

PDV coated grade for milling

MIRACLE **VP15TF**

Integrating the carbide technology and coating technology!

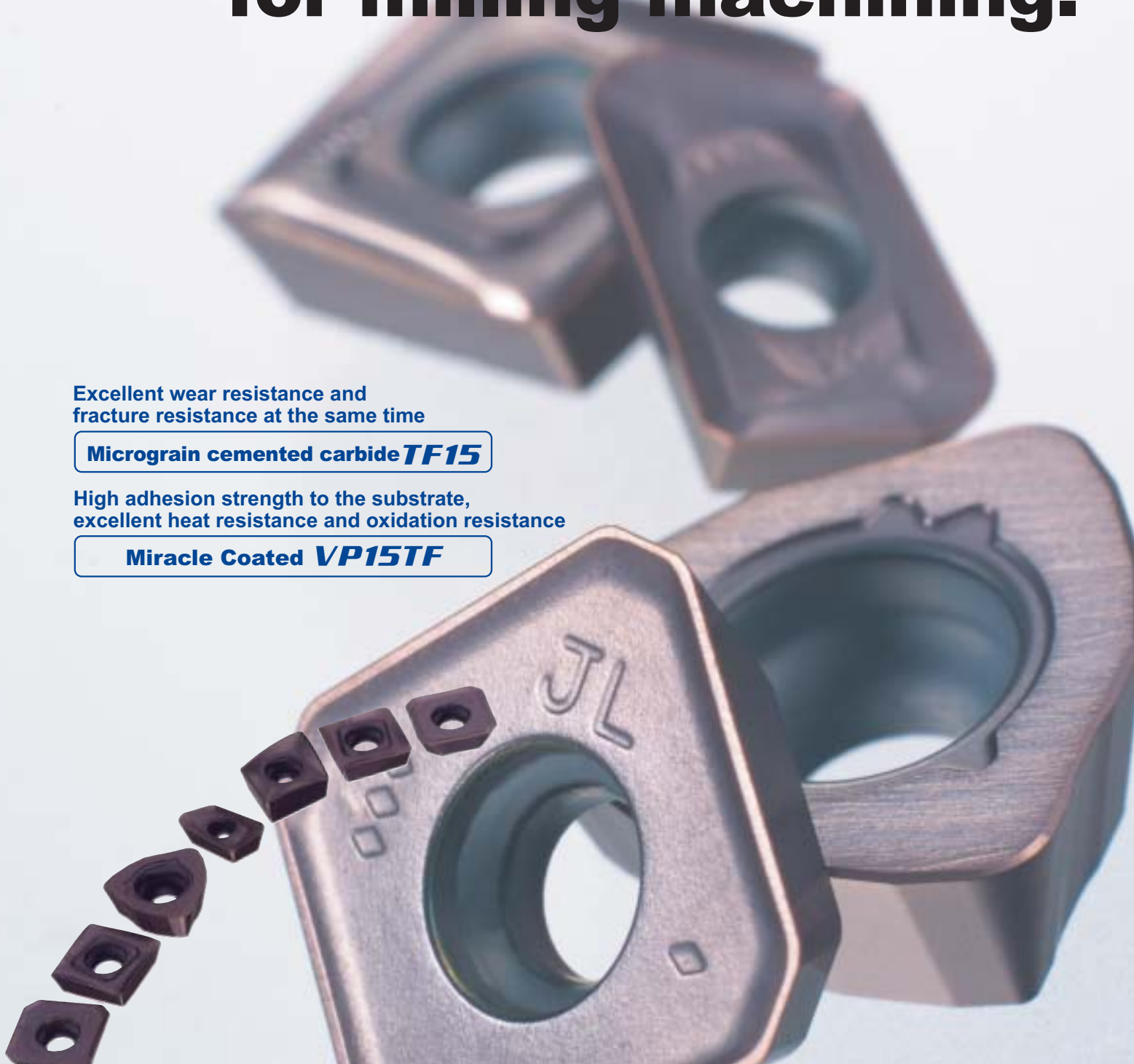
# "Miracle" coated grade for milling machining.

