

NS TOOL

CORE LINE

For Crafting Tomorrow

PCD

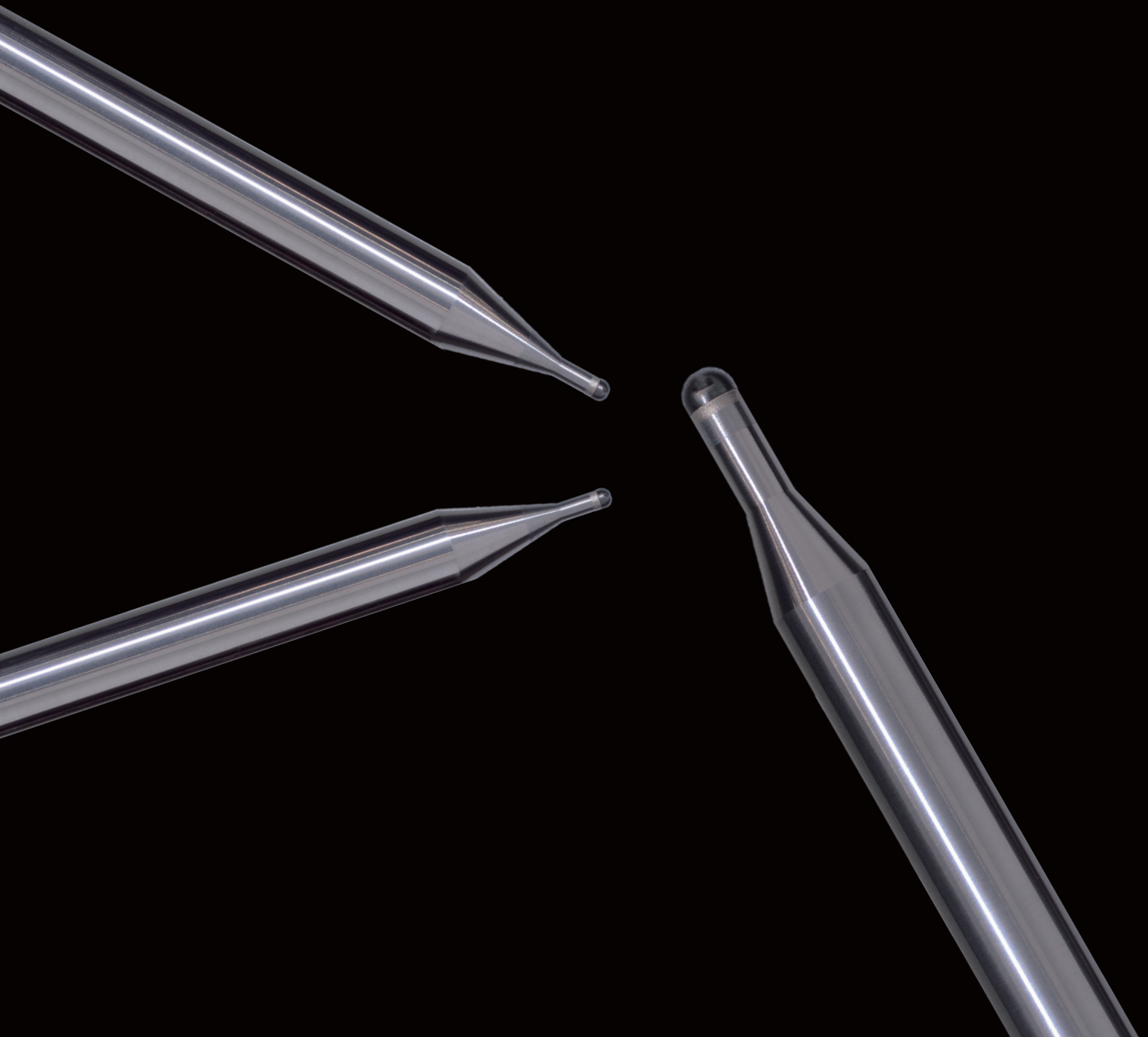
Polishing time reduced by advanced technology

PCD End Mill

Size expansion up to R3

PCDRB

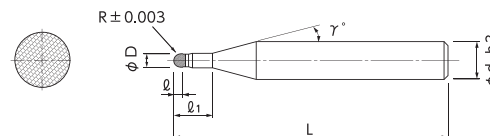
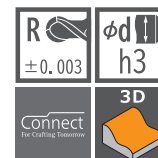
Lineup Expansion in December , 2022



PCD Ball End Mill

Total 13 sizes

Capable to machine nano level surface roughness, and mirror finishing



- Unique tool geometry makes stable surface.
- Polish-less machining become reality by nano-level roughness on profiling finish.

Work Material

Hardened Steel H	Hard Brittle Material O
◎	◎



Actual diameter is indicated in 1 micron units on product label, and enables high precision machining.

※Micron units dimensions cannot be specified.



Cutting edge shape

◆ Released in December, 2022.

