TT SERVICES

KATALOG NÁSTROJŮ

PRO TŘÍSKOVÉ OBRÁBĚNÍ

2022

TECHNOLOGICKÉ A TOOLING SLUŽBY, PORADENSTVÍ A DODÁVKY PRO SNIŽOVÁNÍ NÁKLADŮ

Cílem společnosti je vytvářet dlouhodobé partnerské vazby a svým partnerům, krom jiného, nabídnout vlastní řadu nejpoužívanějších nástrojů a vyměnitelných břitových destiček pro obrábění kovů, které vám představujeme v tomto katalogu.

Katalog se skládá ze tří oblastí: soustružení (turning), frézování (milling cutter) a vrtání (drilling). Celkem katalog obsahuje takřka čtyři tisíce produktů.

V oblasti soustružení to jsou destičky ze slinutého karbidu, řezné keramiky a destičky s CBN a PCD rožkem. Destičkové nástroje pro zapichování, upichování a řezání závitu.

V oblasti frézování jsou to nástroje pro čelní frézování, vysokorychlostní frézování, frézování do rohu, tvarové frézování a multifunkční frézování.

V oblasti vrtání katalog obsahuje standardní destičkové vrtáky, korunkové vrtáky a vrtáky pro vrtání hlubokých děr. A jako doplněk nástroje pro úkos.

Cílem naší společnosti je také průběžně sledovat a vyhodnocovat výrobní procesy a na základě toho je optimalizovat a snižovat zákazníkům výrobní náklady.

Díky nadstandardním distributorským vztahům umíme rychle doplnit a zkompletovat požadovaný sortiment.

Díky tomu jsme připraveni zajišťovat kompletní služby a dodávky dle potřeb svých partnerů v oblasti toolingu, tváření za studena, obrábění, přípravy technologie, programování a konstrukce, a to včetně zajištění renovace rotačních nástrojů, dodávky „komunálního nářadí", měřidel, realizaci dotovaných projektů atd.

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Obsah

Turning

Milling Cutter

Drilling

KATALOG NÁSTROJŮ

PRO TŘÍSKOVÉ OBRÁBĚNÍ

OBSAH

C N M G 12

1 Insert Shape | 2 Relief Angle | 3 Tolerance | 4 Cross Section Type | 5 Cutting Edge Length Diameter of Inscribed Circle

1 Insert Shape

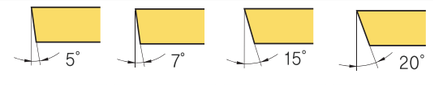
C N M G 12 04 08 – MP

C | D | E | K | L

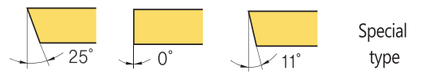
R | S | T | V | W

2 Relief Angle

C N M G 12 04 08 – MP



B | C | D | E

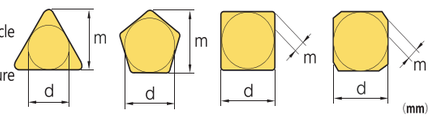


F | N | P | Special type O

3 Tolerance

C N M G 12 04 08 – MP

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)

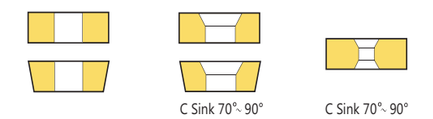
d	Tolerance on d		Tolerance on m	
	J, K, L, M, N	U	M, N	U
6. 35	±0. 05	±0. 08	±0. 08	±0. 13
9. 525	±0. 05	±0. 08	±0. 08	±0. 13
12. 7	±0. 08	±0. 13	±0. 13	±0. 20
15. 875	±0. 10	±0. 18	±0. 15	±0. 27
19. 05	±0. 10	±0. 18	±0. 15	±0. 27
25. 4	±0. 13	±0. 25	±0. 18	±0. 38

Tolerance on D Insert Shape (Exceptional case)

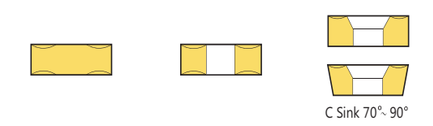
d	Tolerance on d	Tolerance on m
6. 35	± 0. 05	±0. 11
9. 525	± 0. 05	±0. 11
12. 7	± 0. 08	±0. 15
15. 875	± 0. 10	±0. 18
19. 05	± 0. 10	±0. 18

4 Cross Section Type

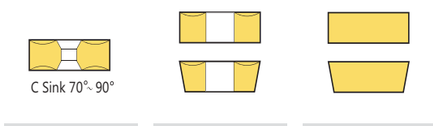
C N M G 12 04 08 – MP



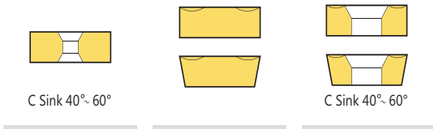
A | B | C



F | G | H



J | M | N



Q | R | T

Special type

U | W | X

04 08 - MP

6 Thickness of Cutting Edge | 7 Nose Radius (Nose R) | 8 Chipbreaker for Turning

5 Cutting Edge Length, Diameter of Inscribed Circle

C N M G 12 04 08 – MP

Symbol							Inch	IC
C	d	S	T	R	V	W		
Metric								d (mm)
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 Thickness of Cutting Edge

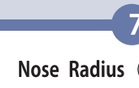
C N M G 12 04 08 – MP

Symbol		Thickness 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 Nose Radius (Nose R)

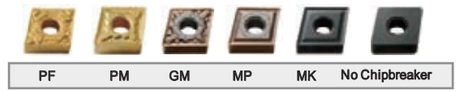
C N M G 12 04 08 – MP



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 Chipbreaker for Turning

C N M G 12 04 08 – MP



PF | PM | GM | MP | MK | No Chipbreaker

FM | SF | US | UG | PU | TQ

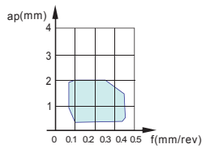
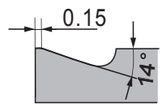
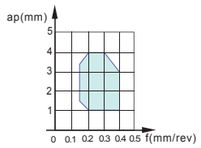
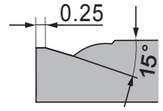
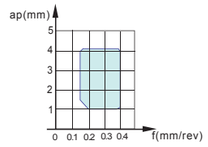
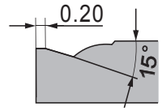
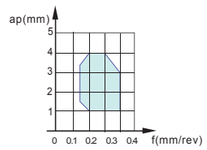
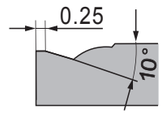
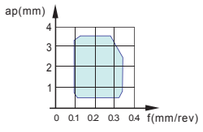
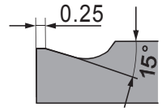
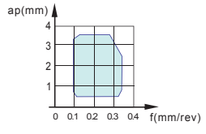
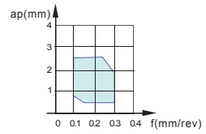
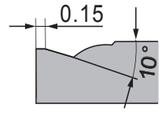
LR | 25UL | 15D | 15M | 24UL | PS

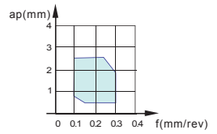
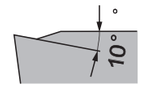
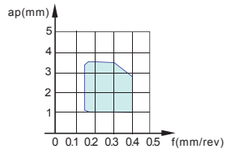
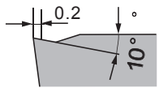
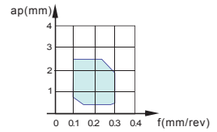
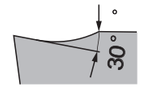
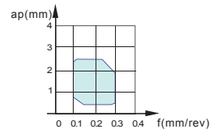
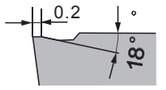
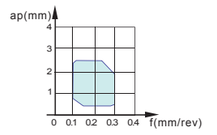
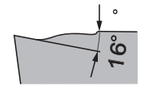
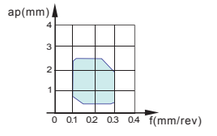
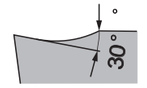
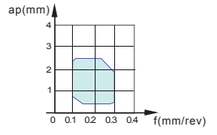
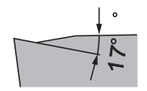
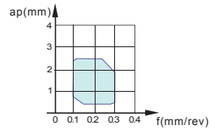
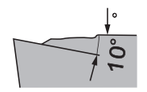
MM | KS | UA | UT | 13U | 15V

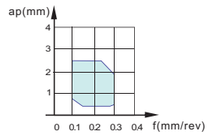
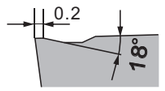
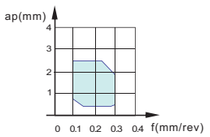
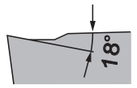
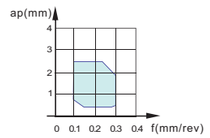
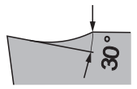
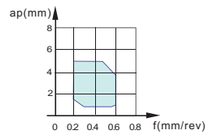
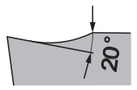
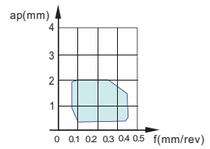
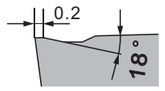
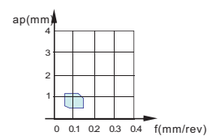
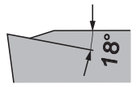
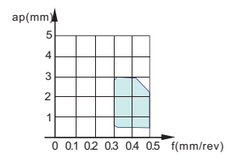
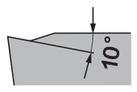
15U | 12U | 16X | 15K | 14VI | AL

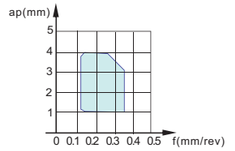
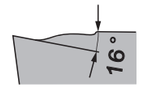
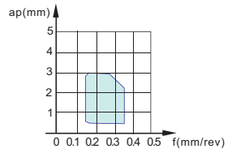
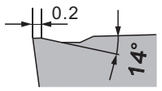
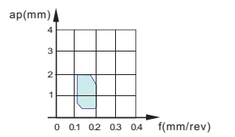
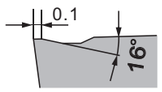
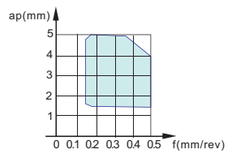
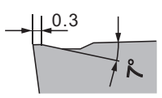
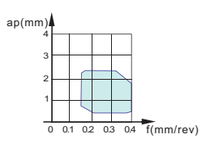
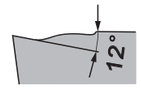
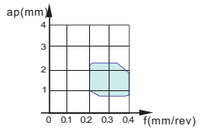
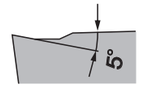
Work Materials		Work Condition	Grade	Cutting Speed (m/min)	ISO	Cutting Performance
P	Steel	Continuous	TP710	150–360	P01	TP710, TP7110, TC580, TC230, TJ15, TJ20U, TP720, TP7220, GT301, GT601
			TP7110	150–360	P10	
			TC580	100–250	P20	
			TC230	100–250	P30	
			GT301	100–250	P40	
			GT601	100–250	P50	
		Interrupted	TP720	120–280		
			TP7220	120–280		
M	Stainless Steel	Continuous	TM810	100–220	M01	TM810, TM8110, TJ15, TJ20U, TM820, TM8220
			TM8110	100–220	M10	
			TJ15	50–180	M20	
			TJ20U	50–180	M30	
		Interrupted	TM820	100–220	M40	
			TM8220	100–220	M50	
K	Cast Iron	Continuous	TK910	200–400	K01	TK910, TK920, TC580, TC230, GT301, GT601
					K10	
		Interrupted	TK920	150–300	K20	
					K30	
N	Non-ferrous Metal	Continuous	TN320	100-1000	N10	TN320
					N20	
S	Superalloys Titanium	Continuous	TMS3115	40–70	S01	TMS3115, TMS3125
					S10	
		Interrupted	TMS3125	45–65	S20	
					S30	
H	Hard Materials	Continuous	TH510	60–150	H10	TH510
					H20	

Work Materials		ISO	Coated Carbide			Cermet	Coated Cermet
			CVD	PVD	No Coated		
P	Steel	P01	TP710, TP7110, TP720, TP7220	TJ15, TJ20U		TC580, TC230	GT301, GT601
		P10					
		P20					
		P30					
		P40					
		P50					
M	Stainless Steel	M01		TM810, TM8110, TJ15, TJ20U, TM820, TM8220			
		M10					
		M20					
		M30					
		M40					
		M50					
K	Cast Iron	K01	TK910, TK920			TC580, TC230	GT301, GT601
		K10					
		K20					
		K30					
N	Non-ferrous Metal	N10			TN320		
		N20					
S	Superalloys Titanium	S01		TMS3115, TMS3125			
		S10					
		S20					
		S30					
N	Hard Materials	N10		TH510			
		N20					

Chipbreaker	Features	Application	Cutting Edge
PF	First choice chipbreaker for finishing steels. The dimple structure decreases the contact area between the insert surface and chips, resulting in significant reduction of heat occurrence.		
PM	General purpose chipbreaker used for medium cutting. Unique chipbreaker geometry with sharp edges and large rake angle assures free cutting action in a wide range of cutting conditions.		
MP	Exellent chip control when finish cutting. Outstanding chip control when high feed turning at small depth of cut.		
GM	Applicable to a wide range of cutting condition with sharp edge. Recommended chipbreaker for stainless steel turning.		
MK	Highly reliable chipbreaker for medium cutting under a wide range of conditions from continuous to interrupted cutting. Recommended chipbreaker for cast iron turning.		
No Chipbreaker	Can cover a wide range of applications from finishing to roughing of cast iron. Excellent in cutting edge strength.		
PS	3-dimensional chipbreaker designed to have excellent chip control capability and low cutting force in finishing to medium cutting. Low cost,M-class positive insert used for high efficiency in a wide range of applications.		

Chipbreaker	Features	Application	Cutting Edge
MM	Developed chipbreaker for medium cutting. Excellent chip control due to wide, positive chip flow zone.		
KS	Highly reliable chipbreaker for medium cutting under a wide range of conditions from continuous to interrupted cutting.		
25UL	High positive cutting edge reduces chip contact. Minimized temperature while machining ensures longer tool life. Stable machining with superior chip evacuation in high depth of cut.		
15D	Excellent chip control at wide range of cutting conditions. Suitable for stainless steel cutting.		
15M	Shallow depth of cut with sharp edge. Longer tool life at high speed cutting due to low cutting force. Good finishing surface.		
24UL	High positive cutting edge reduces chip contact. Minimized temperature while machining ensures longer tool life. Stable machining with superior chip evacuation in high depths of cut.		
15V	Longer tool life due to minimizing chip contact and reducing cutting heat while machining.		
12U/13U/15U	Improved chip control makes tool life longer and better machining.		

Chipbreaker	Features	Application	Cutting Edge
16X	Stable machinability in interrupted machining toughness. Stable chip evacuation and machining in machining with high depth of cut.		
15K	Excellent chip control in application with micro depth of cut and low feed. Low cutting load and super finishing surface. Excellent for both internal and external machining.		
14VI	Longer tool life due to minimizing chip contact and reducing cutting heat while machining.		
AL	Extremely sharp cutting edge. Polished surface.Excellent chip forming at high cutting feeds.Low power consumption.		
FM	Suitable for finishing to medium cutting. Excellent chip control.		
SF	Large rake angle reduces cutting force. Less burring achieved by diminishing damage from notching.		
US	Superior cutting edge sharpness and strength achieved by a positive land. Extra strength of cutting edge inhibits damage from wall shouldering.		

Chipbreaker	Features	Application	Cutting Edge
UG	Large rake angle reduces cutting force. Less burring achieved by diminishing damage from notching.		
PU	General purpose chipbreaker. Excellent chip control at machining of low carbon steel.		
TQ	Sharp cutting performance with 3-D rake angle and double projection design.		
LR	Smooth chipbreaker geometry improves chip flow with less adhesion. Large curled chips.		
UA	Enables machining over a wide range of conditions by using the optimum chipbreaker width according to the cutting depth.		
UT	Strong edge chipbreaker for medium machining range.		

● :Continuous Cutting ◐ :Light Interrupted Cutting

CN				TP710	TP720	TP7110	TP7220	TM810	TM820	TM8110	TM8220	TK910	TK920	TMS3115	TMS3125	TH510	TJ15	TJ20U	TN320	TC580	TC230	GT601	GT301
	Rhombic 80°	P	Steel	●	◐	●	◐										●	●		●	●	●	●
		M	Stainless					●	◐	●	◐						●	●					
	Negative	K	Cast Iron									●	◐							●	●	●	●
		N	Non-ferrous																●				
	with Hole	S	Superalloys											●	◐								
		H	Hard Materials													●							

Application	Chipbreaker	Designation	Corner Radius	TP710	TP720	TP7110	TP7220	TM810	TM820	TM8110	TM8220	TK910	TK920	TMS3115	TMS3125	TH510	TJ15	TJ20U	TN320	TC580	TC230	GT601	GT301
Finishing		CNMG090304-PF	0.4		●																		
		CNMG090308-PF	0.8		●																		
		CNMG120404-PF	0.4	●	●																		
		CNMG120408-PF	0.8	●	●																		
Medium Cutting		CNMG090304-PM	0.4	●	●																		
		CNMG090308-PM	0.8	●	●																		
		CNMG120404-PM	0.4	●	●																		
		CNMG120408-PM	0.8	●	●																		
		CNMG120412-PM	1.2	●	●																		
		CNMG120416-PM	1.6	●	●																		
		CNMG160608-PM	0.8	●	●																		
		CNMG160612-PM	1.2	●	●																		
		CNMG190608-PM	0.8	●	●																		
		CNMG190612-PM	1.2	●	●																		
		CNMG190616-PM	1.6	●																			
		CNMG120404-FM	0.4			●	●																
		CNMG120408-FM	0.8			●	●																
		CNMG120404-SF	0.4											●									
		CNMG120408-SF	0.8											●									
		CNMG120404-GM	0.4						●	●	○												
		CNMG120408-GM	0.8						●	●	○					●							
		CNMG120412-GM	1.2						●	●	○					●							
		CNMG090304-MP	0.4								●												
		CNMG090308-MP	0.8								●												
		CNMG120404-MP	0.4						●	●	○					●							
		CNMG120408-MP	0.8						●	●	○					●	●						
		CNMG120412-MP	1.2							●	●					●	●						
		CNMG120416-MP	1.6								●					●							
		CNMG160608-MP	0.8								●												
		CNMG160612-MP	1.2								●												
		CNMG190608-MP	0.8								●												
		CNMG190612-MP	1.2								●												
		CNMG120404-MK	0.4									●	●										
		CNMG120408-MK	0.8									●	●										
		CNMG120412-MK	1.2									●	●										
		CNMG120416-MK	1.6									●	●										
		CNMG160608-MK	0.8									●	●										
		CNMG160612-MK	1.2									●	●										

● In Stock ○ Inquiry Each Time

● :Continuous Cutting ◐ :Light Interrupted Cutting

CN				TP710	TP720	TP7110	TP7220	TM810	TM820	TM8110	TM8220	TK910	TK920	TMS3115	TMS3125	TH510	TJ15	TJ20U	TN320	TC580	TC230	GT601	GT301
	Rhombic 80°	P	Steel		●	◐	●	◐									●	●		●	●	●	●
		M	Stainless					●	◐	●	◐						●	●					
	Negative	K	Cast Iron									●	◐							●	●	●	●
		N	Non-ferrous																●				
	with Hole	S	Superalloys											●	◐								
		H	Hard Materials													●							

Application	Chipbreaker	Designation	Corner Radius	TP710	TP720	TP7110	TP7220	TM810	TM820	TM8110	TM8220	TK910	TK920	TMS3115	TMS3125	TH510	TJ15	TJ20U	TN320	TC580	TC230	GT601	GT301
Medium Cutting		CNMG160616-MK	1.6									●	●										
		CNMG190612-MK	1.2									●	●										
		CNMG190616-MK	1.6									●	●										
		CNMA120404	0.4									●	●										
		CNMA120408	0.8									●	●										
		CNMA120412	1.2									●	●										
		CNMA120416	1.6									●	●										
		CNMA160612	1.2									●	●										
		CNMA160616	1.6									●	●										
		CNMA160620	2.0									●	●										
		CNMA190612	1.2									●	●										
		CNMA190616	1.6									●	●										
		CNMA190624	2.4									●	●										
		CNMG120404-US	0.4													○							
		CNMG120408-US	0.8													○							
		CNMG120404-UG	0.4													○							
		CNMG120408-UG	0.8													○							
		CNMG120404-PU	0.4																			●	
		CNMG120408-PU	0.8																			●	
		CNMG120404-TQ	0.4																			●	
		CNMG120408-TQ	0.8																			●	

● In Stock ○ Inquiry Each Time

● :Continuous Cutting ◐ :Light Interrupted Cutting

DN	ISO	Material	TP710	TP720	TP7110	TP7220	TM810	TM820	TM8110	TM8220	TK910	TK920	TMS3115	TMS3125	TH510	TJ15	TJ20U	TN320	TC580	TC230	GT601	GT301
Rhombic 55°	P	Steel	●	◐	●	◐										●	●		●	●	●	●
Rhombic 55°	M	Stainless					●	◐	●	◐						●	●					
Negative	K	Cast Iron									●	◐							●	●	●	●
Negative	N	Non-ferrous																●				
with Hole	S	Superalloys											●	◐								
with Hole	H	Hard Materials													●							

Application	Chipbreaker	Designation	Corner Radius	Coating															No Coated	Cermet		Coated Cermet	
				TP710	TP720	TP7110	TP7220	TM810	TM820	TM8110	TM8220	TK910	TK920	TMS3115	TMS3125	TH510	TJ15	TJ20U	TN320	TC580	TC230	GT601	GT301
Finishing		DNMG110404-PF	0.4	●	●																		
Finishing		DNMG110408-PF	0.8	●	●																		
Finishing		DNMG150404-PF	0.4	●	●																		
Finishing		DNMG150408-PF	0.8	●	●																		
Finishing		DNMG150604-PF	0.4	●	●																		
Finishing		DNMG150608-PF	0.8	●	●																		
Medium Cutting		DNMG110404-PM	0.4	●	●																		
Medium Cutting		DNMG110408-PM	0.8	●	●																		
Medium Cutting		DNMG110412-PM	1.2	●																			
Medium Cutting		DNMG150404-PM	0.4		●																		
Medium Cutting		DNMG150408-PM	0.8	●	●																		
Medium Cutting		DNMG150412-PM	1.2	●	●																		
Medium Cutting		DNMG150608-PM	0.8	●	●																		
Medium Cutting		DNMG150612-PM	1.2	●	●																		
Medium Cutting		DNMG110404-SF	0.4											●									
Medium Cutting		DNMG110408-SF	0.8											●									
Medium Cutting		DNMG150404-SF	0.4											●									
Medium Cutting		DNMG150408-SF	0.8											●									
Medium Cutting		DNMG150604-SF	0.4											●									
Medium Cutting		DNMG150608-SF	0.8											●									
Medium Cutting		DNMG110404-GM	0.4							●	●												
Medium Cutting		DNMG110408-GM	0.8							●	●												
Medium Cutting		DNMG150404-GM	0.4							●	●												
Medium Cutting		DNMG150408-GM	0.8							●	●												
Medium Cutting		DNMG150412-GM	1.2							●	●												
Medium Cutting		DNMG150604-GM	0.4							●	●												
Medium Cutting		DNMG150608-GM	0.8							●	●				●								
Medium Cutting		DNMG150612-GM	1.2							●	●				●								
Medium Cutting		DNMG110404-MP	0.4								●												
Medium Cutting		DNMG110408-MP	0.8							●	●												
Medium Cutting		DNMG110412-MP	1.2								●												
Medium Cutting		DNMG150404-MP	0.4						●	●	○												
Medium Cutting		DNMG150408-MP	0.8							●	●												
Medium Cutting		DNMG150412-MP	1.2								●												
Medium Cutting		DNMG150604-MP	0.4							●	●												
Medium Cutting		DNMG150608-MP	0.8							●	●												
Medium Cutting		DNMG150612-MP	1.2								●												

● In Stock ○ Inquiry Each Time

● :Continuous Cutting ◐ :Light Interrupted Cutting

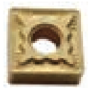
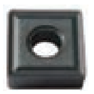
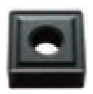
DN	ISO	Material	TP710	TP720	TP7110	TP7220	TM810	TM820	TM8110	TM8220	TK910	TK920	TMS3115	TMS3125	TH510	TJ15	TJ20U	TN320	TC580	TC230	GT601	GT301
Rhombic 55°	P	Steel	●	◐	●	◐										●	●		●	●	●	●
Rhombic 55°	M	Stainless					●	◐	●	◐						●	●					
Negative	K	Cast Iron									●	◐							●	●	●	●
Negative	N	Non-ferrous																●				
with Hole	S	Superalloys											●	◐								
with Hole	H	Hard Materials													●							

Application	Chipbreaker	Designation	Corner Radius	Coating															No Coated	Cermet		Coated Cermet	
				TP710	TP720	TP7110	TP7220	TM810	TM820	TM8110	TM8220	TK910	TK920	TMS3115	TMS3125	TH510	TJ15	TJ20U	TN320	TC580	TC230	GT601	GT301
Medium Cutting		DNMG150608-LR	0.8												●								
Medium Cutting		DNMG150612-LR	1.2												●								
Medium Cutting																							
Medium Cutting		DNMG150404-MK	0.4									●	●										
Medium Cutting		DNMG150408-MK	0.8									●	●										
Medium Cutting		DNMG150412-MK	1.2									●	●										
Medium Cutting		DNMG150604-MK	0.4									●	●										
Medium Cutting		DNMG150608-MK	0.8									●	●										
Medium Cutting		DNMG150612-MK	1.2									●	●										
Medium Cutting		DNMG150616-MK	1.6									●	●										
Medium Cutting		DNMA150404	0.4									●	●										
Medium Cutting		DNMA150408	0.8									●	●										
Medium Cutting		DNMA150412	1.2									●	●										
Medium Cutting		DNMA150604	0.4									●	●										
Medium Cutting		DNMA150608	0.8									●	●										
Medium Cutting		DNMA150612	1.2									●	●										
Medium Cutting		DNMG150404-US	0.4													○							
Medium Cutting		DNMG150408-US	0.8													○							
Medium Cutting																							
Medium Cutting		DNMG150404-PU	0.4																		●		
Medium Cutting		DNMG150408-PU	0.8																		●		
Medium Cutting																							
Medium Cutting		DNMG150408-TQ	0.8																		●		
Medium Cutting																							
Medium Cutting																							

● In Stock ○ Inquiry Each Time

● :Continuous Cutting ◐ :Light Interrupted Cutting

SN	Square 90° / Negative / with Hole	Material	TP710	TP720	TP7110	TP7220	TM810	TM820	TM8110	TM8220	TK910	TK920	TMS3115	TMS3125	TH510	TJ15	TJ20U	TN320	TC580	TC230	GT601	GT301
	P	Steel	●	◐	●	◐										●	●		●	●	●	●
	M	Stainless					●	◐	●	◐						●	●					
	K	Cast Iron									●	◐							●	●	●	●
	N	Non-ferrous																●				
	S	Superalloys											●	◐								
	H	Hard Materials													●							

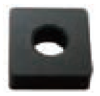
Application	Chipbreaker	Designation	Corner Radius	Coating															No Coated	Cermet		Coated Cermet	
				TP710	TP720	TP7110	TP7220	TM810	TM820	TM8110	TM8220	TK910	TK920	TMS3115	TMS3125	TH510	TJ15	TJ20U	TN320	TC580	TC230	GT601	GT301
Finishing		SNMG090304-PF	0.4	●	●																		
		SNMG090308-PF	0.8	●	●																		
		SNMG120404-PF	0.4	●	●																		
		SNMG120408-PF	0.8	●	●																		
Medium Cutting		SNMG090304-PM	0.4	●	●																		
		SNMG090308-PM	0.8	●	●																		
		SNMG120404-PM	0.4	●	●																		
		SNMG120408-PM	0.8	●	●																		
		SNMG120412-PM	1.2	●	●																		
		SNMG120416-PM	1.6	●	●																		
		SNMG150608-PM	0.8	●	●																		
		SNMG150612-PM	1.2	●	●																		
		SNMG190612-PM	1.2	●	●																		
		SNMG120404-SF	0.4											●									
		SNMG120408-SF	0.8											●									
		SNMG120404-GM	0.4						●	●	○												
		SNMG120408-GM	0.8						●	●	○				●								
		SNMG120412-GM	1.2							●	●				●								
		SNMG120404-MP	0.4							●	●												
		SNMG120408-MP	0.8							●	●			●									
		SNMG120412-MP	1.2							●	●												
		SNMG150612-MP	1.2											●									
		SNMG190612-MP	1.2											●									
		SNMG120408-MK	0.8									●	●										
		SNMG120412-MK	1.2									●	●										
		SNMG150412-MK	1.2									●	●										
		SNMG150612-MK	1.2									●	●										
		SNMG150616-MK	1.6									●	●										
		SNMG190612-MK	1.2									●	●										
		SNMG190616-MK	1.6									●	●										
		SNMA090304	0.4									●	●										
		SNMA090308	0.8									●	●										
		SNMA090312	1.2									●	●										
		SNMA120404	0.4									●	●										
		SNMA120408	0.8									●	●										
		SNMA120412	1.2									●	●										

● In Stock ○ Inquiry Each Time

TTSERVICES TurnLine Insert
Negative Type

● :Continuous Cutting ◐ :Light Interrupted Cutting

SN	Square 90° / Negative / with Hole	Material	TP710	TP720	TP7110	TP7220	TM810	TM820	TM8110	TM8220	TK910	TK920	TMS3115	TMS3125	TH510	TJ15	TJ20U	TN320	TC580	TC230	GT601	GT301
	P	Steel	●	◐	●	◐										●	●		●	●	●	●
	M	Stainless					●	◐	●	◐						●	●					
	K	Cast Iron									●	◐							●	●	●	●
	N	Non-ferrous																●				
	S	Superalloys											●	◐								
	H	Hard Materials													●							

Application	Chipbreaker	Designation	Corner Radius	Coating															No Coated	Cermet		Coated Cermet	
				TP710	TP720	TP7110	TP7220	TM810	TM820	TM8110	TM8220	TK910	TK920	TMS3115	TMS3125	TH510	TJ15	TJ20U	TN320	TC580	TC230	GT601	GT301
Medium Cutting		SNMA120416	1.6									●	●										
		SNMA190612	1.2									●	●										
		SNMA190616	1.6									●	●										

● In Stock ○ Inquiry Each Time

● :Continuous Cutting ◐ :Light Interrupted Cutting

TN	Triangular 60° / Negative / with Hole	Material	TP710	TP720	TP7110	TP7220	TM810	TM820	TM8110	TM8220	TK910	TK920	TMS3115	TMS3125	TH510	TJ15	TJ20U	TN320	TC580	TC230	GT601	GT301
	P	Steel	●	◐	●	◐										●	●		●	●	●	●
	M	Stainless					●	◐	●	◐						●	●					
	K	Cast Iron									●	◐							●	●	●	●
	N	Non-ferrous																●				
	S	Superalloys											●	◐								
	H	Hard Materials													●							

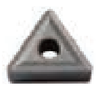
Application	Chipbreaker	Designation	Corner Radius	Coating															No Coated	Cermet		Coated Cermet	
				TP710	TP720	TP7110	TP7220	TM810	TM820	TM8110	TM8220	TK910	TK920	TMS3115	TMS3125	TH510	TJ15	TJ20U	TN320	TC580	TC230	GT601	GT301
Finishing		TNMG160404-PF	0.4	●	●																		
		TNMG160408-PF	0.8	●	●																		
		TNMG220404-PF	0.4	●	●																		
		TNMG220408-PF	0.8	●	●																		
Medium Cutting		TNMG110304-PM	0.4	●	●																		
		TNMG110308-PM	0.8	●	●																		
		TNMG160404-PM	0.4	●	●																		
		TNMG160408-PM	0.8	●	●																		
		TNMG160412-PM	1.2	●	●																		
		TNMG220408-PM	0.8	●	●																		
		TNMG220412-PM	1.2	●	●																		
		TNMG220416-PM	1.6	●	●																		
		TNMG160404-FM	0.4			●	●																
		TNMG160408-FM	0.8			●	●																
		TNMG160404-SF	0.4											●									
		TNMG160408-SF	0.8											●									
		TNMG160404-GM	0.4						●	●	○												
		TNMG160408-GM	0.8						●	●	○												
		TNMG160412-GM	1.2							●	●												

● In Stock ○ Inquiry Each Time

TT SERVICES **TurnLine Insert**
Negative Type

● :Continuous Cutting ◐ :Light Interrupted Cutting

				TP710	TP720	TP7110	TP7220	TM810	TM820	TM8110	TM8220	TK910	TK920	TMS3115	TMS3125	TH510	TJ15	TJ20U	TN320	TC580	TC230	GT601	GT301
TN	Triangular 60°	P	Steel	●	◐	●	◐										●	●		●	●	●	●
	Negative	M	Stainless					●	◐	●	◐						●	●					
	Negative	K	Cast Iron									●	◐							●	●	●	●
	with Hole	N	Non-ferrous																●				
	with Hole	S	Superalloys											●	◐								
		H	Hard Materials													●							

Application	Chipbreaker	Designation	Corner Radius	Coating															No Coated	Cermet		Coated Cermet	
				TP710	TP720	TP7110	TP7220	TM810	TM820	TM8110	TM8220	TK910	TK920	TMS3115	TMS3125	TH510	TJ15	TJ20U	TN320	TC580	TC230	GT601	GT301
Medium Cutting		TNMG160404-MP	0.4						●	●	○			●									
Medium Cutting		TNMG160408-MP	0.8						●	●	○			●									
Medium Cutting		TNMG160412-MP	1.2							●	●												
Medium Cutting		TNMG220408-MP	0.8							●													
Medium Cutting		TNMG220412-MP	1.2							●													
Medium Cutting		TNMG220416-MP	1.6								●												
Medium Cutting		TNMG160404-MK	0.4									●	●										
Medium Cutting		TNMG160408-MK	0.8									●	●										
Medium Cutting		TNMG160412-MK	1.2									●	●										
Medium Cutting		TNMG160416-MK	1.6									●	●										
Medium Cutting		TNMG220408-MK	0.8									●	●										
Medium Cutting		TNMG220412-MK	1.2									●	●										
Medium Cutting		TNMG220416-MK	1.6									●	●										
Medium Cutting		TNMA110304	0.4									●	●										
Medium Cutting		TNMA110308	0.8									●	●										
Medium Cutting		TNMA160308	0.8									●	●										
Medium Cutting		TNMA160404	0.4									●	●										
Medium Cutting		TNMA160408	0.8									●	●										
Medium Cutting		TNMA160412	1.2									●	●										
Medium Cutting		TNMA160416	1.6									●	●										
Medium Cutting		TNMA220404	0.4									●	●										
Medium Cutting		TNMA220408	0.8									●	●										
Medium Cutting		TNMA220416	1.6									●	●										
Medium Cutting		TNMG160404-US	0.4													○							
Medium Cutting		TNMG160408-US	0.8													○							
Medium Cutting		TNMG160404-UG	0.4													○							
Medium Cutting		TNMG160408-UG	0.8													○							
Medium Cutting		TNMG160404R/L-C	0.4																		●		
Medium Cutting		TNMG160408R/L-C	0.8																		●		
Medium Cutting		TNMG160404 PU	0.4																		●		
Medium Cutting		TNMG160408 PU	0.8																		●		
Medium Cutting		TNMG160404 TQ	0.4																		●		
Medium Cutting		TNMG160408 TQ	0.8																		●		

● In Stock ○ Inquiry Each Time

TT SERVICES **TurnLine Insert**
Negative Type

● :Continuous Cutting ◐ :Light Interrupted Cutting

				TP710	TP720	TP7110	TP7220	TM810	TM820	TM8110	TM8220	TK910	TK920	TMS3115	TMS3125	TH510	TJ15	TJ20U	TN320	TC580	TC230	GT601	GT301
TN	Triangular 60°	P	Steel	●	◐	●	◐										●	●		●	●	●	●
	Negative	M	Stainless					●	◐	●	◐						●	●					
	Negative	K	Cast Iron									●	◐							●	●	●	●
	with Hole	N	Non-ferrous																●				
	with Hole	S	Superalloys											●	◐								
		H	Hard Materials													●							

Application	Chipbreaker	Designation	Corner Radius	Coating															No Coated	Cermet		Coated Cermet	
				TP710	TP720	TP7110	TP7220	TM810	TM820	TM8110	TM8220	TK910	TK920	TMS3115	TMS3125	TH510	TJ15	TJ20U	TN320	TC580	TC230	GT601	GT301
Medium Cutting		TNGG160401R/L-25UL	0.1														●						
Medium Cutting		TNGG160402R/L-25UL	0.2															●					
Medium Cutting		TNGG160404R/L-25UL	0.4															●					
Medium Cutting		TNGG160402R/L-24UL	0.2																	●			
Medium Cutting		TNGG160404R/L-24UL	0.4																	●			
Medium Cutting		TNGG160401R/L-15D	0.1																	●			
Medium Cutting		TNGG160402R/L-15D	0.2																	●			
Medium Cutting		TNGG160404R/L-15D	0.4																	●			
Medium Cutting		TNGG160408R/L-15D	0.8																	●			
Medium Cutting		TNGG160402R/L-15M	0.2																	●			
Medium Cutting		TNGG160404R/L-15M	0.4																	●			
Medium Cutting		TNGG160408R/L-15M	0.8																	●			

● In Stock ○ Inquiry Each Time

● :Continuous Cutting ◐ :Light Interrupted Cutting

				TP710	TP720	TP7110	TP7220	TM810	TM820	TM8110	TM8220	TK910	TK920	TMS3115	TMS3125	TH510	TJ15	TJ20U	TN320	TC580	TC230	GT601	GT301
VN	Rhombic 35°	P	Steel	●	◐	●	◐										●	●		●	●	●	●
	Negative	M	Stainless					●	◐	●	◐						●	●					
	Negative	K	Cast Iron									●	◐							●	●	●	●
	with Hole	N	Non-ferrous																●				
	with Hole	S	Superalloys											●	◐								
		H	Hard Materials													●							

Application	Chipbreaker	Designation	Corner Radius	Coating															No Coated	Cermet		Coated Cermet	
				TP710	TP720	TP7110	TP7220	TM810	TM820	TM8110	TM8220	TK910	TK920	TMS3115	TMS3125	TH510	TJ15	TJ20U	TN320	TC580	TC230	GT601	GT301
Finishing		VNMG160404-PF	0.4	●	●																		
Finishing		VNMG160408-PF	0.8	●	●																		
Finishing		VNMG220404-PF	0.4	●	●																		
Finishing		VNMG220408-PF	0.8	●	●																		
Medium Cutting		VNMG160404-PM	0.4	●	●																		
Medium Cutting		VNMG160408-PM	0.8	●	●																		
Medium Cutting		VNMG160412-PM	1.2	●	●																		
Medium Cutting		VNMG160404-FM	0.4			●	●																
Medium Cutting		VNMG160408-FM	0.8			●	●																
Medium Cutting		VNMG160404-SF	0.4											●									
Medium Cutting		VNMG160408-SF	0.8											●									

● In Stock ○ Inquiry Each Time

Turning
Milling Cutter
Drilling

● :Continuous Cutting ◐ :Light Interrupted Cutting

VN	Rhombic 35° / Negative / with Hole		TP710	TP720	TP7110	TP7220	TM810	TM820	TM8110	TM8220	TK910	TK920	TMS3115	TMS3125	TH510	TJ15	TJ20U	TN320	TC580	TC230	GT601	GT301
	P	Steel	●	◐	●	◐										●	●		●	●	●	●
	M	Stainless					●	◐	●	◐						●	●					
	K	Cast Iron									●	◐							●	●	●	●
	N	Non-ferrous																●				
	S	Superalloys											●	◐								
	H	Hard Materials													●							

Application	Chipbreaker	Designation	Corner Radius	Coating															No Coated	Cermet		Coated Cermet	
				TP710	TP720	TP7110	TP7220	TM810	TM820	TM8110	TM8220	TK910	TK920	TMS3115	TMS3125	TH510	TJ15	TJ20U	TN320	TC580	TC230	GT601	GT301
Medium Cutting		VNMG160404-GM	0.4						●	●	○												
		VNMG160408-GM	0.8						●	●	○												
		VNMG160404-MP	0.4							●	●												
		VNMG160408-MP	0.8						●	●	○												
		VNMG160404-MK	0.4									●	●										
		VNMG160408-MK	0.8									●	●										
		VNMG160412-MK	1.2									●	●										
		VNMG160404-UG	0.4													○							
		VNMG160408-UG	0.8													○							
		VNMG160404-PU	0.4																		●		
		VNMG160408-PU	0.8																		●		

● In Stock ○ Inquiry Each Time

● :Continuous Cutting ◐ :Light Interrupted Cutting

WN	Trigon 80° / Negative / with Hole		TP710	TP720	TP7110	TP7220	TM810	TM820	TM8110	TM8220	TK910	TK920	TMS3115	TMS3125	TH510	TJ15	TJ20U	TN320	TC580	TC230	GT601	GT301
	P	Steel	●	◐	●	◐										●	●		●	●	●	●
	M	Stainless					●	◐	●	◐						●	●					
	K	Cast Iron									●	◐							●	●	●	●
	N	Non-ferrous																●				
	S	Superalloys											●	◐								
	H	Hard Materials													●							

Application	Chipbreaker	Designation	Corner Radius	Coated															No Coated	Cermet		Coated Cermet	
				TP710	TP720	TP7110	TP7220	TM810	TM820	TM8110	TM8220	TK910	TK920	TMS3115	TMS3125	TH510	TJ15	TJ20U	TN320	TC580	TC230	GT601	GT301
Finishing		WNMG060404-PF	0.4	●	●																		
		WNMG060408-PF	0.8	●	●																		
		WNMG080404-PF	0.4	●	●																		
		WNMG080408-PF	0.8	●	●																		

