FRIDRO

ALL IN ONE PLACE

06/25

JJ TOOLS

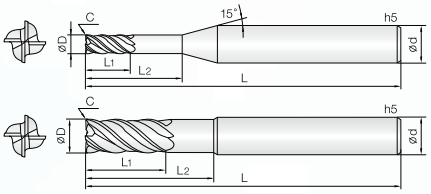
special offer

Valid until: 31.12.2025

JJTOOLS

4SLE

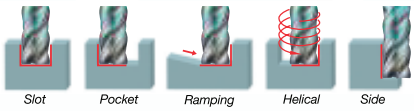
4 Flutes High Speed Sloting End Mills for SUS



- Endmills for finishing and roughing of alloy steels, SUS, Inconel, Mild steels and various hard-to-cut materials
- Chip emission is excellent for slotting, and thick double core designed enables continuous machining without chattering
- Minimize fracturing by high TRS fine(0.5㎛) WC grade
- TISIN-R coating provides wear resistance improvement as well as avoid edge stress in various applications

Condition	D Size	D Tolerance
ØD ≠Ød	Ø1 ~ 6	+0 ~ -0.01mm
	Ø8 ~ 20	+0 ~ -0.015mm

Condition	D Size	D Tolerance
ØD =Ød	Ø6	-0.005 ~ -0.015mm
	Ø8 ~ 12	-0.01 ~ -0.025mm
	Ø14 ~ 20	-0.015 ~ -0.03mm

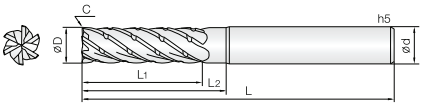


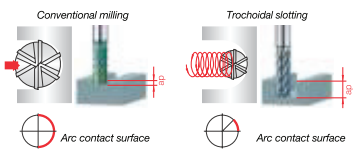
Order Number	Diameter D	Length of cut L1	Chamfer C	Effective Length L2	Overall Length L	Shank Dia d
4SLE030080S06	3	8	0,06	-	50	6
4SLE030210S06	3	8	0,06	21	60	6
4SLE040100S06	4	10	0,08	-	50	6
4SLE040210S06	4	10	0,08	21	60	6
4SLE060150S06	6	15	0,12	-	60	6
4SLE060210S06	6	15	0,12	21	60	6
4SLE080200S08	8	20	0,16	-	70	8
4SLE080270S08	8	20	0,16	27	70	8

Order Number	Diameter D	Length of cut L1	Chamfer C	Effective Length L2	Overall Length L	Shank Dia d
4SLE100250S10	10	25	0,2	-	80	10
4SLE100350S10	10	25	0,2	35	80	10
4SLE120300S12	12	30	0,24	-	90	12
4SLE120400S12	12	30	0,24	40	90	12
4SLE160400S16	16	40	0,32	-	100	16
4SLE160500S16	16	40	0,32	50	100	16
4SLE200450S20	20	45	0,4	-	110	20
4SLE200550S20	20	45	0,4	55	110	20

5&6TROE

5&6 Flutes Trochoidal Milling End Mills





- Roughing Endmills for alloy steels, SUS, Inconel, Mild steels and various hard-to-cut materials
- Chip breaker designed for side flute and TISIN-R coating provides wea resistance improvement as well as avoid edge stress in various applications
- Variable helix Design for minimizing cutting resistance and long time process
- Minimize fracturing by high TRS fine(0.5㎛) WC grade

Condition	D Size	D Tolerance
ØD ≠ Ød	Ø6	+0 ~ -0.01mm
	Ø8 ~ 20	+0 ~ -0.015mm

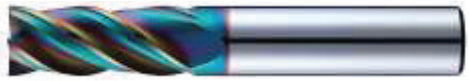
Condition	D Size	D Tolerance
ØD =Ød	Ø6	-0.005 ~ -0.015mm
	Ø8 ~ 12	-0.01 ~ -0.025mm
	Ø14 ~ 20	-0.015 ~ -0.03mm

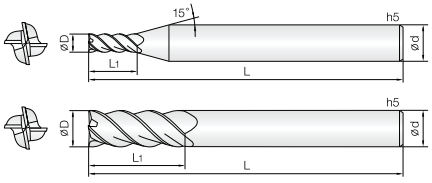
Order Number	Diameter D	Length of cut L1	Chamfer C	Effective Length L2	Overall Length L	Shank Dia d
6TROE060200065	6	20	0,12	-	65	6
5TROE060260070	6	26	0,12	-	70	6
6TROE080260070	8	26	0,16	-	70	8
5TROE080340080	8	34	0,16	-	80	8
6TROE100220075	10	22	0,2	-	75	10
6TROE100330080	10	33	0,2	-	80	10
5TROE100430090	10	43	0,2	-	90	10
6TROE120270080	12	27	0,24	-	80	12

Order Number	Diameter D	Length of cut L1	Chamfer C	Effective Length L2	Overall Length L	Shank Dia d
6TROE120390095	12	39	0,24	-	95	12
5TROE120510110	12	51	0,24	-	110	12
6TROE120600110	12	31	0,24	60	110	12
6TROE160360100	16	36	0,32	-	100	16
5TROE160680130	16	68	0,32	-	130	16
6TROE200450110	20	45	0,4	-	110	20
5TROE200850150	20	85	0,4	-	150	20

4VSE

4 Flutes Various Symmetry End Mills for Steels, Cast Irons & Stainless Steels





- Mid-low hardened steels(~HRc42), Mild steels, Cast irons, SUS
- HR coating reduces stress of flute and enhances wear resistance
- Unequal pitch design and helix enable decrease of chattering
- 4flutes and deep pocket enable chip evacuation and increase surface roughness

Condition	D Size	D Tolerance
ØD ≠Ød	Ø1 ~ 6	+0 ~ -0.01mm
	Ø8 ~ 20	+0 ~ -0.015mm

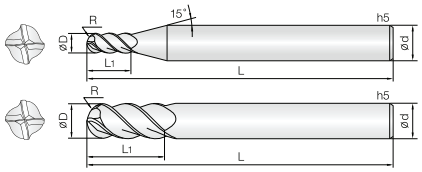
Condition	D Size	D Tolerance
ØD =Ød	Ø6	-0.005 ~ -0.015mm
	Ø8 ~ 12	-0.01 ~ -0.025mm
	Ø14 ~ 20	-0.015 ~ -0.03mm

Order Number	Diameter D	Length of cut L1	Overall Length L	Shank Dia d
4VSE010025S06	1	2.5	50	6
4VSE010035S06	1	3.5	50	6
4VSE015040S06	1.5	4	50	6
4VSE015060S06	1.5	6	50	6
4VSE020060S06	2	6	50	6
4VSE020090S06	2	9	50	6
4VSE030080S06	3	8	50	6
4VSE030120S06	3	12	50	6
4VSE040100S06	4	10	50	6
4VSE040150S06	4	15	60	6
4VSE050150S06	5	15	60	6
4VSE050200S06	5	20	70	6

Order Number	Diameter D	Length of cut L1	Overall Length L	Shank Dia d
4VSE060150S06	6	15	60	6
4VSE060200S06	6	20	70	6
4VSE080200S08	8	20	70	8
4VSE080300S08	8	30	80	8
4VSE100250S10	10	25	75	10
4VSE100400S10	10	40	90	10
4VSE120300S12	12	30	80	12
4VSE120450S12	12	45	100	12
4VSE160400S16	16	40	100	16
4VSE160600S16	16	60	120	16
4VSE200450S20	20	45	100	20
4VSE200650S20	20	65	120	20

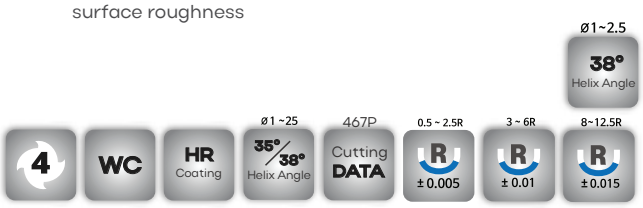
4VSB

4 Flutes Various Symmetry End Mills for Steel, Cast Iron & Stainless Steels



- Mid-low hardened steels(~HRc42), Mild steels, Cast irons, SUS
- HR coating reduces stress of flute and enhances wear resistance
- Unequal pitch Ball design and helix enable decrease of chattering
- 4flutes and deep pocket enable chip evacuation and increase surface roughness

Condition	D Size	D Tolerance
ØD ≠Ød	Ø1 ~ 6	+0 ~ -0.01mm
	Ø8 ~ 25	+0 ~ -0.015mm



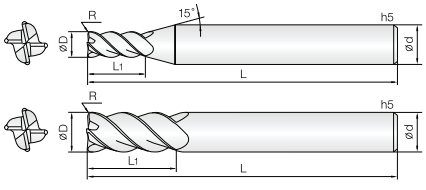
Condition	D Size	D Tolerance
ØD =Ød	Ø4 ~ 6	-0.005 ~ -0.015mm
	Ø8 ~ 12	-0.01 ~ -0.025mm
	Ø16 ~ 25	-0.015 ~ -0.03mm

Order Number	Diameter RxD	Length of cut L1	Overall Length L	Shank Dia d
4VSB010025S06	0.5Rx1	2.5	50	6
4VSB012030S06	0.6Rx1.2	3	50	6
4VSB015040S06	0.75Rx1.5	4	50	6
4VSB020050S06	1Rx2	5	50	6
4VSB025060S06	1.25Rx2.5	6	50	6
4VSB030060S03	1.5Rx3	6	50	3
4VSB030080S06	1.5Rx3	8	50	6
4VSB040080S04	2Rx4	8	50	4
4VSB040100S06	2Rx4	10	50	6
4VSB050150S06	2.5Rx5	15	60	6
4VSB060150S06	3Rx6	15	60	6
4VSB060150090	3Rx6	15	90	6

Order Number	Diameter RxD	Length of cut L1	Overall Length L	Shank Dia d
4VSB080200S08	4Rx8	20	70	8
4VSB080200100	4Rx8	20	100	8
4VSB100250S10	5Rx10	25	75	10
4VSB100250100	5Rx10	25	100	10
4VSB120300S12	6Rx12	30	80	12
4VSB120300120	6Rx12	30	120	12
4VSB160400S16	8Rx16	40	100	16
4VSB160400130	8Rx16	40	130	16
4VSB200450S20	10Rx20	45	100	20
4VSB200450150	10Rx20	45	150	20
4VSB250500S25	12.5Rx25	50	125	25
4VSB250500160	12.5Rx25	50	160	25

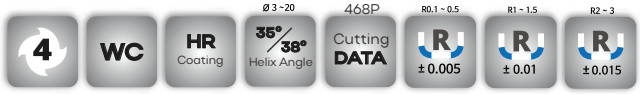
4VSC

4 Flutes Various Symmetry End Mills for Steels, Cast Irons & Stainless Steels



- Mid-low hardened steels(~HRc42), Mild steels, Cast irons, SUS
- HR coating reduces stress of flute and enhances wear resistance
- Unequal pitch design and helix enable decrease of chattering
- 4flutes and deep pocket enable chip evacuation and increase surface roughness

Condition	D Size	D Tolerance
ØD ≠ Ød	Ø1 ~ 20	+0 ~ -0.01mm

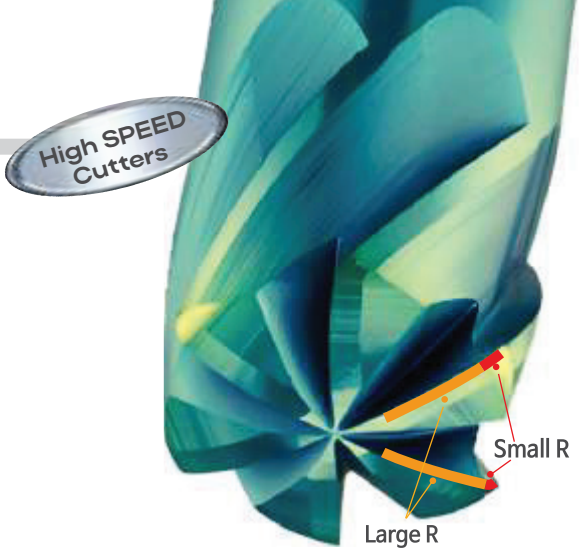


Condition	D Size	D Tolerance
ØD =Ød	Ø6 ~ 12	-0.005 ~ -0.015mm
	Ø14 ~ 20	-0.01 ~ -0.02mm

Order Number	Diameter DxR	Length of cut L1	Overall Length L	Shank Dia d
4VSC020002S06	2xR0.2	6	50	6
4VSC080005S08	8xR0.5	20	70	8
4VSC080010S08	8xR1	20	70	8
4VSC100005S10	10xR0.5	25	75	10
4VSC100010S10	10xR1	25	75	10

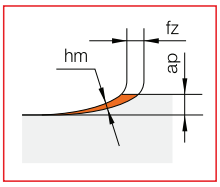
Order Number	Diameter DxR	Length of cut L1	Overall Length L	Shank Dia d
4VSC100015S10	10xR1.5	25	75	10
4VSC100020S10	10xR2	25	75	10
4VSC120005S12	12xR0.5	30	80	12
4VSC120010S12	12xR1	30	80	12
4VSC120020S12	12xR2	30	80	12

JJ Double Corner Radius Cutters



Dramatically decreased cutting stress

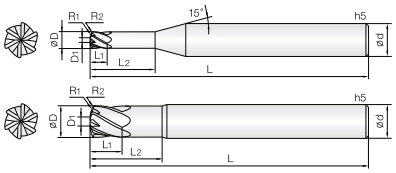
- Double radius design on the endface makes thinner chip removal and reduce cutting stress than conventional corner radius End mills
- The maximum cutting depth is up to the end of the large R, and the large R minimizes vibration, enabling stable milling



Thinner removal chip

4&6JJDRC

4&6 Flutes JJ Double Corner Radius Cutters for Hardened Steels



- Endmills for pre-hardened and hardened steels(HRc52~68)
- Good wear resistance by high quality Si-based PVD coating
- Designed for low speed with high feed condition
- Suitable for heavy duty and roughing application
- Applied multi-radius design on the endface of the tool, reduced cutting stress by splitting small chip emission

421P

4 | 6 | WC | TISIN-S Coating | 30° Helix Angle | Cutting DATA | R ±0.015

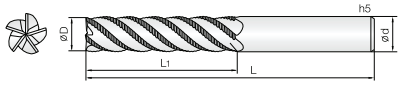
Condition	D Size	D Tolerance
ØD ≠ Ød	Ø1 ~ 16	+0 ~ -0.01mm

Condition	D Size	D Tolerance
ØD = Ød	Ø6 ~ 12	-0.005 ~ -0.015mm
	Ø16	-0.01 ~ -0.02mm

Order Number	Diameter D	Large Radius R1	Corner Radius R2	Front Diameter D1	Length of cut L1	Overall Length L2	Overall Length L	Shank Dia d
4JJDRC010010030	1	1	0.1	0.28	1	3	50	4
4JJDRC020020060	2	2	0.1	0.56	2	6	50	6
4JJDRC030030090	3	3	0.2	0.68	3	9	60	6
4JJDRC040040120	4	4	0.2	0.8	4	12	60	6
4JJDRC050050150	5	5	0.3	1.08	5	15	60	6
6JJDRC060060180	6	6	0.3	1.22	6	18	60	6
6JJDRC080080240	8	8	0.5	1.76	8	24	75	8
6JJDRC100100300	10	10	0.5	2.02	10	30	80	10
6JJDRC120120360	12	12	0.5	2.28	12	36	100	12
6JJDRC160160450	16	16	0.8	2.8	16	45	110	16

