We Create Your Tomorrow!

2010-2011
CA-EM-01

CUTTING TOOLS

KORLOY

2010 - 2011









KORLOY



The 21st century of KORLOY is the power for a better future.

KORLOY Inc. is a total cutting tool manufacturer specializing in uncoated, coated (CVD, PVD), and Cermet inserts.
KORLOY Inc. was founded in 1966.
Our establishment is now a top leading cutting tool provider that constantly invests and improves our R&D center in Korea
Our goal is to be the top, globally leading company that overcomes the continuous challenges and innovations.
KORLOY Inc. products manufactured by the ever growing R&D department along with our innovative production technology are selling and exporting to over 80 countries, as the global company recognized with higher technology.
KORLOY Inc. continuously endeavors to grow as the global enterprise representing Korea.
We sincerely anticipate your on-going interest for KORLOY Inc.

KORLOY Inc.

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SAFETY GUIDE OF CARBIDE PRODUCTS

KORLOY Inc. continuously trying to develop safe and good quality products
Please be aware of safety guidance first written below, prior to use KORLOY Inc. products

* It is a general guidance of handling of cemented carbide tools written above
* For more information, please contact us
* KORLOY does not take any responsibility for any accident caused by in-appropriated changes of the products or abusing of tools

1. PL (Product Liability)

In accordance with the PL (Product Liability) law, we have attached label of WARNING on the case of KORLOY products But there's no warning on the surface of tools. Please read this safety guidance before using carbide tools and educate the safety guidance to engineers working at the field

2. Basic characteristics of CEMENTED CARBIDE tools

Cemented carbide tools are made of carbides, nitrides, carbonitrides, oxides of W, Ti, Al, Si, Ta, B etc and metal component like Co,Ni, Cr, Mo as binder. Cemented carbides tools have high hardness and specific gravity. Generally there's no smell but according to usage and treatment, appreance and color could be changed

3. Pre-cautions for CEMENTED CARBIDE tools

1) Cemented carbides are extremely hard but brittle at the same time
   Impactive shock and clamping with excessive power could cause fracture and break of tool
2) Cemented carbides have large sepcific gravity, thus they require special attention as heavy material when you handle big size or large quantity
3) Cemented carbides have different thermal expansion coefficient with steel and ferrous materials
   Shrink fit or swell fit products may cause trouble if they are used at un-desirable conditions like extremly high or low temperature
4) There are several cemented carbide products having sharp cutting edges
   Be careful not to handle the tools with bare hand which may cause cut or injury
   Especially when put out the tools from the case, do not touch the cutting edgies and be careful not to drop it
5) Storing carbide tools at corrosive atmosphere may cause erosion which cause poor toughness
6) Please refer to catalouge, safety guidance prior to handle the tools
7) Do not absue tools at in-appropriate condition

4. Pre-cautions for machining (grinding, welding, EDM) of CEMENTED CARBIDE tools

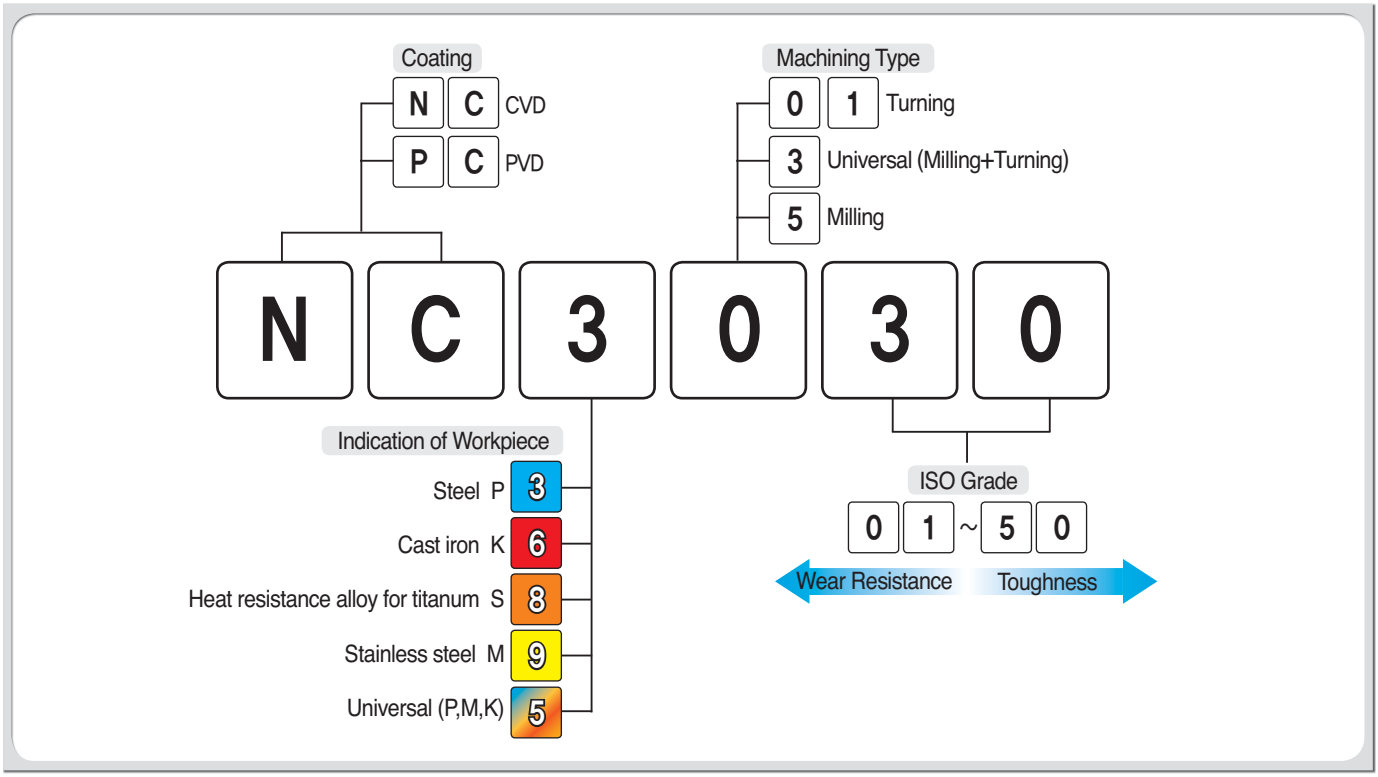
1) Surface condition can affect the toughness of tool, so it is recommended to use diamond grinding wheel
2) Grinding of cemented carbide cause mist and dust. It contains harmful composition like Co, thus it is recommended to use mask, mist collection and other protective facilities. If the dust gets in your skin and eye, washing out with running water immediately
3) In case of grinding with coolant, coolant contains harmful metal components which cause environmental problem
   Treat the coolant very well to get rid of trouble
4) Check crack first after re-grinding carbide tool
5) Marking with laser and ele ctric pen may cause crack on carbide tool. The crack can cause shortened tool life
6) EDM of carbide may cause residual crack on carbide tool, so if necessary, remove the crack with grinding processing
7) Brazing of carbide tools at the extremly high or low temperature compare with melting point of brazing materials may cause loosening or break
8) Using a oil base coolant may cause fire due to over-heat or frame, thus prepare to prevent fire

5. METALCUTTING SAFETY

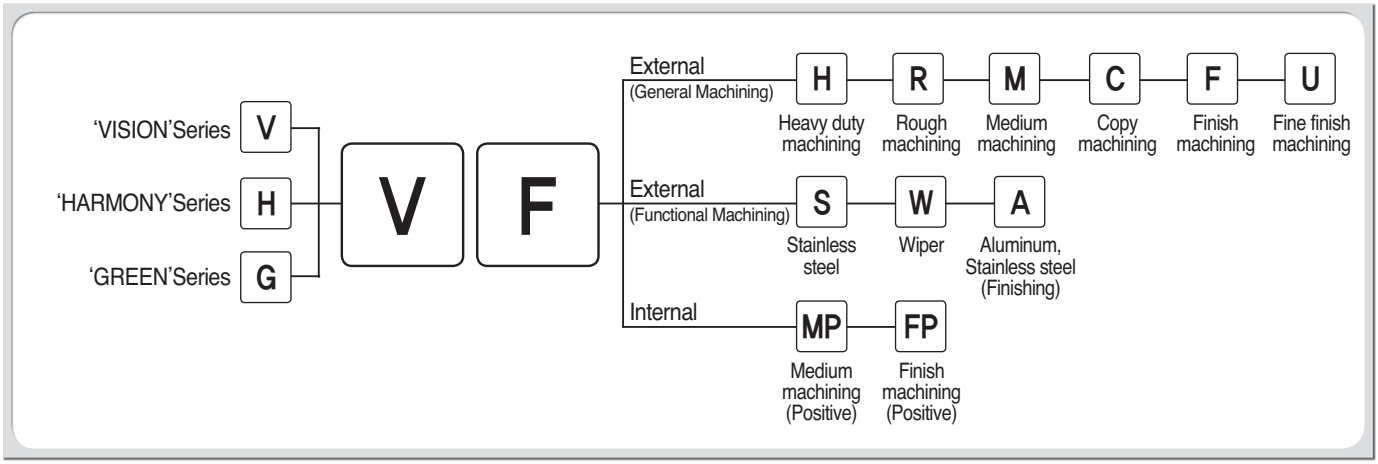
	DANGEROUS FACTOR	SAFETY COUNTERPLAN
Cutting tools	· Sharp cutting edge of cutting tools may cut your bare-hand	· Take gloves when pull out the insert from the case or mount it on the machine
	· In-appropriate condition or usage may cause flagmentation and expel of part of tools that may cause injury	· Use glasses or safety cover for your safety · Use the tools within the recommended range · Please refer to catalogue and safety guide first.
	· Severe load on tool and premature wear of cutting edge may bring excessive cutting force on tool, and it may cause fracture of tools that may cause injure	· Use glasses or safety cover for your safety · Change the tool at proper time
	· Chips evacuated during the cutting are so hot and sharp that may cause a burn and a cut	· Use glasses or safety cover for your safety · Stop the machine first and take safety glove and use hook to get rid of chips
	· If you touch the surface of workpiece immediately after the cutting operation, it may cause a burn	· Use gloves or safety cover for your safety
	· Be aware of a fire and a explosion may brought by the hot chips and spark generated during the cutting operation	· Do not use at the place where having explosive materials · Prepare for fire extinguishments
	· In case of high RPM machining, vibration and chattering may happen due to the balancing trouble of machine	· Use glasses or safety cover for your safety · Check it first that if there's any chattering, vibration or strange noise prior to your main cutting operation
	· Touching of the burr remained on the workpiece with bare-hand may cause a cut	· Do not touch the burr with bare-hand · Use gloves or safety cover for your safety
	· Loose clamping of workpiece may cause the fracture of tool and injure of body	· Clamp the workpiece tightly
	· Tools are operated to right-hand direction normally. Left-hand direction operation can cause fracture of tool and injure of body	· Do not use left-hand direction without notice · Check the package of product to check the availability of left-hand operation
Indexable tools	· Loose clamping of inserts and parts may cause flying out from the tool during the cutting, and it may cause injure	· Chcek the clamping of inserts and parts prior to machining, and do use original parts only
	· Over loaded clamping of inserts by using of zig (such as pipe) may cause dangerous drop out of parts and inserts by fracture	· Do not use zig inappropriately
	· In case of high speed machining, parts and inserts can be dropped out by centrifugal force	· Use within recommended condition · Use glasses or safety cover for your safety
Rotating tools	· Since cutter has sharp cutting edges, bare-hand touch may cause a cut	· Use gloves or safety cover for your safety
	· It is dangerous to take glove with rotating machine · It is also dangerous to be contacted body or clothes with rotating parts	· Do not wear gloves when you work with rotating machine · Keep your body and clothes away from rotating machine
	· Vibration generated by balancing troble may cause a fracture and flying out of tool which may cause injure	· RPM should be controled within recommended condition · Check the balance of rotating part periodically
	· In case of drilling, core bottom part chip of drilled region can be flying out with high speed	· Use gloves or safety cover for your safety
	· The edges of small diameter drill are sharp and easy to break	· Use gloves or profer safety cover for your safety
Brazed tools	· Fragmentation and flying of brazed carbide tip may cause injury	· Check the brazed tip before using. · Do not use at high temperature cutting condition
ETC	· There's a possibility of breaking of carbide tip after several brazing	· Do not use brazing carbide tip that brazed several times
	· Abusing may cause fragmentation of machine and tool that very dangerous	· Stick to safety regulation

KORLOY Inc. Code System

Grade Name for Coated Carbide



Chip Breaker



Terminology of tool formula

TERM	CODE	UNIT
Tool diameter	D	mm
Cutting speed	vc	m/min
Revolution per minute	n	min^{-1}
Feed per minute	vf	mm/min
Feed per revolution	fn	mm/rev
Feed per tooth	fz	mm/t
Tooth	z	
Axial depth of cut	ap	mm
Radial depth of cut	ae	mm
Peak feed	pf	mm

TERM	CODE	UNIT
Horse power requirement	Pc	kW
Specific cutting resistance	kc	MPa
Torque	Mc	N.m
Thrust	Tc	N
Cycle time	tc	min
Tool life	T	min
Flank wear	V_B	mm
Crater wear	Kt	mm
Nose radius	r	mm

C O N T E N T S

Grades / Chip Breakers

A



Grades

Korloy grades system A02

Turning Grades

Turning grade selections A03
CVD coated grades A04
PVD coated grades A06
Uncoated grades A08
Cermet grades A09

Milling Grades

Milling grade selections A11
CVD coated grades A12
PVD coated grades A14
Uncoated grades/Cermet grades A18

Solid Endmills Grades

Solid Endmills grade selections A17
Ultra fine cemented carbides A18

Solid Drills Grades

Solid Drills grade selections A19

Others(turning/milling/endmills)

Diamond coated/DLC coated grades A20
CBN grades A21
PCD grades A23

Chip Breakers

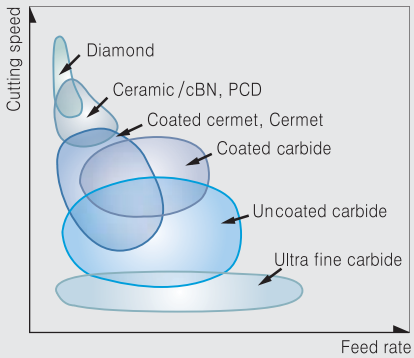
KORLOY Chip Breaker For Turning A24
KORLOY Chip Breaker For Milling A26
KORLOY Chip Breaker For Drilling A27

A Grades

Korloy grades system

Cutting Tool	Uncoated carbide	P	Steel	ST10	ST15	ST20	ST30A	ST30N	ST30	ST40	ST45	ST46
		M	Stainless steel	U10	U20	ST30A	U40					
		K	Cast iron	H02	H01	H05	H10	G10				
		N	Non-ferrous metal	H01								
	Coated carbide for turning	P	Steel	NC3010	NC3020	NC3120	NC3030	NC5330	NC500H			
		M	Stainless steel	PC8110	NC9025	PC5300	PC9030					
		K	Cast iron	NC6105	NC6110	NC315K	NC5330	PC5300				
		S	HRSA	PC8110	NC5330	PC5300						
	Coated carbide for milling	P	For steel	NC5330	NCM325	PC3500	PC5300	NCM335	PC3545			
		M	Stainless steel	NC5330	PC5300	PC9530	PC3545					
		K	Cast iron	PC8110	PC6510	PC5300	NC5330					
		S	HRSA	PC5300	PC3545							
	Coated carbide for Drills, Endmills	Coated	General	PC203F	PC205F	PC210F	PC215F	PC220F	PC220	PC225F		
		Uncoated	General	H01	FS1	FA1	FA2	FG2	FCC			
	Cermet	P	Steel	CN1000	CN2000	CN20	CN30					
		K	Cast iron	CN1000								
	Coated cermet	P	Steel	CC105	CC115	CC125						
	cBN	P	Steel	KB320	KB330	KB350	KB360					
		K	Cast iron	KB410	KB350	KB370						
		S	HRSA	KB370								
		H	Hardened steel	KB410	KB420	KB425	DNC300	DNC200	KB320	KB330	KB370	
	PCD	N	Non-ferrous metal	DP90	DP150	DP200						
	Diamond Coating	N	Turning	ND1000								
			Milling	ND2000								
			Endmills	ND3000								
	DLC Coating	N	Turning	PD1000								
			Milling	PD2000								
			Endmills	PD3000								
Wear resistance Tool	Ultra fine grain cemented carbide	Z	Ultra fine grain cemented carbide	FS1	FA1	FCC						
	Uncoated carbide	V	Wear parts	D1	D2	D3	G5	G6	K20G			
		I	Corrosion resistance	IN10	IN20	IN40						
Mining Tool	Uncoated carbide	E	General	GR10	GR20	GR30	GR35	GR40	GR50			

Application range

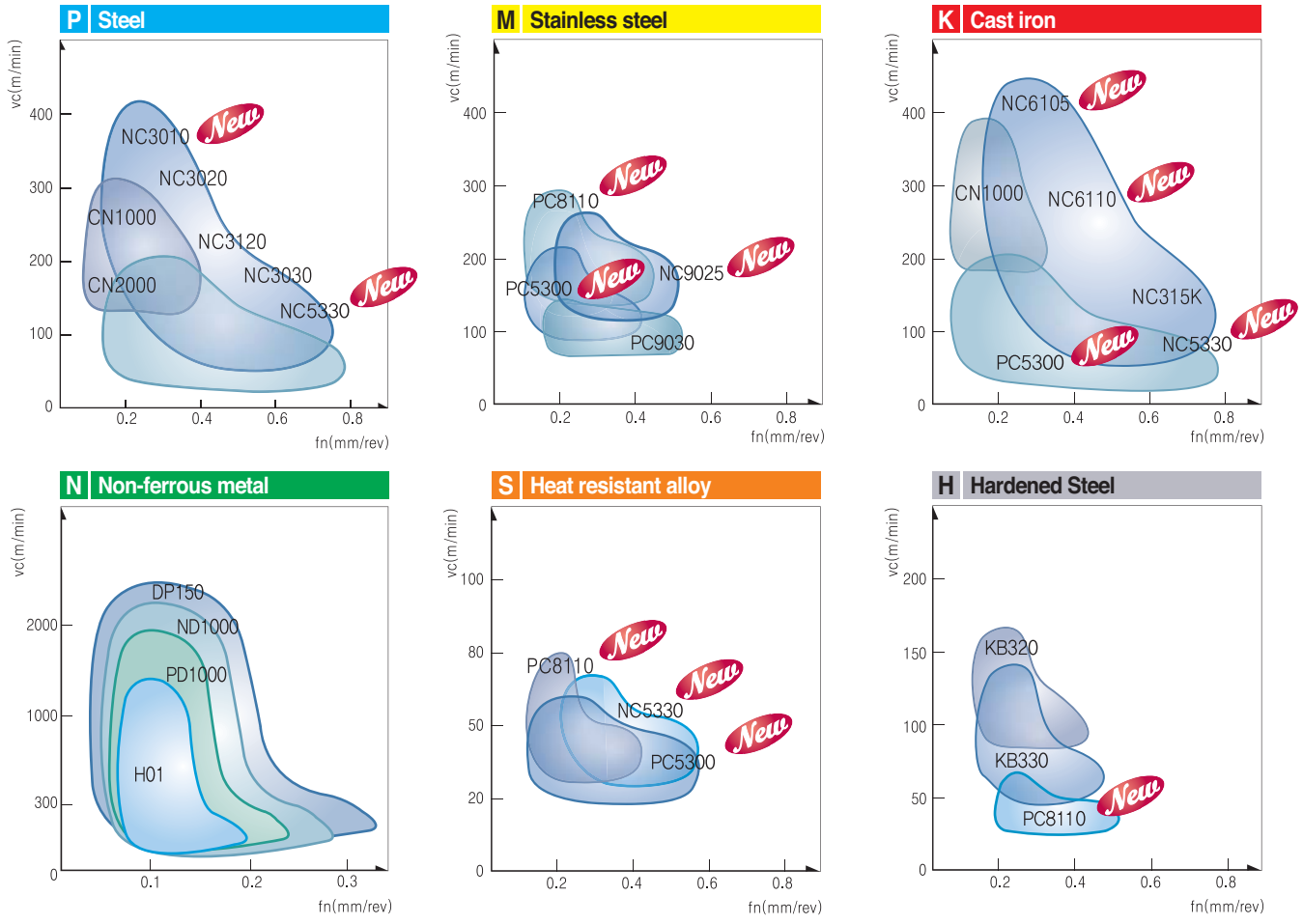


The best way to choose KORLOY turning inserts

Selection system

Workpiece	P Steel						M Stainless steel				K Cast iron				N Nonferrous			S HRSA				H Hardened		
ISO	P01	P10	P20	P30	P40	P50	M10	M20	M30	M40	K01	K10	K20	K30	N10	N20	N30	S01	S10	S20	S30	H01	H10	H20
Coated carbide	NC3010 New						PC8110 New				NC6105 New				ND1000			PC8110 New				PC8110 New		
	NC3020						NC9025 New				NC6110 New				PD1000			NC5330 New						
	NC3120						PC5300 New				NC315K							PC5300 New						
	NC3030						PC9030				NC5330 New													
	NC5330 New										PC5300 New													
	NC500H																							
Cermet	CN1000 New										CN1000 New													
	CN2000 New																							
	CN20																							
cBN / PCD											KB350				DP150							KB320		
											KB360											KB330		
Uncoated carbide	ST05						U10				H02				H01							H01		
	ST10						U20				H01													
	ST15						U40				H05													
	ST20										H10													
	ST30N	ST40									G10													
	ST30		ST46																					
			ST45																					

Application range of turning grades



A Turning Grades

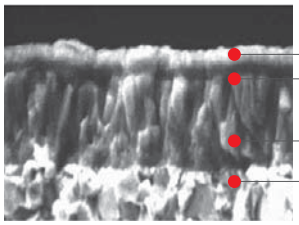
CVD coated Grade

CVD Coated grade for stainless steel and soft steel New

NC9025, NC5330

- Tough carbide, smooth coating applied
- Built-up-edge resistance, notch wear resistance, and the toughness have been improved
- Outstanding performance for stainless steel machining
- Excellent for machining sticky, soft steels and forged steels
- Superior tool life for machining hard to cut material such as inconel and stellite

Coating structure



- TiN film : Smooth surface roughness and superior anti built-up-edge
- Fine columnar TiCN film : Optimimal toughness and hardness
- Toughest dedicated carbide substrate employed
- Al_2O_3 film : Excellent oxidation resistance

Selection system

Workpiece		Machining types	Recommended grade	Recommended cutting speed(m/min)	ISO	Application range
P	Steel	Continuous cutting	NC3010 New	300 (200~400)	P01	NC3010 New
					P10	NC3020
					P15	NC3120
			NC3020	270 (170~370)	P20	NC3030
		Interrupted cutting	NC3120	250 (150~350)		NC5330 New
			NC3030	200 (150~250)	P30	NC500H
			NC5330 New	190 (100~230)	P35	
			NC500H	100 (50~150)	P40	
M	Stainless steel	Continuous cutting	NC9025 New	140 (80~220)	M30	NC9025 New
		Interrupted cutting			M40	
K	Cast iron	Continuous cutting	NC6105 New	270 (150~300)	K05	NC6105 New
			NC6110 New	350 (250~450)	K10	NC6110 New
		Interrupted cutting	NC315K	200 (150~250)	K20	NC315K
			NC5330 New	180 (130~230)	K30	NC5330 New
S	HRSA	Continuous cutting	NC5330 New	40 (20~60)	S20	NC5330 New
		Continuous cutting			S30	

The features of CVD turning grades

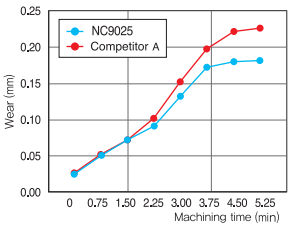
CVD Coated grades	ISO	Features
NC3010 New	P05 ~ P15	• High speed cutting for steel • Combining excellent wear resistance substrate with chipping resistance and heat resistance Al_2O_3 increased stability • MT-TiCN + Al_2O_3 + TiN
NC3020	P15 ~ P25	• High speed cutting for steel • Combining excellent wear resistance substrate with chipping resistance and heat resistance Al_2O_3 increased stability • MT-TiCN + Al_2O_3 + TiN
NC3120	P15 ~ P30	• Medium to roughing for steel • Combining excellent fracture resistance substrate with chipping resistance and heat resistance Al_2O_3 increased stability • MT-TiCN + TiC + Al_2O_3
NC3030	P25 ~ P35	• For general cutting, interrupted cutting and roughing operations in steel and stainless steel • Combining excellent fracture resistance substrate with chipping resistance and heat resistance Al_2O_3 increased stability in wide ranges of cutting conditions • MT-TiCN + TiC + Al_2O_3 + TiN
NC5330 New	P30~P40 M25~M35 K15~K25 S15~S25	• stainless Steel/General Cutting for Mild Steel & Forging Steel • MT-TiCN + Al_2O_3 + TiN
NC9025 New	M25 ~ M35	• General stainless Steel • MT-TiCN + Al_2O_3 + TiN
NC500H	P25 ~ P35	• Heavy interrupted cutting for steel • Plastic deformation and fracture resistance substrate with chipping resistance and heat resistance Al_2O_3 increased stability in wide ranges of cutting conditions • MT-TiCN + TiC + Al_2O_3 + TiN
NC6105 New	K01 ~ K10	• High speed Cutting for cast iron • MT-TiCN + Al_2O_3
NC6110 New	K05 ~ K15	• General cutting for gray cast iron and ductile cast iron • Tough substrate and improved adhesion of thick Al_2O_3 show superior wear resistance • MT-TiCN + Al_2O_3
NC315K	K10 ~ K20	• Interrupted cutting and high-efficiency machining for cast iron • Tough substrate and improved adhesion of thick Al_2O_3 show superior wear resistance • MT-TiCN + Al_2O_3 + TiN

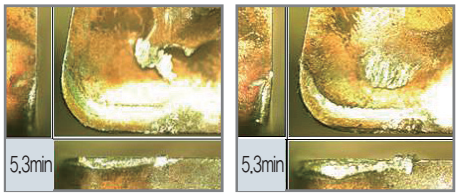
Cutting performance (NC9025 / NC5330)

M Stainless steel (STS316)

- Cutting condition : vc(m/min)=200
  fn(mm/rev)=0.25
  ap(mm)=1.5
  wet
  Wear resistance test
- Designation : **INSERT** CNMG120408-HS
  HOLDER PCLNR2525-M12

■ Test result



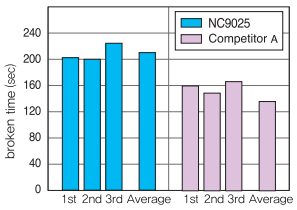


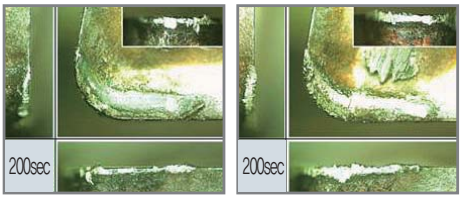
NC9025 New　　Competitor A

M Stainless steel (STS316 with 2 holes)

- Cutting condition : vc(m/min)=200
  fn(mm/rev)=0.25
  ap(mm)=1.5
  wet
  Toughness test
- Designation : **INSERT** CNMG120408-HS
  HOLDER PCLNR2525-M12

■ Test result



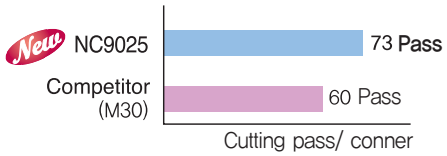


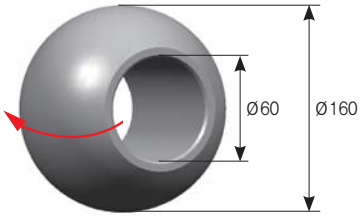
NC9025 New　　Competitor A

M Stainless steel (STS304)

- Cutting condition : vc(m/min)=197
  fn(mm/rev)=0.30
  ap(mm)=0.5
  dry
- Designation : **INSERT** TNMG160408-HS
  HOLDER PTGNR2525-M16

■ Test result

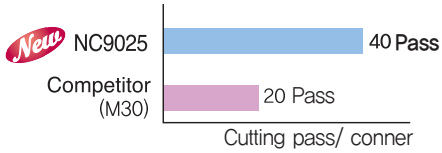


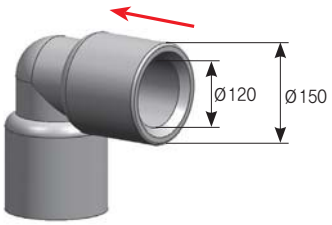


M Stainless steel (STS304)

- Cutting condition : vc(m/min)=115
  fn(mm/rev)=0.20
  ap(mm)=2.0
  wet
- Designation : **INSERT** CNMG120408-HS
  HOLDER DCLNR2525-M12

■ Test result

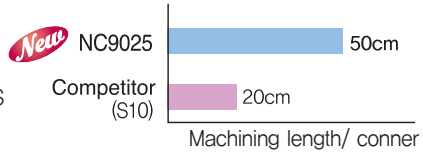


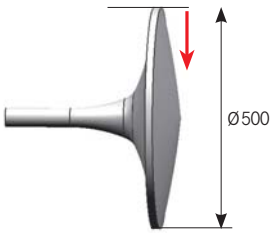


M Stainless steel (STS304)

- Cutting condition : vc(m/min)=32
  fn(mm/rev)=0.14
  ap(mm)=5.0
  wet
- Designation : **INSERT** CNMG190612-GS
  HOLDER PCLNR4040-P19

■ Test result

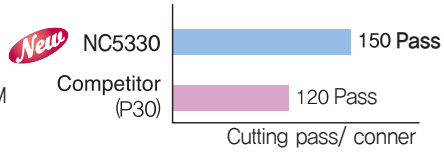


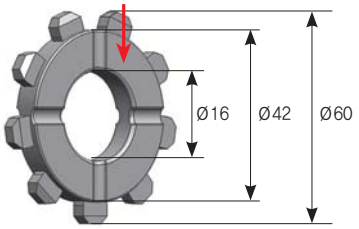


P Forged steel (SCM420HV)

- Cutting condition : vc(m/min)=286
  fn(mm/rev)=0.15
  ap(mm)=2.0
  wet
- Designation : **INSERT** DNMG150608-VM
  HOLDER PDJNR2525-M15

■ Test result





A Turning Grades

PVD coating Grade

PVD Coated grade for stainless steel and HRSA.

PC8110 New

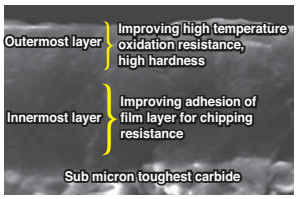
- Micro grain carbide provides minimized chipping of cutting edge due to the enhanced edge strength
- Latest technology of PVD coating equipped with high hardness and high temperature oxidation resistance has applied
- PC8110 provides high productivity during machining HRSA material in high speed, high feed cutting conditions

PVD turning grade for stainless steel and HRSA

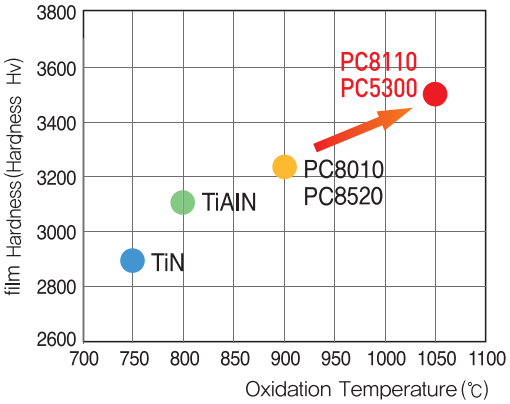
PC5300 New

- High efficiency during machining for carbon steel / cast iron / stainless steel / HRSA
- Stable machining due to specific carbide substrate with strong toughness and high hardness that restrains fracture by chipping
- Excellent wear resistance due to special PVD coating film with oxidation resistance, thermal stability, and surface smoothness

Coating structure



Latest PVD coating technology developed by KORLOY
New concept of coating equipped with high temperature oxidation resistance and high hardness



Selection system

Workpiece		Machining types	Recommended grade	Recommended cutting speed(m/min)	ISO	Application range
P	Steel	Continuous cutting	PC5300 New	120~220(150)	P30	PC5300 New
		Interrupted cutting			P40	
M	Stainless steel	Continuous cutting	PC8110 New	150~250(200)	M10	PC8110 New
			PC5300 New	120~220(170)	M20	PC5300 New
		Interrupted cutting			M30	PC9030
			PC9030	50~180(120)	M40	
S	HRSA	Continuous cutting	PC8110 New	40~90(60)	S10	PC8110 New
		Interrupted cutting	PC5300 New	30~70(50)	S20	PC5300 New
					S30	

The features of PVD coated grades

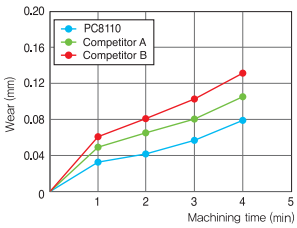
PVD Coated grades	ISO	Features
PC9030	M30~M40	• Medium,roughing and heavy interrupted cutting for stainless steel • TiAlN coating and ultra fine grain substrate adopted • High chipping and welding resistance for stable machining
PC8110 New	M10~M20 S10~S20	• High speed and continuous machining for stainless & HRSA • High chipping and welding resistance longer tool life • New TiAlN coating and ultra fine grain substrate adopted
PC5300 New	P30~P40 M20~M30 K20~K25 S20~S30	• Universal grade for stainless,HRSA,steel and interrupted cast iron machining • High chipping and welding resistance longer tool life • New TiAlN coating and ultra fine grain substrate adopted

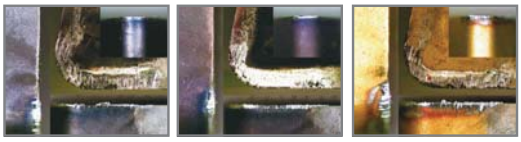
Cutting performance (PC8110 / PC5300)

S Inconel 718

- Cutting condition : vc(m/min)=60, fn(mm/rev)=0.2, ap(mm)=2, wet, (4min machining)
- Designation : INSERT CNMG120408-HS, HOLDER DCLNL2525-M12

■ Test result



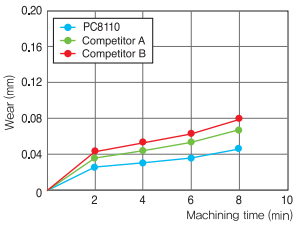


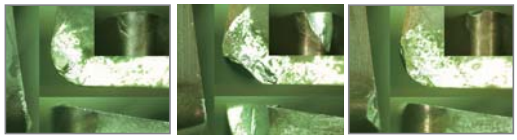
PC8110 New | Competitor A | Competitor B

S Titanium

- Cutting condition : vc(m/min)=70, fn(mm/rev)=0.2, ap(mm)=1, wet, (8min machining)
- Designation : INSERT CNMG120408-HA, HOLDER PCLNR2525-M12

■ Test result



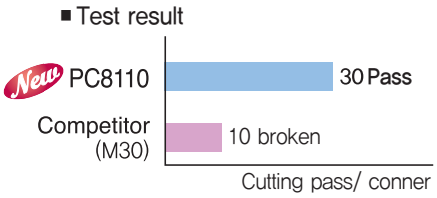


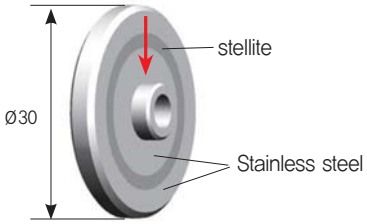
PC8110 New | Competitor A | Competitor B

M S Stainless steel(stellite welded)

- Cutting condition : vc(m/min)=60, fn(mm/rev)=0.2, ap(mm)=2, wet
- Designation : INSERT CNMG120408-GS, HOLDER DCLNL2525-M12

■ Test result

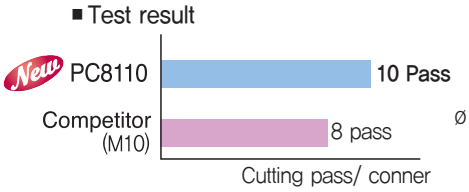


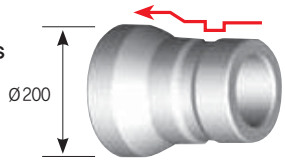


M Inconel 625

- Cutting condition : vc(m/min)=60, fn(mm/rev)=0.2, ap(mm)=2, wet
- Designation : INSERT DNMG150608-HS, HOLDER DDLNL2525-M15

■ Test result

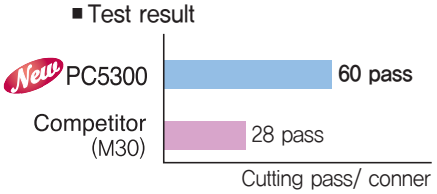


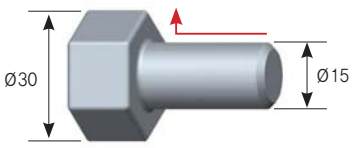


M Stainless steel (STS304)

- Cutting condition : vc(m/min)=282, fn(mm/rev)=0.2, ap(mm)=3, wet
- Designation : INSERT CNMG120408-HS, HOLDER DCLNL2525-M12

■ Test result

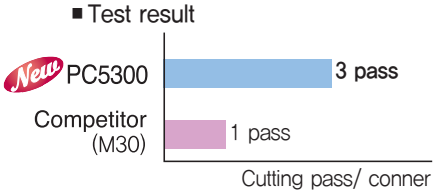


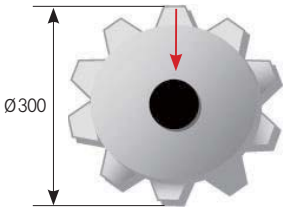


M Stainless steel (STS316)

- Cutting condition : vc(m/min)=120, fn(mm/rev)=0.2, ap(mm)=0.5~1.5, wet
- Designation : INSERT SNMG120408-GS, HOLDER DSBNL2525-M12

■ Test result





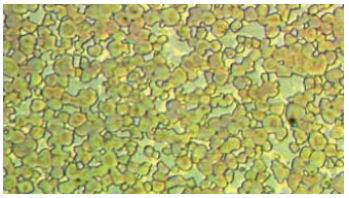
A Turning Grades

KORLOY Uncoated Carbide Grades

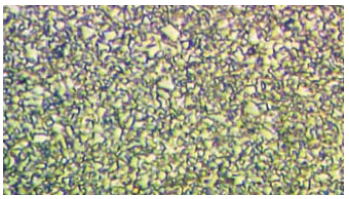
Features

- Korloy's uncoated cemented carbides are designed to optimize machining with uniform quality Furthermore, Korloy's cemented carbide manufactured by top quality tungsten carbides, cobalt and refractory carbides (TiC,TaC) has good toughness and wear resistance

[Microstructure]



P



K

Advantages

- P.M.K cemented carbide can be applied for various workpiece
- Excellent thermal crack resistance makes it possible to machine in wet cutting conditions
- Fine grain and minimizing chemical affinity to workpiece developed by Special design
- High toughness and low cutting force

Selection system

Workpiece		Recommended grade	Recommended cutting speed(m/min)	ISO	Application range
P	Steel	ST10	150 (100 ~ 200)	P10	ST10
		ST15	140 (90 ~ 190)	P20	ST15
		ST20	130 (70 ~ 180)	P30	ST20
		ST30A	130 (70 ~ 180)		ST30A
K	Cast iron	H02	150 (100 ~ 200)	K01	H02
		H01, H05	140 (100 ~ 200)	K10	H01
		H10, G10	130 (90 ~ 190)	K20	H05
	Alloyed aluminum	H01	500 (300 ~ 800)		H10
	Alloyed copper	H01	200 (150 ~ 300)	K30	G10

Main application

ISO	Composition	Features	Workpiece
P	WC–TiC–TaC–Co	Heat resistance, excellent plastic deformation resistance	Carbon steel, Alloy steel, Stainless steel
M	WC–TiC–TaC–Co	General tools harmonized heat resistance with strength	Carbon steel, Alloy steel, Stainless steel, Cast steel
K	WC–Co계	High strength and superior wear resistance	Cast iron, Non-ferrous metal, Plastic, etc

Properties of Uncoated Carbide

ISO	Grade	Hardness (H_RA)	TRS (kgf/mm²)	Young's modulus (10^3kgf/mm²)	Thermal expansion coefficient(10^{-6}/℃)	Thermal conductivity (cal/cm · sec · ℃)
P	ST05	92.7	140	-	-	-
	ST10	92.1	175	48	6.2	25
	ST20	91.9	200	56	5.2	45
	ST30A	91.3	230	53	5.2	-
M	U10	92.4	170	47	-	-
	U20	91.1	210	-	-	88
	ST30A	91.3	230	53	5.2	-
	U40	89.2	270	-	-	-
K	H02	93.2	185	61	4.4	105
	H01	92.9	210	66	4.7	109
	G10	90.9	250	63	-	105

GPa = 102kg/mm², 1W/mk = 2.39×10^{-3}cal/cm · sec · ℃

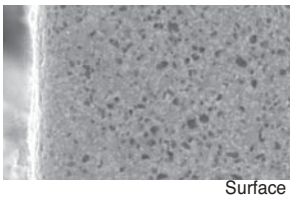
Cermet Grade

For steel, cast iron, other sintering alloy steel(P10, K10) Continuous cutting exclusive cermet

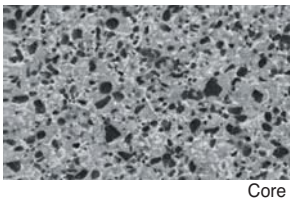
CN1000 New

- Functionally gradient cermet materialization leads excellent quality on both non-grinding and grinding inserts
- Due to increase of plastic deformation resistance, it maintains superior wear resistance and precision on workpiece dimension over long period usage with wet and dry cutting conditions
- Improved adhesion wear resistance on upper part and cutting edge, reduces tool s cutting load and makes surface finishing smooth after machining
- New cermet grade for finishing of cast iron, carbon steel, alloy steel, and other sintered steels

[Microstructure of Ticn-based cermets]



Surface



Core

Selection system

Workpiece		Machining types	Recommended grade	Recommended cutting speed(m/min)	ISO	Application range
P	Steel	Continuous cutting	CN1000 New	280 (150 ~ 400)	P10	CN1000 New
		Interrupted cutting	CN20	210 (120 ~ 300)	P20	CN20
			CN2000 New			CN2000 New
K	Cast iron	Finishing	CN1000 New	280 (150 ~ 400)	K01	CN1000 New
					K10	

The features of KORLOY main cermet grade

Cermet	ISO	Features
CN1000	P05 ~ P15 / K05 ~ K10	• High hardness cermet for steel, cast iron, sintered metal • Functionally gradient material cermet as a next generation cermet
CN2000	P10 ~ P20	• Wide ranges from finishing to roughing in steel machining • Functionally gradient material cermet as a next generation cermet
CN20	P10 ~ P20	• For general turning and milling for steel • General purpose grade provided with both wear resistance and toughness

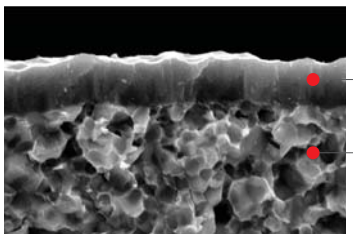
Properties of cermet

ISO	Grade	Hardness	TRS	Specific Gravity
P	CN1000 New	<1900	180<	6.5~7.5
	CN2000 New	<1800	210<	6.8~7.0
	CN20	<1600	220<	6.7~7.0
K	CN1000 New	<1900	180<	6.5~7.5

KORLOY Coated Cermet Grades

Features

- Impact resistance and superior toughness substrate prevent from chipping at initial stage and fracture, ensuring longer tool life
- Lubricant coating layer inducing chip flows reduces the loads on the insert



Selection system

Workpiece		Machining types	Recommended grade	Recommended cutting speed(m/min)	ISO	Application range
P	Steel	Continuous cutting	CC105	350 (250 ~ 450)	P05	CC105
		Interrupted cutting	CC115	280 (230 ~ 400)	P10	CC115
			CC125	230 (150 ~ 300)	P20	CC125

The features of KORLOY coated cermet grade

Coated cermet	ISO	Features
CC105	P01 ~ P10	• PVD coated Cermet • Light cutting for steel and cast iron in high speed machining • Optimized for precision boring
CC115	P10 ~ P20	• PVD coated Cermet • Light cutting for steel and cast iron in medium or high speed machining • Dry and wet cutting are available
CC125	P15 ~ P25	• PVD coated Cermet • High toughness cermet for milling

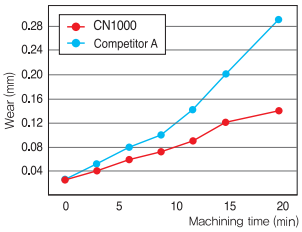
A Turning Grades

Cutting performance(CN1000)

P Carbon steel (SM45C)

- Cutting condition : vc(m/min)=400
  fn(mm/rev)=0.2
  ap(mm)=1.0
  wet
  20min machining
- Designation : **INSERT** CNMG120408-VG
  HOLDER PCLNL2525-M12

■ Test result





CN1000

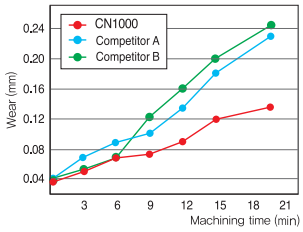


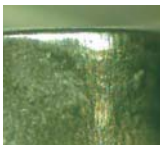
Competitor

K Cast iron(GC250)

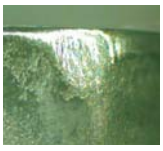
- Cutting condition : vc(m/min)=300
  fn(mm/rev)=0.2
  ap(mm)=1.0
  wet
  21min machining
- Designation : **INSERT** CNMG120408-B25
  HOLDER PCLNR3232-P12

■ Test result

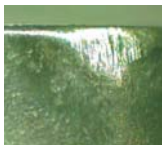




CN1000



Competitor A

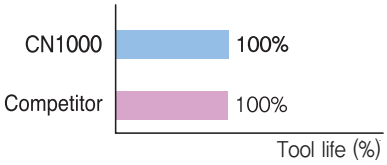


Competitor B

P Carbon steel (SM45C)

- Cutting condition : vc(m/min)=250
  fn(mm/rev)=0.1
  ap(mm)=0.2
  wet
- Designation : **INSERT** VNMG160404-VG
  HOLDER MVQNR2525-M16

■ Test result

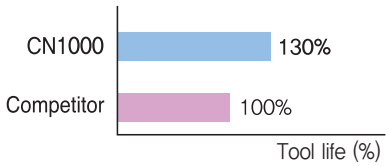


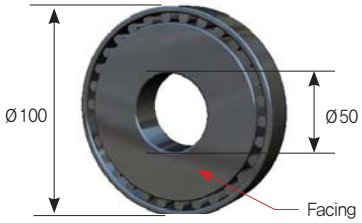


P Alloy steel (SCM420H)

- Cutting condition : vc(m/min)=250
  fn(mm/rev)=0.18
  ap(mm)=0.5
  wet
- Designation : **INSERT** DCMT11T304-C25
  HOLDER SDJCR2020-K11

■ Test result

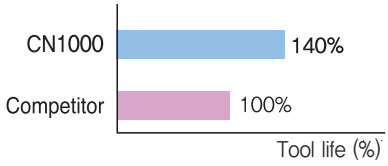


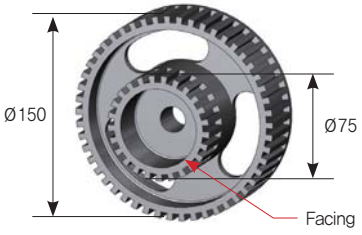


P Sintered ferrous metals

- Cutting condition : vc(m/min)=338
  fn(mm/rev)=0.2
  ap(mm)=0.5
  wet
- Designation : **INSERT** CNMG120408-B25
  HOLDER PCLNR3232-P12

■ Test result





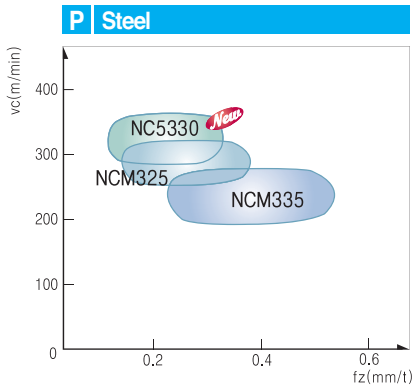
The best way to choose KORLOY Milling inserts

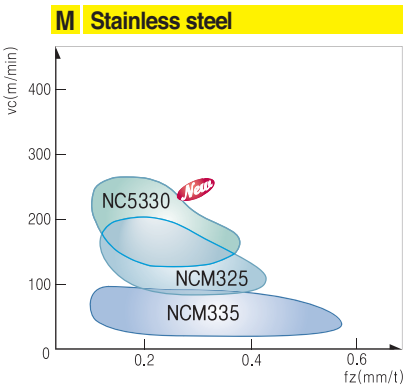
Selection system

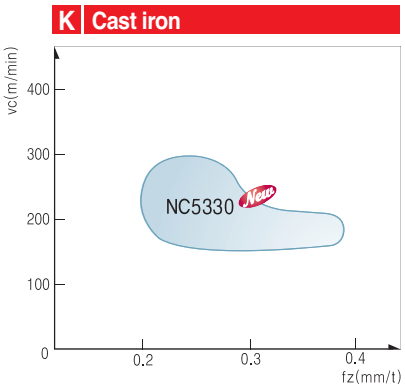
Workpiece	P Steel						M Stainless steel				K Cast iron				N Nonferrous			S HRSA				H Hardened		
ISO	P01	P10	P20	P30	P40	P50	M10	M20	M30	M40	K01	K10	K20	K30	N10	N20	N30	S01	S10	S20	S30	H01	H10	H20
Coated carbide		NC5330 New NCM325 PC3500 New PC5300 New NCM335 PC3545					NC5330 New NCM325 PC5300 New PC9530 NCM335 PC3545				PC8110 New PC6510 PC5300 New NC5330 New				ND2000 PD2000			PC5300 New PC3545				PC210F		
Cermet		CN2000 New CN20 CN30																						
cBN / PCD															DP150			KB360				KB350		
Uncoated carbide		ST20 ST30A ST30N ST40						U10 U20 U40			H01 H05 H10 G10				H01									

Application range of Milling grades

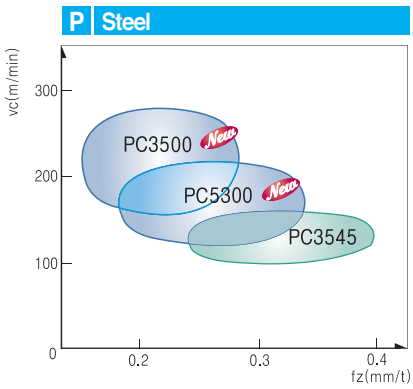
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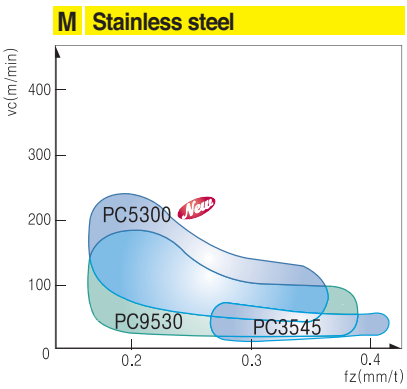


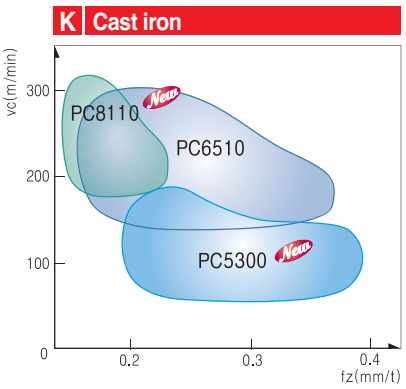


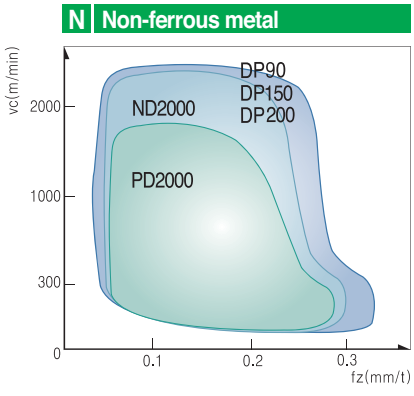


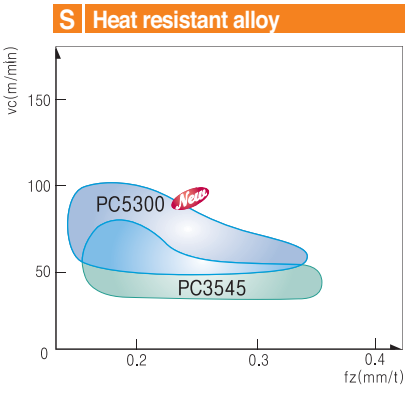
- PVD

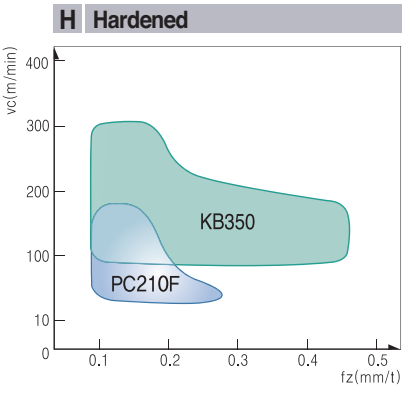












A Milling Grades

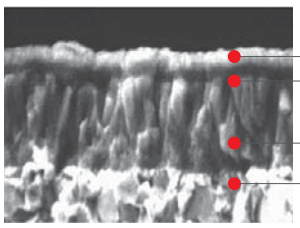
CVD Coated grade

CVD Coated grade for stainless steel and soft steel

NC5330 New

- Tough carbide, smooth coating applied
- Built-up-edge resistance, notch wear resistance, and the toughness have been improved
- Outstanding performance for stainless steel machining
- Excellent for machining sticky, soft steels and forged steels
- Superior tool life for machining hard to cut material such as inconel and stellite

Coating structure



- TiN film : Smooth surface roughness and superior anti built-up-edge
- Fine columnar TiCN film : Optimimal toughness and hardness
- Toughest dedicated carbide substrate employed
- $A\ell_2O_3$ film : Excellent oxidation resistance

Selection system

Workpiece	Machining types	Recommended grade	Recommended cutting speed(m/min)	ISO	Application range
P Steel	Continuous cutting	NC5330 New	270(220~320)	P15, P20	NC5330 New
	Continuous cutting	NCM325	250(150~300)	P25, P30	NCM325
	Interrupted cutting	NCM335	230(120~280)	P35, P40	NCM335
M Stainless steel	Continuous cutting	NC5330 New	200(150~250)	M10, M20	NC5330 New
	Continuous cutting	NCM325	180(140~230)	M30	NCM325
	Interrupted cutting	NCM335	170(120~210)	M40	NCM335
K Cast iron	Continuous cutting	NC5330 New	170(130~220)	K20, K30	NC5330 New

The features of CVD Milling grades

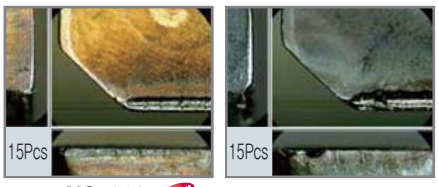
CVD Coated grades	ISO	Features
NC5330 New	P15 ~ P25 M10 ~ M20 K10 ~ K20	• For high speed milling of steel and stainless steel • Superior wear resistance and chipping resistance grade for steel and stainless steel • MT-TiCN + $A\ell_2O_3$ + TiN
NCM325	P20 ~ P30 M20 ~ M30	• For high speed milling of steel and stainless steel • Optimized grade for steel & stainless steel by employing proper substrate and hard coating • MT-TiCN + $A\ell_2O_3$ + TiN
NCM335	P30 ~ P40 M30 ~ M40	• For interrupted and rough milling of steel and stainless steel • Toughest substrate with hard coating provides stable cutting and tool life for severe interrupted cutting • MT-TiCN + $A\ell_2O_3$ + TiN

Cutting performance(NC5330)

P Alloy steel (SCM440)

- Cutting condition : vc(m/min)=250, fz(mm/t)=0.30, ap(mm)=2.0, dry
- Designation : INSERT SDKN1504AESN-SU, HOLDER ADNM5125R

■ Test result

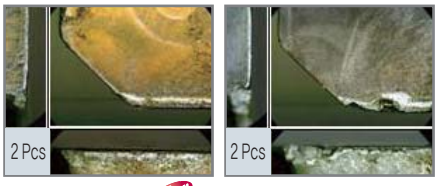


NC5330 New　　Competitor A

M Stainless steel (STS304)

- Cutting condition : vc(m/min)=150, fz(mm/t)=0.25, ap(mm)=2.0, dry
- Designation : INSERT SDKN1504AESN-SU, HOLDER ADNM5125R

■ Test result

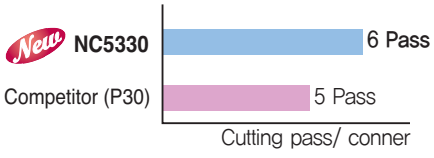


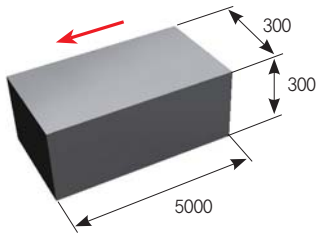
NC5330 New　　Competitor A

P carbon steel (SM45C)

- Cutting condition : vc(m/min)=275, fz(mm/t)=0.13, ap(mm)=7.0, wet
- Designation : INSERT TNMX2710AZNR-NM, HOLDER PBAM5125R-M

■ Test result

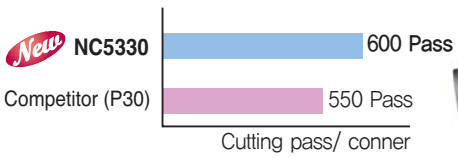


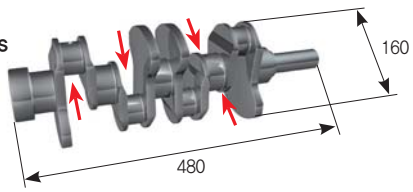


P Alloy steel (SCM440H)

- Cutting condition : vc(m/min)=130, fz(mm/tooth)=0.30, ap(mm)=3.5, dry
- Designation : INSERT HS004072

■ Test result

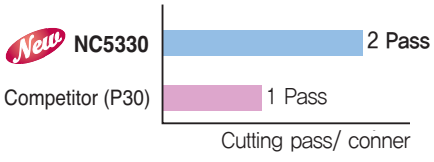


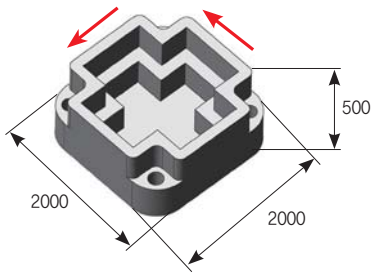


K Ductile cast iron (GCD500)

- Cutting condition : vc(m/min)=200, fz(mm/t)=0.20, ap(mm)=5.0, dry
- Designation : INSERT SDKN1504AESN-SU, HOLDER ADNM5100R

■ Test result

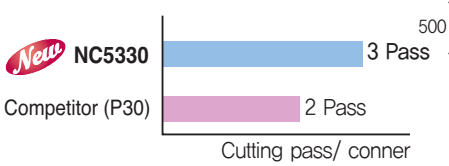


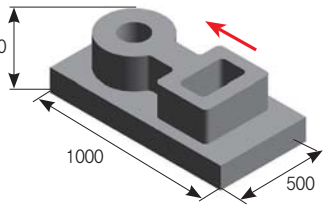


K Gray cast iron(GC400)

- Cutting condition : vc(m/min)=355, fz(mm/t)=0.16, ap(mm)=5.0, dry
- Designation : INSERT SPKN1504EDSR-SU, HOLDER ADNM5100R

■ Test result





A Milling Grades

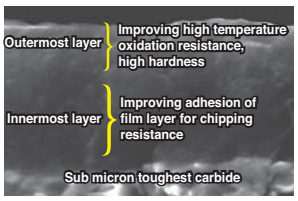
PVD coating Grade

Universal PVD Grade

PC5300 New

- High efficiency during machining for carbon steel / cast iron / stainless steel / HRSA
- Stable machining due to specific carbide substrate with strong toughness and high hardness that restrains fracture by chipping
- Excellent wear resistance due to special coating film with oxidation resistance, thermal stability, and surface smoothness

Coating structure



Latest PVD coating technology developed by KORLOY
New concept of coating equipped with high temperature oxidation resistance and high hardness

Selection system

Workpiece		Machining types	Recommended grade	Recommended cutting speed(m/min)	ISO	Application range
P	Steel	Continuous cutting	PC3500	200 (150~250)	P20	PC3500
					P30	PC5300 New
		Interrupted cutting	PC5300 New	120 (100~150)	P40	PC3545
			PC3545		P50	
M	Stainless steel	Continuous cutting	PC5300 New	120 (100~150)	M20	PC5300 New
		Interrupted cutting	PC9530	130 (50~200)	M30	PC9530
			PC3545	120 (100~150)	M40	
K	Cast iron	Continuous cutting	PC8110 New	250 (200~400)	K01	PC8110 New
			PC6510	200 (150~250)	K05	PC6510
		Interrupted cutting	PC5300 New	165 (120~210)	K10	PC5300 New
					K20	
S	HSRA	Continuous cutting	PC5300 New	70(40~100)	S20	PC5300 New
		Interrupted cutting	PC3545	50(30~70)	S30	PC3545
H	High hardness steel	Continuous cutting	PC210F	250(150~300)	H01	PC210F
					H10	

The features of PVD coated grades

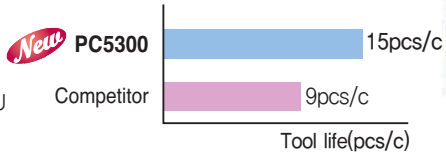
PVD Coated grades	ISO	Features
PC3500	P20 ~ P30	• For medium to rough milling of steel • Special coating film with oxidation resistance, thermal stability and • New technological concept in TiAlN/ TiN coating technology • Inserts available for Grooving, Parting, & Milling
PC8110 New	K01~K10	• Medium and rough cutting for hard to cut material and stainless steel • Superior wear resistance for finishing cast iron • New coating and ultra fine grain provide wear resistance and oxidation resistance • For turning, milling, grooving, parting
PC3545	P30 ~ P50	• Medium and rough milling for steel. • Enhanced chipping resistant substrate. • K-Gold coating
PC5300 New	P30~P40 M20~M30 K10~K20 S20~S25	• Superior universal grade for steel, cast iron, hard to cut material, stainless steel • New coating and ultra fine grain provide wear resistance and oxidation resistance • For turning, milling, grooving, parting, drilling, and threading
PC6510	K05~K15	• High speed milling grade for cast iron and aluminum. • K-Gold coating
PC9530	M20 ~ M35	• Milling grade for cast iron and aluminum in medium to low cutting speed. • The toughest sub-micron substrate provides excellent cutting performance at high feed. • TiAlN coating • For milling, drilling
PC210F	H01~H10	• High speed milling grade for hardened steel , cast iron, and stainless steel(ILaser Mill) • New coating and ultra fine grain provide wear resistance and oxidation resistance • Endmilling

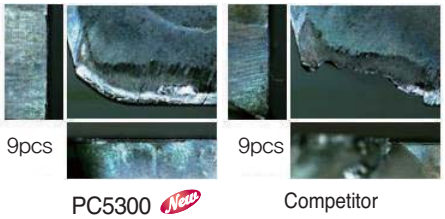
Cutting performance(PC5300)

P Carbon steel (SM45C)

- Cutting condition : vc(m/min)=250, fz(mm/t)=0.3, ap(mm)=2.0, dry
- Designation : INSERT SPKN1504EDSR-SU, HOLDER EPN5160R

■ Test result

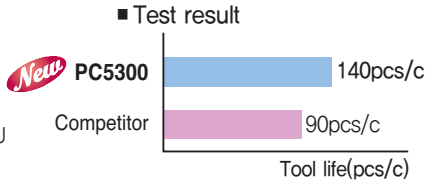


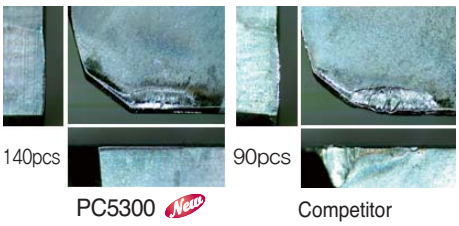


P Alloy steel(SCM440)

- Cutting condition : vc(m/min)=200, fz(mm/t)=0.3, ap(mm)=2, dry
- Designation : INSERT SPKN1504EDSR-SU, HOLDER EPN5160R

■ Test result

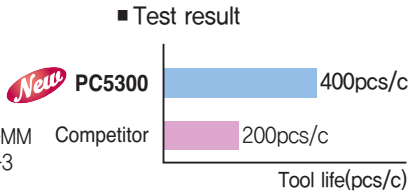


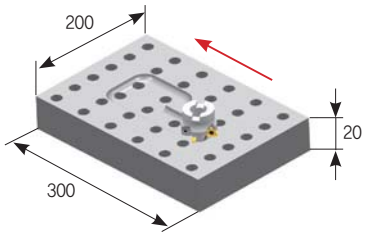


P Hardened steel (KP4M)

- Cutting condition : vc(m/min)=250, fz(mm/t)=1, ap(mm)=1, dry
- Designation : INSERT WNMX130520ZNN-MM, HOLDER HRMDCM13050HR-3

■ Test result

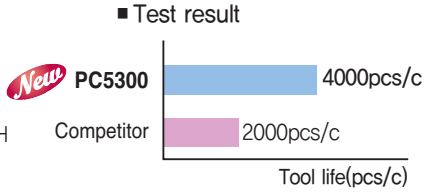


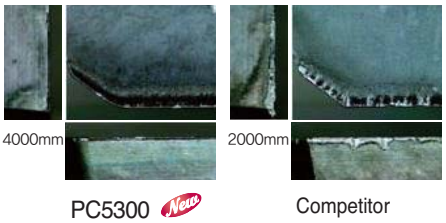


K Cast iron (GC250)

- Cutting condition : vc(m/min)=400, fz(mm/t)=0.2, ap(mm)=3.0, wet
- Designation : INSERT SPCN1203EDER-RH, HOLDER EPN4160R

■ Test result

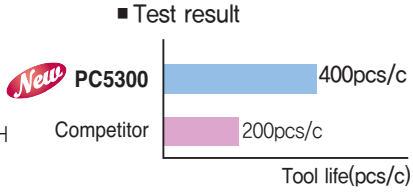


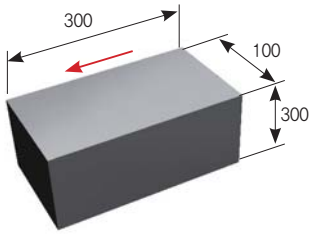


M Stainless steel (STS304)

- Cutting condition : vc(m/min)=175, fz(mm/t)=0.18, ap(mm)=4, dry
- Designation : INSERT SPCN1203EDER-RH, HOLDER EPN4160R

■ Test result

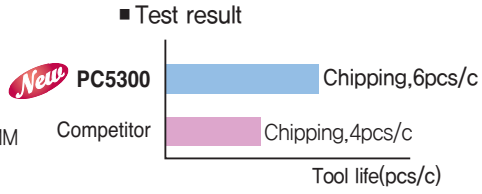


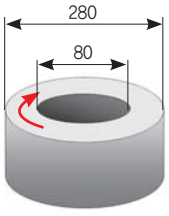


M Stainless steel (STS316)

- Cutting condition : vc(m/min)=65, fz(mm/t)=0.14, ap(mm)=3.0, wet
- Designation : INSERT SEET14M4AGSN-MM, HOLDER FMACM4100HR

■ Test result





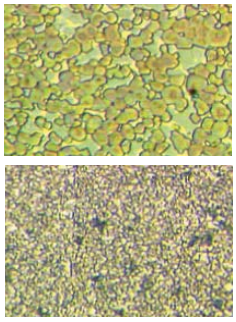
A Milling Grades

Cemented Carbide Grades

Features

- Due to the advanced sintering technology that korloy use, korloy uncoated carbide grades have fine alloy structure which is necessary to get superior quality as a cutting tool

[Microstructure]



Advantages

- Consist of P,M,K carbide grades and can be used in all kinds of workpiece
- Excellent quality at machining with coolant, due to the great thermal crack resistance of carbide
- Due to the special design of carbides, it has fine micro structure and low affinity with workpiece
- It has excellent toughness and low cutting load

Selection system

Workpiece		Grade	Recommended cutting speed(m/min)	ISO	Application range
P	Steel	ST30A	130 (70 ~ 180)	P30	ST30A
K	Cast iron	H01, H05	150 (100 ~ 200)	K01	
		H10, G10	140 (90 ~ 190)	K10	H01
	Aluminum alloy	H01	500 (300 ~ 800)	K20	H05
	Copper alloys	H01	200 (150 ~ 300)	K30	G10

Main composition and application range

ISO	Composition	Features	Workpiece
P	WC–TiC–TaC–Co	Excellent thermal shock resistance and plastic deformation resistance	Carbon steel, Alloy steel, Stainless steel
M	WC–TiC–TaC–Co	General grades with thermal shock resistance and hardness	Carbon steel, Alloy steel, Stainless steel, Cast steel
K	WC–Co계	High hardness and superior wear resistance	Cast iron, Non-ferrous metal, Non metal

The physical properties of grades

ISO	Grade	Hardness (H_RA)	TRS (kgf/mm^2)	Young's modulus ($10^3 kgf/mm^2$)	Thermal expansion coefficient($10^{-6}/℃$)	Thermal conductivity (cal/cm · sec · ℃)
P	ST05	92.7	140	-	-	-
	ST10	92.1	175	48	6.2	25
	ST20	91.9	200	56	5.2	45
	ST30A	91.3	230	53	5.2	-
M	U10	92.4	170	47	-	-
	U20	91.1	210	-	-	88
	ST30A	91.3	230	53	5.2	-
	U40	89.2	270	-	-	-
K	H02	93.2	185	61	4.4	105
	H01	92.9	210	66	4.7	109
	G10	90.9	250	63	-	105

1Gpa = 102kg/m^2, 1w/m · k = 2.59×10^{-3}cal/cm · sec · ℃

Cermet Grades

Selection system

Workpiece		Machining types	Grade	Recommended cutting speed(m/min)	ISO	Application range
P	Steel	Continuous cutting	CN2000 New	250 (200 ~ 300)	P10 ~ P20	CN2000 New
		Continuous cutting	CN20	180 (130 ~ 230)	P15 ~ P25	CN20
		Interrupted cutting	CN30	150 (100 ~ 200)	P20 ~ P30	CN30

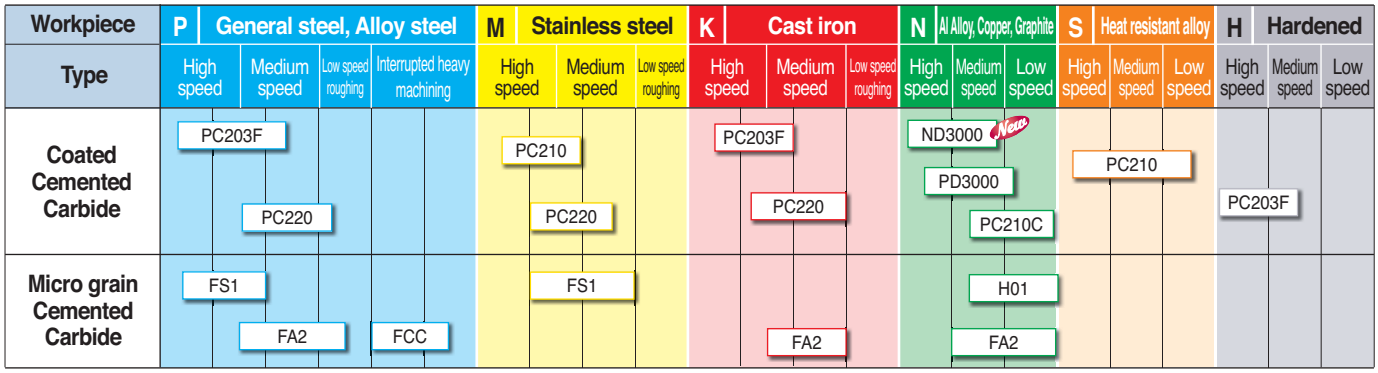
The features of main cermet grades

Cermet Grade	ISO	Features
CN2000	P10 ~ P20	• General grade form roughing to finishing • Cermet with FGM technolodgy
CN20	P15 ~ P25	• Turning and milling for steel. • For general purpose cermet with wear resistance and toughness.
CN30	P20 ~ P30	• Milling for steel. • The toughest cermet with chipping resistance.

The physical properties of grades

ISO	Grade	Hardness(Hv)	TRS(kgf/mm^2)	SG($g \cdot cm^{-3}$)
P	CN20	〈 1600	220 〈	6.7~7.0
	CN30	〈 1500	240 〈	7.0~7.3
	CN2000 New	〈 1800	210 〈	6.8~7.0

Selection system



Selection system

Workpiece		Recommended grade	Recommended cutting speed(m/min)	ISO	Application range
P	Steel	PC203F (H-Max)	130~260	P01	PC203F (H-Max)
				P10	
		PC220 (I-Max)	80~150	P20	PC220 (I-Max)
				P30	
M	Stainless steel	PC210	80~150	M10	PC210
				M20	
K	Cast iron	PC203F (H-Max)	130~260	K01	PC203F (H-Max)
				K10	
		PC220 (I-Max)	80~150	K20	PC220 (I-Max)
				K30	
S	HRSA	PC210	50~100	S15	PC210
				S25	
N	Nonferrous	ND3000(D-Max) New	150~250	N01	ND3000(D-Max) New
		PD3000	150~250	N10	PD3000
		PC210C(C-Max) New	150~250	N20	PC210C(C-Max) New

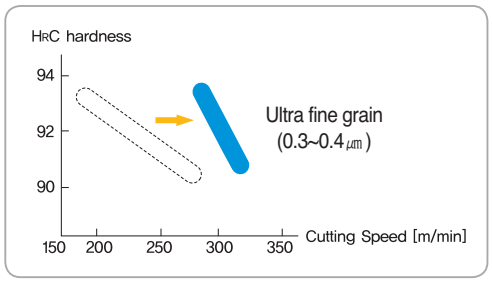
The features of PVD coated grades

PVD Coated grades	ISO	Features
PC203F (H-Max)	P01~P10 K01~K10	• Suitable for high speed cutting of steel • Combination of tough ultra fine grain substrate and PVD coating provide superior wear resistance and chipping resistance • New concept of coating equipped with high • temperature oxidation resistance and high hardness
PC210	M10~S20 S15~S25	• Suitable for medium/low speed cutting of steel, stainless steel and super alloy • Ultra fine grain with coating provide superior tool life in high speed cutting
PC210C (C-Max) New	N10~N20	• Medium to high speed machining of copper • Excellent combination of chipping resistance substrate and K-Silver coating file having wear resistance, good lubrication
PC220 (I-Max)	P15~P35 K15~K35	• General cutting for steel • Combination ultra fine grain and hard coating provide wear resistance and chip welding resistance. • Superior new coating to better chipping resistance and wear resistance

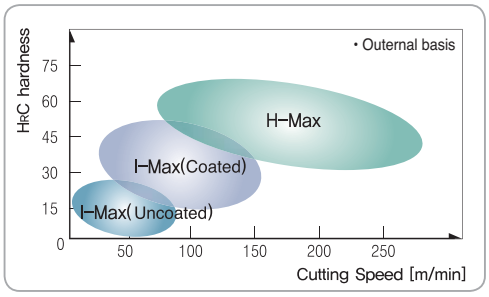
A Solid Endmills

Ultra fine grain cemented carbide

- Ultra fine grade has better toughness than general cemented carbide with same hardness.These properties allow it to replace High Speed Steel
- It is achieved through a high oxidation temperature(1200°C) with high hardness, and provides superb performance for high speed cutting and dry cutting



• Increasing TRS, Cutting speed by applying ultra fine grain

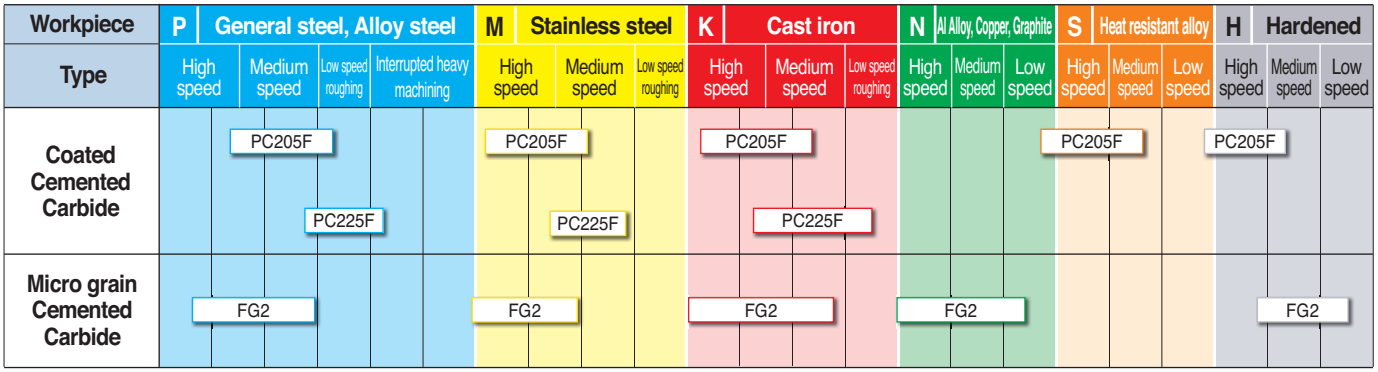


Features of Korloy endmills

Index	Grade	Coating	Features
H-Max	PC203F	TiAlN	Suitable high speed machining for high hardness steel applying by HRC65
I-Max (Coated)	PC220	TiAlN	For general machining (less than HRC45)
I-Max (Uncoated)	FA2	Uncoated	Excellent wear resistance and toughness due to ultra fine grain substrate
I-Max (STS)	PC210	TiAlN	For hard to cut material, stainless steel, non-ferrous metals
SSEA	H01 PD3000	Uncoated DLC	For Aluminum, Aluminum alloy, non-ferrous metals
MSE/MSBE	PC215F	TiAlN	For small work piece machining (machining range Φ0.4~Φ1.0)
Rib Endmills	PC220G PC203G	TiAlN	For copper (magnetic)
C-Max	PC210C New	CrN	For copper, copper alloy (magnetic)
D-Max	ND3000 New	Dia	For Graphite(magnetic), non-ferrous metal

Index	Features
H-Max (for high speed, high hardened steel)	• New design for high hardened steel cutting(over HRc53). Special sphere tool geometry provides increased tool life and it enables higher speed and feed operations • Combination TialN hard coating with suitable substrate increases longer tool life
I-Max (Coated, General machining)	• Superior wear resistance and chipping resistance by applying ultra fine grain and Korloy's exclusive PVD layer • Available for various machining from roughing to finishing
I-Max (Carbide endmills)	• Suitable for all milling types such as jig and molding with various designation • Multi purpose machining possible(shouldering, slotting)
Hard to cut machining, stainless steel	• Sharp cutting edge and high rake angle with streamline chip pocket show good cutting performance in stainless steel machining where work hardening makes tool troubles
Carbide endmills for aluminum alloy (SSEA, SSBEA)	• Suitable for high speed machining in aluminum and other non-ferrous materials • Can accomplish excellent surface finishing, superior chip removal in high feed rate
Micro endmills (MSE/MSBE)	• Small size endmills, for various micro machining, has been strengthened in the neck part for protection against fracture in high speed
Rib endmills	• Suitable for high hardened steel at high speed cutting(HRC65) • For various machining like auto-motor, mobile phone and semi-conductor device mold and die provide high productivity, high efficiency at high speed
C-Max New	• Excellent combination of chipping resistant substrate and CrN coating film having wear resistance and chipping resistance
D-Max New	• Optimum coated property with fine diamond particle in nonferrous metal machining as graphi increasing tool life and good surface roughness through improved edge geometry • Available to cutting application in intermittent cutting condition and high precision machining as well

Selection system



Selection system

Workpiece		Recommended grade	Recommended cutting speed(m/min)	ISO	Application range
P	Steel	PC205F	130~250	P01	
				P10	PC205F
		PC225F	120~220	P20	PC225F
				P30	
M	Stainless steel	PC205F	80~180	M01	
				M10	PC205F
		PC225F	50~150	M20	PC225F
				M30	
K	Cast iron	PC205F	130~250	K01	
				K10	PC205F
		PC225F	120~220	K20	PC225F
				K30	
S	HRSA	PC205F	80~130	S01	
				S10	PC205F
		PC225F	50~100	S20	PC225F
				S30	

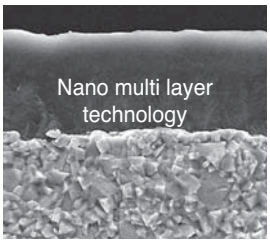
The features of PVD coated grades

PVD Coated grades	ISO	Features
PC205F	P15~P30 M15~M30 K15~K30 S15~S25	• Solid drill(under Φ20) for steel, stainless steel and super alloy • Superior wear resistance and chipping resistance with ultra fine grain
PC225F	P20~P35 M20~M35 K20~K35 S20~S35	• Solid drill(over Φ16) for steel, stainless steel , cast iron, and super alloy • Combining excellent wear resistance and tough substrate for increase stability

A Others

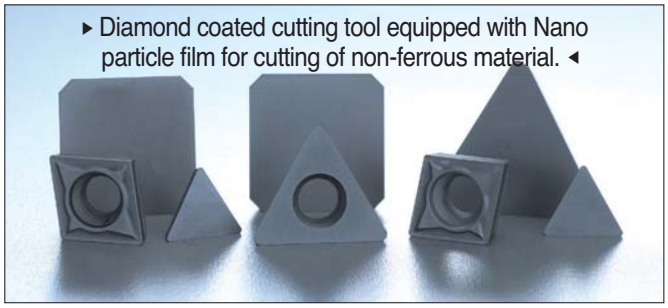
KORLOY Diamond Coated Grades

Special Features



ND1000/ND2000 coating structure

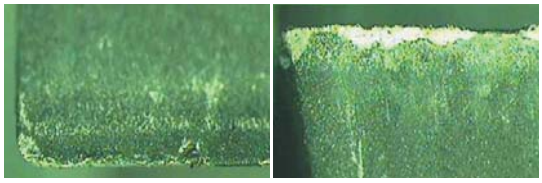
- An increased tool life of up to 150% due to our Nano technology
- Thanks to the nano-size (~100nm) diamond particles, the friction co-efficient has been decreased. Less friction leads to better chip flow
- Due to the minimized built-up on the cutting edge, machined surfaces retain a better finish



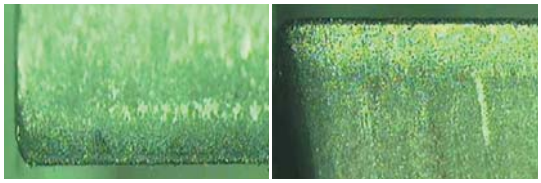
ND Series

Cutting Performance of ND2000

● ND200



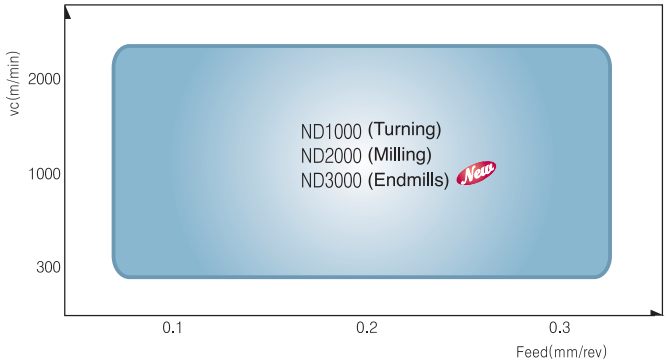
● ND2000



(APKT1604PDFR-MA, AMS3063S)

- Cutting length : 10m
- Speed(vc) : 950m/min
- Feed(fz) : 0.15mm/t
- Workpiece : AC8A
- Depth of cut(ap) : 5mm
- Coolant : Dry

Application range



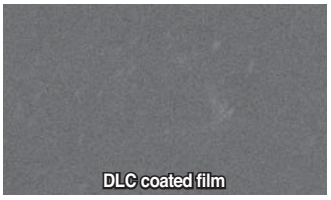
Available Products

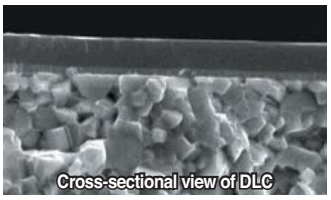
- AR Chip breaker
- AK Chip breaker
- Insert for Aluminum machining

KORLOY DLC Coated Grades

Special Features

- Hardness of film is up to Hv 7000, tool life is 3~6times of the cemented carbide cutting tool
- Good surface finish can be acquired due to the lubrication effect that led from low friction co-efficient (<0.1)
- Suitable for non-ferrous material machining
- Application - For aluminum, carbon, plastic, wood / Insert, drill, end-mill

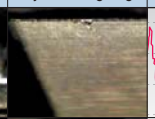
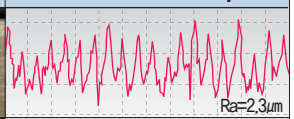
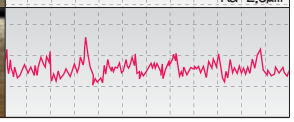






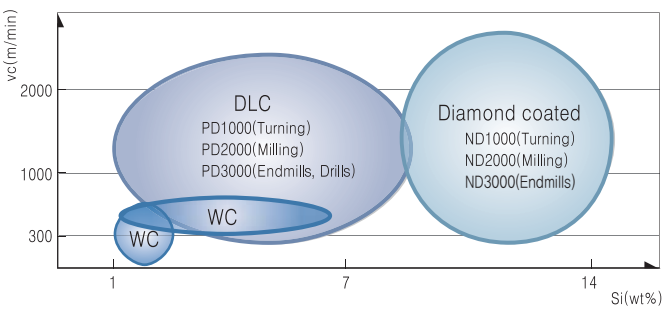
PD Series

Cutting performance (built- up edge / surface finish, FMACM3100R)

View / Grade	Top face	Major cutting edge	Surface finish of workpiece
Uncoated			 Ra=2.3㎛
DLC			

- Workpiece : AC2B
- Cutting length : 12m
- Cutting condition : vc=1500m/min, fz=0.15mm/t, ap=2mm, Dry

Application range



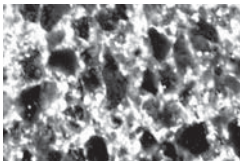
Brand new cBN insert

Coated Multi-Cornered cBN

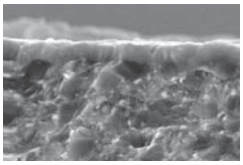
DNC250

New

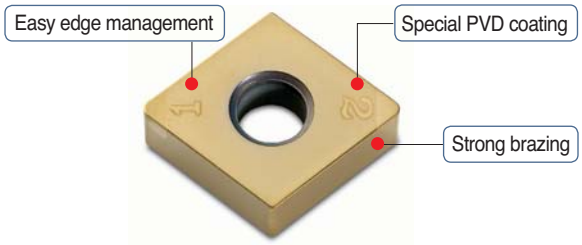
- Stable and long tool life
- Cost effective by multi-cornered one-use insert



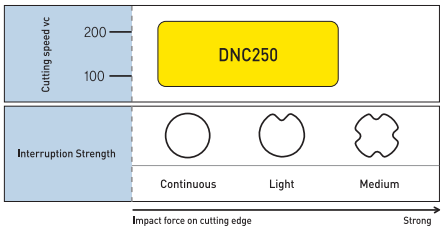
- Black Position : cBN
- White Position : paste



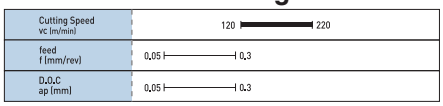
- New technology K-Gold PVD Coated
- Lubricant film
- Enhance wear Resistance



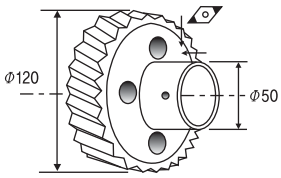
• Application range



• Recommended Cutting Condition

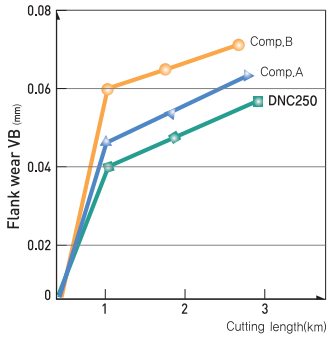


• Application Example



- Cutting condition : vc(m/min)=90, fn(mm/rev)=0.15, ap(mm)=0.15, wet, Light interruption cutting
- Workpiece : Gear, SCM415(HRC58~60)
- INSERT : 2NU-CNGA120408

• Cutting performance Continuous

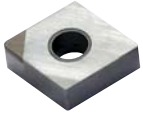
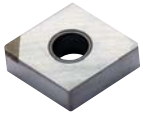
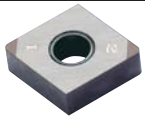


- Cutting condition : vc(m/min)=200, fn(mm/rev)=0.1, ap(mm)=0.1, dry
- Work material : SCM415(HRC58~60)
- INSERT : 2NU-CNGA120408

Features of cBN Grade

Type	Grade	Applications	Features
Uncoated	KB410	High speed continuous cutting of hardened steel	Best wear resistance grade and suitable for high speed continuous cutting
	KB420	High efficiency cutting of hardened steel	Binder with high heat resistance improve tool life during high speed machining
	KB425	High speed interrupted cutting of hardened steel	Superior fracture resistance and suitable for high speed interrupted hard turning
	KB320	Continuous cutting and interrupted cutting of hardened steel	Micro grain cBN with ceramic binder improve fracture resistance and wear resistance
	KB330	Heavy interrupted cutting of hardened steel	Micro grain cBN with higher fracture resistance and wear resistance
	KB350	High speed precision machining of cast iron (GC/GCD)	High fracture resistance and wear resistance
	KB370	High speed machining of cast iron and difficult-to-cut material	The highest hardness and toughness acquire good performance for difficult-to-cut material and cast iron

Type of cBN insert

Regrinding type	One use type	Multi edge type	cBN Coated Multi-Cornered cBN
			
• Long tool life • Excellent wear resistance, High hardness • Saved tool cost due to the regrinding insert 3~4 time  CNMA120408	• Economical price • Cost down • Simple tool management • Various line-up • Stable machining and long tool life due to strong brazing technology  NU CNMA120408	• Insert with several brazed cBN • Price per edge is more reasonable compare to normal single cornered, one-used type • Wide application of continuous to interrupted machining  4NU-CNGA120408	• Easy Edge Management • Specail PVD Coating • Strong Brazing 

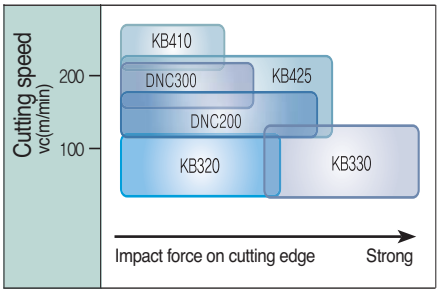
A Others

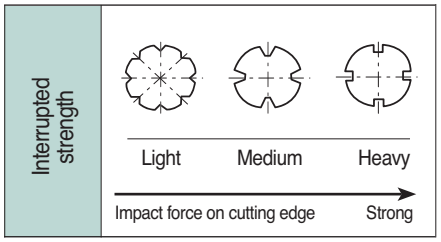
For general hardened steel machining

• Recommended cutting condition

Grade	Cutting Speed, vc(m/min) (50 100 (120) 150 200 250)	feed fn(m/rev) (0 0.1 0.2 0.3) / D.O.C ap(mm) (0 0.1 0.2 0.3 0.4 0.5)
KB410	150 – 200	fn 0.03 – 0.13 / ap 0.03 – 0.2
KB420	120 – 150	fn 0.03 – 0.3 / ap 0.03 – 0.5
KB425	150 – 200	fn 0.03 – 0.3 / ap 0.03 – 0.5
KB320	80 – 120	fn 0.03 – 0.2 / ap 0.03 – 0.3
KB330	80 – 110	fn 0.03 – 0.2 / ap 0.03 – 0.3
DNC200	130 – 170	fn 0.05 – 0.3 / ap 0.05 – 0.3
DNC300	140 – 200	fn 0.05 – 0.5 / ap 0.05 – 0.3

• Application range



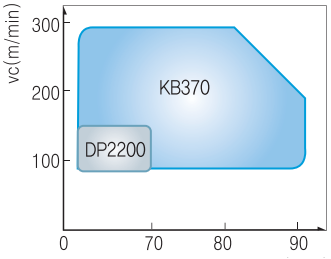


For valve seat ring (VSR)

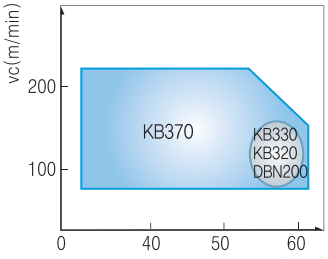
division	Gasoline VSR material	Diesel VSR material
Plunge machining	KB370 KB330	KB370 KB330
Traverse machining	KB370 KB350	KB370 KB350
Hardness(HV)	Low ⬅ HV300 ➡ High	Low ⬅ HV300 ➡ High

For sintered component machining

• General sintered alloy



• High density/ Hardened sintered alloy

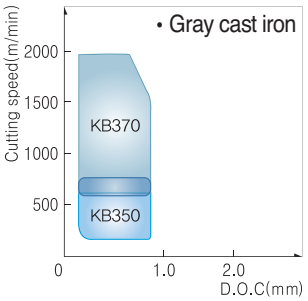


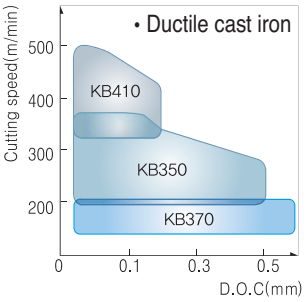
cBN for cast iron

• Recommended cutting condition

division	Workpiece: Material	Workpiece: Grade	Cutting speed, vc(m/min) (100 1000 2000)	fn (mm/rev)	ap (mm)
Turning	Gray cast iron	KB370	500 – 2000	0.1~0.5	≦1.0
		KB350	200 – 700	0.1~0.5	≦1.0
	Alloyed cast iron	KB370	200 – 800	0.1~0.4	≦0.5
	Ductile cast iron	KB370	80 – 200	0.1~0.4	≦0.6
		KB350	100 – 350	0.1~0.4	≦0.5
		KB410	250 – 500	0.1~0.4	≦0.5
Milling	Gray cast iron	KB370	800 – 2000	0.1~0.5	≦0.5

• Application range





Technical information for PCD insert

Features

KORLOY PCD products are manufactured by using high quality PCD tip which is made under ultra high temperature and pressure. The PCD tip has been welded on the qualified carbide insert of KORLOY
Since KORLOY supplies high quality PCD products for turning, milling and endmills, it is possible to meet the needs of variety of application

- Excellent tool life for aluminum alloy and copper alloy
- Excellent tool life for Ceramic, high-Si aluminum and rock or stone
- Excellent tool life for rubber, carbon, graphite and wood



PCD Grade

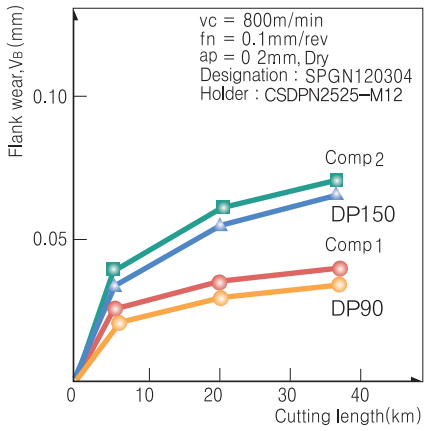
Grade	Features	Application	Grain size(㎛)	Hardness(Hv)	TRS(kgf/㎟)
DP90	Coarse diamond grain has been used to get excellent wear resistance enough to machine cemented-carbide, high Si aluminum alloy	Cemented carbide Ceramic roughing High Si aluminum alloy Rock, Stone	50	10,000~ 12,000	110
DP150	By use of fine diamond grain having good bonding property, it is suitable for machining of non-ferrous metal, graphite	High Si aluminum alloy Copper, Bronze alloy Rubber, Wood, Carbon	5	10,000~ 12,000	200
DP200	By use of ultra fine diamond grain, it is possible to make sharp cutting edge. Thus it is appropriate grade to machine non-ferrous material	Plastic Wood Precise finishing of aluminum	0.5	8,000~ 10,000	220

Recommended cutting condition

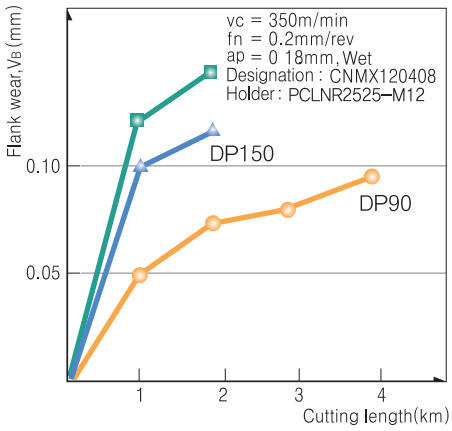
Workpiece	Cutting speed (m/min)	Feed (mm/rev)	Depth of cut (mm)	Recommended grade	
				1st	2nd
Aluminum alloy (4%~8% Si)	1000 ~ 3000	0.1 ~ 0.6	~ 3	DP150	DP200
Aluminum alloy (9%~14% Si)	600 ~ 2500	0.1 ~ 0.5	~ 3	DP150	DP200
Aluminum alloy (15%~18% Si)	300 ~ 700	0.1 ~ 0.4	~ 3	DP150	DP200
Copper, Bronze alloy	~ 1000	0.05 ~ 0.2	~ 3	DP150	DP200
Reinforced plastic	~ 1000	0.1 ~ 0.3	~ 2	DP150	DP200
Wood	~ 4000	0.1 ~ 0.4	–	DP150	DP200
Cemented carbide	10 ~ 30	~ 0.2	~ 0.5	DP90	DP150

Cutting performance

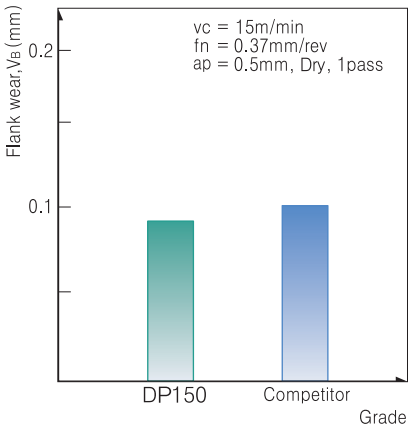
• Continuous cutting test(Workpiece:Al-25%Si)



• Interrupted cutting test(Workpiece:Al-20%Si)



• Cutting test of cemented carbide



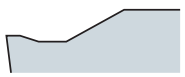
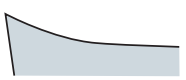
A Chip breakers(Turning)

KORLOY Chip Breaker For Turning

	Geometry	Cutting edge	Application range (feed rate mm/rev: 0.04 0.063 0.10 0.16 0.25 0.4 0.63 1.0 1.6 2.5 4.0 6.3 / depth of cut mm: 0.1 0.16 0.25 0.4 0.63 1.0 1.6 2.5 4.0 6.3 10.0 11.6 13)	Features
V Series	VG		0.1~0.35 0.5~2.5	For finishing • Ensures stable chip flow even at very small depth of cut • Suitable for copying
	VQ		0.1~0.4 1.0~3.0	For Medium to Finish Cutting • Strong cutting edge makes excellent cutting performance at interrupted cutting
	VL		0.1~0.35 0.2~1.5	For Medium cutting • Stable chip control in high toughness material; low carbon steel, pipe steel & steel plates • Improved chip control for facing, copy machining and better surface finish
	VF		0.05~0.35 0.5~2.0	For Finishing • Good chip control quality on varied depth of cut • Excellent cutting edge strength has been acquired due to the special chip-breaker
	VB		0.15~0.45 0.5~2.0	For finishing • Improved chip control for smaller depth of cuts • Excellent chip control in copying, corner R machining
	VM		0.1~0.5 1.0~5.0	For Medium cutting • Wide available chip control range from medium-finishing to medium-roughing • Suitable chip breaker for CNC machining
	VH		0.7~1.4 6.0~15.0	For Heavy duty cutting • Designed specifically for heavy machining • Specialized chip breaker for the heavy industries like Ship building, Power plant industry
	VT		0.75~1.6 7.0~17.0	For Heavy duty cutting • Designed specifically for heavy machining • Specialized chip breaker for the heavy industries like Ship building, Power plant industry
H Series	HU		0.03~0.25 0.1~1.5	For Ultra-fine Finishing, Finishing • Suitable for a machining need fine surface finish and a machining generate low cutting force due to sharp cutting edge design. • Specially designed chip breaker ensure stable chip control at ultra fine finishing condition.
	HC		0.08~0.4 0.8~3.0	For Medium to Finish Cutting • Excellent for copying of special shape • Smooth chip control at shallow cut as well as deep depth of cut
	HR		0.25~0.65 2.5~7.0	For Roughing • Excellent chip control at deep depth of cut and fast feed rate • Strong cutting edge makes excellent cutting performance at intermittent cutting
	HA		0.03~0.3 0.5~2.5	For Light-alloy, Stainless-steel machining • Sharp cutting edge generates low cutting force • Specially designed tough main cutting edge • Suitable for cutting of low carbon steel, stainless steel, aluminum
	HS		0.1~0.4 1.0~4.0	For Medium cutting of Stainless steel • Exclusive design for stainless steel cutting provide longer tool life • Wear resistance have been reinforced through high rake angle of chip breaker land
G Series	GM		0.1~0.5 0.7~4.0	For Medium to Light cutting • Excellent chip control at general cutting conditions • Strong cutting edge strength provides good performance at intermittent and fast feed cutting

Notice: Application ranges are based on main cutting material

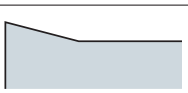
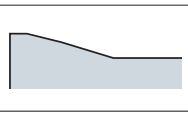
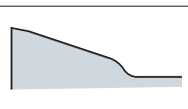
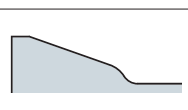
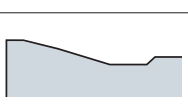
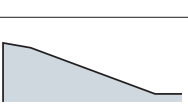
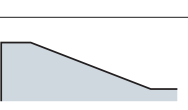
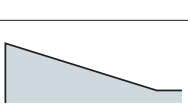
KORLOY Chip Breaker For Turning

Geometry		Cutting edge	Application range feed rate (mm/rev): 0.04 0.063 0.10 0.16 0.25 0.4 0.63 1.0 1.6 2.5 4.0 6.3 depth of cut (mm): 0.1 0.16 0.25 0.4 0.63 1.0 1.6 2.5 4.0 6.3 10.0 11.6 13	Features
G Series	GR		0.3~0.8 3.0~8.0	For Medium to Roughing • Suitable for deep depth of cut and high feed cutting of steel and cast iron • Suitable for intermittent cutting
	GH		0.3~1.3 3.0~11.0	For Heavy duty cutting • Suitable for heavy duty cutting due to strong cutting edge • Wide chip control range with low cutting force
	GS		0.15~0.5 1.5~5.5	For Medium to Roughing of Stainless-steel • Exclusive chip breaker for stainless steel
B Series	B25		0.5~1.0 4.0~10.0	For General cutting • Suitable for general cutting condition cutting
V-posi Series	VF		0.05~0.25 0.1~1.5	For finishing • Improved surface finish and size accuracy due to stable inner boring
H-posi Series	HFP		0.05~0.25 0.1~1.5	For Finishing • Excellent chip control at shallow depth of cut and low feed rate • Excellent surface finish of work piece due to reduced cutting force • Suitable for fine boring
	HMP		0.02~0.4 0.5~3.5	For Medium cutting • Excellent chip control at wide range of cutting conditions • Suitable for stainless steel cutting
C Series	C25		0.1~0.35 1.0~3.0	For Medium cutting • Suitable for interrupted cutting and cast iron machining • Good surface finish due to low cutting force • Suitable for both boring and outer diameter turning
AL Series	AK		0.03~0.4 0.1~4.0	For Aluminum cutting • High rake angle and low resistance cutting edge secures long tool life in continuous cutting of aluminum turning • High speed of finishing operation
	AR		0.05~0.5 0.5~4.0	For Aluminum cutting • High stability of cutting edge secures great performance in high speed and interrupted machining • High speed of medium and interrupted operation
Auto tool Series	KF		0.01~0.12 0.01~1.0	For Finishing • Shallow depth of cut with sharp edge. • Longer tool life at high speed cutting due to low cutting force • Good surface finish
	KM		0.04~0.15 0.05~1.5	For Medium to Finish cutting • Improved chip control makes tool life long and better machining
Wiper tool Series	LW		0.15~0.6 1.0~5.0	For Medium cutting (Wiper) • Guarantees excellent surface roughness and good chip controls at high feed machining
	VW		0.15~0.5 0.5~3.5	For Finishing (Wiper) • Improved surface roughness at shallow depth of cut and high feed due to strong cutting edge

Notice: Application ranges are based on main cutting material

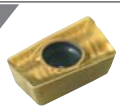
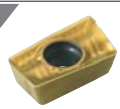
A Chip breakers(Milling)

KORLOY Chip Breaker For Milling

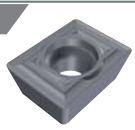
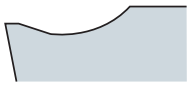
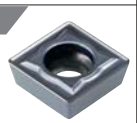
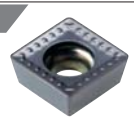
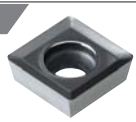
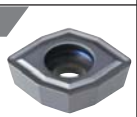
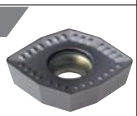
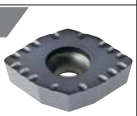
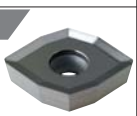
Geometry		Cutting edge	Application range (feed rate (mm/t): 0.04 0.063 0.10 0.16 0.25 0.4 0.63 1.0 1.6 2.5 4.0 6.3 / depth of cut (mm): 0.1 0.16 0.25 0.4 0.63 1.0 1.6 2.5 4.0 6.3 10.0 11.6 13)	Features
MX Series	MX		0.1~0.3 1.0~5.0	For General Milling • Possible to increase productivity through increase feed and depth • Excellent heat resistance due to the special chip breaker design of top face of insert
Futur Mill Series	MF		0.05~0.2 0.5~'5.0	For Finishing of Milling • Special design for light cutting of gummy materials like stainless steel and hard to machine material provide fine surface finish and longer tool life
	MM		0.05~0.3 1.0~5.0	For Medium cutting of Milling • Chip breaker design to cover general cutting condition provides wide available application range • Ground type and as sintered type is available
	MR		0.05~0.35 1.5~5.0	For Roughing of Milling • Strongest cutting edge strength provide stable tool life even in case of severe cutting with heavy intermittent and heavy roughing
	MA		0.1~0.35 0.5~5.0	For Aluminum Milling • Suitable design for aluminum machining like sharp cutting edge, mirror face of insert top which prevent built-up-edge, provide excellent cutting performance
RichMill Series-RM8	MA		0.05~0.35 0.3~6.0	For Aluminum • Sharp cutting edge and buffed top face show excellent chip flow and welding resistance in aluminum machining
	MF		0.05~0.35 0.3~6.0	For Finishing of Milling • Low cutting force chip breaker design ensures longer tool life and excellent machining in difficult-to-cut material and light machining
	MM		0.1~0.4 0.5~6.0	For Medium to Roughing of Milling • Suitable geometry design for general milling has wider ranges of machining
RichMill Series-RM4	MA		0.05~0.25 0.3~14.0	For Aluminum cutting • Sharp cutting edge design ensures low cutting resistance and excellent machining in difficult-tocut materials, aluminum and light machining
	MF		0.05~0.3 0.5~14.0	For Finishing of Milling • Low cutting force chip breaker design ensures longer tool life and excellent machining in difficult-to-cut material and light machining
	MM		0.05~0.3 1.0~14.0	For Medium to Roughing of Milling • Suitable geometry design for general milling has wider ranges of machining
RichMill Series-RMT	MF		0.05~0.2 0.5~5.0	For Finishing of Milling • Low cutting force chip breaker design ensures longer tool life and excellent machining in difficult-to-cut material and light machining
	MM		0.05~0.3 0.5~8.0	For Medium to Roughing of Milling • Suitable geometry design for general milling has wider ranges of machining
RichMill Series-RM16	MA		0.05~0.3 0.3~5.5	For Aluminum cutting • Sharp cutting edge design ensures low cutting resistance and excellent machining in difficult-tocut materials, aluminum and light machining
	MF		0.05~0.4 0.3~5.5	For Finishing of Milling • Low cutting force chip breaker design ensures longer tool life and excellent machining in difficult-to-cut material and light machining
	MM		0.1~0.45 0.5~5.5	For Medium to Roughing of Milling • Suitable geometry design for general milling has wider ranges of machining
	W		0.05~0.3 0.3~2.0	For Finishing of Milling (Wiper) • Wiper insert provides improved surface roughness due to special cutting edge

Notice: Application ranges are based on main cutting material

KORLOY Chip Breaker For Milling

Geometry		Cutting edge	Application range (feed rate (mm/t): 0.04 0.063 0.10 0.16 0.25 0.4 0.63 1.0 1.6 2.5 4.0 6.3 / depth of cut (mm): 0.1 0.16 0.25 0.4 0.63 1.0 1.6 2.5 4.0 6.3 10.0 11.6 13)	Features
Alpha Mill Series	MA 		0.1~0.4 0.5~16	For Aluminum • Sharp cutting edge and buffed top face show excellent chip flow and welding resistance in aluminum machining
	MF 		0.05~0.15 0.5~16	For Finishing of Milling • Low cutting force chip breaker design ensures longer tool life and excellent machining in difficult-to-cut material and light machining
	MM 		0.1~0.25 0.5~16	For Medium to Roughing of Milling • Suitable geometry design for general milling has wider ranges of machining

KORLOY Chip Breaker For Drilling

Geometry		Cutting edge	Application range (feed rate (mm/rev): 0.04 0.063 0.10 0.16 0.25 0.4 0.63 1.0 1.6 2.5 4.0 6.3 / depth of cut (mm): 30 60 90 120 150 180 210 240 270 300 330 900)	Features
LPDrill Series	DF 		0.02~0.10 70~150	For Finishing of Drilling • Suitable design for small hole drilling • It provides excellent cutting performance in high speed and feed
SPDrill Series	DF 		0.02~0.12 70~170	For Finishing of Drilling • As a chip breaker for general drilling, it guarantees long tool life and good performance at low speed & feed and specially applies to difficult-to-cut material
	DM 		0.04~0.15 70~170	General steel, cast iron • As a chip breaker for general drilling, it minimizes cutting load and shows excellent chip control in especially small hole making so that it ensures longer tool life and excellent machining
	DS 		0.04~0.15 50~120	For Stainless steel Drilling • As an insert for stainless steel drilling, combination of high rake angle and convex dot put on top face make good chip control and long last tool life at the same time
	DA 		0.04~0.16 150~300	For Aluminum Drilling • As an insert for aluminum drilling, it has sharp cutting edge and polished mirror top face. It prevents built-up-edge, thus get great chip flow
NPDrill Series	DM 		0.06~0.25 70~170	For Medium cutting of Drilling • Major application of steel and cast iron • Strong cutting edge suitable for interrupted hole drilling
	DS 		0.06~0.18 50~120	For Stainless steel Drilling • Suitable design for stainless steel drilling having sharp edge and chip breaker
	DR 		0.04~0.18 30~90	For Roughing of Soft steel • Roughing of soft steel • Strong cutting edge suitable for interrupted hole drilling provides excellent cutting performance
	DA 		0.06~0.25 50~300	For Aluminum Drilling • Suitable design for aluminum machining • Sharp cutting edge and buffed surface prevent built-up-edge • It provides excellent cutting performance in high speed aluminum drilling

Notice: Application ranges are based on main cutting material



CONTENTS

Turning

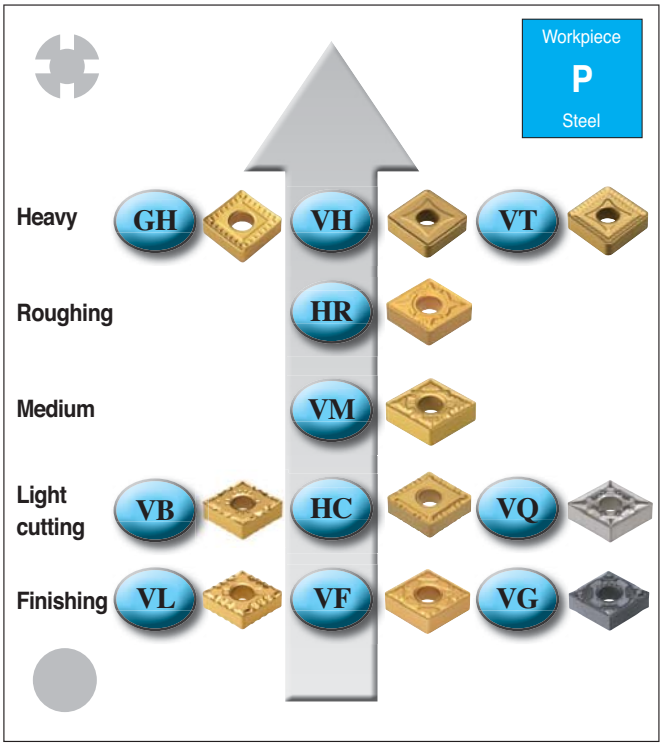
Application range of Korloy main Chip Breakers B02
Recommended Chip Breakers for Work piece B04
New chip breakers B11

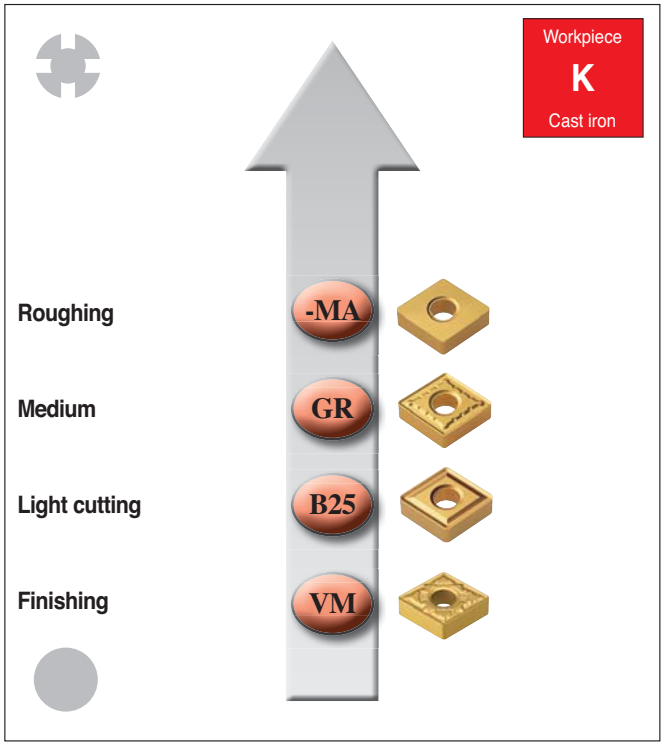
Turning Insert Code System(ISO) B14
Turning Insert B16

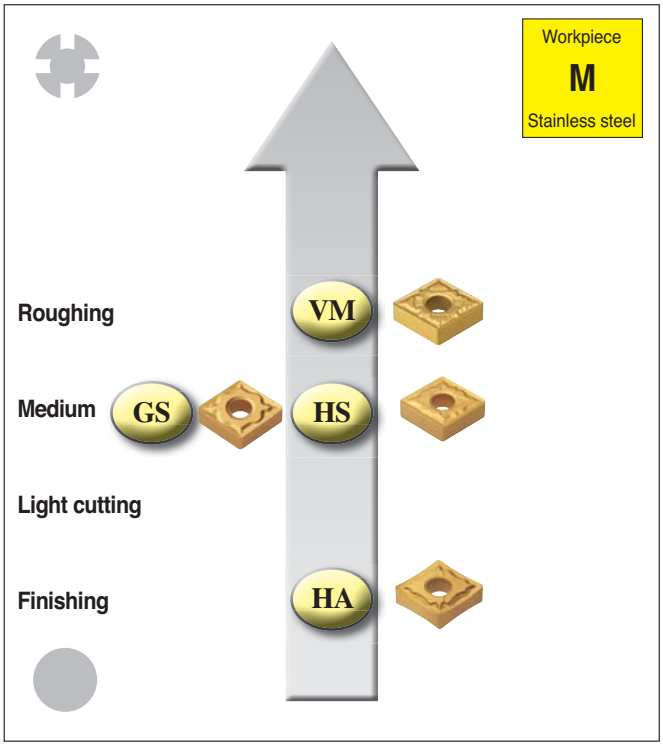


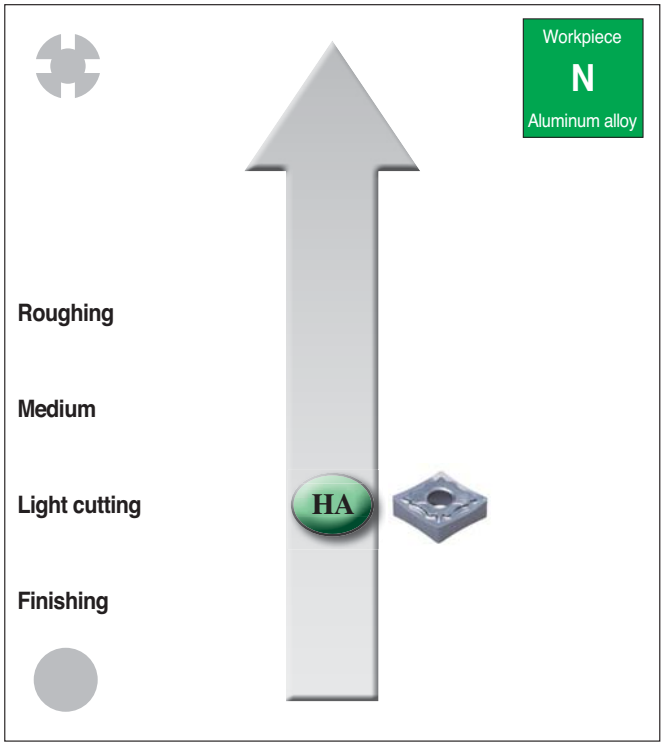
Applications range of chip breakers

Negative inserts

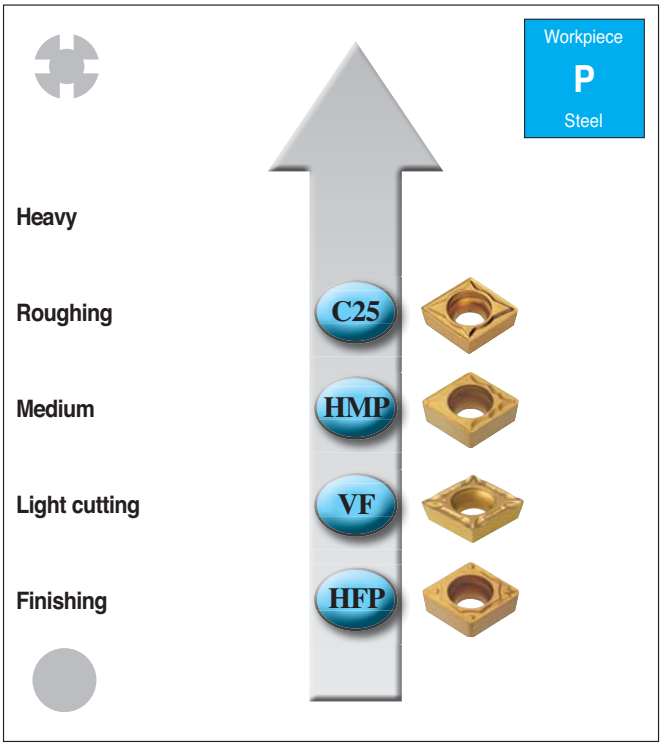


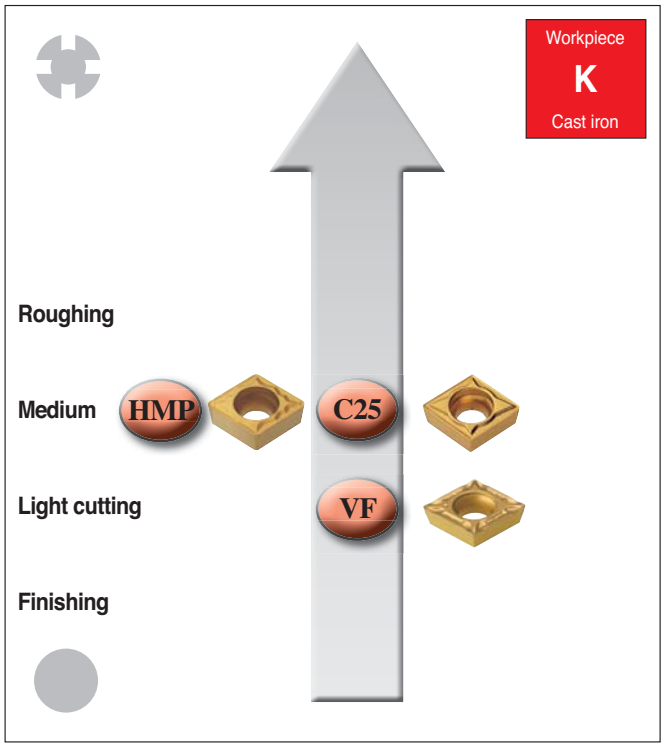


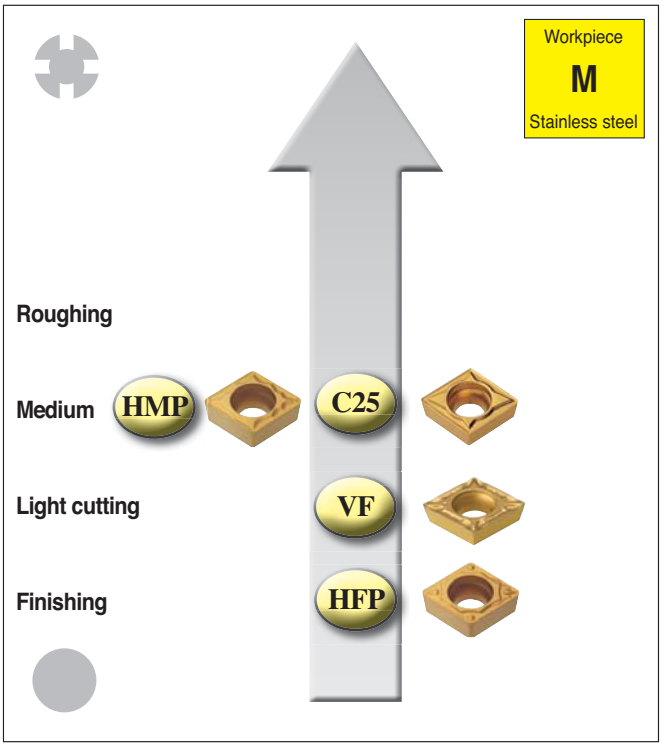


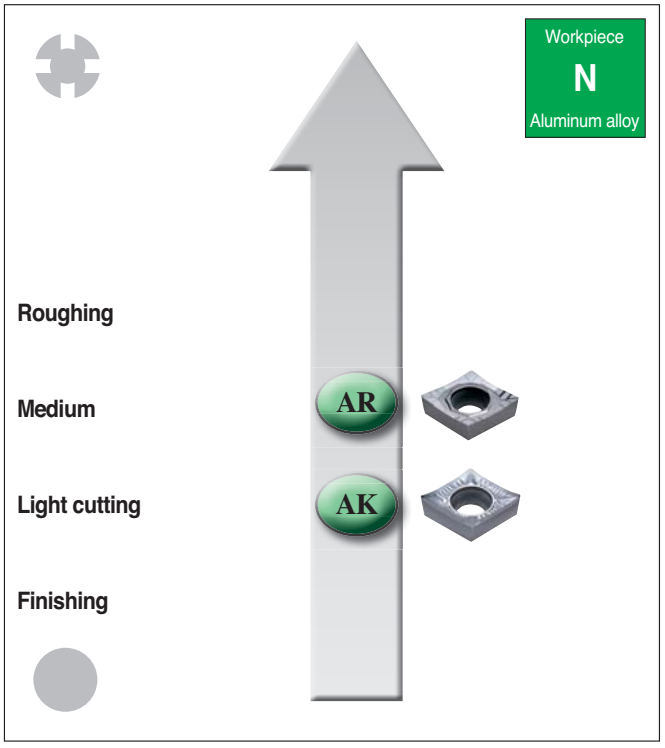


Positive inserts









B Turning Chip Breakers

Recommended chip breaker for workpiece

- **Materials : SM10C, SM15C, SM25C, SS400, SCr415, SCM415, etc. Soft steel**
  Hardness : under 180HB

Workpiece **P** Steel

	Depth of cut (mm)	C/B	Cutting edge	Feed (mm/rev)	Grades	Cutting Speed (m/min)	Insert shape 80°	55°	90°	60°	35°	80°
Negative	0.1 ~ 0.5 ~ 1.5 finishing	HU		0.03 ~ 0.10 ~ 0.25	CT10	280	CNG(M)G p.B17	DNG(M)G p.B19, B20	SNG(M)G p.B22, B24	TNG(M)G p.B26, B28		
	0.2 ~ 0.8 ~ 1.5 finishing	VL		0.1 ~ 0.2 ~ 0.35	NC3010 NC3020	300 250	CNMG p.B17	DNMG p.B20	SNMG p.B24	TNMG p.B28	VNMG p.B30	WNMG p.B32
	0.5 ~ 1.0 ~ 1.5 finishing	VF		0.05 ~ 0.15 ~ 0.35	NC3010 NC3120 NC5330	310 270 230	CNMG p.B17	DNMG p.B20	SNMG p.B24	TNMG p.B28	VNMG p.B30	WNMG p.B32
	0.5 ~ 1.0 ~ 2.0 finishing	VB		0.15 ~ 0.2 ~ 0.4	NC3010 NC3020	300 250	CNMG p.B17	DNMG p.B20				
	0.8 ~ 1.5 ~ 3.5 medium to finishing	HA		0.10 ~ 0.20 ~ 0.40	NC3010 NC3120 NC9025	300 230 180	CNMG p.B16	DNMG p.B19	SNMG p.B23	TNMG p.B27	VNMG p.B30	WNMG p.B31
	0.8 ~ 1.5 ~ 3.0 medium to finishing	HC		0.08 ~ 0.20 ~ 0.40	NC3010 NC3120 NC5330	290 250 210	CNMG p.B16	DNMG p.B19	SNMG p.B24	TNMG p.B27		WNMG p.B31
	1.0 ~ 2.5 ~ 5.0 medium machining	VM		0.10 ~ 0.25 ~ 0.50	NC3010 NC3120 NC3030 NC5330 CN2000	270 230 210 200 220	CNMG p.B18	DNMG p.B20	SNMG p.B24	TNMG pB28	VNMG p.B30	WNMG p.B32
	2.5 ~ 4.0 ~ 7.0 roughing	HR		0.25 ~ 0.45 ~ 0.65	NC3010 NC3120 NC3030	150 130 100	CNMG p.B17	DNMG p.B19	SNMG p.B24	TNMG p.B28		WNMG p.B31
	6.0 ~ 10.0 ~ 15.0 Heavy	VH		0.7 ~ 1.0 ~ 1.4	NC3010 NC3030 NC500H NC5330	50~250 50~150 50~150 50~150	CNMM p.B18		SNMM p.B25			
	7.0 ~ 12.0 ~ 17.0 Heavy (heavy roughing)	VT		0.75 ~ 1.2 ~ 1.6	NC3010 NC3030 NC500H NC5330	50~250 50~150 50~150 50~150	CNMM p.B18		SNMM p.B25			
Positive	0.1 ~ 0.5 ~ 1.5 finishing	VF		0.5 ~ 0.15 ~ 0.25	NC3010 NC3120 NC5330 CC105	280 250 250 260	CCMT p.B34	DCMT p.B35	SCMT p.B36	TCMT p.B39	VCMT p.B43	
	0.1 ~ 0.5 ~ 1.5 finishing	HFP		0.05 ~ 0.15 ~ 0.25	NC3010 NC3120 NC5330 CC105	280 250 220 250	CCG(M)T p.B33, B34	DCG(M)T p.B35	SCG(M)T p.B36	TCG(M)T p.B39	VCG(M)T p.B43	
	0.5 ~ 1.5 ~ 3.5 medium to finishing, medium machining	HMP		0.08 ~ 0.20 ~ 0.40	NC3010 NC3120 NC5330 CN2000	260 230 200 230	CCMT p.B34	DCMT p.B35	SCMT p.B36	TCMT p.B39	VCMT p.B43	
	1.0 ~ 2.0 ~ 3.0 medium machining	C25		0.10 ~ 0.25 ~ 0.35	NC3010 NC3120 NC5330	250 220 200	CCMT p.B33	DCMT p.B35	SCMT p.B36	TCMT p.B39		

● : The first recommended cutting condition

Recommended chip breaker for workpiece

Workpiece **P** Steel

- **Materials : S45C, S55C, SCM430, SCM440, etc. General steel**
  Hardness : under 180~260HB

Depth of cut (mm)		C/B	Cutting edge	Feed (mm/rev)	Grades	Cutting Speed (m/min)	Insert shape 80°	55°	90°	60°	35°	80°
Negative	0.5 ~ 1.0 ~ 1.5 finishing	VF		0.05 ~ 0.15 ~ 0.35	NC3010 NC3020 NC3120	220 200 190	CNMG p.B17	DNMG p.B20	SNMG p.B24	TNMG p.B28	VNMG p.B30	WNMG p.B32
	0.5 ~ 1.0 ~ 2.0 finishing	VB		0.15 ~ 0.2 ~ 0.4	NC3010 NC3020	300 250	CNMG p.B17	DNMG p.B20				
	0.8 ~ 1.5 ~ 3.0 medium to finishing	HC		0.08 ~ 0.20 ~ 0.40	NC3010 NC3020 NC3120 NC3030	210 190 180 160	CNMG p.B16	DNMG p.B19	SNMG p.B24	TNMG p.B27		WNMG p.B31
	1.0 ~ 2.5 ~ 5.0 medium machining	VM		0.10 ~ 0.25 ~ 0.50	NC3010 NC3020 NC3120 NC3030	200 180 170 150	CNMG p.B18	DNMG p.B20	SNMG p.B24	TNMG pB28	VNMG p.B30	WNMG p.B32
	2.5 ~ 4.0 ~ 7.0 roughing	HR		0.25 ~ 0.45 ~ 0.65	NC3010 NC3020 NC3120 NC3030	170 150 150 130	CNMG p.B17	DNMG p.B19	SNMG p.B24	TNMG p.B28		WNMG p.B31
	6.0 ~ 10.0 ~ 15.0 Heavy	VH		0.7 ~ 1.0 ~ 1.4	NC3010 NC3030 NC500H NC5330	50~250 50~150 50~150 50~150	CNMM p.B18		SNMM p.B25			
	7.0 ~ 12.0 ~ 17.0 Heavy (heavy roughing)	VT		0.75 ~ 1.2 ~ 1.6	NC3010 NC3030 NC500H NC5330	50~250 50~150 50~150 50~150	CNMM p.B18		SNMM p.B25			
Positive	0.1 ~ 0.5 ~ 1.5 finishing	VF		0.05 ~ 0.15 ~ 0.25	NC3010 NC3120 NC5330 CC105	280 250 250 260	CCMT p.B34	DCMT p.B35	SCMT p.B36	TCMT p.B39	VCMT p.B43	
	0.1 ~ 0.5 ~ 1.5 finishing	HFP		0.05 ~ 0.15 ~ 0.25	NC3010 NC3120 NC5330 CC105	220 190 180 200	CCG(M)T p.B33, B34	DCG(M)T p.B35	SCG(M)T p.B36	TCG(M)T p.B39	VCG(M)T p.B43	
	0.5 ~ 1.5 ~ 3.5 medium to finishing, medium machining	HMP		0.08 ~ 0.20 ~ 0.40	NC3010 NC3020 NC3120 NC3030 CN2000	210 190 180 150 170	CCMT p.B34	DCMT p.B35	SCMT p.B36	TCMT p.B39	VCMT p.B43	
	1.0 ~ 2.0 ~ 3.0 medium machining	C25		0.1 ~ 0.25 ~ 0.35	NC3010 NC3020 NC3120 NC3030	200 180 170 150	CCMT p.B33	DCMT p.B35	SCMT p.B36	TCMT p.B39		

● : The first recommended cutting condition

B Turning Chip Breakers

Recommended chip breaker for workpiece

- **Materials : SNC415, SNC815, SNCM240, SNCM439, STS12, STS61, etc SCM440, Hardened steel**
  Hardness : 260~350HB

Workpiece **P** Steel

	Depth of cut (mm)	C/B	Cutting edge	Feed (mm/rev)	Grades	Cutting Speed (m/min)	Insert shape: 80°	55°	90°	60°	35°	80°
Negative	0.5 ~ 1.0 ~ 1.5 finishing	VF		0.08 ~ 0.15 ~ 0.30	NC3010 NC3020 NC3120	130 110 110	CNMG p.B17	DNMG p.B20	SNMG p.B24	TNMG p.B28	VNMG p.B30	WNMG p.B32
	0.5 ~ 1.0 ~ 2.0 finishing	VB		0.15 ~ 0.2 ~ 0.4	NC3010 NC3020	300 250	CNMG p.B17	DNMG p.B20				
	0.8 ~ 1.5 ~ 3.0 medium to finishing	HC		0.10 ~ 0.20 ~ 0.35	NC3010 NC3020 NC3120 NC3030	150 130 130 110	CNMG p.B16	DNMG p.B19	SNMG p.B24	TNMG p.B27		WNMG p.B31
	1.0 ~ 2.5 ~ 5.0 medium machining heavy roughing	VM		0.15 ~ 0.25 ~ 0.50	NC3010 NC3020 NC3120 CN2000	130 110 100 90	CNMG p.B18	DNMG p.B20	SNMG p.B24	TNMG pB28	VNMG p.B30	WNMG p.B32
	2.5 ~ 4.0 ~ 7.0 roughing	HR		0.25 ~ 0.35 ~ 0.60	NC3010 NC3020 NC3120 NC3030	100 90 90 80	CNMG p.B17	DNMG p.B19	SNMG p.B24	TNMG p.B28		WNMG p.B31
	6.0 ~ 10.0 ~ 15.0 Heavy	VH		0.7 ~ 1.0 ~ 1.4	NC3010 NC3030 NC500H NC5330	50~250 50~150 50~150 50~150	CNMM p.B18		SNMM p.B25			
	7.0 ~ 12.0 ~ 17.0 Heavy (heavy roughing)	VT		0.75 ~ 1.2 ~ 1.6	NC3010 NC3030 NC500H NC5330	50~250 50~150 50~150 50~150	CNMM p.B18		SNMM p.B25			
Positive	0.1 ~ 0.5 ~ 1.5 finishing	VF		0.05 ~ 0.15 ~ 0.25	NC3010 NC3120 NC5330 CC105	280 250 250 260	CCMT p.B34	DCMT p.B35	SCMT p.B36	TCMT p.B39	VCMT p.B43	
	0.1 ~ 0.5 ~ 1.5 finishing	HFP		0.05 ~ 0.15 ~ 0.25	NC3010 NC3020 NC3120 CC105	130 120 110 120	CCG(M)T p.B33, B34	DCG(M)T p.B35	SCG(M)T p.B36	TCG(M)T p.B39	VCG(M)T p.B43	
	0.5 ~ 1.5 ~ 3.5 medium to finishing, medium machining	HMP		0.08 ~ 0.20 ~ 0.40	NC3010 NC3020 NC3120 CN2000	120 110 110 100	CCMT p.B34	DCMT p.B35	SCMT p.B36	TCMT p.B39	VCMT p.B43	
	1.0 ~ 2.0 ~ 3.0 medium machining	C25		0.1 ~ 0.25 ~ 0.35	NC3010 NC3020 NC3120 NC3030	110 100 100 90	CCMT p.B33	DCMT p.B35	SCMT p.B36	TCMT p.B39		

● : The first recommended cutting condition

Recommended chip breaker for workpiece

- **Materials** : STS304, STS316, STS430, STS630
  Ferrite, austenite, martensite, precipitation hardening stainless steels
- **Hardness** : 135~300HB

Workpiece **M** Stainless steel

	Depth of cut (mm)	C/B	Cutting edge	Feed (mm/rev)	Grades	Cutting Speed (m/min)	Insert shape 80°	55°	90°	60°	35°	80°
Negative	0.5 ~ 1.5 ~ 2.5 medium to finishing	HA		0.03 ~ 0.15 ~ 0.30	PC8110 NC9025 PC5300 PC9030	250 180 150 120	CNMG p.B16	DNMG p.B19	SNMG p.B23	TNMG p.B27	VNMG p.B30	WNMG p.B31
Negative	1.0 ~ 2.5 ~ 4.0 medium machining	HS		0.1 ~ 0.25 ~ 0.40	PC8110 NC9025 PC5300 PC9030	280 200 160 120	CNMG p.B17	DNMG p.B20	SNMG pB24	TNMG p.B28	VNMG p.B30	WNMG p.B31
Negative	1.5 ~ 3.0 ~ 5.5 Interrupred heavy roughing	GS		0.15 ~ 0.3 ~ 0.50	PC8110 NC9025 PC5300 PC9030	250 180 150 120	CNMG p.B16	DNMG p.B19	SNMG p.B23	TNMG p.B27		WNMG p.B31
Negative	2.0 ~ 4.5 ~ 6.5 continuous heavy roughing	VM		0.20 ~ 0.40 ~ 0.60	PC8110 NC5330 PC5300 PC9030	250 180 150 120	CNMG p.B18	DNMG p.B20	SNMG p.B24	TNMG pB28	VNMG p.B30	WNMG p.B32
Positive	0.1 ~ 0.5 ~ 1.5 finishing	HFP		0.05 ~ 0.15 ~ 0.25	PC8110 NC5330 PC5300 PC9030	250 200 180 160	CCG(M)T p.B33, B34	DCG(M)T p.B35	SCG(M)T p.B36	TCG(M)T p.B39	VCG(M)T p.B43	
Positive	0.5 ~ 1.5 ~ 3.0 medium to finishing	HMP		0.10 ~ 0.20 ~ 0.30	PC8110 NC5330 PC5300 PC9030	250 200 180 150	CCMT p.B34	DCMT p.B35	SCMT p.B36	TCMT p.B39	VCMT p.B43	
Positive	1.0 ~ 1.5 ~ 3.0 medium machining	C25		0.15 ~ 0.25 ~ 0.35	PC8110 NC5330 PC5300 PC9030	250 200 170 140	CCMT p.B33	DCMT p.B35	SCMT p.B36	TCMT p.B39		

● : The first recommended cutting condition

Recommended chip breaker for workpiece

Materials : GC250, GC300, GCD400, GCD700, etc : Gray cast iron, Ductile cast iron
Hardness : 135 ~185HB
Tensile strength : 450N/mm²

Workpiece **K** Cast iron

	Depth of cut (mm)	C/B	Cutting edge	Feed (mm/rev)	Grades	Cutting Speed (m/min)	Insert shape 80°	55°	90°	60°	35°	80°
Negative	0.1 ~ **0.4** ~ 1.0 finishing	C/B None		0.05 ~ **0.10** ~ 0.50	DBNX10 **DBN500** DBN700 NC6105 NC6110 NC315K	150~200 **200~500** 500~2000 300~500 250~450 150~300	CNMA p.B16	DNMA p.B19	SNGMA p.B22, B23	TNGMA p.B26		
	0.5 ~ **2.0** ~ 3.5 medium to finishing	B25		0.2 ~ **0.35** ~ 0.6	NC6105 **NC6110** NC315K	400~450 **300~400** 150~250	CNMG p.B16	DNMG p.B19	SNMG p.B23	TNMG p.B27	VNMG p.B31	
	1.0 ~ **2.5** ~ 4.0 medium machining	VM		0.15 ~ **0.30** ~ 0.50	NC6105 **NC6110** NC315K	450~550 **350~450** 200~250	CNMG p.B18	DNMG p.B20	SNMG p.B24	TNMG pB28	VNMG p.B30	WNMG p.B32
	1.0 ~ **3.0** ~ 4.5 heavy roughing	GR		0.20 ~ **0.35** ~ 0.50	NC6105 **NC6110** NC315K	450~550 **350~450** 200~250	CNMG p.B16	DNMG p.B19	SNMG p.B23	TNMG p.B27		WNMG p.B31
	2.5 ~ **3.5** ~ 6.0 roughing	HR		0.25 ~ **0.35** ~ 0.60	NC6105 **NC6110** NC315K	400~450 **300~400** 150~250	CNMG p.B17	DNMG p.B19	SNMG p.B24	TNMG p.B28		WNMG p.B31
	4.3 ~ **6.5** ~ 10.0 heavy roughing	GH		0.30 ~ **0.70** ~ 1.10	**NC6110** **NC315K**	180 **150**	CNMM p.B18		SNMM p.B25			
Positive	0.5 ~ **1.5** ~ 3.0 medium to finishing	HMP		0.08 ~ **0.20** ~ 0.40	**NC6105** NC6110 NC315K	**250** 230 200	CCMT p.B34	DCMT p.B35	SCMT p.B36	TCMT p.B39	VCMT p.B43	
	1.0 ~ **2.0** ~ 3.5 medium machining	C25		0.10 ~ **0.25** ~ 0.40	**NC6105** NC6110 NC315K	**250** 230 200	CCMT p.B33	DCMT p.B35	SCMT p.B36	TCMT p.B39		

● : The first recommended cutting condition

Recommended chip breaker for workpiece

Materials : Aluminum alloy
Hardness : 20~110HB

Workpiece **N** Aluminum alloy

	Depth of cut (mm)	C/B	Cutting edge	Feed (mm/rev)	Grades	Cutting Speed (m/min)	Insert shape 80°	55°	90°	60°	35°	80°
Negative	0.5 ~ **2.0** ~ 6.0 roughing	HA		0.1 ~ **0.2** ~ 0.5	H01	500	CNMG p.B16	DNMG p.B19	SNMG p.B23	TNMG p.B27	VNMG p.B30	WNMG p.B31
Positive	0.1 ~ **1.0** ~ 4.0 medium to finishing	AK		0.03 ~ **0.2** ~ 0.4	H01 ND1000 PD1000	1000 1000 1000	CCGT p.B46	DCGT p.B46	SCGT p.B47	TCGT p.B48	VCGT p.B48	VCGT p.B47
	0.5 ~ **1.5** ~ 4.0 roughing	AR		0.05 ~ **0.3** ~ 0.5	H01 ND1000 PD1000	1000 1000 1000	CCGT p.B46	DCGT p.B46	SCGT p.B47	TCGT p.B48	VBGT p.B48	RCGT p.B47

● : The first recommended cutting condition

Materials : Copper Bronze alloy
Hardness : 20~110HB

Workpiece **N** Aluminum alloy

	Depth of cut (mm)	C/B	Cutting edge	Feed (mm/rev)	Grades	Cutting Speed (m/min)	Insert shape 80°	55°	90°	60°	35°	80°
Negative	0.5 ~ **2.0** ~ 4.0 roughing	HA		0.1 ~ **0.2** ~ 0.5	PC130 PC230 H01	500 500 1000	CNMG p.B16	DNMG p.B19	SNMG p.B23	TNMG p.B27	VNMG p.B30	WNMG p.B31
Positive	0.1 ~ **1.0** ~ 3.0 medium to finishing	AK		0.03 ~ **0.2** ~ 0.3	PC130 PC230 H01	500 500 1000	CCGT p.B46	DCGT p.B46	SCGT p.B47	TCGT p.B48	VCGT p.B48	VCGT p.B47
	0.5 ~ **1.5** ~ 3.0 roughing	AR		0.05 ~ **0.25** ~ 0.4	PC130 PC230 H01	500 500 1000	CCGT p.B46	DCGT p.B46	SCGT p.B47	TCGT p.B48	VBGT p.B48	RCGT p.B47

● : The first recommended cutting condition

B Turning Chip Breakers

Recommended chip breaker for workpiece

- **Materials : Inconel, Nimonic, Stellite, Ti alloy**
  Hardness : 160~350HB

Workpiece
S
Heat resistant alloy

	Depth of cut (mm)	C/B	Cutting edge	Feed (mm/rev)	Grades	Cutting Speed (m/min)	Insert shape 80°	55°	90°	60°	35°	80°
Negative	0.5 ~ 1.5 ~ 2.5 medium to finishing	HA		0.03 ~ 0.15 ~ 0.30	PC8110 NC9025 PC5300	70 60 50	CNMG p.B16	DNMG p.B19	SNMG p.B23	TNMG p.B27	VNMG p.B30	WNMG p.B31
	1.0 ~ 2.5 ~ 4.0 medium machining	HS		0.1 ~ 0.25 ~ 0.40	PC8110 NC9025 PC5300	80 50 30	CNMG p.B17	DNMG p.B20	SNMG pB24	TNMG p.B28	VNMG p.B30	WNMG p.B31
	1.5 ~ 3.0 ~ 5.5 Interrupred heavy roughing	GS		0.15 ~ 0.3 ~ 0.50	PC8110 NC9025 PC5300	80 50 30	CNMG p.B16	DNMG p.B19	SNMG p.B23	TNMG p.B27		WNMG p.B31
	2.0 ~ 4.5 ~ 6.5 continuous heavy roughing	VM		0.20 ~ 0.40 ~ 0.60	PC8110 NC5330 PC5300	80 50 30	CNMG p.B18	DNMG p.B20	SNMG p.B24	TNMG pB28	VNMG p.B30	WNMG p.B32
Positive	0.1 ~ 0.5 ~ 1.5 finishing	HFP		0.05 ~ 0.15 ~ 0.25	PC8110 NC9025 PC5300	80 50 30	CCG(M)T p.B33, B34	DCG(M)T p.B35	SCG(M)T p.B36	TCG(M)T p.B39	VCG(M)T p.B43	
	0.5 ~ 1.5 ~ 3.0 medium to finishing	HMP		0.10 ~ 0.20 ~ 0.30	PC8110 NC9025 PC5300 PC9030	80 50 30	CCMT p.B34	DCMT p.B35	SCMT p.B36	TCMT p.B39	VCMT p.B43	
	1.0 ~ 1.5 ~ 3.0 medium machining	C25		0.15 ~ 0.25 ~ 0.35	PC8110 NC9025 PC5300	80 50 30	CCMT p.B33	DCMT p.B35	SCMT p.B36	TCMT p.B39		

● : The first recommended cutting condition

Chip Breakers

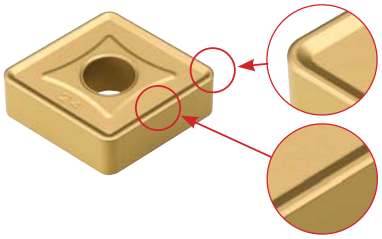
VH / VT Chip Breakers (Heavy duty machining)

New

- Heavy duty chip breaker suitable Heavy machining in the ship building and power plant industries
- Suitable for large horizontal machines when machining shafts, rollers, rotors and optimal for the big flange machining

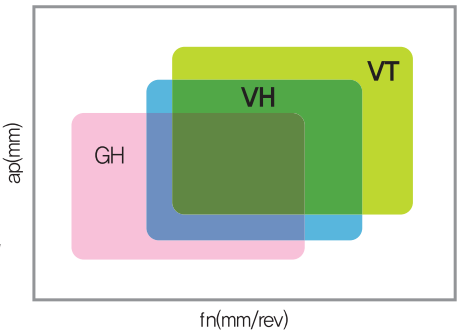
Special features of VH

• For good chip control in heavy machining (comprehensive type)



- Designed from the study of heavy cutting mechanism
- Smooth chip control from the high rake angle
- Wider cutting edge land provides stronger cutting
- Unique cutting edge treatment provides smooth cutting
- Optimized chip pocket design provides smooth chip flow

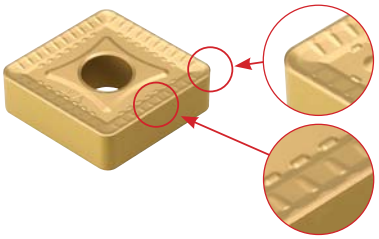
Applications range of Chip breakers



GH : ap=5.0~12.0mm fn=0.55~1.20mm/rev
VH : ap=6.0~15.0mm fn=0.70~1.40mm/rev
VT : ap=7.0~17.0mm fn=0.75~1.60mm/rev

Special features of VT

• For long tool life and stable cutting (higher feeds, big depth) in heavy machining



- Designed from the study of heavy cutting mechanism
- Strong edge design provides long and stable cutting (2 step rake angle of cutting edge)
- Varied cutting edge land with (strengthening of cutting edge)
- The positioning of the chip breaking convex dot (Deflects the machining heat, optimizes inserts wear & absorb shock)

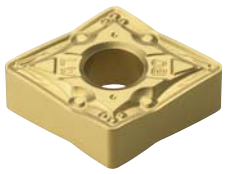


LW / VW Chip Breakers (Wiper)

New

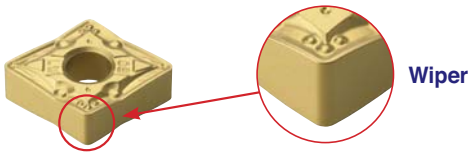
- Improved productivity due to high feed rate and surface finish
- Improved wear resistance and toughness

Special features of LW



- **Curvilinear cutting edge**
  - Reduces cutting force
- **Cutting edge design able to handle deeper depth of cuts**
  - lower cutting load & reduces heat incurred
- **Chip breaker design enables for shallow depth of cuts**
  - Chip pocket design good for smooth chip flow
- **For shallow depth cutting and low speed machining**
  - 3D design at the corner

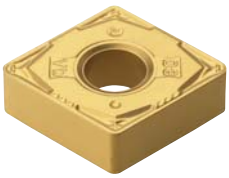
Advantages



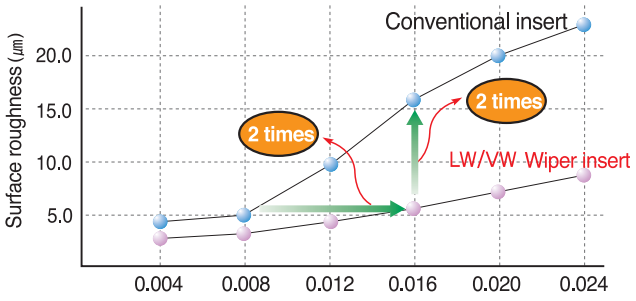
Wiper Insert

- High productivity
- Improved surface roughness
- High feed-reducing machining time
- Improved tool life due to reduce cutting force

Special features of VW



- **Excellent Finishing applications**
  - Excellent chip control
- **Insert design great for stable clmaping**
  - Chip breaker designed close to the cutting edge
- **Similar cutting edge to C/B for medium**
  - strong cutting edge
- **3 Dimensional dot design on cutting corner**
  - reduces cutting force and good chip control at shallow depth of cut



Chip Breakers

VL Chip Breakers (Mild steel) New

- Improved chip control for machining material that have high toughness such as low carbon steel, pipe, steel plate etc
- Improved chip control and decreased cutting load on external, facing, copying applications
- Improved intensity of cutting edge for efficiency in automated facility

Special features of VL



- **2 steps designed chip-breaker**
  - Suitable Mild steel
  - Stable chip control on the low feed and cutting depth
- **Designed with special dots**
  - Stable chip breaking on the low cutting depth
- **Applied side rake angle**
  - Improved chip control on facing, copying applications
  - Decreased cutting load and better surface finish

Chip control test

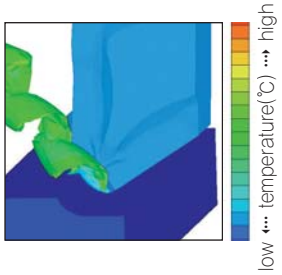
- Workpiece : SM20C
- Cutting Condition : vc=250m/min fn=0.2mm/rev(Side) ap=0.5mm wet
- Designation : DNMG150408-VL

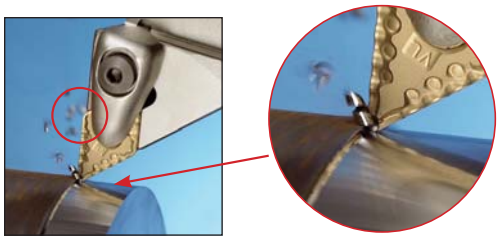


VL Chip Breakers | Comp. A | Comp. B | Comp. C

FEM Cutting simulation analysis in the design

- For design of geometry, chip shapes and chip flow are predicted
- Optimal chip breaker design by various cutting conditions and workpieces





VB Chip Breakers (Copying) New

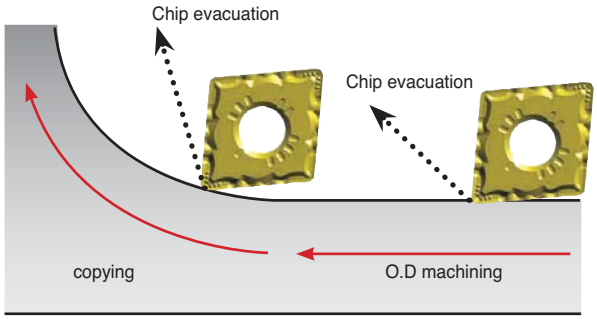
- General chip breaker suitable for low depth of machining due to good chip control
- Excellent chip control on copying, corner R machining

Special features of VB

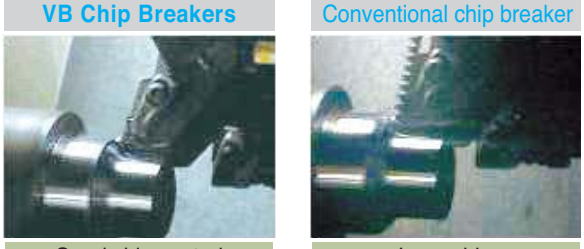


- **6 dots on cutting corner**
  - Excellent chip control in shallow to larger depth of cut and superior chip breaking in copy machining
- **Applied rake angle on side part of insert.**
  - excellent chip control in facing, copying and finishing applications
- **Strong cutting edge on 100° part**
  - Suitable Medium cutting

The feature



VB Chip Breakers | Conventional chip breaker



Good chip control | Long chips

- Cutting Condition

W·P=SCM420 vc=250m/min fn=0.35mm/rev ap=1.0mm

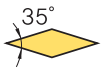

D3
VG

B Turning Insert Code System (ISO)

C	N	M	G	12
1	2	3	4	5
Insert Shape	Relief Angle	Tolerance	Cross Section Type	Cutting Edge Length, Diameter of Inscribed Circle

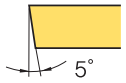
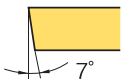
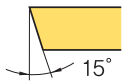
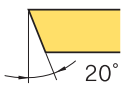
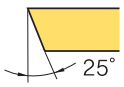
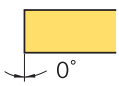
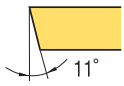
1 C N M G 12 04 08 - VM

Insert Shape

				
C	D	E	K	L
				
R	S	T	V	W

2 C N M G 12 04 08 - VM

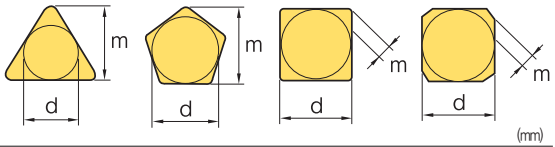
Relief Angle

			
B	C	D	E
			Special type
F	N	P	O

3 C N M G 12 04 08 - VM

Tolerance

d : Inscribed circle
t : Thickness
m : Refer to figure



(mm)

Class	d	m	t
A	±0.025	±0.005	±0.025
C	±0.025	±0.013	±0.025
H	±0.013	±0.013	±0.025
E	±0.025	±0.025	±0.025
G	±0.025	±0.025	±0.13
J*	±0.05 ~ ±0.15	±0.005	±0.025
K*	±0.05 ~ ±0.15	±0.013	±0.025
L*	±0.05 ~ ±0.15	±0.025	±0.025
M*	±0.05 ~ ±0.15	±0.08 ~ ±0.20	±0.13
N*	±0.05 ~ ±0.15	±0.08 ~ ±0.18	±0.025
U*	±0.08 ~ ±0.25	±0.13 ~ ±0.38	±0.13

* Sides are based on unground insert

Tolerance on C,E,H,M,O,P,R,S,T,W Insert Shape (Exceptional case)

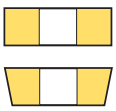
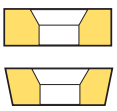
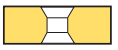
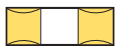
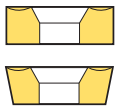
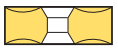
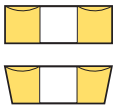
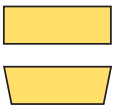
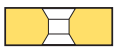
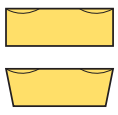
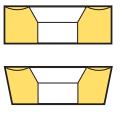
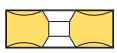
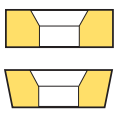
d	Tolerance on d		Tolerance on m	
	J, K, L, M, N	U	M, N	U
6.35	±0.05	±0.08	±0.08	±0.13
9.525	±0.05	±0.08	±0.08	±0.13
12.7	±0.08	±0.13	±0.13	±0.20
15.875	±0.10	±0.18	±0.15	±0.27
19.05	±0.10	±0.18	±0.15	±0.27
25.4	±0.13	±0.25	±0.18	±0.38

Tolerance on D Insert Shape (Exceptional case)

d	Tolerance on d	Tolerance on m
6.35	±0.05	±0.11
9.525	±0.05	±0.11
12.7	±0.08	±0.15
15.875	±0.10	±0.18
19.05	±0.10	±0.18

4 C N M G 12 04 08 - VM

Cross Section Type

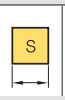
		
A	B	C
		
F	G	H
		
J	M	N
		
Q	R	T
		Special type
U	W	X

04 08 – VM

6	7	8
Height of Cutting Edge	Nose Radius (Nose R)	Chip Breaker for Turning

5 C N M G 12 04 08 - VM

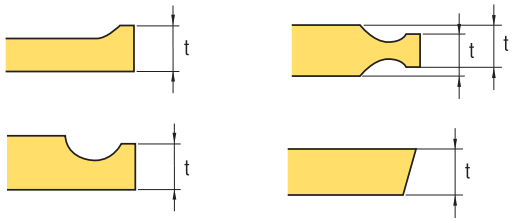
Cutting Edge Length, Diameter of Inscribed Circle

Symbol								IC
							Inch	d(mm)
Metric								
03	04	03	06	03	-	02	1.2(5)	3.97
04	05	04	08	04	08	S3	1.5(6)	4.76
05	06	05	09	05	09	03	1.8(7)	5.56
-	-	-	-	06	-	-	-	6.00
06	07	06	11	06	11	04	2	6.35
08	09	07	13	07	13	05	2.5	7.94
-	-	-	-	08	-	-	-	8.00
09	11	09	16	09	16	06	3	9.525
-	-	-	-	10	-	-	-	10.00
11	13	11	19	11	19	07	3.5	11.11
-	-	-	-	12	-	-	-	12.00
12	15	12	22	12	22	08	4	12.70
14	17	14	24	14	24	09	4.5	14.29
16	19	15	27	15	27	10	5	15.875
-	-	-	-	16	-	-	-	16.00
17	21	17	30	17	30	11	5.5	17.46
19	23	19	33	19	33	13	6	19.05
-	-	-	-	20	-	-	-	20.00
22	27	22	38	22	38	15	7	22.225
-	-	-	-	25	-	-	-	25.00
25	31	25	44	25	44	17	8	25.40
32	38	31	54	31	54	21	10	31.75
-	-	-	-	32	-	-	-	32.00

( ) Symbol for small size insert

6 C N M G 12 04 08 - VM

Height of Cutting Edge

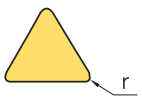


Symbol		Height of Cutting Edge(t)	
Metric	Inch	mm	Inch
01	1(2)	1.59	1/16
T0	1.125	1.79	9/128
T1	1.2	1.98	5/64
02	1.5(3)	2.38	3/32
T2	1.75	2.78	7/64
03	2	3.18	1/8
T3	2.5	3.97	5/32
04	3	4.76	3/16
05	3.5	5.56	7/32
06	4	6.35	1/4
07	5	7.94	5/16
09	6	9.52	3/8
11	7	11.11	7/16
12	8	12.70	1/2

( ) Symbol for small size insert

7 C N M G 12 04 08 - VM

Nose Radius (Nose R)



Symbol		Corner Radius	
Metric	Inch	Metric	Inch
01	0	0.1	0.004
02	0.5	0.2	0.008
04	1	0.4	1/64
08	2	0.8	1/32
12	3	1.2	3/64
16	4	1.6	1/16
20	5	2.0	5/64
24	6	2.4	3/32
28	7	2.8	7/64
32	8	3.2	1/8
00	-	Round insert(Inch)	
M0	-	Round insert(Metric)	

8 C N M G 12 04 08 - VM

Chip Breaker for Turning

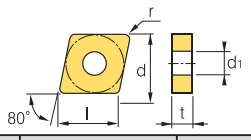
					
VG	VL	VF	VB	VQ	VW
					
VM	VH	VT	HU	HC	HA
					
HS	HR	GS	GM	GR	GH
					
B25	HFP	HMP	C25	AK	AR

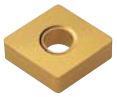
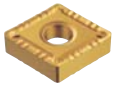
B Turning Insert (Negative)

CN○○ Rhombic 80° Negative

Workpiece		
Steel	P	● ● ● ✱ ✱ ● ● ● ●
Stainless steel	M	● ● ● ✱ ✱ ✱ ● ● ●
Cast iron	K	● ● ● ● ● ● ● ● ●
Non-ferrous metal	N	
Heat resistant alloy, Titanium alloy	S	● ● ● ✱ ✱ ✱
Hardened steel	H	

Machining types
● Continuous cutting
● General cutting
✱ Interrupted cutting



Inserts	Designation		Coated: NC3010	NC3020	NC3120	NC3030	NC500H	PC8110	NC9020	NC9025	NC5330	PC5300	PC9030	NC6105	NC6110	NC315K	Cermet: CN1000	CN2000	CN20	Coated: CC105	CC115	Uncoated: U20	H01	G10	Dimensions (mm): l	d	t	r	d1	Cutting Condition: fn	ap	Available toolholders
	CNGG	120404-HU																							12.4	12.7	4.76	0.4	5.16	0.03~0.25	0.10~1.50	
		120408-HU																							12.0	12.7	4.76	0.8	5.16	0.03~0.25	0.10~1.50	
CNMA  Roughing	CNMA	090308																							8.8	9.525	3.18	0.8	3.18	0.10~0.30	0.50~3.00	
		120404												●	●	●							●	●	12.4	12.7	4.76	0.4	5.16	0.15~0.60	1.00~5.00	
		120408	●	●										●	●	●						●	●		12.0	12.7	4.76	0.8	5.16	0.15~0.60	1.00~6.00	
		120412	●											●	●	●								○	11.6	12.7	4.76	1.2	5.16	0.15~0.70	1.50~6.00	
		120416												●	●										11.2	12.7	4.76	1.6	5.16	0.20~0.80	2.00~6.00	
	New	160608																							15.3	15.875	6.35	0.8	6.35	0.15~0.70	2.00~6.00	
		160612												●	●										14.8	15.875	6.35	1.2	6.35	0.15~0.70	2.00~6.00	
		160616												●											14.4	15.875	6.35	1.6	6.35	0.15~0.50	2.00~10.00	
		190608												●	●										18.5	19.05	6.35	0.8	7.93	0.15~0.70	2.00~10.00	
		190612												●	●	●									18.1	19.05	6.35	1.2	7.93	0.15~0.70	2.00~10.00	
		190616												●	●									○	17.7	19.05	6.35	1.6	7.93	0.20~1.00	3.00~10.00	
CNMG-B25 	CNMG	120404-B25	●	●	●	●					●	●			●		●	●	●						12.4	12.7	4.76	0.4	5.16	0.17~0.45	1.00~5.00	
		120408-B25	●	●	●	●	●	○	●		●	●	●	●	●		●	●							12.0	12.7	4.76	0.8	5.16	0.23~0.60	1.50~5.00	
		120412-B25	●	●	●	●					●			●	●										11.6	12.7	4.76	1.2	5.16	0.25~0.60	2.00~5.00	
		160608-B25	●	●	●	●					●			●											15.3	15.875	6.35	0.8	6.35	0.25~0.60	2.00~6.50	
		160612-B25		●	●									●											14.8	15.875	6.35	1.2	6.35	0.27~0.60	2.00~6.50	
	New	160616-B25												●											14.4	15.875	6.35	1.6	6.35	0.27~0.60	2.00~6.50	
		190604-B25	●	●	●	●					●														18.9	19.05	6.35	0.4	7.93	0.20~0.45	3.00~8.00	
		190608-B25	●	●	●	●					●				●										18.5	19.05	6.35	0.8	7.93	0.25~0.60	3.00~8.00	
		190612-B25	●		●	●	●	○			●			●	●										18.1	19.05	6.35	1.2	7.93	0.30~0.60	3.00~8.00	
		190616-B25	●	●	●	●					●			●											17.7	19.05	6.35	1.6	7.93	0.23~0.70	3.00~8.00	
CNMG-GM 	CNMG	090304-GM																							9.2	9.525	3.18	0.4	3.81	0.05~0.30	0.90~3.50	
		090308-GM																							8.8	9.525	3.18	0.8	3.81	0.10~0.45	1.00~3.50	
		120404-GM	●	●	●	●											●	●	●						12.4	12.7	4.76	0.4	5.16	0.05~0.30	0.90~5.00	
		120408-GM	●	●	●	●					●						●	●	●						12.0	12.7	4.76	0.8	5.16	0.10~0.50	1.00~5.00	
		120412-GM	●	●	●																				11.6	12.7	4.76	1.2	5.16	0.18~0.60	0.30~5.00	
		190608-GM		●	●																				18.5	19.05	6.35	0.8	7.93	0.10~0.50	1.00~8.00	
CNMG-GR  Roughing	CNMG	120408-GR	●	●	●	●					●			●	●	●									12.0	12.7	4.76	0.8	5.16	0.20~0.50	1.00~7.00	
		120412-GR	●	●	●	●	●				●			●	●	●									11.6	12.7	4.76	1.2	5.16	0.25~0.50	1.30~7.00	
		120416-GR												●	○										11.2	12.7	4.76	1.6	5.16	0.25~0.60	1.80~6.00	
		160608-GR	●	●	●	●									●										15.3	15.875	6.35	0.8	6.35	0.20~0.70	1.00~8.00	
		160612-GR	●	●	●	●	●				●			●	●										14.8	15.875	6.35	1.2	6.35	0.25~0.70	1.30~8.00	
		160616-GR		●	●	●								●	●										14.4	15.875	6.35	1.6	6.35	0.25~0.75	1.80~8.00	
		190608-GR		●	●	●					●				●										18.5	19.05	6.35	0.8	7.93	0.20~0.70	1.70~10.00	
		190612-GR	●	●	●	●	●				●				●										18.1	19.05	6.35	1.2	7.93	0.30~0.75	1.70~10.00	
		190616-GR		●	●	●	●				●														17.7	19.05	6.35	1.6	7.93	0.30~0.80	1.80~10.00	
		190624-GR																							16.8	19.05	6.35	2.4	7.93	0.35~0.85	2.00~12.00	
		250724-GR																							23.3	25.4	7.94	2.4	9.12	0.40~1.00	2.30~15.00	
		250924-GR				●					●														23.3	25.4	9.52	2.4	9.12	0.40~1.00	2.30~15.00	
CNMG-GS 	CNMG	120404-GS	New					●	●	●		●	●												12.4	12.7	4.76	0.4	5.16	0.05~0.25	0.10~3.00	
		120408-GS				●		●	●	●		●	●												12.0	12.7	4.76	0.8	5.16	0.10~0.50	1.00~5.00	
		120412-GS						●	●	●		●	●												11.6	12.7	4.76	1.2	5.16	0.13~0.65	1.00~5.00	
	New	160608-GS																							15.3	15.875	6.35	0.8	6.35	0.10~0.50	1.00~6.50	
	New	160612-GS																							14.8	15.875	6.35	1.2	6.35	0.13~0.65	1.00~6.50	
		190612-GS						●		●		○													18.1	19.05	6.35	1.2	7.93	0.13~0.65	1.00~7.80	
		190616-GS						●																									
CNMG-HA 	CNMG	120404-HA		●	●			●	●	●		●	●										●		12.4	12.7	4.76	0.4	5.16	0.05~0.20	0.80~3.50	
		120408-HA		●	●			●	●	●		●	●										●		12.0	12.7	4.76	0.8	5.16	0.10~0.40	0.80~3.50	
		120412-HA								●			●												11.6	12.7	4.76	1.2	5.16	0.13~0.55	0.80~3.50	
CNMG-HC 	CNMG	120404-HC	●	●	●	●					●														12.4	12.7	4.76	0.4	5.16	0.05~0.30	0.80~3.50	
		120408-HC	●	●	●	●			●		●														12.0	12.7	4.76	0.8	5.16	0.08~0.40	0.80~4.00	
		120412-HC									●														11.6	12.7	4.76	1.2	5.16	0.17~0.50	1.00~4.00	

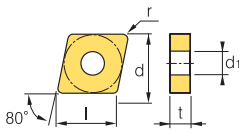
• Cutting edge geometry : A24 ~ A27 • Recommended chip breaker : B04 ~ B10 • Code system : B14 ~ B15
Note)Unit : Feed(fn) = mm/rev Depth of cut(ap) = mm

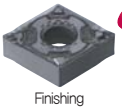
● : Stock Korea ○ : Under preparing for stock
● : Stock Netherlands

CN○○ Rhombic 80° Negative

Workpiece		
Steel	P	● ● ✱ ✱ ✱ ✱ ✱ ✱ ✱
Stainless steel	M	✱ ● ● ✱ ✱ ✱ ● ●
Cast iron	K	✱ ✱ ✱ ● ● ●
Non-ferrous metal	N	
Heat resistant alloy, Titanium alloy	S	● ✱ ✱ ✱ ✱ ✱ ✱ ✱
Hardened steel	H	

Machining types
● Continuous cutting
✱ General cutting
✱ Interrupted cutting



Inserts	Designation		Coated													Cermet		Coated		Uncoated		Dimensions (mm)					Cutting Condition		Available toolholders	
			NC3010	NC3020	NC3120	NC3030	NC500H	PC8110	NC9020	NC9025	NC5330	PC5300	PC9030	NC6105	NC6110	NC315K	CN1000	CN2000	CN20	CC105	CC115	H01	G10	l	d	t	r	d1	fn	ap	Designation	
CNMG-HR  Roughing	CNMG	120404-HR	New																				12.4	12.7	4.76	0.4	5.16	0.15~0.30	0.80~6.00	PCBNR/L PCLNR/L	
		120408-HR	●	●	●	●				●	●												12.0	12.7	4.76	0.8	5.16	0.20~0.50	1.00~7.00		
		120412-HR	●	●	●	●	●				●												11.6	12.7	4.76	1.2	5.16	0.25~0.70	1.30~7.00		
		120416-HR																					11.2	12.7	4.76	1.6	5.16	0.32~0.75	1.80~7.00		
		160608-HR		●	●																		15.3	15.875	6.35	0.8	6.35	0.20~0.50	1.00~8.00		
		160612-HR	●	●	●	●																	14.8	15.875	6.35	1.2	6.35	0.25~0.70	1.30~8.00		
		160616-HR	●																				14.4	15.875	6.35	1.6	6.35	0.30~0.80	1.80~8.00		
		160624-HR																					13.6	15.875	6.35	2.4	6.35	0.32~0.90	2.30~10.00		
		190608-HR		●	●																		18.5	19.05	6.35	0.8	7.93	0.20~0.50	1.70~10.00		
		190612-HR		●	●		●								○								18.1	19.05	6.35	1.2	7.93	0.25~0.70	1.30~10.00		
		190616-HR	●	●	●	●																	17.7	19.05	6.35	1.6	7.93	0.30~0.80	1.80~10.00		
		190624-HR																					16.8	19.05	6.35	2.4	7.93	0.32~0.90	2.30~10.00		
		250924-HR																					23.3	25.4	9.52	2.4	9.12	0.40~1.00	2.30~10.00		
CNMG-HS  Medium to finishing	CNMG	090304-HS							●	●			●										9.2	9.525	3.18	0.4	3.81	0.05~0.20	1.00~2.50	PCBNR/L PCLNR/L	
		090308-HS							●	●			●										8.8	9.525	3.18	0.8	3.81	0.10~0.20	1.00~2.50		
		120404-HS						●	●	●		●	●										12.4	12.7	4.76	0.4	5.16	0.05~0.20	1.00~4.50		
		120408-HS						●	●	●		●	●										12	12.7	4.76	0.8	5.16	0.10~0.40	1.00~4.50		
		120412-HS						●	●	●		●	●										11.6	12.7	4.76	1.2	5.16	0.13~0.55	1.00~4.50		
		160612-HS							●	●			●										14.8	15.875	6.35	1.2	6.35	0.13~0.55	2.00~6.00		
		160616-HS							●				●										14.4	15.875	6.35	1.6	6.35	0.15~0.60	2.00~6.00		
		190612-HS						●	●	●		○	●										18.1	19.05	6.35	1.2	7.93	0.13~0.55	2.00~7.30		
		190616-HS						●	●	●		○	●										17.7	19.05	6.35	1.6	7.93	0.15~0.60	2.00~7.30		
CNMG-HU  Finishing	CNMG	120404-HU																					12.4	12.7	4.76	0.4	5.16	0.05~0.25	0.10~1.00	PCBNR/L PCLNR/L	
		120408-HU																					12.0	12.7	4.76	0.8	5.16	0.10~0.35	0.20~1.50		
		120412-HU																					11.6	12.7	4.76	1.2	5.16	0.12~0.40	0.30~1.50		
CNMG-LW New  Wiper Medium cutting	CNMG	120408-LW				●					●												12.0	12.7	4.76	0.8	5.16	0.15~0.60	1.00~5.00	PCBNR/L PCLNR/L	
		120412-LW			●																		11.6	12.7	4.76	1.2	5.16	0.20~0.70	1.00~6.00		
CNMG-VB New  Finishing	CNMG	120404-VB																					12.4	12.7	4.76	0.4	5.16	0.15~0.35	0.3~2.0	PCBNR/L PCLNR/L	
		120408-VB	○	○							●												12.0	12.7	4.76	0.8	5.16	0.15~0.45	0.5~2.0		
CNMG-VL New  Mild steel	CNMG	120404-VL	●	●							●						○	○					12.4	12.7	4.76	0.4	5.16	0.05~0.25	0.1~1.0	PCBNR/L PCLNR/L	
		120408-VL	●	●							●						○	○					12.0	12.7	4.76	0.8	5.16	0.10~0.35	0.2~1.5		
CNMG-VF  Finishing	CNMG	090304-VF	●		●						●						●						9.2	9.525	3.18	0.4	3.81	0.07~0.30	0.50~1.50	PCBNR/L PCLNR/L	
		090308-VF	●		●						●												8.8	9.525	3.18	0.8	3.81	0.10~0.30	0.50~1.50		
		120404-VF	●		●						●												12.4	12.7	4.76	0.4	5.16	0.07~0.30	0.50~1.50		
		120408-VF	●		●						●												12.0	12.7	4.76	0.8	5.16	0.10~0.40	0.50~1.50		
		120412-VF			●																		11.6	12.7	4.76	1.2	5.16	0.10~0.50	0.60~1.50		
CNMG-VG New  Finishing	CNMG	090304-VG															●			●	●		9.2	9.525	3.18	0.4	3.81	0.07~0.30	0.50~1.50	PCBNR/L PCLNR/L	
		090308-VG															●				●		8.8	9.525	3.18	0.8	3.81	0.10~0.30	0.50~1.50		
		120404-VG														●	●				●		12.4	12.7	4.76	0.4	5.16	0.07~0.30	0.50~1.50		
		120408-VG														●	●				●		12.0	12.7	4.76	0.8	5.16	0.10~0.40	0.50~1.50		

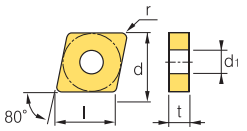
• Cutting edge geometry : A24 ~ A27 • Recommended chip breaker : B04 ~ B10 • Code system : B14 ~ B15
Note)Unit : Feed(fn) = mm/rev Depth of cut(ap) = mm

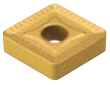
● : Stock item ○ : Under preparing for stock
● : Stock Netherlands

B Turning Insert (Negative)

CN○○ Rhombic 80° Negative

Workpiece			Machining types
Steel	P	●●●✱✱ ●●● ●●● ●●	● Continuous cutting
Stainless steel	M	✱●● ●●✱✱ ✱✱	● General cutting
Cast iron	K	●●● ●●●	✱ Interrupted cutting
Non-ferrous metal	N	●	
Heat resistant alloy, Titanium alloy	S	●✱✱	
Hardened steel	H		



Inserts	Designation		Coated: NC3010	NC3020	NC3120	NC3030	NC500H	PC8110	NC9020	NC9025	NC5330	PC5300	PC9030	NC6110	NC315K	Cermet: CN1000	CN2000	CN20	Coated: CC105	CC115	Uncoated: U20	H01	G10	Dimensions (mm): l	d	t	r	d1	Cutting Condition: fn	ap	Available toolholders: Designation
CNMG-VM  Medium cutting	CNMG	090304-VM			●	●					●						●							9.2	9.525	3.18	0.4	3.81	0.05~0.30	0.90~3.50	PCBNR/L PCLNR/L
		090308-VM			●	●					●						●							8.8	9.525	3.18	0.8	3.81	0.10~0.45	1.00~3.50	
		120404-VM	●		●	●					●		●	●		○	●							12.4	12.7	4.76	0.4	5.16	0.05~0.30	0.90~5.00	
		120408-VM	●	○	●	●		●	●		●	○	●	●		○	●							12.0	12.7	4.76	0.8	5.16	0.10~0.50	1.00~5.00	
		120412-VM	●		●	●		●			●			●										11.6	12.7	4.76	1.2	5.16	0.13~0.60	1.30~5.00	
		120416-VM									●													11.2	12.7	4.76	1.6	5.16	0.20~0.60	1.50~5.50	
		160608-VM			●	●																		15.3	15.875	6.35	0.8	6.35	0.10~0.50	1.00~6.70	
		160612-VM			●	●		●																14.8	15.875	6.35	1.2	6.35	0.13~0.60	1.30~6.70	
		190608-VM																						18.5	19.05	6.35	0.8	7.93	0.10~0.50	1.00~8.10	
		190612-VM																						18.1	19.05	6.35	1.2	7.93	0.13~0.60	1.30~8.10	
CNMG-VQ  Medium to finishing	CNMG	090304-VQ															●							9.2	9.525	3.18	0.4	3.81	0.05~0.30	0.05~3.50	PCBNR/L PCLNR/L
		090308-VQ															●							8.8	9.525	3.18	0.8	3.81	0.08~0.30	0.08~4.00	
		120404-VQ														●	●			●				12.4	12.7	4.76	0.4	5.16	0.05~0.30	0.80~4.00	
		120408-VQ														●	●			●				12.0	12.7	4.76	0.8	5.16	0.08~0.40	0.80~4.00	
CNMG-VW  Wiper finishing	CNMG	120404-VW	●								●													12.4	12.7	4.76	0.4	5.16	0.10~0.30	0.50~3.00	PCBNR/L PCLNR/L
		120408-VW	●																					12.0	12.7	4.76	0.8	5.16	0.15~0.50	0.50~4.00	
CNMM-GH  Heavy	CNMM	120408-GH	●	●	●	●					●													12.0	12.7	4.76	0.8	5.16	0.30~0.60	2.50~8.00	PCBNR/L PCLNR/L
		120412-GH	●	●	●	●					●													11.6	12.7	4.76	1.2	5.16	0.30~0.70	2.50~8.00	
		160412-GH																						14.8	15.875	4.76	1.2	6.35	0.30~0.70	2.50~8.00	
		160424-GH																						13.6	15.875	4.76	2.4	6.35	0.30~1.20	2.50~8.00	
		160612-GH	●			●																		14.8	15.875	6.35	1.2	6.35	0.30~0.90	2.50~8.00	
		160616-GH	●			●																		14.4	15.875	6.35	1.6	6.35	0.30~1.20	2.50~8.00	
		160624-GH																						13.6	15.875	6.35	2.4	6.35	0.30~1.50	2.50~8.00	
		190608-GH									●													18.5	19.05	6.35	0.8	7.93	0.30~0.60	2.50~8.00	
		190612-GH	●	●	●	●	●				●													18.1	19.05	6.35	1.2	7.93	0.30~0.70	3.00~8.00	
		190616-GH	●	●	●	●	●				●													17.7	19.05	6.35	1.6	7.93	0.45~0.90	3.00~8.00	
		190624-GH	●	●	●						●													16.8	19.05	6.35	2.4	7.93	0.55~1.20	4.00~9.00	
	New	250716-GH																						24.1	25.4	7.94	1.6	9.12	0.50~1.00	4.50~10.00	
		250724-GH		●	●	●																		23.3	25.4	7.94	2.4	9.12	0.55~1.20	5.00~12.00	
		250924-GH	●	●	●	●	●				●													23.3	25.4	9.52	2.4	9.12	0.55~1.20	5.00~12.00	
	New	250950-GH																						20.6	25.4	9.52	5.0	9.12	0.65~1.30	6.00~12.00	
CNMM-VH  heavy	CNMM	190612-VH				●	●																	18.1	19.05	6.35	1.2	7.93	0.50~0.90	5.0~10.0	PCBNR/L PCLNR/L
		190616-VH				●	●																	17.7	19.05	6.35	1.6	7.93	0.50~1.10	5.0~10.0	
		190624-VH				●	●																	16.8	19.05	6.35	2.4	7.93	0.60~1.20	6.0~12.0	
		250724-VH				●	●																	23.3	25.4	7.94	2.4	9.12	0.70~1.40	6.0~15.0	
		250924-VH	●			●	●																	23.3	25.4	9.52	2.4	9.12	0.70~1.40	6.0~15.0	
CNMM-VT  heavy	CNMM	190612-VT				●	●																	18.1	19.05	6.35	1.2	7.93	0.60~1.00	6.0~13.0	PCBNR/L PCLNR/L
		190616-VT				●	●																	17.7	19.05	6.35	1.6	7.93	0.60~1.10	5.0~10.0	
		190624-VT				●	●																	16.8	19.05	6.35	2.4	7.93	0.60~1.60	7.0~13.0	
		250724-VT				●	●																	23.3	25.4	7.94	2.4	9.12	0.75~16.0	7.0~17.0	
		250924-VT	●			●	●																	23.3	25.4	9.52	2.4	9.12	0.75~16.0	7.0~17.0	
CNMM-GM  Medium cutting	CNMM	120408-GM																						12.0	12.7	4.76	0.8	5.16	0.10~0.50	1.00~5.00	PCBNR/L PCLNR/L
CNMM-GR  Roughing	CNMM	120408-GR																						12.0	12.7	4.76	0.8	5.16	0.20~0.50	1.00~7.00	PCBNR/L PCLNR/L
		120412-GR																						11.6	12.7	4.76	1.2	5.16	0.25~0.50	1.30~7.00	
		190612-GR																						18.1	19.05	6.35	1.2	7.93	0.30~0.75	1.70~10.00	
		190616-GR																						17.7	19.05	6.35	1.6	7.93	0.30~0.80	1.80~10.00	
CNMM-HA  Medium to finishing	CNMM	120408-HA																						12.0	12.7	4.76	0.8	5.16	0.10~0.40	0.80~3.50	PCBNR/L PCLNR/L

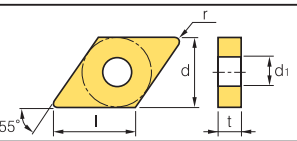
• Cutting edge geometry : A24 ~ A27 • Recommended chip breaker : B04 ~ B10 • Code system : B14 ~ B15
Note)Unit : Feed(fn) = mm/rev Depth of cut(ap) = mm

● : Stock item ○ : Under preparing for stock
● : Stock Netherlands

DN○○ Rhombic 55° Negative

Workpiece		
Steel	P	● ⬢ ⬢ ✱ ⬢ ⬢ ⬢
Stainless steel	M	✱ ● ⬢ ⬢ ✱ ✱
Cast iron	K	⬢ ● ⬢ ⬢ ●
Non-ferrous metal	N	●
Heat resistant alloy, Titanium alloy	S	● ⬢ ✱ ✱ ✱
Hardened steel	H	

Machining types
● Continuous cutting
⬢ General cutting
✱ Interrupted cutting



Inserts	Designation		Coated: NC3010	NC3020	NC3120	NC3030	PC8110	NC9020	NC9025	NC5330	PC5300	PC9030	NC6105	NC6110	MC315K	Cermet: CN1000	CN2000	CN20	Coated: CC105	CC115	Uncoated: H01	G10	Dimensions (mm): l	d	t	r	d1	Cutting Condition: fn	ap	Available toolholders: Designation
DNGG-HU	DNGG	150604-HU																					15.0	12.7	6.35	0.4	5.16	0.05~0.25	0.10~1.50	
		150608-HU																					14.7	12.7	6.35	0.8	5.16	0.10~0.30	0.20~1.50	
																														PDJNR/L PDNNR/L PDSNR/L PDUNR/L
Finishing																														
DNMA	DNMA	110408																					10.8	9.525	4.76	0.8	3.81	0.17~0.45	0.80~3.00	
		150404								○													15.1	12.7	4.76	0.4	5.16	0.17~0.55	0.40~4.00	
		150408								●			●	●									14.7	12.7	4.76	0.8	5.16	0.25~0.55	0.80~4.00	
		150412											●	●									14.4	12.7	4.76	1.2	5.16	0.25~0.65	1.50~4.00	
		150604																					15.1	12.7	6.35	0.4	5.16	0.17~0.55	0.40~4.00	
		150608	●							●			●	●	●								14.7	12.7	6.35	0.8	5.16	0.25~0.55	0.80~4.00	
		150612								●			●	○									14.4	12.7	6.35	1.2	5.16	0.25~0.65	1.20~4.00	
		190608																					18.5	15.875	6.35	0.8	7.93	0.30~0.80	2.50~13.00	
DNMG-B25	DNMG	150402-B25																					15.3	12.7	4.76	0.2	5.16	0.15~0.40	0.50~3.50	
		150404-B25				●					●												15.1	12.7	4.76	0.4	5.16	0.17~0.45	1.00~4.00	
		150408-B25		●	●	●	○						●	●									14.7	12.7	4.76	0.8	5.16	0.17~0.55	1.50~4.00	
		150412-B25									●		●										14.4	12.7	4.76	1.2	5.16	0.25~0.55	1.50~4.00	PDJNR/L PDNNR/L PDSNR/L PDUNR/L
	New	150425-B25																					13.2	12.7	4.76	2.5	5.16	0.35~0.65	2.50~5.50	
Medium Roughing		150602-B25																					15.2	12.7	6.35	0.2	5.16	0.15~0.40	0.50~3.50	
		150604-B25	●	●	●	●	○				●			●		●	●	●					15.1	12.7	6.35	0.4	5.16	0.17~0.55	1.50~4.00	
		150608-B25	●	●	●	●	○				●	●	●	●		●	●	●					14.7	12.7	6.35	0.8	5.16	0.17~0.55	1.50~4.00	
		150612-B25									●		●	●									14.4	12.7	6.35	1.2	5.16	0.25~0.55	1.50~4.00	
	New	150625-B25																					13.2	12.7	6.35	2.5	5.16	0.35~0.65	2.50~5.50	
DNMG-GM	DNMG	110308-GM																					10.8	9.525	3.18	0.8	3.81	0.10~0.50	1.00~4.00	
		110404-GM		●	●																		11.2	9.525	4.76	0.4	3.81	0.05~0.30	0.90~4.00	
		110408-GM		●	●																		10.8	9.525	4.76	0.8	3.81	0.10~0.50	1.00~4.00	
		150404-GM		●	●	●										●	●						15.1	12.7	4.76	0.4	5.16	0.05~0.30	0.90~5.00	
		150408-GM		●	●	●										●	●						14.7	12.7	4.76	0.8	5.16	0.10~0.50	1.00~5.00	PDJNR/L PDNNR/L PDSNR/L PDUNR/L
		150412-GM																					14.4	12.7	4.76	1.2	5.16	0.13~0.60	1.30~5.00	
Medium cutting		150604-GM		●	●	●										●	●	●					15.1	12.7	6.35	0.4	5.16	0.05~0.30	0.90~5.00	
		150608-GM	●	●	●	●										●	●	●					14.7	12.7	6.35	0.8	5.16	0.10~0.50	1.00~5.00	
		150612-GM	●	●	●	●																	14.4	12.7	6.35	1.2	5.16	0.13~0.60	1.30~5.00	
DNMG-GR	DNMG	150408-GR		●	●	●							●	●									14.7	12.7	4.76	0.8	5.16	0.20~0.50	1.00~7.00	
		150412-GR											●	○									14.4	12.7	4.76	1.2	5.16	0.25~0.90	1.30~7.00	
		150416-GR																					14.0	12.7	4.76	1.6	5.16	0.30~0.75	1.80~7.00	
		150608-GR	●	●	●	●				●	●			●	●								14.7	12.7	6.35	0.8	5.16	0.20~0.50	1.00~7.00	PDJNR/L PDNNR/L PDSNR/L PDUNR/L
		150612-GR		●	●	●				●			●	●									14.4	12.7	6.35	1.2	5.16	0.25~0.70	1.30~7.00	
Roughing		150616-GR		●	●						●		●										14.0	12.7	6.35	1.6	5.16	0.20~0.75	1.80~7.00	
DNMG-GS	DNMG	150404-GS					●																15.1	12.7	4.76	0.4	5.16	0.07~0.40	1.00~5.00	
		150408-GS					●	●															14.7	12.7	4.76	0.8	5.16	0.10~0.50	1.00~5.00	
		150412-GS																					14.4	12.7	4.76	1.2	5.16	0.13~0.65	1.00~5.00	
		150604-GS					●	●	●			●											15.1	12.7	6.35	0.4	5.16	0.07~0.40	1.00~5.00	PDJNR/L PDNNR/L PDSNR/L PDUNR/L
		150608-GS					●	●				●											14.7	12.7	6.35	0.8	5.16	0.10~0.50	1.00~5.00	
Medium to finishing		150612-GS							●														14.4	12.7	6.35	1.2	5.16	0.10~0.65	1.00~5.00	
DNMG-HA	DNMG	150404-HA					●		●			●									●		15.1	12.7	4.76	0.4	5.16	0.05~0.30	0.80~3.50	
		150408-HA					●		●			●									●		14.7	12.7	4.76	0.8	5.16	0.10~0.40	0.80~3.50	
		150604-HA		●	●		●	●	●			●									●		15.1	12.7	6.35	0.4	5.16	0.05~0.30	0.80~3.50	PDJNR/L PDNNR/L PDSNR/L PDUNR/L
		150608-HA		●	●		●	●	●			●									●		14.7	12.7	6.35	0.8	5.16	0.10~0.40	0.80~3.50	
Medium to finishing																														
DNMG-HC	DNMG	150404-HC	●								●												15.1	12.7	4.76	0.4	5.16	0.05~0.30	0.05~3.50	
		150408-HC	●	●							●												14.7	12.7	4.76	0.8	5.16	0.08~0.40	0.80~4.00	
		150412-HC																					14.4	12.7	4.76	1.2	5.16	0.13~0.50	0.90~4.00	
		150604-HC	●	●	●						●												15.1	12.7	6.35	0.4	5.16	0.05~0.30	0.80~4.00	PDJNR/L PDNNR/L PDSNR/L PDUNR/L
		150608-HC	●	●	●	●																	14.7	12.7	6.35	0.8	5.16	0.08~0.40	0.80~4.00	
Medium to finishing		150612-HC		●	●																		14.4	12.7	6.35	1.2	5.16	0.13~0.50	0.90~4.00	
DNMG-HR	DNMG	150408-HR		●		●																	14.7	12.7	4.76	0.8	5.16	0.20~0.50	1.00~7.00	
		150412-HR																					14.4	12.7	4.76	1.2	5.16	0.25~0.70	1.30~7.00	
		150416-HR																					14.0	12.7	4.76	1.6	5.16	0.30~0.75	1.80~7.00	
		150608-HR	●	●	●	●				●													14.7	12.7	6.35	0.8	5.16	0.20~0.50	1.00~7.00	PDJNR/L PDNNR/L PDSNR/L PDUNR/L
		150612-HR	●	●	●																		14.4	12.7	6.35	1.2	5.16	0.25~0.70	1.30~7.00	
Roughing	New	150616-HR		●	●																		14.0	12.7	6.35	1.6	5.16	0.20~0.75	1.80~7.00	
		190612-HR																					18.1	15.875	6.35	1.2	7.93	0.20~0.75	1.80~8.00	

• Cutting edge geometry : A24 ~ A27 • Recommended chip breaker : B04 ~ B10 • Code system : B14 ~ B15
Note)Unit : Feed(fn) = mm/rev Depth of cut(ap) = mm

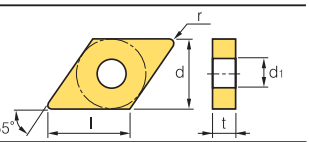
● : Stock item ○ : Under preparing for stock
● : Stock Netherlands

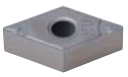
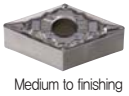
B Turning Insert (Negative)

DN○○ Rhombic 55° Negative

Workpiece		
Steel	P	● ◐ ◐ ✱ ◐ ◐ ◐ ✱ ✱ ◐ ● ◐
Stainless steel	M	◐ ● ◐ ◐ ✱ ✱ ● ◐ ✱ ✱
Cast iron	K	◐ ◐ ●
Non-ferrous metal	N	
Heat resistant alloy, Titanium alloy	S	● ◐ ✱ ✱ ✱
Hardened steel	H	

Machining types
● Continuous cutting
◐ General cutting
✱ Interrupted cutting



Inserts	Designation		Coated													Cermet		Coated		Uncoated			Dimensions (mm)					Cutting Condition		Available toolholders
			NC3010	NC3020	NC3120	NC3030	NC500H	PC8110	NC9020	NC9025	NC5330	PC5300	PC9030	NC6105	NC6110	NC315K	CN1000	CN2000	CN20	CC105	CC115	U20	H01	G10	l	d	t	r	d1	fn	ap	Designation
DNMG-HS	DNMG	110404-HS							●	●			●												11.2	9.525	4.76	0.4	3.81	0.05~0.35	0.80~2.50	
		110408-HS							●	●			●												10.8	9.525	4.76	0.8	3.81	0.10~0.40	1.00~2.50	
Medium to finishing		150404-HS						●	●	●		●	●												15.1	12.7	4.76	0.4	5.16	0.05~0.35	0.80~4.00	
		150408-HS						●	●	●		●	●												14.7	12.7	4.76	0.8	5.16	0.10~0.40	1.00~4.00	PDJNR/L
		150412-HS										●	●												14.4	12.7	4.76	1.2	5.16	0.13~0.55	1.00~4.50	PDNNR/L
		150604-HS						●	●	●		●	●												15.1	12.7	6.35	0.4	5.16	0.05~0.35	0.80~4.00	PDSNR/L
		150608-HS						●	●	●		●	●												14.7	12.7	6.35	0.8	5.16	0.10~0.40	1.00~4.50	PDUNR/L
		150612-HS								●			●												14.4	12.7	6.35	1.2	5.16	0.10~0.55	1.00~4.50	
DNMG-HU	DNMG	150404-HU																							15.1	12.7	4.76	1.2	5.16	0.05~0.25	0.10~1.50	
		150408-HU																							14.7	12.7	4.76	0.8	5.16	0.10~0.30	0.20~1.50	
Finishing		150412-HU																							14.4	12.7	4.76	1.2	5.16	0.15~0.35	0.30~1.50	
		150604-HU																							15.1	12.7	6.35	0.4	5.16	0.05~0.25	0.10~1.50	PDJNR/L
		150608-HU																							14.7	12.7	6.35	0.8	5.16	0.10~0.30	0.20~1.50	PDNNR/L
		150612-HU																							14.4	12.7	6.35	1.2	5.16	0.15~0.35	0.30~1.50	PDSNR/L PDUNR/L
DNMG-LW	DNMG	150408-LW	●												●										14.7	12.7	4.76	0.8	5.16	0.15~0.50	0.70~4.50	
		150412-LW	●												●										14.4	12.7	4.76	1.2	5.16	0.20~0.60	1.00~5.00	
Wiper Medium cutting		150608-LW	●												●										14.7	12.7	6.35	0.8	5.16	0.15~0.50	0.70~4.50	
		150612-LW	●												●										14.4	12.7	6.35	1.2	5.16	0.20~0.60	1.00~5.00	PDJNR/L PDNNR/L PDSNR/L PDUNR/L
DNMG-VB	DNMG	150404-VB																							15.1	12.7	4.76	0.4	5.16	0.10~0.35	0.3~2.0	
		150408-VB	○	○							●														14.7	12.7	4.76	0.8	5.16	0.15~0.45	0.5~2.0	
Finishing		150604-VB																							15.1	12.7	6.35	0.4	5.16	0.10~0.35	0.3~2.0	PDJNR/L
		150608-VB	○	○							●														14.7	12.7	6.35	0.8	5.16	0.15~0.45	0.5~2.0	PDNNR/L PDSNR/L PDUNR/L
DNMG-VL	DNMG	110408-VL																							10.8	9.52	4.76	0.8	3.81	0.05~0.20	0.1~1.0	
		150404-VL	●	●							●						○	○							15.1	12.7	4.75	0.4	5.16	0.05~0.25	0.1~1.5	
Mild steel		150408-VL	●	●							●						○	○							14.7	12.7	4.76	0.8	5.16	0.05~0.30	0.2~1.5	
		150412-VL																							14.4	12.7	4.76	1.2	5.16	0.10~0.30	0.25~1.5	PDJNR/L
		150604-VL	●	●							●						○	○							15.1	12.7	6.35	0.4	5.16	0.05~0.25	0.1~1.5	PDNNR/L
		150608-VL	●	●							●						○	○							14.7	12.7	6.35	0.8	5.16	0.05~0.30	0.2~1.5	PDSNR/L
		150612-VL																							14.4	12.7	6.35	1.2	5.16	0.10~0.30	0.25~1.5	PDUNR/L
DNMG-VF	DNMG	110402-VF			●																				11.4	9.525	4.76	0.2	3.81	0.05~0.20	0.20~1.00	
		110404-VF			●						●														11.2	9.525	4.76	0.4	3.81	0.07~0.30	0.50~1.50	
Finishing		110408-VF			●						●							●							10.8	9.525	4.76	0.8	3.81	0.10~0.40	0.50~1.50	
		150404-VF			●																				15.1	12.7	4.76	0.4	5.16	0.07~0.30	0.50~1.50	PDJNR/L
		150408-VF			●																				14.7	12.7	4.76	0.8	5.16	0.10~0.40	0.50~1.50	PDNNR/L
		150412-VF																							14.4	12.7	4.76	1.2	5.16	0.15~0.50	0.60~1.50	PDSNR/L
		150604-VF	●		●						●														15.1	12.7	6.35	0.4	5.16	0.13~0.30	0.50~1.50	PDUNR/L
		150608-VF	●		●						●														14.7	12.7	6.35	0.8	5.16	0.10~0.40	0.50~1.50	
		150612-VF			●																				14.4	12.7	6.35	1.2	5.16	0.15~0.50	0.60~1.50	
DNMG-VG	DNMG	110404-VG																			●				11.2	9.525	4.76	0.4	3.81	0.07~0.30	0.50~1.50	
		110408-VG																●			●				10.8	9.525	4.76	0.8	3.81	0.10~0.40	0.50~1.50	
Finishing		150404-VG															●	●			●				15.1	12.7	4.76	0.4	5.16	0.07~0.30	0.50~1.50	
		150408-VG															●	●			●				14.7	12.7	4.76	0.8	5.16	0.10~0.40	0.50~1.50	PDJNR/L
		150604-VG															●	●			●				15.1	12.7	6.35	0.4	5.16	0.13~0.30	0.50~1.50	PDNNR/L
		150608-VG															●	●			●				14.7	12.7	6.35	0.8	5.16	0.10~0.40	0.50~1.50	PDSNR/L PDUNR/L
DNMG-VM	DNMG	110404-VM																●							11.2	9.525	4.76	0.4	3.81	0.05~0.30	0.90~4.00	
		110408-VM	●		●						●							●							10.8	9.525	4.76	0.8	3.81	0.10~0.50	1.00~4.00	
Medium cutting		110412-VM	●		●																				10.3	9.525	4.76	1.2	3.81	0.13~0.50	1.30~4.00	
		150404-VM	●		●	●			●		●				●			●							15.1	12.7	4.76	0.4	5.16	0.05~0.30	0.90~5.00	PDJNR/L
		150408-VM	●		●	●			●		●				●			●							14.7	12.7	4.76	0.8	5.16	0.10~0.50	1.00~5.00	PDNNR/L
		150412-VM									●							●							14.4	12.7	4.76	1.2	5.16	0.13~0.60	1.30~5.00	PDSNR/L PDUNR/L
		150604-VM	●	○	●	●			●		●		●		○			●							15.1	12.7	6.35	0.4	5.16	0.05~0.30	0.90~5.00	
		150608-VM	●	○	●	●			●		●	●	●					●							14.7	12.7	6.35	0.8	5.16	0.10~0.50	1.00~5.00	
		150612-VM							●		●							●							14.4	12.7	6.35	1.2	5.16	0.13~0.60	1.30~5.00	
DNMG-VQ	DNMG	110404-VQ																●			●				11.2	9.525	4.76	0.4	3.81	0.05~0.30	0.50~3.50	
		110408-VQ																			●				10.8	9.525	4.76	0.8	3.81	0.08~0.40	0.80~4.00	
Medium to finishing		150404-VQ															●	●			●				15.1	12.7	4.76	0.4	5.16	0.05~0.30	0.80~3.50	
		150408-VQ															●	●			●				14.7	12.7	4.76	0.8	5.16	0.08~0.40	0.80~4.00	PDJNR/L
		150604-VQ															●	●			●				15.1	12.7	6.35	0.4	5.16	0.05~0.30	0.80~4.00	PDNNR/L
		150608-VQ															●	●			●				14.7	12.7	6.35	0.8	5.16	0.08~0.40	0.80~4.00	PDSNR/L PDUNR/L