● In Stock ○ Inquiry Each Time

● :Continuous Cutting ◐ :Light Interrupted Cutting

WN	Trigon80° / Negative / with Hole		TP710	TP720	TP7110	TP7220	TM810	TM820	TM8110	TM8220	TK910	TK920	TMS3115	TMS3125	TH510	TJ15	TJ20U	TN320	TC580	TC230	GT601	GT301
	P	Steel	●	◐	●	◐										●	●		●	●	●	●
	M	Stainless					●	◐	●	◐						●	●					
	K	Cast Iron									●	◐							●	●	●	●
	N	Non-ferrous																●				
	S	Superalloys											●	◐								
	H	Hard Materials													●							

Application	Chipbreaker	Designation	Corner Radius	Coating															No Coated	Cermet		Coated Cermet	
				TP710	TP720	TP7110	TP7220	TM810	TM820	TM8110	TM8220	TK910	TK920	TMS3115	TMS3125	TH510	TJ15	TJ20U	TN320	TC580	TC230	GT601	GT301
Medium Cutting		WNMG060404-PM	0.4	●	●																		
		WNMG060408-PM	0.8	●	●																		
		WNMG060412-PM	1.2	●																			
		WNMG080404-PM	0.4	●	●																		
		WNMG080408-PM	0.8	●	●																		
		WNMG080412-PM	1.2	●	●																		
		WNMG080416-PM	1.6		●																		
		WNMG080404-FM	0.4			●	●																
		WNMG080408-FM	0.8			●	●																
		WNMG080412-FM	1.2			●	●																
		WNMG060404-SF	0.4											●									
		WNMG060408-SF	0.8											●									
		WNMG080404-SF	0.4											●									
		WNMG080408-SF	0.8											●									
		WNMG060404-GM	0.4							●	●												
		WNMG060408-GM	0.8						●	●	○												
		WNMG060412-GM	1.2							●	●												
		WNMG080404-GM	0.4						●	●	○												
		WNMG080408-GM	0.8						●	●	○												
		WNMG080412-GM	1.2							●	●												
		WNMG060404-MP	0.4								●												
		WNMG060408-MP	0.8							●	●												
		WNMG060412-MP	1.2							●	●			●									
		WNMG080404-MP	0.4						●	●	○												
		WNMG080408-MP	0.8						●	●	○			●									
		WNMG080412-MP	1.2							●	●												
		WNMG080404-MK	0.4									●	●										
		WNMG080408-MK	0.8									●	●										
		WNMG080412-MK	1.2									●	●										
		WNMA060404	0.4									●	●										
		WNMA060408	0.8									●	●										
		WNMA080404	0.4									●	●										
		WNMA080408	0.8									●	●										
		WNMA080412	1.2									●	●										
		WNMA080416	1.6									●	●										
		WNMG080404-US	0.4													○							
		WNMG080408-US	0.8													○							

● In Stock ○ Inquiry Each Time

Turning
Milling Cutter
Drilling

TT SERVICES **TurnLine Insert**
Negative Type

● :Continuous Cutting ◐ :Light Interrupted Cutting

WN Trigon80° Negative with Hole

		TP710	TP720	TP7110	TP7220	TM810	TM820	TM8110	TM8220	TK910	TK920	TMS3115	TMS3125	TH510	TJ15	TJ20U	TN320	TC580	TC230	GT601	GT301
P	Steel	●	◐	●	◐										●	●		●	●	●	●
M	Stainless					●	◐	●	◐						●	●					
K	Cast Iron									●	◐							●	●	●	●
N	Non-ferrous																●				
S	Superalloys											●	◐								
H	Hard Materials													●							

Application	Chipbreaker	Designation	Corner Radius	Coating															No Coated	Cermet		Coated Cermet	
				TP710	TP720	TP7110	TP7220	TM810	TM820	TM8110	TM8220	TK910	TK920	TMS3115	TMS3125	TH510	TJ15	TJ20U	TN320	TC580	TC230	GT601	GT301
Medium Cutting		WNMG080404-UG	0.4													○							
		WNMG080408-UG	0.8													○							
		WNMG080404-PU	0.4																		●		
		WNMG080408-PU	0.8																		●		
		WNMG080412-PU	1.2																		●		
		WNMG080404-TQ	0.4																		●		
		WNMG080408-TQ	0.8																		●		
		WNMG080412-TQ	1.2																		●		

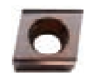
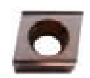
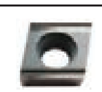
● In Stock ○ Inquiry Each Time

TT SERVICES **TurnLine Insert**
Positive Type

● :Continuous Cutting ◐ :Light Interrupted Cutting

CC Rhombic 80° Positive7° with Hole

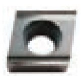
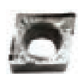
		TP710	TP720	TP7110	TP7220	TM810	TM820	TM8110	TM8220	TK910	TK920	TMS3115	TMS3125	TH510	TJ15	TJ20U	TN320	TC580	TC230	GT601	GT301
P	Steel	●	◐	●	◐										●	●		●	●	●	●
M	Stainless					●	◐	●	◐						●	●					
K	Cast Iron									●	◐							●	●	●	●
N	Non-ferrous																●				
S	Superalloys											●	◐								
H	Hard Materials													●							

Application	Chipbreaker	Designation	Corner Radius	Coating															No Coated	Cermet		Coated Cermet	
				TP710	TP720	TP7110	TP7220	TM810	TM820	TM8110	TM8220	TK910	TK920	TMS3115	TMS3125	TH510	TJ15	TJ20U	TN320	TC580	TC230	GT601	GT301
Finishing to Medium Cutting		CCMT060202-PS	0.2	●								●	●										
		CCMT060204-PS	0.4	●	●							●	●								●		
		CCMT060208-PS	0.8		●							●	●								●		
		CCMT09T302-PS	0.2	●	●							●	●								●		
		CCMT09T304-PS	0.4	●	●							●	●										
		CCMT09T308-PS	0.8	●	●							●	●										
		CCMT120404-PS	0.4	●	●							●	●										
		CCMT120408-PS	0.8	●	●							●	●								●		
		CCMT060202-MM	0.2							●	●			●							●		
		CCMT060204-MM	0.4							●	●			●							●		
		CCMT060208-MM	0.8						●	●	○										●		
		CCMT09T302-MM	0.2								●			●	●						●		
		CCMT09T304-MM	0.4						●	●	○			●	●						●		
		CCMT09T308-MM	0.8						●	●	○			●							●		
		CCMT09T304-KS	0.4		●							●	●										
		CCMT09T308-KS	0.8		●							●	●										
		CCMT120408-KS	0.8		●							●	●										
		CCMT120412-KS	1.2		●							●	●										
		CCMT060202-UA	0.2													○							
		CCMT060204-UA	0.4													○							
		CCMT09T302-UA	0.2													○							
		CCMT09T304-UA	0.4													○							
		CCMT060202-UT	0.2													○							
		CCMT060204-UT	0.4													○							
		CCMT09T302-UT	0.2													○							
		CCMT09T304-UT	0.4													○							
		CCGT0602005R/L-13U	0.05														●						
		CCGT060201R/L-13U	0.1														●						
		CCGT060202R/L-13U	0.2															●					
		CCGT060204R/L-13U	0.4															●					
		CCGT09T301R/L-15V	0.1														●						
		CCGT09T302R/L-15V	0.2															●					
		CCGT09T304R/L-15V	0.4															●					
		CCGT09T3003R/L-15U	0.03														●						
		CCGT09T3005R/L-15U	0.05														●						
		CCGT09T301R/L-15U	0.1														●						
		CCGT09T302R/L-15U	0.2															●					
		CCGT09T304R/L-15U	0.4															●					
		CCGT060201R/L-12U	0.1																	●			
		CCGT060202R/L-12U	0.2																	●			
		CCGT060204R/L-12U	0.4																	●			

● In Stock ○ Inquiry Each Time

● :Continuous Cutting ◐ :Light Interrupted Cutting

				TP710	TP720	TP7110	TP7220	TM810	TM820	TM8110	TM8220	TK910	TK920	TMS3115	TMS3125	TH510	TJ15	TJ20U	TN320	TC580	TC230	GT601	GT301
CC	Rhombic 80°	P	Steel	●	◐	●	◐										●	●		●	●	●	●
		M	Stainless					●	◐	●	◐						●	●					
	Positive 7°	K	Cast Iron									●	◐							●	●	●	●
		N	Non-ferrous																●				
	with Hole	S	Superalloys											●	◐								
		H	Hard Materials													●							

Application	Chipbreaker	Designation	Corner Radius	Coating															No Coated	Cermet		Coated Cermet	
				TP710	TP720	TP7110	TP7220	TM810	TM820	TM8110	TM8220	TK910	TK920	TMS3115	TMS3125	TH510	TJ15	TJ20U	TN320	TC580	TC230	GT601	GT301
Finishing to Medium Cutting		CCGT09T301R/L-15U	0.1																	●			
		CCGT09T302R/L-15U	0.2																	●			
		CCGT09T304R/L-15U	0.4																	●			
		CCGT09T302-AL	0.2																●				
		CCGT09T304-AL	0.4																●				
		CCGT09T308-AL	0.8																●				
		CCGT120402-AL	0.2																●				
		CCGT120404-AL	0.4																●				
		CCGT120408-AL	0.8																●				

● In Stock ○ Inquiry Each Time

● :Continuous Cutting ◐ :Light Interrupted Cutting

				TP710	TP720	TP7110	TP7220	TM810	TM820	TM8110	TM8220	TK910	TK920	TMS3115	TMS3125	TH510	TJ15	TJ20U	TN320	TC580	TC230	GT601	GT301
DC	Rhombic 55°	P	Steel	●	◐	●	◐										●	●		●	●	●	●
		M	Stainless					●	◐	●	◐						●	●					
	Positive7°	K	Cast Iron									●	◐							●	●	●	●
		N	Non-ferrous																●				
	with Hole	S	Superalloys											●	◐								
		H	Hard Materials													●							

Application	Chipbreaker	Designation	Corner Radius	Coating															No Coated	Cermet		Coated Cermet	
				TP710	TP720	TP7110	TP7220	TM810	TM820	TM8110	TM8220	TK910	TK920	TMS3115	TMS3125	TH510	TJ15	TJ20U	TN320	TC580	TC230	GT601	GT301
Finishing to Medium Cutting		DCMT070204-PS	0.4		●							●	●								●		
		DCMT070208-PS	0.8		●							●	●										
		DCMT11T304-PS	0.4	●	●							●	●								●		
		DCMT11T308-PS	0.8	●	●							●	●										
		DCMT150408-PS	0.8												●								
		DCMT070202-MM	0.2								●			●									
		DCMT070204-MM	0.4							●	●			●							●		
		DCMT070208-MM	0.8								●												
		DCMT11T302-MM	0.2																		●		
		DCMT11T304-MM	0.4						●	●	○			●									
		DCMT11T308-MM	0.8						●	●	○			●							●		
		DCMT11T304-KS	0.4		●							●	●										
		DCMT11T308-KS	0.8		●							●	●										
		DCMT070202-UA	0.2													○							
		DCMT070204-UA	0.4													○							
		DCMT11T302-UA	0.2													○							
		DCMT11T304-UA	0.4													○							

● In Stock ○ Inquiry Each Time

● :Continuous Cutting ◐ :Light Interrupted Cutting

				TP710	TP720	TP7110	TP7220	TM810	TM820	TM8110	TM8220	TK910	TK920	TMS3115	TMS3125	TH510	TJ15	TJ20U	TN320	TC580	TC230	GT601	GT301
DC	Rhombic 55°	P	Steel	●	◐	●	◐										●	●		●	●	●	●
		M	Stainless					●	◐	●	◐						●	●					
	Positive7°	K	Cast Iron									●	◐							●	●	●	●
		N	Non-ferrous																●				
	with Hole	S	Superalloys											●	◐								
		H	Hard Materials													●							

Application	Chipbreaker	Designation	Corner Radius	Coating															No Coated	Cermet		Coated Cermet	
				TP710	TP720	TP7110	TP7220	TM810	TM820	TM8110	TM8220	TK910	TK920	TMS3115	TMS3125	TH510	TJ15	TJ20U	TN320	TC580	TC230	GT601	GT301
Finishing to Medium Cutting		DCMT070202-UT	0.2													○							
		DCMT070204-UT	0.4													○							
		DCMT11T302-UT	0.2													○							
		DCMT11T304-UT	0.4													○							
		DCGT070201R/L-15V	0.1														●						
		DCGT070202R/L-15V	0.2															●					
		DCGT070204R/L-15V	0.4															●					
		DCGT11T3003R/L-15V	0.03														●						
		DCGT11T3005R/L-15V	0.05														●						
		DCGT11T301R/L-15V	0.1														●						
		DCGT11T302R/L-15V	0.2															●					
		DCGT11T304R/L-15V	0.4															●					
		DCGT070201R/L-12U	0.1														●						
		DCGT070202R/L-12U	0.2															●					
		DCGT070204R/L-12U	0.4															●					
		DCGT11T3005R/L-15U	0.05														●						
		DCGT11T301R/L-15U	0.1														●						
		DCGT11T302R/L-15U	0.2															●					
		DCGT11T304R/L-15U	0.4															●					
		DCGT11T3005R/L-16X	0.05														●						
		DCGT11T301R/L-16X	0.1														●						
		DCGT11T302R/L-16X	0.2															●					
		DCGT11T304R/L-16X	0.4															●					
		DCGT070201R/L-12U	0.1																	●			
		DCGT070202R/L-12U	0.2																	●			
		DCGT070204R/L-12U	0.4																	●			
		DCGT0702005R/L-15V	0.05																	●			
		DCGT070201R/L-15V	0.1																	●			
		DCGT070202R/L-15V	0.2																	●			
		DCGT070204R/L-15V	0.4																	●			
		DCGT11T302R/L-15V	0.2																	●			
		DCGT11T304R/L-15V	0.4																	●			
		DCGT070201R/L-15M	0.1																	●			
		DCGT070202R/L-15M	0.2																	●			
		DCGT070204R/L-15M	0.4																	●			
		DCGT11T301R/L-15M	0.1																	●			
		DCGT11T302R/L-15M	0.2																	●			
		DCGT11T304R/L-15M	0.4																	●			

● In Stock ○ Inquiry Each Time

● :Continuous Cutting ◐ :Light Interrupted Cutting

DC — Rhombic 55° / Positive 7° / with Hole

P	Steel	● ◐ ● ◐
M	Stainless	● ◐ ● ◐
K	Cast Iron	● ◐
N	Non-ferrous	●
S	Superalloys	● ◐
H	Hard Materials	●

Application	Chipbreaker	Designation	Corner Radius	TP710	TP720	TP7110	TP7220	TM810	TM820	TM8110	TM8220	TK910	TK920	TMS3115	TMS3125	TH510	TJ15	TJ20U	TN320	TC580	TC230	GT601	GT301
				Coating															No Coated	Cermet		Coated Cermet	
Finishing to Medium Cutting		DCGT11T3005R/L-15U	0.05																	●			
		DCGT11T301R/L-15U	0.1																	●			
		DCGT11T302R/L-15U	0.2																	●			
		DCGT11T304R/L-15U	0.4																	●			
		DCGT070204-AL	0.4																●				
		DCGT070208-AL	0.8																●				
		DCGT11T302-AL	0.2																●				
		DCGT11T304-AL	0.4																●				
		DCGT11T308-AL	0.8																●				
		DCGT11T312-AL	1.2																●				

● In Stock ○ Inquiry Each Time

● :Continuous Cutting ◐ :Light Interrupted Cutting

SC — Square 90° / Positive 7° / with Hole

P	Steel	● ◐ ● ◐
M	Stainless	● ◐ ● ◐
K	Cast Iron	● ◐
N	Non-ferrous	●
S	Superalloys	● ◐
H	Hard Materials	●

Application	Chipbreaker	Designation	Corner Radius	TP710	TP720	TP7110	TP7220	TM810	TM820	TM8110	TM8220	TK910	TK920	TMS3115	TMS3125	TH510	TJ15	TJ20U	TN320	TC580	TC230	GT601	GT301
				Coating															No Coated	Cermet		Coated Cermet	
Finishing to Medium Cutting		SCMT09T304-PS	0.4		●							●	●	●									
		SCMT09T308-PS	0.8	●	●							●	●										
		SCMT120404-PS	0.4		●																		
		SCMT120408-PS	0.8		●							●	●										
		SCMT09T308-MM	0.8							●													
		SCMT09T308-KS	0.8		●							●	●										
		SCMT120408-KS	0.8		●							●	●										

● In Stock ○ Inquiry Each Time

● :Continuous Cutting ◐ :Light Interrupted Cutting

TC — Triangular 60° / Positive 7° / with Hole

P	Steel	● ◐ ● ◐
M	Stainless	● ◐ ● ◐
K	Cast Iron	● ◐
N	Non-ferrous	●
S	Superalloys	● ◐
H	Hard Materials	●

Application	Chipbreaker	Designation	Corner Radius	TP710	TP720	TP7110	TP7220	TM810	TM820	TM8110	TM8220	TK910	TK920	TMS3115	TMS3125	TH510	TJ15	TJ20U	TN320	TC580	TC230	GT601	GT301
				Coating															No Coated	Cermet		Coated Cermet	
Finishing to Medium Cutting		TCMT090204-PS	0.4	●	●							●	●										
		TCMT110202-PS	0.2		●							●	●								●		
		TCMT110204-PS	0.4	●	●							●	●										
		TCMT110208-PS	0.8		●							●	●								●		
		TCMT16T304-PS	0.4		●							●	●								●		
		TCMT16T308-PS	0.8	●	●							●	●										
		TCMT110202-MM	0.2								●										●		
		TCMT110204-MM	0.4							●	●			●							●		
		TCMT110208-MM	0.8								●												
		TCMT16T304-MM	0.4						●		○												
		TCMT16T308-MM	0.8						●	●	○												
		TCMT110204-KS	0.4		●							●	●										
		TCMT16T304-KS	0.4		●							●	●										
		TCMT16T308-KS	0.8		●							●	●										
		TCMT110202-UA	0.2														○						
		TCMT110204-UA	0.4														○						
		TCMT110202-UT	0.2														○						
		TCMT110204-UT	0.4														○						
		TCGT0902005R/L-15V	0.05															●					
		TCGT090201R/L-15V	0.1															●					
		TCGT090202R/L-15V	0.2																●				
		TCGT090204R/L-15V	0.4																●				
		TCGT1102005R/L-15V	0.05															●					
		TCGT110201R/L-15V	0.1															●					
		TCGT110202R/L-15V	0.2																●				
		TCGT110204R/L-15V	0.4																●				
		TCGT110301R/L-10U	0.1																			●	
		TCGT110302R/L-10U	0.2																			●	
		TCGT090204-AL	0.4																			●	
		TCGT110204-AL	0.4																			●	
		TCGT16T302-AL	0.2																			●	
		TCGT16T304-AL	0.4																			●	
		TCGT16T308-AL	0.8																			●	

● In Stock ○ Inquiry Each Time

● :Continuous Cutting ◐ :Light Interrupted Cutting

TP — Triangular 60° / Positive 11° / with Hole

	Material	TP710	TP720	TP7110	TP7220	TM810	TM820	TM8110	TM8220	TK910	TK920	TMS3115	TMS3125	TH510	TJ15	TJ20U	TN320	TC580	TC230	GT601	GT301
P	Steel	●	◐	●	◐										●	●		●	●	●	●
M	Stainless					●	◐	●	◐						●	●					
K	Cast Iron									●	◐							●	●	●	●
N	Non-ferrous																●				
S	Superalloys											●	◐								
H	Hard Materials													●							

Application	Chipbreaker	Designation	Corner Radius	Coating															No Coated	Cermet		Coated Cermet	
				TP710	TP720	TP7110	TP7220	TM810	TM820	TM8110	TM8220	TK910	TK920	TMS3115	TMS3125	TH510	TJ15	TJ20U	TN320	TC580	TC230	GT601	GT301
Finishing to Medium Cutting		TPMT110202-MM	0.2								●			●									
		TPMT110204-MM	0.4								●			●									
		TPGH080202R/L-15K	0.2															●					
		TPGH080204R/L-15K	0.4															●					
		TPGH090201R/L-15K	0.1														●						
		TPGH090202R/L-15K	0.2															●					
		TPGH090204R/L-15K	0.4															●					
		TPGH110302R/L-15K	0.2															●					
		TPGH110304R/L-15K	0.4															●					
		TPGH080201R/L-15K	0.1																	●			
		TPGH080202R/L-15K	0.2																	●			
		TPGH080204R/L-15K	0.4																	●			
		TPGH090201R/L-15K	0.1																	●			
		TPGH090202R/L-15K	0.2																	●			
		TPGH090204R/L-15K	0.4																	●			
		TPGH110302R/L-15K	0.2																	●			
		TPGH110304R/L-15K	0.4																	●			
		TPGH110202R/L-15K	0.2																	●			
		TPGH110204R/L-15K	0.4																	●			

● In Stock ○ Inquiry Each Time

● :Continuous Cutting ◐ :Light Interrupted Cutting

VB — Rhombic 60° / Positive5° / with Hole

	Material	TP710	TP720	TP7110	TP7220	TM810	TM820	TM8110	TM8220	TK910	TK920	TMS3115	TMS3125	TH510	TJ15	TJ20U	TN320	TC580	TC230	GT601	GT301
P	Steel	●	◐	●	◐										●	●		●	●	●	●
M	Stainless					●	◐	●	◐						●	●					
K	Cast Iron									●	◐							●	●	●	●
N	Non-ferrous																●				
S	Superalloys											●	◐								
H	Hard Materials													●							

Application	Chipbreaker	Designation	Corner Radius	Coating															No Coated	Cermet		Coated Cermet	
				TP710	TP720	TP7110	TP7220	TM810	TM820	TM8110	TM8220	TK910	TK920	TMS3115	TMS3125	TH510	TJ15	TJ20U	TN320	TC580	TC230	GT601	GT301
Medium Cutting		VBMT160404-PS	0.4	●	●							●	●								●		
		VBMT160408-PS	0.8	●	●							●	●								●		

● In Stock ○ Inquiry Each Time

● :Continuous Cutting ◐ :Light Interrupted Cutting

VB — Rhombic35° / Positive 5° / with Hole

	Material	TP710	TP720	TP7110	TP7220	TM810	TM820	TM8110	TM8220	TK910	TK920	TMS3115	TMS3125	TH510	TJ15	TJ20U	TN320	TC580	TC230	GT601	GT301
P	Steel	●	◐	●	◐										●	●		●	●	●	●
M	Stainless					●	◐	●	◐						●	●					
K	Cast Iron									●	◐							●	●	●	●
N	Non-ferrous																●				
S	Superalloys											●	◐								
H	Hard Materials													●							

Application	Chipbreaker	Designation	Corner Radius	Coating															No Coated	Cermet		Coated Cermet	
				TP710	TP720	TP7110	TP7220	TM810	TM820	TM8110	TM8220	TK910	TK920	TMS3115	TMS3125	TH510	TJ15	TJ20U	TN320	TC580	TC230	GT601	GT301
Finishing to Medium Cutting		VBMT110304-MM	0.4							●	●			●							●		
		VBMT110308-MM	0.8								●												
		VBMT160402-MM	0.2								●												
		VBMT160404-MM	0.4							●	●			●							●		
		VBMT160408-MM	0.8							●	●										●		
		VBMT160408-KS	0.8		●							●	●										
		VBGT1103005R/L-15V	0.05														●						
		VBGT110301R/L-15V	0.1														●						
		VBGT110302R/L-15V	0.2															●					
		VBGT110304R/L-15V	0.4															●					
		VBGT1103005R/L-14VI	0.05														●						
		VBGT110301R/L-14VI	0.1														●						
		VBGT110302R/L-14VI	0.2															●					
		VBGT110304R/L-14VI	0.4															●					
		VBGT1103003R/L-12U	0.03														●						
		VBGT1103005R/L-12U	0.05														●						
		VBGT110301R/L-12U	0.1														●						
		VBGT110302R/L-12U	0.2															●					
		VBGT110304R/L-12U	0.4															●					
		VBGT1103005R/L-14VI	0.05																	●			
		VBGT110301R/L-14VI	0.1																	●			
		VBGT110302R/L-14VI	0.2																	●			
		VBGT110304R/L-14VI	0.4																	●			
		VBGT1103005R/L-15M	0.05																	●			
		VBGT110301R/L-15M	0.1																	●			
		VBGT110302R/L-15M	0.2																	●			
		VBGT110304R/L-15M	1.4																	●			
		VBGT110302-AL	0.2																●				
		VBGT110304-AL	0.4																●				
		VBGT160402-AL	0.2																●				
		VBGT160404-AL	0.4																●				

● In Stock Inquiry Each Time

TTSERVICES TurnLine Insert
Positive Type

● :Continuous Cutting ◐ :Light Interrupted Cutting

VC				TP710	TP720	TP7110	TP7220	TM810	TM820	TM8110	TM8220	TK910	TK920	TMS3115	TMS3125	TH510	TJ15	TJ20U	TN320	TC580	TC230	GT601	GT301
Rhombic 35°	P	Steel		●	◐	●	◐										●	●		●	●	●	●
	M	Stainless						●	◐	●	◐						●	●					
Positive 7°	K	Cast Iron										●	◐							●	●	●	●
	N	Non-ferrous																	●				
with Hole	S	Superalloys												●	◐								
	H	Hard Materials														●							

Application	Chipbreaker	Designation	Corner Radius	Coating: TP710	TP720	TP7110	TP7220	TM810	TM820	TM8110	TM8220	TK910	TK920	TMS3115	TMS3125	TH510	TJ15	TJ20U	No Coated: TN320	Cermet: TC580	TC230	Coated Cermet: GT601	GT301
Finishing to Medium Cutting		VCMT110304-PS	0.4		●							●	●								●		
		VCMT160404-PS	0.4	●	●							●	●										
		VCMT160408-PS	0.8	●	●							●	●								●		
		VCMT160404-KS	0.4		●							●	●										
		VCMT160408-KS	0.8		●							●	●										
		VCGT1103005R/L-15V	0.05														●						
		VCGT110301R/L-15V	0.1														●						
		VCGT110302R/L-15V	0.2															●					
		VCGT110304R/L-15V	0.4															●					
		VCGT1103003R/L-12U	0.03														●						
		VCGT1103005R/L-12U	0.05														●						
		VCGT110301R/L-12U	0.1														●						
		VCGT110302R/L-12U	0.2															●					
		VCGT110304R/L-12U	0.4															●					

● In Stock ○ Inquiry Each Time

● :Continuous Cutting ◐ :Light Interrupted Cutting

VP				TP710	TP720	TP7110	TP7220	TM810	TM820	TM8110	TM8220	TK910	TK920	TMS3115	TMS3125	TH510	TJ15	TJ20U	TN320	TC580	TC230	GT601	GT301
Rhombic 35°	P	Steel		●	◐	●	◐										●	●		●	●	●	●
	M	Stainless						●	◐	●	◐						●	●					
Positive11°	K	Cast Iron										●	◐							●	●	●	●
	N	Non-ferrous																	●				
with Hole	S	Superalloys												●	◐								
	H	Hard Materials														●							

Application	Chipbreaker	Designation	Corner Radius	Coated: TP710	TP720	TP7110	TP7220	TM810	TM820	TM8110	TM8220	TK910	TK920	TMS3115	TMS3125	TH510	TJ15	TJ20U	No Coated: TN320	Cermet: TC580	TC230	Coated Cermet: GT601	GT301
Finishing to Medium Cutting		VPET1103005R/L-15M	0.05														●						
		VPET1103008R/L-15M	0.08														●						
		VPET110301R/L-15M	0.1														●						
		VPET110302R/L-15M	0.2															●					
		VPET110304R/L-15M	0.4															●					

● In Stock ○ Inquiry Each Time

TTSERVICES TurnLine Insert
Positive Type

● :Continuous Cutting ◐ :Light Interrupted Cutting

WC				TP710	TP720	TP7110	TP7220	TM810	TM820	TM8110	TM8220	TK910	TK920	TMS3115	TMS3125	TI620	TJ15	TJ20U	TN200	TC580	TC230	GT601	GT301
Trigon 80°	P	Steel		●	◐	●	◐									●	●	●		●	●	●	●
	M	Stainless						●	◐	●	◐					●	●	●					
Positive 7°	K	Cast Iron										●	◐			●				●	●	●	●
	N	Non-ferrous																	●				
with Hole	S	Superalloys												●	◐								
	H	Hard Materials																					

Application	Chipbreaker	Designation	Corner Radius	Coating: TP710	TP720	TP7110	TP7220	TM810	TM820	TM8110	TM8220	TK910	TK920	TMS3115	TMS3125	TI620	TJ15	TJ20U	No Coated: TN200	Cermet: TC580	TC230	Coated Cermet: GT601	GT301
Finishing to Medium Cutting		WCMT06T304-PS	0.4	●	●							●	●										
		WCMT06T308-PS	0.8	●	●																		
		WCMX030208	0.8													●							
		WCMX040208	0.8													●							
		WCMX050308	0.8													●							
		WCMX06T308	0.8													●							
		WCMX080412	1.2													●							
		WCGX030208	0.8																●				
		WCGX040208	0.8																●				
		WCGX050308	0.8																●				
		WCGX06T308	0.8																●				
		WCGX080412	1.2																●				

● In Stock ○ Inquiry Each Time

ceramic insert is in good wear-resistance and shock-resistance in high speed cutting.
Pure raw materials give stability and fine microstructure to the products.
Shaped bodies are completely condensed so that the finished goods are strong and resistant against fracture and wear .

- Improved work efficiency by increasing cutting speed on extremely higher than carbide inserts.
- Longer tool life through excellent wear resistance.
- Precise cutting and superior surface roughness.

Grade	Workpiece Material	Advantages
K30G	Gray Cast Iron (FC) Malleable (FCMB) Chilled Cast Iron	Al2O3+TiCN Excellent wear resistance A basic choice for machining hardened steel and alloy steel
KC30G	Carbon Steel Alloy Steel Bearing Steel	Al2O3+TiCN+TiN coated Excellent wear resistance Finishing for hardened steel and cast iron
H70G	Gray Cast Iron (FC) Steel （HRC45≤）	Al2O3+ZrO2 Finishing, semi-finishing of cast iron and steel
C60G	Ductile Cast Iron	TiC+Al2O3 High thermal shock resistance Usable with coolant Finishing for ductile cast iron

CN — Rhombic 80° Negative with Hole

		P	Steel	●	●	●					
		M	Stainless								
		K	Cast Iron	●	●	●	●				
		N	Non-ferrous								
		S	Superalloys								
		H	Hard Materials	●	●						
Application	Chipbreaker	Designation	Corner Radius	CERAMIC							
				K30G	KC30G	H70G	C60G				
Medium Cutting		CNGA120404	0.4	●	●	●	●				
		CNGA120408	0.8	●	●	●	●				
		CNGA120412	1.2	●	●		●				

DN — Rhombic55° Negative with Hole

		P	Steel	●	●	●					
		M	Stainless								
		K	Cast Iron	●	●	●	●				
		N	Non-ferrous								
		S	Superalloys								
		H	Hard Materials	●	●						
Application	Chipbreaker	Designation	Corner Radius	CERAMIC							
				K30G	KC30G	H70G	C60G				
Medium Cutting		DNGA150404	0.4	●	●	●	●				
		DNGA150408	0.8	●	●	●	●				

SN — Square 90° Negative with Hole

		P	Steel	●	●	●					
		M	Stainless								
		K	Cast Iron	●	●	●	●				
		N	Non-ferrous								
		S	Superalloys								
		H	Hard Materials	●	●						
Application	Chipbreaker	Designation	Corner Radius	CERAMIC							
				K30G	KC30G	H70G	C60G				
Medium Cutting		SNGA120404	0.4	●	●	●	●				
		SNGA120408	0.8	●	●	●	●				

TN	Triangular 60° Negative with Hole	P	Steel	●	●	●					
		M	Stainless								
		K	Cast Iron	●	●	●	●				
		N	Non-ferrous								
		S	Superalloys								
		H	Hard Materials	●	●						

Application	Chipbreaker	Designation	Corner Radius	CERAMIC							
				K30G	KC30G	H70G	C60G				
Medium Cutting		TNGA160404	0.4	●	●	●	●				
		TNGA160408	0.8	●	●	●	●				
		TNGA160412	1.2	●	●		●				

VN	Rhombic 35° Negative with Hole	P	Steel	●	●	●					
		M	Stainless								
		K	Cast Iron	●	●	●	●				
		N	Non-ferrous								
		S	Superalloys								
		H	Hard Materials	●	●						

Application	Chipbreaker	Designation	Corner Radius	CERAMIC							
				K30G	KC30G	H70G	C60G				
Medium Cutting		VNGA080404	0.4	●	●	●					
		VNGA080408	0.8	●	●	●					
		VNGA080412	1.2	●	●						

WN	Trigon 80° Negative with Hole	P	Steel	●	●	●					
		M	Stainless								
		K	Cast Iron	●	●	●	●				
		N	Non-ferrous								
		S	Superalloys								
		H	Hard Materials	●	●						

Application	Chipbreaker	Designation	Corner Radius	CERAMIC							
				K30G	KC30G	H70G	C60G				
Medium Cutting		WNGA080404	0.4	●	●	●					
		WNGA080408	0.8	●	●	●					
		WNGA080412	1.2	●	●						

Characteristics of Cubic Boron Nitride (CBN)

Cubic boron nitride (CBN) is an excellent tool material with high hardness, high heat resistance and high chemical inertness. It can be applied to difficult-to-machine materials such as hardened steel, cast iron, superalloy and powder metal. Due to its high temperature resistance, high hardness, strong cutting force and low friction coefficient, CBN inserts enable to produce workpieces with outstanding surface roughness and maintain long life, high efficiency and stable performance.

Grade	Application	Work Material
TBN3500	Heavy cutting	Excellent impact resistance and wear resistance: High nickel chrome High hardness alloy cast iron Grey cast iron High manganese steel
TBN7000	Semi-Finishing Finishing	Excellent overall performance with universal application: Grey cast iron Hardened cast iron Hardened steel over HRC45
TBS7000	Finishing	
TBN7200	Heavy cutting	Excellent wear resistance: Grey cast iron
TBS7200	Finishing	
TBN9500	Finishing	Hardened steel over HRC45
TBK7520	Finishing for continuous to light interrupted cutting	Grey cast iron Powder metallurgy
TBK9550	Finishing for continuous to light interrupted cutting	Bearing steel Carburized steel

CN											
Rhombic 80° Negative with Hole	P	Steel	●			●				
	M	Stainless								
	K	Cast Iron	●	●	●		●	●	●	
	N	Non-ferrous								
	S	Superalloys								
	H	Hard Materials		●		●	●		●	●

Application	Chipbreaker	Designation	Corner Radius	CBN							
				TBN3500	TBN7000	TBN7200	TBN9500	TBS7000	TBS7200	TBK7520	TBK9550
Medium Cutting		CNMN120404	0.4	●	●	●	●				
		CNMN120408	0.8	●	●	●	●				
		CNMN120412	1.2	●	●	●	●				
		CNGA120404-4T	0.4					●	●		
		CNGA120408-4T	0.8					●	●		
		CNGA120412-4T	1.2					●	●		
		CNGA160404-4T	0.4					●	●		
		CNGA160408-4T	0.8					●	●		
		CNGA160412-4T	1.2					●	●		
		CNGA120404-2S	0.4							●	●
		CNGA120408-2S	0.8							●	●
		CNGA120412-2S	1.2							●	●

SN											
Square90° Negative without Hole	P	Steel	●			●				
	M	Stainless								
	K	Cast Iron	●	●	●		●	●	●	
	N	Non-ferrous								
	S	Superalloys								
	H	Hard Materials		●		●	●		●	●

Application	Chipbreaker	Designation	Corner Radius	CBN							
				TBN3500	TBN7000	TBN7200	TBN9500	TBS7000	TBS7200	TBK7520	TBK9550
Medium Cutting		SNMN090304	0.4	●	●	●	●				
		SNMN090308	0.8	●	●	●	●				
		SNMN090312	1.2	●	●	●	●				
		SNMN120404	0.4	●	●	●	●				
		SNMN120408	0.8	●	●	●	●				

SN											
Square90° Negative with Hole	P	Steel	●			●				
	M	Stainless								
	K	Cast Iron	●	●	●		●	●	●	
	N	Non-ferrous								
	S	Superalloys								
	H	Hard Materials		●		●	●		●	●

Application	Chipbreaker	Designation	Corner Radius	CBN							
				TBN3500	TBN7000	TBN7200	TBN9500	TBS7000	TBS7200	TBK7520	TBK9550
Medium Cutting		SNGA120404-8T	0.4					●	●		
		SNGA120408-8T	0.8					●	●		
		SNGA120412-8T	1.2					●	●		
		SNGA120404-2S	0.4							●	●
		SNGA120408-2S	0.8							●	●
		SNGA120412-2S	1.2							●	●

TN											
Triangular 60° Negative with Hole	P	Steel	●			●				
	M	Stainless								
	K	Cast Iron	●	●	●		●	●	●	
	N	Non-ferrous								
	S	Superalloys								
	H	Hard Materials		●		●	●		●	●

Application	Chipbreaker	Designation	Corner Radius	CBN							
				TBN3500	TBN7000	TBN7200	TBN9500	TBS7000	TBS7200	TBK7520	TBK9550
Medium Cutting		TNGN110304	0.4	●	●	●	●				
		TNGN110308	0.8	●	●	●	●				
		TNGN110312	1.2	●	●	●	●				
		TNGN160404	0.4	●		●	●				
		TNGN160408	0.8	●		●	●				
		TNGN160412	1.2	●		●	●				
		TNGA160404-6T	0.4					●	●		
		TNGA160408-6T	0.8					●	●		
		TNGA160412-6T	1.2					●	●		
		TNGA160404-3S	0.4							●	●
		TNGA160408-3S	0.8							●	●
		TNGA160412-3S	1.2							●	●
		TNGA160416-3S	1.6							●	●

RN											
Round 90° Negative without Hole	P	Steel	●			●				
	M	Stainless								
	K	Cast Iron	●	●	●		●	●	●	
	N	Non-ferrous								
	S	Superalloys								
	H	Hard Materials		●		●	●		●	●

Application	Chipbreaker	Designation	Corner Radius	CBN							
				TBN3500	TBN7000	TBN7200	TBN9500	TBS7000	TBS7200	TBK7520	TBK9550
Medium Cutting		RNMN090300	-	●	●	●	●				
		RNMN120400	-	●	●	●	●				
		RNGN090300	-	●	●	●	●				
		RNGN120400	-	●	●	●	●				

WN											
Trigon 80° Negative with Hole	P	Steel	●			●				
	M	Stainless								
	K	Cast Iron	●	●	●		●	●	●	
	N	Non-ferrous								
	S	Superalloys								
	H	Hard Materials		●		●	●		●	●

Application	Chipbreaker	Designation	Corner Radius	CBN							
				TBN3500	TBN7000	TBN7200	TBN9500	TBS7000	TBS7200	TBK7520	TBK9550
Medium Cutting		WNMN080404	0.4	●	●	●	●				
		WNMN080408	0.8	●	●	●	●				
		WNMN080412	1.2	●	●	●	●				
		WNGA080404-6T	0.4					●	●		
		WNGA080408-6T	0.8					●	●		
		WNGA080412-6T	1.2					●	●		
		WNGA060404-3S	0.4							●	●
		WNGA060408-3S	0.8							●	●
		WNGA080404-3S	0.4							●	●
		WNGA080408-3S	0.8							●	●
		WNGA080412-3S	1.2							●	●

CC											
Rhombic 80° Positive 7° with Hole	P	Steel	●			●				
	M	Stainless								
	K	Cast Iron	●	●	●		●	●	●	
	N	Non-ferrous								
	S	Superalloys								
	H	Hard Materials		●		●	●		●	●

Application	Chipbreaker	Designation	Corner Radius	CBN							
				TBN3500	TBN7000	TBN7200	TBN9500	TBS7000	TBS7200	TBK7520	TBK9550
Medium Cutting		CCGW09T304-2T	0.4					●	●		
		CCGW09T308-2T	0.8					●	●		
		CCGW09T312-2T	1.2					●	●		
		CCGW120404-2T	0.4					●	●		
		CCGW120408-2T	0.8					●	●		
		CCGW120412-2T	1.2					●	●		
		CCGW09T304-2S	0.4							●	●
		CCGW09T308-2S	0.8							●	●
		CCGW09T312-2S	1.2							●	●
		CCGW120404-2S	0.4							●	●
		CCGW120408-2S	0.8							●	●
		CCGW120412-2S	1.2							●	●

DC											
Rhombic 55° Positive 7° with Hole	P	Steel	●			●				
	M	Stainless								
	K	Cast Iron	●	●	●		●	●	●	
	N	Non-ferrous								
	S	Superalloys								
	H	Hard Materials		●		●	●		●	●

Application	Chipbreaker	Designation	Corner Radius	CBN							
				TBN3500	TBN7000	TBN7200	TBN9500	TBS7000	TBS7200	TBK7520	TBK9550
Medium Cutting		DCGW11T304-2T	0.4					●	●		
		DCGW11T308-2T	0.8					●	●		
		DCGW11T312-2T	1.2					●	●		
		DCGW11T304-2S	0.4							●	●
		DCGW11T308-2S	0.8							●	●

TC — Triangular 60° / Positive 7° / with Hole

P	Steel
M	Stainless
K	Cast Iron
N	Non-ferrous
S	Superalloys
H	Hard Materials

Application	Chipbreaker	Designation	Corner Radius	CBN							
				TBN3500	TBN7000	TBN7200	TBN9500	TBS7000	TBS7200	TBK7520	TBK9550
Medium Cutting		TCGW110304-3T	0.4					●	●		
		TCGW110308-3T	0.8					●	●		
		TCGW110312-3T	1.2					●	●		

VB — Rhombic 35° / Positive 5° / with Hole

P	Steel
M	Stainless
K	Cast Iron
N	Non-ferrous
S	Superalloys
H	Hard Materials

Application	Chipbreaker	Designation	Corner Radius	CBN							
				TBN3500	TBN7000	TBN7200	TBN9500	TBS7000	TBS7200	TBK7520	TBK9550
Medium Cutting		VBGW160404-2T	0.4					●	●		
		VBGW160408-2T	0.8					●	●		
		VBGW160412-2T	1.2					●	●		
		VBGW160404-2S	0.4							●	●
		VBGW160408-2S	0.8							●	●
		VBGW160412-2S	1.2							●	●

VC — Rhombic 35° / Positive 7° / with Hole

P	Steel
M	Stainless
K	Cast Iron
N	Non-ferrous
S	Superalloys
H	Hard Materials

Application	Chipbreaker	Designation	Corner Radius	CBN							
				TBN3500	TBN7000	TBN7200	TBN9500	TBS7000	TBS7200	TBK7520	TBK9550
Medium Cutting		VCGW160404-2T	0.4					●	●		
		VCGW160408-2T	0.8					●	●		
		VCGW160412-2T	1.2					●	●		
		VCGW160404-2S	0.4							●	●
		VCGW160408-2S	0.8							●	●
		VCGW160412-2S	1.2							●	●

Polycrystalline Diamond (PCD)

diamond material is a synthetic diamond sintered under high temperatures and pressures. PCD (Polycrystalline diamond) is ideal for non-ferrous metals and non-metals.

