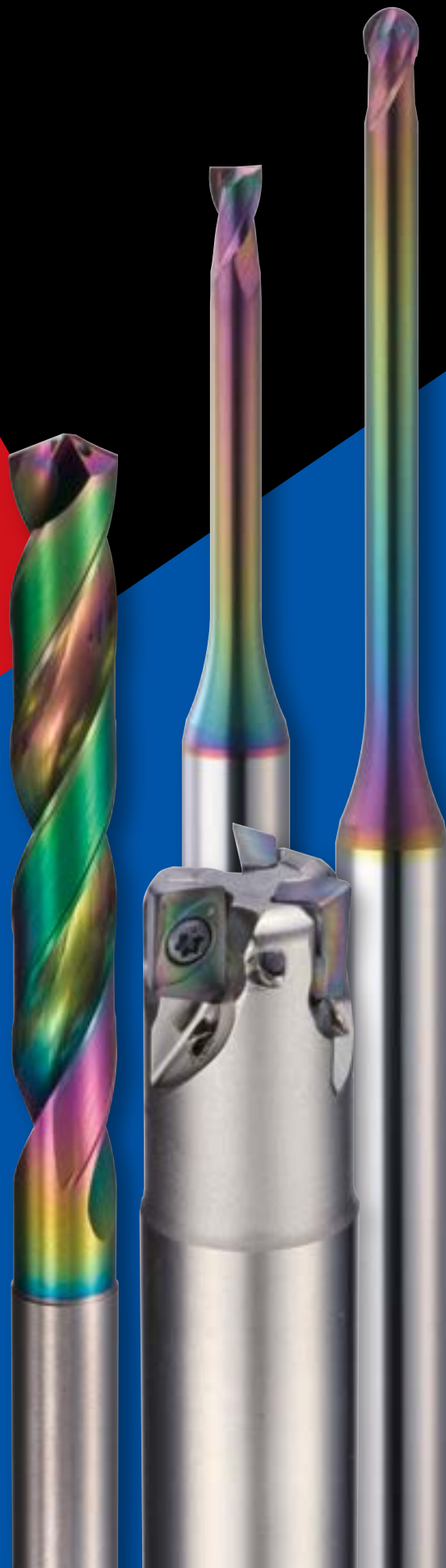


Coating series for non-ferrous metals

SD(S-DLC)

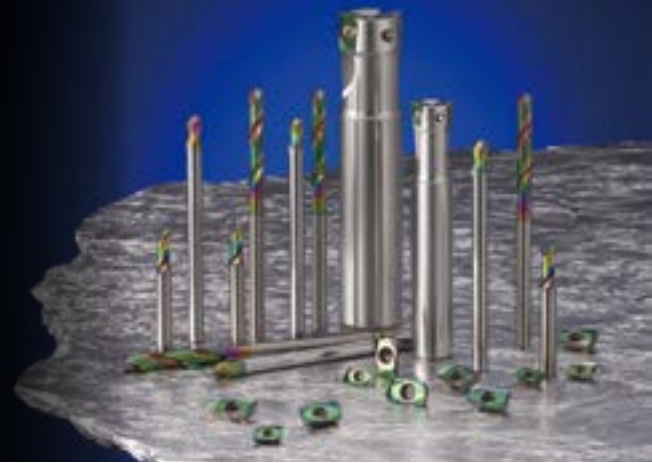
SD(S-DLC) Coating series



MOLDINO Tool Engineering, Ltd.

New Product News | No.0805E-17 | 2026-2

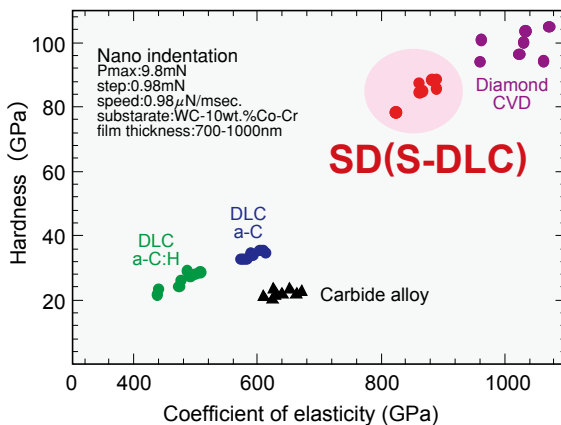
A phenomenal new coating with hardness exceeding 60GPa



Features & Characteristics

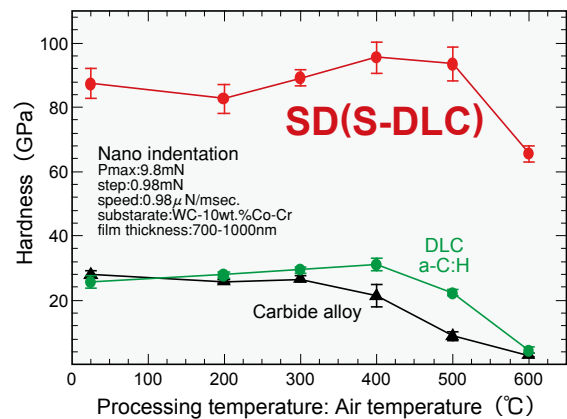
High hardness

The DLC coating infinitely close to that of diamond.
Hardness: More than 70GPa



High heat-resistance temperature

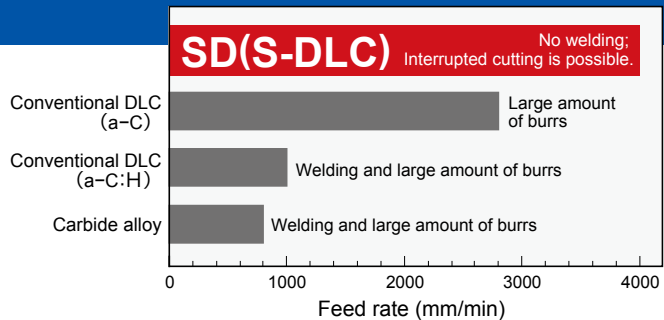
Impurities are low, providing high heat resistance and enabling high-efficiency machining.
Withstand temperature: 600°C Maintains high hardness even in an atmosphere of 600°C!



High-efficiency cutting machining

Cutting machining of aluminum alloys or resins showcases the effects, with low heat generation making it ideal for dry cutting.

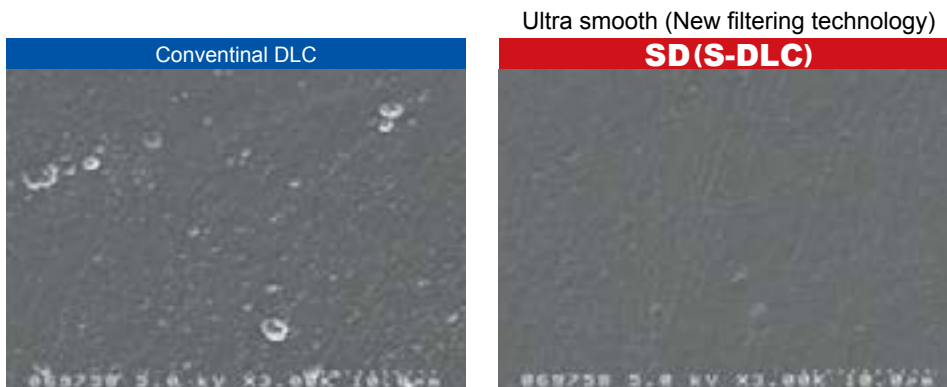
φ6×2 flutes, Epoch SD(S-DLC) Square (EPAS2060-SD)
A5052 Slotting, Revolution : 12,000min⁻¹ Groove depth : 3mm
Dry cutting



Ultra smooth

A new filtering technology is utilized to remove droplet from the coating to provide the extremely smooth DLC coating.

Comparison of surface droplet on carbide insert tools



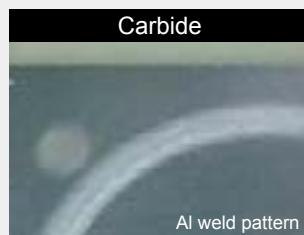
Note: SD (S-DLC) Coating has high density and is optically clear. Some interference color may be exhibited but this does not affect performance.

High adhesion resistance

Prevents welding of sharp flute edge and flute tip. Friction coefficient: 0.1 or less

Examination of surface after ball-on-disk friction test

Ball material : A1050
Ball diameter : 6mm
Load : 5N
Radius : 5m
Speed : 100mm/s
Rubbing distance : 100m
Substrate : Carbide
No lubrication



Achieves 10 times better high-efficiency cutting machining than non coating carbide.

Definition of terms

Ball-on-disk wear test

An adhesion measurement method in which a load is applied to balls mounted on a disk and the substrate is rotated.

New filtering technology

Special filtering technology employed in order to create ultra-smooth coatings.

Nano indentation

A hardness measurement method in which ultra-fine loads are used to measure membrane hardness.

GPa

Same as GN/m²

SD Coating

Indexable Tools

End Mills

Drills

SD5010 Technical Data

01 Comparison of welding resistance (air blow and wet cutting)

Work material : A5052

<Cutting condition>

$v_c=500\text{m/min}$ $f_z=0.15\text{mm/t}$ $a_p \times a_e=2 \times 5\text{mm}$ $OH=25\text{mm}$
Cutter body : AHU1032R-5 (Single insert cutting)

With SD5010, suppresses welding even when cutting with air blower.

Insert : JDET100304R-FA

	SD5010	Non coating (WH10)
Air-blow Cutting length = 45m		
Wet (Water-soluble agent) Cutting length = 6m		

02 Comparison of welding resistance (comparison with conventional product)

Work material : A7075

<Cutting condition>

$v_c=500\text{m/min}$ $f_z=0.1\text{mm/t}$ $a_p \times a_e=2 \times 5\text{mm}$ $OH=25\text{mm}$
Cutter body : AHU1032R-5 (Single insert cutting)

SD5010 provides superior welding resistance.

	SD5010	Conventional DLC
Air-blow Cutting length = 80m (160min. cutting)		

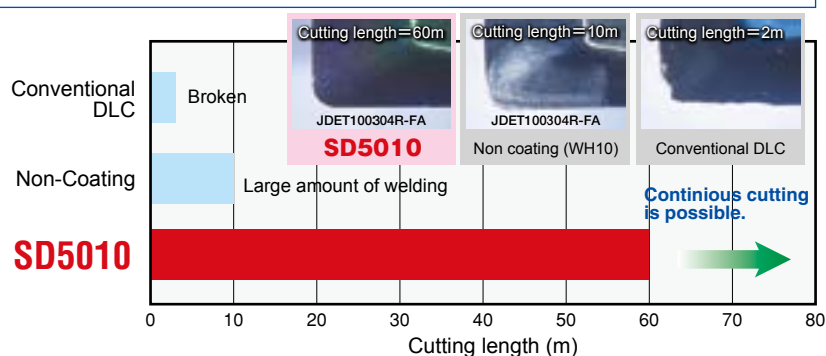
03 Comparison of chipping resistance (comparison with conventional product)

Work material : A7075

<Cutting condition>

$v_c=500\text{m/min}$ $f_z=0.2\text{mm/t}$ $a_p \times a_e=2 \times 5\text{mm}$
 $OH=35\text{mm}$ Tool dia. : $\phi 32$ Air-blow

For conventional DLC product, $f_z=0.1$ is the limit. SD5010 provides twice the machining efficiency.