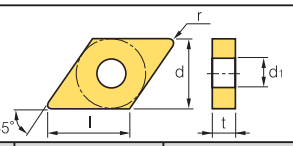
• Cutting edge geometry : A24 ~ A27 • Recommended chip breaker : B04 ~ B10 • Code system : B14 ~ B15
Note)Unit : Feed(fn) = mm/rev Depth of cut(ap) = mm

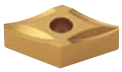
● : Stock item ○ : Under preparing for stock
● : Stock Netherlands

DN○○ Rhombic 55° Negative

Workpiece: Steel (P), Stainless steel (M), Cast iron (K), Non-ferrous metal (N), Heat resistant alloy, Titanium alloy (S), Hardened steel (H)

Machining types
- ● Continuous cutting
- Interrupted cutting
- ✱ Interrupted cutting



Inserts	Designation	Coated: NC3010	NC3020	NC3120	NC3030	NC500H	PC8110	NC9020	NC9025	NC5330	PC5300	PC9030	NC6105	NC6110	NC315K	Cermet: CN1000	CN2000	CN20	Coated: CC105	CC115	Uncoated: U20	H01	G10	l	d	t	r	d1	Cutting Condition: fn	ap	Available toolholders: Designation
DNMG-VW  Wiper finishing	DNMG 150404-VW																							15.1	12.7	4.76	0.4	5.16	0.10~0.35	0.30~3.00	PDJNR/L PDNNR/L PDSNR/L PDUNR/L
	150408-VW	●			●									●										14.7	12.7	4.76	0.8	5.16	0.10~0.40	0.30~3.00	
	150604-VW																							15.1	12.7	6.35	0.4	5.16	0.10~0.35	0.30~3.00	
	150608-VW	●			●									●										14.7	12.7	6.35	0.8	5.16	0.10~0.40	0.30~3.00	
DNMP  Medium to finishing	DNMP 150408																							14.7	12.7	4.76	0.8	5.16	0.10~0.40	0.30~3.00	
	150608																							14.7	12.7	6.35	0.8	5.16	0.10~0.40	0.30~3.00	

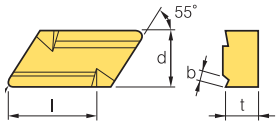
• Cutting edge geometry : A24 ~ A27 • Recommended chip breaker : B04 ~ B10 • Code system : B14 ~ B15
Note)Unit : Feed(fn) = mm/rev Depth of cut(ap) = mm

● : Stock item ○ : Under preparing for stock

KN○○ Parallelogram 55° Negative

Workpiece: Steel (P), Stainless steel (M), Cast iron (K), Non-ferrous metal (N), Heat resistant alloy, Titanium alloy (S), Hardened steel (H)

Machining types
- ● Continuous cutting
- Interrupted cutting
- ✱ Interrupted cutting



Inserts	Designation	Coated: NC3010	NC3020	NC3120	NC3030	NC500H	PC8110	NC9020	NC9025	NC5330	PC5300	PC9030	NC6105	NC6110	NC315K	Cermet: CN1000	CN2000	CN20	Coated: CC105	CC115	Uncoated: ST10	H01	G10	l	d	t	r	b	Cutting Condition: fn	ap	Available toolholders: Designation
KNUX-11  Medium cutting	KNUX 160405R-11	●	●	●	●	●		●		●		●		●							●			19.2	9.525	4.76	0.5	2.2	0.20~0.35	1.00~6.00	CKJNR/L
	160410R-11	●	●	●	●					●				●										18.8	9.525	4.76	1.0	2.2	0.30~0.60	1.50~6.00	
	160405L-11	●	●	●	●			●		●														19.2	9.525	4.76	0.5	3.2	0.20~0.35	1.00~6.00	
	160410L-11	●	●	●	●					●														18.8	9.525	4.76	1.0	3.2	0.30~0.60	1.50~6.00	
KNUX-12  Roughing	KNUX 160405R-12	●	●	●	●					●														19.2	9.525	4.76	0.5	2.2	0.25~0.35	1.50~6.00	CKJNR/L
	160410R-12		●	●	●					●														18.8	9.525	4.76	1.0	2.2	0.40~0.70	1.50~6.00	
	160405L-12		●	●	●																			19.2	9.525	4.76	0.5	3.2	0.25~0.35	1.50~6.00	
	160410L-12			●	●					●														18.8	9.525	4.76	1.0	3.2	0.40~0.70	1.50~6.00	

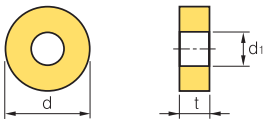
• Cutting edge geometry : A24 ~ A27 • Recommended chip breaker : B04 ~ B10 • Code system : B14 ~ B15
Note)Unit : Feed(fn) = mm/rev Depth of cut(ap) = mm

● : Stock item ○ : Under preparing for stock

RN○○ Round Negative

Workpiece: Steel (P), Stainless steel (M), Cast iron (K), Non-ferrous metal (N), Heat resistant alloy, Titanium alloy (S), Hardened steel (H)

Machining types
- ● Continuous cutting
- Interrupted cutting
- ✱ Interrupted cutting



Inserts	Designation	Coated: NC3010	NC3020	NC3120	NC3030	NC500H	PC8110	NC9020	NC9025	NC5330	PC5300	PC9030	NC6105	NC6110	NC315K	Cermet: CN1000	CN2000	CN20	Coated: CC105	CC115	Uncoated: ST10	H01	G10	d	t	d1	Cutting Condition: fn	ap	Available toolholders: Designation	
RNMG-B25  Medium Roughing	RNMG 090300-B25				●																			9.525	3.18	3.81	0.90~4.50	0.09~0.90		
	120400-B25				●					●														12.7	4.76	5.16	1.20~4.80	0.12~1.20		
	150600-B25				●																			15.875	6.35	6.35	1.15~1.50	1.50~7.50		
	190600-B25				●																			19.05	6.35	7.93	1.90~7.60	0.19~1.90	-	-
	250600-B25																							25.4	6.35	9.12	2.50~10.00	0.25~2.50		
	250900-B25				●																			25.4	9.52	9.12	2.50~10.00	0.25~2.50		
	310900-B25																							31.75	9.52	12.7	3.50~13.00	0.30~2.50		

• Cutting edge geometry : A24 ~ A27 • Recommended chip breaker : B04 ~ B10 • Code system : B14 ~ B15
Note)Unit : Feed(fn) = mm/rev Depth of cut(ap) = mm

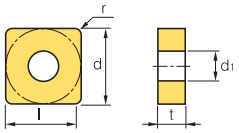
● : Stock item ○ : Under preparing for stock
● : Stock Netherlands

B Turning Insert (Negative)

SN○○ ○ Square 90° Negative

Workpiece			Coated														Cermet			Coated		Uncoated			Dimensions (mm)					Cutting Condition		Available toolholders
			NC3010	NC3020	NC3120	NC3030	NC500H	PC8110	NC9020	NC9025	NC5330	PC5300	PC9030	NC6105	NC6110	NC315K	CN1000	CN2000	CN20	CC105	CC115	ST30A	H01	G10	l	d	t	r	d_1	fn	ap	Designation
Steel	P																●	●	●			✱										
Stainless steel	M																															
Cast iron	K																●							●								
Non-ferrous metal	N																															
Heat resistant alloy, Titanium alloy	S																															
Hardened steel	H																															

Machining types
● Continuous cutting
● General cutting
✱ Interrupted cutting



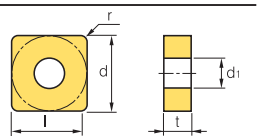
Inserts	Designation																															
SNGA  Roughing	**SNGA**	090304																							9.1	9.525	3.18	0.4	3.81	0.17~0.50	0.50~4.50	PSBNR/L PSDNN PSKNR/L PSSNR/L
		090308																							8.7	9.525	3.18	0.8	3.81	0.17~0.50	0.50~4.50	
		120404																							12.3	12.7	4.76	0.4	5.16	0.15~0.60	1.50~8.00	
		120408																							11.9	12.7	4.76	0.8	5.16	0.15~0.60	1.50~8.00	
		120412																							11.5	12.7	4.76	1.2	5.16	0.20~0.80	1.50~8.00	
		150608																							15.0	15.875	6.35	0.8	6.35	0.20~0.80	2.00~10.00	
		150616																							14.2	15.875	6.35	1.6	6.35	0.20~0.90	2.00~10.00	
		190608																							18.2	19.05	6.35	0.8	7.93	0.15~0.60	3.00~12.00	
		190612																							17.8	19.05	6.35	1.2	7.93	0.20~0.80	3.00~12.00	
SNGG  Medium cutting	**SNGG**	090304R																							9.1	9.525	3.18	0.4	3.81	0.12~0.35	1.00~3.00	PSBNR/L PSDNN PSKNR/L PSSNR/L
		090308R																							8.7	9.525	3.18	0.8	3.81	0.15~0.35	1.00~3.00	
		120404R															●	●							12.3	12.7	4.76	0.4	5.16	0.15~0.35	1.00~4.00	
		120408R															●	●							11.9	12.7	4.76	0.8	5.16	0.15~0.35	1.00~4.00	
		120412R																							11.5	12.7	4.76	1.2	5.16	0.15~0.35	1.00~4.00	
		090304L																							9.1	9.525	3.18	0.4	3.81	0.12~0.35	1.00~3.00	
		090308L																							8.7	9.525	3.18	0.8	3.81	0.15~0.35	1.00~3.00	
		120404L																							12.3	12.7	4.76	0.4	5.16	0.15~0.35	1.00~4.00	
		120408L																							11.9	12.7	4.76	0.8	5.16	0.15~0.35	1.00~4.00	
		120412L																							11.5	12.7	4.76	1.2	5.16	0.15~0.35	1.00~4.00	
SNGG-HU  Finishing	**SNGG**	120408-HU																							11.9	12.7	4.76	0.8	5.16	0.10~0.30	0.20~1.50	PSBNR/L PSDNN PSKNR/L PSSNR/L
SNGN  Roughing	**SNGN**	090302																							9.3	9.525	3.18	0.2		0.05~0.30	0.50~4.00	CSDNN CSKNR/L
		090304																							9.1	9.525	3.18	0.4		0.10~0.35	0.50~4.00	
		090308																						●	8.7	9.525	3.18	0.8		0.10~0.40	1.00~4.00	
		120304																							12.3	12.7	3.18	0.4		0.13~0.50	1.30~5.00	
		120308																							11.9	12.7	3.18	0.8		0.15~0.60	1.50~6.00	
		120312																							11.5	12.7	3.18	1.2		0.17~0.60	1.70~6.00	
		120402																							12.5	12.7	4.76	0.2		0.10~0.45	1.00~5.00	
		120404																	○						12.3	12.7	4.76	0.4		0.13~0.50	1.30~5.00	
		120408																							11.9	12.7	4.76	0.8		0.15~0.60	1.50~6.00	
		120412																							11.5	12.7	4.76	1.2		0.17~0.60	1.70~6.00	
		120424																							10.3	12.7	4.76	2.4		0.20~0.65	2.00~6.00	
		150402																							15.7	15.875	4.76	0.2		0.10~0.50	0.50~6.00	
		150408																							15.0	15.875	4.76	0.8		0.15~0.60	1.50~8.00	
		150412																							14.6	15.875	4.76	1.2		0.17~0.60	2.00~8.00	
		150416																							14.2	15.875	4.76	1.6		0.20~0.65	2.50~8.50	
		190402																							18.9	19.05	4.76	0.2		0.10~0.60	2.00~8.50	
		190412																				●			17.4	19.05	4.76	1.2		0.17~0.70	2.50~10.00	
		190416																							17.5	19.05	4.76	1.6		0.20~0.75	2.50~10.00	
		250604																														
		250616																							25.0	25.4	6.35	0.4		0.30~0.80	3.00~12.00	
																									23.8	25.4	6.35	1.6		0.35~1.00	4.00~12.00	
SNGX  Roughing	**SNGX**	120408R																							11.9	12.7	4.76	0.8		1.00~4.00	0.15~0.35	PSBNR/L PSDNN PSKNR/L PSSNR/L

• Cutting edge geometry : A24 ~ A27 • Recommended chip breaker : B04 ~ B10 • Code system : B14 ~ B15 ● : Stock item ○ : Under preparing for stock
Note)Unit : Feed(fn) = mm/rev Depth of cut(ap) = mm

SN○○ ○ Square 90° Negative

Workpiece: Steel P, Stainless steel M, Cast iron K, Non-ferrous metal N, Heat resistant alloy, Titanium alloy S, Hardened steel H

Machining types: ● Continuous cutting, ⬣ General cutting, ✱ Interrupted cutting



Inserts	Designation		Coated													Cermet			Coated		Uncoated			Dimensions (mm)					Cutting Condition		Available toolholders
			NC3010	NC3020	NC3120	NC3030	NC500H	PC8110	NC9020	NC9025	NC5330	PC5300	PC9030	NC6105	NC6110	NC315K	CN1000	CN2000	CN20	CC105	CC115	U20	H01	G10	l	d	t	r	d_1	fn	ap	Designation
SNMA	SNMA	090304 New																							9.1	9.525	3.18	0.4	3.81	0.10~0.45	0.50~4.50	
		090308												●											8.7	9.525	3.18	0.8	3.81	0.15~0.50	0.50~4.50	
		090312																							8.3	9.525	3.18	1.2	3.81	0.20~0.50	0.50~4.50	
		120402																							12.5	12.7	4.76	0.2	5.16	0.10~0.50	1.00~4.50	
		120404																							12.3	12.7	4.76	0.4	5.16	0.15~0.60	1.00~5.00	PSBNR/L
SNMA		120408	●											●	●	●						●		●	11.9	12.7	4.76	0.8	5.16	0.15~0.70	1.00~6.00	PSDNN
		120412	●									●		●	●										11.5	12.7	4.76	1.2	5.16	0.20~0.80	1.50~6.00	PSKNR/L
		120416												●	●										11.1	12.7	4.76	1.6	5.16	0.30~1.00	2.00~6.00	PSSNR/L
	New	120430																							9.7	12.7	4.76	3.0	5.16	0.30~0.70	2.50~5.00	
		150612												●	●										14.6	15.875	6.35	1.2	6.35	0.20~0.80	2.00~8.00	
		150616												●											14.2	15.875	6.35	1.6	6.35	0.25~0.85	2.50~10.00	
		190608												●											18.2	19.05	6.35	0.8	7.93	0.20~0.80	2.00~10.00	
		190612												●	●	●									17.8	19.05	6.35	1.2	7.93	0.20~0.80	2.00~10.00	
		190616												●	●	●									17.4	19.05	6.35	1.6	7.93	0.25~0.85	2.50~10.00	
		190624																							16.6	19.05	6.35	2.4	7.93	0.35~0.90	3.00~10.00	
		250724												●											23.0	25.4	7.94	2.4	9.12	0.40~1.00	3.00~13.00	
		250924																							23.0	25.4	9.52	2.4	9.12	0.40~1.00	3.00~13.00	
SNMG-B25	SNMG	090308-B25		●	●	●					●														8.7	9.525	3.18	0.8	3.81	0.17~0.45	0.80~3.50	
		120404-B25	●	●	●	●					●				●		●								12.3	12.7	4.76	0.4	5.16	0.17~0.45	1.00~3.50	
		120408-B25	●	●	●	●		○	●		●	●	●		●		●								11.9	12.7	4.76	0.8	5.16	0.23~0.60	1.50~5.00	
		120412-B25		●	●	●					●			●	●										11.5	12.7	4.76	1.2	5.16	0.25~0.60	2.00~5.00	
		120416-B25				●					●			●											11.1	12.7	4.76	1.6	5.16	0.35~0.70	2.50~5.00	PSBNR/L
	New	120420-B25																							10.7	12.7	4.76	2.0	5.16	0.40~0.70	3.00~5.00	PSDNN
		150608-B25				●					●														15.0	15.875	6.35	0.8	6.35	0.25~0.60	1.50~6.00	PSKNR/L
		150612-B25		●	●									●											14.6	15.875	6.35	1.2	6.35	0.25~0.60	2.00~6.00	PSSNR/L
		150616-B25		●	●									●											14.2	15.875	6.35	1.6	6.35	0.35~0.70	2.00~6.00	
		190608-B25	●	●	●	●					●				●										18.2	19.05	6.35	0.8	7.93	0.25~0.60	3.00~8.00	
		190612-B25	●	●	●	●	●	○			●				●										17.8	19.05	6.35	1.2	7.93	0.30~0.60	3.00~8.00	
		190616-B25	●	●	●	●		○			●														17.4	19.05	6.35	1.6	7.93	0.35~0.70	3.00~8.00	
		250716-B25	●								●														23.8	25.4	7.94	1.6	9.12	0.35~0.70	4.00~12.00	
		250724-B25									●														23.0	25.4	7.94	2.4	9.12	0.50 ~1.00	5.00~12.00	
SNMG-GM	SNMG	120404-GM		●	●												●								12.3	12.7	4.76	0.4	5.16	0.05~0.30	0.90~5.00	
		120408-GM	●	●	●	●						●					●	●	●						11.9	12.7	4.76	0.8	5.16	0.10~0.50	1.00~5.00	
		120412-GM				●																			11.5	12.7	4.76	1.2	5.16	0.13~0.60	1.30~5.00	
																															PSBNR/L
																															PSDNN
																															PSKNR/L
																															PSSNR/L
SNMG-GR	SNMG	120404-GR																							12.3	12.7	4.76	0.4	5.16	0.15~0.45	0.08~6.00	
		120408-GR	●	●	●	●					●			●	●	●									11.9	12.7	4.76	0.8	5.16	0.20~0.50	1.00~7.00	
		120412-GR		●	●	●	●							●	●	●									11.5	12.7	4.76	1.2	5.16	0.20~0.50	1.00~7.00	
		150608-GR				●																			15.0	15.875	6.35	0.8	6.35	0.25~0.60	1.00~7.00	
		150612-GR	●	●	●	●	●							●											14.6	15.875	6.35	1.2	6.35	0.29~0.75	1.40~7.00	PSBNR/L
		190608-GR		●	●	●																			18.2	19.05	6.35	0.8	7.93	0.30~0.80	1.70~9.00	PSDNN
		190612-GR		●	●	●	●				●														17.8	19.05	6.35	1.2	7.93	0.30~0.80	1.70~9.00	PSKNR/L
		190616-GR		●	●	●	●				●			●											17.4	19.05	6.35	1.6	7.93	0.31~0.82	1.90~12.30	PSSNR/L
		250724-GR				●								●											23.0	25.4	7.94	2.4	9.12	0.45~1.20	2.60~14.00	
		250924-GR		●	●	●																			23.0	25.4	9.52	2.4	9.12	0.50~1.20	2.60~14.00	
SNMG-GS	SNMG	120404-GS							●	●															12.3	12.7	4.76	0.4	5.16	0.10~0.45	0.80~4.50	
		120408-GS		●		●		●	●	●		●	●												11.9	12.7	4.76	0.8	5.16	0.10~0.50	1.00~5.00	
		120412-GS						●	●	●		○													11.5	12.7	4.76	1.2	5.16	0.13~0.65	1.00~5.00	
		120416-GS																							11.1	12.7	4.76	1.6	5.16	0.15~0.70	1.00~5.00	PSBNR/L
		190612-GS						●		●		○																				PSDNN
																															PSKNR/L
																															PSSNR/L
SNMG-HA	SNMG	120404-HA		●	●				●	●			●										●		12.3	12.7	4.76	0.4	5.16	0.10~0.35	0.80~3.50	
		120408-HA		●	●			●	●	●			●										●		11.9	12.7	4.76	0.8	5.16	0.10~0.40	0.80~3.50	
		120412-HA																							11.5	12.7	4.76	1.2	5.16	0.13~0.55	0.80~3.50	
																															PSBNR/L
																															PSDNN
																															PSKNR/L
																															PSSNR/L

Medium Roughing (SNMA)

Medium Roughing (SNMG-B25)

Medium cutting (SNMG-GM)

Roughing (SNMG-GR)

Medium to finishing (SNMG-GS)

Medium to finishing (SNMG-HA)

• Cutting edge geometry : A24 ~ A27 • Recommended chip breaker : B04 ~ B10 • Code system : B14 ~ B15 ● : Stock item ○ : Under preparing for stock

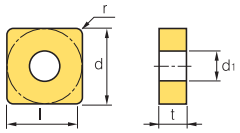
Note)Unit : Feed(fn) = mm/rev Depth of cut(ap) = mm

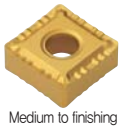
B Turning Insert (Negative)

SN○○ Square 90° Negative

Workpiece: Steel (P), Stainless steel (M), Cast iron (K), Non-ferrous metal (N), Heat resistant alloy, Titanium alloy (S), Hardened steel (H)

Machining types
- ● Continuous cutting
- ◓ General cutting
- ✱ Interrupted cutting



Inserts	Designation	Coated: NC3010	NC3020	NC3120	NC3030	NC500H	PC8110	NC9020	NC9025	NC5330	PC5300	PC9030	NC6105	NC6110	NC315K	Cermet: CN1000	CN2000	Coated: CN20	CC105	CC115	Uncoated: U20	H01	G10	l	d	t	r	d1	Cutting Condition: fn	ap	Available toolholders: Designation
SNMG-HC  Medium to finishing	SNMG 120404-HC	●	●	●																				12.3	12.7	4.76	0.4	5.16	0.05~0.35	0.80~4.00	PSBNR/L PSDNN PSKNR/L PSSNR/L
	120408-HC	●	●	●																				11.9	12.7	4.76	0.8	5.16	0.08~0.40	0.80~4.00	
SNMG-HR  Roughing	SNMG 120408-HR																							11.9	12.7	4.76	0.8	5.16	0.20~0.50	1.00~7.00	PSBNR/L PSDNN PSKNR/L PSSNR/L
	120412-HR	●		●																				11.5	12.7	4.76	1.2	5.16	0.25~0.70	1.30~7.00	
	120416-HR																							11.1	12.7	4.76	1.6	5.16	0.32~0.75	1.80~7.00	
	150608-HR	●	●	●	●																			15	15.875	6.35	0.8	6.35	0.20~0.50	1.80~8.00	
	150612-HR		●	●	●																			14.6	15.875	6.35	1.2	6.35	0.20~0.70	1.30~8.00	
	150616-HR																							14.2	15.875	6.35	1.6	6.35	0.30~0.80	1.80~8.00	
	150624-HR																							13.4	15.875	6.35	2.4	6.35	0.32~0.90	2.20~8.00	
	190608-HR	●	●																					18.2	19.05	6.35	0.8	7.93	0.20~0.50	1.00~10.00	
	190612-HR	●	●	●		●																		17.8	19.05	6.35	1.2	7.93	0.25~0.70	1.30~10.00	
	190616-HR	●	●	●	●																			17.4	19.05	6.35	1.6	7.93	0.30~0.80	1.80~10.00	
	190624-HR																							16.6	19.05	6.35	2.4	7.93	0.32~0.90	2.30~10.00	
	250724-HR																							23	25.4	7.94	2.4	9.12	0.40~1.20	2.30~15.00	
	250924-HR		●	●	●																			23	25.4	9.52	2.4	9.12	0.40~1.20	2.30~15.00	
SNMG-HS  Medium to finishing	SNMG 090304-HS								●															9.1	9.525	3.18	0.4	3.81	0.05~0.25	1.00~2.50	PSBNR/L PSDNN PSKNR/L PSSNR/L
	090308-HS						○																	8.7	9.525	3.18	0.8	3.81	0.10~0.30	1.00~2.50	
	120404-HS							●	●	●														12.3	12.7	4.76	0.4	5.16	0.05~0.30	1.00~4.50	
	120408-HS						●	●	●	●														11.9	12.7	4.76	0.8	5.16	0.10~0.40	1.00~4.50	
	120412-HS						●	●		●														11.5	12.7	4.76	1.2	5.16	0.13~0.55	1.00~4.50	
	150612-HS						●	●	●															14.6	15.875	6.35	1.2	6.35	0.13~0.55	1.00~6.10	
	150616-HS																							14.2	15.875	6.35	1.6	6.35	0.15~0.60	1.00~4.50	
	190612-HS						●	●	●	●														17.8	19.05	6.35	1.2	7.93	0.13~0.55	1.00~7.60	
	190616-HS						●		●	●														17.4	19.05	6.35	1.6	7.93	0.15~0.60	1.00~7.60	
SNMG-HU  Finishing	SNMG 120404-HU																							12.3	12.7	4.76	0.4	5.16	0.05~0.25	0.10~1.00	PSBNR/L PSDNN PSKNR/L PSSNR/L
	120408-HU																							11.9	12.7	4.76	0.8	5.16	0.10~0.35	0.20~1.50	
	120412-HU																							11.5	12.7	4.76	1.2	5.16	0.12~0.35	0.30~1.50	
SNMG-VL  Mild steel	SNMG 120408-VL	●	●																					11.9	12.7	4.76	0.6	5.16	0.10~0.35	0.2~1.5	PSBNR/L PSDNN PSKNR/L PSSNR/L
SNMG-VF  Finishing	SNMG 090304-VF			●							●													9.1	9.525	3.18	0.4	3.81	0.07~0.30	0.50~1.50	PSBNR/L PSDNN PSKNR/L PSSNR/L
	090308-VF										●																				
	120404-VF			●							●													12.3	12.7	4.76	0.4	5.16	0.07~0.30	0.50~1.50	
	120408-VF	●		●							●													11.9	12.7	4.76	0.8	5.16	0.10~0.40	0.50~1.50	
SNMG-VG  Finishing	SNMG 090304-VG																●							9.1	9.525	3.18	0.4	3.81	0.07~0.30	0.50~1.50	PSBNR/L PSDNN PSKNR/L PSSNR/L
	090308-VG																●							8.7	9.525	3.18	0.8	3.81	0.10~0.30	0.50~1.50	
	120404-VG															●	●							12.3	12.7	4.76	0.4	5.16	0.07~0.30	0.50~1.50	
	120408-VG															●	●							11.9	12.7	4.76	0.8	5.16	0.10~0.40	0.50~1.50	
SNMG-VM  Medium cutting	SNMG 090304-VM	●		●													●							9.1	9.525	3.18	0.4	3.81	0.05~0.30	0.90~3.50	PSBNR/L PSDNN PSKNR/L PSSNR/L
	090308-VM	●		●							●						●							8.7	9.525	3.18	0.8	3.81	0.10~5.00	1.00~3.50	
	120404-VM	●		●							●		●				●							12.3	12.7	4.76	0.4	5.16	0.05~0.30	0.90~5.00	
	120408-VM	●	○	●	●		●	●			●		●				●							11.9	12.7	4.76	0.8	5.16	0.10~0.50	1.00~5.00	
	120412-VM	●		●	●						●		●				●							11.5	12.7	4.76	1.2	5.16	0.13~0.60	1.30~5.00	
	190612-VM																							17.8	19.05	6.35	1.2	7.93	0.25~0.60	2.50~7.50	
SNMG-VQ  Medium to finishing	SNMG 090304-VQ																							9.1	9.525	3.18	0.4	3.81	0.05~0.30	0.05~3.50	PSBNR/L PSDNN PSKNR/L PSSNR/L
	090308-VQ																							8.7	9.525	3.18	0.8	3.81	0.08~0.30	0.08~4.00	
	120404-VQ															●	●							12.3	12.7	4.76	0.4	5.16	0.05~0.30	0.80~4.00	
	120408-VQ															●	●							11.9	12.7	4.76	0.8	5.16	0.08~0.40	0.80~4.00	

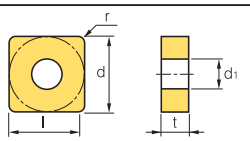
• Cutting edge geometry : A24 ~ A27 • Recommended chip breaker : B04 ~ B10 • Code system : B14 ~ B15 ● : Stock item ○ : Under preparing for stock

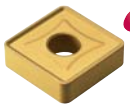
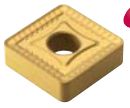
Note)Unit : Feed(fn) = mm/rev Depth of cut(ap) = mm

SN○○ Square 90° Negative

Workpiece: Steel P, Stainless steel M, Cast iron K, Non-ferrous metal N, Heat resistant alloy, Titanium alloy S, Hardened steel H

Machining types: ● Continuous cutting, ⬣ General cutting, ✱ Interrupted cutting



Inserts	Designation		Coated: NC3010	NC3020	NC3120	NC3030	NC500H	CX269	NC9020	NC9025	NC5330	PC5300	PC9030	NC6105	NC6110	NC315K	Cermet: CN1000	CN2000	CN20	Coated: CC105	CC115	Uncoated: ST30A	H01	G10	Dimensions (mm): l	d	t	r	d1	Cutting Condition: fn	ap	Available toolholders: Designation
SNMM-GH  Heavy	SNMM	120408-GH		●	●	●					●														11.9	12.7	4.76	0.8	5.16	0.30~0.60	2.50~8.00	PSBNR/L PSDNN PSKNR/L PSSNR/L
		120412-GH		●	●	●					●														11.5	12.7	4.76	1.2	5.16	0.30~0.70	2.50~8.00	
		150612-GH		●	●	●					●														14.6	15.875	6.35	1.2	6.35	0.30~0.70	2.50~8.00	
		190612-GH		●	●	●		●			●														17.8	19.05	6.35	1.2	7.93	0.30~0.70	3.00~8.00	
		190616-GH	●	●	●	●	●	●			●														17.4	19.05	6.35	1.6	7.93	0.45~1.00	4.00~9.00	
		190624-GH	●	●	●	●		●			●														16.6	19.05	6.35	2.4	7.93	0.55~1.20	4.00~9.00	
		250724-GH		●	●	●	●	●			●														23	25.4	7.94	2.4	9.12	0.55~1.20	5.00~12.00	
		250924-GH	●	●	●	●	●	●			●														23	25.4	9.52	2.4	9.12	0.55~1.20	5.00~12.00	
		250932-GH																							22.2	25.4	9.52	3.2	9.12	0.55~1.20	5.00~12.00	
SNMM-VH New  Heavy	SNMM	190612-VH				●	●	●																	17.8	19.05	6.35	1.2	7.93	0.50~0.90	5.0~10.0	PSBNR/L PSDNN PSKNR/L PSSNR/L
		190616-VH				●	●	●																	17.4	19.05	6.35	1.6	7.93	0.50~1.10	5.0~10.0	
		190624-VH				●	●	●																	16.6	19.05	6.35	2.4	7.93	0.60~1.20	6.0~12.0	
		250724-VH				●	●	●																	23.0	25.4	7.94	2.4	9.12	0.70~1.40	6.0~15.0	
		250920-VH																							23.4	25.4	9.52	2.0	9.12	0.70~1.40	6.0~15.0	
		250924-VH	●			●	●	●																	23.0	25.4	9.52	2.4	9.12	0.70~1.40	6.0~15.0	
SNMM-VT New  Heavy	SNMM	190612-VT				●	●	●			●														17.8	19.05	6.35	1.2	7.93	0.60~1.00	6.0~13.0	PSBNR/L PSDNN PSKNR/L PSSNR/L
		190616-VT	●			●	●	●																	17.4	19.05	6.35	1.6	7.93	0.60~1.10	6.0~13.0	
		190624-VT	●			●	●	●																	16.6	19.05	6.35	2.4	7.93	0.60~1.60	7.0~13.	
		250724-VT				●	●	●			●														23.0	25.4	7.94	2.4	9.12	0.75~16.0	7.0~15.0	
		250920-VT																							23.4	25.4	9.52	2.0	8.12	0.75~16.0	7.0~15.0	
		250924-VT	●			●	●	●																	23.0	25.4	9.52	2.4	9.12	0.75~16.0	7.0~17.0	
SNMM-GM  Medium cutting	SNMM	120408-GM																							11.9	12.7	4.76	0.8	5.16	0.10~0.50	1.00~5.00	PSBNR/L PSDNN PSKNR/L PSSNR/L
		120412-GM																							11.5	12.7	4.76	1.2	5.16	0.13~0.60	1.30~5.00	
SNMM-GR  Roughing	SNMM	120408-GR																							11.9	12.7	4.76	0.8	5.16	0.20~0.50	1.00~7.00	PSBNR/L PSDNN PSKNR/L PSSNR/L
		120412-GR																							11.5	12.7	4.76	1.2	5.16	0.25~0.65	1.30~7.00	
		190612-GR																							17.8	19.05	6.35	1.2	7.93	0.25~0.65	1.30~11.50	
		190616-GR																							17.4	19.05	6.35	1.6	7.93	0.32~0.85	1.80~11.50	
SNMN  Medium Roughing	SNMN	120304																							12.3	12.7	3.18	0.4		0.17~0.45	1.00~3.50	CSDNN CSKNR/L
		120308																							11.9	12.7	3.18	0.8		0.23~0.60	1.50~6.00	
		120312																							11.5	12.7	3.18	1.2		0.25~0.60	2.00~5.00	
		120404																							12.3	12.7	4.76	0.4		0.17~0.45	1.00~3.50	
		120408																							11.9	12.7	4.76	0.8		0.23~0.60	1.50~5.00	
		120412			○																				11.5	12.7	4.76	1.2		0.25~0.60	2.00~5.00	
		150404																							15.5	15.875	4.76	0.4		0.20~0.50	1.50~6.00	
		150408																							15.0	15.875	4.76	0.8		0.25~0.60	1.50~6.00	
		150412																							11.5	12.7	4.76	1.2		0.25~0.60	2.00~6.00	
		190416																							17.4	19.05	4.76	1.6		0.35~0.70	2.00~6.00	
SNMX  Roughing	SNMX	120408R																							11.9	12.7	4.76	0.8	5.16	0.15~0.35	1.00~4.00	PSBNR/L PSDNN PSKNR/L PSSNR/L
SNUN  Medium Roughing	SNUN	120408																				●			11.9	12.7	4.76	0.8		0.23~0.60	1.50~5.00	CSDNN CSKNR/L
		120412																				●			11.5	12.7	4.76	1.2		0.25~0.60	2.00~5.00	
		190412																							17.4	19.05	4.76	1.2		0.30~1.00	3.00~10.00	
		120412TN																							11.5	12.7	4.76	1.2		0.25~0.60	2.00~5.00	
		250724TN																							23	25.4	7.94	2.4		0.30~1.20	3.00~12.00	

• Cutting edge geometry : A24 ~ A27 • Recommended chip breaker : B04 ~ B10 • Code system : B14 ~ B15

Note)Unit : Feed(fn) = mm/rev Depth of cut(ap) = mm

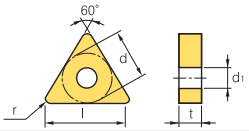
● : Stock item ○ : Under preparing for stock

B Turning Insert (Negative)

TN○○ Triangular 60° Negative

Workpiece: Steel (P), Stainless steel (M), Cast iron (K), Non-ferrous metal (N), Heat resistant alloy, Titanium alloy (S), Hardened steel (H)

Machining types
● Continuous cutting
● General cutting
✱ Interrupted cutting



Inserts	Designation		Coated: NC3010	NC3020	NC3120	NC3030	NC500H	PC8110	NC9020	NC9025	NC5330	PC5300	PC9030	NC6105	NC6110	NC315K	Cermet: CN1000	CN2000	Coated Cermet: CN20	CN30	CC105	Uncoated: U20	H01	G10	l	d	t	r	d1	fn	ap	Available toolholders: Designation
TNGA Roughing	TNGA	110302																							10.5	6.35	3.18	0.2	2.4	0.05~0.30	0.20~3.00	MTENN MTFNR/L MTGNR/L MTJNR/L PTFNR/L PTGNR/L PTTNR/L
		110304																							10.0	6.35	3.18	0.4	2.4	0.05~0.30	0.40~3.00	
		160304																							15.5	9.525	3.18	0.4	3.81	0.10~0.35	0.40~4.00	
		160402																							16.0	9.525	4.76	0.2	3.81	0.10~0.30	0.20~4.00	
		160404															○	●						○	15.5	9.525	4.76	0.4	3.81	0.10~0.35	0.40~5.00	
		160408															●								14.5	9.525	4.76	0.8	3.81	0.12~0.40	0.50~5.00	
		220304																							21.0	12.7	3.18	0.4	5.16	0.10~0.35	0.50~5.00	
		220402																							21.7	12.7	4.76	0.2	5.16	0.05~0.30	0.20~3.00	
		220404																						○	21.0	12.7	4.76	0.4	5.16	0.10~0.35	0.40~5.00	
		220408																							20.0	12.7	4.76	0.8	5.16	0.10~0.40	0.50~5.00	
		220412																							19.0	12.7	4.76	1.2	5.16	0.12~0.45	1.00~5.50	
		270612																							24.5	15.875	6.35	1.2	6.35	0.12~0.45	1.00~7.00	
		270624																							21.3	15.875	6.35	2.4	6.35	0.20~0.55	2.00~7.00	
TNGG Medium cutting	TNGG	110304R																							10.0	6.35	3.18	0.4	2.4	0.05~0.30	0.05~0.25	MTENN MTFNR/L MTGNR/L MTJNR/L PTFNR/L PTGNR/L PTTNR/L
		160402R															●	●							16.0	9.525	4.76	0.2	3.81	0.08~0.30	0.50~3.50	
		160404R															●	●	●						15.5	9.525	4.76	0.4	3.81	0.12~0.30	1.00~3.50	
		160408R															●	●							14.5	9.525	4.76	0.8	3.81	0.15~0.35	1.30~3.50	
		220404R															●	●							21.0	12.7	4.76	0.4	5.16	0.12~0.30	1.00~5.00	
		220408R															●	●							20.0	12.7	4.76	0.8	5.16	0.15~0.35	1.30~5.00	
		220412R																							19.0	12.7	4.76	1.2	5.16	0.17~0.40	1.50~5.00	
		110304L																							10.0	6.35	4.76	0.4	2.4	0.05~0.30	0.05~0.25	
		160402L																							16.0	9.525	4.76	0.2	3.81	0.08~0.30	0.50~3.50	
		160404L															●	●	●						15.5	9.525	3.18	0.4	3.81	0.12~0.30	1.00~3.50	
		160408L																●							14.5	9.525	4.76	0.8	3.81	0.15~0.35	1.30~3.50	
		220404L																							21.0	12.7	4.76	0.4	5.16	0.12~0.30	1.00~5.00	
		220408L																							20.0	12.7	4.76	0.8	5.16	0.15~0.35	1.30~5.00	
		220412L																							19.0	12.7	4.76	1.2	5.16	0.17~0.40	1.50~5.00	
TNGG-HU Finishing	TNGG	160404-HU																							15.5	9.525	4.76	0.4	3.81	0.05~0.25	0.10~1.50	MTENN MTFNR/L MTGNR/L MTJNR/L PTFNR/L PTGNR/L PTTNR/L
		160408-HU																							14.5	9.525	4.76	0.8	3.81	0.10~0.30	0.20~1.50	
TNGG-SC Finishing Neu	TNGG	160402R-SC																							16.0	9.525	4.76	0.2	3.81	0.03~0.20	0.10~1.50	MTENN MTFNR/L MTGNR/L MTJNR/L PTFNR/L PTGNR/L PTTNR/L
		160404R-SC																							15.5	9.525	4.76	0.4	3.81	0.05~0.25	0.30~2.00	
		160402L-SC																							16.0	9.525	4.76	0.2	3.81	0.03~0.20	0.10~1.50	
		160404L-SC																							15.5	9.525	4.76	0.4	3.81	0.05~0.25	0.30~2.00	
TNGN Medium cutting	TNGN	110302																							10.5	6.35	3.18	0.2		0.05~0.25	0.20~2.50	CTFNR/L CTGNR/L
		110304																							10.0	6.35	3.18	0.4		0.10~0.30	0.50~2.50	
		110308																							9.0	6.35	3.18	0.8		0.10~0.30	0.80~2.50	
		160302																							16.0	9.525	3.18	0.2		0.05~0.30	0.20~3.00	
		160304																							15.5	9.525	3.18	0.4		0.10~0.30	0.50~4.00	
		160308																							14.5	9.525	3.18	0.8		0.10~0.40	0.80~4.00	
		160404																							15.5	9.525	4.76	0.4		0.10~0.40	0.50~4.00	
		160408																							14.5	9.525	4.76	0.8		0.10~0.40	1.00~4.00	
		160412																							13.5	9.525	4.76	1.2		0.10~0.50	1.50~4.50	
		220404																							21.0	12.7	4.76	0.4		0.10~0.35	1.00~4.00	
		220408																	○						20.0	12.7	4.76	0.8		0.15~0.40	1.50~5.00	
		220412																							19.0	12.7	4.76	1.2		0.20~0.50	1.50~5.00	
		220416																							18.2	12.7	4.76	1.6		0.25~0.55	1.50~5.00	
		220424																							17.4	12.7	4.76	2.4		0.30~0.65	2.00~5.00	
		270630																							19.7	15.875	6.35	3.0		0.35~0.70	2.00~5.00	
TNMA Roughing	TNMA	110308																							9.0	6.35	3.18	0.8	2.4	0.05~0.30	0.50~3.00	MTENN MTFNR/L MTGNR/L MTJNR/L PTFNR/L PTGNR/L PTTNR/L
		160404									●			●	●										15.5	9.525	4.76	0.4	3.81	0.10~0.30	1.00~4.00	
		160408	●								●			●	●	●						●			14.5	9.525	4.76	0.8	3.81	0.10~0.40	1.00~4.00	
		160412												●	●										13.5	9.525	4.76	1.2	3.81	0.10~0.50	1.50~4.50	
	Neu	160416												●											12.5	9.525	4.76	1.6	3.81	0.15~0.55	1.50~4.50	
		220404												●											21.0	12.7	4.76	0.4	5.16	0.10~0.35	1.00~4.00	
		220408	●								●			●	●										20.0	12.7	4.76	0.8	5.16	0.15~0.40	1.50~5.00	
		220412	●								●			●	●										19.0	12.7	4.76	1.2	5.16	0.20~0.50	1.50~5.00	
		220416												●											18.2	12.7	4.76	1.6	5.16	0.25~0.55	1.50~5.00	
		220420																							16.8	12.7	4.76	2.0	5.16	0.30~0.65	2.00~5.00	
		220432																							16.5	12.7	4.76	3.2	5.16	0.35~0.70	2.00~5.00	
	Neu	270608																							25.4	15.875	6.35	0.8	6.35	0.20~0.45	2.00~7.00	
	Neu	270612																							24.4	15.875	6.35	1.2	6.35	0.25~0.55	3.00~7.00	
	Neu	270616												●											23.3	15.875	6.35	1.6	6.35	0.30~0.65	3.00~7.00	
	Neu	330924																							27.1	15.875	9.52	2.4	7.93	0.35~0.75	3.00~9.00	

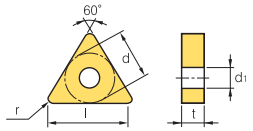
• Cutting edge geometry : A24 ~ A27 • Recommended chip breaker : B04 ~ B10 • Code system : B14 ~ B15
Note)Unit : Feed(fn) = mm/rev Depth of cut(ap) = mm

● : Stock item ○ : Under preparing for stock

TN○○ Triangular 60° Negative

Workpiece		
Steel	P	● ● ● ✱ ✱ ●
Stainless steel	M	● ● ✱ ● ● ● ✱ ✱ ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●
Cast iron	K	● ●
Non-ferrous metal	N	● ●
Heat resistant alloy, Titanium alloy	S	● ●
Hardened steel	H	● ●

Machining types
● Continuous cutting
● General cutting
✱ Interrupted cutting



Inserts	Designation		Coated													Cermet			Coated		Uncoated			Dimensions (mm)					Cutting Condition		Available toolholders
			NC3010	NC3020	NC3120	NC3030	NC500H	PC8110	NC9020	NC9025	NC5330	PC5300	PC9030	NC6105	NC6110	NC315K	CN1000	CN2000	CN20	CC105	CC115	ST30A	H01	G10	l	d	t	r	d_1	fn	ap	Designation
TNMG-B25  Medium Roughing	TNMG	110308-B25																							9.0	6.35	3.18	0.8	2.4	0.17~0.40	1.50~3.00	MTENN MTFNR/L MTGNR/L MTJNR/L PTFNR/L PTGNR/L PTTNR/L
		160304-B25																							15.5	9.525	3.18	0.4	3.81	0.17~0.45	2.00~3.50	
		160308-B25			●																			●	14.5	9.525	3.18	0.8	3.81	0.17~0.55	2.00~3.50	
		160312-B25																							13.5	9.525	3.18	1.2	3.81	0.25~0.55	2.00~3.50	
		160316-B25																							12.5	9.525	3.18	1.6	3.81	0.30~0.60	2.50~3.00	
		160404-B25	●	●	●	●					●				●		●								15.5	9.525	4.76	0.4	3.81	0.17~0.45	2.00~3.50	
		160408-B25	●	●	●	●					●		●		●		●								14.5	9.525	4.76	0.8	3.81	0.17~0.55	2.00~3.50	
		160412-B25				●						●		●											13.5	9.525	4.76	1.2	3.81	0.25~0.55	2.00~3.50	
		160416-B25												○											12.5	9.525	4.76	1.6	3.81	0.30~0.60	2.50~3.00	
		220404-B25	●	●	●	●					●	○													21.0	12.7	4.76	0.4	5.16	0.17~0.45	1.50~5.00	
		220408-B25	●	●	●	●	●				●			●	●										20.0	12.7	4.76	0.8	5.16	0.17~0.55	2.00~5.00	
		220412-B25				●								●											19.0	12.7	4.76	1.2	5.16	0.25~0.55	2.00~5.00	
		220416-B25		●	●	●								●											18.2	12.7	4.76	1.6	5.16	0.30~0.60	2.00~5.00	
		220424-B25																							17.2	12.7	4.76	2.4	5.16	0.35~0.70	3.00~7.00	
	New	220432-B25																							16.5	12.7	4.76	3.2	5.16	0.40~0.75	3.50~7.00	
		270608-B25		●	●	●																			25.5	15.875	6.35	0.8	6.35	0.17~0.55	2.00~5.00	
		270612-B25	●	●	●	●																			24.5	15.875	6.35	1.2	6.35	0.25~0.55	3.00~7.00	
		270616-B25	●																						23.5	15.875	6.35	1.6	6.35	0.30~0.60	3.00~7.00	
		330716-B25	●	●	●																				29.0	19.05	7.94	1.6	7.93	0.35~0.70	3.00~9.00	
		330924-B25																							27.1	19.05	9.52	2.4	7.93	0.40~0.80	3.00~9.00	
TNMG-GM  Medium cutting	TNMG	160304-GM																							15.5	9.525	3.18	0.4	3.81	0.05~0.30	0.80~5.00	MTENN MTFNR/L MTGNR/L MTJNR/L PTFNR/L PTGNR/L PTTNR/L
		160404-GM	●	●	●	●											●	●	●						15.5	9.525	4.76	0.4	3.81	0.05~0.30	0.80~5.00	
		160408-GM	●	●	●	●											●	●	●						14.5	9.525	4.76	0.8	3.81	0.10~0.50	1.00~5.00	
		160412-GM																							13.5	9.525	4.76	1.2	3.81	0.13~0.60	1.30~5.00	
		220404-GM		●	●	●																			21.0	12.7	4.76	0.4	5.16	0.05~0.30	0.90~6.30	
		220408-GM	●	●	●	●																			20.0	12.7	4.76	0.8	5.16	0.10~0.50	1.00~6.60	
		220412-GM		●	●	●																			19.0	12.7	4.76	1.2	5.16	0.13~0.60	1.30~6.60	
TNMG-GR  Roughing	TNMG	160408-GR	●	●	●	●								●	●	●									14.5	9.525	4.76	0.8	3.81	0.20~0.50	1.00~7.00	MTENN MTFNR/L MTGNR/L MTJNR/L PTFNR/L PTGNR/L PTTNR/L
		160412-GR		●	●									●	●										13.5	9.525	4.76	1.2	3.81	0.23~0.54	1.20~8.00	
		220408-GR		●	●	●					●			●	●										20.0	12.7	4.76	0.8	5.16	0.22~0.61	1.10~7.80	
		220412-GR		●	●	●	●							●	○										19.0	12.7	4.76	1.2	5.16	0.28~0.78	1.20~7.80	
		220416-GR				●								●											18.2	12.7	4.76	1.6	5.16	0.31~0.75	1.50~7.80	
		270608-GR				●																			25.5	15.875	6.35	0.8	6.35	0.31~0.75	1.50~7.80	
		270612-GR		●	●	●																			24.5	15.875	6.35	1.2	6.35	0.31~0.75	1.50~7.80	
		270616-GR				●								●											23.5	15.875	6.35	1.6	6.35	0.36~1.00	1.60~7.80	
		330924-GR				●																			27.1	19.05	9.52	2.4	7.93	0.40~1.00	2.00~9.00	
TNMG-GS  Medium to finishing	TNMG	160404-GS						●	●	●			●												15.5	9.525	4.76	0.4	3.81	0.05~0.35	1.00~4.50	MTENN MTFNR/L MTGNR/L MTJNR/L PTFNR/L PTGNR/L PTTNR/L
		160408-GS						●	●	●		●	●												14.5	9.525	4.76	0.8	3.81	0.10~0.50	1.00~5.00	
	New	160412-GS								●															13.5	9.525	4.76	1.2	3.81	0.13~0.65	1.00~5.00	
		220408-GS						●		●															20.0	12.7	4.76	0.8	5.16	0.10~0.50	1.00~6.80	
		220412-GS																														
TNMG-HA  Medium to finishing	TNMG	160404-HA		●	●			●	●				●										●		15.5	9.525	4.76	0.4	3.81	0.05~0.30	0.80~3.50	MTENN MTFNR/L MTGNR/L MTJNR/L PTFNR/L PTGNR/L PTTNR/L
		160408-HA		●	●			●	●	●			●										●		14.5	9.525	4.76	0.8	3.81	0.10~0.40	0.80~3.50	
		160412-HA																							13.5	9.525	4.76	1.2	3.81	0.13~0.55	0.80~3.50	
		220408-HA								●			●												20.0	12.7	4.76	0.8	5.16	0.10~0.40	0.80~5.30	
TNMG-HC  Medium to finishing	TNMG	160404-HC	●	●	●						●														15.5	9.525	4.76	0.4	3.81	0.05~0.35	0.50~3.50	MTENN MTFNR/L MTGNR/L MTJNR/L PTFNR/L PTGNR/L PTTNR/L
		160408-HC	●	●	●	●					●														14.5	9.525	4.76	0.8	3.81	0.08~0.40	0.80~4.00	
		160412-HC									●														13.5	9.525	4.76	1.2	3.81	0.13~0.50	0.90~4.00	
		220408-HC	●	●	●																				20.0	12.7	4.76	0.8	5.16	0.08~0.40	0.80~4.00	

• Cutting edge geometry : A24 ~ A27 • Recommended chip breaker : B04 ~ B10 • Code system : B14 ~ B15
Note)Unit : Feed(fn) = mm/rev Depth of cut(ap) = mm

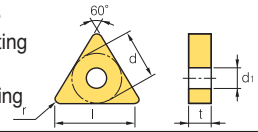
● : Stock item ○ : Under preparing for stock

B Turning Insert (Negative)

TN○○ Triangular 60° Negative

Workpiece		
Steel	P	● ⬢ ⬢ ✱ ✱ ⬢ ⬢ ⬢
Stainless steel	M	⬢ ● ⬢ ⬢ ✱ ✱
Cast iron	K	⬢ ⬢ ●
Non-ferrous metal	N	
Heat resistant alloy, Titanium alloy	S	● ⬢ ⬢ ✱ ✱
Hardened steel	H	

Machining types
● Continuous cutting
⬢ General cutting
✱ Interrupted cutting



Inserts	Designation		Coated												Cermet		Coated			Uncoated			Dimensions (mm)					Cutting Condition		Available toolholders
			NC3010	NC3020	NC3120	NC3030	NC500H	PC8110	NC9020	NC9025	NC5330	PC5300	PC9030	NC6105	NC6110	NC315K	CN1000	CN2000	CC20	CC105	CC115	U20	H01	G10	l	d	t	r	d1	fn	ap	Designation
TNMG-HR Roughing	TNMG	160408-HR	●		●																				14.5	9.525	4.76	0.8	3.81	0.20~0.50	1.00~7.00	MTENN MTFNR/L MTGNR/L MTJNR/L PTFNR/L PTGNR/L PTTNR/L
		160412-HR		●	●																				13.5	9.525	4.76	1.2	3.81	0.25~0.60	1.30~7.00	
		220404-HR																							21.0	12.7	4.76	0.4	5.16	0.20~0.45	1.00~7.50	
		220408-HR	●	●	●																				20.0	12.7	4.76	0.8	5.16	0.20~0.50	1.00~8.00	
		220412-HR	●				●																		19.0	12.7	4.76	1.2	5.16	0.25~0.60	1.30~8.00	
		220416-HR		●	●																				18.2	12.7	4.76	1.6	5.16	0.32~0.70	1.80~8.00	
		270608-HR																							25.5	15.875	6.35	0.8	6.35	0.35~0.50	1.80~13.00	
		270612-HR		●																					24.5	15.875	6.35	1.2	6.35	0.35~0.70	2.30~13.00	
		270632-HR																							19.2	15.875	6.35	3.2	6.35	0.40~0.90	3.00~13.00	
		330716-HR																							29.0	19.05	7.94	1.6	7.93	0.40~0.70	1.80~9.00	
		330924-HR																							27.1	19.05	9.52	2.4	7.93	0.45~0.90	3.30~16.00	
TNMG-HS Medium to finishing	TNMG	160404-HS						●	●	●		●	●												15.5	9.525	4.76	0.4	3.81	0.08~0.35	0.50~4.00	MTENN MTFNR/L MTGNR/L MTJNR/L PTFNR/L PTGNR/L PTTNR/L
		160408-HS						●	●	●		●	●												14.5	9.525	4.76	0.8	3.81	0.10~0.40	1.00~4.50	
		160412-HS								●		●	●												13.5	9.525	4.76	1.2	3.81	0.13~0.55	1.00~4.50	
		220408-HS						●	●	●		●	●												20.0	12.7	4.76	0.8	5.16	0.10~0.40	1.00~6.30	
		220412-HS								●			●												19.0	12.7	4.76	1.2	5.16	0.13~0.55	1.00~6.30	
TNMG-HU Finishing	TNMG	160404-HU																							15.5	9.525	4.76	0.4	3.81	0.05~0.25	0.10~1.50	MTENN MTFNR/L MTGNR/L MTJNR/L PTFNR/L PTGNR/L PTTNR/L
		160408-HU																							14.5	9.525	4.76	0.8	3.81	0.10~0.30	0.20~1.50	
TNMG-LW New Wiper Medium cutting	TNMG	160408-LW	●																						14.5	9.525	4.76	0.8	3.81	0.15~0.50	0.70~4.50	MTENN MTFNR/L MTGNR/L MTJNR/L PTFNR/L PTGNR/L PTTNR/L
		160412-LW	●																						13.5	9.525	4.76	1.2	3.81	0.20~0.60	1.00~5.00	
TNMG-VL New Mild steel	TNMG	160404-VL	●	●																					15.4	9.525	4.76	0.4	3.81	0.05~0.25	0.1~1.0	MTENN MTFNR/L MTGNR/L MTJNR/L PTFNR/L PTGNR/L PTTNR/L
		160408-VL	●	●																					14.5	9.525	4.76	0.8	3.81	0.10~0.35	0.2~1.5	
		220408-VL																							20.0	9.525	4.76	0.8	5.16	0.10~0.35	0.2~1.5	
TNMG-VF Finishing	TNMG	110304-VF			●						●							●							10.0	6.35	3.18	0.4	2.4	0.05~0.20	0.20~1.00	MTENN MTFNR/L MTGNR/L MTJNR/L PTFNR/L PTGNR/L PTTNR/L
		160404-VF			●						●							○							15.5	9.525	4.76	0.4	3.81	0.07~0.30	0.50~1.50	
		160408-VF	●		●						●														14.5	9.525	4.76	0.8	3.81	0.10~0.40	0.50~1.50	
		160412-VF			●								○												13.5	9.525	4.76	1.2	3.81	0.15~0.50	0.50~1.50	
		220404-VF			●						●														21.0	12.7	4.76	0.4	5.16	0.10~0.40	0.50~1.50	
		220408-VF			●																				20.0	12.7	4.76	0.8	5.16	0.10~0.40	0.50~1.50	
TNMG-VG Finishing	TNMG	110304-VG																●							10.0	6.35	3.18	0.4	2.4	0.05~0.20	0.20~1.00	MTENN MTFNR/L MTGNR/L MTJNR/L PTFNR/L PTGNR/L PTTNR/L
		160404-VG															●	●							15.5	9.525	4.76	0.4	3.81	0.07~0.30	0.50~1.50	
		160408-VG															●	●							14.5	9.525	4.76	0.8	3.81	0.10~0.40	0.50~1.50	
		220404-VG																●							21.0	12.7	4.76	0.4	5.16	0.10~0.40	0.50~1.50	
TNMG-VM Medium cutting	TNMG	110308-VM							●						●										9.0	6.35	3.18	0.8	2.4	0.05~0.30	0.80~4.00	MTENN MTFNR/L MTGNR/L MTJNR/L PTFNR/L PTGNR/L PTTNR/L
		160404-VM	●		●	●			●		●				●			●							15.5	9.525	4.76	0.4	3.81	0.05~0.30	0.90~5.00	
		160408-VM	●	○	●						●	●	●		●			●							14.5	9.525	4.76	0.8	3.81	0.10~0.50	1.00~5.00	
		160412-VM			●	●			●		●							●							13.5	9.525	4.76	1.2	3.81	0.13~0.60	1.30~5.00	
		220404-VM			●				●																21.0	12.7	4.76	0.4	5.16	0.05~0.30	0.90~6.60	
		220408-VM			●		●				●														20.0	12.7	4.76	0.8	5.16	0.10~0.50	1.00~6.60	
		220412-VM			●						●														19.0	12.7	4.76	1.2	5.16	0.13~0.60	1.30~6.60	

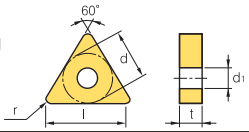
• Cutting edge geometry : A24 ~ A27 • Recommended chip breaker : B04 ~ B10 • Code system : B14 ~ B15
Note)Unit : Feed(fn) = mm/rev Depth of cut(ap) = mm

● : Stock item ○ : Under preparing for stock

TN○○ Triangular 60° Negative

Workpiece		
Steel	P	
Stainless steel	M	
Cast iron	K	
Non-ferrous metal	N	
Heat resistant alloy, Titanium alloy	S	
Hardened steel	H	

Machining types
● Continuous cutting
⬢ General cutting
✱ Interrupted cutting



Inserts	Designation		Coated												Cermet			Coated		Uncoated			Dimensions (mm)					Cutting Condition		Available toolholders
			NC3010	NC3020	NC3120	NC3030	NC500H	PC8110	NC9020	NC9025	NC5330	PC5300	PC9030	NC6105	NC6110	NC315K	CN1000	CN2000	CN20	CC105	CC115	U20	H01	G10	l	d	t	r	d_1	fn	ap	Designation
TNMG-VQ	TNMG	110304-VQ																							10.0	6.35	3.18	0.4	2.4	0.05~0.30	0.50~3.50	MTENN MTFNR/L MTGNR/L MTJNR/L PTFNR/L PTGNR/L PTTNR/L
		160404-VQ															●	●			●				15.5	9.525	4.76	0.4	3.81	0.05~0.35	0.50~3.50	
		160408-VQ															●	●			●				14.5	9.525	4.76	0.8	3.81	0.08~0.40	0.80~4.00	
		220404-VQ																							21.0	12.7	4.76	0.4	5.16	0.05~0.35	0.50~4.00	
Medium to finishing																															
TNMG-VW	TNMG	160404-VW													●										15.5	9.525	4.76	0.4	3.81	0.10~0.35	0.30~3.00	MTENN MTFNR/L MTGNR/L MTJNR/L PTFNR/L PTGNR/L PTTNR/L
		160408-VW													●										14.5	9.525	4.76	0.8	3.81	0.10~0.40	0.30~3.00	
Wiper finishing																															
TNMM-GH	TNMM	160408-GH				●																			14.5	9.525	4.76	0.8	3.81	0.20~0.50	1.00~7.00	MTENN MTFNR/L MTGNR/L MTJNR/L PTFNR/L PTGNR/L PTTNR/L
		220408-GH																							20.0	12.7	4.76	0.8	5.16	0.25~0.60	1.30~7.00	
		220412-GH	●	●	●																				19.0	12.7	4.76	1.2	5.16	0.20~0.50	1.00~8.00	
		220416-GH		●	●																				18.2	12.7	4.76	1.6	5.16	0.25~0.60	1.30~8.00	
		270616-GH																							23.4	15.875	6.35	1.6	6.35	0.32~0.70	1.80~8.00	
		270624-GH																							21.3	15.875	6.35	2.4	6.35	0.35~0.50	1.80~13.00	
Heavy		330924-GH																							27.1	19.05	9.52	2.4	7.93	0.35~0.70	2.30~13.00	
TNMM-GM	TNMM	160412-GM																							13.5	9.525	4.76	1.2	3.81	0.13~0.60	1.30~5.00	MTENN MTFNR/L MTGNR/L MTJNR/L PTFNR/L PTGNR/L PTTNR/L
		220408-GM																							20.0	12.7	4.76	0.8	5.16	0.10~0.50	1.00~6.60	
		220412-GM																							19.0	12.7	4.76	1.2	5.16	0.13~0.60	1.30~6.60	
		220416-GM																							18.2	12.7	4.76	1.6	5.16	0.15~0.65	1.50~7.00	
Medium cutting																															
TNMM-GR	TNMM	220408-GR																							20.0	12.7	4.76	0.8	5.16	0.22~0.61	1.10~7.80	MTENN MTFNR/L MTGNR/L MTJNR/L PTFNR/L PTGNR/L PTTNR/L
		220412-GR																							19.0	12.7	4.76	1.2	5.16	0.28~0.78	1.20~7.80	
		220416-GR																							18.2	12.7	4.76	1.6	5.16	0.31~0.75	1.50~7.80	
Roughing																															
TNMN	TNMN	160408																							14.5	9.525	4.76	0.8		0.10~0.30	1.00~4.00	CTFNR/L CTGNR/L
		220408																○	○						20.0	12.7	4.76	0.8		0.15~0.40	1.50~5.00	
		220412																							19.0	12.7	4.76	1.2		0.20~0.50	1.50~5.00	
Medium Roughing																															
TNMX	TNMX	160402R																●							16.5	9.525	4.76	0.2	3.81	0.10~0.30	0.50~3.00	MTENN MTFNR/L MTGNR/L MTJNR/L PTFNR/L PTGNR/L PTTNR/L
		160404R	●	●	●						●						●	●	●						15.5	9.525	4.76	0.4	3.81	0.12~0.30	1.00~3.50	
		160408R	●	●	●												●	●	●						14.5	9.525	4.76	0.8	3.81	0.15~0.35	1.30~3.40	
		220404R	●	●							●								●						21.0	12.7	4.76	0.4	5.16	0.12~0.30	1.00~5.00	
		220408R																							20.0	12.7	4.76	0.8	5.16	0.15~0.35	1.30~5.00	
		160404L	●	●														●							15.5	9.525	4.76	0.4	3.81	0.12~0.30	1.00~3.50	
		160408L	●	●	●																				14.5	9.525	4.76	0.8	3.81	0.15~0.35	1.30~3.40	
Medium Roughing																															

• Cutting edge geometry : A24 ~ A27 • Recommended chip breaker : B04 ~ B10 • Code system : B14 ~ B15
Note)Unit : Feed(fn) = mm/rev Depth of cut(ap) = mm

● : Stock item ○ : Under preparing for stock

B Turning Insert (Negative)

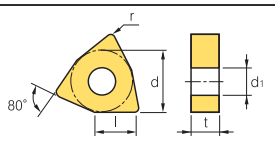
VN○○ Rhombic 35° Negative

Workpiece		
Steel	P	● ● ● ✱ ✱ ● ● ●

WN○○ Trigon 80° Negative

Workpiece			NC3010	NC3020	NC3120	NC3030	NC500H	PC8110	NC9020	NC9025	NC5330	PC5300	PC9030	NC6105	NC6110	NC315K	CN1000	CN2000	CN20	CC105	CC115	ST30A	H01	G10
	Steel	P	●	●	●	●			●		●													
	Stainless steel	M				●		●	●	●		●	●											
	Cast iron	K									●			●	●	●							●	
	Non-ferrous metal	N																						
	Heat resistant alloy, Titanium alloy	S						●			●	●	●											
	Hardened steel	H																						

Machining types
● Continuous cutting
● General cutting
● Interrupted cutting



Inserts	Designation		l	d	t	r	d1	fn	ap	Designation
			Dimensions (mm)					Cutting Condition		Available toolholders
WNMA	WNMA	060404	6.2	9.525	4.76	0.4	3.81	0.10~0.30	0.50~3.00	MWLNR/L
		060408	6.1	9.525	4.76	0.8	3.81	0.10~0.30	0.50~3.00	PWLNR/L
		060412 (New)	6.0	9.525	4.76	1.2	3.81	0.10~0.40	1.00~3.00	
		080404 (New)	8.4	12.7	4.76	0.4	5.16	0.15~0.60	1.00~5.00	
		080408	8.3	12.7	4.76	0.8	5.16	0.15~0.60	1.00~6.00	
		080412	8.2	12.7	4.76	1.2	5.16	0.15~0.70	1.50~6.00	
Roughing										
WNMG-B25	WNMG	080404-B25	8.4	12.7	4.76	0.4	5.16	0.17~0.45	1.00~5.00	MWLNR/L
		080408-B25	8.3	12.7	4.76	0.8	5.16	0.23~0.60	1.50~5.00	PWLNR/L
		080412-B25	8.2	12.7	4.76	1.2	5.16	0.25~0.60	2.00~5.00	
Medium Roughing										
WNMG-GM	WNMG	060404-GM	6.2	9.525	4.76	0.4	3.81	0.05~0.30	0.90~3.50	MWLNR/L
		060408-GM	6.1	9.525	4.76	0.8	3.81	0.10~0.45	1.00~3.50	PWLNR/L
		080404-GM	8.4	12.7	4.76	0.4	5.16	0.05~0.30	0.90~5.00	
		080408-GM	8.3	12.7	4.76	0.8	5.16	0.10~0.50	1.00~5.00	
		080412-GM	8.2	12.7	4.76	1.2	5.16	0.18~0.60	0.30~5.00	
Medium cutting										
WNMG-GR	WNMG	080404-GR (New)	8.4	12.7	4.76	0.4	5.16	0.15~0.50	0.08~6.00	MWLNR/L
		080408-GR	8.3	12.7	4.76	0.8	5.16	0.20~0.50	1.00~7.00	PWLNR/L
		080412-GR	8.2	12.7	4.76	1.2	5.16	0.25~0.50	1.30~7.00	
		080416-GR	8.1	12.7	4.76	1.6	5.16	0.25~0.60	1.80~6.00	
Roughing										
WNMG-GS	WNMG	060404-GS	6.2	9.525	4.76	0.4	3.81	0.05~0.25	0.10~3.00	MWLNR/L
		060408-GS	6.1	9.525	4.76	0.8	3.81	0.10~0.50	1.00~4.00	PWLNR/L
		080404-GS	8.4	12.7	4.76	0.4	5.16	0.05~0.25	0.10~3.00	
		080408-GS	8.3	12.7	4.76	0.8	5.16	0.10~0.50	1.00~5.00	
		080412-GS	8.2	12.7	4.76	1.2	5.16	0.13~0.65	1.00~5.00	
Medium to finishing										
WNMG-HA	WNMG	060404-HA	6.2	9.525	4.76	0.4	3.81	0.05~0.30	0.10~3.00	MWLNR/L
		060408-HA	6.1	9.525	4.76	0.8	3.81	0.10~0.40	0.80~3.50	PWLNR/L
		080404-HA	8.4	12.7	4.76	0.4	5.16	0.05~0.30	0.80~3.50	
		080408-HA	8.3	12.7	4.76	0.8	5.16	0.10~0.40	0.80~3.50	
		080412-HA	8.2	12.7	4.76	1.2	5.16	0.13~0.55	0.80~3.50	
Medium to finishing										
WNMG-HC	WNMG	060404-HC	6.2	9.525	4.76	0.4	3.81	0.05~0.30	0.80~4.00	MWLNR/L
		080404-HC	8.4	12.7	4.76	0.4	5.16	0.05~0.30	0.80~4.00	PWLNR/L
		080408-HC	8.3	12.7	4.76	0.8	5.16	0.08~0.40	0.80~4.00	
Medium to finishing										
WNMG-HR	WNMG	060408-HR	6.1	9.525	4.76	0.8	3.81	0.20~0.40	1.00~5.50	MWLNR/L
		060412-HR	6.0	9.525	4.76	1.2	3.81	0.25~0.50	1.10~5.50	PWLNR/L
		080408-HR	8.3	12.7	4.76	0.8	5.16	0.20~0.50	1.00~7.00	
		080412-HR	8.2	12.7	4.76	1.2	5.16	0.25~0.65	1.30~7.00	
		080416-HR	8.1	12.7	4.76	1.6	5.16	0.32~0.70	1.80~7.00	
Roughing										
WNMG-HS	WNMG	060404-HS	6.2	9.525	4.76	0.4	3.81	0.05~0.20	1.00~2.50	MWLNR/L
		060408-HS	6.1	9.525	4.76	0.8	3.81	0.10~0.20	1.00~2.50	PWLNR/L
		060412-HS	6.0	9.525	4.76	1.2	3.81	0.10~0.30	1.00~3.50	
		080404-HS	8.4	12.7	4.76	0.4	5.16	0.05~0.30	1.00~4.50	
		080408-HS	8.3	12.7	4.76	0.8	5.16	0.10~0.40	1.00~4.50	
		080412-HS	8.2	12.7	4.76	1.2	5.16	0.13~0.55	1.00~4.50	
Medium to finishing										

• Cutting edge geometry : A24 ~ A27 • Recommended chip breaker : B04 ~ B10 • Code system : B14 ~ B15
Note)Unit : Feed(fn) = mm/rev Depth of cut(ap) = mm

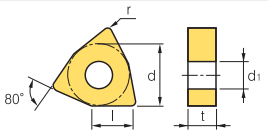
● : Stock item ○ : Under preparing for stock
● : Stock Netherlands

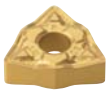
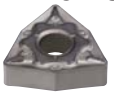
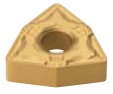
B Turning Insert (Negative)

WN○○ Trigon 80° Negative

Workpiece: Steel (P), Stainless steel (M), Cast iron (K), Non-ferrous metal (N), Heat resistant alloy, Titanium alloy (S), Hardened steel (H)

Machining types
- ● Continuous cutting
- ⬣ General cutting
- ✱ Interrupted cutting



Inserts	Designation	Coated: NC3010	NC3020	NC3120	NC3030	NC500H	PC8110	NC9020	NC9025	NC5330	PC5300	PC9030	NC6105	NC6110	NC315K	Cermet: CN1000	CN2000	CN20	Coated: CC105	CC115	Uncoated: ST30A	H01	G10	l	d	t	r	d1	Cutting Condition: fn	ap	Available toolholders: Designation
WNMG-HU	WNMG 080404-HU																							8.4	12.7	4.76	0.4	5.16	0.10~0.30	0.20~1.50	MWLNR/L
	080408-HU																							8.3	12.7	4.76	0.8	5.16	0.10~0.30	0.50~1.50	PWLNR/L
Finishing	080412-HU																							8.2	12.7	4.76	1.2	5.16	0.10~0.35	0.80~1.50	
WNMG-LW	WNMG 060408-LW	●												●										6.1	9.525	4.76	0.8	3.81	0.15~0.60	0.50~3.50	MWLNR/L
 New	060412-LW									●				●										6.0	9.525	4.76	1.2	3.81	0.20~0.70	0.80~3.50	PWLNR/L
	080408-LW	●								●				●										8.3	12.7	4.76	0.8	5.16	0.15~0.60	1.00~5.00	
Wiper Medium cutting	080412-LW	●			●					●				●										8.2	12.7	4.76	1.2	5.16	0.20~0.70	1.00~6.00	
WNMG-VL	WNMG 080404-VL	○	○																					8.4	12.7	4.76	0.4	5.16	0.05~0.25	0.1~1.0	MWLNR/L
 New	080408-VL	●	●																					8.3	12.7	4.76	0.8	5.16	0.10~0.35	0.2~1.5	PWLNR/L
Mild steel																															
WNMG-VF	WNMG 060404-VF	●		●						●							●							6.1	9.525	4.76	0.4	3.81	0.07~0.30	0.50~1.50	MWLNR/L
	060408-VF	●		●						●							●							6.1	9.525	4.76	0.8	3.81	0.10~0.40	0.50~1.50	PWLNR/L
	080404-VF	●		●						●														8.4	12.7	4.76	0.4	5.16	0.07~0.30	0.50~1.50	
Finishing	080408-VF			●						●														8.3	12.7	4.76	0.8	5.16	0.10~0.40	0.50~1.50	
WNMG-VG	WNMG 060404-VG																●							6.2	9.525	4.76	0.4	3.81	0.07~0.30	0.50~1.50	MWLNR/L
	060408-VG																●							6.1	9.525	4.76	0.8	3.81	0.10~0.40	0.50~1.50	PWLNR/L
	080404-VG															●	●							8.4	12.7	4.76	0.4	5.16	0.07~0.30	0.50~1.50	
Finishing	080408-VG															●	●							8.3	12.7	4.76	0.8	5.16	0.10~0.40	0.50~1.50	
WNMG-VM	WNMG 060402-VM																							6.5	9.525	4.76	0.2	3.81	0.05~0.30	0.90~3.50	MWLNR/L
	060404-VM			●						●							●							6.2	9.525	4.76	0.4	3.81	0.10~0.45	1.00~3.50	PWLNR/L
	060408-VM	●		●						●							●							6.1	9.525	4.76	0.8	3.81	0.10~0.50	1.00~4.00	
	060412-VM			●										●										6.0	9.525	4.76	1.2	3.81	0.13~0.60	1.30~4.00	
	080404-VM	●		●						●							●							8.4	12.7	4.76	0.4	5.16	0.05~0.30	0.90~5.00	
	080408-VM	●	○	●	●		●	●		●		●		●			●							8.3	12.7	4.76	0.8	5.16	0.10~0.50	1.00~5.00	
Medium cutting	080412-VM			●	●					●				●			●							8.2	12.7	4.76	1.2	5.16	0.10~0.50	1.00~5.00	
WNMG-VQ	WNMG 060404-VQ															●	●							6.2	9.525	4.76	0.4	3.81	0.05~0.30	0.50~4.00	MWLNR/L
	060408-VQ																●							6.1	9.525	4.76	0.8	3.81	0.08~0.30	0.80~4.00	PWLNR/L
	080404-VQ															●	●							8.4	12.7	4.76	0.4	5.16	0.05~0.30	0.50~4.00	
	080408-VQ															●	●							8.3	12.7	4.76	0.8	5.16	0.08~0.40	0.80~4.00	
Finishing, Medium cutting																															
WNMG-VW	WNMG 080404-VW	●												●										8.4	12.7	4.76	0.4	5.16	0.10~0.30	0.50~3.00	MWLNR/L
 New	080408-VW													●										8.3	12.7	4.76	0.8	5.16	0.15~0.50	0.50~4.00	PWLNR/L
Finishing																															
WNMM-B25	WNMM 100608-B25				●																			10.0	15.875	6.35	0.8	6.35	0.30~0.80	3.00~8.00	MWLNR/L
	130612-B25																							12.0	19.05	6.35	1.2	7.93	0.40~0.90	4.00~10.00	PWLNR/L
Medium Roughing																															

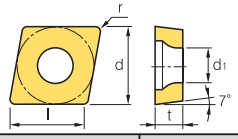
• Cutting edge geometry : A24 ~ A27 • Recommended chip breaker : B04 ~ B10 • Code system : B14 ~ B15
Note)Unit : Feed(fn) = mm/rev Depth of cut(ap) = mm

● : Stock item ○ : Under preparing for stock
● : Stock Netherlands

CC○○ Rhombic 80° Positive Relief Angle : 7°

Workpiece: Steel P, Stainless steel M, Cast iron K, Non-ferrous metal N, Heat resistant alloy, Titanium alloy S, Hardened steel H

Machining types
● Continuous cutting
Ⓖ General cutting
Ⓘ Interrupted cutting



Inserts	Designation		Coated NC3010	NC3020	NC3120	NC3030	NC500H	PC8110	NC9020	NC9025	NC5330	PC5300	PC9030	NC6105	NC6110	NC315K	Cermet CN1000	CN2000	CN20	Coated CC105	CC115	Uncoated U20	H01	G10	l	d	t	r	d1	fn	ap	Available toolholders Designation
CCET Finishing	CCET	0301005R																							3.6	3.5	1.39	0.05	1.9	0.01~0.05	0.10~0.30	SCLCR/L
		030101R																							3.5	3.5	1.39	0.1	1.9	0.01~0.05	0.10~0.30	(Boring Bar)
		030102R																							3.3	3.5	1.39	0.2	1.9	0.01~0.05	0.10~0.30	
		030104R																							3.1	3.5	1.39	0.4	1.9	0.01~0.05	0.10~0.30	
		0401005R																							4.3	4.3	1.79	0.05	2.3	0.01~0.10	0.10~0.50	
		040101R																							4.2	4.3	1.79	0.1	2.3	0.01~0.10	0.10~0.50	
		040102R																							4.1	4.3	1.79	0.2	2.3	0.01~0.10	0.10~0.50	
		040104R																							3.9	4.3	1.79	0.4	2.3	0.01~0.10	0.10~0.50	
		0301005L																							3.6	3.5	1.39	0.05	1.9	0.01~0.05	0.10~0.30	SCLCR/L
		030101L																							3.5	3.5	1.39	0.1	1.9	0.01~0.05	0.10~0.30	(Boring Bar)
		030102L											●				○	●				●			3.3	3.5	1.39	0.2	1.9	0.01~0.05	0.10~0.30	
		030104L																							3.1	3.5	1.39	0.4	1.9	0.01~0.05	0.10~0.30	
		0401005L																							4.3	4.3	1.79	0.05	2.3	0.01~0.10	0.10~0.50	
		040101L																							4.2	4.3	1.79	0.1	2.3	0.01~0.10	0.10~0.50	
		040102L											●				○	●				●			4.1	4.3	1.79	0.2	2.3	0.01~0.10	0.10~0.50	
		040104L																							3.9	4.3	1.79	0.4	2.3	0.01~0.10	0.10~0.50	
CCGT-C05 Finishing	CCGT	060202-C05																							6.2	6.35	2.38	0.2	2.8	0.06~0.11	0.06~1.70	SCACR/L
		060204-C05																							6.0	6.35	2.38	0.4	2.8	0.08~0.17	0.10~1.70	SCLCR/L
		09T304-C05																	●						9.2	9.525	3.97	0.4	4.4	0.11~0.23	0.10~2.00	
		09T308-C05																							8.8	9.525	3.97	0.8	4.4	0.08~0.30	0.20~2.00	
		120404-C05																							12.4	12.7	4.76	0.4	5.5	0.07~0.27	0.10~2.70	
		120408-C05																							12.0	12.7	4.76	0.8	5.5	0.08~0.30	0.20~2.70	
CCGT-HFP Finishing	CCGT	060202-HFP		●	●		○																		6.2	6.35	2.38	0.2	2.8	0.03~0.06	0.06~1.20	SCACR/L
		060204-HFP		●	●		○					●													6.0	6.35	2.38	0.4	2.8	0.05~0.12	0.10~1.20	SCLCR/L
		060208-HFP																							5.6	6.35	2.38	0.8	2.8	0.05~0.12	0.12~1.40	
		09T302-HFP		●	●		○																		9.4	9.525	3.97	0.2	4.4	0.04~0.16	0.08~1.50	
		09T304-HFP		●	●	●	○				●	●	●												9.2	9.525	3.97	0.4	4.4	0.06~0.18	0.10~1.50	
		09T308-HFP		●	●						●	●													8.8	9.525	3.97	0.8	4.4	0.08~0.25	0.20~1.50	
		120404-HFP																							12.4	12.7	4.76	0.4	5.5	0.06~0.20	0.10~2.00	
		120408-HFP																							12.0	12.7	4.76	0.8	5.5	0.10~0.25	0.20~2.00	
CCGT-KF Finishing (Auto Tool)	CCGT	0602003R-KF																							6.5	6.35	2.38	0.03	2.8	0.01~0.06	0.04~1.30	SCACR/L
		060201R-KF											●												6.5	6.35	2.38	0.1	2.8	0.02~0.08	0.05~1.50	SCLCR/L
		060202R-KF											●												6.5	6.35	2.38	0.2	2.8	0.03~0.11	0.06~1.70	
		09T3003R-KF																							9.7	9.525	3.97	0.03	4.4	0.02~0.08	0.05~1.50	
		09T301R-KF											●												9.7	9.525	3.97	0.1	4.4	0.03~0.11	0.06~1.70	
		09T302R-KF											●												9.7	9.525	3.97	0.2	4.4	0.04~0.15	0.08~2.00	
		0602003L-KF																							6.5	6.35	2.38	0.03	2.8	0.01~0.06	0.04~1.30	
		060201L-KF																							6.5	6.35	2.38	0.1	2.8	0.02~0.08	0.05~1.50	
		060202L-KF																							6.5	6.35	2.38	0.2	2.8	0.03~0.11	0.06~1.70	
		09T3003L-KF																							9.7	9.525	3.97	0.03	4.4	0.02~0.08	0.05~1.50	
		09T301L-KF																							9.7	9.525	3.97	0.1	4.4	0.03~0.11	0.06~1.70	
		09T302L-KF																							9.7	9.525	3.97	0.2	4.4	0.04~0.15	0.08~2.00	
CCGT-KM Medium cutting (Auto Tool)	CCGT	0602003R-KM																							6.5	6.35	2.38	0.03	2.8	0.01~0.06	0.04~1.30	SCACR/L
		060201R-KM											●												6.5	6.35	2.38	0.1	2.8	0.02~0.08	0.05~1.50	SCLCR/L
		060202R-KM											●												6.5	6.35	2.38	0.2	2.8	0.03~0.11	0.06~1.70	
		09T3003R-KM																							9.7	9.525	3.97	0.03	4.4	0.02~0.08	0.06~1.50	
		09T301R-KM											●												9.7	9.525	3.97	0.1	4.4	0.03~0.11	0.06~1.70	
		09T302R-KM											●												9.7	9.525	3.97	0.2	4.4	0.04~0.15	0.08~2.00	
		0602003L-KM																							6.5	6.35	2.38	0.03	2.8	0.01~0.06	0.04~1.30	SCACR/L
		060201L-KM																							6.5	6.35	2.38	0.1	2.8	0.02~0.08	0.05~1.50	SCLCR/L
		060202L-KM																							6.5	6.35	2.38	0.2	2.8	0.03~0.11	0.06~1.70	
		09T3003L-KM																							9.7	9.525	3.97	0.03	4.4	0.02~0.08	0.06~1.50	
		09T301L-KM																							9.7	9.525	3.97	0.1	4.4	0.03~0.11	0.06~1.70	
		09T302L-KM																							9.7	9.525	3.97	0.2	4.4	0.04~0.15	0.08~2.00	
CCMT-C25 Medium cutting	CCMT	060202-C25		●	●	●											●	●	●						6.2	6.35	2.38	0.2	2.8	0.03~0.12	0.40~2.00	SCACR/L
		060204-C25	●	●	●	●					●		●		●		●		●						6.0	6.35	2.38	0.4	2.8	0.05~0.15	0.60~2.30	SCLCR/L
		060208-C25		●	●	●					●				●										5.6	6.35	2.38	0.8	2.8	0.07~0.20	0.80~2.30	
		080308-C25		●	●																				7.2	7.94	3.18	0.8	3.4	0.08~0.25	0.80~2.30	
		09T304-C25	●	●	●	●		○	●		●	○	●		●		●	●	●						9.2	9.525	3.97	0.4	4.4	0.08~0.25	0.80~3.00	
		09T308-C25	●	●	●	●		○	●		●	○	●		●		●	●	●						8.8	9.525	3.97	0.8	4.4	0.10~0.30	1.00~3.00	
		120404-C25	●	●	●	●					●				●		●	●							12.4	12.7	4.76	0.4	5.5	0.10~0.32	0.80~3.00	
		120408-C25	●	●	●	●					●				●										12.0	12.7	4.76	0.8	5.5	0.12~0.36	1.20~3.50	
		120412-C25		●	●										●										11.6	12.7	4.76	1.2	5.5	0.15~0.40	1.40~3.50	

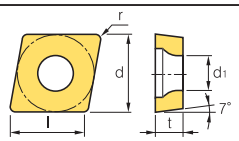
• Cutting edge geometry : A24 ~ A27 • Recommended chip breaker : B04 ~ B10 • Code system : B14 ~ B15 ● : Stock item ○ : Under preparing for stock
Note)Unit : Feed(fn) = mm/rev Depth of cut(ap) = mm

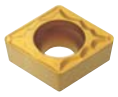
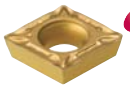
B Turning Insert (Positive)

CC○○ Rhombic 80° Positive Relief Angle : 7°

Workpiece		
Steel	P	● ⬣ ⬣ ✱ ⬣ ⬣ ⬣
Stainless steel	M	⬣ ● ⬣ ✱ ✱
Cast iron	K	⬣ ⬣ ⬣ ●
Non-ferrous metal	N	
Heat resistant alloy, Titanium alloy	S	● ⬣ ✱ ✱
Hardened steel	H	

Machining types
● Continuous cutting
⬣ General cutting
✱ Interrupted cutting



Inserts	Designation	Coated NC3010	NC3020	NC3120	NC3030	NC500H	PC8110	NC9020	NC9025	NC5330	PC9030	PC5300	NC6105	NC6110	NC315K	Cermet CN1000	CN2000	Coated CN20	CC105	CC115	Uncoated H01	G10	Dimensions (mm) l	d	t	r	d1	Cutting Condition fn	ap	Available toolholders Designation
CCMT-HFP  Finishing	CCMT 060202-HFP		●																				6.2	6.35	2.38	0.2	2.8	0.03~0.06	0.08~1.20	SCACR/L
	060204-HFP		●																				6.0	6.35	2.38	0.4	2.8	0.05~0.12	0.10~1.20	SCLCR/L
	060208-HFP																						5.6	6.35	2.38	0.8	2.8	0.05~0.12	0.10~1.40	
	09T302-HFP		●							●													9.4	9.525	3.97	0.2	4.4	0.04~0.16	0.08~1.50	
	09T304-HFP		●	●			○			●													9.2	9.525	3.97	0.4	4.4	0.06~0.18	0.10~1.50	
	09T308-HFP						○																0.8	9.525	3.97	0.8	4.4	0.08~0.25	0.20~1.50	
	120404-HFP		●																				2.4	12.7	4.76	0.4	5.5	0.07~0.22	0.10~2.00	
	120408-HFP																						12.0	12.7	4.76	0.8	5.5	0.08~0.30	0.12~2.20	
CCMT-HMP  Medium cutting	CCMT 060202-HMP	●	●	●		●	●		●	●													6.2	6.35	2.38	0.2	2.8	0.03~0.12	0.10~1.50	SCACR/L
	060204-HMP	●	●	●	●	●	●		●	●	●		●	●	●	●	●						6.0	6.35	2.38	0.4	2.8	0.06~0.17	0.20~2.40	SCLCR/L
	060208-HMP	●	●	●	●		●	●		●	●												5.6	6.35	2.38	0.8	2.8	0.08~0.23	0.40~2.40	
	09T302-HMP	●	●	●		●		●		●	●					●	●						9.4	9.525	3.97	0.2	4.4	0.07~0.22	0.10~2.00	
	09T304-HMP	●	●	●	●	●		●		●	●	●		●	●	●	●			●			9.2	9.525	3.97	0.4	4.4	0.08~0.23	0.30~3.00	
	09T308-HMP	●	●	●	●		●	●		●	●	●		●	●	●	●						8.8	9.525	3.97	0.4	4.4	0.10~0.30	0.50~3.00	
	120404-HMP	●	●	●	●			●		●	●	●		●	●	●	●						12.4	12.7	4.76	0.4	5.5	0.09~0.27	0.30~3.60	
	120408-HMP	●	●	●	●			●		●	●	●		●	●								12.0	12.7	4.76	0.8	5.5	0.24~0.36	1.00~3.60	
	120412-HMP																						11.6	12.7	4.76	1.2	5.5	0.14~0.43	0.70~3.60	
CCMT-VF New  Finishing	CCMT 060202-VF						●			●		●				●	●						6.2	6.35	2.38	0.2	2.8	0.05~0.20	0.03~1.0	SCACR/L
	060204-VF		○				●			●		●											6.0	6.35	2.38	0.4	2.8	0.10~0.25	0.03~1.0	SCLCR/L
	09T302-VF						●			●													9.4	9.525	3.97	0.2	4.4	0.04~0.16	0.08~1.5	
	09T304-VF		○		○		●			●		●				●	●						9.2	9.525	3.18	0.4	4.4	0.05~0.20	0.3~1.5	
	09T308-VF									●		●											8.8	9.525	3.18	0.8	4.4	0.10~0.25	0.3~1.5	
	120404-VF									●													12.4	12.70	4.76	0.4	5.5	0.07~0.22	0.1~2.0	

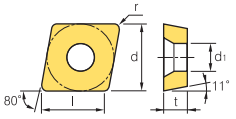
• Cutting edge geometry : A24 ~ A27 • Recommended chip breaker : B04 ~ B10 • Code system : B14 ~ B15
Note)Unit : Feed(fn) = mm/rev Depth of cut(ap) = mm

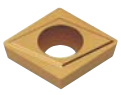
● : Stock item ○ : Under preparing for stock

CP○○ Rhombic 80° Positive Relief Angle : 11°

Workpiece		
Steel	P	● ⬣ ⬣ ⬣ ● ⬣
Stainless steel	M	
Cast iron	K	⬣ ●
Non-ferrous metal	N	
Heat resistant alloy, Titanium alloy	S	⬣
Hardened steel	H	

Machining types
● Continuous cutting
⬣ General cutting
✱ Interrupted cutting



Inserts	Designation	Coated NC3010	NC3020	NC3120	NC3030	NC500H	PC8110	NC9020	NC9025	NC5330	PC5300	PC9030	NC6105	NC6110	NC315K	Cermet CN1000	CN2000	Coated CN20	CC105	CC115	Uncoated ST30A	H01	G10	Dimensions (mm) l	d	t	r	d1	Cutting Condition fn	ap	Available toolholders Designation
CPGT  Finishing	CPGT 080202															○	●							7.8	7.94	2.38	0.2	3.4	0.06~0.20	0.10~2.00	SCLPR/L
	080204															●	●							7.6	7.94	2.38	0.4	3.4	0.08~0.20	0.30~2.00	(Boring Bar)
	080208																							7.2	7.94	2.38	0.8	3.4	0.10~0.25	0.50~2.00	
	090302																							9.4	9.525	3.18	0.2	4.4	0.04~0.20	0.30~1.50	
	090304															●	●							9.2	9.525	3.18	0.4	4.4	0.06~0.25	0.50~2.00	
	090308																							8.8	9.525	3.18	0.8	4.4	0.08~0.30	0.70~2.50	
CPGT-C05  Finishing	CPGT 080204-C05		●	●																				7.6	7.94	2.38	0.4	3.4	0.02~0.15	0.50~1.70	SCLPR/L
	080208-C05		●	●																				7.2	7.94	2.38	0.8	3.4	0.04~0.18	0.50~1.70	(Boring Bar)
	090304-C05		●	●																				9.2	9.525	3.18	0.4	4.4	0.03~0.20	0.70~2.00	
	090308-C05		●	●																				8.8	9.525	3.18	0.8	4.4	0.05~0.20	0.70~2.00	
CPGT-HMP  Medium cutting	CPGT 090308-HMP																							8.8	9.525	3.18	0.8	4.4	0.05~0.20	0.70~2.00	SCLPR/L (Boring Bar)
CPMT-VF New  Finishing	CPMT 080204-VF																							7.6	7.94	2.38	0.4	3.4	0.05~0.20	0.3~1.2	SCLPR/L
	080208-VF																							7.6	7.94	2.38	0.8	3.4	0.10~0.25	0.3~1.2	
	090304-VF	●	●							●						○	○							9.2	9.525	3.18	0.4	4.4	0.05~0.20	0.3~1.5	
	090308-VF	●	●							●														8.8	9.525	3.18	0.8	4.4	0.10~0.25	0.3~1.5	

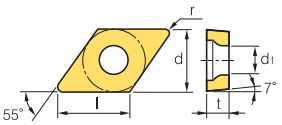
• Cutting edge geometry : A24 ~ A27 • Recommended chip breaker : B04 ~ B10 • Code system : B14 ~ B15
Note)Unit : Feed(fn) = mm/rev Depth of cut(ap) = mm

● : Stock item ○ : Under preparing for stock
● : Stock Netherlands

DC○○ Rhombic 55° Positive Relief Angle : 7°

Workpiece: Steel (P), Stainless steel (M), Cast iron (K), Non-ferrous metal (N), Heat resistant alloy, Titanium alloy (S), Hardened steel (H)

Machining types
- ● Continuous cutting
- Ⓖ General cutting
- Ⓘ Interrupted cutting



Inserts	Designation		Coated: NC3010	NC3020	NC3120	NC3030	NC500H	PC8110	NC9020	NC9025	NC5330	PC5300	PC9030	NC6105	NC6110	NC315K	Cermet: CN1000	CN2000	CN20	Coated: CC105	CC115	Uncoated: H01	G10	l	d	t	r	d1	fn	ap	Available toolholders: Designation
DCGT-C05	DCGT	070202-C05																						7.5	6.35	2.38	0.2	2.8	0.06~0.11	0.06~1.50	SDACR/L
		070204-C05																						7.3	6.35	2.38	0.4	2.8	0.05~0.17	0.08~1.50	SDJCR/L
		11T302-C05																						11.4	9.525	3.97	0.2	4.4	0.04~0.15	0.08~2.00	SDNCN
		11T304-C05																	●					11.2	9.525	3.97	0.4	4.4	0.06~0.23	0.10~2.00	SDQCR/L
Finishing		11T308-C05																						10.8	9.525	3.97	0.8	4.4	0.08~0.30	0.20~2.00	SDUCR/L
																															SDZCR/L
DCGT-HFP	DCGT	070202-HFP																						7.5	6.35	2.38	0.2	2.8	0.03~0.10	0.06~1.00	SDACR/L
		070204-HFP		●	●																			7.3	6.35	2.38	0.4	2.8	0.05~0.12	0.08~1.00	SDJCR/L
		070208-HFP																						6.8	6.35	2.38	0.8	2.8	0.06~0.12	0.10~1.00	SDNCN
		11T301-HFP																						11.5	9.525	3.97	0.1	4.4	0.03~0.13	0.06~1.00	SDQCR/L
		11T302-HFP																	●					11.4	9.525	3.97	0.2	4.4	0.04~0.15	0.08~1.50	SDUCR/L
Finishing	New	11T304-HFP		●	●			○			●	●								●				11.2	9.525	3.97	0.4	4.4	0.06~0.20	0.10~1.50	SDZCR/L
		11T308-HFP	●					○			●	●												10.8	9.525	3.97	0.8	4.4	0.08~0.25	0.20~1.50	
DCGT-KF	DCGT	0702003R-KF																						7.8	6.35	2.38	0.03	2.8	0.01~0.06	0.04~1.30	SDJCR/L
		070201R-KF											●											7.8	6.35	2.38	0.1	2.8	0.02~0.08	0.05~1.50	SDNCN
		070202R-KF											●											7.8	6.35	2.38	0.2	2.8	0.03~0.11	0.06~1.50	
		11T3003R-KF																						11.6	9.525	3.97	0.03	4.4	0.02~0.08	0.05~1.50	
		11T301R-KF											●											11.6	9.525	3.97	0.1	4.4	0.03~0.11	0.06~1.70	
		11T302R-KF											●											11.6	9.525	3.97	0.2	4.4	0.04~0.15	0.08~2.00	
		0702003L-KF																						7.8	6.35	2.38	0.03	2.8	0.01~0.06	0.04~1.30	
		070201L-KF																						7.8	6.35	2.38	0.1	2.8	0.02~0.08	0.05~1.50	
		070202L-KF																						7.8	6.35	2.38	0.2	2.8	0.03~0.11	0.06~1.50	
		11T3003L-KF																						11.6	9.525	3.97	0.03	4.4	0.02~0.08	0.05~1.50	
		11T301L-KF																						11.6	9.525	3.97	0.1	4.4	0.03~0.11	0.06~1.70	
Finishing (Auto Tool)		11T302L-KF																						11.6	9.525	3.97	0.2	4.4	0.04~0.15	0.08~2.00	
DCGT-KM	DCGT	0702003R-KM																						7.8	6.35	2.38	0.03	2.8	0.01~0.06	0.04~1.30	SDJCR/L
		070201R-KM											●											7.8	6.35	2.38	0.1	2.8	0.02~0.08	0.05~1.50	SDNCN
		070202R-KM											●											7.8	6.35	2.38	0.2	2.8	0.03~0.11	0.06~1.50	
		11T3003R-KM																						11.6	9.525	3.97	0.03	4.4	0.02~0.08	0.05~1.50	
		11T301R-KM											●											11.6	9.525	3.97	0.1	4.4	0.03~0.11	0.06~1.70	
		11T302R-KM											●											11.6	9.525	3.97	0.2	4.4	0.04~0.15	0.08~2.00	
		0702003L-KM																						7.8	6.35	2.38	0.03	2.8	0.01~0.06	0.04~1.30	
		070201L-KM																						7.8	6.35	2.38	0.1	2.8	0.02~0.08	0.05~1.50	
		070202L-KM																						7.8	6.35	2.38	0.2	2.8	0.03~0.11	0.06~1.50	
		11T3003L-KM																						11.6	9.525	3.97	0.03	4.4	0.02~0.08	0.05~1.50	
		11T301L-KM																						11.6	9.525	3.97	0.1	4.4	0.03~0.11	0.06~1.70	
Medium to finishing (Auto Tool)		11T302L-KM																						11.6	9.525	3.97	0.2	4.4	0.04~0.15	0.08~2.00	
DCMT-C25	DCMT	070202-C25															●	●						7.5	6.35	2.38	0.2	2.8	0.03~0.15	0.30~2.00	SDACR/L
		070204-C25		●	●	●					●		●				●	●						7.3	6.35	2.38	0.4	2.8	0.05~0.20	0.50~2.50	SDJCR/L
		070208-C25		●	●	●																		6.8	6.35	2.38	0.8	2.8	0.06~0.25	0.80~2.50	SDNCN
		11T302-C25															●	●						11.3	9.525	3.97	0.2	4.4	0.04~0.25	0.50~2.50	SDQCR/L
		11T304-C25	●	●	●	●			●		●		●		●		●	●	●					11.2	9.525	3.97	0.4	4.4	0.08~0.30	0.80~3.00	SDUCR
Medium cutting		11T308-C25	●	●	●	●			●		●		●		●	●	●	●	●					10.8	9.525	3.97	0.8	4.4	0.10~0.30	1.00~3.00	SDZCR/L
DCMT-HFP	DCMT	070202-HFP			●						●													7.5	6.35	2.38	0.2	2.8	0.03~0.10	0.06~1.00	SDACR/L
		070204-HFP			●																			7.3	6.35	2.38	0.4	2.8	0.05~0.12	0.08~1.00	SDJCR/L
		070208-HFP																						6.8	6.35	2.38	0.8	2.8	0.06~0.12	0.10~1.00	SDNCN
	New	11T301-HFP																						11.5	9.525	3.97	0.1	4.4	0.03~0.13	0.06~1.00	SDQCR/L
		11T302-HFP			●						●													11.4	9.525	3.97	0.2	4.4	0.04~0.15	0.08~1.50	SDUCR
Finishing		11T304-HFP			●			○				○												11.2	9.525	3.97	0.4	4.4	0.06~0.20	0.10~1.50	SDZCR/L
		11T308-HFP						○				○												10.8	9.525	3.97	0.8	4.4	0.08~0.25	0.20~1.50	
DCMT-HMP	DCMT	070202-HMP	●	●	●	●		●			●													7.5	6.35	2.38	0.2	2.8	0.03~0.12	0.10~1.50	SDACR/L
		070204-HMP	●	●	●	●		●	●		●		●		●		●	●						7.3	6.35	2.38	0.4	2.8	0.06~0.17	0.20~2.30	SDJCR/L
		070208-HMP	●	●	●	●					●													6.8	6.35	2.38	0.8	2.8	0.08~0.23	0.40~2.30	SDNCN
		11T302-HMP	●	●	●	●		●	●		●		●											11.4	9.525	3.97	0.2	4.4	0.04~0.22	0.10~2.00	SDQCR/L
		11T304-HMP	●	●	●	●		●	●		●	●	●	●	●	●	●	●			●			11.2	9.525	3.97	0.4	4.4	0.08~0.23	0.30~3.00	SDUCR/L
Medium cutting		11T308-HMP	●	●	●	●		●	●		●	●	●		●	●	●	●						10.8	9.525	3.97	0.8	4.4	0.10~0.30	0.50~3.00	SDZCR/L
DCMT-VF	DCMT	070202-VF						●			●													7.5	6.35	2.38	0.2	2.8	0.03~0.10	0.06~1.0	SDACR/L
	New	070204-VF						●			●						●	●						7.3	6.35	2.38	0.4	2.8	0.05~0.20	0.3~1.2	SDJCR/L
		11T302-VF	○	○				●			●													11.4	9.525	3.97	0.2	4.4	0.04~0.15	0.08~1.5	SDNCN
		11T304-VF	○	○				●			●	●					●	●						11.2	9.525	3.97	0.4	4.4	0.05~0.20	0.3~1.5	SDQCR/L
Finishing		11T308-VF						●			●	●												10.8	9.525	3.18	0.8	4.4	0.10~0.25	0.3~1.5	SDUCR/L
																															SDZCR/L

• Cutting edge geometry : A24 ~ A27 • Recommended chip breaker : B04 ~ B10 • Code system : B14 ~ B15
Note)Unit : Feed(fn) = mm/rev Depth of cut(ap) = mm

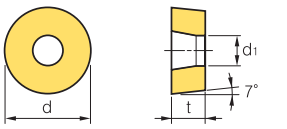
● : Stock item ○ : Under preparing for stock
● : Stock Netherlands

B Turning Insert (Positive)

RC○○ Round R° Positive Relief Angle : 7°

Workpiece: Steel (P), Stainless steel (M), Cast iron (K), Non-ferrous metal (N), Heat resistant alloy, Titanium alloy (S), Hardened steel (H)

Machining types
- ● Continuous cutting
- ◐ General cutting
- ✱ Interrupted cutting



Inserts	Designation	Coated: NC3010	NC3020	NC3120	NC3030	NC500H	PC8110	NC9020	NC9025	NC5330	PC5300	PC9030	NC6105	NC6110	NC315K	Cermet: CN1000	CN2000	CN20	Coated: CC105	CC115	Uncoated: ST30A	H01	G10	d	t	d1	fn	ap	Available toolholders: Designation
RCMX  Medium Roughing	RCMX 1003M0		●	●	●			●		●				●	●									10.0	3.18	3.6	0.25~0.50	1.50~4.00	PRDCN
	1204M0		●	●	●					●				●	●									12.0	4.76	4.2	0.30~0.60	2.50~5.00	PRGCR/L
	1606M0		●	●	●					●				●										16.0	6.35	5.2	0.40~0.70	3.00~7.00	
	2006M0	●	●	●	●	●								●										20.0	6.35	6.5	0.48~0.90	3.50~9.00	
	2507M0		●	●	●	●								●										25.0	7.94	7.25	0.55~1.20	4.00~12.00	
	3209M0				●									●										32.0	9.52	9.55	0.65~1.50	5.00~15.00	

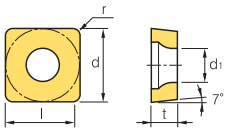
• Cutting edge geometry : A24 ~ A27 • Recommended chip breaker : B04 ~ B10 • Code system : B14 ~ B15
Note)Unit : Feed(fn) = mm/rev Depth of cut(ap) = mm

● : Stock item ○ : Under preparing for stock

SC○○ Square 90° Positive Relief Angle : 7°

Workpiece: Steel (P), Stainless steel (M), Cast iron (K), Non-ferrous metal (N), Heat resistant alloy, Titanium alloy (S), Hardened steel (H)

Machining types
- ● Continuous cutting
- ◐ General cutting
- ✱ Interrupted cutting



Inserts	Designation	Coated: NC3010	NC3020	NC3120	NC3030	NC500H	PC8110	NC9020	NC9025	NC5330	PC9030	PC5300	NC6105	NC6110	NC315K	Cermet: CN1000	CN2000	CN20	Coated: CC105	CC115	Uncoated: ST30A	H01	G10	l	d	t	r	d1	fn	ap	Available toolholders: Designation
SCGT-C05  Finishing	SCGT 09T304-C05																							9.1	9.525	3.97	0.4	4.4	0.11~0.23	0.10~2.00	SSBCR/L
	09T308-C05																							8.7	9.525	3.97	0.8	4.4	0.08~0.30	0.20~2.00	SSDCN
	120408-C05																							11.9	12.7	4.76	0.8	5.5	0.08~0.33	0.20~2.00	SSKCR/L
																															SSSCR/L
SCGT-HFP  Finishing	SCGT 09T304-HFP	●																						9.1	9.525	3.97	0.4	4.4	0.05~0.25	0.10~1.50	SSBCR/L
																															SSDCN
																															SSKCR/L
																															SSSCR/L
SCMT-C25  Medium cutting	SCMT 060204-C25				●																			5.9	6.35	2.38	0.4	2.8	0.08~0.25	0.40~2.50	SSBCR/L
	09T304-C25		●	●	●					●				●		●	●	●						9.1	9.525	3.97	0.4	4.4	0.08~0.25	0.60~3.00	SSDCN
	09T308-C25	●	●	●	●					●				●		●	●	●						8.7	9.525	3.97	0.8	4.4	0.10~0.30	1.00~3.00	SSKCR/L
	120404-C25		●	●						●	●					●	●							12.3	12.7	4.76	0.4	5.5	0.10~0.30	0.80~3.80	SSSCR/L
	120408-C25	●	●	●	●						●			●		●	●							11.9	12.7	4.76	0.8	5.5	0.12~0.38	1.20~3.80	
SCMT-HFP  Finishing	SCMT 09T304-HFP	●																						9.1	9.525	3.97	0.4	4.4	0.05~0.25	0.10~1.50	SSBCR/L
																															SSDCN
																															SSKCR/L
																															SSSCR/L
SCMT-HMP  Medium cutting	SCMT 09T304-HMP	●	●	●	●							●			●	●	●	●						9.1	9.525	3.97	0.4	4.4	0.08~0.23	0.30~3.00	SSBCR/L
	09T308-HMP	●	●	●	●					●		●			●									8.7	9.525	3.97	0.8	4.4	0.10~0.30	0.50~3.00	SSDCN
	120404-HMP	●																						12.3	12.7	4.76	0.4	5.5	0.09~0.27	0.30~3.60	SSKCR/L
	120408-HMP	●	●	●	●							●		●	●									11.9	12.7	4.76	0.8	5.5	0.12~0.36	0.60~3.60	SSSCR/L
SCMT-VF New  Finishing	SCMT 09T304-VF											●				○	○							9.1	9.525	3.97	0.4	4.4	0.05~0.20	0.3~1.5	SSBCR/L
																															SSDCN
																															SSKCR/L
																															SSSCR/L

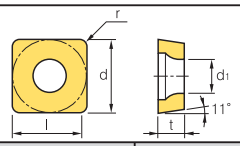
• Cutting edge geometry : A24 ~ A27 • Recommended chip breaker : B04 ~ B10 • Code system : B14 ~ B15
Note)Unit : Feed(fn) = mm/rev Depth of cut(ap) = mm

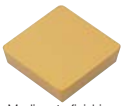
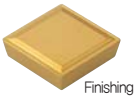
● : Stock item ○ : Under preparing for stock

SP○○ Square 90° Positive Relief Angle : 11°

Workpiece		
Steel	P	● ✱ ● ●
Stainless steel	M	✱ ● ●
Cast iron	K	● ● ● ●
Non-ferrous metal	N	
Heat resistant alloy, Titanium alloy	S	✱ ✱ ●
Hardened steel	H	

Machining types
● Continuous cutting
● General cutting
✱ Interrupted cutting



Inserts	Designation		Coated											Cermet		Coated		Uncoated				Dimensions (mm)					Cutting Condition		Available toolholders	
			NC3010	NC3020	NC3120	NC3030	PC6510	PC8110	NC9020	NC9025	NC5330	PC5300	PC9030	NC6110	NC315K	CN1000	CN2000	CC105	CC115	ST30A	ST30N	ST20	G10	l	d	t	r	d1	fn	ap	Designation	
SPGA	**SPGA**	**060204**														●	●							5.9	6.35	2.38	0.4	2.8	0.50~0.25	0.50~2.00		
		**090308T**														●	●							8.7	9.525	3.18	C0.8	4.5	0.10~0.25	0.70~3.00		
Medium to finishing		**090308T-Z**														●	●							8.7	9.525	3.18	0.8	3.4	0.10~0.25	0.70~3.00	-	
	(Z=Special Nega land)																															
SPGN	**SPGN**	**070202**																						7.7	7.94	2.38	0.2	-	0.03~0.10	0.50~2.00		
		070208																						7.8	7.94	2.38	0.8	-	0.10~0.25	0.70~3.00		
		090302																						9.3	9.525	3.18	0.2		0.03~0.10	0.50~3.00		
		090304																						9.1	9.525	3.18	0.4	-	0.08~0.20	0.70~3.50		
		090308					●															●		8.7	9.525	3.18	0.8	-	0.10~0.25	0.70~3.50		
		120302																						12.5	12.7	3.18	0.2	-	0.03~0.20	0.50~3.00		
		120304																						12.3	12.7	3.18	0.4	-	0.08~0.20	1.00~5.00		
		120308	●			●														●			●	11.9	12.7	3.18	0.8	-	0.10~0.25	1.00~5.00		
		120312													●								●	11.5	12.7	3.18	1.2	-	0.15~0.30	1.00~5.00		
		120316																						11.1	12.7	3.18	1.6	-	0.18~0.33	1.00~5.00		
		120402																						12.5	12.7	4.76	0.2	-	0.03~0.20	0.50~3.00		
		120404																						12.3	12.7	4.76	0.4	-	0.08~0.20	1.00~5.00		
		**120408**																					○	11.9	12.7	4.76	0.8	-	0.10~0.25	1.00~5.00		
		120412																													-	
Medium to finishing		**120416**																						11.1	12.7	4.76	1.6	-	0.18~0.33	1.00~5.00		-
		120430																						9.7	12.7	4.76	3.0	-	0.20~0.60	2.00~5.00		
		120440																						8.7	12.7	4.76	4.0	-	0.25~0.70	3.00~5.00		
		150404																						15.5	15.875	4.76	0.4	-	0.08~0.20	1.50~7.00		
		150408																						15.0	15.875	4.76	0.8	-	0.10~0.25	1.50~7.00		
		150412																						14.8	15.875	4.76	1.2	-	0.15~0.30	1.50~7.00		
		150416																						14.2	15.875	4.76	1.6	-	0.18~0.33	1.50~7.00		
		150420																						13.9	15.875	4.76	2.0	-	0.20~0.45	1.50~7.00		
		190404																						18.7	19.05	4.76	0.4	-	0.08~0.20	1.50~9.00		
		190408																					●	18.3	19.05	4.76	0.8	-	0.10~0.25	1.50~9.00		
		190412																			●			17.8	19.05	4.76	1.2	-	0.15~0.45	1.50~9.00		
		190416																					●	17.4	19.05	4.76	1.6	-	0.18~0.60	1.50~9.00		
		190424																						16.7	19.05	4.76	2.4		0.25~0.70	2.50~9.00		
SPGR-F	**SPGR**	**090304-F**																						9.1	9.525	3.18	0.4	-	0.05~0.20	0.30~2.00	CSDPN	
		**120304-F**																						12.3	12.7	3.18	0.4	-	0.10~0.25	0.50~2.00	CSKPR/L	
Finishing																																
SPGR-M	**SPGR**	**090308-M**																						8.7	9.525	3.18	0.8	-	0.10~0.40	1.00~3.50	CSDPN	
		**120308-M**																						11.9	12.7	3.18	0.8	-	0.20~0.40	1.50~4.00	CSKPR/L	
Medium cutting																																
SPGT	**SPGT**	**090304R**																						9.1	9.525	3.18	0.4	3.4	0.08~0.23	0.30~3.00	SSKPR/L	
		**090308R**																						8.7	9.525	3.18	0.8	3.4	0.10~0.30	0.50~3.00	(보링바)	
		090304L																						9.1	9.525	3.18	0.4	3.4	0.08~0.23	0.30~3.00		
Medium to finishing		**090308L**																						8.7	9.525	3.18	0.8	3.4	0.10~0.30	0.50~3.00		
SPGT-C05	**SPGT**	**090304-C05**																						9.1	9.525	3.18	0.4	4.4	0.11~0.23	0.10~2.00	SSKPR/L	
		**090308-C05**																						8.7	9.525	3.18	0.8	4.4	0.08~0.30	0.20~2.00	(보링바)	
Finishing																																
SPMT-VF	**SPMT**	**090304-VF**																						9.1	9.525	3.18	0.4	3.4	0.05~0.20	0.3~1.5	SSKPR/L	
 New		**090308-VF**																						8.7	9.525	3.18	0.8	3.4	0.10~0.25	0.3~1.5	(보링바)	
Finishing																																

• Cutting edge geometry : A24 ~ A27 • Recommended chip breaker : B04 ~ B10 • Code system : B14 ~ B15
Note)Unit : Feed(fn) = mm/rev Depth of cut(ap) = mm

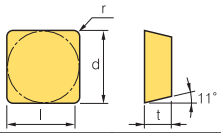
● : Stock item ○ : Under preparing for stock

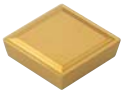
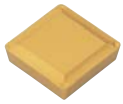
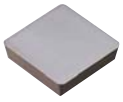
B Turning Insert (Positive)

SP○○ Square 90° Positive Relief Angle : 11°

Workpiece		
Steel	P	●✱
Stainless steel	M	✱
Cast iron	K	✱ ✱
Non-ferrous metal	N	
Heat resistant alloy, Titanium alloy	S	✱
Hardened steel	H	✱

Machining types
● Continuous cutting
✱ General cutting
✱ Interrupted cutting



Inserts	Designation	Coated													Cermet		Coated		Uncoated			Dimensions (mm)				Cutting Condition		Available toolholders	
		NC3010	NC3020	NC3120	NC3030	NC500H	PC8110	NC9020	NC9025	NC5330	PC5300	PC9030	NC6105	NC6110	NC315K	CN1000	CN2000	CN20	CC105	CC115	ST30A	H01	G10	l	d	t	r	fn	ap	Designation	
SPMR-F	**SPMR 090304-F**	●	●	●																				9.1	9.525	3.18	0.4	0.05~0.20	0.30~2.00	CSDPN	
	**120304-F**	●	●	●	●																			12.3	12.7	3.18	0.4	0.10~0.25	0.50~2.00	CSKPR/L (Boring Bar)	
Finishing																															
SPMR-M	**SPMR 090308-M**	●	●	●	●																			8.7	9.525	3.18	0.8	0.10~0.40	1.00~3.50	CSDPN	
	**120308-M**	●	●	●	●																			11.9	12.7	3.18	0.8	0.10~0.40	1.50~4.00	CSKPR/L	
Medium cutting	**120312-M**		●		●																			11.5	12.7	3.18	1.2	0.20~0.40	1.50~4.00	(Boring Bar)	
SPUN	**SPUN 120304**																○							12.3	12.7	3.18	0.4	0.10~0.30	1.00~5.00		
	**120308**		●	●																	●		●	11.9	12.7	3.18	0.8	0.15~0.40	1.00~5.00	-	-
Medium to finishing	**150412**																				●			14.6	15.875	4.76	1.2	0.20~0.50	1.00~5.00		
	190412		●	●																	●			17.8	19.05	4.76	1.2	0.20~0.50	1.50~7.00		
	190416																							17.5	19.05	4.76	1.6	0.25~0.60	2.00~7.00		
	250620																							23.4	25.4	6.35	2.0	0.30~0.80	3.00~10.00		
	120308SN														●									11.9	12.7	3.18	0.8	0.15~0.40	1.00~5.00		

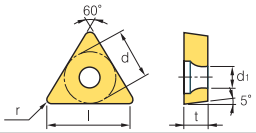
• Cutting edge geometry : A24 ~ A27 • Recommended chip breaker : B04 ~ B10 • Code system : B14 ~ B15
Note)Unit : Feed(fn) = mm/rev Depth of cut(ap) = mm

● : Stock item ○ : Under preparing for stock

TB○○ Triangular 60° Positive Relief Angle : 5°

Workpiece		
Steel	P	●✱
Stainless steel	M	✱
Cast iron	K	● ●
Non-ferrous metal	N	
Heat resistant alloy, Titanium alloy	S	✱
Hardened steel	H	

Machining types
● Continuous cutting
✱ General cutting
✱ Interrupted cutting



Inserts	Designation	Coated													Cermet			Coated		Uncoated			Dimensions (mm)					Cutting Condition		Available toolholders	
		NC3010	NC3020	NC3120	NC3030	NC500H	PC8110	NC9020	NC9025	NC5330	PC5300	PC9030	NC6105	NC6110	NC315K	CN1000	CN2000	CN20	CC105	CC115	U20	H01	G10	l	d	t	r	d_1	fn	ap	Designation	
TBGT	**TBGT 060102L**											●				●	●					●		6.4	3.97	1.59	0.2	2.16	0.05~0.20	0.10~1.30	STUBR (Compact mini)	
	**060104L**																							5.8	3.97	1.59	0.4	2.16	0.08~0.20	0.10~1.30		
Finishing																															

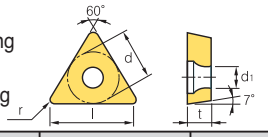
• Cutting edge geometry : A24 ~ A27 • Recommended chip breaker : B04 ~ B10 • Code system : B14 ~ B15
Note)Unit : Feed(fn) = mm/rev Depth of cut(ap) = mm

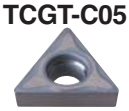
● : Stock item ○ : Under preparing for stock

TC○○ Triangular 60° Positive Relief Angle : 7°

Workpiece		
Steel	P	● ● ● ✱ ● ● ● ● ● ● ● ● ●
Stainless steel	M	● ● ● ✱ ● ● ✱ ✱
Cast iron	K	● ● ● ● ●
Non-ferrous metal	N	
Heat resistant alloy, Titanium alloy	S	● ● ✱ ✱ ✱
Hardened steel	H	

Machining types
● Continuous cutting
● General cutting
✱ Interrupted cutting



Inserts	Designation		Coated: NC3010	NC3020	NC3120	NC3030	NC500H	PC8110	NC9020	NC9025	NC5330	PC5300	PC9030	NC6105	NC6110	NC315K	Cermet: CN1000	CN2000	CN20	Coated: CC105	CC115	Uncoated: ST30A	H01	G10	l	d	t	r	d1	Cutting Condition: fn	ap	Available toolholders: Designation
TCGT-C05	TCGT	090204-C05																							8.6	5.56	2.38	0.4	2.5	0.05~0.19	0.10~1.70	STACR/L
		110204-C05																							9.0	6.35	2.38	0.8	2.8	0.08~0.22	0.10~1.70	STFCR/L
Finishing		110208-C05																														STGCR/L
																																STTCR/L
TCGT-HFP	TCGT	090204-HFP																							8.6	5.56	2.38	0.4	2.5	0.05~0.19	0.10~1.70	STACR/L
		110202-HFP																							10.5	6.35	2.38	0.2	2.8	0.03~0.13	0.06~1.70	STFCR/L
Finishing		110204-HFP																							10.0	6.35	2.38	0.4	2.8	0.05~0.19	0.10~1.70	STGCR/L
		16T304-HFP		●	●						●														15.5	9.525	3.97	0.4	4.4	0.07~0.26	0.10~1.70	STTCR/L
TCGT-KF	TCGT	0802003R-KF																							8.2	4.76	2.38	0.03	2.3	0.01~0.06	0.04~1.30	STACR/L
		080201R-KF																							8.0	4.76	2.38	0.1	2.3	0.02~0.08	0.05~1.50	
Finishing (Auto Tool)		080202R-KF																							7.7	4.76	2.38	0.2	2.3	0.03~0.11	0.06~1.70	
		0802003L-KF																							8.2	4.76	2.38	0.03	2.3	0.01~0.06	0.04~1.30	STACR/L
		080201L-KF																							8.0	4.76	2.38	0.1	2.3	0.02~0.08	0.05~1.50	
		080202L-KF																							7.7	4.76	2.38	0.2	2.3	0.03~0.11	0.06~1.70	
TCMT-C25	TCMT	090204-C25	●	●	●	●				●				●											8.6	5.56	2.38	0.4	2.5	0.06~0.18	0.40~2.50	STACR/L
		090208-C25	●	●	●					●				●											7.6	5.56	2.38	0.8	2.5	0.08~0.25	0.80~2.50	STFCR/L
Roughing		110202-C25		●	●																				10.5	6.35	2.38	0.2	2.8	0.04~0.12	0.40~2.00	STGCR/L
		110204-C25	●	●	●	●				●				●			●	●	●						10.0	6.35	2.38	0.4	2.8	0.06~0.20	0.60~2.50	STTCR/L
		110208-C25	●	●	●	●		●		●		●		●			●	●							9.0	6.35	2.38	0.8	2.8	0.08~0.25	0.80~2.50	
		16T304-C25	●	●	●	●		●		●		●		●			●	●	●						15.5	9.525	3.97	0.4	4.4	0.08~0.28	0.80~3.00	
		16T308-C25	●	●	●	●		●		●		●		●			●	●	●						14.5	9.525	3.97	0.8	4.4	0.10~0.30	1.00~3.00	
TCMT-HFP	TCMT	090204-HFP																							8.6	5.56	2.38	0.4	2.5	0.05~0.19	0.10~1.70	STACR/L
		110202-HFP																							7.6	6.35	2.38	0.2	2.8	0.03~0.13	0.06~1.70	STFCR/L
Finishing		110204-HFP									●														10.0	6.35	2.38	0.4	2.8	0.05~0.19	0.10~1.70	STGCR/L
	Neu	16T302-HFP																							15.5	9.525	3.97	0.2	4.4	0.03~0.13	0.06~1.70	STTCR/L
		16T304-HFP			●																				15.5	9.525	3.97	0.4	4.4	0.07~0.26	0.10~1.70	
TCMT-HMP	TCMT	090204-HMP			●																				8.6	5.56	2.38	0.4	2.5	0.06~0.17	0.20~2.30	STACR/L
		090208-HMP									●														7.6	5.56	2.38	0.8	2.5	0.08~0.23	0.40~2.30	STFCR/L
Medium cutting		110202-HMP																							10.5	6.35	2.38	0.2	2.8	0.03~0.15	0.10~1.50	STGCR/L
		110204-HMP	●	●	●	●		●		●	●	●					●	●							10.0	6.35	2.38	0.4	2.8	0.06~0.19	0.20~2.50	STTCR/L
		110208-HMP	●	●	●	●				●	●														9.0	6.35	2.38	0.8	2.8	0.09~0.26	0.40~2.50	
		16T304-HMP	●	●	●	●	●	●		●	●	●			●	●	●	●							15.5	9.525	3.97	0.4	4.4	0.08~0.23	0.30~3.00	
		16T308-HMP	●	●	●	●		●		●	●	●			●	●									14.5	9.525	3.97	0.8	4.4	0.10~0.30	0.50~3.00	
TCMT-VF	TCMT	110202-VF																							7.6	5.56	2.38	0.2	2.5	0.03~0.13	0.06~1.7	STACR/L
	Neu	110204-VF		○							●	●						●	●						10.0	6.35	2.38	0.4	2.8	0.05~0.20	0.3~1.2	STFCR/L
Finishing		110208-VF									●	●						●	●						9.0	6.35	2.38	0.8	2.8	0.10~0.25	0.3~1.2	STGCR/L
		16T304-VF									●							●	●						15.5	9.525	3.97	0.4	4.4	0.05~0.20	0.3~1.5	STTCR/L

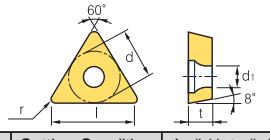
• Cutting edge geometry : A24 ~ A27 • Recommended chip breaker : B04 ~ B10 • Code system : B14 ~ B15
Note)Unit : Feed(fn) = mm/rev Depth of cut(ap) = mm

● : Stock item ○ : Under preparing for stock

TO○○ Triangular 60° Positive Relief Angle : 8°

Workpiece		
Steel	P	●
Stainless steel	M	
Cast iron	K	●
Non-ferrous metal	N	
Heat resistant alloy, Titanium alloy	S	
Hardened steel	H	

Machining types
● Continuous cutting
● General cutting
✱ Interrupted cutting



Inserts	Designation		Coated: NC3010	NC3020	NC3120	NC3030	NC500H	PC8110	NC9020	NC9025	NC5330	PC5300	PC9030	NC6105	NC6110	NC315K	Cermet: CN1000	CN2000	CN20	Coated: CC105	CC115	Uncoated: ST10	H01	G10	l	d	t	r	d1	Cutting Condition: fn	ap	Available toolholders: Designation
TOEH	TOEH	060102L																				●		●	6.4	3.97	1.59	0.2	2.15	0.05~0.17	0.10~1.50	For FZ unit
		090204L																				●		●	8.6	5.56	2.38	0.4	2.8	0.05~0.20	0.30~2.50	
Medium to finishing		140304L																						●	13.1	8.2	3.0	0.4	3.8	0.05~0.25	0.30~2.50	-

• Cutting edge geometry : A24 ~ A27 • Recommended chip breaker : B04 ~ B10 • Code system : B14 ~ B15
Note)Unit : Feed(fn) = mm/rev Depth of cut(ap) = mm

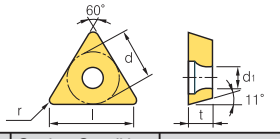
● : Stock item ○ : Under preparing for stock

B Turning Insert (Positive)

TP ○○ Triangular 60° Positive Relief Angle : 11°

Workpiece		
Steel	P	● ◕ ◕ ✱ ◕ ◕
Stainless steel	M	◕ ✱ ◕
Cast iron	K	◕ ◕ ● ◕ ◕
Non-ferrous metal	N	
Heat resistant alloy, Titanium alloy	S	◕ ✱ ◕
Hardened steel	H	

Machining types
● Continuous cutting
◕ General cutting
✱ Interrupted cutting



Inserts	Designation		Coated												Cermet			Coated		Uncoated				Dimensions (mm)					Cutting Condition		Available toolholders	
			NC3010	NC3020	NC3120	NC3030	NC500H	PC8110	NC9020	NC9025	NC5330	PC5300	PC9030	NC6105	NC6110	NC315K	CN1000	CN2000	CN20	CC105	CC115	ST20	ST30A	H01	G10	l	d	t	r	d_1	fn	ap	Designation	
TPGH	TPGH	080202L															●									7.7	4.76	2.38	0.2	2.3	0.01~0.12	0.06~1.70		
		080204L															●									7.2	4.76	2.38	0.4	2.3	0.01~0.15	0.08~1.70		
		110202L											●				●																-	-
		110204L											●				●																	
Medium to finishing																																	
TPGN	TPGN	090204																								8.6	5.56	2.38	0.4	-	0.07~0.20	0.70~2.00		
		110302																								10.5	6.35	3.18	0.2	-	0.05~0.15	0.50~2.00		
		110304		●	●	●																	●	●	●	10.0	6.35	3.18	0.4	-	0.07~0.20	0.70~3.00		
		110308				●																		●		9.0	6.35	3.18	0.8	-	0.10~0.25	1.00~3.00		
		160302																								16.0	9.525	3.18	0.2	-	0.05~0.18	1.00~5.00		
		160304		●	●	●																	●	●	●	15.5	9.525	3.18	0.4	-	0.07~0.20	1.00~5.00		
		160308	●	●	●	●					●								●			●		●	●	14.5	9.525	3.18	0.8	-	0.10~0.25	1.00~5.00		
		160310																								13.4	9.525	3.18	1.0	-	0.10~0.25	1.00~5.00		
		160312				●																●	●			13.5	9.525	3.18	1.2	-	0.15~0.30	1.00~5.00		
		160316				●																●	●		●	12.5	9.525	3.18	1.6	-	0.15~0.30	1.00~5.00	-	-
		160404																								15.5	9.525	4.76	0.4	-	0.07~0.20	1.00~5.00		
		220404				●																	●		●	21.0	12.7	4.76	0.4	-	0.07~0.20	1.50~7.00		
		220408				●																	●		●	20.0	12.7	4.76	0.8	-	0.10~0.25	1.50~7.00		
		220412				●																				19.0	12.7	4.76	1.2	-	0.15~0.30	1.50~7.00		
		220430																							●	14.2	12.7	4.76	3.0	-	0.30~0.45	1.50~7.00		
		220440																								11.6	12.7	4.76	4.0	-	0.30~0.50	1.50~7.00		
		270408																								25.4	15.875	4.76	0.8	-	0.15~0.25	3.00~8.00		
		270608																								25.4	15.875	6.35	0.8	-	0.15~0.25	3.00~8.00		
Medium to finishing																																	
TPGR-F	TPGR	110302-F																								10.5	6.35	3.18	0.2	-	0.05~0.15	0.10~1.50	CTFPR/L	
		110304-F																								10.0	6.35	3.18	0.4	-	0.05~0.20	0.30~1.50	CTGPR/L	
		160304-F																								15.5	9.525	3.18	0.4	-	0.08~0.25	0.50~2.00		
Finishing																																	
TPGR-M	TPGR	110308-M																								9.0	6.35	3.18	0.8	-	0.13~0.30	1.00~3.00	CTFPR/L	
		160308-M																								14.5	9.525	3.18	0.8	-	0.13~0.30	1.00~5.00	CTGPR/L	
Medium cutting																																	
TPGT	TPGT	080202R																								7.7	4.76	2.38	0.2	2.3	0.05~0.20	0.30~1.50	STFPR/L	
		110302R																								10.5	6.35	3.18	0.2	3.4	0.05~0.20	0.30~1.50	(Boring Bar)	
		110304R															●									10.0	6.35	3.18	0.4	3.4	0.05~0.20	0.50~2.00	STUPR/L	
		110308R																								9.0	6.35	3.18	0.8	3.4	0.07~0.25	0.50~2.00	(Compact mini)	
		160404R															●									15.5	9.525	4.76	0.4	4.4	0.05~0.20	0.70~3.00		
		160408R																								14.5	9.525	4.76	0.8	4.4	0.05~0.20	0.70~3.00		
		080202L											●						●					●		7.7	4.76	2.38	0.2	2.3	0.05~0.20	0.30~1.50		
		110302L																								10.5	6.35	3.18	0.2	3.4	0.05~0.20	0.30~1.50		
		110304L															●	●	●							10.0	6.35	3.18	0.4	3.4	0.05~0.20	0.50~2.00		
		110308L																								9.0	6.35	3.18	0.8	3.4	0.07~0.25	0.50~2.00		
		160404L															●	●	●							15.5	9.525	4.76	0.4	4.4	0.05~0.20	0.70~3.00		
		160408L																								14.5	9.525	4.76	0.8	4.4	0.05~0.20	0.70~3.00		
Medium to finishing																																	
TPGT-C05	TPGT	110304-C05																								10.0	6.35	3.18	0.4	3.4	0.05~0.30	0.50~2.00	STFPR/L	
		160404-C05																								15.5	9.525	4.76	0.4	4.4	0.05~0.30	0.80~2.00	(Boring Bar)	
Finishing																																	
TPGT-HFP	TPGT	110304-HFP																								10.0	6.35	3.18	0.4	3.4	0.05~0.25	0.30~1.50	STFPR/L	
		160308-HFP																								14.5	9.525	3.18	0.8	4.4	0.05~0.25	0.30~1.50	(Boring Bar)	
Finishing																																	

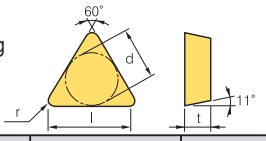
• Cutting edge geometry : A24 ~ A27 • Recommended chip breaker : B04 ~ B10 • Code system : B14 ~ B15
Note)Unit : Feed(fn) = mm/rev Depth of cut(ap) = mm

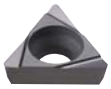
● : Stock item ○ : Under preparing for stock

TP ○○ Triangular 60° Positive Relief Angle : 11°

Workpiece		
Steel	P	● ⬢ ⬢ ✱ ⬢ ⬢ ⬢ ⬢ ✱ ✱ ✱
Stainless steel	M	⬢ ● ⬢ ✱
Cast iron	K	⬢ ⬢ ⬢ ⬢ ✱
Non-ferrous metal	N	
Heat resistant alloy, Titanium alloy	S	● ⬢ ⬢ ✱
Hardened steel	H	

Machining types
● Continuous cutting
⬢ General cutting
✱ Interrupted cutting



Inserts	Designation		Coated												Cermet		Coated		Uncoated				Dimensions (mm)					Cutting Condition		Available toolholders
			NC3010	NC3020	NC3120	NC3030	NC500H	PC8110	NC9020	NC9025	NC5330	PC5300	PC9030	NC6105	NC6110	NC315K	CN1000	CN2000	CN20	CC105	CC115	ST30A	ST20	ST30N	G10	l	d	t	r	d_1	fn	ap	Designation
TPGX	TPGX	090202L																	●							9.1	5.56	2.38	0.2	-	0.10~0.20	0.30~1.00	
		090204L																	●							8.6	5.56	2.38	0.4	-	0.10~0.25	0.50~1.00	
		090208L																								7.6	5.56	2.38	0.8	-	0.10~0.30	1.00~1.00	-
		110304L																	●							10.0	6.35	3.18	0.4	-	0.10~0.25	0.50~1.20	
Medium to finishing																																
TPMR-F	TPMR	090202-F																								9.1	5.56	2.38	0.2	-	0.05~0.15	0.10~1.00	CTFPR/L
		090204-F																								8.6	5.56	2.38	0.4	-	0.05~0.15	0.10~1.00	CTGPR/L
		110302-F																								10.5	6.35	3.18	0.2	-	0.05~0.15	0.10~1.50	
		110304-F	●	●	●	●			●				●		●											10.0	6.35	3.18	0.4	-	0.05~0.20	0.30~1.50	
Finishing		110308-F																								9.0	6.35	3.18	0.8	-	0.05~0.25	0.30~1.50	
		160304-F	●	●	●	●		●	●		●		●		●											15.5	9.525	3.18	0.4	-	0.08~0.25	0.50~2.00	
		160308-F			●				●																	14.5	9.525	3.18	0.8	-	0.08~0.25	0.50~3.00	
TPMR-M	TPMR	110304-M																								10.0	6.35	3.18	0.4	-	0.10~0.25	0.70~3.00	CTFPR/L
		110308-M	●	●	●	●																				9.0	6.35	3.18	0.8	-	0.13~0.30	1.00~3.00	CTGPR/L
		160304-M				●																				15.5	9.525	3.18	0.4	-	0.10~0.25	1.00~5.00	
		160308-M	●	●	●	●		●	●						●										●	14.5	9.525	3.18	0.8	-	0.13~0.30	1.00~5.00	
Medium cutting		160312-M				●																				13.5	9.525	3.18	1.2	-	0.15~0.35	1.00~5.00	
		220408-M		●	●										●											20.0	12.7	4.76	0.8	-	0.13~0.30	1.50~7.00	
TPUN	TPUN	090308																								7.6	5.56	3.18	0.8	-	0.10~0.30	0.50~2.00	
		110208																				●				9.0	6.35	2.38	0.8	-	0.15~0.40	1.00~3.00	
		110304																				●				10.0	6.35	3.18	0.4	-	0.10~0.30	1.00~3.00	
		110308																				●				9.0	6.35	3.18	0.8	-	0.15~0.40	1.00~3.00	
		160304	●	●	●	●																●		●	●	15.5	9.525	3.18	0.4	-	0.10~0.30	1.00~5.00	
		160308		●	●	●																●	●		●	14.5	9.525	3.18	0.8	-	0.15~0.40	1.00~5.00	
		160312		●	●	●																●				13.5	9.525	3.18	1.2	-	0.20~0.50	1.50~5.00	-
		220404																				●				21.0	12.7	4.76	0.4	-	0.10~0.30	1.50~7.00	
Medium to finishing		220408		●	●	●																●				20.0	12.7	4.76	0.8	-	0.15~0.40	1.50~7.00	
		220412																				●				19.0	12.7	4.76	1.2	-	0.20~0.50	1.50~7.00	
		330620																								27.8	19.05	6.35	2.0	-	0.30~0.70	3.00~10.00	
		160308TN																						●		14.5	9.525	3.18	0.8	-	0.15~0.40	1.00~5.00	
		160312TN																						●		13.5	9.525	3.18	1.2	-	0.20~0.50	1.50~5.00	
		220412TN																								19.0	12.7	4.76	1.2	-	0.20~0.50	1.50~7.00	
TPMT-VF	TPMT	110304-VF	●	●							●						○	○								10.0	6.35	3.18	0.4	3.4	0.05~0.20	0.3~1.5	STFPR/L
		110308-VF	●	●							●															9.0	6.35	3.18	0.8	3.4	0.10~0.25	0.3~1.5	(Boring Bar)
		160404-VF																								15.5	9.525	4.76	0.4	4.4	0.05~0.20	0.3~2.0	
Finishing		160408-VF																								14.5	9.525	4.76	0.8	4.4	0.10~0.25	0.3~2.0	

New

• Cutting edge geometry : A24 ~ A27 • Recommended chip breaker : B04 ~ B10 • Code system : B14 ~ B15
Note)Unit : Feed(fn) = mm/rev Depth of cut(ap) = mm

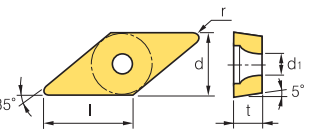
● : Stock item ○ : Under preparing for stock

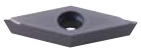
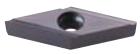
B Turning Insert (Positive)

VB○○ Rhombic 35° Positive Relief Angle : 5°

Workpiece			NC3010	NC3020	NC3120	NC3030	NC500H	PC8110	NC9020	NC9025	NC5330	PC5300	PC9030	NC6105	NC6110	NC315K	CN1000	CN2000	CN20	CC105	CC115	H01	G10
	Steel	P	●	●	●	✱			●		●						●	●					
	Stainless steel	M				●		●	●			✱	✱										
	Cast iron	K									●				●	●	●						
	Non-ferrous metal	N																					
	Heat resistant alloy, Titanium alloy	S						●			●	✱	✱										
	Hardened steel	H																					

Machining types
● Continuous cutting
● General cutting
✱ Interrupted cutting



Inserts	Designation		Dimensions (mm) l	d	t	r	d1	Cutting Condition fn	ap	Available toolholders Designation
VBGT  Medium to finishing	VBGT	160404	15.6	9.525	4.76	0.4	4.4	0.07~0.20	0.50~1.50	SVABR/L
		160408	14.6	9.525	4.76	0.8	4.4	0.15~0.25	0.70~2.00	SVHBR/L
										SVJBR/L
										SVVBN
										SVQBR/L
										SVUBR/L
VBGT-HFP  Finishing	VBGT	110301-HFP	11.0	6.35	3.18	0.1	2.8	0.07~0.20	0.50~1.50	SVABR/L
		160408-HFP	14.6	9.525	4.76	0.8	4.4	0.15~0.25	0.70~2.00	SVHBR/L
										SVJBR/L
										SVVBN
										SVQBR/L
										SVUBR/L
VBGT-KF  Finishing (Auto tool)	VBGT	1103003R-KF	11.0	6.35	3.18	0.03	2.8	0.01~0.06	0.04~1.30	SVJBR/L
		110301R-KF	11.0	6.35	3.18	0.1	2.8	0.02~0.08	0.05~1.50	
		110302R-KF	11.0	6.35	3.18	0.2	2.8	0.03~0.13	0.06~1.70	
		1103003L-KF	11.0	6.35	3.18	0.03	2.8	0.01~0.06	0.04~1.30	
		110301L-KF	11.0	6.35	3.18	0.1	2.8	0.02~0.08	0.05~1.50	
		110302L-KF	11.0	6.35	3.18	0.2	2.8	0.03~0.13	0.06~1.70	
VBGT-KM  Medium to finishing (Auto tool)	VBGT	1103003R-KM	11.0	6.35	3.18	0.03	2.8	0.01~0.06	0.04~1.30	SVJBR/L
		110301R-KM	11.0	6.35	3.18	0.1	2.8	0.02~0.08	0.05~1.50	
		110302R-KM	11.0	6.35	3.18	0.2	2.8	0.03~0.13	0.06~1.70	
		1103003L-KM	11.0	6.35	3.18	0.03	2.8	0.01~0.06	0.04~1.30	
		110301L-KM	11.0	6.35	3.18	0.1	2.8	0.02~0.08	0.05~1.50	
		110302L-KM	11.0	6.35	3.18	0.2	2.8	0.03~0.13	0.06~1.70	
VBMT  Medium to finishing	VBMT	160404	15.6	9.525	4.76	0.4	4.4	0.07~0.20	0.50~1.50	SVABR/L
		160408	14.6	9.525	4.76	0.8	4.4	0.15~0.25	0.70~2.00	SVHBR/L
										SVJBR/L
										SVVBN
										SVQBR/L
										SVUBR/L
VBMT-VM Neu  Medium cutting	VBMT	160404-VM	15.6	9.52	4.76	0.4	4.4	0.07~0.20	0.20~2.70	SVABR/L
		160408-VM	14.6	9.52	4.76	0.8	4.4	0.09~0.27	0.50~2.70	SVHBR/L
										SVJBR/L
										SVVBN
										SVQBR/L
										SVUBR/L
VBMT-HMP  Medium cutting	VBMT	110204-HMP Neu	10.0	6.35	2.38	0.4	2.8	0.03~0.20	0.15~2.50	SVABR/L
		110208-HMP	9.0	6.35	2.38	0.8	2.8	0.03~0.25	0.15~2.50	SVHBR/L
		110304-HMP	10.0	6.35	3.18	0.4	3.4	0.03~0.20	0.15~2.70	SVJBR/L
		110308-HMP	9.0	6.35	3.18	0.8	3.4	0.05~0.25	0.40~2.70	SVVBN
		160404-HMP	15.6	9.525	4.76	0.4	4.4	0.07~0.20	0.20~2.70	SVQBR/L
	Neu	160408-HMP	14.6	9.525	4.76	0.8	4.4	0.09~0.27	0.50~2.70	SVUBR/L
		160412-HMP	13.5	9.525	4.76	1.2	4.4	0.11~0.32	0.50~2.70	
VBMT-VF Neu  Finishing	VBMT	160404-VF	15.6	9.525	4.76	0.4	4.4	0.05~0.20	0.3~1.0	SVABR/L
		160408-VF	14.6	9.525	4.76	0.8	4.4	0.10~0.25	0.3~1.0	SVHBR/L
										SVJBR/L
										SVVBN
										SVQBR/L
										SVUBR/L

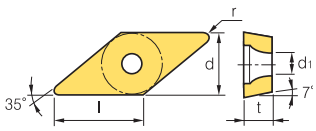
• Cutting edge geometry : A24 ~ A27 • Recommended chip breaker : B04 ~ B10 • Code system : B14 ~ B15
Note)Unit : Feed(fn) = mm/rev Depth of cut(ap) = mm

● : Stock item ○ : Under preparing for stock
● : Stock Netherlands

VC○○ Rhombic 35° Positive Relief Angle : 7°

Workpiece			Coated														Cermet			Coated		Uncoated	
			NC3010	NC3020	NC3120	NC3030	NC500H	PC8110	NC9020	NC9025	NC5330	PC5300	PC9030	NC6105	NC6110	NC315K	CN1000	CN2000	CN20	CC105	CC115	H01	G10
Steel	P		●	●	●	✱			●		●												
Stainless steel	M					●		●	●				✱										
Cast iron	K										●												
Non-ferrous metal	N																						
Heat resistant alloy, Titanium alloy	S							●			●		✱										
Hardened steel	H																						

Machining types
● Continuous cutting
● General cutting
✱ Interrupted cutting



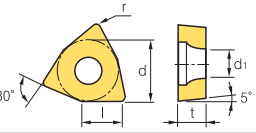
Inserts	Designation		Dimensions (mm) l	d	t	r	d1	Cutting Condition fn	ap	Available toolholders Designation
VCGT-HFP	VCGT	110302-HFP	10.5	6.35	3.18	0.2	3.4	0.02~0.18	0.10~1.00	SVJCR/L
Finishing		110304-HFP	10.0	6.35	3.18	0.4	3.4	0.03~0.18	0.15~1.20	SVVCN
		110308-HFP	9.0	6.35	3.18	0.8	3.4	0.04~0.23	0.20~1.20	SVQCR/L
		160404-HFP	15.6	9.525	4.76	0.4	4.4	0.04~0.20	0.15~1.50	SVUCR/L
		160408-HFP	14.6	9.525	4.76	0.8	4.4	0.05~0.25	0.20~1.50	
VCGT-KF	VCGT	1103003R-KF	11.0	6.35	3.18	0.03	2.8	0.01~0.06	0.04~1.30	SVJCR/L
Finishing (Auto tool)		110301R-KF	11.0	6.35	3.18	0.1	2.8	0.02~0.08	0.05~1.50	
		110302R-KF	11.0	6.35	3.18	0.2	2.8	0.03~0.13	0.06~1.70	
		1103003L-KF	11.0	6.35	3.18	0.03	2.8	0.01~0.06	0.04~1.30	
		110301L-KF	11.0	6.35	3.18	0.1	2.8	0.02~0.08	0.05~1.50	
		110302L-KF	11.0	6.35	3.18	0.2	2.8	0.03~0.13	0.06~1.70	
VCGT-KM	VCGT	1103003R-KM	11.0	6.35	3.18	0.03	2.8	0.01~0.06	0.04~1.30	SVJCR/L
Medium cutting (Auto tool)		110301R-KM	11.0	6.35	3.18	0.1	2.8	0.02~0.08	0.05~1.50	
		110302R-KM	11.0	6.35	3.18	0.2	2.8	0.03~0.13	0.06~1.70	
		1103003L-KM	11.0	6.35	3.18	0.03	2.8	0.01~0.06	0.04~1.30	
		110301L-KM	11.0	6.35	3.18	0.1	2.8	0.02~0.08	0.05~1.50	
		110302L-KM	11.0	6.35	3.18	0.2	2.8	0.03 ~0.13	0.06~1.70	
VCMT-HFP	VCMT	110302-HFP	10.5	6.35	3.18	0.2	3.4	0.02~0.18	0.10~1.00	SVJCR/L
Finishing		110304-HFP	10.0	6.35	3.18	0.4	3.4	0.03~0.18	0.15~1.20	SVVCN
		110308-HFP	9.0	6.35	3.18	0.8	3.4	0.04~0.23	0.20~1.20	SVQCR/L
		160404-HFP	15.6	9.525	4.76	0.4	4.4	0.04~0.20	0.15~1.50	SVUCR/L
		160408-HFP	14.6	9.525	4.76	0.8	4.4	0.05~0.25	0.20~1.50	
VCMT-VF New	VCMT	080202-VF	8.0	4.76	2.38	0.2	2.3	0.05~0.20	0.3~1.0	SVJCR/L
Finishing		080204-VF	7.5	4.76	2.38	0.4	2.3	0.10~0.25	0.3~1.0	SVVCN
		110304-VF	10.0	6.35	3.18	0.4	3.4	0.03~0.18	0.15~1.20	SVQCR/L
		160404-VF	15.6	9.525	4.76	0.4	4.4	0.04~0.20	0.15~1.50	SVUCR/L
VCMT-HMP	VCMT	160404-HMP	15.6	9.525	4.76	0.4	4.4	0.10~0.25	0.30~2.60	SVJCR/L
Medium cutting		160408-HMP	14.3	9.525	4.76	0.8	4.4	0.13~0.33	0.60~2.60	SVVCN
										SVQCR/L
										SVUCR/L
VCMT-VM New	VCMT	160404-VM	15.6	9.525	4.76	0.4	4.4	0.10~0.25	0.30~2.60	SVJCR/L
Medium cutting		160408-VM	14.6	9.525	4.76	0.8	4.4	0.13~0.33	0.60~2.60	SVVCN
										SVQCR/L
										SVUCR/L

• Cutting edge geometry : A24 ~ A27 • Recommended chip breaker : B04 ~ B10 • Code system : B14 ~ B15 ● : Stock item ○ : Under preparing for stock
Note)Unit : Feed(fn) = mm/rev Depth of cut(ap) = mm

WB○○ Trigon 80° Positive Relief Angle : 5°

Workpiece			Coated														Cermet			Coated		Uncoated	
			NC3010	NC3020	NC3120	NC3030	NC500H	PC8110	NC9020	NC9025	NC5330	PC5300	PC9030	NC6105	NC6110	NC315K	CN1000	CN2000	CN20	CC105	CC115	U20	H01	G10
Steel	P																●	●						
Stainless steel	M												✱											
Cast iron	K																●						●	
Non-ferrous metal	N																							
Heat resistant alloy, Titanium alloy	S												✱											
Hardened steel	H																							

Machining types
● Continuous cutting
● General cutting
✱ Interrupted cutting



Inserts	Designation		Dimensions (mm) l	d	t	r	d1	Cutting Condition fn	ap	Available toolholders Designation
WBGT	WBGT	020102R New	2.6	3.97	1.59	0.2	2.2	0.01~0.05	0.10~0.30	SWUBR/L (Compact Mini)
Medium to finishing		S30204R	3.0	4.76	2.38	0.4	2.4	0.01~0.10	0.10~0.50	
		020102L	2.6	3.97	1.59	0.2	2.2	0.01~0.08	0.10~0.40	
		S30202L	3.1	4.76	2.38	0.2	2.4	0.01~0.08	0.10~0.40	
		S30204L	3.0	4.76	2.38	0.4	2.4	0.01~0.10	0.10~0.50	

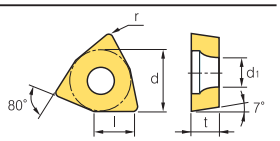
• Cutting edge geometry : A24 ~ A27 • Recommended chip breaker : B04 ~ B10 • Code system : B14 ~ B15 ● : Stock item ○ : Under preparing for stock
Note)Unit : Feed(fn) = mm/rev Depth of cut(ap) = mm

B Turning Insert (Positive)

WC○○ Trigon 80° Positive Relief Angle : 7°

Workpiece			Coated														Cermet			Coated		Uncoated			Dimensions (mm)					Cutting Condition		Available toolholders	
			NC3010	NC3020	NC3120	NC3030	NC500H	PC8110	NC9020	NC9025	NC5330	PC5300	PC9030	NC6105	NC6110	NC315K	CN1000	CN2000	CN20	CC105	CC115	U20	H01	G10	l	d	t	r	d1	fn	ap	Designation	
Steel	P			◓																												
Stainless steel	M																															
Cast iron	K																															
Non-ferrous metal	N																															
Heat resistant alloy, Titanium alloy	S																															
Hardened steel	H																															
Inserts	Designation																															
WCGT-C05	WCGT 080408-C05			●																				8.3	12.7	4.76	0.8	5.5	0.08~0.30	0.20~2.70	SWACR/L SWLCR/L	

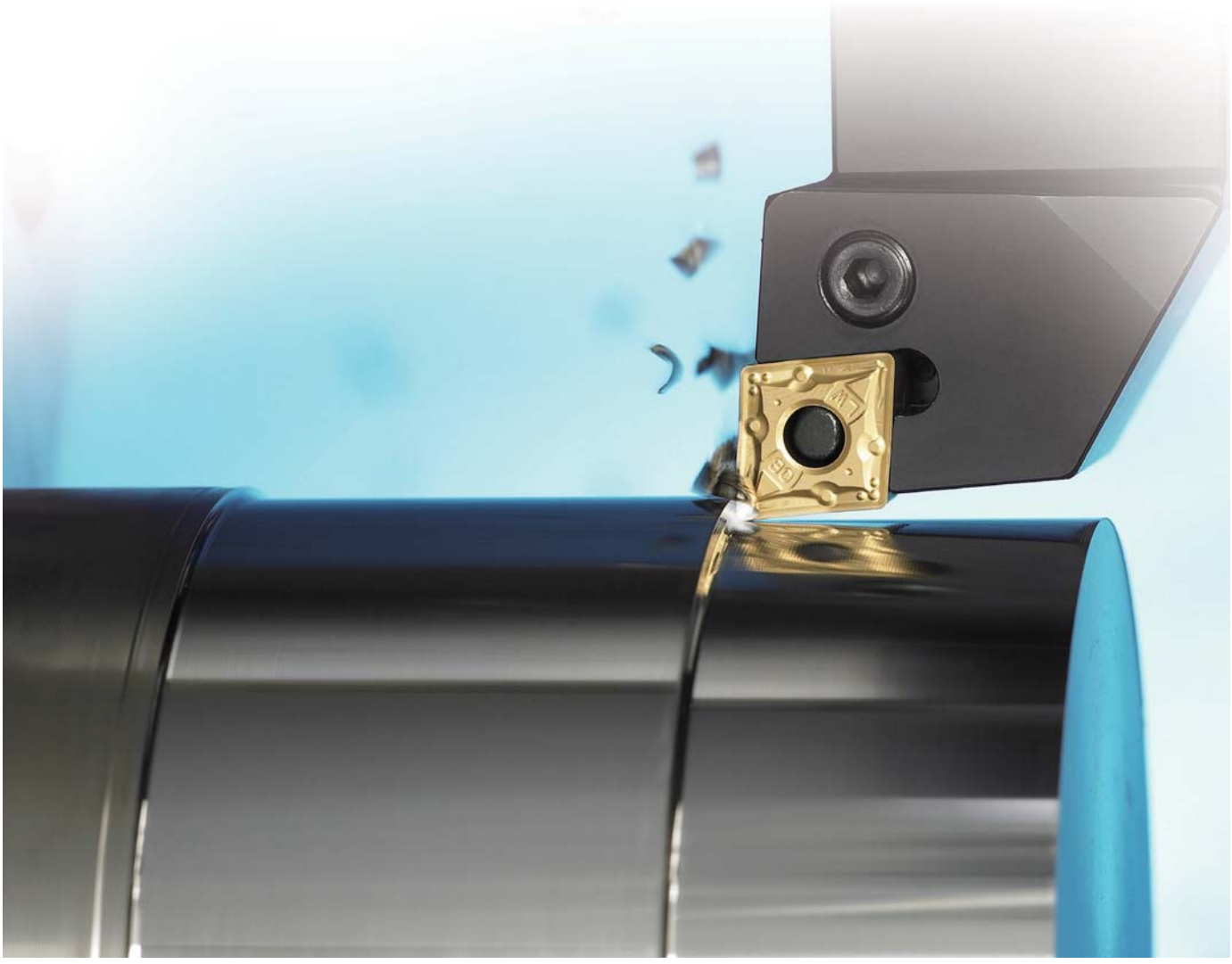
Machining types
● Continuous cutting
◓ General cutting
✱ Interrupted cutting




Finishing

• Cutting edge geometry : A24 ~ A27 • Recommended chip breaker : B04 ~ B10 • Code system : B14 ~ B15
Note)Unit : Feed(fn) = mm/rev Depth of cut(ap) = mm

● : Stock item ○ : Under preparing for stock



Technical Information for Aluminum

AK special chip breaker for aluminum



Features

- Unique and 3-dimensional rake angle controls chip breaking and chip flow ensuring longer tool life and reducing cutting load
- High rake angle at cutting edge part reduces cutting load to increase tool life.
- Buffed on top face controls chip flow reducing built-up edge



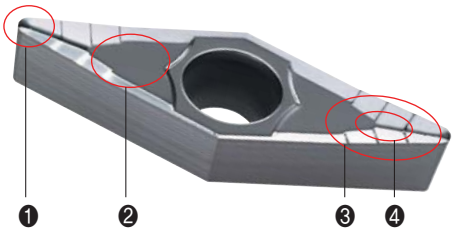
① High rake angle & tabby pattern chip pocket - Low cutting load
② Unique rake angle design - Effective chip breaking and good chip flow
③ Unique and 3-dimensional top face
- Longer tool life & Excellent surface roughness
④ Tabby pattern & Sharp cutting edge
- Distributing cutting load, long tool life
⑤ Buffed on top face
- Excellent machining, Reducing built-up edge, Excellent chip flow

AR special chip breaker for aluminum



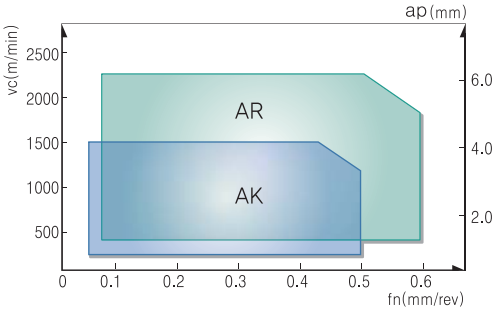
Features

- AR chip breaker ensures reliability and good cutting performance at high feed, speed and interrupted machining

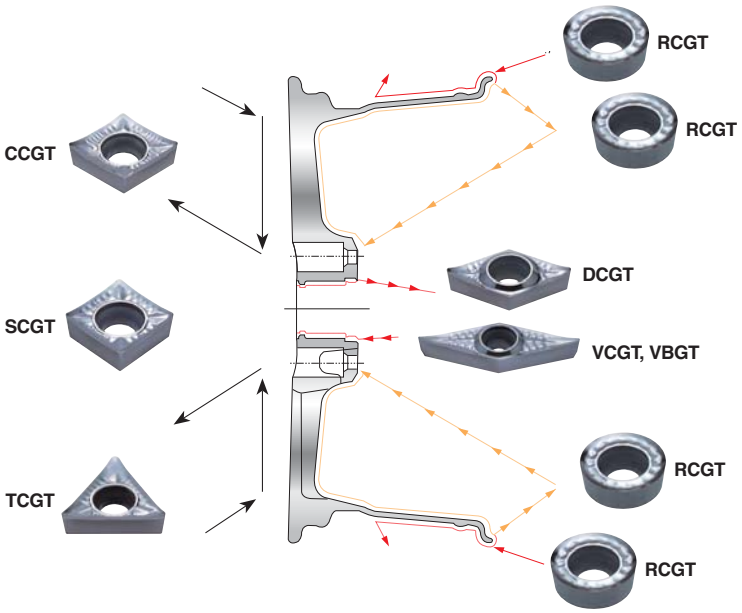


① Flat corner cutting edge improved productivity at high feed machining and ensures good surface roughness and reliability owing to strong cutting edge
② Specially buffed on top face controls chip flow reducing built-up edge
③ KORLOY's own technology applied for cutting edge and corner shape controlling chip flow ensures longer tool life
④ KORLOY special chip breaker design controls chip flow at high speed machining

AK and AR chip breaker specially developed for aluminum



	Recommendation range	Grades
AK	ap=0.1~5.0㎜ fn=0.03~0.5㎜/rev	H01(Uncoated cemented carbides K10~K20) ND1000(Diamond coating)
AR	ap=0.5~6.0㎜ fn=0.05~0.6㎜/rev	H01(Uncoated cemented carbides K10~K20) ND1000(Diamond coating) PD1000(DLC coating)



Features of H01

- Useful for aluminum and alloyed steel machining
- Buffed on top face reduced built-up edge
- 3-dimensional design reduced cutting load and shows good performance at high feed and speed machining

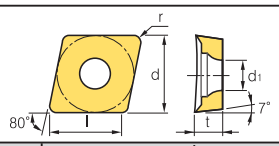
Workpiece		Hardness(HB)	kc(Mpa)	vc(m/min)	fn(mm/rev)
Aluminum alloy(forged)	before heat treatment	50 ~ 70	500 ~ 600	1000 ~ 2500	0.1 ~ 0.6
	after heat treatment	90 ~ 110	700 ~ 900	300 ~ 1000	0.1 ~ 0.5
Aluminum alloy (cast)	before heat treatment	70 ~ 80	700 ~ 800	300 ~ 1000	0.1 ~ 0.6
	after heat treatment	80 ~ 100	800 ~ 950	200 ~ 600	0.1 ~ 0.4
Copper alloy	-	90 ~ 110	700	250 ~ 600	0.1 ~ 0.5
Non-ferrous metal, etc	-	100	1700	150 ~ 300	0.1 ~ 0.6

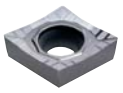
B Aluminum Insert (Positive)

CC○○ Rhombic 80° Positive Relief Angle : 7°

Workpiece			PC130	PC230	PD1000	H01	H10
	Steel	P	●	⇕			
	Stainless steel	M					
	Cast iron	K	●	⇕			
	Non-ferrous metal	N			●	●	⇕
	Heat resistant alloy, Titanium alloy	S					
	Hardened steel	H					

Machining types
● Continuous cutting
⇕ General cutting
⇔ Interrupted cutting



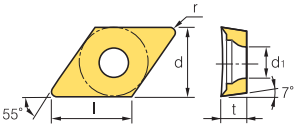
Inserts	Designation		PC130	PC230	PD1000	H01	H10	l	d	t	r	d1	fn	ap	Designation	Page
			Coated			Uncoated		Dimensions (mm)					Cutting Condition		Available toolholders	
CCGT-AK 	CCGT	060202-AK		●		●		6.2	6.35	2.38	0.2	2.8	0.01~0.12	0.05~3.00	SCACR/L	B82
		060204-AK	●	●		●	●	6.0	6.35	2.38	0.4	2.8	0.02~0.15	0.10~3.00	SCLCR/L	B101
		060208-AK				●		5.6	6.35	2.38	0.8	2.8	0.02~0.20	0.10~4.00		
		09T302-AK		●		●		9.4	9.525	3.97	0.2	4.4	0.02~0.20	0.05~3.00		
		09T304-AK	●	●	●	●		9.2	9.525	3.97	0.4	4.4	0.02~0.30	0.10~5.00		
		09T308-AK		●		●		8.8	9.525	3.97	0.8	4.4	0.03~0.50	0.10~5.00		
		120402-AK		●		●		12.6	12.7	4.76	0.2	5.5	0.02~0.30	0.05~4.00		
		120404-AK	●	●	●	●		12.4	12.7	4.76	0.4	5.5	0.03~0.50	0.10~5.00		
		120408-AK	●	●		●		12.0	12.7	4.76	0.8	5.5	0.04~0.80	0.10~5.50		
CCGT-AR 	CCGT	060202-AR				●		6.2	6.35	2.38	0.2	2.8	0.02~0.30	0.30~4.00	SCACR/L	B82
		060204-AR				●		6.0	6.35	2.38	0.4	2.8	0.03~0.35	0.50~4.50	SCLCR/L	B101
		060208-AR				●		5.6	6.35	2.38	0.8	2.8	0.04~0.50	0.50~4.50		
		09T302-AR				●		9.4	9.525	3.97	0.2	4.4	0.03~0.45	0.30~4.00		
		09T304-AR				●		9.2	9.525	3.97	0.4	4.4	0.04~0.50	0.50~4.50		
		09T308-AR				●		8.8	9.525	3.97	0.8	4.4	0.05~0.60	0.50~6.00		
		120402-AR				●		12.6	12.7	4.76	0.2	5.5	0.04~0.50	0.30~5.00		
		120404-AR				●		12.4	12.7	4.76	0.4	5.5	0.05~0.60	0.50~6.00		
		120408-AR				●		12.0	12.7	4.76	0.8	5.5	0.06~0.65	0.50~6.00		
		120412-AR				●		11.6	12.7	4.76	1.2	5.5	0.08~0.70	0.50~6.50		

• Cutting edge geometry : A24 ~ A27 • Recommended chip breaker : B04 ~ B10 • Code system : B14 ~ B15 ● : Stock item ○ : Under preparing for stock
Note)Unit : Feed(fn) = mm/rev Depth of cut(ap) = mm

DC○○ Rhombic 55° Positive Relief Angle : 7°

Workpiece			PC130	PC230	PD1000	H01	H10
	Steel	P	●	⇕			
	Stainless steel	M					
	Cast iron	K	●	⇕			
	Non-ferrous metal	N			●	●	
	Heat resistant alloy, Titanium alloy	S					
	Hardened steel	H					

Machining types
● Continuous cutting
⇕ General cutting
⇔ Interrupted cutting



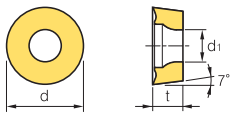
Inserts	Designation		PC130	PC230	PD1000	H01	H10	l	d	t	r	d1	fn	ap	Designation	Page
			Coated			Uncoated		Dimensions (mm)					Cutting Condition		Available toolholders	
DCGT-AK 	DCGT	070202-AK		●		●		7.5	6.35	2.38	0.2	2.8	0.01~0.20	0.05~3.00	SDACR/L	B82
		070204-AK	●			●		7.3	6.35	2.38	0.4	2.8	0.02~0.30	0.10~4.00	SDJCR/L	B83
		070208-AK				●		6.8	6.35	2.38	0.8	2.8	0.03~0.40	0.10~4.00	SDNCN	B102
		11T302-AK		●		●		11.4	9.525	3.97	0.2	4.4	0.02~0.30	0.05~4.00	SDQCR/L	B103
		11T304-AK	●	●	●	●		11.2	9.525	3.97	0.4	4.4	0.03~0.50	0.10~5.00	SDUCR/L	
		11T308-AK		●		●		10.8	9.525	3.97	0.8	4.4	0.03~0.50	0.10~5.00	SDZCR/L	
		11T312-AK				●		10.4	9.525	3.97	1.2	4.4	0.04~0.60	0.15~5.00		
DCGT-AR 	DCGT	070202-AR				●		7.5	6.35	2.38	0.2	2.8	0.02~0.30	0.30~4.00	SDACR/L	B82
		070204-AR				●		7.3	6.35	2.38	0.4	2.8	0.03~0.40	0.50~5.00	SDJCR/L	B83
		070208-AR				●		6.8	6.35	2.38	0.8	2.8	0.04~0.50	0.50~5.00	SDNCN	B102
		11T302-AR				●		11.4	9.525	3.97	0.2	4.4	0.03~0.45	0.30~6.00	SDQCR/L	B103
		11T304-AR				●		11.2	9.525	3.97	0.4	4.4	0.04~0.50	0.50~6.00	SDUCR/L	
		11T308-AR				●		10.8	9.525	3.97	0.8	4.4	0.05~0.60	0.50~6.00	SDZCR/L	
		11T312-AR				●		10.4	9.525	3.97	1.2	4.4	0.08~0.65	0.50~6.50		

• Cutting edge geometry : A24 ~ A27 • Recommended chip breaker : B04 ~ B10 • Code system : B14 ~ B15 ● : Stock item ○ : Under preparing for stock
Note)Unit : Feed(fn) = mm/rev Depth of cut(ap) = mm

RC○○ Round Positive Relief Angle : 7°

Workpiece			Coated			Uncoated		Dimensions (mm)			Cutting Condition		Available toolholders	
			PC130	PC230	PD1000	H01	H10	d	t	d_1	fn	ap	Designation	Page
Steel	P													
Stainless steel	M													
Cast iron	K													
Non-ferrous metal	N					●								
Heat resistant alloy, Titanium alloy	S													
Hardened steel	H													
RCGT-AK	RCGT	0602M0-AK				●		6.0	2.38	2.8	0.05~0.20	0.50~2.00	SRDCN	B83
		0803M0-AK				●		8.0	3.18	3.35	0.05~0.25	0.50~2.50	SRGCR/L	B84
		1003M0-AK				●		10.0	3.18	4.0	0.10~0.30	1.00~3.00		
		10T3M0-AK						10.0	3.97	4.4	0.10~0.30	1.00~3.00		
		1204M0-AK				●		12.0	4.76	4.4	0.10~0.35	1.00~3.50		
RCGT-AR	RCGT	0602M0-AR				●		6.0	2.38	2.8	0.05~0.20	0.50~2.00	SRDCN	B83
		0803M0-AR				●		8.0	3.18	3.35	0.05~0.25	0.50~2.50	SRGCR/L	B84
		1003M0-AR				●		10.0	3.18	4.0	0.10~0.30	1.00~3.00		
		10T3M0-AR						10.0	3.97	4.4	0.10~0.30	1.00~3.00		
		1204M0-AR				●		12.0	4.76	4.4	0.10~0.35	1.00~3.50		

Machining types
● Continuous cutting
General cutting
Interrupted cutting



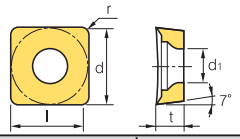
• Cutting edge geometry : A24 ~ A27 • Recommended chip breaker : B04 ~ B10 • Code system : B14 ~ B15
Note)Unit : Feed(fn) = mm/rev Depth of cut(ap) = mm

● : Stock item ○ : Under preparing for stock

SC○○ Square 90° Positive Relief Angle : 7°

Workpiece			Coated			Uncoated		Dimensions (mm)					Cutting Condition		Available toolholders	
			PC130	PC230	PD1000	H01	H10	l	d	t	r	d_1	fn	ap	Designation	Page
Steel	P															
Stainless steel	M															
Cast iron	K															
Non-ferrous metal	N					●										
Heat resistant alloy, Titanium alloy	S															
Hardened steel	H															
SCGT-AK	SCGT	09T302-AK						9.3	9.525	3.97	0.2	4.4	0.02~0.30	0.10~4.00	SSBCR/L	B84
		09T304-AK				●		9.1	9.525	3.97	0.4	4.4	0.04~0.40	0.10~5.00	SSDCN	B85
		09T308-AK				●		8.7	9.525	3.97	0.8	4.4	0.03~0.40	0.10~5.00	SSKCR/L	B103
		120404-AK				●		12.3	12.7	4.76	0.4	5.5	0.03~0.50	0.10~5.00	SSSCR/L	
		120408-AK				●		11.9	12.7	4.76	0.8	5.5	0.04~0.60	0.15~5.50		
		120416-AK						11.1	12.7	4.76	1.6	5.5				
SCGT-AR	SCGT	09T302-AR						9.3	9.525	3.97	0.2	4.4	0.03~0.40	0.50~5.00	SSBCR/L	B84
		09T304-AR				●		9.1	9.525	3.97	0.4	4.4	0.04~0.50	0.50~6.00	SSDCN	B85
		09T308-AR				●		8.7	9.525	3.97	0.8	4.4	0.04~0.50	0.50~6.50	SSKCR/L	B103
		120404-AR				●		12.3	12.7	4.76	0.4	4.4	0.05~0.60	0.50~6.50	SSSCR/L	
		120408-AR				●		11.9	12.7	4.76	0.8	5.5	0.05~0.60	0.50~7.00		
		120416-AR						11.1	12.7	4.76	1.6	5.5				

Machining types
● Continuous cutting
General cutting
Interrupted cutting



• Cutting edge geometry : A24 ~ A27 • Recommended chip breaker : B04 ~ B10 • Code system : B14 ~ B15
Note)Unit : Feed(fn) = mm/rev Depth of cut(ap) = mm

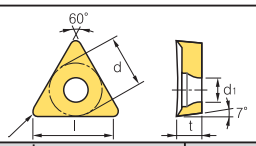
● : Stock item ○ : Under preparing for stock

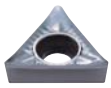
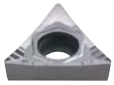
B Aluminum Insert (Positive)

TC○○ Triangular 60° Positive Relief Angle : 7°

Workpiece			PC130	PC230	PD1000	H01	H10
	Steel	P	●				
	Stainless steel	M					
	Cast iron	K	●				
	Non-ferrous metal	N				●	
	Heat resistant alloy, Titanium alloy	S					
	Hardened steel	H					

Machining types
● Continuous cutting
General cutting
Interrupted cutting



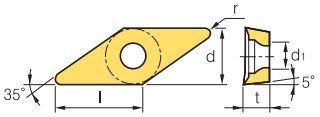
Inserts	Designation	PC130	PC230	PD1000	H01	H10	l	d	t	r	d1	fn	ap	Designation	Page
TCGT-AK 	TCGT 090202-AK				●		9.1	5.56	2.38	0.2	2.5	0.01~0.12	0.05~3.00	STACR/L	B85
	090204-AK				●		8.6	5.56	2.38	0.4	2.5	0.02~0.15	0.10~4.00	STFCR/L	B86
	110202-AK				●		10.5	6.35	2.38	0.2	2.8	0.02~0.20	0.05~4.00	STGCR/L	B104
	110204-AK				●		10.0	6.35	2.38	0.4	2.8	0.03~0.30	0.10~4.00	STTCR/L	
	110208-AK				●		9.0	6.35	2.38	0.8	2.8	0.03~0.40	0.10~5.00		
	16T302-AK				●		15.0	9.525	3.97	0.2	4.4	0.02~0.30	0.05~5.00		
	16T304-AK	●			●		15.5	9.525	3.97	0.4	4.4	0.03~0.40	0.10~5.50		
	16T308-AK				●		14.5	9.525	3.97	0.8	4.4	0.03~0.50	0.10~5.50		
	16T312-AK				●		13.5	9.525	3.97	1.2	4.4	0.04~0.60	0.15~5.50		
	16T316-AK				●		12.5	9.525	3.97	1.6	4.4	0.05~0.80	0.15~5.50		
	16T325-AK						10.0	9.525	3.97	2.5	4.4	0.06~0.90	0.20~7.00		
TCGT-AR 	TCGT 090202-AR						9.1	5.56	2.38	0.2	2.5	0.02~0.18	0.30~3.00	STACR/L	B85
	090204-AR				●		8.6	5.56	2.38	0.4	2.5	0.02~0.25	0.30~5.00	STFCR/L	B86
	110202-AR				●		10.5	6.35	2.38	0.2	2.8	0.02~0.30	0.30~4.00	STGCR/L	B104
	110204-AR				●		10.0	6.35	2.38	0.4	2.8	0.03~0.40	0.30~5.00	STTCR/L	
	110208-AR				●		9.0	6.35	2.38	0.8	2.8	0.04~0.45	0.50~6.00		
	16T302-AR				●		15.0	9.525	3.97	0.2	4.4	0.03~0.45	0.30~5.00		
	16T304-AR				●		15.5	9.525	3.97	0.4	4.4	0.04~0.50	0.50~6.00		
	16T308-AR				●		14.5	9.525	3.97	0.8	4.4	0.05~0.60	0.50~6.00		
	16T312-AR				●		13.5	9.525	3.97	1.2	4.4	0.06~0.65	0.50~6.00		
	16T316-AR				●		12.5	9.525	3.97	1.6	4.4	0.08~0.70	0.50~6.50		
	16T325-AR						10.0	9.525	3.97	2.5	4.4	0.10~0.10	0.80~7.00		

• Cutting edge geometry : A24 ~ A27 • Recommended chip breaker : B04 ~ B10 • Code system : B14 ~ B15 ● : Stock item ○ : Under preparing for stock
Note)Unit : Feed(fn) = mm/rev Depth of cut(ap) = mm

VB○○ Rhombic 35° Positive Relief Angle : 7°

Workpiece			PC130	PC230	PD1000	H01	H10
	Steel	P					
	Stainless steel	M					
	Cast iron	K					
	Non-ferrous metal	N				●	
	Heat resistant alloy, Titanium alloy	S					
	Hardened steel	H					

Machining types
● Continuous cutting
General cutting
Interrupted cutting



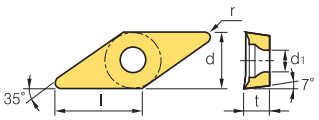
Inserts	Designation	PC130	PC230	PD1000	H01	H10	l	d	t	r	d1	fn	ap	Designation	Page
VBGT-AK 	VBGT 110302-AK				●		10.5	6.35	3.18	0.2	2.8	0.02~0.15	0.05~3.00	SVABR/L	B86
	110304-AK				●		10.0	6.35	3.18	0.4	2.8	0.02~0.15	0.10~4.00	SVJBR/L	B87
	110308-AK						9.0	6.35	3.18	0.8	2.8	0.03~0.18	0.10~5.00	SVVBN	B105
	160402-AK						16.1	9.525	4.76	0.2	4.4	0.03~0.30	0.05~4.00	SVQBR/L	B106
	160404-AK				●		15.6	9.525	4.76	0.4	4.4	0.03~0.40	0.10~5.00	SVUBR/L	
	160408-AK				●		14.6	9.525	4.76	0.8	4.4	0.03~0.50	0.10~5.00		
	160412-AK						13.6	9.525	4.76	1.2	4.4	0.05~0.60	0.10~5.50		
VBGT-AR 	VBGT 110302-AR				●		10.5	6.35	3.18	0.2	2.8	0.02~0.35	0.30~3.00	SVABR/L	B86
	110304-AR				●		10.0	6.35	3.18	0.4	2.8	0.03~0.45	0.30~4.00	SVJBR/L	B87
	110308-AR						9.0	6.35	3.18	0.8	2.8	0.03~0.50	0.50~6.00	SVVBN	B105
	160402-AR						16.1	9.525	4.76	0.2	4.4	0.04~0.45	0.30~5.00	SVQBR/L	B106
	160404-AR				●		15.6	9.525	4.76	0.4	4.4	0.04~0.50	0.50~6.00	SVUBR/L	
	160408-AR				●		14.6	9.525	4.76	0.8	4.4	0.05~0.60	0.50~6.00		
	160412-AR						13.6	9.525	4.76	1.2	4.4	0.05~0.70	0.50~6.50		

• Cutting edge geometry : A24 ~ A27 • Recommended chip breaker : B04 ~ B10 • Code system : B14 ~ B15 ● : Stock item ○ : Under preparing for stock
Note)Unit : Feed(fn) = mm/rev Depth of cut(ap) = mm

VC○○ Rhombic 35° Positive Relief Angle : 7°

Workpiece							
Steel	P	●	⬌				
Stainless steel	M						
Cast iron	K	●	⬌				
Non-ferrous metal	N			●	●		
Heat resistant alloy, Titanium alloy	S						
Hardened steel	H						

Machining types
● Continuous cutting
⬌ General cutting
✱ Interrupted cutting



Inserts	Designation	Coated			Uncoated		Dimensions (mm)					Cutting Condition		Available toolholders	
		PC130	PC230	PD1000	H01	H10	l	d	t	r	d1	fn	ap	Designation	Page
VCGT-AK	VCGT 110301-AK						10.2	6.35	3.18	0.1	2.8	0.02~0.15	0.05~3.00	SVJCR/L	B87
	110302-AK				●		10.5	6.35	3.18	0.2	2.8	0.02~0.20	0.05~3.00	SVVCN	B88
	110304-AK	●	●		●		10.0	6.35	3.18	0.4	2.8	0.02~0.25	0.10~4.00	SVQCR/L	B105
	110308-AK				●		9.0	6.35	3.18	0.8	2.8	0.03~0.30	0.10~5.00	SVUCR/L	B106
	130302-AK				●		10.5	7.94	3.18	0.2	3.4	0.02~0.35	0.10~5.00		
	130304-AK				●		10.0	7.94	3.18	0.4	3.4	0.03~0.35	0.10~5.00		
	130308-AK						9.0	7.94	3.18	0.8	3.4	0.04~0.40	0.10~5.00		
	160402-AK		●		●		16.1	9.525	4.76	0.2	4.4	0.02~0.30	0.05~5.00		
	160404-AK		●	●	●		15.6	9.525	4.76	0.4	4.4	0.03~0.40	0.10~5.00		
	160408-AK		●	●	●		14.0	9.525	4.76	0.8	4.4	0.03~0.50	0.10~5.00		
	160412-AK			●	●		13.6	9.525	4.76	1.2	4.4	0.03~0.50	0.10~5.00		
	220516-AK						18.0	12.7	5.56	1.6	5.6	0.03~0.60	0.10~7.00		
	220525-AK						15.6	12.7	5.56	2.5	5.6	0.05~0.70	0.10~7.00		
	220530-AK				●		14.3	12.7	5.56	3.0	5.6	0.08~1.00	0.10~7.00		
VCGT-AR	VCGT 110301-AR						10.2	6.35	3.18	0.1	2.8	0.02~0.20	0.10~3.00	SVJCR/L	B87
	110302-AR				●		10.5	6.35	3.18	0.2	2.8	0.02~0.25	0.30~3.00	SVVCN	B88
	110304-AR				●		10.0	6.35	3.18	0.4	2.8	0.03~0.35	0.30~4.00	SVQCR/L	B105
	110308-AR				●		9.0	6.35	3.18	0.8	2.8	0.04~0.45	0.50~6.00	SVUCR/L	B106
	130302-AR				●		10.5	7.94	3.18	0.2	3.4	0.02~0.40	0.50~3.00		
	130304-AR				●		10.0	7.94	3.18	0.4	3.4	0.03~0.45	0.50~4.00		
	130308-AR				●		9.0	7.94	3.18	0.8	3.4	0.04~0.50	0.50~5.00		
	160402-AR				●		16.1	9.525	4.76	0.2	4.4	0.03~0.40	0.30~5.00		
	160404-AR				●		15.6	9.525	4.76	0.4	4.4	0.04~0.50	0.50~6.00		
	160408-AR				●		14.6	9.525	4.76	0.8	4.4	0.05~0.60	0.50~6.00		
	160412-AR				●		13.6	9.525	4.76	1.2	4.4	0.06~0.65	0.50~6.50		
	220516-AR						18.0	12.7	5.56	1.6	5.6	0.10~0.65	0.80~6.50		
	220525-AR				●		15.6	12.7	5.56	2.5	5.6	0.10~0.70	0.80~7.00		
	220530-AR				●		14.3	12.7	5.56	3.0	5.6	0.12~0.75	1.00~7.00		



• Cutting edge geometry : A24 ~ A27 • Recommended chip breaker : B04 ~ B10 • Code system : B14 ~ B15
Note)Unit : Feed(fn) = mm/rev Depth of cut(ap) = mm

● : Stock item ○ : Under preparing for stock

B Note

C O N T E N T S

Multi functional Tools

C

MGT Series

Technical Information for MGT C04
MGT Cartridge C10
MGT C11
MGT Face Grooving C17
MGT Aluminum Wheel C19
Available Insert for MGT Series C21
Special MGT Insert Order Form C23

Saw-man

Saw-man C24
Grooving C26
Parting off C30

New Fine Tools

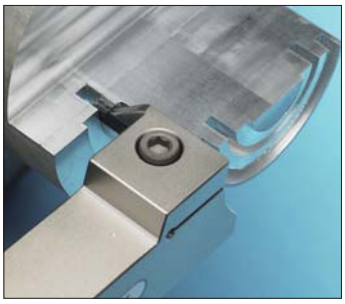
Technical Information for New Fine Tools C31
New Fine Tools C32

Multi Turn

Technical Information for Multi Turn C34
Multi Turn C36



Features of MGT



Features

- **Inserts are offered with two edges, for better economical machining**
- **Multi function operations**
  Reduce cycle time & increase productivity with the ability to groove, turn, face or copy in an application.
- **Shorten time & save on tool cost**
  Korloy's MGT system allows a machinist to apply one tool against many applications, reducing the number of tools
- **Flat Cutting Edge**
  MGT tools have a flat geometry on its cutting edge to ensure excellent surface roughness. Even in high feed applications by using a wiper function, Korloy ensures excellent surface roughness even in roughing operation

Geometry of chip breaker



MGM(G)N-M
- Specially designed chip breaker allows a smoother chip flow versus conventional flat-top geometries through the use of a central chip breaker
- Specially placed convex dots assists with chip control in external machining, for a smoother chip flow.
- Chip breaker designed for turning & grooving applications



MGMN-G
- Specially designed chip breaker allows narrower chips to promote better chip flow
- Specifically designed for grooving applications



MRMN-M
- Full radius geometry for applications that require profiling
- Available for relief machining



MFMN300
- Specially designed chip breaker allows narrower chips to promote better chip flow
- Chip breaker specially designed for face-grooving



MRGN-A
- Specially designed high positive geometry, ideal for machining aluminum
- The chip breaker's super buffed, high rake angle allows optimal chip flow of aluminum



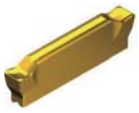
MGMR-PS
- Sharply designed cutting edge.
- Recommended in machining low carbon steel and stainless steel
- Specially designed chip breaker allows narrower chips to promote better chip flow.
- Able to machine feed rates and small diameter cutting



MGMR-PT
- Stronger cutting edge with a negative land for tougher applications
- Able to machine at feed rates as high and bar stock
- Chip breaker design helps narrows chips for better flow



MGMN-L
- Sharp cutting edge
- Low cutting resistance
- For auto CNC machine
- For small Dia. processing



MGMN-R
- Strong cutting edge
- For high feed rate processing



MGMN-T
- For turning & grooving
- Reduced chipwidth & smooth chip control by dot designed on the top corner



MGMN-A
- Smooth chip flow
- Reduced build up on cutting edge

Parting off (MGMN / MGMR/L)

Workpiece	Cutting Speed											Feed				
	CVD					PVD					Uncoated	Cutting width (mm)				
	NC3120	NC3030	NCM325	NC5330	NC500H	PC230	PC8110	PC5300	PC3500	PC6510	ST30A	2	3	4	5	6
SM□□C	80~180			80~180		80~180						0.02~0.15	0.03~0.2	0.08~0.3	0.10~0.4	0.12~0.5
SCM	70~150	70~150	70~150	70~150	70~150	70~150			70~150			0.02~0.15	0.03~0.2	0.08~0.3	0.10~0.4	0.12~0.5
GC/GCD				50~100						50~100	50~100	0.05~0.12	0.1~0.25	0.1~0.30	0.1~0.35	0.1~0.40
STS			50~120	50~120			50~120	60~140				0.02~0.1	0.03~0.15	0.08~0.25	0.1~0.35	0.12~0.40
Non-ferrous metal (AL, Copper)											200~450	0.05~0.1	0.05~0.2	0.05~0.25	0.05~0.30	0.05~0.35

Facing (FGD / FGM / FMM / MFMN / MGMN)

Workpiece	Cutting Speed								Feed		
	CVD				PVD			Uncoated	Cutting width (mm)		
	NC6110	NC3030	NC5330	NC3120	PC3500	PC215K	PC8110 / PC5300	H01	3	4	5
SM□□C			100~160	100~160					0.05~0.1	0.05~0.12	0.05~0.15
SCM		50~130	50~130	50~130	50~130				0.05~0.1	0.05~0.12	0.05~0.15
GC/GCD	120~150		120~150			120~150			0.05~0.1	0.05~0.12	0.05~0.15
STS			60~150				60~150		0.05~0.1	0.05~0.12	0.05~0.15
Non-ferrous metal(AL, Copper)								200~800	0.05~0.15	0.08~0.15	0.08~0.15

Grooving, Turning (MGMN / MRMN)

Workpiece	Cutting Speed												Feed					
	CVD				PVD				Cermet		Uncoated		Cutting width (mm)					
	NC3010	NC3120	NC3030	NC5330	PC215K	PC5300	PC230	PC3500	CN20	CT10	ST30A	ST20	0.5~1.0	1.0~2.0	2~3	3~4	4~5	6~8
SM□□C	80~200	80~200		80~200		80~180	80~200		80~120	80~120		80~120	0.03~0.08	0.04~0.09	0.05~0.1	0.05~0.12	0.05~0.15	0.05~0.2
SCM	80~180	80~180	80~180	80~180		80~160	80~180	80~180	80~120		80~120	80~120	0.03~0.07	0.04~0.08	0.05~0.08	0.05~0.1	0.05~0.12	0.05~0.15
GC/GCD				60~130		60~130							0.03~0.07	0.04~0.08	0.05~0.08	0.05~0.1	0.05~0.10	0.05~0.12
STS				60~100	60~100						60~100		0.03~0.08	0.04~0.09	0.05~0.10	0.05~0.12	0.05~0.12	0.05~0.15
Non-ferrous metal(AL, Copper)					150~300						150~400		0.05~0.12	0.05~0.15	0.05~0.15	0.08~0.15	0.08~0.15	0.10~0.20

Face grooving tools

For Shallow Grooving

MFMN300	MGMN400-M
	
Cutting width 3mm	Cutting Width 4mm

Horizontal MGFHR	Vertical MGFVR
	
Machined diameter ∅24~200mm	Machined diameter ∅24~60mm

Features

- Economical tools utilizing a double ended cutting edge system
- Newly designed chip breakers that help ensure chip control for various face grooving applications
- Korloy face grooving tools provide various holder line-ups to give you more options and benefits

For Deep Grooving

FGD	FGM	FMM
		
Deep face grooving (G class)	Wide face grooving turning (G class)	Wide face grooving turning (M class)

Horizontal FGHH	Vertical FGVH
	
Machined diameter ∅25~140mm	Machined diameter ∅25~140mm

Features

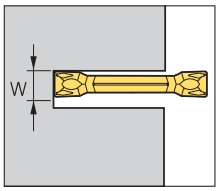
- These tools are suitable for deep grooving with a single cutting edge(Tmax 25mm)
- A variety of chip breakers enable a machinist to apply a wide range of functions in machining
- A variety of holders ensures multiple application ranges

Note

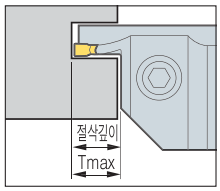
FGM and FMM have similar application rages but are NOT interchangeable with each other's holder

Selection System of Holder

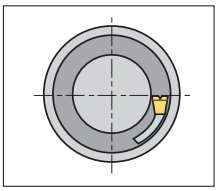
Follow these 3 simple directions to choose the right insert and holder for your application



• Choose the insert and holder that best applies to your application according to the cutting width and workpiece shape to be machined



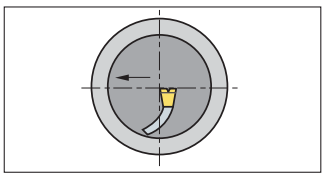
• Choose the holder with the shortest overhang that will still meet the cutting depth required



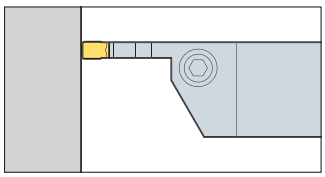
• Choose the largest size of shank depending on the initial grooving diameter required in the application

Notice for Face Grooving

Before machining, check and adjust the following holder position



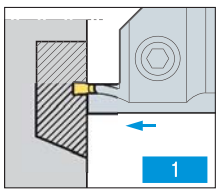
- Check the cutting edge height at the center of the workpiece
- Machine towards the center and check for burrs



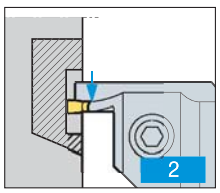
• For better surface roughness, set up the insert in order to perpendicular at center line

Optimization of Face Grooving

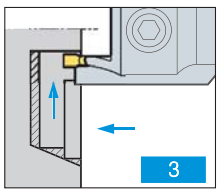
Roughing : When face grooving decrease the cutting speed 40% below a normal face turning operation



Grooving at the initial diameter

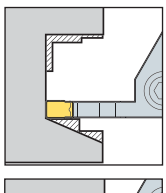


Face turning away from center

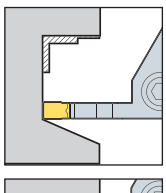


Face turning to center

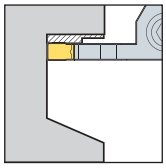
Finishing : When face grooving decrease the cutting speed 40% below a normal face turning operation



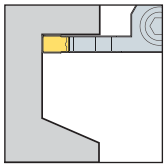
• Grooving at the initial diameter to the final cutting depth and face turning away from center



• Radius operation toward final dimension at the bottom



• Face turning to center



• Grooving for the right dimension you want

Turning and Grooving

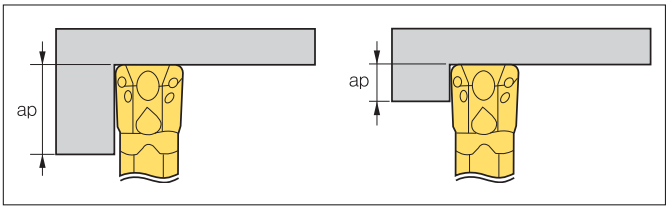
Selection of Insert

Feed rate

- Decide maximum feed rate after considering the insert's characteristics and machine capabilities. (Fmax = W x 0.075)
- Max feed rate should not be larger than the corner radius of the insert
- In grooving applications, chip evacuation problems can be remedied by using step feed methods at small intervals

Depth of cut

- The minimum depth of cut should be bigger than corner radius of insert
- When deciding on the max depth of cut please consider the machine's cutting load
- Depending on the shape of the insert, deflection of work piece and clearance angle can be changed

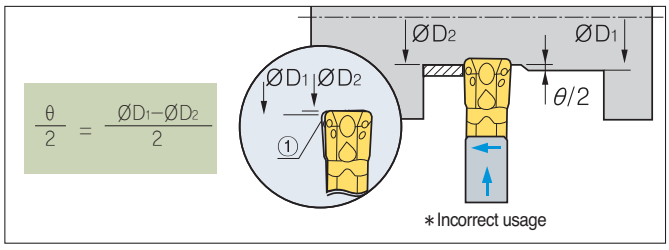


Notice for turning

MGT tools are designed to incur side cutting force from its clearance angle; this feature gives you advantage over a standard ISO insert. The standard MGT insert also provides a "wiper" effect to improve surface roughness

Notice for Finishing (offset need final quality)

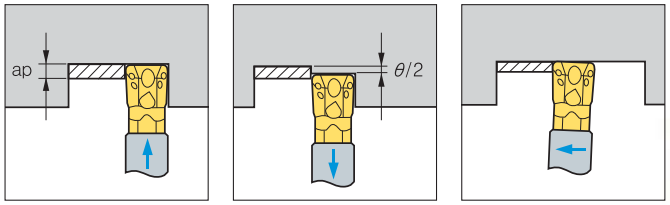
After desired diameter is grooved, continuous turning operation might cause some deflection of the workpiece. In these cases follow the given formula, offsetting these factors enables the desired diameter that you want



To eliminate the difference in the machined diameter by utilizing the clearance angle (which generates commonly while final turning operation) follow the directions above when machining

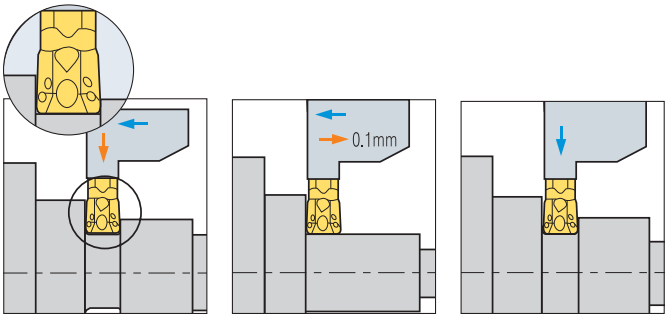
To obtain a good surface roughness without offsetting in an application follows the directions below

1) Groove to the desired diameter
2) Pull the tool backs a total distance of θ/2
3) Continue the external turning operation to desired diameter



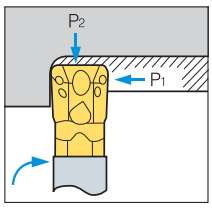
Notice for MGT turning applications

M.G.T tools are available for grooving and turning as a multifunctional tool. When using a M.G.T tool keep in mind that the tool imitates a standard ISO turning application. The application uses a positive clearance angle where a tool's cutting force and depth of cut are all applied in an application. This might create normal wear on the insert, after turning, a grooving process might not meet the desired diameter on the work piece. To off set this, adjust the tool 0.004 inches and return to the original position of the grooving application



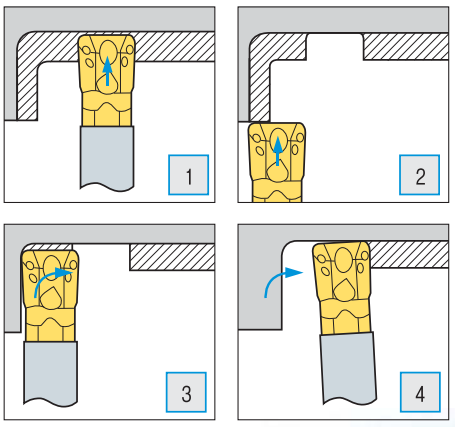
∗Incorrect usage

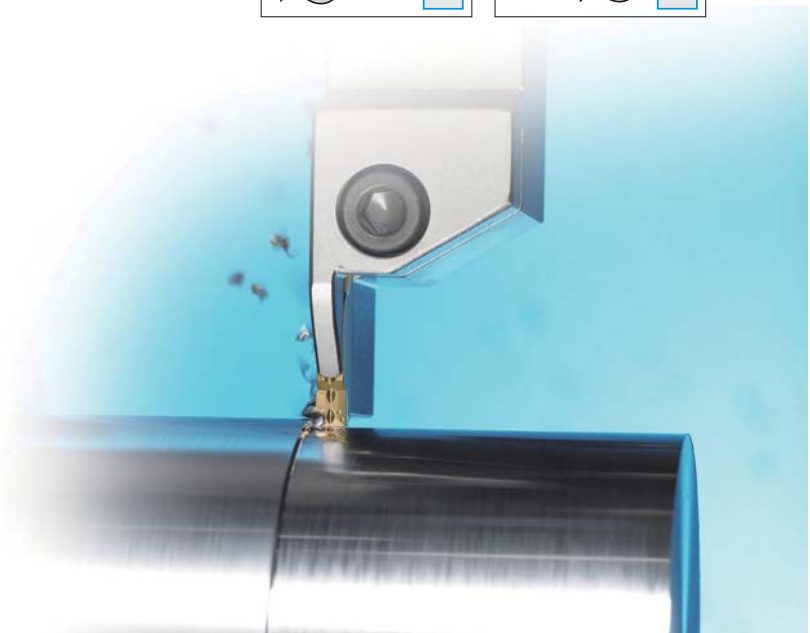
Machining workpiece with a radius smaller than the insert's corner radius



∗Incorrect usage

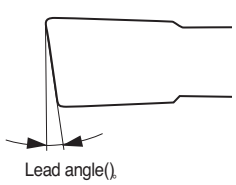
Stabilize your tool pressure. MGT tools create a cutting load when machining a workpiece with a radius larger than the corner radius of insert (shown in the picture). The unequal cutting force might initially break the insert or holder





Parting off & Grooving

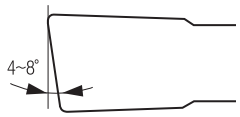
Insert



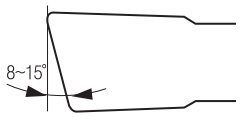
• **Lead angle applications**
4°- Pipe (Tubing and hollow bar)
6°- Pipe and solid bar
8°- Solid bar
15°- Small diameter Solid bar



Lead angle 0°(Neutral)
- Parting off on solid bar type
- Occurring the center stub when parting off
- Prevent to be deflected workpiece by cutting diretion during parting off
- Availble for use deep parting depth



Lead angle 4° ~ 8°
- Reduce the center stub when parting off on solid bar type
- Reduce the burr when parting off on tubing or hollow bar type



Lead angle 8°~15°
- Parting off on small diameter and hollow bar type
- Reduce the burr and center stub when parting off on small diameter solid bar type

※ Available Inserts : MGMR/L □□□ – □□ – PS/PT
Lead angle(°)

Selection of Insert

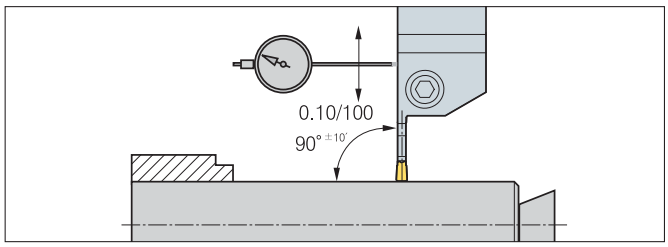
To properly match the insert and cutting condition, the following factors should be considered
- Width of insert
- Chip breaker
- Grade and nose R

• The relationship between the cutting width and cutting depth
- Neutral type, inserts with a 0 degree lead angle are best when used an applications maximum depth of cut
- In general alloy steel, the maximum depth of cut = W x 0.8

• Insert with lead angle
To reduce burrs, we recommend using insert with a lead angle. Insert that have larger lead angles reduce burrs but will also decrease tool life. In the case where burrs are acceptable, we recommend using a neutral type insert

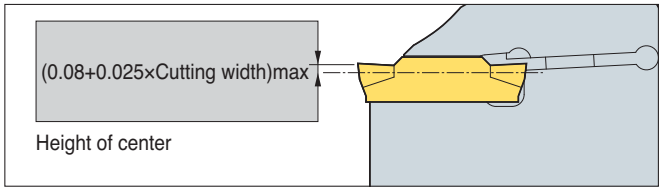
Setting of Holders

The cutting position should be exactly mounted on machined axis in order to create a perpendicular direction or 90 to minimize vibration



