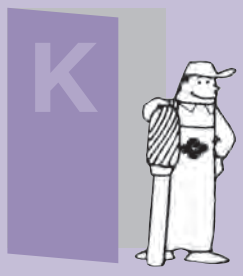
Carbide Materials Brazed Tools K1 to K11

K



Stock Markings and Symbols

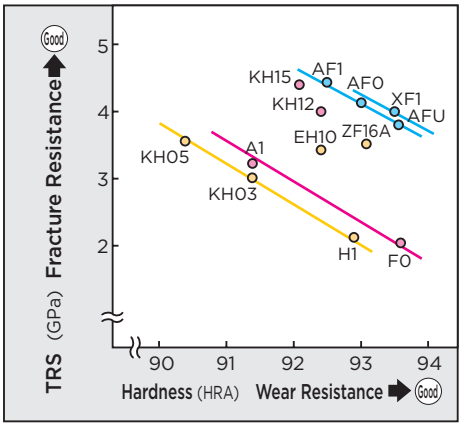
●● mark: Standard stocked item
● mark: To be replaced with the new item featured on the same page
▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)
* mark: Semi-standard stock (please confirm stock availability)
○ mark: Stock or planned stock (please confirm stock availability)
Blank: Made-to-order item
— mark: Not available

Carbide Material Features and Applications

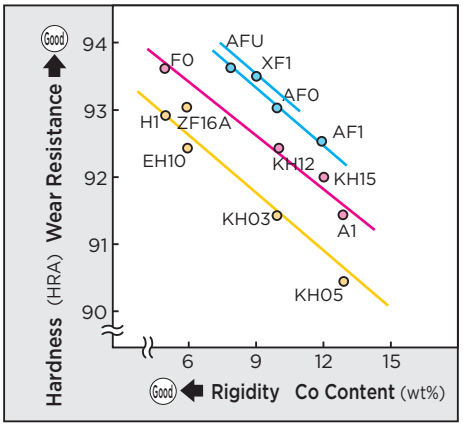
- Stringent selection of high purity and high quality raw materials
- Consistent quality and shorter delivery with the latest production facilities and techniques
- Fully equipped with the latest quality assurance system
- Constant R&D to develop the latest grades

■ Grade Map

● Hardness and Transverse Rupture Strength



● Co Content vs Hardness



■ Grade Properties and Features

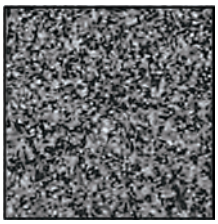
Classification	Grade	Properties					Features	Applications
		Grain Size *1 (μm)	Co Content (wt%)	Transverse Rupture Strength *2 (GPa)	Hardness (HRA)	Hardness HV (GPa)		
Ultra-fine Grained Carbide	**XF1**	0.2	9.0	4.0	93.5	20.4	Ultra-fine grained carbide with the world's finest grains	Microdrills, Very Small Diameter Drills
	AF1	0.5	12.0	4.4	92.5	17.3	World's toughest ultra-fine grained carbide	PCB Microdrills, Mini-tools, Punches
	AF0	0.5	10.0	4.1	93.0	18.1	Tough, wear-resistant ultra-fine grained carbide	Material Dedicated for Microdrills and Routers
	AFU	0.5	8.0	3.8	93.6	19.4	Wear-resistant ultra-fine grained carbide	PCB Drills, Endmills for High-Hardness Materials
Micro-fine Grained Carbide	**A1**	0.7	13.0	4.2	91.4	15.6	Tough micro-fine grained carbide	Endmills, Taps, Drills for Cast Iron, Punches
	KH12	0.7	10.0	4.0	92.4	17.0	Micro-fine grained carbide with excellent wear resistance and toughness	Endmills, Drills for Steel
	KH15	0.7	12.0	4.4	92.0	16.3	Micro-fine grained carbide with a balance of hardness and strength	Endmills for Exotic Alloys
	F0	0.7	5.0	3.6	93.6	20.1	Micro-fine grained carbide with superior wear resistance	PCB Drills, Routers
Micro-grained Carbide	**KH03**	1.0	10.0	3.8	91.4	15.2	Micro-grained carbide with excellent strength and toughness	Molds/Dies, Drills, Endmills
	KH05	1.0	13.0	3.5	90.4	13.6	Tough micro-grained carbide	Molds/Dies
	H1	1.0	5.0	3.3	93.2	17.7	Micro-grained carbide with superior wear resistance	Drills for Cast Iron and High-Hardness, Reamers
	EH10	1.2	6.0	3.4	92.4	17.3	Micro-grained carbide with a balance of hardness and strength	Drills for Exotic Alloy, Reamers
	ZF16A	1.0	6.0	3.5	93.0	17.6	Wear and chipping resistant micro-grained carbide for high-speed machining	Material Dedicated for PCB Drills

*1: Grain size shown is the average grain size of the WC (tungsten carbide) material. *2: Transverse rupture strength differs between round bars and plates.

Carbide Material Features and Applications

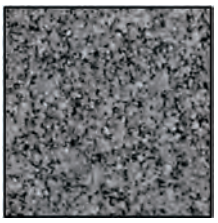
■ Structure

● Ultra-fine Grained Carbide



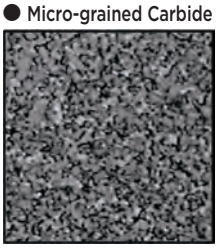
AF1
Average Grain Size: 0.5μm

● Micro-fine Grained Carbide



KH12
Average Grain Size: 0.7μm

● Micro-grained Carbide



KH03
Average Grain Size: 1.0μm

■ Recommended Grades by Application and Work Material (◎: Best, ○: Good)

