



Carbide step drill

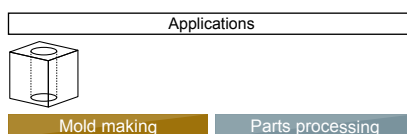
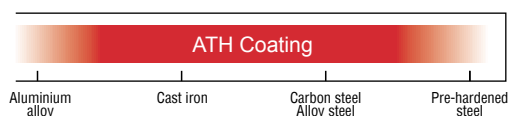
STB-ATH ***STBH-ATH***

Carbide Step Borer

Mitsubishi Hitachi Tool Engineering, Ltd.

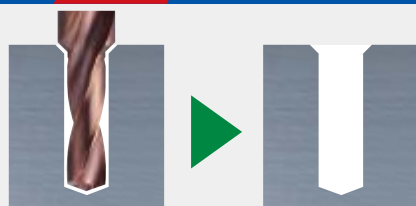
New Product News | No.1223E-3 | 2017-8

Carbide step drill for drilling and chamfering can be performed in one process!!



STBH-ATH φ3.4~φ10.3 [12 Items]
STB-ATH φ3.4~φ10.3 [12 Items]

Features 01 Carbide step drill for drilling and chamfering can be performed in one process.



[Note]

Stepped-hole boring cannot be performed.
(Because there is no back taper in the large-diameter section.)

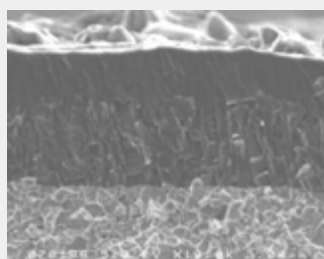
Features 02 Employs the groove shape of carbide Non-Stepping (pecking) Borers



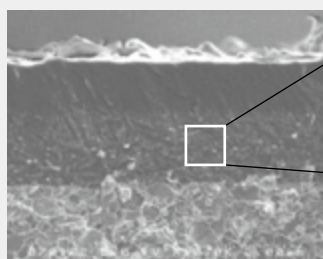
Chip removal is smooth to reduce problems with chip clogging.

Features 03 Improved heat-resistant coating "ATH Coating"

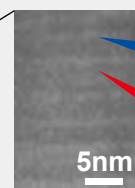
- The heat-resistant TH coating used previously has further evolved. A laminated structure is applied to achieve both heat resistance and adhesion strength.
- Achieves even higher hardness (3800HV)** than before! Exhibits good abrasion resistance.
(Hardness of conventional high-hardness membrane: 3600HV)



Conventional coating



ATH Coating



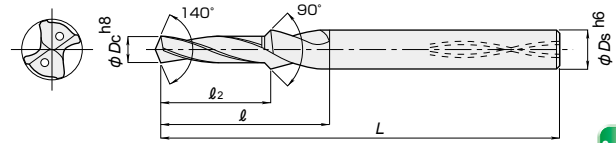
High hardness membrane

High heat resistance membrane

Even finer particle size of nano order.

Pat.No.3934136

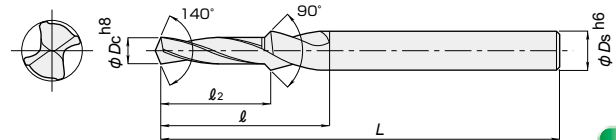
Internal coolant type (with Oil holes)



STBH-ATH

Item code	Stock	Size (mm)						
		L/D	Small dia. Dc	Step length l ₂	Flute length l	Overall length L	Shank dia. (Large dia.) Ds	Corresponding tap size
STBH034S-ATH	●	2	3.4	8	25	80	6.0	M4
STBH034M-ATH	●	3		12	30	80	6.0	
STBH043S-ATH	●	2	4.3	10	30	85	7.0	M5
STBH043M-ATH	●	3		15	35	85	7.0	
STBH051S-ATH	●	2	5.1	12	35	90	8.0	M6
STBH051M-ATH	●	3		18	40	90	8.0	
STBH068S-ATH	●	2	6.8	16	45	100	10.0	M8
STBH068M-ATH	●	3		24	50	105	10.0	
STBH085S-ATH	●	2	8.5	20	50	115	12.0	M10
STBH085M-ATH	●	3		30	60	125	12.0	
STBH103S-ATH	●	2	10.3	24	60	125	14.0	M12
STBH103M-ATH	●	3		36	70	135	14.0	

External coolant type (without Oil hole)