Setting of Parting off

The edge height of an insert should be set within ±0.1mm based on the center line
- Parting off should be done as close to the chuck as possible to minimize vibration



Notice

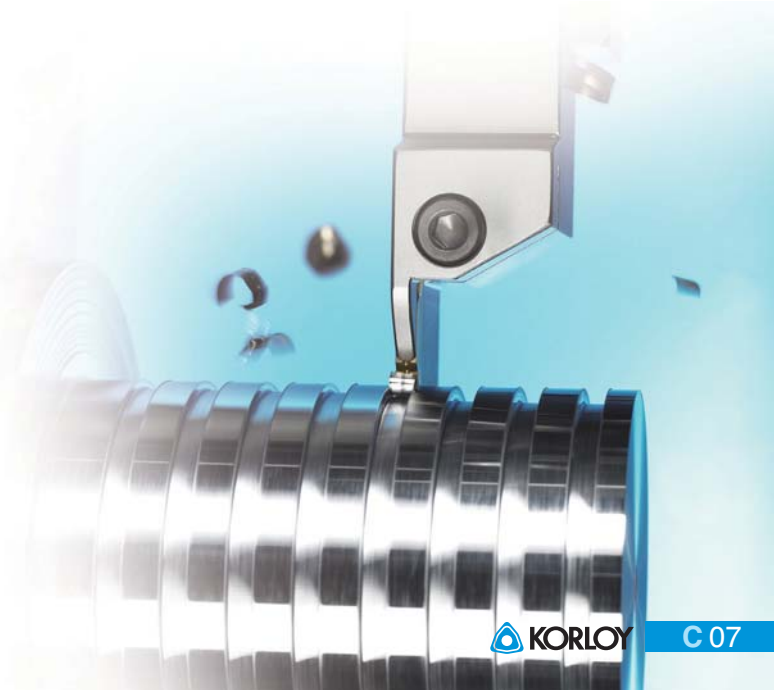
• Keep a consistent cutting speed and feed
• Use proper amounts of coolant for better performance
• Properly clean insert pocket before mounting insert

Usage

• If insert is worn, immediately replace with a new insert. This is to prevent the damage on the workpiece
• If the holder seat is worn or damaged replace with a new one immediately for stable clamping
• Do not grind or regrind the holder seat

Selection of Chip Breaker

Our chip breakers are designed to narrow chips during grooving operations. Narrow chips usually offer the following advantages
• Decrease friction between chips and the workpiece. This usually gives a better surface roughness finish
• With better chip flow, a machinist is able to increase feed rates due to a reduced cutting load



MGT - Machining Al Wheels

Features

- Optimally designed inserts for aluminum wheel machining
- Longer tool life when matched with the best grade for application
- Unique clamping mechanism places a strong clamp over insert
- A variety of insert types for multi application functions



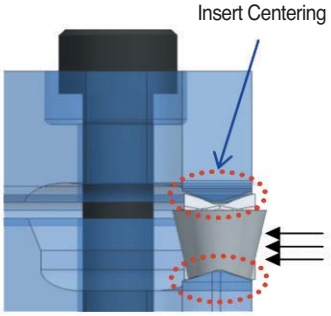
Various insert types

• MRGN type : Full "Round" geometry

MRGN-A(For general)	MRGN-A5(For copying)	MRGN-AM(Medium finishing)	MRGN-AP(PCD)	MVGN-A(For fine finishing)
				
High rake angle, Sharp cutting edge	Reinforced clamping force	For ductile cast iron	Improved chip control	High rake and relief angle

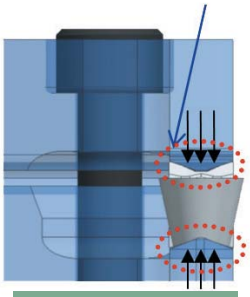
New clamping system

Insert Centering



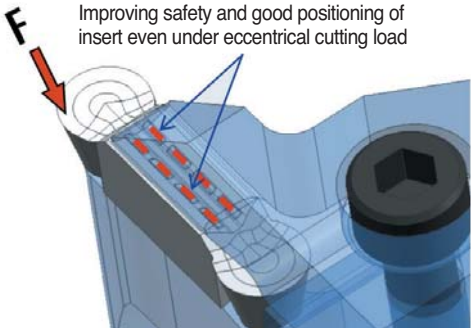
Before tightening

1st powerful clamping



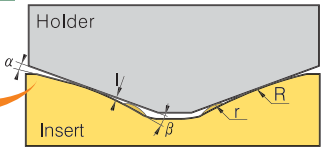
After tightening

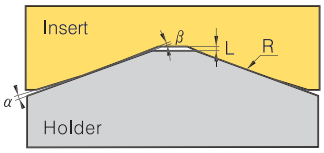
Improving safety and good positioning of insert even under eccentrical cutting load



Reinforcing the clamping force due to radius designed on the top & bottom side of insert and convex"DOT"on the top of insert

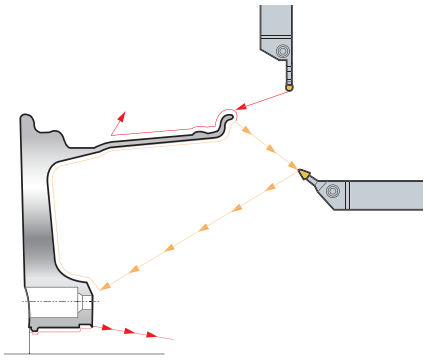
PATENT



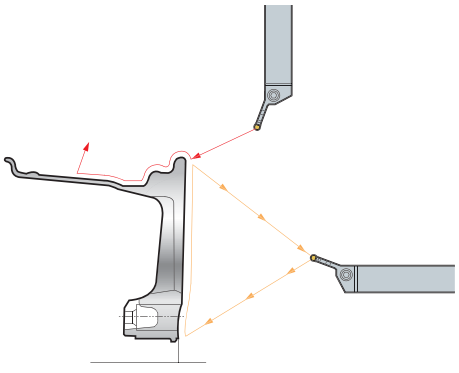


Application of Al Wheels

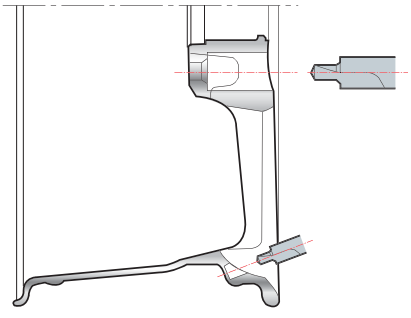
MACHINING A



MACHINING B



MACHINING C



Recommended cutting condition

Workpiece		Hardness Brinell (HB)	kc (MPa)	vc (m/min)	fn (mm/rev)
Aluminum alloy (Forged)	Unhardened	50 ~ 70	500 ~ 600	1,000 ~ 2,500	0.1 ~ 0.6
	Hardened	90 ~ 110	700 ~ 900	300 ~ 1,000	0.1 ~ 0.5
Aluminum alloy (Cast)	Unhardened	70 ~ 80	700 ~ 800	300 ~ 1,000	0.1 ~ 0.5
	Hardened	80 ~ 110	800 ~ 950	200 ~ 600	0.1 ~ 0.4
Copper alloy		90 ~ 110	700 ~ 900	300 ~ 800	0.1 ~ 0.5
Magnesium alloy		70 ~ 80	700 ~ 800	300 ~ 1,000	0.1 ~ 0.5

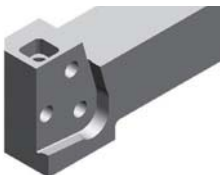
MGT- Cartridge

Holder Code System

MC	H	R/L	25	25
MGT-Cartridge System	Holder Style	Hand of Tool	Height (mm)	Width (mm)

H : Horizontal
V : Vertical

Holder

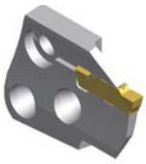
Horizontal Type		Vertical Type	
MCHR	MCHL	MCVR	MCVL
			

Cartridge Code System

MC	F	R/L	3	-	24/35	-	T16
MGT-Cartridge System	Working Style	Hand of Tool	Cutting Width (mm)		Face Working Dia.(mm)		Maximum Depth (mm)

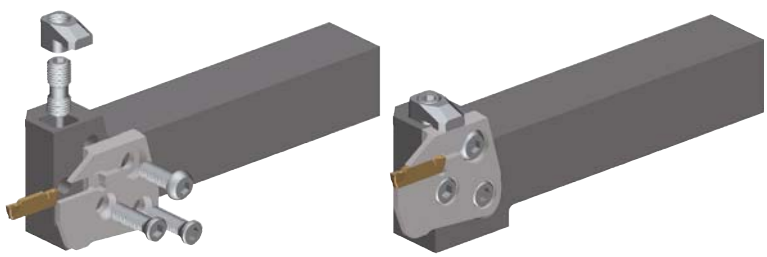
E : External Process
F : Facing Process

Cartridge

External Process		Facing Process	
MCER	MCEL	MCFR	MCFL
			

System Figure

- **Compatible and Economical due to divided** cartridge & exclusive holder system from existing single body system
- **Interchangeable cartridge**
  - Various assembly depends on working style
  - Reduce cutting tool costs by over 30%
  - Setting with upper clamp & side screw
- **Strong & Stable setting force**
  - Simultaneous assembly of insert & cartridge
  - Easy assembly & tool exchange
- **Stable assembly system**
  - Simple & Superior setting force



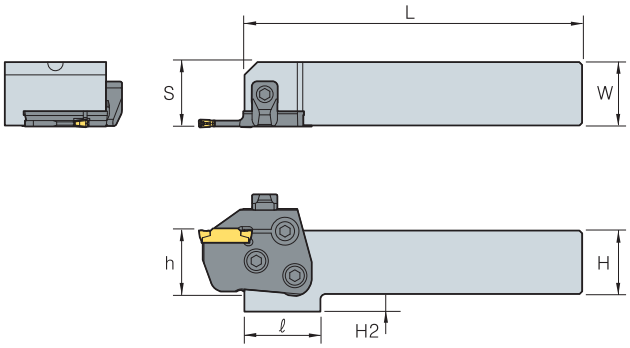
Stable Assembly thanks to double screw & clamp ▶ Simple & Strong Setting

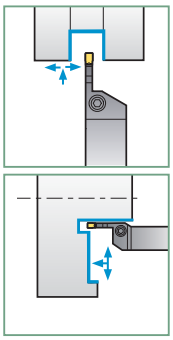
MCHR/L
(Holder)



MCER/L
MCFR/L

For Grooving, Turning, Parting off, Reliefing, Profiling machining





R type insert

(mm)

Designation		Stock R	Stock L	H=(h)	W	L	S	ℓ	H_2	Cartridge	Clamp	Clamp Screw	Hinge Screw	Clamping screw	Wrench
MCHR/L	**2020**	●	●	20	20	133	20.7	30	12	MCER/L MCFR/L	CXH8N	DHA0818F	RHA0613	FHGA0618	HW40L
	2525	●	●	25	25	133	25.7	30	7						
	3232	●	●	32	32	153	32.7	-	-						

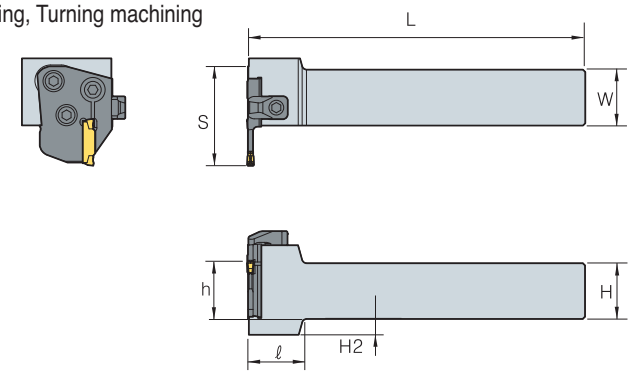
● : Stock item ○ : Under preparing for stock

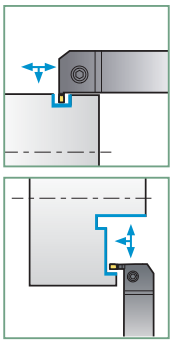
MCVR/L
(Holder)



MCER/L
MCFR/L

For Face Grooving, Turning machining





R type insert

(mm)

Designation		Stock R	Stock L	H=(h)	W	L	S	ℓ	H_2	Cartridge	Clamp	Clamp Screw	Hinge Screw	Clamping screw	Wrench
MCVR/L	**2020**	○	○	20	20	150	38	30	12	MCER/L MCFR/L	CXH8N	DHA0818F	RHA0613	FHGA0618	HW40L
	2525	○	○	25	25	150	43	30	7						
	3232	○	○	32	32	170	50	-	-						

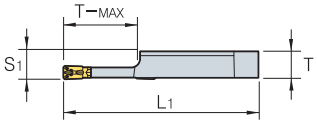
● : Stock item ○ : Under preparing for stock

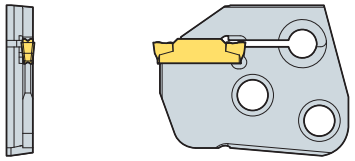
MCER/L
(Cartridge)

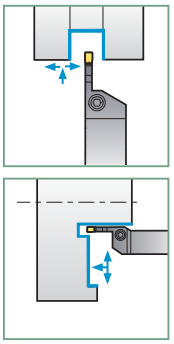


MGMN
MGMR
MGGN
MRMN

For Grooving, Turning, Parting off, Reliefing, Profiling machining







R type insert

(mm)

Designation		Stock R	Stock L	T	L_1	S_1	T–max	Inserts width	Inserts Designation	Holder
MCER/L	3-T16	●	●	6.00	44.5	6.35	16	3	MGMN MGMR/L MGGN MRMN	MCHR/L MCVR/L
	4-T16	●	●	5.97	44.5	6.35	16	4		
	5-T20	●	●	5.87	48.5	6.35	20	5		
	6-T20	●	●	5.82	48.5	6.35	20	6		

• Applicable inserts, see pages C21, C22

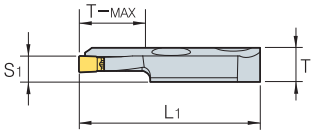
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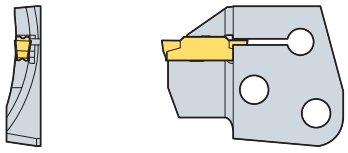
MCFR/L
(Cartridge)

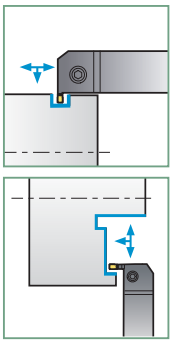


MFNM
MGMN

For Face Grooving, Turning machining







R type insert

(mm)

Designation	Stock R	Stock L	T	L_1	S_1	T–max	Inserts width	Inserts Designation	Holder
MCFR/L3-24/35-T16	○	○	8.00	44.5	6.35	16	3	MFMN300	MCHR/L MCVR/L
MCFR/L3-29/40-T16	○	○	8.00	44.5	6.35	16	3		
MCFR/L3-34/50-T16	○	○	8.00	44.5	6.35	16	3		
MCFR/L3-44/70-T16	○	○	8.00	44.5	6.35	16	3		
MCFR/L3-64/99-T16	○	○	8.00	44.5	6.35	16	3		
MCFR/L4-44/60-T16	○	○	7.97	44.5	6.35	16	4	MGMN400	
MCFR/L4-60/120-T16	○	○	7.97	44.5	6.35	16	4		
MCFR/L4-112/200-T16	○	○	7.97	44.5	6.35	16	4		

• Applicable inserts, see pages C21, C22

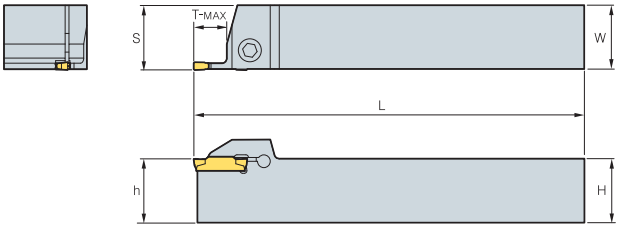
● : Stock item ○ : Under preparing for stock

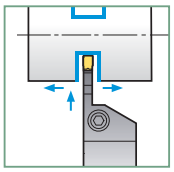
MGEHR/L



MGMN MRMN
MGMR MRGN
MGGN

For Grooving, Turning, Parting off, Reliefing, Profiling machining





R type insert

(mm)

Designation		Stock R	Stock L	H=(h)	W	L	S	T–MAX	Inserts	Screw	Wrench
MGEHR/L	1616-1.5	●	●	16	16	100	16.2	14	MGMN150-G	LTX0514	TW20L
	2020-1.5	●	●	20	20	125	20.2	14			
	2525-1.5	●	●	25	25	150	25.2	14			
	1212-2	●		12	12	100	14.25	14	MGMN200-G MGMN200-M MGMR200-□□-□□	MHA0512	HW40L
	1616-2	●	●	16	16	100	16.25	14			
	2020-2	●	●	20	20	125	20.25	14			
	2525-2	●	●	25	25	150	25.25	14			
	1616-2.5	●	●	16	16	100	16.30	16	MGMN250-G MGMN250-M	MHA0512	HW40L
	2020-2.5	●	●	20	20	125	20.30	16			
	2525-2.5	●	●	25	25	150	25.30	16			
	1616-3	●	●	16	16	100	16.35	18	MGMN300-M/T MGGN300-□□-M MRMN300-M MGMR300-□□-□□ MGMN300-□□-L/R	BHA0616	HW50L
	2020-3	●	●	20	20	125	20.4	18			
	2020-3-T10	●		20	20	125	20.4	10			
	2525-3	●	●	25	25	150	25.4	18			
	2525-3-T10	●		25	25	150	25.4	10			
	3232-3	●	●	32	32	170	32.4	18			
	3232-3-T10			32	32	170	32.4	10			
	2020-4	●	●	20	20	125	20.4	18	MGMN400-M/T MGGN400-□□-M MRMN400-M MGMR400-□□-□□ MGMN400-□□-L/R		
	2020-4-T10	●		20	20	125	20.4	10			
	2525-4	●	●	25	25	150	25.4	18			
	2525-4-T10	●		25	25	150	25.4	10			
	3232-4	●	●	32	32	170	32.4	18			
	3232-4-T10			32	32	170	32.4	10			
	2020-5	●	●	20	20	150	20.5	23	MGMN500-M/T MGGN500-□□-M MRMN500-M MGMR500-□□-□□ MGMN500-□□-L/R		
	2020-5-T15			20	20	150	20.5	15			
	2525-5	●	●	25	25	150	25.5	23			
	2525-5-T15			25	25	150	25.5	15			
	3232-5	●	●	32	32	170	32.5	23			
	3232-5-T15			32	32	170	32.5	15			
	2020-6	●	●	20	20	125	20.6	23	MGMN600-M MGGN600-□□-M MRMN600-M		
	2020-6-T15			20	20	125	20.6	15			
	2525-6	●	●	25	25	150	25.6	23			
	2525-6-T15			25	25	150	25.6	15			
	3232-6	●	●	32	32	170	32.6	23			
	3232-6-T15			32	32	170	32.6	15			
	2525-8	●	●	25	25	150	26.1	28	MRMN800-M MGMN800-M		
	2525-8-T15	●		25	25	150	26.1	15			
	3232-8	●		32	32	170	33.1	28			
	3232-8-T15			32	32	170	33.1	16			
	2525-6A	●	●	25	25	150	25.6	23	MRGN600-A		
	2525-6A-T15			25	25	150	25.6	15			
	3232-6A			32	32	170	32.6	23			
	3232-6A-T15			32	32	170	32.6	15			
	2525-8A	●	●	25	25	150	26.1	28	MRGN800-A		
	2525-8A-T15	●	●	25	25	150	26.1	16			
	3232-8A			32	32	170	33.1	28			
	3232-8A-T15			32	32	170	33.1	15			

• Applicable inserts, see pages C21, C22

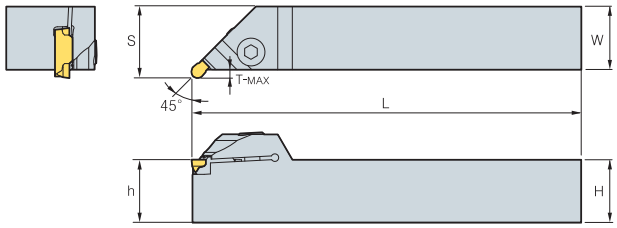
● : Stock item ○ : Under preparing for stock
● : Stock Netherlands

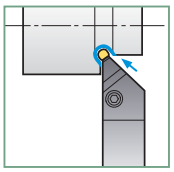
MGEUR/L



MRMN
MRGN

For Reliefing, Profiling machining





R type insert

(mm)

Designation		Stock R	Stock L	H=(h)	W	L	S	T–MAX	Inserts	Screw	Wrench
MGEUR/L	2020-3	●		20	20	125	23	3	MRMN300-M	BHA0616	HW50L
	2525-3	●		25	25	150	28	3			
	3232-3			32	32	170	35	3			
	2020-4			20	20	125	23	3	MRMN400-M		
	2525-4	●		25	25	150	28	3			
	3232-4			32	32	170	35	3			
	2020-5			20	20	125	24	4	MRMN500-M		
	2525-5	●		25	25	150	29	4			
	3232-5			32	32	170	36	4			
	2020-6			20	20	125	24	4	MRMN600-M		
	2525-6	●	●	25	25	150	29	4			
	3232-6	●	●	32	32	170	36	4			
	2525-8			25	25	150	30	5	MRMN800-M		
	3232-8			32	32	170	37	5			
	2525-6A			25	25	150	29	4	MRGN600-A		
	3232-6A			32	32	170	36	4			
	2525-8A			25	25	150	30	5	MRGN800-A		
	3232-8A			32	32	170	37	5			

• Applicable inserts, see pages C22

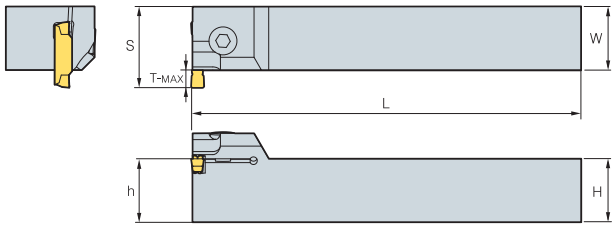
● : Stock item ○ : Under preparing for stock

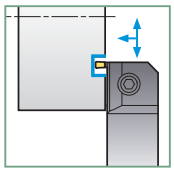
MGEVR/L



MGMN MRMN
MGGN MRGN

For Grooving, Turning, Profiling machining





R type insert

(mm)

Designation		Stock R	Stock L	H=(h)	W	L	S	T–MAX	Min. diameter	Inserts	Screw	Wrench
MGEVR/L	2020-1.5			20	20	125	23	3	85	MGMN150-G	LTX0514	TW20L
	2525-1.5			25	25	150	28	3	85			
	3232-1.5			32	32	170	35	3	85			
	2020-2	●		20	20	125	23.5	3.5	65	MGMN200-M MGMN200-G	BHA0616	HW50L
	2525-2			25	25	150	28.5	3.5	65			
	3232-2			32	32	170	35.5	3.5	65			
	2020-2.5			20	20	125	24	4	65	MGMN250-M MGMN250-G		
	2525-2.5			25	25	150	29	4	65			
	3232-2.5			32	32	170	36	4	65			
	2020-3	●		20	20	125	25.5	5	75	MGMN300-M/T MGGN300-□□-M MRMN300-M MGMN300-□□-L/R		
	2525-3	●	●	25	25	150	30.5	5	75			
	3232-3			32	32	170	37.5	5	75			
	2020-4	●		20	20	125	25.5	5	70	MGMN400-M/T MGGN400-□□-M MRMN400-M MGMN400-□□-L/R		
	2525-4	●		25	25	150	30.5	5	70			
	3232-4			32	32	170	37.5	5	70			
	2020-5			20	20	125	27	7	75	MGMN500-M/T MGGN500-□□-M MRMN500-M MGMN500-□□-L/R		
	2525-5			25	25	150	32	7	75			
	3232-5			32	32	170	39	7	75			
	2020-6			20	20	125	27	7	70	MGMN600-M		
	2525-6			25	25	150	32	7	70	MGGN600-□□-M		
	3232-6			32	32	170	39	7	70	MRMN600-M		
	2525-8			25	25	150	34	9	50	MRMN800-M		
	3232-8			32	32	170	41	9	50	MGMN800-M		
	2525-6A			25	25	150	32	7	70	MRGN600-A		
	3232-6A			32	32	170	39	7	70			
	2525-8A			25	25	150	34	9	45	MRGN800-A		
	3232-8A			32	32	170	41	9	45			

• Applicable inserts, see pages C21, C22

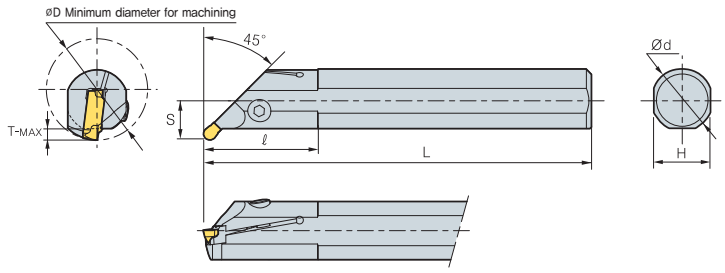
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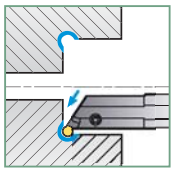
MGIUR/L



MRMN
MRGN

For Reliefing, Profiling machining





R type insert

(mm)

Designation		Stock R	Stock L	øD	ød	L	ℓ	T–MAX	H	S	Inserts	Screw	Wrench
MGIUR/L	3520-3			35	20	150	45	3.5	18	13	MRMN300-M	MHA0512	HW40L
	4025-3	●		40	25	200	45	3.5	23	15.5			
	5032-3			50	32	250	65	3.5	30	19			
	3520-4			35	20	150	45	3.5	18	13	MRMN400-M		
	4025-4	●		40	25	200	45	3.5	23	15.5			
	5032-4	●		50	32	250	65	3.5	30	19			
	4025-5			40	25	200	45	3.5	23	15.5	MRMN500-M	BHA0616	HW50L
	5032-5	●		50	32	250	65	3.5	30	19		BHA0620	
	4025-6			40	25	200	45	3.5	23	19	MRMN600-M	BHA0616	
	5032-6			50	32	250	65	3.5	30	19		BHA0620	
	4025-8			40	25	200	45	6.5	23	15.5	MRMN800-M	BHA0616	
	5032-8	●		50	32	250	65	6.5	30	19		BHA0620	
	4025-6A			40	25	200	45	3.5	23	15.5	MRGN600-A	BHA0616	
	5032-6A			50	32	250	65	3.5	30	19		BHA0620	
	4025-8A			40	25	200	45	5.0	23	18.5	MRGN800-A	BHA0616	
	5032-8A			50	32	250	65	6.5	30	22		BHA0620	

• Applicable inserts, see pages C22

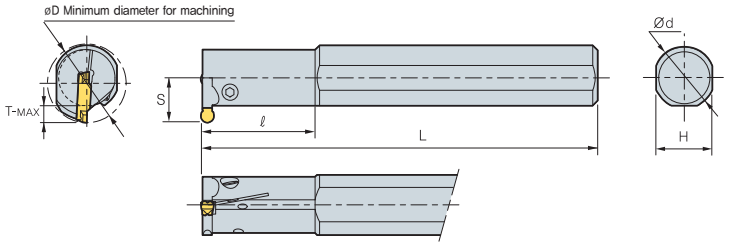
● : Stock item ○ : Under preparing for stock

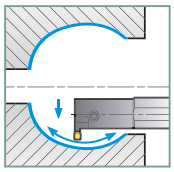
MGIVR/L



MGMN MRMN
MGGN MRGN

For Grooving, Turning, Profiling machining





R type insert

(mm)

Designation		Stock R	Stock L	øD	ød	L	ℓ	T-MAX	H	S	Inserts	Screw	Wrench
MGIVR/L	2016-1.5			20	16	125	35	3.5	15	11.3	MGMN150-G	MHB0310	HW25L
	2520-1.5			25	20	150	45	3.5	18	13.1		MHA0512	HW40L
	2925-1.5			29	25	200	45	3.5	23	16.2			
	2016-2	●	●	20	16	125	35	4.5	15	12.4	MGMN200-G	MHB0310	HW25L
	2520-2	●	●	25	20	150	45	4.5	18	14.0	MGMN200-M	MHA0512	HW40L
	2925-2	●	●	29	25	200	45	4.5	23	17.2	MRMN200-M		
	2016-2.5			20	16	125	35	4.5	15	12.5	MGMN250-G	MHB0310	HW25L
	2520-2.5			25	20	150	45	4.5	18	15.1	MGMN250-M	MHB0512	HW40L
	2925-2.5			29	25	200	45	4.5	23	18.2			
	2520-3	●	●	25	20	150	45	5	18	15.6	MGMN300-M/G/T MGGN300-□□-M MRMN300-M MRMN300-□□-L/R	MHA0512	HW40L
	3125-3	●	●	31	25	200	45	6	23	18.9			
	3732-3	●		37	32	250	65	6	30	21.5			
	2520-4	●	●	25	20	150	45	6	18	15.6	MGMN400-M/G/T MGGN400-□□-M MRMN400-M MRMN400-□□-L/R		
	3125-4	●		31	25	200	45	6	23	18.9			
	3732-4	●		37	32	250	65	6	30	21.5			
	3125-5	●		31	25	200	45	8	23	19.4	MGMN500-M/G/T MGGN500-□□-M MRMN500-M MRMN500-□□-L/R	BHA0616	HW50L
	3732-5	●	●	37	32	250	65	8	30	21.5		BHA0620	
	3125-6	●	●	31	25	200	45	8	23	19.4	MGMN600-M/G	BHA0616	
	3732-6	●		37	32	250	65	8	30	21.5	MGGN600-□□-M MRMN600-M	BHA0620	
	3732-8	●		37	32	250	65	10	30	23.4	MRMN800-M		
	4540-8	●		45	40	300	70	10	37	27.2	MGMN800-M		
	3125-6A			31	25	200	45	8	23	19.4	MRGN600-A	BHA0616	
	3732-6A			37	32	250	65	8	30	21.5		BHA0620	
	3732-8A			37	32	250	65	10	30	23.4	MRGN800-A		
	4540-8A			45	40	300	70	10	37	27.2			

• Applicable inserts, see pages C21, C22

● : Stock item ○ : Under preparing for stock
● : Stock Netherlands

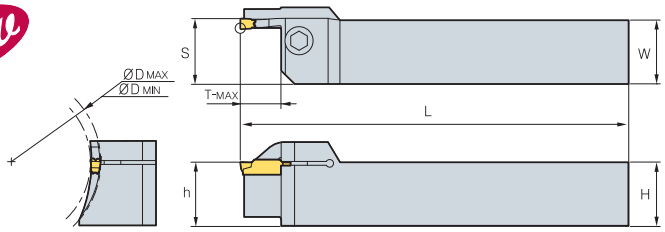
MGFHR/L

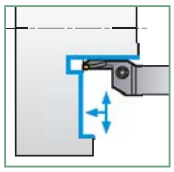


MFMN
MGMN

For Face Grooving machining

New





R type insert

(mm)

Designation		Stock R	Stock L	H=(h)	W	L	S	T-MAX	min. (øD)	max. (øD)	Inserts	Screw	Wrench
MGFHR/L	325-24/35-T10	●		25	25	150	25.6	10	24	35	MFMN300	BHA0616	HW50L
	325-29/40-T10	●		25	25	150	25.6	10	29	40			
	325-34/50-T10	●		25	25	150	25.6	10	34	50			
	325-44/70-T10	●		25	25	150	25.6	10	44	70			
	325-64/99-T10	●		25	25	150	25.6	10	64	99			
	425-62/120-T15	●		25	25	150	25.6	15	62	120	MGMN400-M/T		
	425-112/200-T15	●		25	25	150	25.6	15	112	200	MGMN400-□□-L/R		

• Applicable inserts, see pages C21

● : Stock item ○ : Under preparing for stock

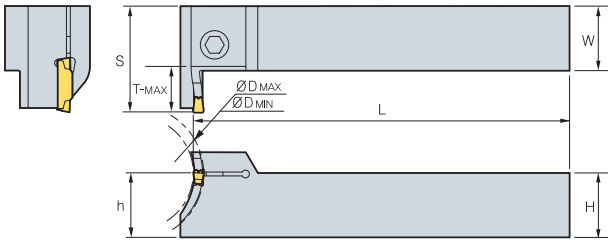
MGFVR/L

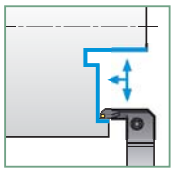


MFMN
MGMN

For Face Grooving machining

New





R type insert

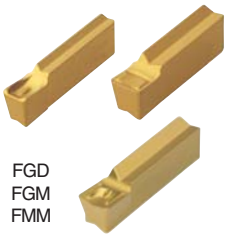
(mm)

Designation		Stock R	Stock L	H=(h)	W	L	S	T-MAX	min. (øD)	max. (øD)	Inserts	Screw	Wrench
MGFVR/L	325-24/35-T10	●		25	25	150	36	10	24	35	MFMN300	MHA0512	HW40L
	325-29/40-T10	●		25	25	150	36	10	29	40			
	325-34/50-T10	●		25	25	150	36	10	34	50			
	325-44/70-T10	●		25	25	150	36	10	44	70			
	325-64/99T10	●		25	25	150	36	10	64	99			
	425-44/60-T10	●		25	25	150	41	15	44	60	MGMN400-M/T	BHA0616	HW50L
	425-60/120-T10	●		25	25	150	41	15	60	120	MGMN400-□□-L/R		
	425-112/200-T10	●		25	25	150	41	15	112	200			

• Applicable inserts, see pages C21

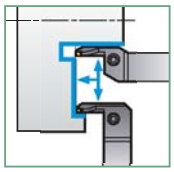
● : Stock item ○ : Under preparing for stock

FGHH

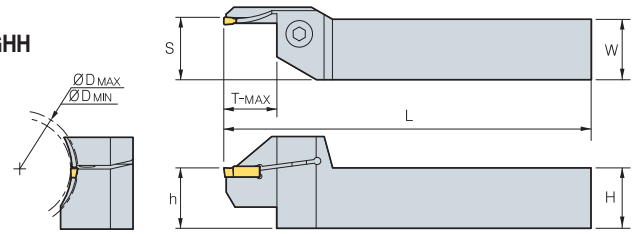


FGD
FGM
FMM

For Face Grooving, Turning machining



• **FGHH**



R type insert

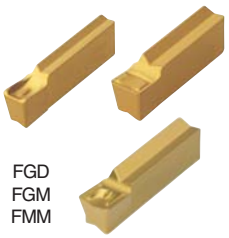
(mm)

Designation	Stock R	Stock L	H=(h)	W	L	S	T-MAX	ØD MIN	ØD MAX	Inserts	Screw	Wrench
FGHH 320R - 25/30	●		20	20	125	20.6	12	25	30	FMM300R-03	BHA0616	HW50L
30/35	●		20	20	125	20.6	12	30	35			
35/48	●		20	20	125	20.6	12	35	48			
48/60			20	20	125	20.6	22	48	60	FGD300R-03 FGM300R-03		
60/75			20	20	125	20.6	22	60	75			
75/100			20	20	125	20.6	22	75	100			
100/140			20	20	125	20.6	22	100	140			
325R - 25/30	●		25	25	150	25.6	12	25	30	FMM300R-03		
30/35	●		25	25	150	25.6	12	30	35			
35/48	●		25	25	150	25.6	12	35	48			
48/60	●		25	25	150	25.6	22	48	60	FGD300R-03 FGM300R-03		
60/75	●		25	25	150	25.6	22	60	75			
75/100	●		25	25	150	25.6	22	75	100			
100/140	●		25	25	150	25.6	22	100	140			
420R - 25/30	●		20	20	125	20.6	12	25	30	FMM400R-04		
30/35	●		20	20	125	20.6	12	30	35			
35/48	●		20	20	125	20.6	12	35	48			
48/60			20	20	125	20.6	25	48	60	FGD400R-04 FGM400R-04		
60/75			20	20	125	20.6	25	60	75			
75/100			20	20	125	20.6	25	75	100			
100/140			20	20	125	20.6	25	100	140			
425R - 25/30	●		25	25	150	25.6	12	25	30	FMM400R-04		
30/35	●		25	25	150	25.6	12	30	35			
35/48	●		25	25	150	25.6	12	35	48			
48/60	●		25	25	150	25.6	25	48	60	FGD400R-04 FGM400R-04		
60/75	●		25	25	150	25.6	25	60	75			
75/100	●		25	25	150	25.6	25	75	100			
100/140	●		25	25	150	25.6	25	100	140			
520R - 25/30	●		20	20	125	20.6	12	25	30	FMM500R-04		
30/35	●		20	20	125	20.6	12	30	35			
35/40	●		20	20	125	20.6	20	35	40			
40/48	●		20	20	125	20.6	20	40	48			
48/60			20	20	125	20.6	25	48	60	FGD500R-04 FGM500R-04		
60/75			20	20	125	20.6	25	60	75			
75/100			20	20	125	20.6	25	75	100			
100/140			20	20	125	20.6	25	100	140			
525R - 25/30	●		25	25	150	25.6	12	25	30	FMM500R-04		
30/35	●		25	25	150	25.6	12	30	35			
35/40	●		25	25	150	25.6	20	35	40			
40/48	●		25	25	150	25.6	20	40	48			
48/60	●		25	25	150	25.6	25	48	60	FGD500R-04 FGM500R-04		
60/75	●		25	25	150	25.6	25	60	75			
75/100	●		25	25	150	25.6	25	75	100			
100/140	●		25	25	150	25.6	25	100	140			

• Applicable inserts, see pages C21

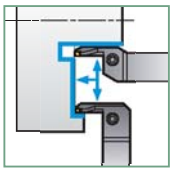
● : Stock item ○ : Under preparing for stock

FGVH

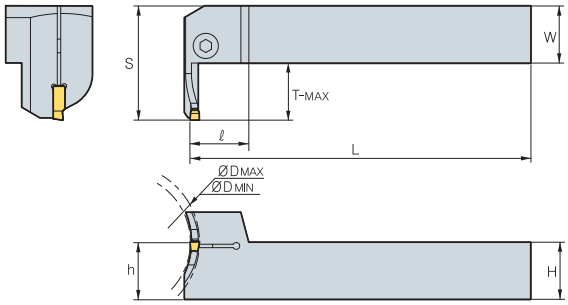


FGD
FGM
FMM

For Face Grooving, Turning machining



• **FGVH**



R type insert

(mm)

Designation		Stock R	Stock L	H=(h)	W	L	S	T–MAX	ØD MIN	ØD MAX	Inserts	Screw	Wrench
FGVH	320R - 25/30	●		20	20	125	20.6	12	25	30	FMM300R-03	BHA0616	HW50L
	30/35	●		20	20	125	20.6	12	30	35			
	35/48	●		20	20	125	20.6	12	35	48			
	48/60			20	20	125	20.6	22	48	60	FGD300R-03 FGM300R-03		
	60/75			20	20	125	20.6	22	60	75			
	75/100			20	20	125	20.6	22	75	100			
	100/140			20	20	125	20.6	22	100	140			
	325R - 25/30	●		25	25	150	25.6	12	25	30	FMM300R-03		
	30/35	●		25	25	150	25.6	12	30	35			
	35/48	●		25	25	150	25.6	12	35	48			
	48/60	●		25	25	150	25.6	22	48	60	FGD300R-03 FGM300R-03		
	60/75	●		25	25	150	25.6	22	60	75			
	75/100	●		25	25	150	25.6	22	75	100			
	100/140	●		25	25	150	25.6	22	100	140			
	420R - 25/30	●		20	20	125	20.6	12	25	30	FMM400R-04		
	30/35	●		20	20	125	20.6	12	30	35			
	35/48	●		20	20	125	20.6	12	35	48			
	48/60			20	20	125	20.6	25	48	60	FGD400R-04 FGM400R-04		
	60/75			20	20	125	20.6	25	60	75			
	75/100			20	20	125	20.6	25	75	100			
	100/140			20	20	125	20.6	25	100	140			
	425R - 25/30	●		25	25	150	25.6	12	25	30	FMM400R-04		
	30/35	●		25	25	150	25.6	12	30	35			
	35/48	●		25	25	150	25.6	12	35	48			
	48/60	●		25	25	150	25.6	25	48	60	FGD400R-04 FGM400R-04		
	60/75	●		25	25	150	25.6	25	60	75			
	75/100	●		25	25	150	25.6	25	75	100			
	100/140	●		25	25	150	25.6	25	100	140			
	520R - 25/30	●		20	20	125	20.6	12	25	30	FMM500R-04		
	30/35	●		20	20	125	20.6	12	30	35			
	35/40	●		20	20	125	20.6	20	35	40			
	40/48	●		20	20	125	20.6	20	40	48			
	48/60			20	20	125	20.6	25	48	60	FGD500R-04 FGM500R-04		
	60/75			20	20	125	20.6	25	60	75			
	75/100			20	20	125	20.6	25	75	100			
	100/140			20	20	125	20.6	25	100	140			
	525R - 25/30	●		25	25	150	25.6	12	25	30	FMM500R-04		
	30/35	●		25	25	150	25.6	12	30	35			
	35/40	●		25	25	150	25.6	20	35	40			
	40/48	●		25	25	150	25.6	20	40	48			
	48/60	●		25	25	150	25.6	25	48	60	FGD500R-04 FGM500R-04		
	60/75	●		25	25	150	25.6	25	60	75			
	75/100	●		25	25	150	25.6	25	75	100			
	100/140	●		25	25	150	25.6	25	100	140			

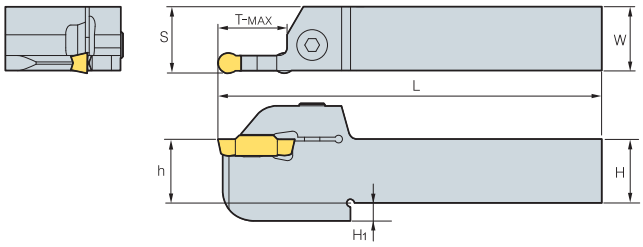
• Applicable inserts, see pages C21

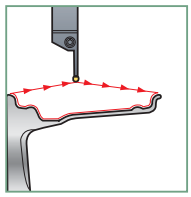
● : Stock item ○ : Under preparing for stock

MGEHR



MRGN





R type insert

(mm)

Designation		Stock R	Stock L	H=(h)	H1	W	L	S	T-MAX	Inserts	Screw	Wrench
MGEHR/L	25N-6A	●		25	7	25	150	25.55	23.5	MRGN6N-A MRGN6N-AP MRGN6N-AM	BHA0620	HW50L
	32N-6A			32	8	32	150	32.55	27			
	25N-6A5	●		25	7	25	150	25.55	23.5	MRGN6N-A5		
	32N-6A5			32	8	32	150	32.55	27			
	25N-8A	●		25	7	25	150	25.55	23.5	MRGN8N-A MRGN8N-AP MRGN8N-AM		
	32N-8A	●		32	8	32	150	32.55	27			
	25N-8A5			25	7	25	150	25.55	23.5	MRGN8N-A5		
	32N-8A5			32	8	32	150	32.55	27			

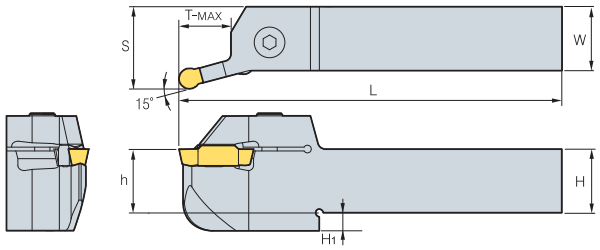
• Applicable inserts, see pages C22

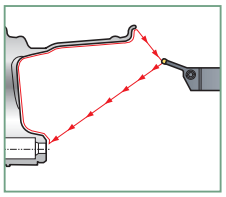
● : Stock item ○ : Under preparing for stock

MGEHR/L-15



MRGN





L type insert

(mm)

Designation		Stock R	Stock L	H=(h)	H1	W	L	S	T-MAX	Inserts	Screw	Wrench
MGEHR/L	25N-6A-15	●		25	7	25	150	32.2	20	MRGN6N-A MRGN6N-AP MRGN6N-AM	BHA0620	HW50L
	32N-6A-15			32	8	32	150	39.2	25			
	25N-6A5-15	●		25	7	25	150	32.2	20	MRGN6N-A5		
	32N-6A5-15			32	8	32	150	39.2	25			
	25N-8A-15	●		25	7	25	150	32.2	20	MRGN8N-A MRGN8N-AP MRGN8N-AM		
	32N-8A-15	●		32	8	32	150	39.2	25			
	25N-8A5-15	●		25	7	25	150	32.2	20	MRGN8N-A5		
	32N-8A5-15	●		32	8	32	150	39.2	25			

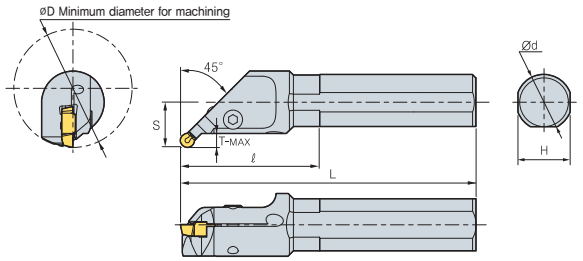
• Applicable inserts, see pages C22

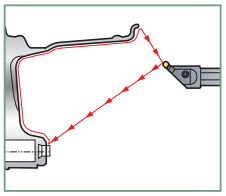
● : Stock item ○ : Under preparing for stock

MGIUR/L-MR



MRGN





R type insert

(mm)

Designation		Stock R	Stock L	øD	ød	L	ℓ	T-MAX	H	S	Inserts	Screw	Wrench
MGIUR/L	6832-8A-MR	●		68	32	170	65	7	30	26	MRGN8N-A/AM/AP	BHA0616	HW50L
	6832-8A5-MR	●		68	32	170	65	7	30	26	MRGN8N-A5		

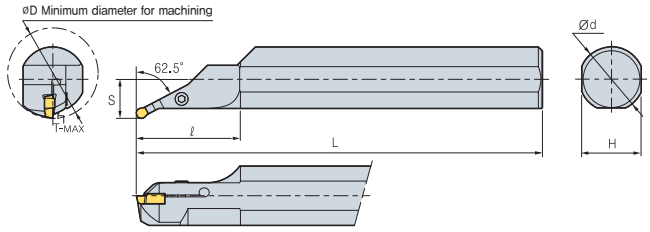
• Applicable inserts, see pages C22

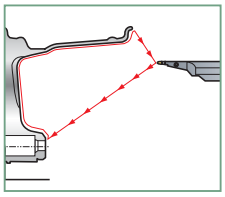
● : Stock item ○ : Under preparing for stock

MGIXR/L-MR



MRGN





R type insert

(mm)

Designation		Stock R	Stock L	øD	ød	L	ℓ	T-MAX	H	S	Inserts	Screw	Wrench
MGIXR/L	7050-8A-MR	●		70	50	350	80	5.5	46	30.2	MRGN8N-A/AM/AP	BHA0616	HW50L
	7050-8A5-MR	●		70	50	350	80	5.5	46	30.2	MRGN8N-A5		

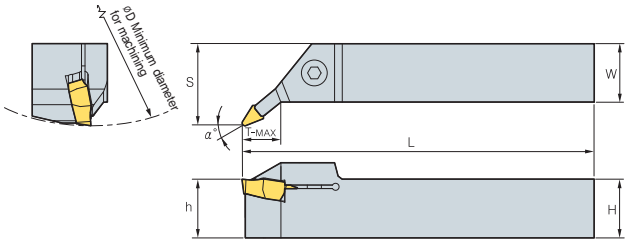
• Applicable inserts, see pages C22

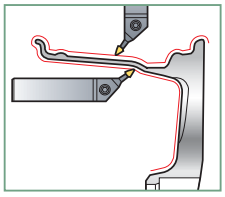
● : Stock item ○ : Under preparing for stock

MGEXR/L



MVGN





R type insert

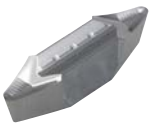
(mm)

Designation		Stock R	Stock L	H=(h)	W	L	S	T-MAX	α°	Inserts	Screw	Wrench
MGEXR/L	25N-8A-5V	●		25	25	150	29	23.5	5	MVGN8N-A-R1.2	BHA0620	HW50L
	25N-8A-22.5V	●		25	25	150	35	27	22.5	MVGN8N-A-R1.6		

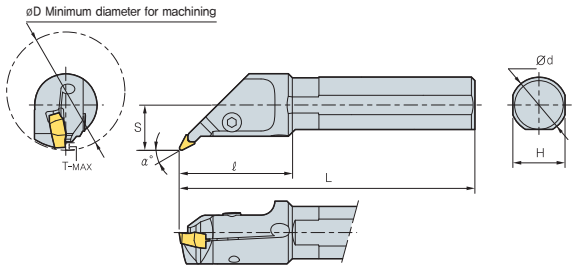
• Applicable inserts, see pages C22

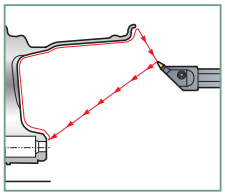
● : Stock item ○ : Under preparing for stock

MGIUR/L-MV



MVGN





R type insert

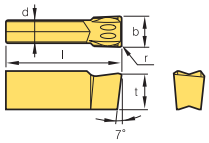
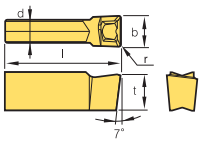
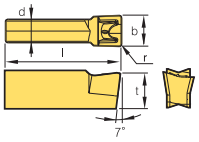
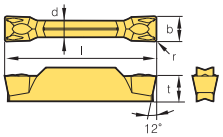
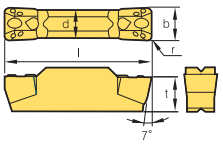
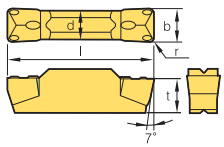
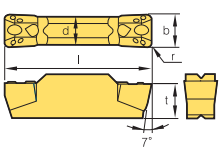
(mm)

Designation		Stock R	Stock L	øD	ød	L	ℓ	T-MAX	H	S	α°	Inserts	Screw	Wrench
MGIUR/L	6832-8A-MV	●		68	32	170	65	4.5	30	26	27.5	MVGN8N-A-R1.2 MVGN8N-A-R1.6	BHA0616	HW50L

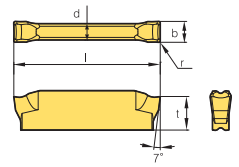
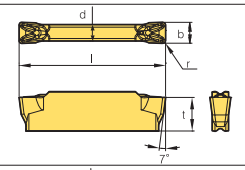
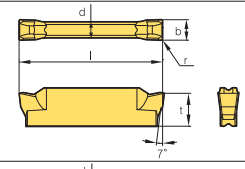
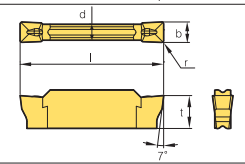
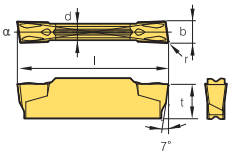
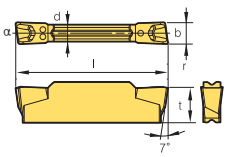
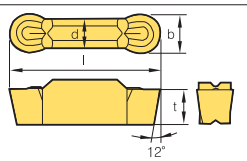
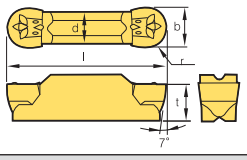
• Applicable inserts, see pages C22

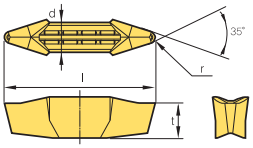
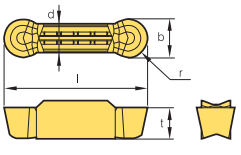
● : Stock item ○ : Under preparing for stock

Available Inserts

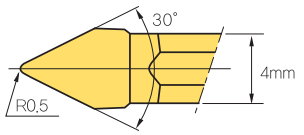
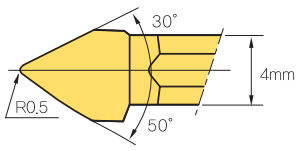
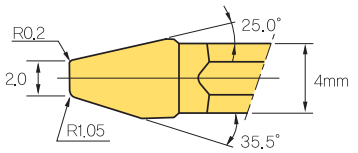
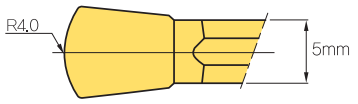
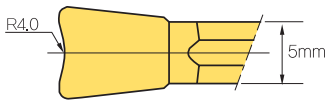
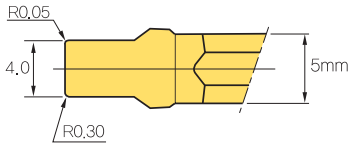
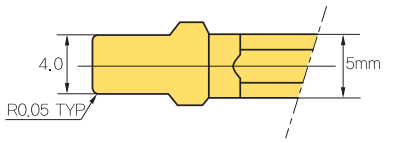
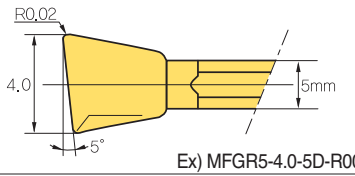
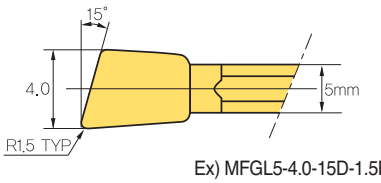
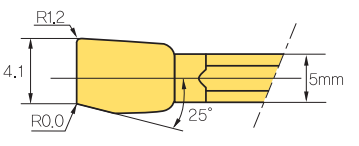
Application	Picture	Designation		Coated								Cermet	Dimensions (mm)					Configuration	Page
				NC3010	NC3020	NC3030	NC3120	PC5300	PC9030	NC5330	PC6510	PC8110	CN20	b	r	l	d	t	
Face Grooving	FGD	FGD	300R-03			●								3.0	0.3	15.0	2.0	4.0		C17
			400R-04			●								4.0	0.4	15.0	3.0	4.5		
			500R-04			●								5.0	0.4	15.0	4.0	5.0		
Face Grooving	FGM	FGM	300R-03											3.0	0.3	15.0	2.0	4.0		C17
			400R-04			●								4.0	0.4	15.0	3.0	4.5		
			500R-04											5.0	0.4	15.0	4.0	5.0		
Face Grooving	FMM	FMM	300R-03			●						●		3.0	0.3	15.0	2.0	3.91		C17
			400R-04			●					●	●		4.0	0.4	15.0	3.0	3.96		
			500R-04			●						●		5.0	0.4	15.0	4.0	4.42		
Face Grooving	MFMN	MFMN	300				●			●				3	0.2	18	2	3		C11 C16
Grooving · Turning	MGGN-M	MGGN	300-02-M										●	3.0	0.2	21.0	2.35	4.8		C11 C12 C13 C15
			300-04-M										●	3.0	0.4	21.0	2.35	4.8		
			300-08-M											3.0	0.8	21.0	2.35	4.8		
			400-02-M										●	4.0	0.2	21.0	3.3	4.8		
			400-04-M										●	4.0	0.4	21.0	3.3	4.8		
			400-08-M											4.0	0.8	21.0	3.3	4.8		
			500-02-M											5.0	0.2	26.0	4.1	5.8		
			500-04-M										●	5.0	0.4	26.0	4.1	5.8		
			500-08-M											5.0	0.8	26.0	4.1	5.8		
			600-02-M											6.0	0.2	26.0	5.0	5.8		
			600-04-M											6.0	0.4	26.0	5.0	5.8		
			600-08-M											6.0	0.8	26.0	5.0	5.8		
Grooving	MGMN-G	MGMN	150-G		●		●	●						1.5	0.15	16.0	1.2	3.5		C11 C12 C13 C15
			200-G		●	○	●		●	●				2.0	0.2	16.0	1.6	3.5		
			250-G		●			●	●					2.5	0.2	18.5	2.0	3.85		
			300-G			○	○		○	●				3.0	0.4	21.0	2.35	4.8		
			400-G				○	●						4.0	0.4	21.0	3.3	4.8		
			500-G											5.0	0.8	26.0	4.1	5.8		
			600-G											6.0	0.8	26.0	5.0	5.8		
Grooving · Turning	MGMN-M	MGMN	200-M		●	●	●	●	●	●				2.0	0.2	16.0	1.2	3.5		C12 C13 C15 C16
			250-M		●	○	●	●	●					2.5	0.2	18.5	2.0	3.85		
			300-02-M							●				3.0	0.2	21.0	2.35	4.8		
			300-M	●	●	●	●	●	●					3.0	0.4	21.0	2.35	4.8		
			350-03-M											3.5	0.3	21.0	2.9	4.8		
			400-02-M											4.0	0.2	21.0	3.3	4.8		
			400-M		l	●	●	●	○	●				4.0	0.4	21.0	3.3	4.8		
			500-04-M			●								5.0	0.4	26.0	4.1	5.8		
			500-M			●	●	○		●				5.0	0.8	26.0	4.1	5.8		
			600-M			●	●			●				6.0	0.8	26.0	5.0	5.8		
			800-M			●		○		●				8.0	0.8	31.0	6.0	6.5		

Available Inserts

Application	Picture	Designation	Coated										Cermet		Dimensions (mm)						Configuration	Page
			NC3020	NC3030	NC3120	PC8110	PC9030	PC3525	PC5300	PC6510	PC230	NC5330	H01	G10	b	r	l	d	t	α°		
Grooving	MGMN-L	MGMN 300-02-L		●					●						3.0	0.2	21	2.35	4.8			C11 C12 C16
		400-02-L		●					●						4.0	0.2	21	3.3	4.8			
		500-04-L		●					●						5.0	0.4	26	4.1	5.8			
Grooving Parting off	MGMN-R	MGMN 300-02-R		●					●						3.0	0.2	21	2.35	4.8			C11 C12 C16
		400-02-R		●					●						4.0	0.2	21	3.3	4.8			
		500-04-R		●					●						5.0	0.4	26	4.1	5.8			
Grooving Turning	MGMN-T	MGMN 300-T		●					●						3.0	0.4	21	2.35	4.8			C11 C16
		400-T		●					●						4.0	0.4	21	3.3	4.8			
		500-T		●					●						5.0	0.8	26	4.1	5.8			
Grooving	MGMN-A	MGGN 300-02-A													3.0	0.2	21	2.35	4.8			C11 C12 C13 C15
		300-04-A													3.0	0.4	21	2.35	4.8			
		300-08-A													3.0	0.8	21	2.35	4.8			
Parting off	MGMR/L-PS	MGMR/L 300-6D-PS			●			●							3	0.2	21	2.35	4.8	6		C11
		300-8D-PS			●			●							3	0.2	21	2.35	4.8	8		
		300-15D-PS			●			●							3	0.2	21	2.35	4.8	15		
		400-4D-PS			●			●							4	0.3	21	3.3	4.8	4		
		500-4D-PS			●			●							5	0.3	26	4.1	5.8	4		
Parting off	MGMR/L-PT	MGMR/L 200-6D-PT			●			●							2	0.2	16	1.6	3.6	6		C11
		300-6D-PT			●			●				●			3	0.2	21	2.35	4.8	6		
		300-8D-PT			●			●							3	0.2	21	2.35	4.8	8		
		300-15D-PT			●			●							3	0.2	21	2.35	4.8	15		
		400-4D-PT			●			●							4	0.3	21	3.3	4.8	4		
		500-4D-PT			●			●							5	0.3	26	4.1	5.8	4		
Aluminum	MRGN-A	MRGN 400-A													4.0	2.0	21.0	3.3	4.8			C11 C12 C13 C14 C15 C19
		500-A													5.0	2.5	26.0	4.1	5.8			
		600-A											●		6.0	3.0	26.0	5.0	5.8			
		800-A											●		8.0	4.0	31.0	6.0	6.5			
Reliefing Profiling	MRMN-M	MRMN 200-M	●		●						●	●			2.0	1.0	16.0	1.50	3.5			C11 C12 C13 C14 C15
		300-M	●	●	●				●		●	●			3.0	1.5	21.0	2.35	4.8			
		400-M	●	●	●					●		●			4.0	2.0	21.0	3.3	4.8			
		500-M	●	●	●				●		●	●			5.0	2.5	26.0	4.1	5.8			
		600-M	●	●	●							●			6.0	3.0	26.0	5.0	5.8			
		800-M	●	●	●						1	●			8.0	4.0	31.0	6.0	6.5			

Application	Picture	Designation	Coated	Uncoated	Dimensions					Configuration	Page
			DA150	G10	b	r	l	d	t		
For Aluminum Wheel	MVGN	MVGN 8N-A-R1.2		●		1.2	30.0	6.0	6.9		C20
		8N-A-R1.6		●		1.6	30.0	6.0	6.9		
For Aluminum Wheel	MRGN-A	MRGN 6N-A		●	6.0	3.0	26.0	5.0	5.9		C19 C20
		6N-AM		●	6.0	3.0	26.0	5.0	5.9		
		6N-AP			6.0	3.0	26.0	5.0	5.9		
		6N-A5		●	6.0	3.0	26.0	5.0	5.9		
		8N-A		●	8.0	4.0	30.0	6.0	6.5		
		8N-AM		●	8.0	4.0	30.0	6.0	6.5		
		8N-AP			8.0	4.0	30.0	6.0	6.5		
		8N-A5		●	8.0	4.0	30.0	6.0	6.5		

● : Stock item ○ : Under preparing for stock
● : Stock Netherlands

Designation	Configuration
M F G N 4 - 0.5R - 30D ① ② ③ ④ ⑤ ⑥ ⑦ ① Multi ② Forming ③ Grinding ④ Feed Direction ⑤ Clamp part : 4mm ⑥ Nose Radius : 0.5 ⑦ Degree : 30°	 Ex) MFGN4-0.5R-30D
MFGN4 - 0.5R - L 50 D - R 30D ① ② ③ ④ ⑤ ⑥ ① Refer to No. 1 ② Nose Radius : 0.5 ③ Left ④ Degree : 50° ⑤ Right ⑥ Degree>30°	 Ex) MFGN4-0.5R-L50D-R30D
MFGN4 - 2.0 - R 020 250 - L 105 335 ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ① Refer to No. 1 ② Width of cutting edge : 2.0mm ③ Right ④ Nose Radius : 0.20 ⑤ Degree : 25.0° ⑥ Left ⑦ Nose Radius : 1.05 ⑧ Degree : 35.5°	 Ex) MFGN4-2.0-R020250-L105335
MFGN5 - 4.0R F ① ② ③ ① Refer to No. 1 ② Radius : 4.0 ③ Front(Concave)	 Ex) MFGN5-4.0RF
MFGN5 - 4.0R B ① ② ③ ① Refer to No. 1 ② Radius : 4.0 ③ Back(Concave)	 Ex) MFGN5-4.0RB
MFGN5 - 4.0 - R 005 - L 030 ① ② ③ ④ ⑤ ⑥ ① Refer to No. 1 ② Width of cutting edge : 4.0mm ③ Right ④ Nose Radius : 0.05 ⑤ Left ⑥ Nose Radius : 0.30	 Ex) MFGN5-4.0-R005-L030
MFGN5 - 4.0 - 0.05 R ① ② ③ ① Refer to No. 1 ② Width of cutting edge: 4.0mm ③ Nose Radius: 0.05	 Ex) MFGN5-4.0-0.05R
MFG R 5 - 4.0 - 5D - R 002 - L 115 ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ① Refer to No. 1 ② Right ③ Clamp part: 5mm ④ Width of cutting edge: 4.0mm ⑤ Lead angle: 5° ⑥ Right ⑦ Nose Radius: 0.02 ⑧ Left ⑨ Nose Radius: 1.15	 Ex) MFGR5-4.0-5D-R002-L115
MFG L 5 - 4.0 - 15D - 1.5R ① ② ③ ④ ⑤ ⑥ ① Refer to No. 1 ② Left ③ Clamp part: 5mm ④ Width of cutting edge: 4.0mm ⑤ Lead angle: 15° ⑥ Right Nose Radius: 1.5	 Ex) MFGL5-4.0-15D-1.5R
MFG R 5 - 4.10 - 25D - R012 - L000 ① ② ③ ④ ⑤ ⑥ ⑦ ① Refer to No. 1 ② Right ③ Clamp part: 5mm ④ Width of cutting edge: 4.1mm ⑤ Degree: 25° ⑥ Right Nose Radius: 1.2⑦ Left Nose Radius :0.0	 Ex) MFGR5-4.10-25D-R012-L000

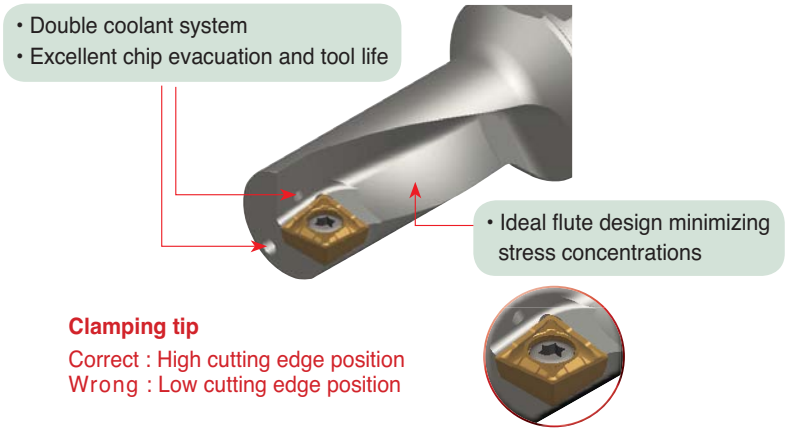
Holder code system

MT	20	R	–	2.25D
Brand Name	Tool Diameter	Hand of Tool		Aspect ratio

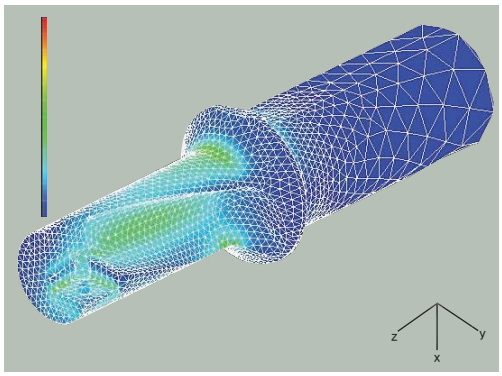
Insert code system

Q	C	M	T	08	03	04	–	CM
Insert shape	Relief angle	Tolerance	Cross Section Type	Cutting Edge Length	Height of Cutting Edge	Nose Radius		Chip Breaker

Tool design by FEM analysis



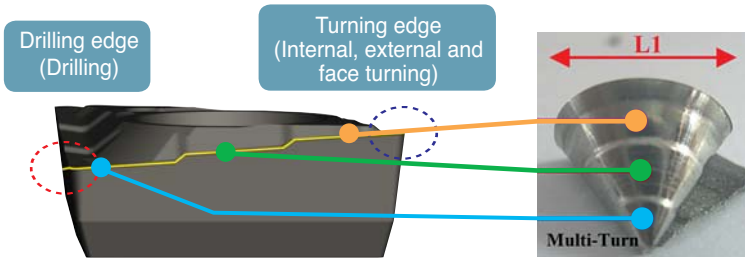
Clamping tip
Correct : High cutting edge position
Wrong : Low cutting edge position

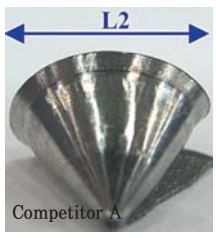


Minimized stress during cutting, prevented damage from vibration and longer tool life

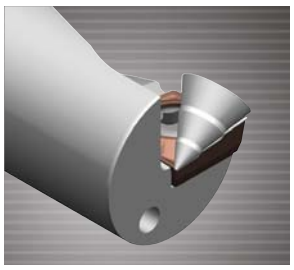
Optimized design

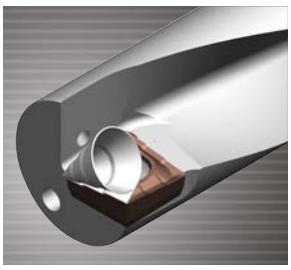
Creative stepping cutting edge





Special chip formed by edge geometry
Better chip evacuation due to small radius width of chip curl





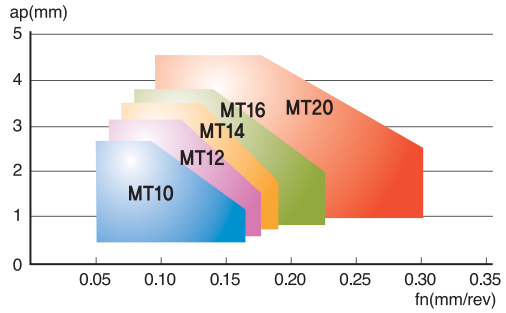
Comparison	Multi turn	Competitor A	Competitor B
fn 0.08 (mm/rev)			
fn 0.10 (mm/rev)			
Chip width (rate)	80%	100%	120%

User's guide

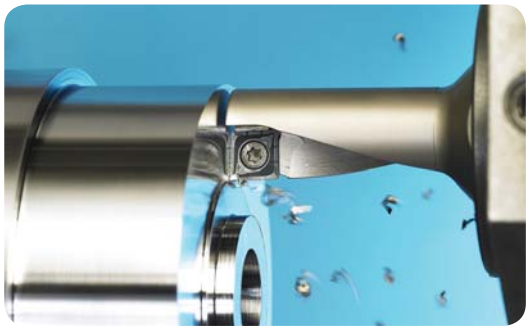
External / Internal turning



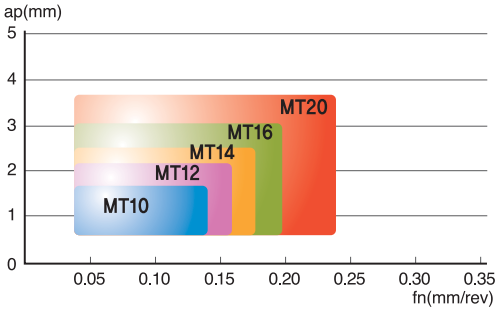
Application range



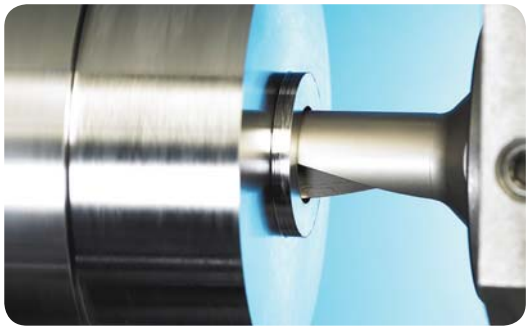
Facing



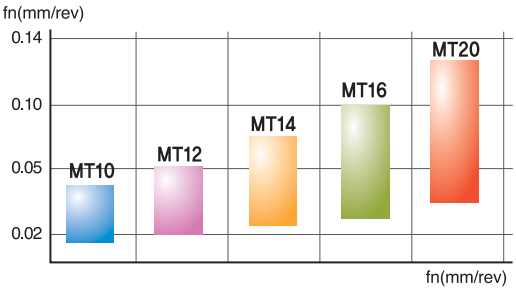
Appication ranges of facing

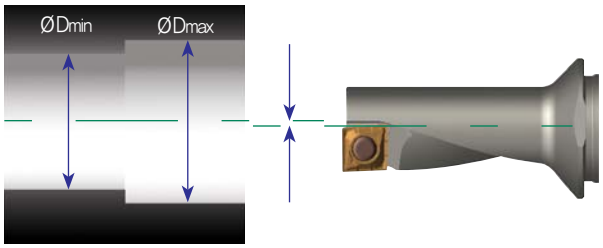


Drilling



Drilling feed range by designation





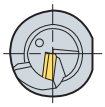
Drill diameter is adjustable by the offset compensation

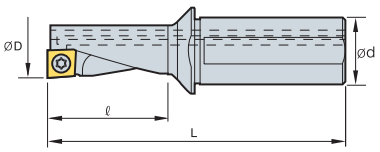
• Offset (Diameter compensation)

Disignation	Diameter	ØDmin(mm)	ØDmax(mm)
MT10R/L-2.25D	10	9.85	10.35
MT12R/L-2.25D	12	11.85	12.35
MT14R/L-2.25D	14	13.85	14.35
MT16R/L-2.25D	16	15.85	16.35
MT20R/L-2.25D	20	19.85	20.35

MT (Multi–Turn)







(mm)

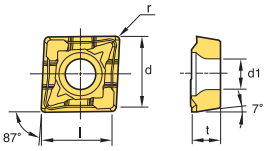
Designation	Stock R	Stock L	øD	ød	ℓ	L	Inserts	Screw	Wrench
MT10R/L-2.25D	●		10	12	22.5	69.5	QC..050204	FTNA0204S	TW06P
MT12R/L-2.25D	●		12	16	27.0	48.0	QC..060204	FTNA02205S	TW06P
MT14R/L-2.25D	●		14	16	31.5	83.5	QC..070304	FTKA02555	TW07P
MT16R/L-2.25D	●		16	20	36.0	94.0	QC..080304	FTNA0306	TW09P
MT20R/L-2.25D	●		20	25	45.0	111.0	QC..10T304	FTNA03508	TW15P

● : Stock item ○ : Under preparing for stock

l : Stock Netherlands

Available Inserts

(mm)

Picture	Designation	Stock P NC3120	Stock M PC5300	Stock K NC6110	l	d	t	r	ød1	Configuration
	**QCMT 050204-CM**	●	●	●	5.0	5.4	2.10	0.4	2.3	
	060204-CM	●	●	●	6.0	6.4	2.38	0.4	2.5	
	070304-CM	●	●	●	7.0	7.4	3.18	0.4	2.8	
	080304-CM	●	●	●	8.0	8.4	3.18	0.4	3.4	
	10T304-CM	●	●	●	10.0	10.4	3.97	0.4	4.0	

● : Stock item ○ : Under preparing for stock

l : Stock Netherlands

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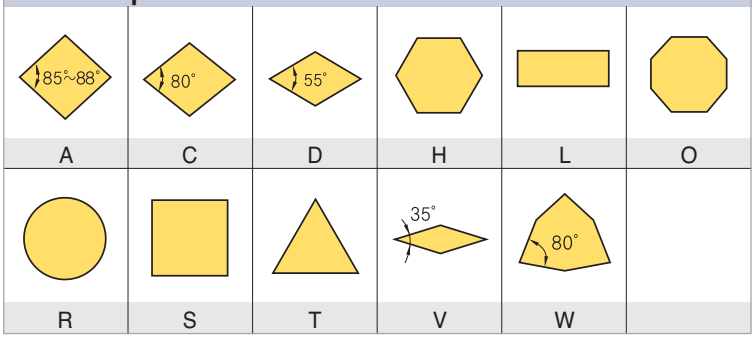


E Milling Insert Code System(ISO)

S	P	K	R	12
1	2	3	4	5
Insert Shape	Relief Angle	Tolerance	Cross Section Type	Cutting Edge Length, Diameter of Inscribed circle

1 S P K R 12 03 ED 08 S R - MX

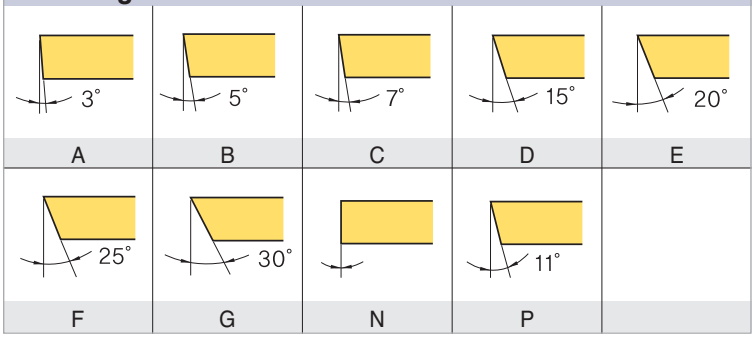
Insert Shape



A	C	D	H	L	O
R	S	T	V	W	

2 S P K R 12 03 ED 08 S R - MX

Relief Angle

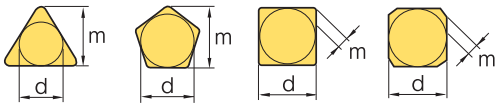


A	B	C	D	E
F	G	N	P	

3 S P K R 12 03 ED 08 S R - MX

Tolerance

d : Inscribed Circle
t : Thickness
m : refer to figure



(mm)

Class	d	m	t
A	±0.025	±0.005	±0.025
C	±0.025	±0.013	±0.025
H	±0.013	±0.013	±0.025
E	±0.025	±0.025	±0.025
G	±0.025	±0.025	±0.13
J	±0.05 ~ ±0.15	±0.005	±0.025
K	±0.05 ~ ±0.15	±0.013	±0.025
L	±0.05 ~ ±0.15	±0.025	±0.025
M	±0.05 ~ ±0.15	±0.08 ~ ±0.20	±0.13
U	±0.08 ~ ±0.25	±0.13 ~ ±0.38	±0.13

■ Tolerance on C,E,H,M,O,P,R,S,T,W Insert Shape (exceptional case)

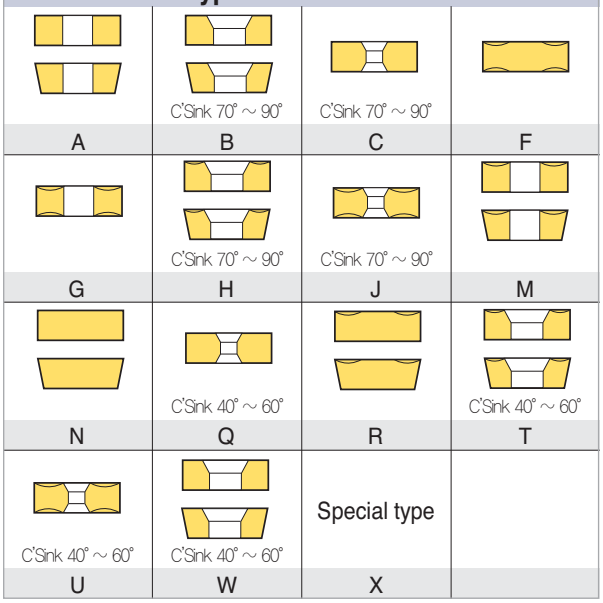
d	Tolerance on d		Tolerance on m	
	J,K,L,M,N	U	M,N	U
6.35	±0.05	±0.08	±0.08	±0.13
9.525	±0.05	±0.08	±0.08	±0.13
12.7	±0.08	±0.13	±0.13	±0.20
15.875	±0.10	±0.18	±0.15	±0.27
19.05	±0.10	±0.18	±0.15	±0.27
25.4	±0.13	±0.25	±0.18	±0.38

■ Tolerance on D Insert Shape (exceptional case)

d	Tolerance on d	Tolerance on m
6.35	±0.05	±0.11
9.525	±0.05	±0.11
12.7	±0.08	±0.15
15.875	±0.10	±0.18
19.05	±0.10	±0.18

4 S P K R 12 03 ED 08 S R - MX

Cross Section Type

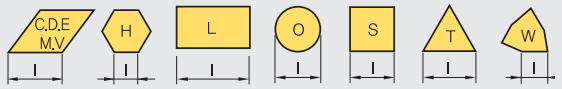


A	B	C	F
G	H	J	M
N	Q	R	T
U	W	X	

5 S P K R 12 03 ED 08 S R - MX

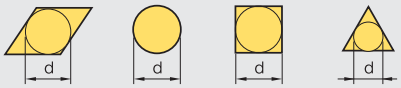
Cutting Edge Length, Diameter of Inscribed circle

■ Metric system

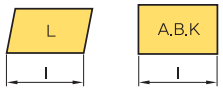


※ 소수점 이하는 정수만 표기

■ Inch system



· Use 1/32″ unit for a insert having smaller I.C under 1/4″
· Use 1/8″ unit for a insert having larger I.C over 1/4″



※ In case of rectangular and rhombic insert indicate cutting edge lenght instead of inscribed circle.

■ Cross over chart for " Metric" and " Inch" system

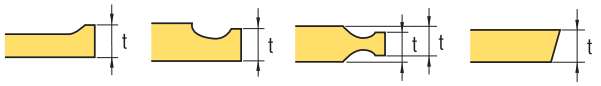
△	06	09	11	16	22	27	33	44
○ □	03	05	06	09	12	15	19	25
55°	04	06	07	11	15	19	23	31
80°	03	05	06	09	12	16	19	25
Inscribed circle	5/32″	7/32″	1/4″	3/8″	1/2″	5/8″	3/4″	1″
Inch system	5	7	2(8)	3	4	5	6	8

03 ED 08 S R - MX

6	7	8	9	10
Height of Cutting Edge	Nose Radius (Nose R)	Edge Preparation	Hand of Tool	Chip Breaker for Milling

6 S P K R 12 03 ED 08 S R - MX

Height of Cutting Edge

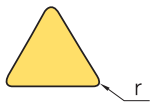


Symbol		Height of cutting edge(t)	
Metric	Inch	mm	Inch
01	1(2)	1.59	1/16
T0	1.125	1.79	9/128
T1	1.2	1.98	5/64
02	1.5(3)	2.38	3/32
T2	1.75	2.78	7/64
03	2	3.18	1/8
T3	2.5	3.97	5/32
04	3	4.76	3/16
05	3.5	5.56	7/32
06	4	6.35	1/4
07	5	7.94	5/16
09	6	9.52	3/8
11	7	11.11	7/16
12	8(16)	12.70	1/2

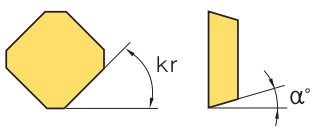
( ) Symbol for small size insert

7 S P K R 12 03 ED 08 S R - MX

Nose Radius (Nose R)



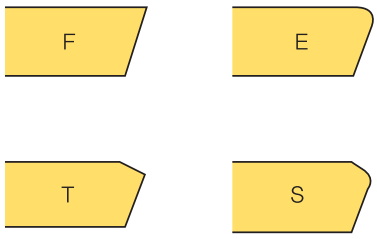
r		Symbol		r		Symbol	
mm	Inch	mm	Inch	mm	Inch	mm	Inch
00	0	0.0		12	3	1.2	3/64
02		0.2		15		1.5	
04	1	0.4	1/64	16	4	1.6	4/64
05		0.5		24	6	2.4	6/64
08	2	0.8	2/64	32	8	3.2	8/64
10		1.0		40		4.0	



Parallel Land	Relief Angle	
kr	α°	
A - 45°	A - 3°	F - 25°
D - 60°	B - 5°	G - 30°
E - 75°	C - 7°	N - 0 °
F - 85°	D - 15°	P - 11°
P - 90°	E - 20°	
Z - Special		

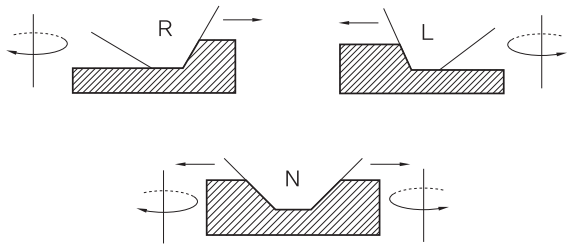
8 S P K R 12 03 ED 08 S R - MX

Edge Preparation



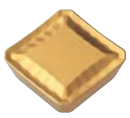
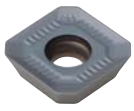
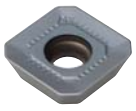
9 S P K R 12 03 ED 08 S R - MX

Hand of Tool

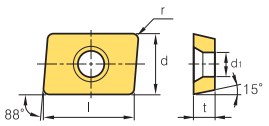
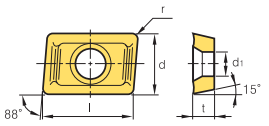
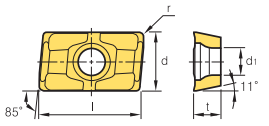
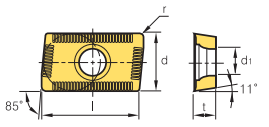
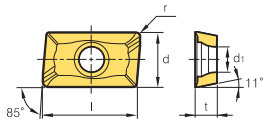
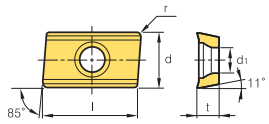
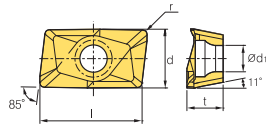
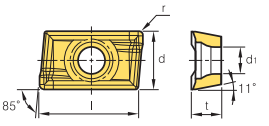
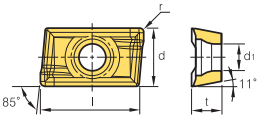
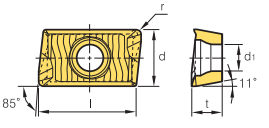
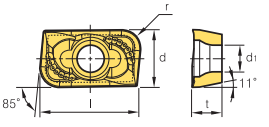


10 S P K R 12 03 ED 08 S R - MX

Chip Breaker for Milling

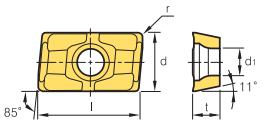
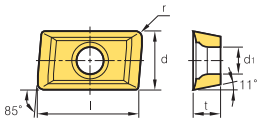
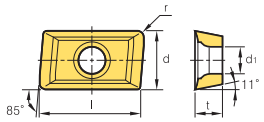
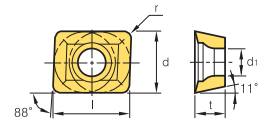
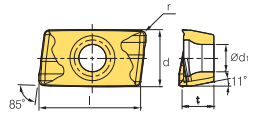
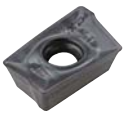
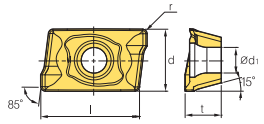
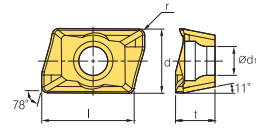
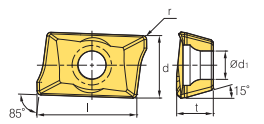
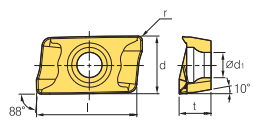
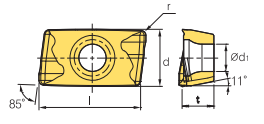
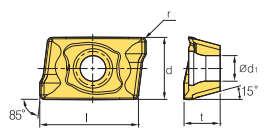
			
MA	MF	MM	MX
			
MA	MF	MM	MR
			
MA	MF	MM	

Workpiece			Machining types
Steel	P	⬢ ✱ ● ⬢ ✱ ✱	● Continuous cutting
Stainless steel	M	✱ ✱ ✱	⬢ General cutting
Cast iron	K	⬢ ⬢ ⬢	✱ Interrupted cutting
Non-ferrous metal	N	● ⬢ ⬢
Heat resistant alloy, Titanium alloy	S	✱ ✱
Hardened steel	H	⬢

Inserts	Designation	Coated										Cermet			Uncoated				Dimensions (mm)					Geometries	Available tools
		NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	CN2000	CN20	CN30	H01	G10	ST30A	ST20	l	d	t	r	d_1		
ADKA	ADKA 150308R																		15.0	9.525	3.18	0.8	4.5		-
	150308SR	●																	15.0	9.525	3.18	0.8	4.5		
	150308TR													●					15.0	9.525	3.18	0.8	4.5		
ADLT	ADLT 150308R	●																	15.0	9.525	3.18	0.8	4.5		E149
	150308SR				●												●		15.0	9.525	3.18	0.8	4.5		
	150308TR													●					15.0	9.525	3.18	0.8	4.5		
APFT-X22	APFT 1604PDSR-X22				●														16.4	9.525	4.76	0.8	4.4		E85 E94
	1604PDTR-X22																		16.4	9.525	4.76	0.8	4.4		
APFT-X28	APFT 1604PDR-X28																		16.4	9.525	4.76	0.8	4.4		E85 E94
	1604PDSR-X28																		16.4	9.525	4.76	0.8	4.4		
	1604PDTR-X28																		16.4	9.525	4.76	0.8	4.4		
APKT	APKT 1604PDSR	●			●				●										16.4	9.525	4.76	0.8	4.4		E85 E94
APKT-MA	APKT 1604PDFR-MA										●			●					16.4	9.525	4.76	0.2	4.4		E85 E94
APKT-MA2	APKT 1604PDFR-MA2																		16.5	9.56	5.76	0.8	4.5		E85 E94
	160416FR-MA2																		16.5	9.56	5.76	1.6	4.5		
	160432FR-MA2																		16.5	9.56	5.76	3.2	4.5		
APKT-MA3	APKT 1604PDFR-MA3														●				16.4	9.525	5.0	0.8	4.4		E85 E94
	160420FR-MA3																		16.4	9.525	5.0	0.8	4.4		
APKT-MF	APKT 1604PDSR-MF	●				●													16.4	9.525	5.0	0.8	4.4		E85 E94 E99
																			16.0	9.525	5.0	2.0	4.4		
APKT-MM	APKT 1604PDSR-MM	●	●		●	●	●	●	●										16.4	9.525	5.2	0.8	4.4		E85 E94 E99
APKT-MM1	APKT 160432R-MM1	●																	16.4	9.525	4.76	3.2	4.4		E85 E94

● : Stock item ○ : Under preparing for stock

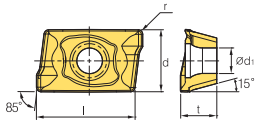
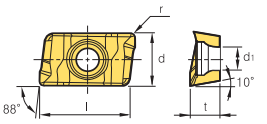
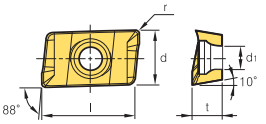
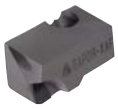
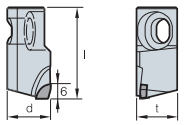
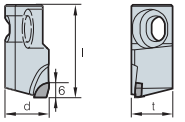
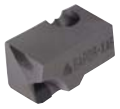
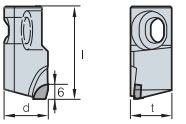
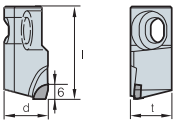
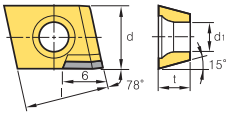
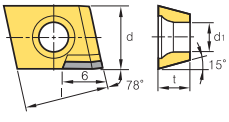
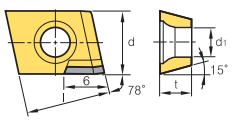
Workpiece			Machining types
Steel	P	● ✱ ✱ ✱	● Continuous cutting
Stainless steel	M	✱ ✱	✱ General cutting
Cast iron	K	✱ ✱	✱ Interrupted cutting
Non-ferrous metal	N		
Heat resistant alloy, Titanium alloy	S	✱ ✱	
Hardened steel	H	✱	

Inserts	Designation		Coated									Cermet			Uncoated				Dimensions (mm)					Geometries	Available tools
			NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	CN2000	CN20	CN30	H01	G10	ST30A	ST20	l	d	t	r	d1		
APKT-X22 	APKT	1604PDSR-X22	●																	16.4	9.525	4.76	0.8	4.4		E85 E94
		1604PDTR-X22																		16.4	9.525	4.76	0.8	4.4		
APKT-X23 	APKT	1604PDR-X23																		16.3	9.525	4.76	1.0	4.4		E85 E94
		1604PDTR-X23																		16.3	9.525	4.76	1.0	4.4		
APKT-X24 	APKT	1604PDR-X24																		16.3	9.525	4.76	1.0	4.4		E85 E94
		1604PDFR-X24																		16.3	9.525	4.76	1.0	4.4		
APLT 	APLT	070304R	●																	7.5	6.35	3.18	0.4	2.8		E149
APMT-MF 	APMT	11T3PDSR-MF	●		●	●	●	●												11.2	6.467	3.6	0.5	2.85		E84~ E110
		1604PDSR-MF	●		●	●	●	●												16.4	9.41	5.76	0.8	4.5		
		1806PDSR-MF	●		●	●	●	●												17.4	10.98	6.35	0.8	4.5		
APMT-ML 	APMT	1806PDSR-ML	●		●	●	●	●												17.4	10.98	6.35	0.8	4.5		E86, E89 E95, E98 E103, E105 E108 E110
APMT-MM 	APMT	060202PDSR-MM			●	●	●	●												6	4.24	2.6	0.2	2.0		E84~ E110
		0602PDSR-MM			●	●	●	●												6	4.24	2.6	0.4	2.0		
		060208PDSR-MM			●	●	●	●												6	4.24	2.6	0.8	2.0		
		060212R-MM			●	●	●	●												6	4.24	2.6	1.2	2.0		
		060216R-MM			●	●	●	●												6	4.24	2.6	1.6	2.0		
		0903PDSR-MM			●	●	●	●												9.4	6.21	3.6	0.4	2.8		
		090308PDSR-MM			●	●	●	●												9.4	6.21	3.6	0.8	2.8		
		090312R-MM			●	●	●	●												9.4	6.21	3.6	1.2	2.8		
		090316R-MM			●	●	●	●												9.4	6.21	3.6	1.6	2.8		
		090320R-MM			●	●	●	●												9.2	6.21	3.6	2.0	2.8		
		090331R-MM																		9.2	6.21	3.6	3.1	2.8		
		090332R-MM																		9.2	6.21	3.6	3.2	2.8		
		11T3PDSR-MM	●		●	●	●	●												11.2	6.467	3.6	0.5	2.85		
		11T308PDSR-MM	●		●	●	●	●												11.2	6.467	3.6	0.8	2.85		
		11T312PDSR-MM	●		●	●	●	●												11.2	6.467	3.6	1.2	2.85		
		11T316R-MM	●		●	●	●	●												11	6.467	3.6	1.6	2.85		
		11T318R-MM																		11	6.467	3.6	1.8	2.85		
		11T324R-MM	●		●	●	●	●												11	6.467	3.6	2.4	2.85		
		1604PDSR-MM	●		●	●	●	●												16.4	9.41	5.76	0.8	4.5		
		160410PDSR-MM	●		●	●	●	●												16.4	9.41	5.76	1.0	4.5		
		160416PDSR-MM	●		●	●	●	●												16.4	9.41	5.76	1.6	4.5		
		160424R-MM	●		●	●	●	●												16	9.41	5.76	2.4	4.5		
		160430R-MM																		16	9.41	5.76	3.0	4.5		
		160432R-MM	●		●	●	●	●												16	9.41	5.76	3.2	4.5		
		180604PDSR-MM	●		●	●	●	●												17.4	10.98	6.35	0.4	4.5		
		1806PDSR-MM	●		●	●	●	●												17.4	10.98	6.35	0.4	4.5		
		180612PDSR-MM	●		●	●	●	●												17.4	10.98	6.35	1.2	4.5		
		180616PDSR-MM	●		●	●	●	●												17.4	10.98	6.35	1.6	4.5		
		180620PDSR-MM	●		●	●	●	●												17.4	10.98	6.35	2.0	4.5		
		180624PDSR-MM	●		●	●	●	●												17.4	10.98	6.35	2.4	4.5		

● : Stock item ○ : Under preparing for stock

Workpiece			Coated									Cermet			Uncoated				
			NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	CN2000	CN20	CN30	H01	G10	ST30A	ST20
	Steel	P	◉			◉													
	Stainless steel	M																	
	Cast iron	K																	
	Non-ferrous metal	N										●				◉			
	Heat resistant alloy, Titanium alloy	S																	
	Hardened steel	H																	

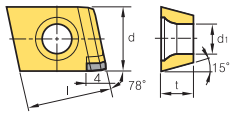
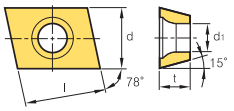
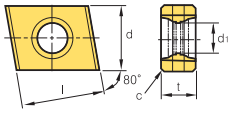
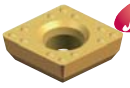
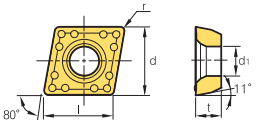
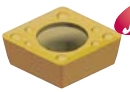
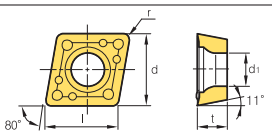
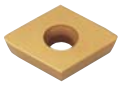
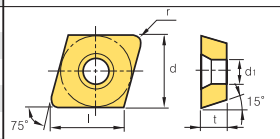
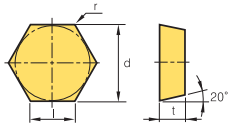
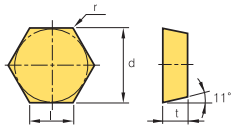
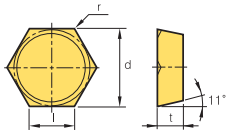
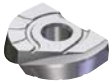
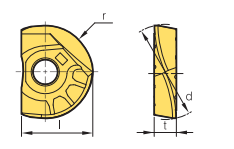
Machining types
● Continuous cutting
◉ General cutting
✱ Interrupted cutting

Inserts	Designation		l	d	t	r	d_1	C	Geometries	Available tools
			Dimensions (mm)							
APMT-MM  New	APMT	180630R-MM	16.7	10.98	6.35	3.0	4.5	-		E84~ E110
		180632R-MM	16.7	10.98	6.35	3.2	4.5	-		
		180640R-MM	16.7	10.98	6.35	4.0	4.5	-		
		180648R-MM	16.7	10.98	6.35	4.8	4.5	-		
		180650R-MM	16.7	10.98	6.35	5.0	4.5	-		
		180660R-MM	16.7	10.98	6.35	6.0	4.5	-		
		180664R-MM	16.7	10.98	6.35	6.4	4.5	-		
APXT-MA 	APXT	11T3PDR-MA	11.3	6.594	3.6	0.5	2.85	-		E92 E96 E99 E100
		11T318R-MA	11.3	6.594	3.6	1.8	2.85	-		
APXT-MR 	APXT	11T3PDSR-MR	11.3	6.594	3.6	0.5	2.85	-		E96
		11T308PDR-MR	11.3	6.594	3.6	0.8	2.85	-		
BAPDR/L-XAF  Sharpe Edge	BAPDR-XAF		31	14	13.8	-	-	-		E77
	BAPDL-XAF		31	14	13.8	-	-	-		
BAPDR/L-XAW  Sharpe Edge Wiper Insert	BAPDR -XAW		31	13.8	13.8	-	-	-		E77
	BAPDL- XAW		31	13.8	13.8	-	-	-		
BAPDR-NAF  strengthened Edge	BAPDR-NAF		31	14	13.8	-	-	-		E77
BAPDR/L-NAW  strengthened Edge Wiper Insert	BAPDR-NAW		31	13.8	13.8	-	-	-		E77
	BAPDL-NAW		31	13.8	13.8	-	-	-		
CDEW-NAF  strengthened Edge	CDEW	1204R-NAF	12.7	9.525	4.76	-	4.4	-		E77
		1204L-NAF	12.7	9.525	4.76	-	4.4	-		
CDEW-NAW  strengthened Edge Wiper Insert	CDEW	1204R-NAW	12.7	9.525	4.76	-	4.4	-		E77
		1204L-NAW	12.7	9.525	4.76	-	4.4	-		
CDEW-XAF  Sharpe Edge	CDEW	1204R-XAF	12.7	9.525	4.76	-	4.4	-		E77
		1204L-XAF	12.7	9.525	4.76	-	4.4	-		

● : Stock item ○ : Under preparing for stock

Workpiece		
	Steel	P
	Stainless steel	M
	Cast iron	K
	Non-ferrous metal	N
	Heat resistant alloy, Titanium alloy	S
	Hardened steel	H

Machining types
● Continuous cutting
◓ General cutting
✱ Interrupted cutting

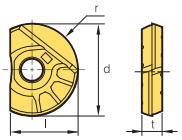
Inserts	Designation		Coated									Cermet			Uncoated				Dimensions (mm)						Geometries	Available tools
			NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC210F	PD2000	CN2000	CN20	CN30	H01	G10	ST30A	ST20	l	d	t	r	d_1	C		
CDEW-XAW  Sharpe Edge Wiper Insert	CDEW	1204R-XAW										●								12.7	9.525	4.76	-	4.4	-		E77
		1204L-XAW										●								12.7	9.525	4.76	-	4.4	-		
CDEW-XCF  Sharpe Edge	CDEW	1204R-XCF														●				12.7	9.525	4.76	-	4.4	-		E77
		1204L-XCF																		12.7	9.525	4.76	-	4.4	-		
CNHQ 	CNHQ	1005-C0.5																		10	10	5.4	-	4.7	0.5		E187 E188
		1305-C0.5																		12.7	10	5.4	-	4.7	0.5		
		1606-C0.5																		16	12	6.4	-	5.9	0.5		
CPMH New 	CPMH	120408-MM				●														12.9	12.7	4.76	0.8	5.5	-		E171
CPMT New 	CPMT	060204-MM				●														6.4	6.35	2.38	0.4	2.75	-		E171
		080308-MM				●														8.1	7.938	3.40	0.8	3.18	-		
		09T308-MM				●														9.7	9.525	3.97	0.8	4.4	-		
EDCW 	EDCW	1604ZDFR																●		16.4	15.875	4.76	0.8	5.5	-		E205
		1605ZDTR																		16.4	15.875	4.76	0.8	5.5	-		
HECN 	HECN	090408FN																		9.0	15.875	4.76	0.8	-	-		E205
		090408SN																		9.0	15.875	4.76	0.8	-	-		
		090408TN																		9.0	15.875	4.76	0.8	-	-		
		110412FN																		11.0	19.05	4.76	1.2	-	-		
		110412TN																		11.0	19.05	4.76	1.2	-	-		
HPEN 	HPEN	090408FN																		9.0	15.875	4.76	0.8	-	-		E206
		090408SN																		9.0	15.875	4.76	0.8	-	-		
		090408EN																		9.0	15.875	4.76	0.8	-	-		
		110412FN																		11.0	19.05	4.76	1.2	-	-		
HPEN-WC 	HPEN	090408-WC																		9.0	15.875	4.76	0.8	-	-		E206
		110412-WC																		11.0	19.05	4.76	1.2	-	-		
LBH 	LBH	080									●									7.0	8	2.4	4	-	-		E157
		090									○									7.5	9	2.4	4.5	-	-		
		100									●									8.5	10	2.6	5	-	-		
		110									○									9.0	11	2.6	5.5	-	-		
		120									●									10.0	12	3	6	-	-		
		130									○									10.5	13	3	6.5	-	-		
		160									●									12.0	16	4	8	-	-		
		170									○									12.5	17	4	8.5	-	-		
		200									●									15.0	20	5	10	-	-		
		210									○									15.5	21	5	10.5	-	-		
		250									●									18.5	25	6	12.5	-	-		
		260									○									19.0	26	6	13	-	-		
		300									●									22.5	30	7	15	-	-		
		310									○									23.0	31	7	15.5	-	-		
		320									●									23.5	32	7	16	-	-		

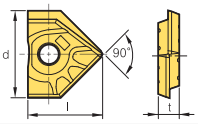
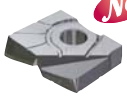
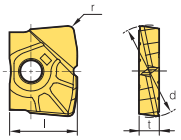
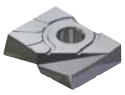
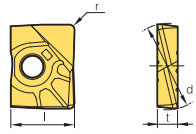
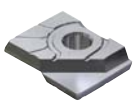
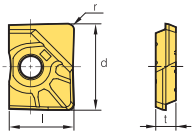
● : Stock item ○ : Under preparing for stock

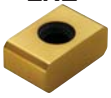
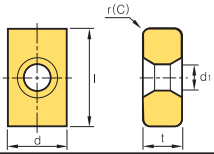
Workpiece		
Steel	P	●
Stainless steel	M	●
Cast iron	K	◓ ●
Non-ferrous metal	N	●
Heat resistant alloy, Titanium alloy	S	●
Hardened steel	H	●

Machining types
● Continuous cutting
◓ General cutting
✱ Interrupted cutting

Inserts	Designation		Coated									Cermet			Uncoated				Dimensions (mm)					Geometries	Available tools
			NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC210F	PD2000	CN2000	CN20	CN30	H01	G10	ST30A	ST20	l	d	t	r	d_1		
LBS	LBS	080									●									7.0	8	2.4	4	-		E157
		090									●									7.5	9	2.4	4.5	-		
		100									●									8.5	10	2.6	5	-		
		110									●									9.0	11	2.6	5.5	-		
		120									●									10.0	12	3	6	-		
		130									●									10.5	13	3	6.5	-		
		160									●									12.0	16	4	8	-		
		170									●									12.5	17	4	8.5	-		
		200									●									15.0	20	5	10	-		
		210									●									15.5	21	5	10.5	-		
		250									●									18.5	25	6	12.5	-		
		260									●									19.0	26	6	13	-		
		300									●									22.5	30	7	15	-		
		310									●									23.0	31	7	15.5	-		
		320									●									23.5	32	7	16	-		
LCF	LCF	160-D90									●									13.7	16	4	-	-		E157
		200-D90									●									17.0	20	5	-	-		
		250-D90									●									21.5	25	6	-	-		
LFH	LFH	100									●									8.5	10	2.6	1.0	-		E157
		120									●									10.0	12	3	1.0	-		
		160									●									12.0	16	4	1.5	-		
		200									●									15.0	20	5	1.5	-		
		250									●									18.5	25	6	2.0	-		
		300									●									22.5	30	7	2.0	-		
		320									●									23.5	32	7	2.0	-		
LRH	LR(H)	100-R05									●									8.5	10	2.6	0.5	-		E157
		100-R10									●									8.5	10	2.6	1.0	-		
		100-R20									●									8.5	10	2.6	2.0	-		
		110-R05									○									9.0	11	2.6	0.5	-		
		120-R05									●									10.0	12	3	0.5	-		
		120-R10									●									10.0	12	3	1.0	-		
		120-R20									●									10.0	12	3	2.0	-		
		130-R05									○									10.5	13	3	0.5	-		
		160-R05									●									12.0	16	4	0.5	-		
		160-R10									●									12.0	16	4	1.0	-		
		160-R20									●									12.0	16	4	2.0	-		
		160-R30									●									12.0	16	4	3.0	-		
		170-R05									○									12.5	17	4	0.5	-		
		200-R05									●									15.0	20	5	0.5	-		
		200-R10									●									15.0	20	5	1.0	-		
		200-R20									●									15.0	20	5	2.0	-		
		200-R30									●									15.0	20	5	3.0	-		
		210-R05									○									15.5	21	5	0.5	-		
		250-R05									●									18.5	25	6	0.5	-		
		250-R10									●									18.5	25	6	1.0	-		
		250-R20									●									18.5	25	6	2.0	-		
		250-R30									●									18.5	25	6	3.0	-		
		260-R05									●									19.0	26	6	0.5	-		
		300-R10									○									22.5	30	7	1.0	-		
		300-R20									●									22.5	30	7	2.0	-		
		300-R30									●									22.5	30	7	3.0	-		
		310-R05									○									23.0	31	7	0.5	-		
		320-R10									●									23.5	32	7	1.0	-		
		320-R20									●									23.5	32	7	2.0	-		
		320-R30									●									23.5	32	7	3.0	-		
LNCS	LNCS	1907-C1.5-WC																		-	-	-	-	-		E213
		1907-R3.0-WC																		-	-	-	-	-		
LNE	LNE	324-R0.8																		15.9	9.525	6.35	0.8	4.4		
		324-C1.0																		15.9	9.525	6.35	1.0	4.4		






LRH형

(Special Type)

LR형

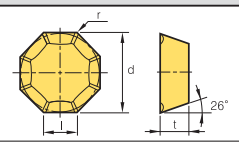
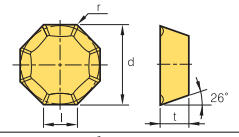
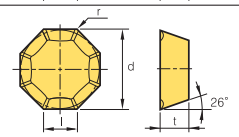
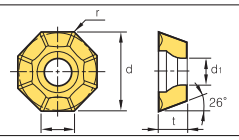
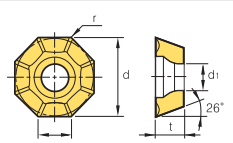
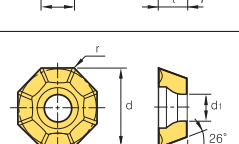
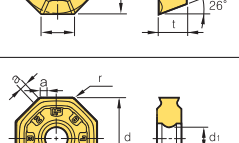
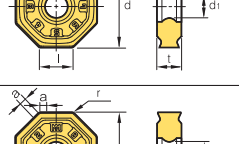
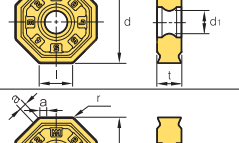
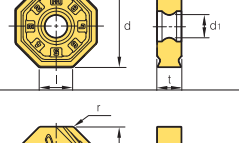
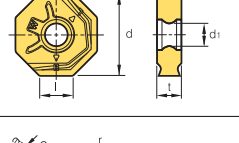
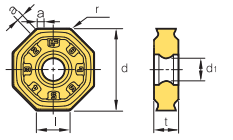
● : Stock item ○ : Under preparing for stock

Workpiece			Machining types
Steel	P	● ◓ ✱ ✱	● Continuous cutting
Stainless steel	M	✱ ✱ ✱	◓ General cutting
Cast iron	K	◓ ◓ ◓	✱ Interrupted cutting
Non-ferrous metal	N	◓	
Heat resistant alloy, Titanium alloy	S	✱ ✱	
Hardened steel	H	◓	

Inserts	Designation		Coated									Cermet			Uncoated				Dimensions (mm)					Geometries	Available tools
			NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	CN2000	CN20	CN30	H01	G10	ST30A	ST20	l	d	t	r	d_1		
LNEX-MF	LNEX	150608-MF																		15.88	10.2	6.35	0.8	-		E209
	LNEX	150608-ML																		15.88	10.2	6.35	0.8	-		E210 E211 E212
LNEX-QNN	LNEX	1506QNN-MF																		15.88	10.2	6.35	0.8	-		E209
	LNEX	1506QNN-ML																		15.88	10.2	6.35	0.8	-		
LNEX-ANN	LNEX	1506ANN-MF																		15.88	10.2	6.35	0.8	-		E212
	LNEX	1506ANN-ML																		15.88	10.2	6.35	0.8	-		
LNM(E)X-MF	LNMX	100605PNR-MF				●	●			●										10.0	6.5	6.5	0.5	3.5		E60
	LNEX	100605PNR-MF				●	●			●										10.0	6.5	6.5	0.5	3.5		E64
	LNMX	100608PNR-MF				●	○			●										10.0	6.5	6.5	0.8	3.5		E67
	LNEX	100608PNR-MF				●	○			●										10.0	6.5	6.5	0.8	3.5		E68 E70
LNM(E)X-MF New	LNMX	151004PNR-MF				●	○			●										15.0	10.0	10.0	0.4	4.5		E61
	LNEX	151004PNR-MF				●	○			●										15.0	10.0	10.0	0.4	4.5		E64
	LNMX	151008PNR-MF				●	●			●										15.0	10.0	10.0	0.8	4.5		E67
	LNEX	151008PNR-MF				●	●			●										15.0	10.0	10.0	0.8	4.5		E69
	LNMX	151016PNR-MF				●	○			●										15.0	10.0	10.0	1.6	4.5		
	LNEX	151016PNR-MF				●	○			●										15.0	10.0	10.0	1.6	4.5		
LNM(E)X-MM	LNMX	100605PNR-MM			●	●	●	○	○	●										10.0	6.5	6.5	0.5	3.5		E60
	LNEX	100605PNR-MM			●	●	●			●										10.0	6.5	6.5	0.5	3.5		E62
	LNMX	100608PNR-MM				●	○			●										10.0	6.5	6.5	0.8	3.5		E64
	LNEX	100608PNR-MM				●	○			●										10.0	6.5	6.5	0.8	3.5		E65
	LNMX	100605PNL-MM				●				●										10.0	6.5	6.5	0.5	3.5		E67
	LNEX	100605PNL-MM				●				●										10.0	6.5	6.5	0.5	3.5		E68 E70
LNM(E)X-MM New	LNMX	151004PNR-MM				●	●	●	●	●										15.0	10.0	10.0	0.4	4.5		E61
	LNEX	151004PNR-MM				●	●			●										15.0	10.0	10.0	0.4	4.5		E63
	LNMX	151008PNR-MM			●	●	●			●										15.0	10.0	10.0	0.8	4.5		E64
	LNEX	151008PNR-MM			●	●				●										15.0	10.0	10.0	0.8	4.5		E66
	LNMX	151016PNR-MM				●				●										15.0	10.0	10.0	1.6	4.5		E67
	LNEX	151016PNR-MM				●				●										15.0	10.0	10.0	1.6	4.5		E69
	LNMX	151008PNL-MM				●				●										15.0	10.0	10.0	0.8	4.5		
	LNEX	151008PNL-MM				●				●										15.0	10.0	10.0	0.8	4.5		
LNEX-MA	LNEX	100605PNR-MA				●				●						●				10.0	6.5	6.5	0.5	3.5		E60
	LNEX	151004PNR-MA				●				●						●				15.0	10.0	10.0	0.4	4.5		E61
	LNEX	151008PNR-MA				●				●						●				15.0	10.0	10.0	0.8	4.5		E64 E67 E68 E69, E70
MPMT	MPMT	090308						●												9.5	9.525	3.18	0.8	4.5		
		120408				○		●												12.7	12.7	4.76	0.8	5.5		
OFCN	OFCN	0704SN				●		●		●										7.4	18	4.86	0.5	-		E42
		0704FN																		7.4	18	4.86	0.5	-		
		070408SN																		7.4	18	4.86	0.8	-		
		070408FN																		7.4	18	4.86	0.8	-		
		070408TN																		7.4	18	4.86	0.8	-		
OFCW	OFCW	05T3SN																		5.2	12.7	3.85	0.5	4.4		E42
		05T3FN																		5.2	12.7	3.85	0.5	4.4		
		05T308FN																		5.2	12.7	3.85	0.8	4.4		

● : Stock item ○ : Under preparing for stock
● : Stock Netherlands

Workpiece			Machining types
Steel	P	✱ ● ⬢ ✱ ✱	● Continuous cutting
Stainless steel	M	✱ ✱ ✱	⬢ General cutting
Cast iron	K	⬢ ⬢ ⬢	✱ Interrupted cutting
Non-ferrous metal	N	⬢	
Heat resistant alloy, Titanium alloy	S	✱ ✱	
Hardened steel	H	⬢	

Inserts	Designation		Coated									Cermet			Uncoated				Dimensions (mm)						Geometries	Available tools
			NCM325	NCM335	NC5330	PC5300	PC5500	PC3545	PC9530	PC6510	PC215K	PD2000	CN2000	CN20	CN30	H01	G10	ST30A	ST20	l	d	t	r	d_1	a		
OFKR-MA	OFKR	0704FN-MA														●				7.4	18	4.76	0.5	-	-		E42
		0704EN-MA																		7.4	18	4.76	0.5	-	-		
OFKR-MF	OFKR	0704SN-MF	●	●		●	●													7.4	18	4.76	0.5	-	-		E42
		070408SN-MF																		7.4	18	4.76	0.8	-	-		
OFKR-MM	OFKR	0704SN-MM	●	●		●		●	●	●										7.4	18	4.76	0.5	-	-		E42
		070408SN-MM	●																	7.4	18	4.76	0.8	-	-		
OFKT-MA	OFKT	05T3FN-MA														●				5.2	12.7	3.97	0.5	4.4	-		E42
		05T3EN-MA																		5.2	12.7	3.97	0.5	4.4	-		
		0704FN-MA														●				7.4	18	4.76	0.5	5.8	-		
		0704EN-MA																		7.4	18	4.76	0.5	5.8	-		
OFKT-MF	OFKT	05T3SN-MF	●	●																5.2	12.7	3.97	0.5	4.4	-		E42
		05T308SN-MF																		5.2	12.7	3.97	0.8	5.8	-		
OFKT-MM	OFKT	05T3SN-MM	●	●		●			●											5.2	12.7	3.97	0.5	4.4	-		E42
		05T308SN-MM																		5.2	12.7	3.97	0.8	4.4	-		
		0704SN-MM	●																	7.4	18	4.76	0.5	5.5	-		
ONHX-MF Neu	ONHX	060608-MF				○				○										6.6	16.0	6.0	0.8	5.6	-		E71
		080608-MF				●	○		●	●										8.4	20.2	6.0	0.8	5.6	-		
		0606ANN-MF				●	●		●	●										6.6	16.0	6.0	0.8	5.6	1.03		
		0806ANN-MF				●	●		●	●										8.4	20.2	6.0	0.8	5.6	1.53		
ONHX-MM Neu	ONHX	060608-MM				○				○										6.6	16.0	6.0	0.8	5.6	-		E71
		080608-MM				●	○		●	●										8.4	20.2	6.0	0.8	5.6	-		
		0606ANN-MM			●	●	●		●	●										6.6	16.0	6.0	0.8	5.6	1.03		
		0806ANN-MM			●	●	●		●	●										8.4	20.2	6.0	0.8	5.6	1.53		
ONHX-MA Neu	ONHX	060608-MA				●				●						●				6.6	16.0	6.0	0.8	5.6	-		E71
		080608-MA				●				●						●				8.4	20.2	6.0	0.8	5.6	-		
ONHX-W Neu	ONHX	060608-W																		6.5	16.0	6.0	0.8	5.6	-		E71
		080608-W				●	●		●	●										8.2	20.2	6.0	0.8	5.6	-		
ONMX-MF Neu	ONMX	060608-MF				○				○										6.6	16.0	6.0	0.8	5.6	-		E71
		080608-MF				●	○		●	●										8.4	20.2	6.0	0.8	5.6	-		
		0606ANN-MF				●	●		●	●										6.6	16.0	6.0	0.8	5.6	1.03		
		0806ANN-MM				●	●		●	●										8.4	20.2	6.0	0.8	5.6	1.53		
ONMX-MM Neu	ONMX	060608-MM				○				○										6.6	16.0	6.0	0.8	5.6	-		E71
		080608-MM				●	○		●	●										8.4	20.2	6.0	0.8	5.6	-		
		0606ANN-MM			●	●	●		●	●										6.6	16.0	6.0	0.8	5.6	1.03		
		0806ANN-MM			●	●	●		●											8.4	20.2	6.0	0.8	5.6	1.53		

● : Stock item ○ : Under preparing for stock

Workpiece			Machining types
	Steel	P	● Continuous cutting
	Stainless steel	M	● General cutting
	Cast iron	K	✱ Interrupted cutting
	Non-ferrous metal	N	
	Heat resistant alloy, Titanium alloy	S	
	Hardened steel	H	

Inserts	Designation		Coated									Cermet			Uncoated					Dimensions (mm)						Geometries	Available tools
			NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PC210F	CN2000	CN20	CN30	H01	G10	ST30A	ST20	l	d	t	r	d_1	적용 커터 폭		
PNEJ	PNEJ	1223N				●														-	12.7	2.3	-	5.0	4.0		E193
		1225N																		-	12.7	2.5	-	5.0	4.5		E194
		1230N																		-	12.7	3.0	-	5.0	5.0		
		1235N																		-	12.7	3.5	-	5.0	6.0		
		1240N		●		●														-	12.7	4.0	-	5.0	7.0		
		1245N	●			●					●									-	12.7	4.5	-	5.0	8.0		
		1250N																		-	12.7	5.0	-	5.0	9.0		
		1255N				●														-	12.7	5.5	-	5.0	10.0		
		1260N																		-	12.7	6.0	-	5.0	11.0		
		1265N		●																-	12.7	6.5	-	5.0	12.0		
		1270N																		-	12.7	7.0	-	5.0	13.0		
		1275N		●																-	12.7	7.5	-	5.0	14.0		
		1285N																		-	12.7	8.5	-	5.0	16.0		
PNEJ-C	PNEJ	1223N-C03																		-	12.7	2.3	-	5.0	4.0		E193
		1230N-C03																		-	12.7	3.0	-	5.0	5.0		E194
		1235N-C03																		-	12.7	3.5	-	5.0	6.0		
		1240N-C05																		-	12.7	4.0	-	5.0	7.0		
		1245N-C05																		-	12.7	4.5	-	5.0	8.0		
		1250N-C05																		-	12.7	5.0	-	5.0	9.0		
		1255N-C05																		-	12.7	5.5	-	5.0	10.0		
		1260N-C05																		-	12.7	6.0	-	5.0	11.0		
		1265N-C05																		-	12.7	6.5	-	5.0	12.0		
※		1270N-C05																		-	12.7	7.0	-	5.0	13.0		
		1275N-C05																		-	12.7	7.5	-	5.0	14.0	※ C03 : Chamfer 0,3mm C05 : Chamfer 0,5mm	
RC	RC	16										●								15.8	16	3.5	8	-	-		E161
		20										●								17.8	20	4	10	-	-		
		25										●								22.0	25	5	12.5	-	-		
		30										●								26.8	30	6	15	-	-		
		32										●								27.8	32	6	16	-	-		
RDCT-MA	RDCT	10T3M0-MA														●				-	10	3.97	-	3.85	-		E129
		1204M0-MA														●				-	12	4.76	-	4.5	-		E132
																											E134
RDHW	RDHW	0501M0F																		-	5	1.59	-	2.3	-		E131
		0501M0E					○		●											-	5	1.59	-	2.3	-		E134
		0501M0S																		-	5	1.59	-	2.3	-		
		06T1M0F																		-	6	1.98	-	2.5	-		
		06T1M0E					○		●											-	6	1.98	-	2.5	-		
		06T1M0S																		-	6	1.98	-	2.5	-		
		0702M0F																		-	7	2.38	-	2.8	-		
		0702M0E					○		●											-	7	2.38	-	2.8	-		
		0702M0S																		-	7	2.38	-	2.8	-		
		0803M0F																		-	8	3.18	-	3.4	-		
		0803M0E					○		●											-	8	3.18	-	3.4	-		
		0803M0S																		-	8	3.18	-	3.4	-		
RDHW		1605M0F																		-	16	5.56	-	5.5	-		E130
		1605M0E																		-	16	5.56	-	5.5	-		E133
		1605M0S																		-	16	5.56	-	5.5	-		E134
		2006M0F																		-	20	6.35	-	5.5	-		
		2006M0E																		-	20	6.35	-	5.5	-		
		2006M0S																		-	20	6.35	-	5.5	-		
RDKT-MF	RDKT	10T3M0-MF				●	●	●	●											-	10	3.97	-	3.85	-		E129
		1204M0-MF				●	●	●	●											-	12	4.76	-	4.5	-		E132
		1605M0-MF																		-	16	5.56	-	5.5	-		E133
																											E134
RDKT-ML	RDKT	1605M0-ML																		-	16	5.56	-	5.5	-		E130
																											E133
																											E134
RDKT-MM	RDKT	10T3M0-MM	●	●	●	●	●	●	●	●										-	10	3.97	-	3.85	-		E129
		1204M0-MM	●	●	●	●	●	●	●	●										-	12	4.76	-	4.5	-		E132
		1605M0-MM				●		●												-	16	5.56	-	5.5	-		E133
		2006M0-MM				●	○	●												-	20	6.35	-	5.5	-		E134

● : Stock item ○ : Under preparing for stock

Workpiece			Machining types
Steel	P	● ✱ ● ✱ ✱	● Continuous cutting
Stainless steel	M	✱ ✱ ✱ ● ✱	● General cutting
Cast iron	K	✱ ● ✱	✱ Interrupted cutting
Non-ferrous metal	N	● ●	
Heat resistant alloy, Titanium alloy	S	✱ ✱	
Hardened steel	H	●	

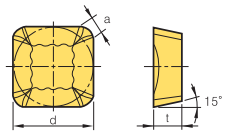
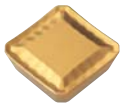
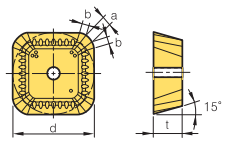
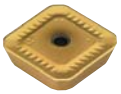
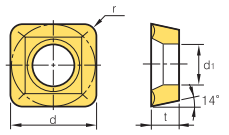
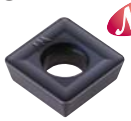
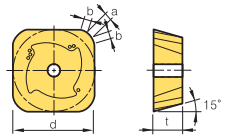
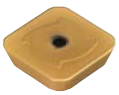
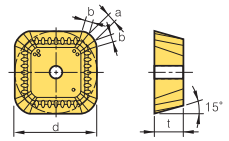
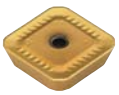
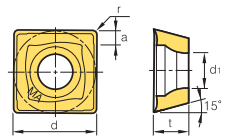
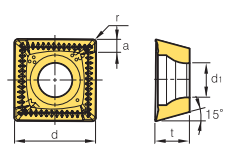
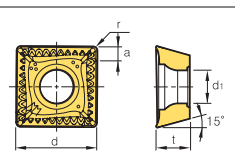
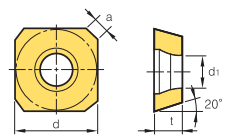
Inserts	Designation	Coated									Cermet			Uncoated				Dimensions (mm)							Geometries	Available tools
		NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	CN2000	CN20	CN30	H01	G10	ST30A	ST20	l	d	t	r	d_1	a	b		
RDKW	RDKW 0501M0E				●														-	5	1.59	-	2.3	-	-		E131
	06T1M0E				●	○													-	6	1.98	-	2.5	-	-		E134
	0702M0E				●	○													-	7	2.38	-	2.8	-	-		
	0803M0E				●	○													-	8	3.18	-	3.4	-	-		
REKR-MM	REKR 170400-MM																		-	17.8	4.76	-	-	-	-		E42
SDCN	SDCN 42R																		-	12.7	3.18	-	-	3.5	-		E204
	42L														●				-	12.7	3.18	-	-	3.5	-		
	53R																		-	15.875	4.76	-	-	5.0	-		
	53L																		-	15.875	4.76	-	-	5.0	-		
	42M															●			-	12.7	3.18	-	-	1.5	-		E29
	42M-G														●				-	12.7	3.18	-	-	1.5	-		E30
	42MT		●										●	●			●	●	-	12.7	3.18	-	-	1.5	-		
	42MT-RH				●														-	12.7	3.18	-	-	1.5	-		
	42MT-S20							●											-	12.7	3.18	-	-	1.5	-		
	53M															●			-	15.875	4.76	-	-	1.5	-		
	53M-G														●				-	15.875	4.76	-	-	1.5	-		
	53MT	●	●										●	●			●	●	-	15.875	4.76	-	-	1.5	-		
	53MT-RH				●														-	15.875	4.76	-	-	1.5	-		
	53MT-S20							●											-	15.875	4.76	-	-	1.5	-		
	1203AEEN																		-	12.7	3.18	-	-	1.5	-		
	1203AEEN-RH																		-	12.7	3.18	-	-	1.43	-		
	1203AESN																		-	12.7	3.18	-	-	1.5	-		
	1203AESN-RH																		-	12.7	3.18	-	-	1.43	-		
	1504AEEN																		-	15.875	4.76	-	-	1.5	-		
	1504AEEN-RH					●			●										-	15.875	4.76	-	-	1.43	-		
	1504AESN																		-	15.875	4.76	-	-	1.5	-		
	1504AESN-RH								●										-	15.875	4.76	-	-	1.43	-		
SDET-MA	SDET 09M402R-MA										●				●				-	9.525	3.923	0.2	4.0	1.2	-		E126
	09M404R-MA																		-	9.525	3.923	0.4	4.0	1.2	-		E127
	09M405R-MA																		-	9.525	3.923	0.5	4.0	1.2	-		E128
	130504R-MA										●				●				-	13.5	5.56	0.4	5.56	2.2	-		
SDET-MF	SDET 09M405R-MF																		-	9.525	4	0.5	4	1.2	-		E126
	130508R-MF																		-	13.5	5.56	0.8	5.56	2.2	-		E127
																											E128
SDET-MM	SDET 09M405R-MM																		-	9.525	4	0.5	4	1.2	-		E126
	130508R-MM																		-	13.5	5.56	0.8	5.56	2.2	-		E127
																			-								E128
SDKN-SM	SDKN 1203AESN-SM						●												-	12.7	3.18	-	-	1.64	0.59		E29
	1203AEEN-SM																		-	12.7	3.18	-	-	1.64	0.59		E30
	1504AESN-SM						●												-	15.875	4.76	-	-	1.64	0.58		
	1504AEEN-SM																		-	15.875	4.76	-	-	1.64	0.58		
SDKN-SU	SDKN 1203AESN-SU				●	○	●												-	12.7	3.18	-	-	1.64	0.59		E29
	1504AESN-SU				●	○	●												-	15.875	4.76	-	-	1.64	0.58		E30

▶Cutting edge geometry
- G : Light Side, Sharpe Edge
- S20 : STS
- RH : Strengthened Edge

▶Sub-cutting edge geometry
- M : AEFN
- MT : AETN

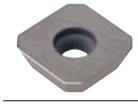
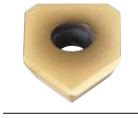
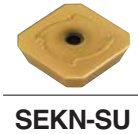
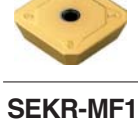
● : Stock item ○ : Under preparing for stock

Workpiece			Machining types
	Steel	P	● Continuous cutting
	Stainless steel	M	◓ General cutting
	Cast iron	K	✱ Interrupted cutting
	Non-ferrous metal	N	
	Heat resistant alloy, Titanium alloy	S	
	Hardened steel	H	

Inserts	Designation		Coated									Cermet			Uncoated				Dimensions (mm)							Geometries	Available tools
			NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	CN2000	CN20	CN30	H01	G10	ST30A	ST20	l	d	t	r	d1	a	b		
SDKR-MX	SDKR	1203AESN-MX			●															-	12.7	3.18	-	-	1.46	-		E29 E30
		1203AETN-MX																		-	12.7	3.18	-	-	1.46	-		
		1203AEN-MX	●		●															-	12.7	3.18	-	-	1.46	-		
		1504AESN-MX		●																-	15.875	4.76	-	-	1.45	-		
		1504AETN-MX																		-	15.875	4.76	-	-	1.45	-		
		1504AEN-MX	●		●															-	15.875	4.76	-	-	1.45	-		
SDKR-SM	SDKR	1203AESN-SM																		-	12.7	3.18	-	-	1.43	0.71		E29 E30
		1504AESN-SM																		-	15.875	4.76	-	-	1.64	0.58		
SDMT-MM	SDMT	090308-MM				○	○													-	9.525	3.18	0.8	4.4	-	-		E149 E162 E163 E164
																												
SDXN-FM	SDXN	1203AESN-FM				●		●												-	12.7	3.18	-	-	1.43	0.71		E29 E30
		1203AEEN-FM																		-	12.7	3.18	-	-	1.43	0.71		
		1504AESN-FM				●														-	15.875	4.76	-	-	1.43	0.70		
		1504AEEN-FM																		-	15.875	4.76	-	-	1.43	0.70		
SDXR-FM	SDXR	1203AESN-FM																		-	12.7	3.18	-	-	1.43	0.71		E29 E30
		1504AESN-FM																		-	15.875	4.76	-	-	1.43	0.70		
SDXT-MA	SDXT	09M405R-MA													●					-	9.525	4.0	0.5	4.0	1.2	-		E126 E127 E128 E189 E190
		130508R-MA													●					-	13.5	5.56	0.8	5.56	2.2	-		
SDXT-MF	SDXT	09M403R-MF																		-	9.525	4.0	0.3	4.0	1.2	-		E126 E127 E128 E189 E190
		09M403L-MF																		-	9.525	4.0	0.3	4.0	1.2	-		
		09M404R-MF																		-	9.525	4.0	0.4	4.0	1.2	-		
		09M404L-MF																		-	9.525	4.0	0.4	4.0	1.2	-		
		09M405R-MF	●	●	●		●		●											-	9.525	4.0	0.5	4.0	1.2	-		
		09M405L-MF																		-	9.525	4.0	0.5	4.0	1.2	-		
		130508R-MF	●	●	●		●		●											-	13.5	5.56	0.8	5.56	2.2	-		
SDXT-MM	SDXT	09M405R-MM	●	●	●	●	●		●	●										-	9.525	4.0	0.5	4.0	1.2	-		E126 E127 E128 E189 E190
		09M405L-MM																		-	9.525	4.0	0.5	4.0	1.2	-		
		130508R-MM	●	●	●	●	●	●	●	●										-	13.5	5.56	0.8	5.56	2.2	-		
		130508L-MM																		-	13.5	5.56	0.8	5.56	2.2	-		
		130538-MM																		-	13.5	5.56	3.8	5.56	2.2	-		
																										-		
SECA	SECA	1204AFSN	●	●																-	12.7	4.76	-	5.56	2.66	-		-
		1204AFTN				●			●						●					-	12.7	4.76	-	5.56	2.66	-		
		1204AFFN																		-	12.7	4.76	-	5.56	2.66	-		
		1204AFEN																		-	12.7	4.76	-	5.56	2.66	-		
		1504AFSN																		-	15.875	4.76	-	5.5	2.8	-		
		1504AFTN																		-	15.875	4.76	-	5.5	2.8	-		
		1504AFFN																		-	15.875	4.76	-	5.5	2.8	-		

● : Stock item ○ : Under preparing for stock

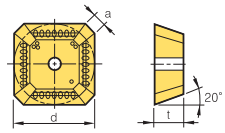
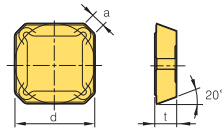
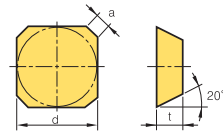
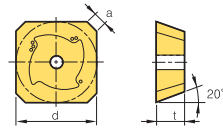
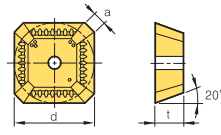
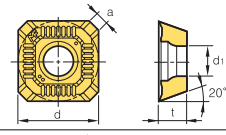
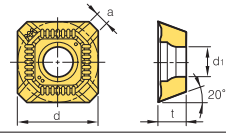
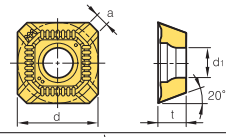
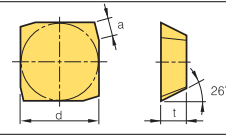
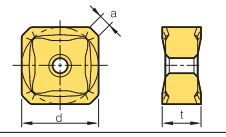
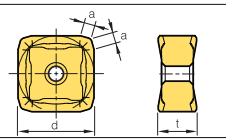
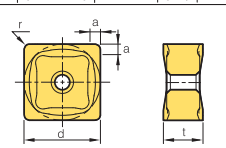
Workpiece			Machining types
	Steel	P	● Continuous cutting
	Stainless steel	M	◓ General cutting
	Cast iron	K	✱ Interrupted cutting
	Non-ferrous metal	N	
	Heat resistant alloy, Titanium alloy	S	
	Hardened steel	H	

Inserts	Designation		Coated									Cermet			Uncoated				Dimensions (mm)						Geometries	Available tools
			NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	CN2000	CN20	CN30	H01	G10	ST30A	ST20	l	d	t	d1	a	b		
SECN	SECN	1203AFFN														●	●			-	12.7	3.18	-	2.36	-		E31 E32
		1203AFTN											●	●	●			●		-	12.7	3.18	-	2.36	-		
		1203AFEN																		-	12.7	3.18	-	2.36	-		
		1203AFSN	●	●	●															-	12.7	3.18	-	2.36	-		
		1203AFEN-RH					●			●										-	12.7	3.18	-	2.36	-		
		1203AFSN-RH								●										-	12.7	3.18	-	2.36	-		
		1203AFTN-S20							●											-	12.7	3.18	-	2.36	-		
		1504AFFN														●				-	15.875	4.76	-	2.4	-		
		1504AFTN													●			●		-	15.875	4.76	-	2.4	-		
		1504AFEN																		-	15.875	4.76	-	2.4	-		
		1504AFSN	●	●	●															-	15.875	4.76	-	2.4	-		
		1504AFEN-RH								●										-	15.875	4.76	-	2.4	-		
		1504AFSN-RH								●										-	15.875	4.76	-	2.4	-		
		1504AFTN-S20																									
SEET-MA	SEET	0903AGFN-MA									●				●					-	9.525	3.18	3.4	2.11	-		E123 E124 E125
		14M4AGFN-MA									●				●					-	14.0	4.0	4.4	2.64	-		
SEET-MF	SEET	0903AGSN-MF	●		●		●		●											-	9.525	3.18	3.4	2.11	-		E123 E124 E125
		14M4AGSN-MF	●	●	●		●		●	●										-	14	4.0	4.4	2.64	-		
SEET-MM	SEET	0903AGSN-MM	●		●		●		●											-	9.525	3.18	3.4	2.11	-		E123 E124 E125
		14M4AGSN-MM	●	●	●	●	●		●											-	14	4	4.4	2.64	-		
SEEW	SEEW	0903AGTN													●					-	9.525	3.18	3.4	2.11	-		E123 E124 E125
		14M4AGTN													●					-	14.0	4.0	4.4	2.64	-		
SEEW-W	SEEW	14M4AGFN-W																		18.2	14.0	4.0	4.4	-	-		E123 E124 E125
		14M4AGSN-W																		18.6	14.0	4.0	4.4	-	-		
		14M4AGTN-W				●	○			●										18.6	14.0	4.0	4.4	-	-		
SEKN-SM	SEKN	1203AFSN-SM																		-	12.7	3.18	-	2.46	-		E31 E32
		1203AFEN-SM																		-	12.7	3.18	-	2.46	-		
		1504AFSN-SM																		-	15.875	4.76	-	2.50	-		
		1504AFEN-SM																		-	15.875	4.76	-	2.50	-		
SEKN-SU	SEKN	1203AFSN-SU				●	●	●												-	12.7	3.18	-	1.98	1.64		E31 E32
		1504AFSN-SU				●	●	●												-	15.875	4.76	-	2.04	1.64		
SEKR-MF1	SEKR	1203AFSN-MF1																		-	12.7	3.18	-	2.3	-		E31 E32
SEKR-MX	SEKR	1203AFSN-MX	●	●	●				●						●					-	12.7	3.18	-	2.3	-		E31 E32
		1204AFSN-MX	●																	-	12.7	4.76	-	2.3	-		
		1504AFSN-MX	●	●	●				●											-	15.875	4.76	-	2.4	-		

▶Shape of Edge
· S20 : STS

● : Stock item ○ : Under preparing for stock

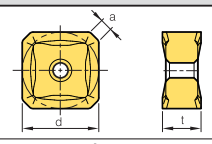
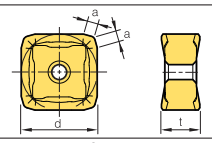
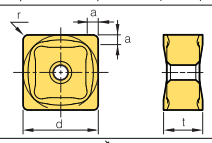
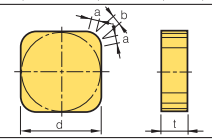
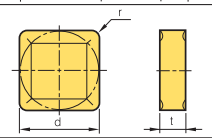
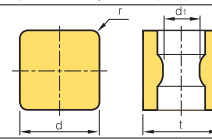
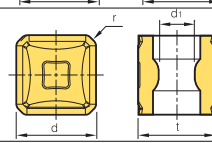
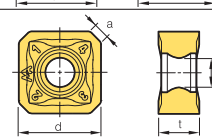
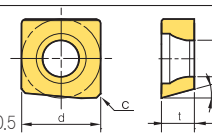
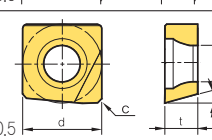
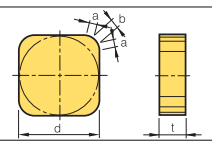
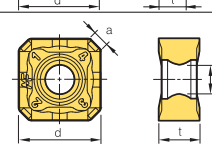
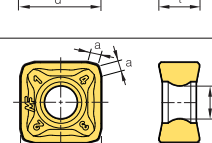
Workpiece			Machining types
	Steel	P	● Continuous cutting
	Stainless steel	M	⧓ General cutting
	Cast iron	K	⧔ Interrupted cutting
	Non-ferrous metal	N	
	Heat resistant alloy, Titanium alloy	S	
	Hardened steel	H	

Inserts	Designation		Coated									Cermet			Uncoated				Dimensions (mm)						Geometries	Available tools
			NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	CN2000	CN20	CN30	H01	G10	ST30A	ST20	l	d	t	r	d_1	a		
SEKR-SM	SEKR	1203AFSN-SM																		-	12.7	3.18	-	-	2.46		E31
		1504AFSN-SM																		-	15.875	4.76	-	-	2.50		E32
SEKR-X35	SEKR	1203AFSN-X35																		-	12.7	3.18	-	-	2.361		E31
		1203AFFN-X35																		-	12.7	3.18	-	-	2.361		
		1204AFFN-X35																		-	12.7	4.76	-	-	2.361		
SEMN	SEMN	1204AZ	●														●	●		-	12.7	4.76	-	-	2.0		E31
SEXN-FM	SEXN	1203AFSN-FM				●		●												-	12.7	3.18	-	-	2.36		E31
		1203AFEN-FM																		-	12.7	3.18	-	-	2.36		E32
		1504AFSN-FM				●														-	15.875	4.76	-	-	2.40		
		1504AFEN-FM																		-	15.875	4.76	-	-	2.40		
SEXR-FM	SEXR	1203AFSN-FM						●												-	12.7	3.18	-	-	2.36		E31
		1504AFSN-FM																		-	15.875	4.76	-	-	2.40		E32
SEXT-MF	SEXT	0903AGSN-MF			●	●	●			●										-	9.525	3.18	-	3.4	2.11		E123
		14M4AGSN-MF	●		●	●	●			●										-	14.0	4.0	-	4.4	2.64		E124 E125
SEXT-MM	SEXT	0903AGSN-MM			●	●	●			●	●									-	9.525	3.18	-	3.4	2.11		E123
		14M4AGSN-MM	●	●	●	●	●		●	●	●									-	14.0	4.0	-	4.4	2.64		E124 E125
SEXT-MR	SEXT	0903AGSN-MR				○														-	9.525	3.18	-	3.4	2.11		E123
		14M4AGSN-MR	●		●	●	●		●											-	14.0	4.0	-	4.4	2.64		E124 E125
SFCN	SFCN	1203EFR														●	●			-	12.7	3.18	-	-	2.5		E33
SNC(M)F-MF	SNCF	1206ANN-MF				●				●										-	12.7	6.6	-	-	2		E72
		1507ANN-MF				○				●										-	15.875	7.35	-	-	2.1		
	SNMF	1206ANN-MF				●														-	12.7	6.6	-	-	2		
		1507ANN-MF				●														-	15.875	7.35	-	-	2.1		
	SNCF	1206ENN-MF				●				●										-	12.7	6.6	-	-	1.8		E73
		1507ENN-MF				●				●										-	15.875	7.35	-	-	1.8		
	SNMF	1206ENN-MF				●														-	12.7	6.6	-	-	1.8		
		1507ENN-MF				●														-	15.875	7.35	-	-	1.8		
SNC(M)F-MF	SNCF	1206QNN-MF				●				●										-	12.7	6.6	0.8		1		E74
	SNMF	1206QNN-MF				●														-	12.7	6.6	0.8		1		

● : Stock item ○ : Under preparing for stock

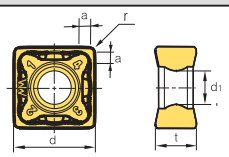
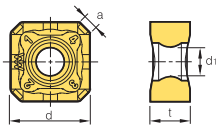
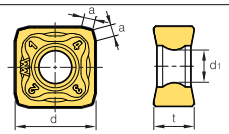
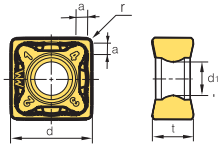
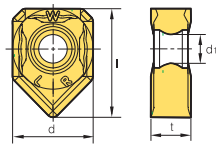
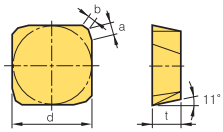
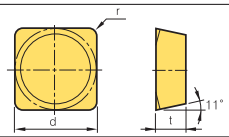
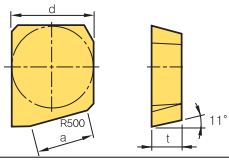
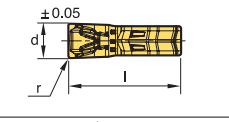
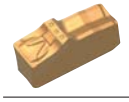
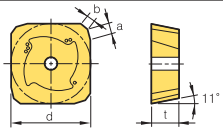
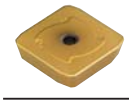
E Milling Inserts

Workpiece			Machining types
Steel	P	⬢ ✱	● Continuous cutting
Stainless steel	M	✱ ✱	⬢ General cutting
Cast iron	K	⬢ ⬢ ✱	✱ Interrupted cutting
Non-ferrous metal	N	● ⬢	
Heat resistant alloy, Titanium alloy	S	✱ ✱	
Hardened steel	H	⬢	

Inserts	Designation		Coated									Cermet			Uncoated				Dimensions (mm)							Geometries	Available tools
			NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	DP200	CN2000	CN20	CN30	H01	G10	ST30A	ST20	l	d	t	r	d_1	a	b		
SNC(M)F-MM	SNCF	1206ANN-MM				●		●												-	12.7	6.6	-	-	2	-		E72
		1507ANN-MM				●		●												-	15.875	7.35	-	-	2.1	-		
	SNMF	1206ANN-MM				●														-	12.7	6.6	-	-	2	-		
		1507ANN-MM				●														-	15.875	7.35	-	-	2.1	-		
SNC(M)F-MM	SNCF	1206ENN-MM				●		●												-	12.7	6.6	-	-	1.8	-		E73
		1507ENN-MM				●		●												-	15.875	7.35	-	-	1.8	-		
	SNMF	1206ENN-MM				●														-	12.7	6.6	-	-	1.8	-		
		1507ENN-MM				●														-	15.875	7.35	-	-	1.8	-		
SNC(M)F-MM	SNCF	1206QNN-MM				●		●		○										-	12.7	6.6	0.8	-	1	-		E74
	SNMF	1206QNN-MM				●														-	12.7	6.6	0.8	-	1	-		
SNCN	SNCN	1204ENN	●													●	●	●		-	12.7	4.76	-	-	1.4	1.0		E203
		1504ENN															●			-	15.875	4.76	-	-	1.4	1.0		
SNEF	SNEF	435								●										-	12.7	4.76	2.0	-	-	-		E207
		535																		-	15.875	4.76	2.0	-	-	-		
SNEX	SNEX	101010								●										-	10	10	1.0	4.6	-	-		E200
		1010ZNN																		-	10	10	(1.0)	4.6	-	-		
SNEX-CU1	SNEX	101010-CU1								●										-	10	10	1.0	4.6	-	-		E200
		1010ZNN-CU1								●										-	10	10	(1.0)	4.6	-	-		
		121212-CU1								●										-	12.7	12.7	1.2	5.6	-	-		
		1212ZNN-CU1								●										-	12.7	12.7	(1.2)	5.6	-	-		
SNEX-MA	SNEX	1206ANN-MA				●				●						●				-	12.7	6.35	-	4.5	2.36	-		E55 E57 E59
		1206ENN-MA				●				●						●				-	12.7	6.35	-	5.2	1.82	-		
		1206QNN-MA																		-	12.7	6.35	-	5.2	1.39	-		
		120612-MA				●				●						●				-	12.7	6.35	1.2	5.2	-	-		
SNEW	SNEW	09T3ADFR														●				-	9.525	3.97	0.5	4.4	-	-		E78
SNEW-NAF	SNEW	09T3ADTR-XAF										●								-	9.525	3.97	0.5	4.4	-	-		E78
		09T3ADTR-NAF										●																
SNKN	SNKN	1204ENN								●										-	12.7	4.76	-	-	1.4	1.0		E34 E203
		1504ENN	●																	-	15.875	4.76	-	-	1.4	1.0		
SNM(E)X-MF	SNMX	1206ANN-MF				●	●			●										-	12.7	6.35	-	4.5	2.36	-		E55 E56
	SNEX	1206ANN-MF				●	●			●										-	12.7	6.35	-	4.5	2.36	-		
	SNMX	1507ANN-MF				○				○										-	15.875	7.94	-	5.6	3.15	-		
	SNEX	1507ANN-MF				○				○										-	15.875	7.94	-	5.6	3.15	-		
SNM(E)X-MF	SNMX	1206ENN-MF				●	●			●										-	12.7	6.35	-	5.2	1.82	-		E57 E58
	SNEX	1206ENN-MF				●	●			●										-	12.7	6.35	-	5.2	1.82	-		
	SNMX	1507ENN-MF				○				○										-	15.875	7.94	-	5.6	2.66	-		
	SNEX	1507ENN-MF				○				○										-	15.875	7.94	-	5.6	2.66	-		

● : Stock item ○ : Under preparing for stock
● : Stock Netherlands

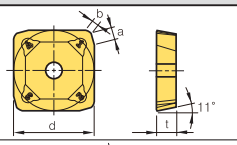
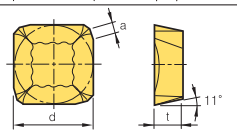
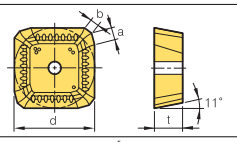
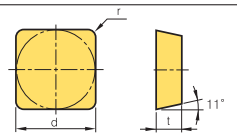
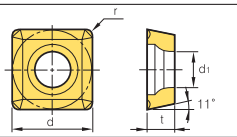
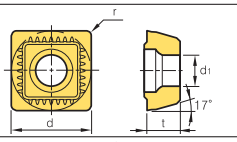
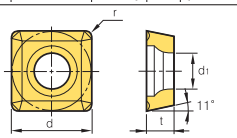
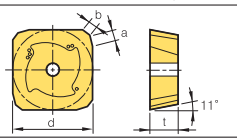
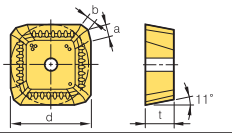
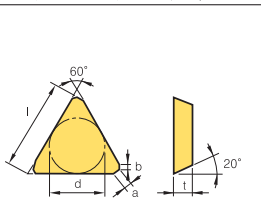
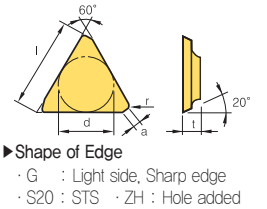
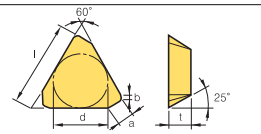
Workpiece			Machining types
	Steel	P	● Continuous cutting
	Stainless steel	M	◓ General cutting
	Cast iron	K	✱ Interrupted cutting
	Non-ferrous metal	N	
	Heat resistant alloy, Titanium alloy	S	
	Hardened steel	H	

Inserts	Designation		Coated									Cermet			Uncoated					Dimensions (mm)							Geometries	Available tools
			NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC8110	PD2000	CN2000	CN20	CN30	H01	G10	ST30A	ST20	l	d	t	r	d1	a	b		
SNM(E)X-MF	SNMX	1206QNN-MF				●				●										-	12.7	6.35	-	4.5	2.36	-		E59
	SNEX	1206QNN-MF				●				●										-	12.7	6.35	-	4.5	2.36	-		
	SNMX	120612-MF				●				●										-	12.7	6.35	1.2	4.5	-	-		
	SNEX	120612-MF				●				●										-	12.7	6.35	1.2	4.5	-	-		
SNM(E)X-MM	SNMX	1206ANN-MM	○		●	●	●		●	●										-	12.7	6.35	-	4.5	2.36	-		E55
New 	SNEX	1206ANN-MM	●		●	●	●			●										-	12.7	6.35	-	4.5	2.36	-		E56
	SNMX	1507ANN-MM				○				○										-	15.875	7.94	-	5.6	3.15	-		
	SNEX	1507ANN-MM				○				○										-	15.875	7.94	-	5.6	3.15	-		
SNM(E)X-MM	SNMX	1206ENN-MM			●	●	●			●										-	12.7	6.35	-	5.2	1.82	-		E57
New 	SNEX	1206ENN-MM			●	●	●			●										-	12.7	6.35	-	5.2	1.82	-		E58
	SNMX	1507ENN-MM				○				○										-	15.875	7.94	-	5.6	2.66	-		
	SNEX	1507ENN-MM				○				○										-	15.875	7.94	-	5.6	2.66	-		
SNM(E)X-MM	SNMX	1206QNN-MM				●				●										-	12.7	6.35	-	4.5	2.36	-		E59
	SNEX	1206QNN-MM				●				●										-	12.7	6.35	-	4.5	2.36	-		
	SNMX	120612-MM				●				●										-	12.7	6.35	1.2	4.5	-	-		
	SNEX	120612-MM				●				●										-	12.7	6.35	1.2	4.5	-	-		
SNEX-W	SNEX	1206ANN-W				●	○			●										17.13	12.7	6.35	-	4.5	-	-		E55
																												
SPCN	SPCN	1203EDR	●	●	●										●	●	●	●	●	-	12.7	3.18	-	-	1.4	1.0		E35
		1203EDL								●						●	●			-	12.7	3.18	-	-	1.4	1.0		E36
		1203EDR-G														●				-	12.7	3.18	-	-	1.4	1.0		
		1203EDER-RH					●			●	○									-	12.7	3.18	-	-	1.63	0.8		
		1203EDSR-RH								●	○									-	12.7	3.18	-	-	1.63	0.8		
		1203EDTR-RH				●														-	12.7	3.18	-	-	1.63	0.8		
		1203EDR-S20							●											-	12.7	3.18	-	-	1.4	1.0		
		1204EDR																		-	12.7	4.76	-	-	1.4	1.0		
		150412T																●		-	15.875	4.76	1.2	-	-	-		
		1504EDR	●		●										●		●	●	●	-	15.875	4.76	-	-	1.4	1.0		
		1504EDSR		●																-	15.875	4.76	-	-	1.4	1.0		
		1504EDL																		-	15.875	4.76	-	-	1.4	1.0		
		1504EDR-G														●				-	15.875	4.76	-	-	1.4	1.0		
		1504EDER-RH					●			●	○									-	15.875	4.76	-	-	1.64	0.8		
		1504EDSR-RH									○									-	15.875	4.76	-	-	1.64	0.8		
		1504EDTR-RH																		-	15.875	4.76	-	-	1.64	0.8		
		1504EDR-S20							●											-	15.875	4.76	-	-	1.4	1.0		
SPEN-WC	SPEN	120416-WC																		-	12.7	4.76	1.6	-	-	-		E35
		150412-WC																		-	15.875	4.76	1.2	-	-	-		E36
		150416-WC																		-	15.875	4.76	1.6	-	-	-		
		150420-WC																		-	15.875	4.76	2.0	-	-	-		
		190424-WC																		-	19.05	4.76	2.4	-	-	-		
SPEX	SPEX	1203EDR-1																		-	12.7	3.18	-	-	10.2	-		E35
		1203EDL-1																		-	12.7	3.18	-	-	10.2	-		E36
		1504EDR-1																		-	15.875	4.76	-	-	10.2	-		
		1504EDL-1																		-	15.875	4.76	-	-	10.2	-		
		1904EDR-1																		-	19.05	4.76	-	-	10.2	-		
		1904EDL-1																		-	19.05	4.76	-	-	10.2	-		
SPFN	SPFN	200-N																		8.8	2.2	-	0.2	-	-	-		E195
		300-N																		9.8	3.0	-	0.2	-	-	-		
		400-N																		9.8	4.0	-	0.25	-	-	-		
SPKN-SM	SPKN	1203EDSR-SM																		-	12.7	3.18	-	-	1.66	0.92		E35
		1203EDER-SM																		-	12.7	3.18	-	-	1.66	0.92		E36
		1504EDSR-SM																		-	15.875	4.76	-	-	1.62	0.93		
		1504EDER-SM																		-	15.875	4.76	-	-	1.62	0.93		

● : Stock item ○ : Under preparing for stock
● : Stock Netherlands

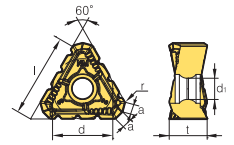
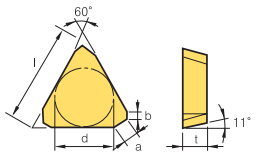
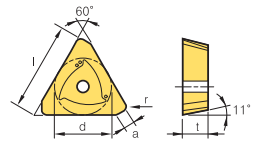
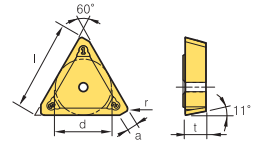
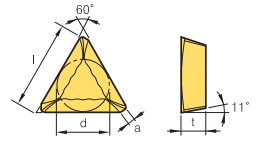
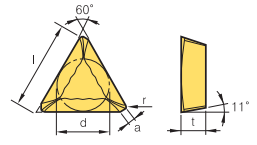
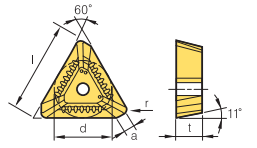
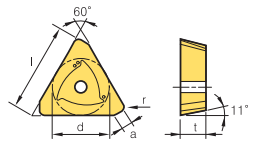
Workpiece			NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	CN2000	CN20	CN30	H01	G10	ST30A	ST20
	Steel	P	●	✱	●	●	✱	✱					●		●			✱	✱
	Stainless steel	M					✱	✱	✱										
	Cast iron	K			●		●			●							✱		
	Non-ferrous metal	N														●			
	Heat resistant alloy, Titanium alloy	S					✱	✱											
	Hardened steel	H					●												

Machining types
● Continuous cutting
● General cutting
✱ Interrupted cutting

Inserts	Designation		Coated / Cermet / Uncoated																	Dimensions (mm)							Geometries	Available tools
			NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	CN2000	CN20	CN30	H01	G10	ST30A	ST20	l	d	t	r	d_1	a	b		
SPKN-SU	SPKN	1203EDSR-SU				●	●													12.7	12.7	3.18	-	-	1.66	0.92		E35 E36
		1203EDSL-SU				●		●												12.7	12.7	3.18	-	-	1.66	0.92		
		1504EDSR-SU				●	●													15.875	15.875	4.76	-	-	1.62	0.93		
		1504EDSL-SU				●		●												15.875	15.875	4.76	-	-	1.62	0.93		
SPKR-MX	SPKR	1203EDSR-MX	●	●	●	●														-	12.7	3.18	-	-	1.4	-		E35 E36
		1203EDSL-MX	●																	-	12.7	3.18	-	-	1.4	-		
		1504EDR-MX	●																	-	15.875	4.76	-	-	1.45	-		
		1504EDSR-MX		●		●														-	15.875	4.76	-	-	1.45	-		
SPKR-SM	SPKR	1203EDSR-SM																		-	12.7	3.18	-	-	1.66	0.92		E35 E36
		1504EDSR-SM																		-	15.875	4.76	-	-	1.63	0.93		
SPMN	SPMN	120308																●		-	12.7	3.18	0.8	-	-	-		E167
SPMT	SPMT	060304	●			●														-	6.35	3.18	0.4	2.8	-	-		E149 E163 E164
SPMT-KC	SPMT	110408-KC				●											●	●		-	11.5	4.8	0.8	4.5	-	-		E167
SPMT-MM	SPMT	120408-MM				●														-	12.7	4.76	0.8	5.6	-	-		E109 E149 E163 E164
		120508-MMN																		-	12.7	5.56	0.8	5.6	-	-		
SPXN-FM	SPXN	1203EDSR-FM				●		●												-	12.7	3.18	-	-	1.41	1.00		E35 E36
		1203EDER-FM																		-	12.7	3.18	-	-	1.41	1.00		
		1504EDSR-FM				●		●												-	15.875	4.76	-	-	1.38	1.01		
		1504EDER-FM																		-	15.875	4.76	-	-	1.38	1.01		
SPXR-FM	SPXR	1203EDSR-FM						●												-	12.7	3.18	-	-	1.41	1.00		E35 E36
		1504EDSR-FM						●												-	15.875	4.76	-	-	1.38	1.01		
TECN	TECN	22R															●			11.0	6.35	3.18	-	-	1.0	0.5		E41
		22TR													●			●		11.0	6.35	3.18	0.8	-	0.5	-		
		32R															●			16.5	9.525	3.18	-	-	1.0	0.5		
		32R-G		●											●			●		16.5	9.525	3.18	-	-	1.0	0.5		
		32TR							●											16.5	9.525	3.18	0.8	-	0.5	-		
		32TR-S20																		16.5	9.525	3.18	0.8	-	0.5	-		
		43R-G																		22.0	12.7	4.76	-	-	2.0	0.5		
		43TR-Z																		22.0	12.7	4.76	0.8	-	1.5	-		
		43TR																		22.0	12.7	4.76	0.8	-	1.5	-		
TEEN	TEEN	32TR																	●	16.5	9.525	3.18	0.8	-	0.5	-	 ▶Shape of Edge · G : Light side, Sharp edge · S20 : STS · ZH : Hole added	E41
		43R-Z																		22.0	12.7	4.76	-	-	2.0	0.5		
		43TR-Z																●		22.0	12.7	4.76	0.8	-	1.5	-		
		43TR-ZH				●			●											22.0	12.7	4.76	0.8	-	1.5	-		
		43R															●			22.0	12.7	4.76	-	-	2.0	0.5		
		43R-G														●				22.0	12.7	4.76	-	-	2.0	0.5		
		43TR	●	●					●			●			●			●	●	22.0	12.7	4.76	0.8	-	1.5	-		
		43TR-S20							●											22.0	12.7	4.76	0.8	-	1.5	-		
TFCN	TFCN	2203PFR														●				22.0	12.7	3.18	-	-	2.42	0.71		E37
		2203PFL														●				22.0	12.7	3.18	-	-	2.42	0.71		

● : Stock item ○ : Under preparing for stock

Workpiece			Machining types
	Steel	P	● Continuous cutting
	Stainless steel	M	◓ General cutting
	Cast iron	K	✱ Interrupted cutting
	Non-ferrous metal	N	
	Heat resistant alloy, Titanium alloy	S	
	Hardened steel	H	

Inserts	Designation		Coated									Cermet			Uncoated				Dimensions (mm)							Geometries	Available tools
			NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC8110	PD2000	CN2000	CN20	CN30	H01	G10	ST30A	ST20	l	d	t	r	d_1	a	b		
TNMX	**TNMX2710AZNR-NM**			●	○		○													27	15.875	10	0.8	5.6	2.63	-		E46 E47
TPCN	**TPCN**	**1103PPN**													●		●	●	●	11.0	6.35	3.18	-	-	0.7	0.7		E38 E191 E192
		1103PPTN													●		●	●	●	11.0	6.35	3.18	-	-	0.7	0.7		
		1603PDR	●		●															16.5	9.525	3.18	-	-	1.2	0.7		
		1603PPN	●							●					●		●			16.5	9.525	3.18	-	-	1.2	1.2		
		1603PPR	●												●		●	●	●	16.5	9.525	3.18	-	-	1.2	1.0		
		1603PPR-G														●				16.5	9.525	3.18	-	-	1.2	1.0		
		1603PPSR		●																16.5	9.525	3.18	-	-	1.2	1.0		
		1603PPTN																		16.5	9.525	3.18	-	-	1.2	1.2		
		1603PPTR																		16.5	9.525	3.18	-	-	1.2	1.0		
		1603PPR-RH				○														16.5	9.525	3.18	-	-	1.2	1.0		
		1603PDER-RH					●	●		●										16.5	9.525	3.18	0.8	-	1.5	-		
		1603PDSR-RH								●										16.5	9.525	3.18	0.8	-	1.5	-		
		1603PDR-S20							●											16.5	9.525	3.18	-	-	1.2	0.7		
		2204PDR	●		●										●		●	●	●	22.0	12.7	4.76	-	-	1.4	0.7		
		2204PDR-G														●				22.0	12.7	4.76	-	-	1.4	0.7		
		2204PDL																●		22.0	12.7	4.76	-	-	1.4	0.7		
		2204PDSR		●																22.0	12.7	4.76	-	-	1.4	0.7		
		2204PDTR																		22.0	12.7	4.76	-	-	1.4	0.7		
		2204PPN																		22.0	12.7	4.76	-	-	1.2	1.2		
		2204PPTN																		22.0	12.7	4.76	-	-	1.2	1.2		
		2204PDR-RH																		22.0	12.7	4.76	0.8	-	1.8	-		
		2204PDER-RH					●			●	○									22.0	12.7	4.76	0.8	-	1.8	-		
		2204PDSR-RH								●	○									22.0	12.7	4.76	0.8	-	1.8	-		
		2204PDR-S20							●											22.0	12.7	4.76	-	-	1.4	0.7		
TPKN-SM	**TPKN**	**1603PDSR-SM**																		16.5	9.525	3.18	1.0	-	1.70			E38
		1603PDER-SM																		16.5	9.525	3.18	1.0	-	1.70			
		2204PDSR-SM						●												22.0	12.7	4.76	1.0	-	1.91			
		2204PDER-SM																		22.0	12.7	4.76	1.0	-	1.91			
TPKN-SU	**TPKN**	**1603PDSL-SU**				●														16.5	9.925	3.18	1.0	-	1.7	-		E38
		1603PDSR-SU				●	○	●												16.5	9.925	3.18	1.0	-	1.7	-		
		2204PDSL-SU				●														22	12.7	3.18	1.0	-	1.91	-		
		2204PDSR-SU				●	●	●												22	12.7	3.18	1.0	-	1.91	-		
TPKR-MX	**TPKR**	**1603PDSN-MX**																		16.5	9.525	3.18	-	-	1.2	1.2		E38
		1603PDSR-MX																		16.5	9.525	3.18	-	-	1.2	0.7		
		1603PPR-MX	●																	16.5	9.525	3.18	-	-	1.2	1.0		
		1603PPSN-MX	●																	16.5	9.525	3.18	-	-	1.2	1.2		
		1603PPSR-MX		●																16.5	9.525	3.18	-	-	1.2	1.0		
		2204PDR-MX	●																	22.0	12.7	4.76	1.0	-	1.4	-		
		2204PDSR-MX		●	●															22.0	12.7	4.76	1.0	-	1.4	-		
		2204PPR-MX																		22.0	12.7	4.76	1.0	-	1.4	-		
TPKR-SM	**TPKR**	**1603PDSR-SM**																		16.5	9.525	3.18	1.0	-	1.70	-		E38
		2204PDSR-SM																		22.0	12.7	4.76	1.0	-	1.91	-		
TPXN-FM	**TPXN**	**1603PDSR-FM**					●	●												16.5	9.525	3.18	1.0	-	1.30	-		E38
		1603PDER-FM																		16.5	9.525	3.18	1.0	-	1.30	-		
		2204PDSR-FM					●	●												22.0	12.7	4.76	1.0	-	1.51	-		
		2204PDER-FM																		22.0	12.7	4.76	1.0	-	1.51	-		

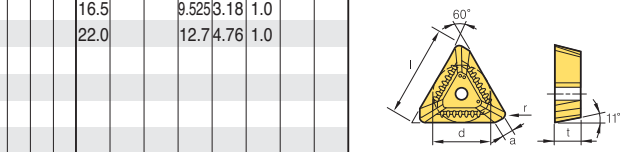
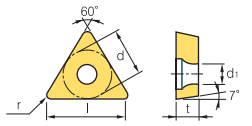
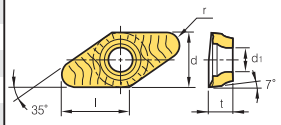
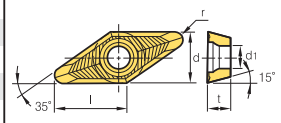
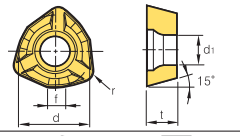
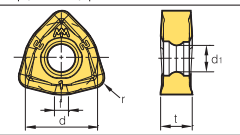
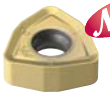
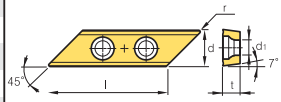
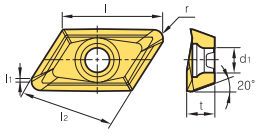
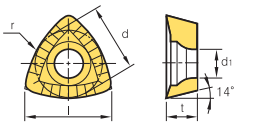
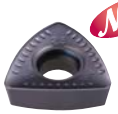
※ TPC(K)N □□□□P~N → For FC · HC
□□□□P~R → For Cutter(face)

● : Stock item ○ : Under preparing for stock

Workpiece

Steel	P
Stainless steel	M
Cast iron	K
Non-ferrous metal	N
Heat resistant alloy, Titanium alloy	S
Hardened steel	H

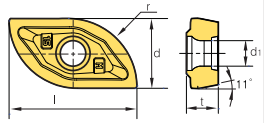
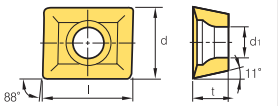
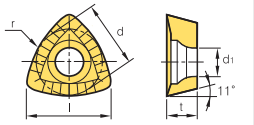
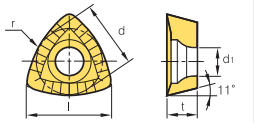
Machining types
- ● Continuous cutting
- ◓ General cutting
- ✱ Interrupted cutting

Inserts	Designation	Coated									Cermet			Uncoated				Dimensions (mm)								Geometries	Available tools
		NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	CN2000	CN20	CN30	H01	G10	ST30A	ST20	l	l_2	l_1	d	t	r	d_1	f		
TPXR-FM	TPXR 1603PDSR-FM						●												16.5			9.525	3.18	1.0				E38
	2204PDSR-FM						●												22.0			12.7	4.76	1.0				
TWX-KC New	TWX 16R-KC				●														16.5			9.52	3.97	0.8	4.45			E169
	22R-KC				●														22			12.7	4.76	0.8	4.45			
VCKT-MA	VCKT 220530N-MA														●				15.6	-	-	12.7	5.56	3.0	5.6	-		E176 E177
																											
VDKT-MA	VDKT 11T210N-MA														●				8.8	-	-	6.35	2.87	1.0	2.8	-		E177 E178
	11T220N-MA																		6.7	-	-	6.35	2.87	2.0	2.8	-		
WDKT-MH	WDKT 080316ZDSR-MH				●	●	●	●											-	-	-	8.0	3.18	1.6	3.3	1.8		E145
	10T320ZDSR-MH				●	●	●	●											-	-	-	10.0	3.97	2.0	4.3	2.3		E146
	130520ZDSR-MH				●	●	●	●											-	-	-	13.5	5.56	2.0	5.56	3.1		E147
	150625ZDSR-MH				●	●	●	●											-	-	-	15.0	6.35	2.5	5.56	3.4		E148
WNMX-MM New	WNMX 09T316ZNN-MM				●	●	●	●											-	-	-	9.525	3.97	1.6	3.6	1.7		E140
	130520ZNN-MM				●	●	●	●														12.7	5.56	2.0	4.7	2.5		E141 E142 E143 E144
XCET-KC	XCET 310404ER-KC				●											●	●		30.9	-	-	9.525	4.5	0.4	4.4	-		E168
																											
XEKT-MA New	XEKT 19M504FR-MA										●				●				18	16.4	1.4	-	5	0.4	4.4	-		E179
	19M508FR-MA										●				●				18	16.4	1.0	-	5	0.8	4.4	-		E180
	19M512FR-MA										●				●				18	16.4	0.6	-	5	1.2	4.4	-		E181
	19M516FR-MA										●				●				17.5	16.4	0.5	-	5	1.6	4.4	-		E182
	19M518FR-MA										●								17.5	16.4	0.5	-	5	1.8	4.4	-		
	19M520FR-MA										●				●				17.5	16.4	0.5	-	5	2.0	4.4	-		
	19M530FR-MA										●				●				17	16.4	0.7	-	5	3.0	4.4	-		
	19M532FR-MA										●				●				17	16.4	0.5	-	5	3.2	4.4	-		
	19M540FR-MA										●				●				16.5	16.4	0.5	-	5	4.0	4.4	-		
	19M550FR-MA										●				●				16	16.4	0.4	-	5	5.0	4.4	-		
	250604FR-MA														●				24.5	21.9	1.5	-	6.35	0.4	6.0	-		
	250608FR-MA														●				24.5	21.9	1.2	-	6.35	0.8	6.0	-		
	250612FR-MA														●				24.5	21.9	0.8	-	6.35	1.2	6.0	-		
	250616FR-MA														●				24.5	21.9	0.4	-	6.35	1.6	6.0	-		
	250620FR-MA														●				24	21.9	0.5	-	6.35	2.0	6.0	-		
	250630FR-MA														●				23.7	21.9	0.6	-	6.35	3.0	6.0	-		
	250632FR-MA														●				23.7	21.9	0.4	-	6.35	3.2	6.0	-		
	250640FR-MA														●				22.8	21.9	1.2	-	6.35	4.0	6.0	-		
	250650FR-MA														●				22.7	21.9	0.4	-	6.35	5.0	6.0	-		
ZDMT-R-MM New	ZDMT 080310R-MM				●														8.4	-	-	6.73	3.2	10	2.8	-		E164
	110312.5R-MM				●														10.6	-	-	8.5	3.65	12.5	2.8	-		
	130416R-MM				●														13.2	-	-	10.5	4.76	16	4.4	-		

● : Stock item ○ : Under preparing for stock

Workpiece		
Steel	P	● ✱
Stainless steel	M	✱
Cast iron	K	●
Non-ferrous metal	N	
Heat resistant alloy, Titanium alloy	S	✱
Hardened steel	H	●

Machining types
● Continuous cutting
● General cutting
✱ Interrupted cutting

Inserts	Designation		Coated									Cermet			Uncoated				Dimensions (mm)								Geometries	Available tools
			NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	CN2000	CN20	CN30	H01	G10	ST30A	ST20	l	l2	l1	d	t	r	d1	f		
ZPET-MM New 내 인	ZPET	080M-MM					○													16	-	-	8.0	3.5	8	2.9	-		E162 E163
		100M-MM				●	○													19	-	-	10.4	4.5	10	3.4	-		
		125M-MM				●	○													24			12.9	5.3	12.5	4.5			
		150M-MM				●	○													28			15.4	7	15	5.6			
		160M-MM				●	○													28.5			16.4	7	16	5.6			
		200M-MM				●	○													38	-	-	20.7	8	20	6.6	-		
		250M-MM					○													48	-	-	25.9	9.5	25	8.6	-		
 New 외 인	ZPET	080S-MM																		15	-	-	6.6	3.1	8	2.9	-		
		100S-MM				●	○													15.5			8.4	3.8	10	3.4			
		125S-MM				●	○													20.5			10.7	4.5	12.5	4.5			
		150S-MM				●	○													25	-	-	12.4	6.5	15	5.6	-		
		160S-MM				●	○													26			13.4	6.5	16	5.6			
		200S-MM				●	○													32			16.7	7	20	6.6			
		250S-MM																		40			20.7	8.5	25	8.6			
ZPMT-MM  New	ZPMT	1504PPSR-MM				●														15.9	-	-	12.7	4.76	-	5.6	-		E109 E149
		1505PPSR-MMN																		15.9	-	-	12.7	5.76	-	5.6	-		
ZPMT-R-MM  New	ZPMT	160520R-MM				●														16.1	-	-	12.7	5.56	20	5.6	-		E164
		160525R-MM				●														16.9	-	-	12.7	5.56	25	5.6	-		
		160531.5R-MM				●														17.6	-	-	12.7	5.56	31.5	5.6	-		
ZPMT-R-MR  New	ZPMT	160525R-MR																		17.6	-	-	12.7	5.56	25	5.6	-		E164

● : Stock item ○ : Under preparing for stock

E Cutter Table

Type	Korloy cutter	Designation	Shape	A.A	Diameter range	Features	Machinable type					Page
							Facing	Shouldering	Slotting	Copying	Ramping, Helical	
Cutters for face milling	Mill-max	ADN(M) 4000/5000		45°	Ø80~Ø315	Excellent cutting edge strength and chip flow	●					E29 E30
		AE(M) 4000/5000		45°	Ø80~Ø315	Low cutting load and good machinability	●					E31 E32
		EF(M) 4000	Al 	75°	Ø80~Ø315	High rake angle to prevents welding	●					E33
		EN(M) 4000		75°	Ø80~Ø315	Economical because double sided inserts applied	●					E34
		EPN(M) 4000/5000		75°	Ø80~Ø315	Double posi rake angle and low cutting force	●					E35 E36
		PF(M) 4000	Al 	90°	Ø80~Ø315	High rake angle and good machinability	●	●	●			E37
		PPN(M) 4000		90°	Ø80~Ø315	Double posi rake angle and low cutting force	●	●	●			E38
	Turbo mill	ADS 4000/5000		45°	Ø50~Ø63	Anti-vibration						E39 E40
		PES 2000/3000/4000		90°	Ø20~Ø63	High rake angle, Cutting efficiency						E41
	Double mill	AFO(M)4000		45°	Ø80~Ø125	High rake angle low cutting force Economical (8 corners available)	●					E42
		AFO(M)5000			Ø80~Ø315							
	Power buster	PBA5000		45°	Ø80~Ø315	Double sided Insert High depth High Feed Roughing	●					E46
		PBZ5000		80°	Ø80~Ø315		●					E47
	Aero mill	APD(M) A Type, B Type	Al 	90°	Ø80~Ø315	Aluminum cutter body suitable for high speed machining, Both cemented carbides and PCD inserts are available, G2.5 balance possible	●					E77
	Aero mill mini	MAPDS	Al 	90°	Ø40~Ø63	Available with small Machining center-Carbide, PCD insert Application-Balancing class G2.5	●					E78
		MAPD	Al 	90°	Ø32~Ø40		●					E78
	Rich mill	RM8AC(M) 4000		45°	Ø50~Ø400	8 corners available Double sided insert for steel, cast iron, stainless steel, aluminum	●					E55 E56
		RM8AC(M) 5000 New			Ø80~Ø400							
		RM8EC(M) 4000		75°	Ø50~Ø400	8 corners available Double sided insert for steel, cast iron	●					E57 E58
		RM8EC(M) 5000 New			Ø80~Ø400							

Al Cutter for Aluminm

Type	Korloy cutter	Designation	Shape	A.A	Diameter range	Features	Machinable type: Facing	Shouldering	Slotting	Copying	Ramping, Helical	Page
Cutters for face milling	Rich mill	RM8QC(M) 4000		88°	Ø63~Ø200	8 corners available Reduced cutting interruption at Cast Iron	●					E59
		RM16AC(M) New 6000/8000		45°	Ø63~Ø400	16 corners avaiable. Wiper inserts can be applied for good surface finish Strong insert and powerful clamping	●					E71
		RMT8A(M) 4000/5000		45°	Ø80~Ø315	Easy insert change and good machinability due to latch clamping system 8 corners available Excellent surface finish	●					E72
		RMT8E(M) 4000/5000		75°	Ø80~Ø315		●					E73
		RMT8Q(M)		88°	Ø80~Ø315		●					E74
Cutters for molds	Rich mill	RM4PC(M)3000		90°	Ø40~Ø100	4corners available. High rake angle insert reduces cutting force. Excellent insert rigidity.	●	●	●		●	E60~ E70
		RM4PC(M)4000			Ø50~Ø160							
	Alpha-mill	AMC(M) New 1000S/1500S/ 2000S		90°	Ø32~Ø100	3 dimensional chip breaker design for grooving, shouldering and facing	●	●	●	●	●	E84
		AMC(M) New 3000S/3000S-K/ 4000S		90°	Ø40~Ø200					●	●	E85 E86
		AMC(M) New 1000SE/2000SE/ 3000SE		75°	Ø40~Ø100							E87
		AMC(M) New 2000M/3000M/ 4000M		90°	Ø50~Ø125		●					E88 E89
	Future mill	FMAC(M)3000		45°	Ø50~Ø125	Accurate inserts and cutter, Excellent chip flow	●					E123
		FMAC(M)4000			Ø50~Ø200							
		FMAC(M)3000A		45°	Ø63~Ø125	Excellent in high speed cutting and tapping center, low power machine due to light aluminum body	●					E124
		FMAC(M)4000A			Ø63~Ø315							
		FMPC(M)3000		90°	Ø50~Ø100	4 corners avaiable various inserts can be applied to machine for different types of workpiece	●	●	●			E126
		FMPC(M)4000			Ø63~Ø125							
		FMPC(M)3000A		90°	Ø63~Ø100	Excellent in high speed cutting and tapping center, low power machine due to light aluminum body		●	●			E127
		FMPC(M)4000A			Ø63~Ø315							
		FMRC(M)3000		–	Ø40~Ø100	4~8 corners available Double contact faces between insert & seat part of cutter for stable clamping Excellent rotating-free machining	●				●	E129
		FMRC(M)4000			Ø50~Ø125							
		FMRC(M)5000		–	Ø50~Ø125							E130
		FMRC(M)6000			Ø63~Ø160							
	HRM	HRMC(M)13		15°	Ø50~Ø80	Powerful clamping by double clamping system 3 corners available high feed cutting with low cutting load	●			●	●	E145 ~ E148
		HRMC(M)15			Ø63~Ø160							

Al Cutter for Aluminm

E Cutter Table

Type	Korloy cutter	Designation	Shape	A.A	Diameter range	Features	Machinable type: Facing	Shouldering	Slotting	Copying	Ramping, Helical	Page
Cutters for molds	HRMD	HRMDC(M)09 HRMDC(M)13		14°	Ø40~Ø100 Ø50~Ø125	Double side insert with 6 cornerHigh feed cutting with strong simple screw-on clamp	●	●	●	●	●	E140 ~ E144
	T-Cutter	TFE		90°	Ø21~Ø50	For slotting	●	●	●	●	●	E171
	New BT/HSK Tooling System	BT30/40/50 HSK63/100		90°	Ø10~Ø50	BT/HSK one solid type has been accepted to increase the precision Inner coolant system can also make it possible to evacuate the chip effectively High feed and high depth	●	●	●	●	●	E102 E103 E104 E105
		BT30/40/50 HSK63/100		90°	Ø16~Ø100		●	●	●			E106 E107 E108 E110 E111
		BT30/40/50–MAT HSK63/100–MAT		90°	Ø12~Ø40	Alpha-Mill, Rich Mill, FMR, Laser Mill, HRM(D), Pro-A, Pro-X Modular head M06~M16 applicable	●	●	●	●	●	E112 E113
	New Helical Cutter	BT50 HAT4000		90°	Ø50~Ø80	Head only replacement possible and higher efficiency by self assembly head	●	●	●			E109
Cutters for aluminum	Pro-X mill	PAXC(M)5000 PAXC(M)6000	Al 	90°	Ø40~Ø125 Ø50~Ø125	Powerful clamping Excellent body rigidity for rectangular and curve machining	●	●	●	●	●	E179
	Pro-A mill	PAC(M) 4000	Al 	90°	Ø40~Ø100	Buffed insert controls chip flow without built-up edge	●	●	●	●	●	E176
High feed cutter for cast iron	High feed cutter	ANH 4000/5000		45°	Ø100~Ø450	Excellent cutting strength Good chip flow	●					E203
		CDH 4000/5000		65°	Ø100~Ø450	Double positive rake angle Minimized cutting load	●					E204
		DEH 5000	Al 	60°	Ø100~Ø450	For aluminum & aluminum alloy. Hexagonal insert available.	●					E205
		DPH 5000		60°	Ø100~Ø450	Hexagonal insert available Economical cutter	●					E206
		PNH 4000/5000		90°	Ø125~Ø450	Wiper insert available Double negative rake angle Excellent surface finish	●					E207
		PPH 4000		90°	Ø125~Ø450	Square insert and wiper insert available Excellent surface finish	●					E208
	shave mill Ultra	SVUM6000		90°	Ø80~Ø315	Good rigidity and economical due to Screw on Simple type	●					E213
		SVUM6000–B		90°	Ø80~Ø315	Easy to handle the run-out due to Korloy exclusive high toughness cutting edge special parts	●					E214

Al Cutter for Aluminm

Type	Korloy cutter		Designation	Shape	A.A	Diameter range	Features	Machinable type: Facing	Shouldering	Slotting	Copying	Ramping, Helical	Page
High feed cutter for cast iron	Storm Mill		SQN3000		88°	Ø80~Ø450	General cutter for various choice	●					E209
			SFN3000		85°								E210
			SEN3000		75°								E211
			SAN3000		45°								E212
Indexable side cutter	Tangential type	Full-side cutter	TAFCP		–	Ø100~Ø315	Various cutting depth can be possible because of adjustable length control.22 Medium to Roughing based on strengthened edge		●	●			E187
			TAFCB		–	Ø100~Ø315		●	●	●			E187
		Half-side cutter	TAHCP		–	Ø100~Ø315			●	●			E188
			TAHCB		–	Ø100~Ø315		●	●	●			E188
	Radial type	Full-side cutter	RAFCP		–	Ø100~Ø315	Wide range of machining width with only one side cutter due to adjustable cutting edge height Suitable for medium and finishing in narrow width side cutting due to good chip evacuation by 3-dimensional chip breaker		●	●			E189
			RAFCB		–	Ø100~Ø315		●	●	●			E189
		Half-side cutter	RAHCP		–	Ø100~Ø315			●	●			E190
			RAHCB		–	Ø100~Ø315		●	●	●			E190
Side cutter	Full-side cutter		FC		–	Ø80~Ø315	Good chip evacuation with low cutting load Effective cutting		●	●			E191
	Half-side cutter		HC		–	Ø100~Ø315	Good chip evacuation with low cutting load Effective cutting		●	●			E192
	–		SPP(M)		–	Ø80~Ø200	Economical by using pentagonal insert Suitable for narrow & deep grooving			●			E193
			SPB(M)		–	Ø80~Ø200	Economical by using pentagonal insert Suitable for narrow & deep grooving			●			E194
			SPS New		–	Ø50~Ø200	For narrow and deep width grooving			●			E195
	New Full-side cutter		RM4PFCB		–	Ø80~Ø160	4 corner usage with double-sided insert can be economical			●			E62 E63
			RM4PFCP		–	Ø80~Ø160	4 corner usage with double-sided insert can be economical			●			E65 E66
	New Half-side cutter		RM4PHCB		–	Ø80~Ø160	4 corner usage with double-sided insert can be economical			●			E64
			RM4PHCP		–	Ø80~Ø160	4 corner usage with double-sided insert can be economical			●			E67

Aℓ Cutter for Aluminm

E Shank Table

Type	Korloy cutter	Designation	Shape	A.A	Diameter range	Features	Machinable type					Page
							Facing	Shouldering	Slotting	Copying	Ramping, Helical	
Cutters for face milling	Turbo mill	ADS 4000/5000		45°	Ø50~Ø63	Uneven insert spacing prevents chattering	●					E39 E40
		PES 2000/3000/4000		90°	Ø20~Ø63	Good machinability due to the high rake angle	●	●	●			E41
Cutters for molds	Rich mill	RM4PS3000		90°	Ø14~Ø50	4 corners available High rake angle insert reduces cutting force Excellent insert rigidity	●	●	●		●	E68
		RM4PS4000			Ø32~Ø63		●	●	●		●	E69
	Alpha-mill	AMS New 1000S/1500S 2000S/3000S 3000S-K/4000S		90°	Ø10~Ø63	The combination of a 3 dimensional curve design & high rake angle helps chip-evacuation effectively with a low cutting force Inner coolant system The various range of inserts can provide the widened choice High depth and high feed can be available during operation	●	●	●	●	●	E90 E91 E92 E93 E94 E95
		AMS New 1000SE/2000SE 3000SE		75°	Ø25~Ø63		●					E96
		AMS New 1000M/1500M 2000M/4000M		90°	Ø16~Ø50		●	●	●	●	●	E97 E98
		AMS New 1000MH/1500MH 2000MH/3000MH		90°	Ø14~Ø40		●	●	●	●	●	E99
	Future mill	FMAS3000		45°	Ø25~Ø63	For precision machining Excellent chip evacuation	●					E125
		FMAS4000			Ø50~Ø63							
		FMPS3000		90°	Ø25~Ø63	4 corners available Strong cutting edge with low cutting load	●					E128
		FMPS4000			Ø40~Ø63							
		FMRS 1000/1500/2000 2500/3000/4000 5000/6000		–	Ø8~Ø63	2 touch clamping system, convenient insert change	●	●	●	●	●	E131 E132 E133
	HRM	HRMS 08/10/13/15		15°	Ø20~Ø63	Powerful clamping by double clamping system 3 corners available High feed cutting with low cutting load	●	●	●	●	●	E146 E147 E148
	HRMD	HRMDS 09/13		14°	Ø25~Ø63	6 conners available, High feed, multi-function, Only one screw can show comfortable application	●	●	●	●	●	E142 E143 E144

Al Cutter for Aluminm

Type	Korloy cutter	Designation	Shape	A.A	Diameter range	Features	Machinable type					Page
							Facing	Shouldering	Slotting	Copying	Ramping, Helical	
Cutters for molds	Tank mill	THE		90°	Ø25~Ø50	Right-hand helix angle employed for good chip evacuation. Special surface treatment prevents body breaking and improves rigidity. Strong cutting edge	●	●				E149
	Laser mill	LBE□□		–	Ø8~Ø32	Indexable ball endmill for precise mold. Rigid holder with simple design finishing MQL is available	●	●	●	●		E158 E158 E160
		LBE□□-C		–	Ø8~Ø32	Indexable ball endmill for precise mold. Rigid holder with simple design finishing MQL is available Carbide shank	●	●	●			E157 E159
	Mach mill	BFE		–	Ø16~Ø32	Upgraded cutting performance with S type curve design V clamping application	●	●	●	●		E161
		GBE New		–	Ø16~Ø50	Helical design of edge can reduce the force during operationSafe application to prevent rotation guarantee the increased tool life	●	●	●	●		E162
		BRE New		–	Ø20~Ø50	Flute type chip-pocket can make chip-evacuation effectivelyCustomized edge design can prevent the breakage of holder's body	●	●	●	●		E164
	Chamfer tool	CE New		15° 30° 45° 60°	Ø25~Ø30 Ø25~Ø35 Ø7~Ø39 Ø25~Ø42	For Back & Front high quality champering and various champering angle machining	–	–	–	–	–	E167
				30° 45° 60°	Ø5~Ø35 Ø5~Ø48 Ø5~Ø57	Various chamfer degree available Effective long chamfer cutting available	–	–	–	–	–	E167
		CE New		45°	~Ø28	Center Ring, Grooving, Chamfer Ring	–	–	–	–	–	E169
		CT		45°	~Ø18	Center Ring, Grooving, Chamfer Ring	–	–	–	–	–	E170
		CS		45° 60°	Ø4~Ø28	Counter sink, Chamfer Ring	–	–	–	–	–	E170
Cutters for aluminum	Pro-X mill	PAXS 5000/6000	Aℓ 	90°	Ø20~Ø40 Ø25~Ø40	Excellent clamping power, Strong cutter body For rectangular machining and curving	●	●	●	●	●	E180
	Pro-A mill	PAS 2000/4000	Aℓ 	90°	Ø12~Ø42 Ø32~Ø40	Buffed on top face controls good chip flow and reduces built-up edge	●	●	●	●	●	E177
Thread milling		TM		–	Ø32~Ø50	For internal and external threading	●					-

Aℓ Cutter for Aluminm

E Modular Adaptor Table

Modular



• FMRM type
• See page E134



• LBE–MHD type
• See page E160



• PAM type
• See page E178



• AMM type
• See page E100



• RM4PM type
• See page E70



• HRMM type
• See page E148



• HRMDM type
• See page E144



• PAXM type
• See page E181

Steel Shank type
• See page E183



Carbide Shank type
• See page E184



BT Arbors
• See page E111



HSK Arbors
• See page E112



ADN(M)4000

AA 45°

• AR : 15°
• RR : -4°



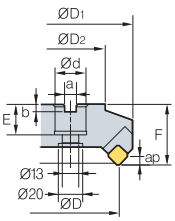


Fig. 1

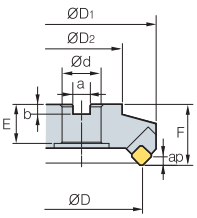


Fig. 2

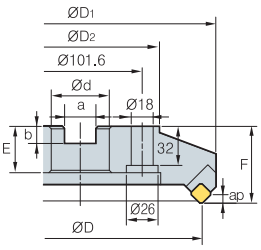


Fig. 3

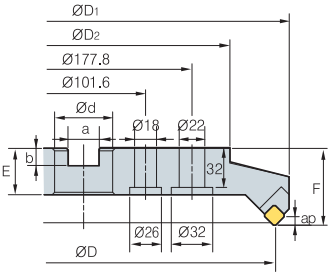


Fig. 4

(mm)

Designation		Stock R	Stock L	⌀	ØD	ØD1	ØD2	Ød	a	b	E	F	ap	kg	Fig.
ADN(M)	4080R/L	●(○)	○	4	80	105	57	25.4(27)	9.5(12.4)	6(7)	25(22)	50	6	1.9	1
	4100R/L	●(○)		5	100	125	67	31.75(32)	12.7(14.4)	8(8)	32(28)	50	6	2.5	2
	4125R/L	●(○)		6	125	149	87	38.1(40)	15.9(16.4)	10(9)	38(30)	63	6	4.3	2
	4160R/L	●(●)		8	160	183	107	50.8(40)	19.0(16.4)	11(9)	38(30)	63	6	6.4	2
	4200R/L	●		10	200	223	130	47.625(60)	25.4(25.7)	14(14)	38(38)	63	6	8.7	3
	4250R/L	●		12	250	273	180	47.625(60)	25.4(25.7)	14(14)	38(38)	63	6	14.0	3
	4315R/L	●		14	315	338	240	47.625(60)	25.4(25.7)	14(14)	38(38)	63	6	21.0	4

• ( )Metric Size

● : Stock item ○ : Under preparing for stock

Parts

Locator	Wedge	Wedge Screw	Locator Screw	Wrench
				
LADN4R/L	WEPN4R/L	DHA0821F	LTX0514	HW40

Available Arbors

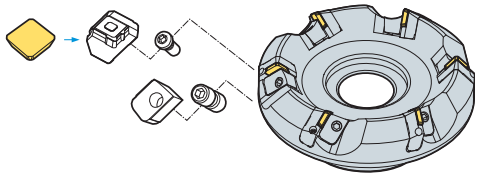
Designation	General Arbor	NC Arbors ADN	NC Arbors ADNM
ADN(M)4080R/L	NT*□□(M/U)-FMA25.4-25	BT**□□-FMA25.4 -□□	FMC27
4100R/L	NT*□□(M/U)-FMA31.75 - □□	BT**□□-FMA31.75 -□□	FMC32
4125R/L	NT*□□(M/U)-FMA38.1 - □□	BT**□□-FMA38.1 -□□	FMB40
4160R/L	NT*□□(M/U)-FMA50.8 - □□	BT**□□-FMA50.8 -□□	FMB40
4200R/L	NT*□□(M/U)-FMA47.625-25, KCP-8***	BT**□□-FMA47.625-□□	FMB60
4250R/L	NT*□□(M/U)-FMA47.625-25, KCP-8***	BT**□□-FMA47.625-□□	FMB60
4315R/L	KCP-8***(Center Ring Plug)		

*□□–NT Number **□□–BT Number ***Over Milling 5

Recommended Cutting Condition

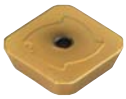
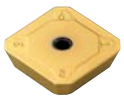
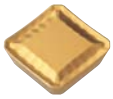
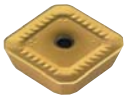
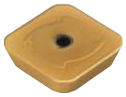
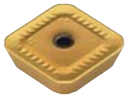
Workpiece	Cutting Condition vc(m/min)	Cutting Condition fz(mm/t)	Grades
P	150 ~ 300 120 ~ 230 100 ~ 200	0.05 ~ 0.15 0.05 ~ 0.20 0.05 ~ 0.20	NCM325 PC3500 ST30A
M	50 ~ 200 50 ~ 120	0.05 ~ 0.20 0.05 ~ 0.20	PC9530 ST30A
K	150 ~ 250 100 ~ 200	0.05 ~ 0.30 0.05 ~ 0.30	PC6510 G10

Assembling



• Available Inserts, see page : E12, E13
• Available Arbors and bolt : E215~E217

Available Inserts

SDCN	SDKN-SM	SDKN-SU	SDKR-MX
			
SDKR-SM	SDXN-FM	SDXR-FM	
			

Designation	Coated NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	Cermet CN2000	CN20	CN30	Uncoated H01	G10	ST30A	ST20	page
SDCN 42M															●			E12
42M-G														●				
42MT		●											●			●	●	
42MT-RH				●														
42MT-S20							●											
1203AEEN																		
1203AEEN-RH								●										
1203AESN																		
1203AESN-RH				●				●										
SDKN 1203AESN-SM						●												E12
1203AEEN-SM																		
1203AESN-SU				●	●	●												
SDKR 1203AESN-MX																		E13
1203AETN-MX																		
1203AEN-MX	●		●															
1203AESN-SM																		
SDXN 1203AESN-FM				●		●												E13
1203AEEN-FM																		
SDXR 1203AESN-FM																		E13

● : Stock item ○ : Under preparing for stock

ADN(M)5000

AA 45°
• AR : 15°
• RR : -4°



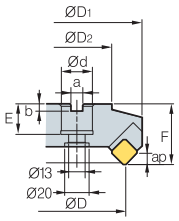


Fig. 1

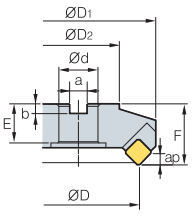


Fig. 2

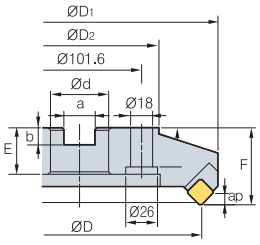


Fig. 3

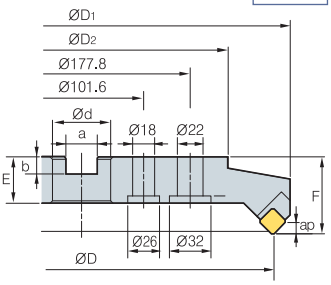


Fig. 4

(mm)

Designation		Stock R	Stock L	⌀	ØD	ØD1	ØD2	Ød	a	b	E	F	ap	kg	Fig.
ADN(M)	5080R/L	●		4	80	107	57	25.4(27)	9.5(12.4)	6(7)	25(22)	50	8	2.0	1
	5100R/L	●		5	100	126	67	31.75(32)	12.7(14.4)	8(8)	32(28)	50	8	2.7	2
	5125R/L	●		6	125	150	87	38.1(40)	15.9(16.4)	10(9)	38(30)	63	8	4.3	2
	5160R/L	●		8	160	185	107	50.8(40)	19.0(16.4)	11(9)	38(30)	63	8	6.5	2
	5200R/L	●		10	200	225	130	47.625(60)	25.4(25.7)	14(14)	38(38)	63	8	9.1	3
	5250R/L	●		12	250	275	180	47.625(60)	25.4(25.7)	14(14)	38(38)	63	8	14.5	3
	5315R/L	●		14	315	340	240	47.625(60)	25.4(25.7)	14(14)	38(38)	63	8	21.0	4

• ( )Metric Size

● : Stock item ○ : Under preparing for stock

Parts

Locator	Wedge	Wedge Screw	Locator Screw	Wrench
				
LADN5R/L	WEPN5R/L	DHA0821F	LTX0514	HW40

Available Arbors

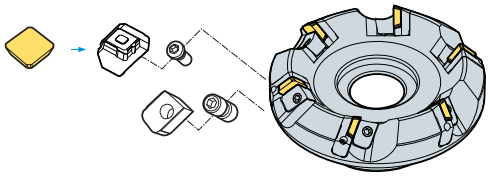
Designation	General Arbor	NC Arbors ADN	NC Arbors ADNM
ADN(M)5080R/L	NT*□□(M/U)-FMA25.4-25	BT**□□-FMA25.4 -□□	FMC27
5100R/L	NT*□□(M/U)-FMA31.75 -□□	BT**□□-FMA31.75 -□□	FMC32
5125R/L	NT*□□(M/U)-FMA38.1 -□□	BT**□□-FMA38.1 -□□	FMB40
5160R/L	NT*□□(M/U)-FMA50.8 -□□	BT**□□-FMA50.8 -□□	FMB40
5200R/L	NT*□□(M/U)-FMA47.625-25, KCP-8***	BT**□□-FMA47.625 -□□	FMB60
5250R/L	NT*□□(M/U)-FMA47.625-25, KCP-8***	BT**□□-FMA47.625 -□□	FMB60
5315R/L	KCP-8***(Center Ring Plug)		

*□□–NT Number **□□–BT Number ***Over Milling 5

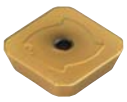
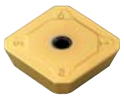
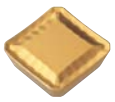
Recommended Cutting Condition

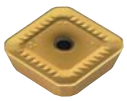
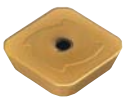
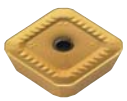
Workpiece	Cutting Condition vc(m/min)	Cutting Condition fz(mm/t)	Grades
P	150 ~ 300 120 ~ 230 100 ~ 200	0.05 ~ 0.15 0.05 ~ 0.20 0.05 ~ 0.20	NCM325 PC3500 ST30A
M	50 ~ 200 50 ~ 120	0.05 ~ 0.20 0.05 ~ 0.20	PC9530 ST30A
K	150 ~ 250 100 ~ 200	0.05 ~ 0.30 0.05 ~ 0.30	PC6510 G10

Assembling



Available Inserts

SDCN	SDKN-SM	SDKN-SU	SDKR-MX
			

SDKR-SM	SDXN-FM	SDXR-FM
		

Designation		Coated NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	Cermet CN2000	CN20	CN30	Uncoated H01	G10	ST30A	ST20	page
SDCN	53M															●			
	53M-G														●				
	53MT	●	●										●	●			●	●	
	53MT-RH				●														
	53MT-S20							●											E12
	1504AEEN																		
	1504AEEN-RH					●			●										
	1504AESN																		
	1504AESN-RH								●										
SDKN	1504AESN-SM						●												
	1504AEEN-SM																		E12
	1504AESN-SU				●	●	●												
SDKR	1504AESN-MX		●																
	1504AETN-MX																		E13
	1504AEN-MX	●		●															
	1504AESN-SM																		
SDXN	1504AESN-FM				●														E13
	1504AEEN-FM																		
SDXR	1504AESN-FM																		E13

