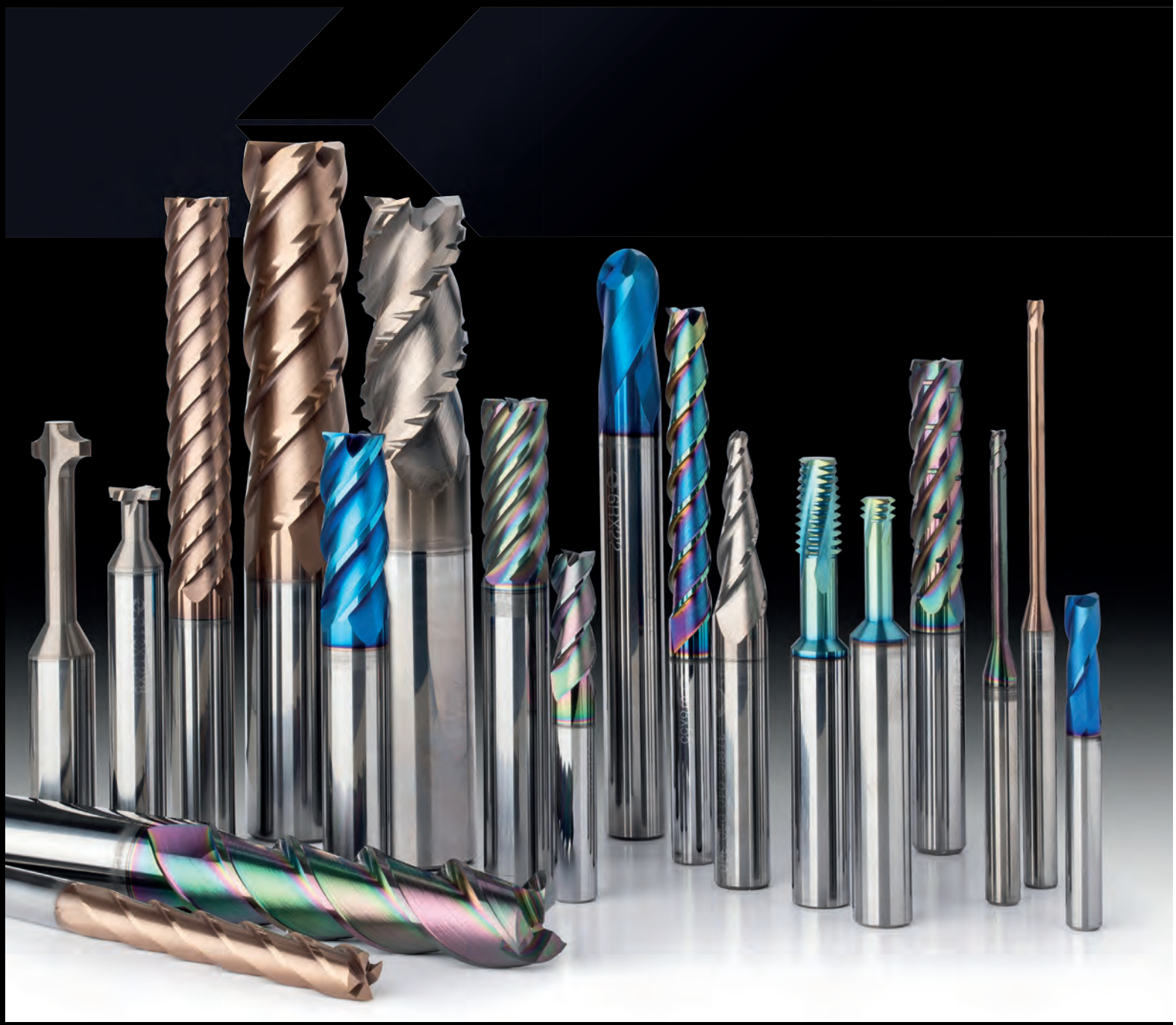
TRUCUT TOOLS

ENGINEERING TOOLING

CARBIDE END MILLS



제이제이툴스(주)
JJ TOOLS Co.,Ltd.

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	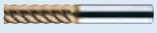	6&8HEM	3-25	46	6&8 Flute 45° Helix End Mills
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		3FALE	6-16	81	3 Flute Mirror Finish End Mills
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		3ALC	3-20	85	3 Flute 45° Helix Corner Radius End Mills
		3ARO	4-20	87	3 Flute 45° Helix Roughing End Mills
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A Little About Us
Established in 1988, Trucut Tools is an independent family run company. We have consistently grown over many years, thanks to our great product range, our loyal customers and our fantastic team.

We supply thousands of companies with high quality tooling, we work closely with our customers to reduce tooling spend and improve production efficiencies.

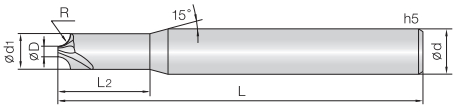
We have a very comprehensive and ever-growing stock range. We are committed to sourcing the highest quality products from around the world, and supplying them at the best prices for our customers.

JJ Tools Solid Carbide Milling Cutters
We have sourced the best products from our global network of suppliers and manufacturers, each one is very important to us. JJ Tools (South Korea) offer one of the widest ranges of carbide end mills, for almost any application. The range from JJ Tools is unrivalled in both quality and value. All the tools in this catalogue can be purchased via our online store.

TRUCUT TOOLS
ENGINEERING TOOLING

2CRC 2 Flute Corner Rounding Cutters

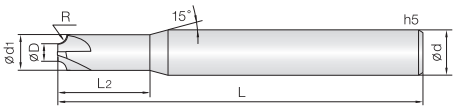
- End Mills for various work materials, hardened steel, pre-hardened steel, tool steel and cast iron.
- Excellent wear resistance from Si-based PVD coating.
- Precise edge tolerance.
- Excellent work surface finish.
- Minimize fracturing by high TRS fine (0.5μm) WC grade.



D Size	D Tolerance
ø0.5 ~ 0.9	+0 ~ −0.01mm
ø1.4 ~ 5.9	+0 ~ −0.02mm

Part Number	Diameter	d1	Effective Length	Overall Length	Shank Dia	Price
	D x R		L2	L	d	£
2CRC 005 001 S04	0.5 x R0.1	0.8	2.5	45	4	£25.80
2CRC 005 0015 S04	0.5 x R0.15	0.9	2.5	45	4	£25.80
2CRC 005 002 S04	0.5 x R0.2	1	2.5	45	4	£25.80
2CRC 005 0025 S04	0.5 x R0.25	1.1	2.5	45	4	£25.80
2CRC 005 003 S04	0.5 x R0.3	1.2	2.5	45	4	£25.80
2CRC 005 0035 S04	0.5 x R0.35	1.3	2.5	45	4	£25.80
2CRC 005 004 S04	0.5 x R0.4	1.4	2.5	45	4	£24.27
2CRC 005 0045 S04	0.5 x R0.45	1.5	2.5	45	4	£24.27
2CRC 005 005 S04	0.5 x R0.5	1.6	2.5	45	4	£24.27
2CRC 009 005 S04	0.9 x R0.5	2	3	45	4	£24.27
2CRC 049 005 S06	4.9 x R0.5	6	-	50	6	£21.07
2CRC 005 0055 S04	0.5 x R0.55	1.7	3	45	4	£25.67
2CRC 005 006 S04	0.5 x R0.6	1.8	3	45	4	£24.27
2CRC 005 0065 S04	0.5 x R0.65	1.9	3	45	4	£25.67
2CRC 005 007 S04	0.5 x R0.7	2	3	45	4	£25.67
2CRC 009 0075 S04	0.9 x R0.75	2.5	4	45	4	£24.27
2CRC 009 008 S04	0.9 x R0.8	2.6	4	45	4	£24.27
2CRC 009 0085 S04	0.9 x R0.85	2.7	4	45	4	£24.27
2CRC 009 009 S04	0.9 x R0.9	2.8	4	45	4	£24.27
2CRC 009 0095 S04	0.9 x R0.95	2.9	4	45	4	£24.27
2CRC 009 010 S06	0.9 x R1	3	5	50	6	£21.07
2CRC 039 010 S06	3.9 x R1	6	-	50	6	£21.07
2CRC 059 010 S08	5.9 x R1	8	-	60	8	£25.00
2CRC 009 0125 S06	0.9 x R1.25	3.5	5	50	6	£21.07
2CRC 034 0125 S06	3.4 x R1.25	6	-	50	6	£21.07
2CRC 014 015 S06	1.4 x R1.5	4.5	8	50	6	£21.07
2CRC 049 015 S08	4.9 x R1.5	8	-	60	8	£25.00
2CRC 014 020 S06	1.4 x R2	5.5	10	50	6	£21.07
2CRC 039 020 S08	3.9 x R2	8	-	60	8	£25.00
2CRC 019 025 S08	1.9 x R2.5	7	13	60	8	£25.00
2CRC 019 030 S08	1.9 x R3	8	-	60	8	£25.00
2CRC 019 035 S10	1.9 x R3.5	9	13	70	10	£31.60
2CRC 019 040 S10	1.9 x R4	10	-	70	10	£31.60
2CRC 019 045 S12	1.9 x R4.5	11	13	80	12	£50.00
2CRC 019 050 S12	1.9 x R5	12	-	80	12	£50.00
2CRC 039 060 S16	3.9 x R6	16	-	90	16	£68.73
2CRC 059 070 S20	5.9 x R7	20	-	90	20	£89.13
2CRC 039 080 S20	3.9 x R8	20	-	90	20	£89.13

- End Mills for various work materials, hardened steel, pre-hardened steel, tool steel and cast iron.
- Excellent wear resistance from Si-based PVD coating.
- Precise edge tolerance.
- Excellent work surface finish.
- Minimize fracturing by high TRS fine (0.5μm) WC grade.

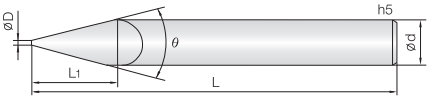


D Size	D Tolerance
ø1.4 ~ 5.9	+0 ~ -0.02mm

Part Number	Diameter	d1	Effective Length	Overall Length	Shank Dia	Price
	D x R		L2	L	d	£
4CRC 029 005 S04	2.9 x R0.5	4	-	50	4	£18.67
4CRC 0240 075 S04	2.4 x R0.75	4	-	50	4	£18.67
4CRC 019 010 S04	1.9 x R1	4	-	50	4	£18.67
4CRC 014 0125 S06	1.4 x R1.25	4	8	50	6	£23.53
4CRC 049 005 S06	4.9 x R0.5	6	-	50	6	£21.73
4CRC 044 0075 S06	4.4 x R0.75	6	-	50	6	£21.73
4CRC 039 010 S06	3.9 x R1	6	-	50	6	£21.73
4CRC 059 010 S08	5.9 x R1	8	-	60	8	£26.07
4CRC 054 0125 S08	5.4 x R1.25	8	-	60	8	£26.07
4CRC 049 015 S08	4.9 x R1.5	8	-	60	8	£26.07
4CRC 039 020 S08	3.9 x R2	8	-	60	8	£26.07
4CRC 059 020 S10	5.9 x R2	10	-	70	10	£35.73
4CRC 049 025 S10	4.9 x R2.5	10	-	70	10	£35.73
4CRC 039 030 S10	3.9 x R3	10	-	70	10	£35.73
4CRC 059 030 S12	5.9 x R3	12	-	75	12	£53.53
4CRC 039 040 S12	3.9 x R4	12	-	75	12	£53.53
4CRC 059 050 S16	5.9 x R5	16	-	80	16	£79.00
4CRC 039 060 S16	3.9 x R6	16	-	80	16	£79.00

1STE Single Flute Engraving End Mills

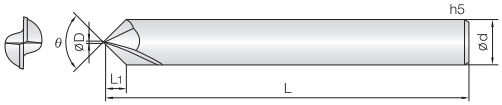
- Engraving End Mills for various work materials, hardened steel, pre-hardened steel, tool steel and cast iron.
- Good wear resistance from Si-based PVD coating.
- Various edge diameters available, maximising engraving efficiency.



D Size	D Tolerance
Ø0	+0.05 ~ −0mm
Ø0.05 ~ 0.3	+0 ~ −0.02mm

Part Number	Diameter	Angle	Length of Cut	Overall Length	Shank Dia	Price
	D		L1	L	d	£
1STE 000 200 S04	0	20°	5	40	4	£12.13
1STE 000 300 S04	0	30°	5	40	4	£12.13
1STE 000 900 S04	0	90°	2	40	4	£12.13
1STE 000 200 S06	0	20°	5	50	6	£15.40
1STE 000 300 S06	0	30°	5	50	6	£15.40
1STE 000 900 S06	0	90°	3	50	6	£15.40
1STE 000 1200 S06	0	120°	1.73	50	6	£15.40
1STE 0005 200 S04	0.05	20°	5	40	4	£12.13
1STE 0005 300 S04	0.05	30°	5	40	4	£12.13
1STE 0005 900 S04	0.05	90°	1.97	40	4	£12.13
1STE 0005 200 S06	0.05	20°	5	50	6	£15.40
1STE 0005 300 S06	0.05	30°	5	50	6	£15.40
1STE 0005 900 S06	0.05	90°	2.97	50	6	£15.40
1STE 0005 1200 S06	0.05	120°	1.71	50	6	£15.40
1STE 001 200 S04	0.1	20°	5	40	4	£12.13
1STE 001 300 S04	0.1	30°	5	40	4	£12.13
1STE001600S04	0.1	60°	3.37	40	4	£12.47
1STE 001 900 S04	0.1	90°	1.95	40	4	£12.13
1STE 001 200 S06	0.1	20°	5	50	6	£15.40
1STE 001 300 S06	0.1	30°	5	50	6	£15.40
1STE 001 900 S06	0.1	90°	2.95	50	6	£15.40
1STE 001 1200 S06	0.1	120°	1.7	50	6	£15.40
1STE 0015 200 S04	0.15	20°	5	40	4	£12.13
1STE 0015 300 S04	0.15	30°	5	40	4	£12.13
1STE0015600S04	0.15	60°	3.33	40	4	£12.47
1STE 0015 900 S04	0.15	90°	1.92	40	4	£12.13
1STE 0015 200 S06	0.15	20°	5	50	6	£15.40
1STE 0015 300 S06	0.15	30°	5	50	6	£15.40
1STE 0015 900 S06	0.15	90°	2.92	50	6	£15.40
1STE 0015 1200 S06	0.15	120°	1.68	50	6	£15.40
1STE 002 200 S04	0.2	20°	5	40	4	£12.13
1STE 002 300 S04	0.2	30°	5	40	4	£12.13
1STE 002 600 S04	0.2	60°	1.9	40	4	£12.47
1STE 002 900 S04	0.2	90°	1.9	40	4	£12.13
1STE 002 200 S06	0.2	20°	5	50	6	£15.40
1STE 002 300 S06	0.2	30°	5	50	6	£15.40
1STE 002 900 S06	0.2	90°	2.9	50	6	£15.40
1STE 002 1200 S06	0.2	120°	1.67	50	6	£15.40
1STE 003 200 S04	0.3	20°	5	40	4	£12.13
1STE 003 300 S04	0.3	30°	5	40	4	£12.13
1STE 003 600 S04	0.3	60°	3.2	40	4	£12.13
1STE 003 900 S04	0.3	90°	1.85	40	4	£12.47

- End Mills for various work materials, hardened steel, pre-hardened steel, tool steel and cast iron.
- Excellent wear resistance from Si-based PVD coating.
- Optimum for NC engraving, chamfering and centering with straight 2flutes.

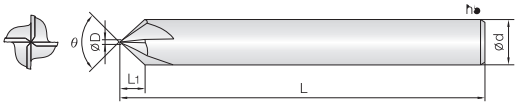


D Size	D Tolerance
Ø0	+0.05 ~ –0mm

Part Number	Diameter	Angle	Length of Cut	Overall Length	Shank Dia	Price
	D		L1	L	d	£
2STEC 000 300 S03	3	30°	5.5	60	3	£18.27
2STEC 000 600 S03	3	60°	2.5	60	3	£16.93
2STEC 000 900 S03	3	90°	1.5	60	3	£14.93
2STEC 000 900 080	3	90°	1.5	80	3	£16.93
2STEC 000 1200 S03	3	120°	0.86	60	3	£14.93
2STEC 000 300 S04	4	30°	7.4	60	4	£18.93
2STEC 000 600 S04	4	60°	3.4	60	4	£17.60
2STEC 000 900 S04	4	90°	2	60	4	£16.27
2STEC 000 900 100	4	90°	2	100	4	£18.47
2STEC 000 1200 S04	4	120°	1.15	60	4	£16.27
2STEC 000 300 S06	6	30°	11.1	60	6	£23.33
2STEC 000 600 S06	6	60°	5.1	60	6	£21.27
2STEC 000 900 S06	6	90°	3	60	6	£19.27
2STEC 000 900 110	6	90°	3	110	6	£25.13
2STEC 000 1200 S06	6	120°	1.73	60	6	£19.27
2STEC 000 600 S08	8	60°	6.9	65	8	£27.67
2STEC 000 900 S08	8	90°	4	65	8	£24.27
2STEC 000 900 120	8	90°	4	120	8	£32.60
2STEC 000 1200 S08	8	120°	2.3	65	8	£24.27
2STEC 000 600 S10	10	60°	8.6	70	10	£36.53
2STEC 000 900 S10	10	90°	5	70	10	£31.73
2STEC 000 900 150	10	90°	5	150	10	£47.40
2STEC 000 1200 S10	10	120°	2.88	70	10	£31.73
2STEC 000 600 S12	12	60°	10.3	75	12	£47.20
2STEC 000 900 S12	12	90°	6	75	12	£41.67
2STEC 000 900 160	12	90°	6	160	12	£67.27
2STEC 000 1200 S12	12	120°	3.46	75	12	£41.67

4STE 4 Flute Chamfer End Mills

- End Mills for various work materials, hardened steel, pre-hardened steel, tool steel and cast iron.
- Excellent wear resistance from Si-based PVD coating.
- Optimum for chamfering with straight 4 flutes.
- Minimize fracturing at high feed by high TRS fine WC grade.

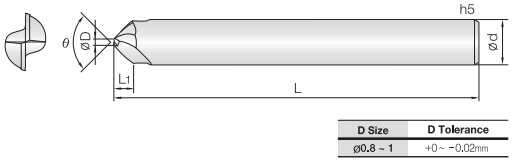


D Size	D Tolerance
ø0	+0,05~ -0mm

Part Number	Diameter	Angle	Length of Cut	Overall Length	Shank Dia	Price
	D		L1	L	d	£
4STE 000 600 S03	3	60°	2.5	50	3	£15.33
4STE 000 900 S03	3	90°	1.5	50	3	£14.00
4STE 000 600 S04	4	60°	3.4	50	4	£16.00
4STE 000 900 S04	4	90°	2	50	4	£15.33
4STE 000 600 S06	6	60°	5.1	60	6	£19.07
4STE 000 900 S06	6	90°	3	60	6	£17.67
4STE 000 900 030	6	90°	3	100	6	£22.53
4STE 000 600 S08	8	60°	6.9	65	8	£24.07
4STE 000 900 S08	8	90°	4	65	8	£22.67
4STE 000 900 040	8	90°	4	100	8	£29.67
4STE 000 600 S10	10	60°	8.6	75	10	£32.27
4STE 000 900 S10	10	90°	5	75	10	£32.27
4STE 000 900 050	10	90°	5	100	10	£34.00
4STE 000 600 S12	12	60°	10.3	80	12	£41.20
4STE 000 900 S12	12	90°	6	80	12	£41.20
4STE 000 900 080	12	90°	8	100	16	£98.00

2 Flute 90° Chamfering Cutter — 2CHA

- End Mills for various work materials, hardened steel, pre-hardened steel, tool steel and cast iron.
- Good wear resistance by Si-based PVD coating.
- Minimize fracturing at high feed by high TRS fine WC grade.

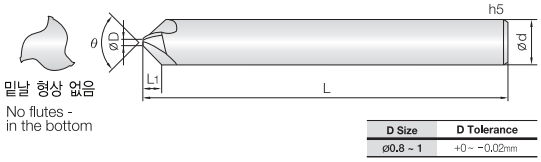


D Size	D Tolerance
ø0.8 ~ 1	+0 ~ -0.02mm

Part Number	Diameter	Angle	Length of Cut	Overall Length	Shank Dia	Price
	D		L1	L	d	£
2CHA 008 900 011	0.8	90°	1.1	50	3	£14.07
2CHA 008 900 016	0.8	90°	1.6	50	4	£14.07
2CHA 010 900 025	1	90°	2.5	60	6	£17.47
2CHA 010 900 035	1	90°	3.5	70	8	£25.07
2CHA 010 900 045	1	90°	4.5	80	10	£33.13
2CHA 010 900 055	1	90°	5.5	90	12	£42.00

3 Flute 90° Chamfering Cutter — 3CHA

- End Mills for various work materials, hardened steel, pre-hardened steel, tool steel and cast iron.
- Good wear resistance by Si-based PVD coating.
- Minimize fracturing at high feed by high TRS fine WC grade.

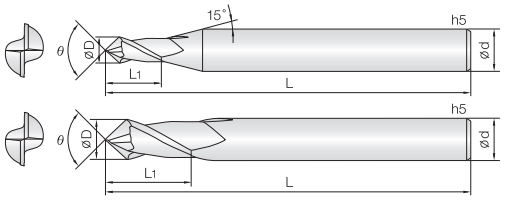


D Size	D Tolerance
ø0.8 ~ 1	+0 ~ -0.02mm

Part Number	Diameter	Angle	Length of Cut	Overall Length	Shank Dia	Price
	D		L1	L	d	£
3CHA 008 900 011	0.8	90°	1.1	50	3	£16.00
3CHA 008 900 016	0.8	90°	1.6	50	4	£16.00
3CHA 010 900 025	1	90°	2.5	60	6	£18.27
3CHA 010 900 035	1	90°	3.5	65	8	£26.27
3CHA 020 900 045	2	90°	4.5	75	10	£34.80
3CHA 020 900 055	2	90°	5.5	80	12	£44.07

2CEN 2 Flute Centering End Mill

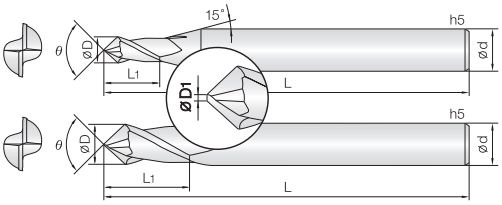
- Uncoated: Acryl, A.B.S, Aluminium, non-ferrous and non-metallic materials.
- Coated: Pre-hardened steel, Cast iron, Non-metallic materials
- Multi-function End Mill for corner chamfering, side wall and centering.
- Fine WC grade optimized for various non-ferrous and non-metallic work materials.
- End Mills for various work materials, hardened steel, pre-hardened steel, tool steel and cast iron.



D Size	D Tolerance
ø0.2 ~ 5	+0 ~ -0.01mm
ø6 ~ 12	-0.01 ~ -0.025mm
ø14 ~ 16	-0.015 ~ -0.03mm

Part Number		Diameter	Angle	Length of Cut	Overall Length	Shank Dia	Price Uncoated	Price Coated
Uncoated	Coated	D		L1	L	d	£	£
2CEN 002 600 S03	2CENC 002 600 S03	0.2	60°	0.4	40	3	£19.80	£21.33
2CEN 002 900 S03	2CENC 002 900 S03	0.2	90°	0.4	40	3	£19.80	£21.33
2CEN 003 600 S03	2CENC 003 600 S03	0.3	60°	0.6	45	3	£17.67	£19.00
2CEN 003 900 S03	2CENC 003 900 S03	0.3	90°	0.6	45	3	£17.67	£19.00
2CEN 005 600 S03	2CENC 005 600 S03	0.5	60°	1	50	3	£16.33	£17.93
2CEN 005 900 S03	2CENC 005 900 S03	0.5	90°	1	50	3	£16.33	£17.93
2CEN 008 600 S03	2CENC 008 600 S03	0.8	60°	1.6	50	3	£15.67	£17.27
2CEN 008 900 S03	2CENC 008 900 S03	0.8	90°	1.6	50	3	£15.67	£17.27
2CEN 010 600 S03	2CENC 010 600 S03	1	60°	2	50	3	£15.00	£16.60
2CEN 010 900 S03	2CENC 010 900 S03	1	90°	2	50	3	£15.00	£16.60
2CEN 015 600 S03	2CENC 015 600 S03	1.5	60°	3	50	3	£15.00	£16.60
2CEN 015 900 S03	2CENC 015 900 S03	1.5	90°	3	50	3	£15.00	£16.60
2CEN 020 600 S03	2CENC 020 600 S03	2	60°	4	50	3	£15.00	£16.60
2CEN 020 900 S03	2CENC 020 900 S03	2	90°	4	50	3	£15.00	£16.60
2CEN 030 600 S03	2CENC 030 600 S03	3	60°	6	50	3	£15.00	£16.60
2CEN 030 900 S03	2CENC 030 900 S03	3	90°	6	50	3	£15.00	£16.60
2CEN 030 600 S06	2CENC 030 600 S06	3	60°	6	50	6	£17.80	£20.07
2CEN 030 900 S06	2CENC 030 900 S06	3	90°	6	50	6	£17.80	£20.07
2CEN 040 600 S06	2CENC 040 600 S06	4	60°	8	50	6	£17.80	£20.07
2CEN 040 900 S06	2CENC 040 900 S06	4	90°	8	50	6	£17.80	£20.07
2CEN 050 600 S06	2CENC 050 600 S06	5	60°	10	50	6	£17.80	£20.07
2CEN 050 900 S06	2CENC 050 900 S06	5	90°	10	50	6	£17.80	£20.07
2CEN 060 600 S06	2CENC 060 600 S06	6	60°	12	60	6	£19.67	£21.87
2CEN 060 900 S06	2CENC 060 900 S06	6	90°	12	60	6	£19.67	£21.87
2CEN 080 600 S08	2CENC 080 600 S08	8	60°	16	70	8	£25.40	£28.33
2CEN 080 900 S08	2CENC 080 900 S08	8	90°	16	70	8	£25.40	£28.33
2CEN 100 600 S10	2CENC 100 600 S10	10	60°	18	70	10	£33.53	£37.07
2CEN 100 900 S10	2CENC 100 900 S10	10	90°	18	70	10	£33.53	£37.07
2CEN 120 600 S12	2CENC 120 600 S12	12	60°	20	75	12	£44.73	£49.33
2CEN 120 900 S12	2CENC 120 900 S12	12	90°	20	75	12	£44.73	£49.33
2CEN 140 600 S14	2CENC 140 600 S14	14	60°	26	80	14	£58.92	£64.14
2CEN 140 900 S14	2CENC 140 900 S14	14	90°	26	80	14	£58.92	£64.14
2CEN 160 600 S16	2CENC 160 600 S16	16	60°	32	100	16	£71.52	£77.40
2CEN 160 900 S16	2CENC 160 900 S16	16	90°	32	100	16	£71.52	£77.40

- End Mills for pre-hardened steel, Cast iron, Non-metallic materials
- Multi-function end mill for corner chamfering, side wall and centering.
- Fine WC grade optimized for various non-ferrous and non-metallic work materials.
- End Mills for various work materials, hardened steel, pre-hardened steel, tool steel and cast iron. (HRc ~50)

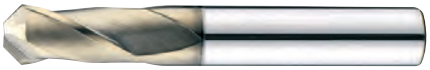


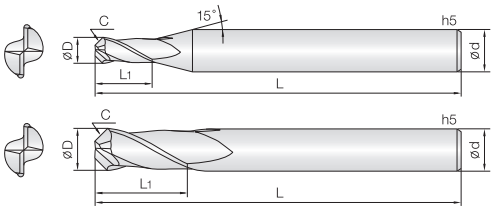
D Size	D Tolerance
Ø0.5 ~ 3	+0 ~ -0.01mm

Part Number	Diameter	Front Diameter	Angle	Effective Length	Overall Length	Shank Dia	Price
	D	D1		L1	L	d	£
2CENE 005 0005 090	0.5	0.05	90°	1	40	3	£19.73
2CENE 006 0005 090	0.6	0.05	90°	1.2	40	3	£19.73
2CENE 007 0005 090	0.7	0.05	90°	1.4	40	3	£19.00
2CENE 008 0005 090	0.8	0.05	90°	1.6	40	3	£19.00
2CENE 010 0005 090	1	0.05	90°	2	40	3	£18.20
2CENE 010 001 090	1	0.1	90°	2	40	3	£18.20
2CENE 010 001 120	1	0.1	120°	2	40	3	£18.20
2CENE 012 001 090	1.2	0.1	90°	2.4	40	3	£18.20
2CENE 015 001 090	1.5	0.1	90°	3	40	3	£18.20
2CENE 015 001 120	1.5	0.1	120°	3	40	3	£18.20
2CENE 020 001 090	2	0.1	90°	4	40	3	£18.20
2CENE 020 002 090	2	0.2	90°	4	40	3	£18.20
2CENE 020 002 120	2	0.2	120°	4	40	3	£18.20
2CENE 025 002 090	2.5	0.2	90°	5	40	3	£18.20
2CENE 030 002 090	3	0.2	90°	6	40	3	£18.20
2CENE 030 002 120	3	0.2	120°	6	40	3	£18.20

2CCMC 2 Flute Corner C End Mills

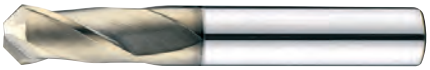
- End Mills for Pre-hardened Steel, Cast iron, Non-metallic materials
- Multi-function end mill for corner chamfering, side wall machining.
- Fine WC grade optimized for various non-ferrous and non-metallic work materials.
- JCRO coating provides wear resistance improvement as well as avoiding edge stress in various applications.

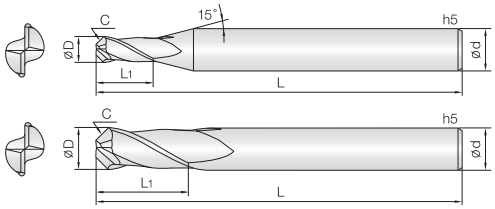




D Size	D Tolerance
Ø1 ~ 5	+0 ~ −0.01mm
Ø6 ~ 12	−0.01 ~ −0.025mm

Part Number	Diameter	Chamfer	Length of Cut	Overall Length	Shank Dia	Price
	D	C	L1	L	d	£
2CCMC 010 0002 S04	1	0.02	2.5	45	4	£9.67
2CCMC 010 0005 S04	1	0.05	2.5	45	4	£9.67
2CCMC 010 001 S04	1	0.1	2.5	45	4	£9.67
2CCMC 010 002 S04	1	0.2	2.5	45	4	£9.67
2CCMC 010 003 S04	1	0.3	2.5	45	4	£9.67
2CCMC 015 0005 S04	1.5	0.05	4	45	4	£9.67
2CCMC 015 001 S04	1.5	0.1	4	45	4	£9.67
2CCMC 015 002 S04	1.5	0.2	4	45	4	£9.67
2CCMC 015 003 S04	1.5	0.3	4	45	4	£9.67
2CCMC 015 005 S04	1.5	0.5	4	45	4	£9.67
2CCMC 020 0005 S04	2	0.05	6	45	4	£9.67
2CCMC 020 001 S04	2	0.1	6	45	4	£9.67
2CCMC 020 002 S04	2	0.2	6	45	4	£9.67
2CCMC 020 003 S04	2	0.3	6	45	4	£9.67
2CCMC 020 004 S04	2	0.4	6	45	4	£9.67
2CCMC 020 005 S04	2	0.5	6	45	4	£9.67
2CCMC 030 0005 S06	3	0.05	8	50	6	£11.73
2CCMC 030 001 S06	3	0.1	8	50	6	£11.73
2CCMC 030 002 S06	3	0.2	8	50	6	£11.73
2CCMC 030 003 S06	3	0.3	8	50	6	£11.73
2CCMC 030 005 S06	3	0.5	8	50	6	£11.73
2CCMC 030 010 S06	3	1	8	50	6	£11.73
2CCMC 040 0005 S06	4	0.05	11	50	6	£11.73
2CCMC 040 001 S06	4	0.1	11	50	6	£11.73
2CCMC 040 002 S06	4	0.2	11	50	6	£11.73
2CCMC 040 003 S06	4	0.3	11	50	6	£11.73
2CCMC 040 005 S06	4	0.5	11	50	6	£11.73
2CCMC 040 010 S06	4	1	11	50	6	£11.73
2CCMC 040 015 S06	4	1.5	11	50	6	£11.73
2CCMC 050 001 S06	5	0.1	13	60	6	£13.53
2CCMC 050 002 S06	5	0.2	13	60	6	£13.53
2CCMC 050 005 S06	5	0.5	13	60	6	£13.53
2CCMC 050 010 S06	5	1	13	60	6	£13.53
2CCMC 050 015 S06	5	1.5	13	60	6	£14.60
2CCMC 050 020 S06	5	2	13	60	6	£14.60

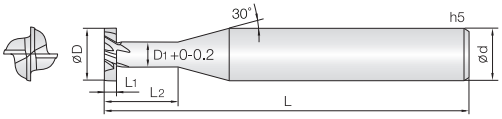




Part Number	Diameter	Chamfer	Length of Cut	Overall Length	Shank Dia	Price
	D	C	L1	L	d	£
2CCMC 060 0005 S06	6	0.05	13	60	6	£13.53
2CCMC 060 001 S06	6	0.1	13	60	6	£13.53
2CCMC 060 002 S06	6	0.2	13	60	6	£13.53
2CCMC 060 003 S06	6	0.3	13	60	6	£13.53
2CCMC 060 005 S06	6	0.5	13	60	6	£13.53
2CCMC 060 010 S06	6	1	13	60	6	£13.53
2CCMC 060 015 S06	6	1.5	13	60	6	£14.60
2CCMC 060 020 S06	6	2	13	60	6	£14.60
2CCMC 060 025 S06	6	2.5	13	60	6	£14.60
2CCMC 080 001 S08	8	0.1	19	70	8	£19.20
2CCMC 080 002 S08	8	0.2	19	70	8	£19.20
2CCMC 080 005 S08	8	0.5	19	70	8	£19.20
2CCMC 080 010 S08	8	1	19	70	8	£19.20
2CCMC 080 015 S08	8	1.5	19	70	8	£19.20
2CCMC 080 020 S08	8	2	19	70	8	£20.47
2CCMC 080 025 S08	8	2.5	19	70	8	£20.47
2CCMC 080 030 S08	8	3	19	70	8	£20.47
2CCMC 100 001 S10	10	0.1	22	75	10	£27.40
2CCMC 100 002 S10	10	0.2	22	75	10	£27.40
2CCMC 100 005 S10	10	0.5	22	75	10	£27.40
2CCMC 100 010 S10	10	1	22	75	10	£27.40
2CCMC 100 015 S10	10	1.5	22	75	10	£27.40
2CCMC 100 020 S10	10	2	22	75	10	£27.40
2CCMC 100 030 S10	10	3	22	75	10	£28.87
2CCMC 100 040 S10	10	4	22	75	10	£28.87
2CCMC 120 001 S12	12	0.1	26	80	12	£32.67
2CCMC 120 002 S12	12	0.2	26	80	12	£32.67
2CCMC 120 005 S12	12	0.5	26	80	12	£32.67
2CCMC 120 010 S12	12	1	26	80	12	£32.67
2CCMC 120 015 S12	12	1.5	26	80	12	£32.67
2CCMC 120 020 S12	12	2	26	80	12	£32.67
2CCMC 120 030 S12	12	3	26	80	12	£34.67
2CCMC 120 040 S12	12	4	26	80	12	£34.67
2CCMC 120 050 S12	12	5	26	80	12	£34.67

4TES 4 Flute T-Slot Cutter

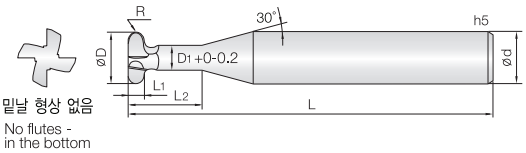
- End Mills for various work materials, hardened steel, pre-hardened steel, tool steel and cast iron.
- JCRO coating provides excellent wear resistance, as well as avoiding edge stress in various applications.
- 4 Flute design minimizes edge chipping.
- Various shapes and lengths available.



D Size	D Tolerance
Ø2 ~ 5	+0 ~ −0.02mm
Ø6 ~ 10	−0.01 ~ −0.03mm

Part Number	Diameter	Width of Cut	Effective Length	Neck Diameter	Overall Length	Shank Dia	Price Coated
Coated	D	L1	L2	D1	L	d	£
4TESC 020 003 040	2	0.3	4	1	50	6	£25.87
4TESC 020 005 040	2	0.5	4	1	50	6	£25.87
4TESC 030 003 045	3	0.3	4.5	1.5	50	6	£25.87
4TESC 030 005 045	3	0.5	4.5	1.5	50	6	£25.87
4TESC 030 010 045	3	1	4.5	1.5	50	6	£25.87
4TESC 040 003 050	4	0.3	5	2	50	6	£25.87
4TESC 040 005 050	4	0.5	5	2	50	6	£25.87
4TESC 040 010 050	4	1	5	2	50	6	£25.87
4TESC 050 005 045	5	0.5	4.5	2.5	50	6	£25.87
4TESC 050 010 050	5	1	5	2.5	50	6	£25.87
4TESC 050 015 055	5	1.5	5.5	2.5	50	6	£25.87
4TESC 050 020 060	5	2	6	2.5	50	6	£25.87
4TESC 060 005 045	6	0.5	4.5	3	60	6	£25.87
4TESC 060 010 050	6	1	5	3	60	6	£25.87
4TESC 060 015 055	6	1.5	5.5	3	60	6	£25.87
4TESC 060 020 060	6	2	6	3	60	6	£25.87
4TESC 080 005 045	8	0.5	4.5	4	60	8	£39.80
4TESC 080 010 050	8	1	5	4	60	8	£39.80
4TESC 080 015 055	8	1.5	5.5	4	60	8	£39.80
4TESC 080 020 060	8	2	6	4	60	8	£39.80
4TESC 080 030 070	8	3	7	4	60	8	£39.80
4TESC 100 010 070	10	1	7	5	70	10	£52.20
4TESC 100 020 080	10	2	8	5	70	10	£52.20
4TESC 100 030 090	10	3	9	5	70	10	£52.20

- End Mills for various work materials, hardened steel, pre-hardened steel, tool steel and cast iron.
- JCRO coating provides excellent wear resistance, as well as avoiding edge stress in various applications.
- 4 Flute design minimizes edge chipping.

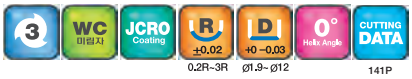


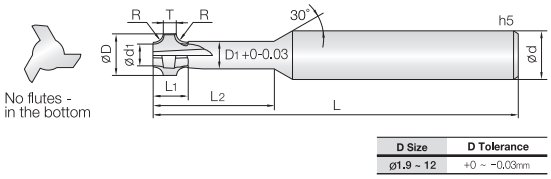
D Size	D Tolerance
Ø5 ~ 12	−0.01 ~ −0.025mm

Part Number	Diameter	Width of Cut	Effective Length	Neck Diameter	Overall Length	Shank Dia	Price
	D x R	L1	L2	D1	L	d	£
4TRS 050 010 045	5 x 0.5R	1	4.5	2.5	50	6	£31.27
4TRS 050 010 070	5 x 0.5R	1	7	2.5	50	6	£34.67
4TRS 050 020 055	5 x 1R	2	5.5	2.5	50	6	£31.27
4TRS 060 010 050	6 x 0.5R	1	5	3	50	6	£31.27
4TRS 060 010 080	6 x 0.5R	1	8	3	50	6	£34.67
4TRS 060 015 055	6 x 0.75R	1.5	5.5	3	50	6	£31.27
4TRS 060 020 060	6 x 1R	2	6	3	50	6	£31.27
4TRS 060 020 100	6 x 1R	2	10	3	50	6	£34.67
4TRS 080 020 070	8 x 1R	2	7	4	60	8	£42.60
4TRS 080 020 130	8 x 1R	2	13	4	60	8	£46.00
4TRS 080 030 080	8 x 1.5R	3	8	4	60	8	£42.60
4TRS 100 040 100	10 x 2R	4	10	4.5	70	10	£57.67
4TRS 100 040 160	10 x 2R	4	16	4.5	70	10	£61.80
4TRS 120 060 150	12 x 3R	6	15	5	75	12	£67.27
4TRS 120 060 210	12 x 3R	6	21	5	75	12	£72.13

3TRC 3 Flute T-Double Angle Corner Rounding Cutter

- End Mills for various work materials, hardened steel, pre-hardened steel, tool steel and cast iron.
- JCRO coating provides excellent wear resistance, as well as avoiding edge stress in various applications.
- Straight 3 Flute design minimizes edge chipping.

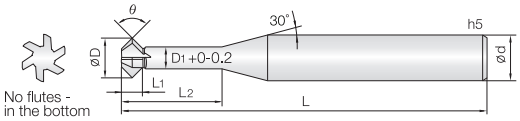




D Size	D Tolerance
Ø1.9 ~ 12	+0 ~ -0.03mm

Part Number	Diameter	Front Diameter	Thickness	Length of Cut	Effective Length	Overall Length	Shank Dia	Price
	D x R	D1	T	L1	L2	L	d	£
3TRC 019 002 080	1.9 x R0.2	1.45	0.9	1.45	8	60	4	£29.13
3TRC 024 003 090	2.4 x R0.3	1.75	1.2	1.95	9	60	4	£29.13
3TRC 026 004 100	2.6 x R0.4	1.75	1.5	2.5	10	60	4	£29.13
3TRC 029 005 120	2.9 x R0.5	1.85	1.8	3	12	60	4	£29.13
3TRC 049 005 150	4.9 x R0.5	3.8	2	3.3	15	80	6	£33.67
3TRC 068 010 200	6.8 x R1	4.7	2.2	4.3	20	80	8	£51.87
3TRC 079 015 250	7.9 x R1.5	4.7	2.5	5.8	25	80	8	£51.87
3TRC 099 020 300	9.9 x R2	5.8	2.8	6.8	30	80	10	£65.67
3TRC 119 030 350	11.9 x R3	5.8	3	8.8	35	80	12	£74.13

- End Mills for various work materials, hardened steel, pre-hardened steel, tool steel and cast iron.
- JCRO coating provides excellent wear resistance, as well as avoiding edge stress in various applications.
- Straight 4 Flute design minimizes edge chipping.
- Wide range of lengths available to cover most applications.

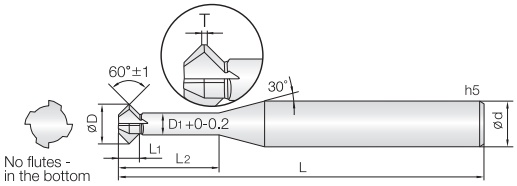


D Size	D Tolerance
Ø1.5 ~ 5	+0 ~ −0.02mm
Ø6 ~ 12	−0.01 ~ −0.03mm

Part Number	Diameter	Angle	Length of Cut	Effective Length	Neck Diameter	Overall Length	Shank Dia	Price
	D		L1	L2	D1	L	d	£
4TDA 015 600 030	1.5	60°	0.43	3	0.75	45	4	£24.00
4TDA 015 900 030	1.5	90°	0.75	3	0.75	45	4	£24.00
4TDA 020 600 050	2	60°	0.57	5	1	50	4	£24.00
4TDA 020 900 050	2	90°	1	5	1	50	4	£24.00
4TDA 025 600 060	2.5	60°	0.75	6	1.2	50	4	£24.00
4TDA 025 900 060	2.5	90°	1.3	6	1.2	50	4	£24.00
4TDA 030 600 075	3	60°	0.86	7.5	1.5	50	4	£24.00
4TDA 030 600 120	3	60°	0.86	12	1.5	50	4	£27.33
4TDA 030 900 075	3	90°	1.5	7.5	1.5	50	4	£24.00
4TDA 030 900 120	3	90°	1.5	12	1.5	50	4	£27.33
4TDA 040 600 100	4	60°	1.15	10	2	50	4	£24.00
4TDA 040 600 160	4	60°	1.15	16	2	50	4	£27.33
4TDA 040 900 100	4	90°	2	10	2	50	4	£24.00
4TDA 040 900 160	4	90°	2	16	2	50	4	£27.33
4TDA 050 600 125	5	60°	1.44	12.5	2.5	60	6	£26.53
4TDA 050 600 200	5	60°	1.44	20	2.5	60	6	£30.60
4TDA 050 900 125	5	90°	2.4	12.5	2.5	60	6	£26.53
4TDA 050 900 200	5	90°	2.4	20	2.5	60	6	£30.60
4TDA 060 600 150	6	60°	1.73	15	3	60	6	£26.53
4TDA 060 600 250	6	60°	1.73	25	3	60	6	£30.60
4TDA 060 900 150	6	90°	2.8	15	3	60	6	£26.53
4TDA 060 900 250	6	90°	2.8	25	3	60	6	£30.60
6TDA 080 600 200	8	60°	2.3	20	4	70	8	£42.60
6TDA 080 600 280	8	60°	2.3	28	4	70	8	£46.67
6TDA 080 900 200	8	90°	3.8	20	4	70	8	£42.60
6TDA 080 900 280	8	90°	3.8	28	4	70	8	£46.67
6TDA 100 600 250	10	60°	2.8	25	5	75	10	£53.53
6TDA 100 600 350	10	60°	2.8	35	5	75	10	£58.40
6TDA 100 900 250	10	90°	4.8	25	5	80	10	£53.53
6TDA 100 900 350	10	90°	4.8	35	6	80	10	£58.40
6TDA 120 600 300	12	60°	3.4	30	6	80	12	£60.40
6TDA 120 600 420	12	60°	3.4	42	6	80	12	£65.27
6TDA 120 900 300	12	90°	5.8	30	6	80	12	£60.40
6TDA 120 900 420	12	90°	5.8	42	6	80	12	£65.27

3&4THC 3&4 Flute Thread Milling Cutter

- End Mills for various work materials, hardened steel, pre-hardened steel, tool steel and cast iron.
- JCRO coating provides excellent wear resistance, as well as avoiding edge stress in various applications.
- Straight Flute design minimizes edge chipping and fracturing.



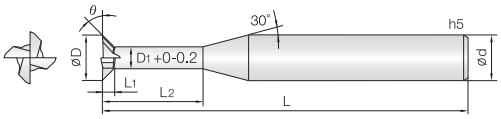
D Size	D Tolerance
Ø0.57 ~ 8	+0 ~ −0.02mm

Part Number	Diameter	Thickness	Length of Cut	Effective Length	Neck Diam-eter	Overall Length	Shank Dia	Flutes	Price
	D	T	L1	L2	D1	L	d	z	£
3THC 0057 025 M008	0.57	0.01	0.16	2.5	0.3	40	4	3	£25.00
3THC 0065 028 M009	0.65	0.01	0.18	2.8	0.35	40	4	3	£25.00
3THC 007 030 M01	0.7	0.015	0.18	3	0.4	40	4	3	£25.00
3THC 009 036 M012	0.9	0.015	0.2	3.6	0.57	40	4	3	£25.00
3THC 0105 045 M014	1.05	0.02	0.24	4.5	0.66	40	4	3	£25.00
3THC 012 050 M016	1.2	0.02	0.28	5	0.75	40	4	3	£25.00
4THC 015 060 M02	1.5	0.025	0.31	6	1	45	4	4	£25.00
4THC 019 070 M025	1.9	0.025	0.34	7	1.35	45	4	4	£25.00
4THC 023 090 M03	2.3	0.03	0.43	9	1.6	65	6	4	£28.67
4THC 031 120 M04	3.1	0.04	0.56	12	2.2	65	6	4	£28.67
4THC 040 150 M05	4	0.05	0.62	15	3	65	6	4	£28.67
4THC 048 180 M06	4.8	0.07	0.79	18	3.55	75	6	4	£28.67
4THC 065 230 M08	6.5	0.08	0.94	23	5	80	8	4	£44.87
4THC 079 260 M10	7.9	0.09	1.13	26	6.1	80	8	4	£44.87

4&6 Flute T-Angular Woodruff Cutter

4&6TAC

- End Mills for various work materials, hardened steel, pre-hardened steel, tool steel and cast iron.
- JCRO coating provides excellent wear resistance, as well as avoiding edge stress in various applications.

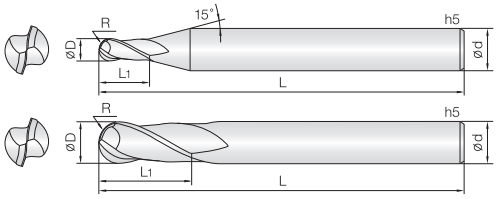


D Size	D Tolerance
Ø1.5 ~ 5	+0 ~ −0.02mm
Ø6 ~ 12	−0.01 ~ −0.03mm

Part Number	Diameter	Angle	Length of Cut	Effective Length	Neck Diameter	Overall Length	Shank Dia	Price
	D		L1	L2	D1	L	d	£
4TAC 015 300 030	1.5	30°	0.21	3	0.75	45	4	£24.00
4TAC 015 450 030	1.5	45°	0.37	3	0.75	45	4	£24.00
4TAC 020 300 050	2	30°	0.28	5	1	50	4	£24.00
4TAC 020 450 050	2	45°	0.5	5	1	50	4	£24.00
4TAC 025 300 060	2.5	30°	0.37	6	1.2	50	4	£24.00
4TAC 025 450 060	2.5	45°	0.65	6	1.2	50	4	£24.00
4TAC 030 300 075	3	30°	0.43	7.5	1.5	50	4	£24.00
4TAC 030 300 120	3	30°	0.43	12	1.5	50	4	£27.33
4TAC 030 450 075	3	45°	0.75	7.5	1.5	50	4	£24.00
4TAC 030 450 120	3	45°	0.75	12	1.5	50	4	£27.33
4TAC 040 300 100	4	30 °	0.57	10	2	50	4	£24.00
4TAC 040 300 160	4	30°	0.57	16	2	50	4	£27.33
4TAC 040 450 100	4	45 °	1	10	2	50	4	£24.00
4TAC 040 450 160	4	45°	1	16	2	50	4	£27.33
4TAC 050 300 125	5	30°	0.72	12.5	2.5	60	6	£26.53
4TAC 050 450 125	5	45°	1.25	12.5	2.5	60	6	£26.53
4TAC 060 300 150	6	30°	0.86	15	3	60	6	£26.53
4TAC 060 300 240	6	30°	0.86	24	3	60	6	£30.60
4TAC 060 450 150	6	45°	1.5	15	3	60	6	£26.53
4TAC 060 450 240	6	45°	1.5	24	3	60	6	£30.60
6TAC 080 300 200	8	30°	1.15	20	4	70	8	£42.60
6TAC 080 300 280	8	30°	1.15	28	4	70	8	£46.67
6TAC 080 450 200	8	45°	2	20	4	70	8	£42.60
6TAC 080 450 280	8	45°	2	28	4	70	8	£46.67
6TAC 100 300 250	10	30°	1.44	25	5	75	10	£53.53
6TAC 100 300 350	10	30°	1.44	35	5	75	10	£58.40
6TAC 100 450 250	10	45°	2.5	25	5	75	10	£53.53
6TAC 100 450 350	10	45°	2.5	35	5	75	10	£58.40
6TAC 120 300 300	12	30°	1.73	30	6	80	12	£60.40
6TAC 120 300 420	12	30°	1.73	42	6	80	12	£65.27
6TAC 120 450 300	12	45°	3	30	6	80	12	£60.40
6TAC 120 450 420	12	45°	3	42	6	80	12	£65.27

2HCBE 2 Flute Ball End Mills for Heavy Cuts

- End Mills for various work materials (~HRc52), pre-hardened steel, carbon steel, mold steel.
- Excellent wear resistance from high quality Si-based PVD coating.
- Suitable shape is designed for tooling in wide areas.
- Minimize fracturing by high TRS fine (0.5μm) WC grade.

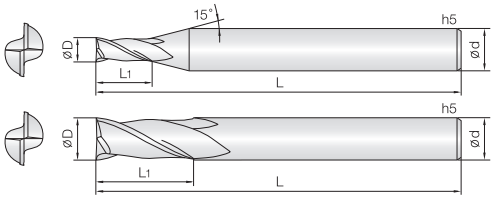


D Size	D Tolerance
ø0.2 ~ 5	+0~ −0.01mm
ø6 ~ 12	−0.005 ~ -0.015mm
ø16	−0.01~ −0.02mm

Part Number	Diameter	Length of Cut	Overall Length	Shank Dia	Price
	RxD	L1	L	d	£
2HCBE 002 004 S04	0.1R x 0.2	0.4	40	4	£14.20
2HCBE 003 006 S04	0.15R x 0.3	0.6	40	4	£13.00
2HCBE 004 008 S04	0.2R x 0.4	0.8	40	4	£12.40
2HCBE 005 010 S04	0.25R x 0.5	1	45	4	£11.40
2HCBE 006 012 S04	0.3R x .06	1.2	45	4	£11.20
2HCBE 007 014 S04	0.35R x 0.7	1.4	45	4	£10.86
2HCBE 008 016 S04	0.4R x 0.8	1.6	45	4	£9.94
2HCBE 009 018 S04	0.45R x 0.9	1.8	45	4	£9.94
2HCBE 010 025 S04	0.5R x 1	2.5	50	4	£9.53
2HCBE 010 025 S06	0.5R x 1	2.5	50	6	£10.40
2HCBE 012 030 S04	0.6R x 1.2	3	50	4	£9.80
2HCBE 015 040 S04	0.75R x 1.5	4	50	4	£9.53
2HCBE 015 040 S06	0.75R x 1.5	4	50	6	£10.40
2HCBE 020 050 S04	1R x 2	5	50	4	£9.53
2HCBE 020 050 S06	1R x 2	5	50	6	£10.40
2HCBE 025 050 S04	1.25R x 2.5	5	50	4	£9.53
2HCBE 025 050 S06	1.25R x 2.5	5	50	6	£10.40
2HCBE 030 060 S04	1.5R x 3	6	60	4	£9.53
2HCBE 030 060 S06	1.5R x 3	6	50	6	£10.40
2HCBE 030 060 060	1.5R x 3	6	60	6	£10.53
2HCBE 040 080 S04	2R x 4	8	70	4	£9.53
2HCBE 040 080 080	2R x 4	8	80	4	£11.93
2HCBE 040 080 S06	2R x 4	8	50	6	£10.47
2HCBE 040 080 070	2R x 4	8	50	6	£10.74
2HCBE 050 100 S06	2.5R x 5	10	50	6	£11.00
2HCBE 050 120 S06	2.5R x 5	12	80	6	£12.20
2HCBE 060 100 050	3R x 6	10	50	6	£10.33
2HCBE 060 100 060	3R x 6	10	60	6	£10.86
2HCBE 060 120 080	3R x 6	12	80	6	£12.20
2HCBE 060 120 100	3R x 6	12	100	6	£16.00
2HCBE 080 120 060	4R x 8	12	60	8	£16.73
2HCBE 080 140 080	4R x 8	14	80	8	£18.53
2HCBE 080 140 100	4R x 8	14	100	8	£20.33
2HCBE 100 150 075	5R x 10	15	75	10	£24.20
2HCBE 100 180 100	5R x 10	18	100	10	£25.73
2HCBE 120 180 080	6R x 12	18	80	12	£30.13
2HCBE 120 220 110	6R x 12	22	110	12	£34.07
2HCBE 160 300 110	8R x 16	30	110	16	£66.55

2HCEE

- End Mills for various work materials (~HRc52), pre-hardened steel, carbon steel, mold steel.
- Excellent wear resistance from high quality Si-based PVD coating.
- Suitable shape is designed for tooling in wide areas.
- Minimize fracturing by high TRS fine (0.5μm) WC grade.

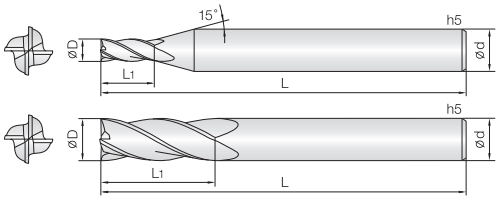


D Size	D Tolerance
Ø0.2 ~ 5	+0 ~ −0,01mm
Ø6 ~ 12	−0.005 ~ −0.025mm
Ø16	−0.015~ −0.03mm

Part Number	Diameter	Length of Cut	Overall Length	Shank Dia	Price
	D	L1	L	d	£
2HCEE 002 004 S04	0.2	0.4	40	4	£12.07
2HCEE 003 006 S04	0.3	0.6	40	4	£9.40
2HCEE 004 008 S04	0.4	0.8	40	4	£9.40
2HCEE 005 010 S04	0.5	1	40	4	£8.87
2HCEE 006 012 S04	0.6	1.2	40	4	£8.87
2HCEE 007 014 S04	0.7	1.4	40	4	£8.87
2HCEE 008 016 S04	0.8	1.6	40	4	£8.87
2HCEE 009 018 S04	0.9	1.8	40	4	£8.87
2HCEE 010 025 S04	1	2.5	45	4	£7.14
2HCEE 010 030 S04	1	3	50	4	£7.26
2HCEE 012 030 S04	1.2	3	45	4	£7.14
2HCEE 015 040 S04	1.5	4	45	4	£7.14
2HCEE 020 060 S04	2	6	45	4	£7.14
2HCEE 025 080 S04	2.5	8	45	4	£7.14
2HCEE 030 080 S04	3	8	50	4	£7.53
2HCEE 030 080 S06	3	8	50	6	£8.60
2HCEE 040 110 S04	4	11	50	4	£7.53
2HCEE 040 110 S06	4	11	50	6	£8.60
2HCEE 050 130 S06	5	13	50	6	£9.33
2HCEE 060 130 050	6	13	50	6	£9.33
2HCEE 060 160 055	6	16	55	6	£10.13
2HCEE 080 200 060	8	20	60	8	£13.67
2HCEE 080 240 070	8	24	70	8	£15.07
2HCEE 100 220 070	10	22	70	10	£18.94
2HCEE 100 250 075	10	25	75	10	£21.27
2HCEE 120 260 075	12	26	75	12	£23.40
2HCEE 120 300 080	12	30	80	12	£26.20
2HCEE 160 400 090	16	40	90	16	£60.38

4HCEE 4 Flute End Mills for Heavy Cuts

- End Mills for various work materials (~HRc52), pre- hardened steel, carbon steel, mold steel.
- Excellent wear resistance from high quality Si-based PVD coating.
- Minimize fracturing by high TRS fine (0.5μm) WC grade.



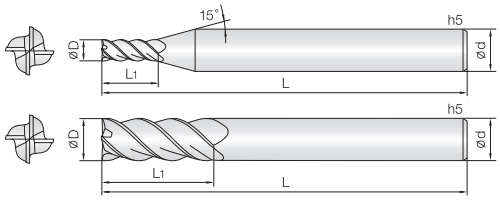
D Size	D Tolerance
Ø1 ~ 5	+0~ −0,01mm
Ø6 ~ 12	−0.005 ~ -0.025mm
Ø16	−0.015~ −0.03mm

Part Number	Diameter	Length of Cut	Overall Length	Shank Dia	Price
	D	L1	L	d	£
4HCEE 010 025 S04	1	2.5	45	4	£8.27
4HCEE 015 040 S04	1.5	4	45	4	£8.27
4HCEE 020 060 S04	2	6	45	4	£8.27
4HCEE 025 080 S04	2.5	8	45	4	£8.27
4HCEE 025 080 S06	2.5	8	45	6	£9.94
4HCEE 025 120 S06	2.5	12	50	6	£9.94
4HCEE 030 080 S04	3	8	50	4	£8.27
4HCEE 030 080 S06	3	8	50	6	£9.94
4HCEE 040 110 S04	4	11	50	4	£8.27
4HCEE 040 110 S06	4	11	50	6	£9.94
4HCEE 050 130 S06	5	13	50	6	£10.47
4HCEE 060 130 050	6	13	50	6	£10.47
4HCEE 060 160 055	6	16	55	6	£11.00
4HCEE 080 200 060	8	20	60	8	£14.67
4HCEE 080 240 070	8	24	70	8	£16.26
4HCEE 100 220 070	10	22	70	10	£20.66
4HCEE 100 250 075	10	25	75	10	£22.73
4HCEE 120 260 075	12	26	75	12	£24.13
4HCEE 120 300 080	12	30	80	12	£26.47
4HCEE 160 400 090	16	40	90	16	£62.87

4 Flute High Speed 45° Helix End Mills for Heavy Cuts

4HEME

- End Mills for various work materials (~HRc52), pre- hardened steel, carbon steel, mold steel.
- Excellent wear resistance from high quality Si-based PVD coating.
- 45° Helix design for high speed conditions
- Minimize fracturing by high TRS fine (0.5μm) WC grade.

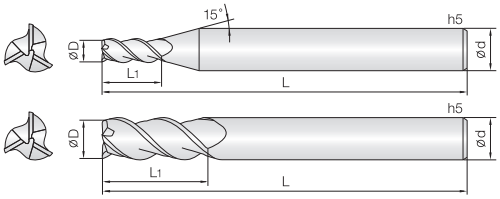


D Size	D Tolerance
Ø1 ~ 5	+0 ~ -0,01mm
Ø6 ~ 12	-0,01 ~ -0,025mm
Ø14 ~ 16	-0,015 ~ -0,03mm

Part Number	Diameter	Length of Cut	Overall Length	Shank Dia	Price
	D	L1	L	d	£
4HEME 010 025 S04	1	2.5	40	4	£9.86
4HEME 010 025 S06	1	2.5	40	6	£10.60
4HEME 010 035 S04	1	3.5	40	4	£11.87
4HEME 010 035 S06	1	3.5	40	6	£12.66
4HEME 012 030 S04	1.2	3	40	4	£9.86
4HEME 012 030 S06	1.2	3	40	6	£10.60
4HEME 015 040 S04	1.5	4	40	4	£9.86
4HEME 015 060 S04	1.5	6	40	4	£11.87
4HEME 015 060 S06	1.5	6	40	6	£12.66
4HEME 020 050 S04	2	5	40	4	£9.86
4HEME 020 080 S04	2	8	45	4	£11.87
4HEME 020 080 S06	2	8	45	6	£13.07
4HEME 030 080 S06	3	8	45	6	£11.00
4HEME 030 120 S06	3	12	50	6	£13.07
4HEME 040 110 S06	4	11	45	6	£11.00
4HEME 040 160 S06	4	16	55	6	£13.07
4HEME 050 130 S06	5	13	50	6	£11.80
4HEME 050 180 S06	5	18	60	6	£14.07
4HEME 060 130 S06	6	13	50	6	£11.80
4HEME 060 200 S06	6	20	60	6	£14.07
4HEME 080 200 S08	8	20	60	8	£18.73
4HEME 080 250 S08	8	25	70	8	£22.54
4HEME 080 300 S08	8	30	75	8	£23.40
4HEME 100 220 S10	10	22	70	10	£23.87
4HEME 100 300 S10	10	30	80	10	£30.00
4HEME 100 400 S10	10	40	90	10	£32.27
4HEME 120 260 S12	12	26	75	12	£29.13
4HEME 120 400 S12	12	40	90	12	£34.93
4HEME 120 500 S12	12	50	100	12	£41.13
4HEME 140 300 S14	14	30	80	14	£61.04
4HEME 140 500 S14	14	50	110	14	£68.86
4HEME 160 350 S16	16	35	90	16	£62.28
4HEME 160 500 S16	16	50	110	16	£74.49

3NSE 3 Flute 45° Helix End Mills for Heavy Cuts

- End Mills for various work materials (~HRc52), pre-hardened steel, carbon steel, mold steel, SUS, Stainless Steel Ti/Ni-base alloy, Inconel.
- Excellent wear resistance from high quality Si-based PVD coating.
- Excellent work surface finish by 3 flute and deep chip pocket.
- Minimize fracturing by high TRS fine (0.5μm) WC grade.

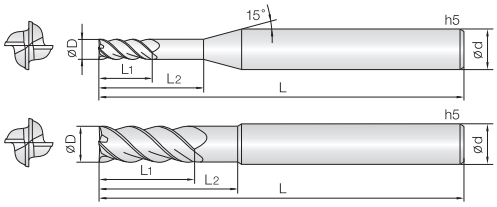


D Size	D Tolerance
Ø1 ~ 5	+0 ~ −0.01mm
Ø6 ~ 12	−0.01 ~ −0.025mm

Part Number	Diameter	Length of Cut	Overall Length	Shank Dia	Price
	D	L1	L	d	£
3NSE 010 025 S04	1	2.5	45	4	£9.53
3NSE 012 030 S04	1.2	3	45	4	£9.53
3NSE 015 040 S04	1.5	4	45	4	£9.53
3NSE 020 060 S04	2	6	45	4	£9.53
3NSE 025 080 S06	2.5	8	45	6	£10.74
3NSE 030 080 S06	3	8	45	6	£10.74
3NSE 040 110 S06	4	11	50	6	£10.74
3NSE 050 130 S06	5	13	50	6	£10.74
3NSE 060 130 S06	6	13	55	6	£11.27
3NSE 080 190 S08	8	19	60	8	£16.80
3NSE 100 220 S10	10	22	70	10	£21.80
3NSE 120 260 S12	12	26	80	12	£25.80

4NSE

- End Mills for various work materials (~HRc52), pre-hardened steel, carbon steel, mold steel, SUS, Stainless Steel Ti/Ni-base alloy, Inconel.
- Excellent wear resistance from high quality Si-based PVD coating.
- Unequal flute spacing design, minimizing chatter
- Minimize fracturing by high TRS fine (0.5μm) WC grade.

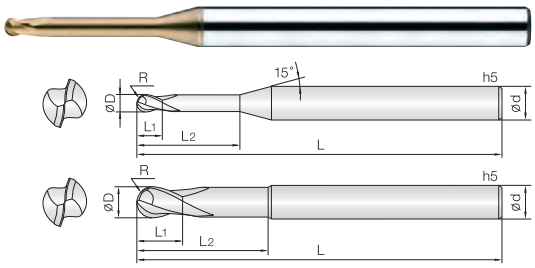


D Size	D Tolerance
Ø1 ~ 5	+0 ~ -0,01mm
Ø6 ~ 12	-0,01 ~ -0,025mm
Ø16 ~ 20	-0,015 ~ -0,03mm

Part Number	Diameter	Length of Cut	Effective Length	Overall Length	Shank Dia	Price
	D	L1	L2	L	d	£
4NSE 010 025 S04	1	2.5	-	45	4	£8.89
4NSE 010 040 S04	1	2.5	4	45	4	£10.07
4NSE 012 030 S04	1.2	3	-	45	4	£8.89
4NSE 012 050 S04	1.2	3	5	45	4	£10.07
4NSE 015 040 S04	1.5	4	-	45	4	£8.89
4NSE 015 060 S04	1.5	4	6	45	4	£10.07
4NSE 020 060 S04	2	6	-	45	4	£8.89
4NSE 020 100 S04	2	6	10	45	4	£10.07
4NSE 025 070 S04	2.5	7	-	45	4	£8.89
4NSE 025 100 S04	2.5	7	10	45	4	£10.07
4NSE 030 080 S06	3	8	-	50	6	£9.72
4NSE 030 100 S06	3	10	-	50	6	£9.72
4NSE 030 120 S06	3	8	12	50	6	£10.96
4NSE 040 100 S06	4	10	-	50	6	£9.72
4NSE 040 120 S06	4	12	-	50	6	£9.72
4NSE 040 160 S06	4	10	16	50	6	£10.96
4NSE 050 120 S06	5	12	-	55	6	£10.07
4NSE 050 160 S06	5	16	-	55	6	£10.49
4NSE 050 200 S06	5	12	20	55	6	£11.32
4NSE 060 130 S06	6	13	-	55	6	£10.07
4NSE 060 180 S06	6	18	-	55	6	£11.14
4NSE 060 210 055	6	13	21	55	6	£12.50
4NSE 080 200 S08	8	20	-	60	8	£17.48
4NSE 080 250 S08	8	25	-	70	8	£19.20
4NSE 080 270 070	8	20	27	70	8	£19.91
4NSE 100 220 S10	10	22	-	70	10	£24.95
4NSE 100 300 S10	10	30	-	75	10	£27.50
4NSE 100 320 075	10	22	32	75	10	£28.56
4NSE 120 260 S12	12	26	-	75	12	£26.90
4NSE 120 300 S12	12	30	-	80	12	£29.93
4NSE 120 380 080	12	26	38	80	12	£31.76
4NSE 140 320 090	14	32	-	90	14	£64.00
4NSE 160 450 S16	16	35	45	90	16	£76.92
4NSE 200 520 S20	20	40	52	100	20	£99.50

2HRB 2 Flute High Speed Rib Ball End Mills

- End Mills for pre-hardened and hardened steel (HRc50~62)
- Good wear resistance from Si-based PVD coating.
- Precise edge tolerance.
- Excellent work surface finish.
- Outstanding performance at high speed machining by ultra-fine (0.2μm) WC grade.



D Size	D Tolerance
ø0.1 ~ 0.15	+0 ~ -0.005mm
ø0.2 ~ 5	+0 ~ -0.01mm
ø6 ~ 12	-0.005 ~ -0.015mm

HARD SERIES - END MILLS FOR STEEL

Part Number	Diameter	Length of Cut	Effective Length	Overall Length	Shank Dia	Price
	R x D	L1	L2	L	d	£
2HRB 001 003 S04	0.05R x 0.1	0.15	0.3	40	4	£35.27
2HRB 001 005 S04	0.05R x 0.1	0.15	0.5	40	4	£35.27
2HRB 0015 003 S04	0.075R X 0.15	0.15	0.3	40	4	£34.00
2HRB 0015 005 S04	0.075R X 0.15	0.15	0.5	40	4	£34.00
2HRB 0015 010 S04	0.075R X 0.15	0.15	1	40	4	£35.00
2HRB 002 005 S04	0.1R x 0.2	0.2	0.5	40	4	£22.27
2HRB 002 010 S04	0.1R x 0.2	0.2	1	40	4	£22.27
2HRB 002 015 S04	0.1R x 0.2	0.2	1.5	40	4	£22.27
2HRB 002 020 S04	0.1R x 0.2	0.2	2	40	4	£22.27
2HRB 002 025 S04	0.1R x 0.2	0.2	2.5	40	4	£23.67
2HRB 002 030 S04	0.1R x 0.2	0.2	3	40	4	£23.67
2HRB 0025 005 S04	0.125R X 0.25	0.25	0.5	40	4	£21.26
2HRB 00250 10 S04	0.125R X 0.25	0.25	1	40	4	£21.26
2HRB 0025 015 S04	0.125R X 0.25	0.25	1.5	40	4	£21.60
2HRB 0025 020 S04	0.125R X 0.25	0.25	2	40	4	£21.60
2HRB 0025 025 S04	0.125R X 0.25	0.25	2.5	40	4	£23.40
2HRB 0025 030 S04	0.125R X 0.25	0.25	3	40	4	£23.40
2HRB 003 010 S04	0.15R x 0.3	0.3	1	40	4	£20.93
2HRB 003 015 S04	0.15R x 0.3	0.3	1.5	40	4	£20.93
2HRB 003 020 S04	0.15R x 0.3	0.3	2	40	4	£20.93
2HRB 003 025 S04	0.15R x 0.3	0.3	2.5	40	4	£20.93
2HRB 003 030 S04	0.15R x 0.3	0.3	3	40	4	£20.93
2HRB 003 035 S04	0.15R x 0.3	0.3	3.5	40	4	£23.20
2HRB 003 040 S04	0.15R x 0.3	0.3	4	40	4	£24.53
2HRB 003 050 S04	0.15R x 0.3	0.3	5	40	4	£24.53
2HRB 004 010 S04	0.2R x 0.4	0.4	1	40	4	£20.13
2HRB 004 015 S04	0.2R x 0.4	0.4	1.5	40	4	£20.13
2HRB 004 020 S04	0.2R x 0.4	0.4	2	40	4	£20.13
2HRB 004 025 S04	0.2R x 0.4	0.4	2.5	40	4	£20.13
2HRB 004 030 S04	0.2R x 0.4	0.4	3	40	4	£20.13
2HRB 004 035 S04	0.2R x 0.4	0.4	3.5	40	4	£20.13
2HRB 004 040 S04	0.2R x 0.4	0.4	4	40	4	£20.13
2HRB 004 045 S04	0.2R x 0.4	0.4	4.5	40	4	£20.13
2HRB 004 050 S04	0.2R x 0.4	0.4	5	40	4	£20.13
2HRB 004 060 S04	0.2R x 0.4	0.4	6	40	4	£20.13
2HRB 004 080 S04	0.2R x 0.4	0.4	8	40	4	£20.13
2HRB 004 100 S04	0.2R x 0.4	0.4	10	40	4	£23.47
2HRB 005 010 S04	0.25R x 0.5	0.5	1	45	4	£18.40
2HRB 005 015 S04	0.25R x 0.5	0.5	1.5	45	4	£18.40

Part Number	Diameter	Length of Cut	Effective Length	Overall Length	Shank Dia	Price
	R x D	L1	L2	L	d	£
2HRB 005 020 S04	0.25R x 0.5	0.5	2	45	4	£18.40
2HRB 005 025 S04	0.25R x 0.5	0.5	2.5	45	4	£18.40
2HRB 005 030 S04	0.25R x 0.5	0.5	3	45	4	£18.40
2HRB 005 035 S04	0.25R x 0.5	0.5	3.5	45	4	£18.40
2HRB 005 040 S04	0.25R x 0.5	0.5	4	45	4	£18.40
2HRB 005 045 S04	0.25R x 0.5	0.5	4.5	45	4	£18.40
2HRB 005 050 S04	0.25R x 0.5	0.5	5	45	4	£18.93
2HRB 005 060 S04	0.25R x 0.5	0.5	6	45	4	£18.93
2HRB 005 080 S04	0.25R x 0.5	0.5	8	45	4	£18.93
2HRB 005 100 S04	0.25R x 0.5	0.5	10	45	4	£18.93
2HRB 005 120 S04	0.25R x 0.5	0.5	12	45	4	£22.40
2HRB 005 140 S04	0.25R x 0.5	0.5	14	45	4	£22.40
2HRB 006 010 S04	0.3R x 0.6	0.6	1	45	4	£17.27
2HRB 006 020 S04	0.3R x 0.6	0.6	2	45	4	£17.27
2HRB 006 030 S04	0.3R x 0.6	0.6	3	45	4	£17.27
2HRB 006 040 S04	0.3R x 0.6	0.6	4	45	4	£17.27
2HRB 006 050 S04	0.3R x 0.6	0.6	5	45	4	£17.27
2HRB 006 060 S04	0.3R x 0.6	0.6	6	45	4	£17.27
2HRB 006 080 S04	0.3R x 0.6	0.6	8	45	4	£17.80
2HRB 006 100 S04	0.3R x 0.6	0.6	10	45	4	£17.80
2HRB 006 120 S04	0.3R x 0.6	0.6	12	45	4	£17.80
2HRB 006 140 S04	0.3R x 0.6	0.6	14	45	4	£21.20
2HRB 006 160 S04	0.3R x 0.6	0.6	16	45	4	£21.20
2HRB 007 020 S04	0.35R x 0.7	0.7	2	45	4	£17.80
2HRB 007 040 S04	0.35R x 0.7	0.7	4	45	4	£17.80
2HRB 007 060 S04	0.35R x 0.7	0.7	6	45	4	£17.80
2HRB 007 080 S04	0.35R x 0.7	0.7	8	45	4	£17.80
2HRB 007 100 S04	0.35R x 0.7	0.7	10	45	4	£21.20
2HRB 007 120 S04	0.35R x 0.7	0.7	12	45	4	£21.20
2HRB 008 020 S04	0.4R x 0.8	0.8	2	45	4	£16.13
2HRB 008 030 S04	0.4R x 0.8	0.8	3	45	4	£16.13
2HRB 008 040 S04	0.4R x 0.8	0.8	4	45	4	£16.13
2HRB 008 050 S04	0.4R x 0.8	0.8	5	45	4	£16.13
2HRB 008 060 S04	0.4R x 0.8	0.8	6	45	4	£16.13
2HRB 008 080 S04	0.4R x 0.8	0.8	8	45	4	£16.13
2HRB 008 100 S04	0.4R x 0.8	0.8	10	45	4	£16.13
2HRB 008 120 S04	0.4R x 0.8	0.8	12	45	4	£16.13
2HRB 008 140 S04	0.4R x 0.8	0.8	14	45	4	£19.60
2HRB 008 160 S04	0.4R x 0.8	0.8	16	45	4	£19.60

Part Number	Diameter	Length of Cut	Effective Length	Overall Length	Shank Dia	Price
	R x D	L1	L2	L	d	£
2HRB 009 040 S04	0.45R x 0.9	0.9	4	45	4	£16.13
2HRB 010 020 S04	0.5R x 1	1	2	45	4	£14.33
2HRB 010 020 S06	0.5R x 1	1	2	50	6	£16.93
2HRB 010 030 S04	0.5R x 1	1	3	45	4	£14.33
2HRB 010 030 S06	0.5R x 1	1	3	50	6	£16.93
2HRB 010 040 S04	0.5R x 1	1	4	45	4	£14.33
2HRB 010 040 S06	0.5R x 1	1	4	50	6	£16.93
2HRB 010 050 S04	0.5R x 1	1	5	45	4	£14.33
2HRB 010 050 S06	0.5R x 1	1	5	50	6	£16.93
2HRB 010 060 S04	0.5R x 1	1	6	45	4	£14.33
2HRB 010 060 S06	0.5R x 1	1	6	50	6	£16.93
2HRB 010 080 S04	0.5R x 1	1	8	45	4	£14.33
2HRB 010 080 S06	0.5R x 1	1	8	50	6	£16.93
2HRB 010 100 S04	0.5R x 1	1	10	50	4	£14.93
2HRB 010 100 S06	0.5R x 1	1	10	50	6	£16.93
2HRB 010 120 S04	0.5R x 1	1	12	50	4	£14.93
2HRB 010 120 S06	0.5R x 1	1	12	50	6	£16.93
2HRB 010 140 S04	0.5R x 1	1	14	50	4	£14.93
2HRB 010 140 S06	0.5R x 1	1	14	50	6	£16.93
2HRB 010 160 S04	0.5R x 1	1	16	50	4	£14.93
2HRB 010 160 S06	0.5R x 1	1	16	60	6	£17.80
2HRB 010 180 S04	0.5R x 1	1	18	50	4	£14.93
2HRB 010 180 S06	0.5R x 1	1	18	60	6	£17.80
2HRB 010 200 S04	0.5R x 1	1	20	50	4	£14.93
2HRB 010 200 S06	0.5R x 1	1	20	60	6	£17.80
2HRB 010 220 S04	0.5R x 1	1	22	60	4	£16.47
2HRB 010 220 S06	0.5R x 1	1	22	65	6	£18.93
2HRB 010 250 S04	0.5R x 1	1	25	60	4	£19.73
2HRB 010 300 S04	0.5R x 1	1	30	70	4	£21.87
2HRB 012 040 S04	0.6R x 1.2	1.2	4	45	4	£14.93
2HRB 012 040 S06	0.6R x 1.2	1.2	4	50	6	£16.93
2HRB 012 060 S04	0.6R x 1.2	1.2	6	45	4	£14.93
2HRB 012 060 S06	0.6R x 1.2	1.2	6	50	6	£16.93
2HRB 012 080 S04	0.6R x 1.2	1.2	8	45	4	£14.93
2HRB 012 080 S06	0.6R x 1.2	1.2	8	50	6	£16.93
2HRB 012 100 S04	0.6R x 1.2	1.2	10	50	4	£14.93
2HRB 012 100 S06	0.6R x 1.2	1.2	10	50	6	£16.93
2HRB 012 120 S04	0.6R x 1.2	1.2	12	50	4	£14.93
2HRB 012 120 S06	0.6R x 1.2	1.2	12	50	6	£16.93
2HRB 012 160 S04	0.6R x 1.2	1.2	16	50	4	£14.93
2HRB 012 160 S06	0.6R x 1.2	1.2	16	60	6	£17.80
2HRB 012 200 S04	0.6R x 1.2	1.2	20	50	4	£14.93
2HRB 012 200 S06	0.6R x 1.2	1.2	20	60	6	£17.80
2HRB 012 240 S04	0.6R x 1.2	1.2	24	60	4	£16.47
2HRB 012 240 S06	0.6R x 1.2	1.2	24	65	6	£18.93
2HRB 014 060 S04	0.7R x 1.4	1.4	6	45	4	£14.93
2HRB 014 080 S04	0.7R x 1.4	1.4	8	45	4	£14.93
2HRB 014 120 S04	0.7R x 1.4	1.4	12	50	4	£14.93
2HRB 014 160 S04	0.7R x 1.4	1.4	16	50	4	£14.93
2HRB 015 030 S04	0.75R x 1.5	1.5	3	45	4	£14.33
2HRB 015 030 S06	0.75R x 1.5	1.5	3	50	6	£16.93

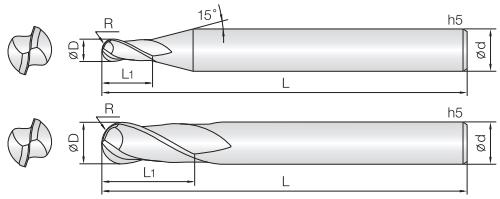
Part Number	Diameter	Length of Cut	Effective Length	Overall Length	Shank Dia	Price
	R x D	L1	L2	L	d	£
2HRB 015 040 S04	0.75R x 1.5	1.5	4	45	4	£14.33
2HRB 015 040 S06	0.75R x 1.5	1.5	4	50	6	£16.93
2HRB 015 060 S04	0.75R x 1.5	1.5	6	45	4	£14.33
2HRB 015 060 S06	0.75R x 1.5	1.5	6	50	6	£16.93
2HRB 015 080 S04	0.75R x 1.5	1.5	8	45	4	£14.33
2HRB 015 080 S06	0.75R x 1.5	1.5	8	50	6	£16.93
2HRB 015 100 S04	0.75R x 1.5	1.5	10	50	4	£14.93
2HRB 015 100 S06	0.75R x 1.5	1.5	10	50	6	£16.93
2HRB 015 120 S04	0.75R x 1.5	1.5	12	50	4	£14.93
2HRB 015 120 S06	0.75R x 1.5	1.5	12	50	6	£16.93
2HRB 015 140 S04	0.75R x 1.5	1.5	14	50	4	£14.93
2HRB 015 140 S06	0.75R x 1.5	1.5	14	50	6	£16.93
2HRB 015 160 S04	0.75R x 1.5	1.5	16	50	4	£14.93
2HRB 015 160 S06	0.75R x 1.5	1.5	16	60	6	£17.80
2HRB 015 180 S04	0.75R x 1.5	1.5	18	50	4	£14.93
2HRB 015 180 S06	0.75R x 1.5	1.5	18	60	6	£17.80
2HRB 015 200 S04	0.75R x 1.5	1.5	20	50	4	£14.93
2HRB 015 200 S06	0.75R x 1.5	1.5	20	60	6	£17.80
2HRB 015 220 S04	0.75R x 1.5	1.5	22	60	4	£16.47
2HRB 015 220 S06	0.75R x 1.5	1.5	22	65	6	£18.93
2HRB 015 250 S04	0.75R x 1.5	1.5	25	60	4	£16.47
2HRB 015 250 S06	0.75R x 1.5	1.5	25	65	6	£18.93
2HRB 015 300 S04	0.75R x 1.5	1.5	30	70	4	£18.00
2HRB 015 300 S06	0.75R x 1.5	1.5	30	70	6	£21.60
2HRB 015 350 S04	0.75R x 1.5	1.5	35	70	4	£21.33
2HRB 015 400 S04	0.75R x 1.5	1.5	40	80	4	£23.20
2HRB 016 060 S04	0.8R x 1.6	1.6	6	45	4	£17.27
2HRB 016 080 S04	0.8R x 1.6	1.6	8	45	4	£17.27
2HRB 016 120 S04	0.8R x 1.6	1.6	12	50	4	£17.27
2HRB 016 160 S04	0.8R x 1.6	1.6	16	50	4	£17.27
2HRB 016 200 S04	0.8R x 1.6	1.6	20	50	4	£17.27
2HRB 018 060 S04	0.9R x 1.8	1.8	6	45	4	£17.27
2HRB 018 080 S04	0.9R x 1.8	1.8	8	45	4	£17.27
2HRB 018 120 S04	0.9R x 1.8	1.8	12	50	4	£17.27
2HRB 018 160 S04	0.9R x 1.8	1.8	16	50	4	£17.27
2HRB 018 200 S04	0.9R x 1.8	1.8	20	50	4	£17.27
2HRB 020 040 S04	1R x 2	2	4	45	4	£14.33
2HRB 020 040 S06	1R x 2	2	4	50	6	£16.93
2HRB 020 060 S04	1R x 2	2	6	45	4	£14.33
2HRB 020 060 S06	1R x 2	2	6	50	6	£16.93
2HRB 020 080 S04	1R x 2	2	8	45	4	£14.33
2HRB 020 080 S06	1R x 2	2	8	50	6	£16.93
2HRB 020 100 S04	1R x 2	2	10	50	4	£14.33
2HRB 020 100 S06	1R x 2	2	10	50	6	£16.93
2HRB 020 120 S04	1R x 2	2	12	50	4	£14.33
2HRB 020 120 S06	1R x 2	2	12	50	6	£16.93
2HRB 020 140 S04	1R x 2	2	14	50	4	£14.33
2HRB 020 140 S06	1R x 2	2	14	50	6	£16.93
2HRB 020 160 S04	1R x 2	2	16	50	4	£14.33
2HRB 020 160 S06	1R x 2	2	16	60	6	£17.80
2HRB 020 180 S04	1R x 2	2	18	50	4	£14.33

2HRB 2 Flute High Speed Rib Ball End Mills

Part Number	Diameter	Length of Cut	Effective Length	Overall Length	Shank Dia	Price
	R x D	L1	L2	L	d	£
2HRB 020 180 S06	1R x 2	2	18	60	6	£17.80
2HRB 020 200 S04	1R x 2	2	20	50	4	£15.40
2HRB 020 200 S06	1R x 2	2	20	60	6	£17.80
2HRB 020 220 S04	1R x 2	2	22	60	4	£15.40
2HRB 020 220 S06	1R x 2	2	22	65	6	£18.93
2HRB 020 250 S04	1R x 2	2	25	60	4	£15.40
2HRB 020 250 S06	1R x 2	2	25	65	6	£18.93
2HRB 020 300 S04	1R x 2	2	30	70	4	£18.07
2HRB 020 300 S06	1R x 2	2	30	70	6	£21.60
2HRB 020 350 S04	1R x 2	2	35	70	4	£18.07
2HRB 020 350 S06	1R x 2	2	35	75	6	£23.73
2HRB 020 400 S04	1R x 2	2	40	80	4	£20.33
2HRB 020 400 S06	1R x 2	2	40	80	6	£25.93
2HRB 020 450 S04	1R x 2	2	45	80	4	£23.67
2HRB 020 500 S04	1R x 2	2	50	90	4	£25.67
2HRB 025 080 S04	1.25R x 2.5	2.5	8	45	4	£15.40
2HRB 025 080 S06	1.25R x 2.5	2.5	8	50	6	£18.87
2HRB 025 100 S04	1.25R x 2.5	2.5	10	50	4	£15.40
2HRB 025 100 S06	1.25R x 2.5	2.5	10	50	6	£18.87
2HRB 025 120 S04	1.25R x 2.5	2.5	12	50	4	£15.40
2HRB 025 120 S06	1.25R x 2.5	2.5	12	50	6	£18.87
2HRB 025 160 S04	1.25R x 2.5	2.5	16	50	4	£15.40
2HRB 025 160 S06	1.25R x 2.5	2.5	16	60	6	£18.87
2HRB 025 200 S04	1.25R x 2.5	2.5	20	60	4	£15.40
2HRB 025 250 S04	1.25R x 2.5	2.5	25	60	4	£16.80
2HRB 025 300 S04	1.25R x 2.5	2.5	30	70	4	£18.20
2HRB 025 350 S04	1.25R x 2.5	2.5	35	70	4	£18.20
2HRB 025 400 S04	1.25R x 2.5	2.5	40	80	4	£20.33
2HRB 030 060 S06	1.5R x 3	3	6	50	6	£16.93
2HRB 030 080 S06	1.5R x 3	3	8	50	6	£16.93
2HRB 030 100 S06	1.5R x 3	3	10	50	6	£16.93
2HRB 030 120 S06	1.5R x 3	3	12	50	6	£16.93
2HRB 030 160 S06	1.5R x 3	3	16	60	6	£17.80
2HRB 030 200 S06	1.5R x 3	3	20	60	6	£17.80
2HRB 030 250 S06	1.5R x 3	3	25	65	6	£18.93
2HRB 030 300 S06	1.5R x 3	3	30	70	6	£21.60
2HRB 030 350 S06	1.5R x 3	3	35	75	6	£23.73
2HRB 030 400 S06	1.5R x 3	3	40	80	6	£25.93
2HRB 030 450 S06	1.5R x 3	3	45	90	6	£27.33
2HRB 030 500 S06	1.5R x 3	3	50	100	6	£29.53
2HRB 030 600 S06	1.5R x 3	3	60	100	6	£32.87
2HRB 030 650 S06	1.5R x 3	3	65	110	6	£35.33
2HRB 030 700 S06	1.5R x 3	3	70	110	6	£36.67
2HRB 040 080 S06	2R x 4	4	8	50	6	£16.93
2HRB 040 100 S06	2R x 4	4	10	50	6	£16.93
2HRB 040 120 S06	2R x 4	4	12	50	6	£16.93
2HRB 040 160 S06	2R x 4	4	16	60	6	£17.80
2HRB 040 200 S06	2R x 4	4	20	60	6	£17.80
2HRB 040 250 S06	2R x 4	4	25	65	6	£18.93
2HRB 040 300 S06	2R x 4	4	30	70	6	£21.60
2HRB 040 350 S06	2R x 4	4	35	75	6	£23.73

Part Number	Diameter	Length of Cut	Effective Length	Overall Length	Shank Dia	Price
	R x D	L1	L2	L	d	£
2HRB 040 400 S06	2R x 4	4	40	80	6	£25.93
2HRB 040 450 S06	2R x 4	4	45	90	6	£27.33
2HRB 040 500 S06	2R x 4	4	50	100	6	£29.53
2HRB 040 550 S06	2R x 4	4	55	100	6	£32.87
2HRB 040 600 S06	2R x 4	4	60	100	6	£32.87
2HRB 040 650 S06	2R x 4	4	65	110	6	£35.33
2HRB 040 700 S06	2R x 4	4	70	110	6	£36.67
2HRB 050 160 S06	2.5R x 5	6	16	60	6	£18.93
2HRB 050 200 S06	2.5R x 5	6	20	60	6	£18.93
2HRB 050 250 S06	2.5R x 5	6	25	70	6	£21.60
2HRB 050 300 S06	2.5R x 5	6	30	75	6	£23.73
2HRB 050 400 S06	2.5R x 5	6	40	80	6	£25.93
2HRB 050 450 S06	2.5R x 5	6	45	90	6	£27.33
2HRB 050 500 S06	2.5R x 5	6	50	100	6	£29.53
2HRB 050 600 S06	2.5R x 5	6	60	100	6	£32.87
2HRB 050 650 S06	2.5R x 5	6	65	110	6	£35.33
2HRB 050 700 S06	2.5R x 5	6	70	110	6	£36.67
2HRB 060 150 S06	3R x 6	10	15	55	6	£16.27
2HRB 060 300 S06	3R x 6	10	30	110	6	£25.93
2HRB 080 250 060	4R x 8	12	25	60	8	£22.33
2HRB 080 300 100	4R x 8	12	30	100	8	£30.20
2HRB 100 300 070	5R x 10	16	30	70	10	£29.27
2HRB 100 350 100	5R x 10	16	35	100	10	£39.80
2HRB 120 300 075	6R x 12	18	30	75	12	£38.13
2HRB 120 400 110	6R x 12	18	40	110	12	£52.87

- End Mills for pre-hardened and hardened steel (HRc50~62)
- Good wear resistance from Si-based PVD coating.
- Precise edge tolerance.
- Excellent work surface finish.
- Outstanding performance at high speed machining by ultra-fine (0.2μm) WC grade.



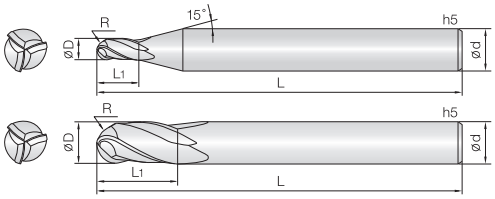
D Size	D Tolerance
ø0.06 ~ 0.19	+0 ~ -0.005mm
ø0.2 ~ 5.8	+0 ~ -0.01mm
Ø6 ~ 12	-0.005 ~ -0.015mm
Ø13 ~ 20	-0.01 ~ -0.02mm

Part Number	Diameter	Length of Cut	Overall Length	Shank Dia	Price
	R x D	L1	L	d	£
2HCB 0006 001 S04	0.03R x 0.06	0.1	40	4	£38.67
2HCB 0007 0012 S04	0.035R x 0.07	0.12	40	4	£38.67
2HCB 0008 0015 S04	0.04R x 0.08	0.15	40	4	£36.00
2HCB 0009 0017 S04	0.045R x 0.09	0.17	40	4	£36.00
2HCB 001 002 S04	0.05R x 0.1	0.2	40	4	£33.40
2HCB 0015 003 S04	0.075R x 0.15	0.3	40	4	£31.27
2HCB 002 004 S04	0.1R x 0.2	0.4	40	4	£20.53
2HCB 003 006 S04	0.15R x 0.3	0.6	40	4	£18.40
2HCB 004 008 S04	0.2R x 0.4	0.8	40	4	£17.67
2HCB 005 010 S04	0.25R x 0.5	1	45	4	£16.13
2HCB 006 012 S04	0.3R x 0.6	1.2	45	4	£14.60
2HCB 007 015 S04	0.35R x 0.7	1.5	45	4	£14.60
2HCB 008 020 S04	0.4R x 0.8	2	45	4	£13.33
2HCB 009 020 S04	0.45R x 0.9	2	45	4	£13.33
2HCB 010 025 S03	0.5R x 1	2.5	50	3	£11.20
2HCB 010 025 S04	0.5R x 1	2.5	50	4	£12.67
2HCB 010 025 S06	0.5R x 1	2.5	50	6	£14.33
2HCB 010 025 070	0.5R x 1	2.5	70	6	£19.20
2HCB 010 025 100	0.5R x 1	2.5	100	6	£23.80
2HCB 011 027 S04	0.55R x 1.1	2.7	50	4	£16.00
2HCB 012 030 S03	0.6R x 1.2	3	50	3	£11.20
2HCB 012 030 S04	0.6R x 1.2	3	50	4	£12.67
2HCB 013 032 S04	0.65R x 1.3	3.2	50	4	£16.00
2HCB 014 035 S04	0.7R x 1.4	3.5	50	4	£16.00
2HCB 015 040 S03	0.75R x 1.5	4	50	3	£11.20
2HCB 015 040 S04	0.75R x 1.5	4	50	4	£12.67
2HCB 015 040 S06	0.75R x 1.5	4	50	6	£14.33
2HCB 015 040 070	0.75R x 1.5	4	70	6	£19.20
2HCB 015 040 100	0.75R x 1.5	4	100	6	£23.80
2HCB 016 040 S04	0.8R x 1.6	4	50	4	£16.00
2HCB 017 042 S04	0.85R x 1.7	4.2	50	4	£16.00
2HCB 018 045 S04	0.9R x 1.8	4.5	50	4	£16.00
2HCB 019 047 S04	0.95R x 1.9	4.7	50	4	£16.00
2HCB 020 050 S03	1R x 2	5	50	3	£11.20
2HCB 020 050 S04	1R x 2	5	50	4	£12.67
2HCB 020 050 S06	1R x 2	5	50	6	£14.33
2HCB 020 050 075	1R x 2	5	75	6	£19.20
2HCB 020 050 100	1R x 2	5	100	6	£23.80
2HCB 022 055 S04	1.1R x 2.2	5.5	50	4	£16.00
2HCB 024 060 S04	1.2R x 2.4	6	50	4	£16.00
2HCB 025 060 S03	1.25R x 2.5	6	50	3	£11.20
2HCB 025 060 S04	1.25R x 2.5	6	50	4	£12.67
2HCB 025 060 S06	1.25R x 2.5	6	75	6	£19.20
2HCB 025 060 100	1.25R x 2.5	6	100	6	£23.80
2HCB 026 060 S04	1.3R x 2.6	6	50	4	£16.00
2HCB 028 070 S04	1.4R x 2.8	7	50	4	£16.00
2HCB 030 080 S03	1.5R x 3	8	60	3	£12.67
2HCB 030 080 S04	1.5R x 3	8	50	4	£12.67
2HCB 030 080 S06	1.5R x 3	8	60	6	£15.00
2HCB 030 080 080	1.5R x 3	8	80	6	£19.47

Part Number	Diameter	Length of Cut	Overall Length	Shank Dia	Price
	R x D	L1	L	d	£
2HCB 030 080 100	1.5R x 3	8	100	6	£23.80
2HCB 032 080 S04	1.6R x 3.2	8	60	4	£16.67
2HCB 034 080 S04	1.7R x 3.4	8	60	4	£16.67
2HCB 035 080 S06	1.75R x 3.5	8	60	6	£15.00
2HCB 036 090 S04	1.8R x 3.6	9	60	4	£16.67
2HCB 038 090 S04	1.9R x 3.8	9	60	4	£16.67
2HCB 040 080 060	2R x 4	8	60	4	£13.33
2HCB 040 080 080	2R x 4	8	80	4	£15.33
2HCB 040 080 S06	2R x 4	8	70	6	£15.00
2HCB 040 080 090	2R x 4	8	90	6	£20.80
2HCB 040 080 120	2R x 4	8	120	6	£26.53
2HCB 042 100 S06	2.1R x 4.2	10	70	6	£18.33
2HCB 044 100 S06	2.2R x 4.4	10	70	6	£18.33
2HCB 045 080 S06	2.25R x 4.5	8	70	6	£18.00
2HCB 046 100 S06	2.3R x 4.6	10	70	6	£18.33
2HCB 048 110 S06	2.4R x 4.8	11	70	6	£18.33
2HCB 050 080 S05	2.5R x 5	8	80	5	£15.13
2HCB 050 100 S06	2.5R x 5	10	75	6	£16.53
2HCB 052 120 S06	2.6R x 5.2	12	75	6	£19.73
2HCB 054 120 S06	2.7R x 5.4	12	75	6	£19.73
2HCB 055 100 S06	2.75R x 5.5	10	75	6	£19.53
2HCB 056 120 S06	2.8R x 5.6	12	75	6	£19.73
2HCB 058 120 S06	2.9R x 5.8	12	75	6	£19.73
2HCB 060 100 060	3R x 6	10	60	6	£15.33
2HCB 060 120 080	3R x 6	12	80	6	£16.53
2HCB 060 120 100	3R x 6	12	100	6	£20.40
2HCB 060 120 120	3R x 6	12	120	6	£24.80
2HCB 060 120 150	3R x 6	12	150	6	£30.27
2HCB 070 140 S08	3.5R x 7	14	80	8	£26.80
2HCB 080 140 090	4R x 8	14	90	8	£26.80
2HCB 080 140 110	4R x 8	14	110	8	£32.87
2HCB 080 140 150	4R x 8	14	150	8	£43.27
2HCB 090 160 S10	4.5R x 9	16	100	10	£37.40
2HCB 100 180 100	5R x 10	18	100	10	£35.33
2HCB 100 180 120	5R x 10	18	120	10	£44.40
2HCB 100 180 150	5R x 10	18	150	10	£57.00
2HCB 100 180 180	5R x 10	18	180	10	£65.93
2HCB 110 200 S12	5.5R x 11	20	110	12	£49.47
2HCB 120 220 110	6R x 12	22	110	12	£47.40
2HCB 120 220 130	6R x 12	22	130	12	£57.87
2HCB 120 220 150	6R x 12	22	150	12	£67.27
2HCB 120 220 200	6R x 12	22	200	12	£89.27
2HCB 130 240 S14	6.5R x 13	24	110	14	£74.16
2HCB 140 240 S14	7R x 14	24	110	14	£72.30
2HCB 160 300 130	8R x 16	30	130	16	£88.74
2HCB 160 300 160	8R x 16	30	160	16	£98.88
2HCB 160 300 200	8R x 16	30	200	16	£115.56
2HCB 200 380 160	10R x 20	38	160	20	£131.34
2HCB 200 380 200	10R x 20	38	200	20	£197.76

3HCB 3 Flute High Speed Standard Length Ball End Mills

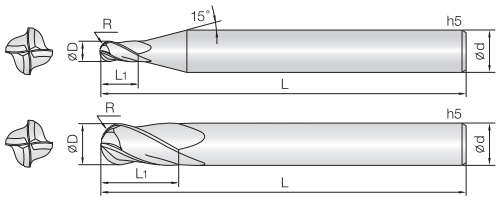
- End Mills for pre-hardened and hardened steel (HRc50~62)
- Excellent wear resistance by Si-based PVD coating.
- Precise edge tolerance.
- Outstanding performance at high speed machining by ultra-fine (0.2μm) WC grade.



D Size	D Tolerance
Ø1 ~ 5	+0 ~ −0.01mm
Ø6 ~ 12	−0.005 ~ −0.015mm

Part Number	Diameter	Length of Cut	Overall Length	Shank Dia	Price
	R x D	L1	L	d	£
3HCB 010 025 S04	0.5R x 1	2.5	50	4	£16.20
3HCB 015 040 S04	0.75R x 1.5	4	50	4	£16.20
3HCB 020 050 S06	1R x 2	5	50	6	£16.53
3HCB 030 080 S06	1.5R x 3	8	65	6	£17.27
3HCB 040 080 S04	2R x 4	8	60	4	£15.33
3HCB 040 080 S06	2R x 4	8	70	6	£17.27
3HCB 050 100 S06	2.5R x 5	10	75	6	£19.07
3HCB 060 120 S06	3R x 6	12	80	6	£19.07
3HCB 060 120 120	3R x 6	12	120	6	£25.33
3HCB 080 140 S08	4R x 8	14	90	8	£30.47
3HCB 080 140 150	4R x 8	14	150	8	£47.60
3HCB 100 180 S10	5R x 10	18	100	10	£41.67
3HCB 100 180 150	5R x 10	18	150	10	£62.67
3HCB 120 220 S12	6R x 12	22	110	12	£54.47
3HCB 120 220 150	6R x 12	22	150	12	£74.00

- End Mills for pre-hardened and hardened steel (HRc50~62)
- Excellent wear resistance by Si-based PVD coating.
- Precise edge tolerance.
- Outstanding performance at high speed machining by ultra-fine (0.2μm) WC grade.

