

# CUTTING TOOLS

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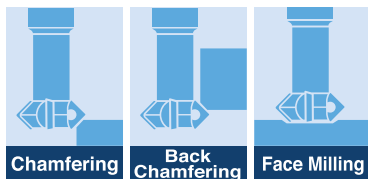


Ultra High Feed Chamfer Mill

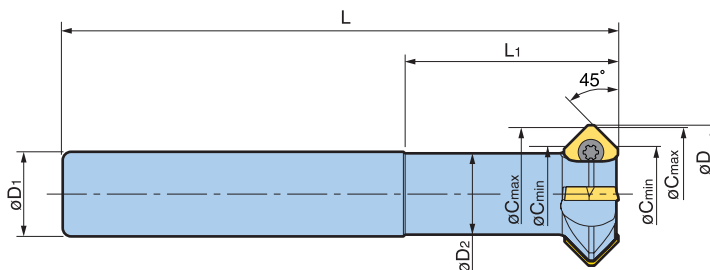
## C-CUTTER mini

### Front & back chamfering

Multi insert type



World's smallest  
Hexagon insert



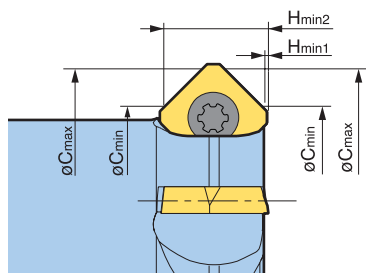
● in the table indicates Long Type

Chamfer		Model	øD	øD1	øD2	L	L1	Insert Model	No. of Insert	Insert Clamping Screw Set
øCmin	øCmax									
10	12	ST12-C1012-45B-20	12.7	12	9.0	93	20	CM04 ...	3	S2SS-T6
		-35 ●				108	35			
11	16	ST12-C1116-45B-25	17.1	12	9.6	98	25	CM05 ...	4	S2TS-T6
		-40 ●				113	40			
15	20	ST16-C1520-45B-50	20.7	16	13.2	123	50	CM10 ...	4	S4S-T15
19	24	ST20-C1924-45B-60	24.7	20	17.2	143	60			
22	32	ST20-C2232-45B-50	32.7	20	19.2	130	50	CM10 ...	4	S4S-T15
		-80 ●				160	80			
32	42	ST32-C3242-45B-65	42.7	32	30.6	175	65	CM10 ...	4	S4S-T15
		-100 ●				211	100			

1. Wrench and screw are included. Inserts are ordered separately (10/pkg).
2. 10 screws and 1 wrench are included in Insert Clamping Screw Set.
3. In case of chamfering with 4 insert type, chatter may occur due to increasing cutting force when plunge cutting. Please try the different types with less inserts, 1 or 2.

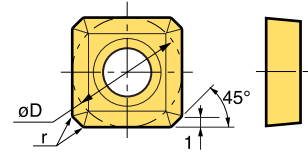
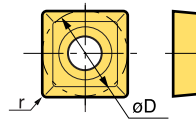
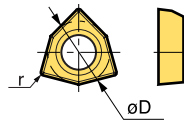
Refer to the Cutting Condition on page 130

### Detailed dimension



Cutter type	øCmin	øCmax	Hmin1	Hmin2
C1012	10	12	1.0	3.7
C1116	11	16	0.4	6.2
C1520	15	20	0.6	6.3
C1924	19	24	0.6	6.3
C2232	22	32	0.4	12.4
C3242	32	42	0.4	12.4

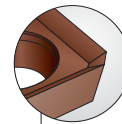
## Indexable Inserts



The suffix **SE** designates a sharp cutting edge version.

