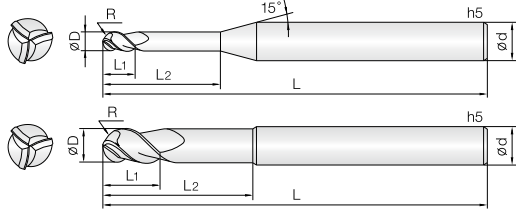


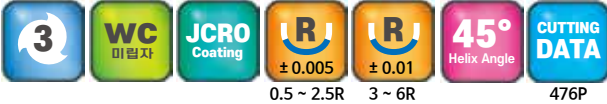
## 3날 45° 헬릭스 SUS가공용 리브 볼 엔드밀



- 합금강, SUS계열, Ti/Ni계합금, 인코넬 등 난삭재 가공 엔드밀
- JCRO 코팅 처리하여 다양한 피삭재 가공시 인선부에 스트레스가 적으며, 피삭재의 면조도가 향상됩니다.
- 45° 헬릭스 형상과 깊은 포켓으로 설계하여 칩배출이 우수하며, 고속·고이송 가공에 적합합니다.
- 항절력이 높은 미립자 초경합금을 채택하여 엔드밀의 파손을 최소화.

### 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.
- Minimize fracturing by high TRS fine WC grade.
- High speed, feed applicable by 45° degree helix and deep chip pocket design.



Condition	D Size	D Tolerance	Condition	D Size	D Tolerance
ØD ≠ Ød	Ø1 ~ 12	+0 ~ -0.01mm	ØD = Ød	Ø6 ~ 12	-0.005 ~ -0.015mm

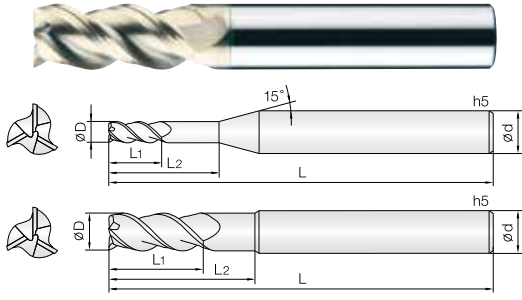
단위 : mm

Order Number	날경 Diameter R × D	날장 Length of cut L1	유효장 Effective Length L2	전장 Overall Length L	샤크 Shank Dia d	비고
3SURB 010 040 S04	0.5R X 1	1.5	4	50	4	
3SURB 010 060 S04	0.5R X 1	1.5	6	50	4	
3SURB 010 080 S04	0.5R X 1	1.5	8	50	4	
3SURB 010 100 S04	0.5R X 1	1.5	10	50	4	
3SURB 010 120 S04	0.5R X 1	1.5	12	50	4	
3SURB 010 160 S04	0.5R X 1	1.5	16	50	4	
3SURB 010 200 S04	0.5R X 1	1.5	20	50	4	
3SURB 012 030 S04	0.6R X 1.2	1.8	3	50	4	
3SURB 012 040 S04	0.6R X 1.2	1.8	4	50	4	
3SURB 012 060 S04	0.6R X 1.2	1.8	6	50	4	
3SURB 012 080 S04	0.6R X 1.2	1.8	8	50	4	
3SURB 012 100 S04	0.6R X 1.2	1.8	10	50	4	
3SURB 012 120 S04	0.6R X 1.2	1.8	12	50	4	
3SURB 015 040 S04	0.75R X 1.5	2	4	50	4	
3SURB 015 060 S04	0.75R X 1.5	2	6	50	4	
3SURB 015 100 S04	0.75R X 1.5	2	10	50	4	
3SURB 015 120 S04	0.75R X 1.5	2	12	50	4	
3SURB 015 160 S04	0.75R X 1.5	2	16	50	4	
3SURB 015 200 S04	0.75R X 1.5	2	20	50	4	
3SURB 020 040 S06	1R X 2	3	4	50	6	
3SURB 020 060 S06	1R X 2	3	6	50	6	
3SURB 020 100 S06	1R X 2	3	10	50	6	
3SURB 020 120 S06	1R X 2	3	12	60	6	
3SURB 020 160 S06	1R X 2	3	16	60	6	
3SURB 020 200 S06	1R X 2	3	20	60	6	
3SURB 020 250 S06	1R X 2	3	25	65	6	
3SURB 025 060 S06	1.25R X 2.5	4	6	50	6	
3SURB 025 100 S06	1.25R X 2.5	4	10	50	6	
3SURB 025 120 S06	1.25R X 2.5	4	12	60	6	
3SURB 025 160 S06	1.25R X 2.5	4	16	60	6	
3SURB 025 200 S06	1.25R X 2.5	4	20	60	6	
3SURB 030 080 S06	1.5R X 3	4.5	8	60	6	
3SURB 030 120 S06	1.5R X 3	4.5	12	60	6	
3SURB 030 160 S06	1.5R X 3	4.5	16	60	6	
3SURB 030 200 S06	1.5R X 3	4.5	20	60	6	
3SURB 030 250 S06	1.5R X 3	4.5	25	70	6	
3SURB 030 300 S06	1.5R X 3	4.5	30	70	6	
3SURB 030 400 S06	1.5R X 3	4.5	40	80	6	
3SURB 040 100 S06	2R X 4	6	10	60	6	
3SURB 040 160 S06	2R X 4	6	16	60	6	
3SURB 040 200 S06	2R X 4	6	20	60	6	
3SURB 040 250 S06	2R X 4	6	25	70	6	
3SURB 040 300 S06	2R X 4	6	30	70	6	
3SURB 040 400 S06	2R X 4	6	40	80	6	
3SURB 050 160 S06	2.5R X 5	8	16	80	6	
3SURB 050 200 S06	2.5R X 5	8	20	80	6	
3SURB 050 300 S06	2.5R X 5	8	30	80	6	
3SURB 060 200 S06	3R X 6	9	20	90	6	
3SURB 060 400 S06	3R X 6	9	40	90	6	
3SURB 080 300 S08	4R X 8	12	30	100	8	

Order Number	날경 Diameter R × D	날장 Length of cut L1	유효장 Effective Length L2	전장 Overall Length L	샤크 Shank Dia d	비고
3SURB 100 400 S10	5R X 10	15	40	100	10	
3SURB 120 500 S12	6R X 12	18	50	110	12	



### 3날 45° 헬릭스 SUS가공용 엔드밀



- 합금강, SUS계열, Ti/Ni계 합금, 인코넬 등 난삭재 가공 엔드밀
- J-CRO 코팅 처리하여 다양한 피삭재 가공시 인선부에 스트레스가 적으며, 내마모성 또한 향상됩니다.
- 3날 적용과 깊은 포켓으로 칩배출이 원활하며, 피삭재 면조도가 우수합니다.
- 45° 헬릭스 형상으로 설계하여 고속, 고이송 가공에 적합합니다.
- 항절력이 높은 미립자 초경합금을 채택, 고이송 작업시 엔드밀 파손을 최소화.