- Applicable for non-ferrous metals, non-metals turning, milling and other various type of cutting.
- Long tool life due to extreme hardness.
- Capable of high cutting speeds which increases cutting productivity.
- Reduced edge build-up allows for high precision cutting.
- Diversified applications for cutting of non-ferrous materials and non-metals.

Grade	Workpiece Material	Advantages
DA100	Pure Aluminum	Good wear resistance and toughness, good grindability.
DA150	High-gloss Aluminum	Cutting edge strength, wear resistance, fracture resistance, good edge-sharpening performance and long, stable tool life.
DA200	Die-cast Aluminum	Superior abrasive wear resistance and toughness due to high density PCD with mixed rough and fine grains.
DC200	Carbon Fiber	Good edge-sharpening performance and long, stable tool life.

CN — Rhombic 80° Negative with Hole

P	Steel									
M	Stainless									
K	Cast Iron									
N	Non-ferrous	●	●	●	●					
S	Superalloys									
H	Hard Materials									

Application	Chipbreaker	Designation	Corner Radius	PCD							
				DA100	DA150	DA200	DC200				
Medium Cutting		CNGA120404	0.4	●	●	●	●				
		CNGA120408	0.8	●	●	●	●				
		CNGA120412	1.2	●	●	●	●				

DN — Rhombic 55° Negative with Hole

P	Steel									
M	Stainless									
K	Cast Iron									
N	Non-ferrous	●	●	●	●					
S	Superalloys									
H	Hard Materials									

Application	Chipbreaker	Designation	Corner Radius	PCD							
				DA100	DA150	DA200	DC200				
Medium Cutting		DNGA150404	0.4	●	●	●	●				
		DNGA150408	0.8	●	●	●	●				

SN — Square 90° Negative with Hole

P	Steel									
M	Stainless									
K	Cast Iron									
N	Non-ferrous	●	●	●	●					
S	Superalloys									
H	Hard Materials									

Application	Chipbreaker	Designation	Corner Radius	PCD							
				DA100	DA150	DA200	DC200				
Medium Cutting		SNGA120404	0.4	●	●	●	●				
		SNGA120408	0.8	●	●	●	●				

TN											
Triangular 60°	P	Steel									
Negative	M	Stainless									
with Hole	K	Cast Iron									
	N	Non-ferrous	●	●	●	●					
	S	Superalloys									
	H	Hard Materials									

Application	Chipbreaker	Designation	Corner Radius	PCD							
				DA100	DA150	DA200	DC200				
Medium Cutting		TNGA160404	0.4	●	●	●	●				
		TNGA160408	0.8	●	●	●	●				
		TNGA160412	1.2	●	●	●	●				

WN								
Trigon 80°	P	Steel						
Negative	M	Stainless						
with Hole	K	Cast Iron						
	N	Non-ferrous	●	●	●	●		
	S	Superalloys						
	H	Hard Materials						

Application	Chipbreaker	Designation	Corner Radius	PCD							
				DA100	DA150	DA200	DC200				
Medium Cutting		WNGA080404	0.4	●	●	●	●				
		WNGA080408	0.8	●	●	●	●				
		WNGA080412	1.2	●	●	●	●				

CC											
Rhombic 80°	P	Steel									
Positive 7°	M	Stainless									
with Hole	K	Cast Iron									
	N	Non-ferrous	●	●	●	●					
	S	Superalloys									
	H	Hard Materials									

Application	Chipbreaker	Designation	Corner Radius	PCD							
				DA100	DA150	DA200	DC200				
Finishing to Medium Cutting		CCGT060202	0.2	●	●	●	●				
		CCGT060204	0.4	●	●	●	●				
		CCGT060208	0.8	●	●	●	●				
		CCGT09T302	0.2	●	●	●	●				
		CCGT09T304	0.4	●	●	●	●				
		CCGT09T308	0.8	●	●	●	●				
		CCGT120402	0.2	●	●	●	●				
		CCGT120404	0.4	●	●	●	●				
		CCGT120408	0.8	●	●	●	●				
		CCGW060202	0.2	●	●	●	●				
		CCGW060204	0.4	●	●	●	●				
		CCGW060208	0.8	●	●	●	●				
		CCGW09T302	0.2	●	●	●	●				
		CCGW09T304	0.4	●	●	●	●				
		CCGW09T308	0.8	●	●	●	●				
		CCGW120402	0.2	●	●	●	●				
		CCGW120404	0.4	●	●	●	●				
		CCGW120408	0.8	●	●	●	●				

DC — Rhombic 55° / Positive 7° / with Hole

P	Steel										
M	Stainless										
K	Cast Iron										
N	Non-ferrous	●	●	●	●						
S	Superalloys										
H	Hard Materials										

Application	Chipbreaker	Designation	Corner Radius	PCD							
				DA100	DA150	DA200	DC200				
Finishing to Medium Cutting		DCGT070202	0.2	●	●	●	●				
		DCGT070204	0.4	●	●	●	●				
		DCGT070208	0.8	●	●	●	●				
		DCGT090202	0.2	●	●	●	●				
		DCGT090204	0.4	●	●	●	●				
		DCGT090208	0.8	●	●	●	●				
		DCGT11T302	0.2	●	●	●	●				
		DCGT11T304	0.4	●	●	●	●				
		DCGT11T308	0.8	●	●	●	●				
		DCGW070202	0.2	●	●	●	●				
		DCGW070204	0.4	●	●	●	●				
		DCGW070208	0.8	●	●	●	●				
		DCGW090202	0.2	●	●	●	●				
		DCGW090204	0.4	●	●	●	●				
		DCGW090208	0.8	●	●	●	●				
		DCGW11T302	0.2	●	●	●	●				
		DCGW11T304	0.4	●	●	●	●				
		DCGW11T308	0.8	●	●	●	●				

TC — Triangular 60° / Positive 7° / with Hole

P	Steel										
M	Stainless										
K	Cast Iron										
N	Non-ferrous	●	●	●	●						
S	Superalloys										
H	Hard Materials										

Application	Chipbreaker	Designation	Corner Radius	PCD							
				DA100	DA150	DA200	DC200				
Finishing to Medium Cutting		TCGT060202	0.2	●	●	●	●				
		TCGT060204	0.4	●	●	●	●				
		TCGT080202	0.2	●	●	●	●				
		TCGT080204	0.4	●	●	●	●				
		TCGT090202	0.2	●	●	●	●				
		TCGT090204	0.4	●	●	●	●				
		TCGT090208	0.8	●	●	●	●				
		TCGT110202	0.2	●	●	●	●				
		TCGT110204	0.4	●	●	●	●				
		TCGT110208	0.8	●	●	●	●				
		TCGT16T304	0.4	●	●	●	●				
		TCGT16T308	0.8	●	●	●	●				
		TCGT160404	0.4	●	●	●	●				
		TCGT160408	0.8	●	●	●	●				
		TCGT160412	1.2	●	●	●	●				
		TCGW060202	0.2	●	●	●	●				
		TCGW060204	0.4	●	●	●	●				
		TCGW080202	0.2	●	●	●	●				
		TCGW080204	0.4	●	●	●	●				
		TCGW090202	0.2	●	●	●	●				
		TCGW090204	0.4	●	●	●	●				
		TCGW090208	0.8	●	●	●	●				
		TCGW110202	0.2	●	●	●	●				
		TCGW110204	0.4	●	●	●	●				
		TCGW110208	0.8	●	●	●	●				
		TCGW16T304	0.4	●	●	●	●				
		TCGW16T308	0.8	●	●	●	●				
		TCGW160404	0.4	●	●	●	●				
		TCGW160408	0.8	●	●	●	●				
		TCGW160412	1.2	●	●	●	●				

TP — Triangular 60° / Positive 11° / with Hole

P	Steel									
M	Stainless									
K	Cast Iron									
N	Non-ferrous	●	●	●	●					
S	Superalloys									
H	Hard Materials									

Application	Chipbreaker	Designation	Corner Radius	PCD DA100	DA150	DA200	DC200				
Finishing to Medium Cutting		TPGH080202	0.2	●	●	●	●				
		TPGH080204	0.4	●	●	●	●				
		TPGH080208	0.8	●	●	●	●				
		TPGH090202	0.2	●	●	●	●				
		TPGH090204	0.4	●	●	●	●				
		TPGH090208	0.8	●	●	●	●				
		TPGH110302	0.2	●	●	●	●				
		TPGH110304	0.4	●	●	●	●				
		TPGH110308	0.8	●	●	●	●				
		TPGH160304	0.4	●	●	●	●				
		TPGW080202	0.2	●	●	●	●				
		TPGW080204	0.4	●	●	●	●				
		TPGW080208	0.8	●	●	●	●				
		TPGW090202	0.2	●	●	●	●				
		TPGW090204	0.4	●	●	●	●				
		TPGW090208	0.8	●	●	●	●				
		TPGW110302	0.2	●	●	●	●				
		TPGW110304	0.4	●	●	●	●				
		TPGW110308	0.8	●	●	●	●				
		TPGW160304	0.4	●	●	●	●				
		TPGW160308	0.8	●	●	●	●				

VB — Rhombic 35° / Positive 5° / with Hole

P	Steel									
M	Stainless									
K	Cast Iron	●	●	●	●					
N	Non-ferrous									
S	Superalloys									
H	Hard Materials									

Application	Chipbreaker	Designation	Corner Radius	PCD DA100	DA150	DA200	DC200				
Finishing to Medium Cutting		VBGT110302	0.2	●	●	●	●				
		VBGT110304	0.4	●	●	●	●				
		VBGT110308	0.8	●	●	●	●				
		VBGT160404	0.4	●	●	●	●				
		VBGT160408	0.8	●	●	●	●				
		VBGW110302	0.2	●	●	●	●				
		VBGW110304	0.4	●	●	●	●				
		VBGW110308	0.8	●	●	●	●				
		VBGW160404	0.4	●	●	●	●				
		VBGW160408	0.8	●	●	●	●				

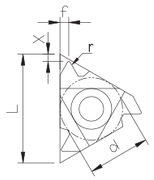
VC — Rhombic 35° / Positive 7° / with Hole

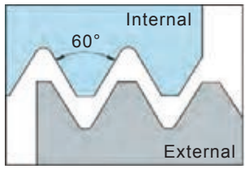
P	Steel									
M	Stainless									
K	Cast Iron									
N	Non-ferrous	●	●	●	●					
S	Superalloys									
H	Hard Materials									

Application	Chipbreaker	Designation	Corner Radius	PCD DA100	DA150	DA200	DC200				
Finishing to Medium Cutting		VCGT110302	0.2	●	●	●	●				
		VCGT110304	0.4	●	●	●	●				
		VCGT110308	0.8	●	●	●	●				
		VCGT160404	0.4	●	●	●	●				
		VCGT160408	0.8	●	●	●	●				
		VCGW110302	0.2	●	●	●	●				
		VCGW110304	0.4	●	●	●	●				
		VCGW110308	0.8	●	●	●	●				
		VCGW160404	0.4	●	●	●	●				
		VCGW160408	0.8	●	●	●	●				

Partial profile
60° thread angle

Grade:TG3225



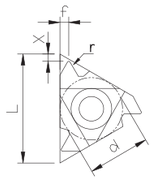


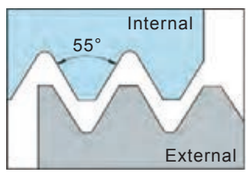
(mm)

Type	Order No.	Pitch	Dimension (mm)				
			L	X	f	r	d
External	16ERA60-TC	0.5-1.5	16	0.8	0.9	0.08	9.525
	16ERAG60-TC	0.5-3.0	16	1.1	1.5	0.08	9.525
	16ERG60-TC	1.75-3.0	16	1.2	1.7	0.25	9.525
	22ERN60-TC	3.5-5.0	22	1.7	2.5	0.51	12.7
Internal	11IRA60-TC	0.5-1.5	11	0.8	0.9	0.08	6.35
	16IRA60-TC	0.5-1.5	16	0.8	0.9	0.08	9.525
	16IRAG60-TC	0.5-3.0	16	1.1	1.5	0.08	9.525
	16IRG60-TC	1.75-3.0	16	1.2	1.7	0.13	9.525
	22IRN60-TC	3.5-5.0	22	1.7	2.5	0.25	12.7

Partial profile
55° thread angle

Grade:TG3225



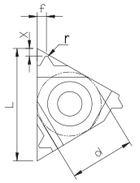


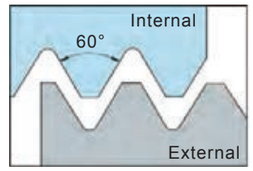
(mm)

Type	Order No.	Pitch	Dimension (mm)				
			L	X	f	r	d
External	16ERA55-TC	48-16	16	0.8	0.9	0.08	9.525
	16ERAG55-TC	48-8	16	1.1	1.5	0.08	9.525
	16ERG55-TC	14-8	16	1.2	1.7	0.21	9.525
	22ERN55-TC	7-5	22	1.7	2.5	0.44	12.7
Internal	11IRA55-TC	48-16	11	0.8	0.9	0.08	6.35
	16IRA55-TC	48-16	16	0.8	0.9	0.08	9.525
	16IRAG55-TC	48-8	16	1.1	1.5	0.08	9.525
	16IRG55-TC	14-8	16	1.2	1.7	0.21	9.525
	22IRN55-TC	7-5	22	1.7	2.5	0.44	12.7

Full profile
ISO Metric

Grade:TG3225



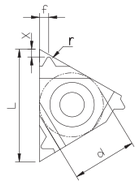


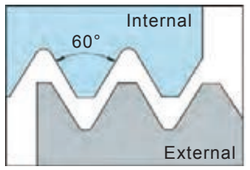
(mm)

Type	Order No.	Pitch	Dimension (mm)				
			L	X	f	r	d
External	16ER1.00ISO-TC	1	16	0.8	0.7	0.14	9.525
	16ER1.25ISO-TC	1.25	16	0.8	0.9	0.18	9.525
	16ER1.50ISO-TC	1.5	16	0.8	1	0.22	9.525
	16ER1.75ISO-TC	1.75	16	1.2	1.2	0.25	9.525
	16ER2.00ISO-TC	2	16	1.2	1.3	0.29	9.525
	16ER2.50ISO-TC	2.5	16	1.2	1.5	0.36	9.525
	16ER3.00ISO-TC	3	16	1.2	1.5	0.43	9.525
	22ER3.50ISO-TC	3.5	22	1.6	2.3	0.45	12.7
	22ER4.00ISO-TC	4	22	1.6	2.3	0.52	12.7
	22ER4.50ISO-TC	4.5	22	1.7	2.4	0.58	12.7
	22ER5.00ISO-TC	5	22	1.7	2.5	0.63	12.7
Internal	11IR1.00ISO-TC	1	11	0.8	0.7	0.07	6.35
	11IR1.25ISO-TC	1.25	11	0.8	0.9	0.09	6.35
	11IR1.50ISO-TC	1.5	11	0.8	1	0.11	6.35
	11IR1.75ISO-TC	1.75	11	0.9	1.1	0.13	6.35
	11IR2.00ISO-TC	2	11	0.9	1.1	0.15	6.35
	16IR1.00ISO-TC	1	16	0.8	0.7	0.07	9.525
	16IR1.25ISO-TC	1.25	16	0.8	0.9	0.09	9.525
	16IR1.50ISO-TC	1.5	16	0.8	1	0.11	9.525
	16IR1.75ISO-TC	1.75	16	1.2	1.2	0.13	9.525
	16IR2.00ISO-TC	2	16	1.2	1.3	0.15	9.525
	16IR2.50ISO-TC	2.5	16	1.2	1.5	0.18	9.525
	16IR3.00ISO-TC	3	16	1.2	1.5	0.22	9.525
	22IR3.50ISO-TC	3.5	22	1.6	2.3	0.22	12.7
	22IR4.00ISO-TC	4	22	1.6	2.3	0.25	12.7
	22IR4.50ISO-TC	4.5	22	1.6	2.4	0.28	12.7
	22IR5.00ISO-TC	5	22	1.6	2.3	0.32	12.7

Full profile
Unified

Grade:TG3225



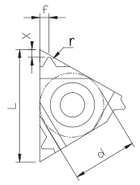


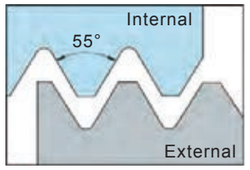
(mm)

Type	Order No.	Pitch	Dimension (mm)				
			L	X	f	r	d
External	16ER24UN-TC	24	16	0.8	0.8	0.15	9.525
	16ER20UN-TC	20	16	0.8	0.9	0.18	9.525
	16ER18UN-TC	18	16	0.8	1	0.2	9.525
	16ER16UN-TC	16	16	0.9	1.1	0.23	9.525
	16ER14UN-TC	14	16	1.2	1.5	0.26	9.525
	16ER12UN-TC	12	16	1.2	1.5	0.31	9.525
	16ER10UN-TC	10	16	1.2	1.5	0.37	9.525
	16ER8UN-TC	8	16	1.3	1.7	0.46	9.525
Internal	11IR20UN-TC	20	11	0.8	0.9	0.09	6.35
	11IR18UN-TC	18	11	0.8	1	0.1	6.35
	16IR24UN-TC	24	16	0.8	0.8	0.08	9.525
	16IR20UN-TC	20	16	0.8	0.9	0.09	9.525
	16IR18UN-TC	18	16	0.8	1	0.1	9.525
	16 IR16UN-TC	16	16	0.9	1.1	0.12	9.525
	16IR14UN-TC	14	16	1.2	1.5	0.13	9.525
	16IR12UN-TC	12	16	1.2	1.5	0.16	9.525
	16IR10UN-TC	10	16	1.2	1.5	0.19	9.525
	16IR8UN-TC	8	16	1.3	1.7	0.23	9.525

Full profile
Whitworth

Grade:TG3225





(mm)

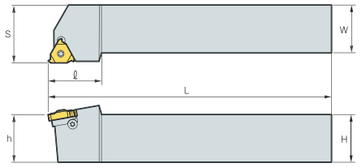
Type	Order No.	Pitch	Dimension (mm)				
			L	X	f	r	d
External	16ER19W-TC	19	16	0.8	1	0.17	9.525
	16ER14W-TC	14	16	1.2	1.5	0.24	9.525
	16ER11W-TC	11	16	1.2	1.5	0.3	9.525
Internal	16IR19W-TC	19	16	0.8	1	0.17	9.525
	16IR14W-TC	14	16	1.2	1.5	0.24	9.525
	16IR11W-TC	11	16	1.2	1.5	0.3	9.525

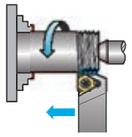
Standard Cutting Conditions

ISO	Workpiece Material		Vc(m/min
P	Non-Alloy steel	<0.25%C	120-230
		0.25%C- 0.55%C	100-195
		≥0.55%C	90-180
	Low Alloy Steel		60-180
	High Alloy Steel		70-140
M	Martensitic Stainless Steel		70-170
	Austenitic Stainless Steel		90-140
K	Grey Cast Iron		80-160
	Ductile Cast Iron		80-160
N	Cast Aluminum Alloy		100-500
	Aluminum Alloy		300-700
	Copper Alloy		80-300
S	Heat-resistance Alloy		10-50
	Titanium Alloy		50-70
H	Hardened Alloy	45-50 HRC	40-50
		51-55 HRC	30-50

External Threading Toolholders

SER
(Screw on system)





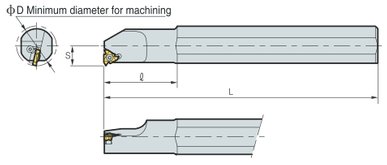
Righthand drawing

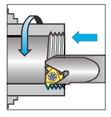
(mm)

Order No.	Dimension (mm)					Insert	Pin	Shim	Wrench	Screw
	H	W	S	L	h					
SER-1212H16	12	12	16	100	12	16ER..	ST3509	-	T15	-
SER-1616H16	16	16	20	100	16		ST3512	STM16	T15 L2.5	ST3006N
SER-2020K16	20	20	25	125	20					
SER-2525M16	25	25	32	150	25					
SER-3232P16	32	32	40	170	32					
SER-2525M22	25	25	32	150	25	22ER..	ST4016	STM22	T20 L3	ST4006N
SER-3232P22	32	32	40	170	32					

Internal Threading Bars

SNR
(Screw on system)





Righthand drawing

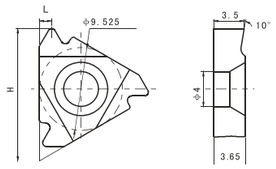
(mm)

Order No.	Dimension (mm)						Insert	Pin	Shim	Wrench	Screw
	D	d	L	S	H	l					
SNR-0008K11	11	8	125	5.5	7	20	11IR..	ST2508	-	T8	-
SNR-0010K11	13	10	125	6.5	9	22					
SNR-0012K11	15	12	125	7.5	11	26					
SNR-0016Q16	19	16	180	10	15	36	16IR..	ST3509	-	T15	-
SNR-0020R16	24	20	200	12	18	40		ST3512	STM16	T15 L2.5	ST3006N
SNR-0025R16	29	25	200	14.5	23	45					
SNR-0032T16	36	32	300	18.5	30	45					
SNR-0040T16	44	40	300	22	37	60					
SNR-0020R22	23	20	200	11.5	18	40	22IR..	ST4016	STM22	T20 L3	ST4006N
SNR-0025S22	31	25	250	16	23	45					
SNR-0032T22	38	32	300	19.5	30	45					
SNR-0040T22	46	40	300	24	37	60					

API tubing and cashing round threading > Standard triangle series round threading inserts

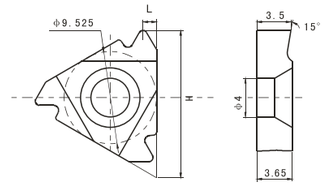
Grade	Introduce of use performance and application
0124	With good red-hardness and toughness, suitable for the high-effective threading machine tooling the dry steel, intermediate grade and high-grade steel (such as J55,K55, N80, L80 etc.) tubing, casing treading and connecting threading.
0326	With good high-intensity and red-hardness, meanwhile own excellent impact resistance. Suitable for the high-effective threading machine tooling the intermediate and high grade steel (such as N80. P110. etc.) tubing, casing and connecting threading.

External threading insert



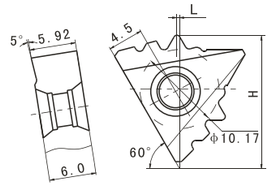
Ordering code	Teeth/inch	Taper	Thread form	H	L	Grade
16ER8API	8	1:16	API round tubing cashing thread	15.2	1.4	0124/0326
16ER10API	10	1:16	API round tubing cashing thread	15.2	1.2	0124/0326

Internal threading insert



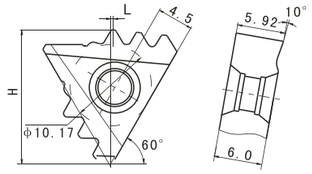
Ordering code	Teeth/inch	Taper	Thread form	H	L	Grade
16IR8API	8	1:16	API round tubing cashing thread	15.2	1.4	0124/0326
16IR10API	10	1:16	API round tubing cashing thread	15.2	1.2	0124/0326

API tubing and cashing round threading > Papilionaceous series round threading inserts
External threading insert

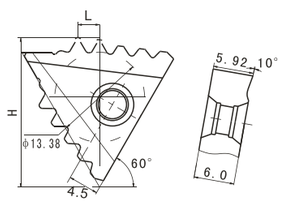


Ordering code	Teeth/inch	Taper	Thread form	H	L	Grade
B8W2-3(15°)	8	1:16	API round tubing thread	17.09	0.32	0124/0326
B8W2-3(12°)	8	1:16	API round casing thread	17.09	0.32	0124/0326
B10W2-4	10	1:16	API round tubing thread	17.09	0.32	0124/0326

Internal threading insert

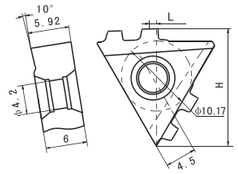


Ordering code	Teeth/inch	Taper	Thread form	H	L	Grade
B8N2-3	8	1:16	API round tubing cashing thread	17.09	0.32	0124/0326
B10N2-4	10	1:16	API round tubing thread	17.09	0.01	0124/0326



Ordering code	Teeth/inch	Taper	Thread form	H	L	Grade
B8N2-5	8	1:16	API round tubing cashing thread	21.84	3.24	0124/0326

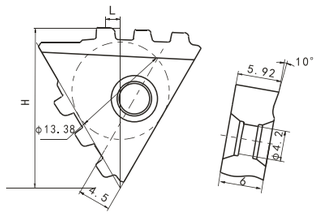
GOST buttress threading inserts for oil pipe
External threading insert



Ordering code	Teeth/inch	Taper	Thread form	H	L	Grade
E5BW2-2	5	1:16	OTTM 、OTTG	17.03	0.83	0124/0326

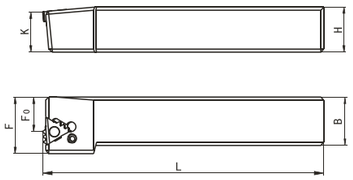
GOST buttress threading inserts for oil pipe

Internal threading insert



Ordering code	Teeth/inch	Taper	Thread form	H	L	Grade
E5BN2-3	5	1:16	OTTM 、OTTG	22.075	2.0	0124/0326

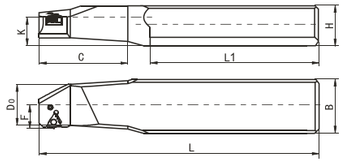
Tool shank for papilionaceous round external threading inserts



Type	Ordering code	Working range	Dimension							Machine tool
			L	H	K	B	F	F0	λ	
A	P10(8)W2-A28×25	$2\frac{3}{8}$"～$3\frac{1}{2}$"	175	28	25	30	35	22	70′	C620
	P10(8)W2-A35×32		175	35	32	35	40	27	70′	QK1312 Q1319 S1-344 S1-189
	P10(8)W2-A40×40		175	40	40	40	45	30	70′	
B	P10(8)W2-B35×32	4"～$5\frac{1}{2}$"	175	35	32	35	40	27	50′	
	P10(8)W2-B40×40		175	40	40	40	45	30	50′	
C	P10(8)W2-C35×32	$6\frac{5}{8}$"～$8\frac{5}{8}$"	175	35	32	35	40	27	30′	
	P10(8)W2-C40×40		175	40	40	40	45	30	30′	
D	P10(8)W2-D35×32	$9\frac{5}{8}$"～$13\frac{3}{8}$"	175	35	32	35	40	27	15′	
	P10(8)W2-D40×40		175	40	40	40	45	30	15′	

Accessory	Insert	Shim	Oblique rod	Lock screw	Wrench
Image					
Ordering code	B8W2-3H B10W2-4H	169.798	Φ4 Oblique rod	M6	S3

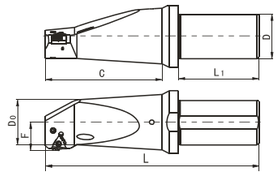
Square tool shank for papilionaceous round internal threading inserts



Type	Ordering code	Working range	Dimension									Machine tool
			L	L1	H	C	K	F	D0	B	λ	
A	P10(8)N2-AS40×25	$2\frac{3}{8}$"～$3\frac{1}{2}$"	275	150	40	100	25	26	42	65	70′	C620
	P10(8)N2-AS48×32		305	180	48	100	32	26	42	74	70′	QK1312 Q1319
	P10(8)N2-AS48×32(A1)	$2\frac{3}{8}$"	265	140	48	85	32	26.5	45	74	70′	-
	P10(8)N2-AS48×32(A2)	$2\frac{7}{8}$"～$3\frac{1}{2}$"	275	140	48	95	32	30.5	50	74	70′	-
B	P10(8)N2-BS48×32	4"～$5\frac{1}{2}$"	335	180	48	130	32	31	50	74	50′	QK1312 Q1319
	P10(8)N2-BS55×36		335	200	55	130	36	31	50	77	50′	S1-262 S1-245 QK1312 Q1319
C	P10(8)N2-CS48×32	$6\frac{5}{8}$"～$8\frac{5}{8}$"	358	180	48	158	32	36	56	74	30′	
	P10(8)N2-CS55×36		378	200	55	158	36	36	56	77	30′	S1-262 S1-245
D	P10(8)N2-DS55×36	$9\frac{5}{8}$"～$13\frac{3}{8}$"	395	200	55	175	36	43	60	81	15′	

Accessory	Insert	Shim	Oblique rod	Lock screw	Wrench
Image					
Ordering code	B8N2-3H B10N2-4H	169.523	Φ4 Oblique rod	M6	S3

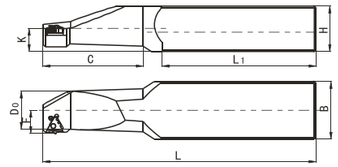
Round tool shank for papilionaceous round internal threading inserts



Type	Ordering code	Working range	Dimension							Machine tool
			L	L1	D	C	D0	F	λ	
A	P10(8)N2-AR40×80	$2\frac{3}{8}$"～$3\frac{1}{2}$"	205	80	40	100	42	26	70′	CK7815 CK7620
	P10(8)N2-AR50×90		215	90	50	100	42	26	70′	CK7832 CK3263A
	P10(8)N2-AR60×100		225	100	60	100	42	26	70′	CK7840
	P10(8)N2-AR80×140		265	140	80	100	42	26	70′	CK3263B
	P10(8)N2-AR60×140(A1)	$2\frac{3}{8}$"	265	140	60	85	45	26.5	70′	-
	P10(8)N2-AR60×140(A2)	$2\frac{7}{8}$"～$3\frac{1}{2}$"	275	140	60	95	50	30.5	70′	-
B	P10(8)N2-BR40×80	4"～$5\frac{1}{2}$"	235	80	40	130	50	31	50′	CK7815 CK7620
	P10(8)N2-BR50×90		245	90	50	130	50	31	50′	CK7832 CK3263A
	P10(8)N2-BR60×100		255	100	60	130	50	31	50′	CK7840
	P10(8)N2-BR80×140		295	140	80	130	50	31	50′	CK3263B
C	P10(8)N2-CR50×90	$6\frac{5}{8}$"～$8\frac{5}{8}$"	268	90	50	158	56	36	30′	CK7840
	P10(8)N2-CR60×100		278	100	60	158	56	36	30′	CK3263B
	P10(8)N2-CR80×140		318	140	80	158	56	36	30′	CK7832 CK3263A
D	P10(8)N2-DR60×100	$9\frac{5}{8}$"～$13\frac{3}{8}$"	295	100	60	175	60	43	15′	CK7840
	P10(8)N2-DR80×140		335	140	80	175	60	43	15′	CK3263B

Accessory	Insert	Shim	Oblique rod	Lock screw	Wrench
Image					
Ordering code	B8N2-3H B10N2-4H	169.523	Φ4 Oblique rod	M6	S3

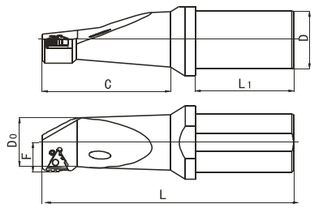
Square tool shank for papilionaceous buttress internal threading inserts



Type	Ordering code	Working range	Dimension									Machine tool
			L	L1	H	C	K	F	D0	B	λ	
B	P5BN2-BS48×32	4"～$5\frac{1}{2}$"	335	180	48	130	32	31	50	74	60′	S1-127 S1-344
	P5BN2-BS55×36		355	200	55	130	36	31	50	77	60′	S1-262 S1-245
C	P5BN2-CS48×32	$6\frac{5}{8}$"～$8\frac{5}{8}$"	358	180	48	158	32	36	56	74	40′	S1-127 S1-344
	P5BN2-CS55×36		378	200	55	158	36	36	56	77	40′	S1-245 S1-262
D	P5BN2-DS55×36	$9\frac{5}{8}$"～$13\frac{3}{8}$"	395	200	55	175	36	43	60	81	20′	

Accessory	Insert	Shim	Oblique rod	Lock screw	Wrench
Image					
Ordering code	B5BN2-3	169.973	Φ4 Oblique rod	M6	S3

Round tool shank for papilionaceous buttress internal threading inserts

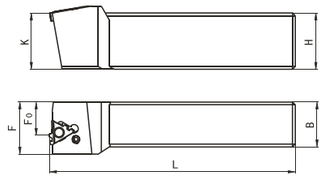


(mm)

Type	Ordering code	Working range	Dimension							Machine tool
			L	L1	D	C	D0	F	λ	
B	P5BN2-BR50×90	$4\frac{1}{2}$"~$6\frac{5}{8}$"	245	90	50	130	50	31	60′	CK7820 CK7832
	P5BN2-BR60×100		255	100	60	130	50	31	60′	CK7840 S1-181
	P5BN2-BR80×140		295	140	80	130	50	31	60′	CK3263
C	P5BN2-CR60×100	7"~$11\frac{3}{4}$"	283	100	60	158	56	36	40′	CK7820 CK7832
	P5BN2- CR80×140		323	140	80	158	56	36	40′	CK3263
D	P5BN2- DR60×100	$13\frac{3}{8}$"~20"	300	100	60	175	60	43	20′	CK7840 S1-181
	P5BN2- Dr80×140		340	140	80	175	60	43	20′	Ck3263

Accessory	Insert	Shim	Oblique rod	Lock screw	Wrench
Image					
Ordering code	B5BN2-3	169.973	Φ4 Oblique rod	M6	S3

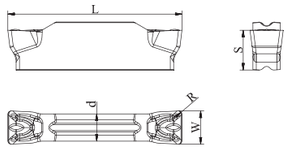
Tool shank for papilionaceous buttress external threading inserts



Type	Ordering code	Working range	Dimension							Machine tool
			L	H	K	B	F	F0	λ	
B	P5BW2-B35×32	4"~$5\frac{1}{2}$"	175	35	32	35	40	25	60′	QK1312 S1-245 S1-127
C	P5BW2-C35×32	$6\frac{5}{8}$"~$8\frac{5}{8}$"	175	35	32	35	40	25	40′	
D	P5BW2-D35×32	$9\frac{5}{8}$"~$13\frac{3}{8}$"	175	35	32	35	40	25	20′	

Accessory	Insert	Shim	Oblique rod	Lock screw	Wrench
Image					
Ordering code	B5BW2-2	169.798	Φ4 Oblique rod	M6	S3

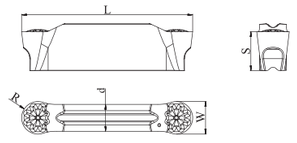
TKD-MT



Order No .	Dimension (mm)				
	W	R	L	d	S
TKD 2002 - MT	2	0.2	16	1.2	3.5
TKD 2502 - MT	2.5	0.2	18.5	2	3.85
TKD 3004 - MT	3	0.4	21.2	2.35	4.8
TKD 4004 - MT	4	0.4	21	3.3	4.8
TKD 5004 - MT	5	0.4	26	4.1	5.8
TKD 5008 - MT	5	0.8	26	4.1	5.8
TKD 6004 - MT	6	0.4	26	5	5.8
TKD 6008 - MT	6	0.8	26	5	5.8

Grade:TG4230
Woking Materials:Steel
Stainless Steel
Cast Iron

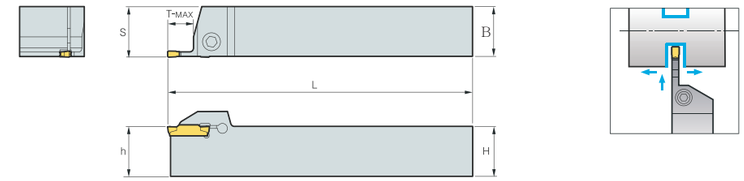
TKD-MR



Order No .	Dimension (mm)				
	W	R	L	d	S
TKD 2010 - MR	2	1	16	1.5	3.5
TKD 3015 - MR	3	1.5	21	2.35	4.8
TKD 4020 - MR	4	2	21	3.3	4.8
TKD 5025 - MR	5	2.5	26	4.1	5.8
TKD 6030 - MR	6	3	26	5	5.8

Grade:TG4230
Woking Materials:Steel
Stainless Steel
Cast Iron

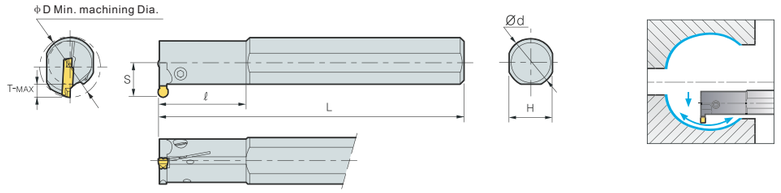
MGEHR/L



(mm)

Order No.	Dimension (mm)							Insert	Wrench	Screw
	W	T-MAX	H	B	L	S	h			
MGEHR/L1212-2.0	2	12	12	12	100	13	12	TKD20 ..MT TKD20 ..MR	L3	BHA0410
MGEHR/L1616-2.0	2	14	16	16	100	17	16		L5	BHA0616
MGEHR/L2020-2.0	2	14	20	20	125	21	20			
MGEHR/L2525-2.0	2	14	25	25	150	26	25			
MGEHR/L1616-2.5	2.5	16	16	16	100	17	16	TKD25 ..MT TKD25 ..MR		
MGEHR/L2020-2.5	2.5	16	20	20	125	21	20			
MGEHR/L2525-2.5	2.5	16	25	25	150	26	25			
MGEHR/L1212-3.0	3	16	12	12	100	13	12	TKD30 ..MT TKD30 ..MR	L3	BHA0410
MGEHR/L1616-3.0	3	18	16	16	100	17	16		L5	BHA0410
MGEHR/L2020-3.0	3	18	20	20	125	21	20			
MGEHR/L2525-3.0	3	18	25	25	150	26	25			
MGEHR/L3232-3.0	3	18	32	32	170	33	32			
MGEHR/L1616-4.0	4	18	16	16	100	17	16	TKD40 ..MT TKD40 ..MR		
MGEHR/L2020-4.0	4	18	20	20	125	21	20			
MGEHR/L2525-4.0	4	18	25	25	150	26	25			
MGEHR/L3232-4.0	4	18	32	32	170	33	32			
MGEHR/L2020-5.0	5	23	20	20	125	21	20	TKD50 ..MT TKD50 ..MR		
MGEHR/L2525-5.0	5	23	25	25	150	26	25			
MGEHR/L3232-5.0	5	23	32	32	170	33	32			
MGEHR/L2525-6.0	6	25	25	25	150	26	25	TKD60 ..MT TKD60 ..MR		
MGEHR/L3232-6.0	6	25	32	32	170	33	32			

MGIVR/L

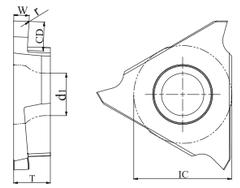


Order No.	Dimension (mm)								Insert	Wrench	Screw
	W	T-MAX	D	d	L	S	H	l			
MGIVR/L2016-2.0	2	4.5	20	16	125	12.4	15	35	TKD20..MT TKD20..MR	L3	BH0410
MGIVR/L2520-2.0	2	4.5	25	20	150	14	18	45		L4	BHA0512
MGIVR/L2925-2.0	2	4.5	29	25	200	17.2	23	45			BHA0516
MGIVR/L2016-2.5	2.5	4.5	20	16	125	12.5	15	35	TKD25..MT TKD25..MR	L3	BH0410
MGIVR/L2520-2.5	2.5	4.5	25	20	150	15.1	18	45		L4	BHA0512
MGIVR/L2925-2.5	2.5	4.5	29	25	200	18.2	23	45			BHA0516
MGIVR/L2520-3.0	3	5	25	20	150	15.6	18	45	TKD30..MT TKD30..MR	L4	BHA0512
MGIVR/L3125-3.0	3	6	31	25	200	18.9	23	45			BHA0516
MGIVR/L3732-3.0	3	6	37	32	250	21.5	30	60			
MGIVR/L2520-4.0	4	6	25	20	150	15.6	18	45	TKD40..MT TKD40..MR		BHA0512
MGIVR/L3125-4.0	4	6	31	25	200	18.9	23	45			BHA0516
MGIVR/L3732-4.0	4	6	37	32	250	21.5	30	60			
MGIVR/L3125-5.0	5	8	31	25	200	19.4	23	45	TKD50..MT TKD50..MR		
MGIVR/L3732-5.0	5	8	37	32	250	21.4	30	60			
MGIVR/L3125-6.0	6	8	31	25	200	19.4	23	45	TKD60..MT TKD60..MR		
MGIVR/L3732-6.0	6	8	37	32	250	21.4	30	60			

TKD Series Standard Cutting Conditions

ISO	Workpiece Material	Vc(m/min)	Grooving				Turning			
			Edge Width (mm)				Edge Width (mm)			
			2-3	4	5	6	2-3	4	5	6
			f(mm/min)				f(mm/min)			
P	Carbon Steel	80-200	0.05-0.15	0.10-0.20	0.15-0.25	0.15-0.30	0.10-0.25	0.10-0.30	0.15-0.30	0.20-0.35
P	Alloy Steel	70-180	0.05-0.15	0.10-0.20	0.15-0.25	0.15-0.30	0.10-0.25	0.10-0.30	0.15-0.30	0.20-0.35
M	Stainless Steel	60-150	0.05-0.15	0.10-0.20	0.15-0.25	0.15-0.30	0.10-0.25	0.10-0.30	0.15-0.30	0.20-0.35
K	Cast Iron	100-200	0.05-0.20	0.10-0.25	0.15-0.30	0.15-0.35	0.10-0.30	0.10-0.35	0.15-0.35	0.20-0.40

