

3 Flutes DLC for Aluminum



Size R0.3~R6

DLC-CFB

Super
MG

DLC

30°

R
±0.005
R0.3~R1.5

R
±0.007
R2~R3

R
±0.01
R4~R6

Shank Dia
0/-0.005

Variable
Pitch
R2~R6

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
			~50HRC	~55HRC	~60HRC	~65HRC	~70HRC										
								★			○	○					

Features

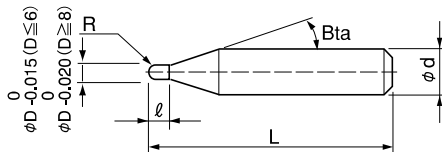
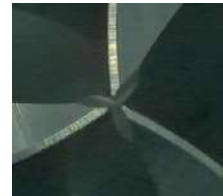
Achieves dramatically higher feed rates with 3 flutes, shortening roughing time.

DLC coating offers excellent welding and wear resistance.

Offers highly efficient milling even for a slow-moving shape, with deep cut milling.

3 flute variable pitch design reduces chattering.

The 3 slots at the tip offers chip evacuation and improved surface finish. (Except R0.75 or below)



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.

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	Suggested Retail Price ¥
DLC-CFB 3006-0090	R0.3	0.9	16°	50	4	7,220
DLC-CFB 3008-0120	R0.4	1.2	16°	50	4	7,040
DLC-CFB 3010-0150	R0.5	1.5	16°	50	4	6,540
DLC-CFB 3015-0225	R0.75	2.25	16°	50	4	7,220
DLC-CFB 3020-0300	R1	3	16°	50	4	7,040
DLC-CFB 3030-0450	R1.5	4.5	16°	60	6	7,220
DLC-CFB 3040-0600-4	R2	6	—	70	4	6,880
DLC-CFB 3040-0600			16°	70	6	7,220
DLC-CFB 3050-0750	R2.5	7.5	16°	80	6	8,170
DLC-CFB 3060-0900	R3	9	—	80	6	9,030
DLC-CFB 3080-1200	R4	12	—	90	8	12,900
DLC-CFB 3080-1200LS				120	8	14,600
DLC-CFB 3100-1500	R5	15	—	100	10	17,100
DLC-CFB 3120-1800	R6	18	—	110	12	21,600

Milling Conditions for DLC-CFB

3 Flutes

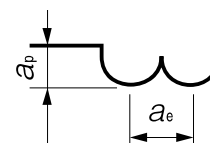
◆Roughing

WORK MATERIAL		ALUMINUM ALLOYS A5052 etc.				ALUMINUM ALLOYS A7075 etc.			
Model Number	Radius of Ball Nose (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	a_p Axial Depth (mm)	a_e Radial Depth (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	a_p Axial Depth (mm)	a_e Radial Depth (mm)
3006-0090	R0.3	30,000	1,200	0.03	0.13	30,000	1,000	0.03	0.13
3008-0120	R0.4	30,000	1,500	0.04	0.17	30,000	1,250	0.04	0.17
3010-0150	R0.5	30,000	1,800	0.05	0.21	30,000	1,500	0.05	0.21
3015-0225	R0.75	30,000	3,000	0.075	0.32	30,000	2,500	0.075	0.32
3020-0300	R1	30,000	3,840	0.2	0.6	30,000	3,200	0.2	0.6
3030-0450	R1.5	24,000	4,800	0.3	0.9	24,000	4,000	0.3	0.9
3040-0600(-4)	R2	18,000	4,800	0.4	1.2	18,000	4,000	0.4	1.2
3050-0750	R2.5	15,000	4,800	0.5	1.5	15,000	4,000	0.5	1.5
3060-0900	R3	12,000	4,800	0.6	1.8	12,000	4,000	0.6	1.8
3080-1200(LS)	R4	9,000	4,800	0.8	2.4	9,000	4,000	0.8	2.4
3100-1500	R5	7,200	4,800	1	3	7,200	4,000	1	3
3120-1800	R6	6,000	4,800	1.2	3.6	6,000	4,000	1.2	3.6

Apply when a deep tool setting causes the tool holder to extend beyond the full shank diameter and over the taper angle. Use the table below to adjust the parameters when compensating for extended overhang on the straight type design.

WORK MATERIAL	ALUMINUM ALLOYS A5052, A7075			
Overhang Length	Spindle Speed	Feed Rate	a_p Axial Depth	a_e Radial Depth
~3D	×1	×1~1.5(※)	×1	×1
4D	×0.9	×0.9~1.2(※)	×1	×1
5D	×0.75	×0.75	×1	×1
6D	×0.6	×0.6	×1	×1
7D	×0.45	×0.4	×0.95	×0.95
8D	×0.35	×0.3	×0.9	×0.9

(※) For high efficiency milling, set the feed rate higher. For improved surface finish and/or longer tool life, reduce the feed rate.