5JJROU

5 Flutes Variable Helix Roughing End Mills



- Roughing Endmills for hard to cut materials, alloy steels, SUS, Inconel and structural steels
- TISIN-S coating provides wear resistance improvement
- Long machining time is available with variable helix application
- Minimize fracturing by high TRS fine(0.5㎛) WC grade

423P

5 | WC | TISIN-S Coating | 42° Helix Angle | Cutting DATA | Shield Edge | Weldon Shank (WELDON)

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

Order Number	Diameter D	Length of cut L1	Overall Length L	Shank Dia d
5JJROU060140060	6	14	60	6
5JJROU060200065	6	20	65	6
5JJROU060260070	6	26	70	6
5JJROU080180065	8	18	65	8
5JJROU080260070	8	26	70	8
5JJROU080340080	8	34	80	8
5JJROU100220075	10	22	75	10
5JJROU100330080	10	33	80	10
5JJROU100430090	10	43	90	10

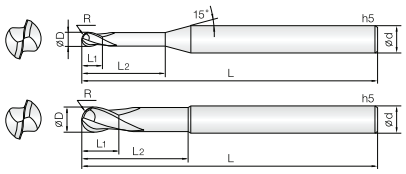
Order Number	Diameter D	Length of cut L1	Overall Length L	Shank Dia d
5JJROU120270080	12	27	80	12
5JJROU120390095	12	39	95	12
5JJROU120510110	12	51	110	12
5JJROU160360100	16	36	100	16
5JJROU160520120	16	52	120	16
5JJROU160680130	16	68	130	16
5JJROU200450110	20	45	110	20
5JJROU200650130	20	65	130	20
5JJROU200850150	20	85	150	20

JJ series for hardened steels

Endmills for pre-hardened and hardened steels (HRc52~68)

- Good wear resistance by high quality Si-based PVD coating
- High precise edge tolerance
- Very nice work surface finish
- Outstanding performance at high speed machining by ultra fine(0.2㎛) WC grade

2JJRB



2 Flutes JJ Rib Ball End Mills for Hardened Steels

- Endmills for pre-hardened and hardened steels(HRc52~68)
- Good wear resistance by high quality Si-based PVD coating
- High precise edge tolerance
- Excellent surface finish
- Very nice work surface finish
- Outstanding performance at high speed machining by ultra fine (0.2㎛) WC grade

2 | UWC | TISIN-S Coating | 30° Helix Angle | 406P Cutting DATA | 0.05 ~ 2.5R ±0.005 | 3 ~ 6R ±0.01

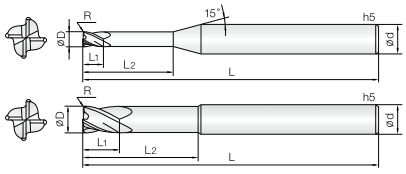
Condition	D Size	D Tolerance
ØD ≠ Ød	Ø0.1 ~ 0.15	+0 ~ -0.005mm
	Ø0.2 ~ 12	+0 ~ -0.01mm

Condition	D Size	D Tolerance
ØD = Ød	Ø6 ~ 12	-0.005 ~ -0.015mm

Order Number	Diameter RxD	Length of cut L1	Effective Length L2	Overall Length L	Shank Dia d
2JJRB004010S04	0.2Rx0.4	0.4	1	40	4
2JJRB004015S04	0.2Rx0.4	0.4	1.5	40	4
2JJRB010040S04	0.5Rx1	1	4	45	4
2JJRB010100S04	0.5Rx1	1	10	50	4
2JJRB010120S04	0.5Rx1	1	12	50	4
2JJRB010120S06	0.5Rx1	1	12	50	6
2JJRB015100S04	0.75Rx1.5	1.5	10	50	4

Order Number	Diameter RxD	Length of cut L1	Effective Length L2	Overall Length L	Shank Dia d
2JJRB015100S06	0.75Rx1.5	1.5	10	50	6
2JJRB020080S04	1Rx2	2	8	45	4
2JJRB020140S04	1Rx2	2	14	50	4
2JJRB020140S06	1Rx2	2	14	50	6
2JJRB020200S06	1Rx2	2	20	60	6
2JJRB030160S06	1.5Rx3	3	16	60	6
2JJRB040120S06	2Rx4	4	12	50	6

4JJCR



4 Flutes JJ Rib Corner Radius End Mills for Hardened Steels

- Endmills for pre-hardened and hardened steels(HRc52~68)
- Good wear resistance by high quality Si-based PVD coating
- High precise edge tolerance
- Designed for minimizing edge chipping by corner R shape
- Various corner R and flute length for wide range application
- Outstanding performance at high speed machining by ultra fine (0.2㎛) WC grade

4 | UWC | TISIN-S Coating | 30° Helix Angle | 418P Cutting DATA | R0.02 ~ 0.5 ±0.005 | R1 ~ 1.5 ±0.01 | R2 ~ 3 ±0.015

Condition	D Size	D Tolerance
ØD ≠ Ød	Ø0.5 ~ 12	+0 ~ -0.01mm

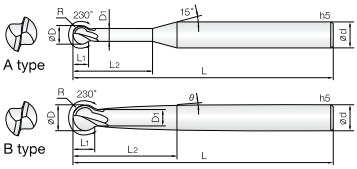
Condition	D Size	D Tolerance
ØD = Ød	Ø6 ~ 12	-0.005 ~ -0.015mm

Order Number	Diameter DxR	Length of cut L1	Effective Length L2	Overall Length L	Shank Dia d
4JJCR015003160	1.5xR0.3	1.5	16	50	4
4JJCR0200005160	2xR0.05	2	16	50	4
4JJCR025005200	2.5xR0.5	2.5	20	50	4
4JJCR030005250	3xR0.5	3	25	65	6
4JJCR030010450	3xR1	3	45	90	6
4JJCR040002160	4xR0.2	4	16	55	6
4JJCR040003160	4xR0.3	4	16	55	6
4JJCR040005130	4xR0.5	4	13	55	6
4JJCR040005300	4xR0.5	4	30	70	6
4JJCR040010500	4xR1	4	50	100	6
4JJCR050005160	5xR0.5	5	16	60	6
4JJCR060005200	6xR0.5	7	20	60	6
4JJCR080002220	8xR0.2	9	22	65	8

Order Number	Diameter DxR	Length of cut L1	Effective Length L2	Overall Length L	Shank Dia d
4JJCR080005220	8xR0.5	9	22	65	8
4JJCR080005400	8xR0.5	9	40	100	8
4JJCR080005500	8xR0.5	9	50	120	8
4JJCR080020500	8xR2	9	50	120	8
4JJCR100005240	10xR0.5	11	24	70	10
4JJCR100005400	10xR0.5	11	40	100	10
4JJCR100005600	10xR0.5	11	60	120	10
4JJCR100010600	10xR1	11	60	120	10
4JJCR120005400	12xR0.5	13	40	110	12
4JJCR120010400	12xR1	13	40	110	12
4JJCR120010600	12xR1	13	60	130	12
4JJCR120020400	12xR2	13	40	110	12

2JJSP

2 Flutes JJ Spherical End Mills for 3D Cut 230°



- Endmills for pre-hardened and hardened steels(HRc52~68)
- Good wear resistance by high quality Si-based PVD coating
- 230°degree ball shape for wide range 3D machining
- Minimize chattering and fracturing by taper designed flute
- Outstanding performance at high speed machining by ultra fine (0.2㎛) WC grade

2 | UWC | TISIN-S Coating | 15° Helix Angle | 412P Cutting DATA | 0.25 ~ 2.5R ± 0.005 | 3 ~ 6R ± 0.01

Condition	D Size	D Tolerance
ØD ≠ Ød	Ø0.5 ~ 12	+0 ~ -0.01mm

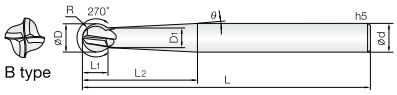
Condition	D Size	D Tolerance
ØD = Ød	Ø6 ~ 12	-0.005 ~ -0.015mm

Order Number	Diameter RxD	Neck Diameter D1	Length of cut L1	Effective Length L2	Angle θ	Overall Length L	Type	Shank Dia d
2JJSP020100S06	1Rx2	1,8	1,4	10	0°	60	A	6
2JJSP030150S06	1,5Rx3	2,7	2,1	15	0°	70	A	6
2JJSP040200S06	2Rx4	3,6	2,8	20	0°	70	A	6
2JJSP060300S06	3Rx6	5,4	4,2	30	0°	90	A	6

Order Number	Diameter RxD	Neck Diameter D1	Length of cut L1	Effective Length L2	Angle θ	Overall Length L	Type	Shank Dia d
2JJSP080010280	4Rx8	7,2	5,7	28	1°	100	B	8
2JJSP100010350	5Rx10	9	7,1	35	1°	110	B	10
2JJSP120010420	6Rx12	10,8	8,5	42	1°	120	B	12
-	-	-	-	-	-	-	-	-

4JJSPM

4 Flutes JJ Spherical End Mills for 3D Cut 270°



- Endmills for pre-hardened and hardened steels(HRc52~68)
- Good wear resistance by high quality Si-based PVD coating
- 270°degree ball shape for wide range 3D machining
- Minimize chattering and fracturing by taper designed flute
- Outstanding performance at high speed machining by ultra fine (0.2㎛) WC grade

4 | UWC | TISIN-S Coating | 15° Helix Angle | 413P Cutting DATA | 0.5 ~ 2.5R ± 0.005 | 3 ~ 6R ± 0.01

Condition	D Size	D Tolerance
ØD ≠ Ød	Ø1 ~ 12	+0 ~ -0.01mm

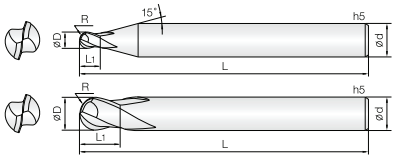
Condition	D Size	D Tolerance
ØD = Ød	Ø6 ~ 12	-0.005 ~ -0.015mm

Order Number	Diameter RxD	Neck Diameter D1	Length off cut L1	Effective Length L2	Angle θ	Overall Length L	Shank Dia d
4JJSPM010013200	0,5Rx1	0,7	0,8	20	1°30	80	6
4JJSPM020013200	1Rx2	1,4	1,7	20	1°30	80	6
4JJSPM030013300	1,5Rx3	2,1	2,5	30	1°30	80	6
4JJSPM040030250	2Rx4	2,8	3,4	25	3°	80	6

Order Number	Diameter RxD	Neck Diameter D1	Length off cut L1	Effective Length L2	Angle θ	Overall Length L	Shank Dia d
4JJSPM060010210	3Rx6	4,2	5,1	21	1°	100	6
4JJSPM080010280	4Rx8	5,6	6,8	28	1°	100	8
4JJSPM100010350	5Rx10	7	8,5	35	1°	110	10
4JJSPM120010420	6Rx12	8,5	10	42	1°	120	12

2JJSB

2 Flutes JJ Short Length Ball End Mills for Hardened Steels



- Endmills for pre-hardened and hardened steels(HRc52~68)
- Good wear resistance by high quality Si-based PVD coating
- High precise edge tolerance
- Short overall length for easy use with shiringking chuck
- Very nice work surface finish
- Outstanding performance at high speed machining by ultra fine (0.2㎛) WC grade

2 | UWC | TISIN-S Coating | 30° Helix Angle | 413P Cutting DATA | 0.05 ~ 2.5R ± 0.005 | 3 ~ 6R ± 0.01

Condition	D Size	D Tolerance
ØD ≠ Ød	Ø0.1 ~ 0.15	+0 ~ -0.005mm
	Ø0.2 ~ 12	+0 ~ -0.01mm

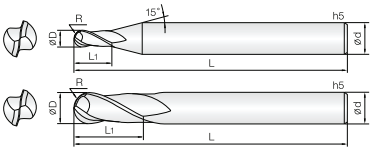
Condition	D Size	D Tolerance
ØD = Ød	Ø4 ~ 12	-0.005 ~ -0.015mm

Order Number	Diameter RxD	Length of cut L1	Overall Length L	Shank Dia d
2JJSB010010S04	0.5Rx1	1	40	4
2JJSB020020S04	1Rx2	2	45	4
2JJSB030030S04	1.5Rx3	3	45	4
2JJSB040040S04	2Rx4	4	45	4
2JJSB050050S06	2.5Rx5	5	50	6

Order Number	Diameter RxD	Length of cut L1	Overall Length L	Shank Dia d
2JJSB060060050	R3x6	6	50	6
2JJSB080080050	4Rx8	8	50	8
2JJSB100100060	5Rx10	10	60	10
2JJSB120120060	6Rx12	12	60	12
-	-	-	-	-

2JJB

2 Flutes JJ Ball End Mills for Hardened Steels



- Endmills for pre-hardened and hardened steels(HRc52~68)
- Good wear resistance by high quality Si-based PVD coating
- High precise edge tolerance
- Excellent surface finish
- Very nice work surface finish
- Outstanding performance at high speed machining by ultra fine (0.2㎛) WC grade

2 | UWC | TISIN-S Coating | 30° Helix Angle | 413P Cutting DATA | 0.05 ~ 2.75R ± 0.005 | 3 ~ 6R ± 0.01 | 7R ± 0.015

Condition	D Size	D Tolerance
ØD ≠ Ød	Ø0.1 ~ 0.15	+0 ~ -0.005mm
	Ø0.2 ~ 14	+0 ~ -0.01mm

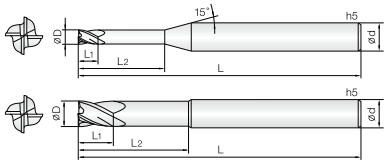
Condition	D Size	D Tolerance
ØD = Ød	Ø3 ~ 12	-0.005 ~ -0.015mm
	Ø14	-0.01 ~ -0.02mm

Order Number	Diameter RxD	Length of cut L1	Overall Length L	Shank Dia d
2JJB010025S06	0.5Rx1	2.5	50	4
2JJB010025070	0.5Rx1	2.5	70	6
2JJB020050075	1Rx2	5	75	6
2JJB040080080	2Rx4	8	80	4
2JJB050100S06	2.5Rx5	10	75	6
2JJB060100060	3Rx6	10	60	6

Order Number	Diameter RxD	Length of cut L1	Overall Length L	Shank Dia d
2JJB060120090	3Rx6	12	90	6
2JJB080120060	4Rx8	12	60	8
2JJB080140100	4Rx8	14	100	8
2JJB100180100	5Rx10	18	100	10
2JJB120220110	6Rx12	22	110	12

4JJRE

4 Flutes JJ Rib End Mills for Hardened Steels



- Endmills for pre-hardened and hardened steels(HRc52~68)
- Good wear resistance by high quality Si-based PVD coating
- High precise edge tolerance
- Reinforced edge design for preventing edge chipping
- Outstanding performance at high speed machining by ultra fine (0.2㎛) WC grade

Condition	D Size	D Tolerance
ØD ≠ Ød	Ø0.5 ~ 6	+0 ~ -0.01mm
	Ø8 ~ 12	+0 ~ -0.015mm

Condition	D Size	D Tolerance
ØD =Ød	Ø 6	-0.005 ~ -0.015mm
	Ø8 ~ 12	-0.01 ~ -0.025mm

