

HOW TO READ THE STANDARD OF ROTATING TOOL INSERTS

●How the section of milling inserts is organised

- ①Organised according to cutter type.
- ②Cutters are arranged in alphabetical order.

●How the standards for milling inserts are organised

- ①Classified into milling inserts, wiper inserts and drilling inserts.
- ②Arranged alphabetically by order number.

PAGE TITLE

PRODUCT SECTION

ROTATING TOOL INSERTS

CLASSIFICATION

Cutter Type	Order Number	Page	Cutter Type	Order Number	Page	Cutter Type	Order Number	Page
AXH400S AXH40W	NMMU20060ZEN-MK	J024	APX3000	ACMT123604PEER-M 123604PEER-M 123610PEER-M 123616PEER-M 123620PEER-M 123624PEER-M 123630PEER-M 123632PEER-M	J020	ASX400	SOET12308PEER-JL 12T308PEER-JM SOM12T308PEER-JM 12T308PEER-JH	J030
	NMMU20060ZEN-HK	J024						
	NMMU20070ZEN-MP	J024		ACMT123604PEER-H 123608PEER-H 123616PEER-H	J020			J030
	WNMU20060ZENC-MK	J040	APX4000	ACMT184040PEER-M 184000PEER-M 184010PEER-M 184012PEER-M 184016PEER-M 184020PEER-M	J020		SOM12T320PEER-FT WOEW12T308PEERC 12T308PETRC	J030
	NNMU120071ZER-MM	J024						
	WNMU20072ZENC-WP	J040		ACMT184040PEER-H 184008PEER-H 184020PEER-H 184040PEER-H 184048PEER-H	J020	ASX445	SEGT133AGFN-JP SEGT133AGEN-JL	J041
ALX PMC	JDMT06T116Z2SR-JM 080120Z2SR-JM JDMT09T130Z2DGR-JM 120420Z2DGR-JM 140032Z2DGR-JM JDMW06T116Z2SR-FT 080130Z2SR-FT JDMW09T130Z2DGR-FT 120430Z2DGR-FT 140032Z2DGR-FT JDMT14032Z2DGR-ST 140320Z2DGR-ST	J022 J022 J022 J022 J022	AXQ	QOGT0830R-01 1030R-01 1342R-01 1651R-01 1856R-01 2062R-01 2870R-01 QOMT07630R-M2 1030R-M2 1342R-M2 1651R-M2 1856R-M2 2062R-M2 2870R-M2	J025 J025 J025		SEM13T3AGSN-JM SEM13T3AGSN-JP SEM13T3AGSN-JL SEM13T3AGSN-FT	J029 J029 J029 J029
APX200W	AOGT123604PEER-GM 123604PEER-GM 123608PEER-GM	J020	ASX400	SOGT12308PEER-FJ	J030			

ROTATING TOOLS

ROTATING TOOL INSERTS

● GRADES

● SINTERED CBN / PCD

IDENTIFICATION.....	J002
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MILLING APPLICATION RANGE	J005
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CERMET	J010
CEMENTED CARBIDE	J011
CBN (SINTERED CBN).....	J012
PCD (SINTERED DIAMOND)	J013
CLASSIFICATION	J014

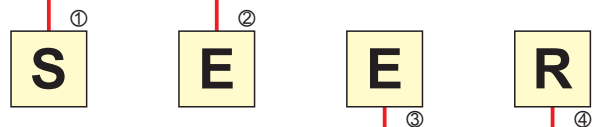
STANDARD MILLING INSERTS

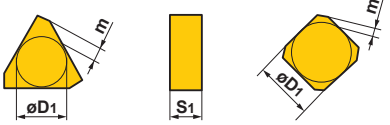
ROTATING INSERTS	J020
WIPER INSERTS	J040
CBN AND PCD.....	J042
CBN AND PCD WITH WIPER.....	J043

IDENTIFICATION

Symbol	Insert Shape	
O	Octagonal	
S	Square	
T	Triangular	
C	Rhombic 80°	
M	Rhombic 86°	
A	Parallelogram 85°	
R	Round	
X	Special Design	—
W	Wiper	—
①Insert Shape		

Symbol	Normal Clearance	
C	7°	
D	15°	
E	20°	
F	25°	
G	30°	
N	0°	
P	11°	
O	Other	
X	Other	
②Normal Clearance		



③Tolerance Class				
				
Symbol	D.I.C	D1	m	S1
C	6.35 9.525	±0.025	±0.013	±0.025
E	12.70 15.875	±0.025	±0.025	±0.025
K*	6.35	±0.05	±0.013	±0.025
	9.525	±0.05	±0.013	±0.025
	12.70	±0.08	±0.013	±0.025
	15.875	±0.08	±0.013	±0.025
M*	6.35	±0.05	±0.08	±0.13
	9.525	±0.05	±0.08	±0.13
	12.70	±0.08	±0.13	±0.13
	15.875	±0.1	±0.15	±0.13

The surface of insert with * mark is sintered.

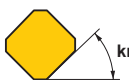
④Fixing and/or for Chip Breaker				
Symbol	Hole	Hole Configuration	Chip Breaker	Figure
W	With Hole	Cylindrical Hole	No	
T	With Hole	+ One Countersink (40°—60°)	One sided	
B	With Hole	Cylindrical Hole + One Countersink (70°—90°)	No	
N	Without Hole	—	No	
R	Without Hole	—	One sided	
X	—	—	—	Special Design

Symbol				Diameter of Inscribed Circle (mm)
				
	06	06	11	6.35
	08	07	13	7.94
	09	09	16	9.525
10				10.00
12				12.00
	12	12	22	12.70
	16	15	27	15.875
20				20.00
⑤Insert Size				

	
Symbol	Insert Thickness (mm)
03	3.18
T3	3.97
04	4.76
⑥Insert Thickness	

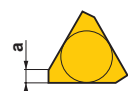
Symbol	Honing
E	 Round
F	 Sharp
T	 Chamfer
S	 Chamfer+Hone
X	 Round (small)
Z	 Chamfer (Strong Cutting Edge Type)
⑨Cutting Edge Condition	

⑤ 12 ⑥ 03 A ⑦ F ⑧ E ⑨ R ⑩ 1 - JS ⑪

⑦Cutting Edge Angle	
	
Symbol	Cutting Edge Angle
A	45°
E	75°
P	90°
Z	Other Angle

⑧Clearance of Wiper Insert	
	
Symbol	Clearance Angle
D	15°
E	20°
F	25°
G	30°
P	0°
N	11°

⑩Cutting Direction	
Symbol	Direction
L	Left
N	Neutral
R	Right

⑪Width of Wiper Edge	
	
Symbol	a
1	1.4 (1.94 only for TEKN)
2	2.4

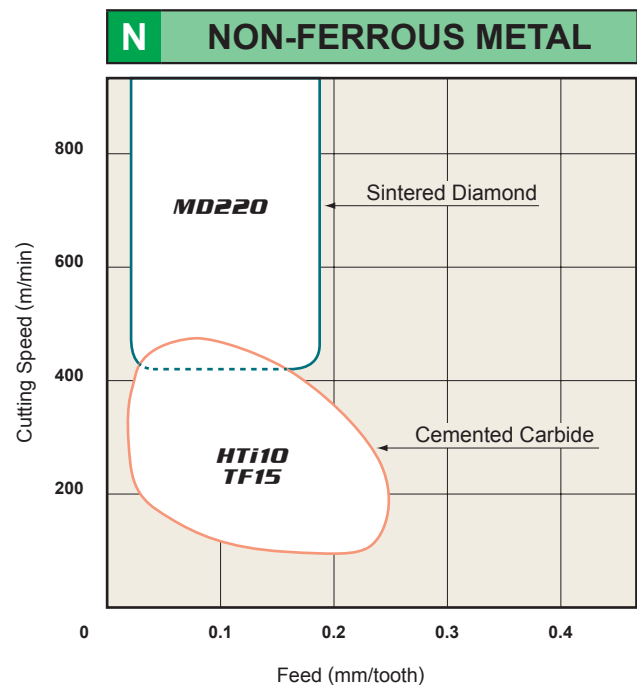
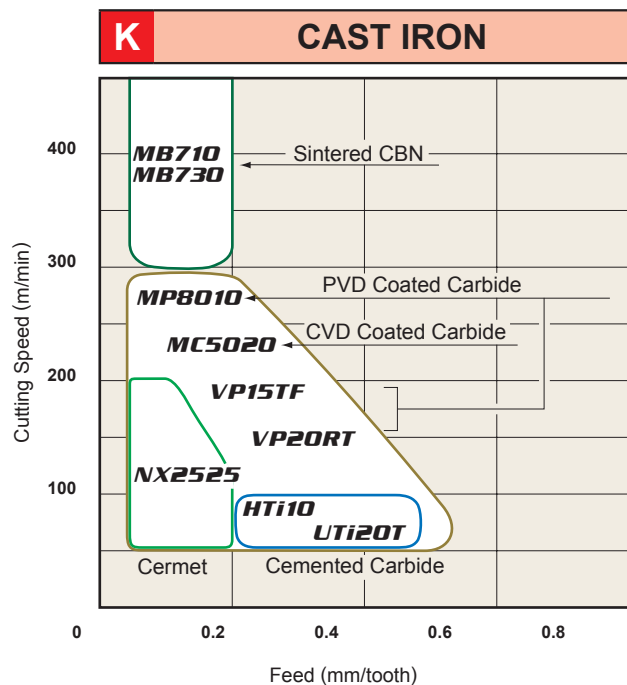
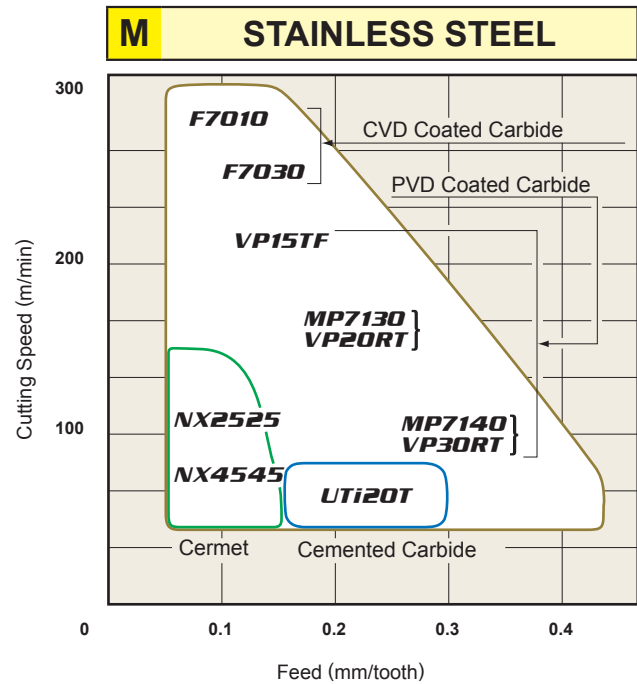
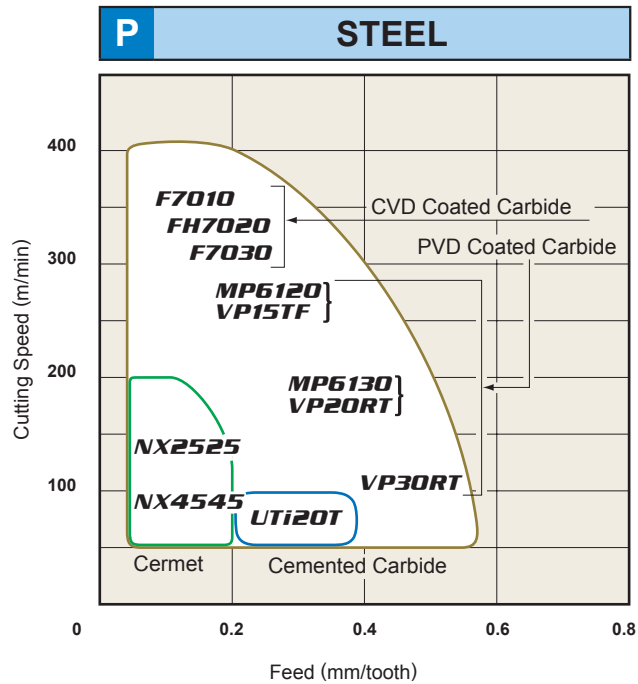
⑫Chip Breaker	
Symbol	Name
JS	JS Breaker
JH	JH Breaker
JL	JL Breaker
JM	JM Breaker
FT	FT Breaker
JP	JP Breaker