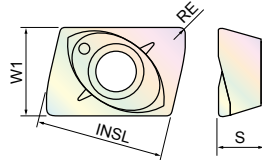
Line Up, Recommended Cutting Conditions

Super Excellent MINI ASM type



○ Inserts

JDMT07020R
Insert with 5mm flute length
for shoulder cutting
(APMX=5.0mm)



Item code	Tolerance	Stocked	Size (mm)			
		DLC Coating	INS	W1	RE	S
		SD5010				
JDMT070202R	M class	●	6.4	4.3	0.2	2.45
JDMT070204R		●	6.4	4.3	0.4	2.45
JDMT070208R		●	6.4	4.3	0.8	2.45

SD5010 is an insert material treated with SD Coating.

○ Recommended Cutting Conditions **ASM**

<Shoulder cutting> : $a_e=0.5DC$

Work material		$\phi 8$	$\phi 10$	$\phi 12$	$\phi 14$	$\phi 16$	$\phi 17$	$\phi 20$	$\phi 21$	$\phi 25$	$\phi 32$
Expanded aluminum alloy material A5052,A7075 etc. (Wet: Water-soluble agent)	Revolution n (min ⁻¹)	11,900	12,700	10,600	11,400	9,900	9,400	9,500	9,100	7,600	6,000
	Cutting speed v_c (m/min)	300	400	400	500	500	500	600	600	600	600
	Feed rate v_f (mm/min)	950	2,040	2,550	2,730	3,180	3,000	3,820	3,640	3,670	3,820
	Feed per tooth f_z (mm/t)	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
	a_p (mm)	2	2	2	2	2	2	2	2	2	2
Cast aluminum alloy material AC4A,ADC12 etc. (Wet: Water-soluble agent)	Revolution n (min ⁻¹)	9,900	11,100	9,300	9,100	8,000	7,500	8,000	7,600	6,400	5,000
	Cutting speed v_c (m/min)	250	350	350	400	400	400	500	500	500	500
	Feed rate v_f (mm/min)	800	1,780	2,230	2,180	2,550	2,400	3,180	3,030	3,060	3,180
	Feed per tooth f_z (mm/t)	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
	a_p (mm)	2	2	2	2	2	2	2	2	2	2
Pure copper C1100,C1020 etc. (Wet: Water-soluble agent)	Revolution n (min ⁻¹)	9,900	9,500	8,000	6,800	6,000	5,600	4,800	4,500	3,800	3,000
	Cutting speed v_c (m/min)	250	300	300	300	300	300	300	300	300	300
	Feed rate v_f (mm/min)	800	1,530	1,910	1,640	1,910	1,800	1,910	1,820	1,830	1,910
	Feed per tooth f_z (mm/t)	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
	a_p (mm)	2	2	2	2	2	2	2	2	2	2

[Note]

- ① Use the appropriate coolant for the work material and machining shape.
- ② The cutting conditions shown in the above table are for reference and should be adjusted according to the actual machining circumstances.
- ③ When cutting grooves, reduce the feed rate by 30% (set it to 0.7 times the value shown above).
- ④ When L/D=4 or higher, reduce rotation speed and feed rate by 50% (set to $0.5 \times$ stated values) as general criteria.
In addition, when machining copper, set cutting depth in axial direction to 1mm or less.
- ⑤ Use on a machine equipped with splashguards. During use, be sure to wear protective equipment such as safety glasses, and always perform work in a safe environment.
- ⑥ When using a machine that cannot provide the rotation speed shown above, set the highest rotation speed possible and calculate the feed rate using the f_z value.
- ⑦ Be sure to use this tool at rotation speeds within the acceptable range for the milling chuck being used. If the acceptable rotation speed range is below the rotation speed shown above, set the highest acceptable rotation speed and calculate the feed rate using the f_z value.

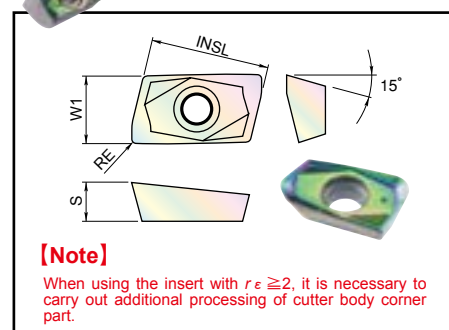
For ASM-type holders and inserts other than SD Coating inserts are available here:
MOLDINO Tool Engineering New Product News No.1203

● : Stocked items.

High-Feed Ultra End Mill AHU

○ Inserts

Item Code	Tolerance	Stock	Size(mm)			
		DLC Coating				
		SD5010	INSL	W1	S	RE
JDET100304R-FA	E class	●	11	6.1	3.5	0.4
JDET150502R-FA		●	16	9.12	5	0.2
JDET150504R-FA		●				0.4
JDET150530R-FA		●				3.0



SD5010 is an insert material treated with SD Coating.

○ Recommended Cutting Conditions **AHU**

<Shoulder cutting> : $a_e=0.5DC$

Work material	Cutting conditions	AHU/AHUM 10 type					AHU/AHUB/AHUM 15 type							
		φ16 (2 Flutes)	φ20 (3 Flutes)	φ25 (4 Flutes)	φ32 (5 Flutes)	φ35 (5 Flutes)	φ25 (2 Flutes)	φ32 (3 Flutes)	φ35 (3 Flutes)	φ40 (4 Flutes)	φ50 (5 Flutes)	φ63 (6 Flutes)	φ80 (7 Flutes)	φ100 (8 Flutes)
Expanded aluminum alloy material A5052, A7075 etc. (Air-blow or wet: Water-soluble agent)	Revolution n (min ⁻¹)	15,900	15,900	12,700	11,900	10,910	12,000	9,950	9,090	9,500	7,640	6,060	5,970	4,770
	Cutting speed v_c (m/min)	800	1,000	1,000	1,200	1,200	950	1,000	1,000	1,200	1,200	1,200	1,500	1,500
	Feed rate v_f (mm/min)	4,770	7,150	7,620	8,920	8,180	4,800	5,970	5,450	7,600	7,640	7,270	8,360	7,630
	Feed per tooth f_z (mm/t)	0.15	0.15	0.15	0.15	0.15	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	a_p (mm)	3	3	3	3	3	5	5	5	5	5	5	5	5
Cast aluminum alloy material AC4A, ADC12 etc. (Air-blow or wet: Water-soluble agent)	Revolution n (min ⁻¹)	12,700	12,700	10,160	9,520	8,730	9,600	7,960	7,270	7,600	6,110	4,850	4,780	3,820
	Cutting speed v_c (m/min)	640	800	800	960	960	760	800	800	960	960	960	1,200	1,200
	Feed rate v_f (mm/min)	3,820	5,720	6,100	7,140	6,550	3,840	4,780	4,360	6,080	6,110	5,820	6,690	6,100
	Feed per tooth f_z (mm/t)	0.15	0.15	0.15	0.15	0.15	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	a_p (mm)	3	3	3	3	3	5	5	5	5	5	5	5	5
Pure copper C1100, C1020 etc. (Wet: Water-soluble agent)	Revolution n (min ⁻¹)	5,970	4,770	3,820	2,980	2,730	3,820	2,980	2,730	2,390	1,910	1,520	1,190	955
	Cutting speed v_c (m/min)	300	300	300	300	300	300	300	300	300	300	300	300	300
	Feed rate v_f (mm/min)	1,790	2,150	2,290	2,240	2,050	1,530	1,790	1,640	1,910	1,910	1,820	1,670	1,530
	Feed per tooth f_z (mm/t)	0.15	0.15	0.15	0.15	0.15	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	a_p (mm)	3	3	3	3	3	5	5	5	5	5	5	5	5

[Note]

- ① Use the appropriate coolant for the work material and machining shape.
- ② These conditions are for general guidance; in actual machining conditions adjust the parameters according to your actual machine and work-piece conditions.
- ③ When cutting grooves, reduce the feed rate by 30% (set it to 0.7 times the value shown above).
- ④ When L/D = 4 or higher, reduce the rotation speed and feed rate by 60% (set them to 0.4 times the values shown above).
- ⑤ Use on a machine equipped with splashguards. During use, be sure to wear protective equipment such as safety glasses, and always perform work in a safe environment.
- ⑥ When using a machine that cannot provide the rotation speed shown above, set the highest rotation speed possible and calculate the feed rate using the f_z value.
- ⑦ Be sure to use this tool at rotation speeds within the acceptable range for the milling chuck being used. If the acceptable rotation speed range is below the rotation speed shown above, set the highest acceptable rotation speed and calculate the feed rate using the f_z value.

For AHU-type holders and inserts other than SD Coating inserts are available here:
MOLDINO Tool Engineering New Product News No.1210

● : Stocked items.

SD Coating

Indexable Tools

End Mills

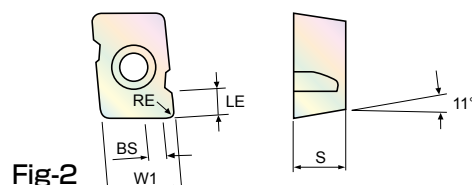
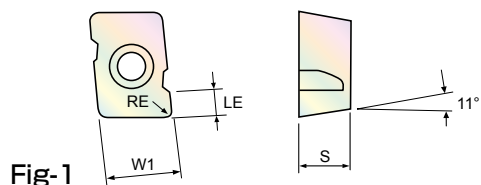
Drills

Line Up, Recommended Cutting Conditions

Polish Mill V type ASPV



○ Inserts

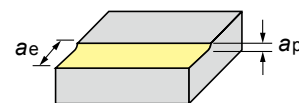


Item code	Tolerance	Stocked	Size (mm)					Shape
		DLC Coating						
		SD5010	W1	BS	S	LE	RE	
MPHW060302ZEL	H class		6.35	—	3.18	3	0.2	Fig-1
MPHW060302ZEL-0.5			6.35	0.5	3.18	3	0.2	Fig-2
MPHW060304ZEL			6.35	—	3.18	3	0.4	Fig-1
MPHW060304ZEL-0.5			6.35	0.5	3.18	3	0.4	Fig-2
MPHW060304ZFL		●	6.35	—	3.18	3	0.4	Fig-1
MPHW060308ZEL			6.35	—	3.18	3	0.8	
MPHW060308ZEL-1.5			6.35	1.5	3.18	3	0.8	Fig-2
MPHW060308ZFL		●	6.35	—	3.18	3	0.8	Fig-1
MPHW060320ZEL	N class		6.35	—	3.18	3	2	
MPNW060308ZEL			6.35	—	3.18	3	0.8	
MPNW060320ZEL			6.35	—	3.18	3	2	

● : Stocked items. No Mark : Manufactured upon request only.

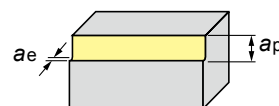
SD5010 is an insert material treated with SD Coating.

