

Addition
of new
items

Chatter Resistant Boring Bars

DIMPLE BAR

Highly rigid and lightweight head prevents vibration for better surface finishes.

- Three different lengths of carbide shank boring bars available.
- A wide range of inserts.
- Expansion of the "MIRACLE" coated **VP15TF** insert series.
- New cermet grade **NX3035** series expansion.
- New items for the **FSCLP / FSTUP** types now included.

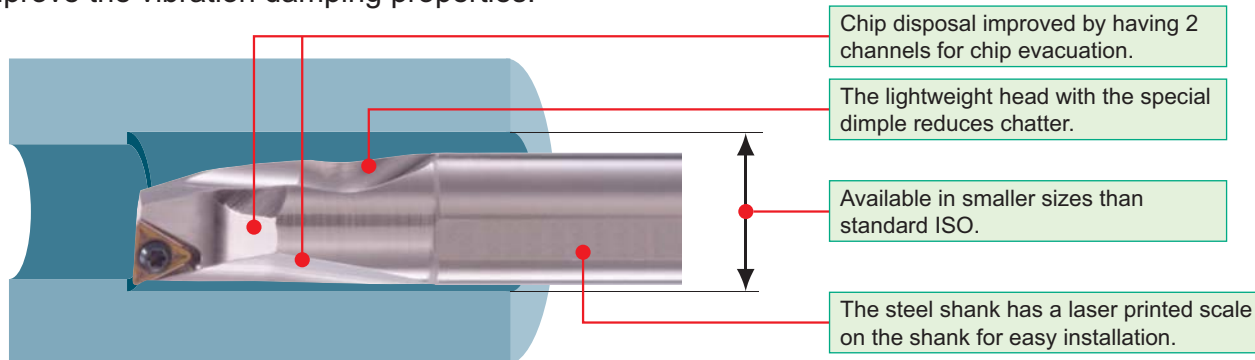


Chatter Resistant Boring Bars

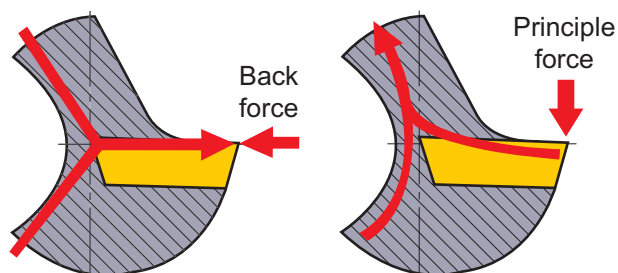
DIMPLE BAR

■ Features

Using computer simulation a highly rigid & lightweight head configuration has been designed to reduce chatter and improve the vibration damping properties.



● Deflection resistance

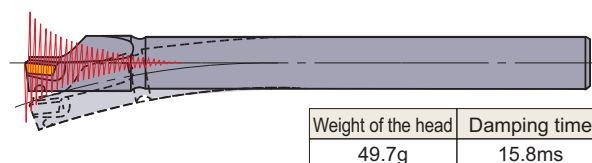


The Dimple bar design effectively balances the principal and back forces, and reduces deflection by up to 17%.

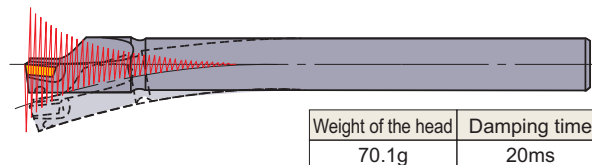
Boring bars	Deflection
Dimple bar	28.3 μ m
Conventional bar	34 μ m

● Vibration resistance

■ Dimple bar



■ Conventional bar



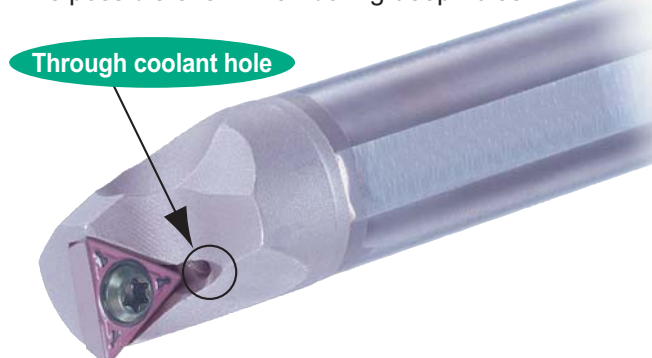
By reducing the weight of the head, the damping properties are increased.

Note) The above data was found when using a FSCLP1816R-09S type holder, under the following conditions; $l/d=5$, Depth of cut=0.5mm, Feed=0.05mm/rev.

■ Carbide Shank Type

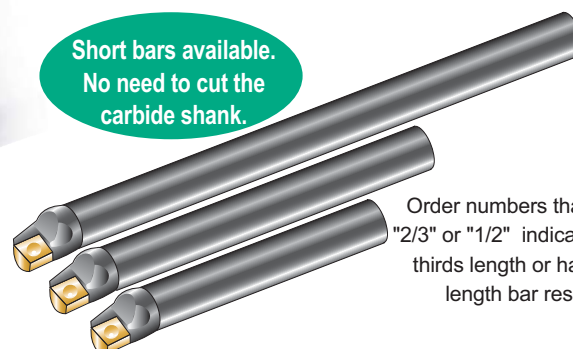
● The carbide shank type Dimple Bar uses through coolant holes.

A stable coolant supply to the cutting point is possible even when boring deep holes.



● Three different lengths of boring bars. (Short shank series)

Selection of the most suitable length bar according to the application.



Order numbers that include "2/3" or "1/2" indicates a two thirds length or half normal length bar respectively.

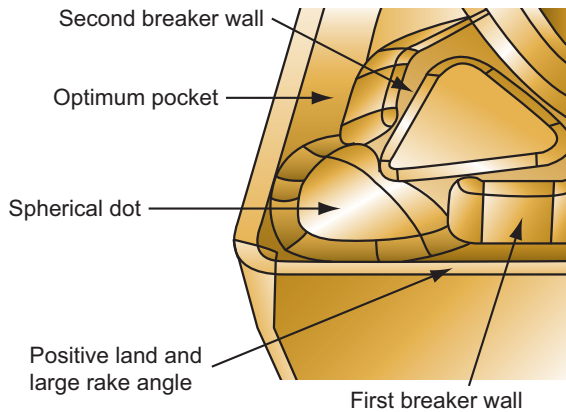
■ Features of *MV•SV* breaker

New-concept moulded chip breakers for Dimple Bars.

Stable chip control and sharp cutting for a wide application area.

● *MV* beaker for medium cutting

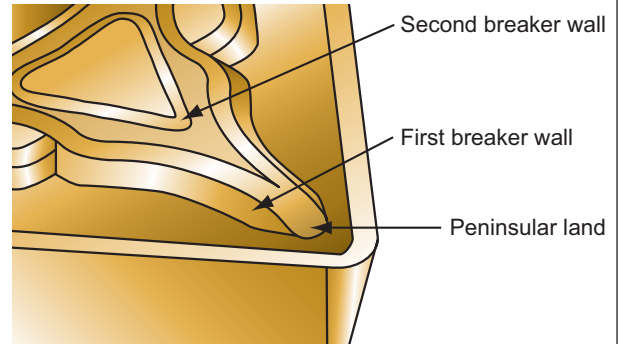
A combination of spherical dots and two-stage breaker wall achieves stable chip control for depths of cut between 0.8mm-2mm.



A large rake angle for sharp cutting and longer tool life.

● *SV* beaker for light cutting

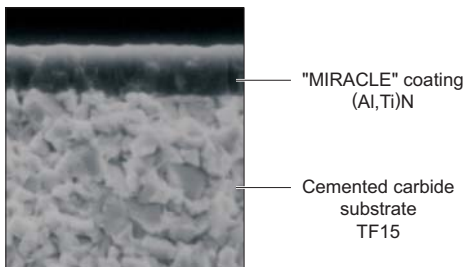
A combination of a "peninsular" land and a two-stage breaker wall ensures chip control even on smaller depths of cut of 1mm or below.



The rake angle ensures sharp cutting to prevent vibrations and gives an excellent surface finish.

■ Grade Features

● MIRACLE coated grade *VP15TF*



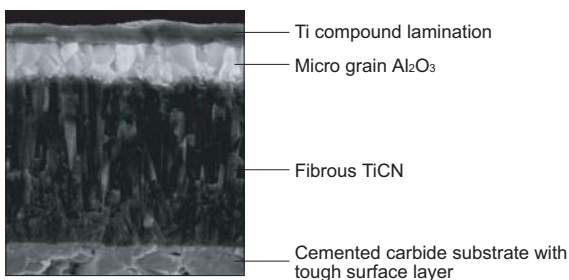
(Al, Ti)N "MIRACLE" coating

Heat resistance and adhesion strength have substantially increased compared to conventional coatings enabling longer tool life.

TF15 micro-grain cemented carbide substrate

Micro-grain cemented carbide with a good balance of wear and fracture resistance.

● CVD coated grade *UE6020*



"Even Coating" Technology

A very smooth and stable laminated structure of a special titanium compound has a high resistance to fracture and peeling.

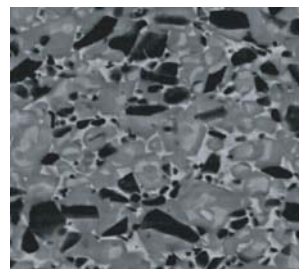
Triple-layer coating structure

The outer layers are a laminated Ti compound over a smooth layer of aluminum oxide (Al_2O_3). This provides the heat resistance needed for high-speed machining. The inner layer is a fibrous crystalline titanium, which has a good balance of wear and fracture resistance.

Special cemented carbide substrate

The substrate has a hard core combined with a very tough surface layer.

● *NX3035*, new cermet grade for steel turning

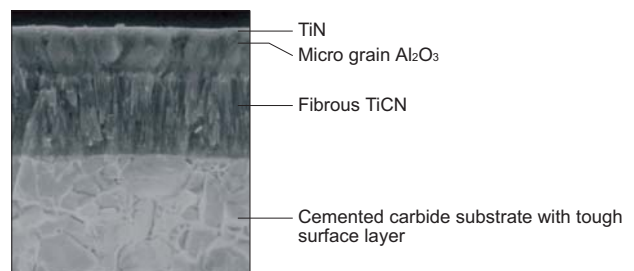


Cermet with a special alloy binder

The special alloy binder has improved the binding of the hard substrate particles to allow stable machining.

The superior surface finishes specific to cermet grades can be maintained.

● CVD coated grade *US7020*



Thin coating layer of fibrous TiCN + Micro grain Al_2O_3

A thin coating layer with high adhesion strength is less liable to peeling than other grades for steel cutting.

Cemented carbide substrate with tough surface layer

The cemented carbide substrate has a hard core and a tougher surface layer than existing grades. This reduces plastic deformation and chipping of the cutting edge when cutting stainless steels at high speed.

