MITSUBISHI MATERIALS

AHB TOOLING & MACHINERY

COMPLETE METALWORKING SOLUTIONS

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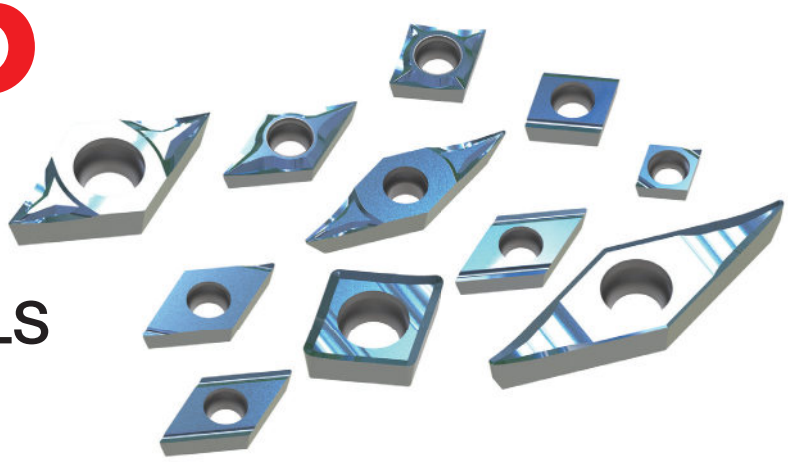
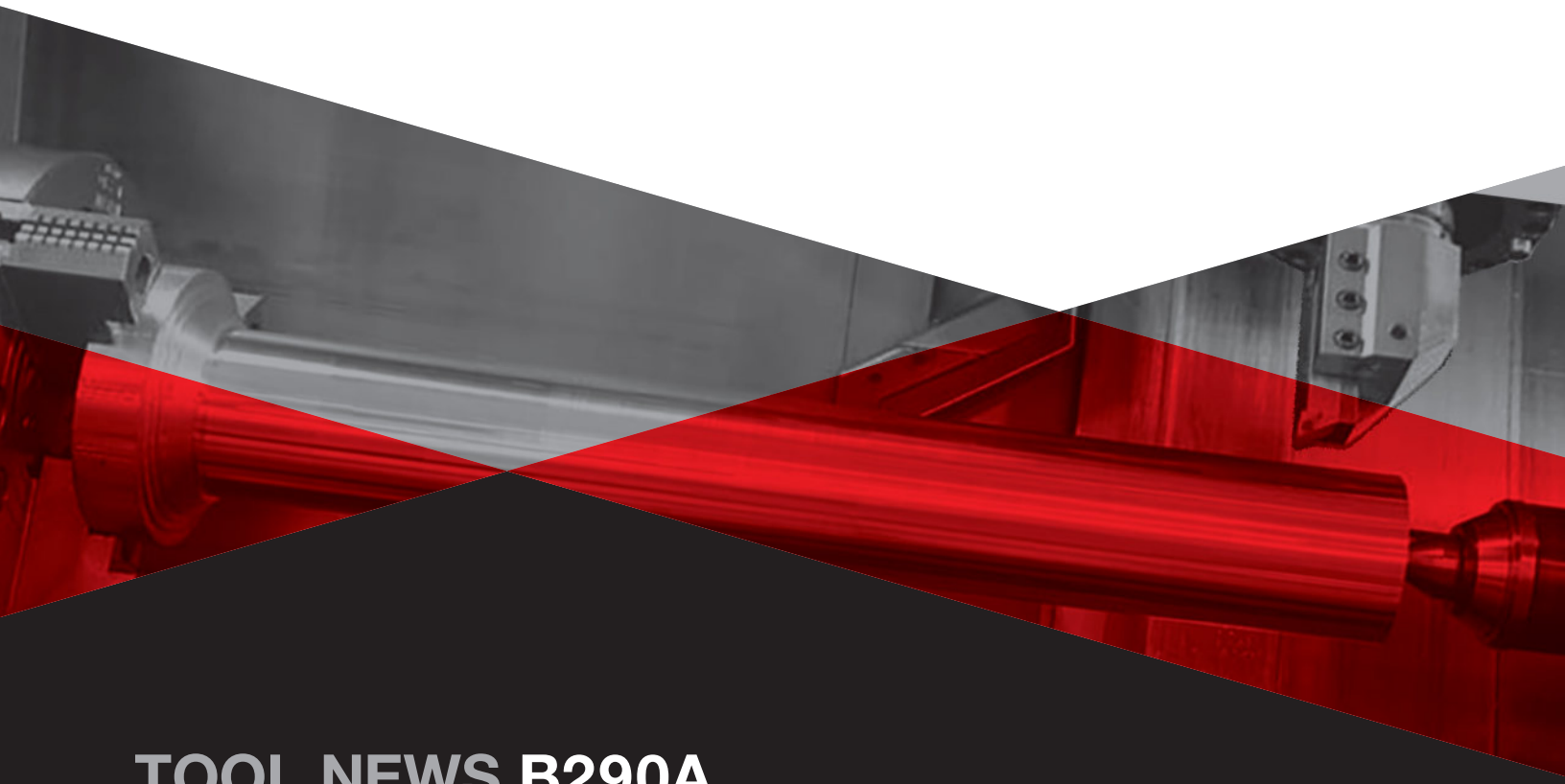
LC2005