○ Recommended Cutting Conditions **ASPV**



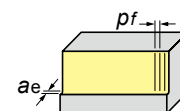
Cutting conditions for bottom finishing : $a_e=0.5DC\sim0.7DC$

Work material		φ16 2 flutes	φ18 2 flutes	φ20 3 flutes	φ22 3 flutes	φ25 4 flutes	φ28 4 flutes	φ30 4 flutes	φ32 5 flutes	φ35 5 flutes	φ40 6 flutes	φ50 7 flutes	φ63 8 flutes
Expanded aluminum alloy material A5052, A7075 etc. (Air-blow or wet: Water-soluble agent)	Revolution n (min ⁻¹)	15,900	15,900	15,900	15,900	15,300	13,640	12,730	11,940	10,910	9,550	7,640	6,060
	Cutting speed v_c (m/min)	800	900	1,000	1,100	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200
	Feed rate v_f (mm/min)	3,180	3,180	4,770	4,770	6,120	5,460	5,090	4,780	4,360	4,580	3,210	2,910
	Feed per tooth f_z (mm/t)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.08	0.08	0.08	0.06	0.06
	a_p (mm)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Cast aluminum alloy material AC4A, ADC12 etc. (Air-blow or wet: Water-soluble agent)	Revolution n (min ⁻¹)	12,700	12,700	12,700	12,700	12,200	10,900	10,190	9,550	8,730	7,640	6,110	4,850
	Cutting speed v_c (m/min)	640	720	800	880	960	960	960	960	960	960	960	960
	Feed rate v_f (mm/min)	2,540	2,540	3,810	3,810	4,900	4,360	4,080	3,820	3,490	3,670	2,570	2,330
	Feed per tooth f_z (mm/t)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.08	0.08	0.08	0.06	0.06
	a_p (mm)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Pure copper C1100, C1020 etc. (Air-blow or wet: Water-soluble agent)	Revolution n (min ⁻¹)	5,970	5,300	4,770	4,340	3,820	3,410	3,180	2,980	2,730	2,390	1,910	1,520
	Cutting speed v_c (m/min)	300	300	300	300	300	300	300	300	300	300	300	300
	Feed rate v_f (mm/min)	1,190	1,060	1,430	1,300	1,530	1,360	1,270	1,190	1,090	1,150	800	730
	Feed per tooth f_z (mm/t)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.08	0.08	0.08	0.06	0.06
	a_p (mm)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2



Cutting conditions for side finishing : $a_e \leq 0.2\text{mm}$

Work material		$\phi 16$ 2 flutes	$\phi 18$ 2 flutes	$\phi 20$ 3 flutes	$\phi 22$ 3 flutes	$\phi 25$ 4 flutes	$\phi 28$ 4 flutes	$\phi 30$ 4 flutes	$\phi 32$ 5 flutes	$\phi 35$ 5 flutes	$\phi 40$ 6 flutes	$\phi 50$ 7 flutes	$\phi 63$ 8 flutes
Expanded aluminum alloy material A5052, A7075 etc. (Air-blow or wet: Water-soluble agent)	Revolution n (min^{-1})	15,900	15,900	15,900	15,900	15,300	13,640	12,730	11,940	10,910	9,550	7,640	6,060
	Cutting speed v_c (m/min)	800	900	1,000	1,100	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200
	Feed rate v_f (mm/min)	4,770	4,770	7,160	7,160	9,180	8,180	7,640	8,960	8,180	10,300	10,700	9,700
	Feed per tooth f_z (mm/t)	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.18	0.2	0.2
	a_p (mm)	2	2	2	2	2	2	2	2	2	2	2	2
Cast aluminum alloy material AC4A, ADC12 etc. (Air-blow or wet: Water-soluble agent)	Revolution n (min^{-1})	12,700	12,700	12,700	12,700	12,200	10,900	10,190	9,550	8,730	7,640	6,110	4,850
	Cutting speed v_c (m/min)	640	720	800	880	960	960	960	960	960	960	960	960
	Feed rate v_f (mm/min)	3,810	3,810	5,720	5,720	7,320	6,540	6,100	7,160	6,550	8,250	8,550	7,760
	Feed per tooth f_z (mm/t)	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.18	0.2	0.2
	a_p (mm)	2	2	2	2	2	2	2	2	2	2	2	2
Pure copper C1100, C1020 etc. (Air-blow or wet: Water-soluble agent)	Revolution n (min^{-1})	5,970	5,300	4,770	4,340	3,820	3,410	3,180	2,980	2,730	2,390	1,910	1,520
	Cutting speed v_c (m/min)	300	300	300	300	300	300	300	300	300	300	300	300
	Feed rate v_f (mm/min)	1,790	1,590	2,150	1,950	2,290	2,050	1,910	2,240	2,730	2,870	3,340	3,040
	Feed per tooth f_z (mm/t)	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.2	0.2	0.25	0.25
	a_p (mm)	2	2	2	2	2	2	2	2	2	2	2	2



Cutting conditions for vertical roughing

Work material		$\phi 16$ 2 flutes	$\phi 18$ 2 flutes	$\phi 20$ 3 flutes	$\phi 22$ 3 flutes	$\phi 25$ 4 flutes	$\phi 28$ 4 flutes	$\phi 30$ 4 flutes	$\phi 32$ 5 flutes	$\phi 35$ 5 flutes	$\phi 40$ 6 flutes	$\phi 50$ 7 flutes	$\phi 63$ 8 flutes
Expanded aluminum alloy material A5052, A7075 etc. (Air-blow or wet: Water-soluble agent)	Revolution n (min^{-1})	15,900	15,900	15,900	15,900	15,300	13,640	12,730	11,940	10,910	9,550	7,640	6,060
	Cutting speed v_c (m/min)	800	900	1,000	1,100	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200
	Feed rate v_f (mm/min)	4,770	4,770	7,160	7,160	9,180	8,180	7,640	8,960	8,180	8,600	8,020	7,270
	Feed per tooth f_z (mm/t)	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
	Pick feed p_f (mm)	3.5	4	4	4	4.5	4.5	5	5	5.5	6	6.5	7
	a_p (mm)	4	4	4	4	4	4	4	4	4	4	4	4
Cast aluminum alloy material AC4A, ADC12 etc. (Air-blow or wet: Water-soluble agent)	Revolution n (min^{-1})	12,700	12,700	12,700	12,700	12,200	10,900	10,190	9,550	8,730	7,640	6,110	4,850
	Cutting speed v_c (m/min)	640	720	800	880	960	960	960	960	960	960	960	960
	Feed rate v_f (mm/min)	3,810	3,810	5,720	5,720	7,320	6,540	6,100	7,160	6,550	6,880	6,420	5,820
	Feed per tooth f_z (mm/t)	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
	Pick feed p_f (mm)	3.5	4	4	4	4.5	4.5	5	5	5.5	6	6.5	7
	a_p (mm)	4	4	4	4	4	4	4	4	4	4	4	4
Pure copper C1100, C1020 etc. (Air-blow or wet: Water-soluble agent)	Revolution n (min^{-1})	5,970	5,300	4,770	4,340	3,820	3,410	3,180	2,980	2,730	2,390	1,910	1,520
	Cutting speed v_c (m/min)	300	300	300	300	300	300	300	300	300	300	300	300
	Feed rate v_f (mm/min)	1,790	1,590	2,150	1,950	2,290	2,050	1,910	2,240	2,050	2,150	2,000	1,820
	Feed per tooth f_z (mm/t)	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
	Pick feed p_f (mm)	3.5	4	4	4	4.5	4.5	5	5	5.5	6	6.5	7
	a_p (mm)	4	4	4	4	4	4	4	4	4	4	4	4

[Note]

- These conditions are for general guidance; in actual machining conditions adjust the parameters according to your actual machine and work-piece conditions.
- When $L/D = 4$ or higher, reduce the rotation speed and feed rate by 60% (set them to 0.4 times the values shown above).
- Use on a machine equipped with splashguards. During use, be sure to wear protective equipment such as safety glasses, and always perform work in a safe environment.
- When using a machine that cannot provide the rotation speed shown above, set the highest rotation speed possible and calculate the feed rate using the f_z value.
- Be sure to use this tool at rotation speeds within the acceptable range for the milling chuck being used. If the acceptable rotation speed range is below the rotation speed shown above, set the highest acceptable rotation speed and calculate the feed rate using the f_z value.

For ASPV-type holders and inserts other than SD Coating inserts are available here:
MOLDINO Tool Engineering New Product News No.1211

Epoch SD(S-DLC) End Mill series

High welding resistance performance. Ideal for machining aluminum alloys and copper.

[Cutting condition]

$\phi 6 \times 2$ flutes
 Epoch SD(S-DLC)
 Square
 Slotting
 Revolution : $n = 12,000 \text{ min}^{-1}$
 ($v_c = 226 \text{ m/min}$)
 Feed rate : $v_f = 540 \text{ mm/min}$
 ($f_z = 0.023 \text{ mm/t}$)
 Depth of cut : $a_p \times a_e = 6 \text{ mm} \times 6 \text{ mm}$

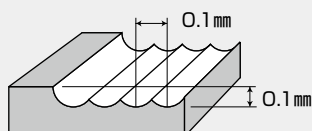
	Non coated	Conventional DLC (A)	Conventional DLC (B)	SD(S-DLC) Coating
Aluminium alloy A5052 Dry cutting				
Aluminium alloy A7075 Dry cutting				
Aluminium alloy AC4A Wet cutting				
Copper C1100 Wet cutting				
Acrylic resin Wet cutting				

Superior wear resistance and high-grade machined surface

● Bottom finish cutting in acrylic resin

[Cutting condition]

RE3 $\times$ 2 Flutes Epoch SD(S-DLC) Ball (EPAB2060-SD)
 Bottom Cutting
 Work material : Acrylic resin
 Revolution : $n = 20,000 \text{ min}^{-1}$ ($v_c = 377 \text{ m/min}$)
 Feed rate : $v_f = 1,600 \text{ mm/min}$ ($f_z = 0.04 \text{ mm/t}$)
 Depth of cut : $a_p \times a_e = 0.1 \times 0.1 \text{ mm}$
 Water-base coolant

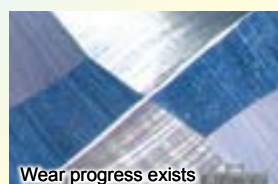


Cutting Length
L=75mm

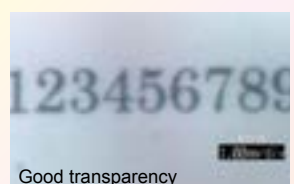
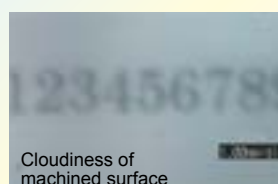
Non coating

S-DLC Coating

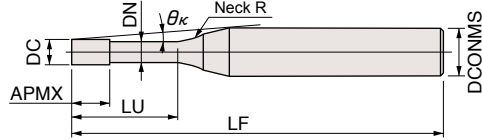
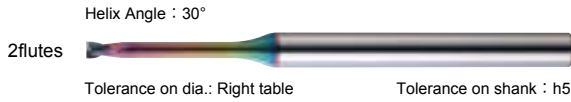
Tool wear