GRADES FOR MILLING

INDEXABLE INSERT GRADES FOR MILLING

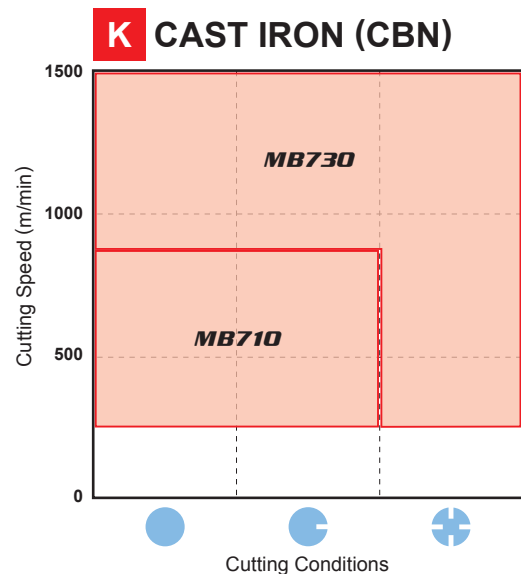
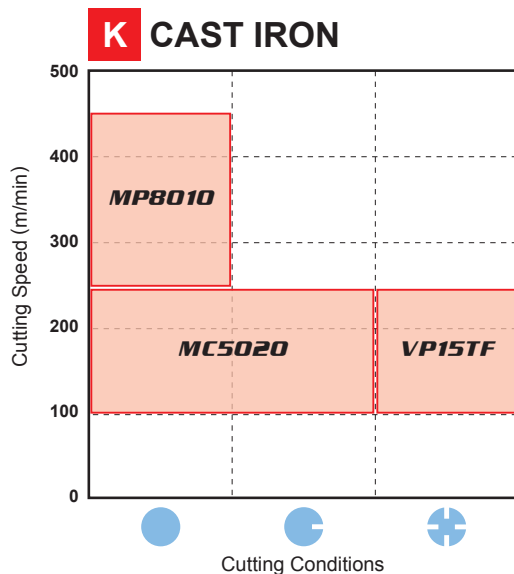
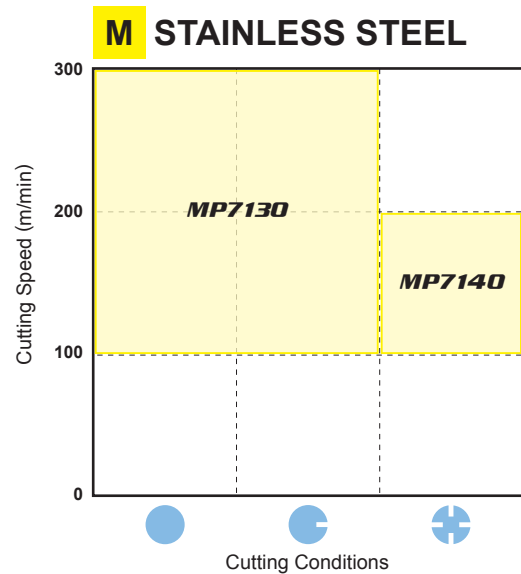
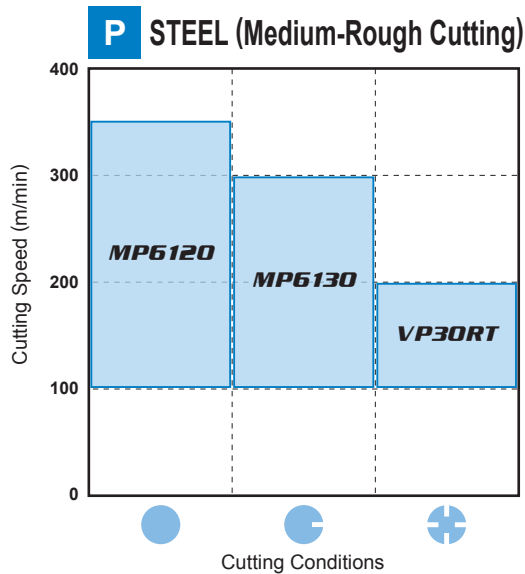
ISO	Coated Carbide		Cermet	Cemented Carbide	CBN (Sintered CBN)	PCD (Sintered Diamond)
	CVD	PVD				
P Steel	P01	F7010				
	P10	F7020	NX2525			
	P20	F7030	NX4545	UTi20T		
	P30	MP6120 NEW VP15TF NEW MP6130				
	P40	LP20M VP20RT VP30RT				
M Stainless Steel	M01	F7010				
	M10	F7030	NX2525			
	M20	VP15TF NEW MP7130	NX4545	UTi20T		
	M30	MP7030 LP20M VP20RT NEW MP7140				
	M40	VP30RT				
K Cast Iron	K01	MC5020		HTi05T	MB710 MB730	
	K10	MP8010	NX2525	HTi10		
	K20	VP15TF		UTi20T		
	K30	VP20RT				
N Non-Ferrous Metal	N01					MD205 MD220 MD230
	N10			HTi10		
	N20	LC15TF		TF15		
	N30					
S Heat Resistant Alloy • Ti Alloy	S01				MB730	
	S10	MP9120 NEW VP15TF NEW MP9130				
	S20	MP9030				
	S30					
H Hardened Materials	H01	MP8010				
	H10	VP15TF				
	H20					
	H30					

MILLING APPLICATION RANGE



MILLING APPLICATION RANGE

● Recommendation of the insert grade based on cutting speed and conditions for each workpiece material.



CUTTING CONDITIONS



Stable Cutting

Plane Cutting
Constant Depth of Cut
Pre-Machined
Securely Clamped Component Cutting

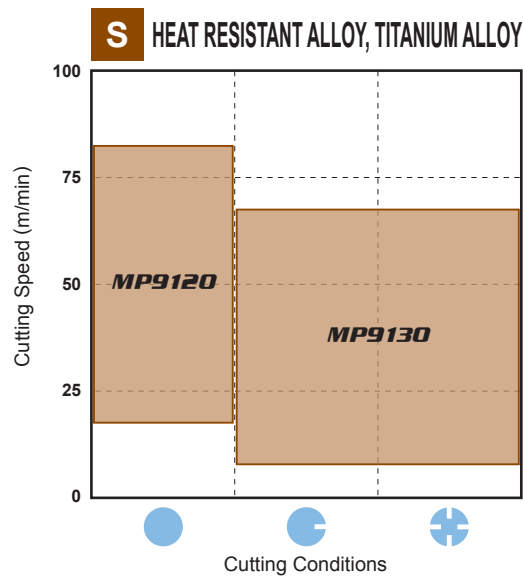
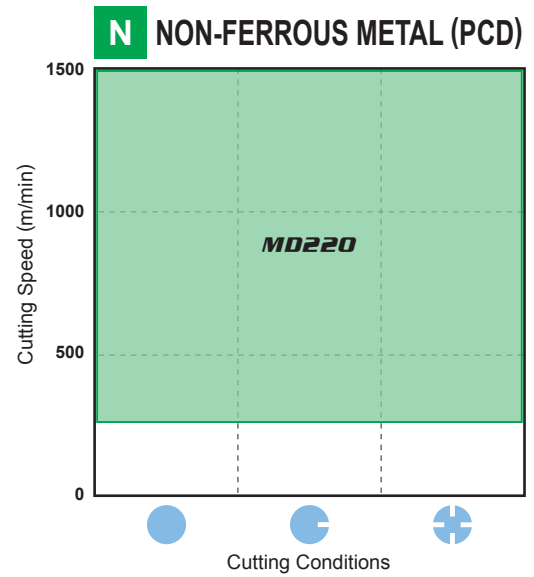
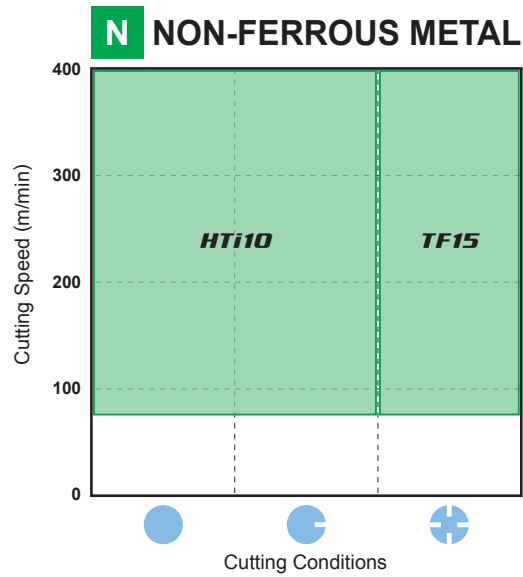


General Cutting



Unstable Cutting

Heavy Interrupted Cutting
Irregular Depth of Cut
Low Clamping Rigidity Cutting



COATED CARBIDE (CVD&PVD)

<CVD>

- Special tough fibrous structure improves wear and fracture resistance.
- It covers a wide application range and reduces the number of tools required.