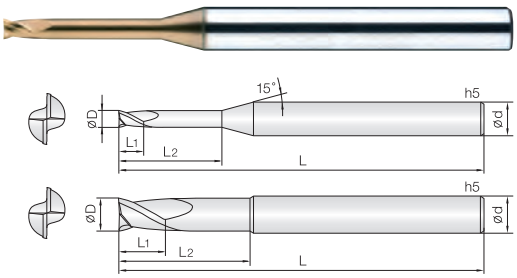


D Size	D Tolerance
Ø1 ~ 5	+0 ~ -0.01mm
Ø6 ~ 12	-0.005 ~ -0.015mm
Ø14 ~ 20	-0.01 ~ -0.02mm

Part Number	Diameter	Length of Cut	Overall Length	Shank Dia	Price
	R x D	L1	L	d	£
4HCB 010 025 S06	0.5R x 1	2.5	50	6	£17.27
4HCB 010 025 080	0.5R x 1	2.5	80	6	£21.80
4HCB 015 040 S06	0.75R x 1.5	4	50	6	£17.27
4HCB 015 040 080	0.75R x 1.5	4	80	6	£21.80
4HCB 020 050 S06	1R x 2	5	50	6	£17.27
4HCB 020 050 080	1R x 2	5	80	6	£21.80
4HCB 025 070 S06	1.25R x 2.5	7	50	6	£17.27
4HCB 025 070 080	1.25R x 2.5	7	80	6	£21.80
4HCB 030 080 S06	1.5R x 3	8	60	6	£17.27
4HCB 030 080 090	1.5R x 3	8	90	6	£23.00
4HCB 040 080 S04	2R x 4	8	60	4	£15.33
4HCB 040 080 090	2R x 4	8	90	4	£18.67
4HCB 040 080 S06	2R x 4	8	70	6	£17.27
4HCB 040 080 100	2R x 4	8	100	6	£24.33
4HCB 050 100 S06	2.5R x 5	10	80	6	£19.07
4HCB 050 100 110	2.5R x 5	10	110	6	£25.33
4HCB 060 120 S06	3R x 6	12	90	6	£20.07
4HCB 060 120 110	3R x 6	12	110	6	£25.33
4HCB 080 140 S08	4R x 8	14	100	8	£32.20
4HCB 080 140 150	4R x 8	14	150	8	£47.60
4HCB 100 180 S10	5R x 10	18	100	10	£41.67
4HCB 100 180 150	5R x 10	18	150	10	£62.67
4HCB 120 220 S12	6R x 12	22	110	12	£54.47
4HCB 120 220 150	6R x 12	22	150	12	£74.00
4HCB 140 240 110	7R x 14	24	110	14	£78.60
4HCB 160 300 S16	8R x 16	30	130	16	£93.96
4HCB 160 300 160	8R x 16	30	160	16	£108.60
4HCB 200 400 S20	10R x 20	40	160	20	£179.22
4HCB 200 400 200	10R x 20	40	200	20	£217.80

2HRE 2 Flute High Speed Rib End Mills

- End Mills for pre-hardened and hardened steel (HRc50~62)
- Good wear resistance from Si-based PVD coating.
- Precise edge tolerance.
- Excellent work surface finish.
- Reinforced edge design for preventing edge chipping.
- Outstanding performance at high speed machining by ultra-fine (0.2µm) WC grade.



D Size	D Tolerance
ø0.1 ~ 0.15	+0 ~ −0.005mm
ø0.2 ~ 5	+0 ~ −0.01mm
ø6 ~ 12	−0.01 ~ −0.025mm

Part Number	Diameter	Length of Cut	Effective Length	Overall Length	Shank Dia	Price
	D	L1	L2	L	d	£
2HRE 001 003 S04	0.1	0.15	0.3	40	4	£27.73
2HRE 001 005 S04	0.1	0.15	0.5	40	4	£27.73
2HRE 0015 003 S04	0.15	0.15	0.3	40	4	£25.13
2HRE 0015 005 S04	0.15	0.15	0.5	40	4	£25.13
2HRE 0015 0075 S04	0.15	0.15	0.75	40	4	£26.33
2HRE 0015 010 S04	0.15	0.15	1	40	4	£26.33
2HRE 002 005 S04	0.2	0.2	0.5	40	4	£17.80
2HRE 002 010 S04	0.2	0.2	1	40	4	£17.80
2HRE 002 015 S04	0.2	0.2	1.5	40	4	£17.80
2HRE 002 020 S04	0.2	0.2	2	40	4	£17.80
2HRE 002 025 S04	0.2	0.2	2.5	40	4	£18.73
2HRE 002 030 S04	0.2	0.2	3	40	4	£19.73
2HRE 0025 005 S04	0.25	0.25	0.5	40	4	£17.80
2HRE 0025 010 S04	0.25	0.25	1	40	4	£17.80
2HRE 0025 015 S04	0.25	0.25	1.5	40	4	£17.80
2HRE 0025 020 S04	0.25	0.25	2	40	4	£17.80
2HRE 0025 030 S04	0.25	0.25	3	40	4	£19.73
2HRE 003 010 S04	0.3	0.3	1	40	4	£15.47
2HRE 003 015 S04	0.3	0.3	1.5	40	4	£15.47
2HRE 003 020 S04	0.3	0.3	2	40	4	£15.47
2HRE 003 025 S04	0.3	0.3	2.5	40	4	£15.47
2HRE 003 030 S04	0.3	0.3	3	40	4	£15.47
2HRE 003 035 S04	0.3	0.3	3.5	40	4	£18.87
2HRE 003 040 S04	0.3	0.3	4	40	4	£18.87
2HRE 003 050 S04	0.3	0.3	5	40	4	£18.87
2HRE 004 010 S04	0.4	0.4	1	40	4	£15.47
2HRE 004 015 S04	0.4	0.4	1.5	40	4	£15.47
2HRE 004 020 S04	0.4	0.4	2	40	4	£15.47
2HRE 004 025 S04	0.4	0.4	2.5	40	4	£15.47
2HRE 004 030 S04	0.4	0.4	3	40	4	£15.47
2HRE 004 035 S04	0.4	0.4	3.5	40	4	£15.47
2HRE 004 040 S04	0.4	0.4	4	40	4	£15.47
2HRE 004 050 S04	0.4	0.4	5	40	4	£15.47
2HRE 004 060 S04	0.4	0.4	6	40	4	£15.47
2HRE 004 080 S04	0.4	0.4	8	40	4	£15.47
2HRE 004 100 S04	0.4	0.4	10	40	4	£18.87
2HRE 005 010 S04	0.5	0.5	1	40	4	£13.73
2HRE 005 020 S04	0.5	0.5	2	40	4	£13.73
2HRE 005 030 S04	0.5	0.5	3	40	4	£13.73
2HRE 005 040 S04	0.5	0.5	4	40	4	£13.73
2HRE 005 050 S04	0.5	0.5	5	40	4	£13.73
2HRE 005 060 S04	0.5	0.5	6	40	4	£13.73

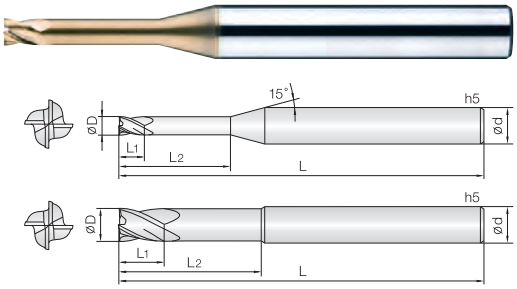
Part Number	Diameter	Length of Cut	Effective Length	Overall Length	Shank Dia	Price
	D	L1	L2	L	d	£
2HRE 005 080 S04	0.5	0.5	8	40	4	£13.73
2HRE 005 100 S04	0.5	0.5	10	40	4	£16.13
2HRE 005 120 S04	0.5	0.5	12	45	4	£19.67
2HRE 005 140 S04	0.5	0.5	14	45	4	£19.67
2HRE 006 010 S04	0.6	0.6	1	40	4	£13.73
2HRE 006 020 S04	0.6	0.6	2	40	4	£13.73
2HRE 006 030 S04	0.6	0.6	3	40	4	£13.73
2HRE 006 040 S04	0.6	0.6	4	40	4	£13.73
2HRE 006 050 S04	0.6	0.6	5	40	4	£13.73
2HRE 006 060 S04	0.6	0.6	6	40	4	£13.73
2HRE 006 080 S04	0.6	0.6	8	40	4	£13.73
2HRE 006 100 S04	0.6	0.6	10	40	4	£13.73
2HRE 006 120 S04	0.6	0.6	12	45	4	£16.13
2HRE 006 140 S04	0.6	0.6	14	45	4	£19.67
2HRE 006 160 S04	0.6	0.6	16	45	4	£19.67
2HRE 007 020 S04	0.7	0.7	2	40	4	£13.07
2HRE 007 040 S04	0.7	0.7	4	40	4	£13.07
2HRE 007 060 S04	0.7	0.7	6	40	4	£13.07
2HRE 007 080 S04	0.7	0.7	8	40	4	£13.07
2HRE 007 100 S04	0.7	0.7	10	40	4	£13.07
2HRE 007 120 S04	0.7	0.7	12	45	4	£16.40
2HRE 008 020 S04	0.8	0.8	2	40	4	£13.07
2HRE 008 030 S04	0.8	0.8	3	40	4	£13.07
2HRE 008 040 S04	0.8	0.8	4	40	4	£13.07
2HRE 008 050 S04	0.8	0.8	5	40	4	£13.07
2HRE 008 060 S04	0.8	0.8	6	40	4	£13.07
2HRE 008 080 S04	0.8	0.8	8	40	4	£13.07
2HRE 008 100 S04	0.8	0.8	10	40	4	£13.07
2HRE 008 120 S04	0.8	0.8	12	45	4	£13.73
2HRE 008 140 S04	0.8	0.8	14	45	4	£17.13
2HRE 009 060 S04	0.9	0.9	6	40	4	£13.07
2HRE 009 080 S04	0.9	0.9	8	40	4	£13.07
2HRE 009 100 S04	0.9	0.9	10	40	4	£13.07
2HRE 010 020 S04	1	1	2	45	4	£11.33
2HRE 010 030 S04	1	1	3	45	4	£11.33
2HRE 010 040 S04	1	1	4	45	4	£11.33
2HRE 010 050 S04	1	1	5	45	4	£11.33
2HRE 010 060 S04	1	1	6	45	4	£11.33
2HRE 010 080 S04	1	1	8	45	4	£11.33
2HRE 010 100 S04	1	1	10	45	4	£12.27
2HRE 010 120 S04	1	1	12	45	4	£12.27
2HRE 010 140 S04	1	1	14	45	4	£12.27

Part Number	Diameter	Length of Cut	Effective Length	Overall Length	Shank Dia	Price
	D	L1	L2	L	d	£
2HRE 010 160 S04	1	1	16	50	4	£12.27
2HRE 010 180 S04	1	1	18	50	4	£12.27
2HRE 010 200 S04	1	1	20	50	4	£12.27
2HRE 010 250 S04	1	1	25	60	4	£13.73
2HRE 010 300 S04	1	1	30	70	4	£18.53
2HRE 012 040 S04	1.2	1.2	4	45	4	£11.33
2HRE 012 060 S04	1.2	1.2	6	45	4	£11.33
2HRE 012 080 S04	1.2	1.2	8	45	4	£11.33
2HRE 012 100 S04	1.2	1.2	10	45	4	£12.27
2HRE 012 120 S04	1.2	1.2	12	45	4	£12.27
2HRE 012 160 S04	1.2	1.2	16	50	4	£12.27
2HRE 012 200 S04	1.2	1.2	20	50	4	£12.27
2HRE 012 250 S04	1.2	1.2	25	60	4	£13.73
2HRE 012 300 S04	1.2	1.2	30	70	4	£18.53
2HRE 014 060 S04	1.4	1.4	6	45	4	£12.27
2HRE 014 080 S04	1.4	1.4	8	45	4	£12.27
2HRE 014 100 S04	1.4	1.4	10	45	4	£12.27
2HRE 014 140 S04	1.4	1.4	14	45	4	£12.27
2HRE 014 160 S04	1.4	1.4	16	50	4	£12.27
2HRE 014 200 S04	1.4	1.4	20	50	4	£12.27
2HRE 015 040 S04	1.5	1.5	4	45	4	£11.33
2HRE 015 060 S04	1.5	1.5	6	45	4	£11.33
2HRE 015 080 S04	1.5	1.5	8	45	4	£11.33
2HRE 015 100 S04	1.5	1.5	10	45	4	£11.33
2HRE 015 120 S04	1.5	1.5	12	45	4	£12.27
2HRE 015 140 S04	1.5	1.5	14	50	4	£12.27
2HRE 015 160 S04	1.5	1.5	16	50	4	£12.27
2HRE 015 180 S04	1.5	1.5	18	50	4	£12.27
2HRE 015 200 S04	1.5	1.5	20	50	4	£12.27
2HRE 015 250 S04	1.5	1.5	25	60	4	£13.73
2HRE 015 300 S04	1.5	1.5	30	70	4	£18.53
2HRE 016 100 S04	1.6	1.6	10	45	4	£12.27
2HRE 016 140 S04	1.6	1.6	14	45	4	£12.27
2HRE 016 180 S04	1.6	1.6	18	60	4	£12.27
2HRE 018 100 S04	1.8	1.8	10	45	4	£12.27
2HRE 018 140 S04	1.8	1.8	14	45	4	£12.27
2HRE 018 180 S04	1.8	1.8	18	50	4	£12.27
2HRE 020 040 S04	2	2	4	45	4	£11.33
2HRE 020 060 S04	2	2	6	45	4	£11.33
2HRE 020 080 S04	2	2	8	45	4	£11.33
2HRE 020 100 S04	2	2	10	45	4	£11.33
2HRE 020 120 S04	2	2	12	45	4	£11.33
2HRE 020 140 S04	2	2	14	45	4	£11.33
2HRE 020 160 S04	2	2	16	50	4	£11.33
2HRE 020 180 S04	2	2	18	50	4	£11.33
2HRE 020 200 S04	2	2	20	50	4	£11.33
2HRE 020 220 S04	2	2	22	60	4	£12.27
2HRE 020 250 S04	2	2	25	60	4	£12.27
2HRE 020 300 S04	2	2	30	60	4	£14.00
2HRE 020 350 S04	2	2	35	70	4	£15.20
2HRE 020 400 S04	2	2	40	80	4	£16.60
2HRE 020 450 S04	2	2	45	80	4	£19.93
2HRE 020 500 S04	2	2	50	90	4	£23.20
2HRE 025 080 S04	2.5	2.5	8	45	4	£12.27
2HRE 025 100 S04	2.5	2.5	10	45	4	£12.27
2HRE 025 120 S04	2.5	2.5	12	45	4	£12.27

Part Number	Diameter	Length of Cut	Effective Length	Overall Length	Shank Dia	Price
	D	L1	L2	L	d	£
2HRE 025 160 S04	2.5	2.5	16	50	4	£12.27
2HRE 025 200 S04	2.5	2.5	20	50	4	£12.27
2HRE 025 250 S04	2.5	2.5	25	60	4	£12.27
2HRE 025 300 S04	2.5	2.5	30	70	4	£14.00
2HRE 025 350 S04	2.5	2.5	35	70	4	£15.20
2HRE 025 400 S04	2.5	2.5	40	80	4	£16.60
2HRE 025 500 S04	2.5	2.5	50	90	4	£20.00
2HRE 030 060 S06	3	3	6	45	6	£12.87
2HRE 030 080 S06	3	3	8	45	6	£12.87
2HRE 030 100 S06	3	3	10	45	6	£12.87
2HRE 030 120 S06	3	3	12	50	6	£12.87
2HRE 030 160 S06	3	3	16	55	6	£12.87
2HRE 030 200 S06	3	3	20	60	6	£14.20
2HRE 030 250 S06	3	3	25	65	6	£14.20
2HRE 030 300 S06	3	3	30	70	6	£17.40
2HRE 030 350 S06	3	3	35	75	6	£20.00
2HRE 030 400 S06	3	3	40	80	6	£20.67
2HRE 030 450 S06	3	3	45	90	6	£21.47
2HRE 030 500 S06	3	3	50	100	6	£22.93
2HRE 030 600 S06	3	3	60	100	6	£26.40
2HRE 040 080 S06	4	4	8	50	6	£13.60
2HRE 040 100 S06	4	4	10	50	6	£13.60
2HRE 040 120 S06	4	4	12	50	6	£13.60
2HRE 040 160 S06	4	4	16	55	6	£13.60
2HRE 040 200 S06	4	4	20	60	6	£14.87
2HRE 040 250 S06	4	4	25	65	6	£14.87
2HRE 040 300 S06	4	4	30	70	6	£17.40
2HRE 040 350 S06	4	4	35	75	6	£20.00
2HRE 040 400 S06	4	4	40	80	6	£20.67
2HRE 040 450 S06	4	4	45	90	6	£21.47
2HRE 040 500 S06	4	4	50	100	6	£22.93
2HRE 040 550 S06	4	4	55	100	6	£26.40
2HRE 040 600 S06	4	4	60	100	6	£28.93
2HRE 050 160 S06	5	6	16	55	6	£14.87
2HRE 050 200 S06	5	6	20	60	6	£14.87
2HRE 050 250 S06	5	6	25	65	6	£17.40
2HRE 050 300 S06	5	6	30	70	6	£17.40
2HRE 050 350 S06	5	6	35	75	6	£20.00
2HRE 050 400 S06	5	6	40	80	6	£20.67
2HRE 050 500 S06	5	6	50	100	6	£22.93
2HRE 050 600 S06	5	6	60	100	6	£26.40
2HRE 060 200 S06	6	10	20	60	6	£14.87
2HRE 060 300 S06	6	10	30	75	6	£17.40
2HRE 060 400 S06	6	10	40	80	6	£20.67
2HRE 060 500 S06	6	10	50	90	6	£21.73
2HRE 060 600 S06	6	10	60	110	6	£24.73
2HRE 080 200 S08	8	12	20	65	8	£22.00
2HRE 080 300 S08	8	12	30	80	8	£24.73
2HRE 080 400 S08	8	12	40	100	8	£28.13
2HRE 100 250 S10	10	15	25	70	10	£32.60
2HRE 100 350 S10	10	15	35	80	10	£36.07
2HRE 100 450 S10	10	15	45	100	10	£40.53
2HRE 120 300 S12	12	18	30	80	12	£37.60
2HRE 120 400 S12	12	18	40	100	12	£43.27
2HRE 120 500 S12	12	18	50	120	12	£49.47

4HRE 4 Flute High Speed Rib End Mills

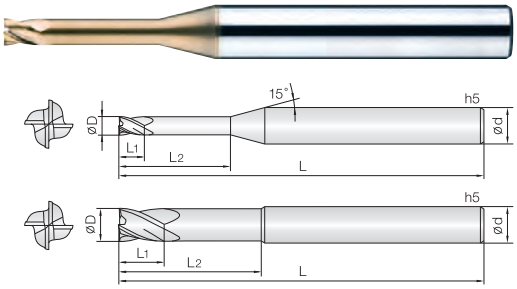
- End Mills for pre-hardened and hardened steel (HRc50~62)
- Good wear resistance from Si-based PVD coating.
- Precise edge tolerance.
- Excellent work surface finish.
- Reinforced edge design for preventing edge chipping.
- Outstanding performance at high speed machining by ultra-fine (0.2µm) WC grade.



D Size	D Tolerance
Ø0.5 ~ 5	+0~ -0.01mm
Ø6 ~ 12	-0.01 ~ -0.025mm

Part Number	Diameter	Length of Cut	Effective Length	Overall Length	Shank Dia	Price
	D	L1	L2	L	d	£
4HRE 005 010 S04	0.5	0.5	1	45	4	£15.33
4HRE 005 020 S04	0.5	0.5	2	45	4	£15.33
4HRE 005 030 S04	0.5	0.5	3	45	4	£15.33
4HRE 005 040 S04	0.5	0.5	4	45	4	£15.33
4HRE 005 050 S04	0.5	0.5	5	45	4	£15.33
4HRE 005 060 S04	0.5	0.5	6	45	4	£15.33
4HRE 005 080 S04	0.5	0.5	8	45	4	£16.47
4HRE 005 100 S04	0.5	0.5	10	50	4	£18.53
4HRE 006 010 S04	0.6	0.6	1	45	4	£15.33
4HRE 006 020 S04	0.6	0.6	2	45	4	£15.33
4HRE 006 030 S04	0.6	0.6	3	45	4	£15.33
4HRE 006 040 S04	0.6	0.6	4	45	4	£15.33
4HRE 006 060 S04	0.6	0.6	6	45	4	£15.33
4HRE 006 080 S04	0.6	0.6	8	45	4	£16.47
4HRE 006 100 S04	0.6	0.6	10	50	4	£18.53
4HRE 006 120 S04	0.6	0.6	12	50	4	£18.53
4HRE 007 020 S04	0.7	0.7	2	45	4	£15.33
4HRE 007 040 S04	0.7	0.7	4	45	4	£15.33
4HRE 007 060 S04	0.7	0.7	6	45	4	£15.33
4HRE 007 080 S04	0.7	0.7	8	45	4	£16.47
4HRE 007 100 S04	0.7	0.7	10	50	4	£18.53
4HRE 008 020 S04	0.8	0.8	2	45	4	£14.67
4HRE 008 040 S04	0.8	0.8	4	45	4	£14.67
4HRE 008 060 S04	0.8	0.8	6	45	4	£14.67
4HRE 008 080 S04	0.8	0.8	8	45	4	£14.67
4HRE 008 100 S04	0.8	0.8	10	45	4	£15.67
4HRE 008 120 S04	0.8	0.8	12	45	4	£15.67
4HRE 008 160 S04	0.8	0.8	16	50	4	£17.00
4HRE 009 020 S04	0.9	0.9	2	45	4	£14.67
4HRE 009 060 S04	0.9	0.9	6	45	4	£14.67
4HRE 009 080 S04	0.9	0.9	8	45	4	£15.67
4HRE 009 100 S04	0.9	0.9	10	45	4	£15.67
4HRE 010 020 S04	1	1	2	45	4	£12.47
4HRE 010 030 S04	1	1	3	45	4	£12.47
4HRE 010 040 S04	1	1	4	45	4	£12.47
4HRE 010 060 S04	1	1	6	45	4	£12.47
4HRE 010 080 S04	1	1	8	45	4	£12.47
4HRE 010 100 S04	1	1	10	45	4	£13.60
4HRE 010 120 S04	1	1	12	45	4	£13.60

Part Number	Diameter	Length of Cut	Effective Length	Overall Length	Shank Dia	Price
	D	L1	L2	L	d	£
4HRE 010 140 S04	1	1	14	50	4	£13.60
4HRE 010 160 S04	1	1	16	50	4	£13.60
4HRE 010 200 S04	1	1	20	50	4	£15.60
4HRE 010 250 S04	1	1	25	60	4	£17.60
4HRE 012 040 S04	1.2	1.2	4	45	4	£12.47
4HRE 012 060 S04	1.2	1.2	6	45	4	£12.47
4HRE 012 080 S04	1.2	1.2	8	45	4	£12.47
4HRE 012 100 S04	1.2	1.2	10	45	4	£12.47
4HRE 012 120 S04	1.2	1.2	12	45	4	£13.60
4HRE 012 160 S04	1.2	1.2	16	50	4	£13.60
4HRE 015 040 S04	1.5	1.5	4	45	4	£12.47
4HRE 015 060 S04	1.5	1.5	6	45	4	£12.47
4HRE 015 080 S04	1.5	1.5	8	45	4	£12.47
4HRE 015 100 S04	1.5	1.5	10	45	4	£13.60
4HRE 015 120 S04	1.5	1.5	12	45	4	£13.60
4HRE 015 160 S04	1.5	1.5	16	50	4	£13.60
4HRE 015 200 S04	1.5	1.5	20	50	4	£15.60
4HRE 015 250 S04	1.5	1.5	25	60	4	£17.60
4HRE 020 040 S04	2	2	4	45	4	£12.47
4HRE 020 060 S04	2	2	6	45	4	£12.47
4HRE 020 080 S04	2	2	8	45	4	£12.47
4HRE 020 100 S04	2	2	10	45	4	£13.87
4HRE 020 120 S04	2	2	12	45	4	£13.87
4HRE 020 140 S04	2	2	14	50	4	£13.87
4HRE 020 160 S04	2	2	16	50	4	£13.87
4HRE 020 180 S04	2	2	18	50	4	£13.87
4HRE 020 200 S04	2	2	20	50	4	£13.87
4HRE 020 250 S04	2	2	25	60	4	£17.60
4HRE 020 300 S04	2	2	30	70	4	£18.93
4HRE 025 100 S04	2.5	2.5	10	45	4	£13.87
4HRE 025 120 S04	2.5	2.5	12	45	4	£13.87
4HRE 025 160 S04	2.5	2.5	16	50	4	£13.87
4HRE 025 200 S04	2.5	2.5	20	50	4	£13.87
4HRE 025 250 S04	2.5	2.5	25	60	4	£15.20
4HRE 025 300 S04	2.5	2.5	30	70	4	£18.93
4HRE 030 060 S06	3	3	6	45	6	£14.93
4HRE 030 080 S06	3	3	8	45	6	£14.93
4HRE 030 100 S06	3	3	10	45	6	£14.93
4HRE 030 120 S06	3	3	12	50	6	£14.93

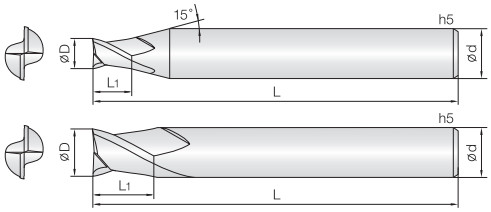


Part Number	Diameter	Length of Cut	Effective Length	Overall Length	Shank Dia	Price
	D	L1	L2	L	d	£
4HRE 030 160 S06	3	3	16	55	6	£14.93
4HRE 030 200 S06	3	3	20	60	6	£15.67
4HRE 030 250 S06	3	3	25	65	6	£15.67
4HRE 030 300 S06	3	3	30	70	6	£19.13
4HRE 030 350 S06	3	3	35	75	6	£21.47
4HRE 030 400 S06	3	3	40	80	6	£23.00
4HRE 030 450 S06	3	3	45	90	6	£26.40
4HRE 030 500 S06	3	3	50	100	6	£28.27
4HRE 035 120 S06	3.5	3.5	12	50	6	£16.33
4HRE 035 160 S06	3.5	3.5	16	55	6	£17.00
4HRE 035 200 S06	3.5	3.5	20	60	6	£17.80
4HRE 035 250 S06	3.5	3.5	25	65	6	£18.47
4HRE 035 300 S06	3.5	3.5	30	70	6	£19.67
4HRE 040 060 S06	4	4	6	50	6	£14.93
4HRE 040 080 S06	4	4	8	50	6	£14.93
4HRE 040 100 S06	4	4	10	50	6	£14.93
4HRE 040 120 S06	4	4	12	50	6	£14.93
4HRE 040 160 S06	4	4	16	55	6	£14.93
4HRE 040 200 S06	4	4	20	60	6	£16.47
4HRE 040 250 S06	4	4	25	65	6	£16.47
4HRE 040 300 S06	4	4	30	70	6	£19.13
4HRE 040 400 S06	4	4	40	80	6	£22.80
4HRE 040 450 S06	4	4	45	90	6	£26.40
4HRE 040 500 S06	4	4	50	100	6	£28.93
4HRE 040 600 S06	4	4	60	110	6	£31.80
4HRE 045 120 S06	4.5	4.5	12	50	6	£16.33
4HRE 045 160 S06	4.5	4.5	16	55	6	£17.00
4HRE 045 200 S06	4.5	4.5	20	60	6	£17.80
4HRE 045 250 S06	4.5	4.5	25	65	6	£18.47
4HRE 045 300 S06	4.5	4.5	30	70	6	£19.67
4HRE 050 160 S06	5	5	16	55	6	£16.47
4HRE 050 200 S06	5	5	20	60	6	£19.13
4HRE 050 250 S06	5	5	25	65	6	£19.13
4HRE 050 300 S06	5	5	30	70	6	£19.13
4HRE 050 400 S06	5	5	40	80	6	£22.80
4HRE 050 500 S06	5	5	50	100	6	£28.93
4HRE 050 600 S06	5	5	60	110	6	£31.80
4HRE 060 200 S06	6	6	20	60	6	£16.47
4HRE 060 300 S06	6	6	30	75	6	£19.13

Part Number	Diameter	Length of Cut	Effective Length	Overall Length	Shank Dia	Price
	D	L1	L2	L	d	£
4HRE 060 400 S06	6	6	40	80	6	£22.80
4HRE 060 500 S06	6	6	50	90	6	£23.93
4HRE 060 600 S06	6	6	60	110	6	£33.13
4HRE 080 200 S08	8	10	20	65	8	£24.20
4HRE 080 300 S08	8	10	30	80	8	£28.13
4HRE 080 400 S08	8	10	40	100	8	£32.93
4HRE 100 250 S10	10	15	25	70	10	£35.93
4HRE 100 350 S10	10	15	35	90	10	£41.87
4HRE 100 450 S10	10	15	45	110	10	£47.27
4HRE 120 300 S12	12	18	30	80	12	£41.40
4HRE 120 400 S12	12	18	40	100	12	£48.73
4HRE 120 500 S12	12	18	50	120	12	£55.60

2HSE 2 Flute High Speed Short Length End Mills

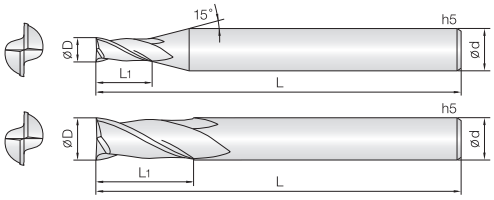
- End Mills for pre-hardened and hardened steel (HRc50~60)
- Excellent wear resistance from Si-based PVD coating.
- Reinforced edge design to prevent edge chipping.
- Short Overall Length
- Minimize fracturing by high TRS fine (0.5μm) WC grade.



D Size	D Tolerance
Ø0.1 ~ 0.15	+0 ~ −0.005mm
Ø0.2 ~ 5	+0 ~ −0.01mm
Ø6 ~ 12	−0.01 ~ −0.025mm

Part Number	Diameter	Length of Cut	Overall Length	Shank Dia	Price
	D	L1	L	d	£
2HSE 001 001 S04	0.1	0.1	40	4	£20.67
2HSE 0015 0015 S04	0.15	0.15	40	4	£18.40
2HSE 002 002 S04	0.2	0.2	40	4	£15.00
2HSE 0025 0025 S04	0.25	0.25	40	4	£13.53
2HSE 003 003 S04	0.3	0.3	40	4	£11.93
2HSE 004 004 S04	0.4	0.4	40	4	£11.93
2HSE 005 005 S04	0.5	0.5	40	4	£11.20
2HSE 006 006 S04	0.6	0.6	40	4	£11.20
2HSE 007 007 S04	0.7	0.7	40	4	£10.40
2HSE 008 008 S04	0.8	0.8	40	4	£10.40
2HSE 009 009 S04	0.9	0.9	40	4	£10.40
2HSE 010 010 S04	1	1	40	4	£8.33
2HSE 012 012 S04	1.2	1.2	40	4	£8.33
2HSE 015 015 S04	1.5	1.5	40	4	£8.33
2HSE 020 020 S04	2	2	40	4	£8.33
2HSE 030 030 S04	3	3	40	4	£8.33
2HSE 040 040 S04	4	4	40	4	£8.80
2HSE 050 050 S06	5	5	45	6	£11.67
2HSE 060 060 S06	6	6	45	6	£11.67
2HSE 080 080 S08	8	8	50	8	£17.00
2HSE 100 100 S10	10	10	60	10	£24.20
2HSE 120 120 S12	12	12	65	12	£29.20

- End Mills for pre-hardened and hardened steel (HRc50~60)
- Excellent wear resistance from Si-based PVD coating.
- Precise edge tolerance.
- Reinforced edge design to prevent edge chipping.
- Wide range of diameters and lengths available.
- Minimize fracturing by high TRS fine (0.5μm) WC grade.

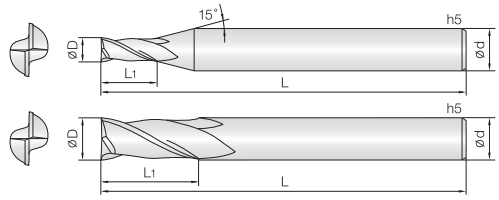


D Size	D Tolerance
ø0.05 ~ 0.15	+0~ −0.005mm
ø0.2 ~ 5.9	+0~ −0.01mm
Ø6 ~ 12	−0.01 ~ −0.025mm
Ø13 ~ 20	−0.015 ~ −0.03mm

Part Number	Diameter	Length of Cut	Overall Length	Shank Dia	Price
	D	L1	L	d	£
2HCE 0005 0008 S04	0.05	0.08	40	4	£51.33
2HCE 0006 001 S04	0.06	0.1	40	4	£45.67
2HCE 0007 0012 S04	0.07	0.12	40	4	£39.93
2HCE 0008 0015 S04	0.08	0.15	40	4	£34.27
2HCE 0009 0017 S04	0.09	0.17	40	4	£31.40
2HCE 001 002 S04	0.1	0.2	40	4	£21.33
2HCE 0015 003 S04	0.15	0.3	40	4	£19.73
2HCE 002 004 S04	0.2	0.4	40	4	£15.33
2HCE 0025 005 S04	0.25	0.5	40	4	£16.73
2HCE 003 006 S04	0.3	0.6	40	4	£11.93
2HCE 0035 007 S04	0.35	0.7	40	4	£13.33
2HCE 004 008 S04	0.4	0.8	40	4	£11.93
2HCE 0045 009 S04	0.45	0.9	40	4	£13.33
2HCE 005 010 S03	0.5	1	40	3	£8.33
2HCE 005 010 S04	0.5	1	40	4	£11.20
2HCE 0055 011 S04	0.55	1.1	40	4	£12.60
2HCE 006 012 S03	0.6	1.2	40	3	£8.33
2HCE 006 012 S04	0.6	1.2	40	4	£11.20
2HCE 0065 013 S04	0.65	1.3	40	4	£12.60
2HCE 007 014 S04	0.7	1.4	40	4	£10.40
2HCE 0075 015 S04	0.75	1.5	40	4	£11.87
2HCE 008 016 S03	0.8	1.6	40	3	£8.33
2HCE 008 016 S04	0.8	1.6	40	4	£10.40
2HCE 0085 017 S04	0.85	1.7	40	4	£11.87
2HCE 009 020 S04	0.9	2	40	4	£10.40
2HCE 0095 020 S04	0.95	2	40	4	£11.87
2HCE 010 025 S03	1	2.5	40	3	£8.33
2HCE 010 025 S04	1	2.5	40	4	£8.33
2HCE 010 025 S06	1	2.5	40	6	£9.60
2HCE 010 025 060	1	2.5	60	6	£12.60
2HCE 0105 025 S04	1.05	2.5	40	4	£9.87
2HCE 011 027 S04	1.1	2.7	40	4	£9.60
2HCE 0115 025 S04	1.15	2.5	40	4	£9.87
2HCE 012 030 S03	1.2	3	40	3	£8.33
2HCE 012 030 S04	1.2	3	40	4	£9.60
2HCE 012 030 060	1.2	3	60	6	£12.80
2HCE 0125 030 S04	1.25	3	40	4	£9.87
2HCE 013 032 S04	1.3	3.2	40	4	£9.60
2HCE 0135 032 S04	1.35	3.2	40	4	£9.87
2HCE 014 035 S04	1.4	3.5	40	4	£9.60
2HCE 0145 035 S04	1.45	3.5	40	4	£9.87
2HCE 015 040 S03	1.5	4	40	3	£8.33
2HCE 015 040 S04	1.5	4	40	4	£8.33
2HCE 015 040 S06	1.5	4	40	6	£9.60
2HCE 015 040 060	1.5	4	60	6	£12.60

Part Number	Diameter	Length of Cut	Overall Length	Shank Dia	Price
	D	L1	L	d	£
2HCE 0155 040 S04	1.55	4	40	4	£9.87
2HCE 016 040 S04	1.6	4	40	4	£9.60
2HCE 0165 040 S04	1.65	4	40	4	£9.87
2HCE 017 042 S04	1.7	4.2	40	4	£9.60
2HCE 0175 042 S04	1.75	4.2	40	4	£9.87
2HCE 018 045 S04	1.8	4.5	40	4	£9.60
2HCE 0185 045 S04	1.85	4.5	40	4	£9.87
2HCE 019 050 S04	1.9	5	40	4	£9.60
2HCE 0195 050 S04	1.95	5	40	4	£9.87
2HCE 020 060 S03	2	6	40	3	£8.33
2HCE 020 060 S04	2	6	40	4	£8.33
2HCE 020 060 S06	2	6	40	6	£9.60
2HCE 020 060 060	2	6	60	6	£12.60
2HCE 021 060 S04	2.1	6	40	4	£9.60
2HCE 022 060 S04	2.2	6	40	4	£9.60
2HCE 023 060 S04	2.3	6	40	4	£9.60
2HCE 024 080 S04	2.4	8	45	4	£9.60
2HCE 025 080 S03	2.5	8	45	3	£13.27
2HCE 025 080 S04	2.5	8	45	4	£8.33
2HCE 025 080 S06	2.5	8	45	6	£8.33
2HCE 025 080 070	2.5	8	70	6	£9.60
2HCE 026 080 S04	2.6	8	45	4	£9.60
2HCE 027 080 S04	2.7	8	45	4	£9.60
2HCE 028 080 S04	2.8	8	45	4	£9.60
2HCE 029 080 S04	2.9	8	45	4	£9.60
2HCE 030 080 S03	3	8	45	3	£8.80
2HCE 030 080 S04	3	8	45	4	£8.80
2HCE 030 080 S06	3	8	45	6	£10.07
2HCE 030 080 070	3	8	70	6	£13.60
2HCE 031 080 S06	3.1	8	45	6	£12.13
2HCE 032 080 S06	3.2	8	45	6	£12.13
2HCE 033 080 S06	3.3	8	45	6	£12.13
2HCE 034 080 S06	3.4	8	45	6	£12.13
2HCE 035 100 S06	3.5	10	45	6	£12.13
2HCE 036 100 S06	3.6	10	45	6	£12.13
2HCE 037 100 S06	3.7	10	45	6	£12.13
2HCE 038 100 S06	3.8	10	45	6	£12.13
2HCE 039 100 S06	3.9	10	45	6	£12.13
2HCE 040 100 S04	4	10	45	4	£8.80
2HCE 040 110 S06	4	11	45	6	£10.07
2HCE 040 110 070	4	11	70	6	£13.60
2HCE 041 110 S06	4.1	11	45	6	£12.13
2HCE 042 110 S06	4.2	11	45	6	£12.13
2HCE 043 110 S06	4.3	11	45	6	£12.13
2HCE 044 110 S06	4.4	11	45	6	£12.13

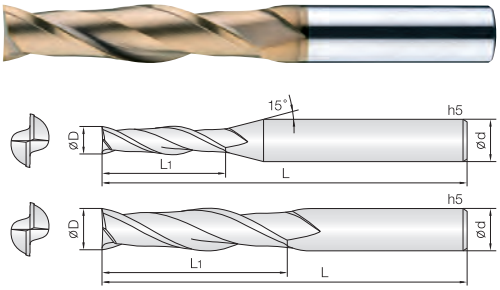
2HCE 2 Flute High Speed Standard Length End Mills



D Size	D Tolerance
ø0.05 ~ 0.15	+0~ −0.005mm
ø0.2 ~ 5.9	+0~ −0.01mm
Ø6 ~ 12	−0.01 ~ −0.025mm
Ø13 ~ 20	−0.015 ~ −0.03mm

Part Number	Diameter	Length of Cut	Overall Length	Shank Dia	Price
	D	L1	L	d	£
2HCE 045 110 S06	4.5	11	45	6	£13.73
2HCE 046 110 S06	4.6	11	45	6	£12.13
2HCE 047 110 S06	4.7	11	45	6	£12.13
2HCE 048 110 S06	4.8	11	45	6	£12.13
2HCE 049 110 S06	4.9	11	45	6	£12.13
2HCE 050 130 S06	5	13	50	6	£11.67
2HCE 050 130 080	5	13	80	6	£15.07
2HCE 051 130 S06	5.1	13	50	6	£13.73
2HCE 052 130 S06	5.2	13	50	6	£13.73
2HCE 053 130 S06	5.3	13	50	6	£13.73
2HCE 054 130 S06	5.4	13	50	6	£13.73
2HCE 055 130 S06	5.5	13	50	6	£13.73
2HCE 056 130 S06	5.6	13	50	6	£13.73
2HCE 057 130 S06	5.7	13	50	6	£13.73
2HCE 058 130 S06	5.8	13	50	6	£13.73
2HCE 059 130 S06	5.9	13	50	6	£13.73
2HCE 060 130 S06	6	13	50	6	£11.67
2HCE 060 130 080	6	13	80	6	£15.07
2HCE 061 150 S08	6.1	15	70	8	£21.53
2HCE 062 150 S08	6.2	15	70	8	£21.53
2HCE 063 150 S08	6.3	15	70	8	£21.53
2HCE 064 150 S08	6.4	15	70	8	£21.53
2HCE 065 160 S08	6.5	16	60	8	£21.53
2HCE 070 160 S08	7	16	60	8	£19.53
2HCE 075 160 S08	7.5	16	60	8	£21.53
2HCE 080 190 S08	8	19	60	8	£17.40
2HCE 085 190 S10	8.5	19	70	10	£28.87
2HCE 090 190 S10	9	19	70	10	£26.80
2HCE 095 190 S10	9.5	19	70	10	£28.87
2HCE 100 220 S10	10	22	70	10	£24.73
2HCE 105 220 S12	10.5	22	75	12	£33.80
2HCE 110 220 S12	11	22	75	12	£31.73
2HCE 115 220 S12	11.5	22	75	12	£33.80
2HCE 120 260 S12	12	26	75	12	£29.67
2HCE 130 260 S14	13	26	80	14	£63.66
2HCE 140 260 S14	14	26	80	14	£65.52
2HCE 140 260 S16	14	26	90	16	£72.90
2HCE 150 350 S16	15	35	100	16	£79.74
2HCE 160 350 S16	16	35	100	16	£79.26
2HCE 170 350 S18	17	35	100	18	£95.82
2HCE 180 350 S18	18	35	100	18	£94.98
2HCE 200 400 S20	20	40	100	20	£108.48

- End Mills for various work materials, hardened steel (HRc~55), pre-hardened steel, tool steel and cast iron
- Excellent wear resistance from Si-based PVD coating.
- Improve tool performance by even run-out and tolerance control.
- Wide range of diameters and lengths available.
- Reinforced shield edge improves corner strength, minimizing chipping.



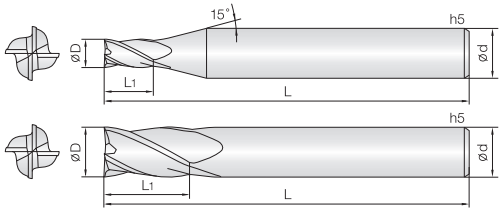
D Size	D Tolerance
Ø1 ~ 5	+0 ~ –0,01mm
Ø6 ~ 12	–0,01 ~ –0,025mm
Ø14 ~ 25	–0,015 ~ –0,03mm

Part Number	Diameter	Length of Cut	Overall Length	Shank Dia	Price
	D	L1	L	d	£
2LEM 010 030 S06	1	3	60	6	£17.67
2LEM 010 050 S06	1	5	60	6	£17.67
2LEM 010 070 S06	1	7	60	6	£19.47
2LEM 010 100 S06	1	10	60	6	£21.73
2LEM 010 120 S06	1	12	60	6	£23.80
2LEM 010 150 S06	1	15	60	6	£25.87
2LEM 012 060 S06	1.2	6	60	6	£17.67
2LEM 012 080 S06	1.2	8	60	6	£19.47
2LEM 012 100 S06	1.2	10	60	6	£21.73
2LEM 012 120 S06	1.2	12	60	6	£23.80
2LEM 015 060 S06	1.5	6	60	6	£17.00
2LEM 015 075 S06	1.5	7.5	60	6	£17.00
2LEM 015 100 S06	1.5	10	60	6	£17.00
2LEM 015 150 S06	1.5	15	60	6	£18.47
2LEM 015 200 S06	1.5	20	60	6	£20.07
2LEM 020 060 S06	2	6	60	6	£14.40
2LEM 020 100 S06	2	10	60	6	£14.40
2LEM 020 150 S06	2	15	60	6	£15.87
2LEM 020 200 S06	2	20	60	6	£18.47
2LEM 025 100 S06	2.5	10	60	6	£15.07
2LEM 025 150 S06	2.5	15	60	6	£17.13
2LEM 025 200 S06	2.5	20	60	6	£19.13
2LEM 030 120 S06	3	12	70	6	£15.67
2LEM 030 150 S06	3	15	70	6	£15.67
2LEM 030 200 S06	3	20	70	6	£17.07
2LEM 030 250 S06	3	25	70	6	£18.33
2LEM 030 300 S06	3	30	70	6	£20.07
2LEM 035 120 S06	3.5	12	70	6	£16.47
2LEM 035 150 S06	3.5	15	70	6	£16.47
2LEM 035 200 S06	3.5	20	70	6	£18.33
2LEM 040 150 S06	4	15	70	6	£15.67
2LEM 040 200 S06	4	20	70	6	£16.40
2LEM 040 300 S06	4	30	75	6	£17.80
2LEM 040 350 S06	4	35	75	6	£20.07
2LEM 040 400 S06	4	40	80	6	£21.73
2LEM 045 120 S06	4.5	12	70	6	£16.47
2LEM 045 150 S06	4.5	15	70	6	£16.47
2LEM 045 200 S06	4.5	20	70	6	£18.33
2LEM 050 200 S06	5	20	80	6	£16.40
2LEM 050 250 S06	5	25	70	6	£16.40
2LEM 050 300 S06	5	30	75	6	£19.73
2LEM 050 400 S06	5	40	80	6	£21.73
2LEM 060 200 100	6	20	100	6	£21.07
2LEM 060 200 S06	6	20	75	6	£16.40
2LEM 060 250 S06	6	25	75	6	£18.00

Part Number	Diameter	Length of Cut	Overall Length	Shank Dia	Price
	D	L1	L	d	£
2LEM 060 300 S06	6	30	80	6	£19.60
2LEM 060 350 S06	6	35	80	6	£21.73
2LEM 060 400 S06	6	40	90	6	£23.80
2LEM 060 450 S06	6	45	90	6	£27.87
2LEM 060 500 S06	6	50	100	6	£32.67
2LEM 080 250 100	8	25	100	8	£28.87
2LEM 080 250 S08	8	25	75	8	£21.87
2LEM 080 300 S08	8	30	80	8	£24.27
2LEM 080 350 S08	8	35	80	8	£25.87
2LEM 080 400 S08	8	40	90	8	£29.13
2LEM 080 450 S08	8	45	100	8	£30.93
2LEM 080 500 S08	8	50	100	8	£36.00
2LEM 080 550 S08	8	55	100	8	£37.80
2LEM 080 600 S08	8	60	110	8	£45.33
2LEM 100 300 110	10	30	110	10	£42.60
2LEM 100 300 S10	10	30	80	10	£31.53
2LEM 100 350 S10	10	35	90	10	£32.67
2LEM 100 400 S10	10	40	90	10	£36.73
2LEM 100 450 S10	10	45	100	10	£39.80
2LEM 100 500 S10	10	50	100	10	£42.00
2LEM 100 550 S10	10	55	110	10	£46.67
2LEM 100 600 S10	10	60	110	10	£49.47
2LEM 100 650 S10	10	65	120	10	£52.87
2LEM 100 700 S10	10	70	120	10	£56.33
2LEM 120 300 S12	12	30	90	12	£40.47
2LEM 120 350110	12	35	110	12	£51.53
2LEM 120 400 S12	12	40	100	12	£43.67
2LEM 120 450 S12	12	45	100	12	£45.00
2LEM 120 500 S12	12	50	100	12	£46.87
2LEM 120 550 S12	12	55	110	12	£50.13
2LEM 120 600 S12	12	60	110	12	£51.73
2LEM 120 700 S12	12	70	130	12	£58.40
2LEM 120 800 S12	12	80	130	12	£61.80
2LEM 140 500 S14	14	50	110	14	£80.04
2LEM 160 1000 S16	16	100	160	16	£111.24
2LEM 160 400 160	16	40	160	16	£100.14
2LEM 160 550 S16	16	55	120	16	£86.04
2LEM 160 700 S16	16	70	130	16	£89.64
2LEM 160 800 S16	16	80	160	16	£106.32
2LEM 200 1000 S20	20	100	200	20	£228.66
2LEM 200 500 160	20	50	160	20	£143.40
2LEM 200 600 S20	20	60	130	20	£129.36
2LEM 250 750 S25	25	75	160	25	£275.22

4HSE 4 Flute High Speed Short Length End Mills

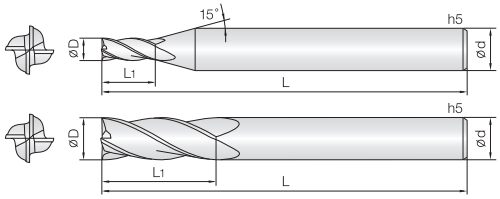
- End Mills for pre-hardened and hardened steel (HRc50~60)
- Excellent wear resistance from Si-based PVD coating.
- Reinforced edge design to prevent edge chipping.
- Short Overall Length
- Minimize fracturing by high TRS fine (0.5µm) WC grade.



D Size	D Tolerance
Ø0.5 ~ 5	+0 ~ –0,01mm
Ø6 ~ 12	–0,01 ~ –0,025mm
Ø16	–0,015 ~ –0,03mm

Part Number	Diameter	Length of Cut	Overall Length	Shank Dia	Price
	D	L1	L	d	£
4HSE 005 0075 S04	0.5	0.75	38	4	£15.80
4HSE 006 009 S04	0.6	0.9	38	4	£15.20
4HSE 008 012 S04	0.8	1.2	38	4	£14.40
4HSE 010 015 S04	1	1.5	40	4	£10.47
4HSE 012 020 S04	1.2	2	40	4	£10.47
4HSE 015 022 S04	1.5	2.2	40	4	£10.47
4HSE 020 035 S04	2	3.5	40	4	£10.47
4HSE 020 035 S06	2	3.5	40	6	£11.33
4HSE 025 038 S04	2.5	3.8	40	4	£10.47
4HSE 030 045 S04	3	4.5	40	4	£10.47
4HSE 030 045 S06	3	4.5	40	6	£11.33
4HSE 035 052 S06	3.5	5.2	40	6	£11.93
4HSE 040 060 S04	4	6	40	4	£11.00
4HSE 040 060 S06	4	6	40	6	£11.93
4HSE 045 068 S06	4.5	6.8	40	6	£12.60
4HSE 050 075 S06	5	7.5	45	6	£12.73
4HSE 060 090 S06	6	9	45	6	£12.73
4HSE 080 120 S08	8	12	50	8	£19.60
4HSE 100 150 S10	10	15	60	10	£26.60
4HSE 120 180 S12	12	18	65	12	£30.67
4HSE 160 240 S16	16	24	75	16	£59.94

- End Mills for pre-hardened and hardened steel (HRc50~60)
- Excellent wear resistance from Si-based PVD coating.
- Precise edge tolerance.
- Reinforced edge design to prevent edge chipping.
- Wide range of diameters and lengths available.
- Minimize fracturing by high TRS fine (0.5μm) WC grade.



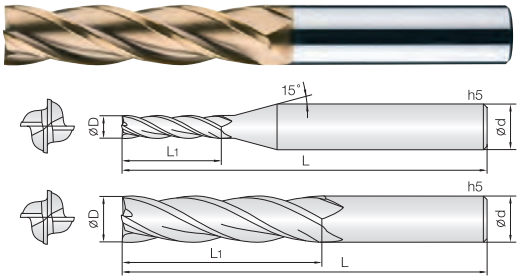
D Size	D Tolerance
Ø0.3 ~ 5	+0 ~ –0,01mm
Ø6 ~ 12	–0,01 ~ –0,025mm
Ø13 ~ 20	–0,015 ~ –0,03mm

Part Number	Diameter	Length of Cut	Overall Length	Shank Dia	Price
	D	L1	L	d	£
4HCE 003 006 S04	0.3	0.6	40	4	£18.33
4HCE 004 008 S04	0.4	0.8	40	4	£17.13
4HCE 005 010 S04	0.5	1	40	4	£16.40
4HCE 006 012 S04	0.6	1.2	40	4	£16.40
4HCE 007 014 S04	0.7	1.4	40	4	£15.73
4HCE 008 020 S04	0.8	2	40	4	£15.07
4HCE 009 018 S04	0.9	1.8	40	4	£15.07
4HCE 010 025 S03	1	2.5	40	3	£11.20
4HCE 010 025 S04	1	2.5	40	4	£11.20
4HCE 010 025 S06	1	2.5	40	6	£12.20
4HCE 010 025 060	1	2.5	60	6	£15.07
4HCE 010 025 080	1	2.5	80	6	£18.13
4HCE 012030 S03	1.2	3	40	3	£11.20
4HCE 012030 S04	1.2	3	40	4	£11.20
4HCE 012030 S06	1.2	3	40	6	£12.20
4HCE 012 030 060	1.2	3	60	6	£15.07
4HCE 015 040 S03	1.5	4	40	3	£11.20
4HCE 015 040 S04	1.5	4	40	4	£11.20
4HCE 015 040 S06	1.5	4	40	6	£12.20
4HCE 015 040 060	1.5	4	60	6	£15.07
4HCE 015 040 080	1.5	4	80	6	£18.13
4HCE 020 060 S03	2	6	40	3	£11.20
4HCE 020 060 S04	2	6	40	4	£11.20
4HCE 020 060 S06	2	6	40	6	£12.20
4HCE 020 060 060	2	6	60	6	£15.07
4HCE 020 060 100	2	6	100	6	£18.47
4HCE 025 080 S03	2.5	8	45	3	£11.20
4HCE 025 080 S04	2.5	8	45	4	£11.20
4HCE 025 080 S06	2.5	8	45	6	£12.20
4HCE 025 080 070	2.5	8	70	6	£15.07
4HCE 025 080 100	2.5	8	100	6	£18.47
4HCE 030 080 S03	3	8	45	3	£11.20
4HCE 030 080 S04	3	8	45	4	£11.80
4HCE 030 080 S06	3	8	45	6	£12.73
4HCE 030 080 070	3	8	70	6	£15.80
4HCE 030 080 100	3	8	100	6	£19.20
4HCE 035 100 S06	3.5	10	45	6	£14.73
4HCE 040 110 S04	4	11	45	4	£11.80
4HCE 040 110 S06	4	11	45	6	£12.73
4HCE 040 110 070	4	11	70	6	£15.80
4HCE 040 110 100	4	11	100	6	£19.20
4HCE 045 110 S06	4.5	11	45	6	£14.73
4HCE 050 130 S06	5	13	50	6	£13.60
4HCE 050 130 080	5	13	80	6	£16.67
4HCE 050 130 100	5	13	100	6	£20.07

Part Number	Diameter	Length of Cut	Overall Length	Shank Dia	Price
	D	L1	L	d	£
4HCE 055 130 S06	5.5	13	50	6	£15.67
4HCE 060 130 S06	6	13	50	6	£13.60
4HCE 060 130 080	6	13	80	6	£16.67
4HCE 060 130 100	6	13	100	6	£20.07
4HCE 065 160 S08	6.5	16	60	8	£24.07
4HCE 070 160 S08	7	16	60	8	£22.67
4HCE 075 160 S08	7.5	16	60	8	£24.07
4HCE 080 190 S08	8	19	60	8	£20.60
4HCE 085 190 S10	8.5	19	70	10	£32.27
4HCE 090 190 S10	9	19	70	10	£30.20
4HCE 095 190 S10	9.5	19	70	10	£32.27
4HCE 100 220 S10	10	22	70	10	£28.13
4HCE 105 220 S12	10.5	22	75	12	£36.80
4HCE 110 220 S12	11	22	75	12	£34.73
4HCE 115 220 S12	11.5	22	75	12	£36.80
4HCE 120 260 S12	12	26	75	12	£32.67
4HCE 130 260 S14	13	26	80	14	£63.66
4HCE 140 260 S14	14	26	80	14	£69.42
4HCE 140 260 S16	14	26	90	16	£76.98
4HCE 150 350 S16	15	35	100	16	£85.26
4HCE 160 350 S16	16	35	100	16	£83.76
4HCE 170 350 S18	17	35	100	18	£103.20
4HCE 180 350 S18	18	35	100	18	£100.20
4HCE 200 400 S20	20	40	100	20	£110.70

4LEM 4 Flute Long Series End Mills

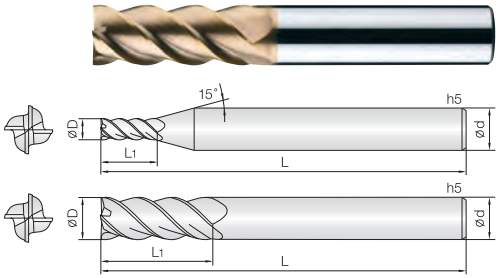
- End Mills for various work materials, hardened steel (HRc~55), pre-hardened steel, tool steel and cast iron
- Excellent wear resistance from Si-based PVD coating.
- Improve tool performance by even run-out and tolerance control.
- Wide range of diameters and lengths available.
- Reinforced shield edge improves corner strength, minimizing chipping.



D Size	D Tolerance
Ø0.5 ~ 5	+0 ~ −0.01mm
Ø6 ~ 12	−0.01 ~ −0.025mm
Ø14 ~ 25	−0.015 ~ −0.03mm

Part Number	Diameter	Length of Cut	Overall Length	Shank Dia	Price
	D	L1	L	d	£
4LEM 005 015 S04	0.5	1.5	40	4	£19.00
4LEM 005 020 S04	0.5	2	40	4	£19.80
4LEM 006 018 S04	0.6	1.8	40	4	£19.00
4LEM 006 024 S04	0.6	2.4	40	4	£19.80
4LEM 008 024 S04	0.8	2.4	40	4	£18.33
4LEM 008 032 S04	0.8	3.2	40	4	£19.13
4LEM 010 030 S06	1	3	60	6	£18.20
4LEM 010 050 S06	1	5	60	6	£18.20
4LEM 010 070 S06	1	7	60	6	£18.93
4LEM 010 100 S06	1	10	60	6	£21.07
4LEM 010 120 S06	1	12	60	6	£23.80
4LEM 012 040 S06	1.2	4	60	6	£18.20
4LEM 012 060 S06	1.2	6	60	6	£18.20
4LEM 012 080 S06	1.2	8	60	6	£19.00
4LEM 012 100 S06	1.2	10	60	6	£21.07
4LEM 015 060 S06	1.5	6	60	6	£17.47
4LEM 015 080 S06	1.5	8	60	6	£17.47
4LEM 015 100 S06	1.5	10	60	6	£18.93
4LEM 015 120 S06	1.5	12	60	6	£21.07
4LEM 015 150 S06	1.5	15	60	6	£23.80
4LEM 020 080 S06	2	8	60	6	£14.80
4LEM 020 100 S06	2	10	60	6	£14.80
4LEM 020 120 S06	2	12	60	6	£14.80
4LEM 020 150 S06	2	15	60	6	£16.87
4LEM 020 200 S06	2	20	70	6	£20.47
4LEM 030 100 S06	3	10	70	6	£16.00
4LEM 030 150 S06	3	15	70	6	£16.00
4LEM 030 200 S06	3	20	70	6	£17.47
4LEM 030 250 S06	3	25	70	6	£19.40
4LEM 030 300 S06	3	30	70	6	£21.07
4LEM 030 350 S06	3	35	75	6	£22.47
4LEM 030 400 S06	3	40	80	6	£24.47
4LEM 035 120 S06	3.5	12	70	6	£16.80
4LEM 035 150 S06	3.5	15	70	6	£17.80
4LEM 035 200 S06	3.5	20	70	6	£18.47
4LEM 040 120 S06	4	12	70	6	£16.00
4LEM 040 150 S04	4	15	70	4	£15.00
4LEM 040 150 S06	4	15	70	6	£16.00
4LEM 040 200 S04	4	20	70	4	£15.00
4LEM 040 200 S06	4	20	70	6	£17.47
4LEM 040 250 S06	4	25	70	6	£18.93
4LEM 040 300 S06	4	30	75	6	£21.07
4LEM 040 350 S06	4	35	75	6	£22.47
4LEM 040 400 S06	4	40	80	6	£24.47
4LEM 040 450 S06	4	45	90	6	£28.33
4LEM 040 500 S06	4	50	100	6	£31.80
4LEM 045 150 S06	4.5	15	70	6	£16.47
4LEM 045 200 S06	4.5	20	70	6	£18.60
4LEM 050 200 S06	5	20	70	6	£17.47
4LEM 050 250 S06	5	25	75	6	£18.93
4LEM 050 300 S06	5	30	80	6	£21.33
4LEM 050 400 S06	5	40	80	6	£24.47
4LEM 050 500 S06	5	50	100		£31.80
4LEM 060 200 S06	6	20	100	6	£21.73
4LEM 060 200 100	6	20	75	6	£17.47
4LEM 060 250 S06	6	25	75	6	£18.93
4LEM 060 300 S06	6	30	80	6	£21.33
4LEM 060 350 S06	6	35	80	6	£23.13
4LEM 060 400 S06	6	40	90	6	£25.87
4LEM 060 450 S06	6	45	90	6	£29.93
4LEM 060 500 S06	6	50	100	6	£35.33
4LEM 080 250 S08	8	25	100	8	£30.93
4LEM 080 250100	8	25	75	8	£24.40
4LEM 080 300 S08	8	30	80	8	£25.20
4LEM 080 350 S08	8	35	90	8	£27.47
4LEM 080 400 S08	8	40	90	8	£30.67
4LEM 080 450 S08	8	45	100	8	£33.47
4LEM 080 500 S08	8	50	100	8	£35.00
4LEM 080 550 S08	8	55	100	8	£39.13
4LEM 080 600 S08	8	60	110	8	£46.67
4LEM 100 300 S10	10	30	110	10	£44.67
4LEM 100 300 110	10	30	80	10	£33.13
4LEM 100 350 S10	10	35	90	10	£34.60
4LEM 100 400 S10	10	40	90	10	£37.80
4LEM 100 450 S10	10	45	100	10	£41.20
4LEM 100 500 S10	10	50	100	10	£43.00
4LEM 100 550 S10	10	55	100	10	£44.67
4LEM 100 600 S10	10	60	110	10	£50.80
4LEM 100 650 S10	10	65	120	10	£54.27
4LEM 100 700 S10	10	70	120	10	£57.67
4LEM 120 300 S12	12	30	90	12	£42.47
4LEM 120 350 110	12	35	110	12	£53.20
4LEM 120 400 S12	12	40	100	12	£45.80
4LEM 120 450 S12	12	45	100	12	£46.67
4LEM 120 500 S12	12	50	100	12	£48.40
4LEM 120 550 S12	12	55	110	12	£51.53
4LEM 120 600 S12	12	60	110	12	£53.33
4LEM 120 700 S12	12	70	130	12	£60.40
4LEM 120 800 S12	12	80	130	12	£64.53
4LEM 140 500 S14	14	50	110	14	£83.76
4LEM 160 400 160	16	40	160	16	£103.20
4LEM 160 550 S16	16	55	120	16	£87.48
4LEM 160 700 S16	16	70	130	16	£102.00
4LEM 160 900 S16	16	90	150	16	£120.54
4LEM 160 1000 S16	16	100	160	16	£129.78
4LEM 200 500 160	20	50	160	20	£146.46
4LEM 200 600 S20	20	60	130	20	£134.58
4LEM 200 800 S20	20	80	160	20	£159.42
4LEM 200 1000 S20	20	100	200	20	£242.88
4LEM 250 750 S25	25	75	160	25	£288.66

- End Mills for pre-hardened and hardened steel (HRc50~62)
- Excellent wear resistance from Si-based PVD coating.
- Precise run-out and tolerance for finishing applications.
- Reinforced shield edge improves corner strength, minimizing chipping.
- 45 degree helix design for high speed, feed condition.

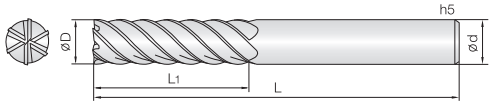


D Size	D Tolerance
Ø1 ~ 5	+0 ~ -0,01mm
Ø6 ~ 12	-0,01 ~ -0,025mm
Ø14 ~ 25	-0,015 ~ -0,03mm

Part Number	Diameter	Length of Cut	Overall Length	Shank Dia	Price
	D	L1	L	d	£
4HEM 010 025 S06	1	2.5	40	6	£12.80
4HEM 010 035 S06	1	3.5	40	6	£15.33
4HEM 010 050 S06	1	5	45	6	£16.00
4HEM 012 030 S06	1.2	3	40	6	£12.80
4HEM 015 040 S06	1.5	4	40	6	£12.80
4HEM 015 060 S06	1.5	6	40	6	£15.33
4HEM 015 080 S06	1.5	8	45	6	£16.00
4HEM 020 050 S06	2	5	40	6	£12.80
4HEM 020 080 S06	2	8	45	6	£15.33
4HEM 020 100 S06	2	10	50	6	£16.00
4HEM 030 080 S06	3	8	45	6	£13.33
4HEM 030 120 S06	3	12	50	6	£15.87
4HEM 030 150 S06	3	15	55	6	£16.67
4HEM 040 110 S06	4	11	45	6	£13.33
4HEM 040 160 S06	4	16	55	6	£15.87
4HEM 040 200 S06	4	20	60	6	£16.67
4HEM 050 130 S06	5	13	50	6	£14.27
4HEM 050 180 S06	5	18	60	6	£17.07
4HEM 050 250 S06	5	25	70	6	£18.00
4HEM 060 130 S06	6	13	50	6	£14.27
4HEM 060 200 S06	6	20	60	6	£17.07
4HEM 060 250 S06	6	25	70	6	£18.00
4HEM 080 200 S08	8	20	60	8	£22.67
4HEM 080 250 S08	8	25	70	8	£27.20
4HEM 080 300 S08	8	30	75	8	£28.13
4HEM 080 400 S08	8	40	90	8	£29.53
4HEM 100 220 S10	10	22	70	10	£28.93
4HEM 100 300 S10	10	30	80	10	£36.27
4HEM 100 400 S10	10	40	90	10	£37.80
4HEM 100 500 S10	10	50	100	10	£39.80
4HEM 120 260 S12	12	26	75	12	£35.20
4HEM 120 400 S12	12	40	90	12	£42.20
4HEM 120 500 S12	12	50	100	12	£49.73
4HEM 120 600 S12	12	60	110	12	£51.53
4HEM 140 300 S14	14	30	80	14	£72.30
4HEM 140 500 S14	14	50	110	14	£81.60
4HEM 160 350 S16	16	35	90	16	£70.68
4HEM 160 500 S16	16	50	110	16	£84.36
4HEM 160 650 S16	16	65	120	16	£92.10
4HEM 200 400 S20	20	40	100	20	£114.00
4HEM 200 500 S20	20	50	110	20	£120.00
4HEM 200 700 S20	20	70	130	20	£145.26
4HEM 250 800 S25	25	80	160	25	£306.00

6&8HEM 6&8 Flutes High Speed 45° Helix End Mills

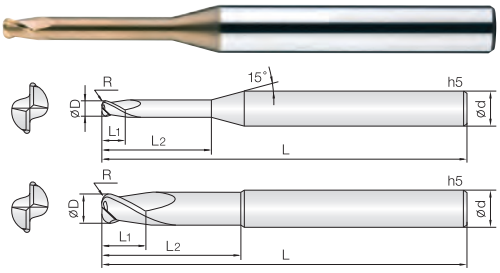
- End Mills for pre-hardened and hardened steel (HRc50~62)
- Excellent wear resistance from Si-based PVD coating.
- Precise run-out and tolerance for finishing applications.
- Reinforced shield edge improves corner strength, minimizing chipping.
- 45 degree helix design for high speed, feed condition.



D Size	D Tolerance
Ø3 ~ 5	+0 ~ -0.01mm
Ø6 ~ 12	-0.01 ~ -0.025mm
Ø16 ~ 25	-0.015 ~ -0.03mm

Part Number	Diameter	Length of Cut	Overall Length	Shank Dia	Price
	D	L1	L	d	£
6HEM 030 100 S06	3	10	50	6	£16.33
6HEM 030 150 S06	3	15	50	6	£18.33
6HEM 040 120 S06	4	12	50	6	£16.33
6HEM 040 160 S06	4	16	50	6	£18.33
6HEM 050 150 S06	5	15	50	6	£16.33
6HEM 050 200 S06	5	20	60	6	£19.60
6HEM 060 150 S06	6	15	50	6	£16.33
6HEM 060 200 S06	6	20	60	6	£19.60
6HEM 060 250 S06	6	25	65	6	£25.27
6HEM 060 300 S06	6	30	70	6	£26.87
6HEM 060 350 S06	6	35	75	6	£28.53
6HEM 080 200 S08	8	20	60	8	£25.87
6HEM 080 250 S08	8	25	65	8	£30.67
6HEM 080 300 S08	8	30	75	8	£33.60
6HEM 080 350 S08	8	35	80	8	£40.27
6HEM 080 400 S08	8	40	90	8	£40.87
6HEM 080 450 S08	8	45	100	8	£43.27
6HEM 080 500 S08	8	50	100	8	£45.67
6HEM 100 250 S10	10	25	70	10	£33.67
6HEM 100 350 S10	10	35	90	10	£43.67
6HEM 100 450 S10	10	45	100	10	£54.40
6HEM 100 500 S10	10	50	100	10	£57.00
6HEM 100 600 S10	10	60	110	10	£60.40
6HEM 120 300 S12	12	30	80	12	£42.20
6HEM 120 400 S12	12	40	90	12	£54.33
6HEM 120 500 S12	12	50	100	12	£59.13
6HEM 120 600 S12	12	60	110	12	£63.20
6HEM 120 700 S12	12	70	120	12	£68.00
6HEM 160 350 S16	16	35	90	16	£150.18
6HEM 160 500 S16	16	50	110	16	£82.38
6HEM 160 650 S16	16	65	120	16	£90.42
6HEM 160 800 S16	16	80	150	16	£93.54
6HEM 160 900 S16	16	90	160	16	£122.34
6HEM 160 1000 S16	16	100	160	16	£137.82
6HEM 200 450 S20	20	45	100	20	£197.76
6HEM 200 600 S20	20	60	120	20	£241.02
6HEM 200 800 S20	20	80	150	20	£259.56
6HEM 200 900 S20	20	90	160	20	£121.62
6HEM 200 1000 S20	20	100	160	20	£137.64
6HEM 200 1100 S20	20	110	170	20	£148.80
6HEM 200 1200 S20	20	120	180	20	£155.58
8HEM 250 1000 S25	25	100	160	25	£287.40
8HEM 250 1250 S25	25	125	200	25	£482.04

- End Mills for pre-hardened and hardened steel (HRc50~62)
- Good wear resistance from Si-based PVD coating.
- Precise edge tolerance.
- Designed for minimizing edge chipping by corner R shape.
- Various corner radius and flute lengths available for a wide range of applications.
- Outstanding performance at high speed machining by ultra-fine (0.2μm) WC grade.



D Size	D Tolerance
Ø0.2 ~ 5	+0 ~ -0.01mm
Ø6 ~ 12	-0.005 ~ -0.015mm
Ø16	-0.01 ~ -0.02mm

R0.02 ~ 05R | 1 ~ 15 | R2 ~ 3 | 160P

Part Number	Diameter	Length of Cut	Effective Length	Over-all Length	Shank Dia	Price
	D x R	L1	L2	L	d	£
2CRE 002 0002 010	0.2 x R0.02	0.2	1	40	4	£22.47
2CRE 002 0002 015	0.2 x R0.02	0.2	1.5	40	4	£22.47
2CRE 002 0002 020	0.2 x R0.02	0.2	2	40	4	£23.67
2CRE 002 0005 010	0.2 x R0.05	0.2	1	40	4	£22.47
2CRE 002 0005 015	0.2 x R0.05	0.2	1.5	40	4	£22.47
2CRE 002 0005 020	0.2 x R0.05	0.2	2	40	4	£23.67
2CRE 003 0005 010	0.3 x R0.05	0.3	1	40	4	£19.60
2CRE 003 0005 020	0.3 x R0.05	0.3	2	40	4	£19.60
2CRE 003 0005 030	0.3 x R0.05	0.3	3	40	4	£19.60
2CRE 003 0005 040	0.3 x R0.05	0.3	4	40	4	£19.67
2CRE 003 0005 050	0.3 x R0.05	0.3	5	40	4	£19.67
2CRE 004 0005 010	0.4 x R0.05	0.4	1	40	4	£18.13
2CRE 004 0005 020	0.4 x R0.05	0.4	2	40	4	£18.13
2CRE 004 0005 030	0.4 x R0.05	0.4	3	40	4	£18.13
2CRE 004 0005 040	0.4 x R0.05	0.4	4	40	4	£18.13
2CRE 004 0005 050	0.4 x R0.05	0.4	5	40	4	£19.67
2CRE 004 0005 060	0.4 x R0.05	0.4	6	40	4	£19.67
2CRE 004 001 010	0.4 x R0.1	0.4	1	40	4	£18.13
2CRE 004 001 015	0.4 x R0.1	0.4	1.5	40	4	£18.13
2CRE 004 001 020	0.4 x R0.1	0.4	2	40	4	£18.13
2CRE 004 001 030	0.4 x R0.1	0.4	3	40	4	£18.13
2CRE 004 001 040	0.4 x R0.1	0.4	4	40	4	£18.13
2CRE 005 0002 010	0.5 x R0.02	0.5	1	45	4	£17.47
2CRE 005 0002 015	0.5 x R0.02	0.5	1.5	45	4	£17.47
2CRE 005 0002 020	0.5 x R0.02	0.5	2	45	4	£17.47
2CRE 005 0002 025	0.5 x R0.02	0.5	2.5	45	4	£17.47
2CRE 005 0002 030	0.5 x R0.02	0.5	3	45	4	£17.47
2CRE 005 0002 040	0.5 x R0.02	0.5	4	45	4	£17.47
2CRE 005 0002 050	0.5 x R0.02	0.5	5	45	4	£18.13
2CRE 005 0002 060	0.5 x R0.02	0.5	6	45	4	£18.13
2CRE 005 0002 080	0.5 x R0.02	0.5	8	45	4	£18.13
2CRE 005 0002 100	0.5 x R0.02	0.5	10	50	4	£18.13
2CRE 005 0005 010	0.5 x R0.05	0.5	1	45	4	£17.47
2CRE 005 0005 015	0.5 x R0.05	0.5	1.5	45	4	£17.47
2CRE 005 0005 020	0.5 x R0.05	0.5	2	45	4	£17.47
2CRE 005 0005 025	0.5 x R0.05	0.5	2.5	45	4	£17.47
2CRE 005 0005 030	0.5 x R0.05	0.5	3	45	4	£17.47
2CRE 005 0005 040	0.5 x R0.05	0.5	4	45	4	£17.47
2CRE 005 0005 050	0.5 x R0.05	0.5	5	45	4	£18.13
2CRE 005 0005 060	0.5 x R0.05	0.5	6	45	4	£18.13
2CRE 005 0005 080	0.5 x R0.05	0.5	8	45	4	£18.13
2CRE 005 0005 100	0.5 x R0.05	0.5	10	50	4	£18.13
2CRE 005 0005 120	0.5 x R0.05	0.5	12	50	4	£19.80
2CRE 005 001 010	0.5 x R0.1	0.5	1	45	4	£17.47
2CRE 005 001 015	0.5 x R0.1	0.5	1.5	45	4	£17.47
2CRE 005 001 020	0.5 x R0.1	0.5	2	45	4	£17.47
2CRE 005 001 025	0.5 x R0.1	0.5	2.5	45	4	£17.47

Part Number	Diameter	Length of Cut	Effective Length	Over-all Length	Shank Dia	Price
	D x R	L1	L2	L	d	£
2CRE 005 001 030	0.5 x R0.1	0.5	3	45	4	£17.47
2CRE 005 001 040	0.5 x R0.1	0.5	4	45	4	£17.47
2CRE 005 001 050	0.5 x R0.1	0.5	5	45	4	£18.13
2CRE 005 001 060	0.5 x R0.1	0.5	6	45	4	£18.13
2CRE 005 001 080	0.5 x R0.1	0.5	8	45	4	£18.13
2CRE 005 001 100	0.5 x R0.1	0.5	10	50	4	£18.13
2CRE 005 001 120	0.5 x R0.1	0.5	12	50	4	£19.80
2CRE 006 0002 020	0.6 x R0.02	0.6	2	45	4	£16.73
2CRE 006 0002 030	0.6 x R0.02	0.6	3	45	4	£16.73
2CRE 006 0002 040	0.6 x R0.02	0.6	4	45	4	£16.73
2CRE 006 0002 060	0.6 x R0.02	0.6	6	45	4	£17.47
2CRE 006 0002 080	0.6 x R0.02	0.6	8	45	4	£17.47
2CRE 006 0002 100	0.6 x R0.02	0.6	10	50	4	£17.47
2CRE 006 0005 020	0.6 x R0.05	0.6	2	45	4	£16.73
2CRE 006 0005 030	0.6 x R0.05	0.6	3	45	4	£16.73
2CRE 006 0005 040	0.6 x R0.05	0.6	4	45	4	£16.73
2CRE 006 0005 060	0.6 x R0.05	0.6	6	45	4	£17.47
2CRE 006 0005 080	0.6 x R0.05	0.6	8	45	4	£17.47
2CRE 006 0005 100	0.6 x R0.05	0.6	10	50	4	£17.47
2CRE 006 0005 120	0.6 x R0.05	0.6	12	50	4	£19.13
2CRE 006 001 020	0.6 x R0.1	0.6	2	45	4	£16.73
2CRE 006 001 030	0.6 x R0.1	0.6	3	45	4	£16.73
2CRE 006 001 040	0.6 x R0.1	0.6	4	45	4	£16.73
2CRE 006 001 060	0.6 x R0.1	0.6	6	45	4	£17.47
2CRE 006 001 080	0.6 x R0.1	0.6	8	45	4	£17.47
2CRE 006 001 100	0.6 x R0.1	0.6	10	50	4	£17.47
2CRE 006 001 120	0.6 x R0.1	0.6	12	50	4	£19.13
2CRE 007 001 020	0.7 x R0.1	0.7	2	45	4	£16.07
2CRE 007 001 040	0.7 x R0.1	0.7	4	45	4	£16.07
2CRE 007 001 060	0.7 x R0.1	0.7	6	45	4	£16.07
2CRE 007 001 080	0.7 x R0.1	0.7	8	45	4	£16.80
2CRE 007 001 100	0.7 x R0.1	0.7	10	45	4	£16.80
2CRE 008 0002 020	0.8 x R0.02	0.8	2	45	4	£16.07
2CRE 008 0002 040	0.8 x R0.02	0.8	4	45	4	£16.07
2CRE 008 0002 060	0.8 x R0.02	0.8	6	45	4	£16.07
2CRE 008 0002 080	0.8 x R0.02	0.8	8	45	4	£16.07
2CRE 008 0002 100	0.8 x R0.02	0.8	10	50	4	£16.07
2CRE 008 0005 020	0.8 x R0.05	0.8	2	45	4	£16.07
2CRE 008 0005 040	0.8 x R0.05	0.8	4	45	4	£16.07
2CRE 008 0005 060	0.8 x R0.05	0.8	6	45	4	£16.07
2CRE 008 0005 080	0.8 x R0.05	0.8	8	45	4	£16.07
2CRE 008 0005 100	0.8 x R0.05	0.8	10	50	4	£16.07
2CRE 008 0005 120	0.8 x R0.05	0.8	12	50	4	£17.67
2CRE 008 001 020	0.8 x R0.1	0.8	2	45	4	£16.07
2CRE 008 001 040	0.8 x R0.1	0.8	4	45	4	£16.07
2CRE 008 001 060	0.8 x R0.1	0.8	6	45	4	£16.07
2CRE 008 001 080	0.8 x R0.1	0.8	8	45	4	£16.07

2CRE 2 Flute Rib Corner Radius End Mills

Part Number	Diameter	Length of Cut	Effective Length	Over-all Length	Shank Dia	Price
	D x R	L1	L2	L	d	£
2CRE 008 001 100	0.8 x R0.1	0.8	10	50	4	£16.07
2CRE 008 001 120	0.8 x R0.1	0.8	12	50	4	£17.67
2CRE 008 001 140	0.8 x R0.1	0.8	14	50	4	£18.47
2CRE 008 002 020	0.8 x R0.2	0.8	2	45	4	£16.07
2CRE 008 002 040	0.8 x R0.2	0.8	4	45	4	£16.07
2CRE 008 002 060	0.8 x R0.2	0.8	6	45	4	£16.07
2CRE 008 002 080	0.8 x R0.2	0.8	8	45	4	£16.07
2CRE 008 002 100	0.8 x R0.2	0.8	10	50	4	£16.07
2CRE 008 002 120	0.8 x R0.2	0.8	12	50	4	£17.67
2CRE 008 002 140	0.8 x R0.2	0.8	14	50	4	£18.47
2CRE 010 0005 040	1 x R0.05	1	4	45	4	£15.27
2CRE 010 0005 060	1 x R0.05	1	6	45	4	£15.27
2CRE 010 0005 080	1 x R0.05	1	8	45	4	£15.27
2CRE 010 0005 100	1 x R0.05	1	10	50	4	£16.00
2CRE 010 0005 120	1 x R0.05	1	12	50	4	£16.00
2CRE 010 0005 140	1 x R0.05	1	14	50	4	£16.00
2CRE 010 0005 160	1 x R0.05	1	16	50	4	£16.00
2CRE 010 0005 200	1 x R0.05	1	20	50	4	£16.67
2CRE 010 0005 220	1 x R0.05	1	22	60	4	£18.20
2CRE 010 0005 250	1 x R0.05	1	25	60	4	£21.47
2CRE 010 001 040	1 x R0.1	1	4	45	4	£15.27
2CRE 010 001 060	1 x R0.1	1	6	45	4	£15.27
2CRE 010 001 080	1 x R0.1	1	8	45	4	£15.27
2CRE 010 001 100	1 x R0.1	1	10	50	4	£16.00
2CRE 010 001 120	1 x R0.1	1	12	50	4	£16.00
2CRE 010 001 140	1 x R0.1	1	14	50	4	£16.00
2CRE 010 001 160	1 x R0.1	1	16	50	4	£16.00
2CRE 010 001 200	1 x R0.1	1	20	50	4	£16.67
2CRE 010 001 220	1 x R0.1	1	22	60	4	£18.20
2CRE 010 001 250	1 x R0.1	1	25	60	4	£21.47
2CRE 010 002 040	1 x R0.2	1	4	45	4	£15.27
2CRE 010 002 060	1 x R0.2	1	6	45	4	£15.27
2CRE 010 002 080	1 x R0.2	1	8	45	4	£15.27
2CRE 010 002 100	1 x R0.2	1	10	50	4	£16.00
2CRE 010 002 120	1 x R0.2	1	12	50	4	£16.00
2CRE 010 002 140	1 x R0.2	1	14	50	4	£16.00
2CRE 010 002 160	1 x R0.2	1	16	50	4	£16.00
2CRE 010 002 200	1 x R0.2	1	20	50	4	£16.67
2CRE 010 002 220	1 x R0.2	1	22	60	4	£18.20
2CRE 010 002 250	1 x R0.2	1	25	60	4	£21.47
2CRE 010 003 040	1 x R0.3	1	4	45	4	£15.27
2CRE 010 003 060	1 x R0.3	1	6	45	4	£15.27
2CRE 010 003 080	1 x R0.3	1	8	45	4	£15.27
2CRE 010 003 100	1 x R0.3	1	10	50	4	£16.00
2CRE 010 003 120	1 x R0.3	1	12	50	4	£16.00
2CRE 010 003 140	1 x R0.3	1	14	50	4	£16.00
2CRE 010 003 160	1 x R0.3	1	16	50	4	£16.00
2CRE 010 003 200	1 x R0.3	1	20	50	4	£16.67
2CRE 010 003 220	1 x R0.3	1	22	60	4	£18.20
2CRE 010 003 250	1 x R0.3	1	25	60	4	£21.47
2CRE 012 001 040	1.2 x R0.1	1.2	4	45	4	£15.27
2CRE 012 001 060	1.2 x R0.1	1.2	6	45	4	£15.27
2CRE 012 001 080	1.2 x R0.1	1.2	8	45	4	£15.27
2CRE 012 001 100	1.2 x R0.1	1.2	10	50	4	£16.00
2CRE 012 001 120	1.2 x R0.1	1.2	12	50	4	£16.00
2CRE 012 001 140	1.2 x R0.1	1.2	14	50	4	£16.00
2CRE 012 001 160	1.2 x R0.1	1.2	16	50	4	£16.00
2CRE 012 001 200	1.2 x R0.1	1.2	20	50	4	£16.67

Part Number	Diameter	Length of Cut	Effective Length	Over-all Length	Shank Dia	Price
	D x R	L1	L2	L	d	£
2CRE 012 002 040	1.2 x R0.2	1.2	4	45	4	£15.27
2CRE 012 002 060	1.2 x R0.2	1.2	6	45	4	£15.27
2CRE 012 002 080	1.2 x R0.2	1.2	8	45	4	£15.27
2CRE 012 002 100	1.2 x R0.2	1.2	10	50	4	£16.00
2CRE 012 002 120	1.2 x R0.2	1.2	12	50	4	£16.00
2CRE 012 002 140	1.2 x R0.2	1.2	14	50	4	£16.00
2CRE 012 002 160	1.2 x R0.2	1.2	16	50	4	£16.00
2CRE 012 002 200	1.2 x R0.2	1.2	20	50	4	£16.67
2CRE 012 003 040	1.2 x R0.3	1.2	4	45	4	£15.27
2CRE 012 003 060	1.2 x R0.3	1.2	6	45	4	£15.27
2CRE 012 003 080	1.2 x R0.3	1.2	8	45	4	£15.27
2CRE 012 003 100	1.2 x R0.3	1.2	10	50	4	£16.00
2CRE 012 003 120	1.2 x R0.3	1.2	12	50	4	£16.00
2CRE 012 003 140	1.2 x R0.3	1.2	14	50	4	£16.00
2CRE 012 003 160	1.2 x R0.3	1.2	16	50	4	£16.00
2CRE 012 003 200	1.2 x R0.3	1.2	20	50	4	£16.67
2CRE 015 001 040	1.5 x R0.1	1.5	4	45	4	£15.27
2CRE 015 001 060	1.5 x R0.1	1.5	6	45	4	£15.27
2CRE 015 001 080	1.5 x R0.1	1.5	8	45	4	£15.27
2CRE 015 001 100	1.5 x R0.1	1.5	10	50	4	£16.00
2CRE 015 001 120	1.5 x R0.1	1.5	12	50	4	£16.00
2CRE 015 001 140	1.5 x R0.1	1.5	14	50	4	£16.00
2CRE 015 001 160	1.5 x R0.1	1.5	16	50	4	£16.00
2CRE 015 001 200	1.5 x R0.1	1.5	20	50	4	£16.67
2CRE 015 001 220	1.5 x R0.1	1.5	22	60	4	£18.07
2CRE 015 001 250	1.5 x R0.1	1.5	25	60	4	£18.07
2CRE 015 002 040	1.5 x R0.2	1.5	4	45	4	£15.27
2CRE 015 002 060	1.5 x R0.2	1.5	6	45	4	£15.27
2CRE 015 002 080	1.5 x R0.2	1.5	8	45	4	£15.27
2CRE 015 002 100	1.5 x R0.2	1.5	10	50	4	£16.00
2CRE 015 002 120	1.5 x R0.2	1.5	12	50	4	£16.00
2CRE 015 002 140	1.5 x R0.2	1.5	14	50	4	£16.00
2CRE 015 002 160	1.5 x R0.2	1.5	16	50	4	£16.00
2CRE 015 002 200	1.5 x R0.2	1.5	20	50	4	£16.67
2CRE 015 002 220	1.5 x R0.2	1.5	22	60	4	£18.07
2CRE 015 002 250	1.5 x R0.2	1.5	25	60	4	£18.07
2CRE 015 003 040	1.5 x R0.3	1.5	4	45	4	£15.27
2CRE 015 003 060	1.5 x R0.3	1.5	6	45	4	£15.27
2CRE 015 003 080	1.5 x R0.3	1.5	8	45	4	£15.27
2CRE 015 003 100	1.5 x R0.3	1.5	10	50	4	£16.00
2CRE 015 003 120	1.5 x R0.3	1.5	12	50	4	£16.00
2CRE 015 003 140	1.5 x R0.3	1.5	14	50	4	£16.00
2CRE 015 003 160	1.5 x R0.3	1.5	16	50	4	£16.00
2CRE 015 003 200	1.5 x R0.3	1.5	20	50	4	£16.67
2CRE 015 003 220	1.5 x R0.3	1.5	22	60	4	£18.07
2CRE 015 003 250	1.5 x R0.3	1.5	25	60	4	£18.07
2CRE 015 005 040	1.5 x R0.5	1.5	4	45	4	£15.27
2CRE 015 005 060	1.5 x R0.5	1.5	6	45	4	£15.27
2CRE 015 005 080	1.5 x R0.5	1.5	8	45	4	£15.27
2CRE 015 005 100	1.5 x R0.5	1.5	10	50	4	£16.00
2CRE 015 005 120	1.5 x R0.5	1.5	12	50	4	£16.00
2CRE 015 005 140	1.5 x R0.5	1.5	14	50	4	£16.00
2CRE 015 005 160	1.5 x R0.5	1.5	16	50	4	£16.00
2CRE 015 005 200	1.5 x R0.5	1.5	20	50	4	£16.67
2CRE 015 005 220	1.5 x R0.5	1.5	22	60	4	£18.07
2CRE 015 005 250	1.5 x R0.5	1.5	25	60	4	£18.07
2CRE 020 001 060	2 x R0.1	2	6	45	4	£15.27
2CRE 020 001 080	2 x R0.1	2	8	45	4	£15.27

Part Number	Diameter	Length of Cut	Effective Length	Over-all Length	Shank Dia	Price
	D x R	L1	L2	L	d	£
2CRE 020 001 100	2 x R0.1	2	10	50	4	£16.00
2CRE 020 001 120	2 x R0.1	2	12	50	4	£16.00
2CRE 020 001 140	2 x R0.1	2	14	50	4	£16.00
2CRE 020 001 160	2 x R0.1	2	16	50	4	£16.67
2CRE 020 001 200	2 x R0.1	2	20	50	4	£16.67
2CRE 020 001 250	2 x R0.1	2	25	60	4	£18.07
2CRE 020 001 300	2 x R0.1	2	30	70	4	£19.33
2CRE 020 001 350	2 x R0.1	2	35	80	4	£21.67
2CRE 020 001 400	2 x R0.1	2	40	80	4	£22.53
2CRE 020 002 060	2 x R0.2	2	6	45	4	£15.27
2CRE 020 002 080	2 x R0.2	2	8	45	4	£15.27
2CRE 020 002 100	2 x R0.2	2	10	50	4	£16.00
2CRE 020 002 120	2 x R0.2	2	12	50	4	£16.00
2CRE 020 002 140	2 x R0.2	2	14	50	4	£16.00
2CRE 020 002 160	2 x R0.2	2	16	50	4	£16.67
2CRE 020 002 200	2 x R0.2	2	20	50	4	£16.67
2CRE 020 002 250	2 x R0.2	2	25	60	4	£18.07
2CRE 020 002 300	2 x R0.2	2	30	70	4	£19.33
2CRE 020 003 060	2 x R0.3	2	6	45	4	£15.27
2CRE 020 003 080	2 x R0.3	2	8	45	4	£15.27
2CRE 020 003 100	2 x R0.3	2	10	50	4	£16.00
2CRE 020 003 120	2 x R0.3	2	12	50	4	£16.00
2CRE 020 003 140	2 x R0.3	2	14	50	4	£16.00
2CRE 020 003 160	2 x R0.3	2	16	50	4	£16.67
2CRE 020 003 200	2 x R0.3	2	20	50	4	£16.67
2CRE 020 003 250	2 x R0.3	2	25	60	4	£18.07
2CRE 020 003 300	2 x R0.3	2	30	70	4	£19.33
2CRE 020 005 060	2 x R0.5	2	6	45	4	£15.27
2CRE 020 005 080	2 x R0.5	2	8	45	4	£15.27
2CRE 020 005 100	2 x R0.5	2	10	50	4	£15.27
2CRE 020 005 120	2 x R0.5	2	12	50	4	£16.00
2CRE 020 005 140	2 x R0.5	2	14	50	4	£16.00
2CRE 020 005 160	2 x R0.5	2	16	50	4	£16.00
2CRE 020 005 200	2 x R0.5	2	20	50	4	£16.67
2CRE 020 005 250	2 x R0.5	2	25	60	4	£18.07
2CRE 020 005 300	2 x R0.5	2	30	70	4	£19.33
2CRE 020 005 350	2 x R0.5	2	35	80	4	£21.67
2CRE 020 005 400	2 x R0.5	2	40	80	4	£22.53
2CRE 025 001 100	2.5 x R0.1	2.5	10	50	4	£15.27
2CRE 025 001 160	2.5 x R0.1	2.5	16	50	4	£16.00
2CRE 025 001 200	2.5 x R0.1	2.5	20	50	4	£16.67
2CRE 025 001 250	2.5 x R0.1	2.5	25	60	4	£18.07
2CRE 025 001 300	2.5 x R0.1	2.5	30	70	4	£19.33
2CRE 025 002 100	2.5 x R0.2	2.5	10	50	4	£15.27
2CRE 025 002 160	2.5 x R0.2	2.5	16	50	4	£16.00
2CRE 025 002 200	2.5 x R0.2	2.5	20	50	4	£16.67
2CRE 025 002 250	2.5 x R0.2	2.5	25	60	4	£18.07
2CRE 025 002 300	2.5 x R0.2	2.5	30	70	4	£19.33
2CRE 025 003 100	2.5 x R0.3	2.5	10	50	4	£15.27
2CRE 025 003 160	2.5 x R0.3	2.5	16	50	4	£16.00
2CRE 025 003 200	2.5 x R0.3	2.5	20	50	4	£16.67
2CRE 025 003 250	2.5 x R0.3	2.5	25	60	4	£18.07
2CRE 025 003 300	2.5 x R0.3	2.5	30	70	4	£19.33
2CRE 025 005 100	2.5 x R0.5	2.5	10	50	4	£15.27
2CRE 025 005 160	2.5 x R0.5	2.5	16	50	4	£16.00
2CRE 025 005 200	2.5 x R0.5	2.5	20	50	4	£16.67
2CRE 025 005 250	2.5 x R0.5	2.5	25	60	4	£18.07
2CRE 025 005 300	2.5 x R0.5	2.5	30	70	4	£19.33

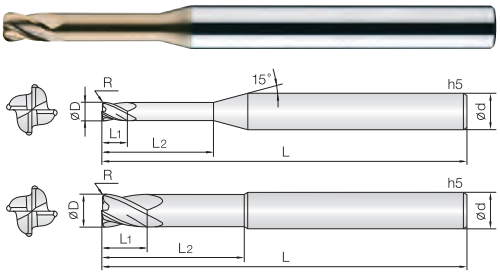
Part Number	Diameter	Length of Cut	Effective Length	Over-all Length	Shank Dia	Price
	D x R	L1	L2	L	d	£
2CRE 030 001 100	3 x R0.1	3	10	50	6	£15.73
2CRE 030 001 120	3 x R0.1	3	12	55	6	£16.47
2CRE 030 001 160	3 x R0.1	3	16	55	6	£16.47
2CRE 030 001 200	3 x R0.1	3	20	60	6	£17.20
2CRE 030 001 250	3 x R0.1	3	25	65	6	£18.60
2CRE 030 001 300	3 x R0.1	3	30	70	6	£19.67
2CRE 030 001 350	3 x R0.1	3	35	75	6	£21.73
2CRE 030 001 400	3 x R0.1	3	40	80	6	£23.93
2CRE 030 002 100	3 x R0.2	3	10	50	6	£15.73
2CRE 030 002 120	3 x R0.2	3	12	55	6	£16.47
2CRE 030 002 160	3 x R0.2	3	16	55	6	£16.47
2CRE 030 002 200	3 x R0.2	3	20	60	6	£17.20
2CRE 030 002 250	3 x R0.2	3	25	65	6	£18.60
2CRE 030 002 300	3 x R0.2	3	30	70	6	£19.67
2CRE 030 002 350	3 x R0.2	3	35	75	6	£21.73
2CRE 030 002 400	3 x R0.2	3	40	80	6	£23.93
2CRE 030 002 450	3 x R0.2	3	45	90	6	£25.53
2CRE 030 002 500	3 x R0.2	3	50	100	6	£27.67
2CRE 030 003 100	3 x R0.3	3	10	50	6	£15.73
2CRE 030 003 120	3 x R0.3	3	12	55	6	£16.47
2CRE 030 003 160	3 x R0.3	3	16	55	6	£16.47
2CRE 030 003 200	3 x R0.3	3	20	60	6	£17.20
2CRE 030 003 250	3 x R0.3	3	25	65	6	£18.60
2CRE 030 003 300	3 x R0.3	3	30	70	6	£19.67
2CRE 030 003 350	3 x R0.3	3	35	75	6	£21.73
2CRE 030 003 400	3 x R0.3	3	40	80	6	£23.93
2CRE 030 005 100	3 x R0.5	3	10	50	6	£15.73
2CRE 030 005 120	3 x R0.5	3	12	55	6	£16.47
2CRE 030 005 160	3 x R0.5	3	16	55	6	£16.47
2CRE 030 005 200	3 x R0.5	3	20	60	6	£17.20
2CRE 030 005 250	3 x R0.5	3	25	65	6	£18.60
2CRE 030 005 300	3 x R0.5	3	30	70	6	£19.67
2CRE 030 005 350	3 x R0.5	3	35	75	6	£21.73
2CRE 030 005 400	3 x R0.5	3	40	80	6	£23.93
2CRE 030 005 450	3 x R0.5	3	45	90	6	£25.53
2CRE 030 005 500	3 x R0.5	3	50	100	6	£27.67
2CRE 030 010 100	3 x R1	3	10	50	6	£15.73
2CRE 030 010 120	3 x R1	3	12	55	6	£16.47
2CRE 030 010 160	3 x R1	3	16	55	6	£16.47
2CRE 030 010 200	3 x R1	3	20	60	6	£17.20
2CRE 030 010 250	3 x R1	3	25	65	6	£18.60
2CRE 030 010 300	3 x R1	3	30	70	6	£19.67
2CRE 030 010 350	3 x R1	3	35	75	6	£21.73
2CRE 030 010 400	3 x R1	3	40	80	6	£23.93
2CRE 040 001 050	4 x R0.1	4	12	50	4	£15.13
2CRE 040 001 070	4 x R0.1	4	20	70	4	£17.93
2CRE 040 001 120	4 x R0.1	4	12	55	6	£16.47
2CRE 040 001 160	4 x R0.1	4	16	55	6	£16.47
2CRE 040 001 200	4 x R0.1	4	20	60	6	£17.20
2CRE 040 001 250	4 x R0.1	4	25	65	6	£18.60
2CRE 040 001 300	4 x R0.1	4	30	70	6	£19.67
2CRE 040 001 350	4 x R0.1	4	35	75	6	£21.73
2CRE 040 001 400	4 x R0.1	4	40	80	6	£23.93
2CRE 040 001 450	4 x R0.1	4	45	90	6	£25.53
2CRE 040 001 500	4 x R0.1	4	50	100	6	£27.53
2CRE 040 002 050	4 x R0.2	4	12	50	4	£15.13
2CRE 040 002 070	4 x R0.2	4	20	70	4	£17.93
2CRE 040 002 120	4 x R0.2	4	12	55	6	£16.47

2CRE 2 Flute Rib Corner Radius End Mills

Part Number	Diameter	Length of Cut	Effective Length	Over-all Length	Shank Dia	Price
	D x R	L1	L2	L	d	£
2CRE 040 002 160	4 x R0.2	4	16	55	6	£16.47
2CRE 040 002 200	4 x R0.2	4	20	60	6	£17.20
2CRE 040 002 250	4 x R0.2	4	25	65	6	£18.60
2CRE 040 002 300	4 x R0.2	4	30	70	6	£19.67
2CRE 040 002 350	4 x R0.2	4	35	75	6	£21.73
2CRE 040 002 400	4 x R0.2	4	40	80	6	£23.93
2CRE 040 002 450	4 x R0.2	4	45	90	6	£25.53
2CRE 040 002 500	4 x R0.2	4	50	100	6	£27.53
2CRE 040 003 050	4 x R0.3	4	12	50	4	£15.13
2CRE 040 003 070	4 x R0.3	4	20	70	4	£17.93
2CRE 040 003 120	4 x R0.3	4	12	55	6	£16.47
2CRE 040 003 160	4 x R0.3	4	16	55	6	£16.47
2CRE 040 003 200	4 x R0.3	4	20	60	6	£17.20
2CRE 040 003 250	4 x R0.3	4	25	65	6	£18.60
2CRE 040 003 300	4 x R0.3	4	30	70	6	£19.67
2CRE 040 003 350	4 x R0.3	4	35	75	6	£21.73
2CRE 040 003 400	4 x R0.3	4	40	80	6	£23.93
2CRE 040 003 450	4 x R0.3	4	45	90	6	£25.53
2CRE 040 003 500	4 x R0.3	4	50	100	6	£27.53
2CRE 040 005 050	4 x R0.5	4	12	50	4	£15.13
2CRE 040 005 070	4 x R0.5	4	20	70	4	£17.93
2CRE 040 005 120	4 x R0.5	4	12	55	6	£16.47
2CRE 040 005 160	4 x R0.5	4	16	55	6	£16.47
2CRE 040 005 200	4 x R0.5	4	20	60	6	£17.20
2CRE 040 005 250	4 x R0.5	4	25	65	6	£18.60
2CRE 040 005 300	4 x R0.5	4	30	70	6	£19.67
2CRE 040 005 350	4 x R0.5	4	35	75	6	£21.73
2CRE 040 005 400	4 x R0.5	4	40	80	6	£23.93
2CRE 040 005 450	4 x R0.5	4	45	90	6	£25.53
2CRE 040 005 500	4 x R0.5	4	50	100	6	£27.53
2CRE 040 010 050	4 x R1	4	12	50	4	£15.13
2CRE 040 010 070	4 x R1	4	20	70	4	£17.93
2CRE 040 010 120	4 x R1	4	12	55	6	£16.47
2CRE 040 010 160	4 x R1	4	16	55	6	£16.47
2CRE 040 010 200	4 x R1	4	20	60	6	£17.20
2CRE 040 010 250	4 x R1	4	25	65	6	£18.60
2CRE 040 010 300	4 x R1	4	30	70	6	£19.67
2CRE 040 010 350	4 x R1	4	35	75	6	£21.73
2CRE 040 010 400	4 x R1	4	40	80	6	£23.93
2CRE 040 010 450	4 x R1	4	45	90	6	£25.53
2CRE 040 010 500	4 x R1	4	50	100	6	£27.53
2CRE 050 002 150	5 x R0.2	6	15	60	6	£16.47
2CRE 050 002 250	5 x R0.2	6	25	70	6	£18.60
2CRE 050 002 300	5 x R0.2	6	30	70	6	£19.67
2CRE 050 002 400	5 x R0.2	6	40	80	6	£23.93
2CRE 050 002 500	5 x R0.2	6	50	100	6	£27.53
2CRE 050 005 150	5 x R0.5	6	15	60	6	£16.47
2CRE 050 005 250	5 x R0.5	6	25	70	6	£18.60
2CRE 050 005 300	5 x R0.5	6	30	70	6	£19.67
2CRE 050 005 400	5 x R0.5	6	40	80	6	£23.93
2CRE 050 005 500	5 x R0.5	6	50	100	6	£27.53
2CRE 050 010 150	5 x R1	6	15	60	6	£16.47
2CRE 050 010 250	5 x R1	6	25	70	6	£18.60
2CRE 050 010 300	5 x R1	6	30	70	6	£19.67
2CRE 050 010 400	5 x R1	6	40	80	6	£23.93
2CRE 050 010 500	5 x R1	6	50	100	6	£27.53
2CRE 060 001 200	6 x R0.1	7	20	60	6	£17.33
2CRE 060 001 400	6 x R0.1	7	40	90	6	£22.80
2CRE 060 002 200	6 x R0.2	7	20	60	6	£17.33
2CRE 060 002 400	6 x R0.2	7	40	90	6	£22.80

Part Number	Diameter	Length of Cut	Effective Length	Over-all Length	Shank Dia	Price
	D x R	L1	L2	L	d	£
2CRE 060 002 600	6 x R0.2	7	60	110	6	£29.13
2CRE 060 003 200	6 x R0.3	7	20	60	6	£17.33
2CRE 060 003 400	6 x R0.3	7	40	90	6	£22.80
2CRE 060 005 200	6 x R0.5	7	20	60	6	£17.33
2CRE 060 005 400	6 x R0.5	7	40	90	6	£22.80
2CRE 060 005 600	6 x R0.5	7	60	110	6	£29.13
2CRE 060 010 200	6 x R1	7	20	60	6	£17.33
2CRE 060 010 400	6 x R1	7	40	90	6	£22.80
2CRE 060 010 600	6 x R1	7	60	110	6	£29.13
2CRE 060 015 200	6 x R1.5	7	20	60	6	£17.33
2CRE 060 015 400	6 x R1.5	7	40	90	6	£22.80
2CRE 080 002 220	8 x R0.2	9	22	65	8	£21.13
2CRE 080 002 400	8 x R0.2	9	40	100	8	£28.87
2CRE 080 003 220	8 x R0.3	9	22	65	8	£21.13
2CRE 080 003 400	8 x R0.3	9	40	100	8	£28.87
2CRE 080 005 220	8 x R0.5	9	22	65	8	£21.13
2CRE 080 005 400	8 x R0.5	9	40	100	8	£28.87
2CRE 080 005 600	8 x R0.5	9	60	120	8	£35.07
2CRE 080 010 220	8 x R1	9	22	65	8	£21.13
2CRE 080 010 400	8 x R1	9	40	100	8	£28.87
2CRE 080 010 600	8 x R1	9	60	120	8	£35.07
2CRE 080 015 220	8 x R1.5	9	22	65	8	£21.13
2CRE 080 015 400	8 x R1.5	9	40	100	8	£28.87
2CRE 100 002 240	10 x R0.2	11	24	70	10	£30.27
2CRE 100 002 450	10 x R0.2	11	45	100	10	£40.53
2CRE 100 002 600	10 x R0.2	11	60	120	10	£51.67
2CRE 100 003 240	10 x R0.3	11	24	70	10	£30.27
2CRE 100 003 450	10 x R0.3	11	45	100	10	£40.53
2CRE 100 005 240	10 x R0.5	11	24	70	10	£30.27
2CRE 100 005 450	10 x R0.5	11	45	100	10	£40.53
2CRE 100 005 600	10 x R0.5	11	60	120	10	£51.67
2CRE 100 010 240	10 x R1	11	24	70	10	£30.27
2CRE 100 010 450	10 x R1	11	45	100	10	£40.53
2CRE 100 010 600	10 x R1	11	60	120	10	£51.67
2CRE 100 015 240	10 x R1.5	11	24	70	10	£30.27
2CRE 100 015 450	10 x R1.5	11	45	100	10	£40.53
2CRE 100 020 240	10 x R2	11	24	70	10	£30.27
2CRE 100 020 450	10 x R2	11	45	100	10	£40.53
2CRE 120 002 260	12 x R0.2	13	26	80	12	£36.60
2CRE 120 002 500	12 x R0.2	13	50	110	12	£52.20
2CRE 120 003 260	12 x R0.3	13	26	80	12	£36.60
2CRE 120 003 500	12 x R0.3	13	50	110	12	£52.20
2CRE 120 005 260	12 x R0.5	13	26	80	12	£36.60
2CRE 120 005 500	12 x R0.5	13	50	110	12	£52.20
2CRE 120 005 700	12 x R0.5	13	70	130	12	£65.13
2CRE 120 010 260	12 x R1	13	26	80	12	£36.60
2CRE 120 010 500	12 x R1	13	50	110	12	£52.20
2CRE 120 010 700	12 x R1	13	70	130	12	£65.13
2CRE 120 015 260	12 x R1.5	13	26	80	12	£36.60
2CRE 120 015 500	12 x R1.5	13	50	110	12	£52.20
2CRE 120 020 260	12 x R2	13	26	80	12	£36.60
2CRE 120 020 500	12 x R2	13	50	110	12	£52.20
2CRE 120 030 260	12 x R3	13	26	80	12	£36.60
2CRE 120 030 500	12 x R3	13	50	110	12	£52.20
2CRE 160 005 110	16 x R0.5	20	35	110	16	£91.80
2CRE 160 005 160	16 x R0.5	20	35	160	16	£125.76
2CRE 160 010 110	16 x R1	20	35	110	16	£91.80
2CRE 160 010 160	16 x R1	20	35	160	16	£125.76

- End Mills for pre-hardened and hardened steel (HRc50~62)
- Good wear resistance from Si-based PVD coating.
- Precise edge tolerance.
- Designed for minimizing edge chipping by corner R shape.
- Various corner radius and flute lengths available for a wide range of applications.
- Outstanding performance at high speed machining by ultra-fine (0.2μm) WC grade.