Machined surface grade



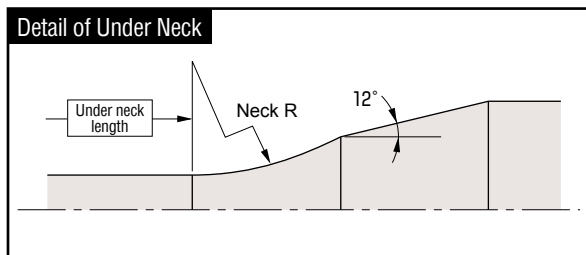
Epoch SD(S-DLC) Deep Square



Tool dia. DC	Tolerance on dia.
DC ≤ φ0.5	0 -0.007
φ0.5 < DC < φ1	0 -0.010
φ1 ≤ DC	0 -0.015

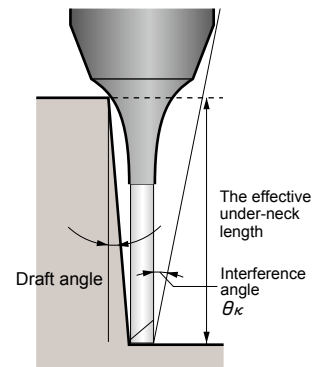
EPDS2000-SD

Item code	Stock	Size (mm)							Interference angle (°) θκ	Effective under neck length with respect to draft angle				
		Tool dia.	Under neck length	Flute length	Neck dia.	Overall length	Shank dia.	Neck R		0.5°	1°	1.5°	2°	3°
		DC	LU	APMX	DN	LF	DCONMS							
EPDS2005-2-SD	●	0.5	2	0.75	0.47	50	4	10	9.64	2.89	3.18	3.44	3.69	4.14
EPDS2005-4-SD	●		4						8.1	5.08	5.48	5.82	6.12	6.67
EPDS2005-6-SD	●		6						6.98	7.27	7.72	8.12	8.47	9.09
EPDS2006-2-SD	●	0.6	2	0.9	0.57	50	4	10	9.59	2.89	3.18	3.44	3.69	4.14
EPDS2006-4-SD	●		4						8.02	5.08	5.48	5.82	6.12	6.67
EPDS2006-6-SD	●		6						6.9	7.24	7.72	8.12	8.47	9.09
EPDS2008-4-SD	●	0.8	4	1.2	0.77	50	4	10	7.86	5.08	5.48	5.82	6.12	6.67
EPDS2008-6-SD	●		6						6.72	7.24	7.72	8.12	8.47	9.09
EPDS2008-8-SD	●		8						5.86	9.38	9.93	10.37	10.76	11.45
EPDS2010-4-SD	●	1	4	1.5	0.96	50	4	10	7.67	5.13	5.52	5.85	6.15	6.69
EPDS2010-8-SD	●		8			55			5.66	9.42	9.95	10.4	10.78	11.46
EPDS2010-12-SD	●		12			60			4.48	13.66	14.3	14.82	15.28	16.06
EPDS2015-6-SD	●	1.5	6	2.25	1.44	50	4	10	5.94	7.37	7.81	8.19	8.54	9.15
EPDS2015-12-SD	●		12			55			3.97	13.72	14.35	14.86	15.31	16.11
EPDS2015-18-SD	●		18			60			2.98	20.01	20.77	21.38	21.9	No interference
EPDS2020-8-SD	●	2	8	3	1.92	50	4	10	4.44	9.56	10.06	10.48	10.86	11.53
EPDS2020-16-SD	●		16			55			2.75	17.97	18.68	19.25	19.75	No interference
EPDS2020-24-SD	●		24			60			1.99	26.3	27.16	27.84	No interference	No interference
EPDS2030-12-SD	●	3	12	4.5	2.88	60	6	10	4.44	13.89	14.48	14.97	15.4	16.3
EPDS2030-24-SD	●		24			65			2.75	26.39	27.22	27.89	29.05	No interference
EPDS2030-36-SD	●		36			80			1.99	38.79	39.81	41.38	No interference	No interference
EPDS2040-16-SD	●	4	16	6	3.85	60	6	10	2.72	18.14	18.81	19.36	19.84	No interference
EPDS2040-32-SD	●		32			80			1.55	34.72	35.66	36.89	No interference	No interference
EPDS2040-48-SD	●		48			90			1.08	51.18	52.67	No interference	No interference	No interference



[Note]

If the workpiece has draft angle, the interference length will be longer than the under-neck length. Please refer to the effective under-neck length for the various draft angles. In addition, the angle at which the tool will interfere with the workpiece is shown as the "interference angle θ_{κ} ", and should also be referred to.



Line Up, Recommended Cutting Conditions

Recommended Cutting Conditions **EPDS-SD**

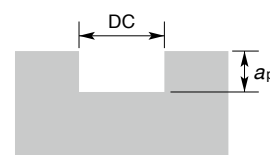
<Slotting>

			Work material	1		2		3		4	
				Expanded aluminum alloy material A5052,A7075 etc.		Cast aluminum alloy material AC4A,ADC12 etc.		Pure copper C1100 etc.		Resin, Acrylic, etc.	
Item code	Tool dia. DC (mm)	Under neck length LU (mm)	Axial direction cutting depth (mm)	Revolution n min ⁻¹	Feed rate v_f mm/min	Revolution n min ⁻¹	Feed rate v_f mm/min	Revolution n min ⁻¹	Feed rate v_f mm/min	Revolution n min ⁻¹	Feed rate v_f mm/min
EPDS2005-2-SD	0.5	2	0.15	50,000	1,180	50,000	1,150	38,400	850	38,400	1,280
EPDS2005-4-SD	0.5	4	0.09	50,000	1,080	46,660	980	34,560	700	34,560	1,050
EPDS2005-6-SD	0.5	6	0.06	46,080	860	41,470	760	30,720	540	30,720	810
EPDS2006-2-SD	0.6	2	0.18	50,000	1,680	50,000	1,535	38,400	1,210	38,400	1,820
EPDS2006-4-SD	0.6	4	0.11	50,000	1,535	46,660	1,390	34,560	995	34,560	1,490
EPDS2006-6-SD	0.6	6	0.06	50,000	1,535	46,660	1,390	34,560	995	34,560	1,490
EPDS2008-4-SD	0.8	4	0.24	50,000	1,680	50,000	1,535	38,400	1,210	38,400	1,820
EPDS2008-6-SD	0.8	6	0.14	50,000	1,535	46,660	1,390	34,560	995	34,560	1,490
EPDS2008-8-SD	0.8	8	0.09	50,000	1,535	46,660	1,390	34,560	995	34,560	1,490
EPDS2010-4-SD	1	4	0.3	50,000	2,500	46,660	2,280	34,560	1,628	34,560	2,440
EPDS2010-8-SD	1	8	0.17	46,650	2,140	41,990	1,880	31,100	1,340	31,100	2,010
EPDS2010-12-SD	1	12	0.11	41,480	1,670	37,330	1,460	27,650	1,045	27,650	1,570
EPDS2015-6-SD	1.5	6	0.45	40,320	2,030	36,290	1,780	26,880	1,270	26,880	1,910
EPDS2015-12-SD	1.5	12	0.25	36,290	1,670	32,660	1,460	24,190	1,045	24,190	1,570
EPDS2015-18-SD	1.5	18	0.16	32,250	1,300	29,030	1,130	21,500	810	21,500	1,220
EPDS2020-8-SD	2	8	0.6	30,240	2,030	27,220	1,780	20,160	1,270	20,160	1,910
EPDS2020-16-SD	2	16	0.35	27,150	1,670	24,440	1,460	18,100	1,045	18,100	1,570
EPDS2020-24-SD	2	24	0.21	24,200	1,300	21,780	1,130	16,130	810	16,130	1,220
EPDS2030-12-SD	3	12	0.9	23,040	1,940	20,740	1,690	15,360	1,210	15,360	1,820
EPDS2030-24-SD	3	24	0.36	20,730	1,600	18,660	1,390	13,820	995	13,820	1,490
EPDS2030-36-SD	3	36	0.26	18,450	1,400	16,610	1,230	12,300	880	12,300	1,320
EPDS2040-16-SD	4	16	1.2	17,250	3,680	15,530	3,220	11,500	2,300	11,500	2,300
EPDS2040-32-SD	4	32	0.64	15,530	2,980	13,970	2,600	10,350	1,860	10,350	1,860
EPDS2040-48-SD	4	48	0.35	13,650	2,640	12,290	2,300	9,100	1,640	9,100	1,640

[Note]

- 1 An air blower is recommended for some resin materials.
- 2 The cutting conditions shown in the table above are reference cutting conditions, and should be adjusted according to the actual shape to be machined, the machine used, and purpose for machining.
- 3 If the machine rotation speed is insufficient, reduce the rotation speed and feed rate by the same ratio.

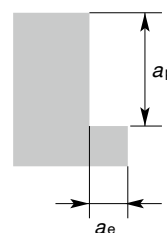
a_p : Axial direction cutting depth (mm)
DC : Outer diameter(mm)



<Side Finishing>

Work material	1		2	
	Expanded aluminum alloy material A5052,A7075 etc.		Resin, Acrylic, etc.	
Tool dia. DC (mm)	Revolution n min^{-1}	Feed rate v_f mm/min	Revolution n min^{-1}	Feed rate v_f mm/min
0.5	50,000	2,000	50,000	2,000
0.6	48,000	1,920	48,000	1,920
0.8	44,000	2,200	44,000	2,200
1	40,000	2,400	40,000	2,400
1.5	34,000	2,400	34,000	2,400
2	30,000	2,400	30,000	2,400
3	26,000	2,080	26,000	2,080
4	24,000	1,920	24,000	1,920