#### 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	Condition	D Size	D Tolerance
øD ≠ ød	ø0.5 ~ 6	+0 ~ -0.01mm	øD = ød	ø4 ~ 6	-0.005 ~ -0.015mm
	ø8 ~ 20	+0 ~ -0.015mm		ø8 ~ 12	-0.01 ~ -0.025mm
				ø16 ~ 20	-0.015 ~ -0.03mm

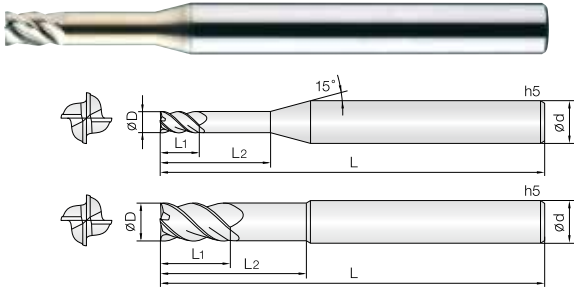


Shield Edge 475P

단위 : mm

Order Number	날경 Diameter D	날장 Length of cut L1	유효장 Effective Length L2	전장 Overall Length L	생크 Shank Dia d	비고	Order Number	날경 Diameter D	날장 Length of cut L1	유효장 Effective Length L2	전장 Overall Length L	생크 Shank Dia d	비고
3SUE 005 010 S04	0.5	1	-	45	4		3SUE 120 380 S12	12	26	38	80	12	
3SUE 005 020 S04	0.5	1	2	45	4		3SUE 160 360 S16	16	36	-	100	16	
3SUE 005 030 S04	0.5	1	3	45	4		3SUE 160 450 S16	16	36	45	100	16	
3SUE 005 040 S04	0.5	1	4	45	4		3SUE 200 550 S20	20	38	55	110	20	
3SUE 006 012 S04	0.6	1.2	-	45	4								
3SUE 006 030 S04	0.6	1.2	3	45	4								
3SUE 006 050 S04	0.6	1.2	5	45	4								
3SUE 007 014 S04	0.7	1.4	-	45	4								
3SUE 007 030 S04	0.7	1.4	3	45	4								
3SUE 008 020 S04	0.8	2	-	45	4								
3SUE 008 040 S04	0.8	2	4	45	4								
3SUE 008 060 S04	0.8	2	6	45	4								
3SUE 010 025 S04	1	2.5	-	45	4								
3SUE 010 025 S06	1	2.5	-	45	6								
3SUE 010 040 S06	1	2.5	4	45	6								
3SUE 010 060 S06	1	2.5	6	45	6								
3SUE 010 080 S06	1	2.5	8	45	6								
3SUE 012 030 S04	1.2	3	-	45	4								
3SUE 012 030 S06	1.2	3	-	45	6								
3SUE 012 060 S06	1.2	3	6	45	6								
3SUE 012 080 S06	1.2	3	8	45	6								
3SUE 015 040 S04	1.5	4	-	45	4								
3SUE 015 040 S06	1.5	4	-	45	6								
3SUE 015 060 S06	1.5	4	6	45	6								
3SUE 015 080 S06	1.5	4	8	45	6								
3SUE 015 100 S06	1.5	4	10	45	6								
3SUE 020 050 S04	2	5	-	45	4								
3SUE 020 050 S06	2	5	-	45	6								
3SUE 020 080 S06	2	5	8	45	6								
3SUE 020 100 S06	2	5	10	50	6								
3SUE 020 120 S06	2	5	12	50	6								
3SUE 025 080 S06	2.5	8	-	45	6								
3SUE 030 080 S04	3	8	-	45	4								
3SUE 030 080 S06	3	8	-	45	6								
3SUE 030 150 S06	3	8	15	45	6								
3SUE 030 200 S06	3	8	20	60	6								
3SUE 035 100 S06	3.5	10	-	50	6								
3SUE 040 100 S04	4	10	-	50	4								
3SUE 040 100 S06	4	10	-	50	6								
3SUE 040 150 S06	4	10	15	50	6								
3SUE 040 200 S06	4	10	20	60	6								
3SUE 045 120 S06	4.5	12	-	50	6								
3SUE 050 120 S06	5	12	-	50	6								
3SUE 060 120 S06	6	12	-	60	6								
3SUE 060 200 S06	6	12	20	60	6								
3SUE 080 190 S08	8	19	-	60	8								
3SUE 080 260 S08	8	19	26	60	8								
3SUE 100 220 S10	10	22	-	70	10								
3SUE 100 320 S10	10	22	32	70	10								
3SUE 120 260 S12	12	26	-	80	12								

FOR SUS



- 합금강, SUS계열, Ti/Ni계 합금, 인코넬 등 난삭재 가공 엔드밀
- J-CRO 코팅 처리하여 다양한 피삭재 가공시 인선부에 스트레스가 적으며, 내마모성 또한 향상됩니다.
- 강력한 채터링방지 설계로 엔드밀의 진동을 최소화하였습니다.
- 4날 적용과 깊은 포켓으로 칩배출이 원활하며, 피삭재 면조도가 우수합니다.
- 항절력이 높은 미립자 초경합금을 채택, 고이송 작업시 엔드밀 파손을 최소화.