DLC COATED GRADE FOR TURNING OF NON-FERROUS METALS

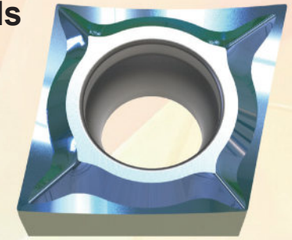




TOOL NEWS **B290A**

DLC Coated Grade for Turning of Non-Ferrous Metals

LC2005 NEW



Hydrogen-Free DLC Coating, Evolved

DLC coating is a film that possesses both the hardness of diamond and the lubricity of graphite. It is particularly suitable for aluminum alloy machining due to its excellent wear resistance and anti-adhesion properties, especially in cutting tools. Hydrogen-free DLC films have high hardness and provide superior wear and heat resistance, which is why they have been widely used in cutting tools. Generally, while hydrogen-free DLC excels in wear and heat resistance, it faces the challenge of being prone to peeling due to the significant hardness difference from the substrate. Mitsubishi Materials has overcome this issue by adopting a newly developed thin hydrogen-free DLC film with improved adhesion, thereby achieving an excellent balance of wear resistance and strong adhesion.

Three Key Features of Hydrogen-Free DLC Coating

Thin Coating Effective for Precision Machining

Ideal for machining high-precision components, delivering excellent component surface finishes.

High Hardness with Excellent Wear Resistance

Its high hardness provides superior wear resistance, resulting in extended tool life.

Outstanding Adhesion

Achieves superior adhesion, suppressing sudden dimensional discrepancies caused by film peeling or chipping.

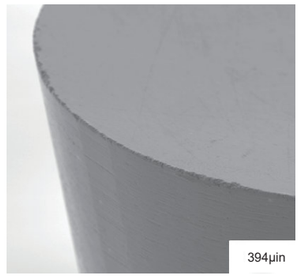
It’s environmentally friendly because of the performance efficiency improvements and longer tool life.

Comparison of component surface finish when machining A6061

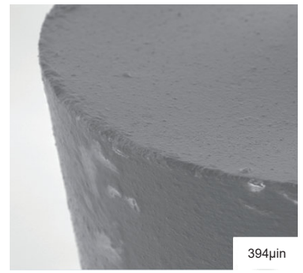
The sharpness of the cemented carbide substrate cutting edge and the smoothness of the thin-film make it possible to achieve high-quality machining.