● : Stock item ○ : Under preparing for stock

• Available Inserts, see page : E12, E13
• Available Arbors and bolt : E215~E217

AE(M)4000

AA 45° | • AR : 20° • RR : -3°



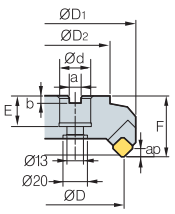


Fig. 1

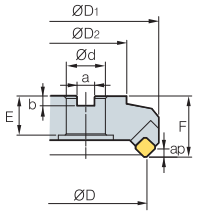


Fig. 2

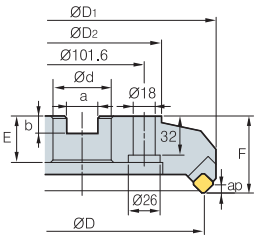


Fig. 3

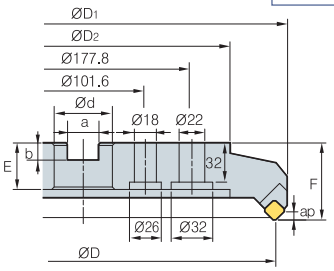


Fig. 4

(mm)

Designation		Stock R	Stock L	⌀	øD	øD1	øD2	ød	a	b	E	F	ap	kg	Fig.
AE(M)	4080R/L	●(●)		4	80	103	60	25.4(27)	9.5(12.4)	6(7)	25(22)	50	5.5	1.7	1
	4100R/L	●(●)		5	100	122	80	31.75(32)	12.7(14.4)	8(8)	32(28)	50	5.5	2.9	2
	4125R/L	●(●)		6	125	146	100	38.1(40)	15.9(16.4)	10(9)	38(30)	63	5.5	4.4	2
	4160R/L	●(●)		8	160	181	120	50.8(40)	19.0(16.4)	11(9)	38(30)	63	5.5	6.1	2
	4200R/L	●(●)		10	200	220	130	47.625(60)	25.4(25.7)	13.5(14)	38(38)	63	5.5	8.9	3
	4250R/L	●(●)		12	250	270	180	47.625(60)	25.4(25.7)	13.5(14)	38(38)	63	5.5	15.7	3
	4315R/L	(●)		15	315	335	240	47.625(60)	25.4(25.7)	13.5(14)	38(38)	63	5.5	25.1	4

• ( )Metric Size

● : Stock item ○ : Under preparing for stock

Parts

Locator	Wedge	Wedge Screw	Locator Screw	Wrench
				
LAE4R/L	WAE4R/L	DHA0821F	LTX0512	HW40

Available Arbors

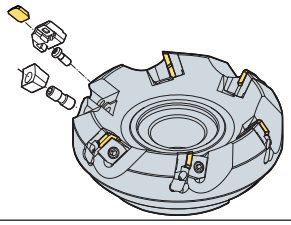
Designation	General Arbor	NC Arbors AE	NC Arbors AEM
AE(M)4080R/L	NT*□□(M/U)-FMA25.4-25	BT**□□-FMA25.4 -□□	FMC27
4100R/L	NT*□□(M/U)-FMA31.75 -□□	BT**□□-FMA31.75 -□□	FMC32
4125R/L	NT*□□(M/U)-FMA38.1 -□□	BT**□□-FMA38.1 -□□	FMB40
4160R/L	NT*□□(M/U)-FMA50.8 -□□	BT**□□-FMA50.8 -□□	FMB40
4200R/L	NT*□□(M/U)-FMA47.625-25, KCP-8***	BT**□□-FMA47.625-□□	FMB60
4250R/L	NT*□□(M/U)-FMA47.625-25, KCP-8***	BT**□□-FMA47.625-□□	FMB60
4315R/L	KCP-8***(Center Ring Plug)		

*□□—NT Number **□□—BT Number ***Over Milling 5

Recommended Cutting Condition

Workpiece	Cutting Condition vc(m/min)	Cutting Condition fz(mm/t)	Grades
P	150 ~ 300 120 ~ 230 100 ~ 200	0.05 ~ 0.15 0.05 ~ 0.20 0.05 ~ 0.20	NCM325 PC3500 ST30A
M	50 ~ 200 50 ~ 120	0.05 ~ 0.20 0.05 ~ 0.20	PC9530 ST30A
K	150 ~ 250 100 ~ 200	0.05 ~ 0.30 0.05 ~ 0.30	PC6510 G10

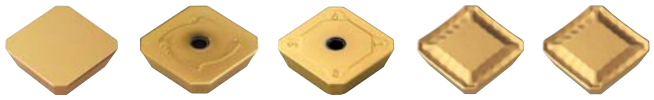
Assembling



• Available Inserts, see page : E14, E15
• Available Arbors and bolt : E215~E217

Available Inserts

SECN | SEKN-SM | SEKN-SU | SEKR-MF1 | SEKR-MX



SEKR-X35 | SEKR-SM | SEXN-FM | SEXR-FM



Designation		Coated NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	Cermet CN2000	CN20	CN30	Uncoated H01	G10	ST30A	ST20	page
SECN	1203AFFN														●	●			
	1203AFTN											●	●	●			●		
	1203AFEN																		
	1203AFSN	●	●	●															E14
	1203AFEN-RH					●			●										
	1203AFSN-RH								●										
	1203AFTN-S20							●											
SEKN	1203AFSN-SM																		
	1203AFEN-SM																		E14
	1203AFSN-SU				●	●	●												
SEKR	1203AFSN-MF1																		
	1203AFSN-MX	●	●	●				●						●					E14
	1203AFSN-X35																		E15
	1203AFFN-X35																		
	1203AFSN-SM																		
SEXN	1203AFSN-FM				●		●												E15
	1203AFEN-FM																		
SEXR	1203AFSN-FM						●												E15

● : Stock item ○ : Under preparing for stock

AE(M)5000

AA 45° | • AR : 20° • RR : -3°



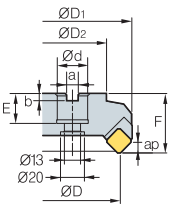


Fig. 1

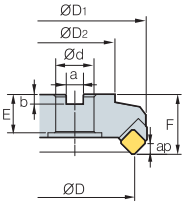


Fig. 2

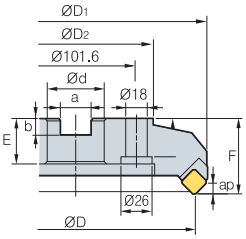


Fig. 3

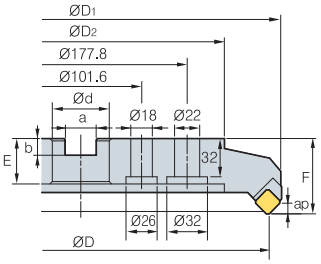


Fig. 4

(mm)

Designation		Stock R	Stock L		øD	øD1	øD2	ød	a	b	E	F	ap	kg	Fig.
AE(M)	5080R/L			4	80	103	60	25.4(27)	9.5(12.4)	6(7)	25(22)	50	7.5	1.7	1
	5100R/L			5	100	122	80	31.75(32)	12.7(14.4)	8(8)	32(28)	50	7.5	2.9	2
	5125R/L	●		6	125	146	100	38.1(40)	15.9(16.4)	10(9)	38(30)	63	7.5	4.4	2
	5160R/L	●		8	160	181	120	50.8(40)	19.0(16.4)	11(9)	38(30)	63	7.5	6.1	2
	5200R/L	●		10	200	220	130	47.625(60)	25.4(25.7)	13.5(14)	38(38)	63	7.5	8.9	3
	5250R/L			12	250	270	180	47.625(60)	25.4(25.7)	13.5(14)	38(38)	63	7.5	15.7	3
	5315R/L			15	315	335	240	47.625(60)	25.4(25.7)	13.5(14)	38(38)	63	7.5	25.1	4

• ( )Metric Size

● : Stock item ○ : Under preparing for stock

Parts

Locator	Wedge	Wedge Screw	Locator Screw	Wrench
				
LAE5R/L	WAE5R/L	DHA0821F	LTX0512	HW40

Available Arbors

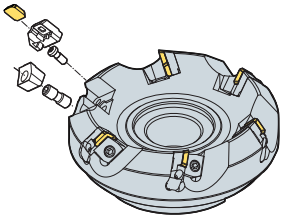
Designation	General Arbor	NC Arbors AE	NC Arbors AEM
AE(M)5080R/L	NT*□□(M/U)-FMA25.4-25	BT**□□-FMA25.4-□□	FMC27
5100R/L	NT*□□(M/U)-FMA31.75-□□	BT**□□-FMA31.75-□□	FMC32
5125R/L	NT*□□(M/U)-FMA38.1-□□	BT**□□-FMA38.1-□□	FMB40
5160R/L	NT*□□(M/U)-FMA50.8-□□	BT**□□-FMA50.8-□□	FMB40
5200R/L	NT*□□(M/U)-FMA47.625-25, KCP-8***	BT**□□-FMA47.625-□□	FMB60
5250R/L	NT*□□(M/U)-FMA47.625-25, KCP-8***	BT**□□-FMA47.625-□□	FMB60
5315R/L	KCP-8***(Center Ring Plug)		

*□□–NT Number **□□–BT Number ***Over Milling 5

Recommended Cutting Condition

Workpiece	Cutting Condition vc(m/min)	Cutting Condition fz(mm/t)	Grades
P	150 ~ 300 120 ~ 230 100 ~ 200	0.05 ~ 0.15 0.05 ~ 0.20 0.05 ~ 0.20	NCM325 PC3500 ST30A
M	50 ~ 200 50 ~ 120	0.05 ~ 0.20 0.05 ~ 0.20	PC9530 ST30A
K	150 ~ 250 100 ~ 200	0.05 ~ 0.30 0.05 ~ 0.30	PC6510 G10

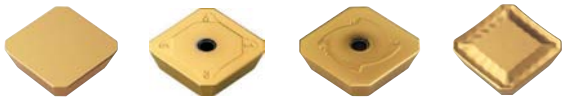
Assembling



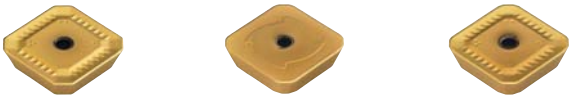
• Available Inserts, see page : E14, E15
• Available Arbors and bolt : E215~E217

Available Inserts

SECN | SEKN-SU | SEKN-SM | SEKR-MX



SEKR-SM | SEXN-FM | SEXR-FM



Designation		Coated NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	Cermet CN2000	CN20	CN30	Uncoated H01	G10	ST30A	ST20	page
SECN	1504AFFN															●			
	1504AFTN													●			●		
	1504AFEN																		
	1504AFSN	●	●	●															E14
	1504AFEN-RH								●										
	1504AFSN-RH								●										
	1504AFTN-S20																		
SEKN	1504AFSN-SM																		
	1504AFEN-SM																		E14
	1504AFSN-SU				●	●	●												
SEKR	1504AFSN-MX	●	●	●															E14
	1504AFSN-SM																		
SEXN	1504AFSN-FM				●														E15
	1504AFEN-FM																		
SEXR	1504AFSN-FM																		E15

● : Stock item ○ : Under preparing for stock

EF(M)4000

AA 75°
• AR : 18°
• RR : 11°



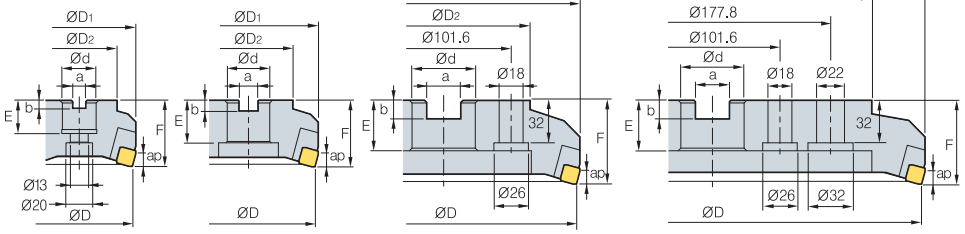


Fig. 1 Fig. 2 Fig. 3 Fig. 4

(mm)

Designation		Stock R	Stock L	⊙	øD	øD1	øD2	ød	a	b	E	F	ap	kg	Fig.
EF(M)	4080R/L	●		4	80	89	57	25.4(27)	9.5(12.4)	6(7)	25(22)	50	8.0	1.5	1
	4100R/L	●		5	100	108	70	31.75(32)	12.7(14.4)	8(8)	32(28)	50	8.0	2.1	2
	4125R/L	●		6	125	133	87	38.1(40)	15.9(16.4)	10(9)	38(30)	63	8.0	3.8	2
	4160R/L	●		8	160	168	107	50.8(40)	19.0(16.4)	11(9)	38(30)	63	8.0	5.5	2
	4200R/L	●		10	200	208	130	47.625(60)	25.4(25.7)	13.5(14)	38(38)	63	8.0	8.2	3
	4250R/L			12	250	257	180	47.625(60)	25.4(25.7)	13.5(14)	38(38)	63	8.0	13.4	3
	4315R/L			16	315	322	240	47.625(60)	25.4(25.7)	13.5(14)	38(38)	63	8.0	21.2	4

• ( )Metric Size

● : Stock item ○ : Under preparing for stock

Parts

Locator	Wedge	Wedge Screw	Locator Screw	Wrench
				
LEF4R/L LEF4R1*/L1*	WEFR/L	DHA0821F	LTX0512	HW40

∗ : Ø80 ~ Ø125

Available Arbors

Designation	General Arbor	NC Arbors EF	NC Arbors EFM
EF(M)4080R/L	NT*□□(M/U)-FMA25.4-25 -□□	BT**□□-FMA25.4 -□□	FMC27
4100R/L	NT*□□(M/U)-FMA31.75 -□□	BT**□□-FMA31.75 -□□	FMC32
4125R/L	NT*□□(M/U)-FMA38.1 -□□	BT**□□-FMA38.1 -□□	FMB40
4160R/L	NT*□□(M/U)-FMA50.8 -□□	BT**□□-FMA50.8 -□□	FMB40
4200R/L	NT*□□(M/U)-FMA47.625-25, KCP-8***	BT**□□-FMA47.625-□□	FMB60
4250R/L	NT*□□(M/U)-FMA47.625-25, KCP-8***	BT**□□-FMA47.625-□□	FMB60
4315R/L	KCP-8***(Center Ring Plug)		

*□□–NT Number **□□–BT Number ***Over Milling 5

Recommended Cutting Condition

Workpiece	Cutting Condition vc(m/min)	Cutting Condition fz(mm/t)	Grades
K	400 ~ 500	0.05 ~ 0.20	H01

Available Inserts

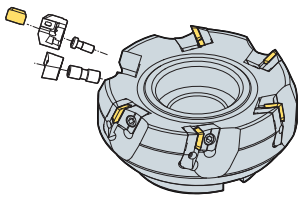
SFCN



Designation	Coated NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	Cermet CN2000	CN20	CN30	Uncoated H01	G10	ST30A	ST20	page
SFCN 1203EFR														●	●			E15

● : Stock item ○ : Under preparing for stock

Assembling



• Available Inserts, see page : E15
• Available Arbors and bolt : E215~E217

EN(M)4000

AA 75° • AR : -6° • RR : -5°



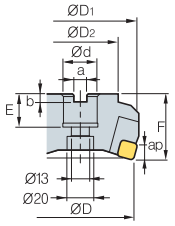


Fig. 1

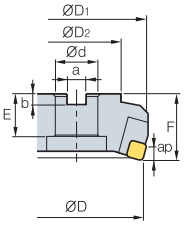


Fig. 2

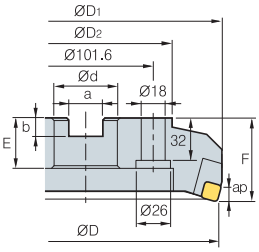


Fig. 3

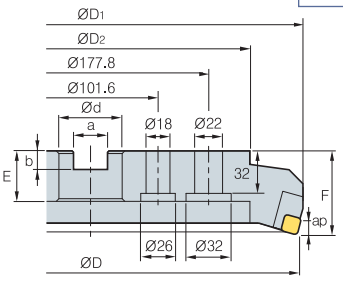


Fig. 4

(mm)

Designation		Stock R	Stock L	⌀	ØD	ØD1	ØD2	Ød	a	b	E	F	ap	kg	Fig.
EN(M)	4080R/L	●		5	80	87	57	25.4(27)	9.5(12.4)	6(7)	25(22)	50	8.5	1.4	1
	4100R/L	●		6	100	107	67	31.75(32)	12.7(14.4)	8(8)	32(28)	50	8.5	2.1	2
	4125R/L	●	●	8	125	132	87	38.1(40)	15.9(16.4)	10(9)	38(30)	63	8.5	3.8	2
	4160R/L	●	●	10	160	167	107	50.8(40)	19.0(16.4)	11(9)	38(30)	63	8.5	5.7	2
	4200R/L	●	●	12	200	207	130	47.625(60)	25.4(25.7)	13.5(14)	38(38)	63	8.5	8.4	3
	4250R/L	●		16	250	257	180	47.625(60)	25.4(25.7)	13.5(14)	38(38)	63	8.5	13.8	3
	4315R/L			20	315	322	240	47.625(60)	25.4(25.7)	13.5(14)	38(38)	63	8.5	21.6	4

• ( )Metric Size

● : Stock item ○ : Under preparing for stock

Parts

Locator	Wedge	Wedge Screw	Locator Screw	Wrench
				
LEN4R/L	WENR/L WENR1*/L1*	DHA0830 DHA0825*	LTX0512	HW40

* : Ø80 ~ Ø100

Available Arbors

Designation	General Arbor	NC Arbors EN	NC Arbors ENM
EN(M) 4080R/L	NT*□□(M/U)-FMA25.4-25-□□	BT**□□-FMA25.4-□□	FMC27
4100R/L	NT*□□(M/U)-FMA31.75-□□	BT**□□-FMA31.75-□□	FMC32
4125R/L	NT*□□(M/U)-FMA38.1-□□	BT**□□-FMA38.1-□□	FMB40
4160R/L	NT*□□(M/U)-FMA50.8-□□	BT**□□-FMA50.8-□□	FMB40
4200R/L	NT*□□(M/U)-FMA47.625-25, KCP-8***	BT**□□-FMA47.625-□□	FMB60
4250R/L	NT*□□(M/U)-FMA47.625-25, KCP-8***	BT**□□-FMA47.625-□□	FMB60
4315R/L	KCP-8***(Center Ring Plug)		

*□□-NT Number **□□-BT Number ***Over Milling 5

Recommended Cutting Condition

Workpiece	Cutting Condition vc(m/min)	Cutting Condition fz(mm/t)	Grades
P	150 ~ 300 120 ~ 230 100 ~ 200	0.05 ~ 0.15 0.05 ~ 0.20 0.05 ~ 0.20	NCM325 PC3500 ST30A
M	50 ~ 200 50 ~ 120	0.05 ~ 0.20 0.05 ~ 0.20	PC9530 ST30A
K	150 ~ 250 100 ~ 200	0.05 ~ 0.30 0.05 ~ 0.30	PC6510 G10

Available Inserts

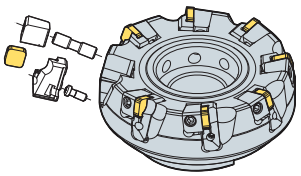
SNCN SNKN




Designation	Coated NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	Cermet CN2000	CN20	CN30	Uncoated H01	G10	ST30A	ST20	page
SNCN 1204ENN	●														●	●	●	E16
SNKN 1204ENN								●										E16

● : Stock item ○ : Under preparing for stock

Assembling



• Available Inserts, see page : E16
• Available Arbors and bolt : E215~E217

EPN(M)4000

AA 75° | • AR : 7° • RR : 0°



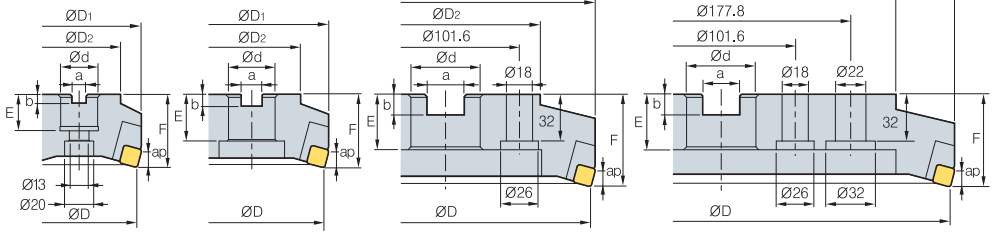


Fig. 1 Fig. 2 Fig. 3 Fig. 4

(mm)

Designation		Stock R	Stock L		øD	øD1	øD2	ød	a	b	E	F	ap	kg	Fig.
EPN(M)	4080R/L	•(•)		5	80	86	57	25.4(27)	9.5(12.4)	6(7)	25(22)	50	9	1.4	1
	4100R/L	•(•)		6	100	107	67	31.75(32)	12.7(14.4)	8(8)	32(28)	50	9	2.1	2
	4125R/L	•(•)	●	8	125	132	87	38.1(40)	15.9(16.4)	10(9)	38(30)	63	9	3.8	2
	4160R/L	•(•)	●	10	160	166	107	50.8(40)	19.0(16.4)	11(9)	38(30)	63	9	5.7	2
	4200R/L	•(•)	●	12	200	206	130	47.625(60)	25.4(25.7)	14(14)	38(38)	63	9	8.2	3
	4250R/L	•(•)		16	250	256	180	47.625(60)	25.4(25.7)	14(14)	38(38)	63	9	13.5	3
	4315R/L	•		20	315	321	240	47.625(60)	25.4(25.7)	14(14)	38(38)	63	9	21.1	4

• ( )Metric Size

● : Stock item ○ : Under preparing for stock

Parts

Locator	Wedge	Wedge Screw	Locator Screw	Wrench
				
LEPN4R/L LEPN4R1*/L1*	WEPN4R/L	DHA0821F DHA0818F*	LTX0514	HW40

* : Ø80 ~ Ø100

Available Arbors

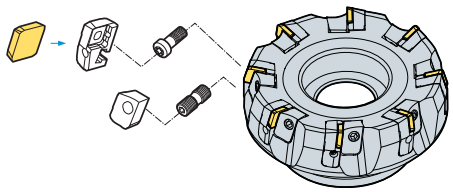
Designation	General Arbor	NC Arbors EPN	NC Arbors EPNM
EPN(M) 4080R/L	NT*□□(M/U)-FMA25.4-25	BT**□□-FMA25.4-□□	FMC27
4100R/L	NT*□□(M/U)-FMA31.75-□□	BT**□□-FMA31.75-□□	FMC32
4125R/L	NT*□□(M/U)-FMA38.1-□□	BT**□□-FMA38.1-□□	FMB40
4160R/L	NT*□□(M/U)-FMA50.8-□□	BT**□□-FMA50.8-□□	FMB40
4200R/L	NT*□□(M/U)-FMA47.625-25, KCP-8***	BT**□□-FMA47.625-□□	FMB60
4250R/L	NT*□□(M/U)-FMA47.625-25, KCP-8***	BT**□□-FMA47.625-□□	FMB60
4315R/L	KCP-8***(Center Ring Plug)		

*□□–NT Number **□□–BT Number ***Over Milling 5

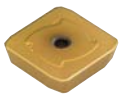
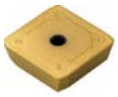
Recommended Cutting Condition

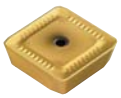
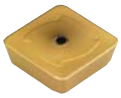
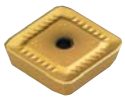
Workpiece	Cutting Condition vc(m/min)	Cutting Condition fz(mm/t)	Grades
P	150 ~ 300 120 ~ 230 100 ~ 200	0.05 ~ 0.15 0.05 ~ 0.20 0.05 ~ 0.20	NCM325 PC3500 ST30A
M	50 ~ 200 50 ~ 120	0.05 ~ 0.20 0.05 ~ 0.20	PC9530 ST30A
K	150 ~ 250 100 ~ 200	0.05 ~ 0.30 0.05 ~ 0.30	PC6510 G10

Assembling



Available Inserts

SPCN	SPKN-SM	SPKN-SU	SPKR-MX
			

SPKR-SM	SPXN-FM	SPXR-FM
		

Designation		Coated NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC8110	PD2000	Cermet CN2000	CN20	CN30	Uncoated H01	G10	ST30A	ST20	page
SPCN	1203EDR	●	●	●										●	●	●	●	●	
	1203EDL								●							●	●		
	1203EDR-G														●				
	1203EDER-RH					●			●	○									E17
	1203EDSR-RH								●	○									
	1203EDTR-RH				●														
	1203EDR-S20							●											
SPKN	1203EDSR-SM																		E17
	1203EDER-SM																		E18
	1203EDSR-SU				●	●	●												E18
	1203EDSL-SU				●														
SPKR	1203EDSR-MX	●	●	●	●														E18
	1203EDSL-MX	●																	
	1203EDSR-SM																		
SPXN	1203EDSR-FM				●		●												E18
	1203EDER-FM																		
SPXR	1203EDSR-FM						●												E18

● : Stock item ○ : Under preparing for stock

• Available Inserts, see page : E17, E18
• Available Arbors and bolt : E215~E217

EPN(M)5000

AA 75°
• AR : 7°
• RR : 0°



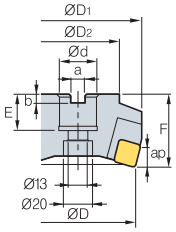


Fig. 1

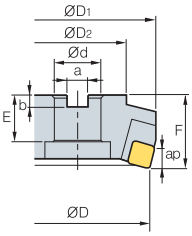


Fig. 2

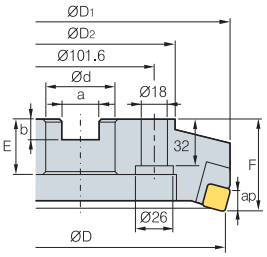


Fig. 3

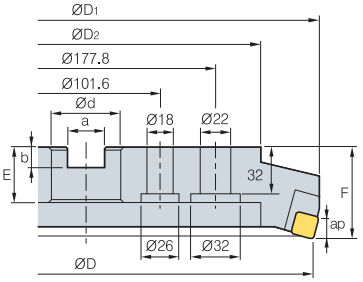


Fig. 4

(mm)

Designation		Stock R	Stock L	⚙	ØD	ØD1	ØD2	Ød	a	b	E	F	ap	kg	Fig.
EPN(M)	5080R/L	●(●)		5	80	91	57	25.4(27)	9.5(12.4)	6(7)	25(22)	50	12	1.5	1
	5100R/L	●(●)		6	100	110	67	31.75(32)	12.7(14.4)	8(8)	32(28)	50	12	2.1	2
	5125R/L	●(●)	●	8	125	134	87	38.1(40)	15.9(16.4)	10(9)	38(30)	63	12	3.9	2
	5160R/L	●(●)	●	10	160	169	107	50.8(40)	19.0(16.4)	11(9)	38(30)	63	12	5.7	2
	5200R/L	●(●)	●	12	200	209	130	47.625(60)	25.4(25.7)	14(14)	38(38)	63	12	8.4	3
	5250R/L	●(●)		16	250	259	180	47.625(60)	25.4(25.7)	14(14)	38(38)	63	12	13.6	3
	5315R/L	●(●)		20	315	324	240	47.625(60)	25.4(25.7)	14(14)	38(38)	63	12	21.6	4

• ( )Metric Size

● : Stock item ○ : Under preparing for stock

Parts

Locator	Wedge	Wedge Screw	Locator Screw	Wrench
				
LEPN5R/L LEPN5R1*/L1*	WEPN5R/L	DHA0821F DHA0818F*	LTX0514	HW40

∗ : Ø80 ~ Ø100

Available Arbors

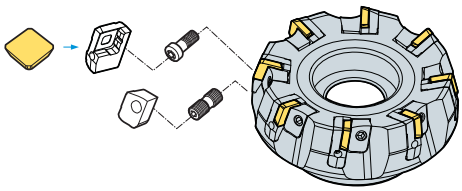
Designation	General Arbor	NC Arbors EPN	NC Arbors EPNM
EPN(M) 5080R/L	NT*□□(M/U)-FMA25.4-25	BT**□□-FMA25.4 -□□	FMC27
5100R/L	NT*□□(M/U)-FMA31.75 -□□	BT**□□-FMA31.75 -□□	FMC32
5125R/L	NT*□□(M/U)-FMA38.1 -□□	BT**□□-FMA38.1 -□□	FMB40
5160R/L	NT*□□(M/U)-FMA50.8 -□□	BT**□□-FMA50.8 -□□	FMB40
5200R/L	NT*□□(M/U)-FMA47.625-25, KCP-8***	BT**□□-FMA47.625-□□	FMB60
5250R/L	NT*□□(M/U)-FMA47.625-25, KCP-8***	BT**□□-FMA47.625-□□	FMB60
5315R/L	KCP-8***(Center Ring Plug)		

*□□–NT Number **□□–BT Number ***Over Milling 5

Recommended Cutting Condition

Workpiece	Cutting Condition vc(m/min)	Cutting Condition fz(mm/t)	Grades
P	150 ~ 300 120 ~ 230 100 ~ 200	0.05 ~ 0.15 0.05 ~ 0.20 0.05 ~ 0.20	NCM325 PC3500 ST30A
M	50 ~ 200 50 ~ 120	0.05 ~ 0.20 0.05 ~ 0.20	PC9530 ST30A
K	150 ~ 250 100 ~ 200	0.05 ~ 0.30 0.05 ~ 0.30	PC6510 G10

Assembling

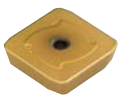


Available Inserts

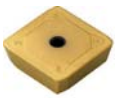
SPCN



SPKN-SM



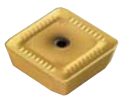
SPKN-SU



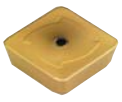
SPKR-MX



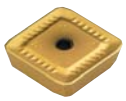
SPKR-SM



SPXN-FM



SPXR-FM



Designation		NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC8110	PD2000	CN2000	CN20	CN30	H01	G10	ST30A	ST20	page
		Coated										Cermet			Uncoated				
SPCN	150412T																●		
	1504EDR	●		●										●		●	●	●	
	1504EDSR		●																
	1504EDL																		
	1504EDR-G														●				E17
	1504EDER-RH					●			●	○									
	1504EDSR-RH									○									
	1504EDTR-RH																		
	1504EDR-S20							●											
SPKN	1504ESR-SM																		E17
	1504EDER-SM																		
	1504EDSR-SU				●	●	●												E18
	1504EDSL-SU				●														
SPKR	1504EDR-MX	●																	
	1504EDSR-MX		●		●														E18
	1504EDSR-SM																		
SPXN	1504EDSR-FM				●		●												E18
	1504EDER-FM																		
SPXR	1504EDSR-FM						●												E18

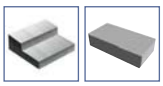
● : Stock item ○ : Under preparing for stock

• Available Inserts, see page : E17, E18
• Available Arbors and bolt : E215~E217

PF(M)4000

AA 90°

• AR : 15°
• RR : 14°





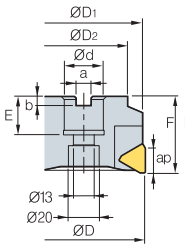


Fig. 1

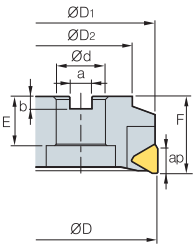


Fig. 2

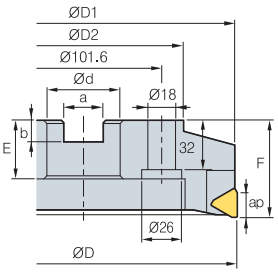


Fig. 3

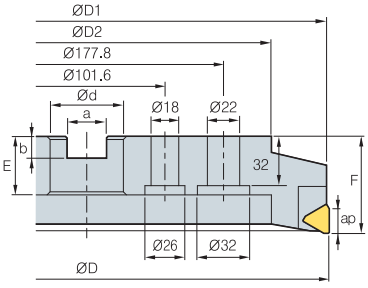


Fig. 4

(mm)

Designation		Stock R	Stock L	⊚	ØD	ØD1	ØD2	Ød	a	b	E	F	ap	kg	Fig.
PF(M)	4080R/L	●		4	80	79	57	25.4(27)	9.5(12.4)	6(7)	25(22)	50	16	1.2	1
	4100R/L	●		4	100	97	67	31.75(32)	12.7(14.4)	8(8)	32(28)	50	16	1.8	2
	4125R/L	●		7	125	122	87	38.1(40)	15.9(16.4)	10(9)	38(30)	63	16	3.1	2
	4160R/L	●		9	160	158	107	50.8(40)	19.0(16.4)	11(9)	38(30)	63	16	5.6	2
	4200R/L			11	200	197	130	47.625(60)	25.4(25.7)	13.5(14)	38(38)	63	16	8.8	3
	4250R/L			15	250	247	180	47.625(60)	25.4(25.7)	13.5(14)	38(38)	63	16	16	3
	4315R/L			19	315	311	240	47.625(60)	25.4(25.7)	13.5(14)	38(38)	63	16	22	4

• ( )Metric Size

● : Stock item ○ : Under preparing for stock

Parts

Locator	Wedge	Wedge Screw	Locator Screw	Wrench
				
LPF4R/L LPF4R1**/L1**	WPFR/L	DHA0821F DHA0818F*	LTX0512	HW40

* : Ø80 ~ Ø100 / ** : Ø80 ~ Ø125

Available Arbors

Designation	General Arbor	NC Arbors PF	NC Arbors PFM
PF(M) 4080R/L	NT*□□(M/U)-FMA25.4-25 -□□	BT**□□-FMA25.4 -□□	FMC27
4100R/L	NT*□□(M/U)-FMA31.75 -□□	BT**□□-FMA31.75 -□□	FMC32
4125R/L	NT*□□(M/U)-FMA38.1 -□□	BT**□□-FMA38.1 -□□	FMB40
4160R/L	NT*□□(M/U)-FMA50.8 -□□	BT**□□-FMA50.8 -□□	FMB40
4200R/L	NT*□□(M/U)-FMA47.625-25, KCP-8***	BT**□□-FMA47.625-□□	FMB60
4250R/L	NT*□□(M/U)-FMA47.625-25, KCP-8***	BT**□□-FMA47.625-□□	FMB60
4315R/L	KCP-8***(Center Ring Plug)		

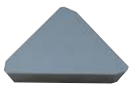
*□□–NT Number **□□–BT Number ***Over Milling 5

Recommended Cutting Condition

Workpiece	Cutting Condition vc(m/min)	Cutting Condition fz(mm/t)	Grades
P	150 ~ 300 120 ~ 230 100 ~ 200	0.05 ~ 0.15 0.05 ~ 0.20 0.05 ~ 0.20	NCM325 PC3500 ST30A
M	50 ~ 200 50 ~ 120	0.05 ~ 0.20 0.05 ~ 0.20	PC9530 ST30A
K	150 ~ 250 100 ~ 200	0.05 ~ 0.30 0.05 ~ 0.30	PC6510 G10

Available Inserts

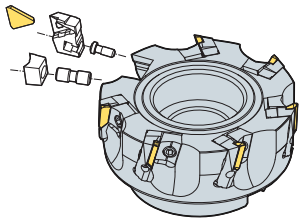
TFCN



Designation	Coated NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	Cermet CN2000	CN20	CN30	Uncoated H01	G10	ST30A	ST20	page
TFCN 2203PFR														●				E18
2203PFL														●				

● : Stock item ○ : Under preparing for stock

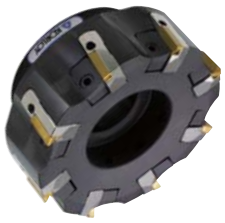
Assembling



• Available Inserts, see page : E18
• Available Arbors and bolt : E215~E217

PPN(M)4000

AA 90° | • AR : 7° • RR : 0°



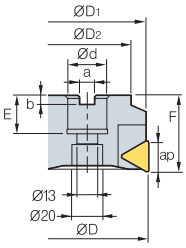


Fig. 1

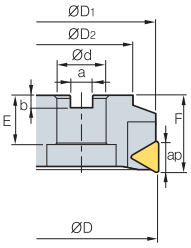


Fig. 2

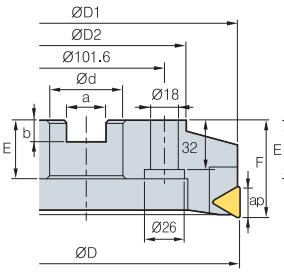


Fig. 3

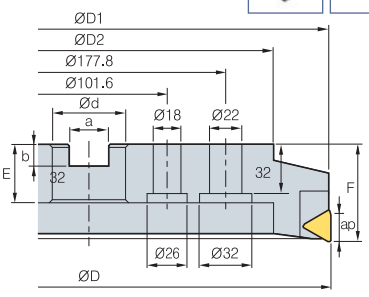


Fig. 4

(mm)

Designation		Stock R	Stock L	⊚	ØD	ØD1	ØD2	Ød	a	b	E	F	ap	kg	Fig.
PPN(M)	4080R/L	●(●)		5	80	79	57	25.4(27)	9.5(12.4)	6(7)	25(22)	50	18	1.3	1
	4100R/L	●(●)		6	100	99	67	31.75(32)	12.7(14.4)	8(8)	32(28)	50	18	1.9	2
	4125R/L	●(●)		8	125	124	87	38.1(40)	15.9(16.4)	10(9)	38(30)	63	18	3.5	2
	4160R/L	●(●)		10	160	158	107	50.8(40)	19.0(16.4)	11(9)	38(30)	63	18	5.6	2
	4200R/L	●(●)		12	200	198	130	47.625(60)	25.4(25.7)	14(14)	38(38)	63	18	8.1	3
	4250R/L	●		16	250	248	180	47.625(60)	25.4(25.7)	14(14)	38(38)	63	18	13.3	3
	4315R/L	●		20	315	313	240	47.625(60)	25.4(25.7)	14(14)	38(38)	63	18	21.4	4

• ( )Metric Size

● : Stock item ○ : Under preparing for stock

Parts

Locator	Wedge	Wedge Screw	Locator Screw	Wrench
				
LPPN4R/L LPPN4R1*/L1*	WPPN4R/L	DHA0821F DHA0818F*	LTX0514	HW40

∗ : Ø80 ~ Ø100

Available Arbors

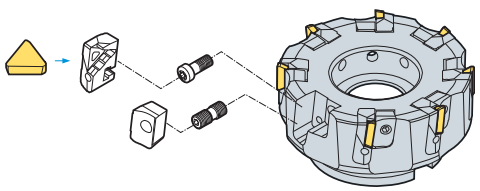
Designation	General Arbor	NC Arbors PPN	NC Arbors PPNM
PPN(M) 4080R/L	NT*□□(M/U)-FMA25.4-25	BT**□□-FMA25.4-□□	FMC27
4100R/L	NT*□□(M/U)-FMA31.75-□□	BT**□□-FMA31.75-□□	FMC32
4125R/L	NT*□□(M/U)-FMA38.1-□□	BT**□□-FMA38.1-□□	FMB40
4160R/L	NT*□□(M/U)-FMA50.8-□□	BT**□□-FMA50.8-□□	FMB40
4200R/L	NT*□□(M/U)-FMA47.625-25, KCP-8***	BT**□□-FMA47.625-□□	FMB60
4250R/L	NT*□□(M/U)-FMA47.625-25, KCP-8***	BT**□□-FMA47.625-□□	FMB60
4315R/L	KCP-8***(Center Ring Plug)		

*□□–NT Number **□□–BT Number ***Over Milling 5

Recommended Cutting Condition

Workpiece	Cutting Condition vc(m/min)	Cutting Condition fz(mm/t)	Grades
P	150 ~ 300 120 ~ 230 100 ~ 200	0.05 ~ 0.15 0.05 ~ 0.20 0.05 ~ 0.20	NCM325 PC3500 ST30A
M	50 ~ 200 50 ~ 120	0.05 ~ 0.20 0.05 ~ 0.20	PC9530 ST30A
K	150 ~ 250 100 ~ 200	0.05 ~ 0.30 0.05 ~ 0.30	PC6510 G10

Assembling



Available Inserts

TPCN	TPKN-SM	TPKN-SU	TPKR-MX
			

TPKR-SM	TPXN-FM	TPXR-FM
		

Designation		Coated NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC8110	PD2000	Cermet CN2000	CN20	CN30	Uncoated H01	G10	ST30A	ST20	page
TPCN	2204PDR	●		●										●		●	●	●	E19
	2204PDR-G														●				
	2204PDL																●		
	2204PDSR		●																
	2204PDTR																		
	2204PDR-RH																		
	2204PDER-RH					●			●	○									
	2204PDSR-RH								●	○									
	2204PDR-S20							●											
TPKN	2204PDSR-SM						●												E19
	2204PDER-SM																		
	2204PDSR-SU					●	●	●											
	2204PDSL-SU					●													
TPKR	2204PDR-MX	●																	E19
	2204PDSR-MX		●	●															
	2204PPR-MX																		
	2204PDSR-SM																		
TPXN	2204PDSR-FM					●	●												E19
	2204PDER-FM																		
TPXR	2204PDSR-FM						●												E20

● : Stock item ○ : Under preparing for stock

• Available Inserts, see page : E19, E20
• Available Arbors and bolt : E215~E217

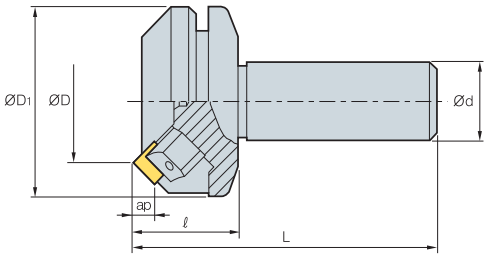
ADS4000

AA 45°

• AR : 15°
• RR : -3°







(mm)

Designation		Stock R	Stock L		ØD	ØD1	Ød	ℓ	L	ap	kg
ADS	4050R	●		3	50	75	32	40	120	6.5	1.8
	4050RS42			3	50	75	42	40	120	6.5	2.2
	4063R	●		4	63	87	32	40	120	6.5	2.3
	4063RS42			4	63	87	42	40	120	6.5	2.7

● : Stock item ○ : Under preparing for stock

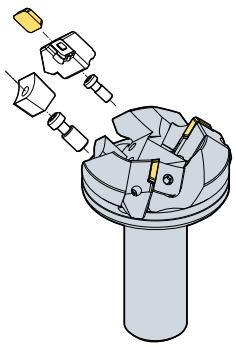
Parts

Locator	Wedge	Wedge Screw	Locator Screw	Wrench
				
LASS4R/L	WASR/L	WTX0817	LTX0512	TW25

Recommended Cutting Condition

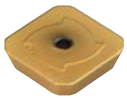
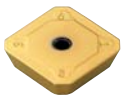
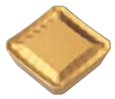
Workpiece	Cutting Condition vc(m/min)	Cutting Condition fz(mm/t)	Grades
P	150 ~ 300 120 ~ 230 100 ~ 200	0.05 ~ 0.15 0.05 ~ 0.20 0.05 ~ 0.20	NCM325 PC3500 ST30A
M	50 ~ 200 50 ~ 120	0.05 ~ 0.20 0.05 ~ 0.20	PC9530 ST30A
K	150 ~ 250 100 ~ 200	0.05 ~ 0.30 0.05 ~ 0.30	PC6510 G10

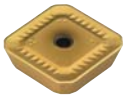
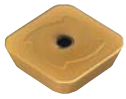
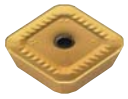
Assembling



• Available Inserts, see page : E12, E13

Available Inserts

SDCN	SDKN-SM	SDKN-SU	SDKR-MX
			

SDKR-SM	SDXN-FM	SDXR-FM
		

Designation		Coated NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	Cermet CN2000	CN20	CN30	Uncoated H01	G10	ST30A	ST20	page
SDCN	42M															●			E12
	42M-G														●				
	42MT		●										●	●			●	●	
	42MT-RH				●														
	42MT-S20							●											
	1203AEEN																		
	1203AEEN-RH																		
	1203AESN																		
	1203AESN-RH																		
SDKN	1203AESN-SM						●												E12
	1203AEEN-SM																		
	1203AESN-SU				●	●	●												
SDKR	1203AESN-MX																		E13
	1203AETN-MX																		
	1203AEN-MX	●		●															
	1203AESN-SM																		
SDXN	1203AESN-FM				●		●												E13
	1203AEEN-FM																		
SDXR	1203AESN-FM																		E13

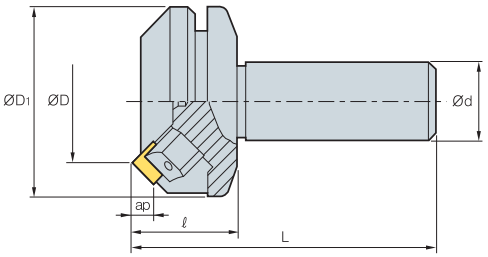
● : Stock item ○ : Under preparing for stock

ADS5000

AA 45°

• AR : 15°
• RR : -3°





(mm)

Designation		Stock R	Stock L	⊚	ØD	ØD1	Ød	ℓ	L	ap	kg
ADS	5050R	●		3	50	75	32	40	120	8.5	1.9
	5050R-S42			3	50	75	42	40	120	8.5	2.3
	5063R	●		4	63	87	32	40	120	8.5	2.4
	5063R-S42			4	63	87	42	40	120	8.5	2.8

● : Stock item ○ : Under preparing for stock

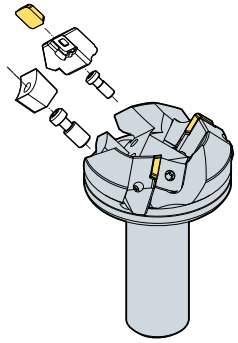
Parts

Locator	Wedge	Wedge Screw	Locator Screw	Wrench
				
LASS5R/L	WASR/L	WTX0817	LTX0512	TW25

Recommended Cutting Condition

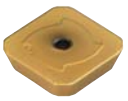
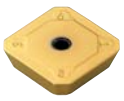
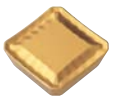
Workpiece	Cutting Condition vc(m/min)	Cutting Condition fz(mm/t)	Grades
P	150 ~ 300 120 ~ 230 100 ~ 200	0.05 ~ 0.15 0.05 ~ 0.20 0.05 ~ 0.20	NCM325 PC3500 ST30A
M	50 ~ 200 50 ~ 120	0.05 ~ 0.20 0.05 ~ 0.20	PC9530 ST30A
K	150 ~ 250 100 ~ 200	0.05 ~ 0.30 0.05 ~ 0.30	PC6510 G10

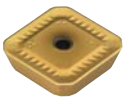
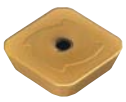
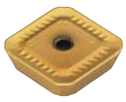
Assembling



• Available Inserts, see page : E12, E13

Available Inserts

SDCN	SDKN-SM	SDKN-SU	SDKR-MX
			

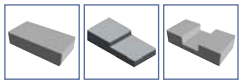
SDKR-SM	SDXN-FM	SDXR-FM
		

Designation		NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	CN2000	CN20	CN30	H01	G10	ST30A	ST20	page
		Coated										Cermet			Uncoated				
SDCN	53M															●			
	53M-G														●				
	53MT	●	●										●	●			●	●	
	53MT-RH				●														
	53MT-S20							●											E12
	1504AEEN																		
	1504AEEN-RH					●			●										
	1504AESN																		
	1504AESN-RH								●										
SDKN	1504AESN-SM						●												
	1504AEEN-SM																		E12
	1504AESN-SU				●	○	●												
SDKR	1504AESN-MX		●																
	1504AETN-MX																		E13
	1504AEN-MX	●		●															
	1504AESN-SM																		
SDXN	1504AESN-FM				●														E13
	1504AEEN-FM																		
SDXR	1504AESN-FM																		E13

● : Stock item ○ : Under preparing for stock

PES2000/3000/4000

AA 90°
• AR : 10°~15°
• RR : 2°~-3°





2000/3000 Type 4000 Type

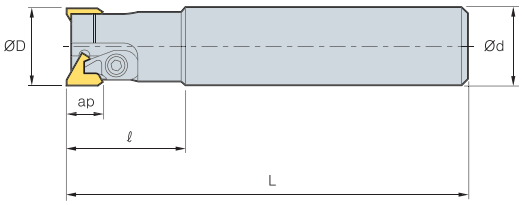


Fig. 1

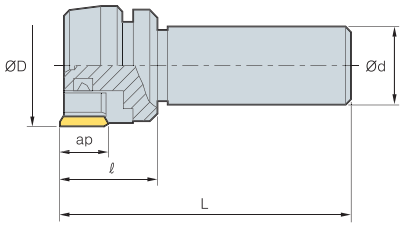


Fig. 2

(mm)

Designation		Stock R	Stock L	⊙	øD	ød	ℓ	L	ap	kg	Fig.
PES	2020R	●		2	20	20	30	110	8	0.3	1
	2025R	●		2	25	25	35	120	8	0.5	1
PES	3030R			2	30	32	45	160	13	0.9	1
	3032R	●		2	32	32	45	160	13	1.0	1
	3033R			2	33	32	45	160	13	1.1	1
	3035R			2	35	32	45	160	13	1.2	1
	3036R			2	36	32	45	160	13	1.3	1
	3040R	●		2	40	32	45	160	13	1.4	1
PES	4050R	●		3	50	32	40	120	16.5	1.2	2
	4050R-S42			3	50	42	40	120	16.5	1.5	2
	4063R	●		4	63	32	40	120	16.5	1.5	2
	4063R-S42			4	63	42	40	120	16.5	1.8	2

● : Stock item ○ : Under preparing for stock

Parts

	Locator	Wedge	Wedge Screw	Locator Screw
				
2000 Type	-	-	-	CHX0407
3000 Type	-	-	-	CHX0510
4000 Type	LPTS4R/L	WPTSR	DHA0815	LTX0512
	Wrench		Clamp	Ring
				
2000 Type	HW25L	-	CH4R1	ER03
3000 Type	HW30L	-	CH5R1	ER04
4000 Type	-	HW40	-	-

Recommended Cutting Condition

Workpiece	Cutting Condition vc(m/min)	Cutting Condition fz(mm/t)	Grades
P	150 ~ 300 120 ~ 230 100 ~ 200	0.05 ~ 0.15 0.05 ~ 0.20 0.05 ~ 0.20	NCM325 PC3500 ST30A
M	50 ~ 200 50 ~ 120	0.05 ~ 0.20 0.05 ~ 0.20	PC9530 ST30A
K	150 ~ 250 100 ~ 200	0.05 ~ 0.30 0.05 ~ 0.30	PC6510 G10

Available Inserts

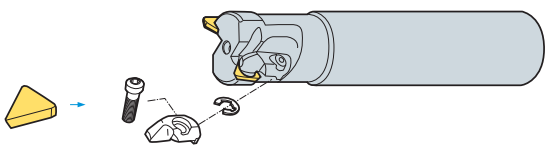
TECN TEEN



Type	Designation	Coated NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	Cermet CN2000	CN20	CN30	Uncoated H01	G10	ST30A	ST20	page
2000 Type	TECN 22R															●			E18
	22TR													●			●		
3000 Type	TECN 32R															●			E18
	32TR							●											
	32TR-S20																		
4000 Type	TEEN 43R															●			E18
	43R-G														●				
	43TR	●	●						●			●		●			●	●	
	43TR-S20							●											
	43TR-Z																●		
	43TR-ZH				●			●											

● : Stock item ○ : Under preparing for stock

Assembling



• Available Inserts, see page : E18

AFO(M)4000/5000

AA 45°
• AR : 15°
• RR : 5°



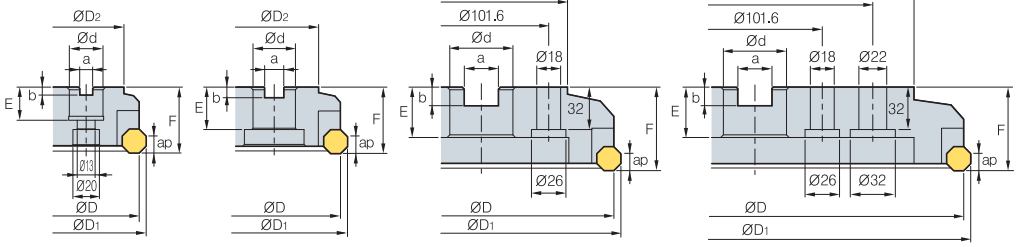


Fig. 1 Fig. 2 Fig. 3 Fig. 4

(mm)

Designation		Stock R	Stock L	⚙	ØD	ØD1	ØD2	Ød	a	b	E	F	ap	kg	Fig.
AFO(M)	4080R/L	(•)		5	80	88	60	25.4(27)	9.5(12.4)	6(7)	25(22)	50	6.5	1.4	1
	4100R/L	(•)		6	100	108	80	31.75(32)	12.7(14.4)	8(8)	32(28)	50	6.5	2.0	1
	4125R/L	(•)		8	125	133	100	38.1(40)	15.9(16.4)	10(9)	38(30)	63	6.5	3.1	1
AFO(M)	5080R/L	•(•)		5	80	91	60	25.4(27)	9.5(12.4)	6(7)	25(22)	50	9.5	1.4	1
	5100R/L	•(•)		6	100	111	80	31.75(32)	12.7(14.4)	8(8)	32(28)	50	9.5	2.0	2
	5125R/L	•(•)		8	125	136	100	38.1(40)	15.9(16.4)	10(9)	38(30)	63	9.5	3.1	2
	5160R/L	•(•)		10	160	171	120	50.8(40)	19.0(16.4)	11(9)	38(30)	63	9.5	5.2	2
	5200R/L	•(•)		12	200	211	130	47.625(60)	25.4(25.7)	13.5(14)	38(38)	63	9.5	7.5	3
	5250R/L	(•)		16	250	261	180	47.625(60)	25.4(25.7)	13.5(14)	38(38)	63	9.5	16.1	3
	5315R/L	(•)		20	315	326	240	47.625(60)	25.4(25.7)	13.5(14)	38(38)	63	9.5	22.8	4

• ( )Metric Size

● : Stock item ○ : Under preparing for stock

Parts

	Locator	Wedge	Wedge Screw	Screw	Wrench	
4000 Type	LAF04R/L	WAFO4R/L	DHA0815	FTKA0408	TW15S	-
5000 Type	LAF05R/L LAF05R*/L-1*	WEFR/L	DHA0821F	LTX0512	-	HW40

* : Ø80 ~ Ø100

Available Arbors

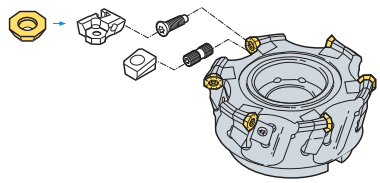
Designation		General Arbor	NC Arbors AFO	NC Arbors AFOM
AFO(M)	4080R/L	NT*□□(M/U)-FMA25.4-25	BT**□□-FMA25.4-□□	FMC27
	4100R/L	NT*□□(M/U)-FMA31.75-□□	BT**□□-FMA31.75-□□	FMC32
	4125R/L	NT*□□(M/U)-FMA38.1-□□	BT**□□-FMA38.1-□□	FMB40
AFO(M)	5080R/L	NT*□□(M/U)-FMA25.4-25	BT**□□-FMA25.4-□□	FMC27
	5100R/L	NT*□□(M/U)-FMA31.75-□□	BT**□□-FMA31.75-□□	FMC32
	5125R/L	NT*□□(M/U)-FMA38.1-□□	BT**□□-FMA38.1-□□	FMB40
	5160R/L	NT*□□(M/U)-FMA50.8-□□	BT**□□-FMA50.8-□□	FMB40
	5200R/L	NT*□□(M/U)-FMA47.625-25, KCP-8***	BT**□□-FMA47.625-□□	FMB60
	5250R/L	NT*□□(M/U)-FMA47.625-25, KCP-8***	BT**□□-FMA47.625-□□	FMB60
	5315R/L	KCP-8***(Center Ring Plug)		

*□□—NT Number **□□—BT Number ***Over Milling 5

Recommended Cutting Condition

Workpiece	Cutting Condition vc(m/min)	Cutting Condition fz(mm/t)	Grades
P	150 ~ 300 120 ~ 230 100 ~ 200	0.05 ~ 0.15 0.05 ~ 0.20 0.05 ~ 0.20	NCM325 PC3500 ST30A
M	50 ~ 200 50 ~ 120	0.05 ~ 0.20 0.05 ~ 0.20	PC9530 ST30A
K	150 ~ 250 100 ~ 200	0.05 ~ 0.30 0.05 ~ 0.30	PC6510 G10

Assembling



Available Inserts

OFCW OFKT-MF OFKT-MM OFKT-MA OFCN



OFKR-MF OFKR-MM OFKR-MA REKR-MM



Type	Designation	Coated NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	Cermet CN2000	CN20	CN30	Uncoated H01	G10	ST30A	ST20	page
4000 Type	OFCW 05T3SN																		E9
	05T3FN																		
	05T308FN																		
	OFKT 05T3SN-MF	●	●																E10
	05T308SN-MF																		
	05T3SN-MM	●	●		●			●											
	05T308SN-MM																		
	05T3FN-MA														●				
	05T3EN-MA																		
5000 Type	OFCN 0704SN				●		●		●										E9
	0704FN																		
	070408SN																		
	070408FN																		
	OFKR 0704SN-MF	●	●		●	●													E10
	070408SN-MF																		
	0704SN-MM	●	●		●		●	●	●										
	070408SN-MM	●																	
	0704FN-MA														●				
	0704EN-MA																		
	OFKT 0704SN-MM	●																	E10
	0704FN-MA														●				
	0704EN-MA																		
	REKR 170400-MM																		E12

● : Stock item ○ : Under preparing for stock

• Available Inserts, see page : E9, E10, E12
• Available Arbors and bolt : E215~E217

Power buster

Code system

PB	A	M	5	100	R/L	–	M
Power Buster	Approach angle	Arbor type	Insert I/C	Tool diameter	Hand of tool		No, of tooth
Power buster	A : 45° Z : 80°	M : Metric I : Inch	5 : 15,875mm	ØD : 100mm	R : Right L : Left		Unmarked: Coarse pitch M : Close pitch

Features

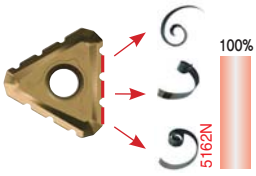
- New generation, new concept tool 'Power Buster; applied special design of 'Nick edge' to reduce cutting load approximately 20%
- Nick edge divides chips into small pieces and also make good chip control. It reduces interference of cutter and guarantees good duration of the cutter
- Double-sided 6 corner insert geometry ensures high rigidity, long tool life and low cost
- AA (approach angle) : 45° and 80° available (same insert used)
- Application : High depth of cut and feed rate(Steel, Cast iron)

Features of Insert

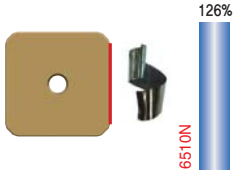
Comparison of chip control and cutting force

Work piece : 24CrMo4, vc=200m/min, ap=8mm, ae=90mm, fz=0.3mm/t

Power Buster



ISO milling insert

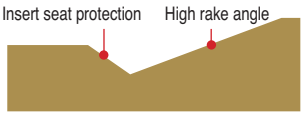


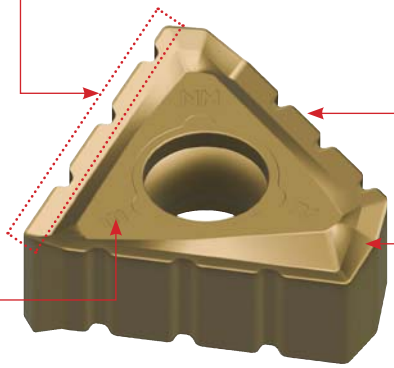
Major cutting edge

- Low cutting load
- Ideal chip control and divided small pieces of chip evacuation
- IDouble sided 6 corner insert
- Ideal edge design for Steel and Cast iron rough milling

Chip breaker

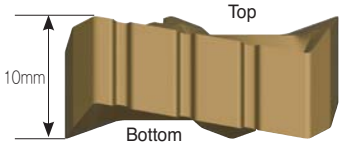
- High rake angle for low cutting force
- Good chip flow at various feed and depth of cut
- Protecting insert seat area for precise mounting





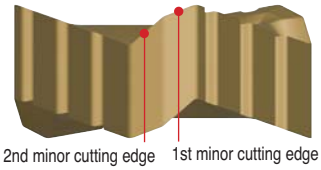
Top & Bottom side

- Balanced insert design for stable mounting
- Thick insert (more than 2 times comparing normal insert) guarantees high rigidity



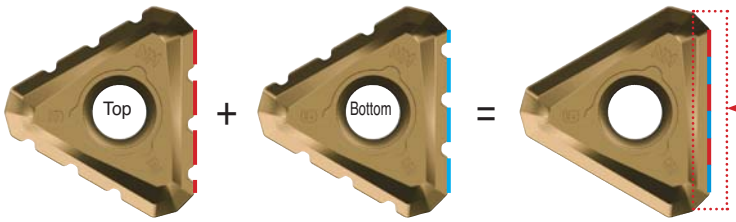
Minor cutting edge

- High rake angle to avoid interference with chip
- Calculated minor cutting edge angel for both AA 45° & 80° cutter



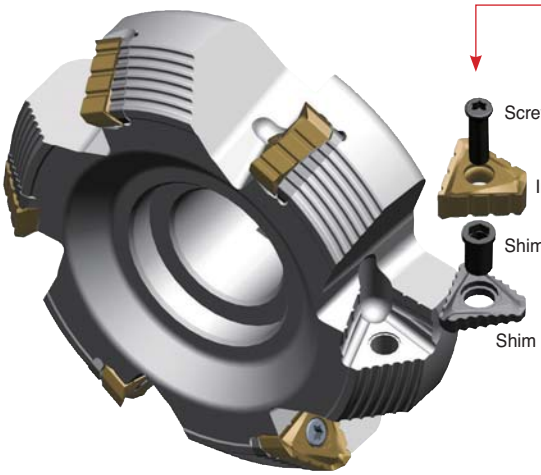
2 in 1 system

Cutting edge on the both side of insert covers all overlapped cutting area



Perfected cutting edge by using 2 different side of cutting edge

Features of Cutter



screwon clamping system

Simple and strong screwon clamping system



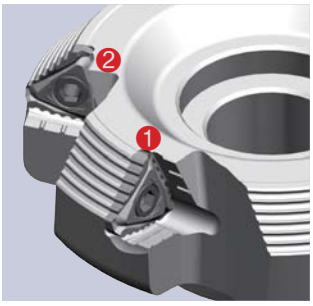
Better rigidity & Stable Assembly system

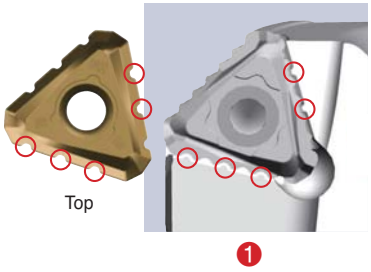
- Strong clamping system- Protect cutter from damage.-High accuracy due to ground shim

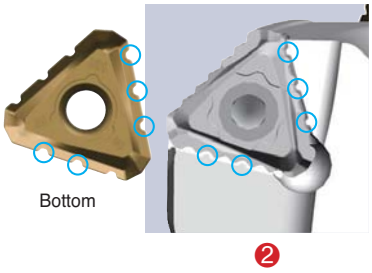


Mounting guide according to nick design

Mounting guide nick serration located at side part of mounting seat for both side insert using

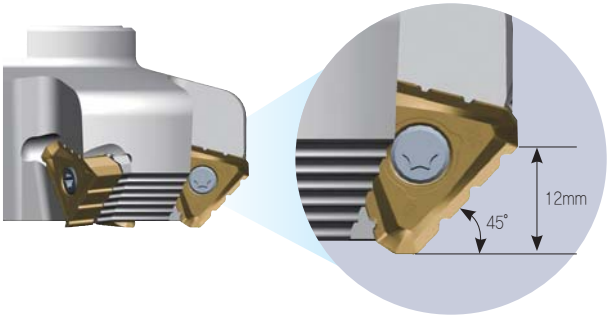




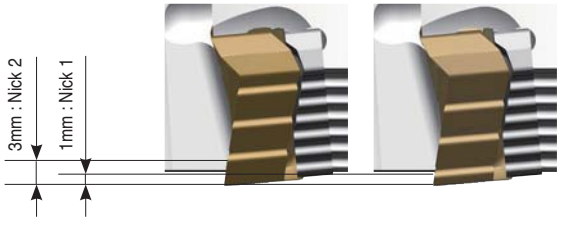


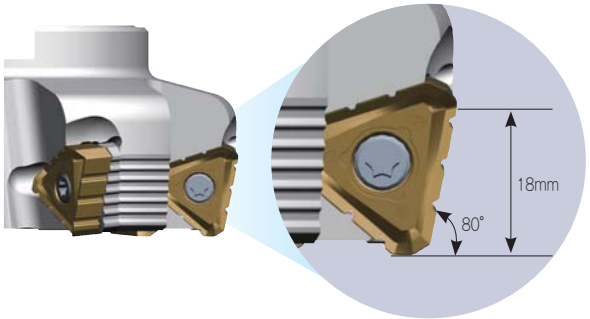
Multi edge system

Insert design for being used with AA 45° & 80° cutter

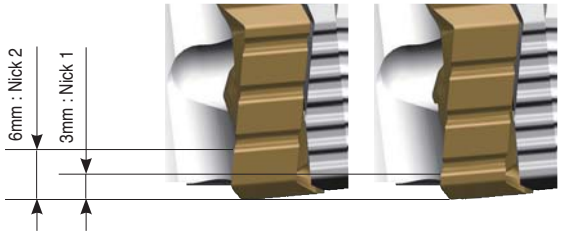


The nicks are effective with a depth of cut larger than 1mm





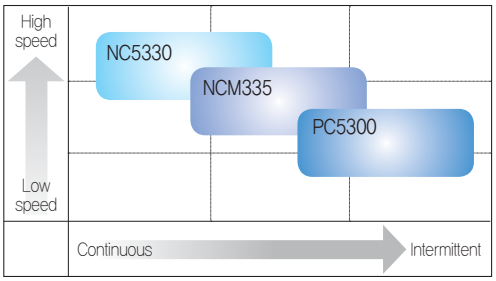
The nicks are effective with a depth of cut larger than 3mm



Recommended cutting condition

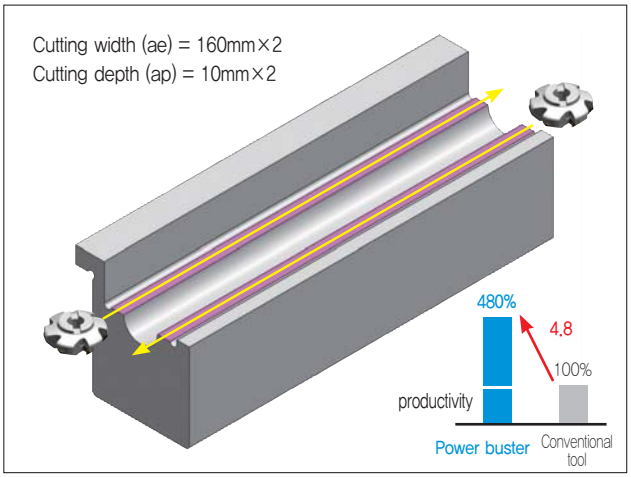
ISO	Workpiece	NC5330	MCM335	PC5300
		fz (mm/t)		
		0.1–0.2–0.3	0.1–0.2–0.3	0.1–0.2–0.3
		vc (m/min)		
P	Carbon steel	300–250–200	280–230–180	250–200–160
P	Alloy steel	250–210–180	230–180–150	180–150–120
P	Die steel	180–150–130	160–130–110	140–120–100
K	Gray cast iron	280–220–180	250–200–160	220–180–150
K	Malleable cast iron	250–200–160	230–180–150	180–150–130
K	Nodular cast iron	230–180–150	210–160–130	160–120–120

Grade as per cutting speed and interruption



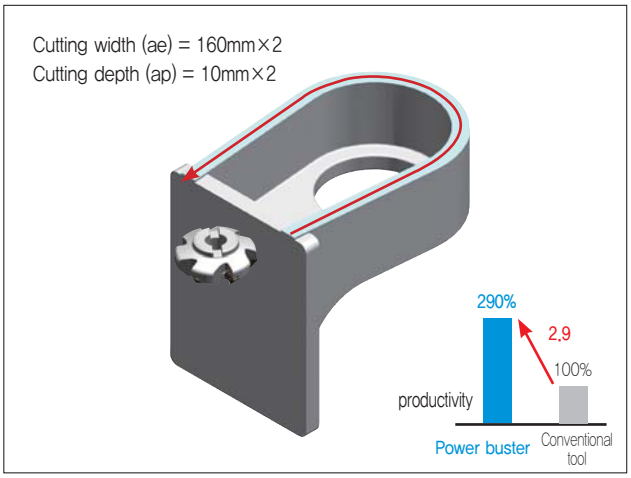
Power Buster Test

■ Cylinder block for ship engine (Cast iron)



Item	Power Buster	Conventional tool
Diameter(ØD)	200mm	200mm
⊙	12 tooth	12 tooth
Grade	NC9025	PVD coating for Cast iron
vc	170m/min	130m/min
rpm	270/min	207/min
fz	0.24mm/t	0.16mm/t
vf	780mm/min	400mm/min
ap	10mm x 2 passes	4mm x 5 passes
min	28.2min/ea	137.5min/ea
4.8 times productivity increased		• One-sided 4 corner insert(Without nick)AA 45° cutter

■ Heavy machinery part (Alloy steel)



Item	Power buster	Conventional tool
Diameter(ØD)	125mm	100mm
⊙	8 tooth	8 tooth
Grade	NCM335	PVD coating for Cast iron
vc	180m/min	150m/min
rpm	458/min	477/min
fz	0.15mm/t	0.10mm/t
vf	550mm/min	382mm/min
ap	5mm x 2 passes	2.5mm x 4 passes
min	5min/ea	14.7min/ea
2.9 times productivity increased		•Double-sided 8 corner insert(Without nick)AA 45° cutter

PBA 5000

New

AA 45°

• AR : -5°
• RR : -11°



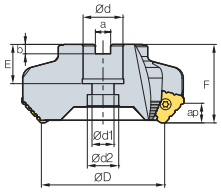


Fig. 1

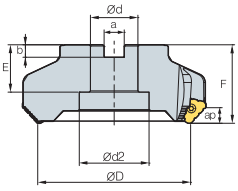


Fig. 2

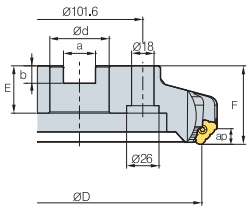


Fig. 3

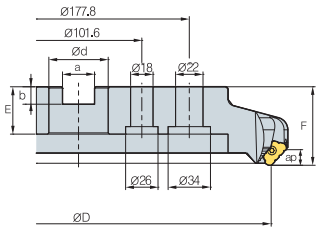


Fig. 4

(mm)

Designation		Stock R	Stock L	⚙	øD	ød	ød1	ød2	a	b	E	F	ap	Fig.
PBA(M)	5080R/L			4	80	25.4(27)	14	20	9.5(12.4)	6(7)	25(22)	50	12	1
	5100R/L			4	100	31.75(32)	-	45	12.7(14.4)	8(8)	32(28)	50	12	2
	5125R/L			6	125	38.1(40)	-	56	15.9(16.4)	10(9)	38(32)	63	12	2
	5160R/L			8	160	50.8(40)	-	100	19(16.4)	11(9)	38(32)	63	12	2
	5200R/L			10	200	47.625(60)	-	-	25.4(25.7)	14(14)	38(38)	63	12	2
	5250R/L			12	250	47.625(60)	-	-	25.4(25.7)	14(14)	38(38)	63	12	3
	5315R/L			14	315	47.625(60)	-	-	25.4(25.7)	14(14)	38(38)	63	12	4
PBA(M)	5080R/L-M			6	80	25.4(27)	14	20	9.5(12.4)	6(7)	25(22)	50	12	1
	5100R/L-M			6	100	31.75(32)	-	45	12.7(14.4)	8(8)	32(28)	50	12	2
	5125R/L-M			8	125	38.1(40)	-	56	15.9(16.4)	10(9)	38(32)	63	12	2
	5160R/L-M			10	160	50.8(40)	-	100	19(16.4)	11(9)	38(32)	63	12	2
	5200R/L-M			12	200	47.625(60)	-	-	25.4(25.7)	14(14)	38(38)	63	12	2
	5250R/L-M			14	250	47.625(60)	-	-	25.4(25.7)	14(14)	38(38)	63	12	3
	5315R/L-M			16	315	47.625(60)	-	-	25.4(25.7)	14(14)	38(38)	63	12	4

● : Stock item ○ : Under preparing for stock

Parts

Screw	Shim	Shim Screw	Wrench
			
FTGA0518	ST53AZR	SHXN0712F	TW20-100

Available Inserts

TNMX-NM



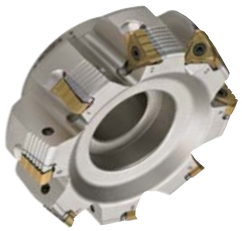
Designation	Coated NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	Cermet CN2000	CN20	CN30	Uncoated H01	G10	ST30A	ST20	page
TNMX 2710AZNR-NM	●	○	○	○													E19
2710AZNL-NM																	

• Available Inserts, see page : E19
• Available Arbors and bolt : E215~E217

PBZ 5000

New

AA 80° | • AR : −5° • RR : −12°



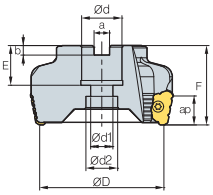


Fig. 1

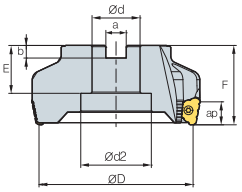


Fig. 2

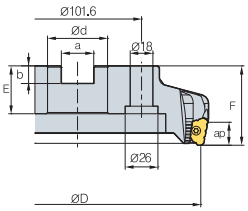


Fig. 3

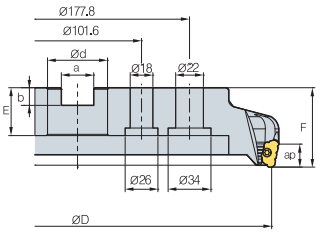


Fig. 4

(mm)

Designation		Stock R	Stock L	⊚	ØD	Ød	Ød1	Ød2	a	b	E	F	ap	Fig.
PBZ(M)	5080R/L			4	80	25.4(27)	14	20	9.5(12.4)	6(7)	25(22)	50	18	1
	5100R/L			4	100	31.75(32)	-	45	12.7(14.4)	8(8)	32(28)	50	18	2
	5125R/L			6	125	38.1(40)	-	56	15.9(16.4)	10(9)	38(32)	63	18	2
	5160R/L			8	160	50.8(40)	-	100	19(16.4)	11(9)	38(32)	63	18	2
	5200R/L			10	200	47.625(60)	-	-	25.4(25.7)	14(14)	38(38)	63	18	2
	5250R/L			12	250	47.625(60)	-	-	25.4(25.7)	14(14)	38(38)	63	18	3
	5315R/L			14	315	47.625(60)	-	-	25.4(25.7)	14(14)	38(38)	63	18	4
PBZ(M)	5080R/L-M			6	80	25.4(27)	14	20	9.5(12.4)	6(7)	25(22)	50	18	1
	5100R/L-M			6	100	31.75(32)	-	45	12.7(14.4)	8(8)	32(28)	50	18	2
	5125R/L-M			8	125	38.1(40)	-	56	15.9(16.4)	10(9)	38(32)	63	18	2
	5160R/L-M			10	160	50.8(40)	-	100	19(16.4)	11(9)	38(32)	63	18	2
	5200R/L-M			12	200	47.625(60)	-	-	25.4(25.7)	14(14)	38(38)	63	18	2
	5250R/L-M			14	250	47.625(60)	-	-	25.4(25.7)	14(14)	38(38)	63	18	3
	5315R/L-M			16	315	47.625(60)	-	-	25.4(25.7)	14(14)	38(38)	63	18	4

● : Stock item ○ : Under preparing for stock

Parts

Screw	Shim	Shim Screw	Wrench
			
FTGA0518	ST53AZR	SHXN0712F	TW20-100

Available Inserts

TNMX-NM



Designation	Coated NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	Cermet CN2000	CN20	CN30	Uncoated H01	G10	ST30A	ST20	page
TNMX 2710AZNR-NM	●	○	○	○													E19
2710AZNL-NM																	

• Available Inserts, see page : E19 ● : Stock item ○ : Under preparing for stock
• Available Arbors and bolt : E215~E217

Rich Mill Code System

RM16	A	C	M	4	100	H	R	–	M
RM4 : Number of edges–4 RM8 : Number of edges–8 RM16 : Number of edges–16 RMT8 : Number of edges–8 (Latch Clamp)	Approach angle A : 45 ° D : 30 ° E : 15 ° F : 5 ° P : 0 ° Q : 2 °	Tool type C :Cutter S :Shank	M :Metric A : Inch	I/C size of insert 3 : 9.525 4 : 12.7 5 : 15.875	Tool diameter Ø100	Coolant type H : Thru–Hole Unmarked : No Thru–Hole	Hand of tool R : Right L : Left		Pitch type M : Close H : Extra Close

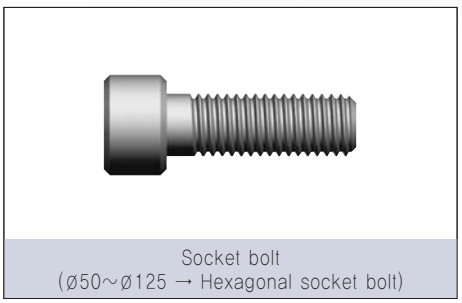
Features

- Rich mill series is one of innovations that provides more available cutting edges by double sided insert and longer tool life for our customers
- The unique geometry and special cutting edge guarantee low cutting load and long tool life
- Rich mill series has a wide application range from steel and stainless steel to cast iron and aluminum
- Applying negative insert makes it stronger and long tool life
- Rich mill series has both screw on clamping system and latch clamping system

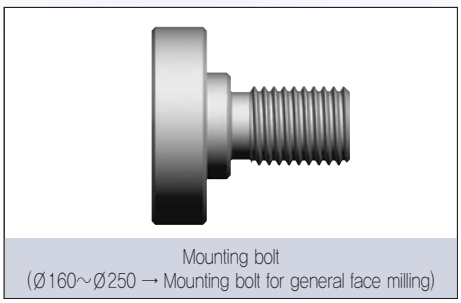


Rich Mill Clamping bolt





Socket bolt
(ø50~ø125 → Hexagonal socket bolt)



Mounting bolt
(Ø160~Ø250 → Mounting bolt for general face milling)

Rich Mill RM8

Double sided insert to use 8 cutting edges

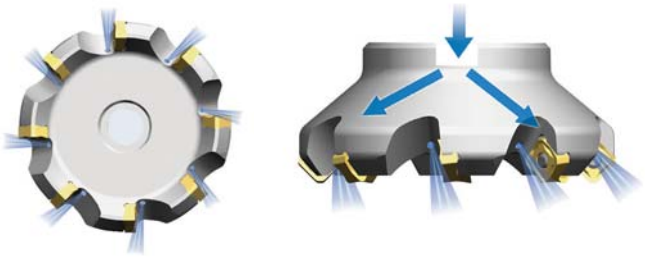
- Innovative double sided insert makes it possible to use 8 cutting edges. It is more economical than conventional single sided insert
- The unique geometry and high rake angle of cutting edge guarantee excellent surface finish. Applicable for various workpiece like steel, stainless steel, cast iron, aluminum
- Combination with the innovative geometry and various grades provide developed durability and excellent tool life
- Various pitches and chip breakers can be applicable for diverse machining.
- Light Rich mill cutter can be useful for high speed machining and low power machine




Facing

Through coolant system

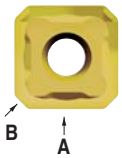
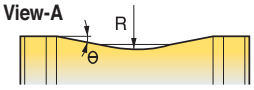
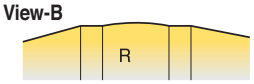
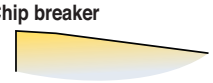
- Exclusive coolant bolt is adapted to get better chip evacuation and more powerful cooling. To get optimal chip evacuation, the direction of coolant injection has been designed to reach to each cutting edge directly. but through coolant arbor is necessary


Through coolant system for decreasing cutting heat and good chip evacuation

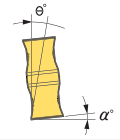
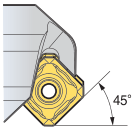
Chip breaker

Insert		Cutting edge	Features
For aluminum MA			Due to sharp cutting edge and buffed surface, it has good chip flow and welding resistance
Light cutting MF			Due to low cutting load, it is good for light cutting and difficult-to-cut material
General cutting MM			It is suitable design for general milling
Wiper W			Specialized edge design can be suitable for excellent surface roughness operation

Features of insert

Insert	Cutting edge	Features
	View-A 	High rake chip breaker & positive setting angle for low cutting load
	View-B 	Designed wiper technology in minor cutting edge for improved surface roughness
	Chip breaker 	Low cutting load due to the positive setting and high rake angle chip breaker

Features of cutter

Shape	Cutting edge	Features
		High rake angle makes positive setting angle for low cutting load
		Suitable for facing and chamfering •RM8A A=45° •RM8E A=75° •RM8Q A=88°

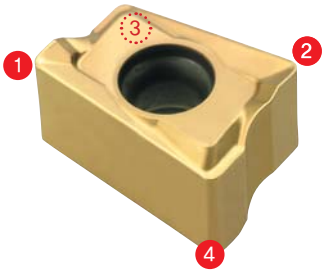
Recommended Cutting Condition

ISO	Grade	SNM(E)X1206A(E)NN-MF		SNM(E)X1206A(E)NN-MM		SNEX1206A(E)NN-MA		Max-ap	SNM(E)X1507A(E)NN-MF		SNM(E)X1507A(E)NN-MM		Max-ap
		vc(m/min)	fz(mm/t)	vc(m/min)	fz(mm/t)	vc(m/min)	fz(mm/t)		vc(m/min)	fz(mm/t)	vc(m/min)	fz(mm/t)	
P	NC5330	-	-	150~300	0.1~0.35	-	-	RM8A 6.0mm RM8E 9.0mm RM8Q 11.5mm	-	-	150~300	0.1~0.35	RM8A 7.5mm RM8E 11mm
P	NCM325	200~300	0.05~0.3	150~300	0.1~0.35	200~350	0.03~0.25		200~300	0.05~0.3	150~300	0.1~0.35	
P	PC3500	200~300	0.05~0.3	150~300	0.1~0.35	200~350	0.03~0.25		200~300	0.05~0.3	150~300	0.1~0.35	
K	PC6510	150~300	0.08~0.35	150~300	0.1~0.4	-	-		150~300	0.08~0.35	150~300	0.1~0.4	
K	PC5300	150~300	0.08~0.35	150~300	0.1~0.4	-	-		150~300	0.08~0.35	150~300	0.1~0.4	
M	PC9530	100~180	0.05~0.3	120~180	0.1~0.35	120~200	0.03~0.2		-	-	-	-	
M	PC5300	-	-	-	-	-	-		100~180	0.05~0.3	120~180	0.1~0.35	

Rich Mill RM4

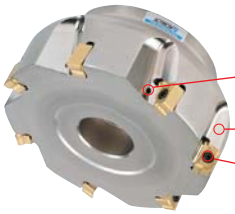
Economical 4 cutting edges by using double-sided insert

- RM4,as a multi functional milling tool, offers economical 4 cutting edges by using innovative double-sided insert
- Special designed chip breaker consists of high rake angle and strong cutting edge decreases the cutting load
- RM4 is multi functional tool can cover facing, side cutting, shouldering, slotting, ramping & helical cutting
- Optimal matching of the special cutting edge geometry with variety of new grades provides consistence & long tool life of insert



Features

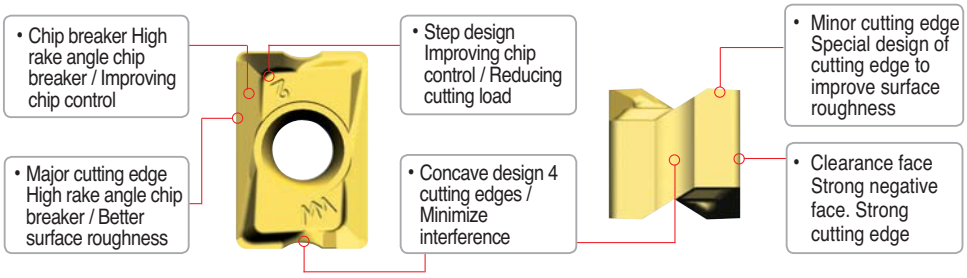
- 4 cutting edges can be used by using double-sided insert
- High rake angle chip breaker and cutting edge can make smooth cutting with low cutting load
- Strong negative insert
- High efficiency, high economy, multi functional tool



- Through coolant system Longer tool life due to direct cooling injection into the cutting edge of insert
- Wide chip pocket for better chip evacuation
- Simple screw on system

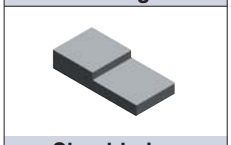
Inserts

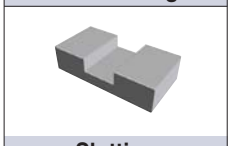
- Double-sided insert using 4 cutting edges
- High rake angle chip breaker, cutting edge
- Flexibility of product
- High efficiency, high economy, multi functional tool
- Negative insert has strong cutting edge



Uses


Facing

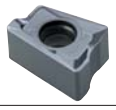

Shouldering


Slotting

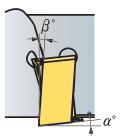
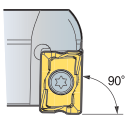

Ramping


Helical cutting

Chip breaker

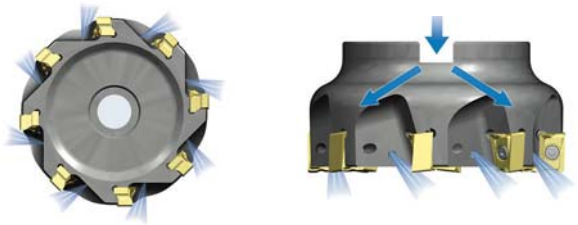
Insert		Cutting edge	Features
알루미늄용 저절삭용 MA			With sharp edge application the better productivity has been accomplished ,especially for Aluminum or low force cut
Light cutting **MF**			Due to low cutting load, it is good for light cutting and difficult-to-cut material.
General cutting **MM**			It is suitable design for general milling.

Setting configuration

Insert	Setting angle of insert	Features
		High rake chip breaker & positive setting angle for low cutting load → Improving machinability
		Multi applications for facing, shouldering, slotting, ramping, helical cutting, etc

Through coolant system

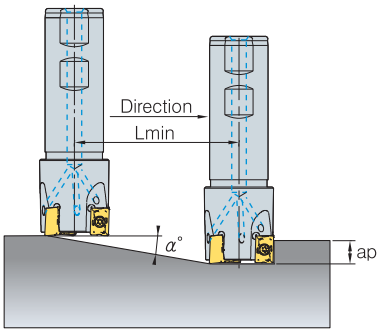
- By using exclusive coolant bolt(hexagonal socket bolt) powerful cooling & better chip evacuation can be acquired. To get optimal chip control, the direction of coolant injection has been designed to reach to each cutting edge directly. (through coolant arbor is necessary)



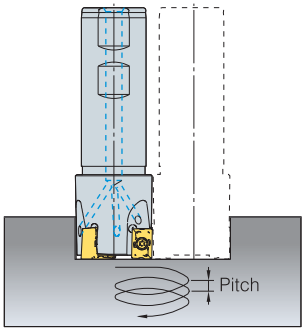
Through coolant system for decreasing cutting heat and good chip evacuation

Ramping and Helical cutting

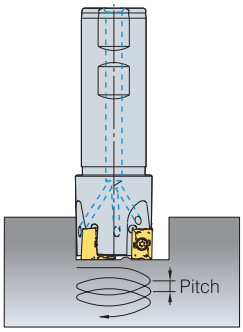
1. Ramping



2. Helical cutting for blind hole



3. Helical cutting for through hole



1. Ramping				2. Helical cutting for blind hole				3.Helical cutting for through hole	
Designation	D	α°	Lmin	Maximum Hole Diameter	Maximum Pitch	Minimum Hole Diameter	Maximum Pitch	Minimum Hole Diameter	Maximum Pitchv
RM4PS3014HR	14	5	114	27	3	25	2.5	19	1.0
RM4PS3016HR	16	4	143	31	3	29	2.0	23	1.0
RM4PS3018HR	18	4	143	35	3	33	3.0	27	2.0
RM4PS3020HR	20	4	143	39	4	37	3.0	31	2.0
RM4PS3025HR	25	3.5	163	49	4	47	4.0	41	3.0
RM4PS3032HR	32	3	191	63	4.5	61	4.0	55	3.5
RM4PS3040HR	40	2	286	79	4	77	3.5	71	3.0
RM4PS3050HR	50	1.5	382	99	3.5	97	3.5	91	3.0
RM4PC(M)3040HR	40	2	286	79	4	77	4.0	71	3.0
RM4PC(M)3050HR	50	1.5	382	99	3.5	97	3.5	91	3.0
RM4PC(M)3063HR	63	1	573	125	3	123	3.0	117	2.5
RM4PC(M)3080HR	80	1	573	159	4	157	4.0	151	3.5
RM4PCM3100HR	100	0.5	1146	199	2	197	2.0	191	2.0
RM4PS4032HR	32	2.5	229	62	4	59.5	3.0	49	2.0
RM4PS4040HR	40	2.0	286	78	4	75.5	3.0	65	2.0
RM4PS4050HR	50	2.0	286	98	5	95.5	4.0	85	3.5
RM4PS4063HR	63	2.0	286	124	5	121.5	5.0	111	5.0
RM4PC(M)4050HR	50	2.0	286	98	5	95.5	4.0	85	3.5
RM4PC(M)4063HR	63	2.0	286	124	5	121.5	5.0	111	5.0
RM4PC(M)4080HR	80	1.5	382	158	5	155.5	5.0	145	5.0
RM4PCM4100HR	100	1.0	573	198	5	195.5	4.5	185	4.0
RM4PC(M)4125HR	125	1.0	573	248	5	245.5	5.0	235	5.0
RM4PC(M)4160R	160	0.5	1146	318	4	315.5	3.5	305	3.5

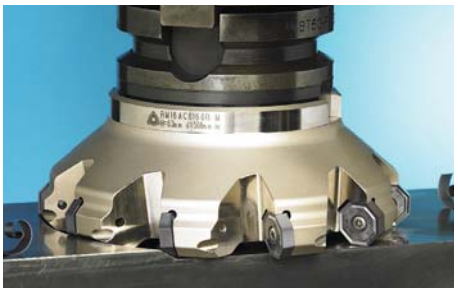
The Lmin is when depth of cut is 10.0mm (Lmin = 10/tan α)

Recommended Cutting Condition

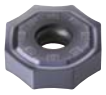
ISO	Grade	LNM(E)X100605PNR-MF		LNM(E)X100605PNR-MM		LNEX100605PNR-MA		Max-ap	LNM(E)X151008PNR-MF		LNM(E)X151008PNR-MM		LNEX151008PNR-MA		Max-ap
		vc(m/min)	fz(mm/t)	vc(m/min)	fz(mm/t)	vc(m/min)	fz(mm/t)		vc(m/min)	fz(mm/t)	vc(m/min)	fz(mm/t)	vc(m/min)	fz(mm/t)	
P	NCM325	-	-	-	-	-	-	9.0mm	150~300	0.05~0.3	120~300	0.05~0.35	150~300	0.03~0.2	14.0mm
P	PC3500	150~300	0.05~0.25	120~300	0.05~0.3	150~300	0.03~0.2		150~300	0.05~0.3	120~300	0.05~0.35	150~300	0.03~0.2	
K	PC6510	150~300	0.08~0.3	120~300	0.08~0.35	-	-		150~300	0.08~0.35	120~300	0.08~0.35	-	-	
M	PC5300	120~180	0.05~0.25	100~180	0.05~0.3	120~200	0.03~0.2		120~180	0.05~0.3	100~180	0.05~0.3	120~200	0.03~0.2	

Rich Mill RM16

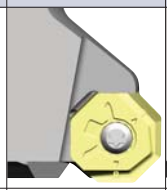
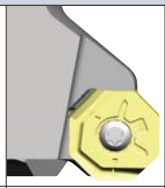
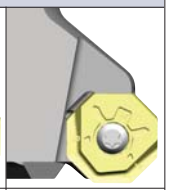
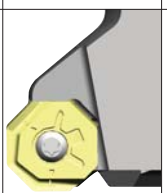
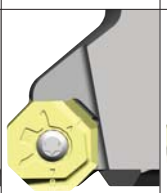
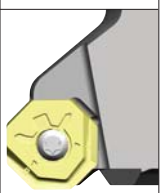
- Economical 16 cutting edges
- It can reduce cost in medium cutting
- Wiper insert can be used for good surface roughnes
- Optimal matching of the special cutting edge geometry with variety of new grades provides consistence & long tool life of insert
- When it is used 16 corners, maximum cutting depth is 5.5mm, but it is used 8 corners, maximum cutting depth is 13mm
- Wiper insert is placed 0.05mm lower than facing insert in cutter
- When feed is bigger than wiper cutting edge length(7mm), 2 wiper inserts are placed in symmetrical position



Chip breaker

Insert		Cutting edge	Features
Aluminum Cutting Light MA			With sharp edge application the better productivity has been accomplished ,especially for Aluminum cutting
Light cutting **MF**			Due to low cutting load, it is good for light cutting and difficult-to-cut material
General cutting **MM**			It is suitable design for general milling
Wiper **W**			It has good surface roughness than MM,MF chip breaker

Instruction for wiper insert

Hand of tool	Correct setting	Incorrect setting			
Right hand					
판정	○	×	×	×	×
Left hand					
판정	○	×	×	×	×

Through coolant system

- Well designed chip pocket for better chip flow
- Through coolant system reduces cutting heat and improves chip evacuation



Recommended Cutting Condition

ISO	Grade	ONM(H)X060608-MM		ONM(H)X060608-MF		ONHX060608-W		ONM(H)X080608-MM		ONM(H)X080608-MF		ONHX080608-W	
		vc(m/min)	fz(mm/t)	vc(m/min)	fz(mm/t)	vc(m/min)	fz(mm/t)	vc(m/min)	fz(mm/t)	vc(m/min)	fz(mm/t)	vc(m/min)	fz(mm/t)
P	NCM325	150~300	0.1~0.35	200~300	0.05~0.3	200~300	0.05~0.2	150~300	0.1~0.4	200~300	0.05~0.35	200~300	0.05~0.25
P	PC3500	150~300	0.1~0.35	200~300	0.05~0.3	200~300	0.05~0.2	150~300	0.1~0.4	200~300	0.05~0.35	200~300	0.05~0.25
P	PC3535	120~250	0.1~0.35	150~250	0.05~0.3	150~250	0.05~0.2	120~250	0.1~0.4	150~250	0.05~0.35	150~250	0.05~0.25
M	PC5300	120~180	0.1~0.35	100~180	0.05~0.3	100~180	0.05~0.2	120~180	0.1~0.4	100~180	0.05~0.35	100~180	0.05~0.25
K	PC6510	150~300	0.1~0.4	150~300	0.08~0.35	150~300	0.05~0.25	150~300	0.1~0.45	150~300	0.08~0.4	150~300	0.05~0.3

Rich Mill RMT8

New generation clamping system

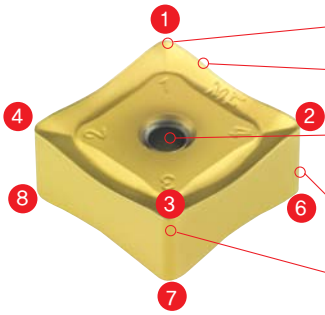
- New latch clamping system ensures the powerful cutting force and easy to insert change
- New grades with chipping resistance provides good surface roughness and better tool life
- Due to the specially designed chip breaker, all operations are possible
- RMT with various pitches can replace conventional ISO milling tool

Features of RMT



- High rigidity cutter body to improve durability
- New latch clamping system ensures the powerful cutting force and easy to insert change
- The chip pocket design of 3-dimensional for smooth chip control
- Economical 8 corners by using double-sided insert

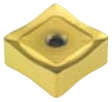
Features of RMT insert(using R/L)



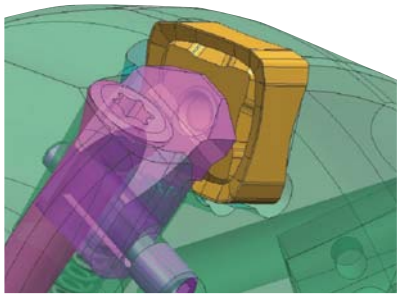
- Economical 8 corners
- Low cutting load due to high rake angle chip breaker
- The chamber shape for stable clamping
- Coated grades with improved chipping resistance
- Optimal design of minor cutting edge to use in R/L cutting type

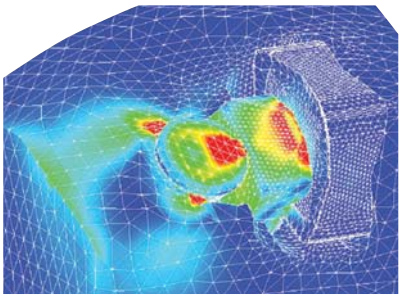
Good surface roughness

Clamping force analysis

Insert		Cutting edge	Features
Fine finishing MF			Our specialized insert design aimed for low cutting force is suitable for light cutting, HRSA
Streng then MM			Suitable geometry design for general milling has wider ranges of machining

Clamping force analysis





Recommended grades and chip breakers

ISO	Grade	MM	MF
P	NCM325		○
	PC3500		○
	PC3545		○
M	PC5300		◎
K	PC6510		◎

◎ : Optimum ○ : Proper

Recommended cutting condition

ISO	Grade	MM		MF	
		vc(m/min)	fz(mm/t)	vc(m/min)	fz(mm/t)
P	NCM325	150~300	0.05~0.3	150~300	0.05~0.2
	PC3500	150~300	0.05~0.3	150~300	0.05~0.2
	PC3545	150~300	0.05~0.3	150~300	0.05~0.2
M	PC5300	120~180	0.05~0.2	120~180	0.05~0.2
K	PC6510	150~300	0.05~0.3	150~300	0.05~0.2

Rich Mill series

Cutter type		Cutter diameter	AA	Application		Features	Page
RM8A RM8AC4000 (RM8ACM) RM8AC5000 (RM8ACM)		Ø50~Ø400	45°	SNEX1206ANN-MF SNMX1206ANN-MF SNEX1206ANN-MM SNMX1206ANN-MM SNEX1206ANN-MA	SNEX1206ANN-W SNEX1507ANN-MF SNMX1507ANN-MF SNEX1507ANN-MM SNMX1507ANN-MM	• Economical 8 corners. • Low cutting load and excellent smooth cutting.	E55 E56
RM8E RM8EC4000 (RM8ECM) RM8EC5000 (RM8ECM)		Ø50~Ø400	75°	SNEX1206ENN-MF SNMX1206ENN-MF SNEX1206ENN-MM SNMX1206ENN-MM SNEX1206ENN-MA	SNEX1507ENN-MF SNMX1507ENN-MF SNEX1507ENN-MM SNMX1507ENN-MM		E57 E58
RM8EQ RM8QC4000 (RM8QCM)		Ø63~Ø200	88°	SNEX1206QNN-MF SNMX1206QNN-MF SNEX1206QNN-MM SNMX1206QNN-MM SNEX1206QNN-MA	SNEX120612-MF SNMX120612-MF SNEX120612-MM SNMX120612-MM SNEX120612-MA		E59
RM4P RM4PC3000 (RM4PCM)		Ø40~Ø100	90°	LNEX100605PNR-MF LNMX100605PNR-MF LNEX100605PNR-MM LNMX100605PNR-MM LNEX100608PNR-MF LNMX100608PNR-MF	LNEX100608PNR-MM LNMX100608PNR-MM LNEX100605PNR-MA LNEX100605PNL-MM LNMX100605PNL-MM	• Economical 4 corners. • Screw on type for slotting, facing.	E60 E61
RM4P RM4PC4000 (RM4PCM)		Ø50~Ø160		LNEX151004PNR-MF LNMX151004PNR-MF LNEX151004PNR-MM LNMX151004PNR-MM LNEX151008PNR-MF LNMX151008PNR-MF LNEX151008PNR-MM LNMX151008PNR-MM	LNEX151016PNR-MF LNMX151016PNR-MF LNEX151016PNR-MM LNMX151016PNR-MM LNEX151004PNR-MA LNEX151008PNR-MA LNEX151008PNL-MM LNMX151008PNL-MM		
RM4PS3000		Ø14~Ø50	90°	LNEX100605PNR-MF LNMX100605PNR-MF LNEX100605PNR-MM LNMX100605PNR-MM LNEX100608PNR-MF LNMX100608PNR-MF	LNEX100608PNR-MM LNMX100608PNR-MM LNEX100605PNR-MA LNEX100605PNL-MM LNMX100605PNL-MM		E68
RM4PS4000		Ø32~Ø63		LNEX151004PNR-MF LNMX151004PNR-MF LNEX151004PNR-MM LNMX151004PNR-MM LNEX151008PNR-MF LNMX151008PNR-MF LNEX151008PNR-MM LNMX151008PNR-MM	LNEX151016PNR-MF LNMX151016PNR-MF LNEX151016PNR-MM LNMX151016PNR-MM LNEX151004PNR-MA LNEX151008PNR-MA LNEX151008PNL-MM LNMX151008PNL-MM		E69
RM4PM3000 Modulan type		Ø14~Ø50	90°	LNEX100605PNR-MF LNMX100605PNR-MF LNEX100605PNR-MM LNMX100605PNR-MM LNEX100608PNR-MF LNMX100608PNR-MF	LNEX100608PNR-MM LNMX100608PNR-MM LNEX100605PNR-MA LNEX100605PNL-MM LNMX100605PNL-MM		E70
RM16AC RM16AC6000 RM16AC8000 (RM16ACM)		Ø63~Ø400	45°	ONHX060608-MF / MM ONMX060608-MF / MM ONHX0606ANN-MF / MM ONMX0606ANN-MF / MM ONHX080608-MF / MM ONMX080608-MF / MM	ONHX0806ANN-MF / MM ONMX0806ANN-MF / MM ONHX060608-MA ONHX060608-W ONHX080608-MA ONHX080608-W	• Economical 16 corners. • Wiper insert for surface roughness.	E71
RMT8A RMT8A4000 RMT8A5000 (RMT8AM)		Ø80~Ø315	45°	SNCF1206ANN-MF / MM SNCF1507ANN-MF / MM SNMF1206ANN-MF / MM SNMF1507ANN-MF / MM		• Economical 8 corners. • Excellent tool life and surface toughness due to low cutting resistance and high rake edge geometry. • Good performance with increased chipping resistance and grade.	E72
RMT8E RMT8E4000 RMT8E5000 (RMT8EM)		Ø80~Ø315	75°	SNCF1206ENN-MF / MM SNCF1507ENN-MF / MM SNMF1206ENN-MF / MM SNMF1507ENN-MF / MM			E73
RMT8Q (RMT8QM)		Ø80~Ø315	88°	SNCF1206QNN-MF SNCF1507QNN-MM SNMF1206QNN-MF SNMF1507QNN-MM			E74

RM8AC(M)4000 New

AA 45° | • AR : -6° • RR : -9°~-6°



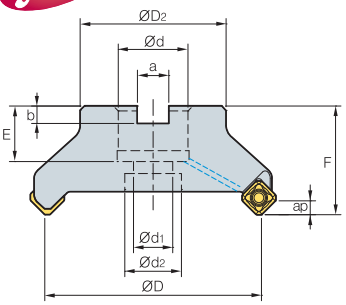


Fig. 1

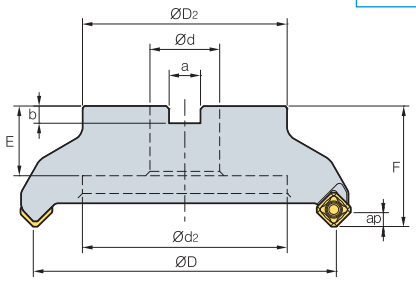


Fig. 2

(mm)

Designation		Stock R	Stock L	⌀	øD	øD2	ød	ød1	ød2	a	b	E	F	ap	kg	Fig.
RM8ACM	4050HR-M	(●)		4	50	49	22	11	18	10.4	6.3	20	40	6.0	0.5	1
	4050HR-H	(●)		6	50	49	22	11	18	10.4	6.3	20	40	6.0	0.5	1
	4063HR-M	(●)		6	63	49	22	11	18	10.4	6.3	20	40	6.0	0.7	1
	4063HR-H	(●)		8	63	49	22	11	18	10.4	6.3	20	40	6.0	0.7	1
RM8AC	4080HR	●(●)		5	80	57	25.4(27)	14	20	9.5(12.4)	6(7)	25(23)	50	6.0	1.2	1
(RM8ACM)	4080HR-M	●(●)		7	80	57	25.4(27)	14	20	9.5(12.4)	6(7)	25(23)	50	6.0	1.2	1
	4080HR-H	●(●)		10	80	57	25.4(27)	14	20	9.5(12.4)	6(7)	25(23)	50	6.0	1.3	1
	4100HR	●(●)		6	100	67	31.75(32)	18	26	12.7(14.4)	8	33(25.5)	63(50)	6.0	1.7	1
	4100HR-M	●(●)		8	100	67	31.75(32)	18	26	12.7(14.4)	8	33(25.5)	63(50)	6.0	1.7	1
	4100HR-H	●(●)		12	100	67	31.75(32)	18	26	12.7(14.4)	8	33(25.5)	63(50)	6.0	1.7	1
	4125HR	●		8	125	87	38.1(40)	22	32	15.9(16.4)	10(9)	36(30)	63	6.0	3.6	1
	4125HR-M	●(●)		10	125	87	38.1(40)	22	32	15.9(16.4)	10(9)	36(30)	63	6.0	3.6	1
	4125HR-H	●(●)		16	125	87	38.1(40)	22	32	15.9(16.4)	10(9)	36(30)	63	6.0	3.7	1
	4160R			10	160	107	50.8(40)	-	107	19(16.4)	11(9)	38(32)	63	6.0	4.8	2
	4160R-M	●(●)		12	160	107	50.8(40)	-	107	19(16.4)	11(9)	38(32)	63	6.0	5.3	2
	4160R-H	●(●)		20	160	107	50.8(40)	-	107	19(16.4)	11(9)	38(32)	63	6.0	5.4	2
	4200R-M	●		14	200	130	47.625(60)	-	135	25.4(25.7)	14	38(32)	63	6.0	7.1	2
	4200R-H	●		24	200	130	47.625(60)	-	135	25.4(25.7)	14	38(32)	63	6.0	7.1	2
	4250R-M	●		16	250	180	47.625(60)	-	180	25.4(25.7)	14	38(32)	63	6.0	11.9	2
	4250R-H	●		30	250	180	47.625(60)	-	180	25.4(25.7)	14	38(32)	63	6.0	12.0	2
	4315R			18	315	240	47.625(60)	-	238	25.4(25.7)	14	38	63	6.0	18.8(18.6)	2
	4315R-M			20	315	240	47.625(60)	-	238	25.4(25.7)	14	38	63	6.0	18.8(18.6)	2
	4400R-M			28	400	260	47.625(60)	-	238	25.4(25.7)	14	38	80	6.0	37.7(37.4)	2

• ( )Metric Size

● : Stock item ○ : Under preparing for stock

Parts

Screw	Wrench
	
FTKA0410	TW15S

Available Arbors

Designation		Arbors RM8AC	Arbors RM8ACM
RM8ACM	4050HR-M 4050HR-H 4063HR-M 4063HR-H	-	BT□□-FMC22-□□
RM8AC (RM8ACM)	4080HR 4080HR-M 4080HR-H	BT□□-FMA25.4-□□	BT□□-FMC27-□□
	4100HR 4100HR-M 4100HR-H	BT□□-FMA31.75-□□	BT□□-FMC32-□□
	4125HR 4125HR-M 4125HR-H	BT□□-FMA38.1-□□	BT□□-FMB40-□□ BT□□-FMC40-□□
	4160R 4160R-M 4160R-H	BT□□-FMA50.8-□□	
	4200R-M 4200R-H 4250R-M 4250R-H 4315R 4315R-M 4400R-M	BT□□-FMA47.625-□□	BT□□-FMB60-□□

Available Inserts

SNEX-MF	SNEX-MM	SNEX-MA
		
SNEX-W	**SNMX-MF**	**SNMX-MM**
		

Designation	Coated NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	Cermet CN2000	CN20	CN30	Uncoated H01	G10	ST30A	ST20	page
SNEX 1206ANN-MF				●	●			●										E16 E17
SNEX 1206ANN-MM	●		●	●	●			●										
SNMX 1206ANN-MF				●	●			●										
SNMX 1206ANN-MM	○		●	●	●		●	●										
SNEX 1206ANN-MA				●				●						●				
SNEX 1206ANN-W				●				●										

● : Stock item ○ : Under preparing for stock

● : Stock Netherlands

• Available Inserts, see page : E16, E17
• Available Arbors and bolt : E215~E217

RM8AC(M)5000 New

AA 45°
• AR : -6°
• RR : -9°~-6°



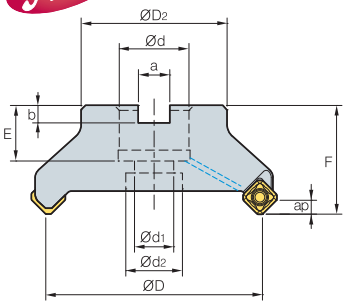


Fig. 1

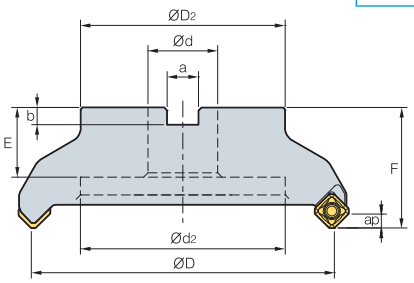


Fig. 2

(mm)

Designation		Stock R	Stock L	⊚	øD	øD2	ød	ød1	ød2	a	b	E	F	ap	kg	Fig.
RM8AC	5080HR-M	●(●)		6	80	57	25.4(27)	14	20	9.5(12.4)	6(7)	25(23)	50	7.5	1.2	1
(RM8ACM)	5100HR-M	●(●)		7	100	67	31.75(32)	18	26	12.7(14.4)	8.0	33(25)	63(50)	7.5	2.5(1.8)	1
	5125HR-M	●(●)		8	125	87	38.1(40)	22	32	15.9(16.4)	10(9)	35(30)	63	7.5	3.6	1
	5160R-M	●(●)		10	160	107	50.8(40)	-	107	19(16.4)	11(9)	38(32)	63	7.5	5(4.56)	2
	5200R-M	●(●)		12	200	130	47.625(60)	-	135	25.4(25.7)	14.0	38	63	7.5	7.1(6.8)	2
	5250R-M	●(●)		15	250	180	47.625(60)	-	180	25.4(25.7)	14.0	38	63	7.5	11.9(10.6)	2
	5315R-M			20	315	240	47.625(60)	-	238	25.4(25.7)	14.0	38	63	7.5	19.1(18.9)	2
	5400R-M			28	400	260	47.625(60)	-	238	25.4(25.7)	14.0	38	80	7.5	37.7(37.5)	2

• ( )Metric Size

● : Stock item ○ : Under preparing for stock

Parts

Screw	Wrench
	
FTGA0513	TW20-100

Available Arbors

Designation		Arbors RM8AC	Arbors RM8ACM
RM8AC	5080HR-M	BT□□-FMA25.4-□□	BT□□-FMC27-□□
(RM8ACM)	5100HR-M	BT□□-FMA31.75-□□	BT□□-FMC32-□□
	5125HR-M	BT□□-FMA38.1-□□	BT□□-FMB40-□□ BT□□-FMC40-□□
	5160R-M	BT□□-FMA50.8-□□	
	5200R-M 5250R-M 5315R-M 5400R-M	BT□□-FMA47.625-□□	BT□□-FMB60-□□

• Available Inserts, see page : E16, E17
• Available Arbors and bolt : E215~E217

Available Inserts

SNEX-MF	SNEX-MM	SNEX-MA
		

SNMX-MF	SNMX-MM
	

Designation	Coated NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	Cermet CN2000	CN20	CN30	Uncoated H01	G10	ST30A	ST20	page
SNEX 1507ANN-MF				○				○										E16 E17
SNEX 1507ANN-MM				○				○										
SNMX 1507ANN-MF				○				○										
SNMX 1507ANN-MM				○				○										

● : Stock item ○ : Under preparing for stock

RM8EC(M)4000

AA 75° | • AR : -6° • RR : -8°~-6°



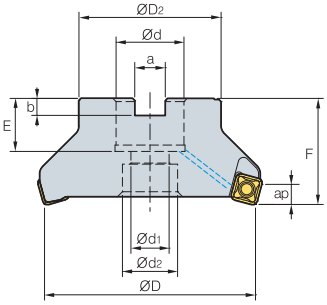


Fig. 1

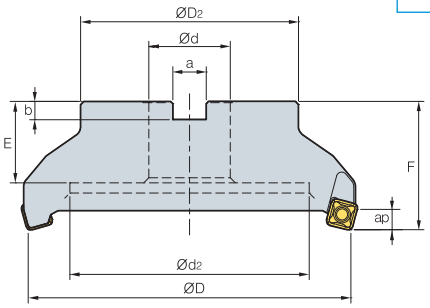


Fig. 2

(mm)

Designation		Stock R	Stock L	⊚	øD	øD2	ød	ød1	ød2	a	b	E	F	ap	kg	Fig.
RM8EC (RM8ECM)	4050HR-M	(●)		4	50	49	22	11	18	10.4	6.3	20	40	9.0	0.4	1
	4063HR-M	(●)		6	63	49	22	11	18	10.4	6.3	20	40	9.0	0.6	1
	4080HR	●		5	80	57	25.4(27)	14	20	9.5(12.4)	6(7)	25(23)	50	9.0	1.2	1
	4080HR-M	(●)		7	80	57	25.4(27)	14	20	9.5(12.4)	6(7)	25(23)	50	9.0	1.1	1
	4100HR	●		6	100	67	31.75(32)	18	26	12.7(14.4)	8	33(25)	63(50)	9.0	1.6	1
	4100HR-M	(●)		8	100	67	31.75(32)	18	26	12.7(14.4)	8	33(25)	63(50)	9.0	2.5	1
	4125HR	●		8	125	87	38.1(40)	22	32	15.9(16.4)	10(9)	35(29)	63	9.0	2.9(3.3)	1
	4125HR-M	(●)		10	125	87	38.1(40)	22	32	15.9(16.4)	10(9)	35(29)	63	9.0	3.0	1
	4160R	●		10	160	107	50.8(40)	-	107	19(16.4)	11(9)	38(32)	63	9.0	4.4	2
	4160R-M	(●)		12	160	107	50.8(40)	-	107	19(16.4)	11(9)	38(32)	63	9.0	4.0	2
	4200R-M			16	200	130	47.625(60)	-	135	25.4(25.7)	14	38(32)	63	9.0	5.9	2
	4250R-M			16	250	180	47.625(60)	-	180	25.4(25.7)	14	38	63	9.0	10.9(10.6)	2
	4315R-M			20	315	240	47.625(60)	-	238	25.4(25.7)	14	38	63	9.0	18.1(17.9)	2
	4400R-M			28	400	260	47.625(60)	-	238	25.4(25.7)	14	38	80	9.0	31.8(31.5)	2

• ( )Metric Size

● : Stock item ○ : Under preparing for stock

Parts

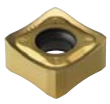
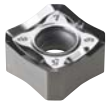
Screw	Wrench
	
PTKA0411-R3	TW15S

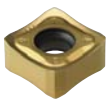
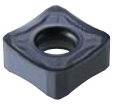
Available Arbors

Designation		Arbors RM8EC	Arbors RM8ECM
RM8EC (RM8ECM)	4050HR-M 4063HR-M	-	BT□□-FMC22-□□
	4080HR 4080HR-M	BT□□-FMA25.4-□□	BT□□-FMC27-□□
	4100HR 4100HR-M	BT□□-FMA31.75-□□	BT□□-FMC32-□□
	4125HR 4125HR-M	BT□□-FMA38.1-□□	BT□□-FMB40-□□ BT□□-FMC40-□□
	4160R 4160R-M	BT□□-FMA50.8-□□	
	4200R-M 4250R-M 4315R-M 4400R-M	BT□□-FMA47.625-□□	BT□□-FMB60-□□

• Available Inserts, see page : E16, E17
• Available Arbors and bolt : E215~E217

Available Inserts

SNEX-MF	SNEX-MM	SNEX-MA
		

SNMX-MF	SNMX-MM
	

Designation	Coated NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	Cermet CN2000	CN20	CN30	Uncoated H01	G10	ST30A	ST20	page
SNEX 1206ENN-MF				●	●			●										E16 E17
SNEX 1206ENN-MM			●	●	●			●										
SNMX 1206ENN-MF				●	●			●										
SNMX 1206ENN-MM			●	●	●			●										
SNEX 1206ENN-MA				●				●						●				

● : Stock item ○ : Under preparing for stock

RM8EC(M)5000

New

AA 75°

• AR : -6°
• RR : -8°~-6°



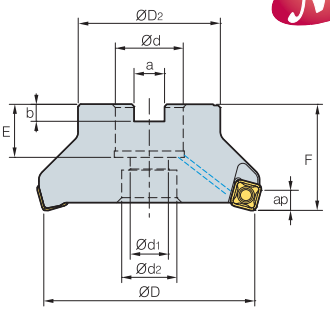


Fig. 1

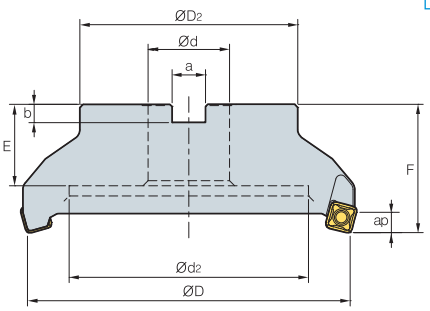


Fig. 2

(mm)

Designation		Stock R	Stock L	⊙	øD	øD2	ød	ød1	ød2	a	b	E	F	ap	kg	Fig.
RM8EC (RM8ECM)	5080HR-M	●(●)		6	80	57	25.4(27)	14	20	9.5(12.4)	6(7)	25(23)	50	11.0	1.1	1
	5100HR-M	●(●)		7	100	67	31.75(32)	18	26	12.7(14.4)	8	33(25)	63(50)	11.0	2.1(1.7)	1
	5125HR-M	●(●)		8	125	87	38.1(40)	22	32	15.9(16.4)	10(9)	35(30)	63	11.0	3.4(3.3)	1
	5160R-M	●(●)		10	160	107	50.8(40)	-	107	19(16.4)	11(9)	38(32)	63	11.0	4.4(4.1)	2
	5200R-M	●(●)		12	200	130	47.625(60)	-	135	25.4(25.7)	14	38	63	11.0	6.4(6.1)	2
	5250R-M	●(●)		15	250	180	47.625(60)	-	180	25.4(25.7)	14	38	63	11.0	11.0(10.7)	2
	5315R-M			20	315	240	47.625(60)	-	238	25.4(25.7)	14	38	63	11.0	18.0(17.7)	2
	5400R-M			28	400	260	47.625(60)	-	238	25.4(25.7)	14	38	80	11.0	35.7(35.4)	2

• ( )Metric Size

● : Stock item ○ : Under preparing for stock

Parts

Screw	Wrench
	
FTGA0513	TW20-100

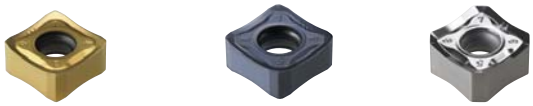
Available Arbors

Designation		Arbors RM8AC	Arbors RM8ACM
RM8EC (RM8ECM)	5080HR-M	BT□□-FMA25.4-□□	BT□□-FMC27-□□
	5100HR-M	BT□□-FMA31.75-□□	BT□□-FMC32-□□
	5125HR-M	BT□□-FMA38.1-□□	BT□□-FMB40-□□ BT□□-FMC40-□□
	5160R-M	BT□□-FMA50.8-□□	
	5200R-M	BT□□-FMA47.625-□□	BT□□-FMB60-□□
	5250R-M		
	5315R-M		
	5400R-M		

• Available Inserts, see page : E16, E17
• Available Arbors and bolt : E215~E217

Available Inserts

SNEX-MF SNEX-MM SNEX-MA



SNMX-MF SNMX-MM



Designation	Coated NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	Cermet CN2000	CN20	CN30	Uncoated H01	G10	ST30A	ST20	page
SNEX 1507ENN-MF				○				○										E16 E17
SNEX 1507ENN-MM				○				○										
SNMX 1507ENN-MF				○				○										
SNMX 1507ENN-MM				○				○										

● : Stock item ○ : Under preparing for stock

RM8QC(M)4000

AA 88°
• AR : -6°
• RR : -8°~-6°



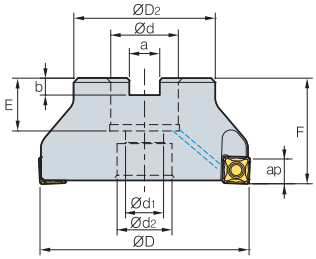


Fig. 1

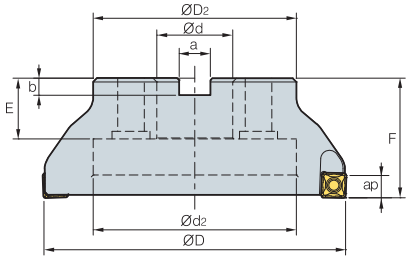


Fig. 2

(mm)

Designation		Stock R	Stock L	⊚	ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	ap	kg	Fig.
RM8QC (RM8QCM)	4063HR-M	(●)		6	63	49	22	11	18	10.4	6.3	20	40	11.5		1
	4063HR-H			8	63	49	22	11	18	10.4	6.3	20	40	11.5		1
	4080HR-M	●(●)		7	80	57	25.4(27)	14	20	9.75(12.4)	6(7)	25(23)	50	11.5		1
	4080HR-H			10	80	57	25.4(27)	14	20	9.75(12.4)	6(7)	25(23)	50	11.5		1
	4100HR-M	●(●)		8	100	67	31.75(32)	18	26	12.95(14.4)	8	33(25.5)	63(50)	11.5		1
	4100HR-H			12	100	67	31.75(32)	18	26	12.95(14.4)	8	33(25.5)	63(50)	11.5		1
	4125HR-M	●(●)		10	125	87	38.1(40)	22	32	16.15(16.4)	10(9)	36(30)	63	11.5		1
	4125HR-H			14	125	87	38.1(40)	22	32	16.15(16.4)	10(9)	36(30)	63	11.5		1
	4160R-M	●(●)		12	160	107	50.8(40)	-	107	19.25(16.4)	11(9)	38(32)	63	11.5		2
	4160R-H			20	160	107	50.8(40)	-	107	19.25(16.4)	11(9)	38(32)	63	11.5		2
	4200R-M			14	200	130	47.625(60)	-	135	25.4(25.7)	14	38(32)	63	11.5		2
	4200R-H			24	200	130	47.625(60)	-	135	25.4(25.7)	14	38(32)	63	11.5		2

• ( )Metric Size

● : Stock item ○ : Under preparing for stock

Parts

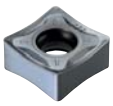
Screw	Wrench
	
PTKA0411-R3	TW15S

Available Arbors

Designation		Arbors RM8QC	Arbors RM8QCM
RM8QC (RM8QCM)	4063HR-M 4063HR-H	-	BT□□-FMC22-□□
	4080HR-M 4080HR-H	BT□□-FMA25.4-□□	BT□□-FMC27-□□
	4100HR-M 4100HR-H	BT□□-FMA31.75-□□	BT□□-FMC32-□□
	4125HR-M 4125HR-H	BT□□-FMA38.1-□□	BT□□-FMB40-□□ BT□□-FMC40-□□
	4160R-M 4160R-H	BT□□-FMA50.8-□□	
	4200R-M 4200R-H	BT□□-FMA47.625-□□	BT□□-FMB60-□□

• Available Inserts, see page : E17
• Available Arbors and bolt : E215~E217

Available Inserts

SNEX-MF	SNEX-MM	SNEX-MA
		

SNMX-MF	SNMX-MM
	

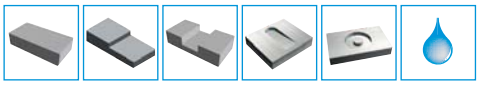
Designation	Coated NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	Cermet CN2000	CN20	CN30	Uncoated H01	G10	ST30A	ST20	page
SNEX 1206QNN-MF				●				●										
SNMX 1206QNN-MF				●				●										
SNEX 1206QNN-MM				●				●										
SNMX 1206QNN-MM				●				●										
SNEX 1206QNN-MA				●				●						●				E17
SNEX 120612-MF				○				○										
SNMX 120612-MF				○				○										
SNEX 120612-MM				●				●										
SNMX 120612-MM				●				●										
SNEX 120612-MA				●				●						●				

● : Stock item ○ : Under preparing for stock

RM4PC(M)3000 New

AA 90°

• AR : −6°
• RR : −19°~−13°





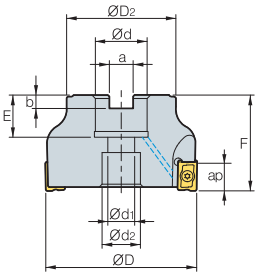


Fig. 1

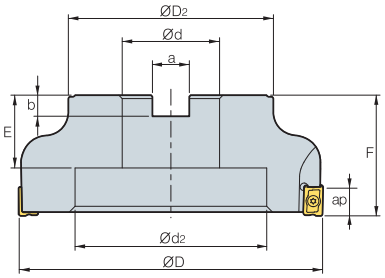


Fig. 2

(mm)

Designation		Stock R	Stock L	⊙	ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	ap	kg	Bolt	Fig.
RM4PC(M)	3040HR	(●)		4	40	35	16	9	14	8.4	5.6	19	40	9.0	0.24	SB0825	1
	3040HR-M	(●)		5	40	35	16	9	14	8.4	5.6	19	40	9.0	0.23	SB0825	1
	3050HR	(●)		5	50	42	22	11	18	10.4	6.3	20	40	9.0	0.36	SB1025	1
	3050HR-M	(●)		7	50	42	22	11	18	10.4	6.3	20	40	9.0	0.35	SB1025	1
	3063HR	(●)		7	63	49	22	11	18	10.4	6.3	20	40	9.0	0.61	SB1025	1
	3063HR-M	(●)		9	63	49	22	11	18	10.4	6.3	20	40	9.0	0.6	SB1025	1
	3080HR	(●)		8	80	57	25.4(27)	14	20	9.5(12.4)	6.0(7.0)	25(23)	50	9.0	1.25(1.24)	SB1230	1
	3080HR-M	●(●)		10	80	57	25.4(27)	14	20	9.5(12.4)	6.0(7.0)	25(23)	50	9.0	1.24(1.23)	SB1230	1
	3100HR	●(●)		9	100	67	31.75(32)	18	26	12.7(14.4)	8.0(8.0)	33(25)	63(50)	9.0	2.46(1.94)	SB1630	1
	3100HR-M	●(●)		12	100	67	31.75(32)	18	26	12.7(14.4)	8.0(8.0)	33(25)	63(50)	9.0	2.44(1.93)	SB1630	1

• ( )Metric Size

● : Stock item ○ : Under preparing for stock

Parts

Screw	Wrench
	
FTKA0307	TW09S

Available Arbors

Designation	Arbors RM4PC	Arbors RM4PCM
RM4PC(M) 3040HR 3040HR-M	-	BT□□-FMC16-□□
3050HR 3050HR-M 3063HR 3063HR-M	-	BT□□-FMC22-□□
3080HR 3080HR-M	BT□□-FMA25.4-□□	BT□□-FMC27-□□
3100HR 3100HR-M	BT□□-FMA31.75-□□	BT□□-FMC32-□□

• Available Inserts, see page : E09
• Available Arbors and bolt : E215~E217

Available Inserts

LNEX-MF LNEX-MM LNEX-MA LNMX-MF LNMX-MM



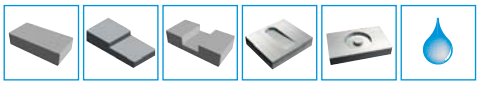
Designation	Coated NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	Cermet CN2000	CN20	CN30	Uncoated H01	G10	ST30A	ST20	page
LNEX 100605PNR-MF				●	●			●										E09
LNMX 100605PNR-MF				●	●			●										
LNEX 100605PNR-MM			●	●	●	○	○	●										
LNMX 100605PNR-MM			●	●	●			●										
LNEX 100608PNR-MF				●	○			●										
LNMX 100608PNR-MF				●	○			●										
LNEX 100608PNR-MM				●	○			●										
LNMX 100608PNR-MM				●	○			●										
LNEX 100605PNR-MA														●				
LNEX 100605PNL-MM				●				●										
LNMX 100605PNL-MM				●				●										

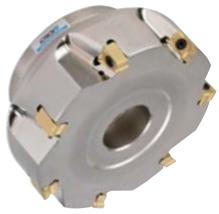
● : Stock item ○ : Under preparing for stock
● : Stock Netherlands

RM4PC(M)4000 New

AA 90°

• AR : −6°
• RR : −19°~−13°





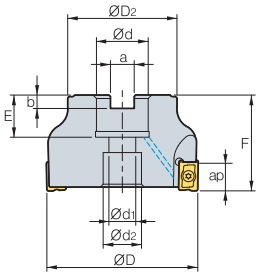


Fig. 1

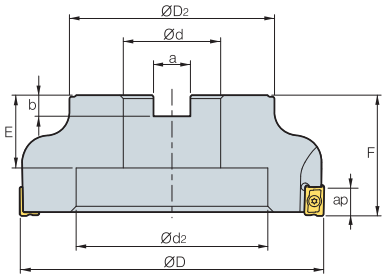


Fig. 2

(mm)

Designation		Stock R	Stock L	⊙	ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	ap	kg	Bolt	Fig.
RM4PC(M)	4050HR	(●)		3	50	46	22	11	18	10.4	6.3	20	40	14	0.36	SB1025	1
	4050HR-M	(●)		4	50	46	22	11	18	10.4	6.3	20	40	14	0.35	SB1025	1
	4063HR	(●)		4	63	49	22	11	18	10.4	6.3	20	40	14	0.56	SB1025	1
	4063HR-M	(●)		6	63	49	22	11	18	10.4	6.3	20	40	14	0.57	SB1025	1
	4080HR	●(●)		5	80	57	25.4(27)	14	20	9.5(12.4)	6.0(7.0)	25(23)	50	14	1.18(1.16)	SB1230	1
	4080HR-M	●(●)		7	80	57	25.4(27)	14	20	9.5(12.4)	6.0(7.0)	25(23)	50	14	1.17(1.14)	SB1230	1
	4100HR	●(●)		5	100	67	31.75(32)	18	26	12.7(14.4)	8.0(8.0)	33(25)	63(50)	14	2.35(1.84)	SB1630	1
	4100HR-M	●(●)		8	100	67	31.75(32)	18	26	12.7(14.4)	8.0(8.0)	33(25)	63(50)	14	2.31(1.82)	SB1630	1
	4125HR	●(●)		7	125	87	38.1(40)	22	32	15.9(16.4)	10(9.0)	35(30)	63	14	3.87(3.79)	SB2040	1
	4125HR-M	●(●)		10	125	87	38.1(40)	22	32	15.9(16.4)	10(9.0)	35(30)	63	14	3.82(3.70)	SB2040	1
	4160R			8	160	107	50.8(40)	-	100	19(16.4)	11(9.0)	38(32)	63	14	5.0(4.75)	MBA	2
	4160R-M			12	160	107	50.8(40)	-	100	19(16.4)	11(9.0)	38(32)	63	14	4.97(4.71)	MBA	2

• ( )Metric Size

● : Stock item ○ : Under preparing for stock

Parts

Screw	Wrench
	
FTKA0412B	TW15S

Available Arbors

Designation	Arbors RM4PC	Arbors RM4PCM
RM4PC(M) 4050HR, 4050HR-M, 4063HR, 4063HR-M	-	BT□□-FMC22-□□
4080HR, 4080HR-M	BT□□-FMA 25.4-□□	BT□□-FMC27-□□
4100HR, 4100HR-M	BT□□-FMA31.75-□□	BT□□-FMC32-□□
4125HR, 4125HR-M	BT□□-FMA38.1-□□	BT□□-FMB40-□□ BT□□-FMC40-□□
4160R, 4160R-M	BT□□-FMA50.8-□□	

• Available Inserts, see page : E09
• Available Arbors and bolt : E215~E217

Available Inserts

LNEX-MF LNEX-MM LNEX-MA LNMX-MF LNMX-MM



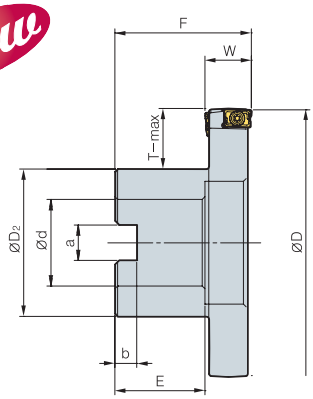
Designation	Coated NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	Cermet CN2000	CN20	CN30	Uncoated H01	G10	ST30A	ST20	page
LNEX 151004PNR-MF				●				●										E09
LNMX 151004PNR-MF				●				●										
LNEX 151004PNR-MM				●	●	●	●	●										
LNMX 151004PNR-MM				●	●			●										
LNEX 151008PNR-MF				●	○			●										
LNMX 151008PNR-MF				●	●			●										
LNEX 151008PNR-MM				●	●			●										
LNMX 151008PNR-MM				●	●			●										
LNEX 151016PNR-MF				●	○			●										
LNMX 151016PNR-MF				●	○			●										
LNEX 151016PNR-MM				●				●										
LNMX 151016PNR-MM				●				●										
LNEX 151004PNR-MA														●				
LNEX 151008PNR-MA														●				
LNEX 151008PNL-MM				●				●										
LNMX 151008PNL-MM				●				●										

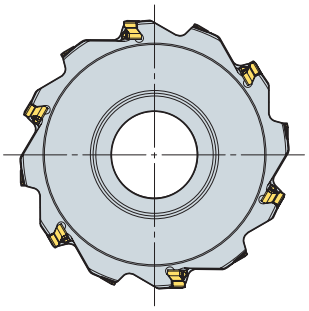
● : Stock item ○ : Under preparing for stock
● : Stock Netherlands

RM4PFCB3000

New







(mm)

Designation	Stock R	Stock L	⊚	øD	øD2	ød	a	b	E	F	W	T-max
RM4PFCB 308011R			10	80	40	25.4	9.5	6	25	50	11	19
308013R			10	80	40	25.4	9.5	6	25	50	13	19
308015R			10	80	40	25.4	9.5	6	25	50	15	19
308017R			10	80	40	25.4	9.5	6	25	50	17	19
310011R			12	100	54	31.75	12.7	8	32	50	11	22
310013R			12	100	54	31.75	12.7	8	32	50	13	22
310015R			12	100	54	31.75	12.7	8	32	50	15	22
310017R			12	100	54	31.75	12.7	8	32	50	17	22
312511R			14	125	70	38.1	15.9	10	38	60	11	26
312513R			14	125	70	38.1	15.9	10	38	60	13	26
312515R			14	125	70	38.1	15.9	10	38	60	15	26
312517R			14	125	70	38.1	15.9	10	38	60	17	26
316011R			16	160	70	38.1	15.9	10	38	60	11	44
316013R			16	160	70	38.1	15.9	10	38	60	13	44
316015R			16	160	70	38.1	15.9	10	38	60	15	44
316017R			16	160	70	38.1	15.9	10	38	60	17	44

• ( )Metric Size

● : Stock item ○ : Under preparing for stock

Parts

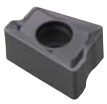
Screw	Wrench
	
FTKA0307	TW09S

Available Arbors

Designation	Arbors RM4PC
RM4PFCB 308011R 308013R 308015R 308017R	BT□□-FMA 25.4-□□
310011R 310013R 310015R 310017R	BT□□-FMA 31.75-□□
312511R 312513R 312515R 312517R 316011R 316013R 316015R 316017R	BT□□-FMA38.1-□□

• Available Inserts, see page : E09
• Available Arbors and bolt : E215~E217

Available Inserts

LNEX-MM	LNMX-MM
	

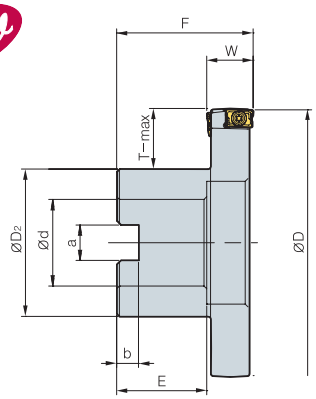
Designation	Coated NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	Cermet CN2000	CN20	CN30	Uncoated H01	G10	ST30A	ST20	page
LNEX 100605PNR-MM			●	●	●	○	○	●										E09
LNMX 100605PNR-MM			●	●	●			●										
LNEX 100605PNL-MM				●				●										
LNMX 100605PNL-MM				●				●										

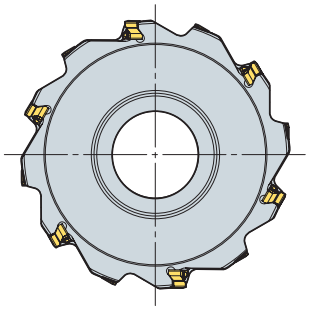
● : Stock item ○ : Under preparing for stock

RM4PFCB4000

New







(mm)

Designation	Stock R	Stock L	⊚	øD	øD2	Ød	a	b	E	F	W	T-max
RM4PFCB 408022R			6	80	40	25.4	9.5	6	25	50	22	19
408024R			6	80	40	25.4	9.5	6	25	50	24	19
408026R			6	80	40	25.4	9.5	6	25	50	26	19
408028R			6	80	40	25.4	9.5	6	25	50	28	19
410022R			8	100	54	31.75	12.7	8	32	50	22	22
410024R			8	100	54	31.75	12.7	8	32	50	24	22
410026R			8	100	54	31.75	12.7	8	32	50	26	22
410028R			8	100	54	31.75	12.7	8	32	50	28	22
412522R			10	125	70	38.1	15.9	10	38	60	22	26
412524R			10	125	70	38.1	15.9	10	38	60	24	26
412526R			10	125	70	38.1	15.9	10	38	60	26	26
412528R			10	125	70	38.1	15.9	10	38	60	28	26
416022R			12	160	70	38.1	15.9	10	38	60	22	44
416024R			12	160	70	38.1	15.9	10	38	60	24	44
416026R			12	160	70	38.1	15.9	10	38	60	26	44
416028R			12	160	70	38.1	15.9	10	38	60	28	44

• ( )Metric Size

● : Stock item ○ : Under preparing for stock

Parts

Screw	Wrench
	
FTKA0412B	TW15S

Available Arbors

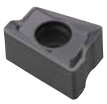
Designation	Arbors RM4PC
RM4PFCB 408022R 408024R 408026R 408028R	BT□□-FMA25.4-□□
410022R 410024R 410026R 410028R	BT□□-FMA 31.75-□□
412522R 412524R 412526R 412528R 412522R 412524R 412526R 412528R	BT□□-FMA38.1-□□

• Available Inserts, see page : E09
• Available Arbors and bolt : E215~E217

Available Inserts

LNEX-MM LNMX-MM



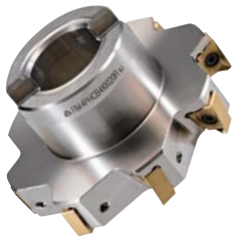


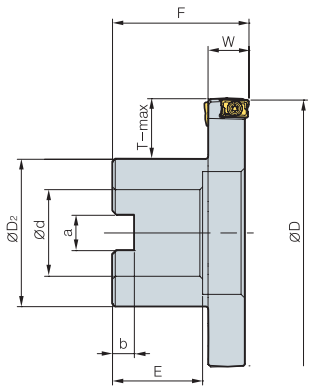
Designation	Coated NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	Cermet CN2000	CN20	CN30	Uncoated H01	G10	ST30A	ST20	page
LNEX 151008PNR-MM			●	●	●			●										E09
LNMX 151008PNR-MM			●	●	●			●										
LNEX 151008PNL-MM				●				●										
LNMX 151008PNL-MM				●				●										

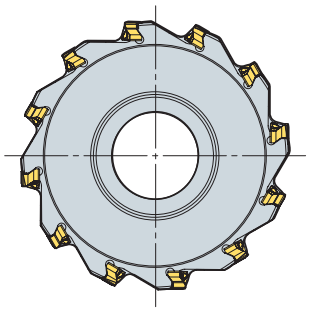
● : Stock item ○ : Under preparing for stock

RM4PHCB3000/4000

New







(mm)

Designation	Stock R	Stock L	⌀	øD	øD2	ød	a	b	E	F	W	T-max
RM4PHCB 308015R			10	80	40	25.4	9.5	6	25	50	15	19
310015R			12	100	54	31.75	12.7	8	32	50	15	22
312515R			14	125	70	38.1	15.9	10	38	60	15	26
316015R			16	160	70	38.1	15.9	10	38	60	15	44
RM4PHCB 408020R			6	80	40	25.4	9.5	6	25	50	20	19
410020R			8	100	54	31.75	12.7	8	32	50	20	22
412520R			10	125	70	38.1	15.9	10	38	60	20	26
416020R			12	160	70	38.1	15.9	10	38	60	20	44

• ( )Metric Size

● : Stock item ○ : Under preparing for stock

Parts

	Screw	Wrench
		
3000 Type	FTKA0307	TW09S
4000 Type	FTKA0412B	TW15S

Available Arbors

Type	Designation	Arbors RM4PC
3000 Type	RM4PHCB 308015R	BT□□-FMA25.4-□□
	310015R	BT□□-FMA 31.75-□□
	312515R 316015R	BT□□-FMA38.1-□□
4000 Type	RM4PHCB 408020R	BT□□-FMB25.4-□□
	410020R	BT□□-FMA 31.75-□□
	412520R 416020R	BT□□-FMA38.1-□□

• Available Inserts, see page : E09
• Available Arbors and bolt : E215~E217

Available Inserts

LNEX-MF LNEX-MM LNEX-MA LNMX-MF LNMX-MM



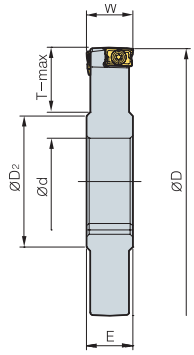
Type	Designation	Coated NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	Cermet CN2000	CN20	CN30	Uncoated H01	G10	ST30A	ST20	page
3000 Type	LNEX 100605PNR-MF				●	●			●										E09
	LNMX 100605PNR-MF				●	●	○	○	●										
	LNEX 100605PNR-MM			●	●	●			●										
	LNMX 100605PNR-MM			●	●	●			●										
	LNEX 100608PNR-MF				●	○			●										
	LNMX 100608PNR-MF				●	○			●										
	LNEX 100608PNR-MM				●	○			●										
	LNMX 100608PNR-MM				●	○			●										
	LNEX 100605PNR-MA														●				
4000 Type	LNEX 151004PNR-MF				●				●										E09
	LNMX 151004PNR-MF				●				●										
	LNEX 151004PNR-MM				●	●	●	●	●										
	LNMX 151004PNR-MM				●	●			●										
	LNEX 151008PNR-MF				●	●			●										
	LNMX 151008PNR-MF				●	●			●										
	LNEX 151008PNR-MM			●	●				●										
	LNMX 151008PNR-MM			●	●				●										
	LNEX 151016PNR-MF				●	○			●										
	LNMX 151016PNR-MF				●	○			●										
	LNEX 151016PNR-MM				●				●										
	LNMX 151016PNR-MM				●				●										
	LNEX 151004PNR-MA														●				
	LNEX 151008PNR-MA														●				

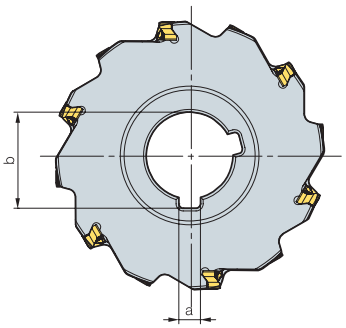
● : Stock item ○ : Under preparing for stock

RM4PFCP3000

New







(mm)

Designation	Stock R	Stock L	⌀	øD	øD2	ød	a	b	E	W	T-max
RM4PFCP 308011R			10	80	41.5	25.4	6.35	28	11	11	17
308013R			10	80	41.5	25.4	6.35	28	13	13	17
308015R			10	80	41.5	25.4	6.35	28	15	15	17
308017R			10	80	41.5	25.4	6.35	28	17	17	17
310011R			12	100	48	31.75	7.94	35.2	11	11	24
310013R			12	100	48	31.75	7.94	35.2	13	13	24
310015R			12	100	48	31.75	7.94	35.2	15	15	24
310017R			12	100	48	31.75	7.94	35.2	17	17	24
312511R			14	125	58	38.1	9.53	42.3	11	11	32
312513R			14	125	58	38.1	9.53	42.3	13	13	32
312515R			14	125	58	38.1	9.53	42.3	15	15	32
312517R			14	125	58	38.1	9.53	42.3	17	17	32
316011R			16	160	58	38.1	9.53	42.3	11	11	49
316013R			16	160	58	38.1	9.53	42.3	13	13	49
316015R			16	160	58	38.1	9.53	42.3	15	15	49
316017R			16	160	58	38.1	9.53	42.3	17	17	49

• ( )Metric Size

● : Stock item ○ : Under preparing for stock

Parts

Screw	Wrench
	
FTKA0307	TW09S

Available Arbors

Designation	Arbors RM4PC
RM4PFCP 308011R 308013R 308015R 308017R	BT□□-SCA25.4-□□
310011R 310013R 310015R 310017R	BT□□-SCA31.75-□□
312511R 312513R 312515R 312517R 316011R 316013R 316015R 316017R	BT□□-SCA38.1-□□

• Available Inserts, see page : E09
• Available Arbors and bolt : E215~E217

Available Inserts

LNEX-MM	LNMX-MM
	

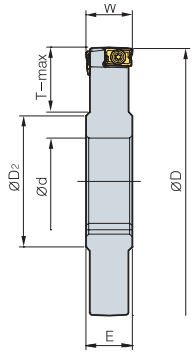
Designation	Coated NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	Cermet CN2000	CN20	CN30	Uncoated H01	G10	ST30A	ST20	page
LNEX 100605PNR-MM			●	●	●	○	○	●										E09
LNMX 100605PNR-MM			●	●	●			●										
LNEX 100605PNL-MM				●				●										
LNMX 100605PNL-MM				●				●										

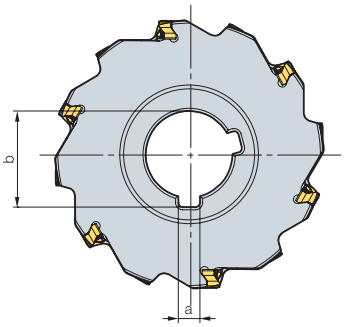
● : Stock item ○ : Under preparing for stock

RM4PFCP4000

New







(mm)

Designation	Stock R	Stock L	⊚	øD	øD2	ød	a	b	E	W	T-max
RM4PFCP 408022R			6	80	41.5	25.4	6.35	28	22	22	17
408024R			6	80	41.5	25.4	6.35	28	24	24	17
408026R			6	80	41.5	25.4	6.35	28	26	26	17
408028R			6	80	41.5	25.4	6.35	28	28	28	17
410022R			8	100	48	31.75	7.94	35.2	22	22	24
410024R			8	100	48	31.75	7.94	35.2	24	24	24
410026R			8	100	48	31.75	7.94	35.2	26	26	24
410028R			8	100	48	31.75	7.94	35.2	28	28	24
412522R			10	125	58	38.1	9.53	42.3	22	22	32
412524R			10	125	58	38.1	9.53	42.3	24	24	32
412526R			10	125	58	38.1	9.53	42.3	26	26	32
412528R			10	125	58	38.1	9.53	42.3	28	28	32
416022R			12	160	58	38.1	9.53	42.3	22	22	49
416024R			12	160	58	38.1	9.53	42.3	24	24	49
416026R			12	160	58	38.1	9.53	42.3	26	26	49
416028R			12	160	58	38.1	9.53	42.3	28	28	49

• ( )Metric Size

● : Stock item ○ : Under preparing for stock

Parts

Screw	Wrench
	
FTKA0412B	TW15S

Available Arbors

Designation	Arbors RM4PC
RM4PFCP 408022R 408024R 408026R 408028R	BT□□-SCA25.4-□□
410022R 410024R 410026R 410028R	BT□□-SCA 31.75-□□
412522R 412524R 412526R 412528R 412522R 412524R 412526R 412528R	BT□□-SCA38.1-□□

• Available Inserts, see page : E09
• Available Arbors and bolt : E215~E217

Available Inserts

LNEX-MM	LNMX-MM
	

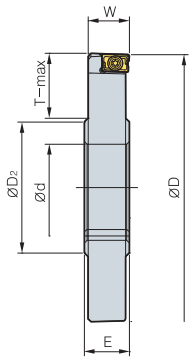
Designation	Coated NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	Cermet CN2000	CN20	CN30	Uncoated H01	G10	ST30A	ST20	page
LNEX 151008PNR-MM			●	●	●			●										E09
LNMX 151008PNR-MM			●	●	●			●										
LNEX 151008PNL-MM				●				●										
LNMX 151008PNL-MM				●				●										

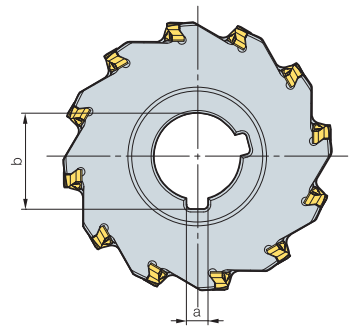
● : Stock item ○ : Under preparing for stock

RM4PHCP3000/4000

New







(mm)

Designation	Stock R	Stock L	⌀	øD	øD2	ød	a	b	E	W	T-max
RM4PHCP 308015R			10	80	41.5	25.4	6.35	28	16.5	15.1	17
310015R			12	100	48	31.75	7.94	35.2	16.5	15.1	24
312515R			14	125	58	38.1	9.53	42.3	16.5	15.1	32
316015R			16	160	58	38.1	9.53	42.3	16.5	15.1	49
RM4PHCP 408020R			6	80	41.5	25.4	6.35	28	22	19.8	17
410020R			8	100	48	31.75	7.94	35.2	22	19.8	24
412520R			10	125	58	38.1	9.53	42.3	22	19.8	32
416020R			12	160	58	38.1	9.53	42.3	22	19.8	49

• ( )Metric Size

● : Stock item ○ : Under preparing for stock

Parts

	Screw	Wrench
		
3000 Type	FTKA0307	TW09S
4000 Type	FTKA0412B	TW15S

Available Arbors

Type	Designation	Arbors RM4PC
3000 Type	RM4PHCP 308015R	BT□□-SCA25.4-□□
	310015R	BT□□-SCA31.75-□□
	312515R 316015R	BT□□-SCA38.1-□□
4000 Type	RM4PHCP 408020R	BT□□-SCA25.4-□□
	410020R	BT□□-SCA31.75-□□
	412520R 416020R	BT□□-SCA38.1-□□

• Available Inserts, see page : E09
• Available Arbors and bolt : E215~E217

Available Inserts

LNEX-MF LNEX-MM LNEX-MA LNMX-MF LNMX-MM



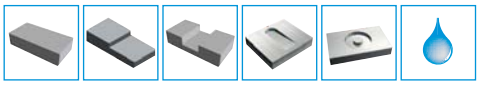
Type	Designation	Coated NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	Cermet CN2000	CN20	CN30	Uncoated H01	G10	ST30A	ST20	page
3000 Type	LNEX 100605PNR-MF				●	●			●										E09
	LNMX 100605PNR-MF				●	●	○	○	●										
	LNEX 100605PNR-MM			●	●	●			●										
	LNMX 100605PNR-MM			●	●	●			●										
	LNEX 100608PNR-MF				●	○			●										
	LNMX 100608PNR-MF				●	○			●										
	LNEX 100608PNR-MM				●	○			●										
	LNMX 100608PNR-MM				●	○			●										
	LNEX 100605PNR-MA														●				
4000 Type	LNEX 151004PNR-MF				●				●										E09
	LNMX 151004PNR-MF				●				●										
	LNEX 151004PNR-MM				●	●	●	●	●										
	LNMX 151004PNR-MM				●	●			●										
	LNEX 151008PNR-MF				●	●			●										
	LNMX 151008PNR-MF				●	●			●										
	LNEX 151008PNR-MM			●	●				●										
	LNMX 151008PNR-MM			●	●				●										
	LNEX 151016PNR-MF				●	○			●										
	LNMX 151016PNR-MF				●	○			●										
	LNEX 151016PNR-MM				●				●										
	LNMX 151016PNR-MM				●				●										
	LNEX 151004PNR-MA														●				
	LNEX 151008PNR-MA														●				

● : Stock item ○ : Under preparing for stock

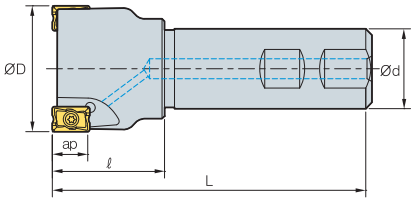
RM4PS3000 New

AA 90°

• AR : −6°
• RR : −39°~−16°







(mm)

Designation	Stock		øD	Ød	ℓ	L	ap	kg
RM4PS 3014HR-S16	●	1	14	16	23	90	9.0	0.11
3016HR-S16	●	1	16	16	25	90	9.0	0.11
3018HR-S16	●	2	18	16	23	90	9.0	0.12
3020HR-S20	●	2	20	20	30	100	9.0	0.21
3020HR-S20M	●	3	20	20	30	100	9.0	0.21
3025HR-S25	●	2	25	25	35	115	9.0	0.38
3025HR-S25M	●	3	25	25	35	115	9.0	0.38
3032HR-S32	●	3	32	32	40	125	9.0	0.69
3032HR-S32M	●	4	32	32	40	125	9.0	0.7
3040HR-S32	●	4	40	32	42	130	9.0	0.86
3040HR-S32M	●	5	40	32	42	130	9.0	0.85
3040HR-S40		4	40	40	42	130	9.0	1.17
3040HR-S40M		5	40	40	42	130	9.0	1.17
3040HR-S42		4	40	42	42	130	9.0	1.26
3040HR-S42M		5	40	42	42	130	9.0	1.25
3050HR-S32	●	5	50	32	45	135	9.0	1.06
3050HR-S32M	●	7	50	32	45	135	9.0	1.05
3050HR-S40		5	50	40	45	135	9.0	1.38
3050HR-S40M		7	50	40	45	135	9.0	1.37
3050HR-S42		5	50	42	45	135	9.0	1.48
3050HR-S42M		7	50	42	45	135	9.0	1.48

● : Stock item ○ : Under preparing for stock

Parts

Screw	Wrench
	
FTKA0307	TW09S

• Available Inserts, see page : E09

Available Inserts

LNEX-MF LNEX-MM LNEX-MA LNMX-MF LNMX-MM



Designation	Coated										Cermet			Uncoated				page
	NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC3530	PC6510	PC215K	PD2000	CN2000	CN20	CN30	H01	G10	ST30A	ST20	
LNEX 100605PNR-MF				●	●			●										E09
LNMX 100605PNR-MF				●	●			●										
LNEX 100605PNR-MM			●	●	●	○	○	●										
LNMX 100605PNR-MM			●	●	●			●										
LNEX 100608PNR-MF				●	○			●										
LNMX 100608PNR-MF				●	○			●										
LNEX 100608PNR-MM				●	○			●										
LNMX 100608PNR-MM				●	○			●										
LNEX 100605PNR-MA														●				
LNEX 100605PNL-MM				●				●										
LNMX 100605PNL-MM				●				●										

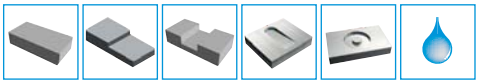
● : Stock item ○ : Under preparing for stock
● : Stock Netherlands

RM4PS4000

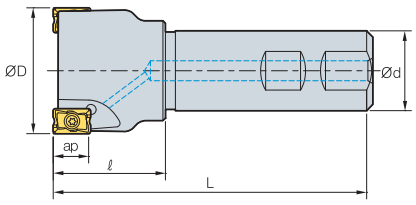
New

AA 90°

• AR : -6°
• RR : -24°~-14°







(mm)

Designation	Stock		øD	ød	ℓ	L	ap	kg
RM4PS 4032HR-S32	●	2	32	32	40	125	14	0.68
4040HR-S32	●	3	40	32	42	125	14	0.83
4040HR-S40		3	40	40	42	125	14	1.14
4040HR-S42		3	40	42	42	125	14	1.23
4050HR-S32	●	3	50	32	45	125	14	1.02
4050HR-S32M	●	4	50	32	45	125	14	1.02
4050HR-S40		3	50	40	45	125	14	1.35
4050HR-S40M		4	50	40	45	125	14	1.34
4050HR-S42		3	50	42	45	125	14	1.45
4050HR-S42M		4	50	42	45	125	14	1.45
4063HR-S32	●	4	63	32	45	125	14	1.25
4063HR-S32M	●	6	63	32	45	125	14	1.24
4063HR-S40		4	63	40	45	125	14	1.62
4063HR-S40M		6	63	40	45	125	14	1.61
4063HR-S42		4	63	42	45	125	14	1.71
4063HR-S42M		6	63	42	45	125	14	1.7

● : Stock item ○ : Under preparing for stock

Parts

Screw	Wrench
	
FTKA0412B	TW15S

• Available Inserts, see page : E09

Available Inserts

LNEX-MF LNEX-MM LNEX-MA LNMX-MF LNMX-MM



Designation	Coated									Cermet			Uncoated				page
	NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	CN2000	CN20	CN30	H01	G10	ST30A	ST20	
LNEX 151004PNR-MF				●				●										E09
LNMX 151004PNR-MF				●				●										
LNEX 151004PNR-MM				●	●	●	●	●										
LNMX 151004PNR-MM				●	●			●										
LNEX 151008PNR-MF				●	●			●										
LNMX 151008PNR-MF	○			●	●			●										
LNEX 151008PNR-MM	○		●	●				●										
LNMX 151008PNR-MM			●	●				●										
LNEX 151016PNR-MF				●	○			●										
LNMX 151016PNR-MF				●	○			●										
LNEX 151016PNR-MM				●				●										
LNMX 151016PNR-MM				●				●										
LNEX 151004PNR-MA														●				
LNEX 151008PNR-MA														●				

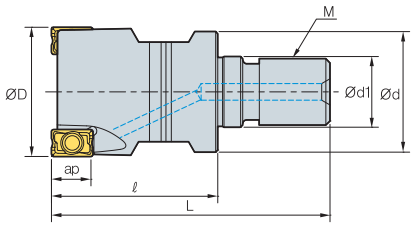
● : Stock item ○ : Under preparing for stock

RM4PM New

AA 90°

• AR : -6°
• RR : -39°~-16°





(mm)

Designation		Stock		øD	ød	ød1	ℓ	L	M	ap	kg
RM4PM	3014HR-M06	●	1	14	12	6.5	25	40	M06	9.0	0.02
	3016HR-M08	●	1	16	14.5	8.5	25	42	M08	9.0	0.02
	3018HR-M08	●	2	18	14.5	8.5	25	42	M08	9.0	0.03
	3020HR-M10	●	2	20	18	10.5	30	51	M10	9.0	0.06
	3025HR-M12	●	2	25	23	12.5	35	59	M12	9.0	0.11
	3032HR-M16	●	3	32	28	17	40	67	M16	9.0	0.21
	3040HR-M16	●	4	40	28	17	40	67	M16	9.0	0.26
	3050HR-M16	●	5	50	30	17	45	72	M16	9.0	0.41

● : Stock item ○ : Under preparing for stock

Parts

Screw	Wrench
	
FTKA0307	TW09S

Available Adoptor

Designation		Available Adoptor
RM4PM	3014HR-M06	MAT - M06
	3016HR-M08	MAT - M08
	3018HR-M08	MAT - M08
	3020HR-M10	MAT - M10
	3025HR-M12	MAT - M12
	3032HR-M16	MAT - M16
	3040HR-M16	MAT - M16
	3050HR-M16	MAT - M16

• Available Inserts, see page : E09
• Applicable adaptor, see pages : E133~E134

Designation : RM4PM3032HR-M16
Modular Head Threading Measure size(M16)
=
Adaptor Spec. : MAT-M16-035-S32S
Adaptor Threading Measure(M16)

Available Inserts

LNEX-MF LNEX-MM LNEX-MA LNMX-MF LNMX-MM



Designation	Coated										Cermet			Uncoated				page
	NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	CN2000	CN20	CN30	H01	G10	ST30A	ST20	
LNEX 100605PNR-MF				●	●			●										E09
LNMX 100605PNR-MF				●	●			●										
LNEX 100605PNR-MM			●	●	●	○	○	●										
LNMX 100605PNR-MM			●	●	●			●										
LNEX 100608PNR-MF				●	○			●										
LNMX 100608PNR-MF				●	○			●										
LNEX 100608PNR-MM				●	○			●										
LNMX 100608PNR-MM				●	○			●										
LNEX 100605PNR-MA														●				
LNEX 100605PNL-MM				●				●										
LNMX 100605PNL-MM				●				●										

● : Stock item ○ : Under preparing for stock

RM16AC(M)6000/8000

New

AA 45°

• AR : -6°
• RR : -6°



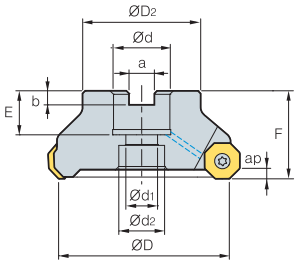


Fig. 1

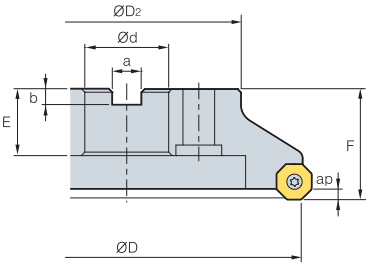


Fig. 2

(mm)

Designation		Stock	⊚	ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	ap	kg	Fig.
RM16AC(M)	6063HR-M	●(●)	5	63	49	22	11	18	10.4	6.3	20	40	4.0	0.6	1
	6080HR-M	●(●)	6	80	57	25.4(27)	14	20	9.5(12.4)	6(7)	25(23)	50	4.0	1.2	1
	6100HR-M	●(●)	7	100	67	31.75(32)	18	26	12.7(14.4)	8	33(25.5)	63(50)	4.0	1.9	1
	6125HR-M	●(●)	8	125	87	38.1(40)	22	32	15.9(16.4)	10(9)	35(29)	63	4.0	3.5	1
	6160R-M		10	160	107	50.8(40)	-	107	19(16.4)	11(9)	38(32)	63	4.0	4.1	2
	6200R-M		12	200	130	47.625(60)	-	135	25.4(25.7)	14	38(32)	63	4.0	6.1	2
	6250R-M		15	250	180	47.625(60)	-	180	25.4(25.7)	14	38	63	4.0	11.5	2
	6315R-M		20	315	240	47.625(60)	-	238	25.4(25.7)	14	38	63	4.0	18.9	2
	6400R-M		26	400	260	47.625(60)	-	238	25.4(25.7)	14	38	80	4.0	32.7	2
RM16AC(M)	8063HR-M	(●)	5	63	49	22	11	18	10.4	6.3	20	40	5.5	0.7	1
	8080HR-M	●(●)	6	80	57	25.4(27)	14	20	9.5(12.4)	6(7)	25(23)	50	5.5	1.2	1
	8100HR-M	●(●)	7	100	67	31.75(32)	18	26	12.7(14.4)	8	33(25)	63(50)	5.5	1.8	1
	8125HR-M	●(●)	8	125	87	38.1(40)	22	32	15.9(16.4)	10(9)	35(29)	63	5.5	3.5	1
	8160R-M	●(●)	10	160	107	50.8(40)	-	107	19(16.4)	11(9)	38(32)	63	5.5	4.5	2
	8200R-M	(●)	12	200	130	47.625(60)	-	135	25.4(25.7)	14	38(32)	63	5.5	5.8	2
	8250R-M		14	250	180	47.625(60)	-	180	25.4(25.7)	14	38	63	5.5	11.4	2
	8315R-M		18	315	240	47.625(60)	-	238	25.4(25.7)	14	38	63	5.5	18.8	2
	8400R-M		24	400	260	47.625(60)	-	238	25.4(25.7)	14	38	80	5.5	32.7	2

• ( )Metric Size

● : Stock item ○ : Under preparing for stock

Parts

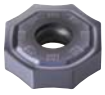
	Screw	Wrench
		
6000 Type	FTGA0513	TW20-100
8000 Type	FTGA0513	TW20-100

Available Arbors

Designation		Arbors	
		RM16AC	RM16ACM
RM16AC(M)	6063HR-M	-	BT□□-FMC22-□□
	6080HR-M	BT□□- FMA25.4-□□	BT□□-FMC27-□□
	6100HR-M	BT□□-FMA31.75-□□	BT□□-FMC32-□□
	6125HR-M	BT□□-FMA38.1-□□	BT□□-FMB40-□□
	6160R-M	BT□□-FMA50.8-□□	BT□□-FMC40-□□
	6200R-M	BT□□-FMA47.625-□□	BT□□-FMB60-□□
	6250R-M		
	6315R-M		
	6400R-M		
RM16AC(M)	8063HR-M	-	BT□□-FMC22-□□
	8080HR-M	BT□□-FMA25.4-□□	BT□□-FMC27-□□
	8100HR-M	BT□□-FMA31.75-□□	BT□□-FMC32-□□
	8125HR-M	BT□□-FMA38.1-□□	BT□□-FMB40-□□
	8160R-M	BT□□-FMA50.8-□□	BT□□-FMC40-□□
	8200R-M	BT□□-FMA47.625-□□	BT□□-FMB60-□□
	8250R-M		
	8315R-M		
	8400R-M		

• Available Inserts, see page : E09
• Available Arbors and bolt : E215~E217

Available Inserts

ONHX-MF	ONHX-MM	ONHX-W
		
ONHX-MA	**ONMX-MF**	**ONMX-MM**
		

Type	Designation	Coated								Cermet			Uncoated				page
		NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	CN2000	CN20	CN30	H01	G10	ST30A	ST20	
6000 Type	ONMX 060608-MM				○				○										E10
	ONHX 060608-MM				●	○		●	●										
	ONMX 060608-MF				○				○										
	ONHX 060608-MF				●	○		●	●										
	ONHX 060608-W																		
	ONMX 0606ANN-MM			●	●	●		●	●										
	ONHX 0606ANN-MM				●	●		●	●										
	ONMX 0606ANN-MF		●		●	●		●	●										
	ONHX 0606ANN-MF				●	●		●	●										
	ONHX 060608-MA				●				●						●				
8000 Type	ONMX 080608-MM				●	○		●	●										E10
	ONHX 080608-MM				●	○		●	●										
	ONMX 080608-MF				●	○		●	●										
	ONHX 080608-MF																		
	ONHX 080608-W				●	●		●	●										
	ONMX 0806ANN-MM				●	●		●	●										
	ONHX 0806ANN-MM					●													
	ONMX 0806ANN-MF				●	●		●	●										
	ONHX 0806ANN-MF					●													
	ONHX 080608-MA				●				●						●				

● : Stock item ○ : Under preparing for stock

RMT8A(M)4000/5000

New

AA 45°

• AR : −5°
• RR : −6°



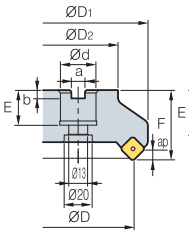


Fig. 1

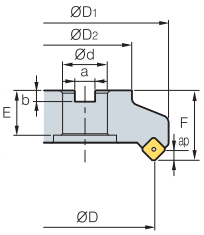


Fig. 2

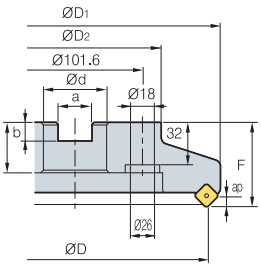


Fig. 3

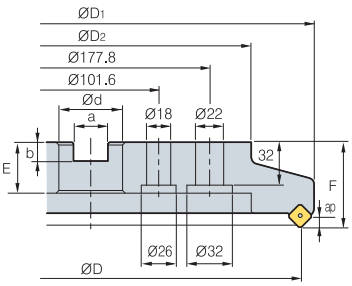


Fig. 4

(mm)

Designation		Stock	⚙	øD	øD1	øD2	ød	a	b	E	F	ap	kg	Fig.
RMT8A(M)	4080R	○	5	80	100	57	25.4(27)	9.5(12.4)	6(7)	25(22)	50	4	1.6	1
	4080R-M		6	80	100	57	25.4(27)	9.5(12.4)	6(7)	25(22)	50	4	1.6	1
	4100R	●	6	100	120	70	31.75(32)	12.7(14.4)	8(8)	32(28)	50	4	2.3	2
	4100R-M		8	100	120	70	31.75(32)	12.7(14.4)	8(8)	32(28)	50	4	2.3	2
	4125R	○	8	125	144	87	38.1(40)	15.9(16.4)	10(9)	38(30)	63	4	4.3	2
	4125R-M		10	125	144	87	38.1(40)	15.9(16.4)	10(9)	38(30)	63	4	4.3	2
	4160R	●	10	160	179	110	50.8(40)	19.0(16.4)	11(9)	38(30)	63	4	6.5	2
	4160R-M		14	160	179	110	50.8(40)	19.0(16.4)	11(9)	38(30)	63	4	6.5	2
	4200R		12	200	219	130	47.625(60)	25.4(25.7)	14(14)	38(38)	63	4	8.8	3
	4200R-M		18	200	219	130	47.625(60)	25.4(25.7)	14(14)	38(38)	63	4	8.8	3
	4250R		16	250	269	180	47.625(60)	25.4(25.7)	14(14)	38(38)	63	4	14.1	3
	4250R-M		22	250	269	180	47.625(60)	25.4(25.7)	14(14)	38(38)	63	4	14.1	3
	4315R		20	315	334	240	47.625(60)	25.4(25.7)	14(14)	38(38)	63	4	22.3	4
	4315R-M		28	315	334	240	47.625(60)	25.4(25.7)	14(14)	38(38)	63	4	22.3	4
RMT8A(M)	5080R	●	5	80	104	57	25.4(27)	9.5(12.4)	6(7)	25(22)	50	6	1.8	1
	5080R-M		6	80	104	57	25.4(27)	9.5(12.4)	6(7)	25(22)	50	6	1.8	1
	5100R	●	6	100	124	70	31.75(32)	12.7(14.4)	8(8)	32(28)	50	6	2.6	2
	5100R-M		8	100	124	70	31.75(32)	12.7(14.4)	8(8)	32(28)	50	6	2.6	2
	5125R	●	8	125	149	87	38.1(40)	15.9(16.4)	10(9)	38(30)	63	6	4.3	2
	5125R-M		10	125	149	87	38.1(40)	15.9(16.4)	10(9)	38(30)	63	6	4.3	2
	5160R	●	10	160	184	110	50.8(40)	19.0(16.4)	11(9)	38(30)	63	6	6.5	2
	5160R-M		14	160	184	110	50.8(40)	19.0(16.4)	11(9)	38(30)	63	6	6.5	2
	5200R		12	200	224	130	47.625(60)	25.4(25.7)	14(14)	38(38)	63	6	9.0	3
	5200R-M		18	200	224	130	47.625(60)	25.4(25.7)	14(14)	38(38)	63	6	9.0	3
	5250R		16	250	274	180	47.625(60)	25.4(25.7)	14(14)	38(38)	63	6	14.4	3
	5250R-M		22	250	274	180	47.625(60)	25.4(25.7)	14(14)	38(38)	63	6	14.4	3
	5315R		20	315	339	240	47.625(60)	25.4(25.7)	14(14)	38(38)	63	6	22.2	4
	5315R-M		28	315	339	240	47.625(60)	25.4(25.7)	14(14)	38(38)	63	6	22.2	4

• ( )Metric Size

● : Stock item ○ : Under preparing for stock

Parts

	Screw	Screw	Spring	Latch	Wrench
					
4000 Type	ETKA0523	KHB0417	SPR0315	LTC05SR-RM4	TW20-100
5000 Type	ETKA0625	KHB0417	SPR0415	LTC06SR-RM5	TW20-100

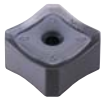
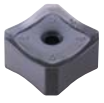
Available Arbors

Designation	General Arbor	NC Arbors	
		RMT8A	RMT8AM
RMT8A(M) □080R	NT*□□(M/U)-FMA25.4-25	BT**□□-FMA25.4 -□□	FMC27
□100R	NT*□□(M/U)-FMA31.75-□□	BT**□□-FMA31.75 -□□	FMC32
□125R	NT*□□(M/U)-FMA38.1 -□□	BT**□□-FMA38.1 -□□	FMB40
□160R	NT*□□(M/U)-FMA50.8 -□□	BT**□□-FMA50.8 -□□	FMB40
□200R	NT*□□(M/U)-FMA47.625-25, KCP-8***	BT**□□-FMA47.625-□□	FMB60
□250R	NT*□□(M/U)-FMA47.625-25, KCP-8***	BT**□□-FMA47.625-□□	FMB60
□315R	KCP-8***(Center Ring Plug)		

*□□–NT Number **□□–BT Number ***Over Milling 5

• Available Inserts, see page : E15, E16
• Available Arbors and bolt : E215~E217

Available Inserts

SNC(M)F-MF	SNC(M)F-MM
	

Type	Designation	Coated									Cermet			Uncoated				page
		NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	CN2000	CN20	CN30	H01	G10	ST30A	ST20	
4000 Type	SNCF 1206ANN-MF				●				●										E15 E16
	SNCF 1206ANN-MM				●				●										
	SNMF 1206ANN-MF				●														
	SNMF 1206ANN-MM				●														
5000 Type	SNCF 1507ANN-MF				○				●										E15 E16
	SNCF 1507ANN-MM				●				●										
	SNMF 1507ANN-MF				●														
	SNMF 1507ANN-MM				○														

● : Stock item ○ : Under preparing for stock

RMT8E(M)4000/5000

New

AA 75°

• AR : -6°
• RR : -8°~-6°



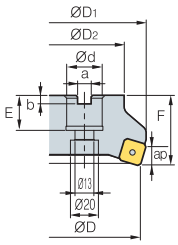


Fig. 1

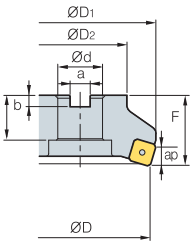


Fig. 2

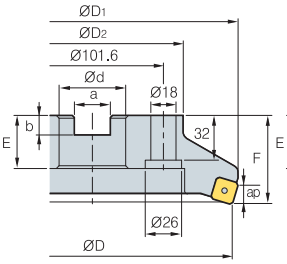


Fig. 3

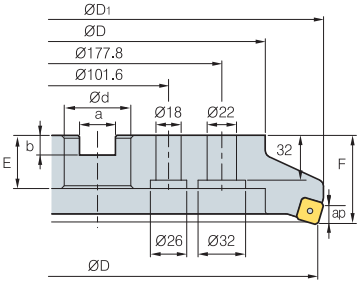


Fig. 4

(mm)

Designation		Stock	⚙	øD	øD1	øD2	ød	a	b	E	F	ap	kg	Fig.
RMT8E(M)	4080R	●	5	80	87	57	25.4(27)	9.5(12.4)	6(7)	25(22)	50	5	1.5	1
	4080R-M		6	80	87	57	25.4(27)	9.5(12.4)	6(7)	25(22)	50	5	1.5	1
	4100R	●	6	100	107	67	31.75(32)	12.7(14.4)	8(8)	32(28)	50	5	2	2
	4100R-M		8	100	107	67	31.75(32)	12.7(14.4)	8(8)	32(28)	50	5	2	2
	4125R	●	8	125	132	87	38.1(40)	15.9(16.4)	10(9)	38(30)	63	5	3.8	2
	4125R-M		10	125	132	87	38.1(40)	15.9(16.4)	10(9)	38(30)	63	5	3.8	2
	4160R	●	10	160	167	107	50.8(40)	19.0(16.4)	11(9)	38(30)	63	5	5.8	2
	4160R-M		14	160	167	107	50.8(40)	19.0(16.4)	11(9)	38(30)	63	5	5.8	2
	4200R		12	200	207	130	47.625(60)	25.4(25.7)	14(14)	38(38)	63	5	7.9	3
	4200R-M		18	200	207	130	47.625(60)	25.4(25.7)	14(14)	38(38)	63	5	7.9	3
	4250R		16	250	257	180	47.625(60)	25.4(25.7)	14(14)	38(38)	63	5	13.0	3
	4250R-M		22	250	257	180	47.625(60)	25.4(25.7)	14(14)	38(38)	63	5	13.0	3
	4315R		20	315	322	240	47.625(60)	25.4(25.7)	14(14)	38(38)	63	5	20.5	4
	4315R-M		28	315	322	240	47.625(60)	25.4(25.7)	14(14)	38(38)	63	5	20.5	4
RMT8E(M)	5080R	●	5	80	88	57	25.4(27)	9.5(12.4)	6(7)	25(22)	50	8	1.4	1
	5080R-M		6	80	88	57	25.4(27)	9.5(12.4)	6(7)	25(22)	50	8	1.4	1
	5100R	●	6	100	108	67	31.75(32)	12.7(14.4)	8(8)	32(28)	50	8	1.9	2
	5100R-M		8	100	108	67	31.75(32)	12.7(14.4)	8(8)	32(28)	50	8	1.9	2
	5125R	●	8	125	133	87	38.1(40)	15.9(16.4)	10(9)	38(30)	63	8	3.7	2
	5125R-M		10	125	133	87	38.1(40)	15.9(16.4)	10(9)	38(30)	63	8	3.7	2
	5160R	●	10	160	168	107	50.8(40)	19.0(16.4)	11(9)	38(30)	63	8	5.7	2
	5160R-M		14	160	168	107	50.8(40)	19.0(16.4)	11(9)	38(30)	63	8	5.7	2
	5200R		12	200	208	130	47.625(60)	25.4(25.7)	14(14)	38(38)	63	8	7.5	3
	5200R-M		18	200	208	130	47.625(60)	25.4(25.7)	14(14)	38(38)	63	8	7.5	3
	5250R		16	250	258	180	47.625(60)	25.4(25.7)	14(14)	38(38)	63	8	12.4	3
	5250R-M		22	250	258	180	47.625(60)	25.4(25.7)	14(14)	38(38)	63	8	12.4	3
	5315R		20	315	323	240	47.625(60)	25.4(25.7)	14(14)	38(38)	63	8	19.9	4
	5315R-M		28	315	323	240	47.625(60)	25.4(25.7)	14(14)	38(38)	63	8	19.9	4

• ( )Metric Size

● : Stock item ○ : Under preparing for stock

Parts

	Screw	Screw	Spring	Latch	Wrench
					
4000 Type	ETKA0523	KHB0417	SPR0315	LTC05SR-RM4	TW20-100
5000 Type	ETKA0625	KHB0417	SPR0415	LTC06SR-RM5	TW20-100

Available Arbors

Designation	General Arbor	NC Arbors	
		RMT8A	RMT8AM
RMT8A(M)□080R	NT*□□(M/U)-FMA25.4-25	BT**□□-FMA25.4 -□□	FMC27
□100R	NT*□□(M/U)-FMA31.75-□□	BT**□□-FMA31.75 -□□	FMC32
□125R	NT*□□(M/U)-FMA38.1 -□□	BT**□□-FMA38.1 -□□	FMB40
□160R	NT*□□(M/U)-FMA50.8 -□□	BT**□□-FMA50.8 -□□	FMB40
□200R	NT*□□(M/U)-FMA47.625-25, KCP-8***	BT**□□-FMA47.625-□□	FMB60
□250R	NT*□□(M/U)-FMA47.625-25, KCP-8***	BT**□□-FMA47.625-□□	FMB60
□315R	KCP-8***(Center Ring Plug)		

*□□–NT Number **□□–BT Number ***Over Milling 5

• Available Inserts, see page : E15, E16
• Available Arbors and bolt : E215~E217

Available Inserts

SNC(M)F-MF SNC(M)F-MM




Type	Designation	Coated									Cermet		Uncoated				page
		NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	CN2000	CN20	CN30	H01	G10	ST30A	ST20	
4000 Type	SNCF 1206ENN-MF				●				●										E15 E16
	SNCF 1206ENN-MM				●		●												
	SNMF 1206ENN-MF				●														
	SNMF 1206ENN-MM				●														
5000 Type	SNCF 1507ENN-MF				●				●										E15 E16
	SNCF 1507ENN-MM				●		●												
	SNMF 1507ENN-MF				●														
	SNMF 1507ENN-MM				●														

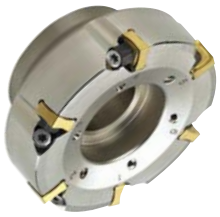
● : Stock item ○ : Under preparing for stock

RMT8Q(M)

New

AA 88°

• AR : −6°
• RR : −11°~−8°



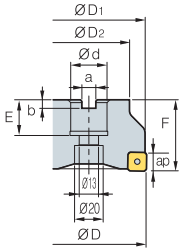


Fig. 1

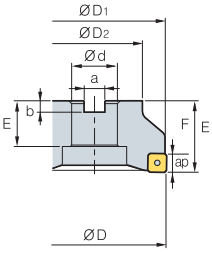


Fig. 2

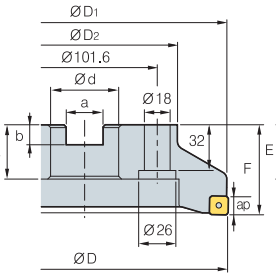


Fig. 3

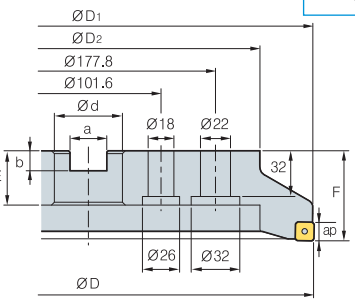


Fig. 4

(mm)

Designation		Stock	⊚	ØD	ØD1	ØD2	Ød	a	b	E	F	ap	kg	Fig.
RMT8Q(M)	4080R	●	5	80	79	57	25.4(27)	9.5(12.4)	6(7)	25(22)	50	5	1.4	1
	4080R-M	●	6	80	79	57	25.4(27)	9.5(12.4)	6(7)	25(22)	50	5	1.4	1
	4100R	●	6	100	99	67	31.75(32)	12.7(14.4)	8(8)	32(28)	50	5	1.8	2
	4100R-M	●	8	100	99	67	31.75(32)	12.7(14.4)	8(8)	32(28)	50	5	1.8	2
	4125R	●(●)	8	125	124	87	38.1(40)	15.9(16.4)	10(9)	38(30)	63	5	3.6	2
	4125R-M	●	10	125	124	87	38.1(40)	15.9(16.4)	10(9)	38(30)	63	5	3.6	2
	4160R	●	10	160	159	107	50.8(40)	19.0(16.4)	11(9)	38(30)	63	5	5.7	2
	4160R-M		14	160	159	107	50.8(40)	19.0(16.4)	11(9)	38(30)	63	5	5.7	2
	4200R		12	200	199	130	47.625(60)	25.4(25.7)	14(14)	38(38)	63	5	7.5	3
	4200R-M		18	200	199	130	47.625(60)	25.4(25.7)	14(14)	38(38)	63	5	7.5	3
	4250R		16	250	249	180	47.625(60)	25.4(25.7)	14(14)	38(38)	63	5	12.5	3
	4250R-M		22	250	249	180	47.625(60)	25.4(25.7)	14(14)	38(38)	63	5	12.5	3
	4315R		20	315	314	240	47.625(60)	25.4(25.7)	14(14)	38(38)	63	5	19.9	4
	4315R-M		28	315	314	240	47.625(60)	25.4(25.7)	14(14)	38(38)	63	5	19.9	4

• ( )Metric Size

● : Stock item ○ : Under preparing for stock

Parts

Screw	Screw	Spring	Latch	Wrench
				
ETKA0523	KHB0417	SPR0315	LTC05SR-RM4	TW20-100

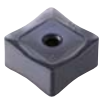
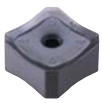
Available Arbors

Designation	General Arbor	NC Arbors	
		RMT8A	RMT8AM
RMT8A(M) □080R	NT*□□(M/U)-FMA25.4-25	BT**□□-FMA25.4 -□□	FMC27
□100R	NT*□□(M/U)-FMA31.75-□□	BT**□□-FMA31.75 -□□	FMC32
□125R	NT*□□(M/U)-FMA38.1 -□□	BT**□□-FMA38.1 -□□	FMB40
□160R	NT*□□(M/U)-FMA50.8 -□□	BT**□□-FMA50.8 -□□	FMB40
□200R	NT*□□(M/U)-FMA47.625-25, KCP-8***	BT**□□-FMA47.625-□□	FMB60
□250R	NT*□□(M/U)-FMA47.625-25, KCP-8***	BT**□□-FMA47.625-□□	FMB60
□315R	KCP-8***(Center Ring Plug)		

*□□—NT Number **□□—BT Number ***Over Milling 5

• Available Inserts, see page : E15, E16
• Available Arbors and bolt : E215~E217

Available Inserts

SNMF-MF	SNMF-MM
	

Designation	Coated										Cermet		Uncoated				page
	NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	CN2000	CN20	CN30	H01	G10	ST30A	ST20	
SNMF 1206QNN-MF				●														E15
1206QNN-MM				●														E16

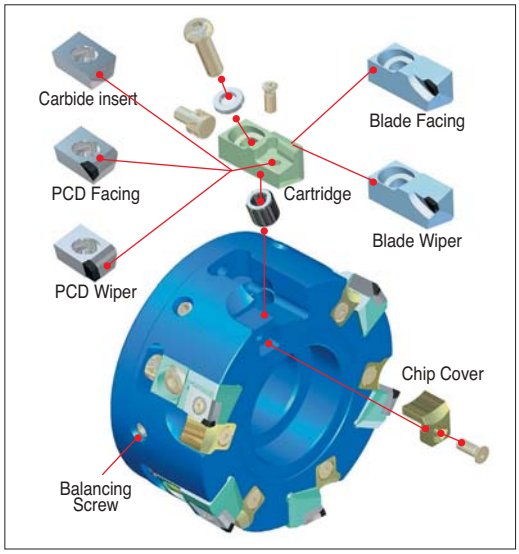
● : Stock item ○ : Under preparing for stock

Aero Mill

Special features

- Excellent machining performance can be acquired especially at the high speed cutting due to the light aluminum cutter body that 50% weight of conventional steel cutter body
- High speed milling cutter can afford to precise machining
- Special Aluminum material and high rake angle of insert provide rigid & stable machining
- High class surface finish can be acquired due to the low cutting load provided from high rake angle
- Balanceable up to G2.5 level

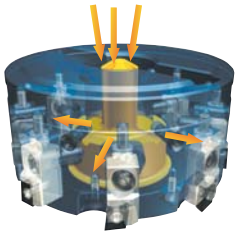
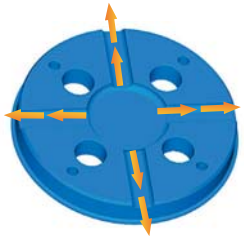
Assembly structure of cutter



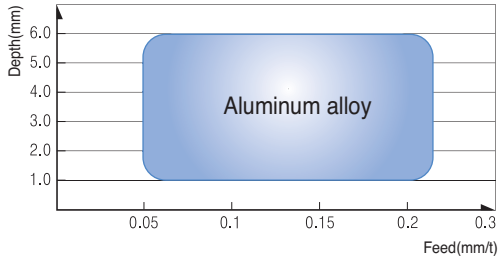
- Increased stability based on cartridge type application
- Both insert and blade can be available to same cutter
- Finishing to roughing can be possible because of wide chip pocket space
- Roughing and finishing available with carbide, PCD insert application
- Cutter breakage can be solved by making usage of chip cover

Coolant through system

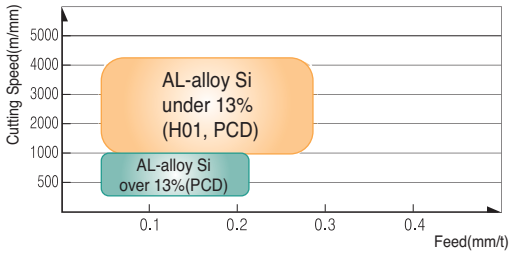
- Specially designed coolant through system provides coolant from the center of the cutter to the insert. It enhances the cooling rate and chip evacuation properity.
- Since shooting direction of coolant has designed directly to the insert cutting edge, it has maximized chip evacuation
- Coolant bolt is applicable upto Ø160, coolant cover is applicable from Ø200 and over. Coolant devices are sold seperately
  For through coolant system, through coolant arbor has to be used

Coolant Bolt	Coolant Cover
	
For Ø 80~Ø 160	For Ø 200 and over

Application range



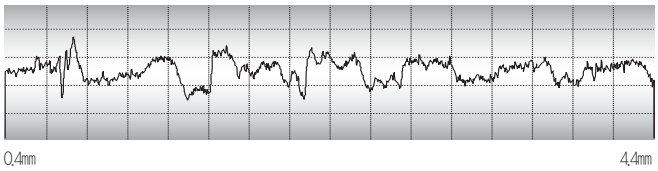
Recommended cutting condition



Maximum revolution

- Machine : PCV620
- vc = 1570m/min
- Workpiece : A6061
- n =5000 rpm
- Cutter : APDM100R-A6Z
- vf = 3000mm/min
- Insert : CDEW1204R-XCF(H01)
- fz = 0.1mm/t
- ap = 0.5mm

- Rmax : 2.1㎛
- Rz : 1.6㎛
- Ra : 0.3㎛



Maximum revolution available

Diameter(mm)	Maximum revolution(rpm)
Ø80	16,000
Ø100	15,000
Ø125	12,500
Ø160	10,000
Ø200	8,000
Ø250	6,500
Ø315	5,000

Coolant parts

Diameter(mm)	Type	Designation	Shape	Note
Ø80	Coolant Bolt	CBP080-IN/MM		Extra charge
Ø100	Coolant Bolt	CBP100-IN CBP100-MM-1		
Ø125	Coolant Bolt	CBP125-IN CBP125-MM-1		
Ø160	Coolant Bolt	CBP160-IN CBP160-MM		
Ø200	Coolant Cover	CCP200		Extra charge
Ø250	Coolant Cover	CCP250		
Ø315	Coolant Cover	CCP315		

•Choice : CBP100-IN : APD type, General for unmarked item

Aero Mill -Mini

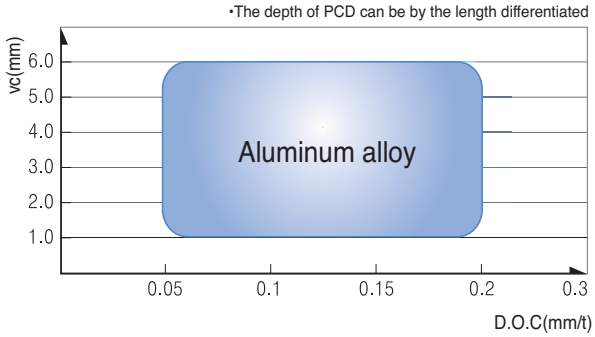
Code system

Aero Mill		Insert Clearance Angle		Diameter(Ø)		Hand of Tool(R/L)		
M	A	P	D	(S)	040	– H	R	24
Mini		Approach Angle		( ) : CutterS : Shank		H : Coolant		Number of tooth

Special Features

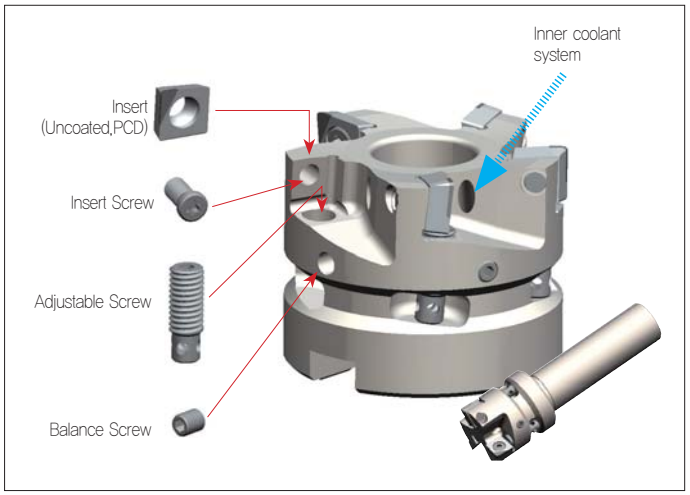
- Good performance in small-medium size of operation
- Good duration of the steel body
- Choice of Uncoated carbide / PCD grade can be applied to various kind of work material
- Balance level : G25

Application range

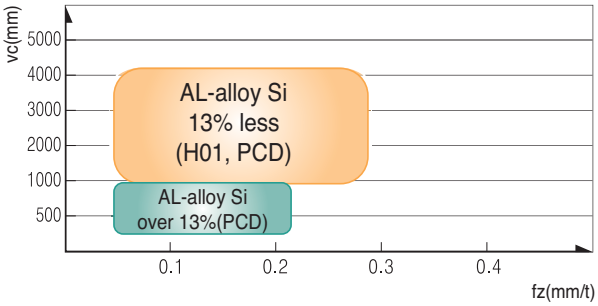


Structure of Aero Mill -Mini

- Simple and strong design of Screw-on clamping.
- Adjustable range : ±0.1mm Max
- Adjustable step : Min. 2 micro meter
- Wide chip pocket area for Roughing and Aluminum machining.
- Inner coolant system



Recommended cutting condition

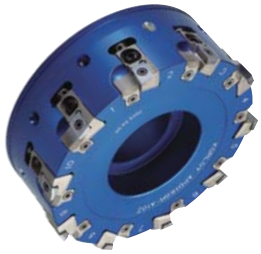


Max. RPM

Diameter	Max. RPM(min−1)
Ø32	26,000
Ø40	24,500
Ø50	22,000
Ø63	20,000

APD(M)-A/B

AA 90° | • AR : 6° • RR : 5~9°



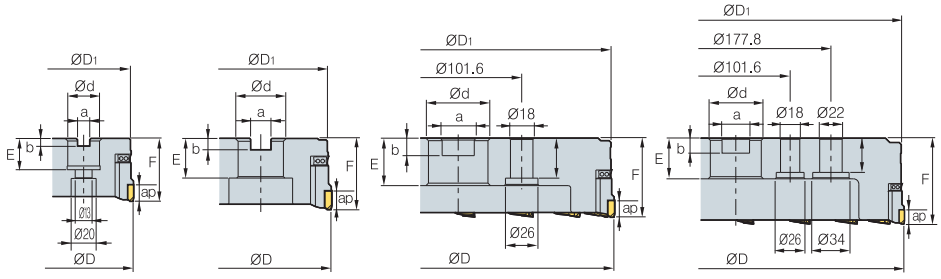


Fig. 1 Fig. 2 Fig. 3 Fig. 4

(mm)

Designation	Stock R	Stock L	⌀	øD	øD1	ød	a	b	E	F	ap	Max rpm	kg	Fig.
APD(M) 080R/L-A6Z	•(•)		6	80	76	25.4(27)	9.5(12.4)	6(7)	25(22)	50	10	16000	0.75	1
100R/L-A6Z	•(•)		6	100	95	31.75(32)	12.7(14.4)	8(8)	32(28)	50	10	15000	0.95	2
125R/L-A8Z	•(•)		8	125	120	38.1(40)	15.9(16.4)	10(9)	38(30)	63	10	12500	1.8	2
160R/L-A10Z			10	160	155	50.8(40)	19.0(16.4)	11(9)	38(30)	63	10	10000	2.9	2
200R/L-A12Z			12	200	195	47.625(60)	25.4(25.7)	14(14)	38(38)	63	10	8000	4.0	3
250R/L-A16Z			16	250	245	47.625(60)	25.4(25.7)	14(14)	38(38)	63	10	6500	6.3	3
315R/L-A18Z			18	315	310	47.625(60)	25.4(25.7)	14(14)	38(38)	80	10	5000	11.3	4
APD(M) 080R/L-B6Z			6	80	76	25.4(27)	9.5(12.4)	6(7)	25(22)	50	6	16000	0.75	1
100R/L-B6Z			6	100	95	31.75(32)	12.7(14.4)	8(8)	32(28)	50	6	15000	0.95	2
125R/L-B8Z			8	125	120	38.1(40)	15.9(16.4)	10(9)	38(30)	63	6	12500	1.8	2
160R/L-B10Z			10	160	155	50.8(40)	19.0(16.4)	11(9)	38(30)	63	6	10000	2.9	2
200R/L-B12Z			12	200	195	47.625(60)	25.4(25.7)	14(14)	38(38)	63	6	8000	4.0	3
250R/L-B16Z			16	250	245	47.625(60)	25.4(25.7)	14(14)	38(38)	63	6	6500	6.3	3
315R/L-B18Z			18	315	310	47.625(60)	25.4(25.7)	14(14)	38(38)	80	6	5000	11.3	4

• A type : Cartridge + Insert, B type : Blade • B형의 ap는 PCD크기입니다 • ( )Metric Size ● : Stock item ○ : Under preparing for stock

Parts

	Cartridge	Chip cover	Chip cover Screw	Insert Screw
				
APD-A	LAPDR/L-AJ	CAPDR/L-AJ	PTMA0411	FTNA0411
APD-B	-	CAPDR/L-AJ	PTMA0411	-
	Adjust Screw	Cartridge Screw	Wrench for Insert	Wrench for Cartridge
				
APD-A	AZ0514	BHA0619-NYLOK	TW15S	HW50
APD-B	AZ0514	BHA0619-NYLOK	-	HW50

Available Arbors

Designation	General Arbor	NC Arbors
APD(M) 080R/L	NT*□□(M/U)-FMA25.4-25	BT** □□-FMA25.4 -□□
100R/L	NT*□□(M/U)-FMA31.75 -□□	BT** □□-FMA31.75 -□□
125R/L	NT*□□(M/U)-FMA38.1 -□□	BT** □□-FMA38.1 -□□
160R/L	NT*□□(M/U)-FMA50.8 -□□	BT** □□-FMA50.8 -□□
200R/L	NT*□□(M/U)-FMA47.625-25, KCP-8***	BT** □□-FMA47.625-□□
250R/L	NT*□□(M/U)-FMA47.625-25, KCP-8***	BT** □□-FMA47.625-□□
315R/L	KCP-8***(Center Ring Plug)	-

*□□-NT Number **□□-BT Number ***Over Milling 5

Recommended Cutting Condition

Workpiece	Cutting Condition vc(m/min)	Cutting Condition fz(mm/t)	Grades
Aluminum	1,000 ~ 4,000 500 ~ 2,500	0.05 ~ 0.30 0.05 ~ 0.20	**DA200** **H01**

• Available Inserts, see page : E06, E07
• Available Arbors and bolt : E215~E217

Available Inserts

CDEW-XCF	CDEW-XAF,NAF	CDEW-XAW,NAW
		

Designation	PCD DA200	Cermet CN2000	Cermet CN20	Cermet CN30	Uncoated H01	Uncoated G10	Uncoated ST30A	Uncoated ST20	page
CDEW 1204R-XCF					●				E06 E07
1204L-XCF									
1204R-XAF	●								
1204L-XAF	●								
1204R-NAF	●								
1204R-XAW	●								
1204L-XAW	●								
1204R-NAW	●								

● : Stock item ○ : Under preparing for stock

Available Blades

BAPDR-XAF	BAPDR-NAF	BAPDR-XAW	BAPDR-NAW
			

Designation	PCD DA200	page
BAPDR-XAF	●	E06
BAPDL-XAF	●	
BAPDR-NAF		E06
BAPDR-XAW	●	E06
BAPDL-XAW	●	
BAPDR-NAW		E06
BAPDL-NAW		

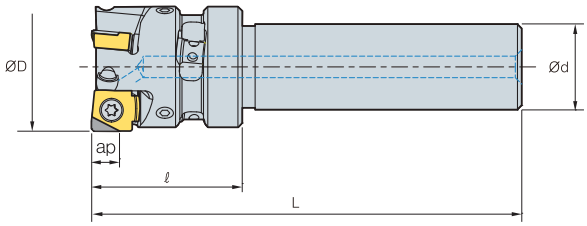
● : Stock item ○ : Under preparing for stock

MAPDS000HR/L-Z0

New

AA 90°
• AR : 6°
• RR : −4°~−1°





(mm)

Designation	Stock R	Stock L	⊚	øD	ød	ℓ	L	ap	Max rpm	kg
MAPDS 032HR/L-Z3	●		3	32	20	35	100	5	26,000	0.35
040HR/L-Z4	●		4	40	20	35	100	5	24,500	0.42

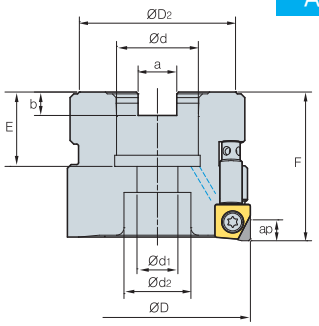
● : Stock item ○ : Under preparing for stock

MAPD000HR/L-Z0

New

AA 90°
• AR : 6°
• RR : −1°~12°





(mm)

Designation	Stock R	Stock L	⊚	øD	øD2	ød	a	b	E	F	ød1	ød2	ap	Max rpm	kg
MAPD 040HR/L-Z4	●		4	40	34	16	8.4	5.6	18	40	9	14	5	24,000	0.24
050HR/L-Z5	●		5	50	42	22	10.4	6.3	20	40	11	18	5	22,000	0.35
063HR/L-Z6	●		6	63	42	22	10.4	6.3	20	40	11	18	5	20,000	0.65

● : Stock item ○ : Under preparing for stock

Parts

Screw			Wrench	
Insert	Adjustable	Balance	Insert	Adjust
				
FTKA0408	AHX0617F-NYLOK	KHD0405	TW15S	HW20L

Available Arbors

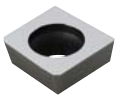
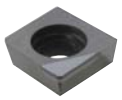
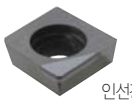
Designation		ød	NC Arbors
MAPD	040HR/L-Z4	16	BT** □□-FMC16-□□
	050HR/L-Z5	22	BT** □□-FMC22-□□
	063HR/L-Z6	22	BT** □□-FMC22-□□

Recommended Cutting Condition

Workpiece	Cutting Condition vc(m/min)	Cutting Condition fz(mm/t)	Grades
Aluminum	1,000 ~ 4,000 500 ~ 2,500	0.05 ~ 0.30 0.05 ~ 0.20	DA200 H01

• Available Inserts, see page : E11, E12
• Available Arbors and bolt : E172~E174

Available Inserts

SNEW	SNEW-XAF	SNEW-NAF
		

인선강화형

Designation	PCD DP200	Cermet CN2000	Cermet CN20	Cermet CN30	Uncoated H01	Uncoated G10	Uncoated ST30A	Uncoated ST20	page
SNEW 09T3ADFR					●				E16
09T3ADTR-XAF	●								
09T3ADTR-NAF	●								

● : Stock item ○ : Under preparing for stock

Coolant Bolt (Not included)

Designation	Applicable cutter
CB0525	MAPD40HR/L-Z4
CB1025	MAPD050HR/L-Z5, MAPD063HR/L-Z6

• Details for cloolant bolt are on catalogue

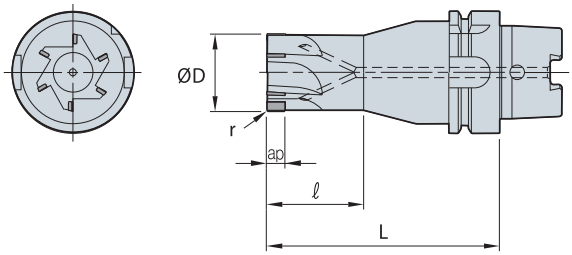
PDF FACE CUTTER Geometry

PDF	6	032	–	HSK63A
PDF FACE CUTTER	tooth	Dia.		Shank

PDF FACE CUTTER

AA 90° | • AR : 0° • RR : 0°





(mm)

Designation		⊙	Grades DP150	Grades DP200	ØD	r	ap	ℓ	L
PDF	4032-HSK50A	4			32	0.5	8	50	120
	4040-HSK50A	4			40	0.5	8	50	120
	4032-HSK63A	4			32	0.5	8	50	120
	4040-HSK63A	4			40	0.5	8	50	120
	4050-HSK63A	4			50	0.5	8	50	120
	6063-HSK63A	6			63	0.5	12	-	100
	6063-HSK100A	6			63	0.5	12	-	100

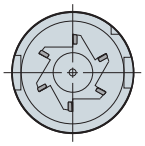
● : Stock item ○ : Under preparing for stock

● Recommended Cutting Condition

Workpiece	vc(m/min)	fz(mm/t)	ap(mm)
Al, Brass, Alloy	200~2,000	0.02~0.1	0.05~4.0

Special PCD order sheet





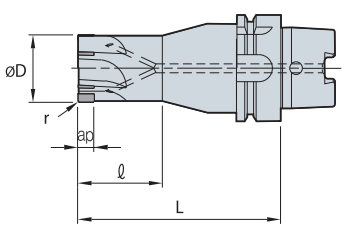


Fig. 1

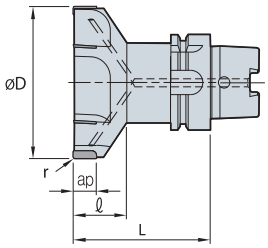


Fig. 2

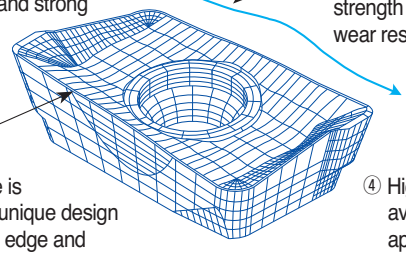
Designation	Fig	tooth	Spec.(mm) ØD	r	ap	ℓ	L	Shank spec.
PDF								

Alpha-Mill

Alpha-mill Insert

① Long tool life at high speed, high feed and deeper cutting by low cutting resistance and strong cutting edge

② Distinguished features of Alpha-Curve make cutting resistance reduce and the strength of cutting edge and wear resistance improve



③ Low cutting resistance is realized by KORLOY unique design i.e alpha curve cutting edge and optimal convex and concave design

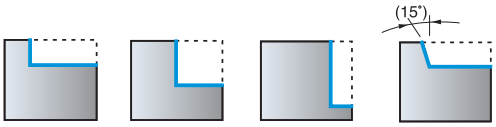
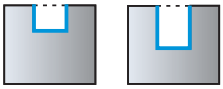
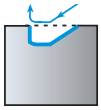
④ High efficient machining is available by the ideal application of the grade to material

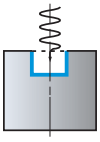


Inserts Feature & Application

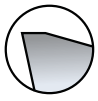
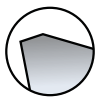
- Innovative curve cutting edge and chip-breaker design ensure ideal 90 degree cutting and lower cutting resistance
- Various applications are available with multi-functional cutters. (Facing, Slotting, Square shoulder milling and etc.)
- Improved insert life time with optimized per each application
- Excellent perfomance ensured at large depth of cutting operations due to strong cutting edge and low cutting resistance

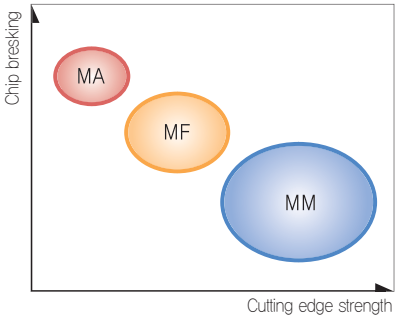
Application example

Shouldering	Slotting
	
Drilling	**Ramping**
	

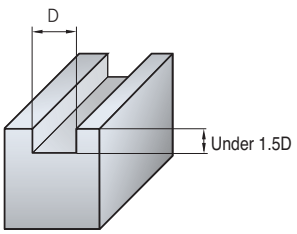
Helical cutting


Recommended grades and chip breakers by workpiece

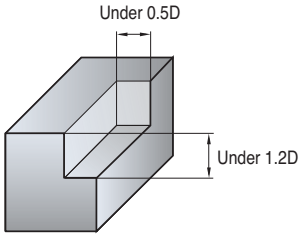
Chip breaker	Cutter edge		Recommended C/B and grade as per workpiece(● : 1st)									
			Low carbon steel Mild steel		High carbon steel Alloy steel		Stainless steel		Cast iron		Aluminum alloy	
			C/B	Grades	C/B	Grades	C/B	Grades	C/B	Grades	C/B	Grades
MF		Sharp cutting edge	●	● PC3500 ○ NCM325 ○ NCM335 ○ NC5330		● PC3500 ○ PC3545 ○ NCM325 ○ NCM335 ○ NC5330		● PC5300 ○ PC9530		● PC5300 ○ PC6510	–	–
MM		Strong cutting edge	–	● PC3500 ○ NCM325 ○ NCM335 ○ NC5330	●	● PC3500 ○ NCM325 ○ NCM335 ○ NC5330	●	● PC5300 ○ PC9530	●	● PC5300 ○ PC6510	–	–
MA		Sharp cutting edge	–	–	–	–	–	–	–	–	●	H01



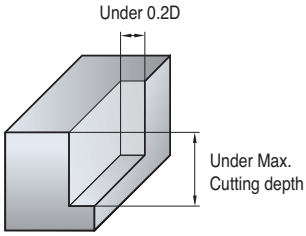
Recommended depth of cut



① Slotting



② Shouldering



③ Shouldering

Recommended cutting condition(for multi edge type)

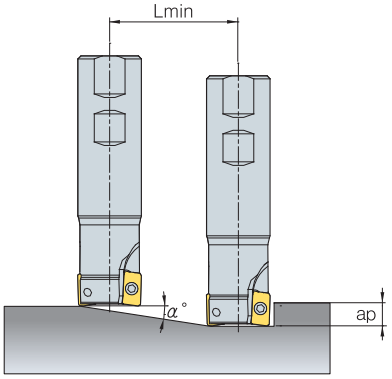
Workpiece	Grades	Fig.	Tool diameter							
			Ø20, 25		Ø32, 40		Ø50, 63		Ø80, 100	
			vc(m/min)	fz(mm/t)	vc(m/min)	fz(mm/t)	vc(m/min)	fz(mm/t)	vc(m/min)	fz(mm/t)
Mild steel, Low carbon steel	NC5330 NCM325 PC3500	①	80~100	0.05~0.08	100~120	0.05~0.08	100~120	0.05~0.08	100~120	0.05~0.08
		②	100~120	0.08~0.1	120~140	0.08~0.1	120~140	0.08~0.1	120~140	0.08~0.1
		③	100~120	0.1~0.15	140~140	0.1~0.15	120~140	0.1~0.15	130~150	0.1~0.15
High carbon steel, Alloy steel	NC5330 NCM325 PC3500	①	60~80	0.05	80~100	0.05	80~100	0.05	80~100	0.05
		②	80~100	0.05~0.08	100~120	0.08~0.1	100~120	0.08~0.1	100~120	0.08~0.1
		③	80~100	0.1~0.15	110~130	0.1~0.15	100~120	0.1~0.15	110~130	0.1~0.15
Alloy tool steel	NC5330 NCM325 PC3500	①	50~70	0.05	70~90	0.05	70~90	0.05	70~90	0.05
		②	60~80	0.05~0.08	90~120	0.05~0.08	100~120	0.05~0.08	100~120	0.05~0.08
		③	90~110	0.12~0.18	100~130	0.1~0.15	100~120	0.1~0.15	110~130	0.1~0.15
Stainless steel	PC5300 PC9530	①	50~70	0.054	70~90	0.05	70~90	0.05	70~90	0.05
		②	60~80	0.05~0.08	90~120	0.05~0.08	100~120	0.05~0.08	100~120	0.05~0.08
		③	90~110	0.1~0.15	100~130	0.1~0.15	110~130	0.1~0.15	110~130	0.1~0.15
Cast iron	PC6510 PC5300	①	70~90	0.1~0.12	70~90	0.1~0.12	90~120	0.1~0.12	90~120	0.1~0.12
		②	80~100	0.12	90~120	0.12	100~140	0.12	100~140	0.12
		③	80~100	0.15~0.2	100~130	0.15~0.2	120~150	0.15~0.2	120~150	0.15~0.2
Aluminum alloy	H01	①	200~800	0.1~0.2	300~900	0.1~0.2	400~1,000	0.1~0.2	400~1,000	0.1~0.2
		②	250~900	0.15~0.3	300~950	0.15~0.3	400~1,000	0.1~0.4	400~1,000	0.1~0.4
		③	250~900	0.15~0.3	300~950	0.15~0.3	400~1,000	0.1~0.4	400~1,000	0.1~0.4
Hardened steel	PC3545 PC5300	①	50~70	0.03	60~90	0.03	60~90	0.03	60~90	0.03
		②	60~80	0.05~0.08	80~100	0.05~0.08	80~100	0.05~0.08	80~100	0.05~0.08
		③	80~100	0.05~0.08	80~100	0.05~0.08	80~100	0.05~0.08	80~100	0.05~0.08

Recommended cutting condition(for single edge type)

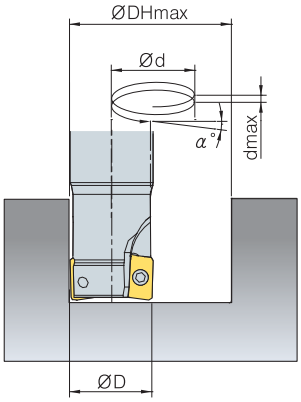
Workpiece	Grades	Fig.	Tool diameter							
			Ø20, 25		Ø32, 40		Ø50, 63		Ø80, 100	
			vc(m/min)	fz(mm/t)	vc(m/min)	fz(mm/t)	vc(m/min)	fz(mm/t)	vc(m/min)	fz(mm/t)
Mild steel, Low carbon steel	NC5330 NCM325 PC3500	①	60~80	0.05~0.08	80~120	0.05~0.08	120~200	0.05~0.08	150~200	0.05~0.08
		②	80~120	0.08~0.1	120~180	0.08~0.1	180~250	0.08~0.1	200~250	0.08~0.1
		③	80~120	0.1~0.15	120~180	0.1~0.15	180~250	0.1~0.15	200~250	0.1~0.15
High carbon steel, Alloy steel	NC5330 NCM325 PC3500	①	50~80	0.05	80~110	0.05	100~150	0.05	100~150	0.05
		②	80~100	0.05~0.08	110~150	0.05~0.1	150~200	0.05~0.1	150~200	0.05~0.1
		③	80~100	0.1~0.15	120~150	0.1~0.15	180~200	0.1~0.15	80~200	0.1~0.15
Alloy tool steel	NC5330 NCM325 PC3500	①	50~70	0.05	80~100	0.05	100~130	0.05	100~130	0.05
		②	70~100	0.05~0.08	100~130	0.05~0.1	130~180	0.05~0.1	130~180	0.05~0.1
		③	70~100	0.1~0.15	100~150	0.1~0.15	130~180	0.1~0.15	130~180	0.1~0.15
Stainless steel	PC5300 PC9530	①	50~70	0.05	80~100	0.05	100~130	0.05	100~130	0.05
		②	70~100	0.05~0.08	100~130	0.05~0.1	130~180	0.05~0.1	130~180	0.05~0.1
		③	70~100	0.1~0.15	100~150	0.1~0.15	130~180	0.1~0.15	130~180	0.1~0.15
Cast iron	PC6510 PC5300	①	80~100	0.08~0.12	80~100	0.15	120~150	0.15	120~150	0.15
		②	100~120	0.12~0.15	100~130	0.15~0.18	150~200	0.15~0.18	150~200	0.15~0.18
		③	100~120	0.15~0.2	100~130	0.15~0.2	150~200	0.15~0.2	150~200	0.15~0.2
Aluminum alloy	H01	①	250~800	0.15~0.2	300~900	0.15~0.2	400~1,000	0.1~0.2	400~1,000	0.1~0.2
		②	250~900	0.2~0.25	350~950	0.2~0.25	400~1,000	0.2~0.3	400~1,000	0.2~0.3
		③	250~900	0.25~0.3	350~950	0.25~0.3	400~1,000	0.3~0.1	400~1,000	0.3~0.4
Hardened steel	PC3545 PC5300	①	50~70	0.03	60~90	0.03	60~90	0.03	60~90	0.03
		②	60~80	0.05~0.08	80~100	0.05~0.08	80~100	0.05~0.08	80~100	0.05~0.08
		③	80~100	0.05~0.08	80~100	0.05~0.08	80~100	0.05~0.08	80~100	0.05~0.08

Cutting condition for ramping and helical operation

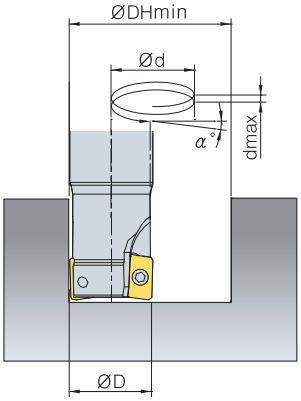
1. Ramping



2. Helical cutting for blind hole



3. Helical cutting for through hole

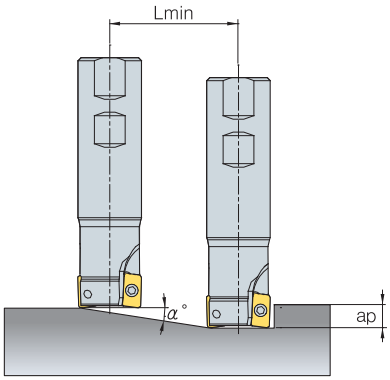


Designation	Tool diameter ØD(min)	Ramping			Helical cutting for blind hole				Helical cutting for through hole	
		ap	Maximum angle α(°)	Lmin(mm)	Max. desirable hole diameter ØDHmax(mm)	Max. pitch dmax(mm)	Min. desirable hole diameter ØDHmin(mm)	Max. pitch dmax(mm)	Min. desirable hole diameter ØDHmin(mm)	Max. pitch dmax(mm)
AMS1010HS	10	5	6.5	44	18.8	2.1	17.6	2.0	13	1.5
AMS1011HS	11		5.6	51	20.8	2.0	19.6	1.9	15	1.5
AMS1012HS	12		4.9	58	22.8	2.0	21.6	1.9	17	1.5
AMS1014HS	14		3.9	73	26.8	1.8	25.6	1.8	21	1.4
AMS1015HS	15		3.6	80	28.8	1.8	27.6	1.7	23	1.4
AMS1016HS	16		3.3	87	30.8	1.8	29.6	1.7	25	1.4
AMS1017HS	17		3.0	94	32.8	1.7	31.6	1.7	27	1.4
AMS1018HS	18		2.8	101	34.8	1.7	33.6	1.7	29	1.4
AMS1020HS	20		2.5	115	38.8	1.7	37.6	1.6	33	1.4
AMS1021HS	21		2.3	123	40.8	1.7	39.6	1.6	35	1.4
AMS1022HS	22		2.2	130	42.8	1.6	41.6	1.6	37	1.4
AMS1025HS	25		1.9	151	48.8	1.6	47.6	1.6	43	1.4
AMS1026HS	26		1.8	158	50.8	1.6	49.6	1.6	45	1.4
AMS1032HS	32		1.4	201	62.8	1.6	61.6	1.5	57	1.4
AMS1033HS	33		1.4	208	64.8	1.6	63.6	1.5	59	1.4
AMC1032HS	32		1.4	201	62.8	1.6	61.6	1.5	57	1.4
AMC1040HS	40		1.1	258	78.8	1.5	77.6	1.5	73	1.4
AMC1050HS	50		0.9	330	98.8	1.5	97.6	1.5	93	1.4
AMC1063HS	63		0.7	423	124.8	1.5	123.6	1.5	119	1.4
AMS1510HS	10	9	7.5	68	18.8	2.5	17.4	2.3	11	1.5
AMS1512HS	12		6.5	79	22.8	2.6	21.4	2.4	15	1.7
AMS1513HS	13		5.7	90	24.8	2.5	23.4	2.3	17	1.7
AMS1514HS	14		6.3	82	26.8	2.9	25.4	2.8	19	2.1
AMS1516HS	16		5.0	102	30.8	2.7	29.4	2.6	23	2.0
AMS1517HS	17		4.6	112	32.8	2.6	31.4	2.5	25	2.0
AMS1518HS	18		4.2	122	34.8	2.6	33.4	2.5	27	2.0
AMS1519HS	19		3.9	132	36.8	2.5	35.4	2.4	29	2.0
AMS1520HS	20		3.6	142	38.8	2.5	37.4	2.4	31	2.0
AMS1521HS	21		3.4	152	40.8	2.4	39.4	2.3	33	2.0
AMS1522HS	22		3.2	162	42.8	2.4	41.4	2.3	35	1.9
AMS1524HS	24		2.8	182	46.8	2.3	45.4	2.2	39	1.9
AMS1525HS	25		2.7	192	48.8	2.3	47.4	2.2	41	1.9
AMS1528HS	28		2.3	222	54.8	2.2	53.4	2.2	47	1.9
AMS1530HS	30		2.1	242	58.8	2.2	57.4	2.1	51	1.9
AMS1532HS	32		2.0	262	62.8	2.2	61.4	2.1	55	1.9
AMS1535HS	35		1.8	292	68.8	2.1	67.4	2.1	61	1.9
AMS1540HS	40		1.5	342	78.8	2.1	77.4	2.0	71	1.9
AMC15040HS	40		1.5	342	78.8	2.1	77.4	2.0	71	1.9
AMC15050HS	50		1.2	442	98.8	2.0	97.4	2.0	91	1.9
AMC15063HS	63		0.9	572	124.8	2.0	123.4	1.9	117	1.8
AMC15080HS	80		0.7	742	158.8	1.9	157.4	1.9	151	1.8
AMC15100HS	100		0.5	942	198.8	1.9	197.4	1.9	191	1.8

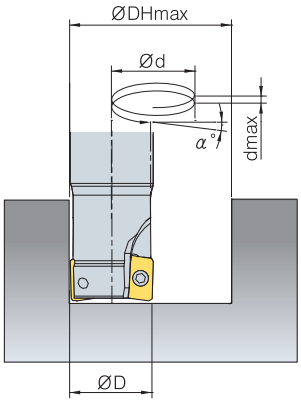
$$L\,min = \frac{ap}{\tan \alpha^{\circ}}\ (mm)$$

Cutting condition for ramping and helical operation

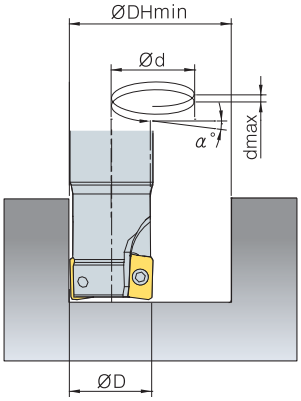
1. Ramping



2. Helical cutting for blind hole



3. Helical cutting for through hole



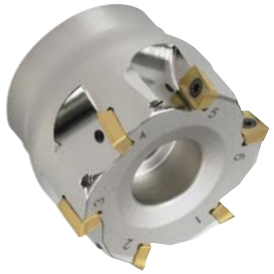
Designation	Tool diameter ØD(min)	Ramping			Helical cutting for blind hole				Helical cutting for through hole	
		ap	Maximum angle α(°)	Lmin(mm)	Max. desirable hole diameter ØDHmax(mm)	Max. pitch dmax(mm)	Min. desirable hole diameter ØDHmin(mm)	Max. pitch dmax(mm)	Min. desirable hole diameter ØDHmin(mm)	Max. pitch dmax(mm)
AMS2010HS	10	10	16.82	33	18	5.4	16.4	5.0	11	3.3
AMS2012HS	12		11.69	48	22	4.6	20.4	4.2	15	3.1
AMS2014HS	14		7.55	75	26	3.4	24.4	3.2	19	2.5
AMS2016HS	16		10.30	55	30	5.5	28	5.1	23	4.2
AMS2018HS	18		8.23	69	34	4.9	32	4.6	27	3.9
AMS2020HS	20		5.60	102	38	3.7	36	3.5	31	3.0
AMS2022HS	22		5.15	111	42	3.8	40	3.6	35	3.2
AMS2025HS	25		3.92	146	48	3.3	46	3.2	41	2.8
AMS2032HS	32		2.70	212	62	2.9	60	2.8	55	2.6
AMS2040HS	40		1.98	289	78	2.7	76	2.6	71	2.5
AMS2050HS	50		1.48	386	98	2.5	96	2.5	91	2.4
AMS2063HS	63		1.11	514	124	2.4	122	2.4	117	2.3
AMC2050HS	50		0.36	1576	98	0.6	96	0.6	91	0.6
AMC2063HS	63		0.27	2104	124	0.6	122	0.6	117	0.6
AMC2080HS	80		0.21	2784	158	0.6	156	0.6	151	0.5
AMC2100HS	100		0.16	3584	198	0.6	196	0.5	191	0.5
AMS3025HS	25	10	4.72	121	48	4.0	46	3.8	36	3.0
AMS3032HS	32		3.00	191	62	3.2	60	3.1	50	2.6
AMS3040HS	40		2.29	250	78	3.1	76	3.0	66	2.6
AMS3050HS	50		1.64	350	98	2.8	96	2.7	86	2.5
AMS3063HS	63		1.22	470	124	2.6	122	2.6	112	2.4
AMC3040HS	40		1.99	288	78	2.7	76	2.6	66	2.3
AMC3050HS	50		1.67	343	98	2.9	96	2.8	86	2.5
AMC3063HS	63		1.22	470	124	2.6	122	2.6	112	2.4
AMC3080HS	80		0.90	636	158	2.5	156	2.5	146	2.3
AMC3100HS	100		0.69	830	198	2.4	196	2.4	186	2.2
AMS2025MH	25	10	1.50	764	48	1.3	46	1.2	-	-
AMS2032MH	32		1.50	1146	62	1.6	60	1.6	-	-
AMS3040MH	40	16	1.50	1528	78	2.0	76	2.0	-	-
AMS4020HS	20	16	9.5	98	38.8	6.5	37.4	6.2	31	5.2
AMS4021HS	21		5.2	179	40.8	3.7	39.4	3.6	33	3.0
AMS4025HS	25		7.6	122	48.8	6.5	47.4	6.3	41	5.5
AMS4026HS	26		7.1	130	50.8	6.4	49.4	6.2	43	5.4
AMS4032HS	32		3.4	276	62.8	3.7	61.4	3.6	55	3.3
AMS4033HS	33		3.2	288	64.8	3.7	63.4	3.6	57	3.2
AMS4040HS	40		2.5	376	78.8	3.4	77.4	3.4	71	3.1
AMS4050HS	50		1.9	502	98.8	3.2	97.4	3.2	91	3.0
AMS4063HS	63		1.4	665	124.8	3.1	123.4	3.0	117	2.9
AMC4050HS	50		1.9	502	98.8	3.2	97.4	3.2	91	3.0
AMC4063HS	63		1.4	665	124.8	3.1	123.4	3.0	117	2.9
AMC4080HS	80		1.1	878	158.8	2.9	157.4	2.9	151	2.8
AMC4100HS	100		0.8	1128	198.8	2.9	197.4	2.9	191	2.8
AMC4125HS	125		0.6	1442	248.8	2.8	247.4	2.8	241	2.7

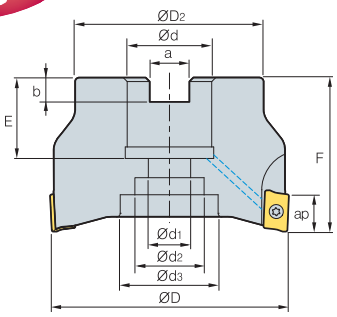
$$L\ min = \frac{ap}{\tan \alpha^{\circ}} \quad (mm)$$

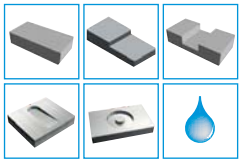
AMC(M)1000S/1500S/2000S New

AA 90°

• AR : 9°~13°
• RR : -14°~-5°







• RR(RR°)

(mm)

Designation		Stock	⊚	ØD	ØD2	Ød	Ød1	Ød2	Ød3	a	b	E	F	ap	kg
AMC(M)	1032HS	(○)	8	32	30	16	9	14	-	8.4	5.6	19	40	5.6	0.15
New	1040HS-16	(○)	10	40	34	16	9	14	-	8.4	5.6	19	40	5.6	0.24
	1040HS-22	(○)	10	40	34	22	11	18	-	10.4	6.3	21	40	5.6	0.24
	1050HS	(○)	12	50	42	22	11	18	-	10.4	6.3	21	40	5.6	0.36
	1063HS	(○)	14	63	49	22	11	18	-	10.4	6.3	21	40	5.6	0.61
AMC(M)	15040HS	(●)	5	40	34	16	9	14	-	8.4	5.6	19	40	9	0.22
New	15050HS	(●)	6	50	42	22	11	18	-	10.4	6.3	21	40	9	0.34
	15063HS	(●)	8	63	49	22	11	18	-	10.4	6.3	21	40	9	0.57
	15080HS	●(●)	10	80	57	25.4(27)	14	25	35	9.5(12.4)	6(7)	24(23)	50	9	1.10
	15100HS	●(●)	12	100	67	31.75(32)	18	26	42	12.7(14.4)	8(8)	32(26)	63	9	2.10
AMC(M)	2040HS	(●)	5	40	34	16	9	14	-	8.4	5.6	18	40	11	0.22
	2050HS	●(●)	6	50	42	22	11	18	-	10.4	6.3	20	40	11	0.34
	2063HS	●(●)	8	63	49	22	11	18	-	10.4	6.3	20	40	11	0.57
	2080HS	○(●)	10	80	57	25.4(27)	14	20	-	9.5(12.4)	6(7)	25(22)	50	11	1.10
	2100HS		12	100	67	31.75(32)	18	26	-	12.7(14.4)	8(8)	32(28)	63	11	2.10

• ( )Metric Size

● : Stock item ○ : Under preparing for stock

Parts

	Screw	Wrench		Applicable cutter Dia.
				