Fig.	Insert Model	øD	Nose Red. r	P	M	K	N
				ACP300	ACP200	DS20	
1	CM0402	3.97	0.2	○	—	—	—
2	CM0502	5	0.2	—	○	○	○
	CM0502SE			—	○	—	—
3	CM10C1	10	C1	—	○	○	○
	CM10C1SE			—	○	—	—

1. Inserts are available in packet of 10pcs. Please specify model number and grade. (ie: CM0502-ACP200)
2. It is recommended to regularly replace clamping screws and wrench to ensure the correct clamping force is maintained.



**New release, sharp cutting edge insert!!** NEW

Sharp cutting edge minimises the generation of burrs. This is especially beneficial when cutting stainless and mild steel materials.

### Anti-seizure Lubricant



5g contained

Model **BN-5**

## Recommended cutting condition

Work Material	Insert Size	Insert Grade	Side Cutting		Plunge Cutting		Face Milling (CM10 insert only)	
			Vc (m/min)	f (mm/tooth)	Vc (m/min)	f (mm/tooth)	Vc (m/min)	f (mm/tooth)
General steel Alloy steel	CM04	ACP300	100 - 300	0.05 - 0.15	100 - 200	0.06 - 0.12	—	—
	CM05	ACP200	100 - 350	0.08 - 0.18	100 - 200	0.06 - 0.12	—	—
	CM10		100 - 350	0.08 - 0.25	100 - 220	0.08 - 0.18	100 - 200	0.1 - 0.2
High-alloy steel	CM04	ACP300	100 - 180	0.05 - 0.15	100 - 180	0.05 - 0.12	—	—
	CM05	ACP200	100 - 200	0.08 - 0.18	100 - 200	0.06 - 0.12	—	—
	CM10		100 - 220	0.08 - 0.22	100 - 250	0.06 - 0.16	100 - 220	0.08 - 0.2
Prehardened steel (Less than HRC40)	CM04	ACP300	50 - 80	0.05 - 0.08	50 - 80	0.04 - 0.10	—	—
	CM05	ACP200	60 - 100	0.06 - 0.10	60 - 100	0.04 - 0.12	—	—
	CM10		60 - 120	0.06 - 0.10	60 - 120	0.04 - 0.15	60 - 100	0.05 - 0.1
Stainless steel	CM04	ACP300	60 - 150	0.05 - 0.18	60 - 150	0.03 - 0.10	—	—
	CM05	ACP200	100 - 200	0.08 - 0.20	80 - 200	0.05 - 0.12	—	—
	CM10		SE	100 - 250	0.08 - 0.30	80 - 220	0.06 - 0.16	80 - 150
Cast iron	CM04	ACP300	80 - 150	0.05 - 0.20	80 - 150	0.06 - 0.12	—	—
	CM05	ACP200	100 - 200	0.08 - 0.30	100 - 200	0.08 - 0.15	—	—
	CM10		100 - 300	0.08 - 0.40	100 - 300	0.08 - 0.20	100 - 180	0.1 - 0.25
Aluminum	CM04	ACP300	100 - 800	0.05 - 0.20	100 - 600	0.05 - 0.20	—	—
	CM05	DS20	150 - 800	0.08 - 0.30	100 - 800	0.08 - 0.25	—	—
	CM10		200-1,000	0.08 - 0.45	200 -1,000	0.08 - 0.30	100 -1,000	0.05 - 0.3

1. The table is just a reference to determine cutting conditions. It should be adjusted according to the condition of the machine tool and workpiece.
2. Wet cutting is recommended to obtain the good surface quality.
3. In case built-up edge occurs cutting aluminum and stainless steel, use soluble oil.
4. Standard length type (w/o ● models) are recommended for stainless and pre-hardened steel.