Small honed edge design

The small edge honing enables sharper cutting than other grades to help prevent welding to the cutting edge.

DIMPLE BAR

Cutting Performance

I/d	Cutting speed	DIMPLE BAR	Competitors boring bar (using a cermet grade)
Hole depth Shank dia. =5	80m/min	Excellent surface finish 	Poor surface finish 
Hole depth Shank dia. =4	160m/min	Excellent surface finish 	Surface chatter marks 

Steel shank

<Cutting conditions>

Workpiece : JIS SCM440 (185HB)

Depth of cut : 0.5mm

Feed : 0.1mm/rev

Wet cutting

<DIMPLE BAR>

Holder: FSCLP1816R-09S

Insert : CPMH090304-MV

Grade : NX2525

Carbide shank

<Cutting conditions>

Workpiece : JIS SCM440 (185HB)

Cutting speed : 80m/min

Depth of cut : 0.5mm

Feed : 0.1mm/rev

Overhang : 96mm (l/d=8)

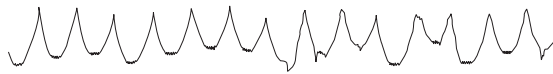
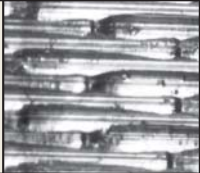
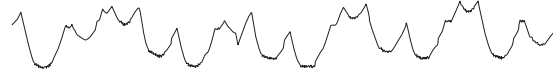
Wet cutting

<DIMPLE BAR>

Holder: FSTUP1412R-09E

Insert : TPMH090204-MV

Grade : NX2525

DIMPLE BAR Carbide shank			Excellent surface finish
Competitor's Carbide Boring bar			Surface chatter marks

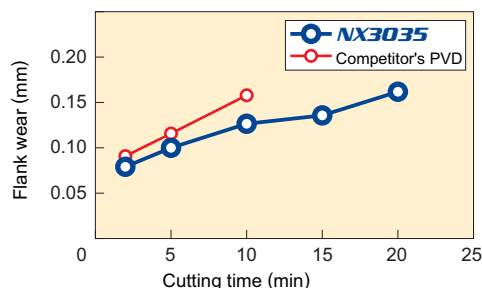


Carbide shank Dimple bars can prevent vibration even in deep boring applications where conventional carbide shanks did not produce good results.

Cutting Performance of VP15TF·VP45N·UE6020·US7020

●NX3035

NX3035, superior wear resistance for general steel turning

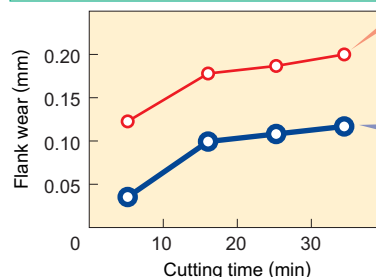


Holder : FSDVC3220R-11S
Insert : DCMT11T304-MV
Cutting speed : 180m/min
Feed : 0.15mm/rev
Depth of cut : 0.5mm

Workpiece : JIS S45C
Wet cutting

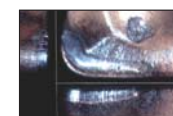
●UE6020

UE6020, superior wear resistance for general steel cutting

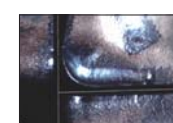


Holder : FSCLP2220L-09E
Insert : CPMH090304-MV
Cutting speed : 180m/min
Feed : 0.15mm/rev
Depth of cut : 1.0mm

Workpiece : JIS SCM440
Boring
Overhang : 48mm (l/d=3)
Wet cutting



Competitor's P20 coating



UE6020

●VP15TF

VP15F exhibits excellent fracture resistance

Feed (mm/rev)	0.08	0.10	0.20	0.30
VP15TF	○	○	○	○
Competitor's P20 coating	○	×	○	○
Competitor's P20 coated cermet	○	×	○	○

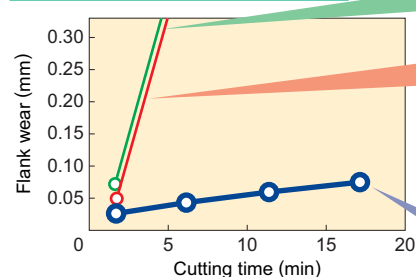


Holder : FSCLP1816R-09E
Insert : CPMH090304-MV
Cutting speed : 120m/min
Feed : Var mm/rev
Depth of cut : 1.0mm

Workpiece : JIS SCM440
Interrupted facing
Overhang : 48mm (l/d=3)
Wet cutting

●US7020

US7020, ideal for stainless steel cutting



Holder : FSCLP1816L-09E
Insert : CPMH090304-MV
Cutting speed : 160m/min
Feed : 0.15mm/rev
Depth of cut : 0.1mm

Workpiece : JIS SUS304 (169HB)
Boring
Overhang : 48mm (l/d=3)
Wet cutting



Competitor B, P20 coating



Competitor A, P20 coating

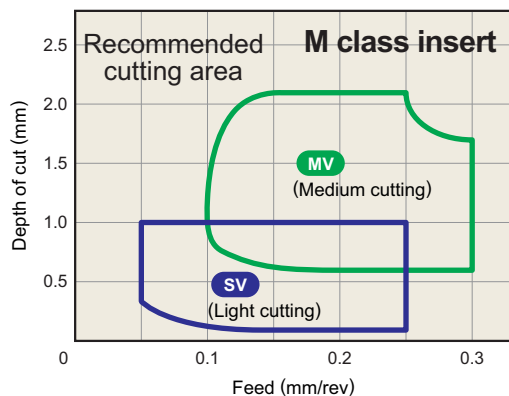


US7020

Recommended Use of the Holder

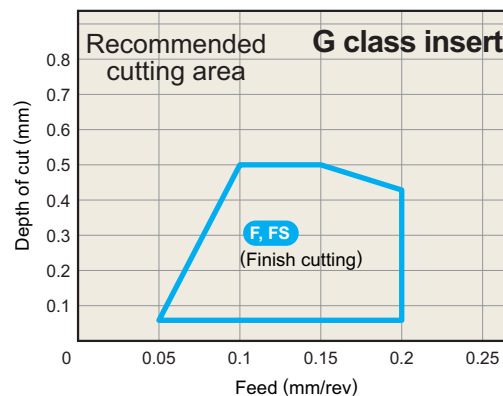
Insert Type	Page	Holder	Lead Angle	Shank Material	Economical	Cutting Edge Strength	Copying	Curved Faces Deep Faces	Internal Coolant
80° Rhombic	5	FSCLC/P...S	95°	Steel		◎			
		FSCLC/P...E	95°	Carbide		◎			◎
Triangular	7	FSTUP...S	93°	Steel	◎				
		FSTUP...E	93°	Carbide	◎				◎
55° Rhombic	9	FSDUC...S	93°	Steel			◎		
		FSDUC...E	93°	Carbide			◎		◎
	11	FSDQC...S	107°30'	Steel			◎		
		FSDQC...E	107°30'	Carbide			◎		◎
Trigon	13	FSWUB/P...S	93°	Steel	◎	◎			
		FSWUB/P...E	93°	Carbide	◎	◎			◎
35° Rhombic	15	FSVUB/C...S	93°	Steel			◎		
		FSVPB/C...S	117°30'	Steel			◎		
	16	FSVJB/C...S	142°	Steel				◎	

Recommended Use of the Chip Breakers



<Cutting conditions>

Insert : CPMH090304-MV, SV Workpiece : JIS SCr420H
Cutting speed : 150m/min Wet cutting



<Cutting conditions>

Insert : CPMH090304L-F Workpiece : JIS SCM440
Cutting speed : 150m/min Wet cutting

Recommended Cutting Conditions

Work Material		Cutting Mode	Breaker	Recommendation	Grade	Cutting Speed (m/min)	L/D≤3 (steel shank), L/D≤6 under (carbide shank)		L/D=4—5 (steel shank), L/D=7—8 (carbide shank)	
							Feed (mm/rev)	D.O.C. (mm)	Feed (mm/rev)	D.O.C. (mm)
P	Mild steel ≤180HB	Finishing	F/FS	①	NX2525	170 (120—220)	0.10 (0.05—0.15)	—0.5	0.10 (0.05—0.15)	—0.5
		Light	SV	①	NX3035	150 (100—200)	0.20 (0.10—0.25)	—1.0	0.15 (0.05—0.20)	—1.0
				②	NX2525	160 (110—210)	0.20 (0.10—0.25)	—1.0	0.15 (0.05—0.20)	—1.0
		Medium	MV	①	NX3035	140 (90—190)	0.25 (0.15—0.35)	—2.0	0.20 (0.15—0.25)	—1.5
				②	NX2525	150 (100—200)	0.25 (0.15—0.35)	—2.0	0.20 (0.15—0.25)	—1.5
	Carbon steel Alloy steel 180—280HB	Finishing	F/FS	①	VP15TF	140 (90—190)	0.10 (0.05—0.15)	—0.5	0.10 (0.05—0.15)	—0.5
				②	NX2525	130 (80—180)	0.10 (0.05—0.15)	—0.5	0.10 (0.05—0.15)	—0.5
		Light	SV	①	UE6020	140 (90—190)	0.20 (0.10—0.25)	—1.0	0.15 (0.05—0.20)	—1.0
				②	NX3035	110 (60—160)	0.20 (0.10—0.25)	—1.0	0.15 (0.05—0.20)	—1.0
		Medium	MV	①	UE6020	130 (80—180)	0.25 (0.15—0.35)	—2.0	0.20 (0.15—0.25)	—1.5
				②	NX3035	100 (60—150)	0.25 (0.15—0.35)	—2.0	0.20 (0.15—0.25)	—1.5
M	Stainless steel 180—280HB	Finishing	F/FS	①	VP15TF	150 (110—190)	0.10 (0.05—0.15)	—0.5	0.10 (0.05—0.15)	—0.5
				①	US735	125 (85—165)	0.20 (0.10—0.25)	—1.0	0.15 (0.05—0.20)	—1.0
		Light	SV	②	VP15TF	130 (90—170)	0.20 (0.10—0.25)	—1.0	0.15 (0.05—0.20)	—1.0
				①	US735	105 (70—135)	0.20 (0.15—0.25)	—2.0	0.20 (0.15—0.25)	—1.0
		②	VP15TF	120 (80—160)	0.20 (0.15—0.25)	—2.0	0.20 (0.15—0.25)	—1.0		
K	Cast iron Tensile strength≤350N/mm ²	Finishing	F/FS	①	HTI10	130 (90—160)	0.15 (0.10—0.20)	—0.5	0.15 (0.10—0.20)	—0.5
		Medium	MV	①	US7020	90 (60—120)	0.20 (0.15—0.25)	—2.0	0.20 (0.15—0.25)	—1.5
H	Heat treated steel 35—65HRC	Finishing	No breaker	①	MB825	100 (80—200)	0.10 (0.05—0.15)	—0.15	0.10 (0.05—0.15)	—0.1
N	Aluminium Alloy	Finishing	F/FS	①	HTI10	300 (200—400)	0.10 (0.05—0.15)	—0.5	0.10 (0.05—0.15)	—0.5
			No breaker	①	MD220	200 (150—250)	0.10 (0.05—0.15)	—2.0	0.10 (0.05—0.15)	—1.0

*If vibrations do occur, reduce the cutting speed by 30%.