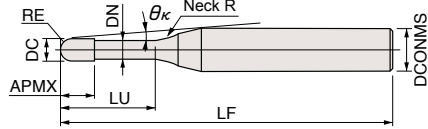
Depth of cut (mm)



$$a_p \leq 1 \text{ DC}$$

$$a_e \leq 0.02 \text{ mm} \sim 0.05 \text{ mm}$$

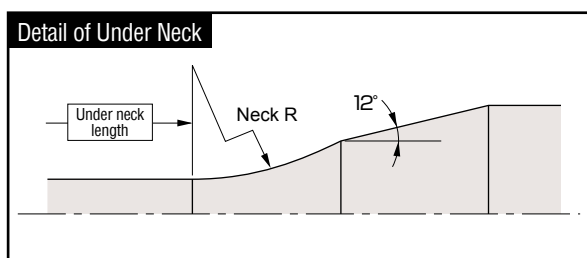
Epoch SD(S-DLC) Deep Ball



(mm)	
Ball radius RE	Tolerance on RE
RE ≤ 0.25	±0.003
0.25 < RE	±0.005

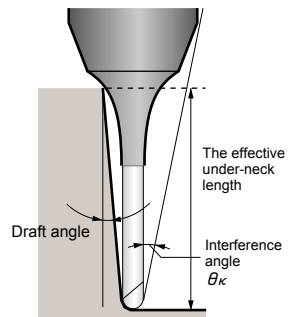
EPDB2-SD

Item code	Stock	Size (mm)								Interference angle (°)	Effective under neck length with respect to draft angle					
		Ball radius	Tool dia.	Under neck length	Flute length	Neck dia.	Overall length	Shank dia.	Neck R		θκ	0.5°	1°	1.5°	2°	3°
		RE	DC	LU	APMX	DN	LF	DCONMS								
EPDB2002-0.4-SD	●	0.1	0.2	0.4	0.15	0.17	50	4	1	11.54	0.59	0.61	0.63	0.66	0.7	
EPDB2002-0.6-SD	●			0.6						11.3	0.8	0.83	0.86	0.88	0.93	
EPDB2002-1-SD	●			1						10.86	1.22	1.26	1.3	1.33	1.39	
EPDB2003-0.5-SD	●	0.15	0.3	0.5	0.25	0.27	50	4	2	11.47	0.78	0.82	0.86	0.9	0.98	
EPDB2003-1-SD	●			1						10.89	1.31	1.38	1.43	1.49	1.59	
EPDB2003-1.5-SD	●			1.5						10.36	1.84	1.92	1.99	2.06	2.18	
EPDB2004-1-SD	●	0.2	0.4	1	0.3	0.37	50	4	2	10.91	1.31	1.37	1.43	1.48	1.58	
EPDB2004-1.5-SD	●			1.5						10.37	1.84	1.92	1.99	2.06	2.17	
EPDB2004-2-SD	●			2						9.88	2.36	2.46	2.54	2.62	2.75	
EPDB2005-2-SD	●	0.25	0.5	2	0.35	0.47	50	4	10	9.88	2.86	3.14	3.39	3.62	4.06	
EPDB2005-4-SD	●			4						8.27	5.06	5.45	5.78	6.08	6.61	
EPDB2005-6-SD	●			6						7.1	7.23	7.69	8.08	8.43	9.05	
EPDB2006-2-SD	●	0.3	0.6	2	0.4	0.57	50	4	10	9.88	2.86	3.13	3.38	3.61	4.04	
EPDB2006-4-SD	●			4						8.22	5.06	5.44	5.77	6.07	6.6	
EPDB2006-6-SD	●			6						7.04	7.22	7.69	8.08	8.42	9.04	
EPDB2008-4-SD	●	0.4	0.8	4	0.5	0.77	50	4	10	8.14	5.05	5.43	5.75	6.05	6.58	
EPDB2008-6-SD	●			6						6.92	7.21	7.68	8.06	8.41	9.02	
EPDB2008-8-SD	●			8						6.01	9.36	9.89	10.33	10.71	11.38	
EPDB2010-4-SD	●	0.5	1	4	0.8	0.96	50	4	10	8.02	5.09	5.45	5.77	6.06	6.58	
EPDB2010-8-SD	●			8			55			5.85	9.39	9.91	10.34	10.72	11.38	
EPDB2010-12-SD	●			12			4.6			13.63	14.26	14.78	15.22	15.99		
EPDB2015-6-SD	●	0.75	1.5	6	1.35	1.44	50	4	10	6.33	7.31	7.73	8.09	8.42	9.01	
EPDB2015-12-SD	●			12			55			4.14	13.68	14.29	14.79	15.23	15.98	
EPDB2015-18-SD	●			18			60			3.08	19.97	20.72	21.32	21.84	23.83	
EPDB2020-8-SD	●	1	2	8	1.7	1.92	50	4	10	4.81	9.5	9.97	10.37	10.73	11.37	
EPDB2020-16-SD	●			16			55			2.88	17.92	18.61	19.17	19.65	No interference	
EPDB2020-24-SD	●			24			60			2.06	26.26	27.11	27.77	28.75	No interference	
EPDB2030-12-SD	●	1.5	3	12	2.5	2.88	55	6	10	4.81	13.82	14.36	14.83	15.24	15.96	
EPDB2030-24-SD	●			24			65			2.88	26.33	27.14	27.79	28.76	No interference	
EPDB2030-36-SD	●			36			80			2.06	38.74	39.74	41.17	43.12	No interference	
EPDB2040-16-SD	●	2	4	16	3	3.9	60	6	10	3.03	17.93	18.58	19.11	19.58	20.91	
EPDB2040-32-SD	●			32			75			1.64	34.56	35.5	36.48	No interference	No interference	
EPDB2040-48-SD	●			48			90			1.13	51.05	52.37	No interference	No interference	No interference	
EPDB2050-20-SD	●	2.5	5	20	3.5	4.9	65	6	10	1.38	22.09	22.81	No interference	No interference	No interference	
EPDB2050-40-SD	●			40			80			0.71	42.8	No interference	No interference	No interference	No interference	



[Note]

If the workpiece has draft angle, the interference length will be longer than the under-neck length. Please refer to the effective under-neck length for the various draft angles. In addition, the angle at which the tool will interfere with the workpiece is shown as the "interference angle θ_k ", and should also be referred to.



● : Stocked items.

SD Coating

Indexable Tools

End Mills

Drills

Line Up, Recommended Cutting Conditions



Recommended Cutting Conditions

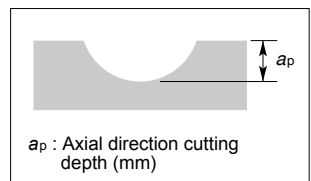
EPDB-SD

<Slotting>

					1		2		3		4	
					Expanded aluminum alloy material A5052, A7075 etc.		Cast aluminum alloy material Die-casting, Si less than 10%		Pure copper C1100 etc.		Resin, Acrylic, etc.	
Item code	Ball radius RE (mm)	Tool dia. DC (mm)	Under neck length LU (mm)	Axial direction cutting depth (mm)	Revolution n min ⁻¹	Feed rate vf mm/min	Revolution n min ⁻¹	Feed rate vf mm/min	Revolution n min ⁻¹	Feed rate vf mm/min	Revolution n min ⁻¹	Feed rate vf mm/min
EPDB2002-0.4-SD	0.1	0.2	0.4	0.03	50,000	500	50,000	500	50,000	500	50,000	750
EPDB2002-0.6-SD	0.1	0.2	0.6	0.025	50,000	450	50,000	450	50,000	450	50,000	680
EPDB2002-1-SD	0.1	0.2	1	0.017	50,000	450	50,000	450	50,000	450	50,000	680
EPDB2003-0.5-SD	0.15	0.3	0.5	0.033	50,000	800	50,000	800	50,000	800	50,000	1,200
EPDB2003-1-SD	0.15	0.3	1	0.026	50,000	700	50,000	700	50,000	700	50,000	1,050
EPDB2003-1.5-SD	0.15	0.3	1.5	0.02	50,000	600	50,000	600	50,000	600	50,000	900
EPDB2004-1-SD	0.2	0.4	1	0.05	50,000	980	50,000	980	50,000	980	47,800	1,470
EPDB2004-1.5-SD	0.2	0.4	1.5	0.04	50,000	840	50,000	840	50,000	840	43,000	1,260
EPDB2004-2-SD	0.2	0.4	2	0.034	50,000	700	50,000	700	47,700	700	38,200	1,050
EPDB2005-2-SD	0.25	0.5	2	0.1	50,000	1,000	50,000	1,000	48,000	960	38,400	1,280
EPDB2005-4-SD	0.25	0.5	4	0.06	50,000	900	50,000	900	43,200	780	34,560	1,050
EPDB2005-6-SD	0.25	0.5	6	0.03	50,000	850	50,000	850	38,400	650	30,720	810
EPDB2006-2-SD	0.3	0.6	2	0.12	50,000	1,500	50,000	1,500	48,000	1,440	38,400	1,820
EPDB2006-4-SD	0.3	0.6	4	0.07	50,000	1,420	50,000	1,420	43,200	1,230	34,560	1,490
EPDB2006-6-SD	0.3	0.6	6	0.04	50,000	1,350	50,000	1,350	43,200	1,170	34,560	1,490
EPDB2008-4-SD	0.4	0.8	4	0.16	50,000	1,800	50,000	1,800	48,000	1,730	38,400	1,820
EPDB2008-6-SD	0.4	0.8	6	0.1	50,000	1,620	50,000	1,620	43,200	1,400	34,560	1,490
EPDB2008-8-SD	0.4	0.8	8	0.05	50,000	1,610	50,000	1,610	38,400	1,240	34,560	1,490
EPDB2010-4-SD	0.5	1	4	0.2	50,000	2,500	50,000	2,500	43,200	2,160	34,560	2,440
EPDB2010-8-SD	0.5	1	8	0.12	50,000	2,250	50,000	2,250	38,880	1,750	31,100	2,010
EPDB2010-12-SD	0.5	1	12	0.06	50,000	2,130	46,660	1,980	34,560	1,470	27,650	1,570
EPDB2015-6-SD	0.75	1.5	6	0.3	50,000	3,300	45,360	3,000	33,600	2,220	26,880	1,910
EPDB2015-12-SD	0.75	1.5	12	0.18	45,360	2,700	40,820	2,430	30,240	1,800	24,190	1,570
EPDB2015-18-SD	0.75	1.5	18	0.09	40,320	2,270	36,290	2,040	26,880	1,510	21,500	1,220
EPDB2020-8-SD	1	2	8	0.4	37,800	3,410	34,020	3,060	25,200	2,270	20,160	1,910
EPDB2020-16-SD	1	2	16	0.24	34,020	2,450	30,620	2,200	22,680	1,630	18,100	1,570
EPDB2020-24-SD	1	2	24	0.12	30,240	2,060	27,220	1,850	20,160	1,370	16,130	1,220
EPDB2030-12-SD	1.5	3	12	0.6	28,800	4,320	25,920	3,890	19,200	2,880	15,360	1,820
EPDB2030-24-SD	1.5	3	24	0.36	25,920	3,500	23,330	3,150	17,280	2,330	13,820	1,490
EPDB2030-36-SD	1.5	3	36	0.18	23,040	2,940	20,740	2,650	15,360	1,960	12,300	1,320
EPDB2040-16-SD	2	4	16	0.8	20,700	4,140	18,630	3,730	13,800	2,760	11,500	2,300
EPDB2040-32-SD	2	4	32	0.48	18,630	3,360	16,770	3,020	12,420	2,240	10,350	1,860
EPDB2040-48-SD	2	4	48	0.24	16,560	2,820	14,900	2,540	11,040	1,880	9,100	1,640
EPDB2050-20-SD	2.5	5	20	1	16,200	3,890	14,580	3,500	10,800	2,590	8,640	1,560
EPDB2050-40-SD	2.5	5	40	0.6	14,580	3,150	13,120	2,840	9,720	2,100	7,780	1,400

[Note]

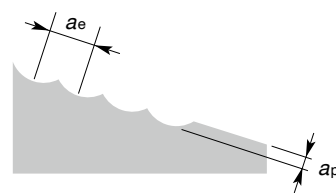
- ① An air blower is recommended for some resin materials.
- ② The cutting conditions shown in the table above are reference cutting conditions, and should be adjusted according to the actual shape to be machined, the machine used, and purpose for machining.
- ③ If the machine rotation speed is insufficient, reduce the rotation speed and feed rate by the same ratio.