<PVD>

- PVD coating prolongs tool life when compared to cemented carbide under the same cutting conditions.
- Coating of tools with sharp edges is possible without softening or changing the quality of the substrate.

SELECTION STANDARD

MILLING

Work Material	Recommended Grade	Recommended Cutting Speed (m/min)	ISO	Application Range
P Steel	F7030	200 (150 – 250)	P10	
	MP6120	150 (100 – 200)	P20	
	MP6130	150 (100 – 200)	P30	
	VP15TF	150 (100 – 200)	P40	
M Stainless Steel	F7030	200 (150 – 250)	M10	
	MP7030	150 (100 – 200)	M20	
	MP7130	150 (100 – 200)	M30	
	MP7140	150 (100 – 200)	M40	
	VP15TF	150 (100 – 200)	M40	
K Cast Iron	MC5020	180 (100 – 250)	K01	
	VP15TF	150 (100 – 200)	K10	
			K20	
			K30	
N Aluminium Alloy	LC15TF	1000 (200 – 3000)	N10	
			N20	
			N30	
S Heat Resistant Alloy Ti Alloy	MP9120	30 (20 – 40)	S01	
	VP15TF	30 (20 – 40)	S10	
	MP9130	40 (25 – 60)	S20	
	MP9030	40 (25 – 60)	S30	
H Hardened Materials	MP8010	80 (50 – 120)	H01	
			H10	
	VP15TF	80 (50 – 120)	H20	
			H30	



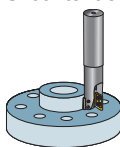
GRADE CHARACTERISTICS

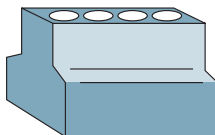
Grade	Substrate		Coating Layer	
	Hardness (HRA)	T.R.S (GPa)	Composition	Thickness
MC5020	91.0	2.2	TiCN-Al ₂ O ₃ -Ti Compound	Thick
FH7020	88.8	2.8	TiCN-Al ₂ O ₃ -Ti Compound	Thick
F7030	88.8	2.8	TiCN-Al ₂ O ₃ -TiN	Thin
MP6120	91.5	2.5	(Al,Ti,Cr)N	Thin
MP6130	90.5	2.5	(Al,Ti,Cr)N	Thin
MP7030	90.5	2.5	(Al,Ti)N-Ti Compound	Thin
MP7130	90.5	2.5	(Al,Ti,Cr)N	Thin
MP7140	88.8	2.8	(Al,Ti,Cr)N	Thin

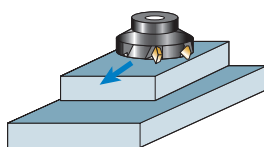
Grade	Substrate		Coating Layer	
	Hardness (HRA)	T.R.S (GPa)	Composition	Thickness
MP8010	93.5	2.3	(Al,Ti,Si)N	Thin
MP9120	91.5	2.5	(Al,Ti,Cr)N	Thin
MP9030	90.5	2.5	(Al,Ti)N-Ti Compound	Thin
MP9130	90.5	2.7	(Al,Ti,Cr)N	Thin
VP15TF	91.5	2.5	(Al,Ti)N	Thin
VP20RT	90.5	2.5	(Al,Ti)N	Thin
VP30RT	88.8	2.8	(Al,Ti)N	Thin
UP20M	90.5	2.0	TiN	Thin

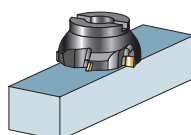
*1GPa=102kg/mm²

APPLICATION EXAMPLES

Tool		AXD4000R252SA25SA
Insert (Grade)		XDGX175008PDER-GM (MP9120)
Workpiece		JIS AC4A: Si content 8-10%  NEW
Cutting Conditions	Spindle speed (min ⁻¹)	8790
	Cutting Speed (m/min)	690
	Feed per Tooth (mm/tooth)	0.46
	Depth of Cut (mm)	2.5
	Width of Cut (mm)	25
Coolant		External coolant
Machine Type		Vertical
Results		Aluminium alloy containing Si tends to cause tool damage, but the MP9120 inserts gave double the tool life compared to conventional grades.

Tool		AHX640WR16016F
Insert (Grade)		NNMU200608ZEN-MK (MC5020)
Workpiece		DIN GG25 (scaled) 
Component		Cylinder block
Cutting Conditions	Cutting Speed (m/min)	155
	Feed per Tooth (mm/rev)	0.32
	Depth of Cut (mm)	3 – 5
	Coolant	Dry cutting
Results		MC5020 showed 3 times longer tool life than the competitor's grade without chipping occurring.

Cutter Body		ASX445R12508E
Insert (Grade)		SEMT13T3AGSN-JM (MP6120)
Workpiece		JIS SCM440H  NEW
Component		Machine parts
Cutting Conditions	Cutting Speed (m/min)	250
	Feed (mm/tooth)	0.1-0.2
	Depth of Cut (mm)	2.0-5.0
	Coolant	Dry cutting
Results		MP6120 shows only a small amount of wear thereby achieving 1.5 times longer tool life compared to conventional cutters.

Cutter Body		ASX400-050A04R
Insert (Grade)		SOMT12T308PEER-JM (MP7130)
Workpiece		JIS SUS316  NEW
Component		Structural component
Cutting Conditions	Cutting Speed (m/min)	88
	Feed (mm/tooth)	0.1
	Axial depth of cut (mm)	≤2
	Radial depth of cut (mm)	—
Coolant		Wet cutting
Results		MP7130 can continue machining without fracture.

CERMET

- NX2525 for high speed milling.
- NX4545 for general milling.

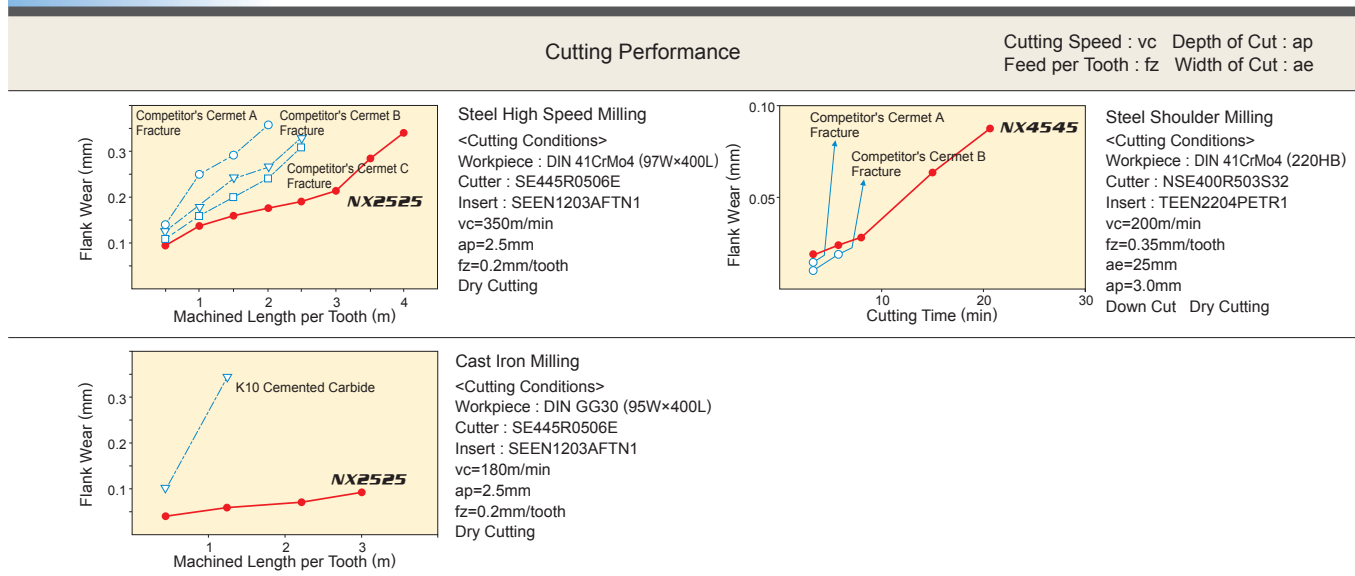
SELECTION STANDARD

Milling

Work Material	Recommended Grade	Recommended Cutting Speed (m/min)	ISO	Application Range
P Steel	NX2525	250 (150 — 350)	P10 M10	NX2525 NX4545
	NX4545	150 (120 — 180)	P20 M20	
			P30 M30	
K Cast Iron	NX2525	200 (150 — 300)	K01	NX2525
			K10	
			K20	

(Note) For wet cutting of steel, please use coated carbide F7030. For wet cutting of cast iron, please use coated carbide MC5020.

CUTTING PERFORMANCE



GRADE CHARACTERISTICS

Grade	Substrate			
	Hardness (HRA)	T.R.S. (GPa)	Thermal Conductivity (W/m·K) *	Thermal Expansion (x 10 ⁻⁶ /K)
NX2525	92.2	2.0	33	7.8
NX4545	90.0	2.2	33	7.8

*1GPa=102kg/mm², 1W/m · K=2.39×10⁻³cal/cm · sec · °C

CEMENTED CARBIDE

- The grades available are UTi20T for steel and cast iron, and HTi10 for cast iron, non-ferrous metal and non-metal.