Grade	Applications					Work Material								
	Endmills	Drills	Reamers	PCB Drills/ Routers	Non-cutting Tool Use	Mild Steel	General Steel	Hardened Steel	Stainless Steel	Titanium Alloy	Inconel	Cast Iron	Aluminum Alloy	Copper Alloy
XF1	●	●				○	○	◎	◎		◎			
				●		Refer to page K7 for the recommended grades for PCB drills and routers.								
AF1	●	●			●	○	○							
				●		Refer to page K7 for the recommended grades for PCB drills and routers.								
AF0				●		Refer to page K7 for the recommended grades for PCB drills and routers.								
AFU	●					○	○	◎						
				●		Refer to page K7 for the recommended grades for PCB drills and routers.								
A1	●	●			●	○	○		○					
			●			○	○							
KH12	●	●				◎	◎	○	○	○	○	○	○	○
KH15	●					◎	◎	○	◎	◎	◎			
F0				●		Refer to page K7 for the recommended grades for PCB drills and routers.								
KH03	●					○	○	○	○	◎	◎			
		●				◎	◎	○	○	◎	◎	◎		
KH05					●	Cannot be used as cutting tool material.								
H1	●	●										◎	◎	◎
			●			○	○	○	○			◎	◎	◎
EH10	●	●						○	○	◎	◎	◎	◎	◎
			●			○	○	○	○	◎	◎	◎	○	○
ZF16A				●		Refer to page K7 for the recommended grades for PCB drills and routers.								

Plate Blanks

A comprehensive stocked range of grades in carbide plate blanks for mold and die materials, as well as carbide rods for drill or reamer materials.

■ Grades

● Ultra-fine Grained Carbide AF1

With grains finer than that of conventional grades, an excellent balance of high toughness and high hardness as well as superior edge sharpness is achieved.

● Micro-fine Grained Carbide A1

Micro-fine grained carbide A1 is a best-selling general-purpose grade with high wear resistance and toughness.

● Micro-grained Carbide H1

Reliable grade for machining non-ferrous metals.

● Basic Carbide EH10

Highly evaluated grade for general machining of cast iron and exotic alloys. Perfect for drills and reamers.

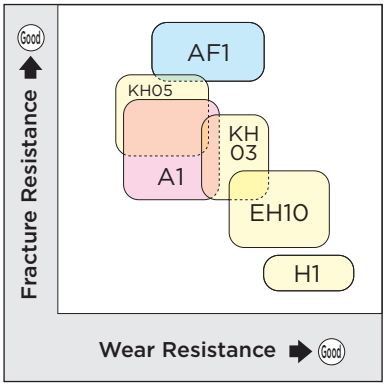
● KH series

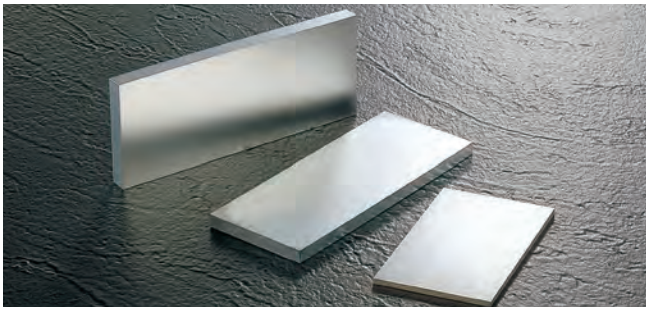
· KH03: Strength (transverse rupture strength) and hardness similar to A1, with greatly improved chipping resistance comparable to ultra-fine grained grades.

· KH05: With higher cemented carbide binder content than KH03, this grade has even greater strength (transverse rupture strength) and chipping resistance.

■ Properties and Applications

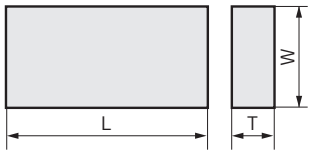
Grade	Hardness		Transverse Rupture Strength	Applications	
	HRA	HV(GPa)	TRS(GPa)		
A1	91.4	15.6	3.3	Endmills	IT Mold Punches
AF1	92.5	17.3	4.4	Small Drills	
KH03	91.4	15.2	3.3	Molds/Dies	
KH05	90.4	13.6	3.5		
EH10	92.4	17.3	3.4	Drills, Reamers	
H1	93.2	17.7	2.4		





Ultra-fine grained carbide (AF1) is specially developed for the manufacturing of carbide mold parts (punches) with a variety of sizes in stock.

Fig 1



■ Stock

Dimensions (mm)

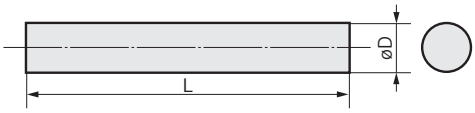
Cat. No.	T		L		W		Grade				Fig
	Nominal Size	Tolerance	Nominal Size	Tolerance	Nominal Size	Tolerance	A1	AF1	KH03	KH05	
0B10060012	1.2	+0.5 +0.2	100	+1.5 0	60	+1.0 0	●	●	●	●	1
0B10060015	1.5						●	●	●	●	1
0B10060020	2.0						●	●	●	●	1
0B10060025	2.5						●	●	●	●	1
0B10060030	3.0						●	●	●	●	1
0B10060040	4.0						●	●	●	●	1
0B15060020	2.0	+0.5 +0.2	150	+1.5 0	60	+1.0 0	●	●	●	●	1
0B15060025	2.5						●	●	●	●	1
0B15060030	3.0						●	●	●	●	1
0B15060035	3.5						●	●	●	●	1
0B15060040	4.0						●	●	●	●	1
0B15060045	4.5						●	●	●	●	1
0B15060050	5.0						●	●	●	●	1
0B15060055	5.5						●	●	●	●	1
0B15060060	6.0						●	●	●	●	1
0B15060070	7.0						●	●	●	●	1
0B15060080	8.0						●	●	●	●	1
0B15060090	9.0						●	●	●	●	1
0B15060100	10.0						●	●	●	●	1

Plates with top and bottom faces ground can be made to order.

Rod Blanks

IGETALLOY grades ideal for applications such as endmills, drills and reamers where edge strength, toughness and wear resistance are essential.