Excellent wear resistance and  
fracture resistance at the same time

Micrograin cemented carbide **TF15**

High adhesion strength to the substrate,  
excellent heat resistance and oxidation resistance

Miracle Coated **VP15TF**

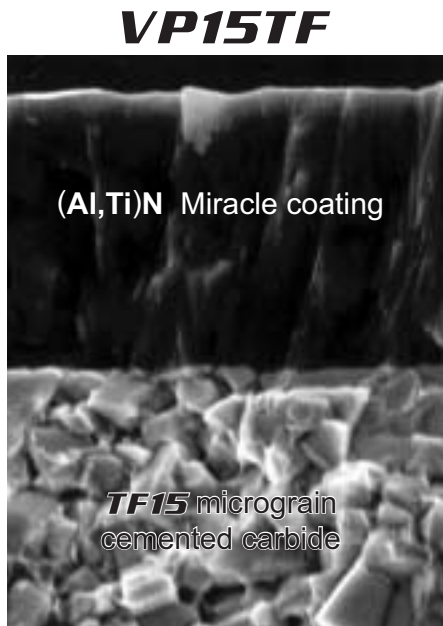


PDV coated grade for milling

# MIRACLE *VP15TF*

## Features

### ● Integrating the carbide technology and coating technology!!

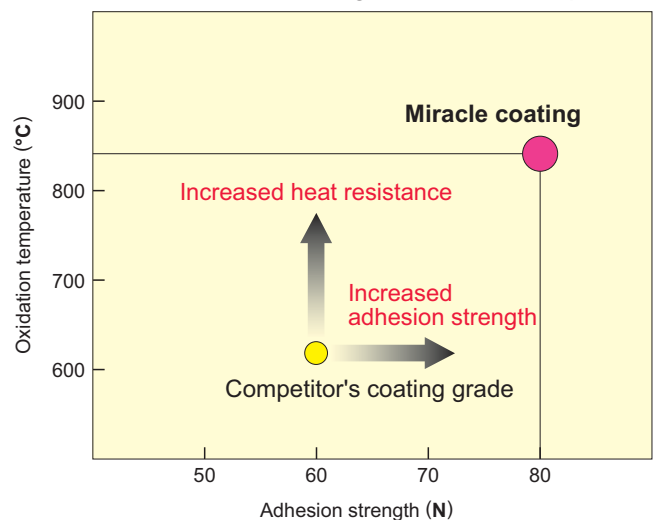


#### TF15 micrograin cemented carbide

- Due to the cemented carbide with high wear resistance and fracture resistance, the VP15TF realized stable machining operation.

#### Miracle coating

- High adhesion strength to the substrate improves stable tool life.
- Due to the excellent heat resistance and oxidation resistance, the VP15TF prevents a failure of tool life even when machining hardened workpiece.



## Recommended cutting conditions

### ● MIRACLE *VP15TF* allows the machining of a variety of materials.

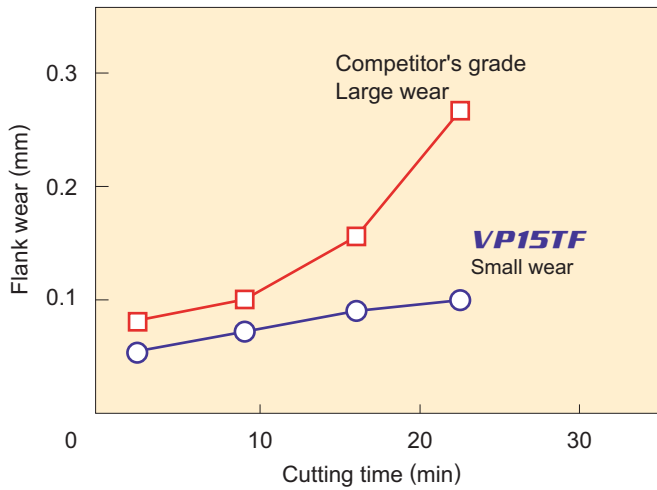
	Workpiece	Hardness	Cutting speed (m/min)
<b>P</b>	Mild steel (JIS SS400, S10C etc.)	≤180HB	250 (200 - 300)
	Carbon steel · Alloy steel (JIS S45C, SCM440 etc.)	180 - 280HB	220 (170 - 270)
		280 - 350HB	140 (100 - 180)
<b>M</b>	Stainless steel (JIS SUS304 etc.)	≤270HB	220 (170 - 270)
<b>K</b>	Cast iron (JIS FC250, FCD400etc.)	Tensile Strength ≤450N/mm <sup>2</sup>	180 (130 - 250)
<b>H</b>	Heat treated steel	≥40HRC	80(60 - 100)
<b>S</b>	Nickel High Alloy (Inconel, Waspaloy etc.)	-	40 (20 - 50)

