SUMITOMO

CARBIDE - CBN - DIAMOND

Global Support, Global Solutions.

Small Diameter Boring Bars

BSME series/SEXC series

Rev. 2

Clamp mechanism achieves high-precision cutting edge position

SumiSmall

BSME Type (Brazed)

Min. Bore Dia ø2.5mm

BN2000 H

SEXC Type (Indexable Insert)

Min. Bore Dia ø4.0mm

New AC1030U P M K N S

New T1500A P M N

BN2000 H

BN7000 K

Inserts for SEXC Type

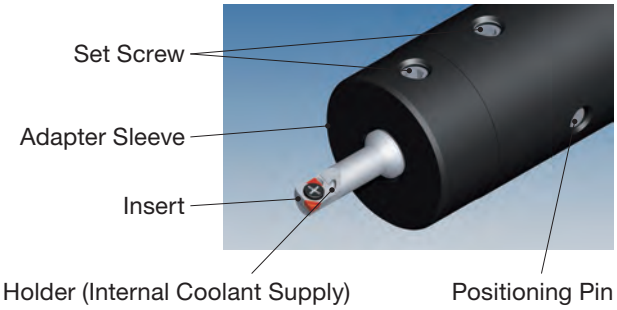
New Coated Carbide and Cermet grades lineup

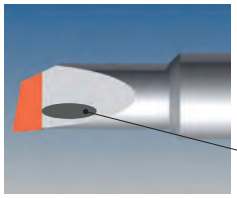
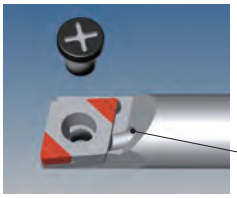
SUMITOMO ELECTRIC GROUP

■ Features

- For internal boring of hardened steel with min. bore diameters from ø2.5mm
- Achieves high-precision cutting edge positioning thanks to the newly developed clamp mechanism
- Realises high-efficiency machining by switching from grinding to cutting in the small diameter range
- Brazed Type BSME Type
  Can be used with bore diameters from ø2.5 to 5.0mm
- Indexable Insert Type SEXC Type
  Can be used with bore diameters from ø4.0 to 6.0mm.
  Expansion of Coated Carbide and Cermet grades
- Economical 2-cornered insert

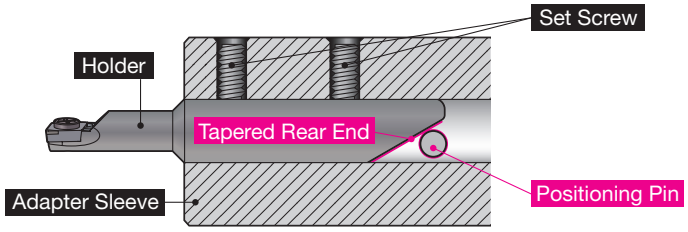
Basic Configuration



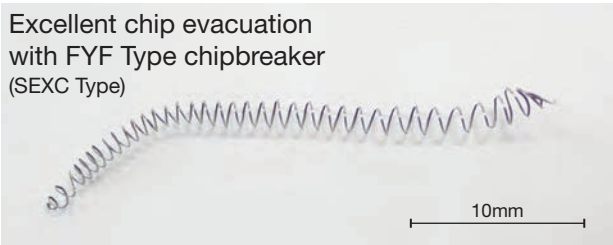
Brazed CBN Type BSME Type	Indexable Insert Type SEXC Type
Min. Bore Dia.: ø2.5 to 5.0mm	Min. Bore Dia.: ø4.0 to 6.0mm
High-quality, unique cutting edge shape  Internal Coolant Supply (Standard)	2-cornered insert used  Internal Coolant Supply (Standard)

Clamp Mechanism

Achieves high-precision cutting edge positioning by combining a holder with a tapered rear end and a sleeve with an internal positioning pin.
(common to BSME and SEXC types)

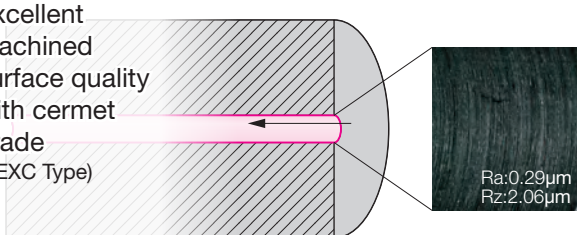


Excellent chip evacuation with FYF Type chipbreaker
(SEXC Type)



