

CVD coated grade for milling of cast iron

F5020/F5010

Improved wear resistance and fracture resistance due to Microstructure control technology.

Covering a wide range of milling application of cast iron

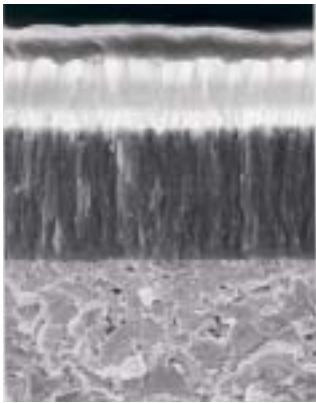


CVD coated grade for milling of cast iron

F5020/F5010

Features

F5020 is a grade for general purpose milling of cast iron with highly improves wear resistance and fracture resistance due to Mitsubishi's proprietary "Technology of controlling micro-structure".



Structure of **F5020**

Improved wear resistance

Combining of "Super fine grain" carbonize titanium layer and flat-alumina (Al₂O₃) layer, the **F5020** coating has improved higher wear resistance than conventional products.

Improved fracture resistance

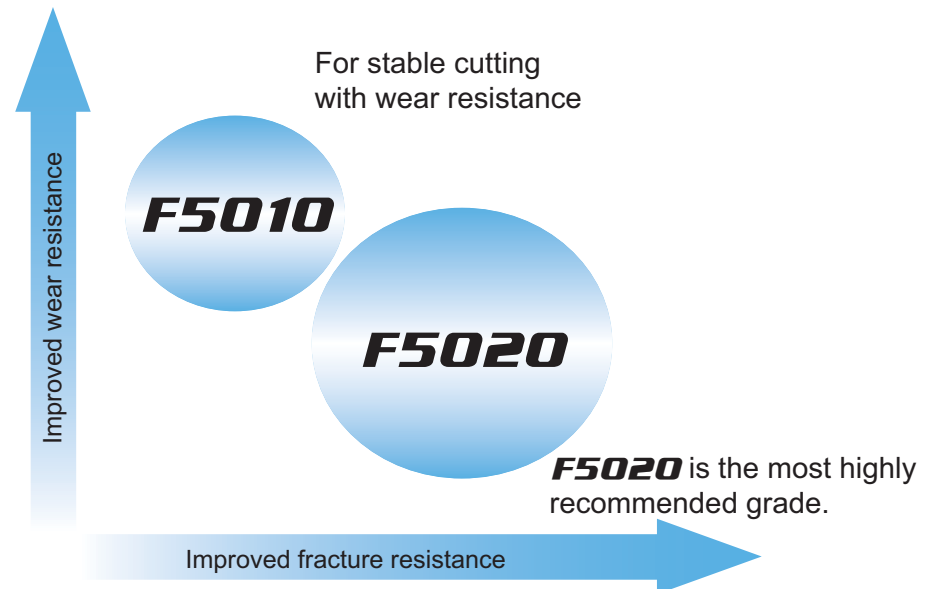
Due to the newly developed cemented carbide substrate for milling of cast iron with high toughness, F5020 improves thermal crack resistance, achieves higher reliability and resists abnormal tool breakage such as cutting edge chipping and fracture.

Preventing "Built-Up" edge

The surface of the coating layers is lamination of special titanium compound that is vapor deposited by Even Coating technology. This prevents the occurrence of welding, which is the cause of chipping at the top cutting edge.

Application range


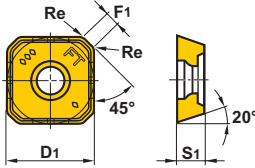

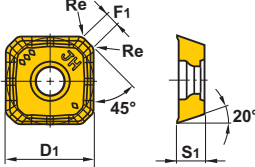


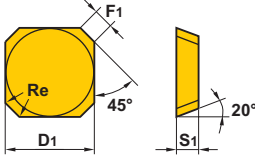

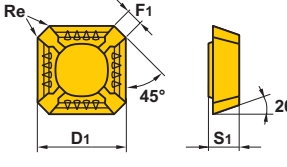

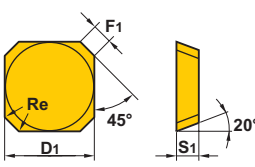

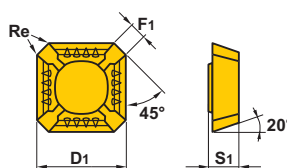

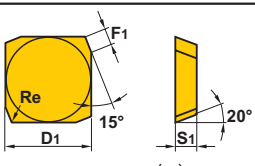

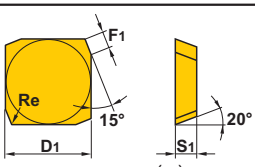
F5020/F5010 enable to cover a wide range of milling application of cast iron.