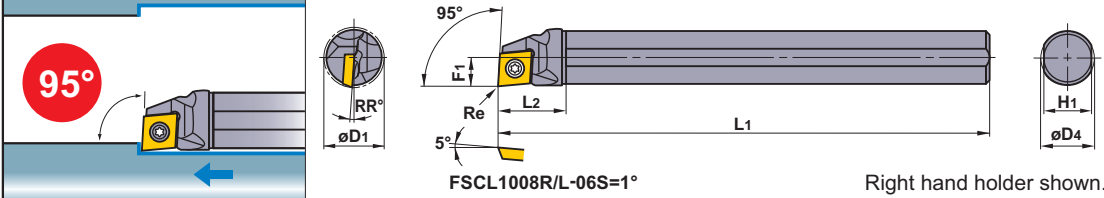
DIMPLE BAR

Holders

FSCLC/P

CC⁰⁰, CP⁰⁰ inserts

Finish	Light
R/L-F  (06,08,09)	SV  (06,08,09)
Medium  (06,08,09)	CBN  (06,08,09)



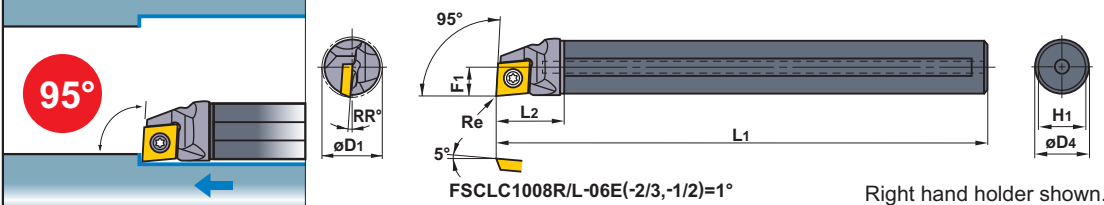
Order Number	Stock		Insert Number	Dimensions (mm)							Min. Cutting Diameter D1 (mm)	Standard Corner Radius Re	Recommended l/d Ratio		
	R	L		D4	L1	L2	F1	H1	RR°						
FSCLC1008R/L-06S	●	●	CCG/MH NP-CCMH NP-CCMB CPMH NP-CPMH NP-CPMB	0602	8	125	18	5	7.2	12	10	0.4	−3	TS253	TKY08F
FSCLP1210R/L-08S	●	●		0802	10	150	22.5	6	9	5	12	0.4	−3.5	TS3D	TKY10F
1412R/L-08S	●	●		0802	12	150	27	7	11	4	14	0.4	−4	TS3D	TKY10F
 1612R/L-09S	●	●		0903	12	150	30	8	11	4	16	0.4	−4	TS4D	TKY15F
1816R/L-09S	●	●		0903	16	180	36	9	15	3.5	18	0.4	−5	TS4D	TKY15F
2220R/L-09S	●	●		0903	20	220	45	11	19	2	22	0.4	−5	TS4D	TKY15F
3025R/L-09S	●	●		0903	25	250	56.3	15	23.4	0	30	0.4	−5	TS4D	TKY15F

FSCLC/P_E

Carbide shank with coolant hole

CC⁰⁰, CP⁰⁰ inserts

Finish	Light
R/L-F  (06,08,09)	SV  (06,08,09)
Medium  (06,08,09)	CBN  (06,08,09)



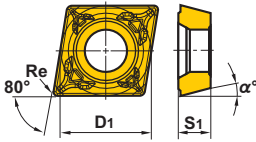
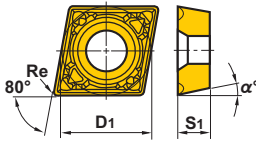
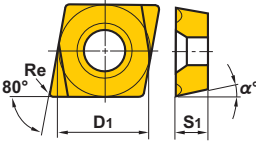
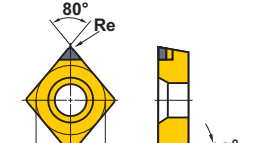
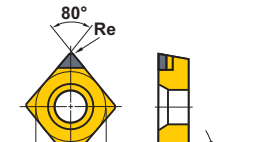
Order Number	Stock		Insert Number	Dimensions (mm)							Min. Cutting Diameter D ₁ (mm)	Standard Corner Radius Re	Recommended l/d Ratio		
	R	L		D4	L ₁	L ₂	F ₁	H ₁	RR°	Clamp Screw				Wrench	
FSCLC1008R/L-06E	●	●	CCGH CCMH NP-CCMH NP-CCMB	0602 	8	140	13.8	5	7.2	12	10	0.4	—7	TS253	TKY08F
1008R-06E-2/3	●			0602 	8	90	13.8	5	7.2	12	10	0.4	—7	TS253	TKY08F
1008R-06E-1/2	●			0602 	8	70	13.8	5	7.2	12	10	0.4	—7	TS253	TKY08F
FSCLP1210R/L-08E	●	●	CPMH NP-CPMH NP-CPMB	0802 	10	160	16.0	6	9	5	12	0.4	—7.5	TS3D	TKY10F
1210R-08E-2/3	●			0802 	10	105	16.0	6	9	5	12	0.4	—7.5	TS3D	TKY10F
1210R-08E-1/2	●			0802 	10	80	16.0	6	9	5	12	0.4	—7.5	TS3D	TKY10F
1412R/L-08E	●	●		0802 	12	180	17.8	7	11	4	14	0.4	—8	TS3D	TKY10F
1412R-08E-2/3	●			0802 	12	120	17.8	7	11	4	14	0.4	—8	TS3D	TKY10F
1412R-08E-1/2	●			0802 	12	90	17.8	7	11	4	14	0.4	—8	TS3D	TKY10F
1816R/L-09E	●	●		0903 	16	220	21.8	9	15	3.5	18	0.4	—8	TS4D	TKY15F
1816R-09E-2/3	●			0903 	16	145	21.8	9	15	3.5	18	0.4	—8	TS4D	TKY15F
1816R-09E-1/2	●			0903 	16	110	21.8	9	15	3.5	18	0.4	—8	TS4D	TKY15F
2220R/L-09E	●	●		0903 	20	250	24.0	11	19	2	22	0.4	—8	TS4D	TKY15F
2220R-09E-2/3	●			0903 	20	165	24.0	11	19	2	22	0.4	—8	TS4D	TKY15F
2220R-09E-1/2	●			0903 	20	125	24.0	11	19	2	22	0.4	—8	TS4D	TKY15F

(Note 1) Insert photo, letters show chip breaker style, figures show insert dimensions.

(Note 2) Please refer to page 4 for recommended cutting conditions.

(Note 3) When using inserts with right and left hand chip breakers, please use left hand inserts for right hand holders and right hand inserts for left hand holders.

Inserts

Geometry			Class	Order Number	Dimensions (mm)		Stock Grade											
							Coated			MIRACLE Coated		Cermet		Coated Cermet	Carbide	CBN	PCD	
							UE6020	US7020	US735	VP15TF	VP45N	NX2525	NX3035	AP25N	HT110	MB825	MD220	
Molded Breaker	Light Cutting		CCMH...-SV	6.35	2.38	0.2	7	●	●	●	●	●	●	●				
			CPMH...-SV	6.35	2.38	0.4	7	●	●	●	●	●	●	●				
			CCMH060202-SV	6.35	2.38	0.2	7	●	●	●	●	●	●	●				
			060204-SV	6.35	2.38	0.4	7	●	●	●	●	●	●	●				
			CPMH080202-SV	7.94	2.38	0.2	11	●	●	●	●	●	●	●				
			080204-SV	7.94	2.38	0.4	11	●	●	●	●	●	●	●				
			090302-SV	9.525	3.18	0.2	11	●	●	●	●	●	●	●				
Molded Cutting		CCMH...-MV	6.35	2.38	0.2	7	●	●	●	●	●	●	●	●				
		CPMH...-MV	6.35	2.38	0.4	7	●	●	●	●	●	●	●	●				
		CCMH060202-MV	6.35	2.38	0.2	7	●	●	●	●	●	●	●	●				
		060204-MV	6.35	2.38	0.4	7	●	●	●	●	●	●	●	●				
		CPMH080204-MV	7.94	2.38	0.4	11	●	●	●	●	●	●	●	●				
		080208-MV	7.94	2.38	0.8	11	●	●	●	●	●	●	●	●				
		090304-MV	9.525	3.18	0.4	11	●	●	●	●	●	●	●	●				
Ground / Molded Breaker		CCGH...R/L-F	6.35	2.38	0.2	7				●		●		□	●			
		CPMH...R/L-F	6.35	2.38	0.2	7				●		●		●	●			
		060204R-F	6.35	2.38	0.4	7				●		●		□	●			
		060204L-F	6.35	2.38	0.4	7				●		●		●	●			
		CPMH080204R-F	7.94	2.38	0.4	11				●		●		□	●			
		080204L-F	7.94	2.38	0.4	11				●		●		●	●			
		090304R-F	9.525	3.18	0.4	11				●		●		□	●			
CBN (No Breaker)		CCGH060202R-F	6.35	2.38	0.4	7				●		●		●	●			
		060202L-F	6.35	2.38	0.2	7				●		●		●	●			
		060204R-F	6.35	2.38	0.4	7				●		●		□	●			
		060204L-F	6.35	2.38	0.4	7				●		●		●	●			
PCD (With Breaker)		NP-CCMH...G	6.35	2.38	0.4	7											●	
		NP-CPMB...G	6.35	2.38	0.4	7											●	
		NP-CCMB060204G	7.94	2.38	0.4	11											●	
		NP-CPMB080204G	7.94	2.38	0.4	11											●	
		090304G	9.525	3.18	0.4	11											●	

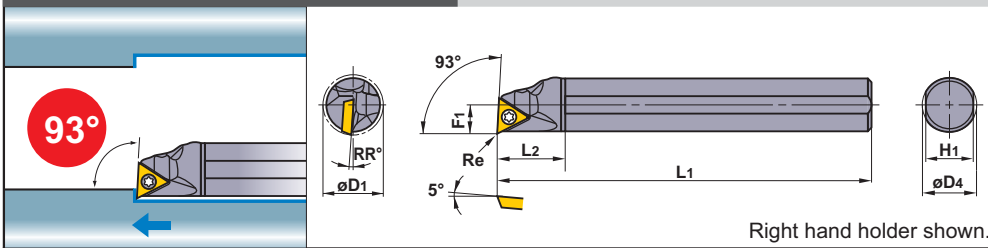
DIMPLE BAR

Holders

FSTUP

TP⁰⁰inserts

Finish	Light	Medium
R/L-FS  (08,09,11,16)	SV  (08,09,11,16)	MV  (08,09,11,16)
PCD	CBN	
R/L-F  (08,09,11)	 (08,09,11,16)	