1000 Type	FTKA01842	-	TW06S-A	Ø32~Ø63
1500 Type	FTKA02555S	TW08S	-	Ø10~Ø14
	FTKA02565S			Ø16~Ø100
2000 Type	FTKA02550S	TW08S	-	Ø10~Ø14
	FTKA02565S			Ø16~Ø100

Available Inserts

APMT-MM	APMT-MF
	

Type	Designation	Coated										Cermet			Uncoated				page
		NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC3530	PC6510	PC215K	PD2000	CN2000	CN20	CN30	H01	G10	ST30A	ST20	
1000 Type	APMT 060202PDSR-MM			●	●	●	●												E05
	0602PDSR-MM			●	●	●	●												
	060208PDSR-MM			●	●	●	●												
	060212R-MM			●	●	●	●												
1500 Type	0903PDSR-MM			●	●	●	●												E05
	090308PDSR-MM			●	●	●	●												
	090312R-MM			●	●	●	●												
	090316R-MM			●	●	●	●												
	090320R-MM			●	●	●	●												
2000 Type	11T3PDSR-MM	●		●	●	●	●												E05
	11T3PDSR-MF	●		●	●	●	●												
	11T308PDSR-MM	●		●	●	●	●												
	11T312PDSR-MM	●		●	●	●	●												
	11T316R-MM	●		●	●	●	●												
	11T318R-MM																		
	11T324R-MM	●		●	●	●	●												

● : Stock item ○ : Under preparing for stock

Available Arbors

	Designation		Ød	NC Arbors
1000 Type	AMC(M)	1032HS	16	BT□□-FMC16-□□
		1040HS-16	16	BT□□-FMC16-□□
		1040HS-22	22	BT□□-FMC22-□□
		1050HS	22	BT□□-FMC22-□□
		1063HS	22	BT□□-FMC22-□□
1500 Type	AMC(M)	15040HS	16	BT□□-FMC16-□□
		15050HS	22	BT□□-FMC22-□□
		15063HS	22	BT□□-FMC22-□□
		15080HS	25.4	BT□□-FMA25.4-□□
			27	BT□□-FMC27-□□
		15100HS	31.75	BT□□-FMA31.75-□□
			32	BT□□-FMC32-□□
2000 Type	AMC(M)	2040HS	16	BT□□-FMC16-□□
		2050HS	22	BT□□-FMC22-□□
		2063HS	22	BT□□-FMC22-□□
		2080HS	25.4	BT□□-FMA25.4-□□
			27	BT□□-FMC27-□□
		2100HS	31.75	BT□□-FMA31.75-□□
			32	BT□□-FMC32-□□

• Available Inserts, see page : E05
• Available Arbors and bolt : E215~E217

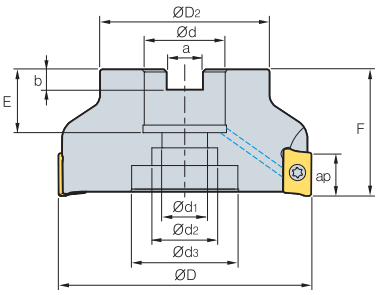
AMC(M)3000S/3000S-K

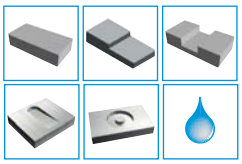
New

AA 90°

• AR : 14°
• RR : −12°~−8°







(mm)

Designation		Stock		ØD	ØD2	Ød	Ød1	Ød2	Ød3	a	b	E	F	ap	kg
AMC(M)	3040HS	(●)	4	40	34	16	9	14	-	8.4	5.6	18	40	16	0.15
	3050HS	(●)	5	50	42	22	11	18	-	10.4	6.3	20	40	16	0.24
	3063HS	(●)	6	63	49	22	11	18	-	10.4	6.3	20	40	16	0.24
	3080HS	●(●)	7	80	57	25.4(27)	14	20	-	9.5(12.4)	6(7)	25(22)	50	16	0.36
	3100HS	●(●)	8	100	67	31.75(32)	18	26	-	12.7(14.4)	8(8)	32(28)	63	16	0.61
AMC(M)	3040HS-K	●	4	40	34	16	9	14	-	8.4	5.6	18	40	16	0.15
New	3050HS-K	●(○)	5	50	42	22	11	18	-	10.4	6.3	20	40	16	0.24
	3063HS-K	●	6	63	49	22	11	18	-	10.4	6.3	20	40	16	0.24
	3080HS-K	●	7	80	57	25.4(27)	14	20	-	9.5(12.4)	6(7)	25(22)	50	16	0.36
	3100HS-K	●	8	100	67	31.75(32)	18	26	-	12.7(14.4)	8(8)	32(28)	63	16	0.61

• ( )Metric Size

● : Stock item ○ : Under preparing for stock

Parts

Screw	Wrench	Applicable cutter Dia.
		
FTKA0408	TW15S	Ø25
FTKA0410		Ø32~Ø100

Available Arbors

Designation		Ød	NC Arbors
AMC(M)	3040HS	16	BT□□-FMC16-□□
	3050HS	22	BT□□-FMC22-□□
	3063HS	22	BT□□-FMC22-□□
	3080HS	25.4	BT□□-FMA25.4-□□
		27	BT□□-FMC27-□□
	3100HS	31.75	BT□□-FMA31.75-□□
		32	BT□□-FMC32-□□
AMC(M)	3040HS-K	16	BT□□-FMC16-□□
	3050HS-K	22	BT□□-FMC22-□□
	3063HS-K	22	BT□□-FMC22-□□
	3080HS-K	25.4	BT□□-FMA25.4-□□
		27	BT□□-FMC27-□□
	3100HS-K	31.75	BT□□-FMA31.75-□□
		32	BT□□-FMC32-□□

• Available Inserts, see page : E04, E05
• Available Arbors and bolt : E215~E217

Available Inserts

APFT-X22 APFT-X28 APMT-MF APMT-MM APKT APKT-MF APKT-MM APKT-MM1



APKT-MA APKT-MA2 APKT-MA3 APKT-X22 APKT-X23 APKT-X24



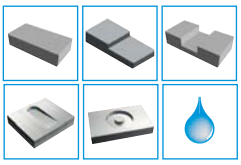
Designation		Coated NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	Cermet CN2000	CN20	CN30	Uncoated H01	G10	ST30A	ST20	적용 커터	Page
APFT	1604PDSR-X22				●														AMS 3000-K	E04
	1604PDTR-X22																			
	1604PDR-X28																			
	1604PDSR-X28																			
	1604PDTR-X28																			
APKT	1604PDSR	●			●				●											E04 E05
	1604PDSR-MF	●				●														
	1604PDSR-MM	●	●		●	●	●	●	●											
	160432R-MM1	●																		
	1604PDFR-MA										●				●					
	1604PDFR-MA2																			
	160416FR-MA2																			
	160432FR-MA2																			
	1604PDFR-MA3														●					
	1604PDSR-X22	●																		
	1604PDTR-X22																			
	1604PDR-X23																			
	1604PDTR-X23																			
	1604PDR-X24																			
	1604PDTR-X24																			
APMT	1604PDSR-MM	●		●	●	●	●	●											AMS 3000	E05
	1604PDSR-MF	●		●	●	●	●	●												
	160410PDSR-MM	●		●	●	●	●	●												
	160416PDSR-MM	●		●	●	●	●	●												
	160424R-MM	●		●	●	●	●	●												
	160430R-MM																			
	160432R-MM	●		●	●		●	●												

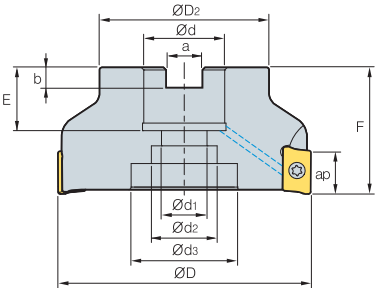
● : Stock item ○ : Under preparing for stock

AMC(M)4000S New



AA 90°
• AR : 13°~15°
• RR : −12°~7°





(mm)

Designation		Stock		ØD	ØD2	Ød	Ød1	Ød2	Ød3	a	b	E	F	ap	kg
AMC(M)	4050HS		5	50	42	22	11	18	-	10.4	6.3	21	40	17	0.28
New	4063HS	(●)	6	63	49	22	11	18	-	10.4	6.3	21	40	17	0.50
	4080HS	●(●)	7	80	57	25.4(27)	14	20	35	9.5(12.4)	6(7)	24(23)	50	17	1.00
	4100HS	●(●)	8	100	67	31.75(32)	18	26	42	12.7(14.4)	8(8)	32(25)	63(50)	17	2.10
	4125HS	●	9	125	87	38.1(40)	22	32	52	15.9(16.4)	10(9)	35(29)	63	17	3.30
	4160S		10	160	107	50.8(40)	-	-	100	19(16.4)	11(9)	38(32)	63	17	3.6
	4200S		10	200	108	47.625(60)	-	-	132	25.4(25.7)	14(14)	40(38)	63	17	6

• ( )Metric Size

● : Stock item ○ : Under preparing for stock

Parts

Screw	Wrench	Applicable cutter Dia.
		
FTKA0408	TW15S	Ø20~Ø25
FTKA0410		Ø32~Ø200

Available Arbors

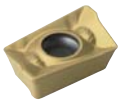
Designation		Ød	NC Arbors
AMC(M)	4050HS	22	BT□□-FMC22-□□
	4063HS	22	BT□□-FMC22-□□
	4080HS	25.4	BT□□-FMA25.4-□□
		27	BT□□-FMC27-□□
	4100HS	31.75	BT□□-FMA31.75-□□
		32	BT□□-FMC32-□□
	4125HS	38.1	BT□□-FMA38.1-□□
		40	BT□□-FMC40-□□
	4160S	50.8	BT□□-FMA50.8-□□
		40	BT□□-FMC40-□□
	4200S	47.625	BT□□-FMA47.625-□□
		60	BT□□-FMC60-□□

• Available Inserts, see page : E05, E06
• Available Arbors and bolt : E215~E217

Available Inserts

APMT-MF APMT-MM





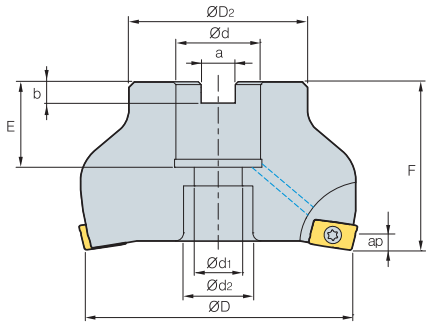
Designation		Coated										Cermet			Uncoated				page
		NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	CN2000	CN20	CN30	H01	G10	ST30A	ST20	
APMT	1806PDSR-MM	●		●	●	●	●												E06 E07
	1806PDSR-MF	●		●	●	●	●												
	1806PDSR-ML	●		●	●	●	●												
	180612PDSR-MM	●		●	●	●	●												
	180616PDSR-MM	●		●	●	●	●												
	180620PDSR-MM	●		●	●	●	●												
	180624PDSR-MM	●		●	●	●	●												
	180630R-MM																		
	180632R-MM																		

● : Stock item ○ : Under preparing for stock

AMC(M)1000SE/2000SE/3000SE

AA 75° | • AR : 4.5° • RR : 0°





(mm)

Designation		Stock	⊙	øD	øD2	ød	ød1	ød2	a	b	E	F	ap	kg
AMC(M)	1040HSE		4	40	34	16	9	14	8.4	5.6	19	40	2.5	0.26
	1050HSE		5	50	42	22	11	18	104	6.3	21	40	2.5	0.39
AMC(M)	2080HSE	(●)	5	80	57	25.4(27)	14	20	9.5(12.4)	6.0(7.0)	25(22)	50	4	1.2
	2100HSE		6	100	67	31.75(32)	18	26	12.7(14.4)	8.0(8.0)	32(28)	63	4	2.33
AMC(M)	3080HSE	●	4	80	57	25.4(27)	14	20	9.5(12.4)	6.0(7.0)	25(22)	50	6	1.3
	3100HSE	●	5	100	67	31.75(32)	18	26	12.7(14.4)	8.0(8.0)	32(28)	63	6	2.3

• ( )Metric Size

● : Stock item ○ : Under preparing for stock

Parts

	Screw	Wrench		Applicable cutter Dia.
				
1000 Type	FTKA01842	–	TW06S–A	Ø10~Ø63
2000 Type	FTKA02550S	TW08S	-	Ø10~Ø14
	FTKA02565S			Ø16~Ø100
3000 Type	FTKA0408	TW08S	-	Ø25
	FTKA0410			Ø32~Ø100

Available Arbors

Designation		ød	NC Arbors
AMC(M)	1040HSE	16	BT□□-FMC16 -□□
	1050HSE	22	BT□□-FMC22-□□
AMC(M)	2080SE	25.4	BT□□-FMA25.4-□□
		27	BT□□-FMC27-□□
	2100SE	31.75	BT□□-FMA31.75-□□
		32	BT□□-FMC32-□□
AMC(M)	3080SE	25.4	BT□□-FMA25.4-□□
		27	BT□□-FMC27-□□
	3100SE	31.75	BT□□-FMA31.75-□□
		32	BT□□-FMC32-□□

• Available Inserts, see page : E05
• Available Arbors and bolt : E215~E217

Available Inserts

APMT-MF APMT-MM



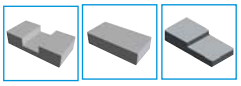


Type	Designation	Coated										Cermet			Uncoated				page
		NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	CN2000	CN20	CN30	H01	G10	ST30A	ST20	
1000 Type	APMT 060202PDSR-MM			●	●	●	●												E05
	0602PDSR-MM			●	●	●	●												
	060208PDSR-MM			●	●	●	●												
	060212R-MM			●	●	●	●												
2000 Type	APMT 11T3PDSR-MM	●		●	●	●	●												E05
	11T3PDSR-MF	●		●	●	●	●												
	11T308PDSR-MM	●		●	●	●	●												
	11T312PDSR-MM	●		●	●	●	●												
	11T316R-MM	●		●	●	●	●												
	11T318R-MM																		
	11T324R-MM	●		●	●	●	●												
3000 Type	APMT 1604PDSR-MM	●		●	●	●	●												E05
	1604PDSR-MF			●	●	●	●												
	160410PDSR-MM	●		●	●	●	●												
	160416PDSR-MM	●		●	●	●	●												
	160424R-MM	●		●	●	●	●												
	160430R-MM																		
	160432R-MM	●		●	●	●	●												

● : Stock item ○ : Under preparing for stock

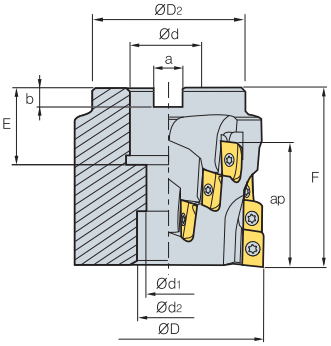
AMC(M)2000M/3000M

AA 90° | • AR : 9° • RR : -9°~-5°





New



(mm)

Designation		Stock	⊚	øD	øD2	ød	ød1	ød2	ød3	a	b	E	F	열수	ap	kg
AMC(M)	2050M	●(●)	16	50	40	22.225(22)	11	18	-	8(10.4)	5(6.3)	29(21)	58	4	39	0.7
	2063M	●(●)	16	63	50	25.4(27)	13.5	20	-	9.5(12.4)	6(7)	25(25)	58	4	39	0.8
	2080M	●(●)	20	80	60	31.75(32)	-	45	-	12.7(14.4)	8(8)	35(28)	63	5	39	0.96
	2100M	(●)	24	100	80	38.1(40)	-	56	-	15.9(16.4)	10(9)	38(30)	63	6	39	1.2
AMC(M)	3063M		16	63	57	25.4(27)	14	20	28	9.5(12.4)	6(7)	38(38)	85	4	57	1.1
	3080M		20	80	67	31.75(32)	14	26	40	12.7(14.4)	8(8)	40(40)	100	4	71	2.23
	3100M		30	100	87	38.1(40)	22	32	60	15.9(16.4)	10(9)	40(40)	100	6	71	3.59

• ( )Metric Size

● : Stock item ○ : Under preparing for stock

Parts

	Screw	Wrench	Applicable cutter Dia.
			
2000 Type	FTKA02550S	TW08S	Ø10~Ø14
	FTKA02565S		Ø16~Ø100
3000 Type	FTKA0408	TW15S	Ø25
	FTKA0410		Ø32~Ø100

Available Arbors

Designation			Ød	NC Arbors
2000 Type	AMC(M)	2050M	22.225	BT□□-SMA22.225-□□ BT□□-FMA22.225-□□
			22	BT□□-SMC22-□□ BT□□-FMC22-□□
		2063M	25.4	BT□□-SMA25.4-□□ BT□□-FMA25.4-□□
			27	BT□□-SMC27-□□ BT□□-FMC27-□□
		2080M	31.75	BT□□-SMA31.75-□□ BT□□-FMA31.75-□□
			32	BT□□-SMC32-□□ BT□□-FMC32-□□
		2100M	38.1	BT□□-SMA38.1-□□ BT□□-FMA38.1-□□
			40	BT□□-SMC40-□□ BT□□-FMC40-□□
3000 Type	AMC(M)	3063M	25.4	BT□□-SMA25.4-□□ BT□□-FMA25.4-□□
			27	BT□□-SMC27-□□ BT□□-FMC27-□□
		3080M	31.75	BT□□-SMA31.75-□□ BT□□-FMA31.75-□□
			32	BT□□-SMC32-□□ BT□□-FMC32-□□
		3100M	38.1	BT□□-SMA38.1-□□ BT□□-FMA38.1-□□
			40	BT□□-SMC40-□□ BT□□-FMC40-□□

• Available Inserts, see page : E05
• Available Arbors and bolt : E215~E217

Available Inserts

APMT-MF APMT-MM

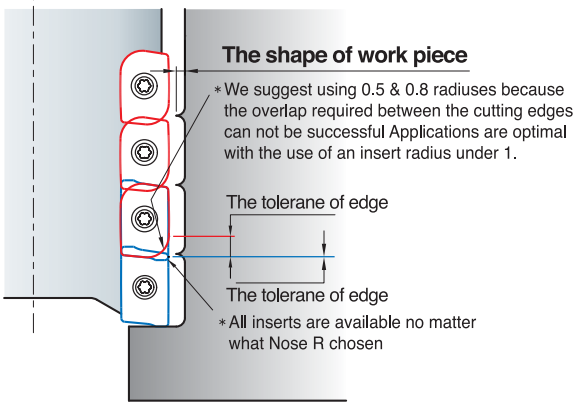




Type	Designation	Coated NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	Cermet CN2000	CN20	CN30	Uncoated H01	G10	ST30A	ST20	page
2000 Type	APMT 11T3PDSR-MM	●		●	●	●	●												E05
	11T3PDSR-MF	●		●	●	●	●												
	11T308PDSR-MM	●		●	●	●	●												
	11T312PDSR-MM	●		●	●	●	●												
	11T316R-MM	●		●	●	●	●												
	11T318R-MM																		
	11T324R-MM	●		●	●	●	●												
3000 Type	APMT 1604PDSR-MM	●		●	●	●	●												E05
	1604PDSR-MF	●		●	●	●	●												
	160410PDSR-MM	●		●	●	●	●												
	160416PDSR-MM	●		●	●	●	●												
	160424R-MM	●		●	●	●	●												
	160430R-MM																		
	160432R-MM	●		●	●	●	●												

● : Stock item ○ : Under preparing for stock

Caution when insert are screwed

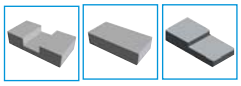


AMC(M)4000M

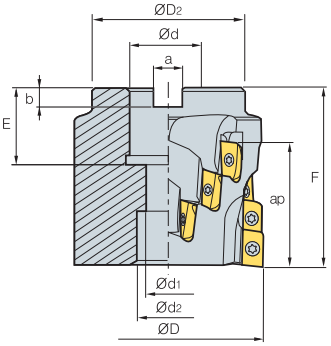
New

AA 90°

• AR : 9°
• RR : -9°~-5°







(mm)

Designation		Stock	⊚	øD	øD2	ød	ød1	ød2	ød3	a	b	E	F	열수	ap	kg
AMC(M)	4063M		16	63	57	25.4(27)	14	20	28	9.5(12.4)	6(7)	38(38)	85	4	61.1	1.1
	4080M		20	80	67	31.75(32)	14	26	40	12.7(14.4)	8(8)	40(40)	100	4	76.1	2.23
	4100M		30	100	87	38.1(40)	22	32	60	15.9(16.4)	10(9)	40(40)	100	6	76.1	3.59
	4125M		18	125	87	38.1(40)	22	32	52	15.9(16.4)	10(9)	36(29)	68	6	46.1	4.0

• ( )Metric Size

● : Stock item ○ : Under preparing for stock

Parts

Screw	Wrench	Applicable cutter Dia.
		
FTKA0408	TW15S	Ø20~Ø25
FTKA0410		Ø32~Ø200

Available Arbors

Designation		Ød	NC Arbors
AMC(M)	4063M	25.4	BT□□-SMA25.4-□□
			BT□□-FMA25.4-□□
		27	BT□□-SMC27-□□
			BT□□-FMC27-□□
	4080M	31.75	BT□□-SMA31.75-□□
			BT□□-FMA31.75-□□
		32	BT□□-SMC32-□□
			BT□□-FMC32-□□
	4100M	38.1	BT□□-SMA38.1-□□
			BT□□-FMA38.1-□□
		40	BT□□-SMC40-□□
			BT□□-FMC40-□□
	4125M	38.1	BT□□-SMA38.1-□□
			BT□□-FMA38.1-□□
		40	BT□□-SMC40-□□
			BT□□-FMC40-□□

• Available Inserts, see page : E05
• Available Arbors and bolt : E215~E217

Available Inserts

APMT-MF APMT-MM

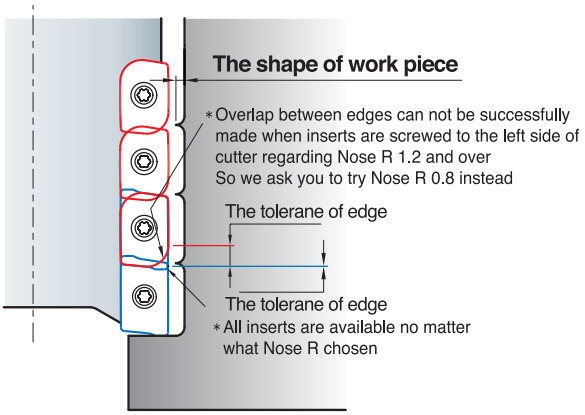




Designation		Coated									Cermet			Uncoated				page
		NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	CN2000	CN20	CN30	H01	G10	ST30A	ST20	
APMT	1806PDSR-MM	●		●	●	●	●												
	1806PDSR-MF	●		●	●	●	●												
	1806PDSR-ML	●		●	●	●	●												
	180612PDSR-MM	●		●	●	●	●												
	180616PDSR-MM	●		●	●	●	●												E05
	180620PDSR-MM	●		●	●	●	●												E06
	180624PDSR-MM	●		●	●	●	●												
	180630R-MM																		
	180632R-MM																		

● : Stock item ○ : Under preparing for stock

Caution when insert are screwed

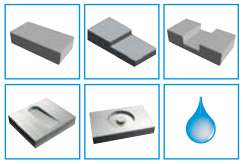


AMS1000S

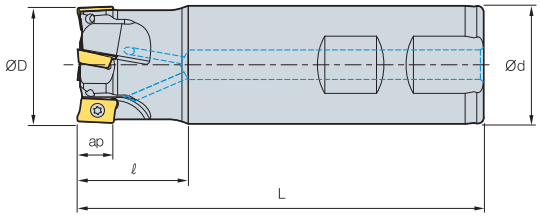
New

AA 90°

• AR : 7.5°~13°
• RR : -17°~-6°







(mm)

Designation		Stock	⊙	øD	ød	ℓ	L	ap	kg
AMS	1010HS	●	2	10	10	20	80	5.6	0.04
	1011HS	●	2	11	10	20	80	5.6	0.04
	1012HS-2	●	2	12	12	25	80	5.6	0.06
	1012HS-2L12		2	12	12	25	120	5.6	0.09
	1012HS-3	●	3	12	12	25	80	5.6	0.06
	1014HS-2	●	2	14	16	25	90	5.6	0.11
	1014HS-2L16		2	14	16	25	140	5.6	0.18
	1014HS-3	●	3	14	16	25	90	5.6	0.11
	1015HS	●	3	15	16	25	90	5.6	0.11
	1015HS-3L16		3	15	16	25	140	5.6	0.18
	1016HS-3	●	3	16	16	25	90	5.6	0.12
	1016HS-3L16		3	16	16	25	160	5.6	0.22
	1016HS-4	●	4	16	16	25	90	5.6	0.12
	1017HS	●	4	17	16	25	90	5.6	0.12
	1017HS-3L16		3	17	16	25	160	5.6	0.22
	1018HS	●	4	18	16	25	90	5.6	0.12
	1018HS-4L16		4	18	16	25	180	5.6	0.25
	1020HS-4	○	4	20	20	30	110	5.6	0.23
	1020HS-4L20		4	20	20	30	200	5.6	0.43
	1020HS-5	○	5	20	20	30	110	5.6	0.23
	1021HS		5	21	20	30	110	5.6	0.24
	1021HS-4L20		4	21	20	30	200	5.6	0.43
	1022HS	●	5	22	20	30	110	5.6	0.27
	1025HS	●	7	25	25	30	120	5.6	0.39
	1026HS	●	7	26	25	30	120	5.6	0.39
	1032HS	●	8	32	32	35	120	5.6	0.65
	1033HS	●	8	33	32	35	120	5.6	0.65

● : Stock item ○ : Under preparing for stock

Parts

Screw	Wrench	Applicable cutter Dia.
		
FTKA01842	TW06S-A	Ø10~Ø63

Available Inserts

APMT-MM



Designation	Coated										Cermet			Uncoated				page
	NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	CN2000	CN20	CN30	H01	G10	ST30A	ST20	
APMT 060202PDSR-MM			●	●	●	●												E05
0602PDSR-MM			●	●	●	●												
060208PDSR-MM			●	●	●	●												
060212R-MM			●	●	●	●												
060216R-MM			●	●	●	●												

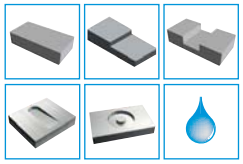
• Available Inserts, see page : E05 ● : Stock item ○ : Under preparing for stock

AMS1500S

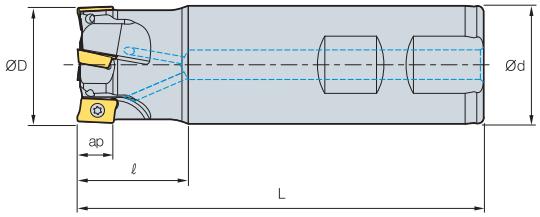
New

AA 90°

• AR : 7.5°~12.5°
• RR : -28°~-14°







(mm)

Designation		Stock		øD	ød	ℓ	L	ap	kg
AMS	15010HS	●	1	10	10	25	80	9	0.04
	15010HS-1L16		1	10	16	30	160	9	0.21
	15012HS	●	1	12	16	25	80	9	0.10
	15012HS-1L16		1	12	16	30	160	9	0.21
	15013HS	●	1	13	12	25	80	9	0.10
	15014HS	●	1	14	16	25	80	9	0.10
	15014HS-1L16		1	14	16	30	160	9	0.21
	15016HS	●	2	16	16	30	90	9	0.11
	15016HS-2L16	●	2	16	16	30	160	9	0.21
	15017HS	●	2	17	16	30	90	9	0.12
	15017HS-2L16		2	17	16	30	160	9	0.21
	15018HS	●	2	18	16	30	90	9	0.14
	15018HS-2L16		2	18	16	30	160	9	0.21
	15019HS	●	2	19	16	30	90	9	0.16
	15020HS	●	2	20	20	30	90	9	0.18
	15020HS-2L20	●	2	20	20	30	160	9	0.34
	15020HS-3	●	3	20	20	30	90	9	0.18
	15021HS	●	2	21	20	30	90	9	0.20
	15021HS-2L20		2	21	20	30	160	9	0.34
	15021HS-3		3	21	20	30	90	9	0.2
	15022HS	●	3	22	20	30	110	9	0.23
	15022HS-3L20		3	22	20	30	180	9	0.38
	15024HS	●	3	24	20	30	110	9	0.30
	15024HS-4	●	4	24	20	30	110	9	0.3
	15025HS-3S20	●	3	25	20	30	110	9	0.35
	15025HS	●	3	25	25	30	110	9	0.35
	15025HS-3L25	●	3	25	25	30	180	9	0.59
	15025HS-4S20		4	25	20	30	110	9	0.25
	15025HS-4S25	●	4	25	25	30	110	9	0.25
	15028HS	●	4	28	25	30	110	9	0.36
	15028HS-4L25		4	28	25	30	180	9	0.61
	15028HS-5	●	5	28	25	30	110	9	0.36
	15030HS	●	4	30	25	30	110	9	0.38
	15030HS-4L25		4	30	25	30	180	9	0.62
	15030HS-5		5	30	25	30	110	9	0.38
	15032HS	●	4	32	32	30	110	9	0.60
	15032HS-4L32	●	4	32	32	30	180	9	1.00
	15032HS-5	●	5	32	32	30	110	9	0.6
	15035HS	●	5	35	32	30	110	9	0.70
	15035HS-6	●	6	35	32	30	110	9	0.7
	15040HS-S32	●	5	40	32	35	130	9	0.80
	15040HS-5L32		5	40	32	35	200	9	1.20
	15040HS-6S32	●	6	40	32	35	130	9	0.8
	15040HS-S40	●	5	40	40	35	130	9	1.13
	15040HS-6S40		6	40	40	35	130	9	1.13
	15040HS-S42	●	5	40	42	35	130	9	1.23
	15040HS-6S42		6	40	42	35	130	9	1.23

● : Stock item ○ : Under preparing for stock

Parts

Screw	Wrench	Applicable cutter Dia.
		
FTKA02555S	TW08S	Ø10~Ø14
FTKA02565S		Ø16~Ø100

Available Inserts

APMT-MM



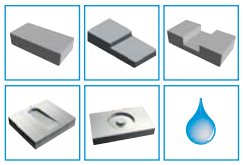
Designation	Coated									Cermet			Uncoated				page
	NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	CN2000	CN20	CN30	H01	G10	ST30A	ST20	
APMT 0903PDSR-MM			●	●	●	●												E05
090308PDSR-MM			●	●	●	●												
090312R-MM			●	●	●	●												
090316R-MM			●	●	●	●												
090320R-MM			●	●	●	●												

• Available Inserts, see page : E05 ● : Stock item ○ : Under preparing for stock

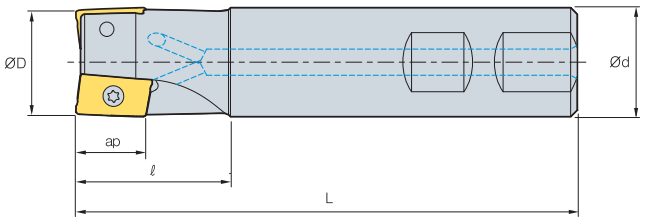
AMS2000S

AA 90°

• AR : 3°~14°
• RR : -25°~-18°







(mm)

Designation		Stock		ØD	Ød	ℓ	L	ap	kg
AMS	2010HS	●	1	10	10	20	85	11	0.04
	2010HS-1L16		1	10	16	30	160	11	0.21
	2012HS	●	1	12	16	25	85	11	0.10
	2012HS-1L16		1	12	16	30	160	11	0.21
	2014HS	●	1	14	16	25	90	11	0.12
	2014HS-1L16		1	14	16	30	160	11	0.21
	2016HS	●	2	16	16	25	90	11	0.12
	2016HS-2L16		2	16	16	30	180	11	0.21
	2018HS	●	2	18	16	25	90	11	0.12
	2018HS-2L16		2	18	16	30	180	11	0.21
	2020HS	●	2	20	20	30	100	11	0.21
	2020HS-2L20	●	2	20	20	30	210	11	0.49
	2022HS	●	3	22	20	35	115	11	0.25
	2022HS-3L20		3	22	20	35	180	11	0.38
	2025HS	●	3	25	25	35	115	11	0.40
	2025HS-3L25	●	3	25	25	40	180	11	0.59
	2032HS	●	4	32	32	40	125	11	0.70
	2032HS-4L32	●	4	32	32	50	180	11	1.00
	2040HS	●	5	40	32	42	130	11	0.84
	2040HS-5L32	●	5	40	32	50	200	11	1.20
	2040HS-S40		5	40	40	42	130	11	1.15
	2040HS-S42		5	40	42	42	130	11	2.00
	2050HS	●	6	50	32	45	135	11	1.06
	2050HS-S40		6	50	40	45	135	11	1.38
	2050HS-S42		6	50	42	45	135	11	1.50
	2063HS		8	63	32	45	135	11	1.31
	2063HS-S40		8	63	40	45	135	11	1.62
	2063HS-S42		8	63	42	45	135	11	1.70

● : Stock item ○ : Under preparing for stock

Parts

Screw	Wrench	Applicable cutter Dia.
		
FTKA02550S	TW08S	Ø10~Ø14
FTKA02565S		Ø16~Ø100

Available Inserts

APMT-MF	APMT-MM	APXT-MA
		

Designation	Coated									Cermet			Uncoated				page
	NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	CN2000	CN20	CN30	H01	G10	ST30A	ST20	
APMT11T3PDSR-MM	●		●	●	●	●												E05 E06
APMT11T3PDSR-MF	●		●	●	●	●												
APMT11T308PDSR-MM	●		●	●	●	●												
APMT11T312PDSR-MF	●		●	●	●	●												
APMT11T316R-MM	●		●	●	●	●												
APMT11T318R-MM																		
APMT11T324R-MM	●		●	●		●												
APXT11T3PDR-MA														●				

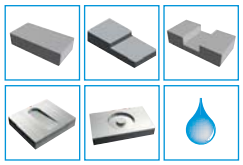
● : Stock item ○ : Under preparing for stock

• Available Inserts, see page : E05, E06

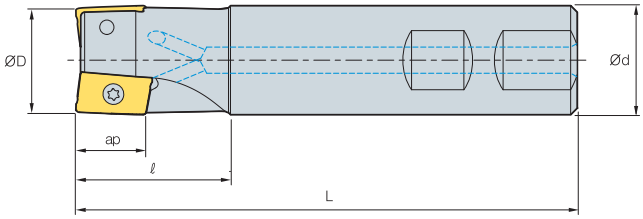
AMS3000S

AA 90°

• AR : 3°~14°
• RR : −18°~−10°







(mm)

Designation		Stock	⊙	ØD	Ød	ℓ	L	ap	kg
AMS	3025HS	●	2	25	25	35	115	16	0.40
	3025HS-2M25	●	2	25	25	35	180	16	0.65
	3025HS-2L25	●	2	25	25	60	220	16	0.75
	3032HS	●	3	32	32	40	125	16	0.69
	3032HS-2M32		2	32	32	40	200	16	1.13
	3032HS-2L32	●	2	32	32	65	260	16	1.52
	3032HS-3M32		3	32	32	40	200	16	1.12
	3032HS-3L32		3	32	32	65	260	16	1.48
	3040HS	●	4	40	32	42	130	16	0.80
	3040HS-3M32	●	3	40	32	42	200	16	1.24
	3040HS-3L32		3	40	32	42	260	16	1.61
	3040HS-4M32		4	40	32	42	200	16	1.21
	3040HS-4L32	●	4	40	32	42	260	16	1.58
	3040HS-S40	●	4	40	40	42	130	16	1.10
	3040HS-S42	●	4	40	42	42	130	16	1.20
	3050HS	●	5	50	32	45	135	16	1.00
	3050HS-S40		5	50	40	45	135	16	1.30
	3050HS-S42		5	50	42	45	135	16	1.40
	3063HS	●	6	63	32	45	135	16	1.25
	3063HS-S40	●	6	63	40	45	135	16	1.50
	3063HS-S42		6	63	42	45	135	16	1.54

● : Stock item ○ : Under preparing for stock

Parts

Screw	Wrench	Applicable cutter Dia.
		
FTKA0408	TW15S	Ø25
FTKA0410		Ø32~Ø100

Available Inserts

APMT-MF APMT-MM





Designation	Coated									Cermet			Uncoated				page
	NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	CN2000	CN20	CN30	H01	G10	ST30A	ST20	
APMT1604PDSR-MM	●		●	●	●	●												
APMT1604PDSR-MF	●		●	●	●	●												
APMT160410PDSR-MM	●		●	●	●	●												
APMT160416PDSR-MM	●		●	●	●	●												E05
APMT160424R-MM	●		●	●	●	●												
APMT160430R-MM																		
APMT160432R-MM	●		●	●	●	●												

● : Stock item ○ : Under preparing for stock

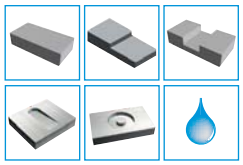
• Available Inserts, see page : E05

AMS3000S-K

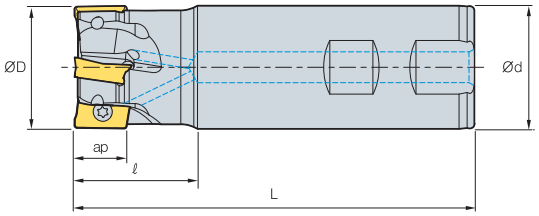
New

AA 90°

• AR : 14°
• RR : −18°~−10°







(mm)

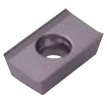
Designation		Stock	⊙	ØD	Ød	ℓ	L	ap	kg
AMS	3025HS-K		2	25	25	35	115	16	0.4
	3032HS-K	●	3	32	32	40	125	16	0.69
	3040HS-K	●	4	40	32	42	130	16	0.8
	3040HS-K-S40		4	40	40	42	130	16	1.1
	3040HS-K-S42		4	40	42	42	130	16	1.2
	3050HS-K		5	50	32	45	135	16	1.0
	3050HS-K-S40		5	50	40	45	135	16	1.3
	3050HS-K-S42		5	50	42	45	135	16	1.4
	3063HS-K		6	63	32	45	135	16	1.25
	3063HS-K-S40		6	63	40	45	135	16	1.5
	3063HS-K-S42		6	63	42	45	135	16	1.54

● : Stock item ○ : Under preparing for stock

Parts

Screw	Wrench		Applicable cutter Dia.
			
FTKA0408	TW15S	-	Ø25
FTKA0410			Ø32~Ø100

Available Inserts

APKT	APKT-MF	APKT-MM	APKT-MM1	APKT-MA
				
APKT-MA2	**APKT-MA3**	**APKT-X22**	**APKT-X23**	**APKT-X24**
				

• Available Inserts, see page : E04, E05

Available Inserts

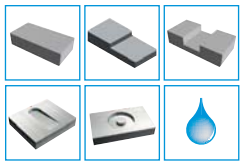
Designation		Coated									Cermet			Uncoated				page
		NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	CN2000	CN20	CN30	H01	G10	ST30A	ST20	
APFT	1604PDSR-X22				●														E04
	1604PDTR-X22																		
	1604PDR-X28																		
	1604PDSR-X28																		
	1604PDTR-X28																		
APKT	1604PDSR	●			●				●										E04 E05
	1604PDSR-MF	●				●													
	1604PDSR-MM	●	●		●	●	●	●	●										
	160432R-MM1	●																	
	1604PDFR-MA										●				●				
	1604PDFR-MA2																		
	160416FR-MA2																		
	160432FR-MA2																		
	1604PDFR-MA3														●				
	1604PDSR-X22	●																	
	1604PDTR-X22																		
	1604PDR-X23																		
	1604PDTR-X23																		
	1604PDR-X24																		
	1604PDTR-X24																		

● : Stock item ○ : Under preparing for stock

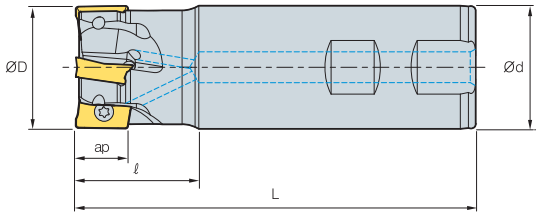
AMS4000S New

AA 90°

• AR : 7°~13°
• RR : -20°~-6°







(mm)

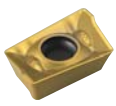
Designation		Stock		ØD	Ød	ℓ	L	ap	kg
AMS	4020HS	●	1	20	20	30	90	17	0.18
	4020HS-M		1	20	20	30	160	17	0.17
	4021HS	●	1	21	20	30	90	17	0.19
	4021HS-M		1	21	20	30	160	17	0.34
	4025HS	●	2	25	25	40	110	17	0.35
	4025HS-2M25		2	25	25	40	180	17	0.58
	4025HS-2L25	●	2	25	25	40	230	17	0.8
	4026HS	●	2	26	25	40	110	17	0.37
	4026HS-2M25		2	26	25	40	180	17	0.60
	4026HS-2L25		2	26	25	40	230	17	0.82
	4032HS	●	3	32	32	40	125	17	0.65
	4032HS-2M32		2	32	32	50	200	17	1.17
	4032HS-2L32	●	2	32	32	50	260	17	1.5
	4032HS-3M32	●	3	32	32	50	200	17	1.10
	4032HS-3L32		3	32	32	50	260	17	1.48
	4033HS	●	3	33	32	40	125	17	0.68
	4033HS-2M32		2	33	32	50	200	17	1.12
	4033HS-2L32		2	33	32	50	260	17	1.55
	4033HS-3M32		3	33	32	50	200	17	1.12
	4033HS-3L32		3	33	32	50	260	17	1.55
	4040HS-3M32	●	3	40	32	50	200	17	1.20
	4040HS-3L32	●	3	40	32	50	260	17	1.60
	4040HS-4M32		4	40	32	50	200	17	1.20
	4040HS-4L32		4	40	32	50	260	17	1.60
	4040HS-S32	●	4	40	32	40	130	17	0.76
	4040HS-S40	●	4	40	40	40	130	17	1.10
	4040HS-S42	●	4	40	42	40	130	17	1.20
	4050HS-S32	●	5	50	32	40	135	17	0.95
	4050HS-S40	●	5	50	40	40	135	17	1.30
	4050HS-S42	●	5	50	42	40	135	17	1.40
	4063HS-S32	●	6	63	32	40	135	17	1.25
	4063HS-S40	●	6	63	40	40	135	17	1.60
	4063HS-S42	●	6	63	42	40	135	17	1.70

● : Stock item ○ : Under preparing for stock

Parts

Screw	Wrench	Applicable cutter Dia.
		
FTKA0408	TW15S	Ø20~Ø25
FTKA0410		Ø32~Ø100

Available Inserts

APMT-MM	APMT-MF	APMT-ML
		

• Available Inserts, see page : E05, E06

Available Inserts

Designation		Coated									Cermet			Uncoated				page
		NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	CN2000	CN20	CN30	H01	G10	ST30A	ST20	
APMT	180604PDSR-MM	●		●	●	●	●												E05 E06
	180604PDSR-MF	●		●	●	●	●												
	1806PDSR-MM	●		●	●	●	●												
	1806PDSR-MF	●		●	●	●	●												
	1806PDSR-ML	●		●	●	●	●												
	180612PDSR-MM	●		●	●	●	●												
	180616PDSR-MM	●		●	●	●	●												
	180620PDSR-MM	●		●	●	●	●												
	180624PDSR-MM	●		●	●	●	●												
	180630R-MM																		
	180632R-MM																		

● : Stock item ○ : Under preparing for stock

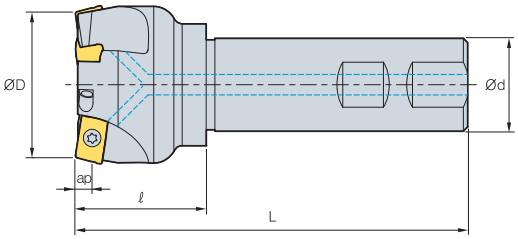
AMS1000SE2000SE/3000SE

New

AA 75°

• AR : -4.5°~-1°
• RR : -3°~0°





(mm)

Designation		Stock	⊚	øD	ød	ℓ	L	ap	kg
AMS	1025HSE		3	25	25	30	115	2.5	0.41
AMS	2025HSE	●	2	25	25	30	115	4	0.4
	2032HSE	●	3	32	32	40	125	4	0.72
	2040HSE	●	3	40	32	40	130	4	0.86
New	2040HSE-S40		3	40	40	40	130	4	1.2
New	2040HSE-S42		3	40	42	40	130	4	1.3
	2050HSE		4	50	32	40	135	4	0.98
New	2050HSE-S40		4	50	40	40	135	4	1.3
New	2050HSE-S42		4	50	42	40	135	4	1.4
	2063HSE	●	5	63	32	40	135	4	1.24
New	2063HSE-S40		5	63	40	40	135	4	1.57
New	2063HSE-S42		5	63	42	40	135	4	1.62
AMS	3050HSE		3	50	32	45	135	6	1.0
New	3050HSE-S40		3	50	40	45	135	6	1.3
New	3050HSE-S42		3	50	42	45	135	6	1.4
	3063HSE	●	4	63	32	45	135	6	1.3
New	3063HSE-S40		4	63	40	45	135	6	1.6
New	3063HSE-S42		4	63	42	45	135	6	1.7

● : Stock item ○ : Under preparing for stock

Parts

	Screw	Wrench		Applicable cutter Dia.
				
1000 Type	FTKA01842	-	TW06S-A	Ø10~Ø63
2000 Type	FTKA02550S	TW08S	-	Ø10~Ø14
	FTKA02565S			Ø16~Ø100
3000 Type	FTKA0408	TW15S	-	Ø25
	FTKA0410			Ø32~Ø100

Available Inserts

APMT-MF	APMT-MM
	

• Available Inserts, see page : E05

Available Inserts

Type	Designation	Coated										Cermet			Uncoated				page
		NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	CN2000	CN20	CN30	H01	G10	ST30A	ST20	
1000 Type	APMT 060202PDSR-MM			●	●	●	●												E05
	0602PDSR-MM			●	●	●	●												
	060208PDSR-MM			●	●	●	●												
	060212R-MM			●	●	●	●												
	060216R-MM			●	●	●	●												
2000 Type	APMT 11T3PDSR-MM	●		●	●	●	●												E05
	11T3PDSR-MF	●		●	●	●	●												
	11T308PDSR-MM	●		●	●	●	●												
	11T312PDSR-MM	●		●	●	●	●												
	11T316R-MM	●		●	●	●	●												
	11T318R-MM																		
	11T324R-MM	●		●	●	●	●												
	APXT 11T3PDSR-MR																		
	11T308PDR-MR																		
	11T3PDR-MA														●				
	11T318R-MA																		
3000 Type	APMT 1604PDSR-MM	●		●	●	●	●												E05
	1604PDSR-MF	●		●	●	●	●												
	160410PDSR-MM	●		●	●	●	●												
	160416PDSR-MM	●		●	●	●	●												
	160424R-MM	●		●	●	●	●												
	160430R-MM																		
	160432R-MM	●		●	●	●	●												

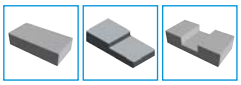
● : Stock item ○ : Under preparing for stock

AMS1000M/1500M

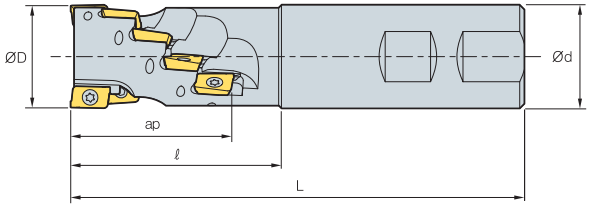
New

AA 90°

• AR : 7°~9°
• RR : -13°~-10°







(mm)

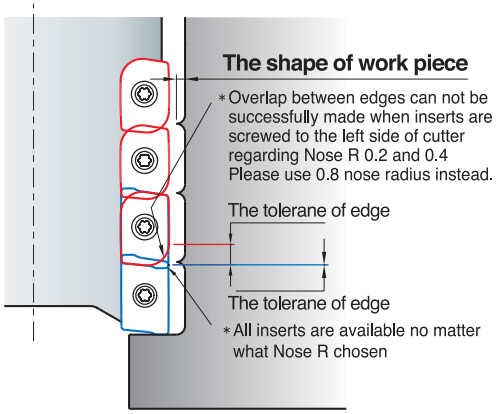
Designation		Stock	⊙	ØD	Ød	ℓ	L	No. of Flutes	ap	kg
AMS	1016M		6	16	16	30	80	2	15.5	0.3
	1020M		12	20	20	32	85	3	20.5	0.3
	1025M		20	25	25	39	95	4	25.5	0.3
AMS	15020M		3	20	20	42	105	1	26.5	0.3
	15025M		8	25	25	50	110	2	35	0.3
	15032M		10	32	32	60	120	2	44	0.3

● : Stock item ○ : Under preparing for stock

Parts

	Screw	Wrench		Applicable cutter Dia.
				
1000 Type	FTKA01842	-	TW06S-A	Ø10~Ø63
1500 Type	FTKA02555	TW08S	-	Ø10~Ø14
	FTKA02565S			Ø16~Ø100

Caution when insert are screwed



Available Inserts

APMT-MM



Type	Designation	Coated										Cermet			Uncoated				page
		NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	CN2000	CN20	CN30	H01	G10	ST30A	ST20	
1000 Type	APMT 060202PDSR-MM			●	●	●	●												E05
	0602PDSR-MM			●	●	●	●												
	060208PDSR-MM			●	●	●	●												
	060212R-MM			●	●	●	●												
	060216R-MM			●	●	●	●												
1500 Type	APMT 0903PDSR-MM			●	●	●	●												E05
	090308PDSR-MM			●	●	●	●												
	090312R-MM			●	●	●	●												
	090316R-MM			●	●	●	●												
	090320R-MM			●	●	●	●												

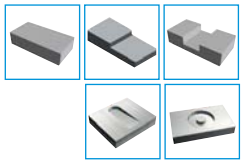
• Available Inserts, see page : E05 ● : Stock item ○ : Under preparing for stock

AMS2000M/4000M

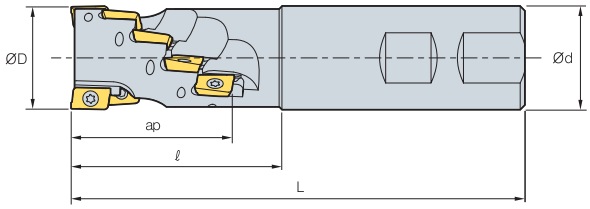
New

AA 90°

• AR : 7°~9°
• RR : -13°~-10°







(mm)

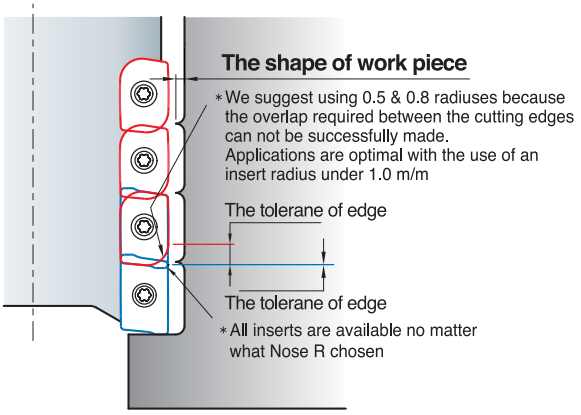
Designation		Stock	⊙	øD	ød	ℓ	L	No. of Flutes	ap	kg
AMS	2020M	●	3	20	20	45	120	1	29.4	0.32
	2025M	●	8	25	25	55	130	2	38.9	0.40
	2032M	●	10	32	32	65	140	2	48.5	0.65
	2040M	●	14	40	42	75	150	2	58	0.75
AMS	4032M		4	32	32	60	130	2	31.6	0.65
	4040M		6	40	40	70	140	2	46	1.11
	4050M-S40		6	50	40	55	125	2	46	1.22
	4050M		8	50	40	70	140	2	61	1.37

● : Stock item ○ : Under preparing for stock

Parts

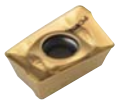
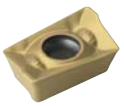
	Screw	Wrench		Applicable cutter Dia.
				
2000 Type	FTKA02565S	TW08S	-	Ø10~Ø14
	FTKA02565S			Ø16~Ø100
4000 Type	FTKA0408	TW15S	-	Ø20~Ø25
	FTKA0410			Ø32~Ø200

Caution when insert are screwed



Available Inserts

APMT-MF APMT-MM

Type	Designation	Coated										Cermet			Uncoated				page
		NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	CN2000	CN20	CN30	H01	G10	ST30A	ST20	
2000 Type	APMT 11T3PDSR-MM	●		●	●	●	●												E05
	11T3PDSR-MF	●		●	●	●	●												
	11T308PDSR-MM	●		●	●	●	●												
	11T312PDSR-MM	●		●	●	●	●												
	11T316R-MM	●		●	●	●	●												
	11T318R-MM																		
	11T324R-MM	●		●	●	●	●												
4000 Type	APMT 1806PDSR-MM	●		●	●	●	●												E05 E06
	1806PDSR-MF	●		●	●	●	●												
	1806PDSR-ML	●		●	●	●	●												
	180612PDSR-MM	●		●	●	●	●												
	180616PDSR-MM	●		●	●	●	●												
	180620PDSR-MM	●		●	●	●	●												
	180624PDSR-MM	●		●	●	●	●												
	180630R-MM																		
	180632R-MM	●		●	●	●	●												

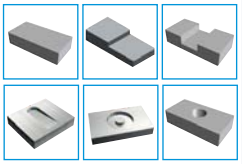
● : Stock item ○ : Under preparing for stock

• Available Inserts, see page : E05, E06

AMS1000MH/2000MH/3000MH

AA 90°

• AR : 9°~12°
• RR : -12°~-10°



New



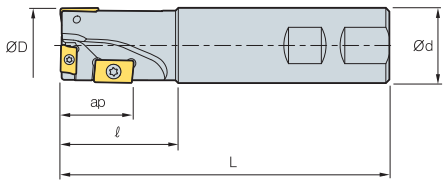


Fig. 1

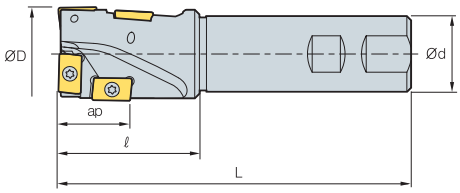


Fig. 2

(mm)

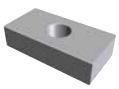
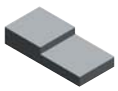
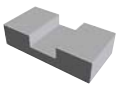
Designation		Stock	⊙	øD	ød	ℓ	L	ap	kg	APMT 0602	APMT 0903	APMT 11T3–	APKT 1604–	Fig.
AMS	1014MH	○	3	14	12	30	120	11	0.16	3	-	-	-	1
	1016MH	○	3	16	14	30	140	11	0.20	3	-	-	-	1
	1018MH	○	3	18	16	30	140	11	0.21	3	-	-	-	1
AMS	15020MH	○	3	20	20	35	140	17	0.31	1	2	-	-	1
AMS	2025MH	●	3	25	25	40	130	20	0.45	-	-	3	-	1
	2032MH	●	3	32	32	50	140	30	0.75	-	-	1	2	1
AMS	3040MH-K	○	4	40	32	60	150	40	0.90	-	-	-	4	2

● : Stock item ○ : Under preparing for stock

Parts

	Screw	Wrench		Applicable cutter Dia.
				
1000 Type	FTKA01842	-	TW06S-A	Ø10~Ø63
1500 Type	FTKA02565S	TW08S		Ø16~Ø100
2000 Type	FTKA02550S	TW08S	-	Ø10~Ø14
	FTKA02565S			Ø16~Ø100
32000 Type	FTKA0408	TW15S	-	Ø25
	FTKA0410			Ø32~Ø100

Recommended Cutting Condition

	Drilling	Shouldering	Slotting
			
vc(m/min)	80~200	80~200	80~200
fz(mm/t)	0.03~0.06	0.05~0.25	0.05~0.2

• Please keep the drill depth under 0.25D when you're drilling
• Please keep the step depth from 0.2 to 0.3mm

Available Inserts

APKT-MF APKT-MM APMT-MF APMT-MM



Type	Designation	Coated									Cermet			Uncoated				적용 홀더	Page
		NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	CN2000	CN20	CN30	H01	G10	ST30A	ST20	
1000 Type	APMT 060202PDSR-MM			●	●	●	●												E05
	0602PDSR-MM			●	●	●	●												
	060208PDSR-MM			●	●	●	●												
1500 Type	APMT 0903PDSR-MM			●	●	●	●												E05
	090308PDSR-MM			●	●	●	●												
2000 Type	APMT 11T3PDSR-MM	●		●	●	●	●												E05
	11T3PDSR-MF	●		●	●	●	●												
	11T308PDSR-MM	●		●	●	●	●												
	11T312PDSR-MM	●		●	●	●	●												
	11T316R-MM	●		●	●	●	●												
	11T318R-MM																		
	11T324R-MM	●		●	●	●	●												
	APXT 11T3PDR-MA														●				E06
3000 Type	APKT 1604PDSR-MM	●		●	●	●	●												E04
	1604PDSR-MF	●		●	●	●	●												

● : Stock item ○ : Under preparing for stock

• Available Inserts, see page : E04, E05, E06

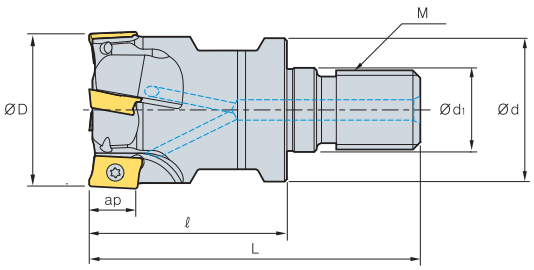
AMM1000/1500/2000

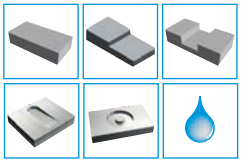
New

AA 90°

• AR : 7.5°~12.5°
• RR : -28°~-6°







(mm)

Designation		Stock		øD	ød	ød1	ℓ	L	M	ap	kg
AMM	1012HR-M06	●	3	12	11	6.5	25	40	M06	5.6	0.02
	1016HR-M08		4	16	14.5	8.5	25	42	M08	5.6	0.03
	1020HR-M10	●	5	20	18	10.5	30	51	M10	5.6	0.07
	1025HR-M12	●	7	25	23	12.5	35	59	M12	5.6	0.12
	1032HR-M16	●	8	32	29	17	40	67	M16	5.6	0.23
AMM	15010HR-M06	●	1	10	9.5	6.5	25	40	M06	9	0.01
	15012HR-M06		1	12	11	6.5	25	40	M06	9	0.02
	15016HR-M08	●	2	16	14.5	8.5	25	42	M08	9	0.03
	15020HR-M10	●	2	20	18	10.5	30	51	M10	9	0.06
	15025HR-M12	●	3	25	23	12.5	35	59	M12	9	0.12
	15032HR-M16	●	4	32	29	17	40	67	M16	9	0.22
AMM	2016HR-M08		2	16	14.5	8.5	25	42	M08	11	0.04
	2020HR-M10		2	20	18	10.5	30	51	M10	11	0.07
	2025HR-M12	●	3	25	23	12.5	35	59	M12	11	0.04
	2032HR-M16		4	32	29	17	40	67	M16	11	0.23
	2040HR-M16		5	40	29	17	40	67	M16	11	0.25

● : Stock item ○ : Under preparing for stock

Parts

	Screw	Wrench		Applicable cutter Dia.
				
1000 Type	FTKA01842	-	TW06S-A	Ø10~Ø63
1500 Type	FTKA02555S	TW08S	-	Ø10~Ø14
	FTKA02565S			Ø16~Ø100
2000 Type	FTKA02550S	TW08S	-	Ø10~Ø14
	FTKA02565S			Ø16~Ø100

Available Adaptor

Designation		Applicable adaptor
AMM	1012HR-M06	MAT - M06
	1016HR-M08	MAT - M08
	1020HR-M10	MAT - M10
	1025HR-M12	MAT - M12
	1032HR-M16	MAT - M16
	15010HR-M06	MAT - M06
	15012HR-M06	MAT - M06
	15016HR-M08	MAT - M08
	15020HR-M10	MAT - M10
	15025HR-M12	MAT - M12
	15032HR-M16	MAT - M16
	2016HR-M08	MAT - M08
	2020HR-M10	MAT - M10
	2025HR-M12	MAT - M12
	2032HR-M16	MAT - M16
	2040HR-M16	MAT - M16

• Available Inserts, see page : E05, E06
• Applicable adaptor, see pages : E133~E134

Available Inserts

APMT-MM APMT-MF APXT-MA





Type	Designation	Coated										Cermet			Uncoated				page
		NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	CN2000	CN20	CN30	H01	G10	ST30A	ST20	
1000 Type	APMT 060202PDSR-MM			●	●	●	●												E05
	0602PDSR-MM			●	●	●	●												
	060208PDSR-MM			●	●	●	●												
	060212R-MM			●	●	●	●												
	060216R-MM			●	●	●	●												
1500 Type	APMT 0903PDSR-MM			●	●	●	●												E05
	090308PDSR-MM			●	●	●	●												
	090312R-MM			●	●	●	●												
	090316R-MM			●	●	●	●												
	090320R-MM			●	●	●	●												
2000 Type	APMT 11T3PDSR-MM	●		●	●	●	●												E05 E06
	11T3PDSR-MF	●		●	●	●	●												
	11T308PDSR-MM	●		●	●	●	●												
	11T312PDSR-MM	●		●	●	●	●												
	11T316R-MM	●		●	●	●	●												
	11T318R-MM																		
	11T324R-MM	●		●	●	●	●												
	APXT 11T3PDR-MA														●				

● : Stock item ○ : Under preparing for stock

Designation : AMM1032HR-M16
Modular Head Threading Measure size(M16)
=
Adaptor Spec. : MAT-M16-035-S32S
Adaptor Threading Measure(M16)

BT/HSK Tooling system

Single, Multi edge geometry Notification

BT50	HAT	4	063	114	–	4	F
Arbor type: BT30/40/50 HSK40/50/63/100	Item Name: AM HAT RM	Series: 1000 Type 1500 Type 2000 Type 3000 Type 4000 Type	Dia.: Dia. of cutting : Ø63	Length(ap): Length : 114 HS : Coolant + Single		No. of flute: No. of flute : 4 No. of tooth:4	Front piece or Total length: Front Piece(Y/N) Y : F None : No L : Long type

Modular geometry Notification

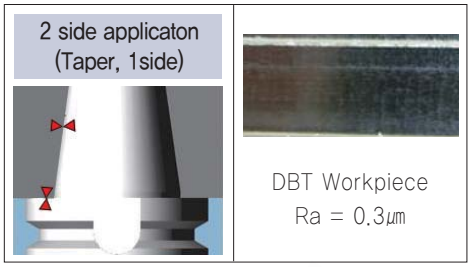
BT50	–	MAT	–	M16	–	092
Arbor type: BT30/40/50 HSK40/50/63/100		Item category: MAT		M Dimensions: M Dimensions : M16		Total length(L): Total length : 92

DBT system

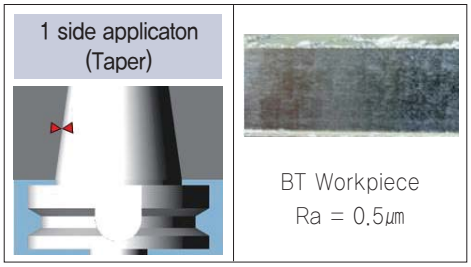
(D)BT Arbor Feature

- Guarantee strong application force by 2 side application
- Guarantee strengthen cutting at high speed
- Guarantee superior surface roughness

DBT



BT



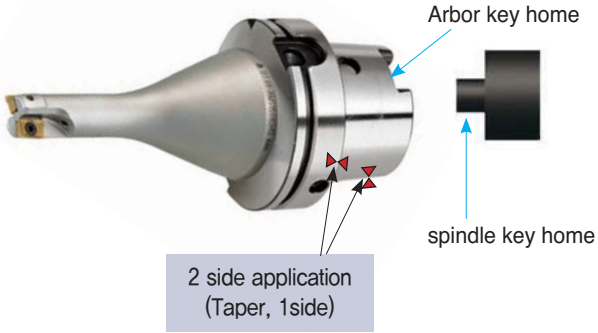
• Application, Increased Surface roughness

HSK system

HSK Arbor Feature

- Guarantee strong application force by 2 side application
- Guarantee strengthen cutting at high speed
- Guarantee superior surface roughness
- Guarantee exactness at axle direction and repeated direction

HSK A : HSK T key Tolerance comparison



HSK Tolerance comparison

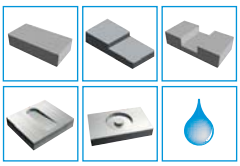
Arbor type	Max. Tolerance	Max. Tolerance	Available facility
HSK-T	0.075	0.035	Multi-Tasking Machine
HSK-A	0.33	0.08 general	MCT

BT30/40 AM1000/1500HS

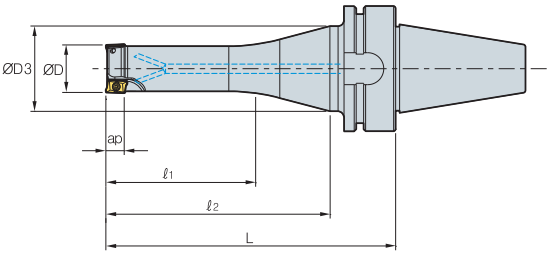
New

AA 90°

• AR : 7.5°~13°
• RR : -28°~-7°







(mm)

	Designation	Stock		ØD	ØD3	ℓ1	ℓ2	L	ap
BT30	AM1010HS-2		2	10	43	35	83	112	5.6
	AM1012HS-2		2	12	43	35	83	112	5.6
	AM1012HS-3		3	12	43	35	83	112	5.6
	AM1016HS-3		3	16	43	35	83	112	5.6
	AM1016HS-4		4	16	43	35	83	112	5.6
	AM1020HS-4		4	20	43	45	98	127	5.6
	AM1020HS-5		5	20	43	45	98	127	5.6
BT40	AM15016HS-2		2	16	43	45	83	117	9
	AM15016HS-2L		2	16	43	35	118	152	9
	AM15020HS-2		2	20	43	60	98	132	9
	AM15020HS-3		3	20	43	60	98	132	9
	AM15020HS-2L		2	20	43	50	118	152	9
	AM15025HS-3		3	25	43	75	113	147	9
	AM15025HS-4		4	25	43	75	113	147	9
	AM15025HS-3L		3	25	43	65	133	167	9
	AM15032HS-4		4	32	43	80	113	147	9
	AM15032HS-5		5	32	43	80	113	147	9
	AM15032HS-4L		4	32	43	70	133	167	9
	AM15040HS-5		5	40	47	60	98	132	9
	AM15040HS-6		6	40	47	60	98	132	9
	AM15040HS-5L		5	40	47	50	118	152	9

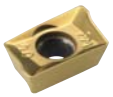
● : Stock item ○ : Under preparing for stock

Parts

	Screw	Wrench		Applicable cutter Dia.
				
1000 Type	FTKA01842	-	TW06S-A	Ø10~Ø63
1500 Type	FTKA02555S	TW08S	-	Ø10~Ø14
	FTKA02565S			Ø16~Ø100

Available Inserts

APMT-MM



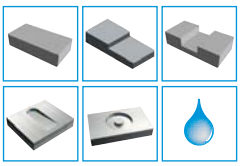
Type	Designation	Coated										Cermet			Uncoated				page
		NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	CN2000	CN20	CN30	H01	G10	ST30A	ST20	
1000 Type	APMT 060202PDSR-MM			●	●	●	●												E05
	0602PDSR-MM			●	●	●	●												
	060208PDSR-MM			●	●	●	●												
	060212R-MM			●	●	●	●												
	060216R-MM			●	●	●	●												
1500 Type	APMT 0903PDSR-MM			●	●	●	●												E05
	090308PDSR-MM			●	●	●	●												
	090312R-MM			●	●	●	●												
	090316R-MM			●	●	●	●												
	090320R-MM			●	●	●	●												

• Available Inserts, see page : E05 ● : Stock item ○ : Under preparing for stock

BT40/50 AM2000/3000/4000HS

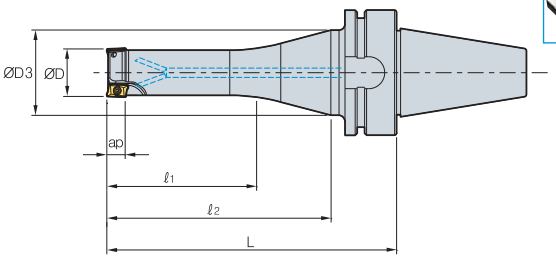
AA 90°

• AR : 7°~10°
• RR : -20°~-7°



New





(mm)

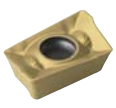
Designation		Stock		øD	øD3	ℓ1	ℓ2	L	ap
BT40	AM2016HS-2		2	16	43	45	83	117	11
	AM2016HS-2L		2	16	43	35	118	152	11
	AM2020HS-2		2	20	43	60	98	132	11
	AM2020HS-2L		2	20	43	50	118	152	11
	AM2025HS-3		3	25	43	75	113	147	11
	AM2025HS-3L		3	25	43	65	113	147	11
	AM2032HS-4		4	32	43	80	113	147	11
	AM2032HS-4L		4	32	43	70	133	167	11
	AM2040HS-5		5	40	47	60	98	132	11
	AM2040HS-5L		5	40	47	50	118	152	11
	AM2050HS-6		6	50	47	60	98	132	11
	AM2050HS-6L		6	50	47	50	118	152	11
BT50	AM3025HS-2		2	25	43	65	113	158	16
	AM3025HS-2L		2	25	43	55	123	168	16
	AM3032HS-3		3	32	43	70	113	158	16
	AM3032HS-3L		3	32	43	60	123	168	16
	AM3040HS-4		4	40	47	50	98	143	16
	AM3040HS-4L		4	40	47	40	108	153	16
	AM3050HS-5		5	50	47	50	98	143	16
	AM3050HS-5L		5	50	47	40	108	153	16
BT50	AM4020HS-1		1	20	43	50	98	143	17
	AM4025HS-2		2	25	43	65	113	158	17
	AM4032HS-3		3	32	43	70	113	158	17
	AM4032HS-3L		3	32	43	60	123	168	17
	AM4040HS-4		4	40	47	50	98	143	17
	AM4040HS-4L		4	40	47	40	108	153	17
	AM4050HS-5		5	50	47	50	98	143	17
	AM4050HS-5L		5	50	47	40	108	153	17

● : Stock item ○ : Under preparing for stock

Parts

	Screw	Wrench	Applicable cutter Dia.
			
2000 Type	FTKA02550S	TW08S	Ø10~Ø14
	FTKA02565S		Ø16~Ø100
3000 Type	FTKA0408	TW15S	Ø25
	FTKA0410		Ø32~Ø100
4000 Type	FTKA0408	TW15S	Ø20~Ø25
	FTKA0410		Ø32~Ø200

Available Inserts

APMT-MM	APMT-MF
	

• Available Inserts, see page : E05, E06

Type	Designation	Coated										Cermet			Uncoated				page
		NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	CN2000	CN20	CN30	H01	G10	ST30A	ST20	
2000 Type	APMT 11T3PDSR-MM	●		●	●	●	●												E05
	11T3PDSR-MF	●		●	●	●	●												
	11T308PDSR-MM	●		●	●	●	●												
	11T312PDSR-MM	●		●	●	●	●												
	11T316R-MM	●		●	●	●	●												
	11T318R-MM																		
	11T324R-MM	●		●	●	●	●												
3000 Type	APMT 1604PDSR-MM	●		●	●	●	●												E05
	1604PDSR-MF	●		●	●	●	●												
	160410PDSR-MM	●		●	●	●	●												
	160416PDSR-MM	●		●	●	●	●												
	160424R-MM	●		●	●	●	●												
	160430R-MM																		
	160432R-MM	●		●	●	●	●												
4000 Type	APMT 180604PDSR-MM	●		●	●	●	●												E05 E06
	180604PDSR-MF	●		●	●	●	●												
	1806PDSR-MM	●		●	●	●	●												
	1806PDSR-MF	●		●	●	●	●												
	1806PDSR-ML	●		●	●	●	●												
	180612PDSR-MM	●		●	●	●	●												
	180616PDSR-MM	●		●	●	●	●												
	180620PDSR-MM	●		●	●	●	●												
	180624PDSR-MM	●		●	●	●	●												
	180630R-MM																		
	180632R-MM																		

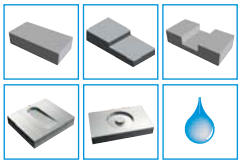
● : Stock item ○ : Under preparing for stock

HSK63A AM1000/1500HS

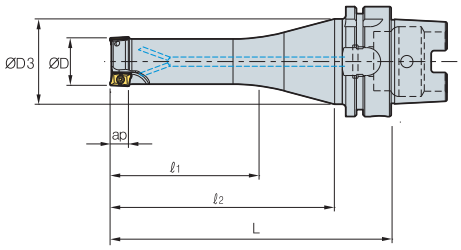
New

AA 90°

• AR : 7.5°~13°
• RR : -28°~-7°







(mm)

Designation		Stock		ØD	ØD3	ℓ1	ℓ2	L	ap
HSK63A	AM1010HS-2		2	10	43	35	83	116	5.6
	AM1012HS-2		2	12	43	35	83	116	5.6
	AM1012HS-3		3	12	43	35	83	116	5.6
	AM1016HS-3		3	16	43	35	83	116	5.6
	AM1016HS-4		4	16	43	35	83	116	5.6
	AM1020HS-4		4	20	43	45	98	131	5.6
	AM1020HS-5		5	20	43	45	98	131	5.6
HSK63A	AM15016HS-2		2	16	43	45	83	116	9
	AM15016HS-2L		2	16	43	35	118	151	9
	AM15020HS-2		2	20	43	60	98	131	9
	AM15020HS-3		3	20	43	60	98	131	9
	AM15020HS-2L		2	20	43	50	118	151	9
	AM15025HS-3		3	25	43	75	113	146	9
	AM15025HS-4		4	25	43	75	113	146	9
	AM15025HS-3L		3	25	43	65	133	166	9
	AM15032HS-4		4	32	43	80	113	146	9
	AM15032HS-5		5	32	43	80	113	146	9
	AM15032HS-4L		4	32	43	70	133	166	9
	AM15040HS-5		5	40	47	60	98	131	9
	AM15040HS-6		6	40	47	60	98	131	9
	AM15040HS-5L		5	40	47	50	118	151	9

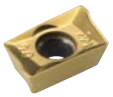
● : Stock item ○ : Under preparing for stock

Parts

	Screw	Wrench		Applicable cutter Dia.
				
1000 Type	FTKA01842	-	TW06S-A	Ø10~Ø63
1500 Type	FTKA02555S	TW08S	-	Ø10~Ø14
	FTKA02565S			Ø16~Ø100

Available Inserts

APMT-MM



Type	Designation	Coated									Cermet			Uncoated				page
		NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	CN2000	CN20	CN30	H01	G10	ST30A	ST20	
1000 Type	APMT 060202PDSR-MM			●	●	●	●												E05
	0602PDSR-MM			●	●	●	●												
	060208PDSR-MM			●	●	●	●												
	060212R-MM			●	●	●	●												
	060216R-MM			●	●	●	●												
1500 Type	APMT 0903PDSR-MM			●	●	●	●												E06
	090308PDSR-MM			●	●	●	●												
	090312R-MM			●	●	●	●												
	090316R-MM			●	●	●	●												
	090320R-MM			●	●	●	●												

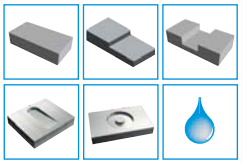
● : Stock item ○ : Under preparing for stock

• Available Inserts, see page : E05, E06

HSK63A AM2000/3000/4000HS

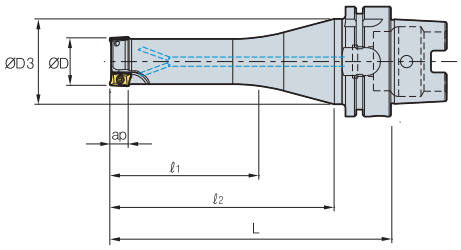
AA 90°

• AR : 7°~10°
• RR : -20°~-7°



New





(mm)

Designation		Stock		øD	øD3	ℓ1	ℓ2	L	ap
HSK63A	AM2016HS-2		2	16	43	45	83	116	11
	AM2016HS-2L		2	16	43	35	118	151	11
	AM2020HS-2		2	20	43	60	98	131	11
	AM2020HS-2L		2	20	43	50	118	151	11
	AM2025HS-3		3	25	43	75	113	146	11
	AM2025HS-3L		3	25	43	65	113	146	11
	AM2032HS-4		4	32	43	80	113	146	11
	AM2032HS-4L		4	32	43	70	133	166	11
	AM2040HS-5		5	40	47	60	98	131	11
	AM2040HS-5L		5	40	47	50	118	151	11
	AM2050HS-6		6	50	47	60	98	131	11
	AM2050HS-6L		6	50	47	50	118	151	11
HSK63A	AM3025HS-2		2	25	43	65	113	146	16
	AM3025HS-2L		2	25	43	55	123	156	16
	AM3032HS-3		3	32	43	70	113	146	16
	AM3032HS-3L		3	32	43	60	123	156	16
	AM3040HS-4		4	40	47	50	98	131	16
	AM3040HS-4L		4	40	47	40	108	141	16
	AM3050HS-5		5	50	47	50	98	131	16
	AM3050HS-5L		5	50	47	40	108	141	16
HSK63A	AM4020HS-1		1	20	43	50	98	131	17
	AM4025HS-2		2	25	43	65	113	146	17
	AM4032HS-3		3	32	43	70	113	146	17
	AM4032HS-3L		3	32	43	60	123	156	17
	AM4040HS-4		4	40	47	50	98	131	17
	AM4040HS-4L		4	40	47	40	108	141	17
	AM4050HS-5		5	50	47	50	98	131	17
	AM4050HS-5L		5	50	47	40	108	141	17

● : Stock item ○ : Under preparing for stock

Parts

	Screw	Wrench		Applicable cutter Dia.
				
2000 Type	FTKA02550S	TW08S	-	Ø10~Ø14
	FTKA02565S			Ø16~Ø100
3000 Type	FTKA0408	TW15S	-	Ø25
	FTKA0410			Ø32~Ø100
4000 Type	FTKA0408	TW15S	-	Ø20~Ø25
	FTKA0410			Ø32~Ø200

Available Inserts

APMT-MM	APMT-MM
	

• Available Inserts, see page : E05, E06

Type	Designation	Coated										Cermet			Uncoated				page
		NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	CN2000	CN20	CN30	H01	G10	ST30A	ST20	
2000 Type	APMT 11T3PDSR-MM	●		●	●	●	●												E05
	11T3PDSR-MF	●		●	●	●	●												
	11T308PDSR-MM	●		●	●	●	●												
	11T312PDSR-MM	●		●	●	●	●												
	11T316R-MM	●		●	●	●	●												
	11T318R-MM																		
	11T324R-MM	●		●	●	●	●												
3000 Type	APMT 1604PDSR-MM	●		●	●	●	●												E05
	1604PDSR-MF	●		●	●	●	●												
	160410PDSR-MM	●		●	●	●	●												
	160416PDSR-MM	●		●	●	●	●												
	160424R-MM	●		●	●	●	●												
	160430R-MM																		
	160432R-MM	●		●	●	●	●												
4000 Type	APMT 180604PDSR-MM	●		●	●	●													E05 E06
	180604PDSR-MF	●		●	●	●													
	1806PDSR-MM	●		●	●	●	●												
	1806PDSR-MF	●		●	●	●	●												
	1806PDSR-ML	●		●	●	●	●												
	180612PDSR-MM	●		●	●	●	●												
	180616PDSR-MM	●		●	●	●	●												
	180620PDSR-MM	●		●	●	●	●												
	180624PDSR-MM	●		●	●	●	●												
	180630R-MM																		
	180632R-MM																		

● : Stock item ○ : Under preparing for stock

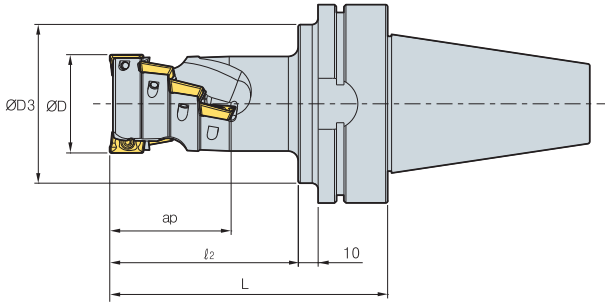
BT30/40 AM1000/1500

New

AA 90°

• AR : 12.5°~13°
• RR : -17°~-6°





(mm)

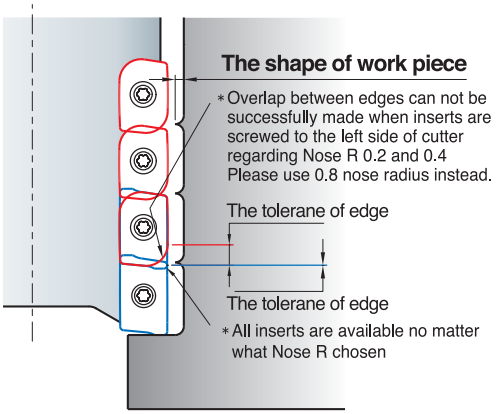
	Designation	Stock		ØD	ØD3	ℓ2	L	No. of Flutes	ap
BT30	AM1016015-2		6	16	80	30	62	2	15.5
	AM1020020-3		12	20	80	32	64	3	20.5
	AM1025025-4		20	25	80	39	71	4	25.5
BT40	AM1016015-2		6	16	80	30	67	2	15.5
	AM1020020-3		12	20	80	32	69	3	20.5
	AM1025025-4		20	25	80	39	76	4	25.5
BT30	AM15020026-1		3	20	80	42	74	1	26.5
	AM15025035-2		8	25	80	50	62	2	35
	AM15032044-2		10	32	80	60	92	2	44
BT40	AM15020026-1		3	20	80	42	79	1	26.5
	AM15025035-2		8	25	80	50	87	2	35
	AM15032044-2		10	32	80	60	97	2	44

● : Stock item ○ : Under preparing for stock

Parts

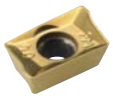
	Screw	Wrench		Applicable cutter Dia.
				
1000 Type	FTKA01842	-	TW06S-A	Ø10~Ø63
1500 Type	FTKA02555S	TW08S	-	Ø10~Ø14
	FTKA02565S			Ø16~Ø100

Caution when insert are screwed



Available Inserts

APMT-MM



Type	Designation	Coated									Cermet			Uncoated				page
		NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	CN2000	CN20	CN30	H01	G10	ST30A	ST20	
1000 Type	APMT 060202PDSR-MM			●	●	●	●												E05
	0602PDSR-MM			●	●	●	●												
	060208PDSR-MM			●	●	●	●												
	060212R-MM			●	●	●	●												
	060216R-MM			●	●	●	●												
1500 Type	APMT 0903PDSR-MM			●	●	●	●												E05
	090308PDSR-MM			●	●	●	●												
	090312R-MM			●	●	●	●												
	090316R-MM			●	●	●	●												
	090320R-MM			●	●	●	●												

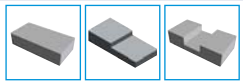
• Available Inserts, see page : E05 ● : Stock item ○ : Under preparing for stock

BT30/40/50 AM2000

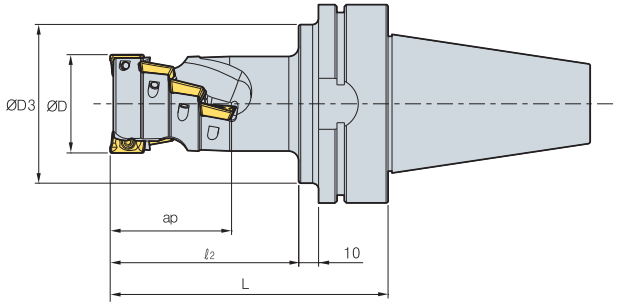
New

AA 90°

• AR : -9°
• RR : -13°~-8°







(mm)

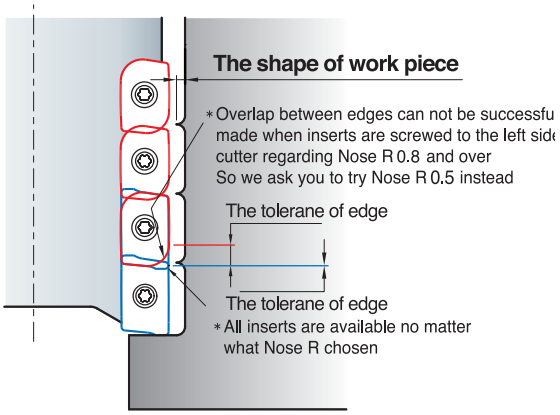
	Designation	Stock		ØD	ØD3	ℓ2	L	No. of Flutes	ap
BT30	AM2020029-1		3	20	80	45	77	1	29.4
	AM2025038-2		8	25	80	55	87	2	38.9
	AM2032048-2		10	32	80	65	97	2	48.5
	AM2040058-2		14	40	80	75	107	2	58
	AM2050039-4		16	50	80	58	90	4	39
	AM2063039-4		16	63	80	58	90	4	39
	AM2080039-5		20	80	80	63	95	5	39
	AM2100039-6		24	100	80	63	95	6	39
BT40	AM2020029-1		3	20	80	45	82	1	29.4
	AM2025038-2		8	25	80	55	92	2	38.9
	AM2032048-2		10	32	80	65	102	2	48.5
	AM2040058-2		14	40	80	75	112	2	58
	AM2050039-4		16	50	80	58	95	4	39
	AM2063039-4		16	63	80	58	95	4	39
	AM2080039-5		20	80	80	63	100	5	39
	AM2100039-6		24	100	80	63	100	6	39

● : Stock item ○ : Under preparing for stock

Parts

Screw	Wrench		Applicable cutter Dia.
			
FTKA02550S	TW08S	-	Ø10~Ø14
FTKA02565S			Ø16~Ø100

Caution when insert are screwed



Available Inserts

APMT-MM APMT-MF





Designation		Coated									Cermet			Uncoated				page
		NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	CN2000	CN20	CN30	H01	G10	ST30A	ST20	
APMT	11T3PDSR-MM	●		●	●	●	●												E05
	11T3PDSR-MF	●		●	●	●	●												
	11T308PDSR-MM	●		●	●	●	●												
	11T312PDSR-MM	●		●	●	●	●												
	11T316R-MM	●		●	●	●	●												
	11T318R-MM																		
	11T324R-MM	●		●	●	●	●												

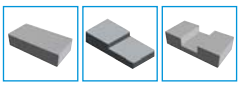
• Available Inserts, see page : E05 ● : Stock item ○ : Under preparing for stock

BT30/40/50 AM3000/4000

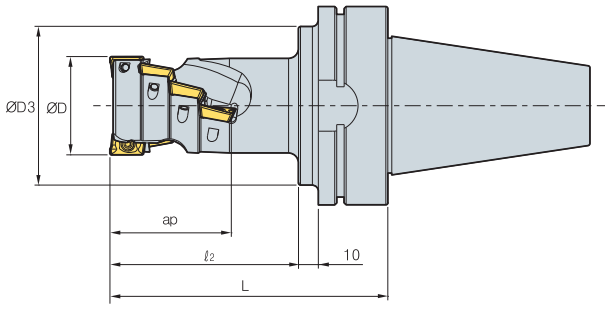
New

AA 90°

• AR : 13°~15°
• RR : -11°~-4°







(mm)

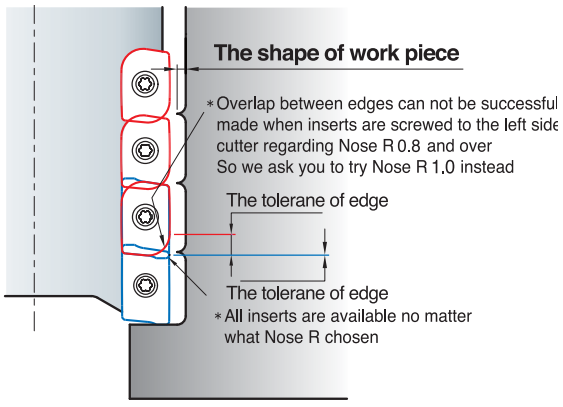
Designation		Stock	⊙	ØD	ØD3	ℓ2	L	No. of Flutes	ap
BT50	AM3050043-2		6	50	80	72	120	2	43
	AM3063057-4		16	63	80	86	134	4	57
	AM3080071-4		20	80	80	100	148	4	71
	AM3100071-6		30	100	80	100	148	6	71
BT50	AM4040046-2		6	40	80	75	123	2	46
	AM4050061-2		8	50	80	95	143	2	61
	AM4063061-4		16	63	80	90	138	4	61
	AM4080076-4		20	80	80	105	153	4	76
	AM4100076-6		30	100	80	105	153	6	76

● : Stock item ○ : Under preparing for stock

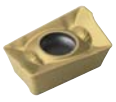
Parts

	Screw	Wrench		Applicable cutter Dia.
				
3000 Type	FTKA0408	TW15S	-	Ø25
	FTKA0410			Ø32~Ø100
4000 Type	FTKA0408	TW15S	-	Ø20~Ø25
	FTKA0410			Ø32~Ø200

Caution when insert are screwed



Available Inserts

	APMT-MM	APMT-MM
		

Type	Designation	Coated										Cermet			Uncoated				page
		NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	CN2000	CN20	CN30	H01	G10	ST30A	ST20	
3000 Type	APMT 1604PDSR-MM	●		●	●	●	●												E05
	1604PDSR-MF	●		●	●	●	●												
	160410PDSR-MM	●		●	●	●	●												
	160416PDSR-MM	●		●	●	●	●												
	160424R-MM	●		●	●	●	●												
	160430R-MM																		
	160432R-MM	●		●	●	●	●												
4000 Type	APMT 180604PDSR-MM	●		●	●	●	●												E05 E06
	180604PDSR-MF	●		●	●	●	●												
	1806PDSR-MM	●		●	●	●	●												
	1806PDSR-MF	●		●	●	●	●												
	1806PDSR-ML	●		●	●	●	●												
	180612PDSR-MM	●		●	●	●	●												
	180616PDSR-MM	●		●	●	●	●												
	180620PDSR-MM	●		●	●	●	●												
	180624PDSR-MM	●		●	●	●	●												
	180630R-MM																		
	180632R-MM																		

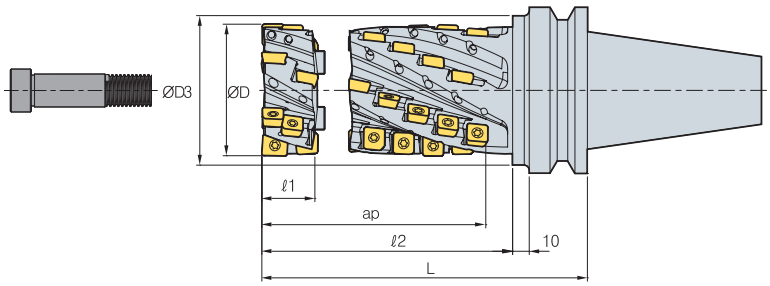
● : Stock item ○ : Under preparing for stock

• Available Inserts, see page : E05, E06

BT50 HAT4000

New





(mm)

Designation		Stock	SPMT	ZPMT	øD	ℓ1	ℓ2	L	No. of Flutes	ap	Application
BT50- (Set)	HAT4050094-2F		10	1	50	32	119	160	2	94	HAT4050032-2F
	HAT4050104-2F		11	1	50	32	129	170	2	104	
	HAT4050114-2F		12	1	50	32	139	180	2	114	
	HAT4063094-4F		20	2	63	32	119	160	4	94	HAT4063032-4F
	HAT4063104-4F		22	2	63	32	129	170	4	104	
	HAT4063114-4F		24	2	63	32	139	180	4	114	
	HAT4080094-4F		20	2	80	33	119	160	4	94	HAT4080033-4F
	HAT4080104-4F		22	2	80	33	129	170	4	104	
	HAT4080114-4F		24	2	80	33	139	180	4	114	
(Front Piece)	HAT4050032-2F		3	1	50	32	-	-	2	-	-
	HAT4063032-4F		6	2	63	32	-	-	4	-	
	HAT4080033-4F		6	2	80	33	-	-	4	-	

● : Stock item ○ : Under preparing for stock

Parts

Screw	Wrench	cutter Dia.
		
ETNA0511	TW20	

Set specification

Set Designation	Designation	Front Piece	Clamping Bolt
HAT4050094-2F	HAT4050062-2F	HAT4050032-2F	HSB1255
HAT4050104-2F	HAT4050072-2F		
HAT4050114-2F	HAT4050082-2F		
HAT4063094-4F	HAT4063062-4F	HAT4063032-4F	HSB1670
HAT4063104-4F	HAT4063072-4F		
HAT4063114-4F	HAT4063082-4F		
HAT4080094-4F	HAT4080061-4F	HAT4080033-4F	HSB1682
HAT4080104-4F	HAT4080071-4F		
HAT4080114-4F	HAT4080081-4F		

Available Inserts

SPMT-MM ZPMT-MM





Designation	Coated										Cermet			Uncoated				page
	NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	CN2000	CN20	CN30	H01	G10	ST30A	ST20	
SPMT 120508-MMN																		E18
ZPMT 1505PPSR-MMN																		E21

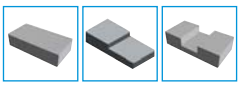
● : Stock item ○ : Under preparing for stock

• Available Inserts, see page : E18, E21

HSK63A AM1000/1500/2000

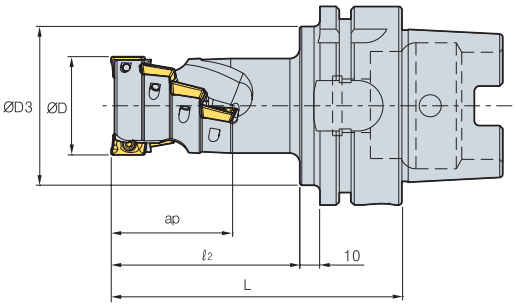
AA 90°

• AR : -12.5°~13°
• RR : -17°~-6°



New





(mm)

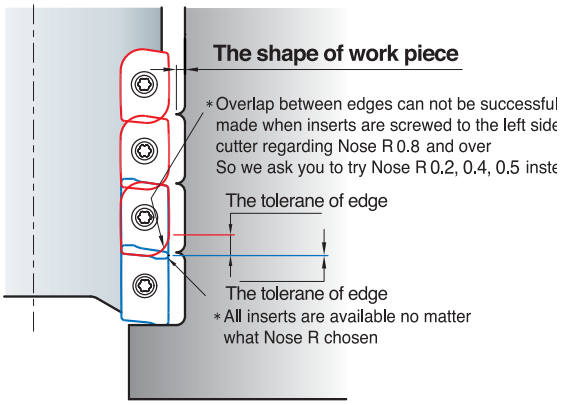
Designation		Stock	⊙	ØD	ØD3	ℓ2	L	No. of Flutes	ap
HSK63A	AM1016015-2		6	16	80	30	66	2	15.5
	AM1020020-3		12	20	80	32	68	3	20.5
	AM1025025-4		20	25	80	39	75	4	25.5
HSK63A	AM15020026-1		3	20	80	42	78	1	26.5
	AM15025035-2		8	25	80	50	86	2	35
	AM15032044-2		10	32	80	60	96	2	44
HSK63A	AM2020029-1		3	20	80	45	81	1	29.4
	AM2025038-2		8	25	80	55	91	2	38.9
	AM2032048-2		10	32	80	65	101	2	48.5
	AM2040058-2		14	40	80	75	111	2	58
	AM2050039-4		16	50	80	58	94	4	39
	AM2063039-4		16	63	80	58	94	4	39
	AM2080039-5		20	80	80	63	99	5	39
	AM2100039-6		24	100	80	63	99	6	39

● : Stock item ○ : Under preparing for stock

Parts

	Screw	Wrench		Applicable cutter Dia.
				
1000 Type	FTKA01842	-	TW06S-A	Ø10~Ø63
1500 Type	FTKA02555S	TW08S	-	Ø10~Ø14
	FTKA02565S			Ø16~Ø100
2000 Type	FTKA02550S	TW08S	-	Ø10~Ø14
	FTKA02565S			Ø16~Ø100

Caution when insert are screwed



Available Inserts

APMT-MM APMT-MF



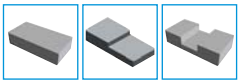


Type	Designation	Coated										Cermet			Uncoated				page
		NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	CN2000	CN20	CN30	H01	G10	ST30A	ST20	
1000 Type	APMT 060202PDSR-MM			●	●	●	●												E05
	0602PDSR-MM			●	●	●	●												
	060208PDSR-MM			●	●	●	●												
	060212R-MM			●	●	●	●												
	060216R-MM			●	●	●	●												
1500 Type	APMT 0903PDSR-MM			●	●	●	●												E05
	090308PDSR-MM			●	●	●	●												
	090312R-MM			●	●	●	●												
	090316R-MM			●	●	●	●												
	090320R-MM			●	●	●	●												
2000 Type	APMT 11T3PDSR-MM	●		●	●	●	●												E05
	11T3PDSR-MF	●		●	●	●	●												
	11T308PDSR-MM	●		●	●	●	●												
	11T312PDSR-MM	●		●	●	●	●												
	11T316R-MM	●		●	●	●	●												
	11T318R-MM																		
	11T324R-MM	●		●	●		●												

• Available Inserts, see page : E05 ● : Stock item ○ : Under preparing for stock

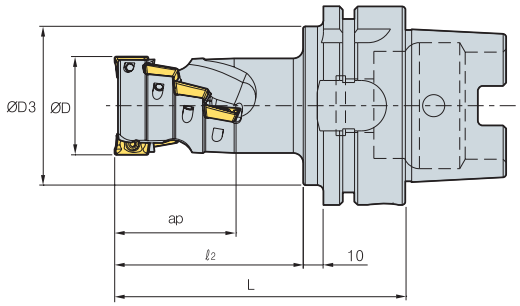
HSK100A AM3000/4000

AA 90° | • AR : 13°~15° • RR : -11°~-4°



New





(mm)

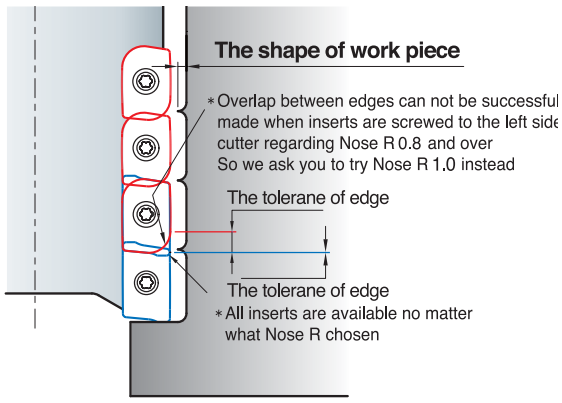
Designation	Stock	⊚	ØD	ØD3	ℓ2	L	No. of Flutes	ap
HSK100A AM3050043-2		6	50	80	72	111	2	43
AM3063057-4		16	63	80	86	125	4	57
AM3080071-4		20	80	80	100	139	4	71
AM3100071-6		30	100	80	100	139	6	71
HSK100A AM4040046-2		6	40	80	75	114	2	46
AM4050061-2		8	50	80	95	134	2	61
AM4063061-4		16	63	80	90	129	4	61
AM4080076-4		20	80	80	105	144	4	76
AM4100076-6		30	100	80	105	144	6	76

● : Stock item ○ : Under preparing for stock

Parts

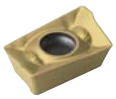
	Screw	Wrench		Applicable cutter Dia.
				
3000 Type	FTKA0408	TW15S	-	Ø25
	FTKA0410			Ø32~Ø100
4000 Type	FTKA0408	TW15S	-	Ø20~Ø25
	FTKA0410			Ø32~Ø200

Caution when insert are screwed



Available Inserts

APMT-MM APMT-MM





Type	Designation	Coated										Cermet			Uncoated				page
		NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	CN2000	CN20	CN30	H01	G10	ST30A	ST20	
3000 Type	APMT 1604PDSR-MM	●		●	●	●	●												E05
	1604PDSR-MF	●		●	●	●	●												
	160410PDSR-MM	●		●	●	●	●												
	160416PDSR-MM	●		●	●	●	●												
	160424R-MM	●		●	●	●	●												
	160430R-MM																		
	160432R-MM	●		●	●	●	●												
4000 Type	APMT 180604PDSR-MM	●		●	●	●	●												E05 E06
	180604PDSR-MF	●		●	●	●	●												
	1806PDSR-MM	●		●	●	●	●												
	1806PDSR-MF	●		●	●	●	●												
	1806PDSR-ML	●		●	●	●	●												
	180612PDSR-MM	●		●	●	●	●												
	180616PDSR-MM	●		●	●	●	●												
	180620PDSR-MM	●		●	●	●	●												
	180624PDSR-MM	●		●	●	●	●												
	180630R-MM																		
	180632R-MM																		

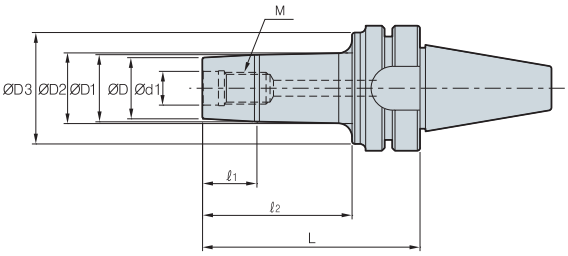
● : Stock item ○ : Under preparing for stock

• Available Inserts, see page : E05, E06

BT30/BT40/BT50

New





(mm)

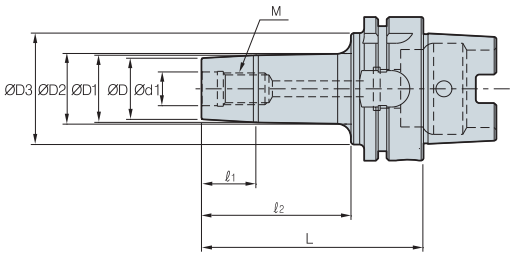
	Designation	Stock	øD	øD1	øD2	øD3	ød1	ℓ1	ℓ2	L	M
BT30	MAT-M06-053		11	11.7	13	30	6.5	5	21	53	06*1.0
	MAT-M08-057		14.5	15.7	17.5	35	8.5	7	25	57	08*1.25
	MAT-M10-062		18	19.7	24	38	10.5	7	30	62	10*1.5
	MAT-M12-067		23	24.7	27.5	41	12.5	10	35	67	12*1.75
	MAT-M16-067		29	31.7	33.5	41	17	10	35	67	16*2.0
BT40	MAT-M06-062		11	11.7	14	40	6.5	5	25	62	08*1.0
	MAT-M06-077		11	11.7	14	40	6.5	5	40	77	06*1.0
	MAT-M06-092		11	11.7	14	40	6.5	5	55	92	06*1.0
	MAT-M08-067		14.5	15.7	19	44	8.5	7	30	67	08*1.25
	MAT-M08-082		14.5	15.7	19	44	8.5	7	45	82	08*1.25
	MAT-M08-097		14.5	15.7	19	44	8.5	7	60	97	08*1.25
	MAT-M10-072		18	19.7	23	50	10.5	10	35	72	10*1.5
	MAT-M10-087		18	19.7	23	50	10.5	10	50	87	10*1.5
	MAT-M10-102		18	19.7	23	50	10.5	10	65	102	10*1.5
	MAT-M12-077		23	24.7	30	55	12.5	10	40	77	12*1.75
	MAT-M12-092		23	24.7	30	55	12.5	13	55	92	12*1.75
	MAT-M12-107		23	24.7	30	55	12.5	13	70	107	12*1.75
	MAT-M16-077		29	31.7	37	55	17	13	40	77	16*2.0
	MAT-M16-092		29	31.7	37	55	17	13	55	92	16*2.0
	MAT-M16-107		29	31.7	37	55	17	13	70	107	16*2.0
BT50	MAT-M06-083		11	11.7	15	40	6.5	5	35	83	06*1.0
	MAT-M06-098		11	11.7	15	40	6.5	5	50	98	06*1.0
	MAT-M06-113		11	11.7	15	40	6.5	5	65	113	06*1.0
	MAT-M08-088		14.5	15.7	20	45	8.5	7	40	88	08*1.25
	MAT-M08-103		14.5	15.7	20	45	8.5	7	55	103	08*1.25
	MAT-M08-118		14.5	15.7	20	45	8.5	7	70	118	08*1.25
	MAT-M10-093		18	19.7	25	55	10.5	10	45	93	10*1.5
	MAT-M10-113		18	19.7	25	55	10.5	10	65	113	10*1.5
	MAT-M10-128		18	19.7	25	55	10.5	10	80	128	10*1.5
	MAT-M12-103		23	24.7	33	65	12.5	10	55	103	12*1.75
	MAT-M12-118		23	24.7	33	65	12.5	13	70	118	12*1.75
	MAT-M12-133		23	24.7	33	65	12.5	13	85	133	12*1.75
	MAT-M16-103		29	31.7	41	85	17	13	55	103	16*2.0
	MAT-M16-118		29	31.7	41	85	17	13	70	118	16*2.0
	MAT-M16-133		29	31.7	41	85	17	13	85	133	16*2.0

• Available Modular : E28

HSK63AT/HSK100AT

New





(mm)

Designation	Stock	øD	øD1	øD2	øD3	ød1	ℓ1	ℓ2	L	M
HSK63AT MAT-M06-061		11	11.7	27	40	6.5	5	25	61	06*1.0
MAT-M06-076		11	11.7	27	40	6.5	5	40	76	06*1.0
MAT-M06-091		11	11.7	27	40	6.5	5	55	91	06*1.0
MAT-M08-066		14.5	15.7	30.5	44	8.5	7	30	66	08*1.25
MAT-M08-081		14.5	15.7	30.5	44	8.5	7	45	81	08*1.25
MAT-M08-096		14.5	15.7	30.5	44	8.5	7	60	96	08*1.25
MAT-M10-071		18	19.7	34	50	10.5	10	35	71	10*1.5
MAT-M10-086		18	19.7	34	50	10.5	10	50	86	10*1.5
MAT-M10-101		18	19.7	34	50	10.5	10	65	101	10*1.5
MAT-M12-076		23	24.7	36.5	55	12.5	10	40	76	12*1.75
MAT-M12-091		23	24.7	36.5	55	12.5	13	55	91	12*1.75
MAT-M12-106		23	24.7	36.5	55	12.5	13	70	106	12*1.75
MAT-M16-076		29	31.7	38.5	55	17	13	40	76	16*2.0
MAT-M16-091		29	31.7	38.5	55	17	13	55	91	16*2.0
MAT-M16-106		29	31.7	38.5	55	17	13	70	106	16*2.0
HSK100AT MAT-M06-074		11	11.7	15	40	6.5	5	35	74	06*1.0
MAT-M06-089		11	11.7	15	40	6.5	5	50	89	06*1.0
MAT-M06-104		11	11.7	15	40	6.5	5	65	104	06*1.0
MAT-M08-079		14.5	15.7	20	45	8.5	7	40	79	08*1.25
MAT-M08-094		14.5	15.7	20	45	8.5	7	55	94	08*1.25
MAT-M08-109		14.5	15.7	20	45	8.5	7	70	109	08*1.25
MAT-M10-084		18	19.7	25	55	10.5	10	45	84	10*1.5
MAT-M10-104		18	19.7	25	55	10.5	10	65	104	10*1.5
MAT-M10-119		18	19.7	25	55	10.5	10	80	119	10*1.5
MAT-M12-094		23	24.7	33	65	12.5	10	55	94	12*1.75
MAT-M12-109		23	24.7	33	65	12.5	13	70	109	12*1.75
MAT-M12-124		23	24.7	33	65	12.5	13	85	124	12*1.75
MAT-M16-094		29	31.7	41	85	17	13	55	94	16*2.0
MAT-M16-109		29	31.7	41	85	17	13	70	109	16*2.0
MAT-M16-124		29	31.7	41	85	17	13	85	124	16*2.0

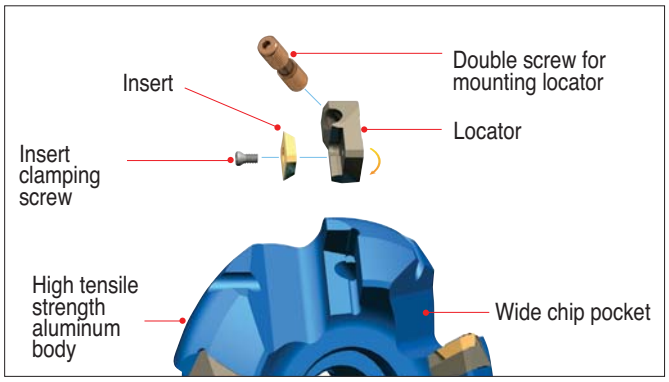
• Available Modular : E28

Future Mill- Aluminum body

Features

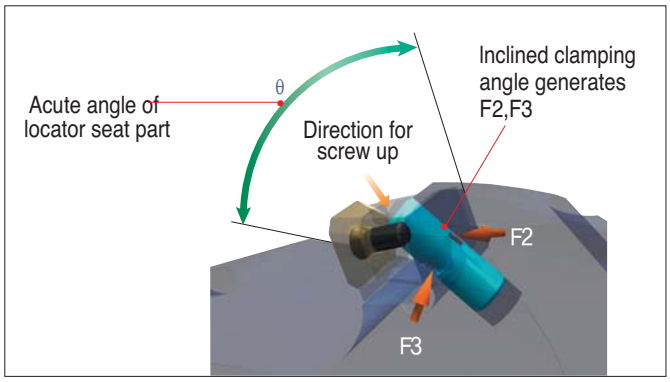
- Light aluminum body(50% of steel body) can be used high speed cutting, tapping center, low power machine
- Easy handling
- It can be used aluminum alloy, medium cutting of steel and cast iron
- Rigid body employs high tensile aluminum
- Locator for excellent durability
- Various kinds of chip breaker are available
- Due to the high rake angle, it provides low cutting load and good surface roughness

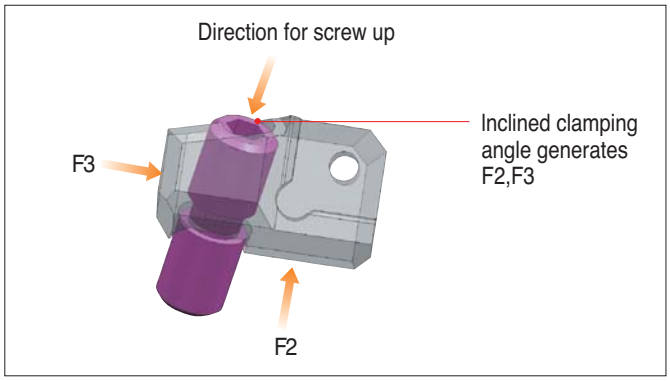
Cutter



- Strong clamping between aluminum body and locator with double screw provides high efficiency
- Acute angle of locator seat provides strong clamping
- Wide chip pocket area provides good chip evacuation
- High tensile strength aluminum body

Locator

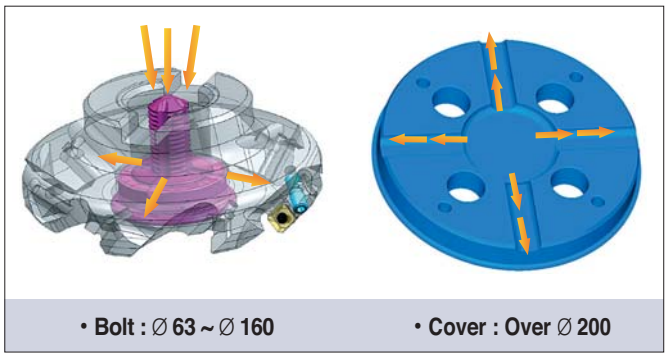




Through coolant system

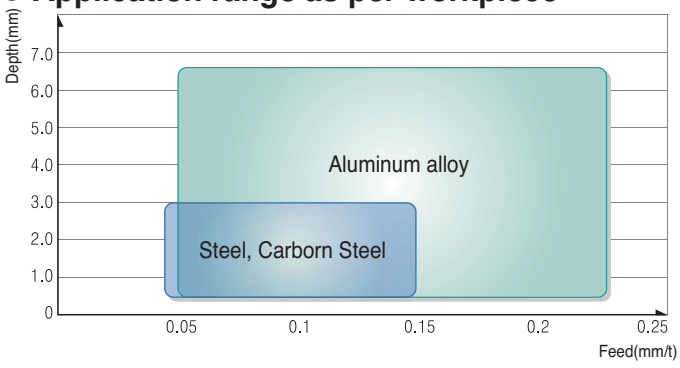
- Exclusively designed coolant bolt and cover provide excellent coolant action and chip evacuation from center of the cutter toward outside
- Exact coolant direction to cutting area
- Exclusive coolant bolt and cover are sold separately Through coolant arbor is necessary

Coolant Bolt & Cover Bolt

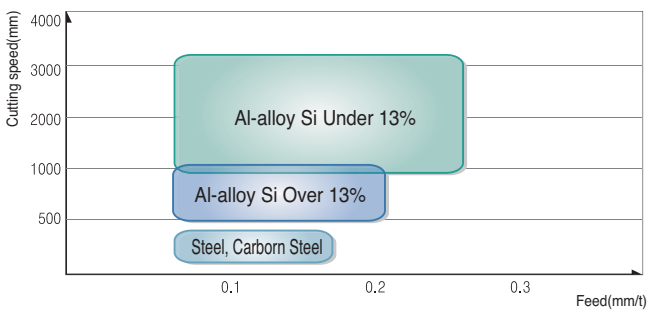


• Bolt : Ø 63 ~ Ø 160 • Cover : Over Ø 200

Application range as per workpiece



Cutting speed



Max. available revolution

Cutter diameter	Max. revolution
Ø63	20,000
Ø80	16,000
Ø100	13,000
Ø125	10,000
Ø160	8,000
Ø200	6,500
Ø250	5,000
Ø315	4,000

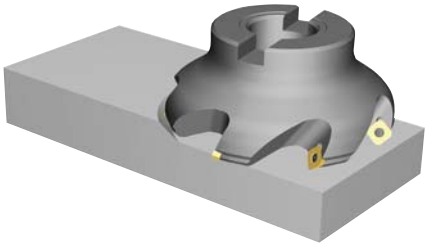
Future Mill(FMA)

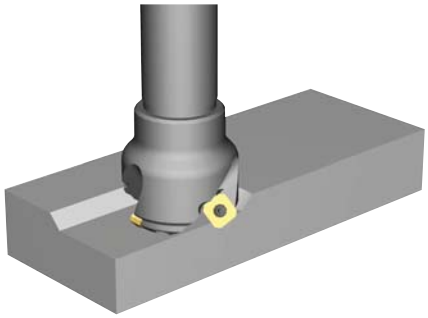
Features

- General milling cutter for high productivity
- Adjustable pitch of cutter and various chip breaker offer wide application range.
- Light cutter body can make high speed cutting and can be used in low horse power machine
- Smooth cutting with low cutting load is accomplished with high rake angle

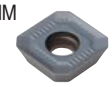
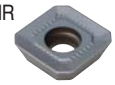


Machining examples





Chip breaker

	Chip breaker	Cutting edge	Features of chip breaker
Light cutting	None C/B		Superior surface roughness at finishing due to ground type cermet insert
	MF 		Superior cutting quality for light and difficult-to-cut material machining through the low cutting load of chip breaker
General cutting	MM 		Suitable for various cutting due to special shape design for general cutting
Roughing	MR 		Tough cutting edge provides stable cutting performance in severe interruption
For aluminum	MA 		Superior cutting quality for aluminum due to sharp cutting edge and buffed surface • S□ET-MA: Sharp cutting edge due to high accurate grinding • S□XT-MA: Suitablecutting edge for roughing

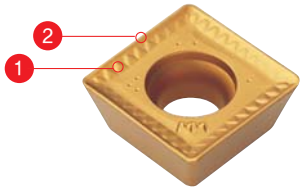
Recommended cutting condition

ISO	C/B / Grade	MF		MM		MR		MA	
		vc(m/min)	fz(mm/t)	vc(m/min)	fz(mm/t)	vc(m/min)	fz(mm/t)	vc(m/min)	fz(mm/t)
P	NC5330	200 ~ 300	0.05 ~ 0.2	150 ~ 300	0.1 ~ 0.3	150 ~ 250	0.1 ~ 0.3	-	-
	NCM325	200 ~ 300	0.05 ~ 0.2	150 ~ 300	0.1 ~ 0.3	150 ~ 250	0.1 ~ 0.3	-	-
	PC3500	200 ~ 300	0.05 ~ 0.2	150 ~ 300	0.1 ~ 0.3	100 ~ 250	0.1 ~ 0.3	-	-
M	PC5300	100 ~ 180	0.05 ~ 0.15	120 ~ 180	0.1 ~ 0.3	-	-	-	-
	NCM335	120 ~ 200	0.05 ~ 0.15	120 ~ 200	0.1 ~ 0.3	-	-	-	-
K	PC5300	150 ~ 250	0.05 ~ 0.2	150 ~ 250	0.1 ~ 0.3	-	-	-	-
Aluminum	H01	-	-	-	-	-	-	350 ~ 1,000	0.1 ~ 0.35

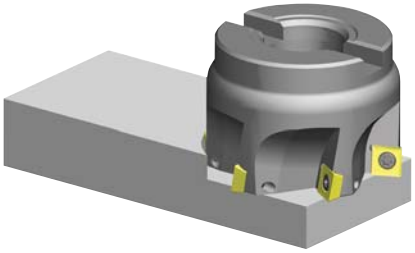
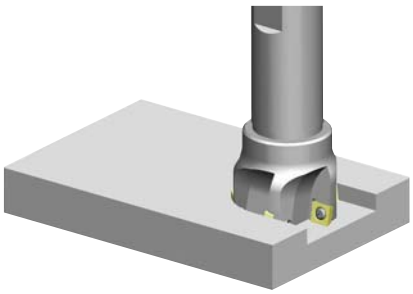
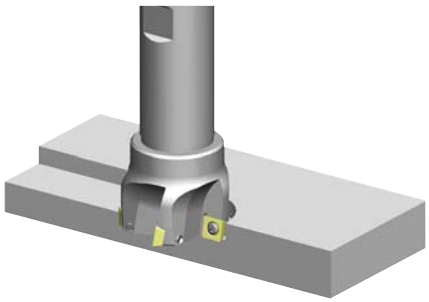
Future Mill(FMP)

Features of FMP insert

- Extremely excellent tool life is ensured in high feed and high speed, deep depth with low cutting load and strong cutting edge
- Optimal grades for workpiece make high efficiency cutting
- Unique chip breaker make good chip evacuation and lower cutting load (①)
- Innovative curve cutting edge makes lower cutting load and stronger cutting edge (②)



Machining examples

Features of chip breaker

- Innovative special cutting edge and chip breaker design ensures ideal 90˚cutting and low cutting load
- Various applications are available with multi functional cutters (Facing, Slotting, Shouldering)
- Improved tool life due to special coated grades
- Superior cutting quality at deep cutting depth through the low cutting load and strong cutting edge

Chip breaker		Cutter edge	Recommended C/B and grade as per workpiece(●:1st)									
			Low carbon steel Mild steel		High carbon steel Alloy steel		Stainless steel		Cast iron		Aluminum alloy	
			C/B	Grade	C/B	Grade	C/B	Grade	C/B	Grade	C/B	Grade
Low cutting load type	MF		●	○NC5330 ○NCM325 ○NC5330 ●NCM335		○NC5330 ●NCM325 ○NC5330 ○NCM335	●	○NC5330 ○NCM325 ○NC5330 ○NCM335 ●PC5300	●	●PC6510 ○PC5300	–	–
Reinforced cutting edge type	MM			○NCM325 ○NC5330 ●NCM335		●NCM325 ○NC5330 ○NCM335		○NCM325 ○NC5330 ○NCM335 ●PC5300		●PC6510 ○PC5300	–	–
Sharp cutting edge type	MA		–	–	–	–	–	–	–	–	●	●H01 ○G10

Recommended cutting condition

Workpiece	Feed (mm/t)	Cutting Speed vc(m/min)								
		CVD Coated			PVD Coated					Carbide
		NC5330	NCM325	NCM335	PC3535	PC3545	PC6510	PC5300	PC9530	H01
SM□□C SCM	~0.3	100~250	100~250	100~220	100~250	100~220	-	100~250	100~250	-
STD KP	~0.25	100~220	100~220	100~200	100~220	100~200	-	100~220	100~220	-
NAK	~0.2	100~220	100~220	100~180	100~200	100~180	-	100~200	100~200	-
STS	~0.2	-	-	-	-	80~200	-	80~200	80~200	-
GC/GCD	~0.25	-	-	-	-	-	100~200	-	-	-
Non-ferrous Aluminum	~0.4	-	-	-	-	-	-	-	-	400~1,000

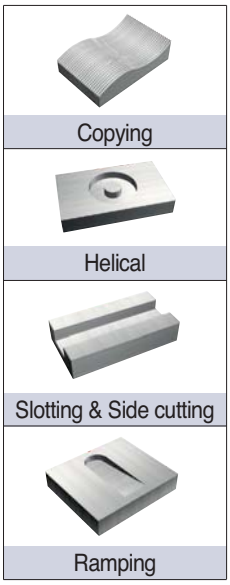
Future Mill(FMR)

Features



- Wide coverage for medium to roughing, general steel to high hardness mold materials.
- 2 step shape of insert provides strong clamp and can be minimize components to replace shim.
- 4-8 cutting edge available per insert.(Inscribed circle 05, 06, 07, 08, 10, 12, 16, 20).
- Uneven flute spacing prevents vibration at high speed application and provides stable machining.
- Precise design on insert seat part prevents insert from chattering.
- Special design put on insert bottom part prevent movement and chatter of insert.
- Very easy to change cutting edge due to the rotate prevention part of insert.

Machining examples



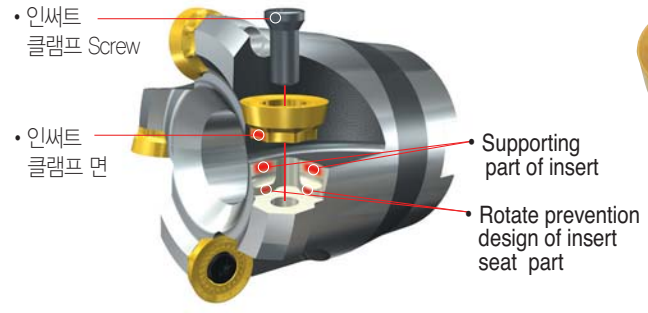
Chip breakers

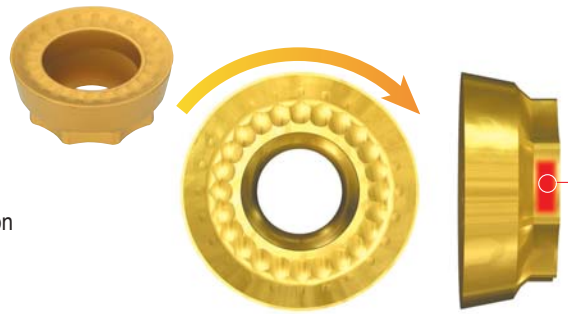
Chip breakers		Cutter edge	Features
Finishing	MF		Low cutting resistance chip breaker design guarantees long tool life good performance at finishing and difficult-to-cut material machining
Medium	MM		Suitable for general milling at wide application range
Aluminum	MA		Sharp cutting edge and buffed top face for aluminum machining prevent welding and control chip flow

FMR Insert cutting edge shape

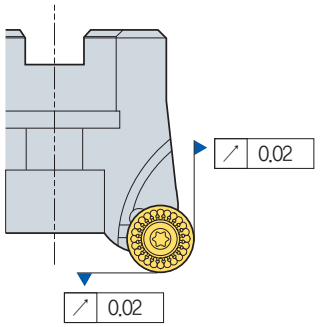
Cutting edge shape (G calss)			
Designation	RDHW□□□□M0F	RDHW□□□□M0E	RDHW□□□□M0S

Clamping system

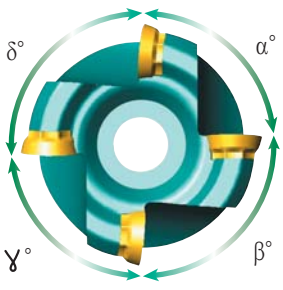




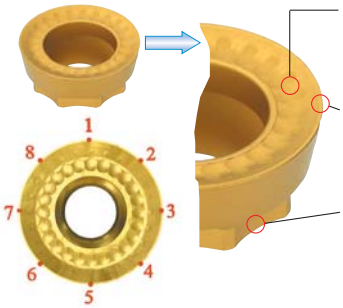
FMR□ 3000 Type FMR□ 4000 Type	FMR□ 5000 Type FMR□ 6000 Type	RDKT10T3M0-□□ RDKT1204M0-□□	RDKT1605M0-MM RDKT2006M0-MM



Good surface finish due to the precise design of insert seat part of cutter



Uneven flute spacing prevents vibration at high speed application and provides stable machining



4-8 cutting edge available per insert

- **Special chip breaker for low cutting load**
  Minimized heat generation due to smooth chip flow
- **Smooth cutting edge preparation**
  Inclined land angle
  Low cutting load and better surface roughness
- **Facial contact through curved face**
  Prevent rotation at high speed cutting Stable and tight clamping of insert. Good positioning of insert repeatedly

Future Mill(FMR)

Chip removal rate (cm³/min)

Workpiece		Grades	Ø8	Ø10	Ø12	Ø15	Ø16	Ø20	Ø21	Ø25	Ø26	Ø32	Ø33	Ø40	Ø50	Ø63	Ø80	Ø100	Ø125	Ø160
P	General structure steel(under 200HB)	PC3500 PC3545 PC5300	4.97	9.94	9.94	14.92	31.83	31.83	47.74	47.74	47.74	71.61	38.19	95.49	119.36	143.23	167.11	190.98	133.69	509.29
	General carbon steel (under 30 HRC)		3.97	7.95	7.95	11.93	25.46	25.46	38.19	38.19	38.19	57.29	38.19	76.39	95.49	114.59	133.69	152.78	133.69	458.36
	High carbon steel, Alloy steel (30~40 HRC)		2.86	5.72	5.72	8.59	22.91	22.91	34.37	34.37	34.37	51.56	34.37	68.75	85.94	103.13	120.32	137.5	120.32	407.43
	High carbon steel, Alloy steel (40~50 HRC)		1.24	2.48	2.48	3.72	11.45	11.45	14.32	17.18	14.32	21.48	14.32	28.64	35.8	42.97	50.13	57.29	50.13	249.55
	Alloy steel (over 50 HRC)		0.95	1.9	1.9	2.86	7.63	7.63	9.54	11.45	9.54	14.32	9.54	19.09	23.87	28.64	33.42	38.19	33.42	152.78
M	Stainless steel	PC5300	2.06	4.13	4.13	6.2	16.55	16.55	12.41	24.82	12.41	18.62	12.41	24.82	31.03	37.24	43.44	49.65	43.44	331.04
K	Cast ironv	PC5300	2.86	5.72	5.72	8.59	14.32	14.32	21.48	21.48	21.48	32.22	21.48	42.97	53.71	64.45	75.2	85.94	75.2	366.69

Required machine power(P_{KW} = 0.75 x P_{HP})

• RDKT10□□

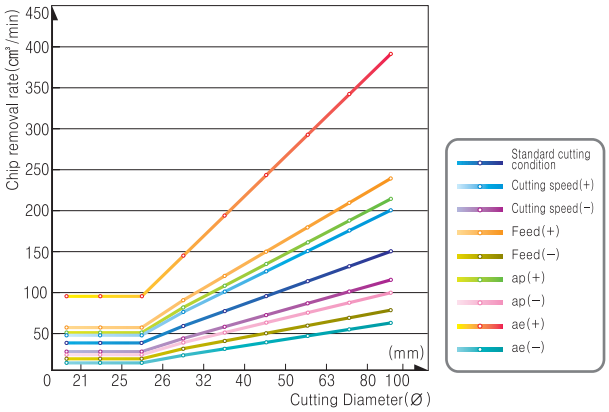
Workpiece		Grades	Ø21	Ø25	Ø26	Ø32	Ø40	Ø50	Ø63	Ø80	Ø100	Cutting condition			
												vc	fz	ap	ae
P	General structure steel(under 200HB)	PC3500 PC3545 PC5300	2.2	2.2	2.2	3.3	4.4	5.5	6.6	7.7	8.8	250	0.4	1.5	0.5D
	General carbon steel (under 30 HRC)		2.1	2.1	2.1	3.1	4.1	5.2	6.2	7.3	8.3	200	0.4	1.5	0.5D
	High carbon steel, Alloy steel (30~40 HRC)		2.2	2.2	2.2	3.3	4.5	5.6	6.7	7.9	9	180	0.4	1.5	0.5D
	High carbon steel, Alloy steel (40~50 HRC)		1.1	1.1	1.1	1.6	2.1	2.6	3.2	3.7	4.2	150	0.3	1.0	0.5D
	Alloy steel(over 50 HRC)		0.7	0.7	0.7	1.1	1.4	1.7	2.1	2.4	2.8	100	0.3	1.0	0.5D
M	Stainless steel	PC5300	0.6	0.6	0.6	0.8	1.2	1.5	1.7	2	2.3	130	0.2	1.5	0.5D
K	Cast iron	PC5300	0.6	0.6	0.6	0.9	1.2	1.5	1.8	2.1	2.4	180	0.2	1.5	0.5D

• RDKT12□□

Workpiece		Grades	Ø32	Ø33	Ø40	Ø50	Ø63	Ø80	Ø100	Ø125	Cutting condition			
											vc	fz	ap	ae
P	General structure steel(under 200HB)	PC3500 PC3545 PC5300	1.7	1.7	2.6	3.5	3.5	4.4		6.1		0.4	1.5	0.5D
	General carbon steel (under 30 HRC)		2	2	3.1	4.1	2.6	5.2		7.2		0.4	1.5	0.5D
	High carbon steel, Alloy steel (30~40 HRC)		2.2	2.2	3.3	4.4	2.8	5.6		7.8		0.4	1.5	0.5D
	High carbon steel, Alloy steel (40~50 HRC)		1	1	1.5	1.6	2.1	2.6		3.6		0.3	1.0	0.5D
	Alloy steel(over 50 HRC)		0.7	0.7	1	1.4	0.8	1.7		2.4		0.3	1.0	0.5D
M	Stainless steel	PC5300	0.5	0.5	0.8	1.1	0.7	1.4		2		0.2	1.5	0.5D
K	Cast iron	PC5300	0.6	0.6	0.9	1.2	0.7	1.5		2.1		0.2	1.5	0.5D

Chip removal rate by cutting condition

• Used insert : RDKT10□



• Variation of cutting condition

	ISO
Standard	vc=200 fz=0.4 ap=1.5 ae=0.5D
Speed (+)	250
Speed (-)	150
Feed (+)	0.6
Feed (-)	0.2
ap (+)	2
ap (-)	1
ae (+)	D
ae (-)	0.2D

Recommended Cutting Condition

• Side milling, Slotting, Ramping, Copying

	Workpiece	Hardness	Grades	Cutting speed (m/min)	FMR1000		FMR1500		FMR2000		FMR2500		FMR3000		FMR4000		FMR5000		FMR6000	
					ap (mm)	fz (mm/t)	ap (mm)	fz (mm/t)	ap (mm)	fz (mm/t)	ap (mm)	fz (mm/t)	ap (mm)	fz (mm/t)	ap (mm)	fz (mm/t)	ap (mm)	fz (mm/t)	ap (mm)	fz (mm/t)
P	General structure steel	200HB≤	PC3500	100~250	≤1.0	≤0.4	≤1.2	≤0.4	≤1.5	≤0.4	≤1.7	≤0.4	≤2.0	≤0.5	≤2.4	≤0.6	≤3.0	≤0.7	≤4.0	≤0.8
P	General carbon steel	30HRC≤	PC5300	100~220	≤0.7	≤0.4	≤1.2	≤0.4	≤1.5	≤0.4	≤1.7	≤0.4	≤2.0	≤0.5	≤2.4	≤0.6	≤3.0	≤0.7	≤4.0	≤0.8
P	High carbon steel,Alloy steel	30~40HRC	PC3545	100~200	≤0.7	≤0.2	≤0.9	≤0.2	≤1.2	≤0.2	≤1.5	≤0.2	≤1.7	≤0.3	≤2.0	≤0.4	≤2.7	≤0.5	≤3.7	≤0.6
P	High carbon steel,Alloy steel	40~50HRC	PC3545	90~150	≤0.7	≤0.2	≤0.9	≤0.2	≤1.2	≤0.2	≤1.5	≤0.2	≤1.7	≤0.3	≤2.0	≤0.4	≤2.7	≤0.5	≤3.7	≤0.6
P	Alloy steel	50HRC≥	PC3545	90~150	≤0.7	≤0.2	≤0.9	≤0.2	≤1.2	≤0.2	≤1.5	≤0.2	≤1.7	≤0.3	≤2.0	≤0.4	≤2.7	≤0.5	≤3.7	≤0.6
M	Stainless steel	270HB≤	PC5300	50~200	≤0.7	≤0.2	≤0.9	≤0.2	≤1.2	≤0.2	≤1.5	≤0.2	≤1.7	≤0.3	≤2.0	≤0.4	≤2.7	≤0.5	≤3.7	≤0.6
K	Cast iron, Ductile cast iron	Tensile strength 350Mpa≤	PC5300	150~250	≤1.0	≤0.4	≤1.2	≤0.4	≤1.5	≤0.4	≤1.7	≤0.4	≤2.0	≤0.5	≤2.4	≤0.6	≤3.0	≤0.7	≤4.0	≤0.8

• Pocketing

	Workpiece	Hardness	Grades	Cutting speed (m/min)	FMR1000		FMR1500		FMR2000		FMR2500		FMR3000		FMR4000		FMR5000		FMR6000	
					ap (mm)	fz (mm/t)	ap (mm)	fz (mm/t)	ap (mm)	fz (mm/t)	ap (mm)	fz (mm/t)	ap (mm)	fz (mm/t)	ap (mm)	fz (mm/t)	ap (mm)	fz (mm/t)	ap (mm)	fz (mm/t)
P	General structure steel	200HB≤	PC3500	100~250	≤1.0	≤0.3	≤1.2	≤0.3	≤1.5	≤0.3	≤1.7	≤0.3	≤2.0	≤0.4	≤2.4	≤0.5	≤3.0	≤0.6	≤4.0	≤0.7
P	General carbon steel	30HRC≤	PC5300	100~220	≤0.7	≤0.3	≤1.2	≤0.3	≤1.5	≤0.3	≤1.7	≤0.3	≤2.0	≤0.4	≤2.4	≤0.5	≤3.0	≤0.6	≤4.0	≤0.7
P	High carbon steel,Alloy steel	30~40HRC	PC3545	100~200	≤0.7	≤0.1	≤0.9	≤0.1	≤1.2	≤0.1	≤1.5	≤0.1	≤1.7	≤0.2	≤2.0	≤0.3	≤2.7	≤0.4	≤3.7	≤0.5
P	High carbon steel,Alloy steel	40~50HRC	PC3545	90~150	≤0.7	≤0.1	≤0.9	≤0.1	≤1.2	≤0.1	≤1.5	≤0.1	≤1.7	≤0.2	≤2.0	≤0.3	≤2.7	≤0.4	≤3.7	≤0.5
P	Alloy steel	50HRC≥	PC3545	90~150	≤0.7	≤0.1	≤0.9	≤0.1	≤1.2	≤0.1	≤1.5	≤0.1	≤1.7	≤0.2	≤2.0	≤0.3	≤2.7	≤0.4	≤3.7	≤0.5
M	Stainless steel	270HB≤	PC5300	50~200	≤0.7	≤0.1	≤0.9	≤0.1	≤1.2	≤0.1	≤1.5	≤0.1	≤1.7	≤0.2	≤2.0	≤0.3	≤2.7	≤0.4	≤3.7	≤0.5
K	Cast iron, Ductile cast iron	Tensile strength 350Mpa≤	PC5300	150~250	≤1.0	≤0.3	≤1.2	≤0.3	≤1.5	≤0.3	≤1.7	≤0.3	≤2.0	≤0.4	≤2.4	≤0.5	≤3.0	≤0.6	≤4.0	≤0.7

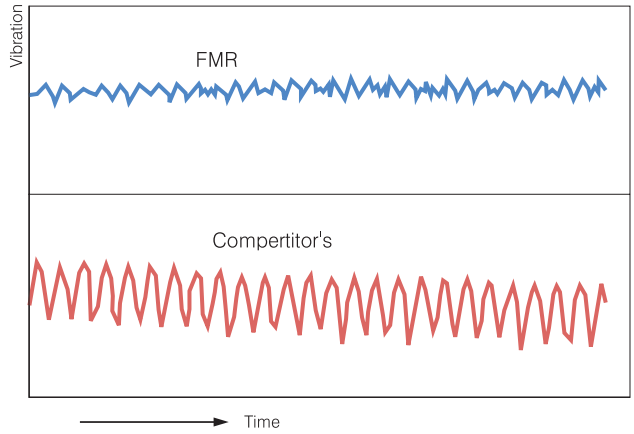
• Plunging

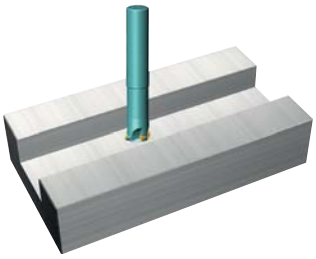
	Workpiece	Hardness	Grades	Cutting speed (m/min)	FMR1000		FMR1500		FMR2000		FMR2500		FMR3000		FMR4000		FMR5000		FMR6000	
					ae (mm)	fz (mm/t)	ae (mm)	fz (mm/t)	ae (mm)	fz (mm/t)	ae (mm)	fz (mm/t)	ae (mm)	fz (mm/t)	ae (mm)	fz (mm/t)	ae (mm)	fz (mm/t)	ae (mm)	fz (mm/t)
P	General structure steel	200HB≤	PC3500	100~250	≤2.5	≤0.2	≤3.0	≤0.2	≤3.5	≤0.2	≤4.0	≤0.2	≤5.0	≤0.3	≤6.0	≤0.4	≤8.0	≤0.5	≤10.0	≤0.6
P	General carbon steel	30HRC≤	PC5300	100~220	≤2.5	≤0.2	≤3.0	≤0.2	≤3.5	≤0.2	≤4.0	≤0.2	≤5.0	≤0.3	≤6.0	≤0.4	≤8.0	≤0.5	≤10.0	≤0.6
P	High carbon steel,Alloy steel	30~40HRC	PC3545	100~200	≤2.5	≤0.1	≤3.0	≤0.1	≤3.5	≤0.1	≤4.0	≤0.1	≤5.0	≤0.2	≤6.0	≤0.3	≤8.0	≤0.4	≤10.0	≤0.5
P	High carbon steel,Alloy steel	40~50HRC	PC3545	90~150	≤2.5	≤0.1	≤3.0	≤0.1	≤3.5	≤0.1	≤4.0	≤0.1	≤5.0	≤0.2	≤6.0	≤0.3	≤8.0	≤0.4	≤10.0	≤0.5
P	Alloy steel	50HRC≥	PC3545	90~150	≤2.5	≤0.1	≤3.0	≤0.1	≤3.5	≤0.1	≤4.0	≤0.1	≤5.0	≤0.2	≤6.0	≤0.3	≤8.0	≤0.4	≤10.0	≤0.5
M	Stainless steel	270HB≤	PC5300	50~200	≤2.5	≤0.1	≤3.0	≤0.1	≤3.5	≤0.1	≤4.0	≤0.1	≤5.0	≤0.2	≤6.0	≤0.3	≤8.0	≤0.4	≤10.0	≤0.5
K	Cast iron, Ductile cast iron	Tensile strength 350Mpa≤	PC5300	150~250	≤2.5	≤0.2	≤3.0	≤0.2	≤3.5	≤0.2	≤4.0	≤0.2	≤5.0	≤0.3	≤6.0	≤0.4	≤8.0	≤0.5	≤10.0	≤0.6

• Helical cutting

	Workpiece	Hardness	Grades	Cutting speed (m/min)	FMR1000		FMR1500		FMR2000		FMR2500		FMR3000		FMR4000		FMR5000		FMR6000	
					ap (mm)	fz (mm/t)	ap (mm)	fz (mm/t)	ap (mm)	fz (mm/t)	ap (mm)	fz (mm/t)	ap (mm)	fz (mm/t)	ap (mm)	fz (mm/t)	ap (mm)	fz (mm/t)	ap (mm)	fz (mm/t)
P	General structure steel	200HB≤	PC3500	100~250	≤1.0	≤0.2	≤1.0	≤0.2	≤1.0	≤0.2	≤1.0	≤0.2	≤2.0	≤0.3	≤2.0	≤0.4	≤4.0	≤0.5	≤4.0	≤0.6
P	General carbon steel	30HRC≤	PC5300	100~220	≤0.7	≤0.2	≤0.7	≤0.2	≤0.7	≤0.2	≤0.7	≤0.2	≤2.0	≤0.3	≤2.0	≤0.4	≤4.0	≤0.5	≤4.0	≤0.6
P	High carbon steel,Alloy steel	30~40HRC	PC3545	100~200	≤0.7	≤0.1	≤0.7	≤0.1	≤0.7	≤0.1	≤0.7	≤0.1	≤1.7	≤0.2	≤1.7	≤0.3	≤3.7	≤0.4	≤3.7	≤0.5
P	High carbon steel,Alloy steel	40~50HRC	PC3545	90~150	≤0.7	≤0.1	≤0.7	≤0.1	≤0.7	≤0.1	≤0.7	≤0.1	≤1.7	≤0.2	≤1.7	≤0.3	≤3.7	≤0.4	≤3.7	≤0.5
P	Alloy steel	50HRC≥	PC3545	90~150	≤0.7	≤0.1	≤0.7	≤0.1	≤0.7	≤0.1	≤0.7	≤0.1	≤1.7	≤0.2	≤1.7	≤0.3	≤3.7	≤0.4	≤3.7	≤0.5
M	Stainless steel	270HB≤	PC5300	50~200	≤0.7	≤0.1	≤0.7	≤0.1	≤0.7	≤0.1	≤0.7	≤0.1	≤1.7	≤0.2	≤1.7	≤0.3	≤3.7	≤0.4	≤3.7	≤0.5
K	Cast iron, Ductile cast iron	Tensile strength 350Mpa≤	PC5300	150~250	≤1.0	≤0.2	≤1.0	≤0.2	≤1.0	≤0.2	≤1.0	≤0.2	≤2.0	≤0.3	≤2.0	≤0.4	≤4.0	≤0.5	≤4.0	≤0.6

FMR Vibration test





●Machining example
- Test sample : FMRS3032RD-S / RDKT10T3M0-MM (PC3535)
- Workpiece : STD11
- Cutting condition : vc = 200m/min fz = 0.40mm/t
  ap = 2.0mm ae = 4.0mm

Cutting condition formulas for milling

- Cutting speed

$$vc = \frac{\pi \times D \times n}{1000} \text{ (m/min)}$$

- RPM

$$n = \frac{vc \times 1000}{\pi \times D} \text{ (min}^{-1}\text{)}$$

- Feed(per tooth)

$$fz = \frac{vf}{n \times z} \text{ (mm/t)}$$

- Feed(per minute)

$$vf = fz \times n \times z \text{ (mm/min)}$$

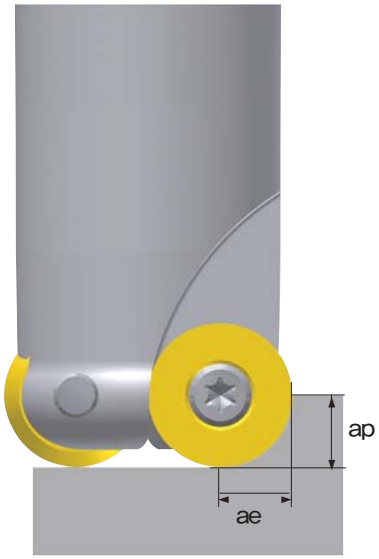
- Chip removal rate

$$Q = \frac{ap \times ae \times vf}{1000} \text{ (cm}^3\text{/min)}$$

- Required machine power

$$Pkw = \frac{Q \times kc}{60 \times 102 \times \eta} \text{ (kW)}$$

$$Php = \frac{Pkw}{0.75} \text{ (hp)}$$

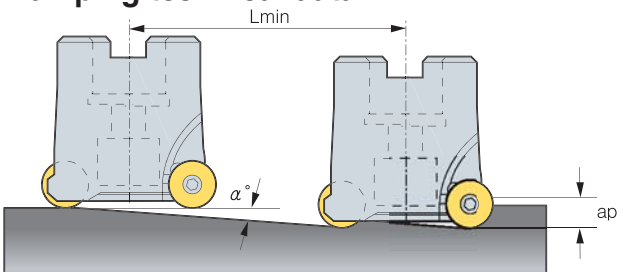


vc	=	Cutting speed(m/min)
n	=	Revolution per a minute(min^{-1})
D	=	Cutting diameter(mm)
vf	=	Feed per a minute(mm/min)
fz	=	Feed per tooth(mm/t)
z	=	Number of tooth
Pc	=	Power requirement(kW)
H	=	Horsepower requirement(Hp)
Q	=	Chip removal amount(cm^3/min)
ap	=	Depth of cut(mm)
ae	=	Width of cut(mm)
Kc	=	Specific cutting resistance(MPa)
η	=	Mechanical efficiency(%)

Feed as per cutting depth

Designation	Chip breaker	Depth of cut (mm)								
		0.2~0.5	0.5~1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0
RDHW0501M0	-	0.25	0.15	-	-	-	-	-	-	-
RDHW06T1M0	-	0.30	0.20	0.10	-	-	-	-	-	-
RDHW0702M0	-	0.35	0.25	0.10	0.07	-	-	-	-	-
RDHW0803M0	-	0.40	0.30	0.15	0.01	-	-	-	-	-
RDKT10T3M0 -	MF/MM	-	0.40	0.35	0.30	0.20	-	-	-	-
RDKT1204M0 -	MF/MM	-	0.50	0.45	0.30	0.25	0.22	-	-	-
RDHW1605M0	-	-	0.60	0.50	0.45	0.35	0.30	0.20	0.10	-
RDHW2006M0	-	-	-	0.60	0.50	0.40	0.30	0.25	0.15	0.10
RDKT1605M0 -	MM	-	0.60	0.50	0.45	0.35	0.30	0.20	0.10	-
RDKT2006M0 -	MM	-	-	0.60	0.50	0.40	0.30	0.25	0.15	0.10

Ramping technical data

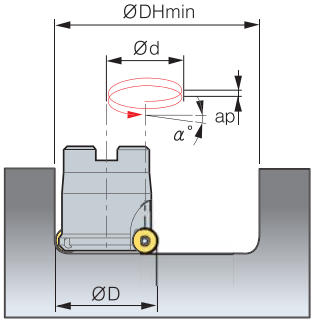


$$L_{min} = \frac{ap}{\tan \alpha^{\circ}} \text{ (mm)}$$

※ Lmin : Min. inclination cutting length
α° : Max. ramping angle
ap : Depth of cut

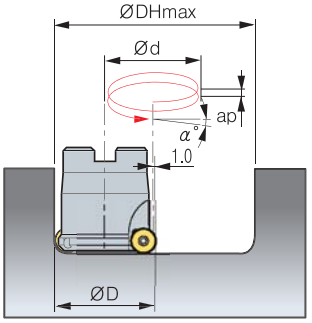
Section	Tool diameter(Ø)	Ramping angle α° (Max)	Cutting length L(mm) by ramping angle									
			ap=1mm	ap=2mm	ap=2.5mm	ap=3mm	ap=3.5mm	ap=4mm	ap=5mm	ap=6mm	ap=8mm	ap=10mm
FMR1000	08	18.14	3	6	8	-	-	-	-	-	-	-
	10	11.7	5	10	12	-	-	-	-	-	-	-
	12	8.43	7	13	17	-	-	-	-	-	-	
	15	5.93	10	19	24	-	-	-	-	-	-	-
FMR1500	10	20.67	21	5	7	8	-	-	-	-	-	-
	12	10.05	10	11	14	17	-	-	-	-	-	-
	16	6.12	6	19	23	28	-	-	-	-	-	-
	20	4.36	4	26	33	39	-	-	-	-	-	-
FMR2000	15	9.42	6	12	15	18	21	-	-	-	-	-
	20	5.85	10	20	24	29	34	-	-	-	-	-
FMR2500	16	13.7	4	8	10	12	14	16	-	-	-	-
	20	9.29	6	12	15	18	21	24	-	-	-	-
	25	6.56	9	17	22	26	30	35	-	-	-	-
FMR3000	25	21.8	3	5	6	8	9	10	13	-	-	-
	32	13.24	4	9	11	13	15	17	21	-	-	-
	40	9.09	6	13	16	19	22	25	31	-	-	-
	50	6.52	9	17	22	26	31	35	44	-	-	-
	63	4.76	12	24	30	36	42	48	60	-	-	-
	80	3.52	16	33	41	49	57	65	81	-	-	-
	100	2.69	21	43	53	64	74	85	106	-	-	-
FMR4000	32	15.95	3	7	9	10	12	14	17	21	-	-
	40	10.3	6	11	14	17	19	22	28	33	-	-
	50	7.13	8	16	20	24	28	32	40	48	-	-
	63	5.08	11	22	28	34	39	45	56	67	-	-
	80	3.69	16	31	39	47	54	62	78	93	-	-
	100	2.79	21	41	51	62	72	82	103	123	-	-
	125	2.14	27	54	67	80	94	107	134	161	-	-
FMR5000	40	7.4	8	15	19	23	27	31	38	46	62	-
	50	5.22	11	22	27	33	38	44	55	66	88	-
	63	3.79	15	30	38	45	53	60	75	91	121	-
	80	2.97	19	39	48	58	67	77	96	116	154	-
	100	2.09	27	55	69	82	96	110	137	164	219	-
	125	1.63	35	70	88	105	123	141	176	211	281	-
FMR6000	40	7.44	8	15	19	23	27	31	38	46	61	77
	50	4.97	11	23	29	34	40	46	57	69	92	46
	63	3.69	16	31	39	47	54	62	78	93	124	62
	80	2.72	21	42	53	63	74	84	105	126	168	84
	100	2.12	27	54	68	81	95	108	135	162	216	108
	125	1.57	36	73	91	109	128	146	182	219	292	146

Helical cutting technical data - ØDHmin



Section	Insert	Tool diameter(Ø)	Ø DHmix	Ød	Ramping angle(α°) ap 1	2	2,5	3	3,5	4	5	6	8	
FMR 1000	5	08	11	3	6.11	12.35	15.57	-	-	-	-	-	-	-
	5	10	15	5	3.65	7.34	7.34	-	-	-	-	-	-	-
	5	12	19	7	2.61	5.23	5.23	-	-	-	-	-	-	-
	5	15	25	10	1.83	3.65	3.65	-	-	-	-	-	-	-
FMR 1500	6	10	14	4	4.57	9.20	9.20	13.95	-	-	-	-	-	-
	6	12	18	6	3.04	6.11	6.11	9.20	-	-	-	-	-	-
	6	16	26	10	1.83	3.65	3.65	5.49	-	-	-	-	-	-
	6	20	34	14	1.30	2.61	2.61	3.92	-	-	-	-	-	-
FMR 2000	7	15	23	8	2.28	4.57	4.57	6.88	8.04	-	-	-	-	-
	7	20	33	13	1.40	2.81	2.81	4.22	4.92	-	-	-	-	-
FMR 2500	8	16	24	8	2.28	4.57	4.57	6.88	8.04	9.20	-	-	-	-
	8	20	32	12	1.52	3.04	3.04	4.57	5.34	6.11	-	-	-	-
	8	25	42	17	1.07	2.15	2.15	3.22	3.76	4.30	-	-	-	-
FMR 3000	10	25	40	15	1.22	2.43	2.43	3.65	4.27	4.88	6.11	-	-	-
	10	32	54	22	0.83	1.66	1.66	2.49	2.91	3.32	4.15	-	-	-
	10	40	70	30	0.61	1.22	1.22	1.83	2.13	2.43	3.04	-	-	-
	10	50	90	40	0.46	0.91	0.91	1.37	1.60	1.83	2.28	-	-	-
	10	63	116	53	0.34	0.69	0.69	1.03	1.21	1.38	1.72	-	-	-
	10	80	150	70	0.26	0.52	0.52	0.78	0.91	1.04	1.30	-	-	-
	10	100	190	90	0.20	0.41	0.41	0.61	0.71	0.81	1.01	-	-	-
FMR 4000	12	32	52	20	0.91	1.83	1.83	2.74	3.20	3.65	4.57	5.49	-	-
	12	40	68	28	0.65	1.30	1.30	1.96	2.28	2.61	3.26	3.92	-	-
	12	50	88	38	0.48	0.96	0.96	1.44	1.68	1.92	2.40	2.88	-	-
	12	63	114	51	0.36	0.72	0.72	1.07	1.25	1.43	1.79	2.15	-	-
	12	80	148	68	0.27	0.54	0.54	0.81	0.94	1.07	1.34	1.61	-	-
	12	100	188	88	0.21	0.41	0.41	0.62	0.73	0.83	1.04	1.24	-	-
	12	125	238	113	0.16	0.32	0.32	0.48	0.57	0.65	0.81	0.97	-	-
FMR 5000	16	40	64	24	0.76	1.52	1.52	2.28	2.66	3.04	3.81	4.57	6.11	-
	16	50	84	34	0.54	1.07	1.07	1.61	1.88	2.15	2.69	3.22	4.30	-
	16	63	110	47	0.39	0.78	0.78	1.16	1.36	1.55	1.94	2.33	3.11	-
	16	80	144	64	0.29	0.57	0.57	0.86	1.00	1.14	1.43	1.71	2.28	-
	16	100	184	84	0.22	0.43	0.43	0.65	0.76	0.87	1.09	1.30	1.74	-
	16	125	234	109	0.17	0.33	0.33	0.50	0.59	0.67	0.84	1.00	1.34	-
FMR 6000	20	50	80	30	0.61	1.22	1.22	1.83	2.13	2.43	3.04	3.65	4.88	6.11
	20	63	106	43	0.42	0.85	0.85	1.27	1.49	1.70	2.12	2.55	3.40	4.25
	20	80	140	60	0.30	0.61	0.61	0.91	1.06	1.22	1.52	1.83	2.43	3.04
	20	100	180	80	0.23	0.46	0.46	0.68	0.80	0.91	1.14	1.37	1.83	2.28
	20	125	230	105	0.17	0.35	0.35	0.52	0.61	0.70	0.87	1.04	1.39	1.74
	20	160	300	140	0.13	0.26	0.26	0.39	0.46	0.52	0.65	0.78	1.04	1.30

Helical cutting technical data - ØDHmax



Section	Insert	Tool diameter(Ø)	Ø DHmax	Ød	Ramping angle(α°) ap 1	2	2,5	3	3,5	4	5	6	8	10
FMR 1000	5	08	14	6	3.04	6.11	7.65	-	-	-	-	-	-	-
	5	10	18	8	2.28	4.57	5.72	-	-	-	-	-	-	-
	5	12	22	10	1.83	3.65	4.57	-	-	-	-	-	-	-
	5	15	28	13	1.40	2.81	3.51	-	-	-	-	-	-	-
FMR 1500	6	10	18	8	2.28	4.57	5.72	6.88	-	-	-	-	-	-
	6	12	22	10	1.83	3.65	4.57	5.49	-	-	-	-	-	-
	6	16	30	14	1.30	2.61	3.26	3.92	-	-	-	-	-	-
	6	20	38	18	1.01	2.03	2.54	3.04	-	-	-	-	-	-
FMR 2000	7	15	28	13	1.40	2.81	3.51	4.22	4.92	-	-	-	-	-
	7	20	38	18	1.01	2.03	2.54	3.04	3.55	-	-	-	-	-
FMR 2500	8	16	30	14	1.30	2.61	3.26	3.92	4.57	5.23	-	-	-	-
	8	20	38	18	1.01	2.03	2.54	3.04	3.55	4.06	-	-	-	-
	8	25	48	23	0.79	1.59	1.98	2.38	2.78	3.18	-	-	-	-
FMR 3000	10	25	48	23	0.79	1.59	1.98	2.38	2.78	3.18	3.97	-	-	-
	10	32	62	30	0.61	1.22	1.52	1.83	2.13	2.43	3.04	-	-	-
	10	40	78	38	0.48	0.96	1.20	1.44	1.68	1.92	2.40	-	-	-
	10	50	98	48	0.38	0.76	0.95	1.14	1.33	1.52	1.90	-	-	-
	10	63	124	61	0.30	0.60	0.75	0.90	1.05	1.20	1.50	-	-	-
	10	80	158	78	0.23	0.47	0.58	0.70	0.82	0.94	1.17	-	-	-
	10	100	198	98	0.19	0.37	0.47	0.56	0.65	0.74	0.93	-	-	-
FMR 4000	12	32	62	30	0.61	1.22	1.52	1.83	2.13	2.43	3.04	3.65	-	-
	12	40	78	38	0.48	0.96	1.20	1.44	1.68	1.92	2.40	2.88	-	-
	12	50	98	48	0.38	0.76	0.95	1.14	1.33	1.52	1.90	2.28	-	-
	12	63	124	61	0.30	0.60	0.75	0.90	1.05	1.20	1.50	1.80	-	-
	12	80	158	78	0.23	0.47	0.58	0.70	0.82	0.94	1.17	1.40	-	-
	12	100	198	98	0.19	0.37	0.47	0.56	0.65	0.74	0.93	1.12	-	-
	12	125	248	123	0.15	0.30	0.37	0.45	0.52	0.59	0.74	0.89	-	-
FMR 5000	16	40	78	38	0.48	0.96	1.20	1.44	1.68	1.92	2.40	2.88	3.85	-
	16	50	98	48	0.38	0.76	0.95	1.14	1.33	1.52	1.90	2.28	3.04	-
	16	63	124	61	0.30	0.60	0.75	0.90	1.05	1.20	1.50	1.80	2.39	-
	16	80	158	78	0.23	0.47	0.58	0.70	0.82	0.94	1.17	1.40	1.87	-
	16	100	198	98	0.19	0.37	0.47	0.56	0.65	0.74	0.93	1.12	1.49	-
	16	125	248	123	0.15	0.30	0.37	0.45	0.52	0.59	0.74	0.89	1.19	-
FMR 6000	20	50	98	48	0.38	0.76	0.95	1.14	1.33	1.52	1.90	2.28	3.04	3.81
	20	63	124	61	0.30	0.60	0.75	0.90	1.05	1.20	1.50	1.80	2.39	2.99
	20	80	158	78	0.23	0.47	0.58	0.70	0.82	0.94	1.17	1.40	1.87	2.34
	20	100	198	98	0.19	0.37	0.47	0.56	0.65	0.74	0.93	1.12	1.49	1.86
	20	125	248	123	0.15	0.30	0.37	0.45	0.52	0.59	0.74	0.89	1.19	1.48
	20	160	318	158	0.12	0.23	0.29	0.35	0.40	0.46	0.58	0.69	0.92	1.16

- Ø D = Tool diameter(mm), Ø DHmin, max = Min, Max diameter(mm)
- Ø d = Tool Path (mm)
- Ø DHmin(Min diameter) = Ø D * 2 - Insert size, Ø DHmax(Max diameter) = Ø D * 2 - 2
- Ø d(tool path) = Ø DHmin, max - Ø D

FMAC(M)3000/4000

AA 45°
• AR : 21°
• RR : -17°~-12°



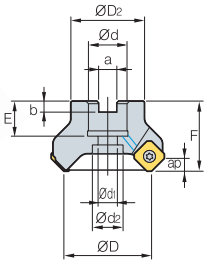


Fig. 1

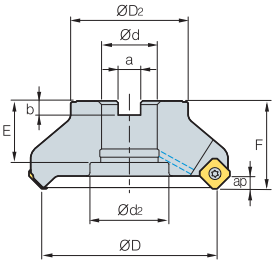


Fig. 2

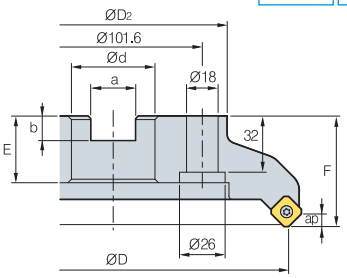


Fig. 3

(mm)

Designation		Stock R	Stock L	⚙	ØD	ØD2	Ød	a	b	E	F	Ød1	Ød2	ap	kg	Fig.
FMAC(M)	3050HR	(●)		4	50	42	22	10.4	6.3	20	40	11	17.5	4.0	0.4	1
	3050HR-H	●(●)		6	50	42	22	10.4	6.3	20	40	11	17.5	4.0	0.4	1
	3063HR	●(●)		5	63	49	22	10.4	6.3	20	40	11	17.5	4.0	0.5	1
	3063HR-H	●(●)		8	63	49	22	10.4	6.3	20	40	11	17.5	4.0	0.6	1
	3080HR	●(●)		6	80	57	25.4(27)	9.5(12.4)	6(7)	25(23)	50	14	20	4.0	1.1	1
	3080HR-H	●(●)		10	80	57	25.4(27)	9.5(12.4)	6(7)	25(23)	50	14	20	4.0	1.2	1
	3100HR	●(●)		7	100	67	31.75(32)	12.7(14.4)	8(8)	25(25.5)	50	(18)	45(26)	4.0	1.7	2(1)
	3100HR-H			12	100	67	31.75(32)	12.7(14.4)	8(8)	25(25.5)	50	(18)	45(26)	4.0	1.7	2(1)
	3125HR			8	125	87	38.1(40)	15.9(16.4)	10(9)	42(29)	63	(22)	55(32)	4.0	3.3(3.5)	2(1)
	3125HR-H			14	125	87	38.1(40)	15.9(16.4)	10(9)	42(29)	63	(22)	55(32)	4.0	3.3(3.5)	2(1)
FMAC(M)	4050HR	●(●)		3	50	49	22	10.4	6.3	20	40	11	18	6.5	0.4	1
	4063HR	●(●)		4	63	49	22	10.4	6.3	20	40	11	18	6.5	0.6	1
	4063HR-M	(●)		5	63	49	22	10.4	6.3	20	40	11	18	6.5	0.6	1
	4063HR-H			6	63	49	22	10.4	6.3	20	40	11	18	6.5	0.6	1
	4080HR	●(●)		5	80	57	25.4(27)	9.5(12.4)	6(7)	25(23)	50	14	20	6.5	1.1	1
	4080HR-M	●(●)		6	80	57	25.4(27)	9.5(12.4)	6(7)	25(23)	50	14	20	6.5	1.1	1
	4080HR-H	●(●)		8	80	57	25.4(27)	9.5(12.4)	6(7)	25(23)	50	18	20	6.5	1.1	1
	4100HR	●(●)		5	100	67	31.75(32)	12.7(14.4)	8(8)	33(25)	63(50)	18	26	6.5	2(1.6)	1
	4100HR-M	●(●)		7	100	67	31.75(32)	12.7(14.4)	8(8)	33(25)	63(50)	18	26	6.5	2(1.6)	1
	4100HR-H	(●)		10	100	67	31.75(32)	12.7(14.4)	8(8)	33(25)	63(50)	18	26	6.5	2(1.6)	1
	4125HR	●(●)		6	125	87	38.1(40)	15.9(16.4)	10(9)	35(29)	63	22	32	6.5	3.1	1
	4125HR-M	●(●)		8	125	87	38.1(40)	15.9(16.4)	10(9)	35(29)	63	22	32	6.5	3.1	1
	4125HR-H	●		12	125	87	38.1(40)	15.9(16.4)	10(9)	35(29)	63	22	32	6.5	3.1	1
	4160R	●(●)		7	160	107	50.8(40)	19.0(16.4)	11(9)	38(35)	63	-	-	6.5	4.8	3
	4160R-M	●(●)		10	160	107	50.8(40)	19.0(16.4)	11(9)	38(35)	63	-	-	6.5	4.8	3
	4160R-H	●(●)		16	160	107	50.8(40)	19.0(16.4)	11(9)	38(35)	63	-	-	6.5	4.8	3
	4200R	●(●)		8	200	130	47.625(60)	25.4(25.7)	14	38(32)	63	-	-	6.5	6.1	4
	4200R-M	●(●)		12	200	130	47.625(60)	25.4(25.7)	14	38(32)	63	-	-	6.5	6.1	4
	4200R-H	●(●)		18	200	130	47.625(60)	25.4(25.7)	14	38(32)	63	-	-	6.5	6.1	4

• ( )Metric Size ● : Stock item ○ : Under preparing for stock

Parts

	Screw	I/S Wrench	Shim Wrench	Shim Screw	Shim
					
3000 Type	FTKA0307	-	-	-	-
4000 Type	FTGA03512	TW15S	HW35L	SHXN0509F	SS42SAF

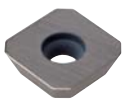
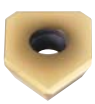
Available Arbors

Designation		Ød	NC Arbors
FMAC(M)	3050HR-□ 3063HR-□	22	BT□□-FMC22-□□
	3080HR-□	25.4 27	BT□□-FMA25.4-□□ BT□□-FMC27-□□
	3100HR-□	31.75 32	BT□□-FMA31.75-□□ BT□□-FMC32-□□
	3125HR-□	38.1 40	BT□□-FMA38.1-□□ BT□□-FMB40-□□
FMAC(M)	4050HR-□ 4063HR-□	22	BT□□-FMC22-□□
	4080HR-□	25.4 27	BT□□-FMA25.4-□□ BT□□-FMC27-□□
	4100HR-□	31.75 32	BT□□-FMA31.75-□□ BT□□-FMC32-□□
	4125HR-□	38.1 40	BT□□-FMA38.1-□□ BT□□-FMB40-□□
	4160R-□	50.8 40	BT□□-FMA50.8-□□ BT□□-FMB40-□□
	4200R-□	47.625 60	BT□□-FMA47.625-□□ BT□□-FMB60-□□

• Available Inserts, see page : E14, E15 • Available Arbors and bolt : E215~E217

Available Inserts

SEET-MF	SEET-MM	SEET-MA	SEXT-MF
			

SEXT-MM	SEXT-MR	SEEW	SEEW-W
			

Type	Designation	Coated NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	Cermet CN2000	CN20	CN30	Uncoated H01	G10	ST30A	ST20	page
3000 Type	SEET 0903AGFN-MA										●				●				E14 E15
	0903AGSN-MF	●		●		●		●											
	0903AGSN-MM	●		●		●		●											
	SEXT 0903AGSN-MF			●	●	●				●									
	0903AGSN-MM			●	●	●			●	●									
	0903AGSN-MR				○														
	SEEW 0903AGTN													●					
4000 Type	SEET 14M4AGFN-MA										●				●				E14 E15
	14M4AGSN-MF	●	●			●		●	●										
	14M4AGSN-MM	●	●	●		●		●	●										
	SEXT 14M4AGSN-MF	●		●	●	●				●									
	14M4AGSN-MM	●	●	●	●	●		●	●	●									
	14M4AGSN-MR	●		●	●	●		●											
	SEEW 14M4AGTN													●					
	14M4AGFN-W																		
	14M4AGSN-W																		
	14M4AGTN-W				●	○			●										

● : Stock item ○ : Under preparing for stock

FMAC(M)3000-A/4000-A (Aluminum body)

AA 45°

• AR : 21°
• RR : −16°~−12°



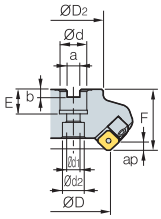


Fig. 1

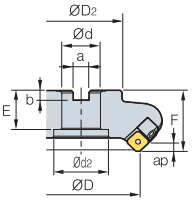


Fig. 2

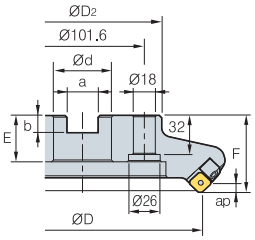


Fig. 3

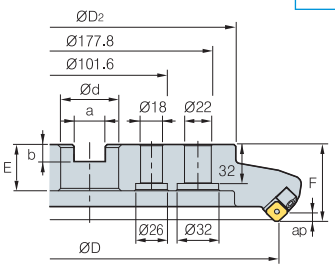


Fig. 4

(mm)

Designation		Stock R	Stock L	⊙	øD	øD2	ød	a	b	E	F	ød1	ød2	ap	kg	Fig.
FMAC(M)	3063R-A	(●)		3	63	49	22	10.4	6.3	20	40	11	18	4	0.5	1
	3080R-A	●(●)		4	80	57	25.4(27)	9.5(12.4)	6(7)	25	50	13.5	20	4	0.6	1
	3100R-A	●(●)		5	100	67	31.75(32)	12.7(14.4)	8(8)	32	50	-	45	4	0.8	2
	3100R-25.4-A	●		5	100	67	25.4	9.5	6	25	50	-	38	4	0.9	2
	3125R-A	●(●)		6	125	87	38.1(40)	15.9(16.4)	10(9)	38	63	-	56	4	1.6	2
	3125R-25.4-A	●		6	125	70	25.4	9.5	6	25	63	-	38	4	1.7	2
FMAC(M)	4063R-A	(●)		3	63	49	22	10.4	6.3	20)	50	11	18	6.5	0.6	1
	4080R-A	●(●)		4	80	67	25.4(27)	9.5(12.4)	6(7)	25(22)	50	13.5	20	6.5	0.8	1
	4100R-A	●(●)		5	100	67	31.75(32)	12.7(14.4)	8(8)	32	50	-	45	6.5	1.1	2
	4100R-25.4-A	●		5	100	67	25.4	9.5	6	25	50	-	38	6.5	1.2	2
	4125R-A	●(●)		6	125	87	38.1(40)	15.9(16.4)	10(9)	38(35)	63	-	56	6.5	1.7	2
	4125R-25.4-A	●		6	125	70	25.4	9.5	6	25	63	-	38	6.5	1.8	2
	4160R-A	●(●)		7	160	107	50.8(40)	19.0(16.4)	11(9)	38(35)	63	-	75	6.5	2.5	2
	4200R-A	●(●)		8	200	130	47.625(60)	25.4(25.7)	14(14)	38(32)	63	-	-	6.5	3.2	3
	4250R-A			10	250	180	47.625(60)	25.4(25.7)	14(14)	38	63	-	-	6.5	4.1	3
	4315R-A			12	315	240	47.625(60)	25.4(25.7)	14(14)	38	63	-	-	6.5	6.7	4

Note) Through coolant type between Ø50~Ø125

• ( )Metric Size

● : Stock item ○ : Under preparing for stock

Parts

	Screw	I/S Wrench	Locator Wrench	Locator	Locator Screw
					
3000 Type	FTKA0307	TW09S	HW30L	LFMA3R-A	DHA620
4000 Type	FTGA03512	TW15S	HW40L	LFMA4R-A	DHA0830

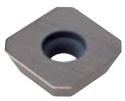
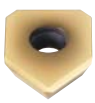
Available Arbors

Designation		Ød	NC Arbors
FMAC(M)	3063R-□ 4063R-□	22	BT□□-FMC22-□□
	3080R-□	25.4	BT□□-FMA25.4-□□
	4080R-□	27	BT□□-FMC27-□□
	3100R-□	31.75	BT□□-FMA31.75-□□
	4100R-□	32	BT□□-FMC32-□□
	3125R-□	38.1	BT□□-FMA38.1-□□
	4125R-□	40	BT□□-FMB40-□□
	4160R-□	50.8 40	BT□□-FMA50.8-□□ BT□□-FMB40-□□
	4200R-□	47.625	BT□□-FMA47.625-□□
	4250R-□	60	BT□□-FMB60-□□
	4315R-□	–	–

• Available Inserts, see page : E14, E15
• Available Arbors and bolt : E215~E217

Available Inserts

SEET-MF	SEET-MM	SEET-MA	SEXT-MF
			

SEXT-MM	SEXT-MR	SEEW	SEEW-W
			

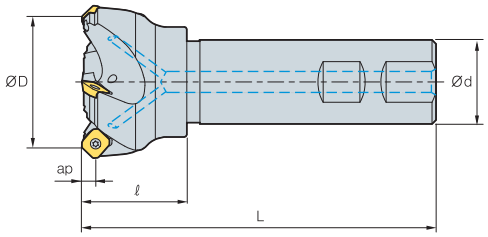
Type	Designation		Coated NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	Cermet CN2000	CN20	CN30	Uncoated H01	G10	ST30A	ST20	page
3000 Type	SEET	0903AGFN-MA										●				●				E14 E15
		0903AGSN-MF	●		●		●		●											
		0903AGSN-MM	●		●		●		●											
	SEXT	0903AGSN-MF			●	●	●				●									
		0903AGSN-MM			●	●	●			●	●									
		0903AGSN-MR				○														
	SEEW	0903AGTN													●					
4000 Type	SEET	14M4AGFN-MA										●				●				E14 E15
		14M4AGSN-MF	●	●			●		●	●										
		14M4AGSN-MM	●	●	●		●		●	●										
	SEXT	14M4AGSN-MF	●		●	●	●				●									
		14M4AGSN-MM	●	●	●	●	●		●	●	●									
		14M4AGSN-MR	●		●	●	●		●											
	SEEW	14M4AGTN													●					
		14M4AGFN-W																		
		14M4AGSN-W																		
		14M4AGTN-W				●	○			●										