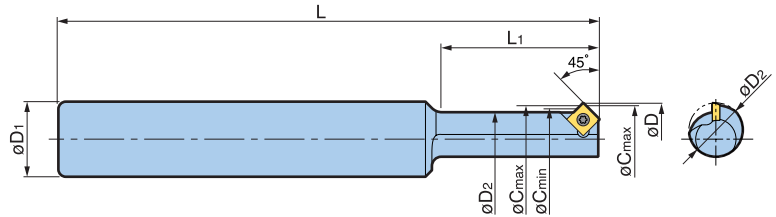
Ultra High Feed Chamfer Mill

## C-CUTTER mini

### Front & back chamfering

Bolt hole & starting hole for tapping type

Tap size : M8 - M20



● in the table indicates Long Type

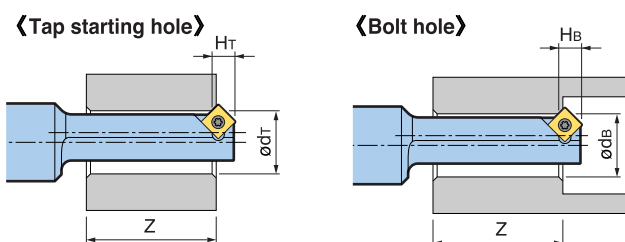
Chamfer		Model	øD	øD1	øD2	L	L1	Insert Model	Insert Clamping Screw Set
øCmin	øCmax								
6.6	8.4	ST10-CM08-45B-19	9.2	10	6.3	81	19	CM04...	S2SS-T6
		-35●							
8.3	10.5	ST12-CM10-45B-25	11.3	12	8.0	99	25	CM05...	S2TS-T6
		-45●							
		ST12-CM12-45B-29							
10.0	12.6	ST12-CM12-45B-29	13.4	12	9.7	102	29	CM05...	S2TS-T6
		-53●							
11.8	14.7	ST16-CM14-45B-33	15.5	16	11.5	107	33	CM05...	S2TS-T6
		-61●							
13.8	16.8	ST16-CM16-45B-37	17.6	16	13.5	110	37	CM05...	S2TS-T6
		-69●							
15.2	18.9	ST20-CM18-45B-42	19.7	20	14.9	126	42	CM05...	S2TS-T6
		-78●							
17.2	21.0	ST20-CM20-45B-46	21.8	20	16.9	129	46	CM05...	S2TS-T6
		-86●							

1. Wrench and screw are included. Inserts are ordered separately (10/pkg).
2. 10 screws and 1 wrench are included in Insert Clamping Screw Set.
3. For ● Long Type, standard insert is recommended rather than "SE" sharp edge insert to avoid chipping.

Refer to the Cutting Condition on page 132

### Detailed dimension

Cutter Type	øCmin1	øCmin2	øCmax	Hmin1	Hmin2	Offset F
CM08	6.4	6.6	8.4	1.0	3.7	1.45
CM10	5.5	8.3	10.5	0.5	5.0	1.65
CM12	7.6	10.0	12.6	0.5	5.2	1.85
CM14	9.7	11.8	14.7	0.5	5.3	2.00
CM16	11.8	13.8	16.8	0.5	5.4	2.05
CM18	13.9	15.2	18.9	0.5	5.7	2.40
CM20	16.0	17.2	21.0	0.5	5.8	2.45



Cutter Type	Tap starting hole		Bolt hole		Z	
	øDr	HT	øDb	HB	Standard type	Long type
CM08	6.8(M8)	3.6	6.6 (M6)	3.7	13	29
CM10	8.5(M10)	4.9	9 (M8)	4.6	17	37
CM12	10.3(M12)	5.0	11 (M10)	4.7	21	45
CM14	12.0(M14)	5.2	-	-	25	53
CM16	14.0(M16)	5.3	14 (M12)	5.3	29	61
CM18	15.5(M18)	5.6	16 (M14)	5.3	33	69
CM20	17.5(M20)	5.6	18 (M16)	5.4	37	77

## Indexable Inserts

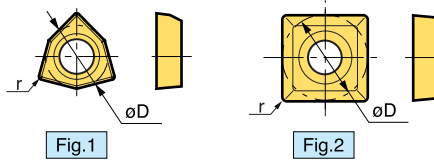
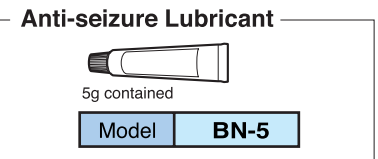