D Size	D Tolerance
Ø0.8 ~ 5	+0 ~ −0.01mm
Ø6 ~ 12	−0.005 ~ −0.015mm

R0.02 ~ 0.5 | R1 ~ 1.5 | R2 ~ 3 | 159P

Part Number	Diameter	Length of Cut	Effective Length	Over-all Length	Shank Dia	Price
	D x R	L1	L2	L	d	£
4CRE 008 0002 020	0.8 x R0.02	0.8	2	45	4	£16.40
4CRE 008 0002 040	0.8 x R0.02	0.8	4	45	4	£16.40
4CRE 008 0002 060	0.8 x R0.02	0.8	6	45	4	£16.40
4CRE 008 0002 080	0.8 x R0.02	0.8	8	45	4	£16.40
4CRE 008 0002 100	0.8 x R0.02	0.8	10	45	4	£16.40
4CRE 008 0002 120	0.8 x R0.02	0.8	12	50	4	£19.13
4CRE 008 0005 020	0.8 x R0.05	0.8	2	45	4	£16.40
4CRE 008 0005 040	0.8 x R0.05	0.8	4	45	4	£16.40
4CRE 008 0005 060	0.8 x R0.05	0.8	6	45	4	£16.40
4CRE 008 0005 080	0.8 x R0.05	0.8	8	45	4	£16.40
4CRE 008 0005 100	0.8 x R0.05	0.8	10	45	4	£16.40
4CRE 008 0005 120	0.8 x R0.05	0.8	12	50	4	£19.13
4CRE 008 001 020	0.8 x R0.1	0.8	2	45	4	£16.40
4CRE 008 001 040	0.8 x R0.1	0.8	4	45	4	£16.40
4CRE 008 001 060	0.8 x R0.1	0.8	6	45	4	£16.40
4CRE 008 001 080	0.8 x R0.1	0.8	8	45	4	£16.40
4CRE 008 001 100	0.8 x R0.1	0.8	10	45	4	£16.40
4CRE 008 001 120	0.8 x R0.1	0.8	12	50	4	£19.13
4CRE 010 0002 040	1 x R0.02	1	4	45	4	£15.47
4CRE 010 0002 060	1 x R0.02	1	6	45	4	£15.47
4CRE 010 0002 080	1 x R0.02	1	8	45	4	£15.47
4CRE 010 0002 100	1 x R0.02	1	10	50	4	£16.20
4CRE 010 0002 120	1 x R0.02	1	12	50	4	£16.20
4CRE 010 0002 140	1 x R0.02	1	14	50	4	£16.20
4CRE 010 0002 160	1 x R0.02	1	16	50	4	£16.20
4CRE 010 0002 200	1 x R0.02	1	20	50	4	£16.80
4CRE 010 0002 250	1 x R0.02	1	25	60	4	£19.13
4CRE 010 0002 300	1 x R0.02	1	30	70	4	£20.80
4CRE 010 0005 040	1 x R0.05	1	4	45	4	£15.47
4CRE 010 0005 060	1 x R0.05	1	6	45	4	£15.47
4CRE 010 0005 080	1 x R0.05	1	8	45	4	£15.47
4CRE 010 0005 100	1 x R0.05	1	10	50	4	£16.20
4CRE 010 0005 120	1 x R0.05	1	12	50	4	£16.20
4CRE 010 0005 140	1 x R0.05	1	14	50	4	£16.20
4CRE 010 0005 160	1 x R0.05	1	16	50	4	£16.20
4CRE 010 0005 200	1 x R0.05	1	20	50	4	£16.80
4CRE 010 0005 250	1 x R0.05	1	25	60	4	£19.13
4CRE 010 0005 300	1 x R0.05	1	30	70	4	£20.80
4CRE 010 001 040	1 x R0.1	1	4	45	4	£15.47
4CRE 010 001 060	1 x R0.1	1	6	45	4	£15.47
4CRE 010 001 080	1 x R0.1	1	8	45	4	£15.47
4CRE 010 001 100	1 x R0.1	1	10	50	4	£16.20
4CRE 010 001 120	1 x R0.1	1	12	50	4	£16.20
4CRE 010 001 140	1 x R0.1	1	14	50	4	£16.20
4CRE 010 001 160	1 x R0.1	1	16	50	4	£16.20
4CRE 010 001 200	1 x R0.1	1	20	50	4	£16.80
4CRE 010 001 250	1 x R0.1	1	25	60	4	£19.13

Part Number	Diameter	Length of Cut	Effective Length	Over-all Length	Shank Dia	Price
	D x R	L1	L2	L	d	£
4CRE 010 001 300	1 x R0.1	1	30	70	4	£20.80
4CRE 010 002 040	1 x R0.2	1	4	45	4	£15.47
4CRE 010 002 060	1 x R0.2	1	6	45	4	£15.47
4CRE 010 002 080	1 x R0.2	1	8	45	4	£15.47
4CRE 010 002 100	1 x R0.2	1	10	50	4	£16.20
4CRE 010 002 120	1 x R0.2	1	12	50	4	£16.20
4CRE 010 002 140	1 x R0.2	1	14	50	4	£16.20
4CRE 010 002 160	1 x R0.2	1	16	50	4	£16.20
4CRE 010 002 200	1 x R0.2	1	20	50	4	£16.80
4CRE 010 002 250	1 x R0.2	1	25	60	4	£19.13
4CRE 010 002 300	1 x R0.2	1	30	70	4	£20.80
4CRE 010 003 040	1 x R0.3	1	4	45	4	£15.47
4CRE 010 003 060	1 x R0.3	1	6	45	4	£15.47
4CRE 010 003 080	1 x R0.3	1	8	45	4	£15.47
4CRE 010 003 100	1 x R0.3	1	10	50	4	£16.20
4CRE 010 003 120	1 x R0.3	1	12	50	4	£16.20
4CRE 010 003 140	1 x R0.3	1	14	50	4	£16.20
4CRE 010 003 160	1 x R0.3	1	16	50	4	£16.20
4CRE 010 003 200	1 x R0.3	1	20	50	4	£16.80
4CRE 010 003 250	1 x R0.3	1	25	60	4	£19.13
4CRE 010 003 300	1 x R0.3	1	30	70	4	£20.80
4CRE 012 0002 040	1.2 x R0.02	1.2	4	45	4	£15.47
4CRE 012 0002 060	1.2 x R0.02	1.2	6	45	4	£15.47
4CRE 012 0002 080	1.2 x R0.02	1.2	8	45	4	£15.47
4CRE 012 0002 100	1.2 x R0.02	1.2	10	50	4	£16.20
4CRE 012 0002 120	1.2 x R0.02	1.2	12	50	4	£16.20
4CRE 012 0002 140	1.2 x R0.02	1.2	14	50	4	£16.20
4CRE 012 0002 160	1.2 x R0.02	1.2	16	50	4	£16.20
4CRE 012 0002 200	1.2 x R0.02	1.2	20	50	4	£16.80
4CRE 012 0005 040	1.2 x R0.05	1.2	4	45	4	£15.47
4CRE 012 0005 060	1.2 x R0.05	1.2	6	45	4	£15.47
4CRE 012 0005 080	1.2 x R0.05	1.2	8	45	4	£15.47
4CRE 012 0005 100	1.2 x R0.05	1.2	10	50	4	£16.20
4CRE 012 0005 120	1.2 x R0.05	1.2	12	50	4	£16.20
4CRE 012 0005 140	1.2 x R0.05	1.2	14	50	4	£16.20
4CRE 012 0005 160	1.2 x R0.05	1.2	16	50	4	£16.20
4CRE 012 0005 200	1.2 x R0.05	1.2	20	50	4	£16.80
4CRE 012 001 040	1.2 x R0.1	1.2	4	45	4	£15.47
4CRE 012 001 060	1.2 x R0.1	1.2	6	45	4	£15.47
4CRE 012 001 080	1.2 x R0.1	1.2	8	45	4	£15.47
4CRE 012 001 100	1.2 x R0.1	1.2	10	50	4	£16.20
4CRE 012 001 120	1.2 x R0.1	1.2	12	50	4	£16.20
4CRE 012 001 140	1.2 x R0.1	1.2	14	50	4	£16.20
4CRE 012 001 160	1.2 x R0.1	1.2	16	50	4	£16.20
4CRE 012 001 200	1.2 x R0.1	1.2	20	50	4	£16.80
4CRE 012 002 040	1.2 x R0.2	1.2	4	45	4	£15.47
4CRE 012 002 060	1.2 x R0.2	1.2	6	45	4	£15.47

4CRE 4 Flute Rib Corner Radius End Mills

Part Number	Diameter	Length of Cut	Effective Length	Over-all Length	Shank Dia	Price
	D x R	L1	L2	L	d	£
4CRE 012 002 080	1.2 x R0.2	1.2	8	45	4	£15.47
4CRE 012 002 100	1.2 x R0.2	1.2	10	50	4	£16.20
4CRE 012 002 120	1.2 x R0.2	1.2	12	50	4	£16.20
4CRE 012 002 140	1.2 x R0.2	1.2	14	50	4	£16.20
4CRE 012 002 160	1.2 x R0.2	1.2	16	50	4	£16.20
4CRE 012 002 200	1.2 x R0.2	1.2	20	50	4	£16.80
4CRE 012 003 040	1.2 x R0.3	1.2	4	45	4	£15.47
4CRE 012 003 060	1.2 x R0.3	1.2	6	45	4	£15.47
4CRE 012 003 080	1.2 x R0.3	1.2	8	45	4	£15.47
4CRE 012 003 100	1.2 x R0.3	1.2	10	50	4	£16.20
4CRE 012 003 120	1.2 x R0.3	1.2	12	50	4	£16.20
4CRE 012 003 140	1.2 x R0.3	1.2	14	50	4	£16.20
4CRE 012 003 160	1.2 x R0.3	1.2	16	50	4	£16.20
4CRE 012 003 200	1.2 x R0.3	1.2	20	50	4	£16.80
4CRE 015 0002 060	1.5 x R0.02	1.5	6	45	4	£15.47
4CRE 015 0002 080	1.5 x R0.02	1.5	8	45	4	£15.47
4CRE 015 0002 100	1.5 x R0.02	1.5	10	50	4	£16.20
4CRE 015 0002 120	1.5 x R0.02	1.5	12	50	4	£16.20
4CRE 015 0002 140	1.5 x R0.02	1.5	14	50	4	£16.20
4CRE 015 0002 160	1.5 x R0.02	1.5	16	50	4	£16.20
4CRE 015 0002 200	1.5 x R0.02	1.5	20	50	4	£16.80
4CRE 015 0002 220	1.5 x R0.02	1.5	22	60	4	£18.13
4CRE 015 0002 250	1.5 x R0.02	1.5	25	60	4	£18.13
4CRE 015 0005 060	1.5 x R0.05	1.5	6	45	4	£15.47
4CRE 015 0005 080	1.5 x R0.05	1.5	8	45	4	£15.47
4CRE 015 0005 100	1.5 x R0.05	1.5	10	50	4	£16.20
4CRE 015 0005 120	1.5 x R0.05	1.5	12	50	4	£16.20
4CRE 015 0005 140	1.5 x R0.05	1.5	14	50	4	£16.20
4CRE 015 0005 160	1.5 x R0.05	1.5	16	50	4	£16.20
4CRE 015 0005 200	1.5 x R0.05	1.5	20	50	4	£16.80
4CRE 015 0005 220	1.5 x R0.05	1.5	22	60	4	£18.13
4CRE 015 0005 250	1.5 x R0.05	1.5	25	60	4	£18.13
4CRE 015 001 060	1.5 x R0.1	1.5	6	45	4	£15.47
4CRE 015 001 080	1.5 x R0.1	1.5	8	45	4	£15.47
4CRE 015 001 100	1.5 x R0.1	1.5	10	50	4	£16.20
4CRE 015 001 120	1.5 x R0.1	1.5	12	50	4	£16.20
4CRE 015 001 140	1.5 x R0.1	1.5	14	50	4	£16.20
4CRE 015 001 160	1.5 x R0.1	1.5	16	50	4	£16.20
4CRE 015 001 200	1.5 x R0.1	1.5	20	50	4	£16.80
4CRE 015 001 220	1.5 x R0.1	1.5	22	60	4	£18.13
4CRE 015 001 250	1.5 x R0.1	1.5	25	60	4	£18.13
4CRE 015 002 060	1.5 x R0.2	1.5	6	45	4	£15.47
4CRE 015 002 080	1.5 x R0.2	1.5	8	45	4	£15.47
4CRE 015 002 100	1.5 x R0.2	1.5	10	50	4	£16.20
4CRE 015 002 120	1.5 x R0.2	1.5	12	50	4	£16.20
4CRE 015 002 140	1.5 x R0.2	1.5	14	50	4	£16.20
4CRE 015 002 160	1.5 x R0.2	1.5	16	50	4	£16.20
4CRE 015 002 200	1.5 x R0.2	1.5	20	50	4	£16.80
4CRE 015 002 220	1.5 x R0.2	1.5	22	60	4	£18.13
4CRE 015 002 250	1.5 x R0.2	1.5	25	60	4	£18.13
4CRE 015 003 060	1.5 x R0.3	1.5	6	45	4	£15.47
4CRE 015 003 080	1.5 x R0.3	1.5	8	45	4	£15.47
4CRE 015 003 100	1.5 x R0.3	1.5	10	50	4	£16.20
4CRE 015 003 120	1.5 x R0.3	1.5	12	50	4	£16.20
4CRE 015 003 140	1.5 x R0.3	1.5	14	50	4	£16.20
4CRE 015 003 160	1.5 x R0.3	1.5	16	50	4	£16.20
4CRE 015 003 200	1.5 x R0.3	1.5	20	50	4	£16.80
4CRE 015 003 220	1.5 x R0.3	1.5	22	60	4	£18.13
4CRE 015 003 250	1.5 x R0.3	1.5	25	60	4	£18.13

Part Number	Diameter	Length of Cut	Effective Length	Over-all Length	Shank Dia	Price
	D x R	L1	L2	L	d	£
4CRE 015 005 060	1.5 x R0.5	1.5	6	45	4	£15.47
4CRE 015 005 080	1.5 x R0.5	1.5	8	45	4	£15.47
4CRE 015 005 100	1.5 x R0.5	1.5	10	50	4	£16.20
4CRE 015 005 120	1.5 x R0.5	1.5	12	50	4	£16.20
4CRE 015 005 140	1.5 x R0.5	1.5	14	50	4	£16.20
4CRE 015 005 160	1.5 x R0.5	1.5	16	50	4	£16.20
4CRE 015 005 200	1.5 x R0.5	1.5	20	50	4	£16.80
4CRE 015 005 220	1.5 x R0.5	1.5	22	60	4	£18.13
4CRE 015 005 250	1.5 x R0.5	1.5	25	60	4	£18.13
4CRE 020 0002 060	2 x R0.02	2	6	45	4	£15.47
4CRE 020 0002 080	2 x R0.02	2	8	45	4	£15.47
4CRE 020 0002 100	2 x R0.02	2	10	50	4	£16.20
4CRE 020 0002 120	2 x R0.02	2	12	50	4	£16.20
4CRE 020 0002 140	2 x R0.02	2	14	50	4	£16.20
4CRE 020 0002 160	2 x R0.02	2	16	50	4	£16.20
4CRE 020 0002 180	2 x R0.02	2	18	50	4	£16.20
4CRE 020 0002 200	2 x R0.02	2	20	50	4	£16.20
4CRE 020 0002 220	2 x R0.02	2	22	60	4	£18.33
4CRE 020 0002 250	2 x R0.02	2	25	60	4	£18.33
4CRE 020 0002 300	2 x R0.02	2	30	70	4	£20.13
4CRE 020 0002 350	2 x R0.02	2	35	70	4	£20.13
4CRE 020 0005 060	2 x R0.05	2	6	45	4	£15.47
4CRE 020 0005 080	2 x R0.05	2	8	45	4	£15.47
4CRE 020 0005 100	2 x R0.05	2	10	50	4	£16.20
4CRE 020 0005 120	2 x R0.05	2	12	50	4	£16.20
4CRE 020 0005 140	2 x R0.05	2	14	50	4	£16.20
4CRE 020 0005 160	2 x R0.05	2	16	50	4	£16.20
4CRE 020 0005 180	2 x R0.05	2	18	50	4	£16.20
4CRE 020 0005 200	2 x R0.05	2	20	50	4	£16.20
4CRE 020 0005 220	2 x R0.05	2	22	60	4	£18.33
4CRE 020 0005 250	2 x R0.05	2	25	60	4	£18.33
4CRE 020 0005 300	2 x R0.05	2	30	70	4	£20.13
4CRE 020 0005 350	2 x R0.05	2	35	70	4	£20.13
4CRE 020 001 060	2 x R0.1	2	6	45	4	£15.47
4CRE 020 001 080	2 x R0.1	2	8	45	4	£15.47
4CRE 020 001 100	2 x R0.1	2	10	50	4	£16.20
4CRE 020 001 120	2 x R0.1	2	12	50	4	£16.20
4CRE 020 001 140	2 x R0.1	2	14	50	4	£16.20
4CRE 020 001 160	2 x R0.1	2	16	50	4	£16.20
4CRE 020 001 180	2 x R0.1	2	18	50	4	£16.20
4CRE 020 001 200	2 x R0.1	2	20	50	4	£16.20
4CRE 020 001 220	2 x R0.1	2	22	60	4	£18.33
4CRE 020 001 250	2 x R0.1	2	25	60	4	£18.33
4CRE 020 001 300	2 x R0.1	2	30	70	4	£20.13
4CRE 020 001 350	2 x R0.1	2	35	70	4	£20.13
4CRE 020 002 060	2 x R0.2	2	6	45	4	£15.47
4CRE 020 002 080	2 x R0.2	2	8	45	4	£15.47
4CRE 020 002 100	2 x R0.2	2	10	50	4	£16.20
4CRE 020 002 120	2 x R0.2	2	12	50	4	£16.20
4CRE 020 002 140	2 x R0.2	2	14	50	4	£16.20
4CRE 020 002 160	2 x R0.2	2	16	50	4	£16.20
4CRE 020 002 180	2 x R0.2	2	18	50	4	£16.20
4CRE 020 002 200	2 x R0.2	2	20	50	4	£16.20
4CRE 020 002 220	2 x R0.2	2	22	60	4	£18.33
4CRE 020 002 250	2 x R0.2	2	25	60	4	£18.33
4CRE 020 002 300	2 x R0.2	2	30	70	4	£20.13
4CRE 020 002 350	2 x R0.2	2	35	70	4	£20.13
4CRE 020 003 060	2 x R0.3	2	6	45	4	£15.47
4CRE 020 003 080	2 x R0.3	2	8	45	4	£15.47

Part Number	Diameter	Length of Cut	Effective Length	Over-all Length	Shank Dia	Price
	D x R	L1	L2	L	d	£
4CRE 020 003 100	2 x R0.3	2	10	50	4	£16.20
4CRE 020 003 120	2 x R0.3	2	12	50	4	£16.20
4CRE 020 003 140	2 x R0.3	2	14	50	4	£16.20
4CRE 020 003 160	2 x R0.3	2	16	50	4	£16.20
4CRE 020 003 180	2 x R0.3	2	18	50	4	£16.20
4CRE 020 003 200	2 x R0.3	2	20	50	4	£16.20
4CRE 020 003 220	2 x R0.3	2	22	60	4	£18.33
4CRE 020 003 250	2 x R0.3	2	25	60	4	£18.33
4CRE 020 003 300	2 x R0.3	2	30	70	4	£20.13
4CRE 020 003 350	2 x R0.3	2	35	70	4	£20.13
4CRE 020 005 060	2 x R0.5	2	6	45	4	£15.47
4CRE 020 005 080	2 x R0.5	2	8	45	4	£15.47
4CRE 020 005 100	2 x R0.5	2	10	50	4	£16.20
4CRE 020 005 120	2 x R0.5	2	12	50	4	£16.20
4CRE 020 005 140	2 x R0.5	2	14	50	4	£16.20
4CRE 020 005 160	2 x R0.5	2	16	50	4	£16.20
4CRE 020 005 180	2 x R0.5	2	18	50	4	£16.20
4CRE 020 005 200	2 x R0.5	2	20	50	4	£16.20
4CRE 020 005 220	2 x R0.5	2	22	60	4	£18.33
4CRE 020 005 250	2 x R0.5	2	25	60	4	£18.33
4CRE 020 005 300	2 x R0.5	2	30	70	4	£20.13
4CRE 020 005 350	2 x R0.5	2	35	70	4	£20.13
4CRE 025 001 100	2.5 x R0.1	2.5	10	50	4	£16.20
4CRE 025 001 120	2.5 x R0.1	2.5	12	50	4	£16.20
4CRE 025 001 160	2.5 x R0.1	2.5	16	50	4	£16.20
4CRE 025 001 200	2.5 x R0.1	2.5	20	50	4	£16.20
4CRE 025 001 250	2.5 x R0.1	2.5	25	60	4	£18.33
4CRE 025 001 300	2.5 x R0.1	2.5	30	70	4	£20.13
4CRE 025 002 100	2.5 x R0.2	2.5	10	50	4	£16.20
4CRE 025 002 120	2.5 x R0.2	2.5	12	50	4	£16.20
4CRE 025 002 160	2.5 x R0.2	2.5	16	50	4	£16.20
4CRE 025 002 200	2.5 x R0.2	2.5	20	50	4	£16.20
4CRE 025 002 250	2.5 x R0.2	2.5	25	60	4	£18.33
4CRE 025 002 300	2.5 x R0.2	2.5	30	70	4	£20.13
4CRE 025 003 100	2.5 x R0.3	2.5	10	50	4	£16.20
4CRE 025 003 120	2.5 x R0.3	2.5	12	50	4	£16.20
4CRE 025 003 160	2.5 x R0.3	2.5	16	50	4	£16.20
4CRE 025 003 200	2.5 x R0.3	2.5	20	50	4	£16.20
4CRE 025 003 250	2.5 x R0.3	2.5	25	60	4	£18.33
4CRE 025 003 300	2.5 x R0.3	2.5	30	70	4	£20.13
4CRE 025 005 100	2.5 x R0.5	2.5	10	50	4	£16.20
4CRE 025 005 120	2.5 x R0.5	2.5	12	50	4	£16.20
4CRE 025 005 160	2.5 x R0.5	2.5	16	50	4	£16.20
4CRE 025 005 200	2.5 x R0.5	2.5	20	50	4	£16.20
4CRE 025 005 250	2.5 x R0.5	2.5	25	60	4	£18.33
4CRE 025 005 300	2.5 x R0.5	2.5	30	70	4	£20.13
4CRE 030 001 100	3 x R0.1	3	10	50	6	£15.80
4CRE 030 001 120	3 x R0.1	3	12	50	6	£16.53
4CRE 030 001 160	3 x R0.1	3	16	55	6	£16.53
4CRE 030 001 200	3 x R0.1	3	20	60	6	£17.27
4CRE 030 001 250	3 x R0.1	3	25	65	6	£18.73
4CRE 030 001 300	3 x R0.1	3	30	70	6	£19.73
4CRE 030 001 350	3 x R0.1	3	35	75	6	£21.07
4CRE 030 001 400	3 x R0.1	3	40	80	6	£23.07
4CRE 030 001 500	3 x R0.1	3	50	100	6	£28.73
4CRE 030 002 100	3 x R0.2	3	10	50	6	£15.80
4CRE 030 002 120	3 x R0.2	3	12	50	6	£16.53
4CRE 030 002 160	3 x R0.2	3	16	55	6	£16.53
4CRE 030 002 200	3 x R0.2	3	20	60	6	£17.27

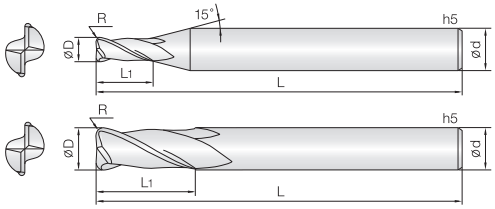
Part Number	Diameter	Length of Cut	Effective Length	Over-all Length	Shank Dia	Price
	D x R	L1	L2	L	d	£
4CRE 030 002 250	3 x R0.2	3	25	65	6	£18.73
4CRE 030 002 300	3 x R0.2	3	30	70	6	£19.73
4CRE 030 002 350	3 x R0.2	3	35	75	6	£21.07
4CRE 030 002 400	3 x R0.2	3	40	80	6	£23.07
4CRE 030 002 500	3 x R0.2	3	50	100	6	£28.73
4CRE 030 003 100	3 x R0.3	3	10	50	6	£15.80
4CRE 030 003 120	3 x R0.3	3	12	50	6	£16.53
4CRE 030 003 160	3 x R0.3	3	16	55	6	£16.53
4CRE 030 003 200	3 x R0.3	3	20	60	6	£17.27
4CRE 030 003 250	3 x R0.3	3	25	65	6	£18.73
4CRE 030 003 300	3 x R0.3	3	30	70	6	£19.73
4CRE 030 003 350	3 x R0.3	3	35	75	6	£21.07
4CRE 030 003 400	3 x R0.3	3	40	80	6	£23.07
4CRE 030 003 500	3 x R0.3	3	50	100	6	£28.73
4CRE 030 005 100	3 x R0.5	3	10	50	6	£15.80
4CRE 030 005 120	3 x R0.5	3	12	50	6	£16.53
4CRE 030 005 160	3 x R0.5	3	16	55	6	£16.53
4CRE 030 005 200	3 x R0.5	3	20	60	6	£17.27
4CRE 030 005 250	3 x R0.5	3	25	65	6	£18.73
4CRE 030 005 300	3 x R0.5	3	30	70	6	£19.73
4CRE 030 005 350	3 x R0.5	3	35	75	6	£21.07
4CRE 030 005 400	3 x R0.5	3	40	80	6	£23.07
4CRE 030 005 500	3 x R0.5	3	50	100	6	£28.73
4CRE 030 005 600	3 x R0.5	3	60	110	6	£32.47
4CRE 030 010 100	3 x R1	3	10	50	6	£15.80
4CRE 030 010 120	3 x R1	3	12	50	6	£16.53
4CRE 030 010 160	3 x R1	3	16	55	6	£16.53
4CRE 030 010 200	3 x R1	3	20	60	6	£17.27
4CRE 030 010 250	3 x R1	3	25	65	6	£18.73
4CRE 030 010 300	3 x R1	3	30	70	6	£19.73
4CRE 030 010 350	3 x R1	3	35	75	6	£21.07
4CRE 030 010 400	3 x R1	3	40	80	6	£23.07
4CRE 030 010 500	3 x R1	3	50	100	6	£28.73
4CRE 030 010 600	3 x R1	3	60	110	6	£32.47
4CRE 040 001 050	4 x R0.1	4	12	50	4	£15.40
4CRE 040 001 070	4 x R0.1	4	20	70	4	£18.27
4CRE 040 001 130	4 x R0.1	4	13	55	6	£16.67
4CRE 040 001 160	4 x R0.1	4	16	55	6	£16.67
4CRE 040 001 200	4 x R0.1	4	20	60	6	£17.40
4CRE 040 001 250	4 x R0.1	4	25	65	6	£18.93
4CRE 040 001 300	4 x R0.1	4	30	70	6	£19.93
4CRE 040 001 350	4 x R0.1	4	35	75	6	£21.20
4CRE 040 001 400	4 x R0.1	4	40	80	6	£23.27
4CRE 040 001 450	4 x R0.1	4	45	90	6	£25.67
4CRE 040 001 500	4 x R0.1	4	50	100	6	£28.73
4CRE 040 001 600	4 x R0.1	4	60	110	6	£32.47
4CRE 040 002 050	4 x R0.2	4	12	50	4	£15.40
4CRE 040 002 070	4 x R0.2	4	20	70	4	£18.27
4CRE 040 002 130	4 x R0.2	4	13	55	6	£16.67
4CRE 040 002 160	4 x R0.2	4	16	55	6	£16.67
4CRE 040 002 200	4 x R0.2	4	20	60	6	£17.40
4CRE 040 002 250	4 x R0.2	4	25	65	6	£18.93
4CRE 040 002 300	4 x R0.2	4	30	70	6	£19.93
4CRE 040 002 350	4 x R0.2	4	35	75	6	£21.20
4CRE 040 002 400	4 x R0.2	4	40	80	6	£23.27
4CRE 040 002 450	4 x R0.2	4	45	90	6	£25.67
4CRE 040 002 500	4 x R0.2	4	50	100	6	£28.73
4CRE 040 002 600	4 x R0.2	4	60	110	6	£32.47
4CRE 040 003 050	4 x R0.3	4	12	50	4	£15.40

4CRE 4 Flute Rib Corner Radius End Mills

Part Number	Diameter	Length of Cut	Effective Length	Over-all Length	Shank Dia	Price
	D x R	L1	L2	L	d	£
4CRE 040 003 070	4 x R0.3	4	20	70	4	£18.27
4CRE 040 003 130	4 x R0.3	4	13	55	6	£16.67
4CRE 040 003 160	4 x R0.3	4	16	55	6	£16.67
4CRE 040 003 200	4 x R0.3	4	20	60	6	£17.40
4CRE 040 003 250	4 x R0.3	4	25	65	6	£18.93
4CRE 040 003 300	4 x R0.3	4	30	70	6	£19.93
4CRE 040 003 350	4 x R0.3	4	35	75	6	£21.20
4CRE 040 003 400	4 x R0.3	4	40	80	6	£23.27
4CRE 040 003 450	4 x R0.3	4	45	90	6	£25.67
4CRE 040 003 500	4 x R0.3	4	50	100	6	£28.73
4CRE 040 003 600	4 x R0.3	4	60	110	6	£32.47
4CRE 040 005 050	4 x R0.5	4	12	50	4	£15.40
4CRE 040 005 070	4 x R0.5	4	20	70	4	£18.27
4CRE 040 005 130	4 x R0.5	4	13	55	6	£16.67
4CRE 040 005 160	4 x R0.5	4	16	55	6	£16.67
4CRE 040 005 200	4 x R0.5	4	20	60	6	£17.40
4CRE 040 005 250	4 x R0.5	4	25	65	6	£18.93
4CRE 040 005 300	4 x R0.5	4	30	70	6	£19.93
4CRE 040 005 350	4 x R0.5	4	35	75	6	£21.20
4CRE 040 005 400	4 x R0.5	4	40	80	6	£23.27
4CRE 040 005 450	4 x R0.5	4	45	90	6	£25.67
4CRE 040 005 500	4 x R0.5	4	50	100	6	£28.73
4CRE 040 005 600	4 x R0.5	4	60	110	6	£32.47
4CRE 040 010 050	4 x R1	4	12	50	4	£15.40
4CRE 040 010 070	4 x R1	4	20	70	4	£18.27
4CRE 040 010 130	4 x R1	4	13	55	6	£16.67
4CRE 040 010 160	4 x R1	4	16	55	6	£16.67
4CRE 040 010 200	4 x R1	4	20	60	6	£17.40
4CRE 040 010 250	4 x R1	4	25	65	6	£18.93
4CRE 040 010 300	4 x R1	4	30	70	6	£19.93
4CRE 040 010 350	4 x R1	4	35	75	6	£21.20
4CRE 040 010 400	4 x R1	4	40	80	6	£23.27
4CRE 040 010 450	4 x R1	4	45	90	6	£25.67
4CRE 040 010 500	4 x R1	4	50	100	6	£28.73
4CRE 040 010 600	4 x R1	4	60	110	6	£32.47
4CRE 050 001 160	5 x R0.1	5	16	60	6	£17.40
4CRE 050 001 300	5 x R0.1	5	30	70	6	£19.93
4CRE 050 001 400	5 x R0.1	5	40	80	6	£23.27
4CRE 050 001 500	5 x R0.1	5	50	100	6	£28.73
4CRE 050 002 160	5 x R0.2	5	16	60	6	£17.40
4CRE 050 002 300	5 x R0.2	5	30	70	6	£19.93
4CRE 050 002 400	5 x R0.2	5	40	80	6	£23.27
4CRE 050 002 500	5 x R0.2	5	50	100	6	£28.73
4CRE 050 003 160	5 x R0.3	5	16	60	6	£17.40
4CRE 050 003 300	5 x R0.3	5	30	70	6	£19.93
4CRE 050 003 400	5 x R0.3	5	40	80	6	£23.27
4CRE 050 003 500	5 x R0.3	5	50	100	6	£28.73
4CRE 050 005 160	5 x R0.5	5	16	60	6	£17.40
4CRE 050 005 300	5 x R0.5	5	30	70	6	£19.93
4CRE 050 005 400	5 x R0.5	5	40	80	6	£23.27
4CRE 050 005 500	5 x R0.5	5	50	100	6	£28.73
4CRE 050 005 600	5 x R0.5	5	60	110	6	£32.47
4CRE 050 010 160	5 x R1	5	16	60	6	£17.40
4CRE 050 010 300	5 x R1	5	30	70	6	£19.93
4CRE 050 010 400	5 x R1	5	40	80	6	£23.27
4CRE 050 010 500	5 x R1	5	50	100	6	£28.73
4CRE 050 010 600	5 x R1	5	60	110	6	£32.47
4CRE 060 001 200	6 x R0.1	7	20	60	6	£17.40
4CRE 060 001 400	6 x R0.1	7	40	80	6	£23.27
4CRE 060 001 500	6 x R0.1	7	50	100	6	£28.73

Part Number	Diameter	Length of Cut	Effective Length	Over-all Length	Shank Dia	Price
	D x R	L1	L2	L	d	£
4CRE 060 002 200	6 x R0.2	7	20	60	6	£17.40
4CRE 060 002 400	6 x R0.2	7	40	80	6	£23.27
4CRE 060 002 500	6 x R0.2	7	50	100	6	£28.73
4CRE 060 002 600	6 x R0.2	7	60	110	6	£32.47
4CRE 060 003 200	6 x R0.3	7	20	60	6	£17.40
4CRE 060 003 400	6 x R0.3	7	40	80	6	£23.27
4CRE 060 003 500	6 x R0.3	7	50	100	6	£28.73
4CRE 060 005 200	6 x R0.5	7	20	60	6	£17.40
4CRE 060 005 400	6 x R0.5	7	40	80	6	£23.27
4CRE 060 005 500	6 x R0.5	7	50	100	6	£28.73
4CRE 060 005 600	6 x R0.5	7	60	110	6	£32.47
4CRE 060 010 200	6 x R1	7	20	60	6	£17.40
4CRE 060 010 400	6 x R1	7	40	80	6	£23.27
4CRE 060 010 500	6 x R1	7	50	100	6	£28.73
4CRE 060 010 600	6 x R1	7	60	110	6	£32.47
4CRE 060 015 200	6 x R1.5	7	20	60	6	£17.40
4CRE 060 015 400	6 x R1.5	7	40	80	6	£23.27
4CRE 060 015 500	6 x R1.5	7	50	100	6	£28.73
4CRE 080 002 220	8 x R0.2	9	22	65	8	£26.27
4CRE 080 002 400	8 x R0.2	9	40	100	8	£32.87
4CRE 080 003 220	8 x R0.3	9	22	65	8	£26.27
4CRE 080 003 400	8 x R0.3	9	40	100	8	£33.87
4CRE 080 005 220	8 x R0.5	9	22	65	8	£26.27
4CRE 080 005 400	8 x R0.5	9	40	100	8	£33.87
4CRE 080 005 600	8 x R0.5	9	60	120	8	£42.13
4CRE 080 010 220	8 x R1	9	22	65	8	£26.27
4CRE 080 010 400	8 x R1	9	40	100	8	£33.87
4CRE 080 010 600	8 x R1	9	60	120	8	£42.13
4CRE 080 015 220	8 x R1.5	9	22	65	8	£26.27
4CRE 080 015 400	8 x R1.5	9	40	100	8	£33.87
4CRE 080 020 220	8 x R2	9	22	65	8	£26.27
4CRE 080 020 400	8 x R2	9	40	100	8	£33.87
4CRE 100 002 240	10 x R0.2	11	24	70	10	£36.67
4CRE 100 002 400	10 x R0.2	11	40	100	10	£48.13
4CRE 100 003 240	10 x R0.3	11	24	70	10	£36.67
4CRE 100 003 400	10 x R0.3	11	40	100	10	£47.20
4CRE 100 005 240	10 x R0.5	11	24	70	10	£36.67
4CRE 100 005 400	10 x R0.5	11	40	100	10	£47.20
4CRE 100 005 600	10 x R0.5	11	60	120	10	£59.67
4CRE 100 010 240	10 x R1	11	24	70	10	£36.67
4CRE 100 010 400	10 x R1	11	40	100	10	£47.20
4CRE 100 010 600	10 x R1	11	60	120	10	£59.67
4CRE 100 015 240	10 x R1.5	11	24	70	10	£36.67
4CRE 100 015 400	10 x R1.5	11	40	100	10	£47.20
4CRE 100 020 240	10 x R2	11	24	70	10	£36.67
4CRE 100 020 400	10 x R2	11	40	100	10	£59.67
4CRE 100 025 240	10 x R2.5	11	24	70	10	£36.67
4CRE 120 003 260	12 x R0.3	13	26	80	12	£45.00
4CRE 120 005 260	12 x R0.5	13	26	80	12	£45.00
4CRE 120 005 400	12 x R0.5	13	40	110	12	£57.00
4CRE 120 005 600	12 x R0.5	13	60	130	12	£76.67
4CRE 120 010 260	12 x R1	13	26	80	12	£45.00
4CRE 120 010 400	12 x R1	13	40	110	12	£57.00
4CRE 120 010 600	12 x R1	13	26	80	12	£76.67
4CRE 120 015 260	12 x R1.5	13	26	80	12	£45.00
4CRE 120 015 400	12 x R1.5	13	40	110	12	£57.00
4CRE 120 020 260	12 x R2	13	26	80	12	£45.00
4CRE 120 020 400	12 x R2	13	40	110	12	£57.00
4CRE 120 030 260	12 x R3	13	26	80	12	£45.00

- End Mills for pre-hardened and hardened steel (HRc50~62)
- Good wear resistance from Si-based PVD coating.
- Precise edge tolerance.
- Designed for minimizing edge chipping by corner R shape.
- Various corner radius and flute lengths available for a wide range of applications.
- Outstanding performance at high speed machining by ultra-fine (0.2μm) WC grade.



D Size	D Tolerance
ø0.2 ~ 5.5	+0 ~ −0.01mm
ø6 ~ 12	−0.005 ~ −0.015mm
ø14 ~ 16	−0.01 ~ −0.02mm

Part Number	Diameter	Length of Cut	Overall Length	Shank Dia	Price
	D x R	L1	L	d	£
2NCR 002 0002 S04	0.2 x R0.02	0.6	45	4	£21.33
2NCR 002 0005 S04	0.2 x R0.05	0.6	45	4	£21.33
2NCR 003 0002 S04	0.3 x R0.02	0.6	45	4	£19.20
2NCR 003 0005 S04	0.3 x R0.05	0.6	45	4	£19.20
2NCR 003 001 S04	0.3 x R0.1	0.6	45	4	£19.20
2NCR 004 0002 S04	0.4 x R0.02	0.8	45	4	£18.33
2NCR 004 0005 S04	0.4 x R0.05	0.8	45	4	£18.33
2NCR 00 4001 S04	0.4 x R0.1	0.8	45	4	£18.33
2NCR 005 0002 S04	0.5 x R0.02	1	45	4	£16.93
2NCR 005 0005 S04	0.5 x R0.05	1	45	4	£16.93
2NCR 005 001 S04	0.5 x R0.1	1	45	4	£16.93
2NCR 006 0002 S04	0.6 x R0.02	1.2	45	4	£16.93
2NCR 006 0005 S04	0.6 x R0.05	1.2	45	4	£16.93
2NCR 006 001 S04	0.6 x R0.1	1.2	45	4	£16.93
2NCR 006 002 S04	0.6 x R0.2	1.2	45	4	£16.93
2NCR 007 0005 S04	0.7 x R0.05	1.4	45	4	£16.20
2NCR 007 001 S04	0.7 x R0.1	1.4	45	4	£16.20
2NCR 007 002 S04	0.7 x R0.2	1.4	45	4	£16.20
2NCR 008 0002 S04	0.8 x R0.02	1.6	45	4	£15.47
2NCR 008 0005 S04	0.8 x R0.05	1.6	45	4	£15.47
2NCR 008 001 S04	0.8 x R0.1	1.6	45	4	£15.47
2NCR 008 002 S04	0.8 x R0.2	1.6	45	4	£15.47
2NCR 009 0005 S04	0.9 x R0.05	1.8	45	4	£15.47
2NCR 009 001 S04	0.9 x R0.1	1.8	45	4	£15.47
2NCR 010 0002 S04	1 x R0.02	2.5	45	4	£13.47
2NCR 010 0005 S04	1 x R0.05	2.5	45	4	£13.47
2NCR 010 001 S04	1 x R0.1	2.5	45	4	£13.47
2NCR 010 002 S04	1 x R0.2	2.5	45	4	£13.47
2NCR 010 003 S04	1 x R0.3	2.5	45	4	£13.47
2NCR 010 004 S04	1 x R0.4	2.5	45	4	£13.47
2NCR 012 0005 S04	1.2 x R0.05	3.2	45	4	£13.47
2NCR 012 001 S04	1.2 x R0.1	3.2	45	4	£13.47
2NCR 012 002 S04	1.2 x R0.2	3.2	45	4	£13.47
2NCR 012 003 S04	1.2 x R0.3	3.2	45	4	£13.47
2NCR 015 0002 S04	1.5 x R0.02	4	45	4	£13.47
2NCR 015 0005 S04	1.5 x R0.05	4	45	4	£13.47
2NCR 015 001 S04	1.5 x R0.1	4	45	4	£13.47
2NCR 015 002 S04	1.5 x R0.2	4	45	4	£13.47
2NCR 015 003 S04	1.5 x R0.3	4	45	4	£13.47
2NCR 015 004 S04	1.5 x R0.4	4	45	4	£13.47
2NCR 015 005 S04	1.5 x R0.5	4	45	4	£13.47
2NCR 020 0002 S04	2 x R0.02	6	45	4	£13.47
2NCR 020 0005 S04	2 x R0.05	6	45	4	£13.47
2NCR 020 001 S04	2 x R0.1	6	45	4	£13.47

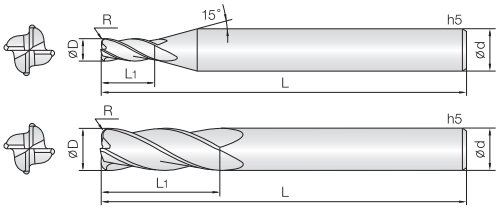
Part Number	Diameter	Length of Cut	Overall Length	Shank Dia	Price
	D x R	L1	L	d	£
2NCR 020 002 S04	2 x R0.2	6	45	4	£13.47
2NCR 020 003 S04	2 x R0.3	6	45	4	£13.47
2NCR 020 004 S04	2 x R0.4	6	45	4	£13.47
2NCR 020 005 S04	2 x R0.5	6	45	4	£13.47
2NCR 025 0005 S04	2.5 x R0.05	6	50	4	£14.93
2NCR 025 001 S04	2.5 x R0.1	6	50	4	£14.93
2NCR 025 002 S04	2.5 x R0.2	6	50	4	£14.93
2NCR 025 003 S04	2.5 x R0.3	6	50	4	£14.93
2NCR 025 004 S04	2.5 x R0.4	6	50	4	£14.93
2NCR 025 005 S04	2.5 x R0.5	6	50	4	£14.93
2NCR 030 0005 S06	3 x R0.05	8	60	6	£15.20
2NCR 030 001 S06	3 x R0.1	8	60	6	£15.20
2NCR 030 002 S06	3 x R0.2	8	60	6	£15.20
2NCR 030 003 S06	3 x R0.3	8	60	6	£15.20
2NCR 030 004 S06	3 x R0.4	8	60	6	£15.20
2NCR 030 005 S06	3 x R0.5	8	60	6	£15.20
2NCR 030 010 S06	3 x R1	8	60	6	£15.20
2NCR 035 001 S06	3.5 x R0.1	9	70	6	£15.80
2NCR 035 002 S06	3.5 x R0.2	9	70	6	£15.80
2NCR 035 003 S06	3.5 x R0.3	9	70	6	£15.80
2NCR 035 005 S06	3.5 x R0.5	9	70	6	£15.80
2NCR 035 010 S06	3.5 x R1	9	70	6	£15.80
2NCR 040 0005 060	4 x R0.05	9	60	4	£14.47
2NCR 040 0005 080	4 x R0.05	9	80	4	£15.00
2NCR 040 0005 S06	4 x R0.05	9	70	6	£15.80
2NCR 040 001 060	4 x R0.1	9	60	4	£14.47
2NCR 040 001 080	4 x R0.1	9	80	4	£15.00
2NCR 040 001 S06	4 x R0.1	10	70	6	£15.80
2NCR 040 002 060	4 x R0.2	9	60	4	£14.47
2NCR 040 002 080	4 x R0.2	9	80	4	£15.00
2NCR 040 002 S06	4 x R0.2	10	70	6	£15.80
2NCR 040 003 060	4 x R0.3	9	60	4	£14.47
2NCR 040 003 080	4 x R0.3	9	80	4	£15.00
2NCR 040 003 S06	4 x R0.3	10	70	6	£15.80
2NCR 040 004 060	4 x R0.4	9	60	4	£14.47
2NCR 040 004 080	4 x 0.4	9	80	4	£15.00
2NCR 040 004 S06	4 x R0.4	10	70	6	£15.80
2NCR 040 005 060	4 x R0.5	9	60	4	£14.47
2NCR 040 005 080	4 x R0.5	9	80	4	£15.00
2NCR 040 005 S06	4 x R0.5	10	70	6	£15.80
2NCR 040 010 060	4 x R1	9	60	4	£14.47
2NCR 040 010 080	4 x R1	9	80	4	£15.00
2NCR 040 010 S06	4 x R1	10	70	6	£15.80

2NCR 2 Flute Corner Radius End Mills

Part Number	Diameter	Length of Cut	Overall Length	Shank Dia	Price
	D x R	L1	L	d	£
2NCR 045 001 S06	4.5 x R0.1	11	75	6	£16.53
2NCR 045 002 S06	4.5 x R0.2	11	75	6	£16.53
2NCR 045 003 S06	4.5 x R0.3	11	75	6	£16.53
2NCR 045 005 S06	4.5 x R0.5	11	75	6	£16.53
2NCR 045 010 S06	4.5 x R1	11	75	6	£16.53
2NCR 050 001 S06	5 x R0.1	13	75	6	£16.53
2NCR 050 002 S06	5 x R0.2	13	75	6	£16.53
2NCR 050 003 S06	5 x R0.3	13	75	6	£16.53
2NCR 050 004 S06	5 x R0.4	13	75	6	£16.53
2NCR 050 005 S06	5 x R0.5	13	75	6	£16.53
2NCR 050 010 S06	5 x R1	13	75	6	£16.53
2NCR 055 002 S06	5.5 x R0.2	13	75	6	£19.00
2NCR 005 003 S06	5.5 x R0.3	13	75	6	£19.00
2NCR 055 005 S06	5.5 x R0.5	13	75	6	£19.00
2NCR 055 010 S06	5.5 x R1	13	75	6	£19.00
2NCR 060 0005 060	6 x R0.05	11	60	6	£14.87
2NCR 060 0005 090	6 x R0.05	13	90	6	£16.53
2NCR 060 001 060	6 x R0.1	11	60	6	£14.87
2NCR 060 001 090	6 x R0.1	13	90	6	£16.53
2NCR 060 002 060	6 x R0.2	11	60	6	£14.87
2NCR 060 002 090	6 x R0.2	13	90	6	£16.53
2NCR 060 003 060	6 x R0.3	11	60	6	£14.87
2NCR 060 003 090	6 x R0.3	13	90	6	£16.53
2NCR 060 004 060	6 x R0.4	11	60	6	£14.87
2NCR 060 004 090	6 x R0.4	13	90	6	£16.53
2NCR 060 005 060	6 x R0.5	11	60	6	£14.87
2NCR 060 005 090	6 x R0.5	13	90	6	£16.53
2NCR 060 010 060	6 x R1	11	60	6	£14.87
2NCR 060 010 090	6 x R1	13	90	6	£16.53
2NCR 060 015 060	6 x R1.5	11	60	6	£14.87
2NCR 060 015 090	6 x R1.5	13	90	6	£16.53
2NCR 060 020 060	6 x R2	11	60	6	£14.87
2NCR 060 020 090	6 x R2	13	90	6	£16.53
2NCR 060 025 090	6 x R2.5	13	90	6	£18.13
2NCR 080 001 070	8 x R0.1	16	70	8	£24.20
2NCR 080 001 100	8 x R0.1	19	100	8	£26.80
2NCR 080 002 070	8 x R0.2	16	70	8	£24.20
2NCR 080 002 100	8 x R0.2	19	100	8	£26.80
2NCR 080 003 070	8 x R0.3	16	70	8	£24.20
2NCR 080 003 100	8 x R0.3	19	100	8	£26.80
2NCR 080 005 070	8 x R0.5	16	70	8	£24.20
2NCR 080 005 100	8 x R0.5	19	100	8	£26.80
2NCR 080 005 120	8 x R0.5	19	120	8	£34.87
2NCR 080 010 070	8 x R1	16	70	8	£24.20
2NCR 080 010 100	8 x R1	19	100	8	£26.80
2NCR 080 010 120	8 x R1	19	120	8	£34.87
2NCR 080 015 070	8 x R1.5	16	70	8	£24.20
2NCR 080 015 100	8 x R1.5	19	100	8	£26.80
2NCR 080 020 070	8 x R2	16	70	8	£24.20
2NCR 080 020 100	8 x R2	19	100	8	£26.80
2NCR 080 025 100	8 x R2.5	19	100	8	£26.80
2NCR 080 030 100	8 x R3	19	100	8	£26.80
2NCR 080 035 100	8 x R3.5	19	100	8	£29.47
2NCR 100 001 075	10 x R0.1	19	75	10	£31.87
2NCR 100 001 100	10 x R0.1	22	100	10	£35.33
2NCR 100 002 075	10 x R0.2	19	75	10	£31.87
2NCR 100 002 100	10 x R0.2	22	100	10	£35.33
2NCR 100 003 075	10 x R0.3	19	75	10	£31.87
2NCR 100 003 100	10 x R0.3	22	100	10	£35.33

Part Number	Diameter	Length of Cut	Overall Length	Shank Dia	Price
	D x R	L1	L	d	£
2NCR 100 005 075	10 x R0.5	19	75	10	£31.87
2NCR 100 005 100	10 x R0.5	22	100	10	£35.33
2NCR 100 005 130	10 x R0.5	22	130	10	£46.00
2NCR 100 010 075	10 x R1	19	75	10	£31.87
2NCR 100 010 100	10 x R1	22	100	10	£35.33
2NCR 100 010 130	10 x R1	22	130	10	£46.00
2NCR 100 015 075	10 x R1.5	19	75	10	£31.87
2NCR 100 015 100	10 x R1.5	22	100	10	£35.33
2NCR 100 015 130	10 x R1.5	22	130	10	£46.00
2NCR 100 020 075	10 x R2	19	75	10	£31.87
2NCR 100 020 100	10 x R2	22	100	10	£35.33
2NCR 100 025 100	10 x R2.5	22	100	10	£35.33
2NCR 100 030 100	10 x R3	22	100	10	£35.33
2NCR 100 040 100	10 x R4	22	100	10	£38.87
2NCR 120 001 080	12 x R0.1	22	80	12	£42.67
2NCR 120 001 110	12 x R0.1	26	110	12	£47.40
2NCR 120 002 080	12 x R0.2	22	80	12	£42.67
2NCR 120 002 110	12 x R0.2	26	110	12	£47.40
2NCR 120 003 080	12 x R0.3	22	80	12	£42.67
2NCR 120 003 110	12 x R0.3	26	110	12	£47.40
2NCR 120 005 080	12 x R0.5	22	80	12	£42.67
2NCR 120 005 110	12 x R0.5	26	110	12	£47.40
2NCR 120 005 130	12 x R0.5	26	130	12	£57.00
2NCR 120 010 080	12 x R1	22	80	12	£42.67
2NCR 120 010 110	12 x R1	26	110	12	£47.40
2NCR 120 010 130	12 x R1	26	130	12	£57.00
2NCR 120 015 080	12 x R1.5	22	80	12	£42.67
2NCR 120 015 110	12 x R1.5	26	110	12	£47.40
2NCR 120 015 130	12 x R1.5	26	130	12	£57.00
2NCR 120 020 080	12 x R2	22	80	12	£42.67
2NCR 120 020 110	12 x R2	26	110	12	£47.40
2NCR 120 020 130	12 x R2	26	130	12	£57.00
2NCR 120 025 110	12 x R2.5	26	110	12	£47.40
2NCR 120 030 110	12 x R3	26	110	12	£47.40
2NCR 120 040 110	12 x R4	26	110	12	£52.13
2NCR 120 050 110	12 x R5	26	110	12	£52.13
2NCR 140 005 110	14 x R0.5	30	110	14	£75.60
2NCR 140 010 110	14 x R1	30	110	14	£75.60
2NCR 140 020 110	14 x R2	30	110	14	£75.60
2NCR 160 005 160	16 x R0.5	32	160	16	£118.20
2NCR 160 010 160	16 x R1	32	160	16	£118.20

- End Mills for pre-hardened and hardened steel (HRc50~62)
- Good wear resistance from Si-based PVD coating.
- Precise edge tolerance.
- Designed for minimizing edge chipping by corner R shape.
- Various corner radius and flute lengths available for a wide range of applications.
- Outstanding performance at high speed machining by ultra-fine (0.2μm) WC grade.



D Size	D Tolerance
ø0.5 ~ 5.5	+0 ~ −0.01mm
ø6 ~ 12	−0.005 ~ −0.015mm
ø14 ~ 20	−0.01 ~ −0.02mm

Part Number	Diameter	Length of Cut	Overall Length	Shank Dia	Price
	D x R	L1	L	d	£
4NCR 005 0005 S04	0.5 x R0.05	1	45	4	£18.47
4NCR 005 001 S04	0.5 x R0.1	1	45	4	£18.47
4NCR 006 001 S04	0.6 x R0.1	1.2	45	4	£17.67
4NCR 006 002 S04	0.6 x R0.2	1.2	45	4	£17.67
4NCR 008 001 S04	0.8 x R0.1	1.6	45	4	£15.80
4NCR 008 002 S04	0.8 x R0.2	1.6	45	4	£15.80
4NCR 010 0002 S04	1 x R0.02	2.5	45	4	£13.73
4NCR 010 0005 S04	1 x R0.05	2.5	45	4	£13.73
4NCR 010 001 S04	1 x R0.1	2.5	45	4	£13.73
4NCR 010 002 S04	1 x R0.2	2.5	45	4	£13.73
4NCR 010 003 S04	1 x R0.3	2.5	45	4	£13.73
4NCR 012 0002 S04	1.2 x R0.02	4	45	4	£13.73
4NCR 012 0005 S04	1.2 x R0.05	4	45	4	£13.73
4NCR 012 001 S04	1.2 x R0.1	4	45	4	£13.73
4NCR 012 002 S04	1.2 x R0.2	4	45	4	£13.73
4NCR 012 003 S04	1.2 x R0.3	4	45	4	£13.73
4NCR 015 0002 S04	1.5 x R0.02	4	45	4	£13.73
4NCR 015 0005 S04	1.5 x R0.05	4	45	4	£13.73
4NCR 015 001 S04	1.5 x R0.1	4	45	4	£13.73
4NCR 015 002 S04	1.5 x R0.2	4	45	4	£13.73
4NCR 015 003 S04	1.5 x R0.3	4	45	4	£13.73
4NCR 015 004 S04	1.5 x R0.4	4	45	4	£13.73
4NCR 015 005 S04	1.5 x R0.5	4	45	4	£13.73
4NCR 020 0002 S04	2 x R0.02	6	45	4	£13.73
4NCR 020 0005 S04	2 x R0.05	6	45	4	£13.73
4NCR 020 001 S04	2 x R0.1	6	45	4	£13.73
4NCR 020 002 S04	2 x R0.2	6	45	4	£13.73
4NCR 020 003 S04	2 x R0.3	6	45	4	£13.73
4NCR 020 004 S04	2 x R0.4	6	45	4	£13.73
4NCR 020 005 S04	2 x R0.5	6	45	4	£13.73
4NCR 025 0005 S04	2.5 x R0.05	6	50	4	£15.07
4NCR 025 001 S04	2.5 x R0.1	6	50	4	£15.07
4NCR 025 002 S04	2.5 x R0.2	6	50	4	£15.07
4NCR 025 003 S04	2.5 x R0.3	6	50	4	£15.07
4NCR 025 005 S04	2.5 x R0.5	6	50	4	£15.07
4NCR 030 0005 S06	3 x R0.05	8	60	6	£18.00
4NCR 030 001 S06	3 x R0.1	8	60	6	£18.00
4NCR 030 002 S06	3 x R0.2	8	60	6	£18.00
4NCR 030 003 S06	3 x R0.3	8	60	6	£18.00
4NCR 030 004 S06	3 x R0.4	8	60	6	£18.00
4NCR 030 005 S06	3 x R0.5	8	60	6	£18.00
4NCR 030 010 S06	3 x R1	8	60	6	£18.00
4NCR 040 0005 060	4 x R0.05	9	60	4	£16.47
4NCR 040 0005 080	4 x R0.05	9	80	4	£17.07

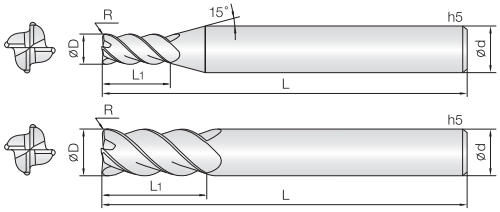
Part Number	Diameter	Length of Cut	Overall Length	Shank Dia	Price
	D x R	L1	L	d	£
4NCR 040 0005 S06	4 x R0.05	10	70	6	£18.00
4NCR 040 001 060	4 x R0.1	9	60	4	£16.47
4NCR 040 001 080	4 x R0.1	9	80	4	£17.07
4NCR 040 001 S06	4 x R0.1	10	70	6	£18.00
4NCR 040 002 060	4 x R0.2	9	60	4	£16.47
4NCR 040 002 080	4 x R0.2	9	80	4	£17.07
4NCR 040 002 S06	4 x R0.2	10	70	6	£18.00
4NCR 040 003 060	4 x R0.3	9	60	4	£16.47
4NCR 040 003 080	4 x R0.3	9	80	4	£17.07
4NCR 040 003 S06	4 x R0.3	10	70	6	£18.00
4NCR 040 004 060	4 x R0.4	9	60	4	£16.47
4NCR 040 004 080	4 x R0.4	9	80	4	£17.07
4NCR 040 004 S06	4 x R0.4	10	70	6	£18.00
4NCR 040 005 060	4 x R0.5	9	60	4	£16.47
4NCR 040 005 080	4 x R0.5	9	80	4	£17.07
4NCR 040 005 S06	4 x R0.5	10	70	6	£18.00
4NCR 040 010 060	4 x R1	9	60	4	£16.47
4NCR 040 010 080	4 x R1	9	80	4	£17.07
4NCR 040 010 S06	4 x R1	10	70	6	£18.00
4NCR 050 0005 S06	5 x R0.05	13	75	6	£19.00
4NCR 050 001 S06	5 x R0.1	13	75	6	£19.00
4NCR 050 002 S06	5 x R0.2	13	75	6	£19.00
4NCR 050 003 S06	5 x R0.3	13	75	6	£19.00
4NCR 050 004 S06	5 x R0.4	13	75	6	£19.00
4NCR 050 005 S06	5 x R0.5	13	75	6	£19.00
4NCR 050 010 S06	5 x R1	13	75	6	£19.00
4NCR 055 002 S06	5.5 x R0.2	13	75	6	£21.87
4NCR 055 003 S06	5.5 x R0.3	13	75	6	£21.87
4NCR 055 005 S06	5.5 x R0.5	13	75	6	£21.87
4NCR 055 010 S06	5.5 x R1	13	75	6	£21.87
4NCR 060 0005 080	6 x R0.05	11	80	6	£19.87
4NCR 060 001 060	6 x R0.1	11	60	6	£17.87
4NCR 060 001 080	6 x R0.1	13	80	6	£19.87
4NCR 060 002 060	6 x R0.2	11	60	6	£17.87
4NCR 060 002 080	6 x R0.2	13	80	6	£19.87
4NCR 060 003 060	6 x R0.3	11	60	6	£17.87
4NCR 060 003 080	6 x R0.3	13	80	6	£19.87
4NCR 060 004 080	6 x R0.4	13	80	6	£19.87
4NCR 060 005 060	6 x R0.5	11	60	6	£17.87
4NCR 060 005 080	6 x R0.5	13	80	6	£19.87
4NCR 060 010 060	6 x R1	11	60	6	£17.87
4NCR 060 010 080	6 x R1	13	80	6	£19.87
4NCR 060 015 060	6 x R1.5	11	60	6	£17.87
4NCR 060 015 080	6 x R1.5	13	80	6	£19.87

4NCR 4 Flute Corner Radius End Mills

Part Number	Diameter	Length of Cut	Overall Length	Shank Dia	Price
	D x R	L1	L	d	£
4NCR 060 020 060	6 x R2	11	60	6	£17.87
4NCR 060 020 080	6 x R2	13	80	6	£19.87
4NCR 080 001 070	8 x R0.1	16	70	8	£26.07
4NCR 080 001 090	8 x R0.1	19	90	8	£29.07
4NCR 080 002 070	8 x R0.2	16	70	8	£26.07
4NCR 080 002 090	8 x R0.2	19	90	8	£29.07
4NCR 080 003 070	8 x R0.3	16	70	8	£26.07
4NCR 080 003 090	8 x R0.3	19	90	8	£29.07
4NCR 080 005 070	8 x R0.5	16	70	8	£26.07
4NCR 080 005 090	8 x R0.5	19	90	8	£29.07
4NCR 080 005 110	8 x R0.5	19	110	8	£34.87
4NCR 080 010 070	8 x R1	16	70	8	£26.07
4NCR 080 010 090	8 x R1	19	90	8	£29.07
4NCR 080 010 110	8 x R1	19	110	8	£34.87
4NCR 080 015 070	8 x R1.5	16	70	8	£26.07
4NCR 080 015 090	8 x R1.5	19	90	8	£29.07
4NCR 080 015 110	8 x R1.5	19	110	8	£34.87
4NCR 080 020 070	8 x R2	16	70	8	£26.07
4NCR 080 020 090	8 x R2	19	90	8	£29.07
4NCR 080 020 110	8 x R2	19	110	8	£34.87
4NCR 080 025 090	8 x R2.5	19	90	8	£31.93
4NCR 100 001 075	10 x R0.1	19	75	10	£37.60
4NCR 100 001 100	10 x R0.1	22	100	10	£41.73
4NCR 100 002 075	10 x R0.2	19	75	10	£37.60
4NCR 100 002 100	10 x R0.2	22	100	10	£41.73
4NCR 100 002 120	10 x R0.2	22	120	10	£50.13
4NCR 100 003 075	10 x R0.3	19	75	10	£37.60
4NCR 100 003 100	10 x R0.3	22	100	10	£41.73
4NCR 100 005 075	10 x R0.5	19	75	10	£37.60
4NCR 100 005 100	10 x R0.5	22	100	10	£41.73
4NCR 100 005 120	10 x R0.5	22	120	10	£50.13
4NCR 100 010 075	10 x R1	19	75	10	£37.60
4NCR 100 010 100	10 x R1	22	100	10	£41.73
4NCR 100 010 120	10 x R1	22	120	10	£50.13
4NCR 100 015 075	10 x R1.5	19	75	10	£37.60
4NCR 100 015 100	10 x R1.5	22	100	10	£41.73
4NCR 100 015 120	10 x R1.5	22	120	10	£50.13
4NCR 100 020 075	10 x R2	19	75	10	£37.60
4NCR 100 020 100	10 x R2	22	100	10	£41.73
4NCR 100 020 120	10 x R2	22	120	10	£50.13
4NCR 100 025 075	10 x R2.5	19	75	10	£37.60
4NCR 100 025 100	10 x R2.5	22	100	10	£41.73
4NCR 100 025 120	10 x R2.5	22	120	10	£50.13
4NCR 100 030 100	10 x R3	22	100	10	£45.87
4NCR 120 002 080	12 x R0.2	22	80	12	£45.53
4NCR 120 002 110	12 x R0.2	26	110	12	£50.60
4NCR 120 002 130	12 x R0.2	26	130	12	£60.73
4NCR 120 003 080	12 x R0.3	22	80	12	£45.53
4NCR 120 003 110	12 x R0.3	26	110	12	£50.60
4NCR 120 005 080	12 x R0.5	22	80	12	£45.53
4NCR 120 005 110	12 x R0.5	26	110	12	£50.60
4NCR 120 005 130	12 x R0.5	26	130	12	£60.73
4NCR 120 010 080	12 x R1	22	80	12	£45.53
4NCR 120 010 110	12 x R1	26	110	12	£50.60
4NCR 120 010 130	12 x R1	26	130	12	£60.73
4NCR 120 015 080	12 x R1.5	22	80	12	£45.53
4NCR 120 015 110	12 x R1.5	26	110	12	£50.60
4NCR 120 015 130	12 x R1.5	26	130	12	£60.73
4NCR 120 020 080	12 x R2	22	80	12	£45.53

Part Number	Diameter	Length of Cut	Overall Length	Shank Dia	Price
	D x R	L1	L	d	£
4NCR 120 020 110	12 x R2	26	110	12	£50.60
4NCR 120 020 130	12 x R2	26	130	12	£60.73
4NCR 120 025 080	12 x R2.5	22	80	12	£45.53
4NCR 120 025 110	12 x R2.5	26	110	12	£50.60
4NCR 120 025 130	12 x R2.5	26	130	12	£60.73
4NCR 120 030 080	12 x R3	22	80	12	£45.53
4NCR 120 030 110	12 x R3	26	110	12	£50.60
4NCR 120 030 130	12 x R3	26	130	12	£60.73
4NCR 120 035 110	12 x R3.5	26	110	12	£55.60
4NCR 120 040 110	12 x R4	26	110	12	£55.60
4NCR 140 005 110	14 x R0.5	30	110	14	£80.40
4NCR 140 010 110	14 x R1	30	110	14	£80.40
4NCR 140 020 110	14 x R2	30	110	14	£80.40
4NCR 160 005 110	16 x R0.5	32	110	16	£89.22
4NCR 160 005 160	16 x R0.5	32	160	16	£124.92
4NCR 160 010 110	16 x R1	32	110	16	£89.22
4NCR 160 010 160	16 x R1	32	160	16	£124.92
4NCR 160 015 110	16 x R1.5	32	110	16	£89.22
4NCR 160 020 110	16 x R2	32	110	16	£89.22
4NCR 160 030 110	16 x R3	32	110	16	£89.22
4NCR 200 005 160	20 x R0.5	38	160	20	£155.10
4NCR 200 010 160	20 x R1	38	160	20	£155.10
4NCR 200 015 160	20 x R1.5	38	160	20	£155.10
4NCR 200 020 160	20 x R2	38	160	20	£155.10

- End Mills for pre-hardened and hardened steel (HRc50~62)
- Good wear resistance from Si-based PVD coating.
- Precise edge tolerance.
- Designed for minimizing edge chipping by corner R shape.
- 45° Helix design for high speed conditions
- Outstanding performance at high speed machining by ultra-fine (0.2μm) WC grade.



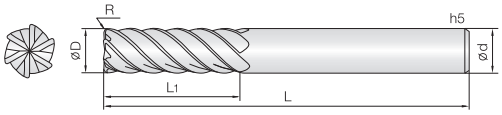
D Size	D Tolerance
ø1 ~ 5	+0 ~ −0.01mm
ø6 ~ 12	−0.005 ~ −0.015mm
ø16 ~ 20	−0.01 ~ −0.02mm

Part Number	Diameter	Length of Cut	Overall Length	Shank Dia	Price
	D x R	L1	L	d	£
4CRL 010 0005 S06	1 x R0.05	2	50	6	£17.53
4CRL 010 001 S06	1 x R0.1	2	50	6	£17.53
4CRL 010 002 S06	1 x R0.2	2	50	6	£17.53
4CRL 010 003 S06	1 x R0.3	2	50	6	£17.53
4CRL 012 0005 S06	1.2 x R0.05	2.5	50	6	£17.53
4CRL 012 001 S06	1.2 x R0.1	2.5	50	6	£17.53
4CRL 012 002 S06	1.2 x R0.2	2.5	50	6	£17.53
4CRL 012 003 S06	1.2 x R0.3	2.5	50	6	£17.53
4CRL 015 0005 S06	1.5 x R0.05	3	50	6	£17.53
4CRL 015 001 S06	1.5 x R0.1	3	50	6	£17.53
4CRL 015 002 S06	1.5 x R0.2	3	50	6	£17.53
4CRL 015 003 S06	1.5 x R0.3	3	50	6	£17.53
4CRL 015 005 S06	1.5 x R0.5	3	50	6	£17.53
4CRL 020 001 S06	2 x R0.1	5	50	6	£17.53
4CRL 020 002 S06	2 x R0.2	5	50	6	£17.53
4CRL 020 003 S06	2 x R0.3	5	50	6	£17.53
4CRL 020 005 S06	2 x R0.5	5	50	6	£17.53
4CRL 025 001 S06	2.5 x R0.1	6	60	6	£18.20
4CRL 025 002 S06	2.5 x R0.2	6	60	6	£18.20
4CRL 025 003 S06	2.5 x R0.3	6	60	6	£18.20
4CRL 025 005 S06	2.5 x R0.5	6	60	6	£18.20
4CRL 030 001 S06	3 x R0.1	6	70	6	£18.20
4CRL 030 002 S06	3 x R0.2	6	70	6	£18.20
4CRL 030 003 S06	3 x R0.3	6	70	6	£18.20
4CRL 030 005 S06	3 x R0.5	6	70	6	£18.20
4CRL 030 010 S06	3 x R1	6	70	6	£18.20
4CRL 040 001 S06	4 x R0.1	8	70	6	£18.20
4CRL 040 002 S06	4 x R0.2	8	70	6	£18.20
4CRL 040 003 S06	4 x R0.3	8	70	6	£18.20
4CRL 040 005 S06	4 x R0.5	8	70	6	£18.20
4CRL 040 010 S06	4 x R1	8	70	6	£18.20
4CRL 050 001 S06	4 x R0.1	10	80	6	£19.27
4CRL 050 002 S06	5 x R0.2	10	80	6	£19.27
4CRL 050 003 S06	5 x R0.3	10	80	6	£19.27
4CRL 050 005 S06	5 x R0.5	10	80	6	£19.27
4CRL 050 010 S06	5 x R1	10	80	6	£19.27
4CRL 060 001 S06	6 x R0.1	12	90	6	£19.27
4CRL 060 002 S06	6 x R0.2	12	90	6	£19.27
4CRL 060 003 S06	6 x R0.3	12	90	6	£19.27
4CRL 060 005 S06	6 x R0.5	12	90	6	£19.27
4CRL 060 010 S06	6 x R1	12	90	6	£19.27
4CRL 060 015 S06	6 x R1.5	12	90	6	£19.27
4CRL 060 020 S06	6 x R2	12	90	6	£19.27
4CRL 080 002 S08	8 x R0.2	16	90	8	£28.93

Part Number	Diameter	Length of Cut	Overall Length	Shank Dia	Price
	D x R	L1	L	d	£
4CRL 080 003 S08	8 x R0.3	16	90	8	£28.93
4CRL 080 005 S08	8 x R0.5	16	90	8	£28.93
4CRL 080 010 S08	8 x R1	16	90	8	£28.93
4CRL 080 015 S08	8 x R1.5	16	90	8	£28.93
4CRL 080 020 S08	8 x R2	16	90	8	£28.93
4CRL 100 002 S10	10 x R0.2	20	100	10	£40.27
4CRL 100 003 S10	10 x R0.3	20	100	10	£40.27
4CRL 100 005 S10	10 x R0.5	20	100	10	£40.27
4CRL 100 010 S10	10 x R1	20	100	10	£40.27
4CRL 100 015 S10	10 x R1.5	20	100	10	£40.27
4CRL 100 020 S10	10 x R2	20	100	10	£40.27
4CRL 120 003 S12	12 x R0.3	24	110	12	£49.47
4CRL 120 005 S12	12 x R0.5	24	110	12	£49.47
4CRL 120 010 S12	12 x R1	24	110	12	£49.47
4CRL 120 015 S12	12 x R1.5	24	110	12	£49.47
4CRL 120 020 S12	12 x R2	24	110	12	£49.47
4CRL 120 030 S12	12 x R3	24	110	12	£49.47
4CRL 160 005 S16	16 x R0.5	32	120	16	£95.16
4CRL 160 010 S16	16 x R1	32	120	16	£95.16
4CRL 160 020 S16	16 x R2	32	120	16	£95.16
4CRL 160 030 S16	16 x R3	32	120	16	£95.16
4CRL 200 005 S20	20 x R0.5	38	130	20	£139.08
4CRL 200 010 S20	20 x R1	38	130	20	£139.08
4CRL 200 020 S20	20 x R2	38	130	20	£139.08
4CRL 200 030 S20	20 x R3	38	130	20	£139.08
4CRL 200 040 S20	20 x R4	38	130	20	£139.08
4CRL 200 050 S20	20 x R5	38	130	20	£139.08

6CRL 6 Flute 45° Helix Corner Radius Long End Mills

- End Mills for pre-hardened and hardened steel (HRc50~62)
- Good wear resistance from Si-based PVD coating.
- Precise edge tolerance.
- Designed for minimizing edge chipping by corner R shape.
- 45° Helix design for high speed conditions
- Outstanding performance at high speed machining by ultra-fine (0.2μm) WC grade.



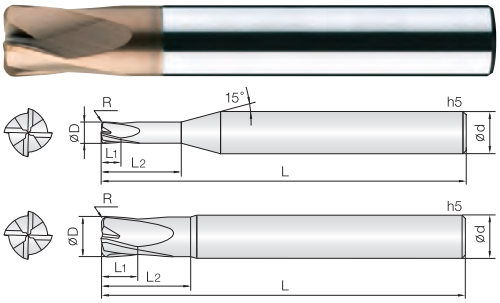
D Size	D Tolerance
ø3 ~ 5	+0~ −0,01mm
ø6 ~ 12	−0,005 ~ −0,015mm
ø16	−0,01 ~ −0,02mm

HARD SERIES - END MILLS FOR STEEL

Part Number	Diameter	Length of Cut	Overall Length	Shank Dia	Price
	D x R	L1	L	d	£
6CRL 030 001 060	3 X R0.1	7.5	60	6	£23.13
6CRL 030 002 060	3 X R0.2	7.5	60	6	£23.13
6CRL 030 003 060	3 X R0.3	7.5	60	6	£23.13
6CRL 030 005 060	3 X R0.5	7.5	60	6	£23.13
6CRL 030 010 060	3 X R1	7.5	60	6	£23.13
6CRL 040 001 060	4 X R0.1	10	60	6	£23.13
6CRL 040 002 060	4 X R0.2	10	60	6	£23.13
6CRL 040 003 060	4 X R0.3	10	60	6	£23.13
6CRL 040 005 060	4 X R0.5	10	60	6	£23.13
6CRL 040 010 060	4 X R1	10	60	6	£23.13
6CRL 050 002 060	5 x R0.2	13	60	6	£23.13
6CRL 050 003 060	5 x R0.3	13	60	6	£23.13
6CRL 050 005 060	5 x R0.5	13	60	6	£23.13
6CRL 050 010 060	5 x R1	13	60	6	£23.13
6CRL 060 001 060	6 X R0.1	15	60	6	£23.13
6CRL 060 002 060	6 x R0.2	15	60	6	£23.13
6CRL 060 002 080	6 x R0.2	15	80	6	£26.33
6CRL 060 003 060	6 x R0.3	15	60	6	£23.13
6CRL 060 003 080	6 x R0.3	15	80	6	£26.33
6CRL 060 005 060	6 x R0.5	15	60	6	£23.13
6CRL 060 005 080	6 x R0.5	15	80	6	£26.33
6CRL 060 010 060	6 x R1	15	60	6	£23.13
6CRL 060 010 080	6 x R1	15	80	6	£26.33
6CRL 080 002 070	8 X R0.2	20	70	8	£34.00
6CRL 080 003 070	8 x R0.3	20	70	8	£34.00
6CRL 080 003 090	8 x R0.3	20	90	8	£37.40
6CRL 080 005 070	8 x R0.5	20	70	8	£34.00
6CRL 080 005 090	8 x R0.5	20	90	8	£37.40
6CRL 080 010 070	8 x R1	20	70	8	£34.00
6CRL 080 010 090	8 x R1	20	90	8	£37.40
6CRL 080 015 070	8 x R1.5	20	70	8	£34.00
6CRL 100 002 075	10 X R0.2	25	75	10	£45.00
6CRL 100 003 075	10 x R0.3	25	75	10	£45.00
6CRL 100 003 100	10 x R0.3	25	100	10	£50.47
6CRL 100 005 075	10 x R0.5	25	75	10	£45.00
6CRL 100 005 100	10 x R0.5	25	100	10	£50.47
6CRL 100 010 075	10 x R1	25	75	10	£45.00
6CRL 100 010 100	10 x R1	25	100	10	£50.47
6CRL 100 020 075	10 x R2	25	75	10	£45.00
6CRL 120 002 080	12 X R0.2	25	80	12	£52.87
6CRL 120 003 080	12 x R0.3	30	80	12	£52.87
6CRL 120 003 110	12 x R0.3	30	110	12	£60.27
6CRL 120 005 080	12 x R0.5	30	80	12	£52.87
6CRL 120 005 110	12 x R0.5	30	110	12	£60.27
6CRL 120 010 080	12 x R1	30	80	12	£52.87
6CRL 120 010 110	12 x R1	30	110	12	£60.27
6CRL 120 020 080	12 x R2	30	80	12	£52.87
6CRL 160 005 110	16 x R0.5	50	110	16	£103.20
6CRL 160 010 110	16 x R1	50	110	16	£103.20
6CRL 160 020 110	16 x R2	50	110	16	£103.20

4RCU

- End Mills for various work materials (HRc50~62), pre-hardened steel, carbon steel, mold steel.
- Excellent wear resistance from high quality Si-based PVD coating.
- Designed for low speed with high feed condition.
- Suitable for heavy duty and roughing application.
- Minimize fracturing at high feed by high TRS ultra fine WC grade.



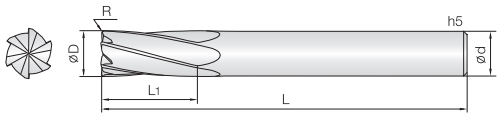
D Size	D Tolerance
ø1 ~ 5	+0 ~ -0.01mm
ø6 ~ 12	-0.005 ~ -0.015mm
ø16	-0.01 ~ -0.02mm

R0.2 ~ 0.5 | R1 ~ 1.5 | R2 ~ 3 | 164P

Part Number	Diameter	Length of Cut	Effective Length	Overall Length	Shank	Price
	D x R	L1	L2	L	d	£
4RCU 010 002 025	1 x R0.2	1	2.5	50	4	£15.80
4RCU 015 005 040	1.5 x R0.5	1.5	4	50	4	£15.80
4RCU 020 005 060	2 x R0.5	2	6	50	6	£18.33
4RCU 030 005 080	3 x R0.5	3	8	50	6	£18.33
4RCU 040 005 120	4 x R0.5	4	12	60	6	£18.33
4RCU 040 005 160	4 x R0.5	4	16	60	6	£18.33
4RCU 040 010 120	4 x R1	4	12	60	6	£18.33
4RCU 040 010 160	4 x R1	4	16	60	6	£18.33
4RCU 050 005 150	5 x R0.5	5	15	60	6	£18.33
4RCU 050 010 150	5 x R1	5	15	60	6	£18.33
4RCU 060 003 150	6 x R0.3	6	15	60	6	£18.33
4RCU 060 005 150	6 x R0.5	6	15	60	6	£18.33
4RCU 060 010 150	6 x R1	6	15	60	6	£18.33
4RCU 060 015 150	6 x R1.5	6	15	60	6	£18.33
4RCU 080 003 160	8 x R0.3	8	16	60	8	£28.73
4RCU 080 005 160	8 x R0.5	8	16	60	8	£28.73
4RCU 080 005 200	8 x R0.5	8	20	80	8	£32.47
4RCU 080 005 300	8 x R0.5	8	30	110	8	£41.53
4RCU 080 010 160	8 x R1	8	16	60	8	£28.73
4RCU 080 010 200	8 x R1	8	20	80	8	£32.47
4RCU 080 010 300	8 x R1	8	30	110	8	£41.53
4RCU 080 020 160	8 x R2	8	16	60	8	£28.73
4RCU 080 020 200	8 x R2	8	20	80	8	£32.47
4RCU 080 020 300	8 x R2	8	30	110	8	£41.53
4RCU 100 003 200	10 x R0.3	10	20	70	10	£39.27
4RCU 100 005 200	10 x R0.5	10	20	70	10	£39.27
4RCU 100 005 250	10 x R0.5	10	25	90	10	£43.80
4RCU 100 005 300	10 x R0.5	10	30	120	10	£55.13
4RCU 100 010 200	10 x R1	10	20	70	10	£39.27
4RCU 100 010 250	10 x R1	10	25	90	10	£43.80
4RCU 100 010 300	10 x R1	10	30	120	10	£55.13
4RCU 100 020 200	10 x R2	10	20	70	10	£39.27
4RCU 100 020 250	10 x R2	10	25	90	10	£43.80
4RCU 100 020 300	10 x R2	10	30	120	10	£55.13
4RCU 120 005 250	12 x R0.5	12	25	80	12	£46.80
4RCU 120 005 300	12 x R0.5	12	30	100	12	£54.40
4RCU 120 005 350	12 x R0.5	12	35	130	12	£64.93
4RCU 120 010 250	12 x R1	12	25	80	12	£46.80
4RCU 120 010 300	12 x R1	12	30	100	12	£54.40
4RCU 120 010 350	12 x R1	12	35	130	12	£64.93
4RCU 120 020 250	12 x R2	12	25	80	12	£46.80
4RCU 120 020 300	12 x R2	12	30	100	12	£54.40
4RCU 120 020 350	12 x R2	12	35	130	12	£64.93
4RCU 120 030 250	12 x R3	12	25	80	12	£46.80
4RCU 160 010 300	16 x R1	16	30	110	16	£92.82
4RCU 160 010 400	16 x R1	16	40	160	16	£132.18
4RCU 160 020 300	16 x R2	16	30	110	16	£92.82
4RCU 160 020 400	16 x R2	16	40	160	16	£132.18

6RCU 6 Flute High Feed Corner Radius Cutter

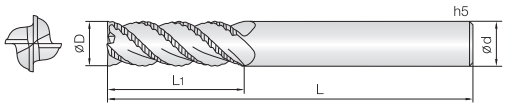
- End Mills for various work materials (HRc50~62), pre-hardened steel, carbon steel, mold steel.
- Excellent wear resistance from high quality Si-based PVD coating.
- Designed for low speed with high feed condition.
- Suitable for heavy duty and roughing application.
- Minimize fracturing at high feed by high TRS ultra fine WC grade.



D Size	D Tolerance
Ø6 ~ 12	−0.005 ~ −0.015mm
Ø16 ~ 20	−0.01 ~ −0.02mm

Part Number	Diameter	Length of Cut	Overall Length	Shank Dia	Price
	D x R	L1	L	d	£
6RCU 060 005 060	6 x R0.5	12	60	6	£19.73
6RCU 060 005 080	6 x R0.5	12	80	6	£22.67
6RCU 060 010 060	6 x R1	12	60	6	£19.73
6RCU 060 010 080	6 x R1	12	80	6	£22.67
6RCU 080 005 060	8 x R0.5	16	60	8	£31.00
6RCU 080 005 090	8 x R0.5	16	90	8	£34.73
6RCU 080 010 060	8 x R1	16	60	8	£31.00
6RCU 080 010 090	8 x R1	16	90	8	£34.73
6RCU 080 020 060	8 x R2	16	60	8	£31.00
6RCU 080 020 090	8 x R2	16	90	8	£34.73
6RCU 100 005 070	10 x R0.5	20	70	10	£41.53
6RCU 100 005 100	10 x R0.5	20	100	10	£46.80
6RCU 100 010 070	10 x R1	20	70	10	£41.53
6RCU 100 010 100	10 x R1	20	100	10	£46.80
6RCU 100 020 070	10 x R2	20	70	10	£41.53
6RCU 100 020 100	10 x R2	20	100	10	£46.80
6RCU 120 005 080	12 x R0.5	25	80	12	£49.07
6RCU 120 005 110	12 x R0.5	25	110	12	£54.40
6RCU 120 010 080	12 x R1	25	80	12	£49.07
6RCU 120 010 110	12 x R1	25	110	12	£54.40
6RCU 120 020 080	12 x R2	25	80	12	£49.07
6RCU 120 020 110	12 x R2	25	110	12	£54.40
6RCU 160 005 160	16 x R0.5	35	160	16	£139.20
6RCU 160 005 200	16 x R0.5	35	200	16	£164.22
6RCU 160 010 160	16 x R1	35	160	16	£139.20
6RCU 160 010 200	16 x R1	35	200	16	£164.22
6RCU 160 015 160	16 x R1.5	35	160	16	£139.20
6RCU 160 015 200	16 x R1.5	35	200	16	£164.22
6RCU 160 020 160	16 x R2	35	160	16	£139.20
6RCU 160 020 200	16 x R2	35	200	16	£164.22
6RCU 200 005 150	20 x R0.5	40	150	20	£169.86
6RCU 200 005 200	20 x R0.5	40	200	20	£221.28
6RCU 200 010 150	20 x R1	40	150	20	£169.86
6RCU 200 010 200	20 x R1	40	200	20	£221.28
6RCU 200 015 150	20 x R1.5	40	150	20	£169.86
6RCU 200 015 200	20 x R1.5	40	200	20	£221.28
6RCU 200 020 150	20 x R2	40	150	20	£169.86
6RCU 200 020 200	20 x R2	40	200	20	£221.28

- Roughing End Mills for most materials, alloy steel, SUS, Inconel and structural steel.
- JCRO coating provides excellent wear resistance, as well as avoiding edge stress in various applications.
- 45° helix improves tool life and provides low cutting forces
- Fine pitch shape designed for high speed roughing applications.

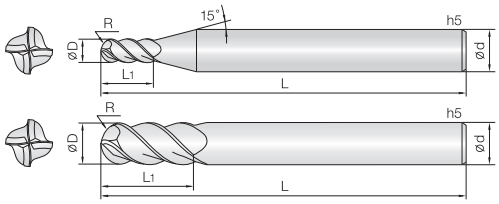


D Size	D Tolerance
Ø4 ~ 9	−0.02 ~ −0.04mm
Ø10 ~ 20	−0.02 ~ −0.05mm

Part Number	Diameter	Length of Cut	Overall Length	Shank Dia	Price
	D	L1	L	d	£
3HROU 040 100 S06	4	10	50	6	£22.00
3HROU 050 130 S06	5	13	50	6	£22.00
3HROU 060 100 050	6	10	50	6	£22.00
3HROU 060 160 055	6	16	55	6	£23.27
3HROU 060 200 060	6	20	60	6	£25.73
3HROU 070 180 S08	7	18	65	8	£34.00
3HROU 080 120 060	8	12	60	8	£30.13
3HROU 080 190 065	8	19	65	8	£32.00
3HROU 080 250 070	8	25	70	8	£35.20
3HROU 080 300 075	8	30	75	8	£39.80
4HROU 090 220 S10	9	22	70	10	£43.13
4HROU 100 150 070	10	15	70	10	£39.00
4HROU 100 220 070	10	22	70	10	£41.07
4HROU 100 300 080	10	30	80	10	£46.00
4HROU 100 400 090	10	40	90	10	£55.60
4HROU 110 270 S12	11	27	80	12	£52.33
4HROU 120 200 075	12	20	75	12	£46.67
4HROU 120 250 080	12	25	80	12	£49.60
4HROU 120 350 090	12	35	90	12	£55.60
4HROU 120 500 100	12	50	100	12	£73.47
4HROU 160 320 090	16	32	90	16	£108.78
4HROU 160 400 110	16	40	110	16	£122.34
4HROU 200 380 110	20	38	110	20	£139.08
4HROU 200 500 120	20	50	120	20	£154.50

4SUB 4 Flute 45° Helix Ball End Mills for SUS

- End Mills for alloy steel, SUS, Ti/Ni based alloy, Inconel and other hard-to-cut materials.
- JCRO coating provides excellent wear resistance, as well as avoiding edge stress in various applications.
- Deep chip pocket and 4 flute design provides excellent work surface finish.
- Minimize fracturing at high feed by high TRS fine WC grade.

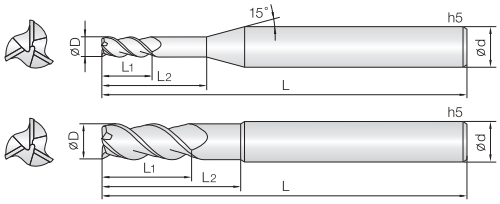


D Size	D Tolerance
ø3 ~ 5	+0~ −0,01mm
ø6 ~ 12	−0.005 ~ -0.015mm
ø16	−0.01~ −0.02mm

4 | WC 미립자 | JCRO Coating | R ±0.005 (1.5 ~ 2.5R) | R ±0.01 (3 ~ 6R) | R ±0.015 (8R) | 45° Helix Angle | CUTTING DATA (166P)

Part Number	Diameter	Length of Cut	Overall Length	Shank Dia	Price
	R x D	L1	L	d	£
4SUB 010 025 S06	0.5R x 1	2.5	50	6	£17.58
4SUB 015 040 S06	0.75R x 1.5	4	50	6	£17.58
4SUB 020 060 S06	1R x 2	6	50	6	£17.58
4SUB 030 080 S06	1.5R x 3	8	60	6	£17.58
4SUB 040 080 S06	2R x 4	8	70	6	£18.18
4SUB 050 100 S06	2.5R x 5	10	80	6	£19.44
4SUB 060 120 S06	3R x 6	12	90	6	£20.82
4SUB 080 140 S08	4R x 8	14	100	8	£29.34
4SUB 100 180 S10	5R x 10	18	100	10	£40.08
4SUB 120 220 S12	6R x 12	22	110	12	£52.38
4SUB 160 300 S16	8R x 16	30	130	16	£83.52

- End Mills for alloy steel, SUS, Ti/Ni base alloy, Inconel and other hard-to-cut materials.
- JCRO coating provides excellent wear resistance, as well as avoiding edge stress in various applications.
- Deep chip pocket and 3 flute design provides excellent work surface finish.
- 45° helix design for high speed, feed condition.
- Minimize fracturing at high feed by high TRS fine WC grade.



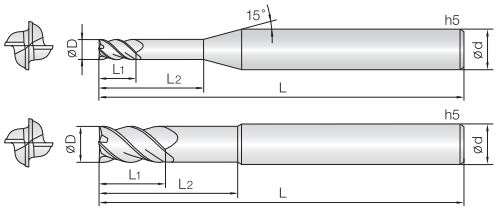
D Size	D Tolerance
Ø0.5 ~ 5	+0 ~ −0.01mm
Ø6 ~ 12	−0.01 ~ −0.025mm
Ø16 ~ 20	−0.015 ~ −0.03mm

Part Number	Diameter	Length of Cut	Effective Length	Overall Length	Shank Dia	Price
	D	L1	L2	L	d	£
3SUE 005 010 S04	0.5	1	-	45	4	£13.02
3SUE 005 020 S04	0.5	1	2	45	4	£14.34
3SUE 005 030 S04	0.5	1	3	45	4	£14.34
3SUE 005 040 S04	0.5	1	4	45	4	£14.34
3SUE 006 012 S04	0.6	1.2	-	45	4	£13.02
3SUE 006 030 S04	0.6	1.2	3	45	4	£14.34
3SUE 006 050 S04	0.6	1.2	5	45	4	£14.34
3SUE 007 014 S04	0.7	1.4	-	45	4	£12.30
3SUE 007 030 S04	0.7	1.4	3	45	4	£13.50
3SUE 008 020 S04	0.8	2	-	45	4	£12.30
3SUE 008 040 S06	0.8	2	4	45	6	£14.40
3SUE 008 060 S06	0.8	2	6	45	6	£15.30
3SUE 010 025 S04	1	2.5	-	45	4	£10.08
3SUE 010 025 S06	1	2.5	-	45	6	£11.40
3SUE 010 040 S06	1	2.5	4	45	6	£13.20
3SUE 010 060 S06	1	2.5	6	45	6	£13.20
3SUE 010 080 S06	1	2.5	8	45	6	£14.52
3SUE 012 030 S04	1.2	3	-	45	4	£10.08
3SUE 012 030 S06	1.2	3	-	45	6	£11.40
3SUE 012 060 S06	1.2	3	6	45	6	£13.20
3SUE 012 080 S06	1.2	3	8	45	6	£14.52
3SUE 015 040 S04	1.5	4	-	45	4	£10.08
3SUE 015 040 S06	1.5	4	-	45	6	£11.40
3SUE 015 060 S06	1.5	4	6	45	6	£13.20
3SUE 015 080 S06	1.5	4	8	45	6	£14.52
3SUE 015 100 S06	1.5	4	10	45	6	£14.52
3SUE 020 050 S04	2	5	-	45	4	£10.08
3SUE 020 050 S06	2	5	-	45	6	£11.40
3SUE 020 080 S06	2	5	8	45	6	£13.20
3SUE 020 100 S06	2	5	10	50	6	£14.52
3SUE 020 120 S06	2	5	12	50	6	£14.52
3SUE 025 080 S06	2.5	8	-	45	6	£11.40
3SUE 030 080 S04	3	8	-	45	4	£10.08
3SUE 030 080 S06	3	8	-	45	6	£11.40
3SUE 030 150 S06	3	8	15	45	6	£13.20
3SUE 030 200 S06	3	8	20	60	6	£15.72
3SUE 035 100 S06	3.5	10	-	50	6	£13.20
3SUE 040 100 S04	4	10	-	50	4	£10.08
3SUE 040 100 S06	4	10	-	50	6	£11.40
3SUE 040 150 S06	4	10	15	50	6	£13.20
3SUE 040 200 S06	4	10	20	60	6	£15.72
3SUE 045 120 S06	4.5	12	-	50	6	£13.20
3SUE 050 120 S06	5	12	-	50	6	£11.40
3SUE 060 120 S06	6	12	-	60	6	£11.94

Part Number	Diameter	Length of Cut	Effective Length	Overall Length	Shank Dia	Price
	D	L1	L2	L	d	£
3SUE 060 200 S06	6	12	20	60	6	£13.80
3SUE 080 190 S08	8	19	-	60	8	£17.82
3SUE 080 260 S08	8	19	26	60	8	£19.98
3SUE 100 220 S10	10	22	-	70	10	£23.04
3SUE 100 320 S10	10	22	32	70	10	£25.50
3SUE 120 260 S12	12	26	-	80	12	£27.36
3SUE 120 380 S12	12	26	38	80	12	£30.48
3SUE 160 360 S16	16	36	-	100	16	£65.38
3SUE 160 450 S16	16	36	45	100	16	£69.76
3SUE 200 550 S20	20	38	55	110	20	£96.70

4SURE 4 Flute Rib End Mills for SUS

- End Mills for alloy steel, SUS, Ti/Ni base alloy, Inconel and other hard-to-cut materials.
- JCRO coating provides excellent wear resistance, as well as avoiding edge stress in various applications.
- Strong design for protection against chattering.
- Excellent work surface finish.
- Minimize fracturing at high feed by high TRS fine WC grade.

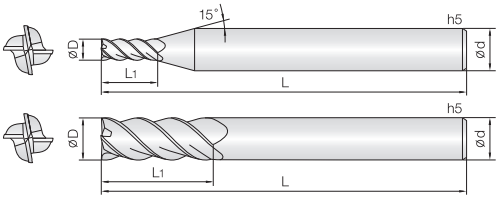


D Size	D Tolerance
Ø1~ 5	+0~ −0.01mm
Ø16 ~ 20	−0.01 ~ −0.025mm

Part Number	Diameter	Length of Cut	Effective Length	Overall Length	Shank	Price
	D	L1	L2	L	d	£
4SURE 010 030 S04	1	1.5	3	50	4	£12.60
4SURE 010 050 S04	1	1.5	5	50	4	£12.60
4SURE 010 060 S04	1	1.5	6	50	4	£13.13
4SURE 010 080 S04	1	1.5	8	50	4	£15.07
4SURE 010 100 S04	1	1.5	10	50	4	£17.13
4SURE 012 040 S04	1.2	2	4	50	4	£12.60
4SURE 012 060 S04	1.2	2	6	50	4	£13.13
4SURE 012 080 S04	1.2	2	8	50	4	£15.07
4SURE 012 100 S04	1.2	2	10	50	4	£17.13
4SURE 015 045 S04	1.5	2.5	4.5	50	4	£12.60
4SURE 015 060 S04	1.5	2.5	6	50	4	£12.60
4SURE 015 080 S04	1.5	2.5	8	50	4	£12.60
4SURE 015 100 S04	1.5	2.5	10	50	4	£13.13
4SURE 015 120 S04	1.5	2.5	12	50	4	£15.07
4SURE 015 150 S04	1.5	2.5	15	60	4	£17.13
4SURE 020 060 S04	2	3	6	50	4	£12.60
4SURE 020 080 S04	2	3	8	50	4	£12.60
4SURE 020 100 S04	2	3	10	50	4	£13.13
4SURE 020 120 S04	2	3	12	50	4	£13.13
4SURE 020 140 S04	2	3	14	60	4	£15.07
4SURE 020 160 S04	2	3	16	60	4	£17.13
4SURE 025 075 S04	2.5	4	7.5	50	4	£12.60
4SURE 025 100 S04	2.5	4	10	50	4	£13.13
4SURE 025 120 S04	2.5	4	12	50	4	£13.13
4SURE 025 140 S04	2.5	4	14	60	4	£15.07
4SURE 025 160 S04	2.5	4	16	60	4	£17.13
4SURE 030 090 S06	3	4.5	9	60	6	£15.47
4SURE 030 120 S06	3	4.5	12	60	6	£15.47
4SURE 030 160 S06	3	4.5	16	60	6	£15.47
4SURE 030 200 S06	3	4.5	20	60	6	£15.47
4SURE 030 250 S06	3	4.5	25	65	6	£18.47
4SURE 030 300 S06	3	4.5	30	75	6	£20.80
4SURE 040 120 S06	4	6	12	60	6	£15.47
4SURE 040 160 S06	4	6	16	60	6	£15.47
4SURE 040 200 S06	4	6	20	60	6	£15.47
4SURE 040 250 S06	4	6	25	65	6	£16.00
4SURE 040 300 S06	4	6	30	75	6	£19.13
4SURE 050 150 S06	5	7.5	15	60	6	£15.60
4SURE 050 180 100	5	7.5	18	100	6	£21.07
4SURE 050 200 S06	5	7.5	20	60	6	£15.60
4SURE 050 250 S06	5	7.5	25	65	6	£16.80
4SURE 050 300 S06	5	7.5	30	70	6	£18.27
4SURE 060 200 S06	6	9	20	60	6	£15.60
4SURE 060 250 100	6	9	25	100	6	£21.07

Part Number	Diameter	Length of Cut	Effective Length	Overall Length	Shank	Price
	D	L1	L2	L	d	£
4SURE 060 300 S06	6	9	30	70	6	£18.27
4SURE 080 250 S08	8	12	25	70	8	£22.00
4SURE 080 350 110	8	12	35	110	8	£30.93
4SURE 080 400 S08	8	12	40	80	8	£24.73
4SURE 100 300 S10	10	15	30	80	10	£30.53
4SURE 100 400 120	10	15	40	120	10	£42.60
4SURE 100 500 S10	10	15	50	100	10	£37.80
4SURE 120 360 S12	12	18	36	90	12	£39.80
4SURE 120 500 130	12	18	50	130	12	£58.40
4SURE 120 600 S12	12	18	60	110	12	£48.07
4SURE 160 480 S16	16	24	48	110	16	£78.48
4SURE 160 700 150	16	24	70	150	16	£103.20
4SURE 160 800 S16	16	24	80	130	16	£92.10
4SURE 200 600 130	20	30	60	130	20	£116.82
4SURE 200 1000 160	20	30	100	160	20	£140.28

- End Mills for alloy steel, SUS, Ti/Ni base alloy, Inconel and other hard-to-cut materials.
- JCRO coating provides excellent wear resistance, as well as avoiding edge stress in various applications.
- Unequal flute spacing design minimizes chatter.
- Deep chip pocket and 4 flute design provides excellent work surface finish.
- Minimize fracturing at high feed by high TRS fine WC grade.



