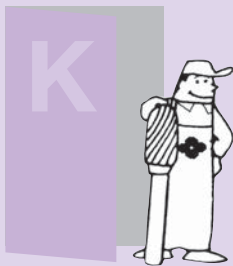


Carbide Materials Braze Tools K1 to K11

K



Carbide Material Features and Applications	K2
Plate Blanks	K4
Rod Blanks	K5
Special Rod Blanks	K6
JIS type Inserts for Carbide Tool Holders	K8
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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

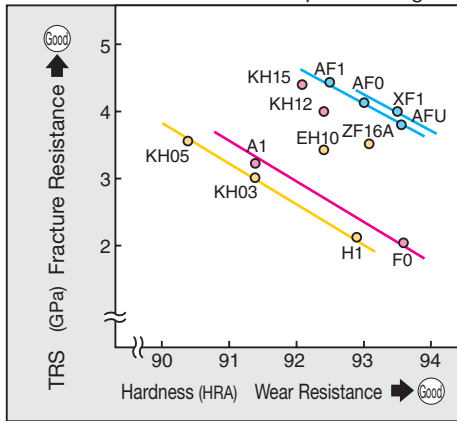
- Stringent selection of high purity and high quality raw materials
- Consistent quality and shorter delivery with the latest production facilities and techniques
- Fully equipped with the latest quality assurance system
- Constant R&D to develop the latest grades

Carbide Materials
Brazed Tools

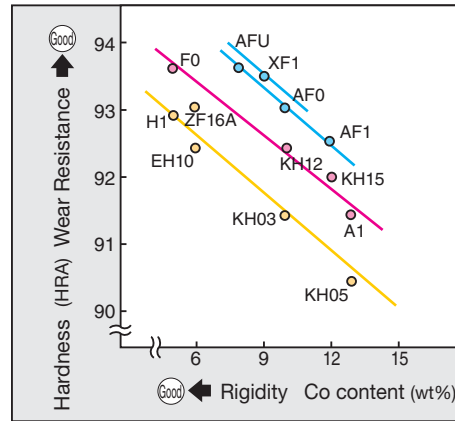
K

■ Grade Map

● Hardness and Transverse Rupture Strength



● Co Content vs Hardness



■ Grade Properties and Features

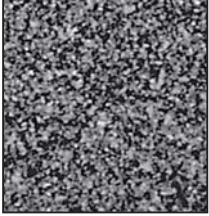
Classification	Grade	Properties					Features	Applications
		Grain Size ¹ (μm)	Co Content (wt%)	Transverse Rupture Strength ² (GPa)	Hardness (HRA)	Hardness HV (GPa)		
Ultra-fine Grained Carbide	XF1	0.2	9.0	4.0	93.5	20.4	Ultra-fine grained carbide with the world's finest grains	Microdrills, Very Small 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

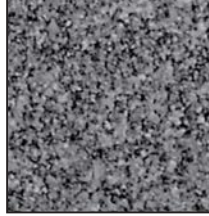
● Ultra-fine Grained Carbide



AF1

Average Grain Size: 0.5µm

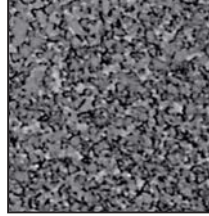
● Micro-fine Grained Carbide



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	●	●	●		●	○	○		○						
	Refer to page K7 for the recommended grades for PCB drills and routers.														
KH12	●	●				◎	◎	○	○	○	○	○	○	○	
KH15	●					◎	◎	○	◎	◎	◎				
F0				●											
	Refer to page K7 for the recommended grades for PCB drills and routers.														
KH03	●	●				○	○	○	○	◎	◎				
	Refer to page K7 for the recommended grades for PCB drills and routers.														
KH05					●	Cannot be used as cutting tool material.									
H1	●	●	●			○	○	○	○			◎	◎	◎	
	Refer to page K7 for the recommended grades for PCB drills and routers.														
EH10	●	●	●			○	○	○	○	◎	◎	◎	◎	◎	
	Refer to page K7 for the recommended grades for PCB drills and routers.														
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.

