Technical Information **KORLOY**

Solid Tools Solution



Endmill

Drill

Reamer

Chamfer

Thread



KORLOY

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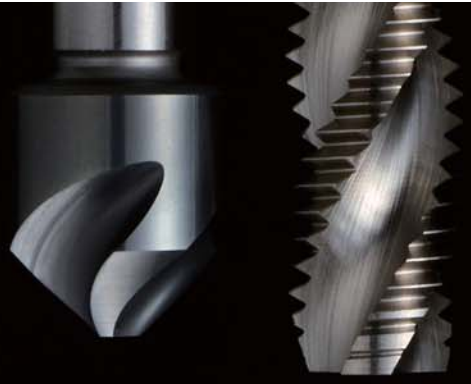
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내열합금(티타늄, 인코넬) 가공용 엔드밀 시리즈

Super Endmill For HRSA For Ti

New

- 항공/발전 산업군의 엔진, 터빈 등의 난삭재 부품 가공
- 절삭열 감소와 우수한 칩 배출성으로 난삭재 가공에 최적화

제품정보 : 30 페이지



Super Endmill

Inconel718, Hastelloy, Waspaloy 등 니켈계 내열합금 가공에 최적화

(*HRSA : Heat Resistance Super Alloy, 내열합금)

초정밀 금형가공 솔루션

The Mirror Endmill

PCD 볼 엔드밀 - 초정밀 피삭재, 고경도 금형 폴리싱 가공용
- 날이 없는 PCD 구형 볼 엔드밀로 최적의 면조도 구현

cBN 볼 엔드밀 - 초정밀 경면 피삭재, HRC60 이상의 금형 가공용
- 고속 가공시 뛰어난 면조도 및 생산성 향상

제품정보 : 39 페이지



The Mirror Endmill

HRC60 이상의 고경도 금형 초정밀 가공에 접합

PCD, cBN전용 재종으로 공구 내마모성 향상



고속, 고경도용 엔드밀

H-Star Endmill

New

- 초미립 모재 적용으로 공구의 인선강도 향상
- 신규코팅 적용으로 고속가공시 날부 고온 내산화성, 경도 유지
- 고속가공에 적합한 인선부 설계로 안정적인 성능 유지

제품정보 : 42 페이지

H-Star Endmill

H_RC50~63 고경도 피삭재의 고속가공에 적합

롱 넥, 리브, 테이퍼 넥 등의 제원으로 다양한 형상의 가공 프로세스에 적합


U-Star Endmill
HRC30~50 중경도의 합금강, 탄소강, 금형강 등 가공에 적합
미니어처 타입, 테이퍼 넥, 구형 볼 등 다양한 형상 시리즈 보유
금형 가공용 엔드밀
U-Star Endmill
New
- 금형 가공 시 황삭 및 중·정삭, 곡면과 경사면, 특수 형상 등 광범위한 가공 방식 대응
- 고인성 모재 적용으로 가공 시 높은 내치핑성, 경도 유지
- 최신의 코팅기술로 높은 내산화성 및 인선 강도
제품정보 : 115 페이지



R+ Endmill
러핑에 최적화된 인선형상 적용

가공 효율 우수 – 중삭, 황삭 가공용 형상 적용

고효율 러핑 엔드밀

R+ Endmill

- 고효율 러핑 인선 적용으로 우수한 가공 효율 확보
- 특수 인선 설계와 부등분할, 부등리드 적용으로 절삭 부하 감소

제품정보 : 199페이지

스테인레스 가공용 엔드밀

S+ Endmill New

- 내산화성이 강화된 스페셜 코팅 적용
- 고경사각과 유선형 칩포켓이 형성되어 있어 칩배출이 용이
- 공구직경화성을 극복하기 위해 특수설계된 날끝 형성

제품정보 : 207페이지

S+ Endmill
스테인레스(STS) 가공시 최적 성능을 발휘
(보통강, 합금강, 소입강 가공 가능)

강력한 커팅엣지 구현으로 공구수명 증대



알루미늄 가공용 엔드밀

A+ Endmill

- 더블 여유각 채용(인선강성 향상으로 탁월한 생산성 효과)
- 샤프엣지 구현(황삭/사상용에서도 적용 가능한 샤프한 인선엣지 구현)
- U 형상으로 고이송 가공에서도 효과적인 칩 배출

제품정보 : 220페이지

A+ Endmill

독자적인 U 플루트 형상 디자인



칩배출이 용이하며 용착방지 우수

Solid Endmill for Aluminum

DLC 코팅

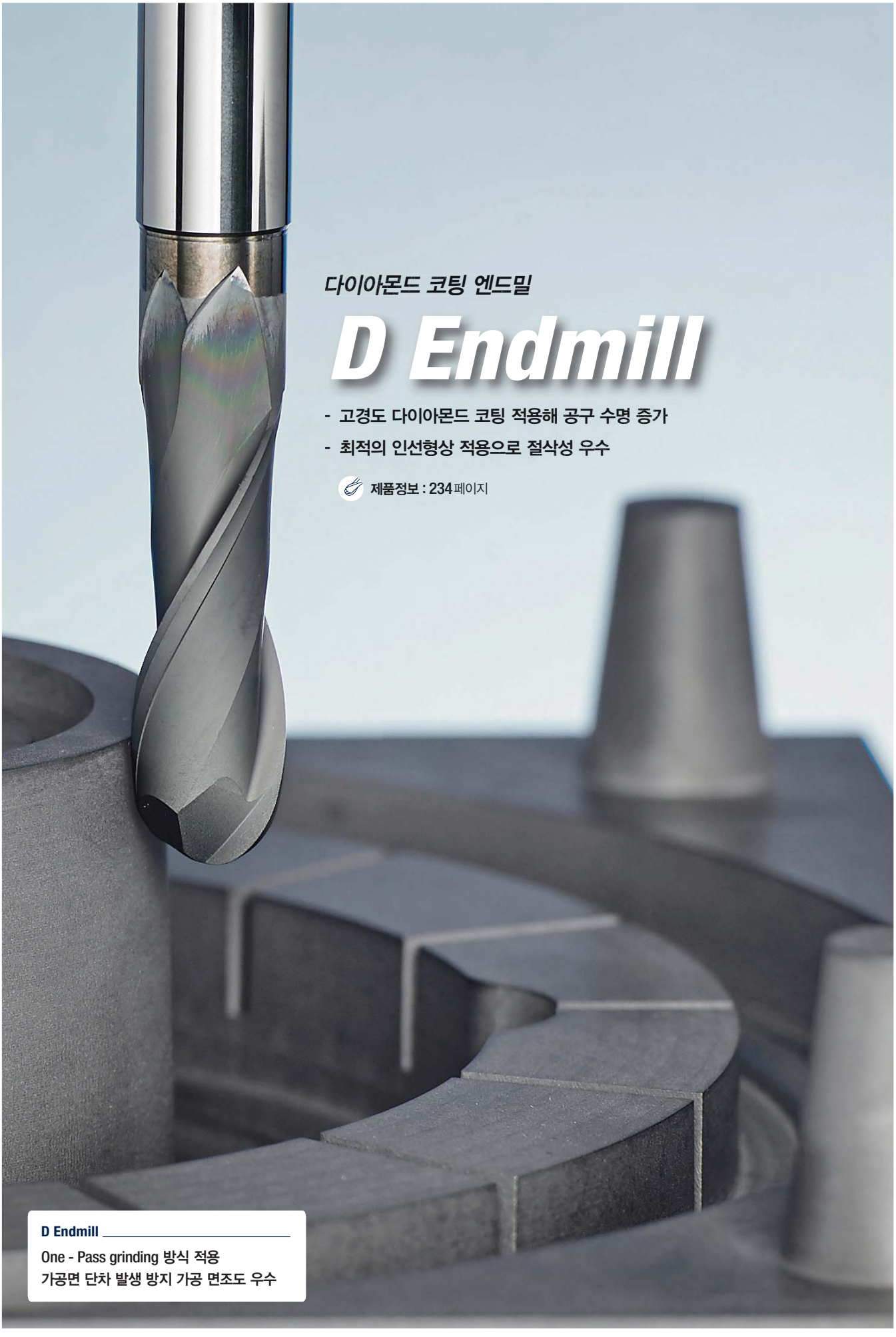
- 높은 경도(Hv 3000~7000)를 가지며, 초경에 비해 3~6배 공구수명 향상
- 낮은 마찰계수(μ < 0.1)에 의한 윤활효과로 피삭재의 표면조도 우수

제품정보 : 231페이지

Solid Endmill for Aluminum

절삭 부하 및 구성 인선발생 최소화, 가공면조도 우수

알루미늄, 알루미늄합금, 동, 동합금 가공



다이아몬드 코팅 엔드밀

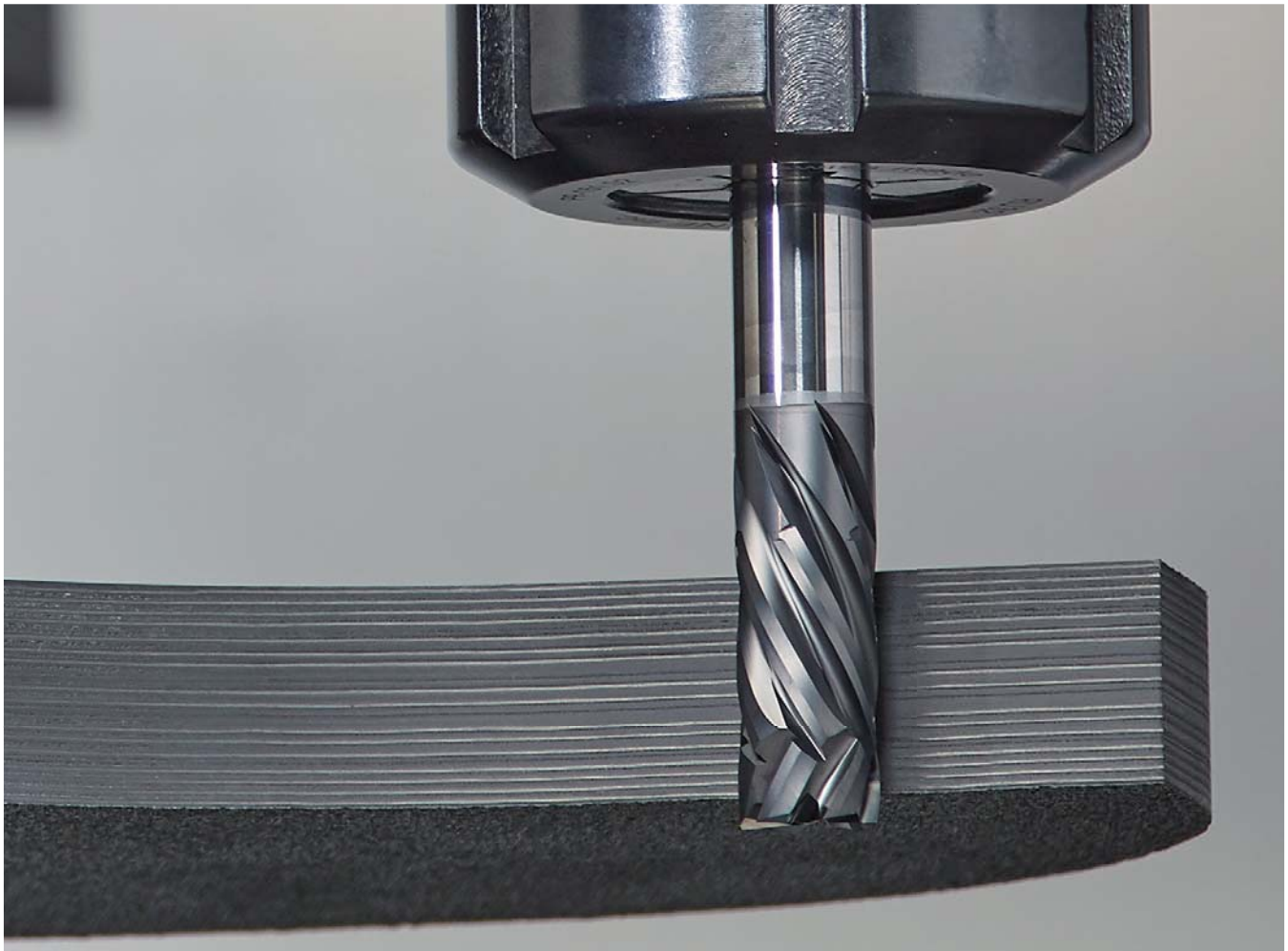
D Endmill

- 고경도 다이아몬드 코팅 적용해 공구 수명 증가
- 최적의 인선형상 적용으로 절삭성 우수

제품정보 : 234페이지

D Endmill

One - Pass grinding 방식 적용
가공면 단차 발생 방지 가공 면조도 우수



복합소재 가공용 라우터 엔드밀

Composite Router Endmill

- 표면박리 & 버 발생 억제를 위한 형상설계
- 고능률 가공을 통한 생산성 향상

제품정보 : 242페이지

Composite Router Endmill

Nano–Crystalline 다이아몬드 코팅 적용으로 공구수명 우수

복합소재(CFRP, GFRP 등) 가공에 최적화된 라우터 엔드밀

T Endmill

맞춤 대응을 통한 다양한 치아보철 피삭재 및
덴탈 밀링머신 적용 가능

치아보철 종류별 맞춤 재종 대응으로 최적의 가공 성능 확보



Zirconia, Titanium, Co–Cr, Wax, PMMA 등
치아보철 가공용 엔드밀

T Endmill

- 인선 형상 최적화로 가공면 단차 발생 억지 및 가공 면조도 우수
- 가공기별 맞춤 형상 대응으로 차별화된 공구 제공

제품정보 : 248페이지



Multi 가공이 가능한 다기능, 고능률 엔드밀

M+ Endmill

- 하나의 엔드밀로 다양한 가공 가능
  드릴(Drilling), 경사(Ramping), 홈(Slotting), 측면(Side Milling)
- 탁월한 공구 강성으로 절삭저항 감소 및 표면 조도 향상

제품정보 : 268페이지

M+ Endmill

크롬 계열 코팅 적용으로 절삭 능력 향상



자동차 부품 등 다양한 피삭재의 고능률 구멍 가공 실현

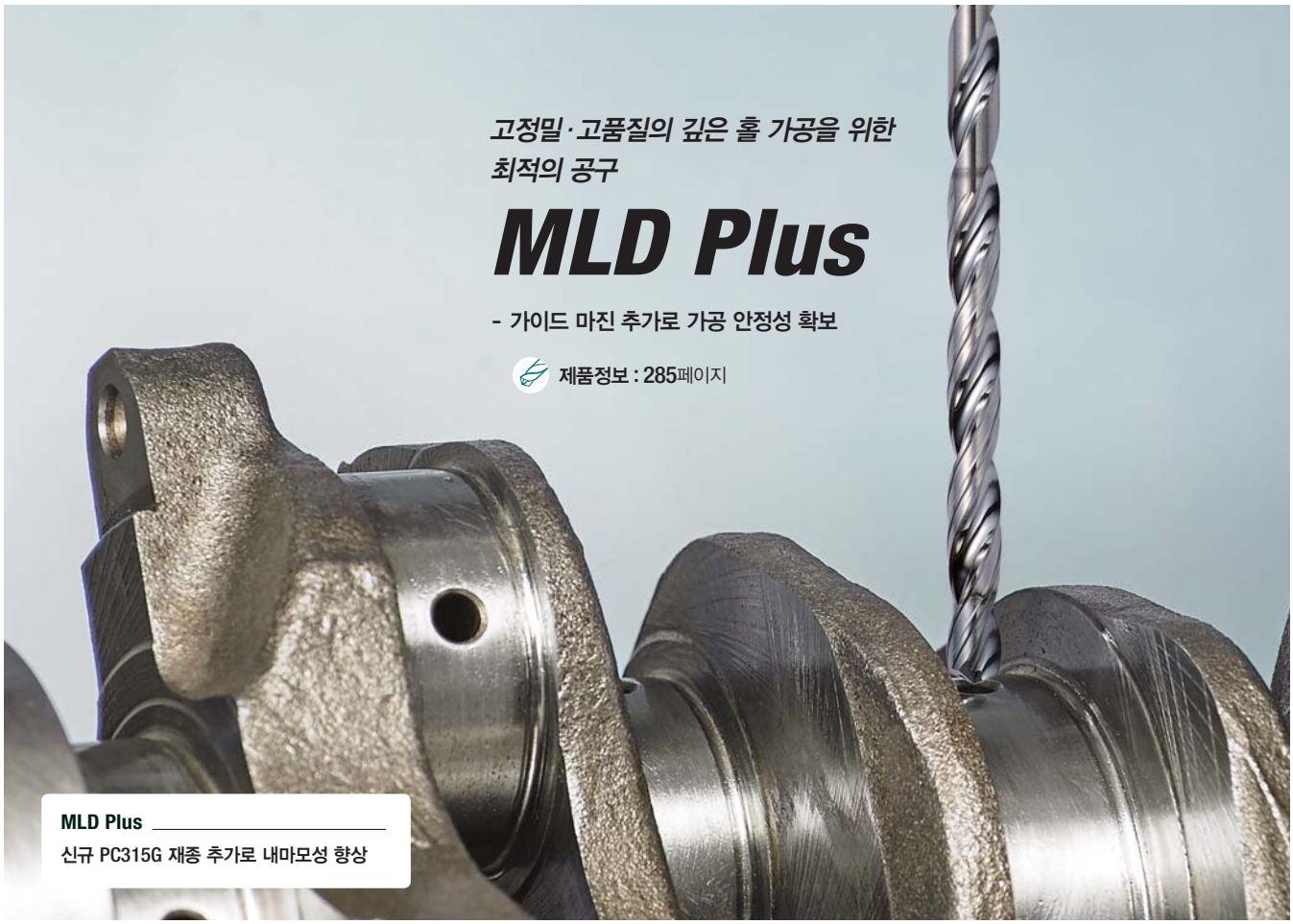
MSD Plus

- 자동차 부품 등 다양한 피삭재의 고능률 구멍 가공 실현
- 칩 포켓 확대로 인한 칩 배출 우수

제품정보 : 274페이지

MSD Plus

신규 PC325U 재종 추가로 내마모성 향상



고정밀·고품질의 깊은 홀 가공을 위한 최적의 공구

MLD Plus

- 가이드 마진 추가로 가공 안정성 확보

제품정보 : 285페이지

MLD Plus

신규 PC315G 재종 추가로 내마모성 향상



인코넬, 티타늄 홀 가공 전용

MSD Plus-S

- 최적의 인선형상과 칩 포켓 구현으로 가공 안정성 확보
- 고온 내치핑성이 우수한 코팅 적용으로 공구 수명 향상

제품정보 : 280페이지

MSD Plus-S

항공, 에너지, 발전, 자동차 산업의 내열합금 가공 전용
마하 솔리드 드릴

가공 안정성 확보를 통한 생산성 향상 / 내마모성 향상



CFRP 피삭재의 홀 가공을 위한 최적의 공구

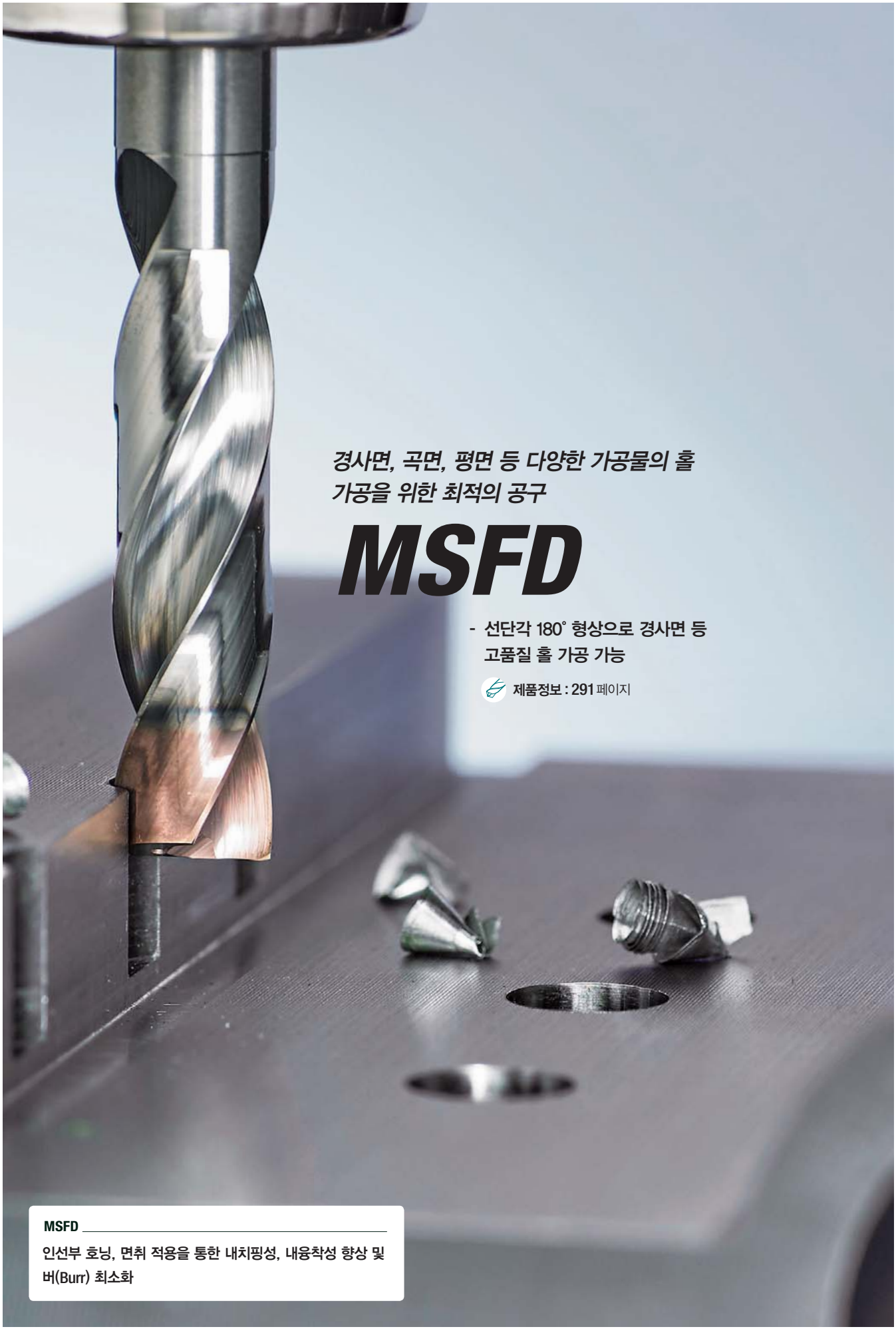
MSD Plus CFRP

- 인선부 절미 향상으로 CFRP 피삭재 가공시 버(Burr) 감소, 우수한 홀 품질

제품정보 : 289페이지

MSD Plus CFRP

신규 ND2100 다이아코팅 재종 적용으로 내마모성 우수



경사면, 곡면, 평면 등 다양한 가공물의 홀 가공을 위한 최적의 공구

MSFD

- 선단각 180° 형상으로 경사면 등 고품질 홀 가공 가능

제품정보 : 291 페이지

MSFD

인선부 호닝, 면취 적용을 통한 내치핑성, 내융착성 향상 및 버(Burr) 최소화



경제형 초경 코팅 솔리드 드릴

WSDP

New

- 개선된 씨닝 형상에 따른 선단 절삭부하 감소로 절삭성 향상
- 최적의 플루트 설계로 강성 보완 및 칩 배출 우수

제품정보 : 296페이지

WSDP

스테인레스강 가공에서도 탁월한 성능 발휘



비철금속, 연강 가공용 초경 솔리드 드릴

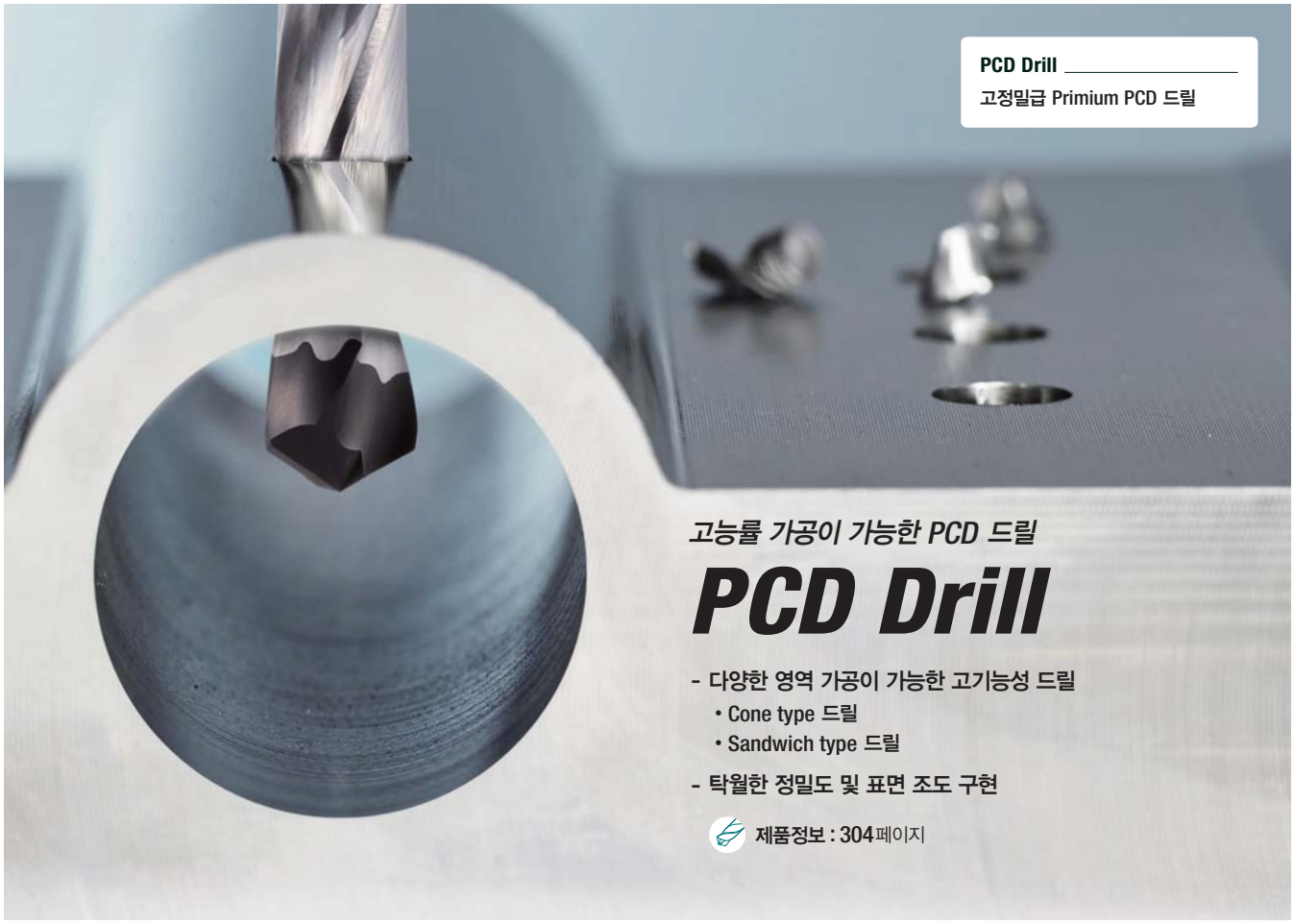
SSD-N

- 안정된 제품 성능으로 생산성 증가

제품정보 : 300페이지

SSD-N

연강, 비철류의 다양한 피삭재 가공에 적용



고능률 가공이 가능한 PCD 드릴

PCD Drill

- 다양한 영역 가공이 가능한 고기능성 드릴
  - Cone type 드릴
  - Sandwich type 드릴
- 탁월한 정밀도 및 표면 조도 구현

제품정보 : 304페이지



고능률 가공이 가능한 다양한 카운터 싱크

Counter Sink

- 인고능률 가공을 위한 부등 분할(Unequal Division) & 부등 리드(Unequal Lead) 적용
- 향상된 절삭성으로 고정밀의 안정적인 가공 가능
- 신규박막 적용으로 가공안정성과 높은 수명 확보

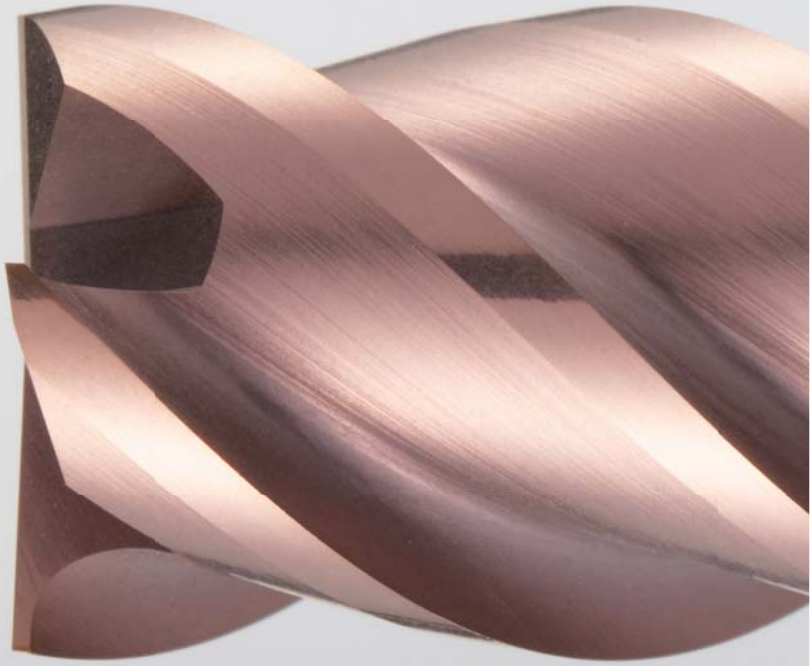
제품정보 : 307페이지

PART 1

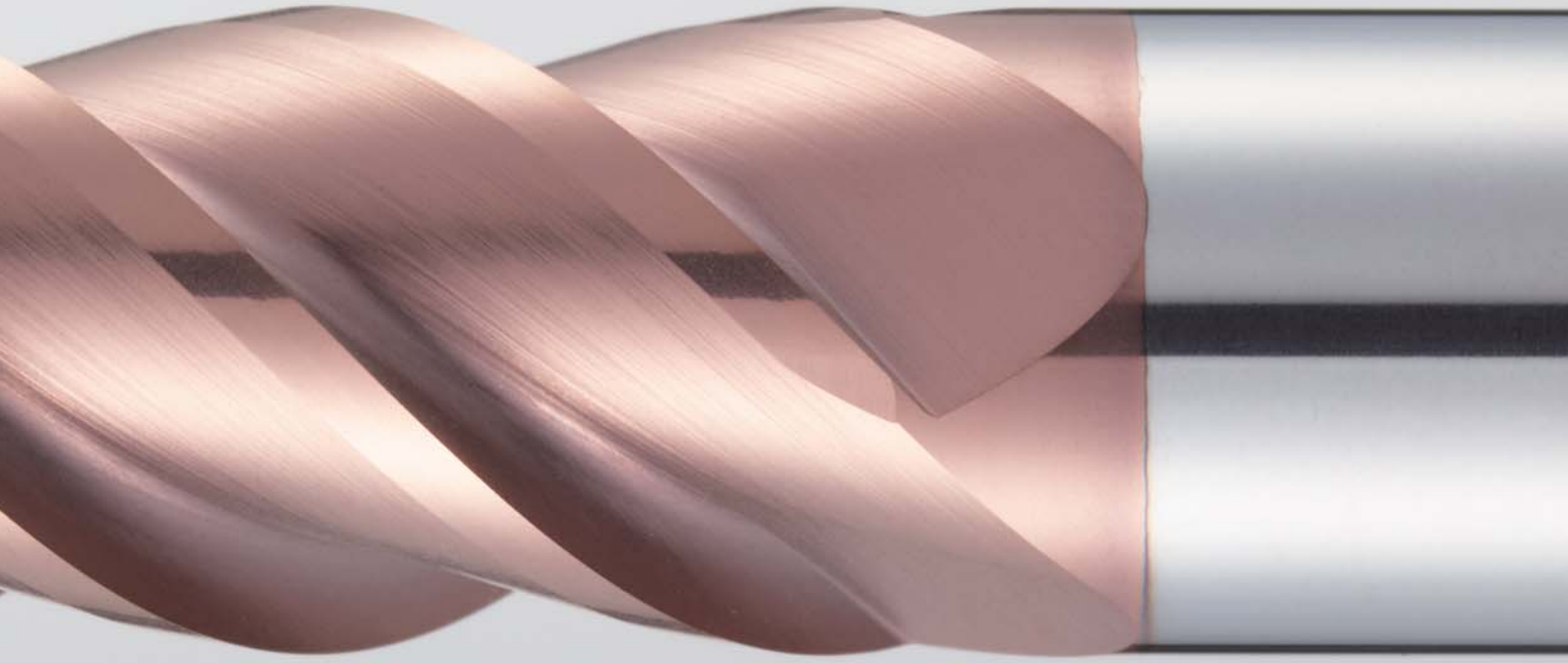
Endmill



Product details



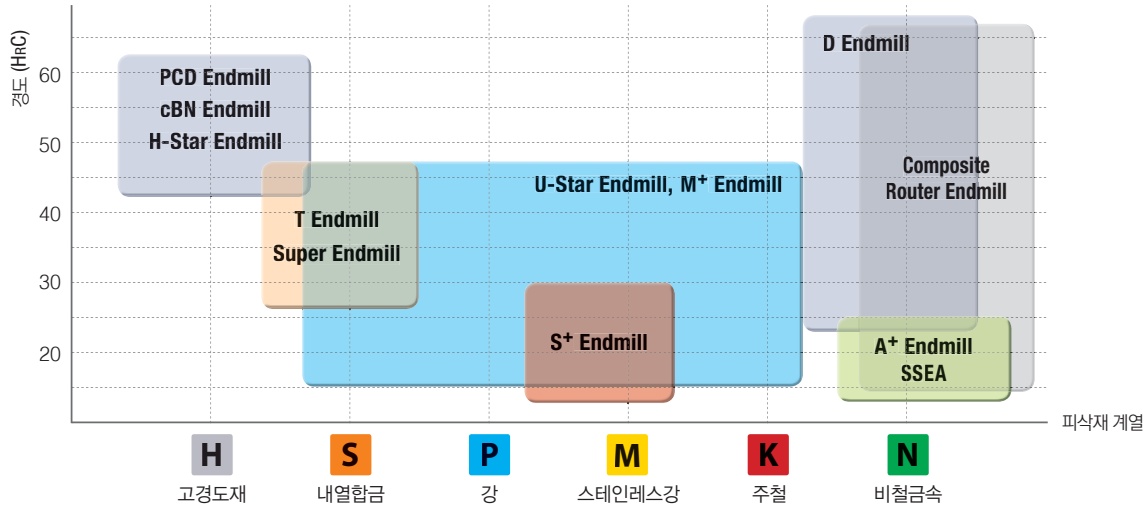
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Technical information for Endmill

KORLOY Endmill

피삭재별 제품 가이드



기능별 공구 선택 가이드

● 1순위 추천 ◑ 2순위 추천 ○ 추천하지 않음

구분	날수		 정밀정삭	 정삭	 황삭	 슬롯밀링	 플런징	 모방가공	 트로코이달 밀링
플랫/레디우스	2날		○	○	◑	●	●	○	○
	3날		○	◑	◑	●	◑	○	○
	4날		●	●	●	●	○	○	●
	6날 이상		●	●	○	○	○	○	●
볼	2날		○	○	○	●	○	●	○
	4날		○	○	○	◑	○	●	○

- 최대한 짧은 길이의 공구 선택을 추천드립니다.
- 안정적인 가공으로 긴 공구수명 구현이 가능하며 우수한 면조도를 얻을 수 있습니다.

라인업 및 특징

피삭재	용도	제품명	타입	날수	인경 (공차)	사진 표준형번 수	특징
H	고경도 (~HRC65)	PCD Endmill	B	-	0.3~2	 6 형번	• 날이 없는 PCD 구형 볼 엔드밀 • 초정밀 제작으로 나노급 면조도 구현
	고경도 (~HRC65)	cBN Endmill	B	2	0.4~2	 9 형번	• 고속가공시 뛰어난 면조도 및 생산성 향상 • 초정밀 제작으로 안정적인 수명확보 및 면조도 향상
	고경도 (~HRC63)	H-Star Endmill	F B R	2~6	1.0~20	 3,007 형번	• 경제형 고속, 고경도용 • 고경도강 가공에 최적화된 인선 처리 적용으로 초기 내치핑성 보완
P K	중경도 (~HRC50)	U-Star Endmill	F B R	2~6	0.1~25	 4,585 형번	• 경제형 고성능 범용 • 다양한 피삭재 가공 (탄소강, 합금강, 주철, 프리하든강 등)
M	스테인레스강	S+ Endmill	F B R R	2~7	1.0~12	 187 형번	• 스테인레스 가공 시 최적 성능 • 내산화성 우수
S	HRSA	Super Endmill	F R	4	3.0~20	 162 형번	• 내열합금 가공용 엔드밀 • 인코넬, 하스텔로이, 와스팔로이 등 니켈계 내열합금 가공에 최적화
	Titanium	Super Endmill	F R	2/4	1.0~20	 64 형번	• 스테인리스강에 최적화한 인선 설계로 돌발 치핑을 최소화하여 안정적 가공 • 내산화성, 표면경도가 높은 신규코팅 적용으로 스테인리스강 계열 및 티타늄, 니켈 등에 우수한 성능 구현
N	비철금속, 알루미늄	A+ Endmill	F B R	2~3	1.0~20	 187 형번	• U 형상으로 고이송 가공에도 효과적인 칩 배출 • 더블 여유각(인선 강성 향상)
	비철금속, 알루미늄	SSEA	F B	2~3	1.0~20	 128 형번	• 내용착성, 칩 배출성 우수 • 절삭 부하 및 구성 인선 발생 최소화, 가공면조도 우수
	복합소재	Composite Router Endmill	F	2~8	4.0~12	 44 형번	• 복합소재 가공용 라우터 • Nano–Crystalline 다이아 코팅 적용으로 성능 우수
	그라파이트, 세라믹	D Endmill	F B R	2~4	0.6~12	 280 형번	• 고경도 다이아 코팅 적용하여 공구 수명 증가 • One-Pass grinding 방식 적용, 가공 면조도 우수
	덴탈, 메탈, 왁스, 지르코니아	T Endmill	B	2	0.6~3	 214 형번	• Zirconia, Titanium, Co–Cr, Wax, PMMA 등 치아보철 가공용 엔드밀 • 다양한 치아보철 피삭재 및 덴탈 밀링머신 적용 가능
범용 특수	다기능	M+ Endmill	F D	4	3.0~20	 32 형번	• 다양한 가공(드릴, 밀링 등)이 가능한 멀티 엔드밀
	러핑	R+ Endmill	R	2~4	5.0~25	 204 형번	• 절삭부하 최소화한 형상의 황삭용 러핑 엔드밀

KORLOY Endmill

품목	용도	품명	형번	형 상	코팅	날수	공구직경 (Ø)		피삭재						페이지
							Min	Max	P 강	M 스테인레스강	K 주철	N 비철금속	S 내열합금	H 고경도재	
Super Endmill (New)	HRSA	플랫	SFES		SL	4	3.0	20.0					◎		31
		레디우스	SRES		SL	4	3.0	20.0					◎		32
	Ti/STS	플랫	SFET		UL	4	3.0	20.0		◎			◎		35
		레디우스	SRET		UL	4	3.0	20.0		◎			◎		36
		SBET	SBET		UL	2	1.0	12.0		◎			◎		37
			SBET		UL	4	4.0	12.0		◎			◎		38
The Mirror Endmill	초정밀 금형가공용	볼	PCD-MBE		-	-	0.3	2.0	◎					◎	40
			cBN-MBE		-	2	0.4	2.0						◎	41
H-Star Endmill (New)	고속, 고경도용	볼	ESB702		AlTiN	2	0.1	12.0	◎		◎		○	◎	44
			ESB712		AlTiN	2	1.0	12.0	◎		◎		○	◎	45
			ESB703		AlTiN	3	2.0	12.0	◎		◎		○	◎	46
			ESB734		AlTiN	4	2.0	10.0	◎		◎		○	◎	47
		플랫	ESE702		AlTiN	2	0.1	20.0	◎		◎		○	◎	48
			ESE712		AlTiN	2	1.0	6.0	◎		◎		○	◎	49
			ESE704		AlTiN	4	1.0	20.0	◎		◎		○	◎	50
			ESE714		AlTiN	4	1.0	12.0	◎		◎		○	◎	51
			ESE724(6)		AlTiN	4/6	1.0	12.0	◎		◎		○	◎	52
			ESE744		AlTiN	4	1.0	12.0	◎		◎		○	◎	53
			ESE716		AlTiN	6	6.0	20.0	◎		◎		○	◎	54
		레디우스	ESR702		AlTiN	2	1.0	12.0	◎		◎		○	◎	55
			ESR732		AlTiN	2	1.0	12.0	◎		◎		○	◎	58
			ESR704		AlTiN	4	1.0	12.0	◎		◎		○	◎	59
			ESR714		AlTiN	4	3.0	12.0	◎		◎		○	◎	61
			ESR724		AlTiN	4	6.0	12.0	◎		◎		○	◎	62

◎: 매우적합 ○: 적합

품목	용도	품명	형번	형 상	코팅	날수	공구직경 (Ø) Min	공구직경 (Ø) Max	피삭재 P 강	피삭재 M 스테인레스강	피삭재 K 주철	피삭재 N 비철금속	피삭재 S 내열합금	피삭재 H 고경도재	페이지
H-Star Endmill (New)	고속, 고경도용	레디우스	ESR734		AlTiN	4	1.0	12.0	◎		◎		○	◎	63
			ESR706		AlTiN	6	6.0	12.0	◎		◎		○	◎	64
			ESR736		AlTiN	6	6.0	12.0	◎		◎		○	◎	65
		립 볼	ESRB712		AlTiN	2	0.1	12.0	◎		◎		○	◎	66
		립 플랫	ESRE712		AlTiN	2	0.1	12.0	◎		◎		○	◎	70
			ESRE714		AlTiN	4	0.5	12.0	◎		◎		○	◎	73
		립 레디우스	ESRR712		AlTiN	2	0.2	16.0	◎		◎		○	◎	76
			ESRR714		AlTiN	4	0.5	20.0	◎		◎		○	◎	82
		플랫	ESXE704		AlTiN	4	1.0	12.0	◎		◎		○	◎	89
			ESXE714		AlTiN	4	2.0	12.0	◎		◎		○	◎	90
		레디우스	ESXR704		AlTiN	4	2.0	12.0	◎		◎		○	◎	91
		립 볼	ESLNB20		AlTiN	2	0.1	5.0	◎		◎		○	◎	92
			ESTNB20		AlTiN	2	0.2	10.0	◎		◎		○	◎	96
			ESTNB30		AlTiN	3	2.0	5.0	◎		◎		○	◎	100
		립 플랫	ESLNS20		AlTiN	2	0.1	5.0	◎		◎		○	◎	102
			ESLNS40		AlTiN	4	1.0	5.0	◎		◎		○	◎	106
		립 레디우스	ESLNR		AlTiN	2	0.2	3.0	◎		◎		○	◎	108
			ESTNR		AlTiN	2	0.2	3.0	◎		◎		○	◎	112
		고이송	ESPM4		AlTiN	4	3.0	12.0	◎		◎		○	◎	114
U-Star Endmill (New)	범용	플랫	UE502		AlCrN	2	0.1	25.0	◎	○	○			◎	118
			UE512		AlCrN	2	0.1	12.0	◎	○	○			◎	120
			UE522		AlCrN	2	1.0	25.0	◎	○	○			◎	123
			UXE502		AlCrN	2	0.1	20.0	◎	○	○			◎	125
			UE504H		AlCrN	4	1.0	20.0	◎	○	○			◎	127

◎: 매우적합 ○: 적합

KORLOY Endmill

품목	용도	품명	형번	형 상	코팅	날수	공구직경 (Ø)		피삭재						페이지
									P	M	K	N	S	H	
							Min	Max	강	스테인레스강	주철	비철금속	내열합금	고경도재	
U-Star Endmill (New)	범용	플랫	UE514		AlCrN	4	1.0	12.0	◎	○	○			◎	128
			UE524		AlCrN	4	1.0	25.0	◎	○	○			◎	130
			ULE504		AlCrN	4	3.0	16.0	◎	○	○			◎	132
			UE504		AlCrN	4	0.8	25.0	◎	○	○			◎	133
			UXE504		AlCrN	4	1.0	20.0	◎	○	○			◎	134
			UE506		AlCrN	6	6.0	20.0	◎	○	○			◎	135
			UTE502		AlCrN	2	0.3	10.0	◎	○	○			◎	136
			UTE504		AlCrN	4	0.8	10.0	◎	○	○			◎	138
		레디우스	UR502		AlCrN	2	0.2	20.0	◎	○	○			◎	141
			UR512		AlCrN	2	0.2	20.0	◎	○	○			◎	144
			UR542		AlCrN	2	0.2	4.0	◎	○	○			◎	150
			UR504		AlCrN	4	3.0	20.0	◎	○	○			◎	156
			UR544		AlCrN	4	1.0	4.0	◎	○	○			◎	157
			UXR504		AlCrN	4	1.0	20.0	◎	○	○			◎	161
			UXR514		AlCrN	4	1.0	20.0	◎	○	○			◎	164
			UR506		AlCrN	6	6.0	20.0	◎	○	○			◎	169
			UDR503		AlCrN	3	6.0	20.0	◎	○	○			◎	170
			USPM4		AlCrN	4	1.0	20.0	◎	○	○			◎	171
			UTR504		AlCrN	4	0.8	2.5	◎	○	○			◎	172
		볼	UB502		AlCrN	2	1.0	25.0	◎	○	○			◎	176
			UB502---P		AlCrN	2	0.1	12.0	◎	○	○			◎	178
			UB512		AlCrN	2	0.1	12.0	◎	○	○			◎	179
			UB512S6		AlCrN	2	0.5	2.0	◎	○	○			◎	183
			UB532		AlCrN	2	3.0	12.0	◎	○	○			◎	184

◎: 매우적합 ○: 적합

품목	용도	품명	형번	형 상	코팅	날수	공구직경 (Ø) Min	공구직경 (Ø) Max	피삭재 P 강	피삭재 M 스테인레스강	피삭재 K 주철	피삭재 N 비철금속	피삭재 S 내열합금	피삭재 H 고경도재	페이지
U-Star Endmill	범용	볼	UB542		AlCrN	2	0.1	12.0	◎	○	○			◎	185
			USB502		AlCrN	2	3.0	20.0	◎	○	○			◎	192
			UB503		AlCrN	3	1.0	12.0	◎	○	○			◎	193
			UB504		AlCrN	4	1.0	12.0	◎	○	○			◎	194
			UTB502		AlCrN	2	0.3	2.0	◎	○	○			◎	195
		러핑	UF50		AlCrN	3~5	3.0	25.0	◎	○	○			◎	196
			UF51		AlCrN	3~5	3.0	25.0	◎	○	○			◎	197
			UF51---H		AlCrN	3~5	3.0	25.0	◎	○	○			◎	198
R+ Endmill	알루미늄용	러핑	RPAE		Carbide, Non	3	6.0	25.0				◎			201
	범용		RPE-FP-H		Carbide, TiAlN	4	5.0	20.0	◎	○	◎		○		201
			RPLE-FP-H		Carbide, TiAlN	4	5.0	20.0	◎	○	◎		○		202
			RPE-XG		Carbide, TiAlN	4	5.0	20.0	◎	○	◎		○		202
			RPE-FP-L		Carbide, TiAlN	4	5.0	20.0	◎	○	◎		○		203
			RPE-RG		Carbide, TiAlCrN	4	5.0	20.0	◎	○	◎		○		203
			RPE-RG		HSS, TiAlN	4	6.0	20.0	◎	○	◎		○		204
			RPE-FF		HSS, TiAlN	4	6.0	20.0	◎	○	◎		○		204
			RPE-FP		HSS, TiAlN	4	6.0	20.0	◎	○	◎		○		205
			RPE-RG		HSS, TiCN HSS, TiN	4	6.0	50.0	◎	○	◎		○		206
S+ Endmill	STS용	플랫	SPFE2000		AlCrN	2	1.0	20.0	○	◎			○		209
			SPFE3000		AlCrN	3	1.0	20.0	○	◎			○		210
			SPFE4000		AlCrN	4	1.0	20.0	○	◎			○		211
			SPFE6000		AlCrN	6	6.0	20.0	○	◎			○		212
		레디우스	SPRE4000		AlCrN	4	1.0	20.0	○	◎			○		213
		니크 타입 레디우스	SPRE5000		AlCrN	5	6.0	20.0	○	◎			○		215

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KORLOY Endmill

품목	용도	품명	형번	형 상	코팅	날수	공구직경 (Ø) Min	공구직경 (Ø) Max	피삭재 P 강	피삭재 M 스테인레스강	피삭재 K 주철	피삭재 N 비철금속	피삭재 S 내열합금	피삭재 H 고경도재	페이지
S+ Endmill	STS용	니크 타입 레디우스	SPRE7000		AlCrN	7	6.0	20.0	○	◎			○		216
		볼	SPBE2000		AlCrN	2	1.0	12.0	○	◎			○		217
			SPBE4000		AlCrN	4	3.0	20.0	○	◎			○		218
		러핑	SPXE3000 SPXE4000 SPXE5000		AlCrN	3~5	3.0	20.0	○	◎			○		219
A+ Endmill (New)	알루미늄용	플랫	APFE		Non	2	2.5	20.0	○			◎			221
					Non	3	2.5	20.0	○			◎			221
		미들 플랫	APMFE		Non	2	3.0	20.0	○			◎			222
					Non	3	3.0	20.0	○			◎			222
		롱 플랫	APLFE		Non	2	3.0	20.0	○			◎			223
					Non	3	3.0	20.0	○			◎			223
		볼	APBE		Non	2	1.0	12.0	○			◎			224
		숏 플랫	AFE		Non	3	1.0	20.0	○			◎			225
		플랫			Non	3	1.0	20.0	○			◎			226
		롱 플랫			Non	3	1.0	20.0	○			◎			227
		러핑	APRE		Non	3	4.0	25.0	○			◎			229
		웨이브 러핑	RPAE		Carbide, Non	3	6.0	25.0				◎			230
알루미늄용 솔리드엔드밀	알루미늄용	플랫	SSEA		Non, Dlc	2	1.0	20.0	○			◎			232
					Non, Dlc	3	2.0	16.0	○			◎			232
		볼	SSBEA		Non, Dlc	2	1.0	20.0	○			◎			233
D Endmill	그라파이트, 세라믹용	플랫	DFE		Diamond	2	1.0	12.0				◎			235
					Diamond	4	2.0	12.0				◎			236
		레디우스	DRE		Diamond	2	0.5	3.0				◎			237
					Diamond	4	4.0	12.0				◎			238

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품목	용도	품명	형번	형 상	코팅	날수	공구직경 (Ø) Min	공구직경 (Ø) Max	피삭재 P 강	피삭재 M 스테인레스강	피삭재 K 주철	피삭재 N 비철금속	피삭재 S 내열합금	피삭재 H 고경도재	페이지
D Endmill	그라파이트, 세라믹용	볼	DBE		Diamond	2	0.6	12.0				◎			239
					Diamond	4	2.0	12.0				◎			241
Composite Router Endmill	복합소재 CFRP, GFRP	플랫	CCDR		Diamond	4	6.0	8.0				◎			243
					Diamond	6	10.0	12.0				◎			243
			CCHR		Diamond	4	6.0	8.0				◎			244
					Diamond	6	10.0	12.0				◎			244
			CCR		Diamond	2	4.0	12.0				◎			245
			CCLR		Diamond	4	4.0	12.0				◎			246
			CCRR		Diamond	6	6.0	8.0				◎			247
					Diamond	8	10.0	12.0				◎			247
T Endmill	덴탈, 지르코니아	볼	TZBE		Diamond	2	0.6	3.0				◎			248
	덴탈, 메탈	볼	TTBE		Diamond	2	0.6	3.0					◎		248
	덴탈, 왁스		TWBE		-	2	0.6	3.0				◎			248
M+ Endmill	Multi	플랫	MPRE		TACrN	4	3.0	20.0	◎	○	◎		○		268
PCD Endmill	비철, 고속용	플랫	PDE		-	1	4.6	6.0				◎			269
					-	2	6.0	12.0				◎			269

◎: 매우적합 ○: 적합

Super Endmill

내열합금(티타늄, 인코넬) 가공용 엔드밀 시리즈

Super Endmill For HRSA

- **Super Endmill For HRSA**는 포지티브 경사각 및 부등분할을 적용하여 절삭성 및 가공 안정성이 향상되었습니다. 또한 고온 경도가 우수한 신규 박막은 공구 인선부의 결손을 억제하고, 내마모성을 향상시켜 내열합금 가공 시 우수한 공구 수명을 나타냅니다.

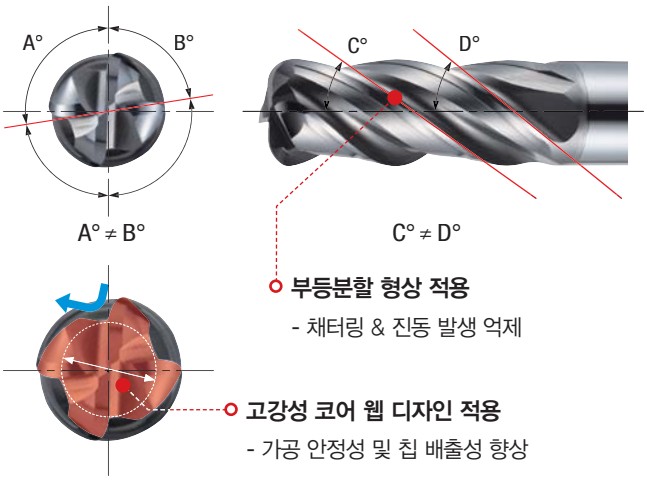
형번표기법

S	RE	S	4	120	-	080	-	R30
Super Endmill	구분	피삭재	날수	공구직경		전장길이		코너 R
	FE: 플랫 RE: 레디우스 BE: 볼	S: Super alloy • Inconel718 • Waspaloy • Hastelloy T: Titanium/STS	4: 4날	120: Ø12.0mm		080: 80mm		R30: 30mm

특징

- **항공/발전 산업** – 엔진, 터빈 부품 등의 내열합금 가공 전용 엔드밀
- **절미형 인선 형상** – 절삭부하 감소 및 가공경화 억제
- **공구 수명 향상** – 고인성 모재 및 내마모 우수 신규재종 적용

SRES4000 (레디우스)



부등분할 형상 적용
- 채터링 & 진동 발생 억제

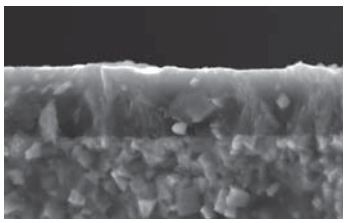
고강성 코어 웹 디자인 적용
- 가공 안정성 및 칩 배출성 향상

SFES4000 (플랫)



코너 게쉬 랜드 형상 적용
- 인선 강성 우수

재종 특징



SL 코팅 (Ultra Lubricating coating)
- **고윤활성 코팅, 특수 표면처리 기술 적용**
  - 표면처리 기술을 더하여 내용착성, 내치핑성, 가공 안정성 향상

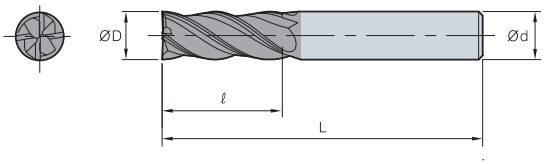
SFES4000(플랫)



4 날 | 35°/38° HELIX | SL 코팅 | 절삭조건 p.360

• 공구직경공차

ØD		Ød
Ø1 ~ Ø6	0 ~ -0.015mm	h6
Ø6.1 ~ Ø20	0 ~ -0.02mm	



(mm)

형 번	ØD	Ød	ℓ	L
SFES4030-050	3	6	8	50
SFES4040-050	4	6	10	50
SFES4050-060	5	6	15	60
SFES4060-060	6	6	15	60
SFES4080-070	8	8	20	70
SFES4100-075	10	10	25	75
SFES4120-080	12	12	30	80
SFES4140-100	14	14	35	90
SFES4160-100	16	16	42	100
SFES4200-100	20	20	48	100

Endmill Super Endmill For HRSA

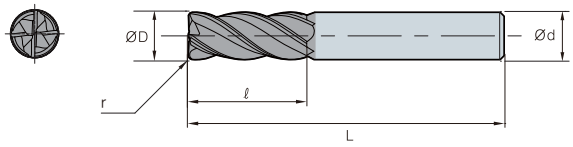
SRES4000(레디우스)



4 | 35°/38° HELIX | R ±0.01 코너 R | SL 코팅 | 절삭조건 p.360

• 공구직경공차

ØD		Ød
Ø1 ~ Ø6	0 ~ -0.015mm	h5
Ø6.1 ~ Ø20	0 ~ -0.02mm	



(mm)

형 번	ØD	Ød	ℓ	L	r
SRES4030-055-R02	3	6	8	55	0.2
SRES4030-055-R03	3	6	8	55	0.3
SRES4030-055-R05	3	6	8	55	0.5
SRES4040-055-R02	4	6	10	55	0.2
SRES4040-055-R03	4	6	10	55	0.3
SRES4040-055-R05	4	6	10	55	0.5
SRES4040-070-R02	4	6	10	70	0.2
SRES4040-070-R03	4	6	10	70	0.3
SRES4040-070-R05	4	6	10	70	0.5
SRES4050-055-R02	5	6	15	55	0.2
SRES4050-055-R03	5	6	15	55	0.3
SRES4050-055-R05	5	6	15	55	0.5
SRES4050-090-R02	5	6	15	90	0.2
SRES4050-090-R03	5	6	15	90	0.3
SRES4050-090-R05	5	6	15	90	0.5
SRES4060-060-R03	6	6	15	60	0.3
SRES4060-060-R05	6	6	15	60	0.5
SRES4060-060-R08	6	6	15	60	0.8
SRES4060-060-R10	6	6	15	60	1.0
SRES4060-060-R15	6	6	15	60	1.5
SRES4060-060-R20	6	6	15	60	2.0
SRES4060-090-R03	6	6	15	90	0.3
SRES4060-090-R05	6	6	15	90	0.5
SRES4060-090-R08	6	6	15	90	0.8
SRES4060-090-R10	6	6	15	90	1.0
SRES4060-090-R15	6	6	15	90	1.5
SRES4060-090-R20	6	6	15	90	2.0
SRES4080-070-R03	8	8	20	70	0.3
SRES4080-070-R05	8	8	20	70	0.5
SRES4080-070-R08	8	8	20	70	0.8
SRES4080-070-R10	8	8	20	70	1.0
SRES4080-070-R15	8	8	20	70	1.5
SRES4080-070-R20	8	8	20	70	2.0
SRES4080-070-R25	8	8	20	70	2.5
SRES4080-070-R30	8	8	20	70	3.0
SRES4080-100-R03	8	8	20	100	0.3

형 번	ØD	Ød	ℓ	L	r
SRES4080-100-R05	8	8	20	100	0.5
SRES4080-100-R08	8	8	20	100	0.8
SRES4080-100-R10	8	8	20	100	1.0
SRES4080-100-R15	8	8	20	100	1.5
SRES4080-100-R20	8	8	20	100	2.0
SRES4080-100-R25	8	8	20	100	2.5
SRES4080-100-R30	8	8	20	100	3.0
SRES4100-075-R03	10	10	25	75	0.3
SRES4100-075-R05	10	10	25	75	0.5
SRES4100-075-R08	10	10	25	75	0.8
SRES4100-075-R10	10	10	25	75	1.0
SRES4100-075-R15	10	10	25	75	1.5
SRES4100-075-R20	10	10	25	75	2.0
SRES4100-075-R25	10	10	25	75	2.5
SRES4100-075-R30	10	10	25	75	3.0
SRES4100-100-R03	10	10	25	100	0.3
SRES4100-100-R05	10	10	25	100	0.5
SRES4100-100-R08	10	10	25	100	0.8
SRES4100-100-R10	10	10	25	100	1.0
SRES4100-100-R15	10	10	25	100	1.5
SRES4100-100-R20	10	10	25	100	2.0
SRES4100-100-R25	10	10	25	100	2.5
SRES4100-100-R30	10	10	25	100	3.0
SRES4120-080-R05	12	12	30	80	0.5
SRES4120-080-R08	12	12	30	80	0.8
SRES4120-080-R10	12	12	30	80	1.0
SRES4120-080-R15	12	12	30	80	1.5
SRES4120-080-R20	12	12	30	80	2.0
SRES4120-080-R25	12	12	30	80	2.5
SRES4120-080-R30	12	12	30	80	3.0
SRES4120-080-R35	12	12	30	80	3.5
SRES4120-080-R40	12	12	30	80	4.0
SRES4120-110-R05	12	12	30	110	0.5
SRES4120-110-R08	12	12	30	110	0.8
SRES4120-110-R10	12	12	30	110	1.0
SRES4120-110-R15	12	12	30	110	1.5

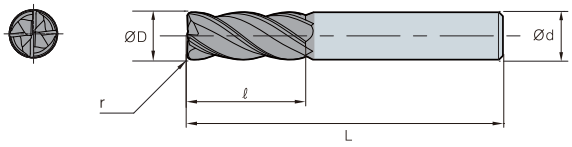
SRES4000(레디우스)



4 날 | 35°/38° HELIX | R ±0.01 코너 R | SL 코팅 | 절삭조건 p.360

• 공구직경공차

ØD		Ød
Ø1 ~ Ø6	0 ~ -0.015mm	h5
Ø6.1 ~ Ø20	0 ~ -0.02mm	



(mm)

형 번	ØD	Ød	ℓ	L	r
SRES4120-110-R20	12	12	30	110	2.0
SRES4120-110-R25	12	12	30	110	2.5
SRES4120-110-R30	12	12	30	110	3.0
SRES4120-110-R35	12	12	30	110	3.5
SRES4120-110-R40	12	12	30	110	4.0
SRES4140-090-R05	14	14	35	90	0.5
SRES4140-090-R08	14	14	35	90	0.8
SRES4140-090-R10	14	14	35	90	1.0
SRES4140-090-R15	14	14	35	90	1.5
SRES4140-090-R20	14	14	35	90	2.0
SRES4140-090-R30	14	14	35	90	3.0
SRES4140-150-R05	14	14	35	150	0.5
SRES4140-150-R08	14	14	35	150	0.8
SRES4140-150-R10	14	14	35	150	1.0
SRES4140-150-R15	14	14	35	150	1.5
SRES4140-150-R20	14	14	35	150	2.0
SRES4140-150-R30	14	14	35	150	3.0
SRES4160-100-R05	16	16	42	100	0.5
SRES4160-100-R08	16	16	42	100	0.8
SRES4160-100-R10	16	16	42	100	1.0
SRES4160-100-R15	16	16	42	100	1.5
SRES4160-100-R20	16	16	42	100	2.0
SRES4160-100-R25	16	16	42	100	2.5
SRES4160-100-R30	16	16	42	100	3.0
SRES4160-100-R35	16	16	42	100	3.5
SRES4160-100-R40	16	16	42	100	4.0
SRES4160-100-R50	16	16	42	100	5.0
SRES4160-100-R60	16	16	42	100	6.0
SRES4160-150-R05	16	16	42	150	0.5
SRES4160-150-R08	16	16	42	150	0.8
SRES4160-150-R10	16	16	42	150	1.0
SRES4160-150-R15	16	16	42	150	1.5
SRES4160-150-R20	16	16	42	150	2.0
SRES4160-150-R25	16	16	42	150	2.5
SRES4160-150-R30	16	16	42	150	3.0
SRES4160-150-R35	16	16	42	150	3.5

형 번	ØD	Ød	ℓ	L	r
SRES4160-150-R40	16	16	42	150	4.0
SRES4160-150-R50	16	16	42	150	5.0
SRES4160-150-R60	16	16	42	150	6.0
SRES4180-100-R05	18	20	45	100	0.5
SRES4180-100-R08	18	20	45	100	0.8
SRES4180-100-R10	18	20	45	100	1.0
SRES4180-100-R15	18	20	45	100	1.5
SRES4180-100-R20	18	20	45	100	2.0
SRES4180-100-R30	18	20	45	100	3.0
SRES4180-150-R05	18	20	45	150	0.5
SRES4180-150-R08	18	20	45	150	0.8
SRES4180-150-R10	18	20	45	150	1.0
SRES4180-150-R15	18	20	45	150	1.5
SRES4180-150-R20	18	20	45	150	2.0
SRES4180-150-R30	18	20	45	150	3.0
SRES4200-100-R05	20	20	48	100	0.5
SRES4200-100-R10	20	20	48	100	1.0
SRES4200-100-R15	20	20	48	100	1.5
SRES4200-100-R20	20	20	48	100	2.0
SRES4200-100-R25	20	20	48	100	2.5
SRES4200-100-R30	20	20	48	100	3.0
SRES4200-100-R35	20	20	48	100	3.5
SRES4200-100-R40	20	20	48	100	4.0
SRES4200-100-R50	20	20	48	100	5.0
SRES4200-100-R60	20	20	48	100	6.0
SRES4200-150-R05	20	20	48	150	0.5
SRES4200-150-R10	20	20	48	150	1.0
SRES4200-150-R15	20	20	48	150	1.5
SRES4200-150-R20	20	20	48	150	2.0
SRES4200-150-R25	20	20	48	150	2.5
SRES4200-150-R30	20	20	48	150	3.0
SRES4200-150-R35	20	20	48	150	3.5
SRES4200-150-R40	20	20	48	150	4.0
SRES4200-150-R50	20	20	48	150	5.0
SRES4200-150-R60	20	20	48	150	6.0

Endmill Super Endmill For Ti

내열합금(티타늄, 인코넬) 가공용 엔드밀 시리즈

Super Endmill For Ti

- **Super Endmill For Ti**는 티타늄 합금 가공에 최적화된 인선설계와 큰 칩 포켓의 플루트 디자인 설계로 절삭부하 및 열 발생을 억제하고, 칩 배출 문제를 개선했습니다. 또한 고인성 모재와 고윤활 박막을 적용하여 불규칙적인 공구파손 및 용착 발생을 최소화하여 최고의 공구 수명을 발휘합니다.

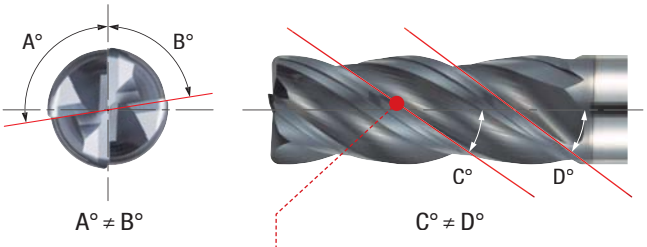
형번표기법

S	RE	T	4	120	-	080	-	R30
Super Endmill	Type	피삭재	날수	공구직경		전장길이		코너 R
	FE: 플랫 RE: 레디우스 BE: 볼	T : Titanium/STS S : Super alloy • Inconel718 • Waspaloy • Hastelloy	4: 4날	120: Ø12.0mm		080: 80mm		R30: 30mm

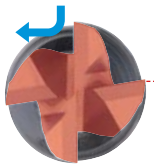
특징

- 티타늄, 스테인리스강 등 가공용 엔드밀
- **공구 수명 향상** – 고인성 모재 및 고윤활성 박막 적용

SFET (플랫) / SRET (레디우스)

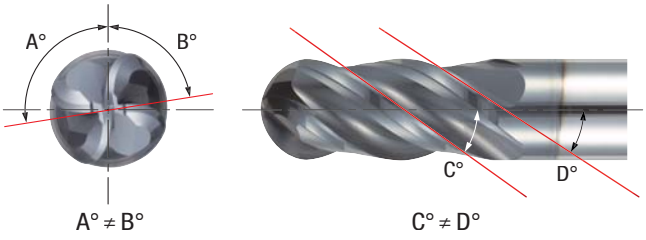


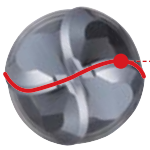
부등분할 형상 적용
- 채터링 & 진동 발생 억제



큰 칩 포켓 및 유선형 플루트 디자인 적용
- 우수한 칩 배출성

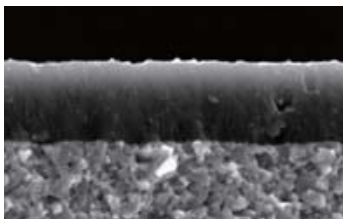
SBET (볼)





S-Curve 인선 형상 적용
- 가공부하 저감

재종 특징



UL 코팅 (Ultra Lubricating coating)
- 독자적인 윤활 코팅 기술을 적용하여 칩 처리성, 내용착성 향상
- 내치핑성이 강화된 모재 적용

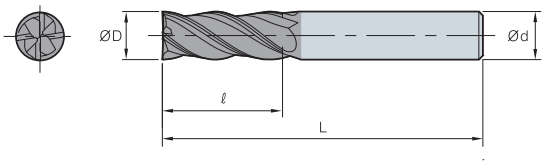
SFET4000(플랫)



4 날 | 35°/38° HELIX | UL 코팅 | 절삭조건 p.361

• 공구직경공차

ØD		Ød
Ø1 ~ Ø6	0 ~ -0.015mm	h6
Ø6.1 ~ Ø20	0 ~ -0.020mm	



(mm)

형 번	ØD	Ød	ℓ	L
SFET4030-050	3	6	8	50
SFET4040-050	4	6	10	50
SFET4050-060	5	6	15	60
SFET4060-060	6	6	15	60
SFET4080-070	8	8	20	70
SFET4100-075	10	10	25	75
SFET4120-080	12	12	30	80
SFET4160-100	16	16	42	100
SFET4200-100	20	20	48	100

Endmill Super Endmill For Ti

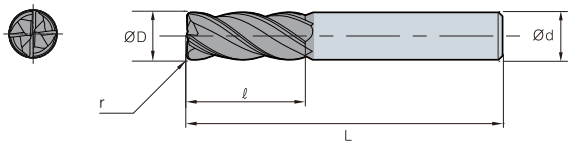
SRET4000(레디우스)



4 | 35°/38° HELIX | UL 코팅 | 절삭조건 p.361

• 공구직경공차

ØD		Ød
Ø1 ~ Ø6	0 ~ -0.015mm	h6
Ø6.1 ~ Ø20	0 ~ -0.020mm	



(mm)

형 번	ØD	Ød	ℓ	L	r
SRET4030-050-R02	3	6	8	50	0.2
SRET4030-050-R05	3	6	8	50	0.5
SRET4040-050-R02	4	6	10	50	0.2
SRET4040-050-R05	4	6	10	50	0.5
SRET4050-060-R02	5	6	15	60	0.2
SRET4050-060-R05	5	6	15	60	0.5
SRET4050-060-R10	5	6	15	60	1
SRET4060-060-R03	6	6	15	60	0.3
SRET4060-060-R05	6	6	15	60	0.5
SRET4060-060-R10	6	6	15	60	1
SRET4080-070-R03	8	8	20	70	0.3
SRET4080-070-R05	8	8	20	70	0.5
SRET4080-070-R10	8	8	20	70	1
SRET4100-075-R03	10	10	25	75	0.3
SRET4100-075-R05	10	10	25	75	0.5
SRET4100-075-R10	10	10	25	75	1
SRET4100-075-R15	10	10	25	75	1.5
SRET4100-075-R20	10	10	25	75	2
SRET4120-080-R05	12	12	30	80	0.5
SRET4120-080-R10	12	12	30	80	1
SRET4120-080-R15	12	12	30	80	1.5
SRET4120-080-R20	12	12	30	80	2
SRET4120-080-R25	12	12	30	80	2.5
SRET4120-080-R30	12	12	30	80	3
SRET4160-100-R05	16	16	42	100	0.5
SRET4160-100-R10	16	16	42	100	1
SRET4200-100-R05	20	20	48	100	0.5
SRET4200-100-R10	20	20	48	100	1

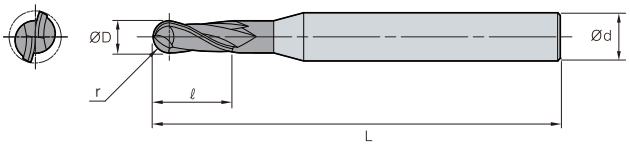
SBET2000(볼)



4 | 30° HELIX | R ±0.01 (r 허용차) | UL 코팅 | 절삭조건 (p.362)

• 공구직경공차

ØD		Ød
Ø1 ~ Ø6	0 ~ -0.015mm	h6
Ø6.1 ~ Ø20	0 ~ -0.020mm	



(mm)

형 번	ØD	Ød	ℓ	L	r
SBET2010-050	1	6	1	50	0.5
SBET2020-050	2	6	2	50	1
SBET2030-050	3	6	3	50	1.5
SBET2040-050	4	6	8	50	2
SBET2040-070	4	6	8	70	2
SBET2050-060	5	6	12	60	2.5
SBET2050-080	5	6	12	80	2.5
SBET2060-060	6	6	12	60	3
SBET2060-090	6	6	12	90	3
SBET2080-070	8	8	16	70	4
SBET2080-100	8	8	16	100	4
SBET2100-075	10	10	20	75	5
SBET2100-100	10	10	20	100	5
SBET2120-080	12	12	25	80	6
SBET2120-100	12	12	25	100	6

Endmill Super Endmill For Ti

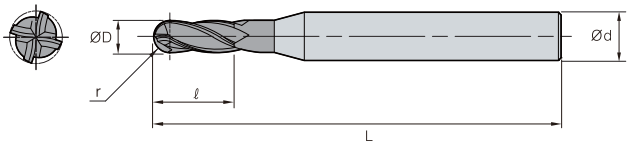
SBET4000(볼)



4 | 38°/40° HELIX | R ±0.01 r 허용차 | UL 코팅 | 절삭조건 p.362

• 공구직경공차

ØD		Ød
Ø1 ~ Ø6	0 ~ -0.015mm	h6
Ø6.1 ~ Ø20	0 ~ -0.020mm	



(mm)

형 번	ØD	Ød	ℓ	L	r
SBET4040-050	4	6	8	50	2.0
SBET4040-070	4	6	8	70	2.0
SBET4050-060	5	6	12	60	2.5
SBET4050-080	5	6	12	80	2.5
SBET4060-060	6	6	12	60	3.0
SBET4060-090	6	6	12	90	3.0
SBET4080-070	8	8	16	70	4.0
SBET4080-100	8	8	16	100	4.0
SBET4100-075	10	10	20	75	5.0
SBET4100-100	10	10	20	100	5.0
SBET4120-080	12	12	25	80	6.0
SBET4120-100	12	12	25	100	6.0

초정밀 금형가공 솔루션

The Mirror Endmill

- HRC60이상의 고경도 금형 초정밀 가공에 접합
- PCD, cBN전용 재종으로 공구 내마모성 향상

초정밀 피삭재, 고경도 금형 폴리싱 가공용

PCD Endmill

- 날이 없는 PCD 구형 볼 엔드밀로 최적의 면조도 구현
- 초정밀 제작으로 나노급 면조도 구현
- PCD 전용 재종 적용으로 공구 내마모성 향상



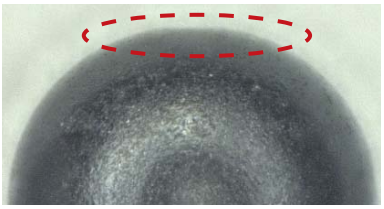
절삭평가 사례

피삭재	STD11(HRC60)
절삭조건	n(min^{-1}) = 40,000, vf(mm/min) = 400
	ap(mm) = 0.003, ae(mm) = 0.003, Mist
공구	PCD-MBE2004-048-N010S04
마모도	3㎛(10h 연속 가공)

▶ 10h 연속가공 후 Ra(um) = 0.035



내마모성 우수



초정밀 경면 피삭재, HRC60 이상의 금형 가공용

cBN Endmill

- 고속 가공 시 뛰어난 면조도 및 생산성 향상
- cBN 전용 재종 적용으로 공구 내마모성 향상
- 인선 강화형 형상으로 수명확보
- 초정밀 제작으로 안정적인 수명확보 및 면조도 향상



절삭평가 사례

피삭재	STD11(HRC60)
절삭조건	n(min^{-1}) = 40,000, vf(mm/min) = 700
	ap(mm) = 0.005, ae(mm) = 0.01, Mist
공구	cBN-MBE2004-050-N010S04
마모도	5㎛(2h 연속 가공)

▶ 2h 연속가공 후 Ra(um) = 0.057



내마모성 우수



▶ 2h 연속가공 후에도 인선 형상 유지성 우수

The Mirror Endmill

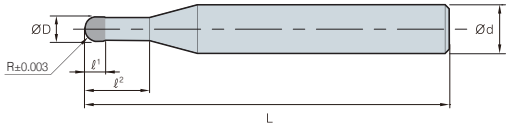
PCD-MBE0000(볼)



절삭조건
p.363

• 공구직경공차

구분	ØD		Ød
DC	0.3 ~ 2.0	0 ~ -0.008mm	h3
RE	0.3 ~ 2.0	±0.003mm	



(mm)

형 번	R	ØD	Ød	ℓ1	ℓ2	L
PCD-MBE0003-048-N007S04	0.15	0.3	4	0.15	0.75	48
PCD-MBE0004-048-N010S04	0.2	0.4	4	0.2	1	48
PCD-MBE0006-048-N015S04	0.3	0.6	4	0.3	1.5	48
PCD-MBE0010-048-N025S04	0.5	1	4	0.5	2.5	48
PCD-MBE0015-048-N040S04	0.75	1.5	4	0.75	4	48
PCD-MBE0020-048-N050S04	1	2	4	1	5	48

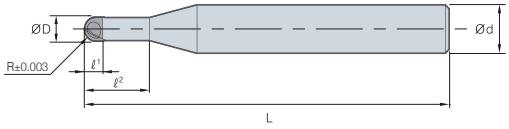
cBN-MBE0000(볼)



2 | 0° HELIX | 절삭조건 p.363

• 공구직경공차

구분	ØD		Ød
DC	0.4 ~ 2.0	0 ~ -0.008mm	h4
RE	0.4 ~ 2.0	±0.003mm	



(mm)

형 번	R	ØD	Ød	ℓ1	ℓ2	L
cBN-MBE 2004-050-N005S04	0.2	0.4	4	0.33	0.5	50
cBN-MBE 2004-050-N010S04	0.2	0.4	4	0.33	1	50
cBN-MBE 2005-050-N010S04	0.25	0.5	4	0.38	1	50
cBN-MBE 2006-050-N015S04	0.3	0.6	4	0.5	1.5	50
cBN-MBE 2008-050-N020S04	0.4	0.8	4	0.6	2	50
cBN-MBE 2010-050-N025S04	0.5	1	4	0.7	2.5	50
cBN-MBE 2012-050-N030S04	0.6	1.2	4	0.8	3	50
cBN-MBE 2015-050-N040S04	0.75	1.5	4	1	4	50
cBN-MBE 2020-050-N050S04	1	2	4	1.2	5	50

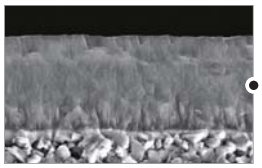
고경도강 가공용 엔드밀

H-Star Endmill New

- **고경도용 코팅 채택** - 신규 AlTiSiN계 박막 적용으로 고함량의 Si 성분, 내마모성 향상, 마찰열에 대한 안정성 확보
- **고경도용 모재 채택** - 초미립 WC + Co 9%의 조성, 인선 특성 확보를 통한 범용성 확대
- **인선처리 적용** - 고경도강 가공 시 초기 내치핑성 보완, 내마모성 향상 및 안정적인 가공 유도

특징

• 고경도용 코팅 채택



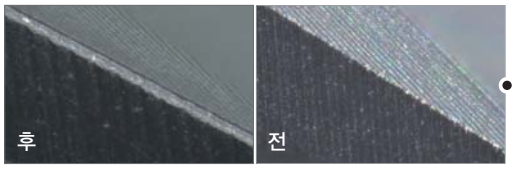
- 고함량의 Si 성분
- 내마모성 향상
- 마찰열에 대한 안정성 확보

• 고경도용 모재 채택

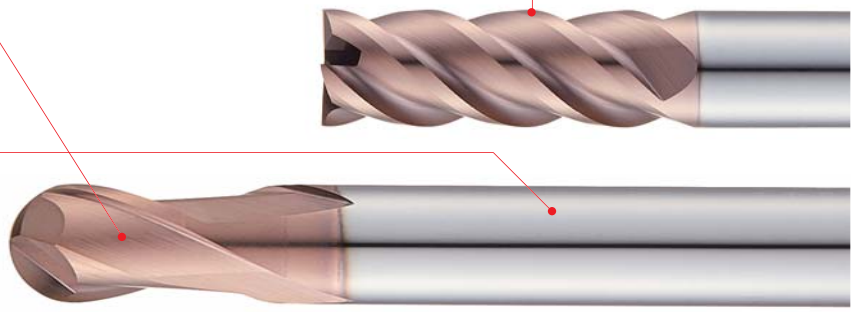


- 초미립 WC + Co. 9%의 조성
- 인선 특성 확보를 통한 범용성 확대

• 인선처리 적용



- 고경도강 가공 시 초기 내치핑성 보완
- 내마모성 향상 및 안정적인 가공 유도



형번표기법

ES R 70 4 100 15 32 - 10

H-Star Endmill

구분
B : 볼
E : 플랫
R : 레디우스
XE : 플랫(부등분할)
XR : 레디우스(부등분할)
PM : 강력 절삭용
RB : 리브 볼
RE : 리브 플랫
RR : 리브 레디우스
LNB : 롱 넥 볼
TNB : 테이퍼 넥 볼
LNS : 롱 넥 플랫
LNR : 롱 넥 레디우스

길이/샹크 타입
70 : 넥
71 : 스트레이트, 넥
72 : 롱 샹크 넥
73 : 롱 샹크
74 : 헬릭스 35°

날수
2 : 2날
3 : 3날
4 : 4날
6 : 6날

공구직경
010 : Ø1.0mm
060 : Ø6.0mm
065 : Ø6.5mm
100 : Ø10.0mm

코너 R
05 : 0.5mm
15 : 1.5mm
20 : 2.0mm

유효장
10 : 10mm
12 : 12mm
32 : 32mm

샹크직경
06 : Ø6.0mm
10 : Ø10.0mm
12 : Ø12.0mm

형번	형상	품명	공구직경	페이지
ESB702		2날 넥 타입 볼 엔드밀	Ø0.1 ~ 12.0	44
ESB712		2날 볼 엔드밀	Ø1.0 ~ 12.0	45
ESB703		3날 넥 타입 볼 엔드밀	Ø2.0 ~ 12.0	46
ESB734		4날 15° 헬릭스 볼 엔드밀	Ø2.0 ~ 10.0	47
ESE702		2날 넥 타입 플랫 엔드밀	Ø0.1 ~ 20.0	48
ESE712		2날 플랫 엔드밀	Ø1.0 ~ 12.0	49
ESE704		4날 넥 타입 플랫 엔드밀	Ø1.0 ~ 20.0	50
ESE714		4날 하이 헬릭스 플랫 엔드밀	Ø1.0 ~ 12.0	51
ESE724(6)		4&6날 하이 헬릭스 플랫 엔드밀	Ø1.0 ~ 12.0	52
ESE744		4날 하이 헬릭스 플랫 엔드밀	Ø1.0 ~ 12.0	53
ESE716		6날 하이 헬릭스 플랫 엔드밀	Ø6.0 ~ 20.0	54
ESR702		2날 넥 타입 레디우스 엔드밀	Ø1.0 ~ 12.0	55~57
ESR732		2날 롱 샹크 레디우스 엔드밀	Ø1.0 ~ 12.0	58
ESR704		4날 넥 타입 레디우스 엔드밀	Ø1.0 ~ 12.0	59~60
ESR714		4날 레디우스 엔드밀	Ø3.0 ~ 12.0	61
ESR724		4날 넥 타입 레디우스 엔드밀	Ø6.0 ~ 12.0	62
ESR734		4날 롱 샹크 레디우스 엔드밀	Ø1.0 ~ 12.0	63
ESR706		6날 넥 타입 레디우스 엔드밀	Ø6.0 ~ 12.0	64
ESR736		6날 레디우스 엔드밀	Ø6.0 ~ 12.0	65
ESRB712		2날 리브 볼 엔드밀	Ø0.1 ~ 12.0	66~69
ESRE712		2날 리브 플랫 엔드밀	Ø0.1 ~ 12.0	70~72
ESRE714		4날 리브 플랫 엔드밀	Ø0.5 ~ 12.0	73~75
ESRR712		2날 리브 레디우스 엔드밀	Ø0.2 ~ 16.0	76~81
ESRR714		4날 리브 레디우스 엔드밀	Ø0.5 ~ 20.0	82~88
ESXE704		4날 넥 타입 플랫 엔드밀	Ø1.0 ~ 12.0	89
ESXE714		4날 플랫 엔드밀	Ø2.0 ~ 12.0	90
ESXR704		4날 넥 타입 레디우스 엔드밀	Ø1.0 ~ 12.0	91
ESLNB20		2날 롱 넥 플랫 엔드밀	Ø0.1 ~ 5.0	92~95
ESTNB20		2날 테이퍼 넥 볼 엔드밀	Ø0.2 ~ 10.0	96~99
ESTNB30		3날 테이퍼 넥 볼 엔드밀	Ø2.0 ~ 5.0	100~101
ESLNS20		2날 롱 넥 플랫 엔드밀	Ø0.1 ~ 5.0	102~105
ESLNS40		4날 롱 넥 플랫 엔드밀	Ø1.0 ~ 5.0	106~107
ESLNR		2날 롱 넥 레디우스 엔드밀	Ø0.2 ~ 3.0	108~111
ESTNR		2날 테이퍼 넥 레디우스 엔드밀	Ø0.2 ~ 3.0	112~113
ESPM4		4날 넥 타입 레디우스 엔드밀	Ø3.0 ~ 12.0	114

H-Star Endmill

ESB702

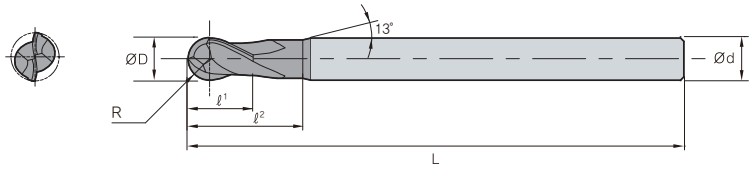
2날 넥 타입 볼 엔드밀

ULTRA FINE | 2 | 30° HELIX | R ±0.005 (R3 이하) | R ±0.008 | AlTiN | 절삭조건 (p.364)

• 공구직경공차

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	





(mm)

형 번	R	ØD	Ød	ℓ1	ℓ2	L
ESB702001	0.05	0.1	4	0.15	-	40
ESB702002	0.1	0.2	4	0.3	-	40
ESB702003	0.15	0.3	4	0.5	-	40
ESB702004	0.2	0.4	4	0.6	-	40
ESB702005	0.25	0.5	4	0.7	-	40
ESB702006	0.3	0.6	4	0.9	-	40
ESB702007	0.35	0.7	4	1.1	-	40
ESB702008	0.4	0.8	4	1.2	-	40
ESB702009	0.45	0.9	4	1.4	-	40
ESB702010	0.5	1	6	1.5	3	50
ESB702010S4	0.5	1	4	1.5	-	45
ESB702015	0.75	1.5	6	2	4	50
ESB702015S4	0.75	1.5	4	2	-	45
ESB702020	1	2	6	2.5	5	50
ESB702020S4	1	2	4	2.5	-	45
ESB702025	1.25	2.5	6	3	7	50
ESB702030	1.5	3	6	4	10	60
ESB702030S	1.5	3	6	4	10	50
ESB702030S4	1.5	3	4	4	-	45
ESB702031	1.5	3	6	4	10	70
ESB702040	2	4	6	5	10	60
ESB702040S	2	4	6	5	10	50
ESB702040S4	2	4	4	5	-	45
ESB702041	2	4	6	5	10	70
ESB702050	2.5	5	6	6	12	60
ESB702060	3	6	6	7	12	60
ESB702061	3	6	6	7	12	90
ESB702080	4	8	8	9	15	70
ESB702081	4	8	8	9	15	100
ESB702100	5	10	10	11	25	75
ESB702101	5	10	10	11	25	100
ESB702120	6	12	12	12	25	80
ESB702121	6	12	12	12	25	110

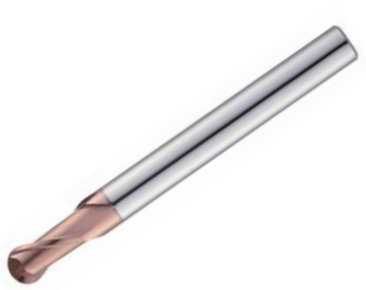
• 적용 피삭재

탄소강 ~ HB225	합금강 HB225~325	프리하든강 HRC30~50	열처리강		동	흑연	주철 ~FCD500	알루미늄	스테인리스강
			SKD61~HRC55	SKD11 HRC55~63					
		○	◎	◎	○				

◎: 매우적합 ○: 적합

ESB712

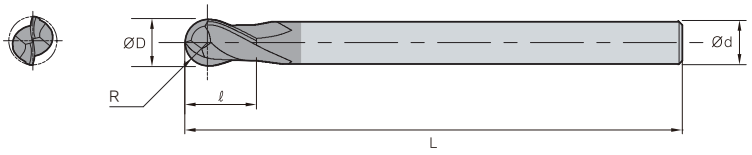
2날 볼 엔드밀



ULTRA FINE | 2 | 30° HELIX | R ±0.005 (R3 이하) | R ±0.008 (R3 초과) | AlTiN | 절삭조건 p.364

• 공구직경공차

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	



(mm)

형 번	R	ØD	Ød	ℓ	L
ESB712010	0.5	1	6	2.5	50
ESB712010S	0.5	1	6	1.5	40
ESB712010S4	0.5	1	4	2.5	50
ESB712012	0.6	1.2	6	3	50
ESB712015	0.75	1.5	6	4	50
ESB712015S	0.75	1.5	6	2.5	40
ESB712015S4	0.75	1.5	4	4	50
ESB712020	1	2	6	5	50
ESB712020S	1	2	6	3	40
ESB712020S4	1	2	4	5	50
ESB712025	1.25	2.5	6	7	60
ESB712030	1.5	3	6	8	60
ESB712030S	1.5	3	6	4.5	50
ESB712030S4	1.5	3	4	8	60
ESB712040	2	4	6	8	70
ESB712040S	2	4	6	6	50
ESB712050	2.5	5	6	10	80
ESB712050S	2.5	5	6	7.5	50
ESB712060	3	6	6	12	90
ESB712060S	3	6	6	9	50
ESB712080S	4	8	8	12	50
ESB712081	4	8	8	14	100
ESB712100	5	10	10	18	100
ESB712100S	5	10	10	15	60
ESB712120	6	12	12	22	110
ESB712120S	6	12	12	18	60

• 적용 피삭재

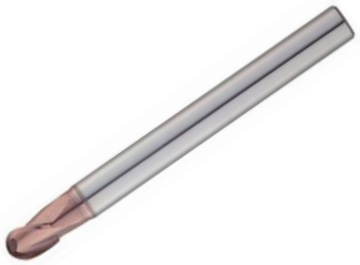
탄소강 ~ HB225	합금강 HB225~325	프리하든강 HRC30~50	열처리강		동	흑연	주철 ~FCD500	알루미늄	스테인리스강
			SKD61~HRC55	SKD11 HRC55~63					
		○	◎	◎	○				

◎: 매우적합 ○: 적합

H-Star Endmill

ESB703

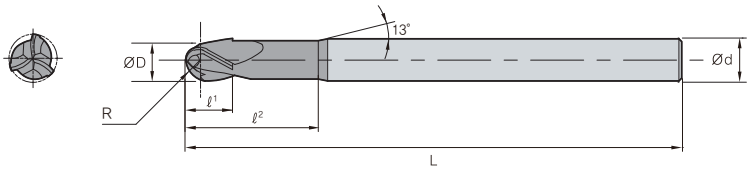
3날 넥 타입 볼 엔드밀



ULTRA FINE | 3 | 30° HELIX | R ±0.005 (R3 이하) | R ±0.008 (R3 초과) | AlTiN | 절삭조건 p.364

• 공구직경공차

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	



(mm)

형 번	R	ØD	Ød	ℓ1	ℓ2	L
ESB703020	1	2	6	2.5	5	50
ESB703025	1.25	2.5	6	3	7	50
ESB703030	1.5	3	6	4	10	60
ESB703030S	1.5	3	6	4	10	50
ESB703031	1.5	3	6	4	10	70
ESB703040	2	4	6	5	10	60
ESB703040S	2	4	6	5	10	50
ESB703041	2	4	6	5	10	70
ESB703050	2.5	5	6	6	12	60
ESB703060	3	6	6	7	12	60
ESB703061	3	6	6	7	12	90
ESB703080	4	8	8	9	15	70
ESB703081	4	8	8	9	15	100
ESB703100	5	10	10	11	25	75
ESB703101	5	10	10	11	25	100
ESB703120	6	12	12	12	25	80
ESB703121	6	12	12	12	25	110

• 적용 피삭재

탄소강 ~ HB225	합금강 HB225~325	프리하든강 HRC30~50	열처리강		동	흑연	주철 ~FCD500	알루미늄	스테인리스강
			SKD61~HRC55	SKD11 HRC55~63					
		○	◎	◎	○				

◎: 매우적합 ○: 적합

ESB734

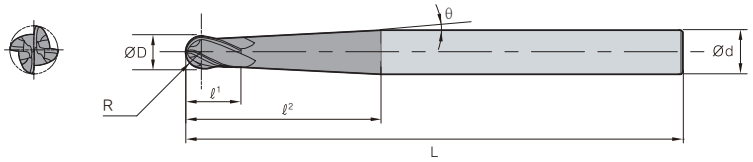
4날 15° 헬릭스 볼 엔드밀

ULTRA FINE | 4 | 15° HELIX | R ±0.005 (R3 이하) | R ±0.008 (R3 초과) | AlTiN | 절삭조건 p.365

• 공구직경공차

ØD		Ød
전 규격	0 ~ -0.012mm	h5





(mm)

형 번	R	ØD	Ød	ℓ1	ℓ2	θ	L
ESB734020-2.5	1	2	4	2	25	2.5	60
ESB734020-3.5	1	2	4	2	18	3.5	60
ESB734025-2.5	1.25	2.5	4	3	20	2.5	60
ESB734025-3.0	1.25	2.5	4	3	17	3	60
ESB734030-2.0	1.5	3	6	3	46	2	70
ESB734030-2.5	1.5	3	6	3	37	2.5	70
ESB734040-2.0	2	4	6	4	33	2	70
ESB734040-2.5	2	4	6	4	27	2.5	70
ESB734050-2.5	2.5	5	6	5	16	2.5	70
ESB734060-1.5	3	6	8	6	44	1.5	100
ESB734060-2.5	3	6	8	6	29	2.5	100
ESB734080-1.5	4	8	10	8	46	1.5	100
ESB734080-2.5	4	8	10	8	31	2.5	100
ESB734100-1.5	5	10	12	10	48	1.5	110
ESB734100-2.5	5	10	12	10	33	2.5	110

• 적용 피삭재

탄소강 ~ HB225	합금강 HB225~325	프리하든강 HRC30~50	열처리강		동	흑연	주철 ~FCD500	알루미늄	스테인리스강
			SKD61~HRC55	SKD11 HRC55~63					
		○	◎	◎	○				

◎: 매우적합 ○: 적합

H-Star Endmill

ESE702

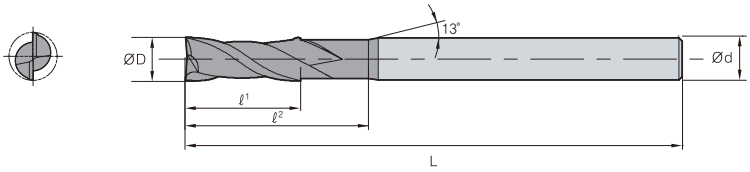
2날 넥 타입 플랫 엔드밀



ULTRA FINE | 2 | 30° HELIX | AlTiN | 절삭조건 p.365, 366

• 공구직경공차

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø20	0 ~ -0.015mm	



(mm)

형 번	ØD	Ød	ℓ1	ℓ2	L
ESE702001	0.1	4	0.2	-	40
ESE702002	0.2	4	0.4	-	40
ESE702003	0.3	4	0.5	-	40
ESE702004	0.4	4	0.7	-	40
ESE702005	0.5	4	1	-	40
ESE702006	0.6	4	1.2	-	40
ESE702007	0.7	4	1.4	-	40
ESE702008	0.8	4	1.6	-	40
ESE702009	0.9	4	2	-	40
ESE702010	1	6	1.5	-	40
ESE702010S4	1	4	1.5	-	40
ESE702015	1.5	6	2.2	-	40
ESE702020	2	6	3	6	40
ESE702020S4	2	4	3	6	40
ESE702025	2.5	6	4	6	40
ESE702030	3	6	4	7	45
ESE702035	3.5	6	6	9	45
ESE702040	4	6	6	9	45
ESE702045	4.5	6	6	10	45
ESE702050	5	6	6	11	50
ESE702060	6	6	7	14	50
ESE702080	8	8	9	18	60
ESE702100	10	10	12	25	75
ESE702120	12	12	15	30	75
ESE702160	16	16	18	38	90
ESE702200	20	20	24	45	100

• 적용 피삭재

탄소강 ~ HB225	합금강 HB225~325	프리하든강 HRC30~50	열처리강		동	흑연	주철 ~FCD500	알루미늄	스테인리스강
			SKD61~HRC55	SKD11 HRC55~63					
		○	◎	◎	○				

◎: 매우적합 ○: 적합

ESE712

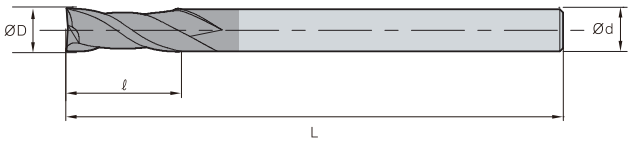
2날 플랫 엔드밀

ULTRA FINE | 2 | 35° HELIX | AlTiN | 절삭조건 p.367

• 공구직경공차

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	





(mm)

형 번	ØD	Ød	ℓ	L
ESE712010	1	6	3	40
ESE712010-02	1	6	2	40
ESE712010-02S4	1	4	2	40
ESE712010-04	1	6	4	40
ESE712012	1.2	6	3	40
ESE712015	1.5	6	4	40
ESE712015S4	1.5	4	4	40
ESE712015-06	1.5	6	6	40
ESE712015-08	1.5	6	8	40
ESE712020	2	6	5	40
ESE712020S4	2	4	5	40
ESE712020-08	2	6	8	40
ESE712020-10	2	6	10	50
ESE712025	2.5	6	6	40
ESE712025S4	2.5	4	6	40
ESE712030	3	6	8	45
ESE712030S4	3	4	8	45
ESE712030-10	3	6	10	50

형 번	ØD	Ød	ℓ	L
ESE712030-12	3	6	12	50
ESE712035	3.5	6	10	45
ESE712040	4	6	10	45
ESE712040S4	4	4	10	45
ESE712040-12	4	6	12	50
ESE712040-16	4	6	16	60
ESE712045	4.5	6	11	45
ESE712050	5	6	13	50
ESE712055	5.5	6	13	50
ESE712060	6	6	13	50
ESE712060-15	6	6	15	60
ESE712065	6.5	8	16	60
ESE712070	7	8	18	60
ESE712080	8	8	19	60
ESE712100	10	10	22	70
ESE712100-25	10	10	25	70
ESE712120	12	12	26	75
ESE712120-30	12	12	30	75

• 적용 피삭재

탄소강 ~ HB225	합금강 HB225~325	프리하든강 HRC30~50	열처리강		동	흑연	주철 ~FCD500	알루미늄	스테인리스강
			SKD61~HRC55	SKD11 HRC55~63					
		○	◎	◎	○				

◎: 매우적합 ○: 적합

H-Star Endmill

ESE704

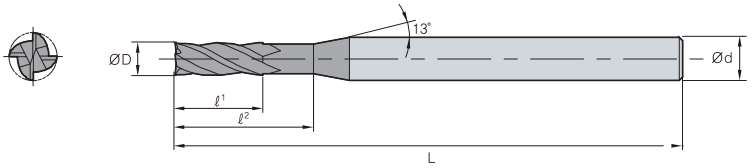
4날 넥 타입 플랫 엔드밀



ULTRA FINE | 4 | 30° HELIX | AlTiN | 절삭조건 p.366

• 공구직경공차

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø20	0 ~ -0.015mm	



(mm)

형 번	ØD	Ød	ℓ1	ℓ2	L
ESE704010	1	6	1.5	-	40
ESE704010S4	1	4	1.5	-	40
ESE704015	1.5	6	2.2	-	40
ESE704015S4	1.5	4	2.2	-	40
ESE704020	2	6	3	6	40
ESE704020S4	2	4	3	6	40
ESE704025	2.5	6	4	6	40
ESE704025S4	2.5	4	4	6	40
ESE704030	3	6	4	7	45
ESE704030S4	3	4	4	7	45
ESE704035	3.5	6	5	9	45
ESE704040	4	6	5	9	45
ESE704040S4	4	4	5	9	45
ESE704045	4.5	6	6	10	45
ESE704050	5	6	6	11	50
ESE704060	6	6	7	14	50
ESE704080	8	8	9	18	60
ESE704100	10	10	12	25	75
ESE704120	12	12	15	30	75
ESE704160	16	16	18	38	90
ESE704200	20	20	24	45	100

• 적용 피삭재

탄소강 ~ HB225	합금강 HB225~325	프리하든강 HRC30~50	열처리강		동	흑연	주철 ~FCD500	알루미늄	스테인리스강
			SKD61~HRC55	SKD11 HRC55~63					
		○	◎	◎	○				

◎: 매우적합 ○: 적합

ESE714

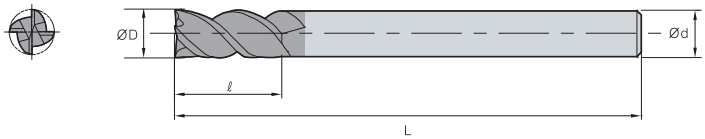
4날 하이 헬릭스 플랫 엔드밀



ULTRA FINE | 4 | 45° HELIX | AlTiN | 절삭조건 p.366

• 공구직경공차

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	



(mm)

형 번	ØD	Ød	ℓ	L
ESE714010	1	6	2.5	40
ESE714010S4	1	4	2.5	40
ESE714012	1.2	6	3	40
ESE714015	1.5	6	4	40
ESE714015S4	1.5	4	4	40
ESE714020	2	6	5	40
ESE714020S4	2	4	5	40
ESE714025	2.5	6	6	40
ESE714025S4	2.5	4	6	40
ESE714030	3	6	8	45
ESE714030S4	3	4	8	45
ESE714035	3.5	6	9	45
ESE714040	4	6	10	45
ESE714040S4	4	4	10	45
ESE714050	5	6	13	50
ESE714060	6	6	13	50
ESE714060-15	6	6	15	60
ESE714060-15L	6	6	15	90
ESE714080	8	8	19	60
ESE714080L	8	8	19	100
ESE714100	10	10	22	70
ESE714100-25	10	10	25	70
ESE714100-25L	10	10	25	100
ESE714120	12	12	26	75
ESE714120-30	12	12	30	80
ESE714120-30L	12	12	30	100

• 적용 피삭재

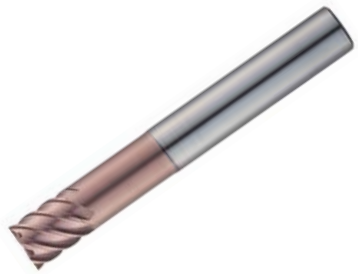
탄소강 ~ HB225	합금강 HB225~325	프리하든강 HRC30~50	열처리강 SKD61~HRC55	열처리강 SKD11 HRC55~63	동	흑연	주철 ~FCD500	알루미늄	스테인리스강
		○	◎	◎	○				

◎: 매우적합 ○: 적합

H-Star Endmill

ESE724(6)

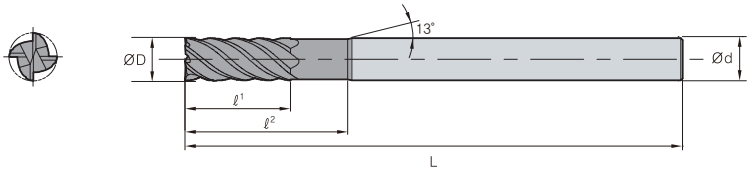
4&6날 하이 헬릭스 플랫 엔드밀



ULTRA FINE | 4 | 6 | 45° HELIX Z=4 | 60° HELIX Z=6 | AlTiN | 절삭조건 p.368

• 공구직경공차

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	



(mm)

형 번	ØD	Ød	ℓ1	ℓ2	L	Z
ESE724010	1	6	1.5	5	45	4
ESE724015	1.5	6	2.2	6	45	4
ESE724020	2	6	3	8	45	4
ESE724030	3	6	4	9	50	4
ESE724040	4	6	5	12	50	4
ESE724040S4L	4	4	5	12	75	4
ESE724050	5	6	6	15	50	4
ESE726060	6	6	7	20	60	6
ESE726080	8	8	9	25	70	6
ESE726100	10	10	12	32	75	6
ESE726120	12	12	15	38	80	6

• 적용 피삭재

탄소강 ~ HB225	합금강 HB225~325	프리하든강 HRC30~50	열처리강		동	흑연	주철 ~FCD500	알루미늄	스테인리스강
			SKD61~HRC55	SKD11 HRC55~63					
		○	◎	◎	○				

◎: 매우적합 ○: 적합

ESE744

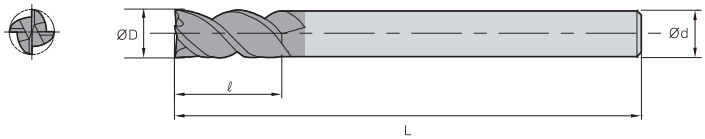
4날 하이 헬릭스 플랫 엔드밀



ULTRA FINE | 4 | 35° HELIX | AlTiN | 절삭조건 p.366

• 공구직경공차

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	



(mm)

형 번	ØD	Ød	ℓ	L
ESE744010S3	1	3	2.5	40
ESE744010S4	1	4	2.5	40
ESE744010	1	6	2.5	40
ESE744012S3	1.2	3	3	40
ESE744012S4	1.2	4	3	40
ESE744015S3	1.5	3	4	40
ESE744015S4	1.5	4	4	40
ESE744015	1.5	6	4	40
ESE744020S3	2	3	6	40
ESE744020S4	2	4	6	40
ESE744020	2	6	6	40
ESE744025S3	2.5	3	8	45
ESE744025S4	2.5	4	8	45
ESE744025	2.5	6	8	45
ESE744030S3	3	3	8	50
ESE744030S4	3	4	8	45
ESE744030	3	6	8	45
ESE744035	3.5	6	10	45
ESE744040S4	4	4	11	45
ESE744040	4	6	11	45
ESE744045	4.5	6	11	45
ESE744050	5	6	13	50
ESE744055	5.5	6	13	50
ESE744060	6	6	13	50
ESE744080	8	8	19	60
ESE744100	10	10	22	70
ESE744120	12	12	26	75

• 적용 피삭재

탄소강 ~ HB225	합금강 HB225~325	프리하든강 HRC30~50	열처리강		동	흑연	주철 ~FCD500	알루미늄	스테인리스강
			SKD61~HRC55	SKD11 HRC55~63					
		○	◎	◎	○				

◎: 매우적합 ○: 적합

H-Star Endmill

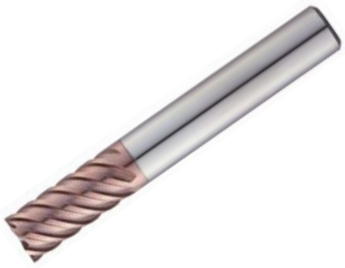
ESE716

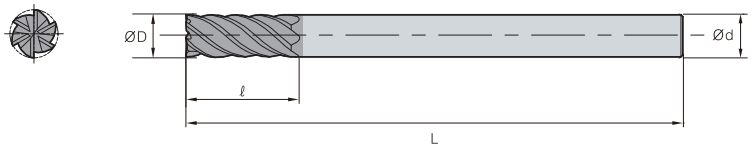
6날 하이 헬릭스 플랫 엔드밀

ULTRA FINE | 6 | 50° HELIX | AlTiN | 절삭조건 p.368

• 공구직경공차

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø20	0 ~ -0.015mm	





(mm)

형 번	ØD	Ød	ℓ	L
ESE716060	6	6	13	50
ESE716080	8	8	18	60
ESE716100	10	10	22	70
ESE716120	12	12	26	75
ESE716160	16	16	35	90
ESE716200	20	20	44	100

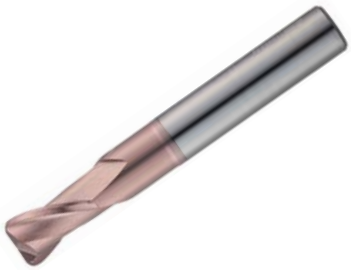
• 적용 피삭재

탄소강 ~ HB225	합금강 HB225~325	프리하든강 HRC30~50	열처리강		동	흑연	주철 ~FCD500	알루미늄	스테인리스강
			SKD61~HRC55	SKD11 HRC55~63					
		○	◎	◎	○				

◎: 매우적합 ○: 적합

ESR702

2날 넥 타입 레디우스 엔드밀

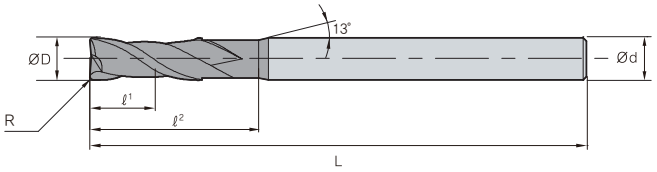


ULTRA FINE | 2 | 30° HELIX | R ±0.01 Ø6 이하 | R ±0.015 Ø6 초과 | AlTiN | 절삭조건 p.369, 370

• 공구직경공차

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	





(mm)

형 번	R	ØD	Ød	ℓ1	ℓ2	L
ESR70201000503S4	0.05	1	4	1.5	3	50
ESR70201000504S4	0.05	1	4	1.5	4	50
ESR70201000506S4	0.05	1	4	1.5	6	50
ESR70201000508S4	0.05	1	4	1.5	8	50
ESR70201000510S4	0.05	1	4	1.5	10	50
ESR7020100103S4	0.1	1	4	1.5	3	50
ESR7020100104	0.1	1	6	1.5	4	50
ESR7020100104S4	0.1	1	4	1.5	4	50
ESR7020100106	0.1	1	6	1.5	6	50
ESR7020100106S4	0.1	1	4	1.5	6	50
ESR7020100108S4	0.1	1	4	1.5	8	50
ESR7020100110S4	0.1	1	4	1.5	10	50
ESR7020100203S4	0.2	1	4	1.5	3	50
ESR7020100204	0.2	1	6	1.5	4	50
ESR7020100204S4	0.2	1	4	1.5	4	50
ESR7020100206	0.2	1	6	1.5	6	50
ESR7020100206S4	0.2	1	4	1.5	6	50
ESR7020100208S4	0.2	1	4	1.5	8	50
ESR7020100210	0.2	1	6	1.5	10	50
ESR7020100210S4	0.2	1	4	1.5	10	50
ESR7020100212	0.2	1	6	1.5	12	50
ESR7020100303S4	0.3	1	4	1.5	3	50
ESR7020100304S4	0.3	1	4	1.5	4	50
ESR7020100306S4	0.3	1	4	1.5	6	50
ESR7020100308S4	0.3	1	4	1.5	8	50
ESR7020100310S4	0.3	1	4	1.5	10	50
ESR7020120208	0.2	1.2	6	2	8	50
ESR7020120212	0.2	1.2	6	2	12	50
ESR70201500504S4	0.05	1.5	4	2.5	4	50
ESR70201500506S4	0.05	1.5	4	2.5	6	50
ESR70201500508S4	0.05	1.5	4	2.5	8	50
ESR70201500510S4	0.05	1.5	4	2.5	10	50
ESR70201500512S4	0.05	1.5	4	2.5	12	50
ESR7020150104S4	0.1	1.5	4	2.5	4	50
ESR7020150106S4	0.1	1.5	4	2.5	6	50
ESR7020150108S4	0.1	1.5	4	2.5	8	50

형 번	R	ØD	Ød	ℓ1	ℓ2	L
ESR7020150110S4	0.1	1.5	4	2.5	10	50
ESR7020150112S4	0.1	1.5	4	2.5	12	50
ESR7020150204	0.2	1.5	6	2.5	4	50
ESR7020150204S4	0.2	1.5	4	2.5	4	50
ESR7020150206	0.2	1.5	6	2.5	6	50
ESR7020150206S4	0.2	1.5	4	2.5	6	50
ESR7020150208	0.2	1.5	6	2.5	8	50
ESR7020150208S4	0.2	1.5	4	2.5	8	50
ESR7020150210	0.2	1.5	6	2.5	10	50
ESR7020150210S4	0.2	1.5	4	2.5	10	50
ESR7020150212S4	0.2	1.5	4	2.5	12	50
ESR7020150215	0.2	1.5	6	2.5	15	50
ESR7020150304S4	0.3	1.5	4	2.5	4	50
ESR7020150306S4	0.3	1.5	4	2.5	6	50
ESR7020150308S4	0.3	1.5	4	2.5	8	50
ESR7020150310S4	0.3	1.5	4	2.5	10	50
ESR7020150312S4	0.3	1.5	4	2.5	12	50
ESR7020150504S4	0.5	1.5	4	2.5	4	50
ESR7020150506S4	0.5	1.5	4	2.5	6	50
ESR7020150508S4	0.5	1.5	4	2.5	8	50
ESR7020150510S4	0.5	1.5	4	2.5	10	50
ESR7020150512S4	0.5	1.5	4	2.5	12	50
ESR7020200106S4	0.1	2	4	3	6	50
ESR7020200108	0.1	2	6	3	8	50
ESR7020200108S4	0.1	2	4	3	8	50
ESR7020200110S4	0.1	2	4	3	10	50
ESR7020200112	0.1	2	6	3	12	50
ESR7020200112S4	0.1	2	4	3	12	50
ESR7020200116S4	0.1	2	4	3	16	50
ESR7020200120S4	0.1	2	4	3	20	50
ESR7020200206	0.2	2	6	3	6	50
ESR7020200206S4	0.2	2	4	3	6	50
ESR7020200208S4	0.2	2	4	3	8	50
ESR7020200209	0.2	2	6	3	9	50
ESR7020200210S4	0.2	2	4	3	10	50
ESR7020200212S4	0.2	2	4	3	12	50

H-Star Endmill

ESR702

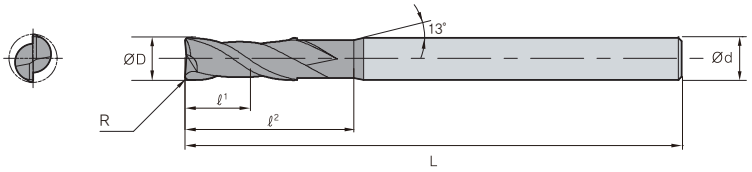
2날 넥 타입 레디우스 엔드밀



ULTRA FINE | 2 | 30° HELIX | R ±0.01 Ø6 이하 | R ±0.015 Ø6 초과 | AlTiN | 절삭조건 p.369, 370

• 공구직경공차

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	



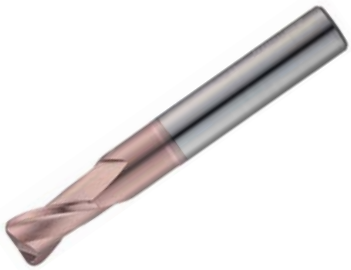
(mm)

형 번	R	ØD	Ød	ℓ1	ℓ2	L
ESR7020200216	0.2	2	6	3	16	50
ESR7020200216S4	0.2	2	4	3	16	50
ESR7020200220S4	0.2	2	4	3	20	50
ESR7020200306	0.3	2	6	3	6	50
ESR7020200306S4	0.3	2	4	3	6	50
ESR7020200308S4	0.3	2	4	3	8	50
ESR7020200310S4	0.3	2	4	3	10	50
ESR7020200312S4	0.3	2	4	3	12	50
ESR7020200316S4	0.3	2	4	3	16	50
ESR7020200320S4	0.3	2	4	3	20	50
ESR7020200506	0.5	2	6	3	6	50
ESR7020200506S4	0.5	2	4	3	6	50
ESR7020200508S4	0.5	2	4	3	8	50
ESR7020200509	0.5	2	6	3	9	50
ESR7020200510S4	0.5	2	4	3	10	50
ESR7020200512	0.5	2	6	3	12	50
ESR7020200512S4	0.5	2	4	3	12	50
ESR7020200516	0.5	2	6	3	16	50
ESR7020200516S4	0.5	2	4	3	16	50
ESR7020200520S4	0.5	2	4	3	20	50
ESR7020250208S4	0.2	2.5	4	3.5	8	50
ESR7020250210S4	0.2	2.5	4	3.5	10	50
ESR7020250212S4	0.2	2.5	4	3.5	12	50
ESR7020250216S4	0.2	2.5	4	3.5	16	50
ESR7020250308S4	0.3	2.5	4	3.5	8	50
ESR7020250310S4	0.3	2.5	4	3.5	10	50
ESR7020250312S4	0.3	2.5	4	3.5	12	50
ESR7020250316S4	0.3	2.5	4	3.5	16	50
ESR7020250508S4	0.5	2.5	4	3.5	8	50
ESR7020250510S4	0.5	2.5	4	3.5	10	50
ESR7020250512S4	0.5	2.5	4	3.5	12	50
ESR7020250516S4	0.5	2.5	4	3.5	16	50
ESR7020300108	0.1	3	6	4.5	8	55
ESR7020300110	0.1	3	6	4.5	10	55
ESR7020300112	0.1	3	6	4.5	12	55
ESR7020300116	0.1	3	6	4.5	16	55

형 번	R	ØD	Ød	ℓ1	ℓ2	L
ESR7020300120	0.1	3	6	4.5	20	60
ESR7020300208	0.2	3	6	4.5	8	55
ESR7020300209	0.2	3	6	4.5	9	55
ESR7020300210	0.2	3	6	4.5	10	55
ESR7020300212	0.2	3	6	4.5	12	55
ESR7020300216	0.2	3	6	4.5	16	55
ESR7020300220	0.2	3	6	4.5	20	60
ESR7020300308	0.3	3	6	4.5	8	55
ESR7020300309	0.3	3	6	4.5	9	55
ESR7020300310	0.3	3	6	4.5	10	55
ESR7020300312	0.3	3	6	4.5	12	55
ESR7020300314	0.3	3	6	4.5	14	55
ESR7020300316	0.3	3	6	4.5	16	55
ESR7020300320	0.3	3	6	4.5	20	60
ESR7020300508	0.5	3	6	4.5	8	55
ESR7020300509	0.5	3	6	4.5	9	55
ESR7020300510	0.5	3	6	4.5	10	55
ESR7020300512	0.5	3	6	4.5	12	55
ESR7020300516	0.5	3	6	4.5	16	55
ESR7020300520	0.5	3	6	4.5	20	60
ESR7020301008	1	3	6	4.5	8	55
ESR7020301010	1	3	6	4.5	10	55
ESR7020301012	1	3	6	4.5	12	55
ESR7020301016	1	3	6	4.5	16	55
ESR7020301020	1	3	6	4.5	20	60
ESR7020301025	1	3	6	4.5	25	60
ESR7020400110	0.1	4	6	6	10	55
ESR7020400112	0.1	4	6	6	12	55
ESR7020400116	0.1	4	6	6	16	55
ESR7020400120	0.1	4	6	6	20	60
ESR7020400125	0.1	4	6	6	25	60
ESR7020400210	0.2	4	6	6	10	55
ESR7020400212	0.2	4	6	6	12	55
ESR7020400216	0.2	4	6	6	16	55
ESR7020400220	0.2	4	6	6	20	60
ESR7020400225	0.2	4	6	6	25	60

ESR702

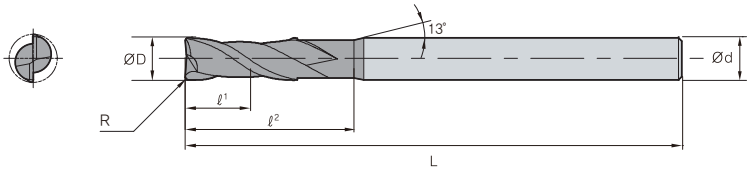
2날 넥 타입 레디우스 엔드밀



ULTRA FINE | 2 | 30° HELIX | R ±0.01 (Ø6 이하) | R ±0.015 (Ø6 초과) | AlTiN | 절삭조건 p.369, 370

• 공구직경공차

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	



(mm)

형 번	R	ØD	Ød	ℓ1	ℓ2	L
ESR7020400310	0.3	4	6	6	10	55
ESR7020400312	0.3	4	6	6	12	55
ESR7020400316	0.3	4	6	6	16	55
ESR7020400320	0.3	4	6	6	20	60
ESR7020400325	0.3	4	6	6	25	60
ESR7020400510	0.5	4	6	6	10	55
ESR7020400512	0.5	4	6	6	12	55
ESR7020400516	0.5	4	6	6	16	55
ESR7020400520	0.5	4	6	6	20	60
ESR7020400525	0.5	4	6	6	25	60
ESR7020400530	0.5	4	6	6	30	70
ESR7020401010	1	4	6	6	10	55
ESR7020401012	1	4	6	6	12	55
ESR7020401016	1	4	6	6	16	55
ESR7020401020	1	4	6	6	20	60
ESR7020401025	1	4	6	6	25	60
ESR7020401030	1	4	6	6	30	70
ESR7020500318	0.3	5	6	8	18	60
ESR7020600220	0.2	6	6	9	20	60
ESR7020600320	0.3	6	6	9	20	60

형 번	R	ØD	Ød	ℓ1	ℓ2	L
ESR7020600520	0.5	6	6	9	20	60
ESR7020601020	1	6	6	9	20	60
ESR7020601520	1.5	6	6	9	20	60
ESR7020602020	2	6	6	9	20	60
ESR7020800225	0.2	8	8	12	25	60
ESR7020800325	0.3	8	8	12	25	60
ESR7020800525	0.5	8	8	12	25	60
ESR7020801025	1	8	8	12	25	60
ESR7020801525	1.5	8	8	12	25	60
ESR7021000232	0.2	10	10	15	32	70
ESR7021000332	0.3	10	10	15	32	70
ESR7021000532	0.5	10	10	15	32	70
ESR7021001032	1	10	10	15	32	70
ESR7021001532	1.5	10	10	15	32	70
ESR7021002032	2	10	10	15	32	70
ESR7021200338	0.3	12	12	18	38	80
ESR7021200538	0.5	12	12	18	38	80
ESR7021201038	1	12	12	18	38	80
ESR7021201538	1.5	12	12	18	38	80
ESR7021202038	2	12	12	18	38	80

• 적용 피삭재

탄소강 ~ HB225	합금강 HB225~325	프리하든강 HRC30~50	열처리강		동	흑연	주철 ~FCD500	알루미늄	스테인리스강
			SKD61~HRC55	SKD11 HRC55~63					
		○	◎	◎	○				

◎: 매우적합 ○: 적합

H-Star Endmill

ESR732

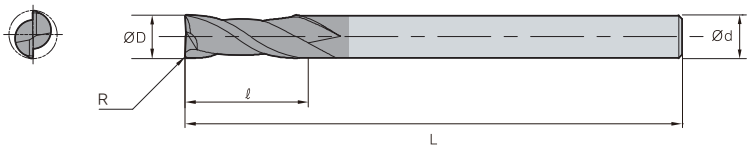
2날 롱 샹크 레디우스 엔드밀

ULTRA FINE | 2 | 30° HELIX | R ±0.01 (Ø6 이하) | R ±0.015 (Ø6 초과) | AlTiN | 절삭조건 p.370

• 공구직경공차

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	





(mm)

형 번	R	ØD	Ød	ℓ	L
ESR73201001	0.1	1	6	2	50
ESR73201002	0.2	1	6	2	50
ESR73201003	0.3	1	6	2	50
ESR73201501	0.1	1.5	6	3	50
ESR73201502	0.2	1.5	6	3	50
ESR73201503	0.3	1.5	6	3	50
ESR73201505	0.5	1.5	6	3	50
ESR73202001	0.1	2	6	5	50
ESR73202002	0.2	2	6	5	50
ESR73202003	0.3	2	6	5	50
ESR73202005	0.5	2	6	5	50
ESR73202501	0.1	2.5	6	7	60
ESR73202502	0.2	2.5	6	7	60
ESR73202503	0.3	2.5	6	7	60
ESR73202505	0.5	2.5	6	7	60
ESR73203001	0.1	3	6	8	60
ESR73203002	0.2	3	6	8	60
ESR73203003	0.3	3	6	8	60
ESR73203005	0.5	3	6	8	60
ESR73204001	0.1	4	6	10	70
ESR73204002	0.2	4	6	10	70
ESR73204003	0.3	4	6	10	70
ESR73204005	0.5	4	6	10	70
ESR73204010	1	4	6	10	70
ESR73205001	0.1	5	6	13	80

형 번	R	ØD	Ød	ℓ	L
ESR73205002	0.2	5	6	13	80
ESR73205003	0.3	5	6	13	80
ESR73205005	0.5	5	6	13	80
ESR73205010	1	5	6	13	80
ESR73206001	0.1	6	6	15	90
ESR73206002	0.2	6	6	15	90
ESR73206003	0.3	6	6	15	90
ESR73206005	0.5	6	6	15	90
ESR73206010	1	6	6	15	90
ESR73208001	0.1	8	8	20	100
ESR73208002	0.2	8	8	20	100
ESR73208003	0.3	8	8	20	100
ESR73208005	0.5	8	8	20	100
ESR73208010	1	8	8	20	100
ESR73208020	2	8	8	20	100
ESR73210002	0.2	10	10	25	100
ESR73210003	0.3	10	10	25	100
ESR73210005	0.5	10	10	25	100
ESR73210010	1	10	10	25	100
ESR73210020	2	10	10	25	100
ESR73212002	0.2	12	12	30	110
ESR73212003	0.3	12	12	30	110
ESR73212005	0.5	12	12	30	110
ESR73212010	1	12	12	30	110
ESR73212020	2	12	12	30	110

• 적용 피삭재

탄소강 ~ HB225	합금강 HB225~325	프리하든강 HRC30~50	열처리강		동	흑연	주철 ~FCD500	알루미늄	스테인리스강
			SKD61~HRC55	SKD11 HRC55~63					
		○	◎	◎	○				

◎: 매우적합 ○: 적합

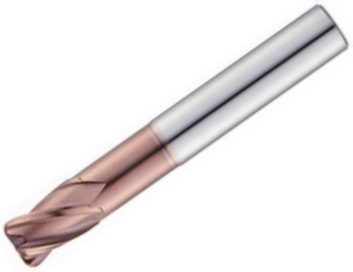
ESR704

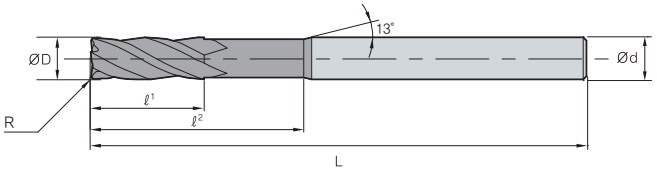
4날 넥 타입 레디우스 엔드밀

ULTRA FINE | 4 | 30° HELIX | R ±0.01 Ø6 이하 | R ±0.015 Ø6 초과 | AlTiN | 절삭조건 p.370

• 공구직경공차

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	





(mm)

형 번	R	ØD	Ød	ℓ1	ℓ2	L
ESR7040100103S4	0.1	1	4	2	3	50
ESR7040100104S4	0.1	1	4	2	4	50
ESR7040100106S4	0.1	1	4	2	6	50
ESR7040100203S4	0.2	1	4	2	3	50
ESR7040100204S4	0.2	1	4	2	4	50
ESR7040100206S4	0.2	1	4	2	6	50
ESR7040100303S4	0.3	1	4	2	3	50
ESR7040100304S4	0.3	1	4	2	4	50
ESR7040100306S4	0.3	1	4	2	6	50
ESR7040150104S4	0.1	1.5	4	2.5	4	50
ESR7040150106S4	0.1	1.5	4	2.5	6	50
ESR7040150204S4	0.2	1.5	4	2.5	4	50
ESR7040150206S4	0.2	1.5	4	2.5	6	50
ESR7040150304S4	0.3	1.5	4	2.5	4	50
ESR7040150306S4	0.3	1.5	4	2.5	6	50
ESR7040200106S4	0.1	2	4	3	6	50
ESR7040200108S4	0.1	2	4	3	8	50
ESR7040200206S4	0.2	2	4	3	6	50
ESR7040200208	0.2	2	6	3	8	50
ESR7040200208S4	0.2	2	4	3	8	50
ESR7040200210	0.2	2	6	3	10	50
ESR7040200212	0.2	2	6	3	12	50
ESR7040200306S4	0.3	2	4	3	6	50
ESR7040200308S4	0.3	2	4	3	8	50
ESR7040200506S4	0.5	2	4	3	6	50
ESR7040200508S4	0.5	2	4	3	8	50
ESR7040250106S4	0.1	2.5	4	3.5	6	50
ESR7040300108	0.1	3	6	4	8	55
ESR7040300110	0.1	3	6	4	10	55
ESR7040300112	0.1	3	6	4	12	55
ESR7040300116	0.1	3	6	4	16	55
ESR7040300120	0.1	3	6	4	20	60
ESR7040300208	0.2	3	6	4	8	55
ESR7040300210	0.2	3	6	4	10	55
ESR7040300212	0.2	3	6	4	12	55
ESR7040300216	0.2	3	6	4	16	55

형 번	R	ØD	Ød	ℓ1	ℓ2	L
ESR7040300220	0.2	3	6	4	20	60
ESR7040300308	0.3	3	6	4	8	55
ESR7040300309	0.3	3	6	4	9	55
ESR7040300310	0.3	3	6	4	10	55
ESR7040300312	0.3	3	6	4	12	55
ESR7040300316	0.3	3	6	4	16	55
ESR7040300320	0.3	3	6	4	20	60
ESR7040300508	0.5	3	6	4	8	55
ESR7040300509	0.5	3	6	4	9	55
ESR7040300510	0.5	3	6	4	10	55
ESR7040300512	0.5	3	6	4	12	55
ESR7040300516	0.5	3	6	4	16	55
ESR7040300520	0.5	3	6	4	20	60
ESR7040301008	1	3	6	4	8	55
ESR7040301010	1	3	6	4	10	55
ESR7040301012	1	3	6	4	12	55
ESR7040301016	1	3	6	4	16	55
ESR7040301020	1	3	6	4	20	60
ESR7040400110	0.1	4	6	6	10	55
ESR7040400112	0.1	4	6	6	12	55
ESR7040400116	0.1	4	6	6	16	55
ESR7040400120	0.1	4	6	6	20	60
ESR7040400125	0.1	4	6	6	25	60
ESR7040400210	0.2	4	6	6	10	55
ESR7040400212	0.2	4	6	6	12	55
ESR7040400216	0.2	4	6	6	16	55
ESR7040400220	0.2	4	6	6	20	60
ESR7040400225	0.2	4	6	6	25	60
ESR7040400310	0.3	4	6	6	10	55
ESR7040400312	0.3	4	6	6	12	55
ESR7040400316	0.3	4	6	6	16	55
ESR7040400320	0.3	4	6	6	20	60
ESR7040400325	0.3	4	6	6	25	60
ESR7040400510	0.5	4	6	6	10	55
ESR7040400512	0.5	4	6	6	12	55
ESR7040400516	0.5	4	6	6	16	55

H-Star Endmill

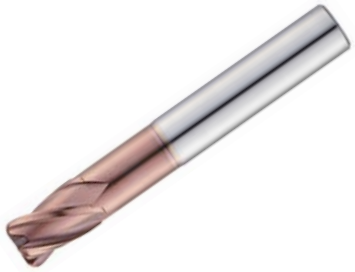
ESR704

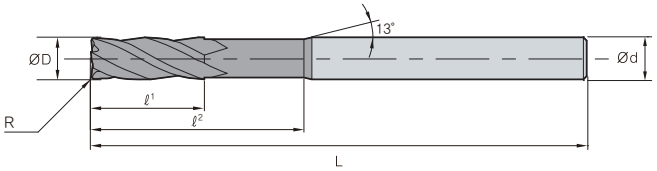
4날 넥 타입 레디우스 엔드밀

ULTRA FINE | 4 | 30° HELIX | R ±0.01 Ø6 이하 | R ±0.015 Ø6 초과 | AlTiN | 절삭조건 p.370

• 공구직경공차

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	





(mm)

형 번	R	ØD	Ød	ℓ1	ℓ2	L
ESR7040400520	0.5	4	6	6	20	60
ESR7040400525	0.5	4	6	6	25	60
ESR7040401010	1	4	6	6	10	55
ESR7040401012	1	4	6	6	12	55
ESR7040401016	1	4	6	6	16	55
ESR7040401020	1	4	6	6	20	60
ESR7040401025	1	4	6	6	25	60
ESR7040600220	0.2	6	6	9	20	60
ESR7040600320	0.3	6	6	9	20	60
ESR7040600520	0.5	6	6	9	20	60
ESR7040601020	1	6	6	9	20	60
ESR7040601520	1.5	6	6	9	20	60
ESR7040602020	2	6	6	9	20	60
ESR7040800225	0.2	8	8	12	25	60
ESR7040800325	0.3	8	8	12	25	60

형 번	R	ØD	Ød	ℓ1	ℓ2	L
ESR7040800525	0.5	8	8	12	25	60
ESR7040801025	1	8	8	12	25	60
ESR7040801525	1.5	8	8	12	25	60
ESR7040802025	2	8	8	12	25	60
ESR7041000232	0.2	10	10	15	32	70
ESR7041000332	0.3	10	10	15	32	70
ESR7041000532	0.5	10	10	15	32	70
ESR7041001032	1	10	10	15	32	70
ESR7041001532	1.5	10	10	15	32	70
ESR7041002032	2	10	10	15	32	70
ESR7041200338	0.3	12	12	18	38	80
ESR7041200538	0.5	12	12	18	38	80
ESR7041201038	1	12	12	18	38	80
ESR7041201538	1.5	12	12	18	38	80
ESR7041202038	2	12	12	18	38	80

• 적용 피삭재

탄소강 ~ HB225	합금강 HB225~325	프리하든강 HRC30~50	열처리강		동	흑연	주철 ~FCD500	알루미늄	스테인리스강
			SKD61~HRC55	SKD11 HRC55~63					
		○	◎	◎	○				

◎: 매우적합 ○: 적합

ESR714

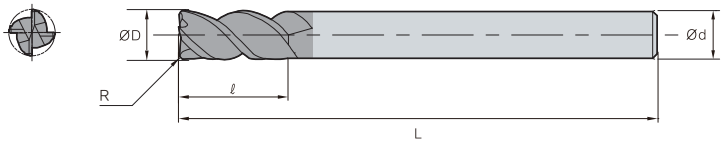
4날 레디우스 엔드밀



ULTRA FINE | 4 | 45° HELIX | R ±0.01 Ø6 이하 | R ±0.015 Ø6 초과 | AlTiN | 절삭조건 p.370

• 공구직경공차

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	



형 번	R	ØD	Ød	ℓ	L
ESR7140303	0.3	3	6	8	50
ESR7140305S4	0.5	3	4	8	50
ESR7140305	0.5	3	6	8	50
ESR7140403	0.3	4	6	11	50
ESR7140405	0.5	4	6	11	50
ESR7140405S4	0.5	4	4	11	50
ESR7140410	1	4	6	11	50
ESR7140603	0.3	6	6	15	60
ESR7140605	0.5	6	6	15	60
ESR7140610	1	6	6	15	60
ESR7140803	0.3	8	8	20	60
ESR7140805	0.5	8	8	20	60
ESR7140810	1	8	8	20	60
ESR7140815	1.5	8	8	20	60
ESR7140820	2	8	8	20	60
ESR7141003	0.3	10	10	25	70
ESR7141005	0.5	10	10	25	70
ESR7141010	1	10	10	25	70
ESR7141015	1.5	10	10	25	70
ESR7141020	2	10	10	25	70
ESR7141025	2.5	10	10	25	70
ESR7141030	3	10	10	25	70
ESR7141203	0.3	12	12	30	80
ESR7141205	0.5	12	12	30	80
ESR7141210	1	12	12	30	80
ESR7141215	1.5	12	12	30	80
ESR7141220	2	12	12	30	80
ESR7141225	2.5	12	12	30	80
ESR7141230	3	12	12	30	80

• 적용 피삭재

탄소강 ~ HB225	합금강 HB225~325	프리하든강 HRC30~50	열처리강		동	흑연	주철 ~FCD500	알루미늄	스테인리스강
			SKD61~HRC55	SKD11 HRC55~63					
		○	◎	◎	○				

◎: 매우적합 ○: 적합

H-Star Endmill

ESR724

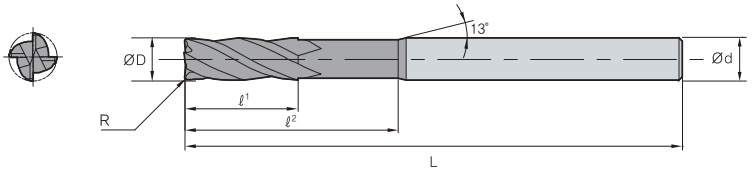
4날 넥 타입 레디우스 엔드밀



ULTRA FINE | 4 | 30° HELIX | R ±0.01 (Ø6 이하) | R ±0.015 (Ø6 초과) | AlTiN | 절삭조건 p.370

• 공구직경공차

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	



(mm)

형 번	R	ØD	Ød	ℓ1	ℓ2	L
ESR7240600520	0.5	6	6	9	20	90
ESR7240601020	1	6	6	9	20	90
ESR7240800525	0.5	8	8	12	25	100
ESR7240801025	1	8	8	12	25	100
ESR7241000532	0.5	10	10	15	32	100
ESR7241001032	1	10	10	15	32	100
ESR7241002032	2	10	10	15	32	100
ESR7241200538	0.5	12	12	18	38	110
ESR7241201038	1	12	12	18	38	110
ESR7241202038	2	12	12	18	38	110

• 적용 피삭재

탄소강 ~ HB225	합금강 HB225~325	프리하든강 HRC30~50	열처리강		동	흑연	주철 ~FCD500	알루미늄	스테인리스강
			SKD61~HRC55	SKD11 HRC55~63					
		○	◎	◎	○				

◎: 매우적합 ○: 적합

ESR734

4날 롱 샹크 레디우스 엔드밀

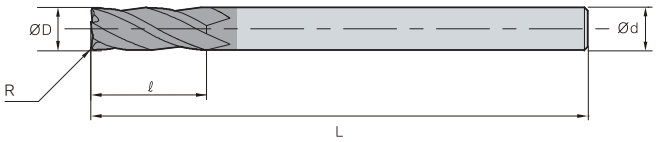


ULTRA FINE | 4 | 30° HELIX | R ±0.01 (Ø6 이하) | R ±0.015 (Ø6 초과) | AlTiN | 절삭조건 p.370

• 공구직경공차

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	





(mm)

형 번	R	ØD	Ød	ℓ	L
ESR73401001	0.1	1	6	2	50
ESR73401002	0.2	1	6	2	50
ESR73401003	0.3	1	6	2	50
ESR73401501	0.1	1.5	6	3	50
ESR73401502	0.2	1.5	6	3	50
ESR73401503	0.3	1.5	6	3	50
ESR73401505	0.5	1.5	6	3	50
ESR73402001	0.1	2	6	5	50
ESR73402002	0.2	2	6	5	50
ESR73402003	0.3	2	6	5	50
ESR73402005	0.5	2	6	5	50
ESR73402501	0.1	2.5	6	7	60
ESR73402502	0.2	2.5	6	7	60
ESR73402503	0.3	2.5	6	7	60
ESR73402505	0.5	2.5	6	7	60
ESR73403001	0.1	3	6	8	60
ESR73403002	0.2	3	6	8	60
ESR73403003	0.3	3	6	8	60
ESR73403005	0.5	3	6	8	60
ESR73404001	0.1	4	6	10	70
ESR73404002	0.2	4	6	10	70
ESR73404002S4	0.2	4	4	10	70
ESR73404003	0.3	4	6	10	70
ESR73404005	0.5	4	6	10	70
ESR73404005S4	0.5	4	4	10	70
ESR73404010	1	4	6	10	70
ESR73405001	0.1	5	6	13	80

형 번	R	ØD	Ød	ℓ	L
ESR73405002	0.2	5	6	13	80
ESR73405003	0.3	5	6	13	80
ESR73405005	0.5	5	6	13	80
ESR73405010	1	5	6	13	80
ESR73406001	0.1	6	6	15	90
ESR73406002	0.2	6	6	15	90
ESR73406003	0.3	6	6	15	90
ESR73406005	0.5	6	6	15	90
ESR73406010	1	6	6	15	90
ESR73408001	0.1	8	8	20	100
ESR73408002	0.2	8	8	20	100
ESR73408003	0.3	8	8	20	100
ESR73408005	0.5	8	8	20	100
ESR73408010	1	8	8	20	100
ESR73408020	2	8	8	20	100
ESR73410002	0.2	10	10	25	100
ESR73410003	0.3	10	10	25	100
ESR73410005	0.5	10	10	25	100
ESR73410010	1	10	10	25	100
ESR73410020	2	10	10	25	100
ESR73412002	0.2	12	12	30	110
ESR73412003	0.3	12	12	30	110
ESR73412005	0.5	12	12	30	110
ESR73412010	1	12	12	30	110
ESR73412010L	1	12	12	30	150
ESR73412020	2	12	12	30	110

• 적용 피삭재

탄소강 ~ HB225	합금강 HB225~325	프리하든강 HRC30~50	열처리강		동	흑연	주철 ~FCD500	알루미늄	스테인리스강
			SKD61~HRC55	SKD11 HRC55~63					
		○	◎	◎	○				

◎: 매우적합 ○: 적합

H-Star Endmill

ESR706

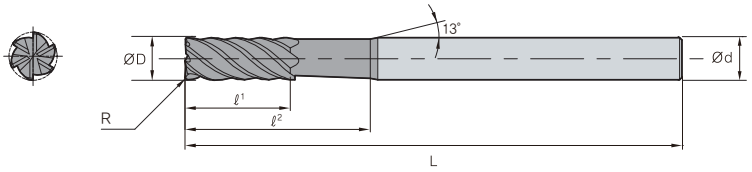
6날 넥 타입 레디우스 엔드밀



ULTRA FINE | 6 | 45° HELIX | R ±0.01 (Ø6 이하) | R ±0.015 (Ø6 초과) | AlTiN | 절삭조건 p.371

• 공구직경공차

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	



(mm)

형 번	R	ØD	Ød	ℓ1	ℓ2	L
ESR7060600314	0.3	6	6	6	14	50
ESR7060600514	0.5	6	6	6	14	50
ESR7060800524	0.5	8	8	8	24	60
ESR7060801024	1	8	8	8	24	60
ESR7061000530	0.5	10	10	10	30	70
ESR7061001030	1	10	10	10	30	70
ESR7061200530	0.5	12	12	12	30	75
ESR7061201030	1	12	12	12	30	75

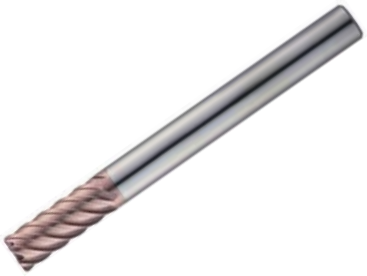
• 적용 피삭재

탄소강 ~ HB225	합금강 HB225~325	프리하든강 HRC30~50	열처리강		동	흑연	주철 ~FCD500	알루미늄	스테인리스강
			SKD61~HRC55	SKD11 HRC55~63					
		○	◎	◎	○				

◎: 매우적합 ○: 적합

ESR736

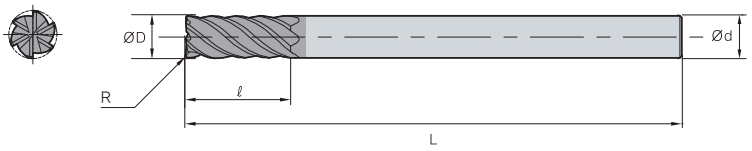
6날 레디우스 엔드밀



ULTRA FINE | 6 | 45° HELIX | R ±0.01 Ø6 이하 | R ±0.015 Ø6 초과 | AlTiN | 절삭조건 p.369

• 공구직경공차

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	



(mm)

형 번	R	ØD	Ød	ℓ	L
ESR73606005	0.5	6	6	15	90
ESR73606010	1	6	6	15	90
ESR73608005	0.5	8	8	20	100
ESR73608010	1	8	8	20	100
ESR73610005	0.5	10	10	25	100
ESR73610010	1	10	10	25	100
ESR73612005	0.5	12	12	30	110
ESR73612010	1	12	12	30	110

• 적용 피삭재

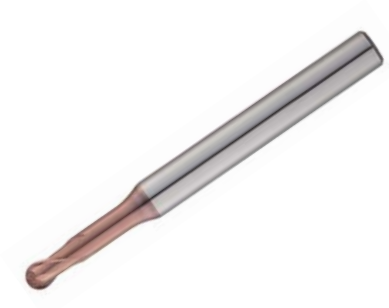
탄소강 ~ HB225	합금강 HB225~325	프리하든강 HRC30~50	열처리강		동	흑연	주철 ~FCD500	알루미늄	스테인리스강
			SKD61~HRC55	SKD11 HRC55~63					
		○	◎	◎	○				

◎: 매우적합 ○: 적합

H-Star Endmill

ESRB712

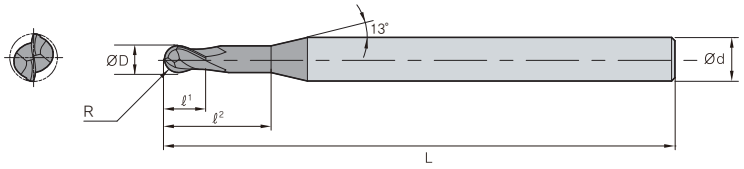
2날 리브 볼 엔드밀



ULTRA FINE | 2 | 30° HELIX | R ±0.005 (R3 이하) | R ±0.008 (R3 초과) | AlTiN | 절삭조건 p.372~376

• 공구직경공차

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	



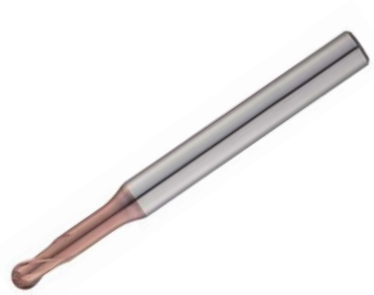
(mm)

형 번	R	ØD	Ød	ℓ1	ℓ2	L
ESRB712001002	0.05	0.1	4	0.1	0.2	40
ESRB712001003	0.05	0.1	4	0.1	0.3	40
ESRB712001005	0.05	0.1	4	0.1	0.5	40
ESRB71200101	0.05	0.1	4	0.1	1	40
ESRB712002005	0.1	0.2	4	0.2	0.5	40
ESRB712002015	0.1	0.2	4	0.2	1.5	40
ESRB71200201	0.1	0.2	4	0.2	1	40
ESRB71200202	0.1	0.2	4	0.2	2	40
ESRB71200203	0.1	0.2	4	0.2	3	40
ESRB712003015	0.15	0.3	4	0.3	1.5	40
ESRB71200301	0.15	0.3	4	0.3	1	40
ESRB712003025	0.15	0.3	4	0.3	2.5	40
ESRB71200302	0.15	0.3	4	0.3	2	40
ESRB71200303	0.15	0.3	4	0.3	3	40
ESRB71200304	0.15	0.3	4	0.3	4	40
ESRB71200305	0.15	0.3	4	0.3	5	40
ESRB712004015	0.2	0.4	4	0.4	1.5	40
ESRB71200401	0.2	0.4	4	0.4	1	40
ESRB712004025	0.2	0.4	4	0.4	2.5	40
ESRB71200402	0.2	0.4	4	0.4	2	40
ESRB71200403	0.2	0.4	4	0.4	3	40
ESRB71200404	0.2	0.4	4	0.4	4	40
ESRB71200405	0.2	0.4	4	0.4	5	40
ESRB71200406	0.2	0.4	4	0.4	6	40
ESRB71200408	0.2	0.4	4	0.4	8	40
ESRB71200410	0.2	0.4	4	0.4	10	40
ESRB712005015	0.25	0.5	4	0.5	1.5	45
ESRB71200501	0.25	0.5	4	0.5	1	45
ESRB71200501S6	0.25	0.5	6	0.5	1	45
ESRB712005025	0.25	0.5	4	0.5	2.5	45
ESRB71200502	0.25	0.5	4	0.5	2	45
ESRB71200502S6	0.25	0.5	6	0.5	2	45
ESRB71200503	0.25	0.5	4	0.5	3	45
ESRB71200504	0.25	0.5	4	0.5	4	45
ESRB71200504S6	0.25	0.5	6	0.5	4	45
ESRB71200505	0.25	0.5	4	0.5	5	45
ESRB71200506	0.25	0.5	4	0.5	6	45
ESRB71200508	0.25	0.5	4	0.5	8	45
ESRB71200510	0.25	0.5	4	0.5	10	45

형 번	R	ØD	Ød	ℓ1	ℓ2	L
ESRB71200512	0.25	0.5	4	0.5	12	45
ESRB71200514	0.25	0.5	4	0.5	14	45
ESRB71200516	0.25	0.5	4	0.5	16	45
ESRB71200601	0.3	0.6	4	0.6	1	45
ESRB71200601S6	0.3	0.6	6	0.6	1	45
ESRB71200602	0.3	0.6	4	0.6	2	45
ESRB71200602S6	0.3	0.6	6	0.6	2	45
ESRB71200603	0.3	0.6	4	0.6	3	45
ESRB71200603S6	0.3	0.6	6	0.6	3	45
ESRB71200604	0.3	0.6	4	0.6	4	45
ESRB71200604S6	0.3	0.6	6	0.6	4	45
ESRB71200605	0.3	0.6	4	0.6	5	45
ESRB71200605S6	0.3	0.6	6	0.6	5	45
ESRB71200606	0.3	0.6	4	0.6	6	45
ESRB71200606S6	0.3	0.6	6	0.6	6	45
ESRB71200608	0.3	0.6	4	0.6	8	45
ESRB71200608S6	0.3	0.6	6	0.6	8	45
ESRB71200610	0.3	0.6	4	0.6	10	45
ESRB71200610S6	0.3	0.6	6	0.6	10	45
ESRB71200612	0.3	0.6	4	0.6	12	45
ESRB71200612S6	0.3	0.6	6	0.6	12	45
ESRB71200614	0.3	0.6	4	0.6	14	45
ESRB71200614S6	0.3	0.6	6	0.6	14	45
ESRB71200616	0.3	0.6	4	0.6	16	45
ESRB71200616S6	0.3	0.6	6	0.6	16	50
ESRB71200702	0.35	0.7	4	0.7	2	45
ESRB71200704	0.35	0.7	4	0.7	4	45
ESRB71200706	0.35	0.7	4	0.7	6	45
ESRB71200708	0.35	0.7	4	0.7	8	45
ESRB71200710	0.35	0.7	4	0.7	10	45
ESRB71200712	0.35	0.7	4	0.7	12	45
ESRB71200801	0.4	0.8	4	0.8	1	45
ESRB71200801S6	0.4	0.8	6	0.8	1	45
ESRB71200802	0.4	0.8	4	0.8	2	45
ESRB71200802S6	0.4	0.8	6	0.8	2	45
ESRB71200803	0.4	0.8	4	0.8	3	45
ESRB71200803S6	0.4	0.8	6	0.8	3	45
ESRB71200804	0.4	0.8	4	0.8	4	45
ESRB71200804S6	0.4	0.8	6	0.8	4	45

ESRB712

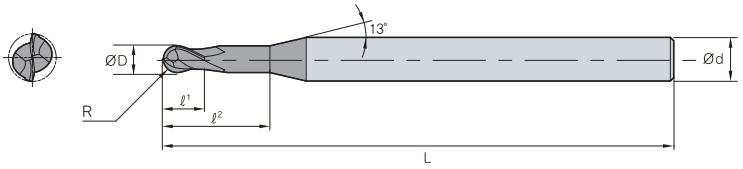
2날 리브 볼 엔드밀



ULTRA FINE | 2 | 30° HELIX | R ±0.005 (R3 이하) | R ±0.008 (R3 초과) | AlTiN | 절삭조건 p.372~376

• 공구직경공차

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	



(mm)

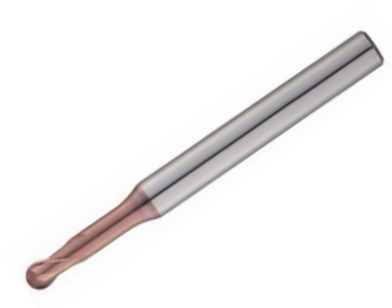
형 번	R	ØD	Ød	ℓ1	ℓ2	L
ESRB71200805	0.4	0.8	4	0.8	5	45
ESRB71200805S6	0.4	0.8	6	0.8	5	45
ESRB71200806	0.4	0.8	4	0.8	6	45
ESRB71200806S6	0.4	0.8	6	0.8	6	45
ESRB71200808	0.4	0.8	4	0.8	8	45
ESRB71200808S6	0.4	0.8	6	0.8	8	45
ESRB71200810	0.4	0.8	4	0.8	10	45
ESRB71200810S6	0.4	0.8	6	0.8	10	45
ESRB71200812	0.4	0.8	4	0.8	12	45
ESRB71200812S6	0.4	0.8	6	0.8	12	45
ESRB71200814	0.4	0.8	4	0.8	14	45
ESRB71200814S6	0.4	0.8	6	0.8	14	45
ESRB71200816	0.4	0.8	4	0.8	16	45
ESRB71200816S6	0.4	0.8	6	0.8	16	50
ESRB71200820	0.4	0.8	4	0.8	20	50
ESRB71200820S6	0.4	0.8	6	0.8	20	55
ESRB71200904	0.45	0.9	4	0.9	4	45
ESRB71200906	0.45	0.9	4	0.9	6	45
ESRB71200908	0.45	0.9	4	0.9	8	45
ESRB71200910	0.45	0.9	4	0.9	10	45
ESRB71201002	0.5	1	4	1	2	50
ESRB71201002S6	0.5	1	6	1	2	50
ESRB71201003	0.5	1	4	1	3	50
ESRB71201003S6	0.5	1	6	1	3	50
ESRB71201004	0.5	1	4	1	4	50
ESRB71201004S6	0.5	1	6	1	4	50
ESRB71201005	0.5	1	4	1	5	50
ESRB71201005S6	0.5	1	6	1	5	50
ESRB71201006	0.5	1	4	1	6	50
ESRB71201006S6	0.5	1	6	1	6	50
ESRB71201007	0.5	1	4	1	7	50
ESRB71201007S6	0.5	1	6	1	7	50
ESRB71201008	0.5	1	4	1	8	50
ESRB71201008S6	0.5	1	6	1	8	50
ESRB71201009	0.5	1	4	1	9	50
ESRB71201009S6	0.5	1	6	1	9	50
ESRB71201010	0.5	1	4	1	10	50
ESRB71201010S6	0.5	1	6	1	10	50
ESRB71201012	0.5	1	4	1	12	50

형 번	R	ØD	Ød	ℓ1	ℓ2	L
ESRB71201012S6	0.5	1	6	1	12	50
ESRB71201014	0.5	1	4	1	14	50
ESRB71201014S6	0.5	1	6	1	14	50
ESRB71201016	0.5	1	4	1	16	50
ESRB71201016S6	0.5	1	6	1	16	50
ESRB71201018	0.5	1	4	1	18	50
ESRB71201018S6	0.5	1	6	1	18	50
ESRB71201020	0.5	1	4	1	20	55
ESRB71201020S6	0.5	1	6	1	20	55
ESRB71201022	0.5	1	4	1	22	60
ESRB71201022S6	0.5	1	6	1	22	60
ESRB71201026	0.5	1	4	1	26	60
ESRB71201026S6	0.5	1	6	1	26	60
ESRB71201030	0.5	1	4	1	30	70
ESRB71201030S6	0.5	1	6	1	30	70
ESRB71201040	0.5	1	4	1	40	80
ESRB71201050	0.5	1	4	1	50	100
ESRB71201204	0.6	1.2	4	1.2	4	50
ESRB71201206	0.6	1.2	4	1.2	6	50
ESRB71201208	0.6	1.2	4	1.2	8	50
ESRB71201210	0.6	1.2	4	1.2	10	50
ESRB71201212	0.6	1.2	4	1.2	12	50
ESRB71201216	0.6	1.2	4	1.2	16	50
ESRB71201220	0.6	1.2	4	1.2	20	50
ESRB71201226	0.6	1.2	4	1.2	26	60
ESRB71201406	0.7	1.4	4	1.4	6	50
ESRB71201408	0.7	1.4	4	1.4	8	50
ESRB71201410	0.7	1.4	4	1.4	10	50
ESRB71201412	0.7	1.4	4	1.4	12	50
ESRB71201416	0.7	1.4	4	1.4	16	50
ESRB71201503	0.75	1.5	4	1.5	3	50
ESRB71201503S6	0.75	1.5	6	1.5	3	50
ESRB71201504	0.75	1.5	4	1.5	4	50
ESRB71201504S6	0.75	1.5	6	1.5	4	50
ESRB71201505	0.75	1.5	4	1.5	5	50
ESRB71201506	0.75	1.5	4	1.5	6	50
ESRB71201506S6	0.75	1.5	6	1.5	6	50
ESRB71201507	0.75	1.5	4	1.5	7	50
ESRB71201508	0.75	1.5	4	1.5	8	50

H-Star Endmill

ESRB712

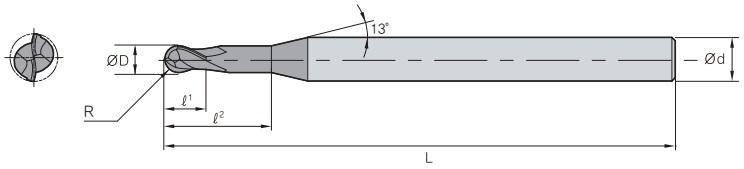
2날 리브 볼 엔드밀



ULTRA FINE | 2 | 30° HELIX | R ±0.005 (R3 이하) | R ±0.008 (R3 초과) | AlTiN | 절삭조건 p.372~376

• 공구직경공차

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	



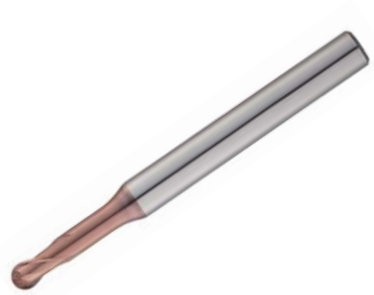
(mm)

형 번	R	ØD	Ød	ℓ1	ℓ2	L
ESRB71201508S6	0.75	1.5	6	1.5	8	50
ESRB71201510	0.75	1.5	4	1.5	10	50
ESRB71201510S6	0.75	1.5	6	1.5	10	50
ESRB71201512	0.75	1.5	4	1.5	12	50
ESRB71201512S6	0.75	1.5	6	1.5	12	50
ESRB71201514	0.75	1.5	4	1.5	14	50
ESRB71201514S6	0.75	1.5	6	1.5	14	50
ESRB71201516	0.75	1.5	4	1.5	16	50
ESRB71201516S6	0.75	1.5	6	1.5	16	50
ESRB71201518	0.75	1.5	4	1.5	18	50
ESRB71201518S6	0.75	1.5	6	1.5	18	50
ESRB71201520	0.75	1.5	4	1.5	20	55
ESRB71201520S6	0.75	1.5	6	1.5	20	55
ESRB71201522	0.75	1.5	4	1.5	22	60
ESRB71201522S6	0.75	1.5	6	1.5	22	60
ESRB71201526	0.75	1.5	4	1.5	26	60
ESRB71201526S6	0.75	1.5	6	1.5	26	60
ESRB71201530	0.75	1.5	4	1.5	30	70
ESRB71201530S6	0.75	1.5	6	1.5	30	70
ESRB71201535	0.75	1.5	4	1.5	35	70
ESRB71201535S6	0.75	1.5	6	1.5	35	70
ESRB71201540	0.75	1.5	4	1.5	40	80
ESRB71201540S6	0.75	1.5	6	1.5	40	80
ESRB71201604	0.8	1.6	4	1.6	4	50
ESRB71201606	0.8	1.6	4	1.6	6	50
ESRB71201608	0.8	1.6	4	1.6	8	50
ESRB71201610	0.8	1.6	4	1.6	10	50
ESRB71201612	0.8	1.6	4	1.6	12	50
ESRB71201616	0.8	1.6	4	1.6	16	50
ESRB71201620	0.8	1.6	4	1.6	20	50
ESRB71201804	0.9	1.8	4	1.8	4	50
ESRB71201806	0.9	1.8	4	1.8	6	50
ESRB71201808	0.9	1.8	4	1.8	8	50
ESRB71201810	0.9	1.8	4	1.8	10	50
ESRB71201812	0.9	1.8	4	1.8	12	50
ESRB71201816	0.9	1.8	4	1.8	16	50
ESRB71201820	0.9	1.8	4	1.8	20	50
ESRB71202004	1	2	4	2	4	50
ESRB71202004S6	1	2	6	2	4	50

형 번	R	ØD	Ød	ℓ1	ℓ2	L
ESRB71202006	1	2	4	2	6	50
ESRB71202006S6	1	2	6	2	6	50
ESRB71202008	1	2	4	2	8	50
ESRB71202008S6	1	2	6	2	8	50
ESRB71202010	1	2	4	2	10	50
ESRB71202010S6	1	2	6	2	10	50
ESRB71202012	1	2	4	2	12	50
ESRB71202012S6	1	2	6	2	12	50
ESRB71202014	1	2	4	2	14	50
ESRB71202014S6	1	2	6	2	14	50
ESRB71202016	1	2	4	2	16	50
ESRB71202016S6	1	2	6	2	16	50
ESRB71202018	1	2	4	2	18	55
ESRB71202018S6	1	2	6	2	18	55
ESRB71202020	1	2	4	2	20	55
ESRB71202020S6	1	2	6	2	20	55
ESRB71202022	1	2	4	2	22	60
ESRB71202022S6	1	2	6	2	22	60
ESRB71202026	1	2	4	2	26	60
ESRB71202026S6	1	2	6	2	26	60
ESRB71202030	1	2	4	2	30	70
ESRB71202030S6	1	2	6	2	30	70
ESRB71202035	1	2	4	2	35	70
ESRB71202035S6	1	2	6	2	35	70
ESRB71202040	1	2	4	2	40	80
ESRB71202040S6	1	2	6	2	40	80
ESRB71202045	1	2	4	2	45	90
ESRB71202045S6	1	2	6	2	45	90
ESRB71202050	1	2	4	2	50	100
ESRB71202050S6	1	2	6	2	50	100
ESRB71202060	1	2	4	2	60	110
ESRB71202508	1.25	2.5	4	2.5	8	50
ESRB71202510	1.25	2.5	4	2.5	10	50
ESRB71202512	1.25	2.5	4	2.5	12	50
ESRB71202516	1.25	2.5	4	2.5	16	50
ESRB71202520	1.25	2.5	4	2.5	20	50
ESRB71202522	1.25	2.5	4	2.5	22	60
ESRB71202526	1.25	2.5	4	2.5	26	60
ESRB71202530	1.25	2.5	4	2.5	30	70

ESRB712

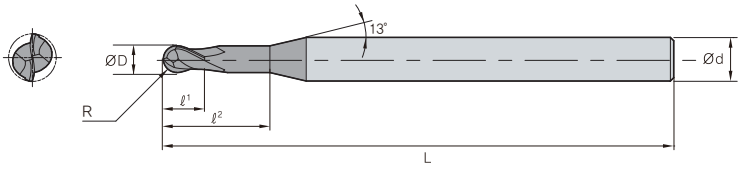
2날 리브 볼 엔드밀



ULTRA FINE | 2 | 30° HELIX | R ±0.005 (R3 이하) | R ±0.008 (R3 초과) | AlTiN | 절삭조건 p.372~376

• 공구직경공차

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	



(mm)

형 번	R	ØD	Ød	ℓ1	ℓ2	L
ESRB71202535	1.25	2.5	4	2.5	35	70
ESRB71202540	1.25	2.5	4	2.5	40	80
ESRB71202545	1.25	2.5	4	2.5	45	90
ESRB71202550	1.25	2.5	4	2.5	50	100
ESRB71203006	1.5	3	6	3	6	50
ESRB71203008	1.5	3	6	3	8	50
ESRB71203010	1.5	3	6	3	10	50
ESRB71203012	1.5	3	6	3	12	50
ESRB71203014	1.5	3	6	3	14	60
ESRB71203016	1.5	3	6	3	16	60
ESRB71203018	1.5	3	6	3	18	60
ESRB71203020	1.5	3	6	3	20	60
ESRB71203022	1.5	3	6	3	22	65
ESRB71203026	1.5	3	6	3	26	65
ESRB71203030	1.5	3	6	3	30	70
ESRB71203035	1.5	3	6	3	35	70
ESRB71203040	1.5	3	6	3	40	80
ESRB71203045	1.5	3	6	3	45	90
ESRB71203050	1.5	3	6	3	50	100
ESRB71203060	1.5	3	6	3	60	100
ESRB71203510	1.75	3.5	6	3	10	50
ESRB71203516	1.75	3.5	6	3	16	60
ESRB71203520	1.75	3.5	6	3	20	60
ESRB71203526	1.75	3.5	6	3	26	65
ESRB71203530	1.75	3.5	6	3	30	70
ESRB71204008	2	4	6	4	8	50
ESRB71204010	2	4	6	4	10	50
ESRB71204012	2	4	6	4	12	50
ESRB71204014	2	4	6	4	14	60
ESRB71204016	2	4	6	4	16	60
ESRB71204018	2	4	6	4	18	60
ESRB71204020	2	4	6	4	20	60
ESRB71204022	2	4	6	4	22	65
ESRB71204026	2	4	6	4	26	65

형 번	R	ØD	Ød	ℓ1	ℓ2	L
ESRB71204030	2	4	6	4	30	70
ESRB71204035	2	4	6	4	35	70
ESRB71204040	2	4	6	4	40	80
ESRB71204045	2	4	6	4	45	90
ESRB71204050	2	4	6	4	50	100
ESRB71204055	2	4	6	4	55	100
ESRB71204060	2	4	6	4	60	100
ESRB71205015	2.5	5	6	6	15	60
ESRB71205020	2.5	5	6	6	20	60
ESRB71205026	2.5	5	6	6	26	65
ESRB71205030	2.5	5	6	6	30	70
ESRB71205035	2.5	5	6	6	35	70
ESRB71205040	2.5	5	6	6	40	80
ESRB71205045	2.5	5	6	6	45	90
ESRB71205050	2.5	5	6	6	50	100
ESRB71205055	2.5	5	6	6	55	100
ESRB71205060	2.5	5	6	6	60	100
ESRB7120602090	3	6	6	12	20	90
ESRB71206020	3	6	6	8	20	60
ESRB7120603090	3	6	6	12	30	90
ESRB71206030	3	6	6	8	30	60
ESRB71208025100	4	8	8	14	25	100
ESRB71208025	4	8	8	10	25	70
ESRB71208035100	4	8	8	14	35	100
ESRB71208035	4	8	8	10	35	70
ESRB71210030100	5	10	10	18	30	100
ESRB71210030	5	10	10	12	30	75
ESRB71210040100	5	10	10	18	40	100
ESRB71210040	5	10	10	12	40	75
ESRB71212032110	6	12	12	22	32	110
ESRB71212032	6	12	12	14	32	80
ESRB71212045110	6	12	12	22	45	110
ESRB71212045	6	12	12	14	45	80

• 적용 피삭재

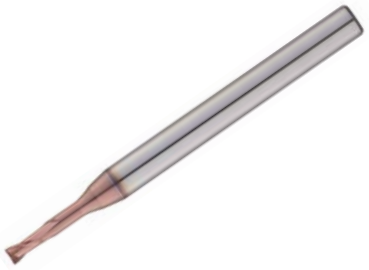
탄소강 ~ HB225	합금강 HB225~325	프리하든강 HRC30~50	열처리강		동	흑연	주철 ~FCD500	알루미늄	스테인리스강
			SKD61~HRC55	SKD11 HRC55~63					
		○	◎	◎	○				

◎: 매우적합 ○: 적합

H-Star Endmill

ESRE712

2날 리브 플랫 엔드밀

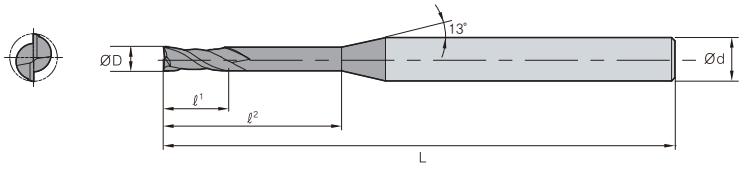


ULTRA FINE | 2 | 30° HELIX | AlTiN | 절삭조건

p.377~381

• 공구직경공차

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	



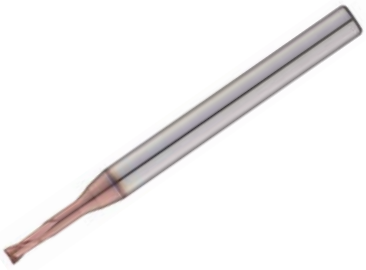
(mm)

형 번	ØD	Ød	ℓ1	ℓ2	L
ESRE712001003	0.1	4	0.15	0.3	40
ESRE712001005	0.1	4	0.15	0.5	40
ESRE71200101	0.1	4	0.15	1	40
ESRE712002005	0.2	4	0.3	0.5	40
ESRE712002015	0.2	4	0.3	1.5	40
ESRE71200201	0.2	4	0.3	1	40
ESRE71200202	0.2	4	0.3	2	40
ESRE712003015	0.3	4	0.5	1.5	40
ESRE71200301	0.3	4	0.5	1	40
ESRE712003025	0.3	4	0.5	2.5	40
ESRE71200302	0.3	4	0.5	2	40
ESRE71200303	0.3	4	0.5	3	40
ESRE71200304	0.3	4	0.5	4	40
ESRE71200305	0.4	4	0.5	5	40
ESRE712004015	0.4	4	0.6	1.5	40
ESRE71200401	0.4	4	0.6	1	40
ESRE712004025	0.4	4	0.6	2.5	40
ESRE71200402	0.4	4	0.6	2	40
ESRE71200403	0.4	4	0.6	3	40
ESRE71200404	0.4	4	0.6	4	40
ESRE71200405	0.4	4	0.6	5	40
ESRE71200406	0.4	4	0.6	6	40
ESRE71200408	0.4	4	0.6	8	40
ESRE71200410	0.5	4	0.6	10	40
ESRE712005015	0.5	4	0.7	1.5	45
ESRE71200501	0.5	4	0.7	1	45
ESRE712005025	0.5	4	0.7	2.5	45
ESRE71200502	0.5	4	0.7	2	45
ESRE71200503	0.5	4	0.7	3	45
ESRE71200504	0.5	4	0.7	4	45
ESRE71200505	0.5	4	0.7	5	45
ESRE71200506	0.5	4	0.7	6	45
ESRE71200508	0.5	4	0.7	8	45
ESRE71200510	0.5	4	0.7	10	45
ESRE71200512	0.5	4	0.7	12	45
ESRE71200514	0.5	4	0.7	14	45
ESRE71200516	0.5	4	0.7	16	45
ESRE71200602	0.6	4	0.9	2	45

형 번	ØD	Ød	ℓ1	ℓ2	L
ESRE71200603	0.6	4	0.9	3	45
ESRE71200604	0.6	4	0.9	4	45
ESRE71200605	0.6	4	0.9	5	45
ESRE71200606	0.6	4	0.9	6	45
ESRE71200608	0.6	4	0.9	8	45
ESRE71200610	0.6	4	0.9	10	45
ESRE71200612	0.6	4	0.9	12	45
ESRE71200614	0.6	4	0.9	14	45
ESRE71200616	0.6	4	0.9	16	45
ESRE71200702	0.7	4	1.2	2	45
ESRE71200704	0.7	4	1.2	4	45
ESRE71200706	0.7	4	1.2	6	45
ESRE71200708	0.7	4	1.2	8	45
ESRE71200710	0.7	4	1.2	10	45
ESRE71200712	0.7	4	1.2	12	45
ESRE71200802	0.8	4	1.2	2	45
ESRE71200803	0.8	4	1.2	3	45
ESRE71200804	0.8	4	1.2	4	45
ESRE71200805	0.8	4	1.2	5	45
ESRE71200806	0.8	4	1.2	6	45
ESRE71200808	0.8	4	1.2	8	45
ESRE71200810	0.8	4	1.2	10	45
ESRE71200812	0.8	4	1.2	12	45
ESRE71200814	0.8	4	1.2	14	45
ESRE71200816	0.8	4	1.2	16	45
ESRE71200820	0.8	4	1.2	20	50
ESRE71200906	0.9	4	1.3	6	45
ESRE71200908	0.9	4	1.3	8	45
ESRE71200910	0.9	4	1.3	10	45
ESRE71201002	1	4	1.5	2	50
ESRE71201003	1	4	1.5	3	50
ESRE71201004	1	4	1.5	4	50
ESRE71201005	1	4	1.5	5	50
ESRE71201006	1	4	1.5	6	50
ESRE71201007	1	4	1.5	7	50
ESRE71201008	1	4	1.5	8	50
ESRE71201010	1	4	1.5	10	50
ESRE71201012	1	4	1.5	12	50

ESRE712

2날 리브 플랫 엔드밀

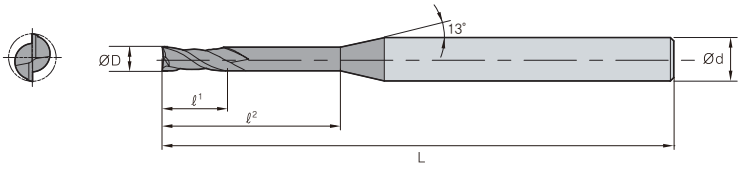


ULTRA FINE | 2 | 30° HELIX | AlTiN | 절삭조건

p.377~381

• 공구직경공차

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	



(mm)

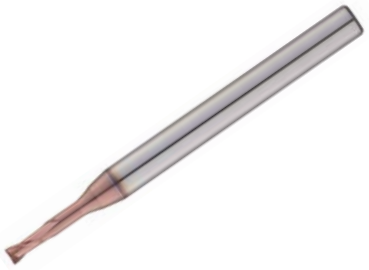
형 번	ØD	Ød	ℓ1	ℓ2	L
ESRE71201014	1	4	1.5	14	50
ESRE71201016	1	4	1.5	16	50
ESRE71201018	1	4	1.5	18	50
ESRE71201020	1	4	1.5	20	50
ESRE71201022	1	4	1.5	22	60
ESRE71201026	1	4	1.5	26	60
ESRE71201030	1	4	1.5	30	70
ESRE71201040	1	4	1.5	40	80
ESRE71201050	1	4	1.5	50	100
ESRE71201204	1.2	4	1.8	4	50
ESRE71201206	1.2	4	1.8	6	50
ESRE71201208	1.2	4	1.8	8	50
ESRE71201210	1.2	4	1.8	10	50
ESRE71201212	1.2	4	1.8	12	50
ESRE71201214	1.2	4	1.8	14	50
ESRE71201216	1.2	4	1.8	16	50
ESRE71201220	1.2	4	1.8	20	50
ESRE71201226	1.2	4	1.8	26	60
ESRE71201230	1.2	4	1.8	30	70
ESRE71201406	1.4	4	2.1	6	50
ESRE71201408	1.4	4	2.1	8	50
ESRE71201410	1.4	4	2.1	10	50
ESRE71201414	1.4	4	2.1	14	50
ESRE71201416	1.4	4	2.1	16	50
ESRE71201420	1.4	4	2.1	20	50
ESRE71201504	1.5	4	2.3	4	50
ESRE71201505	1.5	4	2.3	5	50
ESRE71201506	1.5	4	2.3	6	50
ESRE71201507	1.5	4	2.3	7	50
ESRE71201508	1.5	4	2.3	8	50
ESRE71201510	1.5	4	2.3	10	50
ESRE71201512	1.5	4	2.3	12	50
ESRE71201514	1.5	4	2.3	14	50
ESRE71201516	1.5	4	2.3	16	50
ESRE71201518	1.5	4	2.3	18	50
ESRE71201520	1.5	4	2.3	20	50
ESRE71201522	1.5	4	2.3	22	60
ESRE71201526	1.5	4	2.3	26	60

형 번	ØD	Ød	ℓ1	ℓ2	L
ESRE71201530	1.5	4	2.3	30	70
ESRE71201608	1.6	4	2.3	8	50
ESRE71201610	1.6	4	2.3	10	50
ESRE71201612	1.6	4	2.3	12	50
ESRE71201616	1.6	4	2.3	16	50
ESRE71201620	1.6	4	2.3	20	50
ESRE71201808	1.8	4	2.7	8	50
ESRE71201810	1.8	4	2.7	10	50
ESRE71201812	1.8	4	2.7	12	50
ESRE71201816	1.8	4	2.7	16	50
ESRE71201820	1.8	4	2.7	20	50
ESRE71202006	2	4	3	6	50
ESRE71202008	2	4	3	8	50
ESRE71202010	2	4	3	10	50
ESRE71202012	2	4	3	12	50
ESRE71202014	2	4	3	14	50
ESRE71202016	2	4	3	16	50
ESRE71202018	2	4	3	18	50
ESRE71202020	2	4	3	20	50
ESRE71202022	2	4	3	22	60
ESRE71202026	2	4	3	26	60
ESRE71202030	2	4	3	30	70
ESRE71202035	2	4	3	35	70
ESRE71202040	2	4	3	40	80
ESRE71202045	2	4	3	45	90
ESRE71202050	2	4	3	50	100
ESRE71202060	2	4	3	60	110
ESRE71202508	2.5	4	4	8	50
ESRE71202510	2.5	4	4	10	50
ESRE71202512	2.5	4	4	12	50
ESRE71202514	2.5	4	4	14	50
ESRE71202516	2.5	4	4	16	50
ESRE71202518	2.5	4	4	18	50
ESRE71202520	2.5	4	4	20	50
ESRE71202522	2.5	4	4	22	60
ESRE71202526	2.5	4	4	26	60
ESRE71202530	2.5	4	4	30	70
ESRE71202535	2.5	4	4	35	70

H-Star Endmill

ESRE712

2날 리브 플랫 엔드밀

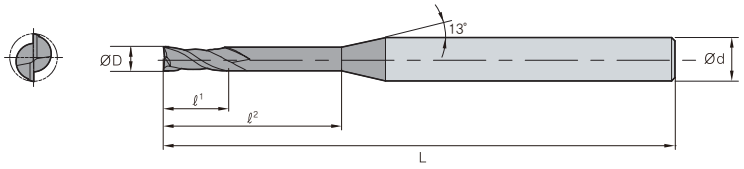


ULTRA FINE | 2 | 30° HELIX | AlTiN | 절삭조건

p.377~381

• 공구직경공차

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	



(mm)

형 번	ØD	Ød	ℓ1	ℓ2	L
ESRE71202540	2.5	4	4	40	80
ESRE71202545	2.5	4	4	45	90
ESRE71202550	2.5	4	4	50	100
ESRE71203006	3	6	4.5	6	50
ESRE71203008	3	6	4.5	8	50
ESRE71203010	3	6	4.5	10	50
ESRE71203012	3	6	4.5	12	50
ESRE71203014	3	6	4.5	14	60
ESRE71203016	3	6	4.5	16	60
ESRE71203018	3	6	4.5	18	60
ESRE71203020	3	6	4.5	20	60
ESRE71203022	3	6	4.5	22	65
ESRE71203026	3	6	4.5	26	65
ESRE71203030	3	6	4.5	30	70
ESRE71203035	3	6	4.5	35	70
ESRE71203040	3	6	4.5	40	80
ESRE71203045	3	6	4.5	45	90
ESRE71203050	3	6	4.5	50	100
ESRE71203060	3	6	4.5	60	100
ESRE71204008	4	6	6	8	50
ESRE71204010	4	6	6	10	50
ESRE71204012	4	6	6	12	50
ESRE71204014	4	6	6	14	60
ESRE71204016	4	6	6	16	60
ESRE71204018	4	6	6	18	60
ESRE71204020	4	6	6	20	60
ESRE71204022	4	6	6	22	65
ESRE71204026	4	6	6	26	65

형 번	ØD	Ød	ℓ1	ℓ2	L
ESRE71204030	4	6	6	30	70
ESRE71204035	4	6	6	35	70
ESRE71204040	4	6	6	40	80
ESRE71204045	4	6	6	45	90
ESRE71204050	4	6	6	50	100
ESRE71204060	4	6	6	60	100
ESRE71205016	5	6	8	16	60
ESRE71205020	5	6	8	20	60
ESRE71205026	5	6	8	26	65
ESRE71205030	5	6	8	30	70
ESRE71205035	5	6	8	35	75
ESRE71205040	5	6	8	40	80
ESRE71205050	5	6	8	50	90
ESRE71205060	5	6	8	60	100
ESRE71206015	6	6	9	15	60
ESRE71206020	6	6	9	20	60
ESRE71206030	6	6	9	30	70
ESRE71206032	6	6	9	32	90
ESRE71208025	8	8	12	25	70
ESRE71208030	8	8	12	30	80
ESRE71208042	8	8	12	42	100
ESRE71210030	10	10	15	30	75
ESRE71210035	10	10	15	35	80
ESRE71210045	10	10	15	45	100
ESRE71212035	12	12	20	35	80
ESRE71212040	12	12	20	40	90
ESRE71212050	12	12	20	50	110

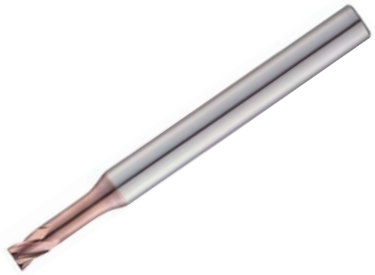
• 적용 피삭재

탄소강 ~ HB225	합금강 HB225~325	프리하든강 HRC30~50	열처리강		동	흑연	주철 ~FCD500	알루미늄	스테인리스강
			SKD61~HRC55	SKD11 HRC55~63					
		○	◎	◎	○				

◎: 매우적합 ○: 적합

ESRE714

4날 리브 플랫 엔드밀

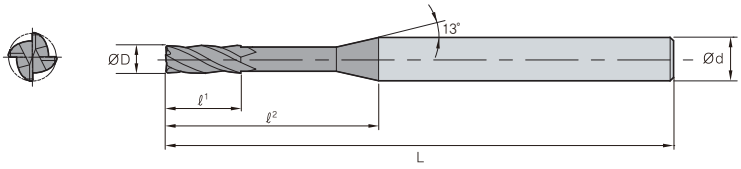


ULTRA FINE | 4 | 30° HELIX | AlTiN | 절삭조건

p.382~385

• 공구직경공차

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	



(mm)

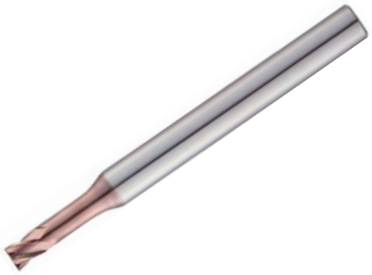
형 번	ØD	Ød	ℓ1	ℓ2	L
ESRE71400501	0.5	4	0.5	1	40
ESRE71400502	0.5	4	0.5	2	40
ESRE71400503	0.5	4	0.5	3	45
ESRE71400504	0.5	4	0.5	4	45
ESRE71400505	0.5	4	0.5	5	45
ESRE71400506	0.5	4	0.5	6	45
ESRE71400508	0.5	4	0.5	8	45
ESRE71400510	0.5	4	0.5	10	50
ESRE71400601	0.6	4	0.6	1	45
ESRE71400602	0.6	4	0.6	2	45
ESRE71400603	0.6	4	0.6	3	45
ESRE71400604	0.6	4	0.6	4	45
ESRE71400605	0.6	4	0.6	5	45
ESRE71400606	0.6	4	0.6	6	45
ESRE71400608	0.6	4	0.6	8	45
ESRE71400610	0.6	4	0.6	10	50
ESRE71400612	0.6	4	0.6	12	50
ESRE71400702	0.7	4	0.7	2	45
ESRE71400704	0.7	4	0.7	4	45
ESRE71400706	0.7	4	0.7	6	45
ESRE71400708	0.7	4	0.7	8	45
ESRE71400710	0.7	4	0.7	10	50
ESRE71400801	0.8	4	0.8	1	40
ESRE71400802	0.8	4	0.8	2	40
ESRE71400803	0.8	4	0.8	3	40
ESRE71400804	0.8	4	0.8	4	40
ESRE71400805	0.8	4	0.8	5	40
ESRE71400806	0.8	4	0.8	6	40
ESRE71400808	0.8	4	0.8	8	40
ESRE71400810	0.8	4	0.8	10	50
ESRE71400812	0.8	4	0.8	12	50
ESRE71400816	0.8	4	0.8	16	50
ESRE71401002	1	4	1	2	45
ESRE71401003	1	4	1	3	45
ESRE71401004	1	4	1	4	45
ESRE71401006	1	4	1	6	45

형 번	ØD	Ød	ℓ1	ℓ2	L
ESRE71401008	1	4	1	8	45
ESRE71401010	1	4	1	10	50
ESRE71401012	1	4	1	12	50
ESRE71401014	1	4	1	14	50
ESRE71401016	1	4	1	16	50
ESRE71401018	1	4	1	18	60
ESRE71401020	1	4	1	20	60
ESRE71401204	1.2	4	1.2	4	45
ESRE71401206	1.2	4	1.2	6	45
ESRE71401208	1.2	4	1.2	8	45
ESRE71401210	1.2	4	1.2	10	50
ESRE71401212	1.2	4	1.2	12	50
ESRE71401216	1.2	4	1.2	16	50
ESRE71401218	1.2	4	1.2	18	60
ESRE71401220	1.2	4	1.2	20	60
ESRE71401406	1.4	4	1.4	6	45
ESRE71401408	1.4	4	1.4	8	45
ESRE71401410	1.4	4	1.4	10	50
ESRE71401412	1.4	4	1.4	12	50
ESRE71401414	1.4	4	1.4	14	50
ESRE71401416	1.4	4	1.4	16	50
ESRE71401504	1.5	4	1.5	4	45
ESRE71401506	1.5	4	1.5	6	45
ESRE71401508	1.5	4	1.5	8	45
ESRE71401510	1.5	4	1.5	10	50
ESRE71401512	1.5	4	1.5	12	50
ESRE71401516	1.5	4	1.5	16	50
ESRE71401518	1.5	4	1.5	18	60
ESRE71401520	1.5	4	1.5	20	60
ESRE71401525	1.5	4	1.5	25	60
ESRE71401530	1.5	4	1.5	30	70
ESRE71401606	1.6	4	1.6	6	45
ESRE71401608	1.6	4	1.6	8	45
ESRE71401610	1.6	4	1.6	10	50
ESRE71401612	1.6	4	1.6	12	50
ESRE71401614	1.6	4	1.6	14	50

H-Star Endmill

ESRE714

4날 리브 플랫 엔드밀

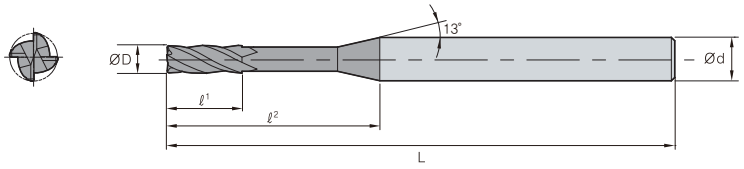


ULTRA FINE | 4 | 30° HELIX | AlTiN | 절삭조건

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• 공구직경공차

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	



(mm)

형 번	ØD	Ød	ℓ1	ℓ2	L
ESRE71401616	1.6	4	1.6	16	50
ESRE71401618	1.6	4	1.6	18	60
ESRE71401620	1.6	4	1.6	20	60
ESRE71401625	1.6	4	1.6	25	70
ESRE71401806	1.8	4	1.8	6	45
ESRE71401808	1.8	4	1.8	8	45
ESRE71401810	1.8	4	1.8	10	50
ESRE71401812	1.8	4	1.8	12	50
ESRE71401816	1.8	4	1.8	16	50
ESRE71401820	1.8	4	1.8	20	60
ESRE71401825	1.8	4	1.8	25	70
ESRE71402004	2	4	2	4	45
ESRE71402006	2	4	2	6	45
ESRE71402008	2	4	2	8	45
ESRE71402010	2	4	2	10	50
ESRE71402012	2	4	2	12	50
ESRE71402014	2	4	2	14	50
ESRE71402016	2	4	2	16	50
ESRE71402018	2	4	2	18	50
ESRE71402020	2	4	2	20	50
ESRE71402022	2	4	2	22	60
ESRE71402025	2	4	2	25	60
ESRE71402030	2	4	2	30	70
ESRE71402510	2.5	4	2.5	10	50
ESRE71402512	2.5	4	2.5	12	50
ESRE71402516	2.5	4	2.5	16	50
ESRE71402520	2.5	4	2.5	20	50
ESRE71402525	2.5	4	2.5	25	60
ESRE71402530	2.5	4	2.5	30	70
ESRE71403006	3	6	3	6	45
ESRE71403008	3	6	3	8	45
ESRE71403010	3	6	3	10	50
ESRE71403012	3	6	3	12	50
ESRE71403016	3	6	3	16	55
ESRE71403020	3	6	3	20	60
ESRE71403025	3	6	3	25	65

형 번	ØD	Ød	ℓ1	ℓ2	L
ESRE71403030	3	6	3	30	70
ESRE71403035	3	6	3	35	75
ESRE71403040	3	6	3	40	80
ESRE71403045	3	6	3	45	90
ESRE71403050	3	6	3	50	100
ESRE71403060	3	6	3	60	110
ESRE71403512	3.5	6	3.5	12	50
ESRE71403516	3.5	6	3.5	16	55
ESRE71403520	3.5	6	3.5	20	60
ESRE71403525	3.5	6	3.5	25	65
ESRE71403530	3.5	6	3.5	30	70
ESRE71403535	3.5	6	3.5	35	75
ESRE71403540	3.5	6	3.5	40	80
ESRE71404006	4	6	4	6	50
ESRE71404008	4	6	4	8	50
ESRE71404010	4	6	4	10	50
ESRE71404012	4	6	4	12	50
ESRE71404016	4	6	4	16	55
ESRE71404020	4	6	4	20	60
ESRE71404025	4	6	4	25	65
ESRE71404030	4	6	4	30	70
ESRE71404040	4	6	4	40	80
ESRE71404045	4	6	4	45	90
ESRE71404050	4	6	4	50	100
ESRE71404060	4	6	4	60	110
ESRE71404512	4.5	6	4.5	12	50
ESRE71404516	4.5	6	4.5	16	55
ESRE71404520	4.5	6	4.5	20	60
ESRE71404525	4.5	6	4.5	25	65
ESRE71404530	4.5	6	4.5	30	70
ESRE71404540	4.5	6	4.5	40	80
ESRE71405016	5	6	5	16	60
ESRE71405020	5	6	5	20	60
ESRE71405025	5	6	5	25	65
ESRE71405030	5	6	5	30	70
ESRE71405040	5	6	5	40	80

