SUMITOMO

CARBIDE - CBN - DIAMOND

AXISMATERIA LTD.

Sumitomo Electric Carbide, Inc.

Carbide Rod Blanks

SUMITOMO ELECTRIC GROUP

■ Carbide Rod for Endmills, Drills & Reamers

Our Mission is to manufacture the highest quality tungsten carbide rod, by using the most modern production techniques available in the industry.

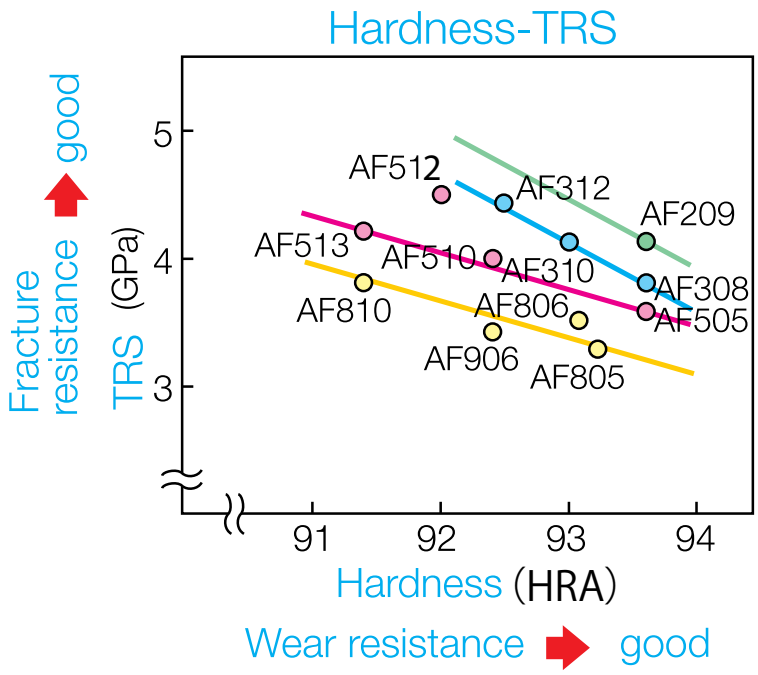
■ Features & Benefits

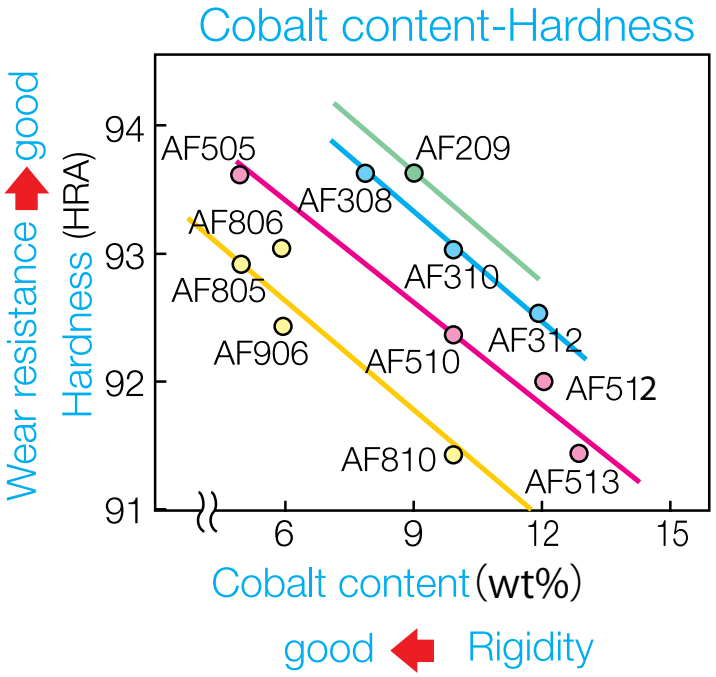
- All products manufactured in Japan
- Axismateria Ltd., subsidiary of Sumitomo Electric Hardmetal features two manufacturing facilities and a research & development location for carbide rod blanks.
- Only materials of highest quality are applied for production
- Incorporating the most advanced production facility available and unique manufacturing techniques, provides short delivery times and consistently high quality products
- We utilize the latest quality control and assurance systems
- We prioritize the advancement of high level research and development