Recommended cutting conditions above are for face milling and are intended as a general guide. Adjustments in the above figures should be considered to your tools when machining.

## Cutting performance

Face milling of alloy steel

The **VP15TF** excels in wear resistance and long tool life.



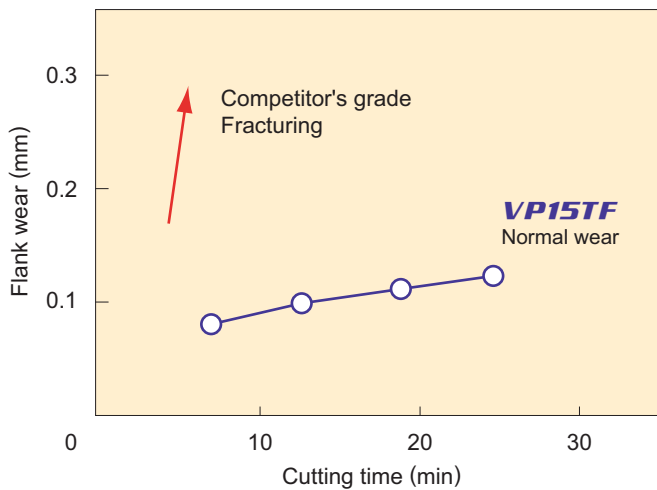
<Cutting conditions>

Workpiece : JIS SCM440 (220HB) Feed per tooth : 0.2mm/tooth  
 Tool : ASX445R12508E Depth of cut : 2mm  
 (single insert) Dry cutting  
 Insert : SEMT13T3AGSN-JM  
 Cutting speed : 200m/min



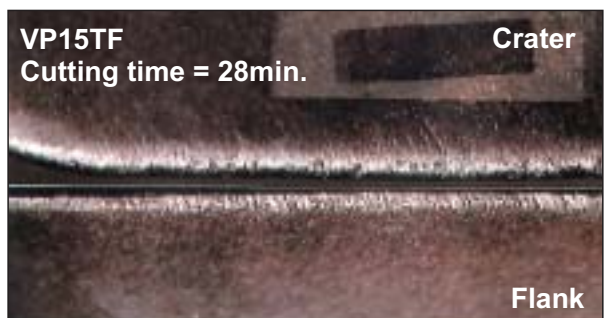
Face milling of hardened steel

The **VP15TF** excels in fracture resistance and long tool life.


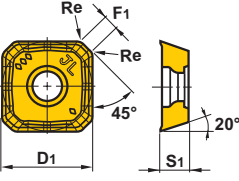
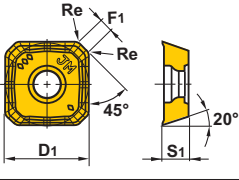
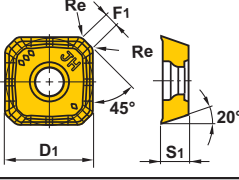

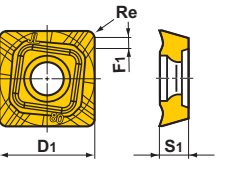
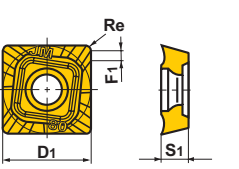
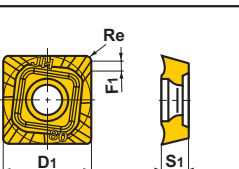