GB

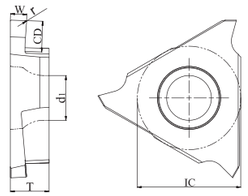


● : Stock ○: Non- Stock

Order No.	Dimension (mm)							
	W	CD	r	IC	T	d1	R	L
GB3075R/L-010	0.75	2.0	0.1	9.525	3.18	4.4	●	○
GB3080R/L-005	0.80		0.05	9.525	3.18	4.4	●	○
GB3095R/L-010	0.95		0.1	9.525	3.18	4.4	●	○
GB3100R/L-005	1.00		0.05	9.525	3.18	4.4	●	○
GB3100R/L-010	1.00		0.1	9.525	3.18	4.4	●	○
GB3120R/L-010	1.20		0.1	9.525	3.18	4.4	●	○
GB3120R/L-020	1.20		0.2	9.525	3.18	4.4	●	○
GB3125R/L-010	1.25		0.1	9.525	3.18	4.4	●	○
GB3140R/L-010	1.40		0.1	9.525	3.18	4.4	●	○
GB3140R/L-020	1.40		0.2	9.525	3.18	4.4	●	●
GB3150R/L-010	1.50		0.1	9.525	3.18	4.4	●	○
GB3150R/L-020	1.50		0.2	9.525	3.18	4.4	●	●
GB3175R/L-010	1.75		0.1	9.525	3.18	4.4	●	○
GB3200R/L-010	2.00	2.5	0.1	9.525	3.18	4.4	●	○
GB3200R/L-020	2.00		0.2	9.525	3.18	4.4	●	●
GB3250R/L-010	2.50		0.1	9.525	3.18	4.4	●	○
GB3250R/L-020	2.50		0.2	9.525	3.18	4.4	●	●
GB3300R/L-020	3.00		0.2	9.525	3.18	4.4	●	●
GB4125R/L-020	1.25	2.0	0.2	12.7	4.76	5.5	●	●
GB4150R/L-010	1.50	3.5	0.1	12.7	4.76	5.5	●	○
GB4150R/L-020	1.50		0.2	12.7	4.76	5.5	●	●
GB4175R/L-020	1.75		0.2	12.7	4.76	5.5	●	○
GB4185R/L-020	1.85		0.2	12.7	4.76	5.5	●	●
GB4200R/L-005	2.00		0.05	12.7	4.76	5.5	●	○
GB4200R/L-010	2.00		0.1	12.7	4.76	5.5	●	○
GB4200R/L-020	2.00		0.2	12.7	4.76	5.5	●	●
GB4200R/L-030	2.00		0.3	12.7	4.76	5.5	●	○
GB4200R/L-050	2.00		0.5	12.7	4.76	5.5	●	○
GB4250R/L-030	2.50	4.0	0.3	12.7	4.76	5.5	●	●
GB4265R/L-030	2.65		0.3	12.7	4.76	5.5	●	○
GB4280R/L-030	2.80		0.3	12.7	4.76	5.5	●	○
GB4300R/L-030	3.00		0.3	12.7	4.76	5.5	●	●
GB4330R/L-030	3.30	5.0	0.3	12.7	4.76	5.5	●	○
GB4350R/L-030	3.50		0.3	12.7	4.76	5.5	●	●
GB4400R/L-040	4.00		0.4	12.7	4.76	5.5	●	●
GB4430R/L-040	4.30		0.4	12.7	4.76	5.5	●	○

Grade:TG4230
Woking Materials:Steel
Stainless Steel
Cast Iron

GBR



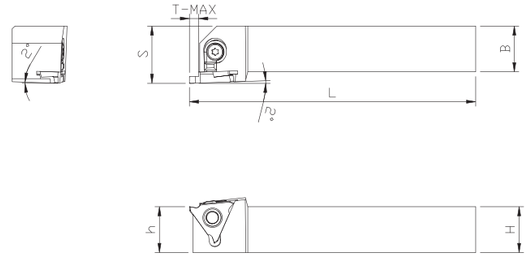
Order No.	Dimension (mm)							
	W	CD	r	IC	T	d1	R	L
GBR4100R/L-050	1.00	2.0	0.50	12.70	4.76	5.50	●	●
GBR4150R/L-075	1.50	3.5	0.75	12.70	4.76	5.50	●	●
GBR4200R/L-100	2.00	3.5	1.00	12.70	4.76	5.50	●	●
GBR4250R/L-125	2.50	4.0	1.25	12.70	4.76	5.50	●	●
GBR4300R/L-150	3.00	4.0	1.50	12.70	4.76	5.50	●	●
GBR4400R/L-200	4.00	5.0	2.00	12.70	4.76	5.50	●	●

Grade:TG4230
Woking Materials:Steel
Stainless Steel
Cast Iron

GB/GBR Series Standard Cutting Conditions

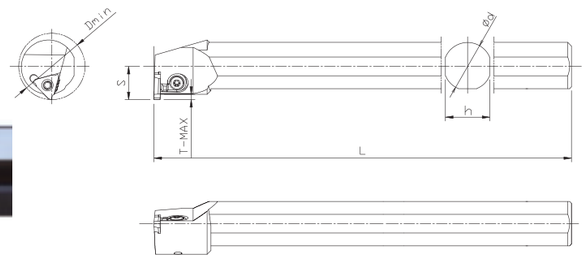
ISO	Workpiece Material	Vc(m/min)	Grooving					Turning				
			Edge Width (mm)					Edge Width (mm)				
			0.75-1.00	1.20-2.00	2.50-3.00	3.30-4.00	4.30	0.75-1.00	1.20-2.00	2.50-3.00	3.30-4.00	4.30
			f(mm/min)					f(mm/min)				
P	Carbon Steel	80-200	0.03-0.08	0.04-0.09	0.05-0.10	0.05-0.12	0.05-0.12	—	0.04-0.09	0.05-0.10	0.05-0.10	0.05-0.10
P	Alloy Steel	80-180	0.03-0.07	0.04-0.08	0.05-0.09	0.05-0.10	0.05-0.10	—	0.04-0.08	0.05-0.09	0.05-0.10	0.05-0.10
M	Stainless Steel	60-150	0.03-0.07	0.04-0.08	0.05-0.09	0.05-0.10	0.05-0.10	—	0.04-0.08	0.05-0.09	0.05-0.10	0.05-0.10
K	Cast Iron	80-180	0.03-0.08	0.04-0.09	0.05-0.10	0.05-0.12	0.05-0.12	—	0.04-0.09	0.05-0.10	0.05-0.10	0.05-0.10

GB Series External Toolholders



Order No.	Dimension (mm)						Insert	Wrench	Screw
	T-MAX	H	B	L	S	h			
GBER2020K3	2.5	20	20	125	25	20	GB3...	TT15P	SI60M 035120
GBER2525M3	2.5	25	25	150	30	25			
GBER2020K4-15	4.0	20	20	125	25	20	GB4/GBR4... (1.0≤W<2.5)	TT20P	SI60M 050120
GBER2525M4-15	4.0	25	25	150	30	25			
GBER2020K4-25	4.5	20	20	125	25	20	GB4/GBR4... (2.5≤W<3.3)		
GBER2525M4-25	4.5	25	25	150	30	25			
GBER2020K4-35	5.5	20	20	125	25	20	GB4/GBR4... (3.3≤W<4.8)		
GBER2525M4-35	5.5	25	25	150	30	25			

GB Series Internal Toolholders



Order No.	Dimension (mm)						Insert	Wrench	Screw
	T-MAX	Dmin	Φd	L	S	h			
GBIR/L2620Q3	3.0	26	20	180	13	18	GB3...	TT15P	SI60M
GBIR/L3525R4	4.5	35	25	200	17.5	23	GB4/GBR4...	TT20P	SI60M

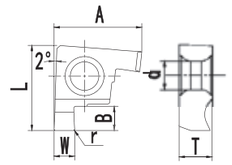
TGE Series Inserts for Grooving

Model	A(mm)	L(mm)	T(mm)	d(mm)
TGER**-A	6.69	6.50	2.58	2.5
TGER**-B	8.46	8.20	3.18	2.7
TGER**-C	5.80	11.48	4.05	2.8
TGER**-D	6.80	16.44	5.05	3.4
TGER**-E	9.54	21.66	5.55	4.4

● Good recommendation

Material Recommended

Grade	TG1225	
Steel	P	●
Stainless	M	●
Cast Iron	K	●



A、B Series Type

Insert	Order No.		Dimensions(mm)			Toolholders
	Right hand	Left hand	W	B	r	
	TGER050-A	TGEL050-A	0.50	1.2	0.05	SIGER/L0808A-EH SIGER/L0808A-WH
	TGER060-A	TGEL060-A	0.60	1.2	0.05	
	TGER070-A	TGEL070-A	0.70	1.2	0.05	
	TGER080-A	TGEL080-A	0.80	1.2	0.05	
	TGER100-A	TGEL100-A	1.00	1.5	0.05	
	TGER120-A	TGEL120-A	1.20	1.5	0.05	
	TGER125-A	TGEL125-A	1.25	1.5	0.05	
	TGER140-A	TGEL140-A	1.40	1.5	0.10	
	TGER150-A	TGEL150-A	1.50	1.5	0.10	
	TGER180-A	TGEL180-A	1.80	1.5	0.10	
	TGER200-A	TGEL200-A	2.00	1.5	0.10	
	TGER080-B	TGEL080-B	0.80	1.8	0.05	SIGER/L1010B-EH SIGER/L1010B-WH SIGER/L1210B-EH
	TGER100-B	TGEL100-B	1.00	2.2	0.05	
	TGER120-B	TGEL120-B	1.20	2.2	0.05	
	TGER125-B	TGEL125-B	1.25	2.2	0.05	
	TGER130-B	TGEL130-B	1.30	2.2	0.10	
	TGER145-B	TGEL145-B	1.45	2.2	0.10	
	TGER150-B	TGEL150-B	1.50	2.2	0.10	
	TGER180-B	TGEL180-B	1.80	2.2	0.10	
	TGER200-B	TGEL200-B	2.00	2.2	0.10	
	TGER225-B	TGEL225-B	2.25	2.2	0.10	
	TGER250-B	TGEL250-B	2.50	2.2	0.10	
	TGER280-B	TGEL280-B	2.80	2.2	0.20	
	TGER300-B	TGEL300-B	3.00	2.2	0.20	
	TGER100-C	TGEL100-C	1.00	2.5	0.05	SIGER/L1412C-EH SIGER/L1612C-EH SIGER/L1616C-EH
	TGER120-C	TGEL120-C	1.20	2.5	0.05	
	TGER125-C	TGEL125-C	1.25	2.5	0.05	
	TGER140-C	TGEL140-C	1.40	2.5	0.10	
	TGER145-C	TGEL145-C	1.45	2.5	0.10	
	TGER150-C	TGEL150-C	1.50	2.5	0.10	
	TGER160-C	TGEL160-C	1.60	2.5	0.10	
	TGER170-C	TGEL170-C	1.70	2.5	0.10	
	TGER185-C	TGEL185-C	1.85	2.5	0.10	
	TGER195-C	TGEL195-C	1.95	2.5	0.10	
	TGER200-C	TGEL200-C	2.00	2.5	0.10	
	TGER225-C	TGEL225-C	2.25	2.5	0.10	
	TGER250-C	TGEL250-C	2.50	2.5	0.20	
	TGER275-C	TGEL275-C	2.75	2.5	0.20	
	TGER280-C	TGEL280-C	2.80	2.5	0.20	
	TGER300-C	TGEL300-C	3.00	2.5	0.20	
	TGER320-C	TGEL320-C	3.20	2.5	0.20	
	TGER350-C	TGEL350-C	3.50	2.5	0.20	

Right-hand Insert for Right-hand Toolholder
Left-hand Insert for Left-hand Toolholder

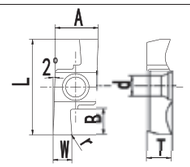
TGE Series Inserts for Grooving

Model	A(mm)	L(mm)	T(mm)	d(mm)
TGER**-A	6.69	6.50	2.58	2.5
TGER**-B	8.46	8.20	3.18	2.7
TGER**-C	5.80	11.48	4.05	2.8
TGER**-D	6.80	16.44	5.05	3.4
TGER**-E	9.54	21.66	5.55	4.4

● Good recommendation

Material Recommended

Grade	TG1225	
Steel	P	●
Stainless	M	●
Cast Iron	K	●



C、D、E Series Type

Insert	Order No.		Dimensions(mm)			Toolholders
	Right hand	Left hand	W	B	r	
	TGER100-D	TGEL100-D	1.00	2.5	0.05	SIGER/L2020D-EH SIGER/L2525D-EH
	TGER120-D	TGEL120-D	1.20	2.5	0.05	
	TGER125-D	TGEL125-D	1.25	2.5	0.05	
	TGER140-D	TGEL140-D	1.40	2.5	0.05	
	TGER145-D	TGEL145-D	1.45	2.5	0.10	
	TGER150-D	TGEL150-D	1.50	3.0	0.10	
	TGER170-D	TGEL170-D	1.70	3.0	0.10	
	TGER185-D	TGEL185-D	1.85	3.0	0.10	
	TGER195-D	TGEL195-D	1.95	3.0	0.10	
	TGER200-D	TGEL200-D	2.00	3.6	0.10	
	TGER225-D	TGEL225-D	2.25	3.6	0.10	
	TGER230-D	TGEL230-D	2.30	3.6	0.20	
	TGER250-D	TGEL250-D	2.50	3.6	0.20	
	TGER275-D	TGEL275-D	2.75	3.6	0.20	
	TGER280-D	TGEL280-D	2.80	4.5	0.20	
	TGER300-D	TGEL300-D	3.00	4.5	0.20	
	TGER320-D	TGEL320-D	3.20	4.5	0.20	
	TGER350-D	TGEL350-D	3.50	4.5	0.20	
	TGER400-D	TGEL400-D	4.00	4.5	0.20	
	TGER100-E	TGEL100-E	1.00	2.5	0.05	SIGER/L2525E-EH SIGER/L3232E-EH SIGER/L4032E-EH
	TGER150-E	TGEL150-E	1.50	3.0	0.10	
	TGER170-E	TGEL170-E	1.70	3.0	0.10	
	TGER185-E	TGEL185-E	1.85	3.0	0.10	
	TGER195-E	TGEL195-E	1.95	3.0	0.10	
	TGER200-E	TGEL200-E	2.00	3.2	0.10	
	TGER225-E	TGEL225-E	2.25	3.2	0.10	
	TGER230-E	TGEL230-E	2.30	3.2	0.20	
	TGER250-E	TGEL250-E	2.50	4.5	0.20	
	TGER275-E	TGEL275-E	2.75	4.5	0.20	
	TGER280-E	TGEL280-E	2.80	4.5	0.20	
	TGER300-E	TGEL300-E	3.00	4.5	0.20	
	TGER330-E	TGEL330-E	3.30	4.5	0.20	
	TGER350-E	TGEL350-E	3.50	5.5	0.20	
	TGER400-E	TGEL400-E	4.00	5.5	0.20	
	TGER430-E	TGEL430-E	4.30	5.5	0.20	
	TGER450-E	TGEL450-E	4.50	6.5	0.20	
	TGER460-E	TGEL460-E	4.60	6.5	0.20	
	TGER500-E	TGEL500-E	5.00	6.5	0.20	

Right-hand Insert for Right-hand Toolholder
Left-hand Insert for Left-hand Toolholder

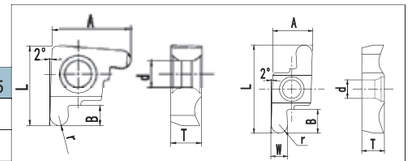
TGE Series Inserts for Grooving

Model	A(mm)	L(mm)	T(mm)	d(mm)
TGER**-A	6.69	6.5	2.58	2.5
TGER**-B	8.46	8.2	3.18	2.7
TGER**-C	5.8	11.48	4.05	2.8
TGER**-D	6.8	16.44	5.05	3.4
TGER**-E	9.54	21.66	5.55	4.4

● Good recommendation

Material Recommended

Grade	TG1225
Steel	P ●
Stainless	M ●
Cast Iron	K ●



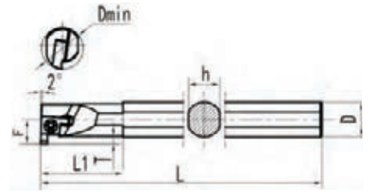
A、B Series Type

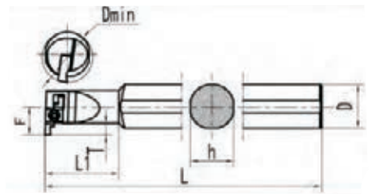
C、D、E Series Type

Insert	Order No.		Dimensions(mm)			Toolholders
	Right hand	Left hand	W	B	r	
	TGER100-050AR	TGEL100-050AR	1.0	1.5	0.50	SIGER/L0808A-EH SIGER/L0808A-WH
	TGER150-075AR	TGEL150-075AR	1.5	1.5	0.75	
	TGER200-100AR	TGEL200-100AR	2.0	1.5	1.00	
	TGER100-050BR	TGEL100-050BR	1.0	2.2	0.50	SIGER/L1010B-EH SIGER/L1010B-WH SIGER/L1210B-EH
	TGER150-075BR	TGEL150-075BR	1.5	2.2	0.75	
	TGER200-100BR	TGEL200-100BR	2.0	2.2	1.00	
	TGER250-125BR	TGEL250-125BR	2.5	2.2	1.25	
	TGER300-150BR	TGEL300-150BR	3.0	2.2	1.50	
	TGER100-050CR	TGEL100-050CR	1.0	2.5	0.50	SIGER/L1412C-EH SIGER/L1612C-EH SIGER/L1616C-EH
	TGER150-075CR	TGEL150-075CR	1.5	2.5	0.75	
	TGER200-100CR	TGEL200-100CR	2.0	2.5	1.00	
	TGER250-125CR	TGEL250-125CR	2.5	2.5	1.25	
	TGER300-150CR	TGEL300-150CR	3.0	2.5	1.50	
	TGER150-075DR	TGEL150-075DR	1.5	3.2	0.75	SIGER/L2020D-EH SIGER/L2525D-EH
	TGER200-100DR	TGEL200-100DR	2.0	3.2	1.00	
	TGER250-125DR	TGEL250-125DR	2.5	4.5	1.25	
	TGER300-150DR	TGEL300-150DR	3.0	4.5	1.50	
	TGER250-125ER	TGEL250-125ER	2.5	5.5	1.25	SIGER/L2525E-EH SIGER/L3232E-EH SIGER/L4032E-EH
	TGER300-150ER	TGEL300-150ER	3.0	5.5	1.50	
	TGER350-175ER	TGEL350-175ER	3.5	5.5	1.75	
	TGER400-200ER	TGEL400-200ER	4.0	6.5	2.00	
	TGER450-225ER	TGEL450-225ER	4.5	6.5	2.25	
	TGER500-250ER	TGEL500-250ER	5.0	6.5	2.50	

Right-hand Insert for Right-hand Toolholder
Left-hand Insert for Left-hand Toolholder

TGE Series Toolholders for Grooving





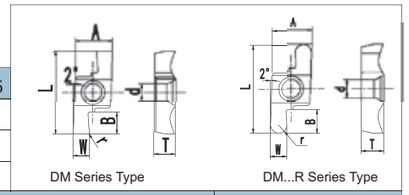
Order No.	Insert	Dimensions (mm)							Insert Screw	Torx Key
		Dmin	T	L1	D	F	h	L		
SIGER0808A-EH	TGER**-A TGER**-AR	8	1.5	20	8	4.8	7.2	100	L60M225	T6
SIGER0808A-WH		8		20	8	4.8	7.2	100		
SIGER1010B-EH	TGER**-B TGER**-BR	10	2.2	25	10	6.2	9.0	125	L60M256	T8
SIGER1010B-WH		10		25	10	6.2	9.0	125		
SIGER1210B-EH		12		30	10	7.0	9.0	125		
SIGER1412C-EH	TGER**-C TGER**-CR	14	2.5	33	12	8.0	11.4	150	L60M256	T8
SIGER1612C-EH		16		20	12	8.5	11.4	150		
SIGER1616C-EH		16		36	16	9.0	15.0	160		
SIGER2020D-EH	TGER**-D TGER**-DR	20	4.5	40	20	12.1	19.0	180	L60M38	T10
SIGER2525D-EH		25	4.2	45	25	12.3	24.0	200		
SIGER2525E-EH	TGER**-E TGER**-ER	25	6.5	45	25	15.6	24.0	200	L60M485	T15
SIGER3232E-EH		32		55	32	19.0	30.4	220		
SIGER4032E-EH		40		45	32	23.0	30.4	250		
SIGEL0808A-EH	TGEL**-A TGEL**AR	8	1.5	20	8	4.8	7.2	100	L60M225	T6
SIGEL0808A-WH		8		20	8	4.8	7.2	100		
SIGEL1010B-EH	TGEL**-B TGEL**-BR	10	2.2	25	10	6.2	9.0	125	L60M256	T8
SIGEL1010B-WH		10		25	10	6.2	9.0	125		
SIGEL1210B-EH		12		30	10	7.0	9.0	125		
SIGEL1412C-EH	TGEL**-C TGEL**-CR	14	2.5	33	12	8.0	11.4	150	L60M256	T8
SIGEL1612C-EH		16		20	12	8.5	11.4	150		
SIGEL1616C-EH		16		36	16	9.0	15.0	160		
SIGEL2020D-EH	TGEL**-D TGEL**-DR	20	4.5	40	20	12.1	19.0	180	L60M38	T10
SIGEL2525D-EH		25	4.2	45	25	12.3	24.0	200		
SIGEL2525E-EH	TGEL**-E TGEL**-ER	25	6.5	45	25	15.6	24.0	200	L60M485	T15
SIGEL3232E-EH		32		55	32	19.0	30.4	220		
SIGEL4032E-EH		40		45	32	23.0	30.4	250		

TGE Series Inserts for Face Grooving

Model	A(mm)	L(mm)	T(mm)	d(mm)
TGER**-D	6. 8	16. 44	5. 05	3. 4

● Good recommendation

Material Recommended	Grade	TG1225
	Steel	P ●
	Stainless	M ●
	Cast Iron	K ●

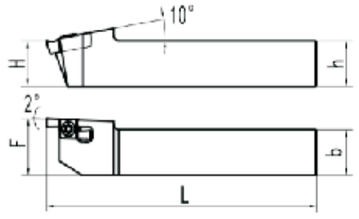


DM Series Type

DM...R Series Type

Insert	Order No.	External Dia. of the Groove	Dimensions (mm)			Toolholders
			W	B	r	
	TGER200DM10-D	>10mm	2.0	3.5	0.20	SEGEL1010H-D SEGEL1212H-D SEGEL1616K-D SEGEL2020K-D SEGEL2525M-D
	TGER250DM15-D	>15mm	2.5	4.5	0.20	
	TGER300DM15-D	>15mm	3.0	4.5	0.20	
	TGER400DM15-D	>15mm	4.0	4.5	0.20	
	TGER200DM10R100-D	>10mm	2.0	3.5	1.00	
	TGER250DM15R125-D	>15mm	2.5	4.5	1.25	
	TGER300DM15R150-D	>15mm	3.0	4.5	1.50	
	TGER400DM15R200-D	>15mm	4.0	4.5	2.00	

TGE Series Toolholders for Face Grooving



Order No.	Insert Type	Dimensions(mm)					Insert Screw	Torx Key
		h	b	L	F	H		
SEGEL1010K-D	TGER**-D	10	10	125	10	10	L60M310	T10
SEGEL1212K-D		12	12	125	12	12		
SEGEL1616H-D		16	16	100	20	16		
SEGEL2020K-D		20	20	125	25	20		
SEGEL2525M-D		25	25	150	32	25		

TGER/L...A(R),TGER/L...B(R) Series

ISO	Workpiece material	Vc(m/min)	Grooving			Turning		
			TGER/L050-200A	TGER/L080-200B	TGER/L225-200B	TGER/L050-200A	TGER/L080-200B	TGER/L225-200B
			TGER/L100-200AR	TGER/L100-200BR	TGER/L250-300BR	TGER/L100-200AR	TGER/L100-200BR	TGER/L250-300BR
			f(mm/min)			f(mm/min)		
P	Carbon Steel	50-80	0.01-0.03	0.02-0.04	0.02-0.04	0.01-0.03	0.02-0.04	0.02-0.04
	Alloy Steel	50-80	0.01-0.03	0.02-0.04	0.02-0.04	0.01-0.03	0.02-0.04	0.02-0.04
M	Stainless Steel	50-80	0.01-0.03	0.01-0.03	0.01-0.03	0.01-0.03	0.01-0.03	0.01-0.03
K	Cast Iron	50-80	0.01-0.03	0.02-0.04	0.02-0.04	0.01-0.03	0.02-0.04	0.02-0.04

TGER/L...C(R),TGER/L...D(R) ,TGER/L...E(R) Series

ISO	Workpiece material	Vc(m/min)	Grooving						
			TGER/L100-200C	TGER/L225-350C	TGER/L200-280D	TGER/L250-330E(R)	TGER/L300-400D	TGER/L350-430E(R)	TGER/L450-500E(R)
			TGER/L100-200CR	TGER/L250-300CR	TGER/L150-200DR	–	TGER/L300DR	–	–
			TGER/L100-145D	TGER/L150-195D	TGER/L200-230E(R)	–	–	–	–
			TGER/L100E(R)	TGER/L150-195E(R)	–	–	–	–	–
			f(mm/min)						
P	Carbon Steel	60-140	0.03-0.08	0.03-0.08	0.04-0.09	0.04-0.09	0.05-0.12	0.05-0.12	0.05-0.12
	Alloy Steel	60-120	0.03-0.07	0.03-0.07	0.04-0.08	0.04-0.08	0.05-0.10	0.05-0.10	0.05-0.10
M	Stainless Steel	60-110	0.03-0.07	0.03-0.07	0.04-0.08	0.04-0.08	0.05-0.10	0.05-0.10	0.05-0.10
K	Cast Iron	60-100	0.03-0.08	0.03-0.08	0.04-0.09	0.04-0.09	0.05-0.12	0.05-0.12	0.05-0.12
ISO	Workpiece material	Vc(m/min)	Turning						
			TGER/L100-200C	TGER/L225-350C	TGER/L200-280D	TGER/L250-330E(R)	TGER/L300-400D	TGER/L350-430E(R)	TGER/L450-500E(R)
			TGER/L100-200CR	TGER/L250-300CR	TGER/L150-200DR	–	TGER/L300DR	–	–
			TGER/L100-145D	TGER/L150-195D	TGER/L200-230E(R)	–	–	–	–
			TGER/L100E(R)	TGER/L150-195E(R)	–	–	–	–	–
			f(mm/min)						
P	Carbon Steel	60-140	0.03-0.08	0.03-0.08	0.04-0.09	0.04-0.09	0.05-0.10	0.05-0.10	0.05-0.10
	Alloy Steel	60-120	0.03-0.10	0.03-0.10	0.04-0.08	0.04-0.08	0.05-0.10	0.05-0.10	0.05-0.10
M	Stainless Steel	60-110	0.03-0.10	0.03-0.10	0.04-0.08	0.04-0.08	0.05-0.10	0.05-0.10	0.05-0.10
K	Cast Iron	60-100	0.03-0.08	0.03-0.08	0.04-0.09	0.04-0.09	0.05-0.10	0.05-0.10	0.05-0.10

TGER...DM Series

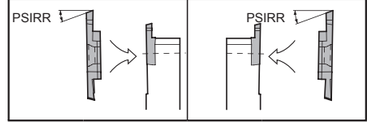
ISO	Workpiece Material	Vc(m/min)	Grooving			Turning		
			TGER200DM	TGER250DM	TGER300-400DM	TGER200DM	TGER250DM	TGER300-400DM
			f(mm/min)			f(mm/min)		
P	Carbon Steel	60-160	0.03-0.10	0.04-0.12	0.05-0.12	0.03-0.10	0.04-0.10	0.05-0.10
	Alloy Steel	60-140	0.03-0.10	0.04-0.12	0.05-0.12	0.03-0.10	0.04-0.10	0.05-0.10
M	Stainless Steel	60-110	0.03-0.08	0.04-0.08	0.05-0.10	0.03-0.10	0.04-0.10	0.05-0.10
K	Cast Iron	60-100	0.03-0.10	0.04-0.12	0.05-0.12	0.03-0.10	0.04-0.10	0.05-0.10

Inserts Identification System

TTF 12 R 050 – S – 16 R

Insert Type	Insert Size	Insert Hand: R : Right-hand, L : Left-hand	Edge Width
Name of Chipbreaker: S : S Chipbreaker, NB : Without Chipbreaker	Lead Angle (PSIRR)	Hand of Lead Angle: R : Right-hand	

Toolholder	Right-hand	Toolholder	Left-hand
Insert	Right-hand	Insert	Left-hand
Lead Angle	Right-hand	Lead Angle	Right-hand



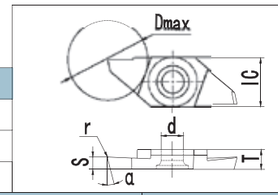
TTF Series Inserts for Parting-off

Model	IC(mm)	T(mm)	d(mm)
TTF12**	8.7	3	5
TTF16**	9.5	4	5

● Good recommendation

Material Recommended

Grade	TG1225
Steel P	●
Stainless M	●
Cast Iron K	●



Insert	Order No.		Dimensions(mm)				Toolholders
	Right hand	Left hand	W	α	Dmax	r	
	TTF12R050-S	TTF12L050-S	0.5	0	5	0.05	
	TTF12R070-S	TTF12L070-S	0.7	0	8	0.05	
	TTF12R100-S	TTF12L100-S	1.0	0	12	0.08	
	TTF12R150-S	TTF12L150-S	1.5	0	12	0.08	
	TTF12R200-S	TTF12L200-S	2.0	0	12	0.08	KTKFR/L1010K-12
	TTF12R050-S-16R	TTF12L050-S-16R	0.5	16	5	0.05	KTKFR/L1212K-12
	TTF12R070-S-16R	TTF12L070-S-16R	0.7	16	8	0.05	KTKFR/L1212M-12
	TTF12R100-S-16R	TTF12L100-S-16R	1.0	16	12	0.08	KTKFR/L1616M-12
	TTF12R150-S-16R	TTF12L150-S-16R	1.5	16	12	0.08	KTKFR/L2020M-12
	TTF12R200-S-16R	TTF12L200-S-16R	2.0	16	12	0.08	KTKFR/L2525M-12
	TTF12R050-NB	TTF12L050-NB	0.5	0	5	0.05	
	TTF12R070-NB	TTF12L070-NB	0.7	0	8	0.05	
	TTF12R100-NB	TTF12L100-NB	1.0	0	12	0.08	
	TTF12R150-NB	TTF12L150-NB	1.5	0	12	0.08	
	TTF12R200-NB	TTF12L200-NB	2.0	0	12	0.08	
	TTF12R050-NB-20R	TTF12L050-NB-20R	0.5	20	5	0.05	
	TTF12R070-NB-20R	TTF12L070-NB-20R	0.7	20	8	0.05	
	TTF12R100-NB-20R	TFK12L100-NB-20R	1.0	20	12	0.08	
	TTF12R150-NB-20R	TTF12L150-NB-20R	1.5	20	12	0.08	
	TTF12R200-NB-20R	TTF12L200-NB-20R	2.0	20	12	0.08	
	TTF16R100-S	TTF16L100-S	1.0	0	16	0.08	
	TTF16R150-S	TTF16L150-S	1.5	0	16	0.10	KTKFR/L1010K-16
	TTF16R200-S	TTF16L200-S	2.0	0	16	0.10	KTKFR/L1212K-16
	TTF16R250-S	TTF16L250-S	2.5	0	16	0.10	KTKFR/L1212M-16
	TTF16R300-S	TTF16L300-S	3.0	0	16	0.15	KTKFR/L1616M-16
	TTF16R100-S-16R	TTF16L100-S-16R	1.0	16	16	0.08	KTKFR/L2020M-16
	TTF16R150-S-16R	TTF16L150-S-16R	1.5	16	16	0.10	KTKFR/L2525M-16
	TTF16R200-S-16R	TTF16L200-S-16R	2.0	16	16	0.10	
	TTF16R250-S-16R	TTF16L250-S-16R	2.5	16	16	0.10	
	TTF16R300-S-16R	TTF16L300-S-16R	3.0	16	16	0.15	

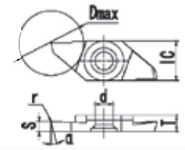
Right-hand Insert for Right-hand Toolholder
Left-hand Insert for Left-hand Toolholder

Model	IC(mm)	T(mm)	d(mm)
TTF12**	8.7	3	5
TTF16**	9.5	4	5

● Good recommendation

Material Recommended

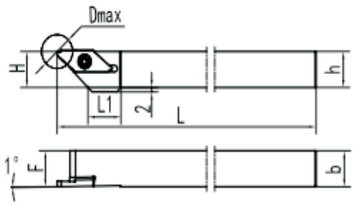
Grade	TG1225
Steel P	●
Stainless M	●
Cast Iron K	●



Insert	Order No.		Dimensions(mm)				Toolholders
	Right hand	Left hand	W	α	Dmax	r	
	TTF16R100-NB	TTF16L100-NB	1.0	0	16	0.08	
	TTF16R150-NB	TTF16L150-NB	1.5	0	16	0.10	
	TTF16R200-NB	TTF16L200-NB	2.0	0	16	0.10	KTKFR/L1010K-16
	TTF16R250-NB	TTF16L250-NB	2.5	0	16	0.10	KTKFR/L1212K-16
	TTF16R300-NB	TTF16L300-NB	3.0	0	16	0.15	KTKFR/L1212M-16
	TTF16R100-NB-20R	TTF16L100-NB-20R	1.0	20	16	0.08	KTKFR/L1616M-16
	TTF16R150-NB-20R	TTF16L150-NB-20R	1.5	20	16	0.10	KTKFR/L2020M-16
	TTF16R200-NB-20R	TTF16L200-NB-20R	2.0	20	16	0.10	KTKFR/L2525M-16
	TTF16R250-NB-20R	TTF16L250-NB-20R	2.5	20	16	0.10	
	TTF16R300-NB-20R	TTF16L300-NB-20R	3.0	20	16	0.15	

Right-hand Insert for Right-hand Toolholder
Left-hand Insert for Left-hand Toolholder

TTF Series Toolholders for Parting-off



Order No.	Insert	Dimensions(mm)							Insert Screw	Torx Key
		h	b	H	F	L	Dmax	L1		
KTKFR1010K-12	TTF12R**	10	10	10	10	125	12	15	L60M410	T15
KTKFR1212K-12		12	12	12	12			—		
KTKFR1212M-12		12	12	12	12	150				
KTKFR1616M-12		16	16	16	16					
KTKFR2020M-12		20	20	20	20					
KTKFR2525M-12		25	25	25	25					
KTKFR1010K-16	TTF16R**	10	10	10	10	125	16	20	L60M410	T15
KTKFR1212K-16		12	12	12	12			—		
KTKFR1212M-16		12	12	12	12	150				
KTKFR1616M-16		16	16	16	16					
KTKFR2020M-16		20	20	20	20					
KTKFR2525M-16		25	25	25	25					
KTKFL1010K-12	TTF12L**	10	10	10	10	125	12	15	L60M410	T15
KTKFL1212K-12		12	12	12	12			—		
KTKFL1212M-12		12	12	12	12	150				
KTKFL1616M-12		16	16	16	16					
KTKFL2020M-12		20	20	20	20					
KTKFL2525M-12		25	25	25	25					
KTKFL1010K-16	TTF16L**	10	10	10	10	125	16	20	L60M410	T15
KTKFL1212K-16		12	12	12	12			—		
KTKFL1212M-16		12	12	12	12	150				
KTKFL1616M-16		16	16	16	16					
KTKFL2020M-16		20	20	20	20					
KTKFL2525M-16		25	25	25	25					

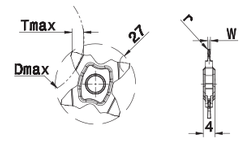
TTF Series Standard Cutting Conditions

ISO	Workpiece Material	Vc(m/min)	TTF12					TTF16				
			Edge Width （mm）					Edge Width （mm）				
			0.5	0.7	1.0	1.5	2.0	1.0	1.5	2.0	2.5	3.0
			f(mm/min)					f(mm/min)				
P	Carbon Steel	70-150	0.01-0.02	0.01-0.03	0.01-0.04	0.01-0.04	0.01-0.04	0.01-0.06	0.02-0.07	0.02-0.07	0.02-0.07	0.02-0.08
P	Alloy Steel	70-150	0.01-0.02	0.01-0.03	0.01-0.04	0.01-0.04	0.01-0.04	0.01-0.06	0.02-0.07	0.02-0.07	0.02-0.07	0.02-0.08
M	Stainless Steel	60-120	0.01-0.02	0.01-0.02	0.01-0.02	0.01-0.02	0.01-0.02	0.01-0.03	0.01-0.04	0.01-0.04	0.01-0.04	0.01-0.05
K	Cast Iron	50-100	0.01-0.03	0.01-0.04	0.010.05	0.01-0.05	0.01-0.05	0.01-0.07	0.02-0.08	0.02-0.08	0.02-0.08	0.02-0.08

TTS27 Series for Inserts

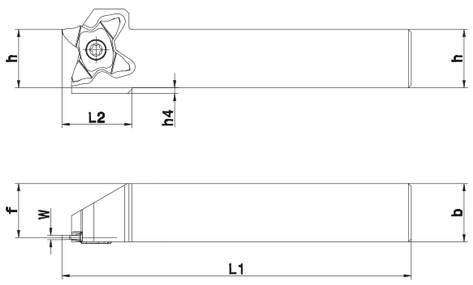
Material Recommended	Grade	TG1230
	Steel	P ●
	Stainless	M ●
	Cast Iron	K ●

● Good recommendation



Insert	Order No.	Dimensions (mm)												Toolholder
		W	r	Tmax	Dmax									
					T≤3.0	T≤3.5	T≤4.0	T≤4.5	T≤5.0	T≤5.5	T≤5.7	T≤6.0	T≤6.2	T≤6.4	
	TTS27-1.00-0.10	1.0	0.1	3.5	∞	600	–	–	–	–	–	–	–	–	TQHR..-27
	TTS27-1.50-0.20	1.5	0.2	5.7	∞	600	280	180	130	50	35	–	–	–	
	TTS27-2.00-0.20	2.0	0.2	6.4	∞	600	280	180	130	105	85	60	50	30	
	TTS27-2.50-0.20	2.5	0.2	5.7	∞	600	280	180	130	50	35	–	–	–	
	TTS27-3.00-0.20	3.0	0.2	6.4	∞	600	280	180	135	105	95	85	78	55	

TTS27 Series for Toolholders



Order No.	Insert	Dimensions (mm)							Insert Screw	Torx Key
		h	b	W	f	l1	l2	h4		
TQHR10-27	TTS27-**	10	10	0.5≤W≤5.3	8.5	120	24	9	BFTX5012	TRX20
TQHR12-27		12	12	0.5≤W≤5.3	10.5	120	24	8		
TQHR16-27		16	16	0.5≤W≤5.3	14.5	120	24	6		
TQHR20-27		20	20	0.5≤W≤5.3	18.5	120	24	2		
TQHR25-27		25	25	0.5≤W≤5.3	23.5	135	-	-		

TTS27 Series Standard Cutting Conditions

ISO	Workpiece Material		Vc(m/min
P	Non-Alloy steel	<0.25%C	110-200
		0.25%C- 0.55%C	70-180
		≥ 0.55%C	60-180
	Low Alloy Steel		80-180
	High Alloy Steel		60-140
M	Martensitic Stainless Steel		120-180
	Austenitic Stainless Steel		70-140
K	Grey Cast Iron		70-180
	Ductile Cast Iron		60-130
N	Cast Aluminum Alloy		200-400
	Aluminum Alloy		300-700
	Copper Alloy		80-300
S	Heat-resistance Alloy		10-50
	Titanium Alloy		25-60
H	Hardened Alloy	45-50 HRC	40-50
		51-55 HRC	30-50

Tolerance zone class of hole (μm)

Basic size step(mm)																															
>	≦	B10	C9	C10	D8	D9	D10	E7	E8	E9	F6	F7	F8	G6	G7	H6	H7	H8	H9	H10	JS6	JS7	K6	K7	M6	M7	N6	N7	P6	P7	R7	S7	T7	U7	X7
-	3	+180 +140	+85 +60	+100 +60	+34 +20	+45 +20	+60 +20	+24 +14	+28 +14	+39 +14	+12 +6	+16 +6	+20 +6	+8 +2	+12 +2	+6 0	+10 0	+14 0	+25 0	+40 0	±3	±5	0 -6	0 -10	-2 -8	-2 -12	-4 -10	-4 -14	-6 -12	-6 -16	-10 -20	-14 -24	-	-18 -28	-20 -30
3	6	+188 +140	+100 +70	+118 +70	+48 +30	+60 +30	+78 +30	+32 +20	+38 +20	+50 +20	+18 +10	+22 +10	+28 +10	+12 +4	+16 +4	+8 0	+12 0	+18 0	+30 0	+48 0	±4	±6	+2 -6	+3 -9	-1 -9	0 -12	-5 -13	-4 -16	-9 -17	-8 -20	-11 -23	-15 -27	-	-19 -31	-24 -36
6	10	+208 +150	+116 +80	+138 +80	+62 +40	+76 +40	+98 +40	+40 +25	+47 +25	+61 +25	+22 +13	+28 +13	+35 +13	+14 +5	+20 +5	+9 0	+15 0	+22 0	+36	+58 0	±4.5	±7	+2 -7	+5 -10	-3 -12	0 -15	-7 -16	-4 -19	-12 -21	-9 -24	-13 -28	-17 -32	-	-22 -37	-28 -43
10	14	+220	+138	+165	+77	+93	+120	+50	+59	+75	+27	+34	+43	+17	+24	+11	+18	+27	+43	+70	±5.5	±9	+2	+6	-4	0	-9	-5	-15	-11	-16	-21	-	-26	-33 -51
14	18	+150	+95	+95	+50	+50	+50	+32	+32	+32	+16	+16	+16	+6	+6	0	0	0	0	0			-9	-12	-15	-18	-20	-23	-26	-29	-34	-39	-	-44	-38 -56
18	24	+244	+162	+194	+98	+117	+149	+61	+73	+92	+33	+41	+53	+20	+28	+13	+21	+33	+52	+84	±6.5	±10	+2	+6	-4	0	-11	-7	-18	-14	-20	-27	-	-33 -54	-46 -67
24	30	+160	+110	+110	+65	+65	+65	+40	+40	+40	+20	+20	+20	+7	+7	0	0	0	0	0			-11	-15	-17	-21	-24	-28	-31	-35	-41	-48	-33 -54	-40 -61	-56 -77
30	40	+270 +170	+182 +120	+220 +120	+119	+142	+180	+75	+89	+112	+41	+50	+64	+25	+34	+16	+25	+39	+62	+100	±8	±12	+3	+7	-4	0	-12	-8	-21	-17	-25	-34	-39 -64	-51 -76	-
40	50	+280 +180	+192 +130	+230 +130	+80	+80	+80	+50	+50	+50	+25	+25	+25	+9	+9	0	0	0	0	0			-13	-18	-20	-25	-28	-33	-37	-42	-50	-59	-45 -70	-61 -86	
50	65	+310 +190	+214 +140	+260 +140	+146	+174	+220	+90	+106	+134	+49	+60	+76	+29	+40	+19	+30	+46	+74	+120	±9.5	±15	+4	+9	-5	0	-14	-9	-26	-21	-30 -60	-42 -72	-55 -85	-76 -106	-
65	80	+320 +200	+224 +150	+270 +150	+100	+100	+100	+60	+60	+60	+30	+30	+30	+10	+10	0	0	0	0	0			-15	-21	-24	-30	-33	-39	-45	-51	-32 -62	-48 -78	-64 -94	-91 -121	
80	100	+360 +220	+257 +170	+310 +170	+174	+207	+260	+107	+126	+159	+58	+71	+90	+34	+47	+22	+35	+54	+87	+140	±11	±17	+4	+10	-6	0	-16	-10	-30	-24	-38 -73	-58 -93	-78 -113	-111 -146	-
100	120	+380 +240	+267 +180	+320 +180	+120	+120	+120	+72	+72	+72	+36	+36	+36	+12	+12	0	0	0	0	0			-18	-25	-28	-35	-38	-45	-52	-59	-41 -76	-66 -101	-91 -126	-131 -166	
120	140	+420 +260	+300 +200	+360 +200																											-48 -88	-77 -117	-107 -147			
140	160	+440 +280	+310 +210	+370 +210	+208 +145	+245 +145	+305 +145	+125 +85	+148 +85	+185 +85	+68 +43	+83 +43	+106 +43	+39 +14	+54 +14	+25 0	+40 0	+63 0	+100 0	+160 0	±12.5	±20	+4 -21	+12 -28	-8 -33	0 -40	-20 -45	-12 -52	-36 -61	-28 -68	-50 -90	-85 -125	-119 -159	-	-
160	180	+470 +310	+330 +230	+390 +230																											-53 -93	-93 -133	-131 -171		
180	200	+525 +340	+355 +240	+425 +240																											-60 -106	-105 -151			
200	225	+565 +380	+375 +260	+445 +260	+242 +170	+285 +170	+355 +170	+146 +100	+172 +100	+215 +100	+79 +50	+96 +50	+122 +50	+44 +15	+61 +15	+29 0	+46 0	+72 0	+115 0	+185 0	±14.5	±23	+5 -24	+13 -33	-8 -37	0 -46	-22 -51	-14 -60	-41 -70	-33 -79	-63 -109	-113 -159	-	-	-
225	250	+605 +420	+395 +280	+465 +280																											-67 -113	-123 -169			
250	280	+690 +480	+430 +300	+510 +300	+271	+320	+400	+162	+191	+240	+88	+108	+137	+49	+69	+32	+52	+81	+130	+210	±16	±26	+5	+16	-9	0	-25	-14	-47	-36	-74 -126	-	-	-	-
280	315	+750 +540	+460 +330	+540 +330	+190	+190	+190	+110	+110	+110	+56	+56	+56	+17	+17	0	0	0	0	0			-27	-36	-41	-52	-57	-66	-79	-88	-78 -130				
315	355	+830 +600	+500 +360	+590 +360	+299	+350	+440	+182	+214	+265	+98	+119	+151	+54	+75	+36	+57	+89	+140	+230	±18	±28	+7	+17	-10	0	-26	-16	-51	-41	-87 -144	-	-	-	-
355	400	+910 +680	+540 +400	+630 +400	+210	+210	+210	+125	+125	+125	+62	+62	+62	+18	+18	0	0	0	0	0			-29	-40	-46	-57	-62	-73	-87	-98	-93 -150				
400	450	+1010 +760	+595 +440	+690 +440	+327	+385	+480	+198	+232	+290	+108	+131	+165	+60	+83	+40	+63	+97	+155	+250	±20	±31	+8	+18	-10	0	-27	-17	-55	-45	-103 -166	-	-	-	-
450	500	+1090 +840	+635 +480	+730 +480	+230	+230	+230	+135	+135	+135	+68	+68	+68	+20	+20	0	0	0	0	0			-32	-45	-50	-63	-67	-80	-95	-108	-109 -172				

In every stey given in the table, the value on the upper side shows the upper deviation and the value on the lower side, the lower deviation.