ESRE714

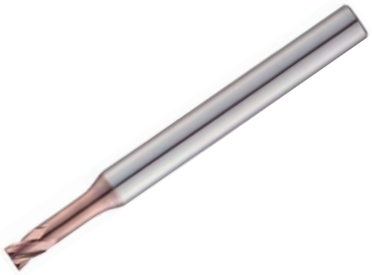
4날 리브 플랫 엔드밀

ULTRA FINE | 4 | 30° HELIX | AlTiN | 절삭조건

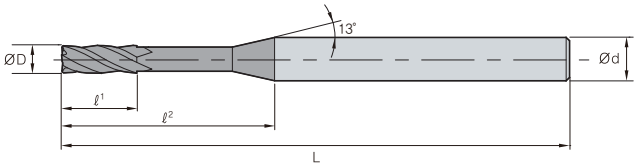
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• 공구직경공차

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	







(mm)

형 번	ØD	Ød	ℓ1	ℓ2	L
ESRE71405050	5	6	5	50	100
ESRE71405060	5	6	5	60	110
ESRE71406020	6	6	6	20	60
ESRE71406030	6	6	6	30	75
ESRE71406040	6	6	6	40	80
ESRE71406050	6	6	6	50	90
ESRE71406060	6	6	6	60	100
ESRE71408025	8	8	12	25	65

형 번	ØD	Ød	ℓ1	ℓ2	L
ESRE71408040	8	8	12	40	100
ESRE71408050	8	8	12	50	110
ESRE71410030	10	10	15	30	70
ESRE71410050	10	10	15	50	100
ESRE71410060	10	10	15	60	120
ESRE71412040	12	12	18	40	80
ESRE71412060	12	12	18	60	110
ESRE71412070	12	12	18	70	130

• 적용 피삭재

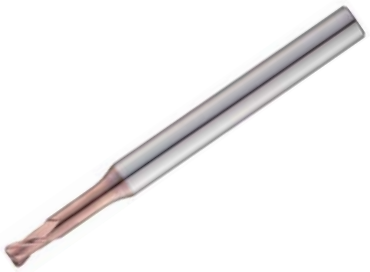
탄소강 ~ HB225	합금강 HB225~325	프리하든강 HRC30~50	열처리강		동	흑연	주철 ~FCD500	알루미늄	스테인리스강
			SKD61~HRC55	SKD11 HRC55~63					
		○	◎	◎	○				

◎: 매우적합 ○: 적합

H-Star Endmill

ESRR712

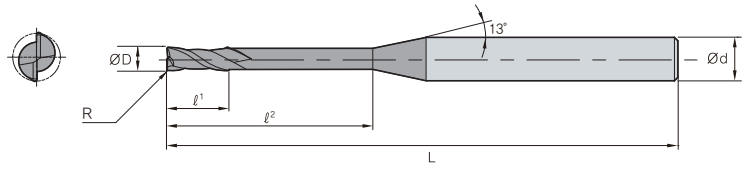
2날 리브 레디우스 엔드밀



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• 공구직경공차

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø16	0 ~ -0.015mm	



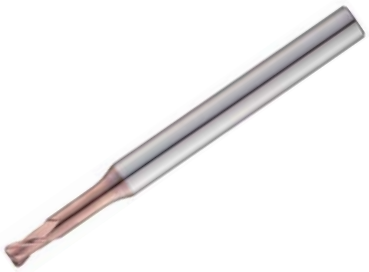
(mm)

형 번	R	ØD	Ød	ℓ1	ℓ2	L
ESRR712002002005	0.02	0.2	4	0.2	0.5	40
ESRR71200200201	0.02	0.2	4	0.2	1	40
ESRR712002002015	0.02	0.2	4	0.2	1.5	40
ESRR712002005005	0.05	0.2	4	0.2	0.5	40
ESRR71200200501	0.05	0.2	4	0.2	1	40
ESRR712002005015	0.05	0.2	4	0.2	1.5	40
ESRR71200300201	0.02	0.3	4	0.3	1	40
ESRR71200300202	0.02	0.3	4	0.3	2	40
ESRR71200300203	0.02	0.3	4	0.3	3	40
ESRR71200300501	0.05	0.3	4	0.3	1	40
ESRR71200300502	0.05	0.3	4	0.3	2	40
ESRR71200300503	0.05	0.3	4	0.3	3	40
ESRR71200400201	0.02	0.4	4	0.4	1	40
ESRR71200400202	0.02	0.4	4	0.4	2	40
ESRR71200400203	0.02	0.4	4	0.4	3	40
ESRR71200400204	0.02	0.4	4	0.4	4	40
ESRR71200400501	0.05	0.4	4	0.4	1	40
ESRR71200400502	0.05	0.4	4	0.4	2	40
ESRR71200400503	0.05	0.4	4	0.4	3	40
ESRR71200400504	0.05	0.4	4	0.4	4	40
ESRR71200401001	0.1	0.4	4	0.4	1	40
ESRR712004010015	0.1	0.4	4	0.4	1.5	40
ESRR71200401002	0.1	0.4	4	0.4	2	40
ESRR71200401003	0.1	0.4	4	0.4	3	40
ESRR71200401004	0.1	0.4	4	0.4	4	40
ESRR71200500201	0.02	0.5	4	0.5	1	45
ESRR712005002015	0.02	0.5	4	0.5	1.5	45
ESRR71200500202	0.02	0.5	4	0.5	2	45
ESRR712005002025	0.02	0.5	4	0.5	2.5	45
ESRR71200500203	0.02	0.5	4	0.5	3	45
ESRR71200500204	0.02	0.5	4	0.5	4	45
ESRR71200500205	0.02	0.5	4	0.5	5	45
ESRR71200500206	0.02	0.5	4	0.5	6	45
ESRR71200500208	0.02	0.5	4	0.5	8	45
ESRR71200500210	0.02	0.5	4	0.5	10	45
ESRR71200500501	0.05	0.5	4	0.5	1	45
ESRR712005005015	0.05	0.5	4	0.5	1.5	45
ESRR71200500502	0.05	0.5	4	0.5	2	45
ESRR712005005025	0.05	0.5	4	0.5	2.5	45

형 번	R	ØD	Ød	ℓ1	ℓ2	L
ESRR71200500503	0.05	0.5	4	0.5	3	45
ESRR71200500504	0.05	0.5	4	0.5	4	45
ESRR71200500505	0.05	0.5	4	0.5	5	45
ESRR71200500506	0.05	0.5	4	0.5	6	45
ESRR71200500508	0.05	0.5	4	0.5	8	45
ESRR71200500510	0.05	0.5	4	0.5	10	45
ESRR71200501001	0.1	0.5	4	0.5	1	45
ESRR712005010015	0.1	0.5	4	0.5	1.5	45
ESRR71200501002	0.1	0.5	4	0.5	2	45
ESRR712005010025	0.1	0.5	4	0.5	2.5	45
ESRR71200501003	0.1	0.5	4	0.5	3	45
ESRR71200501004	0.1	0.5	4	0.5	4	45
ESRR71200501005	0.1	0.5	4	0.5	5	45
ESRR71200501006	0.1	0.5	4	0.5	6	45
ESRR71200501008	0.1	0.5	4	0.5	8	45
ESRR71200501010	0.1	0.5	4	0.5	10	45
ESRR71200600202	0.02	0.6	4	0.6	2	45
ESRR71200600203	0.02	0.6	4	0.6	3	45
ESRR71200600204	0.02	0.6	4	0.6	4	45
ESRR71200600206	0.02	0.6	4	0.6	6	45
ESRR71200600208	0.02	0.6	4	0.6	8	45
ESRR71200600210	0.02	0.6	4	0.6	10	45
ESRR71200600212	0.02	0.6	4	0.6	12	50
ESRR71200600502	0.05	0.6	4	0.6	2	45
ESRR71200600503	0.05	0.6	4	0.6	3	45
ESRR71200600504	0.05	0.6	4	0.6	4	45
ESRR71200600506	0.05	0.6	4	0.6	6	45
ESRR71200600508	0.05	0.6	4	0.6	8	45
ESRR71200600510	0.05	0.6	4	0.6	10	45
ESRR71200600512	0.05	0.6	4	0.6	12	50
ESRR71200601002	0.1	0.6	4	0.6	2	45
ESRR71200601003	0.1	0.6	4	0.6	3	45
ESRR71200601004	0.1	0.6	4	0.6	4	45
ESRR71200601006	0.1	0.6	4	0.6	6	45
ESRR71200601008	0.1	0.6	4	0.6	8	45
ESRR71200601010	0.1	0.6	4	0.6	10	45
ESRR71200601012	0.1	0.6	4	0.6	12	50
ESRR71200701002	0.1	0.7	4	0.7	2	45
ESRR71200701004	0.1	0.7	4	0.7	4	45

ESRR712

2날 리브 레디우스 엔드밀

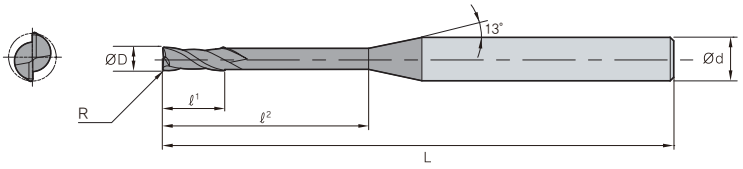


ULTRA FINE | 2 | 30° HELIX | AlTiN | 절삭조건

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• 공구직경공차

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø16	0 ~ -0.015mm	



(mm)

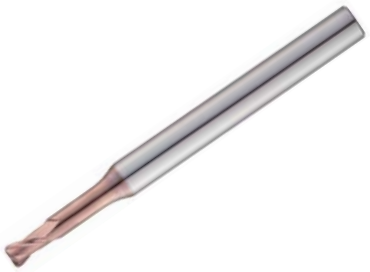
형 번	R	ØD	Ød	ℓ1	ℓ2	L
ESRR71200701006	0.1	0.7	4	0.7	6	45
ESRR71200701008	0.1	0.7	4	0.7	8	45
ESRR71200701010	0.1	0.7	4	0.7	10	45
ESRR71200800202	0.02	0.8	4	0.8	2	45
ESRR71200800204	0.02	0.8	4	0.8	4	45
ESRR71200800206	0.02	0.8	4	0.8	6	45
ESRR71200800208	0.02	0.8	4	0.8	8	45
ESRR71200800210	0.02	0.8	4	0.8	10	45
ESRR71200800212	0.02	0.8	4	0.8	12	50
ESRR71200800502	0.05	0.8	4	0.8	2	45
ESRR71200800504	0.05	0.8	4	0.8	4	45
ESRR71200800506	0.05	0.8	4	0.8	6	45
ESRR71200800508	0.05	0.8	4	0.8	8	45
ESRR71200800510	0.05	0.8	4	0.8	10	45
ESRR71200800512	0.05	0.8	4	0.8	12	50
ESRR71200801002	0.1	0.8	4	0.8	2	45
ESRR71200801004	0.1	0.8	4	0.8	4	45
ESRR71200801006	0.1	0.8	4	0.8	6	45
ESRR71200801008	0.1	0.8	4	0.8	8	45
ESRR71200801010	0.1	0.8	4	0.8	10	45
ESRR71200801012	0.1	0.8	4	0.8	12	50
ESRR71200802002	0.2	0.8	4	0.8	2	45
ESRR71200802004	0.2	0.8	4	0.8	4	45
ESRR71200802006	0.2	0.8	4	0.8	6	45
ESRR71200802008	0.2	0.8	4	0.8	8	45
ESRR71200802010	0.2	0.8	4	0.8	10	45
ESRR71200802012	0.2	0.8	4	0.8	12	50
ESRR71201000204	0.02	1	4	1	4	45
ESRR71201000206	0.02	1	4	1	6	45
ESRR71201000208	0.02	1	4	1	8	45
ESRR71201000210	0.02	1	4	1	10	50
ESRR71201000212	0.02	1	4	1	12	50
ESRR71201000214	0.02	1	4	1	14	50
ESRR71201000216	0.02	1	4	1	16	50
ESRR71201000220	0.02	1	4	1	20	50
ESRR71201000504	0.05	1	4	1	4	45
ESRR71201000506	0.05	1	4	1	6	45
ESRR71201000508	0.05	1	4	1	8	45
ESRR71201000510	0.05	1	4	1	10	50

형 번	R	ØD	Ød	ℓ1	ℓ2	L
ESRR71201000512	0.05	1	4	1	12	50
ESRR71201000514	0.05	1	4	1	14	50
ESRR71201000516	0.05	1	4	1	16	50
ESRR71201000520	0.05	1	4	1	20	50
ESRR71201001004	0.1	1	4	1	4	45
ESRR71201001006	0.1	1	4	1	6	45
ESRR71201001008	0.1	1	4	1	8	45
ESRR71201001010	0.1	1	4	1	10	50
ESRR71201001012	0.1	1	4	1	12	50
ESRR71201001014	0.1	1	4	1	14	50
ESRR71201001016	0.1	1	4	1	16	50
ESRR71201001020	0.1	1	4	1	20	50
ESRR71201002004	0.2	1	4	1	4	45
ESRR71201002006	0.2	1	4	1	6	45
ESRR71201002008	0.2	1	4	1	8	45
ESRR71201002010	0.2	1	4	1	10	50
ESRR71201002012	0.2	1	4	1	12	50
ESRR71201002014	0.2	1	4	1	14	50
ESRR71201002016	0.2	1	4	1	16	50
ESRR71201002020	0.2	1	4	1	20	50
ESRR71201003004	0.3	1	4	1	4	45
ESRR71201003006	0.3	1	4	1	6	45
ESRR71201003008	0.3	1	4	1	8	45
ESRR71201003010	0.3	1	4	1	10	50
ESRR71201003012	0.3	1	4	1	12	50
ESRR71201003014	0.3	1	4	1	14	50
ESRR71201003016	0.3	1	4	1	16	50
ESRR71201003020	0.3	1	4	1	20	50
ESRR71201200204	0.02	1.2	4	1.2	4	45
ESRR71201200206	0.02	1.2	4	1.2	6	45
ESRR71201200208	0.02	1.2	4	1.2	8	45
ESRR71201200210	0.02	1.2	4	1.2	10	50
ESRR71201200212	0.02	1.2	4	1.2	12	50
ESRR71201200214	0.02	1.2	4	1.2	14	50
ESRR71201200216	0.02	1.2	4	1.2	16	50
ESRR71201200220	0.02	1.2	4	1.2	20	50
ESRR71201200504	0.05	1.2	4	1.2	4	45
ESRR71201200506	0.05	1.2	4	1.2	6	45
ESRR71201200508	0.05	1.2	4	1.2	8	45

H-Star Endmill

ESRR712

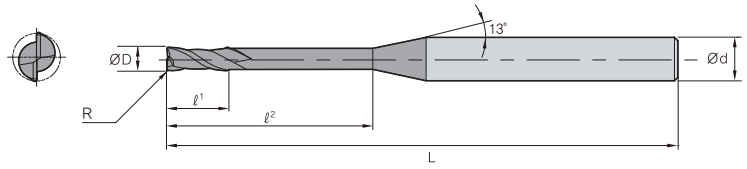
2날 리브 레디우스 엔드밀



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• 공구직경공차

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø16	0 ~ -0.015mm	



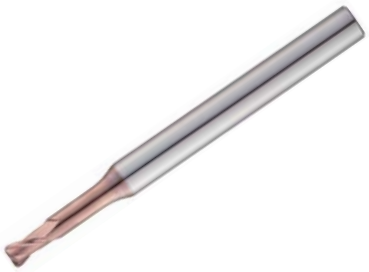
(mm)

형 번	R	ØD	Ød	ℓ1	ℓ2	L
ESRR71201200510	0.05	1.2	4	1.2	10	50
ESRR71201200512	0.05	1.2	4	1.2	12	50
ESRR71201200514	0.05	1.2	4	1.2	14	50
ESRR71201200516	0.05	1.2	4	1.2	16	50
ESRR71201200520	0.05	1.2	4	1.2	20	50
ESRR71201201004	0.1	1.2	4	1.2	4	45
ESRR71201201006	0.1	1.2	4	1.2	6	45
ESRR71201201008	0.1	1.2	4	1.2	8	45
ESRR71201201010	0.1	1.2	4	1.2	10	50
ESRR71201201012	0.1	1.2	4	1.2	12	50
ESRR71201201014	0.1	1.2	4	1.2	14	50
ESRR71201201016	0.1	1.2	4	1.2	16	50
ESRR71201201020	0.1	1.2	4	1.2	20	50
ESRR71201202004	0.2	1.2	4	1.2	4	45
ESRR71201202006	0.2	1.2	4	1.2	6	45
ESRR71201202008	0.2	1.2	4	1.2	8	45
ESRR71201202010	0.2	1.2	4	1.2	10	50
ESRR71201202012	0.2	1.2	4	1.2	12	50
ESRR71201202014	0.2	1.2	4	1.2	14	50
ESRR71201202016	0.2	1.2	4	1.2	16	50
ESRR71201202020	0.2	1.2	4	1.2	20	50
ESRR71201203004	0.3	1.2	4	1.2	4	45
ESRR71201203006	0.3	1.2	4	1.2	6	45
ESRR71201203008	0.3	1.2	4	1.2	8	45
ESRR71201203010	0.3	1.2	4	1.2	10	50
ESRR71201203012	0.3	1.2	4	1.2	12	50
ESRR71201203014	0.3	1.2	4	1.2	14	50
ESRR71201203016	0.3	1.2	4	1.2	16	50
ESRR71201203020	0.3	1.2	4	1.2	20	50
ESRR71201500204	0.02	1.5	4	1.5	4	45
ESRR71201500206	0.02	1.5	4	1.5	6	45
ESRR71201500208	0.02	1.5	4	1.5	8	45
ESRR71201500210	0.02	1.5	4	1.5	10	50
ESRR71201500212	0.02	1.5	4	1.5	12	50
ESRR71201500214	0.02	1.5	4	1.5	14	50
ESRR71201500216	0.02	1.5	4	1.5	16	50
ESRR71201500220	0.02	1.5	4	1.5	20	50
ESRR71201500504	0.05	1.5	4	1.5	4	45
ESRR71201500506	0.05	1.5	4	1.5	6	45

형 번	R	ØD	Ød	ℓ1	ℓ2	L
ESRR71201500508	0.05	1.5	4	1.5	8	45
ESRR71201500510	0.05	1.5	4	1.5	10	50
ESRR71201500512	0.05	1.5	4	1.5	12	50
ESRR71201500514	0.05	1.5	4	1.5	14	50
ESRR71201500516	0.05	1.5	4	1.5	16	50
ESRR71201500520	0.05	1.5	4	1.5	20	50
ESRR71201501004	0.1	1.5	4	1.5	4	45
ESRR71201501006	0.1	1.5	4	1.5	6	45
ESRR71201501008	0.1	1.5	4	1.5	8	45
ESRR71201501010	0.1	1.5	4	1.5	10	50
ESRR71201501012	0.1	1.5	4	1.5	12	50
ESRR71201501014	0.1	1.5	4	1.5	14	50
ESRR71201501016	0.1	1.5	4	1.5	16	50
ESRR71201501020	0.1	1.5	4	1.5	20	50
ESRR71201502004	0.2	1.5	4	1.5	4	45
ESRR71201502006	0.2	1.5	4	1.5	6	45
ESRR71201502008	0.2	1.5	4	1.5	8	45
ESRR71201502010	0.2	1.5	4	1.5	10	50
ESRR71201502012	0.2	1.5	4	1.5	12	50
ESRR71201502014	0.2	1.5	4	1.5	14	50
ESRR71201502016	0.2	1.5	4	1.5	16	50
ESRR71201502020	0.2	1.5	4	1.5	20	50
ESRR71201503004	0.3	1.5	4	1.5	4	45
ESRR71201503006	0.3	1.5	4	1.5	6	45
ESRR71201503008	0.3	1.5	4	1.5	8	45
ESRR71201503010	0.3	1.5	4	1.5	10	50
ESRR71201503012	0.3	1.5	4	1.5	12	50
ESRR71201503014	0.3	1.5	4	1.5	14	50
ESRR71201503016	0.3	1.5	4	1.5	16	50
ESRR71201503020	0.3	1.5	4	1.5	20	50
ESRR71201505004	0.5	1.5	4	1.5	4	45
ESRR71201505006	0.5	1.5	4	1.5	6	45
ESRR71201505008	0.5	1.5	4	1.5	8	45
ESRR71201505010	0.5	1.5	4	1.5	10	50
ESRR71201505012	0.5	1.5	4	1.5	12	50
ESRR71201505014	0.5	1.5	4	1.5	14	50
ESRR71201505016	0.5	1.5	4	1.5	16	50
ESRR71201505020	0.5	1.5	4	1.5	20	50
ESRR71202000206	0.02	2	4	2	6	45

ESRR712

2날 리브 레디우스 엔드밀

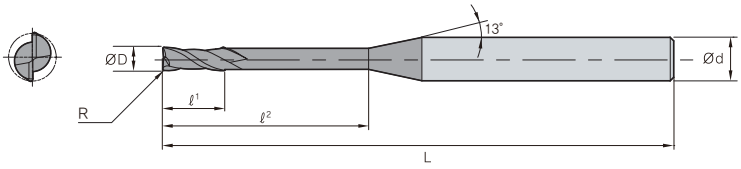


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• 공구직경공차

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø16	0 ~ -0.015mm	



(mm)

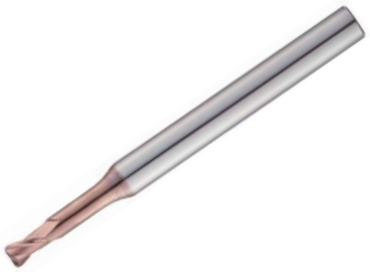
형 번	R	ØD	Ød	ℓ1	ℓ2	L
ESRR71202000208	0.02	2	4	2	8	45
ESRR71202000210	0.02	2	4	2	10	50
ESRR71202000212	0.02	2	4	2	12	50
ESRR71202000214	0.02	2	4	2	14	50
ESRR71202000216	0.02	2	4	2	16	50
ESRR71202000220	0.02	2	4	2	20	50
ESRR71202000225	0.02	2	4	2	25	60
ESRR71202000506	0.05	2	4	2	6	45
ESRR71202000508	0.05	2	4	2	8	45
ESRR71202000510	0.05	2	4	2	10	50
ESRR71202000512	0.05	2	4	2	12	50
ESRR71202000514	0.05	2	4	2	14	50
ESRR71202000516	0.05	2	4	2	16	50
ESRR71202000520	0.05	2	4	2	20	50
ESRR71202000525	0.05	2	4	2	25	60
ESRR71202001006	0.1	2	4	2	6	45
ESRR71202001008	0.1	2	4	2	8	45
ESRR71202001010	0.1	2	4	2	10	50
ESRR71202001012	0.1	2	4	2	12	50
ESRR71202001014	0.1	2	4	2	14	50
ESRR71202001016	0.1	2	4	2	16	50
ESRR71202001020	0.1	2	4	2	20	50
ESRR71202001025	0.1	2	4	2	25	60
ESRR71202001030	0.1	2	4	2	30	70
ESRR71202002006	0.2	2	4	2	6	45
ESRR71202002008	0.2	2	4	2	8	45
ESRR71202002010	0.2	2	4	2	10	50
ESRR71202002012	0.2	2	4	2	12	50
ESRR71202002014	0.2	2	4	2	14	50
ESRR71202002016	0.2	2	4	2	16	50
ESRR71202002020	0.2	2	4	2	20	50
ESRR71202002025	0.2	2	4	2	25	60
ESRR71202002030	0.2	2	4	2	30	70
ESRR71202003006	0.3	2	4	2	6	45
ESRR71202003008	0.3	2	4	2	8	45
ESRR71202003010	0.3	2	4	2	10	50
ESRR71202003012	0.3	2	4	2	12	50
ESRR71202003014	0.3	2	4	2	14	50
ESRR71202003016	0.3	2	4	2	16	50

형 번	R	ØD	Ød	ℓ1	ℓ2	L
ESRR71202003020	0.3	2	4	2	20	50
ESRR71202003025	0.3	2	4	2	25	60
ESRR71202003030	0.3	2	4	2	30	70
ESRR71202005006	0.5	2	4	2	6	45
ESRR71202005008	0.5	2	4	2	8	45
ESRR71202005010	0.5	2	4	2	10	50
ESRR71202005012	0.5	2	4	2	12	50
ESRR71202005014	0.5	2	4	2	14	50
ESRR71202005016	0.5	2	4	2	16	50
ESRR71202005020	0.5	2	4	2	20	50
ESRR71202005025	0.5	2	4	2	25	60
ESRR71202005030	0.5	2	4	2	30	70
ESRR71202501010	0.1	2.5	4	2.5	10	50
ESRR71202501016	0.1	2.5	4	2.5	16	50
ESRR71202501020	0.1	2.5	4	2.5	20	50
ESRR71202501025	0.1	2.5	4	2.5	25	60
ESRR71202501030	0.1	2.5	4	2.5	30	70
ESRR71202502010	0.2	2.5	4	2.5	10	50
ESRR71202502016	0.2	2.5	4	2.5	16	50
ESRR71202502020	0.2	2.5	4	2.5	20	50
ESRR71202503010	0.3	2.5	4	2.5	10	50
ESRR71202503016	0.3	2.5	4	2.5	16	50
ESRR71202503020	0.3	2.5	4	2.5	20	50
ESRR71202505010	0.5	2.5	4	2.5	10	50
ESRR71202505016	0.5	2.5	4	2.5	16	50
ESRR71202505020	0.5	2.5	4	2.5	20	50
ESRR71203001010	0.1	3	6	3	10	50
ESRR71203001012	0.1	3	6	3	12	50
ESRR71203001016	0.1	3	6	3	16	55
ESRR71203001020	0.1	3	6	3	20	60
ESRR71203001025	0.1	3	6	3	25	65
ESRR71203001030	0.1	3	6	3	30	70
ESRR71203001035	0.1	3	6	3	35	75
ESRR71203001040	0.1	3	6	3	40	80
ESRR71203002010	0.2	3	6	3	10	50
ESRR71203002012	0.2	3	6	3	12	50
ESRR71203002016	0.2	3	6	3	16	55
ESRR71203002020	0.2	3	6	3	20	60
ESRR71203002025	0.2	3	6	3	25	65

H-Star Endmill

ESRR712

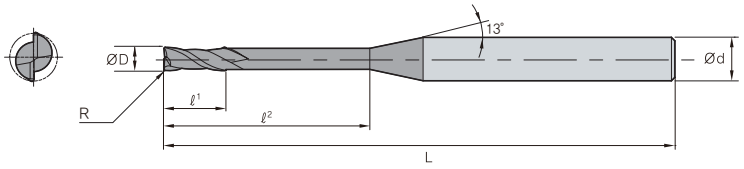
2날 리브 레디우스 엔드밀



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• 공구직경공차

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø16	0 ~ -0.015mm	



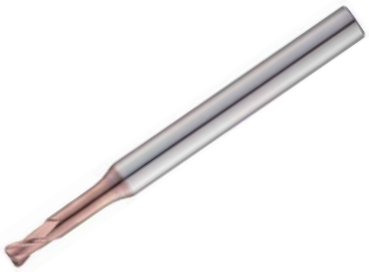
(mm)

형 번	R	ØD	Ød	ℓ1	ℓ2	L
ESRR71203002030	0.2	3	6	3	30	70
ESRR71203002035	0.2	3	6	3	35	75
ESRR71203002040	0.2	3	6	3	40	80
ESRR71203003010	0.3	3	6	3	10	50
ESRR71203003012	0.3	3	6	3	12	50
ESRR71203003016	0.3	3	6	3	16	55
ESRR71203003020	0.3	3	6	3	20	60
ESRR71203003025	0.3	3	6	3	25	65
ESRR71203003030	0.3	3	6	3	30	70
ESRR71203003035	0.3	3	6	3	35	75
ESRR71203003040	0.3	3	6	3	40	80
ESRR71203005010	0.5	3	6	3	10	50
ESRR71203005012	0.5	3	6	3	12	50
ESRR71203005016	0.5	3	6	3	16	55
ESRR71203005020	0.5	3	6	3	20	60
ESRR71203005025	0.5	3	6	3	25	65
ESRR71203005030	0.5	3	6	3	30	70
ESRR71203005035	0.5	3	6	3	35	75
ESRR71203005040	0.5	3	6	3	40	80
ESRR71203010010	1	3	6	3	10	50
ESRR71203010012	1	3	6	3	12	50
ESRR71203010016	1	3	6	3	16	55
ESRR71203010020	1	3	6	3	20	60
ESRR71203010025	1	3	6	3	25	65
ESRR71203010030	1	3	6	3	30	70
ESRR71203010035	1	3	6	3	35	75
ESRR71203010040	1	3	6	3	40	80
ESRR71204001012	0.1	4	6	4	12	50
ESRR71204001016	0.1	4	6	4	16	55
ESRR71204001020	0.1	4	6	4	20	60
ESRR71204001025	0.1	4	6	4	25	65
ESRR71204001030	0.1	4	6	4	30	70
ESRR71204001035	0.1	4	6	4	35	75
ESRR71204001040	0.1	4	6	4	40	80
ESRR71204002012	0.2	4	6	4	12	50
ESRR71204002016	0.2	4	6	4	16	55
ESRR71204002020	0.2	4	6	4	20	60
ESRR71204002025	0.2	4	6	4	25	65
ESRR71204002030	0.2	4	6	4	30	70

형 번	R	ØD	Ød	ℓ1	ℓ2	L
ESRR71204002035	0.2	4	6	4	35	75
ESRR71204002040	0.2	4	6	4	40	80
ESRR71204003012	0.3	4	6	4	12	50
ESRR71204003016	0.3	4	6	4	16	55
ESRR71204003020	0.3	4	6	4	20	60
ESRR71204003025	0.3	4	6	4	25	65
ESRR71204003030	0.3	4	6	4	30	70
ESRR71204003035	0.3	4	6	4	35	75
ESRR71204003040	0.3	4	6	4	40	80
ESRR71204005012	0.5	4	6	4	12	50
ESRR71204005016	0.5	4	6	4	16	55
ESRR71204005020	0.5	4	6	4	20	60
ESRR71204005025	0.5	4	6	4	25	65
ESRR71204005030	0.5	4	6	4	30	70
ESRR71204005035	0.5	4	6	4	35	75
ESRR71204005040	0.5	4	6	4	40	80
ESRR71204010012	1	4	6	4	12	50
ESRR71204010016	1	4	6	4	16	55
ESRR71204010020	1	4	6	4	20	60
ESRR71204010025	1	4	6	4	25	65
ESRR71204010030	1	4	6	4	30	70
ESRR71204010035	1	4	6	4	35	75
ESRR71204010040	1	4	6	4	40	80
ESRR71205002015	0.2	5	6	6	15	60
ESRR71205002025	0.2	5	6	6	25	70
ESRR71205002030	0.2	5	6	6	30	70
ESRR71205002040	0.2	5	6	6	40	80
ESRR71205005015	0.5	5	6	6	15	60
ESRR71205005025	0.5	5	6	6	25	70
ESRR71205005030	0.5	5	6	6	30	70
ESRR71205005040	0.5	5	6	6	40	80
ESRR71205010015	1	5	6	6	15	60
ESRR71205010025	1	5	6	6	25	70
ESRR71205010030	1	5	6	6	30	70
ESRR71205010040	1	5	6	6	40	80
ESRR71206001020	0.1	6	6	7	20	60
ESRR71206001040	0.1	6	6	7	40	80
ESRR71206002020	0.2	6	6	7	20	60
ESRR71206002040	0.2	6	6	7	40	80

ESRR712

2날 리브 레디우스 엔드밀

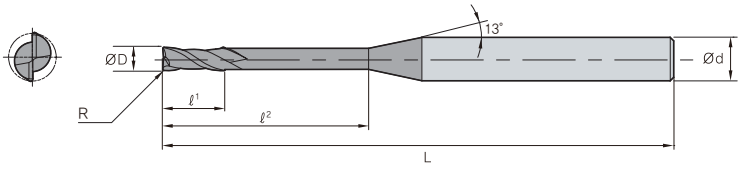


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• 공구직경공차

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø16	0 ~ -0.015mm	



(mm)

형 번	R	ØD	Ød	ℓ1	ℓ2	L
ESRR71206003020	0.3	6	6	7	20	60
ESRR71206003040	0.3	6	6	7	40	80
ESRR71206005020	0.5	6	6	7	20	60
ESRR71206005040	0.5	6	6	7	40	80
ESRR71206010020	1	6	6	7	20	60
ESRR71206010040	1	6	6	7	40	80
ESRR71206015020	1.5	6	6	7	20	60
ESRR71206015040	1.5	6	6	7	40	80
ESRR71208002022	0.2	8	8	9	22	65
ESRR71208003022	0.3	8	8	9	22	65
ESRR71205005022	0.5	5	8	9	22	65
ESRR71208010022	1	8	8	9	22	65
ESRR71208015022	1.5	8	8	9	22	65
ESRR71210002024	0.2	10	10	11	24	70

형 번	R	ØD	Ød	ℓ1	ℓ2	L
ESRR71210003024	0.3	10	10	11	24	70
ESRR71210005024	0.5	10	10	11	24	70
ESRR71210010024	1	10	10	11	24	70
ESRR71210015024	1.5	10	10	11	24	70
ESRR71210020024	2	10	10	11	24	70
ESRR71212002026	0.2	12	12	13	26	80
ESRR71212003026	0.3	12	12	13	26	80
ESRR71212005026	0.5	12	12	13	26	80
ESRR71212010026	1	12	12	13	26	80
ESRR71212015026	1.5	12	12	13	26	80
ESRR71212020026	2	12	12	13	26	80
ESRR71212030026	3	12	12	13	26	80
ESRR71216005035	0.5	16	16	20	35	110
ESRR71216010035	1	16	16	20	35	110

• 적용 피삭재

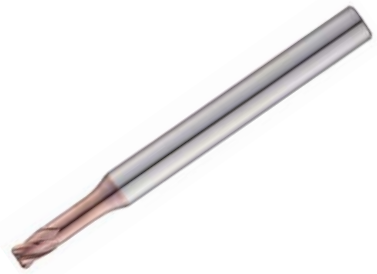
탄소강 ~ HB225	합금강 HB225~325	프리하든강 HRC30~50	열처리강		동	흑연	주철 ~FCD500	알루미늄	스테인리스강
			SKD61~HRC55	SKD11 HRC55~63					
		○	◎	◎	○				

◎: 매우적합 ○: 적합

H-Star Endmill

ESRR714

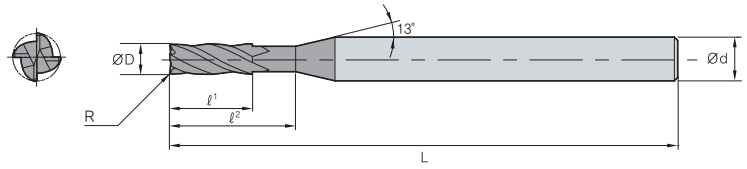
4날 리브 레디우스 엔드밀



ULTRA FINE | 4 | 30° HELIX | R ±0.01 Ø6 이하 | R ±0.015 Ø6 초과 | AlTiN | 절삭조건 p.396~407

• 공구직경공차

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø20	0 ~ -0.015mm	



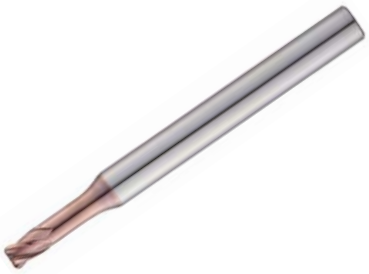
(mm)

형 번	R	ØD	Ød	ℓ1	ℓ2	L
ESRR71400500502	0.05	0.5	4	0.5	2	45
ESRR71400500504	0.05	0.5	4	0.5	4	45
ESRR71400500506	0.05	0.5	4	0.5	6	45
ESRR71400500508	0.05	0.5	4	0.5	8	45
ESRR71400501002	0.1	0.5	4	0.5	2	45
ESRR71400501004	0.1	0.5	4	0.5	4	45
ESRR71400501006	0.1	0.5	4	0.5	6	45
ESRR71400501008	0.1	0.5	4	0.5	8	45
ESRR71400600502	0.05	0.6	4	0.6	2	45
ESRR71400600504	0.05	0.6	4	0.6	4	45
ESRR71400600506	0.05	0.6	4	0.6	6	45
ESRR71400600508	0.05	0.6	4	0.6	8	45
ESRR71400601002	0.1	0.6	4	0.6	2	45
ESRR71400601004	0.1	0.6	4	0.6	4	45
ESRR71400601006	0.1	0.6	4	0.6	6	45
ESRR71400601008	0.1	0.6	4	0.6	8	45
ESRR71400700502	0.05	0.7	4	0.7	2	45
ESRR71400700504	0.05	0.7	4	0.7	4	45
ESRR71400700506	0.05	0.7	4	0.7	6	45
ESRR71400700508	0.05	0.7	4	0.7	8	45
ESRR71400701002	0.1	0.7	4	0.7	2	45
ESRR71400701004	0.1	0.7	4	0.7	4	45
ESRR71400701006	0.1	0.7	4	0.7	6	45
ESRR71400701008	0.1	0.7	4	0.7	8	45
ESRR71400800202	0.02	0.8	4	0.8	2	45
ESRR71400800204	0.02	0.8	4	0.8	4	45
ESRR71400800206	0.02	0.8	4	0.8	6	45
ESRR71400800208	0.02	0.8	4	0.8	8	45
ESRR71400800210	0.02	0.8	4	0.8	10	45
ESRR71400800212	0.02	0.8	4	0.8	12	50
ESRR71400800502	0.05	0.8	4	0.8	2	45
ESRR71400800504	0.05	0.8	4	0.8	4	45
ESRR71400800506	0.05	0.8	4	0.8	6	45
ESRR71400800508	0.05	0.8	4	0.8	8	45
ESRR71400800510	0.05	0.8	4	0.8	10	45
ESRR71400800512	0.05	0.8	4	0.8	12	50
ESRR71400801002	0.1	0.8	4	0.8	2	45
ESRR71400801004	0.1	0.8	4	0.8	4	45
ESRR71400801006	0.1	0.8	4	0.8	6	45

형 번	R	ØD	Ød	ℓ1	ℓ2	L
ESRR71400801008	0.1	0.8	4	0.8	8	45
ESRR71400801010	0.1	0.8	4	0.8	10	45
ESRR71400801012	0.1	0.8	4	0.8	12	50
ESRR71401000204	0.02	1	4	1	4	45
ESRR71401000206	0.02	1	4	1	6	45
ESRR71401000208	0.02	1	4	1	8	45
ESRR71401000210	0.02	1	4	1	10	50
ESRR71401000212	0.02	1	4	1	12	50
ESRR71401000214	0.02	1	4	1	14	50
ESRR71401000216	0.02	1	4	1	16	50
ESRR71401000220	0.02	1	4	1	20	50
ESRR71401000503	0.05	1	4	1	3	45
ESRR71401000504	0.05	1	4	1	4	45
ESRR71401000506	0.05	1	4	1	6	45
ESRR71401000508	0.05	1	4	1	8	45
ESRR71401000510	0.05	1	4	1	10	50
ESRR71401000512	0.05	1	4	1	12	50
ESRR71401000514	0.05	1	4	1	14	50
ESRR71401000516	0.05	1	4	1	16	50
ESRR71401000520	0.05	1	4	1	20	50
ESRR71401001003	0.1	1	4	1	3	45
ESRR71401001004	0.1	1	4	1	4	45
ESRR71401001006	0.1	1	4	1	6	45
ESRR71401001008	0.1	1	4	1	8	45
ESRR71401001010	0.1	1	4	1	10	50
ESRR71401001012	0.1	1	4	1	12	50
ESRR71401001014	0.1	1	4	1	14	50
ESRR71401001016	0.1	1	4	1	16	50
ESRR71401001020	0.1	1	4	1	20	50
ESRR71401002003	0.2	1	4	1	3	45
ESRR71401002004	0.2	1	4	1	4	45
ESRR71401002006	0.2	1	4	1	6	45
ESRR71401002008	0.2	1	4	1	8	45
ESRR71401002010	0.2	1	4	1	10	50
ESRR71401002012	0.2	1	4	1	12	50
ESRR71401002014	0.2	1	4	1	14	50
ESRR71401002016	0.2	1	4	1	16	50
ESRR71401002020	0.2	1	4	1	20	50
ESRR71401003003	0.3	1	4	1	3	45

ESRR714

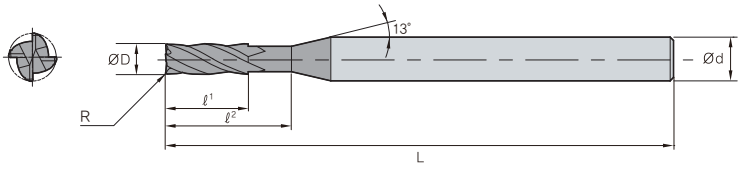
4날 리브 레디우스 엔드밀



ULTRA FINE | 4 | 30° HELIX | R ±0.01 Ø6 이하 | R ±0.015 Ø6 초과 | AlTiN | 절삭조건 p.396~407

• 공구직경공차

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø20	0 ~ -0.015mm	



(mm)

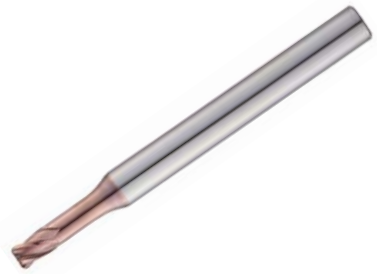
형 번	R	ØD	Ød	ℓ1	ℓ2	L
ESRR71401003004	0.3	1	4	1	4	45
ESRR71401003006	0.3	1	4	1	6	45
ESRR71401003008	0.3	1	4	1	8	45
ESRR71401003010	0.3	1	4	1	10	50
ESRR71401003012	0.3	1	4	1	12	50
ESRR71401003014	0.3	1	4	1	14	50
ESRR71401003016	0.3	1	4	1	16	50
ESRR71401003020	0.3	1	4	1	20	50
ESRR71401200204	0.02	1.2	4	1.2	4	45
ESRR71401200206	0.02	1.2	4	1.2	6	45
ESRR71401200208	0.02	1.2	4	1.2	8	45
ESRR71401200210	0.02	1.2	4	1.2	10	50
ESRR71401200212	0.02	1.2	4	1.2	12	50
ESRR71401200214	0.02	1.2	4	1.2	14	50
ESRR71401200216	0.02	1.2	4	1.2	16	50
ESRR71401200220	0.02	1.2	4	1.2	20	50
ESRR71401200503	0.05	1.2	4	1.2	3	45
ESRR71401200504	0.05	1.2	4	1.2	4	45
ESRR71401200506	0.05	1.2	4	1.2	6	45
ESRR71401200508	0.05	1.2	4	1.2	8	45
ESRR71401200510	0.05	1.2	4	1.2	10	50
ESRR71401200512	0.05	1.2	4	1.2	12	50
ESRR71401200514	0.05	1.2	4	1.2	14	50
ESRR71401200516	0.05	1.2	4	1.2	16	50
ESRR71401200520	0.05	1.2	4	1.2	20	50
ESRR71401201003	0.1	1.2	4	1.2	3	45
ESRR71401201004	0.1	1.2	4	1.2	4	45
ESRR71401201006	0.1	1.2	4	1.2	6	45
ESRR71401201008	0.1	1.2	4	1.2	8	45
ESRR71401201010	0.1	1.2	4	1.2	10	50
ESRR71401201012	0.1	1.2	4	1.2	12	50
ESRR71401201014	0.1	1.2	4	1.2	14	50
ESRR71401201016	0.1	1.2	4	1.2	16	50
ESRR71401201020	0.1	1.2	4	1.2	20	50
ESRR71401202003	0.2	1.2	4	1.2	3	45
ESRR71401202004	0.2	1.2	4	1.2	4	45
ESRR71401202006	0.2	1.2	4	1.2	6	45
ESRR71401202008	0.2	1.2	4	1.2	8	45
ESRR71401202010	0.2	1.2	4	1.2	10	50

형 번	R	ØD	Ød	ℓ1	ℓ2	L
ESRR71401202012	0.2	1.2	4	1.2	12	50
ESRR71401202014	0.2	1.2	4	1.2	14	50
ESRR71401202016	0.2	1.2	4	1.2	16	50
ESRR71401202020	0.2	1.2	4	1.2	20	50
ESRR71401203003	0.3	1.2	4	1.2	3	45
ESRR71401203004	0.3	1.2	4	1.2	4	45
ESRR71401203006	0.3	1.2	4	1.2	6	45
ESRR71401203008	0.3	1.2	4	1.2	8	45
ESRR71401203010	0.3	1.2	4	1.2	10	50
ESRR71401203012	0.3	1.2	4	1.2	12	50
ESRR71401203016	0.3	1.2	4	1.2	16	50
ESRR71401203020	0.3	1.2	4	1.2	20	50
ESRR71401500206	0.02	1.5	4	1.5	6	45
ESRR71401500208	0.02	1.5	4	1.5	8	45
ESRR71401500210	0.02	1.5	4	1.5	10	50
ESRR71401500212	0.02	1.5	4	1.5	12	50
ESRR71401500214	0.02	1.5	4	1.5	14	50
ESRR71401500216	0.02	1.5	4	1.5	16	50
ESRR71401500220	0.02	1.5	4	1.5	20	50
ESRR71401500222	0.02	1.5	4	1.5	22	60
ESRR71401500504	0.05	1.5	4	1.5	4	45
ESRR71401500506	0.05	1.5	4	1.5	6	45
ESRR71401500508	0.05	1.5	4	1.5	8	45
ESRR71401500510	0.05	1.5	4	1.5	10	50
ESRR71401500512	0.05	1.5	4	1.5	12	50
ESRR71401500514	0.05	1.5	4	1.5	14	50
ESRR71401500516	0.05	1.5	4	1.5	16	50
ESRR71401500520	0.05	1.5	4	1.5	20	50
ESRR71401500522	0.05	1.5	4	1.5	22	60
ESRR71401500526	0.05	1.5	4	1.5	26	60
ESRR71401501004	0.1	1.5	4	1.5	4	45
ESRR71401501006	0.1	1.5	4	1.5	6	45
ESRR71401501008	0.1	1.5	4	1.5	8	45
ESRR71401501010	0.1	1.5	4	1.5	10	50
ESRR71401501012	0.1	1.5	4	1.5	12	50
ESRR71401501014	0.1	1.5	4	1.5	14	50
ESRR71401501016	0.1	1.5	4	1.5	16	50
ESRR71401501020	0.1	1.5	4	1.5	20	50
ESRR71401501022	0.1	1.5	4	1.5	22	60

H-Star Endmill

ESRR714

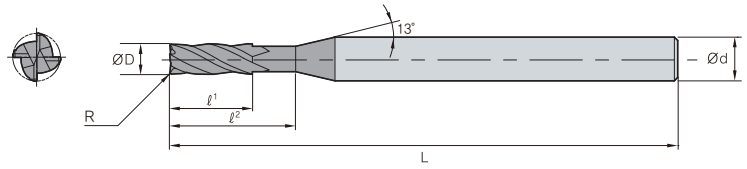
4날 리브 레디우스 엔드밀



ULTRA FINE | 4 | 30° HELIX | R ±0.01 (Ø6 이하) | R ±0.015 (Ø6 초과) | AlTiN | 절삭조건 p.396~407

• 공구직경공차

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø20	0 ~ -0.015mm	



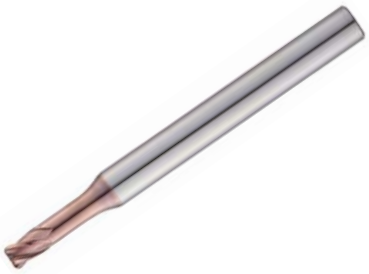
(mm)

형 번	R	ØD	Ød	ℓ1	ℓ2	L
ESRR71401501026	0.1	1.5	4	1.5	26	60
ESRR71401502004	0.2	1.5	4	1.5	4	45
ESRR71401502006	0.2	1.5	4	1.5	6	45
ESRR71401502008	0.2	1.5	4	1.5	8	45
ESRR71401502010	0.2	1.5	4	1.5	10	50
ESRR71401502012	0.2	1.5	4	1.5	12	50
ESRR71401502014	0.2	1.5	4	1.5	14	50
ESRR71401502016	0.2	1.5	4	1.5	16	50
ESRR71401502020	0.2	1.5	4	1.5	20	50
ESRR71401502022	0.2	1.5	4	1.5	22	60
ESRR71401502025	0.2	1.5	4	1.5	25	60
ESRR71401503004	0.3	1.5	4	1.5	4	45
ESRR71401503006	0.3	1.5	4	1.5	6	45
ESRR71401503008	0.3	1.5	4	1.5	8	45
ESRR71401503010	0.3	1.5	4	1.5	10	50
ESRR71401503012	0.3	1.5	4	1.5	12	50
ESRR71401503014	0.3	1.5	4	1.5	14	50
ESRR71401503016	0.3	1.5	4	1.5	16	50
ESRR71401503020	0.3	1.5	4	1.5	20	50
ESRR71401503022	0.3	1.5	4	1.5	22	60
ESRR71401503025	0.3	1.5	4	1.5	25	60
ESRR71401505004	0.5	1.5	4	1.5	4	45
ESRR71401505006	0.5	1.5	4	1.5	6	45
ESRR71401505008	0.5	1.5	4	1.5	8	45
ESRR71401505010	0.5	1.5	4	1.5	10	50
ESRR71401505012	0.5	1.5	4	1.5	12	50
ESRR71401505014	0.5	1.5	4	1.5	14	50
ESRR71401505016	0.5	1.5	4	1.5	16	50
ESRR71401505020	0.5	1.5	4	1.5	20	50
ESRR71401505022	0.5	1.5	4	1.5	22	60
ESRR71401505025	0.5	1.5	4	1.5	25	60
ESRR71402000206	0.02	2	4	2	6	45
ESRR71402000208	0.02	2	4	2	8	45
ESRR71402000210	0.02	2	4	2	10	50
ESRR71402000212	0.02	2	4	2	12	50
ESRR71402000214	0.02	2	4	2	14	50
ESRR71402000216	0.02	2	4	2	16	50
ESRR71402000220	0.02	2	4	2	20	50
ESRR71402000225	0.02	2	4	2	25	60

형 번	R	ØD	Ød	ℓ1	ℓ2	L
ESRR71402000230	0.02	2	4	2	30	70
ESRR71402000506	0.05	2	4	2	6	45
ESRR71402000508	0.05	2	4	2	8	45
ESRR71402000510	0.05	2	4	2	10	50
ESRR71402000512	0.05	2	4	2	12	50
ESRR71402000514	0.05	2	4	2	14	50
ESRR71402000516	0.05	2	4	2	16	50
ESRR71402000520	0.05	2	4	2	20	50
ESRR71402000525	0.05	2	4	2	25	60
ESRR71402000530	0.05	2	4	2	30	70
ESRR71402001006	0.1	2	4	2	6	45
ESRR71402001008	0.1	2	4	2	8	45
ESRR71402001010	0.1	2	4	2	10	50
ESRR71402001012	0.1	2	4	2	12	50
ESRR71402001014	0.1	2	4	2	14	50
ESRR71402001016	0.1	2	4	2	16	50
ESRR71402001020	0.1	2	4	2	20	50
ESRR71402001022	0.1	2	4	2	22	60
ESRR71402001025	0.1	2	4	2	25	60
ESRR71402001030	0.1	2	4	2	30	70
ESRR71402002006	0.2	2	4	2	6	45
ESRR71402002008	0.2	2	4	2	8	45
ESRR71402002010	0.2	2	4	2	10	50
ESRR71402002012	0.2	2	4	2	12	50
ESRR71402002014	0.2	2	4	2	14	50
ESRR71402002016	0.2	2	4	2	16	50
ESRR71402002020	0.2	2	4	2	20	50
ESRR71402002022	0.2	2	4	2	22	60
ESRR71402002025	0.2	2	4	2	25	60
ESRR71402002030	0.2	2	4	2	30	70
ESRR71402003006	0.3	2	4	2	6	45
ESRR71402003008	0.3	2	4	2	8	45
ESRR71402003010	0.3	2	4	2	10	50
ESRR71402003012	0.3	2	4	2	12	50
ESRR71402003014	0.3	2	4	2	14	50
ESRR71402003016	0.3	2	4	2	16	50
ESRR71402003020	0.3	2	4	2	20	50
ESRR71402003022	0.3	2	4	2	22	60
ESRR71402003025	0.3	2	4	2	25	60

ESRR714

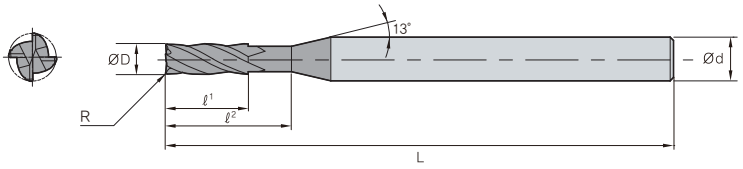
4날 리브 레디우스 엔드밀



ULTRA FINE | 4 | 30° HELIX | R ±0.01 Ø6 이하 | R ±0.015 Ø6 초과 | AlTiN | 절삭조건 p.396~407

• 공구직경공차

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø20	0 ~ -0.015mm	



(mm)

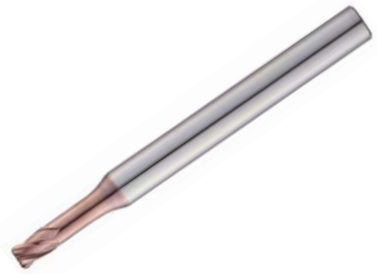
형 번	R	ØD	Ød	ℓ1	ℓ2	L
ESRR71402003030	0.3	2	4	2	30	70
ESRR71402005006	0.5	2	4	3	6	45
ESRR71402005008	0.5	2	4	2	8	45
ESRR71402005010	0.5	2	4	2	10	50
ESRR71402005012	0.5	2	4	2	12	50
ESRR71402005014	0.5	2	4	2	14	50
ESRR71402005016	0.5	2	4	2	16	50
ESRR71402005020	0.5	2	4	2	20	50
ESRR71402005022	0.5	2	4	2	22	60
ESRR71402005025	0.5	2	4	2	25	60
ESRR71402005030	0.5	2	4	2	30	70
ESRR71402501008	0.1	2.5	4	2.5	8	45
ESRR71402501010	0.1	2.5	4	2.5	10	50
ESRR71402501012	0.1	2.5	4	2.5	12	50
ESRR71402501014	0.1	2.5	4	2.5	14	50
ESRR71402501016	0.1	2.5	4	2.5	16	50
ESRR71402501020	0.1	2.5	4	2.5	20	50
ESRR71402501025	0.1	2.5	4	2.5	25	60
ESRR71402501030	0.1	2.5	4	2.5	30	70
ESRR71402502008	0.2	2.5	4	2.5	8	45
ESRR71402502010	0.2	2.5	4	2.5	10	50
ESRR71402502012	0.2	2.5	4	2.5	12	50
ESRR71402502014	0.2	2.5	4	2.5	14	50
ESRR71402502016	0.2	2.5	4	2.5	16	50
ESRR71402502020	0.2	2.5	4	2.5	20	50
ESRR71402502025	0.2	2.5	4	2.5	25	60
ESRR71402502030	0.2	2.5	4	2.5	30	70
ESRR71402503008	0.3	2.5	4	2.5	8	45
ESRR71402503010	0.3	2.5	4	2.5	10	50
ESRR71402503012	0.3	2.5	4	2.5	12	50
ESRR71402503014	0.3	2.5	4	2.5	14	50
ESRR71402503016	0.3	2.5	4	2.5	16	50
ESRR71402503020	0.3	2.5	4	2.5	20	50
ESRR71402503025	0.3	2.5	4	2.5	25	60
ESRR71402503030	0.3	2.5	4	2.5	30	70
ESRR71402505008	0.5	2.5	4	2.5	8	45
ESRR71402505010	0.5	2.5	4	2.5	10	50
ESRR71402505012	0.5	2.5	4	2.5	12	50
ESRR71402505014	0.5	2.5	4	2.5	14	50

형 번	R	ØD	Ød	ℓ1	ℓ2	L
ESRR71402505016	0.5	2.5	4	2.5	16	50
ESRR71402505020	0.5	2.5	4	2.5	20	50
ESRR71402505025	0.5	2.5	4	2.5	25	60
ESRR71402505030	0.5	2.5	4	2.5	30	70
ESRR71403001008	0.1	3	6	3	8	45
ESRR71403001010	0.1	3	6	3	10	50
ESRR71403001012	0.1	3	6	3	12	50
ESRR71403001014	0.1	3	6	3	14	50
ESRR71403001016	0.1	3	6	3	16	55
ESRR71403001020	0.1	3	6	3	20	60
ESRR71403001025	0.1	3	6	3	25	65
ESRR71403001030	0.1	3	6	3	30	70
ESRR71403001035	0.1	3	6	3	35	75
ESRR71403001040	0.1	3	6	3	40	80
ESRR71403001045	0.1	3	6	3	45	90
ESRR71403002008	0.2	3	6	3	8	45
ESRR71403002010	0.2	3	6	3	10	50
ESRR71403002012	0.2	3	6	3	12	50
ESRR71403002014	0.2	3	6	3	14	50
ESRR71403002016	0.2	3	6	3	16	55
ESRR71403002020	0.2	3	6	3	20	60
ESRR71403002025	0.2	3	6	3	25	65
ESRR71403002030	0.2	3	6	3	30	70
ESRR71403002035	0.2	3	6	3	35	75
ESRR71403002040	0.2	3	6	3	40	80
ESRR71403002045	0.2	3	6	3	45	90
ESRR71403003008	0.3	3	6	3	8	45
ESRR71403003010	0.3	3	6	3	10	50
ESRR71403003012	0.3	3	6	3	12	50
ESRR71403003014	0.3	3	6	3	14	50
ESRR71403003016	0.3	3	6	3	16	55
ESRR71403003020	0.3	3	6	3	20	60
ESRR71403003025	0.3	3	6	3	25	65
ESRR71403003030	0.3	3	6	3	30	70
ESRR71403003035	0.3	3	6	3	35	75
ESRR71403003040	0.3	3	6	3	40	80
ESRR71403003045	0.3	3	6	3	45	90
ESRR71403005008	0.5	3	6	3	8	45
ESRR71403005010	0.5	3	6	3	10	50

H-Star Endmill

ESRR714

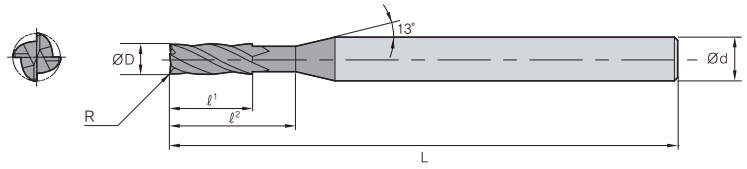
4날 리브 레디우스 엔드밀



ULTRA FINE | 4 | 30° HELIX | R ±0.01 Ø6 이하 | R ±0.015 Ø6 초과 | AlTiN | 절삭조건 p.396~407

• 공구직경공차

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø20	0 ~ -0.015mm	



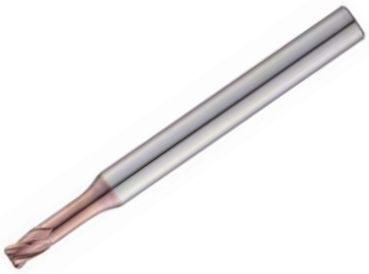
(mm)

형 번	R	ØD	Ød	ℓ1	ℓ2	L
ESRR71403005012	0.5	3	6	3	12	50
ESRR71403005014	0.5	3	6	3	14	50
ESRR71403005016	0.5	3	6	3	16	55
ESRR71403005020	0.5	3	6	3	20	60
ESRR71403005025	0.5	3	6	3	25	65
ESRR71403005030	0.5	3	6	3	30	70
ESRR71403005035	0.5	3	6	3	35	75
ESRR71403005040	0.5	3	6	3	40	80
ESRR71403005045	0.5	3	6	3	45	90
ESRR71403005050	0.5	3	6	3	50	100
ESRR71403010008	1	3	6	3	8	45
ESRR71403010010	1	3	6	3	10	50
ESRR71403010012	1	3	6	3	12	50
ESRR71403010014	1	3	6	3	14	50
ESRR71403010016	1	3	6	3	16	55
ESRR71403010020	1	3	6	3	20	60
ESRR71403010025	1	3	6	3	25	65
ESRR71403010030	1	3	6	3	30	70
ESRR71403010035	1	3	6	3	35	75
ESRR71403010040	1	3	6	3	40	80
ESRR71403010045	1	3	6	3	45	90
ESRR71403010050	1	3	6	3	50	100
ESRR71404001010	0.1	4	6	4	10	50
ESRR71404001012	0.1	4	6	4	12	50
ESRR71404001013	0.1	4	6	4	13	55
ESRR71404001016	0.1	4	6	4	16	55
ESRR71404001020	0.1	4	6	4	20	60
ESRR71404001025	0.1	4	6	4	25	65
ESRR71404001030	0.1	4	6	4	30	70
ESRR71404001035	0.1	4	6	4	35	75
ESRR71404001040	0.1	4	6	4	40	80
ESRR71404001045	0.1	4	6	4	45	90
ESRR71404001050	0.1	4	6	4	50	100
ESRR71404002010	0.2	4	6	4	10	50
ESRR71404002012	0.2	4	6	4	12	50
ESRR71404002013	0.2	4	6	4	13	55
ESRR71404002016	0.2	4	6	4	16	55
ESRR71404002020	0.2	4	6	4	20	60
ESRR71404002025	0.2	4	6	4	25	65

형 번	R	ØD	Ød	ℓ1	ℓ2	L
ESRR71404002030	0.2	4	6	4	30	70
ESRR71404002035	0.2	4	6	4	35	75
ESRR71404002040	0.2	4	6	4	40	80
ESRR71404002045	0.2	4	6	4	45	90
ESRR71404002050	0.2	4	6	4	50	100
ESRR71404003010	0.3	4	6	4	10	50
ESRR71404003012	0.3	4	6	4	12	50
ESRR71404003013	0.3	4	6	4	13	55
ESRR71404003016	0.3	4	6	4	16	55
ESRR71404003020	0.3	4	6	4	20	60
ESRR71404003025	0.3	4	6	4	25	65
ESRR71404003030	0.3	4	6	4	30	70
ESRR71404003035	0.3	4	6	4	35	75
ESRR71404003040	0.3	4	6	4	40	80
ESRR71404003045	0.3	4	6	4	45	90
ESRR71404003050	0.3	4	6	4	50	100
ESRR71404005010	0.5	4	6	4	10	50
ESRR71404005012	0.5	4	6	4	12	50
ESRR71404005013	0.5	4	6	4	13	55
ESRR71404005016	0.5	4	6	4	16	55
ESRR71404005020	0.5	4	6	4	20	60
ESRR71404005025	0.5	4	6	4	25	65
ESRR71404005030	0.5	4	6	4	30	70
ESRR71404005035	0.5	4	6	4	35	75
ESRR71404005040	0.5	4	6	4	40	80
ESRR71404005045	0.5	4	6	4	45	90
ESRR71404005050	0.5	4	6	4	50	100
ESRR71404005055	0.5	4	6	4	55	100
ESRR71404010010	1	4	6	4	10	50
ESRR71404010012	1	4	6	4	12	50
ESRR71404010013	1	4	6	4	13	55
ESRR71404010016	1	4	6	4	16	55
ESRR71404010020	1	4	6	4	20	60
ESRR71404010025	1	4	6	4	25	65
ESRR71404010030	1	4	6	4	30	70
ESRR71404010035	1	4	6	4	35	75
ESRR71404010040	1	4	6	4	40	80
ESRR71404010045	1	4	6	4	45	90
ESRR71404010050	1	4	6	4	50	100

ESRR714

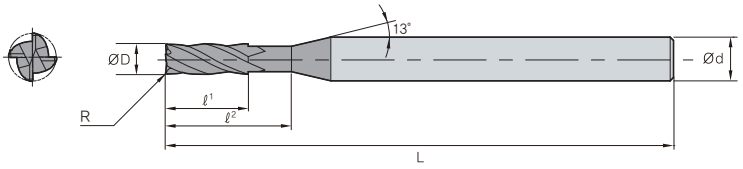
4날 리브 레디우스 엔드밀



ULTRA FINE | 4 | 30° HELIX | R ±0.01 Ø6 이하 | R ±0.015 Ø6 초과 | AlTiN | 절삭조건 p.396~407

• 공구직경공차

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø20	0 ~ -0.015mm	



(mm)

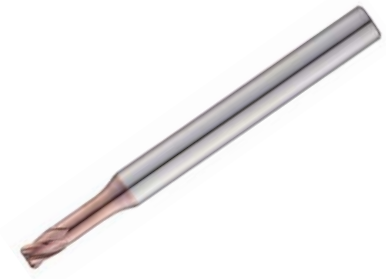
형 번	R	ØD	Ød	ℓ1	ℓ2	L
ESRR71404010055	1	4	6	4	55	100
ESRR71405001016	0.1	5	6	5	16	60
ESRR71405001030	0.1	5	6	5	30	70
ESRR71405001040	0.1	5	6	5	40	80
ESRR71405002016	0.2	5	6	5	16	60
ESRR71405002030	0.2	5	6	5	30	70
ESRR71405002040	0.2	5	6	5	40	80
ESRR71405003016	0.3	5	6	5	16	60
ESRR71405003030	0.3	5	6	5	30	70
ESRR71405003040	0.3	5	6	5	40	80
ESRR71405005016	0.5	5	6	5	16	60
ESRR71405005030	0.5	5	6	5	30	70
ESRR71405005040	0.5	5	6	5	40	80
ESRR71405005050	0.5	5	6	5	50	100
ESRR71405005060	0.5	5	6	5	60	110
ESRR71405010016	1	5	6	5	16	60
ESRR71405010030	1	5	6	5	30	70
ESRR71405010040	1	5	6	5	40	80
ESRR71405010050	1	5	6	5	50	100
ESRR71405010060	1	5	6	5	60	110
ESRR71405015015	1.5	5	6	5	15	60
ESRR71405020015	2	5	6	5	15	60
ESRR71406001020	0.1	6	6	7	20	60
ESRR71406001040	0.1	6	6	7	40	80
ESRR71406001050	0.1	6	6	7	50	100
ESRR71406002020	0.2	6	6	7	20	60
ESRR71406002040	0.2	6	6	7	40	80
ESRR71406002050	0.2	6	6	7	50	100
ESRR71406003020	0.3	6	6	7	20	60
ESRR71406003030	0.3	6	6	7	30	70
ESRR71406003040	0.3	6	6	7	40	80
ESRR71406003050	0.3	6	6	7	50	100
ESRR71406005020	0.5	6	6	7	20	60
ESRR71406005030	0.5	6	6	7	30	70
ESRR71406005040	0.5	6	6	7	40	80
ESRR71406005050	0.5	6	6	7	50	100
ESRR71406005060	0.5	6	6	7	60	110
ESRR71406010020	1	6	6	7	20	60
ESRR71406010030	1	6	6	7	30	70

형 번	R	ØD	Ød	ℓ1	ℓ2	L
ESRR71406010040	1	6	6	7	40	80
ESRR71406010050	1	6	6	7	50	100
ESRR71406010060	1	6	6	7	60	110
ESRR71406015020	1.5	6	6	7	20	60
ESRR71406015040	1.5	6	6	7	40	80
ESRR71406015050	1.5	6	6	7	50	100
ESRR71406020020	2	6	6	7	20	60
ESRR71406020030	2	6	6	7	30	70
ESRR71406020040	2	6	6	7	40	80
ESRR71406020050	2	6	6	7	50	100
ESRR71408001025	0.1	8	8	9	25	70
ESRR71408002022	0.2	8	8	9	22	65
ESRR71408002040	0.2	8	8	9	40	100
ESRR71408003022	0.3	8	8	9	22	65
ESRR71408003040	0.3	8	8	9	40	100
ESRR71408005022	0.5	8	8	9	22	65
ESRR71408005035	0.5	8	8	9	35	100
ESRR71408005040	0.5	8	8	9	40	100
ESRR71408005050	0.5	8	8	9	50	120
ESRR71408005060	0.5	8	8	9	60	120
ESRR71408010022	1	8	8	9	22	65
ESRR71408010035	1	8	8	9	35	100
ESRR71408010040	1	8	8	9	40	100
ESRR71408010050	1	8	8	9	50	120
ESRR71408010060	1	8	8	9	60	120
ESRR71408015022	1.5	8	8	9	22	65
ESRR71408015040	1.5	8	8	9	40	100
ESRR71408020022	2	8	8	9	22	65
ESRR71408020040	2	8	8	9	40	100
ESRR71408020050	2	8	8	9	50	120
ESRR71410001030	0.1	10	10	11	30	75
ESRR71410002024	0.2	10	10	11	24	70
ESRR71410002040	0.2	10	10	11	40	100
ESRR71410003024	0.3	10	10	11	24	70
ESRR71410003040	0.3	10	10	11	40	100
ESRR71410005024	0.5	10	10	11	24	70
ESRR71410005040	0.5	10	10	11	40	100
ESRR71410005050	0.5	10	10	11	50	120
ESRR71410005060	0.5	10	10	11	60	120

H-Star Endmill

ESRR714

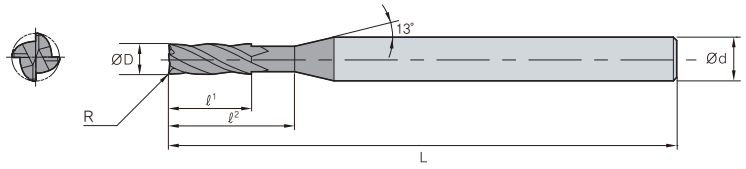
4날 리브 레디우스 엔드밀



ULTRA FINE | 4 | 30° HELIX | R ±0.01 Ø6 이하 | R ±0.015 Ø6 초과 | AlTiN | 절삭조건 p.396~407

• 공구직경공차

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø20	0 ~ -0.015mm	



(mm)

형 번	R	ØD	Ød	ℓ1	ℓ2	L
ESRR71410010024	1	10	10	11	24	70
ESRR71410010040	1	10	10	11	40	100
ESRR71410010050	1	10	10	11	50	120
ESRR71410010060	1	10	10	11	60	120
ESRR71410015024	1.5	10	10	11	24	70
ESRR71410015040	1.5	10	10	11	40	100
ESRR71410020024	2	10	10	11	24	70
ESRR71410020040	2	10	10	11	40	100
ESRR71410020050	2	10	10	11	50	120
ESRR71410025024	2.5	10	10	11	24	70
ESRR71412002032	0.2	12	12	13	32	80
ESRR71412003026	0.3	12	12	13	26	80
ESRR71412003045	0.3	12	12	13	45	110
ESRR71412005026	0.5	12	12	13	26	80
ESRR71412005040	0.5	12	12	13	40	110
ESRR71412005060	0.5	12	12	13	60	130

형 번	R	ØD	Ød	ℓ1	ℓ2	L
ESRR71412010026	1	12	12	13	26	80
ESRR71412010040	1	12	12	13	40	110
ESRR71412010060	1	12	12	13	60	130
ESRR71412015026	1.5	12	12	13	26	80
ESRR71412020026	2	12	12	13	26	80
ESRR71412020040	2	12	12	13	40	110
ESRR71412030026	3	12	12	13	26	80
ESRR71416005035	0.5	16	16	20	35	100
ESRR71416005050	0.5	16	20	35	50	150
ESRR71416010035	1	16	16	20	35	100
ESRR71416010050	1	16	20	35	50	150
ESRR71420005040	0.5	20	20	25	40	100
ESRR71420005055	0.5	20	20	40	55	150
ESRR71420010040	1	20	20	25	40	100
ESRR71420010055	1	20	20	40	55	150

• 적용 피삭재

탄소강 ~ HB225	합금강 HB225~325	프리하든강 HRC30~50	열처리강		동	흑연	주철 ~FCD500	알루미늄	스테인리스강
			SKD61~HRC55	SKD11 HRC55~63					
		○	◎	◎	○				

◎: 매우적합 ○: 적합

ESXE704

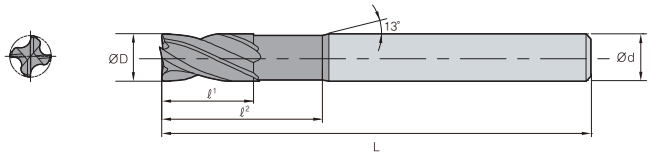
4날 넥 타입 플랫 엔드밀

ULTRA FINE | 4 | M HELIX | AlTiN | 절삭조건 p.408

• 공구직경공차

ØD		Ød
전 규격	0 ~ -0.02mm	h5





(mm)

형 번	ØD	Ød	ℓ1	ℓ2	L
ESXE704010	1	4	1.5	4	45
ESXE704020	2	4	3	6	45
ESXE704030	3	6	4	7	45
ESXE704040	4	6	5	9	45
ESXE704060	6	6	7	14	50
ESXE704080	8	8	9	18	60
ESXE704100	10	10	12	25	75
ESXE704120	12	12	15	30	75

• 적용 피삭재

탄소강 ~ HB225	합금강 HB225~325	프리하든강 HRC30~50	열처리강		동	흑연	주철 ~FCD500	알루미늄	스테인리스강
			SKD61~HRC55	SKD11 HRC55~63					
		○	◎	◎	○				

◎: 매우적합 ○: 적합

H-Star Endmill

ESXE714

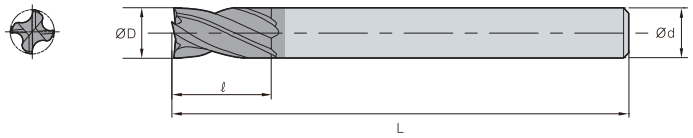
4날 플랫 엔드밀

ULTRA FINE | 4 | M HELIX | AlTiN | 절삭조건 p.408

• 공구직경공차

ØD		Ød
전 규격	0 ~ -0.02mm	h5





(mm)

형 번	ØD	Ød	ℓ	L
ESXE714020	2	4	5	45
ESXE714030	3	6	8	45
ESXE714040	4	6	10	45
ESXE714040S4	4	4	10	45
ESXE714060	6	6	16	50
ESXE714080	8	8	20	60
ESXE714100	10	10	25	75
ESXE714120	12	12	35	85

• 적용 피삭재

탄소강 ~ HB225	합금강 HB225~325	프리하든강 HRC30~50	열처리강		동	흑연	주철 ~FCD500	알루미늄	스테인리스강
			SKD61~HRC55	SKD11 HRC55~63					
		○	◎	◎	○				

◎: 매우적합 ○: 적합

ESXR704

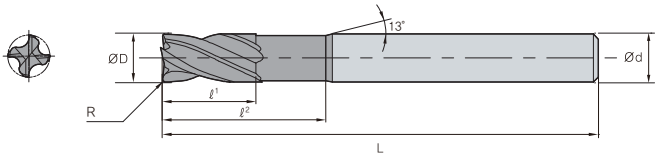
4날 넥 타입 레디우스 엔드밀

ULTRA FINE | 4 | M HELIX | R ±0.01 Ø6 이하 | R ±0.015 Ø6 초과 | AlTiN | 절삭조건 p.408

• 공구직경공차

ØD		Ød
전 규격	0 ~ -0.02mm	h5





(mm)

형 번	R	ØD	Ød	ℓ1	ℓ2	L
ESXR70401000504	0.05	1	4	1.5	4	45
ESXR70402000506	0.05	2	4	3	6	45
ESXR70402000507	0.05	2	4	2.5	7	50
ESXR7040200107	0.1	2	4	2.5	7	50
ESXR7040300107	0.1	3	6	4	7	45
ESXR7040300109	0.1	3	6	4	9	55
ESXR7040300209	0.2	3	6	4	9	55
ESXR7040300309	0.3	3	6	4	9	55
ESXR7040300312	0.3	3	6	4	12	55
ESXR7040300316	0.3	3	6	4	16	55
ESXR7040400109	0.1	4	6	5	9	45
ESXR7040400212	0.2	4	6	5	12	55
ESXR7040400212S4	0.2	4	4	5	12	55
ESXR7040400312	0.3	4	6	5	12	55
ESXR7040400316	0.3	4	6	5	16	55
ESXR7040400320	0.3	4	6	5	20	55
ESXR7040400512	0.5	4	6	5	12	55
ESXR7040400516	0.5	4	6	5	16	55
ESXR7040400516S4	0.5	4	4	5	16	55
ESXR7040400520	0.5	4	6	5	20	55
ESXR7040401012	1	4	6	5	12	55
ESXR7040500116	0.1	5	6	6	16	60
ESXR7040500216	0.2	5	6	6	16	60
ESXR7040500316	0.3	5	6	6	16	60
ESXR7040500516	0.5	5	6	6	16	60
ESXR7040501016	1	5	6	6	16	60
ESXR7040600120	0.1	6	6	7	20	60
ESXR7040600214	0.2	6	6	7	14	50

형 번	R	ØD	Ød	ℓ1	ℓ2	L
ESXR7040600220	0.2	6	6	7	20	60
ESXR7040600320	0.3	6	6	7	20	60
ESXR7040600520	0.5	6	6	7	20	60
ESXR7040601020	1	6	6	7	20	60
ESXR7040601520	1.5	6	6	7	20	60
ESXR7040800125	0.1	8	8	9	25	60
ESXR7040800218	0.2	8	8	9	18	60
ESXR7040800225	0.2	8	8	9	25	60
ESXR7040800325	0.3	8	8	9	25	60
ESXR7040800525	0.5	8	8	9	25	60
ESXR7040801025	1	8	8	9	25	60
ESXR7040801525	1.5	8	8	9	25	60
ESXR7040802025	2	8	8	9	25	60
ESXR7041000225	0.2	10	10	12	25	75
ESXR7041000232	0.2	10	10	11	32	75
ESXR7041000332	0.3	10	10	11	32	75
ESXR7041000532	0.5	10	10	11	32	75
ESXR7041001032	1	10	10	11	32	75
ESXR7041001532	1.5	10	10	11	32	75
ESXR7041002032	2	10	10	11	32	75
ESXR7041200238	0.2	12	12	12	38	75
ESXR7041200330	0.3	12	12	15	30	75
ESXR7041200338	0.3	12	12	12	38	75
ESXR7041200538	0.5	12	12	12	38	75
ESXR7041201038	1	12	12	12	38	75
ESXR7041201538	1.5	12	12	12	38	75
ESXR7041202038	2	12	12	12	38	75

• 적용 피삭재

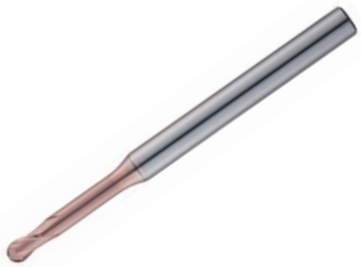
탄소강 ~ HB225	합금강 HB225~325	프리하든강 HRC30~50	열처리강		동	흑연	주철 ~FCD500	알루미늄	스테인리스강
			SKD61~HRC55	SKD11 HRC55~63					
		○	◎	◎	○				

◎: 매우적합 ○: 적합

H-Star Endmill

ESLNB20

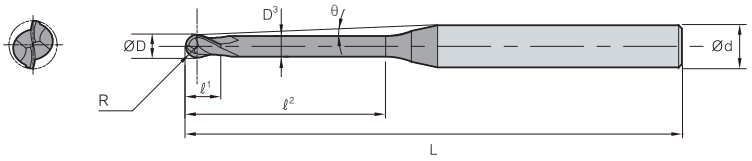
2날 롱 넥 플랫 엔드밀



ULTRA FINE | 2 | 30° HELIX | R ±0.005 Ø6 초과 | AlTiN | 절삭조건 p.408

• 공구직경공차

ØD		Ød
전 규격	0 ~ -0.012mm	h5

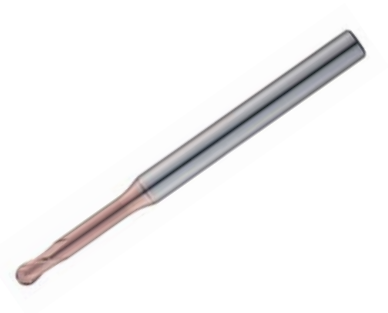


(mm)

형 번	규격(mm)								가공물 구배각별 유효길이				
	R	ØD	Ød	ℓ¹	ℓ²	D³	θ	L	0.5°	1°	1.5°	2°	3°
ESLNB2001-0.2	0.05	0.1	4	0.08	0.2	0.08	11.8	45	0.3	0.3	0.3	0.4	0.4
ESLNB2001-0.3	0.05	0.1	4	0.08	0.3	0.08	11.7	45	0.4	0.4	0.5	0.5	0.5
ESLNB2001-0.5	0.05	0.1	4	0.08	0.5	0.08	11.4	45	0.6	0.7	0.7	0.7	0.8
ESLNB2002-0.5	0.1	0.2	4	0.15	0.5	0.17	11.5	50	1.2	1.3	1.5	1.6	2
ESLNB2002-1	0.1	0.2	4	0.15	1	0.17	10.9	50	1.7	1.9	2.1	2.3	2.7
ESLNB2002-1.5	0.1	0.2	4	0.15	1.5	0.17	10.4	50	2.3	2.5	2.8	3	3.4
ESLNB2002-2	0.1	0.2	4	0.15	2	0.17	9.9	50	2.8	3.1	3.4	3.6	4.1
ESLNB2002-2.5	0.1	0.2	4	0.15	2.5	0.17	9.5	50	3.4	3.7	4	4.2	4.7
ESLNB2002-3.0	0.1	0.2	4	0.15	3	0.17	9.1	50	3.9	4.3	4.6	4.9	5.4
ESLNB2003-1	0.15	0.3	4	0.25	1	0.27	10.9	50	1.7	1.9	2.1	2.3	2.7
ESLNB2003-1.5	0.15	0.3	4	0.25	1.5	0.27	10.4	50	2.3	2.5	2.7	3	3.4
ESLNB2003-2	0.15	0.3	4	0.25	2	0.27	9.9	50	2.8	3.1	3.4	3.6	4
ESLNB2003-2.5	0.15	0.3	4	0.25	2.5	0.27	9.5	50	3.4	3.7	4	4.2	4.7
ESLNB2003-3	0.15	0.3	4	0.25	3	0.27	9.1	50	3.9	4.3	4.6	4.8	5.3
ESLNB2004-1	0.2	0.4	4	0.3	1	0.37	11	50	1.7	1.9	2.1	2.3	2.7
ESLNB2004-1.5	0.2	0.4	4	0.3	1.5	0.37	10.4	50	2.3	2.5	2.7	2.9	3.4
ESLNB2004-2	0.2	0.4	4	0.3	2	0.37	9.9	50	2.8	3.1	3.4	3.6	4
ESLNB2004-2.5	0.2	0.4	4	0.3	2.5	0.37	9.5	50	3.4	3.7	4	4.2	4.7
ESLNB2004-3	0.2	0.4	4	0.3	3	0.37	9.1	50	3.9	4.3	4.6	4.8	5.3
ESLNB2004-3.5	0.2	0.4	4	0.3	3.5	0.37	8.7	50	4.5	4.8	5.2	5.4	6
ESLNB2004-4	0.2	0.4	4	0.3	4	0.37	8.3	50	5	5.4	5.7	6	6.6
ESLNB2004-4.5	0.2	0.4	4	0.3	4.5	0.37	8	50	5.6	6	6.3	6.6	7.2
ESLNB2005-1	0.25	0.5	4	0.35	1	0.47	11	50	1.7	1.9	2.1	2.3	2.6
ESLNB2005-2	0.25	0.5	4	0.35	2	0.47	9.9	50	2.8	3.1	3.3	3.6	4
ESLNB2005-3	0.25	0.5	4	0.35	3	0.47	9	50	3.9	4.3	4.6	4.8	5.3
ESLNB2005-4	0.25	0.5	4	0.35	4	0.47	8.3	50	5	5.4	5.7	6	6.6
ESLNB2005-5	0.25	0.5	4	0.35	5	0.47	7.7	50	6.1	6.5	6.9	7.2	7.8
ESLNB2005-6	0.25	0.5	4	0.35	6	0.47	7.1	50	7.2	7.6	8	8.4	9
ESLNB2005-8	0.25	0.5	4	0.35	8	0.47	6.3	50	9.3	9.9	10.3	10.7	11.4
ESLNB2006-1	0.3	0.6	4	0.4	1	0.57	11	50	1.7	1.9	2.1	2.3	2.6
ESLNB2006-2	0.3	0.6	4	0.4	2	0.57	9.9	50	2.8	3.1	3.3	3.6	4
ESLNB2006-3	0.3	0.6	4	0.4	3	0.57	9	50	3.9	4.3	4.5	4.8	5.3
ESLNB2006-4	0.3	0.6	4	0.4	4	0.57	8.3	50	5	5.4	5.7	6	6.6
ESLNB2006-5	0.3	0.6	4	0.4	5	0.57	7.6	50	6.1	6.5	6.9	7.2	7.8
ESLNB2006-6	0.3	0.6	4	0.4	6	0.57	7.1	50	7.2	7.6	8	8.4	9
ESLNB2006-7	0.3	0.6	4	0.4	7	0.57	6.6	50	8.3	8.8	9.2	9.5	10.2

ESLNB20

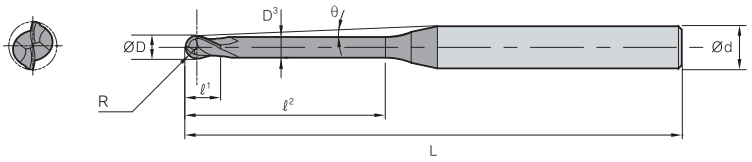
2날 롱 넥 플랫 엔드밀



ULTRA FINE | 2 | 30° HELIX | R ±0.005 Ø6 초과 | AlTiN | 절삭조건 p.408

• 공구직경공차

ØD		Ød
전 규격	0 ~ -0.012mm	h5



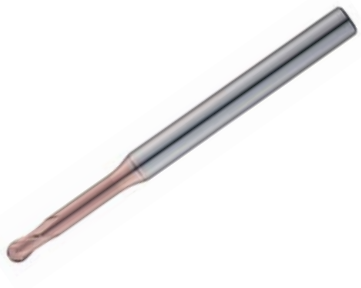
(mm)

형 번	규격(mm)								가공물 구배각별 유효길이				
	R	ØD	Ød	ℓ¹	ℓ²	D³	θ	L	0.5°	1°	1.5°	2°	3°
ESLNB2006-8	0.3	0.6	4	0.4	8	0.57	6.2	50	9.3	9.9	10.3	10.7	11.4
ESLNB2006-9	0.3	0.6	4	0.4	9	0.57	5.8	50	10.4	10.9	11.4	11.8	12.5
ESLNB2006-10	0.3	0.6	4	0.4	10	0.57	5.5	50	11.4	12	12.5	12.9	13.7
ESLNB2006-12	0.3	0.6	4	0.4	12	0.57	5	50	13.6	14.2	14.7	15.2	16
ESLNB2008-2	0.4	0.8	4	0.5	2	0.77	9.9	50	2.8	3.1	3.3	3.5	4
ESLNB2008-4	0.4	0.8	4	0.5	4	0.77	8.2	50	5	5.4	5.7	6	6.5
ESLNB2008-5	0.4	0.8	4	0.5	5	0.77	7.5	50	6.1	6.5	6.9	7.2	7.8
ESLNB2008-6	0.4	0.8	4	0.5	6	0.77	7	50	7.2	7.6	8	8.4	9
ESLNB2008-8	0.4	0.8	4	0.5	8	0.77	6.1	50	9.3	9.8	10.3	10.7	11.3
ESLNB2008-10	0.4	0.8	4	0.5	10	0.77	5.4	50	11.4	12	12.5	12.9	13.7
ESLNB2010-2	0.5	1	4	0.8	2	0.96	9.9	50	2.9	3.1	3.3	3.5	4
ESLNB2010-3	0.5	1	4	0.8	3	0.96	8.9	50	4	4.3	4.5	4.8	5.3
ESLNB2010-4	0.5	1	4	0.8	4	0.96	8.1	50	5	5.4	5.7	6	6.5
ESLNB2010-5	0.5	1	4	0.8	5	0.96	7.4	50	6.1	6.5	6.9	7.2	7.8
ESLNB2010-6	0.5	1	4	0.8	6	0.96	6.8	50	7.2	7.7	8	8.4	9
ESLNB2010-7	0.5	1	4	0.8	7	0.96	6.3	50	8.3	8.8	9.2	9.5	10.2
ESLNB2010-8	0.5	1	4	0.8	8	0.96	5.9	50	9.3	9.9	10.3	10.7	11.3
ESLNB2010-9	0.5	1	4	0.8	9	0.96	5.5	50	10.4	11	11.4	11.8	12.5
ESLNB2010-10	0.5	1	4	0.8	10	0.96	5.2	50	11.5	12	12.5	12.9	13.7
ESLNB2010-12	0.5	1	4	0.8	12	0.96	4.6	55	13.6	14.2	14.7	15.2	15.9
ESLNB2010-14	0.5	1	4	0.8	14	0.96	4.2	55	15.7	16.4	16.9	17.4	18.5
ESLNB2010-16	0.5	1	4	0.8	16	0.96	3.8	55	17.8	18.5	19.1	19.6	21.2
ESLNB2010-18	0.5	1	4	0.8	18	0.96	3.5	60	19.9	20.7	21.3	21.8	23.8
ESLNB2010-20	0.5	1	4	0.8	20	0.96	3.3	60	22	22.8	23.4	24	26.5
ESLNB2012-4	0.6	1.2	4	1.1	4	1.15	7.9	50	5.1	5.4	5.7	6	6.5
ESLNB2012-6	0.6	1.2	4	1.1	6	1.15	6.6	50	7.2	7.7	8	8.4	9
ESLNB2012-8	0.6	1.2	4	1.1	8	1.15	5.7	50	9.4	9.9	10.3	10.7	11.3
ESLNB2012-10	0.6	1.2	4	1.1	10	1.15	5	50	11.5	12.1	12.5	12.9	13.7
ESLNB2012-12	0.6	1.2	4	1.1	12	1.15	4.5	55	13.6	14.2	14.7	15.2	15.9
ESLNB2014-8	0.7	1.4	4	1.3	8	1.34	5.5	50	9.4	9.9	10.3	10.7	11.3
ESLNB2014-12	0.7	1.4	4	1.3	12	1.34	4.3	55	13.6	14.2	14.7	15.2	15.9
ESLNB2014-16	0.7	1.4	4	1.3	16	1.34	3.5	55	17.8	18.5	19.1	19.6	21.2
ESLNB2015-4	0.75	1.5	4	1.35	4	1.44	7.7	50	5.1	5.4	5.7	6	6.5
ESLNB2015-6	0.75	1.5	4	1.35	6	1.44	6.4	50	7.3	7.7	8	8.4	9
ESLNB2015-8	0.75	1.5	4	1.35	8	1.44	5.4	50	9.4	9.9	10.3	10.7	11.3
ESLNB2015-10	0.75	1.5	4	1.35	10	1.44	4.7	50	11.5	12.1	12.5	12.9	13.7

H-Star Endmill

ESLNB20

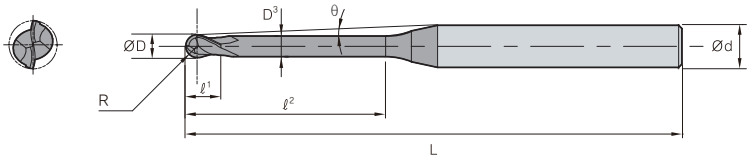
2날 롱 넥 플랫 엔드밀



ULTRA FINE | 2 | 30° HELIX | R ±0.005 Ø6 초과 | AlTiN | 절삭조건 p.408

• 공구직경공차

ØD		Ød
전 규격	0 ~ -0.012mm	h5



(mm)

형 번	규격(mm)								가공물 구배각별 유효길이				
	R	ØD	Ød	ℓ¹	ℓ²	D³	θ	L	0.5°	1°	1.5°	2°	3°
ESLNB2015-12	0.75	1.5	4	1.35	12	1.44	4.2	55	13.6	14.2	14.7	15.2	15.9
ESLNB2015-14	0.75	1.5	4	1.35	14	1.44	3.8	55	15.7	16.4	16.9	17.4	18.5
ESLNB2015-16	0.75	1.5	4	1.35	16	1.44	3.4	55	17.8	18.5	19.1	19.6	21.1
ESLNB2015-20	0.75	1.5	4	1.35	20	1.44	2.9	60	22	22.8	23.4	24	-
ESLNB2016-8	0.8	1.6	4	1.4	8	1.54	5.3	50	9.4	9.9	10.3	10.7	11.3
ESLNB2016-10	0.8	1.6	4	1.4	10	1.54	4.6	55	11.5	12.1	12.5	12.9	13.7
ESLNB2016-12	0.8	1.6	4	1.4	12	1.54	4.1	55	13.6	14.2	14.7	15.2	15.9
ESLNB2016-16	0.8	1.6	4	1.4	16	1.54	3.3	55	17.8	18.5	19.1	19.6	21.1
ESLNB2016-20	0.8	1.6	4	1.4	20	1.54	2.8	60	22	22.8	23.4	24	-
ESLNB2018-8	0.9	1.8	4	1.6	8	1.73	5.1	50	9.4	9.9	10.3	10.7	11.3
ESLNB2018-12	0.9	1.8	4	1.6	12	1.73	3.9	55	13.7	14.3	14.7	15.2	15.9
ESLNB2018-16	0.9	1.8	4	1.6	16	1.73	3.1	55	17.9	18.6	19.1	19.6	21.1
ESLNB2018-20	0.9	1.8	4	1.6	20	1.73	2.6	60	22	22.8	23.4	24	-
ESLNB2020-3	1	2	4	1.7	3	1.92	8.3	50	4.1	4.4	4.6	4.8	5.2
ESLNB2020-4	1	2	4	3	4	1.92	7.3	50	5.2	5.5	5.8	6	6.5
ESLNB2020-6	1	2	4	3	6	1.92	5.8	50	7.3	7.7	8.1	8.4	9
ESLNB2020-8	1	2	4	3	8	1.92	4.9	50	9.5	9.9	10.3	10.7	11.3
ESLNB2020-10	1	2	4	3	10	1.92	4.2	50	11.6	12.1	12.6	12.9	13.6
ESLNB2020-12	1	2	4	3	12	1.92	3.7	55	13.7	14.3	14.8	15.2	15.9
ESLNB2020-14	1	2	4	3	14	1.92	3.2	55	15.8	16.4	16.9	17.4	18.5
ESLNB2020-16	1	2	4	3	16	1.92	2.9	55	17.9	18.6	19.1	19.6	-
ESLNB2020-18	1	2	4	3	18	1.92	2.7	60	20	20.7	21.3	21.8	-
ESLNB2020-20	1	2	4	3	20	1.92	2.4	60	22.1	22.8	23.4	24	-
ESLNB2020-22	1	2	4	3	22	1.92	2.3	60	24.1	24.9	25.6	26.3	-
ESLNB2020-25	1	2	4	3	25	1.92	2	65	27.3	28.1	28.8	-	-
ESLNB2020-30	1	2	4	3	30	1.92	1.7	70	32.4	33.4	34.2	-	-
ESLNB2020-35	1	2	4	3	35	1.92	1.5	75	37.6	38.6	-	-	-
ESLNB2020-40	1	2	4	3	40	1.92	1.4	80	42.8	43.8	-	-	-
ESLNB2025-10	1.25	2.5	4	4	10	2.4	3.4	50	11.6	12.1	12.6	13	13.6
ESLNB2025-16	1.25	2.5	4	4	16	2.4	2.3	55	17.9	18.6	19.1	19.6	-
ESLNB2025-20	1.25	2.5	4	4	20	2.4	1.9	60	22.1	22.8	23.5	-	-
ESLNB2030-8	1.5	3	6	4	8	2.88	6.2	55	9.6	10	10.4	10.7	11.3
ESLNB2030-10	1.5	3	6	4	10	2.88	5.5	55	11.7	12.2	12.6	13	13.6
ESLNB2030-13	1.5	3	6	4	13	2.88	4.6	60	14.8	15.4	15.9	16.3	17.1
ESLNB2030-16	1.5	3	6	4	16	2.88	4	60	18	18.6	19.1	19.6	21.1
ESLNB2030-18	1.5	3	6	4	18	2.88	3.6	60	20	20.7	21.3	21.8	23.7

ESLNB20

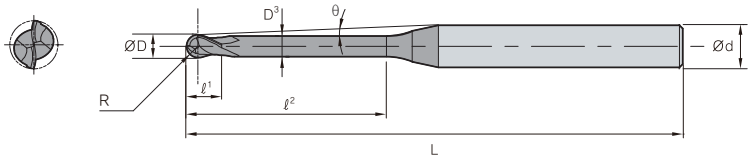
2날 롱 넥 플랫 엔드밀

ULTRA FINE | 2 | 30° HELIX | R ±0.005 Ø6 초과 | AlTiN | 절삭조건 p.408

• 공구직경공차

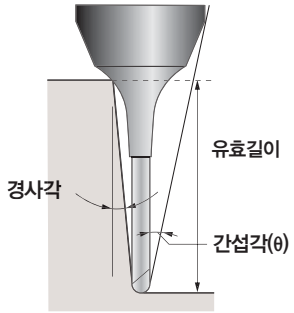
ØD		Ød
전 규격	0 ~ -0.012mm	h5

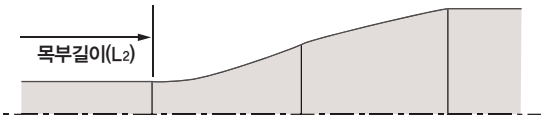




(mm)

형 번	규격(mm)								가공물 구배각별 유효길이				
	R	ØD	Ød	ℓ1	ℓ2	D3	θ	L	0.5°	1°	1.5°	2°	3°
ESLNB2030-20	1.5	3	6	4	20	2.88	3.4	65	22.1	22.9	23.5	24	26.4
ESLNB2030-25	1.5	3	6	4	25	2.88	2.8	70	27.3	28.2	28.8	29.9	-
ESLNB2030-30	1.5	3	6	4	30	2.88	2.5	75	32.5	33.4	34.3	35.9	-
ESLNB2030-35	1.5	3	6	4	35	2.88	2.2	80	37.7	38.7	40	41.9	-
ESLNB2040-10	2	4	6	5	10	3.9	4.5	55	11.6	12.1	12.5	12.9	13.5
ESLNB2040-13	2	4	6	5	13	3.9	3.6	60	14.7	15.3	15.8	16.2	17
ESLNB2040-16	2	4	6	5	16	3.9	3.1	60	17.9	18.5	19.1	19.5	20.9
ESLNB2040-20	2	4	6	5	20	3.9	2.5	65	22.1	22.8	23.4	23.9	-
ESLNB2040-25	2	4	6	5	25	3.9	2.1	70	27.3	28.1	28.8	29.8	-
ESLNB2040-30	2	4	6	5	30	3.9	1.8	75	32.4	33.4	34.2	-	-
ESLNB2040-35	2	4	6	5	35	3.9	1.6	80	37.6	38.6	39.9	-	-
ESLNB2040-40	2	4	6	5	40	3.9	1.4	80	42.8	43.8	-	-	-
ESLNB2040-45	2	4	6	5	45	3.9	1.2	90	47.9	49.1	-	-	-
ESLNB2040-50	2	4	6	5	50	3.9	1.1	100	53.1	54.5	-	-	-
ESLNB2050-20	2.5	5	6	6	20	4.9	1.4	65	22	22.8	-	-	-
ESLNB2050-25	2.5	5	6	6	25	4.9	1.2	70	27.2	28.1	-	-	-
ESLNB2050-30	2.5	5	6	6	30	4.9	1	75	32.4	-	-	-	-
ESLNB2050-35	2.5	5	6	6	35	4.9	0.8	80	42.8	-	-	-	-
ESLNB2050-40	2.5	5	6	6	40	4.9	0.7	90	42.8	-	-	-	-





※ 표시된 유효길이는 공작물과의 간섭을 막기 위한 기본 값입니다.
가공환경의 적절한 제어가 필요합니다.

• 적용 피삭재

탄소강 ~ HB225	합금강 HB225~325	프리하든강 HRC30~50	열처리강		동	흑연	주철 ~FCD500	알루미늄	스테인리스강
			SKD61~HRC55	SKD11 HRC55~63					
		○	◎	◎	○				

◎: 매우적합 ○: 적합

H-Star Endmill

ESTNB20

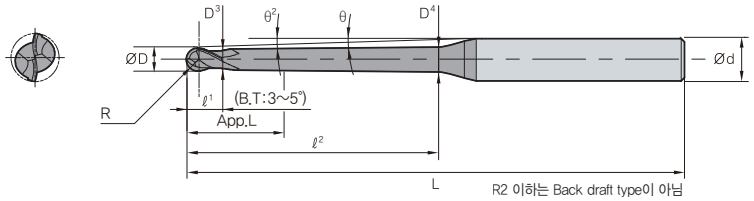
2날 테이퍼 넥 볼 엔드밀



ULTRA FINE | 2 | 30° HELIX | R ±0.01 (Ø6 이하) | R ±0.015 (Ø6 초과) | AlTiN | 절삭조건 p.409~411

• 공구직경공차

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	



(mm)

형 번	규격(mm)											가공물 구배각별 유효길이				
	R	ØD	Ød	ℓ1	ℓ2	θ	D3	D4	App. L	θ2	L	0.5°	1°	1.5°	2°	3°
ESTNB2002-1-04	0.1	0.2	4	0.15	1	0.4	0.17	0.18	1.35	10.9	50	1.5	1.7	1.8	2	2.3
ESTNB2002-1.5-04	0.1	0.2	4	0.15	1.5	0.4	0.17	0.19	1.77	10.4	50	2	2.2	2.4	2.6	2.9
ESTNB2002-2-09	0.1	0.2	4	0.15	2	0.9	0.17	0.23	1.1	10.1	50	-	2.8	3.1	3.4	3.9
ESTNB2002-2.5-09	0.1	0.2	4	0.15	2.5	0.9	0.17	0.24	1.1	9.6	50	-	3.3	3.7	4	4.5
ESTNB2003-2-04	0.15	0.3	4	0.25	2	0.4	0.28	0.29	2.19	10	50	2.5	2.8	3	3.2	3.5
ESTNB2003-3-09	0.15	0.3	4	0.25	3	0.9	0.28	0.36	1.2	9.3	50	-	3.8	4.2	4.5	5.1
ESTNB2003-4-09	0.15	0.3	4	0.25	4	0.9	0.28	0.39	1.2	8.6	50	-	4.8	5.3	5.7	6.3
ESTNB2004-2-04	0.2	0.4	4	0.3	2	0.4	0.37	0.39	2.2	10	50	2.5	2.8	3	3.2	3.5
ESTNB2004-3-04	0.2	0.4	4	0.3	3	0.4	0.37	0.41	2.44	9.1	50	3.6	3.9	4.1	4.4	4.8
ESTNB2004-4-04	0.2	0.4	4	0.3	4	0.4	0.37	0.42	2.44	8.4	50	4.7	5.2	5.6	5.9	6.5
ESTNB2004-4-09	0.2	0.4	4	0.3	4	0.9	0.37	0.49	1.25	8.5	50	-	4.8	5.3	5.7	6.3
ESTNB2004-5-04	0.2	0.4	4	0.3	5	0.4	0.37	0.44	2.44	7.8	50	5.7	6.3	6.7	7.1	7.7
ESTNB2004-5-09	0.2	0.4	4	0.3	5	0.9	0.37	0.52	1.25	7.9	50	-	5.9	6.4	6.8	7.5
ESTNB2005-4-04	0.25	0.5	4	0.35	4	0.4	0.47	0.52	2.49	8.4	50	4.6	5	5.3	5.5	5.9
ESTNB2005-8-09	0.25	0.5	4	0.35	8	0.9	0.47	0.71	1.3	6.5	50	-	8.9	9.6	10.1	10.9
ESTNB2005-12-09	0.25	0.5	4	0.35	12	0.9	0.47	0.84	1.3	5.3	50	-	13	13.9	14.5	15.4
ESTNB20054-2-04	0.27	0.54	4	0.37	2	0.4	0.52	0.54	1.8	10	50	2.3	2.5	2.7	2.8	3
ESTNB20054-4-04	0.27	0.54	4	0.37	4	0.4	0.52	0.57	1.8	8.4	50	4.5	4.9	5.2	5.5	5.9
ESTNB20054-5-04	0.27	0.54	4	0.37	5	0.4	0.52	0.59	1.8	7.8	50	5.5	6	6.3	6.6	7.1
ESTNB20054-6-04	0.27	0.54	4	0.37	6	0.4	0.52	0.6	1.8	7.2	50	6.7	7.3	7.8	8.2	8.8
ESTNB20054-6.5-04	0.27	0.54	4	0.37	6.5	0.4	0.52	0.61	1.8	7	50	7.2	7.9	8.3	8.7	9.4
ESTNB20054-7-04	0.27	0.54	4	0.37	7	0.4	0.52	0.61	1.8	6.8	50	7.7	8.4	8.9	9.3	10
ESTNB2006-2-04	0.3	0.6	4	0.4	2	0.4	0.57	0.59	2.17	10	50	2.4	2.5	2.7	2.8	3
ESTNB2006-4-04	0.3	0.6	4	0.4	4	0.4	0.57	0.62	2.54	8.4	50	4.6	5	5.2	5.5	5.9
ESTNB2006-6-04	0.3	0.6	4	0.4	6	0.4	0.57	0.65	2.54	7.2	50	6.8	7.4	7.8	8.2	8.8
ESTNB2006-6-09	0.3	0.6	4	0.4	6	0.9	0.57	0.75	1.35	7.3	50	-	6.9	7.5	7.9	8.6
ESTNB2006-8-09	0.3	0.6	4	0.4	8	0.9	0.57	0.81	1.35	6.4	50	-	8.9	9.6	10.1	10.9
ESTNB2006-10-04	0.3	0.6	4	0.4	10	0.4	0.57	0.7	2.54	5.6	50	10.8	11.7	12.2	12.7	13.5
ESTNB2006-10-09	0.3	0.6	4	0.4	10	0.9	0.57	0.87	1.35	5.7	50	-	11	11.8	12.3	13.2
ESTNB2006-12-09	0.3	0.6	4	0.4	12	0.9	0.57	0.93	1.35	5.2	55	-	13	13.9	14.5	15.4
ESTNB2006-15-04	0.3	0.6	4	0.4	15	0.4	0.57	0.77	2.54	4.4	55	15.9	17	17.6	18.2	19.2
ESTNB2006-15-09	0.3	0.6	4	0.4	15	0.9	0.57	1.03	1.35	4.5	55	-	16.1	17.1	17.7	18.8
ESTNB2008-4-04	0.4	0.8	4	0.5	4	0.4	0.77	0.82	2.64	8.3	50	4.6	4.9	5.2	5.5	5.9
ESTNB2008-6-04	0.4	0.8	4	0.5	6	0.4	0.77	0.85	2.64	7.1	50	6.6	7.1	7.5	7.7	8.3
ESTNB2008-8-09	0.4	0.8	4	0.5	8	0.9	0.77	1.01	1.45	6.3	50	-	8.9	9.6	10.1	10.9
ESTNB2008-12-09	0.4	0.8	4	0.5	12	0.9	0.77	1.13	1.45	5	55	-	13	13.9	14.5	15.4

ESTNB20

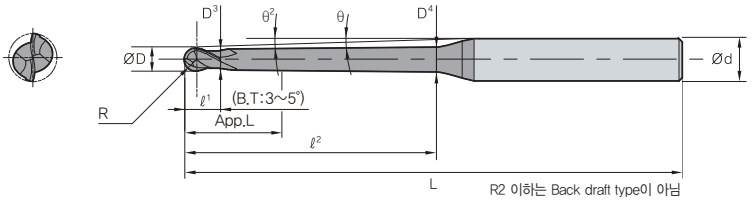
2날 테이퍼 넥 볼 엔드밀



ULTRA FINE | 2 | 30° HELIX | R ±0.01 (Ø6 이하) | R ±0.015 (Ø6 초과) | AlTiN | 절삭조건 p.409~411

• 공구직경공차

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	



R2 이하는 Back draft type이 아님

(mm)

형 번	규격(mm)											가공물 구배각별 유효길이				
	R	ØD	Ød	ℓ1	ℓ2	θ	D3	D4	App. L	θ2	L	0.5°	1°	1.5°	2°	3°
ESTNB2008-16-09	0.4	0.8	4	0.5	16	0.9	0.77	1.26	1.45	4.2	55	-	17.1	18.1	18.8	19.9
ESTNB2009-4-04	0.45	0.9	4	0.6	4	0.4	0.86	0.91	3.46	8.2	50	4.5	4.7	4.9	5.1	5.4
ESTNB2009-8-04	0.45	0.9	4	0.6	8	0.4	0.86	0.96	3.46	6.1	55	8.7	9.3	9.7	10	10.6
ESTNB2009-12-04	0.45	0.9	4	0.6	12	0.4	0.86	1.02	3.46	4.8	55	12.9	13.8	14.4	14.9	15.7
ESTNB2009-16-04	0.45	0.9	4	0.6	16	0.4	0.86	1.08	3.46	4	60	17	18	18.7	19.3	20.5
ESTNB2009-18-04	0.45	0.9	4	0.6	18	0.4	0.86	1.1	3.46	3.7	65	19.1	20.1	20.9	21.5	23.1
ESTNB2009-20-04	0.45	0.9	4	0.6	20	0.4	0.86	1.13	3.46	3.4	65	21.1	22.2	23	23.6	25.6
ESTNB2009-22-04	0.45	0.9	4	0.6	22	0.4	0.86	1.16	3.46	3.2	65	23.1	24.3	25.1	25.8	28.2
ESTNB2009-24-04	0.45	0.9	4	0.6	24	0.4	0.86	1.19	3.46	3	70	25.2	26.4	27.2	27.9	-
ESTNB2010-6-04	0.5	1	6	0.8	6	0.4	0.94	1.01	5.09	8.3	50	6.8	7.2	7.5	7.8	8.3
ESTNB2010-8-04	0.5	1	6	0.8	8	0.4	0.94	1.04	5.09	7.5	55	8.8	9.3	9.7	10	10.6
ESTNB2010-10-04	0.5	1	6	0.8	10	0.4	0.94	1.07	5.09	6.8	55	11	11.7	12.3	12.7	13.5
ESTNB2010-10-09	0.5	1	6	0.8	10	0.9	0.94	1.23	2.7	6.9	55	-	11.2	11.9	12.4	13.2
ESTNB2010-15-09	0.5	1	6	0.8	15	0.9	0.94	1.39	2.7	5.7	60	-	16.2	17.1	17.8	18.8
ESTNB2010-20-04	0.5	1	6	0.8	20	0.4	0.94	1.21	5.09	4.7	65	21.2	22.3	23	23.6	25.7
ESTNB2010-20-09	0.5	1	6	0.8	20	0.4	0.94	1.54	2.7	4.8	65	-	21.3	22.4	23.1	24.6
ESTNB2010-25-09	0.5	1	6	0.8	25	0.4	0.94	1.7	2.7	4.2	70	-	26.4	27.6	28.4	30.8
ESTNB2010-30-04	0.5	1	6	0.8	30	0.4	0.94	1.35	5.09	3.6	75	31.3	32.7	33.6	34.8	38.5
ESTNB2010-30-09	0.5	1	6	0.8	30	0.9	0.94	1.86	2.7	3.7	75	-	31.4	32.8	33.7	36.9
ESTNB2010-35-09	0.5	1	6	0.8	35	0.9	0.94	2.02	2.7	3.3	80	-	36.5	38	39	43.1
ESTNB2010-40-09	0.5	1	6	0.8	40	0.9	0.94	2.17	2.7	3	85	-	41.6	43.2	44.4	-
ESTNB2010-50-09	0.5	1	6	0.8	50	0.9	0.94	2.49	2.7	2.5	95	-	51.7	53.5	55.5	-
ESTNB2010-60-09	0.5	1	6	0.8	60	0.9	0.94	2.8	2.7	2.2	105	-	61.8	63.8	66.6	-
ESTNB2010-70-09	0.5	1	6	0.8	70	0.9	0.94	3.11	2.7	1.9	115	-	71.9	74	-	-
ESTNB2015-8-04	0.75	1.5	6	1.35	8	0.4	1.42	1.51	7.07	7.3	55	8.9	9.4	9.7	10	10.6
ESTNB2015-10-04	0.75	1.5	6	1.35	10	0.4	1.42	1.54	7.07	6.6	55	10.9	11.5	11.9	12.2	12.9
ESTNB2015-12-04	0.75	1.5	6	1.35	12	0.4	1.42	1.57	7.07	6	55	13	13.6	14	14.4	15.4
ESTNB2015-15-09	0.75	1.5	6	1.35	15	0.9	1.42	1.85	3.89	5.4	60	-	16.4	17.2	17.8	18.8
ESTNB2015-20-09	0.75	1.5	6	1.35	20	0.9	1.42	2.01	3.89	4.5	65	-	21.4	22.4	23.2	24.7
ESTNB2015-30-09	0.75	1.5	6	1.35	30	0.9	1.42	2.32	3.89	3.4	75	-	31.5	32.9	33.7	37
ESTNB2018-4-04	0.9	1.8	6	1.6	4	0.4	1.73	1.76	4.38	9.2	50	4.6	4.8	4.9	5.1	5.4
ESTNB2018-8-04	0.9	1.8	6	1.6	8	0.4	1.73	1.82	6.61	7.1	50	8.6	9	9.2	9.4	10.2
ESTNB2018-12-04	0.9	1.8	6	1.6	12	0.4	1.73	1.88	6.61	5.8	55	12.9	13.5	14	14.4	15.4
ESTNB2018-16-04	0.9	1.8	6	1.6	16	0.4	1.73	1.93	6.61	4.9	60	17	17.7	18.3	18.7	20.5
ESTNB2018-20-04	0.9	1.8	6	1.6	20	0.4	1.73	1.99	6.61	4.3	65	21.2	22.3	23	23.6	25.6
ESTNB2018-24-04	0.9	1.8	6	1.6	24	0.4	1.73	2.04	6.61	3.8	65	25.3	26.5	27.3	27.9	30.8

H-Star Endmill

ESTNB20

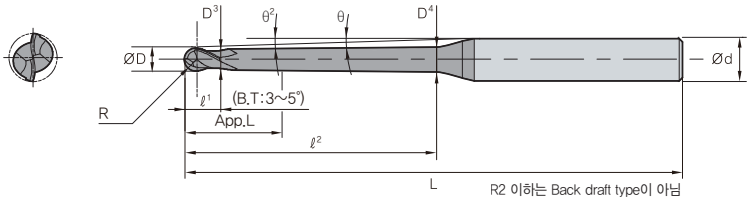
2날 테이퍼 넥 볼 엔드밀



ULTRA FINE | 2 | 30° HELIX | R ±0.01 (Ø6 이하) | R ±0.015 (Ø6 초과) | AlTiN | 절삭조건 p.409~411

• 공구직경공차

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	



(mm)

형 번	규격(mm)											가공물 구배각별 유효길이				
	R	ØD	Ød	ℓ1	ℓ2	θ	D3	D4	App. L	θ2	L	0.5°	1°	1.5°	2°	3°
ESTNB2018-28-04	0.9	1.8	6	1.6	28	0.4	1.73	2.1	6.61	3.4	70	29.4	30.6	31.5	32.4	35.9
ESTNB2018-32-04	0.9	1.8	6	1.6	32	0.4	1.73	2.15	6.61	3	70	33.4	34.8	35.7	37.1	-
ESTNB2018-36-04	0.9	1.8	6	1.6	36	0.4	1.73	2.21	6.61	2.8	75	37.5	38.9	39.9	41.7	-
ESTNB2018-38-04	0.9	1.8	6	1.6	38	0.4	1.73	2.24	6.61	2.7	80	39.5	41	42	44	-
ESTNB2018-40-04	0.9	1.8	6	1.6	40	0.4	1.73	2.27	6.61	2.6	80	41.5	43.1	44.2	46.3	-
ESTNB2020-8-04	1	2	6	1.7	8	0.4	1.92	2.01	7.42	7	50	8.7	9	9.2	9.5	10.2
ESTNB2020-12-04	1	2	6	1.7	12	0.4	1.92	2.06	7.42	5.7	55	13	13.6	14	14.4	15.4
ESTNB2020-16-04	1	2	6	1.7	16	0.4	1.92	2.12	7.42	4.8	60	17	17.7	18.3	18.7	20.5
ESTNB2020-20-04	1	2	6	1.7	20	0.4	1.92	2.18	7.42	4.1	65	21.3	22.3	23	23.6	25.6
ESTNB2020-20-09	1	2	6	1.7	20	0.9	1.92	2.5	4.24	4.2	65	-	21.4	22.4	23.2	24.6
ESTNB2020-25-09	1	2	6	1.7	25	0.9	1.92	2.65	4.24	3.6	65	-	26.5	27.7	28.5	30.8
ESTNB2020-30-04	1	2	6	1.7	30	0.4	1.92	2.32	7.42	3.1	70	31.4	32.7	33.6	34.8	38.5
ESTNB2020-30-09	1	2	6	1.7	30	0.9	1.92	2.81	4.24	3.2	70	-	31.6	32.9	33.7	36.9
ESTNB2020-35-09	1	2	6	1.7	35	0.9	1.92	2.97	4.24	2.8	75	-	36.6	38	39	-
ESTNB2020-40-04	1	2	6	1.7	40	0.4	1.92	2.46	7.42	2.5	80	41.5	43.1	44.2	46.3	-
ESTNB2020-40-09	1	2	6	1.7	40	0.9	1.92	3.12	4.24	2.6	80	-	41.7	43.2	44.5	-
ESTNB2020-50-09	1	2	6	1.7	50	0.9	1.92	3.44	4.24	2.1	90	-	51.5	53.5	55.5	-
ESTNB2020-60-09	1	2	6	1.7	60	0.9	1.92	3.75	4.24	1.8	100	-	61.9	63.8	-	-
ESTNB2020-70-09	1	2	6	1.7	70	0.9	1.92	4.07	4.24	1.8	110	-	72	74.1	-	-
ESTNB2030-8-04	1.5	3	6	2.5	8	0.4	2.86	2.94	8.5	6.3	50	8.8	9.1	9.3	9.5	10.3
ESTNB2030-16-04	1.5	3	6	2.5	16	0.4	2.86	3.05	12.52	4.1	55	17.2	17.8	18.3	18.7	20.6
ESTNB2030-20-04	1.5	3	6	2.5	20	0.4	2.86	3.1	12.52	3.4	60	21.2	22	22.6	23.3	25.7
ESTNB2030-30-04	1.5	3	6	2.5	30	0.4	2.86	3.24	12.52	2.5	70	31.6	32.8	33.7	34.9	-
ESTNB2030-30-09	1.5	3	6	2.5	30	0.9	2.86	3.72	6.95	2.6	70	-	31.8	33	33.8	-
ESTNB2030-40-04	1.5	3	6	2.5	40	0.4	2.86	3.38	12.52	2	80	41.7	43.2	44.3	-	-
ESTNB2030-40-09	1.5	3	6	2.5	40	0.9	2.86	4.04	6.95	2	80	-	41.9	43.3	-	-
ESTNB2030-50-09	1.5	3	6	2.5	50	0.9	2.86	4.35	6.95	1.7	90	-	52	53.6	-	-
ESTNB2030-60-09	1.5	3	6	2.5	60	0.9	2.86	4.67	6.95	1.4	100	-	62.1	-	-	-
ESTNB2030-70-09	1.5	3	6	2.5	70	0.9	2.86	4.98	6.95	1.2	110	-	72.1	-	-	-
ESTNB2040-20-10	2	4	8	8	20	1	3.86	4.28	12.01	5	70	20.5	21.6	22.3	22.8	23.5
ESTNB2040-30-10	2	4	8	8	30	1	3.86	4.63	12.01	3.51	80	22	31.6	32.5	33.2	34.16
ESTNB2040-40-10	2	4	8	8	40	1	3.86	4.98	12.01	2.7	90	22	42	43.4	44.3	-
ESTNB2040-50-10	2	4	8	8	50	1	3.86	5.33	12.01	2.2	100	22	52	53.6	54.7	-
ESTNB2040-60-10	2	4	8	8	60	1	3.86	5.68	12.01	1.9	110	22	62	63.8	-	-
ESTNB2050-30-10	2.5	5	8	10	30	1	4.86	5.56	14.01	2.8	80	25.5	31.7	32.6	33.2	-
ESTNB2050-40-10	2.5	5	8	10	40	1	4.86	5.91	14.01	2.1	90	25.5	41.7	42.8	43.5	-

ESTNB20

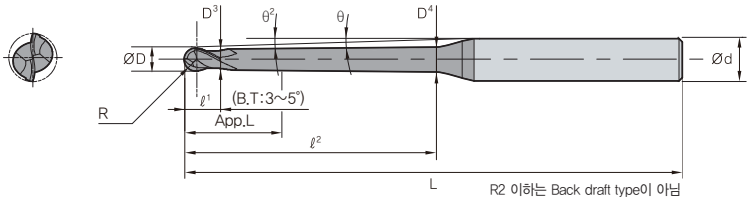
2날 테이퍼 넥 볼 엔드밀



ULTRA FINE | 2 | 30° HELIX | R ±0.01 (Ø6 이하) | R ±0.015 (Ø6 초과) | AlTiN | 절삭조건 p.409~411

• 공구직경공차

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	



(mm)

형 번	규격(mm)											가공물 구배각별 유효길이				
	R	ØD	Ød	ℓ1	ℓ2	θ	D3	D4	App. L	θ2	L	0.5°	1°	1.5°	2°	3°
ESTNB2050-60-10	2.5	5	8	10	60	1	4.86	6.61	14.01	1.5	110	25.5	62.1	-	-	-
ESTNB2060-30-10	3	6	8	12	30	1	5.86	6.49	16.01	1.9	80	29	31.8	32.6	-	-
ESTNB2060-40-10	3	6	8	12	40	1	5.86	6.84	16.01	1.5	90	29	41.8	-	-	-
ESTNB2060-50-10	3	6	8	12	50	1	5.86	7.19	16.01	1.2	100	29	51.8	-	-	-
ESTNB2060-60-10	3	6	10	12	60	1	5.86	7.54	16.01	1.9	110	29	62.2	63.9	-	-
ESTNB2060-70-10	3	6	10	12	70	1	5.86	7.89	16.01	1.7	120	29	72.2	74.1	-	-
ESTNB2060-80-10	3	6	10	12	80	1	5.86	8.23	16.01	1.5	130	29	82.2	-	-	-
ESTNB2080-50-10	4	8	10	14	50	1	7.86	9.12	18.01	1.2	110	32	51.9	-	-	-
ESTNB2080-60-10	4	8	10	14	60	1	7.86	9.47	18.01	1	120	32	-	-	-	-
ESTNB2080-70-10	4	8	10	14	70	1	7.86	9.82	18.01	0.9	130	32	-	-	-	-
ESTNB2080-80-10	4	8	12	14	80	1	7.86	10.16	18.01	1.5	140	32	82.3	-	-	-
ESTNB2100-60-10	5	10	12	18	60	1	9.86	11.33	22.01	1.1	130	39	62.1	-	-	-
ESTNB2100-75-10	5	10	12	18	75	1	9.86	11.85	22.01	0.9	140	39	-	-	-	-

• 적용 피삭재

탄소강 ~ HB225	합금강 HB225~325	프리하든강 HRC30~50	열처리강		동	흑연	주철 ~FCD500	알루미늄	스테인리스강
			SKD61~HRC55	SKD11 HRC55~63					
		○	◎	◎	○				

◎: 매우적합 ○: 적합

H-Star Endmill

ESTNB30

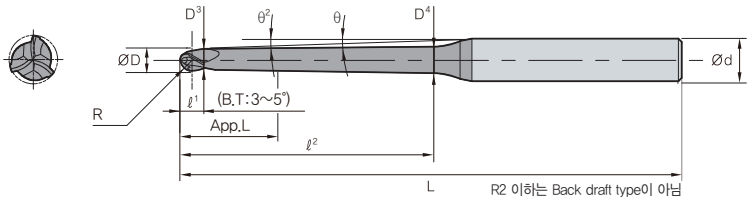
3날 테이퍼 넥 볼 엔드밀



ULTRA FINE | 3 | 30° HELIX | R ±0.005 전 규격 | AlTiN | 절삭조건 p.412~415

• 공구직경공차

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	



(mm)

형 번	규격(mm)											가공물 구배각별 유효길이				
	R	ØD	Ød	ℓ1	ℓ2	θ	D3	D4	App. L	θ2	L	0.5°	1°	1.5°	2°	3°
ESTNB3020-8-04	1	2	6	1.7	8	0.4	1.92	2.01	7.42	7	50	8.7	9	9.2	9.5	10.2
ESTNB3020-12-04	1	2	6	1.7	12	0.4	1.92	2.06	7.42	5.7	55	13	13.6	14	14.4	15.4
ESTNB3020-16-04	1	2	6	1.7	16	0.4	1.92	2.12	7.42	4.8	60	17	17.7	18.3	18.7	20.5
ESTNB3020-20-04	1	2	6	1.7	20	0.4	1.92	2.18	7.42	4.1	65	21.3	22.3	23	23.6	25.6
ESTNB3020-20-09	1	2	6	1.7	20	0.9	1.92	2.5	4.24	4.2	65	-	21.4	22.4	23.2	24.6
ESTNB3020-25-09	1	2	6	1.7	25	0.9	1.92	2.65	4.24	3.6	65	-	26.5	27.7	28.5	30.8
ESTNB3020-30-04	1	2	6	1.7	30	0.4	1.92	2.32	7.42	3.1	70	31.4	32.7	33.6	34.8	38.5
ESTNB3020-30-09	1	2	6	1.7	30	0.9	1.92	2.81	4.24	3.2	70	-	31.6	32.9	33.7	36.9
ESTNB3020-35-09	1	2	6	1.7	35	0.9	1.92	2.97	4.24	2.8	75	-	36.6	38	39	-
ESTNB3020-40-04	1	2	6	1.7	40	0.4	1.92	2.46	7.42	2.5	80	41.5	43.1	44.2	46.3	-
ESTNB3020-40-09	1	2	6	1.7	40	0.9	1.92	3.12	4.24	2.6	80	-	41.7	43.2	44.5	-
ESTNB3020-50-09	1	2	6	1.7	50	0.9	1.92	3.44	4.24	2.1	90	-	51.8	53.5	55.5	-
ESTNB3020-60-09	1	2	6	1.7	60	0.9	1.92	3.75	4.24	1.8	100	-	61.9	63.8	-	-
ESTNB3020-70-09	1	2	6	1.7	70	0.9	1.92	4.07	4.24	1.6	110	-	72	74.1	-	-
ESTNB3030-8-04	1.5	3	6	2.5	8	0.4	2.86	2.94	8.5	6.3	50	8.8	9.1	9.3	9.5	10.3
ESTNB3030-16-04	1.5	3	6	2.5	16	0.4	2.86	3.05	12.52	4.1	55	17.2	17.8	18.3	18.7	20.6
ESTNB3030-20-04	1.5	3	6	2.5	20	0.4	2.86	3.1	12.52	3.4	60	21.2	22	22.6	23.3	25.7
ESTNB3030-30-04	1.5	3	6	2.5	30	0.4	2.86	3.24	12.52	2.5	70	31.6	32.8	33.7	34.9	-
ESTNB3030-30-09	1.5	3	6	2.5	30	0.9	2.86	3.72	6.95	2.6	70	-	31.8	33	33.8	-
ESTNB3030-40-04	1.5	3	6	2.5	40	0.4	2.86	3.38	12.52	2	80	41.7	43.2	44.3	-	-
ESTNB3030-40-09	1.5	3	6	2.5	40	0.9	2.86	4.04	6.95	2	80	-	41.9	43.3	-	-
ESTNB3030-50-09	1.5	3	6	2.5	50	0.9	2.86	4.35	6.95	1.7	90	-	52	53.6	-	-
ESTNB3030-60-09	1.5	3	6	2.5	60	0.9	2.86	4.67	6.95	1.4	100	-	62.1	-	-	-
ESTNB3030-70-09	1.5	3	6	2.5	70	0.9	2.86	4.98	6.95	1.2	110	-	72.1	-	-	-
ESTNB3040-20-10	2	4	8	8	20	1	3.86	4.28	12.01	5	70	20.5	21.6	22.3	22.8	23.5
ESTNB3040-30-10	2	4	8	8	30	1	3.86	4.63	12.01	3.6	80	22	31.6	32.5	33.2	34.1
ESTNB3040-40-10	2	4	8	8	40	1	3.86	4.98	12.01	2.7	90	22	42	43.4	44.3	-
ESTNB3040-50-10	2	4	8	8	50	1	3.86	5.33	12.01	2.2	100	22	52	53.6	54.7	-
ESTNB3040-60-10	2	4	8	8	60	1	3.86	5.68	12.01	1.9	110	22	62	63.8	-	-
ESTNB3050-30-10	2.5	5	8	10	30	1	4.86	5.56	14.01	2.8	80	25.5	31.7	32.6	33.2	-

ESTNB30

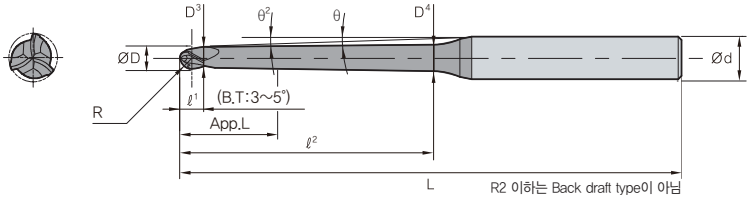
3날 테이퍼 넥 볼 엔드밀



ULTRA FINE | 3 | 30° HELIX | R ±0.005 전 규격 | AlTiN | 절삭조건 p.412~415

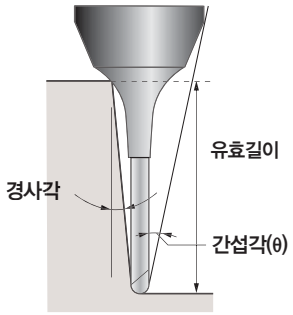
• 공구직경공차

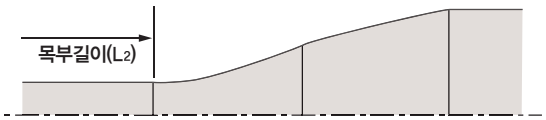
ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	



(mm)

형 번	규격(mm)											가공물 구배각별 유효길이				
	R	ØD	Ød	ℓ1	ℓ2	θ	D3	D4	App. L	θ2	L	0.5°	1°	1.5°	2°	3°
ESTNB3050-40-10	2.5	5	8	10	40	1	4.86	5.91	14.01	2.1	90	25.5	41.7	42.8	43.5	-
ESTNB3050-60-10	2.5	5	8	10	60	1	4.86	6.61	12.52	1.5	110	25.5	62.1	-	-	-





※ 표시된 유효길이는 공작물과의 간섭을 막기 위한 기본 값입니다.
가공환경의 적절한 제어가 필요합니다.

• 적용 피삭재

탄소강 ~ HB225	합금강 HB225~325	프리하든강 HRC30~50	열처리강		동	흑연	주철 ~FCD500	알루미늄	스테인리스강
			SKD61~HRC55	SKD11 HRC55~63					
		○	◎	◎	○				

◎: 매우적합 ○: 적합

H-Star Endmill

ESLNS20

2날 롱 넥 플랫 엔드밀

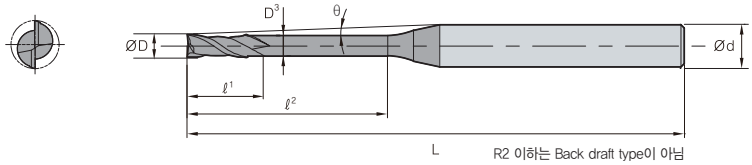
ULTRA FINE | 2 | 45° HELIX | AlTiN | 절삭조건

p.416

• 공구직경공차

ØD		Ød
전 규격	0 ~ -0.012mm	h5





R2 이하는 Back draft type이 아님

(mm)

형 번	규격(mm)							가공물 구배각별 유효길이				
	ØD	Ød	ℓ1	ℓ2	D3	θ	L	0.5°	1°	1.5°	2°	3°
ESLNS2001-0.3	0.1	4	0.15	0.3	0.08	11.6	45	0.4	0.4	0.5	0.5	0.5
ESLNS2001-0.5	0.1	4	0.15	0.5	0.08	11.4	45	0.6	0.7	0.7	0.7	0.8
ESLNS2001-1	0.1	4	0.15	1	0.08	10.9	45	1.2	1.2	1.2	1.3	1.4
ESLNS2002-0.5	0.2	4	0.3	0.5	0.17	11.3	50	1.2	1.3	1.5	1.7	2
ESLNS2002-1	0.2	4	0.3	1	0.17	10.8	50	1.7	1.9	2.2	2.4	2.7
ESLNS2002-1.5	0.2	4	0.3	1.5	0.17	10.3	50	2.3	2.5	2.8	3	3.4
ESLNS2003-1	0.3	4	0.45	1	0.27	10.8	50	1.7	1.9	2.2	2.4	2.7
ESLNS2003-1.5	0.3	4	0.45	1.5	0.27	10.3	50	2.3	2.5	2.8	3	3.4
ESLNS2003-2	0.3	4	0.45	2	0.27	9.8	50	2.8	3.1	3.4	3.6	4.1
ESLNS2003-2.5	0.3	4	0.45	2.5	0.27	9.4	50	3.4	3.7	4	4.3	4.7
ESLNS2003-3	0.3	4	0.45	3	0.27	9	50	3.9	4.3	4.6	4.9	5.4
ESLNS2004-1	0.4	4	0.6	1	0.37	10.7	50	1.7	1.9	2.2	2.4	2.7
ESLNS2004-1.5	0.4	4	0.6	1.5	0.37	10.2	50	2.3	2.5	2.8	3	3.4
ESLNS2004-2	0.4	4	0.6	2	0.37	9.7	50	2.8	3.1	3.4	3.6	4.1
ESLNS2004-2.5	0.4	4	0.6	2.5	0.37	9.3	50	3.4	3.7	4	4.3	4.7
ESLNS2004-3	0.4	4	0.6	3	0.37	8.9	50	3.9	4.3	4.6	4.9	5.4
ESLNS2004-3.5	0.4	4	0.6	3.5	0.37	8.6	50	4.5	4.9	5.2	5.5	6
ESLNS2004-4	0.4	4	0.6	4	0.37	8.2	50	5	5.4	5.8	6.1	6.6
ESLNS2004-5	0.4	4	0.6	5	0.37	7.6	50	6.1	6.6	6.9	7.3	7.8
ESLNS2004-6	0.4	4	0.6	6	0.37	7.1	50	7.2	7.7	8.1	8.4	9
ESLNS2005-1	0.5	4	0.75	1	0.47	10.7	50	1.7	1.9	2.2	2.4	2.7
ESLNS2005-1.5	0.5	4	0.75	1.5	0.47	10.2	50	2.3	2.5	2.8	3	3.4
ESLNS2005-2	0.5	4	0.75	2	0.47	9.7	50	2.8	3.1	3.4	3.6	4.1
ESLNS2005-2.5	0.5	4	0.75	2.5	0.47	9.3	50	3.4	3.7	4	4.3	4.7
ESLNS2005-3	0.5	4	0.75	3	0.47	8.9	50	3.9	4.3	4.6	4.9	5.4
ESLNS2005-4	0.5	4	0.75	4	0.47	8.1	50	5	5.4	5.8	6.1	6.6
ESLNS2005-5	0.5	4	0.75	5	0.47	7.5	50	6.1	6.6	6.9	7.3	7.8
ESLNS2005-6	0.5	4	0.75	6	0.47	7	50	7.2	7.7	8.1	8.4	9
ESLNS2005-8	0.5	4	0.75	8	0.47	6.2	50	9.3	9.9	10.3	10.7	11.4
ESLNS2006-2	0.6	4	0.9	2	0.57	9.6	50	2.8	3.1	3.4	3.6	4.1
ESLNS2006-4	0.6	4	0.9	4	0.57	6.9	50	7.2	7.7	8.1	8.4	9
ESLNS2006-6	0.6	4	0.9	6	0.57	6.1	50	9.3	9.9	10.3	10.7	11.4
ESLNS2006-8	0.6	4	0.9	8	0.57	5.4	50	11.5	12.1	12.6	13	13.7
ESLNS2006-10	0.6	4	0.9	10	0.57	9.6	50	2.8	3.1	3.4	3.6	4.1
ESLNS2007-2	0.7	4	1.05	2	0.67	8	50	5	5.4	5.8	6.1	6.6
ESLNS2007-4	0.7	4	1.05	4	0.67	6.9	50	7.2	7.7	8.1	8.4	9
ESLNS2007-6	0.7	4	1.05	6	0.67	6	50	9.3	9.9	10.3	10.7	11.4
ESLNS2007-8	0.7	4	1.05	8	0.67	5.3	50	11.5	12.1	12.6	13	13.7
ESLNS2007-10	0.7	4	1.2	10	0.77	7.9	50	5	5.4	5.8	6.1	6.6
ESLNS2008-4	0.8	4	1.2	4	0.77	6.8	50	7.2	7.7	8.1	8.4	9

ESLNS20

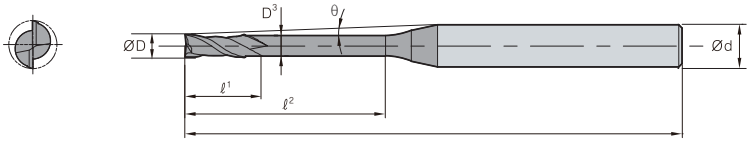
2날 롱 넥 플랫 엔드밀



ULTRA FINE | 2 | 45° HELIX | AlTiN | 절삭조건 p.416

• 공구직경공차

ØD		Ød
전 규격	0 ~ -0.012mm	h5



R2 이하는 Back draft type이 아님

(mm)

형 번	규격(mm)							가공물 구배각별 유효길이				
	ØD	Ød	ℓ¹	ℓ²	D³	θ	L	0.5°	1°	1.5°	2°	3°
ESLNS2008-6	0.8	4	1.2	6	0.77	5.9	50	9.3	9.9	10.3	10.7	11.4
ESLNS2008-8	0.8	4	1.2	8	0.77	5.2	50	11.5	12.1	12.6	13	13.7
ESLNS2008-10	0.8	4	1.2	10	0.77	4.7	55	13.6	14.2	14.8	15.2	16
ESLNS2008-12	0.8	4	1.2	12	0.77	6.7	55	7.2	7.7	8.1	8.4	9.1
ESLNS2009-6	0.9	4	1.35	6	0.86	5.8	50	9.4	9.9	10.4	10.7	11.4
ESLNS2009-8	0.9	4	1.35	8	0.86	5.1	50	11.5	12.1	12.6	13	13.7
ESLNS2009-10	0.9	4	1.35	10	0.86	4.6	55	13.6	14.3	14.8	15.2	16
ESLNS2009-12	0.9	4	1.35	12	0.86	9.4	55	2.9	3.2	3.4	3.7	4.1
ESLNS2010-2	1	4	1.5	2	0.96	7.7	50	5.1	5.5	5.8	6.1	6.6
ESLNS2010-4	1	4	1.5	4	0.96	6.6	50	7.2	7.7	8.1	8.4	9.1
ESLNS2010-6	1	4	1.5	6	0.96	5.7	50	9.4	9.9	10.4	10.7	11.4
ESLNS2010-8	1	4	1.5	8	0.96	5	50	11.5	12.1	12.6	13	13.7
ESLNS2010-10	1	4	1.5	10	0.96	4.5	55	13.6	14.3	14.8	15.2	16
ESLNS2010-12	1	4	1.5	12	0.96	4.1	55	15.7	16.4	17	17.4	18.7
ESLNS2010-14	1	4	1.5	14	0.96	3.8	60	17.8	18.6	19.1	19.6	21.3
ESLNS2010-16	1	4	1.5	16	0.96	3.2	60	22	22.8	23.5	24	26.6
ESLNS2010-20	1	4	1.5	20	0.96	6.3	60	7.3	7.7	8.1	8.5	9.1
ESLNS2012-6	1.2	4	1.8	6	1.15	5.5	50	9.4	9.9	10.4	10.8	11.4
ESLNS2012-8	1.2	4	1.8	8	1.15	4.8	50	11.5	12.1	12.6	13	13.7
ESLNS2012-10	1.2	4	1.8	10	1.15	11.5	50	12.1	12.6	13	13.7	16
ESLNS2012-12	1.2	4	1.8	12	1.15	4.3	55	13.6	14.3	14.8	15.2	16
ESLNS2012-16	1.2	4	1.8	16	1.15	3.6	55	17.8	18.6	19.2	19.7	21.3
ESLNS2014-6	1.4	4	2.1	6	1.34	6.1	50	7.3	7.8	8.1	8.5	9.1
ESLNS2014-8	1.4	4	2.1	8	1.34	5.3	50	9.4	10	10.4	10.8	11.5
ESLNS2014-10	1.4	4	2.1	10	1.34	4.6	50	11.6	12.1	12.6	13	13.8
ESLNS2014-12	1.4	4	2.1	12	1.34	4.1	55	13.7	14.3	14.8	15.3	16.1
ESLNS2014-14	1.4	4	2.1	14	1.34	3.7	55	15.8	16.5	17	17.5	18.7
ESLNS2014-16	1.4	4	2.1	16	1.34	3.4	55	17.9	18.6	19.2	19.7	21.4
ESLNS2015-4	1.5	4	2.25	4	1.44	7.2	50	5.2	5.5	5.9	6.2	6.7
ESLNS2015-6	1.5	4	2.25	6	1.44	6	50	7.3	7.8	8.1	8.5	9.1
ESLNS2015-8	1.5	4	2.25	8	1.44	5.1	50	9.4	10	10.4	10.8	11.5
ESLNS2015-10	1.5	4	2.25	10	1.44	4.5	50	11.6	12.1	12.6	13	13.8
ESLNS2015-12	1.5	4	2.25	12	1.44	4	55	13.7	14.3	14.8	15.3	16.1
ESLNS2015-14	1.5	4	2.25	14	1.44	3.6	55	15.8	16.5	17	17.5	18.7
ESLNS2015-16	1.5	4	2.25	16	1.44	3.3	55	17.9	18.6	19.2	19.7	-
ESLNS2015-18	1.5	4	2.25	18	1.44	3	60	20	20.7	21.3	21.9	-
ESLNS2015-20	1.5	4	2.25	20	1.44	2.8	60	22	22.9	23.5	24.1	-
ESLNS2015-25	1.5	4	2.25	25	1.44	2.4	65	27.3	28.1	28.8	30	-
ESLNS2016-6	1.6	4	2.4	6	1.54	5.9	50	7.3	7.8	8.1	8.5	9.1
ESLNS2016-8	1.6	4	2.4	8	1.54	5	50	9.4	10	10.4	10.8	11.5

H-Star Endmill

ESLNS20

2날 롱 넥 플랫 엔드밀

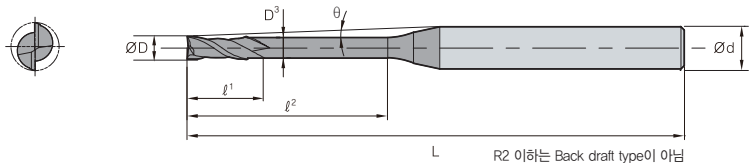
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• 공구직경공차

ØD		Ød
전 규격	0 ~ -0.012mm	h5





R2 이하는 Back draft type이 아님

(mm)

형 번	규격(mm)							가공물 구배각별 유효길이				
	ØD	Ød	ℓ1	ℓ2	D3	θ	L	0.5°	1°	1.5°	2°	3°
ESLNS2016-10	1.6	4	2.4	10	1.54	4.4	50	11.6	12.1	12.6	13	13.8
ESLNS2016-12	1.6	4	2.4	12	1.54	3.9	55	13.7	14.3	14.8	15.3	16.1
ESLNS2016-14	1.6	4	2.4	14	1.54	3.5	55	15.8	16.5	17	17.5	18.7
ESLNS2016-16	1.6	4	2.4	16	1.54	3.2	55	17.9	18.6	19.2	19.7	21.4
ESLNS2016-18	1.6	4	2.4	18	1.54	2.9	60	20	20.7	21.3	21.9	-
ESLNS2016-20	1.6	4	2.4	20	1.54	2.7	60	22	22.9	23.5	24.1	-
ESLNS2018-6	1.8	4	2.7	6	1.73	5.6	50	7.4	7.8	8.2	8.5	9.1
ESLNS2018-8	1.8	4	2.7	8	1.73	4.8	50	9.5	10	10.4	10.8	11.5
ESLNS2018-10	1.8	4	2.7	10	1.73	4.2	50	11.6	12.2	12.6	13	13.8
ESLNS2018-12	1.8	4	2.7	12	1.73	3.7	55	13.7	14.3	14.8	15.3	16.1
ESLNS2018-14	1.8	4	2.7	14	1.73	3.3	55	15.8	16.5	17	17.5	18.8
ESLNS2018-16	1.8	4	2.7	16	1.73	3	55	17.9	18.6	19.2	19.7	-
ESLNS2018-18	1.8	4	2.7	18	1.73	2.7	60	20	20.7	21.3	21.9	-
ESLNS2018-20	1.8	4	2.7	20	1.73	2.5	60	22.1	22.9	23.5	24.1	-
ESLNS2020-4	2	4	3	4	1.92	6.5	50	5.3	5.6	5.9	6.2	6.7
ESLNS2020-6	2	4	3	6	1.92	5.3	50	7.4	7.8	8.2	8.5	9.1
ESLNS2020-8	2	4	3	8	1.92	4.5	50	9.5	10	10.4	10.8	11.5
ESLNS2020-10	2	4	3	10	1.92	3.9	50	11.6	12.2	12.7	13.1	13.8
ESLNS2020-12	2	4	3	12	1.92	3.4	55	13.7	14.3	14.9	15.3	16.1
ESLNS2020-14	2	4	3	14	1.92	3.1	55	15.8	16.5	17	17.5	18.8
ESLNS2020-16	2	4	3	16	1.92	2.8	55	17.9	18.6	19.2	19.7	-
ESLNS2020-18	2	4	3	18	1.92	2.6	60	20	20.8	21.4	21.9	-
ESLNS2020-20	2	4	3	20	1.92	2.4	60	22.1	22.9	23.5	24.1	-
ESLNS2020-25	2	4	3	25	1.92	2	65	27.3	28.2	28.9	-	-
ESLNS2020-30	2	4	3	30	1.92	1.7	70	32.5	33.4	34.4	-	-
ESLNS2025-8	2.5	4	3.75	8	2.4	3.7	50	9.6	10.1	10.5	10.9	11.5
ESLNS2025-10	2.5	4	3.75	10	2.4	3.1	50	11.7	12.2	12.7	13.1	13.8
ESLNS2025-12	2.5	4	3.75	12	2.4	2.7	55	13.8	14.4	14.9	15.3	-
ESLNS2025-14	2.5	4	3.75	14	2.4	2.4	55	15.9	16.5	17.1	17.5	-
ESLNS2025-16	2.5	4	3.75	16	2.4	2.2	55	18	18.7	19.2	19.7	-
ESLNS2025-18	2.5	4	3.75	18	2.4	2	55	20.1	20.8	21.4	-	-
ESLNS2025-20	2.5	4	3.75	20	2.4	1.8	60	22.1	22.9	23.5	-	-
ESLNS2025-25	2.5	4	3.75	25	2.4	1.5	60	27.3	28.2	-	-	-
ESLNS2025-30	2.5	4	3.75	30	2.4	1.3	70	32.6	33.5	-	-	-
ESLNS2030-8	3	6	4.5	8	2.88	5.6	55	9.6	10.1	10.5	10.9	11.5
ESLNS2030-10	3	6	4.5	10	2.88	5	55	11.7	12.3	12.7	13.1	13.8
ESLNS2030-12	3	6	4.5	12	2.88	4.5	60	13.8	14.4	14.9	15.4	16.3
ESLNS2030-14	3	6	4.5	14	2.88	4.1	60	15.9	16.6	17.1	17.6	18.9
ESLNS2030-16	3	6	4.5	16	2.88	3.7	60	18	18.7	19.3	19.8	21.6
ESLNS2030-18	3	6	4.5	18	2.88	3.4	60	20.1	20.8	21.4	21.9	24.2

ESLNS20

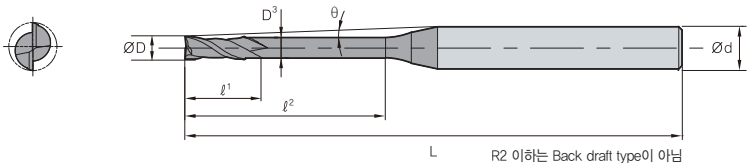
2날 롱 넥 플랫 엔드밀



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• 공구직경공차

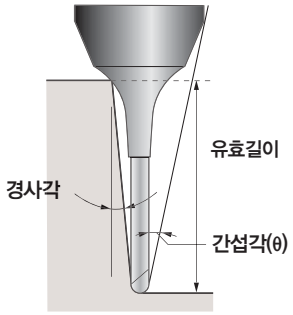
ØD		Ød
전 규격	0 ~ -0.012mm	h5

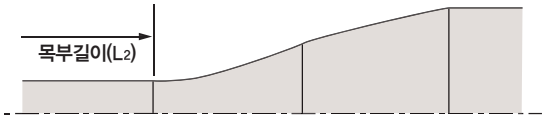


R2 이하는 Back draft type이 아님

(mm)

형 번	규격(mm)							가공물 구배각별 유효길이				
	ØD	Ød	ℓ¹	ℓ²	D³	θ	L	0.5°	1°	1.5°	2°	3°
ESLNS2030-20	3	6	4.5	20	2.88	3.2	65	22.2	23	23.6	24.2	26.9
ESLNS2030-25	3	6	4.5	25	2.88	2.7	70	27.4	28.2	28.9	30.2	-
ESLNS2030-30	3	6	4.5	30	2.88	2.4	75	32.6	33.5	34.5	36.2	-
ESLNS2030-35	3	6	4.5	35	2.88	2.1	80	37.7	38.7	40.2	42.2	-
ESLNS2030-40	3	6	4.5	40	2.88	1.9	90	42.9	43.9	45.9	-	-
ESLNS2040-12	4	6	6	12	3.85	3.4	60	13.9	14.5	15	15.4	16.3
ESLNS2040-16	4	6	6	16	3.85	2.8	60	18.1	18.8	19.3	19.8	-
ESLNS2040-20	4	6	6	20	3.85	2.3	70	22.3	23	23.6	24.3	-
ESLNS2040-25	4	6	6	25	3.85	2	70	27.4	28.3	28.9	-	-
ESLNS2040-30	4	6	6	30	3.85	1.7	80	32.6	33.5	34.6	-	-
ESLNS2040-35	4	6	6	35	3.85	1.5	80	37.8	38.8	-	-	-
ESLNS2040-40	4	6	6	40	3.85	1.3	90	42.9	44	-	-	-
ESLNS2040-45	4	6	6	45	3.85	1.2	90	48.1	49.4	-	-	-
ESLNS2040-50	4	6	6	50	3.85	1.1	100	53.2	54.8	-	-	-
ESLNS2050-16	5	6	7.5	16	4.85	1.5	60	18.1	18.8	-	-	-
ESLNS2050-20	5	6	7.5	20	4.85	1.3	60	22.3	23	-	-	-
ESLNS2050-25	5	6	7.5	25	4.85	1.1	70	27.4	28.3	-	-	-
ESLNS2050-30	5	6	7.5	30	4.85	0.9	70	32.6	-	-	-	-
ESLNS2050-35	5	6	7.5	35	4.85	0.8	80	37.8	-	-	-	-
ESLNS2050-40	5	6	7.5	40	4.85	0.7	90	42.9	-	-	-	-
ESLNS2050-50	5	6	7.5	50	4.85	0.6	100	53.2	-	-	-	-





※ 표시된 유효길이는 공작물과의 간섭을 막기 위한 기본 값입니다.
가공환경의 적절한 제어가 필요합니다.

• 적용 피삭재

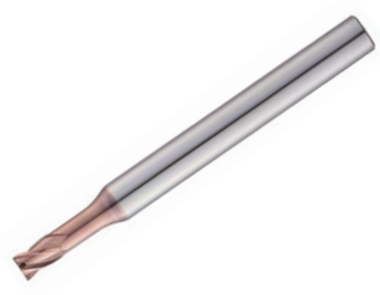
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			SKD61~HRC55	SKD11 HRC55~63					
		○	◎	◎	○				

◎: 매우적합 ○: 적합

H-Star Endmill

ESLNS40

4날 롱 넥 플랫 엔드밀

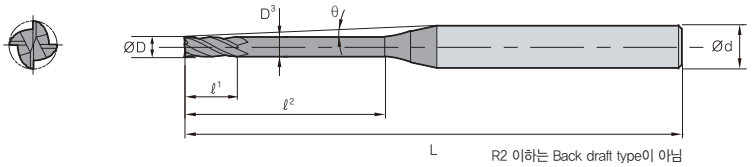


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• 공구직경공차

ØD		Ød
전 규격	0 ~ -0.012mm	h5



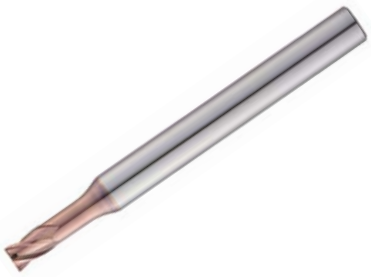
R2 이하는 Back draft type이 아님

(mm)

형 번	규격(mm)							가공물 구배각별 유효길이				
	ØD	Ød	ℓ1	ℓ2	D3	θ	L	0.5°	1°	1.5°	2°	3°
ESLNS4010-4	1	4	1.5	4	0.96	7.7	50	5.1	5.5	5.8	6.1	6.6
ESLNS4010-6	1	4	1.5	6	0.96	6.6	50	7.2	7.7	8.1	8.4	9.1
ESLNS4010-8	1	4	1.5	8	0.96	5.7	50	9.4	9.9	10.4	10.7	11.4
ESLNS4010-10	1	4	1.5	10	0.96	5	50	11.5	12.1	12.6	13	13.7
ESLNS4015-4	1.5	4	2.25	4	1.44	7.2	50	5.2	5.5	5.9	6.2	6.7
ESLNS4015-6	1.5	4	2.25	6	1.44	6	50	7.3	7.8	8.1	8.5	9.1
ESLNS4015-8	1.5	4	2.25	8	1.44	5.1	50	9.4	10	10.4	10.8	11.5
ESLNS4015-10	1.5	4	2.25	10	1.44	4.5	50	11.6	12.1	12.6	13	13.8
ESLNS4015-12	1.5	4	2.25	12	1.44	4	55	13.7	14.3	14.8	15.3	16.1
ESLNS4015-14	1.5	4	2.25	14	1.44	3.6	55	15.8	16.5	17	17.5	18.7
ESLNS4015-16	1.5	4	2.25	16	1.44	3.3	55	17.9	18.6	19.2	19.7	-
ESLNS4015-18	1.5	4	2.25	18	1.44	3	60	20	20.7	21.3	21.9	-
ESLNS4015-20	1.5	4	2.25	20	1.44	2.8	60	22	22.9	23.5	24.1	-
ESLNS4015-25	1.5	4	2.25	25	1.44	2.4	65	27.3	28.1	28.8	30	-
ESLNS4020-4	2	4	3	4	1.92	6.5	50	5.3	5.6	5.9	6.2	6.7
ESLNS4020-6	2	4	3	6	1.92	5.3	50	7.4	7.8	8.2	8.5	9.1
ESLNS4020-8	2	4	3	8	1.92	4.5	50	9.5	10	10.4	10.8	11.5
ESLNS4020-10	2	4	3	10	1.92	3.9	50	11.6	12.2	12.7	13.1	13.8
ESLNS4020-12	2	4	3	12	1.92	3.4	55	13.7	14.3	14.9	15.3	16.1
ESLNS4020-14	2	4	3	14	1.92	3.1	55	15.8	16.5	17	17.5	18.8
ESLNS4020-16	2	4	3	16	1.92	2.8	55	17.9	18.6	19.2	19.7	-
ESLNS4020-18	2	4	3	18	1.92	2.6	60	20	20.8	21.4	21.9	-
ESLNS4020-20	2	4	3	20	1.92	2.4	60	22.1	22.9	23.5	24.1	-
ESLNS4020-25	2	4	3	25	1.92	2	65	27.3	28.2	28.9	-	-
ESLNS4020-30	2	4	3	30	1.92	1.7	70	32.5	33.4	34.4	-	-
ESLNS4025-8	2.5	4	3.75	8	2.4	3.7	50	9.6	10.1	10.5	10.9	11.5
ESLNS4025-10	2.5	4	3.75	10	2.4	3.1	50	11.7	12.2	12.7	13.1	13.8
ESLNS4025-12	2.5	4	3.75	12	2.4	2.7	55	13.8	14.4	14.9	15.3	-
ESLNS4025-14	2.5	4	3.75	14	2.4	2.4	55	15.9	16.5	17.1	17.5	-
ESLNS4025-16	2.5	4	3.75	16	2.4	2.2	55	18	18.7	19.2	19.7	-
ESLNS4025-18	2.5	4	3.75	18	2.4	2	60	20.1	20.8	21.4	-	-
ESLNS4025-20	2.5	4	3.75	20	2.4	1.8	60	22.1	22.9	23.5	-	-
ESLNS4025-25	2.5	4	3.75	25	2.4	1.5	65	27.3	28.2	-	-	-
ESLNS4025-30	2.5	4	3.75	30	2.4	1.3	70	32.6	33.5	-	-	-
ESLNS4030-8	3	6	4.5	8	2.88	5.6	55	9.6	10.1	10.5	10.9	11.5
ESLNS4030-10	3	6	4.5	10	2.88	5	55	11.7	12.3	12.7	13.1	13.8

ESLNS40

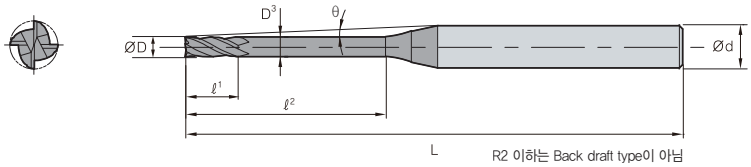
4날 롱 넥 플랫 엔드밀



ULTRA FINE | 4 | 30° HELIX | AlTiN | 절삭조건 p.416

• 공구직경공차

ØD		Ød
전 규격	0 ~ -0.012mm	h5



R2 이하는 Back draft type이 아님

(mm)

형 번	규격(mm)							가공물 구배각별 유효길이				
	ØD	Ød	ℓ1	ℓ2	D3	θ	L	0.5°	1°	1.5°	2°	3°
ESLNS4030-12	3	6	4.5	12	2.88	4.5	60	13.8	14.4	14.9	15.4	16.3
ESLNS4030-14	3	6	4.5	14	2.88	4.1	60	15.9	16.6	17.1	17.6	18.9
ESLNS4030-16	3	6	4.5	16	2.88	3.7	60	18	18.7	19.3	19.8	21.6
ESLNS4030-18	3	6	4.5	18	2.88	3.4	60	20.1	20.8	21.4	21.9	24.2
ESLNS4030-20	3	6	4.5	20	2.88	3.2	65	22.2	23	23.6	24.2	26.9
ESLNS4030-25	3	6	4.5	25	2.88	2.7	70	27.4	28.2	28.9	30.2	-
ESLNS4030-30	3	6	4.5	30	2.88	2.4	75	32.6	33.5	34.5	36.2	-
ESLNS4030-35	3	6	4.5	35	2.88	2.1	80	37.7	38.7	40.2	42.2	-
ESLNS4030-40	3	6	4.5	40	2.88	1.9	90	42.9	43.9	45.9	-	-
ESLNS4040-12	4	6	6	12	3.85	3.4	60	13.9	14.5	15	15.4	16.3
ESLNS4040-16	4	6	6	16	3.85	2.8	60	18.1	18.8	19.3	19.8	-
ESLNS4040-20	4	6	6	20	3.85	2.3	70	22.3	23	23.6	24.3	-
ESLNS4040-25	4	6	6	25	3.85	2	70	27.4	28.3	28.9	-	-
ESLNS4040-30	4	6	6	30	3.85	1.7	80	32.6	33.5	34.6	-	-
ESLNS4040-35	4	6	6	35	3.85	1.5	80	37.8	38.8	-	-	-
ESLNS4040-40	4	6	6	40	3.85	1.3	90	42.9	44	-	-	-
ESLNS4040-45	4	6	6	45	3.85	1.2	90	48.1	49.4	-	-	-
ESLNS4040-50	4	6	6	50	3.85	1.1	100	53.2	54.8	-	-	-
ESLNS4050-16	5	6	7.5	16	4.85	1.5	60	18.1	18.8	-	-	-
ESLNS4050-20	5	6	7.5	20	4.85	1.3	60	22.3	23	-	-	-
ESLNS4050-25	5	6	7.5	25	4.85	1.1	70	27.4	28.3	-	-	-
ESLNS4050-30	5	6	7.5	30	4.85	0.9	70	32.6	-	-	-	-
ESLNS4050-35	5	6	7.5	35	4.85	0.8	80	37.8	-	-	-	-
ESLNS4050-40	5	6	7.5	40	4.85	0.7	90	42.9	-	-	-	-
ESLNS4050-50	5	6	7.5	50	4.85	0.6	100	53.2	-	-	-	-

• 적용 피삭재

탄소강 ~ HB225	합금강 HB225~325	프리하든강 HRC30~50	열처리강		동	흑연	주철 ~FCD500	알루미늄	스테인리스강
			SKD61~HRC55	SKD11 HRC55~63					
		○	◎	◎	○				

◎: 매우적합 ○: 적합

H-Star Endmill

ESLNR

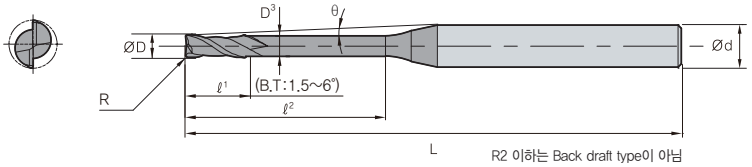
2날 롱 넥 레디우스 엔드밀



ULTRA FINE | 2 | 30° HELIX | R ±0.01 전 규격 | AlTiN | 절삭조건 p.417~419

• 공구직경공차

ØD		Ød
전 규격	0 ~ -0.012mm	h5



R2 이하는 Back draft type이 아님

(mm)

형 번	규격(mm)								가공물 구배각별 유효길이				
	R	ØD	Ød	ℓ¹	ℓ²	D³	θ	L	0.5°	1°	1.5°	2°	3°
ESLNR2002-0.5-005	0.05	0.2	4	0.15	0.5	0.17	11.4	50	0.9	1	1	1.1	12
ESLNR2002-1-005	0.05	0.2	4	0.15	1	0.17	10.9	50	1.6	1.7	1.9	2	2.3
ESLNR2002-1.5-005	0.05	0.2	4	0.15	1.5	0.17	10.3	50	2.1	2.3	2.5	2.7	3
ESLNR2002-2-005	0.05	0.2	4	0.15	2	0.17	9.9	50	2.8	3.1	3.4	3.6	4.1
ESLNR2003-1-005	0.05	0.3	4	0.25	1	0.27	10.8	50	1.4	1.5	1.6	1.7	1.9
ESLNR2003-1.5-005	0.05	0.3	4	0.25	1.5	0.27	10.3	50	2.1	2.3	2.5	2.7	3
ESLNR2003-2.5-005	0.05	0.3	4	0.25	2.5	0.27	9.8	50	2.7	2.9	3.1	3.3	3.6
ESLNR2003-2-005	0.05	0.3	4	0.25	2	0.27	9.4	50	3.2	3.5	3.7	3.9	4.3
ESLNR2003-3-005	0.05	0.3	4	0.25	3	0.27	9	50	3.9	4.3	4.6	4.9	5.4
ESLNR2004-1-005	0.05	0.4	4	0.3	1	0.37	10.8	50	1.4	1.5	1.6	1.7	1.9
ESLNR2004-1.5-005	0.05	0.4	4	0.3	1.5	0.37	10.3	50	2	2.1	2.2	2.3	2.5
ESLNR2004-2-005	0.05	0.4	4	0.3	2	0.37	9.8	50	2.7	2.9	3.1	3.3	3.6
ESLNR2004-2.5-005	0.05	0.4	4	0.3	2.5	0.37	9.4	50	3.2	3.5	3.7	3.9	4.3
ESLNR2004-3-005	0.05	0.4	4	0.3	3	0.37	9	50	3.8	4	4.3	4.5	4.9
ESLNR2004-3.5-005	0.05	0.4	4	0.3	3.5	0.37	8.6	50	4.3	4.6	4.9	5.1	5.5
ESLNR2004-4-005	0.05	0.4	4	0.3	4	0.37	8.3	50	5	5.4	5.8	6.1	6.6
ESLNR2004-2-01	0.1	0.4	4	0.3	2	0.37	9.8	50	2.7	2.9	3.1	3.3	3.6
ESLNR2004-3-01	0.1	0.4	4	0.3	3	0.37	9	50	3.8	4	4.3	4.5	4.9
ESLNR2004-4-01	0.1	0.4	4	0.3	4	0.37	8.3	50	5	5.4	5.8	6.1	6.6
ESLNR2005-1-005	0.05	0.5	4	0.35	1	0.47	10.8	50	1.4	1.5	1.6	1.7	1.9
ESLNR2005-2-005	0.05	0.5	4	0.35	2	0.47	9.7	50	2.5	2.6	2.8	2.9	3.1
ESLNR2005-3-005	0.05	0.5	4	0.35	3	0.47	8.9	50	3.8	4	4.3	4.5	4.9
ESLNR2005-4-005	0.05	0.5	4	0.35	4	0.47	8.2	50	4.8	5.2	5.4	5.7	6.1
ESLNR2005-5-005	0.05	0.5	4	0.35	5	0.47	7.6	50	6.1	6.6	6.9	7.3	7.8
ESLNR2005-6-005	0.05	0.5	4	0.35	6	0.47	7	50	7.2	7.7	8.1	8.4	9
ESLNR2005-1-01	0.1	0.5	4	0.35	1	0.47	10.8	50	1.4	1.5	1.6	1.7	1.9
ESLNR2005-2-01	0.1	0.5	4	0.35	2	0.47	9.8	50	2.5	2.6	2.8	2.9	3.1
ESLNR2005-3-01	0.1	0.5	4	0.35	3	0.47	8.9	50	3.8	4	4.3	4.5	4.9
ESLNR2005-4-01	0.1	0.5	4	0.35	4	0.47	8.2	50	4.8	5.2	5.4	5.7	6.1
ESLNR2005-5-01	0.1	0.5	4	0.35	5	0.47	7.6	50	6.1	6.5	6.9	7.2	7.8
ESLNR2005-6-01	0.1	0.5	4	0.35	6	0.47	7.1	50	7.2	7.7	8.1	8.4	9
ESLNR2006-2-01	0.1	0.6	4	0.4	2	0.57	9.7	50	2.5	2.6	2.8	2.9	3.1
ESLNR2006-4-01	0.1	0.6	4	0.4	4	0.57	8.1	50	4.8	5.2	5.4	5.7	6.1
ESLNR2006-6-01	0.1	0.6	4	0.4	6	0.57	7	50	7.2	7.7	8.1	8.4	9

ESLNR

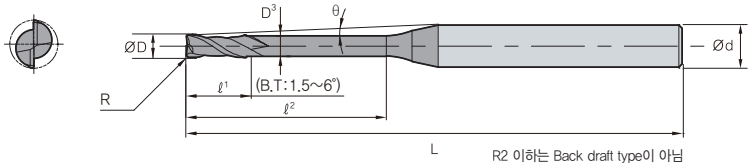
2날 롱 넥 레디우스 엔드밀



ULTRA FINE | 2 | 30° HELIX | R ±0.01 전 규격 | AlTiN | 절삭조건 p.417~419

• 공구직경공차

ØD		Ød
전 규격	0 ~ -0.012mm	h5



R2 이하는 Back draft type이 아님

(mm)

형 번	규격(mm)								가공물 구배각별 유효길이				
	R	ØD	Ød	ℓ¹	ℓ²	D³	θ	L	0.5°	1°	1.5°	2°	3°
ESLNR2006-8-01	0.1	0.6	4	0.4	8	0.57	6.1	50	9.3	9.9	10.3	10.7	11
ESLNR2006-10-01	0.1	0.6	4	0.4	10	0.57	5.5	50	11.5	12.1	12.5	13	13.7
ESLNR2008-4-01	0.1	0.8	4	0.5	4	4	8	50	4.8	5.2	5.4	5.7	6.1
ESLNR2008-6-01	0.1	0.8	4	0.5	6	6	6.8	50	7	7.4	7.7	7.9	8.4
ESLNR2008-8-01	0.1	0.8	4	0.5	8	8	5.9	50	9.3	9.9	10.3	10.7	11.4
ESLNR2008-12-01	0.1	0.8	4	0.5	12	12	4.7	50	13.6	14.2	14.7	15.2	16
ESLNR2008-4-02	0.2	0.8	4	0.5	4	4	8	50	4.8	5.1	5.4	5.6	6.1
ESLNR2008-6-02	0.2	0.8	4	0.5	6	6	6.9	50	7	7.3	7.7	7.9	8.4
ESLNR2010-4-01	0.1	1	4	0.8	4	0.94	7.7	50	4.7	4.9	5.1	5.2	5.5
ESLNR2010-6-01	0.1	1	4	0.8	6	0.94	6.6	50	7.1	7.4	7.7	8	8.5
ESLNR2010-8-01	0.1	1	4	0.8	8	0.94	5.7	50	9.2	9.6	9.9	10.2	10.8
ESLNR2010-10-01	0.1	1	4	0.8	10	0.94	5.1	50	11.6	12.1	12.6	13	13.7
ESLNR2010-12-01	0.1	1	4	0.8	12	0.94	4.5	55	13.7	14.3	14.8	15.3	16
ESLNR2010-16-01	0.1	1	4	0.8	16	0.94	3.8	60	17.9	18.6	19.2	19.7	21.3
ESLNR2010-20-01	0.1	1	4	0.8	20	0.94	3.2	60	22	22.8	23.5	24	26.7
ESLNR2010-4-02	0.2	1	4	0.8	4	0.94	7.8	50	4.7	4.9	5.1	5.2	5.5
ESLNR2010-6-02	0.2	1	4	0.8	6	0.94	6.6	50	7.1	7.4	7.7	8	8.5
ESLNR2010-8-02	0.2	1	4	0.8	8	0.94	5.8	50	9.2	9.6	9.9	10.2	10.8
ESLNR2010-10-02	0.2	1	4	0.8	10	0.94	5.1	50	11.6	12.1	12.6	13	13.7
ESLNR2010-12-02	0.2	1	4	0.8	12	0.94	4.6	55	13.7	14.3	14.8	15.2	16
ESLNR2010-16-02	0.2	1	4	0.8	16	0.94	3.8	60	17.9	18.6	19.2	19.7	21.3
ESLNR2010-20-02	0.2	1	4	0.8	20	0.94	3.2	60	22	22.8	23.5	24	26.6
ESLNR2010-6-03	0.3	1	4	0.8	6	0.94	6.7	50	7.1	7.4	7.7	8	8.4
ESLNR2010-10-03	0.3	1	4	0.8	10	0.94	5.1	50	11.5	12.1	12.6	13	13.7
ESLNR2010-16-03	0.3	1	4	0.8	16	0.94	3.8	60	17.9	18.6	19.1	19.6	21.3
ESLNR2010-20-03	0.3	1	4	0.8	20	0.94	3.2	60	22	22.8	23.5	24	26.6
ESLNR2015-4-01	0.1	1.5	4	1.35	4	1.42	7.2	50	4.8	4.9	5.1	5.3	5.5
ESLNR2015-8-01	0.1	1.5	4	1.35	8	1.42	5.2	50	9.2	9.6	10	10.3	10.8
ESLNR2015-12-01	0.1	1.5	4	1.35	12	1.42	4	55	13.4	13.9	14.3	14.7	16.1
ESLNR2015-15-01	0.1	1.5	4	1.35	15	1.42	3.5	55	16.9	17.6	18.1	18.6	20.1
ESLNR2015-20-01	0.1	1.5	4	1.35	20	1.42	2.8	60	22.1	22.9	23.5	24.1	-
ESLNR2015-4-02	0.2	1.5	4	1.35	4	1.42	7.3	50	4.7	4.9	5.1	5.3	5.5
ESLNR2015-8-02	0.2	1.5	4	1.35	8	1.42	5.2	50	9.2	9.6	10	10.3	10.8
ESLNR2015-12-02	0.2	1.5	4	1.35	12	1.42	4.1	55	13.4	13.9	14.3	14.7	16.1

H-Star Endmill

ESLNR

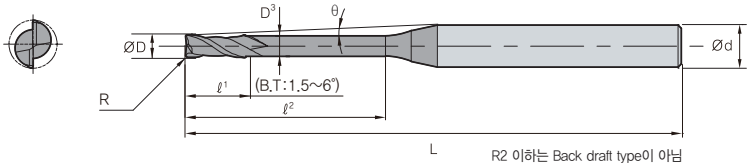
2날 롱 넥 레디우스 엔드밀



ULTRA FINE | 2 | 30° HELIX | R ±0.01 전 규격 | AlTiN | 절삭조건 p.417~419

• 공구직경공차

ØD		Ød
전 규격	0 ~ -0.012mm	h5



R2 이하는 Back draft type이 아님

(mm)

형 번	규격(mm)								가공물 구배각별 유효길이				
	R	ØD	Ød	ℓ¹	ℓ²	D³	θ	L	0.5°	1°	1.5°	2°	3°
ESLNR2015-15-02	0.2	1.5	4	1.35	15	1.42	3.5	55	16.9	17.5	18.1	18.6	20
ESLNR2015-20-02	0.2	1.5	4	1.35	20	1.42	2.8	60	22.1	22.9	23.5	24.1	-
ESLNR2015-8-03	0.3	1.5	4	1.35	8	1.42	5.2	50	9.2	9.6	10	10.3	10.8
ESLNR2015-15-03	0.3	1.5	4	1.35	15	1.42	3.5	55	16.9	17.5	18.1	18.6	20
ESLNR2015-20-03	0.3	1.5	4	1.35	20	1.42	2.8	60	22.1	22.9	23.5	24	-
ESLNR2020-6-02	0.2	2	4	1.7	6	1.92	5.4	50	6.8	7.1	7.3	7.5	8.1
ESLNR2020-8-02	0.2	2	4	1.7	8	1.92	4.6	50	8.9	9.2	9.4	9.7	10.8
ESLNR2020-12-02	0.2	2	4	1.7	12	1.92	3.5	55	13.4	13.9	14.3	14.7	16.1
ESLNR2020-16-02	0.2	2	4	1.7	16	1.92	2.8	55	17.6	18.1	18.6	19.3	-
ESLNR2020-20-02	0.2	2	4	1.7	20	1.92	2.4	60	22.1	22.9	23.5	24.1	-
ESLNR2020-25-02	0.2	2	4	1.7	25	1.92	2	65	27.3	28.2	28.8	-	-
ESLNR2020-30-02	0.2	2	4	1.7	30	1.92	1.7	70	32.5	33.4	34.4	-	-
ESLNR2020-8-03	0.3	2	4	1.7	8	1.92	4.6	50	8.9	9.2	9.4	9.7	10.7
ESLNR2020-16-03	0.3	2	4	1.7	16	1.92	2.8	55	17.6	18.1	18.6	19.3	-
ESLNR2020-20-03	0.3	2	4	1.7	20	1.92	2.4	60	22.1	22.9	23.5	24	-
ESLNR2020-6-05	0.5	2	4	1.7	6	1.92	5.5	50	6.8	7.1	7.3	7.4	8
ESLNR2020-8-05	0.5	2	4	1.7	8	1.92	4.7	50	8.9	9.2	9.4	9.6	10.7
ESLNR2020-12-05	0.5	2	4	1.7	12	1.92	3.5	55	13.4	13.9	14.3	14.6	16
ESLNR2020-16-05	0.5	2	4	1.7	16	1.92	2.9	55	17.6	18.1	18.6	19.2	-
ESLNR2020-20-05	0.5	2	4	1.7	20	1.92	2.4	60	22.1	22.9	23.5	24	-
ESLNR2020-25-05	0.5	2	4	1.7	25	1.92	2	65	27.3	28.1	28.8	-	-
ESLNR2020-30-05	0.5	2	4	1.7	30	1.92	1.7	70	32.5	33.4	34.3	-	-
ESLNR2020-8-08	0.8	2	4	1.7	8	1.92	4.8	50	8.9	9.2	9.4	9.6	10.6
ESLNR2020-16-08	0.8	2	4	1.7	16	1.92	2.9	55	17.6	18.1	18.6	19.2	-
ESLNR2020-20-08	0.8	2	4	1.7	20	1.92	2.4	60	22.1	22.8	23.5	24	-
ESLNR2030-8-02	0.2	3	6	2.5	8	2.86	5.7	55	9	9.3	9.5	9.9	10.9
ESLNR2030-12-02	0.2	3	6	2.5	12	2.86	4.5	60	13.1	13.5	14	14.7	16.2
ESLNR2030-16-02	0.2	3	6	2.5	16	2.86	3.8	60	17.7	18.2	18.7	19.5	21.6
ESLNR2030-20-02	0.2	3	6	2.5	20	2.86	3.2	65	21.8	22.4	23.1	24.2	26.9
ESLNR2030-30-02	0.2	3	6	2.5	30	2.86	2.4	75	32.6	33.5	34.5	36.2	-
ESLNR2030-35-02	0.2	3	6	2.5	35	2.86	2.1	80	37.7	38.7	40.2	42.2	-
ESLNR2030-8-03	0.3	3	6	2.5	8	2.86	5.7	55	9	9.3	9.5	9.9	10.9
ESLNR2030-16-03	0.3	3	6	2.5	16	2.86	3.8	60	17.7	18.2	18.7	19.4	21.5
ESLNR2030-20-03	0.3	3	6	2.5	20	2.86	3.2	65	21.8	22.4	23.1	24.2	26.8

ESLNR

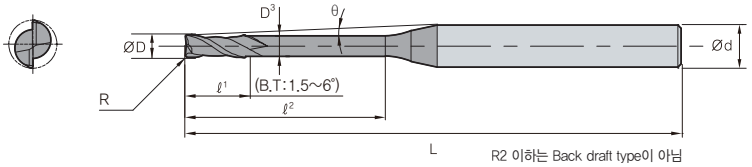
2날 롱 넥 레디우스 엔드밀



ULTRA FINE | 2 | 30° HELIX | R ±0.01 전 규격 | AlTiN | 절삭조건 p.417~419

• 공구직경공차

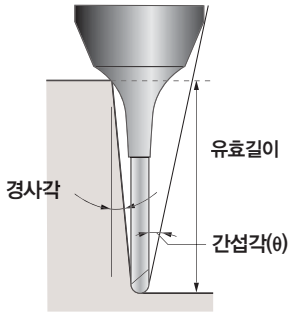
ØD		Ød
전 규격	0 ~ -0.012mm	h5

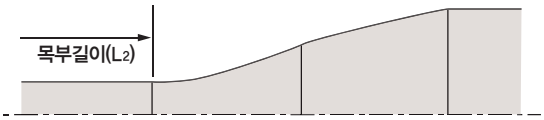


R2 이하는 Back draft type이 아님

(mm)

형 번	규격(mm)								가공물 구배각별 유효길이				
	R	ØD	Ød	ℓ1	ℓ2	D3	θ	L	0.5°	1°	1.5°	2°	3°
ESLNR2030-30-03	0.3	3	6	2.5	30	2.86	2.4	75	32.6	33.5	34.5	36.2	-
ESLNR2030-8-05	0.5	3	6	2.5	8	2.86	5.8	55	9	9.3	9.5	9.8	10.8
ESLNR2030-12-05	0.5	3	6	2.5	12	2.86	4.6	60	13.1	13.5	13.9	14.6	16.2
ESLNR2030-16-05	0.5	3	6	2.5	16	2.86	3.8	60	17.7	18.2	18.7	19.4	21.5
ESLNR2030-20-05	0.5	3	6	2.5	20	2.86	3.2	65	21.8	22.4	23.1	24.2	26.8
ESLNR2030-30-05	0.5	3	6	2.5	30	2.86	2.4	75	32.6	33.5	34.5	36.1	-
ESLNR2030-35-05	0.5	3	6	2.5	35	2.86	2.1	80	37.7	38.7	40.2	42.1	-





※ 표시된 유효길이는 공작물과의 간섭을 막기 위한 기본 값입니다.
가공환경의 적절한 제어가 필요합니다.

• 적용 피삭재

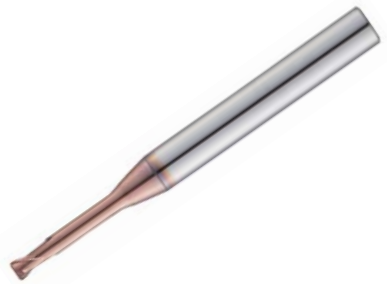
탄소강 ~ HB225	합금강 HB225~325	프리하든강 HRC30~50	열처리강		동	흑연	주철 ~FCD500	알루미늄	스테인리스강
			SKD61~HRC55	SKD11 HRC55~63					
		○	◎	◎	○				

◎: 매우적합 ○: 적합

H-Star Endmill

ESTNR

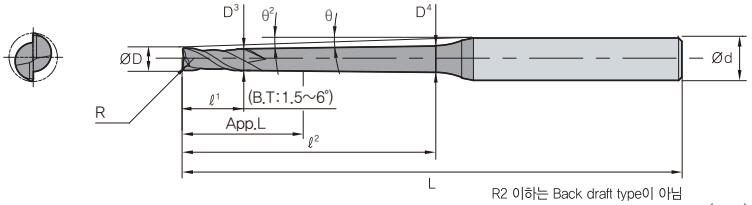
2날 테이퍼 넥 레디우스 엔드밀



ULTRA FINE | 2 | 30° HELIX | R ±0.01 (전 규격) | AlTiN | 절삭조건 (p.420~421)

• 공구직경공차

ØD		Ød
전 규격	0 ~ -0.015mm	h5



R2 이하는 Back draft type이 아님

(mm)

형 번	규격(mm)											가공물 구배각별 유효길이				
	R	ØD	Ød	ℓ1	ℓ2	θ	D3	D4	App. L	θ2	L	0.5°	1°	1.5°	2°	3°
ESTNR2002-2-09005	0.05	0.2	4	0.15	2	0.9	0.17	0.23	1.1	10	50	-	2.8	3.1	3.4	3.9
ESTNR2004-4-09005	0.05	0.4	4	0.3	4	0.9	0.37	0.49	1.25	8.4	50	-	4.9	5.3	5.7	6.3
ESTNR2004-5-09005	0.05	0.4	4	0.3	5	0.9	0.37	0.52	1.25	7.8	50	-	5.9	6.4	6.8	7.5
ESTNR2004-4-0901	0.1	0.4	4	0.3	4	0.9	0.37	0.49	1.25	8.5	50	-	4.9	5.3	5.7	6.3
ESTNR2004-5-0901	0.1	0.4	4	0.3	5	0.9	0.37	0.52	1.25	7.9	50	-	5.9	6.4	6.8	7.5
ESTNR2005-5-0901	0.1	0.5	4	0.35	5	0.9	0.47	0.62	1.3	7.8	50	-	5.9	6.4	6.8	7.5
ESTNR2005-8-0901	0.1	0.5	4	0.35	8	0.9	0.47	0.71	1.3	6.4	50	-	9	9.7	10.2	11
ESTNR2005-10-0901	0.1	0.5	4	0.35	10	0.9	0.47	0.77	1.3	5.8	55	-	11	11.8	12.4	13.2
ESTNR2006-12-0901	0.1	0.6	4	0.4	12	0.9	0.57	0.93	1.35	5.1	55	-	13	13.9	14.5	15.5
ESTNR2006-15-0901	0.1	0.6	4	0.4	15	0.9	0.57	13	1.35	4.5	55	-	16.1	17.1	17.8	18.8
ESTNR2008-6-0402	0.2	0.8	4	0.5	6	0.4	0.77	0.85	2.64	7	50	6.6	7.1	7.5	7.8	8.3
ESTNR2008-12-0902	0.2	0.8	4	0.5	12	0.9	0.77	1.13	1.45	5	55	-	13	13.9	14.5	15.5
ESTNR2010-8-0402	0.2	1	6	0.8	8	0.4	0.94	14	5.09	7.4	55	8.8	9.3	9.7	10.1	10.6
ESTNR2010-10-0902	0.2	1	6	0.8	10	0.9	0.94	1.23	5.09	6.8	55	-	11.2	11.9	12.4	13.3
ESTNR2010-15-0902	0.2	1	6	0.8	15	0.9	0.94	1.39	2.7	5.6	60	-	16.3	17.2	17.8	18.8
ESTNR2010-20-0902	0.2	1	6	0.8	20	0.9	0.94	1.54	2.7	4.8	65	-	21.3	22.4	23.2	24.7
ESTNR2010-25-0902	0.2	1	6	0.8	25	0.9	0.94	1.7	2.7	4.1	70	-	26.4	27.6	28.5	30.9
ESTNR2010-30-0902	0.2	1	6	0.8	30	0.9	0.94	1.86	2.7	3.7	75	-	31.5	32.8	33.7	37
ESTNR2010-35-0902	0.2	1	6	0.8	35	0.9	0.94	22	2.7	3.3	80	-	36.5	38	39	43.2
ESTNR2010-8-0403	0.3	1	6	0.8	8	0.4	0.94	14	2.7	7.4	55	8.8	9.3	9.7	10	10.6
ESTNR2010-15-0903	0.3	1	6	0.8	15	0.9	0.94	1.39	2.7	5.6	60	-	16.3	17.2	17.8	18.8
ESTNR2010-25-0903	0.3	1	6	0.8	25	0.9	0.94	1.7	2.7	4.2	70	-	26.4	27.6	28.5	30.8
ESTNR2010-30-0903	0.3	1	6	0.8	30	0.9	0.94	1.86	2.7	3.7	75	-	31.5	32.8	33.7	37
ESTNR2015-10-0402	0.2	1.5	6	1.35	10	0.4	1.42	1.54	7.07	6.4	55	11	11.5	11.9	12.3	13
ESTNR2015-15-0902	0.2	1.5	6	1.35	15	0.9	1.42	1.85	7.07	5.3	60	-	16.4	17.3	17.9	18.9
ESTNR2015-20-0902	0.2	1.5	6	1.35	20	0.9	1.42	21	3.89	4.5	65	-	21.5	22.5	23.2	24.9
ESTNR2015-25-0902	0.2	1.5	6	1.35	25	0.9	1.42	2.16	3.89	3.9	70	-	26.6	27.7	28.5	31
ESTNR2015-30-0902	0.2	1.5	6	1.35	30	0.9	1.42	2.32	3.89	3.4	75	-	31.6	32.9	33.8	37.1
ESTNR2015-10-0403	0.3	1.5	6	1.35	10	0.4	1.42	1.54	3.89	6.4	55	11	11.5	11.9	12.3	13
ESTNR2015-20-0903	0.3	1.5	6	1.35	20	0.9	1.42	21	3.89	4.5	65	-	21.5	22.5	23.2	24.8
ESTNR2015-25-0903	0.3	1.5	6	1.35	25	0.9	1.42	2.16	3.89	3.9	70	-	26.5	27.7	28.5	31
ESTNR2015-30-0903	0.3	1.5	6	1.35	30	0.9	1.42	2.32	3.89	3.4	75	-	31.6	32.9	33.8	37.1
ESTNR2020-30-0902	0.2	2	6	1.7	30	0.9	1.92	2.81	7.42	3.1	70	-	31.6	32.9	33.8	37.2
ESTNR2020-40-0902	0.2	2	6	1.7	40	0.9	1.92	3.12	7.42	2.5	80	-	41.8	43.3	44.6	-
ESTNR2020-50-0902	0.2	2	6	1.7	50	0.9	1.92	3.44	7.42	2.1	90	-	51.9	53.6	55.7	-
ESTNR2020-12-0403	0.3	2	6	1.7	12	0.4	1.92	2.06	7.42	5.5	55	13	13.6	14.1	14.5	15.6
ESTNR2020-20-0903	0.3	2	6	1.7	20	0.9	1.92	2.5	4.24	4.1	65	-	21.5	22.5	23.2	24.9
ESTNR2020-30-0903	0.3	2	6	1.7	30	0.9	1.92	2.81	4.24	3.1	70	-	31.6	32.9	33.8	37.1

ESTNR

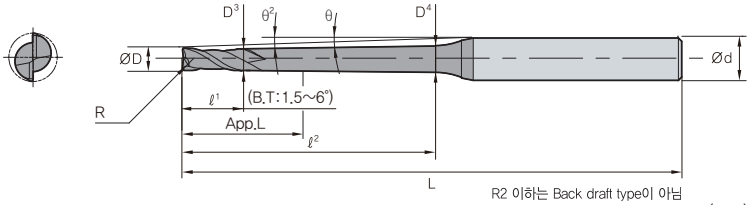
2날 테이퍼 넥 레디우스 엔드밀



ULTRA FINE | 2 | 30° HELIX | R ±0.01 전 규격 | AlTiN | 절삭조건 p.420~421

• 공구직경공차

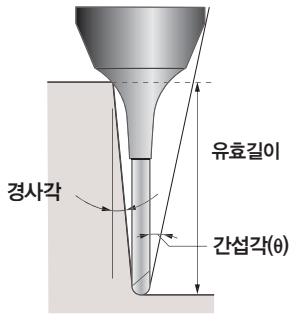
ØD		Ød
전 규격	0 ~ -0.015mm	h5

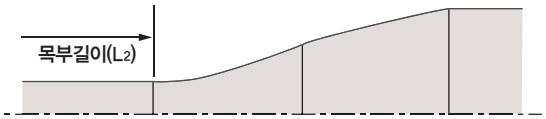


R2 이하는 Back draft type이 아님

(mm)

형 번	규격(mm)											가공물 구배각별 유효길이				
	R	ØD	Ød	ℓ1	ℓ2	θ	D3	D4	App. L	θ2	L	0.5°	1°	1.5°	2°	3°
ESTNR2020-40-0903	0.3	2	6	1.7	40	0.9	1.92	3.12	4.24	2.5	80	-	41.7	43.3	44.6	-
ESTNR2020-50-0903	0.3	2	6	1.7	50	0.9	1.92	3.44	4.24	2.1	90	-	51.8	53.6	55.7	-
ESTNR2020-8-0405	0.5	2	6	1.7	8	0.4	1.92	2.01	4.24	6.8	50	8.7	9	9.3	9.5	10.4
ESTNR2020-12-0405	0.5	2	6	1.7	12	0.4	1.92	2.06	4.24	5.6	55	13	13.6	14.1	14.4	15.5
ESTNR2020-16-0405	0.5	2	6	1.7	16	0.4	1.92	2.12	4.24	4.7	60	17	17.8	18.3	18.7	20.7
ESTNR2020-20-0905	0.5	2	6	1.7	20	0.9	1.92	2.5	4.24	4.2	65	-	21.5	22.5	23.2	24.8
ESTNR2020-25-0905	0.5	2	6	1.7	25	0.9	1.92	2.65	4.24	3.6	65	-	26.6	27.7	28.5	30.9
ESTNR2020-30-0905	0.5	2	6	1.7	30	0.9	1.92	2.81	4.24	3.1	70	-	31.6	32.9	33.8	37.1
ESTNR2020-40-0905	0.5	2	6	1.7	40	0.9	1.92	3.12	4.24	2.5	80	-	41.7	43.2	44.6	-
ESTNR2020-50-0905	0.5	2	6	1.7	50	0.9	1.92	3.44	4.24	2.1	90	-	51.8	53.6	55.6	-
ESTNR2030-40-0902	0.2	3	6	2.5	40	0.9	2.86	4.04	6.95	2	80	-	42	43.4	-	-
ESTNR2030-50-0902	0.2	3	6	2.5	50	0.9	2.86	4.35	6.95	1.6	90	-	52.1	53.7	-	-
ESTNR2030-60-0902	0.2	3	6	2.5	60	0.9	2.86	4.67	6.95	1.4	100	-	62.2	-	-	-
ESTNR2030-40-0903	0.3	3	6	2.5	40	0.9	2.86	4.04	6.95	2	80	-	42	43.4	-	-
ESTNR2030-50-0903	0.3	3	6	2.5	50	0.9	2.86	4.35	6.95	1.7	90	-	52.1	53.7	-	-
ESTNR2030-60-0903	0.3	3	6	2.5	60	0.9	2.86	4.67	6.95	1.4	100	-	62.2	-	-	-
ESTNR2030-40-0905	0.5	3	6	2.5	40	0.9	2.86	4.04	6.95	2	80	-	42	43.4	-	-
ESTNR2030-50-0905	0.5	3	6	2.5	50	0.9	2.86	4.35	6.95	1.7	90	-	52.1	53.7	-	-
ESTNR2030-60-0905	0.5	3	6	2.5	60	0.9	2.86	4.67	6.95	1.4	100	-	62.1	-	-	-





※ 표시된 유효길이는 공작물과의 간섭을 막기 위한 기본 값입니다.
가공환경의 적절한 제어가 필요합니다.