STB-ATH

Item code	Stock	Size (mm)						
		L/D	Small dia. Dc	Step length l ₂	Flute length l	Overall length L	Shank dia. (Large dia.) Ds	Corresponding tap size
STB034S-ATH	●	2	3.4	8	25	80	6.0	M4
STB034M-ATH	●	3		12	30	80	6.0	
STB043S-ATH	●	2	4.3	10	30	85	7.0	M5
STB043M-ATH	●	3		15	35	85	7.0	
STB051S-ATH	●	2	5.1	12	35	90	8.0	M6
STB051M-ATH	●	3		18	40	90	8.0	
STB068S-ATH	●	2	6.8	16	45	100	10.0	M8
STB068M-ATH	●	3		24	50	105	10.0	
STB085S-ATH	●	2	8.5	20	50	115	12.0	M10
STB085M-ATH	●	3		30	60	125	12.0	
STB103S-ATH	●	2	10.3	24	60	125	14.0	M12
STB103M-ATH	●	3		36	70	135	14.0	

- : Stocked Items.
- Chamfer width: for corresponding screw sizes of M4 to M6, processing to C1.0 is possible; for M8 to M12, processing to C1.5 is possible.
- Corresponding screw sizes are for metric coarse threads.

Special sizes can also be served. For details, please contact our sales office.

Recommended Cutting Conditions

Internal coolant type (with Oil holes)

Small dia.		Structural steel ~180HB	Carbon steel ~200HB	Alloy steel ~30HRC	Pre-hardened steel ~45HRC	Gray cast iron FC	Ductile cast iron FCD	Aluminium alloy	Stainless steel SUS300	Heat-resistant alloy Inconel 718
φ3.0 } φ6.0	Cutting speed (m/min)	80 (40~120)	80 (40~120)	80 (40~120)	40 (20~60)	80 (40~120)	60 (30~90)	100 (80~120)	40 (20~60)	20 (10~25)
	Feed rate (mm/rev.)	0.07~0.2	0.07~0.2	0.07~0.2	0.05~0.12	0.07~0.2	0.07~0.2	0.07~0.2	0.05~0.2	0.05~0.15
φ6.1 } φ10.0	Cutting speed (m/min)	80 (40~120)	80 (40~120)	80 (40~120)	40 (20~60)	80 (40~120)	60 (30~90)	100 (80~120)	40 (20~60)	25 (15~30)
	Feed rate (mm/rev.)	0.12~0.3	0.12~0.3	0.12~0.3	0.06~0.2	0.12~0.3	0.12~0.3	0.12~0.3	0.09~0.2	0.05~0.15
φ10.1 } φ13.0	Cutting speed (m/min)	80 (40~120)	80 (40~120)	80 (40~120)	40 (20~60)	80 (40~120)	60 (30~90)	100 (80~120)	40 (20~60)	25 (15~30)
	Feed rate (mm/rev.)	0.2~0.4	0.2~0.4	0.2~0.4	0.1~0.25	0.2~0.4	0.2~0.4	0.2~0.4	0.15~0.35	0.1~0.2

External coolant type (without Oil hole)

Small dia.		Structural steel ~180HB	Carbon steel ~200HB	Alloy steel ~30HRC	Pre-hardened steel ~45HRC	Gray cast iron FC	Ductile cast iron FCD	Aluminium alloy
φ3.0 } φ6.0	Cutting speed (m/min)	60 (40~80)	60 (40~80)	60 (40~80)	40 (20~60)	70 (40~100)	50 (30~70)	70 (50~90)
	Feed rate (mm/rev.)	0.07~0.2	0.07~0.2	0.07~0.2	0.05~0.12	0.07~0.2	0.07~0.2	0.07~0.2
φ6.1 } φ10.0	Cutting speed (m/min)	60 (40~80)	60 (40~80)	60 (40~80)	40 (20~60)	70 (40~100)	50 (30~70)	70 (50~90)
	Feed rate (mm/rev.)	0.12~0.3	0.12~0.3	0.12~0.3	0.06~0.2	0.12~0.3	0.12~0.3	0.12~0.3
φ10.1 } φ13.0	Cutting speed (m/min)	60 (40~80)	60 (40~80)	60 (40~80)	40 (20~60)	70 (40~100)	50 (30~70)	70 (50~90)
	Feed rate (mm/rev.)	0.2~0.4	0.2~0.4	0.2~0.4	0.1~0.25	0.2~0.4	0.2~0.4	0.2~0.4

[Attentions on use]