■ Carbide Rod Grade Description

Class	Properties					Features	Products
	Grade	Grain Size (µm)	Cobalt Content (wt%)	TRS (GPa)	Hardness (HRA)		
Ultra- micro Grain	AF209	0.2	9.0	4.0	93.5	The finest micro-grain carbide	Ultra small size PCB Drills, drills, & endmills
	AF312	0.3	12.0	4.4	92.5	Very high toughness characteristics	Small size PCB drills
	AF310	0.3	10.0	4.1	93.0	High wear resistance with toughness	Small size PCB drills & routers
	AF308	0.3	8.0	3.8	93.6	High wear resistance ultra-micro grained	PCB drills & endmills for hardened steel
Micro Grain	AF513	0.5	13.0	4.2	91.4	Tough micro-grain carbide	Endmills, drills for fracture resistance & taps
	AF512	0.5	12.0	4.4	92.0	High wear resistance with added toughness	Endmills
	AF510	0.5	10.0	4.0	92.4	High wear resistance with added toughness	Endmills & drills for general purpose
	AF505	0.5	5.0	3.6	93.6	High wear resistance, micro-grain carbide	PCB drills & routers
Fine Grain	AF810	0.8	10.0	3.8	91.4	High wear resistance with added toughness	Endmills & drills
	AF806	0.8	6.0	3.5	93.0	High wear resistance at high speed machining	PCB drills
	AF805	0.8	5.0	3.3	93.2	High wear resistance, fine grain carbide	Endmills, drills for aluminum & reamers
	AF906	0.9	6.0	3.4	92.4	High toughness with average hardness	Endmills & drills for cast iron

■ Grade Range





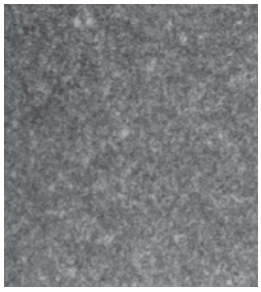
■ Application Recommendation

Class	Application				Work Materials								
					P		H	M	S		K	N	
	Endmills	Drills	Reamers	PCB Drills, Routers	Soft Steel	General Steel	Hardened Material	Stainless Steel	Titanuim Alloy	Inconel	Cast Iron	Aluminum Alloy	Copper Alloy
AF209	●	●			②	②	②	①	②	②		②	②
AF312	●	●			①							②	②
AF310				●									
AF308	●				②	②	①	②	②	②		②	②
AF513	●	●			①	①	②	①	②	②	②	②	②
			●		①	①	②	①	②	②	②		②
AF512	●				②	②		①	①	①			
AF510	●				①	①	②	②	②	②	②	②	②
		●			①	①	①	①	②	②	②	②	②
AF505				●									
AF810	●				①	①	②	②	②	②	②	②	②
		●			①	①	①	①	②	②	②		②
AF806				●									
AF805	●	●		●					②	②	①	①	①
			●		②	②	②	②	②	②	①	①	①
AF906	●	●					②	②	①	①	①	①	①
			●		②	②	②	②	①	①	①	①	①