Fig 1



Stock

● **Length L = 310**

Dimensions (mm)

Cat. No.	øD		L		Grade				Fig
	Nominal Size	Tolerance	Nominal Size	Tolerance	A1	AF1	EH10	H1	
AR010310	1.0	+0.3 +0.2	310	+6.0 0	*	*	*	*	1
AR015310	1.5				*	*	*	*	1
AR020310	2.0				*	*	*	*	1
AR025310	2.5				*	*	*	*	1
AR030310	3.0	+0.5 +0.3			*	*	*	*	1
AR035310	3.5				*	*	*	*	1
AR040310	4.0				*	*	*	*	1
AR045310	4.5				*	*	*	*	1
AR050310	5.0				*	*	*	*	1
AR055310	5.5				*	*	*	*	1
AR060310	6.0				*	*	*	*	1
AR065310	6.5				*	*	*	*	1
AR070310	7.0				*	*	*	*	1
AR075310	7.5				*	*	*	*	1
AR080310	8.0				*	*	*	*	1
AR090310	9.0	+0.6 +0.3			*	*	*	*	1
AR100310	10.0				*	*	*	*	1
AR110310	11.0				*	*	*	*	1
AR120310	12.0				*	*	*	*	1
AR130310	13.0								1
AR140310	14.0				*	*	*	*	1
AR150310	15.0								1
AR160310	16.0	+0.7 +0.3			*	*	*	*	1
AR170310	17.0								1
AR180310	18.0				*	*	*	*	1
AR190310	19.0								1
AR200310	20.0				*	*	*	*	1

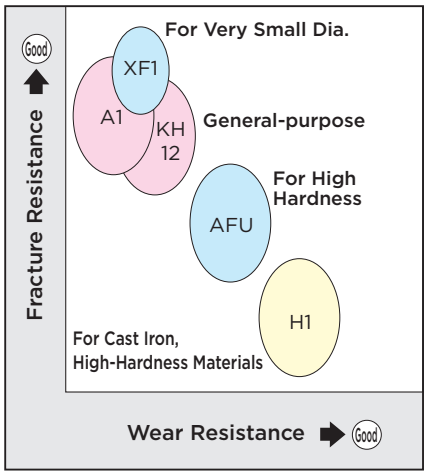
Ground rods can be made to order.

Items marked * are semi-standard stock. Please inquire about stock availability when ordering.

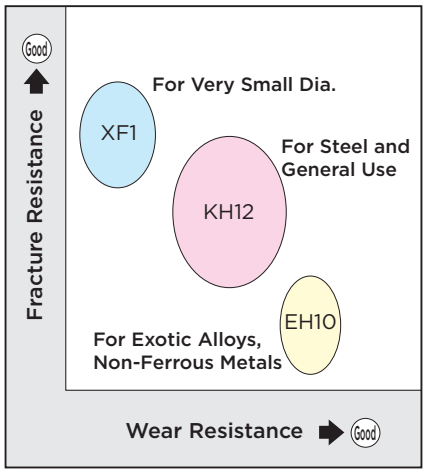
· For length requirements other than L=310mm, refer to "Special Rod Blanks" on page K6 for the available made-to-order specifications.

Special Rod Blanks

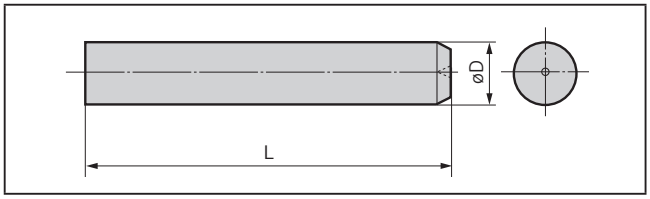
Endmill Blanks



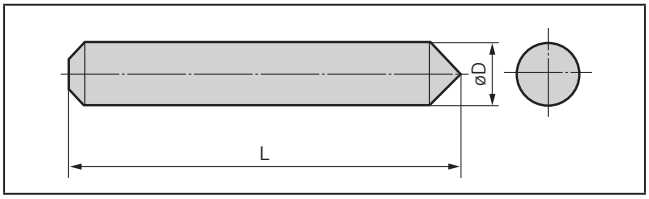
Drill Blanks



Endmill Mill-scale Blank Shapes (Example)



Drill Mill-scale Blank Shapes (Example)



O.D.

Dimensions (mm)

øD	Tolerance
1.0 ≤ D < 3.0	+ 0.3 + 0.2
3.0 ≤ D ≤ 8.0	+ 0.5 + 0.3
8.0 < D ≤ 15.0	+ 0.6 + 0.3
15.0 < D ≤ 25.0	+ 0.7 + 0.3

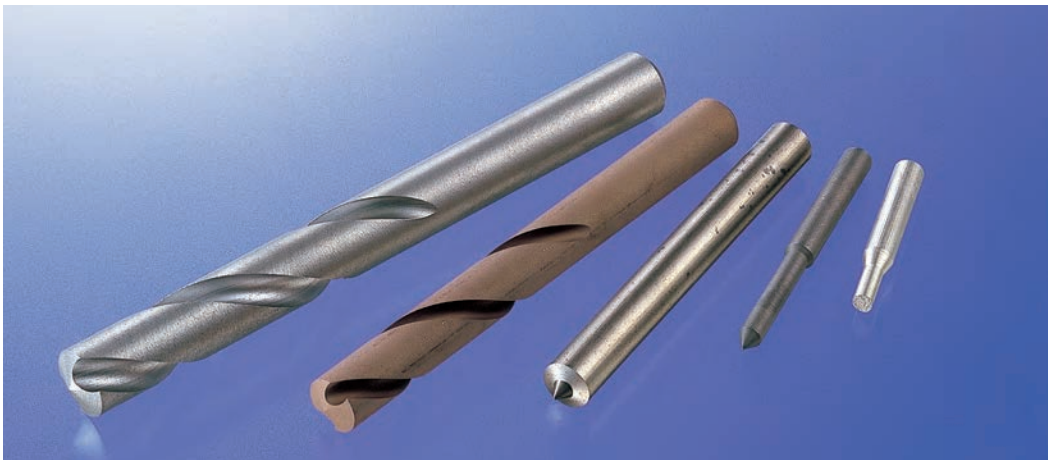
Rods with steps can be made to order.
*XF1 is available up to ≤ ø16.

Overall Length

Dimensions (mm)

L	Tolerance	Warpage
40 ≤ L < 310	Overall Length ± 0.5%	0.15
310 ≤ L ≤ 330	Overall Length + 6.0 0	

Ground rods can be made to order.