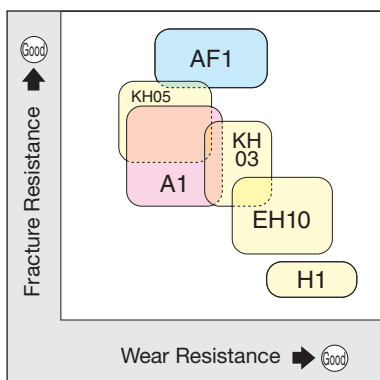
● KH series

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

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

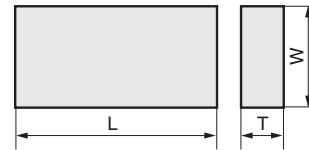
Properties and Applications

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

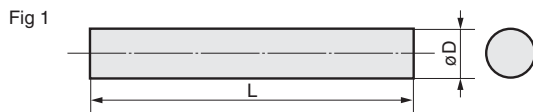
Cat. No.	T		L		W		Grade				Fig
	Nominal Size	Tolerance	Nominal Size	Tolerance	Nominal Size	Tolerance	A1	AF1	KH03	KH05	
OB10060012	1.2						●	●	●	●	1
OB10060015	1.5						●	●	●	●	1
OB10060020	2.0	+0.5	100	+1.5	60	+1.0	●	●	●	●	1
OB10060025	2.5	+0.2		0		0	●	●	●	●	1
OB10060030	3.0						●	●	●	●	1
OB10060040	4.0						●	●	●	●	1
OB15060020	2.0						●	●	●	●	1
OB15060025	2.5						●	●	●	●	1
OB15060030	3.0						●	●	●	●	1
OB15060035	3.5						●	●	●	●	1
OB15060040	4.0						●	●	●	●	1
OB15060045	4.5						●	●	●	●	1
OB15060050	5.0	+0.5	150	+1.5	60	+1.0	●	●	●	●	1
OB15060055	5.5	+0.2		0		0	●	●	●	●	1
OB15060060	6.0						●	●	●	●	1
OB15060070	7.0						●	●	●	●	1
OB15060080	8.0						●	●	●	●	1
OB15060090	9.0						●	●	●	●	1
OB15060100	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.



Stock

- Length L = 310

Dimensions (mm)

Cat. No.	ø D		L		Grade				Fig
	Nominal Size	Tolerance	Nominal Size	Tolerance	A1	AF1	EH10	H1	
AR010310	1.0	+0.3	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	+0.6 +0.3			*	*	*	*	1
AR075310	7.5				*	*	*	*	1
AR080310	8.0				*	*	*	*	1
AR090310	9.0				*	*	*	*	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.

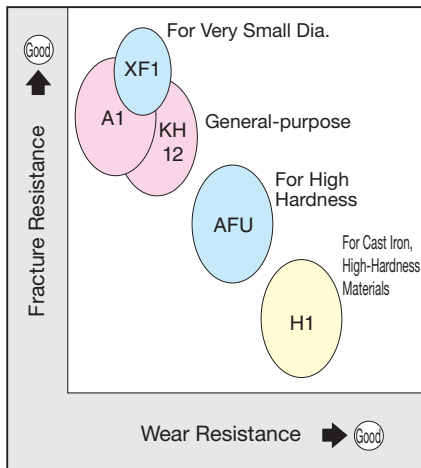
Items marked * are semi-standard stock.

Please inquire about stock availability when ordering.

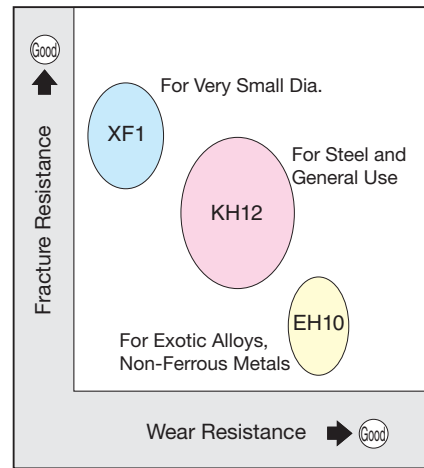
- For length requirements other than L=310mm, refer to "Special Rod Blanks" on page K6 for the available made-to-order specifications.

Special Rod Blanks

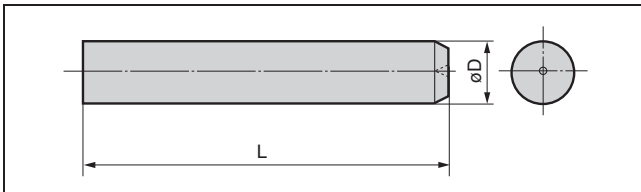
Endmill Blanks



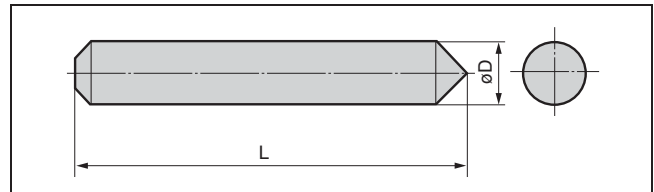
Drill Blanks



Endmill Mill-scale Blank Shapes (Example)



Drill Mill-scale Blank Shapes (Example)



O.D. Dimensions (mm)