#### 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.



Shield Edge 477P

Condition	D Size	D Tolerance	Condition	D Size	D Tolerance
øD ≠ ød	ø1 ~ 6	+0 ~ -0.01mm	øD = ød	ø6	-0.005 ~ -0.015mm
	ø8 ~ 20	+0 ~ -0.015mm		ø8 ~ 12	-0.01 ~ -0.025mm
		ø16 ~ 20		-0.015 ~ -0.03mm	

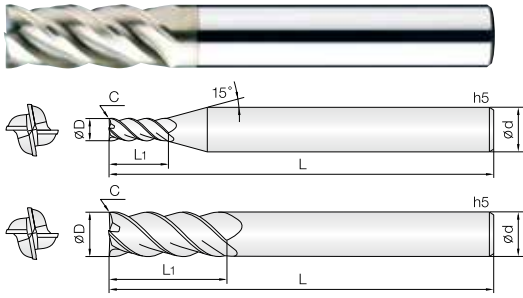
단위 : mm

Order Number	날경 Diameter D	날장 Length of cut L1	유효장 Effective Length L2	전장 Overall Length L	생크 Shank Dia d	비고	Order Number	날경 Diameter D	날장 Length of cut L1	유효장 Effective Length L2	전장 Overall Length L	생크 Shank Dia d	비고
4SURE 010 030 S04	1	1.5	3	50	4		4SURE 100 500 S10	10	15	50	100	10	
4SURE 010 050 S04	1	1.5	5	50	4		4SURE 120 360 S12	12	18	36	90	12	
4SURE 010 060 S04	1	1.5	6	50	4		4SURE 120 500 S13	12	18	50	130	12	
4SURE 010 080 S04	1	1.5	8	50	4		4SURE 120 600 S12	12	18	60	110	12	
4SURE 010 100 S04	1	1.5	10	50	4		4SURE 160 480 S16	16	24	48	110	16	
4SURE 012 040 S04	1.2	2	4	50	4		4SURE 160 700 S15	16	24	70	150	16	
4SURE 012 060 S04	1.2	2	6	50	4		4SURE 160 800 S16	16	24	80	130	16	
4SURE 012 080 S04	1.2	2	8	50	4		4SURE 200 600 S13	20	30	60	130	20	
4SURE 012 100 S04	1.2	2	10	50	4		4SURE 200 1000 S16	20	30	100	160	20	
4SURE 015 045 S04	1.5	2.5	4.5	50	4								
4SURE 015 060 S04	1.5	2.5	6	50	4								
4SURE 015 080 S04	1.5	2.5	8	50	4								
4SURE 015 100 S04	1.5	2.5	10	50	4								
4SURE 015 120 S04	1.5	2.5	12	50	4								
4SURE 015 150 S04	1.5	2.5	15	60	4								
4SURE 020 060 S04	2	3	6	50	4								
4SURE 020 080 S04	2	3	8	50	4								
4SURE 020 100 S04	2	3	10	50	4								
4SURE 020 120 S04	2	3	12	50	4								
4SURE 020 140 S04	2	3	14	60	4								
4SURE 020 160 S04	2	3	16	60	4								
4SURE 025 075 S04	2.5	4	7.5	50	4								
4SURE 025 100 S04	2.5	4	10	50	4								
4SURE 025 120 S04	2.5	4	12	50	4								
4SURE 025 140 S04	2.5	4	14	60	4								
4SURE 025 160 S04	2.5	4	16	60	4								
4SURE 030 090 S06	3	4.5	9	60	6								
4SURE 030 120 S06	3	4.5	12	60	6								
4SURE 030 160 S06	3	4.5	16	60	6								
4SURE 030 200 S06	3	4.5	20	60	6								
4SURE 030 250 S06	3	4.5	25	65	6								
4SURE 030 300 S06	3	4.5	30	75	6								
4SURE 040 120 S06	4	6	12	60	6								
4SURE 040 160 S06	4	6	16	60	6								
4SURE 040 200 S06	4	6	20	60	6								
4SURE 040 250 S06	4	6	25	65	6								
4SURE 040 300 S06	4	6	30	75	6								
4SURE 050 150 S06	5	7.5	15	60	6								
4SURE 050 180 S10	5	7.5	18	100	6								
4SURE 050 200 S06	5	7.5	20	60	6								
4SURE 050 250 S06	5	7.5	25	65	6								
4SURE 050 300 S06	5	7.5	30	70	6								
4SURE 060 200 S06	6	9	20	60	6								
4SURE 060 250 S10	6	9	25	100	6								
4SURE 060 300 S06	6	9	30	70	6								
4SURE 080 250 S08	8	12	25	70	8								
4SURE 080 350 S110	8	12	35	110	8								
4SURE 080 400 S08	8	12	40	80	8								
4SURE 100 300 S10	10	15	30	80	10								
4SURE 100 400 S120	10	15	40	120	10								

FOR SUS

# 4SUE 4 Flutes Non Symmetry End Mills for SUS

## 4날 SUS가공용 엔드밀



- 합금강, SUS계열, Ti/Ni계 합금, 인코넬 등 난삭재 가공 엔드밀
- J-CRO 코팅 처리하여 다양한 피삭재 가공시 인선부에 스트레스가 적으며, 내마모성 또한 향상됩니다.
- 강력한 채터링방지 설계로 엔드밀의 진동을 최소화하였습니다.
- 4날 적용과 깊은 포켓으로 칩배출이 원활하며, 피삭재 면조도가 우수합니다.
- 항절력이 높은 미립자 초경합금을 채택, 고이송 작업시 엔드밀 파손을 최소화.
- 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.



C Cutting 478P

Condition	D Size	D Tolerance	Condition	D Size	D Tolerance
øD ≠ ød	ø0.3 ~ 6	+0 ~ -0.01mm	øD = ød	ø6	-0.005 ~ -0.015mm
	ø7 ~ 20	+0 ~ -0.015mm		ø8 ~ 12	-0.01 ~ -0.025mm
				ø14 ~ 20	-0.015 ~ -0.03mm