Extremely High Quality Cutting Edge

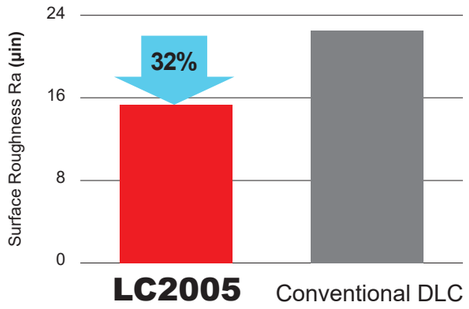
LC2005



Conventional

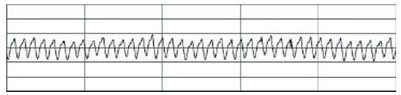
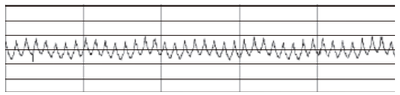
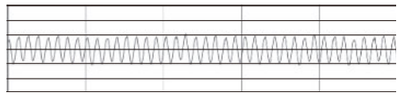
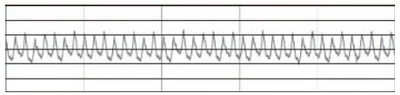


<Cutting Conditions>
Material : ASTM 6061
Insert : DCGT32.50.5MFS-P LC2005
Cutting Speed : vc=985 SFM
Feed per Rev. : f=.002 IPR
Depth of Cut : ap=.008"
Cutting Mode : Dry and Wet Cutting



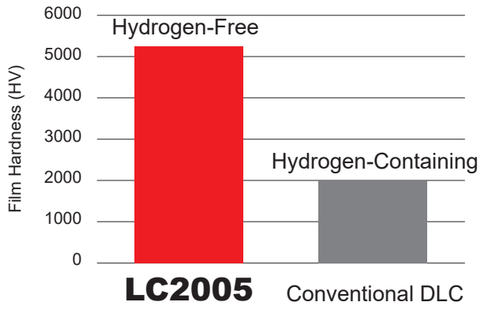
Surface Roughness

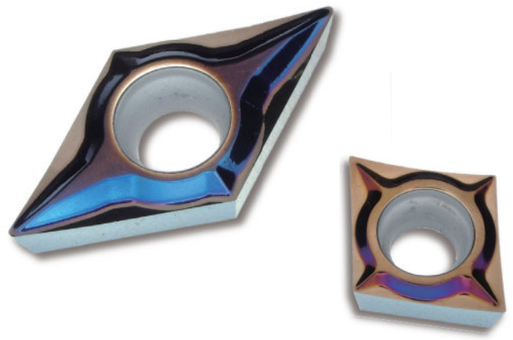
	Ra (µin)	Rz (µin)
LC2005	15	69
Conventional DLC	22	80

	Measured after 226 minutes of wet cutting	Measured after 27 minutes of dry cutting
LC2005	 Ra=15 µin Rz=69 µin	 Ra=11 µin Rz=64 µin
Conventional DLC	 Ra=22 µin Rz=80 µin	 Ra=17 µin Rz=88 µin

A Hydrogen-Free DLC Coating with Excellent Wear and Heat Resistance

The thin-film enhances adhesion, achieving excellent tool life in both wet and dry cutting.

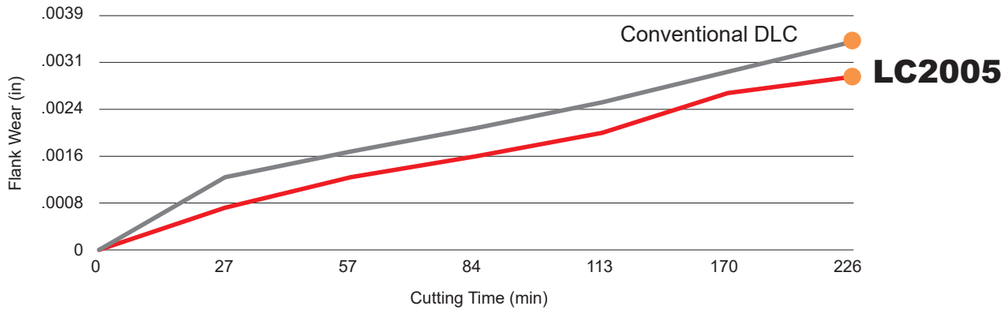


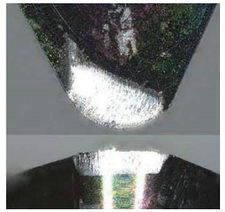


The colors of DLC coatings can vary in appearance depending on the thickness of the film.
However, this is only visual and has no effect on quality or performance.

Wear resistance comparison when machining A6061

Mitsubishi Materials' hydrogen-free coating has excellent peeling resistance and demonstrates the inherent high performance of the coating.