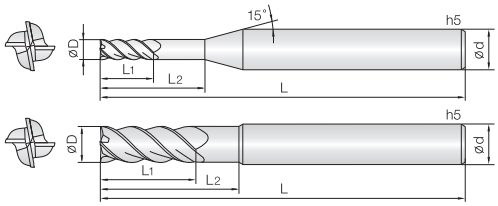
D Size	D Tolerance
Ø1 ~ 5	+0 ~ −0,01mm
Ø6 ~ 12	−0.01 ~ -0.025mm
Ø16 ~ 20	−0.015 ~ −0.03mm

Part Number	Diameter	Length of Cut	Overall Length	Shank Dia	Price
	D	L1	L	d	£
4SUE 010 015 S04	1	1.5	50	4	£9.44
4SUE 010 025 S04	1	2.5	50	4	£9.44
4SUE 010 035 S04	1	3.5	50	4	£9.82
4SUE 010 050 S04	1	5	50	4	£11.20
4SUE 010 060 S04	1	6	50	4	£11.74
4SUE 012 015 S04	1.2	1.5	50	4	£9.44
4SUE 012 030 S04	1.2	3	50	4	£9.44
4SUE 012 050 S04	1.2	5	50	4	£11.20
4SUE 012 070 S04	1.2	7	50	4	£11.74
4SUE 015 025 S04	1.5	2.5	50	4	£9.44
4SUE 015 040 S04	1.5	4	50	4	£9.44
4SUE 015 055 S04	1.5	5.5	50	4	£9.82
4SUE 015 070 S04	1.5	7	50	4	£11.20
4SUE 015 085 S04	1.5	8.5	50	4	£11.74
4SUE 020 030 S04	2	3	50	4	£9.44
4SUE 020 060 S04	2	6	50	4	£9.44
4SUE 020 080 S04	2	8	50	4	£9.82
4SUE 020 100 S04	2	10	50	4	£11.20
4SUE 020 120 S04	2	12	50	4	£12.26
4SUE 020 140 S04	2	14	50	4	£13.34
4SUE 025 035 S04	2.5	3.5	50	4	£9.44
4SUE 025 080 S04	2.5	8	50	4	£9.44
4SUE 025 100 S04	2.5	10	50	4	£11.20
4SUE 025 120 S04	2.5	12	50	4	£12.26
4SUE 025 140 S04	2.5	14	50	4	£13.34
4SUE 030 045 S06	3	4.5	60	6	£10.30
4SUE 030 100 S06	3	10	60	6	£10.30
4SUE 030 120 S06	3	12	60	6	£10.78
4SUE 030 150 S06	3	15	60	6	£12.42
4SUE 030 200 S06	3	20	70	6	£13.98
4SUE 030 250 S06	3	25	70	6	£14.24
4SUE 030 300 S06	3	30	70	6	£15.42
4SUE 035 055 S06	3.5	5.5	60	6	£11.94
4SUE 035 100 S06	3.5	10	60	6	£13.06
4SUE 035 150 S06	3.5	15	60	6	£14.14
4SUE 035 200 S06	3.5	20	60	6	£15.78
4SUE 040 060 S06	4	6	60	6	£10.30
4SUE 040 120 S06	4	12	60	6	£10.30
4SUE 040 160 S06	4	16	60	6	£10.78
4SUE 040 200 S06	4	20	70	6	£13.98
4SUE 040 250 S06	4	25	70	6	£15.10
4SUE 040 300 S06	4	30	75	6	£15.84
4SUE 045 070 S06	4.5	7	60	6	£11.94
4SUE 045 130 S06	4.5	13	60	6	£13.06
4SUE 045 180 S06	4.5	18	60	6	£14.14
4SUE 050 075 S06	5	7.5	60	6	£10.66
4SUE 050 150 S06	5	15	60	6	£10.66

Part Number	Diameter	Length of Cut	Overall Length	Shank Dia	Price
	D	L1	L	d	£
4SUE 050 200 S06	5	20	70	6	£11.14
4SUE 050 250 S06	5	25	70	6	£13.98
4SUE 050 300 S06	5	30	75	6	£15.84
4SUE 060 090 S06	6	9	60	6	£10.66
4SUE 060 150 S06	6	15	60	6	£10.66
4SUE 060 180 S06	6	18	65	6	£11.74
4SUE 060 250 S06	6	25	70	6	£13.22
4SUE 060 300 S06	6	30	70	6	£15.26
4SUE 060 400 S06	6	40	80	6	£18.50
4SUE 070 110 S08	7	11	70	8	£18.50
4SUE 070 180 S08	7	18	70	8	£18.50
4SUE 070 210 S08	7	21	70	8	£20.38
4SUE 080 120 S08	8	12	70	8	£18.50
4SUE 080 200 S08	8	20	70	8	£18.50
4SUE 080 240 S08	8	24	70	8	£20.38
4SUE 080 300 S08	8	30	80	8	£21.28
4SUE 080 400 S08	8	40	90	8	£25.12
4SUE 080 500 S08	8	50	100	8	£28.58
4SUE 090 140 S10	9	14	80	10	£26.40
4SUE 090 220 S10	9	22	80	10	£26.40
4SUE 090 270 S10	9	27	80	10	£29.06
4SUE 100 150 S10	10	15	80	10	£26.40
4SUE 100 250 S10	10	25	80	10	£26.40
4SUE 100 300 S10	10	30	80	10	£29.06
4SUE 100 400 S10	10	40	90	10	£30.66
4SUE 100 500 S10	10	50	100	10	£32.16
4SUE 100 600 S10	10	60	110	10	£37.34
4SUE 110 170 S12	11	17	90	12	£31.68
4SUE 110 220 S12	11	22	90	12	£31.68
4SUE 110 330 S12	11	33	90	12	£34.88
4SUE 120 180 S12	12	18	90	12	£31.68
4SUE 120 300 S12	12	30	90	12	£31.68
4SUE 120 360 S12	12	36	90	12	£34.88
4SUE 120 500 S12	12	50	100	12	£36.10
4SUE 120 600 S12	12	60	110	12	£38.08
4SUE 120 700 S12	12	70	120	12	£46.72
4SUE 160 240 S16	16	24	100	16	£63.20
4SUE 160 350 S16	16	35	100	16	£69.22
4SUE 160 500 S16	16	50	110	16	£74.18
4SUE 160 700 S16	16	70	130	16	£91.74
4SUE 160 900 S16	16	90	150	16	£118.14
4SUE 200 300 S20	20	30	100	20	£89.54
4SUE 200 400 S20	20	40	100	20	£89.54
4SUE 200 600 S20	20	60	120	20	£102.18
4SUE 200 800 S20	20	80	150	20	£146.66
4SUE 200 1000 S20	20	100	160	20	£163.14

4SUV 4 Flute Variable Helix End Mills for SUS

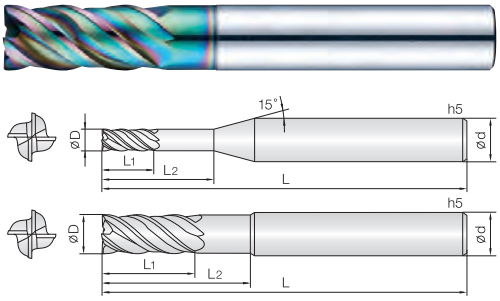
- End Mills for alloy steel, SUS, Ti/Ni base alloy, Inconel and other hard-to-cut materials.
- JCRO coating provides excellent wear resistance, as well as avoiding edge stress in various applications.
- Unequal Flutes and variable helix minimizes chatter.
- Type A minimizes chipping, Type B maximizes chip emissions.
- Minimize fracturing at high feed by high TRS fine WC grade.



D Size	D Tolerance
Ø1 ~ 5	+0~ −0,01mm
Ø6 ~ 12	−0.01 ~ -0.025mm
Ø16 ~ 20	−0.015 ~ −0.03mm

Part Number	Diameter	Length of Cut	Effective Length	Chamfer Type	Overall Length	Shank Dia	Price
	D	L1	L2	Type	L	d	£
4SUVA 010 025 S04	1	2.5	-	A	50	4	£9.54
4SUVB 010 025 S04	1	2.5	-	B	50	4	£9.54
4SUVA 010 060 S04	1	2.5	6	A	50	4	£10.62
4SUVA 015 040 S04	1.5	4	-	A	50	4	£9.54
4SUVB 015 040 S04	1.5	4	-	B	50	4	£9.54
4SUVA 015 100 S04	1.5	4	10	A	50	4	£10.62
4SUVA 020 050 S04	2	5	-	A	50	4	£9.54
4SUVB 020 050 S04	2	5	-	B	50	4	£9.54
4SUVA 020 120 S04	2	5	12	A	50	4	£10.62
4SUVA 030 080 S06	3	8	-	A	60	6	£10.72
4SUVB 030 080 S06	3	8	-	B	60	6	£10.72
4SUVA 030 180 S06	3	8	18	A	60	6	£11.90
4SUVA 040 110 S06	4	11	-	A	60	6	£10.72
4SUVB 040 110 S06	4	11	-	B	60	6	£10.72
4SUVA 040 210 S06	4	11	21	A	60	6	£11.90
4SUVA 050 130 S06	5	13	-	A	60	6	£10.72
4SUVB 050 130 S06	5	13	-	B	60	6	£10.72
4SUVA 050 210 S06	5	13	21	A	60	6	£11.90
4SUVA 060 130 S06	6	13	-	A	60	6	£10.72
4SUVB 060 130 S06	6	13	-	B	60	6	£10.72
4SUVA 060 210 S06	6	13	21	A	60	6	£11.90
4SUVA 080 190 S08	8	19	-	A	60	8	£17.18
4SUVB 080 190 S08	8	19	-	B	60	8	£17.18
4SUVA 080 270 S08	8	19	27	A	60	8	£18.82
4SUVA 100 220 S10	10	22	-	A	70	10	£24.54
4SUVB 100 220 S10	10	22	-	B	70	10	£24.54
4SUVA 100 320 S10	10	22	32	A	70	10	£26.18
4SUVA 120 260 S12	12	26	-	A	80	12	£29.38
4SUVB 120 260 S12	12	26	-	B	80	12	£29.38
4SUVA 120 380 S12	12	26	38	A	80	12	£31.58
4SUVA 160 320 S16	16	32	-	A	90	16	£60.42
4SUVB 160 320 S16	16	32	-	B	90	16	£60.42
4SUVA 160 450 S16	16	32	45	A	90	16	£63.20
4SUVA 200 380 S20	20	38	-	A	100	20	£93.38
4SUVB 200 380 S20	20	38	-	B	100	20	£93.38
4SUVA 200 550 S20	20	38	55	A	110	20	£96.16

- End Mills for alloy steel, SUS, Ti/Ni base alloy, Inconel and other hard-to-cut materials.
- Chip emission is excellent for slotting, and thick double core design enables continuous machining without chattering.
- TISIN-R coating provides wear excellent wear resistance.
- Minimize fracturing at high feed by high TRS fine WC grade.

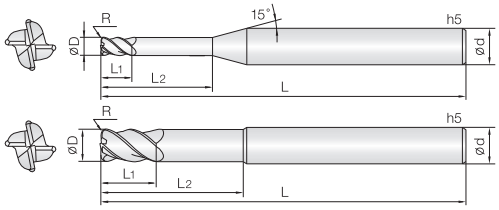


D Size	D Tolerance
Ø3 ~ 4	+0 ~ −0,01mm
Ø6 ~ 12	−0,01 ~ −0,025mm
Ø16 ~ 20	−0,015 ~ −0,03mm

Part Number	Diameter	Length of Cut	Effective Length	Overall Length	Shank Dia	Price
	D	L1	L2	L	d	£
4SLE 030 080 S06	3	8	-	50	6	£12.33
4SLE 030 210 S06	3	8	21	60	6	£14.47
4SLE 040 100 S06	4	10	-	50	6	£12.33
4SLE 040 210 S06	4	10	21	60	6	£14.47
4SLE 060 150 S06	6	15	-	60	6	£12.80
4SLE 060 210 S06	6	15	21	60	6	£14.47
4SLE 080 200 S08	8	20	-	70	8	£20.80
4SLE 080 270 S08	8	20	27	70	8	£23.27
4SLE 100 250 S10	10	25	-	80	10	£27.27
4SLE 100 350 S10	10	25	35	80	10	£30.60
4SLE 120 300 S12	12	30	-	90	12	£35.00
4SLE 120 400 S12	12	30	40	90	12	£38.33
4SLE 160 400 S16	16	40	-	100	16	£83.10
4SLE 160 500 S16	16	40	50	100	16	£87.60
4SLE 200 450 S20	20	45	-	110	20	£127.80
4SLE 200 550 S20	20	45	55	110	20	£132.60

4SUCR 4 Flute Rib Corner Radius End Mills for SUS

- End Mills for alloy steel, SUS, Ti/Ni base alloy, Inconel and other hard-to-cut materials.
- JCRO coating provides excellent wear resistance, as well as avoiding edge stress in various applications.
- Strong design for protection against chattering.
- Excellent work surface finish.
- Minimize fracturing at high feed by high TRS fine WC grade.

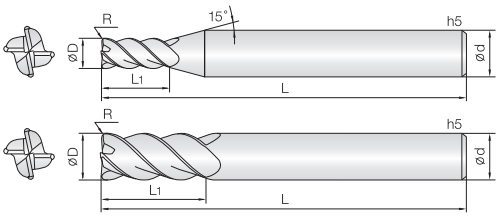


D Size	D Tolerance
ø1 ~ 5	+0 ~ −0.01mm
ø6 ~ 12	−0.005 ~ −0.015mm
ø16 ~ 20	−0.01 ~ −0.02mm

Part Number	Diameter	Length of Cut	Effective Length	Overall Length	Shank Dia	Price
	D x R	L1	L2	L	d	£
4SUCR 010 001 050	1 x R0.1	1.5	5	60	4	£15.00
4SUCR 010 001 060	1 x R0.1	1.5	6	60	4	£15.80
4SUCR 010 001 080	1 x R0.1	1.5	8	60	4	£15.80
4SUCR 020 001 100	2 x R0.1	3	10	60	4	£15.00
4SUCR 020 001 120	2 x R0.1	3	12	60	4	£15.80
4SUCR 020 001 160	2 x R0.1	3	16	60	4	£16.40
4SUCR 020 002 100	2 x R0.2	3	10	60	4	£15.00
4SUCR 020 002 120	2 x R0.2	3	12	60	4	£15.80
4SUCR 020 002 160	2 x R0.2	3	16	60	4	£16.40
4SUCR 030 002 150	3 x R0.2	4.5	15	65	6	£18.13
4SUCR 030 002 200	3 x R0.2	4.5	20	65	6	£18.87
4SUCR 030 005 150	3 x R0.5	4.5	15	65	6	£18.13
4SUCR 030 005 200	3 x R0.5	4.5	20	70	6	£18.87
4SUCR 040 002 200	4 x R0.2	6	20	70	6	£18.87
4SUCR 040 002 300	4 x R0.2	6	30	65	6	£21.67
4SUCR 040 005 200	4 x R0.5	6	20	70	6	£18.87
4SUCR 040 005 300	4 x R0.5	6	30	80	6	£21.67
4SUCR 040 010 200	4 x R1	6	20	70	6	£18.87
4SUCR 050 002 250	5 x R0.2	7.5	25	70	6	£18.87
4SUCR 050 002 360	5 x R0.2	7.5	36	80	6	£21.67
4SUCR 050 005 250	5 x R0.5	7.5	25	70	6	£18.87
4SUCR 050 005 360	5 x R0.5	7.5	36	80	6	£21.67
4SUCR 050 010 250	5 x R1	7.5	25	70	6	£18.87
4SUCR 060 003 300	6 x R0.3	9	30	70	6	£18.87
4SUCR 060 003 400	6 x R0.3	9	40	80	6	£21.67
4SUCR 060 005 300	6 x R0.5	9	30	70	6	£18.87
4SUCR 060 005 400	6 x R0.5	9	40	80	6	£21.67
4SUCR 060 010 300	6 x R1	9	30	70	6	£18.87
4SUCR 060 010 400	6 x R1	9	40	80	6	£21.67
4SUCR 060 015 300	6 x R1.5	9	30	70	6	£18.87
4SUCR 070 003 350	7 x R0.3	10	35	80	8	£32.93
4SUCR 070 005 350	7 x R0.5	10	35	80	8	£32.93
4SUCR 070 010 350	7 x R1	10	35	80	8	£32.93
4SUCR 080 003 400	8 x R0.3	12	40	80	8	£28.87
4SUCR 080 005 400	8 x R0.5	12	40	80	8	£28.87
4SUCR 080 010 400	8 x R1	12	40	80	8	£28.87
4SUCR 080 015 400	8 x R1.5	12	40	80	8	£28.87
4SUCR 080 020 400	8 x R2	12	40	80	8	£28.87
4SUCR 090 003 450	9 x R0.3	13	45	90	10	£47.40
4SUCR 090 005 450	9 x R0.5	13	45	90	10	£47.40
4SUCR 090 010 450	9 x R1	13	45	90	10	£47.40
4SUCR 100 003 500	10 x R0.3	15	50	100	10	£43.27
4SUCR 100 005 500	10 x R0.5	15	50	100	10	£43.27
4SUCR 100 010 500	10 x R1	15	50	100	10	£43.27

Part Number	Diameter	Length of Cut	Effective Length	Overall Length	Shank Dia	Price
	D x R	L1	L2	L	d	£
4SUCR 100 015 500	10 x R1.5	15	50	100	10	£43.27
4SUCR 100 020 500	10 x R2	15	50	100	10	£43.27
4SUCR 110 003 550	11 x R0.3	16	55	100	12	£59.73
4SUCR 110 005 550	11 x R0.5	16	55	100	12	£59.73
4SUCR 110 010 550	11 x R1	16	55	100	12	£59.73
4SUCR 120 003 600	12 x R0.3	18	60	110	12	£52.20
4SUCR 120 005 600	12 x R0.5	18	60	110	12	£52.20
4SUCR 120 010 600	12 x R1	18	60	110	12	£52.20
4SUCR 120 015 600	12 x R1.5	18	60	110	12	£52.20
4SUCR 120 020 600	12 x R2	18	60	110	12	£52.20
4SUCR 120 025 600	12 x R2.5	18	60	110	12	£52.20
4SUCR 120 030 600	12 x R3	18	60	110	12	£52.20
4SUCR 160 005 800	16 x R0.5	24	80	130	16	£90.24
4SUCR 160 010 800	16 x R1	24	80	130	16	£90.24
4SUCR 160 015 800	16 x R1.5	24	80	130	16	£90.24
4SUCR 160 020 800	16 x R2	24	80	130	16	£90.24
4SUCR 160 030 800	16 x R3	24	80	130	16	£90.24
4SUCR 200 005 1000	20 x R0.5	30	100	150	20	£152.64
4SUCR 200 010 1000	20 x R1	30	100	150	20	£152.64
4SUCR 200 015 1000	20 x R1.5	30	100	150	20	£152.64
4SUCR 200 020 1000	20 x R2	30	100	150	20	£152.64
4SUCR 200 030 1000	20 x R3	30	100	150	20	£152.64
4SUCR 200 050 1000	20 x R5	30	100	150	20	£152.64

- End Mills for alloy steel, SUS, Ti/Ni base alloy, Inconel and other hard-to-cut materials.
- JCRO coating provides excellent wear resistance, as well as avoiding edge stress in various applications.
- Strong design for protection against chattering.
- Minimize fracturing at high feed by high TRS fine WC grade.



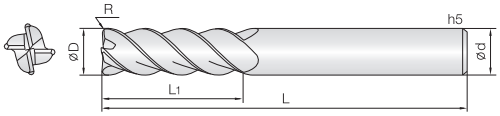
D Size	D Tolerance
Ø1 ~ 5.5	+0 ~ -0.01mm
Ø6 ~ 12	-0.005 ~ -0.015mm
Ø16 ~ 20	-0.01 ~ -0.02mm

Part Number	Diameter	Length of Cut	Overall Length	Shank Dia	Price
	D x R	L1	L	d	£
4SUC 010 001 S04	1 x R0.1	2.5	50	4	£10.94
4SUC 010 002 S04	1 x R0.2	2.5	50	4	£10.94
4SUC 012 001 S04	1.2 x R0.1	3	50	4	£10.94
4SUC 012 002 S04	1.2 x R0.2	3	50	4	£10.94
4SUC 015 001 S04	1.5 x R0.1	4	50	4	£10.94
4SUC 015 002 S04	1.5 x R0.2	4	50	4	£10.94
4SUC 015 003 S04	1.5 x R0.3	4	50	4	£10.94
4SUC 020 001 S04	2 x R0.1	6	50	4	£10.94
4SUC 020 002 S04	2 x R0.2	6	50	4	£10.94
4SUC 020 003 S04	2 x R0.3	6	50	4	£10.94
4SUC 020 005 S04	2 x R0.5	6	50	4	£10.94
4SUC 025 001 S04	2.5 x R0.1	7	50	4	£10.94
4SUC 025 002 S04	2.5 x R0.2	7	50	4	£10.94
4SUC 025 003 S04	2.5 x R0.3	7	50	4	£10.94
4SUC 030 001 S06	3 x R0.1	10	60	6	£14.08
4SUC 030 002 055	3 x R0.2	6	55	6	£12.96
4SUC 030 002 S06	3 x R0.2	10	60	6	£14.08
4SUC 030 003 S06	3 x R0.3	10	60	6	£14.08
4SUC 030 005 055	3 x R0.5	6	55	6	£12.96
4SUC 030 005 S06	3 x R0.5	10	60	6	£14.08
4SUC 035 002 S06	3.5 x R0.2	10	60	6	£14.08
4SUC 040 001 S06	4 x R0.1	12	60	6	£14.08
4SUC 040 002 055	4 x R0.2	8	55	6	£12.96
4SUC 040 002 S06	4 x R0.2	12	60	6	£14.08
4SUC 040 003 S06	4 x R0.3	12	60	6	£14.08
4SUC 040 005 055	4 x R0.5	8	55	6	£12.96
4SUC 040 005 S06	4 x R0.5	12	60	6	£14.08
4SUC 040 010 S06	4 x R1	12	60	6	£14.08
4SUC 045 002 S06	4.5 x R0.2	14	60	6	£14.08
4SUC 050 002 055	5 x R0.2	10	55	6	£12.96
4SUC 050 002 S06	5 x R0.2	15	60	6	£14.08
4SUC 050 003 S06	5 x R0.3	15	60	6	£14.08
4SUC 050 005 055	5 x R0.5	10	55	6	£12.96
4SUC 050 005 S06	5 x R0.5	15	60	6	£14.08
4SUC 050 010 S06	5 x R1	15	60	6	£14.08
4SUC 055 002 S06	5.5 x R0.2	15	60	6	£14.08
4SUC 060 003 055	6 x R0.3	12	55	6	£12.96
4SUC 060 003 S06	6 x R0.3	15	60	6	£14.08
4SUC 060 005 055	6 x R0.5	12	55	6	£12.96
4SUC 060 005 S06	6 x R0.5	15	60	6	£14.08
4SUC 060 010 055	6 x R1	12	55	6	£12.96
4SUC 060 010 S06	6 x R1	15	60	6	£14.08
4SUC 060 015 S06	6 x R1.5	15	60	6	£14.08
4SUC 065 003 S08	6.5 x R0.3	18	60	8	£20.86
4SUC 070 003 S08	7 x R0.3	20	80	8	£21.28
4SUC 070 005 S08	7 x R0.5	20	80	8	£21.28
4SUC 070 010 S08	7 x R1	20	80	8	£21.28
4SUC 080 003 070	8 x R0.3	16	70	8	£18.78

Part Number	Diameter	Length of Cut	Overall Length	Shank Dia	Price
	D x R	L1	L	d	£
4SUC 080 003 S08	8 x R0.3	20	80	8	£21.28
4SUC 080 005 070	8 x R0.5	16	70	8	£18.78
4SUC 080 005 S08	8 x R0.5	20	80	8	£21.28
4SUC 080 010 070	8 x R1	16	70	8	£18.78
4SUC 080 010 S08	8 x R1	20	80	8	£21.28
4SUC 080 015 S08	8 x R1.5	20	80	8	£21.28
4SUC 080 020 S08	8 x R2	20	80	8	£21.28
4SUC 085 003 S10	8.5 x R0.3	22	80	10	£30.66
4SUC 090 003 S10	9 x R0.3	25	80	10	£30.66
4SUC 100 003 070	10 x R0.3	20	70	10	£27.20
4SUC 100 003 S10	10 x R0.3	25	80	10	£30.66
4SUC 100 005 070	10 x R0.5	20	70	10	£27.20
4SUC 100 005 S10	10 x R0.5	25	80	10	£30.66
4SUC 100 010 070	10 x R1	20	70	10	£27.20
4SUC 100 010 S10	10 x R1	25	80	10	£30.66
4SUC 100 015 070	10 x R1.5	20	70	10	£27.20
4SUC 100 015 S10	10 x R1.5	25	80	10	£30.66
4SUC 100 020 070	10 x R2	20	70	10	£27.20
4SUC 100 020 S10	10 x R2	25	80	10	£30.66
4SUC 100 025 070	10 x R2.5	20	70	10	£27.20
4SUC 100 025 S10	10 x R2.5	25	80	10	£30.66
4SUC 100 030 070	10 x R3	20	70	10	£27.20
4SUC 100 030 S10	10 x R3	25	80	10	£30.66
4SUC 110 005 S12	11 x R0.5	27	90	12	£38.98
4SUC 110 010 S12	11 x R1	27	90	12	£38.98
4SUC 120 003 080	12 x R0.3	24	80	12	£33.12
4SUC 120 003 S12	12 x R0.3	30	100	12	£37.06
4SUC 120 005 080	12 x R0.5	24	80	12	£33.12
4SUC 120 005 S12	12 x R0.5	30	100	12	£37.06
4SUC 120 010 080	12 x R1	24	80	12	£33.12
4SUC 120 010 S12	12 x R1	30	100	12	£37.06
4SUC 120 015 080	12 x R1.5	24	80	12	£33.12
4SUC 120 015 S12	12 x R1.5	30	100	12	£37.06
4SUC 120 020 080	12 x R2	24	80	12	£33.12
4SUC 120 020 S12	12 x R2	30	100	12	£37.06
4SUC 120 025 S12	12 x R2.5	30	100	12	£37.06
4SUC 120 030 080	12 x R3	24	80	12	£33.12
4SUC 120 030 S12	12 x R3	30	100	12	£37.06
4SUC 140 005 S14	14 x R0.5	35	100	14	£48.32
4SUC 140 010 S14	14 x R1	35	100	14	£48.32
4SUC 160 005 100	16 x R0.5	32	100	16	£62.62
4SUC 160 005 S16	16 x R0.5	42	110	16	£72.54
4SUC 160 010 100	16 x R1	32	100	16	£62.62
4SUC 160 010 S16	16 x R1	42	110	16	£72.54
4SUC 180 005 S18	18 x R0.5	45	110	18	£86.24
4SUC 180 010 S18	18 x R1	45	110	18	£86.24
4SUC 200 005 S20	20 x R0.5	48	110	20	£96.70
4SUC 200 010 S20	20 x R1	48	110	20	£96.70

4LSUC 4 Flute Long Length Corner Radius End Mills for SUS

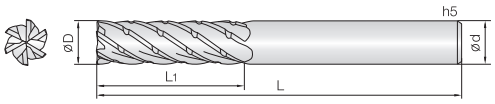
- End Mills for alloy steel, SUS, Ti/Ni base alloy, Inconel and other hard-to-cut materials.
- JCRO coating provides excellent wear resistance, as well as avoiding edge stress in various applications.
- Strong design for protection against chattering.
- Minimize fracturing at high feed by high TRS fine WC grade.



D Size	D Tolerance
Ø6 ~ 12	−0.005 ~ −0.015mm
Ø16 ~ 20	−0.01 ~ −0.02mm

Part Number	Diameter	Length of Cut	Overall Length	Shank Dia	Price
	D x R	L1	L	d	£
4LSUC 060 003070	6 x R0.3	30	70	6	£21.12
4LSUC 060 005070	6 x R0.5	30	70	6	£21.12
4LSUC 060 010070	6 x R1	30	70	6	£21.12
4LSUC 060 015070	6 x R1.5	30	70	6	£21.12
4LSUC 080 003080	8 x R0.3	40	80	8	£30.12
4LSUC 080 005080	8 x R0.5	40	80	8	£30.12
4LSUC 080 010080	8 x R1	40	80	8	£30.12
4LSUC 080 015080	8 x R1.5	40	80	8	£30.12
4LSUC 080 020080	8 x R2	40	80	8	£30.12
4LSUC 100 003100	10 x R0.3	50	100	10	£44.52
4LSUC 100 005100	10 x R0.5	50	100	10	£44.52
4LSUC 100 010100	10 x R1	50	100	10	£44.52
4LSUC 100 015100	10 x R1.5	50	100	10	£44.52
4LSUC 100 020100	10 x R2	50	100	10	£44.52
4LSUC 120 003120	12 x R0.3	60	120	12	£59.34
4LSUC 120 005120	12 x R0.5	60	120	12	£59.34
4LSUC 120 010120	12 x R1	60	120	12	£59.34
4LSUC 120 015120	12 x R1.5	60	120	12	£59.34
4LSUC 120 020120	12 x R2	60	120	12	£59.34
4LSUC 120 025120	12 x R2.5	60	120	12	£59.34
4LSUC 120 030120	12 x R3	60	120	12	£59.34
4LSUC 160 005130	16 x R0.5	80	130	16	£119.20
4LSUC 160 010130	16 x R1	80	130	16	£119.20
4LSUC 160 015130	16 x R1.5	80	130	16	£119.20
4LSUC 160 020130	16 x R2	80	130	16	£119.20
4LSUC 160 030130	16 x R3	80	130	16	£119.20
4LSUC 200 005160	20 x R0.5	100	160	20	£195.04
4LSUC 200 010160	20 x R1	100	160	20	£195.04
4LSUC 200 015160	20 x R1.5	100	160	20	£195.04
4LSUC 200 020160	20 x R2	100	160	20	£195.04
4LSUC 200 030160	20 x R3	100	160	20	£195.04

- Roughing End Mills for alloy steel, SUS, Inconel, Mild steel and various hard-to-cut materials.
- Chip breaker designed for side flute and TISN-R coating provides wear resistance improvement.
- Variable helix design minimises cutting resistance.
- Minimize fracturing at high feed by high TRS fine WC grade.

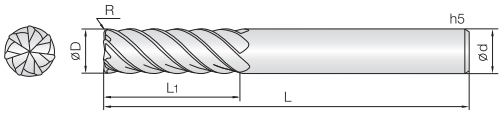


D Size	D Tolerance
Ø6 ~ 12	-0.01 ~ -0.025mm
Ø16 ~ 20	-0.015 ~ -0.03mm

Part Number	Diameter	Length of Cut	Effective Length	Overall Length	Shank Dia	Flutes	Price
	D	L1	L2	L	d	z	£
6TROE 060 140 060	6	14	-	60	6	6	£19.13
6TROE 060 200 065	6	20	-	65	6	6	£23.00
5TROE 060 260 070	6	26	-	70	6	5	£26.47
6TROE 060 300 070	6	16	30	70	6	6	£21.93
6TROE 080 180 065	8	18	-	65	8	6	£30.00
6TROE 080 260 070	8	26	-	70	8	6	£35.80
5TROE 080 340 080	8	34	-	80	8	5	£41.67
6TROE 080 400 080	8	21	40	80	8	6	£34.00
6TROE 100 220 075	10	22	-	75	10	6	£39.13
6TROE 100 330 080	10	33	-	80	10	6	£47.33
5TROE 100 430 090	10	43	-	90	10	5	£54.47
6TROE 100 500 100	10	26	50	100	10	6	£43.93
6TROE 120 270 080	12	27	-	80	12	6	£49.67
6TROE 120 390 095	12	39	-	95	12	6	£60.33
5TROE 120 510 110	12	51	-	110	12	5	£74.67
6TROE 120 600 110	12	31	60	110	12	6	£55.00
6TROE 160 360 100	16	36	-	100	16	6	£106.20
6TROE 160 520 120	16	52	-	120	16	6	£129.00
5TROE 160 680 130	16	68	-	130	16	5	£147.00
6TROE 160 800 130	16	41	80	130	16	6	£115.80
6TROE 200 450 110	20	45	-	110	20	6	£154.20
6TROE 200 650 130	20	65	-	130	20	6	£173.40
5TROE 200 850 150	20	85	-	150	20	5	£197.40
6TROE 200 900 150	20	51	90	150	20	6	£165.00

7SUC 7 Flute Non-Symmetry Corner Radius End Mills for SUS

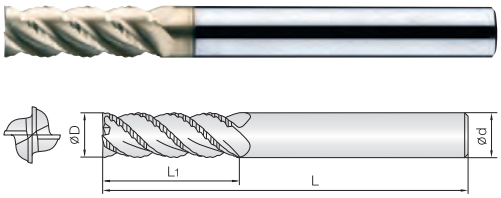
- End Mills for alloy steel, SUS, Inconel, Mild steel and various hard-to-cut materials.
- Chip breaker designed for side flute and TISN-R coating provides wear resistance improvement.
- Variable helix design minimises cutting resistance.
- Minimize fracturing at high feed by high TRS fine WC grade.



D Size	D Tolerance
Ø6 ~ 12	−0.005 ~ −0.015mm
Ø16 ~ 20	−0.01 ~ −0.02mm

Part Number	Diameter	Length of Cut	Overall Length	Shank Dia	Price
	D x R	L1	L	d	£
7SUC 060 050 060	6 x R0.5	15	60	6	£17.22
7SUC 080 050 070	8 x R0.5	25	70	8	£26.10
7SUC 100 005 075	10 x R0.5	25	75	10	£40.62
7SUC 120 005 085	12 x R0.5	30	85	12	£52.56
7SUC 160 005 100	16 x R0.5	42	100	16	£82.66
7SUC 200 005 110	20 x R0.5	48	110	20	£125.86

- Roughing End Mills for Alloy steel, SUS, Inconel, Mild Steels and other hard-to-cut materials.
- JCRO coating provides excellent wear resistance, as well as avoiding edge stress in various applications.
- 45° helix Design minimizes cutting resistance and improves tool life.

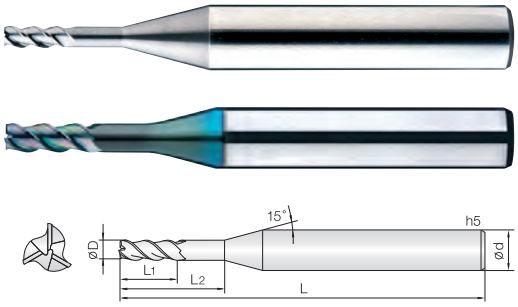


D Size	D Tolerance
Ø3 ~ 9	−0.02 ~ −0.04mm
Ø10 ~ 20	−0.02 ~ −0.05mm

Part Number	Diameter	Length of Cut	Effective Length	Overall Length	Shank Dia	No. Flutes	Price
	D	L1	L2	L	d	z	£
3SUR 030 002 S06	3 x R0.2	8	-	50	6	3F	£16.53
3SUR 040 002 S06	4 x R0.2	10	-	50	6	3F	£16.53
4SUR 050 002 S06	5 x R0.2	13	-	50	6	4F	£16.53
4SUR 060 002 200	6 x R0.2	10	20	60	6	4F	£18.73
4SUR 060 002 S06	6 x R0.2	13	-	60	6	4F	£17.33
4SUR 060 005 S06	6 x R0.5	13	-	60	6	4F	£17.33
4SUR 070 002 S08	7 x R0.2	18	-	70	8	4F	£26.47
4SUR 080 002 250	8 x R0.2	12	25	70	8	4F	£27.80
4SUR 080 002 S08	8 x R0.2	19	-	70	8	4F	£26.47
4SUR 080 010 S08	8 x R1	19	-	70	8	4F	£26.47
4SUR 090 003 S10	9 x R0.3	20	-	70	10	4F	£34.93
4SUR 100 003 300	10 x R0.3	15	30	75	10	4F	£36.33
4SUR 100 003 S10	10 x R0.3	22	-	75	10	4F	£34.93
4SUR 100 010 S10	10 x R1	22	-	75	10	4F	£34.93
4SUR 110 003 S12	11 x R0.3	25	-	80	12	4F	£44.20
4SUR 120 003 350	12 x R0.3	20	35	80	12	4F	£41.04
4SUR 120 003 S12	12 x R0.3	26	-	80	12	4F	£39.78
4SUR 120 010 S12	12 x R1	26	-	80	12	4F	£39.78
5SUR 140 005 S16	14 x R0.5	28	-	90	16	5F	£86.78
5SUR 160 005 100	16 x R0.5	32	-	100	16	5F	£89.02
5SUR 160 005 110	16 x R0.5	42	-	110	16	5F	£93.92
5SUR 160 015 100	16 x R1.5	32	-	100	16	5F	£89.02
5SUR 160 015 110	16 x R1.5	42	-	110	16	5F	£93.92
5SUR 200 005 100	20 x R0.5	38	-	100	20	5F	£125.22
5SUR 200 005 110	20 x R0.5	45	-	110	20	5F	£131.30
5SUR 200 020 100	20 x R2	45	-	100	20	5F	£125.22
5SUR 200 020 110	20 x R2	45	-	110	20	5F	£131.30

3ALR 3 Flute 45° Helix Rib End Mills for Aluminium

- End Mills for Aluminium, AL alloy, non-ferrous and non-metallic materials.
- Fine WC grade gives excellent surface finish.
- Flute Lengths available for various applications.
- Tetrabond TAC coating provides excellent work surface finish through high hardness and low friction.
- Minimize built up edge by double edge and deep pocket design.



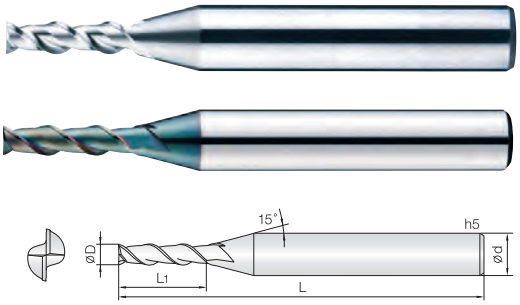
D Size	D Tolerance
ø0,8 ~ 20	+0 ~ -0,01mm

Part Number	Part Number	Diameter	Length of Cut	Effective Length	Overall Length	Shank Dia	Price	Price
Uncoated	RTAC Coated	D	L1	L2	L	d	Uncoated	Coated
3ALR 008 016 S04	3ALRC 008 016 S04	0.8	1.6	-	50	4	£14.00	£17.33
3ALR 008 030 S04	3ALRC 008 030 S04	0.8	1.6	3	50	4	£15.33	£18.67
3ALR 008 040 S04	3ALRC 008 040 S04	0.8	1.6	4	50	4	£15.33	£18.67
3ALR 008 050 S04	3ALRC 008 050 S04	0.8	1.6	5	50	4	£15.33	£18.67
3ALR 008 060 S04	3ALRC 008 060 S04	0.8	1.6	6	50	4	£15.33	£18.67
3ALR 008 080 S04	3ALRC 008 080 S04	0.8	1.6	8	50	4	£16.13	£19.47
3ALR 008 100 S04	3ALRC 008 100 S04	0.8	1.6	10	50	4	£16.13	£19.47
3ALR 008 120 S04	3ALRC 008 120 S04	0.8	1.6	12	50	4	£16.13	£19.47
3ALR 010 020 S06	3ALRC 010 020 S06	1	2	-	60	6	£14.73	£18.13
3ALR 010 040 S06	3ALRC 010 040 S06	1	2	4	60	6	£16.87	£20.27
3ALR 010 060 S06	3ALRC 010 060 S06	1	2	6	60	6	£16.87	£20.27
3ALR 010 080 S06	3ALRC 010 080 S06	1	2	8	60	6	£17.40	£20.80
3ALR 010 100 S06	3ALRC 010 100 S06	1	2	10	60	6	£17.40	£20.80
3ALR 010 120 S06	3ALRC 010 120 S06	1	2	12	60	6	£17.40	£20.80
3ALR 010 140 S06	3ALRC 010 140 S06	1	2	14	60	6	£17.40	£20.80
3ALR 010 160 S06	3ALRC 010 160 S06	1	2	16	60	6	£19.53	£22.93
3ALR 010 180 S06	-	1	2	18	60	6	£21.13	-
3ALR 010 200 S06	-	1	2	20	60	6	£23.20	-
3ALR 015 030 S06	3ALRC 015 030 S06	1.5	3	-	60	6	£14.73	£18.13
3ALR 015 060 S06	3ALRC 015 060 S06	1.5	3	6	60	6	£16.87	£20.27
3ALR 015 080 S06	3ALRC 015 080 S06	1.5	3	8	60	6	£16.87	£20.27
3ALR 015 100 S06	3ALRC 015 100 S06	1.5	3	10	60	6	£16.87	£20.27
3ALR 015 120 S06	3ALRC 015 120 S06	1.5	3	12	60	6	£17.40	£20.80
3ALR 015 140 S06	3ALRC 015 140 S06	1.5	3	14	60	6	£17.40	£20.80
3ALR 015 160 S06	3ALRC 015 160 S06	1.5	3	16	60	6	£17.40	£20.80
3ALR 015 180 S06	3ALRC 015 180 S06	1.5	3	18	60	6	£19.53	£22.93
3ALR 015 200 S06	3ALRC 015 200 S06	1.5	3	20	60	6	£19.53	£22.93
3ALR 015 220 S06	-	1.5	3	22	65	6	£21.13	-
3ALR 015 250 S06	-	1.5	3	25	65	6	£23.20	-
3ALR 020 040 S06	3ALRC 020 040 S06	2	4	-	60	6	£14.73	£18.13
3ALR 020 080 S06	3ALRC 020 080 S06	2	4	8	60	6	£16.87	£20.27
3ALR 020 100 S06	3ALRC 020 100 S06	2	4	10	60	6	£16.87	£20.27
3ALR 020 120 S06	3ALRC 020 120 S06	2	4	12	60	6	£16.87	£20.27
3ALR 020 140 S06	3ALRC 020 140 S06	2	4	14	60	6	£16.53	£19.93
3ALR 020 160 S06	3ALRC 020 160 S06	2	4	16	60	6	£17.40	£20.80
3ALR 020 200 S06	3ALRC 020 200 S06	2	4	20	60	6	£17.40	£20.80
3ALR 020 220 S06	3ALRC 020 220 S06	2	4	22	60	6	£19.53	£22.93
3ALR 020 250 S06	3ALRC 020 250 S06	2	4	25	65	6	£21.07	£24.47
3ALR 020 280 S06	-	2	4	28	70	6	£22.47	-
3ALR 020 300 S06	-	2	4	30	70	6	£23.73	-

Part Number	Part Number	Diameter	Length of Cut	Effective Length	Overall Length	Shank Dia	Price	Price
Uncoated	RTAC Coated	D	L1	L2	L	d	Uncoated	Coated
3ALR 025 050 S06	3ALRC 025 050 S06	2.5	5	-	60	6	£14.73	£18.13
3ALR 025 100 S06	3ALRC 025 100 S06	2.5	5	10	60	6	£16.87	£20.27
3ALR 025 150 S06	3ALRC 025 150 S06	2.5	5	15	60	6	£16.87	£20.27
3ALR 025 200 S06	3ALRC 025 200 S06	2.5	5	20	60	6	£18.80	£22.20
3ALR 025 250 S06	3ALRC 025 250 S06	2.5	5	25	60	6	£19.40	£22.80
3ALR 025 300 S06	3ALRC 025 300 S06	2.5	5	30	70	6	£21.07	£24.47
3ALR 025 350 S06	-	2.5	5	35	80	6	£22.47	-
3ALR 025 400 S06	-	2.5	5	40	90	6	£23.80	-
3ALR 030 060 S06	3ALRC 030 060 S06	3	6	-	60	6	£14.73	£18.13
3ALR 030 100 S06	3ALRC 030 100 S06	3	6	10	60	6	£16.87	£20.27
3ALR 030 150 S06	3ALRC 030 150 S06	3	6	15	60	6	£16.87	£20.27
3ALR 030 200 S06	3ALRC 030 200 S06	3	6	20	70	6	£18.80	£22.20
3ALR 030 250 S06	3ALRC 030 250 S06	3	6	25	70	6	£19.73	£23.13
3ALR 030 300 S06	3ALRC 030 300 S06	3	6	30	80	6	£21.07	£24.47
3ALR 030 350 S06	3ALRC 030 350 S06	3	6	35	80	6	£23.13	£26.53
3ALR 030 400 S06	3ALRC 030 400 S06	3	6	40	90	6	£25.13	£28.53
3ALR 030 450 S06	-	3	6	45	90	6	£26.40	-
3ALR 030 500 S06	-	3	6	50	100	6	£28.00	-
3ALR 040 080 S06	3ALRC 040 080 S06	4	8	-	70	6	£16.87	£20.27
3ALR 040 100 S06	3ALRC 040 100 S06	4	8	10	70	6	£18.80	£22.20
3ALR 040 150 S06	3ALRC 040 150 S06	4	8	15	70	6	£18.80	£22.20
3ALR 040 200 S06	3ALRC 040 200 S06	4	8	20	70	6	£18.80	£22.20
3ALR 040 250 S06	3ALRC 040 250 S06	4	8	25	70	6	£19.73	£23.13
3ALR 040 300 S06	3ALRC 040 300 S06	4	8	30	80	6	£21.07	£24.47
3ALR 040 350 S06	3ALRC 040 350 S06	4	8	35	80	6	£23.13	£26.53
3ALR 040 400 S06	3ALRC 040 400 S06	4	8	40	90	6	£25.13	£28.53
3ALR 040 450 S06	-	4	8	45	90	6	£26.40	-
3ALR 040 500 S06	-	4	8	50	100	6	£28.00	-
3ALR 050 100 S06	3ALRC 050 100 S06	5	10	-	80	6	£18.80	£22.20
3ALR 050 200 S06	3ALRC 050 200 S06	5	10	20	80	6	£21.07	£24.47
3ALR 050 300 S06	3ALRC 050 300 S06	5	10	30	80	6	£21.07	£24.47
3ALR 050 400 S06	3ALRC 050 400 S06	5	10	40	90	6	£23.80	£27.20
3ALR 050 500 S06	3ALRC 050 500 S06	5	10	50	100	6	£25.87	£29.27
3ALR 050 600 S06	-	5	10	60	110	6	£28.00	-
3ALR 060 200 S06	3ALRC 060 200 S06	6	12	20	80	6	£21.07	£24.47
3ALR 060 400 S06	3ALRC 060 400 S06	6	12	40	80	6	£23.13	£26.53
3ALR 060 600 110	3ALRC 060 600 110	6	12	60	110	6	£27.87	£31.27
3ALR 060 800 120	-	6	12	80	120	6	£30.33	-
3ALR 080 400 S08	3ALRC 080 400 S08	8	16	40	100	8	£30.93	£35.33
3ALR 080 600 110	3ALRC 080 600 110	8	16	60	110	8	£35.73	£40.20
3ALR 080 800 120	-	8	16	80	120	8	£45.80	-
3ALR 100 500 S10	3ALRC 100 500 S10	10	20	50	110	10	£42.93	£48.13
3ALR 100 700 120	3ALRC 100 700 120	10	20	70	120	10	£48.73	£54.00
3ALR 100 900 150	-	10	20	90	150	10	£64.67	-
3ALR 120 500 S12	3ALRC 120 500 S12	12	24	50	110	12	£52.20	£58.40
3ALR 120 700 130	3ALRC 120 700 130	12	24	70	130	12	£59.73	£65.93
3ALR 120 900 150	-	12	24	90	150	12	£76.67	-
3ALR 140 600 110	-	14	28	60	110	14	£78.00	-
3ALR 140 800 120	-	14	28	80	120	14	£85.33	-
3ALR 160 800 130	-	16	32	80	130	16	£92.00	-
3ALR 160 1000 160	-	16	32	100	160	16	£118.00	-
3ALR 200 800 130	-	20	40	80	130	20	£138.67	-
3ALR 200 1200 160	-	20	40	120	160	20	£150.00	-
3ALR 200 1500 200	-	20	40	150	200	20	£197.33	-

2ALE 2 Flute 45° Helix End Mills for Aluminium

- End mills for Aluminium, AL alloy, non-ferrous and non-metallic materials.
- Fine WC grade gives excellent surface finish.
- Wide range of flute lengths available, covering many applications.
- Tetrabond TAC coating provides excellent work surface finish through high hardness and low friction.
- Minimize built up edge by double edge and deep pocket design.

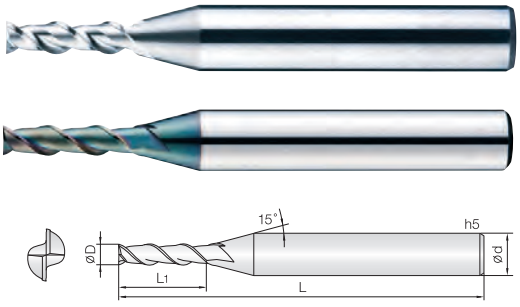


D Size	D Tolerance
ø0.5 ~ 20	+0 ~ -0.01mm

Part Number	Part Number	Diameter	Length of Cut	Overall Length	Shank Dia	Price	Price
Uncoated	RTAC Coated	D	L1	L	d	Uncoated	Coated
2ALE 005 005 S04	2ALEC 005 005 S04	0.5	0.5	40	4	£10.80	£14.13
2ALE 005 010 S04	2ALEC 005 010 S04	0.5	1	40	4	£10.80	£14.13
2ALE 005 015 S04	2ALEC 005 015 S04	0.5	1.5	40	4	£10.80	£14.13
2ALE 005 020 S04	2ALEC 005 020 S04	0.5	2	40	4	£11.47	£14.80
2ALE 005 025 S04	-	0.5	2.5	40	4	£12.47	-
2ALE 005 030 S04	-	0.5	3	40	4	£13.07	-
2ALE 006 006 S04	2ALEC 006 006 S04	0.6	0.6	40	4	£10.47	£13.80
2ALE 006 012 S04	2ALEC 006 012 S04	0.6	1.2	40	4	£10.47	£13.80
2ALE 006 020 S04	2ALEC 006 020 S04	0.6	2	40	4	£11.13	£14.47
2ALE 006 030 S04	-	0.6	3	40	4	£11.87	-
2ALE 006 040 S04	-	0.6	4	40	4	£12.47	-
2ALE 007 007 S04	2ALEC 007 007 S04	0.7	0.7	40	4	£9.93	£13.27
2ALE 007 014 S04	2ALEC 007 014 S04	0.7	1.4	40	4	£9.93	£13.27
2ALE 007 020 S04	2ALEC 007 020 S04	0.7	2	40	4	£10.60	£13.93
2ALE 007 030 S04	-	0.7	3	40	4	£11.20	-
2ALE 007 040 S04	-	0.7	4	40	4	£11.80	-
2ALE 008 008 S04	2ALEC 008 008 S04	0.8	0.8	40	4	£9.93	£13.27
2ALE 008 016 S04	2ALEC 008 016 S04	0.8	1.6	40	4	£9.93	£13.27
2ALE 008 020 S04	2ALEC 008 020 S04	0.8	2	40	4	£10.60	£13.93
2ALE 008 030 S04	-	0.8	3	40	4	£11.20	-
2ALE 008 040 S04	-	0.8	4	40	4	£11.80	-
2ALE 009 009 S04	2ALEC 009 009 S04	0.9	0.9	40	4	£9.47	£12.80
2ALE 009 018 S04	2ALEC 009 018 S04	0.9	1.8	40	4	£9.47	£12.80
2ALE 009 025 S04	2ALEC 009 025 S04	0.9	2.5	40	4	£10.13	£13.47
2ALE 009 040 S04	-	0.9	4	40	4	£11.00	-
2ALE 010 015 S04	2ALEC 010 015 S04	1	1.5	40	4	£9.00	£12.33
2ALE 010 015 S06	2ALEC 010 015 S06	1	1.5	40	6	£10.00	£13.33
2ALE 010 025 S04	2ALEC 010 025 S04	1	2.5	40	4	£9.00	£12.33
2ALE 010 025 S06	2ALEC 010 025 S06	1	2.5	40	6	£12.20	£15.53
2ALE 010 035 S04	2ALEC 010 035 S04	1	3.5	40	4	£9.67	£13.00
2ALE 010 035 S06	2ALEC 010 035 S06	1	3.5	40	6	£13.93	£17.27
2ALE 010 050 S06	2ALEC 010 050 S06	1	5	45	6	£14.40	£17.73
2ALE 010 060 S06	2ALEC 010 060 S06	1	6	45	6	£15.07	£18.40
2ALE 010 080 S06	2ALEC 010 080 S06	1	8	45	6	£16.47	£19.80
2ALE 010 100 S06	2ALEC 010 100 S06	1	10	45	6	£17.87	£21.20
2ALE 010 120 S06	-	1	12	45	6	£19.73	-
2ALE 012 030 S06	2ALEC 012 030 S06	1.2	3	40	6	£12.67	£16.00
2ALE 012 040 S06	2ALEC 012 040 S06	1.2	4	40	6	£12.67	£16.00
2ALE 012 060 S06	2ALEC 012 060 S06	1.2	6	40	6	£13.67	£17.00

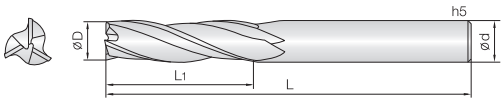
Part Number	Part Number	Diameter	Length of Cut	Overall Length	Shank Dia	Price	Price
Uncoated	RTAC Coated	D	L1	L	d	Uncoated	Coated
2ALE 012 080 S06	-	1.2	8	45	6	£15.13	-
2ALE 012 100 S06	-	1.2	10	45	6	£17.07	-
2ALE 015 040 S06	2ALEC 015 040 S06	1.5	4	40	6	£11.47	£14.80
2ALE 015 060 S06	2ALEC 015 060 S06	1.5	6	40	6	£13.00	£16.33
2ALE 015 080 S06	2ALEC 015 080 S06	1.5	8	45	6	£13.67	£17.00
2ALE 015 100 S06	2ALEC 015 100 S06	1.5	10	50	6	£14.67	£18.00
2ALE 015 120 S06	2ALEC 015 120 S06	1.5	12	50	6	£14.67	£18.00
2ALE 015 150 S06	2ALEC 015 150 S06	1.5	15	55	6	£17.13	£20.47
2ALE 015 180 S06	-	1.5	18	60	6	£18.60	-
2ALE 020 050 S06	2ALEC 020 050 S06	2	5	45	6	£10.00	£13.33
2ALE 020 070 S06	2ALEC 020 070 S06	2	7	45	6	£10.00	£13.33
2ALE 020 100 S06	2ALEC 020 100 S06	2	10	50	6	£11.67	£15.00
2ALE 020 120 S06	2ALEC 020 120 S06	2	12	50	6	£12.27	£15.60
2ALE 020 140 S06	2ALEC 020 140 S06	2	14	50	6	£12.27	£15.60
2ALE 020 160 S06	2ALEC 020 160 S06	2	16	60	6	£14.67	£18.00
2ALE 020 180 S06	-	2	18	60	6	£17.13	-
2ALE 020 200 S06	-	2	20	60	6	£18.60	-
2ALE 025 080 S06	2ALEC 025 080 S06	2.5	8	45	6	£13.00	£16.33
2ALE 025 120 S06	2ALEC 025 120 S06	2.5	12	50	6	£14.47	£17.80
2ALE 025 150 S06	2ALEC 025 150 S06	2.5	15	60	6	£15.80	£19.13
2ALE 025 180 S06	-	2.5	18	60	6	£17.13	-
2ALE 025 200 S06	-	2.5	20	60	6	£18.60	-
2ALE 030 080 S06	2ALEC 030 080 S06	3	8	45	6	£10.00	£13.33
2ALE 030 100 S06	2ALEC 030 100 S06	3	10	45	6	£10.00	£13.33
2ALE 030 120 S06	2ALEC 030 120 S06	3	12	50	6	£11.00	£14.33
2ALE 030 150 S06	2ALEC 030 150 S06	3	15	50	6	£11.53	£14.87
2ALE 030 200 S06	2ALEC 030 200 S06	3	20	60	6	£12.47	£15.80
2ALE 030 250 S06	2ALEC 030 250 S06	3	25	65	6	£13.67	£17.00
2ALE 030 300 S06	-	3	30	70	6	£17.13	-
2ALE 035 100 S06	2ALEC 035 100 S06	3.5	10	45	6	£13.00	£16.33
2ALE 035 150 S06	2ALEC 035 150 S06	3.5	15	50	6	£14.47	£17.80
2ALE 035 200 S06	-	3.5	20	60	6	£16.47	-
2ALE 040 120 S06	2ALEC 040 120 S06	4	12	50	6	£10.00	£13.33
2ALE 040 150 S06	2ALEC 040 150 S06	4	15	55	6	£11.93	£15.27
2ALE 040 180 S06	2ALEC 040 180 S06	4	18	55	6	£12.47	£15.80
2ALE 040 250 S06	2ALEC 040 250 S06	4	25	65	6	£13.20	£16.53
2ALE 040 300 S06	2ALEC 040 300 S06	4	30	70	6	£16.87	£20.20
2ALE 040 350 S06	-	4	35	75	6	£19.80	-
2ALE 040 400 S06	-	4	40	80	6	£21.67	-
2ALE 045 120 S06	2ALEC 045 120 S06	4.5	12	50	6	£14.47	£17.80
2ALE 045 180 S06	2ALEC 045 180 S06	4.5	18	55	6	£15.73	£19.07
2ALE 045 220 S06	-	4.5	22	65	6	£17.13	-
2ALE 045 250 S06	-	4.5	25	70	6	£18.33	-
2ALE 050 150 S06	2ALEC 050 150 S06	5	15	50	6	£10.40	£13.73
2ALE 050 200 S06	2ALEC 050 200 S06	5	20	60	6	£11.53	£14.87
2ALE 050 250 S06	2ALEC 050 250 S06	5	25	65	6	£12.47	£15.80
2ALE 050 300 S06	2ALEC 050 300 S06	5	30	70	6	£16.87	£20.20
2ALE 050 400 S06	-	5	40	80	6	£19.80	-
2ALE 055 150 S06	2ALEC 055 150 S06	5.5	15	50	6	£15.73	£19.07
2ALE 060 150 S06	2ALEC 060 150 S06	6	15	50	6	£10.40	£13.73
2ALE 060 200 S06	2ALEC 060 200 S06	6	20	60	6	£11.53	£14.87
2ALE 060 250 S06	2ALEC 060 250 S06	6	25	65	6	£12.80	£16.13
2ALE 060 300 S06	2ALEC 060 300 S06	6	30	70	6	£13.93	£17.27

2ALE 2 Flute 45° Helix End Mills for Aluminium



Part Number	Part Number	Diameter	Length of Cut	Overall Length	Shank Dia	Price	Price
Uncoated	RTAC Coated	D	L1	L	d	Uncoated	Coated
2ALE 060 350 S06	2ALEC 060 350 S06	6	35	75	6	£16.00	£19.33
2ALE 060 400 S06	2ALEC 060 400 S06	6	40	80	6	£18.67	£22.00
2ALE 060 450 S06	-	6	45	90	6	£21.67	-
2ALE 060 500 S06	-	6	50	100	6	£23.80	-
2ALE 070 200 S08	2ALEC 070 200 S08	7	20	60	8	£16.73	£21.07
2ALE 070 300 S08	2ALEC 070 300 S08	7	30	70	8	£21.53	£25.87
2ALE 080 200 S08	2ALEC 080 200 S08	8	20	60	8	£16.73	£21.07
2ALE 080 250 S08	2ALEC 080 250 S08	8	25	65	8	£19.80	£24.13
2ALE 080 300 S08	2ALEC 080 300 S08	8	30	70	8	£21.53	£25.87
2ALE 080 400 S08	2ALEC 080 400 S08	8	40	80	8	£23.13	£27.47
2ALE 080 450 S08	2ALEC 080 450 S08	8	45	90	8	£24.67	£29.00
2ALE 080 500 S08	-	8	50	100	8	£27.80	-
2ALE 100 250 S10	2ALEC 100 250 S10	10	25	70	10	£23.07	£28.13
2ALE 100 300 S10	2ALEC 100 300 S10	10	30	75	10	£27.60	£32.67
2ALE 100 350 S10	2ALEC 100 350 S10	10	35	80	10	£30.20	£35.27
2ALE 100 450 S10	2ALEC 100 450 S10	10	45	90	10	£31.80	£36.87
2ALE 100 500 S10	2ALEC 100 500 S10	10	50	100	10	£34.67	£39.73
2ALE 100 600 S10	-	10	50	100	10	£39.47	-
2ALE 120 300 S12	2ALEC 120 300 S12	12	30	75	12	£28.80	£34.80
2ALE 120 350 S12	2ALEC 120 350 S12	12	35	80	12	£34.53	£40.53
2ALE 120 400 S12	2ALEC 120 400 S12	12	40	90	12	£36.67	£42.67
2ALE 120 450 S12	2ALEC 120 450 S12	12	45	100	12	£38.67	£44.67
2ALE 120 500 S12	2ALEC 120 500 S12	12	50	100	12	£38.80	£44.80
2ALE 120 600 S12	2ALEC 120 600 S12	12	60	110	12	£42.67	£48.67
2ALE 120 700 S12	-	12	70	120	12	£45.80	-
2ALE 140 300 S14	2ALEC 140 300 S14	14	30	80	14	£55.74	£61.74
2ALE 140 500 S14	-	14	50	90	14	£61.80	-
2ALE 140 600 S14	-	14	60	110	14	£75.00	-
2ALE 160 400 S16	2ALEC 160 400 S16	16	40	90	16	£60.96	£66.96
2ALE 160 550 S16	2ALEC 160 550 S16	16	55	110	16	£73.14	£79.14
2ALE 160 700 S16	2ALEC 160 700 S16	16	70	120	16	£95.10	£101.10
2ALE 160 900 S16	-	16	90	150	16	£118.20	-
2ALE 200 450 S20	2ALEC 200 450 S20	20	45	100	20	£92.94	£101.04
2ALE 200 650 S20	2ALEC 200 650 S20	20	65	120	20	£111.06	£119.16
2ALE 200 800 S20	2ALEC 200 800 S20	20	80	135	20	£133.56	£141.66
2ALE 200 1000 S20	-	20	100	160	20	£142.20	-

- End Mills for Aluminium, AL alloy, non-ferrous and non-metallic materials.
- 25° Helix and special edge design enables superior mirror surface milling.
- Minimise fracturing by high TRS fine WC grade.

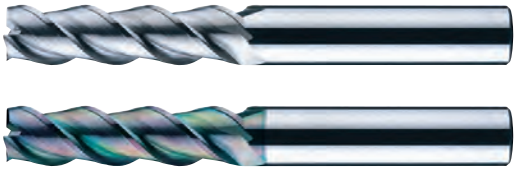


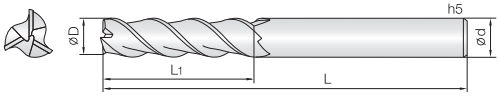
D Size	D Tolerance
ø6 ~ 16	+0 ~ −0,01mm

Part Number	Diameter	Length of Cut	Overall Length	Shank Dia	Price
	D	L1	L	d	£
3FALE 060 170 S06	6	17	60	6	£15.27
3FALE 060 220 S06	6	22	65	6	£16.33
3FALE 080 260 S08	8	26	70	8	£26.93
3FALE 080 360 S08	8	36	80	8	£29.67
3FALE 100 310 S10	10	31	80	10	£37.53
3FALE 100 410 S10	10	41	90	10	£43.20
3FALE 120 360 S12	12	36	90	12	£47.13
3FALE 120 460 S12	12	46	100	12	£51.73
3FALE 160 460 S16	16	46	100	16	£86.40
3FALE 160 660 S16	16	66	120	16	£106.80

3ALE 3 Flute 45° Helix End Mills for Aluminium

- End mills for Aluminium, AL alloy, non-ferrous and non-metallic materials.
- Fine WC grade gives excellent surface finish.
- Wide range of flute lengths available, covering many applications.
- Tetrabond TAC coating provides excellent work surface finish through high hardness and low friction.
- Minimize built up edge by double edge and deep pocket design.





D Size	D Tolerance
ø0.8 ~ 20	+0~ –0.01mm

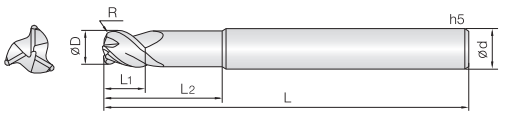
Part Number	Part Number	Diameter	Length of Cut	Overall Length	Shank Dia	Price	Price
Uncoated	RTAC Coated	D	L1	L	d	Uncoated	Coated
3ALE 008 012 S04	-	0.8	1.2	40	4	£13.13	-
3ALE 008 020 S04	-	0.8	2	40	4	£13.13	-
3ALE 008 030 S04	-	0.8	3	40	4	£14.40	-
3ALE 008 040 S04	-	0.8	4	40	4	£15.13	-
3ALE 010 015 S06	3ALEC 010 015 S06	1	1.5	40	6	£12.20	£15.53
3ALE 010 030 S06	3ALEC 010 030 S06	1	3	40	6	£12.20	£15.53
3ALE 010 050 S06	3ALEC 010 050 S06	1	5	45	6	£14.40	£17.73
3ALE 010 060 S06	3ALEC 010 060 S06	1	6	45	6	£15.07	£18.40
3ALE 010 080 S06	3ALEC 010 080 S06	1	8	45	6	£16.47	£19.80
3ALE 010 100 S06	3ALEC 010 100 S06	1	10	45	6	£17.87	£21.20
3ALE 010 120 S06	-	1	12	50	6	£19.93	-
3ALE 010 140 S06	-	1	14	50	6	£21.80	-
3ALE 012 030 S06	3ALEC 012 030 S06	1.2	3	40	6	£11.87	£15.20
3ALE 012 040 S06	3ALEC 012 040 S06	1.2	4	40	6	£11.87	£15.20
3ALE 012 060 S06	3ALEC 012 060 S06	1.2	6	45	6	£13.60	£16.93
3ALE 012 080 S06	-	1.2	8	45	6	£15.27	-
3ALE 012 100 S06	-	1.2	10	45	6	£17.13	-
3ALE 012 120 S06	-	1.2	12	50	6	£19.00	-
3ALE 015 025 S06	3ALEC 015 025 S06	1.5	2.5	40	6	£11.53	£14.87
3ALE 015 040 S06	3ALEC 015 040 S06	1.5	4	40	6	£11.53	£14.87
3ALE 015 060 S06	3ALEC 015 060 S06	1.5	6	45	6	£12.87	£16.20
3ALE 015 080 S06	3ALEC 015 080 S06	1.5	8	45	6	£13.67	£17.00
3ALE 015 100 S06	3ALEC 015 100 S06	1.5	10	50	6	£14.67	£18.00
3ALE 015 120 S06	3ALEC 015 120 S06	1.5	12	50	6	£15.67	£19.00
3ALE 015 150 S06	3ALEC 015 150 S06	1.5	15	50	6	£17.13	£20.47
3ALE 015 180 S06	-	1.5	18	60	6	£19.00	-
3ALE 015 200 S06	-	1.5	20	60	6	£21.80	-
3ALE 020 030 S06	3ALEC 020 030 S06	2	3	45	6	£10.07	£13.40
3ALE 020 050 S06	3ALEC 020 050 S06	2	5	45	6	£10.07	£13.40
3ALE 020 070 S06	3ALEC 020 070 S06	2	7	45	6	£10.07	£13.40
3ALE 020 100 S06	3ALEC 020 100 S06	2	10	50	6	£11.67	£15.00
3ALE 020 120 S06	3ALEC 020 120 S06	2	12	50	6	£12.27	£15.60
3ALE 020 140 S06	3ALEC 020 140 S06	2	14	60	6	£13.67	£17.00
3ALE 020 160 S06	3ALEC 020 160 S06	2	16	60	6	£14.67	£18.00
3ALE 020 180 S06	3ALEC 020 180 S06	2	18	60	6	£16.67	£20.00
3ALE 020 200 S06	3ALEC 020 200 S06	2	20	60	6	£19.33	£22.67
3ALE 020 220 S06	-	2	22	60	6	£21.80	-
3ALE 020 250 S06	-	2	25	65	6	£23.73	-
3ALE 025 040 S06	3ALEC 025 040 S06	2.5	4	45	6	£13.00	£16.33

Part Number	Part Number	Diameter	Length of Cut	Overall Length	Shank Dia	Price	Price
Uncoated	RTAC Coated	D	L1	L	d	Uncoated	Coated
3ALE 025 080 S06	3ALEC 025 080 S06	2.5	8	45	6	£13.00	£16.33
3ALE 025 120 S06	3ALEC 025 120 S06	2.5	12	50	6	£14.47	£17.80
3ALE 025 150 S06	3ALEC 025 150 S06	2.5	15	60	6	£15.80	£19.13
3ALE 025 200 S06	-	2.5	20	60	6	£18.60	-
3ALE 025 250 S06	-	2.5	25	65	6	£21.80	-
3ALE 030 045 S06	3ALEC 030 045 S06	3	4.5	45	6	£10.07	£13.40
3ALE 030 080 S06	3ALEC 030 080 S06	3	8	45	6	£10.07	£13.40
3ALE 030 120 S06	3ALEC 030 120 S06	3	12	50	6	£11.07	£14.40
3ALE 030 150 S06	3ALEC 030 150 S06	3	15	50	6	£11.53	£14.87
3ALE 030 200 S06	3ALEC 030 200 S06	3	20	55	6	£12.47	£15.80
3ALE 030 250 S06	3ALEC 030 250 S06	3	25	60	6	£13.20	£16.53
3ALE 030 300 S06	3ALEC 030 300 S06	3	30	65	6	£16.87	£20.20
3ALE 030 350 S06	-	3	35	75	6	£19.80	-
3ALE 030 400 S06	-	3	40	80	6	£23.00	-
3ALE 035 055 S06	3ALEC 035 055 S06	3.5	5.5	45	6	£13.00	£16.33
3ALE 035 100 S06	3ALEC 035 100 S06	3.5	10	45	6	£13.00	£16.33
3ALE 035 150 S06	3ALEC 035 150 S06	3.5	15	50	6	£14.47	£17.80
3ALE 035 200 S06	3ALEC 035 200 S06	3.5	20	55	6	£16.47	£19.80
3ALE 035 250 S06	3ALEC 035 250 S06	3.5	25	60	6	£18.47	£21.80
3ALE 035 300 S06	3ALEC 035 300 S06	3.5	30	65	6	£20.47	£23.80
3ALE 035 350 S06	-	3.5	35	75	6	£23.13	-
3ALE 040 060 S06	3ALEC 040 060 S06	4	6	45	6	£10.07	£13.40
3ALE 040 110 S06	3ALEC 040 110 S06	4	11	45	6	£10.07	£13.40
3ALE 040 160 S06	3ALEC 040 160 S06	4	16	50	6	£11.53	£14.87
3ALE 040 200 S06	3ALEC 040 200 S06	4	20	55	6	£12.47	£15.80
3ALE 040 250 S06	3ALEC 040 250 S06	4	25	60	6	£13.20	£16.53
3ALE 040 300 S06	3ALEC 040 300 S06	4	30	65	6	£16.87	£20.20
3ALE 040 350 S06	-	4	35	75	6	£19.80	-
3ALE 040 400 S06	-	4	40	80	6	£23.00	-
3ALE 045 120 S06	3ALEC 045 120 S06	4.5	12	50	6	£14.47	£17.80
3ALE 045 180 S06	3ALEC 045 180 S06	4.5	18	55	6	£15.73	£15.73
3ALE 045 250 S06	3ALEC 045 250 S06	4.5	25	60	6	£17.13	£20.47
3ALE 045 300 S06	3ALEC 045 300 S06	4.5	30	65	6	£19.80	£16.47
3ALE 050 075 S06	3ALEC 050 075 S06	5	7.5	50	6	£10.73	£14.07
3ALE 050 130 S06	3ALEC 050 130 S06	5	13	50	6	£10.73	£14.07
3ALE 050 200 S06	3ALEC 050 200 S06	5	20	55	6	£11.53	£14.87
3ALE 050 250 S06	3ALEC 050 250 S06	5	25	60	6	£12.47	£15.80
3ALE 050 300 S06	3ALEC 050 300 S06	5	30	65	6	£16.87	£20.20
3ALE 050 350 S06	3ALEC 050 350 S06	5	35	70	6	£19.67	£23.00
3ALE 050 400 S06	3ALEC 050 400 S06	5	40	75	6	£22.00	£25.33
3ALE 050 450 S06	-	5	45	80	6	£24.47	-
3ALE 055 150 S06	3ALEC 055 150 S06	5.5	15	50	6	£15.73	£19.07
3ALE 055 200 S06	3ALEC 055 200 S06	5.5	20	55	6	£17.13	£20.47
3ALE 055 250 S06	3ALEC 055 250 S06	5.5	25	60	6	£19.80	£23.13
3ALE 060 090 050	3ALEC 060 090 050	6	9	50	6	£10.73	£14.07
3ALE 060 150 050	3ALEC 060 150 050	6	15	50	6	£10.73	£14.07
3ALE 060 200 055	3ALEC 060 200 055	6	20	55	6	£11.53	£14.87
3ALE 060 250 060	3ALEC 060 250 060	6	25	60	6	£13.20	£16.53
3ALE 060 300 070	3ALEC 060 300 070	6	30	70	6	£13.93	£17.27
3ALE 060 350 070	3ALEC 060 350 070	6	35	70	6	£16.00	£19.33
3ALE 060 400 075	3ALEC 060 400 075	6	40	75	6	£18.67	£22.00
3ALE 060 450 080	3ALEC 060 450 080	6	45	80	6	£22.00	£25.33
3ALE 060 500 090	3ALEC 060 500 090	6	50	90	6	£25.33	£28.67

3ALE 3 Flute 45° Helix End Mills for Aluminium

Part Number	Part Number	Diameter	Length of Cut	Overall Length	Shank Dia	Price	Price
Uncoated	RTAC Coated	D	L1	L	d	Uncoated	Coated
3ALE 070 200 060	3ALEC 070 200 060	7	20	60	8	£21.33	£25.67
3ALE 070 300 075	3ALEC 070 300 075	7	30	75	8	£26.00	£30.33
3ALE 070 400 090	3ALEC 070 400 090	7	40	90	8	£29.13	£33.47
3ALE 080 120 060	3ALEC 080 120 060	8	12	60	8	£17.53	£21.87
3ALE 080 200 060	3ALEC 080 200 060	8	20	60	8	£17.53	£21.87
3ALE 080 250 065	3ALEC 080 250 065	8	25	65	8	£20.73	£25.07
3ALE 080 300 070	3ALEC 080 300 070	8	30	70	8	£22.53	£26.87
3ALE 080 350 075	3ALEC 080 350 075	8	35	75	8	£23.33	£27.67
3ALE 080 400 080	3ALEC 080 400 080	8	40	80	8	£24.20	£28.53
3ALE 080 450 090	3ALEC 080 450 090	8	45	90	8	£25.00	£29.33
3ALE 080 500 090	3ALEC 080 500 090	8	50	90	8	£26.27	£30.60
3ALE 080 550 100	3ALEC 080 550 100	8	55	100	8	£27.93	£32.27
3ALE 080 600 110	3ALEC 080 600 110	8	60	110	8	£30.00	£34.33
3ALE 080 700 120	3ALEC 080 700 120	8	70	120	8	£34.00	£38.33
3ALE 100 150 070	3ALEC 100 150 070	10	15	70	10	£24.13	£29.20
3ALE 100 250 070	3ALEC 100 250 070	10	25	70	10	£24.13	£29.20
3ALE 100 300 075	3ALEC 100 300 075	10	30	75	10	£28.87	£33.93
3ALE 100 350 080	3ALEC 100 350 080	10	35	80	10	£31.67	£36.73
3ALE 100 400 090	3ALEC 100 400 090	10	40	90	10	£33.20	£38.27
3ALE 100 450 090	3ALEC 100 450 090	10	45	90	10	£33.40	£38.47
3ALE 100 500 100	3ALEC 100 500 100	10	50	100	10	£35.67	£40.73
3ALE 100 550 100	3ALEC 100 550 100	10	55	100	10	£36.07	£41.13
3ALE 100 600 110	3ALEC 100 600 110	10	60	110	10	£39.67	£44.73
3ALE 100 650 110	3ALEC 100 650 110	10	65	110	10	£40.47	£45.53
3ALE 100 700 120	3ALEC 100 700 120	10	70	120	10	£43.33	£48.40
3ALE 100 800 130	3ALEC 100 800 130	10	80	130	10	£47.13	£52.20
3ALE 120 180 075	3ALEC 120 180 075	12	18	75	12	£30.27	£36.27
3ALE 120 260 075	3ALEC 120 260 075	12	26	75	12	£30.27	£36.27
3ALE 120 350 080	3ALEC 120 350 080	12	35	80	12	£36.27	£42.27
3ALE 120 400 090	3ALEC 120 400 090	12	40	90	12	£39.20	£45.20
3ALE 120 450 090	3ALEC 120 450 090	12	45	90	12	£39.80	£45.80
3ALE 120 500 100	3ALEC 120 500 100	12	50	100	12	£41.20	£47.20
3ALE 120 550 100	3ALEC 120 550 100	12	55	100	12	£41.93	£47.93
3ALE 120 650 110	3ALEC 120 650 110	12	65	110	12	£43.13	£49.13
3ALE 120 700 120	3ALEC 120 700 120	12	70	120	12	£46.00	£52.00
3ALE 120 800 130	3ALEC 120 800 130	12	80	130	12	£51.33	£57.33
3ALE 140 300 080	3ALEC 140 300 080	14	30	80	14	£58.14	£64.14
3ALE 140 450 110	3ALEC 140 450 110	14	45	110	14	£62.46	£68.46
3ALE 140 600 120	-	14	60	120	14	£82.20	-
3ALE 160 300 090	3ALEC 160 300 090	16	30	90	16	£63.18	£69.18
3ALE 160 500 110	3ALEC 160 500 110	16	50	110	16	£66.78	£72.78
3ALE 160 650 120	3ALEC 160 650 120	16	65	120	16	£77.70	£83.70
3ALE 160 800 130	3ALEC 160 800 130	16	80	130	16	£91.50	£97.50
3ALE 160 1000 160	3ALEC 160 1000 160	16	100	160	16	£126.00	£132.00
3ALE 200 500 100	3ALEC 200 500 100	20	50	100	20	£107.46	£115.56
3ALE 200 750 130	3ALEC 200 750 130	20	75	130	20	£137.22	£145.32
3ALE 200 1000 160	3ALEC 200 1000 160	20	100	160	20	£143.76	£151.86
3ALE 200 1300 200	3ALEC 200 1300 200	20	130	200	20	£216.36	£224.46
3ALE 200 1500 220	3ALEC 200 1500 220	20	150	220	20	£238.20	£246.30

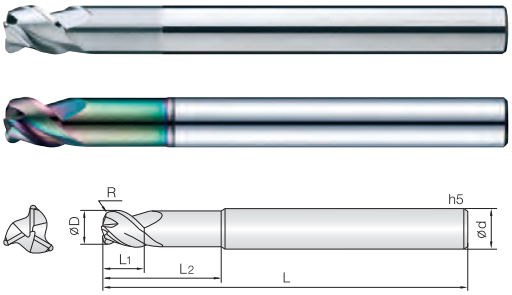
- End mills for Aluminium, AL alloy, non-ferrous and non-metallic materials.
- Fine WC grade gives excellent surface finish.
- Minimize built up edge by double edge and deep pocket design.
- Tetrabond TAC coating provides excellent work surface finish through high hardness and low friction.
- High speed, feed applicable by 3 flute 45 degree helix and short flute design.



D Size	D Tolerance
ø3 ~ 20	+0~ -0,015mm

Part Number	Part Number	Diameter	Length of Cut	Effective Length	Overall Length	Shank Dia	Price	Price
Uncoated	RTAC Coated	D x R	L1	L2	L	d	Uncoated	Coated
3ALC 030 005 050	3ALCC 030 005 050	3 x R0.5	10	-	50	6	£16.80	£23.00
3ALC 030 005 060	3ALCC 030 005 060	3 x R0.5	10	15	60	6	£19.13	£25.33
3ALC 030 010 050	3ALCC 030 010 050	3 x R1	10	-	50	6	£16.80	£23.00
3ALC 030 010 060	3ALCC 030 010 060	3 x R1	10	15	60	6	£19.13	£25.33
3ALC 040 005 050	3ALCC 040 005 050	4 x R0.5	12	-	50	6	£16.80	£23.00
3ALC 040 005 060	3ALCC 040 005 060	4 x R0.5	12	20	60	6	£19.13	£25.33
3ALC 040 010 050	3ALCC 040 010 050	4 x R1	12	-	50	6	£16.80	£23.00
3ALC 040 010 060	3ALCC 040 010 060	4 x R1	12	20	60	6	£19.13	£25.33
3ALC 050 005 050	3ALCC 050 005 050	5 x R0.5	15	-	50	6	£16.80	£23.00
3ALC 050 005 060	3ALCC 050 005 060	5 x R0.5	15	20	60	6	£19.13	£25.33
3ALC 050 010 050	3ALCC 050 010 050	5 x R1	15	-	50	6	£16.80	£23.00
3ALC 050 010 060	3ALCC 050 010 060	5 x R1	15	20	60	6	£19.13	£25.33
3ALC 060 005 050	3ALCC 060 005 050	6 x R0.5	15	-	50	6	£17.73	£23.73
3ALC 060 005 070	3ALCC 060 005 070	6 x R0.5	7	20	70	6	£20.20	£26.20
3ALC 060 010 050	3ALCC 060 010 050	6 x R1	15	-	50	6	£17.73	£23.73
3ALC 060 010 070	3ALCC 060 010 070	6 x R1	7	20	70	6	£20.20	£26.20
3ALC 080 005 060	3ALCC 080 005 060	8 x R0.5	20	-	60	8	£24.93	£33.33
3ALC 080 005 080	3ALCC 080 005 080	8 x R0.5	9	25	80	8	£28.87	£37.40
3ALC 080 010 060	3ALCC 080 010 060	8 x R1	20	-	60	8	£24.93	£33.33
3ALC 080 010 080	3ALCC 080 010 080	8 x R1	9	25	80	8	£28.87	£37.40
3ALC 080 020 060	3ALCC 080 020 060	8 x R2	20	-	60	8	£24.93	£33.33
3ALC 080 020 080	3ALCC 080 020 080	8 x R2	9	25	80	8	£28.87	£37.40
3ALC 080 025 080	3ALCC 080 025 080	8 x R2.5	9	25	80	8	£28.87	£37.40
3ALC 100 005 070	3ALCC 100 005 070	10 x R0.5	25	-	70	10	£33.07	£42.93
3ALC 100 005 100	3ALCC 100 005 100	10 x R0.5	11	30	100	10	£41.53	£50.13
3ALC 100 010 070	3ALCC 100 010 070	10 x R1	25	-	70	10	£33.07	£42.93
3ALC 100 010 100	3ALCC 100 010 100	10 x R1	11	30	100	10	£41.53	£50.13
3ALC 100 015 070	3ALCC 100 015 070	10 x R1.5	25	-	70	10	£33.07	£42.93
3ALC 100 015 100	3ALCC 100 015 100	10 x R1.5	11	30	100	10	£41.53	£50.13
3ALC 100 020 070	3ALCC 100 020 070	10 x R2	25	-	70	10	£33.07	£42.93
3ALC 100 020 100	3ALCC 100 020 100	10 x R2	11	30	100	10	£41.53	£50.13
3ALC 100 025 100	3ALCC 100 025 100	10 x R2.5	11	30	100	10	£41.53	£50.13
3ALC 120 005 075	3ALCC 120 005 075	12 x R0.5	30	-	75	12	£39.40	£51.13
3ALC 120 005 110	3ALCC 120 005 110	12 x R0.5	13	36	110	12	£51.87	£63.53
3ALC 120 010 075	3ALCC 120 010 075	12 x R1	30	-	75	12	£39.40	£51.13
3ALC 120 010 110	3ALCC 120 010 110	12 x R1	13	36	110	12	£51.87	£63.53
3ALC 120 015 075	3ALCC 120 015 075	12 x R1.5	30	-	75	12	£39.40	£51.13
3ALC 120 015 110	3ALCC 120 015 110	12 x R1.5	13	36	110	12	£51.87	£63.53
3ALC 120 020 075	3ALCC 120 020 075	12 x R2	30	-	75	12	£39.40	£51.13

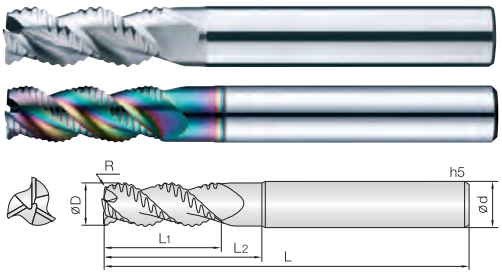
3ALC 3 Flute 45° Helix Corner Radius End Mills for Aluminium



Part Number	Part Number	Diameter	Length of Cut	Effective Length	Overall Length	Shank Dia	Price	Price
Uncoated	RTAC Coated	D x R	L1	L2	L	d	Uncoated	Coated
3ALC 120 020 110	3ALCC 120 020 110	12 x R2	13	36	110	12	£51.87	£63.53
3ALC 120 025 110	3ALCC 120 025 110	12 x R2.5	13	36	110	12	£51.87	£63.53
3ALC 120 030 075	3ALCC 120 030 075	12 x R3	30	-	75	12	£39.40	£51.13
3ALC 120 030 110	3ALCC 120 030 110	12 x R3	13	36	110	12	£51.87	£63.53
3ALC 120 040 075	3ALCC 120 040 075	12 x R4	30	-	75	12	£39.40	£51.13
3ALC 120 040 110	3ALCC 120 040 110	12 x R4	13	36	110	12	£51.87	£63.53
3ALC 160 005 130	3ALCC 160 005 130	16 x R0.5	17	50	130	16	£95.82	£110.64
3ALC 160 010 090	3ALCC 160 010 090	16 x R1	35	-	90	16	£72.30	£89.64
3ALC 160 010 130	3ALCC 160 010 130	16 x R1	17	50	130	16	£95.82	£110.64
3ALC 160 020 090	3ALCC 160 020 090	16 x R2	35	-	90	16	£72.30	£89.64
3ALC 160 020 130	3ALCC 160 020 130	16 x R2	17	50	130	16	£95.82	£110.64
3ALC 160 025 130	3ALCC 160 025 130	16 x R2.5	17	50	130	16	£95.82	£110.64
3ALC 160 030 090	3ALCC 160 030 090	16 x R3	35	-	90	16	£72.30	£89.64
3ALC 160 030 130	3ALCC 160 030 130	16 x R3	17	50	130	16	£95.82	£110.64
3ALC 160 040 090	3ALCC 160 040 090	16 x R4	35	-	90	16	£72.30	£89.64
3ALC 160 040 130	3ALCC 160 040 130	16 x R4	17	50	130	16	£95.82	£110.64
3ALC 160 050 090	3ALCC 160 050 090	16 x R5	35	-	90	16	£72.30	£89.64
3ALC 200 010 150	3ALCC 200 010 150	20 x R1	21	60	150	20	£170.58	£191.58
3ALC 200 020 150	3ALCC 200 020 150	20 x R2	21	60	150	20	£170.58	£191.58
3ALC 200 025 150	3ALCC 200 025 150	20 x R2.5	21	60	150	20	£170.58	£191.58
3ALC 200 030 150	3ALCC 200 030 150	20 x R3	21	60	150	20	£170.58	£191.58
3ALC 200 040 150	3ALCC 200 040 150	20 x R4	21	60	150	20	£170.58	£191.58

3 Flute 45° Helix Roughing End Mills for Aluminium — 3ARO

- High speed roughing end mills for Aluminium, AL alloy, non-ferrous and non-metallic materials.
- Tetrabond TAC coating provides excellent work surface finish by high hardness and low friction.
- Minimize built up edge by chip breaker and deep pocket design.

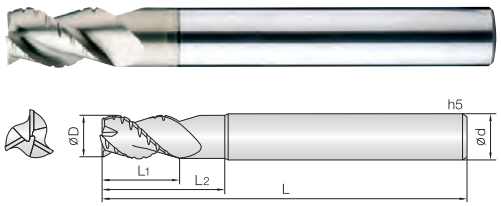


D Size	D Tolerance
Ø4 ~ 8	−0.02 ~ −0.04mm
Ø10 ~ 20	−0.02 ~ −0.05mm

Part Number	Part Number	Diameter	Length of Cut	Effective Length	Overall Length	Shank Dia	Price	Price
Uncoated	RTAC Coated	D	L1	L2	L	d	Uncoated	Coated
3ARO 040 080 S06	3AROC 040 080 S06	4	8	-	50	6	£15.78	£21.18
3ARO 040 150 S06	3AROC 040 150 S06	4	10	15	60	6	£19.58	£24.96
3ARO 050 100 S06	3AROC 050 100 S06	5	10	-	60	6	£15.78	£21.18
3ARO 050 200 S06	3AROC 050 200 S06	5	15	20	60	6	£19.58	£24.96
3ARO 060 120 S06	3AROC 060 120 S06	6	12	-	60	6	£15.78	£21.18
3ARO 060 210 S06	3AROC 060 210 S06	6	16	21	65	6	£19.58	£24.96
3ARO 080 160 S08	3AROC 080 160 S08	8	16	-	70	8	£20.86	£28.16
3ARO 080 270 S08	3AROC 080 270 S08	8	21	27	70	8	£25.28	£32.58
3ARO 100 200 S10	3AROC 100 200 S10	10	20	-	70	10	£27.46	£36.26
3ARO 100 310 S10	3AROC 100 310 S10	10	26	31	75	10	£31.84	£40.64
3ARO 120 240 S12	3AROC 120 240 S12	12	24	-	75	12	£35.14	£45.38
3ARO 120 380 S12	3AROC 120 380 S12	12	30	38	80	12	£39.58	£49.76
3ARO 160 320 S16	3AROC 160 320 S16	16	32	-	100	16	£74.72	£87.90
3ARO 160 450 S16	3AROC 160 450 S16	16	36	45	100	16	£92.26	£105.50
3ARO 200 550 S20	3AROC 200 550 S20	20	41	55	110	20	£118.14	£134.62

3 Flute Semi-Finishing & Roughing End Mills for Aluminium — 3ARE

- High speed semi-finishing and roughing end mills for Aluminium, AL alloy, non-ferrous and non-metallic materials.
- JCRO coating provides excellent wear resistance, as well as avoiding edge stress in various applications.
- Minimize built up edge by chip breaker and deep pocket design.



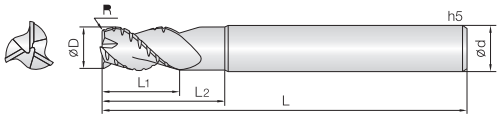
D Size	D Tolerance
Ø6 ~ 8	−0.02 ~ −0.04mm
Ø10 ~ 20	−0.02 ~ −0.05mm

Part Number	Diameter	Length of Cut	Effective Length	Overall Length	Shank Dia	Price
	D	L1	L2	L	d	£
3ARE 060 150 S06	6	10	15	50	6	£16.70
3ARE 060 200 S06	6	15	20	70	6	£18.50
3ARE 080 200 S08	8	15	20	60	8	£22.40
3ARE 080 250 S08	8	20	25	80	8	£27.78
3ARE 100 250 S10	10	18	25	70	10	£30.24
3ARE 100 300 S10	10	23	30	90	10	£36.86
3ARE 120 300 S12	12	20	30	80	12	£38.56
3ARE 120 400 S12	12	30	40	100	12	£44.42
3ARE 160 350 S16	16	25	35	110	16	£88.54
3ARE 160 500 S16	16	35	50	120	16	£98.82
3ARE 200 500 S20	20	35	50	110	20	£118.72
3ARE 200 600 S20	20	45	60	120	20	£132.96

3ARC

3 Flute Semi-Finishing & Roughing Corner Radius End Mills for Aluminium

- High speed semi-finishing and roughing end mills for Aluminium, AL alloy, non-ferrous and non-metallic materials.
- JCRO coating provides excellent wear resistance, as well as avoiding edge stress in various applications.
- Minimize built up edge by chip breaker and deep pocket design.

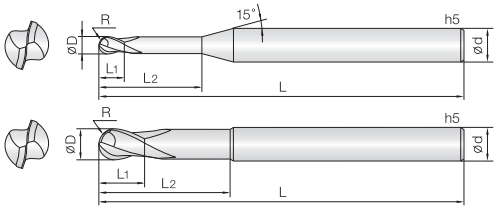


D Size	D Tolerance
ø6 ~ 8	−0.02 ~ −0.04mm
ø10 ~ 20	−0.02 ~ −0.05mm

Part Number	Diameter	Length of Cut	Effective Length	Overall Length	Shank Dia	Price
	D x R	L1	L2	L	d	£
3ARC 060 005 S06	6 x R0.5	9	15	65	6	£20.96
3ARC 060 010 S06	6 x R1	9	15	65	6	£20.96
3ARC 080 005 S08	8 x R0.5	12	20	70	8	£29.54
3ARC 080 010 S08	8 x R1	12	20	70	8	£29.54
3ARC 100 010 S10	10 x R1	15	25	75	10	£36.00
3ARC 100 020 S10	10 x R2	15	25	75	10	£36.00
3ARC 120 010 S12	12 x R1	20	30	80	12	£43.78
3ARC 120 020 S12	12 x R2	20	30	80	12	£43.78
3ARC 120 030 S12	12 x R3	20	30	80	12	£43.78
3ARC 160 010 S16	16 x R1	25	35	110	16	£94.40
3ARC 160 020 S16	16 x R2	25	35	110	16	£94.40
3ARC 160 030 S16	16 x R3	25	35	110	16	£94.40
3ARC 200 020 S20	20 x R2	30	50	110	20	£127.30
3ARC 200 030 S20	20 x R3	30	50	110	20	£127.30

2COB 2 Flute 45° Helix Rib Ball End Mills for Copper

- End Mills for copper, copper alloy, non-ferrous and non-metallic materials.
- JCRO coating provides wear resistance improvement and avoids edge stress in various applications.
- High speed & feed applicable, by 45° helix and deep chip pocket design.

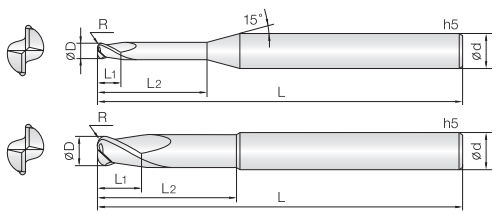


D Size	D Tolerance
ø0.5 ~ 5	+0~ −0.01mm
ø6 ~ 12	−0.005 ~ −0.015mm
ø16	−0.01 ~ −0.02mm

Part Number	Diameter	Length of Cut	Effective Length	Overall Length	Shank Dia	Price
	R x D	L1	L2	L	d	£
2COB 005 010 S04	0.25R x 0.5	0.7	1	45	4	£16.53
2COB 005 020 S04	0.25R x 0.5	0.7	2	45	4	£16.53
2COB 005 030 S04	0.25R x 0.5	0.7	3	45	4	£16.53
2COB 005 040 S04	0.25R x 0.5	0.7	4	45	4	£16.53
2COB 005 050 S04	0.25R x 0.5	0.7	5	45	4	£17.00
2COB 005 060 S04	0.25R x 0.5	0.7	6	45	4	£17.00
2COB 006 020 S04	0.3R x 0.6	0.9	2	45	4	£15.53
2COB 006 030 S04	0.3R x 0.6	0.9	3	45	4	£15.53
2COB 006 040 S04	0.3R x 0.6	0.9	4	45	4	£15.53
2COB 006 050 S04	0.3R x 0.6	0.9	5	45	4	£15.53
2COB 006 060 S04	0.3R x 0.6	0.9	6	45	4	£15.53
2COB 006 080 S04	0.3R x 0.6	0.9	8	45	4	£16.00
2COB 006 100 S04	0.3R x 0.6	0.9	10	45	4	£16.00
2COB 008 020 S04	0.4R x 0.8	1.2	2	45	4	£14.47
2COB 008 030 S04	0.4R x 0.8	1.2	3	45	4	£14.47
2COB 008 040 S04	0.4R x 0.8	1.2	4	45	4	£14.47
2COB 008 060 S04	0.4R x 0.8	1.2	6	45	4	£14.47
2COB 008 080 S04	0.4R x 0.8	1.2	8	45	4	£14.47
2COB 008 100 S04	0.4R x 0.8	1.2	10	45	4	£14.47
2COB 008 120 S04	0.4R x 0.8	1.2	12	45	4	£14.47
2COB 010 030 S04	0.5R x 1	1.5	3	50	4	£12.87
2COB 010 050 S04	0.5R x 1	1.5	5	50	4	£12.87
2COB 010 080 S04	0.5R x 1	1.5	8	50	4	£12.87
2COB 010 100 S04	0.5R x 1	1.5	10	50	4	£13.40
2COB 010 120 S04	0.5R x 1	1.5	12	50	4	£13.40
2COB 010 160 S04	0.5R x 1	1.5	16	50	4	£13.40
2COB 010 200 S04	0.5R x 1	1.5	20	50	4	£13.40
2COB 020 030 S04	0.6R x 1.2	1.8	3	50	4	£13.40
2COB 020 040 S04	0.6R x 1.2	1.8	4	50	4	£13.40
2COB 020 060 S04	0.6R x 1.2	1.8	6	50	4	£13.40
2COB 020 080 S04	0.6R x 1.2	1.8	8	50	4	£13.40
2COB 020 100 S04	0.6R x 1.2	1.8	10	50	4	£13.40
2COB 020 120 S04	0.6R x 1.2	1.8	12	50	4	£13.40
2COB 015 050 S04	0.75R x 1.5	2	5	50	4	£12.87
2COB 015 080 S04	0.75R x 1.5	2	8	50	4	£12.87
2COB 015 100 S04	0.75R x 1.5	2	10	50	4	£13.40
2COB 015 120 S04	0.75R x 1.5	2	12	50	4	£13.40
2COB 015 160 S04	0.75R x 1.5	2	16	50	4	£13.40
2COB 015 200 S04	0.75R x 1.5	2	20	50	4	£13.40
2COB 020 050 S06	1R x 2	3	5	50	6	£15.20
2COB 020 080 S06	1R x 2	3	8	50	6	£15.20
2COB 020 100 S06	1R x 2	3	10	50	6	£15.20
2COB 020 120 S06	1R x 2	3	12	60	6	£15.20
2COB 020 160 S06	1R x 2	3	16	60	6	£16.00

Part Number	Diameter	Length of Cut	Effective Length	Overall Length	Shank Dia	Price
	R x D	L1	L2	L	d	£
2COB 020 200 S06	1R x 2	3	20	60	6	£16.00
2COB 020 250 S06	1R x 2	3	25	65	6	£17.00
2COB 025 060 S06	1.25R x 2.5	4	6	50	6	£15.20
2COB 025 100 S06	1.25R x 2.5	4	10	50	6	£15.20
2COB 025 120 S06	1.25R x 2.5	4	12	60	6	£15.20
2COB 025 160 S06	1.25R x 2.5	4	16	60	6	£16.00
2COB 025 200 S06	1.25R x 2.5	4	20	60	6	£16.00
2COB 030 080 S06	1.5R x 3	4.5	8	60	6	£15.20
2COB 030 120 S06	1.5R x 3	4.5	12	60	6	£15.20
2COB 030 160 S06	1.5R x 3	4.5	16	60	6	£16.00
2COB 030 200 S06	1.5R x 3	4.5	20	60	6	£16.00
2COB 030 250 S06	1.5R x 3	4.5	25	70	6	£17.00
2COB 030 300 S06	1.5R x 3	4.5	30	70	6	£19.47
2COB 030 400 S06	1.5R x 3	4.5	40	80	6	£23.27
2COB 040 100 S06	2R x 4	6	10	60	6	£15.20
2COB 040 160 S06	2R x 4	6	16	60	6	£16.00
2COB 040 200 S06	2R x 4	6	20	60	6	£16.00
2COB 040 250 S06	2R x 4	6	25	70	6	£17.00
2COB 040 300 S06	2R x 4	6	30	70	6	£19.47
2COB 040 400 S06	2R x 4	6	40	80	6	£23.27
2COB 050 160 S06	2.5R x 5	8	16	80	6	£17.00
2COB 050 200 S06	2.5R x 5	8	20	80	6	£17.00
2COB 050 250 S06	2.5R x 5	8	25	80	6	£19.47
2COB 060 150 S06	3R x 6	9	15	90	6	£22.27
2COB 060 300 S06	3R x 6	9	30	90	6	£23.27
2COB 060 400 S06	3R x 6	9	40	90	6	£24.27
2COB 080 200 S08	4R x 8	12	20	100	8	£27.20
2COB 100 250 S10	5R x 10	15	25	100	10	£35.87
2COB 120 300 S12	6R x 12	18	30	110	12	£47.60
2COB 160 600 S16	8R x 16	30	60	160	16	£110.53

- End Mills for copper, copper alloy, non-ferrous and non-metallic materials.
- JCRO coating provides wear resistance improvement and avoids edge stress in various applications.
- Smooth chip outflow with deep chip pocket.