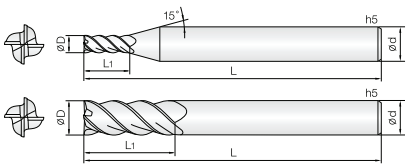
4 | UWC | TISIN-S Coating | 30° Helix Angle | 414P Cutting DATA | Shield Edge

Order Number	Diameter D	Length of cut L1	Effective Length L2	Overall Length L	Shank Dia d
4JJRE010160S04	1	1	16	50	4
4JJRE015160S04	1.5	1.5	16	50	4
4JJRE020060S04	2	2	6	45	4
4JJRE020200S04	2	2	20	50	4
4JJRE030080S06	3	3	8	45	6

Order Number	Diameter D	Length of cut L1	Effective Length L2	Overall Length L	Shank Dia d
4JJRE030200S06	3	3	20	60	6
4JJRE040100S06	4	4	10	50	6
4JJRE040300S06	4	4	30	70	6
4JJRE060200S06	6	6	20	60	6
4JJRE080250S08	8	12	25	65	8

4JJHE

4 Flutes JJ 45° Helix End Mills for Hardened Steel



- Endmills for pre-hardened and hardened steels(HRc52~68)
- Good wear resistance by high quality Si-based PVD coating
- High precise edge tolerance
- Reinforced edge design for preventing edge chipping
- Produce down to 0.03mm in diameter endmills at the first time in Korea
- Outstanding performance at high speed machining by ultra fine (0.2㎛) WC grade

Condition	D Size	D Tolerance
ØD ≠ Ød	Ø0.3 ~ 6	+0 ~ -0.01mm
	Ø7 ~ 20	+0 ~ -0.015mm

Condition	D Size	D Tolerance
ØD =Ød	Ø6	-0.005 ~ -0.015mm
	Ø8 ~ 12	-0.01 ~ -0.025mm
	Ø14 ~ 20	-0.015 ~ -0.03mm

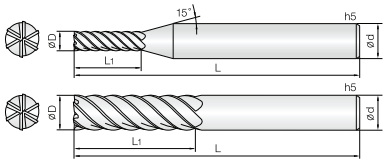
4 | UWC | TISIN-S Coating | 45° Helix Angle | 415P Cutting DATA | Shield Edge

Order Number	Diameter D	Length of cut L1	Overall Length L	Shank Dia d
4JJHE010035S06	1	3,5	40	6
4JJHE020080S06	2	8	40	6
4JJHE030080S06	3	8	45	6
4JJHE030120S06	3	12	50	6
4JJHE040110S06	4	11	45	6
4JJHE040150S06	4	15	55	6
4JJHE050130S06	5	13	50	6
4JJHE050250S06	5	25	70	6
4JJHE060150S06	6	15	55	6

Order Number	Diameter D	Length of cut L1	Overall Length L	Shank Dia d
4JJHE060250S06	6	25	70	6
4JJHE080200S08	8	20	60	8
4JJHE080300S08	8	30	80	8
4JJHE100220S10	10	22	70	10
4JJHE100300S10	10	30	90	10
4JJHE120260S12	12	26	75	12
4JJHE120350S12	12	35	90	12
4JJHE160350S16	16	35	90	16
4JJHE160500S16	16	50	110	16

6JJHE

6 Flutes JJ 45° Helix End Mills for Hardened Steels



- Endmills for pre-hardened and hardened steels(HRc52~68)
- Good wear resistance by high quality Si-based PVD coating
- High precise edge tolerance
- Reinforced edge design for preventing edge chipping
- Produce down to 0.03mm in diameter endmills at the first time in Korea
- Outstanding performance at high speed machining by ultra fine (0.2㎛) WC grade

Condition	D Size	D Tolerance
ØD ≠ Ød	Ø3 ~ 6	+0 ~ -0.01mm
	Ø8 ~ 25	+0 ~ -0.015mm

Condition	D Size	D Tolerance
ØD =Ød	Ø6	-0.005 ~ -0.015mm
	Ø8 ~ 12	-0.01 ~ -0.025mm
	Ø14 ~ 25	-0.015 ~ -0.03mm

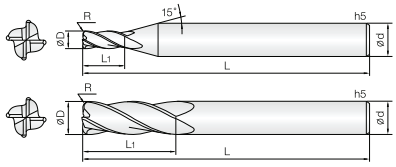
6 | UWC | TISIN-S Coating | 45° Helix Angle | 415P Cutting DATA | Shield Edge

Order Number	Diameter D	Length of cut L1	Overall Length L	Shank Dia d
6JJHE050200S06	5	20	60	6
6JJHE060200S06	6	20	60	6
6JJHE060350S06	6	35	75	6
6JJHE080250S08	8	25	65	8
6JJHE080400S08	8	40	90	8
6JJHE100250S10	10	25	70	10
6JJHE100450S10	10	45	100	10

Order Number	Diameter D	Length of cut L1	Overall Length L	Shank Dia d
6JJHE120300S12	12	30	80	12
6JJHE120400S12	12	40	90	12
6JJHE120500S12	12	50	100	12
6JJHE120700S12	12	70	120	12
6JJHE160800S16	16	80	150	16
6JJHE1601000S16	16	100	160	16
-	-	-	-	-

4JJC

4 Flutes JJ Corner Radius End Mills for Hardened Steels



- Endmills for pre-hardened and hardened steels(HRc52~68)
- Good wear resistance by high quality Si-based PVD coating
- High precise edge tolerance
- Designed for minimizing edge chipping by corner R shape
- Various corner R and overall length for wide range application
- Outstanding performance at high speed machining by ultra fine (0.2㎛) WC grade

Condition	D Size	D Tolerance
ØD ≠ Ød	Ø0.4 ~ 16	+0 ~ -0.01mm

Condition	D Size	D Tolerance
ØD =Ød	Ø3 ~ 12	-0.005 ~ -0.015mm
	Ø14 ~ 16	-0.01 ~ -0.02mm

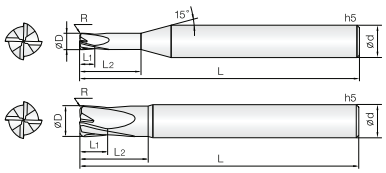
4 | UWC | TISIN-S Coating | 30° Helix Angle | 420P Cutting DATA | R0.05 ~ 0.5 ±0.005 | R1 ~ 1.5 ±0.01 | R2 ~ 3 ±0.015

Order Number	Diameter DxR	Length of cut L1	Overall Length L	Shank Dia d
4JJC030003S06	3xR0.3	8	60	6
4JJC030005S06	3xR0.5	8	60	6
4JJC030010S06	3xR1	8	60	6
4JJC040010S06	4xR1	10	70	6
4JJC050003S06	5xR0.3	13	75	6
4JJC050010S06	5xR1	13	75	6
4JJC060010080	6xR1	13	80	6
4JJC080005090	8xR0.5	19	90	8
4JJC080010090	8xR1	19	90	8
4JJC100005070	10xR0.5	19	70	10
4JJC100010070	10xR1	19	70	10
4JJC100020070	10xR2	19	70	10

Order Number	Diameter DxR	Length of cut L1	Overall Length L	Shank Dia d
4JJC120005075	12xR0.5	22	75	12
4JJC120010075	12xR1	22	75	12
4JJC120015075	12xR1.5	22	75	12
4JJC120020075	12xR2	22	75	12
4JJC050005S06	5xR0.5	13	75	6
4JJC060003080	6xR0.3	13	80	6
4JJC080015090	8xR1.5	19	90	8
4JJC080020090	8xR2	19	90	8
4JJC040003S06	4xR0.3	10	70	6
4JJC040005S06	4xR0.5	10	70	6
4JJC060005080	6xR0.5	13	80	6
4JJC060020080	6xR2	13	80	6

4JJRC

4 Flutes JJ Corner Radius Cutters for Hardened Steels



- Endmills for pre-hardened and hardened steels(HRc52~68)
- Good wear resistance by high quality Si-based PVD coating
- High precise edge tolerance
- 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

Condition	D Size	D Tolerance
ØD ≠ Ød	Ø1 ~ 16	+0 ~ -0.01mm

Condition	D Size	D Tolerance
ØD =Ød	Ø6 ~ 12	-0.005 ~ -0.015mm
	Ø16	-0.01 ~ -0.02mm

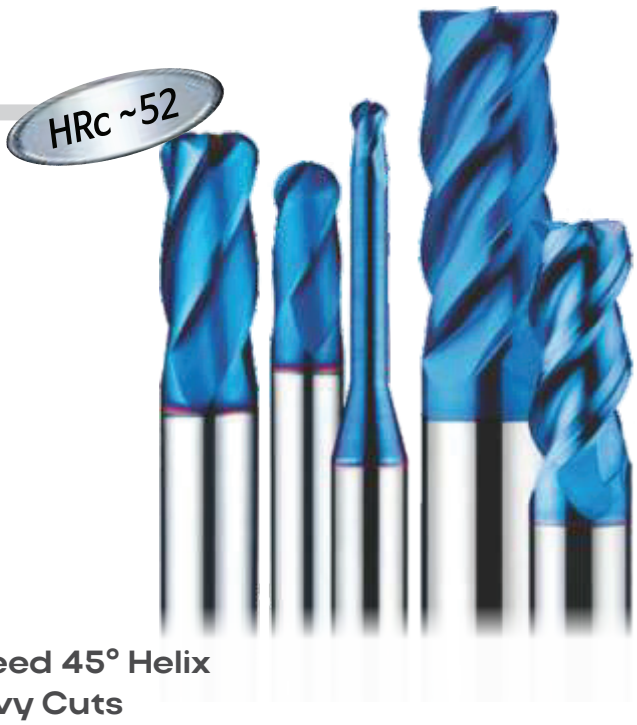
4 | UWC | TISIN-S Coating | 15° Helix Angle | 422P Cutting DATA | R0.2 ~ 0.5 ±0.005 | R1 ~ 1.5 ±0.01 | R2 ~ 3 ±0.015

Order Number	Diameter DxR	Length of cut L1	Effective Length L2	Overall Length L	Shank Dia d
4JJRC020005060	2xR0.5	2	6	50	6
4JJRC030005080	3xR0.5	3	8	50	6
4JJRC040005120	4xR0.5	4	12	60	6
4JJRC060010150	6xR1	6	15	60	6
4JJRC080010160	8xR1	8	16	60	8

Order Number	Diameter DxR	Length of cut L1	Effective Length L2	Overall Length L	Shank Dia d
4JJRC080010300	8xR1	8	30	110	8
4JJRC080020160	8xR2	8	16	60	8
4JJRC100005300	10xR0.5	10	30	120	10
4JJRC100010200	10xR1	10	20	70	10
4JJRC120020250	12xR2	12	25	80	12

E series for heavy cuts

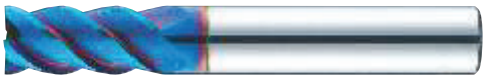
Endmills for various work materials (~HRc52), prehardened steels, carbon steels, mold steels

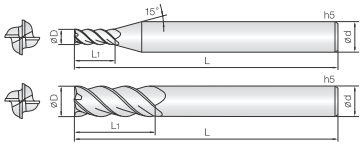


- Good wear resistance by high quality Si-based PVD coating
- Suitable shape is designed for tooling in wide areas
- Maximize the manufacturing cost saving with low price of products
- Minimize fracturing by high TRS fine(0.5㎛) WC grade

4HEME

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





- Endmills for various work materials(~HRc52),pre-hardened steels, carbon steels, mold steels
- Good wear resistance by high quality Si-based PVD coating
- Suitable shape is designed for tooling in wide areas
- 45° degree helix design for high speed, feed condition
- Minimize fracturing by high TRS fine(0.5㎛) WC grade

Condition	D Size	D Tolerance
ØD ≠ Ød	Ø1 ~ 6	+0 ~ -0.01mm
	Ø8 ~ 16	+0 ~ -0.015mm

448P

4 | WC | BLUE Coating | 45° Helix Angle | Cutting DATA | Shield Edge

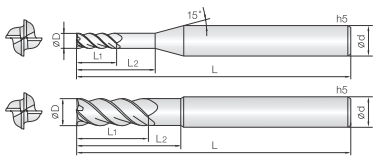
Condition	D Size	D Tolerance
ØD =Ød	Ø6	-0.005 ~ -0.015mm
	Ø8 ~ 12	-0.01 ~ -0.025mm
	Ø14 ~ 16	-0.015 ~ -0.03mm

Order Number	Diameter D	Length of cut L1	Overall Length L	Shank Dia d
4HEME010035S04	1	3.5	40	4
4HEME015040S04	1.5	4	40	4
4HEME020080S04	2	8	40	4
4HEME030120S06	3	12	50	6
4HEME040110S06	4	11	45	6
4HEME040160S06	4	16	55	6
4HEME050180S06	5	18	60	6
4HEME060130S06	6	13	50	6
4HEME060200S06	6	20	60	6
4HEME080200S08	8	20	60	8

Order Number	Diameter D	Length of cut L1	Overall Length L	Shank Dia d
4HEME080250S08	8	25	70	8
4HEME080300S08	8	30	75	8
4HEME100220S10	10	22	70	10
4HEME100300S10	10	30	80	10
4HEME100400S10	10	40	90	10
4HEME120260S12	12	26	75	12
4HEME120400S12	12	40	90	12
4HEME140300S14	14	30	80	14
4HEME140500S14	14	50	110	14
4HEME160350S16	16	35	90	16

4NSE

4 Flutes End Mills for Heavy Cuts



- Endmills for various work materials(~HRc52), pre-hardened steels, carbon steels, mold steels
- Good wear resistance by high quality Si-based PVD coating
- Minimize chattering by unequal flute spacing design
- Minimize fracturing by high TRS fine(0.5㎛) WC grade

Condition	D Size	D Tolerance
ØD ≠ Ød	Ø1 ~ 6	+0 ~ -0.01mm
	Ø8 ~ 20	+0 ~ -0.015mm

447P

4 | WC | BLUE Coating | 42° Helix Angle | Cutting DATA | Multi-Flute | Shield Edge

Condition	D Size	D Tolerance
ØD =Ød	Ø6	-0.005 ~ -0.015mm
	Ø8 ~ 12	-0.01 ~ -0.025mm
	Ø14 ~ 20	-0.015 ~ -0.03mm

Order Number	Diameter D	Length of cut L1	Effective Length L2	Overall Length L	Shank Dia d
4NSE030120S06	3	8	12	50	6
4NSE040100S06	4	10	-	50	6
4NSE040120S06	4	12	-	50	6
4NSE050120S06	5	12	-	55	6
4NSE050160S06	5	16	-	55	6
4NSE060130S06	6	13	-	55	6
4NSE060180S06	6	18	-	55	6
4NSE080200S08	8	20	-	60	8
4NSE080250S08	8	25	-	70	8

Order Number	Diameter D	Length of cut L1	Effective Length L2	Overall Length L	Shank Dia d
4NSE100220S10	10	22	-	70	10
4NSE100300S10	10	30	-	75	10
4NSE100320075	10	22	32	75	10
4NSE120260S12	12	26	-	75	12
4NSE120300S12	12	30	38	80	12
4NSE120380080	12	26	-	80	12
4NSE160450S16	16	35	45	90	16
4NSE200520S20	20	40	52	100	20
-	-	-	-	-	-