• 적용 피삭재

탄소강 ~ HB225	합금강 HB225~325	프리하든강 HRC30~50	열처리강		동	흑연	주철 ~FCD500	알루미늄	스테인리스강
			SKD61~HRC55	SKD11 HRC55~63					
		○	◎	◎	○				

◎: 매우적합 ○: 적합

H-Star Endmill

ESPM4

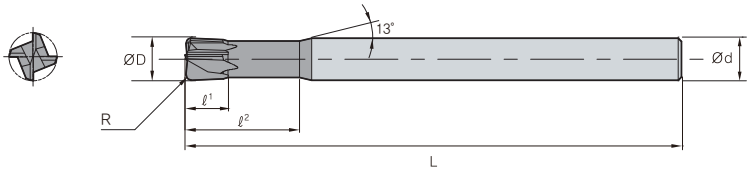
4날 넥 타입 레디우스 엔드밀



ULTRA FINE | 4 | 0° HELIX | R ±0.015 전 규격 | AlTiN | 절삭조건 p.422

• 공구직경공차

ØD		Ød
전 규격	0 ~ -0.02mm	h5



(mm)

형 번	R	ØD	Ød	ℓ1	ℓ2	L
ESPM4030-05	0.5	3	6	1.2	8	50
ESPM4040-05	0.5	4	6	1.5	10	50
ESPM4060-05	0.5	6	6	2.5	12	60
ESPM4060-10	1	6	6	2.5	12	60
ESPM4060-15	1.5	6	6	2.5	12	60
ESPM4060-15L	1.5	6	6	2.5	12	90
ESPM4080-10	1	8	8	3.5	16	60
ESPM4080-20	2	8	8	3.5	16	60
ESPM4080-20L	2	8	8	3.5	16	100
ESPM4100-10	1	10	10	4	20	70
ESPM4100-20	2	10	10	4	20	70
ESPM4100-20L	2	10	10	4	20	100
ESPM4120-20	2	12	12	5	25	80
ESPM4120-30	3	12	12	5	25	80
ESPM4120-30L	3	12	12	5	25	110

• 적용 피삭재

탄소강 ~ HB225	합금강 HB225~325	프리하든강 HRC30~50	열처리강		동	흑연	주철 ~FCD500	알루미늄	스테인리스강
			SKD61~HRC55	SKD11 HRC55~63					
		○	◎	◎	○				

◎: 매우적합 ○: 적합

금형 가공용 엔드밀

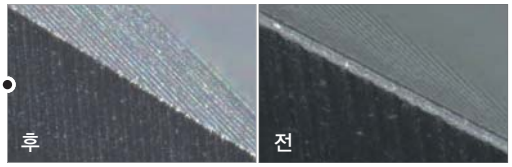
U-Star Endmill New

- HRC30~50 중경도강, 금형강 가공용 초경 엔드밀
- AlCrN계 박막 적용을 통한 내마모성, 윤활성 향상

특징

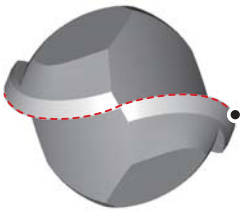
- 초미립자 소재(PC303W)를 적용한 볼 엔드밀의 인선 강도 향상
- 고인성 소재(PC315W)를 적용한 플랫 엔드밀의 내치핑성 향상
- 복잡한 금형가공에 적합한 다양한 형상, 제원의 제품군 보유
- h5샹크, 날경 및 레디우스 고정밀 공차 적용으로 정밀 가공에 적합

• 인선처리 적용

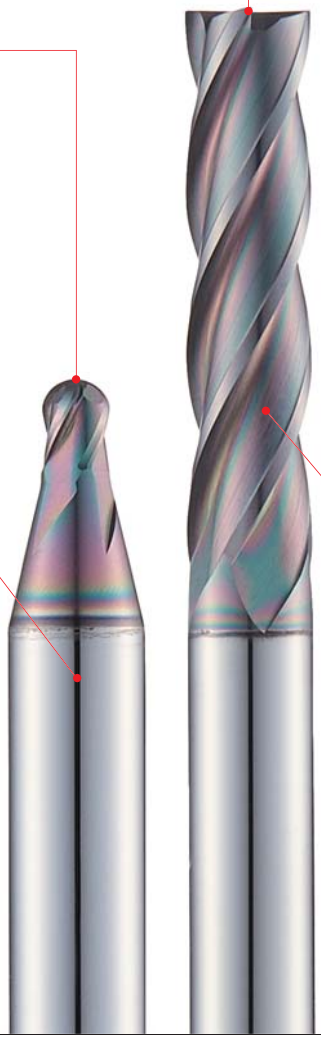


- 초기 절입 시 내치핑성 보완
- 금형가공 특성 대응을 위한 안정적인 가공 유도

• S커브 게쉬형상 채택



- 가공부하 분산을 통한 절삭성, 내마모성 향상

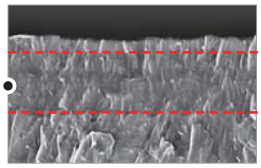


• 중경도용 소재 채택



- 소재 분리 적용(PC303W, PC315W)을 통한 공구 특성의 극대화, 범용 가공성 확대

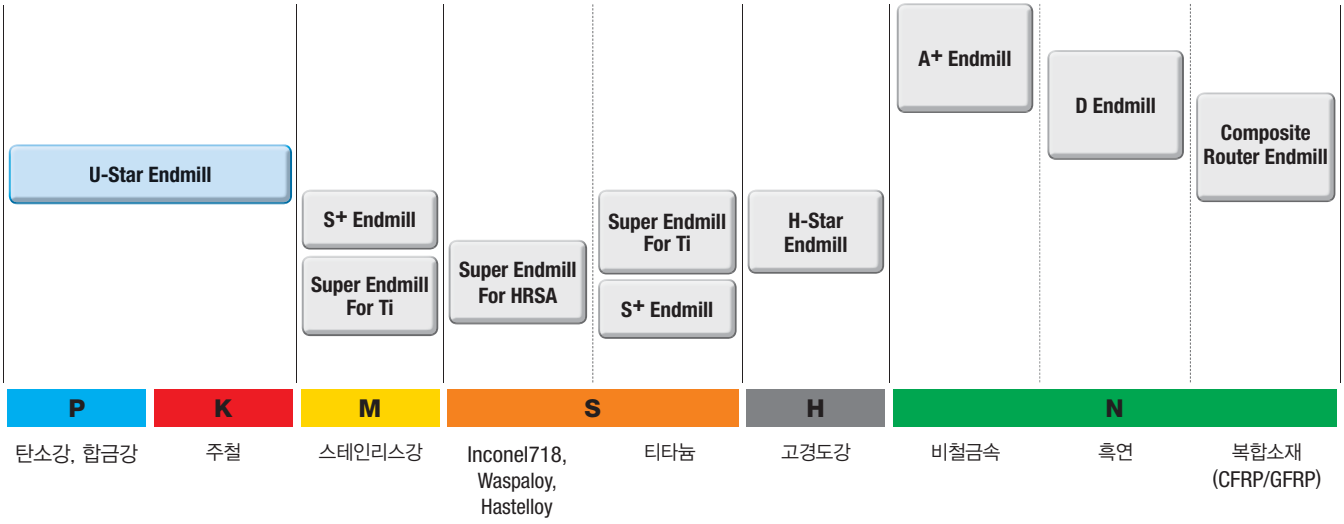
• AlCrN계 신규 코팅



- Multi layer 박막으로 내마모성과 내산화성 향상
- Cr 함유를 통한 윤활성 향상
- 마찰열에 의한 안정성 확보

U-Star Endmill

공구 선택 가이드



형번표기법



형번	형상	품명	공구직경	페이지
UE502		2날 플랫 엔드밀	Ø0.1 ~ 25.0	118~119
UE512		2날 롱 넥 플랫 엔드밀	Ø0.1 ~ 12.0	120~122
UE522		2날 플랫 엔드밀	Ø1.0 ~ 25.0	123~124
UXE502		2날 강력 절삭용 플랫 엔드밀	Ø0.1 ~ 20.0	125~126
UE504H		4날 45° 헬릭스 플랫 엔드밀	Ø1.0 ~ 20.0	127
UE514		4날 롱 넥 플랫 엔드밀	Ø1.0 ~ 12.0	128~129
UE524		4날 플랫 엔드밀	Ø1.0 ~ 25.0	130~131
ULE504		4날 자동 선반용 플랫 엔드밀	Ø3.0 ~ 16.0	132
UE504		4날 플랫 엔드밀	Ø0.8 ~ 25.0	133
UXE504		4날 강력 절삭용 플랫 엔드밀	Ø1.0 ~ 20.0	134
UE506		6날 플랫 엔드밀	Ø6.0 ~ 20.0	135
UTE502		2날 테이퍼 플랫 엔드밀	Ø0.3 ~ 10.0	136~137
UTE504		4날 테이퍼 플랫 엔드밀	Ø0.8 ~ 10.0	138~140
UR502		2날 레디우스 엔드밀	Ø0.2 ~ 20.0	141~143
UR512		2날 넥 타입 레디우스 엔드밀	Ø0.2 ~ 20.0	144~149
UR542		2날 테이퍼 넥 레디우스 엔드밀	Ø0.2 ~ 4.0	150~155
UR504		4날 레디우스 엔드밀	Ø3.0 ~ 20.0	156
UR544		4날 테이퍼 넥 레디우스 엔드밀	Ø1.0 ~ 4.0	157~160
UXR504		4날 멀티 헬릭스 레디우스 엔드밀	Ø1.0 ~ 20.0	161~163
UXR514		4날 멀티 헬릭스 넥 레디우스 엔드밀	Ø1.0 ~ 20.0	164~168
UR506		6날 레디우스 엔드밀	Ø6.0 ~ 20.0	169
UDR503		3날 더블 레디우스 엔드밀	Ø6.0 ~ 20.0	170
USPM4		4날 고이송 레디우스 엔드밀	Ø1.0 ~ 20.0	171
UTR504		4날 테이퍼 레디우스 엔드밀	Ø0.8 ~ 2.5	172~175
UB502		2날 볼 엔드밀	Ø1.0 ~ 25.0	176~177
UB502---P		2날 고정밀 볼 엔드밀	Ø0.1 ~ 12.0	178
UB512		2날 롱 넥 볼 엔드밀	Ø0.1 ~ 12.0	179~182
UB512S6		2날 롱 넥 볼 엔드밀(자루경 6)	Ø0.5 ~ 2.0	183
UB532		2날 롤리팝 스타일 볼 엔드밀	Ø3.0 ~ 12.0	184
UB542		2날 테이퍼 넥 볼 엔드밀	Ø0.1 ~ 12.0	185~191
USB502		2날 스트레이트 볼 엔드밀	Ø3.0 ~ 20.0	192
UB503		3날 볼 엔드밀	Ø1.0 ~ 12.0	193
UB504		4날 볼 엔드밀	Ø1.0 ~ 12.0	194
UTB502		2날 테이퍼 볼 엔드밀	Ø0.3 ~ 2.0	195
UF50		3~5날 챔퍼 피치 러핑 엔드밀	Ø3.0 ~ 25.0	196
UF51		3~5날 파인 피치 러핑 엔드밀	Ø3.0 ~ 25.0	197
UF51---H		3~5날 45° 헬릭스 파인 피치 러핑 엔드밀	Ø3.0 ~ 25.0	198

U-Star Endmill

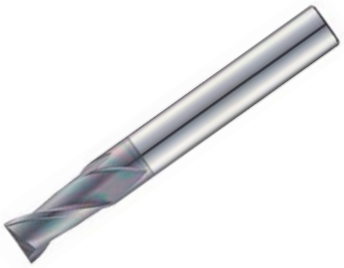
UE502

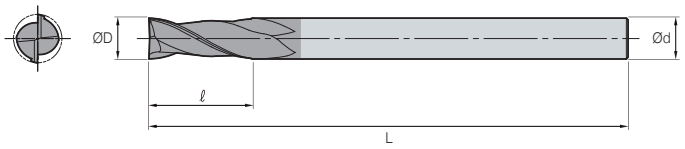
2날 플랫 엔드밀

CARBIDE | 2 | 30° HELIX | AlCrN | 절삭조건 p.423

• 공구직경공차

ØD		Ød
Ø0.1 ~ Ø6	0 ~ -0.012mm	h5
Ø6.5 ~ Ø25	0 ~ -0.015mm	





(mm)

형 번	ØD	Ød	ℓ	L
UE502001S3	0.1	3	0.2	40
UE502001	0.1	4	0.2	40
UE5020015	0.15	4	0.3	40
UE502002S3	0.2	3	0.4	40
UE502002	0.2	4	0.4	40
UE5020025	0.25	4	0.5	40
UE502003S3	0.3	3	0.6	40
UE502003	0.3	4	0.6	40
UE5020035	0.35	4	0.7	40
UE502004S3	0.4	3	0.8	40
UE502004	0.4	4	0.8	40
UE5020045	0.45	4	0.9	40
UE502005S3	0.5	3	1	40
UE502005	0.5	4	1	40
UE5020055	0.55	4	1.1	40
UE502006S3	0.6	3	1.2	40
UE502006	0.6	4	1.2	40
UE5020065	0.65	4	1.3	40
UE502007S3	0.7	3	1.4	40
UE502007	0.7	4	1.4	40
UE5020075	0.75	4	1.5	40
UE502008S3	0.8	3	1.6	40
UE502008	0.8	4	1.6	40
UE5020085	0.85	4	1.7	40
UE502009S3	0.9	3	1.8	40
UE502009	0.9	4	1.8	40
UE5020095	0.95	4	2	40
UE502010S3	1	3	2.5	50
UE502010S4	1	4	2.5	50
UE502010	1	6	2.5	50
UE502011S4	1.1	4	3	50
UE502012S3	1.2	3	3	50
UE502012S4	1.2	4	3	50
UE502012	1.2	6	3	50
UE502013S4	1.3	4	3	50
UE502014S4	1.4	4	4	50

형 번	ØD	Ød	ℓ	L
UE502015S3	1.5	3	4	50
UE502015S4	1.5	4	4	50
UE502015	1.5	6	4	50
UE502016S4	1.6	4	4	50
UE502017S4	1.7	4	4	50
UE502018S4	1.8	4	5	50
UE502019S4	1.9	4	5	50
UE502020S3	2	3	6	50
UE502020S4	2	4	6	50
UE502020	2	6	6	50
UE502021S4	2.1	4	6	50
UE502022S4	2.2	4	6	50
UE502023S4	2.3	4	6	50
UE502024S4	2.4	4	6	50
UE502025S3	2.5	3	7	50
UE502025	2.5	6	7	50
UE502025S4	2.5	4	8	50
UE502026S4	2.6	4	8	50
UE502027S4	2.7	4	8	50
UE502028S4	2.8	4	8	50
UE502029S4	2.9	4	8	50
UE502030S3	3	3	8	50
UE502030S4	3	4	8	50
UE502030	3	6	8	50
UE502035S4	3.5	4	10	50
UE502035	3.5	6	10	50
UE502040080S4	4	4	10	80
UE502040S4	4	4	10	50
UE502040	4	6	10	50
UE502045	4.5	6	14	50
UE502050	5	6	15	60
UE502055	5.5	6	15	60
UE502060	6	6	15	60
UE502065	6.5	8	18	60
UE502070	7	8	20	60
UE502075	7.5	8	20	60

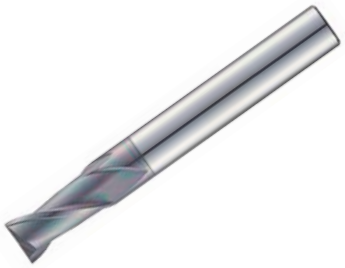
UE502

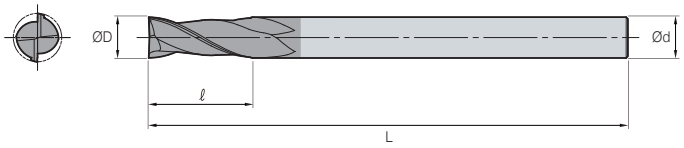
2날 플랫 엔드밀

CARBIDE | 2 | 30° HELIX | AlCrN | 절삭조건 p.423

• 공구직경공차

ØD		Ød
Ø0.1 ~ Ø6	0 ~ -0.012mm	h5
Ø6.5 ~ Ø25	0 ~ -0.015mm	





(mm)

형 번	ØD	Ød	ℓ	L
UE502080	8	8	20	70
UE502085	8.5	10	22	70
UE502090	9	10	22	70
UE502095	9.5	10	24	70
UE502100	10	10	25	75
UE502105	10.5	12	26	75
UE502110	11	12	30	75
UE502115	11.5	12	30	80
UE502120	12	12	30	80
UE502130	13	12	35	100
UE502140S16	14	16	35	100
UE502140	14	14	35	100
UE502140S12	14	12	35	100

형 번	ØD	Ød	ℓ	L
UE502150	15	16	38	100
UE502160	16	16	40	100
UE502170	17	16	42	100
UE502180	18	18	45	100
UE502180S16	18	16	45	100
UE502190	19	20	45	100
UE502200	20	20	45	100
UE502210	21	20	45	100
UE502220	22	20	45	100
UE502230	23	25	50	120
UE502240	24	25	50	120
UE502250	25	25	50	120

• 적용 피삭재

탄소강 ~ HB225	합금강 HB225~325	프리하든강 HRC30~50	열처리강		주철 ~FCD500	알루미늄	스테인리스강	Ti합금	Ni합금
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○		○				

◎: 매우적합 ○: 적합

U-Star Endmill

UE512

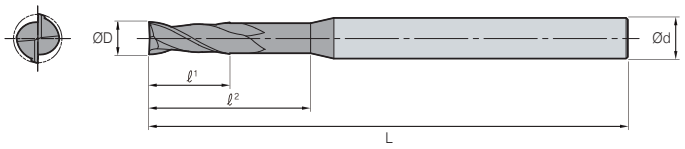
2날 롱 넥 플랫 엔드밀

CARBIDE | 2 | 30° HELIX | AlCrN | 절삭조건 p.424~428

• 공구직경공차

ØD		Ød
Ø0.1 ~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	





(mm)

형 번	ØD	Ød	ℓ1	ℓ2	L
UE512001003	0.1	4	0.15	0.3	40
UE512001005	0.1	4	0.15	0.5	40
UE51200101	0.1	4	0.15	1	40
UE512002005	0.2	4	0.3	0.5	40
UE51200201	0.2	4	0.3	1	40
UE512002015	0.2	4	0.3	1.5	40
UE51200202	0.2	4	0.3	2	40
UE51200301	0.3	4	0.5	1	40
UE512003015	0.3	4	0.5	1.5	40
UE51200302	0.3	4	0.5	2	40
UE512003025	0.3	4	0.5	2.5	40
UE51200303	0.3	4	0.5	3	40
UE51200304	0.3	4	0.5	4	40
UE51200305	0.3	4	0.5	5	40
UE51200401	0.4	4	0.6	1	40
UE512004015	0.4	4	0.6	1.5	40
UE51200402	0.4	4	0.6	2	40
UE512004025	0.4	4	0.6	2.5	40
UE51200403	0.4	4	0.6	3	40
UE51200404	0.4	4	0.6	4	40
UE51200405	0.4	4	0.6	5	40
UE51200406	0.4	4	0.6	6	40
UE51200408	0.4	4	0.6	8	40
UE51200410	0.4	4	0.6	10	40
UE51200501	0.5	4	0.7	1	45
UE512005015	0.5	4	0.7	1.5	45
UE51200502	0.5	4	0.7	2	45
UE512005025	0.5	4	0.7	2.5	45
UE51200503	0.5	4	0.7	3	45
UE51200504	0.5	4	0.7	4	45
UE51200505	0.5	4	0.7	5	45
UE51200506	0.5	4	0.7	6	45
UE51200508	0.5	4	0.7	8	45
UE51200510	0.5	4	0.7	10	45
UE51200512	0.5	4	0.7	12	45
UE51200514	0.5	4	0.7	14	45
UE51200516	0.5	4	0.7	16	45

형 번	ØD	Ød	ℓ1	ℓ2	L
UE51200602	0.6	4	0.9	2	45
UE51200603	0.6	4	0.9	3	45
UE51200604	0.6	4	0.9	4	45
UE51200605	0.6	4	0.9	5	45
UE51200606	0.6	4	0.9	6	45
UE51200608	0.6	4	0.9	8	45
UE51200610	0.6	4	0.9	10	45
UE51200612	0.6	4	0.9	12	45
UE51200614	0.6	4	0.9	14	45
UE51200616	0.6	4	0.9	16	45
UE51200702	0.7	4	1.2	2	45
UE51200704	0.7	4	1.2	4	45
UE51200706	0.7	4	1.2	6	45
UE51200708	0.7	4	1.2	8	45
UE51200710	0.7	4	1.2	10	45
UE51200712	0.7	4	1.2	12	45
UE51200802	0.8	4	1.2	2	45
UE51200803	0.8	4	1.2	3	45
UE51200804	0.8	4	1.2	4	45
UE51200805	0.8	4	1.2	5	45
UE51200806	0.8	4	1.2	6	45
UE51200808	0.8	4	1.2	8	45
UE51200810	0.8	4	1.2	10	45
UE51200812	0.8	4	1.2	12	45
UE51200814	0.8	4	1.2	14	45
UE51200816	0.8	4	1.2	16	45
UE51200820	0.8	4	1.2	20	45
UE51200906	0.9	4	1.3	6	45
UE51200908	0.9	4	1.3	8	45
UE51200910	0.9	4	1.3	10	45
UE51201002	1	4	1.5	2	50
UE51201003	1	4	1.5	3	50
UE51201004	1	4	1.5	4	50
UE51201005	1	4	1.5	5	50
UE51201006	1	4	1.5	6	50
UE51201007	1	4	1.5	7	50
UE51201008	1	4	1.5	8	50

UE512

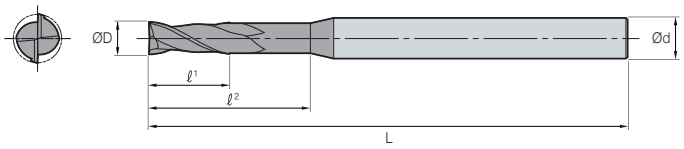
2날 롱 넥 플랫 엔드밀

CARBIDE | 2 | 30° HELIX | AlCrN | 절삭조건 p.424~428

• 공구직경공차

ØD		Ød
Ø0.1 ~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	





(mm)

형 번	ØD	Ød	ℓ1	ℓ2	L
UE51201010	1	4	1.5	10	50
UE51201012	1	4	1.5	12	50
UE51201014	1	4	1.5	14	50
UE51201016	1	4	1.5	16	50
UE51201018	1	4	1.5	18	50
UE51201020	1	4	1.5	20	50
UE51201022	1	4	1.5	22	60
UE51201026	1	4	1.5	26	60
UE51201030	1	4	1.5	30	70
UE51201040	1	4	1.5	40	80
UE51201050	1	4	1.5	50	100
UE51201204	1.2	4	1.8	4	50
UE51201206	1.2	4	1.8	6	50
UE51201208	1.2	4	1.8	8	50
UE51201210	1.2	4	1.8	10	50
UE51201212	1.2	4	1.8	12	50
UE51201214	1.2	4	1.8	14	50
UE51201216	1.2	4	1.8	16	50
UE51201220	1.2	4	1.8	20	50
UE51201226	1.2	4	1.8	26	60
UE51201230	1.2	4	1.8	30	70
UE51201406	1.4	4	2.1	6	50
UE51201408	1.4	4	2.1	8	50
UE51201410	1.4	4	2.1	10	50
UE51201414	1.4	4	2.1	14	50
UE51201416	1.4	4	2.1	16	50
UE51201420	1.4	4	2.1	20	50
UE51201504	1.5	4	2.3	4	50
UE51201505	1.5	4	2.3	5	50
UE51201506	1.5	4	2.3	6	50
UE51201507	1.5	4	2.3	7	50
UE51201508	1.5	4	2.3	8	50
UE51201510	1.5	4	2.3	10	50
UE51201512	1.5	4	2.3	12	50
UE51201514	1.5	4	2.3	14	50
UE51201516	1.5	4	2.3	16	50
UE51201518	1.5	4	2.3	18	50

형 번	ØD	Ød	ℓ1	ℓ2	L
UE51201520	1.5	4	2.3	20	50
UE51201522	1.5	4	2.3	22	60
UE51201526	1.5	4	2.3	26	60
UE51201530	1.5	4	2.3	30	70
UE51201608	1.6	4	2.3	8	50
UE51201610	1.6	4	2.3	10	50
UE51201612	1.6	4	2.3	12	50
UE51201616	1.6	4	2.3	16	50
UE51201620	1.6	4	2.3	20	50
UE51201808	1.8	4	2.7	8	50
UE51201810	1.8	4	2.7	10	50
UE51201812	1.8	4	2.7	12	50
UE51201816	1.8	4	2.7	16	50
UE51201820	1.8	4	2.7	20	50
UE51202006	2	4	3	6	50
UE51202008	2	4	3	8	50
UE51202010	2	4	3	10	50
UE51202012	2	4	3	12	50
UE51202014	2	4	3	14	50
UE51202016	2	4	3	16	50
UE51202018	2	4	3	18	50
UE51202020	2	4	3	20	50
UE51202022	2	4	3	22	60
UE51202026	2	4	3	26	60
UE51202030	2	4	3	30	70
UE51202035	2	4	3	35	70
UE51202040	2	4	3	40	80
UE51202045	2	4	3	45	90
UE51202050	2	4	3	50	100
UE51202060	2	4	3	60	110
UE51202508	2.5	4	4	8	50
UE51202510	2.5	4	4	10	50
UE51202512	2.5	4	4	12	50
UE51202514	2.5	4	4	14	50
UE51202516	2.5	4	4	16	50
UE51202518	2.5	4	4	18	50
UE51202520	2.5	4	4	20	50

U-Star Endmill

UE512

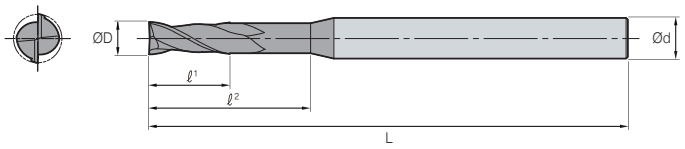
2날 롱 넥 플랫 엔드밀

CARBIDE | 2 | 30° HELIX | AlCrN | 절삭조건 p.424~428

• 공구직경공차

ØD		Ød
Ø0.1 ~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	





(mm)

형 번	ØD	Ød	ℓ1	ℓ2	L
UE51202522	2.5	4	4	22	60
UE51202526	2.5	4	4	26	60
UE51202530	2.5	4	4	30	70
UE51202535	2.5	4	4	35	70
UE51202540	2.5	4	4	40	80
UE51202545	2.5	4	4	45	90
UE51202550	2.5	4	4	50	100
UE51203006	3	6	4.5	6	50
UE51203008	3	6	4.5	8	50
UE51203010	3	6	4.5	10	50
UE51203012	3	6	4.5	12	50
UE51203014	3	6	4.5	14	60
UE51203016	3	6	4.5	16	60
UE51203018	3	6	4.5	18	60
UE51203020	3	6	4.5	20	60
UE51203022	3	6	4.5	22	65
UE51203026	3	6	4.5	26	65
UE51203030	3	6	4.5	30	70
UE51203035	3	6	4.5	35	70
UE51203040	3	6	4.5	40	80
UE51203045	3	6	4.5	45	90
UE51203050	3	6	4.5	50	100
UE51203060	3	6	4.5	60	100
UE51204008	4	6	6	8	50
UE51204010	4	6	6	10	50
UE51204012	4	6	6	12	50
UE51204014	4	6	6	14	60
UE51204016	4	6	6	16	60
UE51204018	4	6	6	18	60
UE51204020	4	6	6	20	60

형 번	ØD	Ød	ℓ1	ℓ2	L
UE51204022	4	6	6	22	65
UE51204026	4	6	6	26	65
UE51204030	4	6	6	30	70
UE51204035	4	6	6	35	70
UE51204040	4	6	6	40	80
UE51204045	4	6	6	45	90
UE51204050	4	6	6	50	100
UE51204060	4	6	6	60	100
UE51205016	5	6	8	16	60
UE51205020	5	6	8	20	60
UE51205026	5	6	8	26	65
UE51205030	5	6	8	30	70
UE51205035	5	6	8	35	75
UE51205040	5	6	8	40	80
UE51205050	5	6	8	50	90
UE51205060	5	6	8	60	100
UE51206015	6	6	9	15	60
UE51206020	6	6	9	20	60
UE51206030	6	6	9	30	70
UE51206032	6	6	9	32	90
UE51208025	8	8	12	25	70
UE51208030	8	8	12	30	80
UE51208042	8	8	12	42	100
UE51210030	10	10	15	30	75
UE51210035	10	10	15	35	80
UE51210045	10	10	15	45	100
UE51212035	12	12	20	35	80
UE51212040	12	12	20	40	90
UE51212050	12	12	20	50	110

• 적용 피삭재

탄소강 ~ HB225	합금강 HB225~325	프리하든강 HRC30~50	열처리강		주철 ~FCD500	알루미늄	스테인리스강	Ti합금	Ni합금
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○		○				

◎: 매우적합 ○: 적합

UE522

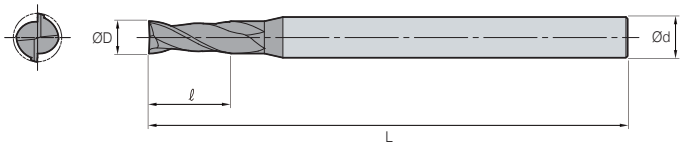
2날 플랫 엔드밀



CARBIDE | 2 | 30° HELIX | AlCrN | 절삭조건 p.429

• 공구직경공차

ØD		Ød
Ø0.1 ~ Ø6	0 ~ -0.012mm	h5
Ø6.5 ~ Ø25	0 ~ -0.015mm	



(mm)

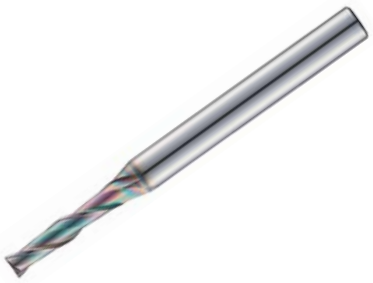
형 번	ØD	Ød	ℓ	L
UE52201003	1	6	3	60
UE52201004	1	6	4	60
UE52201005	1	6	5	60
UE52201006	1	6	6	60
UE52201007	1	6	7	60
UE52201008	1	6	8	60
UE52201010	1	6	10	60
UE52201012	1	6	12	60
UE52201204	1.2	6	4	60
UE52201206	1.2	6	6	60
UE52201208	1.2	6	8	60
UE52201210	1.2	6	10	60
UE52201212	1.2	6	12	60
UE52201506	1.5	6	6	60
UE52201508	1.5	6	8	60
UE52201510	1.5	6	10	60
UE52201512	1.5	6	12	60
UE52201514	1.5	6	14	60
UE52201516	1.5	6	16	60
UE52202008	2	6	8	60
UE52202010	2	6	10	60
UE52202012	2	6	12	60
UE52202014	2	6	14	60
UE52202016	2	6	16	60
UE52202510	2.5	6	10	60
UE52202512	2.5	6	12	60
UE52202516	2.5	6	16	60
UE52202520	2.5	6	20	60
UE52202526	2.5	6	26	60
UE52203010	3	6	10	70
UE52203012	3	6	12	70
UE52203014	3	6	14	70
UE52203016	3	6	16	70
UE52203016S3	3	3	16	100
UE52203020	3	6	20	70
UE52203026	3	6	26	70
UE52203030	3	6	30	70

형 번	ØD	Ød	ℓ	L
UE52204012	4	6	12	70
UE52204016	4	6	16	70
UE52204020	4	6	20	70
UE52204020S4	4	4	20	100
UE52204026	4	6	26	70
UE52204030	4	6	30	70
UE52205015	5	6	15	70
UE52205020	5	6	20	70
UE52205025100	5	6	25	100
UE52205025	5	6	25	70
UE52205030	5	6	30	80
UE52205035	5	6	35	90
UE52205040	5	6	40	100
UE52206015080	6	6	15	80
UE52206015	6	6	15	60
UE52206020090	6	6	20	90
UE52206020	6	6	20	70
UE52206025	6	6	25	75
UE52206030150	6	6	30	150
UE52206030100	6	6	30	100
UE52206030	6	6	30	80
UE52206035	6	6	35	90
UE52206040120	6	6	40	120
UE52206040	6	6	40	90
UE52206045	6	6	45	150
UE52207035	7	8	35	85
UE52208020	8	8	20	100
UE52208025	8	8	25	80
UE52208030100	8	8	30	100
UE52208030	8	8	30	80
UE52208035	8	8	35	90
UE52208040150	8	8	40	150
UE52208040120	8	8	40	120
UE52208040	8	8	40	90
UE52208045	8	8	45	100
UE52208050150	8	8	50	150
UE52208050	8	8	50	100

U-Star Endmill

UE522

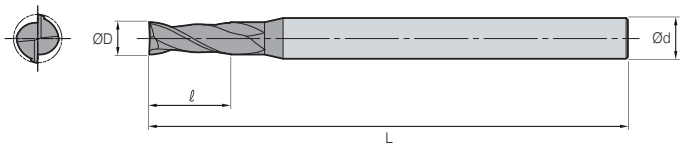
2날 플랫 엔드밀



CARBIDE | 2 | 30° HELIX | AlCrN | 절삭조건 p.429

• 공구직경공차

ØD		Ød
Ø0.1 ~ Ø6	0 ~ -0.012mm	h5
Ø6.5 ~ Ø25	0 ~ -0.015mm	



(mm)

형 번	ØD	Ød	ℓ	L
UE52209045	9	10	45	100
UE52210025	10	10	25	100
UE52210030100	10	10	30	100
UE52210030	10	10	30	80
UE52210035	10	10	35	90
UE52210040120	10	10	40	120
UE52210040	10	10	40	90
UE52210045	10	10	45	100
UE52210050200	10	10	50	200
UE52210050150	10	10	50	150
UE52210050	10	10	50	100
UE52210055	10	10	55	150
UE52210060200	10	10	60	200
UE52210060155	10	10	60	155
UE52210060	10	10	60	110
UE52211050	11	12	50	110
UE52212035	12	12	35	90
UE52212040120	12	12	40	120
UE52212040	12	12	40	100
UE52212045	12	12	45	130
UE52212050150	12	12	50	150
UE52212050	12	12	50	100
UE52212055	12	12	55	110
UE52212060200	12	12	60	200
UE52212060150	12	12	60	150
UE52212060	12	12	60	110
UE52212065	12	12	65	150
UE52212070200	12	12	70	200
UE52212070	12	12	70	120
UE52214040	14	16	40	110
UE52214050	14	16	50	110
UE52214060150	14	16	60	150

형 번	ØD	Ød	ℓ	L
UE52214060	14	16	60	120
UE52216040150	16	16	40	150
UE52216040	16	16	40	120
UE52216050150	16	16	50	150
UE52216050	16	16	50	110
UE52216060	16	16	60	120
UE52216070200	16	16	70	200
UE52216070150	16	16	70	150
UE52216070	16	16	70	130
UE52216080	16	16	80	150
UE52216090	16	16	90	150
UE522160110	16	16	110	200
UE522160120	16	16	120	250
UE52218050	18	20	50	120
UE52218060	18	18	60	120
UE52218070	18	20	70	130
UE522180100	18	20	100	200
UE52220050150	20	20	50	150
UE52220050	20	20	50	110
UE52220060	20	20	60	130
UE52220070	20	20	70	130
UE52220080	20	20	80	150
UE52220090200	20	20	90	200
UE52220090	20	20	90	150
UE522200110	20	20	110	200
UE522200120	20	20	120	250
UE52222075	22	20	75	150
UE522220110	22	20	110	200
UE52225070	25	25	70	150
UE52225090	25	25	90	150
UE522250110	25	25	110	200
UE522250120	25	25	120	250

• 적용 피삭재

탄소강 ~ HB225	합금강 HB225~325	프리하든강 HRC30~50	열처리강		주철 ~FCD500	알루미늄	스테인리스강	Ti합금	Ni합금
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○		○				

◎: 매우적합 ○: 적합

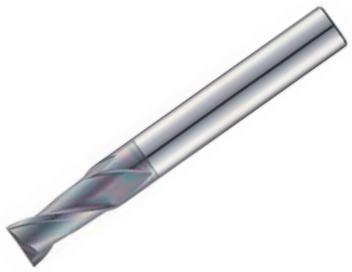
UXE502

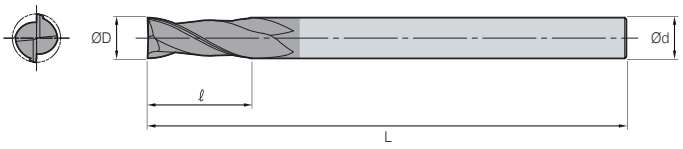
2날 강력 절삭용 플랫 엔드밀

CARBIDE | 2 | 30° HELIX | AlCrN | 절삭조건 p.423

• 공구직경공차

ØD		Ød
Ø0.1 ~ Ø7	0 ~ -0.012mm	h5
Ø8 ~ Ø20	0 ~ -0.015mm	





(mm)

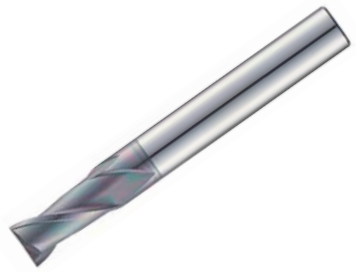
형 번	ØD	Ød	ℓ	L
UXE502001001	0.1	4	0.1	40
UXE502001	0.1	4	0.2	40
UXE502001003	0.1	4	0.3	40
UXE502002002	0.2	4	0.2	40
UXE502002	0.2	4	0.4	40
UXE502002006	0.2	4	0.6	40
UXE502003003	0.3	4	0.3	40
UXE502003	0.3	4	0.6	40
UXE502003009	0.3	4	0.9	40
UXE502004004	0.4	4	0.4	40
UXE502004	0.4	4	0.8	40
UXE502004012	0.4	4	1.2	40
UXE502005005	0.5	4	0.5	40
UXE502005	0.5	4	1	40
UXE502005015	0.5	4	1.5	40
UXE502006006	0.6	4	0.6	40
UXE502006	0.6	4	1.2	40
UXE502006018	0.6	4	1.8	40
UXE502007007	0.7	4	0.7	40
UXE502007	0.7	4	1.4	40
UXE502007021	0.7	4	2.1	40
UXE502008008	0.8	4	0.8	40
UXE502008	0.8	4	1.6	40
UXE502008024	0.8	4	2.4	40
UXE502009009	0.9	4	0.9	40
UXE502009	0.9	4	1.8	40
UXE502009027	0.9	4	2.7	40
UXE50201001	1	6	1	40
UXE50201002	1	6	2	40
UXE502010	1	6	2.5	50
UXE50201003	1	6	3	50
UXE50201004	1	6	4	50
UXE50201006	1	6	6	50
UXE50201202	1.2	6	2	40
UXE502012	1.2	6	3	50
UXE50201204	1.2	6	4	50
UXE50201206	1.2	6	6	50

형 번	ØD	Ød	ℓ	L
UXE502015015	1.5	6	1.5	40
UXE50201503	1.5	6	3	40
UXE502015	1.5	6	4	50
UXE50201506	1.5	6	6	50
UXE50201508	1.5	6	8	50
UXE50201510	1.5	6	10	50
UXE50202002	2	6	2	40
UXE50202004	2	6	4	40
UXE502020	2	6	6	50
UXE50202008	2	6	8	50
UXE50202010	2	6	10	50
UXE50202012	2	6	12	50
UXE502025025	2.5	6	2.5	40
UXE50202505	2.5	6	5	40
UXE502025	2.5	6	7	50
UXE50202510	2.5	6	10	50
UXE50202512	2.5	6	12	50
UXE50203003	3	6	3	40
UXE50203006	3	6	6	40
UXE502030	3	6	8	50
UXE50203010	3	6	10	50
UXE50203012	3	6	12	50
UXE50203014	3	6	14	50
UXE50203510	3.5	6	10	50
UXE50204004	4	6	4	40
UXE50204008	4	6	8	40
UXE502040	4	6	10	50
UXE50204012	4	6	12	50
UXE50204014	4	6	14	50
UXE50204016	4	6	16	50
UXE50204511	4.5	6	11	50
UXE50205005	5	6	5	50
UXE50205010	5	6	10	50
UXE502050	5	6	15	60
UXE50205020	5	6	20	60
UXE50205025	5	6	25	60
UXE50205513	5.5	6	13	50

U-Star Endmill

UXE502

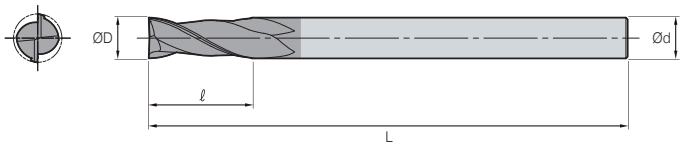
2날 강력 절삭용 플랫 엔드밀



CARBIDE | 2 | 30° HELIX | AlCrN | 절삭조건 p.423

• 공구직경공차

ØD		Ød
Ø0.1 ~ Ø7	0 ~ -0.012mm	h5
Ø8 ~ Ø20	0 ~ -0.015mm	



(mm)

형 번	ØD	Ød	ℓ	L
UXE50206006	6	6	6	50
UXE50206012	6	6	12	50
UXE502060	6	6	15	60
UXE50206020	6	6	20	60
UXE50206025	6	6	25	60
UXE50206513	6.5	8	13	60
UXE50207018	7	8	18	60
UXE50208016	8	8	16	60
UXE502080	8	8	20	70
UXE50208025	8	8	25	70
UXE50208030	8	8	30	70
UXE50210022	10	10	22	65

형 번	ØD	Ød	ℓ	L
UXE502100	10	10	25	75
UXE50210030	10	10	30	75
UXE50210035	10	10	35	75
UXE50212026	12	12	26	70
UXE502120	12	12	30	80
UXE50212035	12	12	35	80
UXE50212040	12	12	40	80
UXE502140	14	16	35	100
UXE502160	16	16	32	100
UXE50216040	16	16	40	100
UXE502180	18	20	45	100
UXE502200	20	20	45	100

• 적용 피삭재

탄소강 ~ HB225	합금강 HB225~325	프리하든강 HRC30~50	열처리강		주철 ~FCD500	알루미늄	스테인리스강	Ti합금	Ni합금
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○		○				

◎: 매우적합 ○: 적합

UE504H

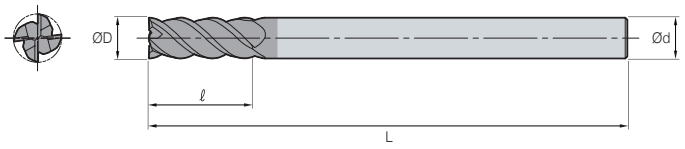
4날 45° 헬릭스 플랫 엔드밀

CARBIDE | 4 | 45° HELIX | AlCrN | 절삭조건 p.429

• 공구직경공차

ØD		Ød
Ø1 ~ Ø20	0 ~ -0.03mm	h5





(mm)

형 번	ØD	Ød	ℓ	L
UE504H010	1	6	2.5	50
UE504H01004	1	6	4	60
UE504H01006	1	6	6	60
UE504H015	1.5	6	4	50
UE504H01506	1.5	6	6	60
UE504H01508	1.5	6	8	60
UE504H020	2	6	6	50
UE504H02008	2	6	8	60
UE504H02010	2	6	10	60
UE504H030	3	6	8	50
UE504H03010	3	6	10	70
UE504H03012	3	6	12	70
UE504H03016	3	6	16	70
UE504H040	4	6	10	50
UE504H04012	4	6	12	70
UE504H04016	4	6	16	70
UE504H04020	4	6	20	70
UE504H050	5	6	15	50
UE504H05030	5	6	30	80
UE504H060	6	6	15	60
UE504H06020	6	6	20	70

형 번	ØD	Ød	ℓ	L
UE504H06030	6	6	30	80
UE504H080	8	8	20	70
UE504H08030	8	8	30	80
UE504H08035	8	8	35	90
UE504H08040	8	8	40	90
UE504H100	10	10	25	75
UE504H10030	10	10	30	80
UE504H10040	10	10	40	90
UE504H10050	10	10	50	100
UE504H120	12	12	30	80
UE504H12040	12	12	40	90
UE504H12050	12	12	50	100
UE504H12060	12	12	60	110
UE504H160	16	16	40	100
UE504H16050	16	16	50	110
UE504H16060	16	16	60	120
UE504H160110	16	16	110	200
UE504H200	20	20	45	100
UE504H20060	20	20	60	120
UE504H20070	20	20	70	130
UE504H200110	20	20	110	200

• 적용 피삭재

탄소강 ~ HB225	합금강 HB225~325	프리하든강 HRC30~50	열처리강		주철 ~FCD500	알루미늄	스테인리스강	Ti합금	Ni합금
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○		○				

◎: 매우적합 ○: 적합

U-Star Endmill

UE514

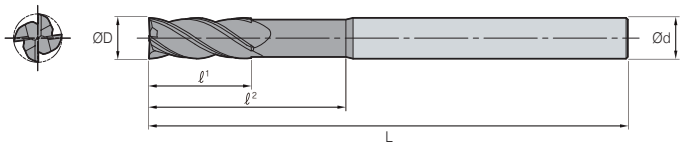
4날 롱 넥 플랫 엔드밀

CARBIDE | 4 | 35° HELIX | AlCrN | 절삭조건 p.430

• 공구직경공차

ØD		Ød
Ø1 ~ Ø12	0 ~ -0.03mm	h5





(mm)

형 번	ØD	Ød	ℓ1	ℓ2	L
UE51401002	1	4	1.5	2	50
UE51401003	1	4	1.5	3	50
UE51401004	1	4	1.5	4	50
UE51401005	1	4	1.5	5	50
UE51401006	1	4	1.5	6	50
UE51401007	1	4	1.5	7	50
UE51401008	1	4	1.5	8	50
UE51401010	1	4	1.5	10	50
UE51401012	1	4	1.5	12	50
UE51401014	1	4	1.5	14	50
UE51401016	1	4	1.5	16	50
UE51401018	1	4	1.5	18	50
UE51401020	1	4	1.5	20	50
UE51401022	1	4	1.5	22	60
UE51401026	1	4	1.5	26	60
UE51401030	1	4	1.5	30	70
UE51401040	1	4	1.5	40	80
UE51401050	1	4	1.5	50	100
UE51401204	1.2	4	1.8	4	50
UE51401206	1.2	4	1.8	6	50
UE51401208	1.2	4	1.8	8	50
UE51401210	1.2	4	1.8	10	50
UE51401212	1.2	4	1.8	12	50
UE51401214	1.2	4	1.8	14	50
UE51401216	1.2	4	1.8	16	50
UE51401220	1.2	4	1.8	20	50
UE51401226	1.2	4	1.8	26	60
UE51401230	1.2	4	1.8	30	70
UE51401504	1.5	4	2.3	4	50
UE51401505	1.5	4	2.3	5	50
UE51401506	1.5	4	2.3	6	50
UE51401507	1.5	4	2.3	7	50
UE51401508	1.5	4	2.3	8	50
UE51401510	1.5	4	2.3	10	50
UE51401512	1.5	4	2.3	12	50
UE51401514	1.5	4	2.3	14	50
UE51401516	1.5	4	2.3	16	50

형 번	ØD	Ød	ℓ1	ℓ2	L
UE51401518	1.5	4	2.3	18	50
UE51401520	1.5	4	2.3	20	50
UE51401522	1.5	4	2.3	22	60
UE51401526	1.5	4	2.3	26	60
UE51401530	1.5	4	2.3	30	70
UE51402006	2	4	3	6	50
UE51402008	2	4	3	8	50
UE51402010	2	4	3	10	50
UE51402012	2	4	3	12	50
UE51402014	2	4	3	14	50
UE51402016	2	4	3	16	50
UE51402018	2	4	3	18	50
UE51402020	2	4	3	20	50
UE51402022	2	4	3	22	60
UE51402026	2	4	3	26	60
UE51402030	2	4	3	30	70
UE51402035	2	4	3	35	70
UE51402040	2	4	3	40	80
UE51402045	2	4	3	45	90
UE51402050	2	4	3	50	100
UE51402060	2	4	3	60	110
UE51402508	2.5	4	4	8	50
UE51402510	2.5	4	4	10	50
UE51402512	2.5	4	4	12	50
UE51402514	2.5	4	4	14	50
UE51402516	2.5	4	4	16	50
UE51402518	2.5	4	4	18	50
UE51402520	2.5	4	4	20	50
UE51402522	2.5	4	4	22	60
UE51402526	2.5	4	4	26	60
UE51402530	2.5	4	4	30	70
UE51402535	2.5	4	4	35	70
UE51402540	2.5	4	4	40	80
UE51402545	2.5	4	4	45	90
UE51402550	2.5	4	4	50	100
UE51403006	3	6	4.5	6	50
UE51403008	3	6	4.5	8	50

UE514

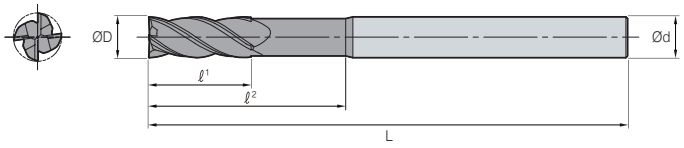
4날 롱 넥 플랫 엔드밀



CARBIDE | 4 | 35° HELIX | AlCrN | 절삭조건 p.430

• 공구직경공차

ØD		Ød
Ø1 ~ Ø12	0 ~ -0.03mm	h5



(mm)

형 번	ØD	Ød	ℓ1	ℓ2	L
UE51403010	3	6	4.5	10	50
UE51403012	3	6	4.5	12	50
UE51403014	3	6	4.5	14	60
UE51403016	3	6	4.5	16	60
UE51403018	3	6	4.5	18	60
UE51403020	3	6	4.5	20	60
UE51403022	3	6	4.5	22	65
UE51403026	3	6	4.5	26	65
UE51403030	3	6	4.5	30	70
UE51403035	3	6	4.5	35	70
UE51403040	3	6	4.5	40	80
UE51403045	3	6	4.5	45	90
UE51403050	3	6	4.5	50	100
UE51403060	3	6	4.5	60	100
UE51404008	4	6	4.5	8	50
UE51404010	4	6	4.5	10	50
UE51404012	4	6	4.5	12	50
UE51404014	4	6	4.5	14	60
UE51404016	4	6	4.5	16	60
UE51404018	4	6	4.5	18	60
UE51404020	4	6	4.5	20	60
UE51404022	4	6	4.5	22	65
UE51404026	4	6	4.5	26	65
UE51404030	4	6	4.5	30	70
UE51404035	4	6	4.5	35	70

형 번	ØD	Ød	ℓ1	ℓ2	L
UE51404040	4	6	4.5	40	80
UE51404045	4	6	4.5	45	90
UE51404050	4	6	4.5	50	100
UE51404060	4	6	4.5	60	100
UE51405016	5	6	8	16	60
UE51405020	5	6	8	20	60
UE51405026	5	6	8	26	65
UE51405030	5	6	8	30	70
UE51405035	5	6	8	35	75
UE51405040	5	6	8	40	80
UE51405050	5	6	8	50	90
UE51405060	5	6	8	60	100
UE51406015	6	6	9	15	60
UE51406020	6	6	9	20	60
UE51406030	6	6	9	30	70
UE51406032	6	6	9	32	90
UE51408025	8	8	12	25	70
UE51408030	8	8	12	30	80
UE51408042	8	8	12	42	100
UE51410030	10	10	15	30	75
UE51410035	10	10	15	35	80
UE51410045	10	10	15	45	100
UE51412035	12	12	20	35	80
UE51412040	12	12	20	40	90
UE51412050	12	12	20	50	110

• 적용 피삭재

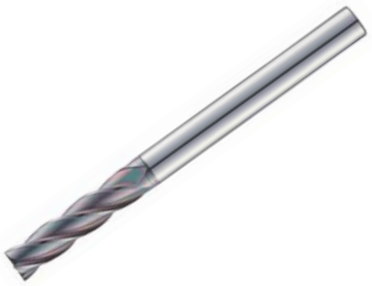
탄소강 ~ HB225	합금강 HB225~325	프리하든강 HRC30~50	열처리강		주철 ~FCD500	알루미늄	스테인리스강	Ti합금	Ni합금
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○		○				

◎: 매우적합 ○: 적합

U-Star Endmill

UE524

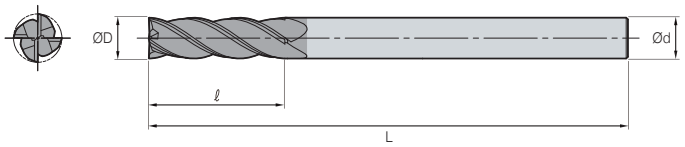
4날 플랫 엔드밀



CARBIDE | 4 | 35° HELIX | AlCrN | 절삭조건 p.430

• 공구직경공차

ØD		Ød
Ø1 ~ Ø25	0 ~ -0.03mm	h5



(mm)

형 번	ØD	Ød	ℓ	L
UE52401003	1	6	3	60
UE52401004	1	6	4	60
UE52401005	1	6	5	60
UE52401006	1	6	6	60
UE52401007	1	6	7	60
UE52401008	1	6	8	60
UE52401010	1	6	10	60
UE52401012	1	6	12	60
UE52401204	1.2	6	4	60
UE52401206	1.2	6	6	60
UE52401208	1.2	6	8	60
UE52401210	1.2	6	10	60
UE52401212	1.2	6	12	60
UE52401506	1.5	6	6	60
UE52401508	1.5	6	8	60
UE52401510	1.5	6	10	60
UE52401512	1.5	6	12	60
UE52401514	1.5	6	14	60
UE52401516	1.5	6	16	60
UE52401520	1.5	6	20	60
UE52401526	1.5	6	26	60
UE52402008	2	6	8	60
UE52402008S4	2	4	8	40
UE52402010	2	6	10	60
UE52402012	2	6	12	60
UE52402014	2	6	14	60
UE52402016	2	6	16	60
UE52402510	2.5	6	10	60
UE52402512	2.5	6	12	60
UE52402516	2.5	6	16	60
UE52402520	2.5	6	20	60
UE52402526	2.5	6	26	60
UE52403010	3	6	10	70
UE52403012	3	6	12	70
UE52403014	3	6	14	70
UE52403016	3	6	16	70
UE52403016S3	3	3	16	100
UE52403020	3	6	20	70
UE52403026	3	6	26	70
UE52403030	3	6	30	70
UE52403035	3	6	35	90

형 번	ØD	Ød	ℓ	L
UE52404012	4	6	12	70
UE52404016	4	6	16	70
UE52404020	4	6	20	70
UE52404020S4	4	4	20	100
UE52404026	4	6	26	70
UE52404030	4	6	30	70
UE52405015	5	6	15	70
UE52405020	5	6	20	70
UE52405025100	5	6	25	100
UE52405025	5	6	25	70
UE52405030	5	6	30	80
UE52405035	5	6	35	90
UE52405040	5	6	40	100
UE52406015080	6	6	15	80
UE52406015	6	6	15	60
UE52406020090	6	6	20	90
UE52406020	6	6	20	70
UE52406025	6	6	25	75
UE52406030150	6	6	30	150
UE52406030100	6	6	30	100
UE52406030	6	6	30	80
UE52406030100	6	6	30	100
UE52406030	6	6	30	80
UE52406035	6	6	35	90
UE52406040120	6	6	40	120
UE52406040	6	6	40	90
UE52406045	6	6	45	150
UE52407035	7	8	35	85
UE52408020	8	8	20	100
UE52408025	8	8	25	80
UE52408030100	8	8	30	100
UE52408030	8	8	30	80
UE52408035	8	8	35	90
UE52408040150	8	8	40	150
UE52408040120	8	8	40	120
UE52408040	8	8	40	90
UE52408045	8	8	45	100
UE52408050150	8	8	50	150
UE52408050	8	8	50	100
UE52408060	8	8	60	155
UE52408080	8	8	80	200

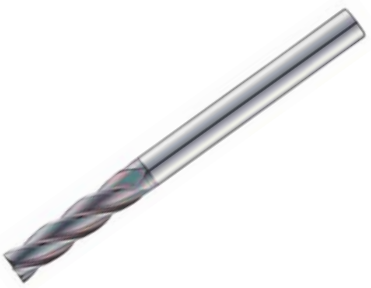
UE524

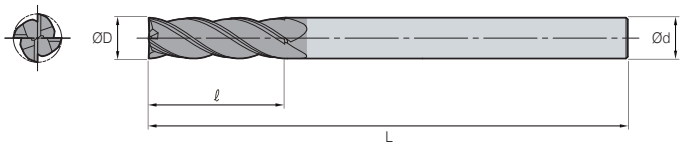
4날 플랫 엔드밀

CARBIDE | 4 | 35° HELIX | AlCrN | 절삭조건 p.430

• 공구직경공차

ØD		Ød
Ø1 ~ Ø25	0 ~ -0.03mm	h5





(mm)

형 번	ØD	Ød	ℓ	L
UE52409045	9	10	45	100
UE52410025	10	10	25	100
UE524100100	10	10	30	100
UE52410030	10	10	30	80
UE52410035	10	10	35	90
UE52410040120	10	10	40	120
UE52410040	10	10	40	90
UE52410045	10	10	45	100
UE52410050200	10	10	50	200
UE52410050150	10	10	50	150
UE52410050	10	10	50	100
UE52410055	10	10	55	150
UE52410060200	10	10	60	200
UE52410060155	10	10	60	155
UE52410060	10	10	60	110
UE52410080200	10	10	80	200
UE52411050	11	12	50	110
UE52412030	12	12	30	110
UE52412035	12	12	35	90
UE52412040120	12	12	40	120
UE52412040	12	12	40	100
UE52412045	12	12	45	130
UE52412050150	12	12	50	150
UE52412050	12	12	50	100
UE52412055	12	12	55	110
UE52412060200	12	12	60	200
UE52412060150	12	12	60	150
UE52412060	12	12	60	110
UE52412065	12	12	65	150
UE52412070200	12	12	70	200
UE52412070	12	12	70	120
UE52412080	12	12	80	200
UE52414040	14	16	40	110
UE52414050	14	16	50	110
UE52414060	14	16	60	150

형 번	ØD	Ød	ℓ	L
UE52416040	16	16	40	150
UE52416050150	16	16	50	150
UE52416050	16	16	50	110
UE52416060	16	16	60	120
UE52416070200	16	16	70	200
UE52416070150	16	16	70	150
UE52416070	16	16	70	130
UE52416080	16	16	80	150
UE52416090	16	16	90	150
UE524160100	16	16	100	200
UE524160110	16	16	110	200
UE524160120	16	16	120	250
UE52418050	18	20	50	120
UE52418070	18	20	70	130
UE524180100	18	20	100	200
UE52420050150	20	20	50	150
UE52420050	20	20	50	110
UE52420060	20	20	60	130
UE52420070	20	20	70	130
UE52420080	20	20	80	150
UE52420090200	20	20	90	200
UE52420090	20	20	90	150
UE524200100	20	20	100	200
UE524200110	20	20	110	200
UE524200120	20	20	120	250
UE524200130	20	20	130	250
UE52422075	22	20	75	150
UE524220110	22	20	110	200
UE52425070	25	25	70	150
UE52425090	25	25	90	150
UE524250100	25	25	100	200
UE524250110	25	25	110	200
UE524250120	25	25	120	250
UE524250150	25	25	150	250

• 적용 피삭재

탄소강 ~ HB225	합금강 HB225~325	프리하든강 HRC30~50	열처리강		주철 ~FCD500	알루미늄	스테인리스강	Ti합금	Ni합금
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○		○				

◎: 매우적합 ○: 적합

U-Star Endmill

ULE504

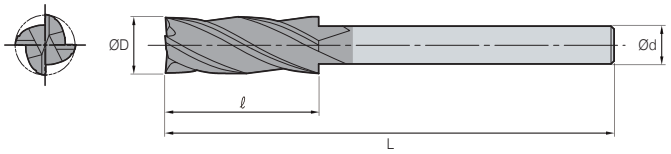
4날 자동 선반용 플랫 엔드밀

CARBIDE | 4 | 30° HELIX | AlCrN | 절삭조건 p.431

• 공구직경공차

ØD		Ød
Ø3 ~ Ø16	0 ~ -0.02mm	h5





(mm)

형 번	ØD	Ød	ℓ	L
ULE504030S04	3	4	3	35
ULE504040S04	4	4	4	35
ULE504060S06	6	6	6	35
ULE504070S07	7	7	20	45
ULE504080S08	8	8	8	45
ULE504080S06	8	6	8	35
ULE504080S07	8	7	15	45
ULE504090S07	9	7	15	45
ULE504100S06	10	6	10	35
ULE504100S10	10	10	15	45
ULE504100S07	10	7	15	45
ULE504110S07	11	7	15	45
ULE504120S10	12	10	12	45
ULE504120S06	12	6	12	35
ULE504120S07	12	7	15	45
ULE504120-25S10	12	10	25	55
ULE504130S10	13	10	25	55
ULE504140S10	14	10	25	55
ULE504140S07	14	7	25	55
ULE504160S10	16	10	25	60

• 적용 피삭재

탄소강 ~ HB225	합금강 HB225~325	프리하든강 HRC30~50	열처리강		주철 ~FCD500	알루미늄	스테인리스강	Ti합금	Ni합금
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○		○				

◎: 매우적합 ○: 적합

UE504

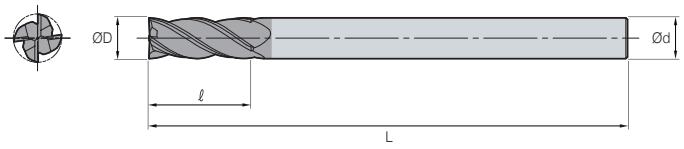
4날 플랫 엔드밀

CARBIDE | 4 | 34° HELIX | 36° HELIX | AlCrN | 절삭조건 p.431

• 공구직경공차

ØD		Ød
Ø0.8 ~ Ø25	0 ~ -0.03mm	h5





(mm)

형 번	ØD	Ød	ℓ	L
UE504008	0.8	4	1.6	40
UE504009	0.9	4	1.8	40
UE504010	1	6	2.5	50
UE504012	1.2	6	3	50
UE504015	1.5	6	4	50
UE504020	2	6	6	50
UE504025	2.5	6	7	50
UE504030	3	6	8	50
UE504035	3.5	6	10	50
UE504040	4	6	10	50
UE504045	4.5	6	14	50
UE504050	5	6	15	60
UE504055	5.5	6	15	60
UE504060	6	6	15	60
UE504065	6.5	8	18	60
UE504070	7	8	20	60
UE504075	7.5	8	20	60
UE504080	8	8	20	70
UE504085	8.5	10	22	70
UE504090	9	10	22	70
UE504095	9.5	10	24	70
UE504100	10	10	25	75

형 번	ØD	Ød	ℓ	L
UE504105	10.5	12	26	75
UE504110	11	12	30	75
UE504115	11.5	12	30	80
UE504120	12	12	30	80
UE504125	12.5	12	30	80
UE504130	13	12	35	100
UE504140	14	16	35	100
UE504140S14	14	14	35	100
UE504140S12	14	12	35	100
UE504150	15	16	38	100
UE504160	16	16	40	100
UE504170	17	16	42	100
UE504180	18	18	45	100
UE504180S16	18	16	45	100
UE504190	19	20	45	100
UE504200	20	20	45	100
UE504210	21	20	45	100
UE504220	22	20	45	100
UE504230	23	25	50	120
UE504240	24	25	50	120
UE504250	25	25	50	120

• 적용 피삭재

탄소강 ~ HB225	합금강 HB225~325	프리하든강 HRC30~50	열처리강		주철 ~FCD500	알루미늄	스테인리스강	Ti합금	Ni합금
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○		○				

◎: 매우적합 ○: 적합

U-Star Endmill

UXE504

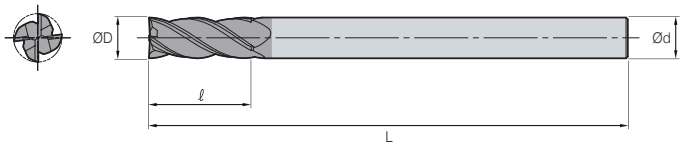
4날 강력 절삭용 플랫 엔드밀



CARBIDE | 4 | 34° HELIX | 36° HELIX | AlCrN | 절삭조건 p.431

• 공구직경공차

ØD		Ød
Ø1 ~ Ø25	0 ~ -0.03mm	h5



(mm)

형 번	ØD	Ød	ℓ	L
UXE50401001	1	6	1	40
UXE50401002	1	6	2	40
UXE504010	1	6	2.5	50
UXE50401003	1	6	3	50
UXE50401004	1	6	4	50
UXE50401006	1	6	6	50
UXE50401202	1.2	6	2	40
UXE504012	1.2	6	3	50
UXE50401204	1.2	6	4	50
UXE50401206	1.2	6	6	50
UXE504015015	1.5	6	1.5	40
UXE50401503	1.5	6	3	40
UXE504015	1.5	6	4	50
UXE50401506	1.5	6	6	50
UXE50401508	1.5	6	8	50
UXE50401510	1.5	6	10	50
UXE50402002	2	6	2	40
UXE50402004	2	6	4	40
UXE504020	2	6	6	50
UXE50402008	2	6	8	50
UXE50402010	2	6	10	50
UXE50402012	2	6	12	50
UXE504025025	2.5	6	2.5	40
UXE50402505	2.5	6	5	40
UXE504025	2.5	6	7	50
UXE50402510	2.5	6	10	50
UXE50402512	2.5	6	12	50
UXE50403003	3	6	3	40
UXE50403006	3	6	6	40
UXE504030	3	6	8	50
UXE50403010	3	6	10	50
UXE50403012	3	6	12	50
UXE50403014	3	6	14	50

형 번	ØD	Ød	ℓ	L
UXE50404004	4	6	4	40
UXE50404008	4	6	8	40
UXE504040	4	6	10	50
UXE50404012	4	6	12	50
UXE50404014	4	6	14	50
UXE50404016	4	6	16	50
UXE50405005	5	6	5	50
UXE50405010	5	6	10	50
UXE504050	5	6	15	60
UXE50405020	5	6	20	60
UXE50405025	5	6	25	60
UXE50406006	6	6	6	50
UXE50406012	6	6	12	50
UXE504060	6	6	15	60
UXE50406020	6	6	20	60
UXE50406025	6	6	25	60
UXE50408016	8	8	16	60
UXE504080	8	8	20	70
UXE50408025	8	8	25	70
UXE50408030	8	8	30	70
UXE50410022	10	10	22	65
UXE504100	10	10	25	75
UXE50410030	10	10	30	75
UXE50410035	10	10	35	75
UXE50412026	12	12	26	70
UXE504120	12	12	30	80
UXE50412035	12	12	35	80
UXE50412040	12	12	40	80
UXE504140	14	16	35	100
UXE50416032	16	16	32	100
UXE504160	16	16	40	100
UXE504180	18	20	45	100
UXE504200	20	20	45	100

• 적용 피삭재

탄소강 ~ HB225	합금강 HB225~325	프리하든강 HRC30~50	열처리강		주철 ~FCD500	알루미늄	스테인리스강	Ti합금	Ni합금
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○		○				

◎: 매우적합 ○: 적합

UE506

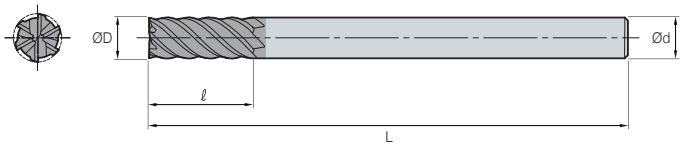
6날 플랫 엔드밀



CARBIDE | 6 | 45° HELIX | AlCrN | 절삭조건 p.432

• 공구직경공차

ØD		Ød
Ø6 ~ Ø25	0 ~ -0.03mm	h5



(mm)

형 번	ØD	Ød	ℓ	L
UE506060	6	6	15	60
UE50606020	6	6	20	70
UE50606030110	6	6	30	110
UE50606030	6	6	30	80
UE506070	7	8	18	60
UE506080	8	8	20	70
UE50608030	8	8	30	80
UE50608035	8	8	35	90
UE50608040130	8	8	40	130
UE50608040	8	8	40	90
UE506090	9	10	22	70
UE506100	10	10	25	75
UE50610030	10	10	30	80
UE50610040	10	10	40	90
UE50610050150	10	10	50	150
UE50610050	10	10	50	100
UE506110	11	12	26	75
UE506120	12	12	30	80
UE50612040	12	12	40	90
UE50612050	12	12	50	100

형 번	ØD	Ød	ℓ	L
UE50612060150	12	12	60	150
UE50612060	12	12	60	110
UE506130	13	14	32	85
UE506140	14	14	32	85
UE506160	16	16	40	100
UE50616050	16	16	50	110
UE50616060	16	16	60	120
UE50616090	16	16	90	150
UE506160110250	16	16	110	250
UE506160110	16	16	110	200
UE506180	18	18	44	100
UE506200	20	20	45	100
UE50620060	20	20	60	120
UE50620070	20	20	70	130
UE506200110300	20	20	110	300
UE506200110250	20	20	110	250
UE506200110	20	20	110	200
UE506250	25	25	50	120
UE506251	25	25	92	180

• 적용 피삭재

탄소강 ~ HB225	합금강 HB225~325	프리하든강 HRC30~50	열처리강		주철 ~FCD500	알루미늄	스테인리스강	Ti합금	Ni합금
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○		○				

◎: 매우적합 ○: 적합

U-Star Endmill

UTE502

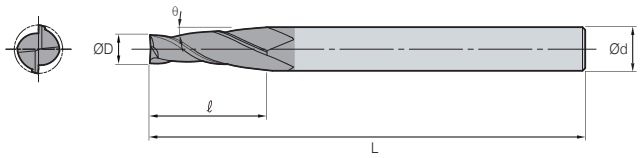
2날 테이퍼 플랫 엔드밀

CARBIDE | 2 | 30° HELIX | AlCrN | 절삭조건 p.433

• 공구직경공차

ØD		Ød
Ø1 ~ Ø12	0 ~ -0.03mm	h5





(mm)

형 번	ØD	Ød	ℓ	θ	L
UTE502003005	0.3	4	1.2	0.5	40
UTE50200301	0.3	4	1.2	1	40
UTE502003015	0.3	4	1.2	1.5	40
UTE50200302	0.3	4	1.2	2	40
UTE50200303	0.3	4	1.5	3	40
UTE50200305	0.3	4	1.5	5	40
UTE50200307	0.3	4	1.5	7	40
UTE50200310	0.3	4	1.5	10	40
UTE502004005	0.4	4	1.6	0.5	40
UTE50200401	0.4	4	1.6	1	40
UTE502004015	0.4	4	1.6	1.5	40
UTE50200402	0.4	4	1.6	2	40
UTE50200403	0.4	4	1.6	3	40
UTE50200405	0.4	4	2	5	40
UTE50200407	0.4	4	2	7	40
UTE50200410	0.4	4	2	10	40
UTE502005005	0.5	4	2	0.5	45
UTE50200501	0.5	4	2	1	45
UTE502005015	0.5	4	2	1.5	45
UTE50200502	0.5	4	2	2	45
UTE50200503	0.5	4	2	3	45
UTE50200505	0.5	4	2.5	5	45
UTE50200507	0.5	4	2.5	7	45
UTE50200510	0.5	4	2.5	10	45
UTE502006005	0.6	4	2.4	0.5	45
UTE50200601	0.6	4	2.4	1	45
UTE502006015	0.6	4	2.4	1.5	45
UTE50200602	0.6	4	2.4	2	45
UTE50200603	0.6	4	2.4	3	45
UTE50200605	0.6	4	3	5	45
UTE50200607	0.6	4	3	7	45
UTE50200610	0.6	4	3	10	45
UTE502007005	0.7	4	2.8	0.5	45
UTE50200701	0.7	4	2.8	1	45
UTE502007015	0.7	4	2.8	1.5	45
UTE50200702	0.7	4	2.8	2	45

형 번	ØD	Ød	ℓ	θ	L
UTE50200703	0.7	4	2.8	3	45
UTE50200705	0.7	4	3.5	5	45
UTE50200707	0.7	4	3.5	7	45
UTE50200710	0.7	4	3.5	10	45
UTE502008005	0.8	4	3.2	0.5	45
UTE50200801	0.8	4	3.2	1	45
UTE502008015	0.8	4	3.2	1.5	45
UTE50200802	0.8	4	3.2	2	45
UTE50200803	0.8	4	3.2	3	45
UTE50200805	0.8	4	4	5	45
UTE50200807	0.8	4	4	7	45
UTE50200810	0.8	4	4	10	45
UTE502010005	1	4	4	0.5	50
UTE50201001	1	4	4	1	50
UTE502010015	1	4	4	1.5	50
UTE50201002	1	4	6	2	50
UTE50201003	1	4	6	3	50
UTE50201005	1	4	8	5	50
UTE50201007	1	4	8	7	50
UTE50201010	1	4	8	10	50
UTE502015005	1.5	4	6	0.5	50
UTE50201501	1.5	4	6	1	50
UTE502015015	1.5	4	6	1.5	50
UTE50201502	1.5	4	8	2	50
UTE50201503	1.5	4	8	3	50
UTE50201505	1.5	4	10	5	50
UTE50201507	1.5	4	10	7	50
UTE50201510	1.5	6	10	10	50
UTE502020005	2	4	8	0.5	50
UTE50202001	2	4	8	1	50
UTE502020015	2	4	8	1.5	50
UTE50202002	2	4	10	2	50
UTE50202003	2	4	10	3	50
UTE50202005	2	6	12	5	50
UTE50202007	2	6	12	7	50
UTE50202010	2	8	12	10	50

UTE502

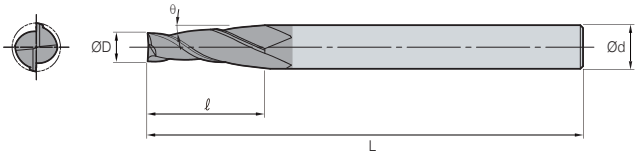
2날 테이퍼 플랫 엔드밀

CARBIDE | 2 | 30° HELIX | AlCrN | 절삭조건 p.433

• 공구직경공차

ØD		Ød
Ø1 ~ Ø12	0 ~ -0.03mm	h5





(mm)

형 번	ØD	Ød	ℓ	θ	L
UTE502025005	2.5	6	10	0.5	50
UTE50202501	2.5	6	10	1	50
UTE502025015	2.5	6	10	1.5	50
UTE50202502	2.5	6	12	2	50
UTE50202503	2.5	6	12	3	50
UTE50202505	2.5	6	14	5	50
UTE50202507	2.5	6	14	7	50
UTE50202510	2.5	8	14	10	50
UTE502030005	3	6	12	0.5	50
UTE50203001	3	6	12	1	50
UTE502030015	3	6	12	1.5	50
UTE50203002	3	6	14	2	50
UTE50203003	3	6	14	3	50
UTE50203005	3	6	16	5	50
UTE50203007	3	8	16	7	50
UTE50203010	3	10	16	10	50
UTE502040005	4	6	16	0.5	60
UTE50204001	4	6	16	1	60
UTE502040015	4	6	16	1.5	60
UTE50204002	4	6	16	2	60
UTE50204003	4	6	19	3	60
UTE50204005	4	8	22	5	65
UTE50204007	4	8	16	7	65
UTE50204010	4	10	17	10	65
UTE502060005	6	8	20	0.5	65
UTE50206001	6	8	20	1	65
UTE502060015	6	8	20	1.5	65
UTE50206002	6	8	20	2	65

형 번	ØD	Ød	ℓ	θ	L
UTE50206003	6	8	19	3	65
UTE50206005	6	10	22	5	75
UTE50206007	6	12	24	7	75
UTE50206010	6	12	17	10	75
UTE502070005	7	8	28	0.5	70
UTE50207001	7	8	28	1	70
UTE502070015	7	10	28	1.5	70
UTE50207002	7	10	28	2	80
UTE50207003	7	10	28	3	80
UTE50207005	7	12	28	5	80
UTE502080005	8	10	35	0.5	90
UTE50208001	8	10	35	1	90
UTE502080015	8	10	35	1.5	90
UTE50208002	8	10	28	2	90
UTE50208003	8	12	38	3	90
UTE50208005	8	16	45	5	100
UTE50208007	8	16	32	7	90
UTE50208010	8	20	34	10	100
UTE50208010S25	8	25	48	10	150
UTE502100005	10	12	40	0.5	90
UTE50210001	10	12	40	1	90
UTE502100015	10	12	38	1.5	90
UTE50210002	10	16	40	2	75
UTE50210003	10	16	40	3	100
UTE50210005	10	16	34	5	100
UTE50210007	10	20	40	7	90
UTE50210010	10	25	42	10	100

• 적용 피삭재

탄소강 ~ HB225	합금강 HB225~325	프리하든강 HRC30~50	열처리강		주철 ~FCD500	알루미늄	스테인리스강	Ti합금	Ni합금
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○		○				

◎: 매우적합 ○: 적합

U-Star Endmill

UTE504

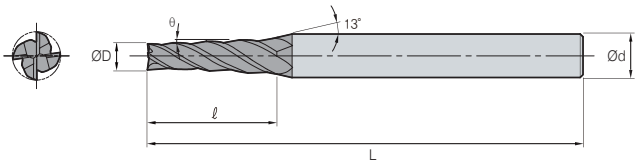
4날 테이퍼 플랫 엔드밀



CARBIDE | 4 | 30° HELIX | AlCrN | 절삭조건 p.433

• 공구직경공차

ØD		Ød
Ø0.8 ~ Ø12	0 ~ -0.08mm	h5



(mm)

형 번	ØD	Ød	ℓ	θ	L
UTE50400800504	0.8	4	4	0.5	45
UTE50400800506	0.8	4	6	0.5	45
UTE50400800508	0.8	4	8	0.5	45
UTE50400800510	0.8	4	10	0.5	45
UTE50400800512	0.8	4	12	0.5	45
UTE50400801004	0.8	4	4	1	45
UTE50400801006	0.8	4	6	1	45
UTE50400801008	0.8	4	8	1	45
UTE50400801010	0.8	4	10	1	45
UTE50400801012	0.8	4	12	1	45
UTE50400801504	0.8	4	4	1.5	45
UTE50400801506	0.8	4	6	1.5	45
UTE50400801508	0.8	4	8	1.5	45
UTE50400801510	0.8	4	10	1.5	45
UTE50400801512	0.8	4	12	1.5	45
UTE50400802004	0.8	4	4	2	45
UTE50400802006	0.8	4	6	2	45
UTE50400802008	0.8	4	8	2	45
UTE50400802010	0.8	4	10	2	45
UTE50400802012	0.8	4	12	2	45
UTE50401000504	1	4	4	0.5	50
UTE50401000506	1	4	6	0.5	50
UTE50401000508	1	4	8	0.5	50
UTE50401000510	1	4	10	0.5	50
UTE50401000512	1	4	12	0.5	50
UTE50401000516	1	4	16	0.5	50
UTE50401001004	1	4	4	1	50
UTE50401001006	1	4	6	1	50
UTE50401001008	1	4	8	1	50
UTE50401001010	1	4	10	1	50
UTE50401001012	1	4	12	1	50
UTE50401001016	1	4	16	1	50
UTE50401001504	1	4	4	1.5	50
UTE50401001506	1	4	6	1.5	50
UTE50401001508	1	4	8	1.5	50
UTE50401001510	1	4	10	1.5	50
UTE50401001512	1	4	12	1.5	50

형 번	ØD	Ød	ℓ	θ	L
UTE50401001516	1	4	16	1.5	50
UTE50401002004	1	4	4	2	50
UTE50401002006	1	4	6	2	50
UTE50401002008	1	4	8	2	50
UTE50401002010	1	4	10	2	50
UTE50401002012	1	4	12	2	50
UTE50401002016	1	4	16	2	50
UTE50401003004	1	4	4	3	50
UTE50401003006	1	4	6	3	50
UTE50401003008	1	4	8	3	50
UTE50401003010	1	4	10	3	50
UTE50401003012	1	4	12	3	50
UTE50401003016	1	4	16	3	50
UTE50401200506	1.2	4	6	0.5	50
UTE50401200508	1.2	4	8	0.5	50
UTE50401200510	1.2	4	10	0.5	50
UTE50401200512	1.2	4	12	0.5	50
UTE50401200516	1.2	4	16	0.5	50
UTE50401201006	1.2	4	6	1	50
UTE50401201008	1.2	4	8	1	50
UTE50401201010	1.2	4	10	1	50
UTE50401201012	1.2	4	12	1	50
UTE50401201016	1.2	4	16	1	50
UTE50401201506	1.2	4	6	1.5	50
UTE50401201508	1.2	4	8	1.5	50
UTE50401201510	1.2	4	10	1.5	50
UTE50401201512	1.2	4	12	1.5	50
UTE50401201516	1.2	4	16	1.5	50
UTE50401202006	1.2	4	6	2	50
UTE50401202008	1.2	4	8	2	50
UTE50401202010	1.2	4	10	2	50
UTE50401202012	1.2	4	12	2	50
UTE50401202016	1.2	4	16	2	50
UTE50401203006	1.2	4	6	3	50
UTE50401203008	1.2	4	8	3	50
UTE50401203010	1.2	4	10	3	50
UTE50401203012	1.2	4	12	3	50

UTE504

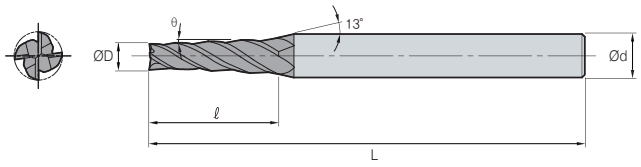
4날 테이퍼 플랫 엔드밀



CARBIDE | 4 | 30° HELIX | AlCrN | 절삭조건 p.433

• 공구직경공차

ØD		Ød
Ø0.8 ~ Ø12	0 ~ -0.08mm	h5



(mm)

형 번	ØD	Ød	ℓ	θ	L
UTE50401203016	1.2	4	16	3	50
UTE50401500506	1.5	4	6	0.5	50
UTE50401500508	1.5	4	8	0.5	50
UTE50401500510	1.5	4	10	0.5	50
UTE50401500512	1.5	4	12	0.5	50
UTE50401500516	1.5	4	16	0.5	50
UTE50401500520	1.5	4	20	0.5	60
UTE50401501006	1.5	4	6	1	50
UTE50401501008	1.5	4	8	1	50
UTE50401501010	1.5	4	10	1	50
UTE50401501012	1.5	4	12	1	50
UTE50401501016	1.5	4	16	1	50
UTE50401501020	1.5	4	20	1	60
UTE50401501506	1.5	4	6	1.5	50
UTE50401501508	1.5	4	8	1.5	50
UTE50401501510	1.5	4	10	1.5	50
UTE50401501512	1.5	4	12	1.5	50
UTE50401501516	1.5	4	16	1.5	50
UTE50401501520	1.5	4	20	1.5	60
UTE50401502006	1.5	4	6	2	50
UTE50401502008	1.5	4	8	2	50
UTE50401502010	1.5	4	10	2	50
UTE50401502012	1.5	4	12	2	50
UTE50401502016	1.5	4	16	2	50
UTE50401502020	1.5	4	20	2	60
UTE50401503006	1.5	4	6	3	50
UTE50401503008	1.5	4	8	3	50
UTE50401503010	1.5	4	10	3	50
UTE50401503012	1.5	4	12	3	50
UTE50401503016	1.5	4	16	3	50
UTE50401503020	1.5	4	20	3	60
UTE50402000508	2	4	8	0.5	50
UTE50402000510	2	4	10	0.5	50
UTE50402000512	2	4	12	0.5	50
UTE50402000516	2	4	16	0.5	50
UTE50402000520	2	4	20	0.5	60
UTE50402000525	2	4	25	0.5	60

형 번	ØD	Ød	ℓ	θ	L
UTE50402001008	2	4	8	1	50
UTE50402001010	2	4	10	1	50
UTE50402001012	2	4	12	1	50
UTE50402001016	2	4	16	1	50
UTE50402001020	2	4	20	1	60
UTE50402001025	2	4	25	1	60
UTE50402001508	2	4	8	1.5	50
UTE50402001510	2	4	10	1.5	50
UTE50402001512	2	4	12	1.5	50
UTE50402001516	2	4	16	1.5	50
UTE50402001520	2	4	20	1.5	60
UTE50402001525	2	4	25	1.5	60
UTE50402002008	2	4	8	2	50
UTE50402002010	2	4	10	2	50
UTE50402002012	2	4	12	2	50
UTE50402002016	2	4	16	2	50
UTE50402002020	2	4	20	2	60
UTE50402002025	2	4	25	2	60
UTE50402003008	2	4	8	3	50
UTE50402003010	2	4	10	3	50
UTE50402003012	2	4	12	3	50
UTE50402003016	2	4	16	3	50
UTE50402003020	2	6	20	3	60
UTE50402003025	2	6	25	3	60
UTE50402500510	2.5	4	10	0.5	50
UTE50402500512	2.5	4	12	0.5	50
UTE50402500516	2.5	4	16	0.5	50
UTE50402500520	2.5	4	20	0.5	60
UTE50402500525	2.5	4	25	0.5	60
UTE50402500530	2.5	4	30	0.5	60
UTE50402501010	2.5	4	10	1	50
UTE50402501012	2.5	4	12	1	50
UTE50402501016	2.5	4	16	1	50
UTE50402501020	2.5	4	20	1	60
UTE50402501025	2.5	4	25	1	60
UTE50402501030	2.5	4	30	1	60
UTE50402501510	2.5	4	10	1.5	50

U-Star Endmill

UTE504

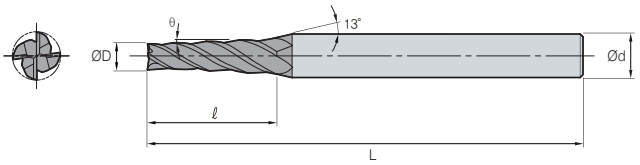
4날 테이퍼 플랫 엔드밀



CARBIDE | 4 | 30° HELIX | AlCrN | 절삭조건 p.433

• 공구직경공차

ØD		Ød
Ø0.8 ~ Ø12	0 ~ -0.08mm	h5



(mm)

형 번	ØD	Ød	ℓ	θ	L
UTE50402501512	2.5	4	12	1.5	50
UTE50402501516	2.5	4	16	1.5	50
UTE50402501520	2.5	4	20	1.5	60
UTE50402501525	2.5	4	25	1.5	60
UTE50402501530	2.5	6	30	1.5	60
UTE50402502010	2.5	4	10	2	50
UTE50402502012	2.5	4	12	2	50
UTE50402502016	2.5	4	16	2	50
UTE50402502020	2.5	4	20	2	60
UTE50402502025	2.5	6	25	2	60
UTE50402502030	2.5	6	30	2	60
UTE50402503010	2.5	4	10	3	50
UTE50402503012	2.5	4	12	3	50
UTE50402503016	2.5	6	16	3	50
UTE50402503020	2.5	6	20	3	60
UTE50402503025	2.5	6	25	3	60
UTE50402503030	2.5	6	30	3	60
UTE504030005	3	6	12	0.5	50
UTE50403001	3	6	12	1	50
UTE504030015	3	6	12	1.5	50
UTE50403002	3	6	14	2	50
UTE50403003	3	6	14	3	50
UTE50403005	3	6	16	5	50
UTE50403007	3	8	16	7	50
UTE50403010	3	10	16	10	50
UTE504040005	4	6	16	0.5	60
UTE50404001	4	6	16	1	60
UTE504040015	4	6	16	1.5	60
UTE50404002	4	6	16	2	60
UTE50404003	4	6	19	3	60
UTE50404005	4	8	22	5	65
UTE50404007	4	8	16	7	65

형 번	ØD	Ød	ℓ	θ	L
UTE50404010	4	10	17	10	65
UTE504060005	6	8	20	0.5	65
UTE50406001	6	8	20	1	65
UTE504060015	6	8	20	1.5	65
UTE50406002	6	8	20	2	65
UTE50406003	6	8	19	3	65
UTE50406005	6	10	22	5	75
UTE50406007	6	12	24	7	75
UTE50406010	6	12	17	10	75
UTE504070005	7	8	28	0.5	70
UTE50407001	7	8	28	1	70
UTE504070015	7	10	28	1.5	70
UTE50407002	7	10	28	2	80
UTE50407003	7	10	28	3	80
UTE50407005	7	12	28	5	80
UTE504080005	8	10	35	0.5	90
UTE50408001	8	10	35	1	90
UTE504080015	8	10	35	1.5	90
UTE50408002	8	10	28	2	90
UTE50408003	8	12	38	3	90
UTE50408005	8	16	45	5	100
UTE50408007	8	16	32	7	90
UTE50408010	8	20	34	10	100
UTE504100005	10	12	40	0.5	90
UTE50410001	10	12	40	1	90
UTE504100015	10	12	38	1.5	90
UTE50410002	10	16	40	2	90
UTE50410003	10	16	40	3	100
UTE50410005	10	16	34	5	100
UTE50410007	10	20	40	7	90
UTE50410010	10	25	42	10	100

• 적용 피삭재

탄소강 ~ HB225	합금강 HB225~325	프리하든강 HRC30~50	열처리강		주철 ~FCD500	알루미늄	스테인리스강	Ti합금	Ni합금
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○		○				

◎: 매우적합 ○: 적합

UR502

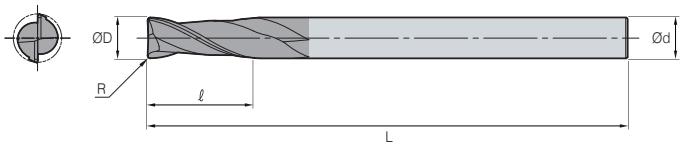
2날 레디우스 엔드밀



CARBIDE | 2 | 30° HELIX | R ±0.01 | R ±0.01 코너 R | AlCrN | 절삭조건 p.434

• 공구직경공차

ØD		Ød
Ø0.2 ~ Ø6	0 ~ -0.012mm	h5
Ø7 ~ Ø20	0 ~ -0.015mm	



(mm)

형 번	R	ØD	Ød	ℓ	L
UR502002002	0.02	0.2	4	0.4	40
UR502002005	0.05	0.2	4	0.4	40
UR502003002	0.02	0.3	4	0.6	40
UR502003005	0.05	0.3	4	0.6	40
UR502004005	0.05	0.4	4	0.8	40
UR50200401	0.1	0.4	4	0.8	40
UR502005005	0.05	0.5	4	1	40
UR50200501	0.1	0.5	4	1	40
UR502006005	0.05	0.6	4	1.2	40
UR50200601	0.1	0.6	4	1.2	40
UR50200602	0.2	0.6	4	1.2	40
UR502007005	0.05	0.7	4	1.4	40
UR50200701	0.1	0.7	4	1.4	40
UR50200702	0.2	0.7	4	1.4	40
UR502008005	0.05	0.8	4	1.6	40
UR50200801	0.1	0.8	4	1.6	40
UR50200802	0.2	0.8	4	1.6	40
UR502009005	0.05	0.9	4	1.8	40
UR50200901	0.1	0.9	4	1.8	40
UR502010005	0.05	1	6	2.5	50
UR50201001	0.1	1	6	2.5	50
UR50201002	0.2	1	6	2.5	50
UR50201003	0.3	1	6	2.5	50
UR502012005	0.05	1.2	6	3	50
UR50201201	0.1	1.2	6	3	50
UR50201202	0.2	1.2	6	3	50
UR50201203	0.3	1.2	6	3	50
UR502015005	0.05	1.5	6	4	50
UR50201501	0.1	1.5	6	4	50
UR50201502	0.2	1.5	6	4	50
UR50201503	0.3	1.5	6	4	50
UR50201505	0.5	1.5	6	4	50
UR50202001	0.1	2	6	6	50
UR50202002	0.2	2	6	6	50
UR50202003	0.3	2	6	6	50
UR50202005	0.5	2	6	6	50
UR50202501	0.1	2.5	6	7	60
UR50202502	0.2	2.5	6	7	60
UR50202503	0.3	2.5	6	7	60

형 번	R	ØD	Ød	ℓ	L
UR50202505	0.5	2.5	6	7	60
UR50203001	0.1	3	6	8	60
UR50203002	0.2	3	6	8	60
UR50203003	0.3	3	6	8	60
UR50203005	0.5	3	6	8	60
UR50203010	1	3	6	8	60
UR50203501	0.1	3.5	6	10	70
UR50203502	0.2	3.5	6	10	70
UR50203503	0.3	3.5	6	10	70
UR50203505	0.5	3.5	6	10	70
UR50204001	0.1	4	6	10	70
UR50204001100S4	0.1	4	4	10	100
UR50204001S4	0.1	4	4	10	70
UR50204002	0.2	4	6	10	70
UR50204002100S4	0.2	4	4	10	100
UR50204002S4	0.2	4	4	10	70
UR50204003	0.3	4	6	10	70
UR50204003100S4	0.3	4	4	10	100
UR50204003S4	0.3	4	4	10	70
UR50204005	0.5	4	6	10	70
UR50204005100S4	0.5	4	4	10	100
UR50204005S4	0.5	4	4	10	70
UR50204010	1	4	6	10	70
UR50204010100S4	1	4	4	10	100
UR50204010S4	1	4	4	10	70
UR50204501	0.1	4.5	6	11	80
UR50204502	0.2	4.5	6	11	80
UR50204503	0.3	4.5	6	11	80
UR50204505	0.5	4.5	6	11	80
UR50205001	0.1	5	6	13	90
UR50205002	0.2	5	6	13	90
UR50205003	0.3	5	6	13	90
UR50205005	0.5	5	6	13	90
UR50205010	1	5	6	13	90
UR50205501	0.1	5.5	6	13	90
UR50205502	0.2	5.5	6	13	90
UR50205503	0.3	5.5	6	13	90
UR50205505	0.5	5.5	6	13	90
UR50205510	1	5.5	6	13	90

U-Star Endmill

UR502

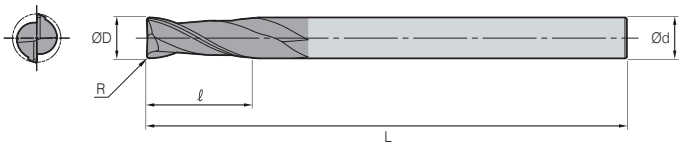
2날 레디우스 엔드밀

CARBIDE | 2 | 30° HELIX | R ±0.01 | R ±0.01 코너 R | AlCrN | 절삭조건 p.434

• 공구직경공차

ØD		Ød
Ø0.2 ~ Ø6	0 ~ -0.012mm	h5
Ø7 ~ Ø20	0 ~ -0.015mm	





(mm)

형 번	R	ØD	Ød	ℓ	L
UR50206001	0.1	6	6	15	90
UR50206002	0.2	6	6	15	90
UR50206003	0.3	6	6	15	90
UR5020600360	0.3	6	6	15	60
UR50206005	0.5	6	6	15	90
UR50206005110	0.5	6	6	15	110
UR50206005130	0.5	6	6	15	130
UR5020600560	0.5	6	6	15	60
UR50206010	1	6	6	15	90
UR50206010110	1	6	6	15	110
UR50206010130	1	6	6	15	130
UR5020601060	1	6	6	15	60
UR50206015	1.5	6	6	15	90
UR50206020	2	6	6	15	90
UR50207001	0.1	7	8	16	90
UR50207002	0.2	7	8	16	90
UR50207003	0.3	7	8	16	90
UR50207005	0.5	7	8	16	90
UR50207010	1	7	8	16	90
UR50207020	2	7	8	16	90
UR50208001	0.1	8	8	20	100
UR50208002	0.2	8	8	20	100
UR50208003	0.3	8	8	20	100
UR5020800370	0.3	8	8	20	70
UR50208005	0.5	8	8	20	100
UR50208005120	0.5	8	8	20	120
UR50208005150	0.5	8	8	20	150
UR5020800570	0.5	8	8	20	70
UR50208010	1	8	8	20	100
UR50208010120	1	8	8	20	120
UR50208010150	1	8	8	20	150
UR5020801070	1	8	8	20	70
UR50208015	1.5	8	8	20	100
UR50208020	2	8	8	20	100
UR50208025	2.5	8	8	20	100
UR50208030	3	8	8	20	100
UR50210001	0.1	10	10	25	100
UR50210002	0.2	10	10	25	100
UR50210003	0.3	10	10	25	100

형 번	R	ØD	Ød	ℓ	L
UR5021000375	0.3	10	10	25	75
UR50210005	0.5	10	10	25	100
UR50210005130	0.5	10	10	25	130
UR50210005150	0.5	10	10	25	150
UR5021000575	0.5	10	10	25	75
UR50210010	1	10	10	25	100
UR50210010130	1	10	10	25	130
UR50210010150	1	10	10	25	150
UR5021001075	1	10	10	25	75
UR50210015	1.5	10	10	25	100
UR50210020	2	10	10	25	100
UR50210025	2.5	10	10	25	100
UR50210030	3	10	10	25	100
UR50210040	4	10	10	25	100
UR50211002	0.2	11	12	25	110
UR50211003	0.3	11	12	25	110
UR50211005	0.5	11	12	25	110
UR50211010	1	11	12	25	110
UR50211020	2	11	12	25	110
UR50212001	0.1	12	12	30	110
UR50212002	0.2	12	12	30	110
UR50212003	0.3	12	12	30	110
UR5021200380	0.3	12	12	30	80
UR50212005	0.5	12	12	30	110
UR50212005130	0.5	12	12	30	130
UR50212005150	0.5	12	12	30	150
UR5021200580	0.5	12	12	30	80
UR50212010	1	12	12	30	110
UR50212010130	1	12	12	30	130
UR50212010150	1	12	12	30	150
UR5021201080	1	12	12	30	80
UR50212015	1.5	12	12	30	110
UR50212020	2	12	12	30	110
UR50212025	2.5	12	12	30	110
UR50212030	3	12	12	30	110
UR50212040	4	12	12	30	110
UR50212050	5	12	12	30	110
UR50214005	0.5	14	16	30	150
UR50214010	1	14	16	30	150

UR502

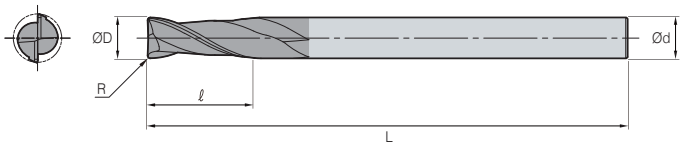
2날 레디우스 엔드밀



CARBIDE | 2 | 30° HELIX | R ±0.01 | R ±0.01 (코너 R) | AlCrN | 절삭조건 (p.434)

• 공구직경공차

ØD		Ød
Ø0.2 ~ Ø6	0 ~ -0.012mm	h5
Ø7 ~ Ø20	0 ~ -0.015mm	



(mm)

형 번	R	ØD	Ød	ℓ	L
UR50214020	2	14	16	30	150
UR50216005	0.5	16	16	32	150
UR50216010	1	16	16	32	150
UR50216015	1.5	16	16	32	150
UR502002002	0.02	0.2	4	0.4	40
UR502002005	0.05	0.2	4	0.4	40
UR502003002	0.02	0.3	4	0.6	40
UR502003005	0.05	0.3	4	0.6	40
UR502004005	0.05	0.4	4	0.8	40
UR50200401	0.1	0.4	4	0.8	40
UR502005005	0.05	0.5	4	1	40
UR50200501	0.1	0.5	4	1	40
UR502006005	0.05	0.6	4	1.2	40
UR50200601	0.1	0.6	4	1.2	40
UR50200602	0.2	0.6	4	1.2	40
UR502007005	0.05	0.7	4	1.4	40
UR50200701	0.1	0.7	4	1.4	40
UR50200702	0.2	0.7	4	1.4	40
UR502008005	0.05	0.8	4	1.6	40
UR50200801	0.1	0.8	4	1.6	40
UR50200802	0.2	0.8	4	1.6	40
UR502009005	0.05	0.9	4	1.8	40
UR50200901	0.1	0.9	4	1.8	40
UR502010005	0.05	1	6	2.5	50
UR50201001	0.1	1	6	2.5	50
UR50201002	0.2	1	6	2.5	50
UR50201003	0.3	1	6	2.5	50
UR502012005	0.05	1.2	6	3	50
UR50201201	0.1	1.2	6	3	50
UR50201202	0.2	1.2	6	3	50
UR50201203	0.3	1.2	6	3	50
UR502015005	0.05	1.5	6	4	50
UR50201501	0.1	1.5	6	4	50

형 번	R	ØD	Ød	ℓ	L
UR50201502	0.2	1.5	6	4	50
UR50201503	0.3	1.5	6	4	50
UR50201505	0.5	1.5	6	4	50
UR50202001	0.1	2	6	6	50
UR50202002	0.2	2	6	6	50
UR50202003	0.3	2	6	6	50
UR50202005	0.5	2	6	6	50
UR50202501	0.1	2.5	6	7	60
UR50202502	0.2	2.5	6	7	60
UR50202503	0.3	2.5	6	7	60
UR50202505	0.5	2.5	6	7	60
UR50203001	0.1	3	6	8	60
UR50203002	0.2	3	6	8	60
UR50203003	0.3	3	6	8	60
UR50203005	0.5	3	6	8	60
UR50203010	1	3	6	8	60
UR50203501	0.1	3.5	6	10	70
UR50203502	0.2	3.5	6	10	70
UR50203503	0.3	3.5	6	10	70
UR50203505	0.5	3.5	6	10	70
UR50204001	0.1	4	6	10	70
UR50204001100S4	0.1	4	4	10	100
UR50204001S4	0.1	4	4	10	70
UR50204002	0.2	4	6	10	70
UR50204002100S4	0.2	4	4	10	100
UR50204002S4	0.2	4	4	10	70
UR50204003	0.3	4	6	10	70
UR50204003100S4	0.3	4	4	10	100
UR50204003S4	0.3	4	4	10	70
UR50204005	0.5	4	6	10	70
UR50204005100S4	0.5	4	4	10	100
UR50204005S4	0.5	4	4	10	70
UR50204010	1	4	6	10	70

• 적용 피삭재

탄소강 ~ HB225	합금강 HB225~325	프리하든강 HRC30~50	열처리강		주철 ~FCD500	알루미늄	스테인리스강	Ti합금	Ni합금
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○		○				

◎: 매우적합 ○: 적합

U-Star Endmill

UR512

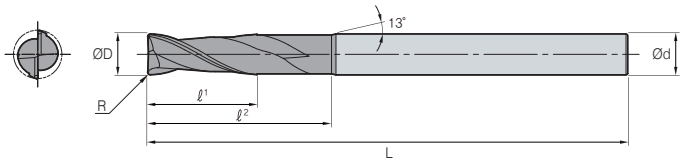
2날 넥 타입 레디우스 엔드밀

CARBIDE | 2 | 30° HELIX | R ±0.01 | R ±0.01 코너 R | AlCrN | 절삭조건 p.435

• 공구직경공차

ØD		Ød
Ø0.2 ~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø20	0 ~ -0.015mm	





(mm)

형 번	R	ØD	Ød	ℓ1	ℓ2	L
UR512002002005	0.02	0.2	4	0.3	0.5	40
UR51200200201	0.02	0.2	4	0.3	1	40
UR512002002015	0.02	0.2	4	0.3	1.5	40
UR51200200202	0.02	0.2	4	0.3	2	40
UR512002005005	0.05	0.2	4	0.3	0.5	40
UR51200200501	0.05	0.2	4	0.3	1	40
UR512002005015	0.05	0.2	4	0.3	1.5	40
UR51200200502	0.05	0.2	4	0.3	2	40
UR51200300201	0.02	0.3	4	0.5	1	40
UR51200300202	0.02	0.3	4	0.5	2	40
UR51200300203	0.02	0.3	4	0.5	3	40
UR51200300501	0.05	0.3	4	0.5	1	40
UR51200300502	0.05	0.3	4	0.5	2	40
UR51200300503	0.05	0.3	4	0.5	3	40
UR51200400501	0.05	0.4	4	0.6	1	40
UR512004005015	0.05	0.4	4	0.6	1.5	40
UR51200400502	0.05	0.4	4	0.6	2	40
UR512004005025	0.05	0.4	4	0.6	2.5	40
UR51200400503	0.05	0.4	4	0.6	3	40
UR51200400504	0.05	0.4	4	0.6	4	40
UR5120040101	0.1	0.4	4	0.6	1	40
UR51200401015	0.1	0.4	4	0.6	1.5	40
UR5120040102	0.1	0.4	4	0.6	2	40
UR51200401025	0.1	0.4	4	0.6	2.5	40
UR5120040103	0.1	0.4	4	0.6	3	40
UR5120040104	0.1	0.4	4	0.6	4	40
UR51200500501	0.05	0.5	4	0.7	1	45
UR512005005015	0.05	0.5	4	0.7	1.5	45
UR51200500502	0.05	0.5	4	0.7	2	45
UR512005005025	0.05	0.5	4	0.7	2.5	45
UR51200500503	0.05	0.5	4	0.7	3	45
UR51200500504	0.05	0.5	4	0.7	4	45
UR51200500505	0.05	0.5	4	0.7	5	45
UR51200500506	0.05	0.5	4	0.7	6	45
UR5120050101	0.1	0.5	4	0.7	1	45
UR51200501015	0.1	0.5	4	0.7	1.5	45
UR5120050102	0.1	0.5	4	0.7	2	45
UR51200501025	0.1	0.5	4	0.7	2.5	45

형 번	R	ØD	Ød	ℓ1	ℓ2	L
UR5120050103	0.1	0.5	4	0.7	3	45
UR5120050104	0.1	0.5	4	0.7	4	45
UR5120050105	0.1	0.5	4	0.7	5	45
UR5120050106	0.1	0.5	4	0.7	6	45
UR51200600502	0.05	0.6	4	0.9	2	45
UR51200600503	0.05	0.6	4	0.9	3	45
UR51200600504	0.05	0.6	4	0.9	4	45
UR51200600506	0.05	0.6	4	0.9	6	45
UR51200600508	0.05	0.6	4	0.9	8	45
UR51200600510	0.05	0.6	4	0.9	10	45
UR5120060102	0.1	0.6	4	0.9	2	45
UR5120060103	0.1	0.6	4	0.9	3	45
UR5120060104	0.1	0.6	4	0.9	4	45
UR5120060106	0.1	0.6	4	0.9	6	45
UR5120060108	0.1	0.6	4	0.9	8	45
UR5120060110	0.1	0.6	4	0.9	10	45
UR5120060202	0.2	0.6	4	0.9	2	45
UR5120060203	0.2	0.6	4	0.9	3	45
UR5120060204	0.2	0.6	4	0.9	4	45
UR5120060206	0.2	0.6	4	0.9	6	45
UR5120060208	0.2	0.6	4	0.9	8	45
UR5120060210	0.2	0.6	4	0.9	10	45
UR51200700502	0.05	0.7	4	1.2	2	45
UR51200700504	0.05	0.7	4	1.2	4	45
UR51200700506	0.05	0.7	4	1.2	6	45
UR51200700508	0.05	0.7	4	1.2	8	45
UR51200700510	0.05	0.7	4	1.2	10	45
UR5120070102	0.1	0.7	4	1.2	2	45
UR5120070104	0.1	0.7	4	1.2	4	45
UR5120070106	0.1	0.7	4	1.2	6	45
UR5120070108	0.1	0.7	4	1.2	8	45
UR5120070110	0.1	0.7	4	1.2	10	45
UR5120070202	0.2	0.7	4	1.2	2	45
UR5120070204	0.2	0.7	4	1.2	4	45
UR5120070206	0.2	0.7	4	1.2	6	45
UR5120070208	0.2	0.7	4	1.2	8	45
UR5120070210	0.2	0.7	4	1.2	10	45
UR51200800502	0.05	0.8	4	1.2	2	45

UR512

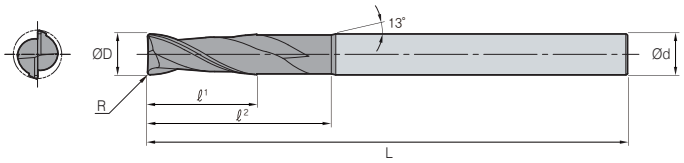
2날 넥 타입 레디우스 엔드밀



CARBIDE | 2 | 30° HELIX | R ±0.01 | R ±0.01 (코너 R) | AlCrN | 절삭조건 p.435

• 공구직경공차

ØD		Ød
Ø0.2 ~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø20	0 ~ -0.015mm	



(mm)

형 번	R	ØD	Ød	ℓ1	ℓ2	L
UR51200800503	0.05	0.8	4	1.2	3	45
UR51200800504	0.05	0.8	4	1.2	4	45
UR51200800506	0.05	0.8	4	1.2	6	45
UR51200800508	0.05	0.8	4	1.2	8	45
UR51200800510	0.05	0.8	4	1.2	10	45
UR5120080102	0.1	0.8	4	1.2	2	45
UR5120080103	0.1	0.8	4	1.2	3	45
UR5120080104	0.1	0.8	4	1.2	4	45
UR5120080106	0.1	0.8	4	1.2	6	45
UR5120080108	0.1	0.8	4	1.2	8	45
UR5120080110	0.1	0.8	4	1.2	10	45
UR5120080202	0.2	0.8	4	1.2	2	45
UR5120080203	0.2	0.8	4	1.2	3	45
UR5120080204	0.2	0.8	4	1.2	4	45
UR5120080206	0.2	0.8	4	1.2	6	45
UR5120080208	0.2	0.8	4	1.2	8	45
UR5120080210	0.2	0.8	4	1.2	10	45
UR51201000503	0.05	1	4	1.5	3	50
UR51201000504	0.05	1	4	1.5	4	50
UR51201000506	0.05	1	4	1.5	6	50
UR51201000508	0.05	1	4	1.5	8	50
UR51201000510	0.05	1	4	1.5	10	50
UR51201000512	0.05	1	4	1.5	12	50
UR51201000514	0.05	1	4	1.5	14	50
UR51201000516	0.05	1	4	1.5	16	50
UR51201000520	0.05	1	4	1.5	20	50
UR5120100103	0.1	1	4	1.5	3	50
UR5120100104	0.1	1	4	1.5	4	50
UR5120100106	0.1	1	4	1.5	6	50
UR5120100108	0.1	1	4	1.5	8	50
UR5120100110	0.1	1	4	1.5	10	50
UR5120100112	0.1	1	4	1.5	12	50
UR5120100114	0.1	1	4	1.5	14	50
UR5120100116	0.1	1	4	1.5	16	50
UR5120100120	0.1	1	4	1.5	20	50
UR5120100203	0.2	1	4	1.5	3	50
UR5120100204	0.2	1	4	1.5	4	50
UR5120100206	0.2	1	4	1.5	6	50

형 번	R	ØD	Ød	ℓ1	ℓ2	L
UR5120100208	0.2	1	4	1.5	8	50
UR5120100210	0.2	1	4	1.5	10	50
UR5120100212	0.2	1	4	1.5	12	50
UR5120100214	0.2	1	4	1.5	14	50
UR5120100216	0.2	1	4	1.5	16	50
UR5120100220	0.2	1	4	1.5	20	50
UR5120100303	0.3	1	4	1.5	3	50
UR5120100304	0.3	1	4	1.5	4	50
UR5120100306	0.3	1	4	1.5	6	50
UR5120100308	0.3	1	4	1.5	8	50
UR5120100310	0.3	1	4	1.5	10	50
UR5120100312	0.3	1	4	1.5	12	50
UR5120100314	0.3	1	4	1.5	14	50
UR5120100316	0.3	1	4	1.5	16	50
UR5120100320	0.3	1	4	1.5	20	50
UR51201200503	0.05	1.2	4	1.8	3	50
UR51201200504	0.05	1.2	4	1.8	4	50
UR51201200506	0.05	1.2	4	1.8	6	50
UR51201200508	0.05	1.2	4	1.8	8	50
UR51201200510	0.05	1.2	4	1.8	10	50
UR51201200512	0.05	1.2	4	1.8	12	50
UR51201200516	0.05	1.2	4	1.8	16	50
UR51201200520	0.05	1.2	4	1.8	20	50
UR5120120103	0.1	1.2	4	1.8	3	50
UR5120120104	0.1	1.2	4	1.8	4	50
UR5120120106	0.1	1.2	4	1.8	6	50
UR5120120108	0.1	1.2	4	1.8	8	50
UR5120120110	0.1	1.2	4	1.8	10	50
UR5120120112	0.1	1.2	4	1.8	12	50
UR5120120116	0.1	1.2	4	1.8	16	50
UR5120120120	0.1	1.2	4	1.8	20	50
UR5120120203	0.2	1.2	4	1.8	3	50
UR5120120204	0.2	1.2	4	1.8	4	50
UR5120120206	0.2	1.2	4	1.8	6	50
UR5120120208	0.2	1.2	4	1.8	8	50
UR5120120210	0.2	1.2	4	1.8	10	50
UR5120120212	0.2	1.2	4	1.8	12	50
UR5120120216	0.2	1.2	4	1.8	16	50

U-Star Endmill

UR512

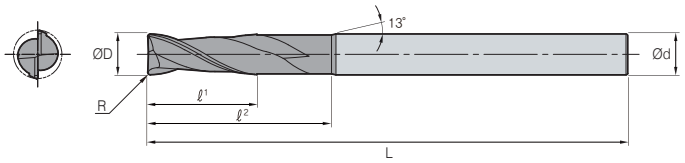
2날 넥 타입 레디우스 엔드밀

CARBIDE | 2 | 30° HELIX | R ±0.01 코너 R | R ±0.01 | AlCrN | 절삭조건 p.435

• 공구직경공차

ØD		Ød
Ø0.2 ~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø20	0 ~ -0.015mm	





(mm)

형 번	R	ØD	Ød	ℓ1	ℓ2	L
UR5120120220	0.2	1.2	4	1.8	20	50
UR5120120303	0.3	1.2	4	1.8	3	50
UR5120120304	0.3	1.2	4	1.8	4	50
UR5120120306	0.3	1.2	4	1.8	6	50
UR5120120308	0.3	1.2	4	1.8	8	50
UR5120120310	0.3	1.2	4	1.8	10	50
UR5120120312	0.3	1.2	4	1.8	12	50
UR5120120316	0.3	1.2	4	1.8	16	50
UR5120120320	0.3	1.2	4	1.8	20	50
UR51201500504	0.05	1.5	4	2.3	4	50
UR51201500506	0.05	1.5	4	2.3	6	50
UR51201500508	0.05	1.5	4	2.3	8	50
UR51201500510	0.05	1.5	4	2.3	10	50
UR51201500512	0.05	1.5	4	2.3	12	50
UR51201500514	0.05	1.5	4	2.3	14	50
UR51201500516	0.05	1.5	4	2.3	16	50
UR51201500520	0.05	1.5	4	2.3	20	50
UR51201500522	0.05	1.5	4	2.3	22	60
UR51201500526	0.05	1.5	4	2.3	26	60
UR5120150104	0.1	1.5	4	2.3	4	50
UR5120150106	0.1	1.5	4	2.3	6	50
UR5120150108	0.1	1.5	4	2.3	8	50
UR5120150110	0.1	1.5	4	2.3	10	50
UR5120150112	0.1	1.5	4	2.3	12	50
UR5120150114	0.1	1.5	4	2.3	14	50
UR5120150116	0.1	1.5	4	2.3	16	50
UR5120150120	0.1	1.5	4	2.3	20	50
UR5120150122	0.1	1.5	4	2.3	22	60
UR5120150126	0.1	1.5	4	2.3	26	60
UR5120150204	0.2	1.5	4	2.3	4	50
UR5120150206	0.2	1.5	4	2.3	6	50
UR5120150208	0.2	1.5	4	2.3	8	50
UR5120150210	0.2	1.5	4	2.3	10	50
UR5120150212	0.2	1.5	4	2.3	12	50
UR5120150214	0.2	1.5	4	2.3	14	50
UR5120150216	0.2	1.5	4	2.3	16	50
UR5120150220	0.2	1.5	4	2.3	20	50
UR5120150222	0.2	1.5	4	2.3	22	60

형 번	R	ØD	Ød	ℓ1	ℓ2	L
UR5120150226	0.2	1.5	4	2.3	26	60
UR5120150304	0.3	1.5	4	2.3	4	50
UR5120150306	0.3	1.5	4	2.3	6	50
UR5120150308	0.3	1.5	4	2.3	8	50
UR5120150310	0.3	1.5	4	2.3	10	50
UR5120150312	0.3	1.5	4	2.3	12	50
UR5120150314	0.3	1.5	4	2.3	14	50
UR5120150316	0.3	1.5	4	2.3	16	50
UR5120150320	0.3	1.5	4	2.3	20	50
UR5120150322	0.3	1.5	4	2.3	22	60
UR5120150326	0.3	1.5	4	2.3	26	60
UR5120150504	0.5	1.5	4	2.3	4	50
UR5120150506	0.5	1.5	4	2.3	6	50
UR5120150508	0.5	1.5	4	2.3	8	50
UR5120150510	0.5	1.5	4	2.3	10	50
UR5120150512	0.5	1.5	4	2.3	12	50
UR5120150514	0.5	1.5	4	2.3	14	50
UR5120150516	0.5	1.5	4	2.3	16	50
UR5120150520	0.5	1.5	4	2.3	20	50
UR5120150522	0.5	1.5	4	2.3	22	60
UR5120150526	0.5	1.5	4	2.3	26	60
UR5120200106	0.1	2	4	3	6	50
UR5120200108	0.1	2	4	3	8	50
UR5120200110	0.1	2	4	3	10	50
UR5120200112	0.1	2	4	3	12	50
UR5120200114	0.1	2	4	3	14	50
UR5120200116	0.1	2	4	3	16	50
UR5120200120	0.1	2	4	3	20	50
UR5120200122	0.1	2	4	3	22	60
UR5120200126	0.1	2	4	3	26	60
UR5120200130	0.1	2	4	3	30	70
UR5120200206	0.2	2	4	3	6	50
UR5120200208	0.2	2	4	3	8	50
UR5120200210	0.2	2	4	3	10	50
UR5120200212	0.2	2	4	3	12	50
UR5120200214	0.2	2	4	3	14	50
UR5120200216	0.2	2	4	3	16	50
UR5120200220	0.2	2	4	3	20	50

UR512

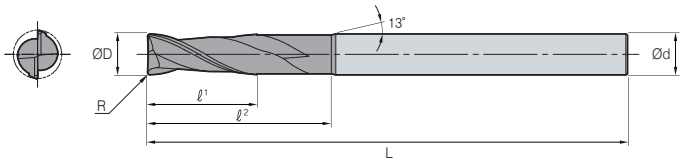
2날 넥 타입 레디우스 엔드밀



CARBIDE | 2 | 30° HELIX | R ±0.01 | R ±0.01 (코너 R) | AlCrN | 절삭조건 p.435

• 공구직경공차

ØD		Ød
Ø0.2 ~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø20	0 ~ -0.015mm	



(mm)

형 번	R	ØD	Ød	ℓ1	ℓ2	L
UR5120200222	0.2	2	4	3	22	60
UR5120200226	0.2	2	4	3	26	60
UR5120200230	0.2	2	4	3	30	70
UR5120200306	0.3	2	4	3	6	50
UR5120200308	0.3	2	4	3	8	50
UR5120200310	0.3	2	4	3	10	50
UR5120200312	0.3	2	4	3	12	50
UR5120200314	0.3	2	4	3	14	50
UR5120200316	0.3	2	4	3	16	50
UR5120200320	0.3	2	4	3	20	50
UR5120200322	0.3	2	4	3	22	60
UR5120200326	0.3	2	4	3	26	60
UR5120200330	0.3	2	4	3	30	70
UR5120200506	0.5	2	4	3	6	50
UR5120200508	0.5	2	4	3	8	50
UR5120200510	0.5	2	4	3	10	50
UR5120200512	0.5	2	4	3	12	50
UR5120200514	0.5	2	4	3	14	50
UR5120200516	0.5	2	4	3	16	50
UR5120200520	0.5	2	4	3	20	50
UR5120200522	0.5	2	4	3	22	60
UR5120200526	0.5	2	4	3	26	60
UR5120200530	0.5	2	4	3	30	70
UR5120250108	0.1	2.5	4	4	8	50
UR5120250110	0.1	2.5	4	4	10	50
UR5120250112	0.1	2.5	4	4	12	50
UR5120250114	0.1	2.5	4	4	14	50
UR5120250116	0.1	2.5	4	4	16	50
UR5120250120	0.1	2.5	4	4	20	50
UR5120250126	0.1	2.5	4	4	26	60
UR5120250130	0.1	2.5	4	4	30	70
UR5120250208	0.2	2.5	4	4	8	50
UR5120250210	0.2	2.5	4	4	10	50
UR5120250212	0.2	2.5	4	4	12	50
UR5120250214	0.2	2.5	4	4	14	50
UR5120250216	0.2	2.5	4	4	16	50
UR5120250220	0.2	2.5	4	4	20	50
UR5120250226	0.2	2.5	4	4	26	60

형 번	R	ØD	Ød	ℓ1	ℓ2	L
UR5120250230	0.2	2.5	4	4	30	70
UR5120250308	0.3	2.5	4	4	8	50
UR5120250310	0.3	2.5	4	4	10	50
UR5120250312	0.3	2.5	4	4	12	50
UR5120250314	0.3	2.5	4	4	14	50
UR5120250316	0.3	2.5	4	4	16	50
UR5120250320	0.3	2.5	4	4	20	50
UR5120250326	0.3	2.5	4	4	26	60
UR5120250330	0.3	2.5	4	4	30	70
UR5120250508	0.5	2.5	4	4	8	50
UR5120250510	0.5	2.5	4	4	10	50
UR5120250512	0.5	2.5	4	4	12	50
UR5120250514	0.5	2.5	4	4	14	50
UR5120250516	0.5	2.5	4	4	16	50
UR5120250520	0.5	2.5	4	4	20	50
UR5120250526	0.5	2.5	4	4	26	60
UR5120250530	0.5	2.5	4	4	30	70
UR5120300108	0.1	3	6	4.5	8	50
UR5120300110	0.1	3	6	4.5	10	50
UR5120300112	0.1	3	6	4.5	12	50
UR5120300114	0.1	3	6	4.5	14	60
UR5120300116	0.1	3	6	4.5	16	60
UR5120300120	0.1	3	6	4.5	20	60
UR5120300126	0.1	3	6	4.5	26	65
UR5120300130	0.1	3	6	4.5	30	70
UR5120300135	0.1	3	6	4.5	35	70
UR5120300140	0.1	3	6	4.5	40	80
UR5120300208	0.2	3	6	4.5	8	50
UR5120300210	0.2	3	6	4.5	10	50
UR5120300212	0.2	3	6	4.5	12	50
UR5120300214	0.2	3	6	4.5	14	60
UR5120300216	0.2	3	6	4.5	16	60
UR5120300220	0.2	3	6	4.5	20	60
UR5120300226	0.2	3	6	4.5	26	65
UR5120300230	0.2	3	6	4.5	30	70
UR5120300235	0.2	3	6	4.5	35	70
UR5120300240	0.2	3	6	4.5	40	80
UR5120300308	0.3	3	6	4.5	8	50

U-Star Endmill

UR512

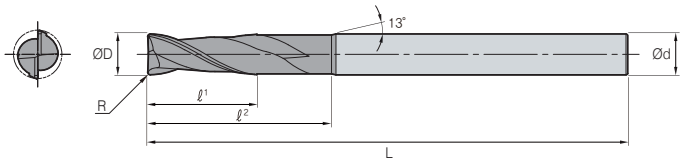
2날 넥 타입 레디우스 엔드밀



CARBIDE | 2 | 30° HELIX | R ±0.01 | R ±0.01 코너 R | AlCrN | 절삭조건 p.435

• 공구직경공차

ØD		Ød
Ø0.2 ~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø20	0 ~ -0.015mm	



(mm)

형 번	R	ØD	Ød	ℓ1	ℓ2	L
UR5120300310	0.3	3	6	4.5	10	50
UR5120300312	0.3	3	6	4.5	12	50
UR5120300314	0.3	3	6	4.5	14	60
UR5120300316	0.3	3	6	4.5	16	60
UR5120300320	0.3	3	6	4.5	20	60
UR5120300326	0.3	3	6	4.5	26	65
UR5120300330	0.3	3	6	4.5	30	70
UR5120300335	0.3	3	6	4.5	35	70
UR5120300340	0.3	3	6	4.5	40	80
UR5120300508	0.5	3	6	4.5	8	50
UR5120300510	0.5	3	6	4.5	10	50
UR5120300512	0.5	3	6	4.5	12	50
UR5120300514	0.5	3	6	4.5	14	60
UR5120300516	0.5	3	6	4.5	16	60
UR5120300520	0.5	3	6	4.5	20	60
UR5120300526	0.5	3	6	4.5	26	65
UR5120300530	0.5	3	6	4.5	30	70
UR5120300535	0.5	3	6	4.5	35	70
UR5120300540	0.5	3	6	4.5	40	80
UR5120301008	1	3	6	4.5	8	50
UR5120301010	1	3	6	4.5	10	50
UR5120301012	1	3	6	4.5	12	50
UR5120301014	1	3	6	4.5	14	60
UR5120301016	1	3	6	4.5	16	60
UR5120301020	1	3	6	4.5	20	60
UR5120301026	1	3	6	4.5	26	65
UR5120301030	1	3	6	4.5	30	70
UR5120301035	1	3	6	4.5	35	70
UR5120301040	1	3	6	4.5	40	80
UR5120400110	0.1	4	6	6	10	50
UR5120400112	0.1	4	6	6	12	50
UR5120400114	0.1	4	6	6	14	60
UR5120400116	0.1	4	6	6	16	60
UR5120400120	0.1	4	6	6	20	60
UR5120400126	0.1	4	6	6	26	65
UR5120400130	0.1	4	6	6	30	65
UR5120400135	0.1	4	6	6	35	70
UR5120400140	0.1	4	6	6	40	80

형 번	R	ØD	Ød	ℓ1	ℓ2	L
UR5120400145	0.1	4	6	6	45	90
UR5120400150	0.1	4	6	6	50	100
UR5120400210	0.2	4	6	6	10	50
UR5120400212	0.2	4	6	6	12	50
UR5120400214	0.2	4	6	6	14	60
UR5120400216	0.2	4	6	6	16	60
UR5120400220	0.2	4	6	6	20	60
UR5120400226	0.2	4	6	6	26	65
UR5120400230	0.2	4	6	6	30	65
UR5120400235	0.2	4	6	6	35	70
UR5120400240	0.2	4	6	6	40	80
UR5120400245	0.2	4	6	6	45	90
UR5120400250	0.2	4	6	6	50	100
UR5120400310	0.3	4	6	6	10	50
UR5120400312	0.3	4	6	6	12	50
UR5120400314	0.3	4	6	6	14	60
UR5120400316	0.3	4	6	6	16	60
UR5120400320	0.3	4	6	6	20	60
UR5120400326	0.3	4	6	6	26	65
UR5120400330	0.3	4	6	6	30	65
UR5120400335	0.3	4	6	6	35	70
UR5120400340	0.3	4	6	6	40	80
UR5120400345	0.3	4	6	6	45	90
UR5120400350	0.3	4	6	6	50	100
UR5120400510	0.5	4	6	6	10	50
UR5120400512	0.5	4	6	6	12	50
UR5120400514	0.5	4	6	6	14	60
UR5120400516	0.5	4	6	6	16	60
UR5120400520	0.5	4	6	6	20	60
UR5120400526	0.5	4	6	6	26	65
UR5120400530	0.5	4	6	6	30	65
UR5120400535	0.5	4	6	6	35	70
UR5120400540	0.5	4	6	6	40	80
UR5120400545	0.5	4	6	6	45	90
UR5120400550	0.5	4	6	6	50	100
UR5120401010	1	4	6	6	10	50
UR5120401012	1	4	6	6	12	50
UR5120401014	1	4	6	6	14	60

UR512

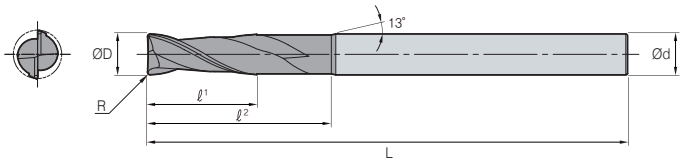
2날 넥 타입 레디우스 엔드밀



CARBIDE | 2 | 30° HELIX | R ±0.01 | R ±0.01 코너 R | AlCrN | 절삭조건 p.435

• 공구직경공차

ØD		Ød
Ø0.2 ~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø20	0 ~ -0.015mm	



(mm)

형 번	R	ØD	Ød	ℓ1	ℓ2	L
UR5120401016	1	4	6	6	16	60
UR5120401020	1	4	6	6	20	60
UR5120401026	1	4	6	6	26	65
UR5120401030	1	4	6	6	30	65
UR5120401035	1	4	6	6	35	70
UR5120401040	1	4	6	6	40	80
UR5120401045	1	4	6	6	45	90
UR5120401050	1	4	6	6	50	100
UR51205001	0.1	5	6	8	15	60
UR51205002	0.2	5	6	8	15	60
UR51205003	0.3	5	6	8	15	60
UR51205005	0.5	5	6	8	15	60
UR51205010	1	5	6	8	15	60
UR51205015	1.5	5	6	8	15	60
UR51205020	2	5	6	8	15	60
UR51206001	0.1	6	6	9	20	60
UR51206002	0.2	6	6	9	20	60
UR51206003	0.3	6	6	9	20	60
UR5120600390	0.3	6	6	15	30	90
UR51206005	0.5	6	6	9	20	60
UR5120600590	0.5	6	6	15	30	90
UR51206010	1	6	6	9	20	60
UR5120601090	1	6	6	15	30	90
UR51206015	1.5	6	6	9	20	60
UR51206020	2	6	6	9	20	60
UR51208001	0.1	8	8	12	25	70
UR51208002	0.2	8	8	12	25	70
UR51208003	0.3	8	8	12	25	70
UR51208003100	0.3	8	8	20	35	100
UR51208005	0.5	8	8	12	25	70
UR51208005100	0.5	8	8	20	35	100

형 번	R	ØD	Ød	ℓ1	ℓ2	L
UR51208010	1	8	8	12	25	70
UR51208010100	1	8	8	20	35	100
UR51208015	1.5	8	8	12	25	70
UR51208020	2	8	8	12	25	70
UR51210001	0.1	10	10	15	30	75
UR51210002	0.2	10	10	15	30	75
UR51210003	0.3	10	10	15	30	75
UR51210003100	0.3	10	10	25	40	100
UR51210005	0.5	10	10	15	30	75
UR51210005100	0.5	10	10	25	40	100
UR51210010	1	10	10	15	30	75
UR51210010100	1	10	10	25	40	100
UR51210015	1.5	10	10	15	30	75
UR51210020	2	10	10	15	30	75
UR51212002	0.2	12	12	18	32	80
UR51212003	0.3	12	12	18	32	80
UR51212003110	0.3	12	12	30	45	110
UR51212005	0.5	12	12	18	32	80
UR51212005110	0.5	12	12	30	45	110
UR51212010	1	12	12	18	32	80
UR51212010110	1	12	12	30	45	110
UR51212015	1.5	12	12	18	32	80
UR51212020	2	12	12	18	32	80
UR51216005	0.5	16	16	20	35	100
UR51216005150	0.5	16	16	35	50	150
UR51216010	1	16	16	20	35	100
UR51216010150	1	16	16	35	50	150
UR51220005	0.5	20	20	25	40	100
UR51220005150	0.5	20	20	40	55	150
UR51220010	1	20	20	25	40	100
UR51220010150	1	20	20	40	55	150

• 적용 피삭재

탄소강 ~ HB225	합금강 HB225~325	프리하든강 HRC30~50	열처리강		주철 ~FCD500	알루미늄	스테인리스강	Ti합금	Ni합금
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○		○				

◎: 매우적합 ○: 적합

U-Star Endmill

UR542

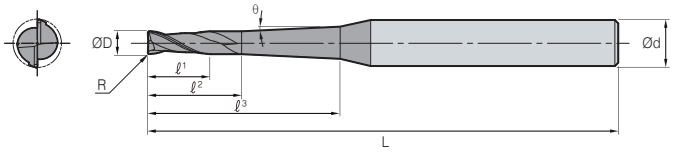
2날 테이퍼 넥 레디우스 엔드밀

CARBIDE | 2 | 30° HELIX | R ±0.01 코너 R | AlCrN | 절삭조건 p.435

• 공구직경공차

ØD		Ød
Ø0.2 ~ Ø4	0 ~ -0.012mm	h5





(mm)

형 번	R	ØD	Ød	ℓ1	ℓ2	ℓ3	θ	L
UR5420020050101	0.05	0.2	4	0.3	0.4	1	1	40
UR5420020050102	0.05	0.2	4	0.3	0.4	2	1	40
UR5420020050103	0.05	0.2	4	0.3	0.4	3	1	40
UR5420020050201	0.05	0.2	4	0.3	0.4	1	2	40
UR5420020050202	0.05	0.2	4	0.3	0.4	2	2	40
UR5420020050203	0.05	0.2	4	0.3	0.4	3	2	40
UR5420030050102	0.05	0.3	4	0.5	0.6	2	1	40
UR5420030050103	0.05	0.3	4	0.5	0.6	3	1	40
UR5420030050104	0.05	0.3	4	0.5	0.6	4	1	40
UR5420030050105	0.05	0.3	4	0.5	0.6	5	1	40
UR5420030050202	0.05	0.3	4	0.5	0.6	2	2	40
UR5420030050203	0.05	0.3	4	0.5	0.6	3	2	40
UR5420030050204	0.05	0.3	4	0.5	0.6	4	2	40
UR5420030050205	0.05	0.3	4	0.5	0.6	5	2	40
UR5420040050102	0.05	0.4	4	0.6	0.8	2	1	50
UR5420040050103	0.05	0.4	4	0.6	0.8	3	1	50
UR5420040050104	0.05	0.4	4	0.6	0.8	4	1	50
UR5420040050105	0.05	0.4	4	0.6	0.8	5	1	50
UR5420040050106	0.05	0.4	4	0.6	0.8	6	1	50
UR5420040050202	0.05	0.4	4	0.6	0.8	2	2	50
UR5420040050203	0.05	0.4	4	0.6	0.8	3	2	50
UR5420040050204	0.05	0.4	4	0.6	0.8	4	2	50
UR5420040050205	0.05	0.4	4	0.6	0.8	5	2	50
UR5420040050206	0.05	0.4	4	0.6	0.8	6	2	50
UR542004010102	0.1	0.4	4	0.6	0.8	2	1	50
UR542004010103	0.1	0.4	4	0.6	0.8	3	1	50
UR542004010104	0.1	0.4	4	0.6	0.8	4	1	50
UR542004010105	0.1	0.4	4	0.6	0.8	5	1	50
UR542004010106	0.1	0.4	4	0.6	0.8	6	1	50
UR542004010202	0.1	0.4	4	0.6	0.8	2	2	50
UR542004010203	0.1	0.4	4	0.6	0.8	3	2	50
UR5420040050204	0.05	0.4	4	0.6	0.8	4	2	50
UR5420040050205	0.05	0.4	4	0.6	0.8	5	2	50
UR5420040050206	0.05	0.4	4	0.6	0.8	6	2	50
UR542004010102	0.1	0.4	4	0.6	0.8	2	1	50
UR542004010103	0.1	0.4	4	0.6	0.8	3	1	50
UR542004010104	0.1	0.4	4	0.6	0.8	4	1	50

형 번	R	ØD	Ød	ℓ1	ℓ2	ℓ3	θ	L
UR542004010105	0.1	0.4	4	0.6	0.8	5	1	50
UR542004010106	0.1	0.4	4	0.6	0.8	6	1	50
UR542004010202	0.1	0.4	4	0.6	0.8	2	2	50
UR542004010203	0.1	0.4	4	0.6	0.8	3	2	50
UR542004010204	0.1	0.4	4	0.6	0.8	4	2	50
UR542004010205	0.1	0.4	4	0.6	0.8	5	2	50
UR542004010206	0.1	0.4	4	0.6	0.8	6	2	50
UR5420050050104	0.05	0.5	4	0.7	1	4	1	50
UR5420050050106	0.05	0.5	4	0.7	1	6	1	50
UR5420050050108	0.05	0.5	4	0.7	1	8	1	50
UR5420050050110	0.05	0.5	4	0.7	1	10	1	50
UR5420050050204	0.05	0.5	4	0.7	1	4	2	50
UR5420050050206	0.05	0.5	4	0.7	1	6	2	50
UR5420050050208	0.05	0.5	4	0.7	1	8	2	50
UR5420050050210	0.05	0.5	4	0.7	1	10	2	50
UR542005010104	0.1	0.5	4	0.7	1	4	1	50
UR542005010106	0.1	0.5	4	0.7	1	6	1	50
UR542005010108	0.1	0.5	4	0.7	1	8	1	50
UR542005010110	0.1	0.5	4	0.7	1	10	1	50
UR542005010204	0.1	0.5	4	0.7	1	4	2	50
UR542005010206	0.1	0.5	4	0.7	1	6	2	50
UR542005010208	0.1	0.5	4	0.7	1	8	2	50
UR542005010210	0.1	0.5	4	0.7	1	10	2	50
UR542006010104	0.1	0.6	4	0.9	1.2	4	1	50
UR542006010106	0.1	0.6	4	0.9	1.2	6	1	50
UR5420020050101	0.05	0.2	4	0.3	0.4	1	1	40
UR5420020050102	0.05	0.2	4	0.3	0.4	2	1	40
UR5420020050103	0.05	0.2	4	0.3	0.4	3	1	40
UR5420020050201	0.05	0.2	4	0.3	0.4	1	2	40
UR5420020050202	0.05	0.2	4	0.3	0.4	2	2	40
UR5420020050203	0.05	0.2	4	0.3	0.4	3	2	40
UR5420030050102	0.05	0.3	4	0.5	0.6	2	1	40
UR5420030050103	0.05	0.3	4	0.5	0.6	3	1	40
UR5420030050104	0.05	0.3	4	0.5	0.6	4	1	40
UR5420030050105	0.05	0.3	4	0.5	0.6	5	1	40
UR5420030050202	0.05	0.3	4	0.5	0.6	2	2	40
UR5420030050203	0.05	0.3	4	0.5	0.6	3	2	40

UR542

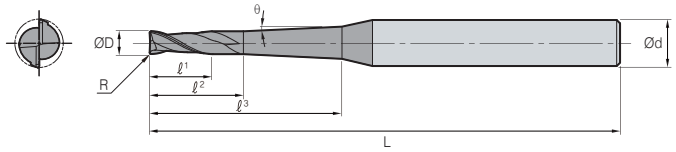
2날 테이퍼 넥 레디우스 엔드밀

CARBIDE | 2 | 30° HELIX | R ±0.01 코너 R | AlCrN | 절삭조건 p.435

• 공구직경공차

ØD		Ød
Ø0.2 ~ Ø4	0 ~ -0.012mm	h5





(mm)

형 번	R	ØD	Ød	ℓ1	ℓ2	ℓ3	θ	L
UR5420030050204	0.05	0.3	4	0.5	0.6	4	2	40
UR5420030050205	0.05	0.3	4	0.5	0.6	5	2	40
UR5420040050102	0.05	0.4	4	0.6	0.8	2	1	50
UR5420040050103	0.05	0.4	4	0.6	0.8	3	1	50
UR5420040050104	0.05	0.4	4	0.6	0.8	4	1	50
UR5420040050105	0.05	0.4	4	0.6	0.8	5	1	50
UR5420040050106	0.05	0.4	4	0.6	0.8	6	1	50
UR5420040050202	0.05	0.4	4	0.6	0.8	2	2	50
UR5420040050203	0.05	0.4	4	0.6	0.8	3	2	50
UR5420040050204	0.05	0.4	4	0.6	0.8	4	2	50
UR5420040050205	0.05	0.4	4	0.6	0.8	5	2	50
UR5420040050206	0.05	0.4	4	0.6	0.8	6	2	50
UR542004010102	0.1	0.4	4	0.6	0.8	2	1	50
UR542004010103	0.1	0.4	4	0.6	0.8	3	1	50
UR542004010104	0.1	0.4	4	0.6	0.8	4	1	50
UR542004010105	0.1	0.4	4	0.6	0.8	5	1	50
UR542004010106	0.1	0.4	4	0.6	0.8	6	1	50
UR542004010202	0.1	0.4	4	0.6	0.8	2	2	50
UR542004010203	0.1	0.4	4	0.6	0.8	3	2	50
UR542004010204	0.1	0.4	4	0.6	0.8	4	2	50
UR542004010205	0.1	0.4	4	0.6	0.8	5	2	50
UR542004010206	0.1	0.4	4	0.6	0.8	6	2	50
UR5420050050104	0.05	0.5	4	0.7	1	4	1	50
UR5420050050106	0.05	0.5	4	0.7	1	6	1	50
UR5420050050108	0.05	0.5	4	0.7	1	8	1	50
UR5420050050110	0.05	0.5	4	0.7	1	10	1	50
UR5420050050204	0.05	0.5	4	0.7	1	4	2	50
UR5420050050206	0.05	0.5	4	0.7	1	6	2	50
UR5420050050208	0.05	0.5	4	0.7	1	8	2	50
UR5420050050210	0.05	0.5	4	0.7	1	10	2	50
UR542005010104	0.1	0.5	4	0.7	1	4	1	50
UR542005010106	0.1	0.5	4	0.7	1	6	1	50
UR542005010108	0.1	0.5	4	0.7	1	8	1	50
UR542005010110	0.1	0.5	4	0.7	1	10	1	50
UR542005010204	0.1	0.5	4	0.7	1	4	2	50
UR542005010206	0.1	0.5	4	0.7	1	6	2	50
UR542005010208	0.1	0.5	4	0.7	1	8	2	50

형 번	R	ØD	Ød	ℓ1	ℓ2	ℓ3	θ	L
UR542005010210	0.1	0.5	4	0.7	1	10	2	50
UR542006010104	0.1	0.6	4	0.9	1.2	4	1	50
UR542006010106	0.1	0.6	4	0.9	1.2	6	1	50
UR542006010108	0.1	0.6	4	0.9	1.2	8	1	50
UR542006010110	0.1	0.6	4	0.9	1.2	10	1	50
UR542006010112	0.1	0.6	4	0.9	1.2	12	1	50
UR542006010204	0.1	0.6	4	0.9	1.2	4	2	50
UR542006010206	0.1	0.6	4	0.9	1.2	6	2	50
UR542006010208	0.1	0.6	4	0.9	1.2	8	2	50
UR542006010210	0.1	0.6	4	0.9	1.2	10	2	50
UR542006010212	0.1	0.6	4	0.9	1.2	12	2	50
UR542006020104	0.2	0.6	4	0.9	1.2	4	1	50
UR542006020106	0.2	0.6	4	0.9	1.2	6	1	50
UR542006020108	0.2	0.6	4	0.9	1.2	8	1	50
UR542006020110	0.2	0.6	4	0.9	1.2	10	1	50
UR542006020112	0.2	0.6	4	0.9	1.2	12	1	50
UR542006020204	0.2	0.6	4	0.9	1.2	4	2	50
UR542006020206	0.2	0.6	4	0.9	1.2	6	2	50
UR542006020208	0.2	0.6	4	0.9	1.2	8	2	50
UR542006020210	0.2	0.6	4	0.9	1.2	10	2	50
UR542006020212	0.2	0.6	4	0.9	1.2	12	2	50
UR542008010104	0.1	0.8	4	1.2	1.6	4	1	50
UR542008010106	0.1	0.8	4	1.2	1.6	6	1	50
UR542008010108	0.1	0.8	4	1.2	1.6	8	1	50
UR542008010110	0.1	0.8	4	1.2	1.6	10	1	50
UR542008010112	0.1	0.8	4	1.2	1.6	12	1	50
UR542008010116	0.1	0.8	4	1.2	1.6	16	1	50
UR542008010204	0.1	0.8	4	1.2	1.6	4	2	50
UR542008010206	0.1	0.8	4	1.2	1.6	6	2	50
UR542008010208	0.1	0.8	4	1.2	1.6	8	2	50
UR542008010210	0.1	0.8	4	1.2	1.6	10	2	50
UR542008010212	0.1	0.8	4	1.2	1.6	12	2	50
UR542008010216	0.1	0.8	4	1.2	1.6	16	2	50
UR542008020104	0.2	0.8	4	1.2	1.6	4	1	50
UR542008020106	0.2	0.8	4	1.2	1.6	6	1	50
UR542008020108	0.2	0.8	4	1.2	1.6	8	1	50
UR542008020110	0.2	0.8	4	1.2	1.6	10	1	50

U-Star Endmill

UR542

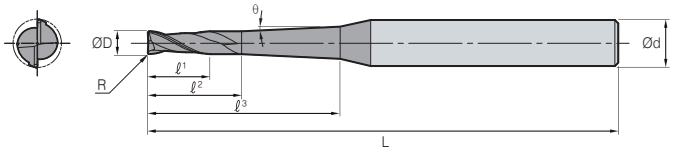
2날 테이퍼 넥 레디우스 엔드밀

CARBIDE | 2 | 30° HELIX | R ±0.01 코너 R | AlCrN | 절삭조건 p.435

• 공구직경공차

ØD		Ød
Ø0.2 ~ Ø4	0 ~ -0.012mm	h5





(mm)

형 번	R	ØD	Ød	ℓ1	ℓ2	ℓ3	θ	L
UR542008020112	0.2	0.8	4	1.2	1.6	12	1	50
UR542008020116	0.2	0.8	4	1.2	1.6	16	1	50
UR542008020204	0.2	0.8	4	1.2	1.6	4	2	50
UR542008020206	0.2	0.8	4	1.2	1.6	6	2	50
UR542008020208	0.2	0.8	4	1.2	1.6	8	2	50
UR542008020210	0.2	0.8	4	1.2	1.6	10	2	50
UR542008020212	0.2	0.8	4	1.2	1.6	12	2	50
UR542008020216	0.2	0.8	4	1.2	1.6	16	2	50
UR542010010106	0.1	1	4	1.5	2.5	6	1	50
UR542010010108	0.1	1	4	1.5	2.5	8	1	50
UR542010010110	0.1	1	4	1.5	2.5	10	1	50
UR542010010112	0.1	1	4	1.5	2.5	12	1	50
UR542010010116	0.1	1	4	1.5	2.5	16	1	50
UR542010010120	0.1	1	4	1.5	2.5	20	1	50
UR542010010125	0.1	1	4	1.5	2.5	25	1	60
UR542010010130	0.1	1	4	1.5	2.5	30	1	70
UR542010010140	0.1	1	4	1.5	2.5	40	1	80
UR542010010150	0.1	1	6	1.5	2.5	50	1	90
UR542010010206	0.1	1	4	1.5	2.5	6	2	50
UR542010010208	0.1	1	4	1.5	2.5	8	2	50
UR542010010210	0.1	1	4	1.5	2.5	10	2	50
UR542010010212	0.1	1	4	1.5	2.5	12	2	50
UR542010010216	0.1	1	4	1.5	2.5	16	2	50
UR542010010220	0.1	1	4	1.5	2.5	20	2	50
UR542010010225	0.1	1	4	1.5	2.5	25	2	60
UR542010010230	0.1	1	4	1.5	2.5	30	2	70
UR542010010240	0.1	1	4	1.5	2.5	40	2	80
UR542010010250	0.1	1	6	1.5	2.5	50	2	90
UR542010020106	0.2	1	4	1.5	2.5	6	1	50
UR542010020108	0.2	1	4	1.5	2.5	8	1	50
UR542010020110	0.2	1	4	1.5	2.5	10	1	50
UR542010020112	0.2	1	4	1.5	2.5	12	1	50
UR542010020116	0.2	1	4	1.5	2.5	16	1	50
UR542010020120	0.2	1	4	1.5	2.5	20	1	50
UR542010020125	0.2	1	4	1.5	2.5	25	1	60
UR542010020130	0.2	1	4	1.5	2.5	30	1	70
UR542010020140	0.2	1	4	1.5	2.5	40	1	80

형 번	R	ØD	Ød	ℓ1	ℓ2	ℓ3	θ	L
UR542010020150	0.2	1	6	1.5	2.5	50	1	90
UR542010020206	0.2	1	4	1.5	2.5	6	2	50
UR542010020208	0.2	1	4	1.5	2.5	8	2	50
UR542010020210	0.2	1	4	1.5	2.5	10	2	50
UR542010020212	0.2	1	4	1.5	2.5	12	2	50
UR542010020216	0.2	1	4	1.5	2.5	16	2	50
UR542010020220	0.2	1	4	1.5	2.5	20	2	50
UR542010020225	0.2	1	4	1.5	2.5	25	2	60
UR542010020230	0.2	1	4	1.5	2.5	30	2	70
UR542010020240	0.2	1	4	1.5	2.5	40	2	80
UR542010020250	0.2	1	6	1.5	2.5	50	2	90
UR542012010108	0.1	1.2	4	1.8	3	8	1	50
UR542012010112	0.1	1.2	4	1.8	3	12	1	50
UR542012010116	0.1	1.2	4	1.8	3	16	1	50
UR542012010120	0.1	1.2	4	1.8	3	20	1	50
UR542012010125	0.1	1.2	4	1.8	3	25	1	60
UR542012010130	0.1	1.2	4	1.8	3	30	1	70
UR542012010208	0.1	1.2	4	1.8	3	8	2	50
UR542012010212	0.1	1.2	4	1.8	3	12	2	50
UR542012010216	0.1	1.2	4	1.8	3	16	2	50
UR542012010220	0.1	1.2	4	1.8	3	20	2	50
UR542012010225	0.1	1.2	4	1.8	3	25	2	60
UR542012010230	0.1	1.2	4	1.8	3	30	2	70
UR542012020108	0.2	1.2	4	1.8	3	8	1	50
UR542012020112	0.2	1.2	4	1.8	3	12	1	50
UR542012020116	0.2	1.2	4	1.8	3	16	1	50
UR542012020120	0.2	1.2	4	1.8	3	20	1	50
UR542012020125	0.2	1.2	4	1.8	3	25	1	60
UR542012020130	0.2	1.2	4	1.8	3	30	1	70
UR542012020208	0.2	1.2	4	1.8	3	8	2	50
UR542012020212	0.2	1.2	4	1.8	3	12	2	50
UR542012020216	0.2	1.2	4	1.8	3	16	2	50
UR542012020220	0.2	1.2	4	1.8	3	20	2	50
UR542012020225	0.2	1.2	4	1.8	3	25	2	60
UR542012020230	0.2	1.2	4	1.8	3	30	2	70
UR542015010108	0.1	1.5	4	2.3	3	8	1	50
UR542015010110	0.1	1.5	4	2.3	3	10	1	50

UR542

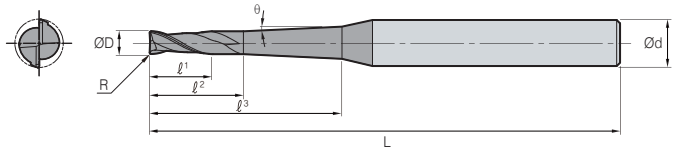
2날 테이퍼 넥 레디우스 엔드밀

CARBIDE | 2 | 30° HELIX | R ±0.01 코너 R | AlCrN | 절삭조건 p.435

• 공구직경공차

ØD		Ød
Ø0.2 ~ Ø4	0 ~ -0.012mm	h5





(mm)

형 번	R	ØD	Ød	ℓ1	ℓ2	ℓ3	θ	L
UR542015010112	0.1	1.5	4	2.3	3	12	1	50
UR542015010116	0.1	1.5	4	2.3	3	16	1	50
UR542015010120	0.1	1.5	4	2.3	3	20	1	50
UR542015010125	0.1	1.5	4	2.3	3	25	1	60
UR542015010130	0.1	1.5	4	2.3	3	30	1	70
UR542015010140	0.1	1.5	4	2.3	3	40	1	80
UR542015010150	0.1	1.5	4	2.3	3	50	1	90
UR542015010208	0.1	1.5	4	2.3	3	8	2	50
UR542015010210	0.1	1.5	4	2.3	3	10	2	50
UR542015010212	0.1	1.5	4	2.3	3	12	2	50
UR542015010216	0.1	1.5	4	2.3	3	16	2	50
UR542015010220	0.1	1.5	4	2.3	3	20	2	50
UR542015010225	0.1	1.5	4	2.3	3	25	2	60
UR542015010230	0.1	1.5	4	2.3	3	30	2	70
UR542015010240	0.1	1.5	6	2.3	3	40	2	80
UR542015010250	0.1	1.5	6	2.3	3	50	2	90
UR542015020108	0.2	1.5	4	2.3	3	8	1	50
UR542015020110	0.2	1.5	4	2.3	3	10	1	50
UR542015020112	0.2	1.5	4	2.3	3	12	1	50
UR542015020116	0.2	1.5	4	2.3	3	16	1	50
UR542015020120	0.2	1.5	4	2.3	3	20	1	50
UR542015020125	0.2	1.5	4	2.3	3	25	1	60
UR542015020130	0.2	1.5	4	2.3	3	30	1	70
UR542015020140	0.2	1.5	4	2.3	3	40	1	80
UR542015020150	0.2	1.5	4	2.3	3	50	1	90
UR542015020208	0.2	1.5	4	2.3	3	8	2	50
UR542015020210	0.2	1.5	4	2.3	3	10	2	50
UR542015020212	0.2	1.5	4	2.3	3	12	2	50
UR542015020216	0.2	1.5	4	2.3	3	16	2	50
UR542015020220	0.2	1.5	4	2.3	3	20	2	50
UR542015020225	0.2	1.5	4	2.3	3	25	2	60
UR542015020230	0.2	1.5	4	2.3	3	30	2	70
UR542015020240	0.2	1.5	6	2.3	3	40	2	80
UR542015020250	0.2	1.5	6	2.3	3	50	2	90
UR542015030108	0.3	1.5	4	2.3	3	8	1	50
UR542015030110	0.3	1.5	4	2.3	3	10	1	50
UR542015030112	0.3	1.5	4	2.3	3	12	1	50

형 번	R	ØD	Ød	ℓ1	ℓ2	ℓ3	θ	L
UR542015030116	0.3	1.5	4	2.3	3	16	1	50
UR542015030120	0.3	1.5	4	2.3	3	20	1	50
UR542015030125	0.3	1.5	4	2.3	3	25	1	60
UR542015030130	0.3	1.5	4	2.3	3	30	1	70
UR542015030140	0.3	1.5	4	2.3	3	40	1	80
UR542015030150	0.3	1.5	4	2.3	3	50	1	90
UR542015030208	0.3	1.5	4	2.3	3	8	2	50
UR542015030210	0.3	1.5	4	2.3	3	10	2	50
UR542015030212	0.3	1.5	4	2.3	3	12	2	50
UR542015030216	0.3	1.5	4	2.3	3	16	2	50
UR542015030220	0.3	1.5	4	2.3	3	20	2	50
UR542015030225	0.3	1.5	4	2.3	3	25	2	60
UR542015030230	0.3	1.5	4	2.3	3	30	2	70
UR542015030240	0.3	1.5	6	2.3	3	40	2	80
UR542015030250	0.3	1.5	6	2.3	3	50	2	90
UR542020010110	0.1	2	4	2	5	10	1	50
UR542020010112	0.1	2	4	2	5	12	1	50
UR542020010116	0.1	2	4	2	5	16	1	50
UR542020010120	0.1	2	4	2	5	20	1	50
UR542020010125	0.1	2	4	2	5	25	1	60
UR542020010130	0.1	2	4	2	5	30	1	70
UR542020010140	0.1	2	6	2	5	40	1	80
UR542020010150	0.1	2	6	2	5	50	1	100
UR542020010160	0.1	2	6	2	5	60	1	100
UR542020010180	0.1	2	6	2	5	80	1	140
UR542020010210	0.1	2	4	2	5	10	2	50
UR542020010212	0.1	2	4	2	5	12	2	50
UR542020010216	0.1	2	4	2	5	16	2	50
UR542020010220	0.1	2	4	2	5	20	2	50
UR542020010225	0.1	2	4	2	5	25	2	60
UR542020010230	0.1	2	4	2	5	30	2	70
UR542020010240	0.1	2	6	2	5	40	2	80
UR542020010250	0.1	2	6	2	5	50	2	100
UR542020010260	0.1	2	6	2	5	60	2	100
UR542020010280	0.1	2	8	2	5	80	2	140
UR542020020110	0.2	2	4	2	5	10	1	50
UR542020020112	0.2	2	4	2	5	12	1	50

U-Star Endmill

UR542

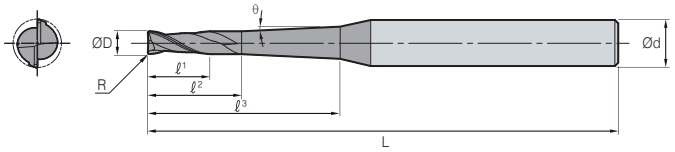
2날 테이퍼 넥 레디우스 엔드밀

CARBIDE | 2 | 30° HELIX | R ±0.01 코너 R | AlCrN | 절삭조건 p.435

• 공구직경공차

ØD		Ød
Ø0.2 ~ Ø4	0 ~ -0.012mm	h5





(mm)

형 번	R	ØD	Ød	ℓ1	ℓ2	ℓ3	θ	L
UR542020020116	0.2	2	4	2	5	16	1	50
UR542020020120	0.2	2	4	2	5	20	1	50
UR542020020125	0.2	2	4	2	5	25	1	60
UR542020020130	0.2	2	4	2	5	30	1	70
UR542020020140	0.2	2	6	2	5	40	1	80
UR542020020150	0.2	2	6	2	5	50	1	100
UR542020020160	0.2	2	6	2	5	60	1	100
UR542020020180	0.2	2	6	2	5	80	1	140
UR542020020210	0.2	2	4	2	5	10	2	50
UR542020020212	0.2	2	4	2	5	12	2	50
UR542020020216	0.2	2	4	2	5	16	2	50
UR542020020220	0.2	2	4	2	5	20	2	50
UR542020020225	0.2	2	4	2	5	25	2	60
UR542020020230	0.2	2	4	2	5	30	2	70
UR542020020240	0.2	2	6	2	5	40	2	80
UR542020020250	0.2	2	6	2	5	50	2	100
UR542020020260	0.2	2	6	2	5	60	2	100
UR542020020280	0.2	2	8	2	5	80	2	140
UR542020030110	0.3	2	4	2	5	10	1	50
UR542020030112	0.3	2	4	2	5	12	1	50
UR542020030116	0.3	2	4	2	5	16	1	50
UR542020030120	0.3	2	4	2	5	20	1	50
UR542020030125	0.3	2	4	2	5	25	1	60
UR542020030130	0.3	2	4	2	5	30	1	70
UR542020030140	0.3	2	6	2	5	40	1	80
UR542020030150	0.3	2	6	2	5	50	1	100
UR542020030160	0.3	2	6	2	5	60	1	100
UR542020030180	0.3	2	6	2	5	80	1	140
UR542020030210	0.3	2	4	2	5	10	2	50
UR542020030212	0.3	2	4	2	5	12	2	50
UR542020030216	0.3	2	4	2	5	16	2	50
UR542020030220	0.3	2	4	2	5	20	2	50
UR542020030225	0.3	2	4	2	5	25	2	60
UR542020030230	0.3	2	4	2	5	30	2	70
UR542020030240	0.3	2	6	2	5	40	2	80
UR542020030250	0.3	2	6	2	5	50	2	100
UR542020030260	0.3	2	6	2	5	60	2	100
UR542020030280	0.3	2	8	2	5	80	2	140
UR542020050110	0.5	2	4	2	5	10	1	50
UR542020050112	0.5	2	4	2	5	12	1	50
UR542020050116	0.5	2	4	2	5	16	1	50
UR542020050120	0.5	2	4	2	5	20	1	50
UR542020050125	0.5	2	4	2	5	25	1	60
UR542020050130	0.5	2	4	2	5	30	1	70
UR542020050140	0.5	2	6	2	5	40	1	80
UR542020050150	0.5	2	6	2	5	50	1	100
UR542020050160	0.5	2	6	2	5	60	1	100
UR542020050180	0.5	2	6	2	5	80	1	140
UR542020050210	0.5	2	4	2	5	10	2	50
UR542020050212	0.5	2	4	2	5	12	2	50
UR542020050216	0.5	2	4	2	5	16	2	50
UR542020050220	0.5	2	4	2	5	20	2	50
UR542020050225	0.5	2	4	2	5	25	2	60
UR542020050230	0.5	2	4	2	5	30	2	70
UR542020050240	0.5	2	6	2	5	40	2	80
UR542020050250	0.5	2	6	2	5	50	2	100
UR542020050260	0.5	2	6	2	5	60	2	100
UR542020050280	0.5	2	8	2	5	80	2	140
UR542030020116	0.2	3	6	4.5	6	16	1	60
UR542030020120	0.2	3	6	4.5	6	20	1	65
UR542030020130	0.2	3	6	4.5	6	30	1	70
UR542030020140	0.2	3	6	4.5	6	40	1	80
UR542030020150	0.2	3	6	4.5	6	50	1	90
UR542030020160	0.2	3	6	4.5	6	60	1	100
UR542030020216	0.2	3	6	4.5	6	16	2	60
UR542030020220	0.2	3	6	4.5	6	20	2	65
UR542030020230	0.2	3	6	4.5	6	30	2	70
UR542030020240	0.2	3	6	4.5	6	40	2	80
UR542030020250	0.2	3	8	4.5	6	50	2	90
UR542030020260	0.2	3	8	4.5	6	60	2	100
UR542030020270	0.2	3	8	4.5	6	70	2	120
UR542030030116	0.3	3	6	4.5	6	16	1	60
UR542030030120	0.3	3	6	4.5	6	20	1	65
UR542030030130	0.3	3	6	4.5	6	30	1	70

UR542

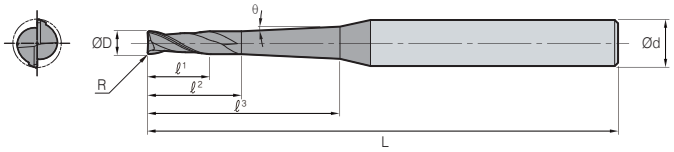
2날 테이퍼 넥 레디우스 엔드밀



CARBIDE | 2 | 30° HELIX | R ±0.01 코너 R | AlCrN | 절삭조건 p.435

• 공구직경공차

ØD		Ød
Ø0.2 ~ Ø4	0 ~ -0.012mm	h5



(mm)

형 번	R	ØD	Ød	ℓ1	ℓ2	ℓ3	θ	L
UR542030030140	0.3	3	6	4.5	6	40	1	80
UR542030030150	0.3	3	6	4.5	6	50	1	90
UR542030030160	0.3	3	6	4.5	6	60	1	100
UR542030030216	0.3	3	6	4.5	6	16	2	60
UR542030030220	0.3	3	6	4.5	6	20	2	65
UR542030030230	0.3	3	6	4.5	6	30	2	70
UR542030030240	0.3	3	6	4.5	6	40	2	80
UR542030030250	0.3	3	8	4.5	6	50	2	90
UR542030030260	0.3	3	8	4.5	6	60	2	100
UR542030030270	0.3	3	8	4.5	6	70	2	120
UR542030050116	0.5	3	6	4.5	6	16	1	60
UR542030050120	0.5	3	6	4.5	6	20	1	65
UR542030050130	0.5	3	6	4.5	6	30	1	70
UR542030050140	0.5	3	6	4.5	6	40	1	80
UR542030050150	0.5	3	6	4.5	6	50	1	90
UR542030050160	0.5	3	6	4.5	6	60	1	100
UR542030050216	0.5	3	6	4.5	6	16	2	60
UR542030050220	0.5	3	6	4.5	6	20	2	65
UR542030050230	0.5	3	6	4.5	6	30	2	70
UR542030050240	0.5	3	6	4.5	6	40	2	80
UR542030050250	0.5	3	8	4.5	6	50	2	90
UR542030050260	0.5	3	8	4.5	6	60	2	100
UR542030050270	0.5	3	8	4.5	6	70	2	120
UR542040020140	0.2	4	6	6	8	40	1	90

형 번	R	ØD	Ød	ℓ1	ℓ2	ℓ3	θ	L
UR542040020150	0.2	4	6	6	8	50	1	100
UR542040020160	0.2	4	6	6	8	60	1	110
UR542040020170	0.2	4	8	6	8	70	1	120
UR542040020240	0.2	4	8	6	8	40	2	90
UR542040020250	0.2	4	8	6	8	50	2	100
UR542040020260	0.2	4	8	6	8	60	2	110
UR542040020270	0.2	4	10	6	8	70	2	120
UR542040030140	0.3	4	6	6	8	40	1	90
UR542040030150	0.3	4	6	6	8	50	1	100
UR542040030160	0.3	4	6	6	8	60	1	110
UR542040030170	0.3	4	8	6	8	70	1	120
UR542040030240	0.3	4	8	6	8	40	2	90
UR542040030250	0.3	4	8	6	8	50	2	100
UR542040030260	0.3	4	8	6	8	60	2	110
UR542040030270	0.3	4	10	6	8	70	2	120
UR542040050140	0.5	4	6	6	8	40	1	90
UR542040050150	0.5	4	6	6	8	50	1	100
UR542040050160	0.5	4	6	6	8	60	1	110
UR542040050170	0.5	4	8	6	8	70	1	120
UR542040050240	0.5	4	8	6	8	40	2	90
UR542040050250	0.5	4	8	6	8	50	2	100
UR542040050260	0.5	4	8	6	8	60	2	110
UR542040050270	0.5	4	10	6	8	70	2	120

• 적용 피삭재

탄소강 ~ HB225	합금강 HB225~325	프리하든강 HRC30~50	열처리강		주철 ~FCD500	알루미늄	스테인리스강	Ti합금	Ni합금
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○		○				

◎: 매우적합 ○: 적합

U-Star Endmill

UR504

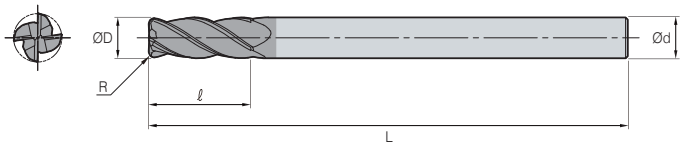
4날 레디우스 엔드밀

CARBIDE | 4 | 40° HELIX | R ±0.02 코너 R | AlCrN | 절삭조건 p.435

• 공구직경공차

ØD		Ød
Ø3 ~ Ø20	0 ~ -0.03mm	h5





(mm)

형 번	R	ØD	Ød	ℓ	L
UR50403002	0.2	3	6	8	60
UR50403002S4	0.2	3	4	8	60
UR50403003	0.3	3	6	8	60
UR50403005	0.5	3	6	8	60
UR50403005S4	0.5	3	4	8	60
UR50404002	0.2	4	6	10	70
UR50404002S4	0.2	4	4	10	70
UR50404003	0.3	4	6	10	70
UR50404005	0.5	4	6	10	70
UR50404005S4	0.5	4	4	10	70
UR50404010	1	4	6	10	70
UR50404010S4	1	4	4	10	70
UR50405002	0.2	5	6	13	90
UR50405003	0.3	5	6	13	90
UR50405003060	0.3	5	6	13	60
UR50405005	0.5	5	6	13	90
UR50405005060	0.5	5	6	13	60
UR50405010	1	5	6	13	90
UR50406002	0.2	6	6	13	90
UR50406003	0.3	6	6	15	90
UR50406003060	0.3	6	6	15	60
UR50406005	0.5	6	6	15	90
UR50406005060	0.5	6	6	15	60
UR50406010	1	6	6	15	90
UR50406010060	1	6	6	15	60
UR50408003	0.3	8	8	20	100
UR50408003070	0.3	8	8	20	70
UR50408005	0.5	8	8	20	100
UR50408005070	0.5	8	8	20	70
UR50408010	1	8	8	20	100
UR50408010070	1	8	8	20	70
UR50408015	1.5	8	8	20	100
UR50408020	2	8	8	20	100
UR50410003	0.3	10	10	25	100

형 번	R	ØD	Ød	ℓ	L
UR50410003075	0.3	10	10	25	75
UR50410005	0.5	10	10	25	100
UR50410005075	0.5	10	10	25	75
UR50410010	1	10	10	25	100
UR50410010075	1	10	10	25	75
UR50410015	1.5	10	10	25	100
UR50410020	2	10	10	25	100
UR50410025	2.5	10	10	25	100
UR50412003	0.3	12	12	30	110
UR50412003080	0.3	12	12	30	80
UR50412005	0.5	12	12	30	110
UR50412005080	0.5	12	12	30	80
UR50412010	1	12	12	30	110
UR50412010080	1	12	12	30	80
UR50412015	1.5	12	12	30	110
UR50412020	2	12	12	30	110
UR50412025	2.5	12	12	30	110
UR50412030	3	12	12	30	110
UR50416005	0.5	16	16	32	150
UR50416005100	0.5	16	16	32	100
UR50416010	1	16	16	32	150
UR50416010100	1	16	16	32	100
UR50416015	1.5	16	16	32	150
UR50416015100	1.5	16	16	32	100
UR50416020	2	16	16	32	150
UR50416020100	2	16	16	32	100
UR50420005	0.5	20	20	38	150
UR50420005100	0.5	20	20	38	100
UR50420010	1	20	20	38	150
UR50420010100	1	20	20	38	100
UR50420015	1.5	20	20	38	150
UR50420015100	1.5	20	20	38	100
UR50420020	2	20	20	38	150
UR50420020100	2	20	20	38	100

• 적용 피삭재

탄소강 ~ HB225	합금강 HB225~325	프리하든강 HRC30~50	열처리강		주철 ~FCD500	알루미늄	스테인리스강	Ti합금	Ni합금
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○		○				

◎: 매우적합 ○: 적합

UR544

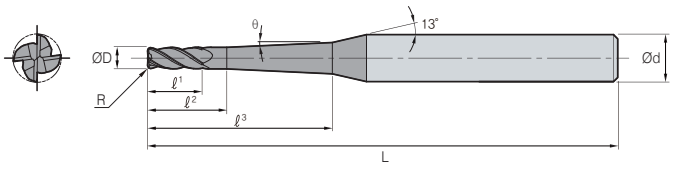
4날 테이퍼 넥 레디우스 엔드밀



CARBIDE | 4 | 30° HELIX | R ±0.01 코너 R | AlCrN | 절삭조건 p.436

• 공구직경공차

ØD		Ød
Ø1 ~ Ø4	0 ~ -0.012mm	h5



(mm)

형 번	R	ØD	Ød	ℓ1	ℓ2	ℓ3	θ	L
UR544010010106	0.1	1	4	1.5	2.5	6	1	50
UR544010010108	0.1	1	4	1.5	2.5	8	1	50
UR544010010110	0.1	1	4	1.5	2.5	10	1	50
UR544010010112	0.1	1	4	1.5	2.5	12	1	50
UR544010010116	0.1	1	4	1.5	2.5	16	1	50
UR544010010120	0.1	1	4	1.5	2.5	20	1	50
UR544010010125	0.1	1	4	1.5	2.5	25	1	60
UR544010010130	0.1	1	4	1.5	2.5	30	1	70
UR544010010140	0.1	1	4	1.5	2.5	40	1	80
UR544010010150	0.1	1	4	1.5	2.5	50	1	90
UR544010010206	0.1	1	4	1.5	2.5	6	1	50
UR544010010208	0.1	1	4	1.5	2.5	8	2	50
UR544010010210	0.1	1	4	1.5	2.5	10	2	50
UR544010010212	0.1	1	4	1.5	2.5	12	2	50
UR544010010216	0.1	1	4	1.5	2.5	16	2	50
UR544010010220	0.1	1	4	1.5	2.5	20	2	50
UR544010010225	0.1	1	4	1.5	2.5	25	2	60
UR544010010230	0.1	1	4	1.5	2.5	30	2	70
UR544010010240	0.1	1	4	1.5	2.5	40	2	80
UR544010010250	0.1	1	6	1.5	2.5	50	2	90
UR544010020106	0.2	1	4	1.5	2.5	6	2	50
UR544010020108	0.2	1	4	1.5	2.5	8	1	50
UR544010020110	0.2	1	4	1.5	2.5	10	1	50
UR544010020112	0.2	1	4	1.5	2.5	12	1	50
UR544010020116	0.2	1	4	1.5	2.5	16	1	50
UR544010020120	0.2	1	4	1.5	2.5	20	1	50
UR544010020125	0.2	1	4	1.5	2.5	25	1	60
UR544010020130	0.2	1	4	1.5	2.5	30	1	70
UR544010020140	0.2	1	4	1.5	2.5	40	1	80
UR544010020150	0.2	1	4	1.5	2.5	50	1	90
UR544010020206	0.2	1	4	1.5	2.5	6	1	50
UR544010020208	0.2	1	4	1.5	2.5	8	2	50
UR544010020210	0.2	1	4	1.5	2.5	10	2	50
UR544010020212	0.2	1	4	1.5	2.5	12	2	50
UR544010020216	0.2	1	4	1.5	2.5	16	2	50
UR544010020220	0.2	1	4	1.5	2.5	20	2	50

형 번	R	ØD	Ød	ℓ1	ℓ2	ℓ3	θ	L
UR544010020225	0.2	1	4	1.5	2.5	25	2	60
UR544010020230	0.2	1	4	1.5	2.5	30	2	70
UR544010020240	0.2	1	4	1.5	2.5	40	2	80
UR544010020250	0.2	1	6	1.5	2.5	50	2	90
UR544012010108	0.1	1.2	4	1.8	3	8	2	50
UR544012010112	0.1	1.2	4	1.8	3	12	1	50
UR544012010116	0.1	1.2	4	1.8	3	16	1	50
UR544012010120	0.1	1.2	4	1.8	3	20	1	50
UR544012010125	0.1	1.2	4	1.8	3	25	1	60
UR544012010130	0.1	1.2	4	1.8	3	30	1	70
UR544012010208	0.1	1.2	4	1.8	3	8	1	50
UR544012010212	0.1	1.2	4	1.8	3	12	2	50
UR544012010216	0.1	1.2	4	1.8	3	16	2	50
UR544012010220	0.1	1.2	4	1.8	3	20	2	50
UR544012010225	0.1	1.2	4	1.8	3	25	2	60
UR544012010230	0.1	1.2	4	1.8	3	30	2	70
UR544012020108	0.2	1.2	4	1.8	3	8	2	50
UR544012020112	0.2	1.2	4	1.8	3	12	1	50
UR544012020116	0.2	1.2	4	1.8	3	16	1	50
UR544012020120	0.2	1.2	4	1.8	3	20	1	50
UR544012020125	0.2	1.2	4	1.8	3	25	1	60
UR544012020130	0.2	1.2	4	1.8	3	30	1	70
UR544012020208	0.2	1.2	4	1.8	3	8	1	50
UR544012020212	0.2	1.2	4	1.8	3	12	2	50
UR544012020216	0.2	1.2	4	1.8	3	16	2	50
UR544012020220	0.2	1.2	4	1.8	3	20	2	50
UR544012020225	0.2	1.2	4	1.8	3	25	2	60
UR544012020230	0.2	1.2	4	1.8	3	30	2	70
UR544015010108	0.1	1.5	4	2.3	3	8	2	50
UR544015010110	0.1	1.5	4	2.3	3	10	1	50
UR544015010112	0.1	1.5	4	2.3	3	12	1	50
UR544015010116	0.1	1.5	4	2.3	3	16	1	50
UR544015010120	0.1	1.5	4	2.3	3	20	1	50
UR544015010125	0.1	1.5	4	2.3	3	25	1	60
UR544015010130	0.1	1.5	4	2.3	3	30	1	70
UR544015010140	0.1	1.5	4	2.3	3	40	1	80

U-Star Endmill

UR544

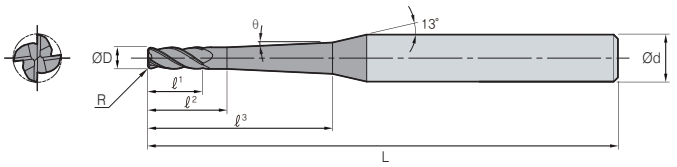
4날 테이퍼 넥 레디우스 엔드밀

CARBIDE | 4 | 30° HELIX | R ±0.01 코너 R | AlCrN | 절삭조건 p.436

• 공구직경공차

ØD		Ød
Ø1 ~ Ø4	0 ~ -0.012mm	h5





(mm)

형 번	R	ØD	Ød	ℓ1	ℓ2	ℓ3	θ	L
UR544015010150	0.1	1.5	4	2.3	3	50	1	90
UR544015010208	0.1	1.5	4	2.3	3	8	1	50
UR544015010210	0.1	1.5	4	2.3	3	10	2	50
UR544015010212	0.1	1.5	4	2.3	3	12	2	50
UR544015010216	0.1	1.5	4	2.3	3	16	2	50
UR544015010220	0.1	1.5	4	2.3	3	20	2	50
UR544015010225	0.1	1.5	4	2.3	3	25	2	60
UR544015010230	0.1	1.5	4	2.3	3	30	2	70
UR544015010240	0.1	1.5	6	2.3	3	40	2	80
UR544015010250	0.1	1.5	6	2.3	3	50	2	90
UR544015020108	0.2	1.5	4	2.3	3	8	2	50
UR544015020110	0.2	1.5	4	2.3	3	10	1	50
UR544015020112	0.2	1.5	4	2.3	3	12	1	50
UR544015020116	0.2	1.5	4	2.3	3	16	1	50
UR544015020120	0.2	1.5	4	2.3	3	20	1	50
UR544015020125	0.2	1.5	4	2.3	3	25	1	60
UR544015020130	0.2	1.5	4	2.3	3	30	1	70
UR544015020140	0.2	1.5	4	2.3	3	40	1	80
UR544015020150	0.2	1.5	4	2.3	3	50	1	90
UR544015020208	0.2	1.5	4	2.3	3	8	1	50
UR544015020210	0.2	1.5	4	2.3	3	10	2	50
UR544015020212	0.2	1.5	4	2.3	3	12	2	50
UR544015020216	0.2	1.5	4	2.3	3	16	2	50
UR544015020220	0.2	1.5	4	2.3	3	20	2	50
UR544015020225	0.2	1.5	4	2.3	3	25	2	60
UR544015020230	0.2	1.5	4	2.3	3	30	2	70
UR544015020240	0.2	1.5	6	2.3	3	40	2	80
UR544015020250	0.2	1.5	6	2.3	3	50	2	90
UR544015030108	0.3	1.5	4	2.3	3	8	2	50
UR544015030110	0.3	1.5	4	2.3	3	10	1	50
UR544015030112	0.3	1.5	4	2.3	3	12	1	50
UR544015030116	0.3	1.5	4	2.3	3	16	1	50
UR544015030120	0.3	1.5	4	2.3	3	20	1	50
UR544015030125	0.3	1.5	4	2.3	3	25	1	60
UR544015030130	0.3	1.5	4	2.3	3	30	1	70
UR544015030140	0.3	1.5	4	2.3	3	40	1	80

형 번	R	ØD	Ød	ℓ1	ℓ2	ℓ3	θ	L
UR544015030150	0.3	1.5	4	2.3	3	50	1	90
UR544015030208	0.3	1.5	4	2.3	3	8	1	50
UR544015030210	0.3	1.5	4	2.3	3	10	2	50
UR544015030212	0.3	1.5	4	2.3	3	12	2	50
UR544015030216	0.3	1.5	4	2.3	3	16	2	50
UR544015030220	0.3	1.5	4	2.3	3	20	2	50
UR544015030225	0.3	1.5	4	2.3	3	25	2	60
UR544015030230	0.3	1.5	4	2.3	3	30	2	70
UR544015030240	0.3	1.5	6	2.3	3	40	2	80
UR544015030250	0.3	1.5	6	2.3	3	50	2	90
UR544020010110	0.1	2	4	2	5	10	2	50
UR544020010112	0.1	2	4	2	5	12	1	50
UR544020010116	0.1	2	4	2	5	16	1	50
UR544020010120	0.1	2	4	2	5	20	1	50
UR544020010125	0.1	2	4	2	5	25	1	60
UR544020010130	0.1	2	4	2	5	30	1	70
UR544020010140	0.1	2	6	2	5	40	1	80
UR544020010150	0.1	2	6	2	5	50	1	100
UR544020010160	0.1	2	6	2	5	60	1	100
UR544020010180	0.1	2	6	2	5	80	1	140
UR544020010210	0.1	2	4	2	5	10	1	50
UR544020010212	0.1	2	4	2	5	12	2	50
UR544020010216	0.1	2	4	2	5	16	2	50
UR544020010220	0.1	2	4	2	5	20	2	50
UR544020010225	0.1	2	4	2	5	25	2	60
UR544020010230	0.1	2	4	2	5	30	2	70
UR544020010240	0.1	2	6	2	5	40	2	80
UR544020010250	0.1	2	6	2	5	50	2	100
UR544020010260	0.1	2	6	2	5	60	2	100
UR544020010280	0.1	2	8	2	5	80	2	140
UR544020020110	0.2	2	4	2	5	10	2	50
UR544020020112	0.2	2	4	2	5	12	1	50
UR544020020116	0.2	2	4	2	5	16	1	50
UR544020020120	0.2	2	4	2	5	20	1	50
UR544020020125	0.2	2	4	2	5	25	1	60
UR544020020130	0.2	2	4	2	5	30	1	70

UR544

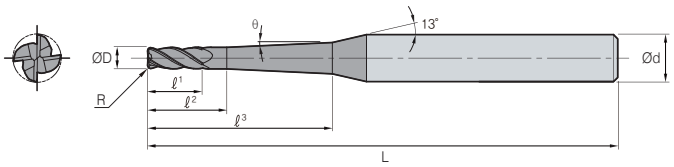
4날 테이퍼 넥 레디우스 엔드밀



CARBIDE | 4 | 30° HELIX | R ±0.01 코너 R | AlCrN | 절삭조건 p.436

• 공구직경공차

ØD		Ød
Ø1 ~ Ø4	0 ~ -0.012mm	h5



(mm)

형 번	R	ØD	Ød	ℓ1	ℓ2	ℓ3	θ	L
UR544020020140	0.2	2	6	2	5	40	1	80
UR544020020150	0.2	2	6	2	5	50	1	100
UR544020020160	0.2	2	6	2	5	60	1	100
UR544020020180	0.2	2	6	2	5	80	1	140
UR544020020210	0.2	2	4	2	5	10	1	50
UR544020020212	0.2	2	4	2	5	12	2	50
UR544020020216	0.2	2	4	2	5	16	2	50
UR544020020220	0.2	2	4	2	5	20	2	50
UR544020020225	0.2	2	4	2	5	25	2	60
UR544020020230	0.2	2	4	2	5	30	2	70
UR544020020240	0.2	2	6	2	5	40	2	80
UR544020020250	0.2	2	6	2	5	50	2	100
UR544020020260	0.2	2	6	2	5	60	2	100
UR544020020280	0.2	2	8	2	5	80	2	140
UR544020030110	0.3	2	4	2	5	10	2	50
UR544020030112	0.3	2	4	2	5	12	1	50
UR544020030116	0.3	2	4	2	5	16	1	50
UR544020030120	0.3	2	4	2	5	20	1	50
UR544020030125	0.3	2	4	2	5	25	1	60
UR544020030130	0.3	2	4	2	5	30	1	70
UR544020030140	0.3	2	6	2	5	40	1	80
UR544020030150	0.3	2	6	2	5	50	1	100
UR544020030160	0.3	2	6	2	5	60	1	100
UR544020030180	0.3	2	6	2	5	80	1	140
UR544020030210	0.3	2	4	2	5	10	1	50
UR544020030212	0.3	2	4	2	5	12	2	50
UR544020030216	0.3	2	4	2	5	16	2	50
UR544020030220	0.3	2	4	2	5	20	2	50
UR544020030225	0.3	2	4	2	5	25	2	60
UR544020030230	0.3	2	4	2	5	30	2	70
UR544020030240	0.3	2	6	2	5	40	2	80
UR544020030250	0.3	2	6	2	5	50	2	100
UR544020030260	0.3	2	6	2	5	60	2	100
UR544020030280	0.3	2	8	2	5	80	2	140
UR544020050110	0.5	2	4	2	5	10	2	50
UR544020050112	0.5	2	4	2	5	12	1	50

형 번	R	ØD	Ød	ℓ1	ℓ2	ℓ3	θ	L
UR544020050116	0.5	2	4	2	5	16	1	50
UR544020050120	0.5	2	4	2	5	20	1	50
UR544020050125	0.5	2	4	2	5	25	1	60
UR544020050130	0.5	2	4	2	5	30	1	70
UR544020050140	0.5	2	6	2	5	40	1	80
UR544020050150	0.5	2	6	2	5	50	1	100
UR544020050160	0.5	2	6	2	5	60	1	100
UR544020050180	0.5	2	6	2	5	80	1	140
UR544020050210	0.5	2	4	2	5	10	1	50
UR544020050212	0.5	2	4	2	5	12	2	50
UR544020050216	0.5	2	4	2	5	16	2	50
UR544020050220	0.5	2	4	2	5	20	2	50
UR544020050225	0.5	2	4	2	5	25	2	60
UR544020050230	0.5	2	4	2	5	30	2	70
UR544020050240	0.5	2	6	2	5	40	2	80
UR544020050250	0.5	2	6	2	5	50	2	100
UR544020050260	0.5	2	6	2	5	60	2	100
UR544020050280	0.5	2	8	2	5	80	2	140
UR544030020116	0.2	3	6	4.5	6	16	2	60
UR544030020120	0.2	3	6	4.5	6	20	1	65
UR544030020130	0.2	3	6	4.5	6	30	1	70
UR544030020140	0.2	3	6	4.5	6	40	1	80
UR544030020150	0.2	3	6	4.5	6	50	1	90
UR544030020160	0.2	3	6	4.5	6	60	1	100
UR544030020216	0.2	3	6	4.5	6	16	1	60
UR544030020220	0.2	3	6	4.5	6	20	2	65
UR544030020230	0.2	3	6	4.5	6	30	2	70
UR544030020240	0.2	3	6	4.5	6	40	2	80
UR544030020250	0.2	3	8	4.5	6	50	2	90
UR544030020260	0.2	3	8	4.5	6	60	2	100
UR544030020270	0.2	3	8	4.5	6	70	2	120
UR544030030116	0.3	3	6	4.5	6	16	2	60
UR544030030120	0.3	3	6	4.5	6	20	1	65
UR544030030130	0.3	3	6	4.5	6	30	1	70
UR544030030140	0.3	3	6	4.5	6	40	1	80
UR544030030150	0.3	3	6	4.5	6	50	1	90

U-Star Endmill

UR544

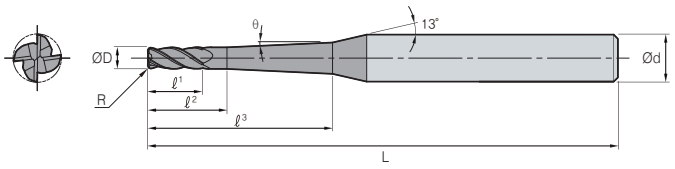
4날 테이퍼 넥 레디우스 엔드밀



CARBIDE | 4 | 30° HELIX | R ±0.01 코너 R | AlCrN | 절삭조건 p.436

• 공구직경공차

ØD		Ød
Ø1 ~ Ø4	0 ~ -0.012mm	h5



(mm)

형 번	R	ØD	Ød	ℓ1	ℓ2	ℓ3	θ	L
UR544030030160	0.3	3	6	4.5	6	60	1	100
UR544030030216	0.3	3	6	4.5	6	16	1	60
UR544030030220	0.3	3	6	4.5	6	20	2	65
UR544030030230	0.3	3	6	4.5	6	30	2	70
UR544030030240	0.3	3	6	4.5	6	40	2	80
UR544030030250	0.3	3	8	4.5	6	50	2	90
UR544030030260	0.3	3	8	4.5	6	60	2	100
UR544030030270	0.3	3	8	4.5	6	70	2	120
UR544030050116	0.5	3	6	4.5	6	16	2	60
UR544030050120	0.5	3	6	4.5	6	20	1	65
UR544030050130	0.5	3	6	4.5	6	30	1	70
UR544030050140	0.5	3	6	4.5	6	40	1	80
UR544030050150	0.5	3	6	4.5	6	50	1	90
UR544030050160	0.5	3	6	4.5	6	60	1	100
UR544030050216	0.5	3	6	4.5	6	16	1	60
UR544030050220	0.5	3	6	4.5	6	20	2	65
UR544030050230	0.5	3	6	4.5	6	30	2	70
UR544030050240	0.5	3	6	4.5	6	40	2	80
UR544030050250	0.5	3	8	4.5	6	50	2	90
UR544030050260	0.5	3	8	4.5	6	60	2	100
UR544030050270	0.5	3	8	4.5	6	70	2	120
UR544040020140	0.2	4	6	6	8	40	2	90
UR544040020150	0.2	4	6	6	8	50	1	100

형 번	R	ØD	Ød	ℓ1	ℓ2	ℓ3	θ	L
UR544040020160	0.2	4	6	6	8	60	1	110
UR544040020170	0.2	4	8	6	8	70	1	120
UR544040020240	0.2	4	8	6	8	40	1	90
UR544040020250	0.2	4	8	6	8	50	2	100
UR544040020260	0.2	4	8	6	8	60	2	110
UR544040020270	0.2	4	10	6	8	70	2	120
UR544040030140	0.3	4	6	6	8	40	2	90
UR544040030150	0.3	4	6	6	8	50	1	100
UR544040030160	0.3	4	6	6	8	60	1	110
UR544040030170	0.3	4	8	6	8	70	1	120
UR544040030240	0.3	4	8	6	8	40	1	90
UR544040030250	0.3	4	8	6	8	50	2	100
UR544040030260	0.3	4	8	6	8	60	2	110
UR544040030270	0.3	4	10	6	8	70	2	120
UR544040050140	0.5	4	6	6	8	40	2	90
UR544040050150	0.5	4	6	6	8	50	1	100
UR544040050160	0.5	4	6	6	8	60	1	110
UR544040050170	0.5	4	8	6	8	70	1	120
UR544040050240	0.5	4	8	6	8	40	1	90
UR544040050250	0.5	4	8	6	8	50	2	100
UR544040050260	0.5	4	8	6	8	60	2	110
UR544040050270	0.5	4	10	6	8	70	2	120