Tolerance zone class of shaft (μm)

Basic size step (mm)																															
>	≦	b9	c9	d8	d9	e7	e8	e9	f6	f7	f8	g5	g6	h5	h6	h7	h8	h9	js5	js6	js7	k5	k6	m5	m6	n6	p6	r6	s6	t6	u6	x6
-	3	-140 -165	-60 -85	-20 -34	-20 -45	-14 -24	-14 -28	-14 -39	-6 -12	-6 -16	-6 -20	-2 -6	-2 -8	0 -4	0 -6	0 -10	0 -14	0 -25	±2	±3	±5	+4 0	+6 0	+6 +2	+8 +2	+10 +4	+12 +6	+16 +10	+20 +14	-	+24 +18	+26 +20
3	6	-140 -170	-70 -100	-30 -48	-30 -60	-20 -32	-20 -38	-20 -50	-10 -18	-10 -22	-10 -28	-4 -9	-4 -12	0 -5	0 -8	0 -12	0 -18	0 -30	±2.5	±4	±6	+6 +1	+9 +1	+9 +4	+12 +4	+16 +8	+20 +12	+23 +15	+27 +19	-	+31 +23	+36 +28
6	10	-150 -186	-80 -116	-40 -62	-40 -76	-25 -40	-25 -47	-25 -61	-13 -22	-13 -28	-13 -35	-5 -11	-5 -14	0 -6	0 -9	0 -15	0 -22	0 -36	±3	±4.5	±7	+7 +1	+10 +1	+12 +6	+15 +6	+19 +10	+24 +15	+28 +19	+32 +23	-	+37 +28	+43 +34
10	14	-150	-95	-50	-50	-32	-32	-32	-16	-16	-16	-6	-6	0	0	0	0	0	±4	±5.5	±9	+9	+12	+15	+18	+23	+29	+34	+39	-	+44	+51 +40
14	18	-193	-138	-77	-93	-50	-59	-75	-27	-34	-43	-14	-17	-8	-11	-18	-27	-43				+1	+1	+7	+7	+12	+18	+23	+28		+33	+56 +45
18	24	-160	-110	-65	-65	-40	-40	-40	-20	-20	-20	-7	-7	0	0	0	0	0	±4.5	±6.5	±10	+11	+15	+17	+21	+28	+35	+41	+48	-	+54 +41	+67 +54
24	30	-212	-162	-98	-117	-61	-73	-92	-33	-41	-53	-16	-20	-9	-13	-21	-33	-52				+2	+2	+8	+8	+15	+22	+23	+35	+54 +41	+61 +48	+77 +64
30	40	-170 -232	-120 -182	-80	-80	-50	-50	-50	-25	-25	-25	-9	-9	0	0	0	0	0	±5.5	±8	±12	+13	+18	+20	+25	+33	+42	+50	+59	+64 +48	+76 +60	-
40	50	-180 -242	-130 -192	-119	-142	-75	-89	-112	-41	-50	-64	-20	-25	-11	-16	-25	-39	-62				+2	+2	+9	+9	+17	+26	+34	+43	+70 +54	+86 +70	
50	65	-190 -264	-140 -214	-100	-100	-60	-60	-60	-30	-30	-30	-10	-10	0	0	0	0	0	±6.5	±9.5	±15	+15	+21	+24	+30	+39	+51	+60 +41	+72 +53	+85 +66	+106 +87	-
65	80	-200 -274	-150 -224	-146	-174	-90	-106	-134	-49	-60	-76	-23	-29	-13	-19	-30	-46	-74				+2	+2	+11	+11	+20	+32	+62 +43	+78 +59	+94 +75	+121 +102	
80	100	-220 -307	-170 -257	-120	-120	-72	-72	-72	-36	-36	-36	-12	-12	0	0	0	0	0	±7.5	±11	±17	+18	+25	+28	+35	+45	+59	+73 +51	+93 +71	+113 +91	+146 +124	-
100	120	-240 -327	-180 -267	-174	-207	-107	-126	-159	-58	-71	-90	-27	-34	-15	-22	-35	-54	-87				+3	+3	+13	+13	+23	+37	+76 +54	+101 +79	+126 +104	+166 +144	
120	140	-260 -360	-200 -300																									+88 +63	+117 +92	+147 +122		
140	160	-280 -380	-210 -310	-145 -208	-145 -245	-85 -125	-85 -148	-85 -185	-43 -68	-43 -83	-43 -106	-14 -32	-14 -39	0 -18	0 -25	0 -40	0 -63	0 -100	±9	±12.5	±20	+21 +3	+28 +3	+33 +15	+40 +15	+52 +27	+68 +43	+90 +65	+125 +100	+159 +134	-	-
160	180	-310 -410	-230 -330																									+93 +68	+133 +108	+171 +146		
180	200	-340 -455	-240 -355																									+106 +77	+151 +122			
200	225	-380 -495	-260 -495	-170 -242	-170 -285	-100 -146	-100 -172	-100 -215	-50 -79	-50 -96	-50 -122	-15 -35	-15 -44	0 -20	0 -29	0 -46	0 -72	0 -115	±10	±14.5	±23	+24 +4	+33 +4	+37 +17	+46 +17	+60 +31	+79 +50	+109 +80	+159 +130	-	-	-
225	250	-420 -535	-280 -395																									+113 +84	+169 +140			
250	280	-480 -610	-300 -430	-190	-190	-110	-110	-110	-56	-56	-56	-17	-17	0	0	0	0	0	±11.5	±16	±26	+27	+36	+43	+52	+66	+88	+126 +94	-	-	-	-
280	315	-540 -670	-330 -460	-271	-320	-162	-191	-240	-88	-108	-137	-40	-49	-23	-32	-52	-81	-130				+4	+4	+20	+20	+34	+56	+130 +98				
315	355	-600 -740	-360 -500	-210	-210	-125	-125	-125	-62	-62	-62	-18	-18	0	0	0	0	0	±12.5	±18	±28	+29	+40	+46	+57	+73	+98	+144 +108	-	-	-	-
355	400	-680 -820	-400 -540	-299	-350	-182	-214	-265	-98	-119	-151	-43	-54	-25	-36	-57	-89	-140				+4	+4	+21	+21	+37	+62	+150 +114				
400	450	-760 -915	-440 -595	-230	-230	-135	-135	-135	-68	-68	-68	-20	-20	0	0	0	0	0	±13.5	±20	±31	+32	+45	+50	+63	+80	+108	+166 +126	-	-	-	-
450	500	-840 -995	-480 -635	-327	-385	-198	-232	-290	-108	-131	-165	-47	-60	-27	-40	-63	-97	-155				+5	+5	+23	+23	+40	+68	+172 +132				

Approximate Conversion Value for Brinel Hardness.

HB		HV	Rockwell*3				HS	Approx. tensile strength (MPa) *2
Brinell,10mm ball, Load 3000kg			HRA	HRB	HRC	HRD		
Standard ball	Tungsten carbide ball	Vickers	A Scale, Load 60kg, Brale Diamond	B Scale, Load 100kg, Diameter 1/16 in. Steel ball	C Scale, Load 150kg, Brale Diamond	D Scale, Load 100kg, Brale Diamond	Shore	
–	–	1865	92. 0	–	80	–	–	–
–	–	1787	91. 5	–	79	–	–	–
–	–	1710	91. 0	–	78	–	–	–
–	–	1633	90. 5	–	77	–	–	–
–	–	1556	90. 0	–	76	–	–	–
–	–	1478	89. 5	–	75	–	–	–
–	–	1400	89. 0	–	74	–	–	–
–	–	1323	88. 5	–	73	–	–	–
–	–	1245	88. 0	–	72	–	–	–
–	–	1160	87. 0	–	71	–	–	–
–	–	1076	86. 5	–	70	–	–	–
–	–	1004	86. 0	–	69	–	–	–
–	–	940	85. 6	–	68. 0	76. 9	97	–
–	–	920	85. 3	–	67. 5	76. 5	96	–
–	–	900	85. 0	–	67. 0	76. 1	95	–
–	767	880	84. 7	–	66. 4	75. 7	93	–
–	757	860	84. 4	–	65. 9	75. 3	92	–
–	745	840	84. 1	–	65. 3	74. 8	91	–
–	733	820	83. 8	–	64. 7	74. 3	90	–
–	722	800	83. 4	–	64. 0	73. 8	88	–
–	712	–	–	–	–	–	–	–
–	710	780	83. 0	–	63. 3	73. 3	87	–
–	698	760	82. 6	–	62. 5	72. 6	86	–
–	684	740	82. 2	–	61. 8	72. 1	–	–
–	682	737	82. 2	–	61. 7	72. 0	84	–
–	670	720	81. 8	–	61. 0	71. 5	83	–
–	656	700	81. 3	–	60. 1	70. 8	–	–
–	653	697	81. 2	–	60. 0	70. 7	81	–
–	647	690	81. 1	–	59. 7	70. 5	–	–
–	638	680	80. 8	–	59. 2	70. 1	80	–
–	630	670	80. 6	–	58. 8	69. 8	–	–
–	627	667	80. 5	–	58. 7	69. 7	79	–
–	601	640	79. 8	–	57. 3	68. 7	77	–
–	578	615	79. 1	–	56. 0	67. 7	75	–
–	555	591	78. 4	–	54. 7	66. 7	73	210
–	534	569	77. 8	–	53. 5	65. 8	71	202
–	514	547	76. 9	–	52. 1	64. 7	70	**193**
	495	528	76. 3		51. 0	63. 8	68	**186**
–	477	508	75. 6	–	49. 6	62. 7	66	177
–	461	491	74. 9	–	48. 5	61. 7	65	170
–	444	472	74. 2	–	47. 1	60. 8	63	162
429	429	455	73. 4	–	45. 7	59. 7	61	154
415	415	440	72. 8	–	44. 5	58. 8	59	149
401	401	425	72. 0	–	43. 1	57. 8	58	142
388	388	410	71. 4	–	41. 8	56. 8	56	136
375	375	396	70. 6	–	40. 4	55. 7	54	129
363	363	383	70. 0	–	39. 1	54. 6	52	124
352	352	372	69. 3	(110. 0)	37. 9	53. 8	51	120
341	341	360	68. 7	(109. 0)	36. 6	52. 8	50	115
331	331	350	68. 1	(108. 5)	36. 6	51. 9	48	112
321	321	339	67. 5	(108. 0)	34. 3	51. 0	47	108
311	311	328	66. 9	(107. 5)	33. 1	50. 0	46	105
302	302	319	66. 3	(107. 0)	32. 1	49. 3	45	103
293	293	309	65. 7	(106. 0)	30. 9	48. 3	43	99
285	285	301	65. 3	(105. 5)	29. 9	47. 6	–	97
277	277	292	64. 6	(104. 5)	28. 8	46. 7	41	94

HB		HV	Rockwell*3				HS	Approx. tensile strength (MPa) *2
Brinell,10mm ball, Load 3000kg			HRA	HRB	HRC	HRD		
Standard ball	Tungsten carbide ball	Vickers	A Scale, Load 60kg, Brale Diamond	B Scale, Load 100kg, Diameter 1/16 in. Steel ball	C Scale, Load 150kg, Brale Diamond	D Scale, Load 100kg, Brale Diamond	Shore	
269	269	284	64. 1	(104. 0)	27. 6	45. 9	40	91
262	262	276	63. 6	(103. 0)	26. 6	45. 0	39	89
255	255	269	63. 0	(102. 0)	25. 4	44. 2	38	86
248	248	261	62. 5	(101. 0)	24. 2	43. 2	37	84
241	241	253	61. 8	100. 0	22. 8	42. 0	36	82
235	235	247	61. 4	99. 0	21. 7	41. 4	35	80
229	229	241	60. 8	98. 2	20. 5	40. 5	34	78
223	223	234	–	97. 3	(18. 8)	–	–	
217	217	228	–	96. 4	(17. 5)	–	33	74
212	212	222	–	95. 5	(16. 0)	–	–	72
207	207	218	–	94. 6	(15. 2)	–	32	70
201	201	212	–	93. 8	(13. 8)	–	31	69
197	197	207	–	92. 8	(12. 7)	–	30	67
192	192	202	–	91. 9	(11. 5)	–	29	65
187	187	196	–	90. 7	(10. 0)	–	–	63
183	183	192	–	90. 0	(9. 0)	–	28	63
179	179	188	–	89. 0	(8. 0)	–	27	61
174	174	182	–	87. 8	(6. 4)	–	–	60
170	170	178	–	86. 8	(5. 4)	–	26	58
167	167	175	–	86. 0	(4. 4)	–		57
163	163	171	–	85. 0	(3. 3)	–	25	56
156	156	163	–	82. 9	(0. 9)		–	53
149	149	156	–	80. 8		–	23	51
143	143	150	–	78. 7		–	22	50
137	137	143	–	76. 4		–	21	47
131	131	137	–	74. 0		–	–	46
126	126	132	–	72. 0		–	20	44
121	121	127	–	69. 8		–	19	42
116	116	122	–	67. 6		–	18	41
111	111	117	–	65. 7		–	17	39

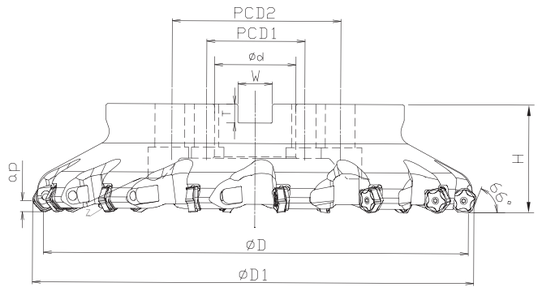
TT Services MILLING CUTTER

TT Services Milling Cutter

MFPN66 SERIES

66° Face Mill with High Economical and 10 Cutting Edge Insert for Higher Productivity

★ Stability and cost efficiency with 10-edge pentagonal inserts.
★ Low cutting forces and reduced chattering with a helical cutting-edge design.
★ Tough and reliable dual cutting edge design.



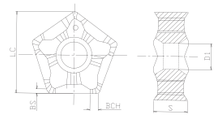
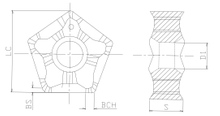
Designation	Size(mm)										Clamping Screw	Wrench
	D	D1	d	H	W	T	Z	PCD 1	PCD 2	Max.ap		
MFPN66050R-4T-M	50	58	22	40	10.4	6.3	4	-	-	5	SB4090	DTPM-15
MFPN66063R-5T-M	63	71	22	40	10.4	6.3	5	-	-	5		
MFPN66080R-6T-M	80	88	27	50	12.4	7.0	6	-	-	5		
MFPN66100R-7T-M	100	108	32	50	12.4	8.0	7	-	-	5		
MFPN66125R-9T-M	125	133	40	63	16.4	9.0	9	-	-	5		
MFPN66160R-11T-M	160	168	40	63	16.4	9.0	11	-	-	5		
MFPN66200R-13T-M	200	208	60	63	25.7	14.0	13	101.6	-	5		
MFPN66250R-15T-M	250	258	60	63	25.7	14.0	15	101.6	-	5		
MFPN66315R-17T-M	315	323	60	63	25.7	14.0	17	101.6	177.8	5		

MFPN66 SERIES

66° Face Mill with High Economical and 10 Cutting Edge Insert for Higher Productivity

Applicable Inserts

Usage Classification										
★ 1st Choice ☆ 2nd Choice	P	Steel	★							
	M	Stainless		★						
	K	Cast iron	★							
	N	Non-ferrous								
	S	Superalloys		★						
	H	Hard materials								

Insert		Insert No.	Size(mm)					Coated Carbide			Carbide			
			LC	S	D1	BS	BCH	TG4025	TG4035	TY602	TI960	HC200		
		PNMU0905XNER-UG	14.6	5.56	4.7	2	2	●						
		PNMU0905XNER-SG	14.6	5.56	4.7	2	2		●					

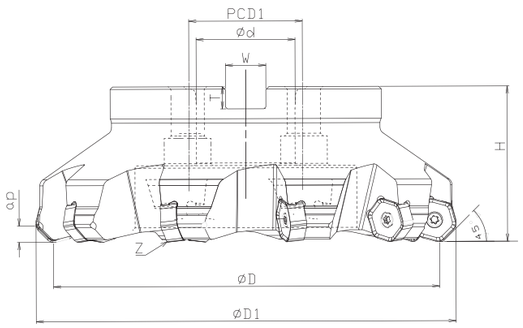
Recommended Cutting Conditions

ISO	Workpiece material	Hardness	Grade	Cutting Speed	Feed
				Vc （m/min）	fz（mm/t）
P	Carbon Steel	⩽HB300	TG4025	120-250	0.10-0.30
	Alloy Steel	HB200-300		100-220	0.10-0.30
	Mold Steel	⩽HB300		80-180	0.10-0.25
M	Stainless Steel	⩽HB200	TG4035	100-200	0.06-0.20

THN45 SERIES

45° Face Mill with High Economical and 12 Cutting Edge Insert for Higher Productivity

★ Enhanced cutting edge for cutting stability and high feed machining.
★ Acute cutter pocket design and inclined screw clamping enables robust clamping.
★ High helical cutting edges for smooth machining double - sided 12 corner insert.



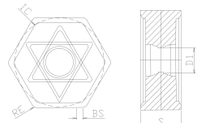
Designation	Size(mm)									Clamping Screw	Wrench
	D	D1	d	H	W	T	Z	PCD1	Max.ap		
THN45-50R04HN09M22	50	61.4	22	40	10.4	6.3	4	-	5	TH3009	THP09
THN45-63R06HN09M22	63	74.4	22	40	10.4	6.3	6	-	5		
THN45-80R06HN09M27	80	91.4	27	50	12.4	7.0	6	-	5		
THN45-100R06HN09M32	100	111.4	32	50	14.4	8.0	6	-	5		
THN45-125R08HN09M40	125	136.4	40	63	16.4	9.0	8	-	5		
THN45-160R10HN09M40	160	171.4	40	63	16.4	9.0	10	66.7	5	TH3009	TTL15P

THN45 SERIES

45° Face Mill with High Economical and 12 Cutting Edge Insert for Higher Productivity

Applicable Inserts

Usage Classification										
★ 1st Choice ☆ 2nd Choice	P	Steel	★							
	M	Stainless	★							
	K	Cast iron	★							
	N	Non-ferrous								
	S	Superalloys								
	H	Hard materials								

Insert		Insert No.	Size(mm)					Coated Carbide				Carbide			
			IC	S	D1	BS	RE	TY602	TY622	TY625	TI960	HC200			
		HNMU0906ANSN-GR	16.5	6.36	5	1.5	1.2	●							

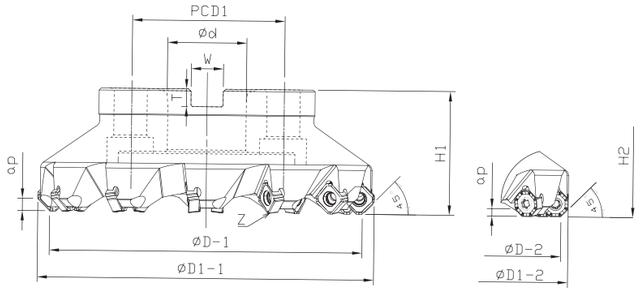
Recommended Cutting Conditions

ISO	Workpiece material	Hardness	Grade	Cutting Speed Vc（m/min）	Feed fz（mm/t）
P	Low Carbon Steel	≤HB180	TY602	200-300	0.20-0.40
	High Cabon and Alloy Steel	HB180-280		100-250	0.15-0.25
	Alloy Steel	HB280-350		100-180	0.20-0.40
M	Stainless Steel	≤HB200		100-200	0.10-0.30
K	Gray Cast Iron	HB150-250		130-230	0.20-0.40
	Ductile Cast Iron	HB150-250		120-220	0.10-0.30

TSON45 SERIES

45° Face Mill Offers Advantage of Using Square, Octagonal Inserts in the Same Pocket

★SNMU inserts offers double-sided, square inserts with eight cutting edges.
★Most suitable for a large depth of cut and free cutting inserts with excellent chip control.
★ONMU inserts offers double-sided, octagonal insert with 16 cutting edges - high economy inserts.
★Light cutting force due to excellent chip control.
★The optimized cutting edge creates barrel-formed chips for easy removal, allowing an operation at higher feed rate.



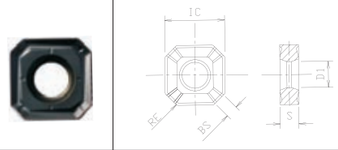
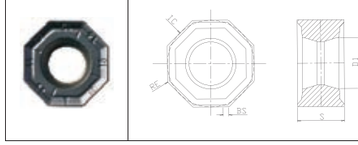
Designation	Size（mm）											Clamping Screw	Wrench
	D -1	D -2	D1 -1	D1 - 2	d	H1	H2	W	T	Z	PCD1		
TSON45-50R04S13O05M22	50	52.3	62.5	62	22	40	38.77	10.4	6.3	4	-	TSO1013	TSOP1305
TSON45-63R06S13O05M22	63	65.3	75.5	75	22	40	38.77	10.4	6.3	6	-		
TSON45-80R06S13O05M27	80	82.3	92.5	92	27	50	48.77	12.4	7.0	6	-		
TSON45-100R08S13O05M32	100	102.3	112.5	112	32	50	48.77	14.4	8.0	8	-		
TSON45-125R10S13O05M40	125	127.3	137.5	137	40	63	61.77	16.4	9.0	10	-		
TSON45-160R12S13O05M40	160	162.3	172.5	172	40	63	61.77	16.4	9.0	12	66.7	TSO1013	TTL20

TSON45 SERIES

45° Face Mill Offers Advantage of Using Square, Octagonal Inserts in the Same Pocket

Applicable Inserts

Usage Classification										
★ 1st Choice ☆ 2nd Choice	P	Steel	★							
	M	Stainless	★							
	K	Cast iron	★							
	N	Non-ferrous								
	S	Superalloys								
	H	Hard materials								

Insert	Insert No.	Size(mm)						Coated Carbide				Carbide			
		IC	S	D1	BS	RE	Max.ap	TY602	TY622	TY625	TI960	HC200			
	SNMU1305ANTR-PR	13	5.5	5.6	3	0.8	4.5	●							
	ONMU050505-PR	13	5.5	5.6	5	0.5	2.5	●							

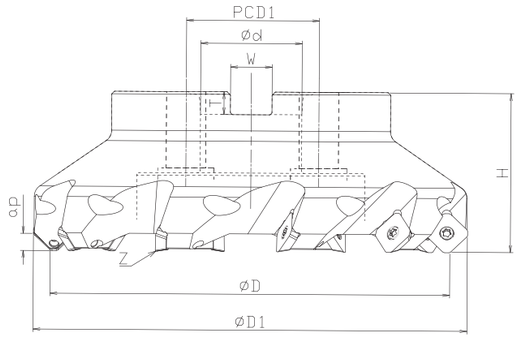
Recommended Cutting Conditions

ISO	Workpiece material	Hardness	Grade	Cutting Speed	Feed
				Vc（m/min）	fz（mm/t）
P	Low Carbon Steel	≤HB180	TY602	120-250	0.10-0.50
	High Cabon and Alloy Steel	HB180-280		100-180	0.15-0.40
	Alloy Steel	HB280-350		70-150	0.15-0.40
M	Stainless Steel	≤HB200		100-200	0.10-0.30
K	Gray Cast Iron	HB150-250		100-180	0.10-0.50
	Ductile Cast Iron	HB150-250		100-180	0.10-0.30

TSE45 SERIES

45° Face Mill with High Precision and 4 Cuttig Edge Insert for Higher Productivty

★ 4 cutting edges on one insert for highly economical machining.
★ Optimized relief geometry on the positive insert ensures low cutting force and minimal chattering.
★ Helical cutting edges and optimized positioning on cutter provide high wall accuracy and surface quality.
★ Sharp yet tough rake geometry reduces fracture of cutting edges.



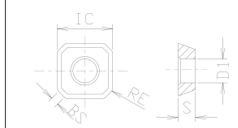
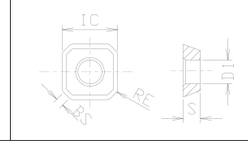
Designation	Size(mm)									Clamping Screw	Wrench
	D	D1	d	H	W	T	Z	PCD1	Max.ap		
TSE45-50R04SE12M22	50	62.9	22	40	10.4	6.3	4	-	6.5	TS2012	TSP12
TSE45-63R05SE12M22	63	75.9	22	40	10.4	6.3	5	-	6.5		
TSE45-80R06SE12M27	80	92.9	27	50	12.4	7.0	6	-	6.5		
TSE45-100R07SE12M32	100	112.9	32	50	14.4	8.0	7	-	6.5		
TSE45-125R08SE12M40	125	137.9	40	63	16.4	9.0	8	-	6.5		
TSE45-160R10SE12M40	160	172.8	40	63	16.4	9.0	10	66.7	6.5	TS3512	TTL15

TSE45 SERIES

45° Face Mill with High Precision and 4 Cuttig Edge Insert for Higher Productivty

Applicable Inserts

Usage Classification										
★ 1st Choice ☆ 2nd Choice	P	Steel	★							
	M	Stainless	★							
	K	Cast iron	★							
	N	Non-ferrous					★			
	S	Superalloys								
	H	Hard materials								

Insert		Insert No.	Size(mm)					Coated Carbide				Carbide			
			IC	S	D1	BS	RE	TY602	TY622	TY625	TI960	HC200			
		SEKT12T3AGTN	13.4	4	5.5	1.3	1.5	●							
		SEHT12T3-HL	13.4	4	5.5	1.3	1.5					●			

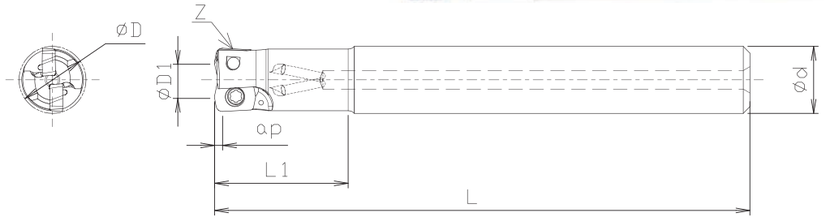
Recommended Cutting Conditions

ISO	Workpiece material	Hardness	Grade	Cutting Speed	Feed
				Vc（m/min）	fz（mm/t）
P	Low Carbon Steel	≤HB180	TY602	120-220	0.15-0.30
	High Cabon and Alloy Steel	HB180-280		70-150	0.15-0.30
	Alloy Steel	HB280-350		70-150	0.15-0.30
M	Stainless Steel	≤HB200		120-200	0.15-0.30
K	Gray Cast Iron	HB150-250		140-220	0.15-0.30
	Ductile Cast Iron	HB150-250		150-240	0.15-0.30
N	Aluminum	—	HC200	300-800	0.07-0.55

MFH SERIES

Micro-Diameter , High-Feed Milling

★Durable Design Aids in Chatter Resistance.
★Stable High Feed Machining on a Wide Range of Applications.
★Controls Chip Biting with Convex Cutting Edge.
★Replaces Solid End Mills to Reduce Machining Costs.



Standard Type

Designation	Size(mm)							Clamping Screw	Wrench
	D	D1	d	L	L1	Z	Max.ap		
MFH08-S10-120-1T	8	4.2	10	120	35	1	0.5	TB1002	TBP02
MFH10-S10-120-2T	10	6.2	10	120	35	2	0.5		
MFH12-S12-120-3T	12	8.2	12	120	35	3	0.5		

Non-interference Type

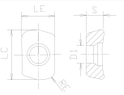
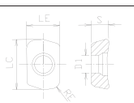
Designation	Size(mm)							Clamping Screw	Wrench
	D	D1	d	L	L1	Z	Max.ap		
MFH10-S08-120-2T	10	6.2	8	120	35	2	0.5	TB1002	TBP02
MFH12-S10-120-3T	12	8.2	10	120	35	3	0.5		
MFH14-S12-120-3T	14	10.2	12	120	35	3	0.5		

MFH SERIES

Micro-Diameter , High-Feed Milling

Applicable Inserts

Usage Classification										
★ 1st Choice ☆ 2nd Choice	P	Steel	★							
	M	Stainless	★							
	K	Cast iron	★							
	N	Non-ferrous								
	S	Superalloys	★							
	H	Hard materials		★						

Insert		Insert No.	Size(mm)					Coated Carbide				Carbide			
			LC	LE	S	D1	RE	TY125	TH105	TY602	TY622	HC200			
		BPMT020210R-UF	6.38	4.19	2.59	2.1	1.0	●							
		BPGT020210R-UH	6.38	4.19	2.59	2.1	1.0		●						

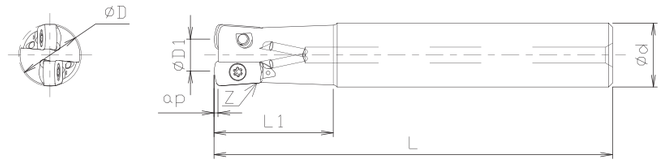
Recommended Cutting Conditions

ISO	Workpiece material	Hardness	Grade	Cutting Speed Vc （m/min）	Feed fz （mm/t）
P	Carbon Steel	≤HB300	TY125	100-300	0.2-0.8
	Alloy Steel	HB200-300		100-300	0.2-0.8
	Mold Steel	＜HRC40		100-200	0.2-0.5
M	Stainless Steel	≤HB200		100-150	0.2-0.5
K	Grey Cast Iron	HB150-250		100-300	0.2-0.8
	Ductile Cast Iron	HB150-250		80-200	0.2-0.6
S	Ni-base HeatResistant Alloy	＜HRC40		20-50	0.1-0.3
	Titanium Alloy	＜HRC40		30-60	0.1-0.3
H	Hard Materials	HRC40-50	TH105	80-150	0.1-0.5
		HRC50-60		50-70	0.1-0.3

MRH SERIES

High-Feed Milling

★ High feed milling for small diameters and small machining centers.
★ Economical inserts with 4 cutting edges.
★ Both of standard type and non-interference type are available.



Standard Type

Designation	Size(mm)							Clamping Screw	Wrench
	D	D1	d	L	L1	Z	Max.ap		
MRH16-S16-03-2T	16	8	16	100	30	2	1	M3065-S	FT08
MRH20-S20-03-3T	20	12	20	130	50	3	1		
MRH25-S25-03-3T	25	17	25	140	60	3	1		
MRH32-S32-03-4T	32	24	32	150	70	4	1		

Non-interference Type

Designation	Size(mm)							Clamping Screw	Wrench
	D	D1	d	L	L1	Z	Max.ap		
MRH17-S16-03-2T	17	9	16	150	25	2	1	M3065-S	FT08
MRH21-S20-03-3T	21	13	20	150	30	3	1		
MRH26-S25-03-3T	26	18	25	150	35	3	1		

MRH SERIES

High-Feed Milling

Applicable Inserts

Usage Classification										
★ 1st Choice ☆ 2nd Choice	P	Steel	★							
	M	Stainless	☆	★						
	K	Cast iron								
	N	Non-ferrous								
	S	Superalloys		★						
	H	Hard materials								

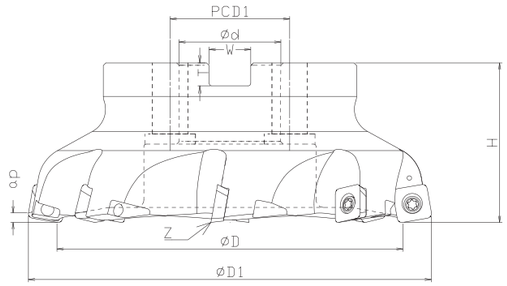
Insert	Insert No.	Size(mm)					Coated Carbide				Carbide			
		LC	LE	S	D1	RE	KX402	KX405	TY602	TY622	HC200			
	LOGU030310ER-GM	11.9	6.2	3.96	3.45	1.0	●	●						

Recommended Cutting Conditions

ISO	Workpiece material	Hardness	Grade	Cutting Speed	Feed
				Vc （m/min）	fz （mm/t）
P	Carbon Steel	≤HB300	KX402	120-250	0.2-1.2
	Alloy Steel	HB200-300		100-220	0.2-1.2
	Mold Steel	＜HRC40		80-180	0.2-0.9
	Mold Steel	HRC40-50		60-130	0.2-0.5
M	Stainless Steel	≤HB200	KX405	100-200	0.2-0.9
S	Ni-base HeatResistant Alloy	—		20-50	0.2-0.6
	Titanium Alloy	—		40-80	0.2-0.6

MRH SERIES

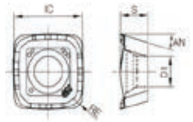
High-Feed Milling



Designation	Size(mm)								Clamping Screw	Wrench
	D	D1	d	H	W	T	Z	Max.ap		
MRH050R-14-3T-22M	27	50	22	50	10.4	6	3	2	M5011-S	WT20
MRH063R-14-4T-22M	40	63	22	50	10.4	6	4	2		
MRH080R-14-5T-M	57	80	27	63	12.4	7	5	2		
MRH100R-14-7T-M	77	100	32	63	14.4	8	7	2		
MRH125R-14-7T-M	102	125	40	63	16.4	9	7	2		
MRH160R-14-8T-M	137	160	40	63	16.4	9	8	2		

Applicable Inserts

Usage Classification			
★ 1st Choice ☆ 2nd Choice	P	Steel	★
	M	Stainless	☆
	K	Cast iron	
	N	Non-ferrous	
	S	Superalloys	
	H	Hard materials	

Insert		Insert No.	Size(mm)					Coated Carbide				Carbide			
			IC	S	D1	RE	AN	KX402	KX405	TY602	TY622	HC200			
		SOMT140520ER-GM	14.1	5.56	5.8	2.0	16°	●							

Recommended Cutting Conditions

ISO	Workpiece material	Hardness	Grade	Cutting Speed	Feed
				Vc（m/min）	fz（mm/t）
P	Carbon Steel	≤HB300	KX402	120-250	0.5-2.0
	Alloy Steel	HB200-300		100-220	0.5-2.0
	Mold Steel	<HRC40		80-180	0.2-1.8
	Mold Steel	HRC40-50		60-130	0.2-1.0

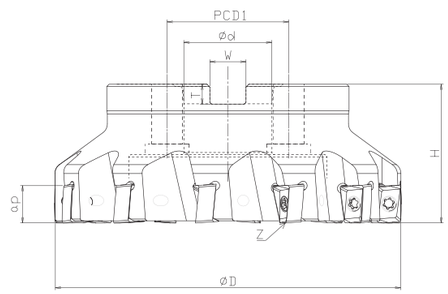
TAN90 SERIES

Shoulder Milling with 4 Cutting-Edge Double-Sided Insert for High-Feed Machining

★ Double sided insert with 4 sharp and tough cutting edges.
★ Available in 3 sizes and wiper edge for excellent surface finish.
★ Low cutting force due to large rake angle.
★ Positive rake face for smooth machining and reduced vibration.
★ Highly rigid cutter body.

Endmills

Designation	Size(mm)						Insert	Clamping Screw	Wrench
	D	d	L1	L	Z	Max.ap			
TANE90-16R02D16AN09L125	16	16	26	125	2	8	ANKT090408	TA4009	TEP09
TANE90-20R03D20AN09L125	20	20	26	125	3	8	ANKT090408		
TANE90-25R04D25AN09L125	25	25	26	125	4	8	ANKT090408		
TANE90-32R05D32AN09L160	32	32	26	160	5	8	ANKT090408		
TANE90-25R02D25AN12L125	25	25	26	125	2	12	ANKT120508	TA4012	TEP12
TANE90-32R03D32AN12L160	32	32	26	160	3	12	ANKT120508		
TANE90-40R04D32AN12L200	40	32	26	200	4	12	ANKT120508		



Milling Cutters

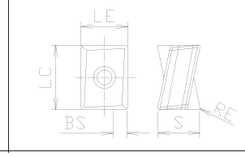
Designation	Size（mm）								Insert	Clamping Screw	Wrench
	D	d	H	W	T	Z	PCD1	Max.ap			
TANF90-50R04AN17M22	50	22	50	10.4	6.3	4	-	16.3	ANKT170608	TA4017	TFP17
TANF90-63R06AN17M27	63	22	50	10.4	6.3	6	-	16.3	ANKT170608		
TANF90-80R07AN17M27	80	27	50	12.4	7.0	7	-	16.3	ANKT170608		
TANF90-100R08AN17M32	100	32	50	14.4	8.0	8	-	16.3	ANKT170608		
TANF90-125R10AN17M40	125	40	63	16.4	9.0	10	-	16.3	ANKT170608		
TANF90-160R12AN17M40	160	40	63	16.4	9.0	12	66.7	16.3	ANKT170608	TA4017	TTL20

TAN90 SERIES

Shoulder Milling with 4 Cutting-Edge Double-Sided Insert for High-Feed Machining

Applicable Inserts

Usage Classification			TY602	TY622	TY625	TI960	HC200			
★ 1st Choice ☆ 2nd Choice	P	Steel			★					
	M	Stainless			★					
	K	Cast iron			★					
	N	Non-ferrous								
	S	Superalloys								
	H	Hard materials								

Insert		Insert No.	Size(mm)					Coated Carbide				Carbide			
			LC	LE	S	BS	RE	TY602	TY622	TY625	TI960	HC200			
		ANKT090408-MT	8.6	6.6	5.20	2.5	0.8			●					
		ANKT120508-MT	13.7	10.0	9.15	3.8	0.8			●					
		ANKT170608-MT	16.7	11.2	10.40	4.7	0.8			●					

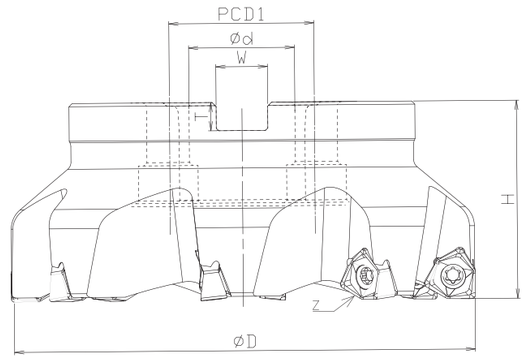
Recommended Cutting Conditions

ISO	Workpiece material	Hardness	Grade	Cutting Speed	Feed
				Vc（m/min）	fz（mm/t）
P	Low Carbon Steel	⩽HB180	TY625	120-180	0.05-0.15
	High Cabon and Alloy Steel	HB200-300		100-160	0.05-0.10
	Mold Steel	⩽HB300		80-120	0.05-0.10
M	Stainless Steel	⩽HB200		80-100	0.10-0.25
K	Gray Cast Iron	HB150-250		150-200	0.10-0.20
	Ductile Cast Iron	HB150-250		120-150	0.05-0.15

TWN90 SERIES

Shoulder Milling Cutter with 6 Double-Sided Cutting Edge and Low Cutting Forces for Reduced Chattering and Superior Fracture Resistance

★Sharp cutting due to lower cutting forces.
★Reduced chattering even with extended milling adapters.
★Superior fracture resistance with thick edge design.