①: 1st choice ②: 2nd choice

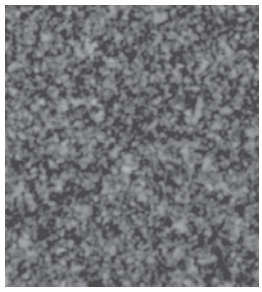
■ Micro Structure

Ultra Micro Grain



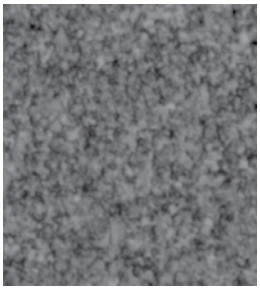
AF209
Grain Size: 0.2 μm

Ultra Micro Grain



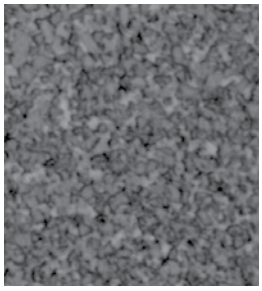
AF312
Grain Size: 0.3 μm

Micro Grain



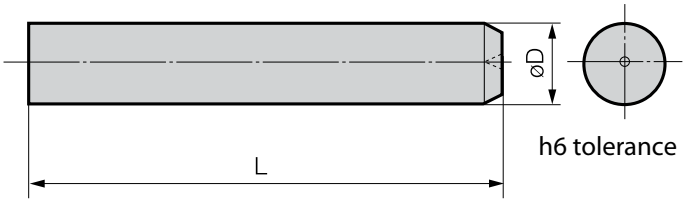
AF513
Grain Size: 0.5 μm

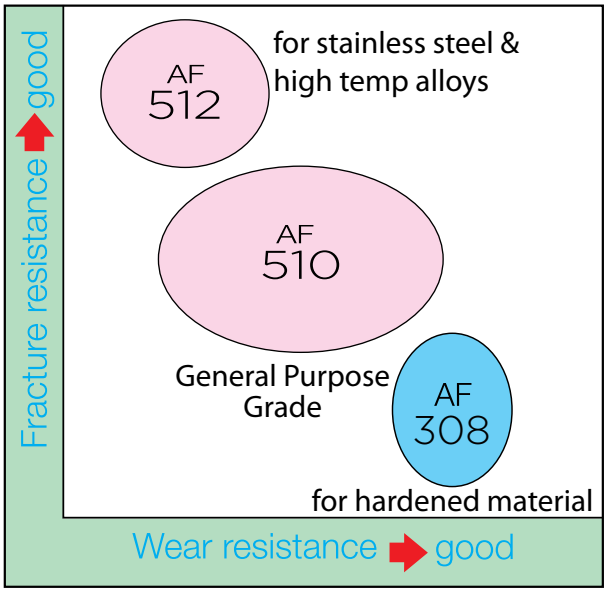
Fine Grain



AF810
Grain Size: 0.8 μm

■ Carbide Rods - (CGC) Cut, Ground, Chamfer

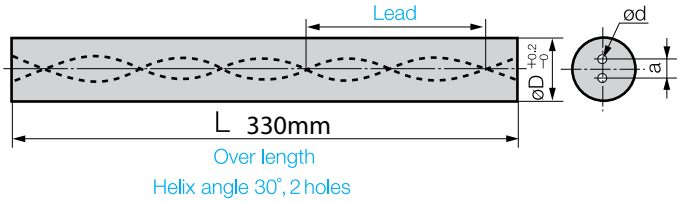




Grade	Order #	Product Description	Stock	øD Diameter (in.)	L Length (in.)	Chamfer (in.)
AF308	AML200K	1/8 X 1.5(CGC CARBIDE ROD)-AF308	●	1/8	1.5	
	AML200P	1/8 X 2(CGC CARBIDE ROD)-AF308	●	1/8	2.0	
	AML200S	1/8 X 2.5(CGC CARBIDE ROD)-AF308	●	1/8	2.5	
	AML200V	1/8 X 3(CGC CARBIDE ROD)-AF308	●	1/8	3	
	AML200Y	3/16 X 2(CGC CARBIDE ROD)-AF308	●	3/16	2	
	AML2012	3/16 X 3(CGC CARBIDE ROD)-AF308	●	3/16	3	
	AML2007	1/4 X 2(CGC CARBIDE ROD)-AF308	●	1/4	2	
	AML200A	1/4 X 2.5(CGC CARBIDE ROD)-AF308	●	1/4	2.5	0.015
	AML200D	1/4 X 3(CGC CARBIDE ROD)-AF308	●	1/4	3	
	AML200G	1/4 X 4(CGC CARBIDE ROD)-AF308	●	1/4	4	
	AML201H	5/16 X 2.5(CGC CARBIDE ROD)-AF308	●	5/16	2.5	
	AML201M	5/16 X 3(CGC CARBIDE ROD)-AF308	●	5/16	3	
	AML2018	3/8 X 2.5(CGC CARBIDE ROD)-AF308	●	3/8	2.5	
	AML201B	3/8 X 3(CGC CARBIDE ROD)-AF308	●	3/8	3	
	AML201E	3/8 X 4(CGC CARBIDE ROD)-AF308	●	3/8	4	
	AML2001	1/2 X 3(CGC CARBIDE ROD)-AF308	●	1/2	3	
	AML2004	1/2 X 4(CGC CARBIDE ROD)-AF308	●	1/2	4	0.031
	AML2015	3/4 X 4(CGC CARBIDE ROD)-AF308	●	3/4	4	
AF510	AML200M	1/8 X 1.5(CGC CARBIDE ROD)-AF510	●	1/8	1.5	
	AML200Q	1/8 X 2(CGC CARBIDE ROD)-AF510	●	1/8	2.0	
	AML200T	1/8 X 2.5(CGC CARBIDE ROD)-AF510	●	1/8	2.5	
	AML200W	1/8 X 3(CGC CARBIDE ROD)-AF510	●	1/8	3	
	AML200Z	3/16 X 2(CGC CARBIDE ROD)-AF510	●	3/16	2	
