

2 Flutes NON-COAT for Plastic Milling



Size $\phi 0.5 \sim \phi 6$

CPR



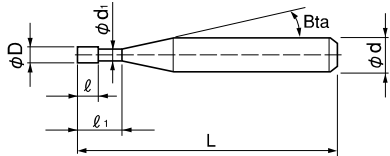
($\phi 0.5 \sim \phi 2.5$) ($\phi 3$ or above)

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

Long Neck Square End Mills for milling Plastics.
Designed especially for deep rib milling using an under cut design.



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 64 models

Unit (mm)

Model Number	Outside Diameter ϕD	Effective Length ℓ_1	Length of Cut ℓ	Neck Diameter ϕd_1	Shank Taper Angle B_{ta}	Overall Length L	Shank Diameter ϕd	Suggested Retail Price ¥
CPR 2005-2	0.5	2	1	0.45	11°	38	3	6,700
CPR 2005-4		4				38		6,700
CPR 2005-6		6				38		6,700
CPR 2006-4	0.6	4	1.2	0.55	11°	38	3	6,000
CPR 2006-6		6				38		6,000
CPR 2007-4	0.7	4	1.4	0.65	11°	38	3	6,100
CPR 2007-6		6				38		6,100
CPR 2008-6	0.8	6	1.6	0.75	11°	45	4	5,100
CPR 2008-8		8				45		5,100
CPR 2009-6	0.9	6	1.8	0.85	11°	45	4	5,100
CPR 2009-10		10				45		5,100
CPR 2010-6	1	6	2	0.9	11°	45	4	5,040
CPR 2010-8		8				45		5,040
CPR 2010-10		10				45		5,040
CPR 2010-12		12				45		5,040
CPR 2010-16		16				50		5,040
CPR 2010-21		21				55		6,000
CPR 2012-6	1.2	6	2.4	1.1	11°	45	4	5,100
CPR 2012-8		8				45		5,100
CPR 2012-10		10				45		5,100
CPR 2012-12		12				50		5,100

- φ3mm 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

Unit (mm)

Model Number	Outside Diameter ϕD	Effective Length ℓ_1	Length of Cut ℓ	Neck Diameter ϕd_1	Shank Taper Angle $B\alpha$	Overall Length L	Shank Diameter ϕd	Suggested Retail Price ¥					
CPR 2014-6	1.4	6	2.8	1.3	11°	45	4	5,100					
CPR 2014-10		10				45		5,100					
CPR 2014-16		16				50		5,100					
CPR 2015-6	1.5	6	3	1.4	11°	45	4	5,100					
CPR 2015-10		10				45		5,100					
CPR 2015-14		14				50		5,100					
CPR 2015-16		16				50		5,100					
CPR 2015-21		21				55		5,100					
CPR 2016-6	1.6	6	3.2	1.5	11°	50	4	5,100					
CPR 2020-8	2	8	4	1.9	11°	50	4	5,040					
CPR 2020-10		10				50		5,040					
CPR 2020-12		12				50		5,040					
CPR 2020-14		14				50		5,040					
CPR 2020-16		16				50		5,040					
CPR 2020-18		18				55		5,040					
CPR 2020-21		21				55		5,040					
CPR 2020-26		26				55		5,100					
CPR 2020-32		32				70		6,100					
CPR 2025-12		2.5				12		5	2.3	11°	55	4	5,600
CPR 2025-21	21		55	5,600									
CPR 2030-8	3	8	6	2.8	11°	70	6	6,510					
CPR 2030-12		12				70		6,510					
CPR 2030-16		16				70		6,510					
CPR 2030-21		21				70		6,510					
CPR 2030-26		26				70		6,510					
CPR 2030-32		32				80		7,200					
CPR 2030-42		42				90		8,400					
CPR 2040-12		4				12		8	3.8	11°	70	6	6,930
CPR 2040-16						16					70		6,930
CPR 2040-18	18		70	6,930									
CPR 2040-21	21		70	6,930									
CPR 2040-24	24		70	6,930									
CPR 2040-32	32		70	6,930									
CPR 2040-36	36		70	6,930									
CPR 2040-42	42		80	7,250									
CPR 2040-52	52		100	9,350									
CPR 2050-16	5		16	10	4.8	11°	80				6		7,980
CPR 2050-22		22	80				7,980						
CPR 2050-32		32	80				7,980						
CPR 2060-12	6	No Under Cut	12	No Under Cut	—	80	6	7,670					
CPR 2060-42		42		80		7,980							
CPR 2060-52		52		120		11,030							
CPR 2060-63		63		120		11,030							