LC2005 FS-P

Conventional DLC
Wear progresses due to peeling

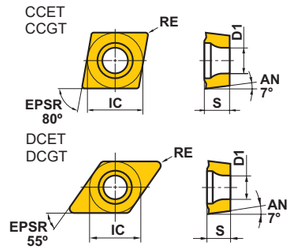
<Cutting Conditions>
Material : ASTM 6061
Insert : DCGT32.50.5MFS-P
LC2005
Cutting Speed : vc=985 SFM
Feed per Rev. : f=.002 IPR
Depth of Cut : ap=.008"
Cutting Mode : Wet Cutting

DLC Coated Grade for Turning of Non-Ferrous Metals

LC2005 NEW

7°Positive Inserts (With Hole)

E Class, G Class



Finish	Finish	Finish	Light	
FS-P	AZ	R/L-SRF	R/L-SS	
				

Finish	Finish	Finish	Finish	Light
FSF-P	FS-P	AZ	R/L-SRF	R/L-SS
				

(in)

Order Number	Cutting Area	LC2005	Dimensions (in)			
			IC	S	RE	D1
CCGT21.50.2MFS-P	F	●	.250	.094	≤.004	.110
CCGT21.50.5MFS-P	F	●	.250	.094	≤.008	.110
CCGT21.51MFS-P	F	●	.250	.094	≤.016	.110
CCGT32.50.2MFS-P	F	●	.375	.156	≤.004	.173
CCGT32.50.5MFS-P	F	●	.375	.156	≤.008	.173
CCGT32.51MFS-P	F	●	.375	.156	≤.016	.173
CCGT32.51AZ	F	●	.375	.156	.016	.173
CCGT32.52AZ	F	●	.375	.156	.031	.173
CCET03S1V3R-SRF	F	●	.156	.055	.001	.079
CCET03S1V3L-SRF	F	●	.156	.055	.001	.079
CCET03S101MR-SRF	F	●	.156	.055	≤.004	.079
CCET03S101ML-SRF	F	●	.156	.055	≤.004	.079
CCET03S102MR-SRF	F	●	.156	.055	≤.008	.079
CCET03S102ML-SRF	F	●	.156	.055	≤.008	.079
CCET03S104MR-SRF	F	●	.156	.055	≤.016	.079
CCET03S104ML-SRF	F	●	.156	.055	≤.016	.079
CCET04T0V3R-SRF	F	●	.187	.070	.001	.094
CCET04T0V3L-SRF	F	●	.187	.070	.001	.094
CCET04T001MR-SRF	F	●	.187	.070	≤.004	.094
CCET04T001ML-SRF	F	●	.187	.070	≤.004	.094
CCET04T002MR-SRF	F	●	.187	.070	≤.008	.094
CCET04T002ML-SRF	F	●	.187	.070	≤.008	.094
CCET04T004MR-SRF	F	●	.187	.070	≤.016	.094
CCET04T004ML-SRF	F	●	.187	.070	≤.016	.094
CCET21.50.2MRSS	L	●	.250	.094	≤.004	.110
CCET21.50.2MLSS	L	●	.250	.094	≤.004	.110
CCET21.50.5MRSS	L	●	.250	.094	≤.008	.110
CCET21.50.5MLSS	L	●	.250	.094	≤.008	.110
CCET32.50.2MRSS	L	●	.375	.156	≤.004	.173
CCET32.50.2MLSS	L	●	.375	.156	≤.004	.173
CCET32.50.5MRSS	L	●	.375	.156	≤.008	.173
CCET32.50.5MLSS	L	●	.375	.156	≤.008	.173
CCET32.51MRSS	L	●	.375	.156	≤.016	.173
CCET32.51MLSS	L	●	.375	.156	≤.016	.173