• 적용 피삭재

탄소강 ~ HB225	합금강 HB225~325	프리하든강 HRC30~50	열처리강		주철 ~FCD500	알루미늄	스테인리스강	Ti합금	Ni합금
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○		○				

◎: 매우적합 ○: 적합

UXR504

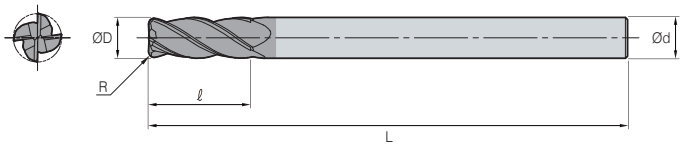
4날 멀티 헬릭스 레디우스 엔드밀

CARBIDE | 4 | 34° HELIX | 36° HELIX | R ±0.02 코너 R | AlCrN | 절삭조건 p.437

• 공구직경공차

ØD		Ød
Ø1 ~ Ø20	0 ~ -0.03mm	h5





(mm)

형 번	R	ØD	Ød	ℓ	L
UXR504010005	0.05	1	6	2.5	50
UXR50401001	0.1	1	6	2.5	50
UXR50401002	0.2	1	6	2.5	50
UXR50401003	0.3	1	6	2.5	50
UXR504012005	0.05	1.2	6	3	50
UXR50401201	0.1	1.2	6	3	50
UXR50401202	0.2	1.2	6	3	50
UXR50401203	0.3	1.2	6	3	50
UXR504015005	0.05	1.5	6	4	50
UXR50401501	0.1	1.5	6	4	50
UXR50401502	0.2	1.5	6	4	50
UXR50401503	0.3	1.5	6	4	50
UXR50401505	0.5	1.5	6	4	50
UXR50402001	0.1	2	6	6	50
UXR50402002	0.2	2	6	6	50
UXR50402003	0.3	2	6	6	50
UXR50402005	0.5	2	6	6	50
UXR50402501	0.1	2.5	6	7	60
UXR50402502	0.2	2.5	6	7	60
UXR50402503	0.3	2.5	6	7	60
UXR50402505	0.5	2.5	6	7	60
UXR50403001	0.1	3	6	8	60
UXR50403002	0.2	3	6	8	60
UXR50403003	0.3	3	6	8	60
UXR50403005	0.5	3	6	8	60
UXR50403010	1	3	6	8	60
UXR50403501	0.1	3.5	6	10	70
UXR50403502	0.2	3.5	6	10	70
UXR50403503	0.3	3.5	6	10	70
UXR50403505	0.5	3.5	6	10	70
UXR50404001	0.1	4	6	10	70
UXR50404001100S4	0.1	4	4	10	100
UXR50404001S4	0.1	4	4	10	70
UXR50404002	0.2	4	6	10	70
UXR50404002100S4	0.2	4	4	10	100
UXR50404002S4	0.2	4	4	10	70

형 번	R	ØD	Ød	ℓ	L
UXR50404003	0.3	4	6	10	70
UXR50404003100S4	0.3	4	4	10	100
UXR50404003S4	0.3	4	4	10	70
UXR50404005	0.5	4	6	10	70
UXR50404005100S4	0.5	4	4	10	100
UXR50404005S4	0.5	4	4	10	70
UXR50404010	1	4	6	10	70
UXR50404010100S4	1	4	4	10	100
UXR50404010S4	1	4	4	10	70
UXR50404501	0.1	4.5	6	11	80
UXR50404502	0.2	4.5	6	11	80
UXR50404503	0.3	4.5	6	11	80
UXR50404505	0.5	4.5	6	11	80
UXR50405001	0.1	5	6	13	90
UXR50405002	0.2	5	6	13	90
UXR50405003	0.3	5	6	13	90
UXR50405005	0.5	5	6	13	90
UXR50405010	1	5	6	13	90
UXR50405501	0.1	5.5	6	13	90
UXR50405502	0.2	5.5	6	13	90
UXR50405503	0.3	5.5	6	13	90
UXR50405505	0.5	5.5	6	13	90
UXR50405510	1	5.5	6	13	90
UXR50406001	0.1	6	6	15	90
UXR50406001060	0.1	6	6	15	60
UXR50406002	0.2	6	6	15	90
UXR50406002060	0.2	6	6	15	60
UXR50406003	0.3	6	6	15	90
UXR50406005	0.5	6	6	15	90
UXR50406005060	0.5	6	6	15	60
UXR50406005110	0.5	6	6	15	110
UXR50406005130	0.5	6	6	15	130
UXR50406010	1	6	6	15	90
UXR50406010060	1	6	6	15	60
UXR50406010110	1	6	6	15	110
UXR50406010130	1	6	6	15	130

U-Star Endmill

UXR504

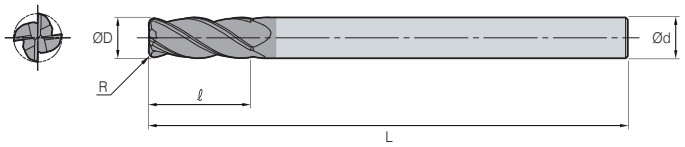
4날 멀티 헬릭스 레디우스 엔드밀



CARBIDE | 4 | 34° HELIX | 36° HELIX | R ±0.02 (코너 R) | AlCrN | 절삭조건 (p.437)

• 공구직경공차

ØD		Ød
Ø1 ~ Ø20	0 ~ -0.03mm	h5



(mm)

형 번	R	ØD	Ød	ℓ	L
UXR50406015	1.5	6	6	15	90
UXR50406020	2	6	6	15	90
UXR50407001	0.1	7	8	16	90
UXR50407002	0.2	7	8	16	90
UXR50407003	0.3	7	8	16	90
UXR50407005	0.5	7	8	16	90
UXR50407010	1	7	8	16	90
UXR50407020	2	7	8	16	90
UXR50408001	0.1	8	8	20	100
UXR50408002	0.2	8	8	20	100
UXR50408003	0.3	8	8	20	100
UXR50408003070	0.3	8	8	20	70
UXR50408005	0.5	8	8	20	100
UXR50408005070	0.5	8	8	20	70
UXR50408005120	0.5	8	8	20	120
UXR50408005150	0.5	8	8	20	150
UXR50408010	1	8	8	20	100
UXR50408010070	1	8	8	20	70
UXR50408010120	1	8	8	20	120
UXR50408010150	1	8	8	20	150
UXR50408015	1.5	8	8	20	100
UXR50408015070	1.5	8	8	20	70
UXR50408020	2	8	8	20	100
UXR50408020070	2	8	8	20	70
UXR50408025	2.5	8	8	20	100
UXR50408030	3	8	8	20	100
UXR50410001	0.1	10	10	25	100
UXR50410002	0.2	10	10	25	100
UXR50410003	0.3	10	10	25	100
UXR50410003075	0.3	10	10	25	75
UXR50410005	0.5	10	10	25	100
UXR50410005075	0.5	10	10	25	75
UXR50410005130	0.5	10	10	22	130
UXR50410005150	0.5	10	10	22	150
UXR50410010	1	10	10	25	100
UXR50410010075	1	10	10	25	75

형 번	R	ØD	Ød	ℓ	L
UXR50410010130	1	10	10	22	130
UXR50410010150	1	10	10	22	150
UXR50410015	1.5	10	10	25	100
UXR50410020	2	10	10	25	100
UXR50410025	2.5	10	10	25	100
UXR50410030	3	10	10	25	100
UXR50410040	4	10	10	25	100
UXR50411002	0.2	11	12	25	110
UXR50411003	0.3	11	12	25	110
UXR50411005	0.5	11	12	25	110
UXR50411010	1	11	12	25	110
UXR50411020	2	11	12	25	110
UXR50412001	0.1	12	12	30	110
UXR50412002	0.2	12	12	30	110
UXR50412003	0.3	12	12	30	110
UXR50412003080	0.3	12	12	30	80
UXR50412005	0.5	12	12	30	110
UXR50412005080	0.5	12	12	30	80
UXR50412005130	0.5	12	12	30	130
UXR50412005150	0.5	12	12	30	150
UXR50412010	1	12	12	30	110
UXR50412010080	1	12	12	30	80
UXR50412010130	1	12	12	30	130
UXR50412010150	1	12	12	30	150
UXR50412015	1.5	12	12	30	110
UXR50412015080	1.5	12	12	30	80
UXR50412020	2	12	12	30	110
UXR50412020080	2	12	12	30	80
UXR50412025	2.5	12	12	30	110
UXR50412025080	2.5	12	12	30	80
UXR50412030	3	12	12	30	110
UXR50412030080	3	12	12	30	80
UXR50412040	4	12	12	30	110
UXR50412050	5	12	12	30	110
UXR50414005	0.5	14	16	35	150
UXR50414010	1	14	16	35	150

UXR504

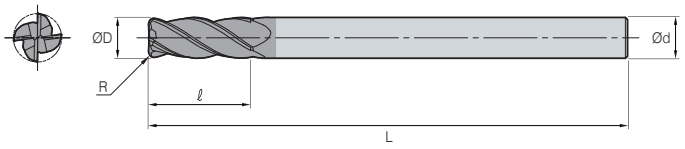
4날 멀티 헬릭스 레디우스 엔드밀

CARBIDE | 4 | 34° HELIX | 36° HELIX | R ±0.02 (코너 R) | AlCrN | 절삭조건 (p.437)

• 공구직경공차

ØD		Ød
Ø1 ~ Ø20	0 ~ -0.03mm	h5





(mm)

형 번	R	ØD	Ød	ℓ	L
UXR50414020	2	14	16	35	150
UXR50416005	0.5	16	16	40	100
UXR50416005150	0.5	16	16	40	150
UXR50416010	1	16	16	40	100
UXR50416010150	1	16	16	40	150
UXR50416015	1.5	16	16	40	100
UXR50416015150	1.5	16	16	40	150
UXR50416020	2	16	16	40	100
UXR50416020150	2	16	16	40	150
UXR50416030	3	16	16	40	100

형 번	R	ØD	Ød	ℓ	L
UXR50420005	0.5	20	20	45	110
UXR50420005150	0.5	20	20	45	150
UXR50420010	1	20	20	45	110
UXR50420010150	1	20	20	45	150
UXR50420015	1.5	20	20	45	110
UXR50420015150	1.5	20	20	45	150
UXR50420020	2	20	20	45	110
UXR50420020150	2	20	20	45	150
UXR50420030	3	20	20	45	110

• 적용 피삭재

탄소강 ~ HB225	합금강 HB225~325	프리하든강 HRC30~50	열처리강		주철 ~FCD500	알루미늄	스테인리스강	Ti합금	Ni합금
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○		○				

◎: 매우적합 ○: 적합

U-Star Endmill

UXR514

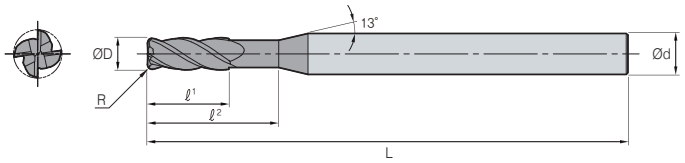
4날 멀티 헬릭스 넥 레디우스 엔드밀



CARBIDE | 4 | 34° HELIX | 36° HELIX | R ±0.02 코너 R | AlCrN | 절삭조건 p.436

• 공구직경공차

ØD		Ød
Ø1 ~ Ø20	0 ~ -0.03mm	h5



(mm)

형 번	R	ØD	Ød	ℓ1	ℓ2	L
UXR51401000503	0.05	1	4	1.5	3	50
UXR51401000504	0.05	1	4	1.5	4	50
UXR51401000506	0.05	1	4	1.5	6	50
UXR51401000508	0.05	1	4	1.5	8	50
UXR51401000510	0.05	1	4	1.5	10	50
UXR51401000512	0.05	1	4	1.5	12	50
UXR51401000514	0.05	1	4	1.5	14	50
UXR51401000516	0.05	1	4	1.5	16	50
UXR51401000520	0.05	1	4	1.5	20	50
UXR5140100103	0.1	1	4	1.5	3	50
UXR5140100104	0.1	1	4	1.5	4	50
UXR5140100106	0.1	1	4	1.5	6	50
UXR5140100108	0.1	1	4	1.5	8	50
UXR5140100110	0.1	1	4	1.5	10	50
UXR5140100112	0.1	1	4	1.5	12	50
UXR5140100114	0.1	1	4	1.5	14	50
UXR5140100116	0.1	1	4	1.5	16	50
UXR5140100120	0.1	1	4	1.5	20	50
UXR5140100203	0.2	1	4	1.5	3	50
UXR5140100204	0.2	1	4	1.5	4	50
UXR5140100206	0.2	1	4	1.5	6	50
UXR5140100208	0.2	1	4	1.5	8	50
UXR5140100210	0.2	1	4	1.5	10	50
UXR5140100212	0.2	1	4	1.5	12	50
UXR5140100214	0.2	1	4	1.5	14	50
UXR5140100216	0.2	1	4	1.5	16	50
UXR5140100220	0.2	1	4	1.5	20	50
UXR5140100303	0.3	1	4	1.5	3	50
UXR5140100304	0.3	1	4	1.5	4	50
UXR5140100306	0.3	1	4	1.5	6	50
UXR5140100308	0.3	1	4	1.5	8	50
UXR5140100310	0.3	1	4	1.5	10	50
UXR5140100312	0.3	1	4	1.5	12	50
UXR5140100314	0.3	1	4	1.5	14	50
UXR5140100316	0.3	1	4	1.5	16	50
UXR5140100320	0.3	1	4	1.5	20	50

형 번	R	ØD	Ød	ℓ1	ℓ2	L
UXR51401200503	0.05	1.2	4	1.8	3	50
UXR51401200504	0.05	1.2	4	1.8	4	50
UXR51401200506	0.05	1.2	4	1.8	6	50
UXR51401200508	0.05	1.2	4	1.8	8	50
UXR51401200510	0.05	1.2	4	1.8	10	50
UXR51401200512	0.05	1.2	4	1.8	12	50
UXR51401200516	0.05	1.2	4	1.8	16	50
UXR51401200520	0.05	1.2	4	1.8	20	50
UXR5140120103	0.1	1.2	4	1.8	3	50
UXR5140120104	0.1	1.2	4	1.8	4	50
UXR5140120106	0.1	1.2	4	1.8	6	50
UXR5140120108	0.1	1.2	4	1.8	8	50
UXR5140120110	0.1	1.2	4	1.8	10	50
UXR5140120112	0.1	1.2	4	1.8	12	50
UXR5140120116	0.1	1.2	4	1.8	16	50
UXR5140120120	0.1	1.2	4	1.8	20	50
UXR5140120203	0.2	1.2	4	1.8	3	50
UXR5140120204	0.2	1.2	4	1.8	4	50
UXR5140120206	0.2	1.2	4	1.8	6	50
UXR5140120208	0.2	1.2	4	1.8	8	50
UXR5140120210	0.2	1.2	4	1.8	10	50
UXR5140120212	0.2	1.2	4	1.8	12	50
UXR5140120216	0.2	1.2	4	1.8	16	50
UXR5140120220	0.2	1.2	4	1.8	20	50
UXR5140120303	0.3	1.2	4	1.8	3	50
UXR5140120304	0.3	1.2	4	1.8	4	50
UXR5140120306	0.3	1.2	4	1.8	6	50
UXR5140120308	0.3	1.2	4	1.8	8	50
UXR5140120310	0.3	1.2	4	1.8	10	50
UXR5140120312	0.3	1.2	4	1.8	12	50
UXR5140120316	0.3	1.2	4	1.8	16	50
UXR5140120320	0.3	1.2	4	1.8	20	50
UXR51401500504	0.05	1.5	4	2.3	4	50
UXR51401500506	0.05	1.5	4	2.3	6	50
UXR51401500508	0.05	1.5	4	2.3	8	50
UXR51401500510	0.05	1.5	4	2.3	10	50

UXR514

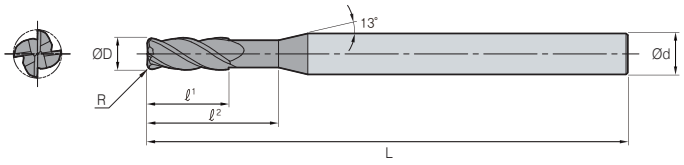
4날 멀티 헬릭스 넥 레디우스 엔드밀



CARBIDE | 4 | 34° HELIX | 36° HELIX | R ±0.02 코너 R | AlCrN | 절삭조건 p.436

• 공구직경공차

ØD		Ød
Ø1 ~ Ø20	0 ~ -0.03mm	h5



(mm)

형 번	R	ØD	Ød	ℓ1	ℓ2	L
UXR51401500512	0.05	1.5	4	2.3	12	50
UXR51401500514	0.05	1.5	4	2.3	14	50
UXR51401500516	0.05	1.5	4	2.3	16	50
UXR51401500520	0.05	1.5	4	2.3	20	50
UXR51401500522	0.05	1.5	4	2.3	22	60
UXR51401500526	0.05	1.5	4	2.3	26	60
UXR5140150104	0.1	1.5	4	2.3	4	50
UXR5140150106	0.1	1.5	4	2.3	6	50
UXR5140150108	0.1	1.5	4	2.3	8	50
UXR5140150110	0.1	1.5	4	2.3	10	50
UXR5140150112	0.1	1.5	4	2.3	12	50
UXR5140150114	0.1	1.5	4	2.3	14	50
UXR5140150116	0.1	1.5	4	2.3	16	50
UXR5140150120	0.1	1.5	4	2.3	20	50
UXR5140150122	0.1	1.5	4	2.3	22	60
UXR5140150126	0.1	1.5	4	2.3	26	60
UXR5140150204	0.2	1.5	4	2.3	4	50
UXR5140150206	0.2	1.5	4	2.3	6	50
UXR5140150208	0.2	1.5	4	2.3	8	50
UXR5140150210	0.2	1.5	4	2.3	10	50
UXR5140150212	0.2	1.5	4	2.3	12	50
UXR5140150214	0.2	1.5	4	2.3	14	50
UXR5140150216	0.2	1.5	4	2.3	16	50
UXR5140150220	0.2	1.5	4	2.3	20	50
UXR5140150222	0.2	1.5	4	2.3	22	60
UXR5140150226	0.2	1.5	4	2.3	26	60
UXR5140150304	0.3	1.5	4	2.3	4	50
UXR5140150306	0.3	1.5	4	2.3	6	50
UXR5140150308	0.3	1.5	4	2.3	8	50
UXR5140150310	0.3	1.5	4	2.3	10	50
UXR5140150312	0.3	1.5	4	2.3	12	50
UXR5140150314	0.3	1.5	4	2.3	14	50
UXR5140150316	0.3	1.5	4	2.3	16	50
UXR5140150320	0.3	1.5	4	2.3	20	50
UXR5140150322	0.3	1.5	4	2.3	22	60
UXR5140150326	0.3	1.5	4	2.3	26	60

형 번	R	ØD	Ød	ℓ1	ℓ2	L
UXR5140150504	0.5	1.5	4	2.3	4	50
UXR5140150506	0.5	1.5	4	2.3	6	50
UXR5140150508	0.5	1.5	4	2.3	8	50
UXR5140150510	0.5	1.5	4	2.3	10	50
UXR5140150512	0.5	1.5	4	2.3	12	50
UXR5140150514	0.5	1.5	4	2.3	14	50
UXR5140150516	0.5	1.5	4	2.3	16	50
UXR5140150520	0.5	1.5	4	2.3	20	50
UXR5140150522	0.5	1.5	4	2.3	22	60
UXR5140150526	0.5	1.5	4	2.3	26	60
UXR5140200106	0.1	2	4	3	6	50
UXR5140200108	0.1	2	4	3	8	50
UXR5140200110	0.1	2	4	3	10	50
UXR5140200112	0.1	2	4	3	12	50
UXR5140200114	0.1	2	4	3	14	50
UXR5140200116	0.1	2	4	3	16	50
UXR5140200120	0.1	2	4	3	20	50
UXR5140200122	0.1	2	4	3	22	60
UXR5140200126	0.1	2	4	3	26	60
UXR5140200130	0.1	2	4	3	30	70
UXR5140200206	0.2	2	4	3	6	50
UXR5140200208	0.2	2	4	3	8	50
UXR5140200210	0.2	2	4	3	10	50
UXR5140200212	0.2	2	4	3	12	50
UXR5140200214	0.2	2	4	3	14	50
UXR5140200216	0.2	2	4	3	16	50
UXR5140200220	0.2	2	4	3	20	50
UXR5140200222	0.2	2	4	3	22	60
UXR5140200226	0.2	2	4	3	26	60
UXR5140200230	0.2	2	4	3	30	70
UXR5140200306	0.3	2	4	3	6	50
UXR5140200308	0.3	2	4	3	8	50
UXR5140200310	0.3	2	4	3	10	50
UXR5140200312	0.3	2	4	3	12	50
UXR5140200314	0.3	2	4	3	14	50
UXR5140200316	0.3	2	4	3	16	50

U-Star Endmill

UXR514

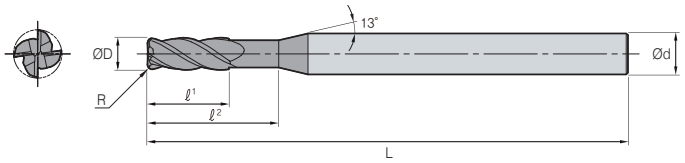
4날 멀티 헬릭스 넥 레디우스 엔드밀



CARBIDE | 4 | 34° HELIX | 36° HELIX | R ±0.02 코너 R | AlCrN | 절삭조건 p.436

• 공구직경공차

ØD		Ød
Ø1 ~ Ø20	0 ~ -0.03mm	h5



(mm)

형 번	R	ØD	Ød	ℓ1	ℓ2	L
UXR5140200320	0.3	2	4	3	20	50
UXR5140200322	0.3	2	4	3	22	60
UXR5140200326	0.3	2	4	3	26	60
UXR5140200330	0.3	2	4	3	30	70
UXR5140200506	0.5	2	4	3	6	50
UXR5140200508	0.5	2	4	3	8	50
UXR5140200510	0.5	2	4	3	10	50
UXR5140200512	0.5	2	4	3	12	50
UXR5140200514	0.5	2	4	3	14	50
UXR5140200516	0.5	2	4	3	16	50
UXR5140200520	0.5	2	4	3	20	50
UXR5140200522	0.5	2	4	3	22	60
UXR5140200526	0.5	2	4	3	26	60
UXR5140200530	0.5	2	4	3	30	70
UXR5140250108	0.1	2.5	4	4	8	50
UXR5140250110	0.1	2.5	4	4	10	50
UXR5140250112	0.1	2.5	4	4	12	50
UXR5140250114	0.1	2.5	4	4	14	50
UXR5140250116	0.1	2.5	4	4	16	50
UXR5140250120	0.1	2.5	4	4	20	50
UXR5140250126	0.1	2.5	4	4	26	60
UXR5140250130	0.1	2.5	4	4	30	70
UXR5140250208	0.2	2.5	4	4	8	50
UXR5140250210	0.2	2.5	4	4	10	50
UXR5140250212	0.2	2.5	4	4	12	50
UXR5140250214	0.2	2.5	4	4	14	50
UXR5140250216	0.2	2.5	4	4	16	50
UXR5140250220	0.2	2.5	4	4	20	50
UXR5140250226	0.2	2.5	4	4	26	60
UXR5140250230	0.2	2.5	4	4	30	70
UXR5140250308	0.3	2.5	4	4	8	50
UXR5140250310	0.3	2.5	4	4	10	50
UXR5140250312	0.3	2.5	4	4	12	50
UXR5140250314	0.3	2.5	4	4	14	50
UXR5140250316	0.3	2.5	4	4	16	50
UXR5140250320	0.3	2.5	4	4	20	50

형 번	R	ØD	Ød	ℓ1	ℓ2	L
UXR5140250326	0.3	2.5	4	4	26	60
UXR5140250330	0.3	2.5	4	4	30	70
UXR5140250508	0.5	2.5	4	4	8	50
UXR5140250510	0.5	2.5	4	4	10	50
UXR5140250512	0.5	2.5	4	4	12	50
UXR5140250514	0.5	2.5	4	4	14	50
UXR5140250516	0.5	2.5	4	4	16	50
UXR5140250520	0.5	2.5	4	4	20	50
UXR5140250526	0.5	2.5	4	4	26	60
UXR5140250530	0.5	2.5	4	4	30	70
UXR5140300108	0.1	3	6	4.5	8	50
UXR5140300110	0.1	3	6	4.5	10	50
UXR5140300112	0.1	3	6	4.5	12	50
UXR5140300114	0.1	3	6	4.5	14	60
UXR5140300116	0.1	3	6	4.5	16	60
UXR5140300120	0.1	3	6	4.5	20	60
UXR5140300126	0.1	3	6	4.5	26	65
UXR5140300130	0.1	3	6	4.5	30	70
UXR5140300135	0.1	3	6	4.5	35	70
UXR5140300140	0.1	3	6	4.5	40	80
UXR5140300208	0.2	3	6	4.5	8	50
UXR5140300210	0.2	3	6	4.5	10	50
UXR5140300212	0.2	3	6	4.5	12	50
UXR5140300214	0.2	3	6	4.5	14	60
UXR5140300216	0.2	3	6	4.5	16	60
UXR5140300220	0.2	3	6	4.5	20	60
UXR5140300226	0.2	3	6	4.5	26	65
UXR5140300230	0.2	3	6	4.5	30	70
UXR5140300235	0.2	3	6	4.5	35	70
UXR5140300240	0.2	3	6	4.5	40	80
UXR5140300308	0.3	3	6	4.5	8	50
UXR5140300310	0.3	3	6	4.5	10	50
UXR5140300312	0.3	3	6	4.5	12	50
UXR5140300314	0.3	3	6	4.5	14	60
UXR5140300316	0.3	3	6	4.5	16	60
UXR5140300320	0.3	3	6	4.5	20	60

UXR514

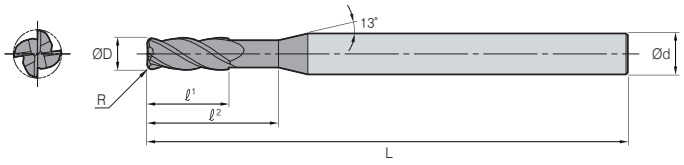
4날 멀티 헬릭스 넥 레디우스 엔드밀



CARBIDE | 4 | 34° HELIX | 36° HELIX | R ±0.02 코너 R | AlCrN | 절삭조건 p.436

• 공구직경공차

ØD		Ød
Ø1 ~ Ø20	0 ~ -0.03mm	h5



(mm)

형 번	R	ØD	Ød	ℓ1	ℓ2	L
UXR5140300326	0.3	3	6	4.5	26	65
UXR5140300330	0.3	3	6	4.5	30	70
UXR5140300335	0.3	3	6	4.5	35	70
UXR5140300340	0.3	3	6	4.5	40	80
UXR5140300508	0.5	3	6	4.5	8	50
UXR5140300510	0.5	3	6	4.5	10	50
UXR5140300512	0.5	3	6	4.5	12	50
UXR5140300514	0.5	3	6	4.5	14	60
UXR5140300516	0.5	3	6	4.5	16	60
UXR5140300520	0.5	3	6	4.5	20	60
UXR5140300526	0.5	3	6	4.5	26	65
UXR5140300530	0.5	3	6	4.5	30	70
UXR5140300535	0.5	3	6	4.5	35	70
UXR5140300540	0.5	3	6	4.5	40	80
UXR5140301008	1	3	6	4.5	8	50
UXR5140301010	1	3	6	4.5	10	50
UXR5140301012	1	3	6	4.5	12	50
UXR5140301014	1	3	6	4.5	14	60
UXR5140301016	1	3	6	4.5	16	60
UXR5140301020	1	3	6	4.5	20	60
UXR5140301026	1	3	6	4.5	26	65
UXR5140301030	1	3	6	4.5	30	70
UXR5140301035	1	3	6	4.5	35	70
UXR5140301040	1	3	6	4.5	40	80
UXR5140400110	0.1	4	6	6	10	50
UXR5140400112	0.1	4	6	6	12	50
UXR5140400114	0.1	4	6	6	14	60
UXR5140400116	0.1	4	6	6	16	60
UXR5140400120	0.1	4	6	6	20	60
UXR5140400126	0.1	4	6	6	26	65
UXR5140400130	0.1	4	6	6	30	70
UXR5140400135	0.1	4	6	6	35	70
UXR5140400140	0.1	4	6	6	40	80
UXR5140400145	0.1	4	6	6	45	90
UXR5140400150	0.1	4	6	6	50	100
UXR5140400210	0.2	4	6	6	10	50

형 번	R	ØD	Ød	ℓ1	ℓ2	L
UXR5140400212	0.2	4	6	6	12	50
UXR5140400214	0.2	4	6	6	14	60
UXR5140400216	0.2	4	6	6	16	60
UXR5140400220	0.2	4	6	6	20	60
UXR5140400226	0.2	4	6	6	26	65
UXR5140400230	0.2	4	6	6	30	70
UXR5140400235	0.2	4	6	6	35	70
UXR5140400240	0.2	4	6	6	40	80
UXR5140400245	0.2	4	6	6	45	90
UXR5140400250	0.2	4	6	6	50	100
UXR5140400310	0.3	4	6	6	10	50
UXR5140400312	0.3	4	6	6	12	50
UXR5140400314	0.3	4	6	6	14	60
UXR5140400316	0.3	4	6	6	16	60
UXR5140400320	0.3	4	6	6	20	60
UXR5140400326	0.3	4	6	6	26	65
UXR5140400330	0.3	4	6	6	30	70
UXR5140400335	0.3	4	6	6	35	70
UXR5140400340	0.3	4	6	6	40	80
UXR5140400345	0.3	4	6	6	45	90
UXR5140400350	0.3	4	6	6	50	100
UXR5140400510	0.5	4	6	6	10	50
UXR5140400512	0.5	4	6	6	12	50
UXR5140400514	0.5	4	6	6	14	60
UXR5140400516	0.5	4	6	6	16	60
UXR5140400520	0.5	4	6	6	20	60
UXR5140400526	0.5	4	6	6	26	65
UXR5140400530	0.5	4	6	6	30	70
UXR5140400535	0.5	4	6	6	35	70
UXR5140400540	0.5	4	6	6	40	80
UXR5140400545	0.5	4	6	6	45	90
UXR5140400550	0.5	4	6	6	50	100
UXR5140401010	1	4	6	6	10	50
UXR5140401012	1	4	6	6	12	50
UXR5140401014	1	4	6	6	14	60
UXR5140401016	1	4	6	6	16	60

U-Star Endmill

UXR514

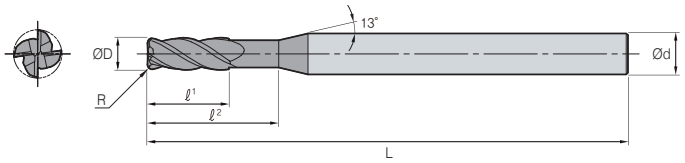
4날 멀티 헬릭스 넥 레디우스 엔드밀



CARBIDE | 4 | 34° HELIX | 36° HELIX | R ±0.02 (코너 R) | AlCrN | 절삭조건 (p.436)

• 공구직경공차

ØD		Ød
Ø1 ~ Ø20	0 ~ -0.03mm	h5



(mm)

형 번	R	ØD	Ød	ℓ1	ℓ2	L
UXR5140401020	1	4	6	6	20	60
UXR5140401026	1	4	6	6	26	65
UXR5140401030	1	4	6	6	30	70
UXR5140401035	1	4	6	6	35	70
UXR5140401040	1	4	6	6	40	80
UXR5140401045	1	4	6	6	45	90
UXR5140401050	1	4	6	6	50	100
UXR51405001	0.1	5	6	8	15	60
UXR51405002	0.2	5	6	8	15	60
UXR51405003	0.3	5	6	8	15	60
UXR51405005	0.5	5	6	8	15	60
UXR51405010	1	5	6	8	15	60
UXR51405015	1.5	5	6	8	15	60
UXR51405020	2	5	6	8	15	60
UXR51406001	0.1	6	6	9	20	60
UXR51406002	0.2	6	6	9	20	60
UXR51406003	0.3	6	6	9	20	60
UXR51406003090	0.3	6	6	15	30	90
UXR51406005	0.5	6	6	9	20	60
UXR51406005090	0.5	6	6	15	30	90
UXR51406010	1	6	6	9	20	60
UXR51406010090	1	6	6	15	30	90
UXR51406015	1.5	6	6	9	20	60
UXR51406020	2	6	6	9	20	60
UXR51408001	0.1	8	8	12	25	70
UXR51408002	0.2	8	8	12	25	70
UXR51408003	0.3	8	8	12	25	70
UXR51408003100	0.3	8	8	20	35	100
UXR51408005	0.5	8	8	12	25	70
UXR51408005100	0.5	8	8	20	35	100
UXR51408010	1	8	8	12	25	70

형 번	R	ØD	Ød	ℓ1	ℓ2	L
UXR51408010100	1	8	8	20	35	100
UXR51408015	1.5	8	8	12	25	70
UXR51408020	2	8	8	12	25	70
UXR51410001	0.1	10	10	15	30	75
UXR51410002	0.2	10	10	15	30	75
UXR51410003	0.3	10	10	15	30	75
UXR51410003100	0.3	10	10	25	40	100
UXR51410005	0.5	10	10	15	30	75
UXR51410005100	0.5	10	10	25	40	100
UXR51410010	1	10	10	15	30	75
UXR51410010100	1	10	10	25	40	100
UXR51410015	1.5	10	10	15	30	75
UXR51410020	2	10	10	15	30	75
UXR51412002	0.2	12	12	18	32	80
UXR51412003	0.3	12	12	18	32	80
UXR51412003110	0.3	12	12	30	45	110
UXR51412005	0.5	12	12	18	32	80
UXR51412005110	0.5	12	12	30	45	110
UXR51412010	1	12	12	18	32	80
UXR51412010110	1	12	12	30	45	110
UXR51412015	1.5	12	12	18	32	80
UXR51412020	2	12	12	18	32	80
UXR51416005	0.5	16	16	20	35	100
UXR51416005150	0.5	16	16	35	50	150
UXR51416010	1	16	16	20	35	100
UXR51416010150	1	16	16	35	50	150
UXR51420005	0.5	20	20	25	40	100
UXR51420005150	0.5	20	20	40	55	150
UXR51420010	1	20	20	25	40	100
UXR51420010150	1	20	20	40	55	150

• 적용 피삭재

탄소강 ~ HB225	합금강 HB225~325	프리하든강 HRC30~50	열처리강		주철 ~FCD500	알루미늄	스테인리스강	Ti합금	Ni합금
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○		○				

◎: 매우적합 ○: 적합

UR506

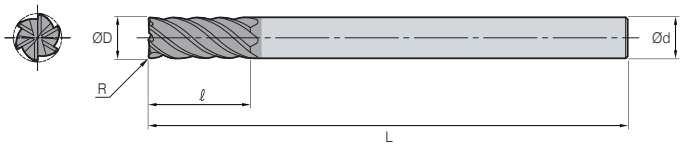
6날 레디우스 엔드밀



CARBIDE | 6 | 45° HELIX | R ±0.015 (코너 R) | AlCrN | 절삭조건 p.437

• 공구직경공차

ØD		Ød
Ø6 ~ Ø20	0 ~ -0.03mm	h5



(mm)

형 번	R	ØD	Ød	ℓ	L
UR50606003	0.3	6	6	15	90
UR50606005	0.5	6	6	15	90
UR50606010	1	6	6	15	90
UR50608003	0.3	8	8	20	100
UR50608005	0.5	8	8	20	100
UR50608010	1	8	8	20	100
UR50610003	0.3	10	10	25	100
UR50610005	0.5	10	10	25	100
UR50610010	1	10	10	25	100
UR50612003	0.3	12	12	30	110
UR50612005	0.5	12	12	30	110
UR50612010	1	12	12	30	110
UR50616005	0.5	16	16	32	150
UR50616010	1	16	16	32	150
UR50616015	1.5	16	16	32	150
UR50616020	2	16	16	32	150
UR50620005	0.5	20	20	38	150
UR50620010	1	20	20	38	150
UR50620015	1.5	20	20	38	150
UR50620020	2	20	20	38	150

• 적용 피삭재

탄소강 ~ HB225	합금강 HB225~325	프리하든강 HRC30~50	열처리강		주철 ~FCD500	알루미늄	스테인리스강	Ti합금	Ni합금
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○		○				

◎: 매우적합 ○: 적합

U-Star Endmill

UDR503

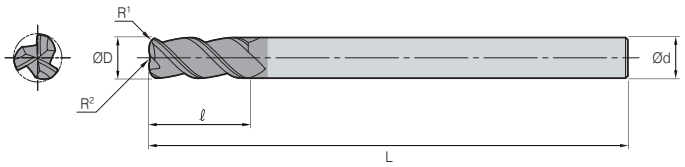
3날 더블 레디우스 엔드밀



CARBIDE | 3 | 45° HELIX | R ±0.02 코너 R | AlCrN | 절삭조건 p.438

• 공구직경공차

ØD		Ød
Ø6 ~ Ø20	0 ~ -0.02mm	h5



(mm)

형 번	R	ØD	Ød	R²	ℓ	L
UDR50306005	0.5	6	6	6	10	90
UDR50306010	1	6	6	6	10	90
UDR50306020	2	6	6	6	10	90
UDR50308005	0.5	8	8	8	16	100
UDR50308010	1	8	8	8	16	100
UDR50308020	2	8	8	8	16	100
UDR50310005	0.5	10	10	10	20	100
UDR50310010	1	10	10	10	20	100
UDR50310020	2	10	10	10	20	100
UDR50312005	0.5	12	12	12	24	110
UDR50312010	1	12	12	12	24	110
UDR50312020	2	12	12	12	24	110
UDR50316005	0.5	16	16	16	32	150
UDR50316010	1	16	16	16	32	150
UDR50320005	0.5	20	20	20	40	150
UDR50320010	1	20	20	20	40	150

• 적용 피삭재

탄소강 ~ HB225	합금강 HB225~325	프리하든강 HRC30~50	열처리강		주철 ~FCD500	알루미늄	스테인리스강	Ti합금	Ni합금
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○		○				

◎: 매우적합 ○: 적합

USPM4

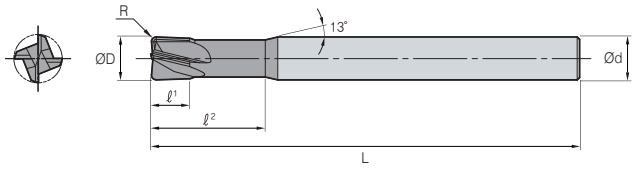
4날 고이송 레디우스 엔드밀



CARBIDE | 4 | 10° HELIX | R ±0.02 코너 R | AlCrN | 절삭조건 p.439

• 공구직경공차

ØD		Ød
Ø1 ~ Ø20	0 ~ -0.03mm	h5



(mm)

형 번	R	ØD	Ød	ℓ1	ℓ2	L
USPM4010-01	0.1	1	6	1	2.5	50
USPM4010-02	0.2	1	6	1	2.5	50
USPM4010-03	0.3	1	6	1	2.5	50
USPM4015-02	0.2	1.5	6	1.5	4	50
USPM4015-03	0.3	1.5	6	1.5	4	50
USPM4015-05	0.5	1.5	6	1.5	4	50
USPM4020-02	0.2	2	6	2	6	50
USPM4020-03	0.3	2	6	2	6	50
USPM4020-05	0.5	2	6	2	6	50
USPM4030-02	0.2	3	6	3	8	50
USPM4030-03	0.3	3	6	3	8	50
USPM4030-05	0.5	3	6	3	8	50
USPM4040-02	0.2	4	6	4	10	50
USPM4040-03	0.3	4	6	4	10	50
USPM4040-05	0.5	4	6	4	10	50
USPM4040-10	1	4	6	4	10	50
USPM4060-02	0.2	6	6	6	15	60
USPM4060-02L	0.2	6	6	6	15	90
USPM4060-03	0.3	6	6	6	15	60
USPM4060-03L	0.3	6	6	6	15	90
USPM4060-05	0.5	6	6	6	15	60
USPM4060-05L	0.5	6	6	6	15	90
USPM4060-10	1	6	6	6	15	60
USPM4060-10L	1	6	6	6	15	90
USPM4060-20	2	6	6	6	15	60
USPM4060-20L	2	6	6	6	15	90
USPM4080-02	0.2	8	8	8	20	70
USPM4080-02L	0.2	8	8	8	20	100
USPM4080-03	0.3	8	8	8	20	70
USPM4080-03L	0.3	8	8	8	20	100
USPM4080-05	0.5	8	8	8	20	70
USPM4080-05L	0.5	8	8	8	20	100
USPM4080-10	1	8	8	8	20	70
USPM4080-10L	1	8	8	8	20	100
USPM4080-20	2	8	8	8	20	70
USPM4080-20L	2	8	8	8	20	100

형 번	R	ØD	Ød	ℓ1	ℓ2	L
USPM4100-02	0.2	10	10	10	25	75
USPM4100-02L	0.2	10	10	10	25	100
USPM4100-03	0.3	10	10	10	25	75
USPM4100-03L	0.3	10	10	10	25	100
USPM4100-05	0.5	10	10	10	25	75
USPM4100-05L	0.5	10	10	10	25	100
USPM4100-10	1	10	10	10	25	75
USPM4100-10L	1	10	10	10	25	100
USPM4100-15	1.5	10	10	10	25	75
USPM4100-15L	1.5	10	10	10	25	100
USPM4100-20	2	10	10	10	25	75
USPM4100-20L	2	10	10	10	25	100
USPM4120-03	0.3	12	12	12	30	80
USPM4120-03L	0.3	12	12	12	30	110
USPM4120-05	0.5	12	12	12	30	80
USPM4120-05L	0.5	12	12	12	30	110
USPM4120-10	1	12	12	12	30	80
USPM4120-10L	1	12	12	12	30	110
USPM4120-15	1.5	12	12	12	30	80
USPM4120-15L	1.5	12	12	12	30	110
USPM4120-20	2	12	12	12	30	80
USPM4120-20L	2	12	12	12	30	110
USPM4120-30	3	12	12	12	30	80
USPM4120-30L	3	12	12	12	30	110
USPM4160-05	0.5	16	16	16	35	100
USPM4160-05L	0.5	16	16	16	35	150
USPM4160-10	1	16	16	16	35	100
USPM4160-10L	1	16	16	16	35	150
USPM4160-20	2	16	16	16	35	100
USPM4160-20L	2	16	16	16	35	150
USPM4200-05	0.5	20	20	20	40	100
USPM4200-05L	0.5	20	20	20	40	150
USPM4200-10	1	20	20	20	40	100
USPM4200-10L	1	20	20	20	40	150
USPM4200-20	2	20	20	20	40	100
USPM4200-20L	2	20	20	20	40	150

• 적용 피삭재

탄소강 ~ HB225	합금강 HB225~325	프리하든강 HRC30~50	열처리강		주철 ~FCD500	알루미늄	스테인리스강	Ti합금	Ni합금
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○		○				

◎: 매우적합 ○: 적합

U-Star Endmill

UTR504

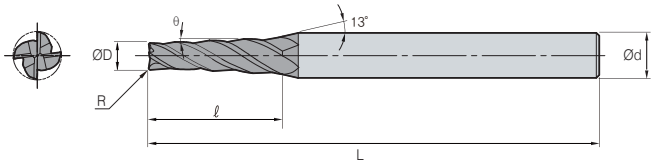
4날 테이퍼 레디우스 엔드밀



CARBIDE | 4 | 30° HELIX | R ±0.01 코너 R | AlCrN | 절삭조건 p.439

• 공구직경공차

ØD		Ød
Ø0.8 ~ Ø2.5	0 ~ -0.03mm	h5



(mm)

형 번	R	ØD	Ød	θ	ℓ	L
UTR504008010104	0.1	0.8	4	1	4	45
UTR504008010106	0.1	0.8	4	1	6	45
UTR504008010108	0.1	0.8	4	1	8	45
UTR5040080101504	0.1	0.8	4	1.5	4	45
UTR5040080101506	0.1	0.8	4	1.5	6	45
UTR5040080101508	0.1	0.8	4	1.5	8	45
UTR504008020104	0.2	0.8	4	1	4	45
UTR504008020106	0.2	0.8	4	1	6	45
UTR504008020108	0.2	0.8	4	1	8	45
UTR5040080201504	0.2	0.8	4	1.5	4	45
UTR5040080201506	0.2	0.8	4	1.5	6	45
UTR5040080201508	0.2	0.8	4	1.5	8	45
UTR504010010104	0.1	1	4	1	4	50
UTR504010010106	0.1	1	4	1	6	50
UTR504010010108	0.1	1	4	1	8	50
UTR504010010110	0.1	1	4	1	10	50
UTR504010010112	0.1	1	4	1	12	50
UTR5040100101504	0.1	1	4	1.5	4	50
UTR5040100101506	0.1	1	4	1.5	6	50
UTR5040100101508	0.1	1	4	1.5	8	50
UTR5040100101510	0.1	1	4	1.5	10	50
UTR5040100101512	0.1	1	4	1.5	12	50
UTR504010010204	0.1	1	4	2	4	50
UTR504010010206	0.1	1	4	2	6	50
UTR504010010208	0.1	1	4	2	8	50
UTR504010010210	0.1	1	4	2	10	50
UTR504010010212	0.1	1	4	2	12	50
UTR504010010304	0.1	1	4	3	4	50
UTR504010010306	0.1	1	4	3	6	50
UTR504010010308	0.1	1	4	3	8	50
UTR504010010310	0.1	1	4	3	10	50
UTR504010010312	0.1	1	4	3	12	50
UTR504010020104	0.2	1	4	1	4	50
UTR504010020106	0.2	1	4	1	6	50
UTR504010020108	0.2	1	4	1	8	50
UTR504010020110	0.2	1	4	1	10	50

형 번	R	ØD	Ød	θ	ℓ	L
UTR504010020112	0.2	1	4	1	12	50
UTR5040100201504	0.2	1	4	1.5	4	50
UTR5040100201506	0.2	1	4	1.5	6	50
UTR5040100201508	0.2	1	4	1.5	8	50
UTR5040100201510	0.2	1	4	1.5	10	50
UTR5040100201512	0.2	1	4	1.5	12	50
UTR504010020204	0.2	1	4	2	4	50
UTR504010020206	0.2	1	4	2	6	50
UTR504010020208	0.2	1	4	2	8	50
UTR504010020210	0.2	1	4	2	10	50
UTR504010020212	0.2	1	4	2	12	50
UTR504010020304	0.2	1	4	3	4	50
UTR504010020306	0.2	1	4	3	6	50
UTR504010020308	0.2	1	4	3	8	50
UTR504010020310	0.2	1	4	3	10	50
UTR504010020312	0.2	1	4	3	12	50
UTR504010030104	0.3	1	4	1	4	50
UTR504010030106	0.3	1	4	1	6	50
UTR504010030108	0.3	1	4	1	8	50
UTR504010030110	0.3	1	4	1	10	50
UTR504010030112	0.3	1	4	1	12	50
UTR5040100301504	0.3	1	4	1.5	4	50
UTR5040100301506	0.3	1	4	1.5	6	50
UTR5040100301508	0.3	1	4	1.5	8	50
UTR5040100301510	0.3	1	4	1.5	10	50
UTR5040100301512	0.3	1	4	1.5	12	50
UTR504010030204	0.3	1	4	2	4	50
UTR504010030206	0.3	1	4	2	6	50
UTR504010030208	0.3	1	4	2	8	50
UTR504010030210	0.3	1	4	2	10	50
UTR504010030212	0.3	1	4	2	12	50
UTR504010030304	0.3	1	4	3	4	50
UTR504010030306	0.3	1	4	3	6	50
UTR504010030308	0.3	1	4	3	8	50
UTR504010030310	0.3	1	4	3	10	50
UTR504010030312	0.3	1	4	3	12	50

UTR504

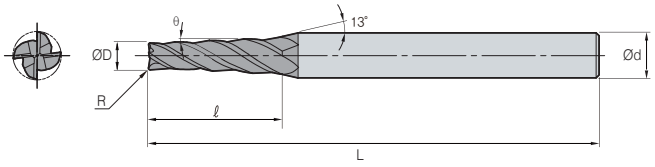
4날 테이퍼 레디우스 엔드밀



CARBIDE | 4 | 30° HELIX | R ±0.01 코너 R | AlCrN | 절삭조건 p.439

• 공구직경공차

ØD		Ød
Ø0.8 ~ Ø2.5	0 ~ -0.03mm	h5



(mm)

형 번	R	ØD	Ød	θ	ℓ	L
UTR504012010106	0.1	1.2	4	1	6	50
UTR504012010108	0.1	1.2	4	1	8	50
UTR504012010110	0.1	1.2	4	1	10	50
UTR504012010112	0.1	1.2	4	1	12	50
UTR504012010206	0.1	1.2	4	2	6	50
UTR504012010208	0.1	1.2	4	2	8	50
UTR504012010210	0.1	1.2	4	2	10	50
UTR504012010212	0.1	1.2	4	2	12	50
UTR504012010306	0.1	1.2	4	3	6	50
UTR504012010308	0.1	1.2	4	3	8	50
UTR504012010310	0.1	1.2	4	3	10	50
UTR504012010312	0.1	1.2	4	3	12	50
UTR504012020106	0.2	1.2	4	1	6	50
UTR504012020108	0.2	1.2	4	1	8	50
UTR504012020110	0.2	1.2	4	1	10	50
UTR504012020112	0.2	1.2	4	1	12	50
UTR504012020206	0.2	1.2	4	2	6	50
UTR504012020208	0.2	1.2	4	2	8	50
UTR504012020210	0.2	1.2	4	2	10	50
UTR504012020212	0.2	1.2	4	2	12	50
UTR504012020306	0.2	1.2	4	3	6	50
UTR504012020308	0.2	1.2	4	3	8	50
UTR504012020310	0.2	1.2	4	3	10	50
UTR504012020312	0.2	1.2	4	3	12	50
UTR504012030106	0.3	1.2	4	1	6	50
UTR504012030108	0.3	1.2	4	1	8	50
UTR504012030110	0.3	1.2	4	1	10	50
UTR504012030112	0.3	1.2	4	1	12	50
UTR504012030206	0.3	1.2	4	2	6	50
UTR504012030208	0.3	1.2	4	2	8	50
UTR504012030210	0.3	1.2	4	2	10	50
UTR504012030212	0.3	1.2	4	2	12	50
UTR504012030306	0.3	1.2	4	3	6	50
UTR504012030308	0.3	1.2	4	3	8	50
UTR504012030310	0.3	1.2	4	3	10	50
UTR504012030312	0.3	1.2	4	3	12	50

형 번	R	ØD	Ød	θ	ℓ	L
UTR504015010106	0.1	1.5	4	1	6	50
UTR504015010108	0.1	1.5	4	1	8	50
UTR504015010110	0.1	1.5	4	1	10	50
UTR504015010112	0.1	1.5	4	1	12	50
UTR504015010116	0.1	1.5	4	1	16	50
UTR504015010120	0.1	1.5	4	1	20	60
UTR504015010206	0.1	1.5	4	2	6	50
UTR504015010208	0.1	1.5	4	2	8	50
UTR504015010210	0.1	1.5	4	2	10	50
UTR504015010212	0.1	1.5	4	2	12	50
UTR504015010216	0.1	1.5	4	2	16	50
UTR504015010220	0.1	1.5	4	2	20	60
UTR504015010306	0.1	1.5	4	3	6	50
UTR504015010308	0.1	1.5	4	3	8	50
UTR504015010310	0.1	1.5	4	3	10	50
UTR504015010312	0.1	1.5	4	3	12	50
UTR504015010316	0.1	1.5	4	3	16	50
UTR504015010320	0.1	1.5	4	3	20	60
UTR504015020106	0.2	1.5	4	1	6	50
UTR504015020108	0.2	1.5	4	1	8	50
UTR504015020110	0.2	1.5	4	1	10	50
UTR504015020112	0.2	1.5	4	1	12	50
UTR504015020116	0.2	1.5	4	1	16	50
UTR504015020120	0.2	1.5	4	1	20	60
UTR504015020206	0.2	1.5	4	2	6	50
UTR504015020208	0.2	1.5	4	2	8	50
UTR504015020210	0.2	1.5	4	2	10	50
UTR504015020212	0.2	1.5	4	2	12	50
UTR504015020216	0.2	1.5	4	2	16	50
UTR504015020220	0.2	1.5	4	2	20	60
UTR504015020306	0.2	1.5	4	3	6	50
UTR504015020308	0.2	1.5	4	3	8	50
UTR504015020310	0.2	1.5	4	3	10	50
UTR504015020312	0.2	1.5	4	3	12	50
UTR504015020316	0.2	1.5	4	3	16	50
UTR504015020320	0.2	1.5	4	3	20	60

U-Star Endmill

UTR504

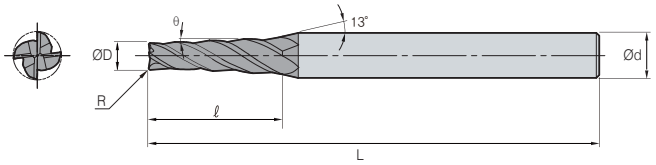
4날 테이퍼 레디우스 엔드밀

CARBIDE | 4 | 30° HELIX | R ±0.01 코너 R | AlCrN | 절삭조건 p.439

• 공구직경공차

ØD		Ød
Ø0.8 ~ Ø2.5	0 ~ -0.03mm	h5





(mm)

형 번	R	ØD	Ød	θ	ℓ	L
UTR504015030106	0.3	1.5	4	1	6	50
UTR504015030108	0.3	1.5	4	1	8	50
UTR504015030110	0.3	1.5	4	1	10	50
UTR504015030112	0.3	1.5	4	1	12	50
UTR504015030116	0.3	1.5	4	1	16	50
UTR504015030120	0.3	1.5	4	1	20	60
UTR504015030206	0.3	1.5	4	2	6	50
UTR504015030208	0.3	1.5	4	2	8	50
UTR504015030210	0.3	1.5	4	2	10	50
UTR504015030212	0.3	1.5	4	2	12	50
UTR504015030216	0.3	1.5	4	2	16	50
UTR504015030220	0.3	1.5	4	2	20	60
UTR504015030306	0.3	1.5	4	3	6	50
UTR504015030308	0.3	1.5	4	3	8	50
UTR504015030310	0.3	1.5	4	3	10	50
UTR504015030312	0.3	1.5	4	3	12	50
UTR504015030316	0.3	1.5	4	3	16	50
UTR504015030320	0.3	1.5	4	3	20	60
UTR504020010108	0.1	2	4	1	8	50
UTR504020010110	0.1	2	4	1	10	50
UTR504020010112	0.1	2	4	1	12	50
UTR504020010116	0.1	2	4	1	16	50
UTR504020010120	0.1	2	4	1	20	60
UTR504020010125	0.1	2	4	1	25	60
UTR504020010208	0.1	2	4	2	8	50
UTR504020010210	0.1	2	4	2	10	50
UTR504020010212	0.1	2	4	2	12	50
UTR504020010216	0.1	2	4	2	16	50
UTR504020010220	0.1	2	4	2	20	60
UTR504020010225	0.1	2	4	2	25	60
UTR504020010308	0.1	2	4	3	8	50
UTR504020010310	0.1	2	4	3	10	50
UTR504020010312	0.1	2	4	3	12	50
UTR504020010316	0.1	2	4	3	16	50
UTR504020010320	0.1	2	6	3	20	60
UTR504020010325	0.1	2	6	3	25	60

형 번	R	ØD	Ød	θ	ℓ	L
UTR504020020108	0.2	2	4	1	8	50
UTR504020020110	0.2	2	4	1	10	50
UTR504020020112	0.2	2	4	1	12	50
UTR504020020116	0.2	2	4	1	16	50
UTR504020020120	0.2	2	4	1	20	60
UTR504020020125	0.2	2	4	1	25	60
UTR504020020208	0.2	2	4	2	8	50
UTR504020020210	0.2	2	4	2	10	50
UTR504020020212	0.2	2	4	2	12	50
UTR504020020216	0.2	2	4	2	16	50
UTR504020020220	0.2	2	4	2	20	60
UTR504020020225	0.2	2	4	2	25	60
UTR504020020308	0.2	2	4	3	8	50
UTR504020020310	0.2	2	4	3	10	50
UTR504020020312	0.2	2	4	3	12	50
UTR504020020316	0.2	2	4	3	16	50
UTR504020020320	0.2	2	6	3	20	60
UTR504020020325	0.2	2	6	3	25	60
UTR504020030108	0.3	2	4	1	8	50
UTR504020030110	0.3	2	4	1	10	50
UTR504020030112	0.3	2	4	1	12	50
UTR504020030116	0.3	2	4	1	16	50
UTR504020030120	0.3	2	4	1	20	60
UTR504020030125	0.3	2	4	1	25	60
UTR504020030208	0.3	2	4	2	8	50
UTR504020030210	0.3	2	4	2	10	50
UTR504020030212	0.3	2	4	2	12	50
UTR504020030216	0.3	2	4	2	16	50
UTR504020030220	0.3	2	4	2	20	60
UTR504020030225	0.3	2	4	2	25	60
UTR504020030308	0.3	2	4	3	8	50
UTR504020030310	0.3	2	4	3	10	50
UTR504020030312	0.3	2	4	3	12	50
UTR504020030316	0.3	2	4	3	16	50
UTR504020030320	0.3	2	6	3	20	60
UTR504020030325	0.3	2	6	3	25	60

UTR504

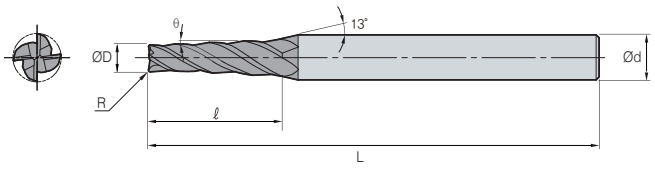
4날 테이퍼 레디우스 엔드밀



CARBIDE | 4 | 30° HELIX | R ±0.01 코너 R | AlCrN | 절삭조건 p.439

• 공구직경공차

ØD		Ød
Ø0.8 ~ Ø2.5	0 ~ -0.03mm	h5



(mm)

형 번	R	ØD	Ød	θ	ℓ	L
UTR504025010110	0.1	2.5	4	1	10	50
UTR504025010112	0.1	2.5	4	1	12	50
UTR504025010116	0.1	2.5	4	1	16	50
UTR504025010120	0.1	2.5	4	1	20	60
UTR504025010125	0.1	2.5	4	1	25	60
UTR504025010130	0.1	2.5	4	1	30	60
UTR504025010210	0.1	2.5	4	2	10	50
UTR504025010212	0.1	2.5	4	2	12	50
UTR504025010216	0.1	2.5	4	2	16	50
UTR504025010220	0.1	2.5	4	2	20	60
UTR504025010225	0.1	2.5	6	2	25	60
UTR504025010230	0.1	2.5	6	2	30	60
UTR504025010310	0.1	2.5	4	3	10	50
UTR504025010312	0.1	2.5	4	3	12	50
UTR504025010316	0.1	2.5	6	3	16	50
UTR504025010320	0.1	2.5	6	3	20	60
UTR504025010325	0.1	2.5	6	3	25	60
UTR504025010330	0.1	2.5	6	3	30	60
UTR504025020110	0.2	2.5	4	1	10	50
UTR504025020112	0.2	2.5	4	1	12	50
UTR504025020116	0.2	2.5	4	1	16	50
UTR504025020120	0.2	2.5	4	1	20	60
UTR504025020125	0.2	2.5	4	1	25	60
UTR504025020130	0.2	2.5	4	1	30	60
UTR504025020210	0.2	2.5	4	2	10	50
UTR504025020212	0.2	2.5	4	2	12	50
UTR504025020216	0.2	2.5	4	2	16	50

형 번	R	ØD	Ød	θ	ℓ	L
UTR504025020220	0.2	2.5	4	2	20	60
UTR504025020225	0.2	2.5	6	2	25	60
UTR504025020230	0.2	2.5	6	2	30	60
UTR504025020310	0.2	2.5	4	3	10	50
UTR504025020312	0.2	2.5	4	3	12	50
UTR504025020316	0.2	2.5	6	3	16	50
UTR504025020320	0.2	2.5	6	3	20	60
UTR504025020325	0.2	2.5	6	3	25	60
UTR504025020330	0.2	2.5	6	3	30	60
UTR504025030110	0.3	2.5	4	1	10	50
UTR504025030112	0.3	2.5	4	1	12	50
UTR504025030116	0.3	2.5	4	1	16	50
UTR504025030120	0.3	2.5	4	1	20	60
UTR504025030125	0.3	2.5	4	1	25	60
UTR504025030130	0.3	2.5	4	1	30	60
UTR504025030212	0.3	2.5	4	2	12	50
UTR504025030216	0.3	2.5	4	2	16	50
UTR504025030220	0.3	2.5	4	2	20	60
UTR504025030225	0.3	2.5	6	2	25	60
UTR504025030230	0.3	2.5	6	2	30	60
UTR504025030310	0.3	2.5	4	3	10	50
UTR504025030312	0.3	2.5	4	3	12	50
UTR504025030316	0.3	2.5	6	3	16	50
UTR504025030320	0.3	2.5	6	3	20	60
UTR504025030325	0.3	2.5	6	3	25	60
UTR504025030330	0.3	2.5	6	3	30	60

• 적용 피삭재

탄소강 ~ HB225	합금강 HB225~325	프리하든강 HRC30~50	열처리강		주철 ~FCD500	알루미늄	스테인리스강	Ti합금	Ni합금
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○		○				

◎: 매우적합 ○: 적합

U-Star Endmill

UB502

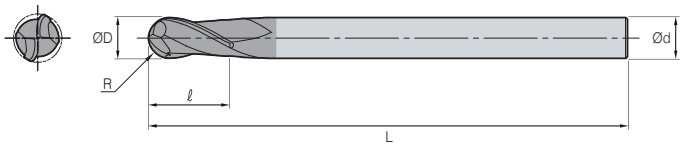
2날 볼 엔드밀



CARBIDE | 2 | 30° HELIX | R ±0.01 | R ±0.005 (코너 R) | AlCrN | 절삭조건 (p.440)

• 공구직경공차

ØD		Ød
Ø0.1 ~ Ø6	0 ~ -0.012mm	h5
Ø6.5 ~ Ø25	0 ~ -0.015mm	



(mm)

형 번	R	ØD	Ød	ℓ	L
UB502001S	0.05	0.1	4	0.1	40
UB502001	0.05	0.1	4	0.2	40
UB502001S3	0.05	0.1	3	0.2	40
UB5020015S	0.075	0.15	4	0.15	40
UB5020015	0.075	0.15	4	0.3	40
UB5020015S3	0.075	0.15	3	0.3	40
UB502002S	0.1	0.2	4	0.2	40
UB502002	0.1	0.2	4	0.4	40
UB502002S3	0.1	0.2	3	0.4	40
UB502003S	0.15	0.3	4	0.3	40
UB502003	0.15	0.3	4	0.6	40
UB502003S3	0.15	0.3	3	0.6	40
UB502004S	0.2	0.4	4	0.4	40
UB502004	0.2	0.4	4	0.8	40
UB502004S3	0.2	0.4	3	0.8	40
UB502005S	0.25	0.5	4	0.5	40
UB502005	0.25	0.5	4	1	40
UB502005S3	0.25	0.5	3	1	40
UB502006S	0.3	0.6	4	0.6	40
UB502006	0.3	0.6	4	1.2	40
UB502006S3	0.3	0.6	3	1.2	40
UB502007S	0.35	0.7	4	0.7	40
UB502007	0.35	0.7	4	1.4	40
UB502007S3	0.35	0.7	3	1.4	40
UB502008S	0.4	0.8	4	0.8	40
UB502008	0.4	0.8	4	1.6	40
UB502008S3	0.4	0.8	3	1.6	40
UB502009S	0.45	0.9	4	0.9	40
UB502009	0.45	0.9	4	1.8	40
UB502009S3	0.45	0.9	3	1.8	40
UB502010S	0.5	1	6	1.5	40
UB502010S3	0.5	1	3	2.5	50
UB502010S4	0.5	1	4	2.5	50
UB502010	0.5	1	6	2.5	50
UB502010070	0.5	1	6	2.5	70
UB502010100	0.5	1	6	2.5	100
UB502012S	0.6	1.2	6	2	40

형 번	R	ØD	Ød	ℓ	L
UB502012S3	0.6	1.2	3	3	50
UB502012S4	0.6	1.2	4	3	50
UB502012	0.6	1.2	6	3	50
UB502012070	0.6	1.2	6	3	70
UB502012100	0.6	1.2	6	3	100
UB502015S	0.75	1.5	6	2.5	40
UB502015S3	0.75	1.5	3	4	50
UB502015S4	0.75	1.5	4	4	50
UB502015	0.75	1.5	6	4	50
UB502015070	0.75	1.5	6	4	70
UB502015100	0.75	1.5	6	4	100
UB502020S	1	2	6	3	40
UB502020S3	1	2	3	5	50
UB502020S4	1	2	4	5	50
UB502020	1	2	6	5	50
UB502020080	1	2	6	5	80
UB502020100	1	2	6	5	100
UB502025S	1.25	2.5	6	4	40
UB502025S3	1.25	2.5	3	6	60
UB502025S4	1.25	2.5	4	6	60
UB502025	1.25	2.5	6	6	60
UB502025080	1.25	2.5	6	6	80
UB502025100	1.25	2.5	6	6	100
UB502030S	1.5	3	6	4.5	40
UB502030S3	1.5	3	3	6	60
UB502030S4	1.5	3	4	6	60
UB502030	1.5	3	6	6	60
UB502030080	1.5	3	6	6	80
UB502030100	1.5	3	6	6	100
UB502035	1.75	3.5	6	8	70
UB502040S	2	4	6	6	50
UB502040S4	2	4	4	8	70
UB502040	2	4	6	8	70
UB502040100S4	2	4	4	8	100
UB502040120S4	2	4	4	8	120
UB502040100	2	4	6	8	100
UB502040120	2	4	6	8	120

UB502

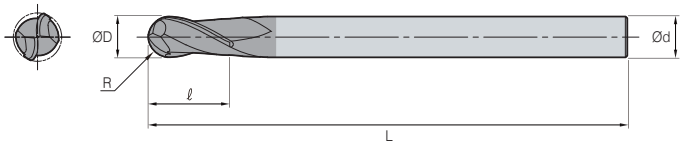
2날 볼 엔드밀



CARBIDE | 2 | 30° HELIX | R ±0.01 | R ±0.005 (코너 R) | AlCrN | 절삭조건 (p.440)

• 공구직경공차

ØD		Ød
Ø0.1 ~ Ø6	0 ~ -0.012mm	h5
Ø6.5 ~ Ø25	0 ~ -0.015mm	



(mm)

형 번	R	ØD	Ød	ℓ	L
UB502045	2.25	4.5	6	9	80
UB502050S	2.5	5	6	7.5	60
UB502050	2.5	5	6	10	80
UB502050S5	2.5	5	5	10	80
UB502055	2.75	5.5	6	11	90
UB502060S	3	6	6	9	50
UB502060060	3	6	6	9	60
UB502060080	3	6	6	9	80
UB502060	3	6	6	12	90
UB502060110	3	6	6	12	110
UB502060130	3	6	6	12	130
UB502060150	3	6	6	12	150
UB502065	3.25	6.5	8	13	90
UB502070	3.5	7	8	14	90
UB502080S	4	8	8	12	50
UB502080060	4	8	8	12	60
UB502080080	4	8	8	12	80
UB502080090	4	8	8	12	90
UB502080	4	8	8	14	100
UB502080130	4	8	8	14	130
UB502080150	4	8	8	14	150
UB502085	4.25	8.5	10	16	100
UB502090	4.5	9	10	18	100
UB502100S	5	10	10	15	50
UB502100060	5	10	10	15	60
UB502100080	5	10	10	15	80
UB502100090	5	10	10	15	90
UB502100	5	10	10	18	100
UB502100130	5	10	10	18	130
UB502100150	5	10	10	18	150

형 번	R	ØD	Ød	ℓ	L
UB502100180	5	10	10	18	180
UB502100200	5	10	10	18	200
UB502110	5.5	11	12	20	100
UB502120S	6	12	12	18	60
UB502120080	6	12	12	18	80
UB502120090	6	12	12	18	90
UB502120100	6	12	12	18	100
UB502120	6	12	12	24	110
UB502120130	6	12	12	24	130
UB502120150	6	12	12	24	150
UB502120180	6	12	12	24	180
UB502120200	6	12	12	24	200
UB502130	6.5	13	12	24	100
UB502140S12	7	14	12	26	100
UB502140	7	14	14	26	100
UB502140S16	7	14	16	26	100
UB502150	7.5	15	16	28	140
UB502160100	8	16	16	24	100
UB502160130	8	16	16	24	130
UB502160	8	16	16	30	150
UB502160180	8	16	16	30	180
UB502160200	8	16	16	30	200
UB502180S16	9	18	16	34	150
UB502180	9	18	18	34	150
UB502200100	10	20	20	30	100
UB502200130	10	20	20	30	130
UB502200	10	20	20	38	150
UB502200200	10	20	20	38	200
UB502250120	12.5	25	25	50	120
UB502250180	12.5	25	25	50	180

• 적용 피삭재

탄소강 ~ HB225	합금강 HB225~325	프리하든강 HRC30~50	열처리강		주철 ~FCD500	알루미늄	스테인리스강	Ti합금	Ni합금
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○		○				

◎: 매우적합 ○: 적합

U-Star Endmill

UB502...P

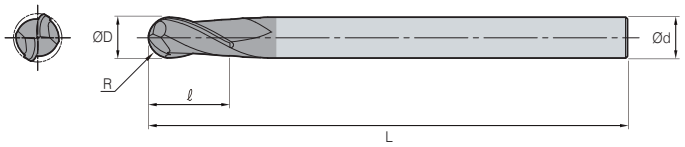
2날 고정밀 볼 엔드밀



CARBIDE | 2 | 30° HELIX | R ±0.01 | R ±0.002 (코너 R) | AlCrN | 절삭조건 p.440

• 공구직경공차

ØD		Ød
Ø0.1 ~ Ø6	0 ~ -0.012mm	h5
Ø6.5 ~ Ø25	0 ~ -0.015mm	



(mm)

형 번	R	ØD	Ød	ℓ	L
UB502001P	0.05	0.1	4	0.2	40
UB5020015P	0.075	0.15	4	0.3	40
UB502002P	0.1	0.2	4	0.4	40
UB502003P	0.15	0.3	4	0.6	40
UB502004P	0.2	0.4	4	0.8	40
UB502005P	0.25	0.5	4	1	40
UB502006P	0.3	0.6	4	1.2	40
UB502007P	0.35	0.7	4	1.4	40
UB502008P	0.4	0.8	4	1.6	40
UB502009P	0.45	0.9	4	1.8	40
UB502010P	0.5	1	6	2.5	50
UB502012P	0.6	1.2	6	3	50
UB502015P	0.75	1.5	6	4	50
UB502020P	1	2	6	5	50
UB502025P	1.25	2.5	6	6	60
UB502030P	1.5	3	6	6	60
UB502040P	2	4	6	8	70
UB502050P	2.5	5	6	10	80
UB502060P	3	6	6	12	90
UB502080P	4	8	8	14	100
UB502100P	5	10	10	18	100
UB502120P	6	12	12	24	110

• 적용 피삭재

탄소강 ~ HB225	합금강 HB225~325	프리하든강 HRC30~50	열처리강		주철 ~FCD500	알루미늄	스테인리스강	Ti합금	Ni합금
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○		○				

◎: 매우적합 ○: 적합

UB512

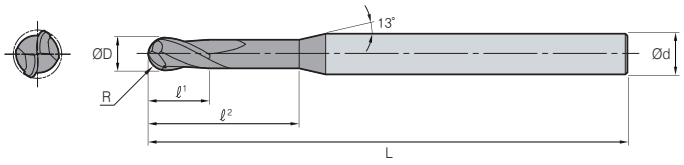
2날 롱 넥 볼 엔드밀



CARBIDE | 2 | 30° HELIX | R ±0.01 | R ±0.005 (코너 R) | AlCrN | 절삭조건 p.441~445

• 공구직경공차

ØD		Ød
Ø0.1 ~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	



(mm)

형 번	R	ØD	Ød	ℓ1	ℓ2	L
UB512001002	0.05	0.1	4	0.1	0.2	40
UB512001003	0.05	0.1	4	0.1	0.3	40
UB512001005	0.05	0.1	4	0.1	0.5	40
UB51200101	0.05	0.1	4	0.1	1	40
UB512002005	0.1	0.2	4	0.2	0.5	40
UB51200201	0.1	0.2	4	0.2	1	40
UB512002015	0.1	0.2	4	0.2	1.5	40
UB51200202	0.1	0.2	4	0.2	2	40
UB51200203	0.1	0.2	4	0.2	3	40
UB51200301	0.15	0.3	4	0.3	1	40
UB512003015	0.15	0.3	4	0.3	1.5	40
UB51200302	0.15	0.3	4	0.3	2	40
UB512003025	0.15	0.3	4	0.3	2.5	40
UB51200303	0.15	0.3	4	0.3	3	40
UB51200304	0.15	0.3	4	0.3	4	40
UB51200305	0.15	0.3	4	0.3	5	40
UB51200401	0.2	0.4	4	0.4	1	40
UB512004015	0.2	0.4	4	0.4	1.5	40
UB51200402	0.2	0.4	4	0.4	2	40
UB512004025	0.2	0.4	4	0.4	2.5	40
UB51200403	0.2	0.4	4	0.4	3	40
UB51200404	0.2	0.4	4	0.4	4	40
UB51200405	0.2	0.4	4	0.4	5	40
UB51200406	0.2	0.4	4	0.4	6	40
UB51200408	0.2	0.4	4	0.4	8	40
UB51200410	0.2	0.4	4	0.4	10	40
UB51200501	0.25	0.5	4	0.5	1	45
UB512005015	0.25	0.5	4	0.5	1.5	45
UB51200502	0.25	0.5	4	0.5	2	45
UB512005025	0.25	0.5	4	0.5	2.5	45
UB51200503	0.25	0.5	4	0.5	3	45
UB51200504	0.25	0.5	4	0.5	4	45
UB51200505	0.25	0.5	4	0.5	5	45
UB51200506	0.25	0.5	4	0.5	6	45

형 번	R	ØD	Ød	ℓ1	ℓ2	L
UB51200508	0.25	0.5	4	0.5	8	45
UB51200510	0.25	0.5	4	0.5	10	45
UB51200512	0.25	0.5	4	0.5	12	45
UB51200514	0.25	0.5	4	0.5	14	45
UB51200516	0.25	0.5	4	0.5	16	45
UB51200601	0.3	0.6	4	0.6	1	45
UB51200602	0.3	0.6	4	0.6	2	45
UB51200603	0.3	0.6	4	0.6	3	45
UB51200604	0.3	0.6	4	0.6	4	45
UB51200605	0.3	0.6	4	0.6	5	45
UB51200606	0.3	0.6	4	0.6	6	45
UB51200608	0.3	0.6	4	0.6	8	45
UB51200610	0.3	0.6	4	0.6	10	45
UB51200612	0.3	0.6	4	0.6	12	45
UB51200614	0.3	0.6	4	0.6	14	45
UB51200616	0.3	0.6	4	0.6	16	45
UB51200702	0.35	0.7	4	0.7	2	45
UB51200704	0.35	0.7	4	0.7	4	45
UB51200706	0.35	0.7	4	0.7	6	45
UB51200708	0.35	0.7	4	0.7	8	45
UB51200710	0.35	0.7	4	0.7	10	45
UB51200712	0.35	0.7	4	0.7	12	45
UB51200801	0.4	0.8	4	0.8	1	45
UB51200802	0.4	0.8	4	0.8	2	45
UB51200803	0.4	0.8	4	0.8	3	45
UB51200804	0.4	0.8	4	0.8	4	45
UB51200805	0.4	0.8	4	0.8	5	45
UB51200806	0.4	0.8	4	0.8	6	45
UB51200807	0.4	0.8	4	0.8	7	45
UB51200808	0.4	0.8	4	0.8	8	45
UB51200810	0.4	0.8	4	0.8	10	45
UB51200812	0.4	0.8	4	0.8	12	45
UB51200814	0.4	0.8	4	0.8	14	45
UB51200816	0.4	0.8	4	0.8	16	45

U-Star Endmill

UB512

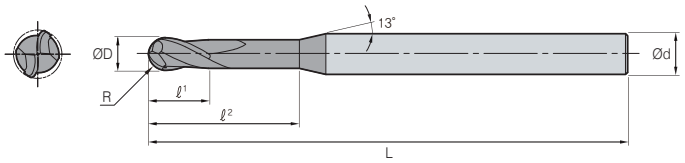
2날 롱 넥 볼 엔드밀



CARBIDE | 2 | 30° HELIX | R ±0.01 | R ±0.005 코너 R | AlCrN | 절삭조건 p.441~445

• 공구직경공차

ØD		Ød
Ø0.1 ~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	



(mm)

형 번	R	ØD	Ød	ℓ1	ℓ2	L
UB51200820	0.4	0.8	4	0.8	20	45
UB51200904	0.45	0.9	4	0.9	4	45
UB51200906	0.45	0.9	4	0.9	6	45
UB51200908	0.45	0.9	4	0.9	8	45
UB51200910	0.45	0.9	4	0.9	10	45
UB51201002	0.5	1	4	1	2	50
UB512010025	0.5	1	4	1	2.5	50
UB51201003	0.5	1	4	1	3	50
UB51201004	0.5	1	4	1	4	50
UB51201005	0.5	1	4	1	5	50
UB51201006	0.5	1	4	1	6	50
UB51201007	0.5	1	4	1	7	50
UB51201008	0.5	1	4	1	8	50
UB51201009	0.5	1	4	1	9	50
UB51201010	0.5	1	4	1	10	50
UB51201012	0.5	1	4	1	12	50
UB51201014	0.5	1	4	1	14	50
UB51201016	0.5	1	4	1	16	50
UB51201018	0.5	1	4	1	18	50
UB51201020	0.5	1	4	1	20	55
UB51201022	0.5	1	4	1	22	60
UB51201026	0.5	1	4	1	26	60
UB51201030	0.5	1	4	1	30	70
UB51201040	0.5	1	4	1	40	80
UB51201050	0.5	1	4	1	50	100
UB51201204	0.6	1.2	4	1.2	4	50
UB51201206	0.6	1.2	4	1.2	6	50
UB51201208	0.6	1.2	4	1.2	8	50
UB51201210	0.6	1.2	4	1.2	10	50
UB51201212	0.6	1.2	4	1.2	12	50
UB51201214	0.6	1.2	4	1.2	14	50
UB51201216	0.6	1.2	4	1.2	16	50
UB51201220	0.6	1.2	4	1.2	20	55
UB51201226	0.6	1.2	4	1.2	26	60

형 번	R	ØD	Ød	ℓ1	ℓ2	L
UB51201406	0.7	1.4	4	1.4	6	50
UB51201408	0.7	1.4	4	1.4	8	50
UB51201410	0.7	1.4	4	1.4	10	50
UB51201412	0.7	1.4	4	1.4	12	50
UB51201416	0.7	1.4	4	1.4	16	50
UB51201503	0.75	1.5	4	1.5	3	50
UB51201504	0.75	1.5	4	1.5	4	50
UB51201505	0.75	1.5	4	1.5	5	50
UB51201506	0.75	1.5	4	1.5	6	50
UB51201507	0.75	1.5	4	1.5	7	50
UB51201508	0.75	1.5	4	1.5	8	50
UB51201510	0.75	1.5	4	1.5	10	50
UB51201512	0.75	1.5	4	1.5	12	50
UB51201514	0.75	1.5	4	1.5	14	50
UB51201516	0.75	1.5	4	1.5	16	50
UB51201518	0.75	1.5	4	1.5	18	50
UB51201520	0.75	1.5	4	1.5	20	55
UB51201522	0.75	1.5	4	1.5	22	60
UB51201526	0.75	1.5	4	1.5	26	60
UB51201530	0.75	1.5	4	1.5	30	70
UB51201535	0.75	1.5	4	1.5	35	70
UB51201540	0.75	1.5	4	1.5	40	80
UB51201604	0.8	1.6	4	1.6	4	50
UB51201606	0.8	1.6	4	1.6	6	50
UB51201608	0.8	1.6	4	1.6	8	50
UB51201610	0.8	1.6	4	1.6	10	50
UB51201612	0.8	1.6	4	1.6	12	50
UB51201616	0.8	1.6	4	1.6	16	50
UB51201620	0.8	1.6	4	1.6	20	50
UB51201804	0.9	1.8	4	1.8	4	50
UB51201806	0.9	1.8	4	1.8	6	50
UB51201808	0.9	1.8	4	1.8	8	50
UB51201810	0.9	1.8	4	1.8	10	50
UB51201812	0.9	1.8	4	1.8	12	50

UB512

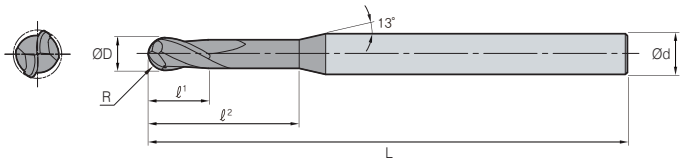
2날 롱 넥 볼 엔드밀



CARBIDE | 2 | 30° HELIX | R ±0.01 | R ±0.005 (코너 R) | AlCrN | 절삭조건 p.441~445

• 공구직경공차

ØD		Ød
Ø0.1 ~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	



(mm)

형 번	R	ØD	Ød	ℓ1	ℓ2	L
UB51201816	0.9	1.8	4	1.8	16	50
UB51201820	0.9	1.8	4	1.8	20	50
UB51202004	1	2	4	2	4	50
UB51202005	1	2	4	2	5	50
UB51202006	1	2	4	2	6	50
UB51202008	1	2	4	2	8	50
UB51202010	1	2	4	2	10	50
UB51202012	1	2	4	2	12	50
UB51202014	1	2	4	2	14	50
UB51202016	1	2	4	2	16	50
UB51202018	1	2	4	2	18	55
UB51202020	1	2	4	2	20	55
UB51202022	1	2	4	2	22	60
UB51202026	1	2	4	2	26	60
UB51202030	1	2	4	2	30	70
UB51202035	1	2	4	2	35	70
UB51202040	1	2	4	2	40	80
UB51202045	1	2	4	2	45	90
UB51202050	1	2	4	2	50	100
UB51202060	1	2	4	2	60	110
UB51202508	1.25	2.5	4	2.5	8	50
UB51202510	1.25	2.5	4	2.5	10	50
UB51202512	1.25	2.5	4	2.5	12	50
UB51202516	1.25	2.5	4	2.5	16	50
UB51202520	1.25	2.5	4	2.5	20	50
UB51202522	1.25	2.5	4	2.5	22	60
UB51202526	1.25	2.5	4	2.5	26	60
UB51202530	1.25	2.5	4	2.5	30	70
UB51202535	1.25	2.5	4	2.5	35	70
UB51202540	1.25	2.5	4	2.5	40	80
UB51202545	1.25	2.5	4	2.5	45	90
UB51202550	1.25	2.5	4	2.5	50	100
UB51203006	1.5	3	6	3	6	50
UB51203008	1.5	3	6	3	8	50

형 번	R	ØD	Ød	ℓ1	ℓ2	L
UB51203010	1.5	3	6	3	10	50
UB51203012	1.5	3	6	3	12	50
UB51203014	1.5	3	6	3	14	60
UB51203016	1.5	3	6	3	16	60
UB51203018	1.5	3	6	3	18	60
UB51203020	1.5	3	6	3	20	60
UB51203022	1.5	3	6	3	22	65
UB51203026	1.5	3	6	3	26	65
UB51203030	1.5	3	6	3	30	70
UB51203035	1.5	3	6	3	35	70
UB51203040	1.5	3	6	3	40	80
UB51203045	1.5	3	6	3	45	90
UB51203050	1.5	3	6	3	50	100
UB51203060	1.5	3	6	3	60	100
UB51204008	2	4	6	4	8	50
UB51204010	2	4	6	4	10	50
UB51204012	2	4	6	4	12	50
UB51204014	2	4	6	4	14	60
UB51204016	2	4	6	4	16	60
UB51204018	2	4	6	4	18	60
UB51204020	2	4	6	4	20	60
UB51204022	2	4	6	4	22	65
UB51204026	2	4	6	4	26	65
UB51204030	2	4	6	4	30	70
UB51204035	2	4	6	4	35	70
UB51204040	2	4	6	4	40	80
UB51204045	2	4	6	4	45	90
UB51204050	2	4	6	4	50	100
UB51204055	2	4	6	4	55	100
UB51204060	2	4	6	4	60	100
UB51205015	2.5	5	6	6	15	60
UB51205020	2.5	5	6	6	20	60
UB51205026	2.5	5	6	6	26	65
UB51205030	2.5	5	6	6	30	70

U-Star Endmill

UB512

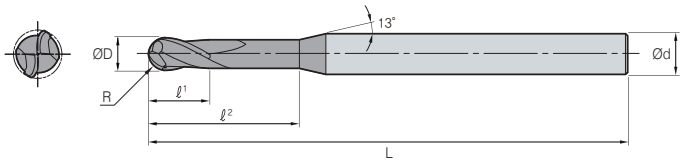
2날 롱 넥 볼 엔드밀



CARBIDE | 2 | 30° HELIX | R ±0.01 | R ±0.005 (코너 R) | AlCrN | 절삭조건 (p.441~445)

• 공구직경공차

ØD		Ød
Ø0.1 ~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	



(mm)

형 번	R	ØD	Ød	ℓ1	ℓ2	L
UB51205035	2.5	5	6	6	35	70
UB51205040	2.5	5	6	6	40	80
UB51205045	2.5	5	6	6	45	90
UB51205050	2.5	5	6	6	50	100
UB51205055	2.5	5	6	6	55	100
UB51205060	2.5	5	6	6	60	100
UB51206020	3	6	6	8	20	60
UB5120602090	3	6	6	12	20	90
UB51206030	3	6	6	8	30	60
UB5120603090	3	6	6	12	30	90
UB51208025	4	8	8	10	25	70

형 번	R	ØD	Ød	ℓ1	ℓ2	L
UB51208025100	4	8	8	14	25	100
UB51208035	4	8	8	10	35	70
UB51208035100	4	8	8	14	35	100
UB51210030	5	10	10	12	30	75
UB51210030100	5	10	10	18	30	100
UB51210040	5	10	10	12	40	75
UB51210040100	5	10	10	18	40	100
UB51212032	6	12	12	14	32	80
UB51212032110	6	12	12	22	32	110
UB51212045	6	12	12	14	45	80
UB51212045110	6	12	12	22	45	110

• 적용 피삭재

탄소강 ~ HB225	합금강 HB225~325	프리하든강 HRC30~50	열처리강		주철 ~FCD500	알루미늄	스테인리스강	Ti합금	Ni합금
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○		○				

◎: 매우적합 ○: 적합

UB512S6

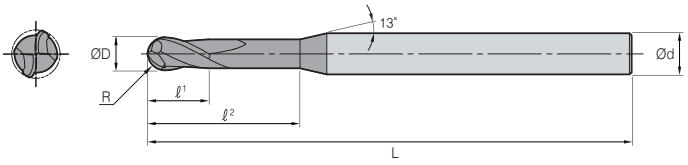
2날 롱 넥 볼 엔드밀(자루경 6)



CARBIDE | 2 | 30° HELIX | R ±0.005 코너 R | AlCrN | 절삭조건 p.441~445

• 공구직경공차

ØD		Ød
Ø0.5 ~ Ø2	0 ~ -0.012mm	h5



(mm)

형 번	R	ØD	Ød	ℓ1	ℓ2	L
UB51200501S6	0.25	0.5	6	0.5	1	45
UB51200502S6	0.25	0.5	6	0.5	2	45
UB51200504S6	0.25	0.5	6	0.5	4	45
UB51200601S6	0.3	0.6	6	0.6	1	45
UB51200602S6	0.3	0.6	6	0.6	2	45
UB51200603S6	0.3	0.6	6	0.6	3	45
UB51200604S6	0.3	0.6	6	0.6	4	45
UB51200605S6	0.3	0.6	6	0.6	5	45
UB51200606S6	0.3	0.6	6	0.6	6	45
UB51200608S6	0.3	0.6	6	0.6	8	45
UB51200610S6	0.3	0.6	6	0.6	10	45
UB51200612S6	0.3	0.6	6	0.6	12	45
UB51200614S6	0.3	0.6	6	0.6	14	45
UB51200616S6	0.3	0.6	6	0.6	16	45
UB51200801S6	0.4	0.8	6	0.8	1	45
UB51200802S6	0.4	0.8	6	0.8	2	45
UB51200803S6	0.4	0.8	6	0.8	3	45
UB51200804S6	0.4	0.8	6	0.8	4	45
UB51200805S6	0.4	0.8	6	0.8	5	45
UB51200806S6	0.4	0.8	6	0.8	6	45
UB51200808S6	0.4	0.8	6	0.8	8	45
UB51200810S6	0.4	0.8	6	0.8	10	45
UB51200812S6	0.4	0.8	6	0.8	12	45
UB51200814S6	0.4	0.8	6	0.8	14	45
UB51200816S6	0.4	0.8	6	0.8	16	45
UB51200820S6	0.4	0.8	6	0.8	20	55
UB51201002S6	0.5	1	6	1	2	50
UB51201003S6	0.5	1	6	1	3	50
UB51201004S6	0.5	1	6	1	4	50
UB51201005S6	0.5	1	6	1	5	50
UB51201006S6	0.5	1	6	1	6	50
UB51201007S6	0.5	1	6	1	7	50
UB51201008S6	0.5	1	6	1	8	50
UB51201009S6	0.5	1	6	1	9	50
UB51201010S6	0.5	1	6	1	10	50
UB51201012S6	0.5	1	6	1	12	50
UB51201014S6	0.5	1	6	1	14	50

형 번	R	ØD	Ød	ℓ1	ℓ2	L
UB51201016S6	0.5	1	6	1	16	50
UB51201018S6	0.5	1	6	1	18	50
UB51201020S6	0.5	1	6	1	20	55
UB51201022S6	0.5	1	6	1	22	60
UB51201026S6	0.5	1	6	1	26	60
UB51201030S6	0.5	1	6	1	30	70
UB51201503S6	0.75	1.5	6	1.5	3	50
UB51201504S6	0.75	1.5	6	1.5	4	50
UB51201506S6	0.75	1.5	6	1.5	6	50
UB51201508S6	0.75	1.5	6	1.5	8	50
UB51201510S6	0.75	1.5	6	1.5	10	50
UB51201512S6	0.75	1.5	6	1.5	12	50
UB51201514S6	0.75	1.5	6	1.5	14	50
UB51201516S6	0.75	1.5	6	1.5	16	50
UB51201518S6	0.75	1.5	6	1.5	18	50
UB51201520S6	0.75	1.5	6	1.5	20	55
UB51201522S6	0.75	1.5	6	1.5	22	60
UB51201526S6	0.75	1.5	6	1.5	26	60
UB51201530S6	0.75	1.5	6	1.5	30	70
UB51201535S6	0.75	1.5	6	1.5	35	70
UB51201540S6	0.75	1.5	6	1.5	40	80
UB51202004S6	1	2	6	2	4	50
UB51202006S6	1	2	6	2	6	50
UB51202008S6	1	2	6	2	8	50
UB51202010S6	1	2	6	2	10	50
UB51202012S6	1	2	6	2	12	50
UB51202014S6	1	2	6	2	14	50
UB51202016S6	1	2	6	2	16	50
UB51202018S6	1	2	6	2	18	50
UB51202020S6	1	2	6	2	20	50
UB51202022S6	1	2	6	2	22	60
UB51202026S6	1	2	6	2	26	60
UB51202030S6	1	2	6	2	30	70
UB51202035S6	1	2	6	2	35	70
UB51202040S6	1	2	6	2	40	80
UB51202045S6	1	2	6	2	45	90
UB51202050S6	1	2	6	2	50	100

• 적용 피삭재

탄소강 ~ HB225	합금강 HB225~325	프리하든강 HRC30~50	열처리강		주철 ~FCD500	알루미늄	스테인리스강	Ti합금	Ni합금
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○		○				

◎: 매우적합 ○: 적합

U-Star Endmill

UB532

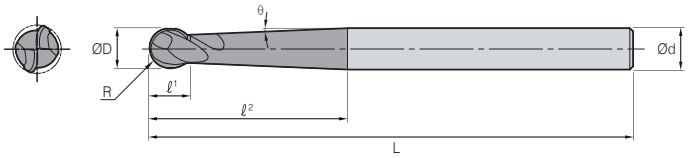
2날 롤리팝 스타일 볼 엔드밀



CARBIDE | 2 | 30° HELIX | R ±0.01 코너 R | AlCrN | 절삭조건 p.446

• 공구직경공차

ØD		Ød
Ø3 ~ Ø12	0 ~ -0.03mm	h5



(mm)

형 번	R	ØD	Ød	ℓ1	ℓ2	θ	L
UB532030	1.5	3	6	2.3	16	1.5	80
UB532040	2	4	6	3.1	20	1.5	80
UB532050	2.5	5	6	3.9	25	1.5	80
UB532060	3	6	6	4.9	30	1.5	100
UB532080	4	8	8	6.3	35	1.5	100
UB532100	5	10	10	7.9	40	1.5	100
UB532120	6	12	12	9.5	50	1.5	100

• 적용 피삭재

탄소강 ~ HB225	합금강 HB225~325	프리하든강 HRC30~50	열처리강		주철 ~FCD500	알루미늄	스테인리스강	Ti합금	Ni합금
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○		○				

◎: 매우적합 ○: 적합

UB542

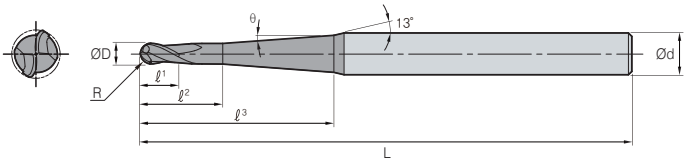
2날 테이퍼 넥 볼 엔드밀

CARBIDE | 2 | 30° HELIX | R ±0.005 (R3 이하) | R ±0.01 (R3 초과) | AlCrN | 절삭조건 p.446

• 공구직경공차

ØD		Ød
Ø0.1 ~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	





(mm)

형 번	R	ØD	Ød	ℓ1	ℓ2	ℓ3	θ	L
UB54200105005	0.05	0.1	4	0.1	-	0.5	0.5	40
UB5420010501	0.05	0.1	4	0.1	-	1	0.5	40
UB54200110005	0.05	0.1	4	0.1	-	0.5	1	40
UB5420011001	0.05	0.1	4	0.1	-	1	1	40
UB54200115005	0.05	0.1	4	0.1	-	0.5	1.5	40
UB5420011501	0.05	0.1	4	0.1	-	1	1.5	40
UB54200120005	0.05	0.1	4	0.1	-	0.5	2	40
UB5420012001	0.05	0.1	4	0.1	-	1	2	40
UB54200130005	0.05	0.1	4	0.1	-	0.5	3	40
UB5420013001	0.05	0.1	4	0.1	-	1	3	40
UB5420020501	0.1	0.2	4	0.2	0.4	1	0.5	40
UB5420020502	0.1	0.2	4	0.2	0.4	2	0.5	40
UB5420020503	0.1	0.2	4	0.2	0.4	3	0.5	40
UB5420021001	0.1	0.2	4	0.2	0.4	1	1	40
UB5420021002	0.1	0.2	4	0.2	0.4	2	1	40
UB5420021003	0.1	0.2	4	0.2	0.4	3	1	40
UB5420021501	0.1	0.2	4	0.2	0.4	1	1.5	40
UB5420021502	0.1	0.2	4	0.2	0.4	2	1.5	40
UB5420021503	0.1	0.2	4	0.2	0.4	3	1.5	40
UB5420022001	0.1	0.2	4	0.2	0.4	1	2	40
UB5420022002	0.1	0.2	4	0.2	0.4	2	2	40
UB5420022003	0.1	0.2	4	0.2	0.4	3	2	40
UB5420023001	0.1	0.2	4	0.2	0.4	1	3	40
UB5420023002	0.1	0.2	4	0.2	0.4	2	3	40
UB5420023003	0.1	0.2	4	0.2	0.4	3	3	40
UB5420025002	0.1	0.2	4	0.2	0.4	2	5	40
UB5420025003	0.1	0.2	4	0.2	0.4	3	5	40
UB5420030502	0.15	0.3	4	0.3	0.6	2	0.5	40
UB5420030503	0.15	0.3	4	0.3	0.6	3	0.5	40
UB5420030504	0.15	0.3	4	0.3	0.6	4	0.5	40
UB5420030505	0.15	0.3	4	0.3	0.6	5	0.5	40
UB5420031002	0.15	0.3	4	0.3	0.6	2	1	40
UB5420031003	0.15	0.3	4	0.3	0.6	3	1	40
UB5420031004	0.15	0.3	4	0.3	0.6	4	1	40
UB5420031005	0.15	0.3	4	0.3	0.6	5	1	40
UB5420031502	0.15	0.3	4	0.3	0.6	2	1.5	40

형 번	R	ØD	Ød	ℓ1	ℓ2	ℓ3	θ	L
UB5420031503	0.15	0.3	4	0.3	0.6	3	1.5	40
UB5420031504	0.15	0.3	4	0.3	0.6	4	1.5	40
UB5420031505	0.15	0.3	4	0.3	0.6	5	1.5	40
UB5420032002	0.15	0.3	4	0.3	0.6	2	2	40
UB5420032003	0.15	0.3	4	0.3	0.6	3	2	40
UB5420032004	0.15	0.3	4	0.3	0.6	4	2	40
UB5420032005	0.15	0.3	4	0.3	0.6	5	2	40
UB5420033002	0.15	0.3	4	0.3	0.6	2	3	40
UB5420033003	0.15	0.3	4	0.3	0.6	3	3	40
UB5420033004	0.15	0.3	4	0.3	0.6	4	3	40
UB5420033005	0.15	0.3	4	0.3	0.6	5	3	40
UB5420035005	0.15	0.3	4	0.3	0.6	5	5	40
UB5420040502	0.2	0.4	4	0.4	0.8	2	0.5	50
UB5420040503	0.2	0.4	4	0.4	0.8	3	0.5	50
UB5420040504	0.2	0.4	4	0.4	0.8	4	0.5	50
UB5420040505	0.2	0.4	4	0.4	0.8	5	0.5	50
UB5420040506	0.2	0.4	4	0.4	0.8	6	0.5	50
UB5420041002	0.2	0.4	4	0.4	0.8	2	1	50
UB5420041003	0.2	0.4	4	0.4	0.8	3	1	50
UB5420041004	0.2	0.4	4	0.4	0.8	4	1	50
UB5420041005	0.2	0.4	4	0.4	0.8	5	1	50
UB5420041006	0.2	0.4	4	0.4	0.8	6	1	50
UB5420041502	0.2	0.4	4	0.4	0.8	2	1.5	50
UB5420041503	0.2	0.4	4	0.4	0.8	3	1.5	50
UB5420041504	0.2	0.4	4	0.4	0.8	4	1.5	50
UB5420041505	0.2	0.4	4	0.4	0.8	5	1.5	50
UB5420041506	0.2	0.4	4	0.4	0.8	6	1.5	50
UB5420042002	0.2	0.4	4	0.4	0.8	2	2	50
UB5420042003	0.2	0.4	4	0.4	0.8	3	2	50
UB5420042004	0.2	0.4	4	0.4	0.8	4	2	50
UB5420042005	0.2	0.4	4	0.4	0.8	5	2	50
UB5420042006	0.2	0.4	4	0.4	0.8	6	2	50
UB5420043002	0.2	0.4	4	0.4	0.8	2	3	50
UB5420043003	0.2	0.4	4	0.4	0.8	3	3	50
UB5420043004	0.2	0.4	4	0.4	0.8	4	3	50
UB5420043005	0.2	0.4	4	0.4	0.8	5	3	50

U-Star Endmill

UB542

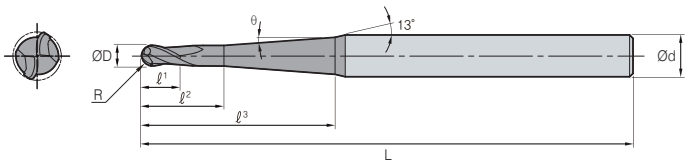
2날 테이퍼 넥 볼 엔드밀

CARBIDE | 2 | 30° HELIX | R ±0.005 R3 이하 | R ±0.01 R3 초과 | AlCrN | 절삭조건 p.446

• 공구직경공차

ØD		Ød
Ø0.1 ~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	





(mm)

형 번	R	ØD	Ød	ℓ1	ℓ2	ℓ3	θ	L
UB5420043006	0.2	0.4	4	0.4	0.8	6	3	50
UB5420045004	0.2	0.4	4	0.4	0.8	4	5	50
UB5420045006	0.2	0.4	4	0.4	0.8	6	5	50
UB5420050504	0.25	0.5	4	0.5	1	4	0.5	50
UB5420050506	0.25	0.5	4	0.5	1	6	0.5	50
UB5420050508	0.25	0.5	4	0.5	1	8	0.5	50
UB5420050510	0.25	0.5	4	0.5	1	10	0.5	50
UB5420051004	0.25	0.5	4	0.5	1	4	1	50
UB5420051006	0.25	0.5	4	0.5	1	6	1	50
UB5420051008	0.25	0.5	4	0.5	1	8	1	50
UB5420051010	0.25	0.5	4	0.5	1	10	1	50
UB5420051504	0.25	0.5	4	0.5	1	4	1.5	50
UB5420051506	0.25	0.5	4	0.5	1	6	1.5	50
UB5420051508	0.25	0.5	4	0.5	1	8	1.5	50
UB5420051510	0.25	0.5	4	0.5	1	10	1.5	50
UB5420052004	0.25	0.5	4	0.5	1	4	2	50
UB5420052006	0.25	0.5	4	0.5	1	6	2	50
UB5420052008	0.25	0.5	4	0.5	1	8	2	50
UB5420052010	0.25	0.5	4	0.5	1	10	2	50
UB5420053004	0.25	0.5	4	0.5	1	4	3	50
UB5420053006	0.25	0.5	4	0.5	1	6	3	50
UB5420053008	0.25	0.5	4	0.5	1	8	3	50
UB5420053010	0.25	0.5	4	0.5	1	10	3	50
UB5420060504	0.3	0.6	4	0.6	1.2	4	0.5	50
UB5420060506	0.3	0.6	4	0.6	1.2	6	0.5	50
UB5420060508	0.3	0.6	4	0.6	1.2	8	0.5	50
UB5420060510	0.3	0.6	4	0.6	1.2	10	0.5	50
UB5420060512	0.3	0.6	4	0.6	1.2	12	0.5	50
UB5420061004	0.3	0.6	4	0.6	1.2	4	1	50
UB5420061006	0.3	0.6	4	0.6	1.2	6	1	50
UB5420061008	0.3	0.6	4	0.6	1.2	8	1	50
UB5420061010	0.3	0.6	4	0.6	1.2	10	1	50
UB5420061012	0.3	0.6	4	0.6	1.2	12	1	50
UB5420061504	0.3	0.6	4	0.6	1.2	4	1.5	50
UB5420061506	0.3	0.6	4	0.6	1.2	6	1.5	50
UB5420061508	0.3	0.6	4	0.6	1.2	8	1.5	50

형 번	R	ØD	Ød	ℓ1	ℓ2	ℓ3	θ	L
UB5420061510	0.3	0.6	4	0.6	1.2	10	1.5	50
UB5420061512	0.3	0.6	4	0.6	1.2	12	1.5	50
UB5420062004	0.3	0.6	4	0.6	1.2	4	2	50
UB5420062006	0.3	0.6	4	0.6	1.2	6	2	50
UB5420062008	0.3	0.6	4	0.6	1.2	8	2	50
UB5420062010	0.3	0.6	4	0.6	1.2	10	2	50
UB5420062012	0.3	0.6	4	0.6	1.2	12	2	50
UB5420063004	0.3	0.6	4	0.6	1.2	4	3	50
UB5420063006	0.3	0.6	4	0.6	1.2	6	3	50
UB5420063008	0.3	0.6	4	0.6	1.2	8	3	50
UB5420063010	0.3	0.6	4	0.6	1.2	10	3	50
UB5420063012	0.3	0.6	4	0.6	1.2	12	3	50
UB5420080504	0.4	0.8	4	0.8	1.6	4	0.5	50
UB5420080506	0.4	0.8	4	0.8	1.6	6	0.5	50
UB5420080508	0.4	0.8	4	0.8	1.6	8	0.5	50
UB5420080510	0.4	0.8	4	0.8	1.6	10	0.5	50
UB5420080512	0.4	0.8	4	0.8	1.6	12	0.5	50
UB5420080516	0.4	0.8	4	0.8	1.6	16	0.5	50
UB5420081004	0.4	0.8	4	0.8	1.6	4	1	50
UB5420081006	0.4	0.8	4	0.8	1.6	6	1	50
UB5420081008	0.4	0.8	4	0.8	1.6	8	1	50
UB5420081010	0.4	0.8	4	0.8	1.6	10	1	50
UB5420081012	0.4	0.8	4	0.8	1.6	12	1	50
UB5420081016	0.4	0.8	4	0.8	1.6	16	1	50
UB5420081504	0.4	0.8	4	0.8	1.6	4	1.5	50
UB5420081506	0.4	0.8	4	0.8	1.6	6	1.5	50
UB5420081508	0.4	0.8	4	0.8	1.6	8	1.5	50
UB5420081510	0.4	0.8	4	0.8	1.6	10	1.5	50
UB5420081512	0.4	0.8	4	0.8	1.6	12	1.5	50
UB5420081516	0.4	0.8	4	0.8	1.6	16	1.5	50
UB5420082004	0.4	0.8	4	0.8	1.6	4	2	50
UB5420082006	0.4	0.8	4	0.8	1.6	6	2	50
UB5420082008	0.4	0.8	4	0.8	1.6	8	2	50
UB5420082010	0.4	0.8	4	0.8	1.6	10	2	50
UB5420082012	0.4	0.8	4	0.8	1.6	12	2	50
UB5420082016	0.4	0.8	4	0.8	1.6	16	2	50

UB542

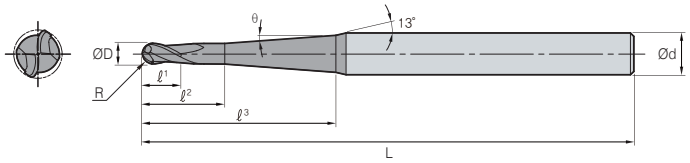
2날 테이퍼 넥 볼 엔드밀



CARBIDE | 2 | 30° HELIX | R ±0.005 (R3 이하) | R ±0.01 (R3 초과) | AlCrN | 절삭조건 p.446

• 공구직경공차

ØD		Ød
Ø0.1 ~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	



(mm)

형 번	R	ØD	Ød	ℓ1	ℓ2	ℓ3	θ	L
UB5420083004	0.4	0.8	4	0.8	1.6	4	3	50
UB5420083006	0.4	0.8	4	0.8	1.6	6	3	50
UB5420083008	0.4	0.8	4	0.8	1.6	8	3	50
UB5420083010	0.4	0.8	4	0.8	1.6	10	3	50
UB5420083012	0.4	0.8	4	0.8	1.6	12	3	50
UB5420083016	0.4	0.8	4	0.8	1.6	16	3	50
UB5420100506	0.5	1	4	1	2.5	6	0.5	50
UB5420100508	0.5	1	4	1	2.5	8	0.5	50
UB5420100510	0.5	1	4	1	2.5	10	0.5	50
UB5420100512	0.5	1	4	1	2.5	12	0.5	50
UB5420100516	0.5	1	4	1	2.5	16	0.5	50
UB5420100520	0.5	1	4	1	2.5	20	0.5	50
UB5420100525	0.5	1	4	1	2.5	25	0.5	60
UB5420100530	0.5	1	4	1	2.5	30	0.5	70
UB5420100540	0.5	1	4	1	2.5	40	0.5	80
UB5420100550	0.5	1	4	1	2.5	50	0.5	90
UB5420101006	0.5	1	4	1	2.5	6	1	50
UB5420101008	0.5	1	4	1	2.5	8	1	50
UB5420101010	0.5	1	4	1	2.5	10	1	50
UB5420101012	0.5	1	4	1	2.5	12	1	50
UB5420101016	0.5	1	4	1	2.5	16	1	50
UB5420101020	0.5	1	4	1	2.5	20	1	50
UB5420101025	0.5	1	4	1	2.5	25	1	60
UB5420101030	0.5	1	4	1	2.5	30	1	70
UB5420101040	0.5	1	4	1	2.5	40	1	80
UB5420101050	0.5	1	4	1	2.5	50	1	90
UB5420101506	0.5	1	4	1	2.5	6	1.5	50
UB5420101508	0.5	1	4	1	2.5	8	1.5	50
UB5420101510	0.5	1	4	1	2.5	10	1.5	50
UB5420101512	0.5	1	4	1	2.5	12	1.5	50
UB5420101516	0.5	1	4	1	2.5	16	1.5	50
UB5420101520	0.5	1	4	1	2.5	20	1.5	50
UB5420101525	0.5	1	4	1	2.5	25	1.5	60
UB5420101530	0.5	1	4	1	2.5	30	1.5	70
UB5420101540	0.5	1	4	1	2.5	40	1.5	80
UB5420101550	0.5	1	4	1	2.5	50	1.5	90

형 번	R	ØD	Ød	ℓ1	ℓ2	ℓ3	θ	L
UB5420102006	0.5	1	4	1	2.5	6	2	50
UB5420102008	0.5	1	4	1	2.5	8	2	50
UB5420102010	0.5	1	4	1	2.5	10	2	50
UB5420102012	0.5	1	4	1	2.5	12	2	50
UB5420102016	0.5	1	4	1	2.5	16	2	50
UB5420102020	0.5	1	4	1	2.5	20	2	50
UB5420102025	0.5	1	4	1	2.5	25	2	60
UB5420102030	0.5	1	4	1	2.5	30	2	70
UB5420102040	0.5	1	4	1	2.5	40	2	80
UB5420102050	0.5	1	6	1	2.5	50	2	90
UB5420103006	0.5	1	4	1	2.5	6	3	50
UB5420103008	0.5	1	4	1	2.5	8	3	50
UB5420103010	0.5	1	4	1	2.5	10	3	50
UB5420103012	0.5	1	4	1	2.5	12	3	50
UB5420103016	0.5	1	4	1	2.5	16	3	50
UB5420103020	0.5	1	4	1	2.5	20	3	50
UB5420103025	0.5	1	4	1	2.5	25	3	60
UB5420103030	0.5	1	6	1	2.5	30	3	70
UB5420103040	0.5	1	6	1	2.5	40	3	80
UB5420103050	0.5	1	6	1	2.5	50	3	90
UB5420105030	0.5	1	6	1	2.5	30	5	70
UB5420120508	0.6	1.2	4	1.2	3	8	0.5	50
UB5420120512	0.6	1.2	4	1.2	3	12	0.5	50
UB5420120516	0.6	1.2	4	1.2	3	16	0.5	50
UB5420120520	0.6	1.2	4	1.2	3	20	0.5	50
UB5420120525	0.6	1.2	4	1.2	3	25	0.5	60
UB5420120530	0.6	1.2	4	1.2	3	30	0.5	70
UB5420121008	0.6	1.2	4	1.2	3	8	1	50
UB5420121012	0.6	1.2	4	1.2	3	12	1	50
UB5420121016	0.6	1.2	4	1.2	3	16	1	50
UB5420121020	0.6	1.2	4	1.2	3	20	1	50
UB5420121025	0.6	1.2	4	1.2	3	25	1	60
UB5420121030	0.6	1.2	4	1.2	3	30	1	70
UB5420121508	0.6	1.2	4	1.2	3	8	1.5	50
UB5420121512	0.6	1.2	4	1.2	3	12	1.5	50
UB5420121516	0.6	1.2	4	1.2	3	16	1.5	50

U-Star Endmill

UB542

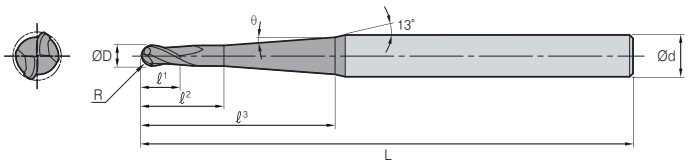
2날 테이퍼 넥 볼 엔드밀

CARBIDE | 2 | 30° HELIX | R ±0.005 R3 이하 | R ±0.01 R3 초과 | AlCrN | 절삭조건 p.446

• 공구직경공차

ØD		Ød
Ø0.1 ~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	





(mm)

형 번	R	ØD	Ød	ℓ1	ℓ2	ℓ3	θ	L
UB5420121520	0.6	1.2	4	1.2	3	20	1.5	50
UB5420121525	0.6	1.2	4	1.2	3	25	1.5	60
UB5420121530	0.6	1.2	4	1.2	3	30	1.5	70
UB5420122008	0.6	1.2	4	1.2	3	8	2	50
UB5420122012	0.6	1.2	4	1.2	3	12	2	50
UB5420122016	0.6	1.2	4	1.2	3	16	2	50
UB5420122020	0.6	1.2	4	1.2	3	20	2	50
UB5420122025	0.6	1.2	4	1.2	3	25	2	60
UB5420122030	0.6	1.2	4	1.2	3	30	2	70
UB5420123008	0.6	1.2	4	1.2	3	8	3	50
UB5420123012	0.6	1.2	4	1.2	3	12	3	50
UB5420123016	0.6	1.2	4	1.2	3	16	3	50
UB5420123020	0.6	1.2	4	1.2	3	20	3	50
UB5420123025	0.6	1.2	4	1.2	3	25	3	60
UB5420123030	0.6	1.2	6	1.2	3	30	5	70
UB5420150508	0.75	1.5	4	1.5	4	8	0.5	50
UB5420150510	0.75	1.5	4	1.5	4	10	0.5	50
UB5420150512	0.75	1.5	4	1.5	4	12	0.5	50
UB5420150516	0.75	1.5	4	1.5	4	16	0.5	50
UB5420150520	0.75	1.5	4	1.5	4	20	0.5	50
UB5420150525	0.75	1.5	4	1.5	4	25	0.5	60
UB5420150530	0.75	1.5	4	1.5	4	30	0.5	70
UB5420150540	0.75	1.5	4	1.5	4	40	0.5	80
UB5420150550	0.75	1.5	4	1.5	4	50	0.5	90
UB5420151008	0.75	1.5	4	1.5	4	8	1	50
UB5420151010	0.75	1.5	4	1.5	4	10	1	50
UB5420151012	0.75	1.5	4	1.5	4	12	1	50
UB5420151016	0.75	1.5	4	1.5	4	16	1	50
UB5420151020	0.75	1.5	4	1.5	4	20	1	50
UB5420151025	0.75	1.5	4	1.5	4	25	1	60
UB5420151030	0.75	1.5	4	1.5	4	30	1	70
UB5420151040	0.75	1.5	4	1.5	4	40	1	80
UB5420151050	0.75	1.5	4	1.5	4	50	1	90
UB5420151508	0.75	1.5	4	1.5	4	8	1.5	50
UB5420151510	0.75	1.5	4	1.5	4	10	1.5	50
UB5420151512	0.75	1.5	4	1.5	4	12	1.5	50

형 번	R	ØD	Ød	ℓ1	ℓ2	ℓ3	θ	L
UB5420151516	0.75	1.5	4	1.5	4	16	1.5	50
UB5420151520	0.75	1.5	4	1.5	4	20	1.5	50
UB5420151525	0.75	1.5	4	1.5	4	25	1.5	60
UB5420151530	0.75	1.5	4	1.5	4	30	1.5	70
UB5420151540	0.75	1.5	4	1.5	4	40	1.5	80
UB5420151550	0.75	1.5	4	1.5	4	50	1.5	90
UB5420121016	0.6	1.2	4	1.2	3	16	1	50
UB5420121020	0.6	1.2	4	1.2	3	20	1	50
UB5420121025	0.6	1.2	4	1.2	3	25	1	60
UB5420121030	0.6	1.2	4	1.2	3	30	1	70
UB5420121508	0.6	1.2	4	1.2	3	8	1.5	50
UB5420121512	0.6	1.2	4	1.2	3	12	1.5	50
UB5420121516	0.6	1.2	4	1.2	3	16	1.5	50
UB5420121520	0.6	1.2	4	1.2	3	20	1.5	50
UB5420121525	0.6	1.2	4	1.2	3	25	1.5	60
UB5420121530	0.6	1.2	4	1.2	3	30	1.5	70
UB5420122008	0.6	1.2	4	1.2	3	8	2	50
UB5420122012	0.6	1.2	4	1.2	3	12	2	50
UB5420122016	0.6	1.2	4	1.2	3	16	2	50
UB5420122020	0.6	1.2	4	1.2	3	20	2	50
UB5420122025	0.6	1.2	4	1.2	3	25	2	60
UB5420122030	0.6	1.2	4	1.2	3	30	2	70
UB5420123008	0.6	1.2	4	1.2	3	8	3	50
UB5420123012	0.6	1.2	4	1.2	3	12	3	50
UB5420123016	0.6	1.2	4	1.2	3	16	3	50
UB5420123020	0.6	1.2	4	1.2	3	20	3	50
UB5420123025	0.6	1.2	4	1.2	3	25	3	60
UB5420123030	0.6	1.2	6	1.2	3	30	5	70
UB5420150508	0.75	1.5	4	1.5	4	8	0.5	50
UB5420150510	0.75	1.5	4	1.5	4	10	0.5	50
UB5420150512	0.75	1.5	4	1.5	4	12	0.5	50
UB5420150516	0.75	1.5	4	1.5	4	16	0.5	50
UB5420150520	0.75	1.5	4	1.5	4	20	0.5	50
UB5420150525	0.75	1.5	4	1.5	4	25	0.5	60
UB5420150530	0.75	1.5	4	1.5	4	30	0.5	70
UB5420150540	0.75	1.5	4	1.5	4	40	0.5	80

UB542

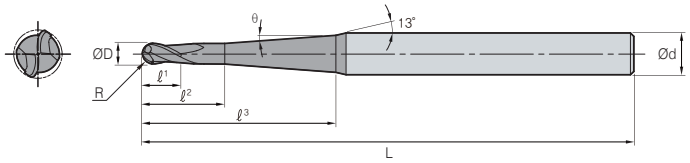
2날 테이퍼 넥 볼 엔드밀



CARBIDE | 2 | 30° HELIX | R ±0.005 (R3 이하) | R ±0.01 (R3 초과) | AlCrN | 절삭조건 p.446

• 공구직경공차

ØD		Ød
Ø0.1 ~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	



(mm)

형 번	R	ØD	Ød	ℓ1	ℓ2	ℓ3	θ	L
UB5420150550	0.75	1.5	4	1.5	4	50	0.5	90
UB5420151008	0.75	1.5	4	1.5	4	8	1	50
UB5420151010	0.75	1.5	4	1.5	4	10	1	50
UB5420151012	0.75	1.5	4	1.5	4	12	1	50
UB5420151016	0.75	1.5	4	1.5	4	16	1	50
UB5420151020	0.75	1.5	4	1.5	4	20	1	50
UB5420151025	0.75	1.5	4	1.5	4	25	1	60
UB5420151030	0.75	1.5	4	1.5	4	30	1	70
UB5420151040	0.75	1.5	4	1.5	4	40	1	80
UB5420151050	0.75	1.5	4	1.5	4	50	1	90
UB5420151508	0.75	1.5	4	1.5	4	8	1.5	50
UB5420151510	0.75	1.5	4	1.5	4	10	1.5	50
UB5420151512	0.75	1.5	4	1.5	4	12	1.5	50
UB5420151516	0.75	1.5	4	1.5	4	16	1.5	50
UB5420151520	0.75	1.5	4	1.5	4	20	1.5	50
UB5420151525	0.75	1.5	4	1.5	4	25	1.5	60
UB5420151530	0.75	1.5	4	1.5	4	30	1.5	70
UB5420151540	0.75	1.5	4	1.5	4	40	1.5	80
UB5420151550	0.75	1.5	4	1.5	4	50	1.5	90
UB5420152008	0.75	1.5	4	1.5	4	8	2	50
UB5420152010	0.75	1.5	4	1.5	4	10	2	50
UB5420152012	0.75	1.5	4	1.5	4	12	2	50
UB5420152016	0.75	1.5	4	1.5	4	16	2	50
UB5420152020	0.75	1.5	4	1.5	4	20	2	50
UB5420152025	0.75	1.5	4	1.5	4	25	2	60
UB5420152030	0.75	1.5	4	1.5	4	30	2	70
UB5420152040	0.75	1.5	6	1.5	4	40	2	80
UB5420152050	0.75	1.5	6	1.5	4	50	2	90
UB5420153020	0.75	1.5	6	1.5	4	20	3	50
UB5420153030	0.75	1.5	6	1.5	4	30	3	70
UB5420153040	0.75	1.5	6	1.5	4	40	3	80
UB5420153050	0.75	1.5	8	1.5	4	50	3	90
UB5420155030	0.75	1.5	8	1.5	4	30	5	70
UB5420200510	1	2	4	2	5	10	0.5	50
UB5420200512	1	2	4	2	5	12	0.5	50
UB5420200516	1	2	4	2	5	16	0.5	50

형 번	R	ØD	Ød	ℓ1	ℓ2	ℓ3	θ	L
UB5420200520	1	2	4	2	5	20	0.5	50
UB5420200525	1	2	4	2	5	25	0.5	60
UB5420200530	1	2	4	2	5	30	0.5	70
UB5420200540	1	2	4	2	5	40	0.5	80
UB5420200550	1	2	6	2	5	50	0.5	100
UB5420200560	1	2	6	2	5	60	0.5	100
UB5420200580	1	2	6	2	5	80	0.5	140
UB5420201010	1	2	4	2	5	10	1	50
UB5420201012	1	2	4	2	5	12	1	50
UB5420201016	1	2	4	2	5	16	1	50
UB5420201020	1	2	4	2	5	20	1	50
UB5420201025	1	2	4	2	5	25	1	60
UB5420201030	1	2	4	2	5	30	1	70
UB5420201040	1	2	6	2	5	40	1	80
UB5420201050	1	2	6	2	5	50	1	100
UB5420201060	1	2	6	2	5	60	1	100
UB5420201080	1	2	6	2	5	80	1	140
UB5420201510	1	2	4	2	5	10	1.5	50
UB5420201512	1	2	4	2	5	12	1.5	50
UB5420201516	1	2	4	2	5	16	1.5	50
UB5420201520	1	2	4	2	5	20	1.5	50
UB5420201525	1	2	4	2	5	25	1.5	60
UB5420201530	1	2	6	2	5	30	1.5	70
UB5420201540	1	2	6	2	5	40	1.5	80
UB5420201550	1	2	6	2	5	50	1.5	100
UB5420201560	1	2	6	2	5	60	1.5	100
UB5420201580	1	2	6	2	5	80	1.5	140
UB5420202010	1	2	4	2	5	10	2	50
UB5420202012	1	2	4	2	5	12	2	50
UB5420202016	1	2	4	2	5	16	2	50
UB5420202020	1	2	4	2	5	20	2	55
UB5420202025	1	2	4	2	5	25	2	60
UB5420202030	1	2	4	2	5	30	2	70
UB5420202040	1	2	6	2	5	40	2	80
UB5420202050	1	2	6	2	5	50	2	90
UB5420202060	1	2	6	2	5	60	2	100

U-Star Endmill

UB542

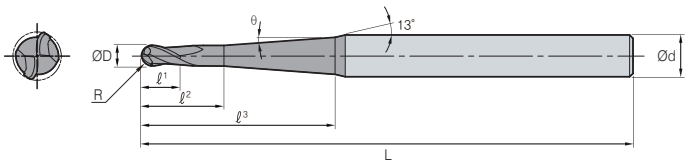
2날 테이퍼 넥 볼 엔드밀

CARBIDE | 2 | 30° HELIX | R ±0.005 (R3 이하) | R ±0.01 (R3 초과) | AlCrN | 절삭조건 p.446

• 공구직경공차

ØD		Ød
Ø0.1 ~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	





(mm)

형 번	R	ØD	Ød	ℓ1	ℓ2	ℓ3	θ	L
UB5420202080	1	2	8	2	5	80	2	140
UB5420203030	1	2	6	2	5	30	3	70
UB5420203040	1	2	6	2	5	40	3	80
UB5420203050	1	2	8	2	5	50	3	90
UB5420203060	1	2	8	2	5	60	3	100
UB5420203080	1	2	10	2	5	80	3	140
UB5420205030	1	2	8	2	5	30	5	70
UB5420205040	1	2	10	2	5	40	5	90
UB5420300516	1.5	3	6	4.5	6	16	0.5	60
UB5420300520	1.5	3	6	4.5	6	20	0.5	65
UB5420300530	1.5	3	6	4.5	6	30	0.5	70
UB5420300540	1.5	3	6	4.5	6	40	0.5	80
UB5420300550	1.5	3	6	4.5	6	50	0.5	90
UB5420300560	1.5	3	6	4.5	6	60	0.5	100
UB5420301016	1.5	3	6	4.5	6	16	1	60
UB5420301020	1.5	3	6	4.5	6	20	1	65
UB5420301030	1.5	3	6	4.5	6	30	1	70
UB5420301040	1.5	3	6	4.5	6	40	1	80
UB5420301050	1.5	3	6	4.5	6	50	1	90
UB5420301060	1.5	3	6	4.5	6	60	1	100
UB5420301070	1.5	3	6	4.5	6	70	1	120
UB5420301516	1.5	3	6	4.5	6	16	1.5	60
UB5420301520	1.5	3	6	4.5	6	20	1.5	65
UB5420301530	1.5	3	6	4.5	6	30	1.5	70
UB5420301540	1.5	3	6	4.5	6	40	1.5	80
UB5420301550	1.5	3	6	4.5	6	50	1.5	90
UB5420301560	1.5	3	6	4.5	6	60	1.5	100
UB5420302016	1.5	3	6	4.5	6	16	2	60
UB5420302020	1.5	3	6	4.5	6	20	2	65
UB5420302030	1.5	3	6	4.5	6	30	2	70
UB5420302040	1.5	3	6	4.5	6	40	2	80
UB5420302050	1.5	3	8	4.5	6	50	2	90
UB5420303030	1.5	3	6	4.5	6	30	3	70
UB5420303040	1.5	3	8	4.5	6	40	3	90
UB5420305030	1.5	3	8	4.5	6	30	5	70
UB5420305040	1.5	3	10	4.5	6	40	5	90

형 번	R	ØD	Ød	ℓ1	ℓ2	ℓ3	θ	L
UB5420400540	2	4	6	6	8	40	0.5	90
UB5420400550	2	4	6	6	8	50	0.5	100
UB5420400560	2	4	6	6	8	60	0.5	110
UB5420400570	2	4	6	6	8	70	0.5	120
UB5420401040	2	4	6	6	8	40	1	90
UB5420401050	2	4	6	6	8	50	1	100
UB5420401060	2	4	8	6	8	60	1	110
UB5420401070	2	4	8	6	8	70	1	120
UB5420401540	2	4	6	6	8	40	1.5	90
UB5420401550	2	4	8	6	8	50	1.5	100
UB5420401560	2	4	8	6	8	60	1.5	110
UB5420401570	2	4	8	6	8	70	1.5	120
UB5420403050	2	4	10	6	8	50	3	100
UB5420405050	2	4	12	6	8	50	5	100
UB5420501060	2.5	5	8	10	13	60	1	120
UB5420501560	2.5	5	8	10	13	60	1.5	120
UB5420503040	2.5	5	8	10	13	40	3	120
UB5420601060	3	6	8	12	15	60	1	120
UB5420601090	3	6	10	12	15	90	1	150
UB5420601560	3	6	10	12	15	60	1.5	120
UB5420601590	3	6	10	12	15	90	1.5	150
UB5420602060	3	6	10	12	15	60	2	120
UB5420602090	3	6	12	12	15	90	2	150
UB5420603060	3	6	12	12	15	60	3	120
UB5420603090	3	6	14	12	15	90	3	150
UB54208010100	4	8	12	14	18	100	1	150
UB5420801070	4	8	10	14	18	70	1	130
UB54208015100	4	8	14	14	18	100	1.5	150
UB5420801570	4	8	12	14	18	70	1.5	130
UB54208020100	4	8	14	14	18	100	2	150
UB5420802070	4	8	12	14	18	70	2	130
UB54208030100	4	8	18	14	18	100	3	150
UB5420803070	4	8	14	14	18	70	3	130
UB54210010100	5	10	14	18	22	100	1	200
UB5421001070	5	10	12	18	22	70	1	130
UB5421001080	5	10	14	18	22	80	1	150

UB542

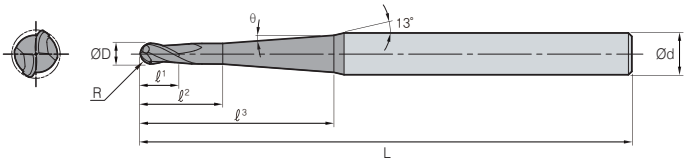
2날 테이퍼 넥 볼 엔드밀



CARBIDE | 2 | 30° HELIX | R ±0.005 (R3 이하) | R ±0.01 (R3 초과) | AlCrN | 절삭조건 p.446

• 공구직경공차

ØD		Ød
Ø0.1 ~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	



(mm)

형 번	R	ØD	Ød	ℓ1	ℓ2	ℓ3	θ	L
UB54210015100	5	10	16	18	22	100	1.5	200
UB5421001570	5	10	14	18	22	70	1.5	130
UB5421001580	5	10	14	18	22	80	1.5	150
UB54210020100	5	10	16	18	22	100	2	200
UB5421002070	5	10	14	18	22	70	2	130
UB5421002080	5	10	16	18	22	80	2	150
UB54210030100	5	10	20	18	22	100	3	200
UB5421003070	5	10	16	18	22	70	3	130
UB5421003080	5	10	18	18	22	80	3	150
UB54212010100	6	12	16	22	25	100	1	200
UB5421201060	6	12	14	22	25	60	1	130
UB5421201080	6	12	14	22	25	80	1	150
UB5421201090	6	12	16	22	25	90	1	180

형 번	R	ØD	Ød	ℓ1	ℓ2	ℓ3	θ	L
UB54212015100	6	12	16	22	25	100	1.5	200
UB5421201560	6	12	14	22	25	60	1.5	130
UB5421201580	6	12	16	22	25	80	1.5	150
UB5421201590	6	12	16	22	25	90	1.5	180
UB54212020100	6	12	18	22	25	100	2	200
UB5421202060	6	12	16	22	25	60	2	130
UB5421202080	6	12	16	22	25	80	2	150
UB5421202090	6	12	18	22	25	90	2	180
UB54212030100	6	12	20	22	25	100	3	200
UB5421203060	6	12	16	22	25	60	3	130
UB5421203080	6	12	18	22	25	80	3	150
UB5421203090	6	12	20	22	25	90	3	180

• 적용 피삭재

탄소강 ~ HB225	합금강 HB225~325	프리하든강 HRC30~50	열처리강		주철 ~FCD500	알루미늄	스테인리스강	Ti합금	Ni합금
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○		○				

◎: 매우적합 ○: 적합

U-Star Endmill

USB502

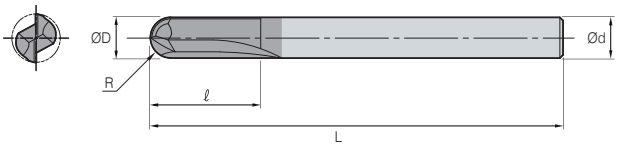
2날 스트레이트 볼 엔드밀

CARBIDE | 2 | 0° HELIX | R ±0.005 (R3 이하) | R ±0.01 (R3 초과) | AlCrN | 절삭조건 p.447

• 공구직경공차

ØD		Ød
Ø3 ~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø20	0 ~ -0.015mm	





(mm)

형 번	R	ØD	Ød	ℓ	L
USB502030	1.5	3	6	10	70
USB502040	2	4	6	12	70
USB502050	2.5	5	6	18	90
USB502060	3	6	6	20	90
USB502080	4	8	8	25	100
USB502100	5	10	10	30	100
USB502120	6	12	12	32	110
USB502160	8	16	16	35	150
USB502200	10	20	20	40	150

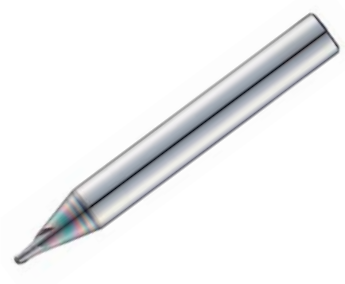
• 적용 피삭재

탄소강 ~ HB225	합금강 HB225~325	프리하든강 HRC30~50	열처리강		주철 ~FCD500	알루미늄	스테인리스강	Ti합금	Ni합금
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○		○				

◎: 매우적합 ○: 적합

UB503

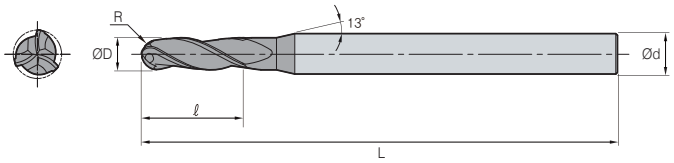
3날 볼 엔드밀



CARBIDE | 3 | 30° HELIX | R ±0.005 (R3 이하) | R ±0.01 (R3 초과) | AlCrN | 절삭조건 p.447

• 공구직경공차

ØD		Ød
Ø1 ~ Ø12	0 ~ -0.02mm	h5



(mm)

형 번	R	ØD	Ød	ℓ	L
UB503010	0.5	1	6	1	50
UB503015	0.75	1.5	6	1.5	50
UB503020	1	2	6	2	50
UB503030	1.5	3	6	3	60
UB503040	2	4	6	4	70
UB503050	2.5	5	6	5	80
UB503060	3	6	6	6	90
UB503080	4	8	8	8	100
UB503100	5	10	10	10	100
UB503120	6	12	12	12	110

• 적용 피삭재

탄소강 ~ HB225	합금강 HB225~325	프리하든강 HRC30~50	열처리강		주철 ~FCD500	알루미늄	스테인리스강	Ti합금	Ni합금
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○		○				

◎: 매우적합 ○: 적합

U-Star Endmill

UB504

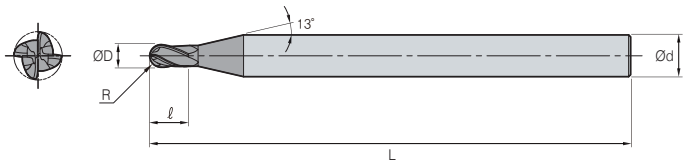
4날 볼 엔드밀



CARBIDE | 4 | 30° HELIX | R ±0.005 (R3 이하) | R ±0.01 (R3 초과) | AlCrN | 절삭조건 p.448

• 공구직경공차

ØD		Ød
Ø1 ~ Ø12	0 ~ -0.02mm	h5



(mm)

형 번	R	ØD	Ød	ℓ	L
UB504010	0.5	1	6	1	50
UB504015	0.75	1.5	6	1.5	50
UB504020	1	2	6	2	50
UB504030	1.5	3	6	3	60
UB504040	2	4	6	4	70
UB504050	2.5	5	6	5	80
UB504060	3	6	6	6	90
UB504080	4	8	8	8	100
UB504100	5	10	10	10	100
UB504120	6	12	12	12	110

• 적용 피삭재

탄소강 ~ HB225	합금강 HB225~325	프리하든강 HRC30~50	열처리강		주철 ~FCD500	알루미늄	스테인리스강	Ti합금	Ni합금
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○		○				

◎: 매우적합 ○: 적합

UTB502

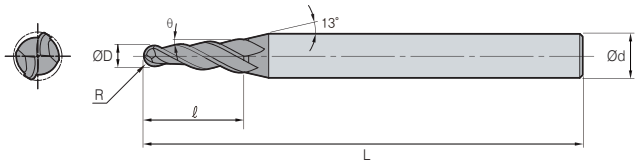
2날 테이퍼 볼 엔드밀

CARBIDE | 2 | 30° HELIX | R ±0.01 (코너 R) | AlCrN | 절삭조건 (p.448)

• 공구직경공차

ØD		Ød
Ø0.3 ~ Ø2	0 ~ -0.03mm	h5





(mm)

형 번	R	ØD	Ød	ℓ	θ	L
UTB502003005	0.15	0.3	4	1.2	0.5	40
UTB50200301	0.15	0.3	4	1.2	1	40
UTB502003015	0.15	0.3	4	1.2	1.5	40
UTB50200302	0.15	0.3	4	1.2	2	40
UTB50200303	0.15	0.3	4	1.2	3	40
UTB50200305	0.15	0.3	4	1.2	5	40
UTB50200307	0.15	0.3	4	1.5	7	40
UTB50200310	0.15	0.3	4	1.5	10	40
UTB502004005	0.2	0.4	4	1.6	0.5	40
UTB50200401	0.2	0.4	4	1.6	1	40
UTB502004015	0.2	0.4	4	1.6	1.5	40
UTB50200402	0.2	0.4	4	1.6	2	40
UTB50200403	0.2	0.4	4	1.6	3	40
UTB50200405	0.2	0.4	4	1.6	5	40
UTB50200407	0.2	0.4	4	2	7	40
UTB50200410	0.2	0.4	4	2	10	40
UTB502005005	0.25	0.5	4	2	0.5	45
UTB50200501	0.25	0.5	4	2	1	45
UTB502005015	0.25	0.5	4	2	1.5	45
UTB50200502	0.25	0.5	4	2	2	45
UTB50200503	0.25	0.5	4	2	3	45
UTB50200505	0.25	0.5	4	2	5	45
UTB50200507	0.25	0.5	4	2.5	7	45
UTB50200510	0.25	0.5	4	2.5	10	45
UTB502006005	0.3	0.6	4	2	0.5	45
UTB50200601	0.3	0.6	4	2	1	45
UTB502006015	0.3	0.6	4	2	1.5	45
UTB50200602	0.3	0.6	4	2	2	45
UTB50200603	0.3	0.6	4	2	3	45
UTB50200605	0.3	0.6	4	2	5	45
UTB50200607	0.3	0.6	4	2.5	7	45
UTB50200610	0.3	0.6	4	2.5	10	45
UTB502007005	0.35	0.7	4	2.5	0.5	45
UTB50200701	0.35	0.7	4	2.5	1	45
UTB502007015	0.35	0.7	4	2.5	1.5	45
UTB50200702	0.35	0.7	4	2.5	2	45

형 번	R	ØD	Ød	ℓ	θ	L
UTB50200703	0.35	0.7	4	2.5	3	45
UTB50200705	0.35	0.7	4	2.5	5	45
UTB50200707	0.35	0.7	4	3	7	45
UTB50200710	0.35	0.7	4	3	10	45
UTB502008005	0.4	0.8	4	3.2	0.5	45
UTB50200801	0.4	0.8	4	3.2	1	45
UTB502008015	0.4	0.8	4	3.2	1.5	45
UTB50200802	0.4	0.8	4	3.2	2	45
UTB50200803	0.4	0.8	4	3.2	3	45
UTB50200805	0.4	0.8	4	3.2	5	45
UTB50200807	0.4	0.8	4	3.2	7	45
UTB50200810	0.4	0.8	4	3.2	10	45
UTB502010005	0.5	1	4	4	0.5	50
UTB50201001	0.5	1	4	4	1	50
UTB502010015	0.5	1	4	4	1.5	50
UTB50201002	0.5	1	4	4	2	50
UTB50201003	0.5	1	4	4	3	50
UTB50201005	0.5	1	4	4	5	50
UTB50201007	0.5	1	4	4	7	50
UTB50201010	0.5	1	4	4	10	50
UTB502015005	0.75	1.5	4	6	0.5	50
UTB50201501	0.75	1.5	4	6	1	50
UTB502015015	0.75	1.5	4	6	1.5	50
UTB50201502	0.75	1.5	4	7	2	50
UTB50201503	0.75	1.5	4	8	3	50
UTB50201505	0.75	1.5	4	10	5	50
UTB50201507	0.75	1.5	4	10	7	50
UTB50201510	0.75	1.5	6	10	10	50
UTB502020005	1	2	4	6	0.5	50
UTB50202001	1	2	4	6	1	50
UTB502020015	1	2	4	6	1.5	50
UTB50202002	1	2	4	10	2	50
UTB50202003	1	2	4	10	3	50
UTB50202005	1	2	4	10	5	50
UTB50202007	1	2	6	10	7	50
UTB50202010	1	2	6	11	10	50

• 적용 피삭재

탄소강 ~ HB225	합금강 HB225~325	프리하든강 HRC30~50	열처리강		주철 ~FCD500	알루미늄	스테인리스강	Ti합금	Ni합금
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○		○				

◎: 매우적합 ○: 적합

U-Star Endmill

UF50

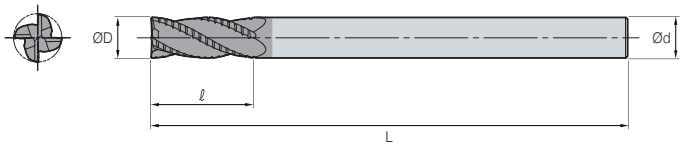
3~5날 챔퍼 피치 러핑 엔드밀



CARBIDE | CHAMFERED | 3-5 | 29° HELIX | 31° HELIX | R ±0.025 (코너 R) | AlCrN | 절삭조건 (p.449)

• 공구직경공차

ØD		Ød
Ø3 ~ Ø25	0 ~ -0.05mm	h5



(mm)

형 번	R	ØD	Ød	ℓ	L	z
UF503030	0.2	3	6	8	50	3
UF503040	0.2	4	6	10	50	3
UF504050	0.2	5	6	13	50	4
UF504060	0.2	6	6	10	50	4
UF50406015	0.2	6	6	15	60	4
UF504070	0.2	7	8	18	70	4
UF504080	0.2	8	8	12	60	4
UF50408020	0.2	8	8	20	70	4
UF504090	0.3	9	10	22	75	4
UF504100	0.3	10	10	15	65	4
UF50410025	0.3	10	10	25	75	4
UF504110	0.3	11	12	27	80	4
UF504120	0.3	12	12	20	70	4
UF50412030	0.3	12	12	30	80	4
UF505130	0.5	13	12	35	100	5
UF505140S16	0.5	14	16	35	100	5
UF505140	0.5	14	14	35	100	5
UF505150	0.5	15	16	35	100	5
UF505160	1	16	16	25	80	5
UF50516040	1	16	16	40	100	5
UF505180S20	1	18	20	40	100	5
UF505180	1	18	18	40	100	5
UF505200	1	20	20	25	80	5
UF50520045	1	20	20	45	100	5
UF505250	1	25	25	45	100	5

• 적용 피삭재

탄소강 ~ HB225	합금강 HB225~325	프리하든강 HRC30~50	열처리강		주철 ~FCD500	알루미늄	스테인리스강	Ti합금	Ni합금
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○		○				

◎: 매우적합 ○: 적합

UF51

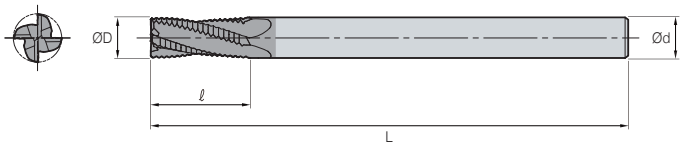
3~5날 파인 피치 러핑 엔드밀



CARBIDE | FINE | 3-5 | 20° HELIX | AlCrN | 절삭조건 p.449

• 공구직경공차

ØD		Ød
Ø3	0 ~ -0.04mm	h5
Ø4 ~ Ø6	0 ~ -0.048mm	
Ø7 ~ Ø10	0 ~ -0.058mm	
Ø11 ~ Ø18	0 ~ -0.07mm	
Ø20 ~ Ø25	0 ~ -0.084mm	



(mm)

형 번	ØD	Ød	ℓ	L	z
UF513030	3	6	8	50	3
UF513040	4	6	10	50	3
UF513050	5	6	13	50	3
UF513060	6	6	15	60	3
UF51306020	6	6	20	60	3
UF513070	7	8	18	70	3
UF513080	8	8	20	70	3
UF51308025	8	8	25	70	3
UF514090	9	10	22	75	4
UF514100	10	10	25	75	4
UF51410030	10	10	30	75	4
UF514110	11	12	27	80	4
UF514120	12	12	30	80	4
UF51412035	12	12	35	80	4
UF514130	13	12	35	100	4
UF514140	14	16	35	100	4
UF514160	16	16	40	100	4
UF514180	18	18	40	100	4
UF514200	20	20	50	100	4
UF515250	25	25	50	100	5

• 적용 피삭재

탄소강 ~ HB225	합금강 HB225~325	프리하든강 HRC30~50	열처리강		주철 ~FCD500	알루미늄	스테인리스강	Ti합금	Ni합금
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○		○				

◎: 매우적합 ○: 적합

U-Star Endmill

UF51H

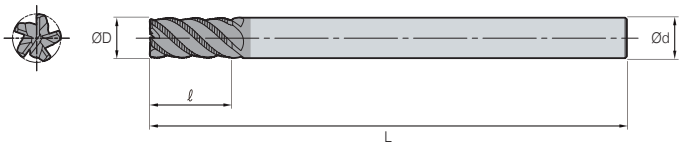
3~5날 45° 헬릭스 파인 피치 러핑 엔드밀

CARBIDE | FINE | 3-5 | 45° HELIX | AlCrN | 절삭조건 p.450

• 공구직경공차

ØD		Ød
Ø3 ~ Ø25	0 ~ -0.05mm	h5





(mm)

형 번	C	ØD	Ød	ℓ	L	z
UF513030H	0.2	3	6	8	50	3
UF513040H	0.2	4	6	10	50	3
UF514050H	0.3	5	6	13	50	4
UF514060H	0.3	6	6	10	50	4
UF51406015H	0.3	6	6	15	60	4
UF514070H	0.4	7	8	18	70	4
UF514080H	0.4	8	8	12	60	4
UF51408020H	0.4	8	8	20	70	4
UF514090H	0.4	9	10	22	75	4
UF514100H	0.4	10	10	15	65	4
UF51410025H	0.4	10	10	25	75	4
UF514110H	0.5	11	12	27	80	4
UF514120H	0.5	12	12	20	70	4
UF51412030H	0.5	12	12	30	80	4
UF515130H	0.5	13	12	35	100	5
UF515140S16H	0.5	14	16	35	100	5
UF515140H	0.5	14	14	35	100	5
UF515160H	0.5	16	16	25	80	5
UF51516040H	0.5	16	16	40	100	5
UF515180S20H	0.5	18	20	40	100	5
UF515180H	0.5	18	18	40	100	5
UF515200H	0.5	20	20	25	80	5
UF51520045H	0.5	20	20	45	100	5
UF515250H	0.5	25	25	45	100	5

• 적용 피삭재

탄소강 ~ HB225	합금강 HB225~325	프리하든강 HRC30~50	열처리강		주철 ~FCD500	알루미늄	스테인리스강	Ti합금	Ni합금
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○		○				

◎: 매우적합 ○: 적합

고효율 러핑 엔드밀 시리즈

R+ Endmill

- 고효율 러핑 인선 적용으로 우수한 가공 효율 확보
- 특수 인선 설계와 부등분할, 부등리드 적용으로 절삭 부하 감소



특징

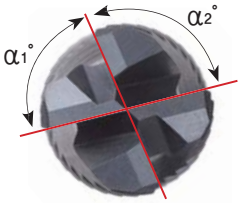
- **가공 효율 우수** – 중삭, 황삭 가공용 형상 적용
- **가공 수명 증가** – 신재종 적용으로 공구 수명 증가
- **절삭성 향상** – 러핑에 최적화된 인선형상 적용



• **절삭 저항 감소**
- 중삭, 황삭 인선 구현
- 엣지형상 적용

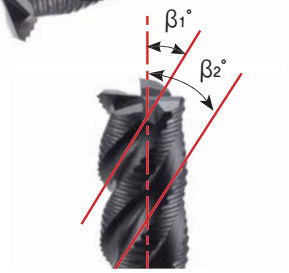


• **부드러운 절삭**
- Serration인선 구현
- 3 Combo R 적용



($\alpha_1^\circ \neq \alpha_2^\circ$)

• 채터링 방지를 위한 부등분할 적용



($\beta_1^\circ \neq \beta_2^\circ$)

• 부등리드 적용, 가공 부하 분산

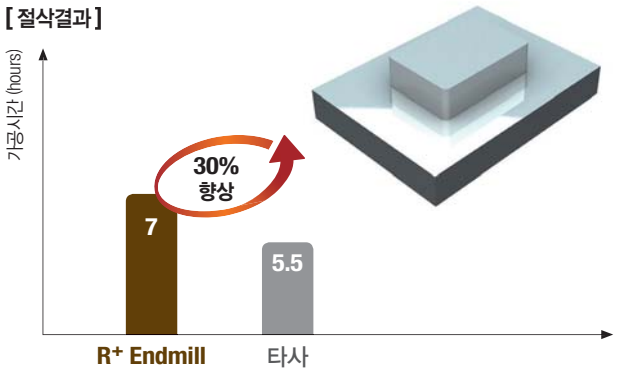
재종표기법

초경 러핑(Carbide roughing)		하이스 러핑(HSS roughing)	
FN30T	초경, Non 코팅	HN30T	분말 하이스, Non 코팅
PC10T	초경, TiCN 코팅	HN20T	하이스, Non 코팅
PC20T	초경, TiN 코팅	HC10T	하이스, TiCN 코팅
PC30T	초경, TiAlN 코팅	HC20T	하이스, TiN 코팅
PC40T	초경, TiAlCrN 코팅	HC30T	분말 하이스, TiAlN 코팅

절삭평가 사례

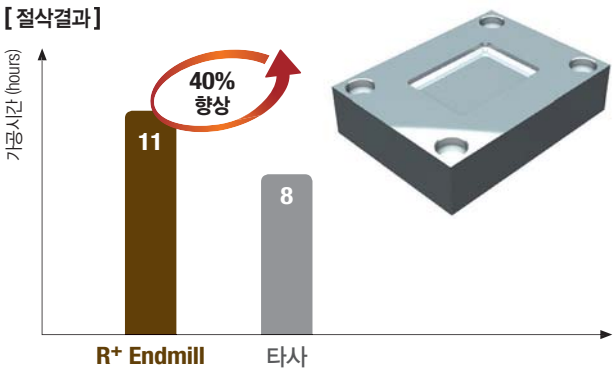
용도	금형
절삭조건	vc (m/min) = 57, fz (mm/t) = 0.03
	ap (mm) = 8, 건식
공구	RPE4080-075-FF

[절삭결과]



용도	금형
절삭조건	vc (m/min) = 68, fz (mm/t) = 0.06
	ap (mm) = 8, 건식
공구	RPE4080-063-FP-H

[절삭결과]



R+ Endmill

형번	형상	품명	공구직경	페이지
RPAE		3날 Al용 웨이브 러핑	Ø6.0 ~ 25.0	201
RPE-FP-H		4날 파인피치 표준형 러핑	Ø5.0 ~ 20.0	201
RPLE-FP-H		4날 파인피치 롱타입 러핑	Ø5.0 ~ 20.0	202
RPE-XG		4날 정 · 황삭용 러핑	Ø5.0 ~ 20.0	202
RPE-FP-L		4날 파인피치 러핑	Ø5.0 ~ 20.0	203
RPE-RG		4날 표준형 러핑	Ø5.0 ~ 20.0	203
RPE-RG		4날 러핑	Ø6.0 ~ 20.0	204
RPE-FF		4날 파인피치 러핑	Ø6.0 ~ 20.0	204
RPE-FP		4날 파인피치 러핑	Ø6.0 ~ 20.0	205
RPE-RG		4날 황삭용 러핑	Ø6.0 ~ 50.0	206

RPAE

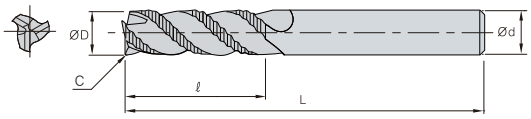
Al용 웨이브 러핑



3 | 45° HELIX | 재종 FN30T | 절삭조건 p.451

• 공구직경공차

ØD		Ød
Ø6 ~ Ø25	0 ~ -0.05mm	h6



• Carbide

(mm)

형 번	ØD	Ød	ℓ	L	C
RPAE 3060-063	6	6	18	63	0.3
RPAE 3070-063	7	8	23	63	0.3
RPAE 3080-063	8	8	23	63	0.3
RPAE 3090-080	9	10	30	80	0.3
RPAE 3100-080	10	10	30	80	0.3
RPAE 3110-080	11	12	32	80	0.5
RPAE 3120-080	12	12	32	80	0.5
RPAE 3140-080	14	14	32	80	0.5
RPAE 3160-105	16	16	48	105	0.5
RPAE 3180-105	18	18	48	105	0.5
RPAE 3200-105	20	20	50	105	0.5
RPAE 3250-105	25	25	50	105	0.5

RPE-FP-H

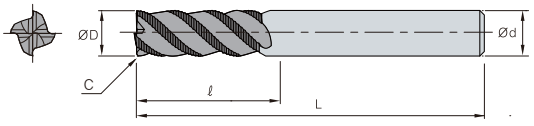
파인피치 표준형 러핑



4 | 40°/42° HELIX | 재종 PC30T | 절삭조건 p.451

• 공구직경공차

ØD		Ød
Ø5 ~ Ø20	0 ~ -0.05mm	h6



• Carbide, 하이헬릭스, 부등분할, 부등리드

(mm)

형 번	ØD	Ød	ℓ	L	C
RPE 4050-057-FP-H	5	6	13	57	0.3
RPE 4060-057-FP-H	6	6	13	57	0.5
RPE 4080-063-FP-H	8	8	19	63	0.5
RPE 4100-072-FP-H	10	10	22	72	0.5
RPE 4120-082-FP-H	12	12	26	82	0.5
RPE 4140-082-FP-H	14	16	26	82	0.6
RPE 4160-092-FP-H	16	16	32	92	0.6
RPE 4180-092-FP-H	18	20	32	92	0.6
RPE 4200-0104-FP-H	20	20	38	104	0.6

R+ Endmill

RPLE-FP-H

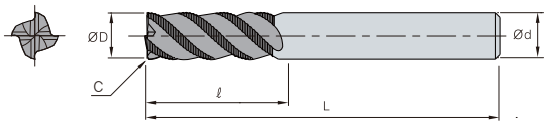
파인피치 롱타입 러핑



4 | 40°/42° HELIX | 재종 PC30T | 절삭조건 p.451

• 공구직경공차

ØD		Ød
Ø5 ~ Ø20	0 ~ -0.05mm	h6



• Carbide, 하이헬릭스, 부등분할, 부등리드

(mm)

형 번	ØD	Ød	ℓ	L	C
RPLE 4050-063-FP-H	5	6	19	63	0.3
RPLE 4060-063-FP-H	6	8	19	63	0.5
RPLE 4080-072-FP-H	8	8	28	72	0.5
RPLE 4100-082-FP-H	10	10	34	82	0.5
RPLE 4120-097-FP-H	12	12	40	97	0.5
RPLE 4140-097-FP-H	14	16	40	97	0.6
RPLE 4160-108-FP-H	16	16	48	108	0.6
RPLE 4180-108-FP-H	18	20	48	108	0.6
RPLE 4200-122-FP-H	20	20	56	122	0.6

RPE-XG

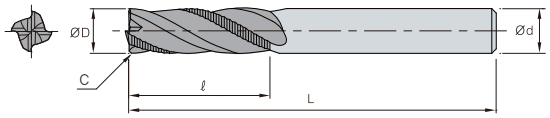
정·황삭용 러핑



4 | 30° HELIX | 재종 PC30T | 절삭조건 p.452

• 공구직경공차

ØD		Ød
Ø6 ~ Ø20	0 ~ -0.05mm	h6



• Carbide

(mm)

형 번	ØD	Ød	ℓ	L	C
RPE 4060-052-XG	6	6	14	52	0.25
RPE 4070-063-XG	7	8	18	63	0.3
RPE 4080-063-XG	8	8	18	63	0.3
RPE 4090-080-XG	9	10	22	80	0.3
RPE 4100-080-XG	10	10	22	80	0.3
RPE 4110-080-XG	11	12	26	80	0.4
RPE 4120-080-XG	12	12	26	80	0.4
RPE 4140-080-XG	14	14	30	80	0.4
RPE 4160-105-XG	16	16	34	105	0.6
RPE 4180-105-XG	18	18	38	105	0.6
RPE 4200-105-XG	20	20	42	105	0.6

RPE-FP-L

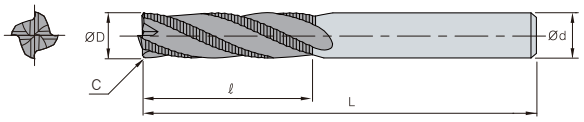
파인피치 러핑



4 | 18°/23° HELIX | 재종 PC30T | 절삭조건 p.452

• 공구직경공차

ØD		Ød
Ø5 ~ Ø20	0 ~ -0.05mm	h6



• Carbide, 부등분할, 부등리드

(mm)

형 번	ØD	Ød	ℓ	L	C
RPE 4050-060-FP-L	5	6	13	60	0.3
RPE 4060-080-FP-L	6	8	13	80	0.5
RPE 4080-080-FP-L	8	8	19	80	0.5
RPE 4100-080-FP-L	10	10	22	80	0.5
RPE 4120-080-FP-L	12	12	26	80	0.5
RPE 4140-085-FP-L	14	16	26	85	0.6
RPE 4160-100-FP-L	16	16	32	100	0.6
RPE 4180-100-FP-L	18	20	32	100	0.6
RPE 4200-105-FP-L	20	20	38	105	0.6

RPE-RG

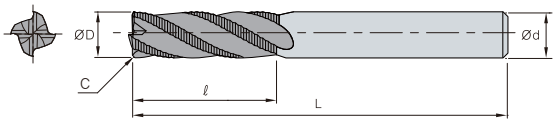
표준형 러핑



4 | 30° HELIX | 재종 PC40T | 절삭조건 p.453

• 공구직경공차

ØD		Ød
Ø5 ~ Ø20	0 ~ -0.05mm	h6



• Carbide

(mm)

형 번	ØD	Ød	ℓ	L	C
RPE 4050-050-RG	5	6	13	50	0.3
RPE 4060-050-RG	6	6	16	50	0.3
RPE 4080-060-RG	8	8	20	60	0.3
RPE 4100-075-RG	10	10	25	75	0.3
RPE 4120-080-RG	12	12	30	80	0.4
RPE 4140-100-RG	14	16	35	100	0.6
RPE 4160-100-RG	16	16	40	100	0.6
RPE 4180-110-RG	18	20	40	110	0.6
RPE 4200-110-RG	20	20	45	110	0.6

R+ Endmill

RPE-RG

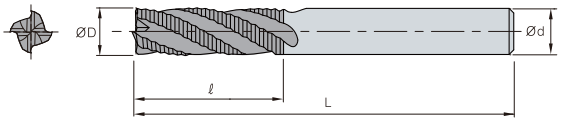
4F 러핑



4 | 30° HELIX | HSS PM | 재종 HN30T HC30T | 절삭조건 p.453

• 공구직경공차

ØD		Ød
Ø6 ~ Ø20	±0.1mm	h6



• HSS PM

(mm)

형 번	ØD	Ød	ℓ	L
RPE 4060-060-RG	6	6	20	60
RPE 4070-070-RG	7	10	20	70
RPE 4080-075-RG	8	10	25	75
RPE 4090-075-RG	9	10	30	75
RPE 4100-085-RG	10	10	35	85
RPE 4120-100-RG	12	12	40	100
RPE 4140-100-RG	14	16	40	100
RPE 4160-110-RG	16	16	50	110
RPE 4180-110-RG	18	20	50	110
RPE 4200-125-RG	20	20	60	125

RPE-FF

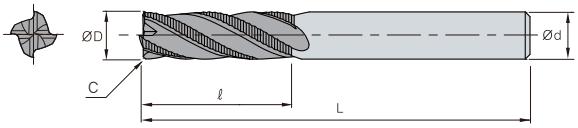
파인피치 러핑



4 | 25°/30° HELIX | HSS PM | 재종 HC30T | 절삭조건 p.453

• 공구직경공차

ØD		Ød
Ø6 ~ Ø20	±0.1mm	h6



• HSS PM, 부등분할

(mm)

형 번	ØD	Ød	ℓ	L	C
RPE 4060-060-FF	6	6	20	60	0.5
RPE 4070-070-FF	7	10	20	70	0.5
RPE 4080-075-FF	8	10	25	75	0.5
RPE 4090-075-FF	9	10	30	75	0.5
RPE 4100-085-FF	10	10	35	85	0.5
RPE 4120-100-FF	12	12	40	100	0.6
RPE 4140-100-FF	14	12	40	100	0.6
RPE 4160-110-FF	16	16	50	110	0.6
RPE 4180-110-FF	18	16	50	110	0.6
RPE 4200-125-FF	20	20	60	125	0.6

RPE-FP

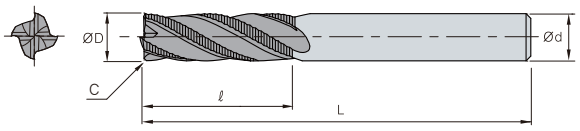
파인피치 러핑



4 | 25°/30° HELIX | HSS PM | 재종 HC30T | 절삭조건 p.453

• 공구직경공차

ØD		Ød
Ø6 ~ Ø12	0 ~ -0.05mm	h6
Ø12.1 ~ Ø20	0 ~ -0.1mm	



• HSS PM, 부등분할, 부등리드

(mm)

형 번	ØD	Ød	ℓ	L	C
RPE 4060-080-FP	6	6	13	80	0.5
RPE 4070-080-FP	7	10	16	80	0.5
RPE 4080-085-FP	8	10	19	85	0.5
RPE 4090-095-FP	9	10	19	95	0.5
RPE 4100-100-FP	10	10	22	100	0.5
RPE 4120-110-FP	12	12	26	110	0.6
RPE 4140-110-FP	14	12	26	110	0.6
RPE 4160-125-FP	16	16	32	125	0.6
RPE 4180-125-FP	18	16	32	125	0.6
RPE 4200-140-FP	20	20	38	140	0.6

R+ Endmill

RPE-RG

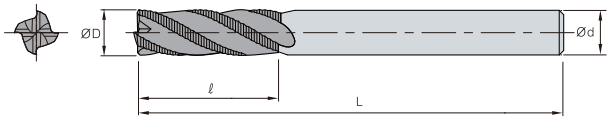
황삭용 러핑



4 | 30° HELIX | HSS Co 8% | 재종 HN20T HC20T HC10T | 절삭조건 p.454

• 공구직경공차

ØD		Ød
Ø6 ~ Ø50	±0.1mm	h6



• HSS

(mm)

형 번	ØD	Ød	ℓ	L
RPE 4060-060-RG	6	6	15	60
RPE 4070-065-RG	7	8	20	65
RPE 4080-065-RG	8	8	20	65
RPE 4090-075-RG	9	10	25	75
RPE 4100-075-RG	10	10	25	75
RPE 4110-080-RG	11	12	30	80
RPE 4120-080-RG	12	12	30	80
RPE 4130-090-RG	13	12	35	90
RPE 4140-090-RG	14	12	35	90
RPE 4150-095-RG	15	12	40	95
RPE 4160-095-RG	16	16	40	95
RPE 4170-095-RG	17	16	40	95
RPE 4180-105-RG	18	16	40	105
RPE 4190-110-RG	19	16	45	110
RPE 4200-110-RG	20	20	45	110
RPE 4210-110-RG	21	20	45	110
RPE 4220-110-RG	22	20	45	110
RPE 4230-110-RG	23	20	45	110
RPE 4240-120-RG	24	25	50	120
RPE 4250-120-RG	25	25	50	120
RPE 4260-120-RG	26	25	50	120
RPE 4270-125-RG	27	25	55	125
RPE 4280-125-RG	28	25	55	125
RPE 4300-125-RG	30	25	55	125
RPE 4320-145-RG	32	32	60	145
RPE 4340-145-RG	34	32	60	145
RPE 4350-145-RG	35	32	60	145
RPE 4360-145-RG	36	32	60	145
RPE 4380-150-RG	38	32	65	150
RPE 4400-150-RG	40	32	65	150
RPE 4420-155-RG	42	42	65	155
RPE 4440-155-RG	44	42	65	155
RPE 4450-160-RG	45	42	70	160
RPE 4460-160-RG	46	42	70	160
RPE 4500-160-RG	50	42	70	160

스테인리스강 가공용 엔드밀

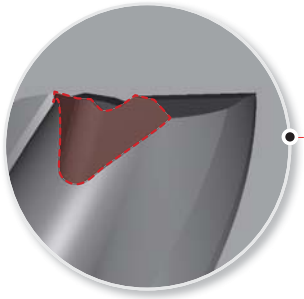
S+ Endmill New

- 스테인리스강에 최적화한 인선 설계로 돌발 치핑을 최소화하여 안정적 가공
- 내산화성, 표면경도가 높은 신규코팅 적용으로 스테인리스강 계열 및 티타늄, 니켈 등에 우수한 성능 구현

특징

- 내치핑성 우수 – 고인성 모재와 강력한 커팅 엣지
- 내용착성 및 내마모성 향상 – AlCrN계 코팅 박막
- 가공부하 및 칩 배출성 향상 – 부등분할, R형 게쉬 형상, 고경사각과 유선형 칩 포켓
- 면조도 우수 – 정삭 날부 추가

• 부등 분할/R게쉬 적용



- R형 게쉬 형상 채택을 통한 칩 배출력 향상
- 숄더링 가공 시 안정성 확보

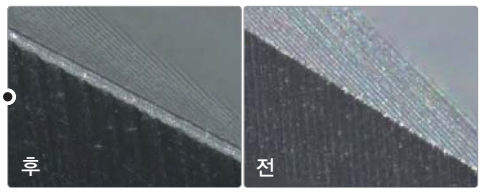
• AlCrN계 박막 사이즈 별 두께 적용



- Multi layer 적용
- Cr 함유를 통한 윤활성 향상
- 마찰열에 대한 안정성 확보
- 박막 두께를 향상을 통한 내마모성 확보



• 인선 처리 적용



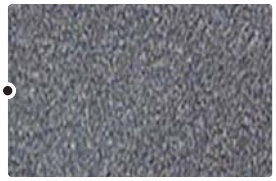
- 가공 시 초기 내치핑성 보완
- 내마모성 향상 및 안정적인 가공 유도
- 인선 처리 안정화로 품질 향상

• 정삭 날부 추가



- 1차 O.D 연삭 조도 향상을 통한 가공면 조도 향상
- 인선 품질 확보, 내융착성 향상

• 고인성 모재 채택



- 고인성 모재 채택을 통한 내치핑성, 가공 안정성 확보

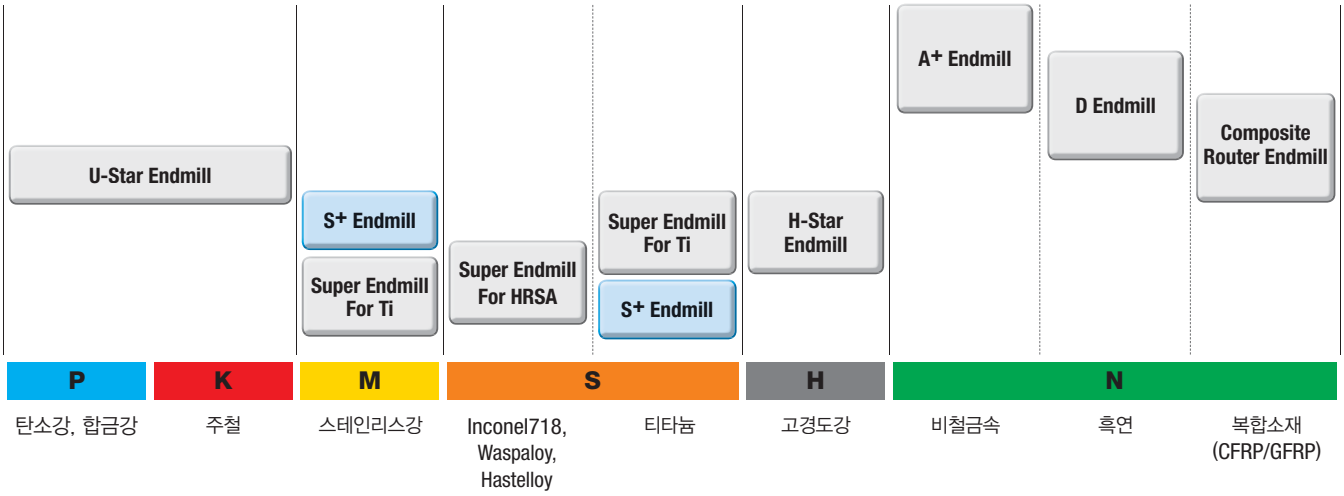
S+ Endmill

형번표기법

SP FE 4 120 - 075 (-V00N00) - R10 (-N)

- **SP** — S Plus Endmill
- **FE** — 구분
  - FE: 플랫
  - RE: 레디우스
  - BE: 볼
  - XE: 러핑
- **4** — 날수
  - 4: 4날
- **120** — 공구직경
  - 120: Ø12.0mm
- **075** — 전장
  - 075: 175mm
- **(-V00N00)** — 인선길이 / 목부길이
  - V10: 10mm
  - N20: 20mm
- **R10** — 코너 R
  - 10: 1.0mm
- **(-N)** — N: Nick type

공구 선택 가이드



형번	형상	품명	공구직경	페이지
SPFE2000		2날 플랫 엔드밀	Ø1.0 ~ 20.0	209
SPFE3000		3날 플랫 엔드밀	Ø1.0 ~ 20.0	210
SPFE4000		4날 플랫 엔드밀	Ø1.0 ~ 20.0	211
SPFE6000		6날 플랫 엔드밀	Ø6.0 ~ 20.0	212
SPRE4000		4날 레디우스 엔드밀	Ø1.0 ~ 20.0	213
SPRE5000		5날 니크 타입 레디우스 엔드밀	Ø6.0 ~ 20.0	215
SPRE7000		7날 니크 타입 레디우스 엔드밀	Ø6.0 ~ 20.0	216
SPBE2000		2날 볼 엔드밀	Ø1.0 ~ 12.0	217
SPBE4000		4날 볼 엔드밀	Ø3.0 ~ 20.0	218
SPXE3000 SPXE4000 SPXE5000		3~5날 러핑 엔드밀	Ø3.0 ~ 20.0	219

SPFE2000(플랫)

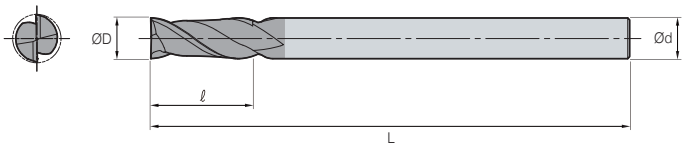
2날 플랫 엔드밀



2 | 36° HELIX | 재종 PC325 | 절삭조건 p.455

• 공구직경공차

ØD		Ød
Ø1 ~ Ø5	0 ~ -0.015mm	h5
Ø6	0 ~ -0.020mm	
Ø8 ~ Ø20	0 ~ -0.030mm	



(mm)

형 번	ØD	Ød	ℓ	L
SPFE2010-050	1.0	6	2.5	50
SPFE2012-050	1.2	6	3	50
SPFE2015-050	1.5	6	4	50
SPFE2020-050	2.0	6	6	50
SPFE2025-050	2.5	6	7	50
SPFE2030-055	3.0	6	8	55
SPFE2040-055	4.0	6	10	55
SPFE2050-055	5.0	6	15	55
SPFE2060-060	6.0	6	15	60
SPFE2080-070	8.0	8	20	70
SPFE2100-075	10.0	10	25	75
SPFE2120-080	12.0	12	30	80
SPFE2140-090	14.0	16	35	90
SPFE2160-0100	16.0	16	42	100
SPFE2180-0100	18.0	16	45	100
SPFE2200-0100	20.0	20	48	100

• 적용 피삭재

탄소강 ~ HB225	합금강 HB225~325	프리하든강 HRC30~50	열처리강		주철 ~FCD500	알루미늄	스테인리스강	Ti합금	Ni합금
			SKD61~HRC55	SKD11 HRC55~					
○	○	○					◎	○	○

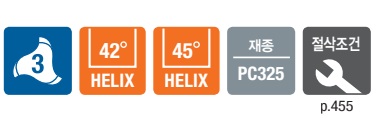
◎: 매우적합 ○: 적합

S+ Endmill

SPFE3000(플랫)

3날 플랫 엔드밀

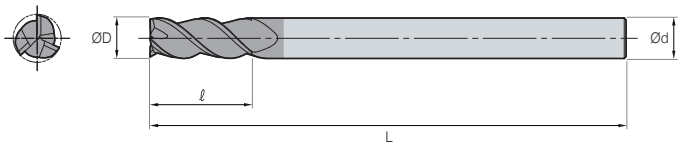




p.455

• 공구직경공차

ØD		Ød
Ø1 ~ Ø5	0 ~ -0.015mm	h5
Ø6	0 ~ -0.020mm	
Ø8 ~ Ø20	0 ~ -0.030mm	



(mm)

형 번	ØD	Ød	ℓ	L
SPFE3010-050	1.0	6	2.5	50
SPFE3012-050	1.2	6	3	50
SPFE3015-050	1.5	6	4	50
SPFE3020-050	2.0	6	6	50
SPFE3025-050	2.5	6	7	50
SPFE3030-055	3.0	6	8	55
SPFE3030-060-V10	3.0	6	10	60
SPFE3040-055	4.0	6	10	55
SPFE3040-060-V12	4.0	6	12	60
SPFE3050-055	5.0	6	13	55
SPFE3060-060	6.0	6	15	60
SPFE3060-065-V20	6.0	6	20	65
SPFE3080-070	8.0	8	20	70
SPFE3080-080-V30	8.0	8	30	80
SPFE3100-075	10.0	10	25	75
SPFE3100-085-V35	10.0	10	35	85
SPFE3120-080	12.0	12	30	80
SPFE3120-090-V40	12.0	12	40	90
SPFE3140-090	14.0	16	35	90
SPFE3160-100	16.0	16	42	100
SPFE3180-100	18.0	16	45	100
SPFE3200-100	20.0	20	48	100

• 적용 피삭재

탄소강 ~ HB225	합금강 HB225~325	프리하든강 HRC30~50	열처리강		주철 ~FCD500	알루미늄	스테인리스강	Ti합금	Ni합금
			SKD61~HRC55	SKD11 HRC55~					
○	○	○					◎	○	○

◎: 매우적합 ○: 적합

SPFE4000(플랫)

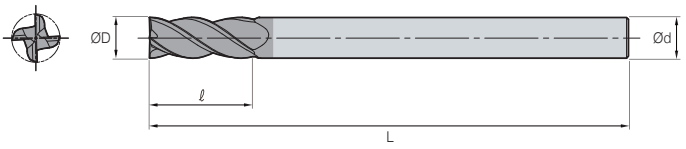
4날 플랫 엔드밀



4 | 35° HELIX | 37° HELIX | 재종 PC325 | 절삭조건 p.455

• 공구직경공차

ØD		Ød
Ø1 ~ Ø5.5	0 ~ -0.015mm	h5
Ø6 ~ Ø7	0 ~ -0.020mm	
Ø8 ~ Ø20	0 ~ -0.030mm	



(mm)

형 번	ØD	Ød	ℓ	L
SPFE4010-050	1.0	6	2.5	50
SPFE4012-050	1.2	6	3	50
SPFE4015-050	1.5	6	4	50
SPFE4020-050	2.0	6	6	50
SPFE4025-050	2.5	6	7	50
SPFE4030-055	3.0	6	8	55
SPFE4030-060-V10	3.0	6	10	60
SPFE4035-055	3.5	6	10	55
SPFE4040-055	4.0	6	10	55
SPFE4040-060-V12	4.0	6	12	60
SPFE4045-055	4.5	6	12	55
SPFE4050-055	5.0	6	15	55
SPFE4055-060	5.5	6	15	60
SPFE4060-060	6.0	6	15	60
SPFE4060-065-V20	6.0	6	20	65
SPFE4065-060	6.5	8	15	60
SPFE4070-080	7.0	8	20	80
SPFE4080-070	8.0	8	20	70
SPFE4080-070-V25	8.0	8	25	70
SPFE4080-080-V30	8.0	8	30	80
SPFE4085-070	8.5	10	20	70
SPFE4090-080	9.0	10	25	80
SPFE4100-075	10.0	10	25	75
SPFE4100-085-V35	10.0	10	35	85
SPFE4120-080	12.0	12	30	80
SPFE4120-090-V40	12.0	12	40	90
SPFE4140-090	14.0	16	35	90
SPFE4160-100	16.0	16	42	100
SPFE4180-100	18.0	16	45	100
SPFE4200-100	20.0	20	48	100

• 적용 피삭재

탄소강 ~ HB225	합금강 HB225~325	프리하든강 HRC30~50	열처리강		주철 ~FCD500	알루미늄	스테인리스강	Ti합금	Ni합금
			SKD61~HRC55	SKD11 HRC55~					
○	○	○					◎	○	○

◎: 매우적합 ○: 적합

Endmill **S+ Endmill**

SPFE6000(플랫)

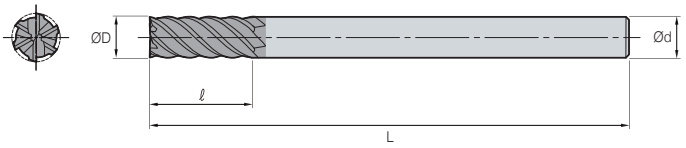
6날 플랫 엔드밀



6 | 45° HELIX | 재종 PC325 | 절삭조건 p.455

• 공구직경공차

ØD		Ød
Ø6	0 ~ -0.020mm	h5
Ø8 ~ Ø20	0 ~ -0.030mm	



(mm)

형 번	ØD	Ød	ℓ	L
SPFE6060-060	6.0	6	15	60
SPFE6080-070	8.0	8	20	70
SPFE6100-075	10.0	10	25	75
SPFE6120-080	12.0	12	30	80
SPFE6160-100	16.0	16	42	100
SPFE6200-100	20.0	20	48	100

• 적용 피삭재

탄소강 ~ HB225	합금강 HB225~325	프리하든강 HRC30~50	열처리강		주철 ~FCD500	알루미늄	스테인리스강	Ti합금	Ni합금
			SKD61~HRC55	SKD11 HRC55~					
○	○	○					◎	○	○

◎: 매우적합 ○: 적합

SPRE4000(레디우스)

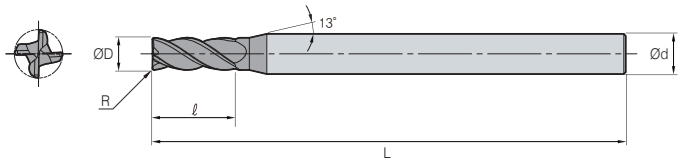
4날 레디우스 엔드밀



4 | 35° HELIX | 37° HELIX | R ±0.01 (R 공차) | 재종 PC325 | 절삭조건 (p.455)

• 공구직경공차

ØD		Ød
Ø1 ~ Ø5	0 ~ -0.015mm	h5
Ø6 ~ Ø7	0 ~ -0.020mm	
Ø8 ~ Ø20	0 ~ -0.030mm	



(mm)

형 번	R	ØD	Ød	ℓ	L
SPRE4010-050-R01	0.1	1	6	2.5	50
SPRE4010-050-R02	0.2	1	6	2.5	50
SPRE4012-050-R01	0.1	1.2	6	3	50
SPRE4015-050-R01	0.1	1.5	6	4	50
SPRE4015-050-R02	0.2	1.5	6	4	50
SPRE4020-050-R01	0.1	2	6	6	50
SPRE4020-050-R02	0.2	2	6	6	50
SPRE4025-050-R02	0.2	2.5	6	7	50
SPRE4030-055-R02	0.2	3	6	8	55
SPRE4030-055-R03	0.3	3	6	8	55
SPRE4030-055-R05	0.5	3	6	8	55
SPRE4040-055-R02	0.2	4	6	10	55
SPRE4040-055-R03	0.3	4	6	10	55
SPRE4040-055-R05	0.5	4	6	10	55
SPRE4050-055-R02	0.2	5	6	15	55
SPRE4050-055-R03	0.3	5	6	15	55
SPRE4050-055-R05	0.5	5	6	15	55
SPRE4060-060-R03	0.3	6	6	15	60
SPRE4060-060-R05	0.5	6	6	15	60
SPRE4060-060-R10	1.0	6	6	15	60
SPRE4070-060-R03	0.3	7	8	15	60
SPRE4080-070-R02	0.2	8	8	20	70
SPRE4080-070-R03	0.3	8	8	20	70
SPRE4080-070-R05	0.5	8	8	20	70
SPRE4080-070-R10	1.0	8	8	20	70
SPRE4100-075-R03	0.3	10	10	25	75
SPRE4100-075-R05	0.5	10	10	25	75
SPRE4100-075-R10	1.0	10	10	25	75
SPRE4100-075-R15	1.5	10	10	25	75
SPRE4100-075-R20	2.0	10	10	25	75
SPRE4100-075-R30	3.0	10	10	25	75

• 적용 피삭재

탄소강 ~ HB225	합금강 HB225~325	프리하든강 HRC30~50	열처리강		주철 ~FCD500	알루미늄	스테인리스강	Ti합금	Ni합금
			SKD61~HRC55	SKD11 HRC55~					
○	○	○					◎	○	○

◎: 매우적합 ○: 적합

S+ Endmill

SPRE4000(레디우스)

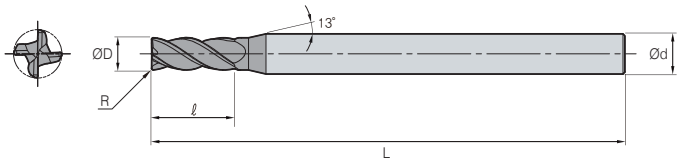
4날 레디우스 엔드밀



4 | 35° HELIX | 37° HELIX | R ±0.01 R 공차 | 재종 PC325 | 절삭조건 p.455

• 공구직경공차

ØD		Ød
Ø1 ~ Ø5	0 ~ -0.015mm	h5
Ø6 ~ Ø7	0 ~ -0.020mm	
Ø8 ~ Ø20	0 ~ -0.030mm	



(mm)

형 번	R	ØD	Ød	ℓ	L
SPRE4120-080-R03	0.3	12	12	30	80
SPRE4120-080-R05	0.5	12	12	30	80
SPRE4120-080-R10	1.0	12	12	30	80
SPRE4120-080-R15	1.5	12	12	30	80
SPRE4120-080-R20	2.0	12	12	30	80
SPRE4120-080-R30	3.0	12	12	30	80
SPRE4120-080-R40	4.0	12	12	30	80
SPRE4140-090-R05	0.5	14	16	35	90
SPRE4140-090-R10	1.0	14	16	35	90
SPRE4160-100-R05	0.5	16	16	42	100
SPRE4160-100-R10	1.0	16	16	42	100
SPRE4180-100-R05	0.5	18	16	45	100
SPRE4200-100-R05	0.5	20	20	48	100
SPRE4200-100-R10	1.0	20	20	48	100

• 적용 피삭재

탄소강 ~ HB225	합금강 HB225~325	프리하든강 HRC30~50	열처리강		주철 ~FCD500	알루미늄	스테인리스강	Ti합금	Ni합금
			SKD61~HRC55	SKD11 HRC55~					
○	○	○					◎	○	○

◎: 매우적합 ○: 적합

SPRE5000(니크 타입 레디우스)

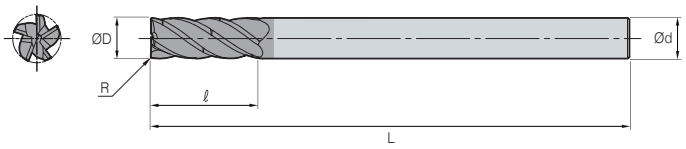
5날 니크 타입 레디우스 엔드밀



5 | 35° HELIX | 38° HELIX | R ±0.01 (R 공차) | 재종 PC325 | 절삭조건 p.455

• 공구직경공차

ØD		Ød
Ø6	0 ~ -0.020mm	h5
Ø8 ~ Ø20	0 ~ -0.030mm	



(mm)

형 번	R	ØD	Ød	ℓ	L
SPRE5060-060-R05-N	0.5	6	6	15	60
SPRE5080-070-R05-N	0.5	8	8	20	70
SPRE5100-170-R05-N	0.5	10	10	25	75
SPRE5120-180-R05-N	0.5	12	12	30	80
SPRE5160-100-R05-N	0.5	16	16	42	100
SPRE5200-100-R05-N	0.5	20	20	48	100

• 적용 피삭재

탄소강 ~ HB225	합금강 HB225~325	프리하든강 HRC30~50	열처리강		주철 ~FCD500	알루미늄	스테인리스강	Ti합금	Ni합금
			SKD61~HRC55	SKD11 HRC55~					
○	○	○					◎	○	○

◎: 매우적합 ○: 적합

S+ Endmill

SPRE7000(니크 타입 레디우스)

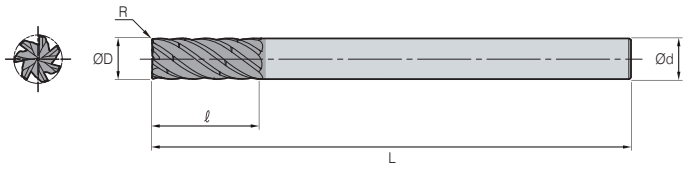
7날 니크 타입 레디우스 엔드밀



7 | 35° HELIX | 38° HELIX | R ±0.01 (R 공차) | 재종 PC325 | 절삭조건 p.455

• 공구직경공차

ØD		Ød
Ø6	0 ~ -0.020mm	h5
Ø8 ~ Ø20	0 ~ -0.030mm	



(mm)

형 번	R	ØD	Ød	ℓ	L
SPRE7060-060-R05-N	0.5	6	6	15	60
SPRE7080-070-R05-N	0.5	8	8	20	70
SPRE7100-075-R05-N	0.5	10	10	25	75
SPRE7120-080-R05-N	0.5	12	12	30	80
SPRE7160-100-R05-N	0.5	16	16	42	100
SPRE7200-100-R05-N	0.5	20	20	48	100

• 적용 피삭재

탄소강 ~ HB225	합금강 HB225~325	프리하든강 HRC30~50	열처리강		주철 ~FCD500	알루미늄	스테인리스강	Ti합금	Ni합금
			SKD61~HRC55	SKD11 HRC55~					
○	○	○					◎	○	○

◎: 매우적합 ○: 적합

SPBE2000(볼)

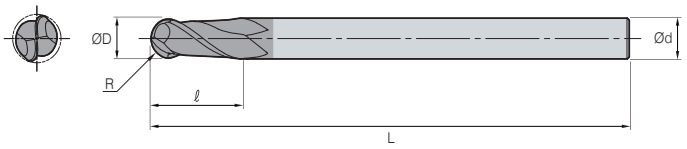
2날 볼 엔드밀



2 | 38° HELIX | R ±0.01 (R 공차) | 재종 PC325 | 절삭조건 p.455

• 공구직경공차

ØD		Ød
Ø1 ~ Ø5	0 ~ -0.015mm	h5
Ø6	0 ~ -0.020mm	
Ø8 ~ Ø20	0 ~ -0.030mm	



(mm)

형 번	R	ØD	Ød	ℓ	L
SPBE2010-050	0.5	1	6	3	50
SPBE2020-050	1.0	2	6	6	50
SPBE2030-050	1.5	3	6	8	50
SPBE2030-070	1.5	3	6	8	70
SPBE2040-050	2.0	4	6	10	50
SPBE2040-070	2.0	4	6	10	70
SPBE2050-050	2.5	5	6	13	50
SPBE2050-080	2.5	5	6	13	80
SPBE2060-050	3.0	6	6	13	50
SPBE2060-090	3.0	6	6	13	90
SPBE2080-060	4.0	8	8	19	60
SPBE2080-100	4.0	8	8	19	100
SPBE2100-070	5.0	10	10	22	70
SPBE2100-100	5.0	10	10	22	100
SPBE2120-075	6.0	12	12	26	75
SPBE2120-110	6.0	12	12	26	110

• 적용 피삭재

탄소강 ~ HB225	합금강 HB225~325	프리하든강 HRC30~50	열처리강		주철 ~FCD500	알루미늄	스테인리스강	Ti합금	Ni합금
			SKD61~HRC55	SKD11 HRC55~					
○	○	○					◎	○	○

◎: 매우적합 ○: 적합

Endmill **S+ Endmill**

SPBE4000(볼)

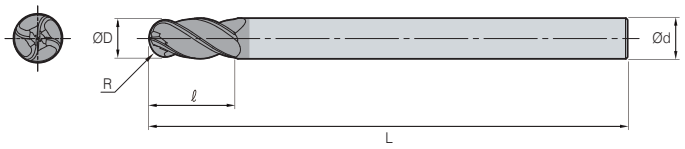
4날 볼 엔드밀



4 | 35° HELIX | 37° HELIX | R ±0.01 (R 공차) | 재종 PC325 | 절삭조건 (p.455)

• 공구직경공차

ØD		Ød
Ø3 ~ Ø5	0 ~ -0.015mm	h5
Ø6	0 ~ -0.020mm	
Ø8 ~ Ø20	0 ~ -0.030mm	



(mm)

형 번	R	ØD	Ød	ℓ	L
SPBE4030-060	1.5	3	6	8	60
SPBE4040-070	2.0	4	6	8	70
SPBE4050-080	2.5	5	6	12	80
SPBE4060-090	3.0	6	6	12	90
SPBE4080-100	4.0	8	8	16	100
SPBE4100-100	5.0	10	10	20	100
SPBE4120-100	6.0	12	12	25	100
SPBE4160-100	8.0	16	16	30	100
SPBE4200-100	10.0	20	20	38	100

• 적용 피삭재

탄소강 ~ HB225	합금강 HB225~325	프리하든강 HRC30~50	열처리강		주철 ~FCD500	알루미늄	스테인리스강	Ti합금	Ni합금
			SKD61~HRC55	SKD11 HRC55~					
○	○	○					◎	○	○

◎: 매우적합 ○: 적합

SPXE3000/4000/5000(러핑)

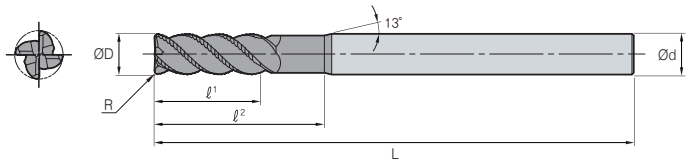
3~5날 러핑 엔드밀



3~5 | 45° HELIX | R ±0.01 (R 공차) | 재종 PC325 | 절삭조건 (p.455)

• 공구직경공차

ØD		Ød
Ø3 ~ Ø20	0 ~ -0.050mm	h5



(mm)