● : Stock item ○ : Under preparing for stock

FMAS3000/4000

AA 45° | • AR : 23° • RR : −17°~−13°





(mm)

Designation		Stock		ØD	Ød	ℓ	L	ap	kg
FMAS	3025HR		2	25	25	35	115	4	0.4
	3032HR	○	3	32	25	40	125	4	0.5
New	3032HR-S32		3	32	32	40	130	4	0.8
	3040HR	●	3	40	32	40	130	4	0.9
New	3040HR-S40		3	40	40	40	140	4	1.3
New	3040HR-S42		3	40	42	40	140	4	1.4
	3050HR	○	4	50	32	40	135	4	1
New	3050HR-S40		4	50	40	40	140	4	1.3
New	3050HR-S42		4	50	42	40	140	4	1.5
	3063HR	●	5	63	32	45	135	4	1.2
New	3063HR-S40		5	63	40	45	145	4	1.6
New	3063HR-S42		5	63	42	45	145	4	1.7
FMAS	4050HR	○	3	50	32	45	135	6.5	1.5
New	4050HR-S40		3	50	40	45	135	6.5	2.1
New	4050HR-S42		3	50	42	45	135	6.5	2.7
	4063HR	○	4	63	32	45	135	6.5	2
New	4063HR-S40		4	63	40	45	135	6.5	2.6
New	4063HR-S42		4	63	42	45	135	6.5	3.2

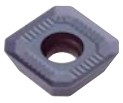
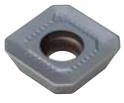
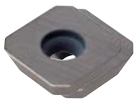
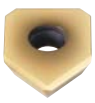
Note) Through coolant type between Ø25~Ø63

● : Stock item ○ : Under preparing for stock

Parts

	Screw	I/S Wrench	Shim Wrench	Shim Screw	Shim
					
3000 Type	FTKA0307	TW09S	-	-	-
4000 Type	FGKA03512	TW15S	HW35L	SHXN0509F	SS42SAF

Available Inserts

SEET-MF	SEET-MM	SEET-MA	SEXT-MF
			
SEXT-MM	**SEXT-MR**	**SEEW**	**SEEW-W**
			

• Available Inserts, see page : E14, E15

Type	Designation	Coated										Cermet		Uncoated				page
		NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	CN2000	CN20	CN30	H01	G10	ST30A	ST20	
3000 Type	SEET 0903AGFN-MA										●				●				E14 E15
	0903AGSN-MF	●		●		●		●											
	0903AGSN-MM	●		●		●		●											
	SEXT 0903AGSN-MF			●	●	●				●									
	0903AGSN-MM			●	●	●			●	●									
	0903AGSN-MR				○														
	SEEW 0903AGTN													●					
4000 Type	SEET 14M4AGFN-MA										●				●				E14 E15
	14M4AGSN-MF	●	●			●		●	●										
	14M4AGSN-MM	●	●	●		●		●	●										
	SEXT 14M4AGSN-MF	●		●	●	●				●									
	14M4AGSN-MM	●	●	●	●	●		●	●	●									
	14M4AGSN-MR	●		●	●	●		●											
	SEEW 14M4AGTN													●					
	14M4AGFN-W																		
	14M4AGSN-W																		
	14M4AGTN-W				●	○			●										

● : Stock item ○ : Under preparing for stock

FMPC(M)3000/4000

AA 90°
• AR : 10°
• RR : -9°~-8°



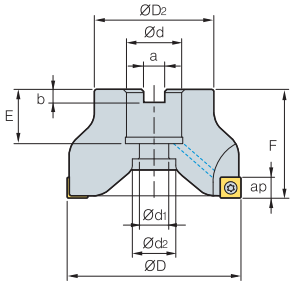


Fig. 1

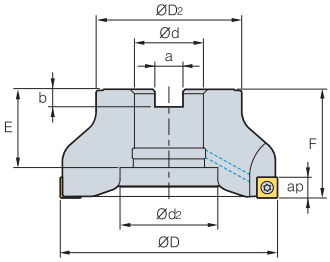


Fig. 2

(mm)

Designation		Stock	⊙	ØD	ØD2	Ød	a	b	E	F	Ød1	Ød2	ap	kg	Fig.
FMPC(M)	3050HS	(●)	5	50	40	22	10.4	6.3	20	40	11	18	7	0.3	1
	3063HS	(○)	6	63	40	22	10.4	6.3	20	40	11	18	7	0.5	1
	3080HS	●(●)	7	80	55	25.4(27)	9.5(12.4)	6(7)	25(22)	50	14	20	7	1.0	1
	3100HS	○(●)	8	100	67	31.75(32)	12.7(14.4)	8(8)	36(26)	50	18	45(26)	7	1.5	2(1)
FMPC(M)	4063HS	(●)	5	63	49	22	10.4	6.3	20(20)	50(50)	11	18	11	0.4	1
	4080HS	●(●)	6	80	57	25.4(27)	9.5(12.4)	6(7)	25(23)	50(50)	14	20	11	0.9	1
	4100HS	○(●)	7	100	67	31.75(32)	12.7(14.4)	8(8)	33(25)	63(50)	18	26	11	1.9(1.5)	1
	4125HS	●(●)	8	125	87	38.1(40)	15.9(16.4)	10(9)	35(29)	63	22	32	11	3.1	1

Note) Through coolant type between Ø50~Ø125 • ( )Metric Size ● : Stock item ○ : Under preparing for stock

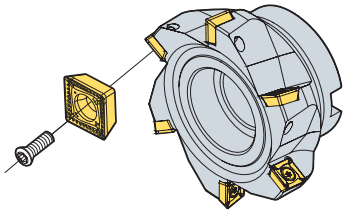
Parts

	Screw	Wrench
		
3000 Type	FTGA03508	TW15S
4000 Type	FTNC04511	TW20S

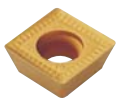
Available Arbors

Designation	Ød	NC Arbors
FMPC(FMPCM) 3050HS 3063HS 4063HS	22	BT□□-FMC22-□□
3080HS	25.4	BT□□-FMA25.4-□□
4080HS	27	BT□□-FMC27-□□
3100HS	31.75	BT□□-FMA31.75-□□
4100HS	32	BT□□-FMC32-□□
4125HS	38.1	BT□□-FMA38.1-□□
	40	BT□□-FMB40-□□

Assembling



Available Inserts

SDET-MF	SDET-MM	SDET-MA
		
SDXT-MF	**SDXT-MM**	**SDXT-MA**
		

Type	Designation	Coated NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	Cermet CN2000	CN20	CN30	Uncoated H01	G10	ST30A	ST20	page
3000 Type	SDET 09M402R-MA										●				●				E12 E13
	09M405R-MF																		
	09M405R-MM																		
	SDXT 09M405R-MF	●	●	●		●		●											
	09M405L-MF																		
	09M405R-MM	●	●	●	●	●		●	●										
	09M405L-MM																		
	09M405R-MA														●				
4000 Type	SDET 130504R-MA										●				●				E12 E13
	130508R-MF																		
	130508R-MM																		
	SDXT 130508R-MF	●	●	●		●		●											
	130508R-MM	●	●	●	●	●	●	●	●										
	130538-MM																		
	130508R-MA														●				

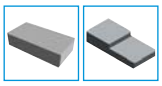
● : Stock item ○ : Under preparing for stock

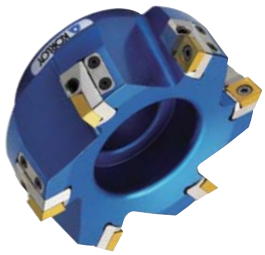
• Available Inserts, see page : E12, E13
• Available Arbors and bolt : E215~E217

FMPC(M)3000-A/4000-A (Aluminum Body)

AA 90°

• AR : 10°
• RR : -9°~-7.3°





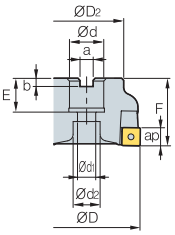


Fig. 1

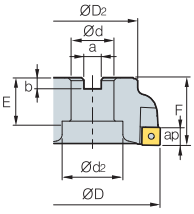


Fig. 2

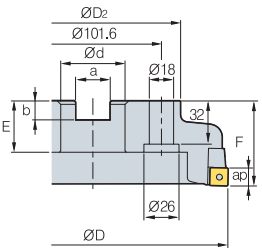


Fig. 3

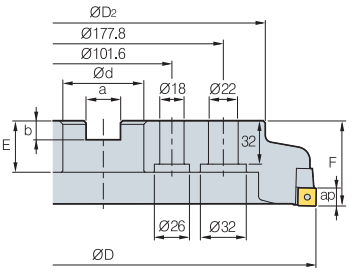


Fig. 4

(mm)

Designation		Stock R	Stock L	⚙	ØD	ØD2	Ød	a	b	E	F	Ød1	Ød2	ap	kg	Fig.
FMPC(M)	3063S-A	(●)		3	63	40	22	10.4	6.3	20	40	11.0	18	4	0.2	1
	3080S-A	●(●)		4	80	55	25.4(27)	9.5(12.4)	6(7)	25(22)	50	13.5	20	4	0.4	1
	3100S-A	●(●)		5	100	67	31.75(32)	12.7(14.4)	8(8)	32	50	-	45	4	0.6	2
	3100S-25.4-A	●		5	100	67	25.4	9.5	6	25	50	-	38	4	0.7	2
FMPC(M)	4063S-A	(●)		3	63	40	22	10.4	6.3	20	40	11.0	18	6.5	0.2	1
	4080S-A	●(●)		4	80	55	25.4(27)	9.5(12.4)	6(7)	25(22)	50	13.5	20	6.5	0.5	1
	4100S-A	●(●)		5	100	67	31.75(32)	12.7(14.4)	8(8)	32	50	-	45	6.5	0.7	2
	4100S-25.4-A	●		5	100	67	25.4	9.5	6	25	50	-	38	6.5	0.8	2
	4125S-A	●(●)		6	125	80	38.1(40)	16.15(16.4)	10(9)	38(30)	63	-	56	6.5	1.3	2
	4125S-25.4-A	●		6	125	80	25.4	9.5	6	25	63	-	38	6.5	1.4	2
	4160S-A			8	160	107	50.8(40)	19.0(16.4)	11(9)	38(30)	63	-	70	6.5	2	2
	4200S-A			10	200	130	47.625(60)	25.7(25.7)	14(14)	38	63	-	-	6.5	3.2	3
	4250S-A			12	250	180	47.625(60)	25.7(25.7)	14(14)	38	63	-	-	6.5	5.2	3
	4315S-A			15	315	240	47.625(60)	25.7(25.7)	14(14)	38	63	-	-	6.5	8.4	4

• ( )Metric Size

● : Stock item ○ : Under preparing for stock

Parts

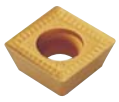
	Screw	Insert Wrench	Locator Wrench	Locator	Chip cover	Chip cover Screw	Locator Screw
							
3063S-A	FTGA03508	TW15S	HW30L	LFMP3R-A	CFMP3R14R1-A	PXMA0306	DHA0624
3080S-A ~3100S-A	FTGA03508	TW15S	HW30L	LFMP3R-A	CFMP3R-A	PXMA0306	DHA0624
4063S-A ~4080S-A	FTNC04509	TW20S	HW40L	LFMP4R1-A	CFMP3R14R1-A	PXMA0306	DHA0825
4100S-A ~4315S-A	FTNC04509	TW20S	HW40L	LFMP4R-A	CFMP3R-A	PXMA0306	DHA0830

Available Arbors

Designation		Ød	NC Arbors
FMPC(M)	3063S-□	22	BT□□-FMC22-□□
	4063S-□		
	3080S-□	25.4	BT□□-FMA25.4-□□
	4080S-□	27	BT□□-FMC27-□□
	3100S-□	31.75	BT□□-FMA31.75-□□
	4100S-□	32	BT□□-FMC32-□□
	3125S-□	38.1	BT□□-FMA38.1-□□
	4125S-□	40	BT□□-FMB40-□□
	4160S-□	50.8	BT□□-FMA50.8-□□
		40	BT□□-FMB40-□□
	4200S-□	47.625	BT□□-FMA47.625-□□
	4250S-□	60	BT□□-FMB60-□□
	4315S-□	–	–

• Available Inserts, see page : E12, E13
• Available Arbors and bolt : E215~E217

Available Inserts

SDET-MF	SDET-MM	SDET-MA
		

SDXT-MF	SDXT-MM	SDXT-MA
		

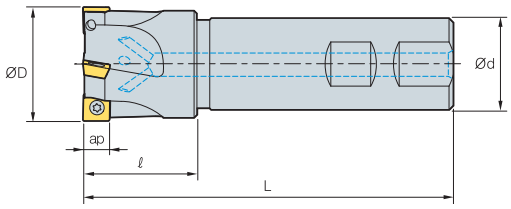
Type	Designation	Coated NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC3530	PC6510	PC215K	Cermet PD2000	CN2000	CN20	CN30	Uncoated H01	G10	ST30A	ST20	page
3000 Type	SDET 09M402R-MA										●				●				E12 E13
	09M405R-MF																		
	09M405R-MM																		
	SDXT 09M405R-MF	●	●	●		●		●											
	09M405L-MF																		
	09M405R-MM	●	●	●	●	●		●	●										
	09M405L-MM																		
	09M405R-MA														●				
4000 Type	SDET 130504R-MA										●				●				E12 E13
	130508R-MF																		
	130508R-MM																		
	SDXT 130508R-MF	●	●	●		●		●											
	130508R-MM	●	●	●	●	●	●	●	●										
	130538-MM																		
	130508R-MA																		
															●				

● : Stock item ○ : Under preparing for stock

FMPS3000/4000

AA 90°
• AR : 10°
• RR : -9°~-8°





(mm)

Designation		Stock R	Stock L	⌀	ØD	Ød	ℓ	L	ap	kg
FMPS	3025HS	●		2	25	25	35	115	7	0.4
	3032HS			3	32	25	40	125	7	0.5
	3040HS	○		4	40	32	40	130	7	0.8
New	3040HS-S40			4	40	40	45	140	7	1.2
New	3040HS-S42			4	40	42	45	140	7	1.3
	3050HS	●		5	50	32	40	135	7	1
New	3050HS-S40			5	50	40	40	140	7	1.3
New	3050HS-S42			5	50	42	40	140	7	1.4
	3063HS	●		6	63	32	45	135	7	1.2
New	3063HS-S40			6	63	40	45	145	7	1.6
New	3063HS-S42			6	63	42	45	145	7	1.7
FMPS	4040HS	●		3	40	32	40	130	11	1
New	4040HS-S40			3	40	40	40	140	11	1.3
New	4040HS-S42			3	40	42	40	140	11	1.4
	4050HS	●		4	50	32	45	135	11	1.5
New	4050HS-S40			4	50	40	45	145	11	1.7
New	4050HS-S42			4	50	42	45	145	11	1.6
	4063HS	○		5	63	32	45	135	11	2.1
New	4063HS-S40			5	63	40	45	145	11	2.4
New	4063HS-S42			5	63	42	45	145	11	2.6

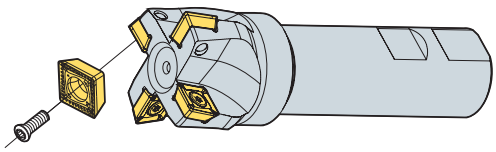
Note) Through coolant type between Ø25~Ø63

● : Stock item ○ : Under preparing for stock

Parts

	Screw	Wrench
		
3000 Type	FTGA03508	TW15S
4000 Type	FTNC04511	TW20S

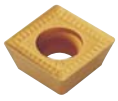
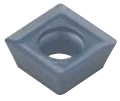
Assembling



• Available Inserts, see page : E12, E13

Available Inserts

SDET-MF	SDET-MM	SDET-MA
		

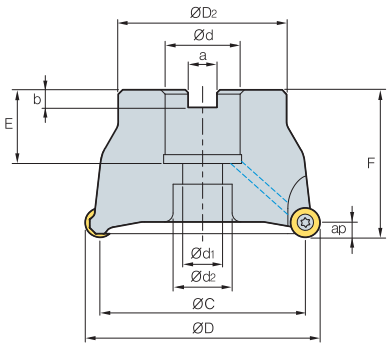
SDXT-MF	SDXT-MM	SDXT-MA
		

Type	Designation	Coated NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	Cermet CN2000	CN20	CN30	Uncoated H01	G10	ST30A	ST20	page
3000 Type	SDET 09M402R-MA										●				●				E12 E13
	09M405R-MF																		
	09M405R-MM																		
	SDXT 09M405R-MF	●	●	●		●		●											
	09M405L-MF																		
	09M405R-MM	●	●	●	●	●		●	●										
	09M405L-MM																		
	09M405R-MA														●				
4000 Type	SDET 130504R-MA										●				●				E12 E13
	130508R-MF																		
	130508R-MM																		
	SDXT 130508R-MF	●	●	●		●		●											
	130508R-MM	●	●	●	●	●	●	●	●										
	130538-MM																		
	130508R-MA														●				

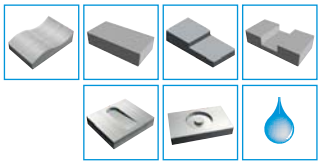
● : Stock item ○ : Under preparing for stock

FMRC(M)3000/4000





• AR : 5°
• RR : -5°



(mm)

Designation	Stock R	Stock L		øD	øC	øD2	ød	a	b	E	F	ød1	ød2	ap	kg
FMRC(M) 3040HRD	●		3	40	30	36	16	8.4	5.6	18	40	9	14	5.0	0.2
3040HRD-H			4	40	30	36	16	8.4	5.6	18	40	9	14	5.0	0.2
3050HRD	○		4	50	40	42	22	10.4	6.3	20	40	11	16.5	5.0	0.3
3050HRD-H			5	50	40	42	22	10.4	6.3	20	40	11	16.5	5.0	0.3
3063HRD			5	63	53	49	22	10.4	6.3	20	50	11	16.5	5.0	0.64
3063HRD-H			6	63	53	49	22	10.4	6.3	20	50	11	16.5	5.0	0.64
3080HRD			6	80	70	57	25.4(27)	9.5(12.4)	6(7.0)	25(22)	50(50)	14	19	5.0	1.1
3080HRD-H			7	80	70	57	25.4(27)	9.5(12.4)	6(7.0)	25(22)	50(50)	14	19	5.0	1.1
3100HRD	○		7	100	90	67	31.75(32)	12.7(14.4)	8(8.0)	32(28)	63(63)	18	26	5.0	2.1
3100HRD-H			8	100	90	67	31.75(32)	12.7(14.4)	8(8.0)	32(28)	63(63)	18	26	5.0	2.1
FMRC(M) 4050HRD	(●)		4	50	38	42	22	10.4	6.3	20	50	11	18	6.0	0.4
4063HRD	○(●)		4	63	51	49	22	10.4	6.3	20	50	11	18	6.0	0.6
4063HRD-M	●		5	63	51	49	22	10.4	6.3	20	50	11	18	6.0	0.6
4080HRD			5	80	68	57	25.4(27)	9.5(12.4)	6(7.0)	25(23)	50(50)	14	20	6.0	1.0
4080HRD-M	(●)		6	80	68	57	25.4(27)	9.5(12.4)	6(7.0)	25(23)	50(50)	14	20	6.0	1.0
4100HRD			6	100	88	67	31.75(32)	12.7(14.4)	8(8.0)	33(25)	63(50)	18	26	6.0	1.9(1.5)
4100HRD-M			7	100	88	67	31.75(32)	12.7(14.4)	8(8.0)	33(25)	63(50)	18	26	6.0	1.9(1.5)
4125HRD	○		7	125	113	87	38.1(40)	15.9(16.4)	10(9.0)	35(29)	63(63)	22	32	6.0	3.0
4125HRD-M			8	125	113	87	38.1(40)	15.9(16.4)	10(9.0)	35(29)	63(63)	22	32	6.0	3.0

Note) It's general that you measure of inner diameter when the diameter of FMRC/FMRCM is Ø40~Ø63 • ( )Metric Size ● : Stock item ○ : Under preparing for stock

Parts

	Screw	Wrench
		
3000 Type	FTGA03508(Ø21=FTGA03507)	TW15S
4000 Type	FTKA04510	TW15S

Available Arbors

Designation	Available Arbors
FMRC(M) 3040HRD 3040HRD-H	BT-□□-FMC16-□□
3050HRD 3050HRD-H 3063HRD 3063HRD-H	BT-□□-FMC22-□□
3080HRD	BT□□-FMA / FMB25.4-□□
3080HRD-H	BT□□-FMB / FMC27-□□
3100HRD	BT□□-FMA31.75-□□
3100HRD-H	BT□□-FMC32-□□
FMRC(M) 4050HRD 4063HRD 4063HRD-M	BT□□-FMC22-□□
4080HRD	BT□□-FMA / FMB25.4-□□
4080HRD-M	BT□□-FMB / FMC27-□□
4100HRD	BT□□-FMA31.75-□□
4100HRD-M	BT□□-FMC32-□□
4125HRD	BT□□-FMA / FMB38.1-□□
4125HRD-M	BT□□-FMB / FMC40-□□

• Available Inserts, see page : E11
• Available Arbors and bolt : E215~E217

Available Inserts

RDKT-MF RDKT-MM RDCT-MA

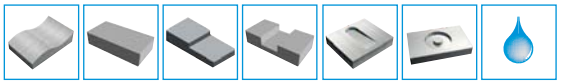


Type	Designation	Coated NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	Cermet CN2000	CN20	CN30	Uncoated H01	G10	ST30A	ST20	page
3000 Type	RDCT 10T3M0-MA														●				E11
	RDKT 10T3M0-MF				●	●	●	●											
	10T3M0-MM	●	●	●	●	●	●	●	●										
4000 Type	RDCT 1204M0-MA														●				E11
	RDKT 1204M0-MF				●	●	●	●											
	1204M0-MM	●	●	●	●	●	●	●	●										

● : Stock item ○ : Under preparing for stock

FMRC(M)5000/6000

• AR : 5°
• RR : -5°





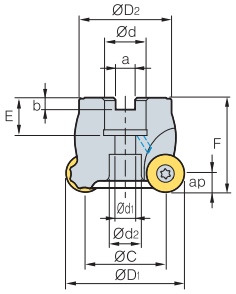


Fig. 1

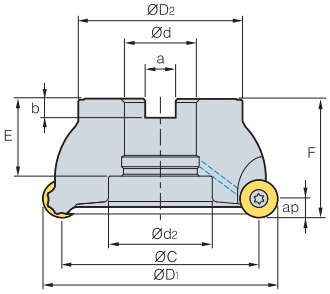


Fig. 2

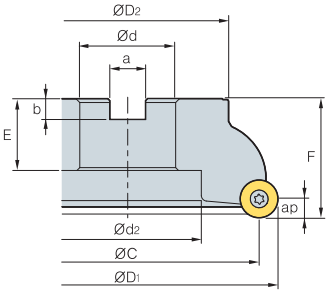


Fig. 3

(mm)

Designation	Stock	⊙	ØD	ØC	ØD2	Ød	a	b	E	F	Ød1	Ød2	ap	kg	Fig.
FMRC(M) 5050HRD		3	50	34	42	22	10.4	6.3	20	50	11	16.5	8.0	0.4	1
5063HRD		4	63	47	49	22	10.4	6.3	20	50	11	18	8.0	0.6	1
5063HRD-H		5	63	47	49	22	10.4	6.3)	20	50	11	18	8.0	0.6	1
5080HRD	●(●)	5	80	64	57	25.4(27)	9.5(12.4)	6(7.0)	25(23)	50(50)	14	20	8.0	0.9	1
5080HRD-H		6	80	64	57	25.4(27)	9.5(12.4)	6(7.0)	25(23)	50(50)	14	20	8.0	0.9	1
5100HRD	(●)	6	100	84	67	31.75(32)	12.7(14.4)	8(8)	33(25)	63(50)	18	26	8.0	1.9(1.4)	1
5100HRD-H		7	100	84	67	31.75(32)	12.7(14.4)	8(8)	33(25)	63(50)	18	26	8.0	1.9(1.4)	1
5125HRD	(●)	7	125	109	87	38.1(40)	15.9(16.4)	10(9)	35(29)	63(63)	22	32	8.0	3	1
5125HRD-H		8	125	109	87	38.1(40)	15.9(16.4)	10(9)	35(29)	63(63)	22	32	8.0	3	1
FMRC(M) 6063HRD		3	63	43	49	22	10.4	6.3	20	50	11	17	10.0	0.5	1
6063HRD-M		4	63	43	49	22	10.4	6.3	20	50	11	17	10.0	0.5	1
6080HRD	(●)	4	80	60	57	25.4(27)	9.5(12.4)	6(7.0)	25(22)	50	14	20	10.0	0.8	1
6080HRD-M		5	80	60	57	25.4(27)	9.5(12.4)	6(7.0)	25(22)	50	14	20	10.0	0.8	1
6100HRD	●(●)	5	100	80	67	31.75(32)	12.7(14.4)	8(8)	32(28)	63	18	26	10.0	1.6	1
6100HRD-M		6	100	80	67	31.75(32)	12.7(14.4)	8(8)	32(28)	63	18	26	10.0	1.6	1
6125HRD	(●)	6	125	105	87	38.1(40)	15.9(16.4)	10(9)	41(29)	63	- (22)	55(32)	10.0	2.7(2.9)	2(1)
6125HRD-M		7	125	105	87	38.1(40)	15.9(16.4)	10(9)	41(29)	63	- (22)	55(32)	10.0	2.7(2.9)	2(1)
6160RD	(●)	7	160	140	107	50.8(40)	19(16.4)	11(9)	38(35)	63	-	78	10.0	4.4	3
6160RD-M		8	160	140	107	50.8(40)	19(16.4)	11(9)	38(35)	63	-	78	10.0	4.4	3

Note) It's general that you measure of inner diameter when the diameter of FMRC/FMRCM is Ø40~Ø63 – Ø160 is not inner coolant • ( )Metric Size ● : Stock item ○ : Under preparing for stock

Parts

	Screw	Wrench
		
5000 Type	FTGA0513-P	TW20S
6000 Type	FTGA0515-P	TW20S

Available Arbors

Designation	Available Arbors
FMRC(M) 5050HRD 5063HRD 5063HRD-H	BT□□-FMC22-□□
5080HRD	BT□□-FMA / FMB25.4-□□
5080HRD-H	BT□□-FMB / FMC27-□□
5100HRD	BT□□-FMA31.75-□□
5100HRD-H	BT□□-FMC32-□□
5125HRD	BT□□-FMA / FMB38.1-□□
5125HRD-H	BT□□-FMB / FMC40-□□
FMRC(M) 6063HRD 6063HRD-M	BT□□-FMC22-□□
6080HRD	BT□□-FMC / FMB25.4-□□
6080HRD-M	BT□□-FMB / FMC27-□□
6100HRD	BT□□-FMA31.75-□□
6100HRD-M	BT□□-FMC32-□□
6125HRD	BT□□-FMA / FMB38.1-□□
6125HRD-M	BT□□-FMB / FMC40-□□
6160RD	BT□□-FMA50.8-□□
6160RD-M	BT□□-FMB / FMC40-□□

• Available Inserts, see page : E11
• Available Arbors and bolt : E215~E217

Available Inserts

RDHW-E,F,S RDKT-MM



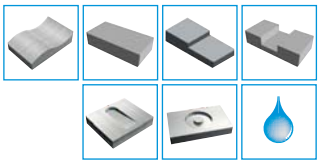


Type	Designation	Coated									Cermet			Uncoated				page
		NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	CN2000	CN20	CN30	H01	G10	ST30A	ST20	
5000 Type	RDHW 1605M0E																		E11
	1605M0F																		
	1605M0S																		
	RDKT 1605M0-MM				●		●												
	1605M0-ML																		
6000 Type	RDHW 2006M0E																		E11
	2006M0F																		
	2006M0S																		
	RDKT 2006M0-MM				●	○	●												

● : Stock item ○ : Under preparing for stock

FMRS1000/1500/2000/2500

• AR : 5°
• RR : -5°~-1°





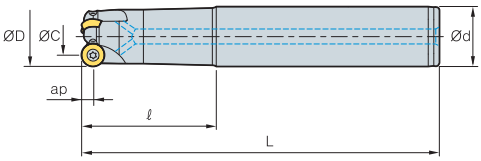


Fig. 1

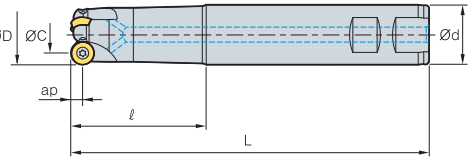


Fig. 2

(mm)

Designation		Stock		øD	øC	ød	ℓ	L	ap	kg	Fig.
FMRS	1008HRD-M		1	8	5.5	10	30	80	2.5	0.2	1
	1008HRD-L		1	8	5.5	10	50	100	2.5	0.2	1
	1010HRD-M		2	10	5	12	44	100	2.5	0.2	1
	1010HRD-L		2	10	5	12	64	120	2.5	0.2	1
	1012HRD-M	●	2	12	7	12	44	100	2.5	0.3	1
	1012HRD-L		2	12	7	16	80	160	2.5	0.3	1
	1015HRD-M		3	15	10	16	80	160	2.5	0.3	1
	1015HRD-L		3	15	10	16	100	200	2.5	0.4	1
FMRS	1510HRD-M		1	10	6	12	44	100	3.0	0.2	1
	1510HRD-L		1	10	6	12	64	120	3.0	0.2	1
	1512HRD-M		2	12	6	12	54	110	3.0	0.3	1
	1512HRD-L	●	2	12	6	16	80	160	3.0	0.3	1
	1516HRD-M		3	16	10	16	60	130	3.0	0.3	1
	1516HRD-L		3	16	10	20	90	180	3.0	0.4	1
	1520HRD-M		3	20	14	20	80	150	3.0	0.4	1
	1520HRD-L		3	20	14	20	90	200	3.0	0.5	1
FMRS	2015HRD-S		2	15	8	16	55	115	3.5	0.3	2
	2015HRD-M	●	2	15	8	20	80	150	3.5	0.4	2
	2015HRD-L		2	15	8	20	90	200	3.5	0.5	2
	2020HRD-S		3	20	14	20	65	125	3.5	0.3	2
	2020HRD-M		3	20	14	20	80	150	3.5	0.4	2
	2020HRD-L		3	20	14	25	90	200	3.5	0.5	2
FMRS	2516HRD-S		2	16	8	16	65	125	4.0	0.3	2
	2516HRD-M	●	2	16	8	16	80	150	4.0	0.4	2
	2516HRD-L	●	2	16	8	20	90	200	4.0	0.5	2
	2520HRD-S		2	20	12	20	65	125	4.0	0.4	2
	2520HRD-M		2	20	12	20	80	150	4.0	0.5	2
	2520HRD-L		2	20	12	25	90	200	4.0	0.6	2
	2525HRD-S		3	25	17	25	55	125	4.0	0.5	2
	2525HRD-M		3	25	17	25	90	200	4.0	0.6	2
	2525HRD-L		3	25	17	32	110	250	4.0	0.7	2

Note) inner coolant : Ø8~Ø25

● : Stock item ○ : Under preparing for stock

Parts

	Screw	Wrench	
			
1000 Type	FTNA0203	TW06P	-
1500 Type	FTNA02205	TW06P	-
2000 Type	FTNA02555	-	TW07S
2500 Type	FTNA0305, FTNA0306 (ø20 Over)	-	TW09S

Available Inserts

RDHW-E,F,S	RDKW
	

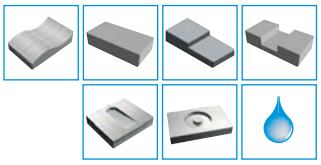
• Available Inserts, see page : E11, E12

Type	Designation	Coated										Cermet			Uncoated				page
		NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	CN2000	CN20	CN30	H01	G10	ST30A	ST20	
1000 Type	RDHW 0501M0E					○		●											E11 E12
	0501M0F																		
	0501M0S																		
	RDKW 0501M0E				●														
1500 Type	RDHW 06T1M0E					○		●											E11 E12
	06T1M0F																		
	06T1M0S																		
	RDKW 06T1M0E				●	○													
2000 Type	RDHW 0702M0E					○		●											E11 E12
	0702M0F																		
	0702M0S																		
	RDKW 0702M0E				●	○													
2500 Type	RDHW 0803M0E					○		●											E11 E12
	0803M0F																		
	0803M0S																		
	RDKW 0803M0E				●	○													

● : Stock item ○ : Under preparing for stock

FMRS3000/4000

• AR : 5°
• RR : -8~-5°





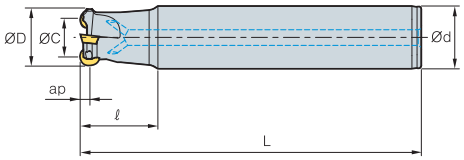


Fig. 1

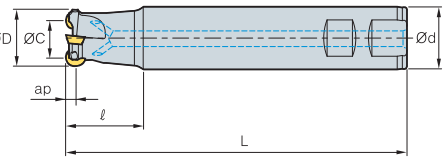


Fig. 2

(mm)

Designation		Stock		ØD	ØC	Ød	ℓ	L	ap	kg	Fig.
FMRS	3021HRD-M		1	21	11	20	40	150	5	0.4	1
	3021HRD-M2		2	21	11	20	40	150	5	0.4	1
	3021HRD-L		1	21	11	20	50	200	5	0.6	1
	3021HRD-L2	●	2	21	11	20	50	200	5	0.6	1
	3025HRD-S	●	2	25	15	25	35	115	5	0.5	2
	3025HRD-M	○	2	25	15	25	70	200	5	0.7	1
	3025HRD-L	●	2	25	15	25	100	250	5	1	1
	3026HRD-M	●	2	26	16	25	70	200	5	0.65	1
	3026HRD-L		2	26	16	25	100	250	5	0.7	1
	3032HRD-S	●	3	32	22	32	40	125	5	1	2
	3032HRD-M	●	3	32	22	32	70	200	5	1.3	1
	3032HRD-L		3	32	22	32	150	300	5	1.6	1
	3040HRD-S		4	40	30	32	40	125	5	1.3	2
	3040HRD-M	●	4	40	30	32	70	200	5	1.5	1
	3040HRD-L		4	40	30	32	150	300	5	1.8	1
FMRS	4032HRD-S	●	2	32	20	32	40	125	6	0.8	2
	4032HRD-M	●	2	32	20	32	70	200	6	1.1	1
	4032HRD-L		2	32	20	32	150	300	6	1.6	1
	4033HRD-S		2	33	21	32	40	125	6	0.9	2
	4033HRD-M	●	2	33	21	32	70	200	6	1.1	1
	4033HRD-L		2	33	21	32	150	300	6	1.7	1
	4040HRD-S	●	3	40	28	32	40	125	6	1	2
	4040HRD-M	●	3	40	28	32	70	200	6	1.6	1
	4040HRD-L	●	3	40	28	32	150	300	6	1.8	1
New	4040HRD-S40		3	40	28	40	40	125	6	1.3	2
New	4040HRD-M40		3	40	28	40	70	200	6	2	1
New	4040HRD-L40		3	40	28	40	150	300	6	2.4	1
New	4040HRD-S42		3	40	28	42	40	125	6	1.6	2
New	4040HRD-M42		3	40	28	42	70	200	6	2.4	1
New	4040HRD-L42		3	40	28	42	150	300	6	2.8	1
	4050HRD-S	●	4	50	38	42	50	125	6	1.5	2
	4050HRD-M	●	4	50	38	42	50	250	6	2.1	1
	4050HRD-L		4	50	38	42	50	300	6	2.7	1
New	4050HRD-S40		4	50	38	40	50	150	6	2	2
New	4050HRD-M40		4	50	38	40	50	250	6	2.6	1
New	4050HRD-L40		4	50	38	40	50	300	6	3.2	1
FMRS	3021HRD-L-30										
	3026HRD-L-30										
	4033HRD-L-40										

Note) inner coolant : Ø21~Ø50

● : Stock item ○ : Under preparing for stock

Parts

	Screw	Wrench
		
3000 Type	FTGA03508(07)	TW15S
4000 Type	FTKA0410	TW15S

• Available Inserts, see page : E11

Available Inserts

RDKT-MF	RDKT-MM	RDCT-MA
		

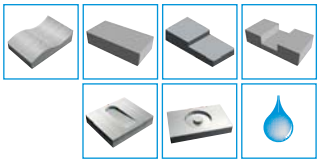
Type	Designation	Coated								Cermet			Uncoated				page
		NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	CN2000	CN20	CN30	H01	G10	ST30A	ST20	
3000 Type	RDCT 10T3M0-MA														●				E11
	RDKT 10T3M0-MF				●	●	●	●											
	10T3M0-MM	●	●	●	●	●	●	●	●										
4000 Type	RDCT 1204M0-MA														●				E11
	RDKT 1204M0-MF				●	●	●	●											
	1204M0-MM	●	●	●	●	●	●	●	●										

● : Stock item ○ : Under preparing for stock

FMRS5000/6000

New

• AR : 5°
• RR : -5°





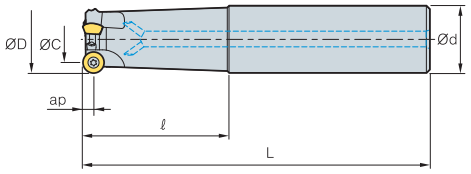


Fig. 1

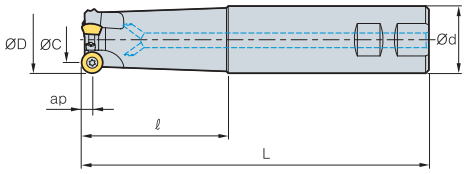


Fig. 2

(mm)

Designation		Stock	⚙	øD	øC	ød	ℓ	L	ap	kg	Fig.
FMRS	5040HRD-S		2	40	24	32	40	125	8	1.4	2
	5040HRD-M		2	40	24	32	70	200	8	1.8	1
	5040HRD-L		2	40	24	32	150	300	8	2.0	1
New	5040HRD-S40		2	40	24	40	40	125	8	1.6	2
New	5040HRD-M40		2	40	24	40	70	200	8	2.0	1
New	5040HRD-L40		2	40	24	40	150	300	8	2.4	1
New	5040HRD-S42		2	40	24	42	40	125	8	2.0	2
New	5040HRD-M42		2	40	24	42	70	200	8	2.4	1
New	5040HRD-L42		2	40	24	42	150	300	8	2.8	1
New	5050HRD-S40		3	50	34	40	50	150	8	2.0	2
New	5050HRD-M40		3	50	34	40	50	250	8	2.4	1
New	5050HRD-L40		3	50	34	40	50	300	8	2.6	1
	5050HRD-S		3	50	34	42	50	150	8	1.5	2
	5050HRD-M		3	50	34	42	50	250	8	1.8	1
	5050HRD-L		3	50	34	42	50	300	8	2.0	1
New	5063HRD-S40		4	63	47	40	50	150	8	1.7	2
New	5063HRD-M40		4	63	47	40	50	250	8	2.0	1
New	5063HRD-L40		4	63	47	40	50	300	8	2.3	1
	5063HRD-S		4	63	47	42	50	150	8	1.6	2
	5063HRD-M		4	63	47	42	50	250	8	1.8	1
	5063HRD-L		4	63	47	42	50	300	8	2.0	1
FMRS	6050HRD-S40		3	50	31	40	50	150	10	1.3	2
New	6050HRD-S42		3	50	31	42	50	150	10	1.4	2
	6050HRD-M40		3	50	31	40	50	250	10	2.2	1
	6050HRD-M42		3	50	31	42	50	250	10	2.4	1
	6050HRD-L40		3	50	31	40	50	300	10	2.7	1
	6050HRD-L42		3	50	31	42	50	300	10	3.0	1
	6063HRD-S40		4	63	44	40	50	150	10	1.5	2
	6063HRD-S42		4	63	44	42	50	150	10	1.6	2
	6063HRD-M40		4	63	44	40	50	250	10	2.5	1
	6063HRD-M42		4	63	44	42	50	250	10	2.7	1
	6063HRD-L40		4	63	44	40	50	300	10	3.0	1
	6063HRD-L42		4	63	44	42	50	300	10	3.2	1

Note) Through coolant type between Ø40~Ø63

● : Stock item ○ : Under preparing for stock

Parts

	Screw	Wrench
		
5000 Type	FTGA0513-P	TW20S
6000 Type	FTGA0515-P	TW20S

• Available Inserts, see page : E11

Available Inserts

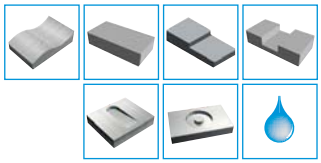
RDHW-E,F,S	RDKT-MM
	

Type	Designation	Coated										Cermet			Uncoated				page
		NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	CN2000	CN20	CN30	H01	G10	ST30A	ST20	
5000 Type	RDHW 1605M0E																		E11
	1605M0F																		
	1605M0S																		
	RDKT 1605M0-MM				●		●												
	1605M0-ML																		
6000 Type	RDHW 2006M0E																		E11
	2006M0F																		
	2006M0S																		
	RDKT 2006M0-MM				●	○	●												

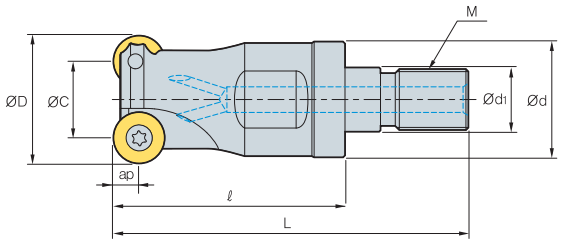
● : Stock item ○ : Under preparing for stock

FMRM1000/1500/2000/2500 3000/4000/5000

• AR : 0~5°
• RR : -5°~-5°







(mm)

Designation		Stock		øD	øC	ød	ød1	ℓ	L	M	ap	kg
FMRM	1008HRD-M06		1	8	5.5	9.5	6.5	25	40	M06	2.5	0.02
	1010HRD-M06		2	10	5	9.5	6.5	25	40	M06	2.5	0.02
	1012HRD-M06	●	2	12	7	11	6.5	25	40	M06	2.5	0.02
	1015HRD-M08		3	15	10	14.5	8.5	30	47	M08	2.5	0.04
FMRM	1510HRD-M06		1	10	7	9.5	6.5	25	40	M06	3.0	0.02
	1512HRD-M06	●	2	12	6	11	6.5	25	40	M06	3.0	0.02
	1516HRD-M08	●	3	16	10	14.5	8.5	30	47	M08	3.0	0.02
	1520HRD-M10		3	20	14	18	10.5	35	56	M10	3.0	0.07
FMRM	2015HRD-M08		2	15	8	14.5	8.5	30	47	M08	3.5	0.04
	2020HRD-M10		3	20	13	18	10.5	35	56	M10	3.5	0.07
FMRM	2516HRD-M08	●	2	16	8	14.5	8.5	30	47	M08	4.0	0.04
	2520HRD-M10	●	2	20	12	18	10.5	35	56	M10	4.0	0.07
	2525HRD-M12		3	25	17	22.5	12.5	45	69	M12	4.0	0.13
FMRM	3021HRD-M10		2	21	11	18	10.5	35	56	M10	5.0	0.1
	3025HRD-M12	●	2	25	15	22.5	12.5	45	69	M12	5.0	0.15
	3032HRD-M16		3	32	22	29	17	50	77	M16	5.0	0.2
	3042HRD-M16		4	42	32	29	17	50	77	M16	5.0	0.24
FMRM	4025HRD-M12		2	25	13	22.5	12.5	45	69	M12	6.0	0.12
	4032HRD-M16	●	2	32	20	29	17	50	77	M16	6.0	0.22
	4040HRD-M16	●	3	40	28	29	17	50	77	M16	6.0	0.23
	4042HRD-M16		4	42	28	29	17	50	77	M16	6.0	0.25
FMRM	5040HRD-M16		2	40	24	29	17	50	77	M16	8.0	0.25

Note) Through coolant type between Ø8~Ø42

● : Stock item ○ : Under preparing for stock

Parts

	Screw	Wrench	
			
1000 Type	FTNA0203	TW06P	–
1500 Type	FTNA02205	TW06P	–
2000 Type	FTNA02555	–	TW07S
2500 Type	FTNA0305	–	TW09S
3000 Type	FTGA03508(07)	–	TW15S
4000 Type	FTKA0410	–	TW15S
5000 Type	FTGA05139	–	TW20S

Available Adaptors

Designation	Available Adaptors	Designation	Available Adaptors
FMRM 1008HRD-M06	MAT - M06	FMRM 2520HRD-M10	MAT - M10
1010HRD-M06	MAT - M06	2525HRD-M12	MAT - M12
1012HRD-M06	MAT - M06	3021HRD-M10	MAT - M10
1015HRD-M08	MAT - M08	3025HRD-M12	MAT - M12
1510HRD-M06	MAT - M06	3032HRD-M16	MAT - M16
1512HRD-M06	MAT - M06	3042HRD-M16	MAT - M16
1516HRD-M08	MAT - M08	4025HRD-M12	MAT - M12
1520HRD-M10	MAT - M10	4032HRD-M16	MAT - M16
2015HRD-M08	MAT - M08	4040HRD-M16	MAT - M16
2516HRD-M08	MAT - M10	4042HRD-M16	MAT - M16
2020HRD-M10	MAT - M08	5040HRD-M16	MAT - M16

Designation : FMRM1008HRD-M16 (Modular Head Threading Measure size(M16)) = Adaptor Spec. : MAT-M06-020-S10S (Adaptor Threading Measure(M16))

Available Inserts

RDHW-E,F,S RDKW RDCT-MA RDKT-MF RDKT-MM



Type	Designation	Coated										Cermet			Uncoated				page
		NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	CN2000	CN20	CN30	H01	G10	ST30A	ST20	
1000 Type	RDHW 0501M0E,F,S				○			●											E11
	RDKW 0501M0E				●														E12
1500 Type	RDHW 06T1M0E,F,S				○			●											E11
	RDKW 06T1M0E				●	○													E12
2000 Type	RDHW 0702M0E,F,S				○			●											E11
	RDKW 0702M0E				●	○													E12
2500 Type	RDHW 0803M0E,F,S				○			●											E11
	RDKW 0803M0E				●	○													E12
3000 Type	RDCT 10T3M0-MA														●				
	RDKT 10T3M0-MF				●	●	●	●											E11
	10T3M0-MM	●	●	●	●	●	●	●	●										
4000 Type	RDCT 1204M0-MA														●				
	RDKT 1204M0-MF				●	●	●	●											E11
	1204M0-MM	●	●	●	●	●	●	●	●										
5000 Type	RDHW 1605M0E,F,S																		
	RDKT 1605M0-MM																		E11
	1605M0-ML																		

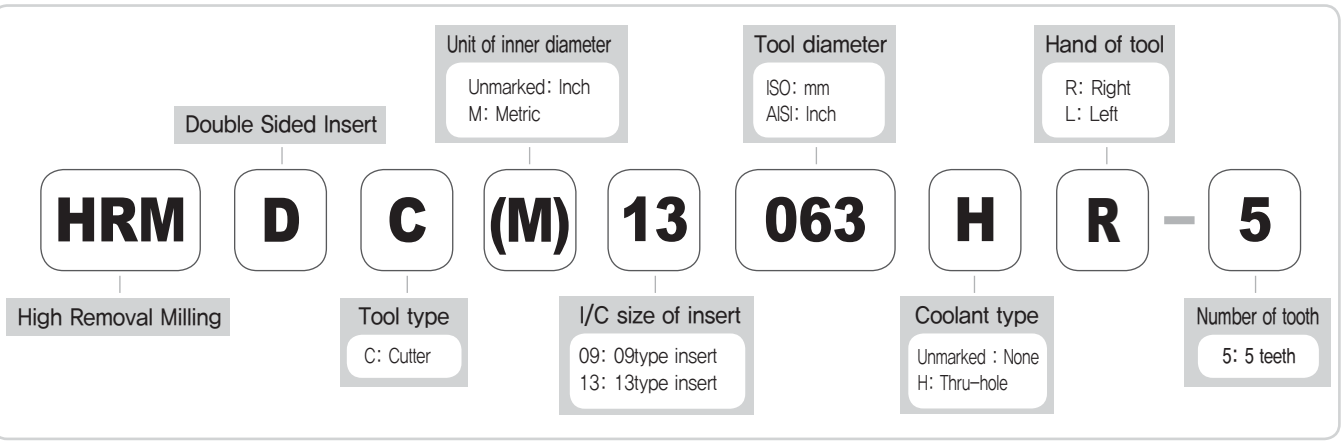
RDHW □□□M0E Stock item

● : Stock item ○ : Under preparing for stock

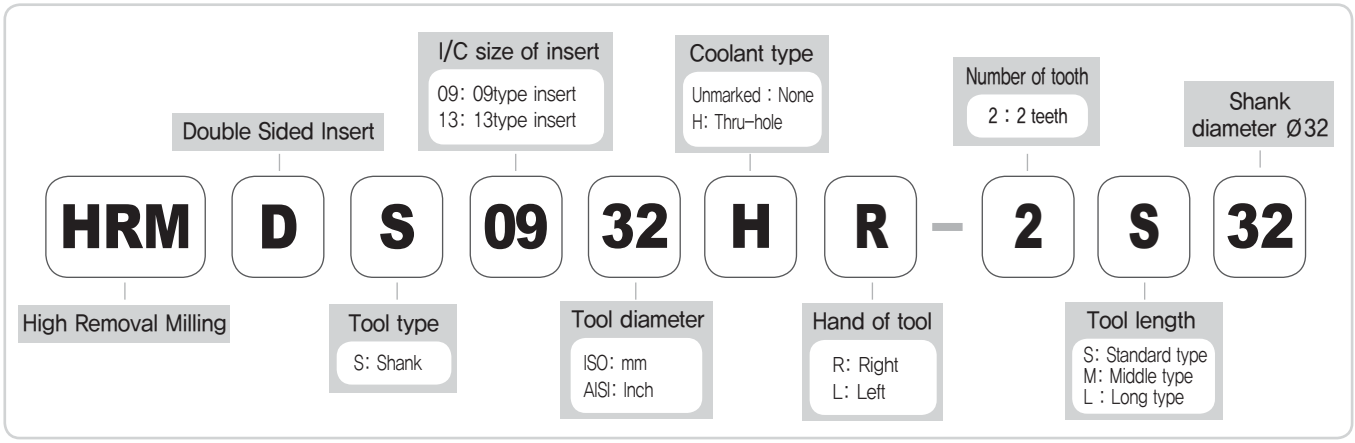
• Available Inserts, see page : E11, E12
• Applicable adaptor, see pages : E133~E134

Code System

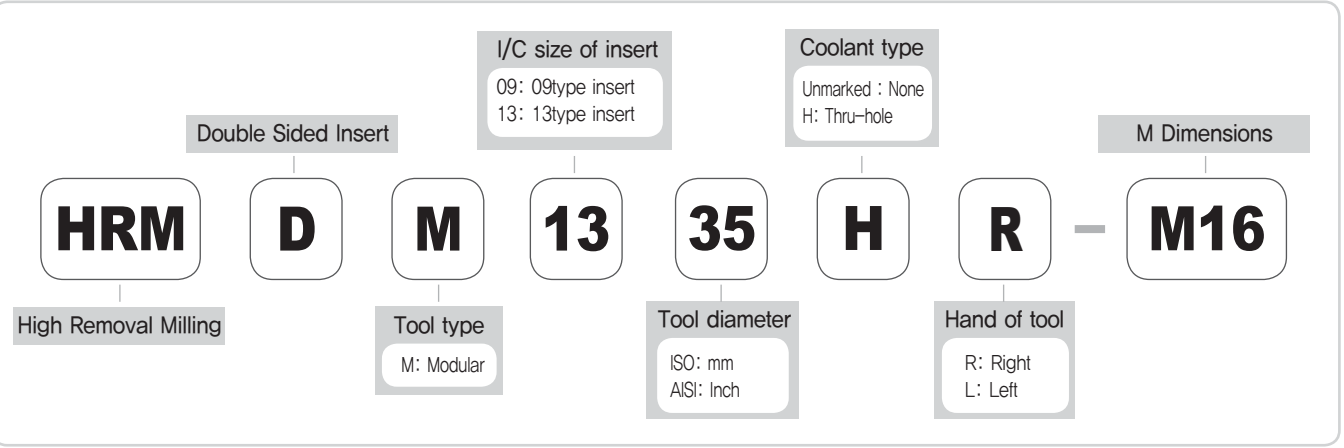
Cutter type



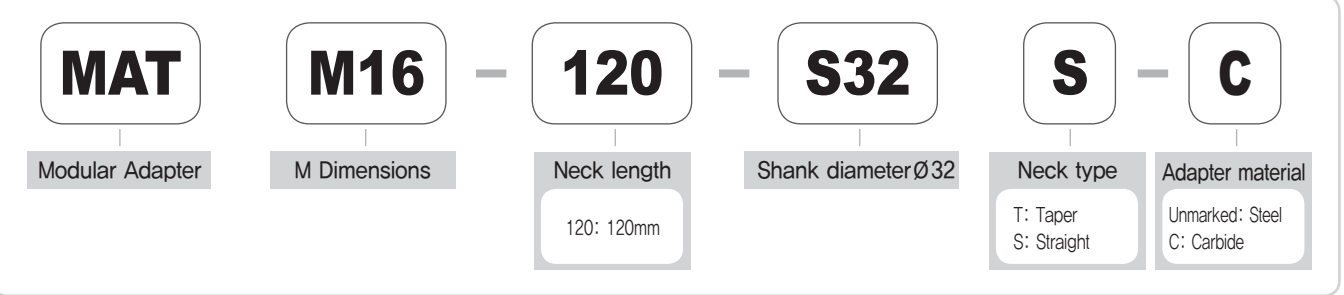
Shank type



Modular Head



Modular Adapter

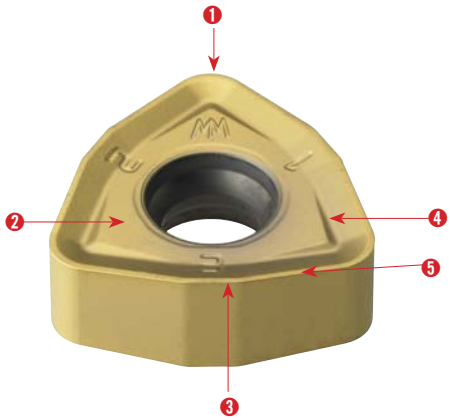


Features

- HRMD is more economical due to the use of 6 cutting edges compared to HRM tool with positive insert
- High rake angle cutting edge and chip breaker reduces cutting load
- Negative geometry has been designed for rigidity of cutting edge and double sided function
- Simple screw on system and stable support achieves strong clamping force
- Unique insert design for high feed and multifunctional machining
- HRMD insert with symmetrical cutting edge is applicable for both R and L type machining



Features of Insert



1 Nose-R
- Security of rigid edge in ramping Pocket machining
- Round edge suitable for high feed rates Insert geometry
- Possible to use R/L type machining

2 Clamping surface
- Design for stable clamping
- Prevention of friction by chip

3 Minor cutting edge
- Improvement of surface roughness in high feed machining
- Special design for decreasing thrust force
- Symmetrical insert design for R/L type tool

4 Chip breaker
- Reduction of cutting load due to high rake angle
- Improvement of chip flow and evacuation in various applications
- Prevention of damage on clamping face of insert

5 Major cutting edge
- Symmetrical design insert for R/L type tool
- Superior cutting performance due to high rake angle cutting edge
- Low cutting resistance in high feed
- Special design for decreasing thrust force

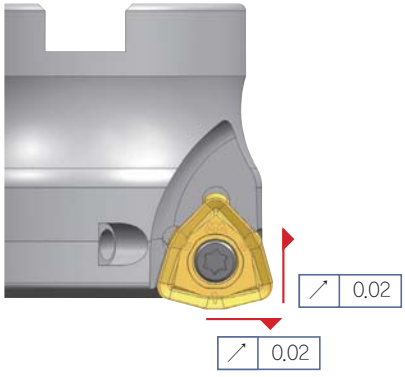
Features of Cutter



Inner coolant system
- Improvement of chip control and evacuation
- Longer tool life due to reduced cutting temperature

Simple screw on system
- Strong clamping of screw on system
- Convenient clamping system
- Wide chip pocket for better chip evacuation

3-surface constrained System
- Strong clamping system
- Stable clamping system against different cutting resistances in various machining applications

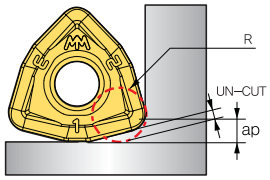


- NOTE: There is lots of repeated information. For example: Symmetrical design for R/L type tool is repeated 4 times on this one page

Corner R programming

Designation	Cutting condition		Approx. R (mm)	
	Max.ap(mm)	Max.fz(mm/t)	Input. R	Uncut
WNMX09T316ZNN-MM	1.5	2.0	2.5	0.6
WNMX130520ZNN-MM	2.0	3.0	3.0	0.8

· Information for uncut part by using "Input.R" for CAM program

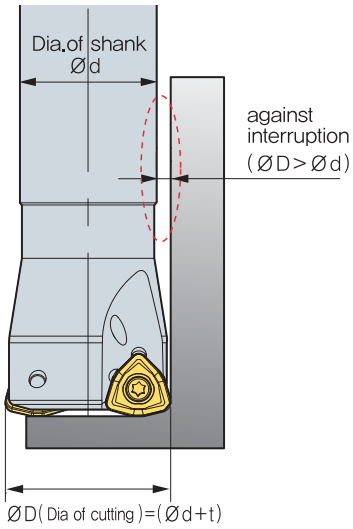


· Uncut part can be changed by poor machine condition or weak clamp of workpiece, etc

Interference prevent system

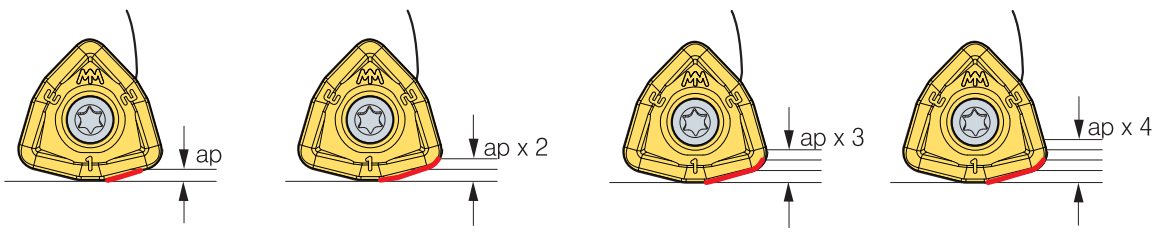
Designation	ØD(mm)	Ød(mm)	t(mm)
HRMS0821HR-2□20	21	20	1
HRMS1206HR-2□25	26	25	1
HRMS1333HR-2□32	33	32	1
HRMS1335HR-2□32	35	32	3
HRMS1340HR-3□32	40	32	8
HRMS1550HR-3□32	50	32	18
HRMS1550HR-3□40	50	40	10
HRMS1550HR-3□42	50	42	8
HRMS1563HR-3□32	63	32	31
HRMS1563HR-3□40	63	40	23
HRMS1563HR-3□42	63	42	21

• The side clearance prevents to interference between tool and workpiece even in deep hole machining



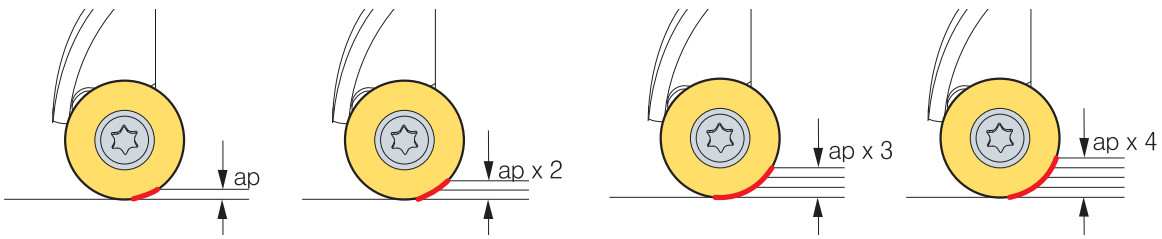
절입깊이

● HRM



Deep depth of cut Stable cutting load

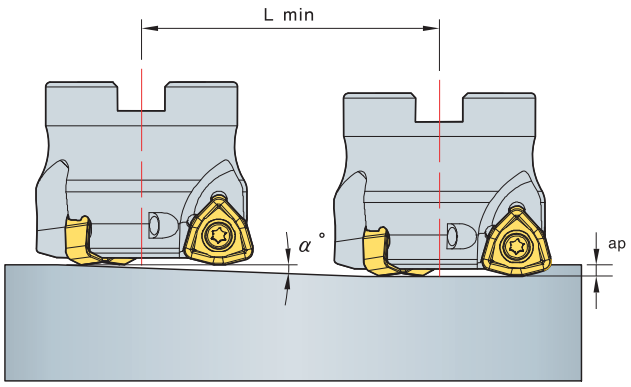
● Round insert



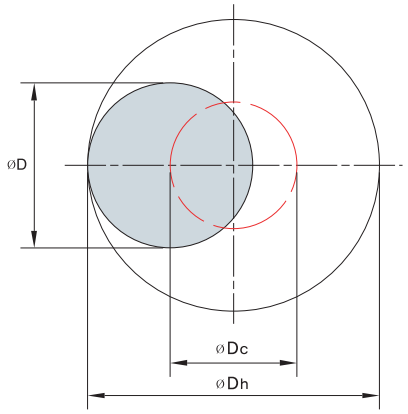
Deep depth of cut Increasing cutting load

Ramping & Helical cutting technical data

Ramping



Helical cutting



Tool pass diameter

$$Lmin = \frac{ap}{\tan \alpha^{\circ}} \ (mm)$$

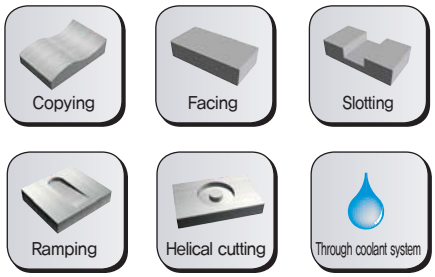
$$ØDc = ØDh - ØD$$

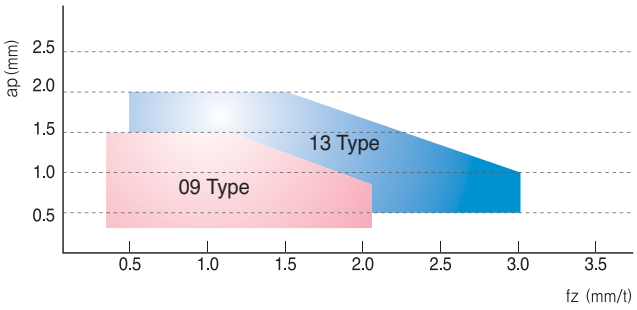
ØDc = Tool pass of tool center
ØDh = Desirable hole diameter on workpiece
ØD = Tool diameter

- Adjust feed to under 70% of recommended cutting condition when ramping & helical cutting
- In helical ramping, max. cutting depth per 1 helical revolution of cutter should not exceed max. cutting depth as per insert size
- in ramping, max. cutting depth for 1 ramping process should not exceed max. depth of cut as per used insert size

Designation		Tool diameter ØD(mm)	Efficient cutting diameter ØDe(mm)	Ramping			Helical ramping	
				Max. ap (mm)	Max. angle α°	Cutting Length Lmin (mm)	Dh Min. Cutting diameter(mm)	Dh Max. Cutting diameter(mm)
HRMDS	0925HR-2□□□	25	15.4	1.5	5.4	15.8	37.6	46.8
	0926HR-2□□□	26	16.4	1.5	5.0	17.0	39.6	48.8
	0930HR-3□□□	30	20.4	1.5	3.9	22.0	47.6	56.8
	0932HR-3□□□	32	22.3	1.5	3.5	24.5	51.6	60.8
	0933HR-3□□□	33	23.3	1.5	3.3	25.8	53.6	62.8
	0935HR-4□□□	35	25.4	1.5	3.0	28.3	57.6	66.8
	0940HR-4□□□	40	30.2	1.5	2.5	34.5	67.6	76.8
	0950HR-□□□□	50	40.2	1.5	1.8	47.0	87.6	96.8
	1332HR-2□□□	32	19.3	2	5.7	20.0	47	60
	1333HR-2□□□	33	20.3	2	5.4	21.3	49	62
	1335HR-2□□□	35	22.3	2	4.8	24.0	53	66
	1340HR-3□□□	40	27.2	2	3.7	30.7	63	76
	1350HR-□□□□	50	37	2	2.6	44.0	83	96
	1363HR-□□□□	63	50	2	1.9	61.3	109	122
HRMDC(M)	09040HR-□	40	30.2	1.5	2.5	34.5	67.6	76.8
	09050HR-□	50	40.2	1.5	1.8	47.0	87.6	96.8
	09063HR-□	63	53.1	1.5	1.4	63.3	113.6	122.8
	09080HR-□	80	70.1	1.5	1.0	84.5	147.6	156.8
	09100HR-□	100	90	1.5	0.8	109.5	187.6	196.8
	13050HR-□	50	37	2	2.6	44.0	83	96
	13063HR-□	63	50	2	1.9	61.3	109	122
	13080HR-□	80	66.9	2	1.4	84.0	143	156
	13100HR-□	100	86.9	2	1.0	110.7	183	196
	13125HR-□	125	111.9	2	0.8	144.0	233	246

Application area





Recommended cutting condition

Workpiece		Hardness	Grades	vc (m/min)	fz (mm/t)
P	General structural steel, Mild steel	Under 200HB	PC3500 PC3545	200 (100~230)	1.0 ~ 2.0
P	Cardon steel, Alloy steel	Under 30HRC	PC3500 PC3545	180 (100 ~ 220)	1.0 ~ 1.5
P	High Carbon steel, Alloy steel	30~40 HRC	PC3500 PC3545	160 (100~200)	0.8 ~ 1.3
P	Pre-hardened steel	40~50 HRC	PC3500 PC5300	120 (80~180)	0.6 ~ 1.2
M	Stainless steel	Under 270HB	PC5300 PC3545	120 (80~150)	0.8 ~ 1.3
K	Cast iron	Under 350N/㎟	PC3500 PC5300	180(100~220)	1.2 ~ 1.8

Machining Example - I



Working condition

Work piece : SM45C(HRC22)
Cutting speed : vc = 283m/min (1,803^{-1})
fz = 1.4mm/tooth
vf = 10,097mm/min
ap = 0.8mm
ae = 35mm
Coolant: Dry, Machining: Copying
Machine: Horizontal MCT
Overhang of tool: 250mm

Tool information : HRMDCM13050HR-4
WNMX130520ZNN-MM(PC3500)

Productivity : 40% increased Tool cost : 80% decreased

※Test result
In comparing HRMD with our competitor using same cutting conditions, the cutting speed of HRMD was higher with the same depth of cut (ap*ae), the cycle time was reduced by 40% and the tool life was increased to over 60%. HRMD is economically more efficient due to the use of 6 cutting edges compared to EDNW type with positive insert

Machining Example - II



Working condition

Work piece : STS304
Cutting speed : vc = 130m/min (414^{-1})
fz = 1.2mm/tooth
vf = 2,981mm/min
ap = 1.0mm
ae = 80mm
Coolant: Wet, Machining: Facing and Slotting
Machine: Vertical MCT
Overhang of tool: 250mm

Tool information : HRMDCM13100HR-6
WNMX130520ZNN-MM(PC3500)

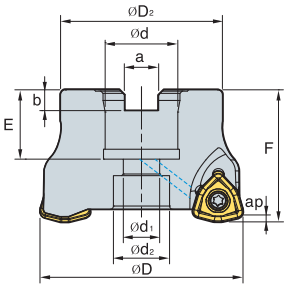
Productivity : 80% increased Tool cost : 25% decreased

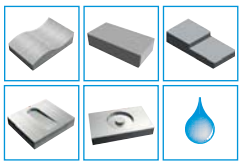
※Test result
In comparing HRMD with our competitor using same cutting conditions, the cutting speed of HRMD was higher with the same depth of cut (ap*ae), the cycle time was reduced by 80% and the tool life was same, but HRMD is economically more efficient due to the use of 6 cutting edges compared to SDKN type with positive insert

HRMDC(M)09

AA 14°
• AR : −7°
• RR : −12°~−18°







(mm)

Designation		Stock R	Stock L	⌀	øD	øD2	ød	ød1	ød2	a	b	E	F	ap	kg	Bolt
HRMDCM	09040HR-3	●		3	40	34	16	9	14	8.4	5.6	19	40	1.5	0.2	SB0825
	09040HR-4	●		4	40	34	16	9	14	8.4	5.6	19	40	1.5	0.2	
	09050HR-4	●		4	50	42	22	11	18	10.4	6.3	21	40	1.5	0.3	SB1025
	09050HR-5	●		5	50	42	22	11	18	10.4	6.3	21	40	1.5	0.3	
	09063HR-5	●		5	63	49	22	11	18	10.4	6.3	21	40	1.5	0.5	SB1025
	09063HR-6	●		6	63	49	22	11	18	10.4	6.3	21	40	1.5	0.5	
	09080HR-6	●		6	80	57	27	14	20	12.4	7	23	50	1.5	1.1	SB1230
	09080HR-7	●		7	80	57	27	14	20	12.4	7	23	50	1.5	1.1	
	09100HR-7	●		7	100	67	32	18	26	14.4	8	25	50	1.5	1.7	SB1630
	09100HR-8	●		8	100	67	32	18	26	14.4	8	25	50	1.5	1.7	
HRMDC	09080HR-6	●		6	80	57	25.4	14	20	9.5	6	24	50	1.5	1.1	SB1230
	09080HR-7	●		7	80	57	25.4	14	20	9.5	6	24	50	1.5	1.1	
	09080HR-31.75-6	●		6	80	67	31.75	18	26	12.7	8	32	63	1.5	1.5	SB1630
	09080HR-31.75-7	●		7	80	67	31.75	18	26	12.7	8	32	63	1.5	1.5	
	09100HR-7	●		7	100	67	31.75	18	26	12.7	8	32	63	1.5	2.1	SB1630
	09100HR-8	●		8	100	67	31.75	18	26	12.7	8	32	63	1.5	2.1	

● : Stock item ○ : Under preparing for stock

Parts

Screw	Wrench
	
FTKA0307	TW09S

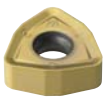
Available Arbors

Designation		NC Arbors
HRMDCM	09040HR-□	BT□□-FMC16-□□ SK□□-FMC16-□□
	09050HR-□ 09063HR-□	BT□□-FMC22-□□ SK□□-FMC22-□□
	09080HR-□	BT□□-FMC27-□□ SK□□-FMC27-□□
	09100HR-□	BT□□-FMC32-□□ SK□□-FMC32-□□
HRMDC	09080HR-□	BT□□-FMA25.4-□□ SK□□-FMA25.4-□□
	09080HR-31.75-□ 09100HR-□	BT□□-FMA31.75-□□ SK□□-FMA31.75-□□

• Available Inserts, see page : E20
• Available Arbors and bolt : E215~E217

Available Inserts

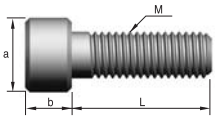
WNMX-MM



Designation	Coated NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	Cermet CN2000	CN20	CN30	Uncoated H01	G10	ST30A	ST20	page
WNMX 09T316ZNN-MM				●	●	●	●											E20

● : Stock item ○ : Under preparing for stock

Bolt



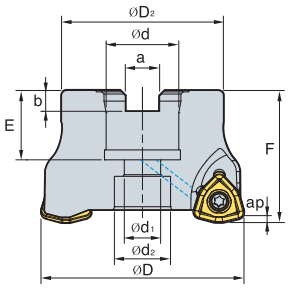
Designation	Dimensions(mm) M	a	b	L	pitch
SB0825	M08	13	8	25	1.25
SB1025	M10	16	10	25	1.5
SB1230	M12	18	12	30	1.75
SB1630	M16	24	16	30	2.0

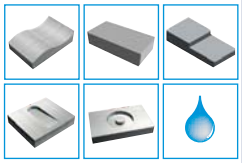
HRMDC(M)13

AA 14°

• AR : – 7°
• RR : –12°~–4°







(mm)

Designation		Stock R	Stock L	⊙	øD	øD2	ød	ød1	ød2	a	b	E	F	ap	kg	Bolt
HRMDCM	13050HR-3	●		3	50	42	22	11	17	10.4	6.3	21	40	2	0.3	SB1025
	13050HR-4	●		4	50	42	22	11	17	10.4	6.3	21	40	2	0.3	
	13063HR-4	●		4	63	49	22	11	18	10.4	6.3	21	40	2	0.5	SB1025
	13063HR-5	●		5	63	49	22	11	18	10.4	6.3	21	40	2	0.5	
	13080HR-5	●		5	80	57	27	14	20	12.4	7	23	50	2	1	SB1230
	13080HR-6	●		6	80	57	27	14	20	12.4	7	23	50	2	1	
	13100HR-6	●		6	100	67	32	18	26	14.4	8	25	50	2	1.6	SB1630
	13100HR-7	●		7	100	67	32	18	26	14.4	8	25	50	2	1.6	
	13125HR-7	●		7	125	87	40	22	32	16.4	9	29	60	2	3.2	SB2040
	13125HR-8	●		8	125	87	40	22	32	16.4	9	29	60	2	3.2	MBA-M20
HRMDC	13080HR-5	●		5	80	57	25.4	14	20	9.5	6	24	50	2	1	SB1230
	13080HR-6	●		6	80	57	25.4	14	20	9.5	6	24	50	2	1	
	13080HR-31.75-5	●		5	80	67	31.75	18	26	12.7	8	32	63	2	1.4	SB1630
	13080HR-31.75-6	●		6	80	67	31.75	18	26	12.7	8	32	63	2	1.4	
	13100HR-6	●		6	100	67	31.75	18	26	12.7	8	32	63	2	2.1	SB1630
	13100HR-7	●		7	100	67	31.75	18	26	12.7	8	32	63	2	2.1	
	13125HR-7	●		7	125	87	38.1	22	32	15.9	10	35	63	2	3.3	SB2040
	13125HR-8	●		8	125	87	38.1	22	32	15.9	10	35	63	2	3.3	MBA-M20

● : Stock item ○ : Under preparing for stock

Parts

Screw	Wrench
	
FTKA0412B	TW15S

Available Arbors

Designation		NC Arbors
HRMDCM	13050HR-□ 13063HR-□	BT□□-FMC22-□□ SK□□-FMC22-□□
	13080HR-□	BT□□-FMC27-□□ SK□□-FMC27-□□
	13100HR-□	BT□□-FMC32-□□ SK□□-FMC32-□□
	13125HR-□	BT□□-FMC40-□□ SK□□-FMC40-□□
HRMDC	13080HR-□	BT□□-FMA25.4-□□ SK□□-FMA25.4-□□
	13080HR-31.75-□ 13100HR-□	BT□□-FMA31.75-□□ SK□□-FMA31.75-□□
	13125HR-□	BT□□-FMA38.1-□□ SK□□-FMA38.1-□□

• Available Inserts, see page : E20
• Available Arbors and bolt : E215~E217

Available Inserts

WNMX-MM



Designation	Coated NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	Cermet CN2000	CN20	CN30	Uncoated H01	G10	ST30A	ST20	page
WNMX 130520ZNN-MM				●	●	●	●											E20

● : Stock item ○ : Under preparing for stock

Bolt

Fig. 1

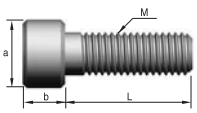
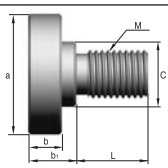


Fig. 2

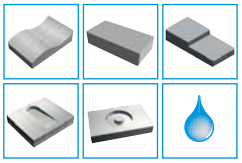


Designation	Dimensions(mm) M	a	b	b1	C	L	pitch	Fig.
SB1025	M10	16	10	-	-	25	1.5	1
SB1230	M12	18	12	-	-	30	1.75	1
SB1630	M16	24	16	-	-	30	2.0	1
SB2040	M20	30	20	-	-	40	2.5	1
MBA-M20	M20	50	14	20	27	30	2.5	2

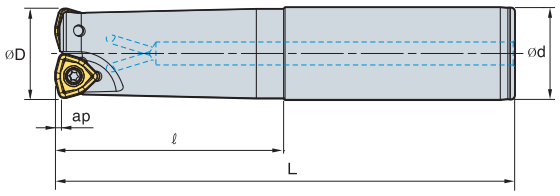
HRMDS09

AA 14°

• AR : −7°
• RR : −17°~−25°







(mm)

Designation		Stock R	Stock L		øD	ød	ℓ	L	ap	kg
HRMDS	0925HR-2S25	●		2	25	25	60	140	1.5	0.5
	0925HR-2M25	●		2	25	25	120	200	1.5	0.6
	0925HR-2L25	●		2	25	25	180	300	1.5	1
	0926HR-2S25	●		2	26	25	60	140	1.5	0.5
	0926HR-2M25	●		2	26	25	60	200	1.5	0.7
	0926HR-2L25	●		2	26	25	60	300	1.5	1
	0930HR-3S32	●		3	30	32	70	150	1.5	0.8
	0930HR-3M32	●		3	30	32	120	200	1.5	1
	0930HR-3L32			3	30	32	180	300	1.5	1.5
	0932HR-3S32			3	32	32	70	150	1.5	0.8
	0932HR-3M32	●		3	32	32	120	200	1.5	1.1
	0932HR-3L32	●		3	32	32	180	300	1.5	1.7
	0933HR-3S32	●		3	33	32	70	150	1.5	0.8
	0933HR-3M32	●		3	33	32	70	200	1.5	1.1
	0933HR-3L32	●		3	33	32	70	300	1.5	1.7
	0935HR-4S32	●		4	35	32	50	150	1.5	0.9
	0935HR-4M32	●		4	35	32	50	200	1.5	1.1
	0935HR-4L32	●		4	35	32	50	300	1.5	1.7
	0940HR-4S32	●		4	40	32	50	150	1.5	0.9
	0940HR-4M32	●		4	40	32	50	250	1.5	1.5
	0940HR-4L32	●		4	40	32	50	300	1.5	1.8
	0940HR-4S40			4	40	40	60	150	1.5	1.3
	0940HR-4M40			4	40	40	130	250	1.5	2.2
	0940HR-4L40			4	40	40	180	300	1.5	2.7
	0940HR-4S42	●		4	40	42	60	150	1.5	1.4
	0940HR-4M42	●		4	40	42	130	250	1.5	2.3
	0940HR-4L42	●		4	40	42	180	300	1.5	2.8
	0950HR-4S32			4	50	32	40	150	1.5	1.1
	0950HR-4M32			4	50	32	40	250	1.5	1.6
	0950HR-4L32			4	50	32	40	300	1.5	2
	0950HR-4S40			4	50	40	40	150	1.5	1.4
	0950HR-4M40			4	50	40	40	250	1.5	2.4
	0950HR-4L40			4	50	40	40	300	1.5	2.9
	0950HR-4S42	●		4	50	42	40	150	1.5	1.6
	0950HR-4M42	●		4	50	42	40	250	1.5	2.6
	0950HR-4L42	●		4	50	42	40	300	1.5	3.1
	0950HR-5S32			5	50	32	40	150	1.5	1.1
	0950HR-5M32			5	50	32	40	250	1.5	1.6
	0950HR-5L32			5	50	32	40	300	1.5	2
	0950HR-5S40			5	50	40	40	150	1.5	1.4
	0950HR-5M40			5	50	40	40	250	1.5	2.4
	0950HR-5L40			5	50	40	40	300	1.5	2.9
	0950HR-5S42			5	50	42	40	150	1.5	1.6
	0950HR-5M42			5	50	42	40	250	1.5	2.6
	0950HR-5L42	●		5	50	42	40	300	1.5	3.1

● : Stock item ○ : Under preparing for stock

Parts

Screw	Wrench
	
FTKA0307	TW09S

Available Inserts

WNMX-MM



Designation	Coated NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	Cermet CN2000	CN20	CN30	Uncoated H01	G10	ST30A	ST20	page
WNMX 09T316ZNN-MM				●	●	●	●											E20

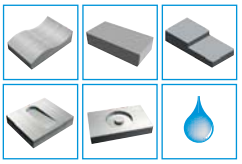
• Available Inserts, see page : E20 ● : Stock item ○ : Under preparing for stock

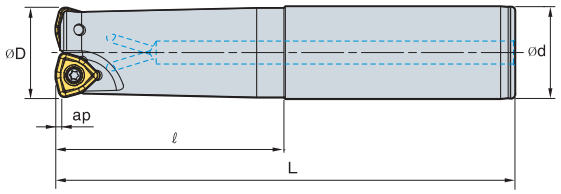
HRMDS13



AA 14°

• AR : −7°
• RR : −14°~−16°





(mm)

Designation		Stock R	Stock L		øD	ød	ℓ	L	ap	kg
HRMDS	1332HR-2S32	●		2	32	32	70	150	2	0.8
	1332HR-2M32	●		2	32	32	120	200	2	1
	1332HR-2L32	●		2	32	32	180	300	2	1.6
	1333HR-2S32	●		2	33	32	70	150	2	0.8
	1333HR-2M32	●		2	33	32	70	200	2	1.1
	1333HR-2L32	●		2	33	32	70	300	2	1.7
	1335HR-2S32			2	35	32	50	150	2	0.8
	1335HR-2M32	●		2	35	32	50	200	2	1.1
	1335HR-2L32	●		2	35	32	50	300	2	1.7
	1340HR-3S32	●		3	40	32	50	150	2	0.8
	1340HR-3M32	●		3	40	32	50	250	2	1.4
	1340HR-3L32	●		3	40	32	50	300	2	1.7
	1340HR-3S40			3	40	40	60	150	2	1.2
	1340HR-3M40			3	40	40	130	250	2	2.1
	1340HR-3L40			3	40	40	180	300	2	2.6
	1340HR-3S42	●		3	40	42	60	150	2	1.4
	1340HR-3M42	●		3	40	42	130	250	2	2.3
	1340HR-3L42	●		3	40	42	180	300	2	2.7
	1350HR-3S32			3	50	32	50	150	2	1.1
	1350HR-3M32			3	50	32	50	250	2	1.7
	1350HR-3L32			3	50	32	50	300	2	2
	1350HR-3S40			3	50	40	50	150	2	1.5
	1350HR-3M40			3	50	40	50	250	2	2.4
	1350HR-3L40			3	50	40	50	300	2	2.9
	1350HR-3S42	●		3	50	42	50	150	2	1.6
	1350HR-3M42	●		3	50	42	50	250	2	2.6
	1350HR-3L42	●		3	50	42	50	300	2	3.1
	1350HR-4S32			4	50	32	50	150	2	1.1
	1350HR-4M32			4	50	32	50	250	2	1.7
	1350HR-4L32			4	50	32	50	300	2	2
	1350HR-4S40			4	50	40	50	150	2	1.5
	1350HR-4M40			4	50	40	50	250	2	2.4
	1350HR-4L40			4	50	40	50	300	2	2.9
	1350HR-4S42	●		4	50	42	50	150	2	1.6
	1350HR-4M42	●		4	50	42	50	250	2	2.6
	1350HR-4L42	●		4	50	42	50	300	2	3.1
	1363HR-4S32			4	63	32	50	150	2	1.4
	1363HR-4M32			4	63	32	50	250	2	2.1
	1363HR-4L32			4	63	32	50	300	2	2.4
	1363HR-4S40			4	63	40	50	150	2	1.8
	1363HR-4M40			4	63	40	50	250	2	2.8
	1363HR-4L40			4	63	40	50	300	2	3.2
	1363HR-4S42	●		4	63	42	50	150	2	1.9
	1363HR-4M42	●		4	63	42	50	250	2	3
	1363HR-4L42	●		4	63	42	50	300	2	3.5
	1363HR-5S32			5	63	32	50	150	2	1.5
	1363HR-5M32			5	63	32	50	250	2	2
	1363HR-5L32			5	63	32	50	300	2	2.3
	1363HR-5S40			5	63	40	50	150	2	1.8
	1363HR-5M40			5	63	40	50	250	2	2.8
	1363HR-5L40			5	63	40	50	300	2	3.2
	1363HR-5S42			5	63	42	50	150	2	1.9
	1363HR-5M42	●		5	63	42	50	250	2	3
	1363HR-5L42	●		5	63	42	50	300	2	3.5

● : Stock item ○ : Under preparing for stock

Parts

Screw	Wrench
	
FTKA0412B	TW15S

Available Inserts

WNMX-MM

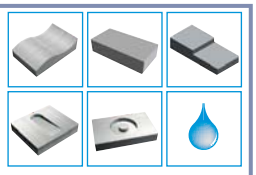


Designation	Coated NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	Cermet CN2000	CN20	CN30	Uncoated H01	G10	ST30A	ST20	page
WNMX 130520ZNN-MM				●	●	●	●											E20

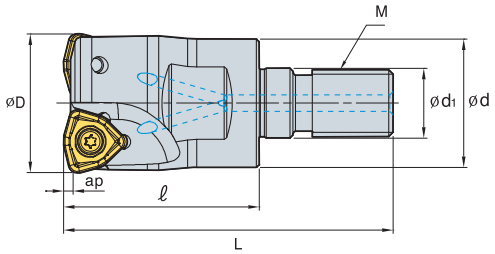
• Available Inserts, see page : E20 ● : Stock item ○ : Under preparing for stock

HRMDM 09/13

AA 14° | • AR : −7° • RR : −18°~−25°







(mm)

Designation		Stock		øD	ød	ød1	ℓ	L	M	ap	kg	Available Inserts
HRMDM	0925HR-M12	●	2	25	23	12.5	35	59	M12	1.5	0.10	WNMX09T316ZNN-MM
	0926HR-M12	●	2	26	23	12.5	35	59	M12	1.5	0.11	
	0930HR-M16	●	3	30	29	17	40	67	M16	1.5	0.19	
	0932HR-M16	●	3	32	29	17	40	67	M16	1.5	0.20	
	0933HR-M16	●	3	33	29	17	40	67	M16	1.5	0.21	
	0935HR-M16	●	4	35	29	17	40	67	M16	1.5	0.22	
	0940HR-M16	●	4	40	29	17	40	67	M16	1.5	0.25	
	1332HR-M16	●	2	32	29	17	40	67	M16	2	0.20	WNMX130520ZNN-MM
	1333HR-M16	●	2	33	29	17	40	67	M16	2	0.20	
	1335HR-M16	●	2	35	29	17	40	67	M16	2	0.22	
	1340HR-M16	●	3	40	29	17	45	72	M16	2	0.26	

● : Stock item ○ : Under preparing for stock

Parts

	Screw	Wrench
		
09 Type	FTKA0307	TW09S
13 Type	FTKA0412B	TW15S

Available Arbors

Designation		Available Modular
HRMDM	0925HR-M12	MAT- M12
	0926HR-M12	MAT- M12
	0930HR-M16	MAT- M16
	0932HR-M16	MAT- M16
	0933HR-M16	MAT- M16
	0935HR-M16	MAT- M16
	0940HR-M16	MAT- M16
	1332HR-M16	MAT- M16
	1333HR-M16	MAT- M16
	1335HR-M16	MAT- M16
	1340HR-M16	MAT- M16

• Available Inserts, see page : E20
• Available Arbors and bolt : E215~E217

Designation : HRMDM0932HR-M16 (Modular Head Threading Measure size(M16)) = Adaptor Spec. : MAT-M16-035-S32S (Adaptor Threading Measure(M16))

Available Inserts

WNMX-MM



Type	Designation	Coated										Cermet			Uncoated				page
		NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	CN2000	CN20	CN30	H01	G10	ST30A	ST20	
09Type	WNMX09T316ZNN-MM				●	●	●	●											E20
13Type	WNMX130520ZNN-MM				●	●	●	●											

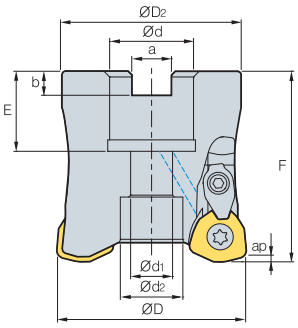
● : Stock item ○ : Under preparing for stock

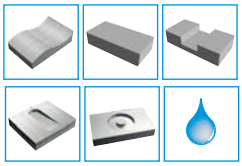
HRMC(M)13/15

AA 15°

• AR : 7°
• RR : −15°~−5°







(mm)

Designation	Stock		øD	øD2	ød	ød1	ød2	a	b	E	F	ap	kg	Bolt
HRMC(M) 13050HR-3	●(●)	3	50	47	22.225(22)	11	16.4	8.0(10.4)	5(6.3)	20(21)	50	2.0	0.4	SB1035
13050HR-4	●(●)	4	50	47	22.225(22)	11	16.4	8.0(10.4)	5(6.3)	20(21)	50	2.0	0.4	SB1035
13063HR-4	●(●)	4	63	60	22.225(22)	11	17	8.0(10.4)	5(6.3)	20(21)	50	2.0	0.7	SB1035
13080HR-5	●(●)	5	80	76	31.75(27)	18(13)	26(20)	12.7(12.4)	8(7)	32(23)	70	2.0	1.6	SB16(12)45
HRMC(M) 15063HR-3	●(●)	3	63	60	22.225(22)	11	17	8.0(10.4)	5(6.3)	20(21)	50	2.5	0.7	SB1035
15080HR-4	●(●)	4	80	76	31.75(27)	18(13)	26(20)	12.7(12.4)	8(7)	32(23)	70	2.5	1.7	SB16(12)45
15100HR-5	●(●)	5	100	96	31.75(32)	18	26	12.7(14.4)	8(8)	32(26)	70	2.5	2.8	SB1645
15100HR-6	●(●)	6	100	96	31.75(32)	18	26	12.7(14.4)	8(8)	32(26)	70	2.5	3.2	SB1645
15125HR-6	●	6	125	98	38.1(40)	22	32	15.9(16.4)	10(9)	35(29)	63	2.5	3.3	SB2040
15160R-7	●	7	160	100	50.8(40)	-	72	19.0(16.4)	11(9)	38(35)	63	2.5	4.3	MBA-M24(M20)

Note) Through coolant type between Ø50~Ø125

• ( )Metric Size

● : Stock item ○ : Under preparing for stock

Parts

	Screw	Clamp	Clamp Screw	C-Ring	Wrench
					
13 Type (Ø50,63,80)	FTGA0513-P	CHH4.5R1	CTX04513H	CR03	TW20-100
15 Type (Ø63,80,100, 125, 160)	FTGA0513-P	CHH5.5R1	CTX0515	CR04	TW20-100

Available Arbors

Designation		Available Arbors	
		HRMC	HRMCM
HRMC(M)	13050HR-3 13050HR-4 13063HR-4	BT□□-FMA22.225-□□	BT□□ - FMC22-□□ SK□□-FMC22-□□
	13080HR-5	BT□□-FMA31.75-□□ SK□□-FMA31.75-□□	BT□□ - FMC27-□□ SK□□-FMC27-□□
HRMC(M)	15063HR-3	BT□□-FMA22.225-□□	BT□□ - FMC22-□□ SK□□-FMC22-□□
	15080HR-4	BT□□-FMA31.75-□□ SK□□-FMA31.75-□□	BT□□ - FMC27-□□ SK□□-FMC27-□□
	15100HR-5 15100HR-6		BT□□ - FMC32-□□ SK□□-FMC32-□□
	15125HR-6	BT□□-FMA38.1-□□ SK□□-FMA38.1-□□	SK□□-FMC40-□□
	15160R-7	BT□□-FMA50.8-□□	

• Available Inserts, see page : E20
• Available Arbors and bolt : E215~E217

Available Inserts

WDKT-MH



Type	Designation	Coated										Cermet			Uncoated				page
		NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	CN2000	CN20	CN30	H01	G10	ST30A	ST20	
13 Type	WDKT130520ZDSR-MH				●	●	●	●	●										E20
15 Type	WDKT150625ZDSR-MH				●	●	●	●	●										

● : Stock item ○ : Under preparing for stock

Bolt

Fig..1

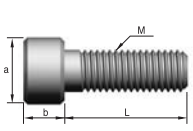
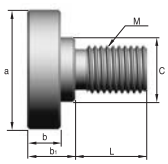


Fig..2

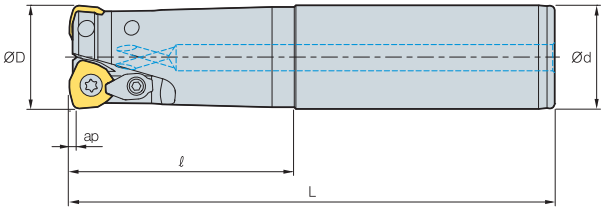


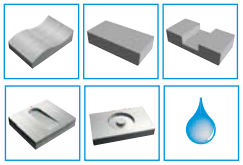
Designation	Dimensions(mm)							
	M	a	b	b1	c	L	pitch	Fig.
SB1035	M10	16	10	-	-	35	1.5	1
SB1245	M12	18	12	-	-	45	1.75	1
SB1645	M16	24	16	-	-	45	2.0	1
SB2040	M20	30	20	-	-	40	2.5	1
MBA-M20	M20	50	14	20	27	30	2.5	2
MBA-M24	M24	65	14	24	37	36	3.0	2

HRMS08/10/13

AA 15° | • AR : 7° • RR : -11°~-5°







(mm)

Designation		Stock	⊙	ØD	Ød	ℓ	L	ap	kg
HRMS	0820HR-2S20	●	2	20	20	50	130	1.0	0.3
	0820HR-2M20	●	2	20	20	100	180	1.0	0.4
	0820HR-2L20	●	2	20	20	130	250	1.0	0.5
	0821HR-2S20	●	2	21	20	50	130	1.0	0.3
	0821HR-2M20	●	2	21	20	50	180	1.0	0.4
	0821HR-2L20	●	2	21	20	50	250	1.0	0.5
HRMS	1025HR-2S25	●	2	25	25	60	140	1.5	0.4
	1025HR-2M25	●	2	25	25	120	200	1.5	0.6
	1025HR-2L25	●	2	25	25	180	300	1.5	0.9
	1026HR-2S25	●	2	26	25	60	140	1.5	0.4
	1026HR-2M25	●	2	26	25	60	200	1.5	0.6
	1026HR-2L25	●	2	26	25	60	300	1.5	1.0
	1030HR-2S32	●	2	30	32	70	150	1.5	0.8
	1030HR-2M32	●	2	30	32	120	200	1.5	1.0
	1030HR-2L32	●	2	30	32	180	300	1.5	1.5
HRMS	1332HR-2S32	●	2	32	32	70	150	2.0	0.8
	1332HR-2M32	●	2	32	32	120	200	2.0	1.0
	1332HR-2L32	●	2	32	32	180	300	2.0	1.6
	1333HR-2S32	●	2	33	32	70	150	2.0	0.8
	1333HR-2M32	●	2	33	32	70	200	2.0	1.1
	1333HR-2L32	●	2	33	32	70	300	2.0	1.7
	1335HR-2S32	●	2	35	32	50	150	2.0	0.8
	1335HR-2M32	●	2	35	32	50	200	2.0	1.1
	1335HR-2L32	●	2	35	32	50	300	2.0	1.7
	1340HR-3S32	●	3	40	32	50	150	2.0	0.8
	1340HR-3M32	●	3	40	32	50	250	2.0	1.4
	1340HR-3L32	●	3	40	32	50	300	2.0	1.7
New	1340HR-3S40	●	3	40	40	60	150	2.0	1.2
New	1340HR-3M40	●	3	40	40	130	250	2.0	2.1
New	1340HR-3L40	●	3	40	40	180	300	2.0	2.6
	1340HR-3S42	●	3	40	42	60	150	2.0	1.4
	1340HR-3M42	●	3	40	42	130	250	2.0	2.3
	1340HR-3L42	●	3	40	42	180	300	2.0	2.7

Note) Through coolant type between Ø20~Ø40

● : Stock item ○ : Under preparing for stock

Parts

	Screw	Clamp	Clamp Screw	C-Ring	렌치
					
08 Type	FTNA0306	-	-	-	TW09P
10 Type	FTKA0408	CHH3.5R1	CTX03510	CR03	TW15S
13 Type Ø32,33,35	FTGA0510-P	CHH4.5R1	CTX04513H	CR03	TW20
13 Type Ø40	FTGA0512-P	CHH4.5R1	CTX04513H	CR03	TW20

• Available Inserts, see page : E20

Available Inserts

WDKT-MH



Type	Designation	Coated										Cermet			Uncoated				page
		NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	CN2000	CN20	CN30	H01	G10	ST30A	ST20	
08Type	WDKT080316ZDSR-MH				●	●	●	●											E20
10Type	WDKT10T320ZDSR-MH				●	●	●	●											
13Type	WDKT130520ZDSR-MH				●	●	●	●	●										

● : Stock item ○ : Under preparing for stock

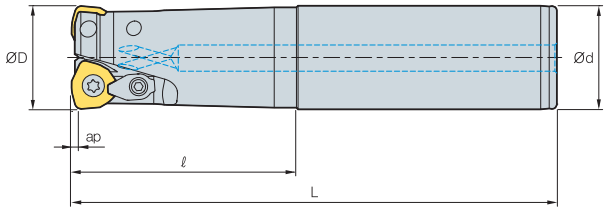
● : Stock Netherlands

HRMS15

AA 15°

• AR : 7°
• RR : -8°~-6°





(mm)

Designation		Stock		øD	ød	ℓ	L	ap	kg
HRMS	1550HR-3S32		3	50	32	50	150	2.5	1.0
	1550HR-3M32		3	50	32	50	250	2.5	1.6
	1550HR-3L32		3	50	32	50	300	2.5	1.9
	1550HR-3S40		3	50	40	50	150	2.5	1.4
	1550HR-3M40		3	50	40	50	250	2.5	2.3
	1550HR-3L40		3	50	40	50	300	2.5	2.8
	1550HR-3S42	●	3	50	42	50	150	2.5	1.5
	1550HR-3M42		3	50	42	50	250	2.5	2.5
	1550HR-3L42	●	3	50	42	50	300	2.5	3.0
	1563HR-4S32		4	63	32	50	150	2.5	1.3
	1563HR-4M32		4	63	32	50	250	2.5	1.9
	1563HR-4L32		4	63	32	50	300	2.5	2.2
	1563HR-4S40		4	63	40	50	150	2.5	1.7
	1563HR-4M40		4	63	40	50	250	2.5	2.6
	1563HR-4L40		4	63	40	50	300	2.5	3.1
	1563HR-4S42		4	63	42	50	150	2.5	1.8
	1563HR-4M42	●	4	63	42	50	250	2.5	2.8
	1563HR-4L42		4	63	42	50	300	2.5	3.3

Note) Through coolant type between Ø50~Ø63

● : Stock item ○ : Under preparing for stock

Parts

	Screw	Clamp	Clamp Screw	C-Ring	Wrench
					
Ø50,63	FTGA0513-P	CHH5.5R1	CTX0515	CR04	TW20

• Available Inserts, see page : E20

Available Inserts

WDKT-MH

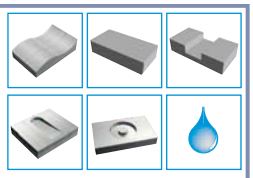


Designation	Coated									Cermet			Uncoated				page
	NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	CN2000	CN20	CN30	H01	G10	ST30A	ST20	
WDKT 150625ZDSR-MH				●	●	●	●	●										E20

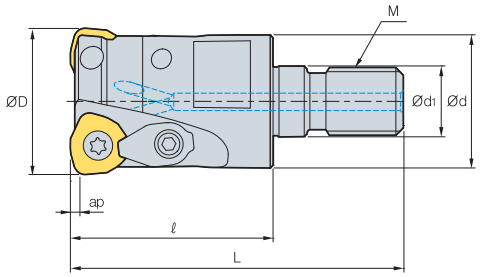
HRMM08/10/13 New

AA 15°

• AR : 7°
• RR : −11°~−5°







(mm)

Designation		Stock		øD	ød	ød1	ℓ	L	M	ap	kg
HRMM	0820HR-M10	●	2	20	18	10.5	30	51	M10	1	0.06
	0821HR-M10	●	2	21	18	10.5	30	51	M10	1	0.06
	0825HR-M12	●	3	25	23	12.5	35	59	M12	1	0.11
	0826HR-M12	●	3	26	23	12.5	35	59	M12	1	0.11
	0828HR-M12	●	3	28	23	12.5	35	59	M12	1	0.12
	0832HR-M16	●	4	32	29	17	40	67	M16	1	0.21
	0833HR-M16	●	4	33	29	17	40	67	M16	1	0.21
	0835HR-M16	●	4	35	29	17	40	67	M16	1	0.23
	0840HR-M16	●	5	40	29	17	40	67	M16	1	0.25
HRMM	1025HR-M12	●	2	25	23	12.5	35	59	M12	1.5	0.1
	1026HR-M12	●	2	26	23	12.5	35	59	M12	1.5	0.1
	1030HR-M16	●	2	30	29	17	40	67	M16	1.5	0.2
	1032HR-M16	●	3	32	29	17	45	72	M16	1.5	0.26
	1035HR-M16	●	3	35	29	17	45	72	M16	1.5	0.23
	1040HR-M16	●	4	40	29	17	45	72	M16	1.5	0.27
HRMM	1332HR-M16	●	2	32	29	17	40	67	M16	2	0.17
	1333HR-M16	●	2	33	29	17	40	67	M16	2	0.17
	1335HR-M16	●	2	35	29	17	40	67	M16	2	0.19
	1340HR-M16	●	3	40	29	17	45	72	M16	2	0.24

Note) Through coolant type between Ø20~Ø40

● : Stock item ○ : Under preparing for stock

Parts

	Screw	Clamp	Clamp Screw	C–Ring	Wrench	
						
08 Type	FTNA0306	-	-	-	-	-
10 Type	FTKA0408	CHH3.5R1	CTX03510	CR03	TW15S	-
13 Type (Ø32,33,35)	FTGA0510-P	CHH4.5R1	CTX04513H	CR03	-	TW20
13Type(Ø40)	FTGA0512-P	CHH4.5R1	CTX04513H	CR03	-	TW20

Applicable adaptor

Designation		Available Adaptors	Designation		Available Adaptors
HRMM	0820HR-M10	MAT - M10	HRMM	1025HR-M12	MAT - M12
	0821HR-M10	MAT - M10		1026HR-M12	MAT - M12
	0825HR-M12	MAT - M12		1030HR-M16	MAT - M16
	0826HR-M12	MAT - M12		1032HR-M16	MAT - M16
	0828HR-M12	MAT - M12		1035HR-M16	MAT - M16
	0832HR-M16	MAT - M16		1040HR-M16	MAT - M16
	0833HR-M16	MAT - M16		1332HR-M16	MAT - M16
	0835HR-M16	MAT - M16		1333HR-M16	MAT - M16
	0840HR-M16	MAT - M16		1335HR-M16	MAT - M16
				1340HR-M16	MAT - M16

Designation : HRMM0820HR-M10 (Modular Head Threading Measure size(M16)) = Adaptor Spec. : MAT-M10-030-S20S (Adaptor Threading Measure(M16))

• Available Inserts, see page : E20
• Applicable adaptor, see pages : E133~E134

Available Inserts

WDKT-MH



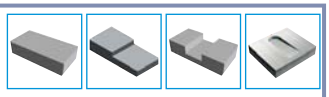
Type	Designation	Coated										Cermet			Uncoated				page
		NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	CN2000	CN20	CN30	H01	G10	ST30A	ST20	
08Type	WDKT080316ZDSR-MH				●	●	●	●											E20
10Type	WDKT10T320ZDSR-MH				●	●	●	●											
13Type	WDKT130520ZDSR-MH				●	●	●	●	●										

● : Stock item ○ : Under preparing for stock

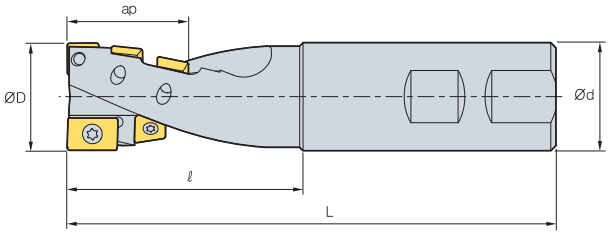
THE

AA 90°

• AR : 5°, 10°
• RR : -5°







(mm)

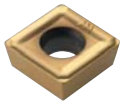
Designation		Stock R	Stock L	ØD	Ød	ℓ	L	Available Inserts: Lower cutting edge	Available Inserts: External cutting edge	ap	No. of Flutes	kg
THE	25R	●		25	25	55	120	APLT070304R 1z	SPMT060304 4z	25	2	0.4
	32R	●		32	32	70	145	ADLT150308R 1z	SDMT090308-MM 5z	40	2	0.5
	40R	●		40	42	88	175	ZPMT1504PPSR-MM 1z	SPMT120408-MM 5z	54	2	1.3
	50R	●		50	42	85	175	ZPMT1504PPSR-MM 2z	SPMT120408-MM 10z	54	4	1.4

● : Stock item ○ : Under preparing for stock

Parts

	Screw	Wrench	
			
THE 25R	ETNA02506	TW07P	-
32R	ETNA0408	-	TW15S
40R	ETNA0511	-	TW20S
50R	ETNA0511	-	TW20S

Available Inserts

ADLT	APLT	SPMT-MM
		
SPMT	**SDMT-MM**	**ZPMT-MM**
		

Designation	Coated: NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	Cermet: CN2000	CN20	CN30	Uncoated: H01	G10	ST30A	ST20	page
SPMT060304	●			●														E04
SDMT090308-MM				○	○													E05
SPMT120408-MM				●														E13
APLT070304R	●																	E18
ADLT150308R	●																	E24
ZPMT1504PPSR-MM				●														

● : Stock item ○ : Under preparing for stock

Recommended Cutting Condition

• Grooving

Workpiece	Cutting Condition vc(m/min)	Cutting Condition fz(mm/t)	Grades
P	60~120	0.06~0.2	NCM325
M	50 ~ 120	0.06~0.15	NCM325
K	60~120	0.1~0.2	NCM325

• Side cutting

Workpiece	Cutting Condition vc(m/min)	Cutting Condition fz(mm/t)	Grades
P	100 ~180	0.1 ~ 0.35	NCM325
M	80 ~ 180	0.1 ~ 0.3	NCM325
K	80 ~150	0.15~ 0.35	NCM325

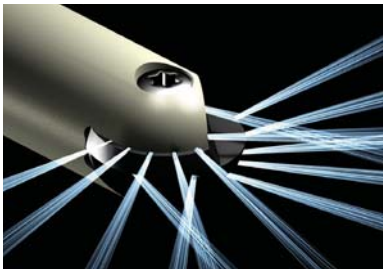
• Available Inserts, see page : E04, E05, E13, E18, E24

Laser Mill

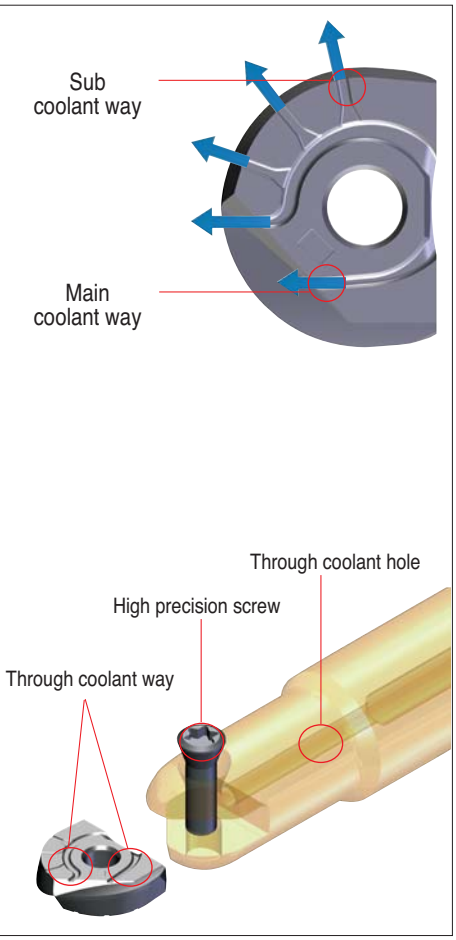
Features

- Long tool life has been achieved due to the excellent cutting performance of the grade
- Optimum machining of mold has been achieved due to the MQL available system
- Easy clamping with simple screw on system
- Various holder line up: steel shank, carbide shank, modular type
- High accuracy indexable endmills for mold finishing

- Environmental friendly system
- Decreased coolant cost
- Lubrication of cutting edge
- Improved chip control property
- Increased tool life & improved surface quality



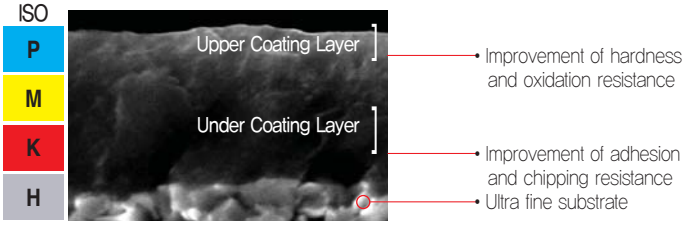
Features



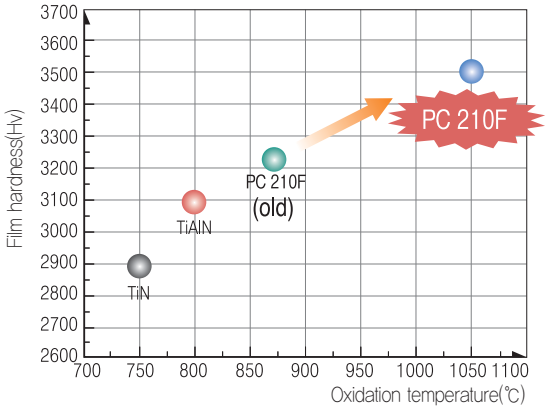
Features



New PC210F Features



- Due to the ultra fine carbide, toughness of cutting edge has been increased
- Special coating has been applied for high-speed machining & hardened workpiece
- High quality of machined surface due to the excellent lubrication property of the film



Cutting condition formula for milling

• Cutting speed

$$vc = \frac{\pi \times De \times n}{1000} \ (m/min)$$

• RPM

$$n = \frac{vce \times 1000}{\pi \times De} \ (rev/min)$$

• Feed per tooth

$$fz = \frac{vf}{n \times z} \ (mm/t)$$

• Feed per minute

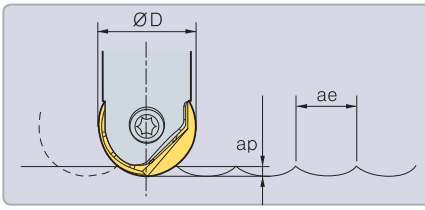
$$vf = fz \times n \times z \ (mm/min)$$

• Chip removal amount

$$Q = \frac{ap \times ae \times vf}{1000} \ (cm^3/min)$$

• Power requirement

$$Pc = \frac{Q \times kc}{60 \times 1000 \times \eta} \ (kW) \quad H = \frac{Pc}{0.75} \ (kW)$$



vc = Cutting speed(m/min)
n = Revolution per Minute(min^{-1})
Dc = Cutting diameter(mm)
vf = Feed per a minute(mm/min)
fz = Feed per tooth(mm/t)
z = Number of tooth
Pkw = Power Requirement (kW)
Php = Horsepower requirement(hp)
Q = Chip removal amount(cm3/min)
ap = Depth of cut(mm)
ae = Width of cut(mm)
kc = Specific cutting resistance(kg/mm^2)
η = Mechanical efficiency(%)

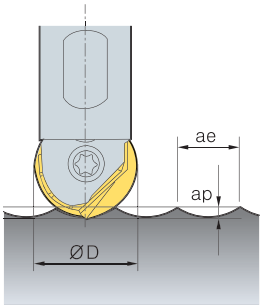
Recommended Cutting Condition

Workpiece	Recommended grade	Hardness	vc (m/min)	fz (mm/t)	ap	ae
					ap(mm)	ae(mm)
Carbon steel, Alloy steel	**PC210F**	Under HRC30	100 ~ 250	0.2 ~ 0.3	0.07D	0.07D
Carbon steel, Alloy steel	**PC210F**	HRC30 ~ 40	80 ~ 150	0.1 ~ 0.3	0.07D	0.07D
Die steel	**PC210F**	HRC30 ~ 40	80 ~ 150	0.1 ~ 0.2	0.05D	0.05D
Cast iron	**PC210F**	–	100 ~ 200	0.3 ~ 0.35	0.07D	0.07D
Hardened steel	**PC210F**	HRC50 ~ 60	100 ~ 150	0.1 ~ 0.3	0.03D	0.03D
Stainless steel	**PC210F**	–	80 ~ 150	0.1 ~ 0.3	0.05D	0.05D
Aluminum alloy	**PC210F**	–	200 ~ 300	0.15 ~ 0.4	0.15D	0.15D

Practical cutting speed calculation formulas

R(mm) \ ae(mm)	h(surface roughness) (μm)									
	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
5	0.3	1.0	2.3	4.0	6.3	9.0	12.3	16.0	20.3	25.0
6	0.2	0.8	1.9	3.3	5.2	7.5	10.2	13.3	16.9	20.8
8	0.2	0.6	1.4	2.5	3.9	5.6	7.7	10.0	12.7	15.6
10	0.1	0.5	1.1	2.0	3.1	4.5	6.1	8.0	10.1	12.5
12.5	0.1	0.4	0.9	1.6	2.5	3.6	4.9	6.4	8.1	10.0
15	0.1	0.3	0.8	1.3	2.1	3.0	4.1	5.3	6.8	8.3
16	0.1	0.3	0.7	1.3	2.0	2.8	3.8	5.0	6.3	7.8

• Formula of surface roughness : $h(\text{surface finish}) = \frac{(ae)^2}{8R} \times 1000(\mu m)$



Actual diameter data

ap \ ØD	Ø08	Ø10	Ø12	Ø16	Ø20	Ø25	Ø30	Ø32
0.1	1.8	2.0	2.2	2.5	2.8	3.2	3.5	3.6
0.2	2.5	2.8	3.1	3.6	4.0	4.5	4.9	5.0
0.3	3.0	3.4	3.7	4.3	4.9	5.4	6.0	6.2
0.5	3.9	4.4	4.8	5.6	6.2	7.0	7.7	7.9
1.0	5.3	6.0	6.6	7.7	8.7	9.8	10.8	11.1
1.5	6.2	7.1	7.9	9.3	10.5	11.9	13.1	13.5
2.0	6.9	8.0	8.9	10.6	12.0	13.6	15.0	15.5
2.5	7.4	8.7	9.7	11.6	13.2	15.0	16.6	17.2
3.0	7.7	9.2	10.4	12.5	14.3	16.2	18.0	18.7
3.5	7.9	9.5	10.9	13.2	15.2	17.3	19.3	20.0
4.0	8.0	9.8	11.3	13.9	16.0	18.3	20.4	21.2
5.0			11.8	14.8	17.3	20.0	22.4	23.2
6.0			12.0	15.5	18.3	21.4	24.0	25.0
7.0				15.9	19.1	22.4	25.4	26.5
8.0				16.0	19.6	23.3	26.5	27.7
10.0					20.0	24.5	28.3	29.7

Practical cutting speed calculation formulas

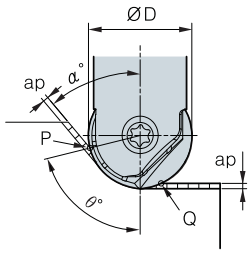
1. θ°Using : Calculating cutting speed at P point
(Cutting speed according to depth of cut when ramping)
• Formula : Practical cutting speed

$$vc = \frac{\pi \times Desin\theta \times n}{1000} \ (m/min)$$

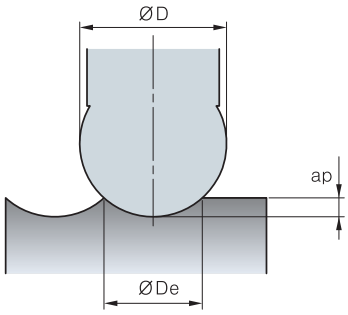
$$\theta = \cos{-1}\left(\frac{De - 2ap}{De}\right) + 90 - \alpha^\circ$$

2. In case of using ap : Calculating cutting speed at Q point
• Formula : Practical cutting speed

$$vce = \frac{2\pi n \sqrt{ap(De - ap)}}{1000}$$



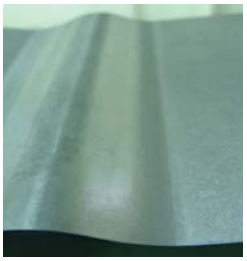
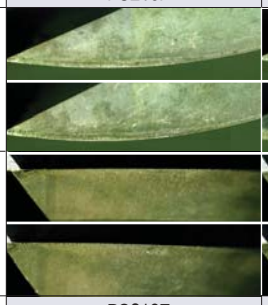
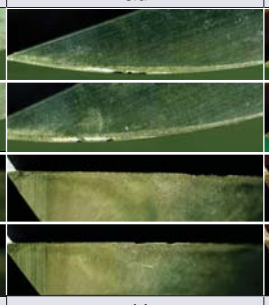
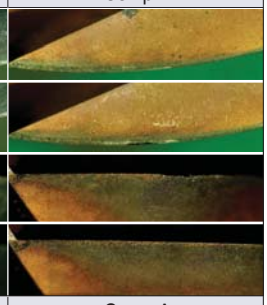
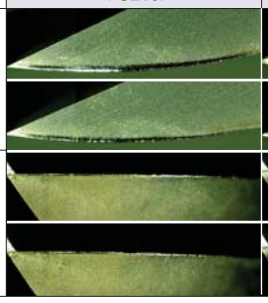
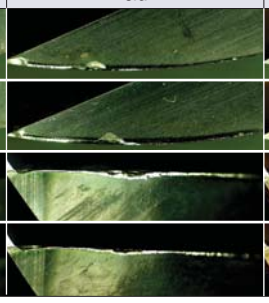
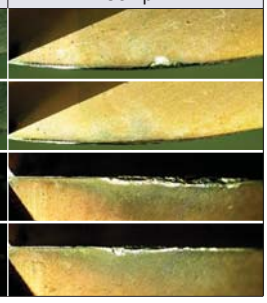
3. Formula of actual diameter



• Formula of actual diameter

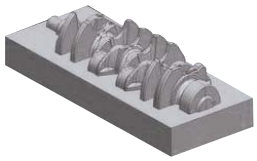
$$De = 2\sqrt{ap(D-ap)}$$

Wear resistance test

Cutting conditioin		Pictures			
			PC210F	old	Comp.A
 Cutting time : 15 hours	NAK80(HRC30), Air vc(m/min) = 376 fz(mm/t) = 0.33 ap(mm) = 0.5 ae(mm) = 0.5 vf(mm/min) = 4,000 n(min^{-1}) = 6,000	Front, back view			
		Top view			
			PC210F	old	Comp.A
 Cutting time : 8 hours	STD11(HRC50~65), Air vc(m/min) = 251 fz(mm/t) = 0.38 ap(mm) = 0.5 ae(mm) = 0.3 vf(m/min) = 3,000 n(min^{-1}) = 4,000	Front, back view			
		Top view			

Machining example

• Crank Shaft

Class	Specifications	Workpiece
Workpiece	SCM440 (HRC 40)	
cutting condition	vc(m/min) = 376 / fz(mm/t) = 0.25 / ap(mm) = 0.5 ae(mm) = 0.2 / n(min^{-1}) = 6000 / vf(mm/min) = 3000 / MQL	
Tools	Holder LBE200115T-S25 Insert LBH200 (PC210F)	

• CV-Joint

Class	Specifications	Workpiece
Workpiece	S53C단조강 (HRC 35)	
cutting condition	vc(m/min) = 200 / fz(mm/t) = 0.25 / ap(mm) = 0.5~2.0 ae(mm) = 0.5~1.0 / n(min^{-1}) = 3000 / vf(mm/min) = 1500 / Air	
Tools	Holder LBE230-HSKC63 Insert LBH230 (PC210F)	

• Car Bumper Mold

Class	Specifications	Workpiece
Workpiece	KP4MA (HRC30~35)	
cutting condition	vc(m/min) = 700 / fz(mm/t) = 0.25 / ap(mm) = 0.5 ae(mm) = 0.2 / n(min^{-1}) = 9000 / vf(mm/min) = 4500 / Air	
Tools	Holder LBE250170S-S25C Insert LBH250 (PC210F)	

GBE

Holder Code System

GBE	300	-	S	32
Product Name	Machining Dia.		Type	Shank Dia.
General Indexable **B**all **E**ndmill	Ø16, Ø20, Ø25 Ø30, Ø32, Ø40, Ø50		S : Standard shank L : Long shank	

Features

- Indexable Ballnose Endmill for Molds in medium & roughing applications
- Long tool life due to high hardness grade
- Helical cutting edge and high accuracy cutting edge
- Optimized mold machining process with our internal coolant system
- Able to adjust to medium processing in middle & big roughing mold process
- Various holder in normal & long style holders


IInternal


External


Flank support

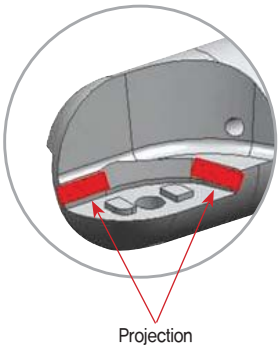

Concave bottom

- Ability to handle high accuracy & large depth of cut applications.
  - Run-out : within 0.05mm
  - R accuracy : within 0.05mm
- Various diameters (Ø16,20,25,30,32,40,50)
- Minimal cutting resistance due to Helical cutting edge
- Anti-rotate of insert due to concave bottom & Stable setting by flank support
- Long tool life & better processing due to 2 cutting inserts
- Better tool life with new grade


Standard type

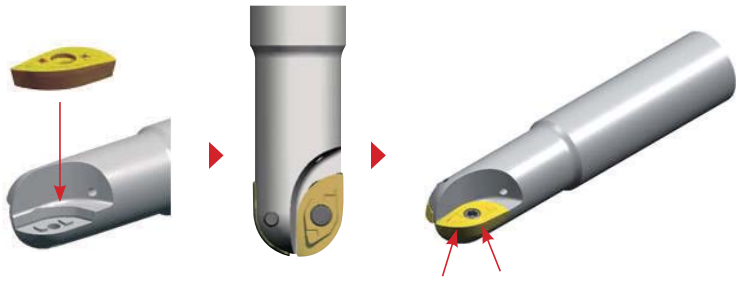

Multi Edge type


Modular type


Projection

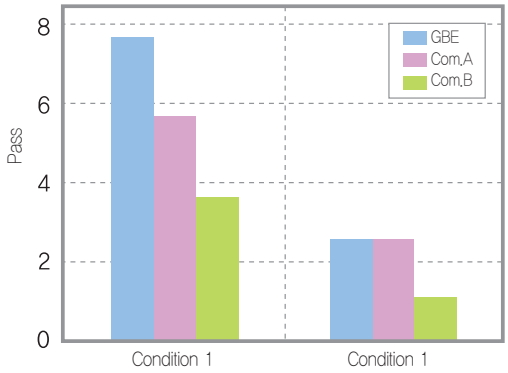
- Various diameters (Ø16,20,25,30,32,40,50)
- Improved chip treatment with internal coolant(cutting edge portion)
- Long tool life & better processing
- Easy insert setting with projection part and prevent vibration during processing

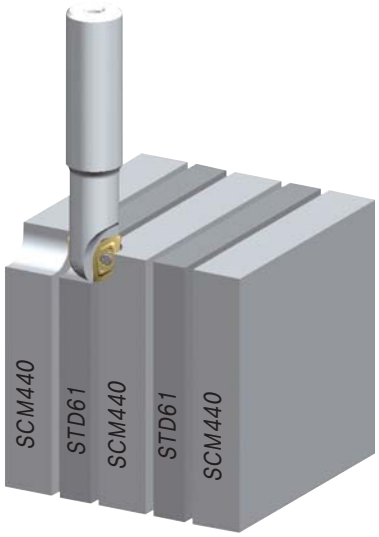
How to set insert



1. Set the insert to the holder projection seat
2. Push the insert into the red arrow direction and screw with wrench

Cutting Performance Test





Cutting condition

Class.	Cutting speed(vc)	Feed(fz)	Depth of cut(ap)	Depth of cut(ae)	Workpiece	Etc.
Condition 1	150m/min	0.15mm/t	5mm	8mm	STD61(HRC50) + SCM440(HRC20)	Dry
Condition 1	100m/min	0.1mm/t	8mm	8mm		

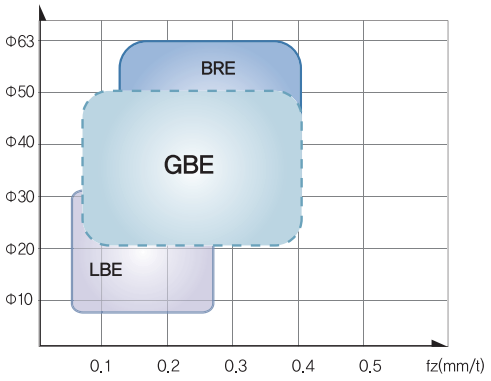
Inserts / Parts

Insert				Parts			
Type							
Dia.	Internal I/S	External I/S	External main I/S	Screw		Wrench	
				Int./Ext. type	Ext. main type	Int./Ext. type	Ext. main type
Ø16	ZPET080M-MM	ZPET080S-MM	-	FTKA02555S	-	TW08S	-
Ø20	ZPET100M-MM	ZPET100S-MM	SPMT060304	FTKA0307	ETNA02506	TW09S	TW07P
Ø25	ZPET125M-MM	ZPET125S-MM	SPMT060304	FTKA0409	ETNA02506	TW15S	TW07P
Ø30	ZPET150M-MM	ZPET150S-MM	SDMT090308-MM	FTGA0511-P	ETNA0408	TW20S	TW15S
Ø32	ZPET160M-MM	ZPET160S-MM	SDMT090308-MM	FTGA0511-P	ETNA0408	TW20S	TW15S
Ø40	ZPET200M-MM	ZPET200S-MM	SDMT120408-MM	FTGA0614	ETNA0511	TW20S	TW25S
Ø50	ZPET250M-MM	ZPET250S-MM	SDMT120408-MM	FTGA0818	ETNA0511	TW25S	TW25S

Recommended Cutting Condition

Workpiece	Machining type	Hardness (HRC)	vc(m/min)	fz(mm/t)	ap(mm)	ae(mm)
Carbon, Alloy steel	Flank Groove Deep flank	Under 25	160~250 120~200 160~250	0.1~0.5 0.1~0.5 0.1~0.5	0.3~0.5D 0.3~0.5D 1.0~1.5D	0.2~0.3D – 0.1~0.2D
Carbon, Alloy steel	Flank Groove Deep flank	Under 45	120~200 120~160 120~200	0.1~0.5 0.1~0.5 0.1~0.5	0.3~0.5D 0.3~0.5D 1.0~1.5D	0.2~0.3D – 0.1~0.2D
Mold Alloy steel	Flank Groove Deep flank	30~40	120~200 120~160 120~200	0.1~0.3 0.1~0.3 0.1~0.3	0.3~0.5D 0.3~0.5D 1.0~1.5D	0.2~0.3D – 0.1~0.2D
Cast iron(GCGCC)	Flank Groove Deep flank	20~30	150~300 150~300 150~300	0.2~0.7 0.2~0.7 0.2~0.7	0.3~0.5D 0.3~0.5D 1.0~1.5D	0.2~0.3D – 0.1~0.2D
Heat treatment steel	Flank Groove Deep flank	50~60	40~100 40~100 40~100	0.1~0.3 0.1~0.3 0.1~0.3	0.3~0.5D 0.3~0.5D 1.0~1.5D	0.2~0.3D – 0.1~0.2D

Line-up for Indexable ball Endmill



Type	Application				
	Machining Dignity	Machining Effeiency	Machining Dia. equivalence	Economical	Flank Machining with LongEdge
Laser Mill	●	○	◐	○	○
GBE	◐	●	◐	◐	●
BRE	○	●	●	●	●

● : Very Good ◐ : Good ○ : Normal

Test Result for wear resistance

Cutting conditioin	Wear resistance photos



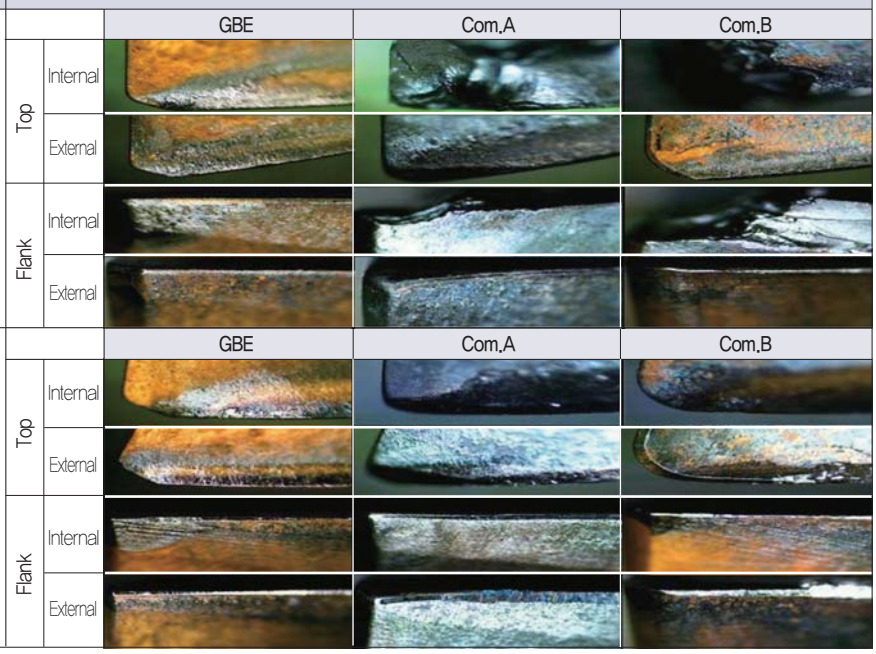
Cutting time : 4 Pass

- Workpiece
  KP4M(HRC33), Dry
- Condition
  vc = 280m/min
  fz = 0.25mm/t
  ap = 5~10mm
  ae = 5~10mm
  vf = 1,486m/min
  n = 2,971rpm
- Tool
  Holder : GBE300-S32
  Insert : ZPET150M-MM(PC3500)
  ZPET150S-MM(PC3500)



Cutting time : 4 Pass

- Workpiece
  STD11(HRC20), Dry
- Condition
  vc = 250m/min
  fz = 0.2mm/t
  ap = 5mm
  ae = 5mm
  vf = 1,062m/min
  n = 2,653rpm
- Tool
  Holder : GBE300-S32
  Insert : ZPET150M-MM(PC3500)
  ZPET150S-MM(PC3500)



BRE

Features

- Cutting Performance : Good chip control & Superior cutting performance with optimal cutting edge line
- High rigidity body : Better tool life and anti-breakage with special surface treatment on the holder
  Easy to set and good durability with TCRX screw
  Good chip control with our 3D flute design & improved external quality
- Insert : Able to apply tool in high speed & feed applications due to special grade which has wear & breakage resistance
  Stable cutting performance with high cutting edge toughness & high rake angle chip breaker

Multi edge holder ISO View



• Good chip flow
• Good heat emission



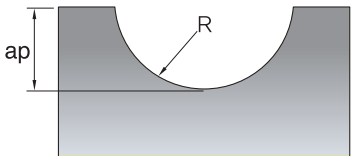
• Improved cutting edge toughness by idthikincreased thickness

• Better setting force by recess



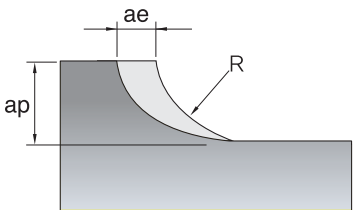
BRE machining type for roughing & recommended cutting condition

• Machining Type



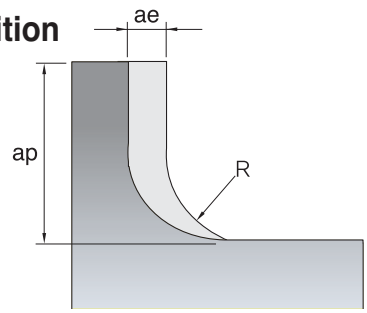
ap=0.3D–0.5D

Machining Type 1



ae=0.2D–0.3D
ap=0.3D–0.5D

Machining Type 2

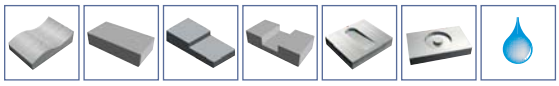


ae=0.1D–0.5D
ap=1.2D–1.5D

Machining Type 3

Workpiece	Machining Type	Velocity(m/min)	Feed(mm/t)	Grade
Carbon / Alloy steel	1	120~220	0.1~0.4	NCM325
	2	120~220	0.2~0.4	NCM325
	3	100~180	0.1~0.3	NCM325
Alloy steel	1	100~200	0.1~0.4	NCM325
	2	100~200	0.2~0.4	NCM325
	3	80~160	0.1~0.3	NCM325
Tool steel	1	80~150	0.1~0.3	NCM325
	2	80~150	0.15~0.35	NCM325
	3	60~120	0.1~0.3	NCM325
High hardness material (HR35–45)	1	60~120	0.1~0.3	NCM325
	2	60~120	0.1~0.3	NCM325
	3	50~80	0.1~0.2	NCM325
Cast iron	1	100~180	0.2~0.5	NCM320K
	2	100~180	0.2~0.5	NCM320K
	3	80~160	0.15~0.4	NCM320K

Carbide Shank-Ball, Corner R type
LBE08/10/12/16/20/25/30/32 (Straight type)





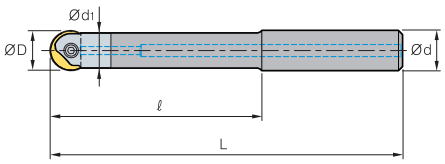


Fig. 1

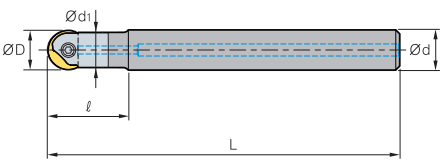


Fig. 2

(mm)

Designation		Stock	ØD	Ød	Ød1	ℓ	L	Parts		Available Inserts(Ø)	Fig.
								Clamp Screw	Wrench		
LBE	080080S-S08C	●	8, 9	8	7.5	80	136	ETND02506F	TWP07S	8,9	1
	080100S-S08C	●	8, 9	8	7.5	100	156				1
	080020S-S08C-130	●	8, 9	8	7.5	20	130	ETND02506F	TWP07S	8,9	2
	080020S-S08C-150	●	8, 9	8	7.5	20	150				2
	100080S-S10C	●	10, 11	10	9.5	80	136	ETND0307F	TWP08S	10, 11	1
	100120S-S10C	●	10, 11	10	9.5	120	176				1
	100023S-S10C-130	●	10, 11	10	9.5	23	130	ETND0307F	TWP08S	10, 11	2
	100023S-S10C-170	●	10, 11	10	9.5	23	170				2
	120100S-S12C	●	12, 13	12	11.5	100	156	ETND03509	TWP10S	12,13	1
	120150S-S12C	●	12, 13	12	11.5	150	206				1
	120025S-S12C-150	●	12, 13	12	11.5	25	150	ETND03509	TWP10S	12,13	2
	120025S-S12C-200	●	12, 13	12	11.5	25	200				2
	160100S-S16C	●	16, 17	16	15.5	100	160	ETND0413	TWP15S	16,17	1
	160150S-S16C	●	16, 17	16	15.5	150	210				1
	160030S-S16C-160	●	16, 17	16	15.5	30	160	ETND0413	TWP15S	16,17	2
	160030S-S16C-210	●	16, 17	16	15.5	30	210				2
	200120S-S20C	●	20, 21	20	19.5	120	190	ETKD0516	TWP20	20,21	1
	200170S-S20C	●	20, 21	20	19.5	170	240				1
	200035S-S20C-190	●	20, 21	20	19.5	35	190	ETKD0516	TWP20	20,21	2
	200035S-S20C-240	●	20, 21	20	19.5	35	240				2
	250140S-S25C		25, 26	25	24.5	140	220	ETKD0620	TWP25	25,26	1
	250170S-S25C		25, 26	25	24.5	170	250				1
	250040S-S25C-220	●	25, 26	25	24.5	40	220	ETKD0620	TWP25	25,26	2
	250040S-S25C-250	●	25, 26	25	24.5	40	250				2
	300140S-S32C	●	30, 31	32	29.5	140	230	ETGD0825	TWP40	30,31	1
	300170S-S32C	●	30, 31	32	29.5	170	260				1
	300050S-S32C-230	●	30, 31	32	29.5	50	230	ETGD0825	TWP40	30,31	2
	300050S-S32C-260	●	30, 31	32	29.5	50	260				2
	320140S-S32C	●	32	32	31.5	140	230	ETGD0825	TWP40	32	1
	320170S-S32C	●	32	32	31.5	170	260				1
	320050S-S32C-230	●	32	32	31.5	50	230	ETGD0825	TWP40	32	2
	320050S-S32C-260	●	32	32	31.5	50	260				2

• Applicable inserts, see pages E08

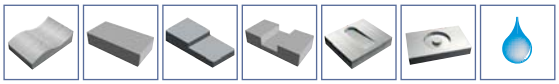
● : Stock item ○ : Under preparing for stock

Available Inserts

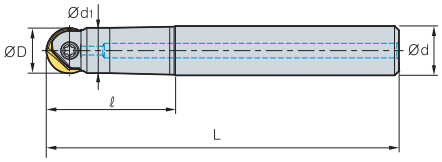
Available Holders	LBH (Ball type)	LRH (Corner radius type)	LFH (High feed type)	LCF (Chamfer type)	LBS(Ball type)	LR(Corner radius type)
	R accuracy ±0.005	Corner R ±0.015			R accuracy ±0.005	Corner R ±0.015
New LBE080	LBH080 LBH090				LBS080 LBS090	
New LBE100 LRE100	LBH100 LBH110	LRH100-R05 LRH100-R20 LRH100-R10 LRH110-R05	LFH100		LBS100 LBS110	LR100-R05 LR100-R20 LR100-R10 LR110-R05
New LBE120 LRE120	LBH120 LBH130	LRH120-R05 LRH120-R20 LRH120-R10 LRH130-R05	LFH120		LBS120 LBS130	LR120-R05 LR120-R20 LR120-R10 LR130-R05
New LBE160 LRE160	LBH160 LBH170	LRH160-R05 LRH160-R30 LRH160-R10 LRH170-R05 LRH160-R20	LFH160		LBS160 LBS170	LR160-R05 LR160-R30 LR160-R10 LR170-R05 LR160-R20
New LBE200 LRE200	LBH200 LBH210	LRH200-R05 LRH200-R30 LRH200-R10 LRH210-R05 LRH200-R20	LFH200	LCF160-D90	LBS200 LBS210	LR200-R05 LR200-R30 LR200-R10 LR210-R05 LR200-R20
New LBE250 LRE250	LBH250 LBH260	LRH250-R05 LRH250-R30 LRH250-R10 LRH260-R05 LRH250-R20	LFH250	LCF200-D90	LBS250 LBS260	LR250-R05 LR250-R30 LR250-R10 LR260-R05 LR250-R20
New LBE300 LRE300	LBH300 LBH310	LRH300-R10 LRH300-R30 LRH300-R20 LRH310-R05	LFH300	LCF250-D90	LBS300 LBS310	LR300-R10 LR300-R30 LR300-R20 LR310-R05
LBE320 LRE320	LBH320	LRH320-R10 LRH320-R30 LRH320-R20	LFH320		LBS320	LR320-R10 LR320-R30 LR320-R20

• Application Product : E157, E158, E159, E160

Steel Shank-Ball, Corner R type
LBE08/10/12/16/20/25/30/32 (Taper type)





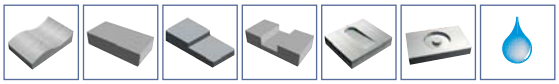


(mm)

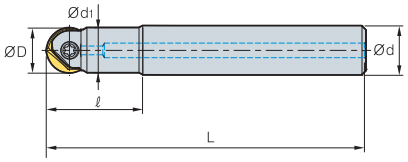
Designation		Stock R	Stock L	øD	ød	ød1	ℓ	L	Parts: Clamp Screw	Parts: Wrench	Available Inserts(Ø)
LBE	080035T-S12	●		8, 9	12	7.5	35	91	ETND02506F	TWP07S	8, 9
	080055T-S12	●		8, 9	12	7.5	55	111			
	080075T-S12	●		8, 9	12	7.5	75	131			
	100035T-S12	●		10, 11	12	9.5	35	91	ETND0307F	TWP08S	10, 11
	100055T-S12	●		10, 11	12	9.5	55	111			
	100075T-S12	●		10, 11	12	9.5	75	131			
	120055T-S12	●		12, 13	12	10.4	55	111	ETND03509	TWP10S	12, 13
	120085T-S16	●		12, 13	16	11.5	85	145			
	160065T-S16	●		16, 17	16	14	65	125	ETND0413	TWP15S	16, 17
	160100T-S20	●		16, 17	20	15.5	100	170			
	200075T-S20	●		20, 21	20	17.5	75	145	ETKD0516	TWP20	20, 21
	200115T-S25	●		20, 21	25	19.5	115	195			
	250090T-S25	●		25, 26	25	22	90	170	ETKD0620	TWP25	25, 26
	250135T-S32	●		25, 26	32	24.5	135	225			
	300105T-S32	●		30, 31	32	29.5	105	195	ETGD0825	TWP40	30, 31
	300160T-S32	●		30, 31	32	29.5	160	250			
	320105T-S32	●		32	32	29	105	195	ETGD0825	TWP40	32
	320160T-S32	●		32	32	29	160	250			

• Applicable inserts, see pages E07, E08
• T stands for taper type, S stands for straight type
● : Stock item ○ : Under preparing for stock

Steel Shank-Ball, Corner R type
LBE12/16/20/25/30/32 (Straight type)







(mm)

Designation		Stock R	Stock L	øD	ød	ød1	ℓ	L	Parts: Clamp Screw	Parts: Wrench	Available Inserts(Ø)
LBE	120035S-S12	●		12, 13	12	11.5	35	91	ETND03509	TWP10S	12,13
	160035S-S16	●		16, 17	16	15.5	35	95	ETND0413	TWP15S	16,17
	200040S-S20	●		22, 21	20	19.5	40	110	ETKD0516	TWP20	20,21
	250045S-S25	●		25, 26	25	24.5	40	125	ETKD0620	TWP25	25,26
	300055S-S32	●		30, 31	32	29.5	55	145	ETGD0825	TWP40	30,31
	320055S-S32	●		32	32	31.5	55	145	ETGD0825	TWP40	32

• Applicable inserts, see pages E07, E08
• T stands for taper type, S stands for straight type
● : Stock item ○ : Under preparing for stock

Carbide Shank-Ball, Corner R type New
LRE10/12/16/20/25/30/32 (Straight type)



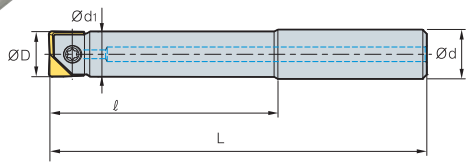


Fig. 1

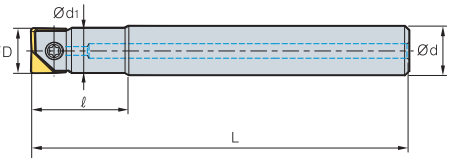


Fig. 2

(mm)

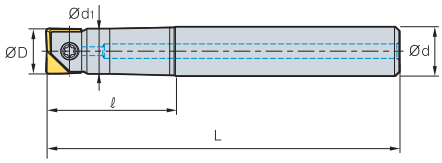
Designation		Stock	øD	ød	ød1	ℓ	L	Parts		Available Inserts(Ø)	Fig.
								Clamp Screw	Wrench		
LRE	100080S-S10C		10, 11	10	9.5	80	136	ETND0307F	TWP08S	10, 11	1
	100120S-S10C		10, 11	10	9.5	120	176				1
	100023S-S10C-130		10, 11	10	9.5	23	130	ETND0307F	TWP08S	10, 11	2
	100023S-S10C-170		10, 11	10	9.5	23	170				2
	120100S-S12C		12, 13	12	11.5	100	156	ETND03509	TWP10S	12,13	1
	120150S-S12C		12, 13	12	11.5	150	206				1
	120025S-S12C-150		12, 13	12	11.5	25	150	ETND03509	TWP10S	12,13	2
	120025S-S12C-200		12, 13	12	11.5	25	200				2
	160100S-S16C		16, 17	16	15.5	100	160	ETND0413	TWP15S	16,17	1
	160150S-S16C		16, 17	16	15.5	150	210				1
	160030S-S16C-160		16, 17	16	15.5	30	160	ETND0413	TWP15S	16,17	2
	160030S-S16C-210		16, 17	16	15.5	30	210				2
	200120S-S20C		20, 21	20	19.5	120	190	ETKD0516	TWP20	20,21	1
	200170S-S20C		20, 21	20	19.5	170	240				1
	200035S-S20C-190		20, 21	20	19.5	35	190	ETKD0516	TWP20	20,21	2
	200035S-S20C-240		20, 21	20	19.5	35	240				2
	250140S-S25C		25, 26	25	24.5	140	220	ETKD0620	TWP25	25,26	1
	250170S-S25C		25, 26	25	24.5	170	250				1
	250040S-S25C-220		25, 26	25	24.5	40	220	ETKD0620	TWP25	25,26	2
	250040S-S25C-250		25, 26	25	24.5	40	250				2
	300140S-S32C		30, 31	32	29.5	140	230	ETGD0825	TWP40	30,31	1
	300170S-S32C		30, 31	32	29.5	170	260				1
	300050S-S32C-230		30, 31	32	29.5	50	230	ETGD0825	TWP40	30,31	2
	300050S-S32C-260		30, 31	32	29..5	50	260				2
	320140S-S32C		32	32	31.5	140	230	ETGD0825	TWP40	32	1
	320170S-S32C		32	32	31.5	170	260				1
	320050S-S32C-230		32	32	31.5	50	230	ETGD0825	TWP40	32	2
	320050S-S32C-260		32	32	31.5	50	260				2

• Applicable inserts, see pages E07, E08

● : Stock item ○ : Under preparing for stock

Steel Shank-Corner R type New
LRE10/12 (Taper type)





(mm)

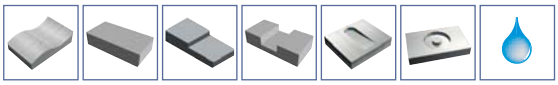
Designation		Stock		øD	ød	ød1	ℓ	L	Parts		Available Inserts(Ø)
		R	L						Clamp Screw	Wrench	
LRE	100025T-S12			10, 11	12	9.5	25	111	ETND0307F	TWP08S	10,11
	100050T-S12			10, 11	12	9.5	50	150			
	120060T-S16			12, 13	12	11.5	60	160	ETND03509	TWP10S	12,13

• Applicable inserts, see pages E07, E08

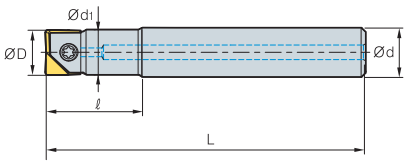
• T stands for taper type, S stands for straight type

● : Stock item ○ : Under preparing for stock

Steel Shank, Corner R type New
LRE12/16/25/30/32 (Straight type)





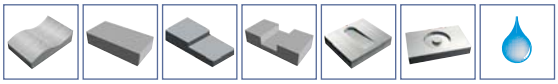


(mm)

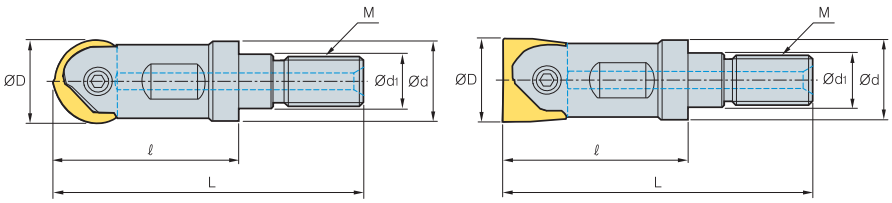
Designation		Stock R	Stock L	ØD	Ød	Ød1	ℓ	L	Parts: Clamp Screw	Parts: Wrench	Available Inserts(Ø)
LRE	120030S-S12			12, 13	12	11.5	30	111	ETND03509	TWP10S	12, 13
	160050S-S16			16, 17	16	15.5	50	131	ETND0413	TWP15S	16, 17
	160060S-S16			16, 17	16	15.5	60	160			
	200060S-S20			20, 21	20	19.5	60	145	ETKD0516	TWP20	20, 21
	200080S-S20			20, 21	20	19.5	80	180			
	250070S-S25			25, 26	25	24.5	70	145	ETKD0620	TWP25	25, 26
	250100S-S25			25, 26	25	24.5	100	225			
	300070S-S32			30, 31	32	29.5	70	160	ETGD0825	TWP40	30, 31
	300100S-S32			30, 31	32	29.5	100	225			
	320080S-S32			32	32	31.5	80	160	ETGD0825	TWP40	32
	320100S-S32			32	32	31.5	100	225			

• Applicable inserts, see pages E07, E08
• T stands for taper type, S stands for straight type
● : Stock item ○ : Under preparing for stock

LBE-MHD







(mm)

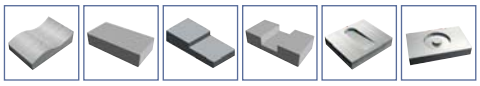
Designation	Stock	M	ØD	L	ℓ	Ød	Ød1	Parts: Clamp Screw	Parts: Wrench	Available Inserts(Ø)
LBE100-MHD-M06	●	M06	10, 11	40	25	9.5	6.5	ETND0307F	TWP08S	10, 11
LBE120-MHD-M06	●	M06	12, 13	40	25	11	6.5	ETND03509	TWP10S	12, 13
LBE160-MHD-M08	●	M08	16, 17	47	30	14.5	8.5	ETND0413	TWP15S	16, 17
LBE200-MHD-M10	●	M10	20, 21	56	35	18	10.5	ETKD0516	TWP20	20, 21
LBE250-MHD-M12	●	M12	25, 26	69	45	22.5	12.5	ETKD0620	TWP25	25, 26
LBE300-MHD-M16	●	M16	30, 31	77	50	28	17	ETGD0825	TWP40	30, 31
LBE320-MHD-M16	●	M16	32	77	50	29	17	ETGD0825	TWP40	32

• Applicable inserts, see pages E07, E08
• Available Adaptors : E133~E134
● : Stock item ○ : Under preparing for stock

Designation : LBE320-MHD-M16
Modular Head Threading Measure size(M16)
=
Adaptor Spec. : MAT-M16-035-S32S
Adaptor Threading Measure(M16)

BFE





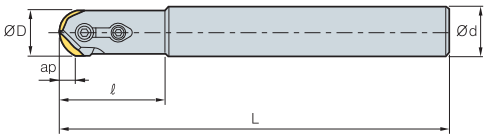


Fig. 1

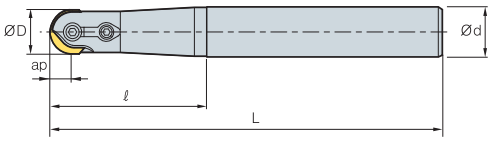


Fig. 2

(mm)

Designation		Stock	ØD	Ød	ℓ	L	ap	kg	Fig.	Available Inserts
BFE	16-S	●	16	16	36	140	8.0	0.2	1	RC16
	16-M	●	16	20	65	170	8.0	0.3	2	
	16-L	●	16	25	65	200	8.0	0.5	2	
	20-S	●	20	20	45	160	10.0	0.4	1	RC20
	20-M	●	20	25	80	200	10.0	0.6	2	
	20-L	●	20	25	80	250	10.0	0.8	2	
	25-S	●	25	25	45	160	12.5	0.7	1	RC25
	25-M	●	25	32	90	210	12.5	1.1	2	
	25-L	●	25	32	90	300	12.5	1.7	2	
	30-S	●	30	32	65	175	15.0	0.9	2	RC30
	30-M	●	30	32	100	250	15.0	1.4	2	
	30-L	●	30	32	100	350	15.0	2.0	2	
	32-S	●	32	32	56	175	16.0	0.9	1	RC32
	32-M	●	32	32	100	250	16.0	1.4	1	
	32-L	●	32	32	100	350	16.0	2.0	1	

● : Stock item ○ : Under preparing for stock

Parts

	Screw	Clamp	Clamp Screw	Stopper Ring	Wrench
					
R16	FTGA0513	CBH4.5R1	CTX04513	ER03	TW20
R20	FTGA0517	CBH4.5R2	CTX04513	ER03	TW20
R25	FTGA0621	CBH5R1	CTX0517	ER04	TW20
R30, 32	FTGA0826	CBH6R1	CTX0621	ER05	TW25

Recommended Cutting Condition

Workpiece	Cutting Condition	
	vc(m/min)	fz(mm/t)
General steel(SS41, SM25C) Over HB180	150 ~ 250	0.1 ~ 0.3
Alloy steel(SM55C, SCM) Under HB300	100 ~ 200	0.1 ~ 0.2
Cast iron Under HB300	100 ~ 200	0.1 ~ 0.3

• Applicable inserts, see pages E11

Available Inserts

RC

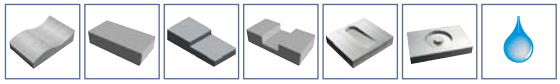


Designation		Coated PC210F	Page
RC	16	●	E16
	20	●	
	25	●	
	30	●	
	32	●	

● : Stock item ○ : Under preparing for stock

GBE(Single Edge)

New





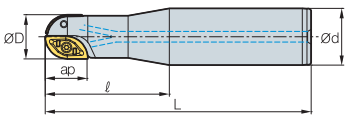


Fig. 1

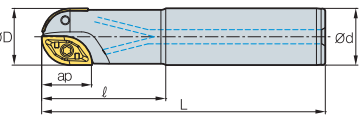


Fig. 2

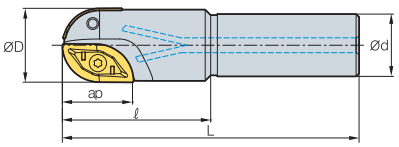


Fig. 3

(mm)

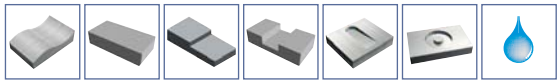
Designation		Stock	size					Available Inserts			Parts				Fig.
											Screw		Wrench		
			øD	ød	ℓ	L	ap	Internal	External	Ext. main	Int./Ext. type	Ext. main type	Int./Ext. type	Ext. main type	
GBE	160-S20		16	20	50	130	15	ZPET080M-MM	ZPET080S-MM	-	FTKA02555S	-	TW08S	-	1
	160-L20		16	20	90	200	15	ZPET080M-MM	ZPET080S-MM	-	FTKA02555S	-	TW08S	-	1
	200-S25	●	20	25	60	140	18	ZPET100M-MM	ZPET100S-MM	-	FTKA0307	-	TW09S	-	1
	200-L25	●	20	25	80	250	18	ZPET100M-MM	ZPET100S-MM	-	FTKA0307	-	TW09S	-	1
	250-S32	●	25	32	70	150	23	ZPET125M-MM	ZPET125S-MM	-	FTKA0409	-	TW15S	-	1
	250-L32	●	25	32	100	300	23	ZPET125M-MM	ZPET125S-MM	-	FTKA0409	-	TW15S	-	1
	300-S32	●	30	32	70	160	27	ZPET150M-MM	ZPET150S-MM	-	FTGA0511-P	-	TW20S	-	2
	300-L32	●	30	32	120	350	27	ZPET150M-MM	ZPET150S-MM	-	FTGA0511-P	-	TW20S	-	2
	320-S32	●	32	32	70	160	28	ZPET160M-MM	ZPET160S-MM	-	FTGA0511-P	-	TW20S	-	2
	320-L32	●	32	32	120	350	28	ZPET160M-MM	ZPET160S-MM	-	FTGA0511-P	-	TW20S	-	2
	400-S42	●	40	42	100	200	37	ZPET200M-MM	ZPET200S-MM	-	FTGA0614	-	TW20S	-	2
	400-L42	●	40	42	150	350	37	ZPET200M-MM	ZPET200S-MM	-	FTGA0614	-	TW20S	-	2
	500-S42		50	42	100	200	47	ZPET250M-MM	ZPET250S-MM	-	FTGA0818	-	TW25-100	-	3
	500-L42		50	42	100	350	47	ZPET250M-MM	ZPET250S-MM	-	FTGA0818	-	TW25-100	-	3

• Applicable inserts, see pages E21

● : Stock item ○ : Under preparing for stock

GBE-M(Multi Edge)

New





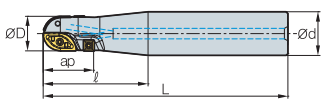


Fig. 4

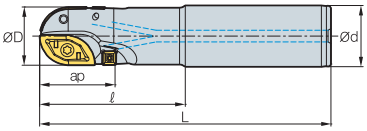


Fig. 5

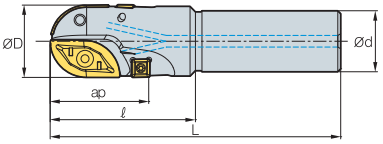


Fig. 6

(mm)

Designation		Stock	size					Available Inserts			Parts				Fig.
											Screw		Wrench		
			øD	ød	ℓ	L	ap	Internal	External	Ext. main	Int./Ext. type	Ext. main type	Int./Ext. type	Ext. main type	
GBE	200M-S25	●	20	25	70	150	28	ZPET100M-MM	ZPET100S-MM	SPMT060304	FTKA0307	ETNA02506	TW09S	TW07P	4
	200M-L25	●	20	25	70	250	28	ZPET100M-MM	ZPET100S-MM	SPMT060304	FTKA0307	ETNA02506	TW09S	TW07P	4
	250M-S32	●	25	32	80	180	33	ZPET125M-MM	ZPET125S-MM	SPMT060304	FTKA0409	ETNA02506	TW15S	TW07P	4
	250M-L32	●	25	32	80	300	33	ZPET125M-MM	ZPET125S-MM	SPMT060304	FTKA0409	ETNA02506	TW15S	TW07P	4
	300M-S32	●	30	32	100	200	41	ZPET150M-MM	ZPET150S-MM	SDMT090308-MM	FTGA0511-P	ETNA0408	TW20S	TW15S	4
	300M-L32	●	30	32	100	350	41	ZPET150M-MM	ZPET150S-MM	SDMT090308-MM	FTGA0511-P	ETNA0408	TW20S	TW15S	4
	320M-S32	●	32	32	100	200	42	ZPET160M-MM	ZPET160S-MM	SDMT090308-MM	FTGA0511-P	ETNA0408	TW20S	TW15S	5
	320M-L32	●	32	32	100	350	42	ZPET160M-MM	ZPET160S-MM	SDMT090308-MM	FTGA0511-P	ETNA0408	TW20S	TW15S	5
	400M-S42		40	42	100	200	56	ZPET200M-MM	ZPET200S-MM	SPMT120408-MM	FTGA0614	ETNA0511	TW20S	TW20S	5
	400M-L42		40	42	100	350	56	ZPET200M-MM	ZPET200S-MM	SPMT120408-MM	FTGA0614	ETNA0511	TW20S	TW20S	5
	500M-S42		50	42	100	200	67	ZPET250M-MM	ZPET250S-MM	SPMT120408-MM	FTGA0818	ETNA0511	TW25-100	TW20S	6
	500M-L42		50	42	100	350	67	ZPET250M-MM	ZPET250S-MM	SPMT120408-MM	FTGA0818	ETNA0511	TW25-100	TW20S	6

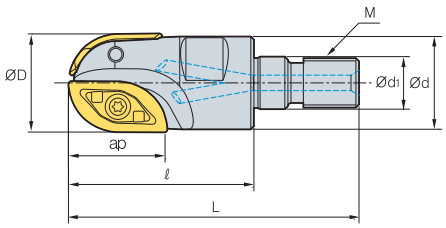
• Applicable inserts, see pages E21

● : Stock item ○ : Under preparing for stock

GBEM

New





(mm)

Designation		Stock	size							Available Inserts		Parts	
			ØD	ød	ød1	ℓ	L	M	ap	Internal	Internal	Screw	Wrench
GBEM	160-M08		16	15	8.5	30	47	M08	15	ZPET080M-MM	ZPET080S-MM	FTKA02555S	TW08S
	200-M10		20	18.6	10.5	35	56	M10	18	ZPET100M-MM	ZPET100S-MM	FTKA0307	TW09S
	250-M12		25	23.2	12.5	45	69	M12	23	ZPET125M-MM	ZPET125S-MM	FTKA0409	TW15S
	300-M16		30	27.8	17	45	77	M16	27	ZPET150M-MM	ZPET150S-MM	FTGA0511-P	TW20S
	320-M16		32	29.8	17	50	77	M16	28	ZPET160M-MM	ZPET160S-MM	FTGA0511-P	TW20S

● : Stock item ○ : Under preparing for stock

Parts

Screw		Wrench		Applicable cutter Dia.
Int./Ext. type	Ext. main type	Int./Ext. type	Ext. main type	
FTKA02555	-	TW08S	-	Ø16
FTKA0307	ETNA02506	TW09S	TW07P	Ø20
FTKA0409	ETNA02506	TW15S	TW07P	Ø25
FTGA511-P	ETNA0408	TW20S	TW15S	Ø30
FTGA511-P	ETNA0408	TW20S	TW15S	Ø32
FTGA0614	ETNA0511	TW20S	TW20S	Ø40
FTGA0818	ETNA0511	TW25-100	TW20S	Ø50

Designation : GBEM320-M16
Modular Head Threading Measure size(M16)

=

Adaptor Spec. : MAT-M16-035-S32S
Adaptor Threading Measure(M16)

Available Inserts (Int./Ext.)

ZPET-M(Int.) ZPET-S(Ext.) SPMT(Ext. main) SPMT-MM(Ext. main)



Designation		Coated			Page
		PC3500	PC3545	PC5300	
ZPET	080M-MM				E21
	100M-MM	●		○	
	125M-MM	●		○	
	150M-MM	●		○	
	160M-MM	●		○	
	200M-MM	●		○	
	250M-MM			○	
ZPET	080S-MM				E21
	100S-MM	●		○	
	125S-MM	●		○	
	150S-MM	●		○	
	160S-MM	●		○	
	200S-MM	●		○	
	250S-MM				
SPMT	060304	●			E18
SDMT	090308-MM	●		○	E13
SPMT	120408-MM	●			E18

● : Stock item ○ : Under preparing for stock

• Applicable inserts, see pages E13, E21

BRE

New



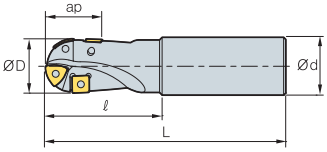


Fig. 1

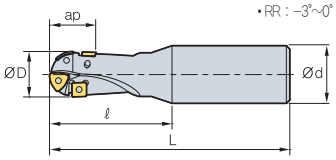


Fig. 2

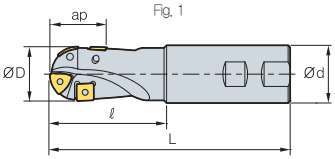


Fig. 3

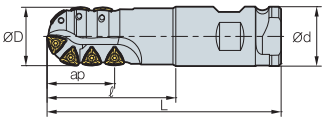
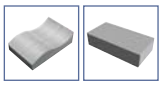


Fig. 4

• AR : 0°~10°
• RR : -3°~0°



(mm)

Designation		Stock	øD	ød	ℓ	L	ap	Available Inserts		Parts		Fig.	kg
								Main	Ext. main	Screw	Wrench		
BRE	20R-S	●	20	20	50	125	20	ZDMT080310R-MM	SPMT060304	ETNA02506	TW07P	1	0.3
	20R-M	●	20	20	75	150	20					1	0.3
	20R-L	●	20	25	100	200	20					2	0.3
	20R-SL	●	20	25	65	125	20					3	0.3
	25R-S	●	25	25	70	150	23	ZDMT110312.5R-MM	SPMT060304	ETNA02506	TW07P	1	0.5
	25R-M	●	25	25	95	175	23					1	0.5
	25R-L	●	25	32	100	200	23					2	0.4
	25R-SL	●	25	25	75	135	23					3	0.4
	32R-S	●	32	32	85	175	31	ZDMT130416R-MM	SDMT090308-MM	ETNA0408	TW15S	1	0.9
	32R-M	●	32	32	100	200	31					1	0.9
	32R-L	●	32	32	150	250	31					1	0.7
	32R-SL	●	32	32	75	150	31					3	0.7
	40R-S	●	40	42	85	175	41	ZPMT160520R-MM	SPMT120408-MM SPMT120508-MMN	ETNA0511	TW20S	1	1.3
	40R-M	●	40	42	100	200	41					1	1.3
	40R-L	●	40	42	150	250	41					1	1.3
	40R-SL	●	40	42	80	160	41					3	1.3
	50R-S	●	50	42	100	200	45	ZPMT160525R-MM	SPMT120408-MM SPMT120508-MMN	ETNA0511	TW20S	1	2.6
	50R-L	●	50	42	100	300	45					1	2.6
	50R-SL	●	50	42	100	250	45					3	2.6
	63R-S	●	63	42	100	200	52	ZPMT160531.5R-MM	SPMT120408-MM SPMT120508-MMN	ETNA0511	TW20S	1	3.0
	63R-L	●	63	42	100	300	52					1	3.0
	63R-SL	●	63	42	100	250	52					3	3.0
	40XR-SC40	●	40	40	110	200	54	ZPMT160520R-MM		ETNA0511	TW20S	4	1.4
	40XR-LC40		40	40	150	250	54					4	1.9
	50XR-SC50.8	●	50	50.8	110	200	57	ZPMT160525R-MM ZPMT160525R-MR		ETNA0511	TW20S	4	2.3
	50XR-LC50.8	●	50	50.8	150	250	57					4	3.0

● : Stock item ○ : Under preparing for stock

Recommended Cutting Condition

Machining • Slotting-A • Shouldering(general cutting edge)-B • Shouldering(long cutting edge)-C

Workpiece		Hardness	Cutting Condition		Mach-ining
			vc(m/min)	fz(mm/t)	
P	Carbon steel, Alloy steel (S50, SCM440)	180 ~ 280HB	260(180 ~ 310)	0.125(0.1 ~ 0.15)	A
				0.15(0.1 ~ 0.2)	B
			240(160 ~ 290)	0.1(0.05 ~ 0.15)	C
		280 ~ 380HB	190(130 ~ 230)	0.1(0.05 ~ 0.15)	A
				0.15(0.1 ~ 0.2)	B
			170(120 ~ 200)	0.1(0.05 ~ 0.15)	C
	Pre-Hardened (NAK55)	35 ~ 45HRC	170(110 ~ 190)	0.1(0.05 ~ 0.15)	A
				0.15(0.1 ~ 0.2)	B
			160(110 ~ 180)	0.1(0.05 ~ 0.15)	C
	High alloy steel (STD, STT)	≤300HB	190(130 ~ 230)	0.1(0.05 ~ 0.15)	A
				0.15(0.1 ~ 0.2)	B
			170(120 ~ 200)	0.1(0.05 ~ 0.15)	C
M	Stainless steel (STS4202J)	≤260HB	260(180 ~ 310)	0.1(0.05 ~ 0.15)	A
				0.15(0.1 ~ 0.2)	B
			240(160 ~ 290)	0.1(0.05 ~ 0.15)	C
K	General cast iron (GC250)	Tensile strength ≤350MPa	260(180 ~ 310)	0.15(0.1 ~ 0.2)	A
				0.15(0.1 ~ 0.2)	B
			240(160 ~ 290)	0.1(0.05 ~ 0.15)	C
	Ductile cast iron (GCD450)	Tensile strength 360~500MPa	200(140 ~ 240)	0.1(0.05 ~ 0.15)	A
				0.15(0.1 ~ 0.2)	B
			190(130 ~ 230)	0.1(0.05 ~ 0.15)	C
	Ductile cast iron (GCD450)	Tensile strength 500~800MPa	170(100 ~ 200)	0.1(0.05 ~ 0.15)	A
				0.15(0.1 ~ 0.2)	B
			150(110 ~ 180)	0.1(0.05 ~ 0.15)	C
H	Hardened steel (STD, STT)	45 ~ 60HRC	110(70 ~ 130)	0.15(0.1 ~ 0.2)	A
				0.15(0.1 ~ 0.2)	B
			100(60 ~ 120)	0.1(0.05 ~ 0.15)	C

• Applicable inserts, see pages E13, E18, E20, E21

Available Inserts

SDMT-MM SPMT SPMT-MM ZDMT-R-MM ZPMT-R-MM



Designation	Coated					Page
	NCM325	PC3500	PC3525	PC3545	PC6510	
SDMT 090308-MM		●				E13
SPMT 060304	●	●				E18
120408-MM		●				
120508-MMN						
ZDMT 080310R-MM		●				E20
110312.5R-MM		●				
130416R-MM		●				
ZPMT 160520R-MM		●				E21
160525R-MM		●				
160531.5R-MM		●				

● : Stock item ○ : Under preparing for stock

Parts

Screw	Wrench	
		
ETNA02506*, ETNA0408**, ETNA0511	TW15S**, TW20S	TW07P*

*BRE 20, BRE 25 **BRE 32

Chamfer Tool

Code System

Chamfer Endmill	Chamfer angle (45°)	Available Inserts		Min. Cutting Dia.	Hand of tool	Tool length	Shank diameter(Ø20)
CE	45	11 : SPMT110408-KC 12 : SPMN120308 31 : XCET310404ER-KC	11	25 : Ø25	R : Right L : Left	S : Standard M : Middle L : Long	20

CE 45 - 11 25 R - S 20

Features

- All application for chamfer
- Chamfer angle 15°, 30°, 45°, 60° for various customer's needs
- The long cutting edge provides a wide chamfering range



Back & Front Chamfer Tools

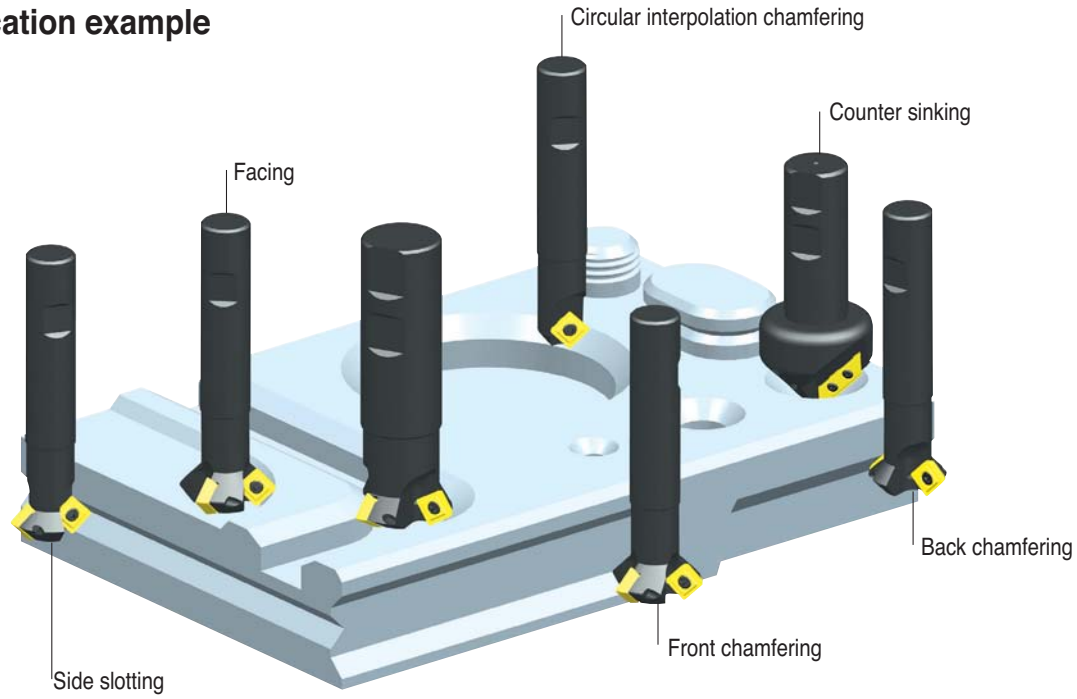


Long Chamfer Tools

Recommended Cutting Condition

Workpiece	Grades	ØD(Ø5 ~Ø20)		ØD(Ø25 ~Ø35)	
		vc (m/min)	fz (mm/t)	vc (m/min)	fz (mm/t)
P	PC3500 PC5300 ST30A	100~160	0.05~0.25	100~160	0.05~0.25
M	PC5300 PC3545	90~120	0.05~0.2	90~120	0.1~0.3
K	PC5300 G10	100~160	0.1~0.3	100~160	0.3~0.5

Application example

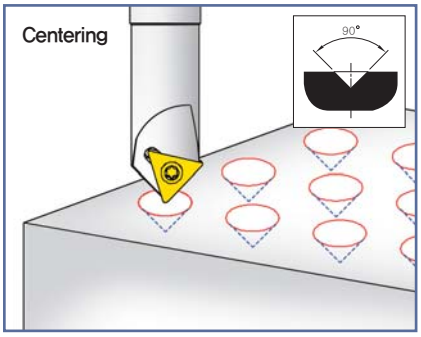


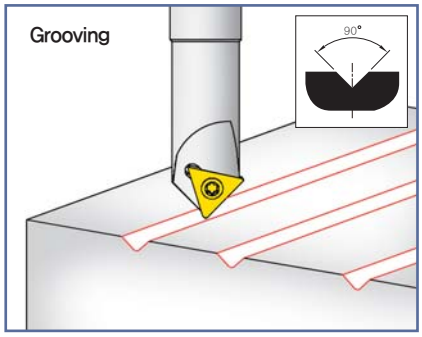
Chamfer Tool Technical Guide

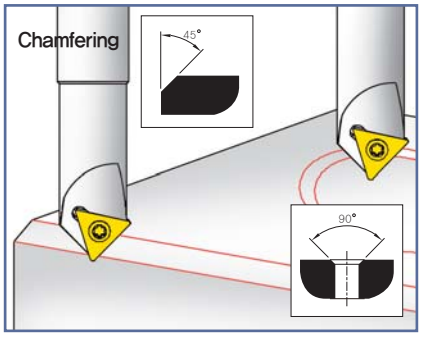
Code System

Chamfer Endmill	Chamfer angle (45°)		I/C size of insert	Min. Cutting Dia.	Hand of tool		Tool length	Shank diameter
CE	45	–	16 : TWX16R-KC 22 : TWX22R-KC	00 Ø0	R R: Right L: Left	–	S S = 90,110 L = 200	20 Ø12 Ø20 Ø25

Application area and recommended cutting condition







Workpiece	Hardness (HRC)	Centering, Grooving		Chamfering	
		vc(m/min)	fz(mm/t)	vc(m/min)	fz(mm/t)
Mild steel, Carbon steel, Alloy steel	Under HRC 30	80 ~ 200	0.01 ~ 0.04	100 ~ 250	0.04 ~ 0.06
High Carbon steel, Alloy steel	HRC 30~40	150 ~ 250	0.02 ~ 0.06	150 ~ 300	0.05 ~ 0.10
Aluminum, Copper	–	150 ~ 300	0.04 ~ 0.08	150 ~ 350	0.05 ~ 0.10
nCast iron	–	80 ~ 150	0.02 ~ 0.06	100 ~ 250	0.05 ~ 0.10
Stainless steel	–	60 ~ 120	0.01 ~ 0.03	60 ~ 150	0.03 ~ 0.06
HRSA		60 ~ 80	0.01 ~ 0.03	60 ~ 100	0.03 ~ 0.06

Note) Please keep fz. Backtouch & Chipping one caused by wrong fz

Machining examples







CE (Back & Front)

New



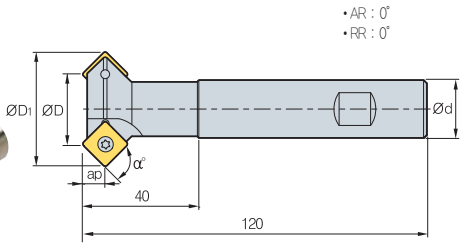


Fig. 1

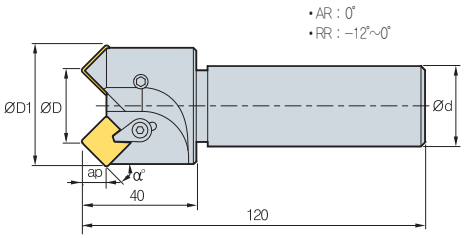


Fig. 2

(mm)

Designation		Stock		øD	øD1	ød	ap	Fig.	Available Inserts	α°(Chamfer angle) Front	α°(Chamfer angle) Back	Available rang (Min~Max)	Uses
CE	15-1125R-S20	●	2	25	30.5	20	9.5	1	SPMT110408 - KC	15°	-	Ø25~Ø30	Front chantering
	30-1125R-S20	●	2	25	35.5	20	8.5	1		30°	60°	Ø25~Ø35	Front, Back chantering
	45-1107R-S20	●	1	7	21.9	20	7.0	1		45°	-	Ø7~Ø21	Front chantering
	45-1119R-S20	●	2	19	33.9	20	7.0	1		45°	45°	Ø19~Ø33	Front, Back chantering
	45-1125R-S20	●	3	25	39.9	20	7.0	1		45°	45°	Ø25~Ø39	Front, Back chantering
	60-1125R-S32	●	3	25	43.3	32	5.0	1		60°	30°	Ø25~Ø42	Front, Back chantering
CE	45-1207R-S32	●	1	7	23.3	32	7.8	2	SPMN120308	45°	-	Ø7~Ø22	Front chantering
	45-1220R-S32	●	2	20	37.3	32	7.8	2		45°	-	Ø21~Ø36	Front chantering
	45-1225R-S32	○	2	25	42.3	32	7.8	2		45°	-	Ø26~Ø41	Front chantering
	45-1235R-S32	●	2	35	52.3	32	7.8	2		45°	-	Ø36~Ø51	Front chantering

● : Stock item ○ : Under preparing for stock

Parts

	Screw	Clamp	C-Ring	Wrench	
					
CE□□-11□□R-S	FTKA0408	-	-	TW15S	-
CE□□-12□□R-S	CHX0617L	CH6R2	CR05	-	HW30L

• Applicable inserts, see pages E18

Available Inserts

SPMT-KC	SPMN
	

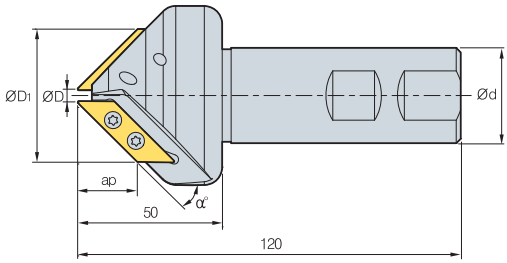
Designation	Coated	Uncoated		Page
	PC3500	ST30A	G10	
SPMT 110408-KC	●	●	●	E18
SPMN 120308		●		E18

● : Stock item ○ : Under preparing for stock

CE (Long Champer)

• AR : −5°~1°
• RR : 0°





(mm)

Designation		Stock		ØD	ØD1	Ød	ap	α°(Chamfer angle)	Available rang (Min~Max)	Uses
CE	30-3105R-S32	●	1	5	35	32	26	30°	Ø5~Ø35	Front Chamfering
	45-3105R-S32	●	2	5	48	32	21	45°	Ø5~Ø48	Front Chamfering
	60-3105R-S32	●	2	5	57	32	15	60°	Ø5~Ø57	Front Chamfering

● : Stock item ○ : Under preparing for stock

Parts

	Screw	Wrench
		
CE□□-31□□R-S	FTKA03510	TW15S

• Applicable inserts, see pages E20

Available Inserts

XCET-KC



Designation	Coated	Uncoated		Page
	NC5330	ST30A	G10	
XCET 310404ER-KC	●	●	●	E20

● : Stock item ○ : Under preparing for stock

CE(Multi-functional)



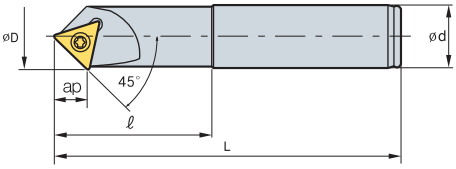


Fig. 1

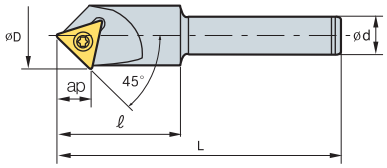


Fig. 2

(mm)

Designation		Stock	øD	ød	ℓ	L	ap	Fig.	Available Inserts	Available rang (Min~Max)	Uses
CE	45-1600R-S12	●	22	12	40	90	10	2	TWX16R-KC	Ø0 ~ Ø20	Centering
	45-1600R-S20	●	22	20	50	110	10	1	TWX16R-KC	Ø0 ~ Ø20	Grooving
	45-1600R-L20	●	22	20	60	200	10	1	TWX16R-KC	Ø0 ~ Ø20	Chamfering
	45-2200R-S12	●	29	12	40	90	14	2	TWX22R-KC	Ø0 ~ Ø27	
	45-2200R-S25	●	29	25	50	110	14	1	TWX22R-KC	Ø0 ~ Ø27	
	45-2200R-L25	●	29	25	60	200	14	1	TWX22R-KC	Ø0 ~ Ø27	

● : Stock item ○ : Under preparing for stock

Parts

Screw	Wrench
	
FTNA0408	TW15L

• Applicable inserts, see pages E20

Available Inserts

TWX-KC



Designation	Coated		Page
	PC3500	PC5300	
TWX 16R-KC	●	○	E20
TWX 22R-KC	●	○	

● : Stock item ○ : Under preparing for stock

Centering Tool



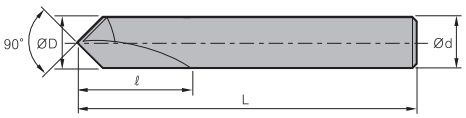


Fig. 1

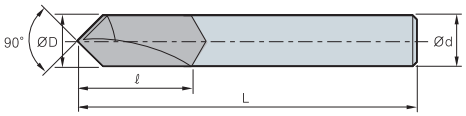


Fig. 2

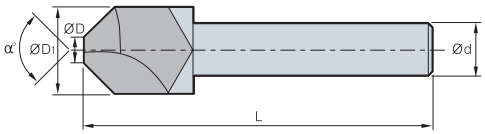
(mm)

Designation		øD	ød	ℓ	L	Fig.
CT	060S	6	6	13	60	1
	080S	8	8	23	80	1
	100S	10	10	24	100	1
	120B	12	12	28	120	2
	160B	16	16	32	160	2
	200B	20	20	35	200	2

• Centering Tool : CT(D/d– ℓ/L)
• Order made for coating, coolant, special Dia.

Counter Sink





(mm)

Designation		◎	øD	øD1	ød	α°	L
CS	100-90	3	4	10	10	90°	70
	200-90	4	8	20	12	90°	85
	300-90	4	16	30	16	90°	120
	100-60	3	4	10	10	60°	70
	200-60	4	8	20	12	60°	85
	300-60	4	16	30	16	60°	120

• Centering Tool : CT(D/d– ℓ/L)
• Order made for coating, coolant, special Dia.