SELECTION STANDARD

MILLING

Work Material	Recommended Grade	Recommended Cutting Speed (m/min)	ISO	Application Range
P Steel	UTi20T	120 (50 – 180)	P10	
			P20	
			P30	
M Stainless Steel	UTi20T	120 (50 – 180)	M10	
			M20	
			M30	
K Cast Iron	HTi10	100 (50 – 150)	K10	
	UTi20T	120 (50 – 180)	K20	
			K30	
N Non-Ferrous Metal	HTi10 TF15	400 (300 – 500)	N01	
			N10	
			N20	
			N30	

MAIN COMPONENT AND APPLICATION

P series for steel cutting, K series for cast iron cutting and M series for general cutting.

ISO	Main Component	Characteristics	Work Material
P M	WC-TiC-TaC-Co	Heat / Deformation resistance.	Carbon steel, Alloy steel, Stainless steel and Cast iron
K N	WC-Co	High rigidity and wear resistance.	Cast iron, Non-Ferrous metals and Non-metal

GRADE CHARACTERISTICS

ISO	Grade	Hardness (HRA)	Thermal Conductivity (W/m·K) *	Thermal Expansion (x10 ⁻⁶ /K)	Young's Modulus (GPa) *	T.R.S (GPa) *
P M	UTi20T	90.5	38	5.5	520	2.0
K N	HTi05T	92.5	79	4.5	600	1.5
	HTi10	92.0	79	4.6	630	2.0
N	TF15	91.5	71	5.3	580	2.5

*1GPa=102kg/mm², 1W/m • K=2.39×10⁻³cal/cm • sec • °C

CBN (SINTERED CBN)



- MB710 and MB730 for cast iron finishing.
- BC5030 for high speed machining of cast iron.
- The combination of the BC5030 insert geometry and the AOX cutter allows the use of up to 16 corners per insert, enabling cost effective high efficiency machining.

SELECTION STANDARD / RECOMMENDED CUTTING CONDITIONS

FINISHING

Work Material		Structure	Cutting Speed (m/min)					Feed (mm/tooth)	Depth of Cut (mm)	Coolant
			250	500	750	1000	1250			
Grey Cast Iron	DIN GG25	Ferritic + Pearlitic	MB710 MB730					—0.3	—0.5	Dry
	DIN GG30	Pearlitic								

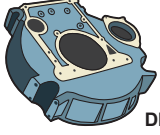
ROUGHING

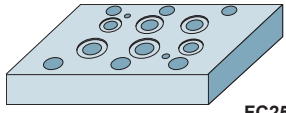
Work Material		Structure	Cutting Speed (m/min)					Feed (mm/tooth)	Depth of Cut (mm)	Coolant
			250	500	1000	1500	2000			
Grey Cast Iron	DIN GG25	Pearlitic			BC5030			—0.15	—3.0	Dry

FEATURES AND BASE

Grade	Application	Features	Main Component	Coating Layer
MB710	For General Cutting	General purpose grade with well balanced wear and fracture resistance.	CBN TiC Al ₂ O ₃	—
MB730	For High Speed Cutting	Has the largest CBN content and therefore displays good thermal conductivity. It is suitable for the high temperatures that are generated in high speed cutting.	CBN (High Content) Co Base Alloy	—
BC5030	For high-speed machining at large depths of cut High-speed interrupted machining at large depths of cut	High CBN content and high thermal conductivity. The whole insert is composed of sintered CBN. This enables high speed, high efficiency machining at larger depths of cut. The coating also ensures easy recognition of used corners.	CBN AlN	TiN

APPLICATION EXAMPLES

Tool		AOX445R10008D
Insert		SL-ONEN120404ASN (BC5030)
Machine		Machining Centre
Workpiece		 DIN GG25
Cutting Condition	Cutting Speed (m/min)	1200
	Depth of Cut (mm)	2.8
	Width of Cut (mm)	70
	Table Feed (mm/min)	3057
	Feed per Tooth (mm/tooth)	0.1
Result		10 times longer tool life and 4 times higher efficiency than ceramics. Excellent machining with a surface finish of Ra < 1.6µm

Tool		NF10000R0408D (MB730)
Workpiece		 FC250
Component		Hydraulic component
Cutting Condition	Cutting Speed (m/min)	1800
	Feed (mm/tooth)	0.1
	Table Feed (mm/min)	4584
	Depth of Cut (mm)	0.05
	Cutting Width (mm)	90
Coolant		Dry cutting (Wet cut at previous process)
Axial Runout (mm)		Below 0.005mm
Result		Compared to the competitor item, wear was reduced offering longer tool life while maintaining higher surface finishes.

PCD (SINTERED DIAMOND)

- Suitable for cutting non-ferrous metals such as aluminium alloy.
- Suitable for extremely high speed finishing.

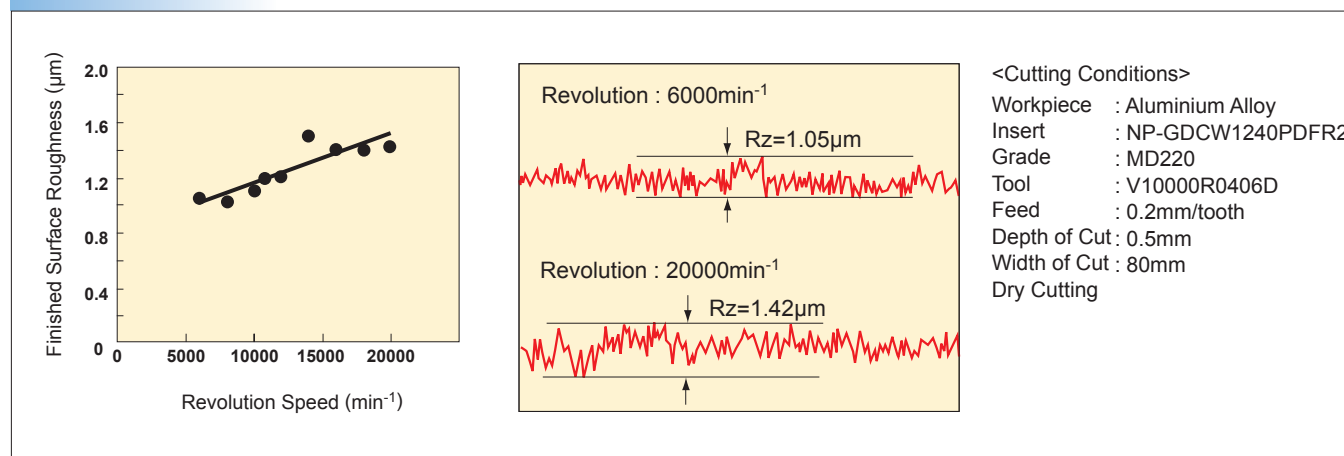
GRADE FEATURES

Grade	Features
MD220	Excellent in the balance between wear resistance and fracture resistance. For a wide range of tooling applications.

RECOMMENDED CUTTING CONDITIONS

Work Material	Cutting Speed (m/min)	Grade	Feed per Tooth (mm/tooth)	Depth of Cut (mm)
Aluminium Alloy (Si ≤12%)	1000—6000	MD220	—0.3	—0.5
Aluminium Alloy (Si ≥13%)	200—800			

CUTTING PERFORMANCE



CLASSIFICATION

Cutter Type	Order Number	Page	Cutter Type	Order Number	Page	Cutter Type	Order Number	Page
AHX640S AHX640W	NNMU200608ZEN-MK	J024	APX3000	AOMT123602PEER-M	J020	ASX400	SOET12T308PEER-JL	J030
				123604PEER-M				
	NNMU200608ZEN-HK	J024		123608PEER-M			SOMT12T308PEER-JM	J030
				123610PEER-M			12T308PEEL-JM	
	NNMU200708ZEN-MP	J024		123612PEER-M				
				123616PEER-M			SOMT12T308PEER-JH	J030
	WNEU2006ZEN7C-WK	J040		123620PEER-M				
			APX4000	AOMT123604PEER-H	J020		SOMT12T320PEER-FT	J030
	NNMU200712ZER-MM	J024		123624PEER-M				
				123630PEER-M			WOEW12T308PEER8C	J041
	WNEU2007ZEN7C-WP	J040		123632PEER-M			12T308PETR8C	
AJX PMC	JOMT06T215ZZSR-JM	J022		AOMT184804PEER-H	J020	ASX445	SEGT13T3AGFN-JP	J028
	080320ZZSR-JM			184808PEER-H				
	JDMT09T320ZDSR-JM	J022		184810PEER-M			SEET13T3AGEN-JL	J029
	120420ZDSR-JM			184812PEER-M				
	140520ZDSR-JM			184816PEER-M				
	JOMW06T215ZZSR-FT	J022		184820PEER-M			SEMT13T3AGSN-JM	J029
	080320ZZSR-FT			AOMT184804PEER-H	J020			
	JDMW09T320ZDSR-FT	J022		184808PEER-H				
	120420ZDSR-FT			184816PEER-H			SEMT13T3AGSN-JH	J029
	140520ZDSR-FT			184832PEER-H				
	JDMT120420ZDSR-ST	J022		184840PEER-H			SEMT13T3AGSN-FT	J029
	140520ZDSR-ST			184850PEER-H				
				184864PEER-H				
APX3000	AOGT123602PEFR-GM	J020	ASX400	SOGT12T308PEFR-JP	J030			
	123604PEFR-GM							
	123608PEFR-GM							