형 번	R	ØD	Ød	ℓ1	ℓ2	L	z
SPXE3030-050-R02	0.2	3	6	8	-	50	3
SPXE3040-050-R02	0.2	4	6	10	-	50	3
SPXE4050-050-R02	0.2	5	6	13	-	50	4
SPXE4060-060	0.2	6	6	13	-	60	4
SPXE4060-060-R05	0.5	6	6	13	-	60	4
SPXE4060-060-V10N20S6-R02	0.2	6	6	10	20	60	4
SPXE4070-070-R02	0.2	7	8	18	-	70	4
SPXE4080-070-R02	0.2	8	8	19	-	70	4
SPXE4080-070-R10	1	8	8	19	-	70	4
SPXE4080-070-V12N25S8-R02	0.2	8	8	12	25	70	4
SPXE4090-070-R03	0.3	9	10	20	-	70	4
SPXE4100-075-R03	0.3	10	10	22	-	75	4
SPXE4100-075-R10	1	10	10	22	-	75	4
SPXE4100-075-V15N30S10-R03	0.3	10	10	15	30	75	4
SPXE4110-080-R03	0.3	11	12	25	-	80	4
SPXE4120-080-R03	0.3	12	12	26	-	80	4
SPXE4120-080-R10	1	12	12	26	-	80	4
SPXE4120-080-V20N35S12-R03	0.3	12	12	20	35	80	4
SPXE5060-060-R02	0.2	6	6	13	-	60	5
SPXE5080-065-R02	0.2	8	8	19	-	65	5
SPXE5100-070-R03	0.3	10	10	22	-	70	5
SPXE5120-080-R03	0.3	12	12	26	-	80	5
SPXE5140-090-R05	0.5	14	16	28	-	90	5
SPXE5160-100-R05	0.5	16	16	32	-	100	5
SPXE5160-100-V42-R05	0.5	16	16	42	-	100	5
SPXE5160-100-R15	1.5	16	16	32	-	100	5
SPXE5160-100-V42-R15	1.5	16	16	42	-	100	5
SPXE5200-100-R05	0.5	20	20	38	-	100	5
SPXE5200-100-V45-R05	0.5	20	20	45	-	100	5
SPXE5200-100-R20	2	20	20	38	-	100	5
SPXE5200-100-V45-R20	2	20	20	45	-	100	5

• 적용 피삭재

탄소강 ~ HB225	합금강 HB225~325	프리하든강 HRC30~50	열처리강		주철 ~FCD500	알루미늄	스테인리스강	Ti합금	Ni합금
			SKD61~HRC55	SKD11 HRC55~					
○	○	○					◎	○	○

◎: 매우적합 ○: 적합

알루미늄 가공용 엔드밀

A+ Endmill

- 알루미늄용 사상, 중삭, 황삭 가공용 엔드밀
- 다양한 솔루션 제공 – 다양한 가공 프로세스에 적합한 공구 제공
- 가공 효율성 향상 – 최신 기술의 특수 인선과 플루트 적용

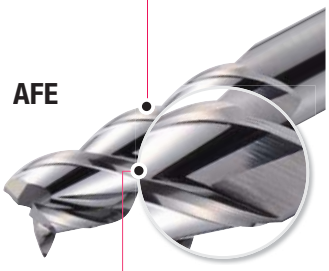
특징

APFE



- **샤프한 인선 및 이중 여유각**
  - 가공부하 감소
  - 인선의 강성 증가로 파손 방지
- **U형 경면 플루트**
  - 넓은 칩 통로로 효과적인 배출
  - 경면을 이용한 용착 방지

AFE



- **샤프한 인선**
  - 높은 가공수명, 경제성 향상
  - 가공부하 감소
- **경면의 플루트**
  - 칩의 용착 방지
  - 용착방지로 가공부하 감소

RPAE



- **웨이브 타입 인선**
  - 절삭부하 감소
  - 칩의 분쇄 및 효율적인 배출
- **샤프한 인선**
  - 절삭부하 감소
  - 설비에 전달되는 부하 감소

형번	형상	품명	공구직경	페이지
APFE		2날 플랫 엔드밀	Ø2.5 ~ 20.0	221
APFE		3날 플랫 엔드밀	Ø2.5 ~ 20.0	221
APMFE		2날 미들 플랫 엔드밀	Ø3.0 ~ 20.0	222
APMFE		3날 미들 플랫 엔드밀	Ø3.0 ~ 20.0	222
APLFE		2날 롱 플랫 엔드밀	Ø3.0 ~ 20.0	223
APLFE		3날 롱 플랫 엔드밀	Ø3.0 ~ 20.0	223
APBE		2날 볼 엔드밀	Ø1.0 ~ 12.0	224
AFE		3날 숏 플랫 엔드밀	Ø1.0 ~ 20.0	225
AFE		3날 플랫 엔드밀	Ø1.0 ~ 20.0	226
AFE		3날 롱 플랫 엔드밀	Ø1.0 ~ 20.0	227
APRE		3날 러핑 엔드밀	Ø4.0 ~ 25.0	229
RPAE		3날 웨이브 러핑 엔드밀	Ø6.0 ~ 25.0	230

APFE2000/3000(플랫)

2~3날 플랫 엔드밀



2 | 3 | 50° HELIX | 재종 H05S | 절삭조건 p.456

• 공구직경공차

ØD		Ød
Ø1 ~ Ø6	0 ~ -0.020mm	h6
Ø6.1 ~ Ø8	0 ~ -0.025mm	
Ø8.1 ~ Ø20	0 ~ -0.030mm	

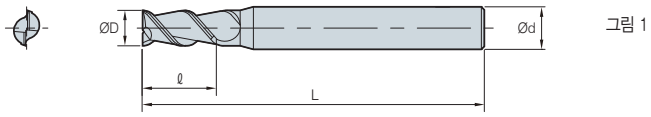


그림 1

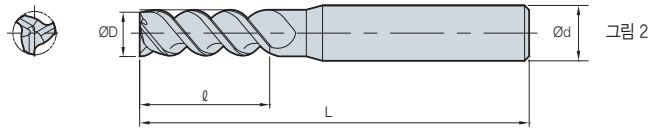


그림 2

(mm)

형 번	ØD	Ød	ℓ	L	그림
APFE2020-050-S4	2	4	6	50	1
APFE2025-050	2.5	6	8	50	1
APFE2030-050	3	6	9	50	1
APFE2040-050	4	6	12	50	1
APFE2050-050	5	6	15	50	1
APFE2060-050	6	6	18	50	1
APFE2080-060	8	8	20	60	1
APFE2100-075	10	10	30	75	1
APFE2120-075	12	12	32	75	1
APFE2160-100	16	16	45	100	1
APFE2200-100	20	20	45	100	1
APFE3020-050-S4	2	4	6	50	2
APFE3025-050	2.5	6	8	50	2
APFE3030-050	3	6	9	50	2
APFE3040-050	4	6	12	50	2
APFE3050-050	5	6	15	50	2
APFE3060-050	6	6	18	50	2
APFE3080-060	8	8	20	60	2
APFE3100-075	10	10	30	75	2
APFE3120-075	12	12	32	75	2
APFE3160-100	16	16	45	100	2
APFE3200-100	20	20	45	100	2

A+ Endmill

APMFE2000/3000(미들 플랫)

2~3날 미들 플랫 엔드밀



2 | 3 | 50° HELIX | 재종 H05S | 절삭조건 p.456

• 공구직경공차

ØD		Ød
Ø1 ~ Ø6	0 ~ -0.020mm	h6
Ø6.1 ~ Ø8	0 ~ -0.025mm	
Ø8.1 ~ Ø20	0 ~ -0.030mm	

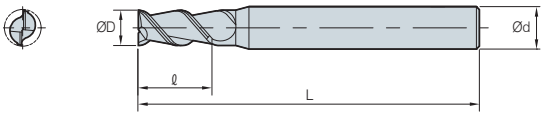


그림 1

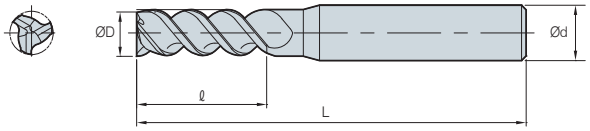


그림 2

(mm)

형 번	ØD	Ød	ℓ	L	그림
APMFE2030-060	3	6	11	60	1
APMFE2040-060	4	6	14	60	1
APMFE2050-060	5	6	17	60	1
APMFE2060-065	6	6	22	65	1
APMFE2080-065	8	8	25	65	1
APMFE2100-080	10	10	37	80	1
APMFE2120-080	12	12	40	80	1
APMFE2160-110	16	16	55	110	1
APMFE2200-125	20	20	60	125	1
APMFE3030-060	3	6	11	60	2
APMFE3040-060	4	6	14	60	2
APMFE3050-060	5	6	17	60	2
APMFE3060-065	6	6	22	65	2
APMFE3080-065	8	8	25	65	2
APMFE3100-080	10	10	37	80	2
APMFE3120-080	12	12	40	80	2
APMFE3160-110	16	16	55	110	2
APMFE3200-125	20	20	60	125	2

APLFE2000/3000(롱 플랫)

2~3날 플랫 엔드밀



2 | 3 | 45° HELIX | 재종 H05S | 절삭조건 p.456

• 공구직경공차

ØD		Ød
Ø1 ~ Ø6	0 ~ -0.020mm	h6
Ø6.1 ~ Ø8	0 ~ -0.025mm	
Ø8.1 ~ Ø20	0 ~ -0.030mm	

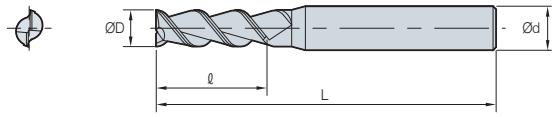


그림 1

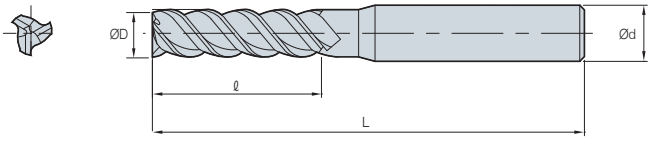


그림 2

(mm)

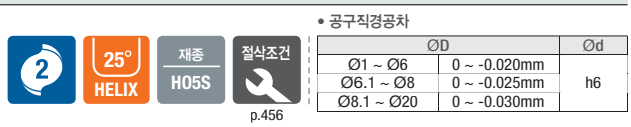
형 번	ØD	Ød	ℓ	L	그림
APLFE2030-060	3	6	12	60	1
APLFE2040-060	4	6	16	60	1
APLFE2050-060	5	6	20	60	1
APLFE2060-075	6	6	25	75	1
APLFE2080-075	8	8	32	75	1
APLFE2100-100	10	10	45	100	1
APLFE2120-100	12	12	45	100	1
APLFE2160-150	16	16	65	150	1
APLFE2200-150	20	20	75	150	1
APLFE3030-060	3	6	12	60	2
APLFE3040-060	4	6	16	60	2
APLFE3050-060	5	6	20	60	2
APLFE3060-075	6	6	25	75	2
APLFE3080-075	8	8	32	75	2
APLFE3100-100	10	10	45	100	2
APLFE3120-100	12	12	45	100	2
APLFE3160-150	16	16	65	150	2
APLFE3200-150	20	20	75	150	2

A+ Endmill

APBE2000(볼)

2날 볼 엔드밀

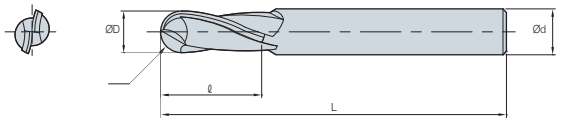




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• 공구직경공차

ØD		Ød
Ø1 ~ Ø6	0 ~ -0.020mm	h6
Ø6.1 ~ Ø8	0 ~ -0.025mm	
Ø8.1 ~ Ø20	0 ~ -0.030mm	



(mm)

형 번	R	ØD	Ød	ℓ	L
2010-050	0.50	1	4	2	50
2015-050	0.75	1.5	4	3	50
2020-050	1.00	2	4	4	50
2025-050	1.25	2.5	4	5	50
2030-050	1.50	3	4	6	50
2035-050	1.75	3.5	4	7	50
2040-050	2.00	4	4	8	50
2045-050	2.25	4.5	6	9	50
2050-050	2.50	5	6	10	50
2055-050	2.75	5.5	6	11	50
2060-050	3.00	6	6	12	50
2080-060	4.00	8	8	16	60
2100-075	5.00	10	10	20	75
2120-075	6.00	12	12	24	75

AFE3000(숏 플랫)

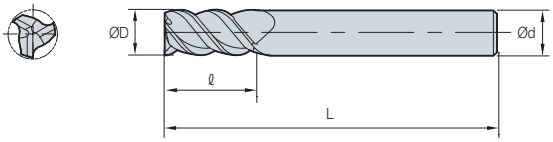
3날 숏 플랫 엔드밀



3 | 30° HELIX | 재종 H05S | 절삭조건 p.456

• 공구직경공차

ØD		Ød
Ø1 ~ Ø12	0 ~ -0.020mm	h6
Ø12.1 ~ Ø20	0 ~ -0.030mm	



(mm)

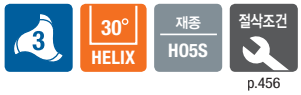
형 번	ØD	Ød	ℓ	L
AFE3010-040-V2S6	1.0	6	2	40
AFE3010-040-V2.5S6	1.0	6	2.5	40
AFE3015-040-V3S6	1.5	6	3	40
AFE3020-040-V3S6	2.0	6	3	40
AFE3030-045-V4S6	3.0	6	4	45
AFE3030-045-V8S6	3.0	6	8	45
AFE3040-045-V5S6	4.0	6	5	45
AFE3040-045-V8S6	4.0	6	8	45
AFE3040-045-V11S6	4.0	6	11	45
AFE3050-045-V6S6	5.0	6	6	45
AFE3060-050-V7S6	6.0	6	7	50
AFE3060-050-V13S6	6.0	6	13	50
AFE3080-060-V9S8	8.0	8	9	60
AFE3080-060-V19S8	8.0	8	19	60
AFE3100-065-V11S10	10.0	10	11	65
AFE3100-065-V22S10	10.0	10	22	65
AFE3120-070-V13S12	12.0	12	13	70
AFE3120-070-V26S12	12.0	12	26	70
AFE3160-090-V18S16	16.0	16	18	90
AFE3160-090-V32S16	16.0	16	32	90
AFE3200-090-V22S20	20.0	20	22	90
AFE3200-090-V38S20	20.0	20	38	90

A+ Endmill

AFE3000(플랫)

3날 플랫 엔드밀

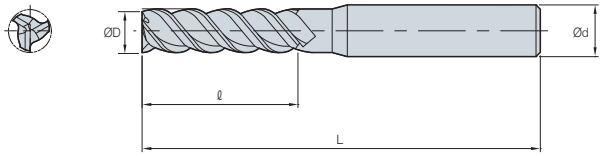




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• 공구직경공차

ØD		Ød
Ø1 ~ Ø12	0 ~ -0.020mm	h6
Ø12.1 ~ Ø20	0 ~ -0.030mm	



(mm)

형 번	ØD	Ød	ℓ	L
AFE3010-050-S4	1.0	4	3	50
AFE3010-050-V3S6	1.0	6	3	50
AFE3015-050-S4	1.5	4	4	50
AFE3015-050-V5S6	1.5	6	5	50
AFE3020-050-V6S6	2.0	6	6	50
AFE3030-055-V11S6	3.0	6	11	55
AFE3040-055-V13S6	4.0	6	13	55
AFE3050-055-V17S6	5.0	6	17	55

AFE3000(롱 플랫)

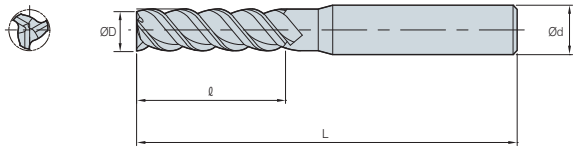
3날 숏 플랫 엔드밀



3 | 30° HELIX | 재종 H05S | 절삭조건 p.456

• 공구직경공차

ØD		Ød
Ø1 ~ Ø12	0 ~ -0.020mm	h6
Ø12.1 ~ Ø20	0 ~ -0.030mm	



(mm)

형 번	ØD	Ød	ℓ	L
AFE3010-060-V4S6	1	6	4	60
AFE3010-060-V6S6	1	6	6	60
AFE3015-060-V6S6	1.5	6	6	60
AFE3015-060-V8S6	1.5	6	8	60
AFE3015-060-V10S6	1.5	6	10	60
AFE3020-060-V8S6	2	6	8	60
AFE3020-060-V10S6	2	6	10	60
AFE3020-060-V12S6	2	6	12	60
AFE3030-065-V15S6	3	6	15	65
AFE3030-070-V20S6	3	6	20	70
AFE3030-075-V25S6	3	6	25	75
AFE3030-080-V30S6	3	6	30	80
AFE3040-065-V16S6	4	6	16	65
AFE3040-070-V20S6	4	6	20	70
AFE3040-075-V26S6	4	6	26	75
AFE3040-080-V30S6	4	6	30	80
AFE3060-060-V22S6	6	6	22	60
AFE3060-070-V25S6	6	6	25	70
AFE3060-075-V30S6	6	6	30	75
AFE3060-080-V35S6	6	6	35	80
AFE3060-090-V42S6	6	6	42	90
AFE3060-100-V50S6	6	6	50	100
AFE3080-080-V28S8	8	8	28	80
AFE3080-080-V30S8	8	8	30	80
AFE3080-085-V35S8	8	8	35	85
AFE3080-090-V40S8	8	8	40	90
AFE3080-095-V45S8	8	8	45	95
AFE3080-100-V50S8	8	8	50	100
AFE3080-105-V55S8	8	8	55	105
AFE3080-110-V65S8	8	8	65	110
AFE3100-090-V32S10	10	10	32	90
AFE3100-090-V35S10	10	10	35	90
AFE3100-090-V40S10	10	10	40	90
AFE3100-100-V45S10	10	10	45	100
AFE3100-100-V50S10	10	10	50	100

A+ Endmill

AFE3000(롱 플랫)

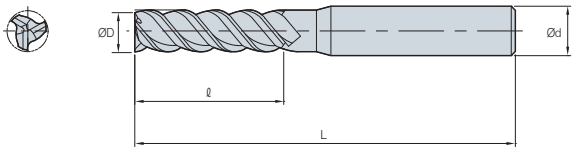
3날 숏 플랫 엔드밀



3 | 30° HELIX | 재종 H05S | 절삭조건 p.456

• 공구직경공차

ØD		Ød
Ø1 ~ Ø12	0 ~ -0.020mm	h6
Ø12.1 ~ Ø20	0 ~ -0.030mm	



(mm)

형 번	ØD	Ød	ℓ	L
AFE3100-110-V55S10	10	10	55	110
AFE3100-110-V60S10	10	10	60	110
AFE3100-120-V65S10	10	10	65	120
AFE3120-095-V40S12	12	12	40	95
AFE3120-100-V45S12	12	12	45	100
AFE3120-100-V50S12	12	12	50	100
AFE3120-110-V55S12	12	12	55	110
AFE3120-110-V60S12	12	12	60	110
AFE3120-120-V65S12	12	12	65	120
AFE3120-120-V70S12	12	12	70	120
AFE3120-135-V75S12	12	12	75	135
AFE3160-105-V52S16	16	16	52	105
AFE3160-110-V55S16	16	16	55	110
AFE3160-130-V65S16	16	16	65	130
AFE3160-150-V75S16	16	16	75	150
AFE3160-160-V85S16	16	16	85	160
AFE3160-180-V95S16	16	16	95	180
AFE3160-190-V105S16	16	16	105	190
AFE3160-200-V115S16	16	16	115	200
AFE3200-110-V55S20	20	20	55	110
AFE3200-130-V65S20	20	20	65	130
AFE3200-150-V75S20	20	20	75	150
AFE3200-160-V85S20	20	20	85	160
AFE3200-180-V95S20	20	20	95	180
AFE3200-190-V105S20	20	20	105	190
AFE3200-200-V115S20	20	20	115	200
AFE3200-220-V125S20	20	20	125	220

APRE3000(러핑)

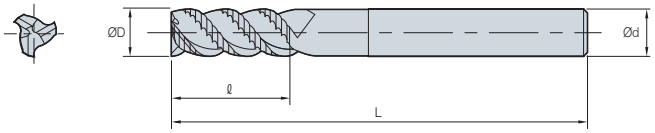
3날 러핑 엔드밀



3 | 45° HELIX | 재종 H05S | 절삭조건 p.456

• 공구직경공차

ØD		Ød
Ø4 ~ Ø8	0 ~ -0.070mm	h6
Ø8.1 ~ Ø25	0 ~ -0.010mm	



(mm)

형 번	ØD	Ød	ℓ	L
APRE3040-050	4	6	8	50
APRE3050-050	5	6	13	50
APRE3060-050	6	6	15	50
APRE3065-060	6.5	8	16	60
APRE3070-060	7	8	16	60
APRE3075-060	7.5	8	20	60
APRE3080-060	8	8	20	60
APRE3085-075	8.5	10	20	75
APRE3090-075	9	10	20	75
APRE3095-075	9.5	10	22	75
APRE3100-075	10	10	25	75
APRE3110-075	11	12	30	75
APRE3120-075	12	12	30	75
APRE3130-075	13	14	30	75
APRE3140-075	14	16	32	75
APRE3150-075	15	16	32	75
APRE3160-100	16	16	35	100
APRE3170-100	17	20	35	100
APRE3180-100	18	20	35	100
APRE3200-100	20	20	45	100
APRE3250-105	25	25	50	105

A+ Endmill

RPAE3000(웨이브 러핑)

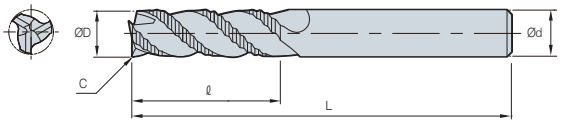
3날 웨이브 러핑 엔드밀



3 | 45° HELIX | 재종 FN30T | 절삭조건 p.456

• 공구직경공차

ØD		Ød
Ø6 ~ Ø10	0 ~ -0.058mm	h6
Ø10 ~ Ø18	0 ~ -0.070mm	
Ø18 ~ Ø25	0 ~ -0.084mm	



(mm)

형 번	C	ØD	Ød	ℓ	L
RPAE3060-063	0.3	6	6	18	63
RPAE3070-063	0.3	7	8	23	63
RPAE3080-063	0.3	8	8	23	63
RPAE3090-080	0.3	9	10	30	80
RPAE3100-080	0.3	10	10	30	80
RPAE3110-080	0.5	11	12	32	80
RPAE3120-080	0.5	12	12	32	80
RPAE3140-080	0.5	14	14	32	80
RPAE3160-105	0.5	16	16	48	105
RPAE3180-105	0.5	18	18	48	105
RPAE3200-105	0.5	20	20	50	105
RPAE3250-105	0.5	25	25	50	105

알루미늄가공용 엔드밀

Solid Endmills for Aluminum

- 절삭 부하 및 구성 인선발생 최소화, 가공면조도 우수
- DLC 코팅 – 높은 경도(Hv 3000~7000)를 가지며, 초경에 비해 3~6배 공구수명 향상
  – 낮은 마찰계수(μ < 0.1)에 의한 윤활효과로 피삭재의 표면조도 우수
- 알루미늄, 알루미늄합금, 동, 동합금 가공

동 알루미늄 합금의 가공 특성

- 절삭저항이 작고 칩처리 능력이 양호하지만 구성인선이 발생하기 용이
- 열팽창 계수가 크므로 절삭열에 의한 변형량이 크고 이는 가공 정도나 잔류 응력 등에 영향을 미침
- 경도가 낮기 때문에 절삭칩에 의한 사상면이 손상되기 쉬우며 플랭크 마모에 의한 공구 수명저하가 발생

동 알루미늄 합금의 가공 기술

- 큰 경사각, 예리한 공구 사용, 오일 미스트 공급하여 절삭 부하 및 구성 인선을 최소화
- 절삭속도 증가, 절입 깊이 감소하여 고속 가공을 실시하면 면조도 향상 및 생산성 향상



Solid Endmills for Aluminum

SSEA2000/3000(플랫)

2~3날 플랫 엔드밀



2 | 3 | 45° HELIX | Carbide DLC | 재종 H01 PD1005 PD1010 | 절삭조건 p.457

• 공구직경공차

ØD	
Ø1 ~ Ø6	-0.010 ~ -0.020mm
Ø7 ~ Ø10	-0.015 ~ -0.025mm
Ø11 ~ Ø20	-0.020 ~ -0.030mm

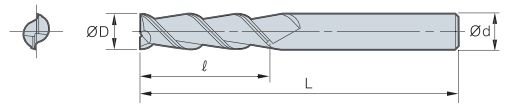


그림 1

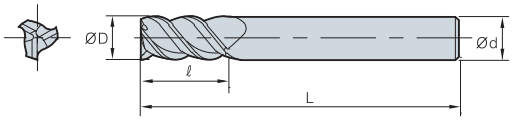


그림 2

(mm)

형 번	ØD	Ød	ℓ	L	그림
SSEA2010	1	6	3	40	1
SSEA2015	1.5	6	4	40	1
SSEA2020	2	6	6	40	1
SSEA2025	2.5	6	7	40	1
SSEA2030	3	6	10	45	1
SSEA2035	3.5	6	10	45	1
SSEA2040	4	6	12	45	1
SSEA2050	5	6	15	50	1
SSEA2060	6	6	15	50	1
SSEA2070	7	8	20	60	1
SSEA2080	8	8	20	60	1
SSEA2090	9	10	20	70	1
SSEA2100	10	10	25	70	1
SSEA2110	11	12	25	75	1
SSEA2120	12	12	30	75	1
SSEA2130	13	16	30	90	1
SSEA2140	14	16	35	90	1
SSEA2150	15	16	40	90	1
SSEA2160	16	16	40	90	1
SSEA2180	18	18	45	100	1
SSEA2200	20	20	45	100	1
SSEA3020	2	6	6	40	2
SSEA3030	3	6	10	45	2
SSEA3035	3.5	6	10	45	2
SSEA3040	4	6	12	45	2
SSEA3050	5	6	15	50	2
SSEA3060	6	6	15	50	2
SSEA3070	7	8	20	60	2
SSEA3080	8	8	20	60	2
SSEA3090	9	10	20	70	2
SSEA3100	10	10	25	70	2
SSEA3110	11	12	25	75	2
SSEA3120	12	12	30	75	2
SSEA3130	13	16	30	90	2
SSEA3140	14	16	35	90	2
SSEA3150	15	16	40	90	2
SSEA3160	16	16	40	90	2

이형품 의뢰 시 식별법 : SSEA○○○○ 인장-전장 L **예.1)** 3날, 공구직경 : 6.3, 인장 : 17, 전장 : 60 SSEA3063 17-60L **예.2)** 3날, 공구직경 : 6.3, 표준형 SSEA3063

SSBEA2000(볼)

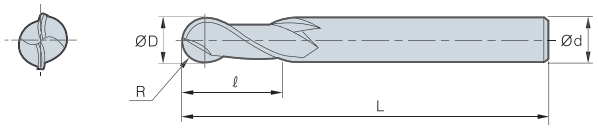
2날 볼 엔드밀



2 | 45° HELIX | Carbide DLC | 재종 H01 PD1005 PD1010 | 절삭조건 p.457

• 공구직경공차

ØD	
Ø4 ~ Ø8	0 ~ -0.070mm
Ø8.1 ~ Ø25	0 ~ -0.010mm



(mm)

형 번	ØD	Ød	ℓ	L	그림
SSBEA2010	0.5	1	6	3	70
SSBEA2015	0.75	1.5	6	4	70
SSBEA2020	1	2	6	6	70
SSBEA2025	1.25	2.5	6	8	70
SSBEA2030	1.5	3	6	10	70
SSBEA2035	1.75	3.5	6	10	70
SSBEA2040	2	4	6	12	70
SSBEA2045	2.25	4.5	6	15	80
SSBEA2050	2.5	5	6	15	80
SSBEA2055	2.75	5.5	6	15	80
SSBEA2060	3	6	6	15	80
SSBEA2065	3.25	6.5	8	20	90
SSBEA2070	3.5	7	8	20	90
SSBEA2075	3.75	7.5	8	20	90
SSBEA2080	4	8	8	20	90
SSBEA2085	4.25	8.5	10	25	100
SSBEA2090	4.5	9	10	25	100
SSBEA2100	5	10	10	25	100
SSBEA2110	5.5	11	12	30	110
SSBEA2120	6	12	12	30	110
SSBEA2130	6.5	13	16	35	120
SSBEA2140	7	14	16	35	120
SSBEA2150	7.5	15	16	40	120
SSBEA2160	8	16	16	40	120
SSBEA2170	8.5	17	20	40	130
SSBEA2180	9	18	20	45	130
SSBEA2190	9.5	19	20	45	130
SSBEA2200	10	20	20	45	130

이형품 의뢰 시 식별법 : SSEA◎◎◎◎ 인장-전장 L **예.1)** 3날, 공구직경 : 6.3, 인장 : 17, 전장 : 60 SSEA3063 17-60L **예.2)** 3날, 공구직경 : 6.3, 표준형 SSEA3063

다이아몬드 코팅 엔드밀 시리즈

D Endmill

- 탄젠셜 컷팅 엣지 형상 구현으로 가공 면조도 우수
- 고경도 다이아몬드 코팅 적용해 공구 수명 증가
- 최적의 인선형상 적용으로 절삭성 우수

특징

• 탄젠셜 컷팅 엣지 형상

- One-Pass grinding 방식 적용
- 가공면 단차 발생 방지 가공 면조도 우수
- D Endmill 볼 타입 2날, 4날에 적용

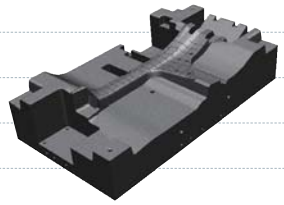


• 센터매치 볼 형상(4날)

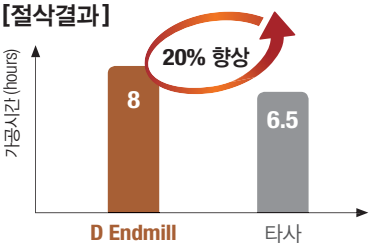
- 고이송 가공에 적합한 볼 포인트 형상
- 강성 보완 및 가공 면조도 우수

절삭평가 사례

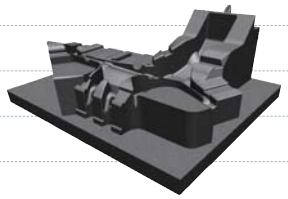
피삭재	흑연 금형
절삭조건	vc (m/min) = 100, fz (mm/t) = 0.11
	ap (mm) = 0.26, 건식(dry)
공구	DBE4060-110-N250S06



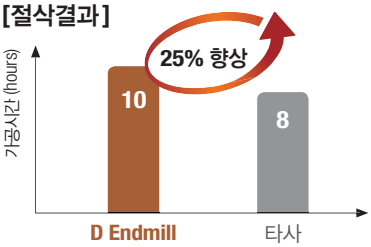
[절삭결과]



피삭재	흑연 금형
절삭조건	vc (m/min) = 180, fz (mm/t) = 0.1
	ap (mm) = 0.2, 건식(dry)
공구	DBE2060-110-N250S06



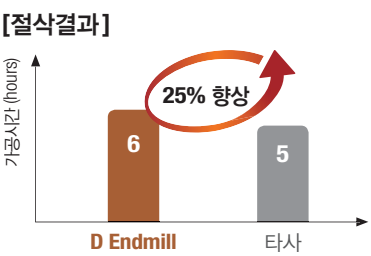
[절삭결과]



피삭재	흑연 금형
절삭조건	vc (m/min) = 300, fz (mm/t) = 0.1
	ap (mm) = 0.15, 건식(dry)
공구	DBE2060-080-N250S06



[절삭결과]



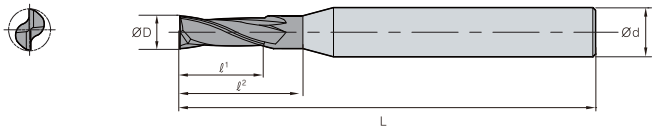
DFE2000(플랫)



2 | 30° HELIX | 재종 ND3000 | 절삭조건 p.458

• 공구직경공차

ØD		Ød
~ Ø5.9	0 ~ -0.02mm	h6
Ø6.0 ~	0 ~ -0.03mm	



(mm)

형 번	ØD	Ød	ℓ1	ℓ2	L
DFE2002-045-N004S04	0.2	4	0.4	-	45
DFE2003-045-N006S04	0.3	4	0.6	-	45
DFE2004-045-N008S04	0.4	4	0.8	-	45
DFE2005-045-N010S04	0.5	4	1	-	45
DFE2006-045-N012S04	0.6	4	1.2	-	45
DFE2007-045-N015S04	0.7	4	1.5	-	45
DFE2008-045-N020S04	0.8	4	2	-	45
DFE2009-045-N025S04	0.9	4	2.5	-	45
DFE2010-045-N030S04	1	4	3	-	45
DFE2010-045-N050S04	1	4	3	5	45
DFE2010-060-N050S04	1	4	3	5	60
DFE2010-060-N100S04	1	4	3	10	60
DFE2010-060-N150S04	1	4	3	15	60
DFE2010-060-N200S04	1	4	3	20	60
DFE2010-060-N250S04	1	4	3	25	60
DFE2015-060-N050S04	1.5	4	4	5	60
DFE2015-060-N060S04	1.5	4	4	6	60
DFE2015-060-N100S04	1.5	4	4	10	60
DFE2015-060-N150S04	1.5	4	4	15	60
DFE2015-060-N200S04	1.5	4	4	20	60
DFE2015-060-N250S04	1.5	4	4	25	60
DFE2020-045-N060S04	2	4	6	-	45
DFE2020-045-N080S04	2	4	6	8	45
DFE2020-080-N080S04	2	4	6	8	80
DFE2020-080-N100S04	2	4	6	10	80
DFE2020-080-N120S04	2	4	6	12	80
DFE2020-080-N150S04	2	4	6	15	80
DFE2020-080-N200S04	2	4	6	20	80

형 번	ØD	Ød	ℓ1	ℓ2	L
DFE2020-080-N250S04	2	4	6	25	80
DFE2020-080-N300S04	2	4	6	30	80
DFE2020-080-N400S04	2	4	6	40	80
DFE2030-050-N100S06	3	6	9	10	50
DFE2030-080-N100S04	3	4	9	10	80
DFE2030-080-N120S04	3	4	9	12	80
DFE2030-080-N200S04	3	4	9	20	80
DFE2030-080-N250S04	3	4	9	25	80
DFE2030-080-N300S04	3	4	9	30	80
DFE2030-080-N400S04	3	4	9	40	80
DFE2040-050-N120S06	4	6	12	-	50
DFE2040-050-N160S06	4	6	12	16	50
DFE2040-080-N160S04	4	4	12	16	80
DFE2050-060-N150S06	5	6	15	-	60
DFE2050-060-N200S06	5	6	15	20	60
DFE2050-110-N200S06	5	6	15	20	110
DFE2060-060-N180S06	6	6	18	-	60
DFE2060-110-N250S06	6	6	18	25	110
DFE2060-150-N250S06	6	6	18	25	150
DFE2080-070-N250S08	8	8	25	-	70
DFE2080-150-N400S08	8	8	25	40	150
DFE2100-080-N300S10	10	10	30	-	80
DFE2100-150-N500S10	10	10	30	50	150
DFE2100-160-N500S10	10	10	30	50	160
DFE2120-080-N250S12	12	12	25	-	80
DFE2120-080-N350S12	12	12	35	-	80
DFE2120-150-N600S12	12	12	35	60	150
DFE2120-160-N600S12	12	12	35	60	160

D Endmill

DFE4000(플랫)

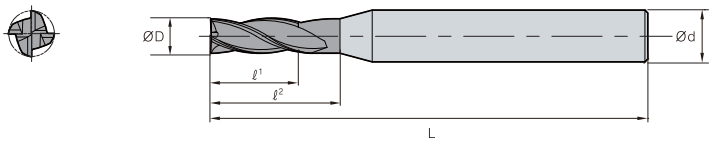


4 | 30° HELIX | 재종 ND3000 | 절삭조건

p.458

• 공구직경공차

ØD		Ød
~ Ø5.9	0 ~ -0.02mm	h6
Ø6.0 ~	0 ~ -0.03mm	



(mm)

형 번	ØD	Ød	ℓ1	ℓ2	L
4020-045-N060S04	2	4	6	8	45
4020-060-N100S04	2	4	10	12	60
4030-050-N100S06	3	6	10	12	50
4030-060-N150S03	3	3	15	-	60
4030-060-N150S04	3	4	15	18	60
4040-050-N120S06	4	6	12	-	50
4040-050-N150S06	4	6	15	18	50
4040-080-N200S04	4	4	20	-	80
4060-060-N180S06	6	6	18	-	60
4060-110-N300S06	6	6	30	-	110
4060-150-N300S06	6	6	30	-	150
4080-070-N250S08	8	8	25	-	70
4080-110-N400S08	8	8	40	-	110
4080-150-N400S08	8	8	40	-	150
4100-080-N250S10	10	10	25	-	80
4100-110-N400S10	10	10	40	-	110
4100-150-N500S10	10	10	50	-	150
4120-080-N300S12	12	12	30	-	80
4120-110-N400S12	12	12	40	-	110
4120-110-N450S12	12	12	45	-	110
4120-150-N500S12	12	12	50	-	150
4120-150-N550S12	12	12	55	-	150

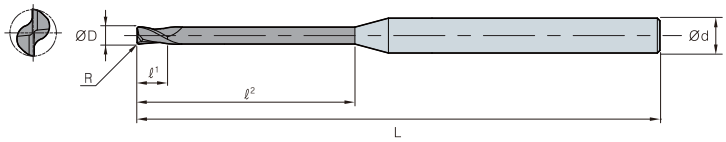
DRE2000(레디우스)



2 | 30° HELIX | 재종 ND3000 | 절삭조건 p.458

• 공구직경공차

ØD		Ød
~ Ø5.9	0 ~ -0.02mm	h6
Ø6.0 ~	0 ~ -0.03mm	



(mm)

형 번	R	ØD	Ød	ℓ1	ℓ2	L
DRE2005-060-N050S04-R005	0.05	0.5	4	1	5	60
DRE2005-060-N080S04-R005	0.05	0.5	4	1	8	60
DRE2005-060-N100S04-R005	0.05	0.5	4	1	10	60
DRE2006-060-N060S04-R005	0.05	0.6	4	1.2	6	60
DRE2006-060-N090S04-R005	0.05	0.6	4	1.2	9	60
DRE2006-060-N120S04-R005	0.05	0.6	4	1.2	12	60
DRE2008-060-N040S04-R005	0.05	0.8	4	1.6	4	60
DRE2008-060-N080S04-R005	0.05	0.8	4	1.6	8	60
DRE2008-060-N100S04-R005	0.05	0.8	4	1.6	10	60
DRE2010-060-N050S04-R005	0.05	1	4	2	5	60
DRE2010-060-N100S04-R005	0.05	1	4	2	10	60
DRE2010-060-N100S04-R02	0.2	1	4	2	10	60
DRE2010-060-N150S04-R02	0.2	1	4	2	15	60
DRE2010-060-N200S04-R005	0.05	1	4	2	20	60
DRE2010-060-N200S04-R02	0.2	1	4	2	20	60
DRE2015-060-N050S04-R005	0.05	1.5	4	3	5	60
DRE2015-060-N100S04-R005	0.05	1.5	4	3	10	60
DRE2015-060-N150S04-R005	0.05	1.5	4	3	15	60
DRE2015-060-N150S04-R02	0.2	1.5	4	3	15	60
DRE2015-060-N200S04-R005	0.05	1.5	4	3	20	60
DRE2015-060-N200S04-R02	0.2	1.5	4	3	20	60
DRE2020-060-N120S04-R02	0.2	2	4	3.5	12	60
DRE2020-060-N120S04-R03	0.3	2	4	3.5	12	60
DRE2020-060-N180S04-R03	0.3	2	4	3.5	18	60
DRE2020-060-N250S04-R02	0.2	2	4	3.5	25	60
DRE2020-060-N250S04-R03	0.3	2	4	3.5	25	60
DRE2020-060-N300S04-R02	0.2	2	4	3.5	30	60
DRE2020-060-N300S04-R03	0.3	2	4	3.5	30	60
DRE2030-080-N100S04-R02	0.2	3	4	4	10	80
DRE2030-080-N200S04-R02	0.2	3	4	4	20	80
DRE2030-080-N200S04-R03	0.3	3	4	4	20	80
DRE2030-080-N300S04-R02	0.2	3	4	4	30	80
DRE2030-080-N400S04-R02	0.2	3	4	4	40	80
DRE2030-080-N400S04-R03	0.3	3	4	4	40	80

D Endmill

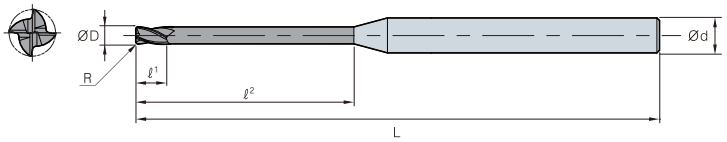
DRE4000(레디우스)



4 | 30° HELIX | 재종 ND3000 | 절삭조건 p.458

• 공구직경공차

ØD		Ød
~ Ø5.9	0 ~ -0.02mm	h6
Ø6.0 ~	0 ~ -0.03mm	



(mm)

형 번	R	ØD	Ød	ℓ1	ℓ2	L
DRE4020-060-N120S04-R03	0.3	2	4	3.5	12	60
DRE4020-060-N180S04-R02	0.2	2	4	3.5	18	60
DRE4020-060-N180S04-R03	0.3	2	4	3.5	18	60
DRE4020-060-N250S04-R02	0.2	2	4	3.5	25	60
DRE4020-060-N250S04-R03	0.3	2	4	3.5	25	60
DRE4020-060-N300S04-R02	0.2	2	4	3.5	30	60
DRE4020-060-N300S04-R03	0.3	2	4	3.5	30	60
DRE4030-080-N100S04-R05	0.5	3	4	4	10	80
DRE4030-080-N200S04-R03	0.3	3	4	4	20	80
DRE4030-080-N200S04-R05	0.5	3	4	4	20	80
DRE4030-080-N300S04-R03	0.3	3	4	4	30	80
DRE4030-080-N300S04-R05	0.5	3	4	4	30	80
DRE4030-080-N400S04-R03	0.3	3	4	4	40	80
DRE4030-080-N400S04-R05	0.5	3	4	4	40	80
DRE4040-100-N200S04-R03	0.3	4	4	6	20	100
DRE4060-110-N250S06-R03	0.3	6	6	9	25	110
DRE4060-110-N250S06-R05	0.5	6	6	9	25	110
DRE4060-150-N300S06-R05	0.5	6	6	9	30	150
DRE4080-110-N300S08-R03	0.3	8	8	12	30	110
DRE4080-110-N300S08-R05	0.5	8	8	12	30	110
DRE4080-150-N400S08-R05	0.5	8	8	12	40	150
DRE4100-110-N350S10-R05	0.5	10	10	15	35	110
DRE4100-160-N450S10-R05	0.5	10	10	15	45	160
DRE4120-110-N400S12-R05	0.5	12	12	18	40	110
DRE4120-160-N450S12-R05	0.5	12	12	18	45	160

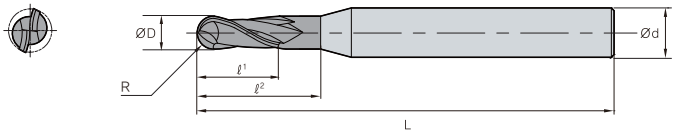
DBE2000(볼)



2 | 30° HELIX | 재종 ND3000 | 절삭조건 p.458

• 공구직경공차

ØD		Ød
~ Ø5.9	0 ~ -0.02mm	h6
Ø6.0 ~	0 ~ -0.03mm	



(mm)

형 번	R	ØD	Ød	ℓ1	ℓ2	L
DBE2003-045-N012S04	0.15	0.3	4	1.2	-	45
DBE2003-045-N020S04	0.15	0.3	4	1.2	2	45
DBE2004-045-N015S04	0.2	0.4	4	1.5	-	45
DBE2004-045-N020S04	0.2	0.4	4	1.5	2	45
DBE2004-045-N030S04	0.2	0.4	4	1.5	3	45
DBE2004-045-N040S04	0.2	0.4	4	1.5	4	45
DBE2004-045-N050S04	0.2	0.4	4	1.5	5	45
DBE2005-045-N020S04	0.25	0.5	4	2	-	45
DBE2005-045-N030S04	0.25	0.5	4	2	3	45
DBE2005-045-N040S04	0.25	0.5	4	2	4	45
DBE2005-045-N050S04	0.25	0.5	4	2	5	45
DBE2005-045-N060S04	0.25	0.5	4	2	6	45
DBE2006-045-N020S04	0.3	0.6	4	2	2	45
DBE2006-045-N030S04	0.3	0.6	4	2	3	45
DBE2006-045-N040S04	0.3	0.6	4	2	4	45
DBE2006-045-N050S04	0.3	0.6	4	2	5	45
DBE2006-045-N060S04	0.3	0.6	4	2	6	45
DBE2006-045-N080S04	0.3	0.6	4	2	8	45
DBE2006-045-N100S04	0.3	0.6	4	2	10	45
DBE2008-045-N030S04	0.4	0.8	4	2.5	3	45
DBE2008-045-N040S04	0.4	0.8	4	2.5	4	45
DBE2008-045-N050S04	0.4	0.8	4	2.5	5	45
DBE2008-045-N060S04	0.4	0.8	4	2.5	6	45
DBE2008-045-N080S04	0.4	0.8	4	2.5	8	45
DBE2008-045-N100S04	0.4	0.8	4	2.5	10	45
DBE2010-060-N030S04	0.5	1	4	3	3	60
DBE2010-060-N040S04	0.5	1	4	3	4	60
DBE2010-060-N050S04	0.5	1	4	3	5	60
DBE2010-060-N060S04	0.5	1	4	3	6	60
DBE2010-060-N080S04	0.5	1	4	3	8	60
DBE2010-060-N100S04	0.5	1	4	3	10	60
DBE2010-060-N120S04	0.5	1	4	3	12	60
DBE2010-060-N150S04	0.5	1	4	3	15	60
DBE2010-060-N200S04	0.5	1	4	3	20	60
DBE2010-080-N250S04	0.5	1	4	3	25	80
DBE2010-080-N300S04	0.5	1	4	3	30	80

형 번	R	ØD	Ød	ℓ1	ℓ2	L
DBE2010-080-N350S04	0.5	1	4	3	35	80
DBE2010-080-N400S04	0.5	1	4	3	40	80
DBE2015-060-N050S04	0.75	1.5	4	4	5	60
DBE2015-060-N080S04	0.75	1.5	4	4	8	60
DBE2015-080-N100S04	0.75	1.5	4	4	10	80
DBE2015-080-N120S04	0.75	1.5	4	4	12	80
DBE2015-080-N150S04	0.75	1.5	4	4	15	80
DBE2015-080-N180S04	0.75	1.5	4	4	18	80
DBE2015-080-N200S04	0.75	1.5	4	4	20	80
DBE2015-080-N250S04	0.75	1.5	4	4	25	80
DBE2015-080-N300S04	0.75	1.5	4	4	30	80
DBE2015-080-N350S04	0.75	1.5	4	4	35	80
DBE2015-080-N400S04	0.75	1.5	4	4	40	80
DBE2020-060-N060S04	1	2	4	6	-	60
DBE2020-060-N080S04	1	2	4	6	8	60
DBE2020-080-N100S04	1	2	4	6	10	80
DBE2020-080-N150S04	1	2	4	6	15	80
DBE2020-080-N200S04	1	2	4	6	20	80
DBE2020-080-N250S04	1	2	4	6	25	80
DBE2020-080-N300S04	1	2	4	6	30	80
DBE2020-080-N350S04	1	2	4	6	35	80
DBE2020-100-N400S04	1	2	4	6	40	100
DBE2020-100-N450S04	1	2	4	6	45	100
DBE2020-100-N500S04	1	2	4	6	50	100
DBE2020-100-N600S04	1	2	4	6	60	100
DBE2030-060-N100S04	1.5	3	4	9	10	60
DBE2030-100-N150S04	1.5	3	4	9	15	100
DBE2030-100-N150S06	1.5	3	6	9	15	100
DBE2030-100-N200S04	1.5	3	4	9	20	100
DBE2030-100-N250S04	1.5	3	4	9	25	100
DBE2030-100-N300S04	1.5	3	4	9	30	100
DBE2030-100-N350S04	1.5	3	4	9	35	100
DBE2030-100-N400S04	1.5	3	4	9	40	100
DBE2030-100-N500S04	1.5	3	4	9	50	100
DBE2030-100-N600S04	1.5	3	4	9	60	100
DBE2040-060-N160S04	2	4	4	12	16	60

D Endmill

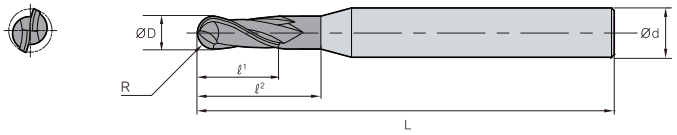
DBE2000(볼)



2 | 30° HELIX | 재종 ND3000 | 절삭조건 p.458

• 공구직경공차

ØD		Ød
~ Ø5.9	0 ~ -0.02mm	h6
Ø6.0 ~	0 ~ -0.03mm	



(mm)

형 번	R	ØD	Ød	ℓ1	ℓ2	L
DBE2040-080-N160S04	2	4	4	12	16	80
DBE2040-080-N300S04	2	4	4	12	30	80
DBE2040-100-N160S04	2	4	4	12	16	100
DBE2040-100-N400S04	2	4	4	12	40	100
DBE2040-130-N160S04	2	4	4	12	16	130
DBE2040-130-N400S04	2	4	4	12	40	130
DBE2040-150-N160S04	2	4	4	12	16	150
DBE2040-150-N500S04	2	4	4	12	50	150
DBE2050-110-N200S06	2.5	5	6	15	20	110
DBE2060-080-N250S06	3	6	6	20	25	80
DBE2060-110-N250S06	3	6	6	20	25	110
DBE2060-110-N400S06	3	6	6	20	40	110
DBE2060-150-N300S06	3	6	6	20	30	150
DBE2060-150-N500S06	3	6	6	20	50	150
DBE2080-080-N300S08	4	8	8	25	30	80

Designation	R	ØD	Ød	ℓ1	ℓ2	L
DBE2080-110-N300S08	4	8	8	25	30	110
DBE2080-110-N400S08	4	8	8	25	40	110
DBE2080-150-N500S08	4	8	8	25	50	150
DBE2080-200-N400S08	4	8	8	25	40	200
DBE2100-080-N400S10	5	10	10	30	40	80
DBE2100-110-N400S10	5	10	10	30	40	110
DBE2100-110-N500S10	5	10	10	30	50	110
DBE2100-150-N600S10	5	10	10	30	60	150
DBE2100-160-N600S10	5	10	10	30	60	160
DBE2100-200-N500S10	5	10	10	30	50	200
DBE2120-110-N500S12	6	12	12	35	50	110
DBE2120-150-N500S12	6	12	12	35	50	150
DBE2120-160-N500S12	6	12	12	35	50	160
DBE2120-200-N600S12	6	12	12	35	60	200

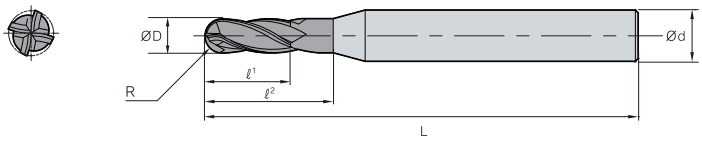
DBE4000(볼)



4 | 30° HELIX | 재종 ND3000 | 절삭조건 p.458

• 공구직경공차

ØD		Ød
~ Ø5.9	0 ~ -0.02mm	h6
Ø6.0 ~	0 ~ -0.03mm	



(mm)

형 번	R	ØD	Ød	ℓ1	ℓ2	L
DBE4010-060-N030S04	0.5	1	4	3	-	60
DBE4010-060-N050S04	0.5	1	4	3	5	60
DBE4010-060-N100S04	0.5	1	4	3	10	60
DBE4010-060-N150S04	0.5	1	4	3	15	60
DBE4010-060-N200S04	0.5	1	4	3	20	60
DBE4010-060-N250S04	0.5	1	4	3	25	60
DBE4015-045-N040S04	0.75	1.5	4	4	-	45
DBE4015-050-N040S04	0.75	1.5	4	4	-	50
DBE4015-060-N100S04	0.75	1.5	4	4	10	60
DBE4015-060-N150S04	0.75	1.5	4	4	15	60
DBE4015-060-N200S04	0.75	1.5	4	4	20	60
DBE4015-060-N250S04	0.75	1.5	4	4	25	60
DBE4020-060-N080S04	1	2	4	6	8	60
DBE4020-080-N100S04	1	2	4	6	10	80
DBE4020-080-N200S04	1	2	4	6	20	80
DBE4020-080-N300S04	1	2	4	6	30	80
DBE4020-080-N400S04	1	2	4	6	40	80
DBE4030-060-N100S04	1.5	3	4	9	10	60
DBE4030-100-N150S04	1.5	3	4	9	15	100
DBE4030-100-N200S04	1.5	3	4	9	20	100
DBE4030-100-N300S04	1.5	3	4	9	30	100

형 번	R	ØD	Ød	ℓ1	ℓ2	L
DBE4030-100-N400S04	1.5	3	4	9	40	100
DBE4030-100-N500S04	1.5	3	4	9	50	100
DBE4040-060-N160S04	2	4	4	12	16	60
DBE4040-080-N160S04	2	4	4	12	16	80
DBE4040-100-N160S04	2	4	4	12	16	100
DBE4040-130-N160S04	2	4	4	12	16	130
DBE4060-080-N250S06	3	6	6	20	25	80
DBE4060-110-N250S06	3	6	6	20	25	110
DBE4060-150-N300S06	3	6	6	20	30	150
DBE4080-080-N300S08	4	8	8	25	30	80
DBE4080-110-N300S08	4	8	8	25	30	110
DBE4080-150-N350S08	4	8	8	25	35	150
DBE4080-200-N400S08	4	8	8	25	40	200
DBE4100-080-N350S10	5	10	10	30	35	80
DBE4100-110-N350S10	5	10	10	30	35	110
DBE4100-150-N400S10	5	10	10	30	40	150
DBE4100-160-N400S10	5	10	10	30	40	160
DBE4100-200-N500S10	5	10	10	30	50	200
DBE4120-110-N500S12	6	12	12	35	50	110
DBE4120-150-N500S12	6	12	12	35	50	150
DBE4120-200-N600S12	6	12	12	35	60	200

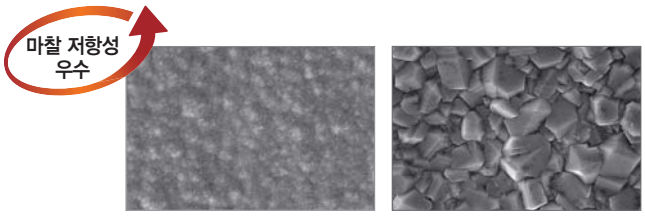
복합소재 가공용 라우터 엔드밀

Composite Router Endmill

- 복합소재(CFRP, GFRP 등) 가공에 최적화된 라우터 엔드밀
- Nano-Crystalline 다이아몬드 코팅 적용으로 공구수명 우수
- 표면박리 & 버 발생 억제를 위한 형상설계
- 고능률 가공을 통한 생산성 향상

특징

- 복합소재 가공용 다이아몬드 코팅 재종 ND2100
- 고경도 다이아몬드 코팅(Hv 8,000이상) 적용
- Nano-Crystalline 다이아몬드 코팅 마찰저항성 및 내용착 우수
- 다이아몬드 코팅 전용 모재 적용 내박리성 향상



나노-다이아몬드 코팅 | 기존 다이아몬드 코팅

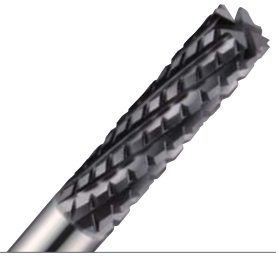
CCDR (Dual Helix Router Endmill)

- 상, 하면 표면박리 억제를 위한 듀얼헬릭스 적용
- 형상 윤곽, 홈, 정삭 가공용 엔드밀



CCHR (High-performance Router Endmill)

- 고능률 가공을 위한 멀티플루트 니크형상 적용
- 형상 윤곽, 홈, 황삭 가공용 엔드밀



CCR (Router Endmill)

- 낮은 진동 및 낮은 절상저항의 다운컷 형상설계
- 형상 윤곽, 홈, 황삭가공용 엔드밀



CCLR (Low Helix Router Endmill)

- 낮은 축방향 절삭저항으로 버 발생 억제
- 형상 윤곽, 막힌 홈, 정삭 가공용 엔드밀



CCRR (Reverse Helix Router Endmill)

- 좌비틀림 형상으로 피삭재 분리 억제
- 형상 윤곽, 관통 홈, 정삭 가공용 엔드밀



CCDR4000/6000(플랫)



4 | 6 | 30°/-30° HELIX | 재종 ND2100

• 공구직경공차

ØD		Ød
Ø6 ~ Ø12	0 ~ -0.03mm	h5

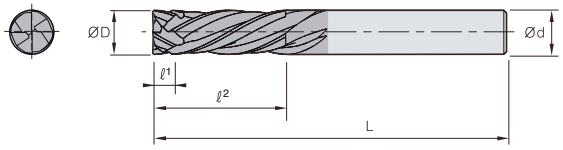


그림 1

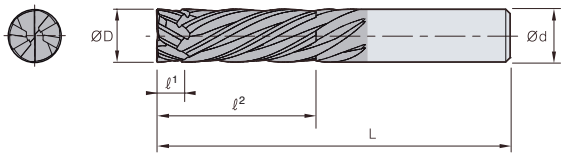


그림 2

(mm)

형 번	ØD	Ød	ℓ1	ℓ2	L	그림
CCDR 4060-065	6	6	3	18	65	1
CCDR 4080-075	8	8	4	24	75	1
CCDR 6100-085	10	10	5	30	85	2
CCDR 6120-100	12	12	6	36	100	2

4 | 6 | 30°/-30° HELIX | 재종 ND2100

• 공구직경공차

ØD		Ød
Ø0.25 ~ Ø0.5	0 ~ -0.0012 (inch)	h5

(inch)

형 번	ØD	Ød	ℓ1	ℓ2	L	그림
CCDR 402500	1/4 0.250	0.25	0.125	0.75	2.5	1
CCDR 402500L	1/4 0.250	0.25	0.125	1.5	4	1
CCDR 603750	3/8 0.375	0.375	0.125	1	3.25	2
CCDR 603750L	3/8 0.375	0.375	0.125	1.5	4	2
CCDR 605000	1/2 0.500	0.5	0.125	1	3.25	2
CCDR 605000L	1/2 0.500	0.5	0.125	1.5	4	2

Endmill Composite Router Endmill

CCHR4000/6000(플랫)



4 | 6 | 15° HELIX | 재종 ND2100

• 공구직경공차

ØD		Ød
Ø6 ~ Ø12	0 ~ -0.05mm	h5

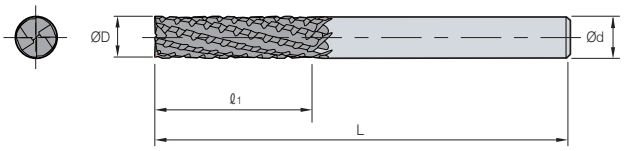


그림 1

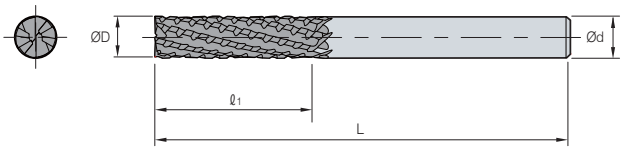


그림 2

(mm)

형 번	ØD	Ød	ℓ	L	그림
CCHR 4060-065	6	6	18	65	1
CCHR 4080-075	8	8	24	75	1
CCHR 6100-085	10	10	30	85	2
CCHR 6120-100	12	12	36	100	2

4 | 6 | 15° HELIX | 재종 ND2100

• 공구직경공차

ØD		Ød
Ø0.25 ~ Ø0.5	0 ~ -0.002 (inch)	h5

(inch)

형 번	ØD	Ød	ℓ	L	그림
CCHR 402500	1/4 0.250	0.25	0.75	2.5	1
CCHR 402500L	1/4 0.250	0.25	1.5	4	1
CCHR 603750	3/8 0.375	0.375	1	3.25	2
CCHR 603750L	3/8 0.375	0.375	1.5	4	2
CCHR 605000	1/2 0.500	0.5	1	3.25	2
CCHR 605000L	1/2 0.500	0.5	1.5	4	2

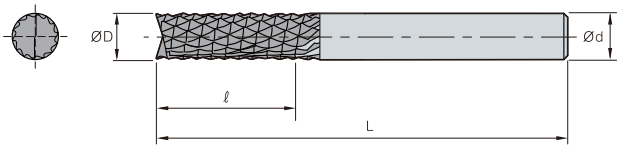
CCR2000(플랫)



2 | -27° HELIX | 재종 ND2100

• 공구직경공차

ØD		Ød
Ø4 ~ Ø12	-0.02 ~ -0.08mm	h5



(mm)

형 번	ØD	Ød	ℓ	L
CCR 2040-050	4	4	12	50
CCR 2050-050	5	5	15	50
CCR 2060-065	6	6	18	65
CCR 2080-075	8	8	24	75
CCR 2100-085	10	10	30	85
CCR 2120-100	12	12	36	100

2 | -27° HELIX | 재종 ND2100

• 공구직경공차

ØD		Ød
Ø0.25 ~ Ø0.5	-0.0008 ~ -0.0032 (inch)	h5

(inch)

형 번	ØD	Ød	ℓ	L
CCR 202500	1/4 0.250	0.25	0.75	2.5
CCR 202500L	1/4 0.250	0.25	1.5	4
CCR 203750	3/8 0.375	0.375	1	3.25
CCR 203750L	3/8 0.375	0.375	1.5	4
CCR 205000	1/2 0.500	0.5	1	3.25
CCR 205000L	1/2 0.500	0.5	1.5	4

Endmill Composite Router Endmill

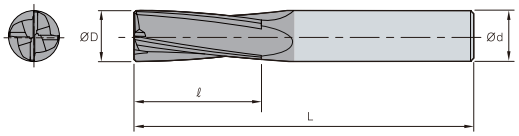
CCLR4000(플랫)



4 | 15° HELIX | 재종 ND2100

• 공구직경공차

ØD		Ød
Ø4 ~ Ø12	0 ~ -0.03mm	h5



(mm)

형 번	ØD	Ød	ℓ	L
CCLR 4040-050	4	4	12	50
CCLR 4050-050	5	5	15	50
CCLR 4060-065	6	6	18	65
CCLR 4080-075	8	8	24	75
CCLR 4100-085	10	10	30	85
CCLR 4120-100	12	12	36	100

4 | 15° HELIX | 재종 ND2100

• 공구직경공차

ØD		Ød
Ø0.25 ~ Ø0.5	0 ~ -0.0012 (inch)	h5

(inch)

형 번	ØD	Ød	ℓ	L
CCLR 402500	1/4 0.250	0.25	0.75	2.5
CCLR 402500L	1/4 0.250	0.25	1.5	4
CCLR 403750	3/8 0.375	0.375	1	3.25
CCLR 403750L	3/8 0.375	0.375	1.5	4
CCLR 405000	1/2 0.500	0.5	1	3.25
CCLR 405000L	1/2 0.500	0.5	1.5	4

CCRR6000/8000(플랫)



6 | 8 | -25° HELIX | 재종 ND2100

• 공구직경공차

ØD		Ød
Ø6 ~ Ø12	0 ~ -0.03mm	h5

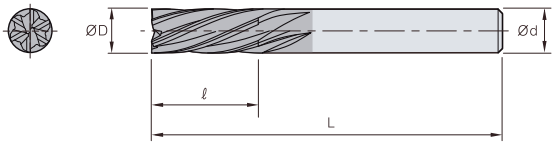


그림 1

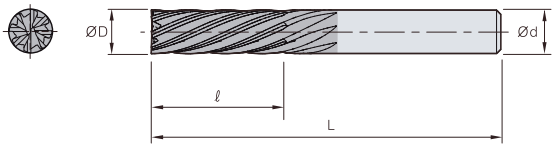


그림 2

(mm)

형 번	ØD	Ød	ℓ	L	그림
CCRR 6060-065	6	6	18	65	1
CCRR 6080-075	8	8	24	75	1
CCRR 8100-085	10	10	30	85	2
CCRR 8120-100	12	12	36	100	2

6 | 8 | -25° HELIX | 재종 ND2100

• 공구직경공차

ØD		Ød
Ø0.25 ~ Ø0.5	0 ~ -0.0012 (inch)	h5

(inch)

형 번	ØD	Ød	ℓ	L	그림
CCRR 602500	1/4 0.250	0.25	0.75	2.5	1
CCRR 602500L	1/4 0.250	0.25	1.5	4	1
CCRR 803750	3/8 0.375	0.375	1	3.25	2
CCRR 803750L	3/8 0.375	0.375	1.5	4	2
CCRR 805000	1/2 0.500	0.5	1	3.25	2
CCRR 805000L	1/2 0.500	0.5	1.5	4	2

맞춤 대응을 통한 다양한 치아보철 피삭재 및 덴탈 밀링머신 적용 가능

T Endmill

- Zirconia, Titanium, Co-Cr, Wax, PMMA 등 치아보철 가공용 엔드밀
- 치아보철 종류별 맞춤 재종 대응으로 최적의 가공 성능 확보
- 인선 형상 최적화로 가공면 단차 발생 억지 및 가공 면조도 우수
- 가공기별 맞춤 형상 대응으로 차별화된 공구 제공

특징

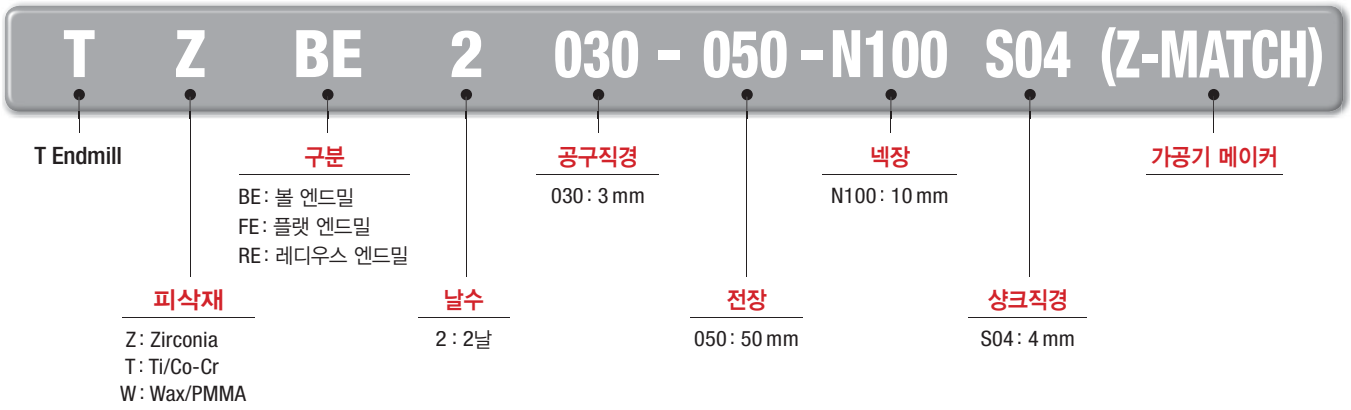
- **가공 장비별 전용 공구 대응** – 다양화된 치과의료기기 시장의 요구 충족
- **피삭재별 맞춤 재종 대응** – 다양한 임플란트용 소재에서 최적의 가공 성능 확보
- **최적의 인선형상 적용** – 절삭성 우수



- **탄젠셜 컷팅 엣지 형상**
  - One-Pass grinding 방식 적용
  - 가공면 단차 발생 방지 가공 면조도 우수

- **센터매치 볼 형상**
  - 센터형상 최적화로 볼 포인트 여유각 확보
  - 볼 포인트 내마모성 우수 및 절삭성 확보

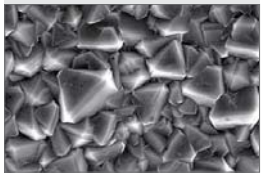
형번표기법



zirconia 재종

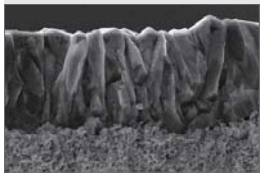
- ND3000 개발(다이아몬드 코팅 재종)
  - 흑연, 세라믹 가공에 우수한 고경도 다이아몬드 코팅
  - 우수한 코팅 밀착력으로 고속, 중(重) 절삭가공에 최적화

ND3000 표면



고경도(Hv 10,000) 다이아몬드 코팅 적용하여 내마모성 우수

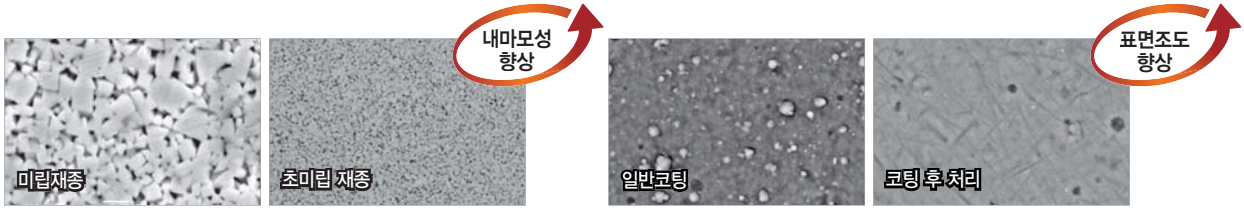
ND3000 표면 단면



전용 모재 적용하여 밀착력 우수, 내박리성 향상

Titanium, Co–Cr 재종

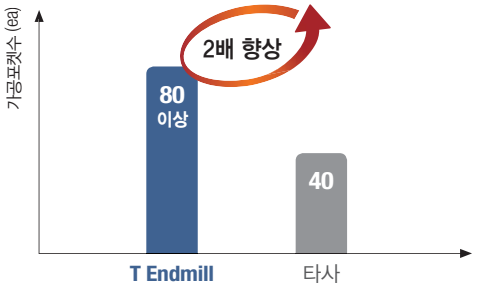
- PC2510 개발(고경도강용 코팅 재종)
  - 향상된 표면 조도를 제공하는 코팅 후 처리 기술 적용
  - 초미립 고인성 모재를 적용하여 안정적인 인성을 바탕으로 고경도강의 단속 및 열충격이 큰 습식가공용에 최적화된 재종

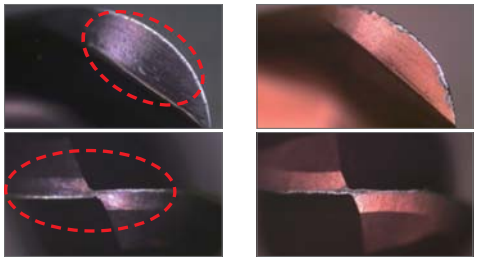


성능평가

피삭재	Co-Cr
절삭조건	vc (m/min) = 150, fz (mm/t) = 0.08
	ap (mm) = 0.13, ae (mm) = 0.7, 습식(wet)
공구	TTBE2030-050

[성능평가 결과]





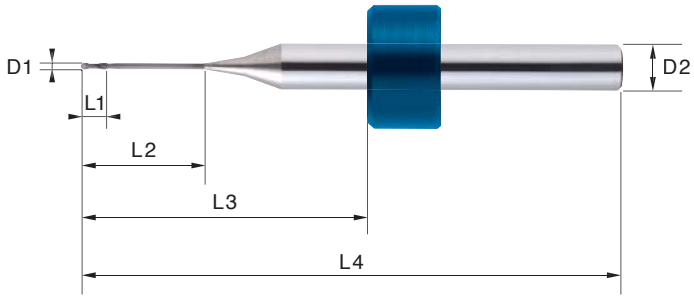
T Endmill 타사

신규 PC2510 재종 적용으로 내인성 및 내마모성 우수

T Endmill

맞춤 공구 제작

• 멈춤링의 유무 및 기타 공구 제원의 경우 맞춤 주문 제작이 가능합니다

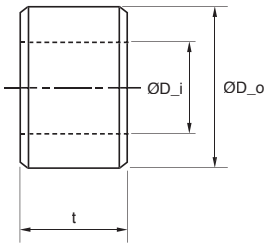


[Data Sheet]

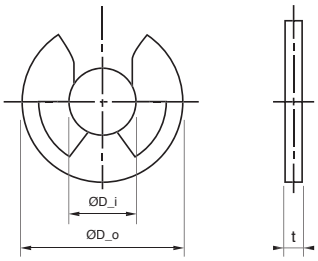
가공기 메이커	
피삭재	
공구형상 구분	
공구직경 (D1)	
샹크직경 (D2)	
인 장 (L1)	
유효길이 (L2)	
스탑링 위치 (L3)	
전 장 (L4)	
스탑링 형태	

※ Data sheet를 작성하시어 인근 KORLOY 영업소로 발송하시면 맞춤 제작이 가능합니다

[멈춤 링 제원]



< 플라스틱 링 >



< E형 링 >

(mm)

구 분	멈춤 링			샹크 직경		
	ØD_o	ØD_i	t	Ø3	Ø4	Ø6
플라스틱 링	Ø7.55	Ø3	4.45	●		
	Ø7.7	Ø4	5.0		●	
	Ø10.5	Ø6	6.5			●
E형 링	Ø6.0	Ø2.5	0.4	●		

※ 필요한 멈춤 링 제원을 작성하시어 인근 KORLOY 영업소로 발송하시면 맞춤 제작이 가능합니다

ROLAND Type

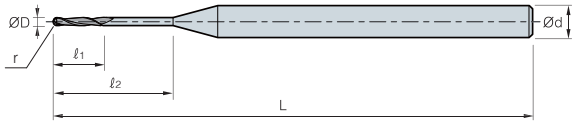
(DWX-30, DWX-50, DWX-51D, DWX-52D)



2 | 30° HELIX | 재종 ~Ø1.0 PC2510 | 재종 Ø1.0~Ø3.0 ND3000 | 절삭조건 p.459

• 공구직경공차

ØD		Ød
~ Ø1.0	0 ~ -0.015mm	h5
Ø1.0 ~ Ø3.0	0 ~ -0.02mm	



(mm)

용도	형 번		코팅	ØD	Ød	ℓ1	ℓ2	L
ZIRCONIA	0.3mm ROLAND	TZBE2003-050-N226(ROLAND)	-	0.3	4	1.8	22.6	50
	0.6mm ROLAND	TZBE2006-050-N12(ROLAND)	PVD	0.6	4	1.5	12	50
	1mm ROLAND	TZBE2010-050-N16(ROLAND)	DIA	1	4	2.2	16	50
	2mm ROLAND	TZBE2020-050-N20(ROLAND)	DIA	2	4	3.2	20	50
PMMA	1mm ROLAND PMMA	TWBE2010-050-N16(ROLAND)	-	1	4	2.2	16	50
	2mm ROLAND PMMA	TWBE2020-050-N20(ROLAND)	-	2	4	3.2	20	50
HYBRID	0.6mm ROLAND ULTIMATE	ETRE006050-S4M325-R(ROLAND)	전착 DIA	0.6	4	10	10	50
	1mm ROLAND ULTIMATE	ETRE010050-S4M170-R(ROLAND)	전착 DIA	1	4	12	12	50
	2mm ROLAND ULTIMATE	ETRE020050-S4M120-R(ROLAND)	전착 DIA	2	4	17	17	50

IMES-ICORE Type

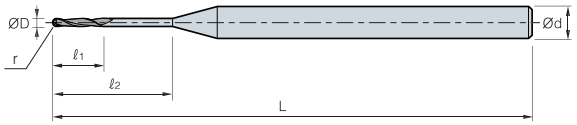
(250i, 340i, 450i)



2 | 30° HELIX | 재종 ~Ø1.0 PC2510 | 재종 Ø1.0~Ø3.0 ND3000 | 절삭조건 p.459

• 공구직경공차

ØD		Ød
~ Ø1.0	0 ~ -0.015mm	h5
Ø1.0 ~ Ø3.0	0 ~ -0.02mm	



(mm)

용도	형 번		코팅	ØD	Ød	ℓ1	ℓ2	L
ZIRCONIA	0.3mm 250i 340i 450i	TZBE2003-048-N080S03(450I)	PVD	1.8	3	1.8	8	48
	0.6mm 250i 340i 450i	TZBE2006-048-N080S03(450I)	PVD	1.5	3	1.5	8	48
	1mm 250i 340i 450i	TZBE2010-048-N14(450I)	DIA	4.4	3	4.4	14	48
	2.5mm 250i 340i 450i	TZBE2025-048-N20(450I)	DIA	6	3	6	20	48
	0.6mm 250i 340i 450i-S6	TZBE2006-053-N090S06(450IS6)	PVD	3	6	3	9	53
	1mm 250i 340i 450i-S6	TZBE2010-053-N142S06(450IS6)	DIA	4.5	6	4.5	14.2	53
	2.5mm 250i 340i 450i-S6	TZBE2025-053-N201S06(450IS6)	DIA	7.5	6	7.5	20.1	53
PMMA	1mm 250i 340i 450i PMMA	TWBE2010-048-N140S03(250I340I450I)	-	4.4	3	4.4	14	48
	2.5mm 250i 340i 450i PMMA	TWBE2025-048-N200S03(250I340I450I)	-	6	3	6	20	48
METAL	1mm 250i 340i 450i TITAN	TTBE2010-040-N090S03(450i)	PVD	2	3	2	9	40
	2mm 250i 340i 450i TITAN	TTBE2020-040-N120S03(450i)	PVD	4	3	4	12	40
	3mm 250i 340i 450i TITAN	TTBE2030-0385-N120S03(450i)	PVD	4	3	4	12.4	40
HYBRID	0.6mm 250i 340i 450i ULTIMATE	ETND006039-S3M325-T5(450i)	전착 DIA	10.3	3	10.3	10.3	39.8
	1mm 250i 340i 450i ULTIMATE	ETRE010039-S3M230(450i)	전착 DIA	10.2	3	10.2	10.2	39.8
	2.5mm 250i 340i 450i ULTIMATE	ETRE025039-S3M120(450i)	전착 DIA	13	3	13	13	39.8

T Endmill

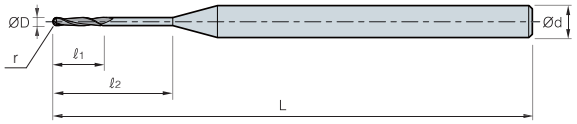
WIELAND SELECT Type



2 | 30° HELIX | 재종 ~Ø1.0 PC2510 | 재종 Ø1.0~Ø3.0 ND3000 | 절삭조건 p.459

• 공구직경공차

ØD		Ød
~ Ø1.0	0 ~ -0.015mm	h5
Ø1.0 ~ Ø3.0	0 ~ -0.02mm	



(mm)

용도	형 번		코팅	ØD	Ød	ℓ1	ℓ2	L
ZIRCONIA	0.7mm WIELAND SELECT	TZBE2007-040-N145S03(WIELAND)	PVD	0.7	3	2.5	14.5	40
	1mm WIELAND SELECT	TZBE2010-040-N145S03(WIELAND)	DIA	1	3	4.5	14.5	40
	2.5mm WIELAND SELECT	TZBE2025-040-N200S03(WIELAND)	DIA	2.5	3	7.5	20	40
PMMA	1mm WIELAND SELECT PMMA	TWBE2010-040-N145S03(WIELAND)	-	1	3	4.5	14.5	40
	2.5mm WIELAND SELECT PMMA	TWBE2025-040-N200S03(WIELAND)	-	2.5	3	7.5	20	40

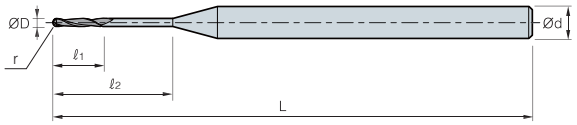
WIELAND MINI Type



2 | 30° HELIX | 재종 ~Ø1.0 PC2510 | 재종 Ø1.0~Ø3.0 ND3000 | 절삭조건 p.459

• 공구직경공차

ØD		Ød
~ Ø1.0	0 ~ -0.015mm	h5
Ø1.0 ~ Ø3.0	0 ~ -0.02mm	



(mm)

용도	형 번		코팅	ØD	Ød	ℓ1	ℓ2	L
ZIRCONIA	1mm WIELAND MINI	TZBE2010-035-N140S03(WIELAND MINI)	-	1	3	4.5	14.5	35
	2.5mm WIELAND MINI	TZBE2025-035-N200S03(WIELAND MINI)	-	2.5	3	6	20	35

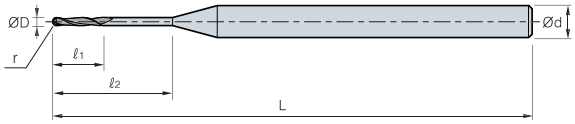
AMANN GIRRBACH Type (CERA-MILL)



2 | 30° HELIX | 재종 ~Ø1.0 PC2510 | 재종 Ø1.0~Ø3.0 ND3000 | 절삭조건 p.459

• 공구직경공차

ØD		Ød
~ Ø1.0	0 ~ -0.015mm	h5
Ø1.0 ~ Ø3.0	0 ~ -0.02mm	



(mm)

용도	형 번		코팅	ØD	Ød	ℓ1	ℓ2	L
ZIRCONIA	0.6mm CERA-MILL	TZBE2006-047-N135S03(CERAMILL)	PVD	0.6	3	2.4	13.5	47
	1mm CERA-MILL	TZBE2010-047-N165S03(CERAMILL)	DIA	1	3	2	12	47
	2.5mm CERA-MILL	TZBE2025-047-N180S03(CERAMILL)	DIA	2.5	3	4	18	47
PMMA	1mm CERA-MILL PMMA	TWBE2010-047-N165S03(CERAMILL)	-	1	3	2	16.5	47
	2.5mm CERA-MILL PMMA	TWBE2025-047-N180S03(CERAMILL)	-	2.5	3	4	18	47

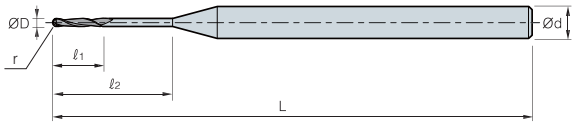
VHF-S1 Type



2 | 30° HELIX | 재종 ~Ø1.0 PC2510 | 재종 Ø1.0~Ø3.0 ND3000 | 절삭조건 p.459

• 공구직경공차

ØD		Ød
~ Ø1.0	0 ~ -0.015mm	h5
Ø1.0 ~ Ø3.0	0 ~ -0.02mm	



(mm)

용도	형 번		코팅	ØD	Ød	ℓ1	ℓ2	L
ZIRCONIA	0.6mm VHF-S1	TZBE2006-035-N030S03(VHFS1)	PVD	0.6	3	1.5	3	35
	1mm VHF-S1	TZBE2010-040-N145S03(VHFS1)	DIA	1	3	5	14.5	40
	2mm VHF-S1	TZBE2020-040-N160S03(VHFS1)	DIA	2	3	4	16	40
PMMA	1mm VHF-S1 PMMA	TWBE2010-040-N145S03(VHFS1)	-	1	3	5	14.5	40
	2mm VHF-S1 PMMA	TWBE2020-040-N160S03(VHFS1)	-	2	3	4	16	40

T Endmill

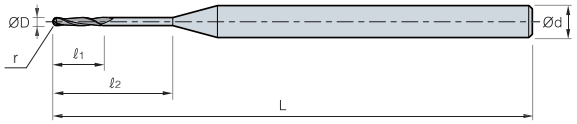
VHF-K4/CM Type



2 | 30° HELIX | 재종 ~Ø1.0 PC2510 | 재종 Ø1.0~Ø3.0 ND3000 | 절삭조건 p.459

• 공구직경공차

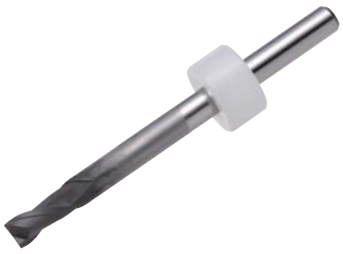
ØD		Ød
~ Ø1.0	0 ~ -0.015mm	h5
Ø1.0 ~ Ø3.0	0 ~ -0.02mm	



(mm)

용도	형 번		코팅	ØD	Ød	ℓ1	ℓ2	L
ZIRCONIA	0.6mm VHF-K4	TWBE2006-035-N030S03(VHFK4)	-	0.6	3	1.4	3	35
	1mm VHF-K4	TWBE2010-035-N160S03(VHFK4)	-	1	3	2.2	16	35
	2mm VHF-K4	TWBE3020-035-N160S03(VHFK4)	-	2	3	4.2	16	35

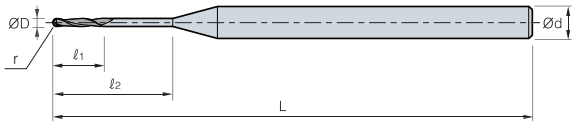
CHARLY Type



2 | 30° HELIX | 재종 ~Ø1.0 PC2510 | 재종 Ø1.0~Ø3.0 ND3000 | 절삭조건 p.459

• 공구직경공차

ØD		Ød
~ Ø1.0	0 ~ -0.015mm	h5
Ø1.0 ~ Ø3.0	0 ~ -0.02mm	



(mm)

용도	형 번		코팅	ØD	Ød	ℓ1	ℓ2	L
ZIRCONIA	0.5mm CHARLY	TZBE2005-0385-N100S03(CHARLY)	PVD	0.5	3	1.5	10	38.5
	1mm CHARLY	TZBE2010-0385-N120S03(CHARLY)	DIA	1	3	2	12	38.5
	1.5mm CHARLY	TZBE2015-0385-N120S03(CHARLY)	DIA	1.5	3	3	12	38.5
	3mm CHARLY	TZFE2030-0385-N060S03(CHARLY)	DIA	3	3	7	6	38.5
PMMA	1mm CHARLY PMMA	TZBE2010-0385-N120S03(CHARLY)-N	-	1	3	2	12	38.5
	1.5mm CHARLY PMMA	TZBE2015-0385-N120S03(CHARLY)-N	-	1.5	3	3	12	38.5
	3mm CHARLY PMMA	TZFE2030-0385-N060S03(CHARLY)-N	-	3	3	7	6	38.5

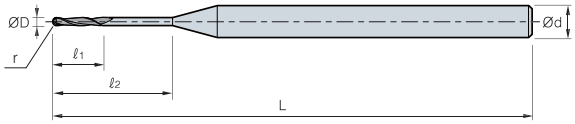
ZIRKONZAHN M5 Type



2 | 30° HELIX | 재종 ~Ø1.0 PC2510 | 재종 Ø1.0~Ø3.0 ND3000 | 절삭조건 p.459

• 공구직경공차

ØD		Ød
~ Ø1.0	0 ~ -0.015mm	h5
Ø1.0 ~ Ø3.0	0 ~ -0.02mm	



(mm)

용도	형 번		코팅	ØD	Ød	ℓ1	ℓ2	L
ZIRCONIA	1mm ZIRKONZHAN M5	TZBE2010-057-N120S03(ZIRKON)-DYD	DIA	1	3	6	12	57
	2mm ZIRKONZHAN M5	TZBE2020-057-N180S03(ZIRKON)-DYD	DIA	2	3	10	18	57
	0.3mm ZIRKONZHAN M5-N	TZBE2003-057-N060S03(ZIRKONZAHN)-DY	-	0.3	3	3	6	57
	0.5mm ZIRKONZHAN M5-N	TZBE2005-057-N100S03(ZIRKONZHAN)-DY	-	0.5	3	3	10	57
	1mm ZIRKONZHAN M5-N	TZBE2010-057-N120S03(ZIRKONZHAN)-DY	-	1	3	6	12	57
	2mm ZIRKONZHAN M5-N	TZBE2020-057-N180S03(ZIRKONZHAN)-DY	-	2	3	10	18	57

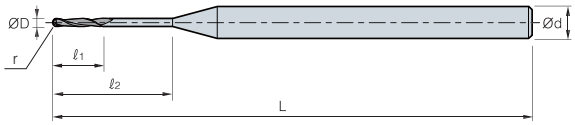
ZIRKONZAHN M1 / M4 Type



2 | 30° HELIX | 재종 ~Ø1.0 PC2510 | 재종 Ø1.0~Ø3.0 ND3000 | 절삭조건 p.459

• 공구직경공차

ØD		Ød
~ Ø1.0	0 ~ -0.015mm	h5
Ø1.0 ~ Ø3.0	0 ~ -0.02mm	



(mm)

용도	형 번		코팅	ØD	Ød	ℓ1	ℓ2	L
ZIRCONIA	0.5mm ZIRKONZHAN M1/M4	TZBE2005-050-N108S06(ZIRKONM1)	PVD	0.5	6	3.5	10.8	50
	1mm ZIRKONZHAN M1/M4	TZBE2010-050-N120S06(ZIRKONM1)	DIA	1	6	6	12	50
	2mm ZIRKONZHAN M1/M4	TZBE2020-050-N180S06(ZIRKONM1)	DIA	2	6	10	18	50
	0.5mm ZIRKONZHAN M1/M4-N	TZBE2005-050-N095S06(ZIRKON M1)	-	0.5	6	3	9.5	50
	1mm ZIRKONZHAN M1/M4-N	TZBE2010-050-N120S06(ZIRKONM1)-N	-	1	6	6	12	50
	2mm ZIRKONZHAN M1/M4-N	TZBE2020-050-N180S06(ZIRKONM1)-N	-	2	6	10	18	50
METAL	1mm ZIRKONZHAN M1/M4 TITAN	TTBE2010-050-N120S06(ZIRKON M1)	PVD	1	6	4	12	50
	2mm ZIRKONZHAN M1/M4 TITAN	TTBE2020-050-N120S06(ZIRKON M1)	PVD	2	6	3	12	50
	3mm ZIRKONZHAN M1/M4 TITAN	TTBE2030-050-N180S06(ZIRKON M1)	PVD	3	6	4.4	18	50

T Endmill

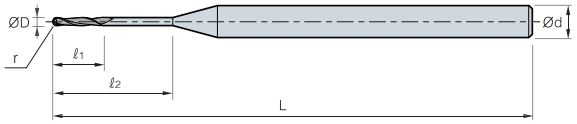
SIRONA Type (MC-X5)



2 | 30° HELIX | 재종 ~Ø1.0 PC2510 | 재종 Ø1.0~Ø3.0 ND3000 | 절삭조건 p.459

• 공구직경공차

ØD		Ød
~ Ø1.0	0 ~ -0.015mm	h5
Ø1.0 ~ Ø3.0	0 ~ -0.02mm	



(mm)

용도	형 번		코팅	ØD	Ød	ℓ1	ℓ2	L
ZIRCONIA	0.5mm MC-X5	TZBE2005-042-N060S03(MC-X5)	PVD	0.5	3	1	5	42
	1mm MC-X5	TZBE2010-043-N170S03(MC-X5)	DIA	1	3	3.4	17.2	43
	2.5mm MC-X 5	TZBE4025-044-N240S03(MC-X5)	DIA	2.5	3	4.5	24	44
PMMA	1mm MC-X5 PMMA	TWBE2010-043-N170S03(MC-X5)	-	1	3	3.4	17.2	45
	2.5mm MC-X5 PMMA	TWBE2025-044-N240S3(MC-X5)	-	2.5	3	4.5	24	45

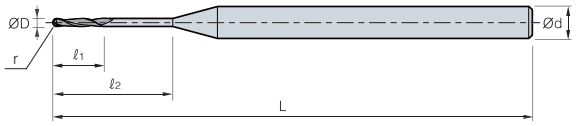
YENA Type



2 | 30° HELIX | 재종 ~Ø1.0 PC2510 | 재종 Ø1.0~Ø3.0 ND3000 | 절삭조건 p.459

• 공구직경공차

ØD		Ød
~ Ø1.0	0 ~ -0.015mm	h5
Ø1.0 ~ Ø3.0	0 ~ -0.02mm	



(mm)

용도	형 번		코팅	ØD	Ød	ℓ1	ℓ2	L
ZIRCONIA	1mm YENA	TZBE2010-045-N160S04(YENA)-DY	DIA	1	4	1.8	16.5	45
	2mm YENA	TZBE2020-045-N160S04(YENA)-DY	DIA	2	4	3	16.5	45
PMMA	1mm YENA PMMA	TWBE2010-045-N160S04(YENA)-DY	-	1	4	1.8	16.5	45
	2mm YENA PMMA	TWBE2020-045-N160S04(YENA)-DY	-	2	4	3	16.5	45
METAL	2mm YENA TITAN	TTBE2020-045-N122S04(YENA)	PVD	2	4	3.6	12.2	45
	3mm YENA TITAN	TTBE2030-045-N125S04(YENA)	PVD	3	4	5.5	12.5	45

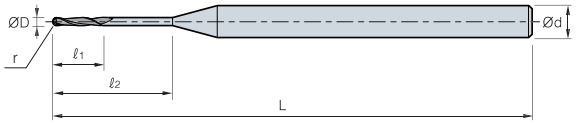
LEZIRTH Type



2 | 30° HELIX | 재종 ~Ø1.0 PC2510 | 재종 Ø1.0~Ø3.0 ND3000 | 절삭조건 p.459

• 공구직경공차

ØD		Ød
~ Ø1.0	0 ~ -0.015mm	h5
Ø1.0 ~ Ø3.0	0 ~ -0.02mm	



(mm)

용도	형 번		코팅	ØD	Ød	ℓ1	ℓ2	L
METAL	1mm 레저스(Co-Cr)	TTBE2010-050-V1.2N8S6	PVD	1	6	1.2	8	50
	1.5mm 레저스(Co-Cr)	TTBE2015-045-V1.7N8.5S6	PVD	1.5	6	1.7	8.5	45
	2mm 레저스(Co-Cr)	TTE2020-050-V2.2N12S6	PVD	2	6	2.2	12	50
	3mm 레저스(Co-Cr)	TTE2030-060-V3.5N16S6	PVD	3	6	3.5	16	60

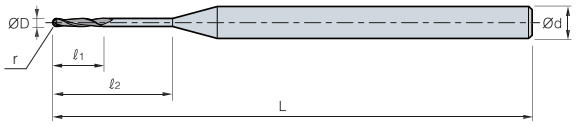
ARUM Type (4X/5X-100)



2 | 30° HELIX | 재종 ~Ø1.0 PC2510 | 재종 Ø1.0~Ø3.0 ND3000 | 절삭조건 p.459

• 공구직경공차

ØD		Ød
~ Ø1.0	0 ~ -0.015mm	h5
Ø1.0 ~ Ø3.0	0 ~ -0.02mm	



(mm)

용도	형 번		코팅	ØD	Ød	ℓ1	ℓ2	L
ZIRCONIA	0.6mm 4X-100	TZBE2006-063-N120S06(4X-100)	PVD	0.6	6	1.5	12	63
	1mm 4X-100	TZBE2010-063-N160S06(4X-100)	DIA	1	6	2.5	16	63
	2mm 4X-100	TZBE2020-063-N200S06(4X-100)	DIA	2	6	6	20	63
PMMA	1mm 4X-100 PMMA	TWBE2010-063-N160S06(4X-100)	-	1	6	2.5	16	63
	2mm 4X-100 PMMA	TWBE2020-063-N200S06(4X-100)	-	2	6	6	20	63

T Endmill

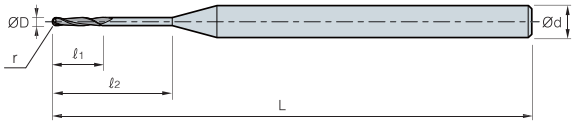
ARUM Type (5X-150)



2 | 30° HELIX | 재종 ~Ø1.0 PC2510 | 재종 Ø1.0~Ø3.0 ND3000 | 절삭조건 p.459

• 공구직경공차

ØD		Ød
~ Ø1.0	0 ~ -0.015mm	h5
Ø1.0 ~ Ø3.0	0 ~ -0.02mm	



(mm)

용도	형 번		코팅	ØD	Ød	ℓ1	ℓ2	L
ZIRCONIA	0.6mm 5X-150	TZBE2006-045-N100S04(5X-150)	PVD	0.6	4	1.5	10	45
	1mm 5X-150	TZBE2010-050-N161S04(5X-150)-K	DIA	1	4	2.5	16.1	50
	2mm 5X-150	TZBE2020-050-N181S04(5X-150)	DIA	2	4	6.5	18.1	50
PMMA	1mm 5X-150 PMMA	TWBE2010-050-N161S04(5X-150)	-	1	4	2.5	16.1	50
	2mm 5X-150 PMMA	TWBE2020-050-N181S04(5X-150)	-	2	4	6.5	18.1	50
HYBRID	0.6mm 5X-150 ULTIMATE	ETND006041-C4M325-T7(5X-150)	전착 DIA	0.6	4	8	8	41
	1mm 5X-150 ULTIMATE	ETND010044-C4M170(5X-150)	전착 DIA	1	4	10	10	44
	1.5mm 5X-150 ULTIMATE	ETND015044-C4M140(5X-150)	전착 DIA	1.5	4	10	10	44
	2.5mm 5X-150 ULTIMATE	ETND025044-C4M120(5X-150)	전착 DIA	2.5	4	12	12	44

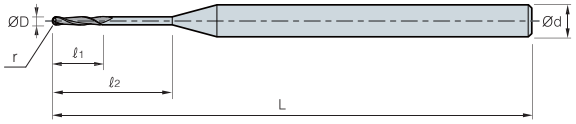
ARUM Type (5X-200)



2 | 30° HELIX | 재종 ~Ø1.0 PC2510 | 재종 Ø1.0~Ø3.0 ND3000 | 절삭조건 p.459

• 공구직경공차

ØD		Ød
~ Ø1.0	0 ~ -0.015mm	h5
Ø1.0 ~ Ø3.0	0 ~ -0.02mm	



(mm)

용도	형 번		코팅	ØD	Ød	ℓ1	ℓ2	L
ZIRCONIA	0.6mm 5X-200	TZBE2006-050-N080S06(5X-200)	PVD	0.6	6	1.6	8	50
	1mm 5X-200	TZBE2010-053-N140S06(5X-200)	DIA	1	6	2	14	53
	2mm 5X-200	TZBE2020-055-N200S06(5X-200)	DIA	2	6	6	20	55
PMMA	1mm 5X-200 PMMA	TWBE2010-053-N140S06(5X-200)	-	1	6	2	14	53
	2mm 5X-200 PMMA	TWBE2020-055-N200S06(5X-200)	-	2	6	6	20	55
HYBRID	0.6mm 5X-200 ULTIMATE	ETND006050-H6M270-T7(5X-200)	전착 DIA	0.6	6	8	8	50
	1mm 5X-200 ULTIMATE	ETRE010050-H6M200(5X-200)	전착 DIA	1	6	10	10	50
	1.5mm 5X-200 ULTIMATE	ETRE015050-H6M170(5X-200)	전착 DIA	1.5	6	10	10	50
	2.5mm 5X-200 ULTIMATE	ETRE025050-H6M140(5X-200)	전착 DIA	2.5	6	12	12	50

ARUM Type

(5X-300)

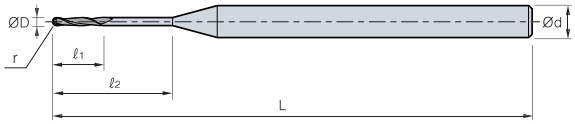


2 | 30° HELIX | 재종 ~Ø1.0 PC2510 | 재종 Ø1.0~Ø3.0 ND3000 | 절삭조건

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• 공구직경공차

ØD		Ød
~ Ø1.0	0 ~ -0.015mm	h5
Ø1.0 ~ Ø3.0	0 ~ -0.02mm	



(mm)

용도	형 번		코팅	ØD	Ød	ℓ1	ℓ2	L
ZIRCONIA	0.3mm 5X-300	TZBE2003-045-N120S04(5X-300)	PVD	0.3	4	0.6	12	45
	0.6mm 5X-300	TZBE2006-045-N100S04(5X-300)	PVD	0.6	4	1.2	10	45
	1mm 5X-300	TZBE2010-050-N160S04(5X-300)	DIA	1	4	2	16	50
	2mm 5X-300	TZBE2020-050-N180S04(5X-300)	DIA	2	4	6	18	50
PMMA	1mm 5X-300 PMMA	TWBE2010-050-N160S04(5X-300)	-	1	4	2	16	50
	2mm 5X-300 PMMA	TWBE2020-050-N180S04(5X-300)	-	2	4	6	18	50

ARUM Type

(Metal Tool)

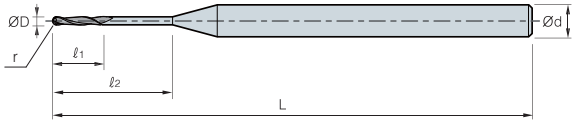


2 | 30° HELIX | 재종 ~Ø1.0 PC2510 | 재종 Ø1.0~Ø3.0 ND3000 | 절삭조건

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• 공구직경공차

ØD		Ød
~ Ø1.0	0 ~ -0.015mm	h5
Ø1.0 ~ Ø3.0	0 ~ -0.02mm	



(mm)

용도	형 번		코팅	ØD	Ød	ℓ1	ℓ2	L
METAL	1mm ARUM TITAN	TTBE2010-050-N100S06(ARUM)-DY	PVD	1	6	2	10	50
	1.5mm ARUM TITAN	TTBE2015-050-N100S06(ARUM)-DY	PVD	1.5	6	3	10	50
	2mm ARUM TITAN	TTBE2020-050-N120S06(ARUM)-DY	PVD	2	6	4	12	50
	2.5mm ARUM TITAN	TTBE2025-050-N140S06(ARUM)C1	PVD	2.5	6	8	14	50
	3mm ARUM TITAN	TTBE2030-050-N120S06(ARUM)-DY	PVD	3	6	6	12	50

T Endmill

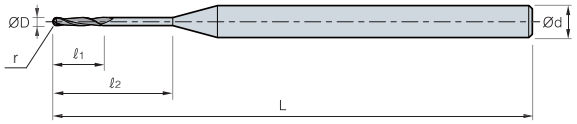
Z-MATCH / CAMELEON Type



2 | 30° HELIX | 재종 ~Ø1.0 PC2510 | 재종 Ø1.0~Ø3.0 ND3000 | 절삭조건 p.459

• 공구직경공차

ØD		Ød
~ Ø1.0	0 ~ -0.015mm	h5
Ø1.0 ~ Ø3.0	0 ~ -0.02mm	



(mm)

용도	형 번		코팅	ØD	Ød	ℓ1	ℓ2	L
ZIRCONIA	0.5mm Z-MATCH	TZBE2005-055-N8(Z-MATCH)	PVD	0.5	6	1.5	8	55
	1mm Z-MATCH	TZBE2010-055-N16(Z-MATCH)	DIA	1	6	3	16	55
	2mm Z-MATCH	TZBE2020-055-N20(Z-MATCH)	DIA	2	6	6	20	55
PMMA	1mm Z-MATCH PMMA	TWBE2010-055-N160S06(Z-MATCH)	-	1	6	3	16	55
	2mm Z-MATCH PMMA	TWBE2020-055-N200S06(Z-MATCH)	-	2	6	6	20	55

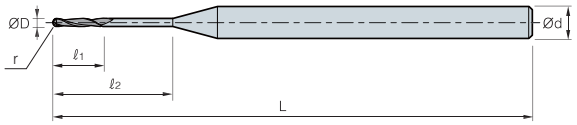
CAMELEON CS Type



2 | 30° HELIX | 재종 ~Ø1.0 PC2510 | 재종 Ø1.0~Ø3.0 ND3000 | 절삭조건 p.459

• 공구직경공차

ØD		Ød
~ Ø1.0	0 ~ -0.015mm	h5
Ø1.0 ~ Ø3.0	0 ~ -0.02mm	



(mm)

용도	형 번		코팅	ØD	Ød	ℓ1	ℓ2	L
ZIRCONIA	0.5mm CAMELEON CS	TZBE2005-040-N080S03(CAMELEON CS)	PVD	0.5	3	1	8	40
	1mm CAMELEON CS	TZBE2010-040-N160S03(CAMELEON CS)	DIA	1	3	2	16	40
	2mm CAMELEON CS	TZBE2020-040-N200S03(CAMELEON CS)	DIA	2	3	4	20	40
PMMA	1mm CAMELEON CS PMMA	TWBE2010-040-N160S03(CAMELEON CS)	-	1	3	2	16	40
	2mm CAMELEON CS PMMA	TWBE2020-040-N200S03(CAMELEON CS)	-	2	3	4	20	40

CAMELEON Type

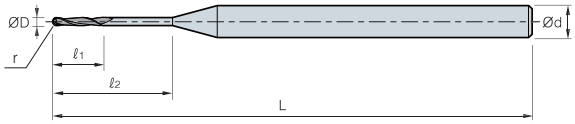
(Metal Tool)



2 | 30° HELIX | 재종 ~Ø1.0 PC2510 | 재종 Ø1.0~Ø3.0 ND3000 | 절삭조건 p.459

• 공구직경공차

ØD		Ød
~ Ø1.0	0 ~ -0.015mm	h5
Ø1.0 ~ Ø3.0	0 ~ -0.02mm	



(mm)

용도	형 번		코팅	ØD	Ød	ℓ1	ℓ2	L
METAL	1.5mm CAMELEON TITAN	TTBE2015-045-N7(Z-MATCH-M)	PVD	1.5	6	3	8	45
	2mm CAMELEON TITAN	TTBE2020-045-N7(Z-MATCH-M)	PVD	2	6	4	8	45
	3mm CAMELEON TITAN	TTBE2030-045-N10(Z-MATCH-M)	PVD	3	6	6	10	45
	1.5mm CAMELEON TITAN-long	TTBE2015-055-N8(CAMELEON-M)	PVD	1.5	6	1.5	8	55
	2mm CAMELEON TITAN-long	TTBE2020-055-N8(CAMELEON-M)	PVD	2	6	2	8	55
	3mm CAMELEON TITAN-long	TTBE2030-055-N10(CAMELEON-M)	PVD	3	6	3	10	55

RND Type

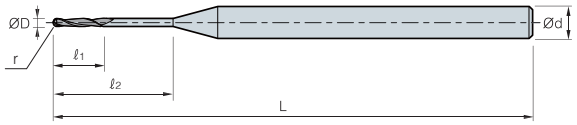
(DS200-5Z, DM-100, DS-4WA)



2 | 30° HELIX | 재종 ~Ø1.0 PC2510 | 재종 Ø1.0~Ø3.0 ND3000 | 절삭조건 p.459

• 공구직경공차

ØD		Ød
~ Ø1.0	0 ~ -0.015mm	h5
Ø1.0 ~ Ø3.0	0 ~ -0.02mm	



(mm)

용도	형 번		코팅	ØD	Ød	ℓ1	ℓ2	L
ZIRCONIA	0.6mm DS200-5Z	TZBE2006-045-N120S03(DS200-5Z)	PVD	0.6	3	1.5	12.3	45.3
	1mm DS200-5Z	TZBE2010-045-N180S03(DS200-5Z)	DIA	1	3	2.8	17.7	45.3
	2mm DS200-5Z	TZBE2020-045-N200S03(DS200-5Z)	DIA	2	3	4.3	19.7	45.3
PMMA	1mm DS200-5Z PMMA	TWBE2010-045-N180S03(DS200-5Z)	-	1	3	2.8	17.7	45.3
	2mm DS200-5Z PMMA	TWBE2020-045-N200S03(DS200-5Z)	-	2	3	4.3	19.7	45.3
METAL	1.5mm RND DM-100	TTBE2015-050-N100S06(RND)-DY	PVD	1.5	6	3	10	50
	2mm RND DM-100	TTBE2020-050-N130S06(RND)-DY	PVD	2	6	4	13	50
	3mm RND DM-100	TTBE2030-050-N120S06(RND)-DY	PVD	3	6	6	12	50

T Endmill

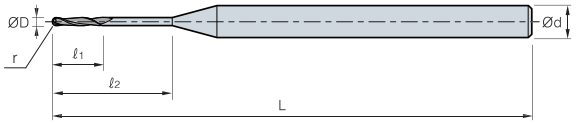
MANIX Type (ZX-5SD, MA-4)



2 | 30° HELIX | 재종 ~Ø1.0 PC2510 | 재종 Ø1.0~Ø3.0 ND3000 | 절삭조건 p.459

• 공구직경공차

ØD		Ød
~ Ø1.0	0 ~ -0.015mm	h5
Ø1.0 ~ Ø3.0	0 ~ -0.02mm	



(mm)

용도	형 번		코팅	ØD	Ød	ℓ1	ℓ2	L
ZIRCONIA	0.6mm ZX-5SD	TZBE2006-045-N145S04(ZX-5SD)	PVD	0.6	4	0.6	12.2	45
	1mm ZX-5SD	TZBE2010-050-N160S04(ZX-5SD)	DIA	1	4	2.8	16.5	50
	2mm ZX-5SD	TZBE2020-050-N200S04(ZX-5SD)	DIA	2	4	5	20	50
PMMA	1mm MANIX ZX-5SD PMMA	TWBE2010-050-N165S04(MANIX)	-	1	4	2.8	16.5	50
	2mm MANIX ZX-5SD PMMA	TWBE2020-050-N200S04(MANIX)	-	2	4	5	20	50
METAL	1.5mm MANIX TITAN	TTBE2015-045-N105S06(MANIX)	PVD	1.5	6	2	10.5	45
	2mm MANIX TITAN	TTBE2020-045-N125S06(MANIX)	PVD	2	6	4.8	12.5	45
	2.5mm MANIX TITAN	TTBE2025-045-N120S06(MANIX)	PVD	2.5	6	3	12	45
	3mm MANIX TITAN	TTBE2030-045-N125S06(MANIX)	PVD	3	6	4	12.5	45

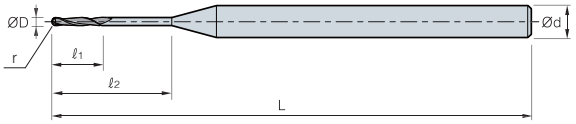
승원 DI Type



2 | 30° HELIX | 재종 ~Ø1.0 PC2510 | 재종 Ø1.0~Ø3.0 ND3000 | 절삭조건 p.459

• 공구직경공차

ØD		Ød
~ Ø1.0	0 ~ -0.015mm	h5
Ø1.0 ~ Ø3.0	0 ~ -0.02mm	



(mm)

용도	형 번		코팅	ØD	Ød	ℓ1	ℓ2	L
METAL	1.5mm 승원 DI TITAN	TTBE2015-050-N100S06(승원 DI-M)	PVD	1.5	6	7.4	10.2	50
	2mm 승원 DI TITAN	TTBE2020-050-N120S06(승원 DI-M)	PVD	2	6	7.6	12.1	50

PROTECH INNOTION Type

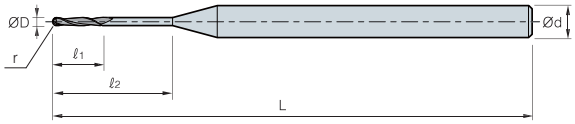
(Proden, Prodia, Nexus)



2 | 30° HELIX | 재종 ~Ø1.0 PC2510 | 재종 Ø1.0~Ø3.0 ND3000 | 절삭조건 p.459

• 공구직경공차

ØD		Ød
~ Ø1.0	0 ~ -0.015mm	h5
Ø1.0 ~ Ø3.0	0 ~ -0.02mm	



(mm)

용도	형 번		코팅	ØD	Ød	ℓ1	ℓ2	L
ZIRCONIA	0.6mm PRODEN	TZBE2006-060-N115S06(PRODEN)	PVD	0.6	6	2.2	11.5	60
	1mm PRODEN	TZBE2010-060-N180S06(PRODEN)	DIA	1	6	2.4	18	60
	2mm PRODEN	TZBE2020-060-N200S06(PRODEN)	DIA	2	6	4.8	20	60
PMMA	1mm PRODEN PMMA	TWBE2010-060-N180S06(PRODEN)	-	1	6	2.4	18	60
	2mm PRODEN PMMA	TWBE2020-060-N200S06(PRODEN)	-	2	6	4.8	20	60

PROTECH INNOTION Type

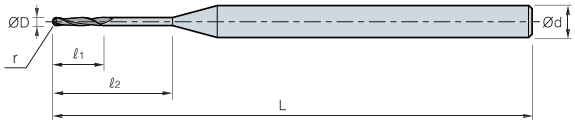
(Metal Tool-Monster, Nexus, Protech)



2 | 30° HELIX | 재종 ~Ø1.0 PC2510 | 재종 Ø1.0~Ø3.0 ND3000 | 절삭조건 p.459

• 공구직경공차

ØD		Ød
~ Ø1.0	0 ~ -0.015mm	h5
Ø1.0 ~ Ø3.0	0 ~ -0.02mm	



(mm)

용도	형 번		코팅	ØD	Ød	ℓ1	ℓ2	L
METAL	1mm NEXUS Co-Cr	TTBE2010-051-N100S06(NEXUS)	PVD	1	6	2	10	51
	1.5mm NEXUS Co-Cr	TTBE2015-051-N100S06(NEXUS)	PVD	1.5	6	2	10	51
	2mm NEXUS Co-Cr	TTBE2020-051-N120S06(NEXUS)	PVD	2	6	3	12	51
	3mm NEXUS Co-Cr	TTBE2030-051-N120S06(NEXUS)	PVD	3	6	4.5	12	51

T Endmill

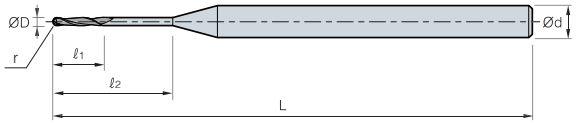
CERACUBE / TRION-Z Type



2 | 30° HELIX | 재종 ~Ø1.0 PC2510 | 재종 Ø1.0~Ø3.0 ND3000 | 절삭조건 p.459

• 공구직경공차

ØD		Ød
~ Ø1.0	0 ~ -0.015mm	h5
Ø1.0 ~ Ø3.0	0 ~ -0.02mm	



(mm)

용도	형 번		코팅	ØD	Ød	ℓ1	ℓ2	L
ZIRCONIA	0.5mm CERACUBE/TRION-Z	TZBE2005-050-N22(TRION-Z)	PVD	0.5	4	2.2	22	50
	1mm CERACUBE/TRION-Z	TZBE2010-050-N18(TRION-Z)	DIA	1	4	3	18	50
	2mm CERACUBE/TRION-Z	TZBE2020-050-N20(TRION-Z)	DIA	2	4	7	20	50
PMMA	1mm CERACUBE/TRION-Z PMMA	TWBE2010-050-N180S04(TRION-Z)	-	1	4	3	18	50
	2mm CERACUBE/TRION-Z PMMA	TWBE2020-050-N200S04(TRION-Z)	-	2	4	7	20	50

DENTIUM Type

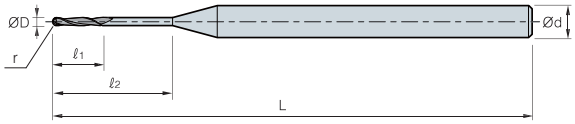
(Rainbow, Rainbow-Mill, Rainbow-Mill Zr 2nd)



2 | 30° HELIX | 재종 ~Ø1.0 PC2510 | 재종 Ø1.0~Ø3.0 ND3000 | 절삭조건 p.459

• 공구직경공차

ØD		Ød
~ Ø1.0	0 ~ -0.015mm	h5
Ø1.0 ~ Ø3.0	0 ~ -0.02mm	



(mm)

용도	형 번		코팅	ØD	Ød	ℓ1	ℓ2	L
ZIRCONIA	0.5mm RAINBOW	TZBE2005-050-N080S06(DENTIUM)	DIA	0.5	6	2	8	50
	1mm RAINBOW	TZBE2010-050-N160S06(DENTIUM)	DIA	1	6	3	16	50
	2mm RAINBOW	TZBE2020-050-N180S06(DENTIUM)	DIA	2	6	6	18	50
	0.5mm RAINBOW-MILL	TZBE2005-043-N080S03(DENTIUM)	DIA	0.5	3	2	8	43
	1mm RAINBOW-MILL	TZBE2010-050-N160S03(DENTIUM)	DIA	1	3	3	16	50
	2mm RAINBOW-MILL	TZBE2020-050-N180S03(DENTIUM)	DIA	2	3	6	18	50
	0.5mm RAINBOW-MILL Zr 2ND	TZBE2005-045-N080S04(DENTIUM)	DIA	0.5	4	2	8	45
	1mm RAINBOW-MILL Zr 2ND	TZBE2010-045-N160S04(DENTIUM)	DIA	1	4	3	16	45
	2.5mm RAINBOW-MILL Zr 2ND	TZBE2025-045-N180S04(DENTIUM)	DIA	2.5	4	6	18	45
PMMA	0.5mm RAINBOW PMMA	TWBE2005-050-N080S06(DENTIUM)	-	0.5	6	2	8	50
	1mm RAINBOW PMMA	TWBE2010-050-N160S06(DENTIUM)	-	1	6	3	16	50
	2mm RAINBOW PMMA	TWBE2020-050-N180S06(DENTIUM)	-	2	6	6	18	50
	1mm RAINBOW-MILL PMMA	TWBE2010-050-N160S03(DENTIUM)	-	1	3	3	16	50
	2mm RAINBOW-MILL PMMA	TWBE2020-050-N180S03(DENTIUM)	-	2	3	6	18	50
	1mm RAINBOW-MILL Zr 2ND PMMA	TWBE2010-045-N160S04(DENTIUM)	-	1	4	3	16	45
	2.5mm RAINBOW-MILL Zr 2ND PMMA	TWBE2025-045-N180S04(DENTIUM)	-	2.5	4	6	18	45
METAL	1mm RAINBOW TITAN	TTBE2010-050-N100S06(DENTIUM)	PVD	1	6	2	10	50
	1.5mm RAINBOW TITAN	TTBE2015-050-N100S06(DENTIUM)	PVD	1.5	6	3	10	50
	2mm RAINBOW TITAN	TTBE2020-050-N120S06(DENTIUM)	PVD	2	6	4	12	50
	3mm RAINBOW TITAN	TTBE2030-050-N120S06(DENTIUM)	PVD	3	6	6	12	50
HYBRID	0.6mm RAINBOW ULTIMATE	ETRE006050-H6M325-D	전착 DIA	0.6	6	6	6	50
	1mm RAINBOW ULTIMATE	ETRE010050-H6M170-D	전착 DIA	1	6	10	10	50
	2mm RAINBOW ULTIMATE	ETRE020050-H6M120-D	전착 DIA	2	6	12	12	50
	0.6mm RAINBOW-MILL ULTIMATE	ETRE006040-H3M325-D	전착 DIA	0.6	3	6	6	40
	1mm RAINBOW-MILL ULTIMATE	ETRE010045-H3M170-D	전착 DIA	1	3	10	10	45
	2mm RAINBOW-MILL ULTIMATE	ETRE020045-H3M120-D	전착 DIA	2	3	12	12	45
	0.6mm RAINBOW-MILL Zr 2ND ULTIMATE	ETRE006045-H4M325-D	전착 DIA	0.6	4	6	6	45
	1mm RAINBOW-MILL Zr 2ND ULTIMATE	ETRE010045-H4M170-D	전착 DIA	1	4	10	10	45
	2mm RAINBOW-MILL Zr 2ND ULTIMATE	ETRE020045-H4M120-D	전착 DIA	2	4	12	12	45

T Endmill

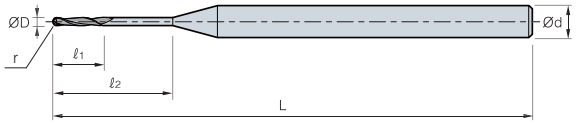
DOF Type



2 | 30° HELIX | 재종 ~Ø1.0 PC2510 | 재종 Ø1.0~Ø3.0 ND3000 | 절삭조건 p.459

• 공구직경공차

ØD		Ød
~ Ø1.0	0 ~ -0.015mm	h5
Ø1.0 ~ Ø3.0	0 ~ -0.02mm	



(mm)

용도	형 번		코팅	ØD	Ød	ℓ1	ℓ2	L
ZIRCONIA	1mm DOF	TZBE2010-044-N19(DOF)	DIA	1	3	5.8	19	45
	2mm DOF	TZBE2020-044-N20(DOF)	DIA	2	3	8	20	45
PMMA	1mm DOF PMMA	TWBE2010-044-N19(DOF)	-	1	3	5.8	19	45
	2mm DOF PMMA	TWBE2020-044-N20(DOF)	-	2	3	8	20	45

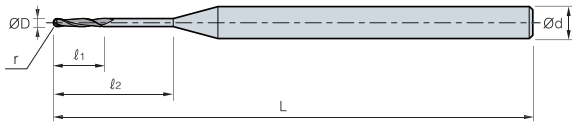
ELBEN Type



2 | 30° HELIX | 재종 ~Ø1.0 PC2510 | 재종 Ø1.0~Ø3.0 ND3000 | 절삭조건 p.459

• 공구직경공차

ØD		Ød
~ Ø1.0	0 ~ -0.015mm	h5
Ø1.0 ~ Ø3.0	0 ~ -0.02mm	



(mm)

용도	형 번		코팅	ØD	Ød	ℓ1	ℓ2	L
ZIRCONIA	0.6mm ELBEN	TZBE2006-043-N080S06(ELBEN)	PVD	0.6	6	1.2	8	43
	1mm ELBEN	TZBE2010-050-N160S06(ELBEN)	DIA	1	6	3	16	50
	2mm ELBEN	TZBE2020-050-N200S06(ELBEN)	DIA	2	6	6	20	50
PMMA	1mm ELBEN PMMA	TWBE2010-050-N160S06(ELBEN)	-	1	6	3	16	50
	2mm ELBEN PMMA	TWBE2020-050-N200S06(ELBEN)	-	2	6	6	20	50
METAL	1mm ELBEN TITAN	TTBE2010-045-N050S06(ELBEN)	PVD	1	6	2	5	45
	2mm ELBEN TITAN	TTBE2020-045-N120S06(ELBEN)	PVD	2	6	4	12	45
	3mm ELBEN TITAN	TTBE2030-045-N150S06(ELBEN)	PVD	3	6	6	15	45

CEREC Type

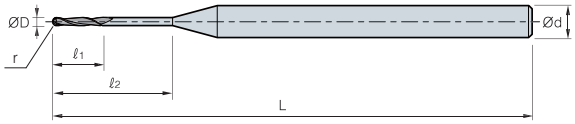
(MC-XL)



2 | 30° HELIX | 재종 ~Ø1.0 PC2510 | 재종 Ø1.0~Ø3.0 ND3000 | 절삭조건 p.459

• 공구직경공차

ØD		Ød
~ Ø1.0	0 ~ -0.015mm	h5
Ø1.0 ~ Ø3.0	0 ~ -0.02mm	



(mm)

용도	형 번		코팅	ØD	Ød	ℓ1	ℓ2	L
ZIRCONIA	MC-XL12	ETRE018038-T35M230-12	DIA	1.73	3.5	8	12	38.1
	MC-XL12S	ETRE009038-T35M230-12S	DIA	0.9	3.5	4	12	38.1

UGINT Type

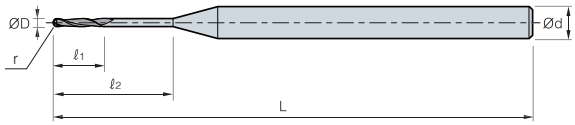
(D-100, D-200)



2 | 30° HELIX | 재종 ~Ø1.0 PC2510 | 재종 Ø1.0~Ø3.0 ND3000 | 절삭조건 p.459

• 공구직경공차

ØD		Ød
~ Ø1.0	0 ~ -0.015mm	h5
Ø1.0 ~ Ø3.0	0 ~ -0.02mm	



(mm)

용도	형 번		코팅	ØD	Ød	ℓ1	ℓ2	L
ZIRCONIA	0.7mm D-100	TZBE2007-040-N145S03(D-100)	PVD	0.7	3	2.5	14.5	40
	1mm D-100	TZBE2010-040-N145S03(D-100)	DIA	1	3	5	14.5	40
	2mm D-100	TZBE2020-040-N160S03(D-100)	DIA	2	3	4	16	40
	0.6mm D-200	TZBE2006-043-N080S06(D-200)	PVD	0.6	6	1.2	8	43
	1mm D-200	TZBE2010-050-N160S06(D-200)	DIA	1	6	3	16	50
	2mm D-200	TZBE2020-050-N200S06(D-200)	DIA	2	6	6	20	50
PMMA	1mm D-100 PMMA	TWBE2010-040-N145S03(D-100)	-	1	3	5	14.5	40
	2mm D-100 PMMA	TWBE2020-040-N160S03(D-100)	-	2	3	4	16	40
	1mm D-200 PMMA	TWBE2010-050-N160S06(D-200)	-	1	6	3	16	50
	2mm D-200 PMMA	TWBE2020-050-N200S06(D-200)	-	2	6	6	20	50
METAL	1.5mm D-200 TITAN	TTBE2015-050-N100S06(D-200)	PVD	1.5	6	7.4	10.2	50
	2mm D-200 TITAN	TTBE2020-050-N120S06(D-200)	PVD	2	6	7.6	12.1	50

Multi 가공이 가능한 다기능, 고능률 엔드밀

M+ Endmill

- 하나의 엔드밀로 다양한 가공 가능 – 드릴(Drilling), 경사(Ramping), 홈(Slotting), 측면(Side Milling)
- 탁월한 공구 강성으로 절삭저항 감소 및 표면 조도 향상
- 크롬 계열 코팅 적용으로 절삭 능력 향상

MPRE4000-B

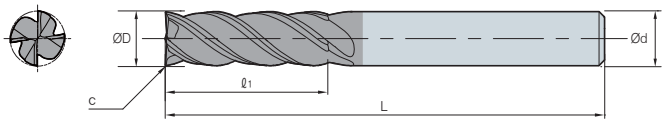


4 | 38° HELIX | 41° HELIX | 재종 PC40T | 절삭조건

p.460

• 공구직경공차

ØD		Ød
Ø3.0 ~ Ø20.0	0 ~ -0.03mm	h6



(mm)

형 번	ØD	Ød	ℓ	L	C
MPRE4030-054	3	6	54	5	-
MPRE4040-054	4	6	54	11	0.04
MPRE4050-054	5	6	54	13	0.05
MPRE4060-054	6	6	54	13	0.06
MPRE4080-065(-B)	8	8	65	19	0.08
MPRE4100-075(-B)	10	10	75	22	0.1
MPRE4120-082(-B)	12	12	82	26	0.12
MPRE4140-082(-B)	14	14	82	26	0.12
MPRE4160-100(-B)	16	16	100	32	0.16
MPRE4200-105(-B)	20	20	105	38	0.2

긴수명과 우수한 표면조도 실현 가능

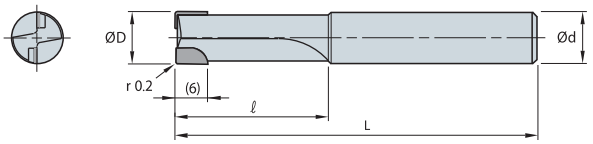
PCD Endmill

- 비철금속 가공 시 버(Burr) 발생 제어 가능
- 1000형 : 비철금속(알루미늄합금, 동합금 등)의 사상가공 용도
- 2000형 : 알루미늄합금, 카본, 흑연, 강화플라스틱(GFRP, CFRP)의 가공에 최적

PDE1000/2000(플랫)



1 | 2 | 0° HELIX | PCD | 재종 DP200 | 절삭조건 p.460



(mm)

형 번	ØD	Ød	ℓ	L
PDE 1040	4	6	15	45
PDE 1050	5	6	15	50
PDE 1060	6	6	20	60
PDE 2060	6	8	20	60
PDE 2070	7	8	20	60
PDE 2080	8	8	20	60
PDE 2090	9	10	25	70
PDE 2100	10	10	25	70
PDE 2120	12	12	25	75

스페셜 엔드밀 주문양식



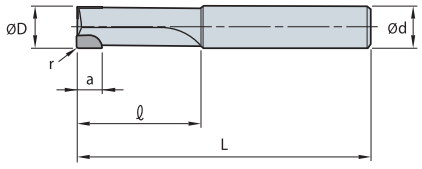


그림 1

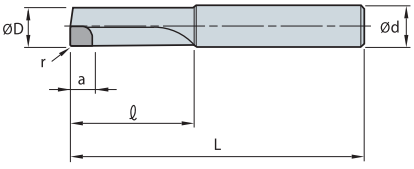
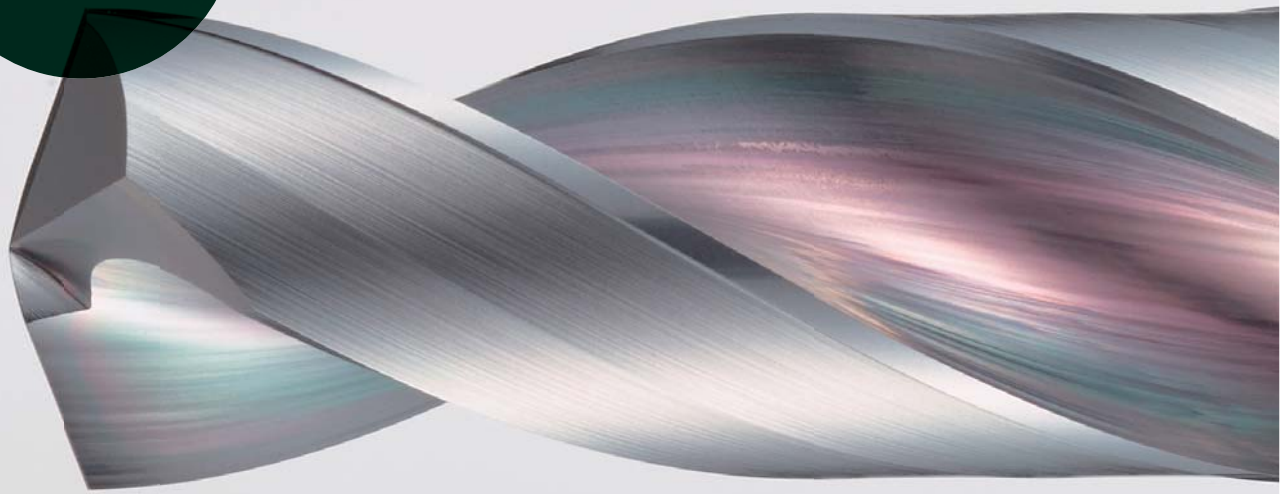


그림 2

형 번	그림	날수	치수 (mm)					
			ØD	Ød	r	a	ℓ	L
PDES								

※ 고객의 요구에 따라 기타 특수형도 수주 제작합니다

PART 2



Drill

Product details



Technical information for Drill

MSD Plus [마하 솔리드 드릴 플러스] **274**

MSD Plus-S [마하 솔리드 드릴 플러스-S] **280**

MLD Plus [마하 롱 드릴 플러스] **285**

MSD Plus CFRP [마하 솔리드 드릴 플러스 CFRP] **289**

MSFD [마하 솔리드 플랫 드릴] **291**

WSDP [Win Drill] New **296**

SSD-N [SSD-N 솔리드 드릴] **300**

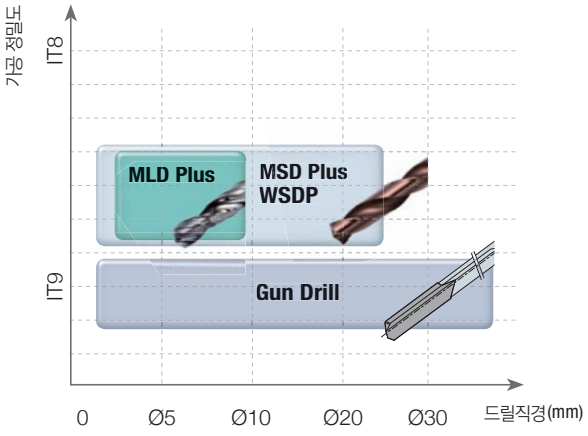
Burnishing Drill [버니싱 드릴] **303**

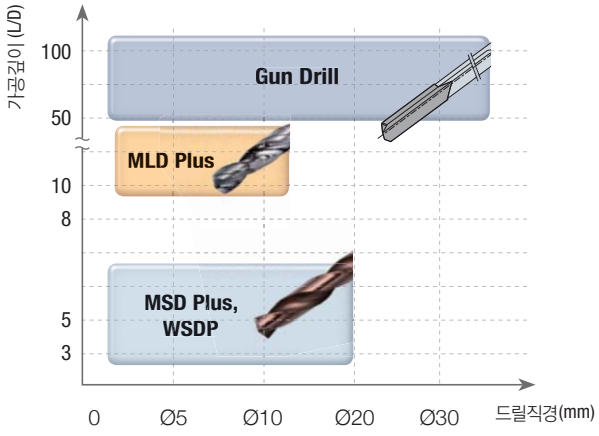
PCD Drill **304**

Gun Drill [건 드릴] **307**

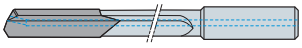
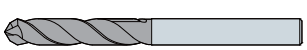
Solid Drill

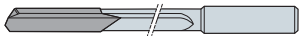
적용영역





라인업 및 특징

피삭재	용도	제품명	쿨런트	드릴직경 (공차)	가공 깊이	도면	특징
P M K	범용	MSD Plus	내부	Ø1.0~20.0 (h7)	3D~7D		• 자동차 부품 등 다양한 피삭재에 고능률 가공이 가능
		MLD Plus (Long drill)	내부	Ø3.0~10.0 (h7)	10D~25D		• 고정밀 · 고품질의 깊은 구멍 가공용
		윈 드릴 (WSDP)	외부	Ø1.0~20.0 (h7)	5D, 7D		• 경제형 초경 코팅 솔리드 드릴
		MSFD	내부/외부	Ø2.5~12.0 (h7)	2D~3D		• 경사면, 곡면, 평면 등 다양한 형상의 구멍 가공용 플랫 드릴
		Gun Drill	–	Ø3.0~33.0 (h7)	50D ~ 100D		• 깊은구멍(50D~100D)의 고능률 가공 가능 • 이형 주문 가능
S	HRSA	MSD Plus-S	내부	Ø3.0~16.0 (h7)	3D~5D		• 내열합금 가공용 • 항공, 에너지, 발전, 자동차 등의 난삭재용
N	CFRP	MSD Plus CFRP	외부	Ø3.0~12.7 (m7)	5D		• CFRP 피삭재 가공용
	비철금속, 알루미늄	SSD-N	외부	Ø1.0~13.0 (h7)	–		• 비철금속, 연강 가공용 비코팅 드릴
		PCD Drill	외부	Ø2.0~12.0 (h7)	–		• 탁월한 정밀도, 표면조도 • Cone/Sandwich type

품목	품명	형번	형 상	드릴직경 (Ø)	가공 깊이	페이지
초경솔리드 드릴	마하 솔리드 드릴 플러스	MSDPH		Ø2.5 ~ Ø20.0	3D ~ 7D	275
	마하 솔리드 드릴 플러스-S	MSDPH-S		Ø3.0 ~ Ø16.0	3D ~ 5D	281
	마하 롱 드릴 플러스	MLD		Ø3.0 ~ Ø10.0	10D ~ 25D	286
	마하 솔리드 드릴 플러스 CFRP	MSDP-C		Ø3.0 ~ Ø12.7	5D	290
	마하 솔리드 플랫 드릴	MSFD		Ø2.5 ~ Ø16.0	2D	292
		MSFDH		Ø2.5 ~ Ø16.0	3D	294
	윈 드릴 New	WSDP		Ø1.0 ~ Ø20.0	5D, 7D	297
	SSD-N 솔리드 드릴	SSD-N		Ø1.0 ~ Ø13.0	-	301
	버니싱 드릴	BDS		Ø4.0 ~ Ø16.0	5D ~ 7D	303
		BDT		Ø4.2 ~ Ø10.3	2D ~ 4D	303
	PCD 드릴	PDD		Ø5.0 ~ Ø12.0	5D	304
		CPD		Ø2.0 ~ Ø8.0	3D ~ 5D	305
		CPDL		Ø2.0 ~ Ø8.0	12D ~ 45D	305
		SPD		Ø4.0 ~ Ø16.0	4D ~ 5D	306
	건 드릴	KGDS		Ø3.0 ~ Ø33.0	50D ~ 100D	308
		KGDT		Ø6.0 ~ Ø26.5	50D ~ 100D	309

다양한 피삭재의 고능률 구멍 가공 실현

MSD Plus

마하 솔리드 드릴 플러스

형번표기법

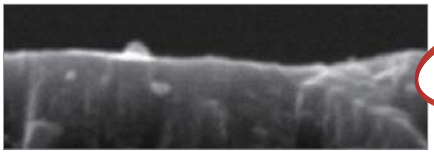
스페셜 타입

MSDPH 040 - 5 P - 100L - 5S

- **오일 홀**: 있음: MSDPH
- **드릴직경(ØD)**: 040: Ø4.0mm (소수1자리 00.0)
- **표준타입**: 절입깊이(L/D) 3D, 5D, 7D
- **스페셜타입**: Flute 길이 100: 100 mm
- **적용 피삭재**: P: 범용 – 탄소강, 합금강 / M: 스테인레스강 / K: 주철 전용 / N: 알루미늄, 황동
- **드릴전장**: 100L: 100mm
- **샹크직경**: 5S: Ø5mm

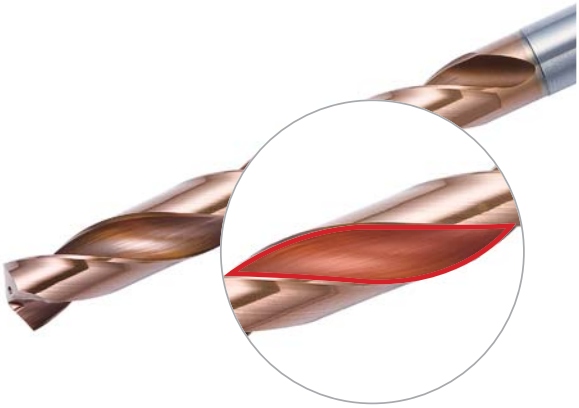
특징

- **신재종(PC325U) 적용**
  - 윤활성이 높은 신규 박막으로 중/고속 영역에서 내용착성 증가
  - 탄소강 영역에서 내마모성 증대



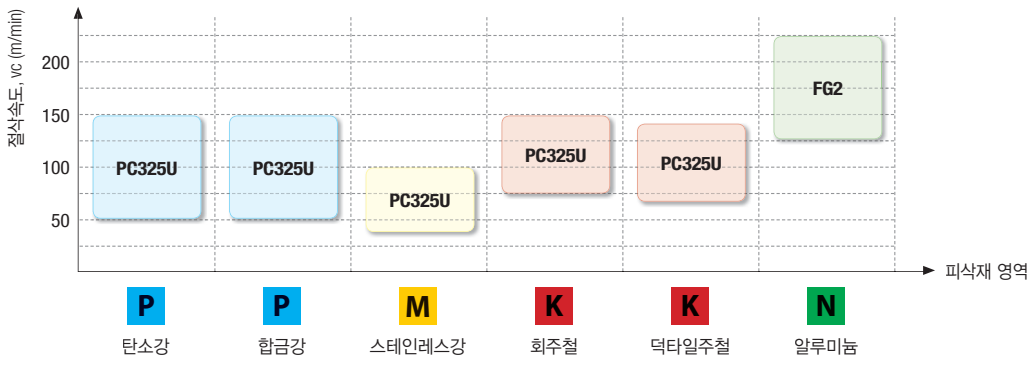
- **박막표면**
  - 내용착성 증가, 절삭 및 가공 부하 감소
  - 인선부, 플루트부 마찰 저항 감소





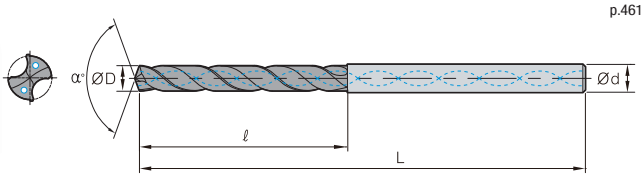
- **플루트 형상**
  - 칩 포켓 확대로 인한 칩 배출성 우수

적용영역



MSDPH - □(P/M/K/N)





절삭조건
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• 공구직경공차

구 분	P	M	K	N
재종	PC325U			FG2
드릴직경공차	h7			
샹크직경공차	h6			
선단각(θ°)	140°			135°
비틀림각	30°			
씨닝형상	X type			
급유방식	내부/외부			

P 강 M 스테인레스강 K 주철 N 비철금속

(mm)

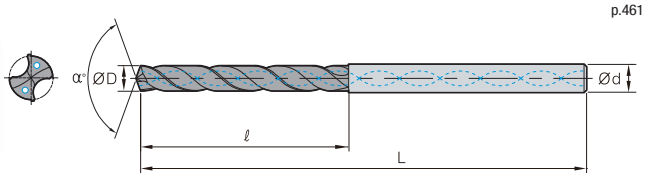
형 번	ØD	Ød	3P,M,K,N		5P,M,K,N		7P,M,K,N	
			ℓ	L	ℓ	L	ℓ	L
MSDPH 025 - □P,M,K,N	2.5	3	14	53	20	66	30	70
MSDPH 026 - □P,M,K,N	2.6	3	17	53	20	66	30	70
MSDPH 027 - □P,M,K,N	2.7	3	17	53	20	66	30	70
MSDPH 028 - □P,M,K,N	2.8	3	17	53	20	66	30	70
MSDPH 029 - □P,M,K,N	2.9	3	17	53	20	66	30	70
MSDPH 030 - □P,M,K,N	3	3	17	53	20	66	30	70
MSDPH 031 - □P,M,K,N	3.1	4	20	58	28	74	30	70
MSDPH 032 - □P,M,K,N	3.2	4	20	58	28	74	30	70
MSDPH 033 - □P,M,K,N	3.3	4	20	58	28	74	30	70
MSDPH 034 - □P,M,K,N	3.4	4	20	58	28	74	37.5	75
MSDPH 035 - □P,M,K,N	3.5	4	20	58	28	74	37.5	75
MSDPH 036 - □P,M,K,N	3.6	4	22	58	32	74	37.5	75
MSDPH 037 - □P,M,K,N	3.7	4	22	58	32	74	37.5	75
MSDPH 038 - □P,M,K,N	3.8	4	22	58	32	74	37.5	75
MSDPH 039 - □P,M,K,N	3.9	4	22	58	32	74	37.5	75
MSDPH 040 - □P,M,K,N	4	4	22	58	32	74	37.5	75
MSDPH 041 - □P,M,K,N	4.1	5	24	62	36	82	37.5	75
MSDPH 042 - □P,M,K,N	4.2	5	24	62	36	82	37.5	75
MSDPH 043 - □P,M,K,N	4.3	5	24	62	36	82	45	85
MSDPH 044 - □P,M,K,N	4.4	5	24	62	36	82	45	85
MSDPH 045 - □P,M,K,N	4.5	5	24	62	36	82	45	85
MSDPH 046 - □P,M,K,N	4.6	5	26	62	38	82	45	85
MSDPH 047 - □P,M,K,N	4.7	5	26	62	38	82	45	85
MSDPH 048 - □P,M,K,N	4.8	5	26	62	38	82	50	90
MSDPH 049 - □P,M,K,N	4.9	5	26	62	38	82	50	90
MSDPH 050 - □P,M,K,N	5	5	26	62	38	82	50	90
MSDPH 051 - □P,M,K,N	5.1	6	28	66	44	82	50	90
MSDPH 052 - □P,M,K,N	5.2	6	28	66	44	82	50	90
MSDPH 053 - □P,M,K,N	5.3	6	28	66	44	82	50	90
MSDPH 054 - □P,M,K,N	5.4	6	28	66	44	82	50	90
MSDPH 055 - □P,M,K,N	5.5	6	28	66	44	82	57	97
MSDPH 056 - □P,M,K,N	5.6	6	28	66	44	82	57	97
MSDPH 057 - □P,M,K,N	5.7	6	28	66	44	82	57	97
MSDPH 058 - □P,M,K,N	5.8	6	28	66	44	82	57	97
MSDPH 059 - □P,M,K,N	5.9	6	28	66	44	82	57	97
MSDPH 060 - □P,M,K,N	6	6	28	66	44	82	57	97
MSDPH 061 - □P,M,K,N	6.1	7	34	74	50	91	66	106

Drill

MSD Plus

MSDPH - □(P/M/K/N)





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• 공구직경공차

구 분	P	M	K	N
재종	PC325U			FG2
드릴직경공차	h7			
샹크직경공차	h6			
선단각(θ°)	140°		135°	
비틀림각	30°			
씨닝형상	X type			
급유방식	내부/외부			

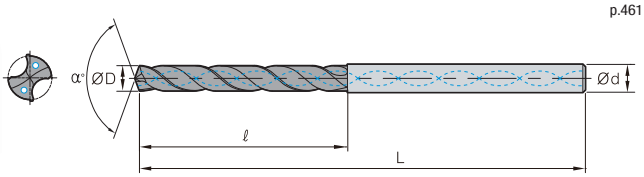
P 강 M 스테인레스강 K 주철 N 비철금속

(mm)

형 번	ØD	Ød	3P,M,K,N		5P,M,K,N		7P,M,K,N	
			ℓ	L	ℓ	L	ℓ	L
MSDPH 062 - □P,M,K,N	6.2	7	34	74	50	91	66	106
MSDPH 063 - □P,M,K,N	6.3	7	34	74	50	91	66	106
MSDPH 064 - □P,M,K,N	6.4	7	34	74	50	91	66	106
MSDPH 065 - □P,M,K,N	6.5	7	34	74	50	91	66	106
MSDPH 066 - □P,M,K,N	6.6	7	34	74	50	91	66	106
MSDPH 067 - □P,M,K,N	6.7	7	34	74	50	91	66	106
MSDPH 068 - □P,M,K,N	6.8	7	34	74	50	91	66	106
MSDPH 069 - □P,M,K,N	6.9	7	34	74	50	91	76	116
MSDPH 070 - □P,M,K,N	7	7	34	74	50	91	76	116
MSDPH 071 - □P,M,K,N	7.1	8	41	79	53	91	76	116
MSDPH 072 - □P,M,K,N	7.2	8	41	79	53	91	76	116
MSDPH 073 - □P,M,K,N	7.3	8	41	79	53	91	76	116
MSDPH 074 - □P,M,K,N	7.4	8	41	79	53	91	76	116
MSDPH 075 - □P,M,K,N	7.5	8	41	79	53	91	76	116
MSDPH 076 - □P,M,K,N	7.6	8	41	79	53	91	76	116
MSDPH 077 - □P,M,K,N	7.7	8	41	79	53	91	76	116
MSDPH 078 - □P,M,K,N	7.8	8	41	79	53	91	76	116
MSDPH 079 - □P,M,K,N	7.9	8	41	79	53	91	76	116
MSDPH 080 - □P,M,K,N	8	8	43	84	58	98	87	131
MSDPH 081 - □P,M,K,N	8.1	9	43	84	58	98	87	131
MSDPH 082 - □P,M,K,N	8.2	9	43	84	58	98	87	131
MSDPH 083 - □P,M,K,N	8.3	9	43	84	58	98	87	131
MSDPH 084 - □P,M,K,N	8.4	9	43	84	58	98	87	131
MSDPH 085 - □P,M,K,N	8.5	9	43	84	58	98	87	131
MSDPH 086 - □P,M,K,N	8.6	9	43	84	58	98	87	131
MSDPH 087 - □P,M,K,N	8.7	9	43	84	58	98	87	131
MSDPH 088 - □P,M,K,N	8.8	9	43	84	58	98	87	131
MSDPH 089 - □P,M,K,N	8.9	9	43	84	58	98	87	131
MSDPH 090 - □P,M,K,N	9	9	43	84	58	98	87	131
MSDPH 091 - □P,M,K,N	9.1	10	47	89	61	105	95	139
MSDPH 092 - □P,M,K,N	9.2	10	47	89	61	105	95	139
MSDPH 093 - □P,M,K,N	9.3	10	47	89	61	105	95	139
MSDPH 094 - □P,M,K,N	9.4	10	47	89	61	105	95	139
MSDPH 095 - □P,M,K,N	9.5	10	47	89	61	105	95	139
MSDPH 096 - □P,M,K,N	9.6	10	47	89	61	105	95	139
MSDPH 097 - □P,M,K,N	9.7	10	47	89	61	105	95	139
MSDPH 098 - □P,M,K,N	9.8	10	47	89	61	105	95	139

MSDPH - □(P/M/K/N)





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• 공구직경공차

구 분	P	M	K	N
재종	PC325U			FG2
드릴직경공차	h7			
샹크직경공차	h6			
선단각(θ°)	140°			135°
비틀림각	30°			
씨닝형상	X type			
급유방식	내부/외부			

P 강 M 스테인레스강 K 주철 N 비철금속

(mm)

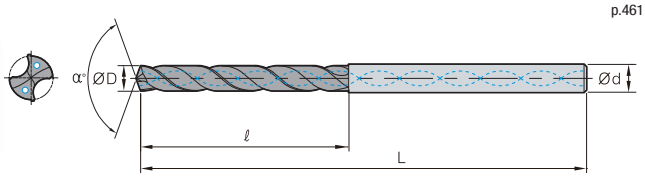
형 번	ØD	Ød	3P,M,K,N		5P,M,K,N		7P,M,K,N	
			ℓ	L	ℓ	L	ℓ	L
MSDPH 099 - □P,M,K,N	9.9	10	47	89	61	105	95	139
MSDPH 100 - □P,M,K,N	10	10	47	89	61	105	95	139
MSDPH 101 - □P,M,K,N	10.1	11	55	95	68	114	106	155
MSDPH 102 - □P,M,K,N	10.2	11	55	95	68	114	106	155
MSDPH 103 - □P,M,K,N	10.3	11	55	95	68	114	106	155
MSDPH 104 - □P,M,K,N	10.4	11	55	95	68	114	106	155
MSDPH 105 - □P,M,K,N	10.5	11	55	95	68	114	106	155
MSDPH 106 - □P,M,K,N	10.6	11	55	95	68	114	106	155
MSDPH 107 - □P,M,K,N	10.7	11	55	95	68	114	106	155
MSDPH 108 - □P,M,K,N	10.8	11	55	95	68	114	106	155
MSDPH 109 - □P,M,K,N	10.9	11	55	95	68	114	106	155
MSDPH 110 - □P,M,K,N	11	11	55	95	68	114	106	155
MSDPH 111 - □P,M,K,N	11.1	12	55	102	71	120	114	163
MSDPH 112 - □P,M,K,N	11.2	12	55	102	71	120	114	163
MSDPH 113 - □P,M,K,N	11.3	12	55	102	71	120	114	163
MSDPH 114 - □P,M,K,N	11.4	12	55	102	71	120	114	163
MSDPH 115 - □P,M,K,N	11.5	12	55	102	71	120	114	163
MSDPH 116 - □P,M,K,N	11.6	12	55	102	71	120	114	163
MSDPH 117 - □P,M,K,N	11.7	12	55	102	71	120	114	163
MSDPH 118 - □P,M,K,N	11.8	12	55	102	71	120	114	163
MSDPH 119 - □P,M,K,N	11.9	12	55	102	71	120	114	163
MSDPH 120 - □P,M,K,N	12	12	55	102	71	120	114	163
MSDPH 121 - □P,M,K,N	12.1	13	60	107	77	124	133	182
MSDPH 122 - □P,M,K,N	12.2	13	60	107	77	124	133	182
MSDPH 123 - □P,M,K,N	12.3	13	60	107	77	124	133	182
MSDPH 124 - □P,M,K,N	12.4	13	60	107	77	124	133	182
MSDPH 125 - □P,M,K,N	12.5	13	60	107	77	124	133	182
MSDPH 126 - □P,M,K,N	12.6	13	60	107	77	124	133	182
MSDPH 127 - □P,M,K,N	12.7	13	60	107	77	124	133	182
MSDPH 128 - □P,M,K,N	12.8	13	60	107	77	124	133	182
MSDPH 129 - □P,M,K,N	12.9	13	60	107	77	124	133	182
MSDPH 130 - □P,M,K,N	13	13	60	107	77	124	133	182
MSDPH 131 - □P,M,K,N	13.1	14	62	107	80	133	133	182
MSDPH 132 - □P,M,K,N	13.2	14	62	107	80	133	133	182
MSDPH 133 - □P,M,K,N	13.3	14	62	107	80	133	133	182
MSDPH 134 - □P,M,K,N	13.4	14	62	107	80	133	133	182
MSDPH 135 - □P,M,K,N	13.5	14	62	107	80	133	133	182

Drill

MSD Plus

MSDPH - □(P/M/K/N)





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• 공구직경공차

구 분	P	M	K	N
재종	PC325U			FG2
드릴직경공차	h7			
샹크직경공차	h6			
선단각(θ°)	140°			135°
비틀림각	30°			
씨닝형상	X type			
급유방식	내부/외부			

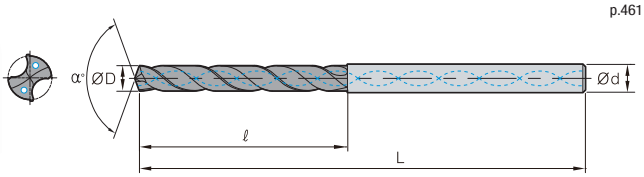
P강 M스테인레스강 K주철 N비철금속

(mm)

형 번	ØD	Ød	3P,M,K,N		5P,M,K,N		7P,M,K,N	
			ℓ	L	ℓ	L	ℓ	L
MSDPH 136 - □P,M,K,N	13.6	14	62	107	80	133	133	182
MSDPH 137 - □P,M,K,N	13.7	14	62	107	80	133	133	182
MSDPH 138 - □P,M,K,N	13.8	14	62	107	80	133	133	182
MSDPH 139 - □P,M,K,N	13.9	14	62	107	80	133	133	182
MSDPH 140 - □P,M,K,N	14	14	62	107	80	133	133	182
MSDPH 141 - □P,M,K,N	14.1	15	65	115	85	143	152	204
MSDPH 142 - □P,M,K,N	14.2	15	65	115	85	143	152	204
MSDPH 143 - □P,M,K,N	14.3	15	65	115	85	143	152	204
MSDPH 144 - □P,M,K,N	14.4	15	65	115	85	143	152	204
MSDPH 145 - □P,M,K,N	14.5	15	65	115	85	143	152	204
MSDPH 146 - □P,M,K,N	14.6	15	65	115	85	143	152	204
MSDPH 147 - □P,M,K,N	14.7	15	65	115	85	143	152	204
MSDPH 148 - □P,M,K,N	14.8	15	65	115	85	143	152	204
MSDPH 149 - □P,M,K,N	14.9	15	65	115	85	143	152	204
MSDPH 150 - □P,M,K,N	15	15	65	115	85	143	152	204
MSDPH 151 - □P,M,K,N	15.1	16	68	115	88	143	152	204
MSDPH 152 - □P,M,K,N	15.2	16	68	115	88	143	152	204
MSDPH 153 - □P,M,K,N	15.3	16	68	115	88	143	152	204
MSDPH 154 - □P,M,K,N	15.4	16	68	115	88	143	152	204
MSDPH 155 - □P,M,K,N	15.5	16	68	115	88	143	152	204
MSDPH 156 - □P,M,K,N	15.6	16	68	115	88	143	152	204
MSDPH 157 - □P,M,K,N	15.7	16	68	115	88	143	152	204
MSDPH 158 - □P,M,K,N	15.8	16	68	115	88	143	152	204
MSDPH 159 - □P,M,K,N	15.9	16	68	115	88	143	152	204
MSDPH 160 - □P,M,K,N	16	16	68	115	88	143	152	204
MSDPH 161 - □P,M,K,N	16.1	17	73	123	93	153	171	223
MSDPH 162 - □P,M,K,N	16.2	17	73	123	93	153	171	223
MSDPH 163 - □P,M,K,N	16.3	17	73	123	93	153	171	223
MSDPH 164 - □P,M,K,N	16.4	17	73	123	93	153	171	223
MSDPH 165 - □P,M,K,N	16.5	17	73	123	93	153	171	223
MSDPH 166 - □P,M,K,N	16.6	17	73	123	93	153	171	223
MSDPH 167 - □P,M,K,N	16.7	17	73	123	93	153	171	223
MSDPH 168 - □P,M,K,N	16.8	17	73	123	93	153	171	223
MSDPH 169 - □P,M,K,N	16.9	17	73	123	93	153	171	223
MSDPH 170 - □P,M,K,N	17	17	73	123	93	153	171	223
MSDPH 171 - □P,M,K,N	17.1	18	73	123	98	153	171	223
MSDPH 172 - □P,M,K,N	17.2	18	73	123	98	153	171	223

MSDPH - □(P/M/K/N)





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• 공구직경공차

구 분	P	M	K	N
재종	PC325U			FG2
드릴직경공차	h7			
샹크직경공차	h6			
선단각(θ°)	140°			135°
비틀림각	30°			
씨닝형상	X type			
급유방식	내부/외부			

P 강 M 스테인레스강 K 주철 N 비철금속

(mm)

형 번	ØD	Ød	3P,M,K,N		5P,M,K,N		7P,M,K,N	
			ℓ	L	ℓ	L	ℓ	L
MSDPH 173 - □P,M,K,N	17.3	18	73	123	98	153	171	223
MSDPH 174 - □P,M,K,N	17.4	18	73	123	98	153	171	223
MSDPH 175 - □P,M,K,N	17.5	18	73	123	98	153	171	223
MSDPH 176 - □P,M,K,N	17.6	18	73	123	98	153	171	223
MSDPH 177 - □P,M,K,N	17.7	18	73	123	98	153	171	223
MSDPH 178 - □P,M,K,N	17.8	18	73	123	98	153	171	223
MSDPH 179 - □P,M,K,N	17.9	18	73	123	98	153	171	223
MSDPH 180 - □P,M,K,N	18	18	73	123	98	153	171	223
MSDPH 181 - □P,M,K,N	18.1	19	79	131	103	153	190	244
MSDPH 182 - □P,M,K,N	18.2	19	79	131	103	153	190	244
MSDPH 183 - □P,M,K,N	18.3	19	79	131	103	153	190	244
MSDPH 184 - □P,M,K,N	18.4	19	79	131	103	153	190	244
MSDPH 185 - □P,M,K,N	18.5	19	79	131	103	153	190	244
MSDPH 186 - □P,M,K,N	18.6	19	79	131	103	153	190	244
MSDPH 187 - □P,M,K,N	18.7	19	79	131	103	153	190	244
MSDPH 188 - □P,M,K,N	18.8	19	79	131	103	153	190	244
MSDPH 189 - □P,M,K,N	18.9	19	79	131	103	153	190	244
MSDPH 190 - □P,M,K,N	19	19	79	131	103	153	190	244
MSDPH 191 - □P,M,K,N	19.1	20	79	131	107	153	190	244
MSDPH 192 - □P,M,K,N	19.2	20	79	131	107	153	190	244
MSDPH 193 - □P,M,K,N	19.3	20	79	131	107	153	190	244
MSDPH 194 - □P,M,K,N	19.4	20	79	131	107	153	190	244
MSDPH 195 - □P,M,K,N	19.5	20	79	131	107	153	190	244
MSDPH 196 - □P,M,K,N	19.6	20	79	131	107	153	190	244
MSDPH 197 - □P,M,K,N	19.7	20	79	131	107	153	190	244
MSDPH 198 - □P,M,K,N	19.8	20	79	131	107	153	190	244
MSDPH 199 - □P,M,K,N	19.9	20	79	131	107	153	190	244
MSDPH 200 - □P,M,K,N	20	20	79	131	107	153	190	244

항공, 에너지, 발전, 자동차 산업의 내열합금 가공 전용 공구

MSD Plus-S

마하 솔리드 드릴 플러스-S

- **가공 안정성 확보를 통한 생산성 향상** – 최적의 인선형상과 칩 포켓 구현으로 가공 안정성 확보
- **내마모성 향상** – 고온 내치핑성이 우수한 코팅 적용으로 공구 수명 향상

형번표기법

스페셜 타입

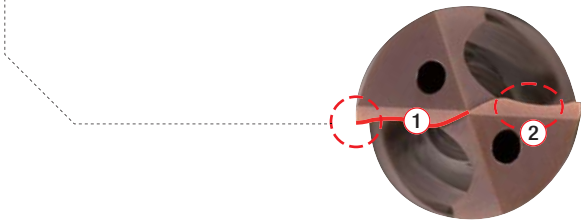
MSDP(H) 060 - 5 S - 100L - 5S

- **오일 홀**: 없음: MSDP / 있음: MSDPH
- **드릴직경(ØD)**: 060: Ø6.0mm (소수1자리 00.0)
- **표준타입**: 절입깊이(L/D) 3D, 5D
- **스페셜타입**: Flute 길이 50: 50mm
- **적용 피삭재**: S: 내열합금
- **드릴전장**: 100L: 100mm
- **샹크직경**: 5S: Ø5mm

특징

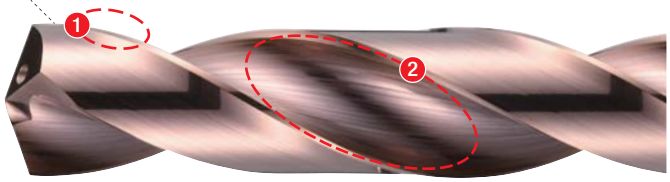
- **노치 제어 인선 형상 및 최적의 인선처리 적용으로 치핑 및 파손 방지**

① 저절삭 저항의 인선 형상
② 열배출에 최적화된 선단 여유각 및 형상 적용

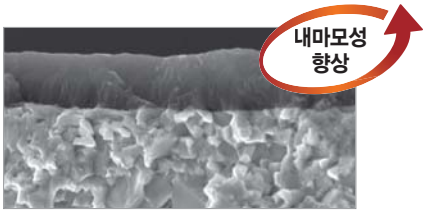


- **최적의 마진 및 백테이퍼 플루트 형상**

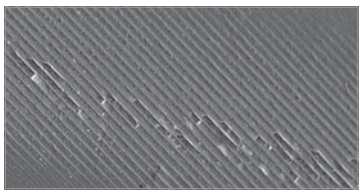
❶ 공구의 마찰 저항과 절삭 온도를 감소
❷ 칩 포켓 확대로 칩 배출성 향상



- PC325T 신재종 적용으로 내열성 및 내산화성 향상
- 우수한 표면조도에 의한 윤활성 증가로 마찰저항 감소 및 칩 배출 향상
- 고온의 내열합금 가공에서 뛰어난 내마모성 실현



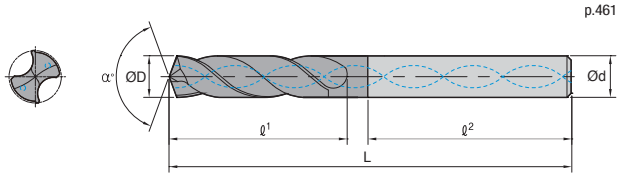
PC325T



부드러운 코팅 표면

MSDPH-S





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• 공구직경공차

구 분	S
재종	PC325T
드릴직경공차	h7
샹크직경공차	h6
선단각(θ°)	140°
비틀림각	30°
씨닝형상	X type
규격	DIN 6537
샹크타입	DIN 6535 HA
급유방식	내부

S 내열합금

(mm)

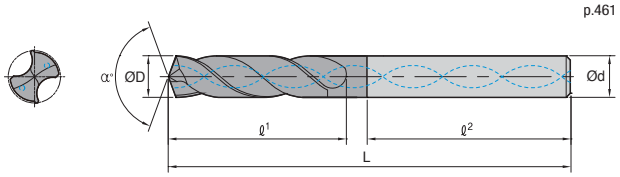
형 번	ØD	Ød	3S		5S		ℓ2
			ℓ1	L	ℓ1	L	
MSDPH 030 - □S	3	6	20	62	28	66	36
MSDPH 031 - □S	3.1	6	20	62	28	66	36
MSDPH 0318 - □S	3.18	6	20	62	28	66	36
MSDPH 032 - □S	3.2	6	20	62	28	66	36
MSDPH 033 - □S	3.3	6	20	62	28	66	36
MSDPH 034 - □S	3.4	6	20	62	28	66	36
MSDPH 035 - □S	3.5	6	20	62	28	66	36
MSDPH 0357 - □S	3.57	6	20	62	28	66	36
MSDPH 036 - □S	3.6	6	20	62	28	66	36
MSDPH 037 - □S	3.7	6	20	62	28	66	36
MSDPH 038 - □S	3.8	6	24	66	36	74	36
MSDPH 039 - □S	3.9	6	24	66	36	74	36
MSDPH 0397 - □S	3.97	6	24	66	36	74	36
MSDPH 040 - □S	4	6	24	66	36	74	36
MSDPH 041 - □S	4.1	6	24	66	36	74	36
MSDPH 042 - □S	4.2	6	24	66	36	74	36
MSDPH 043 - □S	4.3	6	24	66	36	74	36
MSDPH 0437 - □S	4.37	6	24	66	36	74	36
MSDPH 044 - □S	4.4	6	24	66	36	74	36
MSDPH 045 - □S	4.5	6	24	66	36	74	36
MSDPH 046 - □S	4.6	6	24	66	36	74	36
MSDPH 047 - □S	4.7	6	24	66	36	74	36
MSDPH 0476 - □S	4.76	6	28	66	44	82	36
MSDPH 048 - □S	4.8	6	28	66	44	82	36
MSDPH 049 - □S	4.9	6	28	66	44	82	36
MSDPH 050 - □S	5	6	28	66	44	82	36
MSDPH 051 - □S	5.1	6	28	66	44	82	36
MSDPH 0516 - □S	5.16	6	28	66	44	82	36
MSDPH 052 - □S	5.2	6	28	66	44	82	36
MSDPH 053 - □S	5.3	6	28	66	44	82	36
MSDPH 054 - □S	5.4	6	28	66	44	82	36
MSDPH 055 - □S	5.5	6	28	66	44	82	36
MSDPH 0556 - □S	5.56	6	28	66	44	82	36
MSDPH 056 - □S	5.6	6	28	66	44	82	36
MSDPH 057 - □S	5.7	6	28	66	44	82	36
MSDPH 058 - □S	5.8	6	28	66	44	82	36
MSDPH 059 - □S	5.9	6	28	66	44	82	36
MSDPH 0595 - □S	5.95	6	28	66	44	82	36
MSDPH 060 - □S	6	6	28	66	44	82	36

Drill

MSD Plus-S

MSDPH-S





절삭조건
p.461

• 공구직경공차

구 분	S
재종	PC325T
드릴직경공차	h7
샹크직경공차	h6
선단각(θ°)	140°
비틀림각	30°
씨닝형상	X type
규격	DIN 6537
샹크타입	DIN 6535 HA
급유방식	내부

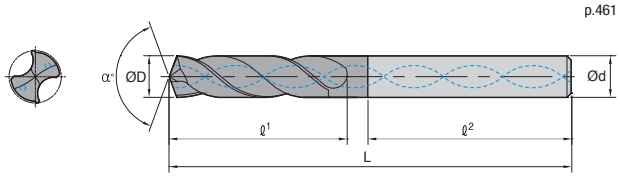
S 내열합금

(mm)

형 번	ØD	Ød	3S		5S		ℓ2
			ℓ1	L	ℓ1	L	
MSDPH 061 - □S	6.1	8	34	79	53	91	36
MSDPH 062 - □S	6.2	8	34	79	53	91	36
MSDPH 063 - □S	6.3	8	34	79	53	91	36
MSDPH 0635 - □S	6.35	8	34	79	53	91	36
MSDPH 064 - □S	6.4	8	34	79	53	91	36
MSDPH 065 - □S	6.5	8	34	79	53	91	36
MSDPH 066 - □S	6.6	8	34	79	53	91	36
MSDPH 067 - □S	6.7	8	34	79	53	91	36
MSDPH 0675 - □S	6.75	8	34	79	53	91	36
MSDPH 068 - □S	6.8	8	34	79	53	91	36
MSDPH 069 - □S	6.9	8	34	79	53	91	36
MSDPH 070 - □S	7	8	34	79	53	91	36
MSDPH 071 - □S	7.1	8	41	79	53	91	36
MSDPH 0714 - □S	7.14	8	41	79	53	91	36
MSDPH 072 - □S	7.2	8	41	79	53	91	36
MSDPH 073 - □S	7.3	8	41	79	53	91	36
MSDPH 074 - □S	7.4	8	41	79	53	91	36
MSDPH 075 - □S	7.5	8	41	79	53	91	36
MSDPH 0754 - □S	7.54	8	41	79	53	91	36
MSDPH 076 - □S	7.6	8	41	79	53	91	36
MSDPH 077 - □S	7.7	8	41	79	53	91	36
MSDPH 078 - □S	7.8	8	41	79	53	91	36
MSDPH 079 - □S	7.9	8	41	79	53	91	36
MSDPH 0794 - □S	7.94	8	41	79	53	91	36
MSDPH 080 - □S	8	8	41	79	53	91	36
MSDPH 081 - □S	8.1	10	47	89	61	103	40
MSDPH 082 - □S	8.2	10	47	89	61	103	40
MSDPH 083 - □S	8.3	10	47	89	61	103	40
MSDPH 0833 - □S	8.33	10	47	89	61	103	40
MSDPH 084 - □S	8.4	10	47	89	61	103	40
MSDPH 085 - □S	8.5	10	47	89	61	103	40
MSDPH 086 - □S	8.6	10	47	89	61	103	40
MSDPH 087 - □S	8.7	10	47	89	61	103	40
MSDPH 0873 - □S	8.73	10	47	89	61	103	40
MSDPH 088 - □S	8.8	10	47	89	61	103	40
MSDPH 089 - □S	8.9	10	47	89	61	103	40
MSDPH 090 - □S	9	10	47	89	61	103	40
MSDPH 091 - □S	9.1	10	47	89	61	103	40
MSDPH 0913 - □S	9.13	10	47	89	61	103	40

MSDPH-S





절삭조건 p.461

• 공구직경공차

구 분	S
재종	PC325T
드릴직경공차	h7
샹크직경공차	h6
선단각(θ°)	140°
비틀림각	30°
씨닝형상	X type
규격	DIN 6537
샹크타입	DIN 6535 HA
급유방식	내부

S 내열합금

(mm)

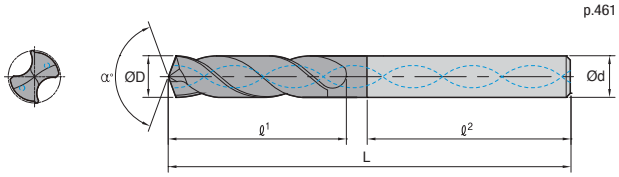
형 번	ØD	Ød	3S		5S		ℓ2
			ℓ1	L	ℓ1	L	
MSDPH 092 - □S	9.2	10	47	89	61	103	40
MSDPH 093 - □S	9.3	10	47	89	61	103	40
MSDPH 094 - □S	9.4	10	47	89	61	103	40
MSDPH 095 - □S	9.5	10	47	89	61	103	40
MSDPH 0953 - □S	9.53	10	47	89	61	103	40
MSDPH 096 - □S	9.6	10	47	89	61	103	40
MSDPH 097 - □S	9.7	10	47	89	61	103	40
MSDPH 098 - □S	9.8	10	47	89	61	103	40
MSDPH 099 - □S	9.9	10	47	89	61	103	40
MSDPH 0992 - □S	9.92	10	47	89	61	103	40
MSDPH 100 - □S	10	10	47	89	61	103	40
MSDPH 101 - □S	10.1	12	55	102	71	118	45
MSDPH 102 - □S	10.2	12	55	102	71	118	45
MSDPH 103 - □S	10.3	12	55	102	71	118	45
MSDPH 1032 - □S	10.32	12	55	102	71	118	45
MSDPH 104 - □S	10.4	12	55	102	71	118	45
MSDPH 105 - □S	10.5	12	55	102	71	118	45
MSDPH 106 - □S	10.6	12	55	102	71	118	45
MSDPH 107 - □S	10.7	12	55	102	71	118	45
MSDPH 1072 - □S	10.72	12	55	102	71	118	45
MSDPH 108 - □S	10.8	12	55	102	71	118	45
MSDPH 109 - □S	10.9	12	55	102	71	118	45
MSDPH 110 - □S	11	12	55	102	71	118	45
MSDPH 111 - □S	11.1	12	55	102	71	118	45
MSDPH 1111 - □S	11.11	12	55	102	71	118	45
MSDPH 112 - □S	11.2	12	55	102	71	118	45
MSDPH 113 - □S	11.3	12	55	102	71	118	45
MSDPH 114 - □S	11.4	12	55	102	71	118	45
MSDPH 115 - □S	11.5	12	55	102	71	118	45
MSDPH 1151 - □S	11.51	12	55	102	71	118	45
MSDPH 116 - □S	11.6	12	55	102	71	118	45
MSDPH 117 - □S	11.7	12	55	102	71	118	45
MSDPH 118 - □S	11.8	12	55	102	71	118	45
MSDPH 119 - □S	11.9	12	55	102	71	118	45
MSDPH 1191 - □S	11.91	12	55	102	71	118	45
MSDPH 120 - □S	12	12	55	102	71	118	45
MSDPH 121 - □S	12.1	14	60	107	77	124	45
MSDPH 122 - □S	12.2	14	60	107	77	124	45
MSDPH 123 - □S	12.3	14	60	107	77	124	45

Drill

MSD Plus-S

MSDPH-S





절삭조건
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• 공구직경공차

구 분	S
재종	PC325T
드릴직경공차	h7
샹크직경공차	h6
선단각(θ°)	140°
비틀림각	30°
씨닝형상	X type
규격	DIN 6537
샹크타입	DIN 6535 HA
급유방식	내부

S 내열합금

(mm)

형 번	ØD	Ød	3S		5S		ℓ2
			ℓ1	L	ℓ1	L	
MSDPH 124 - □S	12.4	14	60	107	77	124	45
MSDPH 125 - □S	12.5	14	60	107	77	124	45
MSDPH 126 - □S	12.6	14	60	107	77	124	45
MSDPH 127 - □S	12.7	14	60	107	77	124	45
MSDPH 128 - □S	12.8	14	60	107	77	124	45
MSDPH 129 - □S	12.9	14	60	107	77	124	45
MSDPH 130 - □S	13	14	60	107	77	124	45
MSDPH 131 - □S	13.1	14	60	107	77	124	45
MSDPH 132 - □S	13.2	14	60	107	77	124	45
MSDPH 133 - □S	13.3	14	60	107	77	124	45
MSDPH 134 - □S	13.4	14	60	107	77	124	45
MSDPH 1349 - □S	13.49	14	60	107	77	124	45
MSDPH 135 - □S	13.5	14	60	107	77	124	45
MSDPH 136 - □S	13.6	14	60	107	77	124	45
MSDPH 137 - □S	13.7	14	60	107	77	124	45
MSDPH 138 - □S	13.8	14	60	107	77	124	45
MSDPH 139 - □S	13.9	14	60	107	77	124	45
MSDPH 140 - □S	14	14	60	107	77	124	45
MSDPH 141 - □S	14.1	16	65	115	83	133	48
MSDPH 142 - □S	14.2	16	65	115	83	133	48
MSDPH 1429 - □S	14.29	16	65	115	83	133	48
MSDPH 143 - □S	14.3	16	65	115	83	133	48
MSDPH 144 - □S	14.4	16	65	115	83	133	48
MSDPH 145 - □S	14.5	16	65	115	83	133	48
MSDPH 146 - □S	14.6	16	65	115	83	133	48
MSDPH 147 - □S	14.7	16	65	115	83	133	48
MSDPH 148 - □S	14.8	16	65	115	83	133	48
MSDPH 149 - □S	14.9	16	65	115	83	133	48
MSDPH 150 - □S	15	16	65	115	83	133	48
MSDPH 151 - □S	15.1	16	65	115	83	133	48
MSDPH 152 - □S	15.2	16	65	115	83	133	48
MSDPH 153 - □S	15.3	16	65	115	83	133	48
MSDPH 154 - □S	15.4	16	65	115	83	133	48
MSDPH 155 - □S	15.5	16	65	115	83	133	48
MSDPH 156 - □S	15.6	16	65	115	83	133	48
MSDPH 157 - □S	15.7	16	65	115	83	133	48
MSDPH 158 - □S	15.8	16	65	115	83	133	48
MSDPH 1587 - □S	15.87	16	65	115	83	133	48
MSDPH 159 - □S	15.9	16	65	115	83	133	48
MSDPH 160 - □S	16	16	65	115	83	133	48

고정밀·고품질의 깊은 홀 가공을 위한 최적의 공구

MLD Plus

마하 롱 드릴 플러스

형번표기법

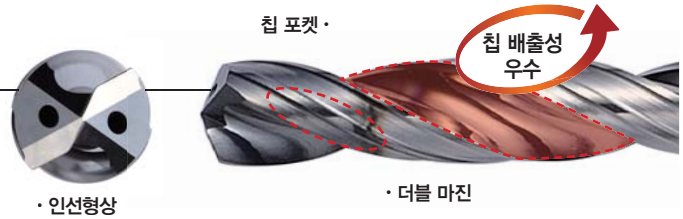
스페셜 타입

MLD 0600N - 10 P - 100L - 10S

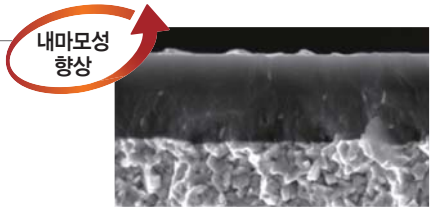
- **MLD** — Mach Long Solid Drill Plus (MLD Plus)
- **0600N** — 드릴직경(ØD)
  - 0600: Ø6.00mm (소수2자리 00.0)
- **10** — 표준타입
  - 절입깊이(L/D)
  - 10D, 15D, 20D, 25D
- **P** — 적용 피삭재
  - P: 탄소강, 합금강
  - K: 주철
  - N: 알루미늄, 동합금
- **100L** — 드릴전장
  - 100L: 100mm
- **10S** — 샹크직경
  - 10S: Ø10mm

특징

- **인선 및 플루트 형상**
  - Straight 인선 형상 적용으로 강성 증가
  - 칩 포켓 확대 및 플루트 표면 조도 향상으로 인한 칩 배출 우수
  - 더블 마진 적용으로 가공 안정성 확보



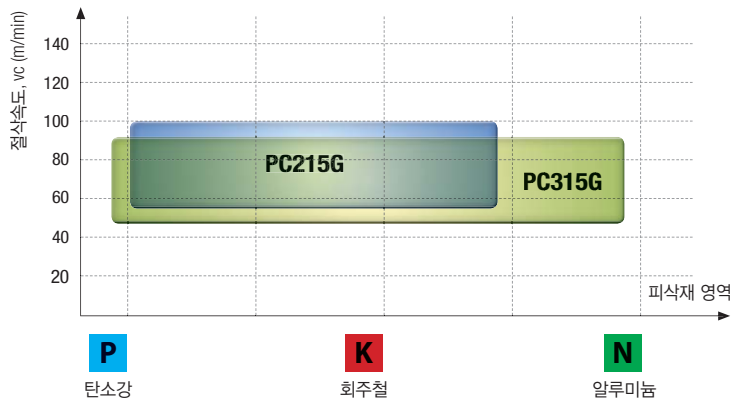
- **신재종(PC315G) 적용**
  - 초 미립 모재 사용 및 신규 박막 적용
  - 박막 윤활성 증대로 인한 마찰 저항 감소, 칩 배출 우수
  - 내마모성 향상으로 가공수명 증대



PC315G

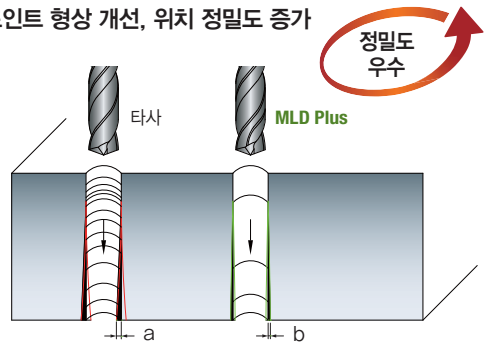
적용영역

- **PC215G** - 고속, 주철, 합금강 영역에서 성능 우수
- **PC315G** - 중, 저속, 탄소강, 주철 등 범용 영역에서 성능 우수



[가공 정밀도]

- **가공 정밀도 개선**
  - 홀 굽힘 현상 감소, 홀 내벽 면조도 향상, 홀 사이즈 균일성 증가
- **포인트 형상 개선, 위치 정밀도 증가**



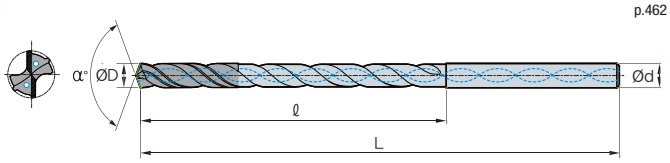
MLD Plus 타사 대비 가공 홀 굽힘 현상 감소 (a > b)

Drill

MSD Plus

MLD - □□(P/K/N)





절삭조건
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• 공구직경공차

구 분	P	K	N
재종	PC215G PC315G		FG2
드릴직경공차	h7		
샹크직경공차	h6		
선단각(θ°)	135°		
비틀림각	30°		
씨닝형상	X type		
급유방식	내부		

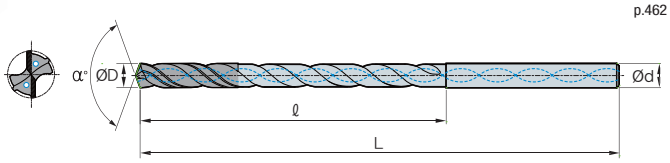
P강 K주철 N비철금속

(mm)

형 번	ØD	Ød	10 P,M,K		15 P,M,K		20 P,M,K		25 P,M,K	
			ℓ	L	ℓ	L	ℓ	L	ℓ	L
MLD 0300N - □□P,K,N	3.0	3.0	40	90	55	105	70	120	-	-
MLD 0310N - □□P,K,N	3.1	4.0	45	100	60	125	80	140	-	-
MLD 0320N - □□P,K,N	3.2	4.0	45	100	60	125	80	140	-	-
MLD 0330N - □□P,K,N	3.3	4.0	45	100	60	125	80	140	-	-
MLD 0340N - □□P,K,N	3.4	4.0	50	100	65	125	85	140	-	-
MLD 0350N - □□P,K,N	3.5	4.0	50	100	65	125	85	140	-	-
MLD 0360N - □□P,K,N	3.6	4.0	50	100	65	125	85	140	-	-
MLD 0370N - □□P,K,N	3.7	4.0	50	100	65	125	85	140	-	-
MLD 0380N - □□P,K,N	3.8	4.0	50	100	75	125	90	140	-	-
MLD 0390N - □□P,K,N	3.9	4.0	50	100	75	125	90	140	-	-
MLD 0400N - □□P,K,N	4.0	4.0	50	100	75	125	90	140	115	165
MLD 0410N - □□P,K,N	4.1	5.0	55	115	75	140	100	165	120	190
MLD 0420N - □□P,K,N	4.2	5.0	55	115	75	140	100	165	120	190
MLD 0430N - □□P,K,N	4.3	5.0	60	115	85	140	110	165	135	190
MLD 0440N - □□P,K,N	4.4	5.0	60	115	85	140	110	165	135	190
MLD 0450N - □□P,K,N	4.5	5.0	60	115	85	140	110	165	135	190
MLD 0460N - □□P,K,N	4.6	5.0	60	115	85	140	110	165	135	190
MLD 0470N - □□P,K,N	4.7	5.0	60	115	85	140	110	165	135	190
MLD 0480N - □□P,K,N	4.8	5.0	65	115	90	140	115	165	140	190
MLD 0490N - □□P,K,N	4.9	5.0	65	115	90	140	115	165	140	190

MLD - □□(P/K/N)





절삭조건
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• 공구직경공차

구 분	P	K	N
재종	PC215G PC315G		FG2
드릴직경공차	h7		
샹크직경공차	h6		
선단각(θ°)	135°		
비틀림각	30°		
씨닝형상	X type		
급유방식	내부		

P 강 K 주철 N 비철금속

(mm)

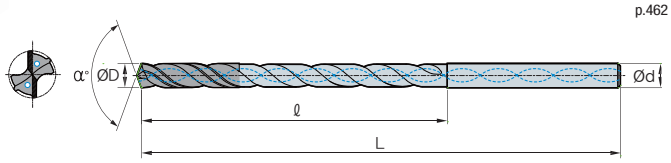
형 번	ØD	Ød	10 P,M,K		15 P,M,K		20 P,M,K		25 P,M,K	
			ℓ	L	ℓ	L	ℓ	L	ℓ	L
MLD 0500N - □□P,K,N	5.0	5.0	65	115	90	140	115	165	140	190
MLD 0510N - □□P,K,N	5.1	6.0	70	128	95	160	120	190	150	220
MLD 0520N - □□P,K,N	5.2	6.0	70	128	95	160	120	190	150	220
MLD 0530N - □□P,K,N	5.3	6.0	70	128	95	160	120	190	150	220
MLD 0540N - □□P,K,N	5.4	6.0	78	128	110	160	140	190	170	220
MLD 0550N - □□P,K,N	5.5	6.0	78	128	110	160	140	190	170	220
MLD 0560N - □□P,K,N	5.6	6.0	78	128	110	160	140	190	170	220
MLD 0570N - □□P,K,N	5.7	6.0	78	128	110	160	140	190	170	220
MLD 0580N - □□P,K,N	5.8	6.0	78	128	110	160	140	190	170	220
MLD 0590N - □□P,K,N	5.9	6.0	78	128	110	160	140	190	170	220
MLD 0600N - □□P,K,N	6.0	6.0	78	128	110	160	140	190	170	220
MLD 0610N - □□P,K,N	6.1	7.0	87	140	120	175	155	210	190	250
MLD 0620N - □□P,K,N	6.2	7.0	87	140	120	175	155	210	190	250
MLD 0630N - □□P,K,N	6.3	7.0	87	140	120	175	155	210	190	250
MLD 0640N - □□P,K,N	6.4	7.0	87	140	120	175	155	210	190	250
MLD 0650N - □□P,K,N	6.5	7.0	87	140	120	175	155	210	190	250
MLD 0660N - □□P,K,N	6.6	7.0	87	140	120	175	155	210	190	250
MLD 0670N - □□P,K,N	6.7	7.0	87	140	120	175	155	210	190	250
MLD 0680N - □□P,K,N	6.8	7.0	90	140	125	175	160	210	200	250
MLD 0690N - □□P,K,N	6.9	7.0	90	140	125	175	160	210	200	250

Drill

MSD Plus

MLD - □□(P/K/N)





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• 공구직경공차

구 분	P	K	N
재종	PC215G PC315G		FG2
드릴직경공차	h7		
샹크직경공차	h6		
선단각(θ°)	135°		
비틀림각	30°		
씨닝형상	X type		
급유방식	내부		

P강 K주철 N비철금속

(mm)

형 번	ØD	Ød	10 P,M,K		15 P,M,K		20 P,M,K		25 P,M,K	
			ℓ	L	ℓ	L	ℓ	L	ℓ	L
MLD 0700N - □□P,K,N	7.0	7.0	90	140	125	175	160	210	200	250
MLD 0710N - □□P,K,N	7.1	8.0	100	155	135	195	170	230	-	-
MLD 0720N - □□P,K,N	7.2	8.0	100	155	135	195	170	230	-	-
MLD 0730N - □□P,K,N	7.3	8.0	100	155	135	195	170	230	-	-
MLD 0740N - □□P,K,N	7.4	8.0	100	155	135	195	170	230	-	-
MLD 0750N - □□P,K,N	7.5	8.0	100	155	135	195	170	230	-	-
MLD 0760N - □□P,K,N	7.6	8.0	105	155	145	195	180	230	-	-
MLD 0770N - □□P,K,N	7.7	8.0	105	155	145	195	180	230	-	-
MLD 0780N - □□P,K,N	7.8	8.0	105	155	145	195	180	230	-	-
MLD 0790N - □□P,K,N	7.9	8.0	105	155	145	195	180	230	-	-
MLD 0800N - □□P,K,N	8.0	8.0	105	155	145	195	180	230	-	-
MLD 0810N - □□P,K,N	8.1	9.0	110	165	155	210	195	260	-	-
MLD 0820N - □□P,K,N	8.2	9.0	110	165	155	210	195	260	-	-
MLD 0830N - □□P,K,N	8.3	9.0	110	165	155	210	195	260	-	-
MLD 0840N - □□P,K,N	8.4	9.0	110	165	155	210	195	260	-	-
MLD 0850N - □□P,K,N	8.5	9.0	110	165	155	210	195	260	-	-
MLD 0860N - □□P,K,N	8.6	9.0	115	165	160	210	210	260	-	-
MLD 0870N - □□P,K,N	8.7	9.0	115	165	160	210	210	260	-	-
MLD 0880N - □□P,K,N	8.8	9.0	115	165	160	210	210	260	-	-
MLD 0890N - □□P,K,N	8.9	9.0	115	165	160	210	210	260	-	-
MLD 0900N - □□P,K,N	9.0	9.0	115	165	160	210	210	260	-	-
MLD 0910N - □□P,K,N	9.1	10.0	125	190	170	240	-	-	-	-
MLD 0920N - □□P,K,N	9.2	10.0	125	190	170	240	-	-	-	-
MLD 0930N - □□P,K,N	9.3	10.0	125	190	170	240	-	-	-	-
MLD 0940N - □□P,K,N	9.4	10.0	125	190	170	240	-	-	-	-
MLD 0950N - □□P,K,N	9.5	10.0	125	190	170	240	-	-	-	-
MLD 0960N - □□P,K,N	9.6	10.0	130	190	180	240	-	-	-	-
MLD 0970N - □□P,K,N	9.7	10.0	130	190	180	240	-	-	-	-
MLD 0980N - □□P,K,N	9.8	10.0	130	190	180	240	-	-	-	-
MLD 0990N - □□P,K,N	9.9	10.0	130	190	180	240	-	-	-	-
MLD 1000N - □□P,K,N	10.0	10.0	130	190	180	240	-	-	-	-

CFRP 피삭재의 홀 가공을 위한 최적의 공구

MSD Plus CFRP

CFRP 가공용 마하 솔리드 드릴 플러스

- 신규 ND2100 다이아코팅 재종 적용으로 내마모성 우수
- 인선각도 최적화를 통한 버(Burr) 품질 우수

형번표기법

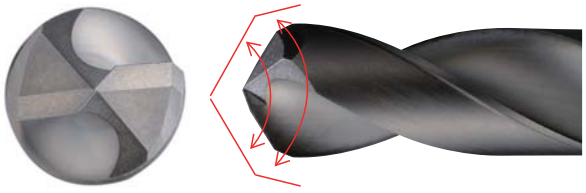
스페셜 타입

MSDP 060 - 5 C - 100L - 6S

- **MSDP**: Mach Solid Drill Plus
- **060**: 드릴직경(ØD) — 060: Ø6.0mm (소수1자리 00.0)
- **5**: 표준타입 — 절입깊이(L/D); 스페셜타입 — Flute 길이 100L: 100mm
- **C**: 적용 피삭재 — C: CFRP
- **100L**: 드릴전장 — 100L: 100 mm
- **6S**: 샹크직경 — 6S: Ø6mm

특징

- 2단 선단 형상 적용으로 절삭부하 감소
- 코너 인선각도 최적화를 통한 버량 감소
- 인선부 강도를 보강하여 내마모성 향상

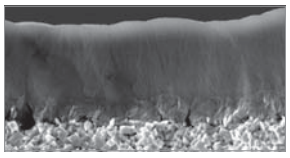


ND2110

- CFRP 가공 전용 다이아몬드 코팅 적용
- CFRP 절삭가공에 최적화된 다이아몬드 코팅 전용 모재



고경도 다이아몬드 코팅으로 절삭 형상 유지

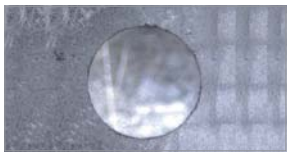


다이아몬드 코팅과 모재간의 우수한 밀착력

- 우수한 인선 형상을 유지하여 버(Burr) 억제



경사면 마모, 박리 억제



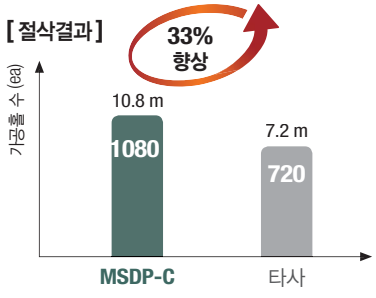
피삭재 버(Burr) 억제

절삭평가 사례

용도	CFRP (항공날개)
절삭조건	vc (m/min) = 100, fz (mm/t) = 0.05
	ap (mm) = 10, Air
공구	MSDP060-5C (ND2110)