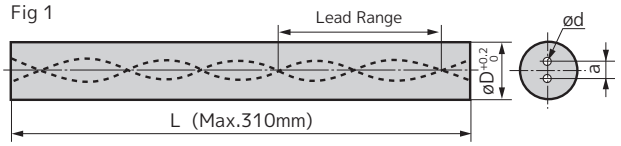


Special Rod Blanks

Drill Blanks with Oil Holes

Shape (Example)

Fig 1



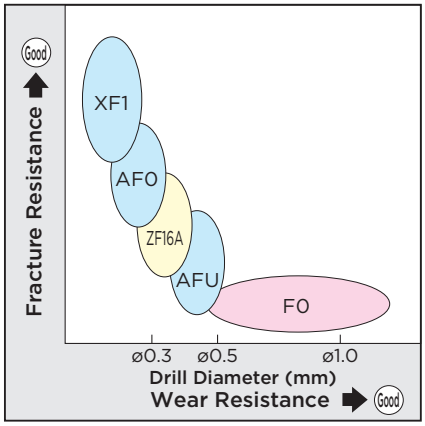
Right-hand Helix 30° , 2 Holes

Dimensions

(mm)

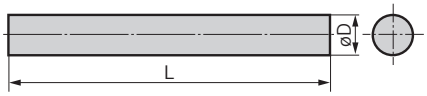
Application	External Diameter øD	Core Diameter øD1	Hole Diameter ød	Oil Hole Pitch a	Lead Range	Grade KH12	Grade KH03	Fig
For Straight Drills	3.6	3.3	0.47 ± 0.05	1.5 $^{0}_{-0.1}$	15.7 to 17.0			1
	4.6	4.3	0.59 $^{+0.05}_{-0.1}$	1.7 $^{0}_{-0.2}$	20.9 to 22.7			1
	5.6	5.3	0.71 ± 0.1	2.4 $^{0}_{-0.3}$	26.2 to 28.4			1
	6.6	6.3	0.83 ± 0.1	2.8 ± 0.2	31.4 to 34.0			1
	7.6	7.3	0.95 ± 0.1	3.2 ± 0.2	36.6 to 39.7			1
	8.6	8.3	1.06 ± 0.1	3.6 ± 0.2	41.9 to 45.4			1
	9.6	9.3	1.18 ± 0.2	4.0 ± 0.2	47.1 to 51.0			1
	10.6	10.3	1.30 ± 0.2	4.4 ± 0.2	52.3 to 56.7			1
	11.6	11.3	1.30 ± 0.2	4.4 ± 0.2	57.5 to 62.4			1
	12.6	12.3	1.42 ± 0.2	4.8 ± 0.2	62.8 to 68.1			1
	13.6	13.3	1.54 ± 0.2	5.2 ± 0.2	68.0 to 73.7			1
	14.6	14.3	1.66 ± 0.2	5.6 ± 0.2	73.2 to 79.4			1
	15.6	15.3	1.77 ± 0.2	6.0 ± 0.2	78.5 to 85.1			1
	16.6	16.3	1.89 ± 0.2	6.4 ± 0.2	83.7 to 90.7			1
	17.6	17.3	1.75 ± 0.2	8.5 ± 0.2	88.9 to 96.3	—		1
	17.6	17.3	2.01 ± 0.2	6.8 ± 0.2	88.9 to 96.3		—	1
	18.6	18.3	2.00 ± 0.2	9.2 ± 0.2	94.1 to 102.0	—		1
	18.6	18.3	2.13 ± 0.2	7.2 ± 0.2	94.1 to 102.0		—	1
	19.6	19.3	2.00 ± 0.2	9.7 ± 0.2	99.3 to 107.7	—		1
	19.6	19.3	2.28 ± 0.2	7.6 ± 0.2	99.3 to 107.7		—	1
	20.6	20.3	2.00 ± 0.2	9.9 ± 0.2	104.6 to 113.4	—		1
	20.6	20.3	2.36 ± 0.2	8.0 ± 0.2	104.6 to 113.4		—	1
For Stepped Drills	3.6	3.3	0.23 ± 0.05	0.8 $^{-0.1}_{-0.2}$	15.7 to 17.0			1
	3.6	3.3	0.35 ± 0.05	1.2 $^{0}_{-0.2}$	15.7 to 17.0			1
	4.6	4.3	0.35 ± 0.05	1.2 $^{0}_{-0.2}$	20.9 to 22.7			1
	5.6	5.3	0.47 ± 0.05	1.5 $^{0}_{-0.3}$	26.2 to 28.4			1
	6.6	6.3	0.47 ± 0.1	2.0 ± 0.2	31.4 to 34.0			1
	7.6	7.3	0.59 ± 0.1	2.0 ± 0.2	36.6 to 39.7			1
	8.6	8.3	0.71 ± 0.1	2.4 ± 0.2	41.9 to 45.4			1
	9.6	9.3	0.83 ± 0.1	2.8 ± 0.2	47.1 to 51.0			1
	10.6	10.3	0.95 ± 0.1	3.2 ± 0.2	52.3 to 56.7			1
	11.6	11.3	0.95 ± 0.1	3.2 ± 0.2	57.5 to 62.4			1
	12.6	12.3	1.06 ± 0.1	3.6 ± 0.2	62.8 to 68.1			1
	13.6	13.3	1.06 ± 0.1	3.6 ± 0.2	68.0 to 73.7			1
	14.6	14.3	1.18 ± 0.2	4.0 ± 0.2	73.2 to 79.4			1
	15.6	15.3	1.30 ± 0.2	4.4 ± 0.2	78.5 to 85.1			1
	16.6	16.3	1.42 ± 0.2	4.8 ± 0.2	83.7 to 90.7			1

PCB Drill Blanks



Shape (Example)

Fig 2



Solid type

Dimensions (mm)

øD	L	Fig
2.15 ± 0.05	32.0 $^{+0.9}_{+0.4}$	2
3.25 ± 0.02	38.1 $^{+1.0}_{+0.4}$	2

Other sizes can be made to order.

