



Size R0.1~R3

UDCB



New Price

Material Applications (☆ Highly Recommended ◎ Recommended ○ Suggested)

Work Material															
Carbon Steels S45C S55C	Alloy Steels SK / SCM SUS	Prehardened Steels NAK HPM	Hardened Steels			Cast Iron	Aluminum Alloys	Graphite	Copper	Plastics	Glass Filled Plastics	Titanium Alloys	Heat Resistant Alloys	Cemented Carbide	Hard Brittle (Non-Metallic) Materials
			~55HRC	~60HRC	~70HRC										
														☆	◎
											○ *1				*2

*1 DCB/DCLB series are highly recommended for Glass Filled Plastic milling.

*2 Hard Brittle (Non-Metallic) Materials: Ceramics (Alumina, Zirconia, etc.), Glasses and etc.

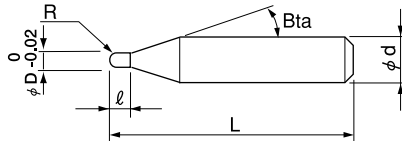
Features

Ball type End Mills for milling Cemented Carbide and Hard Brittle (Non-Metallic) Materials.

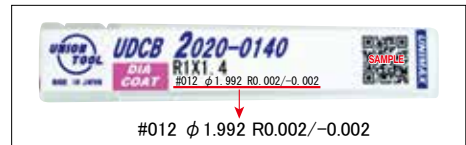
Developed to give improved hardness and durability, new Diamond coating also has outstanding adhesion to the cutting tool.

By combining the new coating with optimum cutting geometries, the tool literally "cuts" the work piece.

Leaves a burr and pit free surface finish on semi-roughing & finishing process.



The shank taper angle shown is not an exact value and to avoid contact with the work piece, we recommend the user controls the precise value of this angle. Shank taper angle should not make contact with the work piece.



Diameter and Ball R accuracy measurements are printed on the label to support High Precision milling.

Total 14 models

Unit (mm)

	Model Number	Radius of Ball Nose R	Length of Cut ℓ	Shank Taper Angle Bta	Overall Length L	Shank Diameter φd	Price (¥)
<input type="checkbox"/>	UDCB 2002-0014	R0.1	0.14	16°	50	4	39,160
<input type="checkbox"/>	UDCB 2003-0021	R0.15	0.21	16°	50	4	39,160
<input type="checkbox"/>	UDCB 2004-0028	R0.2	0.28	16°	50	4	35,660
<input type="checkbox"/>	UDCB 2005-0035	R0.25	0.35	16°	50	4	35,660
<input type="checkbox"/>	UDCB 2006-0042	R0.3	0.42	16°	50	4	32,000
<input type="checkbox"/>	UDCB 2007-0049	R0.35	0.49	16°	50	4	32,000
<input type="checkbox"/>	UDCB 2008-0056	R0.4	0.56	16°	50	4	32,000
<input type="checkbox"/>	UDCB 2009-0063	R0.45	0.63	16°	50	4	32,000
<input type="checkbox"/>	UDCB 2010-0070	R0.5	0.7	16°	50	4	32,000
<input type="checkbox"/>	UDCB 2020-0140	R1	1.4	16°	50	4	32,000
<input type="checkbox"/>	UDCB 2030-0210	R1.5	2.1	16°	60	6	35,160
<input type="checkbox"/>	UDCB 2040-0280	R2	2.8	16°	60	6	35,160
<input type="checkbox"/>	UDCB 2050-0350	R2.5	3.5	16°	60	6	35,160
<input type="checkbox"/>	UDCB 2060-0420	R3	4.2	—	60	6	35,160

New price

Milling Conditions for UDCB

Model Number	Radius of Ball Nose (mm)	Length of Cut (mm)	Cemented Carbide					Hard Brittle (Non-Metallic) Materials				
			Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Feed Rate2 (mm/min)	a_p Axial Depth (mm)	a_e Radial Depth (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Feed Rate2 (mm/min)	a_p Axial Depth (mm)	a_e Radial Depth (mm)
2002-0014	R0.1	0.14	30,000	100	10	0.01	0.01	30,000	100	10	0.01	0.01
2003-0021	R0.15	0.21	30,000	125	13	0.015	0.03	30,000	125	13	0.015	0.03
2004-0028	R0.2	0.28	30,000	150	15	0.02	0.08	30,000	150	15	0.02	0.08
2005-0035	R0.25	0.35	30,000	175	18	0.025	0.11	30,000	175	18	0.025	0.11
2006-0042	R0.3	0.42	30,000	200	20	0.03	0.14	30,000	200	20	0.03	0.14
2007-0049	R0.35	0.49	30,000	225	23	0.035	0.17	30,000	225	23	0.035	0.17
2008-0056	R0.4	0.56	30,000	250	25	0.04	0.19	30,000	250	25	0.04	0.19
2009-0063	R0.45	0.63	30,000	275	28	0.045	0.22	30,000	275	28	0.045	0.22
2010-0070	R0.5	0.7	30,000	300	30	0.05	0.25	30,000	300	30	0.05	0.25
2020-0140	R1	1.4	30,000	300	100	0.1	0.3	24,000	240	100	0.1	0.3
2030-0210	R1.5	2.1	27,500	275	140	0.125	0.33	24,000	240	120	0.125	0.33
2040-0280	R2	2.8	24,000	240	120	0.15	0.35	24,000	240	120	0.15	0.35
2050-0350	R2.5	3.5	22,000	220	110	0.175	0.37	22,000	220	110	0.175	0.37
2060-0420	R3	4.2	20,000	200	100	0.2	0.4	20,000	200	100	0.2	0.4