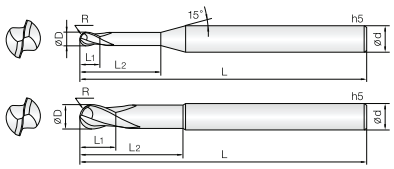
Spherical End Mills for 3D Machining

HARD series

Endmills for pre-hardened and hardened steels (HRc50~65)

- 230°, 270° degree ball shape for wide range 3D machining
- Minimize chattering and fracturing by taper and straight designed flute
- Outstanding performance at high speed machining by ultra fine (0.2㎛) WC grade

2HRB



2 Flutes High Speed Rib Ball End Mills

- Endmills for pre-hardened and hardened steel(HRc52~62)
- Good wear resistance by Si-based PVD coating
- High precise edge tolerance
- Very nice work surface finish
- Outstanding performance at high speed machining by ultra fine (0.2㎛) WC grade

2 | UWC | TISIN Coating | 30° Helix Angle | 424P Cutting DATA | 0.05 ~ 2.5R ±0.005 | 3~6R ±0.01

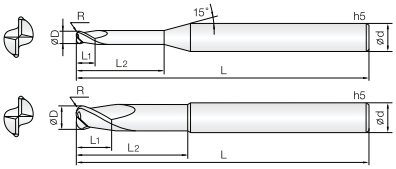
Condition	D Size	D Tolerance
ØD ≠ Ød	Ø0.1 ~ 0.15	+0 ~ -0.005mm
	Ø0.2 ~ 12	+0 ~ -0.01mm

Condition	D Size	D Tolerance
ØD =Ød	Ø6 ~ 12	-0.005 ~ -0.015mm

Order number	Diameter RxD	Length of cut L1	Effective Lenght L2	Overall Lenght L	Shank dia d
2HRB005020S04	0.25R x 0.5	0.5	2	45	4
2HRB010080S04	0.5R x 1	1	8	45	4
2HRB010120S04	0.5R x 1	1	12	50	4
2HRB015080S04	0.75R x 1.5	1.5	8	45	4
2HRB020060S04	1R x 2	2	6	45	4
2HRB020080S04	1R x 2	2	8	45	4
2HRB020100S04	1R x 2	2	10	50	4

Order number	Diameter RxD	Length of cut L1	Effective Lenght L2	Overall Lenght L	Shank dia d
2HRB020100S06	1R x 2	2	10	50	4
2HRB020120S04	1R x 2	2	12	50	4
2HRB030080S06	1.5R x 3	3	8	50	6
2HRB030160S06	1.5R x 3	3	16	60	6
2HRB040080S06	2R x 4	4	8	50	6
2HRB040350S06	2R x 4	4	35	75	6
-	-	-	-	-	-

2CRE



2 Flutes Rib Corner Radius End Mills

- Endmills for pre-hardened and hardened steels(HRc52~62)
- Good wear resistance by Si-based PVD coating
- High precise edge tolerance
- Designed for minimizing edge chipping by corner R shape
- Various corner R and flute length for wide range application
- Outstanding performance at high speed machining by ultra fine (0.2㎛) WC grade

2 | UWC | TISIN Coating | 30° Helix Angle | 435P Cutting DATA | R0.02 ~ 0.5 ±0.005 | R1 ~ 1.5 ±0.01 | R2 ~ 3 ±0.015

Condition	D Size	D Tolerance
ØD ≠ Ød	Ø0.2 ~ 16	+0 ~ -0.01mm

Condition	D Size	D Tolerance
ØD =Ød	Ø4 ~ 12	-0.005 ~ -0.015mm
	Ø16	-0.01 ~ -0.02mm

Order Number	Diameter DxR	Length of cut L1	Effective Length L2	Overall Length L	Shank Dia d
2CRE008002100	0.8 x R0.2	0.8	10	50	4
2CRE010001080	1 x R0.1	1	8	45	4
2CRE010001100	1 x R0.1	1	10	50	4

Order Number	Diameter DxR	Length of cut L1	Effective Length L2	Overall Length L	Shank Dia d
2CRE010001120	1 x R0.1	1	12	50	4
2CRE015002120	1.5 x R0.2	1.5	12	50	4
2CRE020002100	2 x R0.2	2	10	50	4

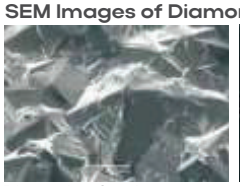
DIAMOND Coated End Mills for Graphite

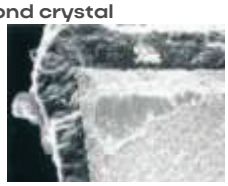
For GRAPHITE

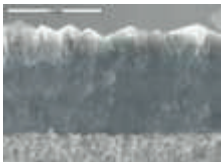
High abrasion resistance

- JJ TOOL's Own Coating Method (CVD Diamond Coating)
- High Resistance and Performance when to cut Graphite
- Multiple Product Line

SEM Images of Diamond crystal

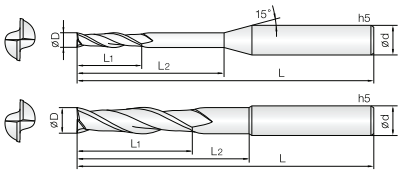

Diamond surface image


Diamond cross section image

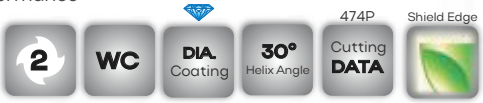

Diamond cross section image

2DEM

2 Flutes Diamond Coated End Mills for Graphite



- Endmills for Graphite, reinforced plastics, carbon fiber, Non-ferrous and non-metallic materials
- Excellent wear resistance by applying qualified CVD diamond coating
- Wide range products prepared for various work shape and excellent performance



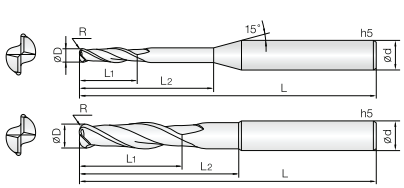
D Size	D Tolerance
ø0.2 ~ 12	+0 ~ -0.02mm

Order number	Diameter D	Length of cut L1	Effective Lenght L2	Overall Lenght L	Shank dia d
2DEM020150S04	2	8	15	80	4
2DEM030300S04	3	12	30	80	4

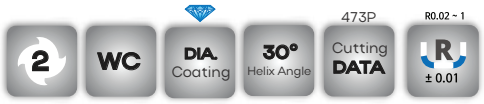
Order number	Diameter D	Length of cut L1	Effective Lenght L2	Overall Lenght L	Shank dia d
2DEM080240S08	8	24	-	70	8
-	-	-	-	-	-

2DCR

2 Flutes Diamond Coated Corner Radius End Mills for Graphite



- Endmills for Graphite, reinforced plastics, carbon fiber, Non-ferrous and non-metallic materials.
- Excellent wear resistance by applying qualified CVD diamond coating
- Wide range products prepared for various work shape and excellent performance



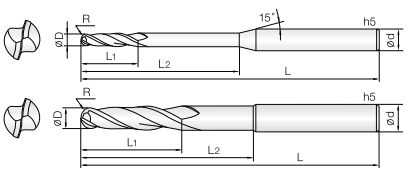
D Size	D Tolerance
ø0.2 ~ 6	+0 ~ -0.02mm

Order Number	Diameter DxR	Length of cut L1	Effective Length L2	Overall Length L	Shank Dia d
2DCR010001150	1xR0.1	2	15	60	4
2DCR020002120	2xR0.2	3.5	12	60	4
2DCR020002250	2xR0.2	3.5	25	60	4

Order Number	Diameter DxR	Length of cut L1	Effective Length L2	Overall Length L	Shank Dia d
2DCR030002300	3xR0.2	4	30	80	4
2DCR040002250	4xR0.2	5	25	80	4
2DCR040002400	4xR0.2	5	40	80	4

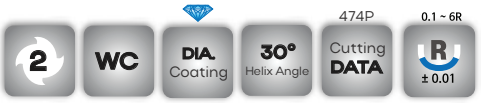
2DBE

2 Flutes Diamond Coated Ball End Mills for Graphite



- Endmills for Graphite, reinforced plastic, carbon fiber, Non-ferrous and non-metallic materials
- Excellent wear resistance by applying qualified CVD diamond coating
- Wide range products prepared for various work shape and excellent performance

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



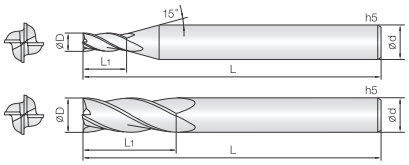
Order Number	Diameter RxD	Length of cut L1	Effective Length L2	Overall Length L	Shank Dia d
2DBE002010S04	0.1Rx0.2	1	-	45	4
2DBE004050S04	0.2x0.4	1.5	5	45	4
2DBE005080S04	0.25Rx0.5	2	8	45	4
2DBE006080S04	0.3Rx0.6	2	8	45	4
2DBE006120S04	0.3Rx0.6	2	12	45	4
2DBE010100S04	0.5Rx1	3	10	60	4

Order Number	Diameter RxD	Length of cut L1	Effective Length L2	Overall Length L	Shank Dia d
2DBE010150S04	0.5Rx1	3	15	60	4
2DBE010200S04	0.5Rx1	3	20	60	4
2DBE020200S04	1Rx2	6	20	80	4
2DBE020300S04	1Rx2	6	30	80	4
2DBE040160060	2Rx4	16	-	60	4
-	-	-	-	-	-

4HCEG

4 Flutes Standard Length End Mills for Multi Purpose

- Endmills for various work materials(~HRc52), pre-hardened steels, carbon steels, mold steels
- Optimum for various work materials by JCRO coating
- High precise edge tolerance
- Minimize fracturing by high TRS fine(0.5㎛) WC grade



Condition	D Size	D Tolerance
ØD ≠Ød	Ø0.8 ~ 6	+0 ~ -0.01mm
	Ø6.5 ~ 20	+0 ~ -0.015mm

460P

4 | WC | JCRO Coating | 35° Helix Angle | Cutting DATA | Shield Edge

Condition	D Size	D Tolerance
ØD =Ød	Ø4 ~ 6	-0.005 ~ -0.015mm
	Ø8 ~ 12	-0.01 ~ -0.025mm
	Ø14 ~ 20	-0.015 ~ -0.03mm

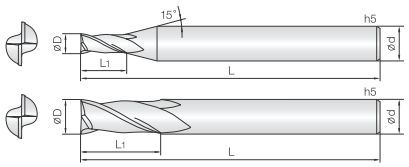
Order Number	Diameter D	Length of cut L1	Overall Length L	Shank Dia d
4HCEG010025S04	1	2.5	40	4
4HCEG010025080	1	2.5	80	6
4HCEG015040S04	1.5	4	40	4
4HCEG020060S04	2	6	40	4
4HCEG030080S03	3	8	45	3
4HCEG040110S04	4	11	45	4
4HCEG050130S06	5	13	50	6
4HCEG060130S06	6	13	50	6

Order Number	Diameter D	Length of cut L1	Overall Length L	Shank Dia d
4HCEG080190S08	8	19	60	8
4HCEG100220S10	10	22	70	10
4HCEG120260S12	12	26	75	12
4HCEG140260S14	14	26	80	14
4HCEG160350S16	16	35	100	16
4HCEG180350S18	18	35	100	18
4HCEG200400S20	20	40	100	20
-	-	-	-	-

2HCEG

2 Flutes Standard Length End Mills for Multi Purpose

- Endmills for various work materials(~HRc52), pre-hardened steels, carbon steels, mold steels
- Optimum for various work materials by JCRO coating
- High precise edge tolerance
- Minimize fracturing by high TRS fine(0.5㎛) WC grade



Condition	D Size	D Tolerance
ØD ≠Ød	Ø0.1 ~ 0.15	+0 ~ -0.005mm
	Ø0.2 ~ 6	+0 ~ -0.01mm
	Ø6.5 ~ 20	+0 ~ -0.015mm

459P

2 | WC | JCRO Coating | 35° Helix Angle | Cutting DATA | Shield Edge

Condition	D Size	D Tolerance
ØD =Ød	Ø4 ~ 6	-0.005 ~ -0.015mm
	Ø8 ~ 12	-0.01 ~ -0.025mm
	Ø14 ~ 20	-0.015 ~ -0.03mm

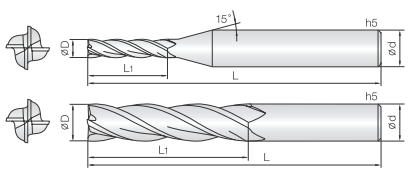
Order Number	Diameter D	Length of cut L1	Overall Length L	Shank Dia d
2HCEG010025S04	1	2.5	40	4
2HCEG015040S04	1.5	4	40	4
2HCEG020060S04	2	6	40	4
2HCEG030080S04	3	8	45	4
2HCEG040100S04	4	10	45	4
2HCEG050130S06	5	13	50	6
2HCEG060130S06	6	13	50	6

Order Number	Diameter D	Length of cut L1	Overall Length L	Shank Dia d
2HCEG080190S08	8	19	60	8
2HCEG100220S10	10	22	70	10
2HCEG120260S12	12	26	75	12
2HCEG140260S14	14	26	80	14
2HCEG160350S16	16	35	100	16
2HCEG180350S18	18	35	100	18
2HCEG200400S20	20	40	100	20

4LEMG

4Flutes Long Length End Mills for Multi Purpose

- Endmills for various work materials(~HRc52), pre-hardened steels, carbon steels, mold steels
- Optimum for various work materials by JCRO coating
- Improve tool performance by even run-out and tolerance control
- Various flute and overall length design for covering wide range applications as well as high efficiency machining
- Minimize edge chipping by improving corner strength



Condition	D Size	D Tolerance
ØD ≠Ød	Ø1 ~ 6	+0 ~ -0.01mm
	Ø8 ~ 25	+0 ~ -0.015mm

460P

4 | WC | JCRO Coating | 35° Helix Angle | Cutting DATA | Shield Edge

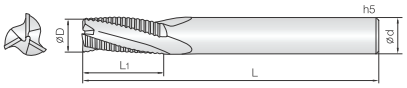
Condition	D Size	D Tolerance
ØD =Ød	Ø4 ~ 6	-0.005 ~ -0.015mm
	Ø8 ~ 12	-0.01 ~ -0.025mm
	Ø14 ~ 25	-0.015 ~ -0.03mm

Order Number	Diameter D	Length of cut L1	Overall Length L	Shank Dia d
4LEMG020100S06	2	10	60	6
4LEMG030250S06	3	25	70	6
4LEMG040300S06	4	30	75	6
4LEMG050250S06	5	25	75	6
4LEMG050300S06	5	30	80	6
4LEMG060200100	6	20	100	6
4LEMG060250S06	6	25	75	6
4LEMG060350S06	6	35	80	6
4LEMG080350S08	8	35	90	8
4LEMG080450S08	8	45	100	8

Order Number	Diameter D	Length of cut L1	Overall Length L	Shank Dia d
4LEMG100350S10	10	35	90	10
4LEMG100500S10	10	50	100	10
4LEMG100600S10	10	60	110	10
4LEMG120400S12	12	40	100	12
4LEMG120600S12	12	60	110	12
4LEMG120700S12	12	70	130	12
4LEMG140500S14	14	50	110	14
4LEMG160400160	16	40	160	16
4LEMG160700S16	16	70	130	16
4LEMG200600S20	20	60	130	20