Composite type (Rough Ground)

Dimensions (mm)

øD	L	Fig
1.0 to 1.8 ± 0.05	333 $^{+2.0}_{0}$	2

Consult us about dimensions.
Centreless grinding can be performed.

Recommended Grades by Application

(◎: Best, ○: Good)

· By Tool Diameter

Dimensions (mm)

Grade	Very Small Diameters (up to ø0.15)	Small Diameters (up to ø0.45)	General Diameters (ø0.50 up)
XF1	◎	○	
AF0	○	◎	
AFU		◎	
ZF16A		○	○
F0			◎

· By Application

Grade	Hardened Steel	High-speed Machining	Stacked Plates	Routers
XF1		○		○
AF0		○	◎	○
AFU	◎	○	○	
ZF16A	○	◎		
F0	◎		○	◎

Inserts for JIS type Brazed Tools

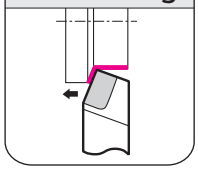
Dimensions (mm)

Shape	Cat. No.	Cemented Carbide: P (Steel) P10 ST10P	P20 ST20E	P30 ST30E	P40 ST40E	M (Stainless Steel) M20 U2	M40 A40	K (Cast Iron) K01 H3	K01 H2	K10 H1	K20 G10E	K20 G2	A	B	C	RE	Typical Applicable Holders	Fig
01 type Fig 1	01-0		●	●			●			●	●	●	10	6	3	4	31 type 32 type 45 type 46 type	1
	01-1		●	●			●	●		●	●		13	9	3	5		1
	01-2			●		●	●	●	●		●		16	11	4	5		1
	01-3		●	●		●		●			●	●	19	13	5	5		1
	01-4		●			●	●			●	●	●	22	15	6	8		1
	01-5												25	17	7	8		1
	01-6												30	20	8	8		1
02 type Fig 2	02-0	●	●	●		●	●	●	●	●	●	●	10	6	3	—	41 type 42 type	2
	02-1	●	●	●		●	●	●		●	●	●	13	9	3	—		2
	02-2	●	●	●	●	●	●	●	●	●	●	●	16	11	4	—		2
	02-3	●	●		●	●	●	●	●	●	●	●	19	13	5	—		2
	02-4	●	●	●		●	●	●	●	●	●	●	22	15	6	—		2
	02-5												25	17	7	—		2
	02-6												30	20	8	—		2
03 type Fig 3	03-0												10	—	3	—	37 type 38 type 47 type 48 type	3
	03-1							●					12	—	3	—		3
	03-2	●	●	●		●	●			●		●	15	—	4	—		3
	03-3					●				●	●		18	—	5	—		3
	03-4										●		24	—	6	—		3
	03-5												24	—	7	—		3
	03-6												28	—	8	—		3
04 type Fig 4 8°	04-0					●					●		10	6	3	4	33 type 34 type	4
	04-1		●								●		13	9	3	5		4
	04-2	●	●	●		●		●	●				16	11	4	5		4
	04-3		●				●	●		●			19	13	5	5		4
	04-4	●		●						●	●		22	15	6	8		4
	04-5												25	17	7	8		4
	04-6												30	20	8	8		4
05 type Fig 5 60°	05-1						●				●		5	8	3	—	49 type 50 type 51 type 52 type	5
	05-2					●		●	●				6	10	4	—		5
	05-3			●							●		7	12	5	—		5
	05-4		●	●			●				●		9	16	6	—		5
	05-5												10	18	7	—		5
	05-6												11	20	8	—		5
06 type Fig 6 RE 40°	06-0		●			●	●						10	10	3	2	36 type 39 type 40 type	6
	06-1					●	●			●			13	13	3	2.5		6
	06-2	●	●			●		●	●	●	●	●	16	16	4	3		6
	06-3	●	●	●		●	●	●	●	●	●		19	19	5	4		6
	06-4		●	●			●	●	●		●		22	22	6	4		6
	06-5												25	25	7	5		6
	06-6												30	30	8	6		6
07 type Fig 7 80°	07-0		●					●			●		10	10	3	—	35 type	7
	07-1												13	13	3	—		7
	07-2		●										16	16	4	—		7
	07-3		●					●		●	●		19	19	5	—		7
	07-4								●	●		●	25	20	6	—		7
	07-5												25	22	7	—		7
	07-6												30	25	8	—		7
08 type Fig 8	08-1			●		●	●	●		●		●	3	8	3	—	43 type	8
	08-3	●	●	●		●	●	●		●	●		4	13	4	—		8
	08-4	●	●	●	●	●	●	●	●	●	●	●	5	15	5	—		8
	08-5									●			6	17	6	—		8
	08-6									●			8	20	8	—		8

JIS type Brazed Tools

Dimensions (mm)

31 type (Right-handed)
32 type (Left-handed)
For Turning



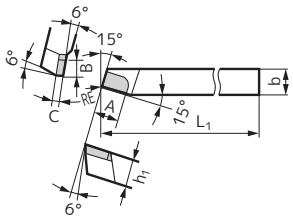
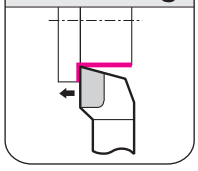
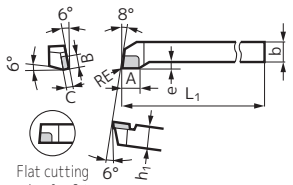


Figure shows right-handed tool.