Recommended cutting conditions

Workpiece		Tensile strength	Cutting speed (m/min)	Feed per tooth (mm/tooth)
K	General cast iron	≤ 350N/mm ²	200 (150 - 250)	0.2 (0.1 - 0.3)
	Ductile cast iron	≤ FCD450	200 (150 - 250)	0.2 (0.1 - 0.3)
		≥ FCD500	500 - 800N/mm ²	150 (100 - 200)

F5020/F5010

Cutter type	Order number	Tolerance class	Coated				Geometry	Dimension (mm)			
			F5010	F5020				D1	S1	F1	Re
	SEMT13T3AGSN-FT	M	●					13.4	3.97	1.9	1.5
	SEMT13T3AGSN-JH	M	●					13.4	3.97	1.9	1.5
	SEMT13T3AGSN-JM	M	●	●				13.4	3.97	1.9	1.5
	SEEN1203AFSN1	E	●	●				12.70	3.18	1.4	1.0
	SEER1203AFEN-JS	E	●	●				12.70	3.18	1.4	1.0
	SEEN1504AFSN1	E	●	●				15.875	4.76	1.4	1.0
	SEER1504AFEN-JS	E	●	●				15.875	4.76	1.4	1.0
	SEEN1203EFSR1	E	●	●			 Right hand insert (R) shown.	12.70	3.18	1.4	1.0
	SEEN1504EFSR1	E	●	●			 Right hand insert (R) shown.	15.875	4.76	1.4	1.0

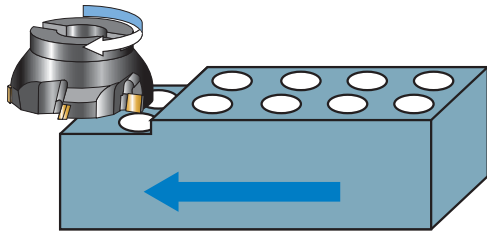
● : Inventory maintained. No mark : Not manufactured.

▲ : Inventory maintained; to be replaced by new products.

Cutter type	Order number	Tolerance class	Coated				Geometry	Dimension (mm)			
			F5010	F5020				D1	S1	F1	Re
FBP415 QBP415 	SPEN1203EEER1	E	●	●				12.70	3.175	1.4	-
	SPNN1203EEER1	N	●	●				12.70	3.175	1.4	-
FBP415 	SPER1203EEER-JS	E	●	●				12.70	3.175	1.4	-
BN425 	SNMF43B2G	M	●	●				12.70	4.8	2.0	-
ASX400 	SOMT12T308PEER-JH	M	●	●				12.70	3.97	1.4	0.8
ASX400 	SOMT12T308PEER-JM	M	●	●				12.70	3.97	1.4	0.8
NSE300 SE300 	TEEN1603PESR1	E	●	●				9.525	3.175	1.4	0.4
NSE400 SE400 	TEEN2204PESR1	E	●	●				12.70	4.76	1.4	1.0
Corner angle 15° 	SPKN1203EDR	K	▲					12.70	3.18	1.4	-

Cutting performance

● Face milling General cast iron JIS FC300 with holes

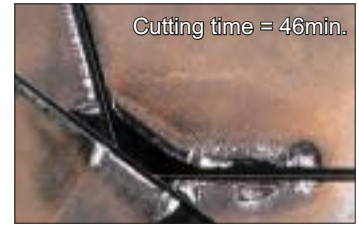


<Cutting conditions>
 Workpiece : JIS FC300
 Length 500mm x Width 150mm
 Insert : SPEN1203EEER1
 Cutting speed : 200m/min
 Feed per tooth : 0.2mm/tooth (Single insert)
 Depth of cut : 2.0mm Wet cutting

F5020



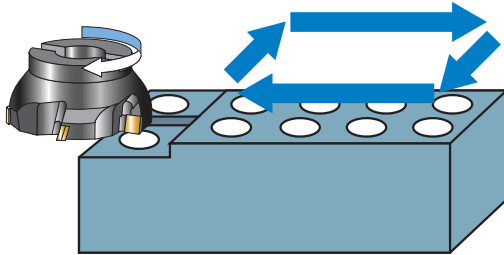
Conventional product



Competitor A's coating



● Shoulder milling General cast iron JIS FC300 with holes



<Cutting conditions>
 Workpiece : JIS FC300
 Length 400mm x Width 100mm
 Insert : SOMT12T308PEER-JM
 Cutting speed : 200m/min
 Feed per tooth : 0.15mm/tooth (Single insert)
 Depth of cut : 3.0mm Wet cutting