Order Number	Cutting Area	LC2005	Dimensions (in)			
			IC	S	RE	D1
DCGT21.50.2MFSF-P	F	●	.250	.094	≤.004	.110
DCGT21.50.5MFSF-P	F	●	.250	.094	≤.008	.110
DCGT32.50.2MFSF-P	F	●	.375	.156	≤.004	.173
DCGT32.50.5MFSF-P	F	●	.375	.156	≤.008	.173
DCGT21.50.2MFS-P	F	●	.250	.094	≤.004	.110
DCGT21.50.5MFS-P	F	●	.250	.094	≤.008	.110
DCGT21.51MFS-P	F	●	.250	.094	≤.016	.110
DCGT32.50.2MFS-P	F	●	.375	.156	≤.004	.173
DCGT32.50.5MFS-P	F	●	.375	.156	≤.008	.173
DCGT32.51MFS-P	F	●	.375	.156	≤.016	.173
DCGT32.51AZ	F	●	.375	.156	.016	.173
DCGT32.52AZ	F	●	.375	.156	.031	.173
DCET21.50.2MRSRF	F	●	.250	.094	≤.004	.110
DCET21.50.2MLSRF	F	●	.250	.094	≤.004	.110
DCET21.50.5MRSRF	F	●	.250	.094	≤.008	.110
DCET21.50.5MLSRF	F	●	.250	.094	≤.008	.110
DCET21.51MRSRF	F	●	.250	.094	≤.016	.110
DCET21.51MLSRF	F	●	.250	.094	≤.016	.110
DCET32.50.2MRSRF	F	●	.375	.156	≤.004	.173
DCET32.50.2MLSRF	F	●	.375	.156	≤.004	.173
DCET32.50.5MRSRF	F	●	.375	.156	≤.008	.173
DCET32.50.5MLSRF	F	●	.375	.156	≤.008	.173
DCET32.51MRSRF	F	●	.375	.156	≤.016	.173
DCET32.51MLSRF	F	●	.375	.156	≤.016	.173
DCET21.5V3RSS	L	●	.250	.094	.001	.110
DCET21.5V3LSS	L	●	.250	.094	.001	.110
DCET21.50.2MRSS	L	●	.250	.094	≤.004	.110
DCET21.50.2MLSS	L	●	.250	.094	≤.004	.110
DCET21.50.5MRSS	L	●	.250	.094	≤.008	.110
DCET21.50.5MLSS	L	●	.250	.094	≤.008	.110
DCET32.50.2MRSS	L	●	.375	.156	≤.004	.173
DCET32.50.2MLSS	L	●	.375	.156	≤.004	.173
DCET32.50.5MRSS	L	●	.375	.156	≤.008	.173
DCET32.50.5MLSS	L	●	.375	.156	≤.008	.173
DCET32.51MRSS	L	●	.375	.156	≤.016	.173
DCET32.51MLSS	L	●	.375	.156	≤.016	.173

● : USA Stock ★ : Stocked in Japan

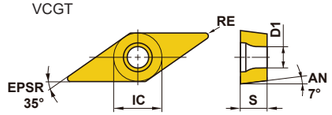
10 inserts in one case

LC2005 NEW

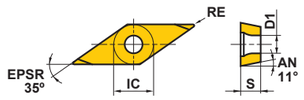
7°, 11°Positive Inserts (With Hole)

G Class

VCGT



VPGT



Finish

AZ

Finish

FSF-P

(in)

Order Number	Cutting Area	LC2005	Dimensions (in)			
			IC	S	RE	D1
VCGT331AZ	F	●	.375	.187	.016	.173
VPGT220.2MFSF-P	F	●	.250	.125	≤.004	.112
VPGT220.5MFSF-P	F	●	.250	.125	≤.008	.112

● : USA Stock ★ : Stocked in Japan

10 inserts in one case

Recommended Cutting Conditions

(in)