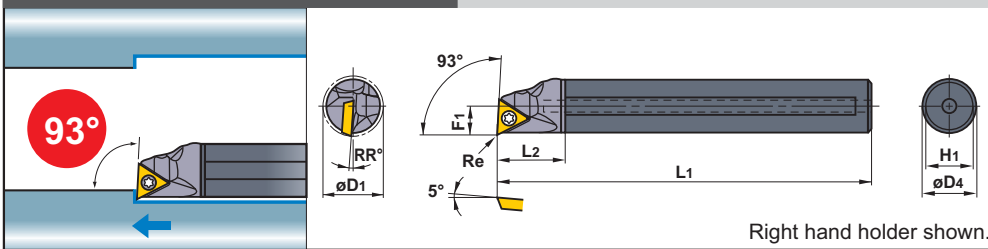
Order Number	Stock		Insert Number		Dimensions (mm)						Min. Cutting Diameter D ₁ (mm)	Standard Corner Radius Re	Recommended I/d Ratio		
	R	L			D ₄	L ₁	L ₂	F ₁	H ₁	RR°					
FSTUP1008R/L-08S	●	●	TPGH TPMH NP-TPMB NP-TPMH	0802 ⁰⁰	8	125	18	5	7.2	10	10	0.4	—3	TS2D	TKY06F
1210R/L-09S	●	●		0902 ⁰⁰	10	150	22.5	6	9	8	12	0.4	—3.5	TS25D	TKY08F
1412R/L-09S	●	●		0902 ⁰⁰	12	150	27	7	11	7	14	0.4	—4	TS25D	TKY08F
NEW 1210R/L-11S	●	●		1103 ⁰⁰	10	150	22.5	6	9	8	12	0.4	—3.5	TS31D	TKY10F
NEW 1412R/L-11S	●	●		1103 ⁰⁰	12	150	27	7	11	7	14	0.4	—4	TS31D	TKY10F
1816R/L-11S	●	●		1103 ⁰⁰	16	180	36	9	15	4	18	0.4	—5	TS31D	TKY10F
2220R/L-11S	●	●		1103 ⁰⁰	20	220	45	11	19	0	22	0.4	—5	TS31D	TKY10F
3225R/L-16S	●	●		1603 ⁰⁰	25	270	56.3	16	23.4	0	32	0.8	—5	TS4D	TKY15F

FSTUP_E

Carbide shank with coolant hole

TP⁰⁰inserts

Finish	Light	Medium
R/L-FS  (08,09,11)	SV  (08,09,11)	MV  (08,09,11)
PCD	CBN	
R/L-F  (08,09,11)	 (08,09,11)	



Order Number	Stock		Insert Number		Dimensions (mm)						Min. Cutting Diameter D ₁ (mm)	Standard Corner Radius Re	Recommended I/d Ratio		
	R	L			D ₄	L ₁	L ₂	F ₁	H ₁	RR°					
FSTUP1008R/L-08E	●	●	TPGH TPMH NP-TPMB NP-TPMH	0802 ⁰⁰	8	140	13.8	5	7.2	10	10	0.4	—7	TS2D	TKY06F
1008R-08E-2/3	●	●		0802 ⁰⁰	8	90	13.8	5	7.2	10	10	0.4	—7	TS2D	TKY06F
1008R-08E-1/2	●	●		0802 ⁰⁰	8	70	13.8	5	7.2	10	10	0.4	—7	TS2D	TKY06F
1210R/L-09E	●	●		0902 ⁰⁰	10	160	16.0	6	9	8	12	0.4	—7.5	TS25D	TKY08F
1210R-09E-2/3	●	●		0902 ⁰⁰	10	105	16.0	6	9	8	12	0.4	—7.5	TS25D	TKY08F
1210R-09E-1/2	●	●		0902 ⁰⁰	10	80	16.0	6	9	8	12	0.4	—7.5	TS25D	TKY08F
1412R/L-09E	●	●		0902 ⁰⁰	12	180	17.8	7	11	7	14	0.4	—8	TS25D	TKY08F
1412R-09E-2/3	●	●		0902 ⁰⁰	12	120	17.8	7	11	7	14	0.4	—8	TS25D	TKY08F
1412R-09E-1/2	●	●		0902 ⁰⁰	12	90	17.8	7	11	7	14	0.4	—8	TS25D	TKY08F
1816R/L-11E	●	●		1103 ⁰⁰	16	220	21.8	9	15	4	18	0.4	—8	TS31D	TKY10F
1816R-11E-2/3	●	●		1103 ⁰⁰	16	145	21.8	9	15	4	18	0.4	—8	TS31D	TKY10F
1816R-11E-1/2	●	●		1103 ⁰⁰	16	110	21.8	9	15	4	18	0.4	—8	TS31D	TKY10F
2220R/L-11E	●	●		1103 ⁰⁰	20	250	24.0	11	19	0	22	0.4	—8	TS31D	TKY10F
2220R-11E-2/3	●	●		1103 ⁰⁰	20	165	24.0	11	19	0	22	0.4	—8	TS31D	TKY10F
2220R-11E-1/2	●	●		1103 ⁰⁰	20	125	24.0	11	19	0	22	0.4	—8	TS31D	TKY10F

(Note 1) Insert photo, letters show chip breaker style, figures show insert dimensions.

(Note 2) Please refer to page 4 for recommended cutting conditions.

(Note 3) When using inserts with right and left hand chip breakers, please use left hand inserts for right hand holders and right hand inserts for left hand holders.

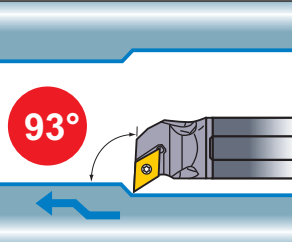
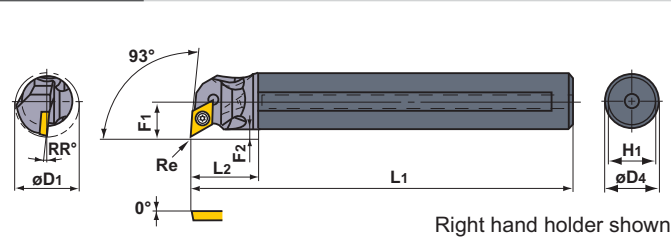
Inserts

Geometry		Class	Order Number	Dimensions (mm)			Stock Grade											
							Coated			MIRACLE Coated		Cermet		Coated Cermet	Carbide	CBN	PCD	
				D1	S1	Re	UE6020	US7020	US735	VP15TF	VP45N	NX2525	NX3035	AP25N	HT110	MB825	MD220	
Molded Breaker	Light Cutting	M	TPMH080202-SV	4.76	2.38	0.2	●	●	●	●	●	●	●					
			080204-SV	4.76	2.38	0.4	●	●	●	●	●	●	●					
			090202-SV	5.56	2.38	0.2	●	●	●	●	●	●	●					
			090204-SV	5.56	2.38	0.4	●	●	●	●	●	●	●					
			110302-SV	6.35	3.18	0.2	●	●	●	●	●	●	●					
			110304-SV	6.35	3.18	0.4	●	●	●	●	●	●	●					
			110308-SV	6.35	3.18	0.8	●	●	●	●	●	●	●					
			160302-SV	9.525	3.18	0.2	●	●	●	●	●	●	●					
			160304-SV	9.525	3.18	0.4	●	●	●	●	●	●	●					
			160308-SV	9.525	3.18	0.8	●	●	●	●	●	●	●					
	Medium Cutting	M	TPMH080202-MV	4.76	2.38	0.2	●	●	●	●	●	●	●	●				
			080204-MV	4.76	2.38	0.4	●	●	●	●	●	●	●	●				
			090202-MV	5.56	2.38	0.2	●	●	●	●	●	●	●	●				
			090204-MV	5.56	2.38	0.4	●	●	●	●	●	●	●	●				
			090208-MV	5.56	2.38	0.8	●			●			●					
			110302-MV	6.35	3.18	0.2	●	●	●	●	●	●	●	●				
			110304-MV	6.35	3.18	0.4	●	●	●	●	●	●	●	●				
			110308-MV	6.35	3.18	0.8	●	●	●	●	●	●	●	●				
			160304-MV	9.525	3.18	0.4	●	●	●	●	●	●	●	●				
			160308-MV	9.525	3.18	0.8	●	●	●	●	●	●	●	●				
Ground Breaker	Finish Cutting	G	TPGH080202R-FS	4.76	2.38	0.2				●		●		□	●			
			080202L-FS	4.76	2.38	0.2				●		●		●	●			
			080204R-FS	4.76	2.38	0.4				●		●		□	●			
			080204L-FS	4.76	2.38	0.4				●		●		●	●			
			090202R-FS	5.56	2.38	0.2				●		●		□	●			
			090202L-FS	5.56	2.38	0.2				●		●		●	●			
			090204R-FS	5.56	2.38	0.4				●		●		□	●			
			090204L-FS	5.56	2.38	0.4				●		●		●	●			
			110302R-FS	6.35	3.18	0.2				●		●		□	●			
			110302L-FS	6.35	3.18	0.2				●		●		●	●			
			110304R-FS	6.35	3.18	0.4				●		●		□	●			
			110304L-FS	6.35	3.18	0.4				●		●		●	●			
			160304R-FS	9.525	3.18	0.4				●		●		□	●			
			160304L-FS	9.525	3.18	0.4				●		●		●	●			
			160308R-FS	9.525	3.18	0.8				●		●		□	●			
			160308L-FS	9.525	3.18	0.8				●		●		●	●			
CBN (No Breaker)	Finish Cutting	M	NP-TPMB080204G	4.76	2.38	0.4										●		
			090204G	5.56	2.38	0.4											●	
			110304G	6.35	3.18	0.4											●	
			160304G	9.525	4.76	0.4											●	
PCD (With Breaker)	Finish Cutting	M	NP-TPMH080202R-F	4.76	2.38	0.2											●	
			080202L-F	4.76	2.38	0.2												●
			080204R-F	4.76	2.38	0.4												●
			080204L-F	4.76	2.38	0.4												●
			090202R-F	5.56	2.38	0.2												●
			090202L-F	5.56	2.38	0.2												●
			090204R-F	5.56	2.38	0.4												●
			090204L-F	5.56	2.38	0.4												●
			110302R-F	6.35	3.18	0.2												●
			110302L-F	6.35	3.18	0.2												●
			110304R-F	6.35	3.18	0.4												●
			110304L-F	6.35	3.18	0.4												●