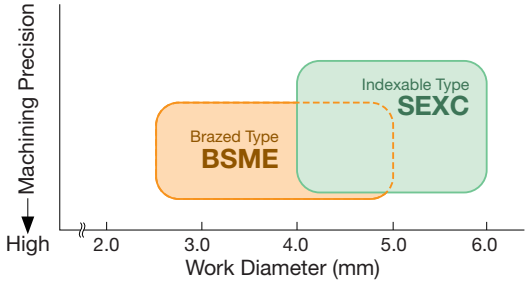
Work Material: SUS304 Internal Boring, Insert: ECEM 03X102L-FYF (AC1030U)
Cutting Conditions: v_c=100m/min f=0.05mm/rev a_p=0.03mm Work Dia.: ø4

Excellent machined surface quality with cermet grade
(SEXC Type)



Work Material: SCM415 Internal Boring, Insert: ECEM 03X102L-FYF (T1500A)
Cutting Conditions: v_c=100m/min f=0.03mm/rev a_p=0.03mm

■ Application Range



CBN

SUMIBORON
Brazed

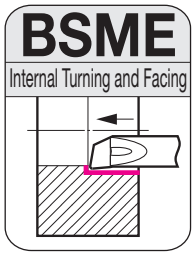


Fig 1

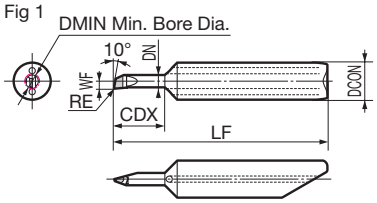
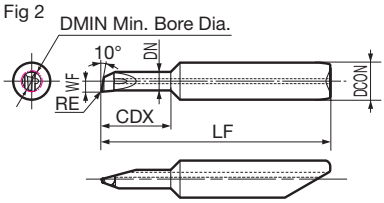


Fig 2



SumiSmall

■ Holder (SUMIBORON)

Dimensions (mm)

Cat. No.	BN2000 R	BN2000 L	Min. Bore Dia. DMIN	Shank Diameter DCON	Neck Diameter DN	Overall Length LF	Cutting Edge Distance WF	Min. Depth of Cut CDX	Corner Radius RE	Applicable Sleeve	Fig
BSME R/L25020D2S6	●	●	**2.5**	6.0	2.0	32.0	1.20	5.3	0.2		1
BSME R/L25020D3S6	●	●	**2.5**	6.0	2.0	34.5	1.20	7.8	0.2		1
BSME R/L25020D4S6			**2.5**	6.0	2.0	37.0	1.20	10.3	0.2		1
BSME R/L30020D2S6	●	●	**3.0**	6.0	2.5	32.8	1.45	6.3	0.2		2
BSME R/L30020D3S6	●	●	**3.0**	6.0	2.5	35.8	1.45	9.3	0.2		2
BSME R/L30020D4S6			**3.0**	6.0	2.5	38.8	1.45	12.3	0.2		2
BSME R/L35020D2S6	●	●	**3.5**	6.0	3.0	33.5	1.70	7.3	0.2		2
BSME R/L35020D3S6	●	●	**3.5**	6.0	3.0	37.0	1.70	10.8	0.2		2
BSME R/L35020D4S6			**3.5**	6.0	3.0	40.5	1.70	14.3	0.2	HBSM6020	2
BSME R/L40020D2S6	●	●	**4.0**	6.0	3.5	33.9	1.95	8.3	0.2	HBSM6020A	2
BSME R/L40020D3S6	●	●	**4.0**	6.0	3.5	37.9	1.95	12.3	0.2		2
BSME R/L40020D4S6			**4.0**	6.0	3.5	41.9	1.95	16.3	0.2		2
BSME R/L45020D2S6	●	●	**4.5**	6.0	4.0	35.0	2.20	9.3	0.2		2
BSME R/L45020D3S6	●	●	**4.5**	6.0	4.0	39.5	2.20	13.8	0.2		2
BSME R/L45020D4S6			**4.5**	6.0	4.0	44.0	2.20	18.3	0.2		2
BSME R/L50020D2S6	●	●	**5.0**	6.0	4.5	35.8	2.45	10.3	0.2		2
BSME R/L50020D3S6	●	●	**5.0**	6.0	4.5	40.8	2.45	15.3	0.2		2
BSME R/L50020D4S6			**5.0**	6.0	4.5	45.8	2.45	20.3	0.2		2

The BSME Type requires HBSM6020(A) adapter sleeve (sold separately).

■ Identification Table

BSM Series | **E** Carbide Shank with Oil Hole | **R** Feed Direction | **350** Min. Bore Dia. | **20** Cutting Edge Corner Radius | **D2** L/D | **S6** Shank Dia.