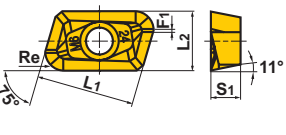

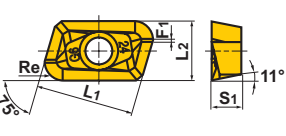

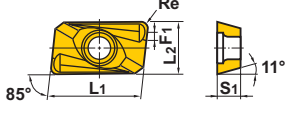



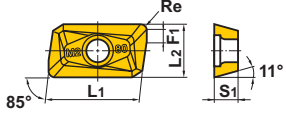

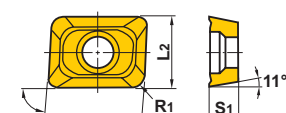

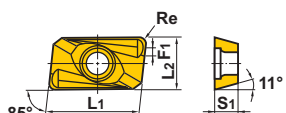

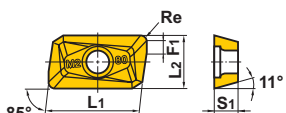

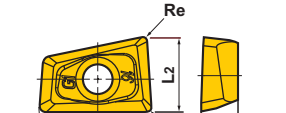

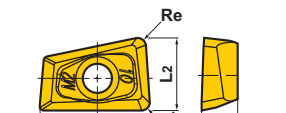



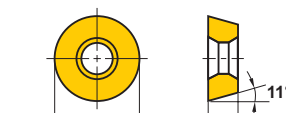


<Cutting conditions>

Workpiece : JIS SKD61(43HRC) Feed per tooth : 0.12mm/tooth  
 Tool : ASX445R12508E Depth of cut : 2mm  
 (single insert) Dry cutting  
 Insert : SEMT13T3AGSN-JM  
 Cutting speed : 100m/min