DIMPLE BAR

Holders

FSDUC		DC $\circ$ inserts										Finish		Light		Medium	
												(07,11)	(07,11)	(07,11)			
												Medium	PCD	CBN			
												Standard	R/L-F				
												(07,11)	(07,11)	(07,11)			
Order Number	Stock		Insert Number	Dimensions (mm)								Min. Cutting Diameter D1 (mm)	Standard Corner Radius Re	Recommended l/d Ratio			
	R	L		D4	L1	L2	F1	F2	H1	RR°	Clamp Screw				Wrench		
FSDUC1410R/L-07S	●	●	DCMT DCGT NP-DCMT NP-DCMW	0702 $\circ$	10	150	18	8.3	3.3	9	7.5	14	0.4	—3.5	TS25	TKY08F	
1612R/L-07S	●	●		0702 $\circ$	12	150	20	9.3	3.3	11	6	16	0.4	—4	TS25	TKY08F	
2016R/L-07S	●	●		0702 $\circ$	16	180	20	11.3	3.3	15	5	20	0.4	—5	TS25	TKY08F	
3220R/L-11S	●	●		11T3 $\circ$	20	180	22.5	16.1	6.1	19	5	32	0.8	—5	TS43	TKY15F	

FSDUC_E											Carbide shank with coolant hole		DC $\circ$ inserts		Finish		Light		Medium	
															 (07,11)		 (07,11)		 (07,11)	
															Medium  (07,11)		PCD  (07,11)		CBN  (07,11)	
															Standard  (07,11)		R/L-F  (07,11)			
Order Number		Stock		Insert Number		Dimensions (mm)							Min. Cutting Diameter D1 (mm)	Standard Corner Radius Re	Recommended l/d Ratio	 Clamp Screw	 Wrench			
		R	L			D4	L1	L2	F1	F2	H1	RR°								
FSDUC1410R/L-07E		●	●	DCMT DCGT NP-DCMT NP-DCMW	0702 $\circ$	10	160	16.0	8.3	3.3	9	7.5	14	0.4	—7.5	TS25	TKY08F			
1612R/L-07E		●	●		0702 $\circ$	12	180	17.8	9.3	3.3	11	6.0	16	0.4	—8	TS25	TKY08F			
2016R/L-07E		●	●		0702 $\circ$	16	220	21.8	11.3	3.3	15	5.0	20	0.4	—8	TS25	TKY08F			
3220R/L-11E		●	●		11T3 $\circ$	20	250	24.0	16.1	6.1	19	5.0	32	0.8	—8	TS43	TKY15F			

(Note 1) Insert photo, letters show chip breaker style, figures show insert dimensions.

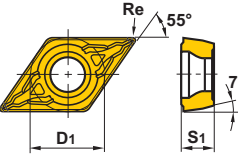
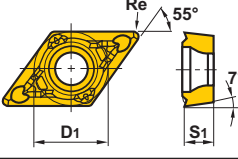
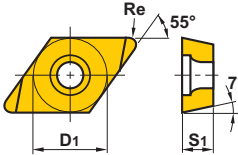
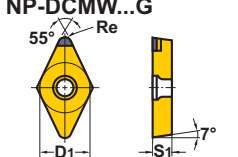
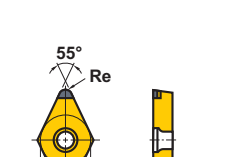
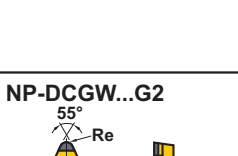
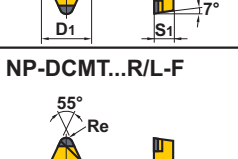
(Note 2) Please refer to page 4 for recommended cutting conditions.

(Note 3) When using inserts with right and left hand chip breakers, please use left hand inserts for right hand holders and right hand inserts for left hand holders.

Inserts

Geometry		Class	Order Number	Dimensions (mm)		Stock Grade													
						Coated			MIRACLE Coated		Cermet		Coated Cermet	Carbide	CBN		PCD		
				D1	S1	Re	UE6020	US7020	US735	VP15TF	VP45N	NX2525	NX3035	AP25N	HT10	MB825	MB8025	MD220	
Molded Breaker Finish Cutting	DCMT...-FV		M	DCMT070202-FV	6.35	2.38	0.2	●						●		●			
				070204-FV	6.35	2.38	0.4	●						●		●			
				11T304-FV	9.525	3.97	0.4	●						●		●			
				11T308-FV	9.525	3.97	0.8	●						●		●			

Inserts

Geometry			Class	Order Number	Dimensions (mm)		Stock Grade													
							Coated			MIRACLE Coated		Cermet		Coated Cermet	Carbide	CBN		PCD		
					D1	S1	Re	UE6020	US7020	US735	VP15TF	VP45N	NX2525	NX3035	AP25N	HT110	MB825	MB8025	MD220	
Molded Breaker	Light Cutting		M	DCMT070202-SV	6.35	2.38	0.2	●	●	●	●	●	●	●						
				070204-SV	6.35	2.38	0.4	●	●	●	●	●	●	●	●					
				070208-SV	6.35	2.38	0.8	●	●	●	●	●	●	●	●					
				11T302-SV	9.525	3.97	0.2	●	●	●	●	●	●	●	●					
				11T304-SV	9.525	3.97	0.4	●	●	●	●	●	●	●	●					
				11T308-SV	9.525	3.97	0.8	●	●	●	●	●	●	●	●					
Molded Breaker	Medium Cutting		M	DCMT070202-MV	6.35	2.38	0.2	●	●	●	●	●	●	●	●					
				070204-MV	6.35	2.38	0.4	●	●	●	●	●	●	●	●	●				
				070208-MV	6.35	2.38	0.8	●	●	●	●	●	●	●	●	●				
				11T302-MV	9.525	3.97	0.2	●	●	●	●	●	●	●	●	●				
				11T304-MV	9.525	3.97	0.4	●	●	●	●	●	●	●	●	●				
				11T308-MV	9.525	3.97	0.8	●	●	●	●	●	●	●	●	●				
Ground Breaker	Finish Cutting		G	DCGT070202R-F	6.35	2.38	0.2				●		●		□	●				
				070202L-F	6.35	2.38	0.2				●		●		□	●	●			
				070204R-F	6.35	2.38	0.4				●		●		□	●	●			
				070204L-F	6.35	2.38	0.4				●		●		□	●	●			
				11T302R-F	9.525	3.97	0.2				●		●		□	●	●			
				11T302L-F	9.525	3.97	0.2				●		●		□	●	●			
				11T304R-F	9.525	3.97	0.4				●		●		□	●	●			
				11T304L-F	9.525	3.97	0.4				●		●		□	●	●			
CBN (No Breaker)	Finish Cutting		M	NP-DCMW070204G	6.35	2.38	0.4										●			
				11T304G	9.525	3.97	0.4											●		
	Finish Cutting		G	NP-DCGW070202G	6.35	2.38	0.2												●	
				070204G	6.35	2.38	0.4												●	
				070208G	6.35	2.38	0.8												●	
				11T302G	9.525	3.97	0.2												●	
				11T304G	9.525	3.97	0.4												●	
				11T304F	9.525	3.97	0.4											□		
				11T304T	9.525	3.97	0.4											□		
				11T308G	9.525	3.97	0.8												●	
				11T308F	9.525	3.97	0.8												□	
				11T308T	9.525	3.97	0.8												□	
	Finish Cutting		G	NP-DCGW11T304G2	9.525	3.97	0.4											●		
				11T308G2	9.525	3.97	0.8												●	
PCD (With Breaker)	Finish Cutting		M	NP-DCMT070202R-F	6.35	2.38	0.2											●		
				070202L-F	6.35	2.38	0.2												●	
				070204R-F	6.35	2.38	0.4												●	
				070204L-F	6.35	2.38	0.4												●	
				11T302R-F	9.525	3.97	0.2												●	
				11T302L-F	9.525	3.97	0.2												●	
				11T304R-F	9.525	3.97	0.4												●	
				11T304L-F	9.525	3.97	0.4												●	

DIMPLE BAR

Holders

FSDQC											DC $\circ$ inserts											Finish		Light		Medium	
 107°30° Right hand holder shown.											FV		SV		MV												
											(07,11)		(07,11)		(07,11)												
											Medium		PCD		CBN												
											Standard		R/L-F		CBN												
						(07,11)		(07,11)		(07,11)																	
Order Number		Stock		Insert Number		Dimensions (mm)								Min. Cutting Diameter D1 (mm)	Standard Corner Radius Re	Recom- mended I/d Ratio											
						D4	L1	L2	F1	F2	H1	RR°															
FSDQC1310R/L-07S		●	●	DCMT DCGT NP-DCMT NP-DCMW	0702 $\circ$	10	150	20.5	7.6	2.6	9	8	13	0.4	-3.5	TS25	TKY08F										
1612R/L-07S		●	●		0702 $\circ$	12	150	22.5	8.6	2.6	11	6	16	0.4	-4	TS25	TKY08F										
2016R/L-07S		●	●		0702 $\circ$	16	180	22.5	10.6	2.6	15	5	20	0.4	-5	TS25	TKY08F										
2520R/L-11S		●	●		11T3 $\circ$	20	180	26	13.7	3.7	19	7	25	0.8	-5	TS43	TKY15F										

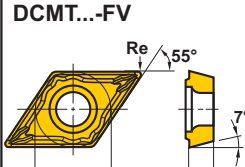
FSDQC_E											Carbide shank with coolant hole DC $\circ$ inserts											Finish	Light	Medium
															(07,11)	(07,11)	(07,11)							
															Medium	PCD	CBN							
															Standard	R/L-F								

(Note 1) Insert photo, letters show chip breaker style, figures show insert dimensions.

(Note 2) Please refer to page 4 for recommended cutting conditions.

(Note 3) When using inserts with right and left hand chip breakers, please use left hand inserts for right hand holders and right hand inserts for left hand holders.