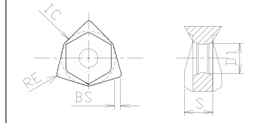
Designation	Size(mm)								Clamping Screw	Wrench
	D	d	H	W	T	Z	PCD1	Max.ap		
TWN90-63R03WN08M22	63	22	40	10.4	6.3	3	-	6.5	TW1008	TWP1008
TWN90-80R04WN08M27	80	27	50	12.4	7.0	4	-	6.5		
TWN90-100R05WN08M32	100	32	50	14.4	8.0	5	-	6.5		
TWN90-125R06WN08M40	125	40	63	16.4	9.0	6	-	6.5		
TWN90-160R08WN08M40	160	40	63	16.4	9.0	8	66.7	6.5	TW1008	TTL20

TWN90 SERIES

Shoulder Milling Cutter with 6 Double-Sided Cutting Edge and Low Cutting Forces for Reduced Chattering and Superior Fracture Resistance

Applicable Inserts

Usage Classification			
★ 1st Choice ☆ 2nd Choice	P	Steel	★
	M	Stainless	★
	K	Cast iron	★
	N	Non-ferrous	
	S	Superalloys	
	H	Hard materials	

Insert		Insert No.	Size(mm)					Coated Carbide				Carbide			
			IC	S	D1	BS	RE	TY602	TY622	TY625	TI960	HC200			
		WNMU080608PTN-CR	14	6.65	6.2	1.3	0.8	●							

Recommended Cutting Conditions

ISO	Workpiece material	Hardness	Grade	Cutting Speed	Feed
				Vc （m/min）	fz （mm/t）
P	Carbon Steel	≤HB300	TY602	120-250	0.05-0.15
	Alloy Steel	HB200-300		100-220	0.05-0.10
	Mold Steel	≤HB300		80-180	0.05-0.10
M	Stainless Steel	≤HB200		80-150	0.10-0.25
K	Gray Cast Iron	HB150-250		120-250	0.10-0.20
	Ductile Cast Iron	HB150-250		100-200	0.05-0.15

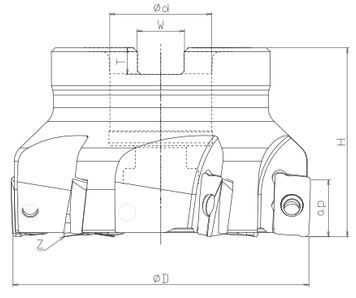
TAP90 SERIES

Shoulder Milling with High Precision Cutting Edge and Low Cutting Forces for Reduced Chattering

★Suitable for 11°positive angle insert, applicable to alloy steel , hardened steel and aluminium alloy.
★Sharp cutting due to lower cutting forces.
★Reduced chattering even with extended milling adapters.

Endmills

Designation	Size(mm)						Insert	Clamping Screw	Wrench
	D	d	L1	L	Z	Max.ap			
TAPE90-16R02D16AP10L150	16	16	28	150	2	9	APKT1003..	TK1000	TKP10
TAPE90-16R02D16AP10L200				200	2	9	APKT1003..		
TAPE90-20R02D20AP10L150	20	20	30	150	2	9	APKT1003..		
TAPE90-20R02D20AP10L200				200	2	9	APKT1003..		
TAPE90-25R02D25AP16L150	25	25	40	150	2	15	APKT1604..	TK1600	TKP16
TAPE90-25R02D25AP16L200				200	2	15	APKT1604..		
TAPE90-32R03D32AP16L150	32	32	45	150	3	15	APKT1604..		
TAPE90-32R03D32AP16L200				200	3	15	APKT1604..		



Milling Cutters

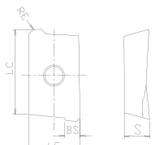
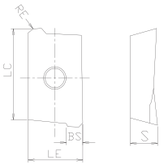
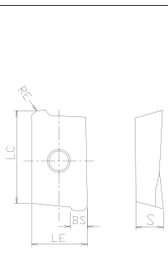
Designation	Size （mm）							Insert	Clamping Screw	Wrench
	D	d	H	W	T	Z	Max.ap			
TAPF90-50R04AP16M22	50	22	50	10.4	6.3	4	15	APKT1604..	TK1600	TKP16
TAPF90-63R05AP16M22	63	22	50	10.4	6.3	5	15	APKT1604..		
TAPF90-80R06AP16M27	80	27	50	12.4	7.0	6	15	APKT1604..		
TAPF90-100R08AP16M32	100	32	50	14.4	8.0	8	15	APKT1604..		

TAP90 SERIES

Shoulder Milling with High Precision Cutting Edge and Low Cutting Forces for Reduced Chattering

Applicable Inserts

Usage Classification			P	M	K	N	S	H
★1st Choice ☆2nd Choice	P	Steel	★					
	M	Stainless	★					
	K	Cast iron	★					
	N	Non-ferrous				★		
	S	Superalloys						
	H	Hard materials		★				

Insert	Insert No.	Size(mm)					Coated Carbide				Carbide			
		LC	LE	S	BS	RE	TY602	TY622	TY625	TI960	HC200			
 	APKT100305PDTR	9.9	6.7	3.6	0.86	0.5	●							
	APKT100308PDTR	9.9	6.7	3.6	0.9	0.8	●							
	APKT160404PDTR	15.2	9.4	5.3	1.11	0.4	●							
	APKT160408PDTR	15.2	9.4	5.3	1.32	0.8	●							
	APKT160412PDTR	15.2	9.4	5.3	1.13	1.2	●							
	APKT160416PDTR	15.2	9.4	5.3	1.13	1.6	●							
	APKT160424PDTR	15.2	9.4	5.3	—	2.4	●							
 	APKT160404-TR	15.2	9.4	5.3	1.11	0.4		●						
	APKT160408-TR	15.2	9.4	5.3	1.32	0.8		●						
	APKT160412-TR	15.2	9.4	5.3	1.13	1.2		●						
	APKT160416-TR	15.2	9.4	5.3	1.13	1.6		●						
	APKT160424-TR	15.2	9.4	5.3	—	2.4		●						
 	APKT100305	9.9	6.7	3.6	0.86	0.5					●			
	APKT100308	9.9	6.7	3.6	0.9	0.8					●			
	APKT160402PDER-AK	15.2	9.4	5.3	1.11	0.2					●			
	APKT160404PDER-AK	15.2	9.4	5.3	1.11	0.4					●			
	APKT160408PDER-AK	15.2	9.4	5.3	1.32	0.8					●			
	APKT160412PDER-AK	15.2	9.4	5.3	1.13	1.2					●			
	APKT160416PDER-AK	15.2	9.4	5.3	1.13	1.6					●			
	APKT160420PDER-GW	15.2	9.4	5.3	—	2.0					●			

TAP90 SERIES

Shoulder Milling with High Precision Cutting Edge and Low Cutting Forces for Reduced Chattering

Recommended Cutting Conditions

ISO	Workpiece material	Hardness	Grade	Cutting Speed Vc (m/min)	Feed fz (mm/t)
P	Low Carbon Steel	≤HB180	TY602	120-220	0.15-0.30
	High Cabon and Alloy Steel	HB180-280		70-150	0.15-0.30
	Alloy Steel	HB280-350		70-150	0.15-0.30
M	Stainless Steel	≤HB200		120-200	0.08-0.25
K	Gray Cast Iron	HB150-250		140-220	0.15-0.30
	Ductile Cast Iron	HB150-250		150-240	0.15-0.30
N	Aluminum	—	HC200	300-800	0.07-0.50
H	Hardened Material	≤HRC55	TY622	40-80	0.26-0.40

EAP SERIES

EAP Right Angle Shoulder Milling Cutter Bar

★ Suitable for heavy cutting, rotary and feed volume is 3 times the normal cutter.
★ Suitable for economical inserts, high cost performance.

Designation	Size(mm)							Insert	Clamping Screw	Wrench
	D	d	L1	L2	L	Z	Max.a			
EAP300R-C10-10-120L-1T	10	10	30	-	120	1	9	APMT1135		
EAP300R-C10-11-120L-1T	11	10	30	-	120	1	9	APMT1135		
EAP300R-C12-12-130L-1T	12	12	30	-	130	1	9	APMT1135		
EAP300R-C12-13-130L-1T	13	12	30	-	130	1	9	APMT1135		
EAP300R-C16-16-120L-2T	16	16	40	-	120	2	9	APMT1135		
EAP300R-C16-16-150L-2T	16	16	40	-	150	2	9	APMT1135		
EAP300R-C16-16-200L-2T	16	16	40	100	200	2	9	APMT1135		
EAP300R-C15-16-150L-2T	16	15	40	-	150	2	9	APMT1135		
EAP300R-C16-17-150L-2T	17	16	40	-	150	2	9	APMT1135	TT1011	TTP11
EAP300R-C16-17-200L-2T	17	16	40	-	200	2	9	APMT1135		
EAP300R-C20-20-150L-2T	20	20	50	-	150	2	9	APMT1135		
EAP300R-C19-20-150L-2T	20	19	50	-	150	2	9	APMT1135		
EAP300R-C20-20-200L-2T	20	20	50	100	200	2	9	APMT1135		
EAP300R-C19-20-200L-2T	20	19	50	-	200	2	9	APMT1135		
EAP300R-C20-21-150L-2T	21	20	50	-	150	2	9	APMT1135		
EAP300R-C20-21-200L-2T	21	20	50	-	200	2	9	APMT1135		
EAP300R-C25-25-150L-3T	25	25	50	-	150	3	9	APMT1135		
EAP400R-C24-25-150L-2T	25	24	40	-	150	2	14	APMT1604		
EAP400R-C25-25-200L-2T	25	25	75	-	200	2	14	APMT1604		
EAP400R-C24-25-200L-2T	25	24	50	-	200	2	14	APMT1604		
EAP400R-C32-32-150L-3T	32	32	50	-	150	3	14	APMT1604	TT1016	TTP16
EAP400R-C32-32-200L-3T	32	32	80	-	200	3	14	APMT1604		
EAP400R-C32-35-150L-3T	35	32	60	-	150	3	14	APMT1604		
EAP400R-C32-35-200L-3T	35	32	60	-	200	3	14	APMT1604		

TT SERVICES Indexable Milling Cutter
Shoulder Milling

EAP SERIES

EAP Right Angle Shoulder Milling Cutter Bar

Applicable Inserts

Usage Classification										
★ 1st Choice ☆ 2nd Choice	P	Steel	★							
	M	Stainless	☆							
	K	Cast iron	★							
	N	Non-ferrous					★			
	S	Superalloys								
	H	Hard materials		★						

	Insert	Insert No.	Size(mm)					Coated Carbide				Carbide		
			LC	LE	S	BS	RE	TI960	TH910	TY602	TY622	HC200		
		APMT1135PDER-M2	11.0	6.35	3.50	1.5	0.8	●	●					
		APMT1604PDER-M2	16.5	9.53	4.76	1.7	0.8	●	●					

Recommended Cutting Conditions

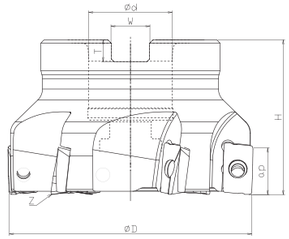
ISO	Workpiece material	Hardness	Grade	Cutting Speed Vc（m/min）	Feed fz（mm/t）
P	Low Carbon Steel	⩽HB180	TY602	120-220	0.15-0.30
	High Cabon and Alloy Steel	HB180-280		70-150	0.15-0.30
	Alloy Steel	HB280-350		70-150	0.15-0.30
M	Stainless Steel	⩽HB200		120-200	0.10-0.25
K	Gray Cast Iron	HB150-250		140-220	0.15-0.30
	Ductile Cast Iron	HB150-250		150-240	0.15-0.30
H	Hardened Material	⩽HRC50	TH910	40-80	0.10-0.30

Turning
Milling Cutter
Drilling

EAP SERIES

EAP Right Angle Shoulder Face Mill

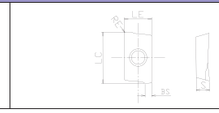
★ Suitable for 11° positive angle insert tip.
★ Suitable for various types of inserts, applicable to aluminum and steel milling.
★ Screw locking,large space for chipping, excellent chip removal performance .
★ Cutting smoothly.low resistance.
★ Customized aluminium milling cutter is available.



Designation	Size(mm)							Insert	Clamping Screw	Wrench
	D	d	H	W	T	Z	Max.ap			
EAP400R-50-22-4T	50	22	50	10.4	6.3	4	14	APMT1604	TT1016	TTP16
EAP400R-63-22-4T	63	22	50	10.4	6.3	4	14	APMT1604		
EAP400R-80-27-6T	80	27	50	12.4	7	6	14	APMT1604		
EAP400R-100-32-6T	100	32	50	14.4	8	6	14	APMT1604		
EAP400R-125-40-7T	125	40	63	16.4	9	7	14	APMT1604		
EAP400R-160-40-8T	160	40	63	16.4	9	8	14	APMT1604		
EAP400R-200-60-10T	200	60	63	25.7	14	10	14	APMT1604		

Applicable Inserts

Usage Classification									
★ 1st Choice ☆ 2nd Choice	P	Steel	★						
	M	Stainless	☆						
	K	Cast iron	★						
	N	Non-ferrous					★		
	S	Superalloys							
	H	Hard materials		★					

Insert	Insert No.	Size					Coated Carbide				Carbide		
		LC	LE	S	BS	RE	TI960	TH910	TY602	TY622	HC200		
 	APMT1604PDER-M2	16.5	9.53	4.76	1.7	0.8	●	●					

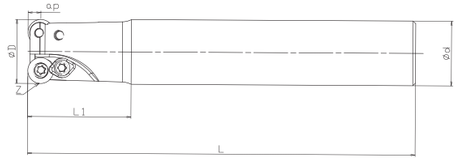
Recommended Cutting Conditions

ISO	Workpiece material	Hardness	Grade	Cutting Speed Vc (m/min)	Feed fz (mm/t)
P	Low Carbon Steel	≤HB180	TI960	120-220	0.15-0.30
	High Cabon and Alloy Steel	HB180-280		70-150	0.15-0.30
	Alloy Steel	HB280-350		70-150	0.15-0.30
M	Stainless Steel	≤HB200		120-200	0.10-0.25
K	Gray Cast Iron	HB150-250		140-220	0.15-0.30
	Ductile Cast Iron	HB150-250		150-240	0.15-0.30
H	Hardened Material	≤HRC50	TH910	40-80	0.10-0.30

TRD SERIES

Radius Milling with Lowers Cutting Costs and Increases Effciency

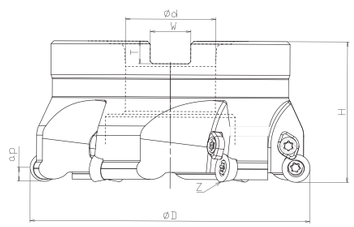
★ Low cutting forces with helical cutting edge design .
★ Suitable for 11°positive angle insert, applicable to alloy steel , hardened steel and aluminium alloy.
★ Reduced chattering even with extended mlling adapters .



Endmills

Designation	Size(mm)						Insert	Clamping Screw	Wrench	Clamping Piece
	D	d	L1	L	Z	Max.ap				
TRDE4R-16R02D16RD08L150	16	16	28	150	2	4	RDKT0802M0	TR1008	TRP08	TRS08
TRDE4R-16R02D16RD08L200				200	2	4	RDKT0802M0			
TRDE4R-20R02D20RD08L150	20	20	30	150	2	4	RDKT0802M0			
TRDE4R-20R02D20RD08L200				200	2	4	RDKT0802M0			
TRDE5R-20R02D20RD10L150	20	20	30	150	2	5	RDKT10T3M0	TR1010	TRP10	TRS10
TRDE5R-20R02D20RD10L200				200	2	5	RDKT10T3M0			
TRDE5R-25R02D25RD10L150	25	25	40	150	2	5	RDKT10T3M0			
TRDE5R-25R02D25RD10L200				200	2	5	RDKT10T3M0			
TRDE6R-32R03D32RD12L150	32	32	45	150	3	6	RDKT1204M0	TR1012	TRP12	TRS12
TRDE6R-32R03D32RD12L200				200	3	6	RDKT1204M0			

Milling Cutters



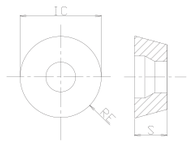
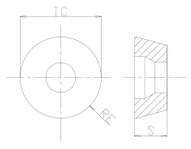
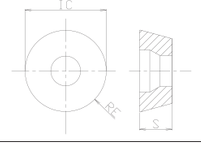
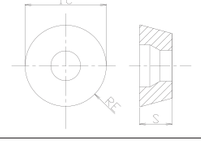
Designation	Size（mm）							Insert	Clamping Screw	Wrench	Clamping Piece
	D	d	H	W	T	Z	Max.ap				
TRDF5R-50R04RD10M22	50	22	50	10.4	6.3	4	5	RDKT10T3M0	TR1010	TRP10	TRS10
TRDF5R-63R04RD10M22	63	22	50	10.4	6.3	4	5	RDKT10T3M0			
TRDF5R-80R06RD10M27	80	27	50	12.4	7.0	6	5	RDKT10T3M0			
TRDF5R-100R06RD10M32	100	32	50	14.4	8.0	6	5	RDKT10T3M0			
TRDF6R-50R04RD12M22	50	22	50	10.4	6.3	4	6	RDKT1204M0	TR1012	TRP12	TRS12
TRDF6R-63R04RD12M22	63	22	50	10.4	6.3	4	6	RDKT1204M0			
TRDF6R-80R06RD12M27	80	27	50	12.4	7.0	6	6	RDKT1204M0			
TRDF6R-100R06RD12M32	100	32	50	14.4	8.0	6	6	RDKT1204M0			

TRD SERIES

Radius Milling with Lowers Cutting Costs and Increases Effciency

Applicable Inserts

Usage Classification											
★1st Choice ☆2nd Choice	P	Steel	★								
	M	Stainless	★								
	K	Cast iron	★								
	N	Non-ferrous					★				
	S	Superalloys									
	H	Hard materials		★							

Insert	Insert No.	Size(mm)			Coated Carbide				Carbide				
		IC	S	RE	TY602	TY622	TY625	TI960	HC200				
 General Chipbreaker		RDKT0802M0	8	2.4	4	●								
		RDKT10T3M0	10	4.0	5	●								
		RDKT1204M0	12	4.8	6	●								
		RDMT0802M0	8	2.4	4	●								
		RDMT10T3M0	10	4.0	5	●								
		RDMT1204M0	12	4.8	6	●								
 Stainless Steel Chipbreaker		RDKT0802M0-ST	8	2.4	4	●								
		RDKT10T3M0-ST	10	4.0	5	●								
		RDKT1204M0-ST	12	4.8	6	●								
		RDKT0802M0-TR	8	2.4	4		●							
		RDKT10T3M0-TR	10	4.0	5		●							
		RDKT1204M0-TR	12	4.8	6		●							
		RDKT0802M0	8	2.4	4					●				
		RDKT10T3M0	10	4.0	5					●				
		RDKT1204M0	12	4.8	6					●				

TRD SERIES

Radius Milling with Lowers Cutting Costs and Increases Effciency

Recommended Cutting Conditions

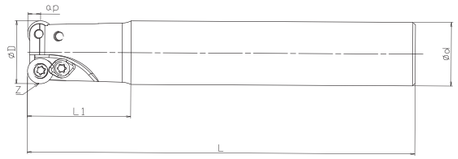
ISO	Workpiece material	Hardness	Grade	Cutting Speed	Feed
				Vc （m/min）	fz （mm/t）
P	Low Carbon Steel	≤HB180	TY602	120-220	0.15-0.30
	High Cabon and Alloy Steel	HB180-280		70-150	0.15-0.30
	Alloy Steel	HB280-350		70-150	0.15-0.30
M	Stainless Steel	≤HB200		120-200	0.10-0.25
K	Gray Cast Iron	HB150-250		140-220	0.15-0.30
	Ductile Cast Iron	HB150-250		150-240	0.15-0.30
N	Aluminum	—	HC200	300-800	0.07-0.55
H	Hardened Material	≤HRC55	TY622	40-80	0.22-0.40

Turning
Milling Cutter
Drilling

EMR SERIES

EMR Round Dowel Milling Cutter Bar

★ Suitable for a variety of economical inserts, high cost performance



Designation	Size(mm)							Insert	Clamping Screw	Wrench	Clamping Piece
	D	d	L1	L2	L	Z	Max.ap				
EMR-4R-C12-12-130L-1T	12	12	40	-	130	1	4	RPMT08T2	TT1008	TTP08	TTS08
EMR-4R-C12-13-130L-1T	13	12	40	-	130	1	4	RPMT08T2			
EMR-4R-C16-16-150L-2T	16	16	40	-	150	2	4	RPMT08T2			
EMR-4R-C15-16-150L-2T	16	15	40	-	150	2	4	RPMT08T2			
EMR-4R-C16-16-200L-2T	16	16	40	100	200	2	4	RPMT08T2			
EMR-4R-C15-16-200L-2T	16	15	40	-	200	2	4	RPMT08T2			
EMR-4R-C16-17-150L-2T	17	16	40	-	150	2	4	RPMT08T2			
EMR-4R-C16-17-200L-2T	17	16	50	-	200	2	4	RPMT08T2			
EMR-4R-C20-20-150L-2T	20	20	50	-	150	2	4	RPMT08T2			
EMR-4R-C19-20-150L-2T	20	19	50	-	150	2	4	RPMT08T2			
EMR-4R-C20-20-200L-2T	20	20	50	100	200	2	4	RPMT08T2			
EMR-4R-C19-20-200L-2T	20	19	50	-	200	2	4	RPMT08T2			
EMR-4R-C20-21-150L-2T	21	20	50	-	150	2	4	RPMT08T2			
EMR-4R-C20-21-200L-2T	21	20	50	-	200	2	4	RPMT08T2			
EMR-5R-C20-30-110L-2T	30	20	40	-	110	2	5	RPM□10□3	TT1011	TTP10	TTS10
EMR-5R-C20-20-150L-2T	20	20	50	-	150	2	5	RPM□10□3			
EMR-5R-C20-20-200L-2T	20	20	50	100	200	2	5	RPM□10□3			
EMR-5R-C20-21-150L-2T	21	20	50	-	150	2	5	RPM□10□3			
EMR-5R-C20-21-200L-2T	21	20	50	-	200	2	5	RPM□10□3			
EMR-5R-C25-25-150L-2T	25	25	50	-	150	2	5	RPM□10□3			
EMR-5R-C20-25-150L-2T	25	20	50	-	150	2	5	RPM□10□3			
EMR-5R-C24-25-150L-2T	25	24	50	-	150	2	5	RPM□10□3			
EMR-5R-C25-25-200L-2T	25	25	75	-	200	2	5	RPM□10□3			
EMR-5R-C25-25-250L-2T	25	25	60	115	250	2	5	RPM□10□3			
EMR-5R-C20-25-200L-2T	25	20	50	-	200	2	5	RPM□10□3			
EMR-5R-C24-25-200L-2T	25	24	50	-	200	2	5	RPM□10□3			
EMR-5R-C24-25-250L-2T	25	24	50	-	250	2	5	RPM□10□3			
EMR-5R-C25-26-150L-2T	26	25	50	-	150	2	5	RPM□10□3			
EMR-5R-C25-26-200L-2T	26	25	50	-	200	2	5	RPM□10□3			
EMR-5R-C25-26-250L-2T	26	25	50	-	250	2	5	RPMT1204	TT1012	TRP12	TRS12
ERP-6R-C32-32-150L-2T	32	32	50	-	150	2	6	RPMT1204			
ERP-6R-C32-32-200L-2T	32	32	50	-	200	2	6	RPMT1204			
ERP-6R-C32-35-150L-3T	35	32	50	-	150	3	6	RPMT1204			
ERP-6R-C32-35-200L-3T	35	32	50	-	200	3	6	RPMT1204			

EMR SERIES

EMR Round Dowel Milling Cutter Bar

Applicable Inserts

Usage Classification											
★1st Choice ☆2nd Choice	P	Steel	★								
	M	Stainless	★								
	K	Cast iron	★								
	N	Non-ferrous									
	S	Superalloys									
	H	Hard materials		★							

Insert		Insert No.	Size(mm)			Coated Carbide				Carbide			
			IC	S	RE	TI960	TH910	TY602	TY622	HC200			
		RPMT08T2M0-MT1	8	2.78	4	●							
		RPMW1003MT	10	3.18	5	●	●						
		RPMT10T3MT	10	3.97	5	●	●						
		RPMT1204M0-MT1	12	4.76	6	●	●						

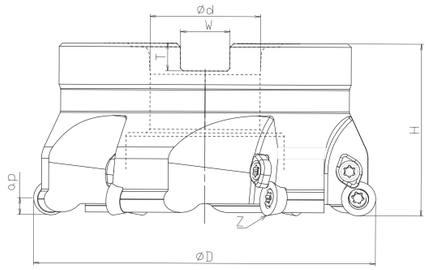
Recommended Cutting Conditions

ISO	Workpiece material	Hardness	Grade	Cutting Speed Vc（m/min）	Feed fz（mm/t）
P	Low Carbon Steel	≤HB180	TI960	120-220	0.15-0.30
	High Cabon and Alloy Steel	HB180-280		70-150	0.15-0.30
	Alloy Steel	HB280-350		70-150	0.15-0.30
M	Stainless Steel	≤HB200		120-200	0.10-0.25
K	Gray Cast Iron	HB150-250		140-220	0.15-0.30
	Ductile Cast Iron	HB150-250		150-240	0.15-0.30
H	Hardened Material	≤HRC50	TH910	40-80	0.22-0.40

EMR SERIES

EMR Round Dowel Mill

★ Suitable for 11° positive angle insert tip
★ Working with very economical insert
★ Large space for chipping, excellent chip removal performance
★ Taper design with high rigidity
★ Customized aluminium milling cutter is available



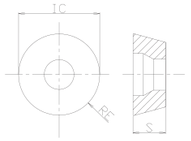
Designation	Size(mm)							Insert	Clamping Screw	Wrench	Clamping Piece
	D	d	H	W	T	Z	Max.ap				
EMR-5R-50-22-4T	50	22	50	10.4	6.3	4	5	RPMW1003 RPMT10T3	TW1010 TT1011	TTP10	TTS10
EMR-5R-63-22-4T	63	22	50	10.4	6.3	4	5				
EMR-5R-80-27-6T	80	27	50	12.4	7	6	5				
EMR-5R-100-32-6T	100	32	50	14.4	7	6	5				
EMR-5R-125-40-7T	125	40	63	16.4	9	7	5				
EMR-5R-160-40-8T	160	40	63	16.4	9	8	5				
ERP-6R-50-22-4T	50	22	50	10.4	6.3	4	6	RPMT1204	TT1012	TRP12	TRS12
ERP-6R-63-22-4T	63	22	50	10.4	6.3	4	6				
ERP-6R-80-27-6T	80	27	50	12.4	7	6	6				
ERP-6R-100-32-6T	100	32	50	14.4	8	6	6				

EMR SERIES

EMR Round Dowel Mill

Applicable Inserts

Usage Classification											
★1st Choice ☆2nd Choice	P	Steel	★								
	M	Stainless	★								
	K	Cast iron	★								
	N	Non-ferrous	★				★				
	S	Superalloys									
	H	Hard materials		★							

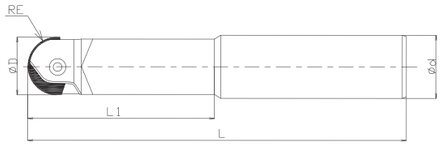
Insert		Insert No.	Size(mm)			Coated Carbide				Carbide				
			IC	S	RE	TI960	TH910	TY602	TY622	HC200				
		RPMW1003MT	10	3.18	5	●	●							
		RPMT10T3MT	10	3.97	5	●	●							
		RPMT1204M0-MT1	12	4.76	6	●	●							

Recommended Cutting Conditions

ISO	Workpiece material	Hardness	Grade	Cutting Speed Vc（m/min）	Feed fz（mm/t）
P	Low Carbon Steel	≤HB180	TI960	120-220	0.10-0.35
	High Cabon and Alloy Steel	HB180-280		70-150	0.10-0.35
	Alloy Steel	HB280-350		70-150	0.10-0.35
M	Stainless Steel	≤HB200		120-200	0.10-0.30
K	Gray Cast Iron	HB150-250		140-220	0.15-0.30
	Ductile Cast Iron	HB150-250		150-240	0.15-0.30
H	Hardened Material	≤HRC50	TH910	40-80	0.10-0.30

C-ABPF SERIES

Indexable End Mills for High Precision Finish



Designation	Size(mm)					Insert	Clamping Screw	Wrench
	D	d	L	L1	RE			
C-ABPF-10S10x30x150L	10	10	150	30	5	SP1W100	TSB-5842	TX10
C-ABPF-10S10x30x180L	10	10	180	30	5	SP1W100		
C-ABPF-12S12x35x165L	12	12	165	35	6	SP1W120	TSB-5843	TX20
C-ABPF-12S12x35x200L	12	12	200	35	6	SP1W120		
C-ABPF-16S16x50x200L	16	16	200	50	8	SP1W160	TSB-5844	
C-ABPF-16S16x50x250L	16	16	250	50	8	SP1W160		
C-ABPF-20S20x70x220L	20	20	220	70	10	SP1W200	TSB-5845	TX25
C-ABPF-20S20x70x250L	20	20	250	70	10	SP1W200		
C-ABPF-20S20x70x300L	20	20	300	70	10	SP1W200		
C-ABPF-25S25x100x200L	25	25	200	100	12.5	SP1W250	TSB-5846	TX30
C-ABPF-25S25x100x250L	25	25	250	100	12.5	SP1W250		
C-ABPF-25S25x100x300L	25	25	300	100	12.5	SP1W250		
C-ABPF-30S32x100x250L	30	32	250	100	15	SP1W300	TSB5847	
C-ABPF-30S32x100x300L	30	32	300	100	15	SP1W300		

TT SERVICES Indexable Milling Cutter
Profile Milling

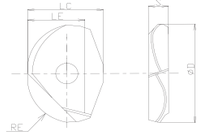
C-ABPF SERIES

Indexable End Mills for High Precision Finish

Applicable Inserts

Usage Classification										
★ 1st Choice ☆ 2nd Choice	P	Steel	★							
	M	Stainless								
	K	Cast iron								
	N	Non-ferrous								
	S	Superalloys								
	H	Hard materials	☆							

Insert	Insert No.	Size(mm)					Coated Carbide				Carbide			
		RE	D	LE	LC	S	TD300	TY622	TY625	TI960	HC200			
	SP1W100	5.0	10	5.6	12.1	2.7	●							
	SP1W120	6.0	12	6.6	14.6	3.2	●							
	SP1W160	8.0	16	9.0	16.6	4.2	●							
	SP1W200	10.0	20	11.5	20.3	5.2	●							
	SP1W250	12.5	25	14.5	24.1	6.2	●							
	SP1W300	15.0	30	18.5	29.2	7.2	●							



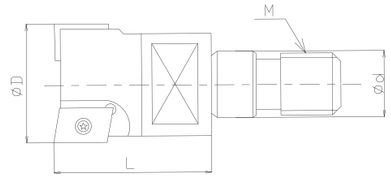
Recommended Cutting Conditions

ISO	Workpiece material	Hardness	Grade	Cutting Speed	Feed
				Vc （m/min）	fz （mm/t）
P	Carbon Steel	⩽HB300	TD300	160-200	0.1-0.25
	Alloy Steel	HB200-300		160-200	0.1-0.25
	Mold Steel	HRC⩽55		120-160	0.1-0.25

Turning
Milling Cutter
Drilling

MODULAR BAPM SERIES

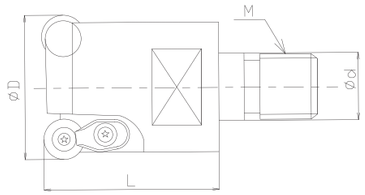
BAPM Square Shoulder Series Screwed End Mill



Designation	Size(mm)					Insert	Clamping Screw	Wrench
	D	L	d	M	Z			
BAPM-16-M8-2T-11	16	25	8.5	M8	2	APMT1135	TT1011	TTP11
BAPM-17-M8-2T-11	17	25	8.5	M8	2	APMT1135		
BAPM-20-M10-2T-11	20	27	10.5	M10	2	APMT1135		
BAPM-21-M10-2T-11	21	27	10.5	M10	2	APMT1135		
BAPM-22-M10-3T-11	22	29	10.5	M10	3	APMT1135		
BAPM-25-M12-3T-11	25	29	12.5	M12	3	APMT1135		
BAPM-26-M12-3T-11	26	29	12.5	M12	3	APMT1135		
BAPM-28-M12-4T-11	28	31.5	12.5	M12	4	APMT1135		
BAPM-30-M16-4T-11	30	30	16.5	M16	4	APMT1135		
BAPM-32-M16-4T-11	32	33	16.5	M16	4	APMT1135		
BAPM-35-M16-4T-11	35	34	16.5	M16	4	APMT1135		
BAPM-40-M16-4T-11	40	37	16.5	M16	4	APMT1135		
BAPM-25-M12-2T-16	25	35	12.5	M12	2	APMT1604	TT1016	TTP16
BAPM-26-M12-2T-16	26	35	12.5	M12	2	APMT1604		
BAPM-30-M16-3T-16	30	39	16.5	M16	3	APMT1604		
BAPM-32-M16-3T-16	32	39	16.5	M16	3	APMT1604		
BAPM-35-M16-3T-16	35	42	16.5	M16	3	APMT1604		
BAPM-40-M16-4T-16	40	43	16.5	M16	4	APMT1604		

MODULAR EMRM SERIES

EMRM Round Nose Series Screwed End Mill



Designation	Size(mm)					Insert	Clamping Screw	Wrench
	D	L	d	M	Z			
EMRM-4R16-M8-2T	16	25	8.5	M8	2	RPMT08T2	TT1008	TTP08
EMRM-4R17-M8-2T	17	25	8.5	M8	2	RPMT08T2		
EMRM-4R20-M10-2T	20	27	10.5	M10	2	RPMT08T2		
EMRM-4R21-M10-2T	21	27	10.5	M10	2	RPMT08T2		
EMRM-4R25-M12-3T	25	29	12.5	M12	3	RPMT08T2		
EMRM-4R26-M12-3T	26	29	12.5	M12	3	RPMT08T2		
EMRM-4R30-M16-4T	30	31	16.5	M16	4	RPMT08T2		
EMRM-4R32-M16-4T	32	32	16.5	M16	4	RPMT08T2		
EMRM-4R35-M16-4T	35	34	16.5	M16	4	RPMT08T2		
EMRM-4R40-M16-5T	40	34	16.5	M16	5	RPMW1003		
EMRM-5R25-M12-2T	25	32	12.5	M12	2	RPMW1003	TT1011	TTP10
EMRM-5R26-M12-2T	26	32	12.5	M12	2	RPMW1003		
EMRM-5R30-M16-2T	30	35	16.5	M16	2	RPMW1003		
EMRM-5R32-M16-3T	32	35	16.5	M16	3	RPMW1003		
EMRM-5R35-M16-3T	35	37	16.5	M16	3	RPMW1003		
EMRM-5R40-M16-4T	40	39	16.5	M16	4	RPMW1003		
EMRM-6R25-M12-2T	25	34	12.5	M12	2	RPMT1204	TT1012	TRP12
EMRM-6R26-M12-2T	26	35	12.5	M12	2	RPMT1204		
EMRM-6R30-M16-2T	30	36	16.5	M16	2	RPMT1204		
EMRM-6R32-M16-2T	32	36	16.5	M16	2	RPMT1204		
EMRM-6R35-M16-3T	35	38	16.5	M16	3	RPMT1204		
EMRM-6R40-M16-3T	40	38	16.5	M16	3	RPMT1204		

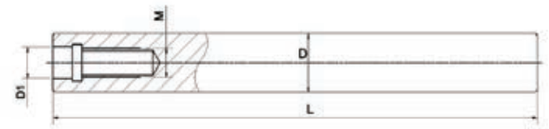
End Mills with Exchangeable Heads

Square	Designation	Size(mm)				
		Diameter	Flute Length	Neck Diameter	Tread Size	Z
	HHD1004	10	10	9.7	M05	4
	HHD1204	12	12	11.7	M06	4
	HHD1604	16	16	15.7	M08	4
	HHD2004	20	20	19.5	M10	4
	HHD2504	25	25	24.5	M12	4

Ball Nose	Designation	Size(mm)				
		Radius	Flute Length	Neck Diameter	Tread Size	Z
	HSB1002	R5.0	10	9.7	M05	2
	HSB1202	R6.0	12	11.7	M06	2
	HSB1602	R8.0	16	15.7	M08	2
	HSB2002	R10.0	20	19.5	M10	2
	HSB2502	R12.5	25	24.5	M12	2
	HSB1004	R5.0	10	9.7	M05	4
	HSB1204	R6.0	12	11.7	M06	4
	HSB1604	R8.0	16	15.7	M08	4
	HSB2004	R10.0	20	19.5	M10	4
	HSB2504	R12.5	25	24.5	M12	4

Corner Radius	Designation	Size(mm)				
		Diameter xCorner R	Flute Length	Neck Diameter	Tread Size	Z
	HRTA100054	10x0.5R	10	9.7	M05	4
	HRTA100104	10x1R	10	9.7	M05	4
	HRTA100204	10x2R	10	9.7	M05	4
	HRTA120054	12x0.5R	12	11.7	M06	4
	HRTA120104	12x1R	12	11.7	M06	4
	HRTA120204	12x2R	12	11.7	M06	4
	HRTA160104	16x1R	16	15.7	M08	4
	HRTA160204	16x2R	16	15.7	M08	4
	HRTA200104	20x1R	20	19.5	M10	4
	HRTA200204	20x2R	20	19.5	M10	4
	HRTA250104	25x1R	25	24.5	M12	4
	HRTA250204	25x2R	25	24.5	M12	4

Tungsten Anti-Vibration Milling Arbor



Designation	Size(mm)				
	Model	L	D1	D	M
MFT-10-100-M5	Φ10mm*100L*M5	100	5.5	10	M5
MFT-10-150-M5	Φ10mm*150L*M5	150	5.5	10	M5
MFT-12-100-M6	Φ12mm*100L*M6	100	6.5	12	M6
MFT-12-150-M6	Φ12mm*150L*M6	150	6.5	12	M6
MFT-12-200-M6	Φ12mm*200L*M6	200	6.5	12	M6
MFT-16-100-M8	Φ16mm*100L*M8	100	8.5	16	M8
MFT-16-150-M8	Φ16mm*150L*M8	150	8.5	16	M8
MFT-16-200-M8	Φ16mm*200L*M8	200	8.5	16	M8
MFT-16-250-M8	Φ16mm*250L*M8	250	8.5	16	M8
MFT-20-100-M10	Φ20mm*100L*M10	100	10.5	20	M10
MFT-20-150-M10	Φ20mm*150L*M10	150	10.5	20	M10
MFT-20-200-M10	Φ20mm*200L*M10	200	10.5	20	M10
MFT-20-250-M10	Φ20mm*250L*M10	250	10.5	20	M10
MFT-20-300-M10	Φ20mm*300L*M10	300	10.5	20	M10
MFT-25-100-M12	Φ25mm*100L*M12	100	12.5	25	M12
MFT-25-150-M12	Φ25mm*150L*M12	150	12.5	25	M12
MFT-25-200-M12	Φ25mm*200L*M12	200	12.5	25	M12
MFT-25-250-M12	Φ25mm*250L*M12	250	12.5	25	M12
MFT-25-300-M12	Φ25mm*300L*M12	300	12.5	25	M12
MFT-32-150-M16	Φ32mm*150L*M16	150	17.0	32	M16
MFT-32-200-M16	Φ32mm*200L*M16	200	17.0	32	M16
MFT-32-250-M16	Φ32mm*250L*M16	250	17.0	32	M16
MFT-32-300-M16	Φ32mm*300L*M16	300	17.0	32	M16
MFT-32-350-M16	Φ32mm*350L*M16	350	17.0	32	M16

TT Services U drill, featuring uniquely designed insert, offers highly economical drilling with enhanced stability and long tool life.