단위 : mm

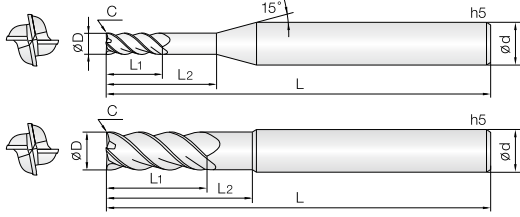
Order Number	날경 Diameter D	날장 Length of cut L1	면취량 Chamfer C	전장 Overall Length L	샙크 Shank Dia d	비고
New 4SUE 003 006 S04	0.3	0.6	0.03	40	4	
New 4SUE 004 008 S04	0.4	0.8	0.04	40	4	
New 4SUE 005 008 S04	0.5	0.8	0.05	40	4	
New 4SUE 005 010 S04	0.5	1	0.05	40	4	
New 4SUE 006 009 S04	0.6	0.9	0.06	40	4	
New 4SUE 006 012 S04	0.6	1.2	0.06	40	4	
New 4SUE 008 012 S04	0.8	1.2	0.08	40	4	
New 4SUE 008 020 S04	0.8	2	0.08	40	4	
4SUE 010 015 S04	1	1.5	0.01	50	4	
4SUE 010 025 S04	1	2.5	0.01	50	4	
4SUE 010 035 S04	1	3.5	0.01	50	4	
4SUE 010 050 S04	1	5	0.01	50	4	
4SUE 010 060 S04	1	6	0.01	50	4	
4SUE 012 015 S04	1.2	1.5	0.012	50	4	
4SUE 012 030 S04	1.2	3	0.012	50	4	
4SUE 012 050 S04	1.2	5	0.012	50	4	
4SUE 012 070 S04	1.2	7	0.012	50	4	
4SUE 015 025 S04	1.5	2.5	0.012	50	4	
4SUE 015 040 S04	1.5	4	0.012	50	4	
4SUE 015 055 S04	1.5	5.5	0.012	50	4	
4SUE 015 070 S04	1.5	7	0.012	50	4	
4SUE 015 085 S04	1.5	8.5	0.012	50	4	
4SUE 020 030 S04	2	3	0.02	50	4	
4SUE 020 060 S04	2	6	0.02	50	4	
4SUE 020 080 S04	2	8	0.02	50	4	
4SUE 020 100 S04	2	10	0.02	50	4	
4SUE 020 120 S04	2	12	0.02	50	4	
4SUE 020 140 S04	2	14	0.02	50	4	
4SUE 025 035 S04	2.5	3.5	0.025	50	4	
4SUE 025 080 S04	2.5	8	0.025	50	4	
4SUE 025 100 S04	2.5	10	0.025	50	4	
4SUE 025 120 S04	2.5	12	0.025	50	4	
4SUE 025 140 S04	2.5	14	0.025	50	4	
4SUE 030 045 S06	3	4.5	0.03	60	6	
4SUE 030 100 S06	3	10	0.03	60	6	
4SUE 030 120 S06	3	12	0.03	60	6	
4SUE 030 150 S06	3	15	0.03	60	6	
4SUE 030 200 S06	3	20	0.03	70	6	
4SUE 030 250 S06	3	25	0.03	70	6	
4SUE 030 300 S06	3	30	0.03	75	6	
4SUE 035 055 S06	3.5	5.5	0.035	60	6	
4SUE 035 100 S06	3.5	10	0.035	60	6	
4SUE 035 150 S06	3.5	15	0.035	60	6	
4SUE 035 200 S06	3.5	20	0.035	60	6	
4SUE 040 060 S06	4	6	0.04	60	6	
4SUE 040 120 S06	4	12	0.04	60	6	
4SUE 040 160 S06	4	16	0.04	60	6	
4SUE 040 200 S06	4	20	0.04	70	6	
4SUE 040 250 S06	4	25	0.04	70	6	
4SUE 040 300 S06	4	30	0.04	75	6	

Order Number	날경 Diameter D	날장 Length of cut L1	면취량 Chamfer C	전장 Overall Length L	샙크 Shank Dia d	비고
4SUE 045 070 S06	4.5	7	0.045	60	6	
4SUE 045 130 S06	4.5	13	0.045	60	6	
4SUE 045 180 S06	4.5	18	0.045	60	6	
4SUE 050 075 S06	5	7.5	0.05	60	6	
4SUE 050 150 S06	5	15	0.05	60	6	
4SUE 050 200 S06	5	20	0.05	70	6	
4SUE 050 250 S06	5	25	0.05	70	6	
4SUE 050 300 S06	5	30	0.05	75	6	
4SUE 060 090 S06	6	9	0.06	60	6	
4SUE 060 150 S06	6	15	0.06	60	6	
4SUE 060 180 S06	6	18	0.06	65	6	
4SUE 060 250 S06	6	25	0.06	70	6	
4SUE 060 300 S06	6	30	0.06	70	6	
4SUE 060 400 S06	6	40	0.06	80	6	
4SUE 070 110 S08	7	11	0.07	70	8	
4SUE 070 180 S08	7	18	0.07	70	8	
4SUE 070 210 S08	7	21	0.07	70	8	
4SUE 080 120 S08	8	12	0.08	70	8	
4SUE 080 200 S08	8	20	0.08	70	8	
4SUE 080 240 S08	8	24	0.08	70	8	
4SUE 080 300 S08	8	30	0.08	80	8	
4SUE 080 400 S08	8	40	0.08	90	8	
4SUE 080 500 S08	8	50	0.08	100	8	
4SUE 090 140 S10	9	14	0.09	80	10	
4SUE 090 220 S10	9	22	0.09	80	10	
4SUE 090 270 S10	9	27	0.09	80	10	
4SUE 100 150 S10	10	15	0.1	80	10	
4SUE 100 250 S10	10	25	0.1	80	10	
4SUE 100 300 S10	10	30	0.1	80	10	
4SUE 100 400 S10	10	40	0.1	90	10	
4SUE 100 500 S10	10	50	0.1	100	10	
4SUE 100 600 S10	10	60	0.1	110	10	
4SUE 110 170 S12	11	17	0.11	90	12	
4SUE 110 220 S12	11	22	0.11	90	12	
4SUE 110 330 S12	11	33	0.11	90	12	
4SUE 120 180 S12	12	18	0.12	90	12	
4SUE 120 300 S12	12	30	0.12	90	12	
4SUE 120 360 S12	12	36	0.12	90	12	
New 4SUE 120 450 S12	12	45	0.12	100	12	
4SUE 120 500 S12	12	50	0.12	100	12	
4SUE 120 600 S12	12	60	0.12	110	12	
4SUE 120 700 S12	12	70	0.12	120	12	
New 4SUE 140 320 S14	14	32	0.14	100	14	
New 4SUE 140 450 S14	14	45	0.14	100	14	
New 4SUE 140 600 S14	14	60	0.14	110	14	
New 4SUE 140 700 S14	14	70	0.14	120	14	
4SUE 160 240 S16	16	24	0.16	100	16	
4SUE 160 350 S16	16	35	0.16	100	16	
4SUE 160 500 S16	16	50	0.16	110	16	
4SUE 160 700 S16	16	70	0.16	130	16	



# 4SUV 4 Flutes Variable Helix End Mills for SUS

## 4날 SUS 강력절삭용 엔드밀



- 합금강, SUS계열, Ti/Ni계 합금, 인코넬 등 난삭재 가공 엔드밀
- JCRO 코팅 처리하여 인선부에 스트레스가 적으며, 내마모성 또한 향상됩니다.
- 부등분할 밀날방식과 가변 헬릭스 인선설계로, chatter링이 더욱 감소 하였습니다.
- A타입은 엔드밀의 치핑을 최소화, B타입은 칩배출을 극대화 하였습니다.
- 항절력이 높은 미립자 초경합금을 채택하여, 고이송 작업시 엔드밀의 파손을 최소화.

### 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.
- Minimize chattering during cutting application by unequal index of flute and helix angle to the endmill edge.
- Type A minimizes chipping, Type B maximizes chip emmissins.
- Minimize fracturing at high feed by high TRS fine WC grade.