Fig 1

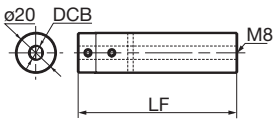
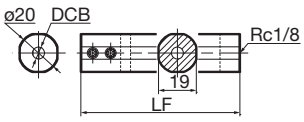


Fig 2



■ Sleeve (Sold Separately)

Dimensions (mm)

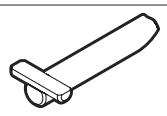
Cat. No.	Stock	Bore Dia. DCB	Overall Length LF	Fig	Set Screw	Wrench
HBSM6020	●	6.0	80	1	BT0506	TH025
HBSM6020A	●	6.0	80	2		

Mounting Method P5

■ Alignment Jig (Sold Separately)

For HBSM6020 Sleeve

Cat. No.	Stock
AFBSM60	●



This jig is used for centring sleeves when setting them into sleeve holders.

■ Recommended Cutting Conditions

Work Material	H Hardened Steel	
Spindle Speed n (min^{-1})	Above 2,000	Above 2,000
Depth of Cut a_p (mm)	0.01-0.15	0.01-0.15
Feed Rate f (mm/rev)	0.01-0.10	0.01-0.10

May cause chattering or chipping at the cutting edge in low-speed machining.
Excessive depth of cut causes deformation of the tool, which consequently leads to deterioration of dimensional tolerance.

● mark: Standard stocked item Blank: Made-to-order item

Carbide Coolant Hole | CBN

Carbide / Cermet / SUMIBORON
Screw-on

SumiSmall

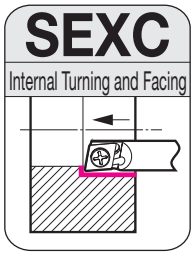
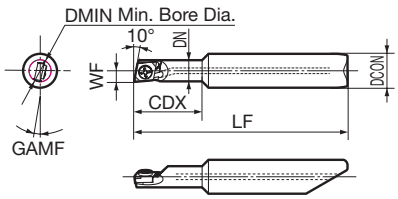


Fig 1



■ Holder

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Shank Diameter DCON	Neck Diameter DN	Overall Length LF	Cutting Edge Distance WF	Depth of Cut CDX	Rake Angle GAMF	Applicable Sleeve	Fig	Bolt	Bolt N·m	Wrench
E06D2-SEXC R/L03-04P	●	●	**4.0**	6.0	3.75	33.75	1.95	8	-13°	HBSM6020 HBSM6020A	1	MIB1.6-2	0.2	SDBSM
E06D3-SEXC R/L03-04P	●	●	**4.0**	6.0	3.75	37.75	1.95	12	-13°		1			
E06D2-SEXC R/L03-05P	●	●	**5.0**	6.0	4.75	35.25	2.45	10	-12°		1	MIB1.6-2.5	0.2	
E06D3-SEXC R/L03-05P	●	●	**5.0**	6.0	4.75	40.25	2.45	15	-12°		1			
E06D2-SEXC R/L03-06P	●	●	**6.0**	6.0	5.75	36.75	2.95	12	-11°		1	MIB1.6-3	0.2	
E06D3-SEXC R/L03-06P	●	●	**6.0**	6.0	5.75	42.75	2.95	18	-11°		1			

The SEXC Type requires HBSM6020(A) adapter sleeve (sold separately).

■ Identification Table

E 06 D2 - S E X C R 03 - 04 P

E	06	D2	S	E	X	C	R	03	04	P
Carbide Shank with Oil Hole	Shank Dia.	L/D	Screw-on	Insert Shape	Cutting Edge Shape	Insert Relief Angle	Feed Direction	Insert Inscribed Circle	Min. Bore Dia.	Accessories

Fig 1

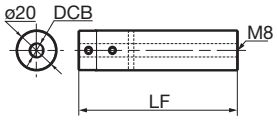
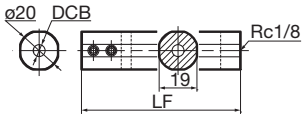


Fig 2



■ Sleeve (Sold Separately)

Dimensions (mm)

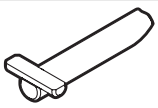
Cat. No.	Stock	Bore Dia. DCB	Overall Length LF	Fig	Set Screw	Wrench
HBSM6020	●	6.0	80	1	BT0506	TH025
HBSM6020A	●	6.0	80	2		

Mounting Method ☞P5

■ Alignment Jig (Sold Separately)

For HBSM6020 Sleeve

Cat. No.	Stock
AFBSM60	●



This jig is used for centring sleeves when setting them into sleeve holders.