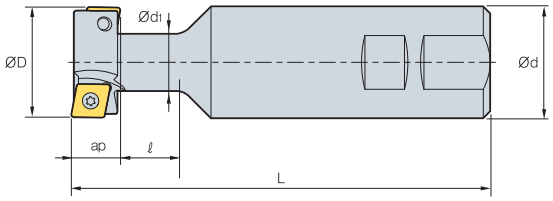
TFE

New

AA 90°

• AR : 5°
• RR : -5°





(mm)

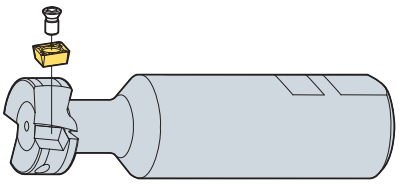
Designation		Stock R	Stock L	⊚	øD	ød	ød1	ℓ	L	ap	Available Inserts
TFE	2125R/L	●		2	21	25	10.5	20	109	9	CPMT06
	2525R/L	●		2	25	25	12.5	21	112	11	CPMT08
	3232R/L	●		2	32	32	16.5	26	120	14	CPMT09
	4032R/L	●		2	40	32	20.5	32	130	18	CPMH12
	5032R/L	●		4	50	32	26.5	38	140	22	CPMH12

● : Stock item ○ : Under preparing for stock

Parts

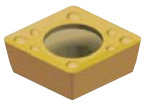
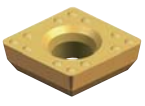
	Screw	Wrench
		
2125R/L	FTNA02555	TW08S
2525R/L	FTNA0306	TW09S
3232R/L	FTNA0407	TW15S
4032R/L	PTMA0511A	TW15S
5032R/L	PTMA0511A	TW15S

Assembling



• Applicable inserts, see pages E07
• Available Arbors and bolt : E215~E217

Available Inserts

	CPMT	CPMH
		

Designation	Coated PC3500	Page
CPMT 060204-MM	●	E07
080308-MM	●	
09T308-MM	●	
CPMH 120408-MM	●	E07

● : Stock item ○ : Under preparing for stock

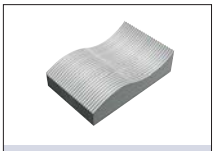
Pro-A Mill

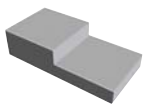
Features

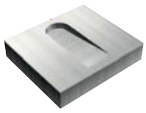
- Buffed on top face of insert ensure good chip control and reduces built-up edge
- Small size modular type for aluminum machining
- Various line up of modular system for aluminum machining
- For shouldering, curved surface and ramping
- High rake angle chip breaker ensures excellent surface roughness
- Improved cooling effect and chip control by through coolant system even deep pocket machining






Copying


Shouldering


Ramping


Through coolant system

Pro-A mill series

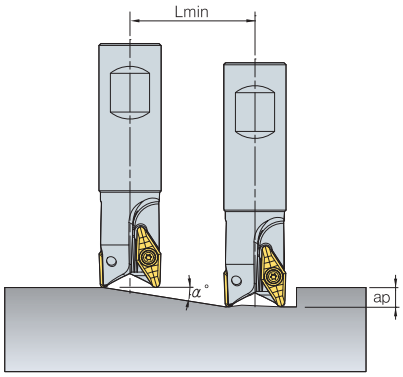
Series	Pro-A mill		Through coolant system
Pro-A 2000	  	• Modular : Ø12~Ø42 • Shank : Ø12~Ø42 • Insert : VDKT11T210N-MA VDKT11T220N-MA	O
Pro-A 4000	  	• cutter : Ø40~Ø100 • Shank : Ø32~Ø40 • Insert : VCKT220530N-MA	O

Recommended Cutting Condition

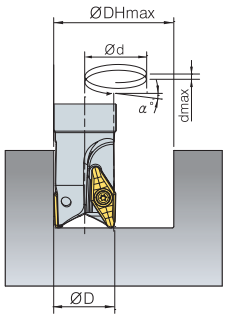
Workpiece		Cutting speed vc(m/min)
Aluminum alloy	Rm 〈 280 MPa Rm 〉 280 MPa	1000 800
Copper alloy	Long chip	250
Thermo plastic	-	300
Aluminum alloy	Si 〈 12%	800
Copper alloy	Short chip	400
Magnesium alloy	-	400
Duroplastics	-	150

Pro-A Mill Ramping & Helical cutting technical data

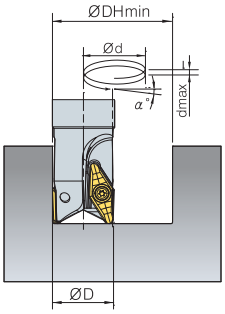
1. Ramping



2. Blind hole Helical cutting



3. Thru hole Helical cutting



Designation	ØD(mm)	Ramping		Blind hole Helical cutting				Thru hole Helical cutting	
		α°(max)	Lmin(mm)	ØDHmax(mm)	dmax(mm)	ØDHmin(mm)	dmax(mm)	ØDHmin(mm)	dmax(mm)
PAS2012HS	12	11.9	38	23	4.8	21	4.4	19	4.0
PAS2016HS	16	12.5	36	31	6.9	29	6.4	27	6.0
PAS2020HS	20	9.7	47	39	6.7	37	6.3	35	6.0
PAS2025HS	25	7.6	60	49	6.5	47	6.3	45	6.0
PAS2032HS	32	5.8	79	63	6.4	61	6.2	59	6.0
PAS2042HS	42	4.3	105	83	6.3	81	6.2	79	6.0
PAS4032HS	32	24.4	22	59	26.8	54	24.5	40	18.2
PAS4040HS	40	18.4	30	75	25.0	70	23.3	56	18.7
PAS4050HS	50	14.0	40	95	23.8	90	22.5	76	19.0
PAS4063HS	63	10.7	53	121	22.8	116	21.9	102	19.2
PAC(M)4080HS	80	8.1	70	155	22.1	150	21.4	136	19.4
PAC(M)4100HS	100	6.3	90	195	21.7	190	21.1	176	19.6

- Lmin : when ap=8mm
- Lmin : Minimum inclination cutting length

α° : Max. rampig angle
ap : Depth of cut

$$Lmin = \frac{ap}{\tan \alpha^{\circ}} \ (mm)$$

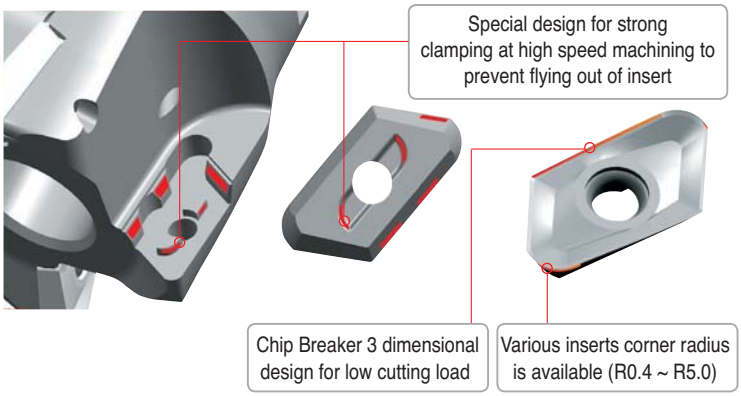
Pro-X Mill

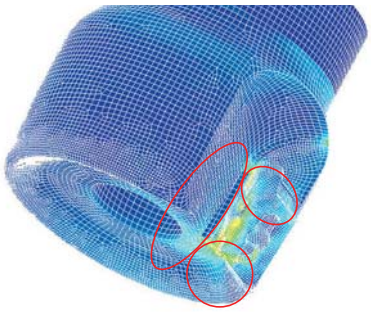
Features

- Strong clamping due to the concave part of insert bottom side
- Good chip flow and less build up edge have been acquired due to buffed surface of insert
- High rake angle of insert provides good surface finish and low cutting load
- Specially designed for high speed machining of aluminum
- Suitable for square shouldering and curved surface machining



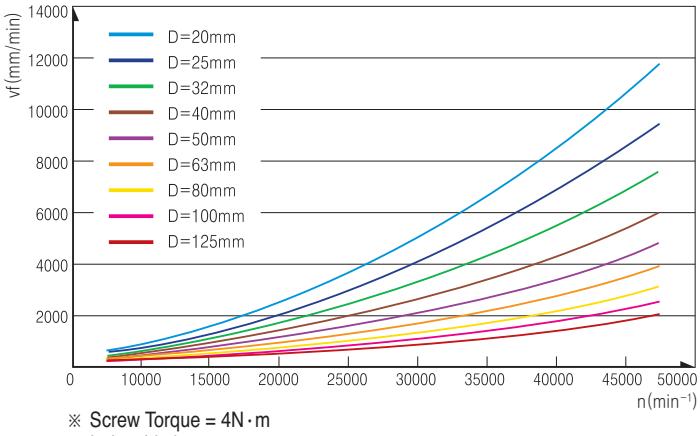
Clamping system for high speed





• Clamping design as per FEM analysis
• Strong clamping of insert

Centrifugal force as per RPM



※ Screw Torque = 4N·m
※ Indexable insert : 6.8g

Marking [• Designation • Max. RPM]



Max. RPM as per cutting diameter

Cutting diameter ØD(mm)		Max. RPM	
5000 type	6000 type	n(min⁻¹)	vc(m/min)
20	–	15,000	940
25	25	32,600	2,559
32	32	28,800	2,894
40	40	25,800	3,240
50	50	23,000	3,611
63	63	20,500	4,055
80	80	18,200	4,572
100	100	16,300	5,118
125	125	14,600	5,731

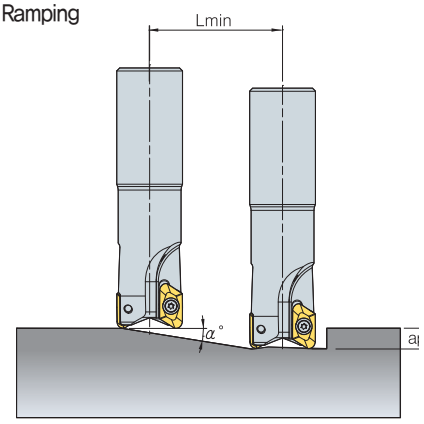
※ In case of actual machining accidental breakage of insert or tool could happen even under the written RPM special cover or door is necessary to prevent damage from broken insert or broken tool

Recommended Cutting Condition

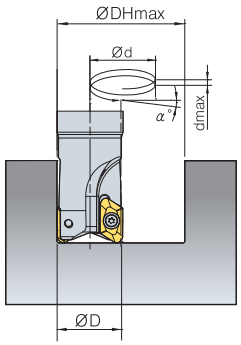
Workpiece		Cutting Speed vc(m/min)	Feed fz(mm/t)
Aluminum alloy	Rm280 MPa	1200	0.3
	Rm280 MPa	1000	0.25
Copper alloy	Long chipping	400	0.2
Thermo plastic	-	350	0.15
Aluminum alloy	Si 12%	1000	0.25
	Si ≥12%	-	-
Copper alloy	Short chipping	500	0.2
Magnesium alloy	-	450	0.2
Duroplastics	-	200	0.15

Pro-X Mill Ramping & Helical cutting technical data

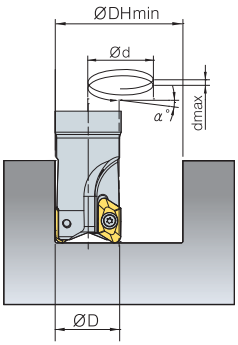
1. Ramping



2. Blind hole Helical cutting



3. Thru hole Helical cutting

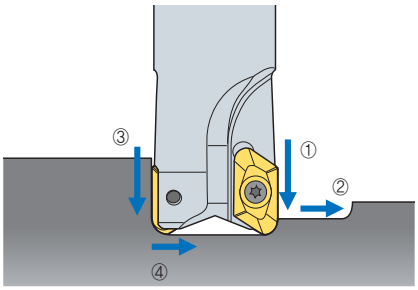


Designation	ØD(mm)	Ramping		Blind hole Helical cutting				Thru hole Helical cutting	
		α°(max)	Lmin(mm)	ØDHmax(mm)	dmax(mm)	ØDHmin(mm)	dmax(mm)	ØDHmin(mm)	dmax(mm)
PAXS5020HS	20	8.4	68	34	5.0	32	4.7	27	4.0
PAXS5025HS	25	13.2	43	44	10.4	42	9.9	34	8.0
PAXS5032HS	32	9.5	60	58	9.7	56	9.3	48	8.0
PAXS5040HS	40	7.1	80	74	9.3	72	9.0	64	8.0
PAXCM5050HS	50	5.4	105	94	9.0	92	8.8	84	8.0
PAXCM5063HS	63	4.2	138	120	8.7	118	8.6	110	8.0
PAXC(M)5080HS	80	3.2	180	154	8.6	152	8.4	144	8.0
PAXC(M)5100HS	100	2.5	230	194	8.4	192	8.3	184	8.0
PAXC(M)5125HS	125	2.0	293	244	8.3	242	8.3	234	8.0
PAXS6025HS	25	9.0	63	44	6.9	42	6.6	38	6.0
PAXS6032HS	32	6.6	87	58	6.7	56	6.5	52	6.0
PAXS6040HS	40	12.1	47	74	15.9	72	15.4	56	12.0
PAXCM6060HS	50	9.0	63	94	14.8	92	14.5	76	12.0
PAXCM6063HS	63	6.7	85	120	14.1	118	13.9	102	12.0
PAXC(M)6080HS	80	5.0	113	154	13.6	152	13.4	136	12.0
PAXC(M)6100HS	100	3.9	147	194	13.2	192	13.1	176	12.0
PAXC(M)6125HS	125	3.0	188	244	13.0	242	12.8	226	12.0

- Lmin : when ap=10mm
- Lmin : Minimum inclination cutting length
  α° : Max. rampig angle
  ap : Depth of cut

$$Lmin = \frac{ap}{\tan \alpha^{\circ}} \ (mm)$$

Plunging, Slotting, Drilling technical data



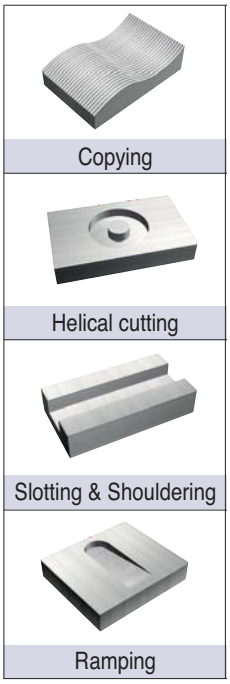
1. When drilling, grooving machining sequence is ① → ② → ③ → ④
2. When drilling, grooving, decrease the feed and cutting speed 30%~50% from the recommended data

- Cutting condition for drilling

Holder	ap(mm)	
	5000 Type	6000 Type
Ø20	8	-
Ø25	4	11
Ø32	4	6
Ø40~125	4	6

Insert	ap(mm)
XETK19	4
XETK25	6

Machining example

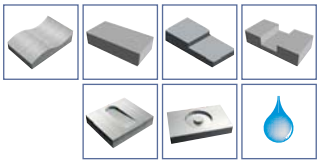


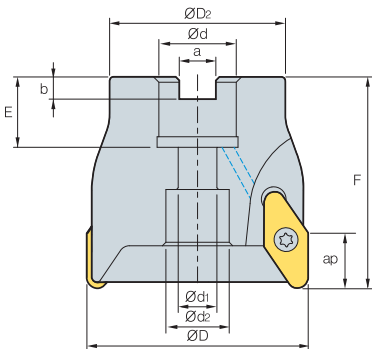
PAC(M)4000



AA 90°

• AR : 0°
• RR : -3°





(mm)

Designation		Stock R	Stock L	⊙	øD	øD2	ød	ød1	ød2	a	b	E	F	ap	kg
PAC(M)	4040HR	●		3	40	32	16	9	11.5	8.4	5.6	20	55	15	0.2
	4050HR	●		3	50	40	22	11	18	10.4	6.3	20	55	15	0.3
	4063HR	●		4	63	50	22	11	18	10.4	6.3	20	60	15	0.6
	4080HR	●		4	80	60	25.4(27)	14	20	9.5(12.4)	6.0(7.0)	25(25)	60	15	1.0
	4100HR	●		5	100	80	31.75(32)	- (18)	44(26)	12.7(14.4)	8.0	37(26)	60	15	1.6

Note) Through coolant type between Ø40~Ø100 • ( )Metric Size ● : Stock item ○ : Under preparing for stock

Parts

Screw	Wrench
	
PTNC04511	TW 20S

Available Arbors

Designation		Ød	Available Arbors
PAC(M)	4040HS	16	BT□□-FMC16-□□
	4050HS	22	BT□□-FMC22-□□
	4063HS	22	BT□□-FMC22-□□
	4080HS	25.4	BT□□-FMA25.4-□□
		27	BT□□-FMC27-□□
	4100HS	31.75	BT□□-FMA31.75-□□
		32	BT□□-FMC32-□□

• Applicable inserts, see pages E20
• Available Arbors and bolt : E172~E174

Available Inserts

VCKT-MA



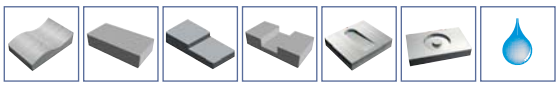
Designation	Uncoated H01	Page
VCKT 220530N-MA	●	E20

● : Stock item ○ : Under preparing for stock

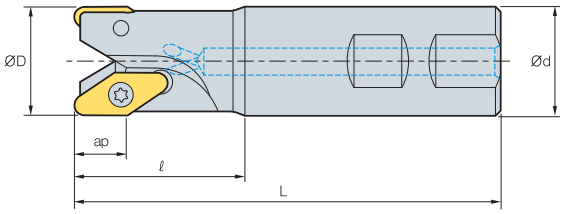
PAS2000/4000

AA 90°

• AR : 0°~7°
• RR : -21°~-3°







(mm)

Designation		Stock R	Stock L		øD	ød	ℓ	L	ap	kg
PAS	2012HR	●		1	12	16	25	85	8	0.1
	2016HR	●		2	16	16	25	90	8	0.11
	2020HR	●		2	20	20	30	100	8	0.2
	2025HR	●		3	25	25	35	115	8	0.36
	2032HR			4	32	32	40	125	8	0.66
	2042HR			5	42	32	42	130	8	0.84
PAS	4032HR	●		2	32	32	50	125	15	0.6
	4040HR	●		3	40	32	50	140	15	0.8
	4040HR-S40			3	40	40	60	150	15	1.2
	4040HR-S42			3	40	42	60	150	15	1.2

Note) Through coolant type between Ø12~Ø40

● : Stock item ○ : Under preparing for stock

Parts

	Screw	Wrench
		
2000Type	ETNA02505, ETNA02506	TW 07S
4000Type	FTNC04509	TW 20S

• Applicable inserts, see pages E20

Available Inserts

	VDKT-MA	VCKT-MA
		

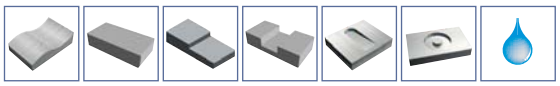
Type	Designation	Uncoated H01	Page
2000Type	VDKT 11T210N-MA	●	E20
4000Type	VCKT 220530N-MA	●	E20

● : Stock item ○ : Under preparing for stock

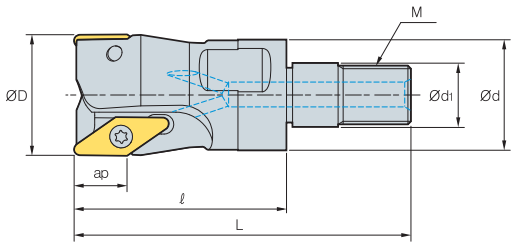
PAM2000

AA 90°

• AR : 7°~10°
• RR : -21°~-9°







(mm)

Designation		Stock		øD	ød	ød1	ℓ	L	M	ap	kg
PAM	2012HR-M06	○	1	12	11.0	6.5	33	48	M06	8	0.02
	2016HR-M08	●	2	16	14.5	8.5	36	53	M08	8	0.04
	2020HR-M10	●	2	20	18.0	10.5	36	57	M10	8	0.06
	2025HR-M12	●	3	25	22.5	12.5	41	65	M12	8	0.1
	2032HR-M16	○	4	32	28.5	17.0	45	72	M16	8	0.18
	2042HR-M16	○	5	42	28.5	17.0	45	72	M16	8	0.27

Note) Through coolant type between Ø12~Ø42

● : Stock item ○ : Under preparing for stock

Parts

Screw	Wrench
	
ETNA02505*, ETNA02506	TW 07S

*PAM2012 · 2016

Available Adaptors

Designation		Available Adaptors
PAM	2012HR-M06	MAT - M06
	2016HR-M08	MAT - M08
	2020HR-M10	MAT - M10
	2025HR-M12	MAT - M12
	2032HR-M16	MAT - M16
	2042HR-M16	MAT - M16

Designation : PAM2012HR-M12
Modular Head Threading Measure size(M16)
=
Adaptor Spec. : MAT-M12-030-S20S
Adaptor Threading Measure(M16)

• Applicable inserts, see pages E20
• Available Adaptors : E133~E134

Available Inserts

VDKT-MA



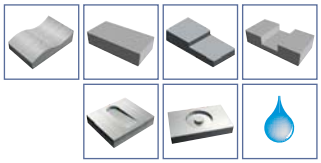
Designation	Uncoated H01	Page
VDKT 11T210N-MA	●	E20

● : Stock item ○ : Under preparing for stock

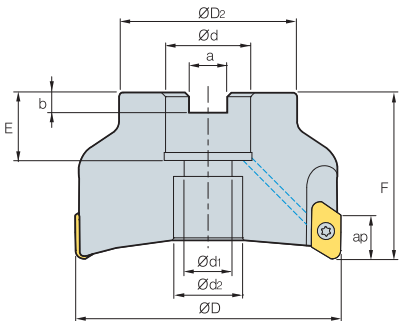
PAXC(M)5000/6000

AA 90°

• AR : 8°~17.5°
• RR : -9.5°~-5°







(mm)

Designation		Stock A	Stock B	⊚	ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	Max rpm	ap	kg
PAXC(M)	5040HR-A,B	(●)	(●)	3	40	34	16	9	14	8.4	5.6	19	40	25,800	17	0.15
	5050HR-A,B	(●)	(●)	4	50	42	22	11	18	10.4	6.3	21	50	23,000	17	0.3
	5063HR-A,B	(●)	(●)	5(4)	63	49	22	11	18	10.4	6.3	21	50	20,500	17	0.56
	5080HR-A,B	●(●)	●(●)	5	80	57	25.4(27)	14	20	9.5(12.4)	6(7)	24(23)	50	18,200	17	1.0
	5100HR-A,B	●(●)	●(●)	6	100	67	31.75(32)	18	26	12.7(14.4)	8(8)	32(26)	63	16,300	17	2.3
	5125HR-A,B	●(●)	(●)	7	125	87	38.1(40)	22	32	15.9(16.4)	10(9)	35(29)	63	14,600	17	3.2
PAXC(M)	6050HR-A,B	(●)		2	50	42	16	9	14	8.4	5.6	18	50	23,000	23	0.32
New	6063HR-A,B	(●		3	63	49	22	11	18	10.4	6.3	21	50	20,500	23	0.53
	6080HR-A,B	●(●	(●)	4	80	57	25.4(27)	14	20	9.5(12.4)	6(7)	25(23)	50	18,200	23	0.73
	6100HR-A,B	●(●)	(●)	5	100	67	31.75(32)	18	26	12.7(14.4)	8(8)	32.5(26)	63	16,300	23	1.7
	6125HR-A,B	(●)	(●)	6	125	87	38.1(40)	22	32	15.9(16.4)	10(9)	35(29)	63	14,600	23	3.06

• A type : Insert NoseR 0.4~3.2, B type : Insert NoseR 4.0~5.0
Note) Through coolant type between Ø40~Ø125

• ( )Metric Size

● : Stock item ○ : Under preparing for stock

Parts

	Screw	Wrench
		
5000Type	PTKA0408	TW 15S
6000Type	FTGA0513	TW 20S

Available Arbors

Designation		Ød	적용 아버
PAXC(M)	5040HR-A,B	16	BT□□-FMC16-□□
	5050HR-A,B	22	BT□□-FMC22-□□
	5063HR-A,B	22	BT□□-FMC22-□□
	5080HR-A,B	25.4	BT□□-FMA25.4-□□
		27	BT□□-FMC27-□□
	5100HR-A,B	31.75	BT□□-FMA31.75-□□
		32	BT□□-FMC32-□□
	5125HR-A,B	38.1	BT□□-FMA38.1-□□
		40	BT□□-FMC40-□□
PAXC(M)	6050HR-A,B	16	BT□□-FMC16-□□
	6063HR-A,B	22	BT□□-FMC22-□□
	6080HR-A,B	25.4	BT□□-FMA25.4-□□
		27	BT□□-FMC27-□□
	6100HR-A,B	31.75	BT□□-FMA31.75-□□
		32	BT□□-FMC32-□□
	6125HR-A,B	38.1	BT□□-FMC40-□□
		40	BT□□-FMC40-□□

• Applicable inserts, see pages E20
• Available Arbors and bolt : E215~E217

Available Inserts

XEKT-MA



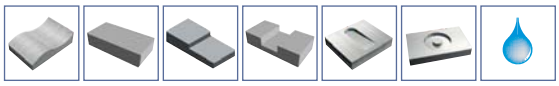
Type	Designation		Coated PD2000	Uncoated H01	Page
5000Type	XEKT	19M504FR-MA	●	●	E20
		19M508FR-MA	●	●	
		19M512FR-MA	●	●	
		19M516FR-MA	●	●	
		19M518FR-MA	●	●	
		19M520FR-MA	●	●	
		19M530FR-MA	●	●	
		19M532FR-MA	●	●	
		19M540FR-MA	●	●	
		19M550FR-MA	●	●	
6000Type	XEKT	250604FR-MA		●	E20
	New	250608FR-MA		●	
		250612FR-MA		●	
		250616FR-MA		●	
		250620FR-MA		●	
		250630FR-MA		●	
		250632FR-MA		●	
		250640FR-MA		●	
		250650FR-MA		●	

● : Stock item ○ : Under preparing for stock

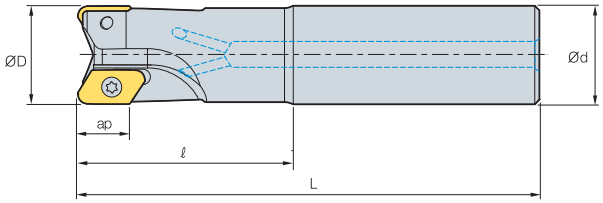
PAXS5000/6000

AA 90°

• AR : 5°~10°
• RR : -14°~-5°







(mm)

Designation		Stock A	Stock B	⊚	ØD	Ød	ℓ	L	Max rpm	ap	kg
PAXS	5020HR-A,B	●	●	1	20	20	60	130	15,000	17	0.24
	5025HR-A,B	●	●	2	25	25	60	140	32,600	17	0.4
	5025HR-A,B-L200			2	25	25	60	200	32,600	17	0.63
	5032HR-A,B	●	●	2	32	32	70	150	28,800	17	0.74
	5032HR-A,B-L220			2	32	32	70	220	28,800	17	1.2
New	5040HR-A,B-S32			3	40	40	70	160	25,800	17	1.0
New	5040HR-A,B-L220			3	40	40	70	220	25,800	17	1.4
New	5040HR-A,B-S40			3	40	40	70	160	25,800	17	1.3
	5040HR-A,B-S42			3	40	40	70	160	25,800	17	1.4
AXS	6025HR-A,B	●		1	25	25	60	140	32,600	23	0.42
New	6025HR-A,B-L200	●		1	25	25	60	200	32,600	23	0.63
	6032HR-A,B	●		1	32	32	70	150	28,800	23	0.72
	6032HR-A,B-L220			1	32	32	70	220	28,800	23	1.14
	6040HR-A,B-S32	●		2	40	32	70	160	25,800	23	0.88
	6040HR-A,B-L220	●		2	40	32	70	220	25,800	23	1.23
	6040HR-A,B-S40			2	40	40	70	160	25,800	23	1.2
	6040HR-A,B-S42			2	40	42	70	160	25,800	23	1.3

• A type : Insert NoseR 0.4~3.2, B type : Insert NoseR 4.0~5.0
Note) Through coolant type between Ø20~Ø40

● : Stock item ○ : Under preparing for stock

Parts

	Screw	Wrench
		
5000Type	PTKA0408	TW 15S
6000Type	FTGA0513	TW 20S

• Applicable inserts, see pages E20

Available Inserts

XEKT-MA



Type	Designation		Coated PD2000	Uncoated H01	Page
5000Type	XEKT	19M504FR-MA	●	●	E20
		19M508FR-MA	●	●	
		19M512FR-MA	●	●	
		19M516FR-MA	●	●	
		19M518FR-MA	●	●	
		19M520FR-MA	●	●	
		19M530FR-MA	●	●	
		19M532FR-MA	●	●	
		19M540FR-MA	●	●	
		19M550FR-MA	●	●	
6000Type	XEKT	250604FR-MA		●	E20
	New	250608FR-MA		●	
		250612FR-MA		●	
		250616FR-MA		●	
		250620FR-MA		●	
		250630FR-MA		●	
		250632FR-MA		●	
		250640FR-MA		●	
		250650FR-MA		●	

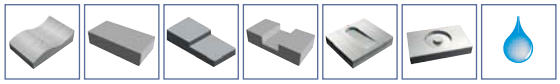
● : Stock item ○ : Under preparing for stock

PAXM5000

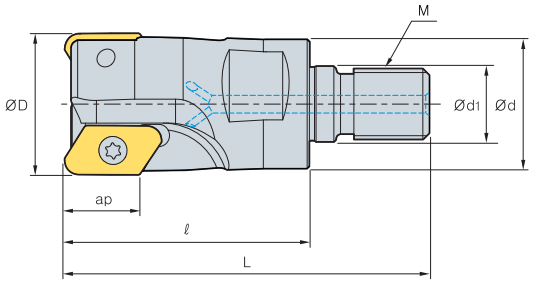
New

AA 90°

• AR : 6°~8°
• RR : -7°~-5°







(mm)

Designation		Stock A	Stock B	⊙	øD	ød	ød1	ℓ	L	M	ap	kg
PAXM	5025HR-A,B-M12	○		2	25	23	12.5	55	79	M12	17	0.12
	5032HR-A,B-M16	○		2	32	29	17.0	55	82	M16	17	0.2
	5040HR-A,B-M16	○		3	40	29	17.0	55	82	M16	17	0.4

• A type : Insert NoseR 0.4~3.2, B type : Insert NoseR 4.0~5.0
Note) Through coolant type between Ø25~Ø40

● : Stock item ○ : Under preparing for stock

Parts

Screw	Wrench
	
PTKA0407/PTKA0408	TW 15S

• For PAXM5025

Available Adaptors

Designation		Available Adaptors
PAXM	5025HR-A,B-M12	MAT - M12
	5032HR-A,B-M16	MAT - M16
	5040HR-A,B-M16	MAT - M16

Designation : PAXM5025HR-M12
Modular Head Threading Measure size(M16)

=

Adaptor Spec. : MAT-M12-030-S25S
Adaptor Threading Measure(M16)

• Applicable inserts, see pages E20
• Available Adaptors : E133~E134

Available Inserts

XEKT-MA



Designation		Coated PD2000	Uncoated H01	Page
XEKT	19M504FR-MA	●	●	E20
	19M508FR-MA	●	●	
	19M512FR-MA	●	●	
	19M516FR-MA	●	●	
	19M518FR-MA	●	●	
	19M520FR-MA	●	●	
	19M530FR-MA	●	●	
	19M532FR-MA	●	●	
	19M540FR-MA	●	●	
	19M550FR-MA	●	●	

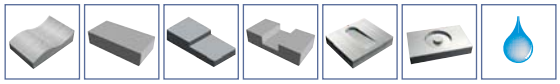
● : Stock item ○ : Under preparing for stock

HSK63A/100A PAX5000

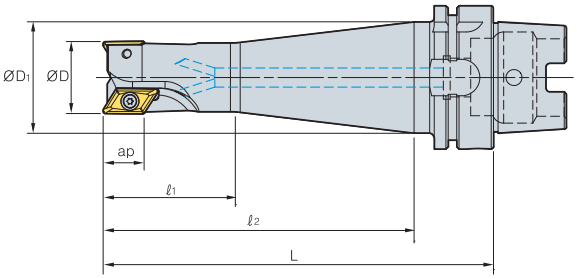
New

AA 90°

• AR : 5°~17.5°
• RR : -14°~-5°







(mm)

Designation	Stock A	Stock B	⊚	ØD	ØD1	L1	L2	L	ap	kg
HSK63T PAX5032HR-A, B			2	32	53	58	137	163	17	1.14
HSK100T PAXCM5080HR-A, B			5	80	-	-	66	95	17	4
PAXCM5100HR-A, B			6	100	-	-	66	95	17	4.6

• A type : Insert NoseR 0.4~3.2, B type : Insert NoseR 4.0~5.0
• Max Rake Angle & Max rpm can be refered to E124~E125
Note) Through coolant type between Ø32, 80, 100

● : Stock item ○ : Under preparing for stock

Parts

Screw	Wrench
	
PTKA0407/PTKA0408	TW 15S

• Applicable inserts, see pages E20

Available Inserts

XEKT-MA



Designation	Coated PD2000	Uncoated H01	Page
XEKT 19M504FR-MA	●	●	E20
19M508FR-MA	●	●	
19M512FR-MA	●	●	
19M516FR-MA	●	●	
19M518FR-MA	●	●	
19M520FR-MA	●	●	
19M530FR-MA	●	●	
19M532FR-MA	●	●	
19M540FR-MA	●	●	
19M550FR-MA	●	●	

● : Stock item ○ : Under preparing for stock

MAT(Steel Shank type)



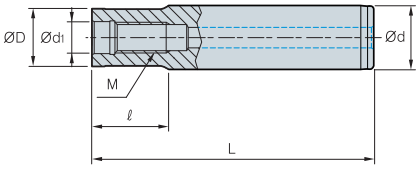


Fig. 1

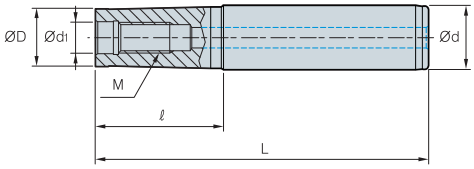


Fig. 2

(mm)

Designation	Stock	øD	ød	ød1	ℓ	L	M	Fig.
MAT M06-020-S10S	●	9.5	10	6.5	20	70	M06	1
M6B-020-S12S	●	11.0	12	6.5	20	76	M06	1
M6B-040-S12S	●	11.0	12	6.5	40	96	M06	1
M08-020-S16S	●	14.5	16	8.5	20	80	M08	1
M10-030-S20S	●	18.0	20	10.5	30	100	M10	1
M12-030-S25S	●	22.5	25	12.5	29	110	M12	1
M16-035-S32S	●	28.5	32	17.0	35	125	M16	1
M06-040-S12T	●	9.5	12	6.5	40	96	M06	2
M06-065-S16T	●	9.5	16	6.5	65	125	M06	2
M6B-065-S16T	●	11.0	16	6.5	65	125	M06	2
M6B-080-S16T	●	11.0	16	6.5	80	140	M06	2
M08-040-S16T	●	14.5	16	8.5	40	100	M08	2
M08-065-S16T	●	14.5	16	8.5	65	125	M08	2
M08-080-S20T	●	14.5	20	8.5	80	150	M08	2
M08-110-S25T	●	14.5	25	8.5	110	190	M08	2
M10-050-S20T	●	18.0	20	10.5	50	120	M10	2
M10-070-S20T	●	18.0	20	10.5	70	140	M10	2
M10-090-S25T	●	18.0	25	10.5	90	170	M10	2
M10-110-S25T	●	18.0	25	10.5	110	190	M10	2
M10-130-S32T	●	18.0	32	10.5	130	220	M10	2
M12-050-S25T	●	22.5	25	12.5	50	130	M12	2
M12-070-S25T	●	22.5	25	12.5	70	150	M12	2
M12-090-S25T	●	22.5	25	12.5	90	170	M12	2
M12-110-S32T	●	22.5	32	12.5	110	200	M12	2
M12-175-S40T	●	22.5	40	12.5	175	300	M12	2
M16-055-S32T	●	28.5	32	17.0	55	145	M16	2
M16-080-S32T	●	28.5	32	17.0	80	170	M16	2
M16-120-S32T	●	28.5	32	17.0	120	210	M16	2
M16-175-S40T	●	28.5	40	17.0	175	300	M16	2

• Applicable Modular, see pages : E28(FMRM, LBE, PAM, AMM, RM4PM, HRMM, PAXM)

• S : Straight Neck Adapter
• T : Taper Neck Adapter

● : Stock item ○ : Under preparing for stock

MAT-C(Carbide Shank type)



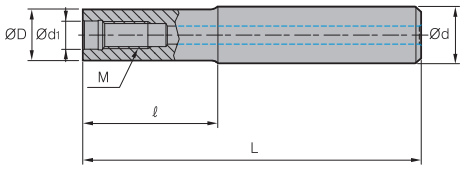


Fig. 1

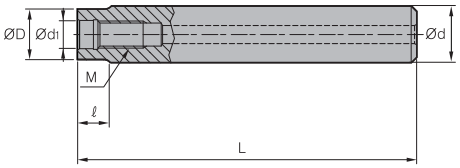


Fig. 2

(mm)

Designation	Stock	ØD	Ød	Ød1	ℓ	L	M	Fig.
MAT M08-080-S16S-C	●	14.5	16	8.5	80	150	M08	1
M08-110-S16S-C	●	14.5	16	8.5	110	180	M08	1
M08-150-S16S-C	●	14.5	16	8.5	150	250	M08	1
New M08-010-S16S-C-150	●	14.5	16	8.5	10	150	M08	2
New M08-010-S16S-C-180	●	14.5	16	8.5	10	180	M08	2
New M08-010-S16S-C-250	●	14.5	16	8.5	10	250	M08	2
M10-090-S20S-C	●	18.0	20	10.5	90	170	M10	1
M10-110-S20S-C	●	18.0	20	10.5	110	200	M10	1
M10-175-S20S-C	●	18.0	20	10.5	175	300	M10	1
New M10-010-S20S-C-170	●	18.0	20	10.5	10	170	M10	2
New M10-010-S20S-C-200	●	18.0	20	10.5	10	200	M10	2
New M10-010-S20S-C-300	●	18.0	20	10.5	10	300	M10	2
M12-090-S25S-C	●	22.5	25	12.5	90	170	M12	1
M12-110-S25S-C	●	22.5	25	12.5	110	200	M12	1
M12-175-S25S-C	●	22.5	25	12.5	175	300	M12	1
New M12-015-S25S-C-170	●	22.5	25	12.5	15	170	M12	2
New M12-015-S25S-C-200	●	22.5	25	12.5	15	200	M12	2
New M12-015-S25S-C-300	●	22.5	25	12.5	15	300	M12	2
M16-090-S32S-C	●	28.5	32	17.0	90	180	M16	1
M16-120-S32S-C	●	28.5	32	17.0	120	210	M16	1
M16-175-S32S-C	●	28.5	32	17.0	175	300	M16	1
New M16-020-S32S-C-180	●	28.5	32	17.0	20	180	M16	2
New M16-020-S32S-C-210	●	28.5	32	17.0	20	210	M16	2
New M16-020-S32S-C-300	●	28.5	32	17.0	20	300	M16	2

• Applicable Modular, see pages : E28(FMRM, LBE, PAM, AMM, RM4PM, HRMM, PAXM)

● : Stock item ○ : Under preparing for stock

Adjusting side cutter

Korloy code system (mm)

Insert clamping way
- R : Radial type (Using SDXT)
- T : Tangential type (Using CNHQ)

Insert configuration
- FC : Full side cutter
- HC : Half side cutter

Cutter diameter(Ø)

Minimum width of the cutter

Hand of tool

Unmarked	R	L
Neutral	Right	Left
Full side cutter Plane type	Half side cutter Boss type	

R A FC B 125 14 18 – R

Adjusting
- A : Adjusting side cutter

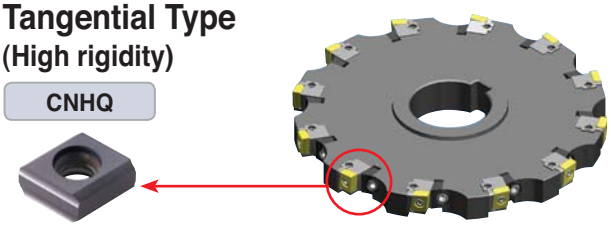
Cutter type
- P : Plane type
- B : Boss type

Maximum width of the cutter

For half side cutter, minimum width of the cutter will be written only.

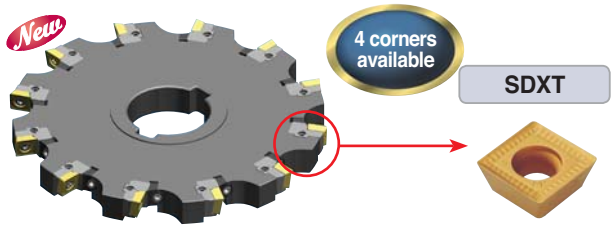
Tangential Type (High rigidity)

CNHQ



- Medium/Roughing
- Excellent performance at medium to roughing range (14~30mm) table operation due to the strong rigidity of the cutter
- Good performance in heavy interruption and deep depth of cut application

Radial Type (Low cutting load)

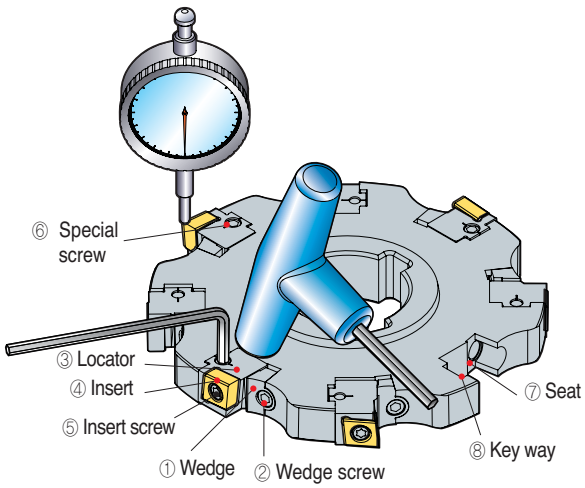


- Medium/Finishing
- Suitable for small width cutting operation (12~24mm)
- 3 dimensional chip breaker provides smooth cutting operation.
- Several chip breakers as per applications are available (MF, MM, FA)
- Economical insert using 4 cutting edges per insert

Insert Features

- Precise adjustable side cutter can control the width of the cutter by 5㎛ unit
- Since the width of the cutter is adjustable up to ±1.5mm, single cutter can cover various cutting width
- Specially designed clamping system of the locator provides excellent rigidity by using elastic deformation of the locator
- Tangential type clamping system of insert provides enough strength can withstand big width of cutting operation
- 3-dimensional chip breaker of insert provides smooth cutting with low cutting load at medium to finishing range

Operating manual



How to assemble the adjusting side cutter
1. Clamp ①wedge slightly on ⑦locator-wedge pocket by using ②wedge screw
2. Put ③locator on ⑦locator-wedge pocket along with the ⑧key-way
3. Tighten the ⑥taper screw little bit to set proper position of locator
4. Tighten the ②wedge screw tightly by using 70~80N.m torque
5. After put the ④insert on insert pocket of ③locator, clamp it with ⑤insert screw by using 40~50N.m torque

How to adjust Run-out & Cutting width
1. Settle the adjusting side cutter after cleaning to the jig for measurement
2. Un-screw the ②Wedge screw first, then tighten ①wedge slightly again by using 8N.m torque
3. Adjusting the height of cutting edge by using a dial gauge to set the width of the cutter
4. Tighten the ②wedge screw tightly by using 70~80N.m torque
5. To finish the setting, tighten the ⑥taper screw for strong clamp

Tangential type

Cutting width as per insert & type of cutter


CNHQ

Designation	Coated		Cutting width for half side cutter (ap)	Cutting width for full side cutter (ap)	L	d	t
	NCM325	PC6510					
CNHQ1005-C0.5	○	○	9.0	14~18	10	10	5.4
-R0.5							
-C1.0			8.5	14~17			
-R1.0							
CNHQ1305-C0.5	○	○	12	18~21 / 21~24	12.7	10	5.4
-R0.5							
-C1.0	○	○	11.5	18~21 / 21~23			
-R1.0							
-C1.5			11	18~21 / 21~22			
-R1.5							
CNHQ1606-C0.5	○	○	15	24~27 / 27~30	16	12	6.4
-R0.5							
-C1.0	○	○	14.5	24~27 / 27~29			
-R1.0	○	○					
-C1.5			14	24~27 / 27~28			
-R1.5							
-C2.0			13.5	24~27			
-R2.0							

● : Stock item ○ : Under preparing for stock

• Applicable holder : E187, E188 • Available Arbors and bolt : E172~E174

Recommended Cutting Condition

ISO	Grades	vc(m/min)	fz(mm/t)
P	NCM325	150~300	0.1~0.3
	PC3535	100~300	
M	PC9530	100~180	0.1~0.3
	NCM335	120~200	
K	PC215K	150~250	0.1~0.3
	PC6510	150~300	

Radial type

Cutting width as per insert & type of cutter


MA MF MM

Designation	Coated							Uncoated	Cutting width for half side cutter (ap)	Cutting width for full side cutter (ap)	d	t
	NCM325	NCM335	PC3535	PC3545	PC9530	PC6510	PC8520	H01				
SDXT09M405R-MA								●	8	12~14 14~16	9.525	4
SDXT09M405L-MA												
SDXT09M405R-MF	●	●	○		●	○	●					
SDXT09M405L-MF												
SDXT09M405R-MM	●	●	●		●	●	●					
SDXT09M405L-MM	○					○						
SDXT130508R-MA								●	10.5	16~18 18~20 20~22 22~24	13.5	5.56
SDXT130508L-MA												
SDXT130508R-MF	●	●	○		●	○	●					
SDXT130508L-MF												
SDXT130508R-MM	●	●	●	•	●	●	●					
SDXT130508L-MM	○						○					

● : Stock item ○ : Under preparing for stock

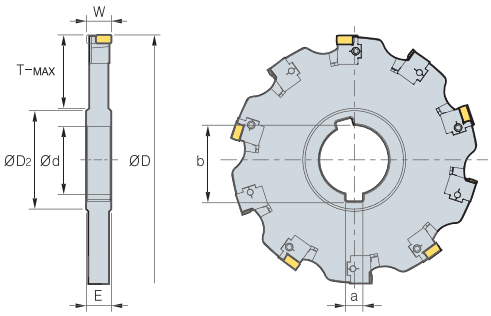
• Applicable holder : E187, E188 • Available Arbors and bolt : E172~E174

Recommended Cutting Condition

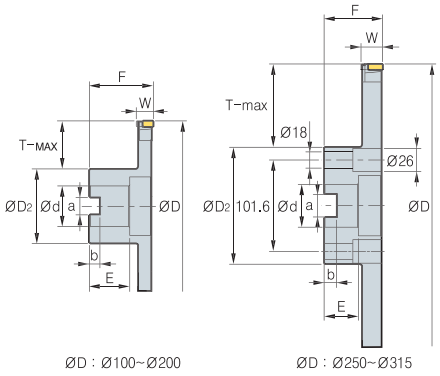
ISO	Grades	vc(m/min)	fz(mm/t)
P	NCM325	120~250	0.08~0.3
	NCM335	120~220	0.08~0.25
	PC3535	100~220	0.1~0.25
M	PC9530	80~180	0.1~0.25
	NCM335		
K	PC8520	150~230	0.1~0.25
	PC6510	180~250	

Tangential type (Full side cutter)

New



• TAFCP



ØD : Ø100~Ø200

ØD : Ø250~Ø315

• TAFCB

Designation		Ød	E	ØD2	a	b	T-MAX	Designation		Ød	F	ØD2	a	b	E	T-MAX	Dimensions ØD	W	No. of tooth
TAFCP	1001418	31.75	14	48	7.92	35.2	24	TAFCB	1001418R/L	31.75	50	54	12.7	8	28	21	100	14-18	6
	1251418	38.1	14	56	9.52	42.3	32		1251418R/L	38.1	60	70	15.9	10	30	25	125	14-18	8
	1601418	38.1	14	56	9.52	42.3	50		1601418R/L	38.1	60	70	15.9	10	30	43	160	14-18	10
	2001418	50.8	14	72	12.7	55.8	61		2001418R/L	50.8	65	90	19.0	11	30	53	200	14-18	12
	2501418	50.8	14	72	12.7	55.8	86		2501418R/L	47.625	65	130	25.4	14	38	58	250	14-18	16
	3151418	50.8	14	72	12.7	55.8	118		3151418R/L	47.625	65	130	25.4	14	38	90	315	14-18	20
TAFCP	1001821	31.75	18	48	7.92	35.2	24	TAFCB	1001821R/L	31.75	50	50	12.7	8	28	21	100	18-21	6
	1251821	38.1	18	56	9.52	42.3	32		1251821R/L	38.1	60	70	15.9	10	30	25	125	18-21	8
	1601821	38.1	18	56	9.52	42.3	50		1601821R/L	38.1	60	70	15.9	10	30	43	160	18-21	10
	2001821	50.8	18	72	12.7	55.8	61		2001821R/L	50.8	65	90	19.0	11	30	53	200	18-21	12
	1501821	50.8	18	72	12.7	55.8	86		2501821R/L	47.625	65	130	25.4	14	38	58	250	18-21	16
	3151821	50.8	18	72	12.7	55.8	118		3151821R/L	47.625	65	130	25.4	14	38	90	315	18-21	20
TAFCP	1002124	31.75	21	48	7.92	35.2	24	TAFCB	1002124R/L	31.75	50	54	12.7	8	28	21	100	21-24	6
	1252124	38.1	21	56	9.52	42.3	32		1252124R/L	38.1	60	70	15.9	10	30	25	125	21-24	8
	1602124	38.1	21	56	9.52	42.3	50		1602124R/L	38.1	60	70	15.9	10	30	43	160	21-24	10
	2002124	50.8	21	72	12.7	55.8	61		2002124R/L	50.8	65	90	19.0	11	30	53	200	21-24	12
	2502124	50.8	21	72	12.7	55.8	86		2502124R/L	47.625	65	130	25.4	14	38	58	250	21-24	16
	3152124	50.8	21	72	12.7	55.8	118		3152124R/L	47.625	65	130	25.4	14	38	90	315	21-24	20
TAFCP	1252427	38.1	24	56	9.52	42.3	32	TAFCB	1252427R/L	38.1	60	70	15.9	10	30	25	125	24-27	8
	1602427	38.1	24	56	9.52	42.3	50		1602427R/L	38.1	60	70	15.9	10	30	43	160	24-27	10
	2002427	50.8	24	72	12.7	55.8	61		2002427R/L	50.8	65	90	19.0	11	30	53	200	24-27	12
	2502427	50.8	24	72	12.7	55.8	86		2502427R/L	47.625	65	130	25.4	14	38	58	250	24-27	16
	3152427	50.8	24	72	12.7	55.8	118		3152427R/L	47.625	65	130	25.4	14	38	90	315	24-27	20
TAFCP	1252730	38.1	27	56	9.52	42.3	32	TAFCB	1252730R/L	38.1	60	70	15.9	10	30	25	125	27-30	8
	1602730	38.1	27	56	9.52	42.3	50		1602730R/L	38.1	60	70	15.9	10	30	43	160	27-30	10
	2002730	50.8	27	72	12.7	55.8	61		2002730R/L	50.8	65	90	19.0	11	30	53	200	27-30	12
	2502730	50.8	27	72	12.7	55.8	86		2502730R/L	47.625	65	130	25.4	14	38	58	250	27-30	16
	3152730	50.8	27	72	12.7	55.8	118		3152730R/L	47.625	65	130	25.4	14	38	90	315	27-30	20

• The ap (Maximium width of cutter) size written above is the number when using insert having corner size C0.5 or R0.5

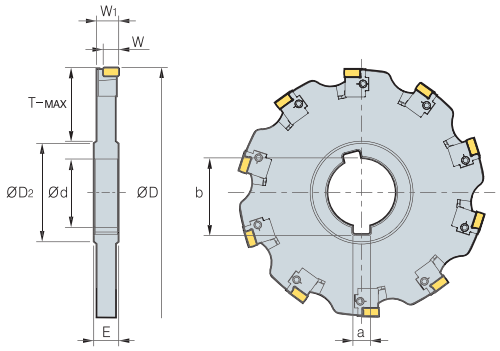
• See the page **E**186 for applicable insert and recommended cutting condition
• Order - made item

Available Insert & Parts

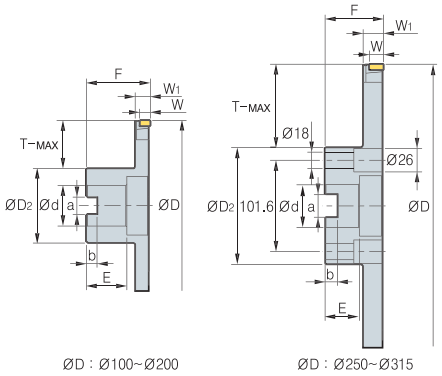
Edge width (TAFCPM) (TAFCBM)	Insert	Locator	Wedge	Screw (Insert)	Screw (Wedge)	Screw (Locator)	Wrench (Insert)	Wrench (Wedge)	Wrench (Locator)
									
□□□1418R/L	CNHQ1005-□□□	LSA-CH10R/L	WSA10N	FTKA0410	DHA0617	SHGA0411	TW15S	HW30	-
□□□1821R/L	CNHQ1305-□□□	LSA-CH13R/L	WSA13N	FTKA0410	DHA0821F	SHGA0411	TW15S	HW40	HW30L
□□□2124R/L	CNHQ1305-□□□	LSA-CH13R/L	WSA13N	FTKA0410	DHA0821F	SHGA0411	TW15S	HW40	HW30L
□□□2427R/L	CNHQ1606-□□□	LSA-CH16R/L	WSA13N	FTGA0513-P	DHA0821F	SHGA0411	TW20S	HW40	HW30L
□□□2730R/L	CNHQ1606-□□□	LSA-CH16R/L	WSA13N	FTGA0513-P	DHA0821F	SHGA0411	TW20S	HW40	HW30L

• Note) The Wedge screw for 1001821, 1002124 cutter is DHA0818F

Tangential type (Half side cutter) New



• TAHCP



ØD : Ø100~Ø200 ØD : Ø250~Ø315

• TAHCB

Designation		Ød	E	ØD2	a	b	T-MAX
TAHCP	10014R/L	31.75	14	48	7.92	35.2	24
	12514R/L	38.1	14	56	9.52	42.3	32
	16014R/L	38.1	14	56	9.52	42.3	50
	20014R/L	50.8	14	72	12.7	55.8	61
	25014R/L	50.8	14	72	12.7	55.8	86
	31514R/L	50.8	14	72	12.7	55.8	118
TAHCP	10018R/L	31.75	18	48	7.92	35.2	24
	12518R/L	38.1	18	56	9.52	42.3	32
	16018R/L	38.1	18	56	9.52	42.3	50
	20018R/L	50.8	18	72	12.7	55.8	61
	25018R/L	50.8	18	72	12.7	55.8	86
	31518R/L	50.8	18	72	12.7	55.8	118
TAHCP	10021R/L	31.75	21	48	7.92	35.2	24
	12521R/L	38.1	21	56	9.52	42.3	32
	16021R/L	38.1	21	56	9.52	42.3	50
	20021R/L	50.8	21	72	12.7	55.8	61
	25021R/L	50.8	21	72	12.7	55.8	86
	31521R/L	50.8	21	72	12.7	55.8	118
TAHCP	12524R/L	38.1	24	56	9.52	42.3	32
	16024R/L	38.1	24	56	9.52	42.3	50
	20024R/L	50.8	24	72	12.7	55.8	61
	25024R/L	50.8	24	72	12.7	55.8	86
	31524R/L	50.8	24	72	12.7	55.8	118
TAHCP	12527R/L	38.1	27	56	9.52	42.3	32
	16027R/L	38.1	27	56	9.52	42.3	50
	20027R/L	50.8	27	72	12.7	55.8	61
	25027R/L	50.8	27	72	12.7	55.8	86
	31527R/L	50.8	27	72	12.7	55.8	118

Designation		Ød	F	ØD2	a	b	E	T-MAX	Dimensions ØD	W	W1	No. of tooth
TAHCB	10014R/L	31.75	50	54	12.7	8	28	21	100	9	13.25	6
	12514R/L	38.1	60	70	15.9	10	30	25	125	9	13.25	8
	16014R/L	38.1	60	70	15.9	10	30	43	160	9	13.25	10
	20014R/L	50.8	65	90	19.0	11	30	53	200	9	13.25	12
	25014R/L	47.625	65	130	25.4	14	38	58	250	9	13.25	16
	31514R/L	47.625	65	130	25.4	14	38	90	315	9	13.25	20
TAHCB	10018R/L	31.75	50	50	12.7	8	28	21	100	12	16.75	6
	12518R/L	38.1	60	70	15.9	10	30	25	125	12	16.75	8
	16018R/L	38.1	60	70	15.9	10	30	43	160	12	16.75	10
	20018R/L	50.8	65	90	19.0	11	30	53	200	12	16.75	12
	25018R/L	47.625	65	130	25.4	14	38	58	250	12	16.75	16
	31518R/L	47.625	65	130	25.4	14	38	90	315	12	16.75	20
TAHCB	10021R/L	31.75	50	54	12.7	8	28	21	100	12	19.75	6
	12521R/L	38.1	60	70	15.9	10	30	25	125	12	19.75	8
	16021R/L	38.1	60	70	15.9	10	30	43	160	12	19.75	10
	20021R/L	50.8	65	90	19.0	11	30	53	200	12	19.75	12
	25021R/L	47.625	65	130	25.4	14	38	58	250	12	19.75	16
	31521R/L	47.625	65	130	25.4	14	38	90	315	12	19.75	20
TAHCB	12524R/L	38.1	60	70	15.9	10	30	25	125	15	22.75	8
	16024R/L	38.1	60	70	15.9	10	30	43	160	15	22.75	10
	20024R/L	50.8	65	90	19.0	11	30	53	200	15	22.75	12
	25024R/L	47.625	65	130	25.4	14	38	58	250	15	22.75	16
	31524R/L	47.625	65	130	25.4	14	38	90	315	15	22.75	20
TAHCB	12527R/L	38.1	60	70	15.9	10	30	25	125	15	25.75	8
	16027R/L	38.1	60	70	15.9	10	30	43	160	15	25.75	10
	20027R/L	50.8	65	90	19.0	11	30	53	200	15	25.75	12
	25027R/L	47.625	65	130	25.4	14	38	58	250	15	25.75	16
	31527R/L	47.625	65	130	25.4	14	38	90	315	15	25.75	20

• The ap (Maximium width of cutter) size written above is the number when using insert having corner size C0.5 or R0.5

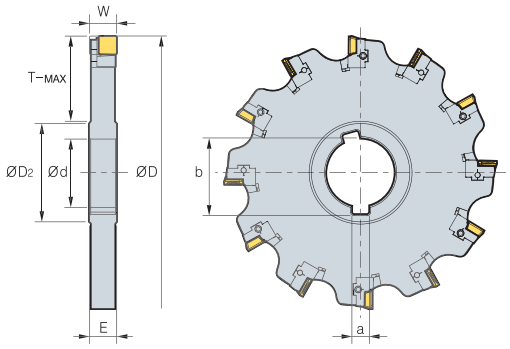
• See the page E186 for applicable insert and recommended cutting condition
• Order - made item

Available Insert & Parts

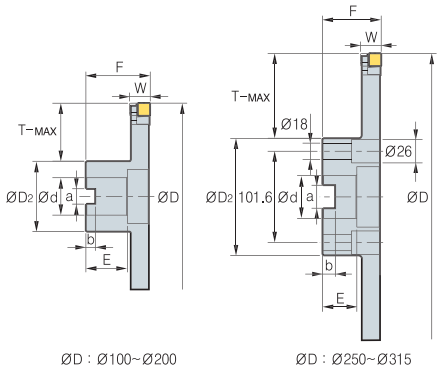
Edge width (TAHCPM) (TAHCBM)	Insert	Locator	Wedge	Screw (Insert)	Screw (Wedge)	Screw (Locator)	Wrench (Insert)	Wrench (Wedge)	Wrench (Locator)
□□□14R/L	CNHQ1005-□□□	LSA-CH10R/L	WSA10N	FTKA0410	DHA0617	SHGA0411	TW15S	HW30	-
□□□18R/L	CNHQ1305-□□□	LSA-CH13R/L	WSA13N	FTKA0410	DHA0821F	SHGA0411	TW15S	HW40	HW30L
□□□21R/L	CNHQ1305-□□□	LSA-CH13R/L	WSA13N	FTKA0410	DHA0821F	SHGA0411	TW15S	HW40	HW30L
□□□24R/L	CNHQ1606-□□□	LSA-CH16R/L	WSA13N	FTGA0513-P	DHA0821F	SHGA0411	TW20S	HW40	HW30L
□□□27R/L	CNHQ1606-□□□	LSA-CH16R/L	WSA13N	FTGA0513-P	DHA0821F	SHGA0411	TW20S	HW40	HW30L

Radial type (Full side cutter)

New



• RAFCP



• RAFCB

Designation		Ød	E	ØD2	a	b	T-MAX
RAFCP	1001214	31.75	12	48	7.92	35.2	24
	1251214	38.1	12	56	9.52	42.3	32
	1601214	38.1	12	56	9.52	42.3	50
	2001214	50.8	12	72	12.7	55.8	61
	2501214	50.8	12	72	12.7	55.8	86
	3151214	50.8	12	72	12.7	55.8	118
RAFCP	1001416	31.75	14	48	7.92	35.2	24
	1251416	38.1	14	56	9.52	42.3	32
	1601416	38.1	14	56	9.52	42.3	50
	2001416	50.8	14	72	12.7	55.8	61
	2501416	50.8	14	72	12.7	55.8	86
	3151416	50.8	14	72	12.7	55.8	118
RAFCP	1251618	38.1	16	56	9.52	42.3	32
	1601618	38.1	16	56	9.52	42.3	50
	2001618	50.8	16	72	12.7	55.8	61
	2501618	50.8	16	72	12.7	55.8	86
	3151618	50.8	16	72	12.7	55.8	118
RAFCP	1251820	38.1	18	56	9.52	42.3	32
	1601820	38.1	18	56	9.52	42.3	50
	2001820	50.8	18	72	12.7	55.8	61
	2501820	50.8	18	72	12.7	55.8	86
	3151820	50.8	18	72	12.7	55.8	118
RAFCP	1252022	38.1	20	56	9.52	42.3	32
	1602022	38.1	20	56	9.52	42.3	50
	2002022	50.8	20	72	12.7	55.8	61
	2502022	50.8	20	72	12.7	55.8	86
	3152022	50.8	20	72	12.7	55.8	118
RAFCP	1252224	38.1	22	56	9.52	42.3	32
	1602224	38.1	22	56	9.52	42.3	50
	2002224	50.8	22	72	12.7	55.8	61
	2502224	50.8	22	72	12.7	55.8	86
	3152224	50.8	22	72	12.7	55.8	118

Designation		Ød	F	ØD2	a	b	E	T-MAX	Dimensions ØD	W	No. of tooth
RAFCB	1001214R/L	31.75	50	54	12.7	8	28	21	100	12-14	6
	1251214R/L	38.1	60	70	15.9	10	30	25	125	12-14	8
	1601214R/L	38.1	60	70	15.9	10	30	43	160	12-14	10
	2001214R/L	50.8	65	90	19.0	11	30	53	200	12-14	12
	2501214R/L	47.625	65	130	25.4	14	38	58	250	12-14	16
	3151214R/L	47.625	65	130	25.4	14	38	90	315	12-14	20
RAFCB	1001416R/L	31.75	50	50	12.7	8	28	21	100	14-16	6
	1251416R/L	38.1	60	70	15.9	10	30	25	125	14-16	8
	1601416R/L	38.1	60	70	15.9	10	30	43	160	14-16	10
	2001416R/L	50.8	65	90	19.0	11	30	53	200	14-16	12
	2501416R/L	47.625	65	130	25.4	14	38	58	250	14-16	16
	3151416R/L	47.625	65	130	25.4	14	38	90	315	14-16	20
RAFCB	1251618R/L	38.1	60	70	15.9	10	30	25	125	16-18	8
	1601618R/L	38.1	60	70	15.9	10	30	43	160	16-18	10
	2001618R/L	50.8	65	90	19.0	11	30	53	200	16-18	12
	2501618R/L	47.625	65	130	25.4	14	38	58	250	16-18	16
	3151618R/L	47.625	65	130	25.4	14	38	90	315	16-18	20
RAFCB	1251820R/L	38.1	60	70	15.9	10	30	25	125	18-20	8
	1601820R/L	38.1	60	70	15.9	10	30	43	160	18-20	10
	2001820R/L	50.8	65	90	19.0	11	30	53	200	18-20	12
	2501820R/L	47.625	65	130	25.4	14	38	58	250	18-20	16
	3151820R/L	47.625	65	130	25.4	14	38	90	315	18-20	20
RAFCB	1252022R/L	38.1	60	70	15.9	10	30	25	125	20-22	8
	1602022R/L	38.1	60	70	15.9	10	30	43	160	20-22	10
	2002022R/L	50.8	65	90	19.0	11	30	53	200	20-22	12
	2502022R/L	47.625	65	130	25.4	14	38	58	250	20-22	16
	3152022R/L	47.625	65	130	25.4	14	38	90	315	20-22	20
RAFCB	1252224R/L	38.1	60	70	15.9	10	30	25	125	22-24	8
	1602224R/L	38.1	60	70	15.9	10	30	43	160	22-24	10
	2002224R/L	50.8	65	90	19.0	11	30	53	200	22-24	12
	2502224R/L	47.625	65	130	25.4	14	38	58	250	22-24	16
	3152224R/L	47.625	65	130	25.4	14	38	90	315	22-24	20

• The ap (Maximium width of cutter) size written above is the number when using insert having corner size C0.5 or R0.5

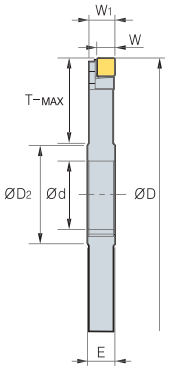
• See the page **E**186 for applicable insert and recommended cutting condition
• Order - made item

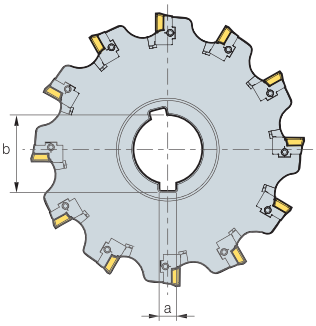
Available Insert & Parts

Edge width (RAFCPM) (RAFCBM)	Insert	Locator	Wedge WSD09N	Wedge WSA10N	Screw (Insert)	Screw (Wedge)	Screw (Locator)	Wrench (Insert)	Wrench (Locator, Wedge)
									
□□□1214R/L	SDXT09M40□R/L	LSD09R/L	WSD09N		FTGA03508	DHA0617	SHGA0409	TW15S	HW30
□□□1416R/L	SDXT09M40□R/L	LSD09R/L	WSD09N		FTGA03508	DHA0617	SHGA0409	TW15S	HW30
□□□1618R/L	SDXT13050□R/L	LSD13R/L	WSA10N		FTNC04509	DHA0617	SHGA0411	TW20S	HW30
□□□1820R/L	SDXT13050□R/L	LSD13R/L	WSA10N		FTNC04509	DHA0617	SHGA0411	TW20S	HW30
□□□2022R/L	SDXT13050□R/L	LSD13R/L	WSA10N		FTNC04509	DHA0617	SHGA0411	TW20S	HW30
□□□2224R/L	SDXT13050□R/L	LSD13R/L	WSA10N		FTNC04509	DHA0617	SHGA0411	TW20S	HW30

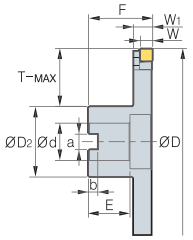
Radial type (Half side cutter)

New

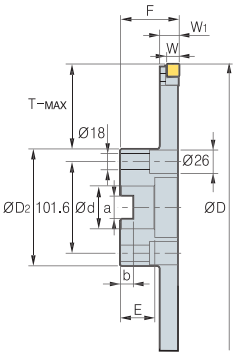




• RAHCP



ØD : Ø100~Ø200



ØD : Ø250~Ø315

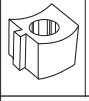
• RAHCB

Designation		Ød	E	ØD2	a	b	T-MAX
RAHCP	10012R/L	31.75	12	48	7.92	35.2	24
	12512R/L	38.1	12	56	9.52	42.3	32
	16012R/L	38.1	12	56	9.52	42.3	50
	20012R/L	50.8	12	72	12.7	55.8	61
	25012R/L	50.8	12	72	12.7	55.8	86
	31512R/L	50.8	12	72	12.7	55.8	118
RAHCP	10014R/L	31.75	14	48	7.92	35.2	24
	12514R/L	38.1	14	56	9.52	42.3	32
	16014R/L	38.1	14	56	9.52	42.3	50
	20014R/L	50.8	14	72	12.7	55.8	61
	25014R/L	50.8	14	72	12.7	55.8	86
	31514R/L	50.8	14	72	12.7	55.8	118
RAHCP	12516R/L	38.1	16	56	9.52	42.3	32
	16016R/L	38.1	16	56	9.52	42.3	50
	20016R/L	50.8	16	72	12.7	55.8	61
	25016R/L	50.8	16	72	12.7	55.8	86
	31516R/L	50.8	16	72	12.7	55.8	118
RAHCP	12518R/L	38.1	18	56	9.52	42.3	32
	16018R/L	38.1	18	56	9.52	42.3	50
	20018R/L	50.8	18	72	12.7	55.8	61
	25018R/L	50.8	18	72	12.7	55.8	86
	31518R/L	50.8	18	72	12.7	55.8	118
RAHCP	12520R/L	38.1	20	56	9.52	42.3	32
	16020R/L	38.1	20	56	9.52	42.3	50
	20020R/L	50.8	20	72	12.7	55.8	61
	25020R/L	50.8	20	72	12.7	55.8	86
	31520R/L	50.8	20	72	12.7	55.8	118
RAHCP	12522R/L	38.1	22	56	9.52	42.3	32
	16022R/L	38.1	22	56	9.52	42.3	50
	20022R/L	50.8	22	72	12.7	55.8	61
	25022R/L	50.8	22	72	12.7	55.8	86
	31522R/L	50.8	22	72	12.7	55.8	118

Designation		Ød	F	ØD2	a	b	E	T-MAX	Dimensions ØD	W	W1	No. of tooth
RAHCB	10012R/L	31.75	50	54	12.7	8	28	21	100	8	11.1	6
	12512R/L	38.1	60	70	15.9	10	30	25	125	8	11.1	8
	16012R/L	38.1	60	70	15.9	10	30	43	160	8	11.1	10
	20012R/L	50.8	65	90	19.0	11	30	53	200	8	11.1	12
	25012R/L	47.625	65	130	25.4	14	38	58	250	8	11.1	16
	31512R/L	47.625	65	130	25.4	14	38	90	315	8	11.1	20
RAHCB	10014R/L	31.75	50	50	12.7	8	28	21	100	8	13.1	6
	12514R/L	38.1	60	70	15.9	10	30	25	125	8	13.1	8
	16014R/L	38.1	60	70	15.9	10	30	43	160	8	13.1	10
	20014R/L	50.8	65	90	19.0	11	30	53	200	8	13.1	12
	25014R/L	47.625	65	130	25.4	14	38	58	250	8	13.1	16
	31514R/L	47.625	65	130	25.4	14	38	90	315	8	13.1	20
RAHCB	12516R/L	38.1	60	70	15.9	10	30	25	125	10.5	15	8
	16016R/L	38.1	60	70	15.9	10	30	43	160	10.5	15	10
	20016R/L	50.8	65	90	19.0	11	30	53	200	10.5	15	12
	25016R/L	47.625	65	130	25.4	14	38	58	250	10.5	15	16
	31516R/L	47.625	65	130	25.4	14	38	90	315	10.5	15	20
RAHCB	12518R/L	38.1	60	70	15.9	10	30	25	125	10.5	17	8
	16018R/L	38.1	60	70	15.9	10	30	43	160	10.5	17	10
	20018R/L	50.8	65	90	19.0	11	30	53	200	10.5	17	12
	25018R/L	47.625	65	130	25.4	14	38	58	250	10.5	17	16
	31518R/L	47.625	65	130	25.4	14	38	90	315	10.5	17	20
RAHCB	12520R/L	38.1	60	70	15.9	10	30	25	125	10.5	19	8
	16020R/L	38.1	60	70	15.9	10	30	43	160	10.5	19	10
	20020R/L	50.8	65	90	19.0	11	30	53	200	10.5	19	12
	25020R/L	47.625	65	130	25.4	14	38	58	250	10.5	19	16
	31520R/L	47.625	65	130	25.4	14	38	90	315	10.5	19	20
RAHCB	12522R/L	38.1	60	70	15.9	10	30	25	125	10.5	21	8
	16022R/L	38.1	60	70	15.9	10	30	43	160	10.5	21	10
	20022R/L	50.8	65	90	19.0	11	30	53	200	10.5	21	12
	25022R/L	47.625	65	130	25.4	14	38	58	250	10.5	21	16
	31522R/L	47.625	65	130	25.4	14	38	90	315	10.5	21	20

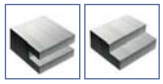
• The ap (Maximum width of cutter) size written above is the number when using insert having corner size R0.5. The ap is subject to change as per insert corner size
• The ap (Maximum width of cutter) size written above is the number when using SDXT09M405R-MM. The ap is subject to change as per insert corner size
• See the page **E**186 for applicable insert and recommended cutting condition
• Order - made item

Parts

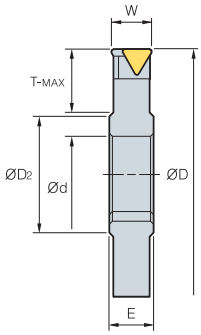
Edge width (RAHCPM) (RAHCBM)	Insert	Locator	Wedge WSD09N	Wedge WSA10N	Screw (Insert)	Screw (Wedge)	Screw (Locator)	Wrench (Insert)	Wrench (Locator, Wedge)
									
□□□12R/L	SDXT09M40□R/L	LSD09R/L	WSD09N		FTGA03508	DHA0617	SHGA0409	TW15S	HW30
□□□14R/L	SDXT09M40□R/L	LSD09R/L	WSD09N		FTGA03508	DHA0617	SHGA0409	TW15S	HW30
□□□16R/L	SDXT13050□R/L	LSD13R/L	WSA10N		FTNC04509	DHA0617	SHGA0411	TW20S	HW30
□□□18R/L	SDXT13050□R/L	LSD13R/L	WSA10N		FTNC04509	DHA0617	SHGA0411	TW20S	HW30
□□□20R/L	SDXT13050□R/L	LSD13R/L	WSA10N		FTNC04509	DHA0617	SHGA0411	TW20S	HW30
□□□22R/L	SDXT13050□R/L	LSD13R/L	WSA10N		FTNC04509	DHA0617	SHGA0411	TW20S	HW30

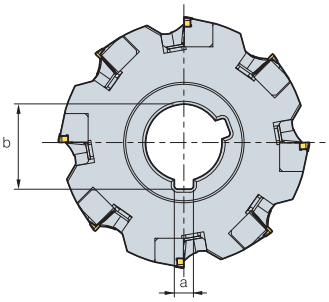
FC (Full side cutter)

AA °
• AR : 5°
• RR : 0°









(mm)

Designation		⊚	øD	W	T-MAX	ød	E	a	b	øD2	Insert
FC	08010	6	80	10	17.0	25.4	12	6.35	28	41.5	TPCN1103PPN
	10012	8	100	12	24.0	31.75	14	7.92	35.2	48	TPCN1103PPN
	12512	10	125	12	31.5	38.1	14	9.52	42.3	58	TPCN1103PPN
	12520	8	125	20	31.5	38.1	22	9.52	42.3	58	TPCN1603PPN
	16012	12	160	12	49.0	38.1	14	9.52	42.3	58	TPCN1103PPN
	16016	12	160	16	49.0	38.1	18	9.52	42.3	58	TPCN1103PPN
	16018	10	10	18	49.0	38.1	20	9.52	42.3	58	TPCN1603PPN
	16020	10	10	20	49.0	38.1	22	9.52	42.3	58	TPCN1603PPN
	20022	12	200	22	61.0	50.8	24	12.7	55.8	72	TPCN1603PPN
	25024	16	250	24	81.0	50.8	26	12.7	55.8	84	TPCN1603PPN
	31524	16	315	24	113.5	50.8	26	12.7	55.8	84	TPCN1603PPN

● : Stock item ○ : Under preparing for stock

Parts

Locator	Wedge	Screw	Locator Screw	Wrench
				
LFC2R/L · LFC3R/L LFC2R/L-1*	WFC2N · WFC3N WFC2N-1*	DHA0617 DHA0815	MHB0310 MHB0410	HW30L HW40L

* FC08010

Available Arbors

Designation		Arbors	
FC	08010	BT40-SCA27-75/120	BT50-SCA27-90/135
	10012	BT40-SCA32-105	BT50-SCA32-90/135
	12512	-	BT50-SCA40-90/135
	12520	-	BT50-SCA40-90/135
	16012	-	BT50-SCA40-90/135
	16018	-	BT50-SCA40-90/135
	16020	-	BT50-SCA40-90/135
	20022	-	-
	25024	-	-
	31524	-	-

Recommended Cutting Condition

Workpiece	Cutting Condition		Grades
	vc(m/min)	fz(mm/t)	
P	150 ~ 250	0.10 ~ 0.25	NCM325
	120 ~ 200	0.10 ~ 0.30	PC3500
	100 ~ 150	0.10 ~ 0.30	ST30A
M	80 ~ 180	0.10 ~ 0.25	PC9530
	80 ~ 150	0.10 ~ 0.30	ST30A
K	130 ~ 200	0.10 ~ 0.35	PC6510
	100 ~ 150	0.10 ~ 0.40	G10

Available Inserts

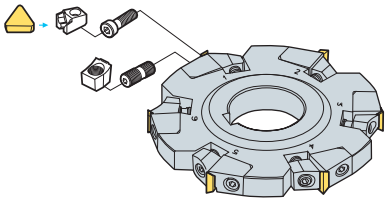
TPCN



Designation		coated									Cetmet		Uncoated				Page
		NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	CN2000	CN20	CN30	H01	G10	ST30A	ST20	
TPCN	1103PPN													●		●	●	●	E19
	1603PPN	●							●					●		●			

● : Stock item ○ : Under preparing for stock

Assembling



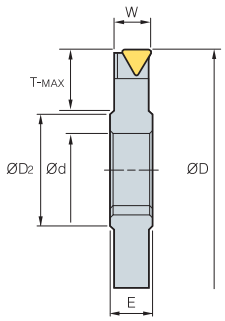
• Applicable inserts, see pages E19
• Available Arbors and bolt : E215~E217

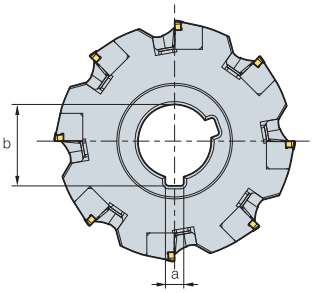
HC (Half side cutter)

AA °
• AR : 5°
• RR : 0°









(mm)

Designation			øD	T-MAX	ød	a	b	E	W	øD2	Insert
HC	10024R/L	6	100	24.0	31.75	7.92	35.2	27	24	48	TPCN1603PPN
	12524R/L	8	125	31.5	38.1	9.52	42.3	27	24	58	TPCN1603PPN
	16024R/L	10	160	49.0	38.1	9.52	42.3	27	24	58	TPCN1603PPN
	20024R/L	12	200	62.0	50.8	12.7	55.8	27	24	72	TPCN1603PPN
	25024R/L	16	250	81.0	50.8	12.7	55.8	27	24	84	TPCN1603PPN
	31524R/L	20	315	113.5	50.8	12.7	55.8	27	24	84	TPCN1603PPN

● : Stock item ○ : Under preparing for stock

Parts

Locator	Wedge	Screw	Locator Screw	Wrench
				
LFC3R/L	WFC3N	DHA0815	MHB0410	HW40L

Available Arbors

Designation	Arbors	
HC 10024R/L	BT40-SCA31.75-105	BT50-SCA31.75-90/135
12524R/L	-	BT50-SCA38.1-90/135
16024R/L	-	BT50-SCA38.1-90/135
20024R/L	-	-
25024R/L	-	-
31524R/L	-	-

Available Inserts

TPCN



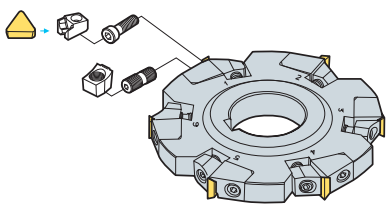
Designation	coated									Cetmet		Uncoated				Page
	NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	CN2000	CN20	CN30	H01	G10	ST30A	ST20	
TPCN 1603PPN	●							●					●		●			E19

● : Stock item ○ : Under preparing for stock

Recommended Cutting Condition

Workpiece	Cutting Condition		Grades
	vc(m/min)	fz(mm/t)	
P	150 ~ 250 120 ~ 200 100 ~ 150	0.10 ~ 0.25 0.10 ~ 0.30 0.10 ~ 0.30	**NCM325** **PC3500** **ST30A**
M	80 ~ 180 80 ~ 150	0.10 ~ 0.25 0.10 ~ 0.30	**PC9530** **ST30A**
K	130 ~ 200 100 ~ 150	0.10 ~ 0.35 0.10 ~ 0.40	**PC6510** **G10**

Assembling

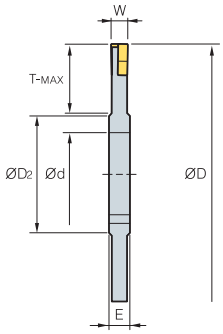


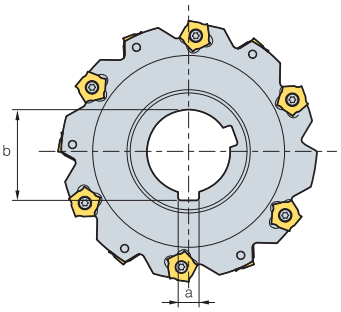
• Applicable inserts, see pages E19
• Available Arbors and bolt : E215~E217

SPP(M)

AA °
• AR : -2°
• RR : -28°







(mm)

Designation		⊚	ØD	W	T-MAX	Ød	a	b	E	ØD2	Insert	Screw	Wrench
SPP(M)	080-04	8	80	4	20	25.4(27)	6.35(7)	28.04(29.8)	8	40	PNEJ1223N	PTMA0403F	TW15S
	080-05	8	80	5	20	25.4(27)	6.35(7)	28.04(29.8)	8	40	PNEJ1230N	PTMA0404F	TW15S
	080-06	8	80	6	20	25.4(27)	6.35(7)	28.04(29.8)	8	40	PNEJ1235N	PTMA0405F	TW15S
	100-04	10	100	4	24	31.75(32)	7.94(8)	35.18(34.8)	8	47	PNEJ1223N	PTMA0403F	TW15S
	100-05	10	100	5	24	31.75(32)	7.94(8)	35.18(34.8)	8	47	PNEJ1230N	PTMA0404F	TW15S
	100-06	10	100	6	25	31.75(32)	7.94(8)	35.18(34.8)	8	47	PNEJ1235N	PTMA0405F	TW15S
	100-07	10	100	7	25	31.75(32)	7.94(8)	35.18(34.8)	10	47	PNEJ1240N	PTMA0406F	TW15S
	100-08	10	100	8	25	31.75(32)	7.94(8)	35.18(34.8)	10	47	PNEJ1245N	PTKA0407F	TW15S
	100-09	10	100	9	25	31.75(32)	7.94(8)	35.18(34.8)	12	47	PNEJ1250N	PTKA0408F	TW15S
	100-10	10	100	10	25	31.75(32)	7.94(8)	35.18(34.8)	12	47	PNEJ1255N	PTKA0409F	TW15S
	125-04	12	125	4	30	38.1(40)	9.53(10)	42.32(43.5)	8	56	PNEJ1223N	PTMA0403F	TW15S
	125-05	12	125	5	32	38.1(40)	9.53(10)	42.32(43.5)	8	56	PNEJ1230N	PTMA0404F	TW15S
	125-06	12	125	6	32	38.1(40)	9.53(10)	42.32(43.5)	8	56	PNEJ1235N	PTMA0405F	TW15S
	125-07	12	125	7	32	38.1(40)	9.53(10)	42.32(43.5)	10	56	PNEJ1240N	PTMA0406F	TW15S
	125-08	12	125	8	32	38.1(40)	9.53(10)	42.32(43.5)	10	56	PNEJ1245N	PTKA0407F	TW15S
	125-09	12	125	9	32	38.1(40)	9.53(10)	42.32(43.5)	12	56	PNEJ1250N	PTKA0408F	TW15S
	125-10	12	125	10	32	38.1(40)	9.53(10)	42.32(43.5)	12	56	PNEJ1255N	PTKA0409F	TW15S
	160-04	16	160	4	45	38.1(40)	9.53(10)	42.32(43.5)	8	66	PNEJ1223N	PTMA0403F	TW15S
	160-05	16	160	5	45	38.1(40)	9.53(10)	42.32(43.5)	8	66	PNEJ1230N	PTMA0404F	TW15S
	160-06	16	160	6	45	38.1(40)	9.53(10)	42.32(43.5)	8	66	PNEJ1235N	PTMA0405F	TW15S
	160-07	16	160	7	45	38.1(40)	9.53(10)	42.32(43.5)	10	66	PNEJ1240N	PTMA0406F	TW15S
	160-08	16	160	8	45	38.1(40)	9.53(10)	42.32(43.5)	10	66	PNEJ1245N	PTKA0407F	TW15S
	160-09	16	160	9	45	38.1(40)	9.53(10)	42.32(43.5)	12	66	PNEJ1250N	PTKA0408F	TW15S
	160-10	16	160	10	45	38.1(40)	9.53(10)	42.32(43.5)	12	66	PNEJ1255N	PTKA0409F	TW15S
	160-11	16	160	11	45	38.1(40)	9.53(10)	42.32(43.5)	14	66	PNEJ1260N	PTKA0410F	TW15S
	160-12	16	160	12	45	38.1(40)	9.53(10)	42.32(43.5)	14	66	PNEJ1265N	PTKA0411F	TW15S
	160-13	16	160	13	45	38.1(40)	9.53(10)	42.32(43.5)	16	66	PNEJ1270N	PTKA0412F	TW15S
	160-14	16	160	14	45	38.1(40)	9.53(10)	42.32(43.5)	16	66	PNEJ1275N	PTKA0413F	TW15S
	200-06	18	200	6	60	50.8(50)	12.7(12)	55.83(53.5)	8	70	PNEJ1235N	PTMA0405F	TW15S
	200-07	18	200	7	60	50.8(50)	12.7(12)	55.83(53.5)	10	70	PNEJ1240N	PTMA0406F	TW15S
	200-08	18	200	8	60	50.8(50)	12.7(12)	55.83(53.5)	10	70	PNEJ1245N	PTKA0407F	TW15S
	200-09	18	200	9	60	50.8(50)	12.7(12)	55.83(53.5)	12	70	PNEJ1250N	PTKA0408F	TW15S
	200-10	18	200	10	60	50.8(50)	12.7(12)	55.83(53.5)	12	70	PNEJ1255N	PTKA0409F	TW15S
	200-11	18	200	11	60	50.8(50)	12.7(12)	55.83(53.5)	14	70	PNEJ1260N	PTKA0410F	TW15S
	200-12	18	200	12	60	50.8(50)	12.7(12)	55.83(53.5)	14	70	PNEJ1265N	PTKA0411F	TW15S
	200-13	18	200	13	60	50.8(50)	12.7(12)	55.83(53.5)	16	70	PNEJ1270N	PTKA0412F	TW15S
	200-14	18	200	14	60	50.8(50)	12.7(12)	55.83(53.5)	16	70	PNEJ1275N	PTKA0413F	TW15S

Recommended Cutting Condition

Workpiece	Cutting Condition		Grades
	vc(m/min)	fz(mm/t)	
P	150 ~ 250	0.10 ~ 0.25	NCM325
	120 ~ 200	0.10 ~ 0.30	PC3500
	100 ~ 150	0.10 ~ 0.30	ST30A
M	80 ~ 180	0.10 ~ 0.25	PC9530
	80 ~ 150	0.10 ~ 0.30	ST30A
K	130 ~ 200	0.10 ~ 0.35	PC6510
	100 ~ 150	0.10 ~ 0.40	G10

Available Arbors

Designation	Arbors		
	BT30	BT40	BT50
SPP 080-04~06	BT30-SCA25.4-60	BT40-SCA25.4-75/120	BT50-SCA25.4-90/135
100-04~10	-	BT40-SCA31.75-105	BT50-SCA31.75-90/135
125-04~09	-	-	BT50-SCA38.1-90/135
160-04~14	-	-	BT50-SCA38.1-90/135
200-06~14	-	-	-
SPPM 080-04~06	-	BT40-SCA27-75/120	BT50-SCA27-90/135
100-04~10	-	BT40-SCA32-105	BT50-SCA32-90/135
125-04~09	-	-	BT50-SCA40-90/135
160-04~14	-	-	BT50-SCA40-90/135
200-06~14	-	-	-

• Applicable inserts, see pages E11
• Available Arbors and bolt : E215~E217

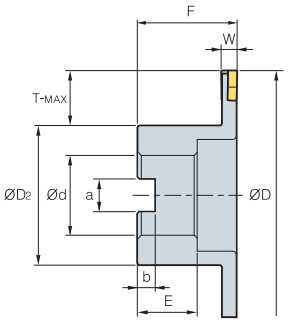
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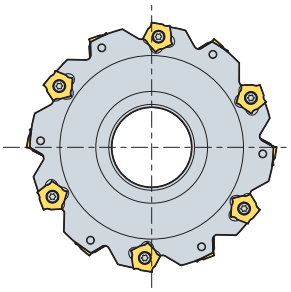
- Hand of tool(R/L)
- Width of cut(W)
- Cutter diameter(ØD)
- Arbor type
- Cutter type(P ⇒ Plane type, B ⇒ Boss type)
- Insert Shape(P ⇒ Pentagonal Insert)
- Cutter use(S ⇒ Side cutter)

SPB(M)

AA °
• AR : −10°
• RR : −0°







(mm)

Designation			ØD	W	T-MAX	ØD2	Ød	a	b	F	E	Insert	Screw	Wrench
SPB(M)	080-04R/L	8	80	4	18	40	25.4(27)	9.5(12.4)	6(7)	50	25(22)	PNEJ1223N	PTMA0403F	TW15S
	080-05R/L	8	80	5	18	40	25.4(27)	9.5(12.4)	6(7)	50	25(22)	PNEJ1230N	PTMA0404F	TW15S
	080-06R/L	8	80	6	18	40	25.4(27)	9.5(12.4)	6(7)	50	25(22)	PNEJ1235N	PTMA0405F	TW15S
	100-04R/L	10	100	4	21	54	31.75(32)	12.7(14.4)	8(8)	50	32(28)	PNEJ1223N	PTMA0403F	TW15S
	100-05R/L	10	100	5	21	54	31.75(32)	12.7(14.4)	8(8)	50	32(28)	PNEJ1230N	PTMA0404F	TW15S
	100-06R/L	10	100	6	21	54	31.75(32)	12.7(14.4)	8(8)	50	32(28)	PNEJ1235N	PTMA0405F	TW15S
	100-07R/L	10	100	7	21	54	31.75(32)	12.7(14.4)	8(8)	50	32(28)	PNEJ1240N	PTMA0406F	TW15S
	100-08R/L	10	100	8	21	54	31.75(32)	12.7(14.4)	8(8)	50	32(28)	PNEJ1245N	PTMA0407F	TW15S
	100-09R/L	10	100	9	21	54	31.75(32)	12.7(14.4)	8(8)	50	32(28)	PNEJ1250N	PTMA0408F	TW15S
	100-10R/L	10	100	10	21	54	31.75(32)	12.7(14.4)	8(8)	50	32(28)	PNEJ1255N	PTMA0409F	TW15S
	125-04R/L	12	125	4	25	70	38.1(40)	15.9(16.4)	10(9)	60(50)	38(30)	PNEJ1223N	PTMA0403F	TW15S
	125-05R/L	12	125	5	25	70	38.1(40)	15.9(16.4)	10(9)	60(50)	38(30)	PNEJ1230N	PTMA0404F	TW15S
	125-06R/L	12	125	6	25	70	38.1(40)	15.9(16.4)	10(9)	60(50)	38(30)	PNEJ1235N	PTMA0405F	TW15S
	125-07R/L	12	125	7	25	70	38.1(40)	15.9(16.4)	10(9)	60(50)	38(30)	PNEJ1240N	PTMA0406F	TW15S
	125-08R/L	12	125	8	25	70	38.1(40)	15.9(16.4)	10(9)	60(50)	38(30)	PNEJ1245N	PTKA0407F	TW15S
	125-09R/L	12	125	9	25	70	38. (40)	15.9(16.4)	10(9)	60(50)	38(30)	PNEJ1250N	PTKA0408F	TW15S
	125-10R/L	12	125	10	25	70	38.1(40)	15.9(16.4)	10(9)	60(50)	38(30)	PNEJ1255N	PTKA0409F	TW15S
	160-04R/L	16	160	4	43	70	38.1(40)	15.9(16.4)	10(9)	60(50)	38(30)	PNEJ1223N	PTMA0403F	TW15S
	160-05R/L	16	160	5	43	70	38.1(40)	15.9(16.4)	10(9)	60(50)	38(30)	PNEJ1230N	PTMA0404F	TW15S
	160-06R/L	16	160	6	43	70	38.1(40)	15.9(16.4)	10(9)	60(50)	38(30)	PNEJ1235N	PTMA0405F	TW15S
	160-07R/L	16	160	7	43	70	38.1(40)	15.9(16.4)	10(9)	60(50)	38(30)	PNEJ1240N	PTMA0406F	TW15S
	160-08R/L	16	160	8	43	70	38.1(40)	15.9(16.4)	10(9)	60(50)	38(30)	PNEJ1245N	PTKA0407F	TW15S
	160-09R/L	16	160	9	43	70	38.1(40)	15.9(16.4)	10(9)	60(50)	38(30)	PNEJ1250N	PTKA0408F	TW15S
	160-10R/L	16	160	10	43	70	50.8(40)	15.9(16.4)	10(9)	60(50)	38(30)	PNEJ1255N	PTKA0409F	TW15S
	160-11R/L	16	160	11	43	70	50.8(40)	15.9(16.4)	10(9)	60(50)	38(30)	PNEJ1260N	PTKA0410F	TW15S
	160-12R/L	16	160	12	43	70	50.8(40)	15.9(16.4)	10(9)	60(50)	38(30)	PNEJ1265N	PTKA0411F	TW15S
	160-13R/L	16	160	13	43	70	50.8(40)	15.9(16.4)	10(9)	60(50)	38(30)	PNEJ1270N	PTKA0412F	TW15S
	160-14R/L	16	160	14	43	70	50.8(40)	15.9(16.4)	10(9)	60(50)	38(30)	PNEJ1275N	PTKA0413F	TW15S
	200-06R/L	18	200	6	53	90	50.8(40)	19(16.4)	11(9)	65	38(30)	PNEJ1235N	PTMA0405F	TW15S
	200-07R/L	18	200	7	53	90	50.8(40)	19(16.4)	11(9)	65	38(30)	PNEJ1240N	PTMA0406F	TW15S
	200-08R/L	18	200	8	53	90	50.8(40)	19(16.4)	11(9)	65	38(30)	PNEJ1245N	PTKA0407F	TW15S
	200-09R/L	18	200	9	53	90	50.8(40)	19(16.4)	11(9)	65	38(30)	PNEJ1250N	PTKA0408F	TW15S
	200-10R/L	18	200	10	53	90	50.8(40)	19(16.4)	11(9)	65	38(30)	PNEJ1255N	PTKA0409F	TW15S
	200-11R/L	18	200	11	53	90	50.8(40)	19(16.4)	11(9)	65	38(30)	PNEJ1260N	PTKA0410F	TW15S
	200-12R/L	18	200	12	53	90	50.8(40)	19(16.4)	11(9)	65	38(30)	PNEJ1265N	PTKA0411F	TW15S
	200-13R/L	18	200	13	53	90	50.8(40)	19(16.4)	11(9)	65	38(30)	PNEJ1270N	PTKA0412F	TW15S
	200-14R/L	18	200	14	53	90	50.8(40)	19(16.4)	11(9)	65	38(30)	PNEJ1275N	PTKA0413F	TW15S

Recommended Cutting Condition

Workpiece	Cutting Condition		Grades
	vc(m/min)	fz(mm/t)	
P	150 ~ 250	0.10 ~ 0.25	NCM325
	120 ~ 200	0.10 ~ 0.30	PC3500
	100 ~ 150	0.10 ~ 0.30	ST30A
M	80 ~ 180	0.10 ~ 0.25	PC9530
	80 ~ 150	0.10 ~ 0.30	ST30A
K	130 ~ 200	0.10 ~ 0.35	PC6510
	100 ~ 150	0.10 ~ 0.40	G10

• Applicable inserts, see pages E11
• Available Arbors and bolt : E215~E217

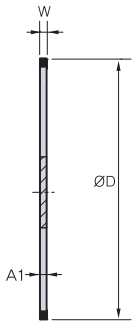
Notice(When mounting inserts)

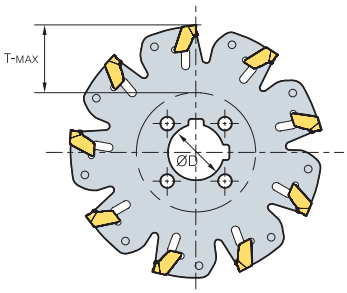
- Insert chip breaker should be faced chip pocket of cutter
- Fasten screw after insert contacts surely on its seat part
- If there is a gap between insert and its seat part after mounting it may cause tool troubles

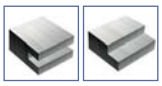
SPS

New





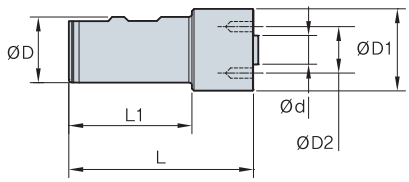




(mm)

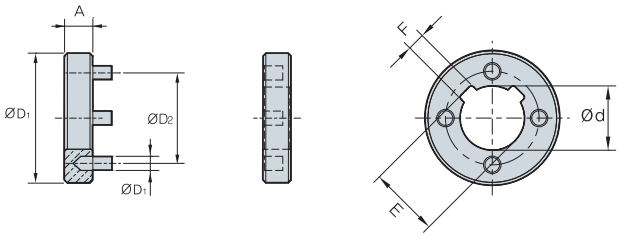
	Designation	◎	ØD	W	T-MAX	ØD1	ØD2	Ød	Ød1	A	A1	Insert	Adaptor WS	Adaptor DF
SPS	050-0204-08R	4	50	2.2	11	28	18	8	-	-	1.8	SPFN 200 - ( )	WS2528-M4	-
	063-0205-10R	5	63	2.2	15.5	32	22	10	-	-	1.8		WS2532-M5	-
	080-0207-22R/F	7	80	2.2	20(17)	40(46)	32	22	5	10	1.8		WS3240-M5	DF22-46
	100-0209-22R/F	9	100	2.2	30(27)	40(46)	32	22	5	10	1.8		WS3240-M5	DF22-46
	125-0211-32F	11	125	2.2	35	55	45	32	6	10	1.8		-	DF32-55
	160-0214-32F	14	160	2.2	52.5	55	45	32	6	10	1.8		-	DF32-55
	063-0305-10R	5	63	3	15.5	32	22	10	-	-	2.55	SPFN 300 - ( )	WS2532-M5	-
	080-0307-22R/F	7	80	3	20(17)	40(46)	32	22	5	10	2.55		WS3240-M5	DF22-46
	100-0309-22R/F	9	100	3	30(27)	40(46)	32	22	5	10	2.55		WS3240-M5	DF22-46
	125-0311-32F	11	125	3	35	55	45	32	6	10	2.55		-	DF32-55
	160-0314-32F	14	160	3	52.5	55	45	32	6	10	2.55		-	DF32-55
	200-0318-40F	18	200	3	60	80	63	40	11	12	2.55		-	DF40-80
	080-0406-22R/F	6	80	4	20(17)	40(46)	32	22	5	10	3.4	SPFN 400 - ( )	WS3240-M5	DF22-46
	100-0408-22R/F	8	100	4	30(27)	40(46)	32	22	5	10	3.4		WS3240-M5	DF22-46
	125-0410-32F	10	125	4	35	55	45	32	6	10	3.4		-	DF32-55
	160-0413-32F	13	160	4	52.5	55	45	32	6	10	3.4		-	DF32-55
	200-0417-40F	17	200	4	60	80	63	40	11	12	3.4		-	DF40-80

WS( )-( ) (Weldon Shank)



Designation	Stock	L	L1	D	D1	D2	d	Screw
WS2528-M4		110	85	25	28	18	8	PTKA0408
WS2532-M5		110	85	25	32	22	10	PTKA0515
WS3240-M5		120	90	32	40	32	22	PTKA0515

DF( )-( ) (Drive Flange set)



Designation	Stock	D1	D2	d	d1	A	E	F
DF22-46		46	32	22	5	10	24.1	6
DF32-55		55	45	32	6	10	34.8	8
DF40-80		80	63	40	11	12	43.5	10
DF50-110		110	80	50	14	14	53.6	12

● : Stock item ○ : Under preparing for stock

Recommended Cutting Condition

Workpiece	Cutting Condition vc(m/min)	Cutting Condition fz(mm/t)	Grades
P	150(100~200) 120(80~170)	0.13~0.25 0.10~0.17	PC3500 PC3545
M	160(120~200)	0.10~0.22	PC5300
K	110(70~150)	0.10~0.25	PC215K

• Applicable inserts, see pages E17

High feed Cutter

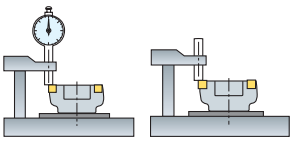
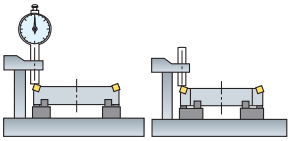
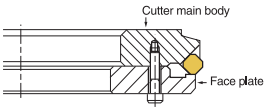
Features

- High feed cutter employs extra pitch for cast iron and light alloy steel
- Quick change type for reduction of cutter change time
- Cutting edge chattering is excellent
- Quick change type for cutter size under ø160, 2piece types for cutter size over ø200



Guide of insert setting

- Special equipment has to be used to get precise run out with high feed cutter.

Type	Adaptor type	Roller type	Plate type
Shape			
Features	- Mainly under ø160 diameter is used in 1piece type - Available for fixed size of cutter and assembling & checking can be done at the same time	- Mainly over ø200 diameter is used in 2piece type - Due to 3 adjustable guide roller, variety size of cutter can be assembled	- Suitable for small size cutter due to the simple tructure - It is unnecessary to unclamp the cutter from the machine, it's possible to reassemble the cutter as it mounted on the machine - You should make plate by yourself

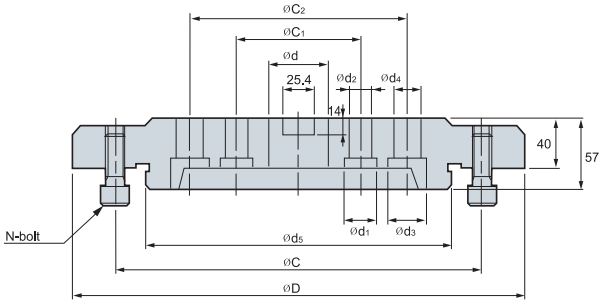
• Guide of insert setting in adaptor/roller type

① Clean the cutter and equipment
② Pointer should be assembled with same height with cutter
③ Move to each insert on tip seat to end of pointer and tighten(torque 2N.m) wedge.
④ Exchange pointer to dial gauge
⑤ Measure the run-out totally
⑥ When a insert over run-out, loosen wedge and adjust run-out. (for roughing 10~20μ, for finishing 5~10μ)
⑦ Tighten(torque 7-8N.m) wedge
⑧ Measure the final run-out by dial gauge

• Notice

- When you clamp wedge too tighten, run-out is getting worse to cutter distortion
- When you clamp wedge, you should use torque wrench to set more precisely

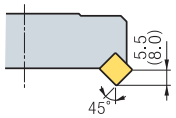
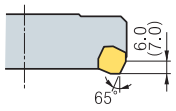
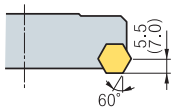
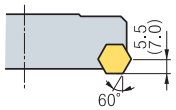
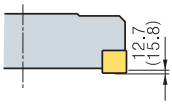
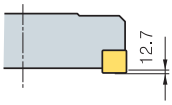
Adaptor(Ø200-Ø450)



Designation		Stock R	Stock L	øD	ød	ød1	ød2	ød3	ød4	ød5	øC	øC1	øC2	N	Cutter
APR	200			180	47.625	26	18	-	-	80	120	101.6	-	4	ø200
	250			230	47.625	26	18	-	-	120	170	101.6	-	4	ø250
	315			295	47.625	26	18	32	22	180	230	101.6	177.8	6	ø315
	355			335	63.50	26	18	32	22	220	270	101.6	177.8	6	ø355
	400			370	63.50	26	18	32	22	250	300	101.6	177.8	8	ø400
	450			420	63.50	26	18	32	22	300	350	101.6	177.8	8	ø450

● : Stock item ○ : Under preparing for stock

High feed cutters type and features

Designation	Cutter diameter	Workpiece, Application range	Min. surface roughness	Approach angle and Max. cutting depth is for 5000 type	Axial rake angle	Radial rake angle	Available insert
ANH4000 ANH5000	Ø100~Ø450	Cast iron Roughing	25Z		–5 °	–6 °	SNCN1204ENN SNCN1504ENN
CDH4000 CDH5000	Ø100~Ø450	Cast iron Roughing Finishing	18Z		+10 °	+5 °	SDCN42R SDCN53R
DEH5000	Ø100~Ø450	Al alloy Roughing	20Z		+14 °	+6 °	HECN090408FN
DPH5000	Ø100~Ø450	Cast iron Roughing Finishing	12Z		+5 °	–3 °	HPEN090408 HPEN090408-WC
PNH4000 PNH5000	Ø125~Ø450	Cast iron Finishing	12Z		–5 °	–6 °	SNEF435 SNEF535
PPH4000	Ø125~Ø450	Cast iron Finishing	12Z		+5 °	–5 °	SPEN120416-WC

Recommended Cutting Condition

Workpiece	Cutting condition		Grades	Remark
	vc(m/min)	fz(mm/t)		
Cast iron	100~230	0.05~0.2	**PC6510**	PVD Coated
	80~150	0.05~0.2	**H01,G10**	Uncoated
Al alloy	400	0.1~0.3	**PC6510**	PVD Coated
	400	0.05~0.2	**H01,G10**	Uncoated

Storm Mill

Code system

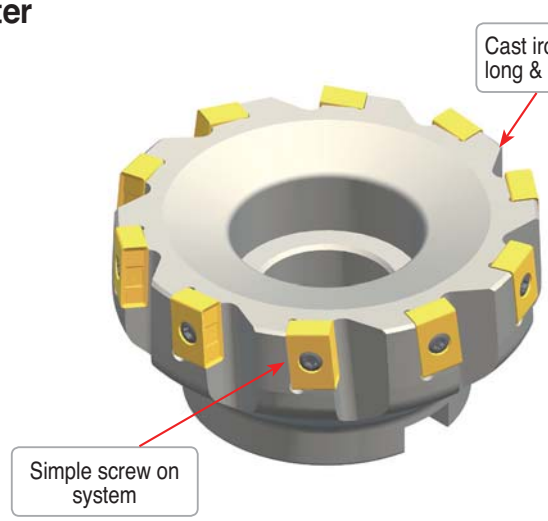
Cutter	Relief angle of insert	Approach angle	Insert I/C	Cutter diameter(Ø)	Hand of tool	Cutter shape		Number of tooth
S : STORM MILL	N : Negative (0 °)	Q : 2 ° F : 5 ° A : 45 ° E : 15 °	3 : 9.525mm 4 : 12.7mm	MM	R : Right hand L : Left hand	Unmarked : Normal type 2 : Quick change type (2 pieces type)		
S	Q	N	3	250	R	(2)	–	28Z

features

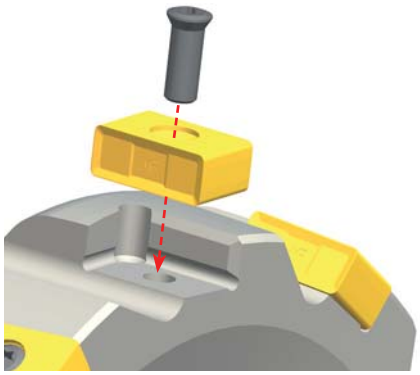
- Conventional cutter with wide coverage
- Using 4 corners (Maximum 8 corner avaiable with R/L type cutter)
- Effective on big depth of cut application due to the long cutting edge
- Excellent tool life guaranted by matching of variety of grades as per working conditions
- 2 different type of inserts(chamfer / nose R) are available with 1 type of cutter



Cutter



Clamping of insertv



Recommended Cutting Condition

Designation / Grades	Gray cast iron		Ductile cast iron	
	GC		GCD	
	vc(m/min)	fz(mm/t)	vc(m/min)	fz(mm/t)
PC3500	150~250	0.08~0.28	100~180	0.08~0.28
PC6510	150~300	0.1~0.28	100~200	0.1~0.28
PC3545	150~250	0.08~0.22	100~180	0.08~0.22
H01	100~200	0.08~0.22	70~140	0.08~0.22
G10	90~120	0.08~0.28	60~130	0.08~0.28

Shave Mill Ultra

Cutter Code Systemy

Shave Mill Ultra		Inscribed Circle 6 : 19.05mm				Tooth(Z)	
SVU	M	6	250	R	–	Z6	B
	Metric Type M : Metric A : Inch		Cutter Dia.(Ø) Ø250	Hand of tool R : Right hand L : Left hand			Cutter Type None : Normal B : Adjustable

Insert Code System

L N C S 1 9 0 7	-	R3.0	-	W C
Shave Mill Ultra		Corner Type C : Chamfer R : Round		Wiper Crown

Features

- Superior surface roughness for this Finishing cutter when applied to heavy work pieces
- Easy to handle and good rigidity with simple screw on system
- Great surface roughness due to wiper crown cutting edge
- Better tool life through special grade which has toughness and wear resistance
- Two different types, economical normal type and adjustable run-out type 'B'

Normal type



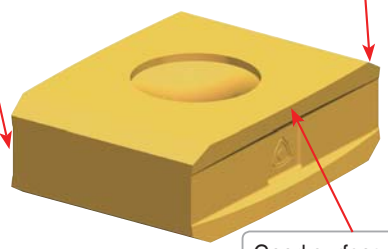
Good rigidity and economical due to Screw on Simple type

Better surface roughness when you use only 1 insert but adjust the 'ap' under 0.03mm

Insert Features

Good cutting performance & chip flow due to positive rake angle chip breaker

Economical 4 corner use insert



Good surface roughness by wiper crown cutting edge design

Adjustable cutting edge(Type B)



Easy to handle the run-out due to Korloy exclusive high toughness cutting edge special parts

Adjustable Range

·Range : 1.0mm

·Allowance : Within 2μ

Recommended Cutting Condition

Workpiece	Cutting Condition		ap(mm)	Tooth	Grade
	vc(m/min)	fz(mm/t)			
P	150~250 150~250	0.05~0.2 2~5	~0.5 ~0.03	Full use 1use	PC3500
K	150~300 150~300	0.05~0.2 2~5	~0.5 ~0.03	Full use 1use	PC6510

Cube Mill

Code system

Cutter		Insert I/C		Approach angle	Cutter diameter(Ø)	Hand of tool	Cutter shape		Number of tooth (Z)
CBM	E	3	250	R	(2)	–	28Z		

- Cutter: CBM : CUBE MILL
- Insert I/C: 3 : 9.525mm, 4 : 12.7mm
- Approach angle: Q : 2˚ C : 25˚, F : 5˚ A : 45˚, E : 15˚
- Cutter diameter(Ø): Ø250
- Hand of tool: R : Right hand, L : Left hand
- Cutter shape: Unmarked : Normal type, 2 : Quick change type (2 pieces type)
- Number of tooth (Z)

Features

- Special Korloy's cutter for cast iron roughing
- 8 corner using insert (maximum 16 corner available with 2 cutter, R/L cutter)
- Excellent cutting performance due to the positive rake angle made by 3 dimensional chip breaker
- Excellent tool life by combination of variety of grades and chip breakers as per working conditions
- 2 different type of inserts(chamfer / nose R) are available with 1 type cutter



Roughing for cast iron

Insert (R/L type)



<Chamfer type>



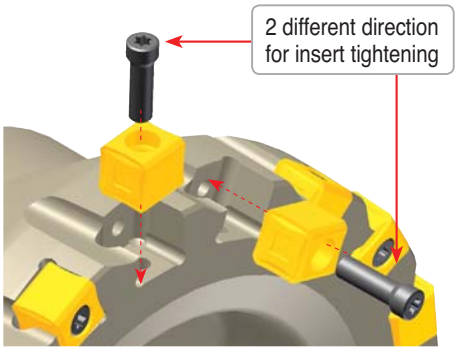
<Nose R type>

Cutter body

	General	Quick change
Cutter diameter(Ø)	Ø80~315 mm	Ø200~450 mm
	3 1/4~12 1/2 Inch	8~18 Inch

Approach angle : 2˚, 5˚, 15˚, 25˚, 45˚

Clamping of insert



Cutter body

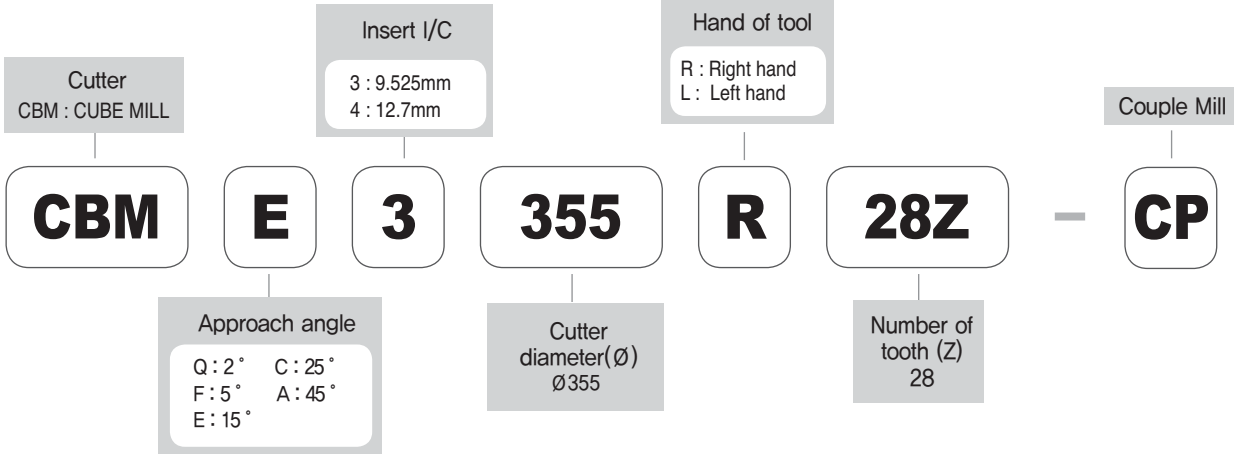


Parts

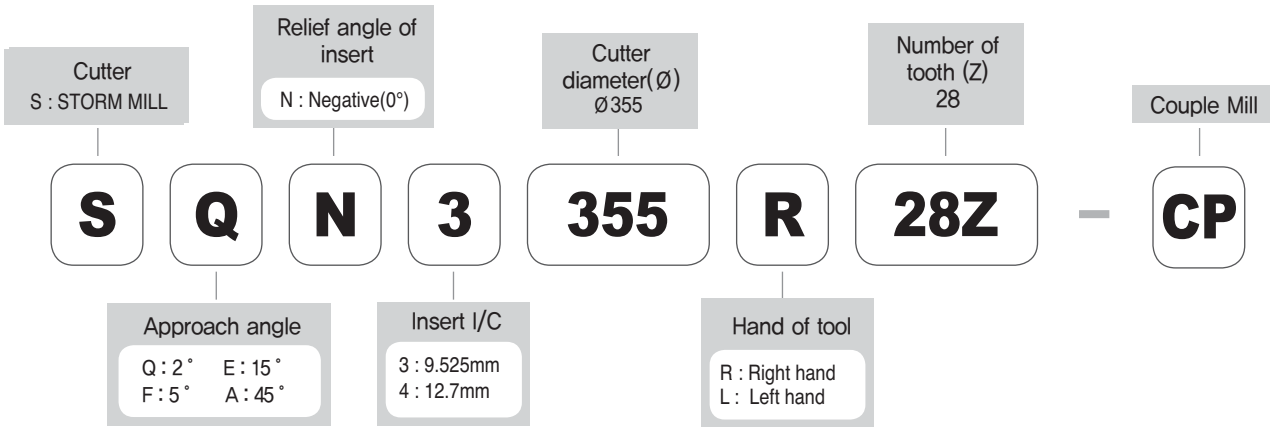
	Screw	Wrench
		
Cube mill 3000	FTGA0417CBM	TW15 – 100
	ETGA0520CBM	TW20 – 100

Couple Mill

CUBE-COUPLE Code system



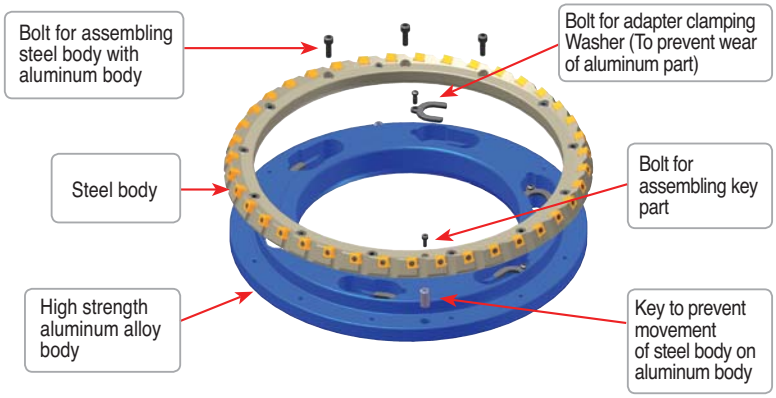
STORM-COUPLE Code system



CUBE-COUPLE features

- Ideal combination of Aluminum body with cast iron high feed cutter
- Since the weight of cutter has been reduced down to 50% of steel cutter, it is very easy to handle and very effectiveness to prevent accident at the field
- Application for Cube mill, Storm mill

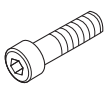
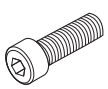
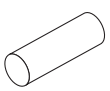
Assembling structure



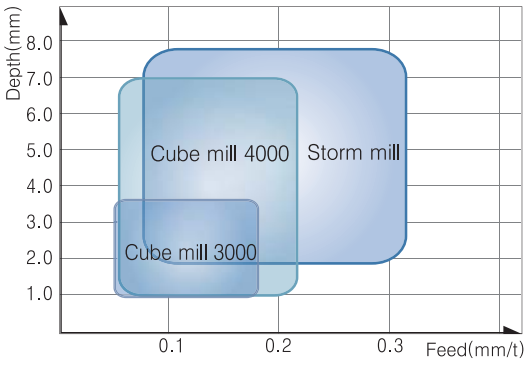
Cutter body

		Quick change
Cutter diameter(Ø)	Metric	Ø355~450mm
	Inch	14 1/4~18 Inch

Parts

	Screw	Wrench		Bolt for body	Bolt for key	Key for body
						
CUBE-COUPLE 3000 Type 4000 Type	FTGA0417CBM ETGA0520CBM	TW15-100 TW20-100	–	BHA0616 BHA0620	MHBO410	PN1019-DRV
STORM-COUPLE 3000Type	FTNA0513	–	TW15S	–	–	–

Application range of High feed Cutters for Cast iron





Recommended Cutting Condition

CUBE MILL		Gray cast iron		Ductile cast iron	
		vc(m/min)	fz(mm/t)	vc(m/min)	fz(mm/t)
PVD	PC6510	150 ~ 300	0.08 ~ 0.18	100 ~ 200	0.08 ~ 0.18
	PC215K	120 ~ 210	0.05 ~ 0.18	80 ~ 150	0.05 ~ 0.18
Uncoated	G10	90 ~ 120	0.05 ~ 0.18	60 ~ 130	0.05 ~ 0.18

Available Arbors and Adaptors

Designation		Available Arbors and Adaptors		
		Arbors	General Arbor	Adaptor
CBMQ (CBMF) (CBME) (CBMC) (CBMA)	3080R/L –00Z	BT□□–FMA25.4–□□	NT*□□(M/U)–FMA25.4–25	
	3100R/L –00Z	BT□□–FMA31.75–□□	NT*□□(M/U)–FMA31.75–□□	
	3125R/L –00Z	BT□□–FMA38.1–□□	NT*□□(M/U)–FMA38.1–□□	
	3160R/L –00Z	BT□□–FMA50.8–□□	NT*□□(M/U)–FMA50.8–□□	
	3200R/L –00Z	BT□□–FMA47.625–□□	NT*□□(M/U)–FMA47.625–25, KCP–8***	
	3250R/L –00Z	BT□□–FMA47.625–□□	KNT*□□(M/U)–FMA47.625–25, KCP–8***	
	3315R/L –00Z		KCP–8***(Centering Plug)	
	3200R/L2 –00Z			APR200
	3250R/L2 –00Z			APR250
	3315R/L2 –00Z			APR315
	3355R/L2 –00Z			APR355
	3400R/L2 –00Z			APR400
	3450R/L2 –00Z			APR450
SQN (SFN) (SEN) (SAN)	3080R/L –00Z	BT□□–FMA25.4–□□	NT*□□(M/U)–FMA25.4–25	
	3100R/L –00Z	BT□□–FMA31.75–□□	NT*□□(M/U)–FMA31.75–□□	
	3125R/L –00Z	BT□□–FMA38.1–□□	NT*□□(M/U)–FMA38.1–□□	
	3160R/L –00Z	BT□□–FMA50.8–□□	NT*□□(M/U)–FMA50.8–□□	
	3200R/L –00Z	BT□□–FMA47.625–□□	NT*□□(M/U)–FMA47.625–25, KCP–8***	
	3250R/L –00Z	BT□□–FMA47.625–□□	NT*□□(M/U)–FMA47.625–25, KCP–8***	
	3315R/L –00Z		KCP–8***(Centering Plug)	
	3200R/L2 –00Z			APR200
	3250R/L2 –00Z			APR250
	3315R/L2 –00Z			APR315
	3355R/L2 –00Z			APR355
	3400R/L2 –00Z			APR400
	3450R/L2 –00Z			APR450

• *□□–NT number / ** □□–BT number / ***Milling over 5

〈Arbors **add〉

ex) BT** □□

ANH4000/5000

AA 45° | • AR : -5° • RR : -6°



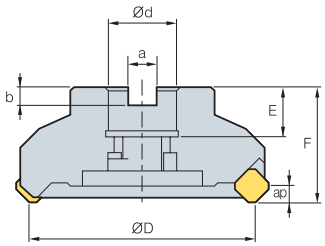


Fig. 1

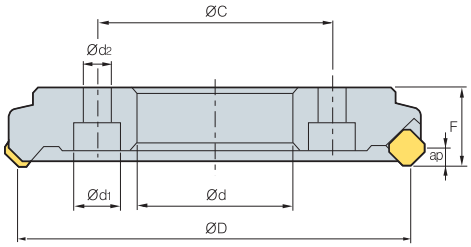


Fig. 2

(mm)

Designation			øD	ød	ød1	ød2	a	b	E	F	øC	ap	kg	Fig.
ANH	4100R/L	8	100	31.75	-	-	12.7	8	22	50	-	5.5	2.5	1
	4125R/L	10	125	38.1	-	-	15.9	10	27	63	-	5.5	4.7	1
	4160R/L	14	160	50.8	-	-	19.0	11	27	63	-	5.5	7.3	1
	4200R/L	18	200	80	24	14	-	-	-	40	120	5.5	7	2
	4250R/L	24	250	120	30	18	-	-	-	40	170	5.5	9.6	2
	4315R/L	30	315	180	30	18	-	-	-	40	230	5.5	12.9	2
	4355R/L	34	355	220	30	18	-	-	-	40	270	5.5	15.5	2
	4400R/L	38	400	250	30	18	-	-	-	40	300	5.5	18.8	2
	4450R/L	44	450	300	30	18	-	-	-	40	350	5.5	22.2	2
ANH	5100R/L	8	100	31.75	-	-	12.7	8	22	50	-	8	2.6	1
	5125R/L	10	125	38.1	-	-	15.9	10	27	63	-	8	5	1
	5160R/L	14	160	50.8	-	-	19.0	11	27	63	-	8	7.5	1
	5200R/L	18	200	80	24	14	-	-	-	40	120	8	7	2
	5250R/L	24	250	120	30	18	-	-	-	40	170	8	9.6	2
	5315R/L	30	315	180	30	18	-	-	-	40	230	8	12.9	2
	5355R/L	34	355	220	30	18	-	-	-	40	270	8	15.5	2
	5400R/L	38	400	250	30	18	-	-	-	40	300	8	18.8	2
	5450R/L	44	450	300	30	18	-	-	-	40	350	8	22.2	2

● : Stock item ○ : Under preparing for stock

Parts

	Wedge	Wedge Screw	Wrench
			
4000Type	WANH4N	DHA0821F	HW40
5000Type	WANH5N	DHA0821F	HW40

Available Arbors

Designation		General Arbor	Arbors
ANH	100R/L	NT*□□(M/U)-FMA31.75-□□	-
	125R/L	NT*□□(M/U)-FMA38.1-□□	-
	160R/L	NT*□□(M/U)-FMA50.8-□□	-
	200R/L	-	APR200
	250R/L	-	APR250
	315R/L	-	APR315
	355R/L	-	APR355
	400R/L	-	APR400
	450R/L	-	APR450

Recommended Cutting Condition

Workpiece	Cutting Condition		Grades
	vc(m/min)	fz(mm/t)	
K	100 ~ 200 80 ~ 150	0.05 ~ 0.30 0.10 ~ 0.30	**PC6510** **H01,G10**

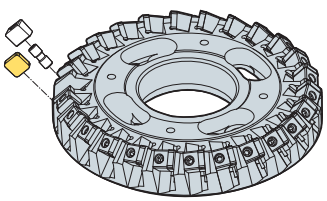
Available Inserts

	SNCN	SNKN
		

Type	Designation	Coated		Uncoated			Page
		NCM325	PC6510	ST30A	H01	G10	
4000Type	SNCN 1204ENN	●		●	●	●	E16
	SNKN 1204ENN		●				
5000Type	SNCN 1504ENN			●			E16
	SNKN 1504ENN	●					

● : Stock item ○ : Under preparing for stock

Assembling



• Applicable inserts, see pages E16
• Available Arbors and bolt : E215~E217

CDH4000/5000

AA 65° | • AR : 10° • RR : 5°





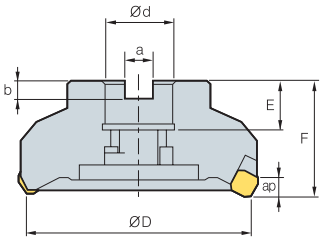


Fig. 1

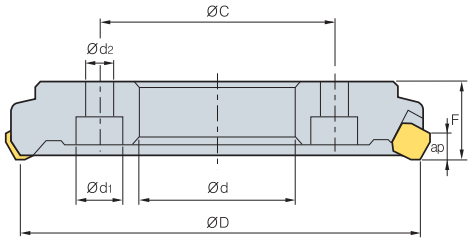


Fig. 2

(mm)

Designation		⚙	øD	ød	ød1	ød2	a	b	E	F	øC	ap	kg	Fig.
CDH	4100R/L	8	100	31.75	-	-	12.7	8	22	50	-	6	2.3	1
	4125R/L	10	125	38.1	-	-	15.9	10	27	63	-	6	4.4	1
	4160R/L	14	160	50.8	-	-	19.0	11	27	63	-	6	6.8	1
	4200R/L	18	200	80	24	14	-	-	-	40	120	6	6.7	2
	4250R/L	24	250	120	30	18	-	-	-	40	170	6	9.1	2
	4315R/L	30	315	180	30	18	-	-	-	40	230	6	12.3	2
	4355R/L	34	355	220	30	18	-	-	-	40	270	6	14.8	2
	4400R/L	38	400	250	30	18	-	-	-	40	300	6	18.1	2
	4450R/L	44	450	300	30	18	-	-	-	40	350	6	21.3	2
CDH	5100R/L	08	100	31.75	-	-	12.7	8	22	50	-	7	2.3	1
	5125R/L	10	125	38.1	-	-	15.9	10	27	63	-	7	4.4	1
	5160R/L	14	160	50.8	-	-	19.0	11	27	63	-	7	6.8	1
	5200R/L	18	200	80	24	14	-	-	-	40	120	7	6.6	2
	5250R/L	24	250	120	30	18	-	-	-	40	170	7	9.1	2
	5315R/L	30	315	180	30	18	-	-	-	40	230	7	12.2	2
	5355R/L	34	355	220	30	18	-	-	-	40	270	7	14.7	2
	5400R/L	38	400	250	30	18	-	-	-	40	300	7	18	2
	5450R/L	44	450	300	30	18	-	-	-	40	350	7	21.2	2

● : Stock item ○ : Under preparing for stock

Parts

	Wedge	Wedge Screw	Wrench
			
4000Type	WCDH4R1/L1(Ø100-Ø160) WCDH4R/L(Ø200-Ø450)	DHA0821F	HW40
5000Type	WCDH5R1/L1(Ø100-Ø160) WCDH5R/L(Ø200-Ø450)	DHA0821F	HW40

Available Arbors

Designation		General Arbor	Adaptor
CDH	100R/L	NT* (M/U)-FMA31.75-□□	-
	125R/L	NT*□□(M/U)-FMA38.1-□□	-
	160R/L	NT*□□(M/U)-FMA50.8-□□	-
	200R/L	-	APR200
	250R/L	-	APR250
	315R/L	-	APR315
	355R/L	-	APR355
	400R/L	-	APR400
	450R/L	-	APR450

Recommended Cutting Condition

Workpiece	Cutting Condition		Grades
	vc(m/min)	fz(mm/t)	
K	100 ~ 200 80 ~ 150	0.05 ~ 0.30 0.10 ~ 0.30	**PC6510** **H01,G10**

Available Inserts

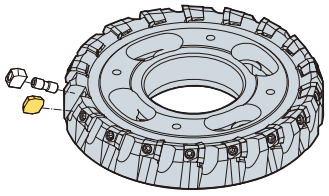
SDCN



Type	Designation	Coated		Uncoated			Page
		NCM325	PC6510	ST30A	H01	G10	
4000Type	SDCN 42R						E12
	42L				●		
5000Type	SDCN 53R						E12
	53L						

● : Stock item ○ : Under preparing for stock

Assembling



• Applicable inserts, see pages E12
• Available Arbors and bolt : E215~E217

DEH5000

AA 60° • AR : 14° • RR : 6°



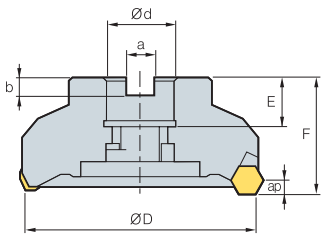


Fig. 1

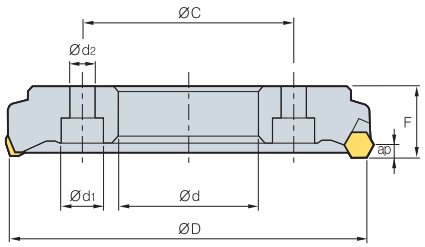


Fig. 2

(mm)

Designation			øD	ød	ød1	ød2	a	b	E	F	øC	ap	kg	Fig.
DEH	5100R/L	6	100	31.75	-	-	12.7	8	22	50	-	7	2.3	1
	5125R/L	7	125	38.1	-	-	15.9	10	27	63	-	7	4.4	1
	5160R/L	8	160	50.8	-	-	19.0	11	27	63	-	7	6.3	1
	5200R/L	12	200	80	24	14	-	-	-	40	120	7	6.5	2
	5250R/L	14	250	120	30	18	-	-	-	40	170	7	9.1	2
	5315R/L	18	315	180	30	18	-	-	-	40	230	7	12.1	2
	5355R/L	20	355	220	30	18	-	-	-	40	270	7	14.8	2
	5400R/L	24	400	250	30	18	-	-	-	40	300	7	17.8	2
	5450R/L	28	450	300	30	18	-	-	-	40	350	7	21	2

● : Stock item ○ : Under preparing for stock

Parts

Wedge	Wedge Screw	Wrench
		
WDEHR-1/L-1(Ø100 - Ø200) WDEHR/L(Ø250 - Ø450)	DHA0821F	HW40

Available Arbors

Designation		General Arbor	Adaptor
DEH	5100R/L	NT*□□(M/U)-FMA31.75-□□	-
	5125R/L	NT*□□(M/U)-FMA38.1-□□	-
	5160R/L	NT*□□(M/U)-FMA50.8-□□	-
	5200R/L	-	APR200
	5250R/L	-	APR250
	5315R/L	-	APR315
	5355R/L	-	APR355
	5400R/L	-	APR400
	5450R/L	-	APR450

Recommended Cutting Condition

Workpiece	Cutting Condition		Grades
	vc(m/min)	fz(mm/t)	
K	100 ~ 200 80 ~ 150	0.05 ~ 0.30 0.10 ~ 0.30	**PC6510** **H01,G10**

Available Inserts

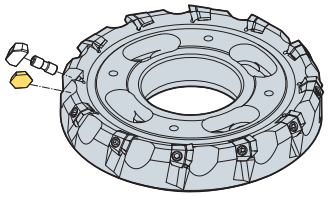
HECN



Designation	Coated		Uncoated			Page
	NCM325	PC6510	ST30A	H10	G10	
HECN 090408FN						E07
090408SN						
090408TN						

● : Stock item ○ : Under preparing for stock

Assembling



• Applicable inserts, see pages E07
• Available Arbors and bolt : E215~E217

DPH5000

AA 60° | • AR : 5° • RR : -3°





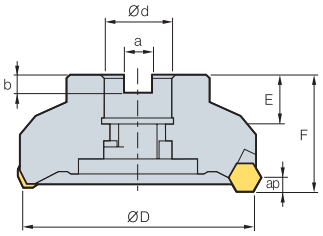


Fig. 1

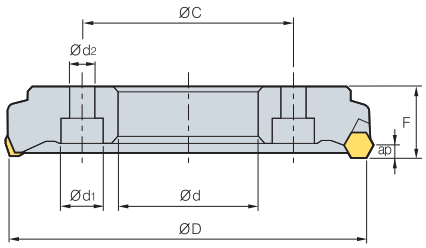


Fig. 2

(mm)

Designation		⚙	øD	ød	ød1	ød2	a	b	E	F	øC	ap	kg	Fig.
DPH	5100R/L	8	100	31.75	-	-	12.7	8	22	50	-	7	2.3	1
	5125R/L	10	125	38.1	-	-	15.9	10	27	63	-	7	4.4	1
	5160R/L	14	160	50.8	-	-	19.0	11	27	63	-	7	6.7	1
	5200R/L	18	200	80	24	14	-	-	-	40	120	7	6.5	2
	5250R/L	24	250	120	30	18	-	-	-	40	170	7	9	2
	5315R/L	30	315	180	30	18	-	-	-	40	230	7	12	2
	5355R/L	34	355	220	30	18	-	-	-	40	270	7	14.5	2
	5400R/L	38	400	250	30	18	-	-	-	40	300	7	17.7	2
	5450R/L	44	450	300	30	18	-	-	-	40	350	7	21	2

● : Stock item ○ : Under preparing for stock

Parts

Wedge	Wedge Screw	Wrench
		
WDPH5R/L	DHA0821F	HW40

Available Arbors

Designation		General Arbor	Adaptor
DPH	5100R/L	NT*□□(M/U)-FMA31.75-□□	-
	5125R/L	NT*□□(M/U)-FMA38.1-□□	-
	5160R/L	NT*□□(M/U)-FMA50.8-□□	-
	5200R/L	-	APR200
	5250R/L	-	APR250
	5315R/L	-	APR315
	5355R/L	-	APR355
	5400R/L	-	APR400
	5450R/L	-	APR450

Recommended Cutting Condition

Workpiece	Cutting Condition		Grades
	vc(m/min)	fz(mm/t)	
K	100 ~ 200 80 ~ 150	0.05 ~ 0.30 0.10 ~ 0.30	**PC6510** **H01,G10**

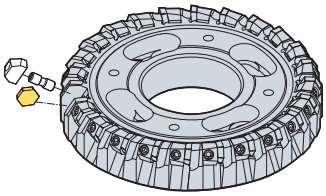
Available Inserts

HPEN	HPEN-WC
	

Designation		Coated		Uncoated			Page
		NCM325	PC6510	ST30A	H10	G10	
HPEN	090408FN						E07
	090408SN						
	090408EN						
	090408-WC						

● : Stock item ○ : Under preparing for stock

Assembling



• Applicable inserts, see pages E07
• Available Arbors and bolt : E215~E217

PNH4000/5000

AA 90° | • AR : -5° • RR : -6°



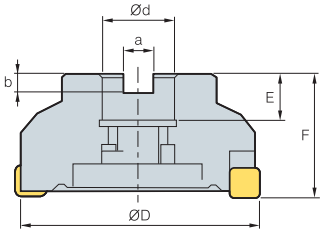


Fig. 1

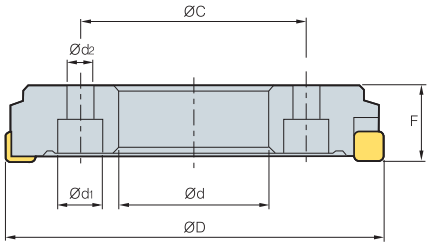


Fig. 2

(mm)

Designation			øD	ød	ød1	ød2	a	b	E	F	øC	kg	Fig.
PNH	4125R/L	10	125	38.1	-	-	15.9	10	27	63	-	3.4	1
	4160R/L	14	160	50.8	-	-	19.0	11	27	63	-	5.5	1
	4200R/L	18	200	80	24	14	-	-	-	40	120	5.5	2
	4250R/L	24	250	120	30	18	-	-	-	40	170	7.7	2
	4315R/L	30	315	180	30	18	-	-	-	40	230	10.5	2
	4355R/L	34	355	220	30	18	-	-	-	40	270	12.9	2
	4400R/L	38	400	250	30	18	-	-	-	40	300	16.1	2
	4450R/L	44	450	300	30	18	-	-	-	40	350	19.1	2
PNH	5125R/L	10	125	38.1	-	-	15.9	10	27	63	-	3.4	1
	5160R/L	14	160	50.8	-	-	19.0	11	27	63	-	5.3	1
	5200R/L	18	200	80	24	14	-	-	-	40	120	5.4	2
	5250R/L	24	250	120	30	18	-	-	-	40	170	7.6	2
	5315R/L	30	315	180	30	18	-	-	-	40	230	10.4	2
	5355R/L	34	355	220	30	18	-	-	-	40	270	12.8	2
	5400R/L	38	400	250	30	18	-	-	-	40	300	15.9	2
	5450R/L	44	450	300	30	18	-	-	-	40	350	18.9	2

● : Stock item ○ : Under preparing for stock

Parts

	Wedge	Wedge Screw	Wrench
			
4000Type	WPNH4N	DHA0821F	HW40
5000Type	WPNH5N	DHA0821F	HW40

Available Arbors

Designation		General Arbor	Adaptor
PNH	125R/L	NT*□□(M/U)-FMA38.1-□□	-
	160R/L	NT*□□(M/U)-FMA50.8-□□	-
	200R/L	-	APR200
	250R/L	-	APR250
	315R/L	-	APR315
	355R/L	-	APR355
	400R/L	-	APR400
	450R/L	-	APR450

Recommended Cutting Condition

Workpiece	Cutting Condition		Grades
	vc(m/min)	fz(mm/t)	
K	100 ~ 200	0.05 ~ 0.30	**PC6510**
	80 ~ 150	0.10 ~ 0.30	**H01,G10**

Available Inserts

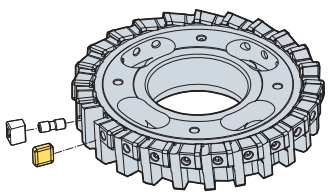
SNEF



Type	Designation	Coated		Uncoated			Page
		NCM325	PC6510	ST30A	H01	G10	
4000Type	**SNEF 435**		●				E07
5000Type	**SNEF 535**						E07

● : Stock item ○ : Under preparing for stock

Assembling



• Applicable inserts, see pages E07
• Available Arbors and bolt : E215~E217

PPH4000

AA 90° • AR : 5° • RR : -5°



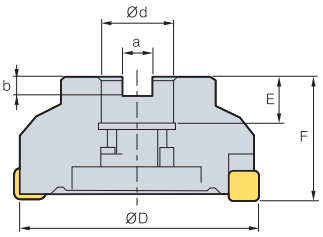


Fig. 1

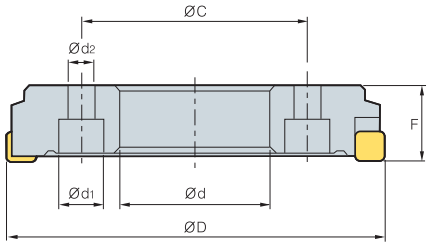


Fig. 2

(mm)

Designation			øD	ød	ød1	ød2	a	b	E	F	øC	kg	Fig.
PPH	4125R/L	10	125	38.1	-	-	15.9	10	27	63	-	3.4	1
	4160R/L	14	160	50.8	-	-	19.0	11	27	63	-	5.3	1
	4200R/L	18	200	80	24	14	-	-	-	40	120	5.5	2
	4250R/L	24	250	120	24	14	-	-	-	40	170	7.7	2
	4315R/L	30	315	180	30	18	-	-	-	40	230	10.5	2
	4355R/L	34	355	220	30	18	-	-	-	40	270	13	2
	4400R/L	38	400	250	30	18	-	-	-	40	300	16	2
	4450R/L	44	450	300	30	18	-	-	-	40	350	19	2

● : Stock item ○ : Under preparing for stock

Parts

Wedge	Wedge Screw	Wrench
		
WPPH4R/L	DHA0821F	HW40

Available Arbors

Designation		General Arbor	Adaptor
PPH	4125R/L	NT*□□(M/U)-FMA38.1-□□	-
	4160R/L	NT*□□(M/U)-FMA50.8-□□	-
	4200R/L	-	APR200
	4250R/L	-	APR250
	4315R/L	-	APR315
	4355R/L	-	APR355
	4400R/L	-	APR400
	4450R/L	-	APR450

Recommended Cutting Condition

Workpiece	Cutting Condition		Grades
	vc(m/min)	fz(mm/t)	
K	100 ~ 200	0.05 ~ 0.30	**PC6510**
	80 ~ 150	0.10 ~ 0.30	**H01,G10**

Available Inserts

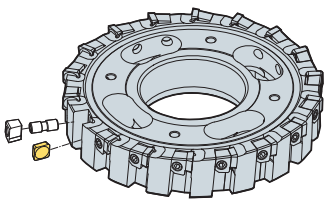
SPEN-WC



Designation	Coated		Uncoated			Page
	NCM325	PC6510	ST30A	H10	G10	
SPEN 120416-WC						E17

● : Stock item ○ : Under preparing for stock

Assembling



• Applicable inserts, see pages E17
• Available Arbors and bolt : E215~E217

SQN3000

New



AA 88° | • AR : -6° • RR : -6°~-11°



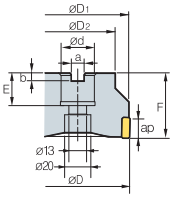


Fig. 1

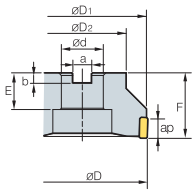


Fig. 2

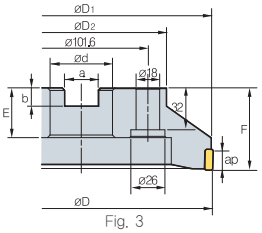


Fig. 3

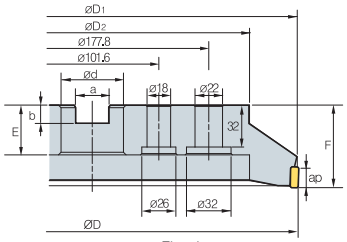


Fig. 4

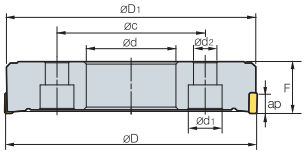


Fig. 5

Normal Type

(mm)

Designation		Stock R	Stock L	øD	øD1	øD2	ød	a	b	E	F	ap	kg	Standard	MAX	Fig.
SQN (SQNM)	3080R/L-8Z			80	82	57	25.4(27)	9.5(12.4)	6(7)	25	50	14	1.3	8	12	1
	3100R/L-10Z			100	102	67	31.75(32)	12.7(14.4)	8(8)	32	50	14	1.8	10	16	2
	3125R/L-14Z			125	127	87	38.1(40)	15.9(16.4)	10(9)	38	63	14	3.6	14	20	2
	3160R/L-18Z			160	162	107	50.8(40)	19.0(16.4)	11(9)	38	63	14	5.1	18	24	2
	3200R/L-24Z			200	202	130	47.625(60)	25.4(25.7)	14(14)	38	63	14	7.1	24	32	3
	3250R/L-30Z			250	252	180	47.625(60)	25.4(25.7)	14(14)	38	63	14	11.9	30	40	3
	3315R/L-36Z			315	317	240	47.625(60)	25.4(25.7)	14(14)	38	63	14	19	36	48	4

● : Stock item ○ : Under preparing for stock

QC(Quick Change) Type

(mm)

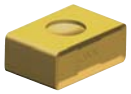
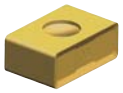
Designation		Stock R	Stock L	øD	øD1	ød	ød1	ød2	øC	F	ap	kg	Standard	MAX	Fig.
SQN	3200R/L2-24Z			200	202	80	24	14	120	40	14	5.9	24	32	5
	3250R/L2-30Z			250	252	120	30	18	170	40	14	8.1	30	40	5
	3315R/L2-36Z			315	317	180	30	18	230	40	14	11.2	36	48	5
	3355R/L2-42Z			355	357	220	30	18	270	40	14	14.4	42	56	5
	3400R/L2-48Z			400	402	250	30	18	300	40	14	16	48	64	5
	3450R/L2-54Z			450	452	300	30	18	350	40	14	20.1	54	72	5

● : Stock item ○ : Under preparing for stock

Parts

Screw	Wrench
	
FTNA0411	TW15S

Available Inserts

LNEX	LNEXQNN
	

Designation		Coated NCM325	Coated PC6510	Uncoated ST30A	Uncoated H10	Uncoated G10	Page
LNEX	150608-MF						E09
	150608-ML						
	15060QNN-MF						
	15060QNN-ML						

● : Stock item ○ : Under preparing for stock

• Applicable inserts, see pages E09

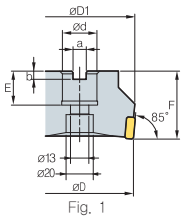
SFN3000

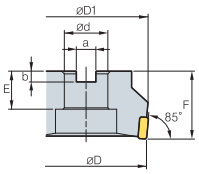
New

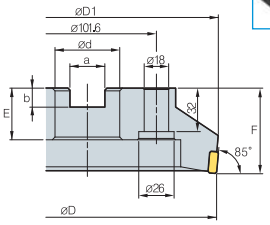


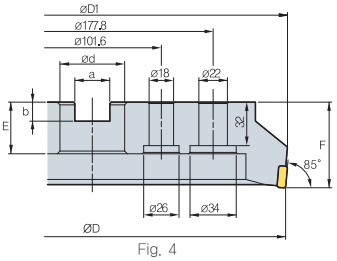
AA 85° | • AR : -6° • RR : -6°~-11°

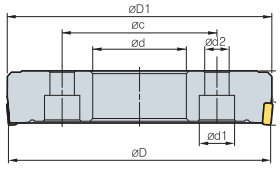



Fig. 1


Fig. 2


Fig. 3


Fig. 4


Fig. 5

Normal Type

(mm)

Designation		Stock R	Stock L	øD	øD1	øD2	ød	a	b	E	F	ap	kg	Standard	MAX	Fig.
SFN (SFNM)	3080R/L-8Z			80	83	57	25.4(27)	9.5(12.4)	6(7)	25	50	13.5	1.3	8	12	1
	3100R/L-10Z			100	103	67	31.75(32)	12.7(14.4)	8(8)	32	50	13.5	1.8	10	16	2
	3125R/L-14Z			125	128	87	38.1(40)	15.9(16.4)	10(9)	38	63	13.5	3.7	14	20	2
	3160R/L-18Z			160	163	107	50.8(40)	19.0(16.4)	11(9)	38	63	13.5	5.3	18	24	2
	3200R/L-24Z			200	203	130	47.625(60)	25.4(25.7)	14(14)	38	63	13.5	7.5	24	32	3
	3250R/L-30Z			250	253	180	47.625(60)	25.4(25.7)	14(14)	38	63	13.5	12.1	30	40	3
	3315R/L-36Z			315	318	240	47.625(60)	25.4(25.7)	14(14)	38	63	13.5	19.6	36	48	4

● : Stock item ○ : Under preparing for stock

QC(Quick Change) Type

(mm)

Designation		Stock R	Stock L	øD	øD1	ød	ød1	ød2	øC	F	ap	kg	Standard	MAX	Fig.
SFN	3200R/L2-24Z			200	203	80	24	14	120	40	13.5	6.2	24	32	5
	3250R/L2-30Z			250	253	120	30	18	170	40	13.5	8.2	30	40	5
	3315R/L2-36Z			315	318	180	30	18	230	40	13.5	11.5	36	48	5
	3355R/L2-42Z			355	358	220	30	18	270	40	13.5	14.3	42	56	5
	3400R/L2-48Z			400	403	250	30	18	300	40	13.5	16.1	48	64	5
	3450R/L2-54Z			450	453	300	30	18	350	40	13.5	20.2	54	72	5

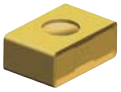
● : Stock item ○ : Under preparing for stock

Parts

Screw	Wrench
	
FTNA0411	TW15S

Available Inserts

LNEX



Designation		Coated NCM325	Coated PC6510	Uncoated ST30A	Uncoated H10	Uncoated G10	Page
LNEX	150608-MF						E09
	150608-ML						

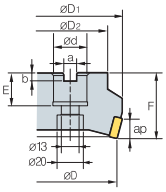
• Applicable inserts, see pages E09

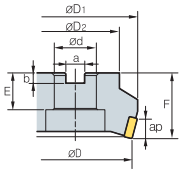
SEN3000

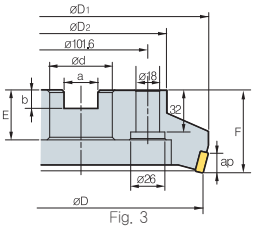
New

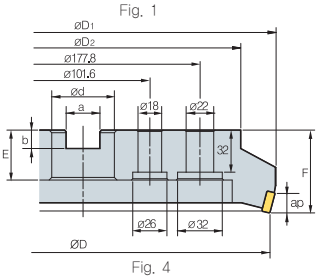
AA 75° | • AR : -6° • RR : -6°~-8°

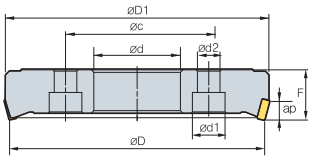



Fig. 1


Fig. 2


Fig. 3


Fig. 4


Fig. 5

Normal Type

(mm)

Designation		Stock R	Stock L	øD	øD1	øD2	ød	a	b	E	F	ap	kg	Standard	MAX	Fig.
SEN (SENM)	3080R/L-8Z			80	88	57	25.4(27)	9.5(12.4)	6(7)	25	50	13	1.5	8	12	1
	3100R/L-10Z			100	108	67	31.75(32)	12.7(14.4)	8(8)	32	50	13	2	10	16	2
	3125R/L-14Z			125	133	87	38.1(40)	15.9(16.4)	10(9)	38	63	13	3.6	14	20	2
	3160R/L-18Z			160	168	107	50.8(40)	19.0(16.4)	11(9)	38	63	13	5.7	18	24	2
	3200R/L-24Z			200	208	130	47.625(60)	25.4(25.7)	14(14)	38	63	13	7.7	24	32	3
	3250R/L-30Z			250	258	180	47.625(60)	25.4(25.7)	14(14)	38	63	13	12.6	30	40	3
	3315R/L-36Z			315	323	240	47.625(60)	25.4(25.7)	14(14)	38	63	13	19.9	36	48	4

● : Stock item ○ : Under preparing for stock

QC(Quick Change) Type

(mm)

Designation		Stock R	Stock L	øD	øD1	ød	ød1	ød2	øC	F	ap	kg	Standard	MAX	Fig.
SEN	3200R/L2-24Z			200	208	80	24	14	120	40	13	6.3	24	32	5
	3250R/L2-30Z			250	258	120	30	18	170	40	13	8.4	30	40	5
	3315R/L2-36Z			315	323	180	30	18	230	40	13	11.7	36	48	5
	3355R/L2-42Z			355	363	220	30	18	270	40	13	14.4	42	56	5
	3400R/L2-48Z			400	408	250	30	18	300	40	13	17.3	48	64	5
	3450R/L2-54Z			450	458	300	30	18	350	40	13	21	54	72	5

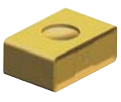
● : Stock item ○ : Under preparing for stock

Parts

Screw	Wrench
	
FTNA0411	TW15S

Available Inserts

LNEX



Designation	Coated NCM325	Coated PC6510	Uncoated ST30A	Uncoated H10	Uncoated G10	Page
LNEX 150608-MF						E09
150608-ML						

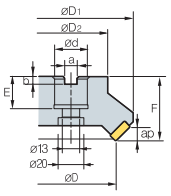
● : Stock item ○ : Under preparing for stock

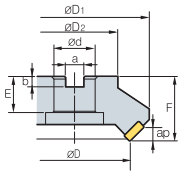
• Applicable inserts, see pages E09

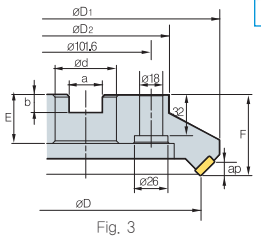
SAN3000 New

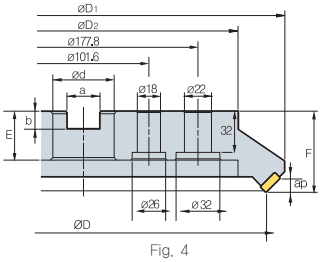
AA 45° • AR : -8° • RR : -2°

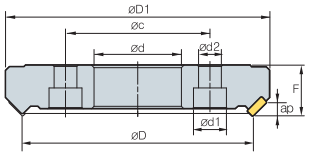



Fig. 1


Fig. 2


Fig. 3


Fig. 4


Fig. 5

Normal Type

(mm)

Designation		Stock R	Stock L	ØD	ØD1	ØD2	Ød	a	b	E	F	ap	kg	Standard	MAX	Fig.
SAN (SANM)	3080R/L-8Z			80	107	57	25.4(27)	9.5(12.4)	6(7)	25	50	8.5	1.8	8	12	1
	3100R/L-10Z			100	127	67	31.75(32)	12.7(14.4)	8(8)	32	50	8.5	2.4	10	16	2
	3125R/L-14Z			125	152	87	38.1(40)	15.9(16.4)	10(9)	38	63	8.5	4.2	14	20	2
	3160R/L-18Z			160	187	107	50.8(40)	19.0(16.4)	11(9)	38	63	8.5	6.1	18	24	2
	3200R/L-24Z			200	227	130	47.625(60)	25.4(25.7)	14(14)	38	63	8.5	8.2	24	32	3
	3250R/L-30Z			250	277	180	47.625(60)	25.4(25.7)	14(14)	38	63	8.5	13.1	30	40	3
	3315R/L-36Z			315	342	240	47.625(60)	25.4(25.7)	14(14)	38	63	8.5	20.7	36	48	4

● : Stock item ○ : Under preparing for stock

QC(Quick Change) Type

(mm)

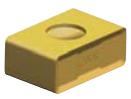
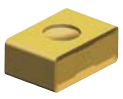
Designation		Stock R	Stock L	ØD	ØD1	Ød	Ød1	Ød2	ØC	F	ap	kg	Standard	MAX	Fig.
SAN	3200R/L2-24Z			200	227	80	24	14	120	40	8.5	6.7	24	32	5
	3250R/L2-30Z			250	277	120	30	18	170	40	8.5	8.7	30	40	5
	3315R/L2-36Z			315	342	180	30	18	230	40	8.5	13.1	36	48	5
	3355R/L2-42Z			355	382	220	30	18	270	40	8.5	16.4	42	56	5
	3400R/L2-48Z			400	427	250	30	18	300	40	8.5	19.6	48	64	5
	3450R/L2-54Z			450	477	300	30	18	350	40	8.5	23.5	54	72	5

● : Stock item ○ : Under preparing for stock

Parts

Screw	Wrench
	
FTNA0411	TW15S

Available Inserts

	LNEX	LNEXANN
		

Designation		Coated NCM325	Coated PC6510	Uncoated ST30A	Uncoated H10	Uncoated G10	Page
LNEX	150608-MF						E09
	150608-ML						
	15060ANN-MF						
	15060ANN-ML						

● : Stock item ○ : Under preparing for stock

• Applicable inserts, see pages E09

SVUM6000

New



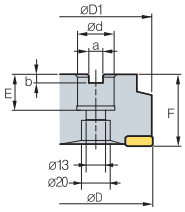


Fig. 1

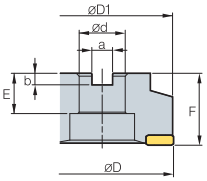


Fig. 2

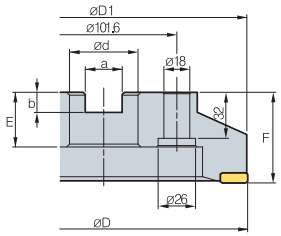


Fig. 3

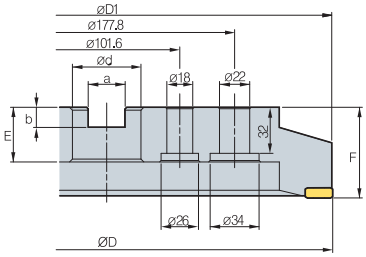


Fig. 4

(mm)

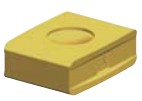
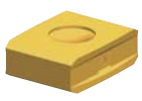
Designation		Stock R	Stock L	⌀	øD	øD1	øD2	ød	a	b	E	F	ap	kg	Fig.
SVUM	6080R/L-Z4			4	80	79	57	27	12.4	7	22	50	0.5	1.2	1
	6100R/L-Z4			4	100	100	67	32	14.4	8	28	63	0.5	2.3	1
	6125R/L-Z4			4	125	125	87	40	16.4	9	30	63	0.5	3.5	2
	6160R/L-Z4			4	160	160	107	40	16.4	9	30	63	0.5	5	3
	6200R/L-Z6			6	200	200	130	60	25.7	14	38	63	0.5	7.2	3
	6250R/L-Z6			6	250	250	180	60	25.7	14	38	63	0.5	12	3
	6315R/L-Z8			8	315	315	240	60	25.7	14	38	63	0.5	19.5	4

● : Stock item ○ : Under preparing for stock

Parts

Screw	Wrench
	
FTNA0513	TW20-100

Available Inserts

LNCS(R3.0)	LNCS(C1.5)
	

Designation	Coated NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	cBN DBN700	DBN920	Uncoated H01	G10	ST30A	ST20	Page
LNCS 1907-R3.0-WC																	E23
1907-C1.5-WC																	

● : Stock item ○ : Under preparing for stock

SVUM6000-B

New



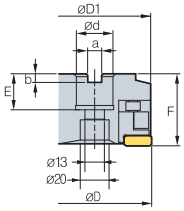


Fig. 1

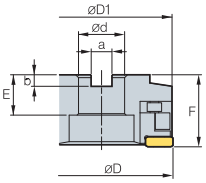


Fig. 2

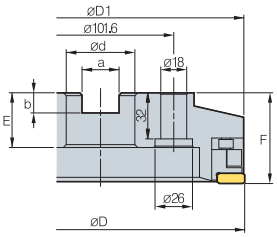


Fig. 3

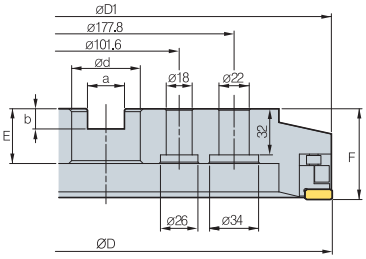


Fig. 4

(mm)

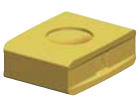
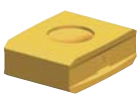
Designation		Stock R	Stock L	○	øD	øD1	øD2	ød	a	b	E	F	ap	kg	Fig.
SVUM	6080R/L-Z4-B			4	80	79	57	27	12.4	7	22	50	0.5	1.2	1
	6100R/L-Z4-B			4	100	99	67	32	14.4	8	28	63	0.5	2.3	1
	6125R/L-Z4-B			4	125	124	87	40	16.4	9	30	63	0.5	3.5	2
	6160R/L-Z4-B			4	160	160	107	40	16.4	9	30	63	0.5	5	3
	6200R/L-Z6-B			6	200	200	130	60	25.7	14	38	63	0.5	7.2	3
	6250R/L-Z6-B			6	250	250	180	60	25.7	14	38	63	0.5	12	3
	6315R/L-Z8-B			8	315	315	240	60	25.7	14	38	63	0.5	19.5	4

● : Stock item ○ : Under preparing for stock

Parts

Locator	Wedge	Wedge Screw	Adjustable Screw	Clamping Screw	Wrench
					
LSH4R	WSH4	DHA0724F	DHA0724F	FTNA0512	TW20-100

Available Inserts

LNCS(R3.0)	LNCS(C1.5)
	

Designation	Coated NCM325	NCM335	NC5330	PC3500	PC5300	PC3545	PC9530	PC6510	PC215K	PD2000	cBN DBN700	DBN920	Uncoated H01	G10	ST30A	ST20	Page
LNCS 1907-R3.0-WC																	E23
1907-C1.5-WC																	

● : Stock item ○ : Under preparing for stock

Inch

Actual designations of milling cutter

Fig. 1

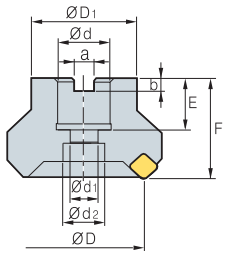


Fig. 2

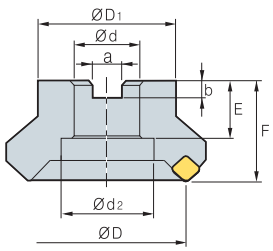


Fig. 3

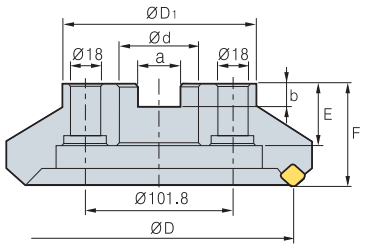
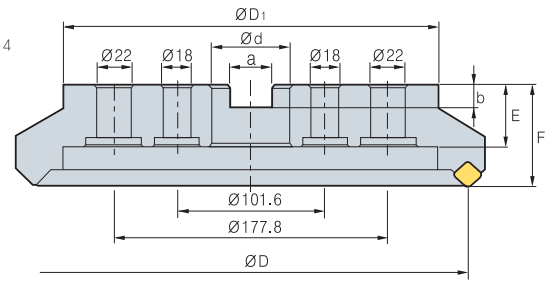


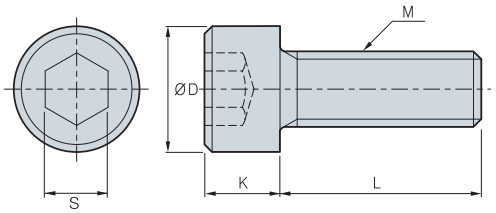
Fig. 4



Inch type

Dimensions (inch)									Fig.	Available Arbors
ØD	Ød	a	b	E	F	ØD1	Ød1	Ød2		
40	16	8.4	5.6	18	40	34	9	14	1	FMC16, SMA16
50	22	10.4	6.3	20	40	42	11	18	1	FMC22
63	22	10.4	6.3	20	40	49	11	18	1	FMC22
80	25.4	9.5	6	25	50	57	14	20	1	FMA25.4
100	31.75	12.7	8	32	50	67	–	45	2	FMA31.75 , SMB31.75
125	38.1	15.9	10	38	63	87	–	56	2	FMA38.1
160	50.8	19	11	38	63	107	–	–	2	FMA50.8
200	47.625	25.4	14	38	63	130	–	–	3	FMA47.625
250	47.625	25.4	14	38	63	180	–	–	3	FMA47.625
315	47.625	25.4	14	38	63	240	–	–	4	–

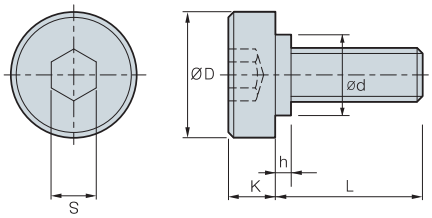
Wrench bolt



Designation	ØD	S	K	L	M	Cutter size
SB0825	13	6	8	25	M08 × 1.25	Ø40
SB1025	16	8	10	25	M10 × 1.50	Ø50, Ø63
SB1035	16	8	10	35	M10 × 1.50	Ø50,Ø63(HRM)
SB1230	18	10	12	30	M12 × 1.75	Ø80
SB1630	24	14	16	30	M16 × 2.0	Ø100
SB1645	24	14	16	45	M16 × 2.0	Ø80, Ø100(HRM)
SB2040	30	17	20	40	M20 × 2.5	Ø125

• Detail spec. for HRM : see pages E107

Clamp bolt



Specifications	Dimensions (inch)						Cutter size
	D	L	K	S	h	d	
M8 X 1.25	20	20	7	6	–	–	Ø40
M10 X 1.5	28	24	9	8	–	–	Ø50 , Ø63
M12 X1.75	33	28	10	10	2	23	Ø80
M16 X 2	40	32	10	14	5	23	Ø100
M20 X 2.5	50	40	14	17	5	27	Ø125
M24 X 3	64	46	14	19	9	37	Ø160

Metric

Clamping part of milling cutter

Fig. 1

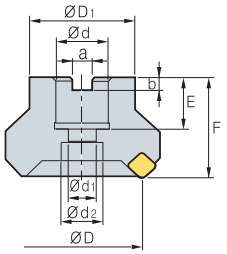


Fig. 2

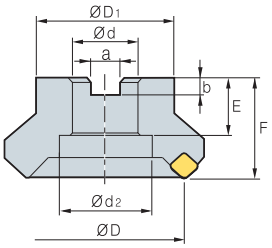


Fig. 3

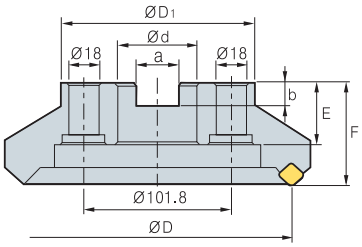
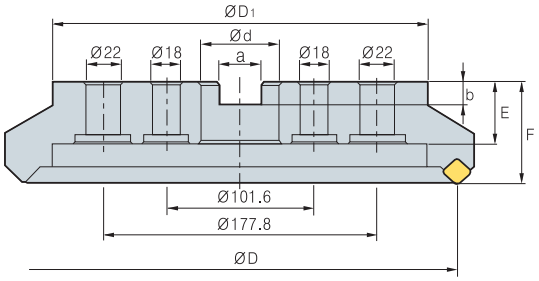


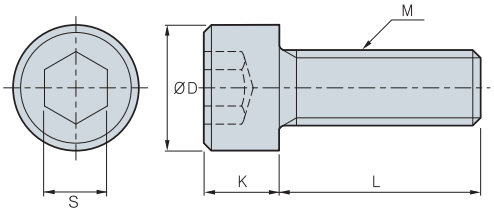
Fig. 4



Metric type(mm)

Dimensions (mm)									Fig.	Available Arbors
ØD	Ød	a	b	E	F	ØD1	Ød1	Ød2		
40	16	8.4	5.6	18	40	34	9	14	1	FMC16, SMA16
50	22	10.4	6.3	20	40	42	11	18	1	FMC22
63	22	10.4	6.3	20	40	49	11	18	1	FMC22
80	27	12.4	7	22	50	57	14	20	1	FMC27
100	32	14.4	8	28	50	67	–	45	2	FMC32
125	40	16.4	9	32	63	87	–	56	2	FMB40
160	40	16.4	9	32	63	107	–	–	2	FMB40
200	60	25.7	14	38	63	130	–	–	3	FMB60
250	60	25.7	14	38	63	180	–	–	3	FMB60
315	60	25.7	14	38	63	240	–	–	4	–

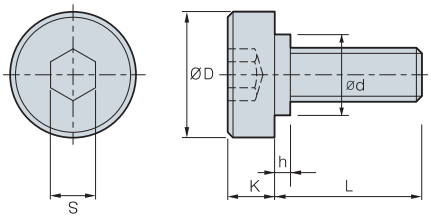
Wrench bolt



Designation	D	S	K	L	M	Cutter size
SB0825	13	6	8	25	M08 × 1.25	Ø40
SB1025	16	8	10	25	M10 × 1.50	Ø50, Ø63
SB1035	16	8	10	35	M10 × 1.50	Ø50, Ø63(HRM)
SB1230	18	10	12	30	M12 × 1.75	Ø80
SB1245	18	10	12	45	M12 × 1.75	Ø80(HRM)
SB1630	24	14	16	30	M16 × 2.0	Ø100
SB1645	24	14	16	45	M16 × 2.0	Ø100(HRM)
SB2040	30	17	20	40	M20 × 2.5	Ø125

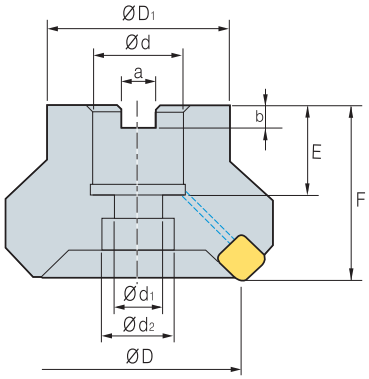
• Detail spec. for HRM : see pages E107

Clamp bolt



Specifications	Dimensions (mm)						Cutter size
	D	L	K	S	h	d	
M12 X1.75	33	28	10	10	2	23	Ø80
M16 X 2	40	32	10	14	5	23	Ø100
M20 X2.5	50	40	14	17	5	27	Ø125 , Ø160

Clamping part of milling cutter(Oil-Hole)



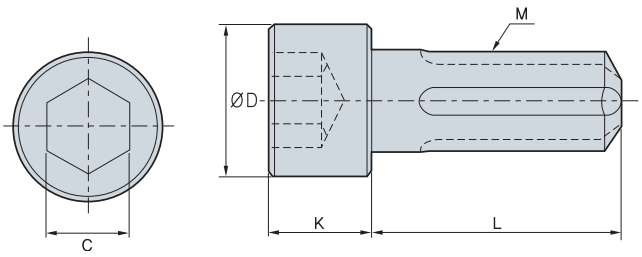
Inch type

Dimensions (inch)									Available Arbors
ØD	Ød	a	b	E	F	ØD1	Ød1	Ød2	
40	16	8.4	5.6	19	40	34	9	14	FMC16,SMA16
50	22	10.4	6.3	21	40	42	11	18	FMC22
63	22	10.4	6.3	21	40	49	11	18	FMC22
80	25.4	9.5	6	24	50	57	14	20	FMA25.4,FMB25.4
100	31.75	12.7	8	32	63	67	18	26	FMA31.75, SMB31.75
125	38.1	15.9	10	35	63	87	22	32	FMA38.1,FMB38.1,FMC38.1

Metric type

Dimensions (mm)									Available Arbors
ØD	Ød	a	b	E	F	ØD1	Ød1	Ød2	
40	16	8.4	5.6	19	40	34	9	14	FMC16,SMA16
50	22	10.4	6.3	21	40	42	11	18	FMC22
63	22	10.4	6.3	21	40	49	11	18	FMC22
80	27	12.4	7.0	23	50	57	14	20	FMC27
100	32	14.4	8.0	25	50	67	18	26	FMC32
125	40	16.4	9.0	29	63	87	22	32	FMB40

Wrench bolt



Designation	D	S	K	L	M	Cutter size
CB0825	13	6	8	25	M08×1.25	Ø40
CB1025	16	8	10	25	M10×1.50	Ø50, Ø63
CB1035	16	8	10	35	M10×1.50	Ø50, Ø63(HRM)
CB1230	18	10	12	30	M12×1.75	Ø80
CB1245	18	10	12	45	M12×1.75	Ø80(HRM)
CB1630	24	14	16	30	M16×2.0	Ø100
CB1645	24	14	16	45	M16×2.0	Ø100(HRM)
CB2040	30	17	20	40	M20×2.5	Ø125

• Detail spec. for HRM : see pages **E**107

Gear Cutter Applicable Example

Applicable Example-External Gear



■ Finishing : M20

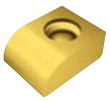
- Cutter Dia : ø400
- Tooth No : 20Tooth
- External Gear: Formal cutter for gear processing which can be expected to KS 4 level accuracy
- Cutter can simultaneously chmpher while milling.





■ Semi-finishing

- Cutter Dia : ø280
- Tooth No : 48Tooth
- Designed for processing of external Gear involute curve line shape
- Possible to work for gear root portion R with optimal insert R design

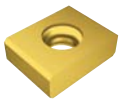




■ Roughing

- Cutter Dia : ø300
- Tooth No : 60Tooth
- High feed rate with low cutting resistance due to V shape insert setting design







Applicable Example-Internal Gear



■ Finishing : M16

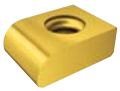
- Cutter Dia : ø400
- Tooth No : 20Tooth
- External Gear: Formal cutter for gear processing which can be expected to KS 4 level accuracy
- Cutter can simultaneously chmpher while milling.

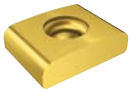




■ Semi-finishing

- Cutter Dia : ø280
- Tooth No : 48Tooth
- The semi-finishing cutter was designed for processing of external Gear involute curb line shape.



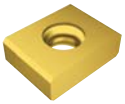




■ Roughing

- Cutter Dia : ø560
- Tooth No : 40Tooth
- Possible to use for gear processing of all module due to step type of insert setting design

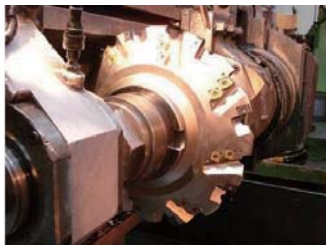


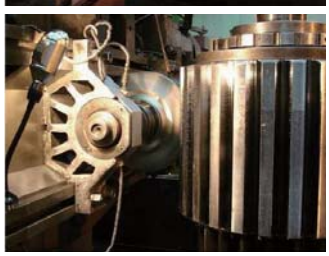


Gear Cutter Machining Example



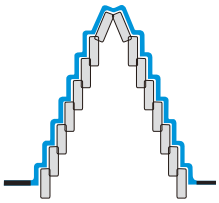
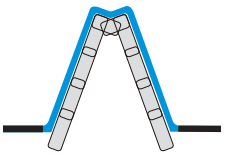
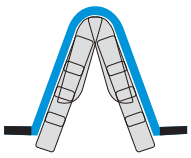
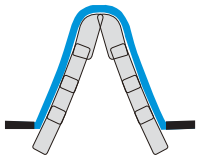
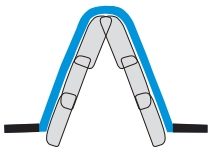
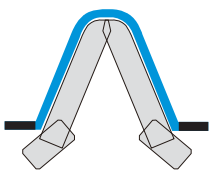
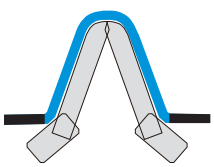
- Machine
  Gleason-PFAUTER CNC Hobbing Machine (Power : 52kW)
- Cutting condition
  vc = 119.98 m/min (n=86.8 rpm)
  fz = 0.518 mm/t (vf=450 mm/min)
  ae = 36mm
  Dry
- Tools
  M16-PT-RACK-KOR03 (Ø440xW90)
- Semi-finishing cutter(low cut, low resistance)





- Machine
  KARATS (Power : 30kW)
- Cutting condition
  vc = 150 m/min (n=119rpm)
  fz = 0.09mm/t (vf=81.6mm/min)
  ae = 45mm
  Dry
- Tools
  M24 Semi-finishing External type
  Applicable Insert
  M40-ROU(Main), CPE424-01(Flank)

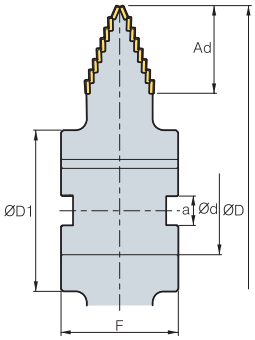
Gear Cutter Table

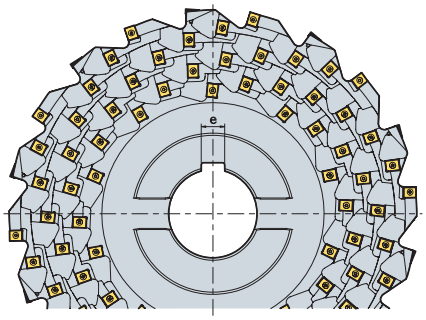
Type	Cutter Shape	Cutting edge Shape	Type	Figure
Roughing			Step Type	1. Working for big sized gear tooth 2. Low cutting resistance with step type insert setting
			V shape Type	1. Low cutting resistance with V shape cutting insert setting 2. Optimal cutting edge line setting according to Rach type & cutting edge sahpe
Semi-finishing			Low cutting resistance Type	1. 4 Corner insert on Root portion 2. 3D chip breaker shape on flank 3. Optimal cutting edge line setting for low cutting resistance
			External gear high rigidity Type	1. Optimal R type insert setting on Root portion 2. Superior Semi-finishing cutting with high rigidity shape of cutter & insert
			Internal gear high rigidity Type	1. Exclusive semi-finishing Internal Gear insert 2. Optimal cutting edge line setting with Internal tooth shape
Ffinishing			External gear	1. Concave shape of cutting edge line according to External gear type 2. Optimal cutting insert setting design according to a customer conditions
			Internal gear	1. 2 corner insert setting on right & left side and chamfering insert setting 2. Adjustable chamfering cartridge use for chamfering control

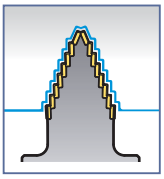
• Optimal cutting insert setting design according to customer condition

Gear Roughing Cutter (Step Type)









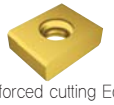
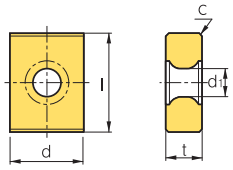
(mm)

m	⊚	øD	Ad	ød	øD1	a	e	F
30	96	450	90	100	180	25	14	140
	108	500	90	100	180	25	14	140
	120	560	90	120	220	40	32	160
40	112	450	105	100	180	25	14	140
	126	500	105	100	180	25	14	140
	140	560	105	120	220	40	32	160
50	160	560	119	120	220	40	32	160

※The above specification is subject to change according to customer related condition & Korloy technical condition

Available Inserts

(mm)

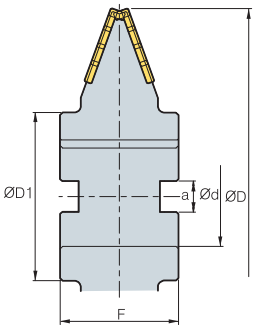
Picture	Designation	Coated				Uncoated		l	d	t	d1	c	Configuration
		NC5330	PC9530	PC3500	PC5300	H01	G10						
 Reinforced cutting Edge	**LNE434-02-1**			○	◎			19.05	14.29	6.35	5.4	0.6	
 Low cutting Resistance	**LNEX1906-C0.6-MF**			○	◎			19.05	14.29	6.35	5.4	0.6	
	LNEX190610-MR			○	◎			19.05	14.29	6.35	5.4	-	

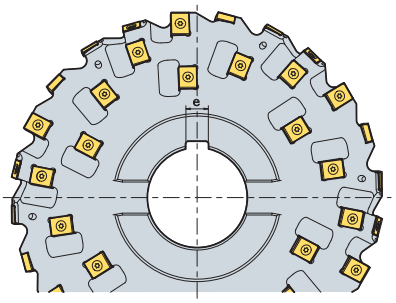
※The above specification is subject to change according to customer related condition & Korloy technical condition

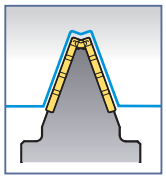
◎ : 1st Rec ○ : 2rd Rec

Gear Roughing Cutter (V shape Type)









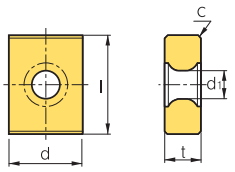
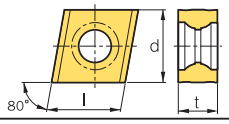
(mm)

m	TYPE	⊚	øD	ød	øD1	a	e	F
20	rack	48	280	80	135	25	18	95
22	rack	48	280	80	135	25	18	95
24	rack	48	320	80	145	25	18	105
26	rack	60	320	80	145	25	18	105
28	rack	96	400	100	180	25	24	130
30	rack	96	400	100	180	25	24	130
32	rack	96	400	100	180	25	24	130
34	rack	112	400	100	180	25	24	130
36	rack	112	450	100	180	25	24	130
38	rack	112	450	100	180	25	24	130
40	rack	128	450	100	180	25	24	160
42	rack	128	450	100	180	25	24	160
44	rack	128	560	120	220	32	32	160
46	rack	144	560	120	220	32	32	160
48	rack	144	560	120	220	32	32	160
50	rack	144	560	120	220	32	32	160

※The above specification is subject to change according to customer related condition & Korloy technical condition

Available Inserts

(mm)

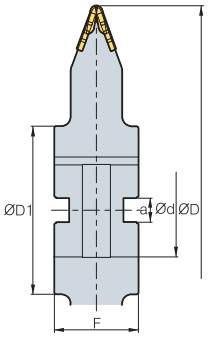
Picture	Designation	Coated						Uncoated		l	d	t	d_1	c	Configuration
		NC5330	PC9530	PC3500	PC5300	NCM325	PC6510	H01	G10						
 Reinforced cutting Edge	**LNE434-02-1**			○	◎					19.05	14.29	6.35	5.4	0.6	
				○	◎					19.05	14.29	6.35	5.4	0.6	
 Low cutting Resistance	**LNEX1906-C0.6-MF**			○	◎					19.05	14.29	6.35	5.4	-	
	LNEX190610-MR			○	◎					14.3	12.7	6.35	5.8	0.8	
 Reinforced cutting Edge	**LNE333-02-1**									10	10	5.4	-	-	
	**CNHQ1005-C0.5**														

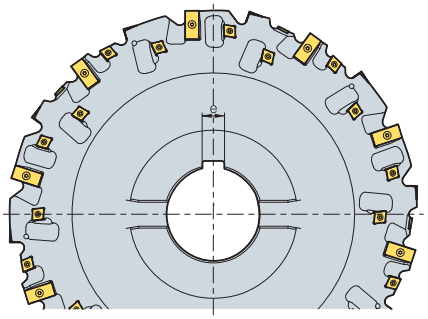
※The above specification is subject to change according to customer related condition & Korloy technical condition

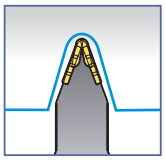
◎ : 1st Rec ○ : 2rd Rec

Gear Semi-finishing Cutter (Low cutting resistance Type)









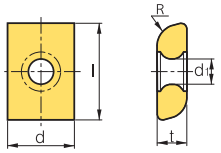
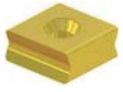
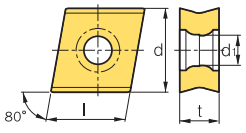
(mm)

m	No,of teeth	⊙	øD	ød	øD1	a	e	F
6	30,60,120	18	250	60	100	25	14	70
8	30,60,120	18	250	60	100	25	14	80
10	30,60,120	24	250	60	100	25	14	80
12	30,60,120	24	250	60	100	25	14	90
14	30,60,120	24	280	80	135	25	18	95
16	30,60,120	32	280	80	135	25	18	100
18	30,60,120	32	320	80	145	25	18	105
20	30,60,120	64	400	100	180	25	24	110
22	30,60,120	64	400	100	180	25	24	110
24	30,60,120	64	400	100	180	25	24	120

※The above specification is subject to change according to customer related condition & Korloy technical condition

Available Inserts

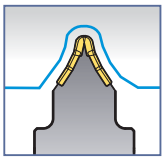
(mm)

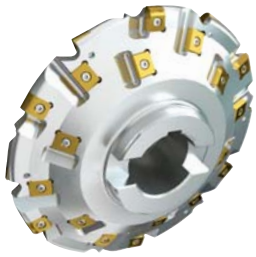
Picture	Designation	Coated				Uncoated		l	d	t	d1	R	Configuration
		NC5330	PC9530	PC3500	PC5300	H01	G10						
	**M6-2ST**			○	◎			19.05	11.6	3.8	4.4	2.25	
	M8-2ST			○	◎			19.05	11.6	4	4.4	3	
	M10-2ST			○	◎			19.05	11.6	4.76	4.4	3.75	
	M12-2ST			○	◎			19.05	14.3	6.35	5.5	4.5	
	**M14-2ST**			○	◎			25.4	14.3	6.35	5.5	5.25	
	M16-2ST			○	◎			31.8	14.3	7.14	5.5	6	
	M18-2ST			○	◎			31.8	14.3	7.14	5.5	6.75	
	**M20-2ST**			○	◎			31.8	14.3	9.52	5.5	7.5	
	M22-2ST			○	◎			31.8	14.3	9.52	5.5	8.25	
	M24-2ST			○	◎			31.8	14.3	9.52	5.5	9	
	**CPEX120606**			○	◎			12	12.7	6.35	4.5	-	
	CPEX150708			○	◎			15.15	15	7.6	5.8	-	

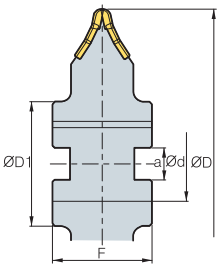
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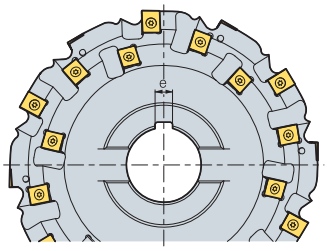
◎ : 1st Rec ○ : 2rd Rec

Gear Semi-finishing Cutter (High rigid edge Type, External Gear)









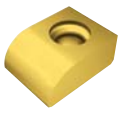
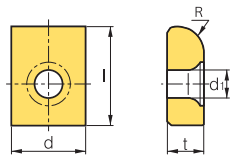
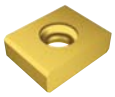
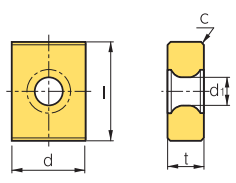
(mm)

m	No.of teeth	⊚	øD	ød	øD1	a	e	F
12	30,60,120	24	250	60	100	25	14	70
14	30,60,120	36	250	60	100	25	14	80
16	30,60,120	36	250	60	100	25	14	80
18	30,60,120	36	250	60	100	25	14	90
20	30,60,120	48	280	80	135	25	18	95
22	30,60,120	48	280	80	135	25	18	100
24	30,60,120	48	320	80	145	25	18	105
26	30,60,120	72	400	100	180	25	24	110
28	30,60,120	72	400	100	180	25	24	110
30	30,60,120	72	400	100	180	25	24	120
32	30,60,120	84	400	100	180	25	24	130
34	30,60,120	84	400	100	180	25	24	130

※The above specification is subject to change according to customer related condition & Korloy technical condition

Available Inserts

(mm)

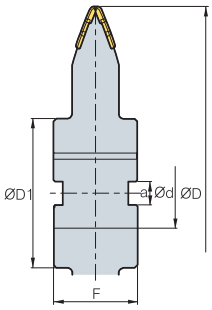
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		NC5330	PC9530	PC3500	PC5300	H01	G10							
	**M8-ROU**			○	◎			15.875	11	4.76	4.6	4.6	-	
	M12-M14-ROU			○	◎			19.05	14.29	6.35	5.4	5.4	-	
	M16-M18-ROU			○	◎			19.05	14.29	7	5.4	5.4	-	
	M20-M22-ROU			○	◎			19.05	14.29	7.94	5.4	5.4	-	
	M40-ROU			○	◎			25.4	14.29	9.52	5.4	5.4	-	
	**LNE434-02-1**			○	◎			19.05	14.29	6.35	5.4	-	0.6	
	**LNEX1906-C0.6-MF**			○	◎			19.05	14.29	6.35	5.4	-	0.6	
	LNEX190610-MR			○	◎			19.05	14.29	6.35	5.4	-	-	

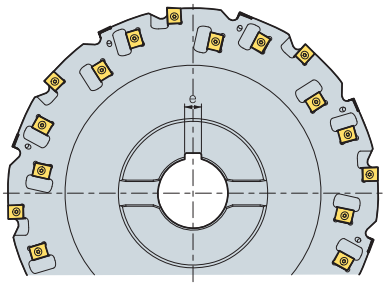
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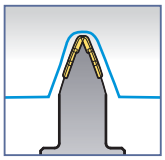
◎ : 1st Rec ○ : 2rd Rec

Gear Semi-finishing Cutter (High rigid edge Type, External Gear)









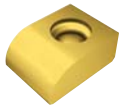
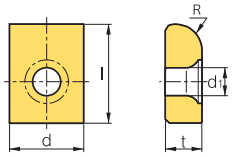
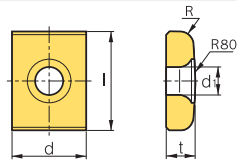
(mm)

m	No.of teeth		øD	ød	øD1	a	e	F
12	30,60,120	24	250	60	100	25	14	70
14	30,60,120	36	250	60	100	25	14	80
16	30,60,120	36	250	60	100	25	14	80
18	30,60,120	36	250	60	100	25	14	90
20	30,60,120	48	280	80	135	25	18	95
22	30,60,120	48	280	80	135	25	18	100
24	30,60,120	48	320	80	145	25	18	105
26	30,60,120	72	400	100	180	25	24	110
28	30,60,120	72	400	100	180	25	24	110
30	30,60,120	72	400	100	180	25	24	120
32	30,60,120	84	400	100	180	25	24	130
34	30,60,120	84	400	100	180	25	24	130

※The above specification is subject to change according to customer related condition & Korloy technical condition

Available Inserts

(mm)

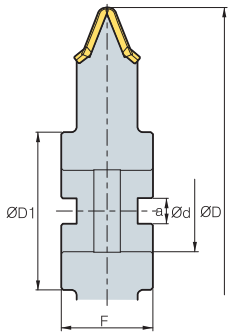
Picture	Designation	Coated				Uncoated		l	d	t	d_1	R	Configuration
		NC5330	PC9530	PC3500	PC5300	H01	G10						
	**M8-ROU**			○	◎			15.875	11	4.76	4.6	2	
	M12-M14-ROU			○	◎			19.05	14.29	6.35	5.4	3	
	M16-M18-ROU			○	◎			19.05	14.29	7	5.4	5	
	M20-M22-ROU			○	◎			19.05	14.29	7.94	5.4	7	
	M40-ROU			○	◎			25.4	14.29	9.52	5.4	10	
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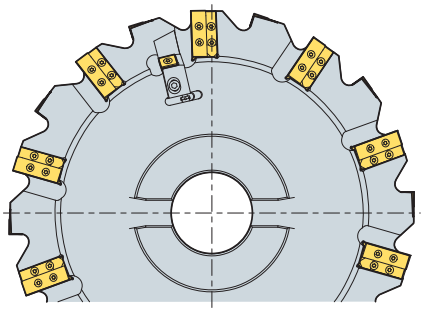
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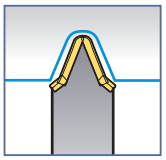
◎ : 1st Rec ○ : 2rd Rec

Gear Finishing Cutter (1 Step Type, External Gear)









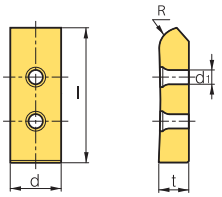
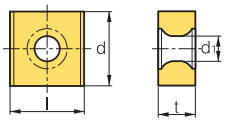
(mm)

m	⊚	øD	ød	øD1	a	F
6	20	400	80	155	25	90
8	20	400	80	155	25	90
10	20	400	80	155	25	90
12	20	400	80	155	25	90
14	20	400	80	155	25	90
16	20	400	80	155	25	90
18	20	400	80	155	25	90
20	20	400	80	155	25	90
22	20	400	80	155	25	90
24	20	400	80	155	25	90

※The above specification is subject to change according to customer related condition & Korloy technical condition

Available Inserts

(mm)

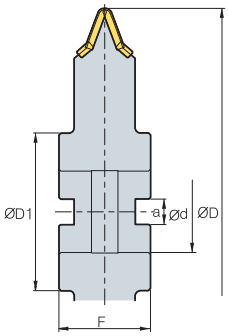
Picture	Designation	Coated				Uncoated		l	d	t	d1	R	Configuration
		NC5330	PC9530	PC3500	PC5300	H01	G10						
	**M6**			○	◎			19	14.3	5	5.5	2.25	
	M8			○	◎			27	14.3	5.4	5.5	3	
	M10			○	◎			29	14.3	6.35	5.5	3.75	
	M12			○	◎			33	14.3	6.35	5.5	4.5	
	M14			○	◎			39	14.3	6.35	5.5	5.25	
	M16			○	◎			43	14.3	7.94	5.5	6	
	M18			○	◎			50	14.3	7.94	5.5	6.75	
	M20			○	◎			54	14.3	9.53	5.5	7.5	
	M22			○	◎			57	14.3	9.53	5.5	8.25	
	M24			○	◎			64	14.3	9.53	5.5	9	
	**SNEQ1507-C0.8**			○	◎			15.875	15.875	7.94	-	-	

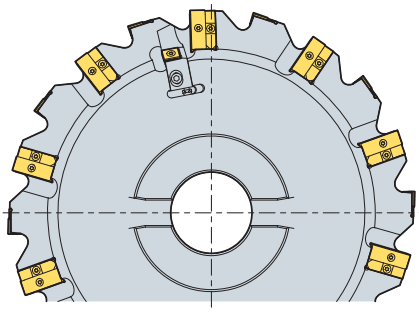
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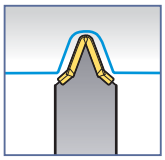
◎ : 1st Rec ○ : 2rd Rec

Gear Finishing Cutter (1 Step Type, External Gear)









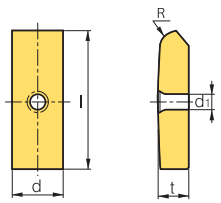
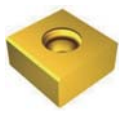
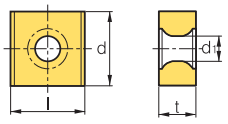
(mm)

m	⊚	øD	ød	øD1	a	F
6	20	400	80	155	25	90
8	20	400	80	155	25	90
10	20	400	80	155	25	90
12	20	400	80	155	25	90
14	20	400	80	155	25	90
16	20	400	80	155	25	90
18	20	400	80	155	25	90
20	20	400	80	155	25	90
22	20	400	80	155	25	90
24	20	400	80	155	25	90

※The above specification is subject to change according to customer related condition & Korloy technical condition

Available Inserts

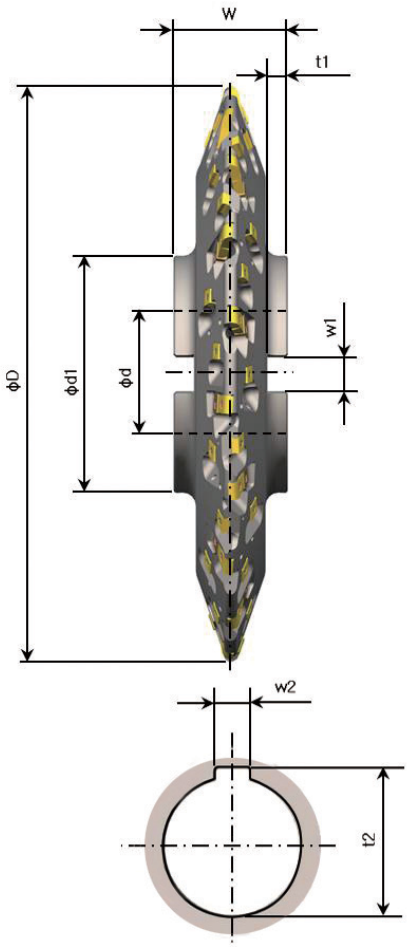
(mm)

Picture	Designation	Coated				Uncoated		l	d	t	d1	R	Configuration
		NC5330	PC9530	PC3500	PC5300	H01	G10						
	**M6**			○	◎			19	14.3	5	5.5	2.25	
	M8			○	◎			27	14.3	5.4	5.5	3	
	M10			○	◎			29	14.3	6.35	5.5	3.75	
	M12			○	◎			33	14.3	6.35	5.5	4.5	
	M14			○	◎			39	14.3	6.35	5.5	5.25	
	M16			○	◎			43	14.3	7.94	5.5	6	
	M18			○	◎			50	14.3	7.94	5.5	6.75	
	M20			○	◎			54	14.3	9.53	5.5	7.5	
	M22			○	◎			57	14.3	9.53	5.5	8.25	
	M24			○	◎			64	14.3	9.53	5.5	9	
	**SNEQ1507-C0.8**			○	◎			15.875	15.875	7.94	-	-	

※The above specification is subject to change according to customer related condition & Korloy technical condition

◎ : 1st Rec ○ : 2rd Rec

Gear Cutter Order Form



CUTTER SPEC.

Cutter Type

☐ Roughing ☐ Semi-finishing ☐ Finishing

☐ Step ☐ Low cutting resistance ☐ 1 Step

☐ V shape ☐ High rigid edge ☐ 2 Step

■ Stock for finishing(one side) **(mm)** :

■ Outside diameter **D(mm)** :

■ Bore diameter **d(mm)** :

■ Hub diameter **d1(mm)** :

■ Cutter width **W(mm)** :

■ Radial keyway **w1(mm)** :

■ Radial keyway **w2(mm)** :

■ Axial keyway **t2(mm)** :

INVOLUTE GEAR DATA.