4 WC 미립자 JCRO Coating 35° Helix Angle 38° Helix Angle A B CUTTING DATA

Shield Edge Sharp Edge 478P

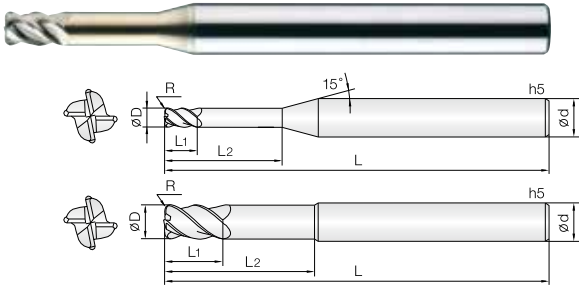
Condition	D Size	D Tolerance	Condition	D Size	D Tolerance
ØD ≠ ød	Ø1 ~ 6	+0 ~ -0.01mm	ØD = ød	Ø6	-0.005 ~ -0.015mm
	Ø8 ~ 20	+0 ~ -0.015mm		Ø8 ~ 12	-0.01 ~ -0.025mm
				Ø14 ~ 20	-0.015 ~ -0.03mm

단위 : mm

Order Number	날경 Diameter D	날장 Length of cut L1	유효장 Effective Length L2	면취타입 Type	전장 Overall Length L	샙크 Shank Dia d	비고
4SUV A 010 025 S04	1	2.5	-	A	50	4	
4SUV B 010 025 S04	1	2.5	-	B	50	4	
4SUV A 010 060 S04	1	2.5	6	A	50	4	
4SUV A 015 040 S04	1.5	4	-	A	50	4	
4SUV B 015 040 S04	1.5	4	-	B	50	4	
4SUV A 015 100 S04	1.5	4	10	A	50	4	
4SUV A 020 050 S04	2	5	-	A	50	4	
4SUV B 020 050 S04	2	5	-	B	50	4	
4SUV A 020 120 S04	2	5	12	A	50	4	
4SUV A 030 080 S06	3	8	-	A	60	6	
4SUV B 030 080 S06	3	8	-	B	60	6	
4SUV A 030 180 S06	3	8	18	A	60	6	
4SUV A 040 110 S06	4	11	-	A	60	6	
4SUV B 040 110 S06	4	11	-	B	60	6	
4SUV A 040 210 S06	4	11	21	A	60	6	
4SUV A 050 130 S06	5	13	-	A	60	6	
4SUV B 050 130 S06	5	13	-	B	60	6	
4SUV A 050 210 S06	5	13	21	A	60	6	
4SUV A 060 130 S06	6	13	-	A	60	6	
4SUV B 060 130 S06	6	13	-	B	60	6	
4SUV A 060 210 S06	6	13	21	A	60	6	
4SUV A 080 190 S08	8	19	-	A	60	8	
4SUV B 080 190 S08	8	19	-	B	60	8	
4SUV A 080 270 S08	8	19	27	A	60	8	
4SUV A 100 220 S10	10	22	-	A	70	10	
4SUV B 100 220 S10	10	22	-	B	70	10	
4SUV A 100 320 S10	10	22	32	A	70	10	
4SUV A 120 260 S12	12	26	-	A	80	12	
4SUV B 120 260 S12	12	26	-	B	80	12	
4SUV A 120 380 S12	12	26	38	A	80	12	
New 4SUV A 140 300 S14	14	30	-	A	90	14	
New 4SUV B 140 300 S14	14	30	-	B	90	14	
New 4SUV A 140 420 S14	14	30	42	A	90	14	
4SUV A 160 320 S16	16	32	-	A	90	16	
4SUV B 160 320 S16	16	32	-	B	90	16	
4SUV A 160 450 S16	16	32	45	A	90	16	
4SUV A 200 380 S20	20	38	-	A	100	20	
4SUV B 200 380 S20	20	38	-	B	100	20	
4SUV A 200 550 S20	20	38	55	A	100	20	

FOR SUS

### 4날 SUS가공용 리브 코너 레디우스 엔드밀



- 합금강, SUS계열, Ti/Ni계 합금, 인코넬 등 난삭재 가공 엔드밀
- J-CRO 코팅 처리하여 다양한 피삭재 가공시 인선부에 스트레스가 적으며, 내마모성 또한 향상됩니다.
- 강력한 채터링방지 설계로 엔드밀의 진동을 최소화하였습니다.
- 4날 적용과 깊은 포켓으로 칩배출이 원활하며, 피삭재 면조도가 우수합니다.
- 항절력이 높은 미립자 초경합금을 채택, 고이송 작업시 엔드밀 파손을 최소화.

#### • 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.

4

WC  
미립자

JCRO  
Coating

R  
± 0.005

R  
± 0.01

R  
± 0.015

42°  
Helix Angle

Shield Edge

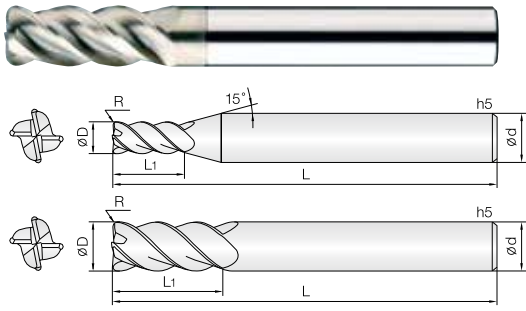
CUTTING  
DATA

Condition	D Size	D Tolerance	Condition	D Size	D Tolerance
ØD ≠ Ød	Ø1 ~ 20	+0 ~ -0.01mm	ØD = Ød	Ø6 ~ 12	-0.005 ~ -0.015mm
				Ø16 ~ 20	-0.01 ~ -0.02mm