φ3mm 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

2 Flutes NON-COAT for Plastic Milling

Milling Conditions for CPR

WORK MATERIAL			ABS / MC NYLON			ACRYLIC / POLYACETAL			POLYCARBONATE			GLASS FIBER REINFORCED POLYCARBONATE		
Model Number	Outside Diameter (mm)	Effective Length (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	a _D Axial Depth (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	a _D Axial Depth (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	a _D Axial Depth (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	a _D Axial Depth (mm)
2005-2	0.5	2	6,000	300	0.2	15,000	300	0.2	9,000	300	0.2	9,000	450	0.2
2005-4		4	6,000	300	0.2	15,000	300	0.2	9,000	300	0.2	9,000	450	0.2
2005-6		6	6,000	300	0.2	15,000	300	0.2	9,000	300	0.2	9,000	450	0.2
2006-4	0.6	4	6,000	340	0.2	14,400	300	0.2	8,800	540	0.2	8,800	810	0.2
2006-6		6	6,000	340	0.2	14,400	300	0.2	8,800	540	0.2	8,800	810	0.2
2007-4	0.7	4	6,000	380	0.2	13,800	300	0.2	8,600	780	0.2	8,600	1,170	0.2
2007-6		6	6,000	380	0.2	13,800	300	0.2	8,600	780	0.2	8,600	1,170	0.2
2008-6	0.8	6	6,000	420	0.2	13,200	300	0.2	8,400	1,000	0.2	8,400	1,500	0.2
2008-8		8	6,000	420	0.2	12,900	280	0.2	8,200	960	0.2	8,200	1,440	0.2
2009-6	0.9	6	6,000	460	0.2	12,600	300	0.2	8,200	1,300	0.2	8,200	1,950	0.2
2009-10		10	6,000	460	0.2	11,800	260	0.2	7,800	1,000	0.2	7,800	1,500	0.2
2010-6	1	6	6,000	500	0.3	12,000	300	0.3	8,000	1,500	0.3	8,000	2,250	0.3
2010-8		8	6,000	500	0.3	11,500	270	0.3	7,700	1,400	0.3	7,700	2,100	0.3
2010-10		10	6,000	500	0.3	11,000	240	0.3	7,500	1,200	0.3	7,500	1,800	0.3
2010-12		12	6,000	500	0.3	10,400	220	0.3	7,200	1,100	0.3	7,200	1,650	0.3
2010-16		16	6,000	500	0.3	9,300	160	0.3	6,700	830	0.3	6,700	1,245	0.3
2010-21		21	6,000	500	0.3	8,000	90	0.3	6,000	500	0.3	6,000	750	0.3
2012-6	1.2	6	6,000	610	0.4	11,700	330	0.4	8,000	1,500	0.4	8,000	2,250	0.4
2012-8		8	6,000	610	0.4	11,200	300	0.4	7,700	1,400	0.4	7,700	2,100	0.4
2012-10		10	6,000	600	0.4	10,700	280	0.4	7,500	1,300	0.4	7,500	1,950	0.4
2012-12		12	6,000	600	0.4	10,200	250	0.4	7,200	1,200	0.4	7,200	1,800	0.4
2014-6	1.4	6	6,000	720	0.4	11,340	360	0.4	8,000	1,600	0.4	8,000	2,400	0.4
2014-10		10	6,000	700	0.4	10,700	310	0.4	7,700	1,400	0.4	7,700	2,100	0.4
2014-16		16	6,000	680	0.4	9,800	230	0.4	7,200	1,000	0.4	7,200	1,500	0.4
2015-6	1.5	6	6,100	780	0.5	11,200	380	0.5	8,000	1,600	0.5	8,000	1,700	0.5
2015-10		10	6,000	760	0.5	10,200	330	0.5	7,500	1,400	0.5	7,500	1,600	0.5
2015-14		14	6,000	730	0.5	9,600	270	0.5	7,000	1,100	0.5	7,000	1,400	0.5
2015-16		16	6,000	730	0.5	8,800	250	0.5	6,700	1,000	0.5	6,700	1,400	0.5
2015-21		21	5,900	700	0.5	7,600	180	0.5	6,100	750	0.5	6,100	1,200	0.5
2016-6	1.6	6	6,100	830	0.8	11,000	390	0.8	8,000	1,600	0.8	8,000	1,700	0.8
2020-8	2	8	6,100	1,000	1	10,100	440	1	7,900	1,700	1	7,900	1,800	1
2020-10		10	6,000	980	1	9,800	420	1	7,700	1,600	1	7,700	1,800	1
2020-12		12	6,000	970	1	9,500	400	1	7,500	1,600	1	7,500	1,700	1
2020-14		14	5,900	950	1	9,100	380	1	7,300	1,500	1	7,300	1,700	1
2020-16		16	5,900	930	1	8,800	360	1	7,100	1,400	1	7,100	1,600	1
2020-18		18	5,800	920	1	8,500	340	1	6,900	1,300	1	6,900	1,600	1
2020-21		21	5,700	890	1	8,000	300	1	6,500	1,200	1	6,500	1,500	1
2020-26		26	5,600	850	1	7,200	250	1	6,000	1,100	1	6,000	1,400	1
2020-32		32	5,400	800	1	6,200	190	1	5,400	850	1	5,400	1,300	1
2025-12		2.5	12	6,000	1,300	1.2	8,600	480	1.2	7,400	1,600	1.2	7,400	1,900
2025-21	21		5,700	1,100	1	6,800	350	1	6,200	1,300	1	6,200	1,600	1