- ① This tool is a tool for boring holes and chamfering the hole opening in a single process. It cannot be used for boring holes with a large-diameter portion (stepped boring, etc.)
- ② Since during chamfering chips may become long and interfere with drilling, it is recommended that chips be cut by performing inching processing, etc.
(If chips become long during processing when chamfering is not being performed, perform pecking or inching processing.)
- ③ It is recommended that the feed rate be reduced to 30 to 70% during chamfering.
- ④ For drilling of stainless steel or heat-resistant steel, select the internal coolant type (with oil holes). Use of external coolant type in such cases is not recommended.)
- ⑤ The cutting conditions stated for the internal coolant type are when using water-based coolants at dilutions of up to 20:1 maximum or when using MQL (mist).
- ⑥ The cutting conditions stated for the external coolant type are when using water-based coolants at dilutions of up to 20:1 maximum.
- ⑦ If water-based coolant at dilutions greater than 20:1 is used, the lower limit of the cutting speed range should be used as a general criteria.
- ⑧ When performing MQL (mist) drilling, it may be necessary in some cases to reduce the cutting conditions depending on the mist equipment or amounts discharged by the tool.
- ⑨ When using an oil-based coolant, 70% of the lower limit for cutting speed should be used as a general criteria.
- ⑩ Cutting conditions should be adjusted according to machine rigidity or work clamp conditions, shape of cutting area, etc.

Regrinding/recoating orders accepted. Please contact our sales department.

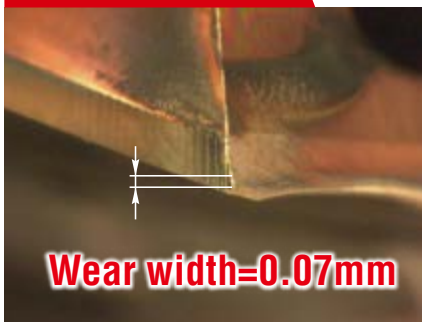


Comparison of wear conditions after boring 2,300 holes to SCM440 (30 HRC)

Cutting conditions ///

Tool = $\phi 6.8 \times 24 \times 50 \times \phi 10$ $v_c = 80 \text{ m/min}$ ($n = 3,750 \text{ min}^{-1}$) $v_f = 637 \text{ mm/min}$ (Chamfering $v_f = 375 \text{ mm/min}$)
 $f = 0.17 \text{ mm/rev.}$ (Chamfering $f = 0.1 \text{ mm/rev.}$) $H = 25.5 \text{ mm}$ Chamfering = C1.5
Coolant = MQL Machine = Horizontal M/C

STBH068M-ATH



Conventional





The diagrams and table data are examples of test results, and are not guaranteed values.

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Attentions on Safety

1. Cautions regarding handling

- (1) When removing the tool from its case (packaging), be careful that the tool does not pop out or is dropped. Be particularly careful regarding contact with the tool flutes.
- (2) When handling tools with sharp cutting flutes, be careful not to touch the cutting flutes directly with your bare hands.

2. Cautions regarding mounting

- (1) Before use, check the outside appearance of the tool for scratches, cracks, etc. and that it is firmly mounted in the collet chuck, etc.
- (2) If abnormal chattering, etc. occurs during use, stop the machine immediately and remove the cause of the chattering.

3. Cautions during use

- (1) Before use, confirm the dimensions and direction of rotation of the tool and milling work material.
- (2) The numerical values in the standard cutting conditions table should be used as criteria when starting new work. The cutting conditions should be adjusted as appropriate when the cutting depth is large, the rigidity of the machine being used is low, or according to the conditions of the work material.
- (3) Cutting tools are made of a hard material. During use, they may break and fly off. In addition, cutting chips may also fly off. Since there is a danger of injury to workers, fire, or eye damage from such flying pieces, a safety cover should be attached when work is performed and safety equipment such as safety goggles should be worn to create a safe environment for work.
- (4) There is a risk of fire or inflammation due to sparks, heat due to breakage, and cutting chips. Do not use where there is a risk of fire or explosion. **Please caution of fire while using oil base coolant, fire prevention is necessary.**
- (5) Do not use the tool for any purpose other than that for which it is intended.

4. Cautions regarding regrinding

- (1) If regrinding is not performed at the proper time, there is a risk of the tool breaking. Replace the tool with one in good condition, or perform regrinding.
- (2) Grinding dust will be created when regrinding a tool. When regrinding, be sure to attach a safety cover over the work area and wear safety clothes such as safety goggles, etc.
- (3) This product contains the specified chemical substance cobalt and its inorganic compounds. When performing regrinding or similar processing, be sure to handle the processing in accordance with the local laws and regulations regarding prevention of hazards due to specified chemical substances.

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