Line up:

Inserts:

Available in the sizes SPG/MX 05, 06, 07, 09, 11, and 14

Each has 4 cutting edges

Drill bodies:

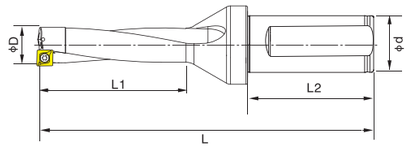
ZD: Available in L/D=2, 3,4 and 5 in metric shank sizes

from øDc 13 to 60 **Tolerance:** -0.1~+0.2

Grades:

TI620: First choice for general purpose

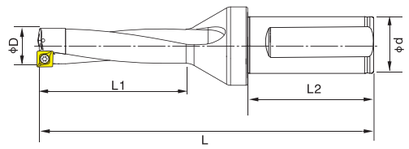
TN200: Suitable for Non-ferrous metal processing



2D-SP U DRILL

Unit (mm)

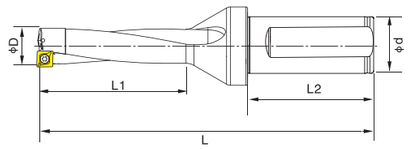
Model No.	Size					Insert	Screw	Wrench
	D	L1	L	L2	d			
ZD02-13.0-XP25-SP05-02	13	26	104	56	25	SP□X050204	ST0205	T6
ZD02-13.5-XP25-SP05-02	13.5	27	105					
ZD02-14.0-XP25-SP05-02	14	28	106					
ZD02-14.5-XP25-SP05-02	14.5	29	107					
ZD02-15.0-XP25-SP05-02	15	30	108					
ZD02-15.5-XP25-SP06-02	15.5	31	109			SP□X060204	ST2205	
ZD02-16.0-XP25-SP06-02	16	32	110					
ZD02-16.5-XP25-SP06-02	16.5	33	111					
ZD02-17.0-XP25-SP06-02	17	34	112					
ZD02-17.5-XP25-SP06-02	17.5	35	113					
ZD02-18.0-XP25-SP06-02	18	36	114					
ZD02-18.5-XP25-SP06-02	18.5	37	115					
ZD02-19.0-XP25-SP06-02	19	38	116					
ZD02-19.5-XP25-SP06-02	19.5	39	117					
ZD02-20.0-XP25-SP06-02	20	40	119					
ZD02-20.5-XP25-SP06-02	20.5	41	120					
ZD02-21.0-XP25-SP06-02	21	42	121					
ZD02-21.5-XP25-SP06-02	21.5	43	122					
ZD02-22.0-XP25-SP07-02	22	44	123			SP□X07T308	ST2506	T8
ZD02-22.5-XP25-SP07-02	22.5	45	124					
ZD02-23.0-XP25-SP07-02	23	46	125					
ZD02-23.5-XP25-SP07-02	23.5	47	126					
ZD02-24.0-XP25-SP07-02	24	48	127					
ZD02-24.5-XP25-SP07-02	24.5	49	128					
ZD02-25.0-XP32-SP07-02	25	50	141	60	32	SP□X090408	ST3508	T15
ZD02-25.5-XP32-SP07-02	25.5	51	142					
ZD02-26.0-XP32-SP07-02	26	52	143					
ZD02-26.5-XP32-SP07-02	26.5	53	144					
ZD02-27.0-XP32-SP07-02	27	54	145					
ZD02-27.5-XP32-SP09-02	27.5	55	146					
ZD02-28.0-XP32-SP09-02	28	56	147					
ZD02-28.5-XP32-SP09-02	28.5	57	148					
ZD02-29.0-XP32-SP09-02	29	58	149					
ZD02-29.5-XP32-SP09-02	29.5	59	150					
ZD02-30.0-XP32-SP09-02	30	60	151					
ZD02-30.5-XP32-SP09-02	30.5	61	152					
ZD02-31.0-XP32-SP09-02	31	62	153					
ZD02-31.5-XP32-SP09-02	31.5	63	154					
ZD02-32.0-XP32-SP09-02	32	64	155					
ZD02-32.5-XP32-SP09-02	32.5	65	156					
ZD02-33.0-XP32-SP09-02	33	66	157					
ZD02-33.5-XP32-SP11-02	33.5	67	158			SP□X110408	ST4010	
ZD02-34.0-XP32-SP11-02	34	68	159					
ZD02-34.5-XP32-SP11-02	34.5	69	160					
ZD02-35.0-XP32-SP11-02	35	70	161					
ZD02-35.5-XP32-SP11-02	35.5	71	162					



2D-SP U DRILL

Unit（mm）

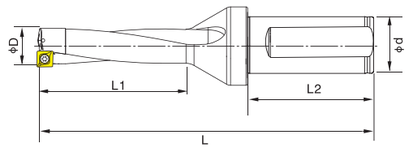
Model No.	Size					Insert	Screw	Wrench
	D	L1	L	L2	d			
ZD02-36.0-XP32-SP11-02	36	72	163	60	32	SP□X110408	ST4010	T15
ZD02-36.5-XP32-SP11-02	36.5	73	164					
ZD02-37.0-XP32-SP11-02	37	74	165					
ZD02-37.5-XP32-SP11-02	37.5	75	166					
ZD02-38.0-XP32-SP11-02	38	76	167					
ZD02-38.5-XP32-SP11-02	38.5	77	168					
ZD02-39.0-XP32-SP11-02	39	78	169					
ZD02-39.5-XP32-SP11-02	39.5	79	170					
ZD02-40.0-XP32-SP11-02	40	80	171					
ZD02-41.0-XP32-SP14-02	41	82	173			SP□X140512	ST5010	T20
ZD02-42.0-XP32-SP14-02	42	84	175					
ZD02-43.0-XP40-SP14-02	43	86	186	65	40			
ZD02-44.0-XP40-SP14-02	44	88	188					
ZD02-45.0-XP40-SP14-02	45	90	190					
ZD02-46.0-XP40-SP14-02	46	92	192					
ZD02-47.0-XP40-SP14-02	47	94	194					
ZD02-48.0-XP40-SP14-02	48	96	196					
ZD02-49.0-XP40-SP14-02	49	98	198					
ZD02-50.0-XP40-SP14-02	50	100	200					
ZD02-51.0-XP40-SP14-02	51	102	202					
ZD02-52.0-XP40-SP09-04	52	104	204			SP□X090408	ST3508	T15
ZD02-53.0-XP40-SP09-04	53	106	206					
ZD02-54.0-XP40-SP09-04	54	108	208					
ZD02-55.0-XP40-SP09-04	55	110	210					
ZD02-56.0-XP40-SP09-04	56	112	212					
ZD02-57.0-XP40-SP09-04	57	114	214					
ZD02-58.0-XP40-SP09-04	58	116	216					
ZD02-59.0-XP40-SP09-04	59	118	218					
ZD02-60.0-XP40-SP09-04	60	120	220					



3D-SP U DRILL

Unit（mm）

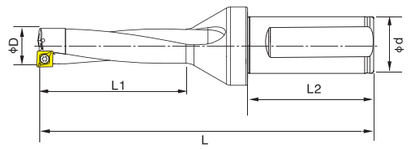
Model No.	Size					Insert	Screw	Wrench
	D	L1	L	L2	d			
ZD03-13.0-XP25-SP05-02	13	39	117	56	25	SP□X050204	ST0205	T6
ZD03-13.5-XP25-SP05-02	13.5	40.5	118					
ZD03-14.0-XP25-SP05-02	14	42	120					
ZD03-14.5-XP25-SP05-02	14.5	43.5	122					
ZD03-15.0-XP25-SP05-02	15	45	123					
ZD03-15.5-XP25-SP06-02	15.5	46.5	124			SP□X060204	ST2205	
ZD03-16.0-XP25-SP06-02	16	48	126					
ZD03-16.5-XP25-SP06-02	16.5	49.5	127					
ZD03-17.0-XP25-SP06-02	17	51	129					
ZD03-17.5-XP25-SP06-02	17.5	52.5	130					
ZD03-18.0-XP25-SP06-02	18	54	132					
ZD03-18.5-XP25-SP06-02	18.5	55.5	133					
ZD03-19.0-XP25-SP06-02	19	57	135					
ZD03-19.5-XP25-SP06-02	19.5	58.5	135					
ZD03-20.0-XP25-SP06-02	20	60	139					
ZD03-20.5-XP25-SP06-02	20.5	61.5	140					
ZD03-21.0-XP25-SP06-02	21	63	142					
ZD03-21.5-XP25-SP06-02	21.5	64.5	143					
ZD03-22.0-XP25-SP07-02	22	66	145			SP□X07T308	ST2506	T8
ZD03-22.5-XP25-SP07-02	22.5	67.5	148					
ZD03-23.0-XP25-SP07-02	23	69	148					
ZD03-23.5-XP25-SP07-02	23.5	70.5	149					
ZD03-24.0-XP25-SP07-02	24	72	151					
ZD03-24.5-XP25-SP07-02	24.5	73.5	152					
ZD03-25.0-XP32-SP07-02	25	75	166	60	32	SP□X090408	ST3508	T15
ZD03-25.5-XP32-SP07-02	25.5	76.5	167					
ZD03-26.0-XP32-SP07-02	26	78	169					
ZD03-26.5-XP32-SP07-02	26.5	79.5	170					
ZD03-27.0-XP32-SP07-02	27	81	172					
ZD03-27.5-XP32-SP09-02	27.5	82.5	173					
ZD03-28.0-XP32-SP09-02	28	84	175					
ZD03-28.5-XP32-SP09-02	28.5	85.5	176					
ZD03-29.0-XP32-SP09-02	29	87	178					
ZD03-29.5-XP32-SP09-02	29.5	88.5	179					
ZD03-30.0-XP32-SP09-02	30	90	181					
ZD03-30.5-XP32-SP09-02	30.5	91.5	182					
ZD03-31.0-XP32-SP09-02	31	93	184					
ZD03-31.5-XP32-SP09-02	31.5	94.5	185					
ZD03-32.0-XP32-SP09-02	32	96	187					
ZD03-32.5-XP32-SP09-02	32.5	97.5	188					
ZD03-33.0-XP32-SP09-02	33	99	190					
ZD03-33.5-XP32-SP11-02	33.5	100.5	191			SP□X110408	ST4010	
ZD03-34.0-XP32-SP11-02	34	102	193					
ZD03-34.5-XP32-SP11-02	34.5	103.5	194					
ZD03-35.0-XP32-SP11-02	35	105	196					
ZD03-35.5-XP32-SP11-02	35.5	106.5	197					



3D-SP U DRILL

Unit（mm）

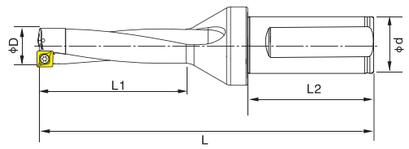
Model No.	Size					Insert	Screw	Wrench
	D	L1	L	L2	d			
ZD03-36.0-XP32-SP11-02	36	108	199	60	32	SP□X110408	ST4010	T15
ZD03-36.5-XP32-SP11-02	36.5	109.5	200					
ZD03-37.0-XP32-SP11-02	37	111	202					
ZD03-37.5-XP32-SP11-02	37.5	112.5	203					
ZD03-38.0-XP32-SP11-02	38	114	205					
ZD03-38.5-XP32-SP11-02	38.5	115.5	206					
ZD03-39.0-XP32-SP11-02	39	117	206					
ZD03-39.5-XP32-SP11-02	39.5	118.5	209					
ZD03-40.0-XP32-SP11-02	40	120	211					
ZD03-41.0-XP32-SP14-02	41	123	214			SP□X140512	ST5010	T20
ZD03-42.0-XP32-SP14-02	42	126	217					
ZD03-43.0-XP40-SP14-02	43	129	229	65	40			
ZD03-44.0-XP40-SP14-02	44	132	232					
ZD03-45.0-XP40-SP14-02	45	135	235					
ZD03-46.0-XP40-SP14-02	46	138	238					
ZD03-47.0-XP40-SP14-02	47	141	241					
ZD03-48.0-XP40-SP14-02	48	144	244					
ZD03-49.0-XP40-SP14-02	49	147	247					
ZD03-50.0-XP40-SP14-02	50	150	250					
ZD03-51.0-XP40-SP14-02	51	153	253					
ZD03-52.0-XP40-SP09-04	52	156	256			SP□X090408	ST3508	T15
ZD03-53.0-XP40-SP09-04	53	159	259					
ZD03-54.0-XP40-SP09-04	54	162	262					
ZD03-55.0-XP40-SP09-04	55	165	265					
ZD03-56.0-XP40-SP09-04	56	168	268					
ZD03-57.0-XP40-SP09-04	57	171	271					
ZD03-58.0-XP40-SP09-04	58	175	274					
ZD03-59.0-XP40-SP09-04	59	177	277					
ZD03-60.0-XP40-SP09-04	60	180	280					



4D-SP U DRILL

Unit（mm）

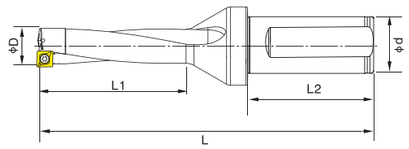
Model No.	Size					Insert	Screw	Wrench
	D	L1	L	L2	d			
ZD04-13.0-XP25-SP05-02	13	52	130	56	25	SP□X050204	ST0205	T6
ZD04-13.5-XP25-SP05-02	13.5	54	132					
ZD04-14.0-XP25-SP05-02	14	56	134					
ZD04-14.5-XP25-SP05-02	14.5	58	136					
ZD04-15.0-XP25-SP05-02	15	60	138					
ZD04-15.5-XP25-SP06-02	15.5	62	140			SP□X060204	ST2205	
ZD04-16.0-XP25-SP06-02	16	64	142					
ZD04-16.5-XP25-SP06-02	16.5	66	144					
ZD04-17.0-XP25-SP06-02	17	68	146					
ZD04-17.5-XP25-SP06-02	17.5	70	148					
ZD04-18.0-XP25-SP06-02	18	72	150					
ZD04-18.5-XP25-SP06-02	18.5	74	152					
ZD04-19.0-XP25-SP06-02	19	76	154					
ZD04-19.5-XP25-SP06-02	19.5	78	155					
ZD04-20.0-XP25-SP06-02	20	80	159					
ZD04-20.5-XP25-SP06-02	20.5	82	161					
ZD04-21.0-XP25-SP06-02	21	84	163					
ZD04-21.5-XP25-SP06-02	21.5	86	165					
ZD04-22.0-XP25-SP07-02	22	88	167			SP□X07T308	ST2506	T8
ZD04-22.5-XP25-SP07-02	22.5	90	169					
ZD04-23.0-XP25-SP07-02	23	92	171					
ZD04-23.5-XP25-SP07-02	23.5	94	173					
ZD04-24.0-XP25-SP07-02	24	96	175					
ZD04-24.5-XP25-SP07-02	24.5	98	177					
ZD04-25.0-XP32-SP07-02	25	100	191	60	32	SP□X090408	ST3508	T15
ZD04-25.5-XP32-SP07-02	25.5	102	193					
ZD04-26.0-XP32-SP07-02	26	104	195					
ZD04-26.5-XP32-SP07-02	26.5	106	197					
ZD04-27.0-XP32-SP07-02	27	108	199					
ZD04-27.5-XP32-SP09-02	27.5	110	201					
ZD04-28.0-XP32-SP09-02	28	112	203					
ZD04-28.5-XP32-SP09-02	28.5	114	205					
ZD04-29.0-XP32-SP09-02	29	116	207					
ZD04-29.5-XP32-SP09-02	29.5	118	209					
ZD04-30.0-XP32-SP09-02	30	120	211					
ZD04-30.5-XP32-SP09-02	30.5	122	213					
ZD04-31.0-XP32-SP09-02	31	124	215					
ZD04-31.5-XP32-SP09-02	31.5	126	217					
ZD04-32.0-XP32-SP09-02	32	128	219					
ZD04-32.5-XP32-SP09-02	32.5	130	221					
ZD04-33.0-XP32-SP09-02	33	132	223					
ZD04-33.5-XP32-SP11-02	33.5	134	225			SP□X110408	ST4010	
ZD04-34.0-XP32-SP11-02	34	136	227					
ZD04-34.5-XP32-SP11-02	34.5	138	229					
ZD04-35.0-XP32-SP11-02	35	140	231					
ZD04-35.5-XP32-SP11-02	35.5	142	233					



4D-SP U DRILL

Unit（mm）

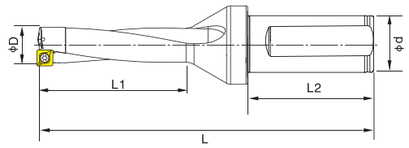
Model No.	Size					Insert	Screw	Wrench
	D	L1	L	L2	d			
ZD04-36.0-XP32-SP11-02	36	144	235	60	32	SP□X110408	ST4010	T15
ZD04-36.5-XP32-SP11-02	36.5	146	237					
ZD04-37.0-XP32-SP11-02	37	148	239					
ZD04-37.5-XP32-SP11-02	37.5	150	241					
ZD04-38.0-XP32-SP11-02	38	152	243					
ZD04-38.5-XP32-SP11-02	38.5	154	245					
ZD04-39.0-XP32-SP11-02	39	156	247					
ZD04-39.5-XP32-SP11-02	39.5	158	249					
ZD04-40.0-XP32-SP11-02	40	160	251					
ZD04-41.0-XP32-SP14-02	41	164	255					
ZD04-42.0-XP32-SP14-02	42	168	259			SP□X140512	ST5010	T20
ZD04-43.0-XP40-SP14-02	43	172	272	65	40			
ZD04-44.0-XP40-SP14-02	44	176	276					
ZD04-45.0-XP40-SP14-02	45	180	280					
ZD04-46.0-XP40-SP14-02	46	184	284					
ZD04-47.0-XP40-SP14-02	47	188	288					
ZD04-48.0-XP40-SP14-02	48	192	292					
ZD04-49.0-XP40-SP14-02	49	196	296					
ZD04-50.0-XP40-SP14-02	50	200	300					
ZD04-51.0-XP40-SP14-02	51	204	304					
ZD04-52.0-XP40-SP09-04	52	208	308			SP□X090408	ST3508	T15
ZD04-53.0-XP40-SP09-04	53	212	312					
ZD04-54.0-XP40-SP09-04	54	216	316					
ZD04-55.0-XP40-SP09-04	55	220	320					
ZD04-56.0-XP40-SP09-04	56	224	324					
ZD04-57.0-XP40-SP09-04	57	228	328					
ZD04-58.0-XP40-SP09-04	58	232	332					
ZD04-59.0-XP40-SP09-04	59	236	336					
ZD04-60.0-XP40-SP09-04	60	240	340					



5D-SP U DRILL

Unit（mm）

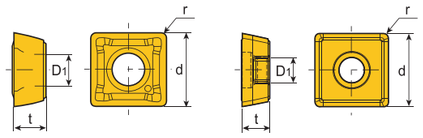
Model No.	Size					Insert	Screw	Wrench
	D	L1	L	L2	d			
ZD05-20.0-XP25-SP06-02	20	100	179	56	25	SP□X060204	ST2205	T6
ZD05-20.5-XP25-SP06-02	20.5	102.5	181					
ZD05-21.0-XP25-SP06-02	21	105	184					
ZD05-21.5-XP25-SP06-02	21.5	107.5	186					
ZD05-22.0-XP25-SP07-02	22	110	189			SP□X07T308	ST2506	T8
ZD05-22.5-XP25-SP07-02	22.5	112.5	193					
ZD05-23.0-XP25-SP07-02	23	115	194					
ZD05-23.5-XP25-SP07-02	23.5	117.5	196					
ZD05-24.0-XP25-SP07-02	24	120	199					
ZD05-24.5-XP25-SP07-02	24.5	122.5	201					
ZD05-25.0-XP32-SP07-02	25	125	216	60	32			
ZD05-25.5-XP32-SP07-02	25.5	127.5	218					
ZD05-26.0-XP32-SP07-02	26	130	221					
ZD05-26.5-XP32-SP07-02	26.5	132.5	223					
ZD05-27.0-XP32-SP07-02	27	135	226					
ZD05-27.5-XP32-SP09-02	27.5	137.5	228			SP□X090408	ST3508	T15
ZD05-28.0-XP32-SP09-02	28	140	231					
ZD05-28.5-XP32-SP09-02	28.5	142.5	233					
ZD05-29.0-XP32-SP09-02	29	145	236					
ZD05-29.5-XP32-SP09-02	29.5	147.5	238					
ZD05-30.0-XP32-SP09-02	30	150	241					
ZD05-30.5-XP32-SP09-02	30.5	152.5	243					
ZD05-31.0-XP32-SP09-02	31	155	246					
ZD05-31.5-XP32-SP09-02	31.5	157.5	248					
ZD05-32.0-XP32-SP09-02	32	160	251					
ZD05-32.5-XP32-SP09-02	32.5	162.5	253					
ZD05-33.0-XP32-SP09-02	33	165	256					
ZD05-33.5-XP32-SP11-02	33.5	167.5	258			SP□X110408	ST4010	
ZD05-34.0-XP32-SP11-02	34	170	261					
ZD05-34.5-XP32-SP11-02	34.5	172.5	263					
ZD05-35.0-XP32-SP11-02	35	175	266					
ZD05-35.5-XP32-SP11-02	35.5	177.5	268					
ZD05-36.0-XP32-SP11-02	36	180	271					
ZD05-36.5-XP32-SP11-02	36.5	182.5	273					
ZD05-37.0-XP32-SP11-02	37	185	276					
ZD05-37.5-XP32-SP11-02	37.5	187.5	278					
ZD05-38.0-XP32-SP11-02	38	190	281					
ZD05-38.5-XP32-SP11-02	38.5	192.5	283					
ZD05-39.0-XP32-SP11-02	39	195	284					
ZD05-39.5-XP32-SP11-02	39.5	197.5	288					
ZD05-40.0-XP32-SP11-02	40	200	291					
ZD05-41.0-XP32-SP14-02	41	205	296			SP□X140512	ST5010	T20
ZD05-42.0-XP32-SP14-02	42	210	301					



5D-SP U DRILL

Unit（mm）

Model No.	Size					Insert	Screw	Wrench
	D	L1	L	L2	d			
ZD05-43.0-XP40-SP14-02	43	215	315	65	40	SP□X140512	ST5010	T20
ZD05-44.0-XP40-SP14-02	44	220	320					
ZD05-45.0-XP40-SP14-02	45	225	325					
ZD05-46.0-XP40-SP14-02	46	230	330					
ZD05-47.0-XP40-SP14-02	47	235	335					
ZD05-48.0-XP40-SP14-02	48	240	340					
ZD05-49.0-XP40-SP14-02	49	245	345					
ZD05-50.0-XP40-SP14-02	50	250	350					
ZD05-51.0-XP40-SP14-02	51	255	355					
ZD05-52.0-XP40-SP09-04	52	260	360			SP□X090408	ST3508	T15
ZD05-53.0-XP40-SP09-04	53	265	365					
ZD05-54.0-XP40-SP09-04	54	270	370					
ZD05-55.0-XP40-SP09-04	55	275	375					
ZD05-56.0-XP40-SP09-04	56	280	380					
ZD05-57.0-XP40-SP09-04	57	285	385					
ZD05-58.0-XP40-SP09-04	58	290	390					
ZD05-59.0-XP40-SP09-04	59	295	395					
ZD05-60.0-XP40-SP09-04	60	300	400					



Unit（mm）

Size	Dimension (mm)		
	d	t	r
05	5.00	2.38	0.4
06	6.00	2.38	0.4
07	7.94	3.97	0.8
09	9.80	4.30	0.8
11	11.50	4.80	0.8
14	14.30	5.20	1.2

Insert	Designation	Material	
		TI620	TN200
	SPMX050204	●	
	SPMX060204	●	
	SPMX07T308	●	
	SPMX090408	●	
	SPMX110408	●	
	SPMX140512	●	
	SPGX050204		●
	SPGX060204		●
	SPGX07T308		●
	SPGX090408		●
	SPGX110408		●
	SPGX140512		●

Cutting Conditions

Unit（mm）

ISO	Material		Condition	Tensile strength	Hardness	Cutting speed	Feed (mm/rev) vs. drill diameter Drill length 2,3,4xD					
				Rm(n/mm²)	HB	Vc(m/min)	SPGX05	SPGX06	SPGX07	SPGX09	SPGX11	SPGX14
P	Non-alloy steel, cast steel, free cutting steel	<0.25%C	Annealed	420	125	200-280	0.04-0.06	0.04-0.06	0.04-0.08	0.04-0.08	0.06-0.10	0.06-0.12
		>=0.25%C	Annealed	650	190	120-190	0.05-0.08	0.06-0.10	0.06-0.12	0.07-0.13	0.08-0.15	0.08-0.16
		<0.55%C	Quenched and tempered	850	250	110-180	0.06-0.12	0.08-0.15	0.10-0.18	0.12-0.22	0.12-0.24	0.13-0.25
		>=0.55%C	Annealed	750	220	110-180	0.06-0.12	0.08-0.15	0.10-0.18	0.12-0.22	0.12-0.24	0.13-0.25
		0.55-0.80%	Quenched and tempered	1000	300	110-180	0.06-0.12	0.08-0.15	0.10-0.18	0.12-0.22	0.12-0.24	0.13-0.25
	Low alloy steel and cast steel (Less than 5% of alloying elements)		Annealed	600	200	120-190	0.06-0.12	0.08-0.14	0.10-0.18	0.12-0.20	0.12-0.20	0.13-0.20
			Quenched and tempered	930	275	120-160	0.06-0.15	0.06-0.15	0.08-0.18	0.08-0.18	0.08-0.18	0.08-0.18
				1000	300	120-160	0.06-0.15	0.06-0.15	0.08-0.18	0.08-0.18	0.08-0.18	0.08-0.18
				1200	350	120-160	0.06-0.15	0.06-0.15	0.08-0.18	0.08-0.18	0.08-0.18	0.08-0.18
	˝High alloy steel, cast steeland tool steel"		Annealed	680	200	120-180	0.06-0.10	0.06-0.10	0.08-0.12	0.08-0.14	0.08-0.14	0.08-0.14
			Quenched and tempered	1100	325	120-180	0.06-0.10	0.08-0.12	0.10-0.15	0.12-0.15	0.12-0.18	0.13-0.18
M	˝Stainless steel and cast steel"		Ferritic / martensitic	680	200	170-230	0.05-0.10	0.06-0.12	0.08-0.15	0.09-0.16	0.10-0.17	0.11-0.18
			Martensitic	820	240	170-230	0.05-0.10	0.06-0.12	0.08-0.15	0.09-0.16	0.10-0.17	0.11-0.18
			Austenitic	600	180	170-230	0.05-0.10	0.06-0.12	0.08-0.15	0.09-0.16	0.10-0.17	0.11-0.18
N	Aluminium Alloy		-	-	-	200-320	0.06-0.17	0.06-0.17	0.06-0.18	0.07-0.20	0.07-0.20	0.08-0.22
	Copper Alloy		-	-	-	200-320	0.06-0.17	0.06-0.17	0.06-0.18	0.07-0.20	0.07-0.20	0.08-0.22

ISO	Material		Condition	Tensile strength	Hardness	Cutting speed	Feed (mm/rev) vs. drill diameter Drill length 5xD					
				Rm(n/mm²)	HB	Vc(m/min)	SPGX05	SPGX06	SPGX07	SPGX09	SPGX11	SPGX14
P	Non-alloy steel, cast steel, free cutting steel	<0.25%C	Annealed	420	125	200-280	0.04-0.05	0.04-0.05	0.04-0.06	0.04-0.07	0.06-0.08	0.06-0.10
		>=0.25%C	Annealed	650	190	120-190	0.06-0.08	0.06-0.08	0.06-0.10	0.07-0.12	0.08-0.13	0.08-0.14
		<0.55%C	Quenched and tempered	850	250	110-180	0.06-0.10	0.08-0.13	0.10-0.16	0.12-0.20	0.12-0.22	0.13-0.23
		>=0.55%C	Annealed	750	220	110-180	0.06-0.10	0.08-0.13	0.10-0.16	0.12-0.20	0.12-0.22	0.13-0.23
		0.55-0.80%	Quenched and tempered	1000	300	110-180	0.06-0.10	0.08-0.13	0.10-0.16	0.12-0.20	0.12-0.22	0.13-0.23
	Low alloy steel and cast steel (Less than 5% of alloying elements)		Annealed	600	200	120-190	0.06-0.10	0.08-0.12	0.10-0.16	0.12-0.18	0.12-0.18	0.13-0.18
			Quenched and tempered	930	275	120-160	0.06-0.12	0.06-0.13	0.08-0.16	0.08-0.16	0.08-0.17	0.08-0.17
				1000	300	120-160	0.06-0.12	0.06-0.13	0.08-0.16	0.08-0.16	0.08-0.17	0.08-0.17
				1200	350	120-160	0.06-0.12	0.06-0.13	0.08-0.16	0.08-0.16	0.08-0.17	0.08-0.17
	˝High alloy steel, cast steeland tool steel"		Annealed	680	200	120-180	0.06-0.08	0.06-0.08	0.08-0.10	0.08-0.12	0.08-0.12	0.08-0.12
			Quenched and tempered	1100	325	120-180	0.08-0.09	0.08-0.10	0.10-0.13	0.12-0.13	0.12-0.15	0.12-0.16
M	˝Stainless steel and cast steel"		Ferritic / martensitic	680	200	170-230	0.05-0.09	0.06-0.10	0.08-0.13	0.09-0.15	0.10-0.15	0.10-0.17
			Martensitic	820	240	170-230	0.05-0.09	0.06-0.10	0.08-0.13	0.09-0.15	0.10-0.15	0.10-0.17
			Austenitic	600	180	170-230	0.05-0.09	0.06-0.10	0.08-0.13	0.09-0.15	0.10-0.15	0.10-0.17
N	Aluminium Alloy		-	-	-	200-320	0.05-0.15	0.05-0.15	0.06-0.16	0.06-0.16	0.06-0.20	0.08-0.18
	Copper Alloy		-	-	-	180-280	0.05-0.15	0.05-0.15	0.06-0.16	0.06-0.16	0.07-0.20	0.08-0.18

Code system of holder

DDT C 5D – 150 20 – 75

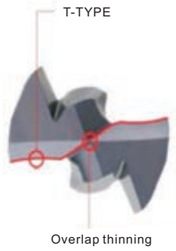
Insert type	Aspect ratio(L/D)	Drill dia.	Shank dia	Flute length (mm)
C:Cone type	3D, 5D, 8D	150: ϕ15. 0	20: ϕ20	

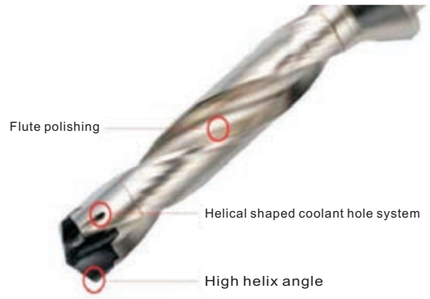
Code system of insert

DTT 1500 C

Drill dia.	Insert type
1500: ϕ15. 00	C:Cone type

Features





Recommended cutting condition

Workpiece			Grade	vc	Depth of cut = 3D,5D	
					Feed rate(mm/rev) per drill dia.(mm)	
ISO	Workpiece	HB		m/min	ϕ 12.00- ϕ 15.99	ϕ 16.00- ϕ 25.99
P	Carbon steel	Low carbon steel	80-120	TD530	110(80-140)	0.15-0.30	0.20-0.35
		High carbon steel	180-280	TD530	100(70-130)	0.15-0.30	0.20-0.35
	Alloy steel	Low alloy steel	140-260	TD530	110(80-140)	0.18-0.35	0.23-0.38
		Low pre-hardened steel	200-400	TD530	75(50-100)	0.18-0.35	0.23-0.38
		High alloy steel	260-320	TD530	70(50-90)	0.18-0.30	0.20-0.35
		High pre-hardened steel	300-450	TD530	60(40-80)	0.18-0.30	0.20-0.35

How to make good insert clamping

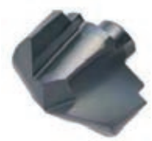
1. Clean the mounting seat with air or cloth.

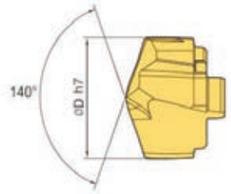
2. Put an insert on the holder.

3. A part of wrench and B part of insert must be parallel to each other before clamp the insert. Turn the wrench clockwise to finish clamping.

4.Clamped state

DTTC insert





Designation	Drill dia.(ϕ D)	W	Coated TD530	Holder	Wrench
DTT 1200C	12.0	11.4	●	DTTC(3,5,8)D-12016-(36,60,96)	DTTC-W12
1220C	12.2				
1250C	12.5			DTTC(3,5,8)D-12516-(38,63,100)	
1260C	12.6				
1300C	13.0	12.3	●	DTTC(3,5,8)D-13016-(39,65,104)	DTTC-W13
1350C	13.5			DTTC(3,5,8)D-13516-(41,68,108)	
1400C	14.0	13.4	●	DTTC(3,5,8)D-14016-(42,70,112)	DTTC-W14
1420C	14.2				
1430C	14.3				
1450C	14.5			DTTC(3,5,8)D-14516-(44,73,116)	
1500C	15.0	14.3	●	DTTC(3,5,8)D-15020-(45,75,120)	DTTC-W15
1550C	15.5				
1600C	16.0	15.3	●	DTTC(3,5,8)D-16020-(48,80,128)	DTTC-W16
1630C	16.3				
1650C	16.5				
1670C	16.7				
1700C	17.0	16.3	●	DTTC(3,5,8)D-17020-(51,85,136)	DTTC-W17
1750C	17.5				
1770C	17.7				
1800C	18.0	17.3	●	DTTC(3,5,8)D-18025-(54,90,144)	DTTC-W18
1810C	18.1				
1850C	18.5				
1860C	18.6				
1870C	18.7				
1900C	19.0	18.3	●	DTTC(3,5,8)D-19025-(57,95,152)	DTTC-W19
1920C	19.2				
1950C	19.5				
1970C	19.7				
2000C	20.0	19.2	●	DTTC(3,5,8)D-20025-(60,100,160)	DTTC-W20
2050C	20.5				
2100C	21.0	20.1	●	DTTC(3,5,8)D-21025-(63,105,168)	DTTC-W21
2150C	21.5				
2200C	22.0	21.0	●	DTTC(3,5,8)D-22025(66,110,176)	DTTC-W22
2250C	22.5				
2260C	22.6				
2270C	22.7				
2300C	23.0	21.9	●	DTTC(3,5,8)D-23025-(69,115,184)	DTTC-W23
2350C	23.5				
2400C	24.0	22.9	●	DTTC(3,5,8)D-24032-(72,120,192)	DTTC-W24
2450C	24.5				
2500C	25.0	23.9	●	DTTC(3,5,8)D-25032-(75,125,200)	DTTC-W25
2530C	25.3				
2550C	25.5				
2580C	25.8				
2590C	25.9				
2600C	26.0	24.9	●	DTTC(3,5,8)D-26032-(78,130,208)	DTTC-W26
2650C	26.5				
2700C	27.0	25.9	●	DTTC(3,5,8)D-27032-(81,135,216)	DTTC-W27
2750C	27.5				
2800C	28.0	26.9	●	DTTC(3,5,8)D-28032-(84,140,224)	DTTC-W28
2850C	28.5				
2900C	29.0	27.9	●	DTTC(3,5,8)D-29032-(87,145,232)	DTTC-W29
2950C	29.5				
3000C	30.0	28.9	●	DTTC(3,5,8)D-30032-(90,150,240)	DTTC-W30
3050C	30.5				

DTTC Parts

Parts(Recommended torque per wrench)

(mm)

Designation	Drill dia.(ϕD)	Torque(Nm)
DTTC-W12	12	2.5
DTTC-W13	13	2.5
DTTC-W14	14	2.5
DTTC-W15	15	2.5
DTTC-W16	16	2.5
DTTC-W17	17	2.5
DTTC-W18	18	2.5
DTTC-W19	19	2.5
DTTC-W20	20	3.5

Designation	Drill dia.(ϕD)	Torque(Nm)
DTTC-W21	21	3.5
DTTC-W22	22	3.5
DTTC-W23	23	3.5
DTTC-W24	24	3.5
DTTC-W25	25	3.5
DTTC-W26	26	5.5
DTTC-W27	27	5.5
DTTC-W28	28	5.5
DTTC-W29	29	5.5
DTTC-W30	30	5.5

DTTC 3D/5D/8D

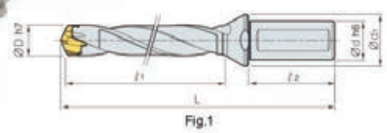


Fig.1

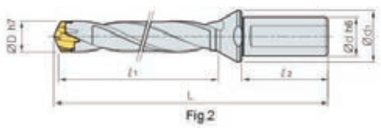
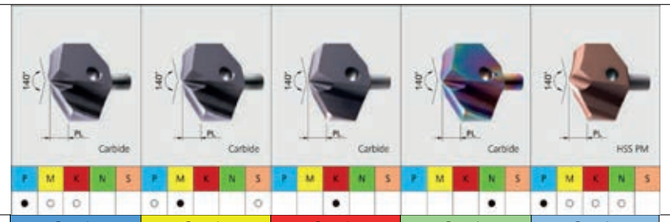


Fig.2

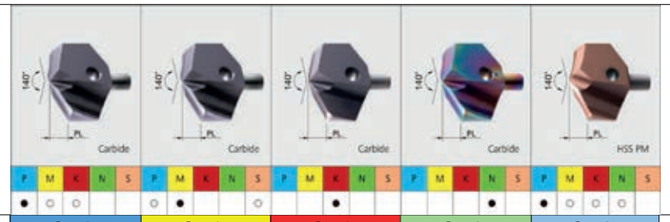
Designation	ϕ D	ϕ d	ϕ d1	l1	l2	L	Insert	Fig.
DTTC 3D-12016-36	12.00-12.49	16	20	36	48	99	DTT1200C□-1249C□	1
3D-12516-38	12.50-12.99	16	20	38	48	101	DTT1250C□-1299C□	1
3D-13016-39	13.00-13.49	16	20	39	48	103	DTT1300C□-1349C□	1
3D-13516-41	13.50-13.99	16	20	41	48	105	DTT1350C□-1399C□	1
3D-14016-42	14.00-14.49	16	20	42	48	106	DTT1400C□-1449C□	1
3D-14516-44	14.50-14.99	16	20	44	48	107	DTT1450C□-1449C□	1
3D-15020-45	15.00-15.99	20	25	45	50	113	DTT1500C□-1599C□	2
3D-16020-48	16.00-16.99	20	25	48	50	117	DTT1600C□-1699C□	2
3D-17020-51	17.00-17.99	20	25	51	50	120	DTT1700C□-1799C□	2
3D-18025-54	18.00-18.99	25	33	54	56	132	DTT1800C□-1899C□	2
3D-19025-57	19.00-19.99	25	33	57	56	135	DTT1900C□-1999C□	2
3D-20025-60	20.00-20.99	25	33	60	56	138	DTT2000C□-2099C□	2
3D-21025-63	21.00-21.99	25	33	63	56	141	DTT2100C□-2199C□	2
3D-22025-66	22.00-22.99	25	33	66	56	145	DTT2200C□-2299C□	2
3D-23025-69	23.00-23.99	25	33	69	56	149	DTT2300C□-2399C□	2
3D-24032-72	24.00-24.99	32	43	72	60	159	DTT2400C□-2499C□	2
3D-25032-75	25.00-25.99	32	43	75	60	162	DTT2500C□-2599C□	2
3D-26032-78	26.00-26.99	32	43	78	60	173	DTT2600C□-2699C□	2

DTTC 3D/5D/8D

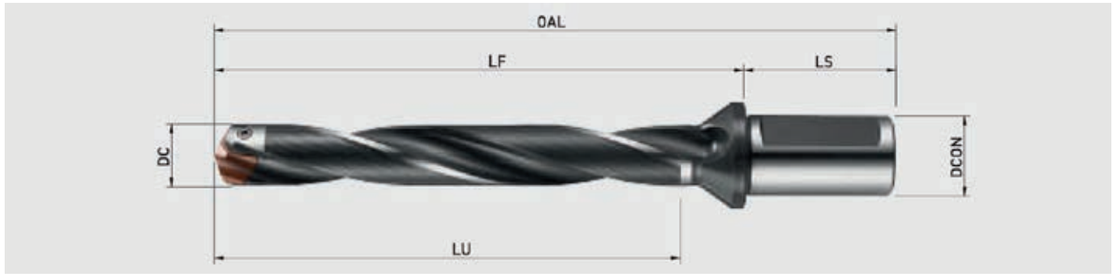
Designation	ϕ D	ϕ d	ϕ d1	l1	l2	L	Insert	Fig.
DTTC 3D-27032-81	27.00-27.99	32	43	81	60	176	DTT2700C□-2799C□	2
3D-28032-84	28.00-28.99	32	43	84	60	180	DTT2800C□-2899C□	2
3D-29032-87	29.00-29.99	32	43	87	60	185	DTT2900C□-2999C□	2
3D-30032-90	30.00-30.99	32	43	90	60	188	DTT3000C□-3099C□	2
5D-12016-60	12.00-12.49	16	20	60	48	123	DTT1200C□-1249C□	1
5D-12516-63	12.50-12.99	16	20	63	48	126	DTT1250C□-1299C□	1
5D-13016-65	13.00-13.49	16	20	65	48	129	DTT1300C□-1349C□	1
5D-13516-68	13.50-13.99	16	20	68	48	132	DTT1350C□-1399C□	1
5D-14016-70	14.00-14.49	16	20	70	48	134	DTT1400C□-1449C□	1
5D-14516-73	14.50-14.99	16	20	73	48	136	DTT1450C□-1499C□	1
5D-15020-75	15.00-15.99	20	25	75	50	143	DTT1500C□-1599C□	2
5D-16020-80	16.00-16.99	20	25	80	50	149	DTT1600C□-1699C□	2
5D-17020-85	17.00-17.99	20	25	85	50	154	DTT1700C□-1799C□	2
5D-18025-90	18.00-18.99	25	33	90	56	168	DTT1800C□-1899C□	2
5D-19025-95	19.00-19.99	25	33	95	56	173	DTT1900C□-1999C□	2
5D-20025-100	20.00-20.99	25	33	100	56	178	DTT2000C□-2099C□	2
5D-21025-105	21.00-21.99	25	33	105	56	183	DTT2100C□-2199C□	2
5D-22025-110	22.00-22.99	25	33	110	56	189	DTT2200C□-2299C□	2
5D-23025-115	23.00-23.99	25	33	115	56	195	DTT2300C□-2399C□	2
5D-24032-120	24.00-24.99	32	43	120	60	207	DTT2400C□-2499C□	2
5D-25032-125	25.00-25.99	32	43	125	60	212	DTT2500C□-2599C□	2
5D-26032-130	26.00-26.99	32	43	130	60	225	DTT2600C□-2699C□	2
5D-27032-135	27.00-27.99	32	43	135	60	230	DTT2700C□-2799C□	2
5D-28032-140	28.00-28.99	32	43	140	60	236	DTT2800C□-2899C□	2
5D-29032-145	29.00-29.99	32	43	145	60	243	DTT2900C□-2999C□	2
5D-30032-150	30.00-30.99	32	43	150	60	248	DTT3000C□-3099C□	2
8D-12016-96	12.00-12.49	16	20	96	48	159	DTT1200C□-1249C□	1
8D-12516-100	12.50-12.99	16	20	100	48	163	DTT1250C□-1299C□	1
8D-13016-104	13.00-13.49	16	20	104	48	168	DTT1300C□-1349C□	1
8D-13516-108	13.50-13.99	16	20	108	48	173	DTT1350C□-1399C□	1
8D-14016-112	14.00-14.49	16	20	112	48	176	DTT1400C□-1449C□	1
8D-14516-116	14.50-14.99	16	20	116	48	180	DTT1450C□-1499C□	1
8D-15020-120	15.00-15.99	20	25	120	50	188	DTT1500C□-1599C□	2
8D-16020-128	16.00-16.99	20	25	128	50	197	DTT1600C□-1699C□	2
8D-17020-136	17.00-17.99	20	25	136	50	205	DTT1700C□-1799C□	2
8D-18025-144	18.00-18.99	25	33	144	56	222	DTT1800C□-1899C□	2
8D-19025-152	19.00-19.99	25	33	152	56	230	DTT1900C□-1999C□	2
8D-20025-160	20.00-20.99	25	33	160	56	238	DTT2000C□-2099C□	2
8D-21025-168	21.00-21.99	25	33	168	56	246	DTT2100C□-2199C□	2
8D-22025-176	22.00-22.99	25	33	176	56	255	DTT2200C□-2299C□	2
8D-23025-184	23.00-23.99	25	33	184	56	264	DTT2300C□-2399C□	2
8D-24032-192	24.00-24.99	32	43	192	60	279	DTT2400C□-2499C□	2
8D-25032-200	25.00-25.99	32	43	200	60	287	DTT2500C□-2599C□	2
8D-26032-208	26.00-26.99	32	43	208	60	303	DTT2600C□-2699C□	2
8D-27032-216	27.00-27.99	32	43	216	60	311	DTT2700C□-2799C□	2
8D-28032-224	28.00-28.99	32	43	224	60	320	DTT2800C□-2899C□	2
8D-29032-232	29.00-29.99	32	43	232	60	330	DTT2900C□-2999C□	2
8D-30032-240	30.00-30.99	32	43	240	60	338	DTT3000C□-3099C□	2