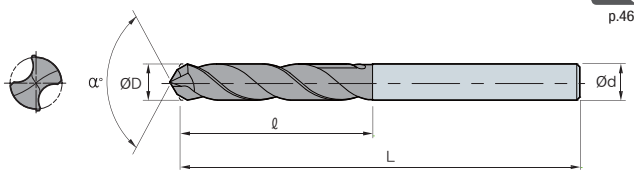
[절삭결과]



Drill MSD Plus CFRP

MSDP-5C





절삭조건
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• 공구직경공차

구 분	C
재종	ND2100
드릴직경공차	m7
샹크직경공차	h6
선단각(θ°)	118°
비틀림각	30°
씨닝형상	X type
급유방식	외부

C CFRP

(mm)

형 번	ØD		Ød	5C	
	mm	inch		ℓ	L
MSDP 030-5C	3	-	6	28	66
MSDP 040-5C	4	-	6	36	74
MSDP 0476-5C	4.76	3/16	6	44	82
MSDP 050-5C	5	-	6	44	82
MSDP 060-5C	6	-	6	44	82
MSDP 0635-5C	6.35	1/4	8	53	91
MSDP 070-5C	7	-	8	53	91
MSDP 0794-5C	7.94	5/16	8	53	91
MSDP 080-5C	8	-	8	53	91
MSDP 090-5C	9	-	10	61	103
MSDP 0952-5C	9.52	3/8	10	61	103
MSDP 100-5C	10	-	10	61	103
MSDP 110-5C	11	-	12	71	118
MSDP 1111-5C	11.11	7/16	12	71	118
MSDP 120-5C	12	-	12	71	118
MSDP 127-5C	12.7	1/2	14	71	124

경사면, 곡면, 평면 등 다양한 가공물의 홀 가공을 위한 최적의 공구

MSFD

마하 솔리드 플랫 드릴

- 선단각 180° 형상으로 경사면 등 고품질 홀 가공 가능
- 인선부 호닝, 면취 적용을 통한 내치핑성, 내용착성 향상 및 일반드릴 대비 버(Burr) 최소화

형번표기법

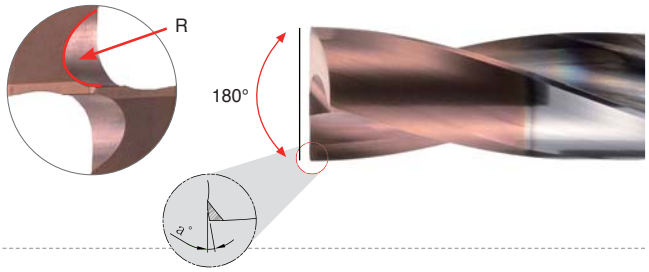
스페셜 타입

MSFD(H) 060 - 2 P - 100L - 6S

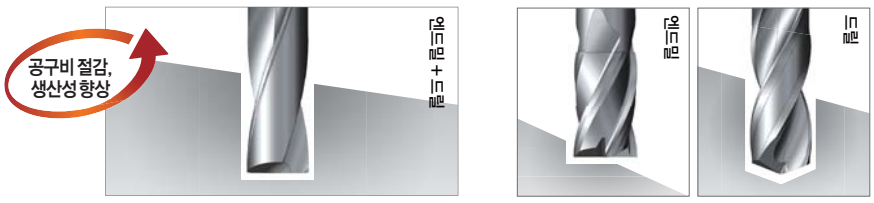
- **MSFD(H)** — 오일홀: 없음 : MSFD / 있음 : MSFDH
- **060** — 드릴직경(ØD): 060: Ø6.0mm (소수1자리 00.0)
- **2** — 표준타입: 절입깊이(L/D) 2D, 3D / 스페셜타입: Flute 길이 100: 100mm
- **P** — 적용 피삭재: P: 범용-탄소강, 합금강
- **100L** — 드릴전장: 100L: 100mm
- **6S** — 샹크직경: 6S: Ø6mm

특징

- 선단각 180° 형상으로 경사면 피삭재의 드릴링 가공 시 진직도 우수
- 선단 코너부 챔퍼 적용으로 내치핑성 향상 및 공구수명 증가
- 씨닝부 R형상으로 선단 칩 포켓 확대



- MSFD 공구 한 가지로 엔드밀 + 드릴 가공을 동시 수행 가능



MSFD　　종래 가공 방법 및 사용 공구

성능평가

피삭재	SM48C
절삭조건	vc (m/min) = 80, fz (mm/min) = 0.10
가공거리	7.2 m (600홀)
공구	MSFD060-2P(PC325U)



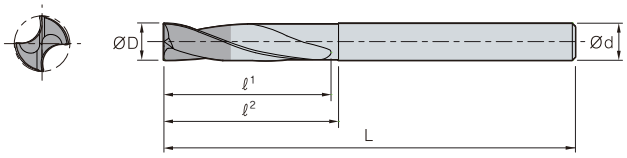
MSFD
공구 수명 증가　　타사

Drill

MSFD

MSFD(2P)





절삭조건
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• 공구직경공차

구 분	P
재종	PC325U
드릴직경공차	H7
샹크직경공차	h6
선단각(θ°)	180°
비틀림각	20°
씨닝형상	R type
급유방식	외부

P 강

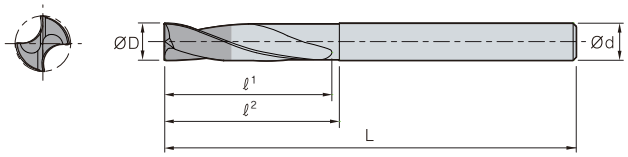
(mm)

형 번	ØD	Ød	2P		
			ℓ1	ℓ2	L
MSFD 025-2P	2.5	4	10.5	11.5	50
MSFD 026-2P	2.6	4	10.9	11.9	50
MSFD 027-2P	2.7	4	11.3	12.3	50
MSFD 028-2P	2.8	4	11.8	12.8	50
MSFD 029-2P	2.9	4	12.2	13.2	50
MSFD 030-2P	3	6	12.6	13.6	50
MSFD 031-2P	3.1	6	13	14	50
MSFD 032-2P	3.2	6	13.4	14.4	50
MSFD 033-2P	3.3	6	13.9	14.9	50
MSFD 034-2P	3.4	6	14.3	15.3	50
MSFD 035-2P	3.5	6	14.7	15.7	50
MSFD 036-2P	3.6	6	15.1	16.1	50
MSFD 037-2P	3.7	6	15.5	16.5	50
MSFD 038-2P	3.8	6	16	17	50
MSFD 039-2P	3.9	6	16.4	17.4	50
MSFD 040-2P	4	6	16.8	17.8	50
MSFD 041-2P	4.1	6	17.2	18.2	60
MSFD 042-2P	4.2	6	17.6	18.6	60
MSFD 043-2P	4.3	6	18.1	19.1	60
MSFD 044-2P	4.4	6	18.5	19.5	60
MSFD 045-2P	4.5	6	18.9	19.9	60
MSFD 046-2P	4.6	6	19.3	20.3	60
MSFD 047-2P	4.7	6	19.7	20.7	60
MSFD 048-2P	4.8	6	20.2	21.2	60
MSFD 049-2P	4.9	6	20.6	21.6	60
MSFD 050-2P	5	6	21	22	60
MSFD 051-2P	5.1	6	21.4	22.4	60
MSFD 052-2P	5.2	6	21.8	22.8	60
MSFD 053-2P	5.3	6	22.3	23.3	60
MSFD 054-2P	5.4	6	22.7	23.7	60
MSFD 055-2P	5.5	6	23.1	24.1	60
MSFD 056-2P	5.6	6	23.5	24.5	60
MSFD 057-2P	5.7	6	23.9	24.9	60
MSFD 058-2P	5.8	6	24.4	25.4	60
MSFD 059-2P	5.9	6	24.8	25.8	60
MSFD 060-2P	6	6	25.2	26.2	60
MSFD 061-2P	6.1	8	25.6	26.6	70

형 번	ØD	Ød	2P		
			ℓ1	ℓ2	L
MSFD 062-2P	6.2	8	26	27	70
MSFD 063-2P	6.3	8	26.5	27.5	70
MSFD 064-2P	6.4	8	26.9	27.9	70
MSFD 065-2P	6.5	8	27.3	28.3	70
MSFD 066-2P	6.6	8	27.7	28.7	70
MSFD 067-2P	6.7	8	28.1	29.1	70
MSFD 068-2P	6.8	8	28.6	29.6	70
MSFD 069-2P	6.9	8	29	30	70
MSFD 070-2P	7	8	29.4	30.4	70
MSFD 071-2P	7.1	8	29.8	30.8	70
MSFD 072-2P	7.2	8	30.2	31.2	70
MSFD 073-2P	7.3	8	30.7	31.7	70
MSFD 074-2P	7.4	8	31.1	32.1	70
MSFD 075-2P	7.5	8	31.5	32.5	70
MSFD 076-2P	7.6	8	31.9	32.9	70
MSFD 077-2P	7.7	8	32.3	33.3	70
MSFD 078-2P	7.8	8	32.8	33.8	70
MSFD 079-2P	7.9	8	33.2	34.2	70
MSFD 080-2P	8	8	33.6	34.6	70
MSFD 081-2P	8.1	10	34	35	80
MSFD 082-2P	8.2	10	34.4	35.4	80
MSFD 083-2P	8.3	10	34.9	35.9	80
MSFD 084-2P	8.4	10	35.3	36.3	80
MSFD 085-2P	8.5	10	35.7	36.7	80
MSFD 086-2P	8.6	10	36.1	37.1	80
MSFD 087-2P	8.7	10	36.5	37.5	80
MSFD 088-2P	8.8	10	37	38	80
MSFD 089-2P	8.9	10	37.4	38.4	80
MSFD 090-2P	9	10	37.8	38.8	80
MSFD 091-2P	9.1	10	38.2	39.2	80
MSFD 092-2P	9.2	10	38.6	39.6	80
MSFD 093-2P	9.3	10	39.1	40.1	80
MSFD 094-2P	9.4	10	39.5	40.5	80
MSFD 095-2P	9.5	10	39.9	40.9	80
MSFD 096-2P	9.6	10	40.3	41.3	80
MSFD 097-2P	9.7	10	40.7	41.7	80
MSFD 098-2P	9.8	10	41.2	42.2	80

MSFD(2P)





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• 공구직경공차

구 분	P
재종	PC325U
드릴직경공차	H7
샹크직경공차	h6
선단각(θ°)	180°
비틀림각	20°
씨닝형상	R type
급유방식	외부

P 강

(mm)

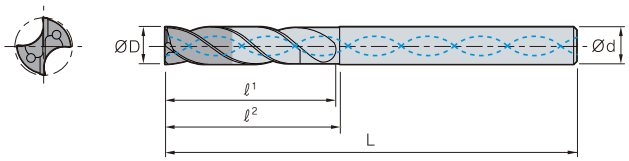
형 번	ØD	Ød	2P		
			ℓ1	ℓ2	L
MSFD 099-2P	9.9	10	41.6	42.6	80
MSFD 100-2P	10	10	42	43	80
MSFD 101-2P	10.1	12	42.4	43.4	90
MSFD 102-2P	10.2	12	42.8	43.8	90
MSFD 103-2P	10.3	12	43.3	44.3	90
MSFD 104-2P	10.4	12	43.7	44.7	90
MSFD 105-2P	10.5	12	44.1	45.1	90
MSFD 106-2P	10.6	12	44.5	45.5	90
MSFD 107-2P	10.7	12	44.9	45.9	90
MSFD 108-2P	10.8	12	45.4	46.4	90
MSFD 109-2P	10.9	12	45.8	46.8	90
MSFD 110-2P	11	12	46.2	47.2	90
MSFD 111-2P	11.1	12	46.6	47.6	90
MSFD 112-2P	11.2	12	47	48	90
MSFD 113-2P	11.3	12	47.5	48.5	90
MSFD 114-2P	11.4	12	47.9	48.9	90
MSFD 115-2P	11.5	12	48.3	49.3	90
MSFD 116-2P	11.6	12	48.7	49.7	90
MSFD 117-2P	11.7	12	49.1	50.1	90
MSFD 118-2P	11.8	12	49.6	50.6	90
MSFD 119-2P	11.9	12	50	51	90
MSFD 120-2P	12	12	50.4	51.4	90
MSFD 121-2P	12.1	14	50.8	51.8	100
MSFD 122-2P	12.2	14	51.2	52.2	100
MSFD 123-2P	12.3	14	51.7	52.7	100
MSFD 124-2P	12.4	14	52.1	53.1	100
MSFD 125-2P	12.5	14	52.5	53.5	100
MSFD 126-2P	12.6	14	52.9	53.9	100
MSFD 127-2P	12.7	14	53.3	54.3	100
MSFD 128-2P	12.8	14	53.8	54.8	100
MSFD 129-2P	12.9	14	54.2	55.2	100

형 번	ØD	Ød	2P		
			ℓ1	ℓ2	L
MSFD 130-2P	13	14	54.6	55.6	100
MSFD 131-2P	13.1	14	55	56	100
MSFD 132-2P	13.2	14	55.4	56.4	100
MSFD 133-2P	13.3	14	55.9	56.9	100
MSFD 134-2P	13.4	14	56.3	57.3	100
MSFD 135-2P	13.5	14	56.7	57.7	110
MSFD 136-2P	13.6	14	57.1	58.1	110
MSFD 137-2P	13.7	14	57.5	58.5	110
MSFD 138-2P	13.8	14	58	59	110
MSFD 139-2P	13.9	14	58.4	59.4	110
MSFD 140-2P	14	14	58.8	59.8	110
MSFD 141-2P	14.1	16	59.2	60.2	110
MSFD 142-2P	14.2	16	59.6	60.6	110
MSFD 143-2P	14.3	16	60.1	61.1	110
MSFD 144-2P	14.4	16	60.5	61.5	110
MSFD 145-2P	14.5	16	60.9	61.9	110
MSFD 146-2P	14.6	16	61.3	62.3	110
MSFD 147-2P	14.7	16	61.7	62.7	110
MSFD 148-2P	14.8	16	62.2	63.2	110
MSFD 149-2P	14.9	16	62.6	63.6	110
MSFD 150-2P	15	16	63	64	110
MSFD 151-2P	15.1	16	65	66	115
MSFD 152-2P	15.2	16	65	66	115
MSFD 153-2P	15.3	16	65.1	66.1	115
MSFD 154-2P	15.4	16	65.1	66.1	115
MSFD 155-2P	15.5	16	65.1	66.1	115
MSFD 156-2P	15.6	16	67.1	68.1	115
MSFD 157-2P	15.7	16	67.1	68.1	115
MSFD 158-2P	15.8	16	67.2	68.2	115
MSFD 159-2P	15.9	16	67.2	68.2	115
MSFD 160-2P	16	16	67.2	68.2	115

Drill **MSFD**

MSFDH(3P)





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• 공구직경공차

구 분	P
재종	PC325U
드릴직경공차	H7
샹크직경공차	h6
선단각(θ°)	180°
비틀림각	30°
씨닝형상	R type
급유방식	내부

P 강

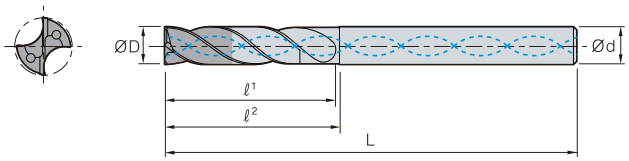
(mm)

형 번	ØD	Ød	3P		
			ℓ1	ℓ2	L
MSFDH 025-3P	2.5	3	17	18	58
MSFDH 026-3P	2.6	3	17	18	58
MSFDH 027-3P	2.7	3	17	18	58
MSFDH 028-3P	2.8	3	17	18	58
MSFDH 029-3P	2.9	3	17	18	58
MSFDH 030-3P	3.0	6	20	21	62
MSFDH 031-3P	3.1	6	20	21	62
MSFDH 032-3P	3.2	6	20	21	62
MSFDH 033-3P	3.3	6	20	21	62
MSFDH 034-3P	3.4	6	20	21	62
MSFDH 035-3P	3.5	6	20	21	62
MSFDH 036-3P	3.6	6	20	21	62
MSFDH 037-3P	3.7	6	20	21	62
MSFDH 038-3P	3.8	6	24	25	66
MSFDH 039-3P	3.9	6	24	25	66
MSFDH 040-3P	4.0	6	24	25	66
MSFDH 041-3P	4.1	6	24	25	66
MSFDH 042-3P	4.2	6	24	25	66
MSFDH 043-3P	4.3	6	24	25	66
MSFDH 044-3P	4.4	6	24	25	66
MSFDH 045-3P	4.5	6	24	25	66
MSFDH 046-3P	4.6	6	24	25	66
MSFDH 047-3P	4.7	6	24	25	66
MSFDH 048-3P	4.8	6	28	29	66
MSFDH 049-3P	4.9	6	28	29	66
MSFDH 050-3P	5.0	6	28	29	66
MSFDH 051-3P	5.1	6	28	29	66
MSFDH 052-3P	5.2	6	28	29	66
MSFDH 053-3P	5.3	6	28	29	66
MSFDH 054-3P	5.4	6	28	29	66
MSFDH 055-3P	5.5	6	28	29	66
MSFDH 056-3P	5.6	6	28	29	66
MSFDH 057-3P	5.7	6	28	29	66
MSFDH 058-3P	5.8	6	28	29	66
MSFDH 059-3P	5.9	6	28	29	66
MSFDH 060-3P	6.0	6	28	29	66
MSFDH 061-3P	6.1	8	34	35	79

형 번	ØD	Ød	3P		
			ℓ1	ℓ2	L
MSFDH 062-3P	6.2	8	34	35	79
MSFDH 063-3P	6.3	8	34	35	79
MSFDH 064-3P	6.4	8	34	35	79
MSFDH 065-3P	6.5	8	34	35	79
MSFDH 066-3P	6.6	8	34	35	79
MSFDH 067-3P	6.7	8	34	35	79
MSFDH 068-3P	6.8	8	34	35	79
MSFDH 069-3P	6.9	8	34	35	79
MSFDH 070-3P	7.0	8	34	35	79
MSFDH 071-3P	7.1	8	41	42	79
MSFDH 072-3P	7.2	8	41	42	79
MSFDH 073-3P	7.3	8	41	42	79
MSFDH 074-3P	7.4	8	41	42	79
MSFDH 075-3P	7.5	8	41	42	79
MSFDH 076-3P	7.6	8	41	42	79
MSFDH 077-3P	7.7	8	41	42	79
MSFDH 078-3P	7.8	8	41	42	79
MSFDH 079-3P	7.9	8	41	42	79
MSFDH 080-3P	8.0	8	41	42	79
MSFDH 081-3P	8.1	10	47	48	89
MSFDH 082-3P	8.2	10	47	48	89
MSFDH 083-3P	8.3	10	47	48	89
MSFDH 084-3P	8.4	10	47	48	89
MSFDH 085-3P	8.5	10	47	48	89
MSFDH 086-3P	8.6	10	47	48	89
MSFDH 087-3P	8.7	10	47	48	89
MSFDH 088-3P	8.8	10	47	48	89
MSFDH 089-3P	8.9	10	47	48	89
MSFDH 090-3P	9.0	10	47	48	89
MSFDH 091-3P	9.1	10	47	48	89
MSFDH 092-3P	9.2	10	47	48	89
MSFDH 093-3P	9.3	10	47	48	89
MSFDH 094-3P	9.4	10	47	48	89
MSFDH 095-3P	9.5	10	47	48	89
MSFDH 096-3P	9.6	10	47	48	89
MSFDH 097-3P	9.7	10	47	48	89
MSFDH 098-3P	9.8	10	47	48	89

MSFDH(3P)





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• 공구직경공차

구 분	P
재종	PC325U
드릴직경공차	H7
샹크직경공차	h6
선단각(θ°)	180°
비틀림각	30°
씨닝형상	R type
급유방식	내부

P 강

(mm)

형 번	ØD	Ød	3P		
			ℓ1	ℓ2	L
MSFDH 099-3P	9.9	10	47	48	89
MSFDH 100-3P	10.0	10	47	48	89
MSFDH 101-3P	10.1	12	55	56	102
MSFDH 102-3P	10.2	12	55	56	102
MSFDH 103-3P	10.3	12	55	56	102
MSFDH 104-3P	10.4	12	55	56	102
MSFDH 105-3P	10.5	12	55	56	102
MSFDH 106-3P	10.6	12	55	56	102
MSFDH 107-3P	10.7	12	55	56	102
MSFDH 108-3P	10.8	12	55	56	102
MSFDH 109-3P	10.9	12	55	56	102
MSFDH 110-3P	11.0	12	55	56	102
MSFDH 111-3P	11.1	12	55	56	102
MSFDH 112-3P	11.2	12	55	56	102
MSFDH 113-3P	11.3	12	55	56	102
MSFDH 114-3P	11.4	12	55	56	102
MSFDH 115-3P	11.5	12	55	56	102
MSFDH 116-3P	11.6	12	55	56	102
MSFDH 117-3P	11.7	12	55	56	102
MSFDH 118-3P	11.8	12	55	56	102
MSFDH 119-3P	11.9	12	55	56	102
MSFDH 120-3P	12.0	12	55	56	102
MSFDH 121-3P	12.1	14	60	61	107
MSFDH 122-3P	12.2	14	60	61	107
MSFDH 123-3P	12.3	14	60	61	107
MSFDH 124-3P	12.4	14	60	61	107
MSFDH 125-3P	12.5	14	60	61	107
MSFDH 126-3P	12.6	14	60	61	107
MSFDH 127-3P	12.7	14	60	61	107
MSFDH 128-3P	12.8	14	60	61	107
MSFDH 129-3P	12.9	14	60	61	107

형 번	ØD	Ød	3P		
			ℓ1	ℓ2	L
MSFDH 130-3P	13.0	14	60	61	107
MSFDH 131-3P	13.1	14	60	61	107
MSFDH 132-3P	13.2	14	60	61	107
MSFDH 133-3P	13.3	14	60	61	107
MSFDH 134-3P	13.4	14	60	61	107
MSFDH 135-3P	13.5	14	60	61	107
MSFDH 136-3P	13.6	14	60	61	107
MSFDH 137-3P	13.7	14	60	61	107
MSFDH 138-3P	13.8	14	60	61	107
MSFDH 139-3P	13.9	14	60	61	107
MSFDH 140-3P	14.0	14	60	61	107
MSFDH 141-3P	14.1	16	65	66	115
MSFDH 142-3P	14.2	16	65	66	115
MSFDH 143-3P	14.3	16	65	66	115
MSFDH 144-3P	14.4	16	65	66	115
MSFDH 145-3P	14.5	16	65	66	115
MSFDH 146-3P	14.6	16	65	66	115
MSFDH 147-3P	14.7	16	65	66	115
MSFDH 148-3P	14.8	16	65	66	115
MSFDH 149-3P	14.9	16	65	66	115
MSFDH 150-3P	15.0	16	65	66	115
MSFDH 151-3P	15.1	16	65	66	115
MSFDH 152-3P	15.2	16	65	66	115
MSFDH 153-3P	15.3	16	65	66	115
MSFDH 154-3P	15.4	16	65	66	115
MSFDH 155-3P	15.5	16	65	66	115
MSFDH 156-3P	15.6	16	65	66	115
MSFDH 157-3P	15.7	16	65	66	115
MSFDH 158-3P	15.8	16	65	66	115
MSFDH 159-3P	15.9	16	65	66	115
MSFDH 160-3P	16.0	16	65	66	115

경제형 초경 코팅 솔리드 드릴

WSDP

New

윈 드릴

- 개선된 씨닝 형상에 따른 선단 절삭부하 감소로 절삭성 향상
- 최적의 플루트 설계로 강성 보완 및 칩 배출 우수
- 스테인레스강 가공에서도 탁월한 성능 발휘

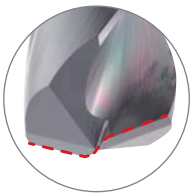
형번표기법

스페셜 타입

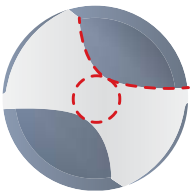
WSDP 040 - 5D - 100L - 5S

- **WSDP**: Win Solid Drill Plus
- **040**: 드릴직경(ØD) — 040 = Ø4.0mm
- **5D**: 절입깊이(L/D) — 5D, 7D
- **100L**: 드릴전장 — 100L: 100mm
- **5S**: 샹크직경 — 5S: Ø5.0mm

특징



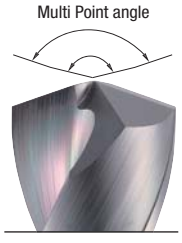
- **XR 씨닝 형상**
  - 유선형 씨닝으로 선단 절삭부하 감소
  - 칩 절삭력 개선



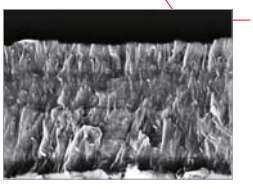
SECTION A-A'

- **최적의 플루트**
  - 칩 포켓 확대적용으로 칩 배출성 우수





- **Multi Point angle**
  - 최적의 Point angle로 절삭력 분산
  - 1차 Point angle을 유선형으로 설계



- **신규 AlCrN 코팅**
  - 플루트 윤활성 향상에 따른 칩 배출 향상
  - 다층 코팅으로 내마모성과 내산화성 향상

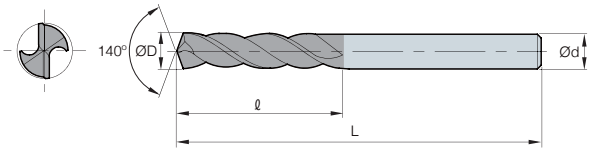
적용영역

◎: 1차 추천 ○: 2차 추천

P					M	K
탄소강	합금강	프리하든강	열처리강		스테인레스강	주철
			STD61(~HRC55)	STD11(HRC55~63)		
◎	◎	○	-	-	◎	○

WSDP - □ D





절삭조건
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• 공구직경공차

구 분	P	M	K
재종	PC320W		
드릴직경공차	h7		
샹크직경공차	h6		
선단각(θ°)	140°		
비틀림각	유선형		
씨닝형상	XR type		
급유방식	외부		

P 강 M 스테인레스강 K 주철

(mm)

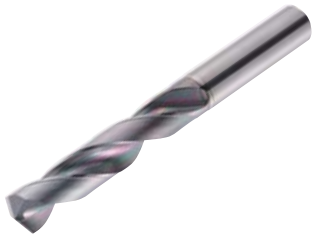
형 번	ØD	Ød	5D		7D	
			ℓ	L	ℓ	L
WSDP 010 - □ D	1	3	8	38	12	60
WSDP 011 - □ D	1.1	3	9	42	12	60
WSDP 012 - □ D	1.2	3	10	42	12	60
WSDP 013 - □ D	1.3	3	10	42	15	60
WSDP 014 - □ D	1.4	3	11	42	15	60
WSDP 015 - □ D	1.5	3	11	42	15	60
WSDP 016 - □ D	1.6	3	12	42	20	60
WSDP 017 - □ D	1.7	3	12	42	20	60
WSDP 018 - □ D	1.8	3	13	42	20	60
WSDP 019 - □ D	1.9	3	13	42	20	60
WSDP 020 - □ D	2	3	18	50	25	66
WSDP 021 - □ D	2.1	3	18	50	25	66
WSDP 022 - □ D	2.2	3	18	50	25	66
WSDP 023 - □ D	2.3	3	18	50	25	66
WSDP 024 - □ D	2.4	3	18	50	30	66
WSDP 025 - □ D	2.5	3	18	50	30	66
WSDP 026 - □ D	2.6	3	18	50	30	66
WSDP 027 - □ D	2.7	3	18	50	30	66
WSDP 028 - □ D	2.8	3	18	50	30	66
WSDP 029 - □ D	2.9	3	18	50	30	66
WSDP 030 - □ D	3	3	20	55	45	80
WSDP 031 - □ D	3.1	4	20	55	45	80
WSDP 032 - □ D	3.2	4	20	55	45	80
WSDP 033 - □ D	3.3	4	20	55	45	80
WSDP 034 - □ D	3.4	4	20	55	45	80
WSDP 035 - □ D	3.5	4	20	55	45	80
WSDP 036 - □ D	3.6	4	25	55	45	80
WSDP 037 - □ D	3.7	4	25	55	45	80
WSDP 038 - □ D	3.8	4	25	55	45	80
WSDP 039 - □ D	3.9	4	25	55	45	80
WSDP 040 - □ D	4	4	25	55	45	80
WSDP 041 - □ D	4.1	5	25	55	45	80
WSDP 042 - □ D	4.2	5	33	63	45	80
WSDP 043 - □ D	4.3	5	33	63	45	80
WSDP 044 - □ D	4.4	5	33	63	45	80
WSDP 045 - □ D	4.5	5	33	63	45	80
WSDP 046 - □ D	4.6	5	33	63	45	80

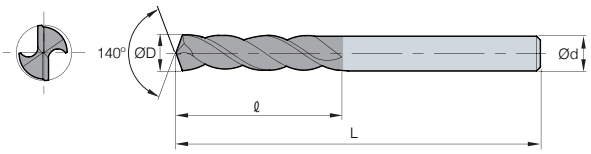
형 번	ØD	Ød	5D		7D	
			ℓ	L	ℓ	L
WSDP 047 - □ D	4.7	5	33	63	45	80
WSDP 048 - □ D	4.8	5	33	63	45	80
WSDP 049 - □ D	4.9	5	33	63	45	80
WSDP 050 - □ D	5	5	33	63	45	80
WSDP 051 - □ D	5.1	6	33	63	45	80
WSDP 052 - □ D	5.2	6	36	66	50	83
WSDP 053 - □ D	5.3	6	36	66	50	83
WSDP 054 - □ D	5.4	6	36	66	50	83
WSDP 055 - □ D	5.5	6	36	66	50	83
WSDP 056 - □ D	5.6	6	36	66	50	83
WSDP 057 - □ D	5.7	6	36	66	50	83
WSDP 058 - □ D	5.8	6	36	66	50	83
WSDP 059 - □ D	5.9	6	36	66	50	83
WSDP 060 - □ D	6	6	36	66	50	83
WSDP 061 - □ D	6.1	7	36	66	50	83
WSDP 062 - □ D	6.2	7	42	75	53	85
WSDP 063 - □ D	6.3	7	42	75	53	85
WSDP 064 - □ D	6.4	7	42	75	53	85
WSDP 065 - □ D	6.5	7	42	75	53	85
WSDP 066 - □ D	6.6	7	42	75	53	85
WSDP 067 - □ D	6.7	7	42	75	53	85
WSDP 068 - □ D	6.8	7	42	75	53	85
WSDP 069 - □ D	6.9	7	42	75	53	85
WSDP 070 - □ D	7	7	42	75	53	85
WSDP 071 - □ D	7.1	8	42	75	53	85
WSDP 072 - □ D	7.2	8	46	80	58	90
WSDP 073 - □ D	7.3	8	46	80	58	90
WSDP 074 - □ D	7.4	8	46	80	58	90
WSDP 075 - □ D	7.5	8	46	80	58	90
WSDP 076 - □ D	7.6	8	46	80	58	90
WSDP 077 - □ D	7.7	8	46	80	58	90
WSDP 078 - □ D	7.8	8	46	80	58	90
WSDP 079 - □ D	7.9	8	46	80	58	90
WSDP 080 - □ D	8	8	46	80	58	90
WSDP 081 - □ D	8.1	9	46	80	58	90
WSDP 082 - □ D	8.2	9	50	85	64	98
WSDP 083 - □ D	8.3	9	50	85	64	98

Drill

WSDP

WSDP - □D





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• 공구직경공차

구 분	P	M	K
재종	PC320W		
드릴직경공차	h7		
샹크직경공차	h6		
선단각(θ°)	140°		
비틀림각	유선형		
씨닝형상	XR type		
급유방식	외부		

P강 M스테인레스강 K주철

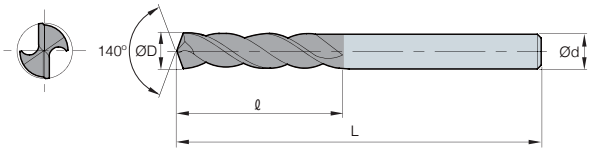
(mm)

형 번	ØD	Ød	5D		7D	
			ℓ	L	ℓ	L
WSDP 084-□D	8.4	9	50	85	64	98
WSDP 085-□D	8.5	9	50	85	64	98
WSDP 086-□D	8.6	9	50	85	64	98
WSDP 087-□D	8.7	9	50	85	64	98
WSDP 088-□D	8.8	9	50	85	64	98
WSDP 089-□D	8.9	9	50	85	64	98
WSDP 090-□D	9	9	50	85	64	98
WSDP 091-□D	9.1	10	50	85	64	98
WSDP 092-□D	9.2	10	55	90	68	105
WSDP 093-□D	9.3	10	55	90	68	105
WSDP 094-□D	9.4	10	55	90	68	105
WSDP 095-□D	9.5	10	55	90	68	105
WSDP 096-□D	9.6	10	55	90	68	105
WSDP 097-□D	9.7	10	55	90	68	105
WSDP 098-□D	9.8	10	55	90	68	105
WSDP 099-□D	9.9	10	55	90	68	105
WSDP 100-□D	10	10	55	90	68	105
WSDP 101-□D	10.1	11	55	90	68	105
WSDP 102-□D	10.2	11	57	95	73	110
WSDP 103-□D	10.3	11	57	95	73	110
WSDP 104-□D	10.4	11	57	95	73	110
WSDP 105-□D	10.5	11	57	95	73	110
WSDP 106-□D	10.6	11	57	95	73	110
WSDP 107-□D	10.7	11	57	95	73	110
WSDP 108-□D	10.8	11	57	95	73	110
WSDP 109-□D	10.9	11	57	95	73	110
WSDP 110-□D	11	11	57	95	73	110
WSDP 111-□D	11.1	12	57	95	73	110
WSDP 112-□D	11.2	12	63	102	80	120
WSDP 113-□D	11.3	12	63	102	80	120
WSDP 114-□D	11.4	12	63	102	80	120
WSDP 115-□D	11.5	12	63	102	80	120
WSDP 116-□D	11.6	12	63	102	80	120
WSDP 117-□D	11.7	12	63	102	80	120
WSDP 118-□D	11.8	12	63	102	80	120
WSDP 119-□D	11.9	12	63	102	80	120
WSDP 120-□D	12	12	63	102	80	120

형 번	ØD	Ød	5D		7D	
			ℓ	L	ℓ	L
WSDP 121-□D	12.1	13	63	102	80	120
WSDP 122-□D	12.2	13	63	102	90	137
WSDP 123-□D	12.3	13	63	102	90	137
WSDP 124-□D	12.4	13	63	102	90	137
WSDP 125-□D	12.5	13	63	102	90	137
WSDP 126-□D	12.6	13	63	102	90	137
WSDP 127-□D	12.7	13	63	102	90	137
WSDP 128-□D	12.8	13	63	102	90	137
WSDP 129-□D	12.9	13	63	102	90	137
WSDP 130-□D	13	13	63	102	90	137
WSDP 131-□D	13.1	14	63	102	90	137
WSDP 132-□D	13.2	14	65	107	96	147
WSDP 133-□D	13.3	14	65	107	96	147
WSDP 134-□D	13.4	14	65	107	96	147
WSDP 135-□D	13.5	14	65	107	96	147
WSDP 136-□D	13.6	14	65	107	96	147
WSDP 137-□D	13.7	14	65	107	96	147
WSDP 138-□D	13.8	14	65	107	96	147
WSDP 139-□D	13.9	14	65	107	96	147
WSDP 140-□D	14	14	65	107	96	147
WSDP 141-□D	14.1	15	65	107	96	147
WSDP 142-□D	14.2	15	67	111	100	153
WSDP 143-□D	14.3	15	67	111	100	153
WSDP 144-□D	14.4	15	67	111	100	153
WSDP 145-□D	14.5	15	67	111	100	153
WSDP 146-□D	14.6	15	67	111	100	153
WSDP 147-□D	14.7	15	67	111	100	153
WSDP 148-□D	14.8	15	67	111	100	153
WSDP 149-□D	14.9	15	67	111	100	153
WSDP 150-□D	15	15	67	111	100	153
WSDP 151-□D	15.1	16	67	111	100	153
WSDP 152-□D	15.2	16	69	115	112	160
WSDP 153-□D	15.3	16	69	115	112	160
WSDP 154-□D	15.4	16	69	115	112	160
WSDP 155-□D	15.5	16	69	115	112	160
WSDP 156-□D	15.6	16	69	115	112	160
WSDP 157-□D	15.7	16	69	115	112	160

WSDP - □D





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• 공구직경공차

구 분	P	M	K
재종	PC320W		
드릴직경공차	h7		
샹크직경공차	h6		
선단각(θ°)	140°		
비틀림각	유선형		
씨닝형상	XR type		
급유방식	외부		

P 강 M 스테인레스강 K 주철

(mm)

형 번	ØD	Ød	5D		7D	
			ℓ	L	ℓ	L
WSDP 158-□D	15.8	16	69	115	112	160
WSDP 159-□D	15.9	16	69	115	112	160
WSDP 160-□D	16	16	69	115	112	160
WSDP 161-□D	16.1	17	69	115	112	160
WSDP 162-□D	16.2	17	71	119	112	160
WSDP 163-□D	16.3	17	71	119	112	160
WSDP 164-□D	16.4	17	71	119	112	160
WSDP 165-□D	16.5	17	71	119	112	160
WSDP 166-□D	16.6	17	71	119	112	160
WSDP 167-□D	16.7	17	71	119	112	160
WSDP 168-□D	16.8	17	71	119	112	160
WSDP 169-□D	16.9	17	71	119	112	160
WSDP 170-□D	17	17	71	119	112	160
WSDP 171-□D	17.1	18	71	119	112	160
WSDP 172-□D	17.2	18	74	123	112	160
WSDP 173-□D	17.3	18	74	123	112	160
WSDP 174-□D	17.4	18	74	123	112	160
WSDP 175-□D	17.5	18	74	123	112	160
WSDP 176-□D	17.6	18	74	123	112	160
WSDP 177-□D	17.7	18	74	123	112	160
WSDP 178-□D	17.8	18	74	123	112	160
WSDP 179-□D	17.9	18	74	123	112	160

형 번	ØD	Ød	5D		7D	
			ℓ	L	ℓ	L
WSDP 180-□D	18	18	74	123	112	160
WSDP 181-□D	18.1	19	74	123	112	160
WSDP 182-□D	18.2	19	76	127	112	160
WSDP 183-□D	18.3	19	76	127	112	160
WSDP 184-□D	18.4	19	76	127	112	160
WSDP 185-□D	18.5	19	76	127	112	160
WSDP 186-□D	18.6	19	76	127	112	160
WSDP 187-□D	18.7	19	76	127	112	160
WSDP 188-□D	18.8	19	76	127	112	160
WSDP 189-□D	18.9	19	76	127	112	160
WSDP 190-□D	19	19	76	127	112	160
WSDP 191-□D	19.1	20	76	127	112	160
WSDP 192-□D	19.2	20	80	131	112	160
WSDP 193-□D	19.3	20	80	131	112	160
WSDP 194-□D	19.4	20	80	131	112	160
WSDP 195-□D	19.5	20	80	131	112	160
WSDP 196-□D	19.6	20	80	131	112	160
WSDP 197-□D	19.7	20	80	131	112	160
WSDP 198-□D	19.8	20	80	131	112	160
WSDP 199-□D	19.9	20	80	131	112	160
WSDP 200-□D	20	20	80	131	112	160

비철금속, 연강 가공용 초경 솔리드 드릴

SSD-N

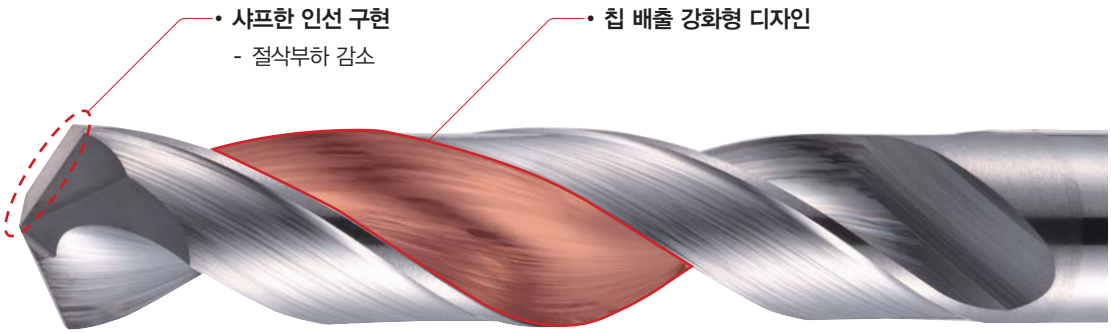
- 안정된 제품 성능으로 생산성 증가
- 연강, 비철류의 다양한 피삭재 가공에 적용

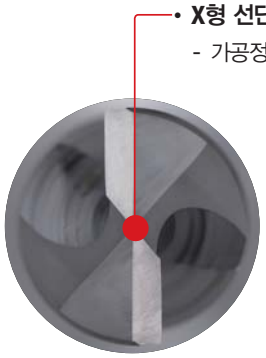
형번표기법

스페셜 타입

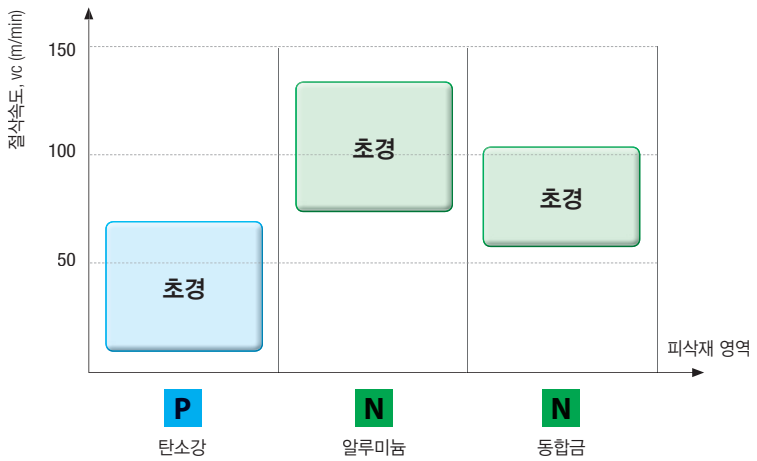
SSD	010	-	N	-	10	-	60L	-	6S
Solid Spiral Drill	드릴직경(ØD) 010 = Ø1.0mm		Nonferrous		Flute 길이 10: 10mm		드릴전장 60L: 60 mm		샹크직경 6S: Ø6.0mm

특징



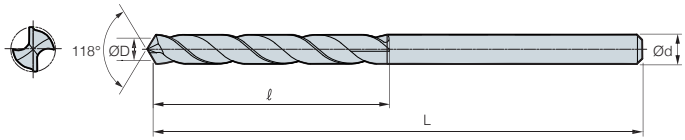


적용영역



SSD-N





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• TOLERANCE

코팅유무	×
드릴직경공차	h8
샹크직경공차	h7
선단각(θ°)	118°
비틀림각	30°
씨닝형상	X type
급유방식	외부

(mm)

형 번	ØD	Ød	ℓ	L
SSD 010-N	1.0	1.0	10	38
SSD 011-N	1.1	1.1	10	38
SSD 012-N	1.2	1.2	10	38
SSD 013-N	1.3	1.3	13	38
SSD 014-N	1.4	1.4	13	38
SSD 015-N	1.5	1.5	13	38
SSD 016-N	1.6	1.6	13	38
SSD 017-N	1.7	1.7	13	38
SSD 018-N	1.8	1.8	13	38
SSD 019-N	1.9	1.9	13	38
SSD 020-N	2.0	2.0	16	45
SSD 021-N	2.1	2.1	16	45
SSD 022-N	2.2	2.2	16	45
SSD 023-N	2.3	2.3	16	45
SSD 024-N	2.4	2.4	18	50
SSD 025-N	2.5	2.5	20	50
SSD 026-N	2.6	2.6	20	50
SSD 027-N	2.7	2.7	22	50
SSD 028-N	2.8	2.8	22	50
SSD 029-N	2.9	2.9	22	50
SSD 030-N	3.0	3.0	22	50
SSD 031-N	3.1	3.1	25	50
SSD 032-N	3.2	3.2	25	50
SSD 033-N	3.3	3.3	25	50
SSD 034-N	3.4	3.4	25	50
SSD 035-N	3.5	3.5	25	50
SSD 036-N	3.6	3.6	28	55
SSD 037-N	3.7	3.7	28	55
SSD 038-N	3.8	3.8	28	55
SSD 039-N	3.9	3.9	28	55
SSD 040-N	4.0	4.0	28	55
SSD 041-N	4.1	4.1	30	60
SSD 042-N	4.2	4.2	30	60
SSD 043-N	4.3	4.3	30	60
SSD 044-N	4.4	4.4	30	60
SSD 045-N	4.5	4.5	30	60
SSD 046-N	4.6	4.6	33	65

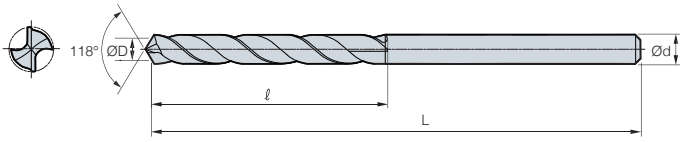
형 번	ØD	Ød	ℓ	L
SSD 047-N	4.7	4.7	33	65
SSD 048-N	4.8	4.8	35	65
SSD 049-N	4.9	4.9	35	65
SSD 050-N	5.0	5.0	35	65
SSD 051-N	5.1	5.1	35	65
SSD 052-N	5.2	5.2	35	65
SSD 053-N	5.3	5.3	35	65
SSD 054-N	5.4	5.4	35	65
SSD 055-N	5.5	5.5	35	65
SSD 056-N	5.6	5.6	38	75
SSD 057-N	5.7	5.7	38	75
SSD 058-N	5.8	5.8	38	75
SSD 059-N	5.9	5.9	38	75
SSD 060-N	6.0	6.0	38	75
SSD 061-N	6.1	6.1	38	75
SSD 062-N	6.2	6.2	38	75
SSD 063-N	6.3	6.3	38	75
SSD 064-N	6.4	6.4	38	75
SSD 065-N	6.5	6.5	38	75
SSD 066-N	6.6	6.6	45	80
SSD 067-N	6.7	6.7	45	80
SSD 068-N	6.8	6.8	45	80
SSD 069-N	6.9	6.9	45	80
SSD 070-N	7.0	7.0	45	80
SSD 071-N	7.1	7.1	45	80
SSD 072-N	7.2	7.2	45	80
SSD 073-N	7.3	7.3	45	80
SSD 074-N	7.4	7.4	45	80
SSD 075-N	7.5	7.5	45	80
SSD 076-N	7.6	7.6	50	85
SSD 077-N	7.7	7.7	50	85
SSD 078-N	7.8	7.8	50	85
SSD 079-N	7.9	7.9	50	85
SSD 080-N	8.0	8.0	50	85
SSD 081-N	8.1	8.1	50	85
SSD 082-N	8.2	8.2	50	85
SSD 083-N	8.3	8.3	50	85

Drill

SSD-N

SSD-N





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• TOLERANCE

코팅유무	×
드릴직경공차	h8
샹크직경공차	h7
선단각(θ°)	118°
비틀림각	30°
씨닝형상	X type
급유방식	외부

(mm)

형 번	ØD	Ød	ℓ	L
SSD 084-N	8.4	8.4	50	85
SSD 085-N	8.5	8.5	50	85
SSD 086-N	8.6	8.6	50	95
SSD 087-N	8.7	8.7	50	95
SSD 088-N	8.8	8.8	50	95
SSD 089-N	8.9	8.9	50	95
SSD 090-N	9.0	9.0	50	95
SSD 091-N	9.1	9.1	50	95
SSD 092-N	9.2	9.2	50	95
SSD 093-N	9.3	9.3	50	95
SSD 094-N	9.4	9.4	50	95
SSD 095-N	9.5	9.5	50	95
SSD 096-N	9.6	9.6	50	95
SSD 097-N	9.7	9.7	50	95
SSD 098-N	9.8	9.8	50	95
SSD 099-N	9.9	9.9	55	100
SSD 100-N	10.0	10.0	55	100
SSD 101-N	10.1	10.1	55	115
SSD 102-N	10.2	10.2	55	115

형 번	ØD	Ød	ℓ	L
SSD 103-N	10.3	10.3	55	115
SSD 104-N	10.4	10.4	55	115
SSD 105-N	10.5	10.5	55	115
SSD 106-N	10.6	10.6	60	115
SSD 107-N	10.7	10.7	60	115
SSD 108-N	10.8	10.8	60	115
SSD 109-N	10.9	10.9	60	115
SSD 110-N	11.0	11.0	60	115
SSD 111-N	11.1	11.1	65	120
SSD 112-N	11.2	11.2	65	120
SSD 113-N	11.3	11.3	65	120
SSD 115-N	11.5	11.5	65	120
SSD 118-N	11.8	11.8	65	120
SSD 119-N	11.9	11.9	65	120
SSD 120-N	12.0	12.0	65	120
SSD 124-N	12.4	12.4	70	125
SSD 125-N	12.5	12.5	70	125
SSD 130-N	13.0	13.0	75	130

Burnishing Drill

버니싱 드릴 - BDS



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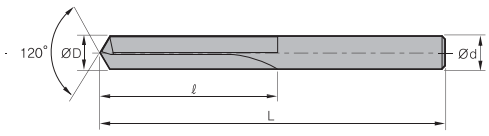


그림 1

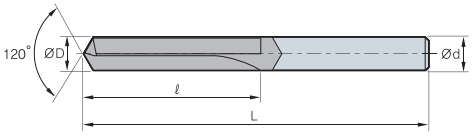


그림 2

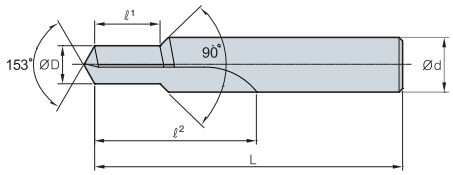
(mm)

형 번	ØD	Ød	ℓ	L	그림
BDS 040S	4.0	4	35	80	1
BDS 050S	5.0	5	40	85	1
BDS 060S	6.0	6	50	95	1
BDS 070S	7.0	7	55	100	1
BDS 080S	8.0	8	65	110	1
BDS 090S	9.0	9	70	120	1
BDS 100S	10.0	10	80	130	1
BDS 110S	11.0	11	90	140	1
BDS 120B	12.0	12	95	150	2
BDS 130B	13.0	16	105	160	2
BDS 140B	14.0	16	110	170	2
BDS 150B	15.0	16	120	185	2
BDS 160B	16.0	16	125	190	2

스텝버니싱 드릴 - BDT



절삭조건
p.464



(mm)

형 번	ØD	Ød	ℓ1	ℓ2	L	Tap
BDT M05080 - ℓ1	4.2	6	35	9~15	90	M5XP0.8
BDT M06100 - ℓ1	5.0	7	40	11~18	95	M6XP1.0
BDT M08125 - ℓ1	6.8	10	50	15~24	105	M8XP1.25
BDT M10125 - ℓ1	8.8	12	55	17~30	110	M10XP1.25
BDT M10150 - ℓ1	8.5	12	55	17~30	110	M10XP1.5
BDT M12125 - ℓ1	10.8	14	60	19~36	120	M12XP1.25
BDT M12150 - ℓ1	10.5	14	60	19~36	120	M12XP1.5
BDT M12175 - ℓ1	10.3	14	60	19~36	120	M12XP1.75

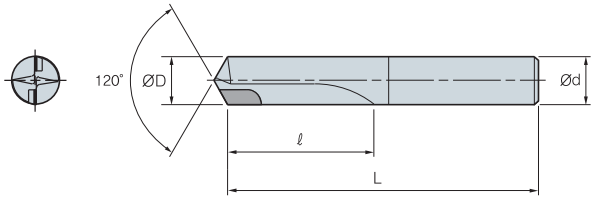
PCD Drill

PDD

브레이징 타입



절삭조건
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(mm)

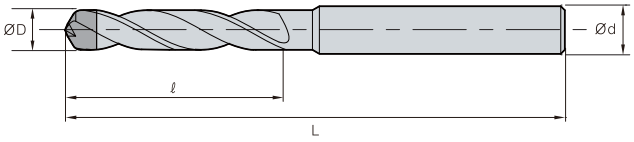
형 번	ØD	Ød	ℓ	L
PDD 0500	5.0	5.0	30	80
PDD 0550	5.5	5.5	30	80
PDD 0600	6.0	6.0	30	80
PDD 0650	6.5	6.5	40	95
PDD 0700	7.0	7.0	40	95
PDD 0750	7.5	7.5	45	100
PDD 0800	8.0	8.0	45	100
PDD 0850	8.5	8.5	50	110
PDD 0900	9.0	9.0	50	110
PDD 0950	9.5	9.5	55	115
PDD 1000	10.0	10.0	55	115
PDD 1050	10.5	10.5	60	120
PDD 1100	11.0	11.0	60	120
PDD 1150	11.5	11.5	65	125
PDD 1200	12.0	12.0	65	125

CPD(표준)

콘(Cone) 타입



절삭조건
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(mm)

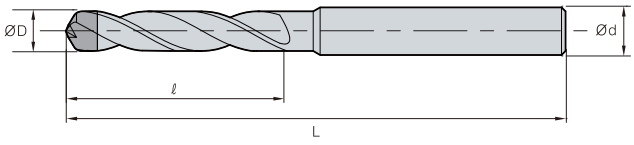
형 번	ØD	Ød	ℓ	L
CPD 020~030	2.0~3.0	4	10	43
CPD 031~035	3.1~3.5	4	15	43
CPD 036~040	3.6~4.0	4	15	43
CPD 041~050	4.1~5.0	6	20	53
CPD 051~060	5.1~6.0	6	25	63
CPD 061~070	6.1~7.0	8	30	79
CPD 071~080	7.1~8.0	8	35	79

CPDL(롱)

콘(Cone) 타입



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(mm)

형 번	ØD	Ød	ℓ	L
CPDL 020~030	2.0~3.0	4	90	160
CPDL 031~035	3.1~3.5	4	90	160
CPDL 036~040	3.6~4.0	4	90	160
CPDL 041~050	4.1~5.0	6	90	160
CPDL 051~060	5.1~6.0	6	90	160
CPDL 061~070	6.1~7.0	8	90	160
CPDL 071~080	7.1~8.0	8	90	160

Notice

- 다양한 영역 가공이 가능한 고기능성 드릴 : Cone type 드릴(CPD)
- 탁월한 정밀도 및 표면 조도 구현
- 고정밀급 Primium PCD 드릴

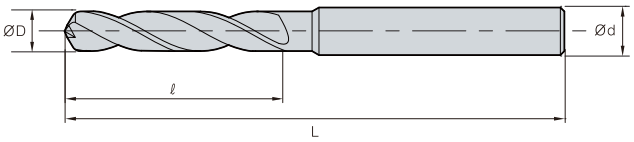
PCD Drill

SPD(표준)

샌드위치 타입

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(mm)

형 번	ØD	Ød	ℓ	L
SPD 040	4.0	4	20	43
SPD 045	4.5	6	20	53
SPD 050	5.0	6	25	63
SPD 055	5.5	6	25	63
SPD 060	6.0	6	25	63
SPD 065	6.5	8	30	79
SPD 070	7.0	8	35	79
SPD 075	7.5	8	35	79
SPD 080	8.0	8	35	79
SPD 085	8.5	10	60	110
SPD 090	9.0	10	60	110
SPD 095	9.5	10	60	110
SPD 100	10.0	10	60	110
SPD 105	10.5	10	60	110
SPD 110	11.0	12	70	110
SPD 115	11.5	12	70	110
SPD 120	12.0	12	80	150
SPD 125	12.5	12	80	150
SPD 130	13.0	14	80	150
SPD 135	13.5	14	80	150
SPD 140	14.0	14	80	150
SPD 145	14.5	14	80	150
SPD 150	15.0	16	80	150
SPD 160	16.0	16	80	150

Notice

- 다양한 영역 가공이 가능한 고기능성 드릴 : Sandwich type 드릴(SPD)
- 탁월한 정밀도 및 표면 조도 구현
- 고정밀급 Primium PCD 드릴

재연삭 사용이 가능하며, 사용한 건 드릴은 초경부위를 교환하여 재생 가능

Gun Drill

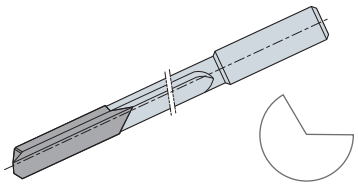
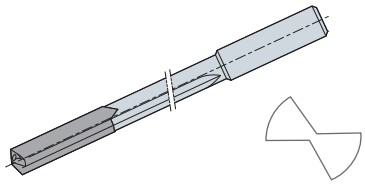
건 드릴

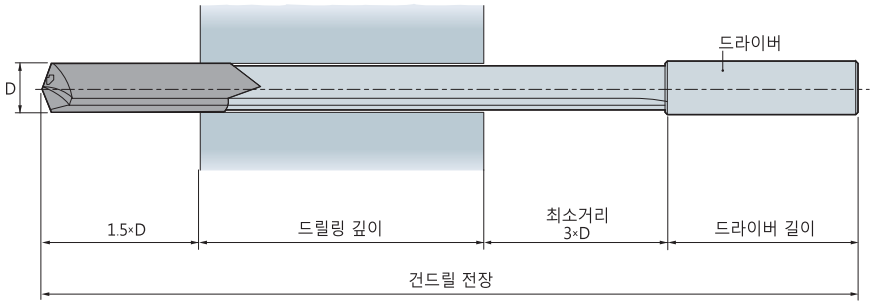
- 깊은 구멍가공(50~100×D)에서 고능률 가공 가능
- 고정도 구멍가공 가능(구멍정도 : IT9, 면조도 : Ra 0.1~3.0S)
- 독자적인 인선형상과 가이드패드의 채용으로 안정적인 품질관리가 가능
- 고객의 요구에 의하여 인선형상 및 드라이버의 사양을 변경 제작가능
- 주문시 전장 지정 필요

형번표기법

KGD	S	-	12.05	-	1500	/	D30
KORLOY Gun Drill	인선형태 S : Single T : Twin		드릴직경(ØD) Ø12.05mm		드릴전장 1500mm		드라이버 규격 D30

특징

	싱글 립 타입(Single lip type)	트윈 립 타입(Twin lip type)
형 상		
적용드릴직경	Ø3.0 ~ Ø33.0	Ø8.0 ~ Ø24.0
가공깊이	≥ 2,000 mm	≥ 1,000 mm
구멍공차	IT9	IT10
면조도	Ra 0.1~3.0 μm	Ra 1.0~4.0 μm
적 용	모든 재질에 적용 가능	• 칩처리가 양호한 피삭재에 적용 • 싱글 립 타입보다 이송을 증가 시켜 사용 가능



- 주문시에 위의 형번표기법과 그림을 참고하여 형번 선정
- 주문 시에는 전장 지정

Gun Drill

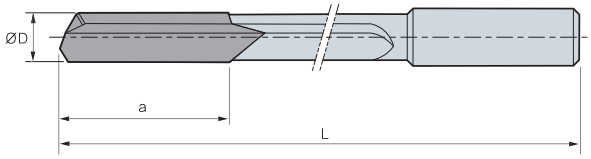
건드릴 - KGDS

싱글 립 타입

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• 공구직경공차

형번 호칭 범례	
O.OO	건 드릴직경
□□□□	전장
D□□	드라이버 규격



(mm)

형 번	ØD	a
KGDS O.OO – □□□□/D□□	3.00~3.49	19
KGDS O.OO – □□□□/D□□	3.50~3.99	19
KGDS O.OO – □□□□/D□□	4.00~4.49	23
KGDS O.OO – □□□□/D□□	4.50~4.99	23
KGDS O.OO – □□□□/D□□	5.00~5.49	24
KGDS O.OO – □□□□/D□□	5.50~5.99	26
KGDS O.OO – □□□□/D□□	6.00~6.49	27
KGDS O.OO – □□□□/D□□	6.50~6.99	28
KGDS O.OO – □□□□/D□□	7.00~7.49	29
KGDS O.OO – □□□□/D□□	7.50~7.99	30
KGDS O.OO – □□□□/D□□	8.00~8.49	31
KGDS O.OO – □□□□/D□□	8.50~8.99	31
KGDS O.OO – □□□□/D□□	9.00~8.49	31
KGDS O.OO – □□□□/D□□	9.50~9.99	31
KGDS O.OO – □□□□/D□□	10.00~10.49	31
KGDS O.OO – □□□□/D□□	10.50~10.99	32
KGDS O.OO – □□□□/D□□	11.00~11.49	35
KGDS O.OO – □□□□/D□□	11.50~11.99	35
KGDS O.OO – □□□□/D□□	12.00~12.49	38
KGDS O.OO – □□□□/D□□	12.50~12.99	38

형 번	ØD	a
KGDS O.OO – □□□□/D□□	13.00~13.99	38
KGDS O.OO – □□□□/D□□	14.00~14.99	38
KGDS O.OO – □□□□/D□□	15.00~15.99	39
KGDS O.OO – □□□□/D□□	16.00~16.99	39
KGDS O.OO – □□□□/D□□	17.00~17.99	40
KGDS O.OO – □□□□/D□□	18.00~18.99	41
KGDS O.OO – □□□□/D□□	19.00~19.99	41
KGDS O.OO – □□□□/D□□	20.00~20.99	44
KGDS O.OO – □□□□/D□□	21.00~21.99	46
KGDS O.OO – □□□□/D□□	22.00~22.99	49
KGDS O.OO – □□□□/D□□	23.00~23.99	51
KGDS O.OO – □□□□/D□□	24.00~24.99	52
KGDS O.OO – □□□□/D□□	25.00~25.99	54
KGDS O.OO – □□□□/D□□	26.00~26.99	54
KGDS O.OO – □□□□/D□□	27.00~27.99	54
KGDS O.OO – □□□□/D□□	28.00~28.99	54
KGDS O.OO – □□□□/D□□	29.00~29.99	56
KGDS O.OO – □□□□/D□□	30.00~30.99	59
KGDS O.OO – □□□□/D□□	31.00~31.99	61
KGDS O.OO – □□□□/D□□	32.00~32.99	61

※ 주문시 전장 및 드라이버 번호(또는 도면 첨부)를 표기

제작 가능 전장

형 번	드릴직경	제작 가능 전장				
		250mm	500mm	1000mm	1500mm	2000mm
KGDS	3.00 ~ 3.49	○	○	○		
	3.50 ~ 32.99	○	○	○	○	○

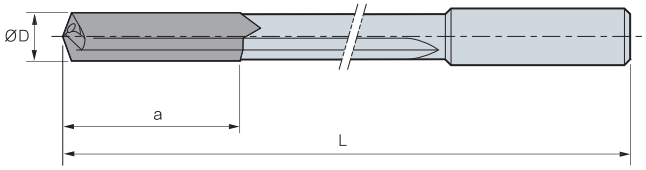
건드릴 - KGDT

트윈 립 타입

절삭조건 p.464

• 공구직경공차

형번 호칭 범례	
○.○○	건 드릴직경
□□□□	전장
D□□	드라이버 규격



(mm)

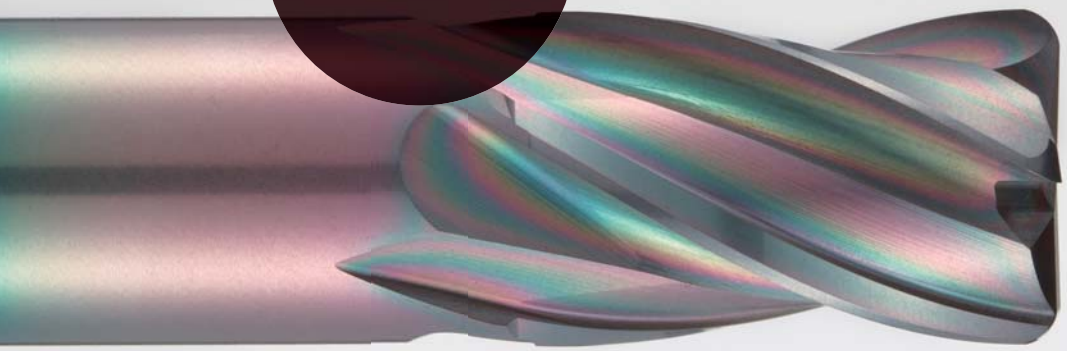
형 번	ØD	a
KGDT ○.○○ – □□□□ / **D**□□	8.00~8.49	38
KGDT ○.○○ – □□□□ / **D**□□	8.50~8.99	38
KGDT ○.○○ – □□□□ / **D**□□	9.00~8.49	40
KGDT ○.○○ – □□□□ / **D**□□	9.50~9.99	40
KGDT ○.○○ – □□□□ / **D**□□	10.00~10.49	40
KGDT ○.○○ – □□□□ / **D**□□	10.50~10.99	40
KGDT ○.○○ – □□□□ / **D**□□	11.00~11.49	45
KGDT ○.○○ – □□□□ / **D**□□	11.50~11.99	45
KGDT ○.○○ – □□□□ / **D**□□	12.00~12.49	45
KGDT ○.○○ – □□□□ / **D**□□	12.50~12.99	48
KGDT ○.○○ – □□□□ / **D**□□	13.00~13.99	48
KGDT ○.○○ – □□□□ / **D**□□	14.00~14.99	48
KGDT ○.○○ – □□□□ / **D**□□	15.00~15.99	48
KGDT ○.○○ – □□□□ / **D**□□	16.00~16.99	50
KGDT ○.○○ – □□□□ / **D**□□	17.00~17.99	50
KGDT ○.○○ – □□□□ / **D**□□	18.00~18.99	50
KGDT ○.○○ – □□□□ / **D**□□	19.00~19.99	50
KGDT ○.○○ – □□□□ / **D**□□	20.00~20.99	55
KGDT ○.○○ – □□□□ / **D**□□	21.00~21.99	55
KGDT ○.○○ – □□□□ / **D**□□	22.00~22.99	55
KGDT ○.○○ – □□□□ / **D**□□	23.00~23.99	60

※주문시 전장 및 드라이버 번호(또는 도면 첨부)를 표기

제작 가능 전장

형 번	드릴직경	제작 가능 전장				
		250mm	500mm	1000mm	1500mm	2000mm
KGDT	8.00 ~ 23.99	○	○	○		

PART 3



- Reamer
- Chamfer
- Thread

Product details

Technical information for Reamer / Chamfer / Thread

Reamer

Chucking / Machine Reamer [척킹/머신 리머] **314**

PCD Reamer [PCD 리머] **316**

Cermet Reamer [써메트 리머] **317**

Broach Reamer [브로치 리머] **318**

Chamfer

Chamfer Tool [챔퍼툴] **319**

Counter Sink [카운터싱크] **322**

Thread

Thread Mill **326**

TAP **348**





Reamer / Chamfer / Thread

Reamer / Chamfer

품목	형번		형 상	공구직경 (Ø)	가공깊이	페이지
Reamer (리머)	척킹/머신 리머	**SCRS**		Ø5.0 ~ Ø20.0	2D ~ 3D	314
		SCRH		Ø5.0 ~ Ø20.0	2D ~ 3D	314
		TCRS		Ø7.0 ~ Ø30.0	2D ~ 3D	315
		TMRS		Ø7.0 ~ Ø30.0	3D ~ 5D	315
	PCD 리머	**PDR**		Ø5.0 ~ Ø20.0	3D ~ 5D	316
	써메트 리머	**KCR**		Ø6.0 ~ Ø30.0	3D ~ 7D	317
	브로치 리머	**HBRE**		Ø3.0 ~ Ø25.0	3D ~ 7D	318
Chamfer (챔퍼)	챔퍼툴	**CET**		Ø3.0 ~ Ø16.0	-	319
		CCT		Ø3.0 ~ Ø12.0	-	320
	카운터싱크	**CSPC**		Ø6.0 ~ Ø20.0	-	322
		CSNC		Ø10.0 ~ Ø30.0	-	322
		CSNC		Ø10.0 ~ Ø30.0	-	323
		CSHC		Ø10.0 ~ Ø30.0	-	323
		CSPH		Ø6.3 ~ Ø25.0	-	324
		CSNH		Ø10.0 ~ Ø50.0	-	324
		CSNH		Ø10.0 ~ Ø50.0	-	325
		CSHH		Ø10.0 ~ Ø50.0	-	325

Tap

Tap 구분			형상	재종	규격	페이지
Carbide Tap (초경 탭)	**ST**	**스트레이트 탭** (Straight Tap)		FN30T	M3~M12	350
				PC10T	M3~M12	350
				PC20T	M3~M12	350
	SP	**스파이럴 탭** (Spiral Tap)		FN30T	M3~M12	351
				PC10T	M3~M12	351
	RT	**롤 탭** (Roll Tap)		FN30T	M3~M12	352
				PC10T	M3~M12	352
	SR	**스파이럴 롤 탭** (Spiral Roll Tap)		FN30T	M3~M6	353
				PC10T	M3~M6	353
HSS Tap (하이스 탭)	**ST**	**스트레이트 탭** (Straight Tap)		HN30T	M3~M20	354
				HC20T	M3~M20	354
				HC10T	M3~M20	354
				HH30T	M3~M20	354
	PT	**포인트 탭** (Point Tap)		HN30T	M3~M20	355
				HC20T	M3~M20	355
				HC10T	M3~M20	355
				HH30T	M3~M20	355
	SP	**스파이럴 탭** (Spiral Tap)		HN30T	M3~M24	356
				HC20T	M3~M24	356
				HC10T	M3~M24	356
				HH30T	M3~M24	356
	RT	**롤 탭** (Roll Tap)		HN30T	M3~M12	357
				HC20T	M3~M12	357
				HC10T	M3~M12	357
	SR	**스파이럴 롤 탭** (Spiral Roll Tap)		HN30T	M3~M12	358
				HC20T	M3~M12	358
				HC10T	M3~M12	358

Chucking / Machine Reamer

SCRS

척킹 리머

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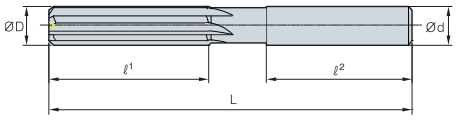


그림 1

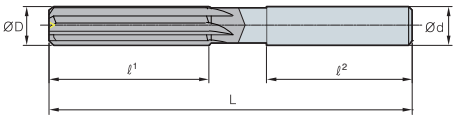


그림 2

(mm)

형 번	날수	ØD	Ød	ℓ1	ℓ2	L	그림
SCRS 050S	4	5.0	6	20	40	100	1
SCRS 060S	4	6.0	6	20	40	115	1
SCRS 070S	4	7.0	8	20	40	125	1
SCRS 080S	4	8.0	8	20	40	135	1
SCRS 090S	4	9.0	10	20	45	140	1
SCRS 100B	4	10.0	10	25	50	145	2
SCRS 110B	4	11.0	12	25	50	150	2
SCRS 120B	4	12.0	12	25	50	160	2
SCRS 130B	4	13.0	16	25	50	165	2
SCRS 140B	6	14.0	16	25	50	170	2
SCRS 150B	6	15.0	16	30	50	180	2
SCRS 160B	6	16.0	16	30	50	190	2
SCRS 180B	6	18.0	20	30	55	210	2
SCRS 200B	6	20.0	20	40	60	230	2

※ SCRS___S : Solid 타입, SCRS___B : Brazing 타입

SCRH

척킹 리머

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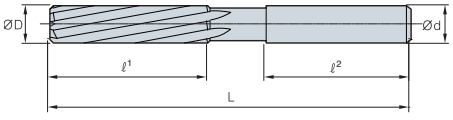


그림 1

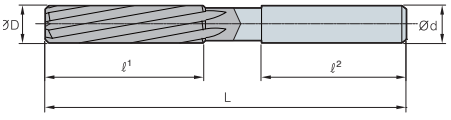


그림 2

(mm)

형 번	날수	ØD	Ød	ℓ1	ℓ2	L	그림
SCRH 050S	4	5.0	6	20	40	100	1
SCRH 060S	4	6.0	6	20	40	115	1
SCRH 070S	4	7.0	8	20	40	125	1
SCRH 080S	4	8.0	8	20	40	135	1
SCRH 090S	4	9.0	10	20	45	140	1
SCRH 100B	4	10.0	10	25	50	145	2
SCRH 110B	4	11.0	12	25	50	150	2
SCRH 120B	4	12.0	12	25	50	160	2
SCRH 130B	4	13.0	16	25	50	165	2
SCRH 140B	6	14.0	16	25	50	170	2
SCRH 150B	6	15.0	16	30	50	180	2
SCRH 160B	6	16.0	16	30	50	190	2
SCRH 180B	6	18.0	20	30	55	210	2
SCRH 200B	6	20.0	20	40	60	230	2

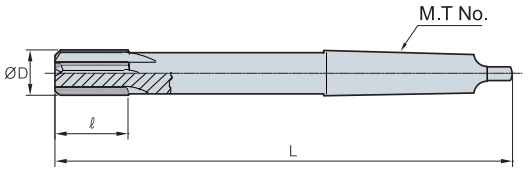
※ SCRS___S : Solid 타입, SCRS___B : Brazing 타입

TCRS

척킹 리머



절삭조건
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(mm)

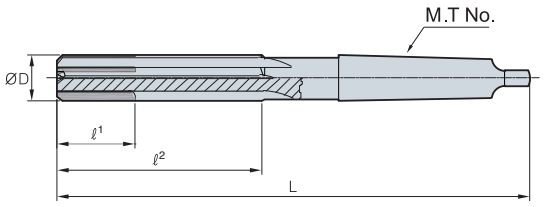
형 번	날수	ØD	ℓ	L	M.T No.
TCRS 070	4	7.0	20	150	1
TCRS 080	4	8.0	20	150	1
TCRS 090	4	9.0	20	160	1
TCRS 100	4	10.0	25	160	1
TCRS 110	4	11.0	25	170	1
TCRS 120	4	12.0	25	170	1
TCRS 130	4	13.0	25	180	1
TCRS 140	6	14.0	25	190	1
TCRS 150	6	15.0	30	200	2
TCRS 160	6	16.0	30	200	2
TCRS 180	6	18.0	30	220	2
TCRS 200	6	20.0	40	230	2
TCRS 250	6	25.0	40	260	3
TCRS 280	8	28.0	40	270	3
TCRS 300	8	30.0	50	290	3

TMRS

머신 리머



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(mm)

형 번	날수	ØD	ℓ1	ℓ2	L	M.T No.
TMRS 070	4	7.0	60	60	150	1
TMRS 080	4	8.0	70	70	150	1
TMRS 090	4	9.0	70	70	160	1
TMRS 100	4	10.0	75	75	170	1
TMRS 110	4	11.0	75	75	170	1
TMRS 120	4	12.0	80	40	180	1
TMRS 130	4	13.0	85	40	190	1
TMRS 140	6	14.0	90	45	210	1
TMRS 150	6	15.0	90	45	215	2
TMRS 160	6	16.0	100	50	220	2
TMRS 180	6	18.0	105	50	225	2
TMRS 200	6	20.0	120	50	240	2
TMRS 250	6	25.0	130	50	270	3
TMRS 280	8	28.0	140	50	280	3
TMRS 300	8	30.0	150	50	290	3

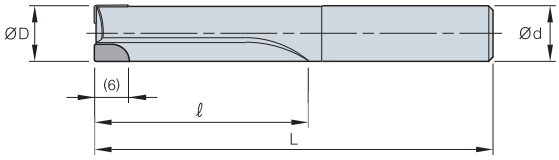
PCD Reamer

PDR

PCD 리머

절삭조건
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(mm)

형 번	날수	ØD	Ød	ℓ	L
PDR 2050	2	5.0	6	30	65
PDR 2060	2	6.0	6	40	75
PDR 2070	2	7.0	8	40	75
PDR 2080	2	8.0	8	40	75
PDR 2090	2	9.0	10	40	85
PDR 2100	2	10.0	10	40	85
PDR 2120	2	12.0	12	50	95
PDR 2140	2	14.0	16	50	95
PDR 2150	2	15.0	16	50	100
PDR 4160	4	16.0	16	50	100
PDR 4180	4	18.0	20	60	110
PDR 4200	4	20.0	20	60	110

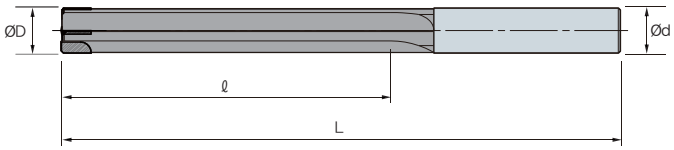
Cermet Reamer

KCR

써메트 리머 - 표준타입

절삭조건
p.465



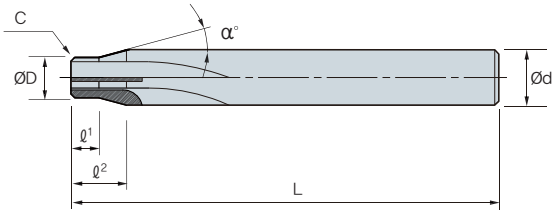


(mm)

형 번	날수	ØD	Ød	ℓ	L
KCR 060~079-25-70L	2	6.0~7.9	8	25	70
KCR 080~099-035-90L	2	8.0~9.9	10	35	90
KCR 100~119-050-100L	4	10.0~11.9	12	50	100
KCR 120~159-060-110L	4	12.0~15.9	12	60	110
KCR 160~199-060-110L	4	16.0~19.9	16	60	110
KCR 200~259-060-110L	4	20.0~25.9	20	60	110
KCR 260~300-070-130L	4	26.0~30.0	25	70	130

※ 플루트(ℓ1) 및 전장은 조정 가능하며 최대 전장은 150mm 이내로 적용 바랍니다.

스페셜 타입



(mm)

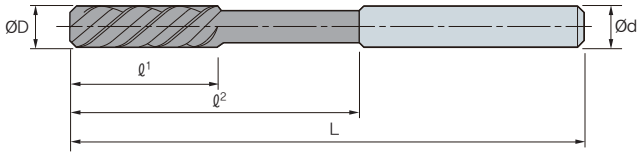
형 번	날수	ØD	Ød	ℓ1	ℓ2	L	α°
KCR□□□~□□□-□□□L	2~4	8.0~25.9	12~30	7~18	2~15	70	10°~ 60°

Broach Reamer

HBRE

브로치 리머





(mm)

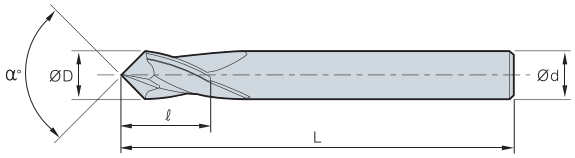
형 번	날수	ØD	Ød	ℓ1	ℓ2	L	타입
HBRE 030	3	3.0	3	20	40	70	Solid
HBRE 040	3	4.0	4	25	40	70	Solid
HBRE 060	4	6.0	6	30	50	80	Solid
HBRE 080	4	8.0	8	30	60	100	Solid
HBRE 100	4	10.0	10	30	60	100	Solid
HBRE 120	4	12.0	12	40	70	120	Top Solid
HBRE 160	6	16.0	16	40	80	130	Top Solid
HBRE 200	6	20.0	20	50	90	150	Top Solid
HBRE 250	6	25.0	25	50	90	150	Top Solid

Chamfer Tool

CET

챔퍼툴





(mm)

형 번	ØD	Ød	ℓ	L	α°
CET060 030	3.0	3	5.5	50	60°
CET060 040	4.0	4	7	50	
CET060 060	6.0	6	10	60	
CET060 080	8.0	8	13	70	
CET060 100	10.0	10	16	70	
CET060 120	12.0	12	18	80	
CET060 160	16.0	16	24	100	
CET090 030	3.0	3	5.5	50	90°
CET090 040	4.0	4	7	50	
CET090 060	6.0	6	10	60	
CET090 080	8.0	8	13	70	
CET090 100	10.0	10	16	70	
CET090 120	12.0	12	18	80	
CET090 160	16.0	16	24	100	
CET120 030	3.0	3	5.5	50	120°
CET120 040	4.0	4	7	50	
CET120 060	6.0	6	10	60	
CET120 080	8.0	8	13	70	
CET120 100	10.0	10	16	70	
CET120 120	12.0	12	18	80	
CET120 160	16.0	16	24	100	

Chamfer Tool

CCT 챔퍼툴



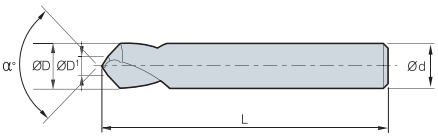


그림 1

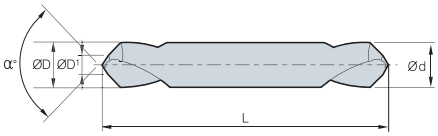


그림 2

(mm)

형 번	ØD = Ød	ØD1	L	α°	그림
CCT060 030	3.0	1.0	40	60°	1
CCT060 040	4.0	1.5	40		
CCT060 060	6.0	2.0	50		
CCT060 080	8.0	2.5	60		
CCT060 100	10.0	3.0	70		
CCT060 120	12.0	4.0	80		
CCT060 160	16.0	5.0	100		
CCT060T 030	3.0	1.0	40		2
CCT060T 040	4.0	1.5	40		
CCT060T 060	6.0	2.0	50		
CCT060T 080	8.0	2.5	60		
CCT060T 100	10.0	3.0	70		
CCT060T 120	12.0	4.0	80		
CCT060T 160	16.0	5.0	100		
CCT060T 030L	3.0	1.0	100		
CCT060T 040L	4.0	1.5	100		
CCT060T 060L	6.0	2.0	100		
CCT060T 080L	8.0	2.5	120		
CCT060T 100L	10.0	3.0	120		
CCT060T 120L	12.0	4.0	150		
CCT090 030	3.0	1.0	40	90°	1
CCT090 040	4.0	1.5	40		
CCT090 060	6.0	2.0	50		
CCT090 080	8.0	2.5	60		
CCT090 100	10.0	3.0	70		
CCT090 120	12.0	4.0	80		
CCT090 160	16.0	5.0	100		
CCT090T 030	3.0	1.0	40		2
CCT090T 040	4.0	1.5	40		
CCT090T 060	6.0	2.0	50		
CCT090T 080	8.0	2.5	60		
CCT090T 100	10.0	3.0	70		
CCT090T 120	12.0	4.0	80		
CCT090T 160	16.0	5.0	100		
CCT090T 030L	3.0	1.0	100		
CCT090T 040L	4.0	1.5	100		
CCT090T 060L	6.0	2.0	100		
CCT090T 080L	8.0	2.5	120		
CCT090T 100L	10.0	3.0	120		
CCT090T 120L	12.0	4.0	150		
CCT120 030	3.0	1.0	40	120°	1
CCT120 040	4.0	1.5	40		
CCT120 060	6.0	2.0	50		
CCT120 080	8.0	2.5	60		

CCT

챔퍼툴



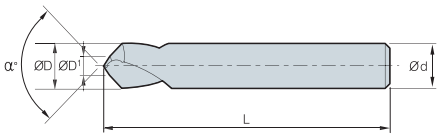


그림 1

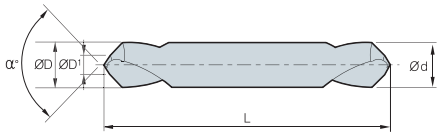
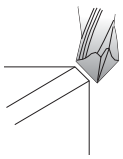
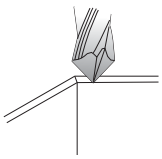
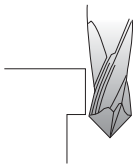
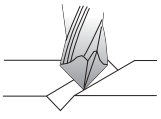
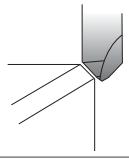
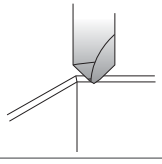
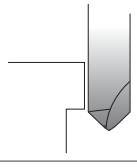
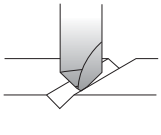


그림 2

(mm)

형 번	ØD = Ød	ØD¹	L	α°	그림
CCT120 100	10.0	3.0	70	120°	1
CCT120 120	12.0	4.0	80		
CCT120 160	16.0	5.0	100		
CCT120T 030	3.0	1.0	40	120°	2
CCT120T 040	4.0	1.5	40		
CCT120T 060	6.0	2.0	50		
CCT120T 080	8.0	2.5	60		
CCT120T 100	10.0	3.0	70		
CCT120T 120	12.0	4.0	80		
CCT120T 160	16.0	5.0	100		
CCT120T 030L	3.0	1.0	100		
CCT120T 040L	4.0	1.5	100		
CCT120T 060L	6.0	2.0	100		
CCT120T 080L	8.0	2.5	120		
CCT120T 100L	10.0	3.0	120		
CCT120T 120L	12.0	4.0	150		

CET/CCT 가공사례

구 분	센터링 (Centering)	홀챔퍼링 (Hole Chamfering)	챔퍼링(외측) (Chamfering)	챔퍼링(내측) (Chamfering)	사이드 밀링 (Side milling)	슬로트 밀링 (Slot milling)
가공사례 (CET)						
60°	×	●	●	● ~ ▲	●	×
90°	▲	●	●	●	●	● ~ ▲
120°	●	●	●	●	●	●
가공사례 (CCT)						
60°	●	●	● ~ ▲	▲ ~ ×	×	×
90°	●	●	● ~ ▲	▲ ~ ×	×	×
120°	●	●	●	●	×	●

Counter Sink

CSPC 3000

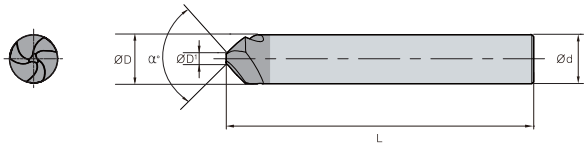
카운터싱크



3 | Unequal Division /Lead | 재종 PC40T | 절삭조건 p.466

• 공구직경공차

ØD		Ød
전 규격	±0.5mm	h6



(mm)

형 번	ØD	Ød	ØD1	L	α°
CSPC 3060-050	6.0	6	1.5	50	90°
CSPC 3080-060	8.0	8	2	60	90°
CSPC 3100-070	10.0	10	2.5	70	90°
CSPC 3120-075	12.0	12	2.8	75	90°
CSPC 3160-080	16.0	16	3.2	80	90°
CSPC 3200-090	20.0	20	3.5	90	90°

CSNC 3000

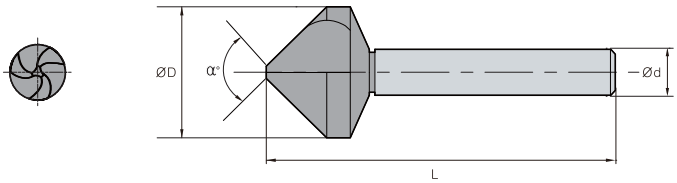
카운터싱크



3 | Straight Type | 재종 PC20T | 절삭조건 p.466

• 공구직경공차

ØD		Ød
전 규격	±1.0mm	h9



(mm)

형 번	ØD	Ød	가공범위	L	α°
CSNC 3100-047	10.0	6	2.0~9.0	47	90°
CSNC 3150-053	15.0	8	3.0~14.0	53	90°
CSNC 3200-057	20.0	10	4.0~19.0	57	90°
CSNC 3250-067	25.0	12	5.0~24.0	67	90°
CSNC 3300-075	30.0	12	6.0~29.0	75	90°

※상기 표준규격 外 Order made 제작 가능함.

CSNC 1000

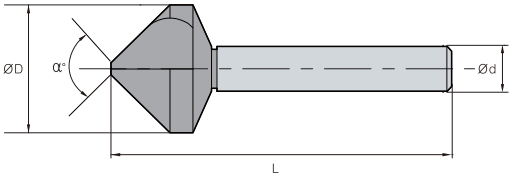
카운터싱크



1 | Straight Type | 재종 PC20T | 절삭조건 p.466

• 공구직경공차

ØD		Ød
전 규격	±1.0mm	h9



(mm)

형 번	ØD	Ød	가공범위	L	α°
CSNC 1100-048	10.0	6	2.0~9.0	48	90°
CSNC 1150-054	15.0	8	2.0~14.0	54	90°
CSNC 1200-059	20.0	10	2.0~19.0	59	90°
CSNC 1250-069	25.0	12	3.0~24.0	69	90°
CSNC 1300-077	30.0	12	4.0~29.0	77	90°

CSHC 1000

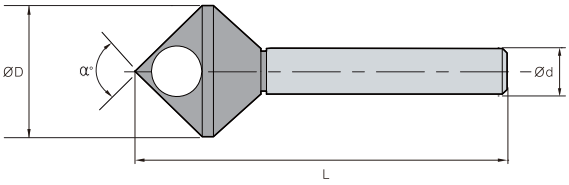
카운터싱크



1 | Hole Type | 재종 PC20T | 절삭조건 p.466

• 공구직경공차

ØD		Ød
전 규격	±1.0mm	h9



(mm)

형 번	ØD	Ød	가공범위	L	α°
CSHC 1100-045	10.0	6	4.0~8.0	45	90°
CSHC 1150-055	15.0	8	5.0~12.0	55	90°
CSHC 1200-070	20.0	10	8.0~15.0	70	90°
CSHC 1250-075	25.0	12	10.0~20.0	75	90°
CSHC 1300-085	30.0	12	12.0~25.0	85	90°

※상기 표준규격 外 Order made 제작 가능함.

Chamfer Counter Sink

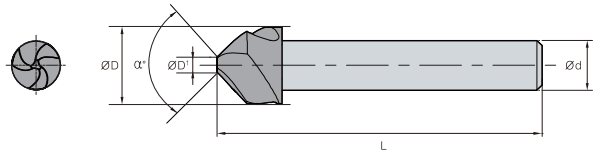
CSPH3000 카운터싱크



3 | Unequal Division /Lead | 재종 HC40T | 절삭조건 | p.466

• 공구직경공차

ØD		Ød
전 규격	±0.5mm	h8



(mm)

형 번	ØD	Ød	ØD1	L	α°
CSPH 3060-045	6.3	5	1.5	45	90°
CSPH 3080-050	8.3	6	2.0	50	90°
CSPH 3100-050	10.4	6	2.5	50	90°
CSPH 3120-056	12.4	8	2.8	56	90°
CSPH 3160-060	16.5	10	3.2	60	90°
CSPH 3200-063	20.5	10	3.5	63	90°
CSPH 3250-068	25.0	10	3.8	68	90°

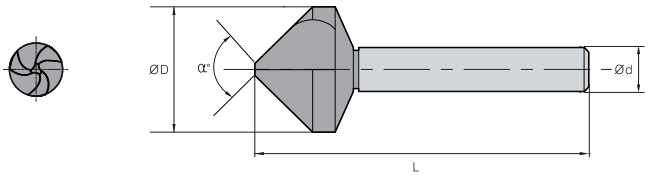
CSNH 3000 카운터싱크



3 | Straight Type | 재종 HC10T HC20T | 절삭조건 | p.467

• 공구직경공차

ØD		Ød
전 규격	±1.0mm	h9
	±1°	



(mm)

형 번	ØD	Ød	가공범위	L	α°
CSNH 3100-050	10	6	3~9	50	90°
CSNH 3150-055	15	8	3~14	55	90°
CSNH 3200-060	20	10	4~19	60	90°
CSNH 3250-068	25	12	5~24	68	90°
CSNH 3300-079	30	12	6~29	79	90°
CSNH 3350-085	35	12	7~34	85	90°
CSNH 3400-090	40	12	8~39	90	90°
CSNH 3450-095	45	16	9~44	95	90°
CSNH 3500-100	50	16	12~49	100	90°

CSNH 1000

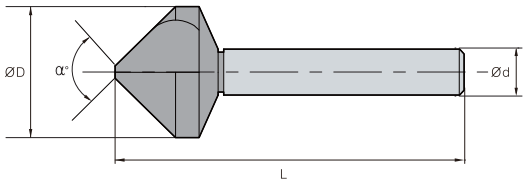
카운터싱크



1 | Straight Type | 재종 HC10T HC20T | 절삭조건 | p.467

• 공구직경공차

ØD		Ød
전 규격	±1.0mm	h9



(mm)

형 번	ØD	Ød	가공범위	L	α°
CSNH 1100-070	10	6	2~9	50	90°
CSNH 1150-075	15	8	2~14	55	90°
CSNH 1200-090	20	10	2~19	60	90°
CSNH 1250-080	25	12	2~24	70	90°
CSNH 1300-090	30	12	6~29	75	90°
CSNH 1350-080	35	12	7~34	80	90°
CSNH 1400-085	40	12	8~39	85	90°
CSNH 1450-087	45	12	9~44	87	90°
CSNH 1500-090	50	12	12~49	90	90°

CSHH 1000

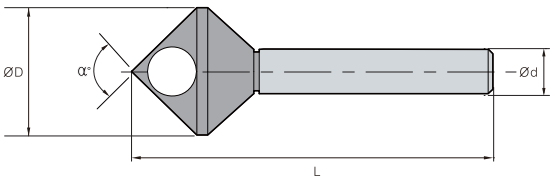
카운터싱크



1 | Hole Type | 재종 HC10T HC20T | 절삭조건 | p.467

• 공구직경공차

ØD		Ød
전 규격	±1.0mm	h9



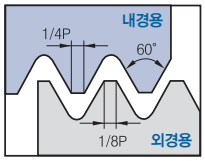
(mm)

형 번	ØD	Ød	가공범위	L	α°
CSHH 1100-070	10	6	3~9	50	90°
CSHH 1150-075	15	8	5~12	60	90°
CSHH 1200-090	20	10	8~15	65	90°
CSHH 1250-080	25	12	10~20	74	90°
CSHH 1300-090	30	12	12~25	85	90°
CSHH 1350-095	35	16	14~30	95	90°
CSHH 1400-105	40	16	16~35	105	90°
CSHH 1450-120	45	16	18~40	120	90°
CSHH 1500-130	50	16	20~45	130	90°

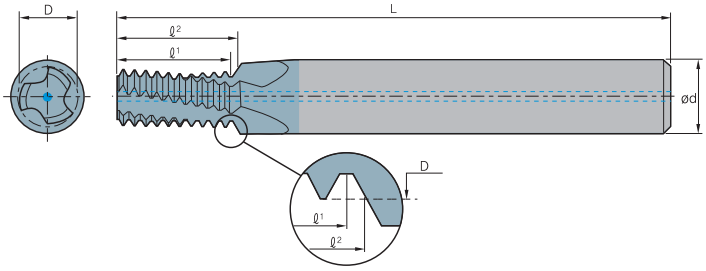
Thread Mill

ISO 메트릭

내부급유식 나사가공 엔드밀/헬리컬 플루트



내경용
규격 : R262 (DIN 13)
공차 : 6H



(ℓ2 ≤ 1.5 × 나사경)

나 사		피치	형 번		PC9070M	치수 (mm)					날수	나사산수	*보어경
보통나사	가는나사	(mm)				Ød	D	L	ℓ1	ℓ2	z	zt	mm
M3×0.5	M3.5~M16×0.5	0.50	STMHC	04024L04-I0.50ISO		4	2.40	45	4.5	4.7	3	9	2.5
M4×0.7	-	0.70		04031L06-I0.70ISO		4	3.15	45	6.3	6.6	3	9	3.3
M5×0.8	-	0.80		04039L07-I0.80ISO		4	3.90	45	7.2	7.6	3	9	4.2
M6×1.0	M8~M40×1.0	1.00		06048L09-I1.00ISO	●	6	4.80	57	9.0	9.5	3	9	5.0
M8×1.25	-	1.25		08065L13-I1.25ISO		8	6.50	61	12.5	13.1	3	10	6.8
M10×1.5	M12~M48×1.5	1.50		10082L15-I1.50ISO		10	8.20	73	15.0	15.7	3	10	8.5
M12×1.75	-	1.75		10099L18-I1.75ISO		10	9.90	73	17.5	18.4	4	10	10.2
M14×2.0	M17~M80×2.0	2.00		12116L21-I2.00ISO		12	11.60	73	20.0	21.0	4	10	12.0
M16×2.0	M17~M80×2.0	2.00		14136L25-I2.00ISO		14	13.60	92	24.0	25.0	4	12	14.0

(ℓ2 ≤ 2 × 나사경)

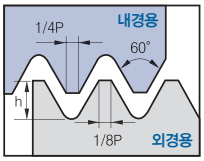
나 사		피치	형 번		PC9070M	치수 (mm)					날수	나사산수	*보어경
보통나사	가는나사	(mm)				Ød	D	L	ℓ1	ℓ2	z	zt	mm
M3×0.5	M3.5~M16×0.5	0.50	STMHC	04024L06-I0.50ISO		4	2.40	45	6.0	6.2	3	12	2.5
-	M4×0.5	0.50		04032L08-I0.50ISO		4	3.20	45	8.0	8.2	3	16	3.5
-	M5×0.5	0.50		06042L10-I0.50ISO		6	4.20	57	10.0	10.2	3	20	4.5
M4×0.7	-	0.70		04031L08-I0.70ISO		4	3.15	45	8.4	8.7	3	12	3.3
-	M6×0.75	0.75		06050L12-I0.75ISO		6	5.00	57	12.0	12.4	3	16	5.3
M5×0.8	-	0.80		04039L10-I0.80ISO		4	3.90	45	10.4	10.8	3	13	4.2
M6×1.0	M8~M40×1.0	1.00		06048L12-I1.00ISO	●	6	4.80	57	12.0	12.5	3	12	5.0
-	M8×1.0	1.00		08067L16-I1.00ISO		8	6.70	61	16.0	16.5	3	16	7.0
-	M10×1.0	1.00		10087L20-I1.00ISO		10	8.70	73	20.0	20.5	3	20	9.0
-	M12×1.0	1.00		12107L24-I1.00ISO	●	12	10.70	73	24.0	24.5	4	24	11.0
M8×1.25	-	1.25		08065L16-I1.25ISO	●	8	6.50	61	16.2	16.9	3	13	6.8
-	M10×1.25	1.25		10085L20-I1.25ISO	●	10	8.50	73	20.0	20.6	3	16	8.8
M10×1.5	M12~M48×1.5	1.50		10082L20-I1.50ISO	●	10	8.20	73	19.5	20.2	3	13	8.5
-	M12×1.5	1.50		10099L24-I1.50ISO	●	10	9.90	73	24.0	24.7	4	16	10.5
-	M14×1.5	1.50		12119L29-I1.50ISO		12	11.90	80	28.5	29.2	4	19	12.5
-	M16×1.5	1.50		14139L32-I1.50ISO	●	14	13.90	92	31.5	32.2	4	21	14.5
M12×1.75	-	1.75		10099L25-I1.75ISO		10	9.90	73	24.5	25.4	4	14	10.2
M14×2.0	M17~M80×2.0	2.00		12116L29-I2.00ISO		12	11.60	80	28.0	29.0	4	14	12.0
M16×2.0	M17~M80×2.0	2.00		14136L33-I2.00ISO		14	13.60	92	32.0	33.0	4	16	14.0
M18×2.5	-	2.50		16148L36-I2.50ISO		16	14.80	92	35.0	36.2	4	14	15.5
M 20×2.5	-	2.50		18171L41-I2.50ISO		18	17.10	102	40.0	41.2	4	16	17.5
M 24×3.0	-	3.00		20199L49-I3.00ISO		20	19.90	102	48.0	49.5	4	16	21.0

* 보어경(Bore Diameter)은 가능한 최소나사경을 적용 * 최대나사길이 = $\ell 2 - \frac{\text{피치}}{4}$

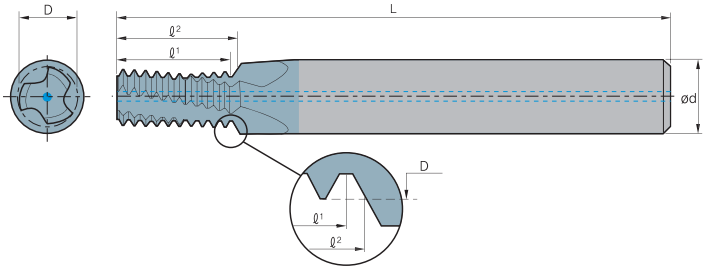
● : 재고 관리 형번

미국 유니파이 (UNC,UNF,UNEF)

내부급유식 나사가공 엔드밀/헬리컬 플루트



내경용
규격 : ANSI B1.1.74
공차 : 2B



(ℓ2≤1.5×나사경)

나사			피치	형번		PC9070M	치수 (mm)					날수	나사산수	*보어경
UNC	UNF	UNEF	(tpi)				Ød	D	L	ℓ1	ℓ2	z	zt	mm
No.10~24	5/16″,3/8″×24	9/16″~11/16″×24	24	STMHC	04035L07-I24UNC		4	3.58	45	7.4	7.9	3	7	3.8
No.10~24	5/16″,3/8″×24	9/16″~11/16″×24	24		06041L08-I24UNC		6	4.15	57	8.5	9.0	3	8	4.5
1/4″×20	7/16″,1/2″×20	3/4″~1″×20	20		06048L09-I20UNC		6	4.88	57	8.9	9.5	3	7	5.2
5/16″×18	9/16″,5/8″×18	11/16″~1 11/16″×18	18		08061L11-I18UNC		8	6.15	61	11.3	12.0	3	8	6.5
3/8″×16	3/4″×16	-	16		08076L15-I16UNC		8	7.65	61	14.3	15.1	3	9	8.0
7/16″×14	7/8″×14	-	14		10090L17-I14UNC		10	9.00	73	16.3	17.2	3	9	9.3
1/2″×13	-	-	13		12104L20-I13UNC		12	10.35	73	19.5	20.5	4	10	10.8
9/16″×12	1″~1 1/2″×12	-	12		12118L22-I12UNC		12	11.80	73	21.2	22.2	4	10	12.3

(ℓ2≤2×나사경)

나사			피치	형번		PC9070M	치수 (mm)					날수	나사산수	*보어경
UNC	UNF	UNEF	(tpi)				Ød	D	L	ℓ1	ℓ2	z	zt	mm
-	No.10~32	No. 12~3/8″×32	32	STMHC	04038L09-I32UNF		4	3.80	45	9.5	9.9	3	12	4.0
-	-	No. 12~3/8″×32	32		06044L11-I32UNEF		6	4.40	57	11.1	11.5	3	14	4.7
-	No.12, 1/4″×28	7/16″; 1/2″×28	28		06043L11-I28UNF		6	4.30	57	10.9	11.3	3	12	4.6
-	1/4″×28	7/16″; 1/2″×28	28		06052L13-I28UNF		6	5.15	57	12.7	13.1	3	14	5.5
-	-	7/16″; 1/2″×28	28		10099L22-I28UNEF		10	9.90	73	21.8	22.2	3	24	10.2
No.10~24	5/16″, 3/8″×24	9/16″~11/16″×24	24		04035L10-I24UNC		4	3.58	45	9.5	10.0	3	9	3.8
No.12~24	5/16″, 3/8″×24	9/16″~11/16″×24	24		06041L11-I24UNC		6	4.15	57	10.6	11.1	3	10	4.5
-	5/16″, 3/8″×24	9/16″~11/16″×24	24		08066L16-I24UNF		8	6.68	61	15.9	16.4	3	15	6.8
-	3/8″×24	9/16″~11/16″×24	24		10082L19-I24UNF		10	8.20	73	19.0	19.6	3	18	8.5
-	-	9/16″~11/16″×24	24		14129L29-I24UNEF		14	12.90	92	28.6	29.1	4	27	13.2
1/4″×20	7/16″, 1/2″×20	3/4″~1″×20	20		06048L13-I20UNC		6	4.88	57	12.7	13.3	3	10	5.2
-	7/16″, 1/2″×20	3/4″~1″×20	20		10096L22-I20UNF		10	9.60	73	21.6	22.2	3	17	9.8
-	1/2″×20	3/4″~1″×20	20		12111L26-I20UNF		12	11.10	80	25.4	26.0	3	20	11.5
-	-	3/4″~1″×20	20		18174L38-I20UNEF		18	17.40	102	38.1	38.7	4	30	17.8
5/16″×18	9/16″, 5/8″×18	11/16″~1 11/16″×18	18		08061L16-I18UNC		8	6.15	61	15.5	16.2	3	11	6.5
-	9/16″, 5/8″×18	11/16″~1 11/16″×18	18		14125L28-I18UNF		14	12.50	92	28.2	28.9	4	20	12.8
-	5/8″×18	11/16″~1 11/16″×18	18		16141L31-I18UNF		16	14.10	92	31.0	31.7	4	22	14.5
3/8″×16	3/4″×16	-	16		08076L19-I16UNC		8	7.65	61	19.0	19.8	3	12	8.0
-	3/4″×16	-	16		18170L38-I16UNF		18	17.00	102	38.1	38.8	4	24	17.5
7/16″×14	7/8″×14	-	14		10090L22-I14UNC		10	9.00	73	21.8	22.7	3	12	9.3
-	7/8″×14	-	14		20199L44-I14UNF		20	19.90	102	43.5	44.4	4	24	20.5
1/2″×13	-	-	13		12104L26-I13UNC		12	10.35	80	25.4	26.4	4	13	10.8
9/16″×12	1″~1 1/2″×12	-	12		12118L28-I12UNC		12	11.80	80	27.5	28.6	4	13	12.3
-	1″~1 1/2″×12	-	12		20199L51-I12UNF		20	19.90	102	50.8	51.9	4	24	23.5
5/8″×11	-	-	11		14131L33-I11UNC		14	13.10	92	32.3	33.5	4	14	13.5
3/4″×10	-	-	10		16159L39-I10UNC		16	15.90	92	38.1	39.4	4	15	16.5
7/8″×9	-	-	9		20190L46-I9UNC		20	19.00	102	45.2	46.6	4	16	19.5
1″×8	-	-	8		20199L52-I8UNC		20	19.90	102	50.8	52.4	4	16	22.0

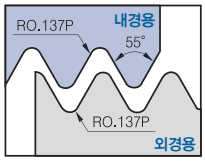
* 보어경(Bore Diameter)은 가능한 최소나사경을 적용 * 최대나사길이 = $\ell^2 - \frac{\text{피치}}{4}$

● : 재고 관리 형번

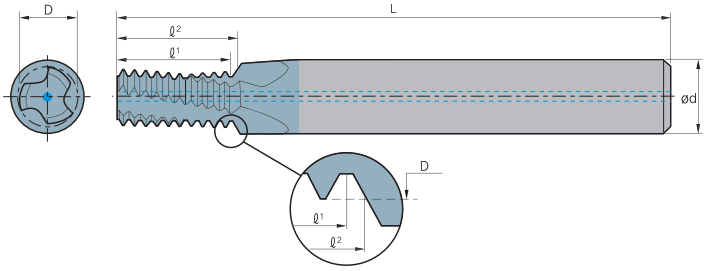
Thread Mill

휘트워드 (BSW,BSF)

내부급유식 나사가공 엔드밀/헬리컬 플루트



외경용/내경용
규격 : B.S.84 : 1956,
DIN 259, ISO228/1 : 1982
공차 : Medium class A



($\ell^2 \leq 2 \times$ 나사경)

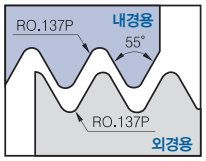
나사		피치	형번		PC9070M	치수 (mm)					날수	나사산수	*보어경
BSW	BSF	(tpi)				Ød	D	L	ℓ^1	ℓ^2	z	zt	mm
-	1/4″×26	26	STMHC	06050L13-EI26BSF		6	5.00	57	12.7	13.2	3	13	5.3
-	5/16″×22	22		08063L16-EI22BSF		8	6.35	61	16.2	16.7	3	14	6.7
1/4″×20	3/8″×20	20		06044L13-EI20BSW		6	4.45	57	12.7	13.3	3	10	5.0
-	3/8″×20	20		08076L19-EI20BSF		8	7.65	61	19.0	19.7	3	15	8.2
5/16″×18	7/16″×18	18		06058L16-EI18BSW		6	5.85	57	15.5	16.2	3	11	6.5
-	7/16″×18	18		10092L23-EI18BSF		10	9.20	73	22.6	23.3	3	16	9.7
3/8″×16	1/2″, 9/16″×16	16		08072L19-EI16BSW		8	7.20	61	19.0	19.8	3	12	7.9
-	1/2″, 9/16″×16	16		12105L26-EI16BSF		12	10.50	80	25.4	26.2	4	16	11.1
-	9/16″×16	16		14122L29-EI16BSF		14	12.15	92	28.6	29.4	4	18	12.6
7/16″×14	5/8″, 11/16″×14	14		10085L22-EI14BSW		10	8.50	73	21.8	22.7	3	12	9.2
-	5/8″, 11/16″×14	14		14134L31-EI14BSF		14	13.40	92	30.8	31.7	4	17	14.0
-	11/16″×14	14		16150L35-EI14BSF		16	15.00	92	34.5	35.4	4	19	15.6
1/2″×12	3/4″×12	12		10096L26-EI12BSW		10	9.65	73	25.4	26.5	3	12	10.5
9/16″×12	3/4″×12	12		12113L28-EI12BSW		12	11.25	80	27.5	28.6	4	13	12.1
-	3/4″×12	12		18162L39-EI12BSF		18	16.20	102	38.1	39.2	4	18	16.8
5/8″×11	7/8″×11	11		14126L33-EI11BSW		14	12.60	92	32.3	33.5	4	14	13.4
11/16″×11	-	11		16142L35-EI11BSW		16	14.20	92	34.6	35.8	4	15	15.0

* 보어경(Bore Diameter)은 가능한 최소나사경을 적용 * 최대나사길이 = $\ell^2 - \frac{\text{피치}}{4}$

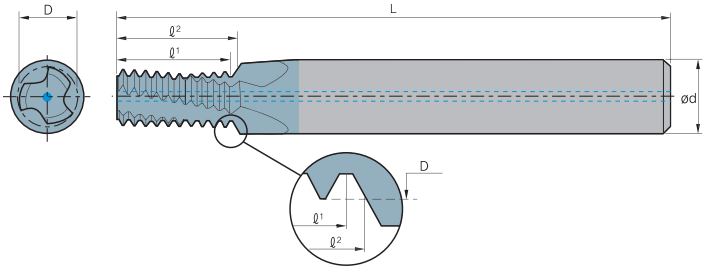
● : 재고 관리 형번

브리티쉬 표준 파이프 나사 BSP(G)

내부급유식 나사가공 엔드밀/헬리컬 플루트



외경용/내경용
규격 : B.S.2779:1956
공차 : Medium class



(ℓ² ≤ 1.5 × 나사경)

나 사 Standard	피치 (tpi)	형 번		PC9070M	치수 (mm) Ød	D	L	ℓ¹	ℓ²	날수 z	나사산수 zt	*보어경 mm
1/16″, 1/8″x28	28	STMHC	08064L12-EI28BSP		8	6.4	61	11.8	12.2	3	13	6.7
1/8″x28	28		10082L15-EI28BSP		10	8.2	73	14.5	15.0	3	16	8.7
1/4″, 3/8″x19	19		12110L20-EI19BSP		12	11.0	80	20.1	20.7	4	15	11.8
3/8″x19	19		16145L26-EI19BSP		16	15.2	92	25.4	26.1	4	19	15.2
1″-4″x11	11		20199L42-EI11BSP		20	30.7	102	41.6	42.7	4	18	30.7

(ℓ² ≤ 2 × 나사경)

나 사 Standard	피치 (tpi)	형 번		PC9070M	치수 (mm) Ød	D	L	ℓ¹	ℓ²	날수 z	나사산수 zt	*보어경 mm
1/16″, 1/8″x28	28	STMHC	08064L15-EI28BSP		8	6.4	61	11.8	15.9	3	13	6.7
1/8″x28	28		10082L19-EI28BSP		10	8.2	73	14.5	19.5	3	16	8.7
1/4″, 3/8″x19	19		12110L27-EI19BSP		12	11.0	80	20.1	27.4	4	15	11.8
3/8″x19	19		16145L34-EI19BSP		16	15.2	92	33.4	34.1	4	25	15.2
1/2″-7/8″x14	14		18179L42-EI14BSP		18	19.0	102	41.7	42.6	4	23	19.0

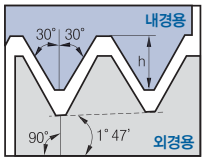
* 보어경(Bore Diameter)은 가능한 최소나사경을 적용 * 최대나사길이 = $\ell^2 - \frac{\text{피치}}{4}$

● : 재고 관리 형번

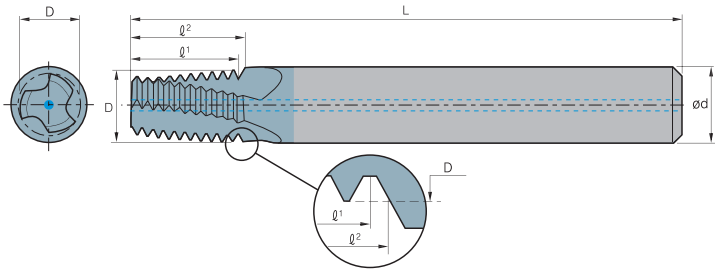
Thread Mill

내셔널 파이프 나사 (NPT)

내부급유식 나사가공 엔드밀/헬리컬 플루트



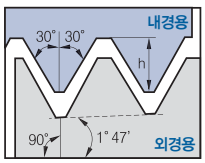
외경용/내경용
규격 : USAS B2.1:1968
공차 : Standard NPT



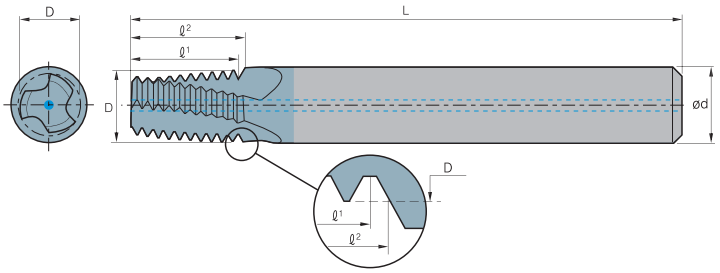
나 사 Standard	피치 (tpi)	형 번		PC9070M	치수 (mm) Ød	D	L	ℓ1	ℓ2	날수 z	나사산수 zt	*보어경 mm
1/16″×27	27.0	STMHC	06059L09-EI27NPT		6	5.90	57	9.4	9.9	3	10	6.3
1/8″×27	27.0		08076L09-EI27NPT		8	7.65	61	9.4	9.9	3	10	8.5
1/4″×18	18.0		10099L14-EI18NPT	●	10	9.90	73	14.1	14.8	3	10	11.1
3/8″×18	18.0		12111L14-EI18NPT		12	11.15	73	14.1	14.8	4	10	14.5
1/2″, 3/4″×14	14.0		16142L19-EI14NPT		16	14.25	92	18.1	19.0	4	10	17.7, 23.0
1″, 1 1/14, 1 1/2″, 2″×11.5	11.5		20196L23-EI11.5NPT		20	19.60	102	22.1	23.2	4	10	29.0, 37.7, 44.0, 56.0
2 1/2″×8 ; 3″×8	8.0		20196L33-EI8NPT		20	19.60	102	31.7	33.3	4	10	66.5, 82.1

내셔널 파이프 나사 파인피치(NPTF)

내부급유식 나사가공 엔드밀/헬리컬 플루트



외경용/내경용
규격 : ANSI 1.20.3-1976
공차 : Standard NPTF



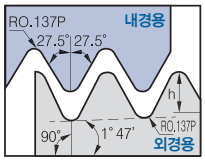
나 사 Standard	피치 (tpi)	형 번		PC9070M	치수 (mm) Ød	D	L	ℓ1	ℓ2	날수 z	나사산수 zt	*보어경 mm
1/16″×27	27.0	STMHC	06059L09-EI27NPTF	●	6	5.90	57	9.4	9.9	3	10	6.3
1/8″×27	27.0		08076L09-EI27NPTF		8	7.65	61	9.4	9.9	3	10	8.5
1/4″×18	18.0		10099L14-EI18NPTF		10	9.90	73	14.1	14.8	3	10	11.1
3/8″×18	18.0		12111L14-EI18NPTF		12	11.15	73	14.1	14.8	4	10	14.5
1/2″, 3/4″×14	14.0		16142L19-EI14NPTF		16	14.25	92	18.1	19.0	4	10	17.7, 23.4
1″, 1 1/14, 1 1/2″, 2″×11.5	11.5		20196L23-EI11.5NPTF		20	19.60	102	22.1	23.2	4	10	29.0, 37.7, 43.7, 55.6
2 1/2″×8 ; 3″×8	8.0		20196L33-EI8NPTF		20	19.60	102	31.7	33.3	4	10	66.3, 82.1

* 보어경(Bore Diameter)은 가능한 최소나사경을 적용 * 최대나사길이 = $\ell^2 - \frac{\text{피치}}{4}$

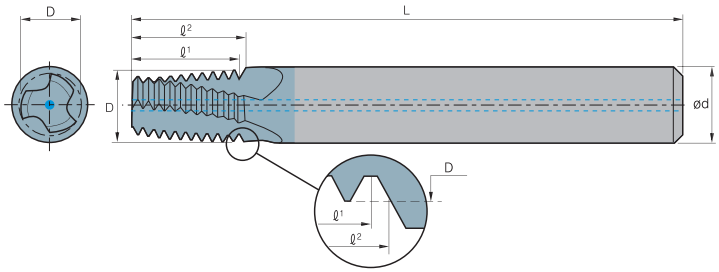
● : 재고 관리 형번

브리티쉬 표준 파이프 나사(BSPT)

내부급유식 나사가공 엔드밀/헬리컬 플루트



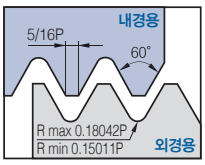
외경용/내경용
규격 : B.S.21:1985
공차 : Standard BSPT



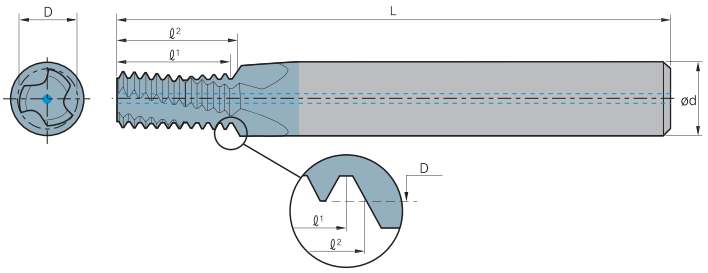
나 사 Standard	피치 (tpi)	형 번		PC9070M	치수 (mm) Ød	D	L	ℓ1	ℓ2	날수 z	나사산수 zt	*보어경 mm
1/16″×28	28	STMHC	06059L10-EI28BSPT		6	5.90	57	10.0	10.2	3	11	6.7
1/8″×28	28		08076L10-EI28BSPT		8	7.65	61	10.0	10.2	3	11	8.7
1/4″×19	19		10099L15-EI19BSPT		10	9.90	73	14.7	15.4	3	11	11.8
3/8″×19	19		12111L15-EI19BSPT		12	11.15	73	14.7	15.4	4	11	15.2
1/2″, 3/4″×14	14		16142L22-EI14BSPT		16	14.25	92	21.8	22.7	4	12	19.0
1″, 1 1/2″, 2″, 2 1/2″×11	11		20196L28-EI11BSPT		20	19.60	102	27.7	28.9	4	12	30.7

UNJ

내부급유식 나사가공 엔드밀/헬리컬 플루트



내경용
규격 : MIL-S-8879C
공차 : 3B



나 사 UNJC	UNJF	UNFEF/UNJ	피치 (tpi)	형 번		PC9070M	치수 (mm) Ød	D	L	ℓ1	ℓ2	날수 z	나사산수 zt	*보어경 mm
0.138″(#6)	0.190″(#10)	0.216(#12)/0.4375(7/16″)	32	STMHC	04027L07-I32UNJ		4	2.7	45	7.1	7.5	3	9	2.80
-	0.250″(1/4″)	0.4375″(7/16″)/0.5625″(9/16″)	28		06054L13-I28UNJ		6	5.4	57	12.7	13.1	3	14	5.60
0.190″(#10)	0.3125″(5/16″)	0.5625″(9/16″)/-	24		04037L09-I24UNJ		4	3.7	45	9.5	10.0	3	9	4.00
-	0.3125″(5/16″)	0.5625″(9/16″)/-	24		08067L15-I24UNJ		8	6.7	61	15.9	16.4	3	15	7.00
0.250″(1/4″)	0.4375″(7/16″)	0.750″(3/4″)/0.3125″(5/16″)	20		06050L12-I20UNJ		6	5.0	57	12.7	13.3	3	10	5.30
-	0.4375″(7/16″)	0.750″(3/4″)/0.5625″(9/16″)	20		10096L21-I20UNJ		10	9.6	73	21.6	22.2	4	17	10.00
0.3125″(5/16″)	0.5625″(9/16″)	1.0625″(1 1/16″)/-	18		08064L15-I18UNJ		8	6.4	61	15.5	16.2	3	11	6.75
0.375″(3/8″)	0.750″(3/4″)	-/0.4375″(7/16″)	16		08077L19-I16UNJ		8	7.7	61	19.1	19.8	3	12	8.10
0.4375″(7/16″)	0.875″(7/8″)	-	14		10092L21-I14UNJ		10	9.2	73	21.8	22.7	4	12	9.50
0.500″(1/2″)	-	-	13		10099L25-I13UNJ		10	9.9	73	25.4	26.4	4	13	11.00

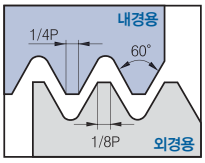
* 보어경(Bore Diameter)은 가능한 최소나사경을 적용 * 최대나사길이 = $\ell^2 - \frac{\text{피치}}{4}$

● : 재고 관리 형번

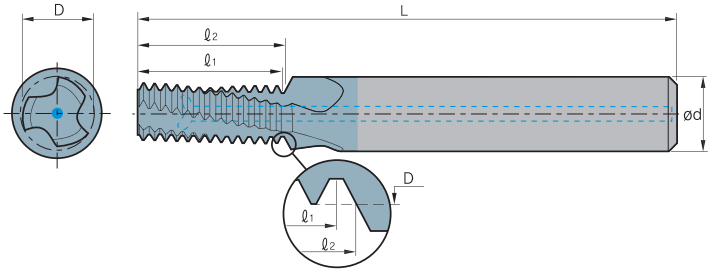
Thread Mill

ISO 메트릭

외부급유식 나사가공 엔드밀/헬리컬 플루트



내경용
규격 : R262 (DIN 13)
공차 : 6H

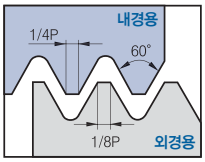


(ℓ≤2× 나사경)

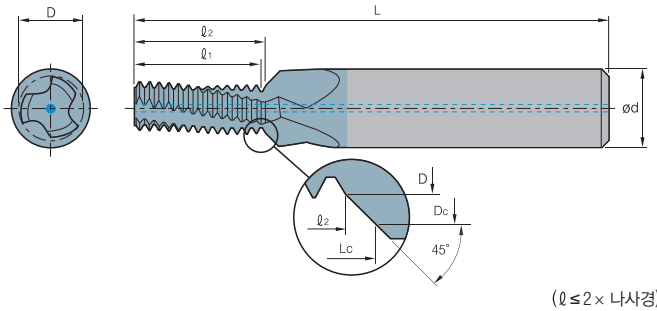
나 사		피치	형 번		PC9070M	치수 (mm)					날수	나사산수	*보어경
보통나사	가는나사	(mm)				Ød	D	L	ℓ1	ℓ2	z	zt	mm
M6×1.0	M8~M40×1.0	1.0	STMHCR	06048L12-I1.00ISO		6	4.8	57	12.0	12.5	3	12	5.0
	M10×1.0	1.0		10087L20-I1.00ISO		10	8.7	73	20.0	20.5	3	20	9.0
	M12×1.0	1.0		12107L24-I1.00ISO		12	10.7	73	24.0	24.5	4	24	11.0
M8×1.25		1.25		08065L16-I1.25ISO		8	6.5	64	16.3	16.9	3	13	6.8
M10×1.5	M12~M48×1.5	1.5		10082L20-I1.50ISO		10	8.2	73	19.5	20.3	3	13	8.5
	M12×1.5	1.5		10099L24-I1.50ISO		10	9.9	73	24.0	24.8	4	16	10.5
	M14×1.5	1.5		12119L29-I1.50ISO		12	11.9	84	28.5	29.3	4	19	12.5
	M16×1.5	1.5		14139L32-I1.50ISO		14	13.9	84	31.5	32.3	4	21	14.5
M12×1.75		1.75		10099L25-I1.75ISO		10	9.9	73	24.5	25.4	4	14	10.2

ISO 메트릭

외부급유식 나사가공 엔드밀/헬리컬 플루트



내경용
규격 : R262 (DIN 13)
공차 : 6H



(ℓ≤2× 나사경)

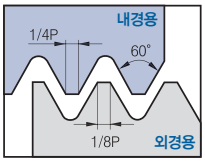
나 사		피치	형 번		PC9070M	치수 (mm)							날수	나사산수	*보어경
보통나사	가는나사	(mm)				Ød	D	Dc	L	ℓ1	ℓ2	Lc	z	zt	mm
M6×1.0	M8~M40×1.0	1.0	STMHCC	08048L12-I1.00ISO		8	4.8	6.3	61	12.0	12.5	13.3	3	12	5.0
	M10×1.0	1.0		12087L20-I1.00ISO		12	8.7	10.3	73	20.0	20.5	21.3	3	20	9.0
	M12×1.0	1.0		14107L24-I1.00ISO		14	10.7	12.3	80	24.0	24.5	25.3	4	24	11.0
M8×1.25		1.25		10065L16-I1.25ISO		10	6.5	8.3	73	16.3	16.9	17.8	3	13	6.8
M10×1.5	M12~M48×1.5	1.5		12082L20-I1.50ISO		12	8.2	10.3	80	19.5	20.3	21.3	3	13	8.5
	M12×1.5	1.5		14099L24-I1.50ISO		14	9.9	12.3	80	24.0	24.8	26.0	4	16	10.5
	M14×1.5	1.5		16119L29-I1.50ISO		16	11.9	14.3	92	28.5	29.3	30.5	4	19	12.5
	M16×1.5	1.5		18139L32-I1.50ISO		18	13.9	16.3	92	31.5	32.3	33.5	4	21	14.5
M12×1.75		1.75		14099L25-I1.75ISO		14	9.9	12.3	80	24.5	25.4	26.6	4	14	10.2

* 보어경(Bore Diameter)은 가능한 최소나사경을 적용 * 최대나사길이 = $\ell^2 - \frac{\text{피치}}{4}$

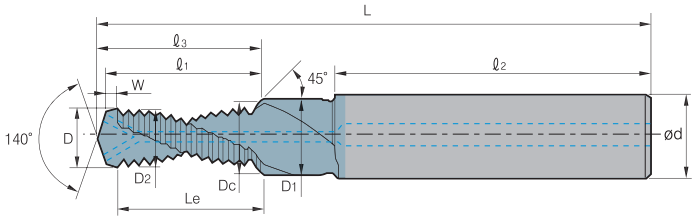
● : 재고 관리 형번

ISO 메트릭

외부급유식 나사가공 엔드밀/헬리컬 플루트



내경용
규격 : R262 (DIN 13)
공차 : 6H



나 사 ISO 2D M Coarse	피치 (mm)	형 번		PC9070M	치수 (mm)											날수	나사산수
					L	ℓ3	ℓ1	ℓ2	W	Le	D	Ød	D1	Dc	D2	z	zt
M6×1.0	1.0	STMHCD	IM6×1.0ISO-2D		62.0	14.5	13.7	36	1.0	12.7	5.0	8	6.6	6.3	4.85	2	11
M8×1.25	1.25		IM8×1.25ISO-2D		74.0	18.2	17.1	40	1.3	15.8	6.8	10	9.0	8.3	6.45	2	11
M10×1.5	1.5		IM10×1.5ISO-2D		79.0	23.4	22.1	45	1.5	20.6	8.5	12	11.0	10.3	8.08	2	12
M12×1.75	1.75		IM12×1.75ISO-2D		89.0	27.1	25.5	45	1.5	24.0	10.3	14	13.5	12.3	9.74	2	12

나 사 ISO 2.5D M Coarse	피치 (mm)	형 번		PC9070M	치수 (mm)											날수	나사산수
					L	ℓ3	ℓ1	ℓ2	W	Le	D	Ød	D1	Dc	D2	z	zt
M6×1.0	1.0	STMHCD	IM6×1.0ISO-2.5D		62.0	16.5	15.7	36	1.0	14.7	5.0	8	6.6	6.3	4.85	2	13
M8×1.25	1.25		IM8×1.25ISO-2.5D		74.0	23.2	22.1	40	1.3	20.8	6.8	10	9.0	8.3	6.45	2	15
M10×1.5	1.5		IM10×1.5ISO-2.5D		79.0	27.9	26.6	45	1.5	25.1	8.5	12	11.0	10.3	8.08	2	15

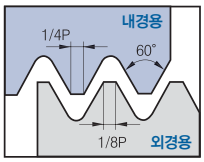
* 보어경(Bore Diameter)은 가능한 최소나사경을 적용 * 최대나사길이 = $\ell^2 - \frac{\text{피치}}{4}$

● : 재고 관리 형번

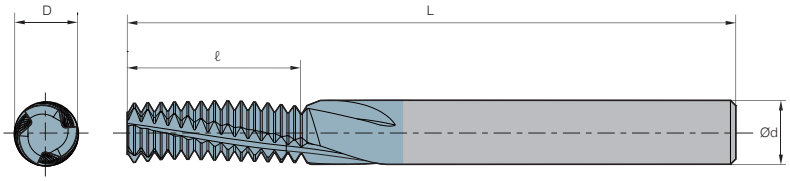
Thread Mill

ISO 메트릭

외부급유식 나사가공 엔드밀/헬리컬 플루트



외경용/내경용
규격 : R262 (DIN 13)
공차 : 6g/6H



외경용

(ℓ ≤ 2 × 나사경)

나사		피치 (mm)	형번		PC9070M	치수 (mm)				날수	나사산수
M 콜스피치	M 파인피치					Ød	D	L	ℓ	z	zt
M3x0.5	-	0.50	STMH	04039L06-E0.50ISO		4	3.9	45	6	3	12
M4.5x0.7	-	0.75		04039L09-E0.75ISO		4	3.9	45	9	3	12
M6x1.0	-	1.00		04039L12-E1.00ISO		4	3.9	45	12	3	12
M8x1.25	-	1.25		06059L16-E1.25ISO		6	5.9	57	16.25	3	13
M10x1.5	-	1.50		08079L21-E1.50ISO	●	8	7.9	63	21	3	14
M14x2.0	-	2.00		10099L28-E2.00ISO		10	9.9	73	28	4	14

내경용

(ℓ ≤ 2 × 나사경)

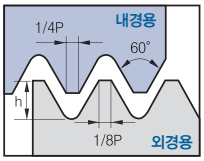
나사		피치 (mm)	형번		PC9070M	치수 (mm)				날수	나사산수	*보어경
M 콜스피치	M 파인피치					Ød	D	L	ℓ	z	zt	mm
M3x0.5	M3.5-M16x0.5	0.50	STMH	04022L06-I0.50ISO		4	2.2	45	6.0	3	12	2.5
-	M4x0.5	0.50		04030L08-I0.50ISO		4	3.0	45	8.0	3	16	3.5
-	M3x0.5	0.50		04039L10-I0.50ISO		4	3.9	45	6.0	3	12	4.5
M4x0.7	-	0.70		04028L08-I0.70ISO		4	2.8	45	8.4	3	12	3.3
-	M6x0.75	0.75		04039L12-I0.75ISO		4	3.9	45	9.0	3	12	5.3
M5x0.8	-	0.80		04035L10-I0.80ISO		4	3.5	45	10.4	3	13	4.2
M6x1.0	M8-M40x1.0	1.00		04039L12-I1.00ISO		4	3.9	45	12.0	3	12	5.0
-	M8x1.0	1.00		06059L16-I1.00ISO		6	5.9	57	16.0	3	16	7.0
-	M10x1.0	1.00		08079L20-I1.00ISO	●	8	7.9	63	20.0	3	20	9.0
-	M12x1.0	1.00		10099L24-I1.00ISO	●	10	3.9	45	12.0	3	12	11.0
M8x1.25	-	1.25		06058L16-I1.25ISO		6	5.8	57	16.25	3	13	6.8
-	M10x1.25	1.25		08077L20-I1.25ISO	●	6	5.9	57	16.25	3	13	8.8
M10x1.5	M12-M48x1.5	1.50		08077L21-I1.50ISO	●	8	7.7	63	21.0	3	14	8.5
-	M12x1.5	1.50		10094L24-I1.50ISO	●	8	7.9	63	21.0	3	14	10.5
-	M14x1.5	1.50		12112L28-I1.50ISO	●	10	9.4	73	24.0	4	16	12.5
-	M16x1.5	1.50		12119L33-I1.50ISO	●	12	11.2	83	28.5	4	19	14.5
M12x1.75	-	1.75		10087L24-I1.75ISO	●	10	8.7	73	24.5	4	14	10.2
M14x2.0	M17-M80x2.0	2.00		10099L28-I2.00ISO	●	10	9.9	73	28.0	4	14	12.0
M16x2.0	M17-M80x2.0	2.00		12119L32-I2.00ISO	●	10	9.9	73	28.0	4	14	14.0
M18-M22x2.5	-	2.50		16139L40-I2.50ISO		16	13.9	92	40.0	5	16	15.5
M24x3.0	-	3.00		16159L42-I3.00ISO		16	15.9	92	42.0	4	14	21.0

* 보어경(Bore Diameter)은 가능한 최소나사경을 적용

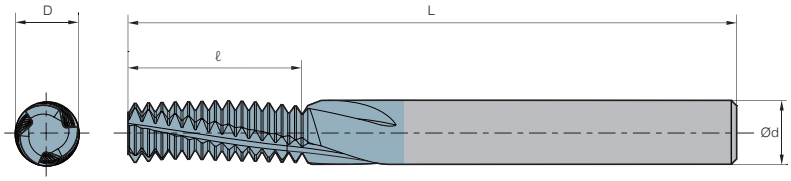
● : 재고 관리 형번

미국 유니파이(UNC,UNF,UNEF)

외부급유식 나사가공 엔드밀/헬리컬 플루트



외경용/내경용
규격 : ANSI B1.1.74
공차 : 2A/2B



외경용

(ℓ≤2×나사경)

나 사		피치	형 번		PC9070M	치수(mm)				날수	나사산수
UNC	UNF	(tpi)				Ød	D	L	ℓ	z	zt
No.8-32	-	32	STMH	04039L09-E32UNC		4	3.9	45	8.7	3	11
-	No.12-28	28		04039L12-E28UNF		4	3.9	45	11.8	3	13
No.12-24	-	24		04039L12-E24UNC		4	3.9	45	11.6	3	11
1/4″x20	-	20		04039L13-E20UNC		4	3.9	45	12.7	3	10
5/16″x18	-	18		06059L17-E18UNC		6	5.9	57	16.9	3	12
3/8″x16	-	16		08079L19-E16UNC		8	7.9	63	19.1	3	12
9/16″x12	-	12		12119L30-E12UNC		12	11.9	83	29.6	4	14

내경용

(ℓ≤2×나사경)

나 사			피치	형 번		PC9070M	치수(mm)				날수	나사산수	*보어경
UNC	UNF	UNEF	(tpi)				Ød	D	L	ℓ	z	zt	mm
-	No.8-36		36	STMH	04030L09-I36UNF		4	3.0	45	8.5	3	12	3.5
-	No.10-32	No.12-3/8″x32	32		04033L11-I32UNF		4	3.3	45	11.1	3	14	4.0
-	No.12-28,1/4″x28	7/16″,1/2″x28	28		04038L12-I28UNF		4	3.8	45	11.8	3	13	4.6
-	1/4″x28	7/16″,1/2″x28	28		06046L13-I28UNF		6	4.6	57	12.7	3	14	5.5
-	-	7/16″,1/2″x28	28		10092L23-I28UNEF		10	9.2	73	22.7	4	25	10.2
No.10-24	5/16″,3/8″x24	9/16″-11/16″x24	24		04029L11-I24UNC		4	2.9	45	10.6	3	10	3.8
No.12-24	5/16″,3/8″x24	9/16″-11/16″x24	24		04035L12-I24UNC		4	3.5	45	11.6	3	11	4.5
5/16″,	3/8″x24	9/16″-11/16″x24	24		06057L16-I24UNF		6	5.7	57	15.9	3	15	6.8
-	3/8″x24	9/16″-11/16″x24	24		08074L19-I24UNF		8	7.4	63	19.1	3	18	8.5
-	-	9/16″-11/16″x24	24		12119L29-I24UNEF		12	11.9	83	28.6	4	27	13.2
1/4″x20	7/16″,1/2″x20	3/4″-1″x20	20		04039L13-I20UNC		4	3.9	45	12.7	3	10	5.2
7/16″,	1/2″x20	3/4″-1″x20	20		10085L23-I20UNF		10	8.5	73	22.9	4	18	9.8
-	1/2″x20	3/4″-1″x20	20		10099L26-I20UNF		10	9.9	73	25.4	4	20	11.5
-	-	3/4″-1″x20	20		16159L38-I20UNEF		16	15.9	92	38.1	5	30	17.8
5/16″x18	9/16″,5/8″x18	11/16″-1 11/16″x18	18		06052L17-I18UNC		6	5.2	57	16.9	3	12	6.5
9/16″,	5/8″x18	11/16″-1 11/16″x18	18		12113L30-I18UNF		12	11.3	83	29.6	4	21	12.8
5/8″x18	11/16″-1	11/16″x18	18		12119L33-I18UNF		12	11.9	83	32.5	4	23	14.5
3/8″x16	3/4″x16	-	16		08067L19-I16UNC		8	6.7	63	19.1	3	12	8.0
-	3/4″x16	-	16		16159L38-I16UNF		16	15.9	92	38.1	4	24	17.5
7/16″x14	7/8″x14	-	14		08076L24-I14UNC		8	7.6	63	23.6	4	13	9.3
-	7/8″x14	-	14		20187L44-I14UNF		20	18.7	104	43.5	4	24	20.5
1/2″x13	-	-	13		10089L26-I13UNC		10	8.9	73	25.4	4	13	10.8
9/16″x12	1″-1 1/2″x12	-	12		12103L30-I12UNC		12	10.3	83	29.6	4	14	12.3
-	1″-1 1/2″x12	-	12		20199L51-I12UNF		20	19.9	104	50.8	5	24	23.5
5/8″x11	-	-	11		12110L32-I11UNC		12	11.0	83	32.3	4	14	13.5
3/4″x10	-	-	10		16135L38-I10UNC		16	13.5	92	38.1	5	15	16.5
7/8″x9	-	-	9		16152L45-I9UNC		16	15.2	92	45.2	4	16	19.5
1″x8	-	-	8		20170L51-I8UNC		20	17.0	104	50.8	4	16	22.0

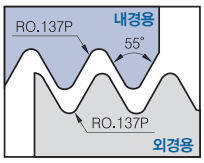
* 보어경(Bore Diameter)은 가능한 최소나사경을 적용

● : 재고 관리 형번

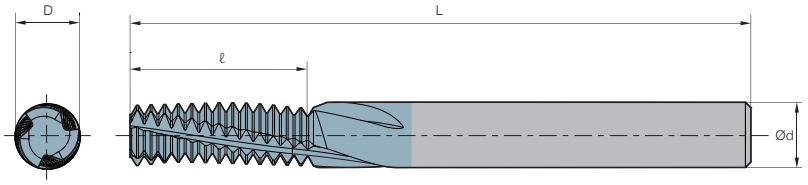
Thread Mill

브리티쉬 표준 파이프 나사(BSP)

외부급유식 나사가공 엔드밀/헬리컬 플루트



외경용/내경용
규격 : B.S.2779 : 1956
공차 : Medium class

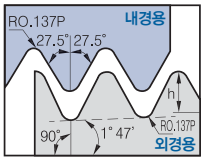


(ℓ ≤ 2 ×나사경)

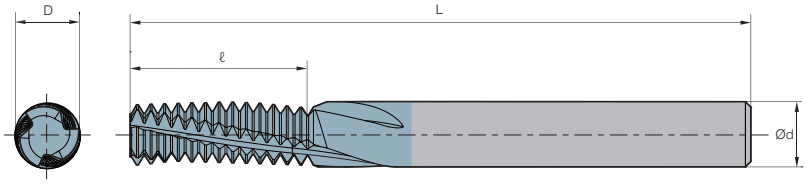
나 사 Standard	피치 (tpi)		형 번	PC9070M	치수 (mm) Ød	D	L	ℓ	날수 z	나사산수 zt	*보어경 mm
1/16″x28,1/8″x28	28	STMH	06058L16-EI28BSP		6	5.8	57	16.3	3	18	6.7
1/8″x28	28		08077L20-EI28BSP		8	7.7	63	20.0	3	22	8.7
1/4″x19, 3/8″x19	19		10099L27-EI19BSP		10	9.9	73	26.7	4	20	11.8
3/8″x19	19		16134L33-EI19BSP		16	13.4	92	33.4	4	25	15.2
1/2″, 3/4″x14	14		16157L44-EI14BSP		16	15.7	92	43.5	5	24	19.0
1″, 1 1/2″, 2″, 2 1/2″x11	11		20199L42-EI11BSP		20	19.9	104	41.6	5	18	30.7

브리티쉬 표준 파이프 나사(BSPT)

외부급유식 나사가공 엔드밀/헬리컬 플루트



외경용/내경용
규격 : B.S.21 : 1985
공차 : Standard BSPT



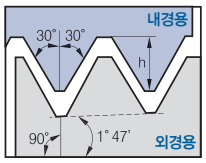
나 사 Standard	피치 (tpi)		형 번	PC9070M	치수 (mm) Ød	D	L	ℓ	날수 z	나사산수 zt	*보어경 mm
1/16″x28	28	STMH	06058L16-EI28BSPT		6	5.8	57	16.3	3	18	6.7
1/8″x28	28		08077L20-EI28BSPT		8	7.7	63	20.0	3	22	8.7
1/4″x19	19		10099L27-EI19BSPT		10	9.9	73	26.7	4	20	11.8
3/8″x19	19		16134L33-EI19BSPT		16	13.4	92	33.4	4	25	15.2
1/2″, 3/4″x14	14		16157L44-EI14BSPT		16	15.7	92	43.5	5	24	19.0
1″, 1 1/2″, 2″, 2 1/2″x11	11		20199L42-EI11BSPT		20	19.9	104	41.6	5	18	30.7

* 보어경(Bore Diameter)은 가능한 최소나사경을 적용

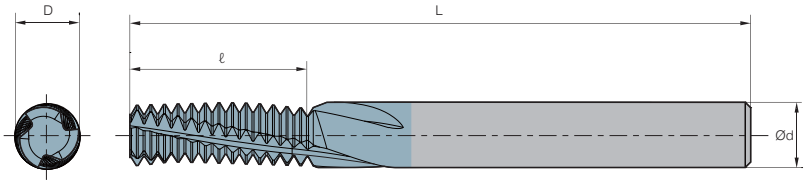
● : 재고 관리 형번

내셔널 파이프 나사(NPT)

외부급유식 나사가공 엔드밀/헬리컬 플루트



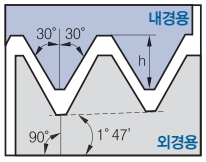
외경용/내경용
규격 : USAS B2.1 : 1968
공차 : Standard NPT



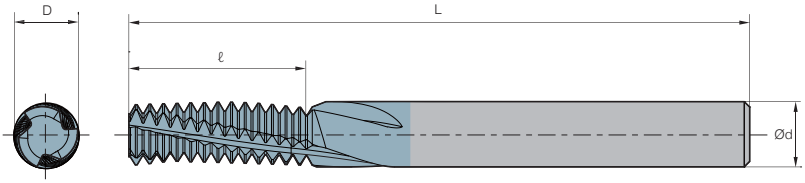
나 사 Standard	피치 (tpi)	형 번		PC9070M	치수 (mm) Ød	D	L	ℓ	날수 z	나사산수 zt	*보어경 mm
1/16"x27	27.0	STMH	06053L09-EI27NPT		6	5.3	57	9.4	3	10	6.3
1/8"x27	27.0		08075L09-EI27NPT		8	7.5	63	9.4	4	10	8.5
1/4"x18	18.0		10094L14-EI18NPT		10	9.4	73	14.1	4	10	11.1
3/8"x18	18.0		12119L14-EI18NPT		12	11.9	83	14.1	4	10	14.5
1/2", 3/4"x14	14.0		16155L25-EI14NPT		16	15.5	92	25.4	5	14	17.7, 23.0
1"-2"x11.5	11.5		20199L33-EI11.5NPT		20	19.9	104	33.1	5	15	29.0-56.0
2 1/2", 3"x8	8.0		20199L38-EI8NPT		20	19.9	104	38.1	4	12	66.0

내셔널 파이프 나사 파인피치(NPTF)

외부급유식 나사가공 엔드밀/헬리컬 플루트



외경용/내경용
규격 : ANSI 1.20.3-1976
공차 : Standard NPTF



나 사 Standard	피치 (tpi)	형 번		PC9070M	치수 (mm) Ød	D	L	ℓ	날수 z	나사산수 zt	*보어경 mm
1/16"x27	27.0	STMH	06053L09-EI27NPTF		6	5.3	57	9.4	3	10	6.3
1/8"x27	27.0		08075L09-EI27NPTF		8	7.5	63	9.4	4	10	8.4
1/4"x18	18.0		10094L14-EI18NPTF		10	9.4	73	14.1	4	10	11.1
3/8"x18	18.0		12119L14-EI18NPTF		12	11.9	83	14.1	4	10	14.7
1/2", 3/4"x14	14.0		16155L25-EI14NPTF		16	15.5	92	25.4	5	14	17.9, 23.4
1"-2"x11.5	11.5		20199L33-EI11.5NPTF		20	19.9	104	33.1	5	15	29.4-56.2
2 1/2", 3"x8	8.0		20199L38-EI8NPTF		20	19.9	104	38.1	4	12	67.0

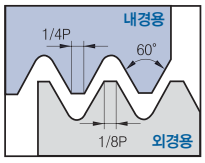
* 보어경(Bore Diameter)은 가능한 최소나사경을 적용

● : 재고 관리 형번

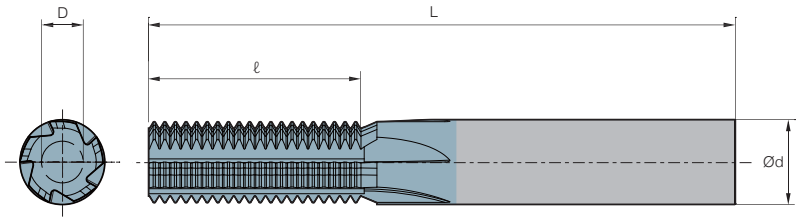
Thread Mill

ISO 메트릭

외부급유식 나사가공 엔드밀/스트레이트 플루트



외경용/내경용
규격 : R262 (DIN 13)
공차 : 6g/6H



외경용

나 사 Standard	피치 (mm)	형 번		PC9060M	치수 (mm) Ød	D	L	ℓ	날수 z	나사산수 zt	*보어경 mm
M3	0.50	STMS	06059-E0.50ISO		6	5.9	57	15	3	30	0.31
M4.5	0.75		08079-E0.75ISO		8	7.9	63	19.5	3	26	0.46
M4.5	0.75		08079-E0.75ISO-TM5		8	7.9	63	19.5	5	26	0.46
M6	1.00		10099-E1.00ISO		10	9.9	72	24	5	24	0.61
M10	1.50		12119-E1.50ISO		12	11.9	83	30	5	20	0.92
M14	2.00		12119-E2.00ISO		12	11.9	83	30	5	15	1.23
M24	3.00		16159-E3.00ISO		16	15.9	92	36	5	12	1.84
M36	4.00		16159-E4.00ISO		16	15.9	92	40	5	10	2.45
M64	6.00		20199-E6.00ISO		20	19.9	104	36	5	6	3.68

내경용

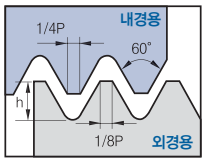
나 사 Standard	피치 (mm)	형 번		PC9060M	치수 (mm) Ød	D	L	ℓ	날수 z	나사산수 zt	*보어경 mm
M4.5	0.75	STMS	04030-I0.75ISO		4	3	42	6.75	3	9	0.43
M8	0.75		06059-I0.75ISO		6	5.9	57	15.0	3	20	0.43
M5	0.80		04036-I0.80ISO		4	3.6	42	8.0	3	10	0.46
M6	1.00		06040-I1.00ISO		6	4	57	9.0	3	9	0.58
M12	1.00		08079-I1.00ISO		8	7.9	63	20.0	3, 5	20	0.58
M12	1.00		08079-I1.00ISO-TM5		8	7.9	63	20.0	3, 5	20	0.58
M8	1.25		06050-I1.25ISO		6	5	57	12.5	3	10	0.72
M10	1.50		06059-I1.50ISO		6	5.9	57	15.0	3	10	0.87
M14	1.50		10099-I1.50ISO		10	9.9	72	24.0	5	16	0.87
M18	1.50		12119-I1.50ISO		12	11.9	83	30.0	5	20	0.87
M12	1.75		08079-I1.75ISO		8	7.9	63	19.25	3, 5	11	1.01
M12	1.75		08079-I1.75ISO-TM5		8	7.9	63	19.25	3, 5	11	1.01
M16	2.00		10099-I2.00ISO		10	9.9	72	24.0	5	12	1.15
M18	2.00		12119-I2.00ISO		12	11.9	83	30.0	5	15	1.15
M20	2.50		12119-I2.50ISO		12	11.9	83	30.0	5	12	1.44
M24	3.00		16159-I3.00ISO		16	15.9	92	36.0	5	12	1.73
M30	3.50		16159-I3.50ISO		16	15.9	92	38.5	5	11	2.02
M36	4.00		16159-I4.00ISO		16	15.9	92	40.0	5	10	2.31
M48	5.00		20199-I5.00ISO		20	19.9	104	40.0	5	8	2.89
M64	6.00		20199-I6.00ISO		20	19.9	104	36.0	5	6	3.46

* 보어경(Bore Diameter)은 가능한 최소나사경을 적용

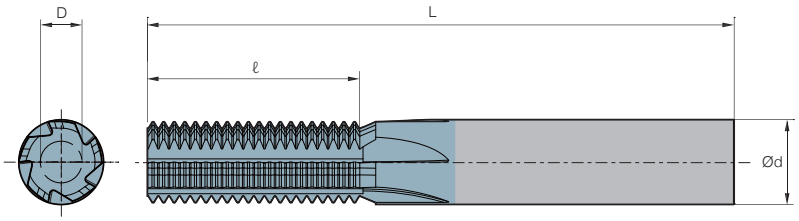
● : 재고 관리 형번

브리티쉬 표준 파이프 나사(BSP)

외부급유식 나사가공 엔드밀/스트레이트 플루트



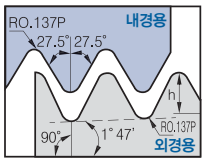
외경용/내경용
규격 : B.S.2779:1956
공차 : Medium class



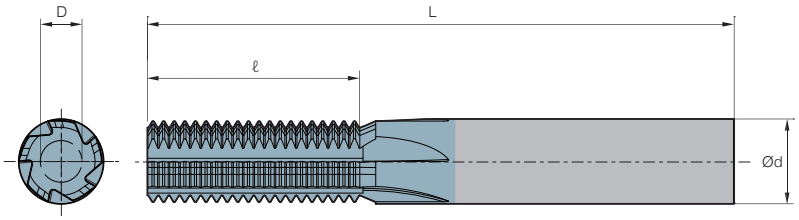
나 사 Standard	피치 (tpi)	형 번		PC9060M	치수 (mm) Ød	D	L	ℓ	날수 z	나사산수 zt	*보어경 mm
1/16″	28	STMS	06059-EI28BSP		6	5.9	57	14.51	3	16	0.58
1/4″	19		08079-EI19BSP		8	7.9	63	18.72	3	14	0.86
1/4″	19		08079-EI19BSP-TM5		8	7.9	63	18.72	5	14	0.86
1/2″	14		12119-EI14BSP		12	11.9	83	29.03	5	16	1.16
1″	11		16159-EI11BSP		16	15.9	92	34.64	5	15	1.48

브리티쉬 표준 파이프 나사(BSPT)

외부급유식 나사가공 엔드밀/스트레이트 플루트



외경용/내경용
규격 : B.S.21 : 1985
공차 : Standard BSPT



나 사 Standard	피치 (tpi)	형 번		PC9060M	치수 (mm) Ød	D	L	ℓ	날수 z	나사산수 zt	*보어경 mm
1/16″	28	STMS	06059-EI28BSPT		6	5.9	57	9.98	3	11	0.58
1/4″	19		08079-EI19BSPT		8	7.9	63	14.71	3	11	0.86
1/4″	19		08079-EI19BSPT-TM5		8	7.9	63	14.71	5	11	0.86
1/2″	14		12119-EI14BSPT		12	11.9	83	19.96	5	11	1.16
1″	11		16159-EI11BSPT		16	15.9	92	39.25	5	17	1.48

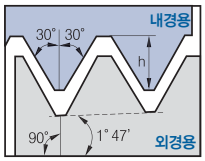
* 보어경(Bore Diameter)은 가능한 최소나사경을 적용

● : 재고 관리 형번

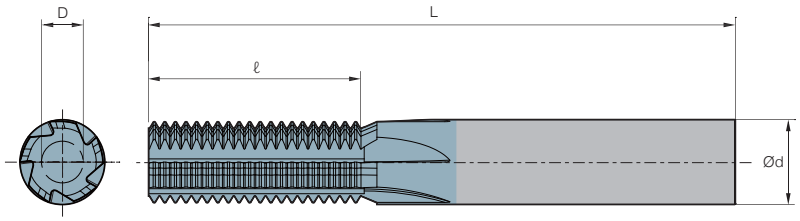
Thread Mill

내셔널 파이프 나사(NPT)

외부급유식 나사가공 엔드밀/스트레이트 플루트



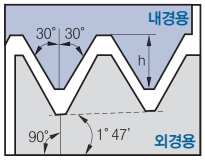
외경용/내경용
규격 : USAS B2.1:1968
공차 : Standard NPT



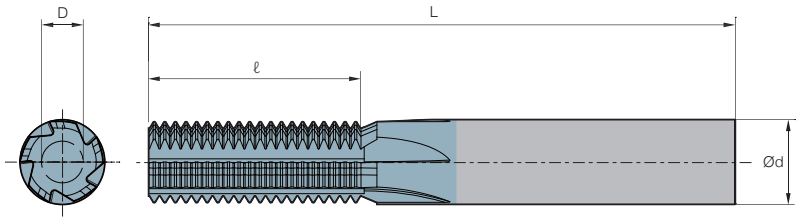
나 사 Standard	피치 (tpi)	형 번		PC9060M	치수 (mm) Ød	D	L	ℓ	날수 z	나사산수 zt	*보어경 mm
1/16″	27.0	STMS	06059-EI27NPT		6	5.9	57	9.41	3.0	10	0.66
1/4″	18.0		08079-EI18NPT		8	7.9	63	14.11	3, 5	10	1.01
1/4″	18.0		08079-EI18NPT-TM5		8	7.9	63	14.11	3, 5	10	1.01
1/2″	14.0		12119-EI14NPT		12	11.9	83	19.96	5.0	11	1.33
1″	11.5		16159-EI11.5NPT		16	15.9	92	26.50	5.0	12	1.64
2 1/2″	8.0		16159-EI8NPT		16	15.9	92	38.10	5.0	12	2.42

내셔널 파이프 나사 파인피치(NPTF)

외부급유식 나사가공 엔드밀/스트레이트 플루트



외경용/내경용
규격 : ANSI 1.20.3-1976
공차 : Standard NPTF



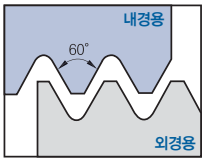
나 사 Standard	피치 (tpi)	형 번		PC9060M	치수 (mm) Ød	D	L	ℓ	날수 z	나사산수 zt	*보어경 mm
1/16″	27.0	STMS	06059-EI27NPTF		6	5.9	57	9.41	3	10	0.64
1/4″	18.0		08079-EI18NPTF		8	7.9	63	14.11	3, 5	10	1.00
1/2″	14.0		12119-EI14NPTF		12	11.9	83	19.96	5	11	1.35
1″	11.5		16159-EI11.5NPTF		16	15.9	92	26.50	5	12	1.63
2 1/2″	8.0		16159-EI8NPTF		16	15.9	92	38.10	5	12	2.38

* 보어경(Bore Diameter)은 가능한 최소나사경을 적용

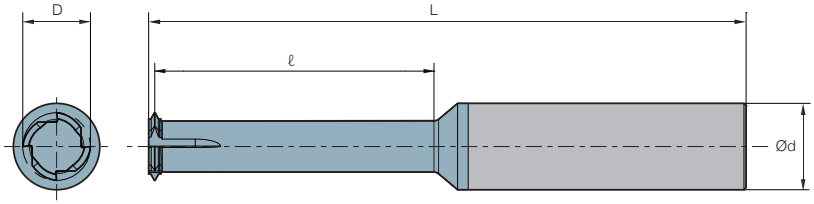
● : 재고 관리 형번

ISO 메트릭

깊은 나사가공 엔드밀/롱타입 툴



내경용
규격 : R262 (DIN 13)
공차 : 6H

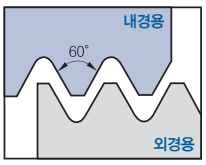


(ℓ1 ≤ 3 × 나사경)

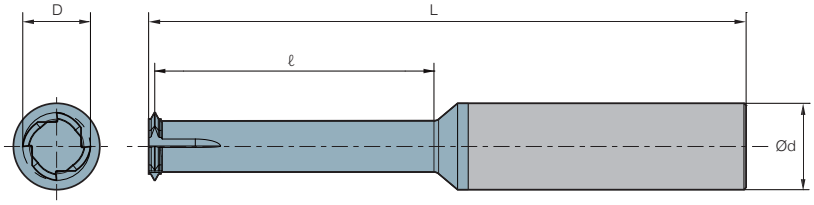
나 사 Standard	피치 (tpi)	형 번		PC9070M	치수 (mm) Ød	D	L	ℓ	날수 z	나사산수 zt	*보어경 mm
M6x1	1.00	STMD1T	08041-I1.00ISO		8	4.1	63	19	3	1	5.0
M8x1.25	1.25		10058-I1.25ISO		10	5.8	73	26	3	1	6.8
M10x1.5	1.50		10077-I1.50ISO		10	7.7	73	32	3	1	8.5
M12x1.5	1.50		12094-I1.50ISO		12	9.4	83	38	4	1	10.5
M12x1.75	1.75		12087-I1.75ISO		12	8.7	83	38	4	1	10.2
M14x2	2.00		16102-I2.00ISO		16	10.2	92	44	4	1	12.0
M16x2	2.00		16122-I2.00ISO		16	12.2	100	50	4	1	14.0
M18x2.5	2.50		16129-I2.50ISO		16	12.9	108	57	5	1	15.5
M20x2.5	2.50		16148-I2.50ISO		16	14.8	114	63	5	1	17.5

부분 프로파일 -TP60

깊은 나사가공 엔드밀/롱타입 툴



내경용



나 사 M 콜스피치	M 파인피치	최소 나사 UN, UNF, UNEF	피치 (mm)	(tpi)	형 번		PC9070M	치수 (mm) Ød	D	L	ℓ	날수 z	나사산수 zt
M5x0.8	M5x0.5, M5X0.75	No.10-56UNS, No.10-48UNS, No.10-40UNS, No.10-36UNS, No.10-32UNF	0.5 ~0.8	32 ~56	STMD1T	04390L160-ITA60		4	3.90	45	16	4	1
M6x1.0	M6x0.5, M6X0.75	No.12-56UNS, No.12-48UNS, 1/4 -40UNS, 1/4 -36UNS, 1/4 -32UNEF, 1/4 -28UNF, 1/4 -27UNS, 1/4 -24UNS	0.5 ~1.0	24 ~56		06485L200-ITB60		6	4.85	51	20	5	1
M8x1.25	M7x0.5, M7x0.75, M7.5x1.0	5/16 -48UNS, 5/16 -40UNS, 5/16 -36UNS, 5/16 -32UNEF, 5/16 -28UN, 5/16 -27UNS, 5/16 -24UNS, 5/16 -20UN	0.5 ~1.25	20 ~48		06590L250-ITF60		6	5.90	64	25	5	1
	M10.5x0.5, M11x0.75, M11x1.0	7/16 -32UN, 7/16 -28UNEF, 7/16 -27UNS, 7/16 -24UNS	0.5 ~1.0	24 ~56		10990L350-ITB60		10	9.90	73	35	6	1
M10x1.5	M10x1.0, M10X1.25	3/8 -24UNF, 3/8 -20UN, 7/16 -18UNS, 7/16 -16UN	1.0 ~1.50	16 ~24		08790L320-ITC60		8	7.90	63	32	6	1
M12x1.75	M12x1.0, M12X1.25, M12x1.5	1/2 -24UNS, 1/2 -20UNS, 1/2 -18UNS, 1/2 -16UNS, 1/2 -14UNS	1.0 ~1.75	14 ~24		10990L380-ITD60		10	9.90	73	38	6	1
-	M13.5x1.0, M14x1.25, M14x1.5	9/16 -24UNEF	1.0 ~1.75	14 ~24		12119L450-ITD60		12	11.90	83	45	6	1

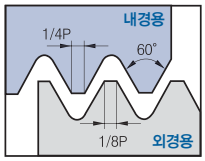
* 보어경(Bore Diameter)은 가능한 최소나사경을 적용

● : 재고 관리 형번

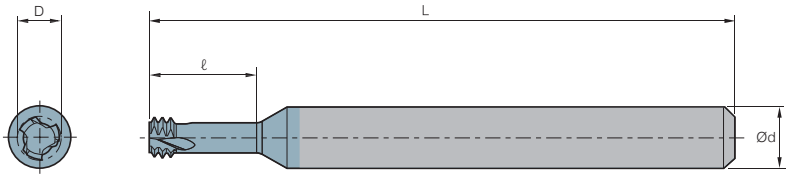
Thread Mill

ISO 메트릭

깊은 나사가공 엔드밀/범용



내경용
규격 : R262 (DIN 13)
공차 : 6H



(ℓ ≤ 2 × 나사경)

나 사		피치 (mm)	형 번		PC9070M	치수 (mm)				날수	나사산수	*보어경
M 콜스피치	M 파인피치					Ød	D	L	ℓ	z	zt	mm
M1.6x0.35	-	0.35	STMD3T	03012L034-I0.35ISO		3	1.20	30	3.4	3	3	1.25
M2x0.4	-	0.40		06015L042-I0.40ISO		6	1.55	57	4.2	3	3	1.60
M2.2x0.45	-	0.45		06016L046-I0.45ISO		6	1.65	57	4.6	3	3	1.75
M2.5x0.45	-	0.45		06019L052-I0.45ISO		6	1.95	57	5.2	3	3	2.05
M3x0.5	M3.5-M16x0.5	0.50		06024L062-I0.50ISO		6	2.40	57	6.2	3	3	2.50
M3.5x0.6	-	0.60		06027L073-I0.60ISO		6	2.75	57	7.3	3	3	2.90
M4x0.7	-	0.70		06031L083-I0.70ISO		6	3.15	57	8.3	3	3	3.30
M5x0.8	-	0.80		06040L104-I0.80ISO		6	4.05	57	10.4	3	3	4.20
M6x1.0	M8-M40x1.0	1.00		06048L125-I1.00ISO		6	4.80	57	12.5	3	3	5.00
M8x1.25	-	1.25		08065L166-I1.25ISO		8	6.50	63	16.6	3	3	6.80
M10x1.5	M12-M48x1.50	1.50		10082L208-I1.50ISO		10	8.20	73	20.8	3	3	8.50
M12x1.75	-	1.75		10099L250-I1.75ISO		10	9.90	73	25.0	3	3	10.30
M16x2.0	-	2.00		12119L330-I2.00ISO		12	11.90	83	33.0	3	3	14.00
M20x2.5	-	2.50		16159L413-I2.50ISO		16	15.90	92	41.3	3	3	17.50

(ℓ ≤ 3 × 나사경)

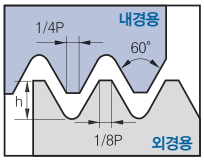
나 사		피치 (mm)	형 번		PC9070M	치수 (mm)				날수	나사산수	*보어경
M 콜스피치	M 파인피치					Ød	D	L	ℓ	z	zt	mm
M1.6X0.35	-	0.35	STMD3T	03012L050-I0.35ISO		3	1.20	30	5.0	3	3	1.25
M2x0.4	-	0.40		03015L062-I0.40IS0		3	1.55	30	6.2	3	3	1.60
M2X0.4	-	0.40		06015L062-I0.40ISO		6	1.55	57	6.2	3	3	1.60
M2.5x0.45	-	0.45		03019L077-I0.45ISO		3	1.95	30	7.7	3	3	2.05
M2.5x0.45	-	0.45		06019L077-I0.45ISO		6	1.95	57	7.7	3	3	2.05
M3X0.5	M3.5-M16x0.5	0.50		03024L092-I0.50ISO		3	2.40	30	9.2	3	3	2.50
M3x0.5	M3.5-M16x0.5	0.50		06024L092-I0.50ISO		6	2.40	57	9.2	3	3	2.50
M4x0.7	-	0.70		06031L123-I0.70ISO		6	3.15	57	12.3	3	3	3.30
M5x0.8	-	0.80		06040L154-I0.80ISO		6	4.05	57	15.4	3	3	4.20
M6x1.0	M8-M40x1.0	1.00		06048L185-I1.00ISO		6	4.80	57	18.5	3	3	5.00
M8x1.25	-	1.25		08065L246-I1.25ISO		8	6.50	63	24.6	3	3	6.80

* 보어경(Bore Diameter)은 가능한 최소나사경을 적용

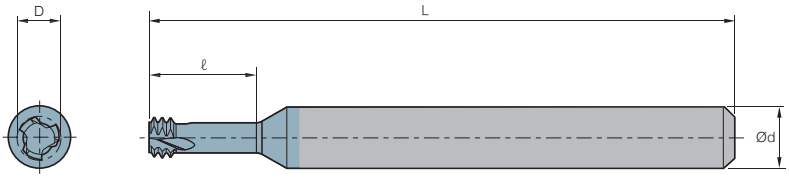
● : 재고 관리 형번

미국 유니파이(UNC,UNF)

깊은 나사가공 엔드밀/범용



외경용/내경용
규격 : ANSI B1.1.74
공차 : 2B



(ℓ ≤ 2 × 나사경)

나 사		피치	형 번		PC9070M	치수 (mm)				날수	나사산수	*보어경
UNC	UNF	(tpi)				Ød	D	L	ℓ	z	zt	mm
-	No.1-72	72	STMD3T	06014L039-I72UN		6	1.45	57	3.9	3	3	1.6
No.1-64	No.2-64	64		06014L042-I64UN		6	1.40	57	4.2	3	3	1.5
No.2-56	No.3-56	56		06016L050-I56UN		6	1.65	57	5.0	3	3	1.8
No.3-48	No.4-48	48		06019L060-I48UN		6	1.90	57	6.0	3	3	2.1
No.4,No.5-40	No.6-40	40		06021L060-I40UN		6	2.10	57	6.0	3	3	2.3
No.5-40	No.6-40	40		06024L072-I40UN		6	2.45	57	7.2	3	3	2.6
-	No.8-36	36		06033L087-I36UN		6	3.30	57	8.7	3	3	3.5
No.6,No.8-32	No.10-32	32		06025L074-I32UN		6	2.55	57	7.4	3	3	2.8
No.8-32	No.10-32	32		06032L100-I32UN		6	3.20	57	10.0	3	3	3.5
-	No.10-32	32		06038L103-I32UN		6	3.80	57	10.3	3	3	4.0
-	1/4˝x28	28		06052L132-I28UN		6	5.25	57	13.2	3	3	5.5
No.10-24	5/16˝x24	24		06035L102-I24UN		6	3.58	57	10.2	3	3	3.9
-	5/16˝x24	24		08066L165-I24UN		8	6.68	63	16.5	3	3	6.9
1/4˝x20	7/16˝x20	20		06048L134-I20UN		6	4.88	57	13.4	3	3	5.2
-	7/16˝x20	20		10095L230-I20UN		10	9.55	73	23.0	3	3	9.9
5/16˝x18	-	18		08061L169-I18UN		8	6.15	63	16.9	3	3	6.6
3/8˝x16	-	16		08067L191-I16UN		8	6.70	63	19.1	3	3	8.0
7/16˝x14	-	14		10090L233-I14UN		10	9.00	73	23.3	3	3	9.4

(ℓ ≤ 3 × 나사경)

나 사		피치	형 번		PC9070M	치수 (mm)				날수	나사산수	*보어경
M 콜스피치	M 파인피치	(tpi)				Ød	D	L	ℓ	z	zt	mm
-	No.1-72	72	STMD3T	03014L057-I72UN		3	1.45	30	5.75	3	3	1.6
-	No.1-72	72		06014L057-I72UN		6	1.45	57	5.75	3	3	1.6
No.2-56	No.3-56	56		03016L070-I56UN		3	1.65	30	7.00	3	3	1.8
No.4, No.5-40	No.6-40	40		03021L090-I40UN		3	2.10	30	9.00	3	3	2.3
No.4, No.5-40	No.6-40	40		06021L090-I40UN		6	2.10	57	9.00	3	3	2.3
No.5-40	No.6-40	40		06024L100-I40UN		6	2.45	57	10.00	3	3	2.6
No.6, No.8-32	No.10-32	32		03025L110-I32UN		3	2.55	30	11.00	3	3	2.8
No.6, No.8-32	No.10-32	32		06025L110-I32UN		6	2.55	57	11.00	3	3	2.8
No.8-32	No.10-32	32		06032L130-I32UN		6	3.20	57	13.00	3	3	3.4
-	No.10-32	32		06038L150-I32UN		6	3.80	57	15.10	3	3	4.0
-	1/4˝x28	28		06052L196-I28UN		6	5.25	57	19.60	3	3	5.5
-	5/16˝x24	24		08066L245-I24UN		8	6.68	63	24.50	3	3	6.9
1/4˝x20	7/16˝x20	20		06048L198-I20UN		6	4.88	57	19.80	3	3	5.1
5/16˝x18	-	18		08061L239-I18UN		8	6.15	63	24.00	3	3	6.6

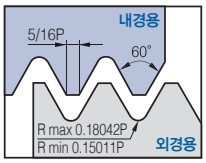
* 보어경(Bore Diameter)은 가능한 최소나사경을 적용

● : 재고 관리 형번

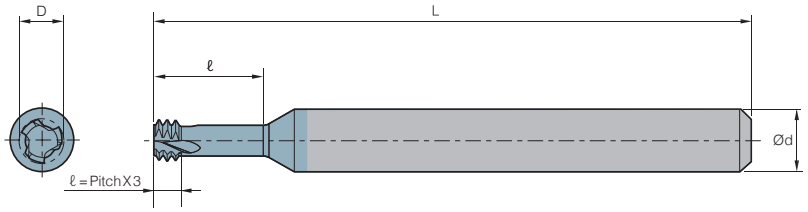
Thread Mill

UNJ

깊은 나사가공 엔드밀/범용



내경용
규격 : MIL-S-8879C
공차 : 3B

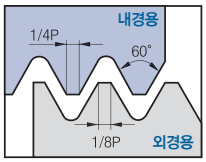


(ℓ ≤ 3 × 나사경)

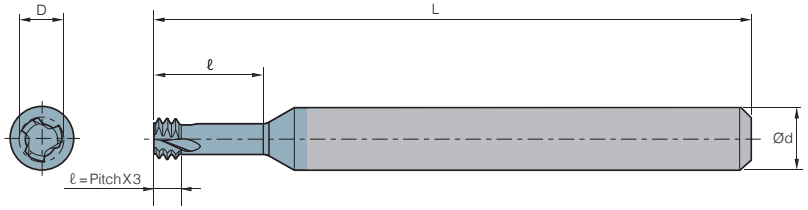
나 사		피치	형 번		PC9070M	치수 (mm)				날수	나사산수	*보어경
UNJC	UNJF	(tpi)				Ød	D	L	ℓ	z	zt	mm
0.138″(#6)	0.190″(#10)	32	STMD3T	06027L110-I32UNJ		6	2.7	57	11.0	3	3	2.80
-	0.250″(1/4″)	28		06054L195-I28UNJ		6	5.4	57	19.5	3	3	5.60
0.190″(#10)	-	24		06037L149-I24UNJ		6	3.7	57	14.9	3	3	4.00
-	0.3125″(5/16″)	24		08067L241-I24UNJ		8	6.7	63	24.1	3	3	7.00
0.250″(1/4″)	-	20		06050L195-I20UNJ		6	5	57	19.5	3	3	5.30
-	0.4375″(7/16″)	20		10096L335-I20UNJ		10	9.6	73	33.5	3	3	10.00
0.3125″(5/16″)	0.5625″(9/16″)	18		08064L241-I18UNJ		8	6.4	63	24.1	3	3	6.75
0.375″(3/8″)	0.750″(3/4″)	16		08077L290-I16UNJ		8	7.7	63	29.0	3	3	8.10
0.4375″(7/16″)	0.875″(7/8″)	14		10092L335-I14UNJ		10	9.2	73	33.5	3	3	9.50
0.500″(1/2″)	-	13		10099L385-I13UNJ		10	9.9	73	38.5	3	3	11.00

MJ

깊은 나사가공 엔드밀/범용



내경용
규격 : ISO 5855
공차 : 4h/6h-4H/5H



(ℓ ≤ 3 × 나사경)

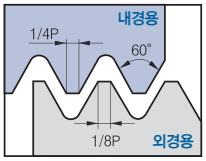
나 사	피치	형 번		PC9070M	치수 (mm)				날수	나사산수	*보어경
Standard	(mm)				Ød	D	L	ℓ	z	zt	mm
MJ3x0.5	0.50	STMD3T	06024L092-I0.5MJ		6	2.40	57	9.2	3	3	2.60
MJ3.5x0.6	0.60		06028L110-I0.6MJ		6	2.85	57	11.0	3	3	3.00
MJ4x0.7	0.70		06031L123-I0.7MJ		6	3.15	57	12.3	3	3	3.40
MJ5x0.8	0.80		06040L154-I0.8MJ		6	4.05	57	15.4	3	3	4.30
MJ6x1.0	1.00		06048L185-I1.0MJ		6	4.80	57	18.5	3	3	5.10
MJ8x1.25	1.25		08065L246-I1.25MJ		8	6.50	63	24.6	3	3	6.90
MJ10x1.5	1.50		10082L308-I1.50MJ		10	8.20	73	30.8	3	3	8.70
MJ12x1.75	1.75		10099L370-I1.75MJ		10	9.90	73	37.0	3	3	10.40
MJ14x2	2.00		12119L425-I2.0MJ		12	11.90	83	42.5	3	3	12.25

* 보어경(Bore Diameter)은 가능한 최소나사경을 적용

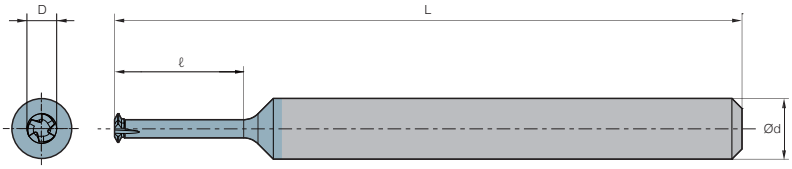
● : 재고 관리 형번

ISO 메트릭

깊은 나사가공 엔드밀/덴탈용



내경용
규격 : R262 (DIN 13)
공차 : 6H

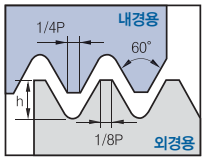


(ℓ ≤ 3 × 나사경)

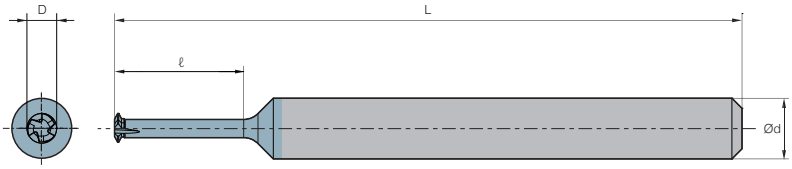
나 사		피치	형 번		PC9070M	치수 (mm)				날수	나사산수	*보어경
M Coarse	M Fine	(mm)				Ød	D	L	ℓ	z	zt	mm
M1.0x0.25	M1.4x0.25	0.25	STMD1T	03007L031-I0.25ISO		3	0.70	31	3.1	3	1	0.75
M1.2x0.25	M1.4x0.25	0.25		03009L038-I0.25ISO		3	0.90	31	3.8	3	1	0.95
M1.4x0.3	-	0.30		03011L044-I0.30ISO		3	1.05	31	4.4	3	1	1.15
M1.6x0.35	-	0.35		03012L050-I0.35ISO		3	1.20	31	5.0	3	1	1.30
M1.8x0.35	M2.0x0.35	0.35		03014L056-I0.35ISO		3	1.40	31	5.6	3	1	1.50
M2.0x0.4	-	0.40		03015L062-I0.40ISO		3	1.50	31	6.2	3	1	1.65
M2.5x0.45	-	0.45		03019L077-I0.45ISO		3	1.95	31	7.7	3	1	2.10

미국 유니파이(UNF)

깊은 나사가공 엔드밀/덴탈용



내경용
규격 : ANSI B1.1.74
공차 : 2B



(ℓ ≤ 3 × 나사경)

나 사	피치	형 번		PC9070M	치수 (mm)				날수	나사산수	*보어경
UNF	(tpi)				Ød	D	L	ℓ	z	zt	mm
0-80	80	STMD1T	03011L046-I80UN		3	1.15	31	4.6	3	1	1.3
1-72	72		03014L065-I72UN		3	1.45	31	6.5	3	1	1.6

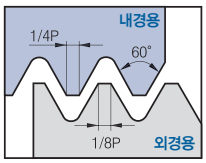
* 보어경(Bore Diameter)은 가능한 최소나사경을 적용

● : 재고 관리 형번

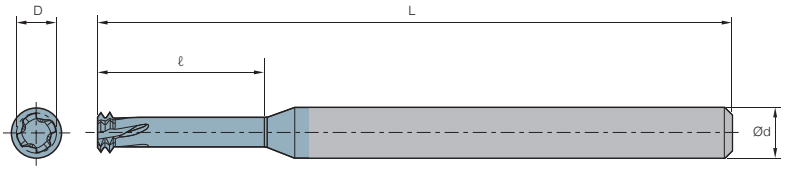
Thread Mill

ISO 메트릭

깊은 나사가공 엔드밀/고경도용



내경용
규격 : R262 (DIN 13)
공차 : 6H

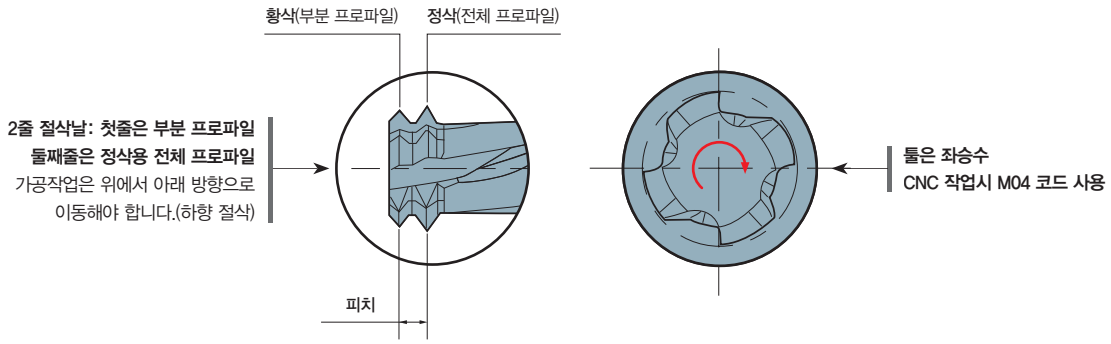


(ℓ ≤ 2 × 나사경)

나 사		피치	형 번		PC9070M	치수 (mm)				날수	나사산수	*보어경
M 콜스피치	M 파인피치	(mm)				Ød	D	L	ℓ	z	zt	mm
M2x0.4	-	0.40	STMD2L	06015L042-I0.40ISO		6	1.55	76	4.60	4	2	1.60
M2.2x0.45	-	0.45		06016L046-I0.45ISO		6	1.65	76	5.05	4	2	1.80
M2.5x0.45	-	0.45		06019L052-I0.45ISO		6	1.95	76	5.65	4	2	2.05
M3x0.5	M3.5-M16x0.5	0.50		06024L062-I0.50ISO		6	2.40	76	6.75	4	2	2.55
M3.5x0.6	-	0.60		06027L073-I0.60ISO		6	2.75	76	7.90	4	2	2.95
M4x0.7	-	0.70		06031L083-I0.70ISO		6	3.15	76	9.05	4	2	3.35
M5x0.8	-	0.80		06040L104-I0.80ISO		6	4.05	76	11.20	4	2	4.30
M6x1.0	M8-M40x1.0	1.00		06048L125-I1.00ISO		6	4.80	76	13.50	5	2	5.10
M8x1.25	-	1.25		08065L166-I1.25ISO		8	6.50	80	17.85	5	2	6.80
M10x1.5	M12-M48x1.50	1.50		08079L208-I1.50ISO		8	7.90	80	22.30	6	2	8.60
M12x1.75	-	1.75		10099L250-I1.75ISO		10	9.90	101	26.75	6	2	10.40

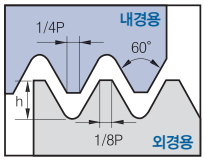
(ℓ ≤ 3 × 나사경)

나 사		피치	형 번		PC9070M	치수 (mm)				날수	나사산수	*보어경
M 콜스피치	M 파인피치	(mm)				Ød	D	L	ℓ	z	zt	mm
M2x0.4	-	0.40	STMD2L	06015L062-I0.40ISO		6	1.55	76	6.60	4	2	1.60
M2.5x0.45	-	0.45		06019L077-I0.45ISO		6	1.95	76	8.15	4	2	2.05
M3x0.5	M3.5-M16x0.5	0.50		06024L092-I0.50ISO		6	2.40	76	9.75	4	2	2.55
M4x0.7	-	0.70		06031L123-I0.70ISO		6	3.15	76	13.05	4	2	3.35
M5x0.8	-	0.80		06040L154-I0.80ISO		6	4.05	76	16.20	4	2	4.30
M6x1.0	M8-M40x1.0	1.00		06048L185-I1.00ISO		6	4.80	76	19.50	5	2	5.10
M8x1.25	-	1.25		08065L246-I1.25ISO		8	6.50	80	25.85	5	2	6.80

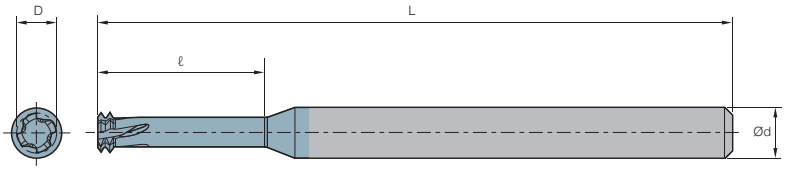


미국 유니파이(UNC,UNF)

깊은 나사가공 엔드밀/고경도용



내경용
규격 : ANSI B1.1.74
공차 : 2B



(ℓ ≤ 2 × 나사경)

나 사		피치	형 번		PC9070M	치수 (mm)				날수	나사산수	*보어경
UNC	UNF	(tpi)				Ød	D	L	ℓ	z	zt	mm
No.2-56	No.3-56	56	STMD2L	06016L050-I56UN		6	1.65	76	5.45	4	2	1.80
No.3-48	No.4-48	48		06019L060-I48UN		6	1.90	76	6.53	4	2	2.10
No.4-40, No.5-40	No.6-40	40		06021L060-I40UN		6	2.10	76	6.64	4	2	2.35
No.5-40	No.6-40	40		06024L072-I40UN		6	2.45	76	7.84	4	2	2.65
-	No.8-36	36		06033L087-I36UN		6	3.30	76	9.41	4	2	3.55
No.6-32, No.8-32	No.10-32	32		06025L074-I32UN		6	2.55	76	8.20	4	2	2.85
No.8-32	No.10-32	32		06032L100-I32UN		6	3.20	76	10.79	4	2	3.50
-	No.10-32	32		06037L100-I32UN		6	3.70	76	10.80	4	2	4.17
-	1/4˝x28	28		06052L132-I28UN		6	5.25	76	14.11	5	2	5.55
No.10-24	5/16˝x24	24		06035L102-I24UN		6	3.58	76	11.26	4	2	3.90
-	5/16˝x24	24		08066L165-I24UN		8	6.68	80	17.56	5	2	7.00
1/4˝-20	7/16˝x20	20		06048L134-I20UN		6	4.88	76	14.67	5	2	5.20
-	7/16˝x20	20		10095L230-I20UN		10	9.55	101	24.27	6	2	9.90
5/16˝x18	-	18		08061L160-I18UN		8	6.15	80	18.17	4	2	6.50
3/8˝x16	-	16		08076L197-I16UN		8	7.65	80	21.29	5	2	8.00
7/16˝x14	-	14		10090L233-I14UN		10	9.00	101	25.11	6	2	9.50
1/2˝x13	-	13		10099L256-I13UN		10	9.90	101	27.55	6	2	10.90

(ℓ ≤ 3 × 나사경)

나 사		피치	형 번		PC9070M	치수 (mm)				날수	나사산수	*보어경
UNC	UNF	(tpi)				Ød	D	L	ℓ	z	zt	mm
No.4-40, No.5-40	No.6-40	40	STMD2L	06021L090-I40UN		6	2.10	76	9.64	4	2	2.35
No.5-40	No.6-40	40		06024L100-I40UN		6	2.45	76	10.64	4	2	2.65
No.6-32, No.8-32	No.10-32	32		06025L110-I32UN		6	2.55	76	11.79	4	2	2.85
No.8-32	No.10-32	32		06032L130-I32UN		6	3.20	76	13.79	4	2	3.50
-	1/4˝x28	28		06052L196-I28UN		6	5.25	76	20.51	5	2	5.55
-	5/16˝x24	24		08066L245-I24UN		8	6.68	80	25.56	5	2	7.00
1/4˝x20	7/16˝x20	20		06048L198-I20UN		6	4.88	76	21.07	5	2	5.20
5/16˝x18	-	18		08061L240-I18UN		8	6.15	80	26.17	4	2	6.50
7/16˝x14	-	14		10090L335-I14UN		10	9.00	101	35.31	6	2	9.50

* 보어경(Bore Diameter)은 가능한 최소나사경을 적용

● : 재고 관리 형번

고능률/고품위 가공이 가능한 초경 및 하이스 탭

TAP

탭 시리즈

- 탁월한 내마모성을 갖춘 초경, 하이스 탭 구성
- 포인트 탭, 스파이럴 탭, 스트레이트 탭, 롤 탭 등 다양성 구현, M 미터 나사 JIS, DIN 규격 대응(M3~)
- 분말하이스 및 M3 이하는 주문생산 가능

특징

- **초경 및 하이스 2가지 모재 적용** – 초경 : 고인성 모재 적용
  – 하이스 : 고(高) 바나듐 모재 적용
- **다양한 피삭재 형상에 대응** – 포인트 탭, 스파이럴 탭, 스트레이트 탭, 롤 탭 등 구성
- **M 미터나사 기준 표준 규격화 완료** – JIS, DIN 표준규격 및 이형(스페셜) 대응 가능
- **타입별, 사이즈별 형번 Line up** – 다양한 타입 라인업을 통한 고객 선택의 폭 확대



형번표기법

M3 x 0.5 - ST 25 (S) - (120)

나사 규격	나사 형상	불완전 나사부	롤 탭	전장 표기
Metric coarse screw threads and thread size	ST : 스트레이트 탭 PT : 포인트 탭 SP : 스파이럴 탭 RT : 롤 탭 SR : 스파이럴 롤 탭 STD : 스트레이트 탭(DIN) PTD : 포인트 탭(DIN) SPD : 스파이럴 탭(DIN) RTD : 롤 탭(DIN)	Incomplete thread length	S : Single M : Multi	스페셜 제품

재종표기법

초경 탭(Carbide Tap)		하이스 탭(HSS Tap)	
FN30T	초경(Carbide), Uncoated	**HN30T**	하이스(HSS), Uncoated
PC20T	초경(Carbide), TiN 코팅	**HC20T**	하이스(HSS), TiN 코팅
PC10T	초경(Carbide), TiCN 코팅	**HC10T**	하이스(HSS), TiCN 코팅
-	-	**HH30T**	하이스(HSS), 호모(Steam Oxide)



· 초경 탭(Carbide Tap) 시리즈

Tap 구분		형상	특징	재종	규격
ST	스트레이트 탭 (Straight Tap)		• 관통 구멍 및 대량 생산에 적합 • 주철, 중탄소강, 비철금속 가공에 적합	FN30T	M3~M12
				PC10T	M3~M12
				PC20T	M3~M12
SP	스파이럴 탭 (Spiral Tap)		• 막힌 구멍 가공에 적합 • 칩 플루트 통해 배출	FN30T	M3~M12
				PC10T	M3~M12
RT	롤 탭 (Roll Tap)		• 비철금속 가공에 적합 • 막힌 구멍 및 관통 구멍 가공용	FN30T	M3~M12
				PC10T	M3~M12
SR	스파이럴 롤 탭 (Spiral Roll Tap)		• 비철합금 및 Al, 마그네슘 가공에 적합	FN30T	M3~M6
				PC10T	M3~M6

· 하이스 탭(HSS Tap) 시리즈

Tap 구분		형상	특징	재종	규격
ST	스트레이트 탭 (Straight Tap)		• 관통 구멍 및 대량 생산에 적합 • 주철, 중탄소강, 비철금속 가공에 적합	HN30T	M3~M20
				HC20T	M3~M20
				HC10T	M3~M20
				HH30T	M3~M20
PT	포인트 탭 (Point Tap)		• 관통 구멍 가공에 적합 • 형상은 스트레이트 탭과 비슷하나 팁 배출 용이하게 형상 구성	HN30T	M3~M20
				HC20T	M3~M20
				HC10T	M3~M20
				HH30T	M3~M20
SP	스파이럴 탭 (Spiral Tap)		• 막힌 구멍 가공에 적합 • 칩 플루트 통해 배출	HN30T	M3~M20
				HC20T	M3~M20
				HC10T	M3~M20
				HH30T	M3~M24
RT	롤 탭 (Roll Tap)		• 비철금속 가공에 적합 • 막힌 구멍 및 관통 구멍 가공용	HN30T	M3~M12
				HC20T	M3~M12
				HC10T	M3~M12
SR	스파이럴 롤 탭 (Spiral Roll Tap)		• 비철합금 및 Al, 마그네슘 가공에 적합	HN30T	M3~M6
				HC20T	M3~M6
				HC10T	M3~M6

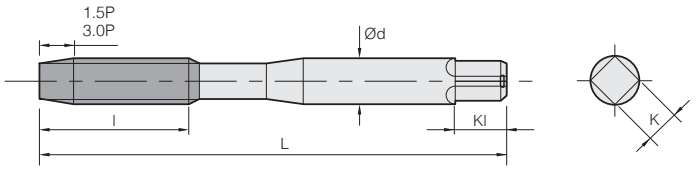
Thread **TAP**

ST 스트레이트 탭



3 | 4 | 0° HELIX | Carbide | Uncoated FN30T | TiN PC20T | TiCN PC10T | 절삭조건

p.468



(mm)

형 번		나사규격	L	ℓ	d	K	KI	등급
1.5P	3P							
M3X0.5-ST15	M3X0.5-ST30	M3×0.5	46	11	4	3.2	6	KH3
M4X0.7-ST15	M4X0.7-ST30	M4×0.7	52	13	5	4	7	KH3
M5X0.8-ST15	M5X0.8-ST30	M5×0.8	60	16	5.5	4.5	7	KH3
M6X1.0-ST15	M6X1.0-ST30	M6×1.0	62	19	6	4.5	7	KH3
M8X1.0-ST15	M8X1.0-ST30	M8×1.0	70	22	6.2	5	8	KH3
M8X1.25-ST15	M8X1.25-ST30	M8×1.25	70	22	6.2	5	8	KH4
M10X1.0-ST15	M10X1.0-ST30	M10×1.0	75	24	7	5.5	8	KH3
M10X1.25-ST15	M10X1.25-ST30	M10×1.25	75	24	7	5.5	8	KH4
M10X1.5-ST15	M10X1.5-ST30	M10×1.5	75	24	7	5.5	8	KH4
M12X1.0-ST15	M12X1.0-ST30	M12×1.0	82	29	8.5	6.5	9	KH3
M12X1.25-ST15	M12X1.25-ST30	M12×1.25	82	29	8.5	6.5	9	KH4
M12X1.5-ST15	M12X1.5-ST30	M12×1.5	82	29	8.5	6.5	9	KH4
M12X1.75-ST15	M12X1.75-ST30	M12×1.75	82	29	8.5	6.5	9	KH5

※ 보통 주철, 강인 주철, 황동 주물, 열경화성수지 등의 피삭재를 대량 가공 할 경우에 적합합니다.
※ TiCN, TiN코팅 적용으로 내구성이 향상되었으며, 고능률적인 나사 작업이 가능합니다.