■ Insert (Coated Carbide / SUMIBORON)

Dimensions (mm)

Cat. No.	AC1030U R	AC1030U L	T1500A R	T1500A L	BN2000	BN7000	Corner Radius RE	Fig
ECEM 03X1005 R/L-FYF	●	●	●	●	—	—	0.05	1
ECEM 03X101 R/L-FYF	●	●	●	●	—	—	0.1	1
ECEM 03X1015 R/L-FYF	●	●	●	●	—	—	0.15	1
ECEM 03X102 R/ L-FYF	●	●	●	●	—	—	0.2	1
2NU-ECXA 030X02 LE	—	—	—	—	●		0.2	2
2NU-ECXA 030X02 LF	—	—	—	—	●	●	0.2	2

Fig 1

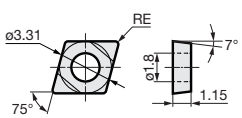
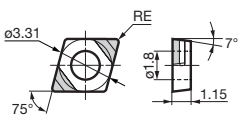


Fig 2



Part Number Suffix: LE: Honed Edge, LF: Sharp Edged, FYF: Sharp Edged (with Chipbreaker)

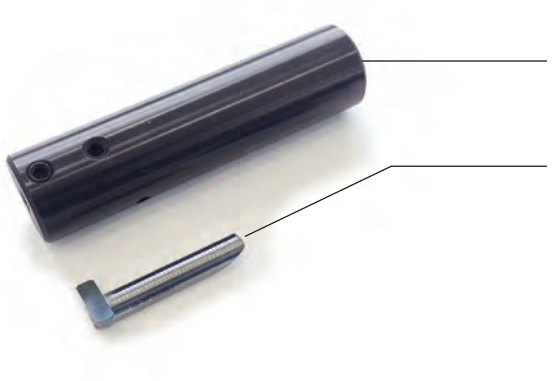
■ Recommended Cutting Conditions

Work Material	P General Steel		M Stainless Steel		K Cast Iron		N Non-Ferrous Metal		S Exotic Alloy	H Hardened Steel	
Insert Grades	AC1030U	T1500A	AC1030U	T1500A	AC1030U	T1500A	AC1030U	T1500A	AC1030U	BN2000	BN7000
Spindle Speed n (min^{-1})	2,000-10,000	2,000-10,000	2,000-8,000	2,000-8,000	2,000-10,000	2,000-10,000	5,000-15,000	5,000-15,000	2,000-6,000	Above 2,000	Above 2,000
Depth of Cut a_p (mm)	up to 0.2	up to 0.2	up to 0.2	up to 0.2	up to 0.2	up to 0.2	up to 0.2	up to 0.2	up to 0.2	0.01-0.15	0.01-0.15
Feed Rate f (mm/rev)	up to 0.05	up to 0.05	up to 0.05	up to 0.05	up to 0.05	up to 0.05	up to 0.05	up to 0.05	up to 0.05	0.01-0.10	0.01-0.10

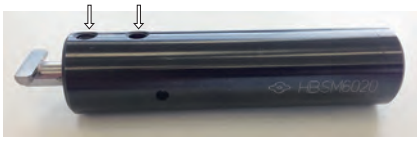
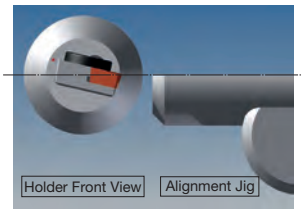
May cause chattering or chipping at the cutting edge in low-speed machining. Excessive depth of cut causes deformation of the tool, which consequently leads to deterioration of dimensional tolerance.

N·m Recommended Tightening Torque (N·m) ● mark: Standard stocked item ● mark: Standard stocked item (new product/expanded item) Blank: Made-to-order item — mark: Not available

■ Dedicated Adapter Sleeve / Alignment Jig



■ **Mounting Method** (HBSM6020A has a side lock flat, so centring with an alignment jig is not required).

1	Insert the alignment jig until it hits the positioning pin set in the adapter sleeve, and tighten the two set screws.	(2) Tighten the two set screws (1) Insert until it hits the positioning pin ⟹ 
2	Mount the sleeve into the sleeve holder and temporarily tighten the fastening screws.	 Temporary screw fastening Holder for Sleeve 
3	Rotate the sleeve gradually to adjust until the flat strip of the alignment jig is horizontal. 	When a boring bar is mounted into the sleeve adjusted by the alignment tool, its cutting edge position will automatically be set at the centre.  Holder Front View Alignment Jig
4	Using a tool presetter, measure the diameter of the tool.	