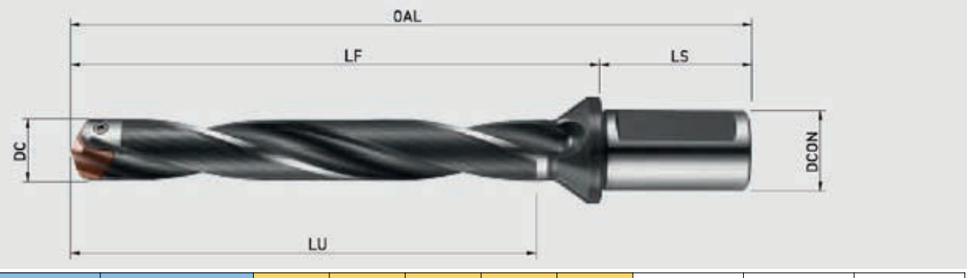
Dia.	PL	Model No.	Grade P	Grade M	Grade K	Grade N	Grade P			
10.00	1.8	S10-1000	TPA	TMA	TKA	TNA	TPC			
10.20	1.9	S10-1020	TPA	TMA	TKA	TNA	TPC			
10.50	1.9	S10-1050	TPA	TMA	TKA	TNA	TPC			
11.00	2.0	S10-1100	TPA	TMA	TKA	TNA	TPC			
11.50	2.1	S10-1150	TPA	TMA	TKA	TNA	TPC			
12.00	2.2	S10-1200	TPA	TMA	TKA	TNA	TPC			
12.50	2.3	S10-1250	TPA	TMA	TKA	TNA	TPC			
13.00	2.4	S10-1300	TPA	TMA	TKA	TNA	TPC			
13.50	2.5	S10-1350	TPA	TMA	TKA	TNA	TPC			
14.00	2.5	S10-1400	TPA	TMA	TKA	TNA	TPC			
14.50	2.6	S10-1450	TPA	TMA	TKA	TNA	TPC			
15.00	2.7	S10-1500	TPA	TMA	TKA	TNA	TPC			
15.50	2.8	S10-1550	TPA	TMA	TKA	TNA	TPC			
16.00	2.9	S10-1600	TPA	TMA	TKA	TNA	TPC			
16.50	3.0	S10-1650	TPA	TMA	TKA	TNA	TPC			
17.00	3.1	S10-1700	TPA	TMA	TKA	TNA	TPC			
17.50	3.2	S10-1750	TPA	TMA	TKA	TNA	TPC			
18.00	3.3	S10-1800	TPA	TMA	TKA	TNA	TPC			
18.50	3.4	S10-1850	TPA	TMA	TKA	TNA	TPC			
19.00	3.5	S10-1900	TPA	TMA	TKA	TNA	TPC			
19.50	3.5	S10-1950	TPA	TMA	TKA	TNA	TPC			
20.00	3.6	S10-2000	TPA	TMA	TKA	TNA	TPC			
20.50	3.7	S10-2050	TPA	TMA	TKA	TNA	TPC			
21.00	3.8	S10-2100	TPA	TMA	TKA	TNA	TPC			
21.50	3.9	S10-2150	TPA	TMA	TKA	TNA	TPC			
22.00	4.0	S10-2200	TPA	TMA	TKA	TNA	TPC			
22.50	4.1	S10-2250	TPA	TMA	TKA	TNA	TPC			
23.00	4.2	S10-2300	TPA	TMA	TKA	TNA	TPC			
23.50	4.3	S10-2350	TPA	TMA	TKA	TNA	TPC			
24.00	4.4	S10-2400	TPA	TMA	TKA	TNA	TPC			
24.50	4.5	S10-2450	TPA	TMA	TKA	TNA	TPC			
25.00	4.5	S10-2500	TPA	TMA	TKA	TNA	TPC			
25.50	4.6	S10-2550	TPA	TMA	TKA	TNA	TPC			
26.00	4.7	S10-2600	TPA	TMA	TKA	TNA	TPC			
26.50	4.8	S10-2650	TPA	TMA	TKA	TNA	TPC			
27.00	4.9	S10-2700	TPA	TMA	TKA	TNA	TPC			
27.50	5.0	S10-2750	TPA	TMA	TKA	TNA	TPC			
28.00	5.1	S10-2800	TPA	TMA	TKA	TNA	TPC			
28.50	5.2	S10-2850	TPA	TMA	TKA	TNA	TPC			
29.00	5.3	S10-2900	TPA	TMA	TKA	TNA	TPC			
29.50	5.4	S10-2950	TPA	TMA	TKA	TNA	TPC			
30.00	5.5	S10-3000	TPA	TMA	TKA	TNA	TPC			
30.50	5.6	S10-3050	TPA	TMA	TKA	TNA	TPC			
31.00	5.6	S10-3100	TPA	TMA	TKA	TNA	TPC			
31.50	5.7	S10-3150	TPA	TMA	TKA	TNA	TPC			
32.00	5.8	S10-3200	TPA	TMA	TKA	TNA	TPC			



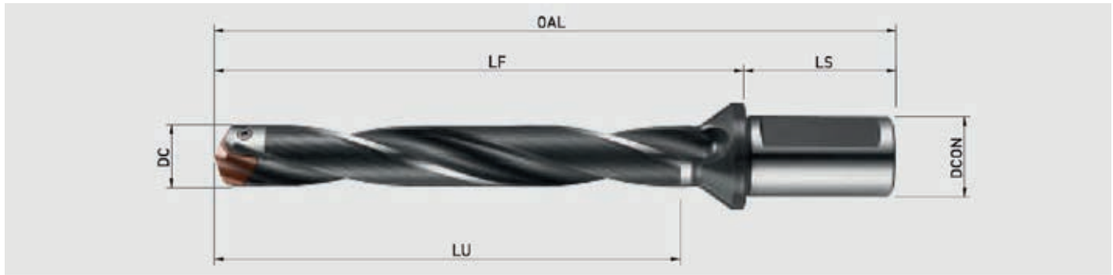
Dia.	PL	Model No.	Grade P	Grade M	Grade K	Grade N	Grade P			
32.50	5.9	S10-3250	TPA	TMA	TKA	TNA	TPC			
33.00	6.0	S10-3300	TPA	TMA	TKA	TNA	TPC			
33.50	6.1	S10-3350	TPA	TMA	TKA	TNA	TPC			
34.00	6.2	S10-3400	TPA	TMA	TKA	TNA	TPC			
34.50	6.3	S10-3450	TPA	TMA	TKA	TNA	TPC			
35.00	6.4	S10-3500	TPA	TMA	TKA	TNA	TPC			
35.50	6.5	S10-3550	TPA	TMA	TKA	TNA	TPC			
36.00	6.6	S10-3600	TPA	TMA	TKA	TNA	TPC			
36.50	6.6	S10-3650	TPA	TMA	TKA	TNA	TPC			
37.00	6.7	S10-3700	TPA	TMA	TKA	TNA	TPC			
37.50	6.8	S10-3750	TPA	TMA	TKA	TNA	TPC			
38.00	6.9	S10-3800	TPA	TMA	TKA	TNA	TPC			
38.50	7.0	S10-3850	TPA	TMA	TKA	TNA	TPC			
39.00	7.1	S10-3900	TPA	TMA	TKA	TNA	TPC			
39.50	7.2	S10-3950	TPA	TMA	TKA	TNA	TPC			
39.99	7.3	S10-3999	TPA	TMA	TKA	TNA	TPC			



Molde No.	Dc	LU	Dcon	LF	OAL	LS			
S10-TG1000-03L16	10.00-10.49	31.5	16	48	96	48			
S10-TG1000-05L16	10.00-10.49	52.5	16	69	117	48			
S10-TG1000-08L16	10.00-10.49	84	16	100	148	48			
S10-TG1050-03L16	10.50-10.99	33	16	50	98	48			
S10-TG1050-05L16	10.50-10.99	55	16	72	120	48			
S10-TG1050-08L16	10.50-10.99	88	16	105	153	48			
S10-TG1100-03L16	11.00-11.49	34.5	16	52	100	48			
S10-TG1100-05L16	11.00-11.49	57.5	16	75	123	48			
S10-TG1100-08L16	11.00-11.49	92	16	110	158	48			
S10-TG1150-03L16	11.50-11.99	36	16	54	102	48			
S10-TG1150-05L16	11.50-11.99	60	16	78	126	48			
S10-TG1150-08L16	11.50-11.99	96	16	114	162	48			
S10-TG1200-03L16	12.00-12.49	37.5	16	57	105	48			
S10-TG1200-05L16	12.00-12.49	62.5	16	82	130	48			
S10-TG1200-08L16	12.00-12.49	100	16	119	167	48			
S10-TG1250-03L16	12.50-12.99	39	16	59	107	48			
S10-TG1250-05L16	12.50-12.99	65	16	85	133	48			
S10-TG1250-08L16	12.50-12.99	104	16	124	172	48			
S10-TG1300-03L16	13.00-13.49	40.5	16	61	109	48			
S10-TG1300-05L16	13.00-13.49	67.5	16	88	136	48			
S10-TG1300-08L16	13.00-13.49	108	16	128	176	48			
S10-TG1350-03L16	13.50-13.99	42	16	63	111	48			
S10-TG1350-05L16	13.50-13.99	70	16	91	139	48			
S10-TG1350-08L16	13.50-13.99	112	16	133	181	48			
S10-TG1400-03L16	14.00-14.49	43.5	16	65	113	48			
S10-TG1400-05L16	14.00-14.49	72.5	16	94	142	48			
S10-TG1400-08L16	14.00-14.49	116	16	138	186	48			
S10-TG1450-03L16	14.50-14.99	45	16	67	115	48			
S10-TG1450-05L16	14.50-14.99	75	16	97	145	48			
S10-TG1450-08L16	14.50-14.99	120	16	142	190	48			
S10-TG1500-03L20	15.00-15.99	48	20	72	122	50			
S10-TG1500-05L20	15.00-15.99	80	20	104	154	50			
S10-TG1500-08L20	15.00-15.99	128	20	152	202	50			
S10-TG1600-03L20	16.00-16.99	51	20	77	127	50			
S10-TG1600-05L20	16.00-16.99	85	20	111	161	50			
S10-TG1600-08L20	16.00-16.99	140	20	162	212	50			
S10-TG1700-03L20	17.00-17.99	54	20	81	131	50			
S10-TG1700-05L20	17.00-17.99	90	20	117	167	50			
S10-TG1700-08L20	17.00-17.99	144	20	171	221	50			
S10-TG1800-03L25	18.00-18.99	57	25	85	141	56			
S10-TG1800-05L25	18.00-18.99	95	25	123	179	56			
S10-TG1800-08L25	18.00-18.99	152	25	180	236	56			



Molde No.	Dc	LU	Dcon	LF	OAL	LS			
S10-TG1900-03L25	19.00-19.99	60	25	90	146	56			
S10-TG1900-05L25	19.00-19.99	100	25	130	186	56			
S10-TG1900-08L25	19.00-19.99	160	25	190	246	56			
S10-TG2000-03L25	20.00-20.99	63	25	94	150	56			
S10-TG2000-05L25	20.00-20.99	105	25	136	192	56			
S10-TG2000-08L25	20.00-20.99	168	25	199	255	56			
S10-TG2100-03L25	21.00-21.99	66	25	98	154	56			
S10-TG2100-05L25	21.00-21.99	110	25	142	198	56			
S10-TG2100-08L25	21.00-21.99	176	25	208	264	56			
S10-TG2200-03L25	22.00-22.99	69	25	102	158	56			
S10-TG2200-05L25	22.00-22.99	115	25	148	204	56			
S10-TG2200-08L25	22.00-22.99	184	25	217	273	56			
S10-TG2300-03L25	23.00-23.99	72	25	107	163	56			
S10-TG2300-05L25	23.00-23.99	120	25	155	211	56			
S10-TG2300-08L25	23.00-23.99	192	25	227	283	56			
S10-TG2400-03L32	24.00-24.99	75	32	112	172	60			
S10-TG2400-05L32	24.00-24.99	125	32	162	222	60			
S10-TG2400-08L32	24.00-24.99	200	32	237	297	60			
S10-TG2500-03L32	25.00-25.99	78	32	116	176	60			
S10-TG2500-05L32	25.00-25.99	130	32	168	228	60			
S10-TG2500-08L32	25.00-25.99	208	32	246	306	60			
S10-TG2600-03L32	26.00-26.99	81	32	121	181	60			
S10-TG2600-05L32	26.00-26.99	135	32	175	235	60			
S10-TG2600-08L32	26.00-26.99	216	32	256	316	60			
S10-TG2700-03L32	27.00-27.99	84	32	125	185	60			
S10-TG2700-05L32	27.00-27.99	140	32	181	241	60			
S10-TG2700-08L32	27.00-27.99	224	32	265	325	60			
S10-TG2800-03L32	28.00-28.99	87	32	129	189	60			
S10-TG2800-05L32	28.00-28.99	145	32	187	247	60			
S10-TG2800-08L32	28.00-28.99	232	32	274	334	60			
S10-TG2900-03L32	29.00-29.99	90	32	133	193	60			
S10-TG2900-05L32	29.00-29.99	150	32	193	253	60			
S10-TG2900-08L32	29.00-29.99	240	32	283	343	60			
S10-TG3000-03L32	30.00-30.99	93	32	138	198	60			
S10-TG3000-05L32	30.00-30.99	155	32	200	260	60			
S10-TG3000-08L32	30.00-30.99	248	32	293	353	60			
S10-TG3100-03L32	31.00-31.99	96	32	142	202	60			
S10-TG3100-05L32	31.00-31.99	160	32	206	266	60			
S10-TG3100-08L32	31.00-31.99	256	32	302	362	60			
S10-TG3200-03L32	32.00-32.99	99	32	146	206	60			
S10-TG3200-05L32	32.00-32.99	165	32	212	272	60			
S10-TG3200-08L32	32.00-32.99	264	32	311	371	60			



Molde No.	Dc	LU	Dcon	LF	OAL	LS			
S10-TG3300-03L32	33.00-33.99	102	32	151	211	60			
S10-TG3300-05L32	33.00-33.99	170	32	219	279	60			
S10-TG3300-08L32	33.00-33.99	272	32	321	381	60			
S10-TG3400-03L40	34.00-34.99	105	40	156	226	70			
S10-TG3400-05L40	34.00-34.99	175	40	224	294	70			
S10-TG3400-08L40	34.00-34.99	280	40	329	399	70			
S10-TG3500-03L40	35.00-35.99	108	40	160	230	70			
S10-TG3500-05L40	35.00-35.99	180	40	230	300	70			
S10-TG3500-08L40	35.00-35.99	288	40	338	408	70			
S10-TG3600-03L40	36.00-36.99	111	40	164	234	70			
S10-TG3600-05L40	36.00-36.99	185	40	236	306	70			
S10-TG3600-08L40	36.00-36.99	296	40	347	417	70			
S10-TG3700-03L40	37.00-37.99	114	40	169	239	70			
S10-TG3700-05L40	37.00-37.99	190	40	243	313	70			
S10-TG3700-08L40	37.00-37.99	304	40	357	427	70			
S10-TG3800-03L40	38.00-38.99	117	40	173	243	70			
S10-TG3800-05L40	38.00-38.99	195	40	249	319	70			
S10-TG3800-08L40	38.00-38.99	312	40	366	436	70			
S10-TG3900-03L40	39.00-39.99	123	40	182	252	70			
S10-TG3900-05L40	39.00-39.99	205	40	262	332	70			
S10-TG3900-08L40	39.00-39.99	328	40	385	455	70			

Deep Hole Drilling

A deep hole is defined by its depth-to-diameter ratio (D:d), and typically holes greater than 10:1 are considered deep holes. Deep hole drilling into metal has a range of applications across several industries, with its origins tracing back to the need for straighter, more accurate gun barrels, and expanding as other industries integrated deep hole drilling processes to improve their own applications.

Deep hole drilling consists of BTA drilling and gun drilling, with additional processes designed for specific tolerance objectives and generally performed on BTA-style deep hole drilling machines. Deep hole drilling is used in a variety of materials from aluminum to super-alloys, and is capable of achieving tight diameter control, straightness, and superior surface finish into workpieces.

Deep hole drilling processes work by using special tools and setups to deliver high pressure coolant, evacuate chips cleanly, and achieve depth-to-diameter holes into metal beyond what a common CNC machine can reach. This allows manufacturers to achieve their manufacturing tolerances and production requirements reliably, accurately, and efficiently.

BTA Drilling

BTA deep hole drilling is used for larger hole drilling, typically 20 – 200 mm [0.80 – 8.00 in] in diameter High-pressure coolant is introduced around the outside of the tool through the pressure head assembly chips are discharged through the tool center, through the drill tube and machine spindle.

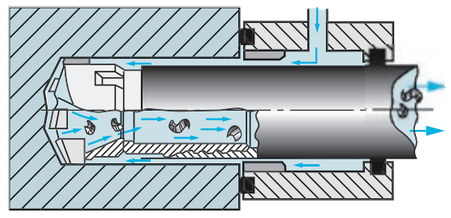
BTA drilling typically performs 5-7 times faster than gundrilling, and requires higher power.

Additional extended diameters can be drilled on BTA machines with secondary deep hole operations, such as counter-boring.

There is 2 types of drilling which are DTS systems and STS systems. We will only focus on STS systems as all our drill heads are for STS system.

The BTA—STS Drill is a single Tube Drilling system used in Deep Hole Drilling applications where fast metal removal is needed. Drill sizes in BTA Drills are from 0.312”-2.559” diameter. New drills are manufactured in a number of grades to fit individual customer requirements. BTA (STS) Drills of brazed construction can be re-tipped in our plant to an “as new” condition at a significant cost reduction and savings to the customer. These drills require high pressure coolant to flush the chips through the tube to the chip box. The STS may also be referred to as the BTA system in the deep hole drilling process.

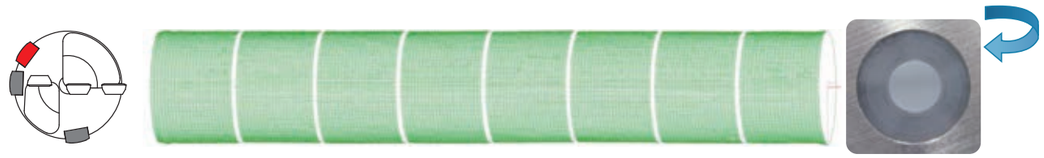
STS DRILLING SYSTEM



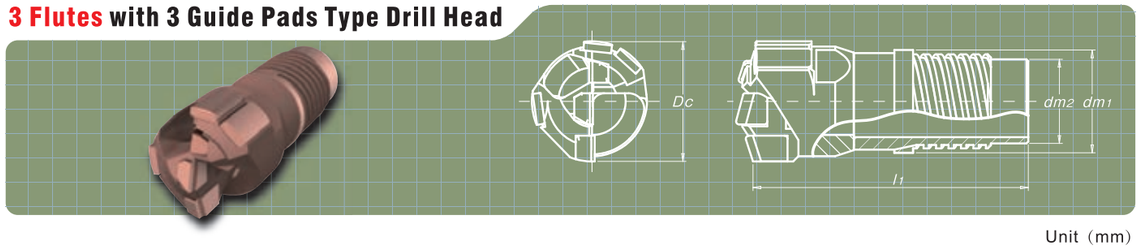
CT Coated Drills: Suitable for Medium and High speed drilling with highly accuracy and longer tool's life. (CT coating is a very special Japanese techonology coating)

Drill Heads Design with 3 Guide Pads(CT Coating)

A. Unique Design of 3 Flutes with 3 Guide Pads Drill Head(CT Coating)
Feature: Reduced vibration during drilling and highly improved the roundness of the drilling holes
Holes with perfect roundness after drilling



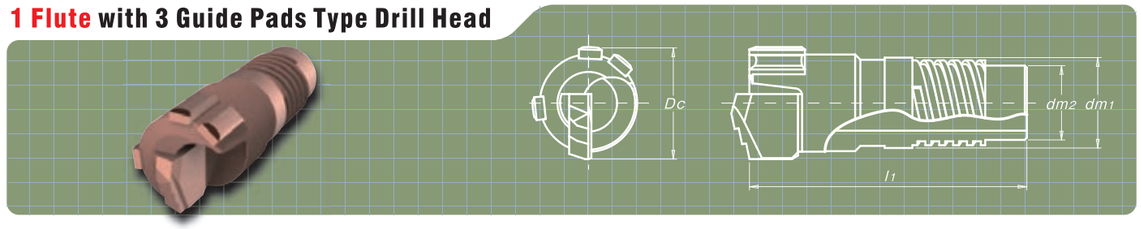
3 Flutes with 3 Guide Pads Type Drill Head



Unit (mm)

Drill Head Model	Drilling Range	Suitable Tube		Dimention		
		Tube Model	Tube Dia(mm)	dm1(mm)	dm2(mm)	L1
BTA-Dxxxx-CT-3	15.60-16.70	BA4S-0097	14	12.6	10.8	40
BTA-Dxxxx-CT-3	17.71-18.90	BA4S-0099	16	14.5	12.5	40
BTA-Dxxxx-CT-3	18.91-20.00	BA4S-0000	17	15.5	13.5	44
BTA-Dxxxx-CT-3	20.01-21.80	BA4S-00	18	16	14	49
BTA-Dxxxx-CT-3	21.81-24.10	BA4S-01	20	18	16	52
BTA-Dxxxx-CT-3	24.11-26.00	BA4S-02	22	19.5	17.5	54

1 Flute with 3 Guide Pads Type Drill Head



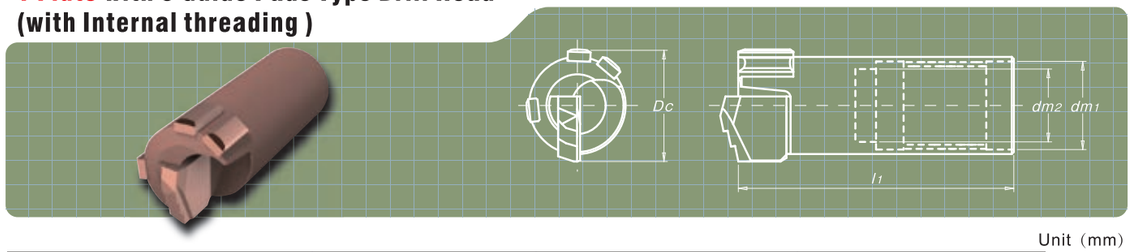
Unit (mm)

Drill Head Model	Drilling Range	Suitable Tube		Dimention		
		Tube Model	Tube Dia(mm)	dm1(mm)	dm2(mm)	L1
BTA-Dxxxx-CT-T-3	15.60-16.70	BA4S-0097	14	12.6	10.8	40

CT Coated Drills: Suitable for Medium and High speed drilling with highly accuracy and longer tool's life. (CT coating is a very special Japanese techonology coating)

Drill Heads Design with 3 Guide Pads(CT Coating)

1 Flute with 3 Guide Pads Type Drill Head (with Internal threading)



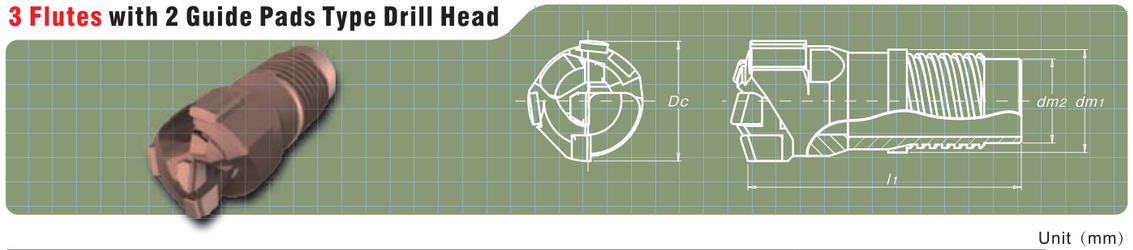
Unit (mm)

Drill Head Model	Drilling Range	Suitable Tube		Dimention		
		Tube Model	Tube Dia(mm)	dm1(mm)	dm2(mm)	L1
BTA-Dxxxx-CT-E-3	15.51-16.00	BA1S-1301	13	12.4	10.8	40
BTA-Dxxxx-CT-E-3	16.01-16.50	BA1S-1302	13	12.7	11.1	40
BTA-Dxxxx-CT-E-3	16.51-17.25	BA1S-1401	14	13.4	11.8	40
BTA-Dxxxx-CT-E-3	17.26-18.00	BA1S-1402	14	13.7	12.1	40
BTA-Dxxxx-CT-E-3	18.01-19.00	BA1S-1500	15	14.4	12.8	40
BTA-Dxxxx-CT-E-3	19.01-19.50	BA1S-1650	16.5	15.4	13.8	40

Drill Heads Design with 2 Guide Pads(CT Coating)

B. Drill Heads Design with 2 Guide Pads(CT Coating)
Feature: With 2 guide pads, drill is able to reduce machining resistance, achieving fast and high-precision machining.

3 Flutes with 2 Guide Pads Type Drill Head



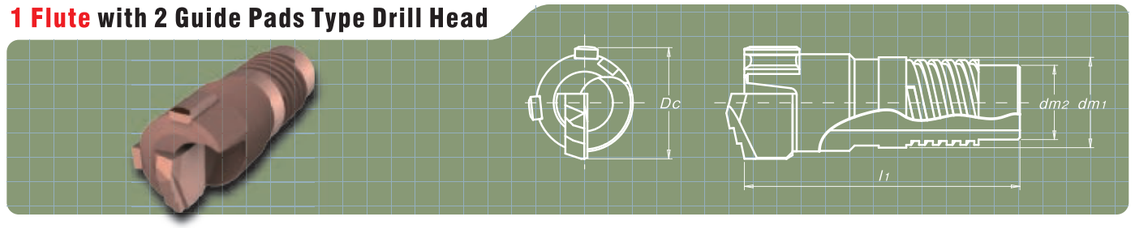
Unit (mm)

Drill Head Model	Drilling Range	Suitable Tube		Dimention		
		Tube Model	Tube Dia(mm)	dm1(mm)	dm2(mm)	L1
BTA-Dxxxx-CT	15.60-16.70	BA4S-0097	14	12.6	10.8	40
BTA-Dxxxx-CT	17.71-18.90	BA4S-0099	16	14.5	12.5	40
BTA-Dxxxx-CT	18.91-20.00	BA4S-0000	17	15.5	13.5	44
BTA-Dxxxx-CT	20.01-21.80	BA4S-00	18	16	14	49
BTA-Dxxxx-CT	21.81-24.10	BA4S-01	20	18	16	52
BTA-Dxxxx-CT	24.11-26.00	BA4S-02	22	19.5	17.5	54

CT Coated Drills: Suitable for Medium and High speed drilling with highly accuracy and longer tool's life. (CT coating is a very special Japanese techonology coating)

Drill Heads Design with 2 Guide Pads(CT Coating)

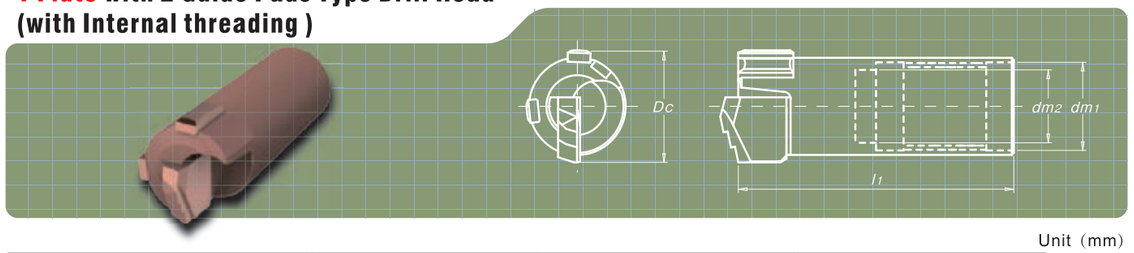
1 Flute with 2 Guide Pads Type Drill Head



Unit (mm)

Drill Head Model	Drilling Range	Suitable Tube		Dimention		
		Tube Model	Tube Dia(mm)	dm1(mm)	dm2(mm)	L1
BTA-Dxxxx-CT-T	15.60-16.70	BA4S-0097	14	12.6	10.8	40

1 Flute with 2 Guide Pads Type Drill Head (with Internal threading)



Unit (mm)

Drill Head Model	Drilling Range	Suitable Tube		Dimention		
		Tube Model	Tube Dia(mm)	dm1(mm)	dm2(mm)	L1
BTA-Dxxxx-CT-E	15.51-16.00	BA1S-1301	13	12.4	10.8	40
BTA-Dxxxx-CT-E	16.01-16.50	BA1S-1302	13	12.7	11.1	40
BTA-Dxxxx-CT-E	16.51-17.25	BA1S-1401	14	13.4	11.8	40
BTA-Dxxxx-CT-E	17.26-18.00	BA1S-1402	14	13.7	12.1	40
BTA-Dxxxx-CT-E	18.01-19.00	BA1S-1500	15	14.4	12.8	40
BTA-Dxxxx-CT-E	19.01-19.50	BA1S-1650	16.5	15.4	13.8	40

Recommended Cutting Conditions

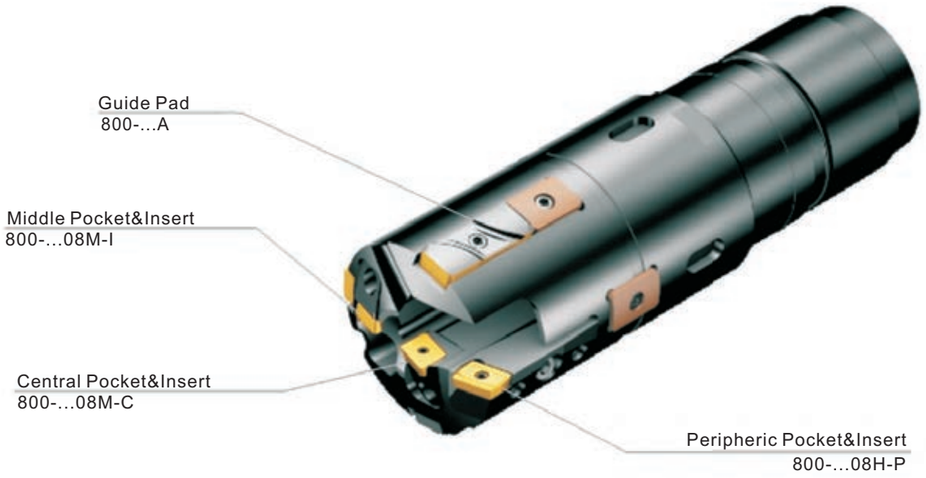
Machining data for BTA

Unit (mm)

ISO	Material		Condition	Tensile strength (N/mm²)	Hardness HB	Material No.	Cutting speed Vc (m/min)	Ø15.60 - Ø20.00
P	Non-alloy steel, cast steel, free cutting steel	<0.25%C	Annealed	420	125	1	70-120	0.08-0.15
		>=0.25%C	Annealed	650	190	2	70-120	0.08-0.15
		<0.55%C	Quenched and tempered	850	250	3	40-70	0.08-0.15
		>=0.55%C	Annealed	750	220	4	70-120	0.08-0.15
			Quenched and tempered	1000	300	5	55-100	0.08-0.12
	Low alloy steel and cast steel (Less than 5% of alloying elements)		Annealed	600	200	6	70-100	0.08-0.15
			Quenched and tempered	930	275	7	55-100	0.08-0.12
				1000	300	8	55-100	0.08-0.12
				1200	350	9	55-100	0.08-0.12
	High alloy steel, cast steel and tool steel		Annealed	680	200	10	50-85	0.08-0.15
			Quenched and tempered	1100	325	11	55-100	0.08-0.12
M	Stainless steel and cast steel		Ferritic / martensitic	680	200	12	60-100	0.08-0.15
			Martensitic	820	240	13	60-100	0.08-0.15
			Austenitic	600	180	14	60-100	0.05-0.12
K	Grey cast iron (GG)		Ferritic		160	15	60-100	0.06-0.13
			Pearlitic		250	16	60-100	0.06-0.13
	Cast iron nodular (GGG)		Ferritic		180	17	80-100	0.08-0.15
			Pearlitic		260	18	80-100	0.08-0.15
	Malleable cast iron		Ferritic		130	19	50-100	0.06-0.13
			Pearlitic		230	20	50-100	0.06-0.13
N	Aluminum - W rought alloy		Not cureable		60	21	65-130	0.08-0.15
			Cured		100	22	65-100	0.08-0.15
	Aluminum-cast, alloyed	<=12% Si	Not cureable		75	23	65-130	0.08-0.15
			Cured		90	24	65-130	0.08-0.15
		>12% Si	High temp.		130	25	65-130	0.08-0.15
	Copper alloys	>1% Pb	Free cutting		11 0	26	65-130	0.08-0.15
			Brass		90	27	65-130	0.08-0.15
			Electrolitic copper		100	28	65-130	0.08-0.15
	Non-metallic		Duroplastics, fiber plastics			29		
			Hard rubber			30		
S	High temp. alloys	Fe based	Annealed		200	31	10-50	0.06-0.12
			Cured		280	32	10-50	0.06-0.12
		Ni or Co based	Annealed		250	33	10-50	0.06-0.12
			Cured		350	34	10-50	0.06-0.12
			Cast		320	35	10-50	0.06-0.12
	Titanium, T i alloys			Rm 400		36	30-50	0.05-0.10
			Alpha+beta alloys cured	Rm 1050		37	30-50	0.05-0.10
H	Hardened steel		Hardened		55HRC	38		
			Hardened		60HRC	39		
	Chilled cast iron		Cast		400	40		
	Cast iron nodular		Hardened		55HRC	41		

Steel Stainless steel Cast iron Nonferrous High temp. alloys Hardened steel

800 SERIES



424.10 SERIES

P25C: It shows good performance when drilling steel, cast iron.

M25C: Not only has good performance on drilling the common steels.But also has a long tool life on drilling some special stainless steel, special high speed steel, special titanium alloy, special nickel base alloy and other difficult materials, such as superalloys for aerospace and military use.

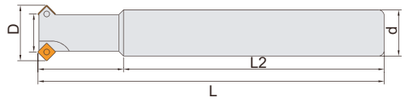
TT Services 800&424.10 SERIES INSERTS 2019-2020

● :Continuous Cutting

800 & 424.10 INSERTS							
	P	Steel	●	●	●	●	●
	M	Stainless	○	●	●	●	●
	K	Cast Iron	●	●	●	●	●
	S	Superalloys	○	●	●	●	●
	H	Hard Materials	○	●	●	●	●

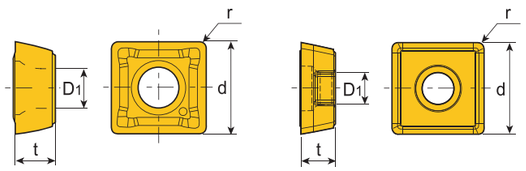
Chipbreaker	Designation	P25C (Coating)	M25C (Coating)	G25C (Coating)	PM10	PM01
	800-050308M-C-G	●	●	●		
	800-06T308M-C-G	●	●	●		
	800-08T308M-C-G	●	●	●		
	800-10T308M-C-G	●	●	●		
	800-12T308M-C-G	●	●	●		
	800-050308M-C-L	●	●	●		
	800-06T308M-C-L	●	●	●		
	800-08T308M-C-L	●	●	●		
	800-10T308M-C-L	●	●	●		
	800-12T308M-C-L	●	●	●		
	800-050308M-I-G	●	●	●		
	800-06T308M-I-G	●	●	●		
	800-08T308M-I-G	●	●	●		
	800-12T308M-I-G	●	●	●		
	800-050308M-I-L	●	●	●		
	800-06T308M-I-L	●	●	●		
	800-08T308M-I-L	●	●	●		
	800-12T308M-I-L	●	●	●		
	800-060308H-P-G	●	●	●		
	800-08T308H-P-G	●	●	●		
	800-09T308H-P-G	●	●	●		
	800-11T308H-P-G	●	●	●		
	800-060308H-P-L	●	●	●		
	800-08T308H-P-L	●	●	●		
	800-09T308H-P-L	●	●	●		
	800-11T308H-P-L	●	●	●		
	R424.9-13T308-22	●	●	●		
	R424.9-13T308-23	●	●	●		
	R424.9-180608-22	●	●	●		
	R424.9-180608-23	●	●	●		
	TPMT16T312R-22	●	●	●		
	TPMT16T312TR-23	●	●	●		
	TPMT220612R-22	●	●	●		
	TPMT220612TR-23	●	●	●		
	800-06A				●	●
	800-07A				●	●
	800-08A				●	●
	800-10A				●	●
	800-12A				●	●
	800-14D065				●	●
	800-16D075				●	●
	800-18D085				●	●
	800-20D100				●	●
	800-22D110				●	●
	800-24D120				●	●
	800-26D130				●	●

CDR45° Chamfer Cutter



Model No.	Size						Blade type	Screw	Wrench
	D	D1	d	L1	L2	L			
CDR1106C10-1T	11	6	10	17	83	100	SP□X050204	TS2003	TK06
CDR1510C12-2T	15	10	12	20	100	120	SP□X050204	TS2003	TK06
CDR1711C16-3T	17	11	16	25	125	150	SP□X050204	TS2003	TK06
CDR1913C16-3T	19	13	16	30	120	150	SP□X050204	TS2003	TK06
CDR2418C20-4T	24	18	20	35	115	150	SP□X050204	TS2003	TK06
CDR2216C16-3T	22	16	16	30	80	120	SP□X060204	TS20205	TK08
CDR2717C20-3T	27	17	20	30	80	120	SP□X07T308	TS2511	TK08
CDR3019C20-2T	30	19	20	40	110	150	SP□X090408	TS3504	TK15
CDR4029C25-3T	40	29	25	40	110	150	SP□X090408	TS3504	TK15
CDR5039C25-4T	50	39	25	40	110	150	SP□X090408	TS3504	TK15
CDR2712C20-1T	27	12	20	40	110	150	SP□X140512	TS5002	TK20
CDR4025C25-2T	40	25	25	40	140	180	SP□X140512	TS5002	TK20
CDR4732C32-3T	47	32	32	40	160	200	SP□X140512	TS5002	TK20

※ **CDR2712C20-1T/CDR4025C25-2T/CDR4732C32-3T MOQ 5P.**



Unit（mm）

Size	Dimension (mm)			
	d	t	r	D1
05	5.00	2.38	0.4	2.25
06	6.00	2.38	0.4	2.61
07	7.94	3.97	0.8	2.85
09	9.80	4.30	0.8	4.05
14	14.30	5.20	1.2	5.75

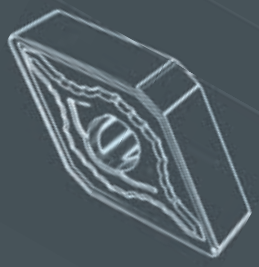
Insert	Designation	Material	
		TI620	TN200
	**SPMX050204**	●	
	SPMX060204	●	
	SPMX07T308	●	
	SPMX090408	●	
	SPMX140512	●	
	**SPGX050204**		●
	SPGX060204		●
	SPGX07T308		●
	SPGX090408		●
	SPGX140512		●

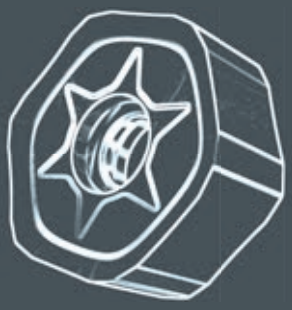
CDR Internal and External Chamfer Cutter

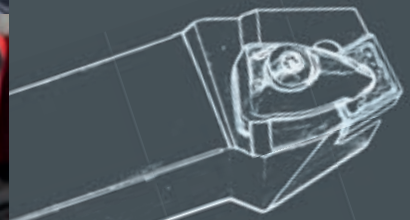
Recommended Cutting Conditions

Material		Hardness	Insert Grade	Cutting speed (m/min)	Feed/T(mm/t) Face Milling
P	Low alloy steel Cast steel	≤HB180	TI620	150(100-200)	0.05-0.25
	High carbon steel Alloy steel	HB180-280	TI620	130(100-180)	0.05-0.25
	Alloy tool steel	HB280-350	TI620	100(80-150)	0.05-0.25
M	Stainless steel	≤HB270	TI620	100(80-150)	0.05-0.20
K	Grey cast iron	HB180-250	TI620	130(100-180)	0.13-0.30
N	Aluminium alloy	-	TN200	200-320	0.06-0.20
	Copper alloy	-	TN200	200-320	0.06-0.20

ZÁKLADNÍ PORTFOLIO:







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