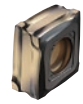
Cutter Type	Order Number	Page	Cutter Type	Order Number	Page	Cutter Type	Order Number	Page
ASX445 	WEEW13T3AGFR3C	J043	BAE 	AEMW150304ER	J021	BF407 	WFC42ZFER2	J043
	13T3AGTR3C			150308ER				
	WEEW13T3AGER8C	J040	BAP300 SRM2 	APGT1135PDFR-G2	J021	BN425 	SNMF43B2G	J029
	13T3AGTR8C							
AXD4000 	XDGX175004PDFR-GL	J037		APMT1135PDER-M0	J021	BRP 	RPMT08T2M0E-JS	J026
	175008PDFR-GL			1135PDER-M1			10T3M0E-JS	
	175012PDFR-GL	J037		1135PDER-M2	J021		1204M0E-JS	J027
	175016PDFR-GL						1606M0E-JS	
	175020PDFR-GL	J037		APMT1135PDER-H1	J021		RPMW08T2M0E	J027
	175024PDFR-GL			1135PDER-H2			08T2M0T	
	175030PDFR-GL	J037		1135PDER-H3	J021		10T3M0E	
	175032PDFR-GL			1135PDER-H4			10T3M0T	
	175040PDFR-GL	J037		1135PDER-H6	J021		1204M0E	J032
	175050PDFR-GL						1204M0T	
	XDGX175004PDER-GM	J037	BAP400 SRM2 	APGT1604PDFR-G2	J021	BSP 	SPMB1204APT	J032
	175008PDER-GM							
	175012PDER-GM	J037		APMT1604PDER-M2	J021			
	175016PDER-GM							
	175020PDER-GM	J037		APMT1604PDER-H1	J021		XDGT1550PDER-G04	J037
	175024PDER-GM			1604PDER-H2			1550PDER-G08	
	175030PDER-GM	J038		1604PDER-H4	J029		1550PDER-G12	
	175032PDER-GM			1604PDER-H6			1550PDER-G16	
	175040PDER-GM	J038		1604PDER-H8	J042		1550PDER-G20	J037
	175050PDER-GM						1550PDER-G30	
AXD7000 	XDGX227008PDFR-GL	J038		SFAN1203ZFFR2	J043		1550PDER-G32	J037
	227016PDFR-GL			1203ZFFL2			1550PDER-G40	
	227020PDFR-GL	J038		SFCN1203ZFFR2	J043		1550PDER-G50	J037
	227030PDFR-GL			NP-WFC42ZFER2				
	227032PDFR-GL	J038			J043		1550PDER-G04	J037
	227040PDFR-GL						1550PDER-G08	
	227050PDFR-GL	J038			J043		1550PDER-G12	J037
							1550PDER-G16	

CLASSIFICATION

Cutter Type	Order Number	Page	Cutter Type	Order Number	Page	Cutter Type	Order Number	Page
BXD4000	XDGT1550PDFR-GL04	J037	FBP415	SPER1203EEER-JS	J031	NSE300	TECN1603PEFR1W	J035
	1550PDFR-GL08						1603PEER1W	
							1603PETR1W	
CBJP CBMP TAB	JPMT060204-E	J023		WPC42EEER10C	J041		TEEN1603PEFR1	J035
				42EEEL10C			1603PEER1	
							1603PETR1	
							1603PESR1	
							1603PEZR1	
MPMT070308	090308	J023	FP490	SPEN424A	J031		TEER1603PEER-JS	J035
	120408							
CESP CFSP CGSP	SPMW090304	J032	FP590	SPEN535A	J031		TECN1603PEFR1	J042
	090308							
	120304							
	120308							
DCCC	CCMX083508EN-A	J022	LSE445	SECN1203AFTN1	J027	NSE400	TECN2204PEFR1	J036
	09T308EN-A			SEEN1203AFFN1			2204PEER1	
				1203AFEN1			2204PETR1	
				1203AFTN1			TEEN2204PEFR1	
				1203AFTN3			2204PEER1	
				1203AFSN1			2204PETR1	
				1203AFSN3			2204PESR1	
							2204PEZR1	
							TEKN2204PEER1	
							2204PETR1	
							2204PESR1	
							2204PETR	
ZCMX083508ER-A	09T308ER-A	J039		SEER1203AFEN-JS	J027		TEER2204PEER-JS	J035
ZCMX09T308ER-B		J039		SECN1203AFFR1	J042			J042
FBP415	SPEN1203EEER1	J031		WEC42AFTR5C	J040		TECN2204PEFR1	J042
	1203EEEL1							
	SPNN1203EEER1							

Cutter Type	Order Number	Page	Cutter Type	Order Number	Page	Cutter Type	Order Number	Page
OCTACUT 	OEMX12T3ETR1	J024	SE415 	SEER1203EFER-JS	J028	SPX 	JPMX140412-JM	J023
	12T3ESR1						190412-JM	
	1705ETR1							
	1705ESR1							
	OEMX12T3EER1-JS	J024		SECN1203EFFR1	J042		JPMX140412-WH	J023
	1705EER1-JS						190412-WH	
	1705ETR1-JS							
	REMX1705SN	J026		WEC42EFER5C	J040		MPMX120412-JM	J023
				42EFTR5C				
	REMX12T3EN-JS	J026	SE515 	SECN1504EFTR1	J028		MPMX120412-WH	J023
	1705EN-JS			SEEN1504EFER1				
				1504EFTR1				
				1504EFTL1				
PMF 		J036		1504EFSR1	J040		SPMX120408-JM	J032
				WEC53EFTR5C				
	TPEW1303ZPER2	J042	SE545 	SEEN1504AFEN1	J027		SPMX120408-WH	J032
				1504AFTN1				
				1504AFTN3				
				1504AFSN1				
PMR 	TPEW1303ZPTR2	J022		1504AFZN1	J028		SRBT10	J033
				SEER1504AFEN-JS			12	
	CPMT1205ZPEN-M2						16	
	1205ZPEN-M3						20	
SE415 	1906ZPEN-M2	J028		WEC53AFER5C	J040		25	J033
	1906ZPEN-M3			53AFTR5C			30	
							32	
SG20 	SEEN1203EFFR1	J026	RGEN2004M0EN		J026		SRFT10	
	1203EFER1			2004M0SN			12	
	1203EFTR1						16	
	1203EFTR3						20	
	1203EFSR1						25	
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							32	

CLASSIFICATION

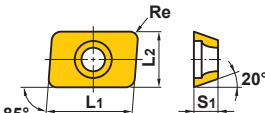
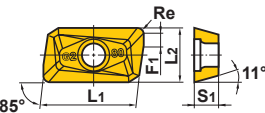
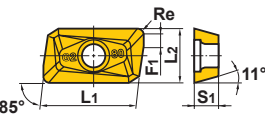
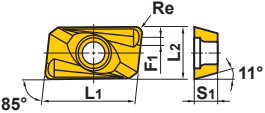
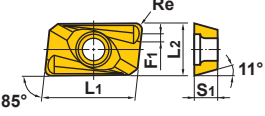
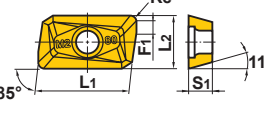
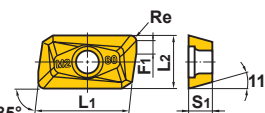
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SRM2 	SRG16C	J033	SRM2 $\phi 40$ $\phi 50$ 	APMT1135PDER-H2	J021	VFX5 	XNMU160708R-MS	J038			
	20C			1604PDER-H2			160712R-MS				
	25C						160716R-MS				
	30C						160724R-MS				
	32C						160732R-MS				
							160740R-MS				
		SRG16E	J033	SUF 	SUFT10R05	J034		XNMU160708R-HS	J038		
		20E			10R10						
		25E			10R20						
		30E			12R05						
	SRM16C-M	J034	12R10						J038		
	20C-M		12R20								
	25C-M		12R30								
	30C-M		16R05								
32C-M	16R10										
	SRM16E-M	J034	16R15				VFX6 	XNMU190912R-MS	J038		
	20E-M		16R20		190916R-MS						
	25E-M		16R30		190924R-MS						
	30E-M		20R05		190932R-MS						
32E-M	20R10		190940R-MS								
	APMT1135PDER-M2	J021	20R15					190950R-MS	J038		
	1604PDER-M2		20R20		XNMU190912R-HS						
			20R30								
			25R05								
	25R10										
	APMT1135PDER-H2	J021	25R20						J038		
	1604PDER-H2		25R30								
			30R05								
			30R10								
	30R20										
SRM2 $\phi 40$ $\phi 50$ 	SRG40C	J033	TBE1 		30R30		J032	VOX400 	SONX1206PER	J030	
	50C				32R05						
					32R10						
					32R20						
		SRG40E		J033	SPMT120408-A	J032				J041	
		50E									
		APMT1135PDER-M2		J021	TSMP 	MPMW070308		J023	VIPER 	TPNX1605N	J036
		1604PDER-M2				090308					
						120408					

Cutter Type	Order Number	Page	Cutter Type	Order Number	Page	Cutter Type	Order Number	Page			
Corner Angle 0° 11° Positive 	TPEN1603PPR	J036	11° Positive 	SPGN120304	J031	RRD 	RDZX0501M0E	J026			
	1603PPN			120308			07T1M0E				
	2204PDR			120312			0702M0E				
	2204PDL			150404			1003M0E				
	150408	1003M0S									
	SPMN120304	12T3M0E									
	120304T	12T3M0S									
Corner Angle 15° 11° Positive 	TPNN2204PDR	J036		11° Positive 		120308	J036		1604M0E	J026	
						120312			1604M0S		
						120408					
						120412					
	150408										
	150412										
Corner Angle 45° 15° Positive 	SPEN1203EDR	J032	RRD 		TPMN160304	J025					
	1203EDL				160308						
	SPKN1203EDR				160312						
	SPEN1504EDR				220404						
Corner Angle 45° 20° Positive 	1504EDL	J032			RRD 			220408	J025		
								220408T			
				220412							
Corner Angle 45° 15° Positive 	SDEN1203AEN	J027		RRD 			RDHX0501M0E	J025			
							0501M0S				
							07T1M0E				
							07T1M0S				
Corner Angle 45° 20° Positive 		J027	RRD 			0702M0E	J025				
						0702M0S					
						1003M0E					
						1003M0S					
Corner Angle 45° 20° Positive 	SEER1204AFEN-JS	J027			RRD 	12T3M0E			J025		
						12T3M0S					
						1604M0E					
						1604M0S					
Corner Angle 45° 20° Positive 	SEEW1204AFTN	J028		RRD 		1604M0S		J025			
						07T1M0T					
						0702M0E					
						0702M0T					
Corner Angle 45° 20° Positive 	SEM1204AZTN	J028	RRD 			1003M0E	J025				
						1003M0S					
						1003M0T					
						12T3M0E					
Negative 		J030			RRD 	12T3M0S			J025		
						12T3M0T					
						1604M0E					
						1604M0S					
Negative 	SNMN120408	J030		RRD 		1604M0T		J025			
	120412										