	AML2013	3/16 X 3(CGC CARBIDE ROD)-AF510	●	3/16	3	
	AML2008	1/4 X 2(CGC CARBIDE ROD)-AF510	●	1/4	2	
	AML200B	1/4 X 2.5(CGC CARBIDE ROD)-AF510	●	1/4	2.5	0.015
	AML200E	1/4 X 3(CGC CARBIDE ROD)-AF510	●	1/4	3	
	AML200H	1/4 X 4(CGC CARBIDE ROD)-AF510	●	1/4	4	
	AML201J	5/16 X 2.5(CGC CARBIDE ROD)-AF510	●	5/16	2.5	
	AML201N	5/16 X 3(CGC CARBIDE ROD)-AF510	●	5/16	3	
	AML2019	3/8 X 2.5(CGC CARBIDE ROD)-AF510	●	3/8	2.5	
	AML201C	3/8 X 3(CGC CARBIDE ROD)-AF510	●	3/8	3	
	AML201F	3/8 X 4(CGC CARBIDE ROD)-AF510	●	3/8	4	
	AML2002	1/2 X 3(CGC CARBIDE ROD)-AF510	●	1/2	3	
	AML2005	1/2 X 4(CGC CARBIDE ROD)-AF510	●	1/2	4	0.031
	AML2016	3/4 X 4(CGC CARBIDE ROD)-AF510	●	3/4	4	
AF512	AML200N	1/8 X 1.5(CGC CARBIDE ROD)-AF512	●	1/8	1.5	
	AML200R	1/8 X 2(CGC CARBIDE ROD)-AF512	●	1/8	2.0	
	AML200U	1/8 X 2.5(CGC CARBIDE ROD)-AF512	●	1/8	2.5	
	AML200X	1/8 X 3(CGC CARBIDE ROD)-AF512	●	1/8	3	
	AML2011	3/16 X 2(CGC CARBIDE ROD)-AF512	●	3/16	2	
	AML2014	3/16 X 3(CGC CARBIDE ROD)-AF512	●	3/16	3	
	AML2009	1/4 X 2(CGC CARBIDE ROD)-AF512	●	1/4	2	
	AML200C	1/4 X 2.5(CGC CARBIDE ROD)-AF512	●	1/4	2.5	0.015
	AML200F	1/4 X 3(CGC CARBIDE ROD)-AF512	●	1/4	3	
	AML200J	1/4 X 4(CGC CARBIDE ROD)-AF512	●	1/4	4	
	AML201K	5/16 X 2.5(CGC CARBIDE ROD)-AF512	●	5/16	2.5	
	AML201P	5/16 X 3(CGC CARBIDE ROD)-AF512	●	5/16	3	
	AML201A	3/8 X 2.5(CGC CARBIDE ROD)-AF512	●	3/8	2.5	
	AML201D	3/8 X 3(CGC CARBIDE ROD)-AF512	●	3/8	3	
	AML201G	3/8 X 4(CGC CARBIDE ROD)-AF512	●	3/8	4	
	AML2003	1/2 X 3(CGC CARBIDE ROD)-AF512	●	1/2	3	
	AML2006	1/2 X 4(CGC CARBIDE ROD)-AF512	●	1/2	4	0.031
	AML2017	3/4 X 4(CGC CARBIDE ROD)-AF512	●	3/4	4	

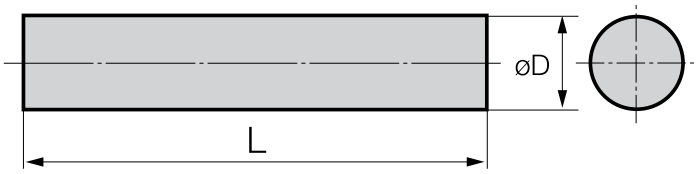
■ Carbide Rods with Coolant Holes

- Grade AF810 is available with coolant holes
- Carbide rods feature a sintered surface
- Variety of applications: straight and step drills are offered