Fig.	Insert Model	øD	Nose Red. r	P	M	K	N
				ACP300	ACP200	DS20	
1	CM0402	3.97	0.2	○	-	-	-
2	CM0502	5	0.2	-	○	○	-



1. Inserts are available in packet of 10pcs. Please specify model number and grade. (ie: CM0502-ACP200)
2. It is recommended to regularly replace clamping screws and wrench to ensure the correct clamping force is maintained.

## Recommended cutting condition

Work Material	Cutter Type	Insert Grade	Standard Type		● Long Type		
			Vc (m/min)	f (mm/rev)	Vc (m/min)	f (mm/rev)	
General steel Alloy steel	CM08	ACP300	80 - 180	0.03 - 0.10	30 - 80	0.03 - 0.08	
	CM10, CM12	ACP200	120 - 200	0.04 - 0.12	30 - 100	0.04 - 0.1	
	CM14, CM16		120 - 200	0.04 - 0.15	30 - 100	0.04 - 0.1	
	CM18, CM20		120 - 250	0.05 - 0.20	40 - 100	0.05 - 0.12	
High-alloy steel	CM08	ACP300	80 - 160	0.03 - 0.08	20 - 80	0.03 - 0.08	
	CM10, CM12	ACP200	100 - 180	0.04 - 0.10	30 - 100	0.04 - 0.1	
	CM14, CM16		100 - 200	0.04 - 0.10	30 - 100	0.04 - 0.1	
	CM18, CM20		100 - 220	0.05 - 0.12	40 - 100	0.05 - 0.12	
Prehardened steel (Less than HRC40)	CM08	ACP300	40 - 80	0.03 - 0.08	20 - 80	0.03 - 0.08	
	CM10, CM12	ACP200	40 - 80	0.04 - 0.10	30 - 80	0.04 - 0.1	
	CM14, CM16		40 - 80	0.04 - 0.10	30 - 80	0.04 - 0.1	
Stainless steel	CM18, CM20	ACP200	40 - 100	0.05 - 0.12	40 - 100	0.05 - 0.12	
	CM08		ACP300	60 - 120	0.03 - 0.08	20 - 80	0.03 - 0.08
	CM10, CM12		ACP200	60 - 120	0.04 - 0.10	30 - 100	0.04 - 0.1
	CM14, CM16			60 - 150	0.04 - 0.10	30 - 100	0.04 - 0.1
Cast iron	CM18, CM20	ACP200	60 - 150	0.05 - 0.12	40 - 100	0.05 - 0.1	
	CM08		ACP300	80 - 150	0.03 - 0.08	20 - 100	0.03 - 0.08
	CM10, CM12		ACP200	100 - 180	0.04 - 0.10	30 - 100	0.04 - 0.12
	CM14, CM16			100 - 200	0.04 - 0.10	30 - 120	0.04 - 0.12
Aluminum	CM18, CM20	ACP200	100 - 250	0.05 - 0.12	50 - 150	0.05 - 0.15	
	CM08		ACP300	100 - 500	0.03 - 0.08	20 - 100	0.03 - 0.08
	CM10, CM12		DS20	100 - 600	0.04 - 0.10	30 - 120	0.04 - 0.1
	CM14, CM16			100 - 800	0.04 - 0.15	30 - 120	0.04 - 0.1
CM18, CM20	ACP200	100 - 800	0.05 - 0.20	40 - 150	0.05 - 0.12		

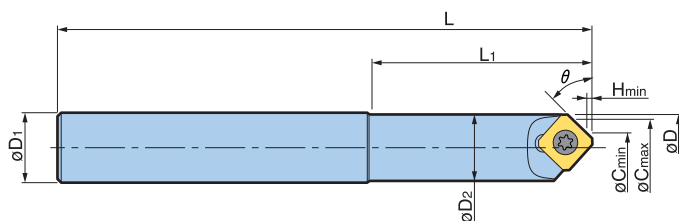
Vc: Cutting speed (m/min.) f: Feed per revolution (mm/rev.)