Order Number	날경 D × R	날장 Length of cut L1	유효장 Effective Length L2	전장 Overall Length L	샙크 Shank Dia d	비고	Order Number	날경 D × R	날장 Length of cut L1	유효장 Effective Length L2	전장 Overall Length L	샙크 Shank Dia d	비고
4SUCR 010 001 050	1 X R0.1	1.5	5	60	4		4SUCR 120 005 600	12 X R0.5	18	60	110	12	
4SUCR 010 001 060	1 X R0.1	1.5	6	60	4		4SUCR 120 010 600	12 X R1	18	60	110	12	
4SUCR 010 001 080	1 X R0.1	1.5	8	60	4		4SUCR 120 015 600	12 X R1.5	18	60	110	12	
4SUCR 020 001 100	2 X R0.1	3	10	60	4		4SUCR 120 020 600	12 X R2	18	60	110	12	
4SUCR 020 001 120	2 X R0.1	3	12	60	4		4SUCR 120 025 600	12 X R2.5	18	60	110	12	
4SUCR 020 001 160	2 X R0.1	3	16	60	4		4SUCR 120 030 600	12 X R3	18	60	110	12	
4SUCR 020 002 100	2 X R0.2	3	10	60	4		4SUCR 160 005 800	16 X R0.5	24	80	130	16	
4SUCR 020 002 120	2 X R0.2	3	12	60	4		4SUCR 160 010 800	16 X R1	24	80	130	16	
4SUCR 020 002 160	2 X R0.2	3	16	60	4		4SUCR 160 015 800	16 X R1.5	24	80	130	16	
4SUCR 030 002 150	3 X R0.2	4.5	15	65	6		4SUCR 160 020 800	16 X R2	24	80	130	16	
4SUCR 030 002 200	3 X R0.2	4.5	20	70	6		4SUCR 160 030 800	16 X R3	24	80	130	16	
4SUCR 030 005 150	3 X R0.5	4.5	15	65	6		4SUCR 200 005 1000	20 X R0.5	30	100	150	20	
4SUCR 030 005 200	3 X R0.5	4.5	20	70	6		4SUCR 200 010 1000	20 X R1	30	100	150	20	
4SUCR 040 002 200	4 X R0.2	6	20	70	6		4SUCR 200 015 1000	20 X R1.5	30	100	150	20	
4SUCR 040 002 300	4 X R0.2	6	30	80	6		4SUCR 200 020 1000	20 X R2	30	100	150	20	
4SUCR 040 005 200	4 X R0.5	6	20	70	6		4SUCR 200 030 1000	20 X R3	30	100	150	20	
4SUCR 040 005 300	4 X R0.5	6	30	80	6		4SUCR 200 050 1000	20 X R5	30	100	150	20	
4SUCR 040 010 200	4 X R1	6	20	70	6								
4SUCR 050 002 250	5 X R0.2	7.5	25	70	6								
4SUCR 050 002 360	5 X R0.2	7.5	36	80	6								
4SUCR 050 005 250	5 X R0.5	7.5	25	70	6								
4SUCR 050 005 360	5 X R0.5	7.5	36	80	6								
4SUCR 050 010 250	5 X R1	7.5	25	70	6								
4SUCR 060 003 300	6 X R0.3	9	30	70	6								
4SUCR 060 003 400	6 X R0.3	9	40	80	6								
4SUCR 060 005 300	6 X R0.5	9	30	70	6								
4SUCR 060 005 400	6 X R0.5	9	40	80	6								
4SUCR 060 010 300	6 X R1	9	30	70	6								
4SUCR 060 010 400	6 X R1	9	40	80	6								
4SUCR 060 015 300	6 X R1.5	9	30	70	6								
4SUCR 070 003 350	7 X R0.3	10	35	80	8								
4SUCR 070 005 350	7 X R0.5	10	35	80	8								
4SUCR 070 010 350	7 X R1	10	35	80	8								
4SUCR 080 003 400	8 X R0.3	12	40	80	8								
4SUCR 080 005 400	8 X R0.5	12	40	80	8								
4SUCR 080 010 400	8 X R1	12	40	80	8								
4SUCR 080 015 400	8 X R1.5	12	40	80	8								
4SUCR 080 020 400	8 X R2	12	40	80	8								
4SUCR 090 003 450	9 X R0.3	13	45	90	10								
4SUCR 090 005 450	9 X R0.5	13	45	90	10								
4SUCR 090 010 450	9 X R1	13	45	90	10								
4SUCR 100 003 500	10 X R0.3	15	50	100	10								
4SUCR 100 005 500	10 X R0.5	15	50	100	10								
4SUCR 100 010 500	10 X R1	15	50	100	10								
4SUCR 100 015 500	10 X R1.5	15	50	100	10								
4SUCR 100 020 500	10 X R2	15	50	100	10								
4SUCR 110 003 550	11 X R0.3	16	55	100	12								
4SUCR 110 005 550	11 X R0.5	16	55	100	12								
4SUCR 110 010 550	11 X R1	16	55	100	12								
4SUCR 120 003 600	12 X R0.3	18	60	110	12								

FOR SUS





- 합금강, SUS계열, Ti/Ni계 합금, 인코넬 등 난삭재 가공 엔드밀
- J-CRO 코팅 처리하여 다양한 피삭재 가공시 인선부에 스트레스가 적으며, 내마모성 또한 향상됩니다.
- 강력한 채터링방지 설계로 엔드밀의 진동을 최소화하였습니다.
- 코너R부 적용으로 밑날 치핑을 방지 하였습니다.
- 항절력이 높은 미립자 초경합금을 채택하여, 고이송 작업시 엔드밀의 파손을 최소화.
- Endmills for alloy steel, SUS, Ti/Ni base alloy, 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.
- Preventing bottom edge chipping by corner R.
- Minimize fracturing at high feed by high TRS fine WC grade.

4

WC  
미립자

JCRO  
Coating

R

R

R

42°  
Helix Angle

CUTTING  
DATA

R0.1 ~ 0.5
R1 ~ 1.5
R2 ~ 3
478P

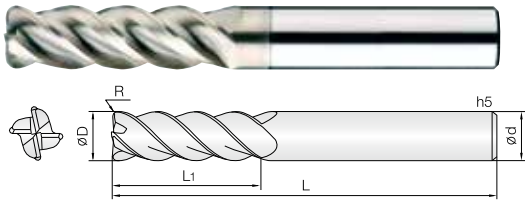
Condition	D Size	D Tolerance	Condition	D Size	D Tolerance
øD ≠ ød	ø1 ~ 20	+0 ~ -0.01mm	øD = ød	ø6 ~ 12	-0.005 ~ -0.015mm
				ø14 ~ 20	-0.01 ~ -0.02mm