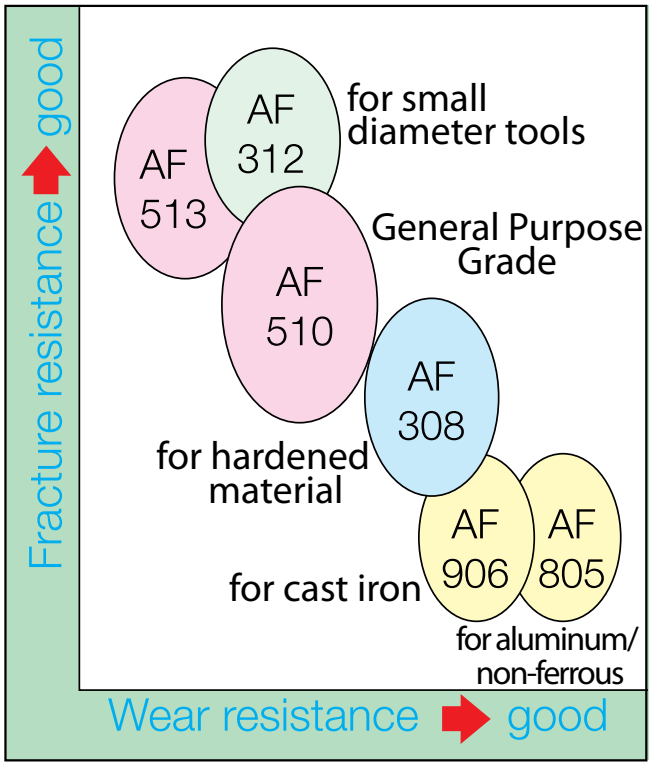


	Order #	Product Description	Stock	øD Diameter (mm)	øD1 Lead Bottom	ød Hole Diameter	a Hole Pitch	Lead (mm)
For Straight Drills	AML300T	3.6X330/30 OH STRAIGHT UNGROUND-AF810	●	3.6	3.3	0.47 ±0.05	1.5 $^{0}_{-0.1}$	15.7 ~ 17.0
	AML300U	4.6X330/30 OH STRAIGHT UNGROUND-AF810	●	4.6	4.3	0.59 ±0.1	1.7 $^{0}_{-0.2}$	20.9 ~ 22.6
	AML300V	5.6X330/30 OH STRAIGHT UNGROUND-AF810	●	5.6	5.3	0.71 ±0.1	2.4 $^{0}_{-0.3}$	26.1 ~ 28.3
	AML300W	6.6X330/30 OH STRAIGHT UNGROUND-AF810	●	6.6	6.3	0.83 ±0.1	2.8 ±0.2	31.3 ~ 34.0
	AML300X	7.6X330/30 OH STRAIGHT UNGROUND-AF810	●	7.6	7.3	0.95 ±0.1	3.2 ±0.2	36.6 ~ 39.6
	AML300Y	8.6X330/30 OH STRAIGHT UNGROUND-AF810	●	8.6	8.3	1.06 ±0.1	3.6 ±0.2	41.8 ~ 45.3
	AML300Z	9.6X330/30 OH STRAIGHT UNGROUND-AF810	●	9.6	9.3	1.18 ±0.2	4.0 ±0.2	47.0 ~ 51.0
	AML300F	10.6X330/30 OH STRAIGHT UNGROUND-AF810	●	10.6	10.3	1.30 ±0.2	4.4 ±0.2	52.3 ~ 56.7
	AML300G	11.6X330/30 OH STRAIGHT UNGROUND-AF810	●	11.6	11.3	1.30 ±0.2	4.4 ±0.2	57.5 ~ 62.3
	AML300H	12.6X330/30 OH STRAIGHT UNGROUND-AF810	●	12.6	12.3	1.42 ±0.2	4.8 ±0.2	62.7 ~ 68.0
	AML300J	13.6X330/30 OH STRAIGHT UNGROUND-AF810	●	13.6	13.3	1.54 ±0.2	5.2 ±0.2	67.9 ~ 73.7
	AML300K	14.6X330/30 OH STRAIGHT UNGROUND-AF810	●	14.6	14.3	1.66 ±0.2	5.6 ±0.2	73.2 ~ 79.3
	AML300M	15.6X330/30 OH STRAIGHT UNGROUND-AF810	●	15.6	15.3	1.77 ±0.2	6.0 ±0.2	78.4 ~ 85.0
	AML300N	16.6X330/30 OH STRAIGHT UNGROUND-AF810	●	16.6	16.3	1.89 ±0.2	6.4 ±0.2	83.7 ~ 90.7
	AML300P	17.6X330/30 OH STRAIGHT UNGROUND-AF810	●	17.6	17.3	2.01 ±0.2	6.8 ±0.2	88.9 ~ 96.3