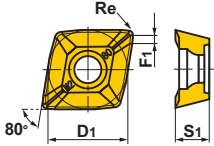

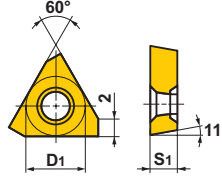

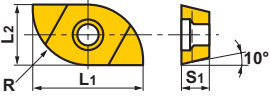

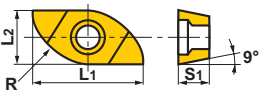

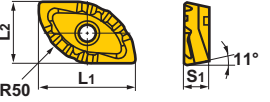

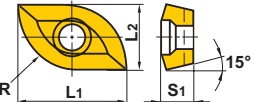

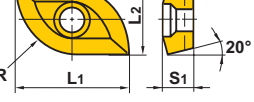



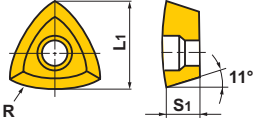

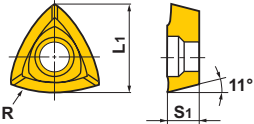

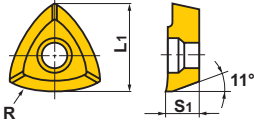

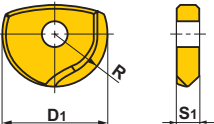

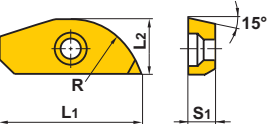

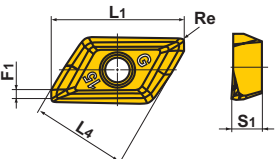
# MIRACLE VP15TF

Cutter type Insert shape	Order number	Class	Stock	Geometry	Dimensions (mm)					
					L1	L2	D1	S1	F1	Re
	SEET13T3AGEN-JL	E	●		-	-	13.4	3.97	1.9	1.5
	SEMT13T3AGSN-JM	M	●		-	-	13.4	3.97	1.9	1.5
	SEMT13T3AGSN-JH	M	●		-	-	13.4	3.97	1.9	1.5
	SOET12T308PEER-JL	E	●		-	-	12.7	3.97	1.4	0.8
	SOMT12T308PEER-JM	M	●		-	-	12.7	3.97	1.4	0.8
	SOMT12T308PEER-JH	M	●		-	-	12.7	3.97	1.4	0.8
	XPMT13T3PDER-M1	M	●		13	7.9	-	3.97	1.6	0.4
	13T3PDER-M2	M	●		13	7.9	-	3.97	1.2	0.8
	13T3PDER-M6	M	●		13	7.9	-	3.97	0.4	2.4
	13T3PDER-M75	M	●		13	7.9	-	3.97	0.4	3.0
	13T3PDER-M8	M	●		13	7.9	-	3.97	0.4	3.2
	XPGT13T3PDER-G1	G	●		13	7.9	-	3.97	1.6	0.4
	13T3PDER-G2	G	●		13	7.9	-	3.97	1.2	0.8
	13T3PDER-G6	G	●		13	7.9	-	3.97	0.4	2.4
	13T3PDER-G75	G	●		13	7.9	-	3.97	0.4	3.0
	13T3PDER-G8	G	●		13	7.9	-	3.97	0.4	3.2
	APMT1135PDER-H1	M	●		11	6.35	-	3.5	1.5	0.4
	1135PDER-H2	M	●		11	6.35	-	3.5	1.2	0.8

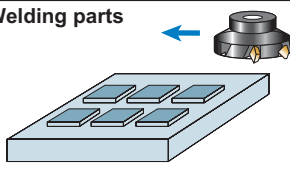
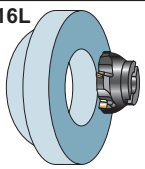
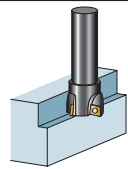
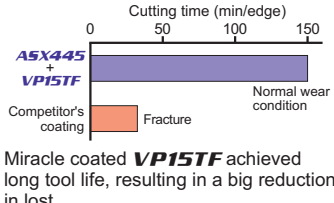
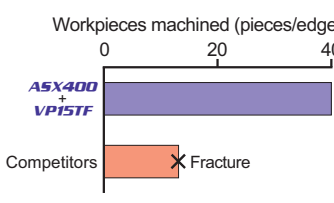
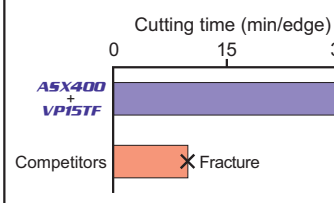
Cutter type Insert shape	Order number	Class	Stock	Geometry	Dimensions (mm)					
					L1	L2	D1	S1	F1	Re
<b>BAP300</b> SRM2 	<b>APMT1135PDER-M2</b>	M	●		11	6.35	–	3.5	1.2	0.8
<b>BAP300</b> Under cutting type 	<b>ZRM0603R-M3</b>	M	●		8.5	6.35	–	3.18	–	1.2
	<b>0603R-M4</b>	M	●		8.5	6.35	–	3.18	–	1.6
	<b>0603R-M5</b>	M	●		8.5	6.35	–	3.18	–	2.0
<b>BAP400</b> SRM2 	<b>APMT1604PDER-H2</b>	M	●		16.5	9.525	–	4.76	1.4	0.8
<b>BAP400</b> SRM2 	<b>APMT1604PDER-M2</b>	M	●		16.5	9.525	–	4.76	1.4	0.8
<b>AQX</b> 	<b>QOGT0830R-G1</b>	G	●		8.4	5.5	–	3	–	0.4
	<b>1035R-G1</b>	G	●		10.6	7	–	3.5	–	0.4
	<b>1342R-G1</b>	G	●		13.1	8.7	–	4.2	–	0.4
	<b>1651R-G1</b>	G	●		16.5	11	–	5.1	–	0.4
	<b>2062R-G1</b>	G	●		20.4	13.6	–	6.2	–	0.4
<b>AQX</b> 	<b>QOMT0830R-M2</b>	M	●		8.4	5.5	–	3	–	0.8
	<b>1035R-M2</b>	M	●		10.6	7	–	3.5	–	0.8
	<b>1342R-M2</b>	M	●		13.1	8.7	–	4.2	–	0.8
	<b>1651R-M2</b>	M	●		16.5	11	–	5.1	–	0.8
	<b>2062R-M2</b>	M	●		20.4	13.6	–	6.2	–	0.8
<b>BRP</b> 	<b>RPMT08T2M0E-JS</b>	M	●		–	–	8	2.78	–	–
	<b>10T3M0E-JS</b>	M	●		–	–	10	3.97	–	–
	<b>1204M0E-JS</b>	M	●		–	–	12	4.76	–	–
	<b>1606M0E-JS</b>	M	●		–	–	16	6.35	–	–
<b>BRP</b> 	<b>RPMW08T2M0T</b>	M	●		–	–	8	2.78	–	–
	<b>10T3M0T</b>	M	●		–	–	10	3.97	–	–
	<b>1204M0T</b>	M	●		–	–	12	4.76	–	–
	<b>1606M0T</b>	M	●		–	–	16	6.35	–	–
<b>AJX</b> 	<b>JDMW120420ZDSR-FT</b>	M	●		–	–	12	4.76	2.5	2.0
	<b>140520ZDSR-FT</b>	M	●		–	–	14	5.56	2.8	2.0