1. The table is just a reference to determine cutting conditions. It should be adjusted according to the condition of the machine tool and workpiece.
2. Wet cutting is recommended to obtain the good surface quality.
3. In case built-up edge occurs cutting aluminum and stainless steel, use soluble oil.
4. Standard length type (w/o ● models) are recommended for stainless and pre-hardened steel.

Ultra High Feed Chamfer Mill

## C-CUTTER mini

### Front chamfering



● in the table indicates Long Type

Chamfer		Chamfering angle $\theta$	Model	$\phi D$	$\phi D_1$	$\phi D_2$	L	L <sub>1</sub>	H <sub>min</sub>	Insert Model	Insert Clamping Screw Set
$\phi C_{min}$	$\phi C_{max}$										
2	7	45°	ST10-C0207-45-20	8.1	10	7.8	81	20	0.4	CM05...	S2TS-T6
			-35 ●				96	35			
5	15	45°	ST16-C0515-45-50	15.8	16	15.2	122	50	0.4	CM10...	S4S-T15
2	14	30°	ST16-C0214-30-40	15.9	16	15.4	105	40	0.2	CM10...	
9	16	60°	ST16-C0916-60-40	16.5	16	15.6	105	40	0.8	CM10...	

1. Wrench and screw are included. Inserts are ordered separately (10/pkg).

2. 10 screws and 1 wrench are included in Insert Clamping Screw Set.

3. Centering is not possible.

### Indexable Inserts

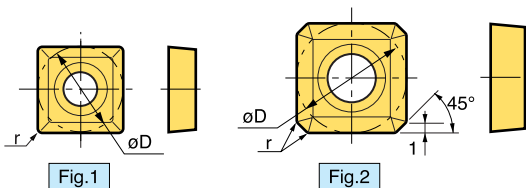
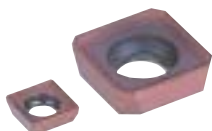


Fig.	Insert Model	$\phi D$	Nose Red. r	P	M	K	N
				ACP200			DS20
1	CM0502	5.0	0.2	○	○	○	○
2	CM10C1	10.0	C1	○	○	○	○

1. Inserts are available in packet of 10pcs. Please specify model number and grade. (ie: CM0502-ACP200)

2. It is recommended to regularly replace clamping screws and wrench to ensure the correct clamping force is maintained.

### Anti-seizure Lubricant



5g contained

Model **BN-5**

### Recommended cutting condition

Work Material	Insert Model	Insert Grade	Plunge Cutting	
			V <sub>c</sub> (m/min)	f (mm/rev)
General steel Alloy steel	CM05	ACP200	100 - 250	0.08 - 0.18
	CM10			0.08 - 0.20
Prehardened steel (Less than HRC40)	CM05	ACP200	60 - 150	0.08 - 0.15
	CM10			0.08 - 0.18
Stainless steel	CM05	ACP200	60 - 120	0.06 - 0.10
	CM10			0.08 - 0.15
Cast iron	CM05	ACP200	80 - 200	0.08 - 0.18
	CM10			0.08 - 0.25
Aluminum	CM05	DS20	100 - 1,000	0.08 - 0.25
	CM10			0.08 - 0.35

1. The table is just a reference to determine cutting conditions.

It should be adjusted according to the condition of the machine tool and workpiece.