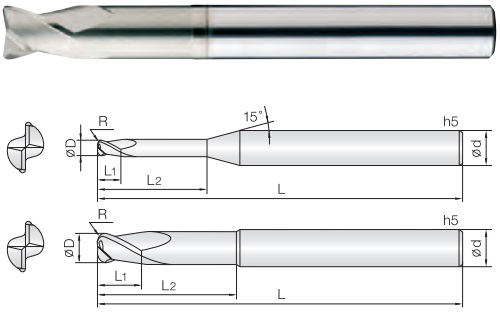


D Size	D Tolerance
Ø1 ~ 4	+0 ~ −0.01mm
Ø6 ~ 12	−0.005 ~ −0.015mm

Part Number	Diameter	Length of Cut	Effective Length	Overall Length	Shank Dia	Price
	D x R	L1	L2	L	d	£
2COR 010 001 040	1 x R0.1	1.5	4	50	4	£13.73
2COR 010 001 060	1 x R0.1	1.5	6	50	4	£13.73
2COR 010 001 080	1 x R0.1	1.5	8	50	4	£13.73
2COR 010 001 100	1 x R0.1	1.5	10	50	4	£14.40
2COR 010 001 120	1 x R0.1	1.5	12	50	4	£14.40
2COR 010 001 160	1 x R0.1	1.5	16	50	4	£14.40
2COR 010 001 200	1 x R0.1	1.5	20	50	4	£15.00
2COR 010 002 040	1 x R0.2	1.5	4	50	4	£13.73
2COR 010 002 060	1 x R0.2	1.5	6	50	4	£13.73
2COR 010 002 080	1 x R0.2	1.5	8	50	4	£13.73
2COR 010 002 100	1 x R0.2	1.5	10	50	4	£14.40
2COR 010 002 120	1 x R0.2	1.5	12	50	4	£14.40
2COR 010 002 160	1 x R0.2	1.5	16	50	4	£14.40
2COR 010 002 200	1 x R0.2	1.5	20	50	4	£15.00
2COR 010 003 040	1 x R0.3	1.5	4	50	4	£13.73
2COR 010 003 060	1 x R0.3	1.5	6	50	4	£13.73
2COR 010 003 080	1 x R0.3	1.5	8	50	4	£13.73
2COR 010 003 100	1 x R0.3	1.5	10	50	4	£14.40
2COR 010 003 120	1 x R0.3	1.5	12	50	4	£14.40
2COR 010 003 160	1 x R0.3	1.5	16	50	4	£14.40
2COR 010 003 200	1 x R0.3	1.5	20	50	4	£15.00
2COR 015 001 060	1.5 x R0.1	2	6	50	4	£13.73
2COR 015 001 100	1.5 x R0.1	2	10	50	4	£14.40
2COR 015 001 120	1.5 x R0.1	2	12	50	4	£14.40
2COR 015 001 160	1.5 x R0.1	2	16	50	4	£14.40
2COR 015 001 200	1.5 x R0.1	2	20	50	4	£15.00
2COR 015 001 250	1.5 x R0.1	2	25	60	4	£16.20
2COR 015 002 060	1.5 x R0.2	2	6	50	4	£13.73
2COR 015 002 100	1.5 x R0.2	2	10	50	4	£14.40
2COR 015 002 120	1.5 x R0.2	2	12	50	4	£14.40
2COR 015 002 160	1.5 x R0.2	2	16	50	4	£14.40
2COR 015 002 200	1.5 x R0.2	2	20	50	4	£15.00
2COR 015 002 250	1.5 x R0.2	2	25	60	4	£16.20
2COR 015 003 060	1.5 x R0.3	2	6	50	4	£13.73
2COR 015 003 100	1.5 x R0.3	2	10	50	4	£14.40
2COR 015 003 120	1.5 x R0.3	2	12	50	4	£14.40
2COR 015 003 160	1.5 x R0.3	2	16	50	4	£14.40
2COR 015 003 200	1.5 x R0.3	2	20	50	4	£15.00
2COR 015 003 250	1.5 x R0.3	2	25	60	4	£16.20
2COR 015 005 060	1.5 x R0.5	2	6	50	4	£13.73
2COR 015 005 100	1.5 x R0.5	2	10	50	4	£14.40
2COR 015 005 120	1.5 x R0.5	2	12	50	4	£14.40
2COR 015 005 160	1.5 x R0.5	2	16	50	4	£14.40
2COR 015 005 200	1.5 x R0.5	2	20	50	4	£15.00

Part Number	Diameter	Length of Cut	Effective Length	Overall Length	Shank Dia	Price
	D x R	L1	L2	L	d	£
2COR 015 005 250	1.5 x R0.5	2	25	60	4	£16.20
2COR 020 001 060	2 x R0.1	3	6	50	4	£13.73
2COR 020 001 100	2 x R0.1	3	10	50	4	£14.40
2COR 020 001 120	2 x R0.1	3	12	50	4	£14.40
2COR 020 001 160	2 x R0.1	3	16	50	4	£15.00
2COR 020 001 200	2 x R0.1	3	20	50	4	£15.00
2COR 020 001 250	2 x R0.1	3	25	60	4	£16.20
2COR 020 002 060	2 x R0.2	3	6	50	4	£13.73
2COR 020 002 100	2 x R0.2	3	10	50	4	£14.40
2COR 020 002 120	2 x R0.2	3	12	50	4	£14.40
2COR 020 002 160	2 x R0.2	3	16	50	4	£15.00
2COR 020 002 200	2 x R0.2	3	20	50	4	£15.00
2COR 020 002 250	2 x R0.2	3	25	60	4	£16.20
2COR 020 003 060	2 x R0.3	3	6	50	4	£13.73
2COR 020 003 100	2 x R0.3	3	10	50	4	£14.40
2COR 020 003 120	2 x R0.3	3	12	50	4	£14.40
2COR 020 003 160	2 x R0.3	3	16	50	4	£15.00
2COR 020 003 200	2 x R0.3	3	20	50	4	£15.00
2COR 020 003 250	2 x R0.3	3	25	60	4	£16.20
2COR 020 005 060	2 x R0.5	3	6	50	4	£13.73
2COR 020 005 100	2 x R0.5	3	10	50	4	£13.73
2COR 020 005 120	2 x R0.5	3	12	50	4	£14.40
2COR 020 005 140	2 x R0.5	3	14	50	4	£14.40
2COR 020 005 160	2 x R0.5	3	16	50	4	£14.40
2COR 020 005 200	2 x R0.5	3	20	50	4	£15.00
2COR 020 005 250	2 x R0.5	3	25	60	4	£16.20
2COR 025 001 060	2.5 x R0.1	3.5	6	50	4	£13.73
2COR 025 001 100	2.5 x R0.1	3.5	10	50	4	£13.73
2COR 025 001 120	2.5 x R0.1	3.5	12	50	4	£14.40
2COR 025 001 160	2.5 x R0.1	3.5	16	50	4	£14.40
2COR 025 001 200	2.5 x R0.1	3.5	20	50	4	£15.00
2COR 025 001 250	2.5 x R0.1	3.5	25	60	4	£16.20
2COR 025 002 060	2.5 x R0.2	3.5	6	50	4	£13.73
2COR 025 002 100	2.5 x R0.2	3.5	10	50	4	£13.73
2COR 025 002 120	2.5 x R0.2	3.5	12	50	4	£14.40
2COR 025 002 160	2.5 x R0.2	3.5	16	50	4	£14.40
2COR 025 002 200	2.5 x R0.2	3.5	20	50	4	£15.00
2COR 025 002 250	2.5 x R0.2	3.5	25	60	4	£16.20
2COR 025 003 060	2.5 x R0.3	3.5	6	50	4	£13.73
2COR 025 003 100	2.5 x R0.3	3.5	10	50	4	£13.73
2COR 025 003 120	2.5 x R0.3	3.5	12	50	4	£14.40
2COR 025 003 160	2.5 x R0.3	3.5	16	50	4	£14.40
2COR 025 003 200	2.5 x R0.3	3.5	20	50	4	£15.00
2COR 025 003 250	2.5 x R0.3	3.5	25	60	4	£16.20

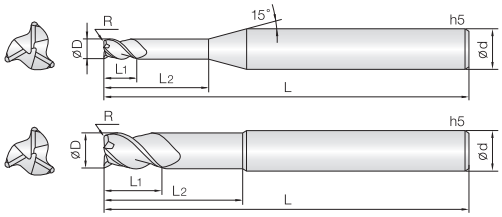
2COR 2 Flute Rib Corner Radius End Mills for Copper



Part Number	Diameter	Length of Cut	Effective Length	Overall Length	Shank Dia	Price
	D x R	L1	L2	L	d	£
2COR 025 005 060	2.5 x R0.5	3.5	6	50	4	£13.73
2COR 025 005 100	2.5 x R0.5	3.5	10	50	4	£13.73
2COR 025 005 120	2.5 x R0.5	3.5	12	50	4	£14.40
2COR 025 005 160	2.5 x R0.5	3.5	16	50	4	£14.40
2COR 025 005 200	2.5 x R0.5	3.5	20	50	4	£15.00
2COR 025 005 250	2.5 x R0.5	3.5	25	60	4	£16.20
2COR 030 001 100	3 x R0.1	4	10	55	6	£14.07
2COR 030 001 120	3 x R0.1	4	12	55	6	£14.73
2COR 030 001 160	3 x R0.1	4	16	55	6	£14.73
2COR 030 001 200	3 x R0.1	4	20	60	6	£15.47
2COR 030 001 250	3 x R0.1	4	25	65	6	£16.73
2COR 030 001 300	3 x R0.1	4	30	70	6	£17.67
2COR 030 001 350	3 x R0.1	4	35	75	6	£19.60
2COR 030 001 400	3 x R0.1	4	40	80	6	£21.47
2COR 030 002 100	3 x R0.2	4	10	55	6	£14.07
2COR 030 002 120	3 x R0.2	4	12	55	6	£14.73
2COR 030 002 160	3 x R0.2	4	16	55	6	£14.73
2COR 030 002 200	3 x R0.2	4	20	60	6	£15.47
2COR 030 002 250	3 x R0.2	4	25	65	6	£16.73
2COR 030 002 300	3 x R0.2	4	30	70	6	£17.67
2COR 030 002 350	3 x R0.2	4	35	75	6	£19.60
2COR 030 002 400	3 x R0.2	4	40	80	6	£21.47
2COR 030 003 100	3 x R0.3	4	10	55	6	£14.07
2COR 030 003 120	3 x R0.3	4	12	55	6	£14.73
2COR 030 003 160	3 x R0.3	4	16	55	6	£14.73
2COR 030 003 200	3 x R0.3	4	20	60	6	£15.47
2COR 030 003 250	3 x R0.3	4	25	65	6	£16.73
2COR 030 003 300	3 x R0.3	4	30	70	6	£17.67
2COR 030 003 350	3 x R0.3	4	35	75	6	£19.60
2COR 030 003 400	3 x R0.3	4	40	80	6	£21.47
2COR 030 005 100	3 x R0.5	4	10	55	6	£14.07
2COR 030 005 120	3 x R0.5	4	12	55	6	£14.73
2COR 030 005 160	3 x R0.5	4	16	55	6	£14.73
2COR 030 005 200	3 x R0.5	4	20	60	6	£15.47
2COR 030 005 250	3 x R0.5	4	25	65	6	£16.73
2COR 030 005 300	3 x R0.5	4	30	70	6	£17.67
2COR 030 005 350	3 x R0.5	4	35	75	6	£19.60
2COR 030 005 400	3 x R0.5	4	40	80	6	£21.47
2COR 030 010 100	3 x R1	4	10	55	6	£14.07
2COR 030 010 120	3 x R1	4	12	55	6	£14.73
2COR 030 010 160	3 x R1	4	16	55	6	£14.73
2COR 030 010 200	3 x R1	4	20	60	6	£15.47
2COR 030 010 250	3 x R1	4	25	65	6	£16.73
2COR 030 010 300	3 x R1	4	30	70	6	£17.67

Part Number	Diameter	Length of Cut	Effective Length	Overall Length	Shank Dia	Price
	D x R	L1	L2	L	d	£
2COR 030 010 350	3 x R1	4	35	75	6	£19.60
2COR 030 010 400	3 x R1	4	40	80	6	£21.47
2COR 040 001 120	4 x R0.1	5	12	55	6	£14.73
2COR 040 001 160	4 x R0.1	5	16	55	6	£14.73
2COR 040 001 200	4 x R0.1	5	20	60	6	£15.47
2COR 040 001 300	4 x R0.1	5	30	70	6	£17.67
2COR 040 001 400	4 x R0.1	5	40	80	6	£21.47
2COR 040 002 120	4 x R0.2	5	12	55	6	£14.73
2COR 040 002 160	4 x R0.2	5	16	55	6	£14.73
2COR 040 002 200	4 x R0.2	5	20	60	6	£15.47
2COR 040 002 300	4 x R0.2	5	30	70	6	£17.67
2COR 040 002 400	4 x R0.2	5	40	80	6	£21.47
2COR 040 003 120	4 x R0.3	5	12	55	6	£14.73
2COR 040 003 160	4 x R0.3	5	16	55	6	£14.73
2COR 040 003 200	4 x R0.3	5	20	60	6	£15.47
2COR 040 003 300	4 x R0.3	5	30	70	6	£17.67
2COR 040 003 400	4 x R0.3	5	40	80	6	£21.47
2COR 040 005 120	4 x R0.5	5	12	55	6	£14.73
2COR 040 005 160	4 x R0.5	5	16	55	6	£14.73
2COR 040 005 200	4 x R0.5	5	20	60	6	£15.47
2COR 040 005 300	4 x R0.5	5	30	70	6	£17.67
2COR 040 005 400	4 x R0.5	5	40	80	6	£21.47
2COR 040 010120	4 x R1	5	12	55	6	£14.73
2COR 040 010 160	4 x R1	5	16	55	6	£14.73
2COR 040 010 200	4 x R1	5	20	60	6	£15.47
2COR 040 010 300	4 x R1	5	30	70	6	£17.67
2COR 040 010 400	4 x R1	5	40	80	6	£21.47
2COR 060 001 200	6 x R0.1	7	20	60	6	£15.60
2COR 060 002 200	6 x R0.2	7	20	60	6	£15.60
2COR 060 003 200	6 x R0.3	7	20	60	6	£15.60
2COR 060 005 200	6 x R0.5	7	20	60	6	£15.60
2COR 060 010 200	6 x R1	7	20	60	6	£15.60
2COR 060 015 200	6 x R1.5	7	20	60	6	£15.60
2COR 080 005 250	8 x R0.5	9	25	65	8	£19.00
2COR 080 010 250	8 x R1	9	25	65	8	£19.00
2COR 080 015 250	8 x R1.5	9	25	65	8	£19.00
2COR 100 005 320	10 x R0.5	11	32	70	10	£27.20
2COR 100 010 320	10 x R1	11	32	70	10	£27.20
2COR 100 015 320	10 x R1.5	11	32	70	10	£27.20
2COR 120 005 380	12 x R0.5	12	38	80	12	£32.87
2COR 120 010 380	12 x R1	12	38	80	12	£32.87
2COR 120 015 380	12 x R1.5	12	38	80	12	£32.87

- End Mills for copper, copper alloy, non-ferrous and non-metallic materials.
- JCRO coating provides wear resistance improvement and avoids edge stress in various applications.
- High speed & feed applicable, by 3 flute 45° helix and deep chip pocket design.



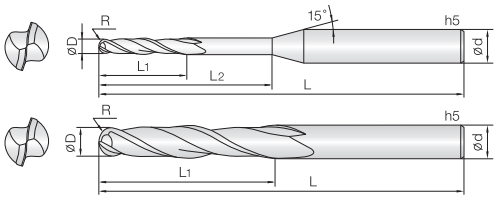
D Size	D Tolerance
Ø1 ~ 4	+0~ −0.01mm
Ø6 ~ 12	−0.005 ~ −0.015mm

Part Number	Diameter	Length of Cut	Effective Length	Overall Length	Shank Dia	Price
	D x R	L1	L2	L	d	£
3COR 010 001 030	1 x R0.1	1.5	3	45	4	£13.87
3COR 010 001 060	1 x R0.1	1.5	6	45	4	£13.87
3COR 010 001 100	1 x R0.1	1.5	10	45	4	£14.53
3COR 010 002 030	1 x R0.2	1.5	3	45	4	£13.87
3COR 010 002 060	1 x R0.2	1.5	6	45	4	£13.87
3COR 010 002 100	1 x R0.2	1.5	10	45	4	£14.53
3COR 015 001 050	1.5 x R0.1	2	5	45	4	£13.87
3COR 015 001 080	1.5 x R0.1	2	8	45	4	£13.87
3COR 015 001 120	1.5 x R0.1	2	12	45	4	£14.53
3COR 015 002 050	1.5 x R0.2	2	5	45	4	£13.87
3COR 015 002 080	1.5 x R0.2	2	8	45	4	£13.87
3COR 015 002 120	1.5 x R0.2	2	12	45	4	£14.53
3COR 020 001 060	2 x R0.1	3	6	45	4	£13.87
3COR 020 001 100	2 x R0.1	3	10	45	4	£14.53
3COR 020 001 140	2 x R0.1	3	14	45	4	£14.53
3COR 020 002 060	2 x R0.2	3	6	45	4	£13.87
3COR 020 002 100	2 x R0.2	3	10	45	4	£14.53
3COR 020 002 140	2 x R0.2	3	14	45	4	£14.53
3COR 025 001 080	2.5 x R0.1	3.5	8	45	4	£13.87
3COR 025 001 120	2.5 x R0.1	3.5	12	45	4	£14.53
3COR 025 001 160	2.5 x R0.1	3.5	16	45	4	£14.53
3COR 025 002 080	2.5 x R0.2	3.5	8	45	4	£13.87
3COR 025 002 120	2.5 x R0.2	3.5	12	45	4	£14.53
3COR 025 002 160	2.5 x R0.2	3.5	16	45	4	£14.53
3COR 025 005 080	2.5 x R0.5	3.5	8	45	4	£13.87
3COR 025 005 120	2.5 x R0.5	3.5	12	45	4	£14.53
3COR 025 005 160	2.5 x R0.5	3.5	16	45	4	£14.53
3COR 030 002 100	3 x R0.2	4	10	50	4	£13.87
3COR 030 002 160	3 x R0.2	4	16	50	4	£14.53
3COR 030 002 200	3 x R0.2	4	20	50	4	£15.20
3COR 030 003 100	3 x R0.3	4	10	50	4	£13.87
3COR 030 003 160	3 x R0.3	4	16	50	4	£14.53
3COR 030 003 200	3 x R0.3	4	20	50	4	£15.20
3COR 030 005 100	3 x R0.5	4	10	50	4	£13.87
3COR 030 005 160	3 x R0.5	4	16	50	4	£14.53
3COR 030 005 200	3 x R0.5	4	20	50	4	£15.20
3COR 040 002 120	4 x R0.2	6	12	50	4	£14.67
3COR 040 002 160	4 x R0.2	6	16	50	4	£14.67
3COR 040 002 200	4 x R0.2	6	20	50	4	£15.33
3COR 040 003 120	4 x R0.3	6	12	50	4	£14.67
3COR 040 003 160	4 x R0.3	6	16	50	4	£14.67
3COR 040 003 200	4 x R0.3	6	20	50	4	£15.33
3COR 040 005 120	4 x R0.5	6	12	50	4	£14.67
3COR 040 005 160	4 x R0.5	6	16	50	4	£14.67

Part Number	Diameter	Length of Cut	Effective Length	Overall Length	Shank Dia	Price
	D x R	L1	L2	L	d	£
3COR 040 005 200	4 x R0.5	6	20	50	4	£15.33
3COR 060 003 200	6 x R0.3	9	20	55	6	£15.67
3COR 060 003 300	6 x R0.3	9	30	70	6	£20.87
3COR 060 005 200	6 x R0.5	9	20	55	6	£15.67
3COR 060 005 300	6 x R0.5	9	30	70	6	£20.87
3COR 060 010 200	6 x R1	9	20	55	6	£15.67
3COR 060 010 300	6 x R1	9	30	70	6	£20.87
3COR 080 003 S08	8.0 x R0.3	12	25	65	8	£23.60
3COR 080 005 S08	8.0 x R0.5	12	25	65	8	£23.60
3COR 080 010 S08	8.0 x R1	12	25	65	8	£23.60
3COR 100 005 S10	10 x R0.5	15	30	70	10	£32.93
3COR 100 010 S10	10 x R1	15	30	70	10	£32.93
3COR 120 005 S12	12 x R0.5	20	35	80	12	£40.47
3COR 120 010 S12	12 x R1	20	35	80	12	£40.47

2GBE 2 Flute Long Shank Ball End Mills for Graphite

- End Mills for various work materials, graphite, hardened steel (HRc~48), pre-hardened steel, tool steel and cast iron.
- Excellent performance with low cutting force with ALTIN coating.
- Long flute length optimized for deep-side wall machining of graphite.
- Applied fine WC grade optimized for various non-ferrous and non-metallic work materials.

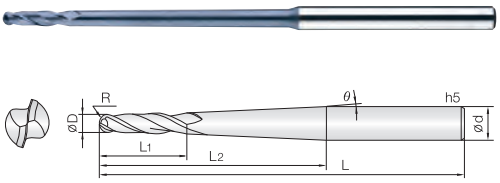


D Size	D Tolerance
Ø0.5 ~ 5	+0~ −0.01mm
Ø6 ~ 12	−0.005 ~ −0.015mm
Ø16 ~ 25	−0.01 ~ −0.02mm

Part Number	Diameter	Length of Cut	Effective Length	Over-all Length	Shank Dia	Price
	R x D	L1	L2	L	d	£
2GBE 005 020 S04	0.25R x 0.5	2	-	50	4	£24.27
2GBE 005 050 S04	0.25R x 0.5	2	5	50	4	£25.67
2GBE 010 050 S04	0.5R x 1	5	-	60	4	£20.67
2GBE 010 050 S06	0.5R x 1	5	-	60	6	£22.60
2GBE 010 100 S04	0.5R x 1	5	10	60	4	£22.80
2GBE 010 100 S06	0.5R x 1	5	10	60	6	£24.00
2GBE 010 150 S04	0.5R x 1	5	15	60	4	£24.27
2GBE 010 200 S04	0.5R x 1	5	20	60	4	£24.27
2GBE 010 250 S04	0.5R x 1	5	25	70	4	£25.67
2GBE 010 300 S04	0.5R x 1	5	30	80	4	£25.67
2GBE 010 350 S04	0.5R x 1	5	35	80	4	£25.67
2GBE 010 400 S04	0.5R x 1	5	40	90	4	£27.13
2GBE 015 080 S06	0.75R x 1.5	8	-	60	6	£22.60
2GBE 015 100 S04	0.75R x 1.5	8	10	60	4	£20.67
2GBE 015 150 S04	0.75R x 1.5	8	15	60	4	£22.80
2GBE 015 150 S06	0.75R x 1.5	8	15	60	6	£24.00
2GBE 015 200 S04	0.75R x 1.5	8	20	60	4	£22.80
2GBE 015 250 S04	0.75R x 1.5	8	25	70	4	£24.27
2GBE 015 300 S04	0.75R x 1.5	8	30	80	4	£24.27
2GBE 015 350 S04	0.75R x 1.5	8	35	80	4	£25.67
2GBE 015 400 S04	0.75R x 1.5	8	40	90	4	£27.13
2GBE 020 100 S04	1R x 2	10	-	60	4	£17.87
2GBE 020 100 S06	1R x 2	10	-	70	6	£23.27
2GBE 020 150 S04	1R x 2	10	15	60	4	£19.27
2GBE 020 200 S04	1R x 2	10	20	60	4	£19.27
2GBE 020 200 S06	1R x 2	10	20	70	6	£24.73
2GBE 020 250 S04	1R x 2	10	25	70	4	£19.27
2GBE 020 300 S04	1R x 2	10	30	80	4	£21.40
2GBE 020 350 S04	1R x 2	10	35	80	4	£21.40
2GBE 020 400 S04	1R x 2	10	40	90	4	£27.13
2GBE 020 500 S04	1R x 2	10	50	100	4	£27.13
2GBE 020 600 S04	1R x 2	10	60	100	4	£27.13
2GBE 025 200 S04	1.25R x 2.5	10	20	70	4	£24.27
2GBE 030 150 100	1.5R x 3	15	-	100	3	£27.13
2GBE 030 150 S06	1.5R x 3	15	-	70	6	£23.27
2GBE 030 200 S04	1.5R x 3	15	20	70	4	£21.40
2GBE 030 300 S04	1.5R x 3	15	30	80	4	£21.40
2GBE 030 300 S06	1.5R x 3	15	30	75	6	£24.73
2GBE 030 400 S04	1.5R x 3	15	40	90	4	£27.13
2GBE 030 400 S06	1.5R x 3	15	40	90	6	£26.20
2GBE 030 500 S04	1.5R x 3	15	50	100	4	£27.13
2GBE 030 600 S04	1.5R x 3	15	60	100	4	£27.13
2GBE 040 200 080	2R x 4	20	-	80	4	£21.40
2GBE 040 200 100	2R x 4	20	-	100	4	£27.13

Part Number	Diameter	Length of Cut	Effective Length	Over-all Length	Shank Dia	Price
	R x D	L1	L2	L	d	£
2GBE 040 200 130	2R x 4	20	-	130	4	£34.27
2GBE 040 200 S06	2R x 4	20	-	75	6	£24.73
2GBE 040 350 S06	2R x 4	20	35	90	6	£26.20
2GBE 040 450 S06	2R x 4	20	45	100	6	£30.53
2GBE 050 250 100	2.5R x 5	25	-	100	5	£29.93
2GBE 050 250 130	2.5R x 5	25	-	130	5	£35.67
2GBE 050 250 S06	2.5R x 5	25	-	90	6	£24.73
2GBE 050 500 S06	2.5R x 5	25	50	110	6	£32.00
2GBE 060 250 110	3R x 6	25	-	110	6	£25.53
2GBE 060 300 150	3R x 6	30	-	150	6	£32.80
2GBE 060 300 200	3R x 6	30	-	200	6	£48.00
2GBE 060 300 220	3R x 6	30	-	220	6	£63.33
2GBE 080 350 110	4R x 8	35	-	110	8	£35.27
2GBE 080 400 150	4R x 8	40	-	150	8	£41.13
2GBE 080 400 200	4R x 8	40	-	200	8	£48.47
2GBE 080 400 220	4R x 8	40	-	220	8	£63.93
2GBE 100 400 120	5R x 10	40	-	120	10	£50.00
2GBE 100 450 150	5R x 10	45	-	150	10	£54.40
2GBE 100 450 200	5R x 10	45	-	200	10	£61.73
2GBE 100 450 230	5R x 10	45	-	230	10	£74.20
2GBE 120 500 130	6R x 12	50	-	130	12	£60.40
2GBE 120 500 150	6R x 12	50	-	150	12	£65.40
2GBE 120 550 200	6R x 12	55	-	200	12	£72.73
2GBE 120 550 250	6R x 12	55	-	250	12	£94.07
2GBE 160 600 160	8R x 16	60	-	160	16	£108.80
2GBE 160 650 200	8R x 16	65	-	200	16	£125.40
2GBE 160 650 250	8R x 16	65	-	250	16	£187.33
2GBE 160 700 320	8R x 16	70	-	320	16	£216.80
2GBE 200 700 160	10R x 20	70	-	160	20	£180.53
2GBE 200 750 200	10R x 20	75	-	200	20	£215.27
2GBE 200 750 250	10R x 20	75	-	250	20	£330.87
2GBE 200 900 320	10R x 20	90	-	320	20	£360.27
2GBE 250 1000 250	12.5R x 25	100	-	250	25	£576.80

- End Mills for various work materials, graphite, hardened steel (HRc~48), pre-hardened steel, tool steel and cast iron.
- Excellent performance with low cutting force with ALTIN coating.
- Long flute length optimized for deep-side wall machining of graphite.
- Applied fine WC grade optimized for various non-ferrous and non-metallic work materials.

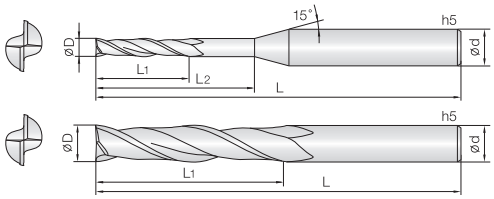


D Size	D Tolerance
Ø1 ~ 5	+0 ~ −0.01mm
Ø6 ~ 12	−0.005 ~ −0.015mm

Part Number	Diameter	Angle	Length of Cut	Effective Length	Overall Length	Shank Dia	Price
	R x D		L1	L2	L	d	£
2TGB 010 003 200	0.5R x 1	0°30	4	20	60	4	£25.00
2TGB 010 003 300	0.5R x 1	0°30	4	30	75	4	£27.13
2TGB 010 003 400	0.5R x 1	0°30	4	40	90	4	£29.93
2TGB 010 010 250	0.5R x 1	1°	4	25	60	4	£25.00
2TGB 010 010 350	0.5R x 1	1°	4	35	75	4	£27.13
2TGB 010 010 500	0.5R x 1	1°	4	50	100	4	£34.27
2TGB 015 003 300	0.75R x 1.5	0°30	6	30	75	4	£25.67
2TGB 015 003 400	0.75R x 1.5	0°30	6	40	80	4	£27.13
2TGB 015 003 500	0.75R x 1.5	0°30	6	50	100	4	£34.27
2TGB 015 010 300	0.75R x 1.5	1°	6	30	75	4	£25.67
2TGB 015 010 500	0.75R x 1.5	1°	6	50	100	4	£34.27
2TGB 015 010 600	0.75R x 1.5	1°	6	60	100	4	£34.27
2TGB 020 003 400	1R x 2	0°30	8	40	90	4	£34.27
2TGB 020 003 500	1R x 2	0°30	8	50	100	4	£34.27
2TGB 020 003 700	1R x 2	0°30	8	70	130	4	£48.53
2TGB 020 010 600	1R x 2	1°	8	60	110	6	£40.73
2TGB 020 010 900	1R x 2	1°	8	90	150	6	£55.27
2TGB 030 003 700	1.5R x 3	0°30	10	70	120	6	£48.00
2TGB 030 010 900	1.5R x 3	1°	10	90	150	6	£55.27
2TGB 040 003 700	2R x 4	0°30	14	70	120	6	£46.60
2TGB 040 010 800	2R x 4	1°	14	80	150	6	£55.27
2TGB 050 003 800	2.5R x 5	0°30	16	80	130	6	£49.53
2TGB 060 003 1000	3R x 6	0°30	16	100	150	8	£58.93
2TGB 060 010 1000	3R x 6	1°	16	100	150	10	£64.93
2TGB 080 010 1000	4R x 8	1°	20	100	150	12	£94.07
2TGB 100 010 830	5R x 10	1°	25	83	200	12	£120.20
2TGB 120 010 1100	6R x 12	1°	30	110	200	16	£197.73

2GEM 2 Flute Long Shank End Mills for Graphite

- End Mills for various work materials, graphite, hardened steel (HRc~48), pre-hardened steel, tool steel and cast iron.
- Excellent performance with low cutting force with ALTIN coating.
- Long flute length optimized for deep-side wall machining of graphite.
- Applied fine WC grade optimized for various non-ferrous and non-metallic work materials, below HRc48.

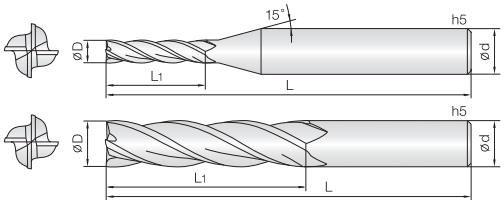


D Size	D Tolerance
Ø0.5 ~ 5	+0 ~ -0.01mm
Ø6 ~ 12	-0.01 ~ -0.025mm
Ø16 ~ 20	-0.015 ~ -0.03mm

Part Number	Diameter	Length of Cut	Effective Length	Overall Length	Shank Dia	Price
	D	L1	L2	L	d	£
2GEM 005 020 S04	0.5	2	-	50	4	£18.00
2GEM 010 050 S04	1	5	-	60	4	£15.40
2GEM 010 100 S04	1	5	10	60	4	£16.67
2GEM 010 100 S06	1	5	10	60	6	£19.00
2GEM 010 150 S04	1	5	15	60	4	£16.67
2GEM 010 200 S04	1	5	20	60	4	£16.67
2GEM 010 250 S04	1	5	25	70	4	£17.33
2GEM 015 100 S04	1.5	10	-	60	4	£14.73
2GEM 015 150 S04	1.5	8	15	60	4	£16.07
2GEM 015 200 S04	1.5	8	20	60	4	£16.07
2GEM 015 200 S06	1.5	8	20	60	6	£18.33
2GEM 015 250 S04	1.5	8	25	70	4	£17.33
2GEM 020 100 S04	2	10	-	60	4	£13.47
2GEM 020 150 S04	2	10	15	60	4	£14.73
2GEM 020 200 S04	2	10	20	60	4	£14.73
2GEM 020 200 S06	2	10	20	60	6	£16.40
2GEM 020 250 S04	2	10	25	70	4	£17.33
2GEM 020 300 S04	2	10	30	80	4	£17.33
2GEM 030 150 S04	3	15	-	70	4	£14.73
2GEM 030 250 S04	3	15	25	75	4	£16.07
2GEM 030 300 S06	3	15	30	75	6	£18.33
2GEM 040 200 100	4	20	-	100	4	£22.47
2GEM 040 400 S06	4	20	40	100	6	£24.87
2GEM 050 250 100	5	25	-	100	5	£24.40
2GEM 060 300 110	6	30	-	110	6	£23.27
2GEM 060 300 150	6	30	-	150	6	£29.47
2GEM 080 400 150	8	40	-	150	8	£38.20
2GEM 100 450 150	10	45	-	150	10	£47.80
2GEM 100 500 200	10	50	-	200	10	£61.73
2GEM 120 600 150	12	60	-	150	12	£60.20
2GEM 120 600 200	12	60	-	200	12	£71.27
2GEM 160 600 130	16	60	-	130	16	£78.18
2GEM 160 700 160	16	70	-	160	16	£91.08
2GEM 160 700 200	16	70	-	200	16	£109.44
2GEM 200 1200 320	20	120	-	320	20	£333.12
2GEM 200 800 160	20	80	-	160	20	£148.20
2GEM 200 900 200	20	90	-	200	20	£202.56

4GEM

- End Mills for various work materials, graphite, hardened steel (HRc~48), pre-hardened steel, tool steel and cast iron.
- Excellent performance with low cutting force with ALTIN coating.
- Long flute length optimized for deep-side wall machining of graphite.
- Applied fine WC grade optimized for various non-ferrous and non-metallic work materials, below HRc48.

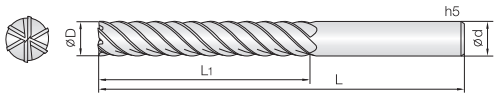


D Size	D Tolerance
Ø3 ~ 5	+0 ~ -0,01mm
Ø6 ~ 12	-0,01 ~ -0,025mm
Ø16 ~ 20	-0,015 ~ -0,03mm

Part Number	Diameter	Length of Cut	Overall Length	Shank Dia	Price
	D	L1	L	d	£
4GEM 030 100 S06	3	10	100	6	£24.73
4GEM 030 150 S06	3	15	100	6	£24.73
4GEM 040 150 S06	4	15	100	6	£25.53
4GEM 040 200 100	4	20	100	4	£23.87
4GEM 040 200 S06	4	20	100	6	£25.53
4GEM 050 200 S06	5	20	100	6	£25.53
4GEM 060 300 110	6	30	110	6	£24.73
4GEM 060 300 150	6	30	150	6	£34.93
4GEM 080 400 150	8	40	150	8	£41.13
4GEM 080 400 200	8	40	200	8	£46.07
4GEM 100 500 150	10	50	150	10	£47.80
4GEM 100 500 200	10	50	200	10	£61.73
4GEM 120 600 150	12	60	150	12	£60.20
4GEM 120 600 200	12	60	200	12	£72.73
4GEM 160 700 160	16	70	160	16	£93.84
4GEM 160 800 200	16	80	200	16	£109.44
4GEM 200 1000 320	20	100	320	20	£333.12
4GEM 200 750 160	20	75	160	20	£148.20
4GEM 200 900 200	20	90	200	20	£202.56

6GEM 6 Flute 45° Long Shank End Mills for Graphite

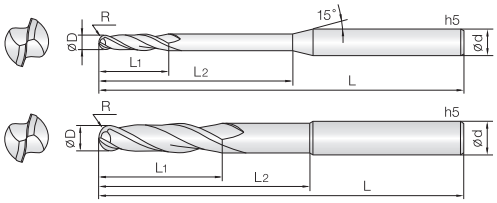
- End Mills for various work materials, graphite, hardened steel (HRc~48), pre-hardened steel, tool steel and cast iron.
- Excellent performance with low cutting force with ALTIN coating.
- Long flute length optimized for deep-side wall machining of graphite.
- Applied fine WC grade optimized for various non-ferrous and non-metallic work materials, below HRc50.



D Size	D Tolerance
Ø6 ~ 12	−0.01 ~ −0.025mm
Ø16 ~ 20	−0.015 ~ −0.03mm

Part Number	Diameter	Length of Cut	Overall Length	Shank Dia	Price
	D	L1	L	d	£
6GEM 060 300 110	6	30	110	6	£32.93
6GEM 080 400 110	8	40	110	8	£54.67
6GEM 100 500 120	10	50	120	10	£58.13
6GEM 100 500 150	10	50	150	10	£70.33
6GEM 120 600 130	12	60	130	12	£62.13
6GEM 120 600 160	12	60	160	12	£71.13
6GEM 160 900 160	16	90	160	16	£103.20
6GEM 160 900 200	16	90	200	16	£125.64
6GEM 160 900 250	16	90	250	16	£217.56
6GEM 200 1000 200	20	100	200	20	£222.30
6GEM 200 1000 250	20	100	250	20	£319.50
6GEM 200 1000 320	20	100	320	20	£367.08

- End Mills for Graphite, reinforced plastic, carbon fibre, non-ferrous and non-metallic materials.
- Excellent wear resistance by applying qualified CVD diamond coating.
- Wide range available for various applications and optimum tool performance.

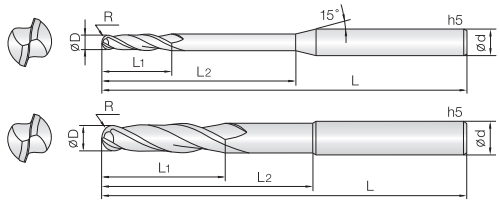


D Size	D Tolerance
ø0.2 ~ 12	+0 ~ −0.02mm

Part Number	Diameter	Length of Cut	Effective Length	Overall Length	Shank Dia	Price
	R x D	L1	L2	L	d	£
2DBE 002 010 S04	0.1R x 0.2	1	-	45	4	£35.40
2DBE 003 012 S04	0.15R x 0.3	1.2	-	45	4	£33.53
2DBE 003 020 S04	0.15R x 0.3	1.2	2	45	4	£35.73
2DBE 004 015 S04	0.2R x 0.4	1.5	-	45	4	£31.33
2DBE 004 020 S04	0.2R x 0.4	1.5	2	45	4	£33.53
2DBE 004 030 S04	0.2R x 0.4	1.5	3	45	4	£33.53
2DBE 004 040 S04	0.2R x 0.4	1.5	4	45	4	£35.73
2DBE 004 050 S04	0.2R x 0.4	1.5	5	45	4	£35.73
2DBE 004 080 S04	0.2R x 0.4	1.5	8	45	4	£38.67
2DBE 004 100 S04	0.2R x 0.4	1.5	10	45	4	£40.00
2DBE 005 020 S04	0.25R x 0.5	2	-	45	4	£31.00
2DBE 005 030 S04	0.25R x 0.5	2	3	45	4	£31.53
2DBE 005 040 S04	0.25R x 0.5	2	4	45	4	£31.53
2DBE 005 050 S04	0.25R x 0.5	2	5	45	4	£31.53
2DBE 005 060 S04	0.25R x 0.5	2	6	45	4	£33.73
2DBE 005 080 S04	0.25R x 0.5	2	8	45	4	£33.73
2DBE 005 100 S04	0.25R x 0.5	2	10	45	4	£35.33
2DBE 005 120 S04	0.25R x 0.5	2	12	45	4	£36.67
2DBE 006 020 S04	0.3R x 0.6	2	-	45	4	£30.33
2DBE 006 030 S04	0.3R x 0.6	2	3	45	4	£30.80
2DBE 006 040 S04	0.3R x 0.6	2	4	45	4	£30.80
2DBE 006 050 S04	0.3R x 0.6	2	5	45	4	£30.80
2DBE 006 060 S04	0.3R x 0.6	2	6	45	4	£30.80
2DBE 006 080 S04	0.3R x 0.6	2	8	45	4	£30.80
2DBE 006 100 S04	0.3R x 0.6	2	10	45	4	£30.80
2DBE 006 120 S04	0.3R x 0.6	2	12	45	4	£33.00
2DBE 006 150 S04	0.3R x 0.6	2	15	45	4	£35.33
2DBE 006 200 S04	0.3R x 0.6	2	20	45	4	£36.67
2DBE 008 030 S04	0.4R x 0.8	3	-	45	4	£29.67
2DBE 008 040 S04	0.4R x 0.8	3	4	45	4	£31.07
2DBE 008 050 S04	0.4R x 0.8	3	5	45	4	£31.07
2DBE 008 060 S04	0.4R x 0.8	3	6	45	4	£31.07
2DBE 008 080 S04	0.4R x 0.8	3	8	45	4	£31.07
2DBE 008 100 S04	0.4R x 0.8	3	10	45	4	£31.07
2DBE 008 150 S04	0.4R x 0.8	3	15	45	4	£31.07
2DBE 008 200 S04	0.4R x 0.8	3	20	45	4	£31.07
2DBE 010 030 S04	0.5R x 1	3	-	60	4	£23.47
2DBE 010 040 S04	0.5R x 1	3	4	60	4	£24.67
2DBE 010 050 S04	0.5R x 1	3	5	60	4	£24.67
2DBE 010 060 S04	0.5R x 1	3	6	60	4	£24.67
2DBE 010 080 S04	0.5R x 1	3	8	60	4	£24.67
2DBE 010 100 S04	0.5R x 1	3	10	60	4	£24.67
2DBE 010 120 S04	0.5R x 1	3	12	60	4	£24.67
2DBE 010 150 S04	0.5R x 1	3	15	60	4	£24.67

Part Number	Diameter	Length of Cut	Effective Length	Overall Length	Shank Dia	Price
	R x D	L1	L2	L	d	£
2DBE 010 200 S04	0.5R x 1	3	20	60	4	£24.67
2DBE 010 250 S04	0.5R x 1	3	25	80	4	£27.00
2DBE 010 300 S04	0.5R x 1	3	30	80	4	£27.00
2DBE 010 350 S04	0.5R x 1	3	35	80	4	£27.00
2DBE 010 400 S04	0.5R x 1	3	40	80	4	£30.00
2DBE 010 450 S04	0.5R x 1	3	45	80	4	£32.67
2DBE 010 500 S04	0.5R x 1	3	50	80	4	£34.00
2DBE 015 050 S04	0.75R x 1.5	4.5	-	60	4	£23.47
2DBE 015 080 S04	0.75R x 1.5	4.5	8	80	4	£24.67
2DBE 015 100 S04	0.75R x 1.5	4.5	10	80	4	£24.67
2DBE 015 120 S04	0.75R x 1.5	4.5	12	80	4	£24.67
2DBE 015 150 S04	0.75R x 1.5	4.5	15	80	4	£24.67
2DBE 015 180 S04	0.75R x 1.5	4.5	18	80	4	£24.67
2DBE 015 200 S04	0.75R x 1.5	4.5	20	80	4	£24.67
2DBE 015 250 S04	0.75R x 1.5	4.5	25	80	4	£27.00
2DBE 015 300 S04	0.75R x 1.5	4.5	30	80	4	£27.00
2DBE 015 350 S04	0.75R x 1.5	4.5	35	80	4	£27.00
2DBE 015 400 S04	0.75R x 1.5	4.5	40	80	4	£30.00
2DBE 020 060 S04	1R x 2	6	-	60	4	£23.47
2DBE 020 100 S04	1R x 2	6	10	80	4	£24.67
2DBE 020 150 S04	1R x 2	6	15	80	4	£24.67
2DBE 020 200 S04	1R x 2	6	20	80	4	£24.67
2DBE 020 250 S04	1R x 2	6	25	80	4	£27.00
2DBE 020 300 S04	1R x 2	6	30	80	4	£27.00
2DBE 020 350 S04	1R x 2	6	35	80	4	£27.00
2DBE 020 400 S04	1R x 2	6	40	100	4	£28.80
2DBE 020 450 S04	1R x 2	6	45	100	4	£28.80
2DBE 020 500 S04	1R x 2	6	50	100	4	£28.80
2DBE 020 600 S04	1R x 2	6	60	100	4	£31.20
2DBE 020 700 S04	1R x 2	6	70	100	4	£34.00
2DBE 030 080 S04	1.5R x 3	8	-	60	4	£23.47
2DBE 030 080 S06	1.5R x 3	3	8	60	6	£34.20
2DBE 030 150 100	1.5R x 3	8	15	100	3	£28.80
2DBE 030 150 S04	1.5R x 3	8	15	100	4	£27.00
2DBE 030 200 S04	1.5R x 3	8	20	100	4	£27.00
2DBE 030 250 S04	1.5R x 3	8	25	100	4	£27.00
2DBE 030 300 S04	1.5R x 3	8	30	100	4	£27.00
2DBE 030 350 S04	1.5R x 3	8	35	100	4	£28.80
2DBE 030 400 S04	1.5R x 3	8	40	100	4	£28.80
2DBE 030 500 S04	1.5R x 3	8	50	100	4	£28.80
2DBE 030 600 S04	1.5R x 3	8	60	100	4	£31.20
2DBE 030 700 S04	1.5R x 3	8	70	100	4	£34.00
2DBE 040 040 060	2R x 4	4	-	60	4	£23.47
2DBE 040 160 060	2R x 4	16	-	60	4	£23.47

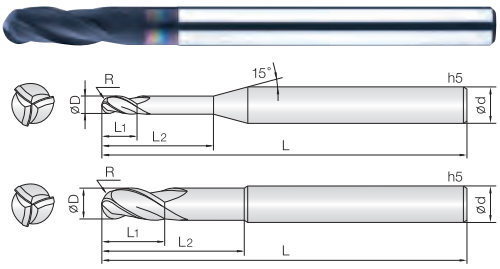
2DBE 2 Flute Diamond Coated Ball End Mills for Graphite



D Size	D Tolerance
ø0.2 ~ 12	+0 ~ −0.02mm

Part Number	Diameter	Length of Cut	Effective Length	Overall Length	Shank Dia	Price
	R x D	L1	L2	L	d	£
2DBE 040 160 080	2R x 4	16	-	80	4	£25.47
2DBE 040 160 100	2R x 4	16	-	100	4	£28.53
2DBE 040 160 130	2R x 4	16	-	130	4	£30.67
2DBE 040 160 150	2R x 4	16	-	150	4	£33.00
2DBE 040 300 080	2R x 4	16	30	80	4	£28.80
2DBE 040 400 100	2R x 4	16	40	100	4	£31.87
2DBE 040 400 130	2R x 4	16	40	130	4	£34.00
2DBE 040 500 150	2R x 4	16	50	150	4	£36.33
2DBE 050 160 110	2.5R x 5	16	-	110	5	£38.67
2DBE 050 200 S06	2.5R x 5	16	20	110	6	£36.93
2DBE 050 400 110	2.5R x 5	16	40	110	5	£41.33
2DBE 050 400 S06	2.5R x 5	16	40	110	6	£41.47
2DBE 050 600 S06	2.5R x 5	16	60	110	6	£41.47
2DBE 060 250 080	3R x 6	16	25	80	6	£34.20
2DBE 060 250 110	3R x 6	16	25	110	6	£36.93
2DBE 060 300 150	3R x 6	16	30	150	6	£43.07
2DBE 060 400 110	3R x 6	16	40	110	6	£38.93
2DBE 060 500 150	3R x 6	16	50	150	6	£45.07
2DBE 080 300 080	4R x 8	20	30	80	8	£44.13
2DBE 080 300 110	4R x 8	20	30	110	8	£45.67
2DBE 080 400 110	4R x 8	20	40	110	8	£47.73
2DBE 080 400 200	4R x 8	20	40	200	8	£69.33
2DBE 080 500 150	4R x 8	20	50	150	8	£53.27
2DBE 100 400 080	5R x 10	22	40	80	10	£62.13
2DBE 100 400 110	5R x 10	22	40	110	10	£65.60
2DBE 100 500 110	5R x 10	22	50	110	10	£67.67
2DBE 100 500 200	5R x 10	22	50	200	10	£95.47
2DBE 100 600 160	5R x 10	22	60	160	10	£73.47
2DBE 120 500 110	6R x 12	25	50	110	12	£81.73
2DBE 120 500 160	6R x 12	25	50	160	12	£100.27
2DBE 120 600 200	6R x 12	25	60	200	12	£120.87

- End Mills for Graphite, reinforced plastic, carbon fibre, non-ferrous and non-metallic materials.
- Excellent wear resistance by applying qualified CVD diamond coating.
- Wide range available for various applications and optimum tool performance.



D Size	D Tolerance
Ø1 ~ 12	+0~ -0.02mm

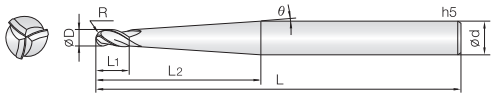
Part Number	Diameter	Length of Cut	Effective Length	Overall Length	Shank Dia	Price
	R x D	L1	L2	L	d	£
3DBE 010 030 S04	0.5R x 1	3	-	60	4	£23.47
3DBE 010 050 S04	0.5R x 1	3	5	60	4	£24.67
3DBE 010 100 S04	0.5R x 1	3	10	60	4	£24.67
3DBE 010 150 S04	0.5R x 1	3	15	60	4	£24.67
3DBE 010 200 S04	0.5R x 1	3	20	60	4	£24.67
3DBE 010 250 S04	0.5R x 1	3	25	80	4	£27.00
3DBE 010 300 S04	0.5R x 1	3	30	80	4	£27.00
3DBE 010 350 S04	0.5R x 1	3	35	80	4	£27.00
3DBE 010 400 S04	0.5R x 1	3	40	80	4	£30.00
3DBE 010 450 S04	0.5R x 1	3	45	80	4	£32.67
3DBE 010 500 S04	0.5R x 1	3	50	80	4	£34.00
3DBE 015 050 S04	0.75R x 1.5	4.5	-	60	4	£23.47
3DBE 015 100 S04	0.75R x 1.5	4.5	10	80	4	£24.67
3DBE 015 150 S04	0.75R x 1.5	4.5	15	80	4	£24.67
3DBE 015 200 S04	0.75R x 1.5	4.5	20	80	4	£24.67
3DBE 015 250 S04	0.75R x 1.5	4.5	25	80	4	£27.00
3DBE 015 300 S04	0.75R x 1.5	4.5	30	80	4	£27.00
3DBE 015 350 S04	0.75R x 1.5	4.5	35	80	4	£27.00
3DBE 015 400 S04	0.75R x 1.5	4.5	40	80	4	£30.00
3DBE 015 450 S04	0.75R x 1.5	4.5	45	80	4	£32.00
3DBE 015 500 S04	0.75R x 1.5	4.5	50	80	4	£34.00
3DBE 020 060 S04	1R x 2	6	-	60	4	£23.47
3DBE 020 100 S04	1R x 2	6	10	80	4	£24.67
3DBE 020 150 S04	1R x 2	6	15	80	4	£24.67
3DBE 020 200 S04	1R x 2	6	20	80	4	£24.67
3DBE 020 250 S04	1R x 2	6	25	80	4	£27.00
3DBE 020 300 S04	1R x 2	6	30	80	4	£27.00
3DBE 020 350 S04	1R x 2	6	35	80	4	£28.80
3DBE 020 400 S04	1R x 2	6	40	100	4	£28.80
3DBE 020 500 S04	1R x 2	6	50	100	4	£31.13
3DBE 020 600 S04	1R x 2	6	60	100	4	£32.47
3DBE 020 700 S04	1R x 2	6	70	100	4	£34.47
3DBE 030 080 S04	1.5R x 3	8	-	60	4	£23.47
3DBE 030 150 100	1.5R x 3	8	15	100	3	£27.00
3DBE 030 150 S04	1.5R x 3	8	15	100	4	£27.00
3DBE 030 200 S04	1.5R x 3	8	20	100	4	£27.00
3DBE 030 300 S04	1.5R x 3	8	30	100	4	£27.00
3DBE 030 400 S04	1.5R x 3	8	40	100	4	£28.80
3DBE 030 500 S04	1.5R x 3	8	50	100	4	£28.80
3DBE 040 160 080	2R x 4	16	-	80	4	£25.47
3DBE 040 160 100	2R x 4	16	-	100	4	£28.53
3DBE 040 160 130	2R x 4	16	-	130	4	£30.67
3DBE 040 300 080	2R x 4	16	30	80	4	£28.80
3DBE 040 400 100	2R x 4	16	40	100	4	£31.87

Part Number	Diameter	Length of Cut	Effective Length	Overall Length	Shank Dia	Price
	R x D	L1	L2	L	d	£
3DBE 040 400 130	2R x 4	16	40	130	4	£34.00
3DBE 050 160 110	2.5R x 5	16	-	110	5	£40.67
3DBE 050 400 110	2.5R x 5	16	40	110	5	£40.67
3DBE 060 250 110	3R x 6	16	25	110	6	£36.93
3DBE 060 300 150	3R x 6	16	30	150	6	£43.07
3DBE 060 400 110	3R x 6	16	40	110	6	£38.93
3DBE 060 500 150	3R x 6	16	50	150	6	£45.07
3DBE 060 500 180	3R x 6	16	50	180	6	£62.53
3DBE 080 400 110	4R x 8	20	40	110	8	£47.73
3DBE 080 500 150	4R x 8	20	50	150	8	£55.33
3DBE 100 400 110	5R x 10	22	40	110	10	£67.67
3DBE 100 600 160	5R x 10	22	60	160	10	£79.00
3DBE 120 500 110	6R x 12	25	50	110	12	£81.73
3DBE 120 500 160	6R x 12	25	50	160	12	£100.27
3DBE 120 600 200	6R x 12	25	60	200	12	£120.87

3TBD

3 Flute Diamond Coated Taper Neck End Mills for Graphite

- End Mills for Graphite, reinforced plastic, carbon fibre, non-ferrous and non-metallic materials.
- Excellent wear resistance by applying qualified CVD diamond coating.
- Wide range available for various applications and optimum tool performance.

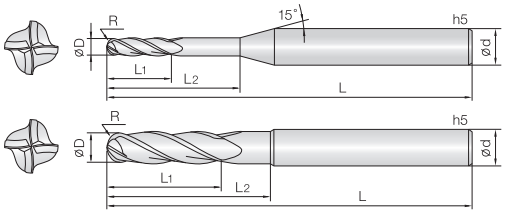


D Size	D Tolerance
ø1 ~ 4	+0~ −0,02mm

Part Number	Diameter	Angle	Length of Cut	Effective Length	Overall Length	Shank Dia	Price
	R x D		L1	L2	L	d	£
3TBD 010 003 300	0.5R x 1	0°30	3	30	100	4	£41.33
3TBD 010 003 400	0.5R x 1	0°30	3	40	100	4	£42.67
3TBD 010 003 500	0.5R x 1	0°30	3	50	100	4	£45.33
3TBD 010 010 300	0.5R x 1	1°	3	30	100	4	£41.33
3TBD 010 010 400	0.5R x 1	1°	3	40	100	4	£42.67
3TBD 010 010 500	0.5R x 1	1°	3	50	100	4	£45.33
3TBD 010 010 600	0.5R x 1	1°	3	60	100	4	£48.00
3TBD 015 003 300	0.75R x 1.5	0°30	4	30	100	4	£41.33
3TBD 015 003 400	0.75R x 1.5	0°30	4	40	100	4	£42.67
3TBD 015 003 500	0.75R x 1.5	0°30	4	50	100	4	£45.33
3TBD 015 010 400	0.75R x 1.5	1°	4	40	100	4	£42.67
3TBD 015 010 500	0.75R x 1.5	1°	4	50	100	4	£48.00
3TBD 015 010 600	0.75R x 1.5	1°	4	60	100	4	£50.67
3TBD 020 003 400	1R x 2	0°30	5	40	130	4	£52.00
3TBD 020 003 500	1R x 2	0°30	5	50	130	4	£53.33
3TBD 020 003 600	1R x 2	0°30	5	60	130	4	£56.00
3TBD 020 010 500	1R x 2	1°	5	50	130	4	£53.33
3TBD 020 010 600	1R x 2	1°	5	60	130	4	£56.00
3TBD 020 010 700	1R x 2	1°	5	70	130	4	£58.67
3TBD 030 003 600	1.5R x 3	0°30	6	60	150	6	£63.27
3TBD 030 003 800	1.5R x 3	0°30	6	80	150	6	£66.67
3TBD 030 010 700	1.5R x 3	1°	6	70	150	6	£66.67
3TBD 030 010 900	1.5R x 3	1°	6	90	150	6	£70.73
3TBD 040 003 1000	2R x 4	0°30	8	100	150	6	£80.27
3TBD 040 003 800	2R x 4	0°30	8	80	150	6	£70.73
3TBD 040 010 1000	2R x 4	1°	8	100	150	6	£80.27

4DBE

- End Mills for Graphite, reinforced plastic, carbon fibre, non-ferrous and non-metallic materials.
- Excellent wear resistance by applying qualified CVD diamond coating.
- Wide range available for various applications and optimum tool performance.



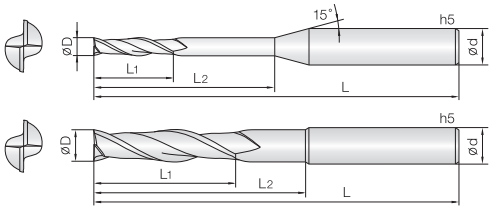
D Size	D Tolerance
ø1 ~ 12	+0~ −0.02mm

Part Number	Diameter	Length of Cut	Effective Length	Overall Length	Shank Dia	Price
	R x D	L1	L2	L	d	£
4DBE 010 030 S04	0.5R x 1	3	-	60	4	£28.20
4DBE 010 050 S04	0.5R x 1	3	5	60	4	£29.67
4DBE 010 100 S04	0.5R x 1	3	10	60	4	£29.67
4DBE 010 150 S04	0.5R x 1	3	15	60	4	£29.67
4DBE 010 200 S04	0.5R x 1	3	20	60	4	£29.67
4DBE 010 250 S04	0.5R x 1	3	25	60	4	£32.00
4DBE 010 300 S04	0.5R x 1	3	30	80	4	£32.40
4DBE 010 350 S04	0.5R x 1	3	35	80	4	£32.40
4DBE 010 400 S04	0.5R x 1	3	40	80	4	£36.00
4DBE 010 450 S04	0.5R x 1	3	45	80	4	£36.00
4DBE 010 500 S04	0.5R x 1	3	50	80	4	£38.67
4DBE 015 045 S04	0.75R x 1.5	4.5	-	60	4	£28.20
4DBE 015 100 S04	0.75R x 1.5	4.5	10	60	4	£29.67
4DBE 015 150 S04	0.75R x 1.5	4.5	15	60	4	£29.67
4DBE 015 200 S04	0.75R x 1.5	4.5	20	60	4	£29.67
4DBE 015 250 S04	0.75R x 1.5	4.5	25	60	4	£31.93
4DBE 015 300 S04	0.75R x 1.5	4.5	30	80	4	£32.40
4DBE 015 350 S04	0.75R x 1.5	4.5	35	80	4	£32.40
4DBE 015 400 S04	0.75R x 1.5	4.5	40	80	4	£36.00
4DBE 015 450 S04	0.75R x 1.5	4.5	45	80	4	£36.00
4DBE 015 500 S04	0.75R x 1.5	4.5	50	80	4	£38.67
4DBE 020 060 S04	1R x 2	6	-	60	4	£28.20
4DBE 020 100 S04	1R x 2	6	10	80	4	£29.27
4DBE 020 200 S04	1R x 2	6	20	80	4	£29.27
4DBE 020 300 S04	1R x 2	6	30	80	4	£29.27
4DBE 020 400 S04	1R x 2	6	40	80	4	£31.73
4DBE 020 500 S04	1R x 2	6	50	100	4	£34.53
4DBE 020 600 S04	1R x 2	6	60	100	4	£36.13
4DBE 020 700 S04	1R x 2	6	70	100	4	£38.33
4DBE 030 080 S04	1.5R x 3	8	-	60	4	£28.20
4DBE 030 150 S04	1.5R x 3	8	15	100	4	£31.67
4DBE 030 200 S04	1.5R x 3	8	20	100	4	£31.67
4DBE 030 300 S04	1.5R x 3	8	30	100	4	£31.67
4DBE 030 400 S04	1.5R x 3	8	40	100	4	£33.80
4DBE 030 500 S04	1.5R x 3	8	50	100	4	£33.80
4DBE 030 600 S04	1.5R x 3	8	60	100	4	£36.13
4DBE 030 700 S04	1.5R x 3	8	70	100	4	£38.33
4DBE 040 160 060	2R x 4	16	-	60	4	£28.20
4DBE 040 160 080	2R x 4	16	-	80	4	£30.47
4DBE 040 160 100	2R x 4	16	-	100	4	£34.20
4DBE 040 160 130	2R x 4	16	-	130	4	£36.67
4DBE 060 250 080	3R x 6	16	25	80	6	£38.87
4DBE 060 250 110	3R x 6	16	25	110	6	£42.00
4DBE 060 300 150	3R x 6	16	30	150	6	£48.93

Part Number	Diameter	Length of Cut	Effective Length	Overall Length	Shank Dia	Price
	R x D	L1	L2	L	d	£
4DBE 080 300 080	4R x 8	20	30	80	8	£49.33
4DBE 080 300 110	4R x 8	20	30	110	8	£52.00
4DBE 080 350 150	4R x 8	20	35	150	8	£60.60
4DBE 080 400 200	4R x 8	20	40	200	8	£79.00
4DBE 100 350 080	5R x 10	22	35	80	10	£68.07
4DBE 100 350 110	5R x 10	22	35	110	10	£75.33
4DBE 100 400 160	5R x 10	22	40	160	10	£87.87
4DBE 100 500 200	5R x 10	22	50	200	10	£113.87
4DBE 120 500 110	6R x 12	25	50	110	12	£93.40
4DBE 120 500 160	6R x 12	25	50	160	12	£109.20
4DBE 120 600 200	6R x 12	25	60	200	12	£135.93

2DEM 2 Flute Diamond Coated End Mills for Graphite

- End Mills for Graphite, reinforced plastic, carbon fibre, non-ferrous and non-metallic materials.
- Excellent wear resistance by applying qualified CVD diamond coating.
- Wide range available for various applications and optimum tool performance.



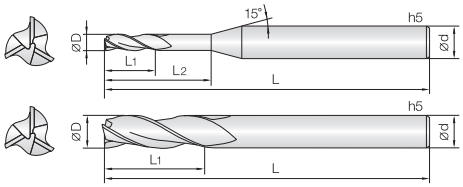
D Size	D Tolerance
ø0.2 ~ 12	+0~ −0.02mm

Part Number	Diameter	Length of Cut	Effective Length	Overall Length	Shank Dia	Price
	D	L1	L2	L	d	£
2DEM 002 004 S04	0.2	0.4	-	45	4	£35.87
2DEM 003 006 S04	0.3	0.6	-	45	4	£32.87
2DEM 003 020 S04	0.3	0.6	2	45	4	£36.00
2DEM 003 040 S04	0.3	0.6	4	45	4	£36.67
2DEM 004 008 S04	0.4	0.8	-	45	4	£30.00
2DEM 004 020 S04	0.4	0.8	2	45	4	£33.33
2DEM 004 040 S04	0.4	0.8	4	45	4	£34.67
2DEM 005 010 S04	0.5	1	-	45	4	£30.00
2DEM 005 030 S04	0.5	1	3	45	4	£33.33
2DEM 005 050 S04	0.5	1	5	45	4	£34.67
2DEM 006 012 S04	0.6	1.2	-	45	4	£30.00
2DEM 006 030 S04	0.6	1.2	3	45	4	£33.33
2DEM 006 050 S04	0.6	1.2	5	45	4	£34.67
2DEM 007 015 S04	0.7	1.5	-	45	4	£30.00
2DEM 007 040 S04	0.7	1.5	4	45	4	£33.33
2DEM 007 060 S04	0.7	1.5	6	45	4	£34.67
2DEM 007 080 S04	0.7	1.5	8	45	4	£36.00
2DEM 008 020 S04	0.8	2	-	45	4	£30.00
2DEM 009 025 S04	0.9	2.5	-	45	4	£30.00
2DEM 010 030 S04	1	3	-	60	4	£24.80
2DEM 010 032 S04	1	3.2	-	45	4	£24.80
2DEM 010 050 S04	1	3	5	60	4	£25.67
2DEM 010 100 S04	1	3	10	60	4	£25.67
2DEM 010 150 S04	1	3	15	60	4	£25.67
2DEM 010 200 S04	1	3	20	60	4	£25.67
2DEM 010 250 S04	1	3	25	60	4	£27.67
2DEM 010 300 S04	1	3	30	60	4	£30.00
2DEM 015 060 S04	1.5	6	-	60	4	£24.80
2DEM 015 100 S04	1.5	6	10	60	4	£25.67
2DEM 015 150 S04	1.5	6	15	60	4	£25.67
2DEM 015 200 S04	1.5	6	20	60	4	£25.67
2DEM 015 250 S04	1.5	6	25	60	4	£27.67
2DEM 015 300 S04	1.5	6	30	60	4	£30.00
2DEM 020 060 S04	2	6	-	45	4	£24.80
2DEM 020 080 S04	2	8	-	80	4	£24.80
2DEM 020 120 S04	2	8	12	80	4	£25.67
2DEM 020 150 S04	2	8	15	80	4	£25.67
2DEM 020 200 S04	2	8	20	80	4	£25.67
2DEM 020 250 S04	2	8	25	80	4	£27.67
2DEM 020 300 S04	2	8	30	80	4	£27.67
2DEM 020 400 S04	2	8	40	80	4	£29.93
2DEM 020 450 S04	2	8	45	80	4	£31.33
2DEM 020 500 S04	2	8	50	80	4	£32.67
2DEM 030 090 S06	3	9	-	50	6	£29.40

Part Number	Diameter	Length of Cut	Effective Length	Overall Length	Shank Dia	Price
	D	L1	L2	L	d	£
2DEM 030 120 S04	3	12	-	80	4	£24.80
2DEM 030 200 S04	3	12	20	80	4	£25.67
2DEM 030 250 S04	3	12	25	80	4	£27.67
2DEM 030 300 S04	3	12	30	80	4	£27.67
2DEM 030 400 S04	3	12	40	80	4	£29.93
2DEM 030 500 S04	3	12	50	80	4	£32.67
2DEM 040 120 S06	4	12	-	50	6	£29.40
2DEM 040 160 080	4	16	-	80	4	£24.80
2DEM 050 150 S06	5	15	-	60	6	£31.60
2DEM 050 200 S06	5	20	-	110	6	£40.13
2DEM 060 180 S06	6	18	-	60	6	£31.60
2DEM 060 250 110	6	25	-	110	6	£40.13
2DEM 060 250 150	6	25	-	150	6	£43.53
2DEM 080 240 S08	8	24	-	70	8	£41.87
2DEM 080 400 150	8	25	40	150	8	£57.93
2DEM 100 250 S10	10	25	-	80	10	£61.80
2DEM 100 500 160	10	25	50	160	10	£82.13
2DEM 120 250 S12	12	25	-	80	12	£78.27
2DEM 120 600 160	12	25	60	160	12	£103.00

3DEM

- End Mills for Graphite, reinforced plastic, carbon fibre, non-ferrous and non-metallic materials.
- Excellent wear resistance by applying qualified CVD diamond coating.
- Wide range available for various applications and optimum tool performance.

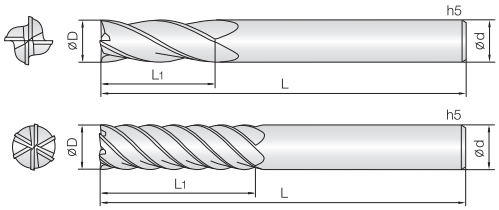


D Size	D Tolerance
ø1 ~ 12	+0 ~ -0.02mm

Part Number	Diameter	Length of Cut	Effective Length	Overall Length	Shank Dia	Price
	D	L1	L2	L	d	£
3DEM 010 030 S04	1	3	-	45	4	£25.80
3DEM 010 050 S04	1	3	5	45	4	£28.67
3DEM 010 100 S04	1	3	10	45	4	£30.00
3DEM 010 150 S04	1	3	15	45	4	£30.00
3DEM 015 060 S04	1.5	6	-	60	4	£25.80
3DEM 015 100 S04	1.5	6	10	60	4	£28.67
3DEM 015 150 S04	1.5	6	15	60	4	£30.00
3DEM 015 200 S04	1.5	6	20	60	4	£30.00
3DEM 020 060 S04	2	6	-	45	4	£25.80
3DEM 020 100 S04	2	10	-	60	4	£25.80
3DEM 020 150 S04	2	10	15	60	4	£28.67
3DEM 020 200 S04	2	10	20	60	4	£30.00
3DEM 020 250 S04	2	10	25	60	4	£30.00
3DEM 030 090 S06	3	9	-	50	6	£30.40
3DEM 030 150 S03	3	15	-	60	3	£25.80
3DEM 030 150 S04	3	15	-	60	4	£25.80
3DEM 030 200 S04	3	15	20	60	4	£30.00
3DEM 030 250 S04	3	15	25	60	4	£30.00
3DEM 040 120 S06	4	12	-	50	6	£30.40
3DEM 040 200 080	4	20	-	80	4	£25.80
3DEM 060 180 060	6	18	-	60	6	£32.67
3DEM 060 250 110	6	25	-	110	6	£41.13
3DEM 060 250 150	6	25	-	150	6	£44.53
3DEM 080 240 070	8	24	-	70	8	£42.93
3DEM 080 350 110	8	35	-	110	8	£49.47
3DEM 080 350 150	8	35	-	150	8	£59.00
3DEM 100 250 080	10	25	-	80	10	£62.80
3DEM 100 400 110	10	40	-	110	10	£80.33
3DEM 100 500 160	10	50	-	160	10	£90.67
3DEM 120 250 080	12	25	-	80	12	£79.67
3DEM 120 450 110	12	45	-	110	12	£96.13
3DEM 120 550 160	12	55	-	160	12	£115.33

4&6DEM 4&6 Flute Diamond Coated End Mills for Graphite

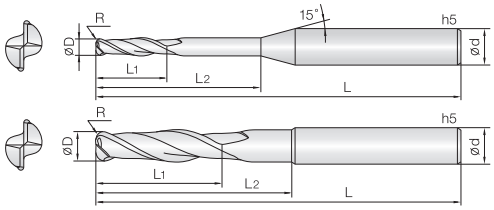
- End Mills for Graphite, reinforced plastic, carbon fibre, non-ferrous and non-metallic materials.
- Excellent wear resistance by applying qualified CVD diamond coating.
- Wide range available for various applications and optimum tool performance.



D Size	D Tolerance
Ø0.2 ~ 16	+0 ~ -0.02mm

Part Number	Diameter	Length of Cut	Overall Length	Shank Diameter	Flutes	Price
	D	L1	L	d	z	£
4DEM 020 060 S04	2	6	45	4	4	£32.53
4DEM 020 100 S04	2	10	60	4	4	£32.53
4DEM 030 090 S06	3	9	50	6	4	£38.73
4DEM 030 150 S03	3	15	60	3	4	£32.53
4DEM 030 150 S04	3	15	60	4	4	£32.53
4DEM 040 120 S06	4	12	50	6	4	£38.73
4DEM 040 200 080	4	20	80	4	4	£35.33
4DEM 040 200 100	4	20	100	4	4	£44.00
4DEM 060 180 060	6	18	60	6	4	£43.33
4DEM 060 250 110	6	25	110	6	4	£44.87
4DEM 060 250 150	6	25	150	6	4	£51.07
4DEM 080 240 070	8	24	70	8	4	£63.00
4DEM 080 350 110	8	35	110	8	4	£67.40
4DEM 080 350 150	8	35	150	8	4	£73.47
4DEM 100 250 080	10	25	80	10	4	£87.87
4DEM 100 400 110	10	40	110	10	4	£96.13
4DEM 100 500 160	10	50	160	10	4	£123.60
4DEM 120 250 080	12	25	80	12	4	£109.20
4DEM 120 450 110	12	45	110	12	4	£120.20
4DEM 120 550 160	12	55	160	12	4	£147.67
6DEM 100 400 110	10	40	110	10	6	£101.60
6DEM 100 400 160	10	40	160	10	6	£118.80
6DEM 120 450 110	12	45	110	12	6	£130.47
6DEM 120 450 160	12	45	160	12	6	£152.47
6DEM 160 500 110	16	50	110	16	6	£211.47
6DEM 160 500 160	16	50	160	16	6	£238.27
6DEM 160 500 200	16	50	200	16	6	£267.80

- End Mills for Graphite, reinforced plastic, carbon fibre, non-ferrous and non-metallic materials.
- Excellent wear resistance by applying qualified CVD diamond coating.
- Wide range available for various applications and optimum tool performance.

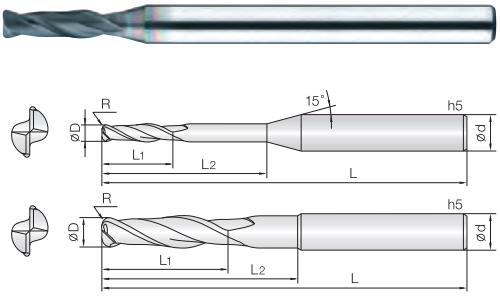


D Size	D Tolerance
ø0,2 ~ 6	+0~ -0,02mm

Part Number	Diameter	Length of Cut	Effective Length	Overall Length	Shank Dia	Price
	D x R	L1	L2	L	d	£
2DCR 002 0002 015	0.2 x R0.02	0.5	1.5	60	4	£58.93
2DCR 003 0002 015	0.3 x R0.02	0.6	1.5	60	4	£52.87
2DCR 003 0002 030	0.3 x R0.02	0.6	3	60	4	£52.87
2DCR 003 0002 045	0.3 x R0.02	0.6	4.5	60	4	£56.93
2DCR 003 0002 060	0.3 x R0.02	0.6	6	60	4	£56.93
2DCR 004 0002 020	0.4 x R0.02	0.8	2	60	4	£46.73
2DCR 004 0002 040	0.4 x R0.02	0.8	4	60	4	£46.73
2DCR 004 0002 060	0.4 x R0.02	0.8	6	60	4	£50.87
2DCR 004 0002 080	0.4 x R0.02	0.8	8	60	4	£50.87
2DCR 005 0005 010	0.5 x R0.05	1		60	4	£42.87
2DCR 005 0005 025	0.5 x R0.05	1	2.5	60	4	£42.87
2DCR 005 0005 035	0.5 x R0.05	1	3.5	60	4	£42.87
2DCR 005 0005 050	0.5 x R0.05	1	5	60	4	£42.87
2DCR 005 0005 075	0.5 x R0.05	1	7.5	60	4	£44.93
2DCR 005 0005 100	0.5 x R0.05	1	10	60	4	£44.93
2DCR 006 0005 012	0.6 x R0.05	1.2		60	4	£42.87
2DCR 006 0005 030	0.6 x R0.05	1.2	3	60	4	£42.87
2DCR 006 0005 060	0.6 x R0.05	1.2	6	60	4	£42.87
2DCR 006 0005 090	0.6 x R0.05	1.2	9	60	4	£44.93
2DCR 006 0005 120	0.6 x R0.05	1.2	12	60	4	£44.93
2DCR 008 0005 016	0.8 x R0.05	1.6		60	4	£40.87
2DCR 008 0005 040	0.8 x R0.05	1.6	4	60	4	£40.87
2DCR 008 0005 080	0.8 x R0.05	1.6	8	60	4	£40.87
2DCR 008 0005 100	0.8 x R0.05	1.6	10	60	4	£42.87
2DCR 008 0005 160	0.8 x R0.05	1.6	16	60	4	£42.87
2DCR 010 0005 020	1 x R0.05	2		60	4	£31.33
2DCR 010 0005 050	1 x R0.05	2	5	60	4	£33.60
2DCR 010 0005 100	1 x R0.05	2	10	60	4	£33.60
2DCR 010 0005 150	1 x R0.05	2	15	60	4	£35.07
2DCR 010 0005 200	1 x R0.05	2	20	60	4	£35.07
2DCR 010 001 020	1 x R0.1	2		60	4	£31.33
2DCR 010 001 050	1 x R0.1	2	5	60	4	£33.60
2DCR 010 001 100	1 x R0.1	2	10	60	4	£33.60
2DCR 010 001 150	1 x R0.1	2	15	60	4	£35.07
2DCR 010 001 200	1 x R0.1	2	20	60	4	£35.07
2DCR 010 002 020	1 x R0.2	2		60	4	£31.33
2DCR 010 002 050	1 x R0.2	2	5	60	4	£33.60
2DCR 010 002 100	1 x R0.2	2	10	60	4	£33.60
2DCR 010 002 150	1 x R0.2	2	15	60	4	£35.07
2DCR 010 002 200	1 x R0.2	2	20	60	4	£35.07
2DCR 015 0005 030	1.5 x R0.05	3		60	4	£31.33
2DCR 015 0005 050	1.5 x R0.05	3	5	60	4	£33.60
2DCR 015 0005 100	1.5 x R0.05	3	10	60	4	£35.07
2DCR 015 0005 150	1.5 x R0.05	3	15	60	4	£35.07

Part Number	Diameter	Length of Cut	Effective Length	Overall Length	Shank Dia	Price
	D x R	L1	L2	L	d	£
2DCR 015 0005 200	1.5 x R0.05	3	20	60	4	£36.53
2DCR 015 001 030	1.5 x R0.1	3		60	4	£31.33
2DCR 015 001 050	1.5 x R0.1	3	5	60	4	£33.60
2DCR 015 001 100	1.5 x R0.1	3	10	60	4	£35.07
2DCR 015 001 150	1.5 x R0.1	3	15	60	4	£35.07
2DCR 015 001 200	1.5 x R0.1	3	20	60	4	£36.53
2DCR 015 0015 030	1.5 x R0.15	3		60	4	£31.33
2DCR 015 0015 050	1.5 x R0.15	3	5	60	4	£33.60
2DCR 015 0015 100	1.5 x R0.15	3	10	60	4	£35.07
2DCR 015 0015 150	1.5 x R0.15	3	15	60	4	£35.07
2DCR 015 0015 200	1.5 x R0.15	3	20	60	4	£36.53
2DCR 015 002 030	1.5 x R0.2	3		60	4	£31.33
2DCR 015 002 050	1.5 x R0.2	3	5	60	4	£33.60
2DCR 015 002 100	1.5 x R0.2	3	10	60	4	£35.07
2DCR 015 002 150	1.5 x R0.2	3	15	60	4	£35.07
2DCR 015 002 200	1.5 x R0.2	3	20	60	4	£36.53
2DCR 015 003 030	1.5 x R0.3	3		60	4	£31.33
2DCR 015 003 050	1.5 x R0.3	3	5	60	4	£33.60
2DCR 015 003 100	1.5 x R0.3	3	10	60	4	£35.07
2DCR 015 003 150	1.5 x R0.3	3	15	60	4	£35.07
2DCR 015 003 200	1.5 x R0.3	3	20	60	4	£36.53
2DCR 020 0005 035	2 x R0.05	3.5		60	4	£31.33
2DCR 020 0005 060	2 x R0.05	3.5	6	60	4	£33.60
2DCR 020 0005 120	2 x R0.05	3.5	12	60	4	£35.07
2DCR 020 0005 180	2 x R0.05	3.5	18	60	4	£35.07
2DCR 020 0005 250	2 x R0.05	3.5	25	60	4	£36.53
2DCR 020 0005 300	2 x R0.05	3.5	30	60	4	£36.53
2DCR 020 002 035	2 x R0.2	3.5		60	4	£31.33
2DCR 020 002 060	2 x R0.2	3.5	6	60	4	£33.60
2DCR 020 002 120	2 x R0.2	3.5	12	60	4	£35.07
2DCR 020 002 180	2 x R0.2	3.5	18	60	4	£35.07
2DCR 020 002 250	2 x R0.2	3.5	25	60	4	£36.53
2DCR 020 002 300	2 x R0.2	3.5	30	60	4	£36.53
2DCR 020 003 035	2 x R0.3	3.5		60	4	£31.33
2DCR 020 003 060	2 x R0.3	3.5	6	60	4	£33.60
2DCR 020 003 120	2 x R0.3	3.5	12	60	4	£35.07
2DCR 020 003 180	2 x R0.3	3.5	18	60	4	£35.07
2DCR 020 003 250	2 x R0.3	3.5	25	60	4	£36.53
2DCR 020 003 300	2 x R0.3	3.5	30	60	4	£36.53
2DCR 020 005 035	2 x R0.5	3.5		60	4	£31.33
2DCR 020 005 060	2 x R0.5	3.5	6	60	4	£33.60
2DCR 020 005 120	2 x R0.5	3.5	12	60	4	£35.07
2DCR 020 005 180	2 x R0.5	3.5	18	60	4	£35.07
2DCR 020 005 250	2 x R0.5	3.5	25	60	4	£36.53

2DCR 2 Flute Diamond Coated Corner Radius End Mills for Graphite

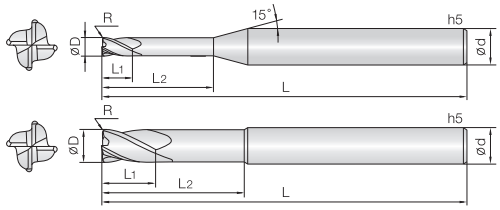


Part Number	Diameter	Length of Cut	Effective Length	Overall Length	Shank Dia	Price
	D x R	L1	L2	L	d	£
2DCR 020 005 300	2 x R0.5	3.5	30	60	4	£36.53
2DCR 030 0005 040	3 x R0.05	4	–	80	4	£34.53
2DCR 030 0005 100	3 x R0.05	4	10	80	4	£36.67
2DCR 030 0005 200	3 x R0.05	4	20	80	4	£36.67
2DCR 030 0005 300	3 x R0.05	4	30	80	4	£38.33
2DCR 030 0005 400	3 x R0.05	4	40	80	4	£38.33
2DCR 030 002 040	3 x R0.2	4	–	80	4	£34.53
2DCR 030 002 100	3 x R0.2	4	10	80	4	£36.67
2DCR 030 002 200	3 x R0.2	4	20	80	4	£36.67
2DCR 030 002 300	3 x R0.2	4	30	80	4	£38.33
2DCR 030 002 400	3 x R0.2	4	40	80	4	£38.33
2DCR 030 003 040	3 x R0.3	4	–	80	4	£34.53
2DCR 030 003 100	3 x R0.3	4	10	80	4	£36.67
2DCR 030 003 200	3 x R0.3	4	20	80	4	£36.67
2DCR 030 003 300	3 x R0.3	4	30	80	4	£38.33
2DCR 030 003 400	3 x R0.3	4	40	80	4	£38.33
2DCR 030 005 040	3 x R0.5	4	–	80	4	£34.53
2DCR 030 005 100	3 x R0.5	4	10	80	4	£36.67
2DCR 030 005 200	3 x R0.5	4	20	80	4	£36.67
2DCR 030 005 300	3 x R0.5	4	30	80	4	£38.33
2DCR 030 005 400	3 x R0.5	4	40	80	4	£38.33
2DCR 030 010 040	3 x R1	4	–	80	4	£34.53
2DCR 030 010 100	3 x R1	4	10	80	4	£36.67
2DCR 030 010 200	3 x R1	4	20	80	4	£36.67
2DCR 030 010 300	3 x R1	4	30	80	4	£38.33
2DCR 030 010 400	3 x R1	4	40	80	4	£38.33
2DCR 040 0005 050	4 x R0.05	5	–	80	4	£35.93
2DCR 040 0005 150	4 x R0.05	5	15	80	4	£38.07
2DCR 040 0005 250	4 x R0.05	5	25	80	4	£38.07
2DCR 040 0005 400	4 x R0.05	5	40	80	4	£39.00
2DCR 040 002 050	4 x R0.2	5	–	80	4	£35.93
2DCR 040 002 150	4 x R0.2	5	15	80	4	£38.07
2DCR 040 002 250	4 x R0.2	5	25	80	4	£38.07
2DCR 040 002 400	4 x R0.2	5	40	80	4	£39.00
2DCR 040 005 050	4 x R0.5	5	–	80	4	£35.93
2DCR 040 005 150	4 x R0.5	5	15	80	4	£38.07
2DCR 040 005 250	4 x R0.5	5	25	80	4	£38.07
2DCR 040 005 400	4 x R0.5	5	40	80	4	£39.00
2DCR 040 010 050	4 x R1	5	–	80	4	£35.93
2DCR 040 010 150	4 x R1	5	15	80	4	£38.07
2DCR 040 010 250	4 x R1	5	25	80	4	£38.07
2DCR 040 010 400	4 x R1	5	40	80	4	£39.00
2DCR 050 0005 060	5 x R0.05	6	–	110	6	£48.27
2DCR 050 0005 150	5 x R0.05	6	15	110	6	£50.47

Part Number	Diameter	Length of Cut	Effective Length	Overall Length	Shank Dia	Price
	D x R	L1	L2	L	d	£
2DCR 050 0005 300	5 x R0.05	6	30	110	6	£50.47
2DCR 050 0005 500	5 x R0.05	6	50	110	6	£51.87
2DCR 050 002 060	5 x R0.2	6	–	110	6	£48.27
2DCR 050 002 150	5 x R0.2	6	15	110	6	£50.47
2DCR 050 002 300	5 x R0.2	6	30	110	6	£50.47
2DCR 050 002 500	5 x R0.2	6	50	110	6	£51.87
2DCR 050 005 060	5 x R0.5	6	–	110	6	£48.27
2DCR 050 005 150	5 x R0.5	6	15	110	6	£50.47
2DCR 050 005 300	5 x R0.5	6	30	110	6	£50.47
2DCR 050 005 500	5 x R0.5	6	50	110	6	£51.87
2DCR 060 0005 070	6 x R0.05	7	–	110	6	£48.27
2DCR 060 0005 200	6 x R0.05	7	20	110	6	£50.47
2DCR 060 0005 300	6 x R0.05	7	30	110	6	£50.47
2DCR 060 0005 500	6 x R0.05	7	50	110	6	£51.87
2DCR 060 002 070	6 x R0.2	7	–	110	6	£48.27
2DCR 060 002 200	6 x R0.2	7	20	110	6	£50.47
2DCR 060 002 300	6 x R0.2	7	30	110	6	£50.47
2DCR 060 002 500	6 x R0.2	7	50	110	6	£51.87
2DCR 060 005 070	6 x R0.5	7	–	110	6	£48.27
2DCR 060 005 200	6 x R0.5	7	20	110	6	£50.47
2DCR 060 005 300	6 x R0.5	7	30	110	6	£50.47
2DCR 060 005 500	6 x R0.5	7	50	110	6	£51.87
2DCR 060 010 070	6 x R1	7	–	110	6	£48.27
2DCR 060 010 200	6 x R1	7	20	110	6	£50.47
2DCR 060 010 300	6 x R1	7	30	110	6	£50.47
2DCR 060 010 500	6 x R1	7	50	110	6	£51.87

4DCR

- End Mills for Graphite, reinforced plastic, carbon fibre, non-ferrous and non-metallic materials.
- Excellent wear resistance by applying qualified CVD diamond coating.
- Wide range available for various applications and optimum tool performance.



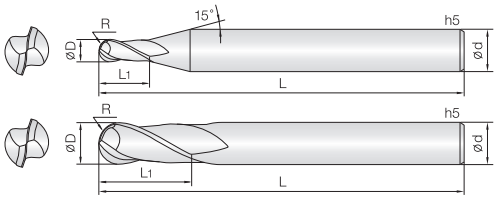
D Size	D Tolerance
ø2 ~ 12	+0~ −0.02mm

Part Number	Diameter	Length of Cut	Effective Length	Overall Length	Shank Dia	Price
	D x R	L1	L2	L	d	£
4DCR 020 0005 035	2 x R0.05	3.5	-	60	4	£34.47
4DCR 020 0005 060	2 x R0.05	3.5	6	60	4	£36.93
4DCR 020 0005 120	2 x R0.05	3.5	12	60	4	£38.60
4DCR 020 0005 180	2 x R0.05	3.5	18	60	4	£38.60
4DCR 020 0005 250	2 x R0.05	3.5	25	60	4	£40.13
4DCR 020 0005 300	2 x R0.05	3.5	30	60	4	£40.13
4DCR 020 002 035	2 x R0.2	3.5	-	60	4	£34.47
4DCR 020 002 060	2 x R0.2	3.5	6	60	4	£36.93
4DCR 020 002 120	2 x R0.2	3.5	12	60	4	£38.60
4DCR 020 002 180	2 x R0.2	3.5	18	60	4	£38.60
4DCR 020 002 250	2 x R0.2	3.5	25	60	4	£40.13
4DCR 020 002 300	2 x R0.2	3.5	30	60	4	£40.13
4DCR 020 003 035	2 x R0.3	3.5	-	60	4	£34.47
4DCR 020 003 060	2 x R0.3	3.5	6	60	4	£36.93
4DCR 020 003 120	2 x R0.3	3.5	12	60	4	£38.60
4DCR 020 003 180	2 x R0.3	3.5	18	60	4	£38.60
4DCR 020 003 250	2 x R0.3	3.5	25	60	4	£40.13
4DCR 020 003 300	2 x R0.3	3.5	30	60	4	£40.13
4DCR 020 005 035	2 x R0.5	3.5	-	60	4	£34.47
4DCR 020 005 060	2 x R0.5	3.5	6	60	4	£36.93
4DCR 020 005 120	2 x R0.5	3.5	12	60	4	£38.60
4DCR 020 005 180	2 x R0.5	3.5	18	60	4	£38.60
4DCR 020 005 250	2 x R0.5	3.5	25	60	4	£40.13
4DCR 020 005 300	2 x R0.5	3.5	30	60	4	£40.13
4DCR 030 0005 040	3 x R0.05	4	-	80	4	£37.93
4DCR 030 0005 100	3 x R0.05	4	10	80	4	£40.33
4DCR 030 0005 200	3 x R0.05	4	20	80	4	£40.33
4DCR 030 0005 300	3 x R0.05	4	30	80	4	£42.13
4DCR 030 0005 400	3 x R0.05	4	40	80	4	£42.13
4DCR 030 002 040	3 x R0.2	4	-	80	4	£37.93
4DCR 030 002 100	3 x R0.2	4	10	80	4	£40.33
4DCR 030 002 200	3 x R0.2	4	20	80	4	£40.33
4DCR 030 002 300	3 x R0.2	4	30	80	4	£42.13
4DCR 030 002 400	3 x R0.2	4	40	80	4	£42.13
4DCR 030 003 040	3 x R0.3	4	-	80	4	£37.93
4DCR 030 003 100	3 x R0.3	4	10	80	4	£40.33
4DCR 030 003 200	3 x R0.3	4	20	80	4	£40.33
4DCR 030 003 300	3 x R0.3	4	30	80	4	£42.13
4DCR 030 003 400	3 x R0.3	4	40	80	4	£42.13
4DCR 030 005 040	3 x R0.5	4	-	80	4	£37.93
4DCR 030 005 100	3 x R0.5	4	10	80	4	£40.33
4DCR 030 005 200	3 x R0.5	4	20	80	4	£40.33
4DCR 030 005 300	3 x R0.5	4	30	80	4	£42.13
4DCR 030 005 400	3 x R0.5	4	40	80	4	£42.13

Part Number	Diameter	Length of Cut	Effective Length	Overall Length	Shank Dia	Price
	D x R	L1	L2	L	d	£
4DCR 030 010 040	3 x R1	4	-	80	4	£37.93
4DCR 030 010 100	3 x R1	4	10	80	4	£40.33
4DCR 030 010 200	3 x R1	4	20	80	4	£40.33
4DCR 030 010 300	3 x R1	4	30	80	4	£42.13
4DCR 030 010 400	3 x R1	4	40	80	4	£42.13
4DCR 040 003 100	4 x R0.3	6	20	100	4	£42.33
4DCR 040 005 100	4 x R0.5	6	20	100	4	£42.33
4DCR 040 010 100	4 x R1	6	20	100	4	£42.33
4DCR 060 003 110	6 x R0.3	9	25	110	6	£53.07
4DCR 060 005 110	6 x R0.5	9	25	110	6	£53.07
4DCR 060 005 150	6 x R0.5	9	30	150	6	£58.53
4DCR 060 010 110	6 x R1	9	25	110	6	£53.07
4DCR 060 010 150	6 x R1	9	30	150	6	£58.47
4DCR 080 003 110	8 x R0.3	12	30	110	8	£72.47
4DCR 080 005 110	8 x R0.5	12	30	110	8	£72.47
4DCR 080 005 150	8 x R0.5	12	40	150	8	£79.60
4DCR 080 010 110	8 x R1	12	30	110	8	£72.47
4DCR 080 010 150	8 x R1	12	40	150	8	£79.60
4DCR 100 005 110	10 x R0.5	15	35	110	10	£97.60
4DCR 100 005 160	10 x R0.5	15	45	160	10	£110.00
4DCR 100 010 110	10 x R1	15	35	110	10	£97.60
4DCR 100 010 160	10 x R1	15	45	160	10	£110.00
4DCR 120 005 110	12 x R0.5	18	40	110	12	£119.40
4DCR 120 005 160	12 x R0.5	18	45	160	12	£135.20
4DCR 120 010 110	12 x R1	18	40	110	12	£119.40
4DCR 120 010 160	12 x R1	18	45	160	12	£135.20

2CPB 2 Flute Ball End Mills for Composite

- End Mills for CFRP, GFRP, glass, and carbon fibre, non-ferrous and non-metallic materials.
- Outstanding performance in machining of various composite materials.
- Excellent wear resistance from very hard Nano coating layer.
- Diamond technology minimizes built up edge through low friction.



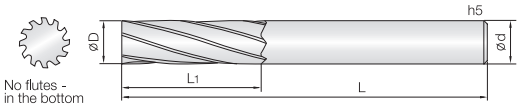
D Size	D Tolerance
Ø0.5 ~ 1	+0~ -0.01mm
Ø1.5 ~ 12	-0.005 ~ -0.02mm

Part Number	Diameter	Length of Cut	Overall Length	Shank Dia	Price
	R x D	L1	L	d	£
2CPB 005 010 S04	0.25R x 0.5	1	50	4	£34.47
2CPB 006 012 S04	0.3R x 0.6	1.2	50	4	£34.47
2CPB 008 020 S04	0.4R x 0.8	2	50	4	£34.47
2CPB 010 025 S04	0.5R x 1	2.5	50	4	£28.73
2CPB 015 040 S04	0.75R x 1.5	4	50	4	£28.73
2CPB 020 050 S04	1R x 2	5	50	4	£28.73
2CPB 025 060 S04	1.25R x 2.5	6	50	4	£28.73
2CPB 030 080 S06	1.5R x 3	8	60	6	£39.40
2CPB 040 080 S06	2R x 4	8	70	6	£39.40

Part Number	Diameter	Length of Cut	Overall Length	Shank Dia	Price
	R x D	L1	L	d	£
2CPB 050 100 S06	2.5R x 5	10	80	6	£40.67
2CPB 060 120 080	3R x 6	12	80	6	£39.40
2CPB 060 120 110	3R x 6	12	110	6	£40.67
2CPB 080 140 080	4R x 8	14	80	8	£50.27
2CPB 080 140 110	4R x 8	14	110	8	£51.13
2CPB 100 180 080	5R x 10	18	80	10	£69.93
2CPB 100 180 110	5R x 10	18	110	10	£70.73
2CPB 120 220 080	6R x 12	22	80	12	£94.60
2CPB 120 220 110	6R x 12	22	110	12	£95.80

8-12CPE 8-12 Flute Finishing End Mills for Composite

- End Mills for CFRP, GFRP, glass, and carbon fibre, non-ferrous and non-metallic materials.
- Outstanding performance in finishing of various composite materials.
- Excellent wear resistance from very hard Nano coating layer.
- Diamond technology minimizes built up edge through low friction.



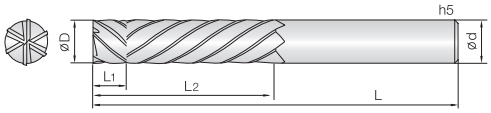
D Size	D Tolerance
Ø6 ~ 12	-0.01~ -0.025mm

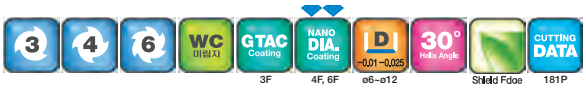
Part Number	Diameter	Length of Cut	Overall Length	Shank Dia	Flutes	Price
	D	L1	L	d	z	£
8CPE 060 180 080	6	18	80	6	8	£53.73
10CPE 080 240 080	8	24	80	8	10	£75.53
12CPE 100 300 100	10	30	100	10	12	£115.33
12CPE 120 360 100	12	36	100	12	12	£144.20

3-6 Flute Compression Routers for Composite

3&4&6CPR

- Router for CFRP, GFRP, glass, carbon fibre, graphite, non-ferrous and non-metallic materials.
- No movement of work material when wall cutting.
- No burr in work materials.
- Excellent wear resistance by applying high hardness coating layer.
- Diamond technology minimizes built up edge through low friction.





D Size	D Tolerance
ø6 ~ 12	-0.01~ -0.025mm

Part Number	Diameter	Length of Cut	Length of Cut	Overall Length	Shank Dia	Flutes	Price
	D	L1	L2	L	d	z	£
3CPR 060 200 S06	6	5	20	70L	S6	3F	£43.60
3CPR 080 250 S08	8	5	25	80L	S8	3F	£56.67
3CPR 100 270 S10	10	6	27	80L	S10	3F	£74.53
3CPR 120 300 S12	12	6	30	80L	S12	3F	£89.87
4CPR 060 200 S06	6	5	20	70L	S6	4F	£58.13
6CPR 080 250 S08	8	5	25	80L	S8	6F	£75.53
6CPR 100 270 S10	10	6	27	80L	S10	6F	£106.47
6CPR 120 300 S12	12	6	30	80L	S12	6F	£128.40

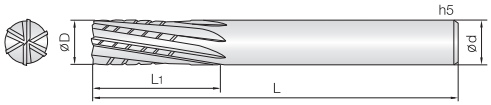
6-16 Flute Router for Composite

6-16CPO

- Router for CFRP, GFRP, glass, carbon fibre, graphite, non-ferrous and non-metallic materials.
- Outstanding performance in roughing of various composite materials.
- 'A Type' has many bottom edges and is optimised for slotting.
- 'B Type' has two bottom edges and excellent performance in vertical & horizontal machining.
- Excellent wear resistance from very hard Nano coating layer.
- Diamond technology minimizes built up edge through low friction.

A Type

B Type



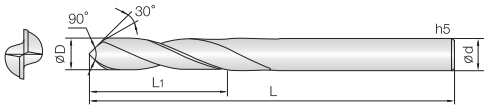
D Size	D Tolerance
ø2 ~ 5	+0~ -0.01mm
ø6 ~ 12	-0.005 ~ -0.02mm

Part Number	Diam-eter	Length of Cut	Overall Length	Type	Shank Dia	Price
	D	L1	L		d	£
6CPOA 020 070 S04	2	7	40	A	4	£32.00
6CPOA 030 120 S04	3	12	50	A	4	£34.67
6CPOB 020 070 S04	2	7	40	B	4	£32.00
6CPOB 030 120 S04	3	12	50	B	4	£34.67
8CPOA 040 160 S04	4	16	60	A	4	£50.67
8CPOB 040 160 S04	4	16	60	B	4	£50.67
10CPOA 050 200 S06	5	20	60	A	6	£58.13
10CPOA 060 200 S06	6	20	70	A	6	£58.13

Part Number	Diam-eter	Length of Cut	Overall Length	Type	Shank Dia	Price
	D	L1	L		d	£
10CPOB 050 200 S06	5	20	60	B	6	£58.13
10CPOB 060 200 S06	6	20	70	B	6	£58.13
12CPOA 080 250 S08	8	25	80	A	8	£75.53
12CPOB 080 250 S08	8	25	80	B	8	£75.53
14CPOA 100 270 S10	10	27	80	A	10	£106.47
14CPOB 100 270 S10	10	27	80	B	10	£106.47
16CPOA 120 300 S12	12	30	80	A	12	£128.40
16CPOB 120 300 S12	12	30	80	B	12	£128.40

2DDCA 2 Flute Diamond Coated Drills for Composite

- Drills for CFRP, GFRP, glass, carbon fibre, copper, copper alloy, graphite, non-ferrous and non-metallic materials.
- Outstanding performance in machining of various composite materials.
- Excellent wear resistance by applying high hardness coating layer.
- Diamond technology minimizes built up edge through low friction.



D Size	D Tolerance
Ø2 ~ 5.5	+0 ~ −0.01mm
Ø6 ~ 12	−0.005 ~ −0.015mm

Part Number	Diameter	Length of Cut	Overall Length	Shank Dia	Price
	D	L1	L	d	£
2DDCA 020 160 S04	2	16	60	4	£42.47
2DDCA 023 180 S04	2.3	18	60	4	£42.47
2DDCA 025 200 S04	2.5 x M3	20	60	4	£42.47
2DDCA 030 220 S04	3	22	60	4	£42.47
2DDCA 033 230 S04	3.3 x M4	23	60	4	£42.47
2DDCA 035 270 S04	3.5	27	60	4	£42.47
2DDCA 040 300 S04	4	30	60	4	£42.47
2DDCA 042 300 S06	4.2 x M5	30	80	6	£57.13
2DDCA 045 330 S06	4.5	33	80	6	£57.13
2DDCA 050 360 S06	5 x M6	36	80	6	£57.13
2DDCA 055 380 S06	5.5	38	80	6	£57.13
2DDCA 060 380 S06	6	38	80	6	£57.13
2DDCA 065 450 S08	6.5	45	90	8	£82.20
2DDCA 068 450 S08	6.8 x M8	45	90	8	£82.20
2DDCA 070 450 S08	7	45	90	8	£82.20
2DDCA 075 480 S08	7.5	48	90	8	£82.20
2DDCA 080 480 S08	8	48	90	8	£82.20
2DDCA 085 510 S10	8.5 x M10	51	110	10	£116.00
2DDCA 090 540 S10	9	54	110	10	£116.00
2DDCA 095 540 S10	9.5	54	110	10	£116.00
2DDCA 100 600 S10	10	60	110	10	£116.00
2DDCA 103 600 S12	10.3 x M12	60	110	12	£142.00
2DDCA 105 600 S12	10.5	60	110	12	£142.00
2DDCA 110 650 S12	11	65	110	12	£142.00
2DDCA 115 650 S12	11.5	65	110	12	£142.00
2DDCA 120 700 S12	12	70	120	12	£148.07

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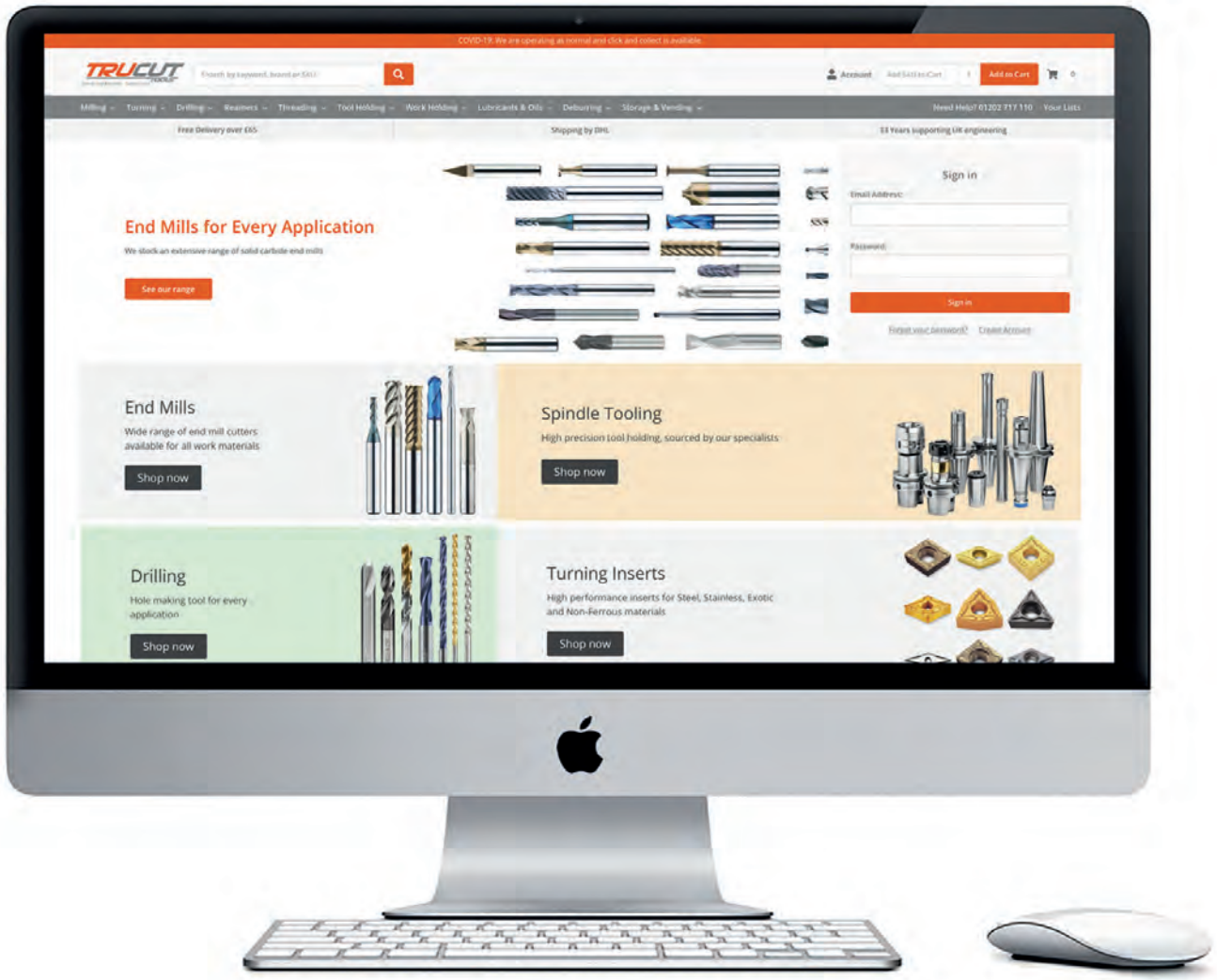
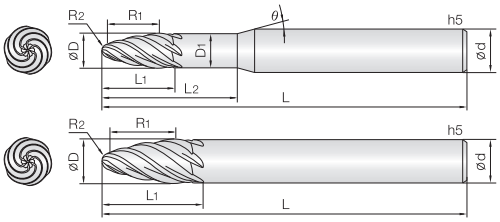


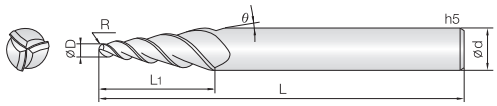
4&6CTDB 4&6 Flute 5 Axis Taper Barrell End Mills

- End Mills for Pre-hardened steel, Cast iron, Non-metallic materials.
- TISN-R coating provides excellent wear resistance.
- Suitable for special components with 3 & 5 axis applications such as impellers, blisks, tire profiles, turbine blades etc.
- Finishing & Roughing with only one tool.