ROTATING INSERTS



J020

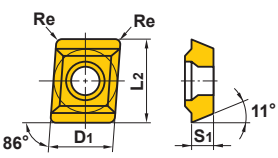
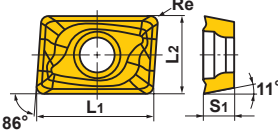
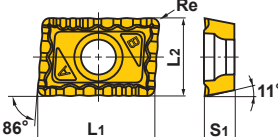
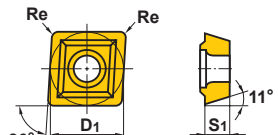
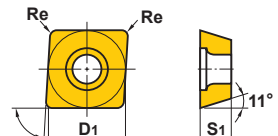
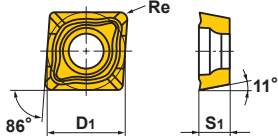
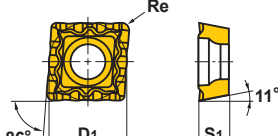
Work Material	P	Steel	     	     	     	     	     	     	     	     	     	     	     	     	     	     	     	     	     	     	     	     	     	     	     	 
	M	Stainless Steel																								
	K	Cast Iron																								
	N	Non-ferrous Metal																								
	S	Heat-resistant Alloy, Titanium Alloy																								
H	Hardened Materials																									
Cutting Conditions (Guide):																										
●: Stable Cutting ●: General Cutting ✖: Unstable Cutting																										
Honing:																										
E: Round F: Sharp																										
Shape	Order Number	Class	Honing	Coated	Cermet	Carbide	Dimensions (mm)					Geometry														
				F7030	VP15TF	UP20M	NX2525	NX4545	HT110	L1	L2		S1	F1	Re											
	BAE AEMW150304ER	M	E		★	●		15.875	9.525	3.18	—	0.4														
	150308ER	M	E		★	★		15.875	9.525	3.18	—	0.8														
	19T304ER	M	E		★	●		19.05	12.7	3.97	—	0.4														
	19T308ER	M	E		★	★		19.05	12.7	3.97	—	0.8														
	BAP300 APGT1135PDFR-G2	G	F				●	11	6.35	3.5	1.2	0.8														
	BAP400 APGT1604PDFR-G2	G	F				●	16.5	9.525	4.76	1.4	0.8														
	BAP300 SRM2 K100 APMT1135PDER-H1	M	E	●	●	●	●	11	6.35	3.5	1.5	0.4														
	1135PDER-H2	M	E	●	●	●	●	11	6.35	3.5	1.2	0.8														
	1135PDER-H3	M	E	●				11	6.35	3.5	0.8	1.2														
	1135PDER-H4	M	E	●				11	6.35	3.5	0.4	1.6														
	1135PDER-H6	M	E	●				11	6.35	3.5	0.4	2.4														
	BAP400 SRM2 K100 APMT1604PDER-H1	M	E	●		●		16.5	9.525	4.76	1.7	0.4														
	1604PDER-H2	M	E	●	●	●	●	16.5	9.525	4.76	1.4	0.8														
	1604PDER-H4	M	E	●				16.5	9.525	4.76	0.4	1.6														
	1604PDER-H6	M	E	●				16.5	9.525	4.76	0.4	2.4														
	1604PDER-H8	M	E	●				16.5	9.525	4.76	0.4	3.2														
	BAP300 SRM2 K100 APMT1135PDER-M0	M	E	★				11	6.35	3.5	1.8	0.2														
	1135PDER-M1	M	E	★				11	6.35	3.5	1.5	0.4														
	1135PDER-M2	M	E	●	●		●	11	6.35	3.5	1.2	0.8														
	BAP400 SRM2 K100 APMT1604PDER-M2	M	E	●	●		●	16.5	9.525	4.76	1.4	0.8														

ROTATING INSERTS

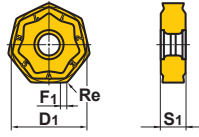
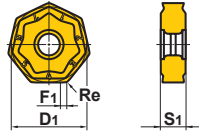
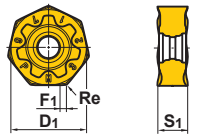
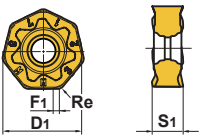
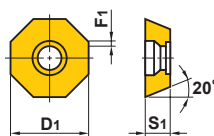
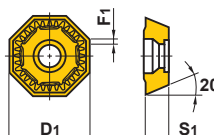


MIRACLE SIGMA

J022

Work Material	P	Steel	●	●	●	●	Cutting Conditions (Guide): ●: Stable Cutting ●: General Cutting ✖: Unstable Cutting					Honing: E: Round				
	M	Stainless Steel	●	●	●	●										
Shape	Order Number	Class	Honing	Coated			Carbide			Dimensions (mm)					Geometry	
				VP15TF	VP20RT	UP20M	UT120T			L1	L2	D1	S1	Re		
CBJP ↳K108 TAB 	JPMT060204-E	M	E	★	●		●			—	7.94	6.5	2.38	0.4	 Inner insert (C) shown.	
SPX ↳K087 	JPMX140412-JM	M	E	●	●					14.3	12.7	—	4.76	1.2		
	190412-JM	M	E	●	●					19.05	12.7	—	4.76	1.2		
SPX ↳K087 	JPMX140412-WH	M	E	●	●					14.3	12.7	—	4.76	1.2		
	190412-WH	M	E	●	●					19.05	12.7	—	4.76	1.2		
CBMP ↳K108 ECMP TAB 	MPMT070308	M	E		★		●			—	—	7.94	3.18	0.8		
	090308	M	E	★	★		●			—	—	9.525	3.18	0.8		
TSMP ↳K107 	MPMW070308	M	E				●			—	—	7.94	3.18	0.8		
	090308	M	E				●			—	—	9.525	3.18	0.8		
SPX ↳K087 	JPMX120412-JM	M	E	●	●					—	—	12.7	4.76	1.2		
SPX ↳K087 	JPMX120412-WH	M	E	●	●					—	—	12.7	4.76	1.2		

ROTATING INSERTS

Work Material	P	Steel								Cutting Conditions (Guide):						
	M	Stainless Steel								●: Stable Cutting	●: General Cutting	✱: Unstable Cutting				
	K	Cast Iron														
	N	Non-ferrous Metal														
	S	Heat-resistant Alloy, Titanium Alloy														
H	Hardened Materials				Honing:											
										E: Round	S: Chamfer + Hone	T: Chamfer				
Shape	Order Number	Class	Honing	Coated						Cermet	Dimensions (mm)				Geometry	
				F7010	F7030	MC5020	MP7030	VP15TF	NX4545	D1	S1	F1	Re			
 AHX640W →K016 AHX640S →K018	NNMU200608ZEN-HK	M	E			●					20	6.55	1	0.8		
 AHX640W →K016 AHX640S →K018	NNMU200608ZEN-MK	M	E			●					20	6.55	1	0.8		
 AHX640S →K018	NNMU200708ZEN-MP	M	E				●				20	8	1	0.8		
 AHX640S →K018	NNMU200712ZER-MM	M	E			●					20	8	1	1.2		
 OCTACUT →K072	OEMX12T3ETR1	M	T	●					★		12.7	3.97	1	—		
	12T3ESR1	M	S	●							12.7	3.97	1	—		
	1705ETR1	M	T	●				★	●		17	5	1.4	—		
	1705ESR1	M	S	●							17	5	1.4	—		
 OCTACUT →K072	OEMX12T3EER1-JS	M	E	●	●						12.7	3.97	1	—		
	1705EER1-JS	M	E	●							17	5	1.4	—		
	1705ETR1-JS	M	T					★			17	5	1.4	—		

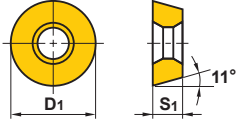


● : Inventory maintained. ★ : Inventory maintained in Japan.

ROTATING INSERTS

ROTATING INSERTS

J026

Work Material	P	Steel	●	●	●	●	●	●	●	Cutting Conditions (Guide): ●: Stable Cutting ●: General Cutting ✖: Unstable Cutting Honing: E: Round F: Sharp S: Chamfer + Hone T: Chamfer Z: Strong			
	M	Stainless Steel	●	●	●	●	●	●	●				
	K	Cast Iron			●	●							
	N	Non-ferrous Metal											
Shape	S	Heat-resistant Alloy, Titanium Alloy			●					Dimensions (mm) D1 S1 F1 Re			
	H	Hardened Materials			●								
	Coated		F7010	F7030	MC5020	VP15TF	AP20M	NX2525	NX4545				
	Cermet							UTi20T	HTi10				
Geometry	Order Number		Class Honing										
BRP 	RPMW08T2M0E		M	E						8	2.78	—	—
	08T2M0T		M	T			●			8	2.78	—	—
	10T3M0E		M	E	●			★	●	10	3.97	—	—
	10T3M0T		M	T			●			10	3.97	—	—
	1204M0E		M	E	●		●	●	●	12	4.76	—	—
	1204M0T		M	T			●	●		12	4.76	—	—
	1606M0E		M	E	●		●	●	●	16	6.35	—	—
	1606M0T		M	T			●			16	6.35	—	—
Corner Angle 45° 	SDEN1203AEN		E	T				●		12.7	3.18	1.2	—
LSE445 SE445 	SECN1203AFTN1		C	T				★		12.7	3.18	1.4	1.0
	SEEN1203AFFN1		E	F					●	12.7	3.18	1.4	1.0
	1203AFEN1		E	E			●			12.7	3.18	1.4	1.0
	1203AFTN1		E	T	●			●	●	12.7	3.18	1.4	1.0
	* 1203AFTN3		E	T	●			●		12.7	3.18	1.4	—
	1203AFSN1		E	S	●	●				12.7	3.18	1.4	1.0
	* 1203AFSN3		E	S	●					12.7	3.18	1.4	—
LSE445 SE445 	SEER1203AFEN-JS		E	E	●	●	●			12.7	3.18	1.4	1.0
Corner Angle 45° 	SEER1204AFEN-JS		E	E	●					12.7	4.76	1.4	1.0
SE545 	SEEN1504AFEN1		E	E			★			15.875	4.76	1.4	1.0
	1504AFTN1		E	T	●			●	●	15.875	4.76	1.4	1.0
	* 1504AFTN3		E	T	●			●		15.875	4.76	1.4	—
	1504AFSN1		E	S	●	●				15.875	4.76	1.4	1.0
	1504AFZN1		E	Z				●		15.875	4.76	1.4	1.0