Inserts

Geometry		Class	Order Number	Dimensions (mm)		Stock Grade											
						Coated			MIRACLE Coated		Cermet		Coated Cermet	Carbide	CBN		PCD
				D1	S1	Re	UE6020	US7020	US735	VP15TF	VP45N	NX2525	NX3035	AP25N	HT110	MB825	MB8025
Molded Breaker Finish Cutting		M	DCMT...-FV	6.35	2.38	0.2	●					●		●			
			070204-FV	6.35	2.38	0.4	●					●		●			
			11T304-FV	9.525	3.97	0.4	●					●		●			
			11T308-FV	9.525	3.97	0.8	●					●		●			

Inserts

Geometry			Class	Order Number	Dimensions (mm)		Stock Grade												
							Coated			MIRACLE Coated		Cermet		Coated Cermet	Carbide	CBN		PCD	
					D1	S1	Re	UE6020	US7020	US735	VP15TF	VP45N	NX2525	NX3035	AP25N	HT110	MB825	MB8025	MD220
Molded Breaker	Light Cutting		M	DCMT070202-SV	6.35	2.38	0.2	●	●	●	●	●	●	●					
				070204-SV	6.35	2.38	0.4	●	●	●	●	●	●	●					
				070208-SV	6.35	2.38	0.8	●	●	●	●	●	●	●					
				11T302-SV	9.525	3.97	0.2	●	●	●	●	●	●	●					
				11T304-SV	9.525	3.97	0.4	●	●	●	●	●	●	●					
				11T308-SV	9.525	3.97	0.8	●	●	●	●	●	●	●					
Molded Cutting		M	DCMT070202-MV	6.35	2.38	0.2	●	●	●	●	●	●	●	●					
			070204-MV	6.35	2.38	0.4	●	●	●	●	●	●	●	●					
			070208-MV	6.35	2.38	0.8	●	●	●	●	●	●	●	●					
			11T302-MV	9.525	3.97	0.2	●	●	●	●	●	●	●	●					
			11T304-MV	9.525	3.97	0.4	●	●	●	●	●	●	●	●					
			11T308-MV	9.525	3.97	0.8	●	●	●	●	●	●	●	●					
Ground Breaker	Finish Cutting		G	DCGT070202R-F	6.35	2.38	0.2				●		●		□	●			
				070202L-F	6.35	2.38	0.2				●		●		●	●			
				070204R-F	6.35	2.38	0.4				●		●		□	●			
				070204L-F	6.35	2.38	0.4				●		●		●	●			
				11T302R-F	9.525	3.97	0.2				●		●		□	●			
				11T302L-F	9.525	3.97	0.2				●		●		●	●			
				11T304R-F	9.525	3.97	0.4				●		●		□	●			
				11T304L-F	9.525	3.97	0.4				●		●		●	●			
CBN (No Breaker)	Finish Cutting		M	NP-DCMW070204G	6.35	2.38	0.4										●		
				11T304G	9.525	3.97	0.4											●	
		G	NP-DCGW070202G	6.35	2.38	0.2												●	
			070204G	6.35	2.38	0.4												●	
			070208G	6.35	2.38	0.8												●	
			11T302G	9.525	3.97	0.2												●	
			11T304G	9.525	3.97	0.4												●	
			11T304F	9.525	3.97	0.4											□		
			11T304T	9.525	3.97	0.4											□		
			11T308G	9.525	3.97	0.8												●	
			11T308F	9.525	3.97	0.8											□		
11T308T	9.525	3.97	0.8											□					
	G	NP-DCGW11T304G2	9.525	3.97	0.4												●		
		11T308G2	9.525	3.97	0.8												●		
PCD (With Breaker)	Finish Cutting		M	NP-DCMT070202R-F	6.35	2.38	0.2											●	
				070202L-F	6.35	2.38	0.2												●
				070204R-F	6.35	2.38	0.4												●
				070204L-F	6.35	2.38	0.4												●
				11T302R-F	9.525	3.97	0.2												●
				11T302L-F	9.525	3.97	0.2												●
				11T304R-F	9.525	3.97	0.4												●
				11T304L-F	9.525	3.97	0.4												●

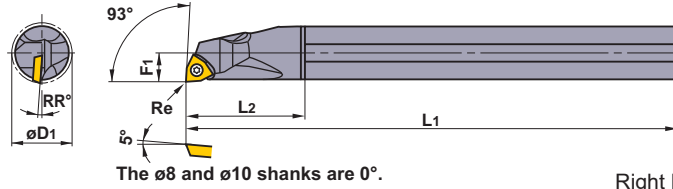
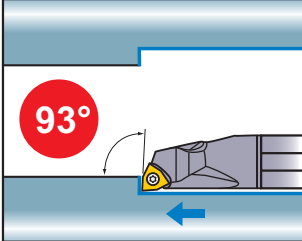
DIMPLE BAR

Holders

FSWUB/P

WB $\circ\circ$, WP $\circ\circ$ inserts

Finish
R/L-F-FS
(L3,04,06)
Medium
MV
(L3,04,06)



Right hand holder shown.

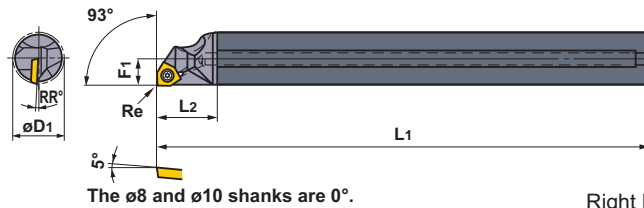
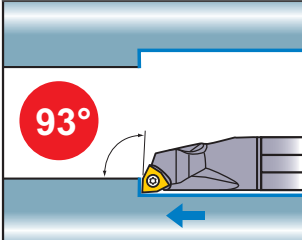
Order Number	Stock		Insert Number		Dimensions (mm)						Min. Cutting Diameter D1 (mm)	Standard Corner Radius Re	Recommended I/d Ratio		
	R	L			D4	L1	L2	F1	H1	RR°				Clamp Screw	Wrench
FSWUB1008R/L-L3S	●	●	WBMT WBGT	L302 	8	125	18	5	7.2	14	10	0.2	—3	TS2	TKY06F
1210R/L-L3S	●	●		L302 	10	150	22.5	6	9	11	12	0.2	—3.5	TS2	TKY06F
FSWUP1412R/L-04S	●	●	WPMT WPGT	0402 	12	150	27	7	11	4	14	0.4	—4	TS253	TKY08F
1816R/L-04S	●	●		0402 	16	180	36	9	15	1	18	0.4	—5	TS253	TKY08F
2220R/L-06S	●	●		0603 	20	220	45	11	19	2	22	0.8	—5	TS4	TKY15F
3025R/L-06S	●	●		0603 	25	250	56.3	15	23.4	0	30	0.8	—5	TS4	TKY15F

FSWUB/P_E

Carbide shank with coolant hole

WB $\circ\circ$, WP $\circ\circ$ inserts

Finish
R/L-F-FS
(L3,04,06)
Medium
MV
(L3,04,06)



Right hand holder shown.

Order Number	Stock		Insert Number		Dimensions (mm)						Min. Cutting Diameter D1 (mm)	Standard Corner Radius Re	Recommended I/d Ratio		
	R	L			D4	L1	L2	F1	H1	RR°				Clamp Screw	Wrench
FSWUB1008R/L-L3E	●	●	WBMT WBGT	L302 	8	140	13.8	5	7.2	14	10	0.2	−7	TS2	TKY06F
1008R-L3E-2/3	●			L302 	8	90	13.8	5	7.2	14	10	0.2	−7	TS2	TKY06F
1008R-L3E-1/2	●			L302 	8	70	13.8	5	7.2	14	10	0.2	−7	TS2	TKY06F
1210R/L-L3E	●	●		L302 	10	160	16.0	6	9	11	12	0.2	−7.5	TS2	TKY06F
1210R-L3E-2/3	●			L302 	10	105	16.0	6	9	11	12	0.2	−7.5	TS2	TKY06F
1210R-L3E-1/2	●			L302 	10	80	16.0	6	9	11	12	0.2	−7.5	TS2	TKY06F
FSWUP1412R/L-04E	●	●	WPMT WPGT	0402 	12	180	17.8	7	11	4	14	0.4	−8	TS253	TKY08F
1412R-04E-2/3	●			0402 	12	120	17.8	7	11	4	14	0.4	−8	TS253	TKY08F
1412R-04E-1/2	●			0402 	12	90	17.8	7	11	4	14	0.4	−8	TS253	TKY08F
1816R/L-04E	●	●		0402 	16	220	21.8	9	15	1	18	0.4	−8	TS253	TKY08F
1816R-04E-2/3	●			0402 	16	145	21.8	9	15	1	18	0.4	−8	TS253	TKY08F
1816R-04E-1/2	●			0402 	16	110	21.8	9	15	1	18	0.4	−8	TS253	TKY08F
2220R/L-06E	●	●		0603 	20	250	24.0	11	19	2	22	0.8	−8	TS4	TKY15F
2220R-06E-2/3	●			0603 	20	165	24.0	11	19	2	22	0.8	−8	TS4	TKY15F
2220R-06E-1/2	●			0603 	20	125	24.0	11	19	2	22	0.8	−8	TS4	TKY15F

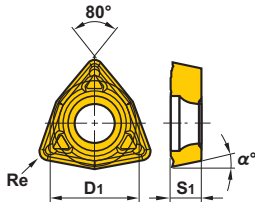
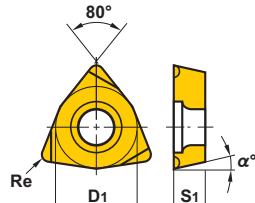
(Note 1) Insert photo, letters show chip breaker style, figures show insert dimensions.

(Note 2) Please refer to page 4 for recommended cutting conditions.

(Note 3) When using inserts with right and left hand chip breakers, please use left hand inserts for right hand holders and right hand inserts for left hand holders.

● : Inventory maintained. □ : Non stock, produced to order only.

Inserts

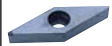
Geometry			Class	Order Number	Dimensions (mm)				Stock Grade							
									Coated			MIRACLE Coated		Cermet		Coated Cermet
					D1	S1	Re	α°	UE6020	US7020	US735	VP15TF	VP45N	NX2525	NX3035	AP25N
Molded Breaker Medium Cutting		M	WBMTL30202R-MV	4.76	2.38	0.2	5	●	●	●	●	●	●	●	□	
			L30202L-MV	4.76	2.38	0.2	5	●	●	●	●	●	●	●	□	
			L30204R-MV	4.76	2.38	0.4	5	●	●	●	●	●	●	●	□	
			L30204L-MV	4.76	2.38	0.4	5	●	●	●	●	●	●	●	□	
			WPMT040202-MV	6.35	2.38	0.2	11	●	●	●	●	●	●	●	□	
			040204-MV	6.35	2.38	0.4	11	●	●	●	●	●	●	●	□	
			060304-MV	9.525	3.18	0.4	11	●	●	●	●	●	●	●	□	
			060308-MV	9.525	3.18	0.8	11	●	●	●	●	●	●	●	□	
Ground Breaker Finish Cutting	 Left hand is shown.	G	WBGTL302V3L-F	4.76	2.38	0.03	5				●		●			
			L30201L-F	4.76	2.38	0.1	5				●		●			
			L30202R-F	4.76	2.38	0.2	5				●		●		□	●
			L30202L-F	4.76	2.38	0.2	5				●		●		□	●
			L30204R-F	4.76	2.38	0.4	5				●		●		□	●
			L30204L-F	4.76	2.38	0.4	5				●		●		□	●
			WPGT040202R-FS	6.35	2.38	0.2	11				●		●		□	●
			040202L-FS	6.35	2.38	0.2	11				●		●		□	●
			040204R-FS	6.35	2.38	0.4	11				●		●		□	●
			040204L-FS	6.35	2.38	0.4	11				●		●		□	●
			060304R-FS	9.525	3.18	0.4	11				●		●		□	●
			060304L-FS	9.525	3.18	0.4	11				●		●		□	●
			060308R-FS	9.525	3.18	0.8	11				●		●		□	●
			060308L-FS	9.525	3.18	0.8	11				●		●		□	●