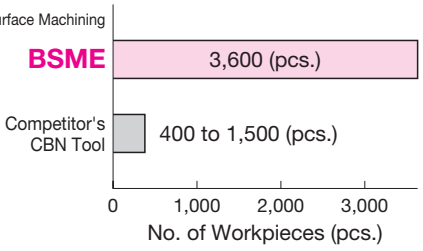
*Steps 1 and 3 above are not required when using HBSM6020A.

■ Application Examples

Machine Components — BSME

BSME Type provides stable machining and a tool life that is over 2 times longer than our competitors' CBN tools.

Machining Application: Conical Surface Machining

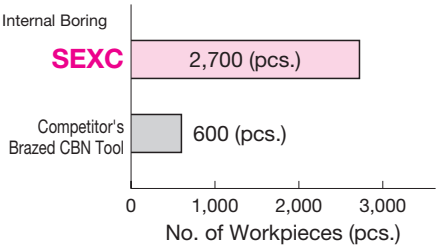


Tool: BSME R30020D3S6 Grade: BN2000
Cutting Conditions: v_c=28 to 48m/min f=0.02mm/rev a_p=0.02-0.05mm Wet (Oil-based)

Small Automotive Components — SEXC

SEXC Type provides stable machining and a tool life that is over 4 times longer than competitors' products.

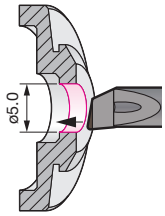
Machining Application: ø7.1 Internal Boring

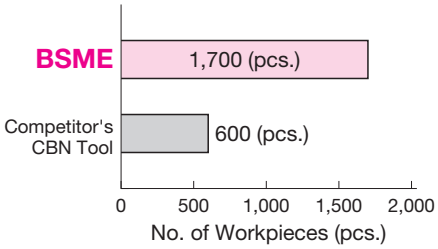


Holder: E06D3-SEXC R03-06P Insert: 2NU-ECXA 030X02LF (BN2000)
Cutting Conditions: v_c=156m/min (7,000min^{-1}) f=0.03mm/rev a_p=0.10mm Wet (Emulsion)

Hardened Alloy Steel Valve Components — BSME

BSME Type provides stable machining and a tool life that is over 2 times longer than our competitors' CBN tools.

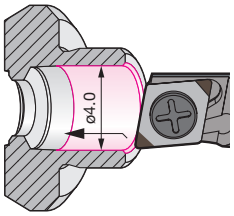


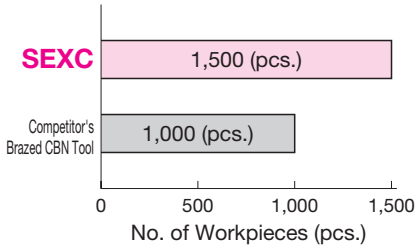


Tool: BSME R50020D2S6 Grade: BN2000
Cutting Conditions: v_c=135m/min (7,500min^{-1}) f=0.02mm/rev a_p=0.10mm Dry

Small Bearing Steel Automotive Components — SEXC

SEXC Type provides drastically reduced tool costs and a tool life that is 1.5 times longer than our competitors' brazed CBN tools.





Holder: E06D2-SEXC R/L03-04P Insert: 2NU-ECXA 030X02LF (BN2000)
Cutting Conditions: v_c=50m/min (4,000min^{-1}) f=0.02mm/rev a_p=0.02mm Wet

M E M O

Sumitomo Electric Cutting Tools Official Apps for iOS/Android

Cutting calculation App

SumiTool Calculator

Download on the App Store

GET IT ON Google Play

Grade & chipbreaker comparison App

SumiTool Converter

Download on the App Store

GET IT ON Google Play

< SAFETY NOTES >

- Very hot or lengthy chips may be discharged while the machine is in operation. Therefore, machine guards, safety goggles or other protective covers must be used. Fire safety precautions must also be considered.
- Please handle with care as this product has sharp edges.
- Improper cutting conditions or mis-handling of the tool may result in breakages or projectiles. Therefore, please use the tool within its recommended conditions.
- When using non-water soluble cutting oil, precautions against fire must be taken and please ensure that a fire extinguisher is placed near the machine.

Sumitomo Electric Industries, Ltd.

Hardmetal Division

Global Marketing Department : 1-1-1, Koyakita, Itami, Hyogo 664-0016, Japan

https://www.sumitool.com/global

R(2022.9)II 1510 TP/AK