Cat. No.	Cermet T1200A	P10 ST10P	P20 ST20E	P30 ST30E	P40 ST40E	M20 U2	M40 A40	K01 H3	K01 H2	K10 H1	K20 G10E	K20 G2	b	h_1	L_1	e	a_r	A	B	C	RE	Applicable Inserts
31-1			●										13	13	100	—	—	13	9	3	0.5	01-1
31-2			●			●					●		16	16	120	—	—	16	11	4	0.5	01-2
31-3			●	●		●			●	●	●		19	19	140	—	—	19	13	5	0.5	01-3
31-4	*		●			●			●		●	●	25	25	160	—	—	22	15	6	1	01-4
31-5	—												25	30	180	—	—	25	17	7	1	01-5
31-6	—												30	35	200	—	—	30	20	8	1	01-6
32-1			●	●			●						13	13	100	—	—	13	9	3	0.5	01-1
32-2				●			●						16	16	120	—	—	16	11	4	0.5	01-2
32-3			●	●		●					●		19	19	140	—	—	19	13	5	0.5	01-3
32-4	*		●	●			●		●		●		25	25	160	—	—	22	15	6	1	01-4
32-5	—												25	30	180	—	—	25	17	7	1	01-5
32-6	—												30	35	200	—	—	30	20	8	1	01-6

33 type (Right-handed)
34 type (Left-handed)
For Turning



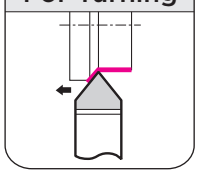


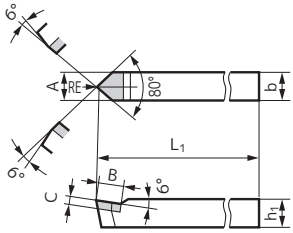
Flat cutting edge for 0 type

Figure shows right-handed tool.

Cat. No.	Cermet T1200A	P10 ST10P	P20 ST20E	P30 ST30E	P40 ST40E	M20 U2	M40 A40	K01 H3	K01 H2	K10 H1	K20 G10E	K20 G2	b	h_1	L_1	e	a_r	A	B	C	RE	Applicable Inserts
33-0		●	●	●		●	●		●	●	●	●	10	10	80	0	—	10	6	3	0.3	04-0
33-1			●	●		●	●	●	●	●	●	●	13	13	100	4	—	13	9	3	0.5	04-1
33-2	●	●	●	●		●	●	●	●	●	●	●	16	16	120	4	—	16	11	4	0.5	04-2
33-3	●	●	●	●	●	●	●	●	●	●	●	●	19	19	140	5	—	19	13	5	0.5	04-3
33-4	*	●	●	●	●	●	●	●	●	●	●	●	25	25	160	5	—	22	15	6	1	04-4
33-5	—												25	30	180	6	—	25	17	7	1	04-5
33-6	—												30	35	200	6	—	30	20	8	1	04-6
34-0			●	●		●			●	●	●	●	10	10	80	0	—	10	6	3	0.3	04-0
34-1		●	●	●		●	●		●	●	●	●	13	13	100	4	—	13	9	3	0.5	04-1
34-2	●		●	●		●	●		●	●	●		16	16	120	4	—	16	11	4	0.5	04-2
34-3	●		●	●	●	●	●		●	●	●	●	19	19	140	5	—	19	13	5	0.5	04-3
34-4	*		●	●		●	●		●	●	●	●	25	25	160	5	—	22	15	6	1	04-4
34-5	—												25	30	180	6	—	25	17	7	1	04-5
34-6	—												30	35	200	6	—	30	20	8	1	04-6

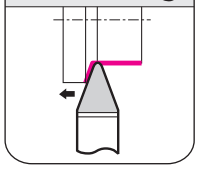
35 type
For Turning

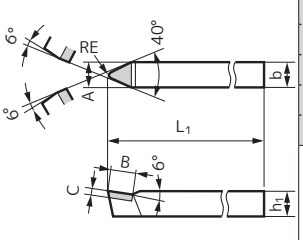




Cat. No.	Cermet T1200A	P10 ST10P	P20 ST20E	P30 ST30E	P40 ST40E	M20 U2	M40 A40	K01 H3	K01 H2	K10 H1	K20 G10E	K20 G2	b	h_1	L_1	e	a_r	A	B	C	RE	Applicable Inserts
35-0			●	●			●		●	●	●	●	10	10	80	—	—	10	10	3	0.3	07-0
35-1			●	●		●	●		●	●	●	●	13	13	100	—	—	13	13	3	0.5	07-1
35-2			●	●	●	●	●		●	●	●		16	16	120	—	—	16	16	4	0.5	07-2
35-3			●	●	●	●	●		●	●	●	●	19	19	140	—	—	19	19	5	0.5	07-3
35-4	*			●	●	●	●		●		●	●	25	25	160	—	—	25	20	6	1	07-4
35-5	—												25	30	180	—	—	25	22	7	1	07-5
35-6	—												30	35	200	—	—	30	25	8	1	07-6

36 type
For Turning





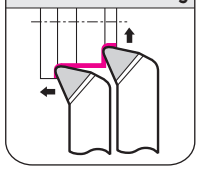
Cat. No.	Cermet T1200A	P10 ST10P	P20 ST20E	P30 ST30E	P40 ST40E	M20 U2	M40 A40	K01 H3	K01 H2	K10 H1	K20 G10E	K20 G2	b	h_1	L_1	e	a_r	A	B	C	RE	Applicable Inserts
36-0			●	●	●				●	●	●		10	10	80	—	—	10	10	3	2	06-0
36-1			●	●	●		●	●	●	●	●	●	13	13	100	—	—	13	13	3	2	06-1
36-2	●		●	●	●		●	●	●	●	●	●	16	16	120	—	—	16	16	4	3	06-2
36-3	●		●	●	●	●		●	●	●	●	●	19	19	140	—	—	19	19	5	4	06-3
36-4	*		●	●	●		●		●	●	●	●	25	25	160	—	—	22	22	6	4	06-4
36-5	—												25	30	180	—	—	25	25	7	5	06-5
36-6	—												30	35	200	—	—	30	30	8	6	06-6

Items marked * follow the insert dimensions of the SS-3 type (one size smaller) in their category. [Made to order]

JIS type Brazed Tools

Dimensions (mm)

37 type (Right-handed)
38 type (Left-handed)
For External Turning



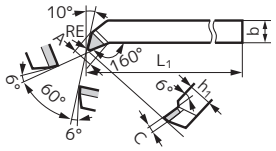
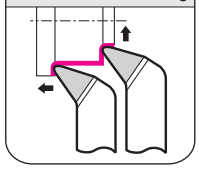


Figure shows right-handed tool.