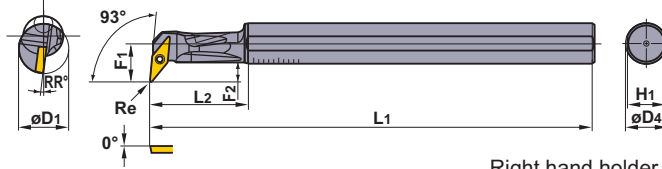
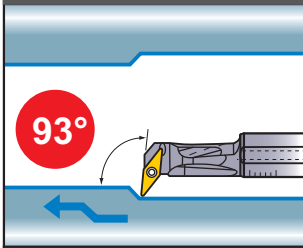
DIMPLE BAR

Holders

FSVUB/C

VC $\circ\circ$, VB $\circ\circ$ inserts

Finish	Medium
R/L-F	MV
	
(08,11,16)	(08,11,16)
Medium	CBN
Standard	
	
(11,16)	(16)

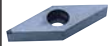


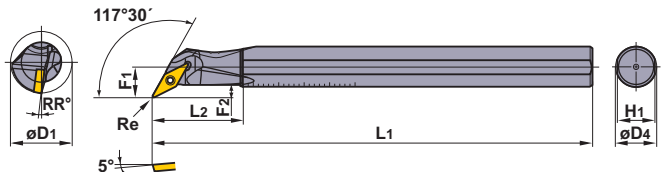
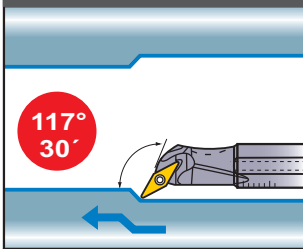
Right hand holder shown.

Order Number	Stock		Insert Number		Dimensions (mm)							Min. Cutting Diameter D1 (mm)	Standard Corner Radius Re	Recommended I/d Ratio				
	R	L			D4	L1	L2	F1	F2	H1	RR°							
FSVUC1612R/L-08S	●	●	VCMT	0802 	12	150	25	11	5.5	11	8	16	0.4	−4	—	—	TS202	TKY06F
FSVUB2016R/L-11S	●	●			1103 	16	180	32.5	15.5	8	15	8	20	0.4	−5	—	—	TS255
2520R/L-11S	●	●	VBGT VBMT NP-VBGW	1103 	20	200	40.5	17.5	8	19	7	25	0.4	−5	—	—	TS255	TKY08F
3425R/L-16S	●	●		1604 	25	220	50	20.5	8.5	23.4	13	34	0.8	−5	SPSVN32	BCP141	TS35D	TKY15F
4032R/L-16S	●	●		1604 	32	250	84.0	27.5	12	30.4	9	40	0.8	−5	SPSVN32	BCP141	TS35D	TKY15F

FSVPB/C

VC $\circ\circ$, VB $\circ\circ$ inserts

Finish	Medium
R/L-F	MV
	
(08,11,16)	(08,11,16)
Medium	CBN
Standard	
	
(11,16)	(16)



Right hand holder shown.

Order Number	Stock		Insert Number		Dimensions (mm)							Min. Cutting Diameter D1 (mm)	Standard Corner Radius Re	Recommended I/d Ratio				
	R	L			D4	L1	L2	F1	F2	H1	RR°							
FSVPC1610R/L-08S	●	●	VCMT VBGT VBMT NP-VBGW	0802	10	150	25	8	3	9	8	16	0.4	—3.5	—	—	TS202	TKY06F
FSVPB2012R/L-11S	●	●		1103	12	150	28	10	4.5	11	8	20	0.4	—4	—	—	TS255	TKY08F
2516R/L-11S	●	●		1103	16	180	35	12.5	5	15	5	25	0.4	—5	—	—	TS255	TKY08F
3020R/L-11S	●	●		1103	20	200	40	15	5	19	5	30	0.4	—5	—	—	TS255	TKY08F
3425R/L-16S	●	●		1604	25	220	50	17	5	23.4	13	34	0.8	—5	SPSVN32	BCP141	TS35D	TKY15F
4032R/L-16S	●	●		1604	32	250	55	22	6.5	30.4	9	40	0.8	—5	SPSVN32	BCP141	TS35D	TKY15F

(Note 1) Insert photo, letters show chip breaker style, figures show insert dimensions.

(Note 2) Please refer to page 4 for recommended cutting conditions.

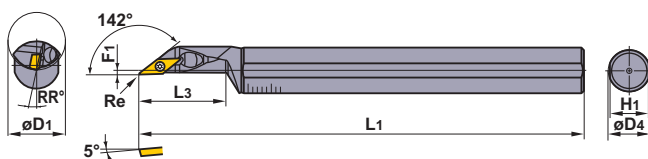
(Note 3) When using inserts with right and left hand chip breakers, please use left hand inserts for right hand holders and right hand inserts for left hand holders.

Holders

FSVJB/C

VC⁰⁰, VB⁰⁰ inserts

142°



Right hand holder shown.

Order Number	Stock		Insert Number	Dimensions (mm)						Min. Cutting Diameter D1 (mm)	Standard Corner Radius Re	Recommended l/d Ratio			
	R	L		D4	L1	L3	F1	H1	RR°				Clamp Screw	Wrench	
FSVJC1612R/L-08S	●	●	VCGT VCMT	0802 	12	150	26	2	11	5	16	0.4	—4	TS202	TKY06F
2016R/L-08S	●	●		0802 	16	180	36	2	15	5	20	0.4	—5	TS202	TKY06F
FSVJB2520R/L-11S	●	●	VBGT VBMT	1103 	20	200	37.5	2	19	5	25	0.4	—5	TS255	TKY08F
3025R/L-11S	●	●		1103 	25	250	45	3.5	23.4	5	30	0.4	—5	TS255	TKY08F

Note) When using inserts with right and left hand chip breakers, please use left hand inserts for right hand holders and right hand inserts for left hand holders.

Inserts

Geometry		Class	Order Number	Dimensions (mm)				Stock Grade									
				D1	S1	Re	α°	Coated		MIRACLE Coated	Cermet	Coated Cermet	Carbide	CBN			
								UE6020	US7020	US735	VP15TF	VP45N	NX2525	NX3035	AP25N	HT10	MB8025
Molded Breaker	Light Cutting	M	VCMT...-SV	080202-SV	4.76	2.38	0.2	7	●	●	●	●	●	●	●	●	●
			VBMT...-SV	080204-SV	4.76	2.38	0.4	7	●	●	●	●	●	●	●	●	●
			VBMT110304-SV	6.35	3.18	0.4	5	●	●	●	●	●	●	●	●	●	●
			110308-SV	6.35	3.18	0.8	5	●	●	●	●	●	●	●	●	●	●
			160404-SV	9.525	4.76	0.4	5	●	●	●	●	●	●	●	●	●	●
			160408-SV	9.525	4.76	0.8	5	●	●	●	●	●	●	●	●	●	●
	Medium Cutting	M	VCMT...-MV	080202-MV	4.76	2.38	0.2	7	●	●	●	●	●	●	●	●	●
			VBMT...-MV	080204-MV	4.76	2.38	0.4	7	●	●	●	●	●	●	●	●	●
			VBMT110304-MV	6.35	3.18	0.4	5	●	●	●	●	●	●	●	●	●	●
			110308-MV	6.35	3.18	0.8	5	●	●	●	●	●	●	●	●	●	●
			160404-MV	9.525	4.76	0.4	5	●	●	●	●	●	●	●	●	●	●
			160408-MV	9.525	4.76	0.8	5	●	●	●	●	●	●	●	●	●	●
Ground Breaker	Finish Cutting	G	VCGT...R/L-F	080202R-F	4.76	2.38	0.2	7			●		●		●	●	
			VBGT...R/L-F	080202L-F	4.76	2.38	0.2	7			●		●		●	●	
				080204R-F	4.76	2.38	0.4	7			●		●		●	●	
				080204L-F	4.76	2.38	0.4	7			●		●		●	●	
			VBGT110302R-F	6.35	3.18	0.2	5			●		●		●	●		
			110302L-F	6.35	3.18	0.2	5			●		●		●	●		
			110304R-F	6.35	3.18	0.4	5			●		●		●	●		
			110304L-F	6.35	3.18	0.4	5			●		●		●	●		
			160402R-F	9.525	4.76	0.2	5			●		●		●	●		
			160402L-F	9.525	4.76	0.2	5			●		●		●	●		
CBN (No Breaker)	Finish Cutting	G	NP-VBGW...G	NP-VBGW160404G	9.525	4.76	0.4	5									●
				160408G	9.525	4.76	0.8	5									●

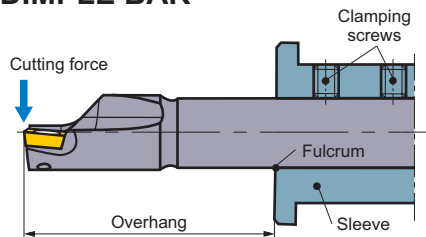
Left hand is shown.

DIMPLE BAR

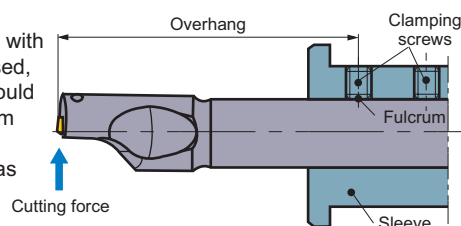
Operational Guidance

● Installation of DIMPLE BAR

- (1) If clamping of the tool is not sufficient, chattering and vibration will occur. Use at least 2 clamp screws to ensure sufficient clamping.



- (2) When machining with the holder reversed, the overhang should be measured from the tip to the first clamping screw as shown.



● CCG/MT, CPG/MT, CPMX, TPG/MX, TPG/MV inserts

	Order Number	Clamp Screw	Remark
By changing the clamp screw it is also possible to use the inserts listed opposite.	CCG/MT0602 (Ø6.35)	Can be used as it is.	Please shorten the screw if it is too long.
	CPG/MT0802 (Ø7.94)	Change to TS3.	
	CPG/MT0903 (Ø9.525)	Change to TS4.	
	CPMX0802 (Ø7.94)	Can be used as it is.	
	CPMX0903 (Ø9.525)	Can be used as it is.	
	TPG/MX0802 (Ø4.76)	Change to CS200T.	
	TPG/MX0902 (Ø5.56)	Change to CS250T.	
	TPG/MX1103 (Ø9.525)	Change to CS300890T.	
	TPG/MV0902 (Ø5.56)	Change to TS25.	
	TPG/MV1103 (Ø9.525)	Change to TS3.	