<Super Finishing>

Work material	1		2	
	Expanded aluminum alloy material A5052, A7075 etc.		Resin, Acrylic, etc.	
Ball radius RE x Tool dia. DC (mm)	Revolution n min ⁻¹	Feed rate vf mm/min	Revolution n min ⁻¹	Feed rate vf mm/min
RE0.1 x 0.2	50,000	1,000	50,000	1,000
RE0.15 x 0.3	50,000	1,200	50,000	1,200
RE0.2 x 0.4	50,000	1,500	50,000	1,500
RE0.25 x 0.5	50,000	2,000	50,000	2,000
RE0.3 x 0.6	48,000	1,920	48,000	1,920
RE0.4 x 0.8	44,000	2,200	44,000	2,200
RE0.5 x 1	40,000	2,400	40,000	2,400
RE0.75 x 1.5	34,000	2,400	34,000	2,400
RE1 x 2	30,000	2,400	30,000	2,400
RE1.5 x 3	26,000	2,080	26,000	2,080
RE2 x 4	24,000	1,920	24,000	1,920
RE2.5 x 5	22,000	1,760	22,000	1,760

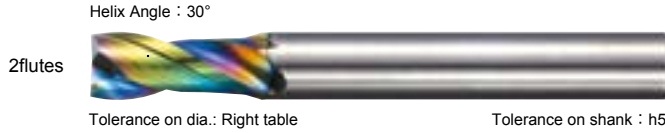
Depth of cut (mm)



[Note]

- ① An air blower is recommended for some resin materials.
- ② The cutting conditions shown in the table above are reference cutting conditions, and should be adjusted according to the actual shape to be machined, the machine used, and purpose for machining.

Epoch SD(S-DLC) Square



(mm)	
Tool dia. DC	Tolerance on dia.
DC ≤ φ6	$\begin{matrix} 0 \\ -0.015 \end{matrix}$
φ7 ≤ DC	$\begin{matrix} 0 \\ -0.020 \end{matrix}$

EPAS2000-SD

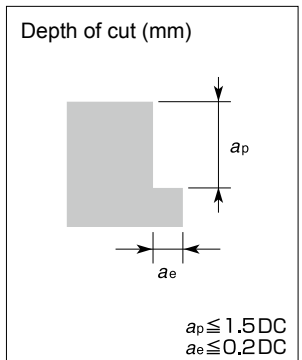
Item code	Stock	Size (mm)			
		Tool dia.	Flute length	Overall length	Shank dia.
EPAS2030-SD	●	3	8	60	6
EPAS2040-SD	●	4	11	60	6
EPAS2050-SD	●	5	13	60	6
EPAS2060-SD	●	6	13	70	6
EPAS2070-SD	●	7	20	70	8

Item code	Stock	Size (mm)			
		Tool dia.	Flute length	Overall length	Shank dia.
EPAS2080-SD	●	8	20	75	8
EPAS2090-SD	●	9	20	80	10
EPAS2100-SD	●	10	25	80	10
EPAS2110-SD	●	11	25	100	12
EPAS2120-SD	●	12	25	100	12

Recommended Cutting Conditions EPAS-SD

<Side milling>

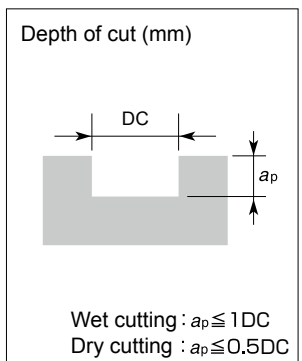
Work material	1		2		3		4	
	Expanded aluminum alloy material A5052,A7075 etc.		Cast aluminum alloy material AC4A,ADC12 etc.		Pure copper C1100 etc.		Resin, Acrylic, etc.	
Tool dia. DC (mm)	Revolution n min ⁻¹	Feed rate v_f mm/min	Revolution n min ⁻¹	Feed rate v_f mm/min	Revolution n min ⁻¹	Feed rate v_f mm/min	Revolution n min ⁻¹	Feed rate v_f mm/min
4	24,000	1,800	19,000	1,300	12,000	900	12,000	1,020
6	16,000	2,000	13,000	1,400	8,000	1,000	8,000	1,120
8	12,000	2,000	9,500	1,500	6,000	1,000	6,000	1,120
10	9,500	2,000	7,600	1,500	4,700	1,000	4,700	1,120
12	8,000	2,000	6,400	1,500	4,000	1,000	4,000	1,120



- [Note] ① An air blower is recommended for some resin materials.
 ② The cutting conditions shown in the table above are reference cutting conditions, and should be adjusted according to the actual shape to be machined, the machine used, and purpose for machining.
 ③ If the machine rotation speed is insufficient, reduce the rotation speed and feed rate by the same ratio.

<Slotting>

Work material	1		2		3		4	
	Expanded aluminum alloy material A5052,A7075 etc.		Cast aluminum alloy material AC4A,ADC12 etc.		Pure copper C1100 etc.		Resin, Acrylic, etc.	
Tool dia. DC (mm)	Revolution n min ⁻¹	Feed rate v_f mm/min	Revolution n min ⁻¹	Feed rate v_f mm/min	Revolution n min ⁻¹	Feed rate v_f mm/min	Revolution n min ⁻¹	Feed rate v_f mm/min
4	19,000	1,100	16,000	750	8,750	550	8,750	650
6	13,000	1,200	11,000	850	5,800	530	5,800	580
8	9,500	1,300	8,000	900	4,300	600	4,300	620
10	7,600	1,300	6,400	900	3,500	600	3,500	620
12	6,400	1,300	5,300	900	3,000	610	3,000	660

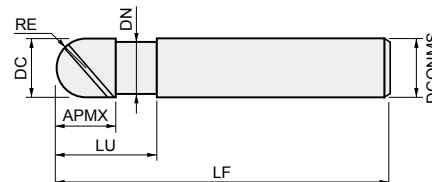


- [Note] ① An air blower is recommended for some resin materials.
 ② The cutting conditions shown in the table above are reference cutting conditions, and should be adjusted according to the actual shape to be machined, the machine used, and purpose for machining.
 ③ If the machine rotation speed is insufficient, reduce the rotation speed and feed rate by the same ratio.

● : Stocked items.

Line Up, Recommended Cutting Conditions

Epoch SD(S-DLC) Ball

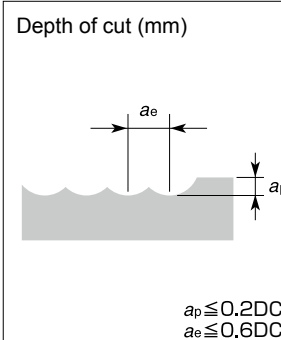


EPAB2000-SD

Item code	Stock	Size (mm)						
		Ball radius	Tool dia.	Under neck length	Flute length	Neck dia.	Overall length	Shank dia.
		RE	DC	LU	APMX	DN	LF	DCONMS
EPAB2060-SD	●	3	6	15	6	5.9	90	6
EPAB2080-SD	●	4	8	20	8	7.9	100	8
EPAB2100-SD	●	5	10	25	10	9.9	100	10
EPAB2120-SD	●	6	12	30	12	11.9	110	12

Recommended Cutting Conditions EPAB-SD

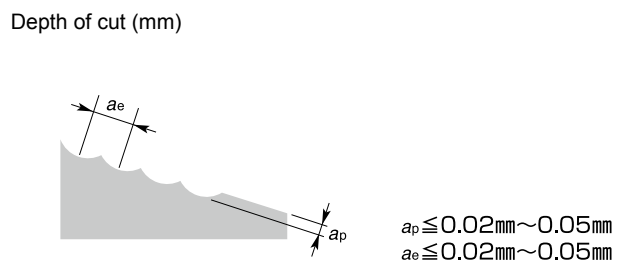
Work material	1		2		3		4	
	Expanded aluminum alloy material A5052, A7075 etc.		Cast aluminum alloy material Die-casting, Si less than 10%		Pure copper C1100 etc.		Resin, Acrylic, etc.	
Ball radius RE × Tool dia. DC (mm)	Revolution n min ⁻¹	Feed rate v_f mm/min	Revolution n min ⁻¹	Feed rate v_f mm/min	Revolution n min ⁻¹	Feed rate v_f mm/min	Revolution n min ⁻¹	Feed rate v_f mm/min
RE3×6	27,000	3,300	21,600	2,310	13,300	1,600	10,600	1,280
RE4×8	20,000	3,200	16,000	2,240	10,000	1,400	8,000	1,120
RE5×10	16,000	3,000	12,800	2,100	8,000	1,280	6,400	1,030
RE6×12	13,300	2,660	10,640	1,860	6,600	1,190	5,300	950



- [Note]**
- 1 An air blower is recommended for some resin materials.
 - 2 The cutting conditions shown in the table above are reference cutting conditions, and should be adjusted according to the actual shape to be machined, the machine used, and purpose for machining.
 - 3 If the machine rotation speed is insufficient, reduce the rotation speed and feed rate by the same ratio.

<Super Finishing>

Work material	1		2	
	Expanded aluminum alloy material A5052, A7075 etc.		Resin, Acrylic, etc.	
Ball radius RE × Tool Dia. DC (mm)	Revolution n min ⁻¹	Feed rate v_f mm/min	Revolution n min ⁻¹	Feed rate v_f mm/min
RE3×6	20,000	1,600	20,000	1,600
RE4×8	15,000	1,200	15,000	1,200
RE5×10	12,000	1,200	12,000	1,200
RE6×12	10,000	1,000	10,000	1,000



- [Note]**
- 1 An air blower is recommended for some resin materials.
 - 2 The cutting conditions shown in the table above are reference cutting conditions, and should be adjusted according to the actual shape to be machined, the machine used, and purpose for machining.

SD(S-DLC) Coating Carbide Oil Hole Non Step Borer

for Aluminium

SD (S-DLC) Coating will change aluminum drilling!

High-efficiency machining with Non-Step Borer!!

Improved chip removal using special groove shape and groove surface. Chips are cut finely due to SD (S-DLC) Coating, enabling high-speed machining with stable chip handling.



Well-shape chips by high-feed boring.



SD Coating

Indexable Tools

High-feed-rate machining is possible!!

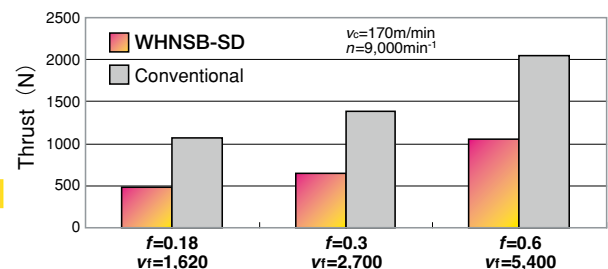
Special tip shape and SD (S-DLC) Coating greatly reduces cutting resistance, so feed rate can be greatly increased, providing a leap in cutting efficiency.

Special tip shape



Comparison of thrust

Tool dia. × Hole depth = $\phi 6.0 \times 33\text{mm}$ (5D)



Horizontal M/C, Water base internal coolant (2.0MPa), Work: AC4B

End Mills

Drills

High welding resistance with superior SD (S-DLC) Coating!!