3&4ROUG

3&4 Flutes Roughing End Mills for Multi Purpose



- Roughing Endmills for tool steels, alloy steels
- JCRO coating provides wear resistance improvement as well as avoid edge stress in various applications
- Reduce machining time by excellent chip control
- Maximize work efficiency by high speed machining
- Minimize fracturing at high feed by high TRS fine WC grade

D Size	D Tolerance
ø4 ~ 9	-0.02 ~ -0.04mm
ø10 ~ 20	-0.02 ~ -0.05mm

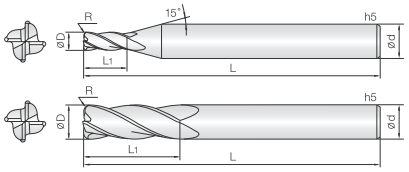
3 | 4 | WC | JCRO Coating | 35° Helix Angle | 465P Cutting DATA | Shield Edge

Order Number	Diameter D	Length of cut L1	Overall Length L	Shank Dia d
3ROUG040100S06	4	10	50	6
3ROUG050130S06	5	13	50	6
3ROUG060100050	6	10	50	6
3ROUG060200060	6	20	60	6
3ROUG080120060	8	12	60	8
3ROUG080250070	8	25	70	8

Order Number	Diameter D	Length of cut L1	Overall Length L	Shank Dia d
4ROUG100150070	10	15	70	10
4ROUG100300080	10	30	80	10
4ROUG120200075	12	20	75	12
4ROUG120350090	12	35	90	12
4ROUG160320090	16	32	90	16
4ROUG200380110	20	38	110	20

4NCRG

4 Flutes Corner Radius End Mills for Multi Purpose



- Endmills for various work materials(~HRc52), pre-hardened steels, carbon steels, mold steels
- Optimum for various work materials by JCRO coating
- High precise edge tolerance
- Designed for minimizing edge chipping by corner R shape
- Various corner R and flute length for wide range application
- Minimize fracturing by high TRS fine(0.5㎛) WC grade

Condition	D Size	D Tolerance
ØD ≠ Ød	Ø1 ~ 16	+0 ~ -0.01mm

Condition	D Size	D Tolerance
ØD =Ød	Ø4 ~ 12	-0.005 ~ -0.015mm
	Ø12.1 ~ 25	-0.01 ~ -0.02mm

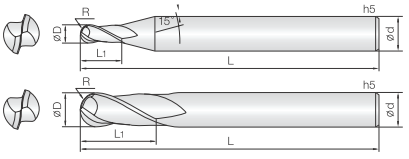
4 | WC | JCRO Coating | 35° Helix Angle | 464P Cutting DATA | R0.05 ~ 0.5 R ±0.005 | R1 ~ 1.5 R ±0.01 | R2 ~ 4 R ±0.015

Order Number	Diameter DxR	Length of cut L1	Overall Length L	Shank Dia d
4NCRG030003S06	3xR0.3	8	60	6
4NCRG030005S06	3xR0.5	8	60	6
4NCRG030010S06	3xR1	8	60	6
4NCRG040003060	4xR0.3	9	60	4
4NCRG040005060	4xR0.5	9	60	4
4NCRG040010060	4xR1	9	60	4
4NCRG050003S06	5xR0.3	13	75	6
4NCRG050005S06	5xR0.5	13	75	6
4NCRG050010S06	5xR1	13	75	6
4NCRG060003060	6xR0.3	11	60	6
4NCRG060005060	6xR0.5	11	60	6
4NCRG060010060	6xR1	11	60	6
4NCRG060015060	6xR1.5	11	60	6

Order Number	Diameter DxR	Length of cut L1	Overall Length L	Shank Dia d
4NCRG060020060	6xR2	11	60	6
4NCRG080005070	8xR0.5	16	70	8
4NCRG080010070	8xR1	16	70	8
4NCRG080015070	8xR1.5	16	70	8
4NCRG080020070	8xR2	16	70	8
4NCRG100005075	10xR0.5	19	75	10
4NCRG100010075	10xR1	19	75	10
4NCRG100015075	10xR1.5	19	75	10
4NCRG100020075	10xR2	19	75	10
4NCRG120005080	12xR0.5	22	80	12
4NCRG120010080	12xR1	22	80	12
4NCRG120015080	12xR1.5	22	80	12
4NCRG120020080	12xR2	22	80	12

2HCBG

2 Flutes Standard Length Ball End Mills for General Purpose



- Endmills for various work materials(~HRc52), pre-hardened steel, carbon steel, mold steel
- Optimum for various work materials by JCRO coating
- High precise edge tolerance
- Minimize fracturing by high TRS fine(0.5 μm) WC grade

Condition	D Size	D Tolerance
ØD ≠ Ød	Ø0.1 ~ 0.15	+0 ~ -0.005mm
	Ø0.2 ~ 20	+0 ~ -0.01mm

Condition	D Size	D Tolerance
ØD =Ød	Ø4 ~ 12	-0.005 ~ -0.015mm
	Ø14 ~ 20	-0.01 ~ -0.02mm

2 | WC | JCRO Coating | 35° Helix Angle | 454P Cutting DATA | 0.05~2.75R R ±0.005 | 3 ~ 6R R ±0.01 | 6.5 ~ 10R R ±0.015

Order Number	Diameter RxD	Length of cut L1	Overall Length L	Shank Dia d
2HCBG010025S04	0.5Rx1	2.5	50	4
2HCBG010025070	0.5Rx1	2.5	70	6
2HCBG010025100	0.5Rx1	2.5	100	6
2HCBG020050S04	1Rx2	5	50	4
2HCBG020050075	1Rx2	5	75	6
2HCBG020050100	1Rx2	5	100	6
2HCBG030080S04	1.5Rx3	8	50	4
2HCBG030080S06	1.5Rx3	8	60	6
2HCBG030080100	1.5Rx3	8	100	6
2HCBG040080060	2Rx4	8	60	4
2HCBG040080080	2Rx4	8	80	4
2HCBG040080120	2Rx4	8	120	6
2HCBG050080S05	2.5Rx5	8	80	5
2HCBG060100060	3Rx6	10	60	6
2HCBG060120080	3Rx6	12	80	6

Order Number	Diameter RxD	Length of cut L1	Overall Length L	Shank Dia d
2HCBG060120120	3Rx6	12	120	6
2HCBG080120060	4Rx8	12	60	8
2HCBG080140090	4Rx8	14	90	8
2HCBG080140150	4Rx8	14	150	8
2HCBG100150070	5Rx10	15	70	10
2HCBG100180120	5Rx10	18	120	10
2HCBG100180180	5Rx10	18	180	10
2HCBG120180070	6Rx12	18	70	12
2HCBG120220110	6Rx12	22	110	12
2HCBG120220150	6Rx12	22	150	12
2HCBG120220200	6Rx12	22	200	12
2HCBG140240S14	7Rx14	24	110	14
2HCBG160300130	8Rx16	30	130	16
2HCBG200380160	10Rx20	38	160	20

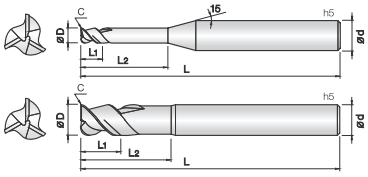
Excellent Chip Control End Mills for SUS

FOR SUS

End Mills for alloy steels, SUS, Ti/Ni base alloys, Inconel and hard to cut materials

- Strong design for protection against chattering
- Excellent work surface finish by deep chip pocket
- 42°degree helix design for high speed, feed condition
- Minimize fracturing at high feed by high TRS fine WC grade

3SUE



3 Flutes 45°Helix End Mills for SUS

- Endmills for alloy steels, SUS, Ti/Ni base alloys, Inconel and hard-to-cut materials
- JCRO coating provides wear resistance improvement as well as avoid edge stress in various applications
- Excellent work surface finish by 3 flute and deep chip pocket
- 45 ° degree helix design for high speed, feed condition
- Minimize fracturing at high feed by high TRS fine WC grade

Condition	D Size	D Tolerance
ØD ≠ Ød	Ø0.5 ~ 6	+0 ~ -0.01mm
	Ø8 ~ 20	+0 ~ -0.015mm

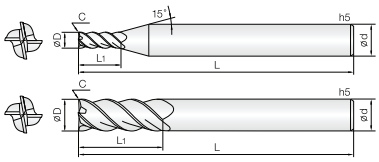
Condition	D Size	D Tolerance
ØD =Ød	Ø4 ~ 6	-0.005 ~ -0.015mm
	Ø8 ~ 12	-0.01 ~ -0.025mm
	Ø16 ~ 20	-0.015 ~ -0.03mm

3 | WC | JCRO Coating | 45° Helix Angle | 477P Cutting DATA | Shield Edge

Order Number	Diameter D	Length of cut L1	Effective Length L2	Overall Length L	Shank Dia d
3SUE030080S04	3	8	-	45	4
3SUE040100S04	4	10	-	50	4
3SUE050120S06	5	12	-	50	6
3SUE060120S06	6	12	-	60	6

Order Number	Diameter D	Length of cut L1	Effective Length L2	Overall Length L	Shank Dia d
3SUE080190S08	8	19	-	60	8
3SUE100220S10	10	22	-	70	10
3SUE120260S12	12	26	-	80	12
-	-	-	-	-	-

4SUE



4 Flutes Non Symmetry End Mills for SUS

- Endmills for alloy steels, SUS, Ti/Ni base alloys, Inconel and hard-to-cut materials
- JCRO coating provides wear resistance improvement as well as avoid edge stress in various applications
- Strong design for protection against chattering
- Excellent work surface finish by 4 flute and deep chip pocket
- Minimize fracturing at high feed by high TRS fine WC grade

Condition	D Size	D Tolerance
ØD ≠ Ød	Ø0.3 ~ 6	+0 ~ -0.01mm
	Ø7 ~ 20	+0 ~ -0.015mm

Condition	D Size	D Tolerance
ØD =Ød	Ø6	-0.005 ~ -0.015mm
	Ø8 ~ 12	-0.01 ~ -0.025mm
	Ø14 ~ 20	-0.015 ~ -0.03mm

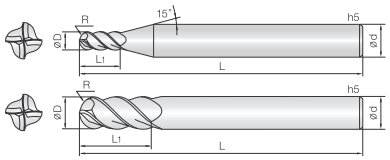
4 | WC | JCRO Coating | 42° Helix Angle | 480P Cutting DATA | C Cutting

Order Number	Diameter D	Length of cut L1	Chamfer C	Overall Length L	Shank Dia d
4SUE010025S04	1	2.5	0.01	50	4
4SUE010035S04	1	3.5	0.01	50	4
4SUE015055S04	1.5	5.5	0.015	50	4
4SUE020030S04	2	3	0.02	50	4
4SUE020080S04	2	8	0.02	50	4
4SUE030100S06	3	10	0.03	60	6
4SUE030120S06	3	12	0.03	60	6
4SUE040120S06	4	12	0.04	60	6
4SUE040160S06	4	16	0.04	60	6
4SUE050150S06	5	15	0.05	60	6

Order Number	Diameter D	Length of cut L1	Chamfer C	Overall Length L	Shank Dia d
4SUE050200S06	5	20	0.05	60	6
4SUE060180S06	6	18	0.06	60	6
4SUE060250S06	6	25	0.06	65	6
4SUE080240S08	8	24	0.08	70	8
4SUE080300S08	8	30	0.08	80	8
4SUE100250S10	10	25	0.1	80	10
4SUE100500S10	10	50	0.1	100	10
4SUE120300S12	12	30	0.12	90	12
4SUE120600S12	12	60	0.12	110	12
4SUE160350S16	16	35	0.16	100	16

4SUB

4 Flutes 45°Helix Ball End Mills for SUS



- Endmills for alloy steels, SUS, Ti/Ni base alloys, Inconel and hard-to-cut materials
- JCRO coating provides wear resistance improvement as well as avoid edge stress in various applications
- Excellent work surface finish by 4 flute and deep chip pocket
- Minimize fracturing at high feed by high TRS fine WC grade

Condition	D Size	D Tolerance
ØD ≠ Ød	Ø1 ~ 16	+0 ~ -0.01mm

Condition	D Size	D Tolerance
ØD = Ød	Ø6 ~ 12	-0.005 ~ -0.015mm
	Ø16	-0.01 ~ -0.02mm

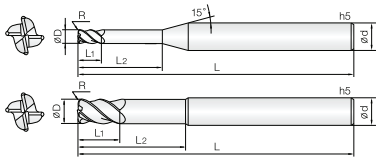
4 | WC | JCRO Coating | 45° Helix Angle | 478P Cutting DATA | 0.5 ~ 2.5R ±0.005 | 3 ~ 6R ±0.01 | 8R ±0.015

Order Number	Diameter RxD	Length of cut L1	Overall Length L	Shank Dia d
4SUB030080S06	1.5Rx3	8	60	6
4SUB040080S06	2Rx4	8	70	6
4SUB050100S06	2.5Rx5	10	80	6
4SUB060120S06	3Rx6	12	90	6

Order Number	Diameter RxD	Length of cut L1	Overall Length L	Shank Dia d
4SUB080140S08	4Rx8	14	100	8
4SUB100180S10	5Rx10	18	100	10
4SUB120220S12	6Rx12	22	110	12
4SUB160300S16	8Rx16	30	130	16

4SUCR

4 Flutes Rib Corner Radius End Mills for SUS



- Endmills for alloy steels, SUS, Ti/Ni base alloys, Inconel and hard-to-cut materials
- JCRO coating provides wear resistance improvement as well as avoid edge stress in various applications
- Strong design for protection against chattering
- Excellent work surface finish by 4 flute and deep chip pocket
- Minimize fracturing at high feed by high TRS fine WC grade

Condition	D Size	D Tolerance
ØD ≠ Ød	Ø1 ~ 20	+0 ~ -0.01mm

Condition	D Size	D Tolerance
ØD = Ød	Ø6 ~ 12	-0.005 ~ -0.015mm
	Ø16 ~ 20	-0.01 ~ -0.02mm

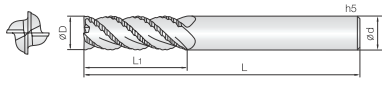
4 | WC | JCRO Coating | 42° Helix Angle | 481P Cutting DATA | Shield Edge | R0.1 ~ 0.5 ±0.005 | R1 ~ 1.5 ±0.01 | R2 ~ 5 ±0.015

Order Number	Diameter DxR	Length of cut L1	Effective Length L2	Overall Length L	Shank Dia d
4SUCR030002150	3xR0.2	4.5	15	65	6
4SUCR030005150	3xR0.5	4.5	15	65	6
4SUCR040005200	4xR0.5	6	20	70	6
4SUCR040010200	4xR1	6	20	70	6
4SUCR050005250	5xR0.5	7.5	25	70	6
4SUCR050010250	5xR1	7.5	25	70	6
4SUCR060003300	6xR0.3	9	30	70	6
4SUCR060005300	6xR0.5	9	30	70	6
4SUCR060010300	6xR1	9	30	70	6
4SUCR070005350	7xR0.5	10	35	80	8
4SUCR070010350	7xR1	10	35	80	8
4SUCR080003400	8xR0.3	12	40	80	8
4SUCR080005400	8xR0.5	12	40	80	8
4SUCR080010400	8xR1	12	40	80	8
4SUCR080015400	8xR1.5	12	40	80	8