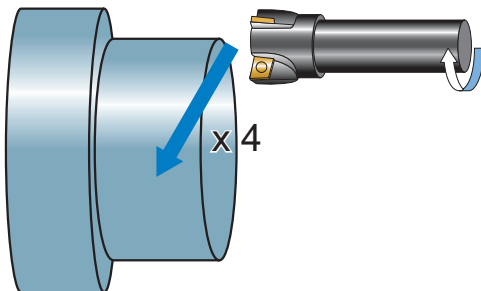
F5020



Competitor A's coating



● Side milling Ductile cast iron JIS FCD700

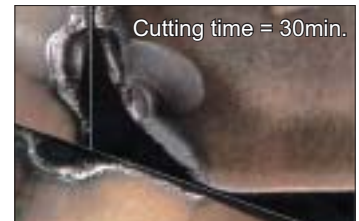


<Cutting conditions>
 Workpiece : JIS FCD700 Dismeter 200mm
 Insert : SEMT13T308AGSN-JM
 Cutting speed : 200m/min
 Feed per tooth : 0.2mm/tooth (Single insert)
 Depth of cut : 2.0mm
 Dry cutting

F5020



Conventional product

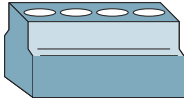
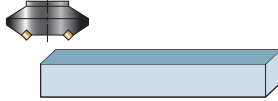
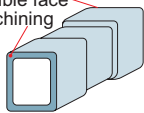
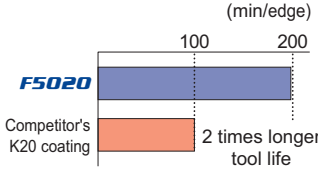


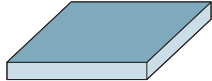
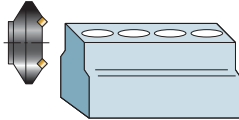
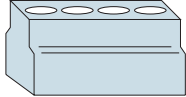
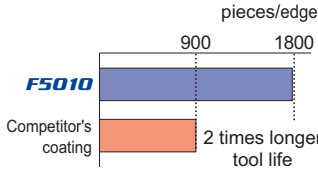
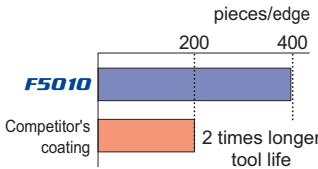
Competitor A's coating



F5020/F5010

Application examples

Insert (Grade)	SPEN1203EEER1(F5020)	SEEN1504AFSN1(F5020)	SOMT12T308PEER-JH(F5020)
Workpiece	General cast iron (JIS FC250)  Rough machining of the all side face	Ductile cast iron (forging)  Rough machining	Ductile cast iron (JIS FCD500)  Rough machining
Component	Cylinder block	Square bar (length 4000mm x width 400mm)	Clutch housing
Cutting conditions	Cutting speed (m/min)	240	200
	Feed per tooth (mm/tooth)	0.2	0.3
	Depth of cut (mm)	3.0	3.5 -
Coolant	Wet	Dry	Wet
Results	A conventional product caused chipping after machining 30 workpieces, however, the F5020 succeeded without chipping in the same machining conditions.	Tool life of the conventional product before machining one workpiece. The F5020 enabled to machine more than 3 workpieces.	

Insert (Grade)	SEMT13T308AGSN-FT(F5020)	SNMF43B2G(F5010)	SPKN1203EDR(F5010)
Workpiece	General cast iron (with scale)  Rough machining	General cast iron (JIS FC250)  Rough machining of the side face	General cast iron (JIS FC250)  Rough machining of the side face
Component	Table (length 1600mm x width 1400mm)	Cylinder block	Cylinder block
Cutting conditions	Cutting speed (m/min)	180	95
	Feed per tooth (mm/tooth)	0.3	0.14
	Depth of cut (mm)	3 - 4 x 2 times	3.0 - 3.5
Coolant	Dry	Dry	Wet
Results	A conventional product caused breaking chips due to the hardened workpiece surface. The F5020 prevents fracture and generated longer tool life.		

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.)