39 type (Right-handed)
40 type (Left-handed)
For External Turning



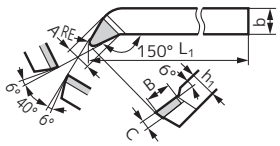
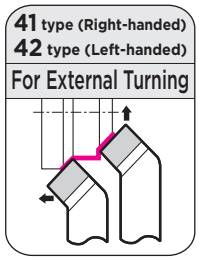


Figure shows right-handed tool.

41 type (Right-handed)
42 type (Left-handed)
For External Turning



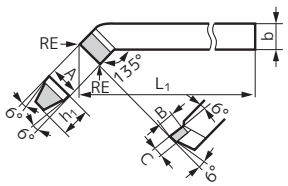
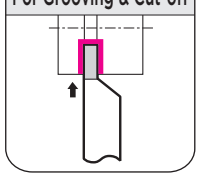
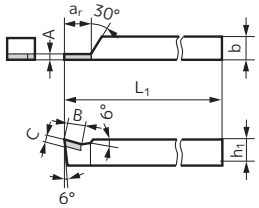


Figure shows right-handed tool.

43 type
For Grooving & Cut-off





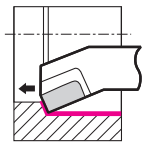
Shape	Cat. No.	Cermet	Cemented Carbide: P (Steel)						M (Stainless Steel)		K (Cast Iron)					Shank					Insert				Applicable Inserts
		T1200A	P10 ST10P	P20 ST20E	P30 ST30E	P40 ST40E			M20 U2	M40 A40	K01 H3	K01 H2	K10 H1	K20 G10E	K20 G2	b	h_1	L_1	e	a_r	A	B	C	RE	
37 type (Right-handed) 38 type (Left-handed) For External Turning	37-1			●									●	●		13	13	100	—	—	12	—	3	0.5	03-1
	37-2		●	●					●			●	●	●		16	16	120	—	—	15	—	4	0.5	03-2
	37-3		●	●	●				●	●		●	●	●		19	19	140	—	—	18	—	5	0.5	03-3
	37-4	*	●	●	●				●			●		●		25	25	160	—	—	24	—	6	1	03-4
	37-5	—														25	30	180	—	—	24	—	7	1	03-5
	37-6	—														30	35	200	—	—	28	—	8	1	03-6
	38-1			●										●		13	13	100	—	—	12	—	3	0.5	03-1
	38-2			●									●	●		16	16	120	—	—	15	—	4	0.5	03-2
	38-3		●	●	●				●				●	●		19	19	140	—	—	18	—	5	0.5	03-3
	38-4	*		●	●								●	●		25	25	160	—	—	24	—	6	1	03-4
	38-5	—														25	30	180	—	—	24	—	7	1	03-5
	38-6	—														30	35	200	—	—	28	—	8	1	03-6
39 type (Right-handed) 40 type (Left-handed) For External Turning	39-0		●	●					●	●			●	●		10	10	80	—	—	10	10	3	2	06-0
	39-1		●	●	●				●	●	●	●	●	●	●	13	13	100	—	—	13	13	3	2	06-1
	39-2	●	●	●	●				●	●	●	●	●	●	●	16	16	120	—	—	16	16	4	3	06-2
	39-3	●	●	●	●				●	●	●	●	●	●	●	19	19	140	—	—	19	19	5	4	06-3
	39-4	*	●	●	●				●	●		●	●	●	●	25	25	160	—	—	22	22	6	4	06-4
	39-5	—														25	30	180	—	—	25	25	7	5	06-5
	39-6	—														30	35	200	—	—	30	30	8	5	06-6
	40-0			●												10	10	80	—	—	10	10	3	2	06-0
	40-1		●	●	●					●			●	●	●	13	13	100	—	—	13	13	3	2	06-1
	40-2		●	●	●				●	●			●	●	●	16	16	120	—	—	16	16	4	3	06-2
	40-3		●	●	●				●	●		●	●	●	●	19	19	140	—	—	19	19	5	4	06-3
	40-4	*		●	●				●			●	●	●	●	25	25	160	—	—	22	22	6	4	06-4
	40-5	—														25	30	180	—	—	25	25	7	5	06-5
	40-6	—														30	35	200	—	—	30	30	8	5	06-6
41 type (Right-handed) 42 type (Left-handed) For External Turning	41-1		●	●						●				●		13	13	100	—	—	13	9	3	0.5	02-1
	41-2		●	●					●	●		●		●		16	16	120	—	—	16	11	4	0.5	02-2
	41-3		●	●	●				●	●		●	●	●	●	19	19	140	—	—	19	13	5	0.5	02-3
	41-4	*	●	●	●					●			●	●	●	25	25	160	—	—	22	15	6	1	02-4
	41-5	—														25	30	180	—	—	25	17	7	1	02-5
	41-6	—														30	35	200	—	—	30	20	8	1	02-6
	42-1			●										●		13	13	100	—	—	13	9	3	0.5	02-1
	42-2			●						●				●		16	16	120	—	—	16	11	4	0.5	02-2
	42-3		●	●	●				●	●				●		19	19	140	—	—	19	13	5	0.5	02-3
	42-4	*		●	●					●			●	●	●	25	25	160	—	—	22	15	6	1	02-4
	42-5	—														25	30	180	—	—	25	17	7	1	02-5
	42-6	—														30	35	200	—	—	30	20	8	1	02-6
43 type For Grooving & Cut-off	43-1		●	●					●	●		●	●	●		10	16	100	—	13	3	8	3	—	08-1
	43-2		●	●	●				●	●		●	●	●		13	19	120	—	16	3	8	3	—	08-1
	43-3	●	●	●	●				●	●		●	●	●	●	16	22	140	—	19	4	13	4	—	08-3
	43-4	*	●	●	●				●	●		●	●	●	●	19	25	160	—	25	5	15	5	—	08-4
	43-5	—														22	32	180	—	30	6	17	6	—	08-5
	43-6	—														25	38	200	—	40	8	20	8	—	08-6

Items marked * follow the insert dimensions of the SS-3 type (one size smaller) in their category. [Made to order]

JIS type Brazed Tools

Dimensions (mm)

45 type (Right-handed)
46 type (Left-handed)
For Internal Boring



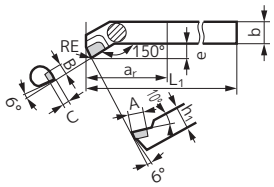
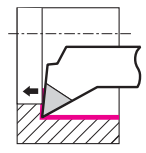


Figure shows right-handed tool.