ROTATING INSERTS

ROTATING INSERTS

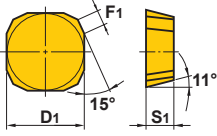
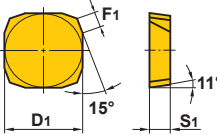
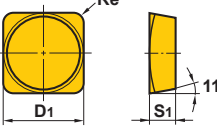
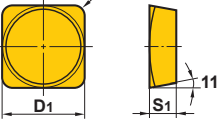
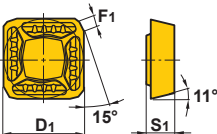
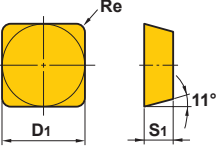
J028

[illegible]

ROTATING INSERTS

ROTATING INSERTS



Work Material	P	Steel	 	 	 	 	 	 	 	 	 	 	Cutting Conditions (Guide):					
	M	Stainless Steel											●: Stable Cutting	●: General Cutting	✖: Unstable Cutting			
	K	Cast Iron											Honing: E: Round F: Sharp T: Chamfer					
	N	Non-ferrous Metal																
	S	Heat-resistant Alloy, Titanium Alloy																
H	Hardened Materials																	
Shape	Order Number	Class	Honing	Coated			Cermet	Carbide	Dimensions (mm)				Geometry					
				F7010	F7030	MC5020	VP15TF	UP20M	NX2525	NX4545	UTi20T	HTi05T		HTi10	D1	S1	F1	Re
	SPEN1203EDR	E	T *1	●	●				●	●				12.7	3.18	1.4	—	 Right hand insert shown.
	1203EDL	E	T *1						●		●	●		12.7	3.18	1.4	—	
	SPKN1203EDR	K	T			★	★							12.7	3.18	1.4	—	
	SPEN1504EDR	E	T *1					●	●	●		●		15.875	4.76	1.4	—	
	1504EDL	E	T *1								●	●		15.875	4.76	1.4	—	
	SPEN1203EEER1	E	E			●						●		12.7	3.175	1.4	—	 Right hand insert shown.
	1203EEEL1	E	E			★						★		12.7	3.175	1.4	—	
	SPNN1203EEER1	N	E			★						★		12.7	3.175	1.4	—	
	SPEN424A	E	F									★	★	12.7	3.18	—	1.6	
	SPEN535A	E	F									★		15.875	4.76	—	2.0	
	SPER1203EEER-JS	E	E			●								12.7	3.175	1.4	—	
	SPGN120304	G	E *1						●	●	●			12.7	3.18	—	0.4	
	120308	G	E *1				★		●	●	●			12.7	3.18	—	0.8	
	120312	G	F									★		12.7	3.18	—	1.2	
	150404	G	E								●			15.875	4.76	—	0.4	
	150408	G	E *1									★		15.875	4.76	—	0.8	
	SPMN120304	M	E *1			★					●	●		12.7	3.18	—	0.4	
	120304T	M	T						●					12.7	3.18	—	0.4	
	120308	M	E		★		★	★			●	●		12.7	3.18	—	0.8	
	120312	M	E *1		★		★				●	●		12.7	3.18	—	1.2	
	120408	M	E *1			★					●	★		12.7	4.76	—	0.8	
	120412	M	E			★					★			12.7	4.76	—	1.2	
	150408	M	E								●			15.875	4.76	—	0.8	
	150412	M	E								●			15.875	4.76	—	1.2	

*1 Grade HTi10 is "F".

ROTATING INSERTS

*1 Grade HTi10 is "T".

J032

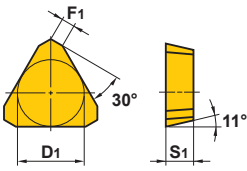
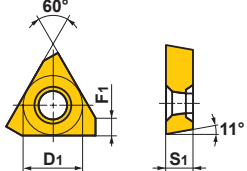
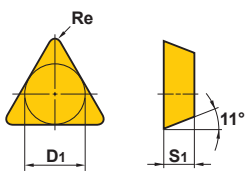
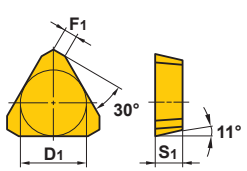
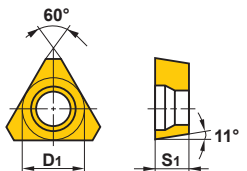
ROTATING INSERTS

ROTATING INSERTS

J034

[illegible]

ROTATING INSERTS

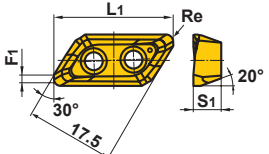
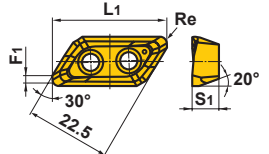
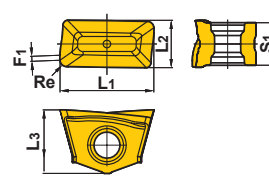
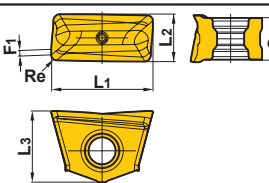
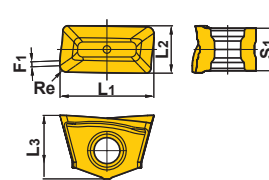
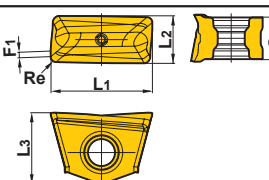
Work Material	P	Steel									Cutting Conditions (Guide): ●:Stable Cutting ●:General Cutting ✖:Unstable Cutting						
	M	Stainless Steel															
	K	Cast Iron									Honing: E:Round T:Chamfer						
	N	Non-ferrous Metal															
	S	Heat-resistant Alloy, Titanium Alloy															
H	Hardened Materials																
Shape	Order Number	Class	Honing	Coated				Cermet	Carbide		Dimensions (mm)				Geometry		
				F7030	VP15TF	UP20M	AP10H	NX2525	NX4545	UT120T	HT105T	HT110	D1	S1		F1	Re
	TPEN1603PPR	E	T	●				●				9.525	3.18	1.2	—		
	1603PPN	E	T *1						●	●		9.525	3.18	1.2	—		
	2204PDR	E	T *1	●				●	●		●	12.7	4.76	1.4	—		
	2204PDL	E	T *1							●	●	12.7	4.76	1.4	—		
	PMF K112	TPEW1303ZPER2	E	E		●	●					7.94	3.18	2	—		
	11° Positive	TPMN160304	M	E *1	●	★	★		●	●	●	9.525	3.18	—	0.4		
		160308	M	E *2	●	★	●		●	●	★	●	9.525	3.18	—		0.8
		160312	M	E *1			●				★		9.525	3.18	—		1.2
		220404	M	E							●		12.7	4.76	—		0.4
		220408	M	E *1	●	★	●				●	●	12.7	4.76	—		0.8
		220408T	M	T					●				12.7	4.76	—		0.8
		220412	M	E *1	★	★					●	●	12.7	4.76	—		1.2
	Corner Angle 0°	TPNN2204PDR	N	E						●		12.7	4.76	1.4	—		
	VIPER	TPNX1605N	N	E		★				●		9.525	5	—	—		

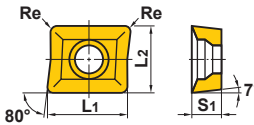
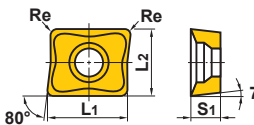
*1 Grade HT110 is "F".

*2 Grade HT110 is "F", Grade NX2525 is "T".

Work Material	P	Steel							Cutting Conditions (Guide):							
	M	Stainless Steel							●: Stable Cutting	●: General Cutting	✱: Unstable Cutting					
	K	Cast Iron														
	N	Non-ferrous Metal														
	S	Heat-resistant Alloy, Titanium Alloy														
H	Hardened Materials															
Shape	Order Number	Class	Honing	Coated			Carbide	Dimensions (mm)					Geometry			
				MP9120	VP15TF	LC15TF	TF15	L1	L4	S1	F1	Re				
	BXD4000	XDGT1550PDER-G04	G	E		●					22	16	5	1.5	0.4	
		1550PDER-G08	G	E		●					22	16	5	1.1	0.8	
		1550PDER-G12	G	E		●					22	16	5	0.7	1.2	
		1550PDER-G16	G	E		●					22	16	5	0.4	1.6	
		1550PDER-G20	G	E		●					21.7	16	5	0.2	2.0	
		1550PDER-G30	G	E		●					20	16	5	0.6	3.0	
		1550PDER-G32	G	E		●					20	16	5	0.4	3.2	
		1550PDER-G40	G	E		●					19	16	5	0.5	4.0	
		1550PDER-G50	G	E		●					18	16	5	0.4	5.0	
	BXD4000	XDGT1550PDFR-G04	G	F			●		●		22	16	5	1.5	0.4	
		1550PDFR-G08	G	F			●		●		22	16	5	1.1	0.8	
		1550PDFR-G12	G	F			●		●		22	16	5	0.7	1.2	
		1550PDFR-G16	G	F			●		●		22	16	5	0.4	1.6	
		1550PDFR-G20	G	F			●		●		21.7	16	5	0.2	2.0	
		1550PDFR-G30	G	F			●		●		20	16	5	0.6	3.0	
		1550PDFR-G32	G	F			●		●		20	16	5	0.4	3.2	
		1550PDFR-G40	G	F			●		●		19	16	5	0.5	4.0	
		1550PDFR-G50	G	F			●		●		18	16	5	0.4	5.0	
	BXD4000	XDGT1550PDFR-GL04	G	F					●		22	16	5	1.5	0.4	
		1550PDFR-GL08	G	F					●		22	16	5	1.1	0.8	
	AXD4000	XDGX175004PDFR-GL	G	F		★			●		23	17.5	5	1.7	0.4	
	➡K044	175008PDFR-GL	G	F		★			●		23	17.5	5	1.3	0.8	
		175012PDFR-GL	G	F		★			●		23	17.5	5	0.9	1.2	
		175016PDFR-GL	G	F		★			●		22	17.5	5	1.4	1.6	
		175020PDFR-GL	G	F		★			●		22	17.5	5	1.0	2.0	
		175024PDFR-GL	G	F		★			●		22	17.5	5	0.6	2.4	
		175030PDFR-GL	G	F		★			●		21.1	17.5	5	0.8	3.0	
		175032PDFR-GL	G	F		★			●		21.1	17.5	5	0.6	3.2	
		175040PDFR-GL	G	F		★			●		20	17.5	5	0.8	4.0	
		175050PDFR-GL	G	F		★			●		19.4	17.5	5	0.4	5.0	
	AXD4000	NEW XDGX175004PDER-GM	G	E	●						23.0	17.5	5	1.7	0.4	
	➡K044	175008PDER-GM	G	E	●						23.0	17.5	5	1.3	0.8	
	NEW	175012PDER-GM	G	E	●						23.0	17.5	5	0.9	1.2	
	NEW	175016PDER-GM	G	E	●						22.0	17.5	5	1.4	1.6	
	NEW	175020PDER-GM	G	E	●						22.0	17.5	5	1.0	2.0	
	NEW	175024PDER-GM	G	E	●						22.0	17.5	5	0.6	2.4	
	NEW	175030PDER-GM	G	E	●						21.1	17.5	5	0.8	3.0	
	NEW	175032PDER-GM	G	E	●						21.1	17.5	5	0.6	3.2	
	NEW	175040PDER-GM	G	E	●						20.0	17.5	5	0.5	4.0	
	NEW	175050PDER-GM	G	E	●						19.4	17.5	5	0.4	5.0	