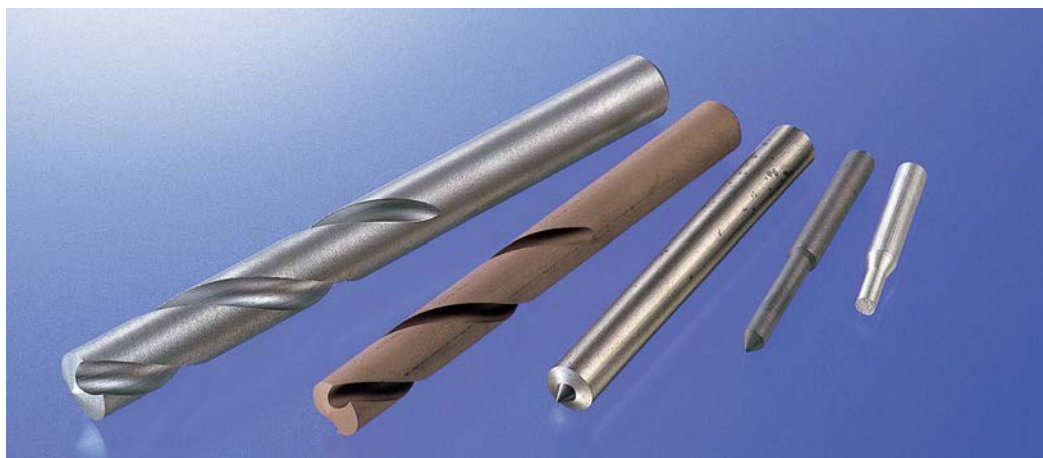
øD	Tolerance
$1.0 \leq D < 3.0$	+0.3 +0.2
$3.0 \leq D \leq 8.0$	+0.5 +0.3
$8.0 < D \leq 15.0$	+0.6 +0.3
$15.0 < D \leq 25.0$	+0.7 +0.3

Rods with steps can be made to order.
*XF1 is available up to $\leq \phi 16$.

Overall Length Dimensions (mm)

L	Tolerance	Warpage
$40 \leq L < 310$	Overall Length $\pm 0.5\%$	0.15
$310 \leq L \leq 330$	Overall Length $+6.0$ 0	

Ground rods can be made to order.

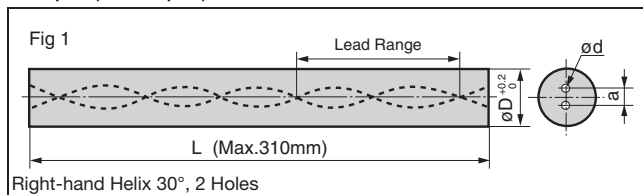


Special Rod Blanks

Drill Blanks with Oil Holes



Shape (Example)

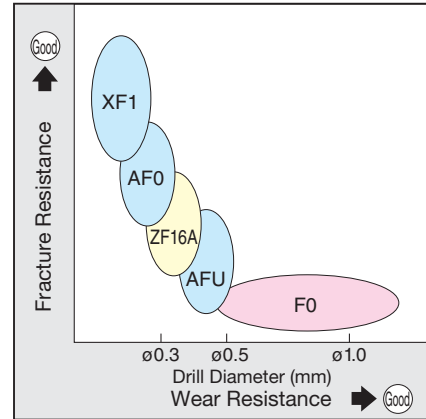


Dimensions

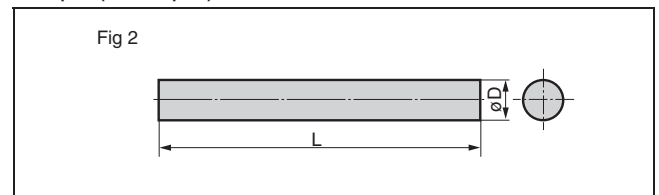
(mm)

Applications	External øD	Core Diameter øD1	Hole Dia. ød	Oil Hole Pitch a	Lead Range	Grade		Fig
						KH12	KH03	
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)



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.

Grade Application (◎: Best, ○: Good)

-By Tool Diameter

Dimensions (mm)

Grade	Very Small Diameter (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	◎		○	◎