	AML300Q	18.6X330/30 OH STRAIGHT UNGROUND-AF810	●	18.6	18.3	2.13 ±0.2	7.2 ±0.2	94.1 ~ 102.0
	AML300R	19.6X330/30 OH STRAIGHT UNGROUND-AF810	●	19.6	19.3	2.28 ±0.2	7.6 ±0.2	99.3 ~ 107.7
	AML300S	20.6X330/30 OH STRAIGHT UNGROUND-AF810	●	20.6	20.3	2.36 ±0.2	8.0 ±0.2	104.6 ~ 113.4
For Step Drills	AML3008	3.6X330/30 OH STEP UNGROUND-AF810	●	3.6	3.3	0.23 ±0.05	0.8 $^{-0.1}_{-0.2}$	15.7 ~ 17.0
	AML3009	4.6X330/30 OH STEP UNGROUND-AF810	●	4.6	4.3	0.35 ±0.05	1.1 $^{0}_{-0.1}$	20.9 ~ 22.6
	AML300A	5.6X330/30 OH STEP UNGROUND-AF810	●	5.6	5.3	0.47 ±0.05	1.5 $^{0}_{-0.3}$	26.1 ~ 28.3
	AML300B	6.6X330/30 OH STEP UNGROUND-AF810	●	6.6	6.3	0.47 ±0.1	2.0 ±0.2	31.3 ~ 34.0
	AML300C	7.6X330/30 OH STEP UNGROUND-AF810	●	7.6	7.3	0.59 ±0.1	2.0 ±0.2	36.6 ~ 39.6
	AML300D	8.6X330/30 OH STEP UNGROUND-AF810	●	8.6	8.3	0.71 ±0.1	2.4 ±0.2	41.8 ~ 45.3
	AML300E	9.6X330/30 OH STEP UNGROUND-AF810	●	9.6	9.3	0.83 ±0.1	2.8 ±0.2	47.0 ~ 51.0
	AML3001	10.6X330/30 OH STEP UNGROUND-AF810	●	10.6	10.3	0.95 ±0.1	3.2 ±0.2	52.3 ~ 56.7
	AML3002	11.6X330/30 OH STEP UNGROUND-AF810	●	11.6	11.3	0.95 ±0.2	3.2 ±0.2	57.5 ~ 62.3
	AML3003	12.6X330/30 OH STEP UNGROUND-AF810	●	12.6	12.3	1.06 ±0.2	3.6 ±0.2	62.7 ~ 68.0
	AML3004	13.6X330/30 OH STEP UNGROUND-AF810	●	13.6	13.3	1.06 ±0.2	3.6 ±0.2	67.9 ~ 73.7
	AML3005	14.6X330/30 OH STEP UNGROUND-AF810	●	14.6	14.3	1.18 ±0.2	4.0 ±0.2	73.2 ~ 79.3
	AML3006	15.6X330/30 OH STEP UNGROUND-AF810	●	15.6	15.3	1.30 ±0.2	4.4 ±0.2	78.4 ~ 85.0
	AML3007	16.6X330/30 OH STEP UNGROUND-AF810	●	16.6	16.3	1.42 ±0.2	4.8 ±0.2	83.7 ~ 90.7