Unit [Size : mm]

Code No.	Radius (R)	Under Neck Length (ℓ1)	Length of Cut (ℓ)	Dia. (D)	Neck Taper Angle (γ)	Shank Dia. (d)	Overall Length (L)
04-00500-00501	R0.05	0.15	0.05	0.1	15°	4	48
04-00500-00502		0.25	0.05	0.1	15°	4	48
04-00500-00751	R0.075	0.23	0.075	0.15	15°	4	48
04-00500-00752		0.38	0.075	0.15	15°	4	48
04-00500-01001	R0.1	0.5	0.1	0.2	15°	4	48
04-00500-02001	R0.2	1	0.2	0.4	15°	4	48
04-00500-03001	R0.3	1.5	0.3	0.6	15°	4	48
04-00500-05001	R0.5	2.5	0.5	1	15°	4	50
04-00500-07501	R0.75	3.8	0.75	1.5	15°	4	48
04-00500-10001	R1	5	1	2	15°	4	48
◆ 04-00500-15001	R1.5	7.5	1.5	3	15°	6	59
◆ 04-00500-20001	R2	10	2	4	15°	6	60
◆ 04-00500-30001	R3	15	3	6	-	6	62

How to Order

When you order, indicate PCDRB (R)×(ℓ1).

※ (γ) is reference Value.

Work Material		Hardened Steels • High Speed Tool Steels (~70HRC)					Cemented Carbide (~92.5HRA)				
Radius	Under Neck Length	Stock	Depth of Cut		Spindle Speed	Feed	Stock	Depth of Cut		Spindle Speed	Feed
		mm	a_p mm	a_e mm	min^{-1}	mm/min	mm	a_p mm	a_e mm	min^{-1}	mm/min
0.05	0.15	0.001	0.001	0.001	40,000	50	0.001	0.001	0.001	40,000	50
	0.25	0.001	0.001	0.001	40,000	25	0.001	0.001	0.001	40,000	25
0.075	0.23	0.001	0.001	0.001	40,000	100	0.001	0.001	0.001	40,000	100
	0.38	0.001	0.001	0.001	40,000	50	0.001	0.001	0.001	40,000	50
0.1	0.5	0.001	0.001	0.001	40,000	100	0.001	0.001	0.001	40,000	100
0.2	1	0.002	0.002	0.002	40,000	200	0.002	0.001	0.002	40,000	150
0.3	1.5	0.003	0.003	0.003	40,000	400	0.002	0.002	0.002	40,000	200
0.5	2.5	0.005	0.005	0.005	40,000	500	0.003	0.003	0.003	40,000	300
0.75	3.8	0.005	0.005	0.005	40,000	600	0.004	0.004	0.004	40,000	400
1	5	0.005	0.005	0.005	40,000	800	0.005	0.005	0.005	40,000	500
1.5	7.5	0.005	0.006	0.006	30,000	800	0.005	0.005	0.005	30,000	500
2	10	0.005	0.007	0.007	22,000	800	0.005	0.006	0.006	20,000	500
3	15	0.005	0.009	0.009	16,000	800	0.005	0.007	0.007	12,000	500
Notes		<p>※1 a_p: Axial Depth of Cut, a_e: Radial Depth of Cut.</p> <p>※2 Described Depth of Cut is max value. Adjust it depending on machine rigidity, main spindle rigidity, and required precision.</p> <p>※3 Obtain uniform stock amount on the cutting surface in the pre-stage cutting (semi-finishing).</p> <p>※4 In order to perform lubricity and chip flow well, coolant must be always reached cutting points.</p> <p>※5 Careful set up for milling condition and tool path are required especially when operate with high cutting load such as corner area and slotting.</p> <p>※6 Water-insoluble fluid is recommended.</p> <p>※7 Using water-insoluble fluid could lead to fires due to sparks generated during machining or heat caused by breakage. Ensure that you take proper fire-prevention measures.</p>									



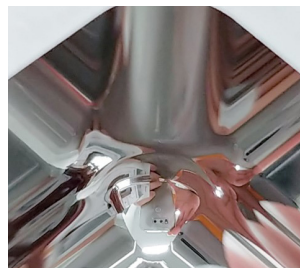
Mirror surface that also reflects the NS TOOL logo



Work Material: **HAP40 (64HRC)**

Work size: 50 × 25 mm (Machining depth 15 mm)

Coolant: Water-insoluble fluid (Finishing)

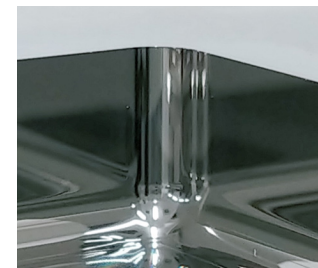


Tool PCDRB R3 × Under Neck length15

n : 16,000 min^{-1} , v_f : 700 mm/min
 $a_p \times a_e$: 0.009 × 0.009 mm

Surface Roughness
 Side Ra 0.004 μm

Bottom Ra 0.023 μm



Tool PCDRB R1.5 × Under Neck length7.5

n : 25,000 min^{-1} , v_f : 700 mm/min
 $a_p \times a_e$: 0.006 × 0.006 mm

Surface Roughness
 Side Ra 0.006 μm

Bottom Ra 0.046 μm

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Attention on Safety

- 1) When removing tools from cases, be careful of getting-out of tools and don't touch directly the cutting edges.
- 2) Never touch the cutting edges directly with bare hand.
- 3) Use safety covers and eye protection, as tools may be broken.
- 4) Use holders, etc. that match the tools and nature of the machining operations.
The tool should be firmly attached to the holder to prevent shaking.
- 5) The work materials clamp firmly.
- 6) Make sure of dimensions of tools and work pieces before starting operation.
- 7) It is necessary to adjust conditions according to the dimensions of work materials and the machine.
- 8) Select a cutting fluid appropriate to the particular usage. Using water-insoluble fluid could lead to fires due to sparks generated during machining or heat caused by breakage.
Ensure that you take proper fire-prevention measures.
- 9) If abnormal sound, etc. occurs during machining, stop the machine immediately.
- 10) Don't modify tools.