Machining of the FSVJB/C type

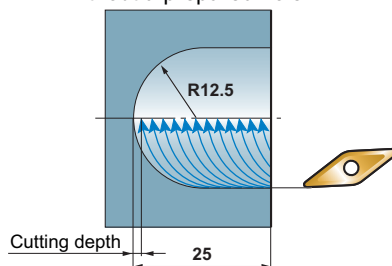
● Curved faces

When machining a prepared hole, the amount of reads is greatly reduced.

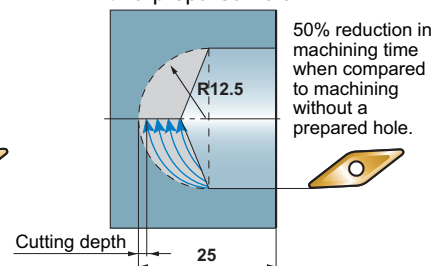
<Cutting conditions>

Workpiece : JIS S55C
 Tool : FSVJB2520R-11S
 Insert : VBMT110304-MV
 Cutting speed: 120m/min
 Feed : 0.05mm/rev
 Depth of cut : 0.3mm
 Coolant : W.S.O.

Machining a workpiece without a prepared hole.



Machining a workpiece with a prepared hole.



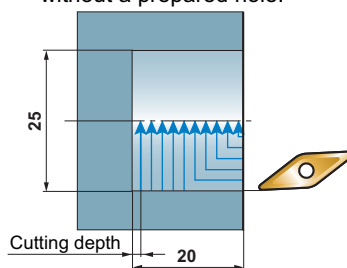
● Deep faces

When machining a prepared hole, the amount of reads is greatly reduced.

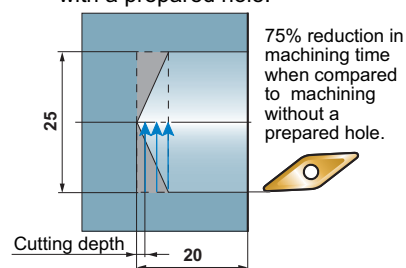
<Cutting conditions>

Workpiece : JIS S55C
 Tool : FSVJB2520R-11S
 Insert : VBMT110304-MV
 Cutting speed: 120m/min
 Feed : 0.05mm/rev
 Depth of cut : 0.3mm
 Coolant : W.S.O.

Machining a workpiece without a prepared hole.

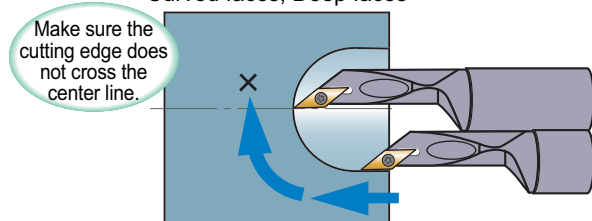


Machining a workpiece with a prepared hole.



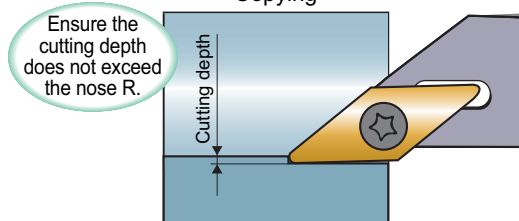
■ Precautions when using the FSVJB/C type

<Curved faces, Deep faces>



Crossing the center line can chip the insert.

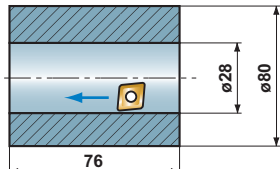
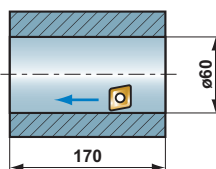
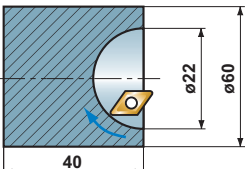
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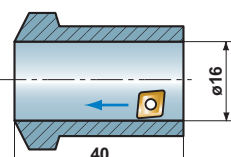
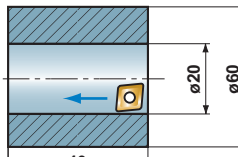
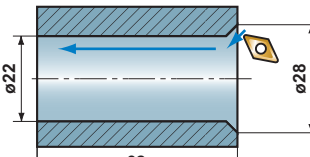
Cutting depths larger than the nose R creates burrs.

Application Examples

● Chatter resistance

Tool		FSCLP1816R-09S	FSCLP2220R-09E	FSVJC2016R-08S		
Insert (Grade)		CPMH090308-MV (NX2525)	CPMH090304L-F (VP15TF)	VCMT090304-MV (NX2525)		
Overhang		80mm (l/d=5)	175mm (l/d=8.75)	64mm (l/d=4)		
Machine		NC lathe	NC lathe	NC lathe		
Workpiece		JIS S45C (200HB) 	JIS SKD11 (200HB) 	JIS SCM440 (220HB) 		
		Cutting Conditions	Cutting Speed (m/min)	80	60	80
			Feed (mm/rev)	0.2	0.18	0.05
			Depth of Cut (mm)	0.5	0.5	0.3
Coolant		W.S.O.	W.S.O.	W.S.O.		
Result		The surface finish is still of a high standard with 1.7 times conventional overhang length.	Possible to machine under demanding cutting conditions with a long overhang.	Excellent chip control and good surface finish compared to conventional boring bars.		

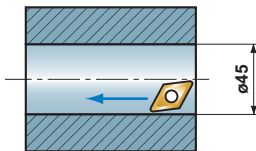
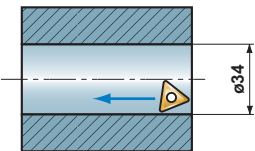
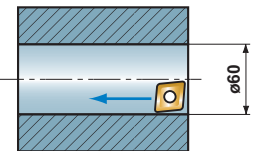
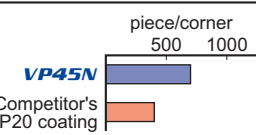
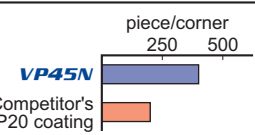
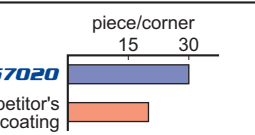
● Chip discharge ability

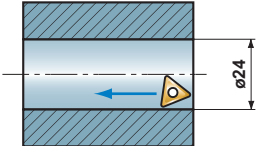
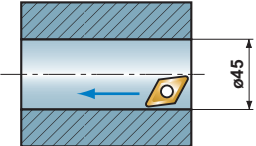
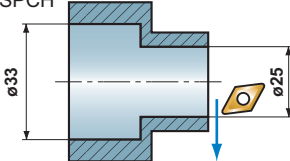
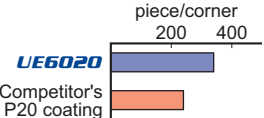
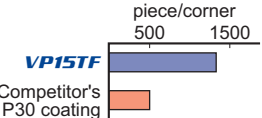
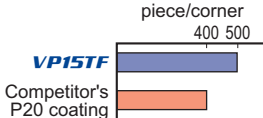
Tool		FSCLP1412R-08S	FSCLP1816R-09S	FSCLP1816L-09S		
Insert (Grade)		CPMH080204-MV (US7020)	CPMH090304-MV (VP45N)	CPMH090304-SV (UE6020)		
Overhang		55mm (l/d=4.58)	60mm (l/d=3.75)	70mm (l/d=4.38)		
Machine		NC lathe	NC lathe	NC lathe		
Workpiece		JIS SUS304 (180HB) 	JIS S10C (100HB) 	JIS SK5 		
		Cutting Conditions	Cutting Speed (m/min)	60	140	170
			Feed (mm/rev)	0.15	0.15	0.1
			Depth of Cut (mm)	1	0.8	0.5
Coolant		W.S.O.	W.S.O.	W.S.O.		
Result		Surface finish is improved. The MV breaker prevents the chips from collecting at the nose of the insert.	Better surface finish due to lack of chattering and improved chip control.	piece/corner 1000 2000 MV breaker UE6020 Competitor's general-purpose breaker P20 coated Prevents chips wrapping round the holder. Tool life increased threefold compared to competitor.		

DIMPLE BAR

Application Examples

● Wear resistance / Chipping resistance

Tool		FSDUC2016R-07S	FSTUP2220R-11E	FSCLP2220R-09S
Insert (Grade)		DCMT070204-SV (VP45N)	TPMH110304-SV (VP45N)	CPMH090304-MV (US7020)
Overhang		72mm (l/d=4.5)	140mm (l/d=7)	80mm (l/d=4)
Machine		NC lathe	NC lathe	NC lathe
Workpiece		JIS S45C	JIS SPHC	JIS SUS304
				
Cutting Conditions	Cutting Speed (m/min)	185	230	120
	Feed (mm/rev)	0.1	0.25	0.1
	Depth of Cut (mm)	0.35	0.1	0.5
Coolant		W.S.O.	W.S.O.	W.S.O.
Result				
		1.8 times longer tool life	Double tool life and improved chip control.	1.5 times longer tool life.

Tool		FSTUP1816R-11S	FSDUC3220R-11S	FSDUC3220R-11S
Insert (Grade)		TPMH110308-SV (UE6020)	DCMT11T304-MV (VP15TF)	DCMT11T308-MV (VP15TF)
Overhang		64mm (l/d=4)	60mm (l/d=3)	60mm (l/d=3)
Machine		NC lathe	NC lathe	NC lathe
Workpiece		JIS SCM420 	JIS SCM440 	JIS SPCH 
Cutting Conditions	Cutting Speed (m/min)	100	170	180
	Feed (mm/rev)	0.25	0.14	0.15
	Depth of Cut (mm)	0.6	0.25	1.0
Coolant		W.S.O.	W.S.O.	W.S.O.
Result		 1.4 times longer tool life.	 No chipping with VP15TF and much longer tool life.	 A combination of a sharp chip breaker and a chipping resistance grade lengthens tool life.

For Your Safety

●Don't handle inserts and chips without gloves. ●Please machine within the recommended application range and exchange expired tools with new ones in advance of breakage. ●Please use safety covers and wear safety glasses. ●When using compounded cutting oils, please take fire precautions. ●When attaching inserts or spare parts, please use only the correct wrench or spanner.

MITSUBISHI MATERIALS CORPORATION



The Scope of the Registration:
Design, Development, and
Production of Cemented
Carbide Tools and Carbide
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The Scope of the Registration:
Design, Development, and
Production of Cutting Tools,
Chatter-resistant Tools, Tools
Drilling Tools, Cemented
Carbide Blanks and Coated
Products



The Scope of the Registration:
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Drilling Tools, Cemented
Carbide Blanks and Coated
Products

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