Order Number	Diameter DxR	Length of cut L1	Effective Length L2	Overall Length L	Shank Dia d
4SUCR080020400	8xR2	12	40	80	8
4SUCR090005450	9xR0.5	13	45	90	10
4SUCR090010450	9xR1	13	45	90	10
4SUCR100005500	10xR0.5	15	50	100	10
4SUCR100010500	10xR1	15	50	100	10
4SUCR100015500	10xR1.5	15	50	100	10
4SUCR100020500	10xR2	15	50	100	10
4SUCR110005550	11xR0.5	16	55	100	12
4SUCR110010550	11xR1	16	55	100	12
4SUCR120005600	12xR0.5	18	60	110	12
4SUCR120010600	12xR1	18	60	110	12
4SUCR120015600	12xR1.5	18	60	110	12
4SUCR120020600	12xR2	18	60	110	12
4SUCR160005800	16xR0.5	24	80	130	16
4SUCR160010800	16xR1	24	80	130	16

3&4SUR

3&4 Flutes 45°Helix Roughing Corner R End Mills for SUSCore R End Mills for SUS



- Roughing Endmills for alloy steels, SUS, Inconel, Mild steels and various hard-to-cut materials
- JCRO coating provides wear resistance improvement as well as avoid edge stress in various applications
- 45 helix Design for minimizing cutting resistance and long time process
- High speed and roughing work applicable by fine pitch flute

D Size	D Tolerance
Ø 3 ~ 9	-0.02 ~ -0.04mm
Ø 10 ~ 20	-0.02 ~ -0.05mm

3 | 4 | WC | JCRO Coating | 45° Helix Angle | 482P Cutting DATA | R0.2 ~ 0.5 ±0.005 | R1 ~ 1.5 ±0.01 | R2 ±0.015

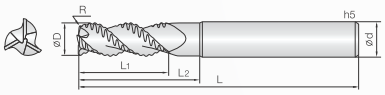
Order Number	Diameter DxR	Length of cut L1	Effective Length L2	Overall Length L	Shank Dia d
3SUR030002S06	3xR0.2	8	-	50	6
3SUR040002S06	4xR0.2	10	-	50	6
4SUR050002S06	5xR0.2	13	-	50	6
4SUR060002200	6xR0.2	10	20	60	6
4SUR060002S06	6xR0.2	13	-	60	6
4SUR060005S06	6xR0.5	13	-	60	6
4SUR070002S08	7xR0.2	18	-	70	8
4SUR080002250	8xR0.2	12	25	70	8
4SUR080002S08	8xR0.2	19	-	70	8

Order Number	Diameter DxR	Length of cut L1	Effective Length L2	Overall Length L	Shank Dia d
4SUR080010S08	8xR1	19	-	70	8
4SUR090003S10	9xR0.3	20	-	70	10
4SUR100003300	10xR0.3	15	30	75	10
4SUR100003S10	10xR0.3	22	-	75	10
4SUR100010S10	10xR1	22	-	75	10
4SUR110003S12	11xR0.3	25	-	80	12
4SUR120003350	12xR0.3	20	35	80	12
4SUR120003S12	12xR0.3	26	-	80	12
4SUR120010S12	12xR1	26	-	80	12

RTAC Coating

3AROC

3 Flutes 45°Helix Roughing End Mills for Aluminum



- High speed semi finishing and roughing Endmills for Aluminum, AL alloys, non-ferrous and non-metallic materials
- Minimize built up edge by chip braker and deep pocket design
- Tetrabond TAC coating provides excellent work surface finish by high hardness and low friction
- Minimize fracturing at high feed by high TRS fine WC grade

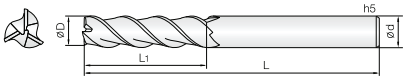
D Size	D Tolerance
Ø 4 ~ 8	-0.02 ~ -0.04mm
Ø 10 ~ 20	-0.02 ~ -0.05mm

Order Number	Diameter D	Length of cut L1	Effective Length L2	Overall Length L	Shank Dia d
3AROC040150S06	4	10	15	60	6
3AROC050200S06	5	15	20	60	6
3AROC060210S06	6	16	21	65	6

Order Number	Diameter D	Length of cut L1	Effective Length L2	Overall Length L	Shank Dia d
3AROC080270S08	8	21	27	70	8
3AROC100310S10	10	26	31	75	10
3AROC120380S12	12	30	38	80	12

3ALEC

3 Flutes 45°Helix End Mills for Aluminum



- Endmills for Aluminum, AL alloys, non-ferrous and non-metallic materials
- Applied fine WC grade for excellent surface finish
- Various flute length design for covering wide range application
- Tetrabond TAC coating provides excellent work surface finish by high hardness and low friction
- Minimize built up edge by double edge and deep pocket design

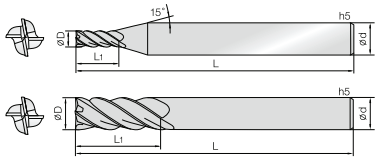
D Size	D Tolerance
Ø 0.8 ~ 20	+0 ~ -0.01mm

Order Number	Diameter D	Length of cut L1	Overall Length L	Shank Dia d
3ALEC020100S06	2	10	50	6
3ALEC030250S06	3	25	60	6
3ALEC040250S06	4	25	60	6
3ALEC050250S06	5	25	60	6
3ALEC060250060	6	25	60	6
3ALEC060450080	6	45	80	6
3ALEC080250065	8	25	65	8

Order Number	Diameter D	Length of cut L1	Overall Length L	Shank Dia d
3ALEC080450090	8	45	90	8
3ALEC100250070	10	25	70	10
3ALEC100500100	10	50	100	10
3ALEC120260075	12	26	75	12
3ALEC120450090	12	45	90	12
3ALEC160300090	16	30	90	16
3ALEC160650120	16	65	120	16

4ALEC

4 Flutes High Speed End Mills for Aluminum



- Endmills for Aluminum, AL alloys, non-ferrous and non-metallic materials
- The powerful anti-chattering design minimizes the vibration of the endmill during side milling
- Excellent performance in semi-finishing and roughing by applying a double cutting edge
- The poket is deeply designed to adsorption

Condition	D Size	D Tolerance
ØD ≠ Ød	Ø3 ~ 6	+0 ~ -0.01mm
	Ø8 ~ 20	+0 ~ -0.015mm

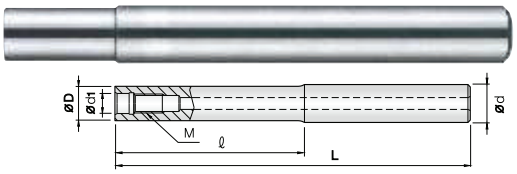
Condition	D Size	D Tolerance
ØD =Ød	Ø6	-0.005 ~ -0.015mm
	Ø8 ~ 12	-0.01 ~ -0.025mm
	Ø16 ~ 20	-0.015 ~ -0.03mm

Order Number	Diameter D	Length of cut L1	Overall Length L	Shank Dia d
4ALEC050200S06	5	20	55	6
4ALEC060200S06	6	20	55	6
4ALEC080250S08	8	25	65	8

Order Number	Diameter D	Length of cut L1	Overall Length L	Shank Dia d
4ALEC100300S10	10	30	75	10
4ALEC120350S12	12	35	80	12
4ALEC160500S16	16	50	110	16

CMA Carbide Modular Adapter

- Adapter for the spiral modular head (Compatible with MHE)
- Deep cavity milling is available with a variety of effective lengths
- Convenient clamping with the modular head (MHE)

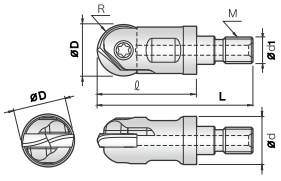


Order Number	M	D	d	d1	ℓ	L
CMA100240114	M06	9.7	10	6.5	24	114
CMA120240129	M06	11	12	6.5	24	129
CMA160300130	M08	14.5	16	8.5	30	130
CMA160300160	M08	14.5	16	8.5	30	160
CMA160300200	M08	14.5	16	8.5	30	200
CMA160300250	M08	14.5	16	8.5	30	250
CMA200500170	M10	18.5	20	10.5	50	170
CMA200500220	M10	18.5	20	10.5	50	220
CMA200500270	M10	18.5	20	10.5	50	270

Dimensions (mm)

MHE Modular Head

- Can be used for both of ball and corner radius inserts
- Possible to exchange variety heads for one modular adopter and helps save your purchasing cost
- Installed modular adopter can change only head without uninstallation, it gives more convenience and it helps save your time

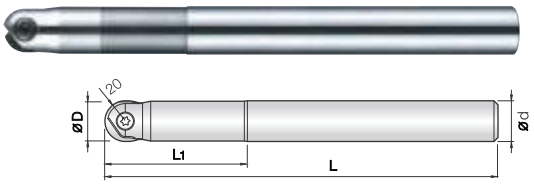


Order Number	M	D	L	ℓ	d	d1	Insert
MHE100250M06	M06	10	40	25	9.5	6.5	2JJIN 100 / 2JJIN 110
MHE120250M06	M06	12	40	25	11	6.5	2JJIN 120 / 2JJIN 130
MHE160290M08	M08	16	45	29	14.5	8.5	2JJIN 160 / 2JJIN 170
MHE200330M10	M10	20	55	33	18	10.5	2JJIN 200 / 2JJIN 210

Dimensions (mm)

CICF Carbide Indexable Cutter for Finishing

- Can be used for both of ball and corner radius inserts
- Suitable for high speed cutting and high precise cutting due to same toughness as solid tools
- Availabe repairing tool holders at JJ TOOLS co., ltd when broken problem
- Availabe stable machining due to minimized vibration on carbide holders

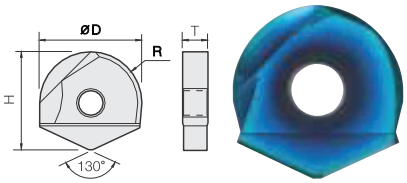


Order Number	D	L1	L	d	Insert
CICF100350150	10	35	150	10	2JJIN 100 / 2JJIN 110
CICF120450160	12	45	160	12	2JJIN 120 / 2JJIN 130
CICF160600230	16	60	230	16	2JJIN 160 / 2JJIN 170

Dimensions (mm)

2HHINB 2 Flutes HH Carbide Helix Ball Inserts for Hardened Steels

- Ball Inserts for hardened steels(~HRc62), pre-hardened and graphite materials
- Optimum for wear resistance by TISIN-S coating
- Maximize cutting force by applying the new helix edge design
- Designed for minimizing edge chipping by ball shape
- Minimize fracturing by ultra fine(0.3㎛) WC grade



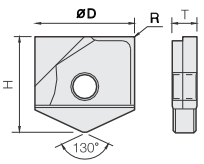
D Size	D Tolerance
Ø 10 ~ 13	+0 ~ -0.01mm
Ø 16 ~ 30	+0 ~ -0.02mm

Order Number	Diameter R x D	H Height	T Thickness
2HHINB100	5R x 10	12.1	2.7
2HHINB120	6R x 12	14.6	3.2
2HHINB160	8R x 16	16.5	4.2
2HHINB200	10R x 20	20.4	5.2

Dimensions (mm)

2HHINC 2 Flutes HH Carbide Helix Corner Radius Inserts for Hardened Steels

- Endmills for Mild steel, Acryl, A.B.S, Aluminum, non-ferrous and non-metallic materials
- Optimum for wear resistance by TISIN-S coating
- Maximize cutting force by applying the new helix edge design
- Designed for minimizing edge chipping by ball shape
- Minimize fracturing by ultra fine(0.3㎛) WC grade



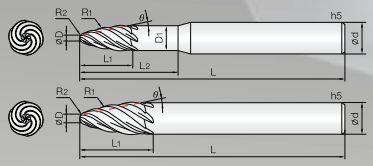
D Size	D Tolerance
Ø 10 ~ 13	+0 ~ -0.01mm
Ø 16 ~ 30	+0 ~ -0.02mm

Order Number	Diameter DxR	H Height	T Thickness
2HHINC100005	10 x R0.5	12.1	2.7
2HHINC100010	10 x R1	12.1	2.7
2HHINC120005	12 x R0.5	14.6	3.2
2HHINC120010	12 x R1	14.6	3.2
2HHINC120020	12 x R2	14.6	3.2
2HHINC160005	16 x R0.5	16.5	4.2
2HHINC160010	16 x R1	16.5	4.2
2HHINC160020	16 x R2	16.5	4.2
2HHINC200005	20 x R0.5	20.4	5.2
2HHINC200010	20 x R1	20.4	5.2
2HHINC200020	20 x R2	20.4	5.2

Dimensions (mm)

4&6CTDB

4&6 Flutes 5 Axies Taper Double Ball End Mills



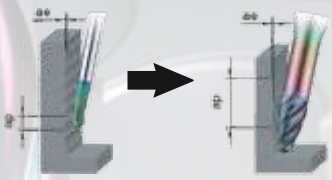
- Pre-hardened steels, Cast irons, Non-metallic materials
- HR coating provides wear resistance improvement as well as avoid edge stress in various applications
- Suitable for special components with 3 axes and 5 axes sector such as impellers, blisks, tire profiles, turbine blades
- Available for simultaneous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

Innovative solution for shortening machining hour!