JIS type Inserts for Carbide Tool Holders

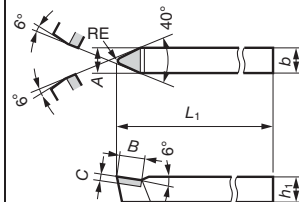
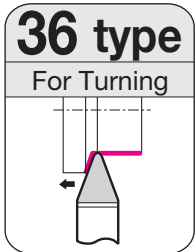
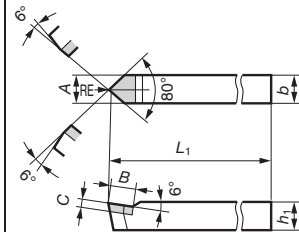
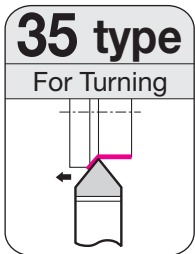
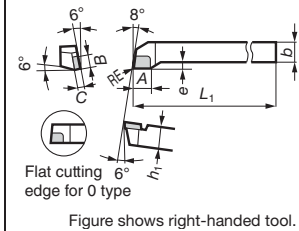
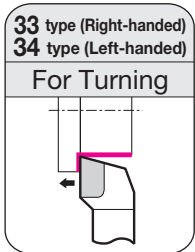
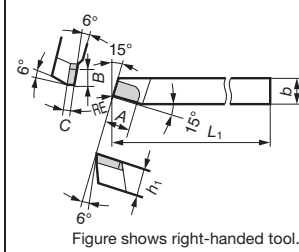
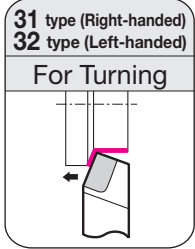
Dimensions (mm)

Shape	Cat. No.	Cemented Carbide										A	B	C	RE	Typical Applicable Holders	Fig
		P (Steel)				M (Stainless Steel)		K (Cast Iron)									
		P10	P20	P30	P40	M20	M40	K01	K01	K10	K20						
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 	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 	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 	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 	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

Carbide Materials
Brazed Tools
K

JIS type Carbide Tool Holders

Dimensions (mm)



Shape	Cat. No.	Cemented Carbide										Shank					Insert				Applicable Insert		
		T1200A	Cermet		P (Steel)				M (Stainless Steel)		K (Cast Iron)		b	h ₁	L ₁	e	a _r	A	B	C		RE	
			P10	P20	P30	P40	M20	M40	K01	K01	K10	K20											K20
			ST10P	ST20E	ST30E	ST40E	U2	A40	H3	H2	H1	G10E											G2
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		
33-0												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		
35-0												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	—	—	22	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		
36-0												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	5	06-6		

Items marked * follow the insert dimensions of the ○○-3 type (one size smaller) in their category. <Made to order>

Carbide Materials
Brazed Tools

K

JIS type Carbide Tool Holders

Dimensions (mm)

Carbide Materials
Brazed Tools

K

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

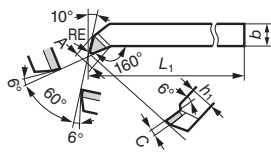
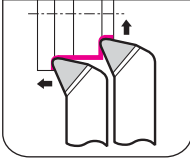


Figure shows right-handed tool.

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

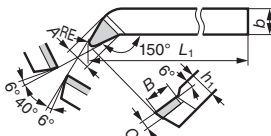
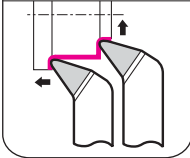


Figure shows right-handed tool.

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

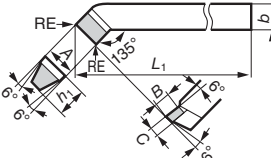
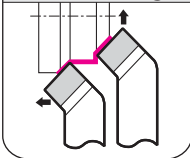
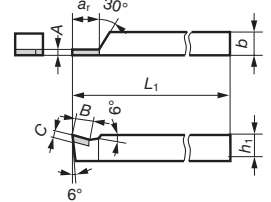
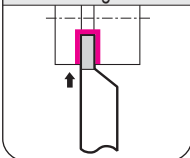


Figure shows right-handed tool.

43 type
For Grooving & Cut-off



Shape	Cat. No.	Cemented Carbide										Shank					Insert				Applicable Insert		
		Cermets		P (Steel)				M (Stainless Steel)		K (Cast Iron)		b	h ₁	L ₁	e	a _r	A	B	C	RE			
		T1200A	ST10P	ST20E	ST30E	ST40E	U2	A40	H3	H2	H1											G10E	G2
37 type (Right-handed) 38 type (Left-handed) For 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 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 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 ○○-3 type (one size smaller) in their category. <Made to order>

JIS type Carbide Tool Holders

Dimensions (mm)

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

Shape	Cat. No.	Cemented Carbide										Shank				Insert				Applicable Insert											
		T1200A	Cermet				P (Steel)		M (Stainless Steel)	K (Cast Iron)		b	h ₁	L ₁	e	a _r	A	B	C		RE										
			P10	P20	P30	P40	M20	M40	K01	K10	K20											K20									
			ST10P	ST20E	ST30E	ST40E	U2	A40	H3	H2	H1											G10E	G2								
	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

Figure shows right-handed tool.

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

	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

Figure shows right-handed tool.

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

	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

Figure shows right-handed tool.

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

	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

Figure shows right-handed tool.

95 type
For External Profiling

	95-1			●																		25	25	160	5	—	20	10	7	1.7	09-E
--	------	--	--	---	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	----	----	-----	---	---	----	----	---	-----	------

Carbide Materials
Brazed Tools
K