단위 : mm

Order Number	날경 Diameter D×R	날장 Length of cut L1	전장 Overall Length L	샙크 Shank Dia d	비고	Order Number	날경 Diameter D×R	날장 Length of cut L1	전장 Overall Length L	샙크 Shank Dia d	비고
4SUC 010 001 S04	1 X R0.1	2.5	50	4		4SUC 080 003 S08	8 X R0.3	20	80	8	
4SUC 010 002 S04	1 X R0.2	2.5	50	4		4SUC 080 005 070	8 X R0.5	16	70	8	
4SUC 012 001 S04	1.2 X R0.1	3	50	4		4SUC 080 005 S08	8 X R0.5	20	80	8	
4SUC 012 002 S04	1.2 X R0.2	3	50	4		4SUC 080 010 070	8 X R1	16	70	8	
4SUC 015 001 S04	1.5 X R0.1	4	50	4		4SUC 080 010 S08	8 X R1	20	80	8	
4SUC 015 002 S04	1.5 X R0.2	4	50	4		4SUC 080 015 S08	8 X R1.5	20	80	8	
4SUC 015 003 S04	1.5 X R0.3	4	50	4		4SUC 080 020 S08	8 X R2	20	80	8	
4SUC 020 001 S04	2 X R0.1	6	50	4		4SUC 085 003 S10	8.5 X R0.3	22	80	10	
4SUC 020 002 S04	2 X R0.2	6	50	4		4SUC 090 003 S10	9 X R0.3	25	80	10	
4SUC 020 003 S04	2 X R0.3	6	50	4		4SUC 100 003 070	10 X R0.3	20	70	10	
4SUC 020 005 S04	2 X R0.5	6	50	4		4SUC 100 003 S10	10 X R0.3	25	80	10	
4SUC 025 001 S04	2.5 X R0.1	7	50	4		4SUC 100 005 070	10 X R0.5	20	70	10	
4SUC 025 002 S04	2.5 X R0.2	7	50	4		4SUC 100 005 S10	10 X R0.5	25	80	10	
4SUC 025 003 S04	2.5 X R0.3	7	50	4		4SUC 100 010 070	10 X R1	20	70	10	
4SUC 030 001 S06	3 X R0.1	10	60	6		4SUC 100 010 S10	10 X R1	25	80	10	
4SUC 030 002 055	3 X R0.2	6	55	6		4SUC 100 015 070	10 X R1.5	20	70	10	
4SUC 030 002 S06	3 X R0.2	10	60	6		4SUC 100 015 S10	10 X R1.5	25	80	10	
4SUC 030 003 S06	3 X R0.3	10	60	6		4SUC 100 020 070	10 X R2	20	70	10	
4SUC 030 005 055	3 X R0.5	6	55	6		4SUC 100 020 S10	10 X R2	25	80	10	
4SUC 030 005 S06	3 X R0.5	10	60	6		4SUC 100 025 070	10 X R2.5	20	70	10	
4SUC 035 002 S06	3.5 X R0.2	10	60	6		4SUC 100 025 S10	10 X R2.5	25	80	10	
4SUC 040 001 S06	4 X R0.1	12	60	6		4SUC 100 030 070	10 X R3	20	70	10	
4SUC 040 002 055	4 X R0.2	8	55	6		4SUC 100 030 S10	10 X R3	25	80	10	
4SUC 040 002 S06	4 X R0.2	12	60	6		4SUC 110 005 S12	11 X R0.5	27	90	12	
4SUC 040 003 S06	4 X R0.3	12	60	6		4SUC 110 010 S12	11 X R1	27	90	12	
4SUC 040 005 055	4 X R0.5	8	55	6		4SUC 120 003 080	12 X R0.3	24	80	12	
4SUC 040 005 S06	4 X R0.5	12	60	6		4SUC 120 003 S12	12 X R0.3	30	100	12	
4SUC 040 010 S06	4 X R1	12	60	6		4SUC 120 005 080	12 X R0.5	24	80	12	
4SUC 045 002 S06	4.5 X R0.2	14	60	6		4SUC 120 005 S12	12 X R0.5	30	100	12	
4SUC 050 002 055	5 X R0.2	10	55	6		4SUC 120 010 080	12 X R1	24	80	12	
4SUC 050 002 S06	5 X R0.2	15	60	6		4SUC 120 010 S12	12 X R1	30	100	12	
4SUC 050 003 S06	5 X R0.3	15	60	6		4SUC 120 015 080	12 X R1.5	24	80	12	
4SUC 050 005 055	5 X R0.5	10	55	6		4SUC 120 015 S12	12 X R1.5	30	100	12	
4SUC 050 005 S06	5 X R0.5	15	60	6		4SUC 120 020 080	12 X R2	24	80	12	
4SUC 050 010 S06	5 X R1	15	60	6		4SUC 120 020 S12	12 X R2	30	100	12	
4SUC 055 002 S06	5.5 X R0.2	15	60	6		4SUC 120 025 S12	12 X R2.5	30	100	12	
New 4SUC 060 002 055	6 X R0.2	12	55	6		4SUC 120 030 080	12 X R3	24	80	12	
New 4SUC 060 002 S06	6 X R0.2	15	60	6		4SUC 120 030 S12	12 X R3	30	100	12	
4SUC 060 003 055	6 X R0.3	12	55	6		4SUC 140 005 S14	14 X R0.5	35	100	14	
4SUC 060 003 S06	6 X R0.3	15	60	6		4SUC 140 010 S14	14 X R1	35	100	14	
4SUC 060 005 055	6 X R0.5	12	55	6		4SUC 160 005 100	16 X R0.5	32	100	16	
4SUC 060 005 S06	6 X R0.5	15	60	6		4SUC 160 005 S16	16 X R0.5	42	110	16	
4SUC 060 010 055	6 X R1	12	55	6		4SUC 160 010 100	16 X R1	32	100	16	
4SUC 060 010 S06	6 X R1	15	60	6		4SUC 160 010 S16	16 X R1	42	110	16	
4SUC 060 015 S06	6 X R1.5	15	60	6		4SUC 180 005 S18	18 X R0.5	45	110	18	
4SUC 065 003 S08	6.5 X R0.3	18	60	8		4SUC 180 010 S18	18 X R1	45	110	18	
4SUC 070 003 S08	7 X R0.3	20	80	8		4SUC 200 005 S20	20 X R0.5	48	110	20	
4SUC 070 005 S08	7 X R0.5	20	80	8		4SUC 200 010 S20	20 X R1	48	110	20	
4SUC 007 010 S08	7 X R1	20	80	8							
4SUC 080 003 070	8 X R0.3	16	70	8							



4날 SUS가공용 긴길이 코너 레디우스 엔드밀



- 합금강, SUS계열, Ti/Ni계합금, 인코넬 등 난삭재 가공 엔드밀
- J-CRO 코팅 처리하여 다양한 피삭재 가공시 인선부에 스트레스가 적으며, 내마모성 또한 향상됩니다.
- 강력한 채터링방지 설계로 엔드밀의 진동을 최소화하였습니다.
- 코너R부 적용으로 밑날 치핑을 방지 하였습니다.
- 항절력이 높은 미립자 초경합금을 채택하여, 고이송 작업시 엔드밀의 파손을 최소화.