4 | 6 | WC | HR Coating | 30° Helix Angle | 492P Cutting DATA | 0.5 ~ 1.5R ±0.01 | 2 ~ 4R ±0.015

Order Number	Diameter RxD	R1	R2	Angle θ	Neck Diameter D1	Length of cut L1	Effective Length L2	Overall Length L	Shank Dia d
4CTDB010013047	0.5Rx1	13	0.5	10	2.4	4.7	10	50	4
4CTDB015020071	0.75R1.5	20	0.75	10	3.6	7.1	15	50	4
4CTDB020025094	1Rx2	25	1	10	4.8	9.4	20	60	6
4CTDB020350116	1Rx2	350	1	15	7	11.6	18	80	8
4CTDB030040141	1.5x3	40	1.5	10	7.3	14.1	30	80	8
6CTDB040050187	2Rx4	50	2	10	9.5	18.7	40	100	12
6CTDB040750124	2Rx4	750	2	30	-	12.4	-	110	16
6CTDB060075200	3Rx6	75	3	10	-	20	-	100	12
6CTDB0601000167	3Rx6	1,000	3	20	-	16.7	-	110	16
6CTDB080100268	4Rx8	135	4	5	-	26.8	-	110	12
6CTDB0801000267	4Rx8	1,000	4	10	-	26.7	-	110	16

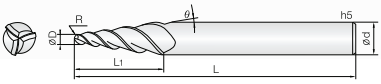
The value of ae is same



- The depth (ap) can be processed deeper than the standard ball End mills during 5-axis machining, so the processing time is faster and it has fewer machining bumps, which is the advantage for finishing
- Applied 4&6 flutes for high speed milling

3TBIC

3 Flutes Taper Ball End Mills for Impellers



- Pre-hardened steels, Cast irons, Non-metallic materials
- JCRO coating provides wear resistance improvement as well as avoid 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 | JCRO Coating | 35° Helix Angle | 491P Cutting DATA | 0.5R ~ 1R ±0.005 | 2R ~ 3R ±0.01

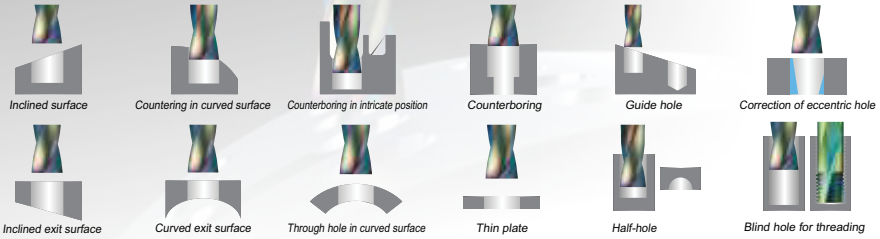
Order Number	Diameter RxD	Angle θ	Length of cut L1	Overall Length L	Shank Dia d
3TBIC010010120	R0.5x1	1°	12	50	6
3TBIC010010200	R0.5x1	1°	20	60	6
3TBIC010020150	R0.5x1	2°	15	55	6
3TBIC010020200	R0.5x1	2°	20	60	6
3TBIC010030150	R0.5x1	3°	15	55	6
3TBIC010030200	R0.5x1	3°	20	60	6
3TBIC010040200	R0.5x1	4°	20	60	6
3TBIC010050200	R0.5x1	5°	20	60	6
3TBIC010060200	R0.5x1	6°	20	60	6
3TBIC010070200	R0.5x1	7°	20	60	6
3TBIC010080180	R0.5x1	8°	18	60	6
3TBIC020010120	R1x2	1°	12	50	6
3TBIC020010200	R1x2	1°	20	60	6
3TBIC020020150	R1x2	2°	15	55	6
3TBIC020020200	R1 x 2	2°	20	60	6
3TBIC020030150	R1x2	3°	15	55	6
3TBIC020030200	R1x2	3°	20	60	6
3TBIC020030300	R1x2	3°	30	70	6
3TBIC020040200	R1x2	4°	20	60	6
3TBIC020050200	R1x2	5°	20	60	6
3TBIC020050300	R1x2	5°	30	75	8
3TBIC020060190	R1 x 2	6°	19	60	6
3TBIC020060290	R1 x 2	6°	29	75	8
3TBIC020070160	R1x2	7°	16	60	6
3TBIC020070250	R1x2	7°	25	70	8
3TBIC020080150	R1x2	8°	15	60	6
3TBIC020080220	R1x2	8°	22	70	8
3TBIC030010200	R1.5x3	1°	20	60	6
3TBIC030010320	R1.5x3	1°	32	75	6
3TBIC030020200	R1.5x3	2°	20	60	6
3TBIC030030200	R1.5x3	3°	20	60	6
3TBIC030030300	R1.5x3	3°	30	70	6
3TBIC030030390	R1.5x3	3°	39	80	8
3TBIC030040200	R1.5x3	4°	20	65	6
3TBIC030050180	R1.5x3	5°	18	60	6
3TBIC030050300	R1.5x3	5°	30	75	8

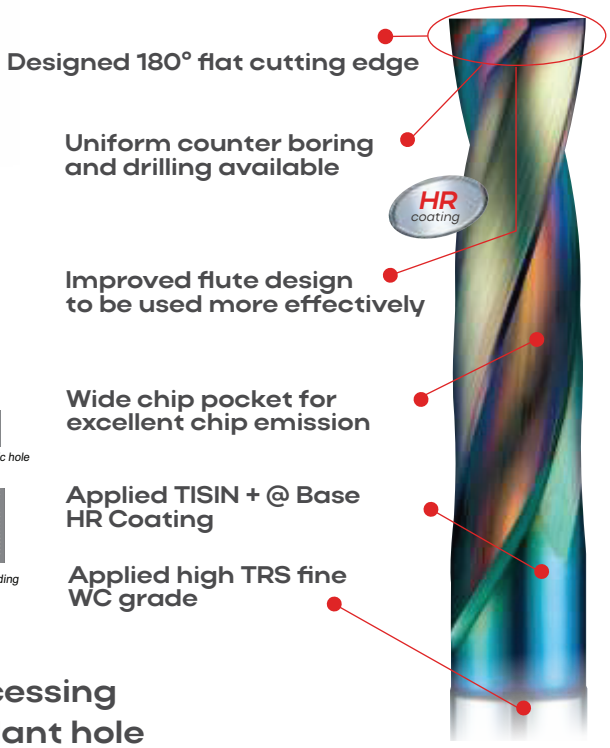
Order Number	Diameter RxD	Angle θ	Length of cut L1	Overall Length L	Shank Dia d
3TBIC030060150	R1.5x3	6°	15	60	6
3TBIC030060250	R1.5x3	6°	25	70	8
3TBIC030070190	R1.5x3	7°	19	70	8
3TBIC030070300	R1.5x3	7°	30	80	10
3TBIC030080190	R1.5x3	8°	19	70	8
3TBIC030080260	R1.5x3	8°	26	75	10
3TBIC040010200	R2x4	1°	20	60	6
3TBIC040010320	R2x4	1°	32	75	6
3TBIC040020200	R2x4	2°	20	60	6
3TBIC040020300	R2x4	2°	30	70	6
3TBIC040030210	R2x4	3°	21	70	6
3TBIC040030320	R2x4	3°	32	80	8
3TBIC040030400	R2x4	3°	40	90	8
3TBIC040040200	R2x4	4°	20	70	8
3TBIC040040300	R2x4	4°	30	75	8
3TBIC040050200	R2x4	5°	20	70	8
3TBIC040050320	R2x4	5°	32	80	10
3TBIC040060200	R2x4	6°	20	70	8
3TBIC040060300	R2x4	6°	30	80	10
3TBIC040070180	R2x4	7°	18	70	8
3TBIC040070260	R2x4	7°	26	80	10
3TBIC040080230	R2x4	8°	23	75	10
3TBIC060010320	R3x6	1°	32	75	8
3TBIC060020300	R3x6	2°	30	75	8
3TBIC060030220	R3x6	3°	22	75	8
3TBIC060030320	R3x6	3°	32	80	10
3TBIC060030400	R3x6	3°	40	90	10
3TBIC060040250	R3x6	4°	25	75	10
3TBIC060040310	R3x6	4°	31	80	10
3TBIC060050210	R3x6	5°	21	75	10
3TBIC060050320	R3x6	5°	32	80	12
3TBIC060060210	R3x6	6°	21	75	10
3TBIC060060310	R3x6	6°	31	80	12
3TBIC060070190	R3x6	7°	19	75	10
3TBIC060070270	R3x6	7°	27	80	12
-	-	-	-	-	-

Flat Drill

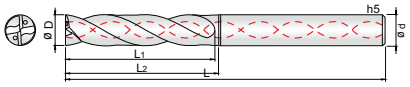
Flat Drill for materials up to HRc50

- Multiple processing is available with one drill





2FDRW



2 Flutes, Multi-Processing Flat Drills with Coolant hole

- Flat drills for materials up to HRc50, pre-hardened steels,alloy steels, cast irons
- With double margin of side flute and coolant hole, high speed drilling is available to a variety of inclined and curved surfaces
- Chip emission is great and stable drilling is available with between 24 to 30 degree helix design
- Minimize burrs during penetration drilling
- Increased tool life by applying HR coating with great heat and wear resistance

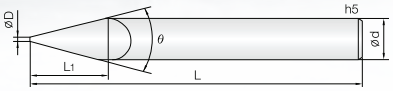
Order Number	Diameter D	Flute Length L1	Effective Length L2	Overall Length L	Shank Dia d
2FDRW030165S04	3	13.5	16.5	60	4
2FDRW031170S04	3.1	14	17	60	4
2FDRW032174S04	3.2	14.4	17.4	60	4
2FDRW033179S04	3.3	14.9	17.9	60	4
2FDRW034183S04	3.4	15.3	18.3	60	4
2FDRW035188S04	3.5	15.8	18.8	60	4
2FDRW036192S04	3.6	16.2	19.2	60	4
2FDRW037197S04	3.7	16.7	19.7	60	4
2FDRW038201S04	3.8	17.1	20.1	60	4
2FDRW039206S04	3.9	17.6	20.6	60	4
2FDRW040210S06	4	18	21	60	6
2FDRW041215S06	4.1	18.5	21.5	70	6
2FDRW042219S06	4.2	18.9	21.9	70	6
2FDRW043224S06	4.3	19.4	22.4	70	6
2FDRW044228S06	4.4	19.8	22.8	70	6
2FDRW045233S06	4.5	20.3	22.3	70	6
2FDRW046237S06	4.6	20.7	23.7	70	6
2FDRW047242S06	4.7	21.2	24.2	70	6
2FDRW048246S06	4.8	21.6	24.6	70	6
2FDRW049251S06	4.9	22.1	25.1	70	6
2FDRW050255S06	5	22.5	25.5	70	6
2FDRW051260S06	5.1	23	26	70	6
2FDRW052264S06	5.2	23.4	26.4	70	6
2FDRW053269S06	5.3	23.9	26.9	70	6
2FDRW054273S06	5.4	24.3	27.3	70	6
2FDRW055278S06	5.5	24.8	27.8	70	6
2FDRW056282S06	5.6	25.2	28.2	70	6
2FDRW057287S06	5.7	25.7	28.7	70	6
2FDRW058291S06	5.8	26.1	29.1	70	6
2FDRW059296S06	5.9	26.6	29.6	70	6
2FDRW060300S06	6	27	30	70	6
2FDRW061305S08	6.1	27.5	30.5	80	8
2FDRW062309S08	6.2	27.9	30.9	80	8
2FDRW063314S08	6.3	28.4	31.4	80	8
2FDRW064318S08	6.4	28.8	31.8	80	8
2FDRW065323S08	6.5	29.3	32.3	80	8
2FDRW066327S08	6.6	29.7	32.7	80	8
2FDRW067332S08	6.7	30.2	33.2	80	8
2FDRW068336S08	6.8	30.6	33.6	80	8
2FDRW069341S08	6.9	31.1	34.1	80	8
2FDRW070345S08	7	31.5	34.5	80	8

Order Number	Diameter D	Flute Length L1	Effective Length L2	Overall Length L	Shank Dia d
2FDRW071350S08	7.1	32	35	80	8
2FDRW072354S08	7.2	32.4	35.4	80	8
2FDRW073359S08	7.3	32.9	35.9	80	8
2FDRW074363S08	7.4	33.3	36.3	80	8
2FDRW075368S08	7.5	33.8	36.8	80	8
2FDRW076372S08	7.6	34.2	37.2	80	8
2FDRW077377S08	7.7	34.7	37.7	80	8
2FDRW078381S08	7.8	35.1	38.1	80	8
2FDRW079386S08	7.9	35.6	38.6	80	8
2FDRW080390S08	8	36	39	80	8
2FDRW081395S10	8.1	36.5	39.5	90	10
2FDRW082399S10	8.2	36.9	39.9	90	10
2FDRW083404S10	8.3	37.4	40.4	90	10
2FDRW084408S10	8.4	37.8	40.8	90	10
2FDRW085413S10	8.5	38.3	41.3	90	10
2FDRW086417S10	8.6	38.7	41.7	90	10
2FDRW087422S10	8.7	39.2	42.2	90	10
2FDRW088426S10	8.8	39.6	42.6	90	10
2FDRW089431S10	8.9	40.1	43.1	90	10
2FDRW090435S10	9	40.5	43.5	90	10
2FDRW091440S10	9.1	41	44	90	10
2FDRW092444S10	9.2	41.4	44.4	90	10
2FDRW093449S10	9.3	41.9	44.9	90	10
2FDRW094453S10	9.4	42.3	45.3	90	10
2FDRW095458S10	9.5	42.8	45.8	90	10
2FDRW096462S10	9.6	43.2	46.2	90	10
2FDRW097467S10	9.7	43.7	46.7	90	10
2FDRW098471S10	9.8	44.1	47.1	90	10
2FDRW099476S10	9.9	44.6	47.6	90	10
2FDRW100480S10	10	45	48	90	10
2FDRW101485S12	10.1	45.5	48.5	100	12
2FDRW102489S12	10.2	45.9	48.9	100	12
2FDRW103494S12	10.3	46.4	49.4	100	12
2FDRW104498S12	10.4	46.8	49.8	100	12
2FDRW105503S12	10.5	47.3	50.3	100	12
2FDRW106507S12	10.6	47.7	50.7	100	12
2FDRW107512S12	10.7	48.2	51.2	100	12
2FDRW108516S12	10.8	48.6	51.6	100	12
2FDRW109521S12	10.9	49.1	52.1	100	12
2FDRW110525S12	11	49.5	52.5	100	12
2FDRW111530S12	11.1	50	53	110	12

JJTOOLS

1STE

1 Flute Straight Flute Taper End Mills



- Endmills for various work materials, hardened steels(HRc~50), pre-hardened steels, tool steels and cast irons
- Good wear resistance by Si-based PVD coating
- Optimum for NC engraving by straight type one edge
- Maximize engraving efficiency by various edge diameter

497P

1 | WC | TISIN Coating | 0° Helix Angle | Cutting DATA

D Size	D Tolerance
Ø 0	+0.05 ~ -0mm
Ø 0.05 ~ 0.3	0 ~ -0.02mm

Order number	Diameter D	Angle θ	Length of cut L1	Overall Length L	Shank dia d
1STE000300S04	0	30°	5	40	4
1STE002200S04	0.2	20°	5	40	4
1STE002600S04	0.2	60°	3.29	40	4
1STE002200S06	0.2	20°	5	50	6

Order number	Diameter D	Angle θ	Length of cut L1	Overall Length L	Shank dia d
1STE002300S06	0.2	30°	5	50	6
1STE002900S06	0.2	90°	2.9	50	6
1STE0021200S06	0.2	120°	1.67	50	6
-	-	-	-	-	-

2CHA

2 Flutes 90°Chamfering Cutters

- Endmills for various work materials, hardened steels(HRc~50), pre-hardened steels, tool steels and cast irons
- Good wear resistance by Si-based PVD coating
- Applied helix 2flutes design for better performance in corner chamfering
- Minimize fracturing at high feed by high TRS fine WC grade

497P

2 | WC | TISIN Coating | 30° Helix Angle | Cutting DATA

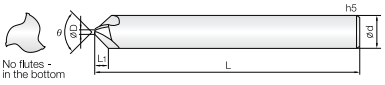
D Size	D Tolerance
Ø 0.8 ~ 1	+0 ~ -0.02mm

Order number	Diameter D	Angle θ	Length of cut L1	Overall Length L	Shank dia d
2CHA008900011	0.8	90°	1.1	50	3
2CHA008900016	0.8	90°	1.6	50	4
2CHA010900025	1	90°	2.5	60	6

Order number	Diameter D	Angle θ	Length of cut L1	Overall Length L	Shank dia d
2CHA010900035	1	90°	3.5	70	8
2CHA010900045	1	90°	4.5	80	10
2CHA010900055	1	90°	5.5	90	12

3CHA

3 Flutes 90°Chamfering Cutters



- Endmills for various work materials, hardened steels (HRc ~50), pre-hardened steels, tool steels and cast irons
- Good wear resistance by Si-based PVD coating
- Applied helix 2flutes design for better performance in corner chamfering
- Minimize fracturing at high feed by high TRS fine WC grade

497P

3 | WC | TISIN Coating | 30° Helix Angle | Cutting DATA

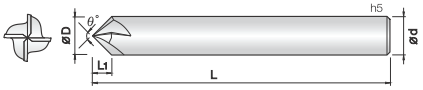
D Size	D Tolerance
Ø 0.8 ~ 2	+0 ~ -0.02mm