ROTATING INSERTS

Work Material	P	Steel						Cutting Conditions (Guide):						
	M	Stainless Steel						●: Stable Cutting	●: General Cutting	✱: Unstable Cutting				
	K	Cast Iron												
	N	Non-ferrous Metal						Honing:						
	S	Heat-resistant Alloy, Titanium Alloy						E: Round	F: Sharp					
	H	Hardened Materials												
Shape	Order Number	Class	Honing	Coated		Cermet	Carbide	Dimensions (mm)						Geometry
				MP9130	LC15TF	MP9030	TF15	L1	L2	L3	S1	F1	Re	
	AXD4000 NEW K044 XDGX175004PDFR-GM	G	F				●	23.0	—	—	5	1.7	0.4	
	NEW 175008PDFR-GM	G	F				●	23.0	—	—	5	1.3	0.8	
	NEW 175012PDFR-GM	G	F				●	23.0	—	—	5	0.9	1.2	
	NEW 175016PDFR-GM	G	F				●	22.0	—	—	5	1.4	1.6	
	NEW 175020PDFR-GM	G	F				●	22.0	—	—	5	1.0	2.0	
	NEW 175024PDFR-GM	G	F				●	22.0	—	—	5	0.6	2.4	
	NEW 175030PDFR-GM	G	F				●	21.1	—	—	5	0.8	3.0	
	NEW 175032PDFR-GM	G	F				●	21.1	—	—	5	0.6	3.2	
	NEW 175040PDFR-GM	G	F				●	20.0	—	—	5	0.5	4.0	
	NEW 175050PDFR-GM	G	F				●	19.4	—	—	5	0.4	5.0	
	AXD7000 K050 XDGX227008PDFR-GL	G	F	★			●	30.0	—	—	7	2.0	0.8	
	227016PDFR-GL	G	F	★			●	30.0	—	—	7	1.2	1.6	
	227020PDFR-GL	G	F	★			●	30.0	—	—	7	0.8	2.0	
	227030PDFR-GL	G	F	★			●	28.8	—	—	7	0.8	3.0	
	227032PDFR-GL	G	F	★			●	28.8	—	—	7	0.6	3.2	
	227040PDFR-GL	G	F	★			●	27.5	—	—	7	0.9	4.0	
	227050PDFR-GL	G	F	★			●	27.0	—	—	7	0.4	5.0	
	VFX5 K082 XNMU160708R-MS	M	E			●		16.0	7.0	11.1	6.5	1.0	0.8	
	160712R-MS	M	E			●		16.0	7.0	11.1	6.5	1.0	1.2	
	160716R-MS	M	E			●		16.0	7.0	11.1	6.5	1.0	1.6	
	160724R-MS	M	E			●		16.0	7.0	11.1	6.5	1.0	2.4	
	160732R-MS	M	E			●		17.3	7.0	11.1	6.5	—	3.2	
	160740R-MS	M	E			●		18.9	7.0	11.1	6.5	—	4.0	
	160708R-HS	M	E			●		16.0	7.0	11.1	6.5	1.0	0.8	
	VFX5 NEW K082 XNMU160708R-LS	M	E	●				16.0	7.0	11.1	6.5	1.0	0.8	
	VFX6 K085 XNMU190912R-MS	M	E			●		19.1	9.5	12.7	8.5	1.0	1.2	
	190916R-MS	M	E			●		19.1	9.5	12.7	8.5	1.0	1.6	
	190924R-MS	M	E			●		19.1	9.5	12.7	8.5	1.0	2.4	
	190932R-MS	M	E			●		20.2	9.5	12.7	8.5	—	3.2	
	190940R-MS	M	E			●		21.8	9.5	12.7	8.5	—	4.0	
	190950R-MS	M	E			●		21.8	9.5	12.7	8.5	—	5.0	
	190912R-HS	M	E			●		19.1	9.5	12.7	8.5	1.0	1.2	
	VFX6 NEW K085 XNMU190912R-LS	M	E	●				19.1	9.5	12.7	8.5	1.0	1.2	

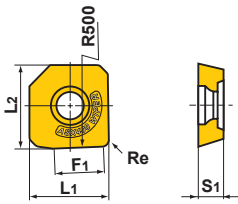
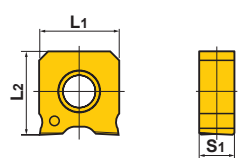
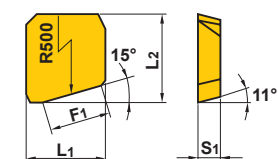
Work Material	P	Steel		Cutting Conditions (Guide): ●:Stable Cutting ●:General Cutting ✖:Unstable Cutting										
	M	Stainless Steel		Honing: E:Round										
	K	Cast Iron												
	N	Non-ferrous Metal												
	S	Heat-resistant Alloy, Titanium Alloy												
	H	Hardened Materials												
Shape	Order Number	Class	Honing	Coated				Dimensions (mm)				Geometry		
				F7030	VP15TF	UP20M					L1		L2	S1
	DCCC	ZCMX083508ER-A	M	E	●					10.4	7.94	3.5	0.8	
		09T308ER-A	M	E	●	●	●			12.0	9.525	3.97	0.8	
	DCCC	ZCMX09T308ER-B	M	E	●	★				12.0	9.525	3.97	0.8	

WIPER INSERTS

ROTATING INSERTS

J040

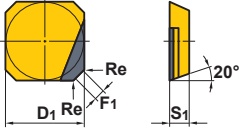
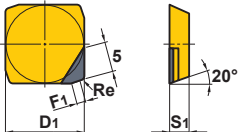
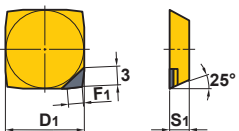
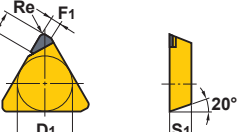
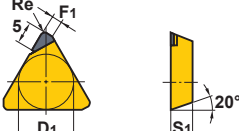
WIPER INSERTS

Work Material	P	Steel						Cutting Conditions (Guide):				
	M	Stainless Steel						●:Stable Cutting	●:General Cutting	✱:Unstable Cutting		
	K	Cast Iron						Honing:				
	N	Non-ferrous Metal						E:Round	T:Chamfer			
	S	Heat-resistant Alloy, Titanium Alloy										
	H	Hardened Materials										
Shape	Order Number	Class	Honing	Coated	Cermet	Carbide	Dimensions (mm)					Geometry
				VP15TF	NX2525	HT105T	L1	L2	S1	F1	Re	
 ASX400 K026	WOEW12T308PEER8C	E	E			●	12.5	13.2	3.97	8	0.8	
	12T308PETR8C	E	T		●		12.5	13.2	3.97	8	0.8	
 VOX400 K022	NEW WOEX1206PER5C	N	E	●			12.5	13.025	5.5	—	—	
 FBP415	WPC42EEER10C	C	E			●	12.7	15.163	3.175	10	—	
	42EEEL10C	C	E			★	12.7	15.163	3.175	10	—	

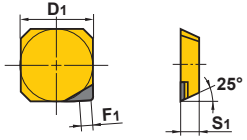
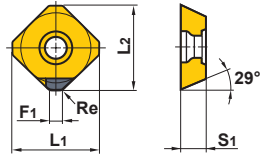
Right hand insert shown.

Right hand insert shown.

CBN AND PCD

Shape	Order Number	Class	CBN		PCD		Dimensions (mm)				Geometry
			MB710		MD220		D ₁	S ₁	F ₁	Re	
LSE445 SE445 	SECN1203AFFR1	C			★		12.7	3.18	1.4	1.0	
SE415 	SECN1203EFFR1	C			★		12.7	3.18	1.4	1.0	
BF407 	SFCN1203ZFFR2	C			★		12.7	3.175	2.4	—	
NSE300 	TECN1603PEFR1	C			★		9.525	3.175	1.4	0.4	
NSE400 	TECN2204PEFR1	C			★		12.7	4.76	1.4	1.0	
PMF K112 	TPEW1303ZPTR2	E ●					7.94	3.18	2	—	

CBN AND PCD WITH WIPER

Shape	Order Number	Class	CBN		PCD		Dimensions (mm)						Geometry
			MB710		MD220		L1	L2	D1	S1	F1	Re	
	BF407	NP-WFC42ZFER2	C		★	—	—	12.4	3.175	2.4	—		
	ASX445	WEEW13T3AGFR3C	E		●	16.48	16.6	—	3.97	3.0	1.5		
	K010	13T3AGTR3C	E	●		16.48	16.6	—	3.97	3.0	1.5		
	BF407	WFC42ZFER2	C		●	—	—	12.4	3.175	2.4	—	