• 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.
- Preventing bottom edge chipping by corner R.
- Minimize fracturing at high feed by high TRS fine WC grade.

4 미립자
WC
JCRO Coating
R ±0.005
R ±0.01
R ±0.015
42° Helix Angle
CUTTING DATA

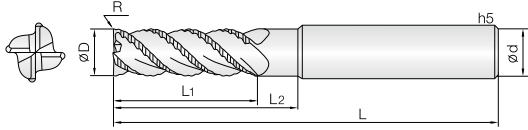
Condition	D Size	D Tolerance	Condition	D Size	D Tolerance
ØD ≠ d	Ø6 ~ 20	+0 ~ -0.01mm	ØD = d	Ø6 ~ 12	-0.005 ~ -0.015mm
				Ø14 ~ 20	-0.01 ~ -0.02mm

R0.3 ~ 0.5 R1 ~ 1.5 R2 ~ 3 479P 단위 : mm

Order Number	날경 Diameter D × R	날장 Length of cut L1	전장 Overall Length L	샙크 Shank Dia d	비고	Order Number	날경 Diameter D × R	날장 Length of cut L1	전장 Overall Length L	샙크 Shank Dia d	비고
4LSUC 060 003 070	6 X R0.3	30	70	6							
4LSUC 060 005 070	6 X R0.5	30	70	6							
4LSUC 060 010 070	6 X R1	30	70	6							
4LSUC 060 015 070	6 X R1.5	30	70	6							
4LSUC 080 003 080	8 X R0.3	40	80	8							
4LSUC 080 005 080	8 X R0.5	40	80	8							
4LSUC 080 010 080	8 X R1	40	80	8							
4LSUC 080 015 080	8 X R1.5	40	80	8							
4LSUC 080 020 080	8 X R2	40	80	8							
4LSUC 100 003 100	10 X R0.3	50	100	10							
4LSUC 100 005 100	10 X R0.5	50	100	10							
4LSUC 100 010 100	10 X R1	50	100	10							
4LSUC 100 015 100	10 X R1.5	50	100	10							
4LSUC 100 020 100	10 X R2	50	100	10							
4LSUC 120 003 120	12 X R0.3	60	120	12							
4LSUC 120 005 120	12 X R0.5	60	120	12							
4LSUC 120 010 120	12 X R1	60	120	12							
4LSUC 120 015 120	12 X R1.5	60	120	12							
4LSUC 120 020 120	12 X R2	60	120	12							
4LSUC 120 025 120	12 X R2.5	60	120	12							
4LSUC 120 030 120	12 X R3	60	120	12							
New 4LSUC 140 005 120	14 X R0.5	70	120	14							
New 4LSUC 140 010 120	14 X R1	70	120	14							
New 4LSUC 140 020 120	14 X R2	70	120	14							
New 4LSUC 140 030 120	14 X R3	70	120	14							
4LSUC 160 005 130	16 X R0.5	80	130	16							
4LSUC 160 010 130	16 X R1	80	130	16							
4LSUC 160 015 130	16 X R1.5	80	130	16							
4LSUC 160 020 130	16 X R2	80	130	16							
4LSUC 160 030 130	16 X R3	80	130	16							
4LSUC 200 005 160	20 X R0.5	100	160	20							
4LSUC 200 010 160	20 X R1	100	160	20							
4LSUC 200 015 160	20 X R1.5	100	160	20							
4LSUC 200 020 160	20 X R2	100	160	20							
4LSUC 200 030 160	20 X R3	100	160	20							

FOR SUS

### 3&4&5날 45° 헬릭스 SUS라핑 코너 R 엔드밀



- 합금강, SUS계열, 인코넬, 일반구조강 등 다양한 난삭재의 황삭가공
- JCRO 코팅 처리하여 다양한 피삭재 가공시 인선부에 스트레스가 적으며, 내마모성 또한 향상됩니다.
- 45° 헬릭스 적용으로 절삭 저항이 감소 되어 장시간 가공에 적합합니다.
- 파인피치 형상 채택으로 고속, 황삭가공 작업에 적합합니다.

#### 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.

3

4

5

WC  
미립자

JCRO  
Coating

R  
± 0.005

R  
± 0.01

R  
± 0.015

45°  
Helix Angle

CUTTING  
DATA

R0.2 ~ 0.5    R1 ~ 1.5    R2    480P

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

단위 : mm

Order Number	날경 Diameter D × R	날장 Length of cut L1	유효장 Effective Length L2	전장 Overall Length L	샙크 Shank Dia d	비고	Order Number	날경 Diameter D × R	날장 Length of cut L1	유효장 Effective Length L2	전장 Overall Length L	샙크 Shank Dia d	비고
3SUR 030 002 S06	3 X R0.2	8	-	50	6								
3SUR 040 002 S06	4 X R0.2	10	-	50	6								
4SUR 050 002 S06	5 X R0.2	13	-	50	6								
4SUR 060 002 200	6 X R0.2	10	20	60	6								
4SUR 060 002 S06	6 X R0.2	13	-	60	6								
4SUR 060 005 S06	6 X R0.5	13	-	60	6								
4SUR 070 002 S08	7 X R0.2	18	-	70	8								
4SUR 080 002 250	8 X R0.2	12	25	70	8								
4SUR 080 002 S08	8 X R0.2	19	-	70	8								
4SUR 080 010 S08	8 X R1	19	-	70	8								
4SUR 090 003 S10	9 X R0.3	20	-	70	10								
4SUR 100 003 300	10 X R0.3	15	30	75	10								
4SUR 100 003 S10	10 X R0.3	22	-	75	10								
4SUR 100 010 S10	10 X R1	22	-	75	10								
4SUR 110 003 S12	11 X R0.3	25	-	80	12								
4SUR 120 003 350	12 X R0.3	20	35	80	12								
4SUR 120 003 S12	12 X R0.3	26	-	80	12								
4SUR 120 010 S12	12 X R1	26	-	80	12								
5SUR 140 005 S16	14 X R0.5	28	-	90	16								
5SUR 160 005 100	16 X R0.5	32	-	100	16								
5SUR 160 005 110	16 X R0.5	42	-	110	16								
5SUR 160 015 100	16 X R1.5	32	-	100	16								
5SUR 160 015 110	16 X R1.5	42	-	110	16								
5SUR 200 005 100	20 X R0.5	38	-	100	20								
5SUR 200 005 110	20 X R0.5	45	-	110	20								
5SUR 200 020 100	20 X R2	38	-	100	20								
5SUR 200 020 110	20 X R2	45	-	110	20								

FOR SUS