Cat. No.	Cermet T1200A	P (Steel) P10 ST10P	P20 ST20E	P30 ST30E	P40 ST40E	M (Stainless Steel) M20 U2	M40 A40	K (Cast Iron) K01 H3	K01 H2	K10 H1	K20 G10E	K20 G2	Shank b	h_1	L_1	e	a_r	Insert A	B	C	RE	Applicable Inserts
45-1													13	13	140	7	50	10	6	3	0.5	01-0
45-2			●										16	16	160	9	60	13	9	3	0.5	01-1
45-3			●										19	19	190	11	80	16	11	4	0.5	01-2
45-4			●										25	25	230	13	100	19	13	5	1	01-3
46-1													13	13	140	7	50	10	6	3	0.5	01-0
46-2													16	16	160	9	60	13	9	3	0.5	01-1
46-3													19	19	190	11	80	16	11	4	0.5	01-2
46-4													25	25	230	13	100	19	13	5	1	01-3

47 type (Right-handed)
48 type (Left-handed)
For Internal Boring



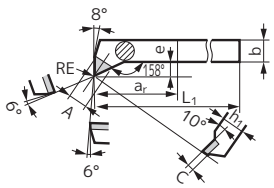
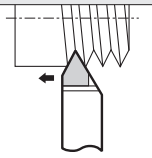


Figure shows right-handed tool.

Cat. No.	Cermet T1200A	P (Steel) P10 ST10P	P20 ST20E	P30 ST30E	P40 ST40E	M (Stainless Steel) M20 U2	M40 A40	K (Cast Iron) K01 H3	K01 H2	K10 H1	K20 G10E	K20 G2	Shank b	h_1	L_1	e	a_r	Insert A	B	C	RE	Applicable Inserts
47-1		●	●								●		13	13	140	7	50	10	—	3	0.5	03-0
47-2		●	●								●		16	16	160	8	60	12	—	3	0.5	03-1
47-3			●								●		19	19	190	9	80	15	—	4	0.5	03-2
47-4			●								●		25	25	230	10	100	18	—	5	1	03-3
48-1													13	13	140	7	50	10	—	3	0.5	03-0
48-2													16	16	160	8	60	12	—	3	0.5	03-1
48-3													19	19	190	9	80	15	—	4	0.5	03-2
48-4													25	25	230	10	100	18	—	5	1	03-3

49 type (Right-handed)
50 type (Left-handed)
For External Threading



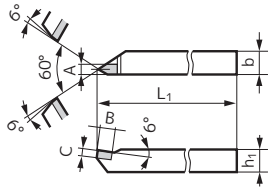
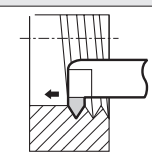


Figure shows right-handed tool.

Cat. No.	Cermet T1200A	P (Steel) P10 ST10P	P20 ST20E	P30 ST30E	P40 ST40E	M (Stainless Steel) M20 U2	M40 A40	K (Cast Iron) K01 H3	K01 H2	K10 H1	K20 G10E	K20 G2	Shank b	h_1	L_1	e	a_r	Insert A	B	C	RE	Applicable Inserts
49-1			●										13	13	100	—	—	5	8	3	—	05-1
49-2			●										16	16	120	—	—	6	10	4	—	05-2
49-3		●	●	●		●					●		19	19	140	—	—	7	12	5	—	05-3
49-4		●	●	●		●					●		25	25	160	—	—	9	16	6	—	05-4
50-1													13	13	100	—	—	5	8	3	—	05-1
50-2													16	16	120	—	—	6	10	4	—	05-2
50-3													19	19	140	—	—	7	12	5	—	05-3
50-4													25	25	160	—	—	9	16	6	—	05-4

51 type (Right-handed)
52 type (Left-handed)
For Internal Threading



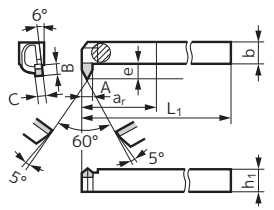
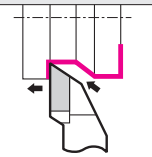
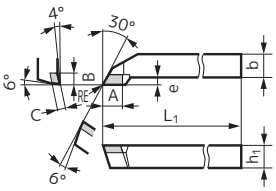


Figure shows right-handed tool.

Cat. No.	Cermet T1200A	P (Steel) P10 ST10P	P20 ST20E	P30 ST30E	P40 ST40E	M (Stainless Steel) M20 U2	M40 A40	K (Cast Iron) K01 H3	K01 H2	K10 H1	K20 G10E	K20 G2	Shank b	h_1	L_1	e	a_r	Insert A	B	C	RE	Applicable Inserts
51-1			●								●		13	13	140	8	50	5	8	3	—	05-1
51-2			●										16	16	160	10	60	6	10	4	—	05-2
51-3			●				●				●		19	19	190	12	80	7	12	5	—	05-3
51-4			●										25	25	230	16	100	9	16	6	—	05-4
52-1													13	13	140	8	50	5	8	3	—	05-1
52-2													16	16	160	10	60	6	10	4	—	05-2
52-3													19	19	190	12	80	7	12	5	—	05-3
52-4													25	25	230	16	100	9	16	6	—	05-4

95 type
For External Profiling





Cat. No.	Cermet T1200A	P (Steel) P10 ST10P	P20 ST20E	P30 ST30E	P40 ST40E	M (Stainless Steel) M20 U2	M40 A40	K (Cast Iron) K01 H3	K01 H2	K10 H1	K20 G10E	K20 G2	Shank b	h_1	L_1	e	a_r	Insert A	B	C	RE	Applicable Inserts
95-1		●											25	25	160	5	—	20	10	7	1.7	09-E