☐ External Gear ☐ Internal Gear ☐ Rack Gear

■ Module **M(mm)** :

■ No.of teeth **Z(mm)** :

■ Pressure angle **α(°)** :

■ Helix angle **β(°)** :

■ Addendum modification coefficient **x** :

■ Tip diameter **d_a(mm)** :

■ Root diameter **d_f(mm)** :

■ Root radius **ρ_{fp}(mm)**

■ Base tangent length **W_k(mm)**

■ No. of measuring teeth **K** :

■ Dimension over balls **M_d(mm)** :

■ Ball diameter **D_M(mm)** :

■ Gear quality **(DIN, JIS)** :



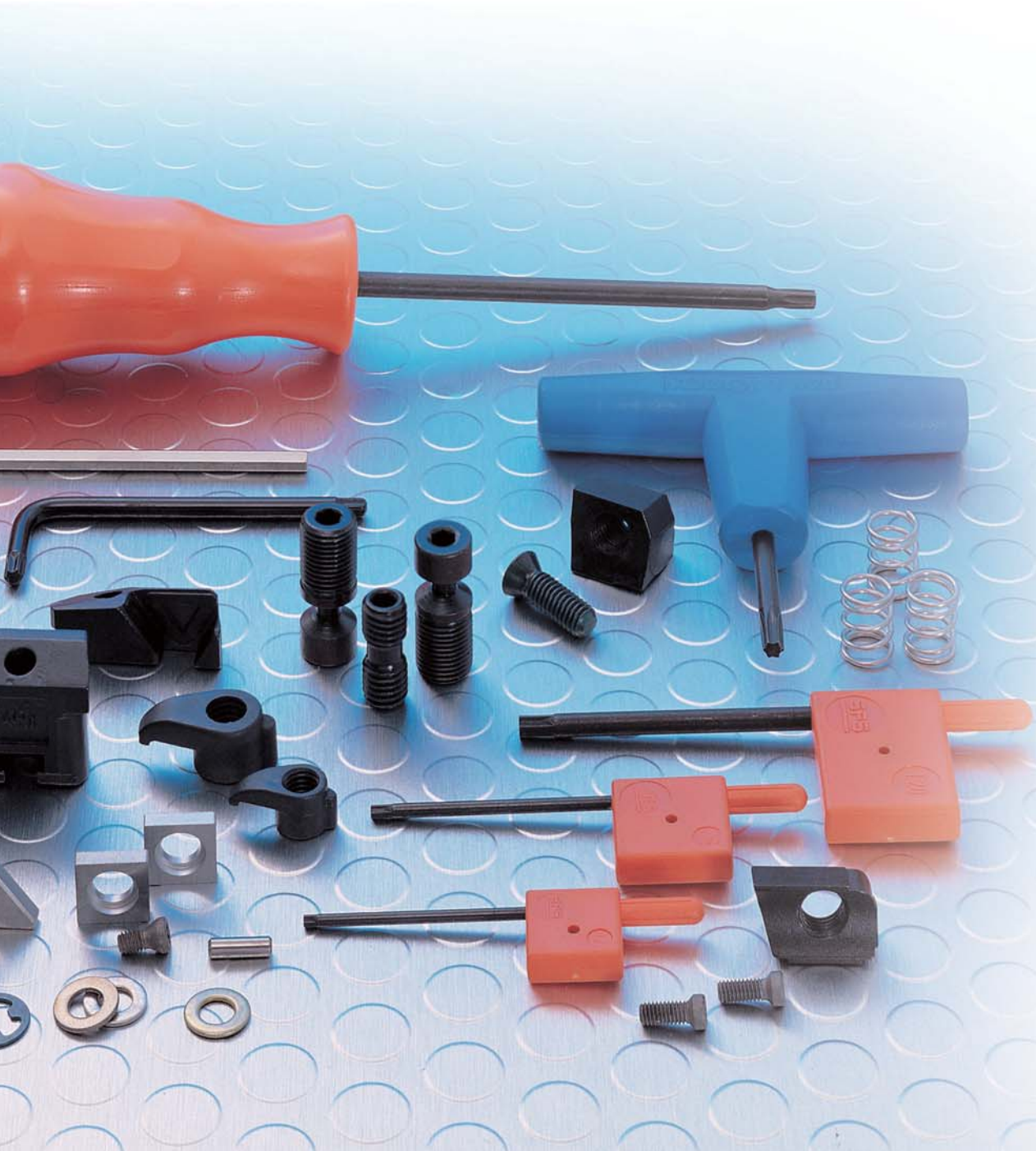
CONTENTS

Parts

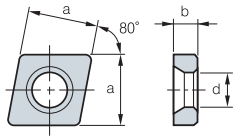
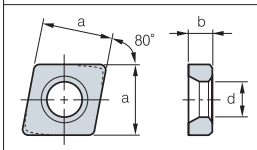
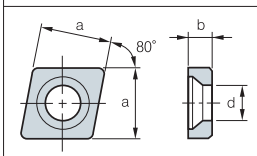
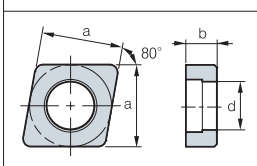
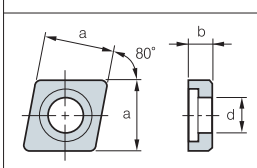
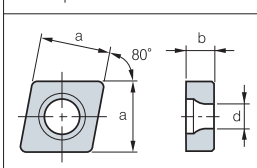
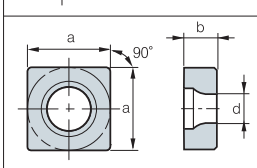
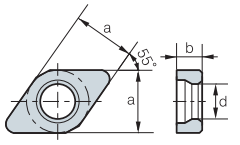
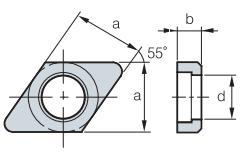
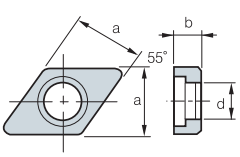
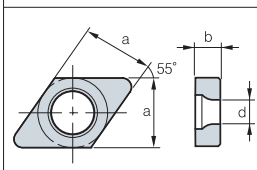
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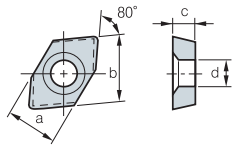
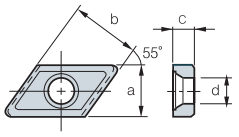
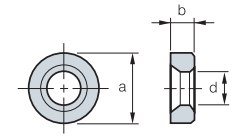
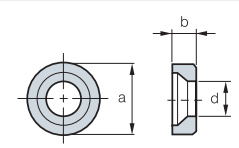
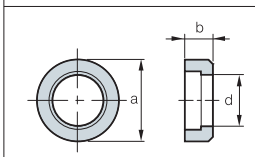
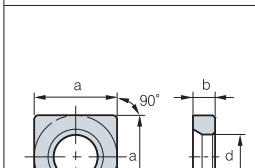
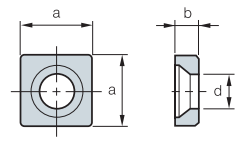
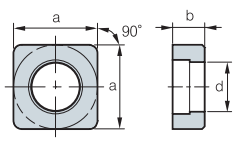
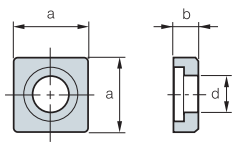
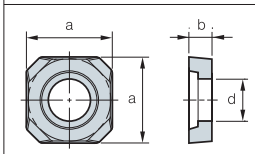
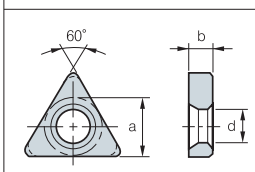
Parts

Shim K02
Cartridge K03
Chip Breaker K03
Chip Cover K03
Clamp K03
Coolant Bolt K04
Wrench Bolt K04
Lever K04
Locator K05
Nut K05
Pin K05
Screw K05
Shim Pin K06
Spring K07
Wrench K07
Stop Ring K07
Washer K07
Stopper K07
Nozzle K07

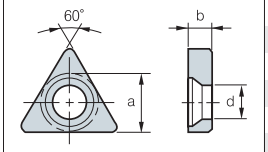
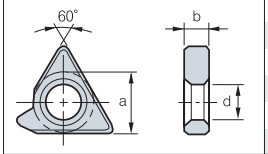
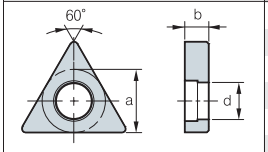
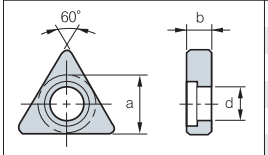
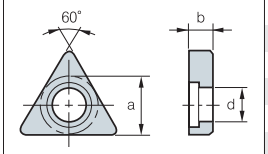
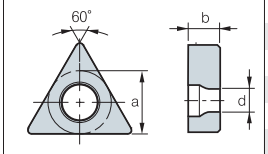
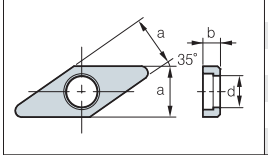
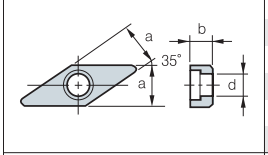
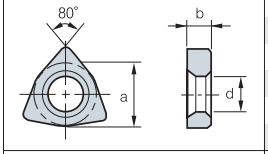
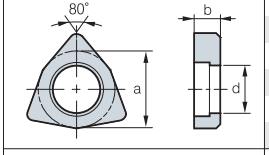
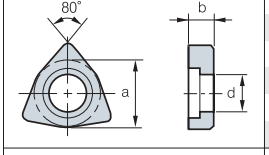
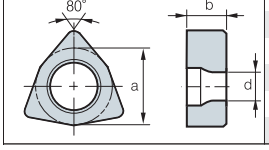


Shim

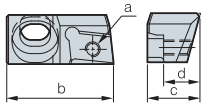
Geometry	Designation	Dimensions				
		a	b	c	d	angle
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	SC32N	8.5	3.18		4.88	
	SC42	12.5	3.18		6.9	
	SC42N	11.6	3.18		6.5	
	SC53	15.7	4.76		7.9	
	SC53N	14.6	4.76		8.11	
	SC63	18.85	4.76		10	
	SC63N	17.8	4.76		9.6	
	SC83	24.4	4.76		12.8	
	SC84N	24.2	6.35		13	
	SC42B	12.5	3.18		6.9	
	SC42CC	12.5	3.18		3.5	
	SC32D	9.27	3.18		6.48	
	SC43D	12.45	4.76		7.34	
	SC53D	15.62	4.76		9.65	
	SC63D	18.8	4.76		11.25	
	SC84D	25.08	6.35		14.85	
	SC42S	11.5	3.18		6.4	
	SC32V	9.12	3.18		3.4	
	SC42V	12.6	3.18		4.5	
	SC44V	12.6	6.35		4.5	
	SC54V	15.75	6.35		5.5	
	SC32V	9.12	3.18		3.4	
	SC42V	12.6	3.18		4.5	
	SS54V	15.75	6.35		5.5	
	SS64V	18.9	6.35		5.5	
	SD317	9.35	2.7		5.2	
	SD32N	8.5	3.18		4.88	
	SD42	12.5	3.18		6.9	
	SD42N	11.6	3.18		6.5	
	SD43N	11.6	4.75		6.5	
	SD32D	9.2	3.18		5.8	
	SD43D	12.45	4.76		7.34	
	SD32S	8.5	3.18		5.4	
	SD32V	9.12	3.18		3.4	
	SD43V	12.6	4.76		4.5	
	SD44V	12.6	6.35		4.5	

Geometry	Designation	Dimensions				
		a	b	c	d	angle
	SES33C	9.1	12	4.76	3.5	
	SK33C	9.33	14.7	4.8	3.5	
	SK33CL	9.33	14.7	4.8	3.5	
	SR10	8.4	3.18		4.7	
	SR12	10	3.18		4.7	
	SR16	13.55	4.76		6.9	
	SR20	17.1	4.85		7.9	
	SR25	22	6.35		9.6	
	SR32	27.8	6.35		13	
	SR42CC	12.575	3.18		3.5	
	SR10S	8.8	3.18		5.4	
	SR12S	10.55	3.18		5.4	
	SS32	8.5	3.18		4.9	
	SS32N	8.5	3.18		4.88	
	SS42	12.5	3.18		6.9	
	SS42B	12.5	3.18		6.9	
	SS42N	11.6	3.18		6.5	
	SS53	15.7	4.76		7.9	
	SS53N	14.6	4.76		8.11	
	SS63	18.85	4.76		10	
	SS63N	17.8	4.76		9.6	
	SS84	24.4	6.35		12.8	
	SS84N	24.2	6.35		13	
	SS42CC	12.5	3.18		3.5	
	SS32D	9.27	3.18		5.77	
	SS43D	12.45	4.76		7.34	
	SS53D	15.62	4.76		9.65	
	SS63D	18.8	4.76		11.25	
	SS84D	25.15	6.35		14.43	
	SS32S	8.3	3.18		5.4	
	SS42S	11.5	3.18		6.4	
	SS42SAF	11.2	3		5.5	
	ST317	9.35	2.7		5	
	ST317B	9.35	2.7		5	
	ST317N	8.5	2.7		4.88	
	ST42	12.5	3.18		6.9	
	ST42N	11.6	3.18		6.5	
	ST53	15.7	4.76		7.9	

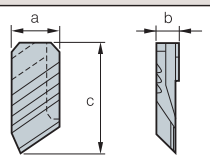
Shim

Geometry	Designation	Dimensions				
		a	b	c	d	angle
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	ST32C1	9.13	3.18		4.95	
	ST42C1	12.3	3.18		4.95	
	ST32D	9.35	3.18		5.77	
	ST43D	12.52	4.76		7.34	
	ST53D	15.7	4.76		9.65	
	ST63D	18.87	4.76		11.25	
	ST32M	8.7	3.18		4.7	
	ST43M	12.5	4.76		6.3	
	ST32S	8.5	3.18		5.4	
	ST32V	9.12	6.18		3.4	
	ST44V	12.6	6.35		4.5	
	SV32D	9.2	3.18		5.8	
	SV43D	12.29	4.76		7.34	
	SV32D2	9.2	3.18		5.8	
	SV32S	8.4	3.18		5.4	
	SW317	9.35	2.7		5	
	SW317N	8.5	2.7		4.88	
	SW42	12.5	3.18		6.9	
	SW42N	11.6	3.18		6.5	
	SW32D	9.25	3.18		5.8	
	SW43D	12.45	4.76		7.34	
	SW43M	12.5	4.76		6.2	
	SW32V	9.12	3.18		3.4	
	SW44V	12.6	6.35		4.5	

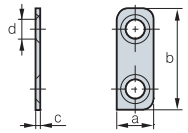
Cartridge

Geometry	Designation	Dimensions				
		a	b	c	d	angle
	LAPDR-AJ	M4×0.7	30	15	10	

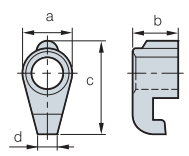
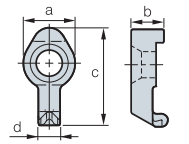
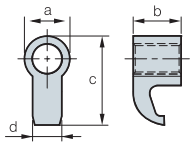
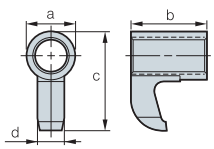
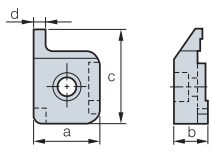
Chip Breaker

Geometry	Designation	Dimensions				
		a	b	c	d	angle
	CB20	8.5	3.4	20		

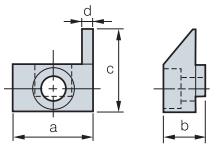
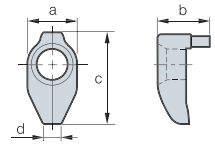
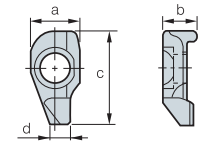
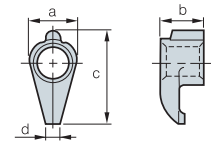
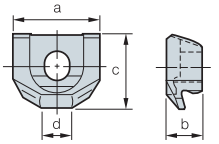
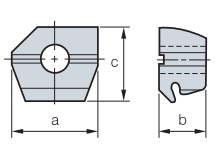
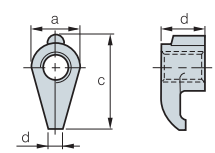
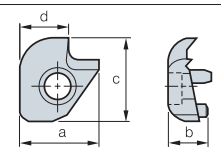
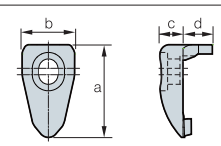
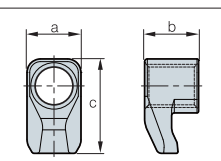
Chip Cover

Geometry	Designation	Dimensions				
		a	b	c	d	angle
	CFMP3R14R1-A	10.5	20	1	(Ø4.3)	
	CFMP3R-A	8	18	1	(Ø4.3)	
	CFMP4R-A	8	22	1	(Ø4.3)	

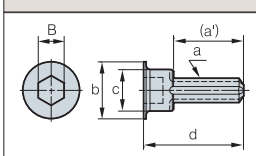
Clamp

Geometry	Designation	Dimensions				
		a	b	c	d	
	CA05R	8.9	5.5	17.6	3.3	
	CA06R	12	7.2	20.6	5.3	
	CH5R3	7.85	7.2	14.8	3.1	
	CH6R4	12.02	9	23.97	3.75	
	CBH4.5R1	8	5.74	17.7	4	
	CBH4.5R2	9.5	6.4	18	4	
	CBH5R1	10	7.8	21.3	5	
	CBH6R1	12	9.3	26	6	
	CDH6N	9.5	10	18.6	6.1	
	CDH7N	7.9	11.4	14.7	4.7	
	CDH8N	10.9	16.9	22.4	6.1	
	CDH8N1	10.9	16.9	19.1	6.1	
	CDH8N2	10.9	16.9	25.4	6.1	
	CDH8N3	12.5	19.8	25.4	9.2	
	CDS8N	10.8	17	22.2	5	
	CGH5R1	19.5	9.5	28.8	2.5	
	CGH5R2	20.5	9.5	28.8	3.5	
	CGH5R3	22.5	9.5	28.8	5.5	

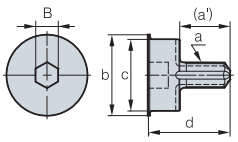
Clamp

Geometry	Designation	Dimensions				
		a	b	c	d	
	CGH6R1	22.3	11.9	23.2	2.5	
	CGH6R2	23.2	11.9	23.2	3.4	
	CGH6R3	24.0	11.9	23.2	4.2	
	CHH3.5R1	7.5	6.7	13	2.45	
	CHH4.5R1	7.9	7.85	14.1	2.54	
	CHH5.5R1	9.8	10	16.4	4	
	CH4R1	7.4	5	14.1	3.1	
	CH5R1	10.0	6.6	20.2	4.5	
	CH5R2	6.85	7	13.8	2	
	CH6R2	8.85	8.7	16.5	2	
	CH6R3	11.8	10	23	4.2	
	CMH5R1	18.5	7.9	16	6.26	
	CMH6R2	20.0	11	17.5	13.8	
	CMH6R6	18.5	7.9	16	6.26	
	CMH6R1	24	8.5	16.5	8.28	
	CMH6R3	20.0	11	17.51		
	CMH6L3	20.0	11	17.51		
	CS5R1	6.8	7	14.5	2	
	CS6R1	8.8	8.5	18.1	2.7	
	CS8R1	11.8	10	23	4.2	
	CTH6L1	23.5	12	25.4	14.35	
	CTH6R1	23.5	12	25.4	14.35	
	CTH6R2	21.78	12.9	31.22	17.33	
	CVH3	21	11	5.8	7.7	
	CHV3V	29	14	7	8	
	CVH4	25.5	14.5	6	7	
	CVH5	30	17	7.5	9.5	
	CVH6	33.5	18.5	8	10	
	CXH8N	10.1	10.0	17.5	-	

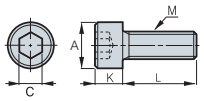
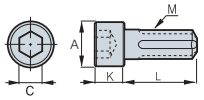
Coolant Bolt

Geometry	Designation	Dimensions					
		a	b	c	d	B(T)	á
	CBA063-3IN/MM	M10	Ø25	Ø16	37	8	(27)
	CBA063-4IN/MM	M10	Ø25	Ø16	42.5	8	(27)
	CBA080-IN/MM	M12	Ø28	Ø18	45.5	10	(32)
	CBP063-IN/MM	M10	Ø22	Ø16	38.6	8	(27)
	CBP080-IN/MM	M12	Ø25	Ø18	48.6	10	(32)

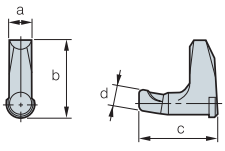
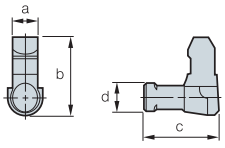
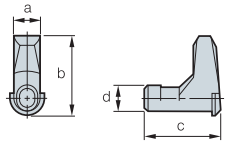
Coolant Bolt

Geometry	Designation	Dimensions					
		a	b	c	d	B(T)	á
	CBA100-IN/MM	M16	Ø54	Ø43	47	14	(32)
	CBA100-IN-25.4	M12	Ø44	Ø36	41.5	10	(25)
	CBA125-IN	M20	Ø65	Ø54	56	17	(38)
	CBA125-IN-25.4	M12	Ø44	Ø36	43.5	10	(25)
	CBA125-MM	M20	Ø65	Ø54	57	17	(35)
	CBA160-IN	M24	Ø83	Ø73	56	19	(38)
	CBA160-MM	M20	Ø83	Ø73	53	17	(34)
	CBP100-IN	M16	Ø50	Ø43	48.6	14	(32)
	CBP100-IN-25.4	M12	Ø44	Ø36	46.5	10	(25)
	CBP100-MM-1	M16	Ø50	Ø43	48.6	14	(36)
	CBP125-IN	M20	Ø65	Ø54	56	17	(38)
	CBP125-IN-25.4	M12	Ø44	Ø36	55	10	(25)
	CBP125-MM	M20	Ø65	Ø54	57	17	(35)
	CBP125-MM-1	M20	Ø61	Ø54	65.6	14	(33)
	CBP160-IN	M24	Ø83	Ø73	56	19	(38)
	CBP160-MM	M20	Ø83	Ø73	53	17	(34)

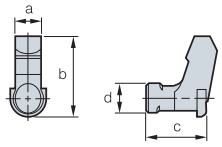
Wrench Bolt

Geometry	Designation	Dimensions				
		A	C	K	L	M
	SB0825	13	6	8	25	M08 × 1.25
	SB1025	16	8	10	25	M10 × 1.50
	SB1035	16	8	10	35	M10 × 1.50
	SB1230	18	10	12	30	M12 × 1.75
	SB1630	24	14	16	30	M16 × 2.0
	SB1645	24	14	16	45	M6 × 2.0
	SB2040	30	17	20	40	M20 × 2.5
	CB1025	13	6	8	25	M08×1.25
	CB1025	16	8	10	25	M10×1.50
	CB1035	16	8	10	35	M10×1.50
	CB1230	18	10	12	30	M12×1.75
	CB1245	18	10	12	45	M12×1.75
	CB1630	24	14	16	30	M16×2.0
	CB1645	24	14	16	45	M16×2.0
	CB2040	30	17	20	40	M20×2.5

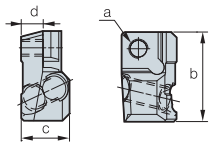
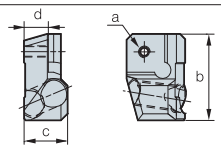
Lever

Geometry	Designation	Dimensions			
		a	b	c	d
	LR10	3.4	10.8	11.7	3
	LR12	3.7	13.5	13.4	3.5
	LR16	4.75	18.7	18.3	4.3
	LR20	5.9	20.5	18.7	5.55
	LR25	7.35	24.25	23.7	6.2
	LR32	8.45	29.7	26.95	7.9
	LV2	2.6	7.75	6	2.1
	LV3B	3.1	10	9.5	3.7
	LV4B	4.7	14.55	15.6	4.7
	LV4BN	4.7	16	14.9	4.68
	LV3	3.7	10	12	3.6
	LV3N	3.75	10	12	3.55
	LV3AN	3.75	12.1	11.4	4.64
	LV3C	3.1	10	7.85	3.6
	LV3CN	3.2	10	7.8	3.6
	LV3D	3.1	11.7	9.5	3.6
	LV3DN	3.2	11.65	9.5	3.55
	LV4	4.7	14.55	14	4.7
	LV4N	4.7	13.45	13.2	4.68
	LV5	6	17.1	17	6
	LV5N	6	16.4	17.08	5.95
	LV5AN	6	18.82	17.3	5.95
	LV6N	7.5	20.5	21	7.6
	LV8N	8.6	25.5	25.4	8.6

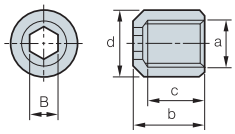
Lever

Geometry	Designation	Dimensions				
		a	b	c	d	
	LV4A	4.6	13.24	9.95	4.7	
	LV4AN	4.7	13.3	10	4.68	

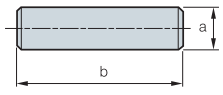
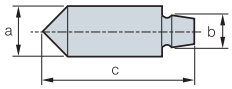
Locator

Geometry	Designation	Dimensions				
		a	b	c	d	
	LFMP3R-A	M3.5	18.7	10.1	4.6	
	LFMP4R1-A	M4.5	24.3	13.8	6.2	
	LFMP4R-A	M4.5	26.3	13.8	6.2	
	LFMA3R-A	M3	18.5	9.5	4.8	
	LFMA4R-A	M3.5	26	13.1	7.3	

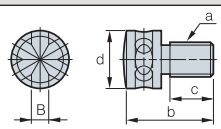
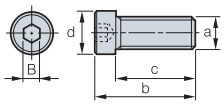
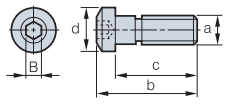
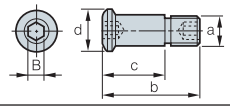
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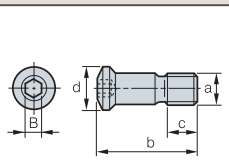
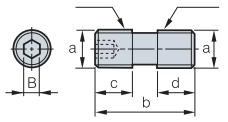
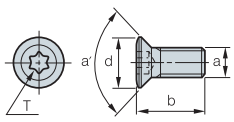
Geometry	Designation	Dimensions					
		a	b	c	d	B(T)	a´
	N0407	M4 X 0.7	7.5	6	7	3	
	N0508	M5 X 0.8	8.3	6.6	7	3	

Pin

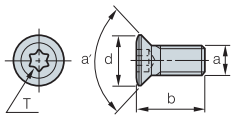
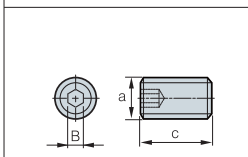
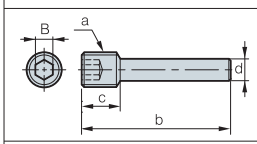
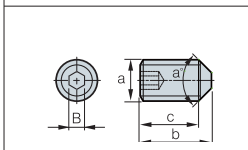
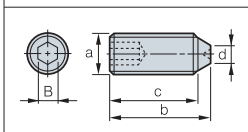
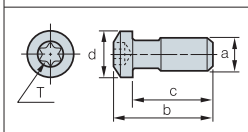
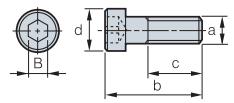
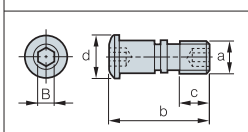
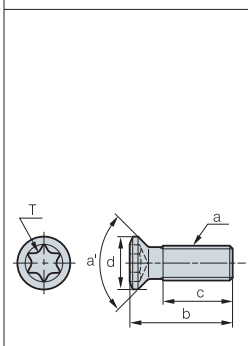
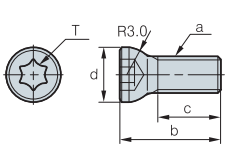
Geometry	Designation	Dimensions				
		a	b	c		
	PN0308	3.0	8			
	PN0310	3.0	10			
	PN0312	3.0	12			
	PN0314	3.0	14			
	PN0515	4.8	3.3	14.5		

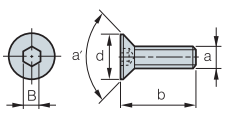
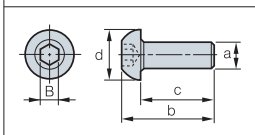
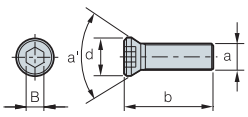
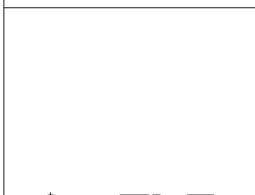
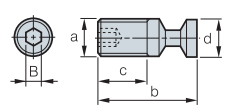
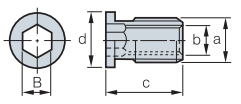
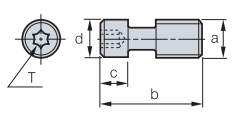
Screw

Geometry	Designation	Dimensions					
		a	b	c	d	B(T)	a´
	AZ0508F	M5 X 0.5	13	8	9	Ø2	
	AZ0514	M5 X 0.8	14	7	9	Ø2.5	
	BHA0510	M5 X 0.8	15	10	8.5	4.0	
	BHA0512	M5 X 0.8	17	12	8.5	4.0	
	BHA0612	M6 X 1.0	18	12	10	5.0	
	BHA0614	M6 X 1.0	20	14	10	5.0	
	BHA0616	M6 X 1.0	22	16	10	5	
	BHA0619-NYLOK	M6 X 1.0	25	19	10	5	
	CHX0407	M4 X 0.7	9.5	7.36	5.7	2.5	
	CHX0415	M4 X 0.7	17.5	15	5.4	2.5	
	CHX0510	M5 X 0.8	13.1	10.1	7.7	3	
	CHX0518	M5 X 0.8	21.5	18	8	3	
	CHX0622	M6 X 1.0	26.5	22	10	4	
	CHX0513	M5 X 0.8	13	8	6.4	2.5	
	CHX0616	M6 x 1.0	16.2	10.1	8.5	3	
	CHX0617L	M6 x 1.0(왼나사)	17.2	10.1	8.5	3	
	CHX0621	M6 X 1.0	21	10.1	8.5	3	

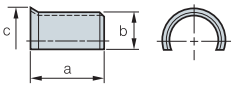
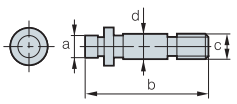
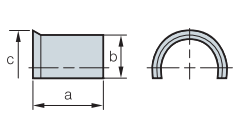
Geometry	Designation	Dimensions					
		a	b	c	d	B(T)	a´
	CHX0625	1/4-20UNC	24.8	11	10	4	
	CTX03510	M3.5 X 0.6	10	4.7	5.3	15	
	CTX04513	M4.5 X 0.75	13.1	6.9	6.8	20	
	CTX04513H	M4.5 X 0.75	13.1	7.2	6.8	20	
	CTX0515	M5 X 0.8	15	8	7	20	
	CTX0517	M5 X 0.8	17.5	10	7	20	
	CTX0621	M6 X 1.0	21.2	12.4	9	25	
	DHA0514	M5 X 0.8	14.0	5.0	7.0	2.5	
	DHA0617	M6 x 1.0	17.0	7.0	7.5	3.0	
	DHA0620	M6 x 1.0	20.0	8.0	8.0	3.0	
	DHA0624	M6 x 1.0	24.0	12.0	8.5	3.0	
	DHA0815	M8 X 1.25	15.5	6.25	6.25	4.0	
	DHA0818F	M8 X 1.0	18	8.5	5.5	4.0	
	DHA0820	M8 X 1.25	20.0	8.0	9.0	4.0	
	DHA0821F	M8 X 1.0	21.0	8.5	8.5	4.0	
	DHA0825	M8 X 1.25	25.0	10.0	9.0	4.0	
	DHA0830	M8 X 1.25	30.0	11.5	11.5	4.0	
	ETGA0520CBM	M5 X 0.8	20		6.5	20	43°
	ETGD0825	M8 X 1.25	25.2		11.1	40	40°
	ETKA0523	M5 X 0.8	23		7.6	20	43°
	ETKA0625	M6 X 1.0	25.5		8.8	20	43°
	ETKD0516	M5 X 0.8	16.4		6.8	20	40°
	ETKD0620	M6 X 1.0	20		8.3	30	40°
	ETNA02506	M2.5 X 0.45	5.7		3.4	7	43°
	ETNA0408	M4 X 0.7	8.0		5.1	15	43°
	ETNA0412	M4 X 0.7	12		5.1	15	43°
	ETNA0511	M5 X 0.8	11.0		6.4	20	43°
	ETND02506F	M2.5 X 0.35	6.25		3.1	7	40°
	ETND0307F	M3 X 0.35	7.8		3.7	8	40°
	ETND03509	M3.5 X 0.6	9.6		4.7	10	40°
	FTGA03507	M3.5 X 0.6	7.0		5.3	15	60°
	FTGA03508	M3.5 X 0.6	8.0		5.3	15	60°
	FTGA03510	M3.5 X 0.6	10.0		5.3	15	60°
	FTGA03512	M3.5 X 0.6	12.0		5.0	15	60°
	FTGA0411F	M4 X 0.5	11.0		7.0	15	60°
	FTGA0417CBM	M4 X 0.7	17.0		5.5	15	62°
	FTGA0510-P	M5 X 0.8	10.0		7.0	20	63°
	FTGA0512-P	M5 X 0.8	12.0		7.0	20	63°
	FTGA0513	M5 X 0.8	13.2		7.0	20	61°
	FTGA0513-P	M5 X 0.8	13.0		7.0	20	63°
	FTGA0517	M5 X 0.8	17.0		7.5	20	61°
	FTGA0621	M6 X 1.0	21.5		9.0	20	61°
	FTGA0826	M8 X 1.25	26.0		11.6	25	61°
	FTKA02206	M2.2 X 0.45	5.5		3.0	6	60°
	FTKA02206S	M2.2 X 0.45	5.6		3.05	7	60°
	FTKA02555	M2.5 X 0.45	5.5		3.5	7	60°
	FTKA02565	M2.5 X 0.45	6.5		3.5	7	60°
	FTKA02565S	M2.5 X 0.45	6.5		3.8	8	60°
	FTKA0307	M3 X 0.5	7.2		4.2	9	60°
	FTKA03508	M3.5 X 0.6	8.4		5.5	15	60°
	FTKA03510	M3.5 X 0.6	10.4		5.5	15	60°
	FTKA03511A	M3.5 X 0.6	11.0		5.2	15	60°
	FTKA0408	M4 X 0.7	8.4		5.5	15	60°
	FTKA0410	M4 X 0.7	10.0		5.5	15	60°
	FTKA0411K	M4 X 0.7	11.0		6.8	15	60°
	FTKA0412B	M4 X 0.7	12.5		5.5	15	60°
	FTKA0413	M4 X 0.7	13.0		5.5	15	60°
	FTNA01633	M1.6 X 0.35	3.3		2.6	6	60°
	FTNA0203	M2 X 0.4	3.0		2.7	6	60°
	FTNA02033	M2 X 0.4	3.3		2.7	6	60°
	FTNA0204	M2 X 0.4	4.3		2.7	6	60°
	FTNA02205	M2.2 X 0.45	4.5		3.0	6	60°
	FTNA0238	M2 X 0.4	3.8		3.0	6	60°
	FTNA0305	M3 X 0.5	5.2		4.2	9	60°
	FTNA0306	M3 X 0.5	6.2		4.2	9	60°
	FTNA0307	M3 X 0.5	7.2		4.2	9	60°
	FTNA0408	M4 X 0.7	8.5		5.5	15	60°
	FTNA0411	M4 X 0.7	11.0		5.5	15	60°
	FTNA0511	M4 X 0.8	7	11	6.7	20	63°
	FTNA0513	M5 X 0.8	13.0		7.0	20	60°
	FTNA0516	M5 X 0.8	16.0		7.0	20	60°

Screw

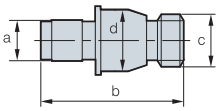
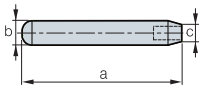
Geometry	Designation	Dimensions					
		a	b	c	d	B(T)	a′
	FTNB0411	M4 X 0.7	10.8		5.7	15	60°
	FTNC04509	M4.5 X 0.75	9.5		6.8	20	55°
	FTNC04511	M4.5 X 0.75	11.5		6.8	20	55°
	KHA0508	M5 X 0.8	8			2.5	
	KHA0510	M5 X 0.8	10			2.5	
	KHA0610	M6 X 1.0	10			3	
	KHA0612	M6 X 1.0	12			3.0	
	KHA0812	M8 X 1.25	12			4.0	
	KHA0815	M8 X 1.25	15			4.0	
	KHA1015	M10 X 1.5	15			5.0	
	KHA1020	M10 X 1.5	20			5.0	
	KHB0417	M4 X 0.7	17.2	4.5	2.5	2	
	KHC0510	M5 X 0.8	10	8.1		2.5	90°
	KHC0610	M6 X 1.0	10	7.8		3.0	90°
	KHC0812	M8 X 1.25	12	9		4.0	90°
	KHC1016	M10 X 1.5	16	12.3		5.0	90°
	KHC1020	M10 X 1.5	20	16.3		5.0	90°
	KHD0510	M5 X 0.8	10	9	3	2.5	
	KHD0610	M6 X 1.0	10	10	4	3	
	KHD0810	M8 X 1.25	10	10	7.5	4	
	LTX0512	M5 X 0.8	15.1	12	7.3	20	
	LTX0514	M5 X 0.8	17.1	14	7.3	20	
	MHA0512	M5 X 0.8	17.0	10.8	8.0	4.0	
	MHB0310	M3 X 0.5	13.4	8.0	5.5	2.5	
	MHB0410	M4 X 0.7	14.0	8.0	7.0	3.0	
	MHB1055	M10 X 1.5	65	50	16	8	
	MHB1260	M12 X 1.75	72	55	18	10	
	MHB1680	M16 X 2.0	96	75	24	14	
	MHX0523	M5 X 0.8	23.5	9.7	10	2.5	
	MHX0626	M6 X 1.0	25.8	10	11	3	
	MHX0630	M6 X 1.0	30	12.5	10.5	4	
	PTKA02508	M2.5 X 0.45	8	5	3.8	8	92°
	PTKA03510	M3.5 X 0.6	10	5	5	15	92°
	PTKA0407	M4 X 0.7	7	4.6	5.5	15	86°
	PTKA0407F	M4 X 0.5	7.3	3.8	6.5	15	91°
	PTKA0408	M4 X 0.7	8	5.6	5.5	15	86°
	PTKA0408F	M4 X 0.5	8.3	5.7	6.5	15	91°
	PTKA0409F	M4 X 0.5	9.3	6.7	6.5	15	91°
	PTKA0410F	M4 X 0.5	10.3	7.7	6.5	15	91°
	PTKA0411F	M4 X 0.5	11.3	8.7	6.5	15	91°
	PTKA0412	M4 X 0.7	12	7.5	5.9	15	92°
	PTKA0412F	M4 X 0.5	12.3	9.7	6.5	15	91°
	PTKA0413F	M4 X 0.5	13.3	10.7	6.5	15	91°
	PTKA0512	M5 X 0.8	12	7	6.9	20	92°
	PTMA03508	M3.5 X 0.6	8	5.3	6	9	90°
	PTMA0403F	M4 X 0.5	3.3	1.7	6.5	15	91°
	PTMA0404F	M4 X 0.5	4.3	2.7	6.5	15	91°
	PTMA0405F	M4 X 0.5	5.3	3.7	6.5	15	91°
	PTMA0406F	M4 X 0.5	6.3	4.7	6.5	15	91°
	PTMA0411	M4 X 0.7	11	8.5	6.6	15	90°
	PTKA0411-R3	M4 X 0.7	11	6.9	6	15	

Geometry	Designation	Dimensions					
		a	b	c	d	B(T)	a′
	PXMA0306	M3 X 0.5	5.9		5.7	2	90°
	SHX0310	M3 X 0.5	10		5.9	2	91°
	RHA0510	M5 X 0.8		10		4.0	
	RHA0613	M6 X 1.0	16.3	13	10.5	4.0	
	RHA0620	M6 X 1.0	24	20	10.5	4.0	
	RHA0613	M6 X 1.0	18		8.5	4.0	61°
	VHX0509B	M5 X 0.8	9	4.15	5	2	
	VHX0512B	M5 X 0.8	12	6.5	5	2	
	VHX0512BN	M5 X 0.8	12	6.56	5	2	
	VHX0514	M5 X 0.8	14.5	8.25	5	2	
	VHX0613N	M6 X 1.0	13.4	7.5	5.93	2.5	
	VHX0617	M6 X 1.0	17	10	6	2.5	
	VHX0617N	M6 X 1.0	16.75	8.34	5.9	2.5	
	VHX0817N	M8 X 1.0	17.05	7.98	7.9	3	
	VHX0820N	M8 X 1.0	20.7	7.98	7.9	3	
	VHX0820AN	M8 X 1.0	20.5	10.36	7.9	3	
	VHX0821	M8 X 1.0	21	10	8	3	
	VHX0821N	M8 X 1.0	21.2	9.68	7.9	3	
	VHX0823N	M8 X 1.0	23.5	10.36	7.9	3	
	VHX0825	M8 X 1.0	25	12	8	3	
	VHX1027N	M10 X 1.0	27.2	14.4	9.8	5	
	VHX1236N	M12 X 1.0	36	18.3	11.8	5	
	VHX0613A	M6 X 1.0	13.4	9.1	6.0	2.5	
	SHXN0509F	M5 X 0.5	M3.5 X 0.6	8.65	6.3	3.5	
	SHXN0610F	M6 X0.75	M4 X 0.5	10	7.8	4	
	SHXN0712F	M7 X0.75	M5 X 0.8	12	8.5	5	
	WTX0813	M8 X 1.25	17.2	4.9	8.5	25	
	WTX0817	M8 X 1.25	22	4.9	8.5	25	

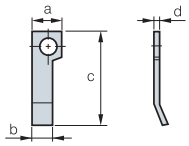
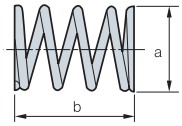
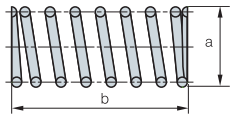
Shim Pin

Geometry	Designation	Dimensions			
		a	b	c	d
	SP3	5.5	3.5	5.9	
	SP3N	6.85	3.3	5.55	
	SP3N-1	5.3	3.3	5.55	
	SP4	7.0	4.0	7.6	
	SP4N	5.8	4.35	7.4	
	SP5	8.5	4.5	8.8	
	SP5N	8.5	5.68	9	
	SP6N	11.1	6.0	11.0	
	SP8N	12.0	10.0	15.35	
	SP2M	5	14	M5 X 0.8	6
	SP3M	3.5	19.5	M4 X 0.7	4
	SP3M-1	3.5	16.5	M4 X 0.7	4
	SP4M	5	19	M5 X 0.8	6
	SP10	6.85	3.3	5.8	

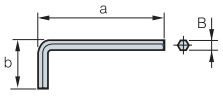
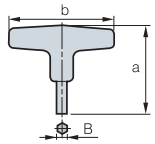
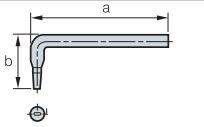
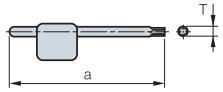
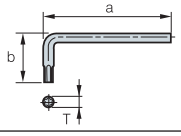
Shim Pin

Geometry	Designation	Dimensions			
		a	b	c	d
	SP3D	3.7	13.1	UNF10-32	5.6
	SP3D2	3.6	12	UNF10-32	5.5
	SP3DS	3.7	11.54	UNF10-32	5.6
	SP4D	4.97	17.19	UNF1/4 28	7.12
	SP4DL	5	17.1	UNF1/4 28	7
	SP4DS	4.97	13.26	UNF1/4 28	
	SP5D	6.21	21.9	UNF5/16-24	9.44
	SP6D	7.75	21.9	UNF3/8-24	11.02
	SP8D	9.02	29.63	UNF7/16-20	14.21
	LSPS3	60	8.2	5.55	
	LSPS4	65	10	7	
	LSPS5	69	11.4	8.85	
	LSPS6	69	13	11	
	LSPS8	73	16.5	15.2	

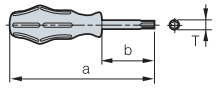
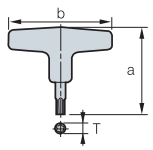
Spring

Geometry	Designation	Dimensions				
		a	b	c	d	
	SR2	4.0	2.8	12.6	0.4	
	SPR0315	3.0	15			
	SPR0415	4.0	15			
	SR3	9.2	12.5			
	SR4	4.0	11.0			
	SPR0714	7	14			
	SPR0510	5	10			
	SPR0714	7	14			
	SPR0811	8	11			

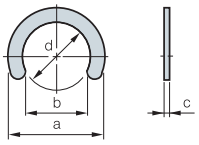
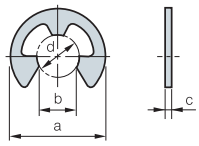
Wrench

Geometry	Designation	Dimensions				
		a	b	B(T)	d	angle
	HW20L	52	18	2		
	HW25L	58.5	20.5	2.5		
	HW30L	66	23	3		
	HW35L	72	25	3.5		
	HW40L	74	29	4		
	HW50L	85	33	5		
	HW40	82	80	4		
	HW50	96	90	5		
	SW50L	70	27.5			
	TW06P	63		6		
	TW07P	63		7		
	TW08P	71		8		
	TW09P	75		9		
	TW10P	78		10		
	TW15P	82		15		
	TW20P	86		20		
	TW15L	60	21	15		
	TW20L	60	21	20		

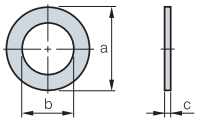
Wrench

Geometry	Designation	Dimensions				
		a	b	B(T)	d	angle
	TW07S	140	60	7		
	TW08S	150	76	8		
	TW09S	165	70	9		
	TW15S	190	90	15		
	TW20S	195	91	20		
	TW20	75	80	20		
	TW25	74	80	25		

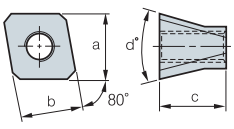
Stop Ring

Geometry	Designation	Dimensions				
		a	b	c	d	
	CR03	4.8	2.6	0.4	3.0	
	CR04	6.6	3.6	0.4	4.0	
	CR05	7.6	4.6	0.4	5.0	
	ER03	7.0	2.6	0.6	3.0	
	ER04	9.0	3.5	0.6	4.0	
	ER05	11	4.3	0.6	5.0	

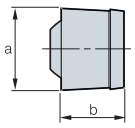
Washer

Geometry	Designation	Dimensions				
		a	b	c		
	WA3	11.0	6.8	0.5~1.0		
	WA4	10.0	5.3	0.5~1.0		

Stopper

Geometry	Designation	Dimensions				
		a	b	c	d°	
	STP5	11	10.2	11	30°	

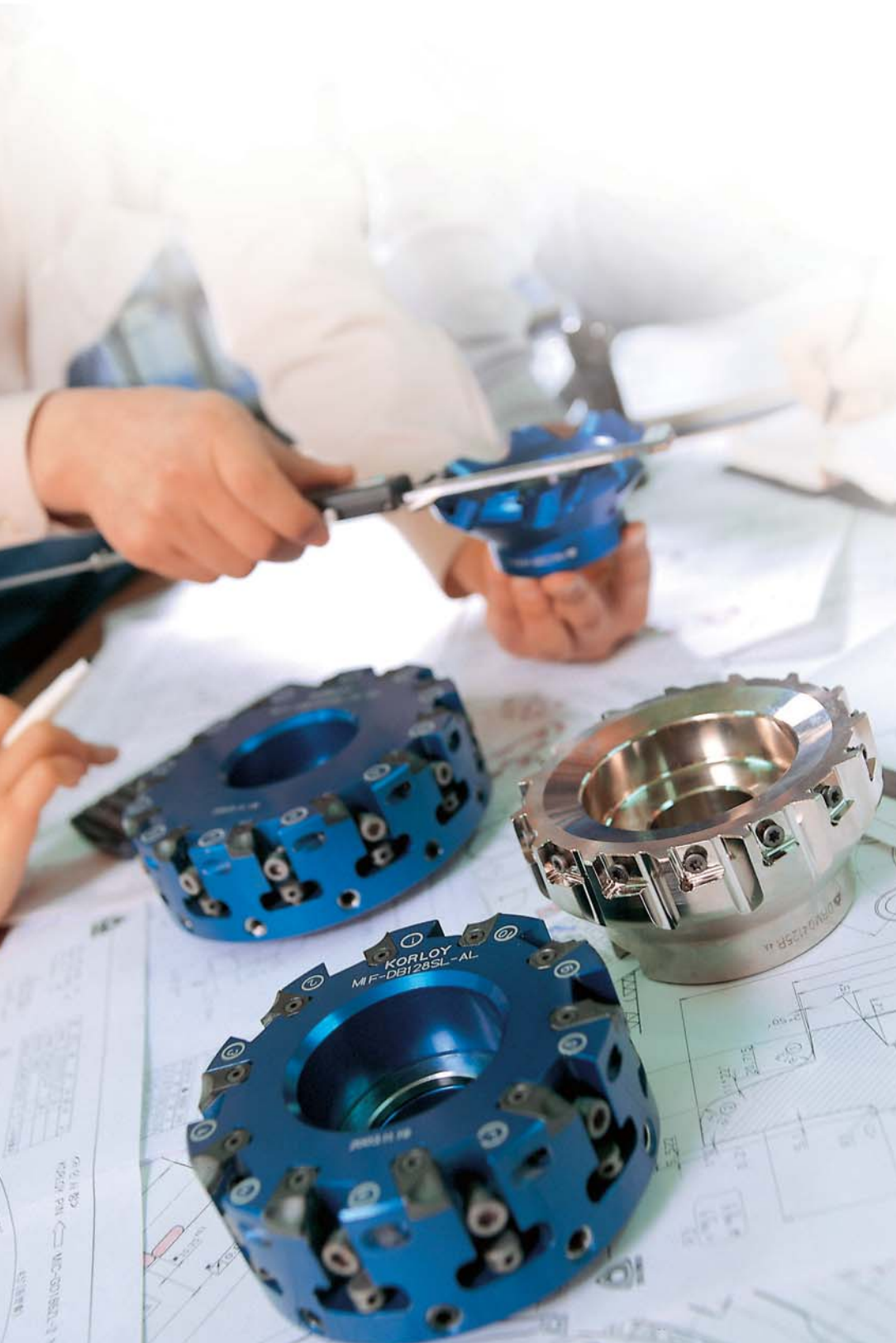
Nozzle

Geometry	Designation	Dimensions				
		a	b	c	d°	
	STP5	11	10.2	11	30°	



C O N T E N T S

Technical Information



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Carbon steel and alloy steel for structural use

Type	Korea	ISO	Japan	U.S.A		Great Britain	Germany	France	Russia
	KS	ISO	JIS	AISI SAE		BS BS/EN	DIN DIN/EN	NF NF/EN	ГОСТ
Carbon steel	SM10C	C10	S10C	1010		040A10 045A10 045M10	C10E C10R	XC10	-
	SM15C	C15E4 C15M2	S15C	1015		055M15	C15E C15R	-	-
	SM20C	-	S20C	1020		070M20 C22, C22E C22R	C22 C22E C22R	C22 C22E C22R	-
	SM25C	C25 C25E4 C25M2	S25C	1025		C25 C25E C25R	C25 C25E C25R	C25 C25E C25R	-
	SM30C	C30 C30E4 C30M2	S30C	1030		080A30 080M30 CC30 C30E C30R	C30 C30E C30R	C30 C30E C30R	30Г
	SM35C	C35 C35E4 C35M2	S35C	1035		C35 C35E C35R	C35 C35E C35R	C35 C35E C35R	35Г
	SM40C	C40 C40E4 C40M2	S40C	1039 1040		080M40 C40 C40E C40R	C40 C40E C40R	C40 C40E C40R	40Г
	SM43C	-	S43C	1042 1043		080A42	-	-	40Г
	SM45C	C45 C45E4 C45M2	S45C	1045 1046		C45 C45E C45R	C45 C45E C45R	C45 C45E C45R	45Г
	SM48C	-	S458C	-		080A47	-	-	45Г
	SM50C	C50 C50E4 C50M2	S50C	1049		080M50 C50 C50E C50R	C50 C50E C50R	C50 C50E C50R	50Г
	SM53C	-	S53C	1050 1053		-	-	-	50Г
	SM55C	C55 C55E4 C55M2	S55C	1055		070M55 C55 C55E C55R	C55 C55E C55R	C55 C55E C55R	-
	SM58C	C60 C60E4 C60M2	S58C	1059 1060		C60 C60E C60R	C60 C60E C60R	C60 C60E C60R	60Г

Type		Korea	ISO	Japan	U.S.A		Great Britain	Germany	France	Russia
		KS	ISO	JIS	AISI SAE		BS BS/EN	DIN DIN/EN	NF NF/EN	ГОСТ
Alloy steel	Nickel chromium steel	SNC236 SNC415(H) SNC631(H) SNC815(H) SNC836	- - - 15NiCr13 -	SNC236 SNC415(H) SNC631(H) SNC815(H) SNC836	- - - - -		- - - 655M13(655H13) -	- - - 15NiCr13 -	- - - - -	40XH - 30XH3A - -
	Nickel chromium molybdenum steel	SNCM220	20NiCrMo2 20NiCrMoS2	SNCM220	8615 8617(H) 8620(H) 8622(H)		805A20 805M20 805A22 805M22	20NiCrMo2 20NiCrMoS2	20NCD2	-
		SNCM240	41CrNiMo2 41CrNiMoS2	SNCM240	8637 8640		-	-	-	-
		SNCM415 SNCM420(H) SNCM431 SNCM439 SNCM447 SNCM616 SNCM625 SNCM630 SNCM815	- - - - - - - - -	SNCM415 SNCM420(H) SNCM431 SNCM439 SNCM447 SNCM616 SNCM625 SNCM630 SNCM815	- 4320(H) - 4340 - - - - -		- - - - - - - - -	- - - - - - - - -	- - - - - - - - -	- 20XH2M(20XHM) - - - - - - -
	Chromium steel	SCr415(H)	-	SCr415(H)	-		-	17Cr3 17CrS3	-	15X 15XA
		SCr420(H)	20Cr4(H) 20CrS4	SCr420(H)	5120(H)		-	-	-	20X
		SCr430(H)	34Cr4 34CrS4	SCr430(H)	5130(H) 5132(H)		34Cr4 34CrS4	34Cr4 34CrS4	34Cr4 34CrS4	30X
		SCr435(H)	34Cr4 34CrS4 37Cr4 37CrS4	SCr435(H)	5135(H)		37Cr4 37CrS4	37Cr4 37CrS4	37Cr4 37CrS4	35X
		SCr440(H)	37Cr4 37CrS4 41Cr4 41CrS4	SCr440(H)	5140(H)		530M40 41Cr4 41CrS4	41Cr4 41CrS4	41Cr4 41CrS4	40X
		SCr445(H)		SCr445(H)						45X

*The above Alloy steel can supplied by domestic manufacturing ☎ 053-852-4839

Type		Korea	ISO	Japan	U.S.A	Great Britain	Germany	France	Russia
		KS	ISO	JIS	AISI SAE	BS BS/EN	DIN DIN/EN	NF NF/EN	ГОСТ
Alloy steel	Chromium molybdenum steel	SCM415(H)	-	SCM415(H)	-	-	-	-	-
		SCM418(H)	18CrMo4 18CrMoS4	SCM418(H)	-	-	18CrMo4 18CrMoS4	-	20XM
		SCM420(H)	-	SCM420(H)	-	708M20(708H20)	-	-	20XM
		SCM430	-	SCM430	4130	-	-	-	30XM 30XMA
		SCM432	-	SCM432	-	-	-	-	-
		SCM435(H)	34CrMo4 34CrMoS4	SCM435(H)	(4135H) 4137(H)	34CrMo4 34CrMoS4	34CrMo4 34CrMoS4	34CrMo4 34CrMoS4	35XM
		SCM440(H)	42CrMo4 42CrMoS4	SCM440(H)	4140(H) 4142(H)	708M70 709M40 42CrMo4 42CrMoS4	42CrMo4 42CrMoS4	42CrMo4 42CrMoS4	-
		SCM445(H)	-	SCM445(H)	4145(H) 4147(H)	-	-	-	-
	Manganese steel and Manganese chromium steel	SMn420(H)	22Mn6(H)	SMn420(H)	1522(H)	150M19	-	-	-
		SMn433(H)	-	SMn433(H)	1534	150M36	-	-	30Г2 35Г2
		SMn438(H)	36Mn6(H)	SMn438(H)	1541(H)	150M36			35Г2 40Г2
		SMn443(H)	42Mn6(H)	SMn443(H)	1541(H)	-	-	-	40Г2 45Г2
		SMnC420(H)	-	SMnC420(H)	-	-	-	-	-
		SMnC443(H)	-	SMnC443(H)	-	-	-	-	-
	Aluminum chromium molybdenum steel	SACM645	41CrAlMo74	SACM645	-	-	-	-	-

*The above Alloy steel can supplied by domestic manufacturing ☎ 053-852-4839

Tool steel

Type	Korea	ISO	Japan	U.S.A	Great Britain	Germany	France	Russia
	KS	ISO	JIS	AISI SAE	BS BS/EN	DIN DIN/EN	NF NF/EN	ГОСТ
High speed steel	SKH2	HS18-0-1	SKH2	T1				
	SKH3	-	SKH3	T4				
	SKH4	-	SKH4	T5				
	SKH10	-	SKH10	T15	BM 2	S6/5/2	Z 85 WDCV	
	SKH51	HS6-5-2	SKH51	M2				
	SKH52	HS6-6-2	SKH52	M3-1				
	SKH53	HS6-5-3	SKH53	M3-2				
	SKH54	HS6-5-4	SKH54	M4	BM 35	S6/5/2/5	6-5-2-5	
	SKH55	HS6-5-2-5	SKH55	M 35				
	SKH56	-	SKH56	M36				
	SKH57	HS10-4-3-10	SKH57	-		S2/9/2		
	SKH58	HS2-9-2	SKH58	M7				
	SKH59	HS2-9-1-8	SKH59	M42				
Alloy tool steel	STS11	-	SKS11	F2				
	STS2	-	SKS2	-				
	STS21	-	SKS21	-				
	STS5	-	SKS5	-				
	STS51	-	SKS51	L6				
	STS7	-	SKS7	-				
	STS8	-	SKS8	-				
	STS4	-	SKS4	-				
	STS41	-	SKS41	-				
	STS43	105V	SKS43	W2-9 1/				
	STS44	-	SKS44	W2-8 1-2				
	STS3	-	SKS3	-		105WCr6	105WC13	
	STS31	105WCr1	SKS31	-				
	STS93	-	SKS93	-				
	STS94	-	SKS94	-				
	STS95	-	SKS95	-	BD3	X210Cr12	Z200C12	
	STD1	210Cr12	SKD1	D3				
	STD11	-	SKD11	D2	BA2	X100CrMoV5 1	Z100CDV5	
	STD12	100CrMoV5	SKD12	A2				
	STD4	-	SKD4	-	BH21	X30WCrV9 3	Z30WCV9	
	STD5	X30WCrV9-3	SKD5	H21				
	STD6	X37CrMoV5-1	SKD6	H11	BH13	X40CrMoV5 1	Z40CDV5	
	STD61	X40CrMoV5-1	SKD61	H13				
	STD62	X35CrWMoV5	SKD62	H12				
	STD7	32CrMoV12-28	SKD7	H10				
	STD8	-	SKD8	H19				
	STF3	-	SKT3	-		55NiCrMoV6	55NCDV7	
	STF4	55NiCrMoV7	SKT4	L6				

*The above High speed steel can supplied by domestic manufacturing ☎ 053-852-4839

Type	Korea	ISO	Japan	U.S.A		Great Britain	Germany	France	Russia
	KS	ISO	JIS	AISI SAE		BS BS/EN	DIN DIN/EN	NF NF/EN	ГОСТ
Free cutting carbon steel	SUM11	-	SUM11	1110					
	SUM12	-	SUM12	1109					
	SUM21	9S20	SUM21	1212					
	SUM22	11SMn28	SUM22	1213		230M07	9SMn28	S250	
	SUM22L	11SMnPb28	SUM22L	12L13			9SMnPb28	S250Pb	
	SUM23	-	SUM23	1215		240M07	9SMn36	S 300	
	SUM23L	-	SUM23L	-					
	SUM24L	11SMnPb28	SUM24L	12L14			9SMnPb36	S300Pb	
	SUM25	12SMn35	SUM25	-					
	SUM31	-	SUM31	1117					
	SUM31L	-	SUM31L	-					
	SUM32	-	SUM32	-					
	SUM41	-	SUM41	1137					
	SUM42	-	SUM42	1141					
	SUM43	44SMn28	SUM43	1144					
High carbon chromiom	STB1	-	SUJ1	-					
	STB2	B1	SUJ2	52100		534A99	100Cr6	100Cr6	
	STB3	B2	SUJ3	ASTM A 485 Grade 1					
	STB4	-	SUJ4	-					
	STB5	-	SUJ5	-					

*The above special steel can supplied by domestic manufacturing ☎ 053-852-4839

Stainless steel

Type		Korea	ISO	Japan	U.S.A		Great Britain	Germany	France	Russia
		KS	ISO	JIS	UNS	AISI SAE	BS BS/EN	DIN DIN/EN	NF NF/EN	ГОСТ
Stainless steel	Austenitic	STS201	X12CrMnNiN17-7-5	SUS201	S20100	201	284S16	X12CrNi17-7	Z12CMN17-07Az	12Х17•√9АН4
		STS202	X12CrMnNiN18-9-5	SUS202	S20200	202	301S21	X2CrNiN18-7		07Х16Н6
		STS301	X10CrNi18-8	SUS301	S30100	301		X12CrNi17-7	Z11CN17-08	
		STS301L	X2CrNiN18-7	SUS301L						
		STS301J1		SUS301J1			302S25			12Х18Н9
		STS302		SUS302	S30200	302		X10CrNiS18-9	Z12CN18-09	
		STS302B	X12CrNiSi18-9-3	SUS302B	S30215	302B	303S21			
		STS303	X10CrNiS18-9	SUS303	S30300	303	303S41		Z8CNF18-09	12Х18Н10Е
		STS303Se		SUS303Se	S30323	303Se		X5CrNi18-10		
		STS303Cu		SUS303Cu			304S31			08Х18Н10
		STS304	X5CrNi18-9 X2CrNi18-9	SUS304	S30400	304	304S11	X2CrNi19-11	Z7CN18-09	03Х18Н11
		STS304L	X2CrNi19-11	SUS304L	S30403	304L		X2CrNiN18-10	Z3CN19-11	
		STS304N1	X5CrNiN18-8	SUS304N1	S30451	304N			Z6CN19-09Az	
		STS304LN	X2CrNiN18-8	SUS304LN	S30453	304LN		X5CrNi18-12	Z3CN18-10Az	
		STS304J1		SUS304J1			305S19			06Х18Н11
		STS305	X6CrNi18-12	SUS305	S30500	305			Z8CN18-12	
		STS309S		SUS309S	S30908	309S	310S31	X5CrNiMo27-12-2	Z10CN24-13	10Х23Н18
		STS310S	X6CrNi25-20	SUS310S	S31008	310S	316S31	X5CrNiMo27-13-3	Z8CN25-20	
		SUS316	X5CrNiMo17-12-2 X3CrNiMo17-12-3	SUS316	S31600	316	316S11	X2CrNiMo17-13-2 X2CrNiMo17-14-3	Z7CND17-12-02 Z6CND18-12-03	03Х17Н14М3
		STS316L	X2CrNiMo17-12-2 X2CrNiMo17-12-3 X2CrNiMo18-14-3	SUS316L	S31603	316L			Z3CND17-12-02 Z3CND17-12-03	
		STS316N		SUS316N	S31651	316N	317S16	X6CrNiTi18-10		
		STS317		SUS317	S31700	317	321S31	X6CrNiNb18-10		08Х18Н10Т
		STS321	X6CrNiTi18-10	SUS321	S32100	321	347S31		Z6CNT18-10	08Х18Н12
		STS347	X6CrNiNb18-10	SUS347	S34700	347		X6CrAl13	Z6CNNb18-10	
		STS384	X3NiCr18-16	SUS384	S38400	384	405S17		Z6CN18-16	
	Ferritic	STS405	X6CrAl13	SUS405	S40500	405			Z8CA12	
		STS410L		SUS410L				X6Cr17	Z3C14	
		STS429		SUS429	S42900	429	430S17	X7CrS18		12Х17
		STS430	X6Cr17	SUS430	S43000	430		X6CrMo17-1	Z8C17	
		STS430F	X7CrS17	SUS430F	S43020	430F	434S17		Z8CF17	
		STS434	X6CrMo17-1	SUS434	S43400	434			Z8CD17-01	
		STS444	X2CrMoTi18-2	SUS444	S44400	444			Z3CDT18-02	
		STSXM27		SUSXM27	S44627			X10Cr13	Z1CD26-01	
	Martensitic	STS403		SUS403	S40300	403	410S21			
		STS410	X12Cr13	SUS410	S41000	410	416S21	X20Cr13	Z13C13	
		STS416	X12CrS13	SUS416	S41600	416	420S29	X20CrNi17-2	Z11CF13	20Х13
		STS420J1	X20Cr13	SUS420J1	S42000	420	431S29		Z20C13	20Х17Н2
		STS431	X19CrNi16-2	SUS431	S43100	431			Z15CN16-02	
		STS440A	X70CrMo15	SUS440A	S44002	440A		X7CrNiAl17-7	Z70C15	
	Precipitation hardening type	STS630	X5CrNiCuNb16-4	SUS630	S17400	S17400			Z6CNU17-04	09Х17Н7ІО
		STS631	X7CrNiAl17-7	SUS631	S17700	S17700			Z9CNA17-07	
		STS631J1		SUS631J1						

*The above Stainless steel can supplied by domestic manufacturing ☎ 053-852-4839

Casting or forging steel

Type		Korea	ISO	Japan	U.S.A	Great Britain	Germany	France	Russia
		KS	ISO	JIS	AISI SAE	BS BS/EN	DIN DIN/EN	NF NF/EN	ГОСТ
Casting Iron	Grey iron casting	GC100 GC150 GC200 GC250 GC300 GC350	100,150, 200, 250, 300, 350	FC100 FC150 FC200 FC250 FC300 FC350	No 20 B No 25 B No 30 B No 35 B No 45 B No 50 B No 55 B	 Grade 150 Grade 220 Grade 260 Grade 300 Grade 350 Grade 400	GG 10 GG 15 GG 20 GG 25 GG 30 GG 35 GG 40	Ft 10 D Ft 15 D Ft 20 D Ft 25 D Ft 30 D Ft 35 D Ft 40 D	-
	Spheroidal graphite iron casting	GCD400 GCD500 GCD600 GCD700	700-2, 600-3, 500-7, 450-10, 400-15, 400-18, 350-22	FCD400 FCD500 FCD600 FCD700	60-40-18 80-55-06 100-70-03	SNG 420/12 SNG 370/17 SNG 500/7 SNG 600/3 SNG 700/2	GGG 40 GGG 40.3 GGG 50 GGG 60 GGG 70	FCS 400-12 FGS 370-17 FGS 500-7 FGS 600-3 FGS 700-2	B
	Austempered Spheroidal graphite iron casting	FCAD	-	FCAD	-	EN-GJS-	EN-GJS-	EN-GJS-	-
	Austenitic iron casting	FCA- FCDA-	L-, S-	FCA- FCDA-	Type 1, 2, Type D-2, D-3A Class 1, 2	F1, F2, S2W, S5S	GGL-, GGG-	L-, S-	-

Non-ferrous alloy

Type		Korea	ISO	Japan	U.S.A		Great Britain	Germany	France	Russia
		KS	ISO	JIS	AISI SAE		BS BS/EN	DIN DIN/EN	NF NF/EN	ГОСТ
Aluminum alloy	Aluminum alloy ingots for casting	AC1B	Al-Cu4MgTi	AC1B	204.0		-	-	A-U5GT	
		AC2A	-	AC2A	-		-	-	-	
		AC2B	-	AC2B	319.0		-	-	-	
		AC3A	-	AC3A	-		LM-6	-	-	
		AC4A	-	AC4A	-		-	G(GK)-AlSi9Cu3	-	
		AC4B	-	AC4B	-		-	-	-	
		AC4C	Al-Si7Mg(Fe)	AC4C	356.0		LM-25	G(GK)-AlSi7MG	A-S7G	
		AC4CH	Al-Si7Mg	AC4CH	A356.0		-	-	-	
		AC4D	Al-Si5Cu1Mg	AC4D	355.0		LM-16	-	-	
		AC5A	Al-Cu4Ni2Mg2	AC5A	242.0		-	G(GK)-AlMg5	A-U4NT	
		AC7A	-	AC7A	514.0		LM-5	-	-	
		AC8A	-	AC8A	-		LM-13	-	A-S12UNG	
		AC8B	-	AC8B	-		LM-26	-	A-S10UG	
		AC8C	-	AC8C	-		-	-	A-S10UG	
		AC9A	-	AC9A	-		LM-29	-	-	
		AC9B	-	AC9B	-		-	GD-AlSi12 (Cu)	A-S18UNG	
	Aluminum alloy die casting	ALDC1	Al-Si12CuFe	ADC1	A413.0		LM20	GD-AlSi10Mg	A-S13	
		ALDC2	-	ADC3	A360.0		-	GD-AlMg9	A-S9G	
		ALDC3	-	ADC5	518.0		-	-	A-G6	
		ALDC4	-	ADC6	-		-	GD-AlSi9Cu3	A-G3T	
		ALDC7	Al-Si8Cu3Fe	ADC10	A380.0		-	GD-AlSi9Cu3	-	
		ALDC7Z	Al-Si8Cu3Fe	ADC10Z	A380.0		LM24	-	-	
		ALDC8	-	ADC12	383.0		LM2	-	-	
		ALDC8Z	-	ADC12Z	383.0		LM2	-	-	
		ALDC9	-	ADC14	B390.0		LM30	EN AW-5052	-	
	Aluminum alloy extruded shapes	A5052S	-	A5052S	5052		EN AW-5052	EN AW-5454	EN AW-5052	
		A5454S	-	A5454S	5454		EN AW-5454	EN AW-5083	EN AW-5454	
		A5083S	AlMg4.5Mn0.7	A5083S	5083		EN AW-5083	EN AW-5086	EN AW-5083	
		A5086S	-	A5086S	5086		EN AW-5086	EN AW-6061	EN AW-5086	
		A6061S	AlMg1SiCu	A6061S	6061		EN AW-6061	EN AW-6063	EN AW-6061	
		A6063S	AlMg0.7Si	A6063S	6063		EN AW-6063	EN AW-7003	EN AW-6063	
		A7003S	-	A7003S	-		EN AW-7003	-	EN AW-7003	
		A7N01S	-	A7N01S	-		-	EN AW-7075	-	
		A7075S	AlZn5.5MgCu	A7075S	7075		EN AW-7075		EN AW-7075	

Heat resistant steel

Type		Korea	ISO	Japan	U.S.A		Great Britain	Germany	France	Russia
		KS	ISO	JIS	UNS	AISI SAE	BS BS/EN	DIN DIN/EN	NF NF/EN	ГОСТ
Heat resistant steel	Austenitic	STR31		SUH31			331S42		Z35CNWS14-14	
		STR35		SUH35			349S52	X53CrMnNi21-9	Z52CMN21-09-Az	
		STR36		SUH36			349S54		Z55CMN21-09-Az	
		STR37		SUH37	S63008		381S34			
		STR38		SUH38	S63017					
		STR309		SUH309			309S24	CrNi2520	Z15CN24-13	
		STR310		SUH310	S30900		310S24		Z15CN25-20	
		STR330		SUH330	S31000	309			Z12NCS35-16	
		STR660		SUH660	N08330	310			Z6NCTV25-20	
		STR661		SUH661	S66286	N08330		CrAl1205		
	Ferritic	STR21		SUH21	R30155			X6CrTi12		
		STR409	X6CrTi12	SUH409			409S19		Z6CT12	
		STR409L	X2CrTi12	SUH409L	S40900				Z3CT12	
		STR446		SUH446		409		X45CrSi9-3	Z12C25	
	Martensitic	STR1		SUH1	S44600		401S45		Z45CS9	
		STR3		SUH3	S65007	446			Z40CSD10	
		STR4		SUH4			443S65		Z80CSN20-02	
		STR11		SUH11						
		STR600		SUH600						
		STR616		SUH616	S42200					

*The above Heat resistant steel can supplied by domestic manufacturing ☎ 053-852-4839

Steel, Non-ferrous metal symbol list

Comparison of workpiece material standards

GROUP		STANDARD TERM	CODE
Structural Steel		Rolled Steel for Welded Suructure	SWS
		Rerolled Steel	SBR
		Rolled Steel for General Structure	SB
		Light Gauge Steel for General Structure	SBC
		Hot- rolled Steel Plate, Sheet/Strip for Automobile Structural Use	SAPH
Steel Plate		Cold-rolled Steel Sheet/Strip	SBC
		Hot-rolled Soft Steel Sheet/Strip	SHP
Steel Pipe		Carbon Steel Pipe for Ordinary Piping	SPP
		Carbon Steel Pipe for Boiler and Heat Exchanger	STH
		Seamless Steel Pipe for High Pressure Gas Cylinder	STHG
		Carbon Steel Pipe for General Structural Use	SPS
		Carbon Steel Pipe for Machine Structural Use	STST
		Alloy Steel Pipe for Structural Use	STA
		Stainless Steel Pipe for Machine and Structural Use	STS-TK
		Carbon Steel Square Pipe for General Structural Use	SPSR
		Alloy Steel Pipe	SPA
		Carbon Steel Pipe for Pressure Service	SPPS
		Carbon Steel Pipe for High Temperature Service	SPSR
		Carbon Steel Pipe for High Pressure Service	SPPH
		Stainless Steel Pipe	STSxT
Iron and Steel		Carbon Steel for Machine Structural Use	SMxxC, SMxxCK
		Aluminum Chromium Molybdenum Steel	SACM
		Chromium Molybdenum Steel	SCM
		Chromium Steel	SBCR
		Nickel Chromium Steel	SNC
		Nickel Chromium Molybdenum Steel	SNCM
		Manganese Steel and manganese Chromium Steel for Machine Structural Use	SMn
Special steel	Tool steel	Carbon Tool Steel	STC
		Hollow Drill Steel	STC
		Alloy Tool Steel	STS, STD, STT
		High Speed Tool Steel	SKH
	Stainless steel	Free Cutting Carbon Steel	SUM
		High Carbon Chromium Bearing Steel	STB
		Spring Steel	SPS
		Stainless Steel Bar	STS
	Heat resisting steel	Heat Resisting Steel	STR
		Heat Resisting Steel Bar	STR
		Heat Resisting Steel Sheet	STR

GROUP	STANDARD TERM	CODE
Forged steel	Carbon Steel Forging	SF
	Chromium Molybdenum Steel Forging	SFCM
	Nickel Chromium Molybdenum Steel Forging	SFNCM
Cast iron	Gray Cast iron	GC
	Spheroidal Graphite Cast iron	GCD
	Blackheart Malleable Cast iron	BMC
	Whiteheat Malleable Cast iron	WMC
	Pearlitic Malleable Cast iron	PMC
Cast steel	Carbon Cast Steel	SC
	High Tensile Strength Carbon Cast Steel&Low Alloy Cast Steel	HSC
	Stainless Cast Steel	SSC
	Heat Resisting Cast Steel	HRSC
	High Manganese Cast Steel	HMnSC
	Cast Steel for High Temperature and High Pressure Service	SCPH
Casting	Brass Casting	BsC
	High Strength Brass Casting	HBsC
	Bronze Casting	BrC
	Phosphoric Bronze Casting	PCB
	Aluminum Bronze Casting	AlBC
	Aluminum Alloy Casting	ACxA
	Magnesium Alloy Casting	MgC
	Zinc Alloy Die Casting	ZnDC
	Aluminum Alloy Die Casting	AlDC
	Magnesium Alloy Die Casting	MgDC
	White Metal	WM
	Aluminum Alloy Casting for Bearing	AM
	Brass Alloy Casting for Bearing	KM

SI unit conversion table

Major SI unit conversion table

• Force

N	kgf	dyn
1	1.01972×10^{-1}	1×10^{-5}
9.80665	1	9.80665×10^{5}
1×10^{-5}	1.01972×10^{-6}	1

• Stress

Pa or N/m^2	MPa or N/mm^2	kgf/mm^2	kgf/cm^2	kgf/m^2
1	1×10^{-6}	1.01972×10^{-7}	1.01972×10^{-5}	1.01972×10^{-1}
1×10^{6}	1	1.01972×10^{-1}	1.01972×10	1.01972×10^{5}
9.80665×10^{6}	9.80665	1	1×10^{2}	1×10^{6}
9.80665×10^{4}	9.80665×10^{-2}	1×10^{-2}	1	1×10^{4}
9.80665	9.80665×10^{-6}	1×10^{-6}	1×10^{-4}	1

• Pressure

Pa	kPa	MPa	bar	kgf/cm^2
1	1×10^{-3}	1×10^{-6}	1×10^{-5}	1.01972×10^{-5}
1×10^{3}	1	1×10^{-3}	1×10^{-2}	1.01972×10^{-2}
1×10^{6}	1×10^{3}	1	1×10	1.01972×10
1×10^{5}	1×10^{2}	1×10^{-1}	1	1.01972
9.80665×10^{4}	9.80665×10	9.80665×10^{-2}	9.80665×10^{-1}	1

• Work, Energy, Calorie

J	kW·h	kgf·m	kcal
1	2.77778×10^{-7}	1.01972×10^{-1}	2.38889×10^{-4}
3.60000×10^{6}	1	3.67098×10^{5}	8.60000×10^{2}
9.80665	2.72407×10^{-6}	1	2.34270×10^{-3}
4.18605×10^{3}	1.16279×10^{-3}	4.26858×10^{2}	1

• Power

W	kW	kgf·m/s	PS	kcal/h
1	1×10^{-3}	1.01972×10^{-1}	1.35962×10^{-3}	0.860
1×10^{3}	1	1.01972×10^{2}	1.359 62	8.60000×10^{2}
9.81 65	9.80665×10^{-3}	1	1.33333×10^{-2}	8.433 71
7.355×10^{2}	7.355×10^{-1}	7.5×10	1	6.32529×10^{2}
1.162 79	1.16279×10^{-3}	1.18572×10^{-1}	1.58095×10^{-3}	1

• Specific heat

J/(kg·K)	kcal/(kg·℃) cal/(g·℃)
1	2.38889×10^{-4}
4.18605×10^{3}	1

• Thermal conductivity

W/(m·k)	kcal/(h·m·℃)
1	8.6000×10^{-1}
1.16279	1

• Revolution per minute

min^{-1}	s^{-1}	r.p.m.
1	0.0167	1
60	1	60

Hardness calculating table

Work piece hardness calculating table

Vickers 50kgf Hv	Brinell, 3000kgf HB: Standard ball 10㎜	Brinell, 3000kgf HB: Cemented carbide ball 10㎜	Rockwell: A scale 60kgf Diamond particle HRA	Rockwell: B scale 100kgf 1/16in ball HRB	Rockwell: C scale 150kgf Diamond particle HRC	Rockwell: D scale 100kgf Diamond particle HRD	Shore HS	Tensile strength (approximate value) MPa(1)
940	-	-	85.6	-	68.0	76.9	97	
920	-	-	85.3	-	67.5	76.5	96	
900	-	-	85.0	-	67.0	76.1	95	
880	-	(767)	84.7	-	66.4	75.7	93	
860	-	(757)	84.4	-	65.9	75.3	92	
840	-	(745)	84.1	-	65.3	74.8	91	
820	-	(733)	83.8	-	64.7	74.3	90	
800	-	(722)	83.4	-	64.0	74.8	88	
780	-	(710)	83.0	-	63.3	73.3	87	
760	-	(698)	82.6	-	62.5	72.6	86	
740	-	(684)	82.2	-	61.8	72.1	84	
720	-	(670)	81.8	-	61.0	71.5	83	
700	-	(656)	81.3	-	60.1	70.8	81	
690	-	(647)	81.1	-	59.7	70.5	-	
680	-	(638)	80.8	-	59.2	70.1	80	
670	-	630	80.6	-	58.8	69.8	-	
660	-	620	80.3	-	58.3	69.4	79	
650	-	611	80.0	-	57.8	69.0	-	
640	-	601	79.8	-	57.3	68.7	77	
630	-	591	79.5	-	56.8	68.3	-	
620	-	582	79.2	-	56.3	67.9	75	
610	-	573	78.9	-	55.7	67.5	-	
600	-	564	78.6	-	55.2	67.0	74	
590	-	554	78.4	-	54.7	66.7	-	2055
580	-	545	78.0	-	54.1	66.2	72	2020
570	-	535	77.8	-	53.6	65.8	-	1985
560	-	525	77.4	-	53.0	65.4	71	1950
550	(505)	517	77.0	-	52.3	64.8	-	1905
540	(496)	507	76.7	-	51.7	64.4	69	1860
530	(488)	497	76.4	-	51.1	63.9	-	1825
520	(480)	488	76.1	-	50.5	63.5	67	1795
510	(473)	479	75.7	-	49.8	62.9	-	1750
500	(465)	471	75.3	-	49.1	62.2	66	1705
490	(456)	460	74.9	-	48.4	61.6	-	1660
480	488	452	74.5	-	47.7	61.3	64	1620
470	441	442	74.1	-	46.9	60.7	-	1570
460	433	433	73.6	-	46.1	60.1	62	1530
450	425	425	73.3	-	45.3	59.4	-	1495
440	415	415	72.8	-	44.5	58.8	59	1460
430	405	405	72.3	-	43.6	58.2	-	1410
420	397	397	71.8	-	42.7	57.5	57	1370
410	388	388	71.4	-	41.8	56.8	-	1330
100	379	379	70.8	-	40.8	56.0	55	1290
390	369	369	70.3	-	39.8	55.2	-	1240
380	360	360	69.8	(100.0)	38.8	54.4	52	1205
370	350	350	69.2	-	39.9	53.6	-	1170
360	341	341	68.7	(109.0)	36.6	52.8	50	1130
350	331	331	68.1	-	35.5	51.9	-	1095
340	322	322	67.6	(108.0)	34.4	51.1	47	1070
330	313	313	67.0	-	33.3	50.2	-	1035

Vickers 50kgf	Brinell, 3000kgf HB: Standard ball 10㎜	Brinell, 3000kgf HB: Cemented carbide ball 10㎜	Rockwell: A scale 60kgf Diamond particle HRA	Rockwell: B scale 100kgf 1/16in ball HRB	Rockwell: C scale 150kgf Diamond particle HRC	Rockwell: D scale 100kgf Diamond particle HRD	Shore HS	Tensile strength (approximate value) MPa(1)
320	303	303	66.4	(107.0)	32.2	49.4	45	1005
310	294	294	65.8	-	31.0	48.4	-	980
300	284	284	65.2	(105.5)	29.8	47.5	42	950
295	280	280	64.8	-	29.2	47.1	-	935
290	275	275	64.5	(104.5)	28.5	46.5	41	915
285	270	270	64.2	-	27.8	46.0	-	905
280	265	265	63.8	(103.5)	27.1	45.3	40	890
275	261	261	63.5	-	26.4	44.9	-	875
270	256	256	63.1	(102.0)	25.6	44.3	38	855
265	252	252	62.7	-	24.8	43.7	-	840
260	247	247	62.4	(101.0)	24.0	43.1	37	825
255	243	243	62.0	-	23.1	42.2	-	805
250	238	238	61.6	99.5	22.2	41.7	36	795
245	233	233	61.2	-	21.3	41.1	-	780
240	228	228	60.7	98.1	20.3	40.3	34	765
230	219	219	-	96.7	(18.0)	-	33	730
220	209	209	-	95.0	(15.7)	-	32	695
210	200	200	-	93.4	(13.4)	-	30	670
200	190	190	-	91.5	(11.0)	-	29	635
190	181	181	-	89.5	(8.5)	-	28	605
180	171	171	-	87.1	(6.0)	-	26	580
170	162	162	-	85.0	(3.0)	-	25	545
160	152	152	-	81.7	(0.0)	-	24	515
150	143	143	-	78.7	-	-	22	490
140	133	133	-	75.0	-	-	21	455
130	124	124	-	71.2	-	-	20	425
120	114	114	-	66.7	-	-	-	390
110	105	105	-	62.3	-	-	-	-
100	95	95	-	56.2	-	-	-	-
95	90	90	-	52.0	-	-	-	-
90	86	86	-	48.0	-	-	-	-
85	81	81	-	41.0	-	-	-	-

Note1.) Gothic number is ASTM E 1 in the list 140

Note2.) 1. 1MPa = 1N/㎟

2. The number In the blank is not generally used ranges.

Properties of Korloy grades

Physical properties of Korloy grades

Application	ISO Classification symbol		Korloy grades	Specific gravity (g/cm^3)	Hardness (H_RA)	TRS (kgf/mm^2)	compressive strength (kg/mm^2)	Young's modulus ($10^3 kgf/mm^2$)	Thermal expansion coefficient ($10^{-6}/℃$)	Thermal conductivity (cal/cm·sec·℃)
Grades for cutting tools	P	P01	ST05	10.6	92.7	140	440	-	-	-
		P10	ST10	10.0	92.1	175	460	48	6.2	25
		P20	ST20	11.8	91.9	200	480	56	5.2	42
		P30	ST30A	12.2	91.3	230	500	53	5.2	-
	M	M10	U10	12.9	92.4	170	500	47	-	-
		M20	U20	13.1	91.1	210	500	-	-	88
		M30	ST30A	12.2	91.3	230	500	53	5.2	-
		M40	U40	13.3	89.2	270	440	-	-	-
	K	K01	H02	14.8	93.2	185	-	61	4.4	105
		K10	H01	13.0	92.9	210	570	66	4.7	109
		K20	G10	14.7	90.9	250	500	63	-	105
Ultra fine grain alloy	Z	Z10	FA1	14.1	91.4	290	-	58	5.7	-
		Z20	FCC	12.5	91.3	235	-	-	-	-
Grade for tungsten carbide wear parts	V	V1	D1	15.0	92.3	205	520	-	-	-
		V2	D2	14.8	90.9	250	150	-	-	-
		V3	D3	14.6	89.7	310	410	-	-	-
		V4	G5	14.3	89.0	320	380	-	-	-
		V5	G6	14.0	87.7	350	330	-	-	-
Grade for mining and civil engineering tools	E	E1	GR10	14.8	90.9	220	-	-	-	-
		E2	GR20	14.8	90.3	240	-	-	-	-
		E3	GR30	14.8	89.0	270	-	-	-	-
		E4	GR35	14.8	88.2	270	-	-	-	-
		E5	GR50	14.5	87.0	300	-	-	-	-

The physical properties of element

Element	Specific gravity (g/cm^3)	Hardness (H_V)	Young's modulus ($\times 10^3 kgf/mm^2$)	Thermal conductivity (cal/cm·sec·℃)	Thermal expansion coefficient ($\times 10^{-6}/℃$)	Melting point (℃)
WC	15.6	2,150	70	0.3	5.1	2,900
TiC	4.94	3,200	45	0.04	7.6	3,200
TaC	14.5	1,800	29	0.05	6.6	3,800
NbC	8.2	2,050	35	0.04	6.8	3,500
TiN	5.43	2,000	26	0.07	9.2	2,950
Al_2O_3	3.98	3,000	42	0.07	8.5	2,050
cBN	3.48	4,500	71	3.1	4.7	-
Diamond	3.52	9,000	99	5.0	3.1	-
Co	8.9	-	10~18	0.165	12.3	1,495
Ni	8.9	-	20	0.22	13.3	1,455

Technical information for Stainless steel

Guide of stainless-steel machining

- Stainless steels are well known for their excellent anti-corrosive property
- Excellent anti-corrosive property is due to Chromium added to these alloys. In general, stainless steels have 4%~10% content of Chromium

• Classifications & Features of Stainless steel.

1) Austenite series : One of the most general kinds of stainless steels, it has some of the best corrosion-resistance properties due to a high Cr & Ni content. A high Nickel content also makes machining more difficult. Austenite series stainless steels are usually used for can processing, chemical products and construction purposes (AISI 303,304,316)
2) Ferrite series : It has Chromium content similar to Austenite series, but none of Ni content which results in freer machining (AISI 410,430,434)
3) Martensite series : The only stainless steel with the ability to be heat treated. It has high carbon content but poor corrosion resistance, so it is used for parts that need higher hardness (AISI410, 420,432)
4) Precipitate hardened series : A Chromium-Nickel alloy, it has improved hardness through low temperature heat-treatment and has superior corrosion resistance and toughness at the same time (AISI 17, 15)
5) Austenite-Ferrite series : Though it has similar properties with Austenite and Ferrite, it has much more superior heat-resistance (approx. 2 times better). Usually used where thermal-corrosion stability is needed, such as condensers (AISI S2304, 2507).

• Difficult-to-Cut Factors of Stainless steel.

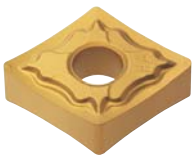
1) Work-hardening property - Causes premature wear of tool and poor control chip
2) Low thermal conductivity - Causes plastic deformation of cutting edge and fast wear of tools
3) Built-up-edge - More susceptible to micro-chipping on cutting edges and causes bad surface-finish
4) Chemical affinity between tool and workpiece caused by work-hardening and low thermal-conductivity of workpiece, this might generate abnormal-wear, chipping and/or abnormal fracture

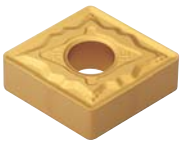
• Tips for Machining of Stainless steel.

1) Use a tool that has higher thermal-conductivity
   Low thermal-conductivity of stainless steels accelerates tool wear resulting from a decline in hardness of the cutting edge of an insert, this is due to heat piling up. It is better to use a tool that has higher thermal conductivity and with enough coolant
2) Sharper cutting edge-line
   It is necessary to utilize larger rake-angles and wider chip-breaker lands to reduce cutting-load pressure and prevent build-up-edge. This will help provide better chip control to an operator
3) Optimal cutting condition
   Inappropriate machining conditions like extremely low or high-speeds or low feed rates can cause poor tool life due to work-hardening of work piece
4) Choose an appropriate tool
   Tools for stainless steels should have good toughness attributes, enough strength on their edge-line (cutting edge) & a higher film adhesion



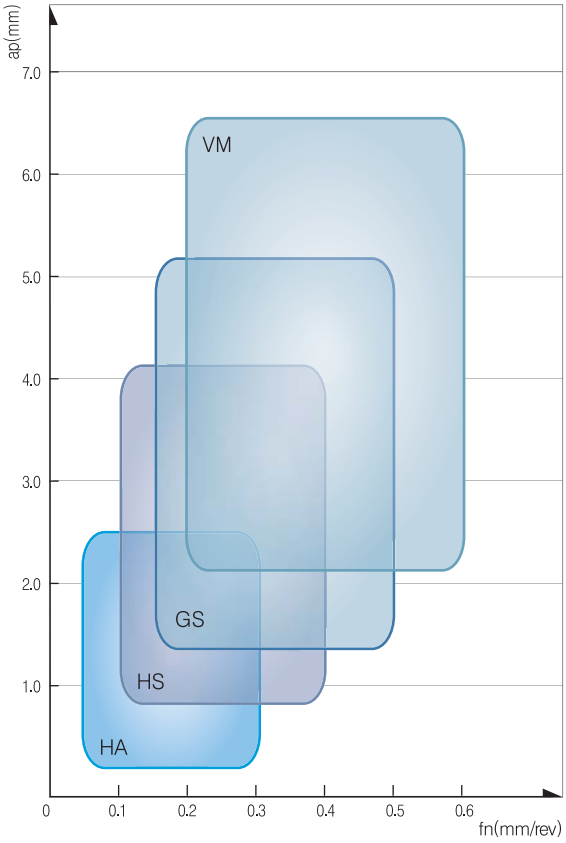
Chip Breakers for Stainless steel

HA / Finishing		
		• Sharp edge for shallow depth cutting • Increase tool life through reduce chip control friction at high speed cutting • Good surface finish of work piece

HS / Medium cutting		
		• Enhanced cutting efficiency and increase tool life due to enhanced chip flow. • Reinforce wear resistance through adopting high land rake angle • Special land design to prevent notching and enhance toughness

GS / Medium to Rough cutting		
		• Superior tool life at light intermittent cutting • Better chip flow through wide chip pocket • Prevent build-up-edge by low cutting force design

VM / Roughing		
		• Chip breaker for intermittent cutting • Unique chip breaker design provide smooth chip control • Strong edge line permit superior toughness

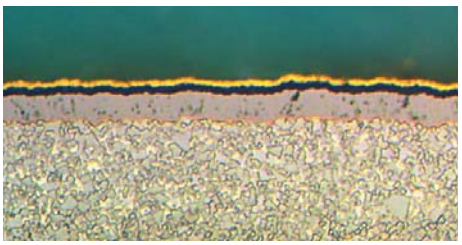


Korloy's New Grades for Stainless steel machining.

‣ KORLOY New Grades for Stainless steel machinig

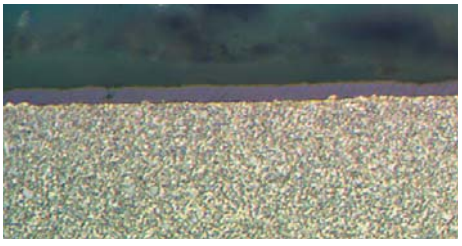
• NC9025, For high and medium speed turning of Stainless steel.

‣ Specially designed substrate & film suitable for high-speed machining of stainless steels
‣ Superior cutting performance under conditions in moderate-speed applications for cutting low-carbon steels and low-carbon alloy steel
‣ Longer tool-life can be achieved thanks to a superior chipping-resistance design in the grade
‣ Obtain better cutting performance. Korloy offers a variety of combinations of chip breakers to machine easily even in deeper depth of cut



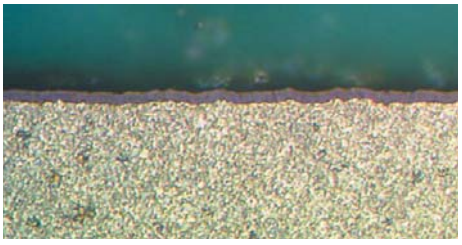
• PC9030, for medium to low speed turning of Stainless steel.

‣ By using an ultra fine carbide substrate, the PC9030 has a tougher substrate for moderate speed machining and intermittent cutting of Stainless steel
‣ A PVD coating is applied to this grade to enhance chipping-resistance and adhesion-resistance during machining of difficult-to-cut material
‣ Exclusive grade for stainless steel, using tougher carbide as a substrate and a PVD coated, this gives the insert superior lubrication properties
‣ Enhance your surface finish and reduce burrs by utilizing our chip-breakers, exclusively made for Stainless steels

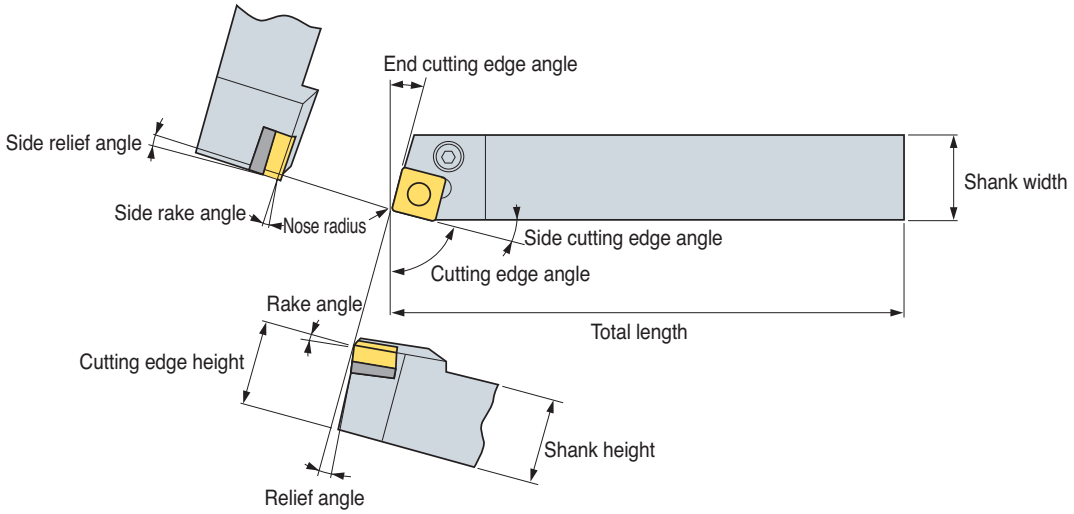


• PC9530, for medium to low speed milling of Stainless steel.

‣ Tough ultra-fine carbide substrate primarily used for roughing and/or intermittent milling applications in stainless steel
‣ A PVD coating is applied to achieve better tool life in stainless steel and Ni-Cr steel applications
‣ To reduce chipping in the cutting edge Korloy uses a tough carbide substrate and PVD coating to help prevent material build up around the cutting edges



Insert shape and terminology

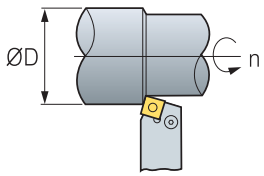


• Relating angles between tool and workpiece

Cutting edge inclination	Terminology	Function	Effect
Rake angle	Side rake angle	• Cutting force, Cutting heat, The effects of chip control on tool life	• (+) : Excellent machine-ability (reducing cutting force, weakening cutting edge strength) • (+) : When machining excellent machine-ability or thin workpiece • (-) : When strong cutting edge is needed at interrupted condition or mill scale
	Rake angle		
Relief angle	Relief angle Side relief angle	• Only cutting edge contact with cutting face	• (-) : Cutting edge is strong but has short tool life to make bad influence on flank wear
Cutting edge angle	Cutting edge angle	• Affects chip control and cutting force direction	• (+) : Improved chip control because chip thickness is big
	Side cutting edge angle	• Affects chip control and cutting force direction	• (+) : Strong cutting edge due to distributed cutting force but chip control is bad by thin chip thickness • (-) : Improved chip performance
	End cutting edge angle	• Prevent friction between cutting edge and cutting face	• (-) : Cutting edge is strong but has short tool life to make bad influence on flank wear

Calculation formulas for machining

• Cutting speed



$$vc = \frac{\pi \times D \times n}{1000} \text{ (m/min)}$$

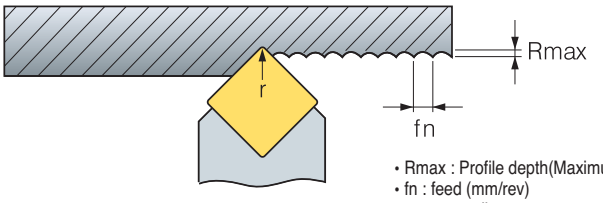
• vc : Cutting speed (m/min) • n : Revolution per minute (min^{-1})
• D : Diameter (mm) • π : Circular constant(3.14)

• Feed

$$fn = \frac{vf}{n} \text{ (mm/rev)}$$

• fn : Feed per revolution(mm/rev) • n : Revolution per minute (min^{-1})
• vf : Table feed (mm/min)

• Surface finish



• Rmax : Profile depth(Maximum height roughness) (μ)
• fn : feed (mm/rev)
• r : nose radius

• Theoretical surface roughness

$$Rmax = \frac{fn^2}{8r} \, 1000(\mu m)$$

• Practical surface roughness
Steel : Rmax × (1.5~3) Cast iron : Rmax × (3~5)

• Power requirement

$$P_{kw} = \frac{Q \times kc}{60 \times 102 \times \eta} \quad P_{HP} = \frac{P_{kw}}{0.75} \quad Q = \frac{vc \times fn \times ap}{1000}$$

• P_{kw} : Power requirement [kW]
• P_{HP} : Power requirement (horse power) [HP]
• vc : Cutting speed [m/min]
• ap : Depth of cut [mm]
• fn : Feed per revolution [mm/rev]
• kc : Specific cutting resistance [kg/mm²]
• η : Machine efficiency rate (0.7~0.8)

Rough Kc	
Mild steel	190
Medium carbon steel	210
High carbon steel	240
Low alloy steel	190
High alloy steel	245
Cast iron	93
Malleable cast iron	120
Bronze, Brass	70

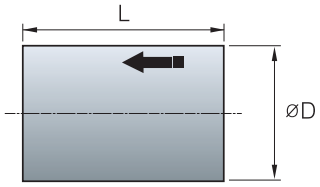
• Material removal rate

$$Q = \frac{vc \times fn \times ap}{1000}$$

• Q : Material removal rate [cm^3/min] • ap : Depth of cut [mm]
• vc : Cutting speed [m/min] • fn : Feed per revolution [mm/rev]

• Machining time

External face machining 1



• Constant Revolution per minute

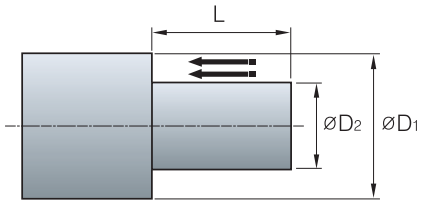
$$T = \frac{60 \times L}{fn \times n}$$

• Constant cutting speed

$$T = \frac{60 \times \pi \times L \times D}{1000 \times fn \times n}$$

T : Machining time [sec]
L : Cutting length [mm]
fn : Feed per revolution [mm/rev]
n : Revolution per minute [min]
D : Diameter of workpiece [mm]
vc : Cutting speed [m/min]

External face machining 2



• Constant Revolution per minute

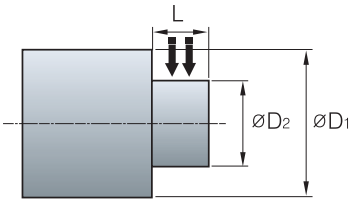
$$T = \frac{60 \times L}{fn \times n} \times N$$

• Constant cutting speed

$$T = \frac{60 \times \pi \times L \times (D1 + D2)}{2 \times 1000 \times fn \times n} \times N$$

T : Machining time [sec]
L : Cutting length [mm]
fn : Feed per revolution [mm/rev]
n : Revolution per minute [min]
D_1 : Maximum diameter of workpiece [mm]
D_2 : Minimum diameter of workpiece [mm]
vc : Cutting speed [m/min]
N : The number of pass = $(D_1-D_2)/d/2$

Facing



• Constant Revolution per minute

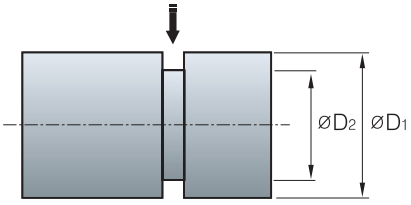
$$T = \frac{60 \times (D_1 - D_2)}{2 \times fn \times n} \times N$$

• Constant cutting speed

$$T_1 = \frac{60 \times \pi \times (D1 + D2) \times (D1 - D2)}{4000 \times fn \times vc} \times N$$

T : Machining time [sec]
T_1 : Machining time before the maximum rpm[sec]
L : Width of machining [mm]
fn : Feed per revolution [mm/rev]
n : Revolution per minute [min^{-1}]
D_1 : Maximum diameter of workpiece [mm]
D_2 : Minimum diameter of workpiece [mm]
vc : Cutting speed [m/min]
N : The number of pass = $(D_1-D_2)/d/2$

Grooving



• Constant Revolution per minute

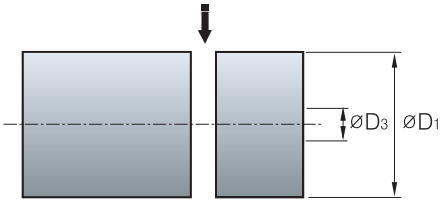
$$T = \frac{60 \times (D_1 - D_2)}{2 \times fn \times n}$$

• Constant cutting speed

$$T_1 = \frac{60 \times \pi \times (D_1 + D_2) \times (D_1 - D_2)}{4000 \times fn \times vc}$$

T : Machining time [sec]
T_1 : Machining time before the maximum rpm[sec]
L : Width of machining [mm]
fn : Feed per revolution [mm/rev]
n : Revolution per minute [min^{-1}]
D_1 : Maximum diameter of workpiece [mm]
D_2 : Minimum diameter of workpiece [mm]
vc : Cutting speed [m/min]

Parting



• Constant Revolution per minute

$$T = \frac{60 \times D_1}{2 \times fn \times n}$$

• Constant cutting speed

$$T_1 = \frac{60 \times \pi \times (D_1 + D_3)\ (D_1 - D_3)}{4000 \times fn \times vc}$$

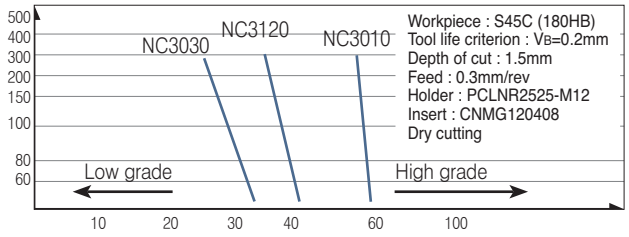
$$T_3 = T_1 + \frac{60 \times D_3}{2 \times fn \times n_{max}}$$

T : Machining time [sec]
T_1 : Machining time before the maximum rpm[sec]
T_3 : Machining time till maximum RPM[sec]
fn : Feed per revolution [mm/rev]
n : Revolution per minute [min^{-1}]
n_{max} : Maximum revolution per minute [min^{-1}]
D_1 : Maximum diameter of workpiece [mm]
D_3 : Maximum diameter at maximum RPM [mm]
vc : Cutting speed [m/min]

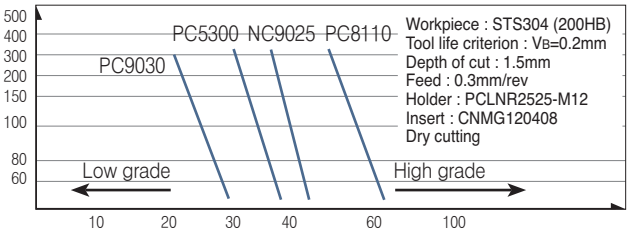
The affects of cutting condition

▸ The most desirable machining means short machining time, long tool life and good precision. This is the reason that proper cutting condition for each tools should be selected according to material's properties, hardness, shapes, the efficiency of machine

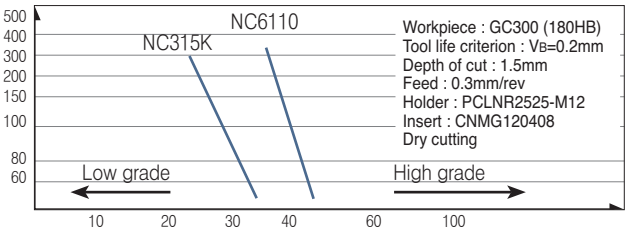
Cutting speed



The tool life feature of P grade



The tool life feature of M grade



The tool life feature of K grade

Cutting Speed's effects

▸ When the cutting speed increases up to 20% in an application, the tool life respectively decreases down 50%. Although inversely, if the cutting speed increases up to 50% the tool life decreases down to 20%. On the other hand if cutting speed is too low (20-40m/min) Tool life shortens due to vibration

Feed

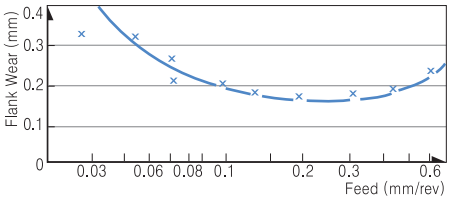
▸ The feed rate in turning means the progressed interval of a distance in a work piece within 1 revolution. The feed rate in a milling application means the table feed divided by number of teeth of cutter (feed rate per tooth)

The effects of feed

▸ When the feed rate decreases the flank wear is increases. When the feed rate is too low, the tool life radically shortens

▸ When the feed rate increases, the flank wear gets larger due to high temperatures, however the feed rates effect tool life less than the cutting speed. And higher feed rates improve machining efficiency

- Relationship between feed and flank wear in steel turning



Cutting condition
Workpiece: SNCN431
Grade : ST20
Cutting speed : 200m/min
Depth of cut : 1.0mm
Cutting time : 10min

Depth of cut

▸ Determined by required allowances in machining a material and the capacity the machine can tolerate. There are cutting limits according to the different shapes and sizes of the insert

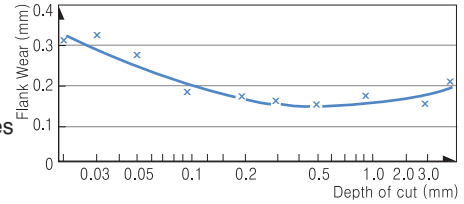
The effect of depth of cut

▸ The depth of cut does not have a big influence on tool life

▸ When the depth of cut is small the work piece is not cut but rather rubbed. In these cases, machine off the work hardened parts that decrease tool life

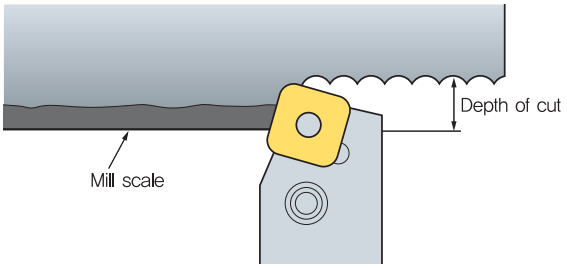
▸ When machining a cast skin or milling scale smaller depth of cuts usually cause chipping and abnormal wear because of hard impurities in the surface of the work piece

- Relationship between depth of cut and flank wear in steel turning



Cutting condition
Workpiece : SNCN431
Grade : ST20
Cutting speed : 200m/min
Feed : 0.2mm/rev
Cutting time : 10min

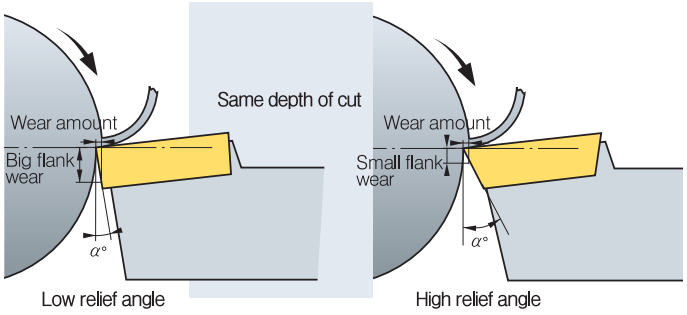
- Surface parts including mill scale Roughing

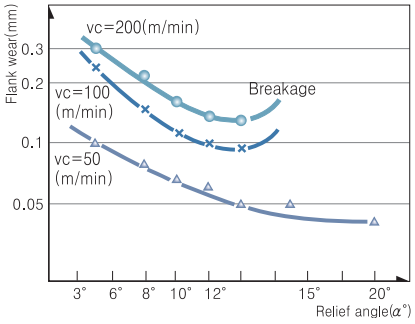


Relief angle

Relief angle avoids the friction between workpiece and relief face and makes cutting edge move along workpiece easily

• Relationship between various relief angle and flank wear





- Workpiece : SNCM431(HB200)
- Grade : P20
- ap : 1mm
- fn : 0.32mm/rev
- T : 20min

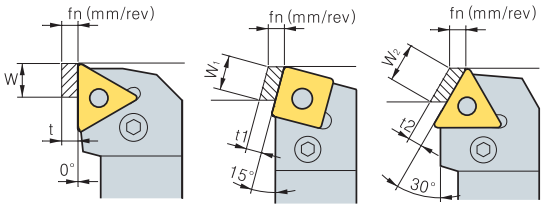
· Affects
1. If relief angle is big Flank wear decreases
2. If relief angle is big Cutting edge strength weakens.
3. If relief angle is small Chattering occurs

· Selection system
1. Hard workpiece / When strong cutting edge is needed - Low relief angle
2. Soft workpiece / Workpiece turning to work hardening easily - High relief angle

Side cutting edge angle

Side cutting edge angle has big influence on chip flow and cutting force therefore proper Side cutting edge angle is very important

• Side cutting edge angle and Chip thickness

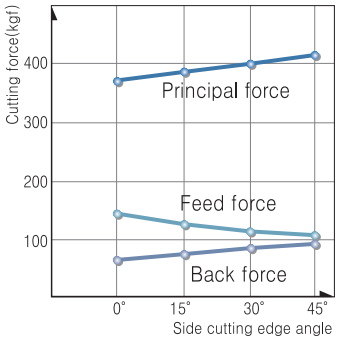


① Approach angle 0° ②Approach angle 15° ③Approach angle 30°

As side cutting edge angle is getting bigger chips are getting thinner and wider(refer to left picture). At the same feed and depth of cut with approach angle 0° Chip thickness is the same as feed(t=fn) and chip width is equal to depth of cut (W=ap)

t1 = 0.97t, W1 = 1.04W
t2 = 0.87t, W2 = 1.15W

• Side cutting edge angle and 3 cutting forces

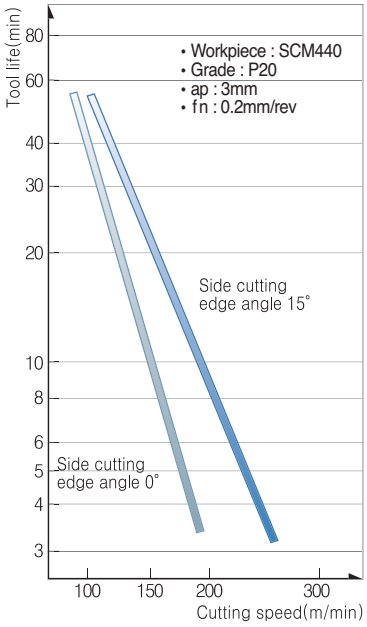


- Workpiece : SCM440(HB250)
- Grade : TNGA220412
- vc = 100m/min
- ap= 4mm
- fn = 0.45mm/rev

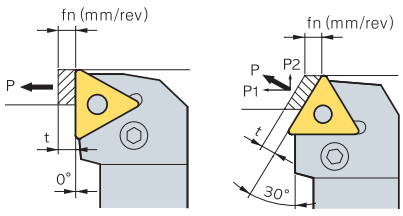
· Affects
1. Big side cutting edge angle with the same feed makes chip attaching length longer and chip thickness thinner. So that cutting forces scatter to long cutting edge therefore tool life gets longer.
2. Big side cutting edge angle for machining long bars can cause bending

· Selection system
1. Deep depth of cut finishing / Long thin workpiece / Low machine rigidity - Side cutting edge angle
2. Hard and high calorific power workpiece / Roughing big workpiece / High machine rigidity - Side cutting edge angle

• Side cutting edge angle and Tool life



• Side cutting edge angle and Cutting load



①"Force P is loaded." ②"Force P is scattered to P1, P2."

As approach angle gets bigger Back force gets bigger and feed force gets smaller

• Side cutting edge angle and Cutting performance

Specification	Low ← Approach angle → High
Wear rate	High ◄ · · ·

End cutting edge angle

It affects machined surface to prevent interference between surface of workpiece and insert

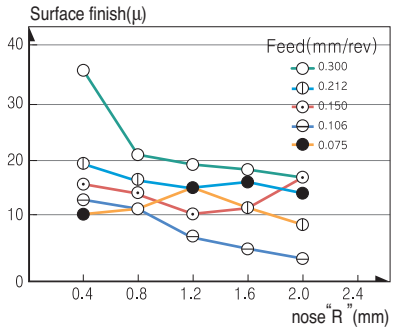
· Affects

1. If end cutting edge angle reduces Cutting edge get stronger but cutting heat generated by machining increases
2. Small end cutting edge angle can cause chattering due to the increases cutting force

Nose "R"

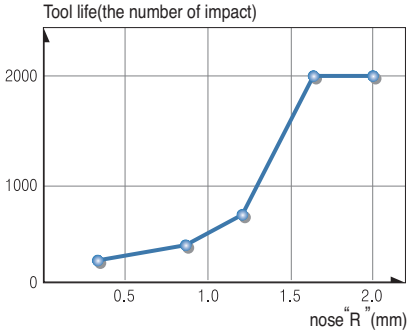
1. Nose"r"affects not only surface roughness but strength of cutting edge
2. In general, It's desirable that nose "R" is 2~3 times bigger than feed

• Nose R and surface finish



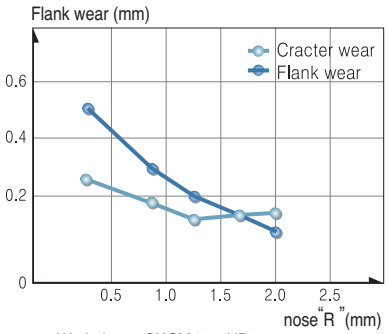
- Workpiece : SNCM439, HB200
- Grade : P20
- vc = 120m/min, ap = 0.5mm

• Nose R and tool life



- Workpiece : SCM440, HB280
- Grade : P10
- vc = 100m/min, ap = 0.5mm
- fn = 0.3mm/rev

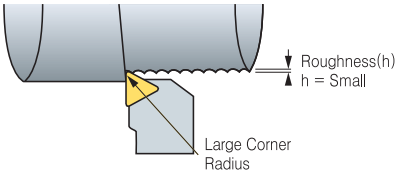
• Nose R and wear of tool



- Workpiece : SNCM439, HB200
- Grade : P10
- vc = 140m/min, ap = 2mm
- fn = 0.2mm/rev, T = 10min

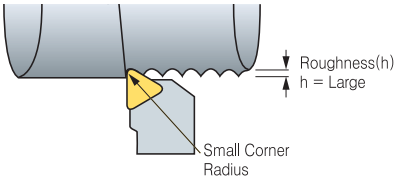
· Affects of nose "R"

1. Big nose "R" improves surface finish
2. Big nose "R" improves cutting edge strength
3. Big nose "R" reduces flank wear and crater wear
4. Too big nose "R" causes chattering due to increased cutting force



· Selection system

1. For finishing with small depth of cut / long and thin workpiece / When machine power is low - Small Nose "R"
2. For applications that need strong cutting edge such as intermittent and machining mill scale / For roughing of big workpiece / When the machine power is strong eough - Big Nose "R"



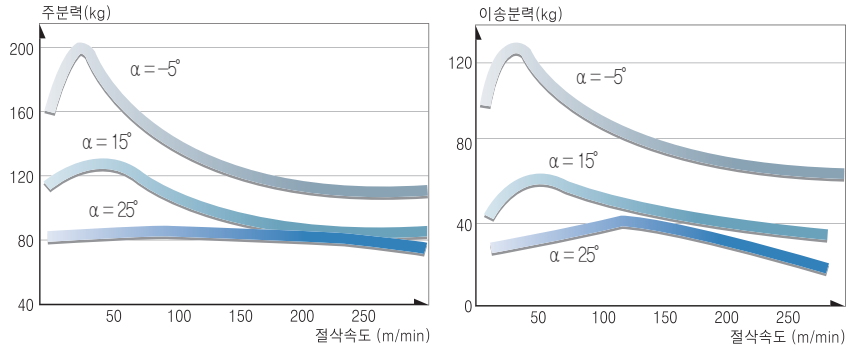
• Relationship between nose radius, feed and various surface roughness.

Nose "R" / Feed(mm/rev)	0.4	0.8	1.2
0.15			
0.26			
0.46			

Cutting edge shape and the affects

• Rake angle[α]

Rake angle has big influence on cutting force, chip flow and tool life



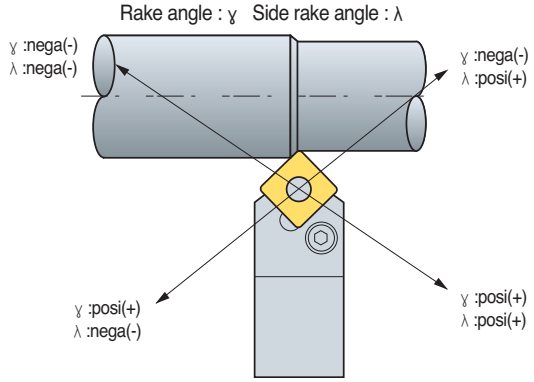
· Affects

1. High rake angle results in good suface finish
2. As the rake angle increases by 1°Machining power decreases by 1%.
3. High rake angle weakens cutting edge

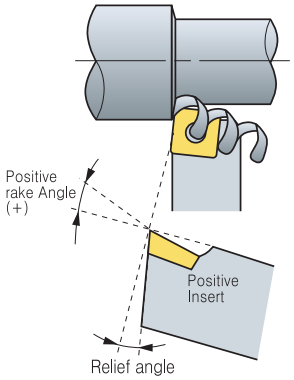
· Selection system

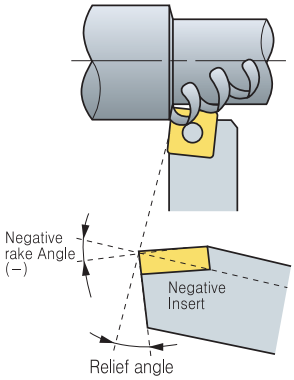
1. For hard workpiece / For applications that need strong cutting edge such as interrupted and machining mill scale
   - Low rake angle
2. For soft workpiece / Easy to cut material / When the rigidity of machine power and workpieceis is low
   - High rake angle

• Rake angle and the direction of chip flow



In order to prevent machined surface from damages Avoid nega, posi combination. γ :nega(-) λ :posi(+)





Selecting proper tools

Nowadays, It's very difficult to select the best tools in complicating tooling system and various cutting conditions.
However, It can be simplified by classifying basic factors below

• Selection of inserts and tool holder

Listed below is the basic factors and choose B according to A

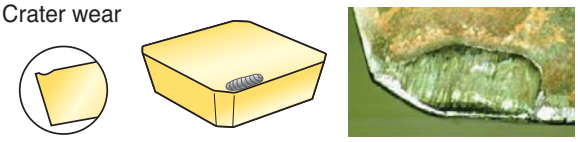
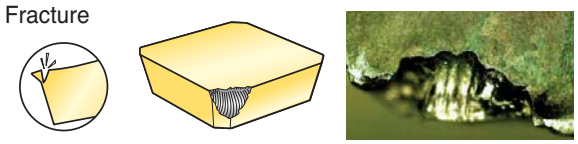
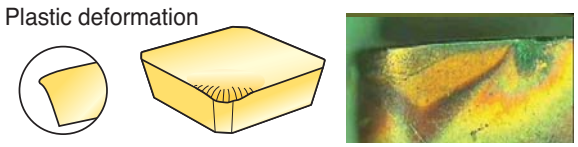
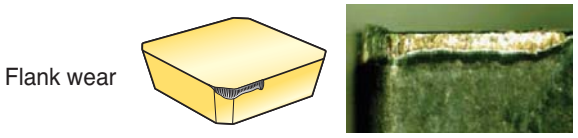
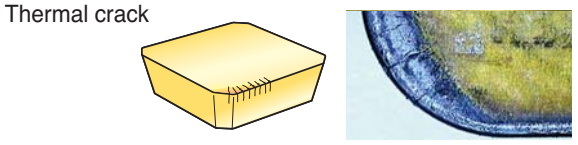
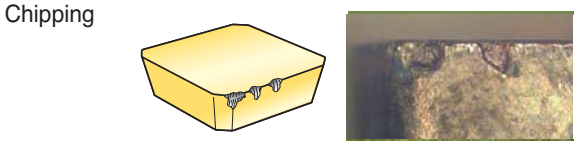
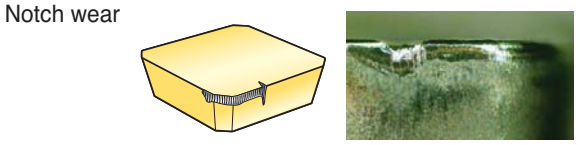
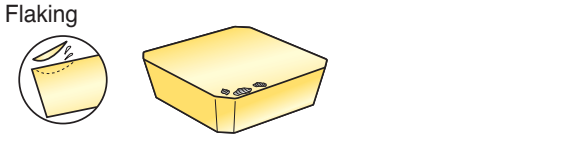
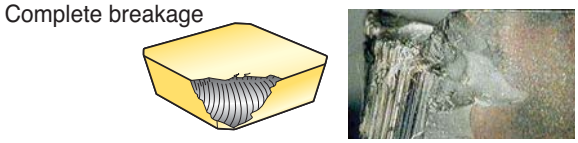
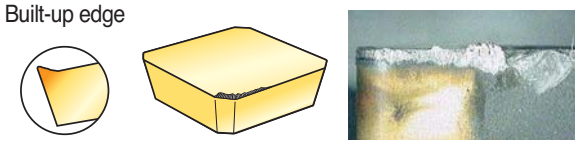
A : Basic factors

· Workpiece material
· Workpiece shape
· Workpiece size
· Hardness of workpiece
· Surface roughness of workpiece (before machining)
· Surface finish required
· Type of lathe machine
· Condition of lathe machine (rigidity, power etc)
· Horse power of machine
· Clamping method of workpiece

B : Selection system

① Select as big approach angle as possible.
② Select as big shank as possible.
③ Select as strong cutting edge of insert as possible
④ Select as big nose radius as possible
⑤ In finishing, Select the insert using many corners
⑥ Select as small insert as possible
⑦ Cutting speed should be determined carefully according to cutting conditions
⑧ Select as deep depth of cut as possible
⑨ Select as fast feed as possible
⑩ Cutting condition should be determined within chip breaker application ranges

Trouble shooting

Tool Failure	Cause	Solution
Crater wear 	• Improper grade • Excessive cutting condition	• Choose harder grade • Decrease cutting condition
Fracture 	• Improper grade • Excessive feed • Shorten cutting edge strength • Insufficient rigidity of holder	• Choose tougher grade • Decrease feed • Apply to large honed or chamfered edge • Choose bigger size holder
Plastic deformation 	• Improper grade • Excessive cutting condition • High cutting temperature	• Choose harder grade • Decrease cutting condition • Choose grade wich heat conductivity are big
Wear on nose radius Flank wear 	• When the hardness of workpiece is too high compare with tool • When machinig surface hardened workpiece • Improper grade • Excessive cutting speed • Too small relief angle • Too low feed	• Choose harder grade • Decrease cutting speed • Choose lager relief angle • Increase feed
Thermal crack 	• Expansion and shrinking by cutting temperature • Improper grade (*Specially milling operation)	• Apply to dry cutting (In case of wet cutting, use enough coolant) • Choose tougher grade
Chipping 	• Improper grade • Excessive feed • Shorten cutting edge strength • Insufficient rigidity of holder	• Choose tougher grade • Decrease feed • Apply to large honing or chamfer edge • Choose bigger size holder
Notch wear 	• Surface hardened workpiece • Friction due to bad chip geometry (Generate vibration)	• Choose harder grade • Improve chip control form large rake angle
Flaking 	• Deposition on cutting edge • Bad chip control	• Improve cutting performance fromd large rake angle • Apply to chip pocket with big size
Complete breakage 	• Unusable condition due to wear off the most parts of cutting edge by progress of wear	
Built-up edge 		

Types of tool failure and trouble shooting

Troubles	Causes	Solution																
		Cutting conditions				Selecting insert grade				Tool shape							Machine clamping	
		Cutting speed	Feed	Depth of cut	Coolant	Select harder grade	Select tougher grade	Select better heat-impact resistance grade	Select better adhesion resistance grade	Chip breaker valuation	Rake angle	Nose radius	Side cutting edge angle	Cutting edge strength Honing	Improving insert precision M class → G class	Improving holder rigidity	Clamping workpiece	Holder overhang	Machine vibration
Poor precision Unstable machining size	Insert precision is variable														●				
	Workpiece, Separation of tool									●	⬆	⬇				●	●	●	●
Cutting edge back thrust is big It's necessary to adjust because machining precision changes during operation.	Flank wear increase					●						⬆							
	Cutting condition is improper	⬇	⬆																
Poor surface roughness for finishing Criterion of tool life.	Weakened cutting force by increasing wear of tool	⬇			Wet cutting	●			●	●	⬆	⬆		⬇	●				
	Cutting edge chipping		⬇	⬇			●			●		⬆		⬆			●	●	●
	Adhesion, built-up edge	⬆	⬆		Wet cutting				●	●	⬆			⬇	●				
	Improper cutting conditions	⬆	⬇	⬇	Wet cutting														
										●		⬆		⬇	●				
	Vibration, chattering	⬇	⬇	⬇	Wet cutting		●			●	⬆	⬇		⬇		●	●	●	●
Cutting heat generation Poor machining precision and short tool life by cutting heat	Improper cutting conditions	⬇	⬇	⬇															
						●				●	⬆			⬇					
burr, chipping, nap steel, aluminum (burr)	Improper cutting conditions	⬇	⬆		Wet cutting														
						●				●	⬆	⬇		⬇					
Cast iron (Weak chipping)	Improper cutting conditions		⬇	⬇															
						●				●	⬆	⬆		⬇		●	●	●	●
Soft steel (nap)	Improper cutting conditions	⬆	⬍		Wet cutting														
						●				●	⬆			⬇					

⬆ : Increase ⬇ : Decrease ○ : use ◉ : Correct use

Tool life criterion

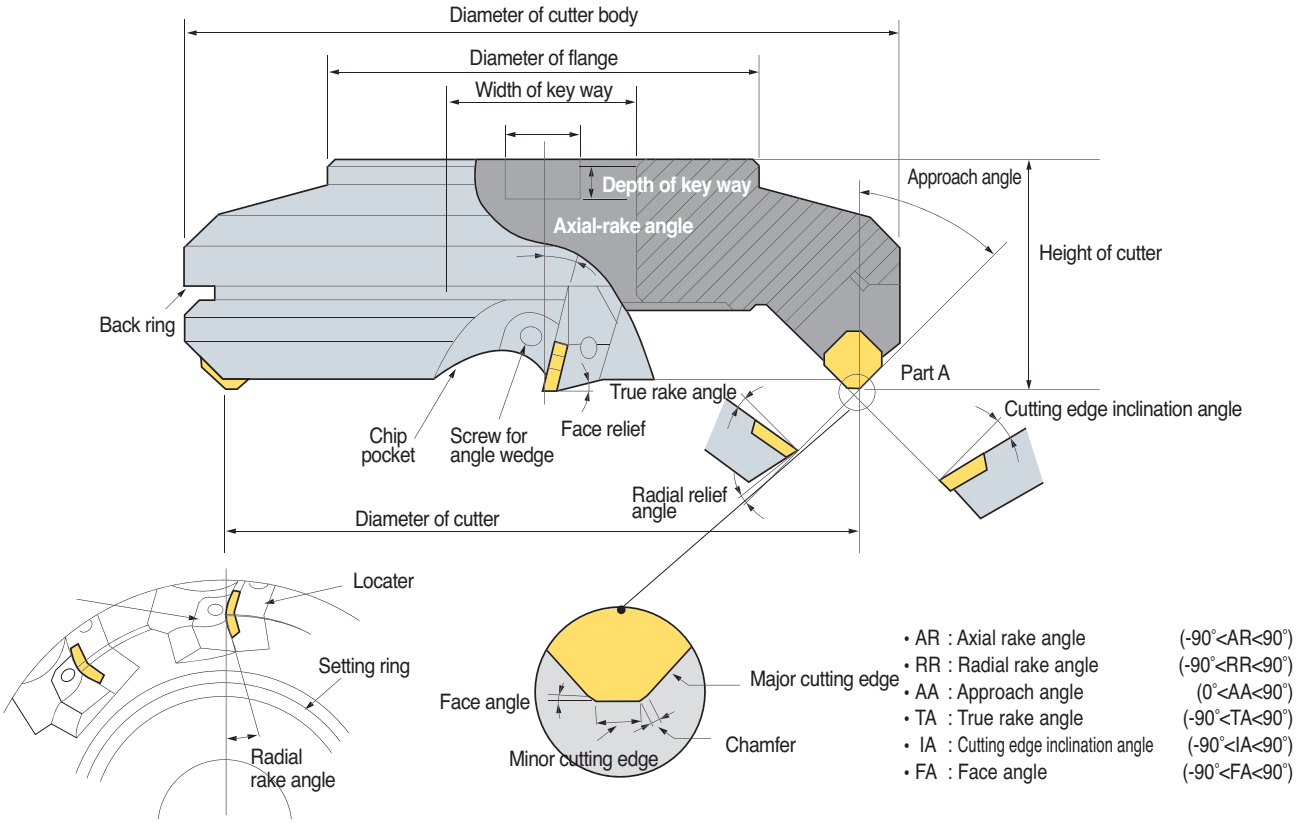
• KS B0813

Flank wear width	0.2mm	Precision light cutting , Finishing in nonferrous alloy
	0.4mm	Machining special steel
	0.7mm	General cutting in cast iron, steel etc
	1~1.25mm	General cutting in cast iron, steel etc
Depth of crater wear	In general 0.05~0.1 mm	

• ISO B8688

Tool life criterion	Application
Complete breakage	Machining special steel
Flank wear width V_B = 0.3mm	Even flank wear of cemented carbides, Ceramic tool
V_{Bmax} = 0.5mm	Uneven flank wear
Crater wear width KT = 0.06+0.3fmm (f : mm/rev)	Cemented carbides tool
Criterion by surface roughness 1, 1.6, 2.5, 4, 6.3, 10㎛Ra	When surface roughness is important

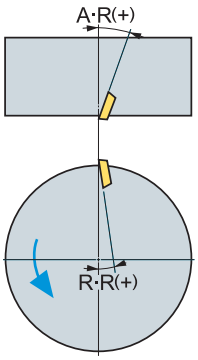
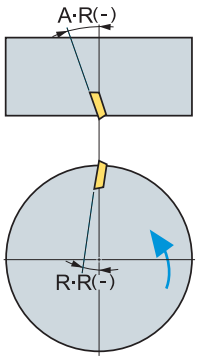
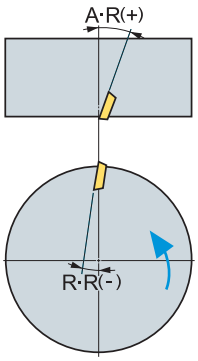
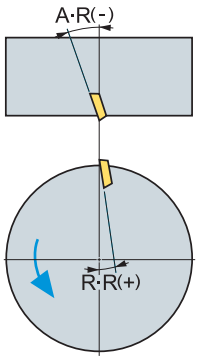
Milling cutter shape and designation



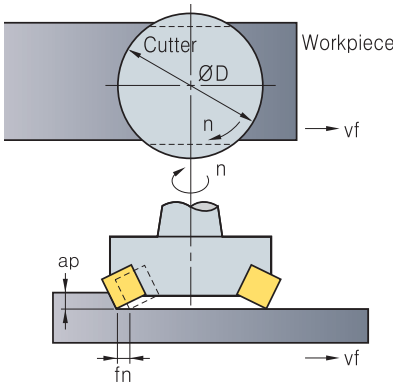
• The terminology and functions of cutting edge angle

Tool failure		Symbol	Function	Effects
1	Axial rake angle	A.R	Chip flow direction, Adhesion	-
2	Radial rake angle	R.R	Affecting on thrust	-
3	Approach angle	A.A	Chip thickness, Determines flow direction	(+) : Chip thickness become thinner, cutting force could be reduced
4	True rake angle	T.A	Effective rake angle	(+) : Better cutting. Preventing adhesion, Weakening cutting edge strength (-) : Cutting edge strength increases, easy to adhere
5	Cutting edge inclination angle	I.A	Determines chip flow direction	(+) : Good chip flow, cutting force decreases, Corner edge strength weakens
6	Face angle	F.A	Controlling surface roughness for finishing	(-) : Surface roughness improves
7	Relief angle	R.A	Controlling cutting edge strength, tool life and chattering	-

Features by combination of rake angle

	Double positive angle	Double negative angle	Posi - Negative angle	Nega - Positive angle
				
Use	• General machining of steel, cast iron, stainless steel • Machining soft steel that brings about built-up edge easily • Machining material having tendency to poor surface roughness	• Under interrupted cutting condition • Roughing of cast iron and steel	• Machining difficult to cut material • Roughing with deep depth of cut and wide width of cut in steel and cast iron	• Chip flows to center of cutter body
Advantages	• As for tough workpiece material It prevents built-up edge to improve surface roughness • Low cutting load and better machinability	• Strong cutting edge • Roughing of workpiece that has bad surface condition containing sand, mill scale • Double sided inserts can be applied(Economical) • Good chip control	• Good chip flow and machinability • Suitable for machining of difficult-to-cut material • Un-even partition clamping prevents chattering	-
Disadvantages	• Weak cutting edge strength. • Only single sided inserts are available (No economical) • Machine and cutter need enough power and rigidity	• Machine and cutter need enough power and rigidity	• Only single sided inserts are available (No economical)	• Since the chips flows toward the center of cutter. Chips scratch on machined surface. • Bad chip flow • No economical

Major cutting formulas



• Cutting speed

$$vc = \frac{\pi \cdot D \cdot n}{1000} \text{ (m/min)}$$

- vc : Cutting speed (m/min)
- D : Diameter of tool (mm)
- n : Revolution per minute (min^{-1})
- π : Circular constant (3.14)

• Feed

$$fz = \frac{vf}{z \cdot n} \text{ (mm/t)}$$

- fz : Feed per tooth (mm/t)
- vf : Feed per minute (mm/min)
- n : Revolution per minute (min^{-1})
- z : Number of tooth

• Chip removal amount

$$Q = \frac{L \times vf \times ap}{1000} \text{ (㎤/min)}$$

- Q : Chip removal amount (㎤/min)
- L : Width of cut (mm)
- vf : Table feed (mm/min)
- ap : Depth of cut (mm)

• Power requirement

$$P_{kw} = \frac{Q \times kc}{60 \times 102 \times \eta} \qquad P_{hp} = \frac{P_{kw}}{0.75}$$

- Pc : Power requirement (kW)
- H : Horse power requirement (hp) (mm/min)
- Q : Chip removal amount (cm^3/min)
- kc : Specific cutting resistance (kgf/mm^3)
- η : Machine efficiency rate (0.7~0.8)

• Machining time

$$T = \frac{60 \times Lt}{vf} \text{ (sec)}$$

- T : Machining time (sec)
- Lt : Total length of table feed (mm)(=Lw+D+2R)
- Lw : The length of workpiece (mm)
- D : The diameter of cutter body (mm)
- vf : Table feed (mm/min)
- R : Relief length (mm)

• True rake angle / Cutting edge inclination angle

True rake angle	tan(T) = tan(R) x cos(AA) + tan(A) x sin(C)
Cutting edge inclination angle	tan(I) = tan(A) x cos(AA) − tan(R) x sin(C)

Values of specific cutting resistance

Workpiece	Tensile strength (kg/㎟) and hardness	Specific cutting resistance according to various feed kc(MPa)				
		0.1 (㎜/t)	0.2 (㎜/t)	0.3 (㎜/t)	0.4 (㎜/t)	0.6 (㎜/t)
Soft steel	52	220	195	182	170	158
Medium carbon steel	62	198	180	173	160	157
High carbon steel	72	252	220	204	185	174
Tool steel	67	198	180	173	170	160
Tool steel	77	203	180	175	170	158
Chrome manganese steel	77	230	200	188	175	166
Chrome manganese steel	63	275	230	206	180	178
Chrome molybdenum steel	73	254	225	214	200	180
Chrome molybdenum steel	60	218	200	186	180	167
Nickel Chrome molybdenum steel	94	200	180	168	160	150
Nickel Chrome molybdenum steel	HB352	210	190	176	170	153
Cast steel	52	280	250	232	220	204
Hardened cast iron	HRC46	300	270	250	240	220
Meehanite cast iron	36	218	200	175	160	147
Gray cast iron	HB200	175	140	124	105	97
Brass	50	115	95	80	70	63
Light alloy(Al - Mg)	16	58	48	40	35	32
Light alloy(Al - Si)	20	70	60	52	45	39

Chip removal amount(cm³/min) per rated horse power

Workpiece		Rated horse power					
		5Hp	10Hp	20Hp	30Hp	40Hp	50Hp
Steel	Soft	32	75	163	295	425	570
	Medium	26	55	127	212	310	425
	hard	18	41	93	163	228	310
Cast iron	Soft	52	116	260	455	670	880
	Medium	32	75	163	295	425	570
	hard	26	55	127	212	310	425
Bronze Brass	Soft	77	163	390	670	980	1,280
	Medium	54	118	275	490	700	910
	hard	26	55	127	245	325	425
Aluminum		90	195	440	780	1,110	1,500

Selection of MILL-MAX diameter(D)

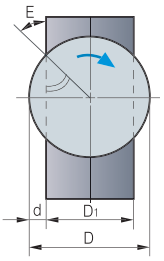
• Selection by machine rigidity

Machine horse power(PS)	10~15	15~20	Over 20
Proper cutter body specification(mm)	ø80~ø100	ø125~ø160	ø160~ø200

• Selection by machine rigidity

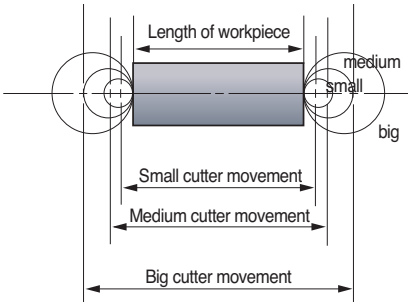
Workpiece	E	δ
Steel	+20°~10°	3 : 2
Cast iron	Under +50°	5 : 4
Light alloy	Under +40°	5 : 3

D : External diameter of cutter body
D1 : Width of workpiece
d : Projected part of cutter body
E : Engage angle
δ : Ratio of cutter body and width of workpiece(D:D1)



• Selection by machining time

The bigger size cutter the longer machining time.

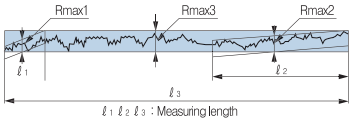
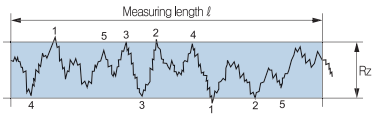
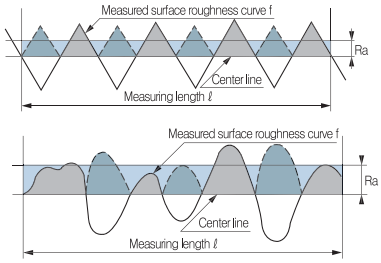


• Selection by number of tooth

Workpiece	Steel	Cast iron	Light alloy
Number of tooth	D×(1~1.5)	D×(1~4)	D×1+α

ex) D=ø100 ⇒ 4″×(1~1.5)=4~6 D is the size of cutter body converted into inch size.

Classification of surface roughness

Type	Symbol	How to calculate	Measured value
Maximum height	Rmax	• The distance between the top of profile peak line and the bottom of profile valley line on this sampled portion is measured in the longitudinal magnification direction of roughness curve (Expressed by unit: μ) • Exclude extraordinary values(too small or big) that look like grooves or mountains	
+10 point mean roughness	Rz	• Sampled from the roughness curve in the direction of its mean line, the sum of the average value of absolute value of the highest profile peaks and the depths of five deepest profile valleys measured in the vertical magnification is expressed by micro meter(μ)	
Arithmetic mean roughness	Ra	• Sampling only the reference length from the roughness curve in the direction of mean line , taking X-axis in the direction of mean line and Y-axis in the direction of longitudinal magnification of this sampled part and is expressed by micro meter(μ) • Generally, Read measured value by Ra measurer	

Finish mark		▽▽▽▽	▽▽▽	▽▽	▽	~
Surface roughness	Rmax	0.8s	6.3s	25s	100s	Unspecified
	Rz	0.8z	6.3z	25z	100z	
	Ra	0.2a	1.6a	6.3a	25a	

Trouble shooting for milling

Trouble	Causes	Solutions										
		Cutting conditions				Tool shape					Insert grade	
		Cutting speed	Depth of cut	Feed	Coolant	Rake angle	Relief angle	Approach angle	Chattering at cutting edge	Nose radius	Toughness	Hardness
Flank wear	• Improper insert grade • Improper cutting conditions • Chattering	⬇		⬆			⬆	⬇		⬆		⬆
Crater wear	• Improper cutting conditions • Improper insert grade	⬇	⬇	⬇		⬆				⬇		⬆
Chipping	• Lack of insert toughness • Excessive feed • Excessive cutting load			⬇		⬇	⬇	⬇		⬆	⬆	
Built-up edge	• Improper cutting conditions • Improper cutting edge shape • Improper insert grade	⬆	⬇	⬆		⬆				⬇		
Chattering	• Improper cutting conditions • Lack of number of cutting teeth • Improper cutting edge shape • Bad chip flow • Unstable workpiece clamping		⬇	⬇	○	⬆		⬆	⬇	⬇		
Poor surface finish	• Built-up edge • Improper cutting conditions • Chattering • Bad chip flow	⬆	⬇	⬇	○	⬆			⬇	⬆		
Thermal crack	• Improper cutting conditions • Improper insert grade	⬇	⬇	⬇	◉	⬆				⬆	⬆	
Fracture	• Improper insert grade • Excessive cutting load • Bad chip flow • Chattering • Excessive overhang		⬇	⬇	○						⬆	

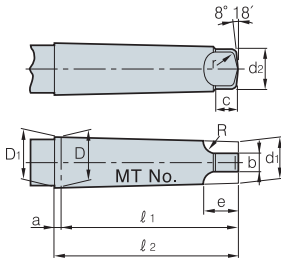
⬆ : Increase ⬇ : Decrease ○ : use ◉ : Correct use

General formulas for milling

• Machine efficiency rate (η)

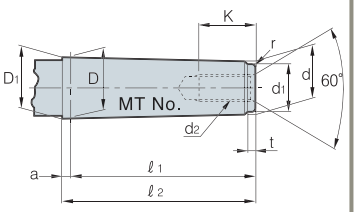
Power transmission mode	Efficiency rate (E)	Reference
Principal axis direct connection driving	0.90	
Belt driving	0.85	Double connection : 0.85 × 0.85 ≒ 0.70
Starting driving	0.75	
Oil pressure driving	0.60~0.90	

• Morse taper (Tang type)



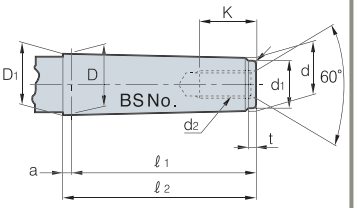
MT No.	Taper	Taper angle(α)	D	a	D1	d1	ℓ1	ℓ2	d2	b	c	e	R	r
0	1/19.212	1°29′27″	9.045	3	9.201	6.104	56.5	59.5	6.0	3.9	6.5	10.5	4	1
1	1/20.047	1°25′43″	12.065	3.5	12.240	8.972	62.0	65.5	8.7	5.2	8.5	13.5	5.	1.2
2	1/20.020	1°25′50″	17.780	5	18.030	14.034	75.0	80.0	13.5	6.3	10	16	6	1.6
3	1/19.922	1°26′16″	23.825	5	24.076	19.107	94.0	99.0	18.5	7.9	13	20	7	2
4	1/19.254	1°29′15″	31.267	6.5	31.605	25.164	117.5	124.0	24.5	11.9	16	24	8	2.5
5	1/19.002	1°30′26″	44.399	6.5	4.741	36.531	149.5	156.0	35.7	15.9	19	29	10	3
6	1/19.180	1°29′36″	63.348	8	63.765	52.399	210.0	218.0	51.0	19.0	27	40	13	4
7	1/19.231	1°29′22″	83.058	10	83.578	68.186	286.0	296.0	66.8	28.6	35	54	19	5

• Morse taper (Screw type)



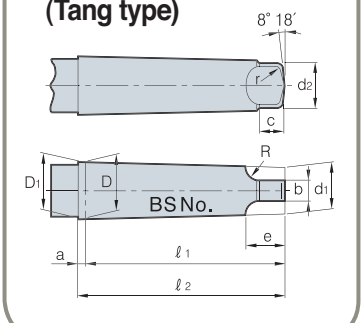
MT No.	Taper	Taper angle(α)	D	a	D1	d	ℓ1	ℓ2	d1	d2	k	t	r
0	1/19.212	1°29′27″	9.045	3	9.201	6.442	50	53	6	-		4	0.2
1	1/20.047	1°25′43″	12.065	3.5	12.230	9.396	53.5	57	9	M6	16	5	0.2
2	1/20.020	1°25′50″	17.780	5	18.030	14.583	64	69	14	M10	24	5	0.2
3	1/19.922	1°26′16″	23.825	5	24.076	19.759	81	86	19	M12	28	7	0.6
4	1/19.254	1°29′15″	31.267	6.5	31.605	25.943	02.5	109	25	M16	32	9	1
5	1/19.002	1°30′26″	44.399	6.5	4.741	37.584	129.5	136	35.7	M20	40	9	2.5
6	1/19.180	1°29′36″	63.348	8	63.765	53.859	182	190	51	M24	50	12	4
7	1/19.231	1°29′22″	83.058	10	83.578	70.058	250	260	65	M33	80	18.5	5

• Brown sharp taper (Screw type)



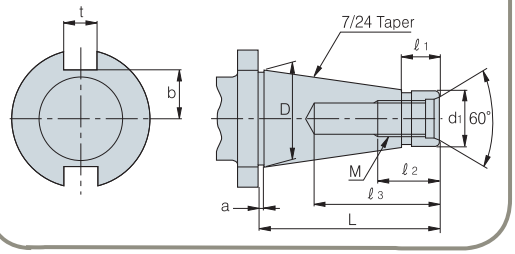
B&S No.	D	a	D1	d	d1	ℓ1	ℓ2	t	r	d2	K
4	10.221	2.4	10.321	8.890	8.0	31.0	34.2	2	0.2	-	-
5	13.286	2.4	13.386	11.430	10.0	44.4	46.8	3	0.2	-	-
6	15.229	2.4	15.330	12.700	11.0	60.0	62.7	3	0.2	M 8(1/4)	20
7	18.424	2.4	18.524	15.240	14.0	76.2	78.6	4	0.2	M10(3/8)	24
8	22.828	3.2	22.962	19.090	17.0	90.5	93.7	4	0.6	M12(1/2)	28
9	27.104	3.2	27.238	22.863	21.0	101.6	104.8	4	0.6	M12(1/2)	28
10	32.749	3.2	32.887	26.534	24.0	144.5	147.7	5	1.0	M16(5/8)	32
11	38.905	3.2	39.039	31.749	29.0	171.4	174.6	5	1.0	M16(5/8)	32
12	45.641	3.2	45.774	38.103	35.0	181.0	184.2	6	2.5	M20(3/4)	40
13	52.654	3.2	52.787	44.451	41.0	196.8	200.0	6	3.0	M20(3/4)	40
14	59.533	3.2	59.666	50.800	47.0	209.6	212.8	7	4.0	M24(1)	40
15	66.408	3.2	66.541	57.150	53.0	222.2	225.4	7	4.0	M24(1)	50
16	73.292	3.2	73.425	63.500	59.0	35.0	238.2	8	5.0	M30(11/8)	60

• Brown sharp taper (Tang type)



B&S No.	D	a	D1	d1	d2	l1	l2	b	c	e	R	r
4	10.221	2.4	10.321	8.458	8.1	42.1	44.5	5.5	8.7	14.4	7.9	1.3
5	13.286	2.4	13.386	10.962	10.7	55.6	58.0	6.3	9.5	16.2	7.9	1.5
6	15.229	2.4	15.330	12.167	11.7	73.0	75.4	7.1	11.1	18.0	7.9	1.5
7	18.424	2.4	18.524	14.675	14.2	89.7	92.1	7.9	11.9	20.3	9.5	1.8
8	22.828	3.2	22.962	18.453.	18.0	104.8	108.0	8.7	12.7	22.0	9.5	2.0
9	28.104	3.2	27.238	22.200	21.8	117.5	120.7	9.5	14.3	25.4	11.1	2.5
10	32.749	3.2	32.887	25.751	25.7	162.7	165.9	11.1	16.7	28.1	11.1	2.8
11	38.905	3.2	39.039	30.985	30.7	189.7	192.9	11.1	16.7	30.0	12.7	3.3
12	45.641	3.2	45.774	37.246	37.1	201.6	204.8	12.7	190	32.5	12.7	3.8
13	52.654	3.2	52.787	43.589	43.4	217.5	220.7	12.7	19.0	35.7	15.9	4.3
14	59.533	3.2	59.666	49.841	49.8	232.6	235.8	14.2	21.4	41.2	19.0	4.8
15	66.408	3.2	66.541	56.186	56.1	245.3	248.5	14.2	21.4	44.4	22.2	5.3
16	73.292	3.2	73.425	62.441	62.2	260.4	263.6	15.8	23.8	50.0	25.4	5.8

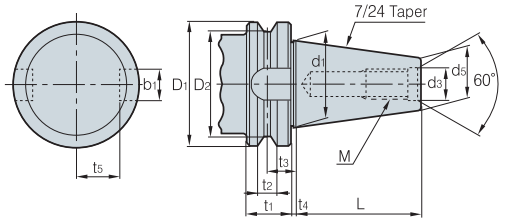
• Standard taper of American milling machine KSB4014



(mm)

NT No.	Dimensions	D	D1	L	ℓ1	M	ℓ2	ℓ3	a	t	b
30	$1\frac{1}{4}$	31.750	$17.40^{-0.29}_{-0.36}$	70	20	M12 UNC$\frac{1}{2}$″	24	50	1.6	15.9	6
40	$1\frac{3}{4}$	44.450	$25.32^{-0.30}_{-0.384}$	95	25	M16 UNC$\frac{5}{8}$″	30	60	1.6	15.9	22.5
50	$2\frac{3}{4}$	69.850	$39.60^{-0.31}_{-0.41}$	130	25	M24 UNC1″	45	90	3.2	25.4	35
60	$4\frac{1}{4}$	107.950	$60.20^{-0.34}_{-0.46}$	210	45	M30 UNC1−$\frac{1}{4}$″	56	110	3.2	25.4	60

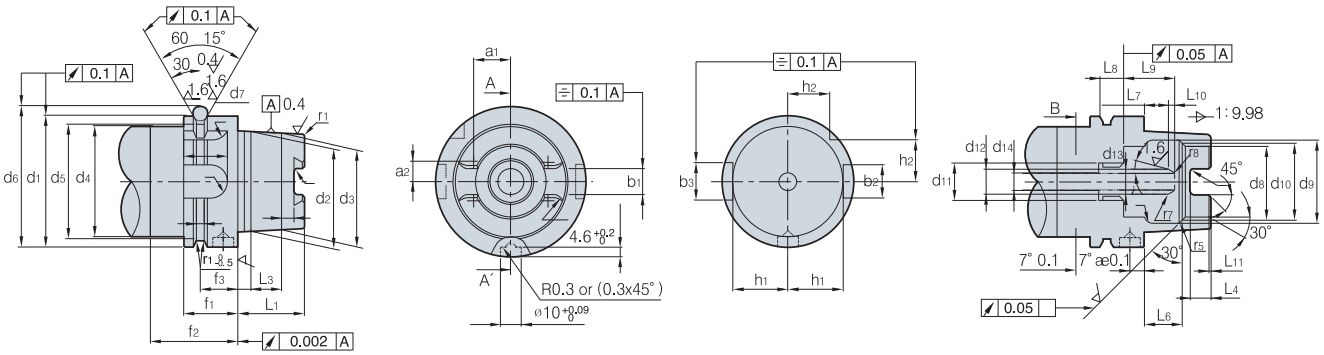
• Bottle grip taper KSB4409



(mm)

BT No.	D1	D2	t1	t2	t3	t4	d1	d3	L	M	b1	t5	d5
35	53	43	22	10	14.6	2	38.1	13	56.5	M12×1.75	16.1	19.6	21.62
40	63	52	25	10	16.6	2	44.45	17	65.4	M16×2	16.1	22.6	25.3
45	85	73	30	12	21.2	3	57.15	21	82.8	M20×25	19.3	29.1	33.1
50	100	85	35	15	23.2	3	69.85	25	101.8	M24×3	25.7	35.4	40.1
60	155	135	45	20	28.2	3	107.95	31	161.8	M30×3.5	25.7	60.1	60.7

• HSK shank (DIN 69893) KSB IS012164-1



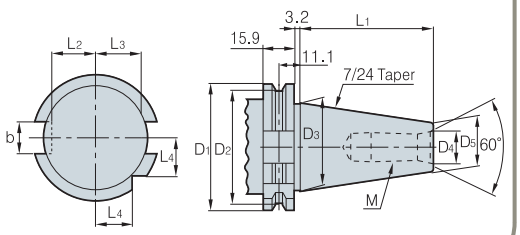
(mm)

HSK No.	b1	b2	b3	d1	d2	d3	d4	d5	d6	d7	d8	d9	d10	d11	d12	d13	d14	a1	a2
50	10.54	12	14	50	38	36.90	42	43	59.3	7	26	32	29	M16X1	10	6.8	6.8	13.997	7.648
63	12.5	16	14	63	48	46.53	53	55	72.3	7	34	40	37	M18X1	12	8	8.4	17.862	9.25
100	20	20	14	100	75	72,80	85	92	109.75	7	53	63	58	M24X1.5	16	12	12	27.329	15.00

(mm)

HSK No.	f1	f2	f3	f4	b1	b2	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	r1	r2	r3	r4	r5	r6	r7	r8
50	26	42	18	3.75	2	15.5	25	5	11	7.5	4.5	14.13	10	10	23	3	1	19	1	1.5	2.38	6	0.5	1	2	6
63	26	42	18	3.75	28.5	20	32	6.3	14.7	10	6	18.13	10	12	24.5	3	1	21	1.2	1.5	3	8	0.6	1.5	3	8
100	29	45	20	3.75	44	31.5	50	10	24	15	10	28.56	12.5	16	28	3	1.5	24	2	2	3	12	1	1.5	3	10

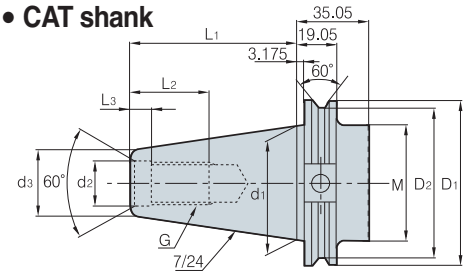
• DIN 69871DIN 69871



(mm)

Shank No	D1	D2	D3	D4	D5	L1	L2	L3	L	b	M
30	50.0	44.3	31.75	13	17.8	47.8	16.4	19.0	33.5	16.	M12×1.75
40	63.5	56.2	44.45	17	24.5	68.4	22.8	25.0	42.5	16.1	M16×2
45	82.5	57.2	57.15	21	33.0	82.7	29.1	31.3	52.5	19.3	M20×2.5
50	97.5	91.2	68.85	25	40.1	101.7	35.5	37.7	61.5	25.7	M24×3

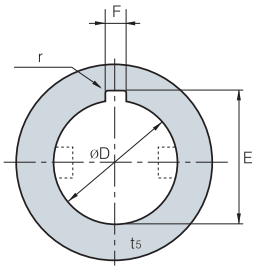
• CAT shank



(mm)

Shank No	D1	D2	M	d1	d2	d3	L1	L2	L3	G
CAT40	63.5	56.36	44.45	44.45	16.28	21.84	68.25	28.45	4.78	5/8-11
CAT45	82.55	75.41	57.15	57.15	19.46	27.69	82.55	38.1	4.78	3/4-10
CAT50	98.43	91.29	69.85	69.85	26.19	35.05	101.6	44.45	6.35	1-8

• Standard of milling cutter hole (KSB3203)



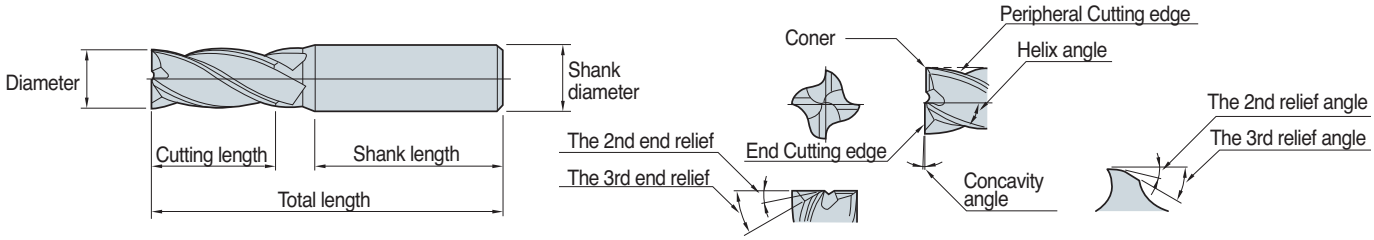
• Type A

Diameter	øDH7	E	F	r
8	$8^{+0.015}_{0}$	$8.9^{+0.25}_{0}$	$2^{+0.16}_{+0.06}$	0.4
10	$10^{+0.015}_{0}$	$11.5^{+0.25}_{0}$	$3^{+0.16}_{+0.06}$	0.4
13	$13^{+0.018}_{0}$	$14.6^{+0.25}_{0}$	$3^{+0.16}_{+0.06}$	0.6
16	$16^{+0.018}_{0}$	$17.7^{+0.25}_{0}$	$4^{+0.19}_{+0.07}$	0.6
19	$19^{+0.021}_{0}$	$21.1^{+0.25}_{0}$	$5^{+0.19}_{+0.07}$	1
22	$22^{+0.021}_{0}$	$24.1^{+0.25}_{0}$	$6^{+0.19}_{+0.07}$	1
27	$27^{+0.021}_{0}$	$29.8^{+0.25}_{0}$	$7^{+0.23}_{+0.08}$	1.2
32	$32^{+0.025}_{0}$	$34.8^{+0.25}_{0}$	$8^{+0.23}_{+0.08}$	1.2
40	$40^{+0.025}_{0}$	$43.5^{+0.3}_{0}$	$10^{+0.23}_{+0.08}$	1.2
50	$50^{+0.025}_{0}$	$53.5^{+0.3}_{0}$	$12^{+0.275}_{+0.095}$	1.6
60	$60^{+0.030}_{0}$	$64.2^{+0.3}_{0}$	$14^{+0.275}_{+0.095}$	1.6
70	$70^{+0.030}_{0}$	$75.0^{+0.3}_{0}$	$16^{+0.275}_{+0.095}$	2
80	$80^{+0.030}_{0}$	$85.5^{+0.3}_{0}$	$18^{+0.275}_{+0.095}$	2
100	$100^{+0.035}_{0}$	$107.0^{+0.3}_{0}$	$24^{+0.32}_{+0.11}$	2.5

• Type B

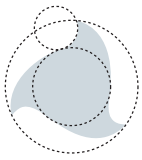
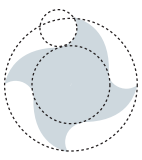
Diameter	øDH7	E	F	r
$\frac{1}{2}$	$12.70^{+0.018}_{0}$	$14.17^{+0.25}_{0}$	$2.38^{+0.31}_{+0.13}$	0.5
$\frac{5}{8}$	$15.875^{+0.018}_{0}$	$17.74^{+0.25}_{0}$	$3.18^{+0.31}_{+0.13}$	0.8
$\frac{3}{4}$	$19.050^{+0.021}_{0}$	$20.89^{+0.25}_{0}$	$3.18^{+0.31}_{+0.13}$	0.8
$\frac{7}{8}$	$22.225^{+0.021}_{0}$	$24.07^{+0.25}_{0}$	$3.18^{+0.31}_{+0.13}$	0.8
1	$25.40^{+0.021}_{0}$	$28.04^{+0.25}_{0}$	$6.35^{+0.31}_{+0.13}$	1.2
$1\frac{1}{4}$	$31.750^{+0.025}_{0}$	$35.18^{+0.25}_{0}$	$7.94^{+0.32}_{+0.14}$	1.6
$1\frac{1}{2}$	$38.10^{+0.025}_{0}$	$42.32^{+0.25}_{0}$	$9.53^{+0.89}_{+0.25}$	1.6
$1\frac{3}{4}$	$44.450^{+0.025}_{0}$	$49.48^{+0.25}_{0}$	$11.11^{+0.89}_{+0.25}$	1.6
2	$50.80^{+0.03}_{0}$	$55.83^{+0.25}_{0}$	$12.7^{+0.89}_{+0.25}$	1.6
$2\frac{1}{2}$	$63.50^{+0.03}_{0}$	$69.42^{+0.25}_{0}$	$15.81^{+0.89}_{+0.25}$	1.6
3	$76.20^{+0.03}_{0}$	$82.93^{+0.25}_{0}$	$19.05^{+0.89}_{+0.25}$	2.4
$3\frac{1}{2}$	$88.90^{+0.035}_{0}$	$98.81^{+0.25}_{0}$	$22.23^{+0.89}_{+0.25}$	2.4
4	$101.60^{+0.035}_{0}$	$111.51^{+0.25}_{0}$	$25.4^{+0.89}_{+0.25}$	2.4
$4\frac{1}{2}$	$114.30^{+0.035}_{0}$	$125.81^{+0.25}_{0}$	$25.58^{+0.89}_{+0.25}$	3.2
5	$127.0^{+0.04}_{0}$	$140.08^{+0.25}_{0}$	$31.75^{+0.89}_{+0.25}$	3.2

Endmill's shape and names



The comparison according to number of flute

• Features of number of flute

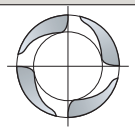
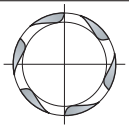
Ø10mm	2 flutes (SSE2100)	3 flutes (SSE3100)	4 flutes (SSE4100)
Shape			
Cross section	44mm^2	46mm^2	48mm^2
Ratio	56%	58%	61%
Advantages	Good chip flow	Good chip flow	High rigidity
Disadvantages	Weak rigidity	Difficult to measure external diameter	Bad chip flow
Usages	Side facing, Grooving	Side facing, Grooving	Side cutting
	Multi-functional	Medium, finishing	Finishing

• Affection of number of flute

Specification	Major features	2 flutes	4 flutes
Tool rigidity	Torsional rigidity	○	◎
	Bending rigidity	○	◎
Surface finish	Surface roughness	○	◎
	Machining precision	○	◎
Chip control	Chip clogging	◎	○
	Chip evacuation	◎	○
Grooving	Chip evacuation	◎	○
	Grooving	◎	○
Side facing	Surface finish	○	◎
	Vibration	◎	○

◎-Excellent ○-Good

The differences between general endmills and high speed endmills

General endmills		High speed endmills	
Cross section shape	Features	Cross section shape	Features
	- Applied for Low speed, High depth of cut, Low feed - Low hardness workpiece(general steel, cast iron)		- Applied for high speed, low depth of cut, high feed - Useful for hardened workpiece such as die steel

Calculations of cutting condition

• Calculations of Cutting speed

$$vc = \frac{\pi \times D \times n}{1000} \qquad n = \frac{1000 \times vc}{\pi \times D}$$

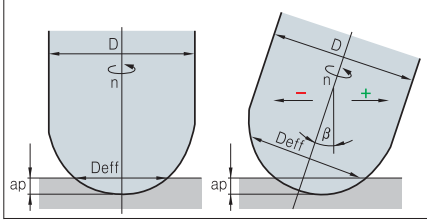
• Calculations of feed speed

$$vf = n \times fn \text{ or } n \times fz \times z$$

$$fn = \frac{vf}{n} \qquad fz = \frac{fn}{z} \text{ or } \frac{vf}{n \times z}$$

vc : Cutting speed(m/min)
π : Circular constant (3.141592)
D : Endmill diameter(mm)
n : Revolution per minute(min^{-1})
vf : Feed speed(mm/min)
fn : Feed per revolution(mm/rev)
fz : Feed per flute (mm/t)
z : Number of flute

Ball endmills cutting speed calculation formulas

Revolution per minute	$n = \frac{vc \times 1000}{D \times \pi}$
Cutting speed	$vc = \frac{D \times \pi \times n}{1000}$
Feed per tooth	$fz = \frac{vf}{z \times n}$
Feed per revolution	$fn = fz \times z$
Feed speed	$vf = fz \times z \times n$
Chip removal rate	$Q = ae \times ap \times vf$
Effective diameter of Ball Endmill 	$D_{eff} = 2 \times \sqrt{DXap - ap^2}$ Calculation Table $D_{eff} = D \times \sin\left[\beta \pm \arccos\left(\frac{D-2ap}{D}\right)\right]$

The affection of flute length

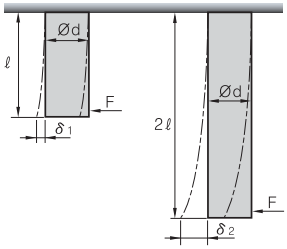
• Expression of aspect ratio

- Aspect ratio
- ℓ/d
- Ex) 3D, 15D, 22D

• Deformation rate according to length

- Deformation rate is reaction force against external force
- Proportional to the cube of length
- Set flute length and overall length as short as possible
- The more flute the better rigidity
- When flute width rate is narrower drill's rigidity is higher

$$\delta = \frac{P\ell^3}{3EI}$$



δ = Deformation volume ℓ = Length of cut I = Inertia moment ($I = \frac{\pi d^4}{64}$)

P = Cutting force E = Elasticity coefficient

- $\ell \rightarrow 2\ell$
- $\delta_1 \rightarrow \delta_1 = 8\delta_1 = \delta_2$

Spindle revolution conversion table(RPM) - external diameter

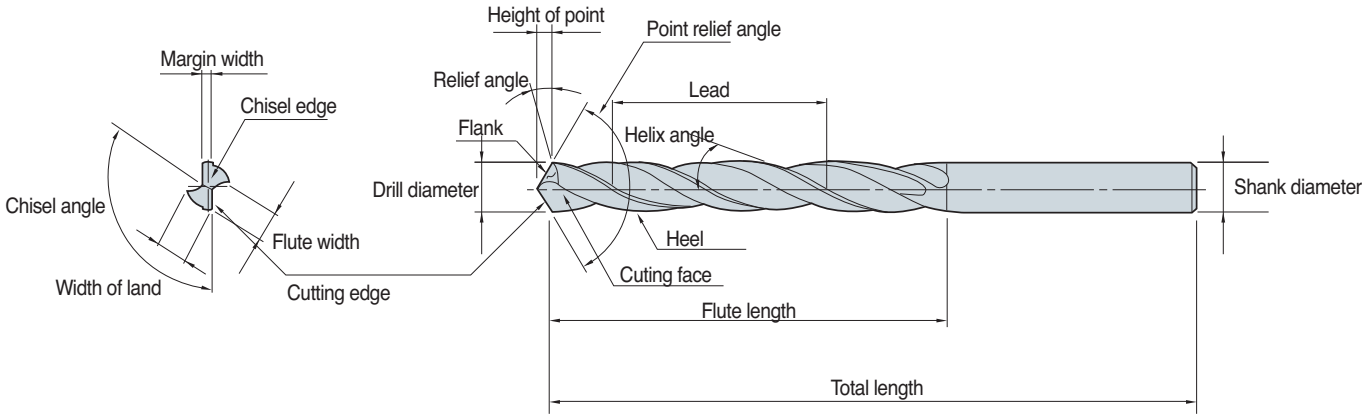
vc / External	Cutting speed (vc, m/min)															
	20	30	40	50	60	70	80	90	100	120	140	150	180	200	250	300
0.2	31,831	47,746	63,662	79,577	95,493	111,408	127,324	143,239	159,155	190,986	222,817	23,872	286,479	318,310	397,887	477,465
0.3	21,221	31,831	42,441	53,052	63,662	74,272	84,883	95,493	106,103	127,324	148,545	159,155	190,986	212,207	265,258	318,310
0.4	15,915	23,873	31,831	39,789	47,746	55,704	63,662	71,620	79,577	95,493	111,408	119,366	143,239	159,155	198,944	238,732
0.5	12,732	19,099	25,465	31,831	38,197	44,563	50,930	57,296	63,662	76,394	89,127	95,493	114,592	127,324	159,155	190,986
0.6	10,610	15,915	21,221	26,526	31,831	37,136	42,441	47,746	53,052	63,662	74,272	79,577	95,493	106,103	132,629	159,155
0.7	9,095	13,642	18,189	22,736	27,284	31,831	36,378	40,926	45,473	54,567	63,662	68,209	81,851	90,946	113,682	136,419
0.8	7,958	11,937	15,915	19,894	23,873	27,852	31,831	35,810	39,789	47,746	55,704	59,683	71,620	79,577	99,472	119,366
0.9	7,074	10,610	14,147	17,684	21,221	24,757	28,294	31,831	35,368	42,441	49,515	53,052	63,662	70,736	88,419	106,103
1	6,366	9,549	12,732	15,915	19,009	22,282	25,465	28,648	31,831	38,197	44,563	47,746	57,296	63,662	79,577	95,793
1.5	4,244	6,366	8,488	10,610	12,732	14,854	16,977	19,099	21,221	25,465	29,709	31,831	38,197	42,441	53,052	63,662
2	3,183	4,775	6,366	7,958	9,549	11,141	12,732	14,324	15,915	19,099	22,282	23,873	28,648	31,831	39,789	47,746
2.5	2,546	3,820	5,093	6,366	7,639	8,913	10,186	11,459	12,732	15,279	17,825	19,099	22,918	25,465	31,831	38,197
3	2,122	3,183	4,244	5,305	6,366	7,427	8,488	9,549	10,610	12,732	14,854	15,915	19,099	21,221	26,526	31,831
3.5	1,819	2,728	3,638	4,547	5,457	6,366	7,276	8,185	9,095	10,913	12,732	13,642	16,370	18,189	22,736	27,284
4	1,592	2,387	3,183	3,979	4,775	5,570	6,366	7,162	7,958	9,549	11,141	11,937	14,324	15,915	19,894	23,873
4.5	1,415	2,122	2,829	3,537	4,244	4,951	5,659	6,366	7,074	8,488	9,903	10,610	12,732	14,147	17,684	21,221
5	1,273	1,910	2,546	3,183	3,820	4,456	5,093	5,730	6,366	7,639	8,913	9,549	11,459	12,732	15,915	19,099
5.5	1,157	1,736	2,315	2,894	3,472	4,051	4,630	5,209	5,787	6,945	8,102	8,681	10,417	11,575	14,469	17,362
6	1,061	1,592	2,122	2,653	3,183	3,714	4,244	4,775	5,305	6,366	7,427	7,958	9,549	10,610	13,263	15,915
6.5	979	1,469	1,959	2,449	2,938	3,428	3,918	4,407	4,897	5,876	6,856	7,346	8,815	9,794	12,243	14,691
7	909	1,364	1,819	2,274	2,728	3,183	3,638	4,093	4,547	5,457	6,366	6,821	8,185	9,095	11,368	13,642
7.5	849	1,273	1,698	2,122	2,546	2,971	3,395	3,820	4,244	5,093	5,942	6,366	7,639	8,488	10,610	12,732
8	796	1,194	1,592	1,989	2,387	2,785	3,183	3,581	3,979	4,775	5,570	5,968	7,162	7,958	9,947	11,937
8.5	749	1,123	1,498	1,872	2,247	2,621	2,996	3,370	3,745	4,494	5,243	5,617	6,741	7,490	9,362	11,234
9	707	1,061	1,415	1,768	2,122	2,476	2,829	3,183	3,537	4,244	4,951	5,305	6,366	7,074	8,842	10,610
9.5	670	1,005	1,340	1,675	2,010	2,345	2,681	3,016	3,351	4,021	4,691	5,026	6,031	6,701	9,377	10,052
10	637	955	1,273	1,592	1,910	2,228	2,546	2,865	3,183	3,820	4,456	4,775	5,730	6,366	7,958	9,549
11	579	868	1,157	1,447	1,736	2,026	2,315	2,604	2,894	3,472	4,051	4,341	5,209	5,787	7,234	8,681
12	531	796	1,061	1,326	1,592	1,857	2,122	2,387	2,653	3,183	3,714	3,979	4,775	5,305	6,631	7,958
13	490	735	979	1,224	1,469	1,714	1,959	2,204	2,449	2,938	3,428	3,673	4,407	4,897	6,121	7,346
14	455	682	909	1,137	1,364	1,592	1,819	2,046	2,274	2,728	3,183	3,410	4,093	4,547	5,684	6,821
15	424	637	849	1,061	1,273	1,485	1,698	1,910	2,122	2,546	2,971	3,183	3,820	4,244	5,305	6,366
16	398	597	796	995	1,194	1,393	1,592	1,790	1,989	2,387	2,785	2,984	3,581	3,979	4,974	5,968
17	374	562	749	969	1,123	1,311	1,498	1,685	1,872	2,247	2,621	2,809	3,370	3,745	4,681	5,617
18	354	531	707	884	1,061	1,238	1,415	1,592	1,768	2,122	2,476	2,653	3,183	3,537	4,421	5,305
19	335	503	670	838	1,005	1,173	1,340	1,508	1,675	2,010	2,345	2,513	3,016	3,351	4,188	5,026
20	318	477	637	796	955	1,114	1,273	1,432	1,592	1,910	2,228	2,387	2,865	3,183	3,979	4,775
21	303	455	606	758	909	1,061	1,213	1,364	1,516	1,819	2,122	2,274	2,728	3,032	9,789	4,547
22	289	434	579	723	868	1,013	1,157	1,302	1,447	1,736	2,026	2,170	2,604	2,894	3,617	4,341
23	277	415	554	692	830	969	1,107	1,246	1,384	1,661	1,938	2,076	2,491	2,768	3,460	4,152
24	265	398	531	663	796	928	1,061	1,194	1,326	1,592	1,857	1,989	2,387	2,653	3,316	3,979
25	255	382	509	637	764	891	1,019	1,146	1,273	1,528	1,783	1,910	2,292	2,546	3,183	3,820

Tool failure and trouble shooting

Troubles		Causes	Solution																
			Cutting condition					Tool shape						Grade		etc			
			Cutting speed	Feed	Depth of cut	Coolant	Up cut ,down cut	Relief angle	Lead angle	Length of flute	Number of flute	Honing	Chip pocket	Toughness	Hardness	Machine rigidity	Machine vibration	Workpiece fixing	Overhang
Damage at cutting edge	Excessive periphery cutting edge	Improper cutting condition	⬇	⬆		◉											⬆		
	Chipping	Improper cutting condition Generating built up edge Weak tool rigidity Improper grade		⬇			⬇	⬇				◉		⬆			⬇	⬆	⬇
	Fracture during operation	Improper cutting conditions Excessive cutting load Excessive overhang		⬇	⬇					⬇			⬆			⬆		⬆	⬇
Poor surface finish		Generating built-up edge	⬆	⬆		◉			⬆			◉							
		Chattering	⬇				⬇			⬇						⬆	⬇	⬆	⬇
		Poor straightness		⬇	⬇		⬆		⬆	⬇									⬇
Poor machining precision (Machined size, Perpendicularity)		Improper cutting conditions Improper tool shape	⬆	⬇			⬇			⬇	⬆					⬆	⬇		⬇
Bad chip evacuation		Excessive cutting volume Improper chip pocket Improper cutting conditions		⬇	⬇						⬇		⬆						

⬆ : Increase ⬇ : Decrease ○ : use ◉ : Correct use

The shape of drills and the names

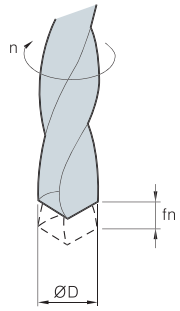


Shape and the feature of cutting

Helix angle	Plays rake angle of cutting edge's role If helix angle increases Cutting force decreases. On the other hand If helix angle is too big Drill rigidity decreases Poor machinability ◀ low - Helix angle - high ▶ Smooth chip evacuation Hard workpiece(hardened steel) ◀ low - Helix angle - high ▶ Soft material(aluminum etc)
Length of flute	The path of both chip evacuation and cooling lubricant. Too big length of flute weakens drill rigidity and too small length of flute worsens chip evacuation to breakage
Point angle	Point angle has big influence on cutting performance. It mainly depends on workpiece. In case of standard drills Point angle is generally 118 thrust resistance decrease ◀ low - Point angle - high ▶ thrust resistance increase Torque increase, Burr on exit increase ◀ low - Point angle - high ▶ Torque decrease, Burr on exit decrease Soft material(aluminum etc) ◀ low - Point angle - high ▶ Hard workpiece(hardened steel)
Margin	While machining Margin is the part of contact between workpiece and drill's external. It prevents bending and plays guide's role . It depends on drill size Cutting force decrease ◀ small - Margin - big ▶ Cutting force increase Poor guide ◀ small - Margin - big ▶ Good guide
Web thickness	Web is the part of center of drill and drill's rigidity depends on the web. Drill needs cutting edge, chisel edge, at the tip of drill because drill makes a hole at the beginning of drilling . When web thickness is big Thinning is needed to reduce cutting force Cutting force decrease ◀ small - Web thickness - big ▶ Cutting force increase Rigidity decrease ◀ small - Web thickness - big ▶ Rigidity increase Good chip evacuation ◀ small - Web thickness - big ▶ Bad chip evacuation Soft material(aluminum etc) ◀ small - Web thickness - big ▶ Hard workpiece(hardened steel)
Back taper	Drill diameter size is getting smaller from point to shank in order to avoid the friction between drill periphery and workpiece. The decrease of diameter divided by flute length 100mm generally becomes 0.04~0.1mm. As for high performance drills and drills for hole shrinkage workpiece during operation have big back taper
Thinning	In general drills Thrust effects on chisel over 50%. Chisel edge length depends on web thickness and chisel angle. But if web is thin Drill rigidity weaken. Therefore without web thickness change Thinning makes chisel edge short or gives rake angle. In other words, Thinning makes rake angle at chisel and improves chip evacuation and decrease thrust

Types of	Edge shape	Feature	Korloy's drills
X type		Good centering High central thickness Crank shaft	Mach drill(MSD) Vulcan drill(VZD)
S type		For wide use For general Easy regrinding	Solid drill(SSD)

Major cutting formulas



Cutting speed	Feed	Helix angle	Machining time
$vc = \frac{\pi \cdot D \cdot n}{1000}$ (m/min)	$fn = \frac{vf}{n}$ (mm/rev)	$\delta = \tan^{-1}\left(\frac{\pi D}{L}\right)$	$tc = \frac{ld}{n \cdot fn}$ (min)
• vc : Cutting speed (m/min) • D : Drill diameter (mm) • n : Revolution per minute (min^{-1}) • π : Circular constant (3.14)	• fn : Feed per revolution (mm/rev) • vf : Feed per minute (mm/min) • n : Revolution per minute (min^{-1})	• δ : Helix angle • D : Drill diameter (mm) • L : Lead (mm) • π : Circular constant (3.14)	• tc : Machining time (min) • n : Revolution per minute (min^{-1}) • ld : Drilling time (mm) • fn : Feed (mm/rev)

Cutting torque and thrust(calculation formulas)

$Md = KD^2 \times (0.0631 + 1.686 \times fn)(kg \cdot cm)$

$T = 57.95KDfn^{0.85}(kg)$

• Md : Cutting torque (kg · cm)
• T : Cutting thrust (kg)
• D : Drill diameter (mm)
• fn : Feed per revolution(mm/rev)
• K : Material coefficient

Workpiece material(SAE/AISI)		Tensile strength(kg/㎟)	Hardness(HB)	Material coefficient K
Cast iron	Cast iron (Gray)	21	177	1.00
	Cast iron	28	198	1.39
	Cast iron (Ductile)	35	224	1.88
General steel	1020(carbon steel C 0.2%)	55	160	2.22
	1112(C 0.12, S 0.2%)	62	183	1.42
	1335(Mn 1.75%)	63	197	1.45
Nickel Chrome steel	3115 (Ni 1.25, Cr 0.6, Mn 0.5)	53	163	1.56
	3120 (Ni 1.25, Cr 0.6, Mn 0.7)	69	174	2.02
	3140	88	241	2.32
Chrome molybdenum steel	4115 (Cr 0.5, Mo 0.11, Mn 0.8)	63	167	1.62
	4130 (Cr 0.95, Mo 0.2, Mn 0.5)	77	229	2.10
	4140 (Cr 0.95, Mo 0.2, Mn 0.85)	94	269	2.41
Nickel molybdenum steel	4615 (Ni 1.8, Mo 0.25, Mn 0.5)	75	212	2.12
	4820 (Ni 3.5, Mo 0.25, Mn 0.6)	140	390	3.44
Chrome steel	5150 (Cr 0.8, Mn 0.8)	95	277	2.46
Chrome vanadium steel	6115 (Cr 0.6, Mn 0.6, V 0.12)	58	174	2.08
	6120 (Cr 0.8, Mn 0.8, V 0.1)	80	255	2.22

Cutting torque and thrust (empirical formula)

$Md = K_1 \cdot d^2 \cdot fn^m$

$T = K_2 \cdot d \cdot fn^n$

• Md : Cutting torque (kg · ㎝)
• T : Thrust (kg)
• fn : Feed (mm/rev)
• K_1, K_2, m, n : Experimental Data Characteristic value
• d : Drill diameter (mm)

Workpiece	K_1	m	K_2	n
Soft steel	5.9	1.00	125.0	0.88
Rolled steel	3.5	1.00	55.0	0.88
7-3 brass	2.5	0.94	44.4	0.87
Aluminum	1.5	0.90	33.3	0.78
Zinc	1.4	0.88	27.0	0.74
Gun metal	2.0	0.94	21.6	0.75
Galvanized Iron	0.3	0.57	6.4	0.55

Tool failures and solutions

Trouble		Causes	Solution																	
			Cutting condition					Tool shape						Grade		etc				
			Cutting speed	Feed	Step feed	Initial feed	Coolant	Relief angle	Point angle	Thinning angle	Honing	Flute width rate	Thinning	Toughness	Hardness	Machine rigidity	Machine vibration	Guide bush	Clamping workpiece
Chipping		• Too sharp cutting edge (too big relief angle) (thinning edge is too sharp)						⬇		⬇	⬆			⬆					
		• Excessive cutting speed	⬇				○												
		• Built-up edge					○	⬇		⬇	⬆			⬆					
		• Vibration and chattering	⬇													⬆	⬇		○
Wear		• Excessive cutting speed (Abnormal wear at margin)	⬇				○												
		• Insufficient cutting speed (Abnormal wear at center)	⬆				○												
Chip		• Long chip	⬆	⬆			○				⬇								
		• Over lap	⬆	⬆															
		• Chip burning	⬆				○												
Hole precision Burr, Poor surface finish		• Tool clamping precision				⬇			⬇		⬇					⬆	⬇		○
		• Excessive feed, sharp point angle		⬇					⬆		⬇								
		• Excessive cutting speed (Considered tool grade)	⬆				○	⬇	◎						⬆				
Fracture	Breakage on contact	• Poor surface finish			○	⬇												○	
		• Insufficient machine rigidity														⬆			○
		• Improper cutting condition	⬆	⬇															
	Breakage at hole bottom	• Crooked hole	⬆						⬆				○				⬇	○	
		• Chip clogging		⬇	○							⬆							

⬆ : Increase ⬇ : Decrease ○ : use ◉ : Correct use

Hole size for threading

• Metric coarse screw threads

Specification			Hole diameter
M1	X	0.25	0.75
M1.1	X	0.25	0.85
M1.2	X	0.25	0.95
M1.4	X	0.3	1.1
M1.6	X	0.35	1.25
M1.7	X	0.35	1.35
M1.8	X	0.35	1.45
M2	X	0.4	1.6
M2.2	X	0.45	1.75
M2.3	X	0.4	1.9
M2.5	X	0.45	2.1
M2.6	X	0.45	2.2
M3	X	0.6	2.4
M3	X	0.5	2.5
M3.5	X	0.6	2.9
M4	X	0.75	3.25
M4	X	0.7	3.3
M4.5	X	0.75	3.8
M5	X	0.9	4.1
M5	X	0.8	4.2
M5.5	X	0.9	4.6
M6	X	1	5
M7	X	1	6
M8	X	1.25	6.8
M9	X	1.25	7.8
M10	X	1.5	8.5
M11	X	1.5	9.5
M12	X	1.75	10.3
M14	X	2	12
M16	X	2	14
M18	X	2.5	15.5
M20	X	2.5	17.5
M22	X	2.5	19.5
M24	X	3	21
M27	X	3	24
M30	X	3.5	26.5
M33	X	3.5	29.5
M36	X	4	32
M39	X	4	35
M42	X	4.5	37.5
M45	X	4.5	40.5
M48	X	5	43

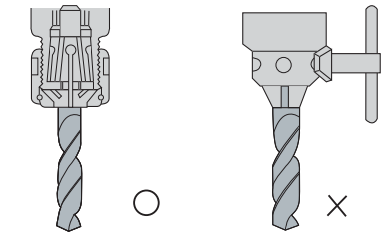
• Metric coarse screw threads

Specification			Hole diameter
M2.5	X	0.35	2.2
M3	X	0.35	2.7
M3.5	X	0.35	3.2
M4	X	0.5	3.5
M4.5	X	0.5	4
M5	X	0.5	4.5
M5.5	X	0.5	5
M6	X	0.75	5.3
M7	X	0.75	6.3
M8	X	1	7
M8	X	0.75	7.3
M9	X	1	8
M9	X	0.75	8.3
M10	X	1.25	8.8
M10	X	1	9
M10	X	0.75	9.3
M11	X	1	10
M11	X	0.75	10.3
M12	X	1.5	10.5
M12	X	1.25	10.8
M12	X	1	11
M14	X	1.5	12.5
M14	X	1	13
M15	X	1.5	13.5
M15	X	1	14
M16	X	1.5	14.5
M16	X	1	15
M17	X	1.5	15.5
M17	X	1	16
M18	X	2	16
M18	X	1.5	16.5
M18	X	1	17
M20	X	2	18
M20	X	1.5	18.5
M20	X	1	19
M22	X	2	20
M22	X	1.5	20.5
M22	X	1	21
M24	X	2	22
M24	X	1.5	22.5
M24	X	1	23
M25	X	2	23
M25	X	1.5	23.5
M25	X	1	24
M26	X	1.5	24.5
M27	X	2	25

Cautions

• Selection of drill chuck

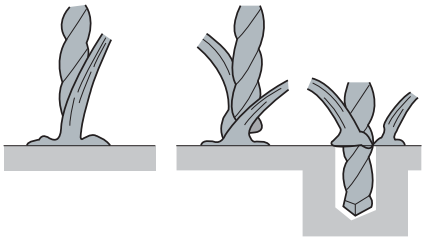
• Collect chuck is favorable Because it has strong grip power
(General drill-chuck and Keyless chuck don't have enough grip power)



• Collect chuck • General drill-chuck

• Coolant supply

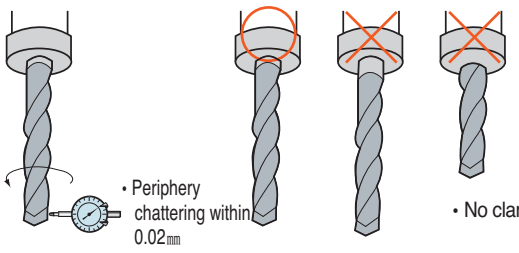
• Supply enough coolant around hole entrance
• Standard cutting oil pressure : 3~5kg/㎠, Flux : 2~5 ℓ/min



• Supply much coolant at hole entrance

• Mounting drill

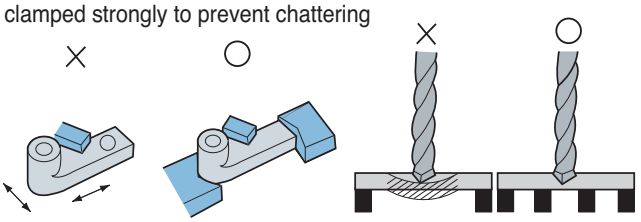
• When mounting drill Periphery chattering should be within 0.02㎜
• Flute should not be clamped



• Periphery chattering within 0.02㎜ • No clamping flute

• How to clamp workpiece

• At high performance drilling High thrust, torque and horizontal cutting force work at the same time so that workpiece should be clamped strongly to prevent chattering



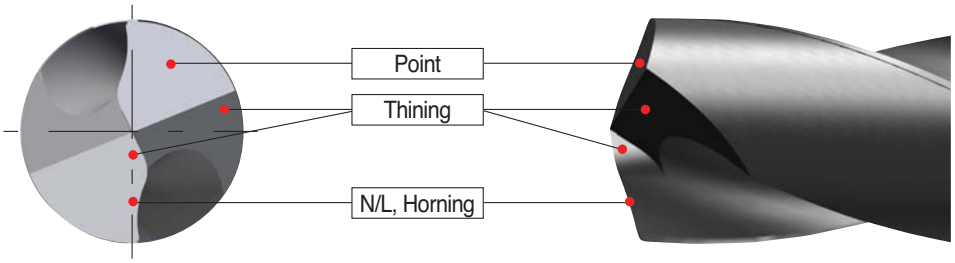
• Uniformed and strong clamping is needed (Right and left, up and down)
• Strong clamping is needed because bending causes chipping

Notice

1) For better drill's life, small damage and wear are favorable to be reground
2) Damage and wear size should be within 1.5mm for regrinding
3) If drill has crack, regrinding is impossible
4) Ordering for regrinding is acceptable or purchase regrinding machine

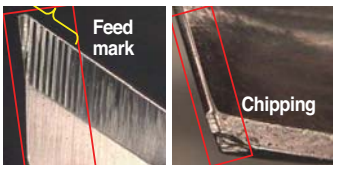
Regrinding procedures

• Regrinding mathod (MACH drill)



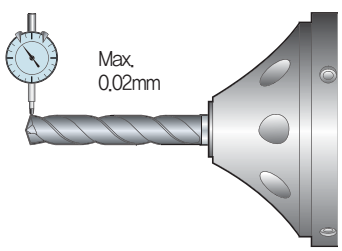
1) Preparation

- Determination of regrinding areas Check the cutting edgefor damage and wear If large fracture is found, remove it by rough grinding



2) Grinding operation

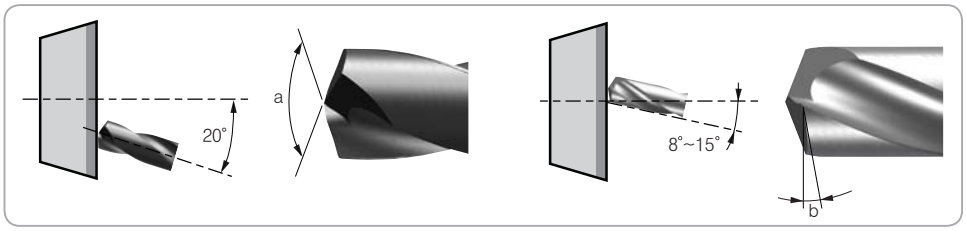
- Drills setting
Drill is clamped to collet chuck Chattering is kept within 0.02mm

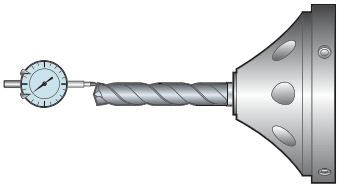


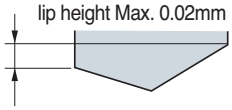
3) Grinding operation-Grinding point

- Check damage and wear at the point and remove it completely
- The difference of the lip height is kept within 0.02mm

Point angle(a) : 140˚
Point relief angle(b)t : 8˚~ 15˚



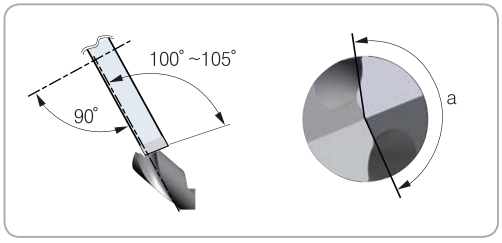


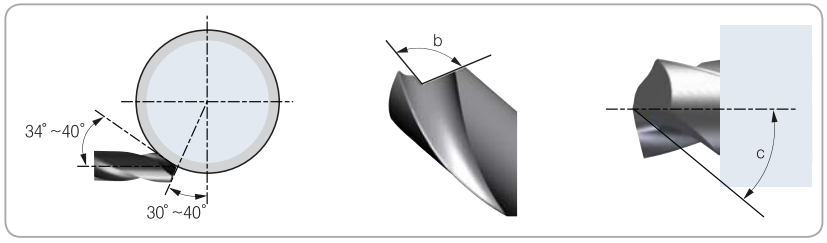


4) Grinding operation-Thinning grinding

- Considering N/L width Cutting edge length from the center of drill axis should be 0.03~0.08mm for balancing
- Set the wheel to tilt drill axis by 34˚~ 40˚

Thinning angle(a)˚ : 155˚~ 160˚/ Thining open angle(b) : 100˚~ 105˚
Thinning relief angle(c) : 34˚~ 40˚

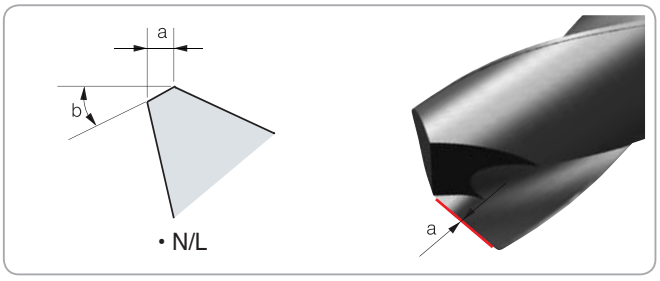




5) Grinding - N/L grinding and honing

- Using diamond chisel Grinds the width flat along point cutting edge
- After negaland operation Finishes with brush or handstone

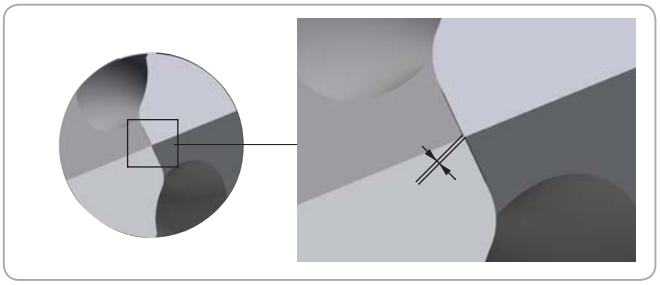
N/L width(a) : 0.05mm~0.16mm / N/L angle(b) : 24˚~26˚



• TIP

· Making point
- Without center drill, the point width should be below 0.10mm

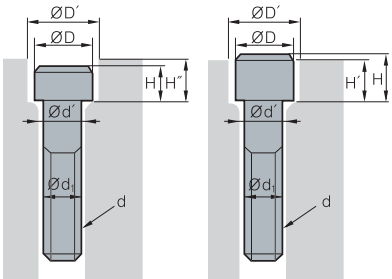
· Recommended grinding condition
- Diamond wheel : 240~400 mesh
- Diamond chisel : 400~600 mesh
- Diamond hand stone : 800~1500 mesh



Hexagonal socket bolt(Clamping screw) size

• Counter boring and size of bolt hole for hexagonal socket bolt

ISO (d)	M3	M4	M5	M6	M8	M10	M12	M14	M16	M18	M20	M22	M24	M27	M30
Ød1	3	4	5	6	8	10	12	14	16	18	20	22	24	27	30
Ød′	3.4	4.5	5.5	6.5	6	11	14	16	18	20	22	24	26	30	33
ØD	5.5	7	8.5	10	13	16	18	21	24	27	30	33	36	40	45
ØD′	5	8	9.5	11	14	17.5	20	23	26	29	32	35	39	43	48
H	3	4	5	6	8	10	12	14	16	18	20	22	24	27	30
H′	2.7	3.6	4.6	5.5	7.4	9.2	11.0	12.8	14.5	16.5	18.5	20.5	22.5	25	28
H″	3.3	4.4	5.4	6.5	8.6	10.8	13.0	15.2	17.5	19.5	21.5	23.5	25.5	29	32



The comparison of chip breakers

Application			KORLOY Main	KORLOY Sub	SMITOMO	SANDVIK	KENNA-METAL	KYOCERA	MITSU-BISHI	ISCAR	TOSHIBA	SECO	WALTER	DIJET	TAEGUTEC
NEG · TYPE	For steel	For ultra-finishing	HU	D02	FA FL	QF	FF	GP DP CF	FS FH FY	SF	TF			F1 FA	FA EA
		Finishing	VF	GF	SU LU	PF	FN FP K	CQ HQ	SA SH SY	NF	TSF TS,SS CF,ZF	MF2	NF NF5	FT UA	FG SF
		For medium to finishing	HC	VM	SX UU	SM	P	CQ HQ	SH	NF RF LF	ZM NM	MF1	NS4 NS8	GP UR PF	ML
		Medium machining	VM	GM	GU UX UG	PM QM	MN MP	GS HS CS PS	MV MA MH	TF PP	CM TM SM	M3 MR3 MF5	NM,NM4 NM5 NM7	UB GG	MP MC MT
		Roughing	HR	GR	MU MX	PR	RN	GT HT ★	GH	NR	TH CH	MR4 M5	NR5 NR7	UD	RT ★
		Heavy duty machining	GH	B40	HG MP HP	HR	RH	HX	HZ HV HH HX	TNM	TU 57 65	RR9		UC	RH HT
		For better surface finish WIPER I/S	VW LW		GUW LUW	WF,WM WR,WL	MW FW RW	WQ WP	MW SW	WG WF	AFW ASW	M3,M5	NF,NM		WS WT
	For general		B25	GR	UZ	23	MG	★	MT, MV	GN				GN	★
	Stainless steel, soft steel		HA HS GS	HC VM GR X38	SU EX (GU) MU FL	MF MM,QM MR,QM LC	FF,FW FP,MP MW,RN	GU,HU XP,XQ XS MU,MS	FS, FJ SH, MJ MS, GJ GH,FY	PP TF	TF SS SA TU MS	MF1 MF3 M5	NS4 NM4 NR7	SF	FG,ML MP,MT RH,ET EA
	For cast iron		GR	B20 B25 HR	UZ UX ★	KF KM,QM KR,QR	FF,FW MP,MW RN,UN	GC ★ ZS	★ MA GH	GN	★ 33 ★ CM	MF3 M5	NS4,NS8 ★ NM4		MT,RT ★
	For aluminum		HA				F GP MS	AH		PP					
POSI · TYPE	For steel · cast iron	For finishing	HFP		LU FP	PF KF	MT-UF MT-LF GT-LF	GP DP HQ	FV SQ	★ SM	01 PF	F1	PF5	FT	FA
		For medium to finishing (medium machining)	HMP		SJ,SU SK	(PM) (KM)	MT-LF	XQ HQ GK	SV R/L R/L-F	14,SM 17,19	PS 23 PM	F1 F2	PS4 PS5		FG
		Medium machining (Roughing)	C25	HMP	SF MU	(PR) (KR)	MT-MF	★ G	MV MQ ★	19	24 ★	F2	PM2 PM5 (PR5)		MT
	For aluminum		AR AK MA		AG	AL	HP	A3		AS	PP			ALU ACB	FL
	For stainless steel		HMP	AK	SU	MF, MM MR	LF	(XQ)	FV ★	14,SM 17,19	SS		PS4 PM5		FA FG MT
	WIPER I/S				LUW	WF WM			SW MW	WF WG					WT
	Indexable drills		DM DS,DA DF	C20 C21	S04 R06	51,53 56,58		★ SU,SP		SW,GF GG,DT		C1,P1 85,86			

★ : Simple Type ★ : Non-name

KORLOY Grade Table

Cat.	ISO	Grade	Range	Workpiece Application	Turning	Milling	Facing	Grooving	Threading	Parting	Index Drill	Solid Drill	Endmill	Coating layer
CVD	P	NC3010	P05–P15	High speed Cutting for Steel	●			●		●				TiN / Al2O3 / MT–TiCN
		NC3020	P15–P25	Medium for Steel	●			●		●				TiN / Al2O3 / MT–TiCN
		NC3120	P15–P30	Medium for Steel	●		●	●		●				Al2O3 / TiC / MT–TiCN
		NC3030	P25–P35	Roughing & Intermittent Cutting for stael	●			●		●				TiN / Al2O3 / TiC / MT–TiCN
		NC5330 (New)	P30–P40	General Cutting for Mild Steel & Forging Steel	●	●	●	●		●	●			TiN / Al2O3 / MT–TiCN
		NC500H	P25–P35	Heavy Cutting for Steel	●					●				TiN / Al2O3 / MT–TiCN
		NCM325	P20–P30	High speed milling Cutting for Steel		●			●		●			TiN / Al2O3 / MT–TiCN
		NCM335	P30–P40	Roughing & Intermittent Milling Cutting for stael High speed Cutting for castiron		●								TiN / Al2O3 / MT–TiCN
	K	NC6105 (New)	K01–K10	General Cutting for gray castiron & ductile castiron	●			●						TiN / Al2O3 / MT–TiCN
		NC6110 (New)	K05–K15	General Cutting for gray castiron & ductile castiron	●			●						Al2O3 / MT–TiCN
		NC315K	K10–K20	Low speed & intermittent Cutting for castiron	●			●						TiN / Al2O3 / MT–TiCN
		NC5330 (New)	K20–K30	General stainless Steel	●	●		●		●				TiN / Al2O3 / MT–TiCN
	M	NC9025 (New)	M25–M35	Stainless Steel	●									TiN / Al2O3 / MT–TiCN
		NC5330 (New)	M25–M35	General Steel(1st Rec.)		●	●	●		●	●			TiN / Al2O3 / MT–TiCN
		NCM325	M20–M30	High speed Milling Cutting for stainless Steel		●				●	●			TiN / Al2O3 / MT–TiCN
		NCM335	M30–M40	Roughing & Intermittent Milling Cutting for stainless stael		●								TiN / Al2O3 / MT–TiCN
	S	NC5330 (New)	S20–S30	Intermittent Cutting for Heat resistance Alloy	●		●	●		●	●			TiN / Al2O3 / MT–TiCN
PVD	P	PC230	P15–P30	Finishing, Medium Cutting for Steel		●			●		●			TiAlN
		PC3500	P25–P35	Medium, Roughing Milling Cutting (1st Rec.) for Steel		●	●	●	●		●			TiN / ★New TiAlN film
		PC5300 (New)	P30–P40	Medium, Roughing Milling Cutting for Steel	●	●	●	●	●	●				★New TiAlN film (High hardness / Oxidation resistance)
		PC3545	P30–P50	Medium, Roughing, Heavy Intermittent Milling Cutting for Steel		●								TiN / TiAlN
		PC3030T	P20–P30	Threading Cutting for Steel				●						TiAlN
		PC203F	P01–P10	High speed E/M Cutting for Steel										★New TiAlN film (High hardness / Oxidation resistance)
		PC210F	P10–P20	General & Alloy Steel, High speed Milling Cutting										★New TiAlN film (High hardness / Oxidation resistance)

KORLOY Grade Table

Cat.	ISO	Grade	Range	Workpiece Application	Turning	Milling	Facing	Grooving	Threading	Parting	Index Drill	Solid Drill	Endmill	Coating layer
PVD	P	PC220	P15–P35	General E/M Cutting for Steel									●	★New TiAlN film (High hardness / Oxidation resistance)
		PC205F	P15–P30	Drill Cutting (general)/ under φ20 for Solid Drill								●		TiAlN
		PC225F	P20–P35	Drill Cutting (general)/ over φ16 for coolant type Solid Drill								●		TiAlN
	K	PC6510	K01–K15	High speed Milling Cutting for castiron	●	●			●		●			TiN / TiAlN
		PC5300 (New)	K15–K25	Medium & Roughing Turning/Milling Cutting for castiron	●	●	●	●	●	●	●			★New TiAlN film (High hardness / Oxidation resistance)
		PC203F	K01–K10	High speed I E/M Cutting for castiron									●	★New TiAlN film (High hardness / Oxidation resistance)
		PC220	K15–K35	General E/M Cutting for castiron									●	★New TiAlN film (High hardness / Oxidation resistance)
		PC205F	K10–K20	Drill Cutting(General)/ under φ20 for Solid Drill								●		TiAlN
		PC225F	K15–K25	Drill Cutting (general)/ over φ16 for coolant type Solid Drill								●		TiAlN
		PC215K	K15–K30	Medium & Roughing Milling Cutting for castiron		●	●	●	●					TiAlN
	M	PC8110 (New)	M01–M10	Finishing to Medium Cutting for stainless Steel	●			●		●				★New TiAlN film (High hardness / Oxidation resistance)
		PC5300 (New)	M20–M35	Medium, Roughing Turning/Milling Cutting for stainless Steel	●	●	●	●	●	●	●			★New TiAlN film (High hardness / Oxidation resistance)
		PC9030	M20–M35	Medium, Roughing & Intermittent Turning Cutting for stainless Steel	●		●	●		●				TiAlN
		PC9530	M20–M35	Medium, Roughing & Intermittent Milling Cutting for stainless Steel		●					●			TiAlN
		PC3545	M30–M50	Roughing/ Heavy Inermittent Milling Cutting stainless Steel		●								TiN / TiAlN
		PC3030T	M20–M30	Threading Cutting for stainless Steel					●					TiAlN
		PC210	M15–M30	General E/M Cutting for stainless Steel									●	★New TiAlN film (High hardness / Oxidation resistance)
		PC205F	M15–M30	Drill Cutting(General)/ under φ20 for Solid Drill								●		TiAlN
		PC225F	M20–M35	Drill Cutting (general)/ over φ16 for coolant type Solid Drill								●		TiAlN
	S	PC8110 (New)	S01–S20	Medium to Finishing Turning Cutting for Heat resistant Alloy Steel	●			●		●				★New TiAlN film (High hardness / Oxidation resistance)
		PC5300 (New)	S15–S25	Medium to Roughing Turning/Milling Cutting for Heat resistant Alloy Steel	●	●	●	●	●	●	●		●	★NewTiAlN film (High hardness / Oxidation resistance)
		PC3545	S30–S50	Roughing/ Heavy Intermittent Milling Cutting for Heat resistant Alloy Steel		●								TiN / TiAlN
		PC210	S15–S30	General E/M Cutting for Heat resistant Alloy Steel									●	★New TiAlN film (High hardness / Oxidation resistance)
		PC205F	S15–S25	Drill Cutting(General)/ under φ20 for Solid Drill								●		TiAlN
		PC225F	S20–S35	Drill Cutting (general)/ over φ16 for coolant type Solid Drill								●		TiAlN

KORLOY Grade Table

Cat.	ISO	Grade	Range	Workpiece Application	Turning	Milling	Facing	Grooving	Threading	Parting	Index Drill	Solid Drill	Endmill	Coating layer
Uncoated	P	ST30A	P25–P35	General Cutting for Steel	●		●		●	●				
	K	H01	K05–K15	Finishing Cutting for castiron, Nonferrous Metal(Al. etc)	●			●			●		●	
		PC210C (New)	N10–N20	Finishing Cutting for castrion	●	●								
		G10	K15–K25	Medium Cutting for castiron	●	●		●						
	N	H01	N05–K15	Finishing Cutting for castiron, Nonferrous Metal(Al. etc)	●			●			●		●	
Cermet	P	CC105	P01–P10	High speed light Cutting for Steel (optimal precise boring)	●									★New TiAlN film (High hardness / Oxidation resistance)
		CC115	P10–P20	Medium, High speed light Cutting for Steel	●									TiN / TiAlN
		CC125	P15–P25	Medium, Roughing Milling Cutting for Steel	●									TiN / TiAlN
		CN1000 (New)	P05–P15	Highspeed Cutting for Steel(Sintered Metal Cutting)	●									
		CN20	P15–P25	General Turning/Milling Cutting for Steel	●	●		●	●	●				
		CN2000	P10–P20	Medium, Roughing Turning/ Milling Cutting for Steel	●			●		●				
		CN30	P20–P30	Roughing Milling Cutting for Steel	●									
	K	CN1000	K05–K10	High speed Cutting for Castiron	●									
cBN	H	DBNX10	H01–H10	High speed continuous Cutting for Heat treatment steel	●									
		DBNX20	H05–H15	High Efficiency Cutting for Heat treatment steel	●									
		DBN210	H10–H20	High speed continuous/light intermittent Cutting for Heat treatment steel	●									
		DBNX25	H15–H25	High speed intermittent Cutting for Heat treatment steel	●									
		DBN250	H15–H25	Continuous, intermittent Cutting for Heat treatment steel	●									
		DBN350	H25–H35	Intermittent Cutting for Heat treatment steel(Heavy intermittent)	●									
	K	DBN500	K01–K10	High Hardness cutting for castiron	●									
		DBN700	K05–K15	High speed cutting for castiron	●	●								
PVD	N	DP90	N01–N10	Cemented carbide, Ceramic roughing, High Si–Al alloy, Rock, Stone	●									
		DP150	N05–N15	High Si–Al alloy, copper Alloy, Rubber, Wood, Carbon	●									
		DP200	N10–N20	Plastic, Wood, Al precise finishing Cutting	●									
DLC	N	PD1000	N01–N20	Nonferrous(Al. etc) Turing cutting	●									DLC
		PD2000	N01–N20	Nonferrous(Al. etc) Milling cutting		●								DLC
		PD3000	N01–N20	Nonferrous(Al. etc) E/M cutting									●	DLC
Diamond Coating	N	ND1000	N01–N20	Nonferrous(graphite, Al, Bronze) Turning cutting	●									Dia Coating
		ND2000	N01–N20	Nonferrous(graphite, Al, Bronze) Milling cutting		●								
		ND3000 (New)	N01–N20	Nonferrous(graphite, Al, Bronze) E/M cutting									●	

The comparison of grade for turning

WC

ISO		KORLOY	SUMITOMO	KYOCERA	ISCAR	SANDVIK	SECO	KENNAMETAL	TOSHIBA	MITSUBISHI	HITACHI	VALENITE	WALTER	TAECUTEC	NTK	DIJET
Turning	P	ST50E ST10 ST15 ST20 MA2 ST30 ST30A ST30N ST40	 ST10P ST20E A30 ST40E	 PW30	 IC50M IC54	 S1P SM30 S30T S6	 TTX TTM TTR	 K45 KM K420	 TX10S TX20 TX30 TX40	 STi10T STi20T UTi20T	SRN5 WS20B EX35 EX40 EX45	S1F VC6 VC5 VC56	 	 P10 P20 P30 P40	 	
	M	U10 U20 U40	U10E U2 A30 A40	 	 	 H13A H10F	AT10 AT15 TTR	K2885 K2S	TU10 TU20 TU40	UTi20T	WAM10B EX35	 VC27 VC28	 	M10 M20 M40	 	
	K	H02 H01 H05 H10 G10	H1 G10E	 KW10H	IC4 IC20 IC28	H1P H10F	THM THR	K68 K8735	TH03 TH10 KS20	HTi10T HTi20T	WH05 W10 WH20	VC3 VC2 VC1	 	K10 K20 K20M K30	 	

CVD COATED

ISO		KORLOY	SUMITOMO	KYOCERA	ISCAR	SANDVIK	SECO	KENNAMETAL	TOSHIBA	MITSUBISHI	HITACHI	VALENITE	WALTER	TAECUTEC	NTK	DIJET
Turning	P	NC3010★ NC3020 NC3120 NC3030 NC5330★ NC500H	AC700G AC820P AC830P	CA5505 CA5515 CA5525 CA5535	IC8150 IC8250 IC8350	GC4205 GC4215 GC4225 GC4235	TP1000 TP1500 TP2500 TP3000	KCP05 KCP10 KU30T KCP25 KCP40	T9005 T9015 T9025 T9035	UE6105 UE6110 UE6020 UE6035	HG8010 HG8025	VP5515 VP5525 VP5535	WPP01 WPP05 WPP10 WPP20 WPP30	TT8115 TT3500 TT5100 TT7100	CP5	JC110V JC215V JC325V JC450
	M	NC9020 NC9025★	AC610M AC630M	CA6515 CA6525	IC9025	GC2015 GC2025	TM2000 TM4000	KCM15 KCM25 KCM35	T6030	US7020 US735	GM25 GX30	VP8515 VP8525	WAM20 WAM30	TT5100		JC5003 JC110V JC5015
	K	NC6105★ NC6110★ NC315K	AC410K AC300G AC700G	CA4110 CA4115 CA4120 CA4125 CR7015	IC5005 IC5010 IC428 IC9150	GC3205 GC3210 GC3215	TK1000 TK2000	KCK05 KCK15 KCK20	T5105 T5115 T5125	UC5105 UC5115	HG3305 HG3315 GM8015 GM8020	VP1505 VP1510 VP5515	WAK10 WAK20	TT7310 TT1300	CP2 CP5	JC105V JC110V JC215V

PVD COATED

ISO		KORLOY	SUMITOMO	KYOCERA	ISCAR	SANDVIK	SECO	KENNAMETAL	TOSHIBA	MITSUBISHI	HITACHI	VALENITE	WALTER	TAECUTEC	NTK	DIJET
Turning	P	PC230 PC3535 PC5300★ PC3545	 	 PR1005 PR915 PR1115 PR930 PR1025 PR630 PR660	IC507 IC808★ IC830★ IC908 IC3028 IC330★	 GC1025 GC4125	 CP200 CP250 CP500	 KU10T KU25T	AH710 GH730 AH330 AH740 AH120 GH330	 VP15TF VP20MF	 IP2000 IP3000	VC907 VC927 VC905	 WTA43 WTA41	 TT5030	 	 JC5003 JC5015
	M	PC8110★ PC5300★ PC9030	AC510U EH510Z AC520U EH520Z AC530U★	PR915 PR930 PR1125 PR630 PR660	IC808★ IC907 IC3028 IC830★ IC330★	GC1005 GC1105★ GC1020 GC1025 GC4125	CP200 CP250 CP500	KC5010 KC5510★ KC5025 KC5525	AH330 GH330 AH120 GH730 AH140	VP05RT VP10RT VP15TF VP20MF	IP50S★ IP100S★	VC929 VC927 VC902 VC901 VC905	 	 TT5030	ZM3 QM3 VM1 TAS	 JC5003 JC5015
	K	PC5300★	EH510Z EH520Z	 	IC5100★ IC810★ IC220 IC908 IC228	 	 CP200 CP250 CP500	 	 AH110 GH110 AH120	 	 CY110H 	VC929 VC903 VC927 VC902 VC901 VC907	 	 TT5030	 	
	S	PC8110★ PC5300★	AC510U AC520U	PR915 PC660	IC808★ IC907 IC3028	 GC1105 GC1025	TS2000★ CP500 TS2500★	 KC5010 KC5025	 AH110 AH120	 VP05RT VP10RT VP15TF	 	 	 	 TT5030	 	

CERMET

ISO		KORLOY	SUMITOMO	KYOCERA	ISCAR	SANDVIK	SECO	KENNAMETAL	TOSHIBA	MITSUBISHI	HITACHI	VALENITE	WALTER	TAECUTEC	NTK	DIJET
Turning	P	CN1000 CC115★ CN2000 CN20	T110A T2000Z★ T1200A T3000Z★	PV30★ TN30 PV60★ TN60 TN6020 TN90	 IC20N IC520N IC30N IC530N	 CT5015 CT525 GC1525★	CM C15M	 HT2 KT125 HT5 KT175 KT195M	 NS520 GT530★ NC530 NC540 NC730	 NX2525 NX3035 UP35N★ AP25N★ NX335	 CH350 CZ25★ CH530 CH550 CH570	 VC83	 WTA43★ WTA41★	PV3010★ CT3000	 T3N T15 N20 C30 N40	 LN10 CX50 CX75 CX90 CX99
	M		T1200A							NX2525						LN10 CX75 CX99
	K	CN1000	T110A T1200A							NX2525				CT3000	 T15	LN10 CX75

★ : PVD Coating cermet ★ : New Grade

The comparison of grade for milling

CVD COATED

ISO		KORLOY	SUMITOMO	KYOCERA	ISCAR	SANDVIK	SECO	KENNAMETAL	TOSHIBA	MITSUBISHI	HITACHI	VALENITE	WALTER	TAECUTEC	NTK	DIJET
Milling	P	NC5330★ NCM325 NCM335	ACP100		IC520M IC635	GC4220 GC4230 GC4240	T20M T250M T350M		T325 T3030	F7030		SM245	WQM15 WKP25 WQM25 WKP35 WQM35	TT7800	QM3	
	M	NC5330★ MCM325 NCM335				GC2040	MH1000 MP2500						WQM25 WTP35 WXP45			
	K	NC5330★	ACK100 ACK200		IC4050	GC3220	MK1500 MK3000	KC992M	T1015	F5010		V01 VN8	WAK15 WKP25 WKP35			

PVD COATED

ISO		KORLOY	SUMITOMO	KYOCERA	ISCAR	SANDVIK	SECO	KENNAMETAL	TOSHIBA	MITSUBISHI	HITACHI	VALENITE	WALTER	TAECUTEC	NTK	DIJET
Milling	P	PC210F PC3500 PC3525 PC3535 PC5300★ PC3545	ACZ310 ACP200 ACZ330 ACP300 ACZ350	PR730 PR830 PR630 PR660	IC903 IC908 IC950 IC1008 IC928	GC1010 GC1025 GC1030 GC1030	MP3000★ F25M F30M F40M T60M	KC522M KUC20M KC525M KUC30M KC935M KC7140 KC720	GH330 AH120	AP20M GP20M VP15TF UP20M VP30RT	ATH80D PCA08M ACS05E PCA12M PC20M JX1005 TB6005 JX1020 CY9020 TB6045 CY250 PTH30E PTH40H	VC935		TT7070 TT7080 TT7030 TT8020		JC5003 JC5015 JC5030 JC5040
	M	PC5300★ PC9530 PC3545	ACP200 ACP300 ACZ350	PR730 PR1025 PR630 PR660	IC903 IC900 IC250 IC928 IC328	GC1125 GC1025 GC2030 GC1030	F25M F30M F40M	KC5510 KC7020 KC522M KC725M KC735M KC7030 KC722	AH120 AH140		JX1020 CY9020 JX1015 TB6020 CY250 JX1045 TB6045 JX1060 TB6060	VC928 VC902 VC901	WQM35 WSP45	TT9030 TT9080 TT8020		JC5003 JC5015 JC5030 JC5040
	K	PC8110★ PC6510 PC5300★		PR510 PR905	DT7150 IC900 IC910 IC950 IC350			KC510M KC915M KC520M	AH120	VP10MF VP15TF VP20RT		VC903 VC928 VC902 VC901		TT6290 TT6030 TT6060		JC5003 JC5015
	S	PC5300★	AC520U	PC660	IC328	GC1025	TS2500	KC510M		VP15TF	ACS05E			TT9030		

CERMET

ISO		KORLOY	SUMITOMO	KYOCERA	ISCAR	SANDVIK	SECO	KENNAMETAL	TOSHIBA	MITSUBISHI	HITACHI	VALENITE	WALTER	TAECUTEC	NTK	DIJET
Milling	P	CN20 CN30	T250A	TN100M TC60M	IC30N			KT195M	NS540 NS740	NX2525 NX4545	CH550 CH570			CT3000 CT5000	C50	
	M		T250A			CT530										
	K									NX2525						

★ : PVD Coating cermet ★ : New Grade



▲ Head Office



▲ CheongJu Factory



▲ R & D Institute



▲ JinCheon Factory
(Reception B/D)



▲ Jincheon Factory
(Alloy B/D)



▲ Jincheon Factory
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