φ3mm Shank
V Series

UDC-PCD
Series

CBN
Series

Square
Square
Long Neck
Square

Radius

Radius
Long Neck
Radius

Radius
Taper Neck
Radius

Ball / Long
Shank Ball

Ball
Long Neck
Ball

Ball
Taper Neck
Ball

Taper
Taper

Barrel

Spiral
V Cutter

Drill

Technical Data

Milling Conditions for DLC-CFB

◆Finishing (overhang length ~6D)

WORK MATERIAL		ALUMINUM ALLOYS A5052				ALUMINUM ALLOYS A7075			
Model Number	Radius of Ball Nose (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	a _p Axial Depth (mm)	a _e Radial Depth (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	a _p Axial Depth (mm)	a _e Radial Depth (mm)
3020-0300	R1	53,000	4,800	0.05	0.04	53,000	4,000	0.05	0.04
3030-0450	R1.5	42,100	5,040	0.06	0.06	42,100	4,200	0.06	0.06
3040-0600	R2	29,400	5,280	0.08	0.08	29,400	4,400	0.08	0.08
3060-0900	R3	17,600	5,520	0.1	0.12	17,600	4,600	0.1	0.12
3080-1200	R4	14,600	5,520	0.1	0.2	14,600	4,600	0.1	0.2
3100-1500	R5	11,700	5,640	0.1	0.2	11,700	4,700	0.1	0.2
3120-1800	R6	8,800	5,760	0.1	0.24	8,800	4,800	0.1	0.24

Adjustments are recommended when finishing with an overhang of over 6 x D.

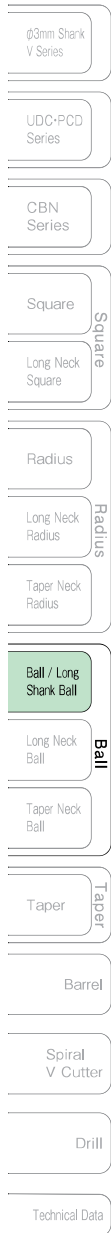
◆Deep and high efficiency roughing (overhang length ~3D for straight type)

This parameter is effective in using the machine that has low acceleration and applying complex milling path that repeats accelerating/braking frequently.

WORK MATERIAL		ALUMINUM ALLOYS A5052				ALUMINUM ALLOYS A7075			
Model Number	Radius of Ball Nose (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	a _p Axial Depth (mm)	a _e Radial Depth (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	a _p Axial Depth (mm)	a _e Radial Depth (mm)
3020-0300	R1	30,000	3,000	0.4	0.8	30,000	2,500	0.4	0.8
3030-0450	R1.5	20,000	3,000	0.6	1.2	20,000	2,500	0.6	1.2
3040-0600	R2	15,000	3,000	0.8	1.6	15,000	2,500	0.8	1.6
3060-0900	R3	10,000	3,000	1.2	2.4	10,000	2,500	1.2	2.4
3080-1200	R4	7,100	2,820	1.6	3.2	7,100	2,350	1.6	3.2
3100-1500	R5	5,400	2,700	2	4	5,400	2,250	2	4
3120-1800	R6	4,500	2,700	2.4	4.8	4,500	2,250	2.4	4.8

Note:

- Fix the work piece firmly, and use a machine that has high rigidity and generates a low level of vibration especially under high efficient deep milling condition in roughing process.
- Decrease the feed rate more than 50% from the milling parameters when slot milling.
- Decrease both spindle speed and feed rate proportionally when the milling parameters exceed the machines maximum speed, or when the tool is chattering and heats up to a red color.
- Decrease both spindle speed and feed rate 10% for slope milling.
- Decrease both spindle speed and feed rate to meet required precision and to prevent the shank making contact with the work piece.
- Recommend water soluble or oil coolant.
- A long overhang may cause tool deflection, leaving uncut material.



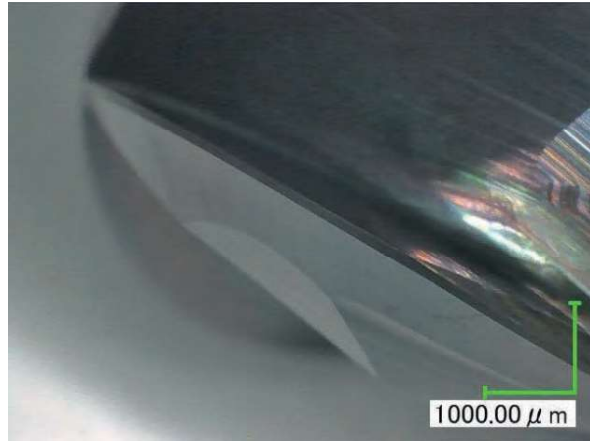
Mold Milling Example for Plastic Container
DLC-CFB R4 × L12

A5052

3 Flutes



Tool after milling



More tool life left

Work Size : 130 x 105 x 95 mm
Pocket Size : ϕ 80,5 x Depth 25 mm
Coolant : Water Soluble (Through Spindle)

No.	Milling Process	Tool	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	a_p (mm)	a_e (mm)	Allowance (mm)	Milling Spot	Cycle Time (h:min)
1	Roughing	DLC-CFB 3080-1200	8,100	4,320	0.8	2.4	0.01	Pocket & Half Pocket	1:05
2	Finishing				0.0001 (Cusp Height)	0.05	0	Pocket	2:58
								Total	4:03

- ϕ 3mm Shank V Series
- UDC-PCD Series
- CBN Series
- Square
- Long Neck Square
- Radius
- Long Neck Radius
- Taper Neck Radius
- Ball / Long Shank Ball
- Long Neck Ball
- Taper Neck Ball
- Taper
- Barrel
- Spiral V Cutter
- Drill
- Technical Data