Order number	Diameter D	Angle θ	Length of cut L1	Overall Length L	Shank dia d
3CHA008900011	0.8	90°	1.1	50	3
3CHA008900016	0.8	90°	1.6	50	4
3CHA010900025	1	90°	2.5	60	6

Order number	Diameter D	Angle θ	Length of cut L1	Overall Length L	Shank dia d
3CHA010900035	1	90°	3.5	70	8
3CHA020900040	2	90°	4.0	80	10
3CHA020900050	2	90°	5.0	90	12

4STE

4 Flutes Straight Flute Taper End Mills



- Endmills for various work materials, hardened steels(HRc~50), pre-hardened steels, tool steels and cast irons
- Good wear resistance by Si-based PVD coating
- Optimum for NC engraving, chamfering and centering with straight 4flutes
- Minimize fracturing at high feed by high TRS fine WC grade

497P

4 | WC | TISIN Coating | 0° Helix Angle | Cutting DATA

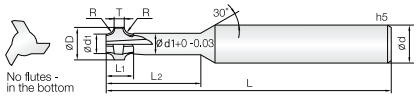
D Size	D Tolerance
ø 0	+0.05 ~ -0mm

Order number	Diameter D	Angle θ	Length of cut L1	Overall cut L	Shank dia d
4STE000600S03	3	60°	2.5	50	3
4STE000900S03	3	90°	1.5	50	3
4STE000600S04	4	60°	3.4	50	4
4STE000900S04	4	90°	2	50	4
4STE000600S06	6	60°	5.1	60	6
4STE000900S06	6	90°	3	60	6
4STE000900030	6	90°	3	100	6
4STE000600S08	8	60°	6.9	65	8

Order number	Diameter D	Angle θ	Length of cut L1	Overall cut L	Shank dia d
4STE000900S08	8	90°	4	65	8
4STE000900040	8	90°	4	100	8
4STE000600S10	10	60°	8.6	75	10
4STE000900S10	10	90°	5	75	10
4STE000900050	10	90°	5	100	10
4STE000600S12	12	60°	10.3	80	12
4STE000900S12	12	90°	6	80	12
4STE000900080	16	90°	8	100	16

3TRC

3 Flutes T-Double Corner Rounding Cutters



- Endmills for various work materials, hardened steels(HRc~50), pre-hardened steels, tool steels and cast irons
- JCRO coating provides wear resistance improvement as well as avoid edge stress in various applications
- Minimize edge chipping by applying straight 3flutes design
- Various shapes and length provides optimum efficiency

498P

3 | WC | JCRO Coating | 0° Helix Angle | Cutting DATA | 0.2R ~ 3R R ± 0.02

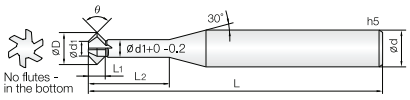
D Size	D Tolerance
Ø 1.9 ~ 11.9	+0 ~ -0.03mm

d1 Size	d1 Tolerance
Ø 1.45 ~ 5.8	+0 ~ -0.02mm

Order Number	Diameter DxR	Front Diameter ød1	Thickness T	Length of cut L1	Effective Length L2	Overall Length L	Shank Dia d
3TRC019002080	1.9 x R0.2	1.45	0.9	1.45	8	60	4
3TRC024003090	2.4 x R0.3	1.75	1.2	1.95	9	60	4
3TRC026004100	2.6 x R0.4	1.75	1.5	2.5	10	60	4
3TRC029005120	2.9 x R0.5	1.85	1.8	3	12	60	4
3TRC049005150	4.9 x R0.5	3.8	2	3.3	15	80	6
3TRC068010200	6.8 x R1	4.7	2.2	4.3	20	80	8
3TRC079015250	7.9 x R1.5	4.7	2.5	5.8	25	80	8
3TRC099020300	9.9 x R2	5.8	2.8	6.8	30	80	10
3TRC119030350	11.9 x R3	5.8	3	8.8	35	80	12

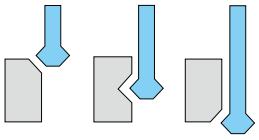
4TDA

4 Flutes T-Double Angular Cutters



- Endmills for various work materials, hardened steels(HRc~50), pre-hardened steels, tool steels and cast irons
- JCRO coating provides wear resistance improvement as well as avoid edge stress in various applications
- Minimize edge chipping by applying straight 4flutes design
- Various shapes and length provides optimum efficiency

Available Cutting Shape



498P

4 | WC | JCRO Coating | 0° Helix Angle | Cutting DATA | ø1~5 L1 ± 0.03 | ø6~12 L1 ± 0.05

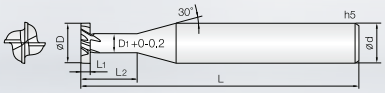
D Size	D Tolerance
Ø 1 ~ 5	+0 ~ -0.02mm
Ø 6 ~ 12	-0.01 ~ -0.03mm

d1 Size	d1 Tolerance
Ø 0.75 ~ 6	+0 ~ -0.02mm

Order Number	Diameter D	Angle θ	Length of cut L1	Effective Length L2	Neck Diameter ø d1	Overall Length L	Shank Dia d
4TDA030600075	3	60°	0.86	7.5	1.5	50	4
4TDA030900075	3	90°	1.5	7.5	1.5	50	4
4TDA040600100	4	60°	1.15	10	2	50	4
4TDA040600160	4	60°	1.15	16	2	50	4
4TDA040900100	4	90°	2	10	2	50	4
4TDA040900160	4	90°	2	16	2	50	4
4TDA050600125	5	60°	1.44	12.5	2.5	60	6
4TDA050900125	5	90°	2.4	12.5	2.5	60	6
4TDA060600150	6	60°	1.73	15	3	60	6
4TDA060600250	6	60°	1.73	25	3	60	6
4TDA060900150	6	90°	2.8	15	3	60	6
4TDA060900250	6	90°	2.8	25	3	60	6

4TESC

4 Flutes T-Slot Cutters



- Endmills for various work materials, hardened steels(HRc~50), pre-hardened steels, tool steels and cast irons
- JCRO coating provides wear resistance improvement as well as avoid edge stress in various applications
- Minimize edge chipping by applying 4flutes design
- Various shapes and length provides optimum efficiency
- Resin, plastic machining applicable witn coated or non coated endmill

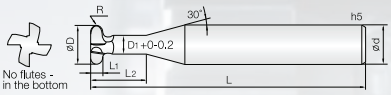
D Size	D Tolerance
Ø 2 ~ 5	+0 ~ -0.02mm
Ø 6 ~ 10	-0.01 ~ -0.03mm

Order Number	Diameter D	Length of cut L1	Effective Length L2	Neck Diameter D1	Overall Length L	Shank Dia d
4TESC020005040	2	0.5	4	1	50	6
4TESC030005045	3	0.5	4.5	1.5	50	6
4TESC030010045	3	1	4.5	1.5	50	6
4TESC040005050	4	0.5	5	2	50	6
4TESC040010050	4	1	5	2	50	6
4TESC050005045	5	0.5	4.5	2.5	50	6
4TESC050010050	5	1	5	2.5	50	6

Order Number	Diameter D	Length of cut L1	Effective Length L2	Neck Diameter D1	Overall Length L	Shank Dia d
4TESC060005045	6	0.5	4.5	3	60	6
4TESC060010050	6	1	5	3	60	6
4TESC060020060	6	2	6	3	60	6
4TESC080005045	8	0.5	4.5	4	60	8
4TESC080020060	8	2	6	4	60	8
4TESC100010070	10	1	7	5	70	10
4TESC100020080	10	2	8	5	70	10

4TRS

4 Flutes T-R Slot Cutters



- Endmills for various work materials, hardened steels(HRc~50), pre-hardened steels, tool steels and cast irons
- JCRO coating provides wear resistance improvement as well as avoid edge stress in various applications
- Minimize edge chipping by applying straight 4flutes design
- Various shapes and length provides optimum efficiency

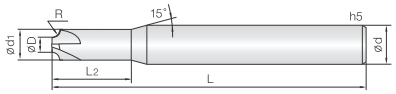
D Size	D Tolerance
Ø 4	+0 ~ -0.02mm
Ø 5 ~ 12	-0.01 ~ -0.025mm

Order Number	Diameter DxR	Length of cut L1	Effective Length L2	Neck Diameter D1	Overall Length L	Shank Dia d
4TRS050010045	5 x 0.5R	1	4.5	2.5	50	6
4TRS050010070	5 x 0.5R	1	7	2.5	50	6
4TRS050020055	5 x 1R	2	5.5	2.5	50	6
4TRS060010050	6 x 0.5R	1	5	3	50	6
4TRS060010080	6 x 0.5R	1	8	3	50	6
4TRS060015055	6 X 0.75R	1.5	5.5	3	50	6
4TRS060020060	8 X 1R	2	6	3	50	6
4TRS060020100	8 X 1R	2	10	3	50	6

Order Number	Diameter DxR	Length of cut L1	Effective Length L2	Neck Diameter D1	Overall Length L	Shank Dia d
4TRS080020070	8 x 1R	2	7	4	60	8
4TRS080020130	8 x 1R	2	13	4	60	8
4TRS080030080	8 x 1.5R	3	8	4	60	8
4TRS100040100	10 x 2R	4	10	4.5	70	10
4TRS100040160	10 x 2R	4	16	4.5	70	10
4TRS120060150	12 x 3R	6	15	5	75	12
4TRS120060210	12 x 3R	6	21	5	75	12
-	-	-	-	-	-	-

4CRC

4 Flutes Corner Rounding Cutters



- Endmills for various work materials, hardened steels (~Hrc52), pre-hardened steels, tool steels and cast irons
- Good wear resistance by Si-based PVD coating
- High precise edge tolerance
- Very nice work surface finish
- Minimize fracturing at high feed by high TRS fine WC grade

d1 Size	d1 Tolerance
Ø 2.9 ~ 5.9	+0 ~ -0.02mm

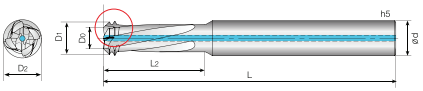
D Size	D Tolerance
Ø 4 ~ 6	+0 ~ -0.01mm
Ø 8 ~ 16	+0 ~ -0.015mm

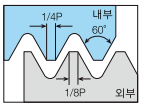
Order number	Diameter d1xR	Length of cut D1	Effective Lenght L2	Overall Lenght L	Shank dia d
4CRC029005S04	2.9 x R0.5	4	-	50	4
4CRC049005S06	4.9 x R0.5	6	-	50	6
4CRC039010S06	3.9 x R1	6	-	50	6
4CRC049015S08	4.9 x R1.5	8	-	60	8

Order number	Diameter d1xR	Length of cut D1	Effective Lenght L2	Overall Lenght L	Shank dia d
4CRC039020S08	3.9 x R2	8	-	60	8
4CRC039030S10	3.9 x R3	10	-	70	10
4CRC059050S16	5.9 x R5	16	-	80	16
-	-	-	-	-	-

4ETM

4 Flutes Multi-functional Thread Mills for Multi Purpose (L Rotation)





- Thread mills for Hardened steels (up to HRc 40), pre-hardened steels, alloy steels, carbon steels, cast irons
- With one 4ETM tool, it's available for drilling, threading and chamfering all together
- Pre-drilling for tapping is no longer needed
- It can also be used on blocked holes, penetrating holes, and sloping curved surfaces as multi-function tool
- If the diameter of hole is longer than 2D without pre-drilled hole, use the tool with coolant for the better chip emission
- It can be used for heli coil threading
- The main direction of tool rotation is left-handed (M4) and the direction of threading is right-handed

521P

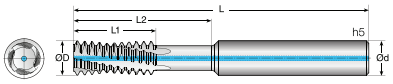
4 | UWC | TISIN-S Coating | 15° Helix Angle | Cutting DATA | L Rotation

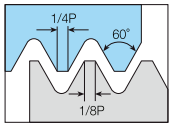
Order Number	Thread	Pitch	Flutes Z	Teeth Zt	Diameter D0	Diameter D1	Diameter D2	Effective Length L2	Lk	Overall Length L	Shank Dia d
4ETM024085S06M3	M3	0.5	4	2	1.37	2.17	2.4	8.5	0.4	60	6
4ETM032112S06M4	M4	0.7	4	2	1.74	2.88	3.2	11.2	0.57	60	6
4ETM039144S06M5	M5	0.8	4	2	2.21	3.61	3.9	14.4	0.7	60	6
4ETM047170S06M6	M6~M9	1	4	2	2.82	4.4	4.7	17	0.79	60	6
4ETM061220S08M8	M8~M12	1.25	4	2	4	5.8	6.1	22	0.9	65	8
4ETM078280S08M10	M10~M15	1.5	4	2	5.16	7.4	7.8	28	1.12	65	8
4ETM090330S10M12	M12	1.75	4	2	6.2	8.6	9	33	1.2	80	10

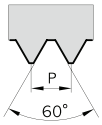
(Without coolant)

4HTMS

4 Flutes Helix Thread Mills for Stainless Steels







- Thread Mills for SUS, Titanium alloys
- Coolant type of helix flutes for deep threading
- With multiple flutes composition, it shortens threading time
- Maximum drilling depth: 3*D2 (Threading diameter)
- It can be used for heli coil threading
- Both right and left threading are available

523P

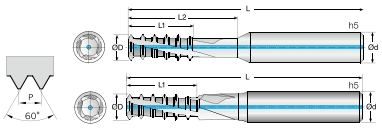
4 | UWC | HR Coating | 15° Helix Angle | Cutting DATA | R Rotation

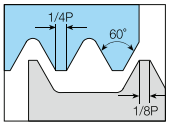
Order Number	Thread	Pitch	Guide Hole mm	Diameter D	Thread Length L1	Effective Length L2	Overall Length L	Shank Dia d
4HTMS0315120S04M4	M4	0.7	3.3	3.15	6.6	12	45	4
4HTMS039150S04M5	M5	0.8	4.2	3.9	7.6	15	50	4
4HTMS048180S06M6	M6	1	5	4.8	9.5	18	60	6
4HTMS065240S08M8	M8	1.25	6.8	6.5	13.1	24	65	8
4HTMS082300S10M10	M10	1.5	8.5	8.2	15.7	30	75	10
4HTMS099360S10M12	M12	1.75	10.2	9.9	18.4	36	85	10
4HTMS116420S12M14	M14	2	12	11.6	21	42	90	12
4HTMS136480S14M16	M16	2	14	13.6	25	48	100	14

(Without coolant)

4NKTM

4 Flutes Helix Nick Type Thread Mills for Multi Purpose





- Thread mills for Hardened steels(up to HRc 62), pre-hardened steels, alloy steels, carbon steels, cast irons
- High spindle speed and feed per tooth are available
- Maximum drilling depth : 2xD, 2.5xD, 3xD(threading diameter)
- Rib type helical design is applied for deep threading
- It can be used for heli coil threading
- Both right and left threading are available

523P

4 | UWC | TISIN-S Coating | 15° Helix Angle | Cutting DATA | R Rotation

Order Number	Thread	Pitch	Flutes Z	Diameter D	Thread Length L1	Effective Length L2	Overall Length L	Shank Dia d
4NKTM065240S08M8	M4	0.7	4	2.9	11.2	-	60	6
4NKTM048180S06M6	M5	0.8	4	3.8	12.8	-	60	6
4NKTM038128S06M5	M6	1	4	4.8	10.9	18	60	6
4NKTM029112S06M4	M8	1.25	4	6.5	13.62	24	65	8

(Without coolant)

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