■ Carbide Rods



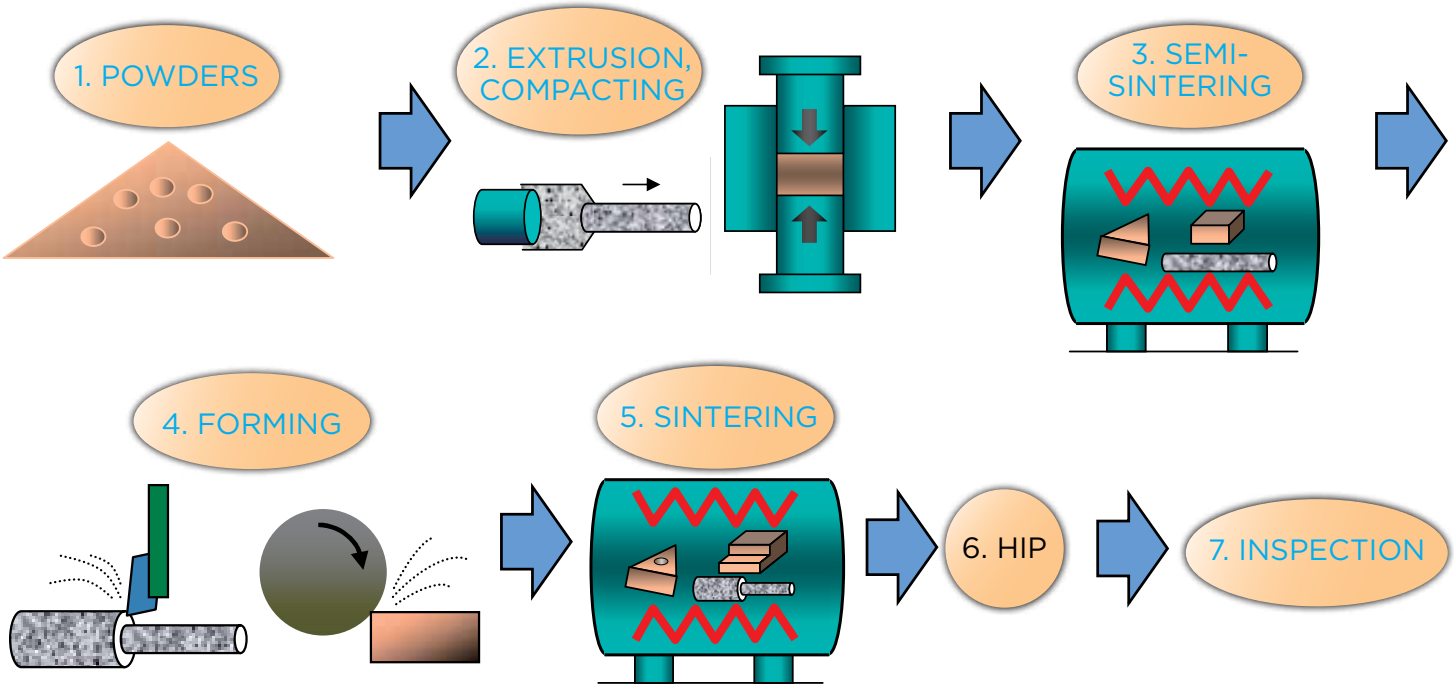
- All Sintered surface
- Available Grades: AF312, AF513, AF805, AF906, AF308, AF510
- Special grades & 330 mm length available upon request



Grade	øD		L		Available Grades					
	Diameter (mm)	Tolerance	Over Length	Tolerance	AF312	AF513	AF805	AF906	AF308	AF510
AR010310	1.0	+0.3 +0.2	310 (mm)	+6.0	★	★	★	★		
AR015310	1.5				★	★	★	★		
AR020310	2.0				★	★	★	★		
AR025310	2.5	+0.4 +0.2			★	★	★	★		
AR030310	3.0				★	★	★	★	★	★
AR035310	3.5				★	★	★	★		
AR040310	4.0				★	★	★	★	★	★
AR045310	4.5				★	★	★	★		
AR050310	5.0	+0.5 +0.2			★	★	★	★		
AR055310	5.5				★	★	★	★		
AR060310	6.0				★	★	★	★	★	★
AR065310	6.5				★	★	★	★		
AR070310	7.0				★	★	★	★		
AR075310	7.5				★	★	★	★		
AR080310	8.0				★	★	★	★	★	★
AR090310	9.0	+0.6 +0.2			★	★	★	★		
AR100310	10.0				★	★	★	★	★	★
AR110310	11.0				★	★	★	★		
AR120310	12.0				★	★	★	★	★	★
AR130310	13.0				★	★	★	★		
AR140310	14.0				★	★	★	★		
AR150310	15.0				★	★	★	★		
AR160310	16.0	+0.8 +0.2			★	★	★	★	★	★
AR170310	17.0				★	★	★	★		
AR180310	18.0				★	★	★	★		
AR190310	19.0				★	★	★	★		
AR200310	20.0				★	★	★	★		