* These milling parameters are based on VF-20, VM-40 (CIS standard) for Cemented Carbide, and Alumina for Hard Brittle Materials. These are for reference only.

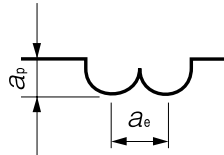
Tool life may differ depending on the type of Cemented Carbide / Hard Brittle Materials.

For best results, fine parameter adjustments may be required, depending on the materials of Cemented Carbide / Hard Brittle Materials; milling shape and strategy; machine rigidity and spindle capability.

Feed Rate2: Approach feed rate and contact time on the surface

$$a_p : \text{Axial Depth (mm)}$$

$$a_e : \text{Radial Depth (mm)} = P_t$$



Note:

- This application requires a high cutting force. A machine with poor rigidity and high vibration is not recommended.
- Allow sufficient machine and spindle warm-up time for stability and to remove any expansion of the main spindle before running the program.
- Tool setting length should achieve the least possible overhang.
- Avoid contact with the coated area of the shank. This will prevent tip vibration and tool jamming in the collet / holder.
- Run-out and vibration should be checked dynamically at the tool point while mounted in the machine and both should achieve the lowest level possible.
- Use an inclined or helical approach (Recommended inclination angle: <1 degree).
- Decrease both spindle speed and feed rate proportionally.
- Air blow is highly recommended for longer tool life. Both oil mist and oil coolant are alternatives.
- Recommend water soluble coolant for Hard Brittle (Non-Metallic) Materials.
- When milling some work pieces, heavier chips may be created. To evacuate these chips it is important to accurately position the coolant nozzle on the milling part.
- Remove chips to prevent heat generation and ignition during milling process.
- Protective gear, such as safety glasses and face guards are required when milling.
- Chips/dust generated while milling can have adverse affects on the machine parts if they are not properly evacuated. Take steps to assure proper evacuation.

UDCB Series
VF-20(92.5HRA)
Pyramid Milling Video



UDCB Series
VM-40(90HRA)
Pyramid Milling Video



UDCB Series
VF-20(92.5HRA)
Hexalobular Milling Video



Square

Square
Long Neck
Square

Radius

Radius
Long Neck
RadiusBall / Long
Shank BallBall
Long Neck
BallTaper Neck
Ball

Taper

Spiral
V CutterDrill
Thread Mill

EURO Series

Technical Data

Cemented Carbide Hexalobular milled with UDCB R0.5x0.7 Ball End Mill

One tool removed 91mm³ of material

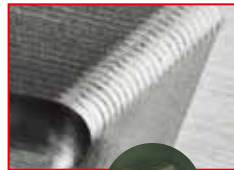


Work size: $\phi 9 \times 2.2\text{mm}$ depth

Work Material	Super Micro Grain VF-20 92.5HRA
Spindle Speed	30,000min ⁻¹
Feed Rate	300mm / min
Axial Depth a_p	0.05mm
Radial Depth a_e	0.3mm ($a_e=0.05\text{mm}$)
Coolant	Oil Mist
Cycle Time	39min
Material Removal Amount	91.7mm ³ 2.35mm ³ / min

Cemented Carbide Pyramid milled with UDCB R0.5x0.7 Ball End Mill

Clean cutter traces ! Equal surface condition !



Work size: $\square 6.6\text{mm} \times \text{Depth } 1.85\text{mm}$

Work Material	Cemented Carbide VM-40 90HRA
Spindle Speed	30,000min ⁻¹
Feed Rate	300mm / min
Axial Depth a_p	0.05mm
Radial Depth a_e	0.25mm ($a_e=0.05\text{mm}$)
Coolant	Oil Mist
Cycle Time	24min
Material Removal Amount	41.3mm ³ 1.72mm ³ / min

Square
Long Neck Square

Radius
Long Neck Radius

Ball / Long Shank Ball

Long Neck Ball
Taper Neck Ball

Taper

Spiral V Cutter

Drill Thread Mill

EURO Series

Technical Data