	Material	Properties	Cutting Area		Chipbreaker	Grade	Cutting Speed **vc** (SFM)	Feed per Rev. **f** (IPR)	Depth of Cut **ap**
N	Aluminum Alloys	Si<5%	●	F	FS-P	**LC2005**	985—2295	.0016—.0047	.008—.055
				F	FSF-P	**LC2005**	985—2295	.0008—.0039	.001—.039
				F	R/L-SRF	**LC2005**	985—2295	.0020—.0047	.008—.024
				F	AZ	**LC2005**	985—2295	.0039—.0157	.008—.118
				L	R/L-SS	**LC2005**	985—2295	.0004—.0035	.004—.197
			◕	F	FS-P	**LC2005**	985—2295	.0016—.0047	.008—.055
				F	FSF-P	**LC2005**	985—2295	.0008—.0039	.001—.039
				F	R/L-SRF	**LC2005**	985—2295	.0020—.0047	.008—.024
				F	AZ	**LC2005**	985—2295	.0039—.0157	.008—.118
				L	R/L-SS	**LC2005**	985—2295	.0004—.0035	.004—.197
			✣	F	FS-P	**LC2005**	985—2295	.0016—.0047	.008—.055
				F	FSF-P	**LC2005**	985—2295	.0008—.0039	.001—.039
				F	R/L-SRF	**LC2005**	985—2295	.0020—.0047	.008—.024
				F	AZ	**LC2005**	985—2295	.0039—.0157	.008—.118
				L	R/L-SS	**LC2005**	985—2295	.0004—.0035	.004—.197
	Aluminum Alloys	5%≤Si≤10%	●	F	FS-P	**LC2005**	985—2295	.0016—.0047	.008—.055
				F	FSF-P	**LC2005**	985—2295	.0008—.0039	.001—.039
				F	R/L-SRF	**LC2005**	985—2295	.0020—.0047	.008—.024
				F	AZ	**LC2005**	985—2295	.0039—.0157	.008—.118
				L	R/L-SS	**LC2005**	985—2295	.0004—.0035	.004—.197
			◕	F	FS-P	**LC2005**	985—2295	.0016—.0047	.008—.055
				F	FSF-P	**LC2005**	985—2295	.0008—.0039	.001—.039
				F	R/L-SRF	**LC2005**	985—2295	.0020—.0047	.008—.024
				F	AZ	**LC2005**	985—2295	.0039—.0157	.008—.118
				L	R/L-SS	**LC2005**	985—2295	.0004—.0035	.004—.197
			✣	F	FS-P	**LC2005**	985—2295	.0016—.0047	.008—.055
				F	FSF-P	**LC2005**	985—2295	.0008—.0039	.001—.039
				F	R/L-SRF	**LC2005**	985—2295	.0020—.0047	.008—.024
				F	AZ	**LC2005**	985—2295	.0039—.0157	.008—.118
				L	R/L-SS	**LC2005**	985—2295	.0004—.0035	.004—.197
	Aluminum Alloys	Si<10%	●	F	FS-P	**LC2005**	985—2295	.0016—.0047	.008—.055
				F	FSF-P	**LC2005**	985—2295	.0008—.0039	.001—.039
				F	R/L-SRF	**LC2005**	985—2295	.0020—.0047	.008—.024
				F	AZ	**LC2005**	985—2295	.0039—.0157	.008—.118
				L	R/L-SS	**LC2005**	985—2295	.0004—.0035	.004—.197
			◕	F	FS-P	**LC2005**	985—2295	.0016—.0047	.008—.055
				F	FSF-P	**LC2005**	985—2295	.0008—.0039	.001—.039
				F	R/L-SRF	**LC2005**	985—2295	.0020—.0047	.008—.024
				F	AZ	**LC2005**	985—2295	.0039—.0157	.008—.118
				L	R/L-SS	**LC2005**	985—2295	.0004—.0035	.004—.197
			✣	F	FS-P	**LC2005**	985—2295	.0016—.0047	.008—.055
				F	FSF-P	**LC2005**	985—2295	.0008—.0039	.001—.039
				F	R/L-SRF	**LC2005**	985—2295	.0020—.0047	.008—.024
				F	AZ	**LC2005**	985—2295	.0039—.0157	.008—.118
				L	R/L-SS	**LC2005**	985—2295	.0004—.0035	.004—.197

Cutting Conditions : ● : Stable Cutting ◕ : General Cutting ✣ : Unstable Cutting
Cutting Area : **F** : Finish Cutting **L** : Light Cutting

MITSUBISHI MATERIALS U.S.A.

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Brighton, MI 48116
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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 driver.
- When using rotating tools, please make a trial run to check run-out, vibration and abnormal sounds etc.

www.mmc-carbide.com/us

Tools specifications subject to change without notice.

B290A-US-2026.4