Part Number	Diameter	R1	R2	Angle	Neck Diameter	Length of Cut	Effective Length	Overall Length	Shank Dia	Price
	R x D				D1	L1	L2	L	d	£
4CTDB 010 013 047	0.5R x 1	13	0.5	10°	2.4	4.7	10	50	4	£35.27
4CTDB 015 020 071	0.75R x	20	0.75	10°	3.6	7.1	15	50	4	£35.27
4CTDB 020 025 094	1R x 2	25	1	10°	4.8	9.4	20	60	6	£42.53
4CTDB 020 350 116	1R x 2	350	1	15°	7	11.6	18	80	8	£59.80
4CTDB 030 040 141	1.5R x 3	40	1.5	10°	7.3	14.1	30	80	8	£59.80
6CTDB 040 050 187	2R x 4	50	2	10°	9.5	18.7	40	100	12	£91.33
6CTDB 040 750 124	2R x 4	750	2	30°	-	12.4	-	110	16	£137.40
6CTDB 060 075 200	3R x 6	75	3	10°	-	20	-	100	12	£88.00
6CTDB 060 1000 167	3R x 6	1000	3	20°	-	16.7	-	110	16	£137.40
6CTDB 080 100 268	4R x 8	100	4	5°	-	26.8	-	110	12	£88.00
6CTDB 080 1000 267	4R x 8	1000	4	10°	-	26.7	-	110	16	£137.40

- Pre-hardened steel, Cast iron, Non-metallic materials
- JCRO coating provides wear resistance improvement as well as avoiding edge stress in various applications.
- Suitable for special components with 3 axes and 5 axes sector such as impellers, blisks, tire profiles, turbine blades.
- Available for simultaneous machining of roughing and finishing with only one tool.



3 | WC 미립자 | JCRO Coating | R ±0.005 0.5R ~ 1R | R ±0.01 2R ~ 3R | 35° Helix Angle | CUTTING DATA 183P

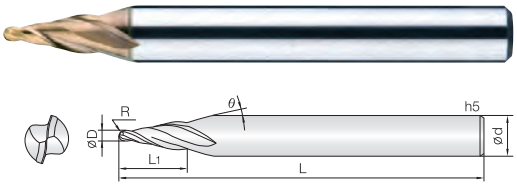
D Size	D Tolerance
ø4 ~ 6	+0,01 ~ −0,01mm

Part Number	Diameter	Angle	Length of Cut	Overall Length	Shank Dia	Price
	R x D		L1	L	d	£
3TBIC 010 010 120	R0.5 x 1	1°	12	50	6	£31.93
3TBIC 010 010 200	R0.5 x 1	1°	20	60	6	£33.33
3TBIC 010 020 150	R0.5 x 1	2°	15	55	6	£31.27
3TBIC 010 020 200	R0.5 x 1	2°	20	60	6	£34.67
3TBIC 010 030 150	R0.5 x 1	2°	15	55	6	£31.93
3TBIC 010 030 200	R0.5 x 1	3°	20	60	6	£33.33
3TBIC 010 040 200	R0.5 x 1	4°	20	60	6	£33.33
3TBIC 010 050 200	R0.5 x 1	5°	20	60	6	£33.33
3TBIC 010 060 200	R0.5 x 1	6°	20	60	6	£33.33
3TBIC 010 070 200	R0.5 x 1	7°	20	60	6	£33.33
3TBIC 010 080 180	R0.5 x 1	8°	18	60	6	£33.33
3TBIC 020 010 120	R1 x 2	1°	12	50	6	£31.93
3TBIC 020 010 200	R1 x 2	1°	20	60	6	£33.33
3TBIC 020 020 150	R1 x 2	2°	15	55	6	£31.93
3TBIC 020 020 200	R1 x 2	2°	20	60	6	£33.33
3TBIC 020 030 150	R1 x 2	3°	15	55	6	£31.93
3TBIC 020 030 200	R1 x 2	3°	20	60	6	£33.33
3TBIC 020 030 300	R1 x 2	3°	30	70	6	£37.40
3TBIC 020 040 200	R1 x 2	4°	20	60	6	£33.33
3TBIC 020 050 200	R1 x 2	5°	20	60	6	£33.33
3TBIC 020 050 300	R1 x 2	5°	30	75	8	£43.93
3TBIC 020 060 190	R1 x 2	6°	19	60	6	£33.33
3TBIC 020 060 290	R1 x 2	6°	29	75	8	£43.93
3TBIC 020 070 160	R1 x 2	7°	16	60	6	£33.33
3TBIC 020 070 250	R1 x 2	7°	25	70	8	£43.93
3TBIC 020 080 150	R1 x 2	8°	15	60	6	£33.33
3TBIC 020 080 220	R1 x 2	8°	22	70	8	£43.93
3TBIC 030 010 200	R1.5 x 3	1°	20	60	6	£33.33
3TBIC 030 010 320	R1.5 x 3	1°	32	75	6	£37.40
3TBIC 030 020 200	R1.5 x 3	2°	20	60	6	£33.33
3TBIC 030 030 200	R1.5 x 3	3°	20	60	6	£33.33
3TBIC 030 030 300	R1.5 x 3	3°	30	70	6	£37.40
3TBIC 030 030 390	R1.5 x 3	3°	39	80	8	£40.53
3TBIC 030 040 200	R1.5 x 3	4°	20	65	6	£33.33
3TBIC 030 050 180	R1.5 x 3	5°	18	60	6	£33.33
3TBIC 030 050 300	R1.5 x 3	5°	30	75	8	£43.93
3TBIC 030 060 150	R1.5 x 3	6°	15	60	6	£33.33
3TBIC 030 060 250	R1.5 x 3	6°	25	70	8	£43.93
3TBIC 030 070 190	R1.5 x 3	7°	19	70	8	£43.93
3TBIC 030 070 300	R1.5 x 3	8°	30	80	10	£57.00
3TBIC 030 080 190	R1.5 x 3	8°	19	70	8	£43.93
3TBIC 030 080 260	R1.5 x 3	8°	26	75	10	£54.27
3TBIC 040 010 200	R2 x 4	1°	20	60	6	£33.33
3TBIC 040 010 320	R2 x 4	1°	32	75	6	£37.40

Part Number	Diameter	Angle	Length of Cut	Overall Length	Shank Dia	Price
	R x D		L1	L	d	£
3TBIC 040 020 200	R2 x 4	2°	20	60	6	£33.33
3TBIC 040 020 300	R2 x 4	2°	30	70	6	£37.40
3TBIC 040 030 210	R2 x 4	3°	21	70	6	£33.33
3TBIC 040 030 320	R2 x 4	3°	32	80	8	£43.93
3TBIC 040 030 400	R2 x 4	3°	40	90	8	£48.73
3TBIC 040 040 200	R2 x 4	4°	20	70	8	£41.20
3TBIC 040 040 300	R2 x 4	4°	30	75	8	£43.93
3TBIC 040 050 200	R2 x 4	5°	20	70	8	£41.20
3TBIC 040 050 320	R2 x 4	5°	32	80	10	£57.00
3TBIC 040 060 200	R2 x 4	6°	20	70	8	£43.93
3TBIC 040 060 300	R2 x 4	6°	30	80	10	£57.00
3TBIC 040 070 180	R2 x 4	7°	18	70	8	£43.93
3TBIC 040 070 260	R2 x 4	7°	26	80	10	£54.27
3TBIC 040 080 230	R2 x 4	8°	23	75	10	£52.87
3TBIC 060 010 320	R3 x 6	1°	32	75	8	£43.93
3TBIC 060 020 300	R3 x 6	2°	30	75	8	£43.93
3TBIC 060 030 220	R3 x 6	3°	22	75	8	£43.93
3TBIC 060 030 320	R3 x 6	3°	32	80	10	£52.87
3TBIC 060 030 400	R3 x 6	3°	40	90	10	£61.13
3TBIC 060 040 250	R3 x 6	4°	25	75	10	£52.87
3TBIC 060 040 310	R3 x 6	4°	31	80	10	£57.00
3TBIC 060 050 210	R3 x 6	5°	21	75	10	£52.87
3TBIC 060 050 320	R3 x 6	5°	32	80	12	£66.60
3TBIC 060 060 210	R3 x 6	6°	21	75	10	£52.87
3TBIC 060 060 310	R3 x 6	6°	31	80	12	£66.60
3TBIC 060 070 190	R3 x 6	7°	19	75	10	£52.87
3TBIC 060 070 270	R3 x 6	7°	27	80	12	£66.60

2CTB 2 Flute Taper Ball End Mills

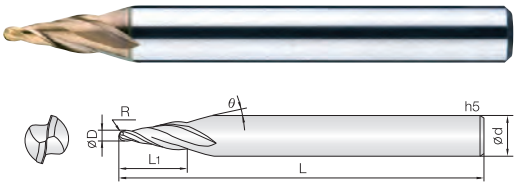
- End Mills for pre-hardened and hardened steel(HRc52~)
- Excellent wear resistance from Si-based PVD coating.
- Precise edge tolerance.
- Excellent work surface finish.
- Minimize fracturing by high TRS fine (0.5μm) WC grade.



D Size	D Tolerance
ø0.2 ~ 3	−0.01 ~ −0.025mm
ø4 ~ 6	−0.015 ~ −0.03mm

Part Number	Diameter	Angle	Length of Cut	Overall Length	Shank Dia	Price
	R x D		L1	L	d	£
2CTB 002 010 015	0.1R x 0.2	1°	1.5	40	4	£25.80
2CTB 002 020 015	0.1R x 0.2	2°	1.5	40	4	£25.80
2CTB 002 030 015	0.1R x 0.2	3°	1.5	40	4	£25.80
2CTB 002 050 015	0.1R x 0.2	5°	1.5	40	4	£25.80
2CTB 002 070 015	0.1R x 0.2	7°	1.5	40	4	£25.80
2CTB 002 100 015	0.1R x 0.2	10°	1.5	40	4	£25.80
2CTB 003 010 020	0.15R x 0.3	1°	2	40	4	£25.80
2CTB 003 020 020	0.15R x 0.3	2°	2	40	4	£25.80
2CTB 003 030 020	0.15R x 0.3	3°	2	40	4	£25.80
2CTB 003 050 020	0.15R x 0.3	5°	2	40	4	£25.80
2CTB 003 070 020	0.15R x 0.3	7°	2	40	4	£25.80
2CTB 003 100 020	0.15R x 0.3	10°	2	40	4	£25.80
2CTB 003 150 020	0.15R x 0.3	15°	2	40	4	£25.80
2CTB 004 010 030	0.2R x 0.4	1°	3	40	4	£25.80
2CTB 004 020 030	0.2R x 0.4	2°	3	40	4	£22.67
2CTB 004 030 030	0.2R x 0.4	3°	3	40	4	£22.67
2CTB 004 040 030	0.2R x 0.4	4°	3	40	4	£22.67
2CTB 004 050 030	0.2R x 0.4	5°	3	40	4	£22.67
2CTB 004 070 030	0.2R x 0.4	7°	3	40	4	£22.67
2CTB 004 100 030	0.2R x 0.4	10°	3	40	4	£22.67
2CTB 004 150 030	0.2R x 0.4	15°	3	40	4	£22.67
2CTB 005 010 030	0.25R x 0.5	1°	3	40	4	£22.67
2CTB 005 020 030	0.25R x 0.5	2°	3	40	4	£22.67
2CTB 005 030 030	0.25R x 0.5	3°	3	40	4	£22.67
2CTB 005 040 035	0.25R x 0.5	4°	3.5	40	4	£22.67
2CTB 005 050 035	0.25R x 0.5	5°	3.5	40	4	£22.67
2CTB 005 070 035	0.25R x 0.5	7°	3.5	40	4	£22.67
2CTB 005 100 035	0.25R x 0.5	10°	3.5	40	4	£22.67
2CTB 005 150 035	0.25R x 0.5	15°	3.5	40	4	£22.67
2CTB 006 010 030	0.3R x 0.6	1°	3	40	4	£22.67
2CTB 006 020 030	0.3R x 0.6	2°	3	40	4	£22.67
2CTB 006 030 030	0.3R x 0.6	3°	3	40	4	£22.67
2CTB 006 040 035	0.3R x 0.6	4°	3.5	40	4	£22.67
2CTB 006 050 035	0.3R x 0.6	5°	3.5	40	4	£22.67
2CTB 006 070 035	0.3R x 0.6	7°	3.5	40	4	£22.67
2CTB 006 100 035	0.3R x 0.6	10°	3.5	40	4	£22.67
2CTB 006 150 035	0.3R x 0.6	15°	3.5	40	4	£22.67
2CTB 007 010 030	0.35R x 0.7	1°	3	40	4	£22.67
2CTB 007 020 030	0.35R x 0.7	2°	3	40	4	£22.67
2CTB 007 030 040	0.35R x 0.7	3°	4	40	4	£22.67
2CTB 007 050 040	0.35R x 0.7	5°	4	40	4	£22.67
2CTB 007 070 040	0.35R x 0.7	7°	4	40	4	£22.67
2CTB 007 100 040	0.35R x 0.7	10°	4	40	4	£22.67
2CTB 007 150 040	0.35R x 0.7	15°	4	40	4	£22.67

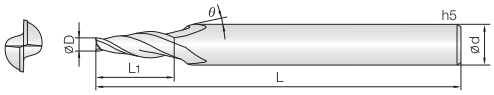
Part Number	Diameter	Angle	Length of Cut	Overall Length	Shank Dia	Price
	R x D		L1	L	d	£
2CTB 008 010 030	0.4R x 0.8	1°	3	40	4	£22.67
2CTB 008 020 030	0.4R x 0.8	2°	3	40	4	£22.67
2CTB 008 030 030	0.4R x 0.8	3°	3	40	4	£22.67
2CTB 008 040 040	0.4R x 0.8	4°	4	40	4	£22.67
2CTB 008 050 040	0.4R x 0.8	5°	4	40	4	£22.67
2CTB 008 070 040	0.4R x 0.8	7°	4	40	4	£22.67
2CTB 008 100 040	0.4R x 0.8	10°	4	40	4	£22.67
2CTB 008 150 040	0.4R x 0.8	15°	4	40	4	£22.67
2CTB 010 003 030	0.5R x 1	0°30	3	40	4	£22.67
2CTB 010 010 030	0.5R x 1	1°	3	40	4	£22.67
2CTB 010 013 040	0.5R x 1	1°30	4	40	4	£22.67
2CTB 010 020 040	0.5R x 1	2°	4	40	4	£22.67
2CTB 010 030 040	0.5R x 1	3°	4	40	4	£22.67
2CTB 010 040 060	0.5R x 1	4°	6	45	4	£22.67
2CTB 010 050 060	0.5R x 1	5°	6	45	4	£22.67
2CTB 010 070 060	0.5R x 1	7°	6	45	4	£22.67
2CTB 010 100 060	0.5R x 1	10°	6	45	4	£22.67
2CTB 010 150 056	0.5R x 1	15°	5.6	45	4	£22.67
2CTB 012 003 030	0.6R x 1.2	0°30	3	40	4	£22.67
2CTB 012 010 030	0.6R x 1.2	1°	3	40	4	£22.67
2CTB 012 013 040	0.6R x 1.2	1°30	4	40	4	£22.67
2CTB 012 020 040	0.6R x 1.2	2°	4	40	4	£22.67
2CTB 012 030 040	0.6R x 1.2	3°	4	40	4	£22.67
2CTB 012 040 060	0.6R x 1.2	4°	6	45	4	£22.67
2CTB 012 050 060	0.6R x 1.2	5°	6	45	4	£22.67
2CTB 012 070 060	0.6R x 1.2	7°	6	45	4	£22.67
2CTB 012 100 060	0.6R x 1.2	10°	6	45	4	£22.67
2CTB 012 150 050	0.6R x 1.2	15°	5	45	4	£22.67
2CTB 015 003 060	0.75R x 1.5	0°30	6	45	4	£22.67
2CTB 015 010 060	0.75R x 1.5	1°	6	45	4	£22.67
2CTB 015 013 060	0.75R x 1.5	1°	6	45	4	£22.67
2CTB 015 020 060	0.75R x 1.5	2°	6	45	4	£22.67
2CTB 015 030 060	0.75R x 1.5	3°	6	45	4	£22.67
2CTB 015 040 060	0.75R x 1.5	4°	6	45	4	£22.67
2CTB 015 050 060	0.75R x 1.5	5°	6	45	4	£22.67
2CTB 015 070 060	0.75R x 1.5	7°	6	45	4	£22.67
2CTB 015 100 060	0.75R x 1.5	10°	6	45	4	£22.67
2CTB 015 150 060	0.75R x 1.5	15°	6	50	6	£26.00
2CTB 020 003 080	1R x 2	0°30	8	45	4	£22.67
2CTB 020 010 080	1R x 2	1°	8	45	4	£22.67
2CTB 020 013 080	1R x 2	1°30	8	45	4	£22.67
2CTB 020 020 080	1R x 2	2°	8	45	4	£22.67
2CTB 020 030 080	1R x 2	3°	8	45	4	£22.67
2CTB 020 040 080	1R x 2	4°	8	45	4	£22.67



Part Number	Diameter	Angle	Length of Cut	Overall Length	Shank Dia	Price
	R x D		L1	L	d	£
2CTB 020 050 080	1R x 2	5°	8	45	4	£22.67
2CTB 020 070 080	1R x 2	7°	8	45	4	£22.67
2CTB 020 100 080	1R x 2	10°	8	50	6	£26.00
2CTB 020 150 080	1R x 2	15°	8	50	6	£26.00
2CTB 030 003 120	1.5R x 3	0°30	12	60	6	£25.87
2CTB 030 010 120	1.5R x 3	1°	12	60	6	£25.87
2CTB 030 013 120	1.5R x 3	1°30	12	60	6	£25.87
2CTB 030 020 120	1.5R x 3	2°	12	60	6	£25.87
2CTB 030 030 120	1.5R x 3	3°	12	60	6	£25.87
2CTB 030 040 120	1.5R x 3	4°	12	60	6	£25.87
2CTB 030 050 120	1.5R x 3	5°	12	60	6	£25.87
2CTB 030 070 120	1.5R x 3	7°	12	60	6	£25.87
2CTB 030 100 120	1.5R x 3	10°	12	60	8	£26.00
2CTB 030 150 120	1.5R x 3	15°	12	70	10	£44.67
2CTB 040 003 160	2R x 4	0°30	16	70	8	£30.20
2CTB 040 010 160	2R x 4	1°	16	70	8	£30.20
2CTB 040 013 160	2R x 4	1°30	16	70	8	£30.20
2CTB 040 020 160	2R x 4	2°	16	70	8	£30.20
2CTB 040 030 160	2R x 4	3°	16	70	8	£30.20
2CTB 040 040 160	2R x 4	4°	16	70	8	£30.20
2CTB 040 050 160	2R x 4	5°	16	70	8	£30.20
2CTB 040 070 160	2R x 4	7°	16	70	8	£30.20
2CTB 040 100 160	2R x 4	10°	16	70	10	£44.67
2CTB 040 150 160	2R x 4	15°	16	80	12	£57.67
2CTB 050 003 200	2.5R x 5	0°30	20	75	8	£32.93
2CTB 050 010 200	2.5R x 5	1°	20	75	8	£32.93
2CTB 050 013 200	2.5R x 5	1°30	20	75	8	£32.93
2CTB 050 020 200	2.5R x 5	2°	20	75	8	£32.93
2CTB 050 030 200	2.5R x 5	3°	20	75	8	£32.93
2CTB 050 040 200	2.5R x 5	4°	20	75	8	£32.93
2CTB 050 050 200	2.5R x 5	5°	20	80	10	£44.67
2CTB 050 070 200	2.5R x 5	7°	20	80	10	£44.67
2CTB 060 003 240	3R x 6	0°30	24	80	10	£44.67
2CTB 060 010 240	3R x 6	1°	24	80	10	£44.67
2CTB 060 013 240	3R x 6	1°30	24	80	10	£44.67
2CTB 060 020 240	3R x 6	2°	24	80	10	£44.67
2CTB 060 030 240	3R x 6	3°	24	80	10	£44.67
2CTB 060 040 240	3R x 6	4°	24	80	10	£44.67
2CTB 060 050 240	3R x 6	5°	24	90	12	£57.67
2CTB 060 070 240	3R x 6	7°	24	90	12	£57.67

2CTE 2 Flute Taper End Mills

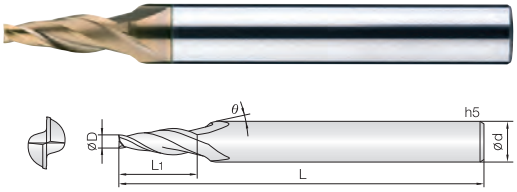
- End Mills for pre-hardened and hardened steel(HRc52~)
- Excellent wear resistance from Si-based PVD coating.
- Precise edge tolerance.
- Excellent work surface finish.
- Minimize fracturing by high TRS fine (0.5μm) WC grade.



D Size	D Tolerance
Ø0.3 ~ 4	+0~ −0.01mm
Ø6 ~ 8	−0.01 ~ −0.025mm

Part Number	Diameter	Angle	Length of Cut	Overall Length	Shank Dia	Price
	D		L1	L	d	£
2CTE 002 003 010	0.2	0°30	1	40	4	£19.80
2CTE 002 010 010	0.2	1°	1	40	4	£19.80
2CTE 002 013 010	0.2	1°30	1	40	4	£19.80
2CTE 002 020 010	0.2	2°	1	40	4	£19.80
2CTE 002 030 010	0.2	3°	1	40	4	£19.80
2CTE 002 050 010	0.2	5°	1	40	4	£19.80
2CTE 002 070 010	0.2	7°	1	40	4	£19.80
2CTE 002 100 010	0.2	10°	1	40	4	£19.80
2CTE 002 150 010	0.2	15°	1	40	4	£19.80
2CTE 003 003 012	0.3	0°30	1.2	40	4	£19.13
2CTE 003 010 012	0.3	1°	1.2	40	4	£19.13
2CTE 003 013 012	0.3	1°30	1.2	40	4	£19.13
2CTE 003 020 012	0.3	2°	1.2	40	4	£19.13
2CTE 003 030 012	0.3	3°	1.2	40	4	£19.13
2CTE 003 050 012	0.3	5°	1.2	40	4	£19.13
2CTE 003 070 015	0.3	7°	1.5	40	4	£19.13
2CTE 003 100 015	0.3	10°	1.5	40	4	£19.13
2CTE 003 150 015	0.3	15°	1.5	40	4	£19.13
2CTE 004 003 016	0.4	0°30	1.6	40	4	£19.13
2CTE 004 010 016	0.4	1°	1.6	40	4	£19.13
2CTE 004 013 016	0.4	1°30	1.6	40	4	£19.13
2CTE 004 020 016	0.4	2°	1.6	40	4	£19.13
2CTE 004 030 016	0.4	3°	1.6	40	4	£19.13
2CTE 004 050 016	0.4	5°	1.6	40	4	£19.13
2CTE 004 070 020	0.4	7°	2	40	4	£19.13
2CTE 004 100 020	0.4	10°	2	40	4	£19.13
2CTE 004 150 020	0.4	15°	2	40	4	£19.13
2CTE 005 003 020	0.5	0°30	2	40	4	£19.13
2CTE 005 010 020	0.5	1°	2	40	4	£19.13
2CTE 005 013 020	0.5	1°30	2	40	4	£19.13
2CTE 005 020 020	0.5	2°	2	40	4	£19.13
2CTE 005 030 020	0.5	3°	2	40	4	£19.13
2CTE 005 050 020	0.5	5°	2	40	4	£19.13
2CTE 005 070 025	0.5	7°	2.5	40	4	£19.13
2CTE 005 100 025	0.5	10°	2.5	40	4	£19.13
2CTE 005 150 025	0.5	15°	2.5	40	4	£19.13
2CTE 005 200 025	0.5	20°	2.5	40	4	£19.13
2CTE 006 003 020	0.6	0°30	2	40	4	£19.13
2CTE 006 010 020	0.6	1°	2	40	4	£19.13
2CTE 006 013 020	0.6	1°30	2	40	4	£19.13
2CTE 006 020 020	0.6	2°	2	40	4	£19.13
2CTE 006 030 020	0.6	3°	2	40	4	£19.13
2CTE 006 050 020	0.6	5°	2	40	4	£19.13
2CTE 006 070 025	0.6	7°	2.5	40	4	£19.13

Part Number	Diameter	Angle	Length of Cut	Overall Length	Shank Dia	Price
	D		L1	L	d	£
2CTE 006 100 025	0.6	10°	2.5	40	4	£19.13
2CTE 006 150 025	0.6	15°	2.5	40	4	£19.13
2CTE 006 200 025	0.6	20°	2.5	40	4	£19.13
2CTE 007 010 025	0.7	1°	2.5	40	4	£19.13
2CTE 007 013 025	0.7	1°30	2.5	40	4	£19.13
2CTE 007 020 025	0.7	2°	2.5	40	4	£19.13
2CTE 007 030 025	0.7	3°	2.5	40	4	£19.13
2CTE 007 050 025	0.7	5°	2.5	40	4	£19.13
2CTE 007 070 030	0.7	7°	3	40	4	£19.13
2CTE 007 100 030	0.7	10°	3	40	4	£19.13
2CTE 007 150 030	0.7	15°	3	40	4	£19.13
2CTE 007 200 030	0.7	20°	3	40	4	£19.13
2CTE 008 003 030	0.8	0°30	3	40	4	£19.13
2CTE 008 010 030	0.8	1°	3	40	4	£19.13
2CTE 008 013 030	0.8	1°30	3	40	4	£19.13
2CTE 008 020 030	0.8	2°	3	40	4	£19.13
2CTE 008 030 030	0.8	3°	3	40	4	£19.13
2CTE 008 050 030	0.8	5°	3	40	4	£19.13
2CTE 008 070 030	0.8	7°	3	40	4	£19.13
2CTE 008 100 030	0.8	10°	3	40	4	£19.13
2CTE 008 150 030	0.8	15°	3	40	4	£19.13
2CTE 008 200 030	0.8	20°	3	40	4	£19.13
2CTE 010 003 040	1	0°30	4	45	4	£19.13
2CTE 010 010 040	1	1°	4	45	4	£19.13
2CTE 010 013 040	1	1°30	4	45	4	£19.13
2CTE 010 020 040	1	2°	4	45	4	£19.13
2CTE 010 030 040	1	3°	4	45	4	£19.13
2CTE 010 050 040	1	5°	4	45	4	£19.13
2CTE 010 070 040	1	7°	4	45	4	£19.13
2CTE 010 100 040	1	10°	4	45	4	£19.13
2CTE 010 150 040	1	15°	4	50	4	£21.13
2CTE 010 200 040	1	20°	4	50	4	£21.13
2CTE 015 003 050	1.5	0°30	5	45	4	£19.13
2CTE 015 010 050	1.5	1°	5	45	4	£19.13
2CTE 015 013 060	1.5	1°30	6	45	4	£19.13
2CTE 015 020 070	1.5	2°	7	45	4	£19.13
2CTE 015 030 080	1.5	3°	8	45	4	£19.13
2CTE 015 050 100	1.5	5°	10	50	4	£19.13
2CTE 015 070 100	1.5	7°	10	50	4	£19.13
2CTE 015 100 100	1.5	10°	10	50	6	£20.87
2CTE 015 150 060	1.5	15°	6	50	6	£21.13
2CTE 015 200 060	1.5	20°	6	50	6	£21.13
2CTE 020 003 060	2	0°30	6	45	4	£19.13
2CTE 020 010 060	2	1°	6	45	4	£19.13

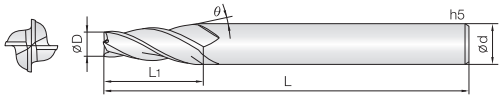


Part Number	Diameter	Angle	Length of Cut	Overall Length	Shank Dia	Price
	D		L1	L	d	£
2CTE 020 013 060	2	1°30	6	45	4	£19.13
2CTE 020 020 080	2	2°	8	45	4	£19.13
2CTE 020 030 100	2	3°	10	50	4	£19.13
2CTE 020 050 100	2	5°	10	50	4	£19.13
2CTE 020 070 100	2	7°	10	50	6	£20.87
2CTE 020 100 110	2	10°	11	50	6	£20.87
2CTE 020 150 070	2	15°	7	50	6	£21.13
2CTE 020 200 070	2	20°	7	50	8	£31.73
2CTE 025 003 080	2.5	0°30	8	45	6	£20.87
2CTE 025 010 100	2.5	1°	10	50	6	£20.87
2CTE 025 013 100	2.5	1°30	10	50	6	£20.87
2CTE 025 020 120	2.5	2°	12	50	6	£20.87
2CTE 025 030 120	2.5	3°	12	50	6	£20.87
2CTE 025 050 120	2.5	5°	12	50	6	£20.87
2CTE 025 070 120	2.5	7°	12	50	6	£20.87
2CTE 025 100 100	2.5	10°	10	50	6	£20.87
2CTE 025 150 100	2.5	15°	10	60	8	£31.73
2CTE 025 200 100	2.5	20°	10	70	10	£34.47
2CTE 030 003 120	3	0°30	12	50	6	£20.87
2CTE 030 010 120	3	1°	12	50	6	£20.87
2CTE 030 013 120	3	1°30	12	50	6	£20.87
2CTE 030 020 120	3	2°	12	50	6	£20.87
2CTE 030 030 120	3	3°	12	50	6	£20.87
2CTE 030 050 120	3	5°	12	50	6	£20.87
2CTE 030 070 120	3	7°	12	50	6	£20.87
2CTE 030 100 080	3	10°	8	50	6	£20.87
2CTE 030 150 090	3	15°	8	50	6	£31.73
2CTE 030 200 090	3	20°	9	60	8	£34.47
2CTE 040 003 150	4	0°30	15	60	6	£22.47
2CTE 040 010 150	4	1°	15	60	6	£22.47
2CTE 040 013 150	4	1°30	15	60	6	£22.47
2CTE 040 020 150	4	2°	15	60	6	£22.47
2CTE 040 030 180	4	3°	18	60	6	£22.47
2CTE 040 050 230	4	5°	23	65	8	£33.80
2CTE 040 070 240	4	7°	24	75	10	£39.33
2CTE 040 100 220	4	10°	22	75	12	£51.33
2CTE 060 003 200	6	0°30	20	65	8	£31.73
2CTE 060 010 200	6	1°	20	65	8	£31.73
2CTE 060 013 200	6	1°30	20	65	8	£31.73
2CTE 060 020 200	6	2°	20	65	8	£31.73
2CTE 060 030 190	6	3°	19	65	8	£31.73
2CTE 060 050 230	6	5°	23	75	10	£33.80
2CTE 060 070 240	6	7°	24	75	12	£51.33
2CTE 060 100 170	6	10°	17	75	12	£51.33

Part Number	Diameter	Angle	Length of Cut	Overall Length	Shank Dia	Price
	D		L1	L	d	£
2CTE 070 003 250	7	0°30	25	70	8	£31.73
2CTE 070 010 250	7	1°	25	70	8	£31.73
2CTE 070 013 250	7	1°30	25	70	10	£31.73
2CTE 070 030 280	7	3°	28	80	10	£39.00
2CTE 070 050 280	7	5°	28	80	12	£51.33
2CTE 080 003 320	8	0°30	32	90	10	£37.60
2CTE 080 010 350	8	1°	35	90	10	£37.60
2CTE 080 013 350	8	1°30	35	90	10	£37.60
2CTE 080 020 280	8	2°	28	75	10	£37.60
2CTE 080 030 350	8	3°	35	90	12	£51.33
2CTE 080 050 450	8	5°	45	100	16	£89.13
2CTE 080 070 320	8	7°	32	90	16	£80.07
2CTE 080 100 340	8	10°	34	100	20	£134.47

4CTE 4 Flute Taper End Mills

- End Mills for pre-hardened and hardened steel(HRc52~)
- Excellent wear resistance from Si-based PVD coating.
- Precise edge tolerance.
- Excellent work surface finish.
- Minimize fracturing by high TRS fine (0.5μm) WC grade.

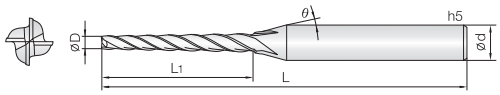


D Size	D Tolerance
Ø0.3 ~ 5	+0~ -0.01mm
Ø6 ~ 8	-0.01 ~ -0.025mm

Part Number	Diameter	Angle	Length of Cut	Overall Length	Shank Dia	Price
	D		L1	L	d	£
4CTE 030 003 110	3	0°30	11	50	6	£24.73
4CTE 030 010 110	3	10	11	50	6	£24.73
4CTE 030 013 110	3	1°30	11	50	6	£24.73
4CTE 030 020 150	3	2°	15	60	6	£26.20
4CTE 030 023 150	3	2°30	15	60	6	£26.20
4CTE 030 030 150	3	3°	15	60	6	£26.20
4CTE 030 050 150	3	5°	15	60	6	£26.20
4CTE 030 070 120	3	7°	12	60	6	£26.20
4CTE 030 100 190	3	10°	19	80	10	£43.80
4CTE 040 003 150	4	0°30	15	60	6	£24.73
4CTE 040 010 150	4	1°	15	60	6	£24.73
4CTE 040 013 150	4	1°30	15	60	6	£24.73
4CTE 040 020 180	4	2°	18	60	6	£26.20
4CTE 040 023 180	4	2°30	18	60	6	£26.20
4CTE 040 030 180	4	3°	18	60	6	£26.20
4CTE 040 050 230	4	5°	23	65	8	£36.27
4CTE 040 070 250	4	7°	25	75	10	£42.27
4CTE 050 003 180	5	0°30	18	60	6	£26.20
4CTE 050 010 180	5	1°	18	60	6	£26.20
4CTE 050 013 180	5	1°30	18	60	6	£26.20
4CTE 050 020 150	5	2°	15	60	6	£26.20
4CTE 050 023 200	5	2°30	20	65	8	£36.27
4CTE 050 030 210	5	3°	21	65	8	£36.27
4CTE 050 050 280	5	5°	28	80	10	£40.00
4CTE 050 070 280	5	7°	28	80	12	£58.93
4CTE 052 0147 120	5.2	1°47	12	60	6	£26.20
4CTE 060 003 200	6	0°30	20	65	8	£36.27
4CTE 060 010 200	6	1°	20	65	8	£36.27
4CTE 060 013 200	6	1°30	20	65	8	£36.27
4CTE 060 020 200	6	2°	20	65	8	£36.27
4CTE 060 023 200	6	2°30	20	65	8	£36.27
4CTE 060 030 260	6	3°	26	75	10	£42.27
4CTE 060 050 230	6	5°	23	75	10	£42.27
4CTE 060 070 240	6	7°	24	80	12	£58.93
4CTE 060 100 390	6	10°	39	110	20	£158.67
4CTE 080 003 250	8	0°30	25	75	10	£42.27
4CTE 080 010 250	8	1°	25	75	10	£42.27
4CTE 080 013 250	8	1°30	25	75	10	£42.27
4CTE 080 020 250	8	2°	25	75	10	£42.27
4CTE 080 023 230	8	2°30	23	75	10	£42.27
4CTE 080 030 300	8	3°	30	80	12	£58.93
4CTE 080 050 230	8	5°	23	85	12	£58.93
4CTE 085 0147 240	8.5	1°47	24	75	10	£42.33

Part Number	Diameter	Angle	Length of Cut	Overall Length	Shank Dia	Price
	D		L1	L	d	£
4CTE 100 003 300	10	0°30	30	80	12	£58.93
4CTE 100 010 300	10	1°	30	80	12	£58.93
4CTE 100 013 300	10	1°30	30	80	12	£58.93
4CTE 100 0147 320	10	1°47	32	85	12	£58.93
4CTE 100 020 280	10	2°	28	80	12	£58.93
4CTE 100 030 400	10	3°	40	100	16	£102.00
4CTE 100 050 340	10	5°	34	100	16	£102.00

- End Mills for pre-hardened and hardened steel(HRc50~)
- Excellent wear resistance from Si-based PVD coating.
- Optimum for deep grooving with 2 bottom edges and 4 flutes.
- Precise edge tolerance.
- Excellent work surface finish.
- Minimize fracturing by high TRS fine (0.5μm) WC grade.



ø0.5~ ø2.5

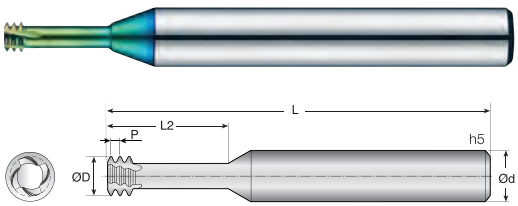
D Size	D Tolerance
ø0.5 ~ 2.5	+0~ -0.01mm

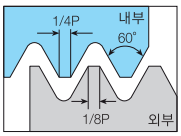
Part Number	Diameter	Angle	Length of Cut	Overall Length	Shank Dia	Price
	D		L1	L	d	£
4RTE 005 030 040	0.5	0°30	4	45	4	£21.27
4RTE 005 030 060	0.5	0°30	6	45	4	£22.13
4RTE 005 045 040	0.5	0°45	4	45	4	£21.27
4RTE 005 045 060	0.5	0°45	6	45	4	£22.13
4RTE 005 100 040	0.5	1°	4	45	4	£21.27
4RTE 005 100 060	0.5	1°	6	45	4	£22.13
4RTE 006 030 040	0.6	0°30	4	45	4	£21.27
4RTE 006 030 060	0.6	0°30	6	45	4	£22.13
4RTE 006 045 040	0.6	0°45	4	45	4	£21.27
4RTE 006 045 060	0.6	0°45	6	45	4	£22.13
4RTE 006 100 040	0.6	1°	4	45	4	£21.27
4RTE 006 100 060	0.6	1°	6	45	4	£22.13
4RTE 007 030 060	0.7	0 30	6	45	4	£20.47
4RTE 007 030 080	0.7	0 30	8	45	4	£21.33
4RTE 007 045 060	0.7	0 45	6	45	4	£20.47
4RTE 007 045 080	0.7	0 45	8	45	4	£21.33
4RTE 007 100 060	0.7	1°	6	45	4	£20.47
4RTE 007 100 080	0.7	1°	8	45	4	£21.33
4RTE 008 030 060	0.8	0°30	6	45	4	£20.47
4RTE 008 030 080	0.8	0°30	8	45	4	£20.47
4RTE 008 030 100	0.8	0°30	10	45	4	£21.33
4RTE 008 045 060	0.8	0°45	6	45	4	£20.47
4RTE 008 045 080	0.8	0°45	8	45	4	£20.47
4RTE 008 045 100	0.8	0°45	10	45	4	£21.33
4RTE 008 100 060	0.8	1°	6	45	4	£20.47
4RTE 008 100 080	0.8	1°	8	45	4	£20.47
4RTE 008 100 100	0.8	1°	10	45	4	£21.33
4RTE 009 030 060	0.9	0°30	6	45	4	£20.47
4RTE 009 030 080	0.9	0°30	8	45	4	£20.47
4RTE 009 030 100	0.9	0°30	10	45	4	£21.33
4RTE 009 045 060	0.9	0°45	6	45	4	£20.47
4RTE 009 045 080	0.9	0°45	8	45	4	£20.47
4RTE 009 045 100	0.9	0°45	10	45	4	£21.33
4RTE 009 100 060	0.9	1°	6	45	4	£20.47
4RTE 009 100 080	0.9	1°	8	45	4	£20.47
4RTE 009 100 100	0.9	1°	10	45	4	£21.33
4RTE 010 030 080	1	0°30	8	45	4	£20.47
4RTE 010 030 100	1	0°30	10	45	4	£20.47
4RTE 010 030 120	1	0°30	12	45	4	£21.33
4RTE 010 045 080	1	0°45	8	45	4	£20.47
4RTE 010 045 100	1	0°45	10	45	4	£20.47
4RTE 010 045 120	1	0°45	12	45	4	£21.33
4RTE 010 100 080	1	1°	8	45	4	£20.47
4RTE 010 100 100	1	1°	10	45	4	£20.47
4RTE 010 100 120	1	1°	12	45	4	£21.33
4RTE 012 030 080	1.2	0°30	8	45	4	£20.47
4RTE 012 030 100	1.2	0°30	10	45	4	£20.47
4RTE 012 030 120	1.2	0°30	12	45	4	£21.27

Part Number	Diameter	Angle	Length of Cut	Overall Length	Shank Dia	Price
	D		L1	L	d	£
4RTE 012 030 160	1.2	0°30	16	50	4	£22.80
4RTE 012 045 080	1.2	0°45	8	45	4	£20.47
4RTE 012 045 100	1.2	0°45	10	45	4	£20.47
4RTE 012 045 120	1.2	0°45	12	45	4	£21.27
4RTE 012 045 160	1.2	0°45	16	50	4	£22.80
4RTE 012 100 080	1.2	1°	8	45	4	£20.47
4RTE 012 100 100	1.2	1°	10	45	4	£20.47
4RTE 012 100 120	1.2	1°	12	45	4	£21.27
4RTE 012 100 160	1.2	1°	16	50	4	£22.80
4RTE 015 030 060	1.5	0°30	6	45	4	£20.47
4RTE 015 030 100	1.5	0°30	10	45	4	£20.47
4RTE 015 030 160	1.5	0°30	16	50	4	£22.80
4RTE 015 030 200	1.5	0°30	20	60	4	£22.80
4RTE 015 100 060	1.5	1°	6	45	4	£20.47
4RTE 015 100 100	1.5	1°	10	45	4	£20.47
4RTE 015 100 160	1.5	1°	16	50	4	£22.80
4RTE 015 100 200	1.5	1°	20	60	4	£22.80
4RTE 015 100 250	1.5	1°	25	60	4	£24.07
4RTE 015 130 060	1.5	1°30	6	45	4	£20.47
4RTE 015 130 100	1.5	1°30	10	45	4	£20.47
4RTE 015 130 160	1.5	1°30	16	50	4	£22.80
4RTE 015 130 200	1.5	1°30	20	60	4	£22.80
4RTE 015 130 250	1.5	1°30	25	60	4	£24.07
4RTE 020 030 100	2	0°30	10	45	4	£20.47
4RTE 020 030 160	2	0°30	16	50	4	£22.80
4RTE 020 030 200	2	0°30	20	60	4	£22.80
4RTE 020 030 250	2	0°30	25	60	4	£24.07
4RTE 020 100 100	2	1°	10	45	4	£20.47
4RTE 020 100 160	2	1°	16	50	4	£22.80
4RTE 020 100 200	2	1°	20	60	4	£22.80
4RTE 020 100 250	2	1°	25	60	4	£24.07
4RTE 020 130 100	2	1°30	10	45	4	£20.47
4RTE 020 130 160	2	1°30	16	50	4	£22.80
4RTE 020 130 200	2	1°30	20	60	4	£22.80
4RTE 020 130 250	2	1°30	25	60	4	£24.07
4RTE 025 030 100	2.5	0°30	10	45	4	£20.47
4RTE 025 030 160	2.5	0°30	16	50	4	£22.80
4RTE 025 030 200	2.5	0°30	20	60	4	£22.80
4RTE 025 030 250	2.5	0°30	25	60	4	£24.07
4RTE 025 100 100	2.5	1°	10	45	4	£20.47
4RTE 025 100 160	2.5	1°	16	50	4	£22.80
4RTE 025 100 200	2.5	1°	20	60	4	£22.80
4RTE 025 100 250	2.5	1°	25	60	4	£24.07
4RTE 025 130 100	2.5	1°30	10	45	4	£20.47
4RTE 025 130 160	2.5	1°30	16	50	4	£22.80
4RTE 025 130 200	2.5	1°30	20	60	4	£22.80
4RTE 025 130 250	2.5	1°30	25	60	4	£24.07

4STM 4 Flute Short Flute Thread Mills for Steels

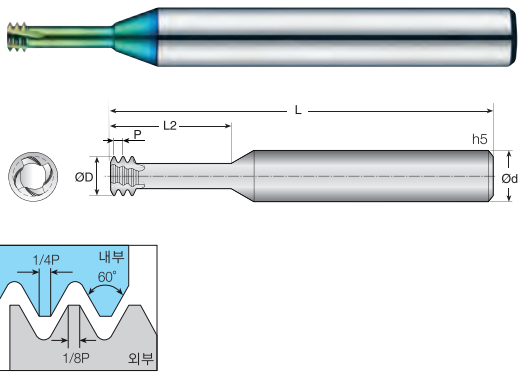
- Thread Mill for hardened and pre-hardened steel(~Hrc50), alloy steel, carbon steel, cast iron.
- Tough and strong edge design for threading in hardened steels.
- Tip shape reduces cutting resistance, reducing tool breakages.





Without Coolant

Part Number	Thread	Pitch	Drill Size	Flutes	Teeth	Diameter	Effective Length	OAL	Shank Dia	Price
				Z	Zt	D	L2	L	d	£
4STM 0072 020 S04 M1	M1	0.25	0.75	4	3	0.72	2	45	4	£66.50
4STM 0072 025 S04 M1	M1	0.25	0.75	4	3	0.72	2.5	45	4	£66.50
4STM 009 024 S04 M012	M1.2	0.25	0.95	4	3	0.9	2.4	45	4	£66.50
4STM 009030 S04 M012	M1.2	0.25	0.95	4	3	0.9	3	45	4	£66.50
4STM 0095 028 S06 M014	M1.4	0.3	1.1	4	3	0.95	2.8	50	6	£66.92
4STM 0095 035 S06 M014	M1.4	0.3	1.1	4	3	0.95	3.5	50	6	£66.92
4STM 011 032 S06 M016	M1.6	0.35	1.3	4	3	1.1	3.2	50	6	£66.92
4STM 011 040 S06 M016	M1.6	0.35	1.3	4	3	1.1	4	50	6	£66.92
4STM 012 050 S03 M016	M1.6	0.35	1.3	4	3	1.2	5	40	3	£66.50
4STM 014 040 S06 M2	M2	0.4	1.6	4	3	1.4	4	50	6	£61.58
4STM 014 050 S06 M2	M2	0.4	1.6	4	3	1.4	5	50	6	£61.58
4STM 0155 062 S03 M2	M2	0.4	1.6	4	3	1.55	6.2	40	3	£61.58
4STM 0155 062 S06 M2	M2	0.4	1.6	4	3	1.55	6.2	60	6	£61.58
4STM 016 044 S06 M022	M2.2	0.45	1.8	4	3	1.6	4.4	50	6	£61.58
4STM 016 055 S06 M022	M2.2	0.45	1.8	4	3	1.6	5.5	50	6	£61.58
4STM 018 050 S06 M025	M2.5	0.45	2.1	4	3	1.8	5	50	6	£61.58
4STM 018 062 S06 M025	M2.5	0.45	2.1	4	3	1.8	6.25	50	6	£61.58
4STM 0195 077 S03 M025	M2.5	0.45	2.1	4	3	1.95	7.7	40	3	£61.58
4STM 0195 077 S06 M025	M2.5	0.45	2.1	4	3	1.95	7.7	60	6	£61.58
4STM 024 060 S06 M3	M3	0.5	2.5	4	3	2.4	6	50	6	£50.92
4STM 024 075 S06 M3	M3	0.5	2.5	4	3	2.4	7.5	50	6	£50.92
4STM 024 092 S03 M3	M3	0.5	2.5	4	3	2.4	9.2	40	3	£50.42
4STM 024 092 S06 M3	M3	0.5	2.5	4	3	2.4	9.2	60	6	£50.92
4STM 0275 108 S06 M035	M3.5	0.6	2.9	4	3	2.75	10.8	60	6	£50.92
4STM 031 080 S06 M4	M4	0.7	3.3	4	3	3.1	8	50	6	£50.92
4STM 031 100 S06 M4	M4	0.7	3.3	4	3	3.1	10	50	6	£50.92
4STM 0315 123 S06 M4	M4	0.7	3.3	4	3	3.15	12.3	60	6	£50.92
4STM 038 100 S06 M5	M5	0.8	4.2	4	3	3.8	10	50	6	£50.92
4STM 038 125 S06 M5	M5	0.8	4.2	4	3	3.8	12.5	50	6	£50.92
4STM 0405 154 S06 M5	M5	0.8	4.2	4	3	4.05	15.4	60	6	£50.92
4STM 046 120 S06 M6	M6	1	5	4	3	4.6	12	50	6	£50.92
4STM 046 150 S06 M6	M6	1	5	4	3	4.6	15	50	6	£50.92
4STM 048 185 S06 M6	M6	1	5	4	3	4.8	18.5	60	6	£50.92
4STM 062 160 S10 M8	M8	1.25	6.8	4	3	6.2	16	70	10	£74.25
4STM 062 200 S10 M8	M8	1.25	6.8	4	3	6.2	20	70	10	£74.25
4STM 065 246 S08 M8	M8	1.25	6.8	4	3	6.5	24.6	65	8	£73.42
4STM 075 200 S10 M10	M10	1.5	8.5	4	3	7.5	20	70	10	£90.90
4STM 075 250 S10 M10	M10	1.5	8.5	4	3	7.5	25	70	10	£90.90
4STM 082 308 S10 M10	M10	1.5	8.5	4	3	8.2	30.8	80	10	£90.90
4STM 090 240 S10 M12	M12	1.75	10.2	4	3	9	24	80	10	£97.88
4STM 090 300 S10 M12	M12	1.75	10.2	4	3	9	30	80	10	£97.88
4STM 099 370 S10 M12	M12	1.75	10.2	4	3	9.9	37	85	10	£97.88
4STM 115 320 S12 M16	M16	2	14	4	3	11.5	32	100	12	£107.54



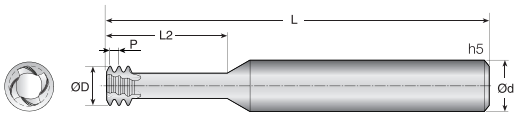
Part Number	Thread	Pitch	Drill Size	Flutes	Teeth	Diameter	Effective Length	OAL	Shank Dia	Price
				Z	Zt	D	L2	L	d	£
4STM 115 400 S12 M16	M16	2	14	4	3	11.5	40	100	12	£107.54
4STM 119 490 S12 M16	M16	2	14	4	3	11.9	49	95	12	£107.54
4STM 140 360 S16 M18	M18	2.5	15.5	4	3	14	36	135	16	£188.20
4STM 140 450 S16 M18	M18	2.5	15.5	4	3	14	45	135	16	£188.20
4STM 150 400 S16 M20	M20	2.5	17.5	4	3	15	40	135	16	£188.20
4STM 150 500 S16 M20	M20	2.5	17.5	4	3	15	50	135	16	£188.20
4STM 159 613 S16 M20	M20	2.5	17.5	4	3	15.9	61.3	115	16	£188.20

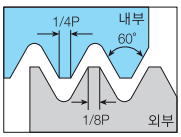
With Coolant

Part Number	Thread	Pitch	Drill Size	Flutes	Teeth	Diameter	Effective Length	OAL	Shank Dia	Price
				Z	Zt	D	L2	L	d	£
4STM 031 080 S06 M4C	M4	0.7	3.3	4	3	3.1	8	50	6	£65.08
4STM 031 100 S06 M4C	M4	0.7	3.3	4	3	3.1	10	50	6	£65.08
4STM 038 100 S06 M5C	M5	0.8	4.2	4	3	3.8	10	50	6	£65.08
4STM 038 125 S06 M5C	M5	0.8	4.2	4	3	3.8	12.5	50	6	£65.08
4STM 046 120 S06 M6C	M6	1	5	4	3	4.6	12	50	6	£65.08
4STM 046 150 S06 M6C	M6	1	5	4	3	4.6	15	50	6	£65.08
4STM 048 185 S06 M6C	M6	1	5	4	3	4.8	18.5	60	6	£65.08
4STM 062 160 S10 M8C	M8	1.25	6.8	4	3	6.2	16	70	10	£94.75
4STM 062 200 S10 M8C	M8	1.25	6.8	4	3	6.2	20	70	10	£93.92
4STM 065 246 S08 M8C	M8	1.25	6.8	4	3	6.5	24.6	65	8	£94.75
4STM 075 200 S10 M10C	M10	1.5	8.5	4	3	7.5	20	70	10	£116.55
4STM 075 250 S10 M10C	M10	1.5	8.5	4	3	7.5	25	70	10	£116.55
4STM 082 308 S10 M10C	M10	1.5	8.5	4	3	8.2	30.8	80	10	£116.55
4STM 090 240 S10 M12C	M12	1.75	10.2	4	3	9	24	80	10	£126.15
4STM 090 300 S10 M12C	M12	1.75	10.2	4	3	9	30	80	10	£126.15
4STM 099 370 S10 M12C	M12	1.75	10.2	4	3	9.9	37	85	10	£126.15
4STM 115 320 S12 M16C	M16	2	14	4	3	11.5	32	100	12	£138.14
4STM 115 400 S12 M16C	M16	2	14	4	3	11.5	40	100	12	£138.14
4STM 119 490 S12 M16C	M16	2	14	4	3	11.9	49	95	12	£138.14
4STM 140 360 S16 M18C	M18	2.5	15.5	4	3	14	36	135	16	£242.34
4STM 140 450 S16 M18C	M18	2.5	15.5	4	3	14	45	135	16	£242.34
4STM 150 400 S16 M20C	M20	2.5	15.5	4	3	15	40	135	16	£242.34
4STM 150 500 S16 M20C	M20	2.5	17.5	4	3	15	50	135	16	£242.34
4STM 159 613 S16 M20C	M20	2.5	17.5	4	3	15.9	61.3	115	16	£242.34

4STMA 4 Flute Short Flute Thread Mills for Aluminium

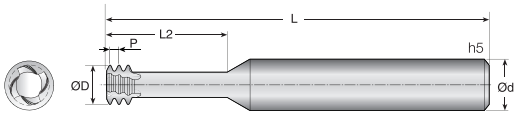
- Thread Mill for Aluminium, Aluminium alloy, non-ferrous and non-metalic materials
- Tough and strong edge design for threading in hardened steels.
- Tip shape reduces cutting resistance, reducing tool breakages.

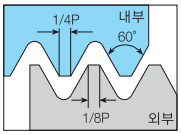




Without Coolant

Part Number	Thread	Pitch	Drill Size	Flutes	Teeth	Diameter	Effective Length	OAL	Shank Dia	Price
				Z	Zt	D	L2	L	d	£
4STMA 0072 020 S04 M1	M1	0.25	0.75	4	3	0.72	2	45	4	£70.33
4STMA 0072 025 S04 M1	M1	0.25	0.75	4	3	0.72	2.5	45	4	£70.33
4STMA 009 024 S04 M012	M1.2	0.25	0.95	4	3	0.9	2.4	45	4	£70.33
4STMA 009 030 S04 M012	M1.2	0.25	0.95	4	3	0.9	3	45	4	£70.33
4STMA 0095 028 S06 M014	M1.4	0.3	1.1	4	3	0.95	2.8	50	6	£70.33
4STMA 0095 035 S06 M014	M1.4	0.3	1.1	4	3	0.95	3.5	50	6	£70.33
4STMA 011 032 S06 M016	M1.6	0.35	1.3	4	3	1.1	3.2	50	6	£70.33
4STMA 011 040 S06 M016	M1.6	0.35	1.3	4	3	1.1	4	50	6	£70.33
4STMA 012 050 S03 M016	M1.6	0.35	1.3	4	3	1.2	5	40	3	£70.33
4STMA 014 040 S06 M2	M2	0.4	1.6	4	3	1.4	4	50	6	£64.92
4STMA 014 050 S06 M2	M2	0.4	1.6	4	3	1.4	5	50	6	£64.92
4STMA 0155 062 S03 M2	M2	0.4	1.6	4	3	1.55	6.2	40	3	£64.92
4STMA 0155 062 S06 M2	M2	0.4	1.6	4	3	1.55	6.2	60	6	£64.92
4STMA 016 044 S06 M022	M2.2	0.45	1.8	4	3	1.6	4.4	50	6	£64.92
4STMA 016 055 S06 M022	M2.2	0.45	1.8	4	3	1.6	5.5	50	6	£64.92
4STMA 018 050 S06 M025	M2.5	0.45	2.1	4	3	1.8	5	50	6	£64.92
4STMA 018 062 S06 M025	M2.5	0.45	2.1	4	3	1.8	6.25	50	6	£64.92
4STMA 0195077 S03 M025	M2.5	0.45	2.1	4	3	1.95	7.7	40	3	£64.92
4STMA 0195077 S06 M025	M2.5	0.45	2.1	4	3	1.95	7.7	60	6	£64.92
4STMA 024 060 S06 M3	M3	0.5	2.5	4	3	2.4	6	50	6	£54.25
4STMA 024 075 S06 M3	M3	0.5	2.5	4	3	2.4	7.5	50	6	£54.25
4STMA 024 092 S03 M3	M3	0.5	2.5	4	3	2.4	9.2	40	3	£54.25
4STMA 024 092 S06 M3	M3	0.5	2.5	4	3	2.4	9.2	60	6	£54.25
4STMA 0275 108 S06 M035	M3.5	0.6	2.9	4	3	2.75	10.8	60	6	£54.25
4STMA 031 080 S06 M4	M4	0.7	3.3	4	3	3.1	8	50	6	£54.25
4STMA 031 100 S06 M4	M4	0.7	3.3	4	3	3.1	10	50	6	£54.25
4STMA 0315 123 S06 M4	M4	0.7	3.3	4	3	3.15	12.3	60	6	£54.25
4STMA 038 100 S06 M5	M5	0.8	4.2	4	3	3.8	10	50	6	£54.25
4STMA 038 125 S06 M5	M5	0.8	4.2	4	3	3.8	12.5	50	6	£54.25
4STMA 0405 154 S06 M5	M5	0.8	4.2	4	3	4.05	15.4	60	6	£54.25
4STMA 046 120 S06 M6	M6	1	5	4	3	4.6	12	50	6	£54.25
4STMA 046 150 S06 M6	M6	1	5	4	3	4.6	15	50	6	£54.25
4STMA 048 185 S06 M6	M6	1	5	4	3	4.8	18.5	60	6	£54.25
4STMA 062 160 S10 M8	M8	1.25	6.8	4	3	6.2	16	70	10	£79.17
4STMA 062 200 S10 M8	M8	1.25	6.8	4	3	6.2	20	70	10	£79.17
4STMA 065 246 S08 M8	M8	1.25	6.8	4	3	6.5	24.6	65	8	£79.17
4STMA 075 200 S10 M10	M10	1.5	8.5	4	3	7.5	20	70	10	£95.33
4STMA 075 250 S10 M10	M10	1.5	8.5	4	3	7.5	25	70	10	£95.33
4STMA 082 308 S10 M10	M10	1.5	8.5	4	3	8.2	30.8	80	10	£95.33
4STMA 090 240 S10 M12	M12	1.75	10.2	4	3	9	24	80	10	£102.38
4STMA 090 300 S10 M12	M12	1.75	10.2	4	3	9	30	80	10	£102.38
4STMA 099 370 S10 M12	M12	1.75	10.2	4	3	9.9	37	85	10	£102.38
4STMA 115 320 S12 M16	M16	2	14	4	3	11.5	32	100	12	£111.80





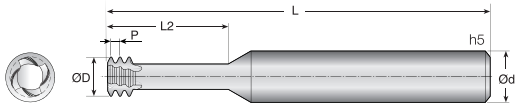
Part Number	Thread	Pitch	Drill Size	Flutes	Teeth	Diameter	Effective Length	OAL	Shank Dia	Price
				Z	Zt	D	L2	L	d	£
4STMA 115 400 S12 M16	M16	2	14	4	3	11.5	40	100	12	£111.80
4STMA 119 490 S12 M16	M16	2	14	4	3	11.9	49	95	12	£111.80
4STMA 140 360 S16 M18	M18	2.5	15.5	4	3	14	36	135	16	£190.66
4STMA 140 450 S16 M18	M18	2.5	15.5	4	3	14	45	135	16	£190.66
4STMA 150 400 S16 M20	M20	2.5	17.5	4	3	15	40	135	16	£190.66
4STMA 150 500 S16 M20	M20	2.5	17.5	4	3	15	50	135	16	£190.66
4STMA 159 613 S16 M20	M20	2.5	17.5	4	3	15.9	61.3	115	16	£190.66

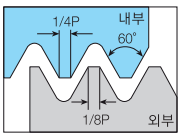
With Coolant

Part Number	Thread	Pitch	Drill Size	Flutes	Teeth	Diameter	Effective Length	OAL	Shank Dia	Price
				Z	Zt	D	L2	L	d	£
4STMA 031 080 S06 M4C	M4	0.7	3.3	4	3	3.1	8	50	6	£68.50
4STMA 031 100 S06 M4C	M4	0.7	3.3	4	3	3.1	10	50	6	£68.50
4STMA 038 100 S06 M5C	M5	0.8	4.2	4	3	3.8	10	50	6	£68.50
4STMA 038 125 S06 M5C	M5	0.8	4.2	4	3	3.8	12.5	50	6	£68.50
4STMA 046 120 S06 M6C	M6	1	5	4	3	4.6	12	50	6	£68.50
4STMA 046 150 S06 M6C	M6	1	5	4	3	4.6	15	50	6	£68.50
4STMA 048 185 S06 M6C	M6	1	5	4	3	4.8	18.5	60	6	£68.50
4STMA 062 160 S10 M8C	M8	1.25	6.8	4	3	6.2	16	70	10	£99.67
4STMA 062 200 S10 M8C	M8	1.25	6.8	4	3	6.2	20	70	10	£99.67
4STMA 065 246 S08 M8C	M8	1.25	6.8	4	3	6.5	24.6	65	8	£98.25
4STMA 075 200 S10 M10C	M10	1.5	8.5	4	3	7.5	20	70	10	£120.98
4STMA 075 250 S10 M10C	M10	1.5	8.5	4	3	7.5	25	70	10	£120.98
4STMA 082 308 S10 M10C	M10	1.5	8.5	4	3	8.2	30.8	80	10	£120.98
4STMA 090 240 S10 M12C	M12	1.75	10.2	4	3	9	24	80	10	£130.65
4STMA 090 300 S10 M12C	M12	1.75	10.2	4	3	9	30	80	10	£130.65
4STMA 099 370 S10 M12C	M12	1.75	10.2	4	3	9.9	37	85	10	£130.65
4STMA 115 320 S12 M16C	M16	2	14	4	3	11.5	32	100	12	£142.40
4STMA 115 400 S12 M16C	M16	2	14	4	3	11.5	40	100	12	£142.40
4STMA 119 490 S12 M16C	M16	2	14	4	3	11.9	49	95	12	£142.40
4STMA 140 360 S16 M18C	M18	2.5	15.5	4	3	14	36	135	16	£244.80
4STMA 140 450 S16 M18C	M18	2.5	15.5	4	3	14	45	135	16	£244.80
4STMA 150 400 S16 M20C	M20	2.5	15.5	4	3	15	40	135	16	£244.80
4STMA 150 500 S16 M20C	M20	2.5	17.5	4	3	15	50	135	16	£244.80
4STMA 159 613 S16 M20C	M20	2.5	17.5	4	3	15.9	61.3	115	16	£244.80

4STMS 4 Flute Short Flute Thread Mills for Stainless Steel

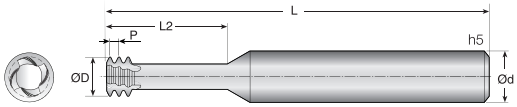
- Thread Mill for Stainless Steel, Hardened Steel & Titanium alloy.
- Tough and strong edge design
- Tip shape reduces cutting resistance, reducing tool breakages.

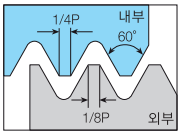




Without Coolant

Part Number	Thread	Pitch	Drill Size	Flutes	Teeth	Diameter	Effective Length	OAL	Shank Dia	Price
				Z	Zt	D	L2	L	d	£
4STMS 0072 020 S04 M1	M1	0.25	0.75	4	3	0.72	2	45	4	£66.25
4STMS 0072 025 S04 M1	M1	0.25	0.75	4	3	0.72	2.5	45	4	£66.25
4STMS 009 024 S04 M012	M1.2	0.25	0.95	4	3	0.9	2.4	45	4	£66.25
4STMS 009 030 S04 M012	M1.2	0.25	0.95	4	3	0.9	3	45	4	£66.25
4STMS 0095 028 S06 M014	M1.4	0.3	1.1	4	3	0.95	2.8	50	6	£66.67
4STMS 0095 035 S06 M014	M1.4	0.3	1.1	4	3	0.95	3.5	50	6	£66.67
4STMS 011 032 S06 M016	M1.6	0.35	1.3	4	3	1.1	3.2	50	6	£66.67
4STMS 011 040 S06 M016	M1.6	0.35	1.3	4	3	1.1	4	50	6	£66.67
4STMS 012 050 S03 M016	M1.6	0.35	1.3	4	3	1.2	5	40	3	£66.25
4STMS 014 040 S06 M2	M2	0.4	1.6	4	3	1.4	4	50	6	£61.33
4STMS 014 050 S06 M2	M2	0.4	1.6	4	3	1.4	5	50	6	£61.33
4STMS 0155 062 S03 M2	M2	0.4	1.6	4	3	1.55	6.2	40	3	£60.92
4STMS 0155 062 S06 M2	M2	0.4	1.6	4	3	1.55	6.2	60	6	£61.33
4STMS 016 044 S06 M022	M2.2	0.45	1.8	4	3	1.6	4.4	50	6	£61.33
4STMS 016 055 S06 M022	M2.2	0.45	1.8	4	3	1.6	5.5	50	6	£61.33
4STMS 018 050 S06 M025	M2.5	0.45	2.1	4	3	1.8	5	50	6	£61.33
4STMS 018 062 S06 M025	M2.5	0.45	2.1	4	3	1.8	6.25	50	6	£61.33
4STMS 0195 077 S03 M025	M2.5	0.45	2.1	4	3	1.95	7.7	40	3	£60.92
4STMS 0195 077 S06 M025	M2.5	0.45	2.1	4	3	1.95	7.7	60	6	£61.33
4STMS 024 060 S06 M3	M3	0.5	2.5	4	3	2.4	6	50	6	£50.67
4STMS 024 075 S06 M3	M3	0.5	2.5	4	3	2.4	7.5	50	6	£50.67
4STMS 024 092 S03 M3	M3	0.5	2.5	4	3	2.4	9.2	40	3	£50.25
4STMS 024 092 S06 M3	M3	0.5	2.5	4	3	2.4	9.2	60	6	£50.67
4STMS 0275 108 S06 M035	M3.5	0.6	2.9	4	3	2.75	10.8	60	6	£50.67
4STMS 031 080 S06 M4	M4	0.7	3.3	4	3	3.1	8	50	6	£50.67
4STMS 031 100 S06 M4	M4	0.7	3.3	4	3	3.1	10	50	6	£50.67
4STMS 0315 123 S06 M4	M4	0.7	3.3	4	3	3.15	12.3	60	6	£50.67
4STMS 038 100 S06 M5	M5	0.8	4.2	4	3	3.8	10	50	6	£50.67
4STMS 038 125 S06 M5	M5	0.8	4.2	4	3	3.8	12.5	50	6	£50.67
4STMS 0405 154 S06 M5	M5	0.8	4.2	4	3	4.05	15.4	60	6	£50.67
4STMS 046 120 S06 M6	M6	1	5	4	3	4.6	12	50	6	£50.67
4STMS 046 150 S06 M6	M6	1	5	4	3	4.6	15	50	6	£50.67
4STMS 048 185 S06 M6	M6	1	5	4	3	4.8	18.5	60	6	£50.67
4STMS 062 160 S10 M8	M8	1.25	6.8	4	3	6.2	16	70	10	£73.83
4STMS 062 200 S10 M8	M8	1.25	6.8	4	3	6.2	20	70	10	£73.83
4STMS 065 246 S08 M8	M8	1.25	6.8	4	3	6.5	24.6	65	8	£73.83
4STMS 075 200 S10 M10	M10	1.5	8.5	4	3	7.5	20	70	10	£90.52
4STMS 075 250 S10 M10	M10	1.5	8.5	4	3	7.5	25	70	10	£90.52
4STMS 082 308 S10 M10	M10	1.5	8.5	4	3	8.2	30.8	80	10	£90.52
4STMS 090 240 S10 M12	M12	1.75	10.2	4	3	9	24	80	10	£97.50
4STMS 090 300 S10 M12	M12	1.75	10.2	4	3	9	30	80	10	£97.50
4STMS 099 370 S10 M12	M12	1.75	10.2	4	3	9.9	37	85	10	£97.50
4STMS 115 320 S12 M16	M16	2	14	4	3	11.5	32	100	12	£107.06





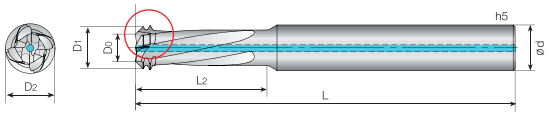
Part Number	Thread	Pitch	Drill Size	Flutes	Teeth	Diameter	Effective Length	OAL	Shank Dia	Price
				Z	Zt	D	L2	L	d	£
4STMS 115 400 S12 M16	M16	2	14	4	3	11.5	40	100	12	£107.06
4STMS 119 490 S12 M16	M16	2	14	4	3	11.9	49	95	12	£107.06
4STMS 140 360 S16 M18	M18	2.5	15.5	4	3	14	36	135	16	£187.46
4STMS 140 450 S16 M18	M18	2.5	15.5	4	3	14	45	135	16	£187.46
4STMS 150 400 S16 M20	M20	2.5	17.5	4	3	15	40	135	16	£187.46
4STMS 150 500 S16 M20	M20	2.5	17.5	4	3	15	50	135	16	£187.46
4STMS 159 613 S16 M20	M20	2.5	17.5	4	3	15.9	61.3	115	16	£187.46

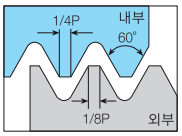
With Coolant

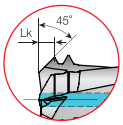
Part Number	Thread	Pitch	Drill Size	Flutes	Teeth	Diameter	Effective Length	OAL	Shank Dia	Price
				Z	Zt	D	L2	L	d	£
4STMS 031 080 S06 M4C	M4	0.7	3.3	4	3	3.1	8	50	6	£64.92
4STMS 031 100 S06 M4C	M4	0.7	3.3	4	3	3.1	10	50	6	£64.92
4STMS 038 100 S06 M5C	M5	0.8	4.2	4	3	3.8	10	50	6	£64.92
4STMS 038 125 S06 M5C	M5	0.8	4.2	4	3	3.8	12.5	50	6	£64.92
4STMS 046 120 S06 M6C	M6	1	5	4	3	4.6	12	50	6	£64.92
4STMS 046 150 S06 M6C	M6	1	5	4	3	4.6	15	50	6	£64.92
4STMS 048 185 S06 M6C	M6	1	5	4	3	4.8	18.5	60	6	£64.92
4STMS 062 160 S10 M8C	M8	1.25	6.8	4	3	6.2	16	70	10	£94.33
4STMS 062 200 S10 M8C	M8	1.25	6.8	4	3	6.2	20	70	10	£94.33
4STMS 065 246 S08 M8C	M8	1.25	6.8	4	3	6.5	24.6	65	8	£93.58
4STMS 075 200 S10 M10C	M10	1.5	8.5	4	3	7.5	20	70	10	£116.17
4STMS 075 250 S10 M10C	M10	1.5	8.5	4	3	7.5	25	70	10	£116.17
4STMS 082 308 S10 M10C	M10	1.5	8.5	4	3	8.2	30.8	80	10	£116.17
4STMS 090 240 S10 M12C	M12	1.75	10.2	4	3	9	24	80	10	£125.78
4STMS 090 300 S10 M12C	M12	1.75	10.2	4	3	9	30	80	10	£125.78
4STMS 099 370 S10 M12C	M12	1.75	10.2	4	3	9.9	37	85	10	£125.78
4STMS 115 320 S12 M16C	M16	2	14	4	3	11.5	32	100	12	£137.74
4STMS 115 400 S12 M16C	M16	2	14	4	3	11.5	40	100	12	£137.74
4STMS 119 490 S12 M16C	M16	2	14	4	3	11.9	49	95	12	£137.74
4STMS 140 360 S16 M18C	M18	2.5	15.5	4	3	14	36	135	16	£241.66
4STMS 140 450 S16 M18C	M18	2.5	15.5	4	3	14	45	135	16	£241.66
4STMS 150 400 S16 M20C	M20	2.5	15.5	4	3	15	40	135	16	£241.66
4STMS 150 500 S16 M20C	M20	2.5	17.5	4	3	15	50	135	16	£241.66
4STMS 159 613 S16 M20C	M20	2.5	17.5	4	3	15.9	61.3	115	16	£241.66

4ETM 4 Flute Multi-functional Thread Mills for Steels

- Thread Mill for hardened and pre-hardened steel(~Hrc50), alloy steel, carbon steel, cast iron.
- 4ETM tool performs both drilling, threading and chamfering in one tool operation.
- Pre-drilled holes are no longer necessary.
- While drilling and thread milling are performed simultaneously, the chamfer is threaded finish.
- This multifunctional tool can be used with all blind holes and through holes.
- All tools are left-handed, thread mills capable of right-handed rotation and left-handed rotation.



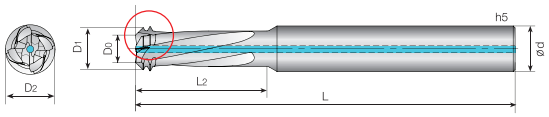


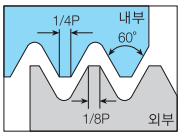


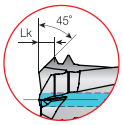
186P

Without Coolant

Part Number	Thread	Pitch	Flutes	Teeth	Diameter			Effective Length	Lk	OAL	Shank Dia	Price
			Z	Zt	D0	D1	D2	L2		L	d	£
4ETM 024 070 S06 M3	M3	0.5	4	2	1.37	2.17	2.4	7	0.4	60	6	£82.92
4ETM 024 085 S06 M3	M3	0.5	4	2	1.37	2.17	2.4	8.5	0.4	60	6	£82.92
4ETM 032 092 S06 M4	M4	0.7	4	2	1.74	2.88	3.2	9.2	0.57	60	6	£82.92
4ETM 032 112 S06 M4	M4	0.7	4	2	1.74	2.88	3.2	11.2	0.57	60	6	£82.92
4ETM 039 115 S06 M5	M5	0.8	4	2	2.21	3.61	3.9	11.5	0.7	60	6	£82.92
4ETM 039 144 S06 M5	M5	0.8	4	2	2.21	3.61	3.9	14.4	0.7	60	6	£82.92
4ETM 047 140 S06 M6	M6 - M9	1	4	2	2.82	4.4	4.7	14	0.79	60	6	£82.92
4ETM 047 170 S06 M6	M6 - M9	1	4	2	2.82	4.4	4.7	17	0.79	60	6	£82.92
4ETM 061 180 S08 M8	M8 - M12	1.25	4	2	4	5.8	6.1	18	0.9	65	8	£121.58
4ETM 061 220 S08 M8	M8 - M12	1.25	4	2	4	5.8	6.1	22	0.9	65	8	£121.58
4ETM 078 230 S08 M10	M10 - M15	1.5	4	2	5.16	7.4	7.8	23	1.12	65	8	£123.82
4ETM 078 280 S08 M10	M10 - M15	1.5	4	2	5.16	7.4	7.8	28	1.12	65	8	£123.82
4ETM 090 260 S10 M12	M12	1.75	4	2	6.2	8.6	9	26	1.2	80	10	£138.98
4ETM 090 330 S10 M12	M12	1.75	4	2	6.2	8.6	9	33	1.2	80	10	£138.98
4ETM 118 350 S12 M16	M16 - M23	2	4	2	7.4	11.4	11.8	35	2	100	12	£158.80
4ETM 118 430 S12 M16	M16 - M23	2	4	2	7.4	11.4	11.8	43	2	100	12	£158.80





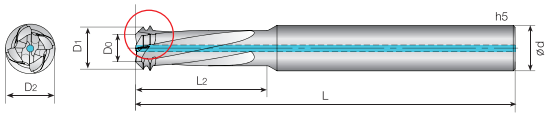


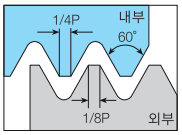
With Coolant

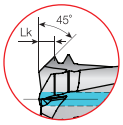
Part Number	Thread	Pitch	Flutes	Teeth	Diameter			Effective Length	Lk	OAL	Shank Dia	Price
			Z	Zt	D0	D1	D2	L2		L	d	£
4ETM 047 140 S06 M6C	M6 - M9	1	4	2	2.82	4.4	4.7	14	0.79	60	6	£103.25
4ETM 047 170 S06 M6C	M6 - M9	1	4	2	2.82	4.4	4.7	17	0.79	60	6	£103.25
4ETM 061 180 S08 M8C	M8 - M12	1.25	4	2	4	5.8	6.1	18	0.9	65	8	£148.33
4ETM 061 220 S08 M8C	M8 - M12	1.25	4	2	4	5.8	6.1	22	0.9	65	8	£148.33
4ETM 078 230 S08 M10C	M10 - M15	1.5	4	2	5.16	7.4	7.8	23	1.12	65	8	£152.70
4ETM 078 280 S08 M10C	M10 - M15	1.5	4	2	5.16	7.4	7.8	28	1.12	65	8	£152.70
4ETM 090 260 S10 M12C	M12	1.75	4	2	6.2	8.6	9	26	1.2	80	10	£187.13
4ETM 090 330 S10 M12C	M12	1.75	4	2	6.2	8.6	9	33	1.2	80	10	£187.13
4ETM 118 350 S12 M16C	M16 - M23	2	4	2	7.4	11.4	11.8	35	2	100	12	£205.86
4ETM 118 430 S12 M16C	M16 - M23	2	4	2	7.4	11.4	11.8	43	2	100	12	£205.86

4ETMA 4 Flute Multi-functional Thread Mills for Aluminum

- Thread Mill for Aluminum, Aluminum alloy, non-ferrous and nonmetalic materials.
- 4ETMA tool performs both drilling, threading and chamfering in one tool operation.
- Pre-drilled holes are no longer necessary.
- While drilling and thread milling are performed simultaneously, the chamfer is threaded finish.
- This multifunctional tool can be used with all blind holes and through holes.
- All tools are left-handed, thread mills capable of right-handed rotation and left-handed rotation.

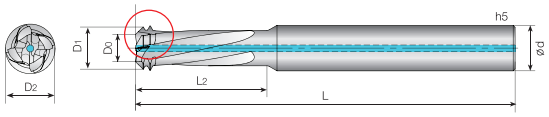


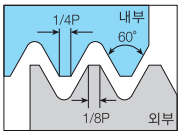


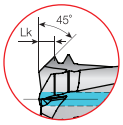


Without Coolant

Part Number	Thread	Pitch	Flutes	Teeth	Diameter			Effective Length	Lk	OAL	Shank Dia	Price
			Z	Zt	D0	D1	D2	L		L	d	£
4ETMA 0105 033 S04 M014	M1.4	0.3	4	2	0.61	0.95	1.05	3.3	0.17	45	4	£86.33
4ETMA 0105 040 S04 M014	M1.4	0.3	4	2	0.61	0.95	1.05	4	0.17	45	4	£86.33
4ETMA 012 037 S04 M016	M1.6 - M1.8	0.35	4	2	0.65	1.04	1.2	3.7	0.195	45	4	£86.33
4ETMA 012 045 S04 M016	M1.6 - M1.8	0.35	4	2	0.65	1.04	1.2	4.5	0.195	45	4	£86.33
4ETMA 0155 045 S04 M2	M2	0.4	4	2	0.94	1.4	1.55	4.5	0.23	45	4	£86.33
4ETMA 0155 055 S04 M2	M2	0.4	4	2	0.94	1.4	1.55	5.5	0.23	45	4	£86.33
4ETMA 020 055 S04 M025	M2.5	0.45	4	2	1.16	1.85	2	5.5	0.345	45	4	£86.33
4ETMA 0200 675 S04 M025	M2.5	0.45	4	2	1.16	1.85	2	6.75	0.345	45	4	£86.33
4ETMA 024 070 S06 M3	M3	0.5	4	2	1.37	2.17	2.4	7	0.4	60	6	£86.33
4ETMA 024 085 S06 M3	M3	0.5	4	2	1.37	2.17	2.4	8.5	0.4	60	6	£86.33
4ETMA 032 092 S06 M4	M4	0.7	4	2	1.74	2.88	3.2	9.2	0.57	60	6	£86.33
4ETMA 032 112 S06 M4	M4	0.7	4	2	1.74	2.88	3.2	11.2	0.57	60	6	£86.33
4ETMA 039 115 S06 M5	M5	0.8	4	2	2.21	3.61	3.9	11.5	0.7	60	6	£86.33
4ETMA 039 144 S06 M5	M5	0.8	4	2	2.21	3.61	3.9	14.4	0.7	60	6	£86.33
4ETMA 047 140 S06 M6	M6 - M9	1	4	2	2.82	4.4	4.7	14	0.79	60	6	£86.33
4ETMA 047 170 S06 M6	M6 - M9	1	4	2	2.82	4.4	4.7	17	0.79	60	6	£86.33
4ETMA 061 180 S08 M8	M8 - M12	1.25	4	2	4	5.8	6.1	18	0.9	65	8	£125.92
4ETMA 061 220 S08 M8	M8 - M12	1.25	4	2	4	5.8	6.1	22	0.9	65	8	£125.92
4ETMA 078 230 S08 M10	M10 - M15	1.5	4	2	5.16	7.4	7.8	23	1.12	65	8	£127.73
4ETMA 078 280 S08 M10	M10 - M15	1.5	4	2	5.16	7.4	7.8	28	1.12	65	8	£127.73
4ETMA 090 260 S10 M12	M12	1.75	4	2	6.2	8.6	9	26	1.2	80	10	£143.48
4ETMA 090 330 S10 M12	M12	1.75	4	2	6.2	8.6	9	33	1.2	80	10	£143.48
4ETMA 118 350 S12 M16	M16 - M23	2	4	2	7.4	11.4	11.8	35	2	100	12	£163.06
4ETMA 118 430 S12 M16	M16 - M23	2	4	2	7.4	11.4	11.8	43	2	100	12	£163.06





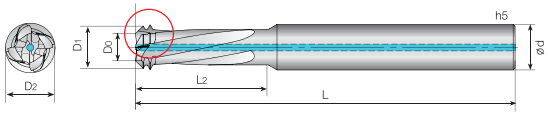


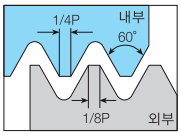
With Coolant

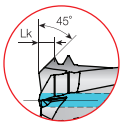
Part Number	Thread	Pitch	Flutes	Teeth	Diameter			Effective Length	Lk	OAL	Shank Dia	Price
			Z	Zt	D0	D1	D2	L		L	d	£
4ETMA 047 140 S06 M6C	M6 - M9	1	4	2	2.82	4.4	4.7	14	0.79	60	6	£106.67
4ETMA 047 170 S06 M6C	M6 - M9	1	4	2	2.82	4.4	4.7	17	0.79	60	6	£106.67
4ETMA 061 180 S08 M8C	M8 - M12	1.25	4	2	4	5.8	6.1	18	0.9	65	8	£152.67
4ETMA 061 220 S08 M8C	M8 - M12	1.25	4	2	4	5.8	6.1	22	0.9	65	8	£152.67
4ETMA 078 230 S08 M10C	M10 - M15	1.5	4	2	5.16	7.4	7.8	23	1.12	65	8	£156.60
4ETMA 078 280 S08 M10C	M10 - M15	1.5	4	2	5.16	7.4	7.8	28	1.12	65	8	£156.60
4ETMA 090 260 S10 M12C	M12	1.75	4	2	6.2	8.6	9	26	1.2	80	10	£191.55
4ETMA 090 330 S10 M12C	M12	1.75	4	2	6.2	8.6	9	33	1.2	80	10	£191.55
4ETMA 118 350 S12 M16C	M16 - M23	2	4	2	7.4	11.4	11.8	35	2	100	12	£210.14
4ETMA 118 430 S12 M16C	M16 - M23	2	4	2	7.4	11.4	11.8	43	2	100	12	£210.14

4ETMS 4 Flute Multi-functional Thread Mill for Stainless Steel

- Thread Mill for SUS, Titanium alloy, Copper alloy.
- 4ETMS tool performs both drilling, threading and chamfering in one tool operation.
- Pre-drilled holes are no longer necessary.
- While drilling and thread milling are performed simultaneously, the chamfer is threaded finish.
- This multifunctional tool can be used with all blind holes and through holes.
- All tools are left-handed, thread mills capable of right-handed rotation and left-handed rotation.



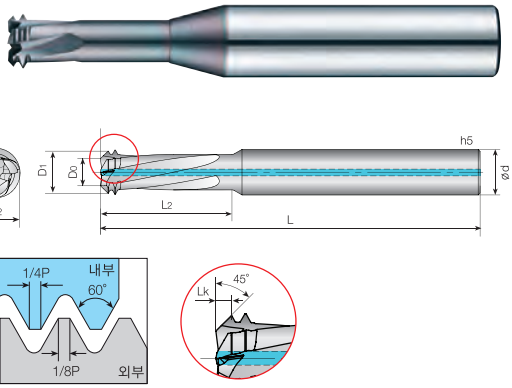




4 | UWC 초미립사 | R TISIN-R | 15° Helix Angle | L Lotation | CUTTING DATA 186P

Without Coolant

Part Number	Thread	Pitch	Flutes	Teeth	Diameter			Effective Length	Lk	OAL	Shank Dia	Price
			Z	Zt	D0	D1	D2	L2		L	d	£
4ETMS 024 070 S06 M3	M3	0.5	4	2	1.37	2.17	2.4	7	0.4	60	6	£82.67
4ETMS 024 085 S06 M3	M3	0.5	4	2	1.37	2.17	2.4	8.5	0.4	60	6	£82.67
4ETMS 032 092 S06 M4	M4	0.7	4	2	1.74	2.88	3.2	9.2	0.57	60	6	£82.67
4ETMS 032 112 S06 M4	M4	0.7	4	2	1.74	2.88	3.2	11.2	0.57	60	6	£82.67
4ETMS 039 115 S06 M5	M5	0.8	4	2	2.21	3.61	3.9	11.5	0.7	60	6	£82.67
4ETMS 039 144 S06 M5	M5	0.8	4	2	2.21	3.61	3.9	14.4	0.7	60	6	£82.67
4ETMS 047 140 S06 M6	M6 - M9	1	4	2	2.82	4.4	4.7	14	0.79	60	6	£82.67
4ETMS 047 170 S06 M6	M6 - M9	1	4	2	2.82	4.4	4.7	17	0.79	60	6	£82.67
4ETMS 061 180 S08 M8	M8 - M12	1.25	4	2	4	5.8	6.1	18	0.9	65	8	£121.25
4ETMS 061 220 S08 M8	M8 - M12	1.25	4	2	4	5.8	6.1	22	0.9	65	8	£121.25
4ETMS 078 230 S08 M10	M10 - M15	1.5	4	2	5.16	7.4	7.8	23	1.12	65	8	£123.53
4ETMS 078 280 S08 M10	M10 - M15	1.5	4	2	5.16	7.4	7.8	28	1.12	65	8	£123.53
4ETMS 090 260 S10 M12	M12	1.75	4	2	6.2	8.6	9	26	1.2	80	10	£138.60
4ETMS 090 330 S10 M12	M12	1.75	4	2	6.2	8.6	9	33	1.2	80	10	£138.60
4ETMS 118 350 S12 M16	M16 - M23	2	4	2	7.4	11.4	11.8	35	2	100	12	£158.40
4ETMS 118 430 S12 M16	M16 - M23	2	4	2	7.4	11.4	11.8	43	2	100	12	£158.40

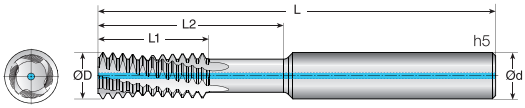


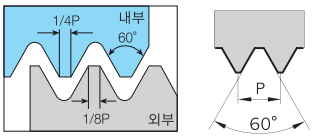
With Coolant

Part Number	Thread	Pitch	Flutes	Teeth	Diameter			Effective Length	Lk	OAL	Shank Dia	Price
			Z	Zt	D0	D1	D2	L2		L	d	£
4ETMS 047 140 S06 M6C	M6 - M9	1	4	2	2.82	4.4	4.7	14	0.79	60	6	£103.00
4ETMS 047 170 S06 M6C	M6 - M9	1	4	2	2.82	4.4	4.7	17	0.79	60	6	£103.00
4ETMS 061 180 S08 M8C	M8 - M12	1.25	4	2	4	5.8	6.1	18	0.9	65	8	£147.92
4ETMS 061 220 S08 M8C	M8 - M12	1.25	4	2	4	5.8	6.1	22	0.9	65	8	£147.92
4ETMS 078 230 S08 M10C	M10 - M15	1.5	4	2	5.16	7.4	7.8	23	1.12	65	8	£152.40
4ETMS 078 280 S08 M10C	M10 - M15	1.5	4	2	5.16	7.4	7.8	28	1.12	65	8	£152.40
4ETMS 090 260 S10 M12C	M12	1.75	4	2	6.2	8.6	9	26	1.2	80	10	£186.75
4ETMS 090 330 S10 M12C	M12	1.75	4	2	6.2	8.6	9	33	1.2	80	10	£186.75
4ETMS 118 350 S12 M16C	M16 - M23	2	4	2	7.4	11.4	11.8	35	2	100	12	£205.46
4ETMS 118 430 S12 M16C	M16 - M23	2	4	2	7.4	11.4	11.8	43	2	100	12	£205.46

4HTM 4 Flute Helical Thread Mills for Steels

- Thread Mill for hardened and pre-hardened steel(~Hrc50), alloy steel, carbon steel, cast iron.
- Helical flutes with coolant thru for extra deep threading applications.
- Multi-tooth geometry.
- Maximum thread length : 3xD2 (thread diameter)





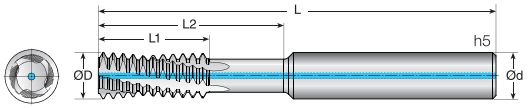
Without Coolant

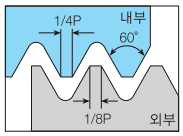
Part Number	Thread	Pitch	Drill Size	Diameter	Thread Length	Reach	Overall Length	Shank Dia	Price
				D	L1	L2	L	d	£
4HTM 024 090 S04 M3	M3	0.5	2.5	2.4	4.7	9	45	4	£62.50
4HTM 0315 120 S04 M4	M4	0.7	3.3	3.15	6.6	12	45	4	£62.50
4HTM 039 150 S04 M5	M5	0.8	4.2	3.9	7.6	15	50	4	£62.50
4HTM 048 180 S06 M6	M6	1	5	4.8	9.5	18	60	6	£70.08
4HTM 065 240 S08 M8	M8	1.25	6.8	6.5	13.1	24	65	8	£76.58
4HTM 082 300 S10 M10	M10	1.5	8.5	8.2	15.7	30	75	10	£75.67
4HTM 099 360 S10 M12	M12	1.75	10.2	9.9	18.4	36	85	10	£97.27
4HTM 116 420 S12 M14	M14	2	12	11.6	21	42	90	12	£107.54
4HTM 136 480 S14 M16	M16	2	14	13.6	25	48	100	14	£125.94

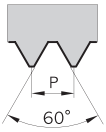
With Coolant

Part Number	Thread	Pitch	Drill Size	Diameter	Thread Length	Reach	Overall Length	Shank Dia	Price
				D	L1	L2	L	d	£
4HTM 024 090 S04 M3C	M3	0.5	2.5	2.4	4.7	9	45	4	£93.17
4HTM 0315 120 S04 M4C	M4	0.7	3.3	3.15	6.6	12	45	4	£93.17
4HTM 039 150 S04 M5C	M5	0.8	4.2	3.9	7.6	15	50	4	£93.17
4HTM 048 180 S06 M6C	M6	1	5	4.8	9.5	18	60	6	£100.08
4HTM 065 240 S08 M8C	M8	1.25	6.8	6.5	13.1	24	65	8	£109.83
4HTM 082 300 S10 M10C	M10	1.5	8.5	8.2	15.7	30	75	10	£110.18
4HTM 099 360 S10 M12C	M12	1.75	10.2	9.9	18.4	36	85	10	£148.65
4HTM 116 420 S12 M14C	M14	2	12	11.6	21	42	90	12	£158.80
4HTM 136 480 S14 M16C	M16	2	14	13.6	25	48	100	14	£185.80

- Thread Mill for Aluminum, Aluminum alloy, non-ferrous and non-metalic materials.
- Helical flutes with coolant thru for extra deep threading applications.
- Multi-tooth geometry.
- Maximum thread length : 3xD2 (thread diameter)







Without Coolant

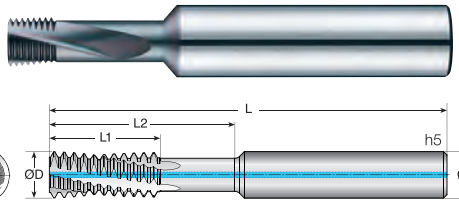
Part Number	Thread	Pitch	Drill Size	Diameter	Thread Length	Reach	Overall Length	Shank Dia	Price
				D	L1	L2	L	d	£
4HTMA 024 090 S04 M3	M3	0.5	2.5	2.4	4.7	9	45	4	£66.25
4HTMA 0315 120 S04 M4	M4	0.7	3.3	3.15	6.6	12	45	4	£66.25
4HTMA 039 150 S04 M5	M5	0.8	4.2	3.9	7.6	15	50	4	£66.25
4HTMA 048 180 S06 M6	M6	1	5	4.8	9.5	18	60	6	£73.50
4HTMA 065 240 S08 M8	M8	1.25	6.8	6.5	13.1	24	65	8	£80.92
4HTMA 082 300 S10 M10	M10	1.5	8.5	8.2	15.7	30	75	10	£80.10
4HTMA 099 360 S10 M12	M12	1.75	10.2	9.9	18.4	36	85	10	£101.77
4HTMA 116 420 S12 M14	M14	2	12	11.6	21	42	90	12	£111.80
4HTMA 136 480 S14 M16	M16	2	14	13.6	25	48	100	14	£130.00

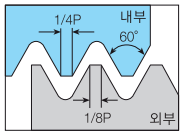
With Coolant

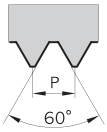
Part Number	Thread	Pitch	Drill Size	Diameter	Thread Length	Reach	Overall Length	Shank Dia	Price
				D	L1	L2	L	d	£
4HTMA 024 090 S04 M3C	M3	0.5	2.5	2.4	4.7	9	45	4	£97.00
4HTMA 0315 120 S04 M4C	M4	0.7	3.3	3.15	6.6	12	45	4	£97.00
4HTMA 039 150 S04 M5C	M5	0.8	4.2	3.9	7.6	15	50	4	£97.00
4HTMA 048 180 S06 M6C	M6	1	5	4.8	9.5	18	60	6	£103.42
4HTMA 065 240 S08 M8C	M8	1.25	6.8	6.5	13.1	24	65	8	£114.17
4HTMA 082 300 S10 M10C	M10	1.5	8.5	8.2	15.7	30	75	10	£114.60
4HTMA 099 360 S10 M12C	M12	1.75	10.2	9.9	18.4	36	85	10	£153.07
4HTMA 116 420 S12 M14C	M14	2	12	11.6	21	42	90	12	£163.06
4HTMA 136 480 S14 M16C	M16	2	14	13.6	25	48	100	14	£189.94

4HTMS 4 Flute Helical Thread Mills for Stainless Steel

- Thread Mill for Stainless Steel, Titanium alloy.
- Helical flutes with coolant thru for extra deep threading applications.
- Multi-tooth geometry.
- Maximum thread length : 3xD2 (thread diameter)
- Reduced machining times for long threads.







Without Coolant

Part Number	Thread	Pitch	Drill Size	Diameter	Thread Length	Reach	Overall Length	Shank Dia	Price
				D	L1	L2	L	d	£
4HTMS 024 090 S04 M3	M3	0.5	2.5	2.4	4.7	9	45	4	£62.25
4HTMS 0315 120 S04 M4	M4	0.7	3.3	3.15	6.6	12	45	4	£62.25
4HTMS 039 150 S04 M5	M5	0.8	4.2	3.9	7.6	15	50	4	£62.25
4HTMS 048 180 S06 M6	M6	1	5	4.8	9.5	18	60	6	£69.83
4HTMS 065 240 S08 M8	M8	1.25	6.8	6.5	13.1	24	65	8	£76.25
4HTMS 082 300 S10 M10	M10	1.5	8.5	8.2	15.7	30	75	10	£75.22
4HTMS 099 360 S10 M12	M12	1.75	10.2	9.9	18.4	36	85	10	£96.90
4HTMS 116 420 S12 M14	M14	2	12	11.6	21	42	90	12	£107.06
4HTMS 136 480 S14 M16	M16	2	14	13.6	25	48	100	14	£125.34

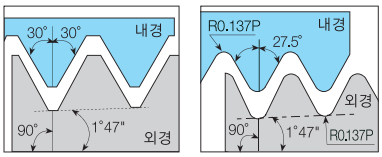
With Coolant

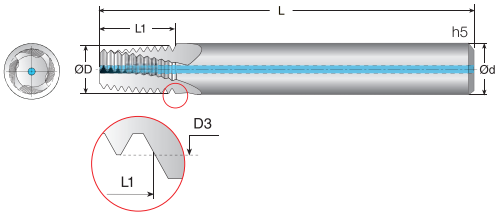
Part Number	Thread	Pitch	Drill Size	Diameter	Thread Length	Reach	Overall Length	Shank Dia	Price
				D	L1	L2	L	d	£
4HTMS 024 090 S04 M3C	M3	0.5	2.5	2.4	4.7	9	45	4	£93.00
4HTMS 0315 120 S04 M4C	M4	0.7	3.3	3.15	6.6	12	45	4	£93.00
4HTMS 039 150 S04 M5C	M5	0.8	4.2	3.9	7.6	15	50	4	£93.00
4HTMS 048 180 S06 M6C	M6	1	5	4.8	9.5	18	60	6	£99.83
4HTMS 065 240 S08 M8C	M8	1.25	6.8	6.5	13.1	24	65	8	£109.42
4HTMS 082 300 S10 M10C	M10	1.5	8.5	8.2	15.7	30	75	10	£109.73
4HTMS 099 360 S10 M12C	M12	1.75	10.2	9.9	18.4	36	85	10	£148.20
4HTMS 116 420 S12 M14C	M14	2	12	11.6	21	42	90	12	£158.40
4HTMS 136 480 S14 M16C	M16	2	14	13.6	25	48	100	14	£185.26

4 Flute NPT Thread Mills for Steels

4NPTM

- Thread Mill for hardened and pre-hardened steel(~Hrc50), alloy steel, carbon steel, cast iron.
- Through Coolant Supply



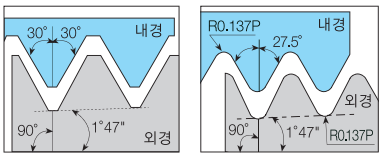


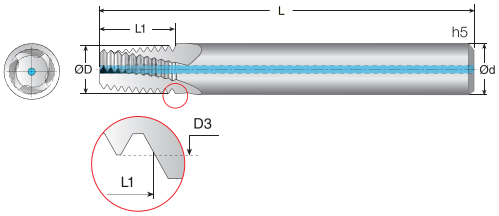
Part Number	Thread	Pitch (TPI)	Drill Size	Flutes	Teeth	Diameter	Thread Length	Overall Length	Shank Dia	Price
				Z	Zt	D	L1	L	d	£
4NPTM 059 098 S06	1/16-27 NPT	27	6.3	4	10	5.9	9.8	60	6	£86.50
4NPTM 0765 098 S08	1/8-27 NPT	27	8.5	4	10	7.65	9.8	60	8	£105.50
4NPTM 099 147 S10	1/4-18 NPT	18	11.1	4	10	9.9	14.7	70	10	£180.25
4NPTM 1115 147 S12	3/8-18 NPT	18	14.5	4	10	11.5	14.7	70	12	£188.33
4NPTM 1425 189 S16	1/2(3/4)-14 NPT	14	17.7	4	10	14.25	18.9	90	16	£250.20

4 Flute NPT Thread Mills for Aluminium

4NPTMA

- Thread Mill for Aluminum, Aluminum alloy, non-ferrous and non-metalic materials.
- Through Coolant Supply

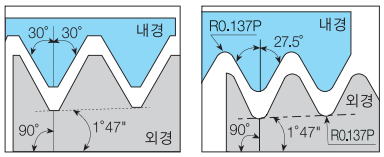


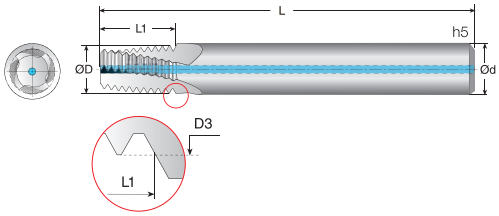


Part Number	Thread	Pitch (TPI)	Drill Size	Flutes	Teeth	Diameter	Thread Length	Overall Length	Shank Dia	Price
				Z	Zt	D	L1	L	d	£
4NPTMA 059 098 S06	1/16-27 NPT	27	6.3	4	10	5.9	9.8	60	6	£89.83
4NPTMA 0765 098 S08	1/8-27 NPT	27	8.5	4	10	7.65	9.8	60	8	£109.83
4NPTMA 099 147 S10	1/4-18 NPT	18	11.1	4	10	9.9	14.7	70	10	£185.25
4NPTMA 1115 147 S12	3/8-18 NPT	18	14.5	4	10	11.5	14.7	70	12	£193.05
4NPTMA 1425 189 S16	1/2(3/4)-14 NPT	14	17.7	4	10	14.25	18.9	90	16	£252.97

4NPTMS 4 Flute NPT Thread Mills for Stainless Steel

- Thread Mill for Stainless Steel, Titanium alloy.
- Through Coolant Supply

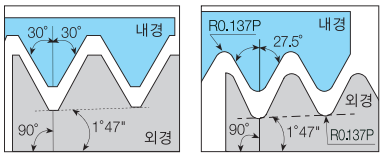


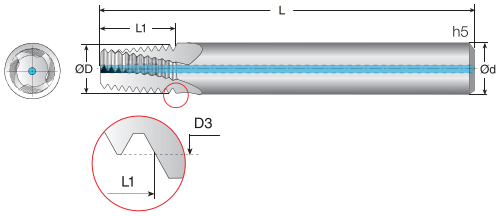


Part Number	Thread	Pitch (TPI)	Drill Size	Flutes	Teeth	Diameter	Thread Length	Overall Length	Shank Dia	Price
				Z	Zt	D	L1	L	d	£
4NPTMS 059 098 S06	1/16-27 NPT	27	6.3	4	10	5.9	9.8	60	6	£86.25
4NPTMS 0765 098 S08	1/8-27 NPT	27	8.5	4	10	7.65	9.8	60	8	£105.17
4NPTMS 099 147 S10	1/4-18 NPT	18	11.1	4	10	9.9	14.7	70	10	£179.83
4NPTMS 1115 147 S12	3/8-18 NPT	18	14.5	4	10	11.5	14.7	70	12	£187.80
4NPTMS 1425 189 S16	1/2(3/4)-14 NPT	14	17.7	4	10	14.25	18.9	90	16	£249.37

4BSTM 4 Flute BSPT Thread Mills for Steels

- Thread Mill for hardened and pre-hardened steel(~Hrc50), alloy steel, carbon steel, cast iron.
- Through Coolant Supply

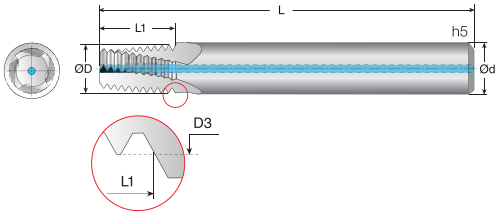


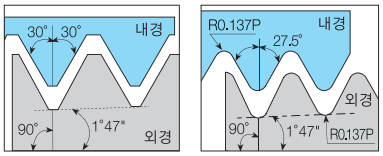


Part Number	Thread	Pitch (TPI)	Drill Size	Flutes	Teeth	Diameter	Thread Length	Overall Length	Shank Dia	Price
				Z	Zt	D	L1	L	d	£
4BSTM 059 103 S06	1/16" - 28 BSPT	28	6.7	4	10	5.9	10.3	60	6	£86.50
4BSTM 0765 103 S08	1/8" - 28 BSPT	28	8.7	4	10	7.65	10.3	60	8	£105.50
4BSTM 099 152 S10	1/4" - 19 BSPT	19	11.8	4	10	9.9	15.2	70	10	£189.17
4BSTM 1115 152 S12	3/8" - 19 BSPT	19	15.2	4	10	11.15	15.2	70	12	£193.12
4BSTM 1425 224 S16	1/2"(3/4") - 14 BSPT	14	19	4	10	14.25	22.4	90	16	£276.68

4 Flute BSPT Thread Mills for Aluminium — 4BSTMA

- Thread Mill for Aluminum, Aluminum alloy, non-ferrous and non-metalic materials.
- Through Coolant Supply

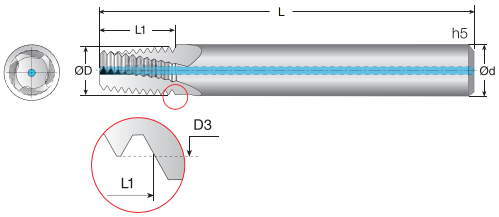


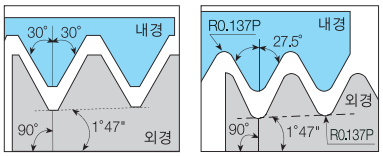


Part Number	Thread	Pitch (TPI)	Drill Size	Flutes	Teeth	Diameter	Thread Length	Overall Length	Shank Dia	Price
				Z	Zt	D	L1	L	d	£
4BSTMA 059 103 S06	1/16" - 28 BSPT	28	6.7	4	10	5.9	10.3	60	6	£89.92
4BSTMA 0765 103 S08	1/8" - 28 BSPT	28	8.7	4	10	7.65	10.3	60	8	£109.83
4BSTMA 099 152 S10	1/4" - 19 BSPT	19	11.8	4	10	9.9	15.2	70	10	£194.17
4BSTMA 1115 152 S12	3/8" - 19 BSPT	19	15.2	4	10	11.15	15.2	70	12	£197.93
4BSTMA 1425 224 S16	1/2"(3/4") - 14 BSPT	14	19	4	10	14.25	22.4	90	16	£279.45

4 Flute BSPT Thread Mills for Stainless Steel — 4BSTMS

- Thread Mill for Stainless Steel, Titanium alloy.
- Through Coolant Supply





Part Number	Thread	Pitch (TPI)	Drill Size	Flutes	Teeth	Diameter	Thread Length	Overall Length	Shank Dia	Price
				Z	Zt	D	L1	L	d	£
4BSTMS 059 103 S06	1/16" - 28 BSPT	28	6.7	4	10	5.9	10.3	60	6	£86.25
4BSTMS 0765 103 S08	1/8" - 28 BSPT	28	8.7	4	10	7.65	10.3	60	8	£105.17
4BSTMS 099 152 S10	1/4" - 19 BSPT	19	11.8	4	10	9.9	15.2	70	10	£188.75
4BSTMS 1115 152 S12	3/8" - 19 BSPT	19	15.2	4	10	11.15	15.2	70	12	£192.67
4BSTMS 1425 224 S16	1/2"(3/4") - 14 BSPT	14	19	4	10	14.25	22.4	90	16	£275.85

Cutting Data

2CRC Cutting Condition

•RPM : rev./min •Feed : mm/min

Material	Carbon Steels		Alloy Steels		Hardened Steels	
경도 Hardness					35~ 40HRC	
외경 Outside Diameter	RPM	FEED	RPM	FEED	RPM	FEED
ø1.9	3,200	60	2,300	50	2,500	40
ø2.9	2,500	60	1,800	50	1,800	40
ø3.9	1,850	60	1,400	50	1,400	40
ø4.9	1,600	60	1,100	50	1,200	40
ø5.9	1,400	60	900	50	1,000	40

4CRC

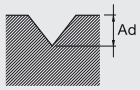
•RPM : rev./min •Feed : mm/min

Material	Carbon Steels		Alloy Steels		Hardened Steels	
Hardness					35~ 40HRC	
Outside Diameter	RPM	FEED	RPM	FEED	RPM	FEED
ø1.9	5,940	1,260	4,950	1,050	3,960	840
ø2.9	5,280	1,130	4,400	940	3,520	750
ø3.9	4,700	1,010	3,910	840	3,100	670
ø4.9	4,200	910	3,400	750	2,800	600
ø5.9	3,700	820	3,000	670	2,400	540

- When entering the tool to the workpiece, enter the tool from outside to the workpiece.
- Measure after cutting through the R gauge.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.