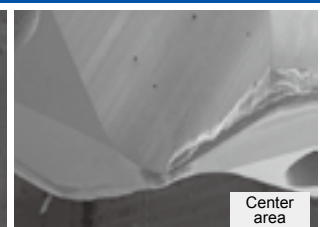
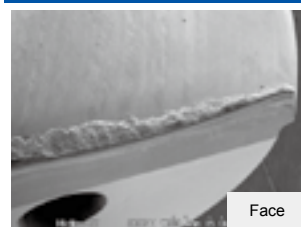
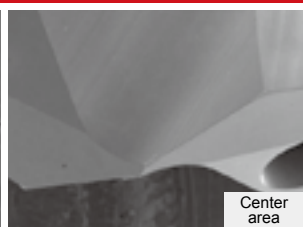
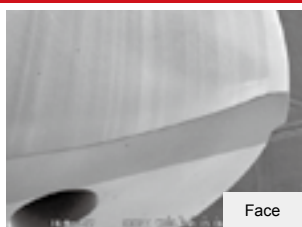
SD (S-DLC) Coating with good welding resistance greatly reduces welding of face surface. Welding of the center area is also reduced by the use of special tip shape and SD (S-DLC) Coating.

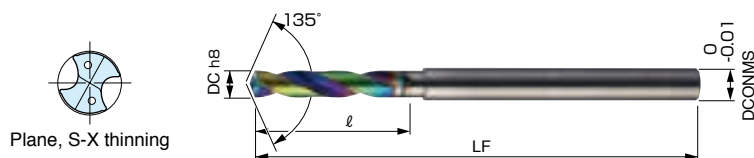
[Comparison of condition after boring 200 holes]

$v_c=170\text{m/min}$, $v_f=3,000\text{mm/min}$, internal supply of water-based cutting agent (2.0MPa); Work material: AC2A

05WHNSB0600-SD

Non coating Oil Hole Drill





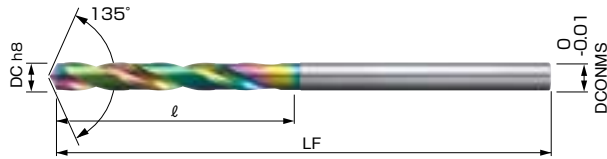
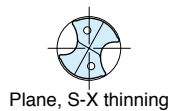
03WHNSB0000-SD

L/D=3

Item code	Stock	Size (mm)			
		Tool dia.	Flute length	Overall length	Shank dia.
		DC	ℓ	LF	DCONMS
03WHNSB0300-SD	●	3.0	19	69	3.0
03WHNSB0303-SD	●	3.03	23	73	4.0
03WHNSB0310-SD	□	3.1	23	73	4.0
03WHNSB0320-SD	□	3.2	23	73	4.0
03WHNSB0330-SD	□	3.3	23	73	4.0
03WHNSB0340-SD	□	3.4	23	73	4.0
03WHNSB0350-SD	□	3.5	23	73	4.0
03WHNSB0353-SD	□	3.53	23	73	4.0
03WHNSB0360-SD	□	3.6	23	73	4.0
03WHNSB0370-SD	□	3.7	23	73	4.0
03WHNSB0380-SD	□	3.8	23	73	4.0
03WHNSB0390-SD	□	3.9	23	73	4.0
03WHNSB0400-SD	●	4.0	23	73	4.0
03WHNSB0403-SD	●	4.03	29	82	5.0
03WHNSB0410-SD	□	4.1	29	82	5.0
03WHNSB0420-SD	□	4.2	29	82	5.0
03WHNSB0430-SD	□	4.3	29	82	5.0
03WHNSB0440-SD	□	4.4	29	82	5.0
03WHNSB0450-SD	□	4.5	29	82	5.0
03WHNSB0453-SD	□	4.53	29	82	5.0
03WHNSB0460-SD	□	4.6	29	82	5.0
03WHNSB0470-SD	□	4.7	29	82	5.0
03WHNSB0480-SD	□	4.8	29	82	5.0
03WHNSB0490-SD	□	4.9	29	82	5.0
03WHNSB0500-SD	●	5.0	29	82	5.0
03WHNSB0503-SD	●	5.03	29	82	6.0
03WHNSB0510-SD	●	5.1	29	82	6.0
03WHNSB0520-SD	□	5.2	29	82	6.0
03WHNSB0530-SD	□	5.3	29	82	6.0
03WHNSB0540-SD	□	5.4	29	82	6.0
03WHNSB0550-SD	●	5.5	29	82	6.0
03WHNSB0553-SD	●	5.53	29	82	6.0
03WHNSB0560-SD	□	5.6	29	82	6.0
03WHNSB0570-SD	□	5.7	29	82	6.0
03WHNSB0580-SD	□	5.8	29	82	6.0
03WHNSB0590-SD	□	5.9	29	82	6.0
03WHNSB0600-SD	●	6.0	29	82	6.0
03WHNSB0603-SD	●	6.03	34	89	7.0
03WHNSB0610-SD	□	6.1	34	89	7.0
03WHNSB0620-SD	□	6.2	34	89	7.0
03WHNSB0630-SD	□	6.3	34	89	7.0
03WHNSB0640-SD	□	6.4	34	89	7.0
03WHNSB0650-SD	●	6.5	34	89	7.0

Item code	Stock	Size (mm)			
		Tool dia.	Flute length	Overall length	Shank dia.
		DC	ℓ	LF	DCONMS
03WHNSB0653-SD	●	6.53	34	89	7.0
03WHNSB0660-SD	□	6.6	34	89	7.0
03WHNSB0670-SD	□	6.7	34	89	7.0
03WHNSB0680-SD	●	6.8	34	89	7.0
03WHNSB0690-SD	□	6.9	34	89	7.0
03WHNSB0700-SD	●	7	34	89	7.0
03WHNSB0703-SD	●	7.03	39	95	8.0
03WHNSB0710-SD	□	7.1	39	95	8.0
03WHNSB0720-SD	□	7.2	39	95	8.0
03WHNSB0730-SD	●	7.3	39	95	8.0
03WHNSB0740-SD	□	7.4	39	95	8.0
03WHNSB0750-SD	●	7.5	39	95	8.0
03WHNSB0753-SD	●	7.53	39	95	8.0
03WHNSB0760-SD	□	7.6	39	95	8.0
03WHNSB0770-SD	□	7.7	39	95	8.0
03WHNSB0780-SD	□	7.8	39	95	8.0
03WHNSB0790-SD	□	7.9	39	95	8.0
03WHNSB0800-SD	●	8.0	39	95	8.0
03WHNSB0803-SD	●	8.03	44	101	9.0
03WHNSB0810-SD	□	8.1	44	101	9.0
03WHNSB0820-SD	□	8.2	44	101	9.0
03WHNSB0830-SD	□	8.3	44	101	9.0
03WHNSB0840-SD	□	8.4	44	101	9.0
03WHNSB0850-SD	●	8.5	44	101	9.0
03WHNSB0853-SD	●	8.53	44	101	9.0
03WHNSB0860-SD	●	8.6	44	101	9.0
03WHNSB0870-SD	□	8.7	44	101	9.0
03WHNSB0880-SD	●	8.8	44	101	9.0
03WHNSB0890-SD	□	8.9	44	101	9.0
03WHNSB0900-SD	●	9.0	44	101	9.0
03WHNSB0903-SD	●	9.03	49	107	10.0
03WHNSB0910-SD	□	9.1	49	107	10.0
03WHNSB0920-SD	□	9.2	49	107	10.0
03WHNSB0930-SD	□	9.3	49	107	10.0
03WHNSB0940-SD	□	9.4	49	107	10.0
03WHNSB0950-SD	●	9.5	49	107	10.0
03WHNSB0953-SD	●	9.53	49	107	10.0
03WHNSB0960-SD	□	9.6	49	107	10.0
03WHNSB0970-SD	□	9.7	49	107	10.0
03WHNSB0980-SD	□	9.8	49	107	10.0
03WHNSB0990-SD	□	9.9	49	107	10.0
03WHNSB1000-SD	●	10.0	49	107	10.0
03WHNSB1003-SD	●	10.03	54	117	11.0

● : Stocked items. □ : Stocked by specified distributor. Contact with our sales department.



05WHNSB-SD

L/D=5

Item code	Stock	Size (mm)			
		Tool dia.	Flute length	Overall length	Shank dia.
		DC	ℓ	LF	DCONMS
05WHNSB0200-SD	●	2.0	20	66	3.0
05WHNSB0203-SD	●	2.03	24	74	3.0
05WHNSB0210-SD	●	2.1	24	74	3.0
05WHNSB0220-SD	●	2.2	24	74	3.0
05WHNSB0230-SD	●	2.3	24	74	3.0
05WHNSB0240-SD	●	2.4	24	74	3.0
05WHNSB0250-SD	●	2.5	24	74	3.0
05WHNSB0253-SD	●	2.53	29	79	3.0
05WHNSB0260-SD	●	2.6	29	79	3.0
05WHNSB0270-SD	●	2.7	29	79	3.0
05WHNSB0280-SD	●	2.8	29	79	3.0
05WHNSB0290-SD	●	2.9	29	79	3.0
05WHNSB0300-SD	●	3.0	29	79	3.0
05WHNSB0303-SD	●	3.03	37	87	4.0
05WHNSB0310-SD	□	3.1	37	87	4.0
05WHNSB0320-SD	□	3.2	37	87	4.0
05WHNSB0330-SD	□	3.3	37	87	4.0
05WHNSB0340-SD	□	3.4	37	87	4.0
05WHNSB0350-SD	●	3.5	37	87	4.0
05WHNSB0353-SD	●	3.53	37	87	4.0
05WHNSB0360-SD	□	3.6	37	87	4.0
05WHNSB0370-SD	□	3.7	37	87	4.0
05WHNSB0380-SD	□	3.8	37	87	4.0
05WHNSB0390-SD	□	3.9	37	87	4.0
05WHNSB0400-SD	●	4.0	37	87	4.0
05WHNSB0403-SD	●	4.03	47	100	5.0
05WHNSB0410-SD	●	4.1	47	100	5.0
05WHNSB0420-SD	●	4.2	47	100	5.0
05WHNSB0430-SD	●	4.3	47	100	5.0
05WHNSB0440-SD	□	4.4	47	100	5.0
05WHNSB0450-SD	●	4.5	47	100	5.0
05WHNSB0453-SD	●	4.53	47	100	5.0
05WHNSB0460-SD	□	4.6	47	100	5.0
05WHNSB0470-SD	□	4.7	47	100	5.0
05WHNSB0480-SD	□	4.8	47	100	5.0
05WHNSB0490-SD	□	4.9	47	100	5.0
05WHNSB0500-SD	●	5.0	47	100	5.0
05WHNSB0503-SD	●	5.03	47	100	6.0
05WHNSB0510-SD	●	5.1	47	100	6.0
05WHNSB0520-SD	□	5.2	47	100	6.0
05WHNSB0530-SD	□	5.3	47	100	6.0
05WHNSB0540-SD	□	5.4	47	100	6.0
05WHNSB0550-SD	●	5.5	47	100	6.0
05WHNSB0553-SD	●	5.53	47	100	6.0
05WHNSB0560-SD	□	5.6	47	100	6.0
05WHNSB0570-SD	□	5.7	47	100	6.0
05WHNSB0580-SD	□	5.8	47	100	6.0
05WHNSB0590-SD	□	5.9	47	100	6.0
05WHNSB0600-SD	●	6.0	47	100	6.0