2. Wet cutting is recommended to obtain the good surface quality.

3. In case built-up edge occurs cutting aluminum and stainless steel, use soluble oil.

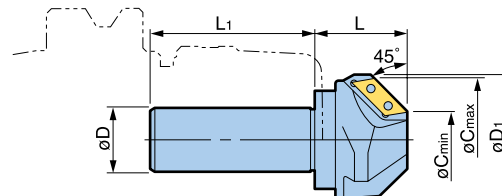
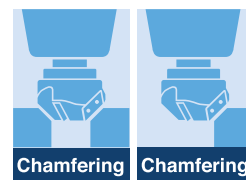
4. Standard length type (w/o ● models) are recommended for stainless and pre-hardened steel.

## Chamfer cutter **C-CUTTER**



One C-Cutter to cover a wide chamfering range.

ø5 - ø25
ø10 - ø40
ø30 - ø60
ø50 - ø100

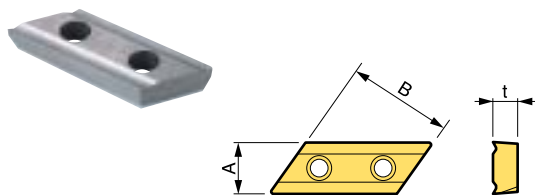


Chamfer		Model	øD	øD1	L	L1	No. of Insert	Insert Model	Screw Set	Wrench
øCmin.	øCmax.									
5.0	25.0	<b>ST20-C0525</b>	20	33	25	48	1	CW12	S2S-B	FLR-13S
10.0	40.0	<b>ST25-C1040</b>	25	45	35	58	2	CW19	S3S	FLR-20S
30.0	60.0	<b>ST32-C3060</b>	32	65	45	80	3			
50.0	100.0	<b>ST42-C50100</b>	42	106	70	80	3	CW31	S5S	FLR-28S

1. Inserts are ordered separately. An Insert Clamping key and Screws are included.
2. 10pcs. of screws and 1pce. of wrench are included in Screw Set.

C-Cutter with **coolant through holes** is available. Please add "C" after each model number when ordering.  
Example : **ST20-C0525C**

### ■ Exclusive indexable



**A**=Non-coated **AZX**=TiCN+TiAlN multilayer coating

Insert Model	A	B	t	P30	P20
				A	AZX
<b>CW1206</b>	6.35	12.7	2.7	○	○
<b>CW1909</b>	9.525	19.05	4.5	○	○
<b>CW3115</b>	15.875	31.75	7.0	○	○

1. Insert is available form 1 pce.
2. Insert set is available in packs of 10 pcs. Please add "S" before each model number when ordering.  
Example:**SCW1206A**

### Recommended cutting condition

Work Material	Cutter Type	Max. Chamfer	Insert Grade	Side Cutting		Plunge Cutting	
				Vc (m/min)	f (mm/rev)	Vc (m/min)	f (mm/rev)
General steel Alloy steel	<b>C0525</b>	C2	<b>AZX</b>	80	0.15	50	0.1
	<b>C1040</b>	C3		120	0.3	90	0.15
	<b>C3060</b>	C4		150	0.45	150	0.45
	<b>C50100</b>						
Stainless steel	<b>C0525</b>	C1.5	<b>A</b>	60	0.1	30	0.08
	<b>C1040</b>	C2		60	0.2	40	0.12
	<b>C3060</b>	C3		60	0.3	60	0.3
	<b>C50100</b>						
Cast iron	<b>C0525</b>	C2	<b>AZX</b>	50	0.15	40	0.1
	<b>C1040</b>	C3		90	0.2	60	0.15
	<b>C3060</b>	C4		120	0.6	120	0.5
	<b>C50100</b>						
Aluminum	<b>C0525</b>	C2.5	<b>A</b>	100	0.15	80	0.1
	<b>C1040</b>	C4		160	0.3	100	0.2
	<b>C3060</b>	C5		200	0.6	220	0.6
	<b>C50100</b>						

Vc: Cutting speed (m/min.) f: Feed per revolution (mm/rev.)