- φ3mm 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

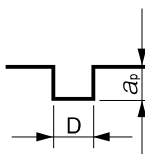
Milling Conditions for CPR

WORK MATERIAL			ABS / MC NYLON			ACRYLIC / POLYACETAL			POLYCARBONATE			GLASS FIBER REINFORCED POLYCARBONATE		
Model Number	Outside Diameter (mm)	Effective Length (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	a_p Axial Depth (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	a_p Axial Depth (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	a_p Axial Depth (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	a_p Axial Depth (mm)
2030-8	3	8	6,200	1,600	1.5	8,700	610	1.5	8,000	1,900	1.5	8,000	2,200	1.5
2030-12		12	6,000	1,500	1.5	8,000	560	1.5	7,500	1,800	1.5	7,500	2,100	1.5
2030-16		16	5,800	1,400	1.5	7,300	510	1.5	7,000	1,700	1.5	7,000	2,000	1.5
2030-21		21	5,600	1,300	1.5	6,400	440	1.5	6,300	1,500	1.5	6,300	1,800	1.5
2030-26		26	5,400	1,200	1.5	5,500	370	1.5	5,600	1,400	1.5	5,600	1,700	1.5
2030-32		32	5,200	1,100	1.5	4,500	290	1.5	4,800	1,200	1.5	4,800	1,400	1.5
2030-42		42	4,800	960	1.5	2,700	160	1.5	3,500	840	1.5	3,500	1,000	1.5
2040-12	4	12	5,000	1,400	2	7,000	520	2	5,800	1,500	2	5,800	1,800	2
2040-16		16	4,900	1,400	2	6,500	480	2	5,500	1,400	2	5,500	1,700	2
2040-18		18	4,800	1,400	2	6,300	470	2	5,400	1,400	2	5,400	1,700	2
2040-21		21	4,800	1,400	2	6,000	440	2	5,100	1,300	2	5,100	1,600	2
2040-24		24	4,700	1,300	2	5,600	410	2	4,900	1,300	2	4,900	1,600	2
2040-32		32	4,500	1,300	2	4,700	340	2	4,400	1,100	2	4,400	1,500	2
2040-36		36	4,300	1,300	2	4,200	300	2	4,100	1,100	2	4,100	1,400	2
2040-42	42	4,200	1,300	2	3,600	250	2	3,600	960	2	3,600	1,200	2	
2040-52	52	3,900	1,200	2	2,400	160	2	2,900	780	2	2,900	1,000	2	
2050-16	5	16	3,400	1,200	2.5	5,800	470	2.5	4,000	1,200	2.5	4,000	1,400	2.5
2050-22		22	3,300	1,100	2.5	5,100	390	2.5	3,600	1,100	2.5	3,600	1,300	2.5
2050-32		32	3,200	1,100	2.5	3,900	260	2.5	2,900	910	2.5	2,900	1,100	2.5
2060-12	6	12	3,000	1,200	3	5,000	450	3	2,500	1,000	3	2,500	1,500	3
2060-42		42	2,400	960	3	2,600	240	3	1,900	760	3	1,900	1,140	3
2060-52		52	2,200	890	3	1,900	170	3	1,700	670	3	1,700	1,005	3
2060-63		63	2,000	800	3	1,000	90	3	1,500	600	3	1,500	900	3

Milling Amount for Slotting (mm)

$$a_p \leq 0.5D$$

D : Outside Diameter (mm)



CPR Finishing Conditions for Side Milling

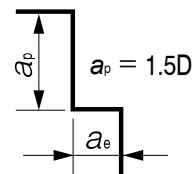
Refer to the slotting parameters for speeds and feeds.

Set the milling amount as below during side milling finishing.

Milling Amount for Side Finishing (mm)

$$a_e : 0.01 \sim 0.015D \text{ (Min 0.01 mm)}$$

D : Outside Diameter (mm)



Note:

- Control the radial depth (a_e) by approximately 0.01-0.015 times of the outside diameter or set to 0.01 mm the minimum during side milling finishing.
- Increase the feed rate per flute to reduce burring on surface of softer materials.
- Chattering may occur when using a spindle with low rigidity or when milling unstable work piece. Reduce the milling amount in this case.
- Recommend to reduce the milling amount when using a machine with low spindle speed. Not recommend to reduce the feed rate.
- Recommend water soluble coolant for Copper and Aluminum Alloys.
- Recommend air blow for Plastics.
- Remove chips from the work piece to keep the milling surface quality.
- If chips clog on the tool, stop the operation and remove them accordingly.

Ø3mm 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