• 적용 피삭재

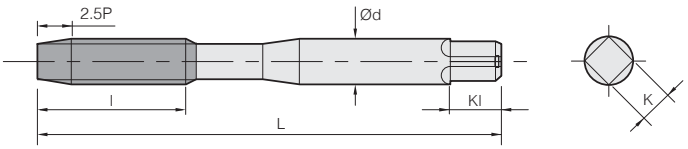
구분	탄소강			합금강	조질강			스테인레스강	공구강	주강	주철	강인주철	동	황동	황동주물	청동	알루미늄 압연재	알루미늄 합금주물	마그네슘 합금주물	아연 합금주물	티타늄 합금		열경화성 플라스틱	열가소성 플라스틱
	C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HRC	45~55 HRC	50~60 HRC	SUS	SKD	SC	GC	GCD	Cu	Bs	BsC	PB	Al	AC ADC	MC	ZDC	Ti	Ni	-	-
FN30T											◎	○		○	○	◎		○	○	○			◎	
PC20T											◎	○		○	○	◎		○	○	○			◎	
PC10T											◎	○		○	○	◎		○	○	○			◎	

◎: 매우적합 ○: 적합

SP 스파이럴 탭



3 | 15° HELIX | Carbide | Uncoated FN30T | TiCN PC10T | 절삭조건 p.468



(mm)

형 번 / 2.5P	나사규격	L	ℓ	d	K	Kl	등급
M3X0.5-SP25	M3×0.5	46	11	4	3.2	6	KH3
M4X0.7-SP25	M4×0.7	52	13	5	4	7	KH3
M5X0.8-SP25	M5×0.8	60	16	5.5	4.5	7	KH3
M6X1.0-SP25	M6×1.0	62	19	6	4.5	7	KH3
M8X1.0-SP25	M8×1.0	70	22	6.2	5	8	KH3
M8X1.25-SP25	M8×1.25	70	22	6.2	5	8	KH4
M10X1.0-SP25	M10×1.0	75	24	7	5.5	8	KH3
M10X1.25-SP25	M10×1.25	75	24	7	5.5	8	KH4
M10X1.5-SP25	M10×1.5	75	24	7	5.5	8	KH4
M12X1.0-SP25	M12×1.0	82	29	8.5	6.5	9	KH3
M12X1.25-SP25	M12×1.25	82	29	8.5	6.5	9	KH4
M12X1.5-SP25	M12×1.5	82	29	8.5	6.5	9	KH4
M12X1.75-SP25	M12×1.75	82	29	8.5	6.5	9	KH5

※ 막힌 구멍 가공용으로써 보통 주철, 강인 주철, 황동 주물, 열가소성수지 등의 피삭재를 대량 가공할 경우에 적합합니다.
※ TiCN 코팅 적용으로 내구성이 향상되었으며, 고능률적인 나사 작업이 가능합니다.

• 적용 피삭재

구분	탄소강			합금강	조질강			스테인레스강	공구강	주강	주철	강인 주철	동	황동	황동 주물	청동	알루미늄 압연재	알루미늄 합금주물	마그네슘 합금주물	아연 합금주물	티타늄 합금		열경화성 플라스틱	열가소성 플라스틱
	C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HRC	45~55 HRC	50~60 HRC	SUS	SKD	SC	GC	GCD	Cu	Bs	BsC	PB	Al	AC ADC	MC	ZDC	Ti	Ni	-	-
FN30T											○	◎	◎	◎	◎	○	○	○	○	○				◎
PC10T											○	◎	◎	◎	◎	○	○	◎	◎	◎			○	◎

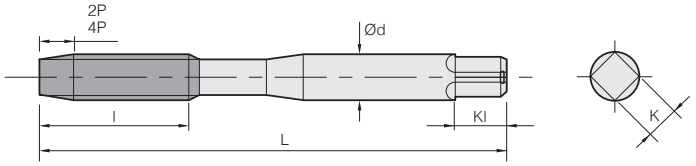
◎: 매우적합 ○: 적합

Thread **TAP**

RT 롤 탭



Carbide | Uncoated FN30T | TiCN PC10T | 절삭조건 p.468



(mm)

오일홀수	형 번		나사규격	L	ℓ	d	K	Kl	등급
	2P	4P							
1	M3X0.5-RT20(S)	-	M3×0.5	46	11	4	3.2	6	GH5
4	M3X0.5-RT20(M)	M3X0.5-RT40(M)	M3×0.5	46	11	4	3.2	6	GH5
1	M4X0.7-RT20(S)	-	M4×0.7	52	13	5	4	7	GH6
4	M4X0.7-RT20(M)	M4X0.7-RT40(M)	M4×0.7	52	13	5	4	7	GH6
1	M5X0.8-RT20(S)	-	M5×0.8	60	16	5.5	4.5	7	GH6
4	M5X0.8-RT20(M)	M5X0.8-RT40(M)	M5×0.8	60	16	5.5	4.5	7	GH6
1	M6X1.0-RT20(S)	-	M6×1.0	62	19	6	4.5	7	GH7
4	M6X1.0-RT20(M)	M6X1.0-RT40(M)	M6×1.0	62	19	6	4.5	7	GH7
1	M8X1.25-RT20(S)	-	M8×1.25	70	22	6.2	5	8	GH7
4	M8X1.25-RT20(M)	M8X1.25-RT40(M)	M8×1.25	70	22	6.2	5	8	GH7
1	M10X1.25-RT20(S)	-	M10×1.25	75	24	7	5.5	8	GH7
4	M10X1.25-RT20(M)	M10X1.25-RT40(M)	M10×1.25	75	24	7	5.5	8	GH7
1	M12X1.0-RT20(S)	-	M12×1.0	82	29	8.5	6.5	9	GH7
4	M12X1.0-RT20(M)	M12X1.0-RT40(M)	M12×1.0	82	29	8.5	6.5	9	GH7
1	M12X1.25-RT20(S)	-	M12×1.25	82	29	8.5	6.5	9	GH7
4	M12X1.25-RT20(M)	M12X1.25-RT40(M)	M12×1.25	82	29	8.5	6.5	9	GH7
1	M12X1.5-RT20(S)	-	M12×1.5	82	29	8.5	6.5	9	GH7
4	M12X1.5-RT20(M)	M12X1.5-RT40(M)	M12×1.5	82	29	8.5	6.5	9	GH7
1	M12X1.75-RT20(S)	-	M12×1.75	82	29	8.5	6.5	9	GH8
4	M12X1.75-RT20(M)	M12X1.75-RT40(M)	M12×1.75	82	29	8.5	6.5	9	GH8

※ 막힌 구멍 및 관통 구멍 가공용으로써 비철금속 가공에 적합합니다.
※ 스틸, 비철합금의 구별없이 적용 가능합니다.
※ TiCN 코팅 적용으로 내구성이 향상되었으며, 고능률적인 나사 작업이 가능합니다.

• 적용 피삭재

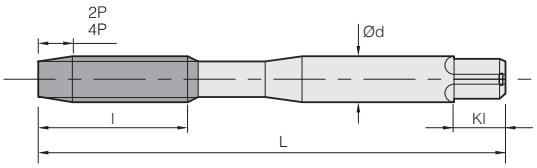
구분	탄소강			합금강	조질강			스테인레스강	공구강	주강	주철	강인주철	동	황동	황동주물	청동	알루미늄 압연재	알루미늄 합금주물	마그네슘 합금주물	아연 합금주물	티타늄 합금		열경화성 플라스틱	열가소성 플라스틱
	C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HRC	45~55 HRC	50~60 HRC	SUS	SKD	SC	GC	GCD	Cu	Bs	BsC	PB	Al	AC ADC	MC	ZDC	Ti	Ni	-	-
FN30T													◎	◎	◎		◎	◎		◎				
PC10T	◎	◎	○	○				◎					◎	◎	◎		◎	◎		◎				

◎: 매우적합 ○: 적합

SR 스파이럴 롤 탭



Carbide | Uncoated FN30T | TiCN PC10T | 절삭조건 p.468



(mm)

형 번		나사규격	L	ℓ	d	K	Kl	등급
2P	4P							
M3X0.5-SR20	M3X0.5-SR40	M3×0.5	46	18	4	3.2	6	GH6
M3.5X0.6-SR20	M3.5X0.6-SR40	M3.5×0.6	46	18	4	3.2	6	GH6
M4X0.7-SR20	M4X0.7-SR40	M4×0.7	52	20	5	4	7	GH7
M5X0.8-SR20	M5X0.8-SR40	M5×0.8	60	22	5.5	4.5	7	GH7
M6X1.0-SR20	M6X1.0-SR40	M6×1.0	62	24	6	4.5	7	GH7

※ 비철합금은 물론 알루미늄, 마그네슘, 아연 등의 나사 작업에 적합합니다.
※ 강, 비철합금 및 스테인리스강 나사 작업에 적합합니다.
※ TiCN 코팅 적용으로 내구성이 향상되었으며, 고능률적인 나사 작업이 가능합니다.

• 적용 피삭재

구분	탄소강			합금강	조질강			스테인레스강	공구강	주강	주철	강인주철	동	황동	황동주물	청동	알루미늄 압연재	알루미늄 합금주물	마그네슘 합금주물	아연 합금주물	티타늄 합금		열경화성 플라스틱	열가소성 플라스틱
	C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HRC	45~55 HRC	50~60 HRC	SUS	SKD	SC	GC	GCD	Cu	Bs	BsC	PB	Al	AC ADC	MC	ZDC	Ti	Ni	-	-
FN30T													◎	◎	◎		◎	◎		◎				
PC10T	◎	◎	○	○				◎					◎	◎	◎		◎	◎		◎				

◎: 매우적합 ○: 적합

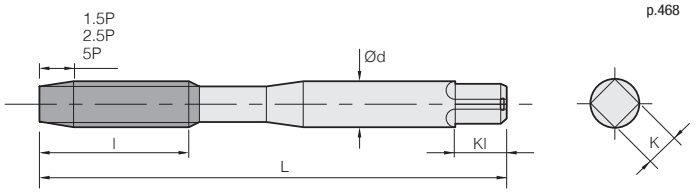
Thread **TAP**

ST 스트레이트 탭



3 | 4 | 0° HELIX | HSSE | Uncoated HN30T | TiN HC20T | TiCN HC10T | Steam Oxide HH30T | 절삭조건

p.468



(mm)

형 번		나사규격	L	ℓ	d	K	Kl	등급
1.5P	5P							
M3X0.5-ST15	M3X0.5-ST50	M3×0.5	46	11	4	3.2	6	KH2
M4X0.7-ST15	M4X0.7-ST50	M4×0.7	52	13	5	4	7	KH2
M5X0.8-ST15	M5X0.8-ST50	M5×0.8	60	16	5.5	4.5	7	KH2
M6X1.0-ST15	M6X1.0-ST50	M6×1.0	62	19	6	4.5	7	KH2
M8X1.25-ST15	M8X1.25-ST50	M8×1.25	70	22	6.2	5	8	KH2
M10X1.25-ST15	M10X1.25-ST50	M10×1.25	75	24	7	5.5	8	KH2
M10X1.5-ST15	M10X1.5-ST50	M10×1.5	75	24	7	5.5	8	KH3
M12X1.0-ST15	M12X1.0-ST50	M12×1.0	82	29	8.5	6.5	9	KH2
M12X1.25-ST15	M12X1.25-ST50	M12×1.25	82	29	8.5	6.5	9	KH2
M12X1.5-ST15	M12X1.5-ST50	M12×1.5	82	29	8.5	6.5	9	KH3
M12X1.75-ST15	M12X1.75-ST50	M12×1.75	82	29	8.5	6.5	9	KH3
M14X1.5-ST15	M14X1.5-ST50	M14×1.5	88	30	10.5	8	11	KH3
M14X2.0-ST15	M14X2.0-ST50	M14×2.0	88	30	10.5	8	11	KH3
M16X1.5-ST15	M16X1.5-ST50	M16×1.5	95	32	12.5	10	13	KH3
M16X2.0-ST15	M16X2.0-ST50	M16×2.0	95	32	12.5	10	13	KH3
M18X1.5-ST15	M18X1.5-ST50	M18×1.5	100	37	14	11	14	KH3
M18X2.5-ST15	M18X2.5-ST50	M18×2.5	100	37	14	11	14	KH3
M20X1.5-ST15	M20X1.5-ST50	M20×1.5	105	37	15	12	15	KH3
M20X2.5-ST15	M20X2.5-ST50	M20×2.5	105	37	15	12	15	KH3

※ 막힌 구멍 및 관통 구멍 가공용으로써 탄소강, 합금강 및 비철금속 가공에 적합합니다.
※ TiCN, TiN, Steam oxide 코팅 적용으로 내구성이 향상되었으며, 고능률적인 나사 작업이 가능합니다.
※ 일반 주철 및 중탄소강, 비철금속 등 피삭재 가공에 적합합니다.
※ SUS강, 주강, 기계구조용 탄소강 등 피삭재 가공에 적합합니다.
※ Fe^3O^4 산화피막 다공질 절삭유 함유로 마찰계수가 감소하여 용착을 방지합니다.

• 적용 피삭재

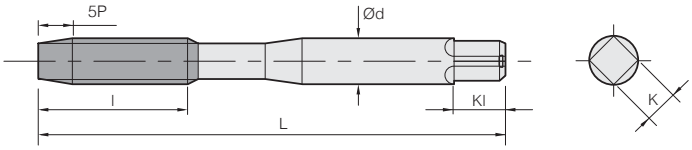
구분	탄소강			합금강	조질강			스테인레스강	공구강	주강	주철	강인주철	동	황동	황동주물	청동	알루미늄 압연재	알루미늄 합금주물	마그네슘 합금주물	아연 합금주물	티타늄 합금		열경화성 플라스틱	열가소성 플라스틱
	C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HRC	45~55 HRC	50~60 HRC	SUS	SKD	SC	GC	GCD	Cu	Bs	BsC	PB	Al	AC ADC	MC	ZDC	Ti	Ni	-	-
HN30T		○										○		○	○	○	○	○	○	○				
HC20T	○	○	○	○	○									○	○	○	○	○	○	○				
HC10T	○	○	○	○	○									○	○	○	○	○	○	○				
HH30T	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○												

◎: 매우적합 ○: 적합

PT 포인트 탭



3 | 0° HELIX | HSSE | Uncoated HN30T | TiN HC20T | TiCN HC10T | Steam Oxide HH30T | 절삭조건 p.468



(mm)

형 번 5P	나사규격	L	ℓ	d	K	Kl	등급
M3X0.5-PT50	M3×0.5	46	11	4	3.2	6	KH2
M4X0.7-PT50	M4×0.7	52	13	5	4	7	KH2
M5X0.8-PT50	M5×0.8	60	16	5.5	4.5	7	KH2
M6X1.0-PT50	M6×1.0	62	19	6	4.5	7	KH2
M8X1.25-PT50	M8×1.25	70	22	6.2	5	8	KH3
M10X1.25-PT50	M10×1.25	75	24	7	5.5	8	KH3
M10X1.5-PT50	M10×1.5	75	24	7	5.5	8	KH3
M12X1.0-PT50	M12×1.0	82	29	8.5	6.5	9	KH3
M12X1.25-PT50	M12×1.25	82	29	8.5	6.5	9	KH3
M12X1.5-PT50	M12×1.5	82	29	8.5	6.5	9	KH3
M12X1.75-PT50	M12×1.75	82	29	8.5	6.5	9	KH4
M14X1.5-PT50	M14×1.5	88	30	10.5	8	11	KH3
M14X2.0-PT50	M14×2.0	88	30	10.5	8	11	KH4
M16X1.5-PT50	M16×1.5	95	32	12.5	10	13	KH3
M16X2.0-PT50	M16×2.0	95	32	12.5	10	13	KH4
M18X1.5-PT50	M18×1.5	100	37	14	11	14	KH4
M18X2.5-PT50	M18×2.5	100	37	14	11	14	KH4
M20X1.5-PT50	M20×1.5	105	37	15	12	15	KH4
M20X2.5-PT50	M20×2.5	105	37	15	12	15	KH4

※ 관통 구멍 가공용으로써 탄소강, 합금강 및 비철금속 가공에 적합합니다.
※ TiCN, TiN, Steam oxide 코팅 적용으로 내구성이 향상되었으며, 고능률적인 나사 작업이 가능합니다.
※ Fe^3O^4 산화피막 다공질 절삭유 함유로 마찰계수가 감소하여 용착을 방지합니다.
※ SUS강, 주강, 기계구조용 탄소강 등 피삭재 가공에 적합합니다.

• 적용 피삭재

구분	탄소강			합금강	조질강			스테인레스강	공구강	주강	주철	강인주철	동	황동	황동주물	청동	알루미늄 압연재	알루미늄 합금주물	마그네슘 합금주물	아연 합금주물	티타늄 합금		열경화성 플라스틱	열가소성 플라스틱
	C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HRC	45~55 HRC	50~60 HRC	SUS	SKD	SC	GC	GCD	Cu	Bs	BsC	PB	Al	AC ADC	MC	ZDC	Ti	Ni	-	-
HN30T		○	○	◎							○	○	○	○	○	○	◎	○	○	○				○
HC20T	○	○	○	○				◎	○	○	○	○	○	○	○	○	○	○	○	○	○	○		○
HC10T	◎	◎	◎	○				○	○	○	○	○	○	○	○	○	○	○	○	○	○	○		○
HH30T	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○												

◎: 매우적합 ○: 적합

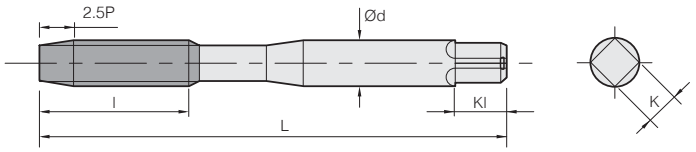
Thread **TAP**

SP 스파이럴 탭



3 | 4 | 35° HELIX | HSSE | Uncoated HN30T | TiN HC20T | TiCN HC10T | Steam Oxide HH30T | 절삭조건

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(mm)

형 번 2.5P	나사규격	L	ℓ	d	K	Kl	등급
M3X0.5-SP25	M3×0.5	46	11	4	3.2	6	KH2
M4X0.7-SP25	M4×0.7	52	13	5	4	7	KH2
M5X0.8-SP25	M5×0.8	60	16	5.5	4.5	7	KH2
M6X1.0-SP25	M6×1.0	62	19	6	4.5	7	KH2
M8X1.25-SP25	M8×1.25	70	22	6.2	5	8	KH2
M10X1.25-SP25	M10×1.25	75	24	7	5.5	8	KH2
M10X1.5-SP25	M10×1.5	75	24	7	5.5	8	KH2
M12X1.0-SP25	M12×1.0	82	29	8.5	6.5	9	KH2
M12X1.25-SP25	M12×1.25	82	29	8.5	6.5	9	KH2
M12X1.5-SP25	M12×1.5	82	29	8.5	6.5	9	KH2
M12X1.75-SP25	M12×1.75	82	29	8.5	6.5	9	KH2
M14X1.5-SP25	M14×1.5	88	30	10.5	8	11	KH2
M14X2.0-SP25	M14×2.0	88	30	10.5	8	11	KH2
M16X1.5-SP25	M16×1.5	95	32	12.5	10	13	KH2
M16X2.0-SP25	M16×2.0	95	32	12.5	10	13	KH2
M18X1.5-SP25	M18×1.5	100	37	14	11	14	KH2
M18X2.5-SP25	M18×2.5	100	37	14	11	14	KH3
M20X1.5-SP25	M20×1.5	105	37	15	12	15	KH3
M20X2.5-SP25	M20×2.5	105	37	15	12	15	KH3

※ 막힌 구멍 가공용으로 탄소강, 합금강 및 비철금속 가공에 있어 절삭칩 배출에 탁월한 홈 형상을 적용하였습니다.
※ TiCN, TiN, Steam oxide 코팅 적용으로 내구성이 향상되었으며, 고능률적인 나사 작업이 가능합니다.
※ Fe^3O^4 산화피막 다공질 절삭유 함유로 마찰계수가 감소하여 용착을 방지합니다.
※ SUS강, 주강, 기계구조용 탄소강 등 피삭재 가공에 적합합니다.

• 적용 피삭재

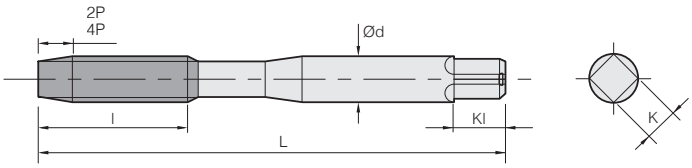
구분	탄소강			합금강	조질강			스테인레스강	공구강	주강	주철	강인주철	동	황동	황동주물	청동	알루미늄 압연재	알루미늄 합금주물	마그네슘 합금주물	아연 합금주물	티타늄 합금		열경화성 플라스틱	열가소성 플라스틱
	C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HRC	45~55 HRC	50~60 HRC	SUS	SKD	SC	GC	GCD	Cu	Bs	BsC	PB	Al	AC ADC	MC	ZDC	Ti	Ni	-	-
HN30T		○		◎								○	○	○	○	○	○	○	○	○				○
HC20T	○	○	○	○				○	○	○		○	○	○	○	○	○	○	○	○	○			○
HC10T	○	◎	◎	○				○	○	○		○	○	○	○	○	○	◎	○	○	○	○		○
HH30T	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○												

◎: 매우적합 ○: 적합

RT 롤 탭



HSSE | Uncoated HN30T | TiN HC20T | TiCN HC10T | 절삭조건 p.468



(mm)

오일홀수	형 번		나사규격	L	ℓ	d	K	Kl	등급
	2P	4P							
1	M3X0.5-RT20(S)	-	M3×0.5	46	11	4	3.2	6	GH5
4	M3X0.5-RT20(M)	M3X0.5-RT40(M)	M3×0.5	46	11	4	3.2	6	GH5
1	M4X0.7-RT20(S)	-	M4×0.7	52	13	5	4	7	GH6
4	M4X0.7-RT20(M)	M4X0.7-RT40(M)	M4×0.7	52	13	5	4	7	GH6
1	M5X0.8-RT20(S)	-	M5×0.8	60	16	5.5	4.5	7	GH6
4	M5X0.8-RT20(M)	M5X0.8-RT40(M)	M5×0.8	60	16	5.5	4.5	7	GH6
1	M6X1.0-RT20(S)	-	M6×1.0	62	19	6	4.5	7	GH7
4	M6X1.0-RT20(M)	M6X1.0-RT40(M)	M6×1.0	62	19	6	4.5	7	GH7
1	M8X1.25-RT20(S)	-	M8×1.25	70	22	6.2	5	8	GH7
4	M8X1.25-RT20(M)	M8X1.25-RT40(M)	M8×1.25	70	22	6.2	5	8	GH7
1	M10X1.25-RT20(S)	-	M10×1.25	75	24	7	5.5	8	GH7
4	M10X1.25-RT20(M)	M10X1.25-RT40(M)	M10×1.25	75	24	7	5.5	8	GH7
1	M10X1.5-RT20(S)	-	M10×1.5	75	24	7	5.5	8	GH7
4	M10X1.5-RT20(M)	M10X1.5-RT40(M)	M10×1.5	75	24	7	5.5	8	GH7
1	M12X1.0-RT20(S)	-	M12×1.0	82	29	8.5	6.5	9	GH7
4	M12X1.0-RT20(M)	M12X1.0-RT40(M)	M12×1.0	82	29	8.5	6.5	9	GH7
1	M12X1.25-RT20(S)	-	M12×1.25	82	29	8.5	6.5	9	GH7
4	M12X1.25-RT20(M)	M12X1.25-RT40(M)	M12×1.25	82	29	8.5	6.5	9	GH7
1	M12X1.5-RT20(S)	-	M12×1.5	82	29	8.5	6.5	9	GH7
4	M12X1.5-RT20(M)	M12X1.5-RT40(M)	M12×1.5	82	29	8.5	6.5	9	GH7
1	M12X1.75-RT20(S)	-	M12×1.75	82	29	8.5	6.5	9	GH8
4	M12X1.75-RT20(M)	M12X1.75-RT40(M)	M12×1.75	82	29	8.5	6.5	9	GH8

※ 스틸, 비철합금의 구별없이 적용 가능합니다.
※ TiCN, TiN 코팅 적용으로 내구성이 향상되었으며, 고능률적인 나사 작업이 가능합니다.
※ 알루미늄, 아연, 동 등의 비철합금에 적합합니다.

• 적용 피삭재

구분	탄소강			합금강	조질강			스테인레스강	공구강	주강	주철	강인주철	동	황동	황동주물	청동	알루미늄 압연재	알루미늄 합금주물	마그네슘 합금주물	아연 합금주물	티타늄 합금		열경화성 플라스틱	열가소성 플라스틱
	C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HRC	45~55 HRC	50~60 HRC	SUS	SKD	SC	GC	GCD	Cu	Bs	BsC	PB	Al	AC ADC	MC	ZDC	Ti	Ni	-	-
FN30T													○	○	○	○	○	○		◎				
HC20T	○	○	○	○				◎	○	○		○	○	○	○									
HC10T	◎	◎	○	○				◎					◎	◎	◎		◎	◎		◎				

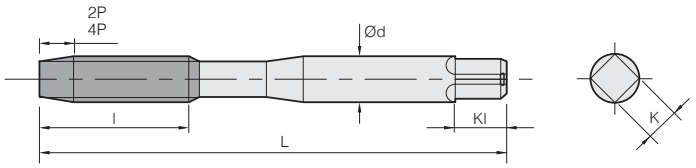
◎: 매우적합 ○: 적합

Thread **TAP**

SR 스파이럴 롤 탭



HSSE | Uncoated HN30T | TiN HC20T | TiCN HC10T | 절삭조건 p.468



(mm)

형 번		나사규격	L	ℓ	d	K	Kl	등급
2P	4P							
M3X0.5-SR20	M3X0.5-SR40	M3×0.5	46	18	4	3.2	6	GH6
M3.5X0.6-SR20	M3.5X0.6-SR40	M3.5×0.6	48	18	4	3.2	6	GH6
M4X0.7-SR20	M4X0.7-SR40	M4×0.7	52	20	5	4	7	GH7
M5X0.8-SR20	M5X0.8-SR40	M5×0.8	60	22	5.5	4.5	7	GH7
M6X1.0-SR20	M6X1.0-SR40	M6×1.0	62	24	6	4.5	7	GH7

※ 비철합금은 물론 알루미늄, 마그네슘, 아연 등의 나사 작업에 적합합니다.
※ 강, 비철합금 및 스테인리스강 나사 작업에 적합합니다.
※ TiCN, TiN 코팅 적용으로 내구성이 향상되었으며, 고능률적인 나사 작업이 가능합니다.

• 적용 피삭재

구분	탄소강			합금강	조질강			스테인레스강	공구강	주강	주철	강인주철	동	황동	황동주물	청동	알루미늄 압연재	알루미늄 합금주물	마그네슘 합금주물	아연 합금주물	티타늄 합금		열경화성 플라스틱	열가소성 플라스틱
	C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HRC	45~55 HRC	50~60 HRC	SUS	SKD	SC	GC	GCD	Cu	Bs	BsC	PB	Al	AC ADC	MC	ZDC	Ti	Ni	-	-
FN30T													○	○	○	○	○	○		◎				
HC20T	○	○	○	○				◎	○	○		○	○	○	○									
HC10T	◎	◎	○	○				◎					◎	◎	◎		◎	◎		◎				

◎: 매우적합 ○: 적합

Recommended Cutting Conditions


Endmill


Drill


Reamer


Chamfer


Thread

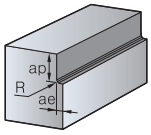


Super Endmill For HRSA

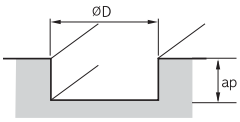
SFES4000 (플랫), SRES4000 (레디우스)

피삭재 / 절삭조건 / 공구직경(Ø)	니켈계 내열합금 (Inconel718, 625)			
	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
3	3,800	220	2,500	125
4	3,000	240	1,900	135
5	2,450	245	1,500	145
6	2,100	250	1,250	145
8	1,600	225	945	155
10	1,250	215	760	145
12	1,050	210	630	145
16	765	210	475	110
20	635	200	380	110

절입기준



■ 측면가공
- ap: ≤ 1.5D
- ae: ≤ 0.05D



■ 홈가공
- ap: ≤ 0.2D

※ 주의사항

- 절삭조건은 기계의 상태, 가공형태 및 목적에 알맞게 조정하여 사용하십시오.
- 가공기계는 강성이 충분한 기계로 선택하고, 가공품의 고정상태를 확인바랍니다.
- 절삭유는 가공물 재질에 적합한 절삭유를 선택하고, 고압 또는 충분한 양의 절삭유가 공구 및 가공물에 공급될 수 있는지 확인바랍니다.
- 가공 시 떨림이 발생할 경우에는 회전속도와 이송을 같은 비율로 내려서 사용하십시오.

Super Endmill For Ti/STS

SFET4000 (플랫), SRET4000 (레디우스)

피삭재				브리넬 경도 (HB)	비절삭 저항 (N/mm^2)	ap (mm)	ae (mm)	가공 방법	공구 직경 (mm)	3	4	5	6	8	10	12	16	20
ISO	피삭재 소재	KS	ISO (DIN)						날장 (mm)	8	10	15	15	20	25	30	42	48
P	탄소강	SM20C SM40C SM45C	(C22) C40 C45	230	400 ~ 600	1.5D	0.1D	측면가공	vc	100	108	114	114	114	114	114	114	114
									fz	0.020	0.030	0.040	0.050	0.065	0.070	0.080	0.085	0.100
									rpm	10610	8594	7257	6048	4536	3629	3024	2268	1814
									feed	849	1031	1161	1210	1179	1016	968	771	726
						0.5D	1D	슬로팅	vc	64	65	68	70	70	70	70	70	70
									fz	0.016	0.022	0.030	0.038	0.046	0.050	0.056	0.060	0.070
									rpm	6791	5173	4329	3714	2785	2228	1857	1393	1114
									feed	435	455	519	564	512	446	416	334	312
	합금강	SNCM220 SNCM420 SCM430 SCM440	20NiCrMo2 - - 42CrMo4	280	800 ~ 1000	1.5D	0.1D	측면가공	vc	141	138	151	151	151	151	151	151	151
									fz	0.021	0.032	0.049	0.069	0.067	0.075	0.078	0.095	0.090
									rpm	15000	11000	9600	8000	6000	4800	4000	3000	2400
									feed	1250	1400	1900	2200	1600	1440	1250	1140	860
						0.5D	1D	슬로팅	vc	65	70	71	70	70	69	72	70	69
									fz	0.015	0.022	0.035	0.050	0.060	0.060	0.070	0.070	0.080
									rpm	6900	5600	4500	3700	2800	2200	1900	1400	1100
									feed	410	490	630	740	670	530	530	390	350
M	페라이트/ 마르텐 사이트계	STS405 STS430 STS416 STS434 STS403 STS410	X6CrAl13 X6Cr17 X12CrS13 X6CrMo17-1 (X6Cr13) X12Cr13	240	450 540 450	1.5D	0.1D	측면가공	vc	100	108	114	114	114	114	114	114	114
									fz	0.020	0.030	0.040	0.050	0.065	0.070	0.080	0.085	0.100
									rpm	10610	8594	7257	6048	4536	3629	3024	2268	1814
									feed	849	1031	1161	1210	1179	1016	968	771	726
						0.5D	1D	슬로팅	vc	64	65	68	70	70	70	70	70	70
									fz	0.016	0.022	0.030	0.038	0.046	0.050	0.056	0.060	0.070
									rpm	6791	5173	4329	3714	2785	2228	1857	1393	1114
									feed	435	455	519	564	512	446	416	334	312
	오스테 나이트계	STS303 STS304 STS316	X10CrNiS18-9 X5CrNi18-9 X5CrNiMo17-12-2	200	520	1.5D	0.1D	측면가공	vc	72	76	78	80	80	80	80	80	80
									fz	0.020	0.030	0.040	0.050	0.065	0.070	0.080	0.085	0.100
									rpm	7639	6048	4966	4244	3183	2546	2122	1592	1273
									feed	611	726	795	849	828	713	679	541	509
						0.5D	1D	슬로팅	vc	45	46	48	50	50	50	50	50	50
									fz	0.016	0.022	0.030	0.038	0.046	0.050	0.056	0.060	0.070
									rpm	4775	3660	3056	2653	1990	1592	1326	955	796
									feed	306	322	367	403	366	318	297	229	223
S	Ti/ Ti 합금	Ti6Al4V Ti5Al5V5Mo Ti7Al4Mo	Ti6Al4V Ti5Al5V5Mo Ti7Al4Mo	320	600 ~ 1800	1.5D	0.1D	측면가공	vc	70	74	75	76	78	78	78	78	78
									fz	0.018	0.027	0.035	0.043	0.054	0.064	0.073	0.080	0.092
									rpm	7427	5889	4775	4032	3104	2483	2069	1552	1241
									feed	535	636	668	693	670	636	604	497	457
						0.5D	1D	슬로팅	vc	40	41	43	45	45	45	45	45	45
									fz	0.014	0.020	0.027	0.034	0.040	0.045	0.050	0.054	0.063
									rpm	4244	3263	2737	2387	1790	1432	1194	895	716
									feed	238	261	296	327	286	258	239	193	180

Super Endmill for Ti/STS

SBET2000 (볼)

피삭재 ISO	피삭재 소재	KS	ISO (DIN)	브리넬 경도 (HB)	비절삭 저항 (N/mm²)	ap (mm)	ae (mm)	가공 방법	공구 직경 (mm)	1	2	3	4	5	6	8	10	12
									날장 (mm)	1	2	3	8	12	12	16	20	25
P	탄소강	SM20C SM40C SM45C	(C22) C40 C45	230	400 ~ 600	≤0.1D	≤0.1D	모방가공	vc	130	130	123	200	200	200	200	200	200
									fz	0.039	0.056	0.080	0.044	0.051	0.050	0.059	0.070	0.085
									rpm	41600	20800	13000	16000	12700	10600	8000	6400	5300
	합금강	SNCM220 SNCM420 SCM430 SCM440	20NiCrMo2 - - 42CrMo4	280	800 ~ 1000	≤0.1D	≤0.1D		feed	1625	1170	1040	1400	1300	1050	950	900	900
M	페라이트/ 마르텐 사이트계	STS405 STS430 STS416 STS434	X6CrAl13 X6Cr17 X12CrS13 X6CrMo17-1	240	450 540	≤0.1D	≤0.1D	모방가공	vc	120	120	113	180	180	180	180	180	180
									fz	0.039	0.056	0.080	0.035	0.039	0.044	0.058	0.068	0.081
									rpm	38400	19200	12000	14400	11520	9600	7200	5760	4800
		STS403 STS410	(X6Cr13) X12Cr13		450	≤0.1D	≤0.1D		feed	3000	2160	1920	1008	897	845	835	783	778
	오스테 나이트계	STS303 STS304 STS316	X10CrNiS18-9 X5CrNi18-9 X5CrNiMo17-12-2	200	520	≤0.1D	≤0.1D	모방가공	vc	100	100	94	150	150	150	150	150	150
									fz	0.039	0.056	0.080	0.035	0.039	0.044	0.058	0.068	0.081
									rpm	32000	16000	10000	12000	9600	8000	6000	4800	4000
									feed	2500	1800	1600	850	750	700	700	650	650
S	Ti/ Ti 합금	Ti6Al4V Ti5Al5V5Mo Ti7Al4Mo	Ti6Al4V Ti5Al5V5Mo Ti7Al4Mo	320	600 ~ 1800	≤0.1D	≤0.1D	모방가공	vc	100	100	94	150	150	150	150	150	150
									fz	0.039	0.056	0.080	0.035	0.039	0.044	0.058	0.068	0.081
									rpm	32000	16000	10000	12000	9600	8000	6000	4800	4000
									feed	2500	1800	1600	850	750	700	700	650	650

SBET4000 (볼)

피삭재 ISO	피삭재 소재	KS	ISO (DIN)	브리넬 경도 (HB)	비절삭 저항 (N/mm²)	ap (mm)	ae (mm)	가공 방법	공구 직경 (mm)	4	5	6	8	10	12
									날장 (mm)	8	12	12	16	20	25
P	탄소강	SM20C SM40C SM45C	(C22) C40 C45	230	400 ~ 600	≤0.1D	≤0.1D	모방가공	vc	200	200	200	200	200	200
									fz	0.044	0.051	0.050	0.059	0.070	0.085
									rpm	16000	12700	10600	8000	6400	5300
	합금강	SNCM220 SNCM420 SCM430 SCM440	20NiCrMo2 - - 42CrMo4	280	800 ~ 1000	≤0.1D	≤0.1D		feed	2800	2600	2100	1900	1800	1800
M	페라이트/ 마르텐 사이트계	STS405 STS430 STS416 STS434	X6CrAl13 X6Cr17 X12CrS13 X6CrMo17-1	240	450 540	≤0.1D	≤0.1D	모방가공	vc	180	180	180	180	180	180
									fz	0.035	0.039	0.044	0.058	0.068	0.081
									rpm	14400	11520	9600	7200	5760	4800
		STS403 STS410	(X6Cr13) X12Cr13		450	≤0.1D	≤0.1D		feed	2040	1800	1680	1680	1560	1560
	오스테 나이트계	STS303 STS304 STS316	X10CrNiS18-9 X5CrNi18-9 X5CrNiMo17-12-2	200	520	≤0.1D	≤0.1D	모방가공	vc	150	150	150	150	150	150
									fz	0.035	0.039	0.044	0.058	0.068	0.081
									rpm	12000	9600	8000	6000	4800	4000
									feed	1700	1500	1400	1400	1300	1300
S	Ti/ Ti 합금	Ti6Al4V Ti5Al5V5Mo Ti7Al4Mo	Ti6Al4V Ti5Al5V5Mo Ti7Al4Mo	320	600 ~ 1800	≤0.1D	≤0.1D	모방가공	vc	150	150	150	150	150	150
									fz	0.035	0.039	0.044	0.058	0.068	0.081
									rpm	12000	9600	8000	6000	4800	4000
									feed	1700	1500	1400	1400	1300	1300

The Mirror Endmill

PCD Endmill

공구직경 (DC, Ø)	R	고속도강, 프리하든강, 열처리강 (~HRC65)			
		n (min^{-1})	vf (mm/min)	ap (mm)	ae (mm)
0.3 ~ 0.4	0.15 ~ 0.2	40,000	200	0.002	0.002
0.6	0.3	40,000	400	0.003	0.003
1	0.5	40,000	500	0.005	0.005
1.5 ~ 2	0.75 ~ 1	40,000	600	0.005	0.005

cBN Endmill

공구직경 (DC, Ø)	넥장 (LU)	HRC~55				HRC55~65				HRC65~68			
		n (min^{-1})	vf (mm/min)	ap (mm)	ae (mm)	n (min^{-1})	vf (mm/min)	ap (mm)	ae (mm)	n (min^{-1})	vf (mm/min)	ap (mm)	ae (mm)
0.4	0.5	40,000	1,500	0.005	0.010	40,000	1,200	0.005	0.010	40,000	750	0.005	0.005
0.4	1	40,000	1,200	0.005	0.010	40,000	900	0.005	0.010	40,000	600	0.005	0.005
0.5	1	40,000	1,500	0.010	0.010	40,000	1,400	0.010	0.010	40,000	900	0.010	0.010
0.6	1.5	35,000	2,000	0.020	0.030	35,000	2,000	0.020	0.030	35,000	1,000	0.010	0.020
0.8	2	35,000	2,000	0.030	0.040	35,000	2,000	0.020	0.030	35,000	1,500	0.010	0.020
1	2.5	35,000	3,000	0.040	0.050	35,000	3,000	0.030	0.040	35,000	2,000	0.020	0.030
1.2	3	35,000	3,000	0.050	0.050	35,000	2,500	0.035	0.035	35,000	2,000	0.020	0.025
1.5	4	30,000	3,000	0.060	0.060	30,000	2,500	0.040	0.040	30,000	2,000	0.020	0.025
2	5	30,000	3,000	0.080	0.080	30,000	2,500	0.050	0.050	30,000	2,000	0.020	0.050

* 상기 추천절삭조건은 외부 급유 적용, 가공 깊이 5D 이하일 때의 절삭조건입니다.

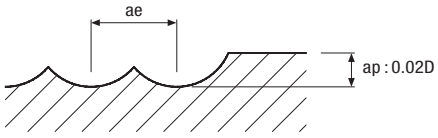
H-Star Endmill

ESB702, ESB712 series

피삭재	열처리강, 내열합금강		열처리강									
절삭조건	HRC30~40		HRC40~50		HRC50~55		HRC55~60		HRC60~65		HRC65~70	
공구직경(Ø)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
~0.2	50,000	1,200	50,000	1,050	45,000	960	40,000	770	35,000	674	31,500	570
0.3	50,000	1,500	50,000	1,350	45,000	1,200	40,000	765	35,000	840	31,500	700
0.4	50,000	1,900	50,000	1,700	45,000	1,500	40,000	1,200	35,000	1,050	31,500	1,100
0.5	50,000	2,400	50,000	2,100	45,000	1,900	40,000	1,500	35,000	1,300	31,500	1,100
0.6	50,000	2,900	50,000	2,500	45,000	2,200	40,000	1,800	35,000	1,600	31,500	1,400
0.8	50,000	3,900	50,000	3,300	45,000	3,000	40,000	2,400	35,000	1,600	31,500	1,800
1	50,000	4,800	50,000	4,200	45,000	3,800	40,000	3,000	35,000	2,600	35,000	2,300
1.5	50,000	5,400	48,000	4,500	43,000	4,000	23,000	3,100	33,000	2,700	29,700	2,300
2	49,700	5,700	47,800	4,800	40,000	4,000	35,000	3,150	32,000	2,800	28,500	2,300
3	33,100	6,000	31,800	5,300	26,500	4,000	23,500	3,150	21,000	28,00	19,000	2,300
4	24,900	6,000	23,900	5,300	20,000	4,000	17,500	3,150	16,000	2,800	14,500	2,300
5	18.6	5,800	17,800	4,900	15,000	3,750	13,500	3,050	11,500	2,550	10,500	2,100
6	13,900	4,850	13,400	4,100	11,000	3,100	10,000	2,500	8,800	2,150	8,000	1,750
8	11,100	4,200	10,700	3,500	9,000	2,700	8,000	2,150	7,000	1,850	6,500	1,550
10	9,300	3,700	8,900	3,100	7,500	2,400	6,600	1,900	5,800	1,650	5,300	1,380
12	6,950	2,950	6,680	2,500	5,600	1,900	5,000	1,550	4,400	1,250	4,000	1,050

절입기준

*ae : D1 ~ D4 = 0.05 × D
D5 ~ D8 = 0.025mm
D10 ~ D20 = 0.30mm

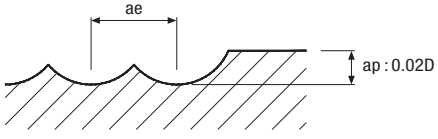


ESB703 series

피삭재	열처리강											
절삭조건	HRC30~40		HRC40~50		HRC50~55		HRC55~60		HRC60~65		HRC65~70	
공구직경(Ø)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
2	57,000	7,100	55,000	6,000	46,000	5,000	40,300	3,900	36,800	3,500	32,800	2,900
2.5	57,000	7,100	55,000	6,000	46,000	5,000	40,300	3,900	36,800	3,500	32,800	2,900
3	38,000	7,500	36,600	6,600	30,500	5,000	27,000	3,900	24,200	3,500	21,900	2,900
4	28,500	7,500	27,500	6,600	23,000	5,000	20,100	3,900	18,400	3,500	16,700	2,900
5	21,500	7,300	20,500	6,100	17,300	4,700	15,500	3,800	13,200	3,200	12,100	2,600
6	16,000	6,100	15,400	5,100	12,700	3,900	11,500	3,100	10,100	2,700	9,200	2,200
8	12,700	5,300	12,300	4,400	10,400	3,400	9,200	2,700	8,100	2,300	7,500	1,900
10	10,700	4,600	10,200	3,900	8,600	3,000	7,600	2,400	6,700	2,100	6,100	1,700
12	8,000	3,700	7,700	3,100	6,400	2,400	5,800	1,900	5,100	1,600	4,600	1,300

절입기준

*ae : D1 ~ D4 = 0.05 × D
D5 ~ D8 = 0.025mm
D10 ~ D20 = 0.30mm

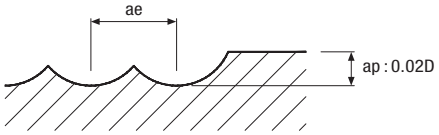


ESB734 series

피삭재 / 절삭조건 / 공구직경(Ø)	열처리강											
	HRC30~40		HRC40~50		HRC50~55		HRC55~60		HRC60~65		HRC65~70	
	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
2	62,100	8,600	59,800	7,200	50,000	6,000	43,800	4,700	40,000	4,200	35,600	3,500
2.5	62,100	8,600	59,800	7,200	50,000	6,000	43,800	4,700	40,000	4,200	35,600	3,500
3	41,400	9,000	39,800	8,000	33,100	6,000	29,400	4,700	26,300	4,200	23,800	3,500
4	31,100	9,000	29,900	8,000	25,000	6,000	21,900	4,700	20,000	4,200	18,100	3,500
5	23,300	8,700	22,300	7,400	18,800	5,600	16,900	4,600	14,400	3,800	13,100	3,200
6	17,400	7,300	16,800	6,200	13,800	4,700	12,500	3,800	11,000	3,200	10,000	2,600
8	13,900	6,300	13,400	5,300	11,300	4,100	10,000	3,200	8,800	2,800	8,100	2,300
10	11,600	5,600	11,100	4,700	9,400	3,600	8,300	2,900	7,300	2,500	6,600	2,100

절입기준

*ae : D1 ~ D4 = 0.05 × D
D5 ~ D8 = 0.025mm
D10 ~ D20 = 0.30mm

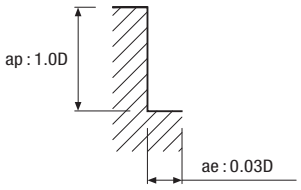


ESE702 series

측면 절삭 가공

피삭재 / 절삭조건 / 공구직경(Ø)	열처리강, 내열합금강		열처리강									
	HRC30~40		HRC40~50		HRC50~55		HRC55~60		HRC60~65		HRC65~70	
	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
1	48,000	1,050	38,000	820	25,500	510	20,500	310	16,000	190	12,500	125
2	33,300	1,200	26,000	970	17,500	600	14,500	370	11,000	230	9,500	165
3	21,800	1,200	17,300	970	11,500	600	9,500	370	7,500	230	6,400	165
4	16,700	1,250	13,200	1,000	8,800	625	7,200	385	5,600	240	4,750	170
5	15,700	1,450	12,500	1,150	8,300	710	6,400	410	5,100	260	4,450	190
6	13,100	1,350	10,350	1,100	6,900	690	5,300	400	4,200	255	3,700	185
8	9,880	1,320	7,800	1,030	5,200	635	4,000	365	3,200	235	2,800	170
10	7,800	1,200	6,150	970	4,100	590	3,200	340	2,550	220	2,200	160
12	6,650	1,200	5,250	970	3,500	590	2,650	340	2,100	220	1,860	160
16	4,900	1,050	3,900	840	2,600	520	2,000	300	1,600	190	1,400	140
20	3,900	950	3,100	750	2,050	475	1,600	275	1,300	175	1,100	125

절입기준



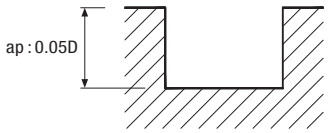
H-Star Endmill

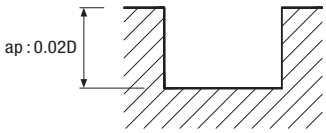
ESE702 series

슬로팅 가공

피삭재	열처리강, 내열합금강		열처리강									
절삭조건	HRC30~40		HRC40~50		HRC50~55		HRC55~60		HRC60~65		HRC65~70	
공구직경(Ø)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
~0.2	50,000	130	45,000	115	40,000	95	33,000	60	33,000	45	26,400	30
0.3	50,000	190	45,000	140	40,000	115	33,000	70	25,000	50	20,000	35
0.4	50,000	235	45,000	180	40,000	140	33,000	90	25,000	55	20,000	40
0.5	50,000	370	45,000	280	40,000	220	33,000	140	25,000	85	20,000	60
0.6	50,000	470	45,000	360	40,000	285	33,000	160	25,000	105	20,000	75
0.8	50,000	600	40,000	440	30,000	295	25,000	185	19,000	110	15,200	80
0.9	49,000	655	39,000	520	27,800	330	22,700	205	17,500	125	14,000	90
1	48,000	750	38,000	570	25,500	360	20,500	215	16,000	135	12,500	85
2	33,300	850	26,000	680	17,500	420	14,500	260	11,000	160	9,500	115
3	21,800	850	17,300	680	11,500	420	9,500	260	7,500	160	6,400	115
4	16,700	880	13,200	700	8,800	440	7,200	270	5,600	170	4,750	118
5	15,700	1,000	12,500	805	8,300	500	6,400	285	5,100	180	4,450	132
6	13,100	950	10,350	770	6,900	480	5,300	280	4,200	180	3,700	130
8	9,880	930	7,800	720	5,200	445	4,000	255	3,200	165	2,800	120
10	7,800	850	6,150	680	4,100	415	3,200	240	2,550	155	2,200	122
12	6,650	850	5,250	680	3,500	415	2,650	240	2,100	155	1,860	112
16	4,900	730	3,900	580	2,600	365	2,000	210	1,600	135	1,400	95
20	3,900	660	3,100	525	2,050	335	1,600	195	1,300	125	1,100	85

절입기준



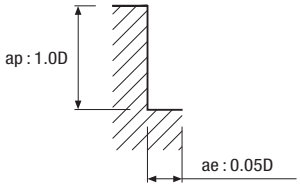


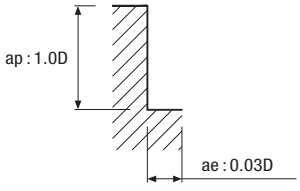
ESE704, ESE714, ESE744 series

측면 절삭 가공

피삭재	열처리강, 내열합금강		열처리강									
절삭조건	HRC30~40		HRC40~50		HRC50~55		HRC55~60		HRC60~65		HRC65~70	
공구직경(Ø)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
1	48,000	1,480	38,000	1,050	25,500	710	20,500	430	16,000	270	12,500	175
2	33,300	1,750	26,000	1,250	17,500	840	14,500	520	11,000	320	9,500	230
3	21,800	1,750	17,300	1,250	11,500	840	9,500	520	7,500	320	6,400	230
4	16,700	1,800	13,200	1,300	8,800	880	7,200	540	5,600	335	4,750	240
5	15,700	2,000	12,500	1,500	8,300	1,000	6,400	580	5,100	370	4,450	270
6	13,100	1,950	10,350	1,400	6,900	950	5,300	560	4,200	350	3,700	260
8	9,880	1,880	7,800	1,350	5,200	900	4,000	520	3,200	330	2,800	240
10	7,800	1,750	6,150	1,260	4,100	840	3,200	480	2,550	310	2,200	220
12	6,650	1,750	5,250	1,260	3,500	840	2,650	480	2,100	300	1,860	220
16	4,900	1,500	3,900	1,100	2,600	730	2,000	420	1,600	270	1,400	200
20	3,900	1,300	3,100	970	2,050	650	1,600	380	1,300	250	1,100	180

절입기준



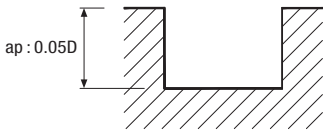


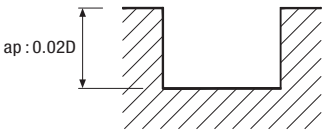
ESE712 series

슬로팅 가공

피삭재	열처리강, 내열합금강		열처리강									
절삭조건	HRC30~40		HRC40~50		HRC50~55		HRC55~60		HRC60~65		HRC65~70	
공구직경(Ø)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
0.2	50,000	130	45,000	115	40,000	95	33,000	60	33,000	45	26,400	30
0.3	50,000	190	45,000	140	40,000	115	33,000	70	25,000	50	20,000	35
0.4	50,000	235	45,000	180	40,000	140	33,000	90	25,000	55	20,000	40
0.5	50,000	370	45,000	280	40,000	220	33,000	140	25,000	85	20,000	60
0.6	50,000	470	45,000	360	40,000	285	30,000	160	25,000	105	20,000	75
0.8	50,000	600	40,000	440	30,000	295	25,000	185	19,000	110	15,200	80
0.9	49,000	655	39,000	520	27,800	330	22,700	205	17,500	125	14,000	90
1	48,000	750	38,000	570	25,500	360	20,500	215	16,000	135	12,500	85
2	33,300	850	26,000	680	17,500	420	14,500	260	11,000	160	9,500	115
3	21,800	850	17,300	680	11,500	420	9,500	260	7,500	160	6,400	115
4	16,700	880	13,200	700	8,800	440	7,200	270	5,600	170	4,750	118
5	15,700	1,000	12,500	805	8,300	500	6,400	285	5,100	180	4,450	132
6	13,100	950	10,350	770	6,900	480	5,300	280	4,200	180	3,700	130
8	9,880	930	7,800	720	5,200	445	4,000	255	3,200	165	2,800	120
10	7,800	850	6,150	680	4,100	415	3,200	240	2,550	155	2,200	112
12	6,650	850	5,250	680	3,500	415	2,650	240	2,100	155	1,860	112
16	4,900	730	3,900	580	2,600	365	2,000	210	1,600	135	1,400	95
20	3,900	660	3,100	525	2,050	335	1,600	195	1,300	125	1,100	85

절입기준



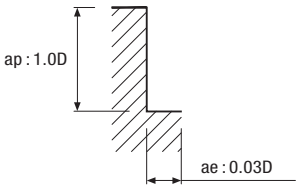


ESE712 series

측면 절삭 가공

피삭재	열처리강, 내열합금강		열처리강									
절삭조건	HRC30~40		HRC40~50		HRC50~55		HRC55~60		HRC60~65		HRC65~70	
공구직경(Ø)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
1	48,000	1,050	38,000	820	25,500	510	20,500	310	16,000	190	12,500	125
2	33,300	1,200	26,000	970	17,500	600	14,500	370	11,000	230	9,500	165
3	21,800	1,200	17,300	970	11,500	600	9,500	370	7,500	230	6,400	165
4	16,700	1,250	13,200	1,000	8,800	625	7,200	385	5,600	240	4,750	170
5	15,700	1,450	12,500	1,150	8,300	710	6,400	410	5,100	260	4,450	190
6	13,100	1,350	10,350	1,100	6,900	690	5,300	400	4,200	255	3,700	185
8	9,880	1,320	7,800	1,030	5,200	635	4,000	365	3,200	235	2,800	170
10	7,800	1,200	6,150	970	4,100	590	3,200	340	2,550	220	2,200	160
12	6,650	1,200	5,250	970	3,500	590	2,650	340	2,100	220	1,860	160
16	4,900	1,050	3,900	840	2,600	520	2,000	300	1,600	190	1,400	140
20	3,900	950	3,100	750	2,050	475	1,600	275	1,300	175	1,100	125

절입기준



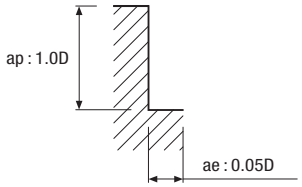
H-Star Endmill

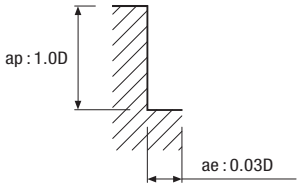
ESE716 series

측면 절삭 가공

피삭재	열처리강, 내열합금강		열처리강									
절삭조건	HRC30~40		HRC40~50		HRC50~55		HRC55~60		HRC60~65		HRC65~70	
공구직경(Ø)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
6	24,800	5,350	23,500	4,900	16,000	4,900	13,500	3,300	10,500	2,100	8,000	1,450
8	20,000	5,500	19,000	5,000	12,000	4,600	10,000	3,100	8,000	2,000	6,000	1,400
10	16,000	4,900	15,500	4,500	9,500	4,100	8,000	2,900	6,400	1,800	4,800	1,300
12	13,000	4,500	12,500	4,100	8,000	3,800	6,600	2,500	5,300	1,600	4,000	1,150
16	10,000	4,000	9,700	3,700	6,000	3,400	5,000	2,300	4,000	1,250	3,000	870
20	8,000	3,350	7,800	3,400	4,800	3,200	4,000	2,100	3,200	1,020	2,400	690

절입기준



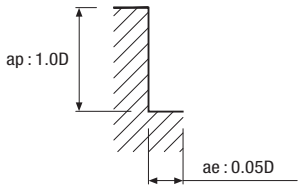


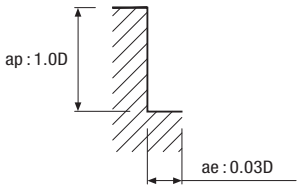
ESE724 series

측면 절삭 가공

피삭재	열처리강, 내열합금강		열처리강									
절삭조건	HRC30~40		HRC40~50		HRC50~55		HRC55~60		HRC60~65		HRC65~70	
공구직경(Ø)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
1	48,000	1,480	38,000	1,050	25,500	710	20,500	430	16,000	270	12,500	175
2	33,300	1,750	26,000	1,250	17,500	840	14,500	520	11,000	320	9,500	230
3	21,800	1,750	17,300	1,250	11,500	840	9,500	520	7,500	320	6,400	230
4	16,700	1,800	13,200	1,300	8,800	880	7,200	540	5,600	335	4,750	240
5	15,700	2,000	12,500	1,500	8,300	1,000	6,400	580	5,100	370	4,450	270
6	13,100	1,950	10,350	1,400	6,900	950	5,300	560	4,200	350	3,700	260
8	9,880	1,880	7,800	1,350	5,200	900	4,000	520	3,200	330	2,800	240
10	7,800	1,750	6,150	1,260	4,100	840	3,200	480	2,550	310	2,200	220
12	6,650	1,750	5,250	1,260	3,500	840	2,650	480	2,100	300	1,860	220
16	4,900	1,500	3,900	1,100	2,600	730	2,000	420	1,600	270	1,400	200
20	3,900	1,300	3,100	970	2,050	650	1,600	380	1,300	250	1,100	180

절입기준

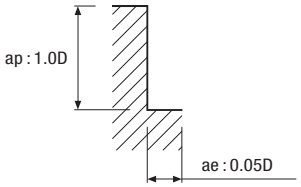


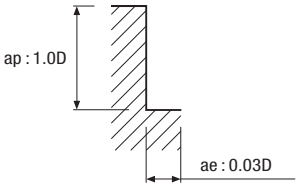


ESE726, ESR736 series

피삭재	열처리강, 내열합금강		열처리강									
절삭조건	HRC30~40		HRC40~50		HRC50~55		HRC55~60		HRC60~65		HRC65~70	
공구직경(Ø)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
6	24,800	5,350	23,500	4,900	16,000	4,900	13,500	3,300	10,500	2,100	8,000	1,450
8	20,000	5,500	19,000	5,000	12,000	4,600	10,000	3,100	8,000	2,000	6,000	1,400
10	16,000	4,900	15,500	4,500	9,500	4,100	8,000	2,900	6,400	1,800	4,800	1,300
12	13,000	4,500	12,500	4,100	8,000	3,800	6,600	2,500	5,300	1,600	4,000	1,150
16	10,000	4,000	9,700	3,700	6,000	3,400	5,000	2,300	4,000	1,250	3,000	870
20	8,000	3,350	7,800	3,400	4,800	3,200	4,000	2,100	3,200	1,020	2,400	690

절입기준



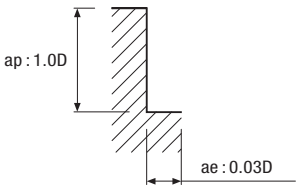


ESR702 series

측면 절삭 가공

피삭재	열처리강, 내열합금강		열처리강									
절삭조건	HRC30~40		HRC40~50		HRC50~55		HRC55~60		HRC60~65		HRC65~70	
공구직경(Ø)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
2	33,300	960	26,000	776	17,500	480	14,500	296	11,000	184	9,500	132
3	21,800	960	17,300	776	11,500	480	9,500	296	7,500	184	6,400	132
4	16,700	1,000	13,200	800	8,800	500	7,200	308	5,600	192	4,750	136
5	15,700	1,160	12,500	920	8,300	568	6,400	328	5,100	208	4,450	152
6	13,100	1,080	10,350	880	6,900	552	5,300	320	4,200	204	3,700	148
8	9,880	1,056	7,800	824	5,200	508	4,000	292	3,200	188	2,800	136
10	7,800	960	6,150	776	4,100	472	3,200	272	2,550	176	2,200	128
12	6,650	960	5,250	776	3,500	472	2,650	272	2,100	176	1,860	128
16	4,900	840	3,900	672	2,600	416	2,000	240	1,600	152	1,400	112
20	3,900	760	3,100	600	2,050	380	1,600	220	1,300	140	1,100	100

절입기준



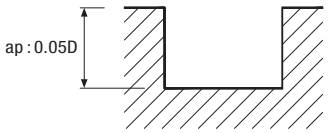
H-Star Endmill

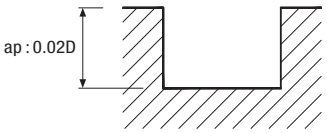
ESR702, ESR732 series

슬로팅 가공

피삭재	열처리강, 내열합금강		열처리강									
절삭조건	HRC30~40		HRC40~50		HRC50~55		HRC55~60		HRC60~65		HRC65~70	
공구직경(Ø)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
2	33,300	680	26,000	544	17,500	336	14,500	208	11,000	128	9,500	92
3	21,800	680	17,300	544	11,500	336	9,500	208	7,500	128	6,400	92
4	16,700	704	13,200	560	8,800	352	7,200	216	5,600	136	4,750	94
5	15,700	800	12,500	644	8,300	400	6,400	228	5,100	144	4,450	106
6	13,100	760	10,350	616	6,900	384	5,300	224	4,200	144	3,700	104
8	9,880	744	7,800	576	5,200	356	4,000	204	3,200	132	2,800	96
10	7,800	680	6,150	544	4,100	332	3,200	192	2,550	124	2,200	90
12	6,650	680	5,250	544	3,500	332	2,650	192	2,100	124	1,860	90
16	4,900	584	3,900	464	2,600	292	2,000	168	1,600	108	1,400	78
20	3,900	528	3,100	420	2,050	268	1,600	168	1,300	100	1,100	70

절입기준



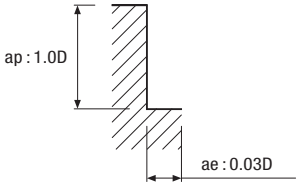


ESR724, ESR714, ESR734, ESR704 series

측면 절삭 가공

피삭재	열처리강, 내열합금강		열처리강									
절삭조건	HRC30~40		HRC40~50		HRC50~55		HRC55~60		HRC60~65		HRC65~70	
공구직경(Ø)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
3	21,800	1,400	17,300	1,000	11,500	672	9,500	416	7,500	256	6,400	184
4	16,700	1,440	13,200	1,040	8,800	704	7,200	432	5,600	268	4,750	192
5	15,700	1,600	12,500	1,200	8,300	800	6,400	464	5,100	296	4,450	216
6	13,100	1,560	10,350	1,120	6,900	760	5,300	448	4,200	280	3,700	208
8	9,880	1,504	7,800	1,080	5,200	720	4,000	416	3,200	264	2,800	192
10	7,800	1,400	6,150	1,008	4,100	672	3,200	384	2,550	248	2,200	176
12	6,650	1,400	5,250	1,008	3,500	672	2,650	384	2,100	240	1,860	176
16	4,900	1,200	3,900	880	2,600	584	2,000	336	1,600	216	1,400	160
20	3,900	1,040	3,100	776	2,050	520	1,600	304	1,300	200	1,100	144

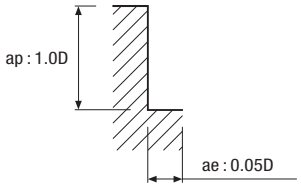
절입기준

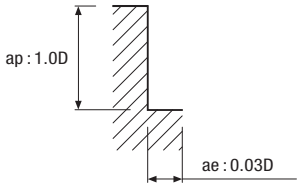


ESR706 series

피삭재	열처리강, 내열합금강		열처리강									
절삭조건	HRC30~40		HRC40~50		HRC50~55		HRC55~60		HRC60~65		HRC65~70	
공구직경(Ø)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
6	24,800	5,350	23,500	4,900	16,000	4,900	13,500	3,300	10,500	2,100	8,000	1,450
8	20,000	5,500	19,000	5,000	12,000	4,600	10,000	3,100	8,000	2,000	6,000	1,400
10	16,000	4,900	15,500	4,500	9,500	4,100	8,000	2,900	6,400	1,800	4,800	1,300
12	13,000	4,500	12,500	4,100	8,000	3,800	6,600	2,500	5,300	1,600	4,000	1,150
16	10,000	4,000	9,700	3,700	6,000	3,400	5,000	2,300	4,000	1,250	3,000	870
20	8,000	3,350	7,800	3,400	4,800	3,200	4,000	2,100	3,200	1,020	2,400	690

절입기준





H-Star Endmill

ESRB712

피삭재		합금강,탄소강 (SCM, SNCM, S45C)			프리하든강 (NAK, CENA, KP4)			열처리강 (SKD, SKT, STAVAX)		
인장강도		~HRC35			HRC35~45			HRC45~55		
절삭조건		~1100N/mm²			1100~1500N/mm²			1500~2000N/mm²		
공구직경(Ø)	유효장	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	절입 (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	절입 (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	절입 (mm)
0.1	**0.3**	50,000	240	0.009	50,000	215	0.007	50,000	190	0.005
0.1	**0.5**	50,000	240	0.006	50,000	215	0.005	50,000	190	0.004
0.1	**1**	45,000	195	0.002	45,000	175	0.002	45,000	155	0.001
0.2	**0.5**	50,000	335	0.018	50,000	310	0.014	43,200	260	0.010
0.2	**1**	50,000	335	0.013	50,000	310	0.010	43,200	260	0.007
0.2	**1.5**	45,000	270	0.007	45,000	250	0.006	38,880	210	0.004
0.2	**2**	45,000	270	0.005	45,000	250	0.004	38,880	210	0.003
0.2	3	45,000	270	0.003	45,000	250	0.003	38,880	210	0.002
0.3	1	50,000	475	0.019	50,000	430	0.015	42,800	365	0.011
0.3	1.5	50,000	475	0.019	50,000	430	0.015	42,800	365	0.011
0.3	2	45,000	385	0.011	45,000	350	0.008	38,520	295	0.006
0.3	2.5	45,000	385	0.007	45,000	350	0.005	38,520	295	0.004
0.3	3	45,000	385	0.007	45,000	350	0.005	38,520	295	0.004
0.3	4	40,000	305	0.004	40,000	275	0.003	34,240	235	0.002
0.3	5	30,000	200	0.003	30,000	180	0.002	25,680	155	0.002
0.4	1	41,000	490	0.036	38,800	425	0.028	34,200	340	0.020
0.4	1.5	41,000	490	0.025	38,800	425	0.020	34,200	340	0.014
0.4	2	41,000	490	0.025	38,800	425	0.020	34,200	340	0.014
0.4	2.5	36,900	395	0.014	34,920	345	0.011	30,780	275	0.008
0.4	3	36,900	395	0.014	34,920	345	0.011	30,780	275	0.008
0.4	4	36,900	395	0.009	34,920	345	0.007	30,780	275	0.005
0.4	5	32,800	315	0.009	31,040	270	0.007	27,360	220	0.005
0.4	6	32,800	315	0.005	31,040	270	0.004	27,360	220	0.003
0.4	8	24,600	205	0.004	23,280	180	0.003	20,520	145	0.002
0.4	10	12,300	90	0.004	11,640	75	0.003	10,260	60	0.002
0.5	1	34,200	685	0.045	32,300	580	0.035	28,500	515	0.025
0.5	1.5	34,200	685	0.045	32,300	580	0.035	28,500	515	0.025
0.5	2	34,200	685	0.032	32,300	580	0.025	28,500	515	0.018
0.5	2.5	34,200	685	0.032	32,300	580	0.025	28,500	515	0.018
0.5	3	30,780	555	0.018	29,070	470	0.014	25,650	415	0.010
0.5	4	30,780	555	0.018	29,070	470	0.014	25,650	415	0.010
0.5	5	30,780	555	0.011	29,070	470	0.009	25,650	415	0.006
0.5	6	27,360	440	0.011	25,840	370	0.009	22,800	330	0.006
0.5	8	20,520	290	0.007	19,380	245	0.005	17,100	215	0.004
0.5	10	20,520	290	0.005	19,380	245	0.004	17,100	215	0.003
0.5	12	10,260	125	0.005	9,690	105	0.004	8,550	95	0.003
0.5	14	10,260	125	0.005	9,690	105	0.004	8,550	95	0.003
0.5	16	3,420	35	0.005	3,230	30	0.004	2,850	25	0.003
0.6	1	34,200	1,025	0.038	32,300	840	0.029	28,500	685	0.021
0.6	2	34,200	1,025	0.038	32,300	840	0.029	28,500	685	0.021
0.6	3	34,200	1,025	0.038	32,300	840	0.029	28,500	685	0.021
0.6	4	30,780	830	0.022	29,070	680	0.017	25,650	555	0.012
0.6	5	30,780	830	0.014	29,070	680	0.011	25,650	555	0.008
0.6	6	30,780	830	0.014	29,070	680	0.011	25,650	555	0.008

ESRB712

피삭재		합금강,탄소강 (SCM, SNCM, S45C)			프리하든강 (NAK, CENA, KP4)			열처리강 (SKD, SKT, STAVAX)		
인장강도		~HRC35			HRC35~45			HRC45~55		
절삭조건		~1100N/mm²			1100~1500N/mm²			1500~2000N/mm²		
공구직경(Ø)	유효장	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	절입 (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	절입 (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	절입 (mm)
0.6	8	27,360	655	0.008	25,840	540	0.006	22,800	440	0.005
0.6	10	20,520	430	0.005	19,380	355	0.004	17,100	290	0.003
0.6	12	20,520	430	0.005	19,380	355	0.004	17,100	290	0.003
0.6	14	10,260	185	0.005	9,690	150	0.004	8,550	125	0.003
0.6	16	10,260	185	0.005	9,690	150	0.004	8,550	125	0.003
0.7	2	34,200	1,130	0.063	32,300	930	0.049	28,500	765	0.035
0.7	4	30,780	915	0.025	29,070	755	0.020	25,650	620	0.014
0.7	6	30,780	915	0.016	29,070	755	0.012	25,650	620	0.009
0.7	8	27,360	725	0.016	25,840	595	0.012	22,800	490	0.009
0.7	10	27,360	725	0.009	25,840	595	0.007	22,800	490	0.005
0.7	12	20,520	475	0.006	19,380	390	0.005	17,100	320	0.004
0.8	2	34,200	1,230	0.072	32,300	1,035	0.056	28,500	855	0.040
0.8	3	34,200	1,230	0.050	32,300	1,035	0.039	28,500	855	0.028
0.8	4	34,200	1,230	0.050	32,300	1,035	0.039	28,500	855	0.028
0.8	5	30,780	995	0.029	29,070	840	0.022	25,650	695	0.016
0.8	6	30,780	995	0.029	29,070	840	0.022	25,650	695	0.016
0.8	8	30,780	995	0.018	29,070	840	0.014	25,650	695	0.010
0.8	10	27,360	785	0.018	25,840	660	0.014	22,800	545	0.010
0.8	12	27,360	785	0.011	25,840	660	0.008	22,800	545	0.006
0.8	14	20,520	515	0.007	19,380	435	0.006	17,100	360	0.004
0.8	16	20,520	515	0.007	19,380	435	0.006	17,100	360	0.004
0.8	20	10,260	220	0.007	9,690	185	0.006	8,550	155	0.004
0.9	4	29,250	1,120	0.032	27,630	935	0.025	24,390	775	0.018
0.9	6	29,250	1,120	0.032	27,630	935	0.025	24,390	775	0.018
0.9	8	29,250	1,120	0.020	27,630	935	0.016	24,390	775	0.011
0.9	10	26,000	885	0.020	24,560	740	0.016	21,680	610	0.011
1.0	2	30,800	1,540	0.090	29,100	1,310	0.070	25,700	1,075	0.050
1.0	3	30,800	1,540	0.090	29,100	1,310	0.070	25,700	1,075	0.050
1.0	4	30,800	1,540	0.063	29,100	1,310	0.049	25,700	1,075	0.035
1.0	5	30,800	1,540	0.063	29,100	1,310	0.049	25,700	1,075	0.035
1.0	6	27,720	1,245	0.036	26,190	1,060	0.028	23,130	870	0.020
1.0	7	27,720	1,245	0.036	26,190	1,060	0.028	23,130	870	0.020
1.0	8	27,720	1,245	0.036	26,190	1,060	0.028	23,130	870	0.020
1.0	10	27,720	1,245	0.023	26,190	1,060	0.018	23,130	870	0.013
1.0	12	24,640	985	0.023	23,280	840	0.018	20,560	690	0.013
1.0	14	24,640	985	0.014	23,280	840	0.011	20,560	690	0.008
1.0	16	18,480	645	0.014	17,460	550	0.011	15,420	450	0.008
1.0	18	18,480	645	0.009	17,460	550	0.007	15,420	450	0.005
1.0	20	18,480	645	0.009	17,460	550	0.007	15,420	450	0.005
1.0	22	9,240	275	0.009	8,730	235	0.007	7,710	195	0.005
1.0	26	9,240	275	0.009	8,730	235	0.007	7,710	195	0.005
1.0	30	9,240	275	0.009	8,730	235	0.007	7,710	195	0.005
1.0	40	3,080	75	0.009	2,910	65	0.007	2,570	55	0.005
1.0	50	3,080	75	0.006	2,910	65	0.005	2,570	55	0.003

H-Star Endmill

ESRB712

피삭재		합금강,탄소강 (SCM, SNCM, S45C)			프리하든강 (NAK, CENA, KP4)			열처리강 (SKD, SKT, STAVAX)		
인장강도		~HRC35			HRC35~45			HRC45~55		
절삭조건		~1100N/mm²			1100~1500N/mm²			1500~2000N/mm²		
공구직경(Ø)	유효장	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	절입 (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	절입 (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	절입 (mm)
1.2	4	26,300	1,375	0.076	24,800	1,150	0.059	21,900	950	0.042
1.2	6	26,300	1,375	0.076	24,800	1,150	0.059	21,900	950	0.042
1.2	8	23,670	1,115	0.043	22,320	930	0.034	19,710	770	0.024
1.2	10	23,670	1,115	0.027	22,320	930	0.021	19,710	770	0.015
1.2	12	23,670	1,115	0.027	22,320	930	0.021	19,710	770	0.015
1.2	16	21,040	880	0.016	19,840	735	0.013	17,520	610	0.009
1.2	20	15,780	580	0.011	14,880	485	0.008	13,140	400	0.006
1.2	26	7,890	245	0.011	7,440	205	0.008	6,570	170	0.006
1.4	6	21,500	1,295	0.088	20,300	1,100	0.069	18,000	935	0.049
1.4	8	19,350	1,050	0.050	18,270	890	0.039	16,200	755	0.028
1.4	10	19,350	1,050	0.050	18,270	890	0.039	16,200	755	0.028
1.4	16	17,200	830	0.032	16,240	705	0.025	14,400	600	0.018
1.5	4	23,900	1,580	0.135	22,600	1,355	0.105	20,000	1,075	0.075
1.5	5	23,900	1,580	0.095	22,600	1,355	0.074	20,000	1,075	0.053
1.5	6	23,900	1,580	0.095	22,600	1,355	0.074	20,000	1,075	0.053
1.5	7	23,900	1,580	0.095	22,600	1,355	0.074	20,000	1,075	0.053
1.5	8	21,510	1,280	0.054	20,340	1,100	0.042	18,000	870	0.030
1.5	10	21,510	1,280	0.054	20,340	1,100	0.042	18,000	870	0.030
1.5	12	21,510	1,280	0.054	20,340	1,100	0.042	18,000	870	0.030
1.5	14	21,510	1,280	0.034	20,340	1,100	0.026	18,000	870	0.019
1.5	16	19,120	1,010	0.034	18,080	865	0.026	16,000	690	0.019
1.5	18	19,120	1,010	0.034	18,080	865	0.026	16,000	690	0.019
1.5	20	19,120	1,010	0.020	18,080	865	0.016	16,000	690	0.011
1.5	22	19,120	1,010	0.020	18,080	865	0.016	16,000	690	0.011
1.5	26	14,340	665	0.014	13,560	570	0.011	12,000	450	0.008
1.5	30	14,340	665	0.014	13,560	570	0.011	12,000	450	0.008
1.5	35	7,170	285	0.010	6,780	245	0.008	6,000	195	0.005
1.5	40	7,170	285	0.010	6,780	245	0.008	6,000	195	0.005
1.6	4	22,200	1,555	0.101	21,000	1,300	0.078	18,500	1,110	0.056
1.6	6	22,200	1,555	0.101	21,000	1,300	0.078	18,500	1,110	0.056
1.6	8	22,200	1,555	0.101	21,000	1,300	0.078	18,500	1,110	0.056
1.6	10	19,980	1,260	0.058	18,900	1,055	0.045	16,650	900	0.032
1.6	12	19,980	1,260	0.058	18,900	1,055	0.045	16,650	900	0.032
1.6	16	19,980	1,260	0.036	18,900	1,055	0.028	16,650	900	0.020
1.6	20	17,760	995	0.036	16,800	830	0.028	14,800	710	0.020
1.8	4	22,200	1,780	0.113	21,000	1,470	0.088	18,500	1,225	0.063
1.8	6	22,200	1,780	0.113	21,000	1,470	0.088	18,500	1,225	0.063
1.8	8	22,200	1,780	0.113	21,000	1,470	0.088	18,500	1,225	0.063
1.8	10	19,980	1,440	0.065	18,900	1,190	0.050	16,650	990	0.036
1.8	12	19,980	1,440	0.065	18,900	1,190	0.050	16,650	990	0.036
1.8	16	19,980	1,440	0.041	18,900	1,190	0.032	16,650	990	0.023
1.8	20	17,760	1,140	0.041	16,800	940	0.032	14,800	785	0.023
2.0	6	18,000	1,795	0.180	17,000	1,525	0.140	15,000	1,285	0.100
2.0	8	18,000	1,795	0.126	17,000	1,525	0.098	15,000	1,285	0.070

ESRB712

피삭재		합금강,탄소강 (SCM, SNCM, S45C)			프리하든강 (NAK, CENA, KP4)			열처리강 (SKD, SKT, STAVAX)		
인장강도		~HRC35			HRC35~45			HRC45~55		
절삭조건		~1100N/mm²			1100~1500N/mm²			1500~2000N/mm²		
공구직경(Ø)	유효장	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	절입 (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	절입 (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	절입 (mm)
2.0	10	18,000	1,795	0.126	17,000	1,525	0.098	15,000	1,285	0.070
2.0	12	16,200	1,455	0.072	15,300	1,235	0.056	13,500	1,040	0.040
2.0	14	16,200	1,455	0.072	15,300	1,235	0.056	13,500	1,040	0.040
2.0	16	16,200	1,455	0.072	15,300	1,235	0.056	13,500	1,040	0.040
2.0	18	16,200	1,455	0.045	15,300	1,235	0.035	13,500	1,040	0.025
2.0	20	16,200	1,455	0.045	15,300	1,235	0.035	13,500	1,040	0.025
2.0	22	14,400	1,150	0.045	13,600	975	0.035	12,000	820	0.025
2.0	26	14,400	1,150	0.045	13,600	975	0.035	12,000	820	0.025
2.0	30	14,400	1,150	0.027	13,600	975	0.021	12,000	820	0.015
2.0	35	10,800	755	0.018	10,200	640	0.014	9,000	540	0.010
2.0	40	10,800	755	0.018	10,200	640	0.014	9,000	540	0.010
2.0	45	5,400	325	0.018	5,100	275	0.014	4,500	230	0.010
2.0	50	5,400	325	0.018	5,100	275	0.014	4,500	230	0.010
2.0	60	5,400	325	0.018	5,100	275	0.014	4,500	230	0.010
2.5	8	15,800	1,925	0.158	14,900	1,605	0.123	13,200	1,305	0.088
2.5	10	15,800	1,925	0.158	14,900	1,605	0.123	13,200	1,305	0.088
2.5	12	15,800	1,925	0.158	14,900	1,605	0.123	13,200	1,305	0.088
2.5	16	14,220	1,560	0.090	13,410	1,300	0.070	11,880	1,055	0.050
2.5	20	14,220	1,560	0.090	13,410	1,300	0.070	11,880	1,055	0.050
2.5	22	14,220	1,560	0.056	13,410	1,300	0.044	11,880	1,055	0.031
2.5	26	12,640	1,230	0.056	11,920	1,025	0.044	10,560	835	0.031
2.5	30	12,640	1,230	0.056	11,920	1,025	0.044	10,560	835	0.031
2.5	35	12,640	1,230	0.034	11,920	1,025	0.026	10,560	835	0.019
2.5	40	9,480	810	0.034	8,940	675	0.026	7,920	550	0.019
2.5	45	9,480	810	0.023	8,940	675	0.018	7,920	550	0.013
2.5	50	9,480	810	0.023	8,940	675	0.018	7,920	550	0.013
3.0	6	13,700	2,050	0.270	12,900	1,730	0.210	11,400	1,435	0.150
3.0	8	13,700	2,050	0.270	12,900	1,730	0.210	11,400	1,435	0.150
3.0	10	13,700	2,050	0.189	12,900	1,730	0.147	11,400	1,435	0.105
3.0	12	13,700	2,050	0.189	12,900	1,730	0.147	11,400	1,435	0.105
3.0	14	13,700	2,050	0.189	12,900	1,730	0.147	11,400	1,435	0.105
3.0	16	12,330	1,660	0.108	11,610	1,400	0.084	10,260	1,160	0.06
3.0	18	12,330	1,660	0.108	11,610	1,400	0.084	10,260	1,160	0.06
3.0	20	12,330	1,660	0.108	11,610	1,400	0.084	10,260	1,160	0.06
3.0	22	12,330	1,660	0.108	11,610	1,400	0.084	10,260	1,160	0.06
3.0	26	12,330	1,660	0.068	11,610	1,400	0.053	10,260	1,160	0.038
3.0	30	12,330	1,660	0.068	11,610	1,400	0.053	10,260	1,160	0.038
3.0	35	10,960	1,310	0.068	10,320	1,105	0.053	9,120	920	0.038
3.0	40	10,960	1,310	0.041	10,320	1,105	0.032	9,120	920	0.023
3.0	45	10,960	1,310	0.041	10,320	1,105	0.032	9,120	920	0.023
3.0	50	8,220	860	0.027	7,740	725	0.021	6,840	605	0.015
3.0	60	8,220	860	0.027	7,740	725	0.021	6,840	605	0.015
4.0	8	9,800	1,965	0.360	9,300	1,670	0.280	8,200	1,395	0.200
4.0	10	9,800	1,965	0.360	9,300	1,670	0.280	8,200	1,395	0.200

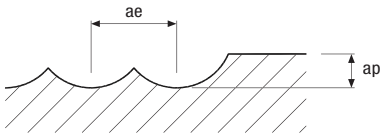
H-Star Endmill

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피삭재		합금강,탄소강 (SCM, SNCM, S45C)			프리하든강 (NAK, CENA, KP4)			열처리강 (SKD, SKT, STAVAX)		
인장강도		~HRC35			HRC35~45			HRC45~55		
절삭조건		~1100N/mm²			1100~1500N/mm²			1500~2000N/mm²		
공구직경(Ø)	유효장	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	절입 (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	절입 (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	절입 (mm)
4.0	12	9,800	1,965	0.360	9,300	1,670	0.280	8,200	1,395	0.200
4.0	14	9,800	1,965	0.252	9,300	1,670	0.196	8,200	1,395	0.140
4.0	16	9,800	1,965	0.252	9,300	1,670	0.196	8,200	1,395	0.140
4.0	18	9,800	1,965	0.252	9,300	1,670	0.196	8,200	1,395	0.140
4.0	20	9,800	1,965	0.252	9,300	1,670	0.196	8,200	1,395	0.140
4.0	22	8,820	1,590	0.144	8,370	1,355	0.112	7,380	1,130	0.080
4.0	26	8,820	1,590	0.144	8,370	1,355	0.112	7,380	1,130	0.080
4.0	30	8,820	1,590	0.144	8,370	1,355	0.112	7,380	1,130	0.080
4.0	35	8,820	1,590	0.090	8,370	1,355	0.070	7,380	1,130	0.050
4.0	40	8,820	1,590	0.090	8,370	1,355	0.070	7,380	1,130	0.050
4.0	45	7,840	1,260	0.090	7,440	1,070	0.070	6,560	895	0.050
4.0	50	7,840	1,260	0.090	7,440	1,070	0.070	6,560	895	0.050
4.0	60	7,840	1,260	0.054	7,440	1,070	0.042	6,560	895	0.030
5.0	15	7,700	1,845	0.315	7,300	1,455	0.245	6,400	1,285	0.175
5.0	20	7,700	1,845	0.315	7,300	1,455	0.245	6,400	1,285	0.175
5.0	26	6,930	1,495	0.180	6,570	1,180	0.140	5,760	1,040	0.100
5.0	30	6,930	1,495	0.180	6,570	1,180	0.140	5,760	1,040	0.100
5.0	35	6,930	1,495	0.180	6,570	1,180	0.140	5,760	1,040	0.100
5.0	40	6,930	1,495	0.180	6,570	1,180	0.140	5,760	1,040	0.100
5.0	50	6,930	1,495	0.113	6,570	1,180	0.088	5,760	1,040	0.063
5.0	60	6,160	1,180	0.113	5,840	930	0.088	5,120	820	0.063
6.0	20	6,500	1,900	0.378	6,200	1,600	0.294	5,500	1,330	0.210
6.0	30	6,500	1,900	0.378	6,200	1,600	0.294	5,500	1,330	0.210
8.0	25	4,850	1,800	0.504	4,600	1,500	0.392	4,000	1,280	0.280
8.0	30	4,850	1,800	0.504	4,600	1,500	0.392	4,000	1,280	0.280
10.0	30	3,850	1,650	0.900	3,680	1,400	0.700	3,200	1,200	0.500
10.0	40	3,850	1,650	0.630	3,680	1,400	0.490	3,200	1,200	0.350
12.0	32	3,200	1,520	1.080	3,050	1,300	0.840	2,650	1,100	0.600
12.0	45	3,200	1,520	0.756	3,050	1,300	0.588	2,650	1,100	0.420

절입기준

*ae : D1 ~ D4 = 0.05 × D
D5 ~ D8 = 0.025mm
D10 ~ D20 = 0.30mm



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측면 절삭 가공

피삭재		합금강,탄소강 (SCM, SNCM, S45C)			프리하든강 (NAK, CENA, KP4)			열처리강 (SKD, SKT, STAVAX)		
인장강도		~HRC35			HRC35~45			HRC45~55		
절삭조건		~1100N/mm²			1100~1500N/mm²			1500~2000N/mm²		
공구직경(Ø)	유효장	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	절입 (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	절입 (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	절입 (mm)
0.1	0.3	50,000	315	0.009	46,200	230	0.007	40,600	170	0.005
0.1	0.5	50,000	315	0.006	46,200	230	0.005	40,600	170	0.004
0.1	1	45,000	255	0.002	41,580	185	0.002	36,540	140	0.001
0.2	0.5	38,500	380	0.018	36,300	270	0.014	32,100	200	0.010
0.2	1	38,500	380	0.013	36,300	270	0.010	32,100	200	0.007
0.2	1.5	34,650	310	0.007	32,670	220	0.006	28,890	160	0.004
0.2	2	34,650	310	0.005	32,670	220	0.004	28,890	160	0.003
0.3	1	34,200	390	0.019	32,300	270	0.015	28,500	230	0.011
0.3	1.5	34,200	390	0.019	32,300	270	0.015	25,800	230	0.011
0.3	2	30,780	315	0.011	29,070	220	0.008	25,650	185	0.006
0.3	2.5	30,780	315	0.007	29,070	220	0.005	25,650	185	0.004
0.3	3	30,780	315	0.007	29,070	220	0.005	25,650	185	0.004
0.3	4	27,360	250	0.004	25,840	175	0.003	22,800	145	0.002
0.3	5	20,520	165	0.003	19,380	115	0.002	17,100	95	0.002
0.4	1	27,400	540	0.036	25,800	380	0.028	22,800	280	0.020
0.4	1.5	27,400	540	0.025	25,800	380	0.020	22,800	280	0.014
0.4	2	27,400	540	0.025	25,800	380	0.020	22,800	280	0.014
0.4	2.5	24,660	435	0.014	23,220	310	0.011	20,520	225	0.008
0.4	3	24,660	435	0.014	23,220	310	0.011	20,520	225	0.008
0.4	4	24,660	435	0.009	23,220	310	0.007	20,520	225	0.005
0.4	5	21,920	345	0.009	20,640	245	0.007	18,240	180	0.005
0.4	6	21,920	345	0.005	20,640	245	0.004	18,240	180	0.003
0.4	8	16,440	225	0.004	15,480	160	0.003	13,680	120	0.002
0.4	10	8,220	95	0.004	7,740	70	0.003	6,840	50	0.002
0.5	1	27,400	540	0.045	25,800	425	0.035	22,800	285	0.025
0.5	1.5	27,400	540	0.045	25,800	425	0.035	22,800	285	0.025
0.5	2	27,400	540	0.032	25,800	425	0.025	22,800	285	0.018
0.5	2.5	27,400	540	0.032	25,800	425	0.025	22,800	285	0.018
0.5	3	24,660	435	0.018	23,220	345	0.014	20,520	230	0.010
0.5	4	24,660	435	0.018	23,220	345	0.014	20,520	230	0.010
0.5	5	24,660	435	0.011	23,220	345	0.009	20,520	230	0.006
0.5	6	21,920	345	0.011	20,640	270	0.009	18,240	180	0.006
0.5	8	16,440	225	0.007	15,480	180	0.005	13,680	120	0.004
0.5	10	16,440	225	0.005	15,480	180	0.004	13,680	120	0.003
0.5	12	8,220	95	0.005	7,740	75	0.004	6,840	50	0.003
0.5	14	8,220	95	0.005	7,740	75	0.004	6,840	50	0.003
0.5	16	2,740	25	0.005	2,580	20	0.004	2,280	15	0.003
0.6	2	27,400	775	0.038	25,800	545	0.029	22,800	405	0.021
0.6	3	27,400	775	0.038	25,800	545	0.029	22,800	405	0.021
0.6	4	24,660	630	0.022	23,220	440	0.017	20,520	330	0.012
0.6	5	24,660	630	0.014	23,220	440	0.011	20,520	330	0.008
0.6	6	24,660	630	0.014	23,220	440	0.011	20,520	330	0.008
0.6	8	21,920	495	0.008	20,640	350	0.006	18,240	260	0.005
0.6	10	16,440	325	0.005	15,480	230	0.004	13,680	170	0.003

H-Star Endmill

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측면 절삭 가공

피삭재		합금강,탄소강 (SCM, SNCM, S45C)			프리하든강 (NAK, CENA, KP4)			열처리강 (SKD, SKT, STAVAX)		
인장강도		~HRC35			HRC35~45			HRC45~55		
절삭조건		~1100N/mm²			1100~1500N/mm²			1500~2000N/mm²		
공구직경(Ø)	유효장	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	절입 (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	절입 (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	절입 (mm)
0.6	12	16,440	325	0.005	15,480	230	0.004	13,680	170	0.003
0.6	14	8,220	140	0.005	7,740	100	0.004	6,840	75	0.003
0.6	16	8,220	140	0.005	7,740	100	0.004	6,840	75	0.003
0.7	2	27,400	775	0.063	25,800	545	0.049	22,800	405	0.035
0.7	4	24,660	630	0.025	23,220	440	0.020	20,520	330	0.014
0.7	6	24,660	630	0.016	23,220	440	0.012	20,520	330	0.009
0.7	8	21,920	495	0.016	20,640	350	0.012	18,240	260	0.009
0.7	10	21,920	495	0.009	20,640	350	0.007	18,240	260	0.005
0.7	12	16,440	325	0.009	15,480	230	0.005	13,680	170	0.004
0.8	2	27,400	775	0.072	25,800	605	0.056	22,800	450	0.040
0.8	3	27,400	775	0.050	25,800	605	0.039	22,800	450	0.028
0.8	4	27,400	775	0.050	25,800	605	0.039	22,800	450	0.028
0.8	5	24,660	630	0.029	23,220	490	0.022	20,520	365	0.016
0.8	6	24,660	630	0.029	23,220	490	0.022	20,520	365	0.016
0.8	8	24,660	630	0.018	23,220	490	0.014	20,520	365	0.010
0.8	10	21,920	495	0.018	20,640	385	0.014	18,240	290	0.010
0.8	12	21,920	495	0.011	20,640	385	0.008	18,240	290	0.006
0.8	14	16,440	325	0.007	15,480	255	0.006	13,680	190	0.004
0.8	16	16,440	325	0.007	15,480	255	0.006	13,680	190	0.004
0.8	20	8,220	140	0.007	7,740	110	0.006	6,840	80	0.004
0.9	6	22,140	575	0.032	20,970	440	0.025	18,450	330	0.018
0.9	8	22,140	575	0.020	20,970	440	0.016	18,450	330	0.011
0.9	10	19,680	455	0.020	18,640	350	0.016	16,400	260	0.011
1.0	2	24,600	1,045	0.090	23,300	890	0.070	20,500	665	0.050
1.0	3	24,600	1,045	0.090	23,300	890	0.070	20,500	665	0.050
1.0	4	24,600	1,045	0.063	23,300	890	0.049	20,500	665	0.035
1.0	5	24,600	1,045	0.063	23,300	890	0.049	20,500	665	0.035
1.0	6	22,140	845	0.036	20,970	720	0.028	18,450	540	0.020
1.0	7	22,140	845	0.036	20,970	720	0.028	18,450	540	0.020
1.0	8	22,140	845	0.036	20,970	720	0.028	18,450	540	0.020
1.0	10	22,140	845	0.023	20,970	720	0.018	18,450	540	0.013
1.0	12	19,680	670	0.023	18,640	570	0.018	16,400	425	0.013
1.0	14	19,680	670	0.014	18,640	570	0.011	16,400	425	0.008
1.0	16	14,760	440	0.014	13,980	375	0.011	12,300	280	0.008
1.0	18	14,760	440	0.009	13,980	375	0.007	12,300	280	0.005
1.0	20	14,760	440	0.009	13,980	375	0.007	12,300	280	0.005
1.0	22	7,380	190	0.009	6,990	160	0.007	6,150	120	0.005
1.0	26	7,380	190	0.009	6,990	160	0.007	6,150	120	0.005
1.0	30	7,380	190	0.009	6,990	160	0.007	6,150	120	0.005
1.0	40	2,460	50	0.009	2,330	45	0.007	2,050	35	0.005
1.0	50	2,460	50	0.006	2,330	45	0.005	2,050	35	0.003
1.2	4	21,900	930	0.076	20,700	720	0.059	18,200	485	0.042
1.2	6	21,900	930	0.076	20,700	720	0.059	18,200	485	0.042
1.2	8	19,710	755	0.043	18,630	585	0.034	16,380	395	0.024

ESRE712

측면 절삭 가공

피삭재		합금강,탄소강 (SCM, SNCM, S45C)			프리하든강 (NAK, CENA, KP4)			열처리강 (SKD, SKT, STAVAX)		
인장강도		~HRC35			HRC35~45			HRC45~55		
절삭조건		~1100N/mm²			1100~1500N/mm²			1500~2000N/mm²		
공구직경(Ø)	유효장	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	절입 (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	절입 (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	절입 (mm)
1.2	10	19,710	755	0.027	18,630	585	0.021	16,380	395	0.015
1.2	12	19,710	755	0.027	18,630	585	0.021	16,380	395	0.015
1.2	14	17,520	595	0.027	16,560	460	0.021	14,560	310	0.015
1.2	16	17,520	595	0.016	16,560	460	0.013	14,560	310	0.009
1.2	20	13,140	390	0.011	12,420	300	0.008	10,920	205	0.006
1.2	26	6,570	165	0.011	6,210	130	0.008	5,460	85	0.006
1.2	30	6,570	165	0.011	6,210	130	0.008	5,460	85	0.006
1.4	6	19,200	815	0.088	18,100	570	0.069	16,000	425	0.049
1.4	8	17,280	660	0.050	16,290	460	0.039	14,400	345	0.028
1.4	10	17,280	660	0.050	16,290	460	0.039	14,400	345	0.028
1.4	14	17,280	660	0.032	16,290	460	0.025	14,400	345	0.018
1.4	16	15,360	520	0.032	14,480	365	0.025	12,800	270	0.018
1.4	20	15,360	520	0.019	14,480	365	0.015	12,800	270	0.011
1.5	4	19,200	905	0.135	18,100	635	0.105	16,000	475	0.075
1.5	5	19,200	905	0.095	18,100	635	0.074	16,000	475	0.053
1.5	6	19,200	905	0.095	18,100	635	0.074	16,000	475	0.053
1.5	7	19,200	905	0.095	18,100	635	0.074	16,000	475	0.053
1.5	8	17,280	735	0.054	16,290	515	0.042	14,400	385	0.030
1.5	10	17,280	735	0.054	16,290	515	0.042	14,400	385	0.030
1.5	12	17,280	735	0.054	16,290	515	0.042	14,400	385	0.030
1.5	14	17,280	735	0.034	16,290	515	0.026	14,400	385	0.019
1.5	16	15,360	580	0.034	14,480	405	0.026	12,800	305	0.019
1.5	18	15,360	580	0.034	14,480	405	0.026	12,800	305	0.019
1.5	20	15,360	580	0.020	14,480	405	0.016	12,800	305	0.011
1.5	22	15,360	580	0.020	14,480	405	0.016	12,800	305	0.011
1.5	26	11,520	380	0.014	10,860	265	0.011	9,600	200	0.008
1.5	30	11,520	380	0.014	10,860	265	0.011	9,600	200	0.008
1.6	8	17,800	840	0.101	16,800	655	0.078	14,800	490	0.056
1.6	10	16,020	680	0.058	15,120	530	0.045	13,320	395	0.032
1.6	12	16,020	680	0.058	15,120	530	0.045	13,320	395	0.032
1.6	16	16,020	680	0.036	15,120	530	0.028	13,320	395	0.020
1.6	20	14,240	540	0.036	13,440	420	0.028	11,840	315	0.020
1.8	8	17,800	840	0.113	16,800	655	0.088	14,800	490	0.063
1.8	10	16,020	680	0.065	15,120	530	0.050	13,320	395	0.036
1.8	12	16,020	680	0.065	15,120	530	0.050	13,320	395	0.036
1.8	16	16,020	680	0.041	15,120	530	0.032	13,320	395	0.023
1.8	20	14,240	540	0.041	13,440	420	0.032	11,840	315	0.023
2.0	6	14,400	820	0.180	13,600	620	0.140	12,000	475	0.100
2.0	8	14,400	820	0.126	13,600	620	0.098	12,000	475	0.070
2.0	10	14,400	820	0.126	13,600	620	0.098	12,000	475	0.070
2.0	12	12,960	665	0.072	12,240	500	0.056	10,800	385	0.040
2.0	14	12,960	665	0.072	12,240	500	0.056	10,800	385	0.040
2.0	16	12,960	665	0.072	12,240	500	0.056	10,800	385	0.040
2.0	18	12,960	665	0.045	12,240	500	0.035	10,800	385	0.025

H-Star Endmill

ESRE712

측면 절삭 가공

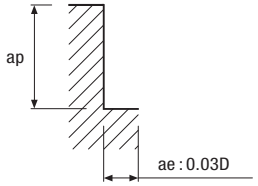
피삭재		합금강,탄소강 (SCM, SNCM, S45C)			프리하든강 (NAK, CENA, KP4)			열처리강 (SKD, SKT, STAVAX)		
인장강도		~HRC35			HRC35~45			HRC45~55		
절삭조건		~1100N/mm²			1100~1500N/mm²			1500~2000N/mm²		
공구직경(Ø)	유효장	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	절입 (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	절입 (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	절입 (mm)
2.0	20	12,960	665	0.045	12,240	500	0.035	10,800	385	0.025
2.0	22	11,520	525	0.045	10,880	395	0.035	9,600	305	0.025
2.0	26	11,520	525	0.045	10,880	395	0.035	9,600	305	0.025
2.0	30	11,520	525	0.027	10,880	395	0.021	9,600	305	0.015
2.0	35	8,640	345	0.018	8,160	260	0.014	7,200	200	0.010
2.0	40	8,640	345	0.018	8,160	260	0.014	7,200	200	0.010
2.0	45	4,320	150	0.018	4,080	110	0.014	3,600	85	0.010
2.0	50	4,320	150	0.018	4,080	110	0.014	3,600	85	0.010
2.0	60	4,320	150	0.018	4,080	110	0.014	3,600	85	0.010
2.5	8	12,300	970	0.158	11,600	680	0.123	10,300	510	0.088
2.5	10	12,300	970	0.158	11,600	680	0.123	10,300	510	0.088
2.5	12	12,300	970	0.158	11,600	680	0.123	10,300	510	0.088
2.5	14	11,070	785	0.090	10,440	550	0.070	9,270	415	0.050
2.5	16	11,070	785	0.090	10,440	550	0.070	9,270	415	0.050
2.5	18	11,070	785	0.090	10,440	550	0.070	9,270	415	0.050
2.5	20	11,070	785	0.090	10,440	550	0.070	9,270	415	0.050
2.5	22	11,070	785	0.056	10,440	550	0.044	9,270	415	0.031
2.5	26	9,840	620	0.056	9,280	435	0.044	8,240	325	0.031
2.5	30	9,840	620	0.056	9,280	435	0.044	8,240	325	0.031
2.5	35	9,840	620	0.034	9,280	435	0.026	8,240	325	0.019
2.5	40	7,380	405	0.034	6,960	285	0.026	6,180	215	0.019
2.5	45	7,380	405	0.023	6,960	285	0.018	6,180	215	0.013
2.5	50	7,380	405	0.023	6,960	285	0.018	6,180	215	0.013
3.0	6	10,900	860	0.270	10,300	605	0.210	6,600	450	0.150
3.0	8	10,900	860	0.270	10,300	605	0.210	6,600	450	0.150
3.0	10	10,900	860	0.189	10,300	605	0.147	6,600	450	0.105
3.0	12	10,900	860	0.189	10,300	605	0.147	6,600	450	0.105
3.0	14	10,900	860	0.189	10,300	605	0.147	6,600	450	0.105
3.0	16	9,810	695	0.108	9,270	490	0.084	5,940	365	0.060
3.0	18	9,810	695	0.108	9,270	490	0.084	5,940	365	0.060
3.0	20	9,810	695	0.108	9,270	490	0.084	5,940	365	0.060
3.0	22	9,810	695	0.108	9,270	490	0.084	5,940	365	0.060
3.0	26	9,810	695	0.068	9,270	490	0.053	5,940	365	0.038
3.0	30	9,810	695	0.068	9,270	490	0.053	5,940	365	0.038
3.0	35	8,720	550	0.068	8,240	385	0.053	5,280	290	0.038
3.0	40	8,720	550	0.041	8,240	385	0.032	5,280	290	0.023
3.0	45	8,720	550	0.041	8,240	385	0.032	5,280	290	0.023
3.0	50	6,540	360	0.027	6,180	255	0.021	3,960	190	0.015
3.0	60	6,540	360	0.027	6,180	255	0.021	3,960	190	0.015
4.0	8	8,000	1,300	0.360	7,600	1,160	0.280	6,700	770	0.200
4.0	10	8,000	1,300	0.360	7,600	1,160	0.280	6,700	770	0.200
4.0	12	8,000	1,300	0.360	7,600	1,160	0.280	6,700	770	0.200
4.0	14	8,000	1,300	0.252	7,600	1,160	0.196	6,700	770	0.140
4.0	16	8,000	1,300	0.252	7,600	1,160	0.196	6,700	770	0.140

ESRE712

측면 절삭 가공

피삭재		합금강,탄소강 (SCM, SNCM, S45C)			프리하든강 (NAK, CENA, KP4)			열처리강 (SKD, SKT, STAVAX)		
인장강도		~HRC35			HRC35~45			HRC45~55		
절삭조건		~1100N/mm²			1100~1500N/mm²			1500~2000N/mm²		
공구직경(Ø)	유효장	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	절입 (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	절입 (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	절입 (mm)
4.0	18	8,000	1,300	0.252	7,600	1,160	0.196	6,700	770	0.140
4.0	20	8,000	1,300	0.252	7,600	1,160	0.196	6,700	770	0.140
4.0	22	7,200	1,055	0.144	6,840	940	0.112	6,030	625	0.080
4.0	26	7,200	1,055	0.144	6,840	940	0.112	6,030	625	0.080
4.0	30	7,200	1,055	0.144	6,840	940	0.112	6,030	625	0.080
4.0	35	7,200	1,055	0.090	6,840	940	0.070	6,030	625	0.050
4.0	40	7,200	1,055	0.090	6,840	940	0.070	6,030	625	0.050
4.0	45	6,400	830	0.090	6,080	740	0.070	5,360	495	0.050
4.0	50	6,400	830	0.090	6,080	740	0.070	5,360	495	0.050
4.0	60	6,400	830	0.054	6,080	740	0.042	5,360	495	0.030
5.0	16	6,400	1,155	0.315	6,100	900	0.245	5,400	605	0.175
5.0	20	6,400	1,155	0.315	6,100	900	0.245	5,400	605	0.175
5.0	26	5,760	935	0.180	5,490	730	0.140	4,860	490	0.100
5.0	30	5,760	935	0.180	5,490	730	0.140	4,860	490	0.100
5.0	35	5,760	935	0.180	5,490	730	0.140	4,860	490	0.100
5.0	40	5,760	935	0.180	5,490	730	0.140	4,860	490	0.100
5.0	50	5,760	935	0.113	5,490	730	0.088	4,860	490	0.063
5.0	60	5,120	740	0.113	4,880	575	0.088	4,320	385	0.063
6.0	15	5,300	1,055	0.540	5,000	820	0.420	4,400	550	0.300
6.0	20	5,300	1,055	0.378	5,000	820	0.294	4,400	550	0.210
6.0	30	5,300	1,055	0.378	5,000	820	0.294	4,400	550	0.210
6.0	32	4,770	855	0.216	4,500	665	0.168	3,960	445	0.120
8.0	25	4,000	950	0.504	3,800	750	0.392	3,300	500	0.280
8.0	30	4,000	950	0.504	3,800	750	0.392	3,300	500	0.280
8.0	42	3,600	770	0.288	3,400	605	0.224	2,950	405	0.160
10.0	30	3,200	900	0.900	3,050	680	0.700	2,630	400	0.500
10.0	35	3,200	900	0.630	3,050	680	0.490	2,630	400	0.350
10.0	45	3,200	900	0.630	3,050	680	0.490	2,630	400	0.350
12.0	35	2,650	800	1.080	2,520	600	0.840	2,180	350	0.600
12.0	40	2,650	800	0.756	2,520	600	0.588	2,180	350	0.420
12.0	50	2,650	800	0.756	2,520	600	0.588	2,180	350	0.420

절입기준



H-Star Endmill

ESRE714

피삭재		합금강,탄소강 (SCM, SNCM, S45C)			프리하든강 (NAK, CENA, KP4)			열처리강 (SKD, SKT, STAVAX)		
인장강도		~HRC35			HRC35~45			HRC45~55		
절삭조건		~1100N/mm²			1100~1500N/mm²			1500~2000N/mm²		
공구직경(Ø)	유효장	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	절입 (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	절입 (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	절입 (mm)
0.5	1	27,400	756	0.045	25,800	595	0.035	22,800	399	0.025
0.5	2	27,400	756	0.032	25,800	595	0.025	22,800	399	0.018
0.5	3	24,660	609	0.018	23,220	483	0.014	20,520	322	0.01
0.5	4	24,660	609	0.018	23,220	483	0.014	20,520	322	0.01
0.5	5	24,660	609	0.011	23,220	483	0.009	20,520	322	0.006
0.5	6	21,920	483	0.011	20,640	378	0.009	18,240	252	0.006
0.5	8	16,440	315	0.007	15,480	252	0.005	13,680	168	0.004
0.5	10	16,440	315	0.005	15,480	252	0.004	13,680	168	0.003
0.6	1	27,400	1085	0.038	25,800	763	0.029	22,800	567	0.021
0.6	2	27,400	1085	0.038	25,800	763	0.029	22,800	567	0.021
0.6	3	27,400	1085	0.038	25,800	763	0.029	22,800	567	0.021
0.6	4	24,660	882	0.022	23,220	616	0.017	20,520	462	0.012
0.6	5	24,660	882	0.014	23,220	616	0.011	20,520	462	0.008
0.6	6	24,660	882	0.014	23,220	616	0.011	20,520	462	0.008
0.6	8	21,920	693	0.008	20,640	490	0.006	18,240	364	0.005
0.6	10	16,440	455	0.005	15,480	322	0.004	13,680	238	0.003
0.6	12	16,440	455	0.005	15,480	322	0.004	13,680	238	0.003
0.7	2	27,400	1085	0.063	25,800	763	0.049	22,800	567	0.035
0.7	4	24,660	882	0.025	23,220	616	0.02	20,520	462	0.014
0.7	6	24,660	693	0.016	23,220	616	0.012	20,520	462	0.009
0.7	8	21,920	693	0.016	20,640	490	0.012	18,240	364	0.009
0.7	10	21,920		0.009	20,640	490	0.007	18,240	364	0.005
0.8	1	27,400	1085	0.072	25,800	847	0.056	22,800	630	0.04
0.8	2	27,400	1085	0.072	25,800	847	0.056	22,800	630	0.04
0.8	3	27,400	1085	0.05	25,800	847	0.039	22,800	630	0.028
0.8	4	27,400	1085	0.05	25,800	847	0.039	22,800	630	0.028
0.8	5	24,660	882	0.029	23,220	686	0.022	20,520	511	0.016
0.8	6	24,660	882	0.029	23,220	686	0.022	20,520	511	0.016
0.8	8	24,660	882	0.018	23,220	686	0.014	20,520	511	0.01
0.8	10	21,920	693	0.018	20,640	539	0.014	18,240	406	0.01
0.8	12	21,920	693	0.011	20,640	539	0.008	18,240	406	0.006
0.8	16	16,440	455	0.007	15,480	357	0.006	13,680	266	0.004
1	2	24,600	1463	0.09	23,300	1246	0.07	20,500	931	0.05
1	3	24,600	1463	0.09	23,300	1246	0.07	20,500	931	0.05
1	4	24,600	1463	0.063	23,300	1246	0.049	20,500	931	0.035
1	6	22,140	1183	0.036	20,970	1008	0.028	18,450	756	0.02
1	8	22,140	1183	0.036	20,970	1008	0.028	18,450	756	0.02
1	10	22,140	1183	0.023	20,970	1008	0.018	18,450	756	0.013
1	12	19,680	938	0.023	18,640	798	0.018	16,400	595	0.013
1	14	19,680	938	0.014	18,640	798	0.011	16,400	595	0.008
1	16	14,760	616	0.014	13,980	525	0.011	12,300	392	0.008
1	18	14,760	616	0.009	13,980	525	0.007	12,300	392	0.005
1	20	14,760	616	0.009	13,980	525	0.007	12,300	392	0.005
1.2	4	21,900	1,302	0.076	20,700	1008	0.059	18,200	679	0.042
1.2	6	21,900	1,302	0.076	20,700	1008	0.059	18,200	679	0.042
1.2	8	19,710	1,057	0.043	18,630	819	0.034	16,380	553	0.024
1.2	10	19,710	1,057	0.027	18,630	819	0.021	16,380	553	0.015
1.2	12	19,710	1057	0.027	18,630	819	0.021	16,380	553	0.015

ESRE714

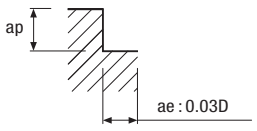
피삭재		합금강,탄소강 (SCM, SNCM, S45C)			프리하든강 (NAK, CENA, KP4)			열처리강 (SKD, SKT, STAVAX)		
인장강도		~HRC35			HRC35~45			HRC45~55		
절삭조건		~1100N/mm²			1100~1500N/mm²			1500~2000N/mm²		
공구직경(Ø)	유효장	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	절입 (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	절입 (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	절입 (mm)
1.2	16	17,520	833	0.016	16,560	644	0.013	14,560	434	0.009
1.2	18	17,520	833	0.016	16,560	644	0.013	14,560	434	0.009
1.2	20	13,140	546	0.011	12,420	420	0.008	10,920	287	0.006
1.4	6	19,200	1141	0.088	18,100	798	0.069	16,000	595	0.049
1.4	8	17,280	924	0.05	16,290	644	0.039	14,400	483	0.028
1.4	10	17,280	924	0.05	16,290	644	0.039	14,400	483	0.028
1.4	12	17,280	924	0.05	16,290	644	0.039	14,400	483	0.028
1.4	14	17,280	924	0.032	16,290	644	0.025	14,400	483	0.018
1.4	16	15,360	728	0.032	14,480	511	0.025	12,800	378	0.018
1.5	4	19,200	1267	0.135	18,100	889	0.105	16,000	665	0.075
1.5	6	19,200	1267	0.095	18,100	889	0.074	16,000	665	0.053
1.5	8	17,280	1029	0.054	16,290	721	0.042	14,400	539	0.03
1.5	10	17,280	1029	0.054	16,290	721	0.042	14,400	539	0.03
1.5	12	17,280	1029	0.054	16,290	721	0.042	14,400	539	0.03
1.5	16	15,360	812	0.034	14,480	567	0.026	12,800	427	0.019
1.5	18	15,360	812	0.034	14,480	567	0.026	12,800	427	0.019
1.5	20	15,360	812	0.02	14,480	567	0.016	12,800	427	0.011
1.5	25	11,520	532	0.014	10,860	371	0.011	9,600	280	0.008
1.5	30	11,520	532	0.014	10,860	371	0.011	9,600	280	0.008
1.6	6	17,800	1176	0.101	16,800	917	0.078	14,800	686	0.056
1.6	8	17,800	1176	0.101	16,800	917	0.078	14,800	686	0.056
1.6	10	16,020	952	0.058	15,120	742	0.045	13,320	553	0.032
1.6	12	16,020	952	0.058	15,120	742	0.045	13,320	553	0.032
1.6	14	16,020	952	0.058	15,120	742	0.045	13,320	553	0.032
1.6	16	16,020	952	0.036	15,120	752	0.028	13,320	553	0.02
1.6	18	16,020	952	0.036	15,120	752	0.028	13,320	553	0.02
1.6	20	14,240	756	0.036	13,440	588	0.028	11,840	441	0.02
1.6	25	14,240	756	0.036	13,440	588	0.028	11,840	441	0.02
1.8	6	17,800	1176	0.113	16,800	917	0.088	14,800	686	0.063
1.8	8	17,800	1176	0.113	16,800	917	0.088	14,800	686	0.063
1.8	10	16,020	952	0.065	15,120	742	0.05	13,320	553	0.036
1.8	12	16,020	952	0.065	15,120	742	0.05	13,320	553	0.036
1.8	16	16,020	952	0.041	15,120	742	0.032	13,320	553	0.023
1.8	20	14,240	756	0.041	13,440	588	0.032	11,840	441	0.023
1.8	25	14,240	756	0.041	13,440	588	0.032	11,840	441	0.023
2	4	14,400	1148	0.18	13,600	868	0.14	12,000	665	0.1
2	6	14,400	1148	0.18	13,600	868	0.14	12,000	665	0.1
2	8	14,400	1148	0.126	13,600	868	0.098	12,000	665	0.07
2	10	14,400	1148	0.126	13,600	868	0.098	12,000	665	0.07
2	12	12,960	931	0.072	12,240	700	0.056	10,800	539	0.04
2	14	12,960	931	0.072	12,240	700	0.056	10,800	539	0.04
2	16	12,960	931	0.072	12,240	700	0.056	10,800	539	0.04
2	18	12,960	931	0.045	12,240	700	0.035	10,800	539	0.025
2	20	12,960	931	0.045	12,240	700	0.035	10,800	539	0.025
2	22	11,520	735	0.045	10,880	553	0.035	9,600	427	0.025
2	25	11,520	735	0.045	10,880	553	0.035	9,600	427	0.025
2	30	11,520	735	0.027	10,880	553	0.021	9,600	427	0.015
2.5	10	12,300	1358	0.158	11,600	952	0.123	10,300	714	0.088

H-Star Endmill

ESRE714

피삭재		합금강,탄소강 (SCM, SNCM, S45C)			프리하든강 (NAK, CENA, KP4)			열처리강 (SKD, SKT, STAVAX)		
인장강도		~HRC35			HRC35~45			HRC45~55		
절삭조건		~1100N/mm²			1100~1500N/mm²			1500~2000N/mm²		
공구직경(Ø)	유효장	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	절입 (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	절입 (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	절입 (mm)
2.5	12	12,300	1358	0.158	11,600	952	0.123	10,300	714	0.088
2.5	16	11,070	1099	0.09	10,440	770	0.07	9,270	581	0.05
2.5	20	11,070	1099	0.09	10,440	770	0.07	9,270	581	0.05
2.5	25	9,840	868	0.056	9,280	609	0.044	8,240	455	0.031
2.5	30	9,840	868	0.056	9,280	609	0.044	8,240	455	0.031
3	6	10,900	1204	0.27	10,300	847	0.21	6,600	630	0.15
3	8	10,900	1204	0.27	10,300	847	0.21	6,600	630	0.15
3	10	10,900	1204	0.189	10,300	847	0.147	6,600	630	0.105
3	12	10,900	1204	0.189	10,300	847	0.147	6,600	630	0.105
3	16	9,810	973	0.108	9,270	686	0.084	5,940	511	0.06
3	20	9,810	973	0.108	9,270	686	0.084	5,940	511	0.06
3	25	9,810	973	0.068	9,270	686	0.053	5,940	511	0.038
3	30	9,810	973	0.068	9,270	686	0.053	5,940	511	0.038
3	35	8,720	770	0.068	8,240	539	0.053	5,280	406	0.038
3	40	8,720	770	0.041	8,240	539	0.032	5,280	406	0.023
3	45	8,720	770	0.041	8,240	539	0.032	5,280	406	0.023
3	50	6,540	504	0.027	6,180	357	0.021	3,960	266	0.015
3	60	6,540	504	0.027	6,180	357	0.021	3,960	266	0.015
3.5	12	9,310	1430	0.236	8,800	1008	0.183	5,640	750	0.131
3.5	16	8,380	1158	0.135	7,920	816	0.105	5,070	608	0.075
3.5	20	8,380	1158	0.135	7,920	816	0.105	5,070	608	0.047
3.5	25	8,380	1158	0.085	7,920	816	0.066	5,070	608	0.047
3.5	30	8,380	1158	0.085	7,920	816	0.066	5,070	608	0.047
3.5	35	7,450	916	0.085	7,040	641	0.066	4,510	483	0.047
3.5	40	7,450	916	0.051	7,040	641	0.04	4,510	483	0.028
4	6	8,000	1820	0.36	7,600	1624	0.28	6,700	1078	0.2
4	8	8,000	1820	0.36	7,600	1624	0.28	6,700	1078	0.2
4	10	8,000	1820	0.36	7,600	1624	0.28	6,700	1078	0.2
4	12	8,000	1820	0.36	7,600	1624	0.28	6,700	1078	0.2
4	16	8,000	1820	0.252	7,600	1624	0.196	6,700	1078	0.14
4	20	8,000	1820	0.252	7,600	1624	0.196	6,700	1078	0.14
4	25	7,200	1477	0.144	6,840	1316	0.112	6,030	875	0.08
4	30	7,200	1477	0.144	6,840	1316	0.112	6,030	875	0.08
4	40	7,200	1477	0.09	6,840	1316	0.07	6,030	875	0.05
4	45	6,400	1162	0.09	6,080	1036	0.07	5,360	693	0.05
4	50	6,400	1162	0.09	6,080	1036	0.07	5,360	693	0.05
4	60	6,400	1162	0.054	6,080	1036	0.042	5,360	693	0.03
4.5	12	6,830	2166	0.45	6,490	1933	0.35	5,720	1283	0.25
4.5	16	6,830	2166	0.315	6,490	1933	0.245	5,720	1283	0.175
4.5	20	6,830	2166	0.315	6,490	1933	0.245	5,720	1283	0.175
4.5	25	6,150	1758	0.18	5,840	1566	0.14	5,150	1041	0.1
4.5	30	6,150	1758	0.18	5,840	1566	0.14	5,150	1041	0.1

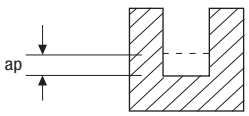
절입기준



ESRE714

피삭재		합금강,탄소강 (SCM, SNCM, S45C)			프리하든강 (NAK, CENA, KP4)			열처리강 (SKD, SKT, STAVAX)		
인장강도		~HRC35			HRC35~45			HRC45~55		
절삭조건		~1100N/mm²			1100~1500N/mm²			1500~2000N/mm²		
공구직경(Ø)	유효장	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	절입 (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	절입 (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	절입 (mm)
4.5	40	6,150	1758	0.112	5,840	1566	0.087	5,150	1041	0.062
5	16	6,400	1617	0.315	6,100	1260	0.245	5,400	847	0.175
5	20	6,400	1617	0.315	6,100	1260	0.245	5,400	847	0.175
5	25	5,760	1309	0.18	5,490	1022	0.14	4,860	686	0.1
5	30	5,760	1309	0.18	5,490	1022	0.14	4,860	686	0.1
5	40	5,760	1309	0.18	5,490	1022	0.14	4,860	686	0.1
5	50	5,760	1309	0.113	5,490	1022	0.088	4,860	686	0.063
5	60	5,120	1036	0.113	4,880	805	0.088	4,320	539	0.063
6	20	5,300	1477	0.378	5,000	1148	0.294	4,400	770	0.21
6	30	5,300	1,477	0.378	5,000	1,148	0.294	4,400	770	0.21
6	40	4,770	1,197	0.216	4,500	931	0.168	3,960	623	0.12
6	50	4,770	1,197	0.216	4,500	931	0.168	3,960	623	0.12
6	60	4,370	958	0.141	4,171	931	0.11	3,690	623	0.078
8	25	4,000	1,330	0.504	3,800	1,050	0.392	3,300	700	0.28
8	40	3,600	1,078	0.288	3,400	847	0.224	2,950	567	0.16
8	50	3,600	1,078	0.288	3,400	847	0.224	2,950	567	0.16
10	30	3,200	1,260	0.9	3,050	952	0.7	2,630	560	0.5
10	50	3,200	1,260	0.63	3,050	952	0.49	2,630	560	0.35
10	60	3,200	1,260	0.63	3,050	952	0.49	2,630	560	0.35
12	40	2,650	1,120	0.756	2,520	840	0.588	2,180	490	0.42
12	60	2,360	896	0.472	2,250	672	0.367	1,940	392	0.262
12	70	2,360	896	0.472	2,250	672	0.367	1,940	392	0.262

절입기준



H-Star Endmill

ESRR712 series

피삭재				탄소강, 합금강 180~250HB		프리하든강 HRC35~45		열처리강 HRC45~55		고경도강 HRC55~65	
표준절삭깊이비율				절삭깊이 × 100%		절삭깊이 × 80%		절삭깊이 × 65%		절삭깊이 × 60%	
공구직경 (Ø)	코너 R (mm)	목부길이 (mm)	절삭깊이 (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
0.2	0.02	0.5	0.016	50,000	258	50,000	205	50,000	180	50,000	160
		1	0.011	50,000	258	50,000	205	50,000	180	50,000	160
		1.5	0.007	42,000	202	36,700	176	36,700	162	36,700	147
	0.05	0.5	0.02	50,000	258	50,000	205	50,000	180	50,000	160
		1	0.014	50,000	258	50,000	205	50,000	180	50,000	160
		1.5	0.008	50,000	240	45,900	202	45,900	170	45,900	153
0.3	0.02	1	0.016	50,000	585	50,000	456	50,000	336	50,000	320
		2	0.011	45,000	530	45,000	420	45,000	300	45,000	290
		3	0.007	35,000	412	35,000	326	30,000	200	30,000	194
	0.05	1	0.021	50,000	585	50,000	456	50,000	336	50,000	320
		2	0.012	45,000	530	45,000	420	45,000	300	45,000	290
		3	0.008	35,000	412	35,000	326	30,000	200	30,000	194
0.4	0.02	1	0.016	50,000	580	50,000	461	40,000	320	36,000	270
		2	0.013	45,000	520	45,000	410	36,000	290	34,000	240
		3	0.01	40,000	410	40,000	330	32,800	240	25,600	200
		4	0.007	30,000	320	30,000	250	21,600	160	19,200	150
	0.05	1	0.025	50,000	580	50,000	461	40,000	320	36,000	270
		2	0.016	45,000	520	45,000	410	36,000	290	34,000	240
		3	0.014	40,000	410	40,000	330	32,800	240	25,600	200
		4	0.008	30,000	320	30,000	250	21,600	160	19,200	150
	0.1	1	0.033	50,000	580	50,000	461	40,000	320	36,000	270
		1.5	0.03	50,000	580	50,000	461	40,000	320	36,000	270
		2	0.028	45,000	520	45,000	410	36,000	290	34,000	240
		3	0.016	40,000	410	40,000	330	32,800	240	25,600	200
		4	0.01	30,000	320	30,000	250	21,600	160	19,200	150
0.5	0.02	1	0.016	50,000	898	40,000	464	30,000	378	28,000	315
		1.5	0.014	50,000	898	40,000	464	30,000	378	28,000	315
		2	0.013	50,000	898	40,000	464	30,000	378	28,000	315
		2.5	0.011	45,000	810	36,000	414	27,000	315	24,500	261
		3	0.01	45,000	810	36,000	414	27,000	315	24,500	261
		4	0.008	40,000	720	32,000	378	24,000	279	20,000	234
		5	0.007	40,000	720	32,000	378	24,000	279	20,000	234
		6	0.006	28,800	480	19,400	260	18,000	250	15,000	200
		8	0.005	28,800	480	19,400	260	18,000	250	15,000	200
		10	0.004	28,800	480	19,400	260	18,000	250	15,000	200
	0.05	1	0.03	50,000	898	40,000	464	30,000	378	28,000	315
		1.5	0.026	50,000	898	40,000	464	30,000	378	28,000	315
		2	0.023	50,000	898	40,000	464	30,000	378	28,000	315
		2.5	0.02	45,000	810	36,000	414	27,000	315	24,500	261
		3	0.017	45,000	810	36,000	414	27,000	315	24,500	261
		4	0.017	40,000	720	32,000	378	24,000	279	20,000	234
		5	0.011	28,800	540	19,400	280	18,000	250	15,000	200
		6	0.008	28,800	480	19,400	260	18,000	250	15,000	200
		8	0.007	28,800	480	19,400	260	18,000	250	15,000	200
		10	0.006	28,800	480	19,400	260	18,000	250	15,000	200

ESRR712 series

피삭재				탄소강, 합금강 180~250HB		프리하든강 HRC35~45		열처리강 HRC45~55		고경도강 HRC55~65	
표준절삭깊이비율				절삭깊이 × 100%		절삭깊이 × 80%		절삭깊이 × 65%		절삭깊이 × 60%	
공구직경 (Ø)	코너 R (mm)	목부길이 (mm)	절삭깊이 (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
0.5	0.1	1	0.035	50,000	898	40,000	464	30,000	378	28,000	315
		1.5	0.032	50,000	898	40,000	464	30,000	378	28,000	315
		2	0.03	50,000	898	40,000	464	30,000	378	28,000	315
		2.5	0.025	45,000	810	36,000	414	27,000	315	24,500	261
		3	0.02	45,000	810	36,000	414	27,000	315	24,500	261
		4	0.02	40,000	720	32,000	378	24,000	279	20,000	234
		5	0.013	28,800	540	19,400	280	18,000	250	15,000	200
		6	0.013	28,800	480	19,400	260	18,000	250	15,000	200
		8	0.01	28,800	480	19,400	260	18,000	250	15,000	200
		10	0.08	28,800	480	19,400	260	18,000	250	15,000	200
0.6	0.02	2	0.016	50,000	1,159	37,830	600	28,200	390	23,000	320
		3	0.014	40,000	830	27,800	440	23,600	280	21,000	230
		4	0.013	40,000	830	27,800	440	23,600	280	21,000	230
		6	0.01	24,000	490	18,000	300	17,800	240	15,000	210
		8	0.008	24,000	466	18,000	285	17,800	228	15,000	200
		10	0.007	24,000	451	18,000	276	17,800	221	15,000	193
		12	0.006	24,000	451	18,000	276	17,800	221	15,000	193
	0.05	2	0.028	50,000	1,159	37,830	600	28,200	390	23,000	320
		3	0.023	40,000	830	27,800	440	23,600	280	21,000	230
		4	0.019	40,000	830	27,800	440	23,600	280	21,000	230
		6	0.012	24,000	490	18,000	300	17,800	240	15,000	210
		8	0.01	24,000	466	18,000	285	17,800	228	15,000	200
		10	0.007	24,000	451	18,000	276	17,800	221	15,000	193
		12	0.006	24,000	451	18,000	276	17,800	221	15,000	193
	0.1	2	0.035	50,000	1,159	37,830	600	28,200	390	23,000	320
		3	0.03	40,000	830	27,800	440	23,600	280	21,000	230
		4	0.024	40,000	830	27,800	440	23,600	280	21,000	230
		6	0.015	24,000	490	18,000	300	17,800	240	15,000	210
		8	0.013	24,000	466	18,000	285	17,800	228	15,000	200
		10	0.009	24,000	451	18,000	276	17,800	221	15,000	193
		12	0.007	24,000	451	18,000	276	17,800	221	15,000	193
0.7	0.1	2	0.042	49,200	1,054	34,190	558	29,030	355	25,830	292
		4	0.029	40,000	830	27,800	440	23,600	280	21,000	230
		6	0.018	24,000	490	18,000	300	17,800	240	15,000	210
		8	0.015	24,000	490	18,000	300	17,800	240	15,000	210
		10	0.012	24,000	490	18,000	300	17,800	240	15,000	210
0.8	0.02	2	0.016	48,000	1,378	28,000	647	20,000	400	20,000	360
		4	0.016	48,000	1,102	28,000	518	20,000	320	20,000	288
		6	0.013	38,700	800	25,000	461	18,000	288	18,000	256
		8	0.011	29,025	600	20,000	369	16,200	259	16,200	230
		10	0.01	29,025	570	20,000	350	16,200	246	16,200	219
		12	0.09	29,025	570	20,000	350	16,200	246	16,200	219
	0.05	2	0.038	48,000	1,378	28,000	647	20,000	400	20,000	360
		4	0.026	48,000	1,102	28,000	518	20,000	320	20,000	288

H-Star Endmill

ESRR712 series

피삭재				탄소강, 합금강 180~250HB		프리하든강 HRC35~45		열처리강 HRC45~55		고경도강 HRC55~65	
표준절삭깊이비율				절삭깊이 × 100%		절삭깊이 × 80%		절삭깊이 × 65%		절삭깊이 × 60%	
공구직경 (Ø)	코너 R (mm)	목부길이 (mm)	절삭깊이 (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
0.8	0.05	6	0.015	38,700	800	25,000	461	18,000	288	18,000	256
		8	0.012	29,025	600	20,000	369	16,200	259	16,200	230
		10	0.011	29,025	570	20,000	350	16,200	246	16,200	219
		12	0.01	29,025	570	20,000	350	16,200	246	16,200	219
	0.1	2	0.047	48,000	1,378	28,000	647	20,000	400	20,000	360
		4	0.032	48,000	1,102	28,000	518	20,000	320	20,000	288
		6	0.019	38,700	800	25,000	461	18,000	288	18,000	256
		8	0.015	29,025	600	20,000	369	16,200	259	16,200	230
		10	0.013	29,025	570	20,000	350	16,200	246	16,200	219
		12	0.012	29,025	570	20,000	350	16,200	246	16,200	219
	0.2	2	0.081	48,000	1,378	28,000	647	20,000	400	20,000	360
		4	0.056	48,000	1,102	28,000	518	20,000	320	20,000	288
		6	0.032	38,700	800	25,000	461	18,000	288	18,000	256
		8	0.018	29,025	600	20,000	369	16,200	259	16,200	230
		10	0.016	29,025	570	20,000	350	16,200	246	16,200	219
		12	0.015	29,025	570	20,000	350	16,200	246	16,200	219
1	0.02	4	0.013	32,400	1,359	27,540	1,039	24,300	815	22,680	666
		6	0.01	26,244	990	22,307	842	19,683	660	18,371	539
		8	0.008	23,328	880	19,829	748	17,496	587	16,330	479
		10	0.006	20,412	770	17,350	655	15,309	514	14,288	419
		12	0.005	18,144	609	15,422	453	13,608	399	12,701	320
		14	0.004	18,144	533	15,422	420	13,608	342	12,701	266
		16	0.004	18,144	533	15,422	420	13,608	342	12,701	266
		20	0.003	13,608	399	11,567	315	10,206	257	9,526	200
	0.05	4	0.027	32,400	1,359	28,917	1,128	24,300	815	22,680	666
		6	0.017	26,244	990	24,538	928	19,683	660	18,371	539
		8	0.016	23,328	880	19,829	748	17,496	587	16,330	479
		10	0.011	20,412	770	17,350	655	15,309	514	14,288	419
		12	0.01	18,144	609	15,422	453	13,608	399	12,701	320
		14	0.008	18,144	533	15,422	420	13,608	342	12,701	266
		16	0.006	18,144	533	15,422	420	13,608	342	12,701	266
		20	0.004	13,608	399	11,567	315	10,206	257	9,526	200
	0.1	4	0.038	32,400	1,359	27,540	1,039	24,300	815	22,680	666
		6	0.024	26,244	990	22,307	842	19,683	660	18,371	539
		8	0.024	23,328	880	19,829	748	17,496	587	16,330	479
		10	0.015	20,412	770	17,350	655	15,309	514	14,288	419
		12	0.015	18,144	609	15,422	453	13,608	399	12,701	320
		14	0.012	18,144	533	15,422	420	13,608	342	12,701	266
		16	0.009	18,144	533	15,422	420	13,608	342	12,701	266
		20	0.006	13,608	399	11,567	315	10,206	257	9,526	200
	0.2	4	0.07	32,400	1,359	27,540	1,039	24,300	815	22,680	666
		6	0.04	26,244	990	22,307	842	19,683	660	18,371	539
		8	0.04	23,328	880	19,829	748	17,496	587	16,330	479
		10	0.025	20,412	770	17,350	655	15,309	514	14,288	419

ESRR712 series

피삭재				탄소강, 합금강 180~250HB		프리하든강 HRC35~45		열처리강 HRC45~55		고경도강 HRC55~65	
표준절삭깊이비율				절삭깊이 × 100%		절삭깊이 × 80%		절삭깊이 × 65%		절삭깊이 × 60%	
공구직경 (Ø)	코너 R (mm)	목부길이 (mm)	절삭깊이 (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
1	0.2	12	0.025	18,144	609	15,422	453	13,608	399	12,701	320
		14	0.02	18,144	533	15,422	420	13,608	342	12,701	266
		16	0.015	18,144	533	15,422	420	13,608	342	12,701	266
		20	0.01	13,608	399	11,567	315	10,206	257	9,526	200
	0.3	4	0.07	32,400	1,359	27,540	1,039	24,300	815	22,680	666
		6	0.04	26,244	990	22,307	842	19,683	660	18,371	539
		8	0.04	23,328	880	19,829	748	17,496	587	16,330	479
		10	0.025	20,412	770	17,350	655	15,309	514	14,288	419
		12	0.025	18,144	609	15,422	453	13,608	399	12,701	320
		14	0.02	18,144	533	15,422	420	13,608	342	12,701	266
		16	0.015	18,144	533	15,422	420	13,608	342	12,701	266
		20	0.01	13,608	399	11,567	315	10,206	257	9,526	200
1.2	0.02	4	0.013	28,868	1,154	24,538	928	21,651	727	20,208	594
		6	0.01	28,868	1,154	24,538	928	21,651	727	20,208	594
		8	0.008	24,640	962	20,944	791	18,480	620	17,248	506
		10	0.006	20,412	770	17,350	655	15,309	514	14,288	419
		12	0.005	19,278	652	16,386	554	14,458	428	13,494	342
		14	0.004	18,144	533	15,422	453	13,608	342	12,701	266
		16	0.004	18,144	533	15,422	453	13,608	342	12,701	266
		20	0.003	13,608	399	11,567	315	10,206	257	9,526	200
	0.05	4	0.027	28,868	1,154	24,538	928	21,651	727	20,208	594
		6	0.017	28,868	1,154	24,538	928	21,651	727	20,208	594
		8	0.016	24,640	962	20,944	791	18,480	620	17,248	506
		10	0.011	20,412	770	17,350	655	15,309	514	14,288	419
		12	0.01	19,278	652	16,386	554	14,458	428	13,494	342
		14	0.008	18,144	533	15,422	453	13,608	342	12,701	266
		16	0.006	18,144	533	15,422	453	13,608	342	12,701	266
		20	0.004	13,608	399	11,567	315	10,206	257	9,526	200
	0.1	4	0.03	28,868	1,154	24,538	928	21,651	727	20,208	594
		6	0.03	28,868	1,154	24,538	928	21,651	727	20,208	594
		8	0.022	24,640	962	20,944	791	18,480	620	17,248	506
		10	0.015	20,412	770	17,350	655	15,309	514	14,288	419
		12	0.012	19,278	652	16,386	554	14,458	428	13,494	342
		14	0.01	18,144	533	15,422	453	13,608	342	12,701	266
		16	0.01	18,144	533	15,422	453	13,608	342	12,701	266
		20	0.006	13,608	399	11,567	315	10,206	257	9,526	200
	0.2	4	0.05	28,868	1,154	24,538	928	21,651	727	20,208	594
		6	0.05	28,868	1,154	24,538	928	21,651	727	20,208	594
		8	0.037	24,640	962	20,944	791	18,480	620	17,248	506
		10	0.025	20,412	770	17,350	655	15,309	514	14,288	419
		12	0.02	19,278	651	16,386	554	14,458	428	13,494	342
		14	0.016	18,144	533	15,422	453	13,608	342	12,701	266
		16	0.016	18,144	533	15,422	453	13,608	342	12,701	266
		20	0.01	13,608	399	11,567	315	10,206	257	9,526	200

H-Star Endmill

ESRR712 series

피삭재				탄소강, 합금강 180~250HB		프리하든강 HRC35~45		열처리강 HRC45~55		고경도강 HRC55~65	
표준절삭깊이비율				절삭깊이 × 100%		절삭깊이 × 80%		절삭깊이 × 65%		절삭깊이 × 60%	
공구직경 (Ø)	코너 R (mm)	목부길이 (mm)	절삭깊이 (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
1.2	0.3	4	0.05	28,868	1,154	24,538	928	21,651	727	20,208	594
		6	0.05	28,868	1,154	24,538	928	21,651	727	20,208	594
		8	0.037	24,640	962	20,944	791	18,480	620	17,248	506
		10	0.025	20,412	770	17,350	655	15,309	514	14,288	419
		12	0.02	19,278	651	16,386	554	14,458	428	13,494	342
		14	0.016	18,144	533	15,422	453	13,608	342	12,701	266
		16	0.016	18,144	533	15,422	453	13,608	342	12,701	266
		20	0.01	13,608	399	11,567	315	10,206	257	9,526	200
1.5	0.02	4	0.013	24,930	1,130	20,956	947	18,711	752	17,364	611
		6	0.01	23,779	1,074	20,382	921	17,834	716	16,560	582
		8	0.008	22,680	1,027	19,278	873	17,010	685	15,876	559
		10	0.006	20,412	924	17,350	785	15,309	616	14,288	503
		12	0.005	18,144	822	15,422	698	13,608	548	12,701	447
		14	0.004	14,112	568	11,995	423	10,584	373	9,878	298
		16	0.004	14,112	568	11,995	423	10,584	373	9,878	298
		20	0.003	14,112	568	11,995	423	10,584	373	9,878	298
	0.05	4	0.027	24,930	1,130	20,956	947	18,711	752	17,364	611
		6	0.017	23,779	1,074	20,382	921	17,834	716	16,560	582
		8	0.016	22,680	1,027	19,278	873	17,010	685	15,876	559
		10	0.011	20,412	924	17,350	785	15,309	616	14,288	503
		12	0.01	18,144	822	15,422	698	13,608	548	12,701	447
		14	0.008	14,112	568	11,995	423	10,584	373	9,878	298
		16	0.006	14,112	568	11,995	423	10,584	373	9,878	298
		20	0.004	14,112	568	11,995	423	10,584	373	9,878	298
	0.1	4	0.042	24,930	1,130	20,956	947	18,711	752	17,364	611
		6	0.04	23,779	1,074	20,382	921	17,834	716	16,560	582
		8	0.036	22,680	1,027	19,278	873	17,010	685	15,876	559
		10	0.036	20,412	924	17,350	785	15,309	616	14,288	503
		12	0.036	18,144	822	15,422	698	13,608	548	12,701	447
		14	0.023	14,112	568	11,995	423	10,584	373	9,878	298
		16	0.023	14,112	568	11,995	423	10,584	373	9,878	298
		20	0.018	14,112	568	11,995	423	10,584	373	9,878	298
	0.2	4	0.07	24,930	1,130	20,956	868	18,711	678	17,364	556
		6	0.065	23,779	1,074	20,382	921	17,834	716	16,560	582
		8	0.06	22,680	1,027	19,278	873	17,010	685	15,876	559
		10	0.06	20,412	924	17,350	785	15,309	616	14,288	503
		12	0.06	18,144	822	15,422	698	13,608	548	12,701	447
		14	0.038	14,112	568	11,995	423	10,584	373	9,878	298
		16	0.038	14,112	568	11,995	423	10,584	373	9,878	298
		20	0.03	14,112	568	11,995	423	10,584	373	9,878	298
	0.3	4	0.07	24,930	1,130	20,956	868	18,711	678	17,364	556
		6	0.065	23,779	1,074	20,382	921	17,834	716	16,560	582
		8	0.06	22,680	1,027	19,278	873	17,010	685	15,876	559
		10	0.06	20,412	924	17,350	785	15,309	616	14,288	503

ESRR712 series

피삭재				탄소강, 합금강 180~250HB		프리하든강 HRC35~45		열처리강 HRC45~55		고경도강 HRC55~65	
표준절삭깊이비율				절삭깊이 × 100%		절삭깊이 × 80%		절삭깊이 × 65%		절삭깊이 × 60%	
공구직경 (Ø)	코너 R (mm)	목부길이 (mm)	절삭깊이 (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
1.5	0.3	12	0.06	18,144	822	15,422	698	13,608	548	12,701	447
		14	0.038	14,112	568	11,995	423	10,584	373	9,878	298
		16	0.038	14,112	568	11,995	423	10,584	373	9,878	298
		20	0.03	14,112	568	11,995	423	10,584	373	9,878	298
	0.5	4	0.085	24,930	1,130	20,956	868	18,711	678	17,364	556
		6	0.08	23,779	1,074	20,382	921	17,834	716	16,560	582
		8	0.07	22,680	1,027	19,278	873	17,010	685	15,876	559
		10	0.067	20,412	924	17,350	785	15,309	616	14,288	503
		12	0.065	18,144	822	15,422	698	13,608	548	12,701	447
		14	0.045	14,112	568	11,995	423	10,584	373	9,878	298
		16	0.045	14,112	568	11,995	423	10,584	373	9,878	298
		20	0.035	14,112	568	11,995	423	10,584	373	9,878	298
	0.02	6	0.013	20,790	1,635	17,672	1,389	15,593	981	14,553	801
		8	0.01	18,900	1,486	16,065	1,263	14,175	892	13,230	728
		10	0.008	17104	1284	14539	1092	12828	807	11973	659
		12	0.006	15,309	1,083	13,013	921	11,482	722	10,716	590
		14	0.005	14,458	1023	12,290	869	10,844	682	10,121	557
		16	0.004	13,608	963	11,567	818	10,206	642	9,526	524
		20	0.004	11,907	843	10,121	716	8,930	562	8,335	459
		25	0.003	11,907	757	10,121	643	8,930	505	8,335	411
	0.05	6	0.027	20,790	1,635	17,672	1,389	15,593	981	14,553	801
		8	0.017	18,900	1,486	16,065	1,263	14,175	892	13,230	728
		10	0.016	17104	1284	14539	1092	12828	807	11973	659
		12	0.011	15,309	1,083	13,013	921	11,482	722	10,716	590
		14	0.01	14,458	1023	12,290	869	10,844	682	10,121	557
		16	0.008	13,608	963	11,567	818	10,206	642	9,526	524
		20	0.006	11,907	843	10,121	716	8,930	562	8,335	459
		25	0.004	11,907	757	10,121	643	8,930	505	8,335	411
	0.1	6	0.07	20,790	1,635	17,672	1,389	15,593	981	14,553	801
		8	0.055	18,900	1,486	16,065	1,263	14,175	892	13,230	728
		10	0.042	17104	1284	14539	1092	12828	807	11973	659
		12	0.03	15,309	1,083	13,013	921	11,482	722	10,716	590
		14	0.03	14,458	1023	12,290	869	10,844	682	10,121	557
		16	0.03	13,608	963	11,567	818	10,206	642	9,526	524
		20	0.025	11,907	843	10,121	716	8,930	562	8,335	459
		25	0.015	11,907	757	10,121	643	8,930	505	8,335	411
		30	0.01	11,312	719	9,615	611	8,484	480	7,918	391
	0.2	6	0.08	20,790	1,635	17,672	1,389	15,593	981	14,553	801
		8	0.07	18,900	1,486	16,065	1,263	14,175	892	13,230	728
		10	0.055	17,104	1,284	14,539	1,092	12,828	807	11,973	659
		12	0.04	15,309	1,083	13,013	921	11,482	722	10,716	590
		14	0.04	14,458	1,023	12,290	869	10,844	682	10,121	557
		16	0.04	13,608	963	11,567	818	10,206	642	9,526	524
		20	0.035	11,907	843	10,121	716	8,930	562	8,335	459

H-Star Endmill

ESRR712 series

피삭재				탄소강, 합금강 180~250HB		프리하든강 HRC35~45		열처리강 HRC45~55		고경도강 HRC55~65	
표준절삭깊이비율				절삭깊이 × 100%		절삭깊이 × 80%		절삭깊이 × 65%		절삭깊이 × 60%	
공구직경 (Ø)	코너 R (mm)	목부길이 (mm)	절삭깊이 (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
2	0.2	25	0.025	11,907	757	10,121	643	8,930	505	8,335	411
		30	0.017	11,312	719	9,615	611	8,484	480	7,918	391
	0.3	6	0.11	20,790	1,635	17,672	1,389	15,593	981	14,553	801
		8	0.09	18,900	1,486	16,065	1,263	14,175	892	13,230	728
		10	0.075	17,104	1,284	14,539	1,092	12,828	807	11,973	659
		12	0.06	15,309	1,083	13,013	921	11,482	722	10,716	590
		14	0.06	14,458	1023	12,290	869	10,844	682	10,121	557
		16	0.06	13,608	963	11,567	818	10,206	642	9,526	524
		20	0.037	11,907	843	10,121	716	8,930	562	8,335	459
		25	0.03	11,907	757	10,121	643	8,930	505	8,335	411
		30	0.021	11,312	719	9,615	611	8,484	480	7,918	391
	0.5	6	0.17	20,790	1,635	17,672	1,389	15,593	981	14,553	801
		8	0.14	18,900	1,486	16,065	1,263	14,175	892	13,230	728
		10	0.11	17,104	1284	14,539	1143	12,828	807	11,973	659
		12	0.08	15,309	1,083	13,013	1,023	11,482	722	10,716	590
		14	0.08	14,458	1023	12,290	920	1,084	682	10,121	557
		16	0.08	13,608	963	11,567	818	10,206	642	9,526	524
		20	0.05	11,907	843	10,121	716	8,930	562	8,335	459
		25	0.05	11,907	757	10,121	643	8,930	505	8,335	411
		30	0.03	11,312	719	9,615	611	8,484	480	7,918	391
2.5	0.1	10	0.055	18,900	1,486	16,065	1,263	14,175	892	13,230	728
		16	0.042	16,254	1224	13,816	1040	12,190	767	11,378	626
		20	0.03	13,608	963	11,567	818	10,206	642	9,526	524
		25	0.022	12,757	860	10,844	730	9,568	573	8,930	467
		30	0.015	11,907	757	10,121	643	8,930	505	8,335	411
	0.2	10	0.07	18,900	1,486	16,065	1,263	14,175	892	13,230	728
		16	0.055	16,254	1,224	1,386	1040	12,190	767	11,378	626
		20	0.04	13,608	963	11,567	818	10,206	642	9,526	524
	0.3	10	0.09	18,900	1,486	16,065	1,263	14,175	892	13,230	728
		16	0.075	16,254	1,224	1,386	1040	12,190	767	11,378	626
		20	0.06	13,608	963	11,567	818	10,206	642	9,526	524
	0.5	10	0.14	18,900	1,486	16,065	1,263	14,175	892	13,230	728
		16	0.11	16,254	1,224	1,386	1040	12,190	767	11,378	626
		20	0.08	13,608	963	11,567	818	10,206	642	9,526	524
3	0.1	10	0.06	14,400	1,415	12,240	1,203	10,800	849	10,080	693
		12	0.05	14,400	1,415	12,240	1,203	10,800	849	10,080	693
		16	0.035	14,400	1,415	12,240	1,203	10,800	849	10,080	693
		20	0.035	11,664	1,146	9,914	974	8,748	687	8,165	561
		25	0.031	10,368	973	8,812	827	7,776	583	7,257	477
		30	0.027	9,072	801	7,711	681	6,804	480	6,350	393
		35	0.02	9,072	801	7,711	681	6,804	480	6,350	393
		40	0.015	9,072	801	7,711	681	6,804	480	6,350	393
	0.2	10	0.08	14,400	1,415	12,240	1,203	10,800	849	10,080	693
		12	0.07	14,400	1,415	12,240	1,203	10,800	849	10,080	693

ESRR712 series

피삭재				탄소강, 합금강 180~250HB		프리하든강 HRC35~45		열처리강 HRC45~55		고경도강 HRC55~65	
표준절삭깊이비율				절삭깊이 × 100%		절삭깊이 × 80%		절삭깊이 × 65%		절삭깊이 × 60%	
공구직경 (Ø)	코너 R (mm)	목부길이 (mm)	절삭깊이 (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
3	0.2	16	0.05	14,400	1,415	12,240	1,203	10,800	849	10,080	693
		20	0.05	11,664	1,146	9,914	974	8,748	687	8,165	561
		25	0.045	10,368	973	8,812	827	7,776	583	7,257	477
		30	0.04	9,072	801	7,711	681	6,804	480	6,350	393
		35	0.035	9,072	801	7,711	681	6,804	480	6,350	393
		40	0.03	9,072	801	7,711	681	6,804	480	6,350	393
	0.3	10	0.115	14,400	1,415	12,240	1,203	10,800	849	10,080	693
		12	0.1	14,400	1,415	12,240	1,203	10,800	849	10,080	693
		16	0.075	14,400	1,415	12,240	1,203	10,800	849	10,080	693
		20	0.075	11,664	1,146	9,914	974	8,748	687	8,165	561
		25	0.067	10,368	973	8,812	827	7,776	583	7,257	477
		30	0.06	9,072	801	7,711	681	6,804	480	6,350	393
		35	0.05	9,072	801	7,711	681	6,804	480	6,350	393
		40	0.04	9,072	801	7,711	681	6,804	480	6,350	393
	0.5	10	0.155	14,400	1,415	12,240	1,203	10,800	849	10,080	693
		12	0.13	14,400	1,415	12,240	1,203	10,800	849	10,080	693
		16	0.1	14,400	1,415	12,240	1,203	10,800	849	10,080	693
		20	0.1	11,664	1,146	9,914	974	8,748	687	8,165	561
		25	0.09	10,368	973	8,812	827	7,776	583	7,257	477
		30	0.08	9,072	801	7,711	681	6,804	480	6,350	393
		35	0.065	9,072	801	7,711	681	6,804	480	6,350	393
		40	0.05	9,072	801	7,711	681	6,804	480	6,350	393
	1	10	0.175	14,400	1,415	12,240	1,203	10,800	849	10,080	693
		12	0.15	14,400	1,415	12,240	1,203	10,800	849	10,080	693
		16	0.12	14,400	1,415	12,240	1,203	10,800	849	10,080	693
		20	0.11	11,664	1,146	9,914	974	8,748	687	8,165	561
		25	0.1	10,368	973	8,812	827	7,776	583	7,257	477
		30	0.09	9,072	801	7,711	681	6,804	480	6,350	393
		35	0.075	9,072	801	7,711	681	6,804	480	6,350	393
		40	0.06	9,072	801	7,711	681	6,804	480	6,350	393
4	0.1	12	0.065	11,213	1,950	9,531	1,658	8,410	1,170	7,849	956
		16	0.06	10,255	1,783	8,697	1,512	7,599	1,057	6,684	814
		20	0.055	10,255	1,783	8,697	1,512	7,599	1,057	6,684	814
		25	0.05	10,255	1,783	7,782	1293	6,545	872	5,904	687
		30	0.045	10,255	1,783	6,867	1,075	5,491	688	5,124	561
		35	0.04	10,255	1,783	6,867	1,075	5,491	688	5,124	561
		40	0.035	10,255	1,783	6,867	1,075	5,491	688	5,124	561
	0.2	12	0.14	11,213	1,950	9,531	1,658	8,410	1,170	7,849	956
		16	0.13	10,255	1,783	8,697	1,512	7,599	1,057	6,684	814
		20	0.11	10,255	1,783	8,697	1,512	7,599	1,057	6,684	814
		25	0.105	10,255	1,783	7,782	1293	6,545	872	5,904	687
		30	0.1	10,255	1,783	6,867	1,075	5,491	688	5,124	561
		35	0.08	10,255	1,783	6,867	1,075	5,491	688	5,124	561
		40	0.07	9,247	1,429	6,225	901	5,217	602	4,621	459

H-Star Endmill

ESRR712 series

피삭재				탄소강, 합금강 180~250HB		프리하든강 HRC35~45		열처리강 HRC45~55		고경도강 HRC55~65	
표준절삭깊이비율				절삭깊이 × 100%		절삭깊이 × 80%		절삭깊이 × 65%		절삭깊이 × 60%	
공구직경 (Ø)	코너 R (mm)	목부길이 (mm)	절삭깊이 (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
4	0.3	12	0.22	11,213	1,950	9,531	1,658	8,410	1,170	7,849	956
		16	0.2	10,255	1,783	8,697	1,512	7,599	1,057	6,684	814
		20	0.18	10,255	1,783	8,697	1,512	7,599	1,057	6,684	814
		25	0.17	10,255	1,783	7,782	1293	6,545	872	5,904	687
		30	0.16	10,255	1,783	6,867	1,075	5,491	688	5,124	561
		35	0.14	10,255	1,783	6,867	1,075	5,491	688	5,124	561
		40	0.13	9,247	1,429	6,225	901	5,217	602	4,621	459
	0.5	12	0.35	11,213	1,950	9,531	1,658	8,410	1,170	7,849	956
		16	0.25	10,255	1,783	8,697	1,512	7,599	1,057	6,684	814
		20	0.2	10,255	1,783	8,697	1,512	7,599	1,057	6,684	814
		25	0.175	10,255	1,783	7,782	1293	6,545	872	5,904	687
		30	0.15	10,255	1,783	6,867	1,075	5,491	688	5,124	561
		35	0.1	10,255	1,783	6,867	1,075	5,491	688	5,124	561
		40	0.075	9,247	1,429	6,225	901	5,217	602	4,621	459
	1	12	0.4	11,213	1,950	9,531	1,658	8,410	1,170	7,849	956
		16	0.29	10,255	1,783	8,697	1,512	7,599	1,057	6,684	814
		20	0.23	10,255	1,783	8,697	1,512	7,599	1,057	6,684	814
		25	0.2	10,255	1,783	7,782	1293	6,545	872	5,904	687
		30	0.17	10,255	1,783	6,867	1,075	5,491	688	5,124	561
		35	0.12	10,255	1,783	6,867	1,075	5,491	688	5,124	561
		40	0.09	9,247	1,429	6,225	901	5,217	602	4,621	459
5	0.2	15	0.16	9,154	1,990	7,781	1,692	6,866	1,194	6,408	975
		25	0.152	8,513	1813	7,236	1541	6,385	1088	5,959	888
		30	0.145	7,872	1637	6,691	1391	5,904	982	5,510	802
		40	0.13	6,590	1,284	5,602	1,091	4,943	770	4,613	629
	0.5	15	0.35	9,154	1,990	7,781	1,692	6,866	1,194	6,408	975
		25	0.296	8,513	1813	7,236	1541	6,385	1088	5,959	888
		30	0.24	7,872	1637	6,691	1391	5,904	982	5,510	802
		40	0.135	6,590	1,284	5,602	1,091	4,943	770	4,613	629
	1	15	0.4	9,154	1,990	7,781	1,692	6,866	1,194	6,408	975
		25	0.337	8,513	1813	7,236	1541	6,385	1088	5,959	888
		30	0.275	7,872	1637	6,691	1391	5,904	982	5,510	802
		40	0.15	6,590	1,284	5,602	1,091	4,943	770	4,613	629
6	0.1	20	0.065	7,630	1,991	6,486	1,692	5,722	1,194	5,342	975
		40	0.05	6,486	1,523	5,513	1,294	4,865	914	4,540	746
	0.2	20	0.14	7,630	1,991	6,486	1,692	5,722	1,194	5,342	975
		40	0.11	6,486	1,523	5,513	1,294	4,865	914	4,540	746
	0.3	20	0.22	7,630	1,991	6,486	1,692	5,722	1,194	5,342	975
		40	0.18	6,486	1,523	5,513	1,294	4,865	914	4,540	746
	0.5	20	0.35	7,630	1,991	6,486	1,692	5,722	1,194	5,342	975
		40	0.24	6,486	1,523	5,513	1,294	4,865	914	4,540	746
	1	20	0.4	7,630	1,991	6,486	1,692	5,722	1,194	5,342	975
		40	0.28	6,486	1,523	5,513	1,294	4,865	914	4,540	746
	1.5	20	0.45	7,630	1,991	6,486	1,692	5,722	1,194	5,342	975
		40	0.3	6,486	1,523	5,513	1,294	4,865	914	4,540	746

ESRR712 series

피삭재				탄소강, 합금강 180~250HB		프리하든강 HRC35~45		열처리강 HRC45~55		고경도강 HRC55~65	
표준절삭깊이비율				절삭깊이 × 100%		절삭깊이 × 80%		절삭깊이 × 65%		절삭깊이 × 60%	
공구직경 (Ø)	코너 R (mm)	목부길이 (mm)	절삭깊이 (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
8	0.2	22	0.35	5,730	1900	4,524	1483	3,016	914	2,320	584
	0.3	22	0.5	5,730	1900	4,524	1483	3,016	914	2,320	584
	0.5	22	0.6	5,730	1900	4,524	1483	3,016	914	2,320	584
	1	22	0.7	5,730	1900	4,524	1483	3,016	914	2,320	584
	1.5	22	0.8	5,730	1900	4,524	1483	3,016	914	2,320	584
10	0.2	24	0.4	4,524	1728	3,567	1396	2,378	849	1,856	544
	0.3	24	0.5	4,524	1728	3,567	1396	2,378	849	1,856	544
	0.5	24	0.6	4,524	1728	3,567	1396	2,378	849	1,856	544
	1	24	0.7	4,524	1728	3,567	1396	2,378	849	1,856	544
	1.5	24	0.8	4,524	1728	3,567	1396	2,378	849	1,856	544
	2	24	0.9	4,524	1728	3,567	1396	2,378	849	1,856	544
12	0.2	26	0.5	3,857	1728	3,045	1396	2,030	849	1,537	544
	0.3	26	0.6	3,857	1728	3,045	1396	2,030	849	1,537	544
	0.5	26	0.7	3,857	1728	3,045	1396	2,030	849	1,537	544
	1	26	0.8	3,857	1728	3,045	1396	2,030	849	1,537	544
	1.5	26	0.9	3,857	1728	3,045	1396	2,030	849	1,537	544
	2	26	1	3,857	1728	3,045	1396	2,030	849	1,537	544
	3	26	1	3,857	1728	3,045	1396	2,030	849	1,537	544
16	0.5	35	2	2,842	1,512	2,262	1209	1,508	748	1,160	480
	1	35	2	2,842	453	2,262	362	1,508	224	1,160	480

- 절삭 깊이(Depth of Cut)는 위 표에서 해당되는 경도 아래 표시된 비율대로 줄여 사용하십시오.
- 상기의 절삭 조건표는 실제 상황과 다를 수 있으니, 기계의 상태, 가공형태 및 목적에 알맞게 조정하여 사용하십시오.
- RPM이 낮은 기계일 경우에는 Feed도 같은 비율로 낮추어 사용하십시오.

H-Star Endmill

ESRR714 series

피삭재				탄소강, 합금강 180~250HB		프리하든강 HRC35~45		열처리강 HRC45~55		고경도강 HRC55~65	
표준절삭깊이비율				절삭깊이 × 100%		절삭깊이 × 80%		절삭깊이 × 65%		절삭깊이 × 60%	
공구직경 (Ø)	코너 R (mm)	목부길이 (mm)	절삭깊이 (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
0.5	0.05	2	0.023	50,000	1257	40,000	649	30,000	529	28,000	441
		4	0.017	40,000	1008	32,000	529	24,000	390	20,000	327
		6	0.008	28,800	672	19,400	364	18,000	350	15,000	280
		8	0.007	28,800	672	19,400	364	18,000	350	15,000	280
	0.1	2	0.03	50,000	1257	40,000	649	30,000	529	28,000	441
		4	0.02	40,000	1008	32,000	529	24,000	390	20,000	327
		6	0.013	28,800	672	19,400	364	18,000	350	15,000	280
		8	0.01	28,800	672	19,400	364	18,000	350	15,000	280
0.6	0.05	2	0.028	50,000	1622	37,830	840	28,200	546	23,000	448
		4	0.019	40,000	1,162	27,800	616	23,600	392	21,000	322
		6	0.012	24,000	686	18,000	420	17,800	336	15,000	294
		8	0.01	24,000	652	18,000	399	17,800	319	15,000	280
	0.1	2	0.035	50,000	1622	37,830	840	28,200	546	23,000	448
		4	0.024	40,000	1,162	27,800	616	23,600	392	21,000	322
		6	0.015	24,000	686	18,000	420	17,800	336	15,000	294
		8	0.013	24,000	652	18,000	399	17,800	319	15,000	280
0.7	0.05	2	0.028	49,200	1,475	34,190	781	29,030	497	25,830	408
		4	0.019	40,000	1,162	27,800	616	23,600	392	21,000	322
		6	0.012	24,000	686	18,000	420	17,800	336	15,000	294
		8	0.01	24,000	686	18,000	420	17,800	336	15,000	294
	0.1	2	0.042	49,200	1,475	34,190	781	29,030	497	25,830	408
		4	0.029	40,000	1,162	27,800	616	23,600	392	21,000	322
		6	0.018	24,000	686	18,000	420	17,800	336	15,000	294
		8	0.015	24,000	686	18,000	420	17,800	336	15,000	294
0.8	0.02	2	0.016	48,000	1929	28,000	905	20,000	560	360	504
		4	0.016	48,000	1,542	28,000	725	20,000	448	288	403
		6	0.013	38,700	1,120	25,000	645	18,000	403	256	358
		8	0.011	29,025	840	20,000	516	16,200	362	230	322
		10	0.01	29,025	798	20,000	490	16,200	344	219	306
		12	0.09	29,025	798	20,000	490	16,200	344	219	306
	0.05	2	0.038	48,000	1929	28,000	905	20,000	560	360	504
		4	0.026	48,000	1,542	28,000	725	20,000	448	288	403
		6	0.015	38,700	1,120	25,000	645	18,000	403	256	358
		8	0.012	29,025	840	20,000	516	16,200	362	230	322
		10	0.011	29,025	798	20,000	490	16,200	344	219	306
		12	0.01	29,025	798	20,000	490	16,200	344	219	306
	0.1	2	0.047	48,000	1929	28,000	905	20,000	560	360	504
		4	0.032	48,000	1,542	28,000	725	20,000	448	288	403
		6	0.019	38,700	1,120	25,000	645	18,000	403	256	358
		8	0.015	29,025	840	20,000	516	16,200	362	230	322
		10	0.013	29,025	798	20,000	490	16,200	344	219	306
		12	0.012	29,025	798	20,000	490	16,200	344	219	306
1	0.02	4	0.013	32,400	1902	27,540	1454	24,300	1141	22,680	932
		6	0.01	26,244	1386	22,307	1178	19,683	924	18,371	754

ESRR714 series

피삭재				탄소강, 합금강 180~250HB		프리하든강 HRC35~45		열처리강 HRC45~55		고경도강 HRC55~65	
표준절삭깊이비율				절삭깊이 × 100%		절삭깊이 × 80%		절삭깊이 × 65%		절삭깊이 × 60%	
공구직경 (Ø)	코너 R (mm)	목부길이 (mm)	절삭깊이 (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
1	0.02	8	0.008	23,328	1232	19,829	1047	17,496	821	16,330	670
		10	0.006	20,412	1,078	17,350	917	15,309	719	14,288	586
		12	0.005	18,144	852	15,422	634	13,608	558	12,701	448
		14	0.004	18,144	746	15,422	588	13,608	478	12,701	372
		16	0.004	18,144	746	15,422	588	13,608	478	12,701	372
		20	0.003	13,608	558	11,567	441	10,206	359	9,526	280
	0.05	3	0.027	32,400	1902	27,540	1454	24,300	1141	22,680	932
		4	0.027	32,400	1902	27,540	1454	24,300	1141	22,680	932
		6	0.017	26,244	1386	22,307	1178	19,683	924	18,371	754
		8	0.016	23,328	1232	19,829	1047	17,496	821	16,330	670
		10	0.011	20,412	1,078	17,350	917	15,309	719	14,288	586
		12	0.01	18,144	852	15,422	634	13,608	558	12,701	448
		14	0.008	18,144	746	15,422	588	13,608	478	12,701	372
		16	0.006	18,144	746	15,422	588	13,608	478	12,701	372
		20	0.004	13,608	558	11,567	441	10,206	359	9,526	280
	0.1	3	0.038	32,400	1902	27,540	1454	24,300	1141	22,680	932
		4	0.038	32,400	1902	27,540	1454	24,300	1141	22,680	932
		6	0.024	26,244	1386	22,307	1178	19,683	924	18,371	754
		8	0.024	23,328	1232	19,829	1047	17,496	821	16,330	670
		10	0.015	20,412	1,078	17,350	917	15,309	719	14,288	586
		12	0.015	18,144	852	15,422	634	13,608	558	12,701	448
		14	0.012	18,144	746	15,422	588	13,608	478	12,701	372
		16	0.009	18,144	746	15,422	588	13,608	478	12,701	372
		20	0.006	13,608	558	11,567	441	10,206	359	9,526	280
	0.2	3	0.07	32,400	1902	27,540	1454	24,300	1141	22,680	932
		4	0.07	32,400	1902	27,540	1454	24,300	1141	22,680	932
		6	0.04	26,244	1386	22,307	1178	19,683	924	18,371	754
		8	0.04	23,328	1232	19,829	1047	17,496	821	16,330	670
		10	0.025	20,412	1,078	17,350	917	15,309	719	14,288	586
		12	0.025	18,144	852	15,422	634	13,608	558	12,701	448
		14	0.02	18,144	746	15,422	588	13,608	478	12,701	372
		16	0.015	18,144	746	15,422	588	13,608	478	12,701	372
		20	0.01	13,608	558	11,567	441	10,206	359	9,526	280
	0.3	3	0.07	32,400	1902	27,540	1454	24,300	1141	22,680	932
		4	0.07	32,400	1902	27,540	1454	24,300	1141	22,680	932
		6	0.04	26,244	1386	22,307	1178	19,683	924	18,371	754
		8	0.04	23,328	1232	19,829	1047	17,496	821	16,330	670
		10	0.025	20,412	1,078	17,350	917	15,309	719	14,288	586
		12	0.025	18,144	852	15,422	634	13,608	558	12,701	448
		14	0.02	18,144	746	15,422	588	13,608	478	12,701	372
		16	0.015	18,144	746	15,422	588	13,608	478	12,701	372
		20	0.01	13,608	558	11,567	441	10,206	359	9,526	280
1.2	0.02	4	0.013	28,868	1,615	24,538	1,299	21,651	1017	20,208	831
		6	0.01	28,868	1,615	24,538	1,299	21,651	1,017	20,208	831

H-Star Endmill

ESRR714 series

피삭재				탄소강, 합금강 180~250HB		프리하든강 HRC35~45		열처리강 HRC45~55		고경도강 HRC55~65	
표준절삭깊이비율				절삭깊이 × 100%		절삭깊이 × 80%		절삭깊이 × 65%		절삭깊이 × 60%	
공구직경 (Ø)	코너 R (mm)	목부길이 (mm)	절삭깊이 (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
1.2	0.02	8	0.008	24,640	1,346	20,944	1,107	18,480	868	17,248	708
		10	0.006	20,412	1,078	17,350	917	15,309	719	14,288	586
		12	0.005	19,278	912	16,386	775	14,458	599	13,494	478
		14	0.004	18,144	746	15,422	634	13,608	478	12,701	372
		16	0.004	18,144	746	15,422	634	13,608	478	12,701	372
		20	0.003	13,608	558	11,567	441	10,206	359	9,526	280
	0.05	3	0.027	28,868	1,615	24,538	1,299	21,651	1017	20,208	831
		4	0.027	28,868	1,615	24,538	1,299	21,651	1017	20,208	831
		6	0.017	28,868	1,615	24,538	1,299	21,651	1,017	20,208	831
		8	0.016	24,640	1,346	20,944	1,107	18,480	868	17,248	708
		10	0.011	20,412	1,078	17,350	917	15,309	719	14,288	586
		12	0.01	19,278	912	16,386	775	14,458	599	13,494	478
		14	0.008	18,144	746	15,422	634	13,608	478	12,701	372
		16	0.006	18,144	746	15,422	634	13,608	478	12,701	372
		20	0.004	13,608	558	11,567	441	10,206	359	9,526	280
	0.1	3	0.03	28,868	1,615	24,538	1,299	21,651	1017	20,208	831
		4	0.03	28,868	1,615	24,538	1,299	21,651	1017	20,208	831
		6	0.03	28,868	1,615	24,538	1,299	21,651	1,017	20,208	831
		8	0.022	24,640	1,346	20,944	1,107	18,480	868	17,248	708
		10	0.015	20,412	1,078	17,350	917	15,309	719	14,288	586
		12	0.012	19,278	912	16,386	775	14,458	599	13,494	478
		14	0.01	18,144	746	15,422	634	13,608	478	12,701	372
		16	0.01	18,144	746	15,422	634	13,608	478	12,701	372
		20	0.006	13,608	558	11,567	441	10,206	359	9,526	280
	0.2	3	0.05	28,868	1,615	24,538	1,299	21,651	1017	20,208	831
		4	0.05	28,868	1,615	24,538	1,299	21,651	1017	20,208	831
		6	0.05	28,868	1,615	24,538	1,299	21,651	1,017	20,208	831
		8	0.037	24,640	1,346	20,944	1,107	18,480	868	17,248	708
		10	0.025	20,412	1,078	17,350	917	15,309	719	14,288	586
		12	0.02	19,278	912	16,386	775	14,458	599	13,494	478
		14	0.016	18,144	746	15,422	634	13,608	478	12,701	372
		16	0.016	18,144	746	15,422	634	13,608	478	12,701	372
		20	0.01	13,608	558	11,567	441	10,206	359	9,526	280
	0.3	3	0.05	28,868	1,615	24,538	1,299	21,651	1017	20,208	831
		4	0.05	28,868	1,615	24,538	1,299	21,651	1017	20,208	831
		6	0.05	28,868	1,615	24,538	1,299	21,651	1,017	20,208	831
		8	0.037	24,640	1,346	20,944	1,107	18,480	868	17,248	708
		10	0.025	20,412	1,078	17,350	917	15,309	719	14,288	586
		12	0.02	19,278	912	16,386	775	14,458	599	13,494	478
		16	0.016	18,144	746	15,422	634	13,608	478	12,701	372
		20	0.01	13,608	558	11,567	441	10,206	359	9,526	280
1.5	0.02	6	0.01	23,779	1,503	20,382	1,325	17,834	1,052	16,560	855
		8	0.008	22,680	1,437	19,278	1,289	17,010	1,002	15,876	814
		10	0.006	20,412	1,293	17,350	1,222	15,309	959	14,288	782

ESRR714 series

피삭재				탄소강, 합금강 180~250HB		프리하든강 HRC35~45		열처리강 HRC45~55		고경도강 HRC55~65	
표준절삭깊이비율				절삭깊이 × 100%		절삭깊이 × 80%		절삭깊이 × 65%		절삭깊이 × 60%	
공구직경 (Ø)	코너 R (mm)	목부길이 (mm)	절삭깊이 (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
1.5	0.02	12	0.005	18,144	1,150	15,422	1,099	13,608	862	12,701	704
		14	0.004	14,112	795	11,995	977	10,584	767	9,878	625
		16	0.004	14,112	795	11,995	592	10,584	522	9,878	417
		20	0.003	14,112	795	11,995	592	10,584	522	9,878	417
		22	0.003	14,112	795	11,995	592	10,584	522	9,878	417
	0.05	4	0.027	24,930	1,582	20,956	1325	18,711	1052	17,364	855
		6	0.017	23,779	1,503	20,382	1,325	17,834	1,052	16,560	855
		8	0.016	22,680	1,437	19,278	1,289	17,010	1,002	15,876	814
		10	0.011	20,412	1,293	17,350	1,222	15,309	959	14,288	782
		12	0.01	18,144	1,150	15,422	1,099	13,608	862	12,701	704
		14	0.008	14,112	795	11,995	977	10,584	767	9,878	625
		16	0.006	14,112	795	11,995	592	10,584	522	9,878	417
		20	0.004	14,112	795	11,995	592	10,584	522	9,878	417
		22	0.004	14,112	795	11,995	592	10,584	522	9,878	417
		26	0.003	14,112	795	11,995	592	10,584	522	9,878	417
	0.1	4	0.042	24,930	1,582	20,956	1325	18,711	1052	17,364	855
		6	0.04	23,779	1,503	20,382	1,325	17,834	1,052	16,560	855
		8	0.036	22,680	1,437	19,278	1,289	17,010	1,002	15,876	814
		10	0.036	20,412	1,293	17,350	1,222	15,309	959	14,288	782
		12	0.036	18,144	1,150	15,422	1,099	13,608	862	12,701	704
		14	0.023	14,112	795	11,995	977	10,584	767	9,878	625
		16	0.023	14,112	795	11,995	592	10,584	522	9,878	417
		20	0.018	14,112	795	11,995	592	10,584	522	9,878	417
		22	0.015	14,112	795	11,995	592	10,584	522	9,878	417
		26	0.01	14,112	795	11,995	592	10,584	522	9,878	417
	0.2	4	0.07	24,930	1,582	20,956	1325	18,711	1052	17,364	855
		6	0.065	23,779	1,503	20,382	1,325	17,834	1,052	16,560	855
		8	0.06	22,680	1,437	19,278	1,289	17,010	1,002	15,876	814
		10	0.06	20,412	1,293	17,350	1,222	15,309	959	14,288	782
		12	0.06	18,144	1,150	15,422	1,099	13,608	862	12,701	704
		14	0.038	14,112	795	11,995	977	10,584	767	9,878	625
		16	0.038	14,112	795	11,995	592	10,584	522	9,878	417
		20	0.03	14,112	795	11,995	592	10,584	522	9,878	417
		22	0.025	14,112	795	11,995	592	10,584	522	9,878	417
		25	0.02	14,112	795	11,995	592	10,584	522	9,878	417
	0.3	4	0.07	24,930	1,582	20,956	1325	18,711	1052	17,364	855
		6	0.065	23,779	1,503	20,382	1,325	17,834	1,052	16,560	855
		8	0.06	22,680	1,437	19,278	1,289	17,010	1,002	15,876	814
		10	0.06	20,412	1,293	17,350	1,222	15,309	959	14,288	782
		12	0.06	18,144	1,150	15,422	1,099	13,608	862	12,701	704
		14	0.038	14,112	795	11,995	977	10,584	767	9,878	625
		16	0.038	14,112	795	11,995	592	10,584	522	9,878	417
		20	0.03	14,112	795	11,995	592	10,584	522	9,878	417
		22	0.025	14,112	795	11,995	592	10,584	522	9,878	417
		25	0.02	14,112	795	11,995	592	10,584	522	9,878	417

H-Star Endmill

ESRR714 series

피삭재				탄소강, 합금강 180~250HB		프리하든강 HRC35~45		열처리강 HRC45~55		고경도강 HRC55~65	
표준절삭깊이비율				절삭깊이 × 100%		절삭깊이 × 80%		절삭깊이 × 65%		절삭깊이 × 60%	
공구직경 (Ø)	코너 R (mm)	목부길이 (mm)	절삭깊이 (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
1.5	0.5	4	0.085	24,930	1,582	20,956	1325	18,711	1052	17,364	855
		6	0.08	23,779	1,503	20,382	1,325	17,834	1,052	16,560	855
		8	0.07	22,680	1,437	19,278	1,289	17,010	1,002	15,876	814
		10	0.067	20,412	1,293	17,350	1,222	15,309	959	14,288	782
		12	0.065	18,144	1,150	15,422	1,099	13,608	862	12,701	704
		14	0.045	14,112	795	11,995	977	10,584	767	9,878	625
		16	0.045	14,112	795	11,995	592	10,584	522	9,878	417
		20	0.035	14,112	795	11,995	592	10,584	522	9,878	417
		22	0.03	14,112	795	11,995	592	10,584	522	9,878	417
		25	0.025	14,112	795	11,995	592	10,584	522	9,878	417
2	0.02	6	0.013	20,790	2289	17,672	1944	15,593	1373	14,553	1121
		8	0.01	18,900	2080	16,065	1768	14,175	1248	13,230	1019
		10	0.008	17104	1797	14539	1528	12828	1129	11973	922
		12	0.006	15,309	1516	13,013	1289	11,482	1010	10,716	826
		14	0.005	14,458	1432	12,290	1216	10,844	954	10,121	779
		16	0.004	13,608	1,348	11,567	1145	10,206	898	9,526	733
		20	0.004	11,907	1180	10,121	1002	8,930	786	8,335	642
		25	0.003	11,907	1059	10,121	900	8,930	707	8,335	575
		30	0.003	11,312	1006	9,615	855	8,484	672	7,918	547
	0.05	6	0.027	20,790	2289	17,672	1944	15,593	1373	14,553	1121
		8	0.017	18,900	2080	16,065	1768	14,175	1248	13,230	1019
		10	0.016	17104	1797	14539	1528	12828	1129	11973	922
		12	0.011	15,309	1516	13,013	1289	11,482	1010	10,716	826
		14	0.01	14,458	1432	12,290	1216	10,844	954	10,121	779
		16	0.008	13,608	1,348	11,567	1145	10,206	898	9,526	733
		20	0.006	11,907	1180	10,121	1002	8,930	786	8,335	642
		25	0.004	11,907	1059	10,121	900	8,930	707	8,335	575
		30	0.003	11,312	1006	9,615	855	8,484	672	7,918	547
	0.1	6	0.07	20,790	2289	17,672	1944	15,593	1373	14,553	1121
		8	0.055	18,900	2080	16,065	1768	14,175	1248	13,230	1019
		10	0.042	17104	1797	14539	1528	12828	1129	11973	922
		12	0.03	15,309	1516	13,013	1289	11,482	1010	10,716	826
		14	0.03	14,458	1432	12,290	1216	10,844	954	10,121	779
		16	0.03	13,608	1,348	11,567	1145	10,206	898	9,526	733
		20	0.025	11,907	1180	10,121	1002	8,930	786	8,335	642
		22	0.02	11,907	1059	10,121	900	8,930	707	8,335	575
		25	0.015	11,907	1059	10,121	900	8,930	707	8,335	575
		30	0.01	11,312	1006	9,615	855	8,484	672	7,918	547
	0.2	6	0.08	20,790	2289	17,672	1944	15,593	1373	14,553	1121
		8	0.07	18,900	2080	16,065	1768	14,175	1248	13,230	1019
		10	0.055	17104	1797	14539	1528	12828	1129	11973	922
		12	0.04	15,309	1516	13,013	1289	11,482	1010	10,716	826
		14	0.04	14,458	1432	12,290	1216	10,844	954	10,121	779
		16	0.04	13,608	1,348	11,567	1145	10,206	898	9,526	733

ESRR714 series

피삭재				탄소강, 합금강 180~250HB		프리하든강 HRC35~45		열처리강 HRC45~55		고경도강 HRC55~65	
표준절삭깊이비율				절삭깊이 × 100%		절삭깊이 × 80%		절삭깊이 × 65%		절삭깊이 × 60%	
공구직경 (Ø)	코너 R (mm)	목부길이 (mm)	절삭깊이 (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
2	0.2	20	0.035	11,907	1180	10,121	1002	8,930	786	8,335	642
		22	0.03	11,907	1059	10,121	900	8,930	707	8,335	575
		25	0.025	11,907	1059	10,121	900	8,930	707	8,335	575
		30	0.017	11,312	1006	9,615	855	8,484	672	7,918	547
	0.3	6	0.11	20,790	2289	17,672	1944	15,593	1373	14,553	1121
		8	0.09	18,900	2080	16,065	1768	14,175	1248	13,230	1019
		10	0.075	17104	1797	14539	1528	12828	1129	11973	922
		12	0.06	15,309	1516	13,013	1289	11,482	1010	10,716	826
		14	0.06	14,458	1432	12,290	1216	10,844	954	10,121	779
		16	0.06	13,608	1,348	11,567	1145	10,206	898	9,526	733
		20	0.037	11,907	1180	10,121	1002	8,930	786	8,335	642
		22	0.033	11,907	1059	10,121	900	8,930	707	8,335	575
		25	0.03	11,907	1059	10,121	900	8,930	707	8,335	575
		30	0.021	11,312	1006	9,615	855	8,484	672	7,918	547
	0.5	6	0.17	20,790	2289	17,672	1944	15,593	1373	14,553	1121
		8	0.14	18,900	2080	16,065	1768	14,175	1248	13,230	1019
		10	0.11	17104	1797	14539	1528	12828	1129	11973	922
		12	0.08	15,309	1516	13,013	1289	11,482	1010	10,716	826
		14	0.08	14,458	1432	12,290	1216	10,844	954	10,121	779
		16	0.08	13,608	1,348	11,567	1145	10,206	898	9,526	733
		20	0.05	11,907	1180	10,121	1002	8,930	786	8,335	642
		22	0.05	11,907	1059	10,121	900	8,930	707	8,335	575
		25	0.05	11,907	1059	10,121	900	8,930	707	8,335	575
		30	0.03	11,312	1006	9,615	855	8,484	672	7,918	547
2.5	0.1	8	0.06	18,900	2,080	16,065	1,768	14,175	1248	13,230	1019
		10	0.055	18,900	2,080	16,065	1,768	14,175	1248	13,230	1019
		12	0.051	18,018	1,958	15,315	1664	13,513	1190	12,613	1019
		14	0.046	17,136	1835	14,566	1560	12,852	1132	11,995	971
		16	0.042	16,254	1,713	13,816	1,456	12,190	1,073	11,378	876
		20	0.03	13,608	1,348	11,567	1,145	10,206	898	9,526	733
		25	0.022	12,757	1204	10,844	1022	9,568	802	8,930	653
		30	0.015	11,907	1,059	10,121	900	8,930	707	8,335	575
	0.2	8	0.08	18,900	2,080	16,065	1,768	14,175	1248	13,230	1019
		10	0.07	18,900	2,080	16,065	1,768	14,175	1248	13,230	1019
		12	0.06	18,018	1,958	15,315	1664	13,513	1190	12,613	1019
		14	0.05	17,136	1835	14,566	1560	12,852	1132	11,995	971
		16	0.055	16,254	1,713	13,816	1,456	12,190	1,073	11,378	876
		20	0.04	13,608	1,348	11,567	1,145	10,206	898	9,526	733
		25	0.03	12,757	1204	10,844	1022	9,568	802	8,930	653
		30	0.02	11,907	1,059	10,121	900	8,930	707	8,335	575
	0.3	8	0.1	18,900	2,080	16,065	1,768	14,175	1248	13,230	1019
		10	0.09	18,900	2,080	16,065	1,768	14,175	1248	13,230	1019
		12	0.085	18,018	1,958	15,315	1664	13,513	1190	12,613	1019
		14	0.08	17,136	1835	14,566	1560	12,852	1132	11,995	971

H-Star Endmill

ESRR714 series

피삭재				탄소강, 합금강 180~250HB		프리하든강 HRC35~45		열처리강 HRC45~55		고경도강 HRC55~65	
표준절삭깊이비율				절삭깊이 × 100%		절삭깊이 × 80%		절삭깊이 × 65%		절삭깊이 × 60%	
공구직경 (Ø)	코너 R (mm)	목부길이 (mm)	절삭깊이 (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
2.5	0.3	16	0.075	16,254	1,713	13,816	1,456	12,190	1,073	11,378	876
		20	0.06	13,608	1,348	11,567	1,145	10,206	898	9,526	733
		25	0.065	12,757	1204	10,844	1022	9,568	802	8,930	653
		30	0.06	11,907	1,059	10,121	900	8,930	707	8,335	575
	0.5	8	0.15	18,900	2,080	16,065	1,768	14,175	1248	13,230	1019
		10	0.14	18,900	2,080	16,065	1,768	14,175	1248	13,230	1019
		12	0.13	18,018	1,958	15,315	1664	13,513	1190	12,613	1019
		14	0.12	17,136	1835	14,566	1560	12,852	1132	11,995	971
		16	0.11	16,254	1,713	13,816	1,456	12,190	1,073	11,378	876
		20	0.08	13,608	1,348	11,567	1,145	10,206	898	9,526	733
		25	0.07	12,757	1204	10,844	1022	9,568	802	8,930	653
		30	0.05	11,907	1,059	10,121	900	8,930	707	8,335	575
3	0.1	8	0.07	14,400	1,981	12,240	1,684	10,800	1188	10,080	970
		10	0.06	14400	1,981	12240	1,684	10800	1188	10080	970
		12	0.05	14,400	1,981	12,240	1,684	10,800	1188	10,080	970
		14	0.047	14,400	1,981	12,240	1,684	10,800	1188	10,080	970
		16	0.035	14,400	1,981	12,240	1,684	10,800	1188	10,080	970
		20	0.035	11,664	1,604	9,914	1,363	8,748	961	8,165	785
		25	0.031	10368	1,362	8812.5	1,158	7776	816	7257.5	667
		30	0.027	9,072	1,121	7,711	953	6,804	672	6,350	550
		35	0.02	9,072	1,121	7,711	953	6,804	672	6,350	550
		40	0.015	8,164	897	6,939	762	6,123	537	5,715	440
		45	0.01	7,258	672	6,169	572	5,443	403	5,080	330
	0.2	8	0.09	14,400	1,981	12,240	1,684	10,800	1188	10,080	970
		10	0.08	14400	1,981	12240	1,684	10800	1188	10080	970
		12	0.07	14,400	1,981	12,240	1,684	10,800	1188	10,080	970
		14	0.06	14,400	1,981	12,240	1,684	10,800	1188	10,080	970
		16	0.05	14,400	1,981	12,240	1,684	10,800	1188	10,080	970
		20	0.05	11,664	1,604	9,914	1,363	8,748	961	8,165	785
		25	0.045	10368	1,362	8812.5	1,158	7776	816	7257.5	667
		30	0.04	9,072	1,121	7,711	953	6,804	672	6,350	550
		35	0.035	9,072	1,121	7,711	953	6,804	672	6,350	550
		40	0.03	8,164	897	6,939	762	6,123	537	5,715	440
		45	0.025	7,258	672	6,169	572	5,443	403	5,080	330
	0.3	8	0.13	14,400	1,981	12,240	1,684	10,800	1188	10,080	970
		10	0.115	14400	1,981	12240	1,684	10800	1188	10080	970
		12	0.1	14,400	1,981	12,240	1,684	10,800	1188	10,080	970
		14	0.085	14,400	1,981	12,240	1,684	10,800	1188	10,080	970
		16	0.075	14,400	1,981	12,240	1,684	10,800	1188	10,080	970
		20	0.075	11,664	1,604	9,914	1,363	8,748	961	8,165	785
		25	0.0675	10368	1,362	8812.5	1,158	7776	816	7257.5	667
		30	0.06	9,072	1,121	7,711	953	6,804	672	6,350	550
		35	0.05	9,072	1,121	7,711	953	6,804	672	6,350	550
		40	0.04	8,164	897	6,939	762	6,123	537	5,715	440
		45	0.03	7,258	672	6,169	572	5,443	403	5,080	330

ESRR714 series

피삭재				탄소강, 합금강 180~250HB		프리하든강 HRC35~45		열처리강 HRC45~55		고경도강 HRC55~65	
표준절삭깊이비율				절삭깊이 × 100%		절삭깊이 × 80%		절삭깊이 × 65%		절삭깊이 × 60%	
공구직경 (Ø)	코너 R (mm)	목부길이 (mm)	절삭깊이 (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
3	0.5	8	0.18	14,400	1,981	12,240	1,684	10,800	1188	10,080	970
		10	0.155	14400	1,981	12240	1,684	10800	1188	10080	970
		12	0.13	14,400	1,981	12,240	1,684	10,800	1188	10,080	970
		14	0.12	14,400	1,981	12,240	1,684	10,800	1188	10,080	970
		16	0.1	14,400	1,981	12,240	1,684	10,800	1188	10,080	970
		20	0.1	11,664	1,604	9,914	1,363	8,748	961	8,165	785
		25	0.09	10368	1,362	8812.5	1,158	7776	816	7257.5	667
		30	0.08	9,072	1,121	7,711	953	6,804	672	6,350	550
		35	0.065	9,072	1,121	7,711	953	6,804	672	6,350	550
		40	0.05	8,164	897	6,939	762	6,123	537	5,715	440
		45	0.04	7,258	672	6,169	572	5,443	403	5,080	330
		50	0.03	6,532	538	5,552	457	4,899	322	4,572	264
	1	8	0.2	14,400	1,981	12,240	1,684	10,800	1188	10,080	970
		10	0.175	14400	1,981	12240	1,684	10800	1188	10080	970
		12	0.15	14,400	1,981	12,240	1,684	10,800	1188	10,080	970
		14	0.13	14,400	1,981	12,240	1,684	10,800	1188	10,080	970
		16	0.12	14,400	1,981	12,240	1,684	10,800	1188	10,080	970
		20	0.11	11,664	1,604	9,914	1,363	8,748	961	8,165	785
		25	0.1	10368	1,362	8812.5	1,158	7776	816	7257.5	667
		30	0.09	9,072	1,121	7,711	953	6,804	672	6,350	550
		35	0.075	9,072	1,121	7,711	953	6,804	672	6,350	550
		40	0.06	8,164	897	6,939	762	6,123	537	5,715	440
		45	0.045	7,258	672	6,169	572	5,443	403	5,080	330
		50	0.03	6,532	538	5,552	457	4,899	322	4,572	264
4	0.1	10	0.072	11,213	2,730	9,531	2,321	8,410	1,638	7,849	1338
		12	0.065	11,213	2,730	9,531	2,321	8,410	1638	7,849	1338
		13	0.062	10,734	2,613	9,114	2,219	8,004	1558	7,266	1239
		16	0.06	10,255	2,496	8,697	2116	7,599	1479	6,684	1139
		20	0.055	10,255	2496	8,697	2,116	7,599	1479	6,884	1139
		25	0.05	10,255	2,496	7,782	1,810	6,545	1,221	5,904	962
		30	0.045	10,255	2,496	6,867	1,505	5,491	963	5,124	785
		35	0.04	10,255	2,496	6,867	1505	5,491	963	5,124	785
		40	0.035	9,247	2,000	6,225	1,262	5,217	842	4,621	643
		45	0.03	8,240	1,505	5,584	1,019	4,944	722	4,119	501
		50	0.02	7,398	1,200	4,980	757	4,174	505	3,697	385
	0.2	10	0.15	11,213	2,730	9,531	2,321	8,410	1,638	7,849	1338
		12	0.14	11,213	2,730	9,531	2,321	8,410	1638	7,849	1338
		13	0.135	10,734	2,613	9,114	2,219	8,004	1558	7,266	1239
		16	0.13	10,255	2,496	8,697	2116	7,599	1479	6,684	1139
		20	0.11	10,255	2496	8,697	2,116	7,599	1479	6,884	1139
		25	0.105	10,255	2,496	7,782	1,810	6,545	1,221	5,904	962
		30	0.1	10,255	2,496	6,867	1,505	5,491	963	5,124	785
		35	0.08	10,255	2,496	6,867	1505	5,491	963	5,124	785
		40	0.07	9,247	2,000	6,225	1,262	5,217	842	4,621	643

H-Star Endmill

ESRR714 series

피삭재				탄소강, 합금강 180~250HB		프리하든강 HRC35~45		열처리강 HRC45~55		고경도강 HRC55~65	
표준절삭깊이비율				절삭깊이 × 100%		절삭깊이 × 80%		절삭깊이 × 65%		절삭깊이 × 60%	
공구직경 (Ø)	코너 R (mm)	목부길이 (mm)	절삭깊이 (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
4	0.2	45	0.06	8,240	1,505	5,584	1,019	4,944	722	4,119	501
		50	0.05	7,398	1,200	4,980	757	4,174	505	3,697	385
	0.3	10	0.23	11,213	2,730	9,531	2,321	8,410	1,638	7,849	1338
		12	0.22	11,213	2,730	9,531	2,321	8,410	1638	7,849	1338
		13	0.21	10,734	2,613	9,114	2,219	8,004	1558	7,266	1239
		16	0.2	10,255	2,496	8,697	2116	7,599	1479	6,684	1139
		20	0.18	10,255	2496	8,697	2,116	7,599	1479	6,884	1139
		25	0.17	10,255	2,496	7,782	1,810	6,545	1,221	5,904	962
		30	0.16	10,255	2,496	6,867	1,505	5,491	963	5,124	785
		35	0.14	10,255	2,496	6,867	1505	5,491	963	5,124	785
		40	0.13	9,247	2,000	6,225	1,262	5,217	842	4,621	643
		45	0.12	8,240	1,505	5,584	1,019	4,944	722	4,119	501
		50	0.11	7,398	1,200	4,980	757	4,174	505	3,697	385
	0.5	10	0.4	11,213	2,730	9,531	2,321	8,410	1,638	7,849	1338
		12	0.35	11,213	2,730	9,531	2,321	8,410	1638	7,849	1338
		13	0.3	10,734	2,613	9,114	2,219	8,004	1558	7,266	1239
		16	0.25	10,255	2,496	8,697	2116	7,599	1479	6,684	1139
		20	0.2	10,255	2496	8,697	2,116	7,599	1479	6,884	1139
		25	0.175	10,255	2,496	7,782	1,810	6,545	1,221	5,904	962
		30	0.15	10,255	2,496	6,867	1,505	5,491	963	5,124	785
		35	0.1	10,255	2,496	6,867	1505	5,491	963	5,124	785
		40	0.075	9,247	2,000	6,225	1,262	5,217	842	4,621	643
		45	0.05	8,240	1,505	5,584	1,019	4,944	722	4,119	501
		50	0.04	7,398	1,200	4,980	757	4,174	505	3,697	385
		55	0.03	6,592	9903	4,467	611	3,955	433	3,295	300
	1	10	0.5	11,213	2,730	9,531	2,321	8,410	1,638	7,849	1338
		12	0.4	11,213	2,730	9,531	2,321	8,410	1638	7,849	1338
		13	0.35	10,734	2,613	9,114	2,219	8,004	1558	7,266	1239
		16	0.29	10,255	2,496	8,697	2116	7,599	1479	6,684	1139
		20	0.23	10,255	2496	8,697	2,116	7,599	1479	6,884	1139
		25	0.2	10,255	2,496	7,782	1,810	6,545	1,221	5,904	962
		30	0.17	10,255	2,496	6,867	1,505	5,491	963	5,124	785
		35	0.12	10,255	2,496	6,867	1505	5,491	963	5,124	785
		40	0.09	9,247	2,000	6,225	1,262	5,217	842	4,621	643
		45	0.06	8,240	1,505	5,584	1,019	4,944	722	4,119	501
		50	0.05	7,398	1,200	4,980	757	4,174	505	3,697	385
		55	0.04	6,592	9903	4,467	611	3,955	433	3,295	300
5	0.1	16	0.08	9,154	2786	7,781	2368	6,866	1671	6,408	1365
		30	0.07	7,872	2291	6,691	1948	5,904	1374	5,510	1122
		40	0.06	6,590	1797	5,602	1527	4,943	1078	4,613	880
	0.2	16	0.16	9,154	2786	7,781	2368	6,866	1671	6,408	1365
		30	0.145	7,872	2291	6,691	1948	5,904	1374	5,510	1122
		40	0.13	6,590	1797	5,602	1527	4,943	1078	4,613	880

ESRR714 series

피삭재				탄소강, 합금강 180~250HB		프리하든강 HRC35~45		열처리강 HRC45~55		고경도강 HRC55~65	
표준절삭깊이비율				절삭깊이 × 100%		절삭깊이 × 80%		절삭깊이 × 65%		절삭깊이 × 60%	
공구직경 (Ø)	코너 R (mm)	목부길이 (mm)	절삭깊이 (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
5	0.3	16	0.24	9,154	2786	7,781	2368	6,866	1671	6,408	1365
		30	0.22	7,872	2291	6,691	1948	5,904	1374	5,510	1122
		40	0.2	6,590	1797	5,602	1527	4,943	1078	4,613	880
	0.5	16	0.35	9,154	2786	7,781	2368	6,866	1671	6,408	1365
		30	0.296	7,872	2291	6,691	1948	5,904	1374	5,510	1122
		40	0.135	6,590	1797	5,602	1527	4,943	1078	4,613	880
		50	0.12	5,272	1078	4,482	916	3,954	646	3,690	528
		60	0.1	4,218	647	3,585	549	3,164	388	2,952	317
	1	16	0.4	9,154	2786	7,781	2368	6,866	1671	6,408	1365
		30	0.275	7,872	2291	6,691	1948	5,904	1374	5,510	1122
		40	0.15	6,590	1797	5,602	1527	4,943	1078	4,613	880
		50	0.13	5,272	1078	4,482	916	3,954	646	3,690	528
		60	0.11	4,218	647	3,585	549	3,164	388	2,952	317
	1.5	15	0.45	9,154	2786	7,781	2368	6,866	1671	6,408	1365
	2	15	0.5	9,154	2786	7,781	2368	6,866	1671	6,408	1365
6	0.1	20	0.065	7,630	2787	6,486	2368	5,722	1671	5,432	1365
		40	0.05	6,486	2132	5,513	1811	4,865	1279	4,540	1044
		50	0.04	5,491	1,470	4,668	1,248	4,118	872	3,844	711
	0.2	20	0.14	7,630	2787	6,486	2368	5,722	1671	5,432	1365
		40	0.11	6,486	2132	5,513	1811	4,865	1279	4,540	1044
		50	0.08	5,491	1,470	4,668	1,248	4,118	872	3,844	711
	0.3	20	0.22	7,630	2787	6,486	2368	5,722	1671	5,432	1365
		30	0.2	7,630	2787	6,486	2368	5,722	1671	5,432	1365
		40	0.18	6,486	2132	5,513	1811	4,865	1279	4,540	1044
		50	0.14	5,491	1,470	4,668	1,248	4,118	872	3,844	711
	0.5	20	0.35	7,630	2787	6,486	2368	5,722	1671	5,432	1365
		30	0.29	7,630	2787	6,486	2368	5,722	1671	5,432	1365
		40	0.24	6,486	2132	5,513	1811	4,865	1279	4,540	1044
		50	0.165	5,491	1,470	4,668	1,248	4,118	872	3,844	711
		60	0.1	5,491	1,470	4,668	1,248	4,118	872	3,844	711
	1	20	0.4	7,630	2787	6,486	2368	5,722	1671	5,432	1365
		30	0.35	7,630	2787	6,486	2368	5,722	1671	5,432	1365
		40	0.28	6,486	2132	5,513	1811	4,865	1279	4,540	1044
		50	0.2	5,491	1,470	4,668	1,248	4,118	872	3,844	711
		60	0.15	5,491	1,470	4,668	1,248	4,118	872	3,844	711
	1.5	20	0.45	7,630	2787	6,486	2368	5,722	1671	5,432	1365
		40	0.4	6,486	2132	5,513	1811	4,865	1279	4,540	1044
		50	0.3	5,491	1,470	4,668	1,248	4,118	872	3,844	711
	2	20	0.5	7,630	2787	6,486	2368	5,722	1671	5,432	1365
		30	0.4	7,630	2787	6,486	2368	5,722	1671	5,432	1365
		40	0.3	6,486	2132	5,513	1811	4,865	1279	4,540	1044
		50	0.2	5,491	1,470	4,668	1,248	4,118	872	3,844	711

H-Star Endmill

ESRR714 series

피삭재				탄소강, 합금강 180~250HB		프리하든강 HRC35~45		열처리강 HRC45~55		고경도강 HRC55~65	
표준절삭깊이비율				절삭깊이 × 100%		절삭깊이 × 80%		절삭깊이 × 65%		절삭깊이 × 60%	
공구직경 (Ø)	코너 R (mm)	목부길이 (mm)	절삭깊이 (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
8	0.1	25	0.35	5,730	2660	4,524	2076	3,016	1279	2,320	817
	0.2	22	0.5	5,730	2660	4,524	2076	3,016	1279	2,320	817
		40	0.25	5,730	2660	4,524	2076	3,016	1279	2,320	817
	0.3	22	0.6	5,730	2660	4,524	2076	3,016	1279	2,320	817
		40	0.3	5,730	2660	4,524	2076	3,016	1279	2,320	817
	0.5	22	0.7	5,730	2660	4,524	2076	3,016	1279	2,320	817
		35	0.5	5,730	2660	4,524	2076	3,016	1279	2,320	817
		40	0.35	5,730	2660	4,524	2076	3,016	1279	2,320	817
		50	0.3	4,584	1596	3,619	1245	2,413	767	1,856	490
		60	0.25	4,584	1596	3,619	1245	2,413	767	1,856	490
	1	22	0.8	5,730	2660	4,524	2076	3,016	1279	2,320	817
		35	0.6	5,730	2660	4,524	2076	3,016	1279	2,320	817
		40	0.4	5,730	2660	4,524	2076	3,016	1279	2,320	817
		50	0.4	4,584	1596	3,619	1245	2,413	767	1,856	490
		60	0.3	4,584	1596	3,619	1245	2,413	767	1,856	490
	1.2	22	0.9	5,730	2660	4,524	2076	3,016	1279	2,320	817
		40	0.45	5,730	2660	4,524	2076	3,016	1279	2,320	817
	2	22	1	5,730	2660	4,524	2076	3,016	1279	2,320	817
		40	0.5	5,730	2660	4,524	2076	3,016	1279	2,320	817
		50	0.4	4,584	1596	3,619	1245	2,413	767	1,856	490
10	0.1	30	0.4	4,524	2419	3,567	1954	2,378	1188	1,856	761
	0.2	24	0.5	4,524	2419	3,567	1954	2,378	1188	1,856	761
		40	0.25	4,524	2419	3,567	1954	2,378	1188	1,856	761
	0.3	24	0.6	4,524	2419	3,567	1954	2,378	1188	1,856	761
		40	0.3	4,524	2419	3,567	1954	2,378	1188	1,856	761
	0.5	24	0.7	4,524	2419	3,567	1954	2,378	1188	1,856	761
		40	0.4	4,524	2419	3,567	1954	2,378	1188	1,856	761
		50	0.3	3,619	1451	2,854	1172	1,902	713	1,485	456
		60	0.2	3,619	1451	2,854	1172	1,902	713	1,485	456
	1	24	0.8	4,524	2419	3,567	1954	2,378	1188	1,856	761
		40	0.5	4,524	2419	3,567	1954	2,378	1188	1,856	761
		50	0.4	3,619	1451	2,854	1172	1,902	713	1,485	456
		60	0.3	3,619	1451	2,854	1172	1,902	713	1,485	456
	1.5	24	0.9	4,524	2419	3,567	1954	2,378	1188	1,856	761
		40	0.55	4,524	2419	3,567	1954	2,378	1188	1,856	761
	2	24	1	4,524	2419	3,567	1954	2,378	1188	1,856	761
		40	0.5	3,619	1451	2,854	1172	1,902	713	1,485	456
		50	0.4	2,895	870	2,283	703	1,522	427	1,188	274
	2.5	24	1.1	4,524	2419	3,567	1954	2,378	1188	1,856	761
12	0.2	32	0.5	3,857	2419	3,045	1954	2,030	1188	1,537	761
	0.3	26	0.6	3,857	2419	3,045	1954	2,030	1188	1,537	761
		45	0.3	3,857	2419	3,045	1954	2,030	1188	1,537	761
	0.5	26	0.7	3,857	2419	3,045	1954	2,030	1188	1,537	761
		40	0.4	3,857	2419	3,045	1954	2,030	1188	1,537	761

ESRR714 series

피삭재				탄소강, 합금강 180~250HB		프리하든강 HRC35~45		열처리강 HRC45~55		고경도강 HRC55~65	
표준절삭깊이비율				절삭깊이 × 100%		절삭깊이 × 80%		절삭깊이 × 65%		절삭깊이 × 60%	
공구직경 (Ø)	코너 R (mm)	목부길이 (mm)	절삭깊이 (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
12	0.5	60	0.3	3,086	1451	2,436	1172	1,624	713	1,230	456
	1	26	0.8	3,857	2419	3,045	1954	2,030	1188	1,537	761
		40	0.5	3,857	2419	3,045	1954	2,030	1188	1,537	761
		60	0.3	3,086	1451	2,436	1172	1,624	713	1,230	456
	1.5	26	0.9	3,857	2419	3,045	1954	2,030	1188	1,537	761
	2	26	1	3,857	2419	3,045	1954	2,030	1188	1,537	761
		40	0.5	3,857	2419	3,045	1954	2,030	1188	1,537	761
	3	26	1	3,857	2419	3,045	1954	2,030	1188	1,537	761
16	0.5	35	2	2,842	2116	2,262	1692	1,508	1047	1,160	672
		50	1	2,842	2116	2,262	1692	1,508	1047	1,160	672
	1	35	2	2,842	2116	2,262	1692	1,508	1047	1,160	672
		50	1	2,842	2116	2,262	1692	1,508	1047	1,160	672
20	0.5	40	2	2,262	1915	1,798	1512	1,189	957	928	616
		55	1	2,262	1915	1,798	1512	1,189	957	928	616
	1	40	2	2,262	1915	1,798	1512	1,189	957	928	616
		55	1	2,262	1915	1,798	1512	1,189	957	928	616

- 절삭 깊이(Depth of Cut)는 위 표에서 해당되는 경도 아래 표시된 비율대로 줄여 사용하십시오.
- 상기의 절삭 조건표는 실제 상황과 다를 수 있으니, 기계의 상태, 가공형태 및 목적에 알맞게 조정하여 사용하십시오.
- RPM이 낮은 기계일 경우에는 Feed도 같은 비율로 낮추어 사용하십시오.