★: Stocked in Japan. 2-4 weeks delivery

■ Manufacturing Process of Carbide Blanks



■ Carbide Rod Availability Range

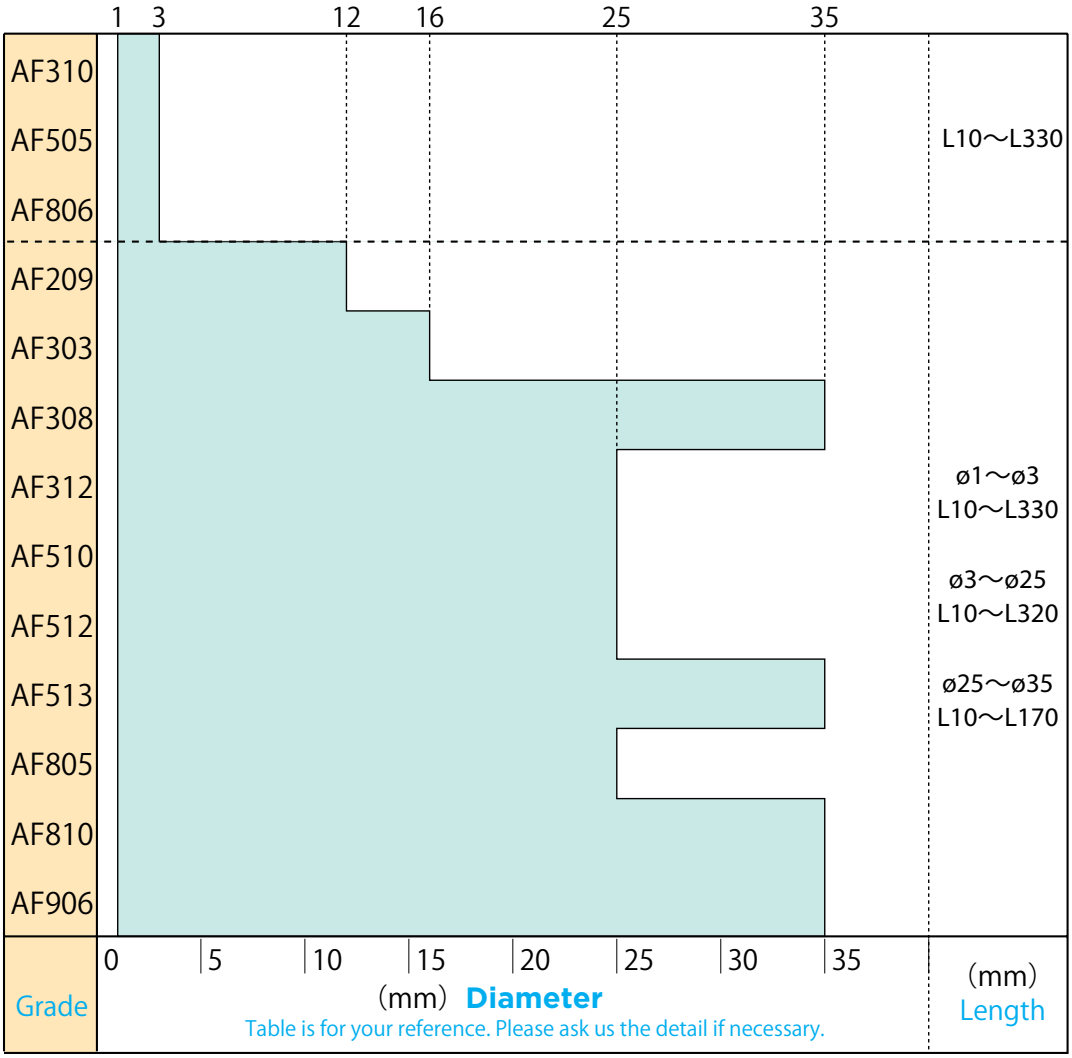


Table is for your reference. Please ask us the detail if necessary.

GLOBAL SUPPORT. GLOBAL SOLUTIONS.

Contact U.S.A. Materials Group : **materialg@sumicarbide.com**

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Huntsville AL Branch

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Huntsville, AL 35806
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Fax: (256) 971-1205

Torrance CA Branch

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Suite 120
Torrance, CA 90501
Phone: (310) 972-7118
Fax: (310) 782-0211

More details about carbide rod blanks @
www.sumicarbide.com/product/carbiderodblanks