1STE/2STE/4STE

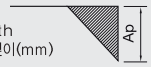
•RPM : rev./min •Feed : mm/min

Material	S45C ~ S55C		SKD/ SUS/ SCM		NAK/HPM	
외경 Outside Diameter	RPM	FEED	RPM	FEED	RPM	FEED
ø2	5,500	85	4,000	75	3,000	50
ø3	4,000	70	3,000	55	2,000	40
ø4	3,000	60	2,500	45	1,800	35
ø5	2,500	50	2,000	40	1,500	30
ø6	2,000	45	1,600	35	1,200	25
ø7	1,800	40	1,300	30	1,150	25
ø8	1,500	35	1,250	30	900	23
ø9	1,350	35	1,100	30	850	20
ø10	1,200	35	900	25	800	20
ø11	1,100	35	850	25	750	20
ø12	1,000	30	800	25	600	15
절입량 Depth of Cut	Ad : 0.05D이하  					

- The parameters on the table is based on 2 flutes. To change the number of flutes, refer to the same diameter of other parameters and then adjust it.
- For engrave machining, check the edge of the flutes.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.

2CHA/3CHA Cutting Condition

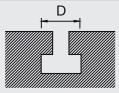
• RPM : rev./min • Feed : mm/min

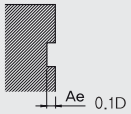
Material	Carbon Steels		Alloy Steels		Hardened Steels	
Hardness	~ 225 HB		225 ~ 325 HB		35~ 40HRC	
Outside Diameter	RPM	FEED	RPM	FEED	RPM	FEED
ø3	4,200	70	3,000	55	2,500	40
ø4	3,000	60	2,500	45	1,800	35
ø6	2,000	40	1,500	35	1,200	25
ø8	1,500	35	1,200	30	900	25
ø10	1,200	35	1,000	25	900	20
ø12	1,000	30	850	25	600	20
Depth of Cut	Ap : 0.1d Ap : Axial Depth 축 방향의 절입 깊이(mm) 					

- The parameters on the table is based on 2 flutes. To change the number of flutes, refer to the same diameter of other parameters and then adjust it.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- Air blow, water-soluble oil, or oil mist is recommended.

4TES/4TRS/3TRC/4&6TDA/4&6TAC

■ 3TRC는 RPM 동일, FEED만 최대 30% Down 적용.
Use the same RPM and reduce the feed by 30% for 3TRC.

Slotting						
Material	Mild Steels / Carbon Steels		Alloy Steels		Prehardened Steels	
Outside Diameter	RPM	FEED	RPM	FEED	RPM	FEED
ø1.5	3,050	117	1,890	77	1,530	59
ø2	2,850	110	1,790	72	1,440	55
ø2.5	2,680	99	1,700	66	1,350	50
ø3	2,500	92	1,610	60	1,260	45
ø4	2,150	81	1,430	54	1,080	41
ø5	1,800	70	1,200	47	900	35
ø6	1,430	59	950	39	720	30
ø8	1,070	44	720	30	540	22
ø10	860	35	580	23	430	17
ø12	720	30	480	20	360	14
Depth of Cut						

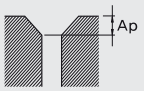
Side Cutting						
Material	Mild Steels / Carbon Steels		Alloy Steels		Prehardened Steels	
Outside Diameter	RPM	FEED	RPM	FEED	RPM	FEED
ø1.5	3,050	162	1,890	94	1,530	76
ø2	2,850	149	1,790	88	1,440	70
ø2.5	2,680	135	1,700	83	1,350	65
ø3	2,500	122	1,610	79	1,260	59
ø4	2,150	108	1,430	72	1,080	54
ø5	1,800	95	1,200	65	900	49
ø6	1,430	86	950	58	720	43
ø8	1,070	64	720	43	540	32
ø10	860	52	580	34	430	26
ø12	720	43	480	29	360	22
Depth of Cut						

- When entering the tool to the workpiece, enter the tool from outside to the workpiece.
- The parameters on the table is based on 4 flutes. For using 3TRC , use the same RPM and reduce the feed by 30%.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.
- If a vibration is occurred while side milling, reduce the feed.

Cutting Data

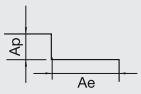
2CEN Cutting Condition

•RPM : rev./min •Feed : mm/min

Material	Mild Steels/ Carbon Steels			Alloy Steels/ Tool Steels			Prehardened Steels (30~45HRC)			Aluminum Alloys		
외경 Outside Diameter	RPM	FEED	Ap Axial Depth	RPM	FEED	Ap Axial Depth	RPM	FEED	Ap Axial Depth	RPM	FEED	Ap Axial Depth
ø2	1,400	100	2	800	50	2	650	40	1	4,800	280	2
ø3	1,400	100	3	800	50	3	650	40	1.5	4,800	280	3
ø4	1,280	100	4	690	50	4	580	40	2	4,200	280	4
ø5	1,300	100	5	640	50	5	520	40	2.5	3,300	280	5
ø6	1,150	100	6	600	50	6	480	40	3	2,900	280	6
ø8	1,000	100	8	530	50	8	420	40	4	2,600	280	8
ø10	850	90	10	490	40	10	390	30	5	2,400	260	10
ø12	720	90	12	410	40	12	310	30	6	1,900	260	12
ø14	610	90	14	340	40	14	270	30	7	1,700	240	14
ø16	550	90	16	310	40	16	250	30	8	1,500	230	16
Depth of Cut												

2CENE/2CCMC

•RPM : rev./min •Feed : mm/min

Material	Mild Steels/ Carbon Steels				Alloy Steels				Prehardened Steels (30~45HRC)				Copper				Aluminum			
Outside Diameter	RPM	FEED	Ap	Ae	RPM	FEED	Ap	Ae	RPM	FEED	Ap	Ae	RPM	FEED	Ap	Ae	RPM	FEED	Ap	Ae
ø1	28,000	230	1.5	0.05	24,500	180	1.5	0.05	17,500	120	1.5	0.05	23,000	150	1.5	0.1	50,000	400	1.5	0.2
ø1.5	18,700	340	2.0	0.10	16,300	180	2.0	0.10	11,700	120	2.0	0.10	13,000	150	2.0	0.3	40,900	400	2.0	0.3
ø2	14,000	360	2.5	0.15	12,300	220	2.5	0.15	8,800	170	2.5	0.15	11,500	150	2.5	0.4	31,800	400	2.5	0.4
ø3	9,300	390	4.0	0.30	8,200	240	4.0	0.30	5,800	170	4.0	0.30	8,000	200	4.0	0.6	21,200	400	4.0	0.6
ø4	7,000	390	5.0	0.40	6,100	240	5.0	0.40	4,400	180	5.0	0.40	6,000	200	5.0	0.8	15,900	500	5.0	0.8
ø5	5,600	470	6.0	0.50	4,900	260	6.0	0.50	3,500	200	6.0	0.50	5,000	200	6.0	1	12,700	500	6.0	1
ø6	4,700	480	8.0	0.60	4,100	270	8.0	0.60	2,900	200	8.0	0.60	4,000	200	8.0	1.2	10,600	500	8.0	1.2
ø8	3,500	470	10.0	1.00	3,100	270	10.0	1.00	2,200	200	10.0	1.00	3,000	200	10.0	1.6	8,000	600	10.0	1.6
ø10	2,800	480	12.0	1.20	2,500	280	12.0	1.20	1,800	200	12.0	1.20	2,400	200	12.0	2	6,400	600	12.0	2
ø12	2,300	470	15.0	1.50	2,000	260	15.0	1.50	1,500	200	15.0	1.50	2,000	200	15.0	2.4	5,300	700	15.0	2.4
Depth of Cut	Side Milling • Ap : Axial Depth • Ae : Radial Depth 																			

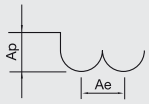
- Grooving with 2CENE is not possible and 2CCMC is also not recommeded.
- Above parameters are for side milling.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.
- If a vibration is occurred while side milling, reduce the feed.

2HCBE Cutting Condition

• RPM : rev./min • Feed : mm/min

Material	Alloy Steels				Prehardened Steels				Hardened Steels			
경도 Hardness	30 ~ 40HRC				40 ~ 50HRC				50 ~ 52HRC			
Corner Radius	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
R 0.15	35,100	728	0.100	0.015	31,200	598	0.093	0.015	25,740	364	0.088	0.015
R 0.2	35,100	936	0.200	0.020	31,200	728	0.186	0.020	25,740	468	0.176	0.020
R 0.25	35,100	1456	0.300	0.025	31,200	1144	0.279	0.025	25,740	728	0.264	0.025
R 0.3	35,100	1872	0.350	0.030	31,200	1482	0.326	0.030	23,400	832	0.308	0.030
R 0.35	31,200	2288	0.400	0.040	23,400	1534	0.372	0.040	19,500	962	0.352	0.040
R0.4	30,420	2704	0.450	0.045	21,684	1716	0.419	0.045	17,706	1066	0.396	0.045
R0.5	29,640	2964	0.450	0.050	19,890	1872	0.419	0.050	15,990	1118	0.396	0.050
R0.75	24,960	3250	0.525	0.075	16,770	2028	0.488	0.075	13,650	1235	0.462	0.075
R 1	20,280	3536	0.600	0.100	13,650	2184	0.558	0.100	11,310	1352	0.528	0.100
R1.25	16,887	3536	0.700	0.125	11,310	2184	0.651	0.125	9,360	1352	0.616	0.125
R1.5	13,494	3536	0.800	0.150	8,970	2184	0.744	0.150	7,410	1352	0.704	0.150
R2	10,296	3640	1.000	0.200	6,864	2288	0.930	0.200	5,616	1404	0.880	0.200
R2.5	9,750	4186	1.200	0.250	6,474	2600	1.116	0.250	4,992	1482	1.056	0.250
R3	8,073	4004	1.500	0.300	5,382	2496	1.395	0.300	4,134	1456	1.320	0.300
R4	6,084	3744	2.000	0.400	4,056	2314	1.860	0.400	3,120	1326	1.760	0.400
R5	4,797	3536	2.500	1.000	3,198	2158	2.325	1.000	2,496	1248	2.200	1.000
R6	4,095	3536	3.000	1.200	2,730	2158	2.790	1.200	2,067	1248	2.640	1.200
R8	3,385	3172	4.000	1.600	2,028	1872	3.720	1.600	1,435	935	3.520	1.600

Depth of Cut



Ap : Axial Depth (mm)
Ae : Radial Depth (mm)
D : Outside Diameter (mm)
n : Speed (min^{-1})
Vf : Feed (mm/min)

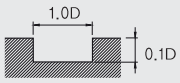
- When milling workpiece HRC over 52 hardened steel , reduce 20% of the RPM and feed compared to the same diameter.
- If the effective length of your tool does not show above the table, use the shorten effevtive length of parameter and reduce the parameters in the same proportion.
- In case of long effective length, reduce the RPM and feed in same proportion.
- Air blow or oil mist is recommended for smooth chip emission, and dry milling is recommended for copper material.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- Use a machine with low vibration and good rigidity (Ø1 or less, the vibration tolerance management should be within 5㎛).
- During the chip evacuation, note for heat and ignition.

Cutting Data

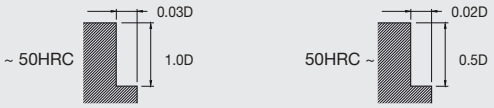
2HCEE/4HCEE : 4HCEE는 RPM 동일 FEED만 최대 30% Up 적용
Use the same RPM and raise up the feed up to 30% for 4HCEE.

•RPM : rev./min •Feed : mm/min

Slotting

Material	Alloy Steels				Prehardened Steels				Hardened Steels			
Hardness	30 ~ 40HRC				40 ~ 50HRC				50 ~ 52HRC			
Outside Diameter	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
ø0.2	50,000	230	0.02	0.15	45,000	207	0.02	0.15	40,000	176	0.02	0.15
ø0.5	50,000	660	0.05	0.45	45,000	594	0.05	0.45	40,000	505	0.05	0.45
ø0.7	50,000	810	0.07	0.65	45,000	729	0.07	0.65	37,500	620	0.07	0.65
ø0.9	49,000	1,180	0.09	0.80	39,000	1062	0.09	0.80	27,800	903	0.09	0.80
ø1	48,000	1,350	0.10	1.00	38,000	1215	0.10	1.00	25,500	1033	0.10	1.00
ø1.5	42,000	1,440	0.15	1.50	30,000	1296	0.15	1.50	21,500	1102	0.15	1.50
ø2	33,300	1,530	0.20	2.00	26,000	1377	0.20	2.00	17,500	1170	0.20	2.00
ø2.5	26,500	1,530	0.25	2.50	22,500	1377	0.25	2.50	15,800	1170	0.25	2.50
ø3	21,800	1,800	0.30	3.00	17,300	1620	0.30	3.00	11,500	1377	0.30	3.00
ø4	16,700	2,160	0.40	4.00	13,200	1944	0.40	4.00	8,800	1652	0.40	4.00
ø5	15,700	2,610	0.50	5.00	12,500	2349	0.50	5.00	8,300	1997	0.50	5.00
ø6	13,100	2,700	0.60	6.00	10,350	2430	0.60	6.00	6,900	2066	0.60	6.00
ø8	9,880	2,375	0.80	8.00	7,800	2137	0.80	8.00	5,200	1817	0.80	8.00
ø10	7,800	2,050	1.00	10.00	6,150	1845	1.00	10.00	4,100	1568	1.00	10.00
ø12	6,650	1,710	1.20	12.00	5,250	1539	1.20	12.00	3,500	1308	1.20	12.00
ø16	5,540	1,670	1.60	16.00	4,340	1503	1.60	16.00	2,600	1278	1.60	16.00
Depth of Cut												

Side Cutting

Material	Alloy Steels				Prehardened Steels				Hardened Steels			
Hardness	30 ~ 40HRC				40 ~ 50HRC				50 ~ 52HRC			
Outside Diameter	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
ø1	48,000	1,260	1.00	0.03	38,000	980	1.00	0.03	25,500	610	1.00	0.02
ø2	33,300	1,440	2.00	0.06	26,000	1160	2.00	0.06	17,500	720	2.00	0.04
ø3	21,800	1,440	3.00	0.09	17,300	1160	3.00	0.09	11,500	720	3.00	0.06
ø4	16,700	1,500	4.00	0.12	13,200	1200	4.00	0.12	8,800	750	4.00	0.08
ø5	15,700	1,740	5.00	0.15	12,500	1380	5.00	0.15	8,300	850	5.00	0.10
ø6	13,100	1,620	6.00	0.18	10,350	1320	6.00	0.18	6,900	830	6.00	0.12
ø8	9,880	1,584	8.00	0.24	7,800	1230	8.00	0.24	5,200	760	8.00	0.16
ø10	7,800	1,440	10.00	0.30	6,150	1160	10.00	0.30	4,100	700	10.00	0.20
ø12	6,650	1,440	12.00	0.36	5,250	1160	12.00	0.36	3,500	700	12.00	0.24
ø16	5,540	1,200	16.00	0.39	4,340	1055	16.00	0.39	2,600	630	16.00	0.32
Depth of Cut												

- The edge of the flute precisely grinded. If you want to measure the tool, and to avoid damaging on the flutes, use non-contact measuring method.
- When milling workpiece HRC over 52 hardened steel , reduce 20% of the RPM and feed compared to the same diameter.
- The parameters on the table is based on 2flutes. For using 4flutes, use the same RPM and raise up the feed up to 30% in stable milling condition.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.
- Use a machine with low vibration and good rigidity (Ø1 or less, the vibration tolerance management should be within 5㎛).
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

3NSE/4NSE

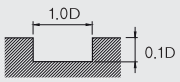
■ 4NSE는 RPM 동일, FEED만 최대 50% Up 적용
■ Use the same RPM and raise up the feed up to 50% for 4NSE.

• RPM : rev./min • Feed : mm/min

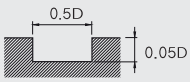
Slotting

Material	Alloy Steels				Prehardened Steels				Hardened Steels			
Hardness	30 ~ 40HRC				40 ~ 50HRC				50 ~ 52HRC			
Outside Diameter	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
ø1	13,000	60	0.10	1.0	9,000	40	0.10	1.0	5,700	15	0.05	0.50
ø1.5	10,000	60	0.15	1.5	6,000	50	0.15	1.5	4,500	15	0.08	0.75
ø2	6,400	60	0.20	2.0	4,800	50	0.20	2.0	3,000	15	0.10	1.00
ø3	4,200	65	0.30	3.0	3,400	60	0.30	3.0	2,100	20	0.15	1.50
ø4	3,400	65	0.40	4.0	2,700	33	0.40	4.0	1,700	20	0.20	2.00
ø5	2,900	65	0.50	5.0	2,300	44	0.50	5.0	1,500	20	0.25	2.50
ø6	2,500	70	0.60	6.0	2,000	55	0.60	6.0	1,300	28	0.30	3.00
ø8	1,900	70	0.80	8.0	1,500	55	0.80	8.0	1,000	28	0.40	4.00
ø10	1,600	70	1.00	10.0	1,300	55	1.00	10.0	800	28	0.50	5.00
ø12	1,300	65	1.20	12.0	1,100	50	1.20	12.0	670	22	0.60	6.00

Depth of Cut



~ 50HRC

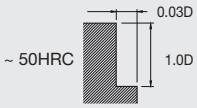


50HRC ~

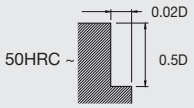
Side Cutting

Material	Alloy Steels				Prehardened Steels				Hardened Steels			
Hardness	30 ~ 40HRC				40 ~ 50HRC				50 ~ 52HRC			
Outside Diameter	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
ø1	13,000	60	1	0.030	9,000	35	1	0.030	5,700	20	0.50	0.02
ø1.5	10,000	60	2	0.045	6,000	45	2	0.045	4,500	35	0.75	0.03
ø2	6,400	60	2	0.060	4,800	45	2	0.060	3,000	30	1.00	0.04
ø3	4,200	65	3	0.090	3,400	55	3	0.090	2,100	40	1.50	0.06
ø4	3,400	80	4	0.120	2,700	65	4	0.120	1,700	50	2.00	0.08
ø5	2,900	100	5	0.150	2,300	80	5	0.150	1,500	60	2.50	0.10
ø6	2,500	120	6	0.180	2,000	100	6	0.180	1,300	75	3.00	0.12
ø8	1,900	130	8	0.240	1,500	100	8	0.240	1,000	85	4.00	0.16
ø10	1,600	130	10	0.300	1,300	100	10	0.300	800	75	5.00	0.20
ø12	1,300	120	12	0.360	1,100	90	12	0.360	670	60	6.00	0.24

Depth of Cut



~ 50HRC



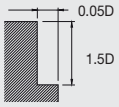
50HRC ~

- The edge of the flute precisely grinded. If you want to measure the tool, and to avoid damaging on the flutes, use non-contact measuring method.
- When milling workpiece HRC over 55 hardened steel , reduce 20% of the RPM and feed compared to the same diameter.
- The parameters on the table is based on 3flutes. For using 4flutes, use the same RPM and raise up the feed up to 50% in stable milling condition.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

Cutting Data

4HEME Cutting Condition

•RPM : rev./min •Feed : mm/min

Side Cutting												
Material	Alloy Steels				Prehardened Steels				Hardened Steels			
Hardness	30 ~ 40HRC				40 ~ 50HRC				50 ~ 52HRC			
Outside Diameter	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
ø1	40,000	960	1.5	0.050	40,000	880	1.5	0.050	40,000	615	0.50	0.03
ø1.5	40,000	1,200	2.3	0.075	40,000	1000	2.3	0.075	38,500	700	0.75	0.05
ø2	40,000	1,600	3.0	0.100	38,000	1440	3.0	0.100	36,500	1000	1.00	0.06
ø3	38,400	3,650	4.5	0.150	34,560	3280	4.5	0.150	27,650	2300	1.50	0.09
ø4	28,800	4,220	6.0	0.200	25,920	3800	6.0	0.200	20,730	2660	2.00	0.12
ø5	24,000	4,800	7.5	0.250	21,600	4320	7.5	0.250	17,280	3020	2.50	0.15
ø6	19,200	5,570	9.0	0.300	17,280	5010	9.0	0.300	13,820	3500	2.50	0.18
ø8	14,400	5,570	12.0	0.400	12,960	5010	12.0	0.400	10,370	3500	3.00	0.24
ø10	11,520	5,570	15.0	0.500	10,360	5010	15.0	0.500	8,290	3500	4.00	0.30
ø12	9,600	4,600	18.0	0.600	8,640	4140	18.0	0.600	6,900	2900	6.00	0.36
ø14	8,950	4,130	21.0	0.700	8,140	3740	21.0	0.700	6,120	2460	7.00	0.42
ø16	7,200	3,460	24.0	0.800	6,480	3110	24.0	0.800	5,190	2180	8.00	0.48
Depth of Cut	~ 50HRC  0.05D 1.5D				50HRC ~  0.03D 0.5D							

- The edge of the flute precisely grinded. If you want to measure the tool, and to avoid damaging on the flutes, use non-contact measuring method.
- When milling workpiece HRC over 52 hardened steel , reduce 20% of the RPM and feed compared to the same diameter.
- If you clamp the endmill with long overhang of effective length, reduce the RPM and feed in the same proportion.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

2NCRE/4NCRE

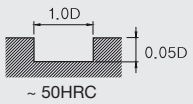
4NCRE는 RPM 동일, FEED만 최대 30% Up 적용
Use the same RPM and raise up the feed up to 30% for 4NCRE.

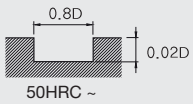
• RPM : rev./min • Feed : mm/min

Slotting

Material	Alloy Steels				Prehardened Steels				Hardened Steels			
Hardness	30 ~ 40HRC				40 ~ 50HRC				50 ~ 52HRC			
Outside Diameter	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
ø1	43,200	2,040	0.05	1.0	24,200	990	0.05	1.0	22,950	400	0.02	0.80
ø1.5	28,250	2,160	0.08	1.5	23,850	1,090	0.08	1.5	20,340	440	0.03	1.20
ø2	29,970	2,430	0.10	2.0	15,570	1,200	0.10	2.0	15,750	470	0.04	1.60
ø3	19,620	2,470	0.15	3.0	11,880	1,230	0.15	3.0	10,350	480	0.06	2.40
ø4	15,030	2,530	0.20	4.0	11,250	1,310	0.20	4.0	7,920	490	0.08	3.20
ø5	14,130	2,700	0.25	5.0	9,315	1,280	0.25	5.0	7,470	520	0.10	4.00
ø6	11,790	2,630	0.30	6.0	7,020	1,170	0.30	6.0	6,210	510	0.12	4.80
ø8	8,890	2,400	0.40	8.0	5,530	1,090	0.40	8.0	4,680	470	0.16	6.40
ø10	7,020	2,240	0.50	10.0	4,720	1,090	0.50	10.0	3,690	440	0.20	8.00
ø12	5,985	2,240	0.60	12.0	4,350	1,050	0.60	12.0	3,150	440	0.24	9.60

Depth of Cut

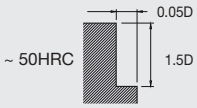


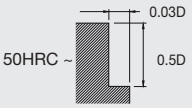


Side Cutting

Material	Alloy Steels				Prehardened Steels				Hardened Steels			
Hardness	30 ~ 40HRC				40 ~ 50HRC				50 ~ 52HRC			
Outside Diameter	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
ø1	43,200	870	1.5	0.050	34,200	780	1.5	0.050	22,950	470	0.50	0.03
ø1.5	37,080	980	2.3	0.075	29,250	890	2.3	0.075	19,350	550	0.75	0.05
ø2	29,970	1,280	3.0	0.100	23,400	1,150	3.0	0.100	15,750	690	1.00	0.06
ø3	19,620	1,300	4.5	0.150	15,570	1,180	4.5	0.150	13,500	700	1.50	0.09
ø4	15,030	1,330	6.0	0.200	11,880	1,200	6.0	0.200	7,920	720	2.00	0.12
ø5	14,130	1,550	7.5	0.250	11,250	1,400	7.5	0.250	7,470	840	2.50	0.15
ø6	11,790	1,440	9.0	0.300	9,310	1,300	9.0	0.300	6,210	780	2.50	0.18
ø8	8,890	1,410	12.0	0.400	7,020	1,270	12.0	0.400	4,680	760	3.00	0.24
ø10	7,020	1,280	15.0	0.500	5,530	1,150	15.0	0.500	3,690	690	4.00	0.30
ø12	5,980	1,280	18.0	0.600	4,720	1,150	18.0	0.600	3,150	690	6.00	0.36

Depth of Cut





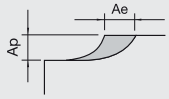
- The parameters on the table is based on 2 flutes. For using 4 flutes, use the same RPM and raise up the feed up to 30% in stable milling condition.
- When milling workpiece HRC over 52 hardened steel, reduce 20% of the RPM and feed compared to the same diameter.
- If the effective length is long, reduce the RPM and feed maximum 30%.
- For curved milling, set up the lower value of the pitch than the corner radius value of tool diameter.
- For curved milling, raise up the feed up to 30% in stable milling condition.
- For groove milling, set up the Ae value by considering of corner radius value.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- Use the adequate coolant for work material and machining geometry and note for heat and ignition.

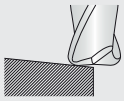
4RCUE Cutting Condition

• RPM : rev./min • Feed : mm/min

Material		Alloy Steels				Prehardened Steels				Hardened Steels			
Hardness		30 ~ 40HRC				40 ~ 50HRC				50 ~ 52HRC			
Outside Diameter	Corner Radius	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
ø1	R0.2	40,500	6,230	0.05	0.06	37,800	6,940	0.03	0.05	31,500	6,050	0.02	0.05
ø1.5	R0.5	36,000	8,010	0.06	0.72	36,000	7,120	0.04	0.65	27,000	6,230	0.03	0.60
ø2	R0.5	29,700	8,900	0.08	0.96	24,300	7,480	0.05	0.86	21,600	6,670	0.04	0.80
ø3	R0.5	19,800	9,790	0.12	1.44	16,200	8,010	0.08	1.30	14,400	7,560	0.06	1.20
ø4	R0.5	17,100	11,570	0.17	2.04	14,400	8,900	0.13	1.84	11,700	8,900	0.09	1.70
〃	R1.0	15,300	10,680	0.15	1.80	12,600	8,450	0.12	1.62	10,800	7,830	0.08	1.50
ø5	R0.5	13,500	12,460	0.23	2.76	10,800	10,680	0.17	2.48	9,900	8,900	0.12	2.30
〃	R1.0	11,700	11,570	0.20	2.40	9,900	9,790	0.15	2.16	8,640	8,450	0.10	2.00
ø6	R0.5	11,680	13,650	0.29	3.42	9,540	11,570	0.17	3.08	8,550	10,680	0.11	2.85
〃	R1.0	11,340	11,210	0.28	3.36	8,930	11,210	0.17	3.02	8,100	9,790	0.11	2.80
〃	R1.5	9,900	11,570	0.25	3.00	8,100	9,790	0.15	2.70	7,200	8,540	0.10	2.50
ø8	R0.5	7,920	14,680	0.34	4.10	7,380	11,570	0.23	3.69	6,390	11,570	0.17	3.42
〃	R1.0	7,560	13,350	0.34	4.03	7,200	10,680	0.22	3.63	6,030	9,790	0.17	3.36
〃	R2.0	7,380	11,570	0.30	3.60	6,300	9,790	0.20	3.24	5,400	8,540	0.15	3.00
ø10	R0.5	6,730	13,300	0.34	6.16	5,700	11,260	0.23	5.54	4,970	9,720	0.17	5.13
〃	R1.0	6,550	12,960	0.34	6.05	5,540	10,960	0.22	5.44	4,840	9,470	0.17	5.04
〃	R2.0	5,850	11,570	0.30	5.40	4,950	9,790	0.20	4.86	4,320	8,450	0.15	4.50
ø12	R0.5	6,300	13,350	0.53	6.37	4,880	10,502	0.35	5.73	4,350	9,450	0.30	5.31
〃	R1.0	5,760	12,460	0.51	6.16	4,760	10,230	0.34	5.54	4,240	9,210	0.29	5.13
〃	R2.0	5,400	11,120	0.50	6.05	4,640	9,970	0.34	5.44	4,130	8,970	0.28	5.04
〃	R3.0	4,950	10,680	0.45	5.40	4,140	8,900	0.30	4.86	3,690	8,010	0.25	4.50

Depth of Cut





Inclined Cutting

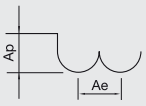
■ Coefficients respective of tool overhang

Type	Overhang	Revolution	Feed rate	Depth of Cut ap
Straight	L/D ≦5	100%	100%	100%
	L/D = 6	90%	80%	80%
	L/D = 7	80%	70%	70%
Taper neck	L/D = 6	100%	100%	100%
	L/D = 8	90%	80%	80%
	L/D ≧10	80%	70%	70%

- If the effective length is long, reduce the RPM and feed maximum 30%.
- For side milling, refer to the corner radius value.
- For curved milling, set up the lower value of the pitch than the corner radius value of tool diameter.
- For curved milling, raise up the feed up to 30% in stable milling condition.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, adjust RPM and feed in the same proportion.
- If the effective length is long, refer to the table (Coefficients respective of tool overhang) and adjust the RPM and feed.
- If you use small value of Ap, raise up the RPM and feed.
- Air blow or oil mist is recommended for smooth chip emission.

2HRB Cutting Condition

• RPM : rev./min • Feed : mm/min

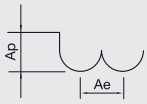
Material		Copper				Prehardened Steel / Hardened Steel				Hardened Steels				Hardened Steels			
Hardness						30 ~ 45HRC				45 ~ 55HRC				55 ~ 62HRC			
Radius	유효 Effective Length	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
R0.05	0.3	50,000	85	0.004	0.004	45,000	70	0.004	0.004	45,000	50	0.002	0.002	45,000	40	0.002	0.002
〃	0.5	50,000	75	0.004	0.004	45,000	60	0.002	0.002	45,000	30	0.002	0.002	45,000	30	0.002	0.002
R0.1	0.5	50,000	492	0.010	0.010	45,000	396	0.006	0.007	45,000	260	0.006	0.006	45,000	220	0.005	0.006
〃	1	50,000	432	0.007	0.008	45,000	372	0.004	0.005	45,000	276	0.004	0.004	45,000	200	0.004	0.004
〃	1.5	50,000	360	0.006	0.006	42,000	276	0.003	0.004	42,000	216	0.003	0.004	42,000	180	0.003	0.003
R0.15	1	50,000	744	0.012	0.013	45,000	552	0.010	0.010	38,000	420	0.090	0.010	38,000	348	0.007	0.009
〃	3	48,000	528	0.008	0.009	40,800	360	0.006	0.007	33,600	264	0.005	0.005	33,600	216	0.004	0.005
〃	5	39,600	336	0.004	0.005	28,800	216	0.003	0.003	24,000	168	0.003	0.003	21,600	120	0.002	0.002
R0.2	1	61,200	1,020	0.021	0.034	54,000	768	0.016	0.022	39,600	516	0.013	0.022	39,600	432	0.011	0.021
〃	3	55,200	768	0.015	0.016	44,400	480	0.010	0.010	32,400	312	0.009	0.010	32,400	264	0.008	0.010
〃	5	39,600	468	0.008	0.016	30,000	372	0.008	0.010	26,400	288	0.006	0.010	26,400	228	0.004	0.005
R0.25	1	63,600	1,560	0.026	0.047	45,600	960	0.020	0.033	33,600	636	0.014	0.032	33,600	312	0.007	0.020
〃	5	52,800	1,032	0.012	0.014	34,800	552	0.008	0.008	31,200	444	0.007	0.010	31,200	216	0.006	0.009
〃	10	38,400	528	0.008	0.016	28,800	456	0.007	0.010	28,800	372	0.005	0.010	27,600	216	0.005	0.009
R0.3	1	63,600	1,956	0.030	0.140	39,600	960	0.022	0.091	27,600	600	0.019	0.091	26,400	516	0.014	0.091
〃	5	50,400	1,104	0.014	0.068	28,800	504	0.012	0.043	26,400	396	0.008	0.042	26,400	336	0.007	0.040
〃	10	31,200	540	0.006	0.032	24,000	360	0.005	0.020	22,800	312	0.004	0.020	22,800	240	0.003	0.018
R0.4	2	61,200	2,280	0.054	0.160	34,800	816	0.045	0.100	27,600	552	0.038	0.100	26,400	456	0.030	0.010
〃	6	51,600	1,452	0.035	0.100	28,800	636	0.028	0.068	21,600	420	0.020	0.068	21,600	348	0.015	0.065
〃	10	31,000	630	0.022	0.080	23,400	468	0.020	0.050	17,300	408	0.015	0.050	16,800	336	0.010	0.050
R0.5	2	50,400	2,160	0.068	0.320	33,600	900	0.052	0.220	21,600	540	0.040	0.220	18,000	540	0.008	0.140
〃	5	50,400	2,160	0.068	0.320	33,600	900	0.052	0.220	21,600	540	0.040	0.220	18,000	540	0.008	0.014
〃	10	30,000	1,164	0.024	0.086	16,320	600	0.020	0.056	15,000	456	0.014	0.056	13,680	312	0.008	0.050
〃	16	17,640	720	0.018	0.086	13,680	480	0.016	0.056	12,360	384	0.012	0.056	11,520	252	0.005	0.030
R0.75	3	31,200	2,400	0.167	0.320	21,600	1,152	0.120	0.210	12,960	672	0.100	0.210	12,000	600	0.090	0.210
〃	10	26,400	1,680	0.100	0.220	14,760	780	0.080	0.170	9,720	480	0.062	0.170	9,720	456	0.050	0.160
〃	18	12,120	624	0.030	0.160	12,120	504	0.022	0.110	9,600	432	0.020	0.110	9,600	408	0.012	0.110
〃	30	9,840	516	0.014	0.080	9,840	456	0.012	0.050	9,480	420	0.010	0.050	9,480	396	0.010	0.050
R1	4	26,400	2,448	0.220	0.520	21,000	1,392	0.180	0.350	14,640	1,080	0.140	0.350	14,640	900	0.120	0.350
〃	10	26,400	2,256	0.180	0.350	21,000	1,224	0.140	0.230	14,640	972	0.110	0.230	14,640	792	0.090	0.230
〃	20	15,960	1,164	0.090	0.165	15,960	600	0.060	0.110	12,720	600	0.055	0.110	12,720	492	0.035	0.110
〃	30	10,200	636	0.025	0.070	10,200	480	0.020	0.050	10,200	480	0.015	0.050	10,200	384	0.015	0.045
R1.5	6	16,800	3,240	0.250	0.500	14,400	1,824	0.200	0.340	9,840	1,320	0.160	0.320	6,480	732	0.160	0.320
〃	10	16,800	3,240	0.250	0.500	14,400	1,824	0.200	0.340	9,840	1,320	0.160	0.320	6,480	732	0.160	0.300
〃	20	14,040	2,244	0.200	0.450	12,360	1,476	0.145	0.320	8,520	1,128	0.120	0.310	5,760	660	0.080	0.300
〃	30	10,920	1,620	0.120	0.220	9,360	816	0.100	0.150	8,520	816	0.080	0.150	5,760	384	0.070	0.300
R2	8	12,600	3,012	0.350	0.850	10,440	1,752	0.290	0.550	7,200	1,332	0.220	0.500	7,200	1,056	0.150	0.500
〃	20	12,600	3,012	0.350	0.850	10,440	1,752	0.290	0.550	7,200	1,332	0.220	0.500	7,200	1,056	0.150	0.500
〃	30	11,160	2,040	0.250	0.500	8,880	1,380	0.200	0.320	6,600	1,056	0.150	0.300	6,600	816	0.130	0.300
〃	40	8,160	1,464	0.150	0.500	7,200	1,056	0.132	0.320	6,600	1,056	0.100	0.300	6,600	816	0.090	0.300
R2.5	15	10,800	2,880	0.380	0.800	8,400	1,500	0.300	0.700	6,000	1,140	0.220	0.700	6,000	900	0.200	0.650
〃	25	10,800	2,400	0.380	0.800	8,400	1,380	0.300	0.550	6,000	1,080	0.220	0.550	6,000	816	0.200	0.500
〃	40	9,360	1,320	0.250	0.800	6,720	840	0.200	0.550	4,920	660	0.150	0.550	4,920	504	0.130	0.500
R3	15	8,400	2,676	0.500	1.000	8,160	1,764	0.420	0.800	5,760	1,320	0.300	0.800	4,440	864	0.300	0.800
〃	30	8,400	1,812	0.380	0.900	7,200	1,680	0.300	0.650	5,040	1,176	0.220	0.650	4,440	792	0.220	0.600
R4	25	8,160	1,764	0.410	1.000	7,200	1,176	0.350	0.750	4,920	912	0.180	0.600	4,560	732	0.200	0.630
〃	30	7,680	1,680	0.380	1.000	6,960	1,128	0.300	0.750	4,800	864	0.160	0.600	4,320	720	0.200	0.600
R5	30	6,240	1,344	0.560	1.200	5,880	1,128	0.370	0.900	4,800	852	0.200	0.670	4,200	708	0.200	0.650
〃	35	6,000	1,296	0.500	1.000	5,400	1,080	0.350	0.850	4,560	816	0.150	0.600	3,840	648	0.200	0.600
R6	30	5,160	1,104	0.650	1.400	4,800	984	0.420	0.900	4,320	828	0.250	0.600	3,600	600	0.250	0.600
〃	40	4,920	1,080	0.600	1.200	4,560	9,600	0.400	0.850	4,080	780	0.200	0.600	3,600	600	0.200	0.600
Depth of Cut		• Ap : Axial Depth • Ae : Radial Depth • D : Outside Diameter • n : Speed • Vf : Feed															

- If the effective length is long, reduce the RPM and feed in the same proportion.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, adjust RPM and feed in the same proportion.
- Use a machine with low vibration and good rigidity (ø1 or less, the vibration tolerance management should be within 5㎛).
- Air blow or oil mist is recommended for smooth chip emission, and dry milling is recommended for copper material.

Cutting Data

2PHCB / 2HSB / 2HCB Cutting Condition

• RPM : rev./min • Feed : mm/min

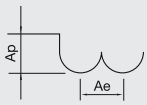
Material		Copper				Prehardened Steel / Hardened Steel				Hardened Steels				Hardened Steels			
Hardness						30 ~ 45HRC				45 ~ 55HRC				55 ~ 62HRC			
Radius	Cutting Length	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
R0.05	0.2	40,000	300	0.010	0.050	40,000	300	0.005	0.040	30,000	200	0.004	0.040	Cutting is not possible.			
R0.1	0.2	54,000	430	0.012	0.008	54,000	630	0.020	0.060	44,300	450	0.040	0.012	30,000	300	0.023	0.008
〃	0.4	54,000	430	0.007	0.008	54,000	430	0.020	0.051	44,300	345	0.016	0.040	32,800	260	0.010	0.023
R0.15	0.3	54,000	720	0.020	0.013	54,000	750	0.030	0.090	44,300	600	0.024	0.072	32,800	450	0.015	0.042
〃	0.6	54,000	720	0.012	0.013	54,000	715	0.030	0.075	44,300	575	0.024	0.060	32,800	430	0.015	0.035
R0.2	0.4	54,000	870	0.028	0.016	54,000	1,000	0.040	0.120	44,300	800	0.032	0.096	32,800	600	0.020	0.056
〃	0.8	54,000	870	0.016	0.016	54,000	880	0.040	0.105	44,300	700	0.032	0.084	32,800	525	0.020	0.049
R0.25	0.5	56,000	1,250	0.035	0.022	53,000	1,250	0.050	0.150	43,500	1,000	0.040	0.120	32,200	750	0.025	0.070
〃	1	56,000	1,380	0.021	0.022	50,000	1,000	0.050	0.125	41,350	800	0.040	0.100	30,600	600	0.025	0.058
R0.3	0.6	58,000	1,510	0.042	0.026	52,000	1,380	0.060	0.180	42,650	1,100	0.048	0.144	31,500	825	0.030	0.084
〃	1.2	58,000	1,710	0.025	0.026	48,500	1,020	0.060	0.155	40,500	810	0.048	0.124	30,000	610	0.030	0.072
R0.4	0.8	52,000	1,870	0.056	0.036	48,000	1,500	0.080	0.240	39,500	1,200	0.064	0.192	29,250	900	0.040	0.112
〃	2	52,000	1,970	0.033	0.036	45,000	1,085	0.080	0.200	37,500	870	0.064	0.160	27,800	650	0.040	0.093
R0.5	1	41,000	1,660	0.063	0.040	38,540	1,560	0.100	0.300	36,900	1,250	0.080	0.240	27,300	940	0.050	0.140
〃	2.5	41,000	1,880	0.022	0.040	38,540	1,000	0.100	0.200	31,500	800	0.080	0.160	23,000	600	0.050	0.090
R0.6	3	34,000	2,120	0.072	0.051	31,960	1,550	0.120	0.360	32,800	1,250	0.096	0.288	24,400	940	0.060	0.168
R0.75	1.5	27,000	2,280	0.087	0.068	25,380	1,600	0.150	0.450	28,700	1,280	0.120	0.360	21,500	960	0.075	0.210
〃	4	27,000	1,830	0.052	0.068	25,380	1,000	0.150	0.325	26,000	800	0.120	0.260	19,250	600	0.075	0.152
R1	2	32,700	3,560	0.112	0.089	30,738	1,850	0.200	0.600	24,600	1,480	0.160	0.480	18,250	1,110	0.100	0.280
〃	5	32,700	2,980	0.067	0.089	30,738	1,350	0.200	0.435	22,000	1,080	0.160	0.348	16,250	810	0.100	0.203
R1.25	6	30,600	3,680	0.067	0.115	28,764	1,600	0.250	0.542	27,901	1,280	0.200	0.430	15,500	960	0.125	0.251
R1.5	3	26,100	4,400	0.197	0.171	24,534	2,520	0.300	0.957	23,798	2,050	0.240	0.766	15,500	1,530	0.150	0.447
〃	8	26,100	4,110	0.100	0.171	24,534	2,350	0.300	0.765	23,798	1,880	0.240	0.612	15,500	1,410	0.150	0.357
R2	4	18,800	4,160	0.266	0.208	17,672	2,450	0.400	1.380	17,142	1,960	0.320	1.100	12,800	1,470	0.200	0.644
〃	8	18,800	3,920	0.134	0.208	17,672	2,350	0.400	1.020	17,142	1,880	0.320	0.816	12,800	1,410	0.200	0.476
R2.5	5	17,300	3,980	0.215	0.240	16,262	2,560	0.500	1.660	15,774	2,050	0.400	1.330	11,000	1,530	0.250	0.770
〃	10	17,300	3,660	0.180	0.240	16,262	2,300	0.500	1.275	15,774	1,840	0.400	1.020	11,000	1,380	0.250	0.595
R3	6	16,500	3,880	0.290	0.281	15,510	2,700	0.600	2.340	15,045	2,160	0.480	1.870	9,600	1,620	0.300	1.090
〃	12	16,500	3,500	0.230	0.281	15,510	2,400	0.600	1.530	15,045	1,920	0.480	1.225	9,600	1,440	0.300	0.715
R4	8	11,660	4,000	0.400	0.175	10,960	2,300	0.800	3.100	10,632	1,840	0.640	2.480	7,600	1,380	0.400	1.446
〃	14	11,660	3,850	0.400	0.175	10,960	2,000	0.800	2.050	10,632	1,600	0.640	1.640	7,600	1,200	0.400	0.957
R5	10	9,560	4,100	0.500	0.154	8,986	2,200	1.000	3.750	8,717	1,780	0.800	3.000	6,400	1,340	0.500	1.750
〃	18	9,560	3,720	0.500	0.154	8,986	1,700	1.000	2.550	8,717	1,360	0.800	2.040	6,400	1,020	0.500	1.190
R6	12	7,100	4,000	0.600	0.159	6,674	1,850	1.200	4.420	6,474	1,480	0.960	3.540	5,450	1,110	0.600	2.060
〃	22	7,100	3,250	0.600	0.159	6,674	1,600	1.200	3.050	6,474	1,280	0.960	2.440	5,450	960	0.600	1.423
R8	30	4,650	2,000	0.115	0.450	4,371	1,630	3.870	1.120	4,240	1,100	2.350	0.790	4,000	810	1.742	0.500
R10	38	3,200	2,200	0.100	0.400	3,008	1,450	4.120	1.100	2,918	1,100	2.530	0.840	3,100	800	1.866	0.520
Depth of Cut		• Ap : Axial Depth • Ae : Radial Depth • D : Outside Diameter • n : Speed • Vf : Feed															

- If the effective length is long, reduce the RPM and feed in the same proportion.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, adjust RPM and feed in the same proportion.
- Use a machine with low vibration and good rigidity (Ø1 or less, the vibration tolerance management should be within 5㎛).
- Air blow or oil mist is recommended for smooth chip emission, and dry milling is recommended for copper material.

3HCB/4HSB/4HCB

: 3HCB는 RPM 동일, FEED만 최대 20% Down 적용
: Use the same RPM, reduce the feed rate up to 20% for 3HCB

Material	Copper				Prehardened Steel / Hardened Steel				Hardened Steels				Hardened Steels			
Hardness					30 ~ 45HRC				45 ~ 55HRC				55 ~ 62HRC			
Radius	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
R 0.5	41,000	1990	0.063	0.040	38,540	1870	0.100	0.300	36,900	1500	0.080	0.240	27,300	1120	0.050	0.140
R 0.75	27,000	2740	0.087	0.068	25,380	1920	0.150	0.450	28,700	1530	0.120	0.360	21,500	1150	0.075	0.210
R 1	32,700	4200	0.112	0.089	30,738	2220	0.200	0.600	24,600	1770	0.160	0.480	18,250	1330	0.100	0.280
R 1.25	30,600	4400	0.067	0.115	28,764	1920	0.250	0.542	27,901	1540	0.200	0.430	15,500	1150	0.125	0.251
R 1.5	26,100	5280	0.197	0.171	24,534	3020	0.300	0.957	23,798	1820	0.240	0.766	15,500	1840	0.150	0.447
R 2	18,800	4990	0.266	0.208	17,672	2940	0.400	1.380	17,142	1850	0.320	1.100	12,800	1760	0.200	0.644
R 2.5	17,300	4770	0.215	0.240	16,262	3070	0.500	1.660	15,774	1870	0.400	1.330	11,000	1800	0.250	0.770
R 3	16,500	4650	0.290	0.281	15,510	3240	0.600	2.340	15,045	1900	0.480	1.870	9,600	2000	0.300	1.090
R 4	11,660	4800	0.400	0.175	10,960	2760	0.800	3.100	10,632	1820	0.640	2.480	7,600	1650	0.400	1.446
R 5	9,560	4920	0.500	0.154	8,986	2640	1.000	3.750	8,717	1850	0.800	3.000	6,400	1600	0.500	1.750
R 6	7,100	4800	0.600	0.159	6,674	2220	1.200	4.420	6,474	1770	0.960	3.540	5,450	1650	0.600	2.060
R 8	4,650	3900	0.115	0.450	4,371	1950	3.870	1.120	4,240	1760	2.350	0.790	4,000	1670	1.742	0.500
R 10	3,200	3950	0.100	0.400	3,008	1740	4.120	1.100	2,918	1750	2.530	0.840	3,100	1680	1.866	0.520
Depth of Cut	• Ap : Axial Depth • Ae : Radial Depth • D : Outside Diameter • n : Speed • Vf : Feed															



- If the effective length is long, reduce the RPM and feed in the same proportion.
- The parameters on the table is based on 4flutes. For using 3 flutes (3HCB), use the same RPM and reduce the feed maximum 20% in stable milling condition.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, adjust RPM and feed in the same proportion.
- Use a machine with low vibration and good rigidity (Ø1 or less, the vibration tolerance management should be within 5㎛).
- Air blow or oil mist is recommended for smooth chip emission, and dry milling is recommended for copper material.

Cutting Data

2HRE Cutting Condition

• RPM : rev./min • Feed : mm/min

Material		Carbon Steels				Alloy steel				Prehardened Steel / Hardened Steel				Hardened Steels			
Hardness		S45C / S50C (~225HB)				225 ~ 325HB				35 ~ 45HRC				45 ~ 60HRC			
Outside Diameter	Effective Length	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
ø0.2	0.5	56,000	340	0.006	0.16	56,000	310	0.005	0.16	56,000	270	0.003	0.16	44,800	180	0.002	0.144
〃	1	50,900	290	0.005	0.02	50,900	260	0.005	0.02	50,900	230	0.004	0.02	40,800	160	0.003	0.018
〃	1.5	48,200	250	0.003	0.006	48,200	230	0.003	0.006	48,200	200	0.002	0.006	38,500	140	0.002	0.0054
ø0.3	1	60,000	560	0.009	0.101	60,000	500	0.008	0.101	60,000	400	0.006	0.101	52,100	330	0.004	0.0909
〃	1.5	50,800	460	0.008	0.057	50,800	410	0.007	0.057	50,800	360	0.005	0.057	42,700	260	0.004	0.0513
〃	2	41,500	350	0.006	0.013	41,500	320	0.005	0.013	41,500	280	0.004	0.013	33,200	190	0.003	0.0117
〃	3	31,900	240	0.002	0.004	31,900	220	0.002	0.004	31,900	190	0.001	0.004	25,500	130	0.001	0.0036
〃	4	26,200	170	0.001	0.003	26,200	160	0.001	0.003	26,200	140	0.001	0.003	20,900	100	0.001	0.0027
〃	5	20,400	100	0.001	0.002	20,400	90	0.001	0.002	20,400	80	0.001	0.002	16,300	60	0.001	0.0018
ø0.4	1	52,700	660	0.012	0.054	57,700	640	0.010	0.054	48,100	470	0.008	0.054	38,500	320	0.005	0.0486
〃	5	38,500	380	0.003	0.003	34,200	300	0.003	0.003	30,100	240	0.002	0.003	24,100	160	0.001	0.0027
〃	10	33,700	260	0.001	0.001	27,300	190	0.001	0.001	24,600	150	0.001	0.001	19,700	100	0.001	0.0009
ø0.5	2	56,800	900	0.020	0.098	54,000	760	0.016	0.098	40,600	510	0.014	0.098	32,500	350	0.010	0.0882
〃	3	44,200	660	0.080	0.016	39,900	530	0.090	0.016	32,200	370	0.008	0.016	25,700	260	0.006	0.0144
〃	4	40,600	580	0.009	0.012	36,100	460	0.008	0.012	29,700	330	0.008	0.012	23,700	230	0.005	0.0108
〃	5	37,000	500	0.080	0.008	32,300	390	0.008	0.008	27,200	290	0.006	0.008	21,700	200	0.004	0.0072
〃	6	33,400	420	0.005	0.004	28,500	320	0.005	0.004	24,700	250	0.003	0.004	19,700	170	0.002	0.0036
〃	8	29,100	320	0.002	0.002	24,100	240	0.002	0.002	21,600	190	0.001	0.002	17,400	130	0.001	0.0018
〃	10	26,100	250	0.001	0.001	21,200	180	0.001	0.001	19,600	150	0.001	0.001	15,600	100	0.001	0.0009
〃	14	21,500	120	0.001	0.001	16,700	80	0.001	0.001	16,300	70	0.001	0.001	13,000	50	0.001	0.0009
ø0.6	2	63,600	1,240	0.025	0.203	53,300	930	0.020	0.203	39,100	600	0.016	0.203	31,300	410	0.011	0.1827
〃	3	52,500	990	0.018	0.114	44,000	740	0.016	0.114	33,500	500	0.013	0.114	26,800	340	0.009	0.1026
〃	4	41,300	740	0.012	0.025	34,700	550	0.011	0.025	27,900	390	0.009	0.025	22,300	270	0.006	0.0225
〃	5	36,700	630	0.010	0.017	30,900	470	0.009	0.017	25,500	340	0.007	0.017	20,400	240	0.005	0.0153
〃	6	32,100	520	0.007	0.008	27,000	390	0.006	0.008	23,000	290	0.005	0.008	18,400	200	0.003	0.0072
〃	8	26,800	390	0.004	0.003	22,600	300	0.004	0.003	20,000	230	0.003	0.003	16,000	160	0.002	0.0027
〃	10	23,400	30	0.002	0.002	19,700	230	0.002	0.002	17,900	180	0.002	0.002	14,300	130	0.001	0.0018
〃	12	20,900	240	0.002	0.001	17,600	180	0.001	0.001	16,400	150	0.001	0.001	13,100	100	0.001	0.0009
〃	16	16,200	100	0.001	0.001	13,700	80	0.001	0.001	13,500	70	0.001	0.001	10,800	50	0.001	0.0009
ø0.7	2	59,800	1,380	0.030	0.038	50,200	1,040	0.027	0.038	36,100	660	0.021	0.038	28,800	430	0.015	0.0342
〃	4	38,900	840	0.017	0.047	32,700	630	0.015	0.047	25,800	440	0.012	0.047	20,600	290	0.009	0.0423
〃	6	30,200	600	0.010	0.014	25,400	450	0.009	0.014	21,200	330	0.007	0.014	16,900	230	0.005	0.0126
〃	8	25,300	460	0.006	0.006	21,300	350	0.005	0.006	18,400	260	0.004	0.006	14,700	190	0.003	0.0054
〃	10	22,000	360	0.004	0.003	18,500	270	0.003	0.003	16,500	220	0.003	0.003	13,200	160	0.002	0.0027
ø0.8	2	41,200	1,050	0.033	0.108	34,500	460	0.029	0.108	26,200	530	0.023	0.108	21,000	370	0.016	0.0972
〃	4	37,100	930	0.027	0.08	31,100	700	0.024	0.08	24,100	480	0.019	0.08	19,300	330	0.013	0.072
〃	6	28,800	680	0.015	0.024	24,200	510	0.013	0.024	19,800	370	0.010	0.024	15,800	250	0.007	0.0216
〃	8	24,100	520	0.009	0.01	20,300	390	0.008	0.01	17,200	300	0.006	0.01	13,800	200	0.004	0.009
〃	10	21,000	420	0.006	0.005	17,700	320	0.005	0.005	15,500	240	0.040	0.005	12,400	170	0.003	0.0045
〃	12	18,700	340	0.004	0.003	15,800	260	0.003	0.003	14,100	200	0.003	0.003	11,300	140	0.002	0.0027
〃	14	15,600	230	0.002	0.001	13,200	180	0.020	0.001	12,300	150	0.001	0.001	980	100	0.001	0.0009
ø0.9	6	27,600	790	0.019	0.019	23,000	590	0.017	0.019	18,500	420	0.013	0.019	14,800	290	0.010	0.0171
〃	8	23,000	600	0.012	0.012	19,300	450	0.011	0.012	16,100	330	0.008	0.012	12,900	230	0.006	0.0108
〃	10	20,000	470	0.008	0.008	16,800	360	0.007	0.008	14,500	270	0.005	0.008	11,600	190	0.004	0.0072
ø1.0	2	37,900	1,340	0.048	0.263	31,500	990	0.043	0.263	23,400	6,500	0.034	0.263	18,700	440	0.237	0.237
〃	3	37,900	1,340	0.048	0.263	31,500	990	0.043	0.263	23,400	6,500	0.034	0.263	18,700	440	0.237	0.237
〃	4	34,100	1,170	0.040	0.195	28,400	870	0.036	0.195	21,500	580	0.028	0.195	17,200	400	0.176	0.176
〃	5	30,300	1,000	0.032	0.013	25,300	750	0.029	0.013	19,600	510	0.022	0.013	15,700	360	0.011	0.011
〃	6	26,500	850	0.023	0.058	22,100	630	0.021	0.058	17,600	440	0.016	0.058	14,100	310	0.052	0.052
〃	8	22,100	660	0.014	0.024	18,600	490	0.013	0.024	15,300	360	0.010	0.024	12,300	250	0.022	0.022
〃	10	19,200	530	0.010	0.013	16,200	400	0.009	0.013	13,800	300	0.007	0.013	11,000	210	0.012	0.012
〃	12	17,200	440	0.007	0.007	14,500	330	0.006	0.007	12,600	250	0.005	0.007	10,100	170	0.006	0.006
〃	14	15,600	360	0.005	0.005	13,200	270	0.004	0.005	11,700	210	0.003	0.005	9,400	150	0.005	0.005
〃	16	14,300	300	0.004	0.003	12,100	230	0.003	0.003	11,000	180	0.003	0.003	8,800	130	0.003	0.003
〃	20	12,500	200	0.003	0.001	10,600	160	0.003	0.001	9,800	130	0.002	0.001	7,900	90	0.001	0.001
〃	25	10,800	120	0.003	0.001	9,200	90	0.002	0.001	8,800	80	0.002	0.001	7,100	50	0.001	0.001
〃	30	9,700	50	0.002	0.001	8,200	40	0.002	0.001	8,100	30	0.001	0.001	6,500	30	0.001	0.0009
ø1.2	4	28,900	1,180	0.050	0.189	24,100	870	0.047	0.189	18,300	580	0.036	0.189	14,500	400	0.170	0.170
〃	6	24,800	970	0.037	0.120	20,700	720	0.034	0.120	16,100	490	0.026	0.120	12,800	340	0.108	0.108
〃	8	20,700	760	0.024	0.051	17,300	570	0.021	0.051	13,900	400	0.016	0.051	11,100	280	0.046	0.046
〃	10	18,000	620	0.016	0.026	15,100	470	0.014	0.026	12,400	340	0.011	0.026	9,900	230	0.023	0.023
〃	12	16,100	520	0.011	0.015	13,500	390	0.010	0.015	11,400	290	0.008	0.015	9,100	200	0.014	0.014
〃	16	13,400	380	0.006	0.006	11,300	290	0.005	0.006	9,800	220	0.004	0.006	7,900	150	0.005	0.005
〃	20	11,700	280	0.004	0.003	9,900	210	0.004	0.003	8,800	170	0.003	0.003	7,000	120	0.003	0.003
〃	25	10,800	120	0.003	0.001	9,200	90	0.002	0.001	8,800	80	0.002	0.001	7,100	50	0.001	0.001
〃	30	9,700	50	0.002	0.001	8,200	40	0.002	0.001	8,100	30	0.001	0.001	6,500	30	0.001	0.0009

2HRE Cutting Condition

•RPM : rev./min •Feed : mm/min

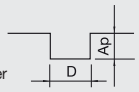
Material		Carbon Steels				Alloy steel				Prehardened Steel / Hardened Steel				Hardened Steels			
Hardness		S45C / S50C (~225HB)				225 ~ 325HB				35 ~ 45HRC				45 ~ 60HRC			
Outside Diameter	Effective Length	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
ø1.4	6	23,300	1,070	0.052	0.222	19,400	800	0.047	0.222	14,800	540	0.060	0.222	11,900	370	0.200	0.200
〃	8	19,500	850	0.035	0.094	16,300	640	0.032	0.094	12,900	440	0.025	0.094	10,300	310	0.085	0.085
〃	10	16,900	710	0.025	0.048	14,200	530	0.022	0.048	11,500	380	0.017	0.048	9,200	260	0.043	0.043
〃	14	13,700	510	0.013	0.018	11,500	390	0.012	0.018	9,700	290	0.009	0.018	7,800	200	0.016	0.016
〃	16	12,600	450	0.010	0.012	10,600	340	0.009	0.012	9,100	250	0.007	0.012	7,300	180	0.011	0.011
〃	20	10,300	300	0.006	0.005	8,700	230	0.005	0.005	7,800	180	0.004	0.005	6,200	120	0.005	0.005
ø1.5	4	26,600	1,340	0.073	0.462	22,100	1,000	0.065	0.462	16,300	640	0.051	0.462	13,000	440	0.416	0.416
〃	6	22,800	1,120	0.057	0.293	19,000	840	0.051	0.293	14,400	550	0.040	0.293	11,500	380	0.264	0.264
〃	8	19,000	900	0.041	0.124	15,900	670	0.037	0.124	12,500	460	0.029	0.124	10,000	320	0.112	0.112
〃	10	16,600	750	0.030	0.063	13,800	560	0.027	0.063	11,200	390	0.021	0.063	8,900	270	0.057	0.057
〃	12	14,800	630	0.023	0.037	12,400	470	0.020	0.037	10,200	340	0.016	0.037	8,200	240	0.033	0.033
〃	14	13,400	550	0.017	0.023	11,200	410	0.016	0.023	9,500	300	0.012	0.023	7,600	210	0.021	0.021
〃	16	12,300	480	0.013	0.015	10,300	360	0.012	0.015	8,900	270	0.009	0.015	7,100	190	0.014	0.014
〃	18	11,500	420	0.011	0.011	9,600	310	0.010	0.011	8,400	240	0.007	0.011	6,700	170	0.010	0.010
〃	20	10,700	370	0.009	0.008	9,000	280	0.008	0.008	7,900	220	0.006	0.008	6,300	150	0.007	0.007
〃	25	9,300	270	0.005	0.004	7,800	200	0.005	0.004	7,100	160	0.004	0.004	5,700	110	0.004	0.004
〃	30	8,300	200	0.004	0.002	7,000	150	0.004	0.002	6,500	120	0.003	0.002	5,200	90	0.002	0.002
ø1.6	10	16,100	780	0.035	0.082	13,500	580	0.032	0.082	10,800	410	0.025	0.082	8,600	280	0.018	0.074
〃	14	13,000	580	0.020	0.030	10,900	430	0.018	0.030	9,100	320	0.014	0.030	7,300	220	0.010	0.027
〃	18	11,100	450	0.013	0.014	9,300	340	0.012	0.014	8,000	260	0.009	0.014	6,400	180	0.006	0.013
ø2	4	23,000	1,500	0.070	0.966	20,000	1,200	0.060	0.966	14,000	750	0.052	0.966	12,000	500	0.040	0.869
〃	6	20,300	1,350	0.064	0.926	17,400	1,030	0.058	0.926	12,500	650	0.045	0.926	10,000	450	0.032	0.833
〃	8	17,000	1,090	0.054	0.391	14,500	830	0.048	0.391	10,800	540	0.038	0.391	8,700	380	0.027	0.352
〃	10	14,800	920	0.045	0.200	12,600	700	0.040	0.200	9,700	470	0.031	0.200	7,800	330	0.022	0.180
〃	12	13,200	790	0.037	0.116	11,200	600	0.034	0.116	8,900	420	0.026	0.116	7,100	290	0.019	0.104
〃	14	12,000	700	0.031	0.073	10,200	530	0.028	0.073	8,200	370	0.022	0.073	6,600	260	0.016	0.066
〃	16	11,100	620	0.026	0.049	9,400	470	0.024	0.049	7,700	340	0.018	0.049	6,100	230	0.013	0.044
〃	18	10,300	550	0.022	0.034	8,700	420	0.020	0.034	7,200	310	0.015	0.034	5,800	210	0.011	0.031
〃	20	9,600	500	0.018	0.025	8,100	380	0.016	0.025	6,900	280	0.013	0.025	5,500	190	0.009	0.023
〃	22	8,700	420	0.014	0.018	7,500	320	0.014	0.018	6,500	250	0.010	0.018	5,200	170	0.008	0.016
〃	25	8,400	390	0.012	0.013	7,100	290	0.011	0.013	6,200	230	0.008	0.013	4,900	160	0.006	0.012
〃	30	7,500	310	0.008	0.007	6,300	230	0.007	0.007	5,600	180	0.005	0.007	4,500	130	0.004	0.006
ø2.5	8	15,000	1,340	0.077	0.954	12,800	1,020	0.069	0.954	9,600	670	0.054	0.954	7,700	460	0.039	0.859
〃	10	13,100	1,140	0.068	0.488	11,100	860	0.061	0.488	8,600	590	0.048	0.488	6,900	400	0.034	0.439
〃	12	11,800	1,000	0.060	0.283	10,000	750	0.054	0.283	7,900	520	0.042	0.283	6,300	360	0.030	0.255
〃	16	9,900	790	0.045	0.119	8,400	590	0.040	0.119	6,800	430	0.031	0.119	5,500	290	0.022	0.107
〃	20	8,700	650	0.033	0.061	7,300	490	0.030	0.061	6,100	360	0.023	0.061	4,900	250	0.017	0.055
〃	25	7,600	520	0.022	0.031	6,400	390	0.019	0.031	5,500	300	0.015	0.031	4,400	210	0.011	0.028
〃	30	6,800	430	0.014	0.018	5,700	320	0.012	0.018	5,000	250	0.010	0.018	4,000	1,700	0.007	0.016
〃	35	6,200	380	0.009	0.012	5,200	280	0.008	0.012	4,800	190	0.007	0.012	3,800	1,400	0.005	0.011
〃	40	5,700	290	0.005	0.008	4,800	220	0.004	0.008	4,400	170	0.003	0.008	3,500	120	0.002	0.007
〃	50	5,000	190	0.001	0.004	4,200	140	0.001	0.004	3,900	120	0.001	0.004	3,100	80	0.001	0.004
ø3	6	13,200	1,470	0.103	1.978	10,900	1,080	0.093	1.978	8,000	700	0.072	1.978	6,400	480	0.052	1.780
〃	10	11,600	1,270	0.092	1.013	9,600	930	0.083	1.013	7,200	620	0.064	1.013	5,800	430	0.046	0.912
〃	12	10,500	1,110	0.081	0.586	8,700	830	0.073	0.586	6,700	560	0.057	0.586	5,300	380	0.041	0.527
〃	16	8,900	900	0.064	0.247	7,400	670	0.058	0.247	5,900	470	0.045	0.247	4,700	320	0.032	0.222
〃	20	7,800	750	0.050	0.127	6,600	560	0.045	0.127	5,300	400	0.035	0.127	4,300	280	0.025	0.114
〃	25	6,900	620	0.036	0.065	5,800	460	0.032	0.065	4,800	340	0.025	0.065	3,900	230	0.018	0.059
〃	30	6,200	520	0.026	0.038	5,200	390	0.023	0.038	4,500	290	0.018	0.038	3,600	200	0.013	0.034
〃	35	5,700	440	0.018	0.024	4,800	330	0.016	0.024	4,200	250	0.013	0.024	3,300	170	0.009	0.022
〃	40	5,300	370	0.013	0.016	4,500	280	0.012	0.016	3,900	220	0.009	0.016	3,100	150	0.006	0.014
〃	45	5,000	330	0.008	0.012	4,200	230	0.008	0.012	3,700	180	0.006	0.012	2,900	130	0.005	0.011
〃	50	4,700	270	0.006	0.008	3,900	200	0.005	0.008	3,600	160	0.004	0.008	2,800	110	0.003	0.007
〃	60	4,500	250	0.003	0.005	3,600	180	0.003	0.005	3,200	130	0.003	0.005	2,500	90	0.002	0.005
ø4	8	10,000	1,600	0.014	1.990	8,800	1,100	0.140	1.990	6,800	770	0.093	1.990	5,300	500	0.070	1.791
〃	10	9,200	1,400	0.120	1.960	8,000	1,000	0.120	1.960	5,900	690	0.085	1.960	4,700	460	0.066	1.764
〃	12	8,500	1,280	0.112	1.852	7,100	950	0.101	1.852	5,100	600	0.078	1.852	4,100	410	0.056	1.667
〃	16	7,200	1,050	0.093	0.781	6,000	770	0.084	0.781	4,400	510	0.065	0.781	3,600	350	0.046	0.703
〃	20	6,300	880	0.077	0.400	5,200	650	0.069	0.400	4,000	440	0.054	0.400	3,200	300	0.038	0.360
〃	25	5,600	750	0.061	0.205	4,600	540	0.055	0.205	3,600	380	0.042	0.205	2,900	260	0.030	0.185
〃	30	5,000	630	0.048	0.119	4,100	460	0.043	0.119	3,300	330	0.033	0.119	2,600	230	0.024	0.107
〃	35	4,600	540	0.038	0.075	3,800	400	0.034	0.075	3,100	290	0.026	0.075	2,500	200	0.019	0.068
〃	40	4,200	470	0.030	0.050	3,500	350	0.027	0.050	2,900	250	0.021	0.050	2,300	180	0.015	0.045
〃	45	3,900	410	0.023	0.035	3,300	300	0.021	0.035	2,700	230	0.016	0.035	2,200	160	0.012	0.032
〃	50	3,700	360	0.018	0.026	3,100	270	0.016	0.026	2,600	200	0.013	0.026	2,100	140	0.009	0.023
〃	55	3,500	320	0.015	0.020	2,950	250	0.015	0.020	2,500	180	0.010	0.020	2,000	130	0.007	0.018
〃	60	3,300	280	0.011	0.015	2,800	210	0.010	0.015	2,400	160	0.008	0.015	1,900	110	0.006	0.014

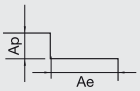
Cutting Data

2HRE Cutting Condition

• RPM : rev./min • Feed : mm/min

Material		Carbon Steels				Alloy steel				Prehardened Steel / Hardened Steel				Hardened Steels			
Hardness		S45C / S50C (~225HB)				225 ~ 325HB				35 ~ 45HRC				45 ~ 60HRC			
Outside Diameter	Effective Length	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
ø5	16	6,000	1,140	0.127	1.907	5,100	860	0.114	1.907	3,500	520	0.089	1.907	2,800	360	0.064	1.716
〃	20	5,300	980	0.121	0.977	4,400	730	0.109	0.977	3,100	440	0.085	0.977	2,500	310	0.061	0.879
〃	25	4,600	820	0.109	0.500	3,800	600	0.099	0.500	2,800	390	0.077	0.500	2,200	270	0.055	0.450
〃	30	4,200	710	0.094	0.289	3,400	510	0.085	0.289	2,500	340	0.066	0.289	2,000	230	0.047	0.260
〃	35	3,800	620	0.077	0.182	3,100	450	0.069	0.182	2,300	300	0.054	0.182	1,900	210	0.038	0.164
〃	40	3,500	540	0.060	0.122	2,800	390	0.054	0.122	2,200	270	0.042	0.122	1,700	180	0.030	0.110
〃	50	3,100	430	0.031	0.063	2,400	300	0.028	0.063	1,900	210	0.022	0.063	1,500	150	0.016	0.057
〃	60	2,800	350	0.013	0.036	2,100	240	0.012	0.036	1,800	170	0.009	0.036	1,400	120	0.007	0.032
ø6	20	4,200	960	0.126	2.025	3,800	780	0.114	2.025	2,600	470	0.088	2.025	2,100	330	0.063	1.823
〃	30	3,400	730	0.109	0.600	2,800	540	0.099	0.600	2,000	340	0.077	0.600	1,600	240	0.055	0.540
〃	40	3,000	600	0.083	0.253	2,300	410	0.074	0.253	1,700	260	0.058	0.253	1,300	170	0.041	0.228
〃	50	2,600	480	0.054	0.130	1,900	310	0.049	0.130	1,500	220	0.038	0.130	1,200	160	0.027	0.117
〃	60	2,400	410	0.031	0.075	1,700	260	0.028	0.075	1,300	170	0.022	0.075	1,000	120	0.016	0.068
ø8	20	3,200	910	0.180	1.600	2,800	710	0.160	1.600	2,300	450	0.130	1.600	1,700	330	0.090	1.440
〃	40	2,600	600	0.120	0.200	2,000	410	0.100	0.200	1,500	250	0.080	0.200	1,100	160	0.060	0.180
ø10	25	2,900	890	0.200	1.760	2,700	680	0.180	1.760	2,100	430	0.130	1.760	1,500	310	0.080	1.584
〃	45	2,200	580	0.140	0.240	2,000	400	0.120	0.240	1,300	220	0.700	0.240	900	150	0.050	0.216
Depth of Cut		Slotting • Ap : Axial Depth • D : Outside Diameter								Side Milling • Ap : Axial Depth • Ae : Radial Depth							





- The edge of the flute precisely grinded. If you want to measure the tool, and to avoid damaging on the flutes, use non-contact measuring method.
- When milling workpiece, HRC over 60 hardened steel , reduce 20% of the RPM and feed compared to the same diameter.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- Use a machine with low vibration and good rigidity (ø1 or less, the vibration tolerance management should be within 5㎛).
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

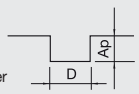
4HRE Cutting Condition

• RPM : rev./min • Feed : mm/min

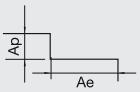
Material		Carbon Steels				Alloy steel				Prehardened Steel / Hardened Steel				Hardened Steels			
Hardness		S45C / S50C (~225HB)				225 ~ 325HB				30 ~ 45HRC				45 ~ 60HRC			
Outside Diameter	Effective Length	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
ø0.8	8	25,000	750	0.009	0.01	21,600	560	0.008	0.01	18,300	450	0.006	0.01	15,900	300	0.004	0.009
〃	16	16,800	340	0.002	0.001	15,700	270	0.020	0.001	13,300	240	0.001	0.001	10,400	200	0.001	0.001
ø1	8	24,000	720	0.014	0.024	20,300	490	0.013	0.024	16,900	390	0.010	0.024	14,200	265	0.007	0.022
〃	16	15,800	325	0.004	0.003	14,300	250	0.003	0.003	12,200	220	0.003	0.003	9,200	178	0.002	0.003
〃	25	12,600	165	0.003	0.001	11,200	120	0.002	0.001	10,800	105	0.002	0.001	8,300	88	0.001	0.001
ø1.5	8	21,000	980	0.041	0.124	18,800	740	0.037	0.124	14,600	520	0.029	0.124	12,400	355	0.020	0.112
〃	16	13,600	544	0.013	0.015	12,200	410	0.012	0.015	10,500	322	0.009	0.015	8,000	230	0.007	0.014
〃	25	11,400	318	0.005	0.004	10,500	240	0.005	0.004	8,600	196	0.004	0.004	6,200	138	0.003	0.004
ø2	8	19,600	1,197	0.054	0.391	17,000	970	0.048	0.391	12,800	630	0.038	0.391	10,600	470	0.027	0.352
〃	16	12,300	740	0.026	0.049	11,600	574	0.024	0.049	9,800	378	0.018	0.049	7,300	268	0.013	0.044
〃	25	10,100	456	0.012	0.013	9,700	348	0.011	0.013	7,900	262	0.008	0.013	6,400	184	0.006	0.012
ø2.5	10	16,600	1,240	0.068	0.488	14,300	1,035	0.061	0.488	10,200	689	0.048	0.488	8,350	510	0.034	0.439
〃	16	11,600	890	0.045	0.119	9,800	710	0.040	0.119	7,220	480	0.031	0.119	6,700	326	0.022	0.107
〃	25	8,700	630	0.022	0.031	8,300	460	0.019	0.031	6,360	338	0.015	0.031	5,500	273	0.011	0.028
ø3	8	14,800	1,390	0.092	1.978	12,100	1,100	0.083	1.978	8,800	736	0.064	1.978	6,900	553	0.046	1.780
〃	16	10,200	968	0.064	0.247	8,600	816	0.058	0.247	6,300	543	0.045	0.247	5,890	362	0.032	0.222
〃	25	7,600	740	0.036	0.038	7,100	518	0.032	0.038	5,880	397	0.025	0.038	3,900	293	0.018	0.034
〃	35	6,200	415	0.018	0.024	5,300	374	0.016	0.024	4,730	322	0.013	0.024	3,300	216	0.009	0.022
ø4	8	12,300	1,830	0.014	1.990	10,200	1,210	0.140	1.990	7,400	848	0.093	1.990	6,300	500	0.070	1.791
〃	16	8,600	1,240	0.093	0.781	7,200	860	0.084	0.781	5,100	573	0.065	0.781	5,150	397	0.046	0.703
〃	25	6,400	890	0.061	0.205	5,000	590	0.055	0.205	4,180	433	0.042	0.205	3,180	304	0.030	0.185
〃	40	4,950	510	0.030	0.050	3,900	385	0.027	0.050	3,300	341	0.021	0.050	2,770	208	0.015	0.045
ø5	16	7,200	1,280	0.127	1.907	6,400	944	0.114	1.907	4,387	554	0.089	1.907	4,220	378	0.064	1.716
〃	25	5,400	955	0.109	0.500	4,600	665	0.099	0.500	3,668	412	0.077	0.500	2,740	280	0.055	0.450
〃	40	4,100	660	0.060	0.122	3,300	470	0.054	0.122	3,655	298	0.042	0.122	2,320	180	0.030	0.110
ø6	20	4,880	1,088	0.126	2.025	4,433	726	0.114	2.025	2,980	528	0.088	2.025	2,640	356	0.063	1.823
〃	40	3,800	720	0.083	0.253	2,950	497	0.074	0.253	2,100	326	0.058	0.253	2,078	226	0.041	0.228
ø8	20	4,460	980	0.180	1.600	3,600	787	0.160	1.600	2,540	487	0.130	1.600	2,430	343	0.090	1.440
〃	40	3,400	780	0.120	0.200	2,460	516	0.100	0.200	1,890	297	0.080	0.200	1,770	211	0.060	0.180
ø10	25	3,400	926	0.200	1.760	3,160	726	0.180	1.760	2,360	467	0.130	1.760	1,650	326	0.080	1.584
〃	35	2,170	640	0.140	0.240	2,120	615	0.120	0.240	1,780	412	0.090	0.240	1,180	192	0.070	0.216
ø12	30	2,500	710	0.220	1.840	2,300	580	0.200	1.840	2,000	400	0.140	1.840	1,400	280	0.080	1.656
〃	40	1,880	526	0.120	0.280	1,820	474	0.110	0.280	1,690	345	0.080	0.280	1,020	184	0.060	0.252

Depth of Cut

Slotting
- Ap : Axial Depth
- D : Outside Diameter



Side Milling
- Ap : Axial Depth
- Ae : Radial Depth



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- Use a machine with low vibration and good rigidity (Ø1 or less, the vibration tolerance management should be within 5㎛).
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

Cutting Data

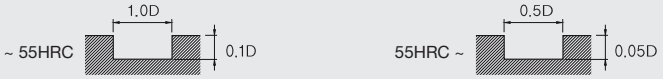
2HSE/2HCE Cutting Condition

• RPM : rev./min • Feed : mm/min

Slotting

Material	Alloy Steel		Prehardened Steel / Hardened Steel		Hardened Steels		Hardened Steels	
Hardness	30 ~ 40HRC		40 ~ 50HRC		50 ~ 55HRC		55 ~ 60HRC	
Outside Diameter	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
Ø 0.1	50,000	100	45,000	100	40,000	90	33,000	50
Ø 0.2	50,000	130	45,000	115	40,000	95	33,000	60
Ø 0.3	50,000	190	45,000	140	40,000	115	33,000	70
Ø 0.4	50,000	235	45,000	180	40,000	140	33,000	90
Ø 0.5	50,000	370	45,000	280	40,000	220	33,000	140
Ø 0.6	50,000	470	45,000	360	40,000	285	30,000	160
Ø 0.8	50,000	600	40,000	440	30,000	295	25,000	185
Ø 0.9	49,000	655	39,000	520	27,800	330	22,700	205
Ø 1	48,000	750	38,000	570	25,500	360	20,500	215
Ø 2	33,300	850	26,000	680	17,500	420	14,500	260
Ø 3	21,800	850	17,300	680	11,500	420	9,500	260
Ø 4	16,700	880	13,200	700	8,800	440	7,200	270
Ø 5	15,700	1,000	12,500	805	8,300	500	6,400	285
Ø 6	13,100	950	10,350	770	6,900	480	5,300	280
Ø 8	9,880	930	7,800	720	5,200	445	4,000	255
Ø 10	7,800	850	6,150	680	4,100	415	3,200	240
Ø 12	6,650	850	5,250	680	3,500	415	2,650	240
Ø 16	5,540	780	4,340	610	2,600	360	1,840	180
Ø 18	5,540	780	4,340	610	2,600	360	1,840	180
Ø 20	4,640	720	4,340	570	2,100	300	1,460	180

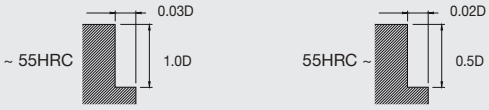
Depth of Cut



Side Cutting

Material	Alloy Steel		Prehardened Steel / Hardened Steel		Hardened Steels		Hardened Steels	
Hardness	30 ~ 40HRC		40 ~ 50HRC		50 ~ 55HRC		55 ~ 60HRC	
Outside Diameter	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
Ø 1	48,000	1,050	38,000	820	25,500	510	20,500	310
Ø 2	33,300	1,200	26,000	970	17,500	600	14,500	370
Ø 3	21,800	1,200	17,300	970	11,500	600	9,500	370
Ø 4	16,700	1,250	13,200	1,000	8,800	625	7,200	385
Ø 5	15,700	1,450	12,500	1,150	8,300	710	6,400	410
Ø 6	13,100	1,350	10,350	1,100	6,900	690	5,300	400
Ø 8	9,880	1,320	7,800	1,030	5,200	635	4,000	365
Ø 10	7,800	1,200	6,150	970	4,100	590	3,200	340
Ø 12	6,650	1,200	5,250	970	3,500	590	2,650	340
Ø 16	5,540	1,000	4,340	880	2,600	530	1,840	300
Ø 18	5,540	1,000	4,200	880	2,450	530	1,650	300
Ø 20	4,640	950	3,650	800	2,100	500	1,460	295

Depth of Cut



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- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
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- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

4HSE/4HCE Cutting Condition

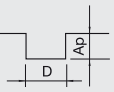
• RPM : rev./min • Feed : mm/min

Slotting

Material	Alloy Steel/ Tool Steel				Prehardened Steel / Hardened Steel				Hardened Steels				Hardened Steels			
Hardness	30 ~ 40HRC				40 ~ 50HRC				50 ~ 55HRC				55 ~ 60HRC			
Outside Diameter	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
ø0.3	50,000	190	0.03	0.3	45,000	140	0.03	0.3	40,000	115	0.02	0.150	33,000	70	0.01	0.075
ø0.4	50,000	235	0.04	0.4	45,000	180	0.04	0.4	40,000	140	0.02	0.200	33,000	90	0.01	0.100
ø0.5	50,000	370	0.05	0.5	45,000	280	0.05	0.5	40,000	220	0.03	0.250	33,000	140	0.01	0.125
ø0.6	50,000	470	0.06	0.6	45,000	360	0.06	0.6	40,000	285	0.03	0.300	30,000	160	0.02	0.150
ø0.8	50,000	600	0.08	0.8	40,000	440	0.08	0.8	30,000	295	0.04	0.400	25,000	185	0.02	0.200
ø0.9	49,000	655	0.09	0.9	39,000	520	0.09	0.9	27,800	330	0.05	0.450	22,700	205	0.02	0.225
ø1	48,000	1,050	0.1	1.0	38,000	684	0.1	1.0	25,500	430	0.05	0.500	20,500	260	0.03	0.250
ø2	33,300	1,190	0.2	2.0	26,000	816	0.2	2.0	17,500	500	0.10	1.000	14,500	310	0.05	0.500
ø3	21,800	1,190	0.3	3.0	17,300	816	0.3	3.0	11,500	500	0.15	1.500	9,500	310	0.08	0.750
ø4	16,700	1,232	0.4	4.0	13,200	840	0.4	4.0	8,800	530	0.20	2.000	7,200	325	0.10	1.000
ø5	15,700	1,400	0.5	5.0	12,500	966	0.5	5.0	8,300	600	0.25	2.500	6,400	340	0.13	1.250
ø6	13,100	1,330	0.6	6.0	10,350	924	0.6	6.0	6,900	575	0.30	3.000	5,300	335	0.15	1.500
ø8	9,880	1,300	0.8	8.0	7,800	864	0.8	8.0	5,200	535	0.40	4.000	4,000	300	0.20	2.000
ø10	7,800	1,190	1.0	10.0	6,150	816	1.0	10.0	4,100	500	0.50	5.000	3,200	290	0.25	2.500
ø12	6,650	1,190	1.2	12.0	5,250	816	1.2	12.0	3,500	500	0.60	6.000	2,650	290	0.30	3.000
ø16	5,540	1,090	1.6	16.0	4,340	732	1.6	16.0	2,600	430	0.80	8.000	1,840	215	0.40	4.000
ø18	5,540	1,090	1.8	18.0	4,340	730	1.8	18.0	2,600	430	0.90	9.000	1,840	215	0.45	4.500
ø20	4,640	1,008	2.0	20.0	4,340	730	2.0	20.0	2,600	430	1.00	10.000	1,840	215	0.50	5.000

Depth of Cut

Slotting
• Ap : Axial Depth
• D : Outside Diameter

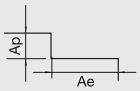


Side Cutting

Material	Alloy Steel/ Tool Steel				Prehardened Steel / Hardened Steel				Hardened Steels				Hardened Steels			
Hardness	30 ~ 40HRC				40 ~ 50HRC				50 ~ 55HRC				55 ~ 60HRC			
Outside Diameter	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
ø0.3	50,000	228	0.3	0.009	45,000	168	0.3	0.009	40,000	138	0.15	0.006	33,000	84	0.08	0.003
ø0.4	50,000	282	0.4	0.012	45,000	216	0.4	0.012	40,000	168	0.20	0.008	33,000	108	0.10	0.004
ø0.5	50,000	444	0.5	0.015	45,000	336	0.5	0.015	40,000	264	0.25	0.010	33,000	168	0.13	0.005
ø0.6	50,000	564	0.6	0.018	45,000	432	0.6	0.018	40,000	342	0.30	0.012	30,000	192	0.15	0.006
ø0.8	50,000	720	0.8	0.024	40,000	528	0.8	0.024	30,000	354	0.40	0.016	25,000	222	0.20	0.008
ø0.9	49,000	786	0.9	0.027	39,000	624	0.9	0.027	27,800	396	0.45	0.018	22,700	246	0.23	0.009
ø1	48,000	1,260	1.0	0.030	38,000	821	1.0	0.030	25,500	516	0.50	0.020	20,500	312	0.25	0.010
ø2	33,300	1,428	2.0	0.060	26,000	979	2.0	0.060	17,500	600	1.00	0.040	14,500	372	0.50	0.020
ø3	21,800	1,428	3.0	0.090	17,300	979	3.0	0.090	11,500	600	1.50	0.060	9,500	372	0.75	0.030
ø4	16,700	1,478	4.0	0.120	13,200	1,008	4.0	0.120	8,800	636	2.00	0.080	7,200	390	1.00	0.040
ø5	15,700	1,680	5.0	0.150	12,500	1,159	5.0	0.150	8,300	720	2.50	0.100	6,400	408	1.25	0.050
ø6	13,100	1,596	6.0	0.180	10,350	1,109	6.0	0.180	6,900	690	3.00	0.120	5,300	402	1.50	0.060
ø8	9,880	1,560	8.0	0.240	7,800	1,037	8.0	0.240	5,200	642	4.00	0.160	4,000	360	2.00	0.080
ø10	7,800	1,428	10.0	0.300	6,150	979	10.0	0.300	4,100	600	5.00	0.200	3,200	348	2.50	0.100
ø12	6,650	1,428	12.0	0.360	5,250	979	12.0	0.360	3,500	600	6.00	0.240	2,650	348	3.00	0.120
ø16	5,540	1,308	16.0	0.480	4,340	878	16.0	0.480	2,600	516	8.00	0.320	1,840	258	4.00	0.160
ø18	5,540	1,308	18.0	0.540	4,340	876	18.0	0.540	2,600	516	9.00	0.360	1,840	258	4.50	0.180
ø20	4,640	1,210	20.0	0.600	4,340	876	20.0	0.600	2,600	516	10.00	0.400	1,840	258	5.00	0.200

Depth of Cut

Side Milling
• Ap : Axial Depth
• Ae : Radial Depth



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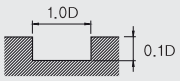
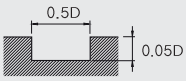
Cutting Data

2LEM / 4LEM

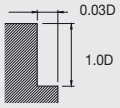
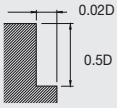
■ 4LEM은 RPM 동일, FEED만 최대 **50% Up** 적용.
■ Use the same RPM and raise up the feed up to 50% for 4LEM.

•RPM : rev./min •Feed : mm/min

Slotting

Material	Alloy Steel/ Tool Steel		Prehardened Steel / Hardened Steel		Hardened Steels		Hardened Steels	
Hardness	30 ~ 40HRC		40 ~ 50HRC		50 ~ 55HRC		55 ~ 62HRC	
Outside Diameter	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
Ø 1	13,000	60	9,000	35	5,700	15	6,500	20
Ø 1.5	10,000	60	6,000	45	4,500	15	4,500	35
Ø 2	6,400	60	4,800	45	3,000	15	3,500	30
Ø 3	4,200	60	3,400	55	2,100	20	2,600	40
Ø 4	3,400	60	2,700	30	1,700	20	1,600	20
Ø 5	2,900	60	2,300	40	1,500	20	1,350	25
Ø 6	2,500	60	2,000	50	1,300	25	1,100	30
Ø 8	1.900	60	1,500	50	1,000	25	900	35
Ø 10	1.600	60	1,300	50	800	25	710	30
Ø 12	1,300	60	1,100	45	670	20	600	25
Ø 16	1,000	40	820	30	500	15	450	20
Ø 20	800	30	650	25	400	13	360	15
Ø 25	650	25	520	20	320	10	280	12
Depth of Cut	~ 50HRC 				50HRC ~ 			

Side Cutting

Material	Alloy Steel/ Tool Steel		Prehardened Steel / Hardened Steel		Hardened Steels		Hardened Steels	
Hardness	30 ~ 40HRC		40 ~ 50HRC		50 ~ 55HRC		55 ~ 62HRC	
Outside Diameter	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
Ø 1	13,000	60	9,000	35	6,500	20	6,500	20
Ø 1.5	10,000	60	6,000	45	5,000	35	4,500	25
Ø 2	6,400	60	4,800	45	3,500	30	3,500	25
Ø 3	4,200	65	3,400	55	2,600	40	2,600	30
Ø 4	3,400	80	2,700	65	2.100	50	1,600	35
Ø 5	2,900	100	2,300	80	1,800	60	1,350	40
Ø 6	2,500	120	2,000	100	1.500	75	1,100	50
Ø 8	1,900	130	1,500	100	1,200	85	900	50
Ø 10	1,600	130	1,300	100	950	75	710	50
Ø 12	1,300	120	1,100	90	800	60	600	40
Ø 16	1,000	80	820	65	600	45	450	30
Ø 20	800	65	650	50	480	40	360	25
Ø 25	650	50	520	40	380	30	280	20
Depth of Cut	~ 50HRC 				50HRC ~ 			

- The edge of the flute precisely grinded. If you want to measure the tool, and to avoid damaging on the flutes, use non-contact measuring method.
- The parameters on the table is based on 2 flutes. For using 4 flutes, use the same RPM and raise up the feed up to 50% in stable milling condition.
- When milling workpiece, HRC over 60 hardened steel , reduce 20% of the RPM and feed compared to the same diameter.
- When milling workpiece, HRC over 60 hardened steel, reduce 20% of the RPM and feed compared to the same diameter.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- Use a machine with low vibration and good rigidity (Ø1 or less, the vibration tolerance management should be within 5㎛).
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

4HEM / 6&8HEM

6&8EM은 RPM 동일, FEED만 최대 50% Up 적용
Use the same RPM and raise up the feed up to 50% for 6&8HEM.

• RPM : rev./min • Feed : mm/min

Side Cutting																
Material	Alloy Steel				Hardened Steels				Hardened Steels				Hardened Steels			
Hardness	30 ~ 40HRC				40 ~ 50HRC				50 ~ 55HRC				55 ~ 60HRC			
Outside Diameter	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
ø1	40,000	1,200	1.5	0.05	45,000	1,100	1.5	0.05	40,000	770	0.5	0.03	38,000	308	0.5	0.06
ø1.5	40,000	1,500	2.25	0.075	40,000	1,250	2.25	0.075	38,500	875	0.75	0.045	35,600	350	0.75	0.24
ø2	40,000	2,000	3	0.1	38,000	1,800	3	0.1	36,500	1,260	1	0.06	31,000	504	1	0.045
ø3	38,400	4,560	4.5	0.15	34,560	4,104	4.5	0.15	27,648	2,873	1.5	0.09	22,118	1,149	1.5	0.3
ø4	28,800	5,280	6	0.2	25,920	4,752	6	0.2	20,736	3,326	2	0.12	16,589	1,331	2	0.03
ø5	24,000	6,000	7.5	0.25	21,600	5,400	7.5	0.25	17,280	3,780	2.5	0.15	13,824	1,512	2.5	0.09
ø6	19,200	6,960	9	0.3	17,280	6,264	9	0.3	13,824	4,385	3	0.18	11,059	1,754	3	0.12
ø8	14,400	6,960	12	0.4	12,960	6,264	12	0.4	10,368	4,385	4	0.24	8,294	1,754	4	0.75
ø10	11,520	6,960	15	0.5	10,368	6,264	15	0.5	8,294	4,385	5	0.3	6,636	1,754	5	0.6
ø12	9,600	5,760	18	0.6	8,640	5,184	18	0.6	6,912	3,629	6	0.36	5,530	1,452	6	0.48
ø16	7,200	4,320	24	0.8	6,480	3,888	24	0.8	5,184	2,722	8	0.48	4,147	1,089	8	0.36
ø20	5,760	3,480	30	1	5,184	3,132	30	1	4,147	2,192	10	0.6	3,318	877	10	0.15
ø25	5,150	3,120	37.5	1.25	4,635	2,808	37.5	1.25	3,708	2,246	12.5	0.75	2,966	899	12.5	0.18
Depth of Cut	~ 50HRC: 0.05D, 1.5D								50HRC ~: 0.03D, 0.5D							

- The edge of the flute precisely grinded. If you want to measure the tool, and to avoid damaging on the flutes, use non-contact measuring method. The
- parameters on the table is based on 4flutes. For using 6 or 8flutes, use the same RPM and raise up the feed up to 50% in stable milling condition.
- When milling workpiece, HRC over 60 hardened steel , reduce 20% of the RPM and feed compared to the same diameter.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion. Air blow
- or mist coolants are recommended and note for chip emission, heat, or ignition.

4CRE Cutting Condition

• RPM : rev./min • Feed : mm/min

Material		Prehardened Steel / Hardened Steel				Hardened Steels			
Hardness		30 ~ 45HRC				45 ~ 55HRC			
Outside Diameter	Effective Length	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
ø1	4	13,455	1,265	0.038	0.264	11,730	1,046	0.030	0.238
〃	10	8,625	495	0.011	0.123	7,475	495	0.009	0.098
ø1.2	4	12,880	1,380	0.031	0.440	11,730	1,070	0.023	0.293
〃	10	8,855	782	0.017	0.176	7,130	587	0.009	0.147
ø1.5	6	11,385	1,265	0.040	0.475	10,350	1,150	0.037	0.435
〃	12	9,280	817	0.028	0.317	6,790	759	0.025	0.290
ø2	6	12,650	1,265	0.063	0.633	11,730	1,173	0.059	0.713
〃	12	9,970	1,012	0.045	0.396	8,280	943	0.043	0.396
ø2.5	10	10,580	1,380	0.065	0.528	9,775	1,150	0.065	0.528
〃	20	8,160	1,150	0.047	0.264	7,845	655	0.030	0.220
ø3	10	11,040	2,070	0.094	0.684	10,235	2,070	0.059	0.684
〃	20	7,340	1,495	0.057	0.567	6,230	1,495	0.035	0.567
ø4	13	9,085	1,576	0.105	1.150	7,590	1,530	0.082	1.150
〃	20	7,130	1,380	0.069	0.920	5,980	1,288	0.054	0.920
〃	30	6,325	1,104	0.043	0.745	5,290	1,058	0.033	0.745
ø6	20	5,635	1,691	0.176	2.305	3,335	978	0.176	1.281
〃	40	2,875	782	0.098	1.320	1,610	460	0.098	0.733
ø8	22	4,600	1,840	0.212	2.921	2,760	782	0.212	1.518
ø10	24	3,680	2,013	0.242	3.140	2,185	621	0.253	1.645
ø12	26	2,875	2,070	0.265	3.105	1,725	495	0.276	1.714
Depth of Cut	Slotting • Ap : Axial Depth • D : Outside Diameter; Side Milling • Ap : Axial Depth • Ae : Radial Depth; Inclined Cutting								

- When milling workpiece HRC over 62, reduce 20% of the RPM and feed with the same diameter.
- If the effective length is long, reduce the RPM and feed maximum 30%.
- Consider the corner radius value when you set up the Ae value.
- For curved milling, set up the lower value of the pitch than the corner radius value of tool diameter.
- For curved milling, raise up the feed up to 30% in stable milling condition.