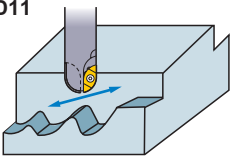
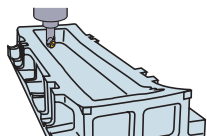

# MIRACLE **VP15TF**

Cutter type Insert shape	Order number	Class	Stock	Geometry	Dimensions (mm)						
					L1	L2	D1	S1	F1	Re	R
	CPMT1205ZPEN-M2	M	●		-	-	12.7	5.56	1.4	0.8	-
	1205ZPEN-M3	M	●		-	-	12.7	5.56	1.4	1.2	-
	1906ZPEN-M2	M	●		-	-	19.05	6.35	1.4	0.8	-
	1906ZPEN-M3	M	●		-	-	19.05	6.35	1.4	1.2	-
	TPEW1303ZPER2	E	●		-	-	7.94	3.18	-	-	-
	SRG20C	G	●		19	10.2	-	4.6	-	-	10
	25C	G	●		24	12.8	-	5.5	-	-	12.5
	30C	G	●		28	15.3	-	7	-	-	15
	SRG20E	G	●		15.5	8.5	-	4.6	-	-	10
	25E	G	●		20.5	10.2	-	5.5	-	-	12.5
	30E	G	●		25.2	12.2	-	7	-	-	15
	SRG50C	G	●		40	26	-	8.5	-	-	-
	SRG50E	G	●		35.8	20	-	8.5	-	-	-
	UDM20E	M	●		18.3	8.2	-	3.97	-	-	10
	25E	M	●		23.4	10.6	-	4.66	-	-	12.5
	30E	M	●		28.4	13	-	5.95	-	-	15
	UEM20C	M	●		16	10.2	-	3.97	-	-	10
	25C	M	●		21	12.8	-	4.66	-	-	12.5
	30C	M	●		26	15.3	-	5.95	-	-	15

Cutter type Insert shape	Order number	Tolerance	Stock	Geometry	Dimensions (mm)								
					L1	L2	L4	D1	S1	R	F1	Re	
	TRM4	UPM40	M	●		13.2	-	-	-	4.8	20	-	-
		50	M	●		16.5	-	-	-	6	25	-	-
	TRM4	UPM50P0	M	●		16.5	-	-	-	5.5	25	-	-
	TRM4	UPM40P1	M	●		13.2	-	-	-	4.4	20	-	-
		50P1	M	●		16.5	-	-	-	5.5	25	-	-
	RM	RMT10		●		-	-	-	10	2.5	5	-	-
		12		●		-	-	-	12	2.8	6	-	-
		16		●		-	-	-	16	3.2	8	-	-
		20		●		-	-	-	20	4	10	-	-
		25		●		-	-	-	25	5	12.5	-	-
		30		●		-	-	-	30	6	15	-	-
		32		●		-	-	-	32	6	16	-	-
	FBE2	UDC20F	C	●		19.4	7.4	-	-	3.5	10	-	-
		25F	C	●		24	9.3	-	-	4	12.5	-	-
		30F	C	●		28.9	11.2	-	-	5	15	-	-
	BXD4000	XDGT1550PDER-G04	G	●		22	-	16	-	5	-	1.5	0.4
		1550PDER-G08	G	●		22	-	16	-	5	-	1.1	0.8
		1550PDER-G12	G	●		22	-	16	-	5	-	0.7	1.2
		1550PDER-G16	G	●		22	-	16	-	5	-	0.4	1.6
		1550PDER-G20	G	●		21.7	-	16	-	5	-	0.2	2.0
		1550PDER-G30	G	●		20	-	16	-	5	-	0.6	3.0
		1550PDER-G32	G	●		20	-	16	-	5	-	0.4	3.2
		1550PDER-G40	G	●		19	-	16	-	5	-	0.5	4.0
		1550PDER-G50	G	●		18	-	16	-	5	-	0.4	5.0