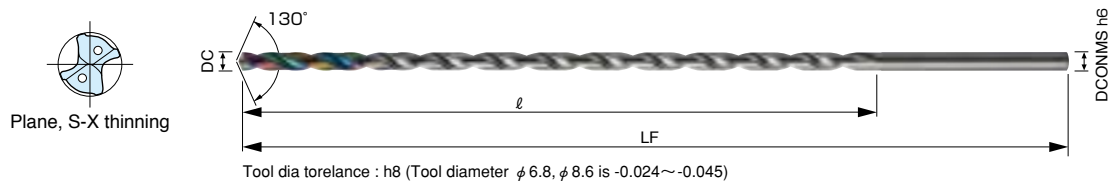
Item code	Stock	Size (mm)			
		Tool dia.	Flute length	Overall length	Shank dia.
		DC	ℓ	LF	DCONMS
05WHNSB0603-SD	●	6.03	55	110	7.0
05WHNSB0610-SD	□	6.1	55	110	7.0
05WHNSB0620-SD	□	6.2	55	110	7.0
05WHNSB0630-SD	□	6.3	55	110	7.0
05WHNSB0640-SD	□	6.4	55	110	7.0
05WHNSB0650-SD	●	6.5	55	110	7.0
05WHNSB0653-SD	●	6.53	55	110	7.0
05WHNSB0660-SD	□	6.6	55	110	7.0
05WHNSB0670-SD	□	6.7	55	110	7.0
05WHNSB0680-SD	●	6.8	55	110	7.0
05WHNSB0690-SD	□	6.9	55	110	7.0
05WHNSB0700-SD	●	7.0	55	110	7.0
05WHNSB0703-SD	●	7.03	63	119	8.0
05WHNSB0710-SD	□	7.1	63	119	8.0
05WHNSB0720-SD	□	7.2	63	119	8.0
05WHNSB0730-SD	□	7.3	63	119	8.0
05WHNSB0740-SD	□	7.4	63	119	8.0
05WHNSB0750-SD	●	7.5	63	119	8.0
05WHNSB0753-SD	●	7.53	63	119	8.0
05WHNSB0760-SD	□	7.6	63	119	8.0
05WHNSB0770-SD	□	7.7	63	119	8.0
05WHNSB0780-SD	●	7.8	63	119	8.0
05WHNSB0790-SD	□	7.9	63	119	8.0
05WHNSB0800-SD	●	8.0	63	119	8.0
05WHNSB0803-SD	●	8.03	71	128	9.0
05WHNSB0810-SD	□	8.1	71	128	9.0
05WHNSB0820-SD	□	8.2	71	128	9.0
05WHNSB0830-SD	□	8.3	71	128	9.0
05WHNSB0840-SD	□	8.4	71	128	9.0
05WHNSB0850-SD	●	8.5	71	128	9.0
05WHNSB0853-SD	●	8.53	71	128	9.0
05WHNSB0860-SD	●	8.6	71	128	9.0
05WHNSB0870-SD	□	8.7	71	128	9.0
05WHNSB0880-SD	●	8.8	71	128	9.0
05WHNSB0890-SD	□	8.9	71	128	9.0
05WHNSB0900-SD	●	9.0	71	128	9.0
05WHNSB0903-SD	●	9.03	79	137	10.0
05WHNSB0910-SD	□	9.1	79	137	10.0
05WHNSB0920-SD	□	9.2	79	137	10.0
05WHNSB0930-SD	□	9.3	79	137	10.0
05WHNSB0940-SD	□	9.4	79	137	10.0
05WHNSB0950-SD	●	9.5	79	137	10.0
05WHNSB0953-SD	●	9.53	79	137	10.0
05WHNSB0960-SD	□	9.6	79	137	10.0
05WHNSB0970-SD	□	9.7	79	137	10.0
05WHNSB0980-SD	●	9.8	79	137	10.0
05WHNSB0990-SD	□	9.9	79	137	10.0
05WHNSB1000-SD	●	10.0	79	137	10.0
05WHNSB1003-SD	●	10.03	87	150	11.0

SD Coating

Indexable Tools

End Mills

Drills



15WHNSB0000-SD

L/D=15

Item code	Stock	Size (mm)			
		Tool dia.	Flute length	Overall length	Shank dia.
		DC	ℓ	LF	DCONMS
15WHNSB0300-SD	●	3.0	54	102	3.0
15WHNSB0350-SD	□	3.5	63	111	4.0
15WHNSB0400-SD	●	4.0	72	121	4.0
15WHNSB0450-SD	□	4.5	81	132	5.0
15WHNSB0500-SD	●	5.0	91	142	5.0
15WHNSB0550-SD	●	5.5	100	151	6.0
15WHNSB0600-SD	●	6.0	109	160	6.0
15WHNSB0650-SD	□	6.5	118	171	7.0
15WHNSB0680-SD	□	6.8	127	180	7.0
15WHNSB0700-SD	●	7.0	127	180	7.0
15WHNSB0750-SD	□	7.5	136	191	8.0
15WHNSB0800-SD	●	8.0	145	200	8.0
15WHNSB0850-SD	□	8.5	154	209	9.0
15WHNSB0860-SD	□	8.6	163	218	9.0
15WHNSB0900-SD	●	9.0	163	218	9.0
15WHNSB0950-SD	□	9.5	172	227	10.0
15WHNSB1000-SD	●	10.0	181	236	10.0

20WHNSB0000-SD

L/D=20

Item code	Stock	Size (mm)			
		Tool dia.	Flute length	Overall length	Shank dia.
		DC	ℓ	LF	DCONMS
20WHNSB0300-SD	●	3.0	69	117	3.0
20WHNSB0350-SD	□	3.5	81	129	4.0
20WHNSB0400-SD	●	4.0	92	141	4.0
20WHNSB0450-SD	□	4.5	104	155	5.0
20WHNSB0500-SD	●	5.0	116	167	5.0
20WHNSB0550-SD	●	5.5	127	178	6.0
20WHNSB0600-SD	●	6.0	139	190	6.0
20WHNSB0650-SD	□	6.5	150	203	7.0
20WHNSB0680-SD	□	6.8	162	215	7.0
20WHNSB0700-SD	●	7.0	162	215	7.0
20WHNSB0750-SD	□	7.5	173	228	8.0
20WHNSB0800-SD	●	8.0	185	240	8.0

25WHNSB0000-SD

L/D=25

Item code	Stock	Size (mm)			
		Tool dia.	Flute length	Overall length	Shank dia.
		DC	ℓ	LF	DCONMS
25WHNSB0300-SD	●	3.0	84	132	3.0
25WHNSB0350-SD	□	3.5	98	146	4.0
25WHNSB0400-SD	●	4.0	113	162	4.0
25WHNSB0450-SD	□	4.5	127	178	5.0
25WHNSB0500-SD	●	5.0	141	192	5.0
25WHNSB0550-SD	●	5.5	155	206	6.0
25WHNSB0600-SD	●	6.0	169	220	6.0
25WHNSB0650-SD	□	6.5	183	236	7.0
25WHNSB0680-SD	□	6.8	191	244	7.0
25WHNSB0700-SD	●	7.0	197	250	7.0
25WHNSB0750-SD	□	7.5	211	266	8.0
25WHNSB0800-SD	●	8.0	225	280	8.0

30WHNSB0000-SD

L/D=30

Item code	Stock	Size (mm)			
		Tool dia.	Flute length	Overall length	Shank dia.
		DC	ℓ	LF	DCONMS
30WHNSB0300-SD	●	3.0	99	147	3.0
30WHNSB0350-SD	□	3.5	116	164	4.0
30WHNSB0400-SD	●	4.0	132	181	4.0
30WHNSB0450-SD	□	4.5	149	200	5.0
30WHNSB0500-SD	●	5.0	166	217	5.0
30WHNSB0550-SD	●	5.5	182	233	6.0
30WHNSB0600-SD	●	6.0	199	250	6.0

● : Stocked items. □ : Stocked by specified distributor. Contact with our sales department.

Recommended Cutting Conditions

○ Cutting Conditions (Water base internal coolant)

Work material	Aluminum alloy material Mg (5052)		Aluminum alloy material Zn-Mg (7075)		Cast aluminum alloy material AC··, ADC		Copper alloy	
Tool dia.	Cutting speed v_c (m/min)	Feed per rev f (mm/rev)	Cutting speed v_c (m/min)	Feed per rev f (mm/rev)	Cutting speed v_c (m/min)	Feed per rev f (mm/rev)	Cutting speed v_c (m/min)	Feed per rev f (mm/rev)
Φ2.0	80~180	0.04~0.08	60~150	0.06~0.10	80~160	0.06~0.10	60~150	0.04~0.08
Φ4.0	80~200	0.08~0.16	60~150	0.12~0.20	80~160	0.12~0.20	60~150	0.08~0.16
Φ6.0	80~200	0.12~0.24	80~180	0.18~0.30	80~180	0.18~0.30	80~180	0.12~0.24
Φ8.0	80~200	0.16~0.30	80~180	0.24~0.40	80~180	0.24~0.40	80~180	0.16~0.30
Φ10.0	80~200	0.18~0.35	80~180	0.25~0.50	80~200	0.25~0.50	80~180	0.18~0.35

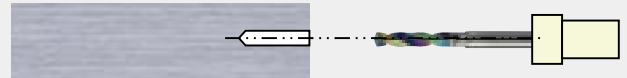
【Setting of Cutting Conditions】

- Use the appropriate coolant for the work material and machining shape.
- These Recommended Cutting Conditions indicate only the rule of a thumb for the cutting conditions. In actual machining, the condition should be adjusted according to the machining shape, purpose and the machine type.
- Internal coolant cutting condition standards above are when water-soluble cutting lubricant is used. In addition, for Φ5.0 or less, coolant pressure of 2.0MPa or more is required.
- For MQL (mist) machining, depending on the mist equipment and amount discharged by the tool, it may be necessary to reduce cutting speed in order to perform machining.
- For MQL (mist) machining of A7075, please consult us.
- When mounting the tool, use a collet without scratches or stains and suppress tool vibration to 0.02mm or less.

○ How to use 15~30WHNSB-SD

1 Drilling of pilot hole (guide hole) (03~05WHNSB-SD)

- Hole depth : tool diameter × 2.0~4.0 times



2 Supplying coolant during low-speed revolution (15~30WHNSB-SD)

- Leading to the guide hole at low speed ($n=0\sim500\text{ min}^{-1}$)
- Stop feed 2.0~5.0 mm before the end of the guide hole. When a long tool (200mm or longer) is used, position the tool to the guide hole at low revolution speed ($n=200\text{ min}^{-1}$ or less).



3 High-speed revolution for drilling feed (15~30WHNSB-SD)

- After confirming that the revolution speed is increasing at the specified rate, start feeding.



4 Machining completion

- Withdraw the tool at low speed. ($n=0\sim500\text{ min}^{-1}$)





The diagrams and table data are examples of test results, and are not guaranteed values.
 "MOLDINO" is a registered trademark of MOLDINO Tool Engineering, Ltd.

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) When preparing for use, be sure that the inserts are firmly mounted in place and that they are firmly mounted on the arbor, etc.
- (3) 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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Database for selection Cutting Tool Products **[TOOL SEARCH]**

TOOLSEARCH

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