Cutting Data

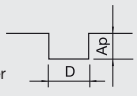
2CRE Cutting Condition

• RPM : rev./min • Feed : mm/min

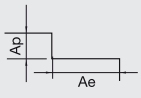
Material		Copper				Prehardened Steel / Hardened Steel				Hardened Steels				Hardened Steels			
Hardness						30 ~ 45HRC				45 ~ 55HRC				55 ~ 62HRC			
Outside Diameter	Effective Length	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
ø0.2	1	50,000	352	0.264	0.020	50,000	196	0.006	0.020	34,500	150	0.004	0.020	14,950	24	0.001	0.015
〃	1.5	50,000	311	0.017	0.010	50,000	173	0.005	0.010	26,450	104	0.003	0.010	11,730	20	0.001	0.007
ø0.3	1	50,000	890	0.029	0.020	50,000	495	0.007	0.020	34,500	345	0.005	0.015	21,505	34	0.004	0.015
〃	3	50,000	393	0.029	0.015	50,000	219	0.006	0.015	24,150	81	0.003	0.010	14,605	20	0.002	0.010
ø0.4	1	47,150	890	0.047	0.062	50,000	495	0.013	0.070	39,675	368	0.011	0.070	23,575	39	0.004	0.070
〃	3	33,350	683	0.026	0.053	26,450	380	0.008	0.026	26,450	276	0.007	0.026	15,755	29	0.003	0.026
ø0.5	1	48,300	2,008	0.079	0.114	48,300	1,116	0.033	0.119	39,100	840	0.029	0.119	24,150	92	0.013	0.119
〃	3	31,050	1,118	0.056	0.088	31,050	621	0.022	0.110	25,415	460	0.020	0.110	15,755	51	0.008	0.110
〃	5	25,760	827	0.026	0.044	25,760	459	0.011	0.010	20,700	345	0.010	0.010	12,995	38	0.004	0.010
ø0.6	2	27,945	890	0.111	0.158	27,945	495	0.010	0.214	23,000	380	0.010	0.214	14,835	42	0.004	0.214
〃	6	16,445	435	0.035	0.044	16,445	242	0.003	0.010	13,570	184	0.003	0.010	8,740	21	0.001	0.010
ø0.8	4	17,250	787	0.129	0.194	17,020	437	0.014	0.114	14,720	345	0.015	0.114	9,890	40	0.007	0.114
〃	8	12,650	475	0.029	0.098	12,650	264	0.005	0.088	10,695	184	0.004	0.088	7,475	20	0.002	0.088
ø1	4	13,800	1,449	0.196	0.396	13,800	805	0.029	0.264	11,730	655	0.034	0.264	8,280	78	0.017	0.264
〃	10	8,625	559	0.047	0.308	8,625	311	0.011	0.123	7,475	264	0.013	0.123	5,290	31	0.006	0.123
〃	16	6,900	331	0.018	0.220	6,900	184	0.004	0.026	5,980	161	0.005	0.026	4,255	19	0.002	0.026
ø1.2	6	9,200	1,035	0.182	0.457	9,200	575	0.018	0.088	8,165	483	0.215	0.088	6,095	59	0.011	0.088
〃	12	6,670	662	0.053	0.396	6,670	368	0.007	0.070	5,980	299	0.008	0.070	4,370	37	0.004	0.070
ø1.5	4	12,880	1,925	0.293	0.660	12,880	1,070	0.044	0.440	11,730	920	0.059	0.440	8,970	121	0.032	0.440
〃	10	8,280	1,325	0.147	0.554	8,280	736	0.031	0.282	7,590	633	0.041	0.282	5,865	83	0.022	0.282
〃	20	5,865	725	0.041	0.352	6,350	403	0.005	0.106	4,160	345	0.006	0.106	3,870	45	0.003	0.106
ø2	6	12,535	1,801	0.314	0.836	12,535	1,001	0.042	0.792	11,730	909	0.059	0.792	9,430	130	0.035	0.792
〃	12	9,200	1,449	0.182	0.704	9,200	805	0.030	0.440	8,280	725	0.043	0.440	6,785	105	0.025	0.440
〃	20	6,900	1,139	0.091	0.651	6,200	633	0.017	0.194	3,520	564	0.023	0.194	3,226	82	0.014	0.194
〃	30	5,865	973	0.049	0.440	3,300	541	0.005	0.132	2,860	495	0.005	0.132	2,386	68	0.002	0.132
ø2.5	10	10,350	1,801	0.331	0.836	10,350	1,001	0.051	0.528	9,775	943	0.073	0.528	8,165	151	0.047	0.528
〃	30	6,210	787	0.067	0.616	6,210	437	0.011	0.176	5,865	414	0.016	0.176	4,830	65	0.010	0.176
ø3	12	10,350	2,029	0.381	0.831	10,350	1,127	0.103	0.616	9,775	874	0.103	0.655	8,740	196	0.073	0.655
〃	20	8,165	1,553	0.254	0.762	6,050	863	0.071	0.567	3,420	667	0.071	0.567	3,108	147	0.043	0.567
〃	30	6,900	1,263	0.137	0.674	3,300	702	0.049	0.371	2,890	541	0.049	0.371	2,440	115	0.028	0.352
ø4	12	8,740	1,904	0.401	1.525	8,740	1,058	0.081	1.124	7,360	920	0.117	1.124	6,210	210	0.083	1.124
〃	20	6,785	1,458	0.375	1.325	5,880	810	0.053	0.880	5,750	840	0.078	0.880	4,830	194	0.057	0.880
〃	30	5,750	752	0.196	1.210	2,950	418	0.028	0.671	2,540	656	0.041	0.671	2,160	149	0.030	0.708
〃	45	4,715	500	0.096	1.118	2,300	278	0.007	0.326	2,015	322	0.010	0.326	1,800	75	0.007	0.326
ø5	15	7,705	3,064	0.697	2.277	7,705	1,702	0.106	1.346	5,520	1,139	0.150	1.346	4,600	342	0.110	1.346
〃	30	5,290	1,470	0.342	1.760	2,780	817	0.053	1.035	3,795	541	0.075	1.035	3,220	164	0.055	1.035
ø6	20	5,980	2,194	0.600	2.194	5,460	1,219	0.476	1.356	3,565	1,035	0.186	1.356	3,105	393	0.145	1.356
〃	40	4,600	1,635	0.565	2.049	2,380	909	0.410	1.304	2,160	759	0.164	1.304	2,040	304	0.123	1.304
ø8	22	5,520	1,946	0.528	2.542	5,520	1,081	0.419	1.518	3,220	909	0.164	1.518	2,760	346	0.128	1.518
〃	40	4,140	1,449	0.497	2.277	2,120	805	0.361	1.323	2,080	667	0.144	1.323	1,955	268	0.108	1.323
ø10	24	4,600	1,656	0.449	2.887	4,485	920	0.356	1.645	2,760	771	0.139	1.645	2,300	294	0.108	1.645
〃	45	3,450	1,221	0.423	2.438	3,450	679	0.307	1.334	1,955	564	0.122	1.334	1,725	228	0.092	1.334
ø12	26	3,795	1,387	0.377	3.013	3,795	771	0.299	2.024	2,300	644	0.117	2.024	1,955	247	0.091	2.024
〃	50	2,875	1,035	0.355	2.415	2,875	575	0.258	1.403	1,725	483	0.103	1.403	1,380	191	0.077	1.403
ø16	35	2,990	1,097	0.302	2.921	2,990	610	0.239	2.162	1,725	518	0.094	2.162	1,610	198	0.073	2.162

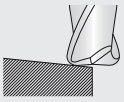
Depth of Cut

Slotting
- Ap : Axial Depth
- D : Outside Diameter



Side Milling
- Ap : Axial Depth
- Ae : Radial Depth





Inclined Cutting

- When milling workpiece HRC over 62, reduce 20% of the RPM and feed with the same diameter.
- If the effective length is long, reduce the RPM and feed maximum 30%.
- Consider the corner radius value when you set up the Ae value.
- For curved milling, set up the lower value of the pitch than the corner radius value of tool diameter.
- For curved milling, raise up the feed up to 30% in stable milling condition.

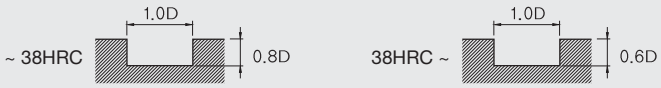
3&4HROU Cutting Condition

• RPM : rev./min • Feed : mm/min

Slotting

Material	Mild Steels/ Carbon Steels				Alloy Steels/ Tool Steels				Tool Steels/ Prehardened Steels				Tool Steels/ Stainless Steels			
경도 Hardness	~ 750N/mm²				~ 30HRC				30 ~ 38HRC				38 ~ 45HRC			
외경 Outside Diameter	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
ø4	4,600	500	3.2	4	4,400	230	3.2	4	3,200	160	3.2	4	2,800	130	2.4	4
ø5	4,600	500	4	5	4,000	250	4	5	2,900	180	4	5	2,500	150	3	5
ø6	4,100	500	4.8	6	3,500	280	4.8	6	2,700	210	4.8	6	2,200	170	3.6	6
ø8	3,100	500	6.4	8	2,500	310	6.4	8	2,100	240	6.4	8	1,700	210	4.8	8
ø10	2,500	500	8	10	2,100	330	8	10	1,600	250	8	10	1,300	210	6	10
ø12	2,100	500	9.6	12	1,700	350	9.6	12	1,400	270	9.6	12	1,100	220	7.2	12
ø16	1,600	500	12.8	16	1,300	360	12.8	16	1,000	290	12.8	16	800	230	4.8	16
ø20	1,300	480	16	20	1,000	360	16	20	800	270	16	20	650	210	12	20

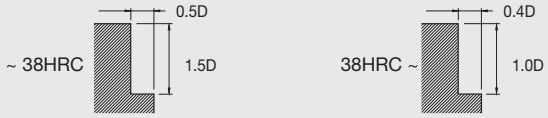
절입량 Depth of Cut



Side Cutting

Material	Mild Steels/ Carbon Steels				Alloy Steels/ Tool Steels				Tool Steels/ Prehardened Steels				Tool Steels/ Stainless Steels			
Hardness	~ 750N/mm²				~ 30HRC				30 ~ 38HRC				38 ~ 45HRC			
Outside Diameter	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
ø4	5,800	600	6	2	4,800	300	6	2	4,100	200	6	2	3,200	150	4	1.6
ø5	5,800	600	7.5	2.5	4,800	310	7.5	2.5	3,700	230	7.5	2.5	2,800	170	5	2
ø6	4,800	600	9	3	4,200	330	9	3	3,200	250	9	3	2,400	200	6	2.4
ø8	3,700	600	12	4	3,100	380	12	4	2,400	290	12	4	1,800	220	8	3.2
ø10	3,000	600	15	5	2,500	400	15	5	1,800	300	15	5	1,500	250	10	4
ø12	2,400	600	18	6	2,100	410	18	6	1,600	310	18	6	1,300	250	12	4.8
ø16	1,850	600	24	8	1,600	440	24	8	1,200	330	24	8	1,000	250	16	6.4
ø20	1,500	550	30	10	1,300	430	30	10	900	320	30	10	750	240	20	8

Depth of Cut



- Use laser tool measurement instead of hydraulic measurement when measuring tool length as possible.
- When entering the tool to the workpiece, enter the tool from outside to the workpiece.
- If the effective length is long, reduce the RPM and feed maximum 30%.
- For stainless and heat resistant alloy, water-soluble oil is the most effective.

Cutting Data

2NCR / 4NCR

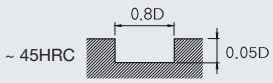
■ 4NCR은 RPM 동일, FEED만 최대 30% Up 적용
■ Use the same RPM and raise up the feed up to 30% for 4NCR.

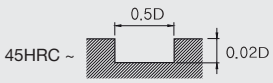
• RPM : rev./min • Feed : mm/min

Slotting

Material	Alloy Steel				Prehardened Steel / Hardened Steel				Hardened Steels				Hardened Steels			
Hardness	30 ~ 40HRC				40 ~ 45HRC				45 ~ 55HRC				55 ~ 62HRC			
Outside Diameter	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
ø0.4	50,000	662	0.020	0.32	45,000	315	0.020	0.32	40,000	126	0.008	0.20	33,000	70	0.008	0.20
ø0.5	50,000	756	0.025	0.4	45,000	360	0.025	0.4	40,000	144	0.01	0.25	33,000	80	0.01	0.25
ø0.6	50,000	851	0.03	0.48	45,000	405	0.03	0.48	40,000	162	0.012	0.3	30,000	90	0.012	0.3
ø0.8	50,000	945	0.04	0.64	45,000	450	0.04	0.64	30,000	180	0.016	0.4	25,000	100	0.016	0.4
ø1	48,000	2,344	0.05	0.8	38,000	1,116	0.05	0.8	25,500	446	0.02	0.5	20,500	248	0.02	0.5
ø2	33,300	2,797	0.1	1.6	26,000	1,332	0.1	1.6	17,500	533	0.04	1	14,500	296	0.04	1
ø3	21,800	2,835	0.15	2.4	17,300	1,350	0.15	2.4	11,500	540	0.06	1.5	9,500	300	0.06	1.5
ø4	16,700	2,911	0.2	3.2	13,200	1,386	0.2	3.2	8,800	554	0.08	2	7,200	308	0.08	2
ø5	15,700	3,100	0.25	4	12,500	1,476	0.25	4	8,300	590	0.1	2.5	6,400	328	0.1	2.5
ø6	13,100	3,024	0.3	4.8	10,350	1,440	0.3	4.8	6,900	576	0.12	3	5,300	320	0.12	3
ø8	9,880	2,759	0.4	6.4	7,800	1,314	0.4	6.4	5,200	526	0.16	4	4,000	292	0.16	4
ø10	7,800	2,570	0.5	8	6,150	1,224	0.5	8	4,100	490	0.2	5	3,200	272	0.2	5
ø12	6,650	2,570	0.6	9.6	5,250	1,224	0.6	9.6	3,500	490	0.24	6	2,650	272	0.24	6
ø16	6,150	2,400	0.8	12.8	5,500	1,180	0.8	12.8	3,210	450	0.32	8	2,420	250	0.32	8

Depth of Cut

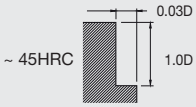


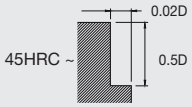


Side Cutting

Material	Alloy Steel				Prehardened Steel / Hardened Steel				Hardened Steels				Hardened Steels			
Hardness	30 ~ 40HRC				40 ~ 45HRC				45 ~ 55HRC				55 ~ 62HRC			
Outside Diameter	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
ø0.4	50,000	278	0.4	0.01	45,000	250	0.4	0.01	40,000	150	0.20	0.01	33,000	70	0.20	0.01
ø0.5	50,000	308	0.5	0.015	45,000	277	0.5	0.015	40,000	166	0.25	0.01	33,000	80	0.25	0.01
ø0.6	50,000	309	0.6	0.018	45,000	278	0.6	0.018	40,000	167	0.30	0.012	30,000	90	0.30	0.012
ø0.8	50,000	503	0.8	0.024	40,000	452	0.8	0.024	30,000	271	0.40	0.016	25,000	100	0.40	0.016
ø1	48,000	980	1	0.03	38,000	882	1	0.03	25,500	529	0.50	0.02	20,500	248	0.50	0.02
ø2	33,300	1,440	2	0.06	26,000	1,296	2	0.06	17,500	778	1.00	0.04	14,500	296	1.00	0.04
ø3	21,800	1,470	3	0.09	17,300	1,323	3	0.09	11,500	794	1.50	0.06	9,500	296	1.50	0.06
ø4	16,700	1,500	4	0.12	13,200	1,350	4	0.12	8,800	810	2.00	0.08	7,200	308	2.00	0.08
ø5	15,700	1,740	5	0.15	12,500	1,566	5	0.15	8,300	940	2.50	0.1	6,400	328	2.50	0.1
ø6	13,100	1,620	6	0.18	10,350	1,458	6	0.18	6,900	875	3.00	0.12	5,300	320	3.00	0.12
ø8	9,880	1,584	8	0.24	7,800	1,426	8	0.24	5,200	855	4.00	0.16	4,000	292	4.00	0.16
ø10	7,800	1,440	10	0.3	6,150	1,296	10	0.3	4,100	778	5.00	0.2	3,200	272	5.00	0.2
ø12	6,650	1,440	12	0.36	5,250	1,296	12	0.36	3,500	778	6.00	0.24	2,650	272	6.00	0.24
ø16	6,280	1,290	16	0.48	5,100	1,120	16	0.48	3,410	750	8.00	0.32	2,440	250	8.00	0.32

Depth of Cut





- When milling workpiece HRC over 62, reduce 20% of the RPM and feed with the same diameter.
- If the effective length is long, reduce the RPM and feed maximum 30%.
- For curved milling, set up the lower value of the pitch than the corner radius value of tool diameter.
- For curved milling, raise up the feed up to 30% in stable milling condition.
- The parameters on the table is based on 2flutes. For using 4flutes, use the same RPM and raise up the feed up to 50% in stable milling condition.
- For groove milling, set up the Ae value by considering of corner radius value.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

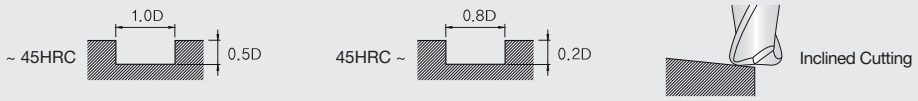
4CRL/6CRL : 6CRL은 RPM 동일, FEED만 최대 30% Up 적용
Use the same RPM and raise up the feed up to 30% for 6CRL.

• RPM : rev./min • Feed : mm/min

Slotting

Material	Alloy Steel								Hardened Steels							
Hardness	200 ~ 250HB				25 ~ 35HRC				35 ~ 45HRC				45 ~ 62HRC			
Outside Diameter	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
ø1	19,250	150	0.50	1	19,250	150	0.50	1	17,280	122	0.50	1	15,552	98	0.2	0.8
ø1.5	12,845	230	0.75	2	12,800	220	0.75	2	11,520	178	0.75	2	10,368	142	0.3	1.2
ø2	9,600	345	1.00	2	9,500	330	1.00	2	8,550	267	1.00	2	7,695	212	0.4	1.6
ø3	6,400	490	1.50	3	6,400	440	1.50	3	5,800	360	1.50	3	5,300	240	0.6	2.4
ø4	4,800	550	2.00	4	4,800	500	2.00	4	4,400	410	2.00	4	4,000	280	0.8	3.2
ø5	3,850	600	2.50	5	3,800	550	2.50	5	3,420	446	2.50	5	3,078	356	1.0	4.0
ø6	3,200	610	3.00	6	3,200	550	3.00	6	2,900	450	3.00	6	2,700	310	1.2	4.8
ø8	2,400	650	4.00	8	2,400	590	4.00	8	2,200	480	4.00	8	2,000	330	1.6	6.4
ø10	1,900	580	5.00	10	1,900	520	5.00	10	1,800	440	5.00	10	1,600	290	2.0	8.0
ø12	1,600	540	6.00	12	1,600	480	6.00	12	1,500	400	6.00	12	1,300	260	2.4	9.6
ø16	1,200	520	8.00	16	1,200	510	8.00	16	1,080	413	8.00	16	972	328	3.2	12.8
ø20	960	510	10.00	20	950	500	10.00	20	855	405	10.00	20	770	324	4.0	1.6

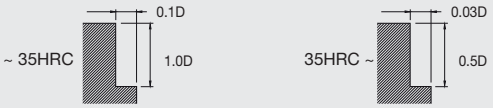
Depth of Cut



측면 절삭 Side Cutting

Material	Alloy Steel								Hardened Steels							
Hardness	200 ~ 250HB				25 ~ 35HRC				35 ~ 45HRC				45 ~ 62HRC			
Outside Diameter	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
ø1	28,790	115	1	0.1	25,911	104	1	0.1	22,024	88	0.5	0.03	17,619	70	0.5	0.03
ø1.5	19,200	403	2	0.2	17,280	363	2	0.2	14,688	308	0.8	0.045	11,750	247	0.8	0.045
ø2	14,400	690	2	0.2	12,960	621	2	0.2	11,016	528	1.0	0.06	8,813	422	1.0	0.06
ø3	9,600	860	3	0.3	9,600	770	3	0.3	8,500	610	1.5	0.09	7,400	460	1.5	0.09
ø4	7,200	920	4	0.4	7,200	830	4	0.4	6,400	660	2.0	0.12	5,600	500	2.0	0.12
ø5	5,750	960	5	0.5	5,175	864	5	0.5	4,399	734	2.5	0.15	3,519	588	2.5	0.15
ø6	4,800	1,080	6	0.6	4,800	970	6	0.6	5,100	720	3.0	0.18	3,700	580	3.0	0.18
ø8	3,600	1,150	8	0.8	3,600	1,040	8	0.8	4,200	750	4.0	0.24	2,800	630	4.0	0.24
ø10	2,900	1,070	10	1.0	2,900	960	10	1.0	2,500	740	5.0	0.3	2,200	570	5.0	0.3
ø12	2,400	1,000	12	1.2	2,400	900	12	1.2	2,100	700	6.0	0.36	1,900	550	6.0	0.36
ø16	1,800	1,000	16	1.6	1,620	900	16	1.6	1,377	765	8.0	0.48	1,102	612	8.0	0.48
ø20	1,440	930	20	2.0	1,296	837	20	2.0	1,102	711	10.0	0.6	881	569	10.0	0.6

Depth of Cut



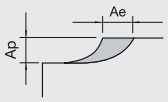
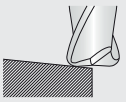
- The parameters on the table is based on 4flutes. For using 6flutes, use the same RPM and raise up the feed up to 30% in stable milling condition.
- If the effective length is long, reduce the RPM and feed maximum 30%.
- For side milling, refer to the corner radius value.
- For curved milling, set up the lower value of the pitch than the corner radius value of tool diameter.
- For curved milling, raise up the feed up to 30% in stable milling condition.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.
- Use suitable cutting oil for material and machining geometry.

Cutting Data

4RCU/6RCU

6RCU는 RPM 동일 FEED만 최대 30% Up 적용.
Use the same RPM and raise up the feed up to 30% for 6RCU.

•RPM : rev./min •Feed : mm/min

Material		Alloy Steel				Alloy Steels/ Tool Steels				Hardened Steels				Hardened Steels			
Hardness		~ 30HRC				30 ~ 45HRC				45 ~ 55HRC				55 ~ 62HRC			
Outside Diameter	Radius	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
ø1	R0.2	45,000	7,000	0.05	0.06	42,000	7,800	0.03	0.05	35,000	6,800	0.02	0.05	25,000	2,600	0.02	0.05
ø1.5	R0.5	40,000	9,000	0.06	0.72	40,000	8,000	0.04	0.65	30,000	7,000	0.03	0.60	21,000	2,800	0.02	0.06
ø2	R0.5	33,000	10,000	0.08	0.96	27,000	8,400	0.05	0.86	24,000	7,500	0.04	0.80	16,000	3,000	0.03	0.80
ø3	R0.5	22,000	11,000	0.12	1.44	18,000	9,000	0.08	1.30	16,000	8,500	0.06	1.20	11,000	3,300	0.05	1.20
ø4	R0.5	19,000	13,000	0.17	2.04	16,000	10,000	0.13	1.84	13,000	10,000	0.09	1.70	900	4,000	0.08	1.70
〃	R1.0	17,000	12,000	0.15	1.80	14,000	9,500	0.12	1.62	12,000	8,800	0.08	1.50	8,000	3,500	0.07	1.50
ø5	R0.5	15,000	14,000	0.23	2.76	12,000	12,000	0.17	2.48	11,000	10,000	0.12	2.30	7,300	4,300	0.09	2.30
〃	R1.0	13,000	13,000	0.20	2.40	11,000	11,000	0.15	2.16	9,600	9,500	0.10	2.00	6,400	3,800	0.08	2.00
ø6	R0.3	13,310	15,730	0.30	3.54	10,900	13,200	0.18	3.19	10,000	13,000	0.12	2.95	6,500	4,600	0.12	2.95
〃	R0.5	12,980	15,340	0.29	3.42	10,600	13,000	0.17	3.08	9,500	12,000	0.11	2.85	6,300	4,500	0.11	2.85
〃	R1.0	12,600	12,600	0.28	3.36	12,654	12,600	0.17	3.02	9,000	11,000	0.11	2.80	5,800	4,100	0.11	2.80
〃	R1.5	11,000	13,000	0.25	3.00	9,000	11,000	0.15	2.70	8,000	9,600	0.10	2.50	5,300	3,800	0.10	2.50
ø8	R0.3	9,800	17,500	0.35	4.25	8,400	13,500	0.24	3.82	7,300	15,000	0.18	3.54	4,700	4,484	0.15	3.54
〃	R0.5	8,800	16,500	0.34	4.10	8,200	13,000	0.23	3.69	7,100	13,000	0.17	3.42	4,600	4,370	0.15	3.42
〃	R1.0	8,400	15,000	0.34	4.03	8,000	12,000	0.22	3.63	6,700	11,000	0.17	3.36	4,520	4,294	0.15	3.36
〃	R2.0	8,200	13,000	0.30	3.60	7,000	11,000	0.20	3.24	6,000	9,600	0.15	3.00	4,000	3,800	0.13	3.00
ø10	R0.3	7,670	15,340	0.35	6.37	6,490	12,980	0.24	5.73	5,664	11,210	0.18	5.31	3,776	4,484	0.15	5.31
〃	R0.5	7,475	14,950	0.34	6.16	6,325	12,650	0.23	5.54	5,520	10,925	0.17	5.13	3,680	4,370	0.15	5.13
〃	R1.0	7,280	14,560	0.34	6.05	6,160	12,320	0.22	5.44	5,376	10,640	0.17	5.04	3,584	4,256	0.15	5.04
〃	R2.0	6,500	13,000	0.30	5.40	5,500	11,000	0.20	4.86	4,800	9,500	0.15	4.50	3,200	3,800	0.13	4.50
ø12	R0.5	7,000	1,500	0.53	6.37	5,428	11,800	0.35	5.73	4,838	10,620	0.30	5.31	3,186	4,130	0.24	5.31
〃	R1.0	6,400	14,000	0.51	6.16	5,290	11,500	0.34	5.54	4,715	10,350	0.29	5.13	3,105	4,025	0.23	5.13
〃	R2.0	6,000	12,500	0.50	6.05	5,152	11,200	0.34	5.44	4,592	10,080	0.28	5.04	3,024	3,920	0.22	5.04
〃	R3.0	5,500	12,000	0.45	5.40	4,600	10,000	0.30	4.86	4,100	9,000	0.25	4.50	2,700	3,500	0.20	4.50
ø16	R1.0	4,838	11,800	0.42	8.58	4,012	10,384	0.25	7.72	3,540	9,204	0.22	7.15	2,360	3,776	0.13	7.35
〃	R2.0	4,100	10,000	0.45	9.00	3,400	8,800	0.30	8.10	3,000	7,800	0.25	7.50	2,000	3,200	0.20	7.50
Depth of Cut										 Inclined Cutting							

■ Coefficients respective of tool overhang

Type	Overhang	Revolution	Feed rate	Depth of Cut ap
Straight	L/D ≦ 5	100%	100%	100%
	L/D = 6	90%	80%	80%
	L/D = 7	80%	70%	70%
Taper neck	L/D = 6	100%	100%	100%
	L/D = 8	90%	80%	80%
	L/D ≧10	80%	70%	70%

- The parameters on the table is based on 4flutes. For using 6flutes, use the same RPM and raise up the feed up to 30% in stable milling condition.
- If the effective length is long, reduce the RPM and feed maximum 30%.
- For side milling, refer to the corner radius value.
- For curved milling, set up the lower value of the pitch than the corner radius value of tool diameter.
- For curved milling, raise up the feed up to 30% in stable milling condition.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, adjust RPM and feed in the same proportion.
- If the effective length is long, refer to the table (Coefficients respective of tool overhang) and adjust the RPM and feed.
- If you use small value of Ap, raise up the RPM and feed.
- Air blow or oil mist is recommended for smooth chip emission.

3SUE Cutting Condition

• RPM : rev./min • Feed : mm/min

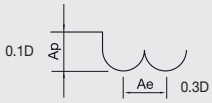
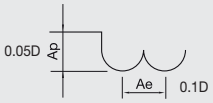
Material	Stainless Steels / Titanium Alloy Steels				Hardened Steels				Heat Resistant Alloy / Inconel			
Hardness					45 ~ 55HRC							
Outside Diameter	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
ø0.8	6,400	60	1.2	0.16	3,900	30	0.8	0.04	2,000	10	0.8	0.04
ø1	5,600	70	1.5	0.20	3,500	30	1.0	0.05	1,700	15	1.0	0.05
ø2	4,800	80	3.0	0.40	2,900	34	1.5	0.08	1,400	20	1.5	0.08
ø3	4,000	90	4.5	0.60	2,200	45	2.5	0.13	1,400	25	2.5	0.13
ø4	3,300	140	6.0	0.80	1,800	70	3.0	0.15	1,200	35	3.0	0.15
ø5	2,700	170	7.5	1.00	1,500	90	4.0	0.20	1,000	45	4.0	0.20
ø6	2,400	180	9.0	1.20	1,400	90	5.0	0.25	900	45	5.0	0.25
ø8	1,800	190	12.0	1.50	1,000	100	7.0	0.35	720	40	7.0	0.35
ø10	1,400	190	14.0	1.80	900	110	9.0	0.45	600	40	9.0	0.45
ø12	1,200	150	17.0	2.00	700	90	10.0	0.50	500	35	10.0	0.50
ø16	900	120	23.0	2.50	550	60	15.0	0.75	360	30	15.0	0.75
Depth of Cut	≦0.2D ≦1.5D D AP AP ≦0.5D (D≦Ø18) AP ≦0.3D (D> Ø18)				≦0.05D ≦1D D ≦0.05D							

- If the effective length is long, reduce the RPM and feed in the same proportion.
- If the diameter or effective length of your tool are not on the table, adjust it compared similarity value on the table.
- The edge of the flute precisely grinded. If you want to measure the tool, and to avoid damaging on the flutes, use non-contact measuring method.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.
- Use a machine with low vibration and good rigidity (Ø1 or less, the vibration tolerance management should be within 5㎛).
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.

Cutting Data

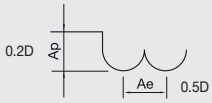
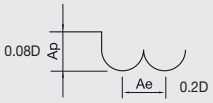
3SURB Cutting Condition

•RPM : rev./min •Feed : mm/min

Material	Alloy Steels/ Cast iron				Stainless steels				Hardened Steels			
Hardness	30 ~ 40HRC								45 ~ 55HRC			
Corner Radius	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
R0.5	45000	1300	0.05	0.15	34600	800	0.05	0.15	9000	130	0.025	0.05
R0.75	38000	1850	0.075	0.225	29200	1135	0.075	0.225	7600	185	0.0375	0.075
R1	32000	2250	0.1	0.3	24600	1380	0.1	0.3	6400	225	0.05	0.1
R1.5	27300	2560	0.15	0.45	20800	1520	0.15	0.45	5460	272	0.075	0.15
R2	20800	2240	0.2	0.6	15600	1360	0.2	0.6	4160	208	0.1	0.2
R3	13780	1680	0.3	0.9	10400	1120	0.3	0.9	2730	168	0.15	0.3
R4	10400	1520	0.4	1.2	7800	1120	0.4	1.2	2080	152	0.2	0.4
R5	8320	1440	0.5	1.5	6240	1040	0.5	1.5	1690	144	0.25	0.5
R6	6890	1400	0.6	1.8	5200	1000	0.6	1.8	1430	100	0.3	0.6
Depth of Cut												

4SUB Cutting Condition

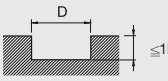
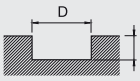
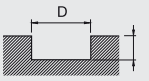
•RPM : rev./min •Feed : mm/min

Material	Alloy Steels/ Cast iron				Stainless steels				Hardened Steels			
Hardness	30 ~ 40HRC								45 ~ 55HRC			
Corner Radius	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
R1.5	21,000	3,200	0.3	0.75	16,000	1,900	0.25	0.75	4200	340	0.12	0.3
R2	16,000	2,800	0.4	1	12,000	1,700	0.33	1	3200	260	0.16	0.4
R2.5	12,700	2,600	0.5	1.25	9,600	1,500	0.42	1.25	2500	250	0.2	0.5
R3	10,600	2,100	0.6	1.5	8,000	1,400	0.5	1.5	2100	210	0.24	0.6
R4	8,000	1,900	0.8	2	6,000	1,400	0.8	2	1600	190	0.32	0.8
R5	6,400	1,800	1	2.5	4,800	1,300	1	2.5	1300	180	0.4	1
R6	5,300	1,800	1.2	3	4,000	1,300	1.2	3	1100	150	0.48	1.2
Depth of Cut												

- If the effective length is long, reduce the RPM and feed in the same proportion.
- If the diameter or effective length of your tool are not on the table, adjust it compared similarity value on the table.
- When milling workpiece, HRC over 55 hardened steel , reduce 20% of the RPM and feed compared to the same diameter.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, reduce the RPM and feed in the same proportion.
- Air blow or oil mist is recommended for smooth chip emission.

4SURE Cutting Condition

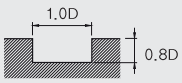
• RPM : rev./min • Feed : mm/min

Material	Alloy Steels / Tools Steel				Stainless Steels / Titanium Alloy Steels				Hardened Steels			
	SKD61 / NAK				SUS304 / SUS 316 / Ti6A				Inconel 718			
Outside Diameter	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
ø1	13760	496	1	1	12600	464	0.5	1	6000	80	0.2	1
ø2	11740	720	2	2	10920	464	1	2	4990	112	0.4	2
ø3	8390	816	3	3	8270	704	1.5	3	4370	160	0.6	3
ø4	6150	912	4	4	6240	800	2	4	3330	184	0.8	4
ø5	5370	1232	5	5	4990	832	2.5	5	2600	208	1	5
ø6	4480	1440	6	6	4130	832	3	6	2180	208	1.2	6
ø8	3350	1040	8	8	3120	784	4	8	1660	208	1.6	8
ø10	2680	912	10	10	2500	640	5	10	1350	176	2	10
ø12	2240	800	12	12	2100	640	6	12	1140	144	2.4	12
ø16	1680	752	16	16	1560	464	8	16	830	112	3.2	16
ø20	1340	561	20	20	1250	416	10	20	620	80	4	20
Depth of Cut	 ≦1D (MAX. 12mm)				 ≦0.5D				 ≦0.2D			

- If the effective length is long, reduce the RPM and feed in the same proportion.
- If the diameter or effective length of your tool are not on the table, adjust it compared similarity value on the table.
- The edge of the flute precisely grinded. If you want to measure the tool, and to avoid damaging on the flutes, use non-contact measuring method.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.
- Use a machine with low vibration and good rigidity (ø1 or less, the vibration tolerance management should be within 5㎛).
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.

4SLE Cutting Condition

• RPM : rev./min • Feed : mm/min

Material	Alloy Steels / Tools Steel				Stainless Steels / Titanium Alloy Steels				Hardened Steels			
	SKD61 / NAK				SUS304 / SUS 316 / Ti6A				Inconel 718			
Outside Diameter	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
ø3	13,270	740	2.4	3.0	5,840	260	2.4	3.0	3,185	115	2.4	3.0
ø4	9,950	710	3.2	4.0	4,380	245	3.2	4.0	2,390	115	3.2	4.0
ø6	6,630	720	4.8	6.0	2,920	245	4.8	6.0	1,590	115	4.8	6.0
ø8	4,970	800	6.4	8.0	2,190	245	6.4	8.0	1,190	115	6.4	8.0
ø10	3,980	800	8.0	10.0	1,750	245	8.0	10.0	955	115	8.0	10.0
ø12	3,320	800	9.6	12.0	1,460	245	9.6	12.0	796	115	9.6	12.0
ø16	2,490	800	12.8	16.0	1,095	245	12.8	16.0	597	115	12.8	16.0
ø20	1,990	800	16.0	20.0	880	245	16.0	20.0	480	115	16.0	20.0
Depth of Cut												

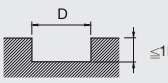
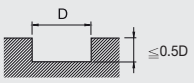
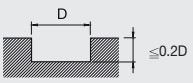
- If the effective length is long, reduce the RPM and feed in the same proportion. When entering the tool to the workpiece, enter the tool from outside to the workpiece.
- If the diameter or effective length of your tool are not on the table, adjust it compared similarity value on the table.
- The edge of the flute precisely grinded. If you want to measure the tool, and to avoid damaging on the flutes, use non-contact measuring method.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

Cutting Data

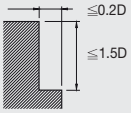
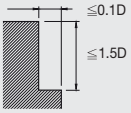
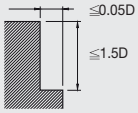
4SUE / 4SUC / 4SUV Cutting Condition

• RPM : rev./min • Feed : mm/min

Slotting

Material	Alloy Steels / Tools Steel				Stainless Steels / Titanium Alloy Steels				Hardened Steels			
	SKD61 / NAK				SUS304 / SUS 316 / Ti6A				Inconel 718			
Outside Diameter	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
ø2	10,000	400	2	2	9,600	310	1	2	3,200	80	0.4	2
ø3	6,900	410	3	3	7,400	380	1.5	3	2,700	110	0.6	3
ø4	5,600	490	4	4	5,600	400	2	4	2,000	120	0.8	4
ø5	4,500	630	5	5	4,500	410	2.5	5	1,600	130	1	5
ø6	3,700	740	6	6	3,700	440	3	6	1,300	160	1.2	6
ø7	3,200	700	7	7	3,200	410	3.5	7	1,100	140	1.4	7
ø8	2,800	670	8	8	2,800	390	4	8	1,000	130	1.6	8
ø9	2,500	600	9	9	2,500	350	4.5	9	900	130	1.8	9
ø10	2,200	530	10	10	2,200	350	5	10	800	130	2	10
ø11	2,000	530	11	11	2,000	320	5.5	11	720	120	2.2	11
ø12	1,900	530	12	12	1,900	300	6	12	660	110	2.4	12
ø16	1,400	390	16	16	1,400	280	8	16	500	80	3.2	16
ø20	1,100	350	20	20	1,100	260	10	20	400	60	4	20
Depth of Cut												

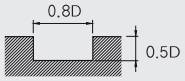
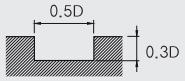
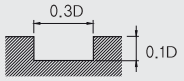
Side Cutting

Material	Alloy Steels / Tools Steel				Stainless Steels / Titanium Alloy Steels				Hardened Steels			
	SKD61 / NAK				SUS304 / SUS 316 / Ti6A				Inconel 718			
Outside Diameter	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
ø2	21,000	1,100	3	0.4	14,000	560	3	0.2	4,800	130	3	0.1
ø3	15,000	1,250	4.5	0.6	10,600	850	4.5	0.3	4,200	200	4.5	0.15
ø4	11,000	1,400	6	0.8	8,000	960	6	0.4	3,200	220	6	0.2
ø5	9,600	1,900	7.5	1	6,400	1,000	7.5	0.5	2,500	250	7.5	0.25
ø6	8,000	2,200	9	1.2	5,300	1,000	9	0.6	2,100	250	9	0.3
ø7	6,800	1,900	10.5	1.4	4,500	1,000	10.5	0.7	1,800	260	10.5	0.35
ø8	6,000	1,600	12	1.6	4,000	960	12	0.8	1,600	260	12	0.4
ø9	5,300	1,480	13.5	1.8	3,500	840	13.5	0.9	1,400	220	13.5	0.45
ø10	4,800	1,440	15	2	3,200	770	15	1	1,300	210	15	0.5
ø11	4,400	1,350	16.5	2.2	2,900	760	16.5	1.1	1,200	190	16.5	0.55
ø12	4,000	1,250	18	2.4	2,700	760	18	1.2	1,100	180	18	0.6
ø16	3,000	1,140	24	3.2	2,000	560	24	1.6	800	130	24	0.8
ø20	2,400	860	30	4	1,600	510	30	2	600	100	30	1
Depth of Cut												

- If the effective length is long, reduce the RPM and feed in the same proportion.
- When entering the tool to the workpiece, enter the tool from outside to the workpiece.
- If the diameter or effective length of your tool are not on the table, adjust it compared similarity value on the table.
- The edge of the flute precisely grinded. If you want to measure the tool, and to avoid damaging on the flutes, use non-contact measuring method.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

4SUCR Cutting Condition

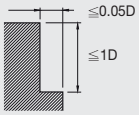
• RPM : rev./min • Feed : mm/min

Material	Alloy Steels / Tools Steel				Stainless Steels / Titanium Alloy Steels				Hardened Steels			
	SKD61 / NAK				SUS304 / SUS 316 / Ti6A				Inconel 718			
Outside Diameter	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
ø1	13,210	476	0.5	0.8	10,836	399	0.3	0.5	5,820	78	0.1	0.3
ø2	11,270	691	1.0	1.6	9,391	399	0.6	1.0	4,840	109	0.2	0.6
ø3	8,054	783	1.5	2.4	7,112	605	0.9	1.5	4,239	155	0.3	0.9
ø4	5,904	876	2.0	3.2	5,366	688	1.2	2.0	3,230	178	0.4	1.2
ø5	5,155	1183	2.5	4.0	4,291	716	1.5	2.5	2,522	202	0.5	1.5
ø6	4,301	1382	3.0	4.8	3,552	716	1.8	3.0	2,115	202	0.6	1.8
ø8	3,216	998	4.0	6.4	2,683	674	2.4	4.0	1,610	202	0.8	2.4
ø10	2,573	876	5.0	8.0	2,150	550	3.0	5.0	1,310	171	1.0	3.0
ø12	2,150	768	6.0	9.6	1,806	550	3.6	6.0	1,106	140	1.2	3.6
ø16	1,613	722	8.0	12.8	1,342	399	4.8	8.0	805	109	1.6	4.8
ø20	1,286	538	10.0	16.0	1,075	358	6.0	10.0	601	78	2.0	6.0
Depth of Cut												

- If the effective length is long, reduce the RPM and feed in the same proportion.
- If the diameter or effective length of your tool are not on the table, adjust it compared similarity value on the table.
- Consider the corner radius value when you set up the Ae value.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.
- Use a machine with low vibration and good rigidity (Ø1 or less, the vibration tolerance management should be within 5㎛).
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.

5&6TROE Cutting Condition

• RPM : rev./min • Feed : mm/min

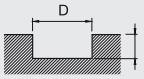
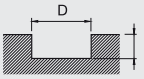
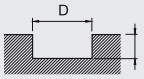
Material	Alloy Steels / Tools Steel				Stainless Steels / Titanium Alloy Steels				Hardened Steels			
	SKD61 / NAK				SUS304 / SUS 316 / Ti6A				Inconel 718			
Outside Diameter	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
ø6	3,700	450	6	0.3	3,200	380	6	0.3	1,100	65	6	0.3
ø8	2,800	400	8	0.4	2,350	420	8	0.4	950	60	8	0.4
ø10	2,250	325	10	0.5	1,990	350	10	0.5	750	60	10	0.5
ø12	1,990	300	12	0.6	1,550	270	12	0.6	600	55	12	0.6
ø16	1,550	250	16	0.8	1,250	250	16	0.8	500	50	16	0.8
ø20	1,200	180	20	1	900	150	20	1	350	50	20	1
Depth of Cut												

- If the effective length is long, reduce the RPM and feed in the same proportion.
- When entering the tool to the workpiece, enter the tool from outside to the workpiece.
- If the diameter or effective length of your tool are not on the table, adjust it compared similarity value on the table.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

Cutting Data

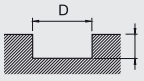
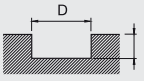
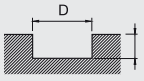
4LSUC Cutting Condition

•RPM : rev./min •Feed : mm/min

Material	Alloy Steels / Tools Steel				Stainless Steels / Titanium Alloy Steels				Hardened Steels			
	SKD61 / NAK				SUS304 / SUS 316 / Ti6A				Inconel 718			
Outside Diameter	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
ø1	10,000	400	1	1	9,600	310	0.5	1	3,200	80	0.2	1
ø2	10,000	400	2	2	9,600	310	1	2	3,200	80	0.4	2
ø3	6,900	410	3	3	7,400	380	1.5	3	2,700	110	0.6	3
ø4	5,600	490	4	4	5,600	400	2	4	2,000	120	0.8	4
ø5	4,500	630	5	5	4,500	410	2.5	5	1,600	130	1	5
ø6	3,700	740	6	6	3,700	440	3	6	1,300	160	1.2	6
ø7	3,200	700	7	7	3,200	410	3.5	7	1,100	140	1.4	7
ø8	2,800	670	8	8	2,800	390	4	8	1,000	130	1.6	8
ø10	2,200	530	10	10	2,200	350	5	10	800	130	2	10
ø11	2,000	530	11	11	2,000	320	5.5	11	720	120	2.2	11
ø12	1,900	530	12	12	1,900	300	6	12	660	110	2.4	12
ø16	1,400	390	16	16	1,400	280	8	16	500	80	3.2	16
ø20	1,100	350	20	20	1,100	260	10	20	400	60	4	20
Depth of Cut	 ≦1D (MAX. 12mm)				 ≦0.5D				 ≦0.2D			

7SUC Cutting Condition

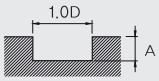
•RPM : rev./min •Feed : mm/min

Material	Alloy Steels / Tools Steel				Stainless Steels / Titanium Alloy Steels				Hardened Steels			
	SKD61 / NAK				SUS304 / SUS 316 / Ti6A				Inconel 718			
Outside Diameter	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
ø6	4,070	925	6	6	4,070	550	3	6	1,430	200	1.2	6
ø8	3,080	838	8	8	3,080	488	4	8	1,100	163	1.6	8
ø10	2,420	663	10	10	2,420	438	5	10	880	163	2	10
ø12	2,090	663	12	12	2,090	375	6	12	726	138	2.4	12
ø16	1,540	488	16	16	1,540	350	8	16	550	100	3.2	16
ø20	1,210	438	20	20	1,210	325	10	20	440	75	4	20
Depth of Cut	 ≦1D (MAX. 12mm)				 ≦0.5D				 ≦0.2D			

- If the effective length is long, reduce the RPM and feed in the same proportion.
- When entering the tool to the workpiece, enter the tool from outside to the workpiece.
- If the diameter or effective length of your tool are not on the table, adjust it compared similarity value on the table.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

3&4&5SUR Cutting Condition

•RPM : rev./min •Feed : mm/min

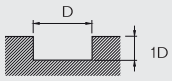
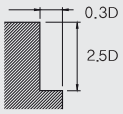
Material	Stainless Steels / Titanium Alloy Steels			
	SUS304 / SUS 316 / Ti6A			
Outside Diameter	RPM	FEED	Ap Axial Depth	Ae Radial Depth
ø3	5,000	380	0.9	3
ø4	4,800	350	1.2	4
ø5	4,700	350	1.5	5
ø6	4,400	340	1.5	6
ø7	3,800	340	1.75	7
ø8	3,300	340	2	8
ø9	3,000	340	2.25	9
ø10	2,700	330	2.5	10
ø12	2,200	330	1.8	12
ø14	2,000	310	2.1	14
ø16	1,750	300	2.4	16
ø20	1,300	210	2	20
Depth of Cut	 A : Ø3 ~ 5 = 0.3 x D Ø6 ~ 10 = 0.25 x D Ø12 ~ 16 = 0.15 x D Ø18 ~ 20 = 0.1 x D			

- When entering the tool to the workpiece, enter the tool from outside to the workpiece.
- If the effective length is long, reduce the RPM and feed maximum 30%.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.
- In case of workpiece and machine do not have enough rigidity and make vibration, reduce the RPM and feed in same proportion.
- Depending on the workpiece and shape, use adequate coolant.
- For parting off stainless or hear resistant alloy, using water-soluble oil is the most effective way.

Cutting Data

3FALE Cutting Condition

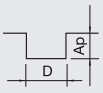
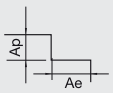
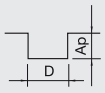
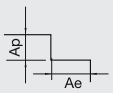
• RPM : rev./min • Feed : mm/min

	Slotting				Side Cutting			
Material	Aluminum Alloys				Aluminum Alloys			
Outside Diameter	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
ø6	8,000	1,000	6	6	8,000	1,200	15	1.8
ø8	6,000	1,000	8	8	6,000	1,200	20	2.4
ø10	4,800	1,000	10	10	4,800	1,200	25	3
ø12	4,000	1,000	12	12	4,000	1,200	30	3.6
ø16	3,000	1,000	16	16	3,000	1,200	40	4.8
Depth of Cut								

- When entering the tool to the workpiece, enter the tool from outside to the workpiece.
- In case of long effective length, reduce the RPM and feed by 20% or less.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- In case of workpiece and machine do not have enough rigidity and make vibration, reduce the RPM and feed in same proportion.
- Depending on the workpiece and shape, use adequate coolant.

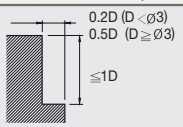
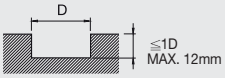
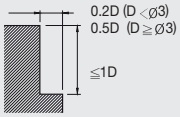
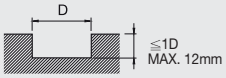
3ALR/3ALE

• RPM : rev./min • Feed : mm/min

Material	Aluminum Alloys etc.							
	3ALR				3ALE			
Outside Diameter	RPM	FEED			RPM	FEED		
		Vertical	Soltting	Side Milling		Vertical	Soltting	Side Milling
ø1	30,000	150	900	1,100	25,500	130	770	930
ø2	30,000	225	1,800	2,150	25,500	190	1,530	1,800
ø3	21,600	225	2,000	2,400	18,400	190	1,700	2,000
ø4	16,200	300	2,000	2,400	14,000	255	1,700	2,000
ø5	13,000	300	2,000	2,400	11,000	255	1,700	2,000
ø6	10,800	300	2,000	2,400	9,200	255	1,700	2,000
ø8	8,100	300	2,000	2,400	7,000	255	1,700	2,000
ø10	6,480	250	2,000	2,400	5,500	210	1,700	2,000
ø12	5,400	200	2,000	2,400	4,400	170	1,700	2,000
ø16	-	-	-	-	3,200	130	1,530	1,900
ø20	-	-	-	-	2,000	85	1,360	1,700
Milling Amount (mm)		Ap=0.75D	Ap=0.75D	Ap=0.75D/ Ae=0.3D		Ap=0.75D	Ap=0.75D	Ap=0.75D/ Ae=0.3D
Depth of Cut								

2ALE

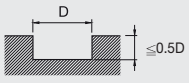
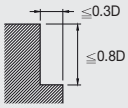
• RPM : rev./min • Feed : mm/min

Material	Aluminum Alloys				Aluminum Alloys			
	Side Milling		Soltting		Side Milling		Slotting	
외경 Outside Diameter	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
ø1	34,000	500	34,000	400	34,000	400	34,000	300
ø2	34,000	950	32,300	720	32,300	720	27,200	470
ø3	27,200	1,200	21,300	800	21,300	800	18,000	510
ø4	20,400	1,300	16,000	850	16,000	850	14,000	550
ø5	16,200	1,400	13,000	850	13,000	850	11,000	600
ø6	13,600	1,600	11,000	940	11,000	940	9,400	640
ø8	10,200	1,600	8,000	1,000	8,000	1,000	6,800	680
ø10	8,100	1,600	6,500	1,000	6,500	1,000	5,400	680
ø12	6,800	1,600	5,400	1,000	5,400	1,000	4,500	680
ø16	5,100	1,600	4,100	1,000	4,100	1,000	3,400	610
ø20	4,100	1,300	3,200	850	3,200	850	2,700	560
Depth of Cut								

- The edge of the flute precisely grinded. If you want to measure the tool, and to avoid damaging on the flutes, use non-contact measuring method.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

3ALC Cutting Condition

• RPM : rev./min • Feed : mm/min

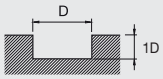
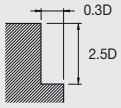
	Slotting				Side Cutting			
Material	Aluminum Alloys				Aluminum Alloys			
Outside Diameter	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
ø6	20,000	6,600	6	6	20,000	8,400	4.8	1.8
ø8	18,000	5,400	8	8	18,000	7,500	6.4	2.4
ø10	15,000	4,000	10	10	15,000	6,000	8	3
ø12	13,000	3,200	12	12	13,000	5,400	9.6	3.6
ø16	10,000	3,200	16	16	10,000	5,400	12.8	4.8
ø20	8,000	3,000	10	10	8,000	5,000	16	6
Depth of Cut								

- In case of long effective length, reduce the RPM and feed by 20% or less.
- Refer to the corner radius value for side milling.
- Consider the corner radius value when you set up the Ae value.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

Cutting Data

3ARE/3ARC Cutting Condition

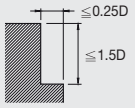
• RPM : rev./min • Feed : mm/min

Material	Copper						Aluminum					
			Slotting		Side Cutting				Slotting		Side Cutting	
Outside Diameter	RPM	FEED	Ap Axial Depth	Ae Radial Depth	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	Ap Axial Depth	Ae Radial Depth
ø6	4,200	1,500	6	6	15	1.8	8,000	1,800	6	6	15	1.8
ø8	3,200	1,500	8	8	20	2.4	6,000	1,800	8	8	20	2.4
ø10	2,600	1,500	10	10	25	3	4,800	1,800	10	10	25	3
ø12	2,100	1,500	12	12	30	3.6	4,000	1,800	12	12	30	3.6
ø16	1,600	1,500	16	16	40	4.8	3,000	1,800	16	16	40	4.8
ø20	1,300	1,500	20	20	50	6	2,400	1,800	20	20	50	6
Depth of Cut												

- When entering the tool to the workpiece, enter the tool from outside to the workpiece.
- In case of long effective length, reduce the RPM and feed by 20% or less.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- In case of workpiece and machine do not have enough rigidity and make vibration, reduce the RPM and feed in same proportion.
- Depending on the workpiece and shape, use adequate coolant.

3ARO Cutting Condition

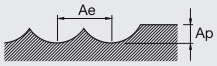
• RPM : rev./min • Feed : mm/min

	Side Cutting							
Material	Aluminum Alloys				Aluminum Alloys			
Outside Diameter	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
ø4	30,000	4,200	6	1	16,000	1,800	6	1
ø5	27,000	4,900	7.5	1.25	14,400	2,000	7.5	1.25
ø6	24,300	5,500	9	1.5	11,700	2,100	9	1.5
ø8	18,000	5,400	12	2	9,000	2,200	12	2
ø10	14,400	5,200	15	2.5	7,200	2,100	15	2.5
ø12	11,700	4,800	18	3	5,900	1,900	18	3
ø16	9,000	4,600	24	4	4,500	1,800	24	4
ø20	7,200	4,300	30	5	3,600	1,700	30	5
Depth of Cut								

- When entering the tool to the workpiece, enter the tool from outside to the workpiece.
- In case of long effective length, reduce the RPM and feed by 20% or less.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- In case of workpiece and machine do not have enough rigidity and make vibration, reduce the RPM and feed in same proportion.
- Depending on the workpiece and shape, use adequate coolant.

2COB Cutting Condition

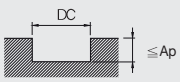
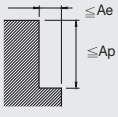
• RPM : rev./min • Feed : mm/min

Material	Copper Alloys							
Corner Radius	$\alpha \leqq 15°$				$\alpha > 15°$			
	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
R 0.5	40,000	8,000	0.06	0.1	40,000	3,200	0.06	0.1
R 0.75	40,000	9,600	0.09	0.15	40,000	4,000	0.09	0.15
R 1	40,000	9,600	0.11	0.2	39,000	4,700	0.11	0.2
R 1.5	40,000	12,000	0.12	0.3	30,000	4,500	0.12	0.3
R 2	40,000	12,000	0.13	0.4	27,000	4,300	0.13	0.4
R 2.5	32,000	11,000	0.15	0.5	20,000	3,600	0.15	0.5
R 3	25,000	9,000	0.2	0.6	16,000	2,900	0.2	0.6
R 4	21,000	8,400	0.25	0.8	13,000	2,600	0.25	0.8
R 5	16,000	6,400	0.3	1	10,000	2,000	0.3	1
R 6	13,000	5,200	0.5	1.2	8,000	1,700	0.5	1.2
R 8	9,000	3,600	0.5	1.6	6,000	1,300	0.5	1.6
Depth of Cut								

- α value represents a slope of workpiece.
- If the effective length is long, reduce the RPM and feed in the same proportion.
- Using Water-soluble oil is recommended for smooth chip emission.
- If the parameters exceed the maximum RPM and feed of your machine, reduce the RPM and feed in the same proportion.

2COR/3COR Cutting Condition

• RPM : rev./min • Feed : mm/min

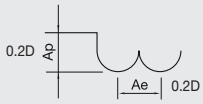
			Slotting				Side Cutting			
Material			Copper / Copper Alloys				Copper / Copper Alloys			
Outside Diameter	Corner Radius	Effective Length	RPM	FEED	Ap Axial Depth	Ap Radial Depth	RPM	FEED	Ap Axial Depth	Ap Radial Depth
ø1	R0.1, R0.2	3	45,000	2,500	0.036	1	45,000	4,500	0.036	0.2
〃	〃	6	40,000	2,000	0.03	1	40,000	3,000	0.03	0.2
〃	〃	10	35,000	1,600	0.025	1	35,000	2,000	0.025	0.2
ø1.5	R0.1, R0.2	5	23,000	1,800	0.08	1.5	50,000	6,000	0.08	0.3
〃	〃	8	26,000	1,600	0.06	1.5	45,000	5,500	0.06	0.3
〃	〃	12	30,000	1,500	0.05	1.5	40,000	4,500	0.04	0.3
ø2	R0.1, R0.2	6	35,000	1,800	0.14	2	45,000	5,000	0.12	0.8
〃	〃	10	30,000	1,600	0.12	2	40,000	4,700	0.1	0.6
〃	〃	14	30,000	1,200	0.08	2	30,000	3,800	0.06	0.4
ø3	R0.2, R0.3	10	30,000	2,200	0.14	3	40,000	6,500	0.12	1
〃	〃	16	20,000	2,000	0.12	3	35,000	6,000	0.1	0.6
〃	〃	20	20,000	2,000	0.12	3	35,000	6,000	0.1	0.6
〃	R0.5	10	20,000	2,600	0.14	3	38,000	10,000	0.12	0.8
〃	〃	16	20,000	2,200	0.12	3	35,000	8,000	0.1	0.6
〃	〃	20	20,000	2,200	0.12	3	35,000	8,000	0.1	0.6
ø4	R0.2, R0.3	12	20,000	2,600	0.5	4	40,000	8,000	0.18	0.12
〃	〃	16	15,000	2,400	0.3	4	32,000	5,000	0.16	0.1
〃	〃	20	15,000	2,000	0.25	4	32,000	5,000	0.15	0.8
〃	R0.5	12	20,000	2,400	0.5	4	35,000	10,000	0.3	0.1
〃	〃	16	15,000	2,200	0.25	4	32,000	7,000	0.15	0.8
〃	〃	20	15,000	2,200	0.25	4	32,000	7,000	0.15	0.8
Depth of Cut										

- Above the parameters are based on V/C 100 with Fz 0.03. Actual machining can be changed depending on your machining purpose and condition of your machine.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

Cutting Data

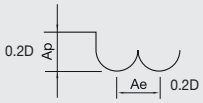
2GBE Cutting Condition

• RPM : rev./min • Feed : mm/min

Material		Graphite			
Radius	Effective Length	RPM	FEED	Ap Axial Depth	Ae Radial Depth
R 0.25	5	25,000	320	0.05	0.05
R 0.5	10	21,850	380	0.10	0.10
〃	20	19,665	342	0.09	0.09
〃	30	18,682	325	0.08	0.08
R 0.75	10	21,850	646	0.15	0.15
〃	20	19,665	630	0.14	0.14
〃	30	18,682	580	0.11	0.11
R 1	15	19,950	760	0.20	0.20
〃	20	17,955	684	0.18	0.18
〃	30	16,160	616	0.16	0.16
〃	40	13,736	523	0.13	0.13
〃	50	10,988	419	0.10	0.10
R 1.5	20	17,575	1,378	0.30	0.30
〃	30	15,818	1,240	0.27	0.27
〃	40	14,236	1,116	0.24	0.24
〃	50	12,100	948	0.22	0.22
R 2	20	15,200	1,995	0.40	0.40
〃	35	13,680	1,796	0.36	0.36
〃	45	12,312	1,616	0.31	0.31
R 2.5	25	14,725	2,423	0.50	0.50
〃	50	11,780	1,938	0.40	0.40
R 3	25	14,250	2,803	0.60	0.60
R 4	30	12,350	2,850	0.80	0.80
R 5	-	10,925	2,898	1.00	1.00
R 6	-	9,975	2,993	1.20	1.20
R 8	-	7,600	2,375	1.60	1.60
R 10	-	6,175	1,900	2.00	2.00
Depth of Cut					

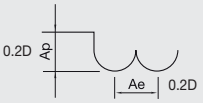
- In case of long effective length, reduce the RPM and feed by 20% or less.
- If the effective length of your tool does not show above the table, use the shorten effevtive length of parameter and reduce the parameters in the same proportion.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- In case of workpiece and machine do not have enough rigidity and make vibration, reduce the RPM and feed in same proportion.

2TGB Cutting Condition

Material		Graphite				
Radius	Effective Length	Angle θ	RPM	FEED	Ap Axial Depth	Ae Radial Depth
R 0.5	20	0°30	18,000	300	0.10	0.10
〃	30	0°30	17,100	285	0.10	0.10
〃	40	0°30	16,245	271	0.09	0.09
〃	25	1°	16,740	279	0.10	0.10
〃	35	1°	15,903	265	0.09	0.09
〃	50	1°	15,108	252	0.08	0.08
R 0.75	30	0°30	17,000	320	0.15	0.15
〃	40	0°30	16,150	304	0.14	0.14
〃	50	0°30	15,343	289	0.12	0.12
〃	30	1°	15,300	288	0.14	0.14
〃	50	1°	14,229	268	0.13	0.13
〃	60	1°	13,233	249	0.12	0.12
R 1	40	0°30	16,500	600	0.20	0.20
〃	50	0°30	14,850	540	0.19	0.19
〃	70	0°30	13,365	486	0.18	0.18
〃	60	1°	12,029	437	0.20	0.20
〃	90	1°	10,224	372	0.19	0.19
R 2	70	0°30	13,500	1,600	0.40	0.40
〃	80	1°	12,825	1,520	0.36	0.36
R 3	100	0°30	11,000	2,200	0.60	0.60
〃	100	1°	10,780	2,156	0.59	0.59
R 5	83	0°30	9,600	2,250	1.00	1.00
R 6	110	0°30	7,500	2,300	1.20	1.20
Depth of Cut						

3TBD

• RPM : rev./min • Feed : mm/min

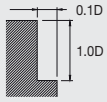
Material		Graphite				
Radius	Effective Length	Angle θ	RPM	FEED	Ap Axial Depth	Ae Radial Depth
R 0.5	20	0°30	18,900	360	0.10	0.10
〃	30	0°30	17,955	342	0.10	0.10
〃	40	0°30	17,057	325	0.09	0.09
〃	25	1°	17,577	335	0.10	0.10
〃	35	1°	16,698	318	0.09	0.09
〃	50	1°	15,863	302	0.08	0.08
R 0.75	30	0°30	17,850	384	0.15	0.15
〃	40	0°30	16,958	365	0.14	0.14
〃	50	0°30	16,110	347	0.12	0.12
〃	40	1°	16,065	346	0.14	0.14
〃	50	1°	14,940	321	0.13	0.13
〃	60	1°	13,895	299	0.12	0.12
R 1	40	0°30	17,325	720	0.20	0.20
〃	50	0°30	15,593	648	0.19	0.19
〃	60	0°30	14,702	559	0.19	0.19
〃	50	1°	14,524	588	0.20	0.20
〃	60	1°	12,630	525	0.20	0.20
〃	70	1°	11,367	472	0.19	0.19
R 2	80	0°30	13,466	1,824	0.40	0.40
〃	100	1°	12,120	1,642	0.36	0.36
Depth of Cut						

- In case of long effective length, reduce the RPM and feed by 20% or less.
- If the effective length of your tool does not show above the table, use the shorten effevtive length of parameter and reduce the parameters in the same proportion.
- If there is no parameter for the angle of your tool, refer to the previous angle, and adjust compare to it.
- Adjust the value of the feed and Ap based on the effective length and taper angle, and adjust the milling condition.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- In case of workpiece and machine do not have enough rigidity and make vibration, reduce the RPM and feed in same proportion.

Cutting Data

2GEM/4GEM/6GEM Cutting Condition

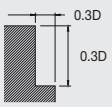
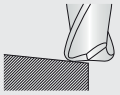
• RPM : rev./min • Feed : mm/min

	2GEM				4GEM				6GEM			
Material	Graphite				Graphite				Graphite			
Outside Diameter	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
ø1	8,000	160	1.00	0.10	-	-	1.00	0.10	-	-	1.00	0.10
ø2	8,000	250	2.00	0.20	-	-	2.00	0.20	-	-	2.00	0.20
ø3	8,000	380	3.00	0.30	8,000	430	3.00	0.30	-	-	3.00	0.30
ø4	8,000	510	4.00	0.40	8,000	570	4.00	0.40	-	-	4.00	0.40
ø5	8,000	640	5.00	0.50	8,000	720	5.00	0.50	-	-	5.00	0.50
ø6	8,000	770	6.00	0.60	8,000	860	6.00	0.60	8,000	960	6.00	0.60
ø8	8,000	1,000	8.00	0.80	8,000	1,100	8.00	0.80	8,000	1,300	8.00	0.80
ø10	8,000	1,250	10.00	1.00	8,000	1,400	10.00	1.00	8,000	1,600	10.00	1.00
ø12	8,000	1,500	12.00	1.20	7,000	1,400	12.00	1.20	7,000	1,600	12.00	1.20
ø16	8,000	1,600	16.00	1.60	7,000	1,500	16.00	1.60	7,000	1,800	16.00	1.60
ø20	8,000	1,600	20.00	2.00	7,000	1,500	20.00	2.00	7,000	1,800	20.00	2.00
Depth of Cut												

- If the effective length is long, reduce the RPM and feed in the same proportion.
- The edge of the flute precisely grinded. If you want to measure the tool, and to avoid damaging on the flutes, use non-contact measuring method.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.
- Use a machine with low vibration and good rigidity (Ø1 or less, the vibration tolerance management should be within 5㎛).
- For graphite milling, air blow method is recommended.

2DCR/4DCR Cutting Condition

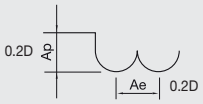
• RPM : rev./min • Feed : mm/min

	2DCR				4DCR			
Material	Graphite				Graphite			
Outside Diameter	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
ø0.2	40,000	100	0.06	0.06	-	-	-	-
ø0.4	40,000	200	0.12	0.12	-	-	-	-
ø0.5	40,000	300	0.15	0.15	-	-	-	-
ø0.6	40,000	400	0.18	0.18	-	-	-	-
ø0.8	40,000	500	0.24	0.24	-	-	-	-
ø1	40,000	900	0.30	0.30	-	-	-	-
ø2	36,000	900	0.60	0.60	40,000	2,800	0.60	0.60
ø3	32,000	1,300	0.90	0.90	40,000	3,150	0.90	0.90
ø4	26,000	1,500	1.20	1.20	40,000	3,500	1.2	1.2
ø5	24,000	1,100	1.50	1.50	-	-	-	-
ø6	21,000	1,100	1.80	1.80	40,000	5,600	1.8	1.8
ø8	-	-	-	-	32,000	5,600	2.4	2.4
ø10	-	-	-	-	26,000	5,700	3.0	3.0
ø12	-	-	-	-	21,000	5,500	3.6	3.6
Ø16	-	-	-	-	15,800	5,500	4.8	4.8
Depth of Cut					 Inclined Cutting			

- If the effective length is long, reduce the RPM and feed in the same proportion.
- For curved milling, set up the lower value of the pitch than the corner radius value of tool diameter.
- For curved milling, raise up the feed up to 50% in stable milling condition.
- For groove milling, set up the Ae value by considering of corner radius value.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- Use the adequate coolant for work material and machining geometry and note for heat and ignition.

2DBE/3DBE/4DBE Cutting Condition

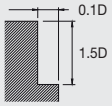
• RPM : rev./min • Feed : mm/min

	2DBE				3DBE				4DBE			
Material	Graphite				Graphite				Graphite			
Outside Diameter	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
ø1	16,000	400	0.20	0.20	16,000	480	0.20	0.20	16,000	700	0.20	0.20
ø2	16,000	800	0.40	0.40	16,000	960	0.40	0.40	16,000	1,200	0.40	0.40
ø3	16,000	1,450	0.60	0.60	16,000	1,740	0.60	0.60	16,000	2,000	0.60	0.60
ø4	16,000	2,100	0.80	0.80	16,000	2,520	0.80	0.80	16,000	3,100	0.80	0.80
ø5	15,500	2,550	1.00	1.00	15,500	3,060	1.00	1.00	15,000	3,800	1.00	1.00
ø6	15,000	2,950	1.20	1.20	15,000	3,540	1.20	1.20	15,000	4,400	1.20	1.20
ø8	13,000	3,000	1.60	1.60	13,000	3,600	1.60	1.60	13,000	4,500	1.60	1.60
ø10	11,500	3,000	2.00	2.00	12,000	3,600	2.00	2.00	12,000	4,600	2.00	2.00
ø12	10,700	3,200	2.40	2.40	10,000	3,840	2.40	2.40	10,000	4,700	2.40	2.40
Depth of Cut												

- If the effective length is long, reduce the RPM and feed maximum 20%.
- If the effective length of your tool does not show above the table, use the shorten effevtive length of parameter and reduce the parameters in the same proportion.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- In case of workpiece and machine do not have enough rigidity and make vibration, reduce the RPM and feed in same proportion.

2DEM/3DEM/4&6DEM Cutting Condition

• RPM : rev./min • Feed : mm/min

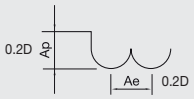
	2DEM				4DEM				6DEM			
Material	Graphite				Graphite				Graphite			
Outside Diameter	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
ø0.2	40,000	100	0.3	0.02	-	-	-	-	-	-	-	-
ø0.4	40,000	200	0.6	0.04	-	-	-	-	-	-	-	-
ø0.6	40,000	350	0.9	0.06	-	-	-	-	-	-	-	-
ø0.8	40,000	550	1.2	0.08	-	-	-	-	-	-	-	-
ø1	40,000	700	1.5	0.10	-	-	-	-	-	-	-	-
ø2	25,000	800	3.0	0.20	-	-	-	-	-	-	-	-
ø3	20,000	800	4.5	0.30	20,000	1,600	4.5	0.3	-	-	-	-
ø4	18,000	950	6.0	0.40	18,000	1,900	6.0	0.4	-	-	-	-
ø5	14,000	1,200	7.5	0.50	14,000	2,400	7.5	0.5	-	-	-	-
ø6	11,000	1,400	9.0	0.60	11,000	2,800	9.0	0.6	22,200	8,000	9	0.6
ø8	8,000	1,300	12.0	0.80	8,000	2,600	12.0	0.8	16,800	8,000	12	0.8
ø10	6,500	1,200	15.0	1.00	6,500	2,400	15.0	1.0	13,400	8,000	15	1.0
ø12	5,500	1,200	18.0	1.20	5,500	2,400	18.0	1.2	11,350	6,700	18	1.2
ø16	5,500	1,200	24.0	1.60	-	-	-	-	8,400	5,000	24	1.6
Depth of Cut												

- If the effective length is long, reduce the RPM and feed in the same proportion.
- The edge of the flute precisely grinded. If you want to measure the tool, and to avoid damaging on the flutes, use non-contact measuring method.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.
- Use a machine with low vibration and good rigidity (ø1 or less, the vibration tolerance management should be within 5㎛).
- For graphite milling, air blow method is recommended.

Cutting Data

2CPB Cutting Condition

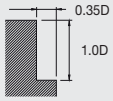
• RPM : rev./min • Feed : mm/min

Material	CFRP				GFRP			
Radius	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
R 0.25	28,000	273	0.05	0.05	13,720	112	0.05	0.05
R 0.3	25,760	315	0.06	0.06	12,622	129	0.06	0.06
R 0.4	18,816	399	0.08	0.08	9,220	164	0.08	0.08
R 0.5	17,920	420	0.1	0.1	8,781	172	0.1	0.1
R 1	17,920	840	0.2	0.2	8,781	344	0.2	0.2
R 2	17,920	2,205	0.4	0.4	8,781	904	0.4	0.4
R 3	16,800	3,098	0.6	0.6	8,232	1,270	0.6	0.6
R 4	14,560	3,150	0.8	0.8	7,134	1,292	0.8	0.8
R 5	12,880	3,360	1	1	6,311	1,378	1	1
R 6	11,200	3,308	1.2	1.2	5,488	1,356	1.2	1.2
Depth of Cut								

- If the effective length is long, reduce the RPM and feed in the same proportion.
- If the effective length of your tool does not show above the table, use the shorten effevtive length of parameter and reduce the parameters in the same proportion.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- In case of workpiece and machine do not have enough rigidity and make vibration, reduce the RPM and feed in same proportion.

8 ~12CPE Cutting Condition

• RPM : rev./min • Feed : mm/min

Material	CFRP				GFRP			
Outside Diameter	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
ø6	8,400	840	6	2.1	4116	378	6	2.1
ø8	6,200	860	8	2.8	3038	387	8	2.8
ø10	5,100	780	10	3.5	2499	351	10	3.5
ø12	4,150	750	12	4.2	2034	338	12	4.2
Depth of Cut								

- In case of long effective length, reduce the RPM and feed by 20% or less.
- The edge of the flute precisely grinded. If you want to measure the tool, and to avoid damaging on the flutes, use non-contact measuring method.
- Above the value of the table is based on 8 flutes. If you use more than 8 flutes of endmill, raise up the RPM and Feed in a same proportion compared to the same diameter.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

2DDCA Cutting Condition

• RPM : rev./min • Feed : mm/min

Material	CFRP			
Outside Diameter	RPM	FEED	V/C	Fz
ø2	15,900	960	100 ~ 150	0.03 ~ 0.07
ø2.5	12,700	760	〃	〃
ø3	10,600	630	〃	〃
ø4	7,960	480	〃	〃
ø5	6,370	380	〃	〃
ø6	5,300	320	〃	〃
ø8	3,980	240	〃	〃
ø9	3,540	210	〃	〃
ø10	3,180	190	〃	〃
ø11	2,890	175	〃	〃
ø12	2,650	160	〃	〃

- Above the parameters are based on V/C 100 with Fz 0.03. Actual machining can be changed depending on your machining purpose and condition of your machine.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

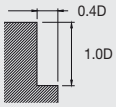
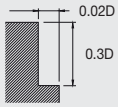
3CPR G-TAC Coating

•RPM : rev./min •Feed : mm/min

Material	CFRP			
Outside Diameter	RPM	FEED	Ap Axial Depth	Ae Radial Depth
ø6	8,000	600	6	2.4
ø8	6,000	600	8	3.2
ø10	4,800	540	10	4.0
ø12	4,000	540	12	4.8

4&6CPR DIA Coating

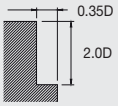
•RPM : rev./min •Feed : mm/min

	4CPR								6CPR							
Material	CFRP				GFRP				CFRP				GFRP			
Outside Diameter	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
ø6	7,900	1,100	6	2.4	4,200	430	6	2.4	10,500	1,950	1.8	0.12	5,300	7,400	1.8	0.12
ø8	5,960	1,600	8	3.2	3,200	590	8	3.2	7,970	2,950	2.4	0.16	3,900	950	2.4	0.16
ø10	4,750	1,500	10	4.0	2,550	560	10	4.0	6,350	2,930	3	0.20	3,120	850	3	0.20
ø12	3,950	2,060	12	4.8	2,120	725	12	4.8	5,300	3,900	3.6	0.24	2,600	1,050	3.6	0.24
Depth of Cut																

- In case of long effective length, reduce the RPM and feed by 20% or less.
- The edge of the flute precisely grinded. If you want to measure the tool, and to avoid damaging on the flutes, use non-contact measuring method.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

6 ~16CPO Cutting Condition

•RPM : rev./min •Feed : mm/min

Material	CFRP				GFRP			
Outside Diameter	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
ø4	15,900	1,400	8	1.4	15,900	1,400	8	1.4
ø5	13,000	1,900	10	1.8	13,000	1,900	10	1.8
ø6	10,600	2,200	12	2.1	10,600	2,200	12	2.1
ø8	7,950	2,600	16	2.8	7,950	2,600	16	2.8
ø10	6300	3050	20	3.5	6300	3050	20	3.5
ø12	5300	3300	24	4.2	5300	3300	24	4.2
Depth of Cut								

- In case of long effective length, reduce the RPM and feed by 20% or less.
- The edge of the flute precisely grinded. If you want to measure the tool, and to avoid damaging on the flutes, use non-contact measuring method.
- Above the value of the table is based on 8 flutes. If you use more than 8 flutes of endmill, raise up the RPM and Feed in a same proportion compared to the same diameter.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

Cutting Data

4&6CTDB

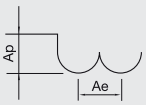
■ 6CTDB는 RPM 동일, FEED만 최대 30% Up 적용.
■ Use the same RPM and raise up the feed up to 30% for 6CTDB.

• RPM : rev./min • Feed : mm/min

Material		Graphite				Hardened Steels			
Hardness						< 35HRC			
Radius	a/2	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
R 0.5	10	35,000	4,200	0.22	0.05	42,000	3,000	0.09	0.3
R 0.75	10	33,000	5,250	0.27	0.05	39,000	4,400	0.10	0.3
R 1	10	32,000	6,300	0.32	0.10	38,500	5,400	0.20	0.6
R 1	15	25,000	6,000	1.18	0.10	30,000	4,200	0.20	0.6
R 1.5	10	25,000	6,000	0.39	0.10	30,000	4,800	0.30	0.8
R 2	10	16,000	4,500	0.45	0.10	20,000	3,500	0.40	1.1
R 2	30	14,500	3,700	1.18	0.10	18,000	3,000	0.40	1.1
R 3	10	12,000	4,250	0.49	0.10	14,000	3,400	0.60	1.4
R 3	20	10,500	4,000	1.18	0.10	13,200	3,100	0.60	1.4
R 4	5	9,500	4,100	0.45	0.10	11,000	3,200	0.80	1.6
R 4	10	8,000	3,850	0.45	0.10	10,000	3,000	0.80	1.6

Depth of Cut

a/2 각도 만큼의 절삭을 권장합니다. a/2



Ap : Axial Depth 축 방향의 절입 깊이 (mm)
Ae : Radial Depth 반경 방향의 절입 깊이 (mm)
D : Outside Diameter 외경 (mm)
n : Speed 회전속도 (min^{-1})
Vf : Feed 이송속도 (mm/min)

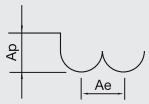
- The parameters on the table is based on 4 flutes. For using 6 flutes, use the same RPM and raise up the feed up to 30% in stable milling condition.
- If there is no parameter for the angle of your tool, refer to the previous angle, and adjust compare to it.
- Consider the RPM and feed based on the taper angle and adjust it with milling condition.
- For 5-axis milling, check the length of the effective length before milling.
- If you want to increase metal removal rates, raise up the feed up to 20%.
- During the chip evacuation, note for heat and ignition.

3TBIC Cutting Condition

• RPM : rev./min • Feed : mm/min

Material			Prehardened Steels/ Hardened Steels				Hardened Steels				Hardened Steels			
Hardness			30 ~ 45HRC				45 ~ 55HRC				55~ 62HRC			
Radius	Effective Length	Taper Angle	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
R 0.5	12	1°	38,000	2,500	0.110	0.16	35,000	1,600	0.080	0.13	25,000	800	0.050	0.08
〃	20	1°	38,000	2,500	0.060	0.09	35,000	1,600	0.050	0.07	25,000	800	0.030	0.05
〃	15	2°	38,000	2,500	0.090	0.14	35,000	1,600	0.070	0.11	25,000	800	0.050	0.07
〃	20	2°	38,000	2,500	0.060	0.09	35,000	1,600	0.050	0.07	25,000	800	0.030	0.05
〃	15	3°	38,000	2,500	0.090	0.14	35,000	1,600	0.070	0.11	25,000	800	0.050	0.07
〃	20	3°	38,000	2,500	0.060	0.09	35,000	1,600	0.050	0.07	25,000	800	0.030	0.05
〃	20	4°	38,000	2,500	0.070	0.1	35,000	1,600	0.060	0.08	25,000	800	0.030	0.05
〃	20	5°	38,000	2,500	0.080	0.11	35,000	1,600	0.060	0.09	25,000	800	0.040	0.06
〃	20	7°	38,000	2,500	0.080	0.11	35,000	1,600	0.060	0.09	25,000	800	0.040	0.06
R 1	12	1°	35,000	2,800	0.180	0.27	30,000	1,800	0.140	0.22	15,000	1,000	0.090	0.14
〃	20	1°	35,000	2,800	0.400	0.21	30,000	1,800	0.110	0.17	15,000	1,000	0.070	0.11
〃	15	2°	35,000	2,800	0.160	0.24	30,000	1,800	0.130	0.19	15,000	1,000	0.080	0.12
〃	20	2°	35,000	2,800	0.400	0.21	30,000	1,800	0.110	0.17	15,000	1,000	0.070	0.11
〃	15	3°	35,000	2,800	0.160	0.24	30,000	1,800	0.130	0.19	15,000	1,000	0.080	0.12
〃	20	3°	35,000	2,800	0.400	0.21	30,000	1,800	0.110	0.17	15,000	1,000	0.070	0.11
〃	30	3°	35,000	2,800	0.3	0.2	30,000	1,800	0.12	0.18	15,000	1,000	0.08	0.12
〃	20	4°	35,000	2,800	0.400	0.21	30,000	1,800	0.110	0.17	15,000	1,000	0.070	0.11
〃	20	5°	35,000	2,800	0.15	0.22	30,000	1,800	0.12	0.18	15,000	1,000	0.08	0.12
〃	30	5°	35,000	2,800	0.13	0.2	30,000	1,800	0.11	0.18	15,000	1,000	0.07	0.12
〃	29	6°	35,000	2,800	0.14	0.2	30,000	1,800	0.1	0.18	15,000	1,000	0.07	0.12
〃	25	7°	35,000	2,800	0.15	0.25	30,000	1,800	0.12	0.18	15,000	1,000	0.07	0.11
R 2	20	1°	24,000	3,500	0.23	0.34	20,000	2,500	0.18	0.27	12,000	1,500	0.11	0.17
〃	20	2°	24,000	3,500	0.23	0.34	20,000	2,500	0.18	0.27	12,000	1,500	0.11	0.17
〃	21	3°	24,000	3,500	0.23	0.34	20,000	2,500	0.18	0.27	12,000	1,500	0.11	0.17
〃	20	4°	24,000	3,500	0.23	0.34	20,000	2,500	0.18	0.27	12,000	1,500	0.11	0.17
〃	20	5°	24,000	3,500	0.24	0.37	20,000	2,500	0.19	0.29	12,000	1,500	0.12	0.18
〃	20	6°	24,000	3,500	0.22	0.32	20,000	2,500	0.17	0.25	12,000	1,500	0.1	0.16
〃	18	7°	24,000	3,500	0.23	0.34	20,000	2,500	0.18	0.27	12,000	1,500	0.11	0.17
R 3	32	1°	16,000	3,500	0.23	0.41	13,500	2,500	0.23	0.35	8,000	1,500	0.14	0.21
〃	30	2°	16,000	3,500	0.25	0.42	13,500	2,500	0.23	0.35	8,000	1,500	0.14	0.21
〃	22	3°	16,000	3,500	0.3	0.45	13,500	2,500	0.24	0.36	8,000	1,500	0.15	0.23
〃	40	3°	16,000	3,500	0.2	0.4	13,500	2,500	0.2	0.35	8,000	1,500	0.13	0.19
〃	25	4°	16,000	3,500	0.22	0.43	13,500	2,500	0.22	0.36	8,000	1,500	0.14	0.2
〃	21	5°	16,000	3,500	0.25	0.45	13,500	2,500	0.23	0.36	8,000	1,500	0.14	0.23
〃	21	6°	16,000	3,500	0.25	0.45	13,500	2,500	0.23	0.36	8,000	1,500	0.14	0.23
〃	19	7°	16,000	3,500	0.21	0.43	13,500	2,500	0.25	0.36	8,000	1,500	0.15	0.25

Depth of Cut



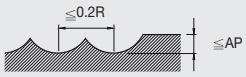
Ap : Axial Depth 축 방향의 절입 깊이 (mm)
Ae : Radial Depth 반경 방향의 절입 깊이 (mm)
D : Outside Diameter 외경 (mm)
n : Speed 회전속도 (min^{-1})
Vf : Feed 이송속도 (mm/min)

- If there is no parameter for the angle of your tool, refer to the previous angle, and adjust compare to it.
- Consider the RPM and feed based on the taper angle and adjust it with milling condition.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If you want to increase metal removal rates, raise up the feed up to 20%.
- During the chip evacuation, note for heat and ignition.

Cutting Data

2CTB Cutting Condition

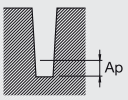
•RPM : rev./min •Feed : mm/min

Material	Alloy/ Tools Steels/ Prehardened Steels						Hardened Steels					
Hardness	30 ~ 45HRC						45~ 55HRC					
Radius	α ≦15°		α >15°		Ap Axial Depth	Ae Radial Depth	α ≦15°		α >15°		Ap Axial Depth	Ae Radial Depth
	RPM	FEED	RPM	FEED			RPM	FEED	RPM	FEED		
R0.5	40,000	5,600	40,000	3,200	0.06	0.1	40,000	5,600	40,000	3,000	0.05	0.1
R0.75	40,000	6,500	40,000	4,000	0.09	0.15	40,000	6,500	32,000	3,200	0.08	0.15
R1	40,000	6,500	39,000	4,700	0.11	0.2	40,000	6,500	31,000	3,500	0.11	0.2
R1.25	40,000	7,000	30,000	4,500	0.12	0.25	36,000	6,500	26,000	3,500	0.12	0.25
R1.5	40,000	7,500	27,000	4,300	0.13	0.3	32,000	6,000	22,000	3,400	0.13	0.3
R2	32,000	7,500	20,000	3,600	0.15	0.4	25,000	6,000	16,000	2,700	0.15	0.4
R2.5	25,000	6,000	16,000	2,900	0.2	0.5	20,000	5,400	13,000	2,300	0.2	0.5
R3	21,000	5,800	13,000	2,600	0.25	0.6	17,000	4,700	10,000	2,000	0.25	0.6
R4	16,000	4,500	10,000	2,000	0.3	0.8	13,000	3,600	8,000	1,500	0.3	0.8
R5	13,000	3,600	8,000	1,700	0.5	1	10,000	2,900	6,400	1,200	0.5	1
R6	9,000	2,500	6,000	1,300	0.5	1.2	7,200	2,000	4,800	1,000	0.5	1.2
Depth of Cut												

- α value represents the inclined angle.
- Consider the RPM and feed based on the taper angle and adjust it with milling condition.
- Air blow or mist coolant is recommended.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- During the chip evacuation, note for heat and ignition.

4RTE Cutting Condition

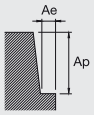
•RPM : rev./min •Feed : mm/min

Material	Alloy Steels / Tool Steels SCM / SKT / SKS / SKD			Prehardened Steels / Hardened Steels SKT / SKD / NAK55 / HPM1			Hardened Steels / Stainless Steels SUS304 / SKD			Hardened Steels		
Hardness	~ 30HRc			30HRc ~ 38HRc			38HRc ~ 45HRc			45HRc ~ 55HRc		
Outside Diameter	RPM	FEED	Ap	RPM	FEED	Ap	RPM	FEED	Ap	RPM	FEED	Ap
ø0.5	31,500	565	0.01~0.025	31,500	475	0.01~0.025	31,500	440	0.01~0.025	19,000	250	0.005~0.01
ø0.6	31,500	680	0.012~0.03	29,500	530	0.012~0.03	26,500	445	0.012~0.03	15,500	260	0.006~0.012
ø0.7	27,000	680	0.014~0.035	25,000	530	0.014~0.035	22,500	445	0.014~0.035	13,500	260	0.007~0.014
ø0.8	23,500	680	0.016~0.04	22,000	630	0.016~0.04	19,500	445	0.016~0.04	11,500	260	0.008~0.016
ø0.9	21,000	680	0.018~0.045	19,500	530	0.018~0.045	17,500	445	0.018~0.045	10,500	260	0.009~0.018
ø1	19,000	680	0.02~0.05	17,500	530	0.02~0.05	15,500	445	0.02~0.05	9,500	260	0.01~0.02
ø1.2	15,500	680	0.024~0.06	14,500	530	0.024~0.06	13,000	445	0.024~0.06	7,950	260	0.012~0.024
ø1.5	12,500	680	0.03~0.075	11,500	530	0.03~0.075	10,500	445	0.03~0.075	6,350	260	0.015~0.03
ø2	9,500	680	0.04~0.1	8,900	530	0.04~0.1	7,950	445	0.04~0.1	4,750	260	0.02~0.04
ø2.5	7,600	680	0.05~0.125	7,100	530	0.05~0.125	7,950	445	0.04~0.1	4,750	260	0.02~0.04
Depth of Cut												

- Consider the RPM and feed based on the taper angle and adjust it with milling condition.
- Reduce the feed by 50% for corner milling.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

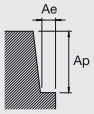
2CTE Cutting Condition

• RPM : rev./min • Feed : mm/min

Material	Mild Steels / Carbon Steels SS400 / S55C		Alloy Steels / Tool Steels SCM / SKT / SKS / SKD		Hardened Steels / Prehardened Steels SKT / SKD / NAK55 / HPM1		Hardened Steels / Stainless Steels SUS304 / SKD		Hardened Steels	
Hardness	~750HN/mm^2		~ 30HRC		30 ~ 38HRC		38 ~ 45HRC		45 ~ 55HRC	
Outside Diameter	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
ø1	15,500	155	15,500	130	13,000	90	12,000	90	10,500	40
ø1.5	10,500	155	10,500	130	8,900	90	8,250	90	7,000	40
ø2	7,950	155	7,950	130	6,650	90	6,200	90	5,250	40
ø2.5	6,200	145	6,200	125	5,300	90	4,950	90	4,200	40
ø3	5,150	145	5,150	125	4,450	90	4,100	90	3,500	40
ø4	3,850	145	3,850	125	3,300	90	3,100	85	2,600	40
ø5	3,100	145	3,100	125	2,650	90	2,450	85	2,100	40
ø6	2,600	145	2,600	125	2,200	90	2,050	85	1,750	40
ø8	1,950	145	1,950	125	1,650	90	1,550	85	1,300	40
ø10	1,550	145	1,550	120	1,300	90	1,200	85	1,050	40
Depth of Cut	Ap 2.5D, Ae 0.02D 									

4CTE

• RPM : rev./min • Feed : mm/min

Material	Mild Steels / Carbon Steels SS400 / S55C		Alloy Steels / Tool Steels SCM / SKT / SKS / SKD		Hardened Steels / Prehardened Steels SKT / SKD / NAK55 / HPM1		Hardened Steels / Stainless Steels SUS304 / SKD		Hardened Steels	
Hardness	~750HN/mm^2		~ 30HRc		30 ~ 38HRc		38 ~ 45HRc		45 ~ 55HRc	
Outside Diameter	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
ø3	5,300	225	4,450	225	4,450	180	4,100	130	3,500	130
ø4	3,950	245	3,300	245	3,300	195	3,100	150	2,600	150
ø5	3,150	275	2,650	275	2,650	225	2,450	160	2,100	160
ø6	2,200	275	2,200	275	2,200	225	2,050	175	1,750	175
ø8	1,950	270	1,650	270	1,650	225	1,550	190	1,300	190
ø10	1,550	270	1,300	270	1,300	225	1,200	180	1,050	180
Depth of Cut	Ap 2.5D, Ae 0.02D 									

- 2CTE and 4CTE type can be used the same depth of cut.
- Consider the RPM and feed based on the taper angle and adjust it with milling condition.
- Using shrink-fit chuck is recommeded.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

Cutting Data

4ETM Cutting Condition

Material	Alloy Steel/ Tool Steel		Hardened Steels		Aluminum		Stainless Steel	
Hardness	~ 30HRC		35 ~ 45HRC					
TAP	V/C	FZ	V/C	FZ	V/C	FZ	V/C	FZ
M3	50 ~ 70	0.01 ~ 0.02	45 ~ 55	0.005 ~ 0.01	100 ~ 130	0.03 ~ 0.04	70 ~ 80	0.015 ~ 0.025
M4	50 ~ 70	0.01 ~ 0.02	45 ~ 55	0.005 ~ 0.01	100 ~ 130	0.03 ~ 0.04	70 ~ 80	0.015 ~ 0.025
M5	50 ~ 70	0.01 ~ 0.02	45 ~ 55	0.005 ~ 0.01	100 ~ 130	0.03 ~ 0.04	70 ~ 80	0.015 ~ 0.025
M6	50 ~ 70	0.02 ~ 0.03	45 ~ 55	0.01 ~ 0.015	100 ~ 130	0.04 ~ 0.05	70 ~ 80	0.025 ~ 0.035
M8	50 ~ 70	0.02 ~ 0.03	45 ~ 55	0.01 ~ 0.015	100 ~ 130	0.04 ~ 0.05	70 ~ 80	0.03 ~ 0.04
M10	50 ~ 70	0.02 ~ 0.03	45 ~ 55	0.015 ~ 0.02	100 ~ 130	0.05 ~ 0.06	70 ~ 80	0.03 ~ 0.04
M12	50 ~ 70	0.03 ~ 0.04	45 ~ 55	0.02 ~ 0.025	100 ~ 130	0.06 ~ 0.07	70 ~ 80	0.03 ~ 0.04
M16	50 ~ 70	0.03 ~ 0.04	45 ~ 55	0.02 ~ 0.025	100 ~ 130	0.06 ~ 0.07	70 ~ 80	0.04 ~ 0.05

4MTM Cutting Condition

Material	Alloy Steel/ Tool Steel		Hardened Steels		Aluminum		Stainless Steel	
Hardness	~ 30HRC		35 ~ 45HRC					
TAP	V/C	FZ	V/C	FZ	V/C	FZ	V/C	FZ
M1	50 ~ 70	0.005 ~ 0.01	55 ~ 65	0.005 ~ 0.01	100 ~ 130	0.02 ~ 0.34	70 ~ 85	0.005 ~ 0.01
M2	50 ~ 70	0.005 ~ 0.01	55 ~ 65	0.005 ~ 0.01	100 ~ 130	0.02 ~ 0.34	70 ~ 85	0.005 ~ 0.01
M3	50 ~ 70	0.01 ~ 0.02	55 ~ 65	0.01 ~ 0.02	100 ~ 130	0.02 ~ 0.34	70 ~ 85	0.005 ~ 0.01
M4	50 ~ 70	0.01 ~ 0.02	55 ~ 65	0.01 ~ 0.02	100 ~ 130	0.04 ~ 0.05	70 ~ 85	0.01 ~ 0.02
M5	50 ~ 70	0.02 ~ 0.03	55 ~ 65	0.02 ~ 0.03	100 ~ 130	0.04 ~ 0.05	70 ~ 85	0.01 ~ 0.02
M6	50 ~ 70	0.02 ~ 0.03	55 ~ 65	0.02 ~ 0.03	100 ~ 130	0.05 ~ 0.06	70 ~ 85	0.02 ~ 0.03

4STM Cutting Condition

Material	Alloy Steel/ Tool Steel		Hardened Steels		Aluminum		Stainless Steel	
Hardness	~ 30HRC		35 ~ 45HRC					
TAP	V/C	FZ	V/C	FZ	V/C	FZ	V/C	FZ
M3	50 ~ 70	0.01 ~ 0.02	55 ~ 65	0.008 ~ 0.01	100 ~ 130	0.03 ~ 0.04	70 ~ 85	0.01 ~ 0.02
M4	50 ~ 70	0.01 ~ 0.02	55 ~ 65	0.008 ~ 0.01	100 ~ 130	0.03 ~ 0.04	70 ~ 85	0.01 ~ 0.02
M5	50 ~ 70	0.01 ~ 0.02	55 ~ 65	0.01 ~ 0.02	100 ~ 130	0.03 ~ 0.04	70 ~ 85	0.01 ~ 0.02
M6	50 ~ 70	0.01 ~ 0.02	55 ~ 65	0.01 ~ 0.02	100 ~ 130	0.04 ~ 0.05	70 ~ 85	0.02 ~ 0.03
M8	50 ~ 70	0.02 ~ 0.03	55 ~ 65	0.02 ~ 0.03	100 ~ 130	0.04 ~ 0.05	70 ~ 85	0.02 ~ 0.03
M10	50 ~ 70	0.02 ~ 0.03	55 ~ 65	0.02 ~ 0.03	100 ~ 130	0.05 ~ 0.06	70 ~ 85	0.03 ~ 0.04
M12	50 ~ 70	0.02 ~ 0.03	55 ~ 65	0.02 ~ 0.03	100 ~ 130	0.06 ~ 0.07	70 ~ 85	0.05 ~ 0.06
M16	50 ~ 70	0.03 ~ 0.04	55 ~ 65	0.03 ~ 0.04	100 ~ 130	0.06 ~ 0.07	70 ~ 85	0.05 ~ 0.06

4HTM Cutting Condition

Material	Alloy Steel/ Tool Steel		Hardened Steels		Aluminum		Stainless Steel	
Hardness	~ 30HRC		35 ~ 45HRC					
TAP	V/C	FZ	V/C	FZ	V/C	FZ	V/C	FZ
M3	50 ~ 70	0.01 ~ 0.02	50 ~ 60	0.005 ~ 0.008	100 ~ 130	0.03 ~ 0.04	70 ~ 85	0.01 ~ 0.02
M4	50 ~ 70	0.01 ~ 0.02	50 ~ 60	0.005 ~ 0.008	100 ~ 130	0.03 ~ 0.04	70 ~ 85	0.01 ~ 0.02
M5	50 ~ 70	0.01 ~ 0.02	50 ~ 60	0.01 ~ 0.02	100 ~ 130	0.03 ~ 0.04	70 ~ 85	0.01 ~ 0.02
M6	50 ~ 70	0.01 ~ 0.02	50 ~ 60	0.01 ~ 0.02	100 ~ 130	0.04 ~ 0.05	70 ~ 85	0.02 ~ 0.03
M8	50 ~ 70	0.02 ~ 0.03	50 ~ 60	0.02 ~ 0.03	100 ~ 130	0.04 ~ 0.05	70 ~ 85	0.02 ~ 0.03
M10	50 ~ 70	0.02 ~ 0.03	50 ~ 60	0.02 ~ 0.03	100 ~ 130	0.05 ~ 0.06	70 ~ 85	0.03 ~ 0.04
M12	50 ~ 70	0.02 ~ 0.03	50 ~ 60	0.02 ~ 0.03	100 ~ 130	0.06 ~ 0.07	70 ~ 85	0.05 ~ 0.06
M16	50 ~ 70	0.03 ~ 0.04	50 ~ 60	0.03 ~ 0.04	100 ~ 130	0.06 ~ 0.07	70 ~ 85	0.05 ~ 0.06

- Using shrink-fit chuck is recommeded.
- When the tool approaches the work material, reduce the feed by 30%.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- Internal and external coolants are recommended for milling.

4NKTM Cutting Condition

Material	Alloy Steel/ Tool Steel		Hardened Steels		Aluminum		Stainless Steel	
Hardness	~ 30HRC		35 ~ 45HRC					
TAP	V/C	FZ	V/C	FZ	V/C	FZ	V/C	FZ
M3	50 ~ 70	0.01 ~ 0.02	55 ~ 65	0.008 ~ 0.01	100 ~ 130	0.03 ~ 0.04	70 ~ 85	0.01 ~ 0.02
M4	50 ~ 70	0.01 ~ 0.02	55 ~ 65	0.008 ~ 0.01	100 ~ 130	0.03 ~ 0.04	70 ~ 85	0.01 ~ 0.02
M5	50 ~ 70	0.01 ~ 0.02	55 ~ 65	0.01 ~ 0.02	100 ~ 130	0.03 ~ 0.04	70 ~ 85	0.01 ~ 0.02
M6	50 ~ 70	0.01 ~ 0.02	55 ~ 65	0.01 ~ 0.02	100 ~ 130	0.04 ~ 0.05	70 ~ 85	0.02 ~ 0.03
M8	50 ~ 70	0.02 ~ 0.03	55 ~ 65	0.02 ~ 0.03	100 ~ 130	0.04 ~ 0.05	70 ~ 85	0.02 ~ 0.03
M10	50 ~ 70	0.02 ~ 0.03	55 ~ 65	0.02 ~ 0.03	100 ~ 130	0.05 ~ 0.06	70 ~ 85	0.03 ~ 0.04
M12	50 ~ 70	0.02 ~ 0.03	55 ~ 65	0.02 ~ 0.03	100 ~ 130	0.06 ~ 0.07	70 ~ 85	0.05 ~ 0.06
M16	50 ~ 70	0.03 ~ 0.04	55 ~ 65	0.03 ~ 0.04	100 ~ 130	0.06 ~ 0.07	70 ~ 85	0.05 ~ 0.06
M20	50 ~ 70	0.03 ~ 0.04	55 ~ 65	0.03 ~ 0.04	100 ~ 130	0.06 ~ 0.07	70 ~ 85	0.05 ~ 0.06

4NPTM Cutting Condition

Material	Alloy Steel/ Tool Steel		Hardened Steels		Aluminum		Stainless Steel	
Hardness	~ 30HRC		35 ~ 45HRC					
TAP	V/C	FZ	V/C	FZ	V/C	FZ	V/C	FZ
1/16-27C NPT	50 ~ 70	0.01 ~ 0.02	55 ~ 65	0.01 ~ 0.02	100 ~ 130	0.03 ~ 0.04	70 ~ 85	0.02 ~ 0.03
1/8-27C NPT	50 ~ 70	0.02 ~ 0.03	55 ~ 65	0.02 ~ 0.03	100 ~ 130	0.03 ~ 0.04	70 ~ 85	0.02 ~ 0.03
1/4-18C NPT	50 ~ 70	0.02 ~ 0.03	55 ~ 65	0.02 ~ 0.03	100 ~ 130	0.03 ~ 0.04	70 ~ 85	0.03 ~ 0.04
3/8-18C NPT	50 ~ 70	0.02 ~ 0.03	55 ~ 65	0.02 ~ 0.03	100 ~ 130	0.04 ~ 0.05	70 ~ 85	0.05 ~ 0.06
1/2(3/4)-14C NPT	50 ~ 70	0.03 ~ 0.04	55 ~ 65	0.03 ~ 0.04	100 ~ 130	0.04 ~ 0.05	70 ~ 85	0.05 ~ 0.06

4BSTM Cutting Condition

Material	Alloy Steel/ Tool Steel		Hardened Steels		Aluminum		Stainless Steel	
Hardness	~ 30HRC		35 ~ 45HRC					
TAP	V/C	FZ	V/C	FZ	V/C	FZ	V/C	FZ
1/16-28C BSPT	50 ~ 70	0.01 ~ 0.02	55 ~ 65	0.01 ~ 0.02	100 ~ 130	0.03 ~ 0.04	70 ~ 85	0.02 ~ 0.03
1/8-28C BSPT	50 ~ 70	0.02 ~ 0.03	55 ~ 65	0.02 ~ 0.03	100 ~ 130	0.03 ~ 0.04	70 ~ 85	0.02 ~ 0.03
1/4-19C BSPT	50 ~ 70	0.02 ~ 0.03	55 ~ 65	0.02 ~ 0.03	100 ~ 130	0.03 ~ 0.04	70 ~ 85	0.03 ~ 0.04
3/8-19C BSPT	50 ~ 70	0.02 ~ 0.03	55 ~ 65	0.02 ~ 0.03	100 ~ 130	0.04 ~ 0.05	70 ~ 85	0.05 ~ 0.06
1/2(3/4)-14C BSPT	50 ~ 70	0.03 ~ 0.04	55 ~ 65	0.03 ~ 0.04	100 ~ 130	0.04 ~ 0.05	70 ~ 85	0.05 ~ 0.06

2DTM Cutting Condition

Material	Aluminum	
TAP	V/C	FZ
M3	90 ~ 130	0.03 ~ 0.04
M4	90 ~ 130	0.03 ~ 0.04
M5	90 ~ 130	0.03 ~ 0.04
M6	90 ~ 130	0.04 ~ 0.05
M8	90 ~ 130	0.04 ~ 0.05
M10	90 ~ 130	0.05 ~ 0.06
M12	90 ~ 130	0.06 ~ 0.07
M16	90 ~ 130	0.06 ~ 0.07

4IMTM Cutting Condition

Material	Titanium Alloys	
TAP	V/C	FZ
M0.8 ~ M1	20 ~ 80	0.005 ~ 0.01
M1 ~ M2	20 ~ 80	0.005 ~ 0.01
M 2.5	20 ~ 80	0.01 ~ 0.02

- Using shrink-fit chuck is recommeded.
- When the tool approaches the work material, reduce the feed by 30%.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- Internal and external coolants are recommended for milling.

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