1. Cutting condition is the same for both non-coated and coated inserts.  
Coated inserts will achieve better surface finish and extended insert life.
2. Reduce cutting speed if a larger chamfer than the max. amount shown in the table is required.

3. Peck feed is necessary in case cutting chips are too long.
4. A High rigidity toolholder is recommended, such as BIG HMC or MEGA-D Chuck.

## Center and Chamfer in one **CENTER BOY**



Accurate centering and chamfering can be obtained in a single operation.

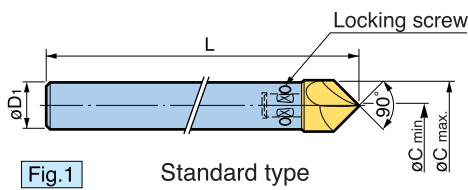
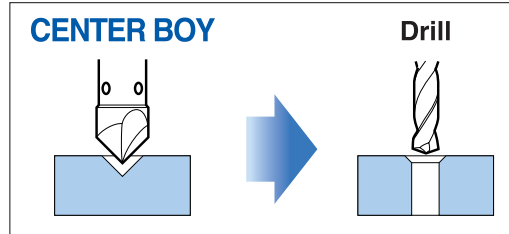


Fig.1 Standard type

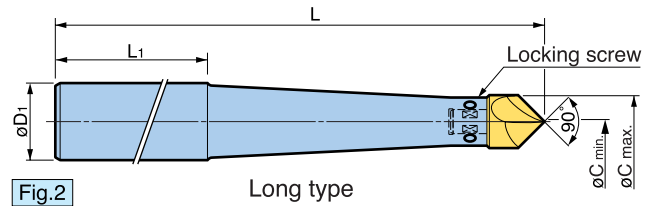


Fig.2 Long type

● in the table indicates Long Type

Chamfer		Model	Fig.	$\phi D_1$	L	$L_1$	Insert Model	Spare Locking Screw
$\phi C_{min}$	$\phi C_{max}$							
0.9	10	ST10-CBY09010	1	10	150	-	CBY09010	H0403-5P
0.9	13	ST12-CBY09013		12				
1.0	16	ST16-CBY09016		16				
1.5	22	ST20-CBY09022		20				
0.9	13	ST20-CBY09013-220 ●	2	20	220	120	CBY09013	H0403-5P
		-260 ●		260				
1.5	22	ST32-CBY09022-260 ●		32	260		300	CBY09022
		-300 ●	300					

1. 2 pcs of Inserts are included as standard accessories.
2. 2 pcs. of Locking Screws are included. Spare Locking Screws are available in a packet of 5 pcs.

⚠ Hand feed is not recommended.

### Insert



Model	CENTER BOY
CBY09010	ST10-CBY09010
CBY09013	ST12-CBY09013 / ST20-CBY09013
CBY09016	ST16-CBY09016
CBY09022	ST20-CBY09022 / ST32-CBY09022



Highly accurate  
Replaceable Insert

1. Inserts are available in packages of 5 pcs.
2. Insert Grade is HSS with TiN coating.

### Recommended cutting condition

Work Material	Cutter Type	Chamfering		Centering	
		Vc (m/min)	f (mm/rev)	Vc (m/min)	f (mm/rev)
General steel Alloy steel	Standard	20-35	0.10	25-50	0.08
	long	20-35	0.08	20-50	0.08
Stainless steel	Standard	15-30	0.08	20-40	0.08
	long	15-30	0.06	15-30	0.06
Cast iron	Standard	20-40	0.12	30-45	0.10
	long	20-40	0.10	30-45	0.10
Aluminum	Standard	45-60	0.15	50-65	0.15
	long	40-60	0.12	40-60	0.12

Vc: Cutting speed (m/min.) f: Feed per revolution (mm/rev.)

1. The table is just a reference to determine cutting conditions. It should be adjusted according to the condition of the machine tool and workpiece.
2. In case vibration occurs, reduce cutting speed V.
3. Tool extension should be as short as possible.