Application examples

Tool	ASX445R16007F	ASX400R10005D	ASX400R635S32
Insert (Grade)	SEMT13T3AGSN-JM (VP15TF)	SOMT12T308PEER-JM (VP15TF)	SOMT12T308PEER-JM (VP15TF)
Workpiece	Welding parts 	JIS SUS316L 	JIS SKD61 (52HRC) 
Component	Machine part	Valve parts	Mold material
Cutting conditions	Cutting speed (m/min)	200	100
	Feed per tooth (mm/tooth)	0.27	0.15
	Depth of Cut (mm)	3	4
	Width of Cut (mm)	-	40 - 100
	Coolant	Dry cutting	Dry cutting
Result	 Miracle coated <b>VP15TF</b> achieved long tool life, resulting in a big reduction in lost.		

Tool	SRM2250SNF(φ25)	SRM2500WNLM	AJX12R05004B
Insert (Grade)	SRG25C/E(VP15TF)	SRG50C/E (VP15TF)	JDMW120420ZDSR-FT (VP15TF)
Workpiece	JIS SKD11 	JIS FCD400 (Zigzag machining) 	JIS NAK80 (HRC40) 
Component	Parts mold	Press mold (drawing die)	Demonstration work (Contouring)
Cutting conditions	Cutting speed (m/min)	235	120
	Feed per tooth (mm/tooth)	0.8	0.25 - 0.55
	Depth of Cut (mm)	6	5 - 20
	Width of Cut (mm)	3 - 5	8
	Coolant	Air blow	Dry cutting
Result	30% longer tool life than competitor's.	<ul style="list-style-type: none"> <li>1.5 times longer tool life.</li> <li>In addition to zigzag machining, SRM2-φ50 displayed stable cutting performance in various cutting modes including heeling down.</li> </ul>	The <b>VP15TF</b> displayed stable cutting performance with no fracture or chipping.

For Your Safety

●Don't touch breakers and chips without gloves. ●Please machine within recommended application range, and exchange expired tools with new parts in advance. ●Please use safety cover and wear safety glasses. ●When using compounded cutting oils, please take fire prevention. ●When attaching chips or spare parts, please use the attached wrench or spanner. ●When using tools in revolution machining, please make a trial run to check run-out, vibration, abnormal sounds etc.

**MITSUBISHI MATERIALS CORPORATION**



**Overseas Operations Center :  
Cutting Tools**

KFC bldg., 7F, 1-6-1, Yokoami, Sumida-ku, Tokyo 130-0015, Japan  
TEL 81-3-5819-8771 FAX 81-3-5819-8774

**MMC HARTMETALL GmbH**

Comeniusstr.2, 40670, Meerbusch GERMANY  
TEL 49-2159-9189-0 FAX 49-2159-50462

**MITSUBISHI MATERIALS U.S.A. CORPORATION  
Headquarters**

17401, Eastman Street, Irvine, California, 92614, USA  
TEL 1-949-862-5100 FAX 1-949-862-5180

**MMC METAL SINGAPORE PTE LTD.**

10, Arumugam Road, #04-00 Lion Industrial Bldg., 409957, SINGAPORE  
TEL 65-6743-9370 FAX 65-6749-1469

**Mitsubishi Carbides Home page : <http://www.mitsubishicarbide.com>**  
(Tools specifications subject to change without notice.)