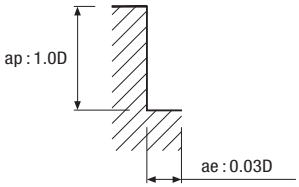
H-Star Endmill

ESXR704, ESXE704, ESXE714 series

측면 절삭 가공

피삭재 / 절삭조건 / 공구직경(Ø)	열처리강, 내열합금강		열처리강							
	HRC40~50		HRC50~55		HRC55~60		HRC60~65		HRC65~70	
	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
4	17,200	1,690	11,440	1,140	9,360	700	7,280	430	6,170	310
6	13,450	1,820	8,970	1,230	6,890	720	5,460	450	4,810	330
8	9,100	1,750	6,760	1,170	5,200	670	4,160	420	3,640	310
10	8,000	1,630	5,330	1,090	4,160	620	3,320	400	2,860	280
12	6,830	1,630	4,550	1,010	3,450	580	2,730	370	2,420	260

절입기준

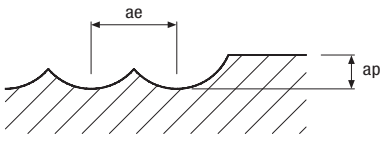


ESLNB20 series

피삭재 / 절삭조건 / 공구직경(Ø)	합금강, 내열합금강 HRC30~45			열처리강 HRC45~55			열처리강 HRC55~65			동, 동합금		
	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	ae (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	ae (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	ae (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	ae (mm)
0.5	34,100~49,500	600~870	0.007~0.028	31,900~35,200	490~540	0.005~0.023	31,900~35,200	440~480	0.005~0.021	49,000~50,000	1,100~1,400	0.010~0.042
0.6	28,600~40,700	590~850	0.007~0.034	26,400~29,700	480~540	0.006~0.028	26,400~29,700	400~480	0.006~0.025	42,000~50,000	1,100~1,700	0.011~0.050
0.8	22,000~30,800	640~890	0.016~0.064	19,800~22,000	490~550	0.013~0.052	19,800~22,000	440~500	0.012~0.048	31,000~50,000	1,100~2,250	0.024~0.096
1.0	17,600~24,200	600~850	0.008~0.080	15,400~17,600	470~540	0.007~0.065	15,400~17,600	440~500	0.006~0.060	24,000~49,500	1,100~2,200	0.012~0.120
1.2	14,300~18,700	590~780	0.024~0.032	12,000~14,000	480~540	0.020~0.026	12,000~14,000	420~480	0.018~0.024	28,500~38,500	1,480~1,950	0.036~0.048
1.5	11,000~14,300	580~760	0.031~0.048	10,000~11,500	480~540	0.025~0.039	10,000~11,500	420~480	0.023~0.036	17,000~28,500	1,100~1,950	0.046~0.072
2.0	8,500~11,000	590~800	0.024~0.160	7,900~8,800	470~530	0.020~0.130	7,900~8,800	440~480	0.018~0.120	12,600~24,000	1,100~2,150	0.036~0.240
3.0	5,700~8,200	730~1,000	0.064~0.24	5,300~5,800	590~650	0.052~0.195	5,300~5,800	550~620	0.048~0.120	11,900~17,000	1,850~2,700	0.096~0.360
4.0	4,300~6,200	680~990	0.080~0.320	3,950~4,400	550~620	0.065~0.260	3,850~4,400	530~570	0.060~0.240	6,600~12,500	1,260~2,500	0.120~0.480

절입기준

*ae : D1 ~ D4 = 0.05 × D
D5 ~ D8 = 0.025mm
D10 ~ D20 = 0.30mm

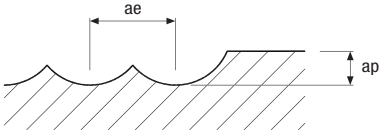


ESTNB20 series

피삭재					탄소강, 합금강 180~250HB		프리하든강 HRC35~45		열처리강 HRC45~55		고경도강 HRC55~65	
표준절삭깊이비율					절삭깊이 × 100%		절삭깊이 × 80%		절삭깊이 × 65%		절삭깊이 × 60%	
반경 (mm)	공구직경 (Ø)	목부길이 (mm)	Neck Angle (°)	절삭깊이 (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
0.4	0.8	4	0.4	0.062	32,000	2,560	22,400	1,613	20,800	1,331	20,800	1,165
		6	0.4	0.045	32,000	2,560	22,400	1,613	20,800	1,331	20,800	1,165
		8	0.9	0.026	25,600	1,475	17,920	1,032	16,640	852	16,640	745
		12	0.9	0.020	20,800	1,065	14,560	699	13,520	606	13,520	519
		16	0.9	0.018	20,800	932	14,560	612	13,520	530	13,520	454
0.45	0.9	4	0.4	0.063	28,300	2,547	19,810	1,605	18,395	1,324	18,395	1,159
		8	0.4	0.050	28,300	2,547	19,810	1,605	18,395	1,324	18,395	1,159
		12	0.4	0.037	18,400	1,325	12,880	811	11,960	753	11,960	646
		16	0.4	0.024	18,400	1,325	12,880	811	11,960	753	11,960	646
		18	0.4	0.018	18,400	1,325	12,880	811	11,960	753	11,960	646
		20	0.4	0.015	15,850	1,141	11,095	699	10,303	649	10,303	556
		22	0.4	0.012	15,850	1,141	11,095	699	10,303	649	10,303	556
		24	0.4	0.009	14,150	1,019	9,905	624	9,198	579	9,198	497
0.5	1	6	0.4	0.055	25,600	2,560	17,920	1,613	16,640	1,331	16,640	1,165
		8	0.4	0.055	25,600	2,560	17,920	1,613	16,640	1,331	16,640	1,165
		10	0.4	0.032	20,800	1,872	14,560	1,310	13,520	1,082	13,520	946
		10	0.9	0.035	20,800	1,872	14,560	1,310	13,520	1,082	13,520	946
		15	0.9	0.028	16,640	1,331	11,648	874	10,816	757	10,816	649
		20	0.4	0.018	16,640	1,331	11,648	874	10,816	757	10,816	649
		20	0.9	0.020	16,640	1,331	11,648	874	10,816	757	10,816	649
		25	0.9	0.017	14,560	1,165	10,192	764	9,464	662	9,464	568
		30	0.4	0.015	12,480	874	8,736	568	8,112	487	8,112	406
		30	0.9	0.017	12,480	874	8,736	568	8,112	487	8,112	406
		35	0.9	0.010	10,400	728	7,280	473	6,760	406	6,760	338
		40	0.9	0.009	10,000	700	7,000	455	6,500	390	6,500	325
		50	0.9	0.007	9,500	665	6,650	432	6,175	371	6,175	309
		60	0.9	0.005	9,000	630	6,300	410	5,850	351	5,850	293
		70	0.9	0.003	8,500	595	5,950	387	5,525	332	5,525	276
0.75	1.5	8	0.4	0.070	16,960	2,544	11,872	1,603	11,024	1,323	11,024	1,158
		10	0.4	0.070	16,960	2,544	11,872	1,603	11,024	1,323	11,024	1,158
		12	0.4	0.070	16,960	2,544	11,872	1,603	11,024	1,323	11,024	1,158
		15	0.9	0.045	13,568	1,832	9,498	1,282	8,819	1,058	8,819	926
		20	0.9	0.040	11,024	1,323	7,717	810	7,166	752	7,166	645
		30	0.9	0.028	11,024	1,323	7,717	810	7,166	752	7,166	645

절입기준

*ae : D1 ~ D4 = 0.05 × D
D5 ~ D8 = 0.025mm
D10 ~ D20 = 0.30mm



- 절삭 깊이(Depth of Cut)는 위 표에서 해당되는 경도 아래 표시된 비율대로 줄여 사용하십시오.
- 리브가공이나 슬로팅 가공 등 칩 배출이 원활하지 않은 가공에서는 위의 절삭 조건에서 절삭 깊이를 20~30% 줄여 사용하십시오.
  예) ESTNB2040-20-10, HRC 55, 리브 가공
  예) 절삭 깊이 : 0.32(표준절삭깊이) × 0.65 × 0.8 = 0.17mm
- 상기의 절삭 조건표는 실제 상황과 다를 수 있으니, 기계의 상태, 가공형태 및 목적에 알맞게 조정하여 사용하십시오.
- RPM이 낮은 기계일 경우에는 Feed도 같은 비율로 낮추어 사용하십시오.

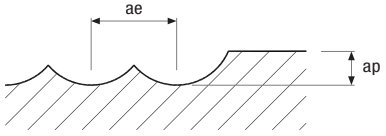
H-Star Endmill

ESTNB20 series

피삭재					탄소강, 합금강 180~250HB		프리하든강 HRC35~45		열처리강 HRC45~55		고경도강 HRC55~65	
표준절삭깊이비율					절삭깊이 × 100%		절삭깊이 × 80%		절삭깊이 × 65%		절삭깊이 × 60%	
반경 (mm)	공구직경 (Ø)	목부길이 (mm)	Neck Angle (°)	절삭깊이 (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
0.9	1.8	4	0.4	0.120	14,200	2,556	9,940	1,610	9,230	1,329	9,230	1,163
		8	0.4	0.100	14,200	2,556	9,940	1,610	9,230	1,329	9,230	1,163
		12	0.4	0.080	14,200	2,556	9,940	1,610	9,230	1,329	9,230	1,163
		16	0.4	0.071	14,200	2,556	9,940	1,610	9,230	1,329	9,230	1,163
		20	0.4	0.062	9,230	1,329	6,461	814	6,000	756	6,000	648
		24	0.4	0.053	9,230	1,329	6,461	814	6,000	756	6,000	648
		28	0.4	0.044	9,230	1,329	6,461	814	6,000	756	6,000	648
		32	0.4	0.036	9,230	1,329	6,461	814	6,000	756	6,000	648
		36	0.4	0.028	9,230	1,329	6,461	814	6,000	756	6,000	648
		38	0.4	0.020	8,000	1,152	5,600	706	5,200	655	5,200	562
		40	0.4	0.015	8,000	1,152	5,600	706	5,200	655	5,200	562
1	2	8	0.4	0.150	15,200	3,040	10,640	1,915	9,880	1,581	9,880	1,383
		12	0.4	0.090	15,200	3,040	10,640	1,915	9,880	1,581	9,880	1,383
		16	0.4	0.090	15,200	3,040	10,640	1,915	9,880	1,581	9,880	1,383
		20	0.4	0.060	12,160	2,189	8,512	1,532	7,904	1,265	7,904	1,107
		20	0.9	0.070	12,160	2,189	8,512	1,532	7,904	1,265	7,904	1,107
		25	0.9	0.070	9,880	1,581	6,916	968	6,442	899	6,422	771
		30	0.4	0.040	9,880	1,581	6,916	968	6,442	899	6,422	771
		30	0.9	0.045	9,880	1,581	6,916	968	6,442	899	6,422	771
		35	0.9	0.045	9,880	1,581	6,916	968	6,442	899	6,422	771
		40	0.4	0.030	9,880	1,581	6,916	968	6,442	899	6,422	771
		40	0.9	0.035	9,880	1,581	6,916	968	6,442	899	6,422	771
		50	0.9	0.170	8,512	1,192	5,958	775	5,533	664	5,533	553
		60	0.9	0.009	7,235	1,013	5,065	658	4,703	564	4,703	470
		70	0.9	0.005	6,150	861	4,305	560	3,997	480	3,997	400
1.5	3	8	0.4	0.320	12,720	3,816	8,904	2,404	8,268	1,984	8,268	1,736
		16	0.4	0.220	12,720	3,816	8,904	2,404	8,268	1,984	8,268	1,736
		20	0.4	0.150	12,720	3,434	8,904	2,137	8,268	1,736	8,268	1,488
		30	0.4	0.080	10,176	2,748	7,123	1,496	6,614	1,389	6,614	1,191
		30	0.9	0.090	10,176	2,748	7,123	1,496	6,614	1,389	6,614	1,191
		40	0.4	0.060	8,268	1,984	5,788	1,215	5,374	1,129	5,374	967
		40	0.9	0.070	8,268	1,984	5,788	1,215	5,374	1,129	5,374	967
		50	0.9	0.050	8,268	1,984	5,788	1,215	5,374	1,129	5,374	967
		60	0.9	0.030	7,123	1,710	4,986	1,047	4,630	972	4,630	833
		70	0.9	0.020	6,233	1,496	4,363	916	4,051	851	4,051	729

절입기준

*ae : D1 ~ D4 = 0.05 × D
D5 ~ D8 = 0.025mm
D10 ~ D20 = 0.30mm



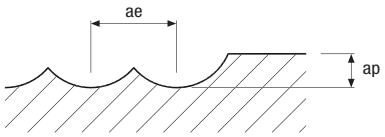
- 절삭 깊이(Depth of Cut)는 위 표에서 해당되는 경도 아래 표시된 비율대로 줄여 사용하십시오.
- 리브가공이나 슬로팅 가공 등 칩 배출이 원활하지 않은 가공에서는 위의 절삭 조건에서 절삭 깊이를 20~30% 줄여 사용하십시오.
  예) ESTNB2040-20-10, HRC 55, 리브 가공
  예) 절삭 깊이 : 0.32(표준절삭깊이) × 0.65 × 0.8 = 0.17mm
- 상기의 절삭 조건표는 실제 상황과 다를 수 있으니, 기계의 상태, 가공형태 및 목적에 알맞게 조정하여 사용하십시오.
- RPM이 낮은 기계일 경우에는 Feed도 같은 비율로 낮추어 사용하십시오.

ESTNB20 series

피삭재					탄소강, 합금강 180~250HB		프리하든강 HRC35~45		열처리강 HRC45~55		고경도강 HRC55~65	
표준절삭깊이비율					절삭깊이 × 100%		절삭깊이 × 80%		절삭깊이 × 65%		절삭깊이 × 60%	
반경 (mm)	공구직경 (Ø)	목부길이 (mm)	Neck Angle (°)	절삭깊이 (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
2	4	20	1	0.32	11,900	2,860	9,000	2,050	7,800	1,680	7,800	1,590
		30	1	0.23	11,900	2,570	9,000	1,850	7,800	1,520	7,800	1,430
		40	1	0.14	9,500	1,940	7,200	1,400	6,200	1,140	6,200	1,080
		50	1	0.11	7,800	1,590	5,800	1,120	5,000	920	5,000	870
		60	1	0.07	7,800	1,590	5,800	1,120	5,000	920	5,000	870
2.5	5	30	1	0.34	9,500	2,140	7,200	1,540	6,200	1,260	6,200	1,190
		40	1	0.25	9,500	2,140	7,200	1,540	6,200	1,260	6,200	1,190
		60	1	0.15	6,200	1,320	4,700	950	4,000	770	4,000	720
3	6	30	1	0.45	8,000	2,000	6,000	1,430	5,200	1,170	5,200	1,110
		40	1	0.40	8,000	1,800	6,000	1,280	5,200	1,050	5,200	990
		50	1	0.32	8,000	1,800	6,000	1,280	5,200	1,050	5,200	990
		60	1	0.22	6,400	1,360	4,800	970	4,100	780	4,100	740
		70	1	0.18	5,200	1,110	3,900	790	3,400	650	3,400	610
		80	1	0.14	5,200	1,110	3,900	790	3,400	650	3,400	610
4	8	50	1	0.50	6,000	1,460	4,500	1,040	3,900	850	3,900	810
		60	1	0.43	6,000	1,460	4,500	1,040	3,900	850	3,900	810
		70	1	0.33	6,000	1,460	4,500	1,040	3,900	850	3,900	810
		80	1	0.25	4,800	1,100	3,600	780	3,100	640	3,100	600
5	10	60	1	0.70	4,800	1,300	3,600	920	3,100	750	3,100	710
		75	1	0.50	4,800	1,300	3,600	920	3,100	750	3,100	710

절입기준

*ae : D1 ~ D4 = 0.05 × D
D5 ~ D8 = 0.025mm
D10 ~ D20 = 0.30mm



- 절삭 깊이(Depth of Cut)는 위 표에서 해당되는 경도 아래 표시된 비율대로 줄여 사용하십시오.
- 리브가공이나 슬로팅 가공 등 칩 배출이 원활하지 않은 가공에서는 위의 절삭 조건에서 절삭 깊이를 20~30% 줄여 사용하십시오.
  예) ESTNB2040-20-10, HRC 55, 리브 가공
  예) 절삭 깊이 : 0.32(표준절삭깊이) × 0.65 × 0.8 = 0.17mm
- 상기의 절삭 조건표는 실제 상황과 다를 수 있으니, 기계의 상태, 가공형태 및 목적에 알맞게 조정하여 사용하십시오.
- RPM이 낮은 기계일 경우에는 Feed도 같은 비율로 낮추어 사용하십시오.

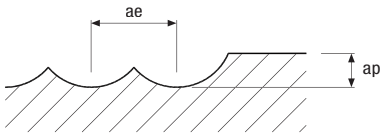
H-Star Endmill

ESTNB30 series

피삭재					탄소강, 합금강 180~250HB		프리하든강 HRC35~45		열처리강 HRC45~55		고경도강 HRC55~65	
표준절삭깊이비율					절삭깊이 × 100%		절삭깊이 × 80%		절삭깊이 × 65%		절삭깊이 × 60%	
반경 (mm)	공구직경 (Ø)	목부길이 (mm)	Neck Angle (°)	절삭깊이 (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
0.1	0.2	1	0.4	0.017	40,000	800	28,000	504	26,000	416	26,000	364
		1.5	0.4	0.009	40,000	800	28,000	504	26,000	416	26,000	364
		2	0.9	0.007	32,000	461	22,400	323	20,800	266	20,800	233
		2.5	0.9	0.004	26,000	333	18,200	204	16,900	189	16,900	162
0.15	0.3	2	0.4	0.025	40,000	1,200	28,000	756	26,000	624	26,000	546
		3	0.9	0.013	32,000	691	22,400	484	20,800	399	20,800	349
		4	0.9	0.010	26,000	499	18,200	306	16,900	284	16,900	243
0.2	0.4	2	0.4	0.035	40,000	1,600	28,000	1,008	26,000	832	26,000	728
		3	0.4	0.020	40,000	1,600	28,000	1,008	26,000	832	26,000	728
		4	0.4	0.007	32,000	922	22,400	645	20,800	532	20,800	466
		4	0.9	0.009	32,000	922	22,400	645	20,800	532	20,800	466
		5	0.4	0.006	26,000	666	18,200	408	16,900	379	16,900	324
		5	0.9	0.007	26,000	666	18,200	408	16,900	379	16,900	324
0.25	0.5	4	0.4	0.040	40,000	2,000	28,000	1,260	26,000	1,040	26,000	910
		8	0.9	0.010	26,000	728	18,200	446	16,900	414	16,900	355
		12	0.9	0.005	22,400	627	15,680	384	14,560	357	14,560	306
0.27	0.54	2	0.4	0.050	40,000	2,160	28,000	1,361	26,000	1,123	26,000	983
		4	0.4	0.037	40,000	2,160	28,000	1,361	26,000	1,123	26,000	983
		5	0.4	0.031	40,000	1,512	28,000	1,176	26,000	1,040	26,000	832
		6	0.4	0.025	26,000	1,244	18,200	871	16,900	676	16,900	629
		6.5	0.4	0.020	26,000	1,011	18,200	619	16,900	575	16,900	493
		7	0.4	0.015	26,000	899	18,200	585	16,900	543	16,900	465
0.3	0.6	2	0.4	0.055	40,000	2,400	28,000	1,512	26,000	1,248	26,000	1,092
		4	0.4	0.035	40,000	2,400	28,000	1,512	26,000	1,248	26,000	1,092
		6	0.4	0.018	32,000	1,382	22,400	968	20,800	799	20,800	699
		6	0.9	0.020	32,000	1,382	22,400	968	20,800	799	20,800	699
		8	0.9	0.020	26,000	998	18,200	612	16,900	568	16,900	487
		10	0.4	0.013	26,000	874	18,200	535	16,900	497	16,900	426
		10	0.9	0.015	26,000	874	18,200	535	16,900	497	16,900	426
		12	0.9	0.010	26,000	874	18,200	535	16,900	497	16,900	426
		15	0.4	0.005	22,400	753	15,680	461	14,560	367	14,560	367
		15	0.9	0.006	22,400	753	15,680	461	14,560	367	14,560	367

절입기준

*ae : D1 ~ D4 = 0.05 × D
D5 ~ D8 = 0.025mm
D10 ~ D20 = 0.30mm



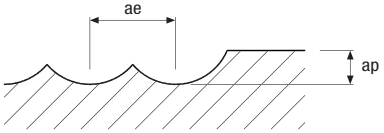
- 절삭 깊이(Depth of Cut)는 위 표에서 해당되는 경도 아래 표시된 비율대로 줄여 사용하십시오.
- 리브가공이나 슬로팅 가공 등 칩 배출이 원활하지 않은 가공에서는 위의 절삭 조건에서 절삭 깊이를 20~30% 줄여 사용하십시오.
  예) ESTNB2040-20-10, HRC 55, 리브 가공
  예) 절삭 깊이 : 0.32(표준절삭깊이) × 0.65 × 0.8 = 0.17mm
- 상기의 절삭 조건표는 실제 상황과 다를 수 있으니, 기계의 상태, 가공형태 및 목적에 알맞게 조정하여 사용하십시오.
- RPM이 낮은 기계일 경우에는 Feed도 같은 비율로 낮추어 사용하십시오.

ESTNB30 series

피삭재					탄소강, 합금강 180~250HB		프리하든강 HRC35~45		열처리강 HRC45~55		고경도강 HRC55~65	
표준절삭깊이비율					절삭깊이 × 100%		절삭깊이 × 80%		절삭깊이 × 65%		절삭깊이 × 60%	
반경 (mm)	공구직경 (Ø)	목부길이 (mm)	Neck Angle (°)	절삭깊이 (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
0.4	0.8	4	0.4	0.062	32,000	2,560	22,400	1,613	20,800	1,331	20,800	1,165
		6	0.4	0.045	32,000	2,560	22,400	1,613	20,800	1,331	20,800	1,165
		8	0.9	0.026	25,600	1,475	17,920	1,032	16,640	852	16,640	745
		12	0.9	0.020	20,800	1,065	14,560	699	13,520	606	13,520	519
		16	0.9	0.018	20,800	932	14,560	612	13,520	530	13,520	454
0.45	0.9	4	0.4	0.063	28,300	2,547	19,810	1,605	18,395	1,324	18,395	1,159
		8	0.4	0.050	28,300	2,547	19,810	1,605	18,395	1,324	18,395	1,159
		12	0.4	0.037	18,400	1,325	12,880	811	11,960	753	11,960	646
		16	0.4	0.024	18,400	1,325	12,880	811	11,960	753	11,960	646
		18	0.4	0.018	18,400	1,325	12,880	811	11,960	753	11,960	646
		20	0.4	0.015	15,850	1,141	11,095	699	10,303	649	10,303	556
		22	0.4	0.012	15,850	1,141	11,095	699	10,303	649	10,303	556
		24	0.4	0.009	14,150	1,019	9,905	624	9,198	579	9,198	497
0.5	1	6	0.4	0.055	25,600	2,560	17,920	1,613	16,640	1,331	16,640	1,165
		8	0.4	0.055	25,600	2,560	17,920	1,613	16,640	1,331	16,640	1,165
		10	0.4	0.032	20,800	1,872	14,560	1,310	13,520	1,082	13,520	946
		10	0.9	0.035	20,800	1,872	14,560	1,310	13,520	1,082	13,520	946
		15	0.9	0.028	16,640	1,331	11,648	874	10,816	757	10,816	649
		20	0.4	0.018	16,640	1,331	11,648	874	10,816	757	10,816	649
		20	0.9	0.020	16,640	1,331	11,648	874	10,816	757	10,816	649
		25	0.9	0.017	14,560	1,165	10,192	764	9,464	662	9,464	568
		30	0.4	0.015	12,480	874	8,736	568	8,112	487	8,112	406
		30	0.9	0.017	12,480	874	8,736	568	8,112	487	8,112	406
		35	0.9	0.010	10,400	728	7,280	473	6,760	406	6,760	338
		40	0.9	0.009	10,000	700	7,000	455	6,500	390	6,500	325
		50	0.9	0.007	9,500	665	6,650	432	6,175	371	6,175	309
		60	0.9	0.005	9,000	630	6,300	410	5,850	351	5,850	293
		70	0.9	0.003	8,500	595	5,950	387	5,525	332	5,525	276
0.75	1.5	8	0.4	0.070	16,960	2,544	11,872	1,603	11,024	1,323	11,024	1,158
		10	0.4	0.070	16,960	2,544	11,872	1,603	11,024	1,323	11,024	1,158
		12	0.4	0.070	16,960	2,544	11,872	1,603	11,024	1,323	11,024	1,158
		15	0.9	0.045	13,568	1,832	9,498	1,282	8,819	1,058	8,819	926
		20	0.9	0.040	11,024	1,323	7,717	810	7,166	752	7,166	645
		30	0.9	0.028	11,024	1,323	7,717	810	7,166	752	7,166	645

절입기준

*ae : D1 ~ D4 = 0.05 × D
D5 ~ D8 = 0.025mm
D10 ~ D20 = 0.30mm



- 절삭 깊이(Depth of Cut)는 위 표에서 해당되는 경도 아래 표시된 비율대로 줄여 사용하십시오.
- 리브가공이나 슬로팅 가공 등 칩 배출이 원활하지 않은 가공에서는 위의 절삭 조건에서 절삭 깊이를 20~30% 줄여 사용하십시오.
  예) ESTNB2040-20-10, HRC 55, 리브 가공
  예) 절삭 깊이 : 0.32(표준절삭깊이) × 0.65 × 0.8 = 0.17mm
- 상기의 절삭 조건표는 실제 상황과 다를 수 있으니, 기계의 상태, 가공형태 및 목적에 알맞게 조정하여 사용하십시오.
- RPM이 낮은 기계일 경우에는 Feed도 같은 비율로 낮추어 사용하십시오.

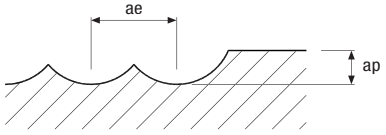
H-Star Endmill

ESTNB30 series

피삭재					탄소강, 합금강 180~250HB		프리하든강 HRC35~45		열처리강 HRC45~55		고경도강 HRC55~65	
표준절삭깊이비율					절삭깊이 × 100%		절삭깊이 × 80%		절삭깊이 × 65%		절삭깊이 × 60%	
반경 (mm)	공구직경 (Ø)	목부길이 (mm)	Neck Angle (°)	절삭깊이 (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
0.9	1.8	4	0.4	0.120	14,200	2,556	9,940	1,610	9,230	1,329	9,230	1,163
		8	0.4	0.100	14,200	2,556	9,940	1,610	9,230	1,329	9,230	1,163
		12	0.4	0.080	14,200	2,556	9,940	1,610	9,230	1,329	9,230	1,163
		16	0.4	0.071	14,200	2,556	9,940	1,610	9,230	1,329	9,230	1,163
		20	0.4	0.062	9,230	1,329	6,461	814	6,000	756	6,000	648
		24	0.4	0.053	9,230	1,329	6,461	814	6,000	756	6,000	648
		28	0.4	0.044	9,230	1,329	6,461	814	6,000	756	6,000	648
		32	0.4	0.036	9,230	1,329	6,461	814	6,000	756	6,000	648
		36	0.4	0.028	9,230	1,329	6,461	814	6,000	756	6,000	648
		38	0.4	0.020	8,000	1,152	5,600	706	5,200	655	5,200	562
		40	0.4	0.015	8,000	1,152	5,600	706	5,200	655	5,200	562
1	2	8	0.4	0.150	15,200	3,040	10,640	1,915	9,880	1,581	9,880	1,383
		12	0.4	0.090	15,200	3,040	10,640	1,915	9,880	1,581	9,880	1,383
		16	0.4	0.090	15,200	3,040	10,640	1,915	9,880	1,581	9,880	1,383
		20	0.4	0.060	12,160	2,189	8,512	1,532	7,904	1,265	7,904	1,107
		20	0.9	0.070	12,160	2,189	8,512	1,532	7,904	1,265	7,904	1,107
		25	0.9	0.070	9,880	1,581	6,916	968	6,442	899	6,422	771
		30	0.4	0.040	9,880	1,581	6,916	968	6,442	899	6,422	771
		30	0.9	0.045	9,880	1,581	6,916	968	6,442	899	6,422	771
		35	0.9	0.045	9,880	1,581	6,916	968	6,442	899	6,422	771
		40	0.4	0.030	9,880	1,581	6,916	968	6,442	899	6,422	771
		40	0.9	0.035	9,880	1,581	6,916	968	6,442	899	6,422	771
		50	0.9	0.170	8,512	1,192	5,958	775	5,533	664	5,533	553
		60	0.9	0.009	7,235	1,013	5,065	658	4,703	564	4,703	470
		70	0.9	0.005	6,150	861	4,305	560	3,997	480	3,997	400
1.5	3	8	0.4	0.320	12,720	3,816	8,904	2,404	8,268	1,984	8,268	1,736
		16	0.4	0.220	12,720	3,816	8,904	2,404	8,268	1,984	8,268	1,736
		20	0.4	0.150	12,720	3,434	8,904	2,137	8,268	1,736	8,268	1,488
		30	0.4	0.080	10,176	2,748	7,123	1,496	6,614	1,389	6,614	1,191
		30	0.9	0.090	10,176	2,748	7,123	1,496	6,614	1,389	6,614	1,191
		40	0.4	0.060	8,268	1,984	5,788	1,215	5,374	1,129	5,374	967
		40	0.9	0.070	8,268	1,984	5,788	1,215	5,374	1,129	5,374	967
		50	0.9	0.050	8,268	1,984	5,788	1,215	5,374	1,129	5,374	967
		60	0.9	0.030	7,123	1,710	4,986	1,047	4,630	972	4,630	833
		70	0.9	0.020	6,233	1,496	4,363	916	4,051	851	4,051	729

절입기준

*ae : D1 ~ D4 = 0.05 × D
D5 ~ D8 = 0.025mm
D10 ~ D20 = 0.30mm



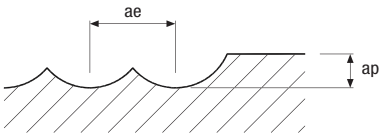
- 절삭 깊이(Depth of Cut)는 위 표에서 해당되는 경도 아래 표시된 비율대로 줄여 사용하십시오.
- 리브가공이나 슬로팅 가공 등 칩 배출이 원활하지 않은 가공에서는 위의 절삭 조건에서 절삭 깊이를 20~30% 줄여 사용하십시오.
  예) ESTNB2040-20-10, HRC 55, 리브 가공
  예) 절삭 깊이 : 0.32(표준절삭깊이) × 0.65 × 0.8 = 0.17mm
- 상기의 절삭 조건표는 실제 상황과 다를 수 있으니, 기계의 상태, 가공형태 및 목적에 알맞게 조정하여 사용하십시오.
- RPM이 낮은 기계일 경우에는 Feed도 같은 비율로 낮추어 사용하십시오.

ESTNB30 series

피삭재					탄소강, 합금강 180~250HB		프리하든강 HRC35~45		열처리강 HRC45~55		고경도강 HRC55~65	
표준절삭깊이비율					절삭깊이 × 100%		절삭깊이 × 80%		절삭깊이 × 65%		절삭깊이 × 60%	
반경 (mm)	공구직경 (Ø)	목부길이 (mm)	Neck Angle (°)	절삭깊이 (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
2	4	20	1	0.32	11,900	2,860	9,000	2,050	7,800	1,680	7,800	1,590
		30	1	0.23	11,900	2,570	9,000	1,850	7,800	1,520	7,800	1,430
		40	1	0.14	9,500	1,940	7,200	1,400	6,200	1,140	6,200	1,080
		50	1	0.11	7,800	1,590	5,800	1,120	5,000	920	5,000	870
		60	1	0.07	7,800	1,590	5,800	1,120	5,000	920	5,000	870
2.5	5	30	1	0.34	9,500	2,140	7,200	1,540	6,200	1,260	6,200	1,190
		40	1	0.25	9,500	2,140	7,200	1,540	6,200	1,260	6,200	1,190
		60	1	0.15	6,200	1,320	4,700	950	4,000	770	4,000	720
3	6	30	1	0.45	8,000	2,000	6,000	1,430	5,200	1,170	5,200	1,110
		40	1	0.40	8,000	1,800	6,000	1,280	5,200	1,050	5,200	990
		50	1	0.32	8,000	1,800	6,000	1,280	5,200	1,050	5,200	990
		60	1	0.22	6,400	1,360	4,800	970	4,100	780	4,100	740
		70	1	0.18	5,200	1,110	3,900	790	3,400	650	3,400	610
		80	1	0.14	5,200	1,110	3,900	790	3,400	650	3,400	610
4	8	50	1	0.50	6,000	1,460	4,500	1,040	3,900	850	3,900	810
		60	1	0.43	6,000	1,460	4,500	1,040	3,900	850	3,900	810
		70	1	0.33	6,000	1,460	4,500	1,040	3,900	850	3,900	810
		80	1	0.25	4,800	1,100	3,600	780	3,100	640	3,100	600
5	10	60	1	0.70	4,800	1,300	3,600	920	3,100	750	3,100	710
		75	1	0.50	4,800	1,300	3,600	920	3,100	750	3,100	710

절입기준

*ae : D1 ~ D4 = 0.05 × D
D5 ~ D8 = 0.025mm
D10 ~ D20 = 0.30mm



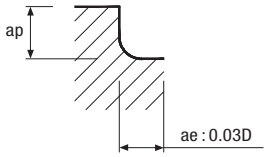
- 절삭 깊이(Depth of Cut)는 위 표에서 해당되는 경도 아래 표시된 비율대로 줄여 사용하십시오.
- 리브가공이나 슬로팅 가공 등 칩 배출이 원활하지 않은 가공에서는 위의 절삭 조건에서 절삭 깊이를 20~30% 줄여 사용하십시오.
  예) ESTNB2040-20-10, HRC 55, 리브 가공
  예) 절삭 깊이 : 0.32(표준절삭깊이) × 0.65 × 0.8 = 0.17mm
- 상기의 절삭 조건표는 실제 상황과 다를 수 있으니, 기계의 상태, 가공형태 및 목적에 알맞게 조정하여 사용하십시오.
- RPM이 낮은 기계일 경우에는 Feed도 같은 비율로 낮추어 사용하십시오.

H-Star Endmill

ESLNS20, ESLNS40 series

피삭재 / 절삭조건 / 공구직경(Ø)	합금강, 내열합금강 HRC30~45			열처리강 HRC45~55			고경도강 HRC55~65			동, 동합금		
	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	ae (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	ae (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	ae (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	ae (mm)
0.4	34,100~50,000	350~590	0.005~0.028	30,500~35,200	295~340	0.003~0.020	18,300~24,600	120~200	0.002~0.012	48,000~50,000	790~920	0.008~0.048
0.5	25,650~33,000	370~470	0.006~0.035	23,750~26,000	285~315	0.004~0.025	14,200~18,000	115~130	0.003~0.015	44,000~50,000	800~1,150	0.010~0.060
0.6	20,900~35,200	330~560	0.007~0.030	19,900~22,000	260~290	0.005~0.021	11,900~15,500	100~120	0.003~0.013	37,500~50,000	770~1,250	0.011~0.051
0.8	16,150~26,400	360~590	0.009~0.040	15,200~16,700	280~310	0.006~0.028	9,000~11,700	110~125	0.004~0.017	28,500~47,000	770~1,300	0.015~0.068
1.0	12,300~18,700	350~540	0.011~0.028	10,500~11,500	250~280	0.008~0.020	6,300~8,050	100~115	0.005~0.012	22,500~34,000	810~1,300	0.018~0.048
1.2	10,450~17,600	350~590	0.025~0.070	9,100~10,000	250~280	0.015~0.042	5,400~7,000	100~115	0.009~0.026	22,500~31,500	950~1,350	0.036~0.101
1.5	9,100~17,600	430~830	0.017~0.077	7,000~8,000	250~280	0.012~0.055	4,300~5,500	100~115	0.007~0.033	14,500~25,000	770~1,320	0.028~0.132
2.0	6,350~10,550	340~570	0.021~0.140	6,100~6,700	270~300	0.015~0.100	3,600~4,700	100~120	0.009~0.060	11,500~18,500	770~1,250	0.036~0.240
3.0	4,300~7,050	550~900	0.056~0.210	3,990~4,600	445~515	0.040~0.150	2,400~3,200	105~310	0.024~0.090	9,000~13,000	1,400~2,110	0.096~0.360
4.0	3,200~5,300	400~675	0.074~0.280	3,000~3,400	335~380	0.053~0.200	1,800~2,400	75~230	0.032~0.120	6,750~9,750	1,050~1,575	0.128~0.480

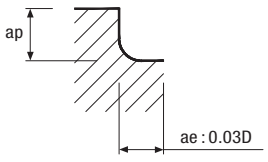
절입기준



ESLNR series

피삭재				탄소강, 합금강 180~250HB		프리하든강 HRC35~45		열처리강 HRC45~55		고경도강 HRC55~65	
표준절삭깊이비율				절삭깊이 × 100%		절삭깊이 × 80%		절삭깊이 × 65%		절삭깊이 × 60%	
공구직경 (Ø)	코너 R (mm)	목부길이 (mm)	절삭깊이 (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
0.2	0.05	0.5	0.020	50,000	258	50,000	205	50,000	180	50,000	160
		1	0.014	50,000	258	50,000	205	50,000	180	50,000	160
		1.5	0.008	50,000	240	45,900	202	45,900	170	45,900	153
		2	0.008	42,000	202	36,700	176	36,700	162	36,700	147
0.3	0.05	1	0.021	50,000	585	50,000	456	50,000	336	50,000	320
		1.5	0.016	50,000	585	45,000	456	45,000	336	45,000	320
		2	0.012	45,000	530	45,000	420	45,000	300	45,000	290
		2.5	0.010	40,000	471	40,000	373	40,000	267	40,000	258
		3	0.008	35,000	412	35,000	326	30,000	200	30,000	194
0.4	0.05	1	0.025	50,000	580	50,000	461	40,000	320	36,000	270
		1.5	0.020	50,000	580	50,000	461	40,000	320	36,000	270
		2	0.016	45,000	520	45,000	410	36,000	290	34,000	240
		2.5	0.015	40,500	480	40,500	370	33,400	270	30,600	220
		3	0.014	40,000	410	40,000	330	32,800	240	25,600	200
		3.5	0.012	36,000	380	36,000	300	29,400	200	22,920	180
		4	0.008	30,000	320	30,000	250	21,600	160	19,200	150
	0.1	2	0.028	45,000	520	45,000	410	36,000	290	34,000	240
		3	0.016	40,000	410	40,000	330	32,800	240	25,600	200
		4	0.010	30,000	320	30,000	250	21,600	160	19,200	150
0.5	0.05	1	0.030	50,000	898	40,000	464	30,000	378	28,000	315
		2	0.023	50,000	898	40,000	464	30,000	378	28,000	315
		3	0.017	45,000	810	36,000	414	27,000	315	24,500	261
		4	0.017	40,000	820	32,000	378	24,000	279	20,000	234
		5	0.011	28,800	540	19,400	280	18,000	250	15,000	200
		6	0.008	28,800	480	19,400	260	18,000	250	15,000	200
	0.1	1	0.035	50,000	898	40,000	464	30,000	378	28,000	315
		2	0.030	50,000	898	40,000	464	30,000	378	28,000	315
		3	0.020	45,000	810	36,000	414	27,000	315	24,500	261
		4	0.020	40,000	720	32,000	378	24,000	279	20,000	234
		5	0.013	28,800	540	19,400	280	18,000	250	15,000	200
		6	0.013	28,800	480	19,400	260	18,000	250	15,000	200
0.6	0.1	2	0.035	50,000	1,159	37,830	600	28,200	390	23,000	320
		4	0.024	40,000	830	27,800	440	23,600	280	21,000	230
		6	0.015	24,000	490	18,000	300	17,800	240	15,000	210
		8	0.013	24,000	466	18,000	285	17,800	228	15,000	200
		10	0.009	24,000	451	18,000	276	17,800	221	15,000	193

절입기준



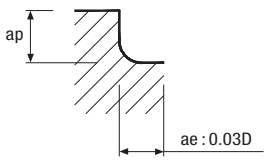
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H-Star Endmill

ESLNR series

피삭재				탄소강, 합금강 180~250HB		프리하든강 HRC35~45		열처리강 HRC45~55		고경도강 HRC55~65	
표준절삭깊이비율				절삭깊이 × 100%		절삭깊이 × 80%		절삭깊이 × 65%		절삭깊이 × 60%	
공구직경 (Ø)	코너 R (mm)	목부길이 (mm)	절삭깊이 (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
2	0.2	6	0.08	20,790	1,635	17,672	1,389	15,593	981	14,553	801
		8	0.07	18,900	1,486	16,065	1,263	14,175	892	13,230	728
		12	0.04	15,309	1,083	13,013	921	11,482	722	10,716	590
		16	0.04	13,608	963	11,567	818	10,206	642	9,526	524
		20	0.035	11,907	843	10,121	716	8,930	562	8,335	459
		25	0.025	11,907	843	10,121	716	8,930	562	8,335	459
		30	0.017	11,312	800	9,615	680	8,484	534	7,918	436
	0.3	8	0.09	18,900	1,651	16,065	1,403	14,175	991	13,230	809
		16	0.06	13,608	1,070	11,567	909	10,206	713	9,526	583
		20	0.037	11,907	936	10,121	796	8,930	624	8,335	510
	0.5	6	0.017	20,709	1,635	17,672	1,389	15,593	981	14,553	801
		8	0.014	18,900	1,651	16,065	1,403	14,175	991	13,230	809
		12	0.08	15,309	1,204	13,013	1,023	11,482	802	10,716	655
		16	0.08	13,608	1,070	11,567	909	10,206	713	9,526	583
		20	0.05	11,907	936	10,121	796	8,930	624	8,335	510
		25	0.05	11,907	936	10,121	796	8,930	624	8,335	510
		30	0.03	11,312	889	9,615	756	8,484	593	7,918	484
	0.8	8	0.2	18,900	1,651	16,065	1,403	14,175	991	13,230	809
		16	0.1	13,608	1,070	11,567	909	10,206	713	9,526	583
		20	0.06	11,907	936	10,121	796	8,930	624	8,335	510
3	0.2	8	0.09	14,400	1,415	12,240	1,203	10,800	849	10,080	693
		12	0.07	14,400	1,415	12,240	1,203	10,800	849	10,080	693
		16	0.05	14,400	1,415	12,240	1,203	10,800	849	10,080	693
		20	0.05	11,664	1,146	9,914	974	8,748	764	8,165	624
		30	0.04	9,072	1,146	7,711	974	6,804	764	6,350	624
		35	0.035	9,072	1,146	7,711	974	6,804	764	6,350	624
	0.3	8	0.13	14,400	1,572	12,240	1,337	10,800	943	10,080	771
		16	0.075	14,400	1,572	12,240	1,337	10,800	943	10,080	771
		20	0.075	11,664	1,274	9,914	1,083	8,748	849	8,165	693
		30	0.06	9,072	1,274	7,711	1,083	6,804	849	6,350	693
	0.5	8	0.18	14,400	1,572	12,240	1,337	10,800	943	10,080	771
		12	0.13	14,400	1,572	12,240	1,337	10,800	943	10,080	771
		16	0.1	14,400	1,572	12,240	1,337	10,800	943	10,080	771
		20	0.1	11,664	1,274	9,914	1,083	8,748	849	8,165	693
		30	0.08	9,072	1,274	7,711	1,083	6,804	849	6,350	693
		35	0.065	9,072	1,274	7,711	1,083	6,804	849	6,350	693

절입기준

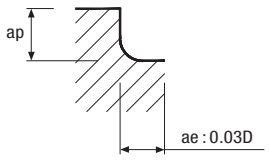


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ESLNR series

피삭재				탄소강, 합금강 180~250HB		프리하든강 HRC35~45		열처리강 HRC45~55		고경도강 HRC55~65	
표준절삭깊이비율				절삭깊이 × 100%		절삭깊이 × 80%		절삭깊이 × 65%		절삭깊이 × 60%	
공구직경 (Ø)	코너 R (mm)	목부길이 (mm)	절삭깊이 (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
0.8	0.1	4	0.032	48,000	1,102	28,000	518	20,000	320	20,000	288
		6	0.019	38,700	800	25,000	461	18,000	288	18,000	256
		8	0.015	29,025	600	20,000	369	16,200	259	16,200	230
		12	0.012	29,025	570	20,000	350	16,200	246	16,200	219
	0.2	4	0.056	48,000	1,102	28,000	518	20,000	320	20,000	288
		6	0.032	38,700	800	25,000	461	18,000	288	18,000	256
1	0.1	4	0.038	32,400	1,359	27,540	1,039	24,300	815	22,680	666
		6	0.024	26,244	990	22,307	842	19,683	660	18,371	539
		8	0.024	23,328	880	19,829	748	17,496	587	16,330	479
		10	0.015	20,412	770	17,350	655	15,309	514	14,288	419
		12	0.015	18,144	609	15,422	453	13,608	399	12,701	320
		16	0.009	18,144	533	15,422	420	13,608	342	12,701	266
		20	0.006	13,608	399	11,567	315	10,206	257	9,526	200
	0.2	4	0.07	32,400	1,359	27,540	1,039	24,300	815	22,680	666
		6	0.040	26,244	990	22,307	842	19,683	660	18,371	539
		8	0.040	23,328	880	19,829	748	17,496	587	16,330	479
		10	0.025	20,412	770	17,350	655	15,309	514	14,288	419
		12	0.025	18,144	609	15,422	453	13,608	399	12,701	320
		16	0.015	18,144	533	15,422	420	13,608	342	12,701	266
		20	0.010	13,608	399	11,567	315	10,206	257	9,526	200
	0.3	6	0.040	26,244	990	22,307	842	19,683	660	18,371	539
		10	0.025	20,412	770	17,350	655	15,309	514	14,288	419
		16	0.015	18,144	533	15,422	420	13,608	342	12,701	266
		20	0.010	13,608	399	11,567	315	10,206	257	9,526	200
1.5	0.1	4	0.042	24,930	1,130	20,956	868	18,711	678	17,364	556
		8	0.036	22,680	1,027	19,278	873	17,010	685	15,876	559
		12	0.036	18,144	822	15,422	698	13,608	548	12,701	447
		15	0.023	14,112	568	11,995	423	10,584	373	9,878	298
		20	0.018	14,112	568	11,995	423	10,584	373	9,878	298
	0.2	4	0.070	24,930	1,130	20,956	868	18,711	678	17,364	556
		8	0.060	22,680	1,027	19,278	873	17,010	685	15,876	559
		12	0.060	18,144	822	15,422	698	13,608	548	12,701	447
		15	0.038	14,112	568	11,995	423	10,584	373	9,878	298
		20	0.030	14,112	568	11,995	423	10,584	373	9,878	298
	0.3	8	0.060	22,680	1,027	19,278	873	17,010	685	15,876	559
		15	0.038	14,112	568	11,995	423	10,584	373	9,878	298
		20	0.030	14,112	568	11,995	423	10,584	373	9,878	298

절입기준



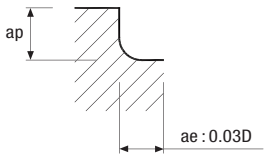
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H-Star Endmill

ESTNR series

피삭재				탄소강, 합금강 180~250HB		프리하든강 HRC35~45		열처리강 HRC45~55		고경도강 HRC55~65	
표준절삭깊이비율				절삭깊이 × 100%		절삭깊이 × 80%		절삭깊이 × 65%		절삭깊이 × 60%	
공구직경 (Ø)	코너 R (mm)	목부길이 (mm)	절삭깊이 (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
0.2	0.05	2	0.007	39,660	887	33,660	754	29,700	591	27,720	483
0.4	0.05	4	0.009	30,096	899	25,582	764	22,572	599	21,067	489
		5	0.007	26,752	710	22,739	528	20,064	466	18,726	373
	0.1	4	0.009	31,680	946	26,928	804	23,760	631	22,176	515
		5	0.007	28,160	747	23,936	556	21,120	490	19,712	392
0.5	0.1	5	0.013	30,413	1,090	25,851	753	22,810	562	21,289	453
		8	0.008	24,330	678	20,681	468	18,248	350	17,031	282
		10	0.007	18,248	509	15,511	351	13,686	262	12,773	211
0.6	0.1	12	0.01	20,377	791	17,320	546	15,282	408	14,264	329
		15	0.006	16,727	649	14,218	448	12,545	335	11,709	270
0.8	0.2	6	0.045	31,680	1,084	26,928	921	23,760	723	22,176	590
		12	0.02	28,160	943	23,936	695	21,120	613	19,712	490
1	0.2	8	0.04	28,512	1,463	24,235	1,244	21,384	976	19,958	797
		10	0.035	28,512	1,596	24,235	1,357	21,384	1,064	19,958	869
		15	0.028	25,344	1,261	21,542	938	19,008	828	17,741	662
		20	0.02	19,008	828	16,157	653	14,256	532	13,306	414
		25	0.017	15,840	690	13,464	544	11,880	443	11,088	345
		30	0.017	15,840	690	13,464	544	11,880	443	11,088	345
		35	0.01	15,840	690	13,464	544	11,880	443	11,088	345
	0.3	8	0.04	28,512	1,463	24,235	1,244	21,384	976	19,958	797
		15	0.028	25,344	1,261	21,542	938	19,008	828	17,741	662
		25	0.017	15,840	690	13,464	544	11,880	443	11,088	345
		30	0.017	15,840	690	13,464	544	11,880	443	11,088	345
1.5	0.2	10	0.05	21,683	1,079	18,431	803	16,262	708	15,178	567
		15	0.045	19,712	981	16,755	730	14,784	644	13,798	515
		20	0.042	17,347	863	14,745	642	13,010	567	12,143	453
		25	0.032	14,784	644	12,566	508	11,088	414	10,349	322
		30	0.028	12,320	536	10,472	423	9,240	345	8,624	268
	0.3	10	0.05	21,683	1,079	18,431	803	16,262	708	15,178	567
		20	0.042	17,347	863	14,745	642	13,010	567	12,143	453
		25	0.032	14,784	644	12,566	508	11,088	414	10,349	322
		30	0.028	12,320	536	10,472	423	9,240	345	8,624	268

절입기준

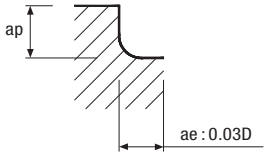


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ESTNR series

피삭재				탄소강, 합금강 180~250HB		프리하든강 HRC35~45		열처리강 HRC45~55		고경도강 HRC55~65	
표준절삭깊이비율				절삭깊이 × 100%		절삭깊이 × 80%		절삭깊이 × 65%		절삭깊이 × 60%	
공구직경 (Ø)	코너 R (mm)	목부길이 (mm)	절삭깊이 (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
2	0.2	30	0.045	13,440	1,254	11,424	933	10,080	823	9,408	658
		40	0.035	10,080	823	8,568	650	7,560	529	7,056	412
		50	0.017	8,400	686	7,140	541	6,300	441	5,880	343
	0.3	12	0.088	22,680	1,814	19,278	1,427	17,010	1,191	15,876	1,048
		20	0.054	18,144	1,452	15,422	1,141	13,608	953	12,701	838
		30	0.045	13,440	1,393	11,424	1,036	10,080	914	9,408	732
		40	0.035	10,080	914	8,568	722	7,560	588	7,056	457
		50	0.017	8,400	762	7,140	601	6,300	490	5,880	381
	0.5	8	0.170	22,680	1,814	19,278	1,427	17,010	1,191	15,876	1,048
		12	0.088	22,680	1,814	19,278	1,427	17,010	1,191	15,876	1,048
		16	0.088	19,278	1,542	16,386	1,213	14,459	1,012	13,495	891
		20	0.054	18,114	1,452	15,422	1,141	13,608	953	12,701	838
		25	0.054	15,876	1,270	13,495	999	11,907	833	11,113	733
		30	0.045	13,440	1,393	11,424	1,036	10,080	914	9,408	732
		40	0.035	10,080	914	8,568	722	7,560	588	7,056	457
		50	0.017	8,400	762	7,140	601	6,300	490	5,880	381
3	0.2	40	0.070	10,240	956	8,704	711	7,680	627	7,168	502
		50	0.050	7,680	627	6,528	495	5,760	403	5,376	314
		60	0.030	6,400	523	5,440	412	4,800	336	4,480	261
	0.3	40	0.070	10,240	1,062	8,704	790	7,680	697	7,168	557
		50	0.050	7,680	697	6,528	550	5,760	448	5,376	348
		60	0.030	6,400	581	5,440	458	4,800	373	4,480	290
	0.5	40	0.070	10,240	1,062	8,704	790	7,680	697	7,168	557
		50	0.050	7,680	697	6,528	550	5,760	448	5,376	348
		60	0.030	6,400	581	5,440	458	4,800	373	4,480	290

절입기준



- 절삭 깊이(Depth of Cut)는 위 표에서 해당되는 경도 아래 표시된 비율대로 줄여 사용하십시오.
- 상기의 절삭 조건표는 실제 상황과 다를 수 있으니, 기계의 상태, 가공형태 및 목적에 알맞게 조정하여 사용하십시오.
- RPM이 낮은 기계일 경우에는 Feed도 같은 비율로 낮추어 사용하십시오.

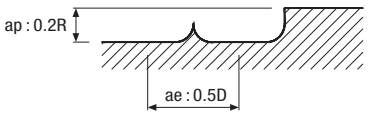
H-Star Endmill

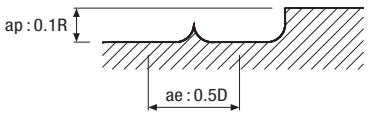
ESPM4 series

측면 절삭 가공

피삭재	열처리강, 내열합금강		열처리강							
절삭조건	~HRC40		HRC40~50		HRC50~55		HRC55~60		HRC60~65	
공구직경(Ø)×코너 R(mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
3 × R0.5	9,550	6,500	6,900	4,150	4,550	2,750	2,850	1,150	1,900	610
4 × R0.5	7,950	7,000	5,750	4,600	4,000	3,200	2,550	1,350	1,750	700
6 × R0.5	5,800	7,650	4,100	4,900	2,900	3,500	1,850	1,850	1,350	795
6 × R1.0	5,800	7,650	4,100	4,900	2,900	3,500	1,850	1,850	1,350	795
8 × R1.0	4,350	7,650	3,050	4,900	2,200	3,500	1,400	1,850	995	795
8 × R2.0	4,350	7,650	3,050	4,900	2,200	3,500	1,400	1,850	995	795
10 × R1.0	3,500	7,650	2,450	4,900	1,750	3,500	1,100	1,850	795	795
10 × R2.0	3,500	7,650	2,450	4,900	1,750	3,500	1,100	1,850	795	795
12 × R2.0	2,900	7,650	2,050	4,900	1,450	3,500	925	1,850	665	795
12 × R3.0	2,900	7,650	2,050	4,900	1,450	3,500	925	1,850	665	795

절입기준



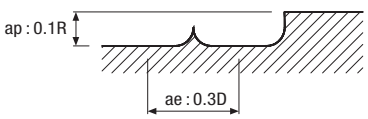


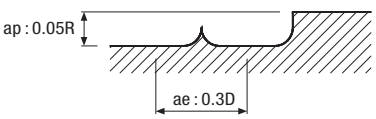
ESPM4 series

고속 가공

피삭재	열처리강, 내열합금강		열처리강							
절삭조건	~HRC40		HRC40~50		HRC50~55		HRC55~60		HRC60~65	
공구직경(Ø)×코너 R(mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
3 × R0.5	22,000	16,000	17,000	10,000	12,500	8,000	9,500	4,600	6,900	2,500
4 × R0.5	17,000	17,500	13,000	12,000	11,000	9,200	8,000	5,500	5,600	2,900
6 × R0.5	13,500	18,500	10,500	13,800	9,000	11,000	6,400	6,400	4,500	3,600
6 × R1.0	13,500	18,500	10,500	13,800	9,000	11,000	6,400	6,400	4,500	3,600
8 × R1.0	10,000	18,500	8,000	14,000	6,800	11,000	4,800	6,700	3,400	4,100
8 × R2.0	10,000	18,500	8,000	14,000	6,800	11,000	4,800	6,700	3,400	4,100
10 × R1.0	8,000	18,500	6,400	14,000	5,400	11,000	3,800	6,800	2,700	3,800
10 × R2.0	8,000	18,500	6,400	14,000	5,400	11,000	3,800	6,800	2,700	3,800
12 × R2.0	6,600	18,500	5,300	14,000	4,500	11,000	3,200	7,000	2,250	3,600
12 × R3.0	6,600	18,500	5,300	14,000	4,500	11,000	3,200	7,000	2,250	3,600

절입기준



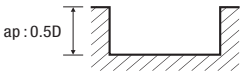


U-Star Endmill

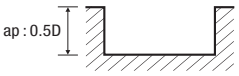
UE502, UXE502 series

피삭재	합금강,탄소강 (SCM, SNCM, S45C)		프리하든강 (NAK, CENA, KP4)		스테인리스강 (SUS)		고경도강 (SKD, SKT, STAVAX)	
강도	~HRC35		HRC35~45				HRC45~55	
절삭조건	~1100N/mm²		1100~1500N/mm²				1500~2000N/mm²	
공구직경(Ø)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
2.0	11,560	190	7,560	120	6,300	90	5,040	35
3.0	8,920	210	5,560	140	4,620	120	3,360	40
4.0	7,560	300	4,620	180	3,880	150	2,940	40
5.0	6,300	320	3,780	190	3,160	160	2,320	50
6.0	5,560	350	3,360	220	2,840	180	2,000	55
8.0	4,200	380	2,520	200	2,100	180	1,680	75
10.0	3,260	330	2,000	160	1,680	160	1,360	60
12.0	2,740	280	1,680	130	1,360	130	1,160	55
16.0	2,200	220	1,360	110	1,060	110	900	40
20.0	1,680	170	1,060	80	840	80	680	30
25.0	1,360	130	840	70	680	60	540	20

절입기준



(ap : UP to Ø3 : 0.2D)



U-Star Endmill

UE512 series

피삭재		합금강,탄소강 (SCM, SNCM, S45C)			프리하든강 (NAK, CENA, KP4)			고경도강 (SKD, SKT, STAVAX)		
강도		~HRC35			HRC35~45			HRC45~55		
절삭조건		~1100N/mm²			1100~1500N/mm²			1500~2000N/mm²		
공구직경 (Ø)	유효길이 (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	ap (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	ap (mm)	테이블이송 vf (mm/min)	Feed vf (mm/min)	ap (mm)
0.1	0.3	50000	315	0.009	46200	230	0.007	40600	170	0.005
0.1	0.5	50000	315	0.006	46200	230	0.005	40600	170	0.004
0.1	1	45000	255	0.002	41580	185	0.002	36540	140	0.001
0.2	0.5	38500	380	0.018	36300	270	0.014	32100	200	0.01
0.2	1	38500	380	0.013	36300	270	0.010	32100	200	0.007
0.2	1.5	34650	310	0.007	32670	220	0.006	28890	160	0.004
0.2	2	34650	310	0.005	32670	220	0.004	28890	160	0.003
0.3	1	34200	390	0.019	32300	270	0.015	28500	230	0.011
0.3	1.5	34200	390	0.019	32300	270	0.015	25800	230	0.011
0.3	2	30780	315	0.011	29070	220	0.008	25650	185	0.006
0.3	2.5	30780	315	0.007	29070	220	0.005	25650	185	0.004
0.3	3	30780	315	0.007	29070	220	0.005	25650	185	0.004
0.3	4	27360	250	0.004	25840	175	0.003	22800	145	0.002
0.3	5	20520	165	0.003	19380	115	0.002	17100	95	0.002
0.4	1	27400	540	0.036	25800	380	0.028	22800	280	0.02
0.4	1.5	27400	540	0.025	25800	380	0.020	22800	280	0.014
0.4	2	27400	540	0.025	25800	380	0.020	22800	280	0.014
0.4	2.5	24660	435	0.014	23220	310	0.011	20520	225	0.008
0.4	3	24660	435	0.014	23220	310	0.011	20520	225	0.008
0.4	4	24660	435	0.009	23220	310	0.007	20520	225	0.005
0.4	5	21920	345	0.009	20640	245	0.007	18240	180	0.005
0.4	6	21920	345	0.005	20640	245	0.004	18240	180	0.003
0.4	8	16440	225	0.004	15480	160	0.003	13680	120	0.002
0.4	10	8220	95	0.004	7740	70	0.003	6840	50	0.002
0.5	1	27400	540	0.045	25800	425	0.035	22800	285	0.025
0.5	1.5	27400	540	0.045	25800	425	0.035	22800	285	0.025
0.5	2	27400	540	0.032	25800	425	0.025	22800	285	0.018
0.5	2.5	27400	540	0.032	25800	425	0.025	22800	285	0.018
0.5	3	24660	435	0.018	23220	345	0.014	20520	230	0.01
0.5	4	24660	435	0.018	23220	345	0.014	20520	230	0.01
0.5	5	24660	435	0.011	23220	345	0.009	20520	230	0.006
0.5	6	21920	345	0.011	20640	270	0.009	18240	180	0.006
0.5	8	16440	225	0.007	15480	180	0.005	13680	120	0.004
0.5	10	16440	225	0.005	15480	180	0.004	13680	120	0.003
0.5	12	8220	95	0.005	7740	75	0.004	6840	50	0.003
0.5	14	8220	95	0.005	7740	75	0.004	6840	50	0.003
0.5	16	2740	25	0.005	2580	20	0.004	2280	15	0.003
0.6	2	27400	775	0.038	25800	545	0.029	22800	405	0.021
0.6	3	27400	775	0.038	25800	545	0.029	22800	405	0.021
0.6	4	24660	630	0.022	23220	440	0.017	20520	330	0.012
0.6	5	24660	630	0.014	23220	440	0.011	20520	330	0.008
0.6	6	24660	630	0.014	23220	440	0.011	20520	330	0.008
0.6	8	21920	495	0.008	20640	350	0.006	18240	260	0.005

UE512 series

피삭재		합금강,탄소강 (SCM, SNCM, S45C)			프리하든강 (NAK, CENA, KP4)			고경도강 (SKD, SKT, STAVAX)		
강도		~HRC35			HRC35~45			HRC45~55		
절삭조건		~1100N/mm²			1100~1500N/mm²			1500~2000N/mm²		
공구직경 (Ø)	유효길이 (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	ap (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	ap (mm)	테이블이송 vf (mm/min)	Feed vf (mm/min)	ap (mm)
0.6	10	16440	325	0.005	15480	230	0.004	13680	170	0.003
0.6	12	16440	325	0.005	15480	230	0.004	13680	170	0.003
0.6	14	8220	140	0.005	7740	100	0.004	6840	75	0.003
0.6	16	8220	140	0.005	7740	100	0.004	6840	75	0.003
0.7	2	27400	775	0.063	25800	545	0.049	22800	405	0.035
0.7	4	24660	630	0.025	23220	440	0.020	20520	330	0.014
0.7	6	24660	630	0.016	23220	440	0.012	20520	330	0.009
0.7	8	21920	495	0.016	20640	350	0.012	18240	260	0.009
0.7	10	21920	495	0.009	20640	350	0.007	18240	260	0.005
0.7	12	16440	325	0.009	15480	230	0.005	13680	170	0.004
0.8	2	27400	775	0.072	25800	605	0.056	22800	450	0.040
0.8	3	27400	775	0.050	25800	605	0.039	22800	450	0.028
0.8	4	27400	775	0.050	25800	605	0.039	22800	450	0.028
0.8	5	24660	630	0.029	23220	490	0.022	20520	365	0.016
0.8	6	24660	630	0.029	23220	490	0.022	20520	365	0.016
0.8	8	24660	630	0.018	23220	490	0.014	20520	365	0.010
0.8	10	21920	495	0.018	20640	385	0.014	18240	290	0.01
0.8	12	21920	495	0.011	20640	385	0.008	18240	290	0.006
0.8	14	16440	325	0.007	15480	255	0.006	13680	190	0.004
0.8	16	16440	325	0.007	15480	255	0.006	13680	190	0.004
0.8	20	8220	140	0.007	7740	110	0.006	6840	80	0.004
0.9	6	22140	575	0.032	20970	440	0.025	18450	330	0.018
0.9	8	22140	575	0.020	20970	440	0.016	18450	330	0.011
0.9	10	19680	455	0.020	18640	350	0.016	16400	260	0.011
1.0	2	24600	1045	0.090	23300	890	0.070	20500	665	0.050
1.0	3	24600	1045	0.090	23300	890	0.070	20500	665	0.050
1.0	4	24600	1045	0.063	23300	890	0.049	20500	665	0.035
1.0	5	24600	1045	0.063	23300	890	0.049	20500	665	0.035
1.0	6	22140	845	0.036	20970	720	0.028	18450	540	0.020
1.0	7	22140	845	0.036	20970	720	0.028	18450	540	0.020
1.0	8	22140	845	0.036	20970	720	0.028	18450	540	0.020
1.0	10	22140	845	0.023	20970	720	0.018	18450	540	0.013
1.0	12	19680	670	0.023	18640	570	0.018	16400	425	0.013
1.0	14	19680	670	0.014	18640	570	0.011	16400	425	0.008
1.0	16	14760	440	0.014	13980	375	0.011	12300	280	0.008
1.0	18	14760	440	0.009	13980	375	0.007	12300	280	0.005
1.0	20	14760	440	0.009	13980	375	0.007	12300	280	0.005
1.0	22	7380	190	0.009	6990	160	0.007	6150	120	0.005
1.0	26	7380	190	0.009	6990	160	0.007	6150	120	0.005
1.0	30	7380	190	0.009	6990	160	0.007	6150	120	0.005
1.0	40	2460	50	0.009	2330	45	0.007	2050	35	0.005
1.0	50	2460	50	0.006	2330	45	0.005	2050	35	0.003
1.2	4	21900	930	0.076	20700	720	0.059	18200	485	0.042

U-Star Endmill

UE512 series

피삭재		합금강,탄소강 (SCM, SNCM, S45C)			프리하든강 (NAK, CENA, KP4)			고경도강 (SKD, SKT, STAVAX)		
강도		~HRC35			HRC35~45			HRC45~55		
절삭조건		~1100N/mm²			1100~1500N/mm²			1500~2000N/mm²		
공구직경 (Ø)	유효길이 (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	ap (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	ap (mm)	테이블이송 vf (mm/min)	Feed vf (mm/min)	ap (mm)
1.2	6	21900	930	0.076	20700	720	0.059	18200	485	0.042
1.2	8	19710	755	0.043	18630	585	0.034	16380	395	0.024
1.2	10	19710	755	0.027	18630	585	0.021	16380	395	0.015
1.2	12	19710	755	0.027	18630	585	0.021	16380	395	0.015
1.2	14	17520	595	0.027	16560	460	0.021	14560	310	0.015
1.2	16	17520	595	0.016	16560	460	0.013	14560	310	0.009
1.2	20	13140	390	0.011	12420	300	0.008	10920	205	0.006
1.2	26	6570	165	0.011	6210	130	0.008	5460	85	0.006
1.2	30	6570	165	0.011	6210	130	0.008	5460	85	0.006
1.4	6	19200	815	0.088	18100	570	0.069	16000	425	0.049
1.4	8	17280	660	0.050	16290	460	0.039	14400	345	0.028
1.4	10	17280	660	0.050	16290	460	0.039	14400	345	0.028
1.4	14	17280	660	0.032	16290	460	0.025	14400	345	0.018
1.4	16	15360	520	0.032	14480	365	0.025	12800	270	0.018
1.4	20	15360	520	0.019	14480	365	0.015	12800	270	0.011
1.5	4	19200	905	0.135	18100	635	0.105	16000	475	0.075
1.5	5	19200	905	0.095	18100	635	0.074	16000	475	0.053
1.5	6	19200	905	0.095	18100	635	0.074	16000	475	0.053
1.5	7	19200	905	0.095	18100	635	0.074	16000	475	0.053
1.5	8	17280	735	0.054	16290	515	0.042	14400	385	0.030
1.5	10	17280	735	0.054	16290	515	0.042	14400	385	0.03
1.5	12	17280	735	0.054	16290	515	0.042	14400	385	0.030
1.5	14	17280	735	0.034	16290	515	0.026	14400	385	0.019
1.5	16	15360	580	0.034	14480	405	0.026	12800	305	0.019
1.5	18	15360	580	0.034	14480	405	0.026	12800	305	0.019
1.5	20	15360	580	0.020	14480	405	0.016	12800	305	0.011
1.5	22	15360	580	0.020	14480	405	0.016	12800	305	0.011
1.5	26	11520	380	0.014	10860	265	0.011	9600	200	0.008
1.5	30	11520	380	0.014	10860	265	0.011	9600	200	0.008
1.6	8	17800	840	0.101	16800	655	0.078	14800	490	0.056
1.6	10	16020	680	0.058	15120	530	0.045	13320	395	0.032
1.6	12	16020	680	0.058	15120	530	0.045	13320	395	0.032
1.6	16	16020	680	0.036	15120	530	0.028	13320	395	0.020
1.6	20	14240	540	0.036	13440	420	0.028	11840	315	0.020
1.8	8	17800	840	0.113	16800	655	0.088	14800	490	0.063
1.8	10	16020	680	0.065	15120	530	0.050	13320	395	0.036
1.8	12	16020	680	0.065	15120	530	0.050	13320	395	0.036
1.8	16	16020	680	0.041	15120	530	0.032	13320	395	0.023
1.8	20	14240	540	0.041	13440	420	0.032	11840	315	0.023
2.0	6	14400	820	0.180	13600	620	0.140	12000	475	0.100
2.0	8	14400	820	0.126	13600	620	0.098	12000	475	0.070
2.0	10	14400	820	0.126	13600	620	0.098	12000	475	0.070
2.0	12	12960	665	0.072	12240	500	0.056	10800	385	0.040

UE512 series

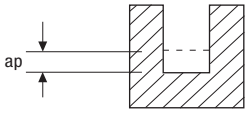
피삭재		합금강,탄소강 (SCM, SNCM, S45C)			프리하든강 (NAK, CENA, KP4)			고경도강 (SKD, SKT, STAVAX)		
강도		~HRC35			HRC35~45			HRC45~55		
절삭조건		~1100N/mm²			1100~1500N/mm²			1500~2000N/mm²		
공구직경 (Ø)	유효길이 (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	ap (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	ap (mm)	테이블이송 vf (mm/min)	Feed vf (mm/min)	ap (mm)
2.0	14	12960	665	0.072	12240	500	0.056	10800	385	0.040
2.0	16	12960	665	0.072	12240	500	0.056	10800	385	0.040
2.0	18	12960	665	0.045	12240	500	0.035	10800	385	0.025
2.0	20	12960	665	0.045	12240	500	0.035	10800	385	0.025
2.0	22	11520	525	0.045	10880	395	0.035	9600	305	0.025
2.0	26	11520	525	0.045	10880	395	0.035	9600	305	0.025
2.0	30	11520	525	0.027	10880	395	0.021	9600	305	0.015
2.0	35	8640	345	0.018	8160	260	0.014	7200	200	0.010
2.0	40	8640	345	0.018	8160	260	0.014	7200	200	0.010
2.0	45	4320	150	0.018	4080	110	0.014	3600	85	0.010
2.0	50	4320	150	0.018	4080	110	0.014	3600	85	0.010
2.0	60	4320	150	0.018	4080	110	0.014	3600	85	0.010
2.5	8	12300	970	0.158	11600	680	0.123	10300	510	0.088
2.5	10	12300	970	0.158	11600	680	0.123	10300	510	0.088
2.5	12	12300	970	0.158	11600	680	0.123	10300	510	0.088
2.5	14	11070	785	0.090	10440	550	0.070	9270	415	0.050
2.5	16	11070	785	0.090	10440	550	0.070	9270	415	0.050
2.5	18	11070	785	0.090	10440	550	0.070	9270	415	0.050
2.5	20	11070	785	0.090	10440	550	0.070	9270	415	0.050
2.5	22	11070	785	0.056	10440	550	0.044	9270	415	0.031
2.5	26	9840	620	0.056	9280	435	0.044	8240	325	0.031
2.5	30	9840	620	0.056	9280	435	0.044	8240	325	0.031
2.5	35	9840	620	0.034	9280	435	0.026	8240	325	0.019
2.5	40	7380	405	0.034	6960	285	0.026	6180	215	0.019
2.5	45	7380	405	0.023	6960	285	0.018	6180	215	0.013
2.5	50	7380	405	0.023	6960	285	0.018	6180	215	0.013
3.0	6	10900	860	0.270	10300	605	0.210	6600	450	0.150
3.0	8	10900	860	0.270	10300	605	0.210	6600	450	0.150
3.0	10	10900	860	0.189	10300	605	0.147	6600	450	0.105
3.0	12	10900	860	0.189	10300	605	0.147	6600	450	0.105
3.0	14	10900	860	0.189	10300	605	0.147	6600	450	0.105
3.0	16	9810	695	0.108	9270	490	0.084	5940	365	0.060
3.0	18	9810	695	0.108	9270	490	0.084	5940	365	0.060
3.0	20	9810	695	0.108	9270	490	0.084	5940	365	0.060
3.0	22	9810	695	0.108	9270	490	0.084	5940	365	0.060
3.0	26	9810	695	0.068	9270	490	0.053	5940	365	0.038
3.0	30	9810	695	0.068	9270	490	0.053	5940	365	0.038
3.0	35	8720	550	0.068	8240	385	0.053	5280	290	0.038
3.0	40	8720	550	0.041	8240	385	0.032	5280	290	0.023
3.0	45	8720	550	0.041	8240	385	0.032	5280	290	0.023
3.0	50	6540	360	0.027	6180	255	0.021	3960	190	0.015
3.0	60	6540	360	0.027	6180	255	0.021	3960	190	0.015
4.0	8	8000	1300	0.360	7600	1160	0.280	6700	770	0.200

U-Star Endmill

UE512 series

피삭재		합금강,탄소강 (SCM, SNCM, S45C)			프리하든강 (NAK, CENA, KP4)			고경도강 (SKD, SKT, STAVAX)		
강도		~HRC35			HRC35~45			HRC45~55		
절삭조건		~1100N/mm²			1100~1500N/mm²			1500~2000N/mm²		
공구직경 (Ø)	유효길이 (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	ap (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	ap (mm)	테이블이송 vf (mm/min)	Feed vf (mm/min)	ap (mm)
4.0	10	8000	1300	0.360	7600	1160	0.280	6700	770	0.200
4.0	12	8000	1300	0.360	7600	1160	0.280	6700	770	0.200
4.0	14	8000	1300	0.252	7600	1160	0.196	6700	770	0.140
4.0	16	8000	1300	0.252	7600	1160	0.196	6700	770	0.140
4.0	18	8000	1300	0.252	7600	1160	0.196	6700	770	0.140
4.0	20	8000	1300	0.252	7600	1160	0.196	6700	770	0.140
4.0	22	7200	1055	0.144	6840	940	0.112	6030	625	0.080
4.0	26	7200	1055	0.144	6840	940	0.112	6030	625	0.080
4.0	30	7200	1055	0.144	6840	940	0.112	6030	625	0.080
4.0	35	7200	1055	0.090	6840	940	0.070	6030	625	0.050
4.0	40	7200	1055	0.090	6840	940	0.070	6030	625	0.050
4.0	45	6400	830	0.090	6080	740	0.070	5360	495	0.050
4.0	50	6400	830	0.090	6080	740	0.070	5360	495	0.050
4.0	60	6400	830	0.054	6080	740	0.042	5360	495	0.030
5.0	16	6400	1155	0.315	6100	900	0.245	5400	605	0.175
5.0	20	6400	1155	0.315	6100	900	0.245	5400	605	0.175
5.0	26	5760	935	0.180	5490	730	0.140	4860	490	0.100
5.0	30	5760	935	0.180	5490	730	0.140	4860	490	0.100
5.0	35	5760	935	0.180	5490	730	0.140	4860	490	0.100
5.0	40	5760	935	0.180	5490	730	0.140	4860	490	0.100
5.0	50	5760	935	0.113	5490	730	0.088	4860	490	0.063
5.0	60	5120	740	0.113	4880	575	0.088	4320	385	0.063
6.0	15	5300	1055	0.540	5000	820	0.420	4400	550	0.300
6.0	20	5300	1055	0.378	5000	820	0.294	4400	550	0.210
6.0	30	5300	1055	0.378	5000	820	0.294	4400	550	0.210
6.0	32	4770	855	0.216	4500	665	0.168	3960	445	0.120
8.0	25	4000	950	0.504	3800	750	0.392	3300	500	0.280
8.0	30	4000	950	0.504	3800	750	0.392	3300	500	0.280
8.0	42	3600	770	0.288	3400	605	0.224	2950	405	0.160
10	30	3200	900	0.900	3050	680	0.700	2630	400	0.500
10	35	3200	900	0.630	3050	680	0.490	2630	400	0.350
10	45	3200	900	0.630	3050	680	0.490	2630	400	0.350
12	35	2650	800	1.080	2520	600	0.840	2180	350	0.600
12	40	2650	800	0.756	2520	600	0.588	2180	350	0.420
12	50	2650	800	0.756	2520	600	0.588	2180	350	0.420

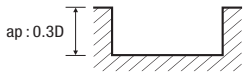
절입기준



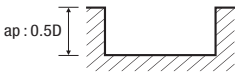
UE522 series

피삭재	합금강,탄소강 (SCM, SNCM, S45C)		프리하든강 (NAK, CENA, KP4)		고경도강 (SKD, SKT, STAVAX)	
강도	~HRC35		HRC35~45		HRC45~55	
절삭조건	~1100N/mm²		1100~1500N/mm²		1500~2000N/mm²	
공구직경(Ø)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
2.0	6,300	60	5,040	50	3,150	25
3.0	4,410	70	3,570	60	2,200	30
4.0	3,570	85	2,840	70	1,790	35
5.0	3,050	105	2,420	85	1,580	40
6.0	2,630	125	2,100	105	1,370	50
8.0	2,000	135	1,580	105	1,050	50
10.0	1,680	135	1,370	105	840	50
12.0	1,370	105	1,160	95	700	40
16.0	1,160	95	890	75	560	35
20.0	840	70	680	50	420	25

절입기준



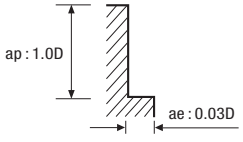
(ap : UP to Ø3.0 : 0.4mm)



UE504H series

피삭재	합금강,탄소강 (SCM, SNCM, S45C)		프리하든강 (NAK, CENA, KP4)		고경도강 (SKD, SKT, STAVAX)	
강도	~HRC35		HRC35~45		HRC45~55	
절삭조건	~1100N/mm²		1100~1500N/mm²		1500~2000N/mm²	
공구직경(Ø)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
1.0	45,000	750	37,000	560	23,000	300
2.0	23,500	800	18,000	540	12,000	360
3.0	15,750	810	12,600	580	8,280	380
4.0	12,150	830	9,540	600	6,345	400
6.0	9,450	900	7,470	640	4,950	440
8.0	7,110	860	5,625	620	3,780	410
10.0	5,580	800	4,410	570	2,925	380
12.0	4,770	800	3,780	570	2,520	380
16.0	3,600	810	2,900	570	2,000	400
20.0	3,000	810	2,300	570	1,600	400

절입기준

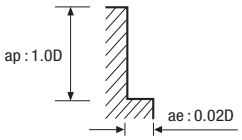


U-Star Endmill

UE514 series

피삭재	합금강,탄소강 (SCM, SNCM, S45C)		프리하든강 (NAK, CENA, KP4)		스테인리스강 (SUS)		고경도강 (SKD, SKT, STAVAX)	
강도	~HRC35		HRC35~45				HRC45~55	
절삭조건	~1100N/mm²		1100~1500N/mm²				1500~2000N/mm²	
공구직경(Ø)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
1.0	22,000	310	13,500	180	10,750	140	8,500	50
1.5	17,000	320	10,700	190	8,500	150	6,500	50
2.0	13,900	330	9,070	200	7,560	165	6,000	60
2.5	12,000	350	7,600	220	6,000	180	4,500	60
3.0	10,700	380	6,670	240	5,110	200	4,030	70
4.0	9,070	680	5,540	420	4,650	330	3,530	70
5.0	7,560	720	4,530	430	3,800	360	2,780	85
6.0	6,670	790	4,030	490	3,400	390	2,400	95
8.0	5,040	850	3,020	450	2,520	420	2,010	130
10.0	3,910	730	2,400	360	2,010	360	1,630	105
12.0	3,300	620	2,010	300	1,630	280	1,400	95

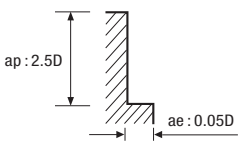
절입기준

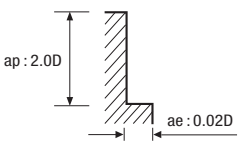


UE524 series

피삭재	합금강,탄소강 (SCM, SNCM, S45C)		프리하든강 (NAK, CENA, KP4)		고경도강 (SKD, SKT, STAVAX)	
강도	~HRC35		HRC35~45		HRC45~55	
절삭조건	~1100N/mm²		1100~1500N/mm²		1500~2000N/mm²	
공구직경(Ø)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
2.0	6,300	100	5,040	80	3,150	45
3.0	4,410	115	3,570	100	2,200	55
4.0	3,570	140	2,840	115	1,790	60
5.0	3,050	180	2,420	140	1,580	70
6.0	2,630	215	2,100	180	1,370	90
8.0	2,000	230	1,580	180	1,050	90
10.0	1,680	230	1,370	180	840	90
12.0	1,370	180	1,160	160	700	70
16.0	1,160	160	890	125	560	60
20.0	840	115	680	90	420	45

절입기준



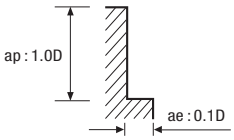


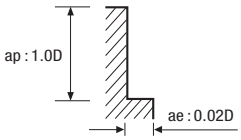
ULE504 series

일반 가공

피삭재	비합금강, 합금강, 주철		열처리강				스테인리스강	
강도	~HRC30		HRC35~45		HRC45~55			
절삭조건	~1000N/mm²		1000~1500N/mm²		1500~2000N/mm²		-	
공구직경(Ø)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
2.0	12,100	320	7,900	195	2,700	47	6,600	160
3.0	9,400	370	5,840	230	2,000	58	4,850	195
4.0	7,900	655	4,850	405	1,500	58	4,070	320
5.0	6,600	690	3,970	415	1,300	58	3,320	345
6.0	5,830	760	3,530	470	1,150	58	2,980	380
8.0	4,410	815	2,650	435	880	58	2,200	405
10.0	3,420	700	2,100	345	720	46	1,760	345
12.0	2,880	600	1,760	290	590	46	1,430	275
16.0	2,310	470	1,430	230	460	29	1,150	230
20.0	1,760	370	1,110	185	340	29	880	175
25.0	1,430	290	880	150	270	23	715	140

절입기준

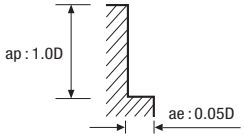




UE504, UXE504 series

피삭재	합금강,탄소강 (SCM, SNCM, S45C)		프리하든강 (NAK, CENA, KP4)		스테인리스강 (SUS)		고경도강 (SKD, SKT, STAVAX)	
강도	~HRC35		HRC35~45				HRC45~55	
절삭조건	~1100N/mm²		1100~1500N/mm²		-		1500~2000N/mm²	
공구직경(Ø)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
2.0	11,560	280	7,560	170	6,300	140	6,300	5,040
3.0	8,920	320	5,560	200	4,620	170	4,620	3,360
4.0	7,560	570	4,620	350	3,880	280	3,880	2,940
5.0	6,300	600	3,780	360	3,160	300	3,160	2,320
6.0	5,560	660	3,360	410	2,840	330	2,840	2,000
8.0	4,200	710	2,520	380	2,100	350	2,100	1,680
10.0	3,260	610	2,000	300	1,680	300	1,680	1,360
12.0	2,740	520	1,680	250	1,360	240	1,360	1,160
16.0	2,200	410	1,360	200	1,100	300	1,100	900
20.0	1,680	320	1,060	160	840	150	840	680
25.0	1,360	250	840	130	680	120	680	540

절입기준



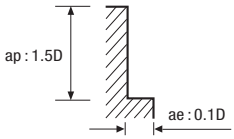
U-Star Endmill

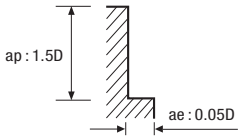
UE506 series

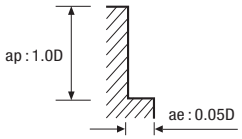
일반 가공

피삭재	합금강,탄소강 (SCM, SNCM, S45C)		프리하든강 (NAK, CENA, KP4)		고경도강 (SKD, SKT, STAVAX)	
강도	~HRC35		HRC35~45		HRC45~55	
절삭조건	~1100N/mm²		1100 ~ 1500N/mm²		1500 ~ 2000N/mm²	
공구직경(Ø)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
6.0	5,560	2,000	3,880	1,370	1,580	210
8.0	4,200	2,000	2,940	1,370	1,160	210
10.0	3,360	2,000	2,320	1,370	1,000	210
12.0	2,840	1,680	2,000	1,160	840	180
16.0	2,100	1,260	1,480	880	640	130
20.0	1,680	1,010	1,160	690	500	110
25.0	1,500	90	1,100	600	430	90

절입기준





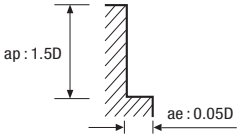


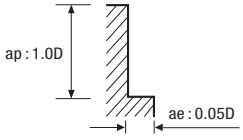
UE506 series

고속 가공

피삭재	합금강,탄소강 (SCM, SNCM, S45C)		고경도강 (SKD, SKT, STAVAX)	
강도	~HRC35		HRC45~55	
절삭조건	~ 1100N/mm²		1500 ~ 2000N/mm²	
공구직경(Ø)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
6.0	16,800	6,090	8,400	3,050
8.0	12,600	6,090	6,300	3,050
10.0	9,980	5,990	5,040	3,050
12.0	8,400	5,040	4,200	2,520
16.0	6,300	3,780	3,160	1,890
20.0	5,040	3,050	2,520	1,470
25.0	4,500	2,700	2,200	1,300

절입기준

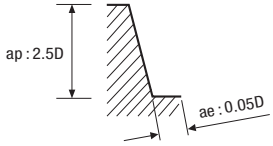




UTE502 series

피삭재	합금강,탄소강 (SCM, SNCM, S45C)		프리하든강 (NAK, CENA, KP4)	
강도	~HRC35		HRC35~45	
절삭조건	~ 1100N/mm²		1100 ~ 1500N/mm²	
공구직경(Ø)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
0.3	45,000	135	35,000	105
0.4	36,000	144	27,900	113
0.6	25,200	144	18,900	113
0.8	18,000	144	13,950	108
1.0	14,850	149	11,250	113
2.0	7,560	153	5,670	113
3.0	3,969	108	3,213	90
4.0	3,213	126	2,556	104
6.0	2,367	189	1,890	153
8.0	1,800	225	1,422	162
10.0	1,440	225	1,170	167

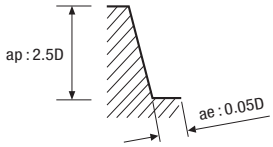
절입기준



UTE504 series

피삭재	합금강,탄소강 (SCM, SNCM, S45C)		프리하든강 (NAK, CENA, KP4)	
강도	~HRC35		HRC35~45	
절삭조건	~ 1100N/mm²		1100 ~ 1500N/mm²	
공구직경(Ø)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
3.0	3,969	216	3,213	180
4.0	3,213	252	2,556	207
6.0	2,367	378	1,890	306
8.0	1,800	450	1,422	324
10.0	1,440	450	1,170	333

절입기준



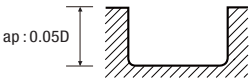
U-Star Endmill

UR502 series

피삭재	합금강,탄소강 (SCM, SNCM, S45C)		프리하든강 (NAK, CENA, KP4)		고경도강 (SKD, SKT, STAVAX)	
강도	~HRC35		HRC35~45		HRC45~55	
절삭조건	~1100N/mm²		1100 ~ 1500N/mm²		1500 ~ 2000N/mm²	
공구직경(Ø)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
0.2	44,000	145	28,800	60	17,600	40
0.3	41,000	170	27,000	70	16,500	45
0.4	41,000	170	27,000	70	16,500	45
0.5	36,000	190	23,400	80	14,300	50
0.6	30,000	210	19,800	90	12,100	55
0.8	30,000	210	19,800	90	12,100	55
1.0	27,600	240	18,000	100	11,000	60
1.5	22,000	250	13,500	110	8,500	60
2.0	18,000	260	11,560	120	7,200	70
2.5	15,000	270	9,500	130	6,100	70
3.0	13,240	280	8,560	140	5,280	70
4.0	10,720	340	6,820	170	4,300	80
5.0	9,160	420	5,800	200	3,800	100
6.0	7,900	500	5,040	250	3,280	120
8.0	6,000	540	3,800	250	2,520	120
10.0	5,040	540	3,280	250	2,020	120
12.0	4,120	420	2,780	230	1,680	100
16.0	3,100	360	2,100	170	1,280	80
20.0	2,520	280	1,640	120	1,000	60

절입기준

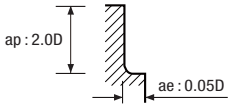


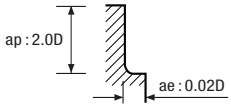


UR504, UR512 series

피삭재	합금강,탄소강 (SCM, SNCM, S45C)		프리하든강 (NAK, CENA, KP4)		고경도강 (SKD, SKT, STAVAX)	
강도	~HRC35		HRC35~45		HRC45~55	
절삭조건	~1100N/mm²		1100 ~ 1500N/mm²		1500 ~ 2000N/mm²	
공구직경(Ø)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
3.0	4,410	115	3,570	100	2,200	55
4.0	3,570	140	2,840	115	1,790	60
5.0	3,050	180	2,420	140	1,580	70
6.0	2,630	215	2,100	180	1,370	85
8.0	2,000	230	1,580	180	1,050	85
10.0	1,680	230	1,370	180	840	85
12.0	1,370	180	1,160	160	700	70
16.0	1,160	160	890	125	560	60
20.0	840	115	680	90	420	45

절입기준

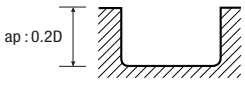


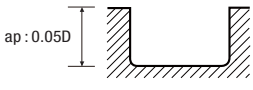


UR542 series

피삭재	합금강,탄소강 (SCM, SNCM, S45C)		프리하든강 (NAK, CENA, KP4)		고경도강 (SKD, SKT, STAVAX)	
강도	~HRC35		HRC35~45		HRC45~55	
절삭조건	~1100N/mm²		1100 ~ 1500N/mm²		1500 ~ 2000N/mm²	
공구직경(Ø)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
0.2	50,000	170	34,500	75	21,150	45
0.3	50,000	200	32,000	85	20,000	50
0.4	50,000	200	32,000	85	20,000	50
0.5	43,000	220	28,000	95	17,100	60
0.6	36,400	250	24,000	110	14,500	65
0.8	36,400	250	24,000	110	14,500	65
1.0	33,100	280	21,600	120	13,200	70
1.5	26,400	300	16,200	130	10,200	70
2.0	21,600	310	13,800	140	8,640	80
2.5	18,000	320	11,400	150	7,320	80
3.0	15,900	330	10,300	160	6,300	80
4.0	12,800	400	8,200	200	5,150	95
5.0	11,000	500	7,000	240	4,560	120
6.0	9,500	600	6,000	300	3,930	140
8.0	7,200	640	4,550	300	3,020	140
10.0	6,000	640	4,000	300	2,420	140
12.0	5,000	500	3,340	270	2,000	120
16.0	3,720	450	2,520	210	1,540	95
20.0	3,000	330	1,950	140	1,200	70

절입기준



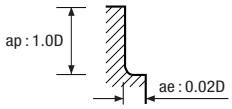


U-Star Endmill

UR544, UXR514 series

피삭재	합금강,탄소강 (SCM, SNCM, S45C)		프리하든강 (NAK, CENA, KP4)		고경도강 (SKD, SKT, STAVAX)	
강도	~HRC35		HRC35~45		HRC45~55	
절삭조건	~1100N/mm²		1100 ~ 1500N/mm²		1500 ~ 2000N/mm²	
공구직경(Ø)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
1.0	33,100	360	21,600	260	13,200	140
1.5	26,400	370	16,200	270	10,200	140
2.0	21,600	380	13,800	280	8,640	150
2.5	18,000	390	11,400	300	7,320	150
3.0	15,900	400	10,300	310	6,300	150
4.0	12,800	500	8,200	360	5,150	160
5.0	11,000	510	7,000	430	4,560	200
6.0	9,500	510	6,000	430	3,930	200
8.0	7,200	550	4,550	430	3,020	200
10.0	6,000	550	4,000	430	2,420	200
12.0	5,000	430	3,340	380	2,000	160
16.0	3,720	330	2,520	280	1,540	135
20.0	3,000	270	1,950	210	1,200	100

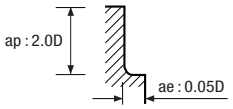
절입기준

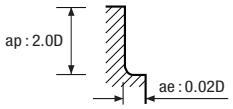


UXR504 series

피삭재	합금강,탄소강 (SCM, SNCM, S45C)		프리하든강 (NAK, CENA, KP4)		고경도강 (SKD, SKT, STAVAX)	
강도	~HRC25		HRC35~45		HRC25~35	
절삭조건	~1100N/mm²		1100 ~ 1500N/mm²		1500 ~ 2000N/mm²	
공구직경(Ø)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
1.0	27,600	300	18,000	220	11,000	120
1.5	22,000	310	13,500	230	8,500	120
2.0	18,000	320	11,560	240	7,200	130
2.5	15,000	330	9,500	250	6,100	130
3.0	13,240	340	8,560	260	5,280	130
4.0	10,720	420	6,820	300	4,300	140
5.0	9,160	430	5,800	360	3,800	170
6.0	7,900	430	5,040	360	3,280	170
8.0	6,000	460	3,800	360	2,520	170
10.0	5,040	460	3,280	360	2,020	170
12.0	4,120	360	2,780	320	1,680	140
16.0	3,100	280	2,100	230	1,280	115
20.0	2,520	230	1,640	180	1,000	90

절입기준

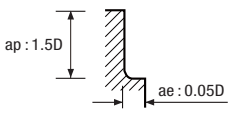


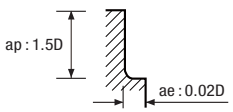


UR506 series

피삭재	합금강,탄소강 (SCM, SNCM, S45C)		프리하든강 (NAK, CENA, KP4)		고경도강 (SKD, SKT, STAVAX)	
강도	~HRC25		HRC35~45		HRC45~55	
절삭조건	~1100N/mm²		1100 ~ 1500N/mm²		1500 ~ 2000N/mm²	
공구직경(Ø)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
6.0	14,880	3,210	14,100	2,940	9,600	2,940
8.0	12,000	3,300	11,400	3,000	7,200	2,760
10.0	9,600	2,940	9,300	2,700	5,700	2,460
12.0	7,800	2,700	7,500	2,460	4,800	2,280
16.0	6,000	2,400	5,820	2,220	3,600	2,040
20.0	4,800	2,010	4,680	2,040	2,880	1,920

절입기준





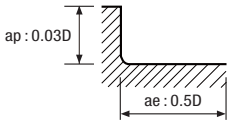
U-Star Endmill

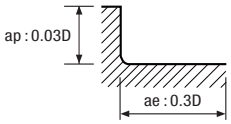
UDR503 series

일반 가공

피삭재	합금강,탄소강 (SCM, SNCM, S45C)		프리하든강 (NAK, CENA, KP4)		고경도강 (SKD, SKT, STAVAX)	
강도	~HRC35		HRC35~45		HRC45~55	
절삭조건	~1100N/mm²		1100 ~ 1500N/mm²		1500 ~ 2000N/mm²	
공구직경(Ø)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
6.0	5,100	3,500	5,500	3,750	3,850	2,700
8.0	3,800	3,400	4,150	3,700	2,850	2,550
10.0	3,800	3,750	3,600	3,500	2,700	2,700
12.0	3,200	4,200	3,250	4,250	2,250	2,300
16.0	2,400	3,100	2,250	2,900	1,700	1,750
20.0	1,900	2,500	1,800	2,350	1,350	1,400

절입기준



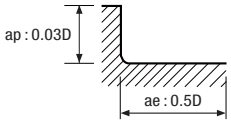


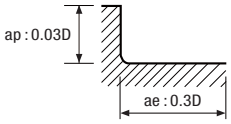
UDR503 series

고속 가공

피삭재	합금강,탄소강 (SCM, SNCM, S45C)		프리하든강 (NAK, CENA, KP4)		고경도강 (SKD, SKT, STAVAX)	
강도	~HRC35		HRC35~45		HRC45~55	
절삭조건	~1100N/mm²		1100 ~ 1500N/mm²		1500 ~ 2000N/mm²	
공구직경(Ø)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
6.0	8,300	5,700	7,650	5,250	6,400	4,550
8.0	6,200	5,550	5,750	5,100	5,250	4,700
10.0	5,750	5,650	5,000	4,900	4,200	4,250
12.0	4,800	6,300	4,150	5,450	3,500	3,650
16.0	3,600	4,700	3,100	4,050	2,650	2,700
20.0	2,900	3,750	2,500	3,250	2,100	2,150

절입기준

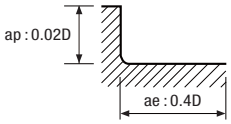


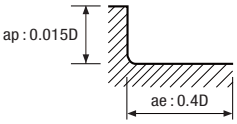


USPM4 series

피삭재	합금강,탄소강 (SCM, SNCM, S45C)		프리하든강 (NAK, CENA, KP4)		고경도강 (SKD, SKT, STAVAX)	
강도	~HRC35		HRC35~45		HRC45~55	
절삭조건	~1100N/mm²		1100~1500N/mm²		1500~2000N/mm²	
공구직경(Ø)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
1.0	49000	7650	40000	6500	35000	5750
1.5	37000	8550	30000	7200	27000	6400
2.0	29700	9000	24300	7560	21600	6750
3.0	19800	9900	16200	8100	14400	7650
4.0	15300	10800	12600	8550	10800	7920
6.0	9900	11700	8100	9900	7200	8640
8.0	7380	11700	6300	9900	5400	8640
10.0	5850	10800	4950	9000	4320	8550
12.0	4950	10800	4140	9000	3690	8100
16.0	3690	9000	3060	7920	2700	7020
20.0	2970	7200	2430	6300	2160	5670

절입기준

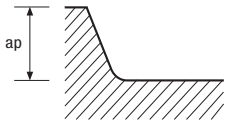




UTR504 series

피삭재	합금강,탄소강 (SCM, SNCM, S45C)			프리하든강 (NAK, CENA, KP4)			고경도강 (SKD, SKT, STAVAX)		
강도	~HRC35			HRC35~45			HRC45~55		
절삭조건	~1100N/mm²			1100~1500N/mm²			1500~2000N/mm²		
공구직경(Ø)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	ap (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	ap (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	ap (mm)
0.4	40,000	630	0.008~0.016	32,000	450	0.008~0.012	22,000	270	0.004~0.008
0.6	30,000	630	0.012~0.024	23,000	450	0.012~0.018	15,000	270	0.006~0.012
0.8	22,500	630	0.016~0.032	17,000	450	0.016~0.024	11,500	270	0.008~0.016
1.0	18,000	630	0.020~0.040	13,500	450	0.020~0.030	9,000	270	0.010~0.020
1.2	14,400	630	0.025~0.050	11,700	450	0.025~0.040	7,200	270	0.012~0.025
1.5	11,700	630	0.030~0.060	9,000	450	0.030~0.050	5,850	270	0.015~0.030
2.0	9,000	630	0.040~0.080	7,200	450	0.040~0.060	4,500	270	0.020~0.040

절입기준

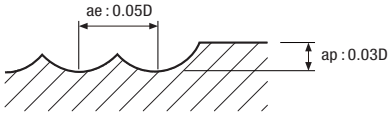


U-Star Endmill

UB502---P series

피삭재	합금강,탄소강 (SCM, SNCM, S45C)		프리하든강 (NAK, CENA, KP4)		고경도강 (SKD, SKT, STAVAX)	
강도	~HRC35		HRC35~45		HRC45~55	
절삭조건	~1100N/mm²		1100 ~ 1500N/mm²		1500 ~ 2000N/mm²	
공구직경(Ø)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
0.1	40,000	550	40,000	500	33,000	400
0.2	30,000	720	30,000	630	27,000	575
0.3	30,000	900	30,000	810	27,000	720
0.4	30,000	1,140	30,000	1,020	27,000	900
0.5	30,000	1,440	30,000	1,260	27,000	1,140
0.6	30,000	1,740	30,000	1,500	27,000	1,320
0.8	30,000	2,340	30,000	1,980	27,000	1,800
1.0	30,000	2,880	30,000	2,520	27,000	2,280
1.2	30,000	3,060	28,800	2,580	25,800	2,310
1.5	30,000	3,240	28,800	2,700	25,800	2,400
2.0	29,820	3,420	28,680	2,880	24,000	2,400
3.0	19,860	3,600	19,080	3,180	15,900	2,400
4.0	14,940	3,600	14,340	3,180	12,000	2,400
5.0	11,160	3,480	10,680	2,940	9,000	2,250
6.0	8,340	2,910	8,040	2,460	6,600	1,860
8.0	6,660	2,520	6,420	2,100	5,400	1,620
10.0	5,580	2,220	5,340	1,860	4,500	1,440
12.0	4,170	1,770	4,008	1,500	3,360	1,140
16.0	3,340	1,590	3,210	1,320	2,700	1,020
20.0	2,670	1,410	2,580	1,170	2,160	900
25.0	2,130	1,150	2,060	950	1,730	730

절입기준



UB512, UB512S6 series

피삭재		합금강,탄소강 (SCM, SNCM, S45C)			프리하든강 (NAK, CENA, KP4)			고경도강 (SKD, SKT, STAVAX)		
강도		~HRC35			HRC35~45			HRC45~55		
절삭조건		~1100N/mm²			1100~1500N/mm²			1500~2000N/mm²		
공구직경 (Ø)	유효길이 (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	ap (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	ap (mm)	테이블이송 vf (mm/min)	Feed vf (mm/min)	ap (mm)
0.1	0.2	50000	240	0.009	50000	215	0.007	50000	190	0.005
0.1	0.3	50000	240	0.009	50000	215	0.007	50000	190	0.005
0.1	0.5	50000	240	0.006	50000	215	0.005	50000	190	0.004
0.1	1	45000	195	0.002	45000	175	0.002	45000	155	0.001
0.2	0.5	50000	335	0.018	50000	310	0.014	43200	260	0.010
0.2	1	50000	335	0.013	50000	310	0.010	43200	260	0.007
0.2	1.5	45000	270	0.007	45000	250	0.006	38880	210	0.004
0.2	2	45000	270	0.005	45000	250	0.004	38880	210	0.003
0.2	3	45000	270	0.003	45000	250	0.003	38880	210	0.002
0.3	1	50000	475	0.019	50000	430	0.015	42800	365	0.011
0.3	1.5	50000	475	0.019	50000	430	0.015	42800	365	0.011
0.3	2	45000	385	0.011	45000	350	0.008	38520	295	0.006
0.3	2.5	45000	385	0.007	45000	350	0.005	38520	295	0.004
0.3	3	45000	385	0.007	45000	350	0.005	38520	295	0.004
0.3	4	40000	305	0.004	40000	275	0.003	34240	235	0.002
0.3	5	30000	200	0.003	30000	180	0.002	25680	155	0.002
0.4	1	41000	490	0.036	38800	425	0.028	34200	340	0.020
0.4	1.5	41000	490	0.025	38800	425	0.020	34200	340	0.014
0.4	2	41000	490	0.025	38800	425	0.020	34200	340	0.014
0.4	2.5	36900	395	0.014	34920	345	0.011	30780	275	0.008
0.4	3	36900	395	0.014	34920	345	0.011	30780	275	0.008
0.4	4	36900	395	0.009	34920	345	0.007	30780	275	0.005
0.4	5	32800	315	0.009	31040	270	0.007	27360	220	0.005
0.4	6	32800	315	0.005	31040	270	0.004	27360	220	0.003
0.4	8	24600	205	0.004	23280	180	0.003	20520	145	0.002
0.4	10	12300	90	0.004	11640	75	0.003	10260	60	0.002
0.5	1	34200	685	0.045	32300	580	0.035	28500	515	0.025
0.5	1.5	34200	685	0.045	32300	580	0.035	28500	515	0.025
0.5	2	34200	685	0.032	32300	580	0.025	28500	515	0.018
0.5	2.5	34200	685	0.032	32300	580	0.025	28500	515	0.018
0.5	3	30780	555	0.018	29070	470	0.014	25650	415	0.010
0.5	4	30780	555	0.018	29070	470	0.014	25650	415	0.010
0.5	5	30780	555	0.011	29070	470	0.009	25650	415	0.006
0.5	6	27360	440	0.011	25840	370	0.009	22800	330	0.006
0.5	8	20520	290	0.007	19380	245	0.005	17100	215	0.004
0.5	10	20520	290	0.005	19380	245	0.004	17100	215	0.003
0.5	12	10260	125	0.005	9690	105	0.004	8550	95	0.003
0.5	14	10260	125	0.005	9690	105	0.004	8550	95	0.003
0.5	16	3420	35	0.005	3230	30	0.004	2850	25	0.003
0.6	1	34200	1025	0.038	32300	840	0.029	28500	685	0.021
0.6	2	34200	1025	0.038	32300	840	0.029	28500	685	0.021
0.6	3	34200	1025	0.038	32300	840	0.029	28500	685	0.021
0.6	4	30780	830	0.022	29070	680	0.017	25650	555	0.012

U-Star Endmill

UB512, UB512S6 series

피삭재		합금강,탄소강 (SCM, SNCM, S45C)			프리하든강 (NAK, CENA, KP4)			고경도강 (SKD, SKT, STAVAX)		
강도		~HRC35			HRC35~45			HRC45~55		
절삭조건		~1100N/mm²			1100~1500N/mm²			1500~2000N/mm²		
공구직경 (Ø)	유효길이 (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	ap (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	ap (mm)	테이블이송 vf (mm/min)	Feed vf (mm/min)	ap (mm)
0.6	5	30780	830	0.014	29070	680	0.011	25650	555	0.008
0.6	6	30780	830	0.014	29070	680	0.011	25650	555	0.008
0.6	8	27360	655	0.008	25840	540	0.006	22800	440	0.005
0.6	10	20520	430	0.005	19380	355	0.004	17100	290	0.003
0.6	12	20520	430	0.005	19380	355	0.004	17100	290	0.003
0.6	14	10260	185	0.005	9690	150	0.004	8550	125	0.003
0.6	16	10260	185	0.005	9690	150	0.004	8550	125	0.003
0.7	2	34200	1130	0.063	32300	930	0.049	28500	765	0.035
0.7	4	30780	915	0.025	29070	755	0.020	25650	620	0.014
0.7	6	30780	915	0.016	29070	755	0.012	25650	620	0.009
0.7	8	27360	725	0.016	25840	595	0.012	22800	490	0.009
0.7	10	27360	725	0.009	25840	595	0.007	22800	490	0.005
0.7	12	20520	475	0.006	19380	390	0.005	17100	320	0.004
0.8	2	34200	1230	0.072	32300	1035	0.056	28500	855	0.040
0.8	3	34200	1230	0.050	32300	1035	0.039	28500	855	0.028
0.8	4	34200	1230	0.050	32300	1035	0.039	28500	855	0.028
0.8	5	30780	995	0.029	29070	840	0.022	25650	695	0.016
0.8	6	30780	995	0.029	29070	840	0.022	25650	695	0.016
0.8	8	30780	995	0.018	29070	840	0.014	25650	695	0.010
0.8	10	27360	785	0.018	25840	660	0.014	22800	545	0.010
0.8	12	27360	785	0.011	25840	660	0.008	22800	545	0.006
0.8	14	20520	515	0.007	19380	435	0.006	17100	360	0.004
0.8	16	20520	515	0.007	19380	435	0.006	17100	360	0.004
0.8	20	10260	220	0.007	9690	185	0.006	8550	155	0.004
0.9	4	29250	1120	0.032	27630	935	0.025	24390	775	0.018
0.9	6	29250	1120	0.032	27630	935	0.025	24390	775	0.018
0.9	8	29250	1120	0.020	27630	935	0.016	24390	775	0.011
0.9	10	26000	885	0.020	24560	740	0.016	21680	610	0.011
1.0	2	30800	1540	0.090	29100	1310	0.070	25700	1075	0.050
1.0	3	30800	1540	0.090	29100	1310	0.070	25700	1075	0.050
1.0	4	30800	1540	0.063	29100	1310	0.049	25700	1075	0.035
1.0	5	30800	1540	0.063	29100	1310	0.049	25700	1075	0.035
1.0	6	27720	1245	0.036	26190	1060	0.028	23130	870	0.020
1.0	7	27720	1245	0.036	26190	1060	0.028	23130	870	0.020
1.0	8	27720	1245	0.036	26190	1060	0.028	23130	870	0.020
1.0	10	27720	1245	0.023	26190	1060	0.018	23130	870	0.013
1.0	12	24640	985	0.023	23280	840	0.018	20560	690	0.013
1.0	14	24640	985	0.014	23280	840	0.011	20560	690	0.008
1.0	16	18480	645	0.014	17460	550	0.011	15420	450	0.008
1.0	18	18480	645	0.009	17460	550	0.007	15420	450	0.005
1.0	20	18480	645	0.009	17460	550	0.007	15420	450	0.005
1.0	22	9240	275	0.009	8730	235	0.007	7710	195	0.005
1.0	26	9240	275	0.009	8730	235	0.007	7710	195	0.005

UB512, UB512S6 series

피삭재		합금강,탄소강 (SCM, SNCM, S45C)			프리하든강 (NAK, CENA, KP4)			고경도강 (SKD, SKT, STAVAX)		
강도		~HRC35			HRC35~45			HRC45~55		
절삭조건		~1100N/mm²			1100~1500N/mm²			1500~2000N/mm²		
공구직경 (Ø)	유효길이 (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	ap (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	ap (mm)	테이블이송 vf (mm/min)	Feed vf (mm/min)	ap (mm)
1.0	30	9240	275	0.009	8730	235	0.007	7710	195	0.005
1.0	40	3080	75	0.009	2910	65	0.007	2570	55	0.005
1.0	50	3080	75	0.006	2910	65	0.005	2570	55	0.003
1.2	4	26300	1375	0.076	24800	1150	0.059	21900	950	0.042
1.2	6	26300	1375	0.076	24800	1150	0.059	21900	950	0.042
1.2	8	23670	1115	0.043	22320	930	0.034	19710	770	0.024
1.2	10	23670	1115	0.027	22320	930	0.021	19710	770	0.015
1.2	12	23670	1115	0.027	22320	930	0.021	19710	770	0.015
1.2	16	21040	880	0.016	19840	735	0.013	17520	610	0.009
1.2	20	15780	580	0.011	14880	485	0.008	13140	400	0.006
1.2	26	7890	245	0.011	7440	205	0.008	6570	170	0.006
1.4	6	21500	1295	0.088	20300	1100	0.069	18000	935	0.049
1.4	8	19350	1050	0.050	18270	890	0.039	16200	755	0.028
1.4	10	19350	1050	0.050	18270	890	0.039	16200	755	0.028
1.4	16	17200	830	0.032	16240	705	0.025	14400	600	0.018
1.5	4	23900	1580	0.135	22600	1355	0.105	20000	1075	0.075
1.5	5	23900	1580	0.095	22600	1355	0.074	20000	1075	0.053
1.5	6	23900	1580	0.095	22600	1355	0.074	20000	1075	0.053
1.5	7	23900	1580	0.095	22600	1355	0.074	20000	1075	0.053
1.5	8	21510	1280	0.054	20340	1100	0.042	18000	870	0.030
1.5	10	21510	1280	0.054	20340	1100	0.042	18000	870	0.03
1.5	12	21510	1280	0.054	20340	1100	0.042	18000	870	0.030
1.5	14	21510	1280	0.034	20340	1100	0.026	18000	870	0.019
1.5	16	19120	1010	0.034	18080	865	0.026	16000	690	0.019
1.5	18	19120	1010	0.034	18080	865	0.026	16000	690	0.019
1.5	20	19120	1010	0.020	18080	865	0.016	16000	690	0.011
1.5	22	19120	1010	0.020	18080	865	0.016	16000	690	0.011
1.5	26	14340	665	0.014	13560	570	0.011	12000	450	0.008
1.5	30	14340	665	0.014	13560	570	0.011	12000	450	0.008
1.5	35	7170	285	0.010	6780	245	0.008	6000	195	0.005
1.5	40	7170	285	0.010	6780	245	0.008	6000	195	0.005
1.6	4	22200	1555	0.101	21000	1300	0.078	18500	1110	0.056
1.6	6	22200	1555	0.101	21000	1300	0.078	18500	1110	0.056
1.6	8	22200	1555	0.101	21000	1300	0.078	18500	1110	0.056
1.6	10	19980	1260	0.058	18900	1055	0.045	16650	900	0.032
1.6	12	19980	1260	0.058	18900	1055	0.045	16650	900	0.032
1.6	16	19980	1260	0.036	18900	1055	0.028	16650	900	0.020
1.6	20	17760	995	0.036	16800	830	0.028	14800	710	0.020
1.8	4	22200	1780	0.113	21000	1470	0.088	18500	1225	0.063
1.8	6	22200	1780	0.113	21000	1470	0.088	18500	1225	0.063
1.8	8	22200	1780	0.113	21000	1470	0.088	18500	1225	0.063
1.8	10	19980	1440	0.065	18900	1190	0.050	16650	990	0.036
1.8	12	19980	1440	0.065	18900	1190	0.050	16650	990	0.036

U-Star Endmill

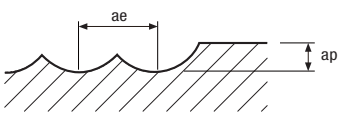
UB512, UB512S6 series

피삭재		합금강,탄소강 (SCM, SNCM, S45C)			프리하든강 (NAK, CENA, KP4)			고경도강 (SKD, SKT, STAVAX)		
강도		~HRC35			HRC35~45			HRC45~55		
절삭조건		~1100N/mm²			1100~1500N/mm²			1500~2000N/mm²		
공구직경 (Ø)	유효길이 (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	ap (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	ap (mm)	테이블이송 vf (mm/min)	Feed vf (mm/min)	ap (mm)
1.8	16	19980	1440	0.041	18900	1190	0.032	16650	990	0.023
1.8	20	17760	1140	0.041	16800	940	0.032	14800	785	0.023
2.0	6	18000	1795	0.18	17000	1525	0.140	15000	1285	0.100
2.0	8	18000	1795	0.126	17000	1525	0.098	15000	1285	0.070
2.0	10	18000	1795	0.126	17000	1525	0.098	15000	1285	0.070
2.0	12	16200	1455	0.072	15300	1235	0.056	13500	1040	0.040
2.0	14	16200	1455	0.072	15300	1235	0.056	13500	1040	0.040
2.0	16	16200	1455	0.072	15300	1235	0.056	13500	1040	0.040
2.0	18	16200	1455	0.045	15300	1235	0.035	13500	1040	0.025
2.0	20	16200	1455	0.045	15300	1235	0.035	13500	1040	0.025
2.0	22	14400	1150	0.045	13600	975	0.035	12000	820	0.025
2.0	26	14400	1150	0.045	13600	975	0.035	12000	820	0.025
2.0	30	14400	1150	0.027	13600	975	0.021	12000	820	0.015
2.0	35	10800	755	0.018	10200	640	0.014	9000	540	0.010
2.0	40	10800	755	0.018	10200	640	0.014	9000	540	0.010
2.0	45	5400	325	0.018	5100	275	0.014	4500	230	0.010
2.0	50	5400	325	0.018	5100	275	0.014	4500	230	0.010
2.0	60	5400	325	0.018	5100	275	0.014	4500	230	0.010
2.5	8	15800	1925	0.158	14900	1605	0.123	13200	1305	0.088
2.5	10	15800	1925	0.158	14900	1605	0.123	13200	1305	0.088
2.5	12	15800	1925	0.158	14900	1605	0.123	13200	1305	0.088
2.5	16	14220	1560	0.090	13410	1300	0.070	11880	1055	0.050
2.5	20	14220	1560	0.090	13410	1300	0.070	11880	1055	0.050
2.5	22	14220	1560	0.056	13410	1300	0.044	11880	1055	0.031
2.5	26	12640	1230	0.056	11920	1025	0.044	10560	835	0.031
2.5	30	12640	1230	0.056	11920	1025	0.044	10560	835	0.031
2.5	35	12640	1230	0.034	11920	1025	0.026	10560	835	0.019
2.5	40	9480	810	0.034	8940	675	0.026	7920	550	0.019
2.5	45	9480	810	0.023	8940	675	0.018	7920	550	0.013
2.5	50	9480	810	0.023	8940	675	0.018	7920	550	0.013
3.0	6	13700	2050	0.270	12900	1730	0.21	11400	1435	0.150
3.0	8	13700	2050	0.270	12900	1730	0.21	11400	1435	0.150
3.0	10	13700	2050	0.189	12900	1730	0.147	11400	1435	0.105
3.0	12	13700	2050	0.189	12900	1730	0.147	11400	1435	0.105
3.0	14	13700	2050	0.189	12900	1730	0.147	11400	1435	0.105
3.0	16	12330	1660	0.108	11610	1400	0.084	10260	1160	0.060
3.0	18	12330	1660	0.108	11610	1400	0.084	10260	1160	0.060
3.0	20	12330	1660	0.108	11610	1400	0.084	10260	1160	0.060
3.0	22	12330	1660	0.108	11610	1400	0.084	10260	1160	0.060
3.0	26	12330	1660	0.068	11610	1400	0.053	10260	1160	0.038
3.0	30	12330	1660	0.068	11610	1400	0.053	10260	1160	0.038
3.0	35	10960	1310	0.068	10320	1105	0.053	9120	920	0.038
3.0	40	10960	1310	0.041	10320	1105	0.032	9120	920	0.023

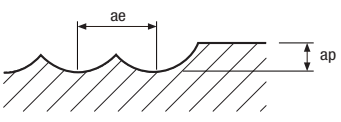
UB512, UB512S6 series

피삭재		합금강,탄소강 (SCM, SNCM, S45C)			프리하든강 (NAK, CENA, KP4)			고경도강 (SKD, SKT, STAVAX)		
강도		~HRC35			HRC35~45			HRC45~55		
절삭조건		~1100N/mm²			1100~1500N/mm²			1500~2000N/mm²		
공구직경 (Ø)	유효길이 (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	ap (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	ap (mm)	테이블이송 vf (mm/min)	Feed vf (mm/min)	ap (mm)
3.0	45	10960	1310	0.041	10320	1105	0.032	9120	920	0.023
3.0	50	8220	860	0.027	7740	725	0.021	6840	605	0.015
3.0	60	8220	860	0.027	7740	725	0.021	6840	605	0.015
4.0	8	9800	1965	0.360	9300	1670	0.28	8200	1395	0.200
4.0	10	9800	1965	0.360	9300	1670	0.28	8200	1395	0.200
4.0	12	9800	1965	0.360	9300	1670	0.28	8200	1395	0.200
4.0	14	9800	1965	0.252	9300	1670	0.196	8200	1395	0.140
4.0	16	9800	1965	0.252	9300	1670	0.196	8200	1395	0.140
4.0	18	9800	1965	0.252	9300	1670	0.196	8200	1395	0.140
4.0	20	9800	1965	0.252	9300	1670	0.196	8200	1395	0.140
4.0	22	8820	1590	0.144	8370	1355	0.112	7380	1130	0.080
4.0	26	8820	1590	0.144	8370	1355	0.112	7380	1130	0.080
4.0	30	8820	1590	0.144	8370	1355	0.112	7380	1130	0.080
4.0	35	8820	1590	0.090	8370	1355	0.07	7380	1130	0.050
4.0	40	8820	1590	0.090	8370	1355	0.07	7380	1130	0.050
4.0	45	7840	1260	0.090	7440	1070	0.07	6560	895	0.050
4.0	50	7840	1260	0.090	7440	1070	0.07	6560	895	0.050
4.0	60	7840	1260	0.054	7440	1070	0.042	6560	895	0.030
5.0	15	7700	1845	0.315	7300	1455	0.245	6400	1285	0.175
5.0	20	7700	1845	0.315	7300	1455	0.245	6400	1285	0.175
5.0	26	6930	1495	0.180	6570	1180	0.14	5760	1040	0.100
5.0	30	6930	1495	0.180	6570	1180	0.14	5760	1040	0.100
5.0	35	6930	1495	0.180	6570	1180	0.14	5760	1040	0.100
5.0	40	6930	1495	0.180	6570	1180	0.14	5760	1040	0.100
5.0	50	6930	1495	0.113	6570	1180	0.088	5760	1040	0.063
5.0	60	6160	1180	0.113	5840	930	0.088	5120	820	0.063
6.0	20	6500	1900	0.378	6200	1600	0.294	5500	1330	0.210
6.0	30	6500	1900	0.378	6200	1600	0.294	5500	1330	0.210
8.0	25	4850	1800	0.504	4600	1500	0.392	4000	1280	0.280
8.0	30	4850	1800	0.504	4600	1500	0.392	4000	1280	0.280
10.0	30	3850	1650	0.900	3680	1400	0.7	3200	1200	0.500
10.0	40	3850	1650	0.630	3680	1400	0.49	3200	1200	0.350
12.0	32	3200	1520	1.080	3050	1300	0.84	2650	1100	0.600
12.0	45	3200	1520	0.756	3050	1300	0.588	2650	1100	0.420

절입기준



ap: D1~D6 = 0.2mm **ae:** 0.2 × D
D8~D12 = 0.3mm



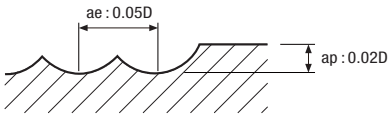
ap: D1~D4 = 0.05 × D **ae:** 0.1 × D
D5~D8 = 0.25mm
D10~D12 = 0.3mm

U-Star Endmill

UB532 series

피삭재	합금강,탄소강 (SCM, SNCM, S45C)		프리하든강 (NAK, CENA, KP4)		고경도강 (SKD, SKT, STAVAX)	
강도	~HRC35		HRC35~45		HRC45~55	
절삭조건	~1100N/mm²		1100 ~ 1500N/mm²		1500 ~ 2000N/mm²	
공구직경(Ø)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
3.0	35,000	2,800	33,000	2,600	12,000	900
4.0	26,000	2,300	25,000	2,200	9,000	800
5.0	21,000	2,100	20,000	2,000	7,000	700
6.0	17,000	1,900	16,000	1,800	6,000	650
8.0	13,000	1,700	12,000	1,600	4,500	550
10.0	10,500	1,450	10,000	1,400	3,500	500
12.0	9,000	1,400	8,000	1,300	3,000	450

절입기준

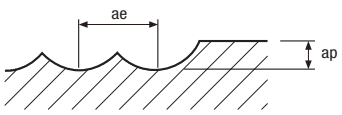


UB542 series

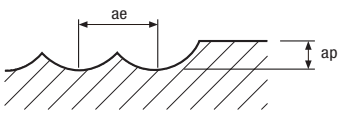
일반 가공

피삭재	합금강,탄소강 (SCM, SNCM, S45C)		프리하든강 (NAK, CENA, KP4)		고경도강 (SKD, SKT, STAVAX)	
강도	~HRC35		HRC35~45		HRC45~55	
절삭조건	~1100N/mm²		1100 ~ 1500N/mm²		1500 ~ 2000N/mm²	
공구직경(Ø)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
0.1	16,500	80	25,500	185	25,500	160
0.2	16,500	90	25,500	220	25,500	200
0.3	15,300	112	24,000	260	24,000	220
0.4	15,300	112	24,000	260	24,000	220
0.5	13,300	128	20,800	300	20,800	250
0.6	11,200	144	17,600	330	17,600	280
0.8	11,200	144	17,600	330	17,600	280
1.0	10,180	160	16,000	370	16,000	320
1.5	9,500	220	13,000	500	12,800	400
2.0	9,250	260	11,500	640	11,300	590
3.0	8,000	370	10,200	880	9,800	850
4.0	6,720	420	8,500	880	8,200	850
5.0	5,840	460	7,500	880	7,200	850
6.0	5,500	660	6,900	920	6,500	880
8.0	4,600	740	5,600	840	5,300	800
10	4,070	820	4,850	800	4,650	770
12	3,700	890	4,350	800	4,150	770

절입기준



ap: D1~D6 = 0.2mm
D8~D12 = 0.3mm
ae: 0.2 × D

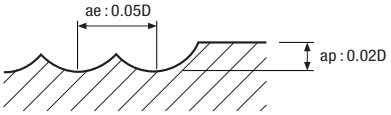


ap: D1~D4 = 0.05 × D
D5~D8 = 0.25mm
D10~D12 = 0.3mm
ae: 0.1 × D

USB502 series

피삭재	합금강,탄소강 (SCM, SNCM, S45C)		프리하든강 (NAK, CENA, KP4)		고경도강 (SKD, SKT, STAVAX)	
강도	~HRC35		HRC35~45		HRC45~55	
절삭조건	~1100N/mm²		1100 ~ 1500N/mm²		1500 ~ 2000N/mm²	
공구직경(Ø)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
3.0	13,500	1,700	13,200	1,620	12,500	860
4.0	10,600	1,700	10,300	1,620	9,800	860
5.0	9,400	1,650	9,050	1,570	8,600	860
6.0	8,600	1,750	8,250	1,670	7,850	865
8.0	7,000	1,550	6,700	1,460	6,350	890
10.0	6,050	1,450	5,800	1,360	5,450	870
12.0	5,450	1,420	5,200	1,330	4,900	785
16.0	4,300	1,200	4,000	1,100	3,700	650
20.0	3,600	1,050	3,200	900	3,000	550

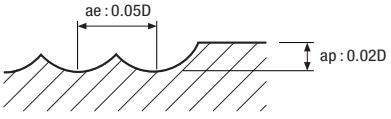
절입기준



UB503 series

피삭재	합금강,탄소강 (SCM, SNCM, S45C)		프리하든강 (NAK, CENA, KP4)		고경도강 (SKD, SKT, STAVAX)	
강도	~HRC35		HRC35~45		HRC45~55	
절삭조건	~1100N/mm²		1100 ~ 1500N/mm²		1500 ~ 2000N/mm²	
공구직경(Ø)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
1.0	50,000	4,150	44,000	3,000	33,000	2100
1.5	40,000	5,100	35,000	3,660	36,400	2600
2.0	33,000	5,890	29,000	4,150	21,700	3000
3.0	25,000	6,930	22,000	4,880	16,500	3490
4.0	21,670	6,930	18,120	4,880	13,400	3490
5.0	18,000	6,520	15,100	4,880	11,160	3320
6.0	16,200	7,710	13,680	5,590	10,980	4050
8.0	12,150	6,610	10,170	4,720	8,280	3580
10.0	9,720	5,870	8,190	4,130	6,620	3100
12.0	8,150	5,490	4,130	3,830	5,520	2870

절입기준

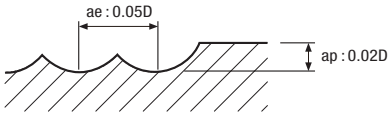


U-Star Endmill

UB504 series

피삭재	합금강,탄소강 (SCM, SNCM, S45C)		프리하든강 (NAK, CENA, KP4)		고경도강 (SKD, SKT, STAVAX)	
강도	~HRC35		HRC35~45		HRC45~55	
절삭조건	~1100N/mm²		1100 ~ 1500N/mm²		1500 ~ 2000N/mm²	
공구직경(Ø)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
1.0	48,000	3,300	35,000	2,350	32,000	2,200
1.5	38,400	4,100	28,000	2,900	25,600	2,700
2.0	31,680	4,600	23,100	3,300	21,000	3,100
3.0	24,000	5,430	17,500	3,880	16,000	3,650
4.0	20,130	5,430	14,880	3,880	14,220	3,650
5.0	16,780	5,430	12,400	3,690	11,670	3,470
6.0	15,200	6,220	12,200	4,500	11,100	3,830
8.0	11,300	5,250	9,200	3,980	8,320	3,350
10.0	9,100	4,590	7,350	3,450	6,660	2,870
12.0	7,590	4,260	6,130	3,190	5,530	2,400

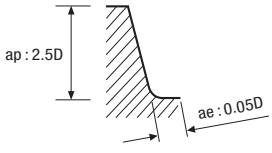
절입기준



UTB502 series

피삭재	합금강,탄소강 (SCM, SNCM, S45C)		프리하든강 (NAK, CENA, KP4)	
강도	~HRC35		HRC35~45	
절삭조건	~ 1100N/mm²		1100 ~ 1500N/mm²	
공구직경(Ø)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
0.4	36,000	144	27,900	113
0.6	25,200	144	18,900	113
0.8	18,000	144	13,950	108
1.0	14,850	149	11,250	113
2.0	7,560	153	5,670	113
3.0	3,969	108	3,213	90
4.0	3,213	126	2,556	104

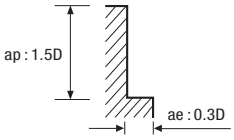
절입기준

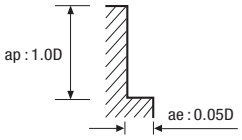


UF50 series

피삭재	비합금강, 합금강, 주철		합금강, 내열합금강		스테인리스강		열처리강			
강도	~HRC30		HRC30~38		HRC38~45		HRC45~55		HRC55~65	
절삭조건	~1000N/mm²		1000~1200N/mm²		1200~1400N/mm²		1400~2000N/mm²		2000N/mm²~	
공구직경(Ø)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
6.0	15,600	2,320	12,400	840	8,400	570	3,400	260	2,400	190
8.0	11,600	2,320	9,200	840	6,300	570	2,400	240	1,800	180
10.0	9,200	2,320	7,600	840	5,100	570	2,000	290	1,300	190
12.0	8,000	2,400	6,000	800	4,200	570	1,680	260	1,200	190
14.0	6,800	2,400	5,200	840	3,600	570	1,400	200	900	130
16.0	6,000	2,400	4,800	760	3,300	510	1,200	160	800	110
18.0	5,200	2,320	4,400	720	2,700	420	1,100	150	700	100
20.0	4,800	2,160	3,600	560	2,400	360	1,000	150	660	100
25.0	4,300	2,150	3,200	620	2,160	410	900	160	600	100

절입기준

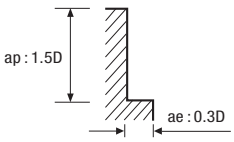


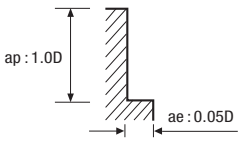


UF51 series

피삭재	합금강,탄소강 (SCM, SNCM, S45C)		프리하든강 (NAK, CENA, KP4)		고경도강 (SKD, SKT, STAVAX)	
강도	~HRC35		HRC35~45		HRC45~55	
절삭조건	~1100N/mm²		1100~1500N/mm²		1500~2000N/mm²	
공구직경(Ø)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
6.0	12,400	840	8,400	570	3,400	260
8.0	9,200	840	6,300	570	2,400	240
10.0	7,600	840	5,100	570	2,000	290
12.0	6,000	800	4,200	570	1,680	260
14.0	5,200	840	3,600	570	1,400	200
16.0	4,800	760	3,300	510	1,200	160
18.0	4,400	720	2,700	420	1,100	150
20.0	3,600	560	2,400	360	1,000	150
25.0	3,200	620	2,160	410	900	160

절입기준



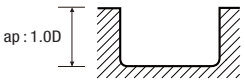


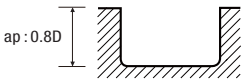
U-Star Endmill

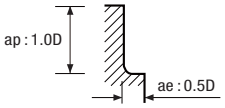
UF51---H series

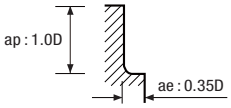
피삭재 / 절삭조건 / 공구직경(Ø)	합금강,탄소강 (SCM, S45C, S50C)		합금강, 탄소강, 프리하든강 (SCM, SKD, NAK, KP4)		합금강, 탄소강 (SCM, S45C, S50C)		합금강, 탄소강, 프리하든강 (SCM, SKD, NAK, KP4)	
	~HRC25		HRC25~40		~HRC25		HRC25~40	
	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
6.0	12,000	1,550	10,600	1,100	15,800	2,570	14,300	1,850
8.0	9,000	1,650	8,100	1,180	11,900	2,700	10,700	1,950
10.0	7,200	1,650	6,400	1,180	9,500	2,700	8,500	1,950
12.0	6,000	1,540	5,400	1,140	8,000	2,570	7,100	1,850
16.0	4,500	1,500	4,100	1,050	6,000	2,450	5,400	1,750
20.0	3,600	1,330	3,200	900	4,800	2,140	4,300	1,500

절입기준









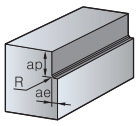
R+ Endmill

RPAE

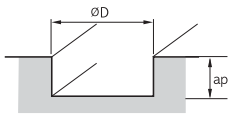
* For Carbide

피삭재 / 절삭조건 / 공구직경(Ø)	알루미늄, 비철금속		알루미늄, 비철금속	
	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
6.0	13,000	1,125	13,000	1,400
8.0	10,400	1,300	10,400	1,600
10.0	10,400	1,585	10,400	2,000
12.0	10,400	1,950	10,400	1,650
14.0	7,800	1,675	7,800	2,050
16.0	7,800	1,755	7,800	2,250
18.0	5,200	1,300	5,200	1,700
20.0	5,200	1,495	5,200	1,800
25.0	5,000	1,495	5,000	1,800

절입기준



■ 측면가공
- ap : ≤ 1.5D
- ae : ≤ 0.15D



■ 홈가공
- ap : ≤ 0.2D

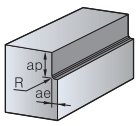
* 가공물 장착 시 강성을 필요로 하며 떨림이 발생할 경우에는 상기 표의 회전속도와 이송을 같은 비율로 내려서 사용

RP(L)E-FP-H

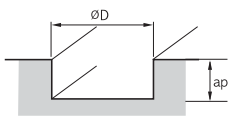
* For Carbide

피삭재 / 절삭조건 / 공구직경(Ø)	합금강, 탄소강 ≤HRC25 이하		합금강, 탄소강, 프리하든강 HRC25~40		합금강, 탄소강 ≤HRC25 이하		합금강, 탄소강, 프리하든강 HRC25~40	
	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
6.0	12,000	1,550	10,600	1,100	15,800	2,570	14,300	1,850
8.0	9,000	1,650	8,100	1,180	11,900	2,700	10,700	1,950
10.0	7,200	1,650	6,400	1,180	9,500	2,700	8,500	1,950
12.0	6,000	1,540	5,400	1,140	8,000	2,570	7,100	1,850
14.0	5,200	1,540	4,750	1,095	7,000	2,510	6,250	1,800
16.0	4,500	1,540	4,100	1,050	6,000	2,450	5,400	1,750
18.0	4,400	1,435	3,650	975	5,400	2,295	4,850	1,625
20.0	3,600	1,330	3,200	900	4,800	2,140	4,300	1,500
25.0	3,200	1,200	2,800	850	4,400	2,000	3,800	1,400

절입기준



■ 측면가공
- ap : ≤ 1.0D
- ae : ≤ 0.5D (≤HRC25 이하)
  ≤ 0.35D (HRC25~40)



■ 홈가공
- ap : ≤ 1.0D (≤HRC25 이하)
  ≤ 0.8D (HRC25~40)

* 가공물 장착 시 강성을 필요로 하며 떨림이 발생할 경우에는 상기 표의 회전속도와 이송을 같은 비율로 내려서 사용

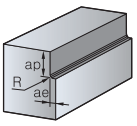
R+ Endmill

RPE-XG

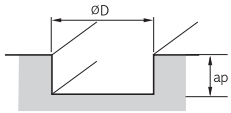
*For Carbide

피삭재 / 절삭조건 / 공구직경(Ø)	합금강, 탄소강 ≤HRC25 이하		합금강, 탄소강, 프리하든강 HRC25~40		합금강, 탄소강 ≤HRC25 이하		합금강, 탄소강, 프리하든강 HRC25~40	
	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
6.0	12,000	1,090	10,600	770	15,800	1,800	14,300	1,300
8.0	9,000	1,160	8,100	830	11,900	1,890	10,700	1,370
10.0	7,200	1,160	6,400	830	9,500	1,890	8,500	1,370
12.0	6,000	1,080	5,400	800	8,000	1,800	7,100	1,300
14.0	5,200	1,080	4,750	770	7,000	1,760	6,250	1,260
16.0	4,500	1,080	4,100	740	6,000	1,720	5,400	1,230
18.0	4,400	1,000	3,650	680	5,400	1,610	4,850	1,140
20.0	3,600	930	3,200	630	4,800	1,500	4,300	1,050
25.0	3,200	840	2,800	600	4,400	1,400	3,800	980

절입기준



■ 측면가공
- ap : ≤ 1.0D
- ae : ≤ 0.5D (≤HRC25 이하)
  ≤ 0.35D (HRC25~40)



■ 홈가공
- ap : ≤ 1.0D (≤HRC25 이하)
  ≤ 0.8D (HRC25~40)

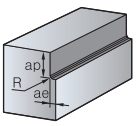
* 가공물 장착 시 강성을 필요로 하며 떨림이 발생할 경우에는 상기 표의 회전속도와 이송을 같은 비율로 내려서 사용

RPE-FP-L

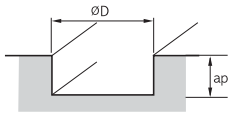
*For Carbide

피삭재 / 절삭조건 / 공구직경(Ø)	합금강, 탄소강 ≤HRC35 이하		프리하든강 HRC35~45		고경도강 HRC45~55	
	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
6.0	12,400	840	8,400	570	3,400	260
8.0	9,200	840	6,300	570	2,400	240
10.0	7,600	840	5,100	570	2,000	290
12.0	6,000	840	4,200	570	1,680	260
14.0	5,200	840	3,600	570	1,400	200
16.0	4,800	760	3,300	510	1,200	160
18.0	4,400	720	2,700	420	1,100	150
20.0	3,600	560	2,400	360	1,000	150
25.0	3,200	620	2,160	410	900	160

절입기준



■ 측면가공
- ap : ≤ 1.0D
- ae : ≤ 0.3D (≤HRC45 이하)
  ≤ 0.05D (HRC45~55)



■ 홈가공
- ap : ≤ 0.3D (≤HRC45 이하)
  ≤ 0.05D (HRC45~55)

* 가공물 장착 시 강성을 필요로 하며 떨림이 발생할 경우에는 상기 표의 회전속도와 이송을 같은 비율로 내려서 사용

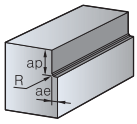
이하

RPE-RG

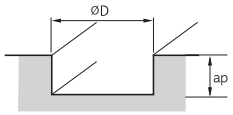
*For Carbide

피삭재 / 절삭조건 / 공구직경(Ø)	합금강, 탄소강 ≤HRC25 이하		합금강, 탄소강, 프리하든강 HRC25~40		합금강, 탄소강 ≤HRC25 이하		합금강, 탄소강, 프리하든강 HRC25~40	
	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
6.0	12,000	1,240	10,600	800	15,800	2,060	14,300	1,480
8.0	9,000	1,320	8,100	940	11,900	2,160	10,700	1,560
10.0	7,200	1,320	6,400	940	9,500	2,160	8,500	1,560
12.0	6,000	1,230	5,400	910	8,000	2,060	7,100	1,480
14.0	5,200	1,230	4,750	880	7,000	2,010	6,250	1,440
16.0	4,500	1,230	4,100	840	6,000	1,960	5,400	1,400
18.0	4,400	1,150	3,650	780	5,400	1,840	4,850	1,300
20.0	3,600	1,060	3,200	720	4,800	1,710	4,300	1,200
25.0	3,200	960	2,800	680	4,400	1,600	3,800	1,120

절입기준



■ 측면가공
- ap : ≤ 1.0D
- ae : ≤ 0.5D (≤HRC25 이하)
  ≤ 0.35D (HRC25~40)



■ 홈가공
- ap : ≤ 1.0D (≤HRC25 이하)
  ≤ 0.8D (HRC25~40)

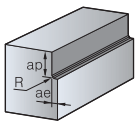
* 가공물 장착 시 강성을 필요로 하며 떨림이 발생할 경우에는 상기 표의 회전속도와 이송을 같은 비율로 내려서 사용

RPE-FF, FP, RG

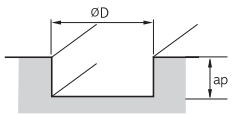
*For HSS PM

피삭재 / 절삭조건 / 공구직경(Ø)	합금강, 탄소강, 공구강		합금강, 탄소강, 공구강 ≤HRC20 이하		합금강, 탄소강, 공구강 HRC20~30		합금강, 탄소강, 공구강 HRC30~40	
	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
6.0	2,700	200	2,100	155	1,500	100	1,250	90
8.0	2,300	250	1,800	200	1,300	140	1,000	110
10.0	1,800	360	1,400	275	1,000	170	850	140
12.0	1,500	360	1,150	290	850	200	700	155
14.0	1,300	360	1,000	290	720	200	600	155
16.0	1,150	360	900	290	625	200	520	155
18.0	1,000	360	850	290	580	200	470	155
20.0	920	370	720	290	500	200	420	155
22.0	850	370	620	290	450	200	380	155
25.0	750	360	570	275	400	190	340	155

절입기준



■ 측면가공
- ap : ≤ 1.5D (모든직경)
- ae : ≤ 0.5D (모든직경)



■ 홈가공
- ap : ≤ 0.15D

* 가공물 장착 시 강성을 필요로 하며 떨림이 발생할 경우에는 상기 표의 회전속도와 이송을 같은 비율로 내려서 사용

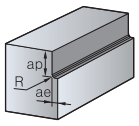
R+ Endmill

RPE-RG

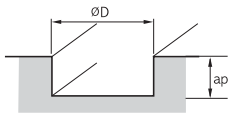
*For HSS PM

피삭재 / 절삭조건 / 공구직경(Ø)	합금강, 탄소강, 공구강		합금강, 탄소강, 공구강 ≤HRC20 이하		합금강, 탄소강, 공구강 HRC20~30		합금강, 탄소강, 공구강 HRC30~40	
	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
6.0	1,800	80	1,600	60	1,200	55	800	30
8.0	1,400	105	1,100	75	900	65	560	45
10.0	1,100	150	900	120	800	110	450	60
12.0	900	180	800	140	630	110	400	70
14.0	800	180	700	140	560	110	350	70
16.0	700	180	560	140	450	110	280	70
18.0	630	180	500	140	400	110	250	70
20.0	560	180	450	140	400	110	220	70
22.0	500	220	450	170	350	140	220	70
25.0	450	220	400	170	310	140	180	85
28.0	400	210	350	160	280	130	160	85
30.0	350	210	310	160	250	130	160	85
32.0	350	210	280	160	220	130	140	85
36.0	310	210	250	160	200	130	120	85
40.0	280	200	220	150	180	120	110	80
50.0	220	200	180	170	160	140	90	80

절입기준



■ 측면가공
- ap : ≤ 1.5D
- ae : ≤ 0.1D



■ 홈가공
- ap : ≤ 0.15D

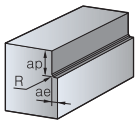
* 가공물 장착 시 강성을 필요로 하며 떨림이 발생할 경우에는 상기 표의 회전속도와 이송을 같은 비율로 내려서 사용

S+ Endmill

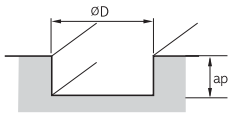
S+ Endmill series

피삭재 / 절삭조건 / 공구직경(Ø)	스테인레스강(STS)		티타늄합금/인코넬		보통강(SS, SM) HRC25 이하		합금강(SCM) HRC25~35 미만		공구강(STD) HRC40~50 미만	
	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
2	5,500	240	2,600	90	9,000	540	6,000	320	4,000	240
4	4,000	260	2,000	90	6,600	600	4,500	340	3,000	280
6	3,000	360	1,200	90	4,800	720	3,000	360	2,500	280
8	2,000	390	1,000	100	3,600	750	2,200	460	2,000	300
10	1,700	410	800	120	2,800	750	1,800	460	1,500	300
12	1,500	380	700	100	2,400	710	1,500	410	1,200	280
14	1,200	320	600	95	2,200	660	1,300	370	1,000	270
16	1,000	270	500	90	1,800	490	1,100	320	800	230
20	750	250	400	85	900	270	900	270	600	200

절입기준



■ 측면가공
- 보통강, 합금강, 스테인레스강 : ap = 1.5D, ae = 0.1D
- 티타늄합금, 인코넬, 소입강 : ap = 1.5D, ae = 0.05D



■ 홈가공
- 보통강, 합금강 : ap = 1.0D
- 스테인레스강 : ap = 0.3D
- 티타늄합금, 인코넬, 소입강 : ap = 0.2D

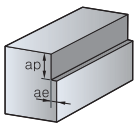
* 가공물 장착 시 강성을 필요로 하며 떨림이 발생할 경우에는 상기 표의 회전속도와 이송을 같은 비율로 내려서 사용

A+ Endmill

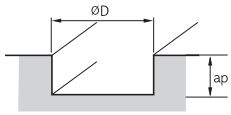
APFE/AFE

구 분	측면가공				홈가공			
피삭재	알루미늄합금 (A7075)		알루미늄합금주물 (AC4B)		알루미늄합금 (A7075)		알루미늄합금주물 (AC4B)	
절삭조건 / 공구직경(Ø)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
1	40,000	480	40,000	368	40,000	368	40,000	280
2	40,000	880	38,000	680	38,000	680	32,000	440
3	32,000	1,120	25,000	760	25,000	760	21,000	480
4	24,000	1,200	19,000	800	19,000	800	13,000	520
5	19,000	1,280	15,000	880	15,000	800	13,000	560
6	16,000	1,520	13,000	960	13,000	880	11,000	600
8	12,000	1,520	9,500	960	9,500	960	8,000	640
10	9,500	1,520	7,600	960	7,600	960	6,400	640
12	8,000	1,520	6,400	960	6,400	960	5,300	640
16	6,000	1,520	4,800	960	4,800	800	4,000	576
20	4,800	1,200	3,800	800	3,800	776	3,200	528

절입기준



■ 측면가공
- ap : ≤ 2.0D
- ae : ≤ 0.2D (D < Ø3)
  ≤ 0.5D (D ≥ Ø3)



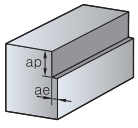
■ 홈가공
- ap : ≤ D (최대 : 12mm)

* 가공물 장착 시 강성을 필요로 하며 떨림이 발생할 경우에는 상기 표의 회전속도와 이송을 같은 비율로 내려서 사용

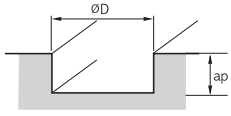
RPAE/APRE

구 분	측면가공				홈가공			
피삭재	알루미늄합금 (A7075)		알루미늄합금주물 (AC4B)		알루미늄합금 (A7075)		알루미늄합금주물 (AC4B)	
절삭조건 / 공구직경(Ø)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
4	20,000	8,000	16,000	6,400	15,000	5,000	12,000	4,000
5	16,000	6,500	12,800	5,200	12,000	4,000	9,600	3,200
6	13,500	6,000	10,800	4,800	10,500	3,800	8,400	3,100
8	10,500	4,700	8,400	3,800	8,000	3,000	6,400	2,400
10	8,500	3,800	6,800	3,100	6,500	2,500	5,200	2,000
12	6,800	3,050	5,500	2,500	5,250	2,000	4,200	1,600
14	5,800	2,600	4,700	2,100	4,500	1,700	3,600	1,400
16	5,200	2,350	4,200	1,900	4,000	1,500	3,200	1,200
18	4,700	2,100	3,800	1,700	3,550	1,300	2,900	1,100
20	4,200	1,900	3,400	1,600	3,200	1,200	2,600	1,000
25	3,400	1,500	2,800	1,200	2,550	1,000	2,100	800

절입기준



■ 측면가공
- ap : ≤ 1.5D
- ae : ≤ 0.5D



■ 홈가공
- ap : ≤ 1.5D

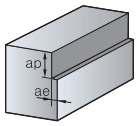
* 가공물 장착 시 강성을 필요로 하며 떨림이 발생할 경우에는 상기 표의 회전속도와 이송을 같은 비율로 내려서 사용

Solid Endmills for Aluminum

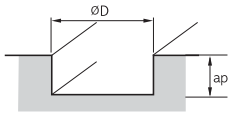
SSEA2000

구 분	측면가공				홈가공			
피삭재	알루미늄합금 (A7075)		알루미늄합금주물 (AC4B)		알루미늄합금 (A7075)		알루미늄합금주물 (AC4B)	
절삭조건 / 공구직경(Ø)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
1	40,000	480	40,000	368	40,000	368	40,000	280
2	40,000	880	38,000	680	38,000	680	32,000	440
3	32,000	1,120	25,000	760	25,000	760	21,000	480
4	24,000	1,200	19,000	800	19,000	800	13,000	520
5	19,000	1,280	15,000	880	15,000	800	13,000	560
6	16,000	1,520	13,000	960	13,000	880	11,000	600
8	12,000	1,520	9,500	960	9,500	960	8,000	640
10	9,500	1,520	7,600	960	7,600	960	6,400	640
12	8,000	1,520	6,400	960	6,400	960	5,300	640
16	6,000	1,520	4,800	960	4,800	800	4,000	576
20	4,800	1,200	3,800	800	3,800	776	3,200	528

절입기준



■ 측면가공
- ap : ≤ 2.0D
- ae : ≤ 0.2D (D < Ø3)
  ≤ 0.5D (D ≥ Ø3)



■ 홈가공
- ap : ≤ D (최대 : 12mm)

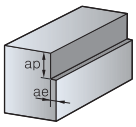
* 가공물 장착 시 강성을 필요로 하며 떨림이 발생할 경우에는 상기 표의 회전속도와 이송을 같은 비율로 내려서 사용

D Endmill

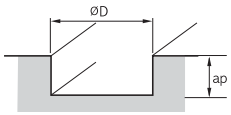
Flat type

구 분	DFE2000 (홈가공용)		DFE2000 (측면가공용)		DFE4000 (측면가공용)	
피삭재	흑연(그라파이트)					
절삭조건 / 공구직경(Ø)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
1.0	40,000	500	40,000	700	-	-
2.0	25,000	570	25,000	800	25,000	1,600
3.0	20,000	570	20,000	800	20,000	1,600
4.0	18,000	680	18,000	950	18,000	1,900
5.0	14,000	960	14,000	1,200	14,000	2,400
6.0	11,000	1,000	11,000	1,400	11,000	2,800
8.0	8,000	930	8,000	1,300	8,000	2,600
10.0	6,500	860	6,500	1,200	6,500	2,400
12.0	5,500	860	5,500	1,200	5,500	2,400

절입기준



■ 측면가공
- D ≤ Ø2.5, ap = 1.5D, ae = 0.05D
- D > Ø2.5, ap = 1.5D, ae = 0.1D



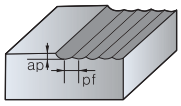
■ 홈가공
- D ≤ Ø2.5, ap = 0.3D
- D > Ø2.5, ap = 0.5D

* 가공물 장착 시 강성을 필요로 하며 떨림이 발생할 경우에는 상기 표의 회전속도와 이송을 같은 비율로 내려서 사용

Ball type

구 분	DBE2000		DBE4000	
피삭재	흑연(그라파이트)			
절삭조건 / 공구직경(Ø)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
1.0	16,000	400	-	-
2.0	16,000	800	16,000	1,200
3.0	16,000	1,450	16,000	2,000
4.0	16,000	2,100	16,000	3,100
5.0	15,500	2,550	15,000	3,800
6.0	15,000	2,950	15,000	4,400
8.0	13,000	3,000	13,000	4,500
10.0	11,500	3,000	12,000	4,600
12.0	10,700	3,200	10,000	4,700

절입기준



■ 홈가공
- ap = 0.2D
- pf = 0.2D

* 가공물 장착 시 강성을 필요로 하며 떨림이 발생할 경우에는 상기 표의 회전속도와 이송을 같은 비율로 내려서 사용

※ 주의사항

- 절삭조건은 기계의 상태, 가공형태 및 목적에 알맞게 조정하여 사용
- 가공물 장착 시 강성을 필요로 하며 떨림이 발생할 경우 회전속도와 이송을 같은 비율로 낮추어 사용
- 공구 오버행에 따라 돌출길이 3D 이상의 경우 회전속도와 이송을 낮추어 적용

T Endmill

Titanium/Co-Cr

공구직경(Ø)	가공 영역	절입 ap (mm)	절입 ae (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
3.0	황삭	0.12	0.7	10,500	1,150
2.5	중삭	0.08	0.53	11,500	850
2.0	중삭	0.08	0.42	14,500	850
1.5	정삭	0.04	0.32	19,000	850
1.0	정삭	0.02	0.07	28,500	850
0.6	정삭	0.02	0.07	28,500	850

Zirconia

공구직경(Ø)	가공 영역	절입 ap (mm)	절입 ae (mm)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
3.0	황삭	0.5	1.5	23,500	1,600
2.5	중삭	0.3	1.25	28,000	1,200
2.0	정삭	0.3	1.0	35,000	1,200
1.0	정삭	0.1	0.2	38,500	1,050
0.6	정삭	0.1	0.2	63,500	630

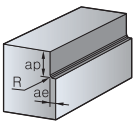
M+ Endmill

MPRE4000-B

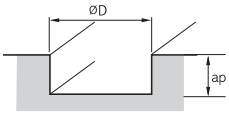
*For Carbide

피삭재 / 절삭조건 / 공구직경(Ø)	합금강, 탄소강 (AISI1049, Cast iron, S50C, SCM) HRC30 이하		스테인레스강 (Pre-hardened steels, STD61, NAK) HRC30~45		주철 (Grey cast iron, Spher, Graphite/malleable cast iron)	
	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)	회전속도 n (min⁻¹)	테이블이송 vf (mm/min)
6.0	12,400	840	8,400	570	3,400	260
8.0	9,200	840	6,300	570	2,400	240
10.0	7,600	840	5,100	570	2,000	290
12.0	6,000	840	4,200	570	1,680	260
14.0	5,200	840	3,600	570	1,400	200
16.0	4,800	760	3,300	510	1,200	160
18.0	4,400	720	2,700	420	1,100	150
20.0	3,600	560	2,400	360	1,000	150
25.0	3,200	620	2,160	410	900	160

절입기준



■ 측면가공
- ap : ≤ 1.5D
- ae : ≤ 0.1D



■ 홈가공
- ap : ≤ 0.05D (D ≤ Ø2)
  ≤ 0.1D (D > Ø2)

* 가공물 장착 시 강성을 필요로 하며 떨림이 발생할 경우에는 상기 표의 회전속도와 이송을 같은 비율로 내려서 사용

PCD Endmill

피삭재	vc (m/min)	n (min⁻¹)	fz (mm/t)
알루미늄합금, 동합금	30~300	2,000~12,000	0.02~0.07
강화플라스틱	35~300	2,800~16,000	0.04~0.12
카본, 흑연	10~100	5,300~16,000	0.04~0.2

MSD Plus

피삭재 구분				재종	절삭속도 vc (m/min)	이송				
						드릴직경(mm)에 따른 이송(mm/rev)				
ISO		피삭재	경도(HB)			Ø1.0~Ø4.0	Ø4.1~Ø8.0	Ø8.1~Ø12.0	Ø12.1~Ø16.0	Ø16.1~Ø20.0
P	탄소강	저탄소강	80~120	PC325U	90 (80~150)	0.10~0.15	0.16~0.24	0.20~0.30	0.25~0.36	0.30~0.40
		고탄소강	250 이상	PC325U	50 (40~80)	0.08~0.20	0.08~0.20	0.10~0.25	0.15~0.25	0.15~0.30
	합금강	저합금강	140~260	PC325U	90 (80~150)	0.10~0.15	0.16~0.24	0.20~0.30	0.25~0.36	0.30~0.40
		저합금열처리강	200~400	PC325U	60 (50~100)	0.10~0.15	0.16~0.24	0.20~0.30	0.25~0.36	0.30~0.40
		고합금강	50~260	PC325U	50 (40~80)	0.08~0.20	0.08~0.20	0.10~0.25	0.15~0.25	0.15~0.30
		고합금열처리강	over 250	PC325U	50 (40~80)	0.08~0.20	0.08~0.20	0.10~0.25	0.15~0.25	0.15~0.30
M	스테인레스강	오스테 나이트계	135~275	PC325U	45 (25~80)	0.05~0.20	0.05~0.20	0.10~0.25	0.10~0.25	0.15~0.30
		페라이트계 마르텐사이트계	135~275	PC325U	50 (30~80)	0.05~0.20	0.05~0.20	0.10~0.25	0.10~0.25	0.15~0.30
K	주철	회주철	150~230	PC325U	100 (80~150)	0.10~0.15	0.16~0.24	0.20~0.30	0.25~0.36	0.30~0.40
		덕타일주철	160~260	PC325U	90 (70~140)	0.10~0.15	0.16~0.24	0.20~0.30	0.25~0.36	0.30~0.40
N	알루미늄	알루미늄합금	30~150	FG2	150 (125~220)	0.24~0.38	0.38~0.53	0.53~0.75	0.61~0.85	0.68~0.98
	동합금	동합금	150~160	FG2	150 (125~220)	0.10~0.15	0.16~0.24	0.20~0.30	0.25~0.36	0.30~0.40

• 상기 추천절삭조건은 내부 급유 적용, 가공 깊이 5D 이하일 때의 절삭조건입니다.
• 외부 급유 적용 시, 위의 조건의 절삭 속도를 20% 낮추어 주십시오.

MSD Plus-S

피삭재 구분			경도(HB)	재종	절삭속도 vc (m/min)	이송(절입 깊이 = 3D~5D)			
						드릴직경(mm)에 따른 이송(mm/rev)			
ISO		피삭재				Ø2.5~Ø5.0	Ø5.1~Ø8.0	Ø8.1~Ø12.0	Ø12.1~Ø16.0
S	내열합금 (Inconel718 등)	Fe-base	25~35	PC325T	25~30	0.055~0.07	0.07~0.10	0.08~0.13	0.10~0.15
		Ni or Co base	35~45	PC325T	20~25	0.045~0.06	0.06~0.09	0.07~0.12	0.09~0.14
	티타늄 합금 (Ti-6Al-4V 등)	Pure titanium	10~15	PC325T	40~50	0.07~0.11	0.09~0.14	0.12~0.18	0.16~0.23
		α and β alloys	35~45	PC325T	30~40	0.05~0.09	0.07~0.12	0.10~0.16	0.14~0.21

• 상기 추천절삭조건은 내부 급유 적용, 가공 깊이 5D 이하일 때의 절삭조건입니다.

MLD Plus

피삭재 구분			재종	절삭속도 vc (m/min)	이송(절입 깊이 = 10D~25D) 드릴직경(mm)에 따른 이송(mm/rev)		
ISO	피삭재	경도(HB)	추천		Ø3.0~Ø5.0	Ø5.1~Ø8.0	Ø8.1~Ø10.0
P 탄소강	저탄소강	80~120	PC315G	80 (60~90)	0.10~0.15	0.15~0.20	0.20~0.25
P 탄소강	고탄소강	180~280	PC315G	70 (60~80)	0.10~0.15	0.15~0.20	0.20~0.25
P 합금강	저합금강	140~260	PC215G	80 (60~90)	0.10~0.15	0.12~0.17	0.15~0.20
P 합금강	고합금강	50-260	PC215G	70 (60~80)	0.08~0.15	0.10~0.15	0.15~0.20
K 주철	회주철	150-230	PC215G	80 (60~100)	0.10~0.20	0.15~0.20	0.15~0.20
K 주철	덕타일주철	160-260	PC215G	70 (60~80)	0.10~0.20	0.15~0.20	0.15~0.20
N 알루미늄	알루미늄합금	30-150	FG2	120 (100~150)	0.12~0.17	0.15~0.20	0.20~0.25
N 동합금	동합금	150-160	FG2	120 (100~150)	0.12~0.17	0.15~0.20	0.20~0.25

MSD Plus CFRP

피삭재 재질	재종	절삭속도 vc (m/min)	이송(절입 깊이 = 5D) 드릴직경(mm)에 따른 이송(mm/rev)		
			Ø2.5~Ø4.0	Ø4.1~Ø8.0	Ø8.1~Ø12.0
CFRP	ND2100	100 (100~150)	0.03 ~ 0.07	0.03 ~ 0.07	0.03 ~ 0.07

MSFD

피삭재 구분			재종	절삭속도 vc (m/min)	이송(절입 깊이 = 2D~3D) 드릴직경(mm)에 따른 이송(mm/rev)		
ISO	피삭재	경도(HB)	추천		Ø2.5~Ø4.0	Ø4.1~Ø8.0	Ø8.1~Ø12.0
P 탄소강	저탄소강	80~120	PC325U	75 (60~90)	0.03~0.10	0.05~0.15	0.10~0.20
P 탄소강	고탄소강	180~280	PC325U	75 (60~80)	0.03~0.10	0.05~0.15	0.10~0.20
P 합금강	저합금강	140~260	PC325U	65 (50~80)	0.03~0.10	0.05~0.15	0.10~0.20
P 합금강	고합금강	50~260	PC325U	65 (50~80)	0.03~0.10	0.05~0.15	0.10~0.20

WSDP Plus

피삭재 구분				재종	절삭속도 vc (m/min)	이송				
						드릴직경(mm)에 따른 이송(mm/rev)				
ISO		피삭재	경도(HB)			Ø2.5~Ø4.0	Ø4.1~Ø8.0	Ø8.1~Ø12.0	Ø12.1~Ø16.0	Ø16.1~Ø20.0
P	탄소강	저탄소강	80~120	PC320W	72(64~120)	0.08~0.12	0.13~0.19	0.16~0.24	0.20~0.29	0.24~0.32
		고탄소강	250 이상	PC320W	40(32~64)	0.06~0.16	0.06~0.16	0.08~0.20	0.12~0.20	0.12~0.24
	합금강	저합금강	140~260	PC320W	72(64~120)	0.08~0.12	0.13~0.19	0.16~0.24	0.20~0.29	0.24~0.32
		저합금열처리강	200~400	PC320W	48(40~80)	0.08~0.12	0.13~0.19	0.16~0.24	0.20~0.29	0.24~0.32
		고합금강	50~260	PC320W	40(32~64)	0.06~0.16	0.06~0.16	0.08~0.20	0.12~0.20	0.12~0.24
		고합금열처리강	250 이상	PC320W	40(32~64)	0.06~0.16	0.06~0.16	0.08~0.20	0.12~0.20	0.12~0.24
M	스테인레스강	오스테 나이트계	135~275	PC320W	36(20~64)	0.04~0.16	0.04~0.16	0.08~0.20	0.08~0.20	0.12~0.24
		페라이트계 마르텐사이트계	135~275	PC320W	40(24~64)	0.04~0.16	0.04~0.16	0.08~0.20	0.08~0.20	0.12~0.24
K	주철	회주철	150~230	PC320W	80(64~120)	0.08~0.12	0.13~0.19	0.16~0.24	0.20~0.29	0.24~0.32
		덕타일주철	160~260	PC320W	72(56~112)	0.08~0.12	0.13~0.19	0.16~0.24	0.20~0.29	0.24~0.32

• 상기 추천절삭조건은 내부 급유 적용, 가공 깊이 5D 이하일 때의 절삭조건입니다.

SSD-N

SSD-N

피삭재 / 절삭조건 / 공구직경(Ø)	공구강, 합금강		알루미늄, 알루미늄 합금		황동, 청동		엑포시, 레진	
	회전속도 n (min⁻¹)	이송 fn (mm/rev)	회전속도 n (min⁻¹)	이송 fn (mm/rev)	회전속도 n (min⁻¹)	이송 fn (mm/rev)	회전속도 n (min⁻¹)	이송 fn (mm/rev)
3	4,000~7,000	0.02	10,000~12,000	0.03	7,000~10,000	0.02	9,000~12,000	0.08
5	2,400~4,200	0.03	6,000~8,000	0.05	4,200~6,000	0.04	5,400~7,200	0.08
8	1,500~2,600	0.05	3,700~5,000	0.08	2,600~3,700	0.08	3,400~4,500	0.09
12	1,000~1,700	0.06	2,500~3,200	0.12	1,700~2,500	0.12	2,200~3,000	0.11

피삭재 구분				재종	절삭속도 vc (m/min)	드릴직경(mm)에 따른 이송(mm/rev)			
ISO		피삭재	경도(HB)			Ø2.5~Ø4.0	Ø4.1~Ø8.0	Ø8.1~Ø12.0	Ø12.1~Ø15.0
P	탄소강	저탄소강	80~120	Carbide	35 (20~65)	0.02~0.06	0.04~0.08	0.06~0.12	0.10~0.16
N	알루미늄	알루미늄합금	30-150		100 (94~120)	0.03~0.06	0.05~0.08	0.08~0.12	0.12~0.18
	동합금	동합금	150-160		80 (65~95)	0.03~0.06	0.05~0.08	0.08~0.12	0.12~0.18

Burnishing Drill

피삭재	절삭속도 vc (m/min)	드릴직경(mm)에 따른 이송(mm/rev)				
		Ø2.0~3.0	Ø3.5~5.0	Ø5.5~8.0	Ø8.5~12.0	Ø12.5~18.0
알루미늄합금, 동합금	30~60	0.02~0.05	0.03~0.10	0.04~0.15	0.05~0.20	0.05~0.30
알루미늄다이캐스팅합금	50~80	0.02~0.05	0.03~0.10	0.04~0.15	0.05~0.20	0.05~0.30
일반주철(GC)	25~60	0.01~0.04	0.02~0.08	0.05~0.12	0.05~0.20	0.05~0.30
덕타일주철(GCD)	20~50	0.01~0.03	0.02~0.05	0.03~0.08	0.04~0.12	0.05~0.15

PCD Drill

피삭재	vc (m/min)	fn (mm/rev)
CFRP	50~250	0.075 (0.05~0.25)
알루미늄합금		0.050 (0.03~0.20)
카운터싱크 가공		0.040 (0.02~0.15)

Gun Drill

피삭재	경도(HB)	절삭속도 vc (m/min)	드릴직경(mm)에 따른 이송(mm/rev)					
			~Ø4	~Ø6	~Ø10	~Ø14	~Ø24	Ø25~
탄소강 합금강	~150	100~150	0.005~0.015	0.010~0.025	0.015~0.035	0.020~0.050	0.030~0.070	0.040~0.080
	150~250	80~120	0.005~0.010	0.010~0.020	0.015~0.030	0.020~0.040	0.030~0.060	0.030~0.060
	250~350	50~100	0.005~0.010	0.005~0.010	0.010~0.020	0.015~0.030	0.020~0.040	0.020~0.040
	350~	~30	-	0.005~0.010	0.005~0.010	0.010~0.020	0.020~0.035	0.020~0.035
스테인레스강	~250	50~80	0.005~0.015	0.010~0.020	0.010~0.020	0.010~0.030	0.020~0.035	0.020~0.040
	250~350	40~50	-	0.005~0.015	0.010~0.015	0.010~0.020	0.010~0.020	0.010~0.020
주철	~220	80~100	0.010~0.0120	0.020~0.040	0.030~0.050	0.040~0.080	0.080~0.120	0.100~0.150
	220~	40~80	0.005~0.010	0.005~0.015	0.010~0.020	0.015~0.030	0.020~0.050	0.025~0.070
알루미늄합금	-	180~250	0.010~0.020	0.020~0.040	0.030~0.060	0.040~0.080	0.100~0.180	0.150~0.200
경합금	-	120~200	0.005~0.010	0.010~0.020	0.020~0.025	0.020~0.030	0.030~0.040	0.040~0.060

Chucking/Machine Reamer

피삭재	경도(HB)	절삭속도 vc (m/min)	리머 직경		
			~Ø9	Ø10~25	Ø26~60
강	~100kg/mm^2	절삭속도(m/min)	8~12	8~12	8~12
		이송속도(mm/rev)	0.15~0.25	0.20~0.40	0.30~0.50
	100~140kg/mm^2	절삭속도(m/min)	5~10	5~10	5~10
		이송속도(mm/rev)	0.10~0.20	0.15~0.25	0.20~0.40
주철	HB ~220	절삭속도(m/min)	6~12	6~12	8~15
		이송속도(mm/rev)	0.15~0.30	0.30~0.50	0.40~0.80
	HB 220~	절삭속도(m/min)	5~10	5~10	8~12
		이송속도(mm/rev)	0.10~0.20	0.20~0.35	0.30~0.50
황동	HB 50~120	절삭속도(m/min)	8~12	10~15	10~15
		이송속도(mm/rev)	0.10~0.15	0.15~0.25	0.25~0.40
청동	HB 60~100	절삭속도(m/min)	8~12	10~15	10~15
		이송속도(mm/rev)	0.10~0.15	0.15~0.25	0.25~0.40
알루미늄합금	HB 90~120	절삭속도(m/min)	15~25	15~25	20~30
		이송속도(mm/rev)	0.15~0.25	0.25~0.40	0.40~0.70
합성수지	-	절삭속도(m/min)	15~30	20~35	30~40
		이송속도(mm/rev)	0.15~0.25	0.25~0.40	0.40~0.50

PCD Reamer

고속, 고정밀 가공용

피삭재	vc (m/min)	fn (mm/rev)
알루미늄합금	50 ~ 250	0.05~0.20

Cermet Reamer

피삭재	경도 (HRC)	이송 fn (mm/rev)	절삭속도 vc (m/min)
일반탄소강	Under HRC30	0.1~0.4	50~80
고탄소강 합금강	HRC30 ~ 40	0.1~0.4	80~120
	HRC40 ~ 50	0.1~0.4	50~80
합금강	More than HRC50	0.05~0.2	30~60

Counter Sink

CSPC

공구직경 (Ø)	탄소강, 합금강 HRC30 이하		프리하든강 HRC30~45		스테인리스강 HRC30~50		고경도강 HRC45~55		알루미늄합금	
	회전속도 n (min⁻¹)	이송속도 (mm/min)	회전속도 n (min⁻¹)	이송속도 (mm/min)	회전속도 n (min⁻¹)	이송속도 (mm/min)	회전속도 n (min⁻¹)	이송속도 (mm/min)	회전속도 n (min⁻¹)	이송속도 (mm/min)
6.0	3,030	1,550	1,820	600	1,520	500	1,350	240	7,580	3,870
8.0	2,300	1,520	1,370	580	1,150	480	1,015	270	5,750	3,800
10.0	1,840	1,490	1,100	590	920	500	810	270	4,590	3,720
12.0	1,540	1,480	930	610	780	510	690	270	3,850	3,700
16.0	1,150	1,310	690	520	570	460	505	260	2,890	3,470

CSNC/CSHC

1F(홀) 타입

공구직경 (Ø)	탄소강, 합금강 HRC30 이하		프리하든강 HRC30~45		스테인리스강		알루미늄합금	
	절삭속도 (m/min)	이송속도 (mm/min)	절삭속도 (m/min)	이송속도 (mm/min)	절삭속도 (m/min)	이송속도 (mm/min)	절삭속도 (m/min)	이송속도 (mm/min)
~ 10.0	42~72	121	28~48	120	15~17	50	50~110	350
10.0 ~ 20.0		110		70		25		230
20.0 ~ 30.0		75		50		20		200

CSNC

3F 타입

공구직경 (Ø)	탄소강, 합금강 HRC30 이하		프리하든강 HRC30~45		스테인리스강		알루미늄합금	
	절삭속도 (m/min)	이송속도 (mm/min)	절삭속도 (m/min)	이송속도 (mm/min)	절삭속도 (m/min)	이송속도 (mm/min)	절삭속도 (m/min)	이송속도 (mm/min)
~ 10.0	30~60	170	20~40	100	10~12	30	40~100	350
10.0 ~ 20.0		85		60		16		230
20.0 ~ 30.0		60		40		10		200

CSPH

공구직경 (Ø)	탄소강, 합금강 HRC30 이하		프리하든강 HRC30~45		스테인리스강 HRC30~50		고경도강 HRC45~55		알루미늄합금	
	회전속도 n (min⁻¹)	이송속도 (mm/min)	회전속도 n (min⁻¹)	이송속도 (mm/min)	회전속도 n (min⁻¹)	이송속도 (mm/min)	회전속도 n (min⁻¹)	이송속도 (mm/min)	회전속도 n (min⁻¹)	이송속도 (mm/min)
6.3	1,328	230	1,970	350	905	160	807	140	5,760	1,040
8.3	995	230	1,490	360	690	160	610	140	4,370	1,050
10.4	792	230	1,190	360	550	160	487	130	3,485	940
12.4	665	230	1,000	360	460	150	407	130	2,920	960
16.5	500	230	750	360	345	160	307	140	2,200	990
20.5	402	230	600	360	276	160	247	140	1,770	1,010

Counter Sink

CSNH/CSHH

1F(홀) 타입

공구직경 (Ø)	탄소강, 합금강 HRC30 이하		프리하든강 HRC30~45		스테인리스강		알루미늄합금	
	절삭속도 (m/min)	이송속도 (mm/min)	절삭속도 (m/min)	이송속도 (mm/min)	절삭속도 (m/min)	이송속도 (mm/min)	절삭속도 (m/min)	이송속도 (mm/min)
~ 10.0	20~30	110	16~20	55	50~60	255	50~100	450
10.0 ~ 20.0		55		35		180		350
20.0 ~ 30.0		35		55		150		300

CSNH

3F 타입

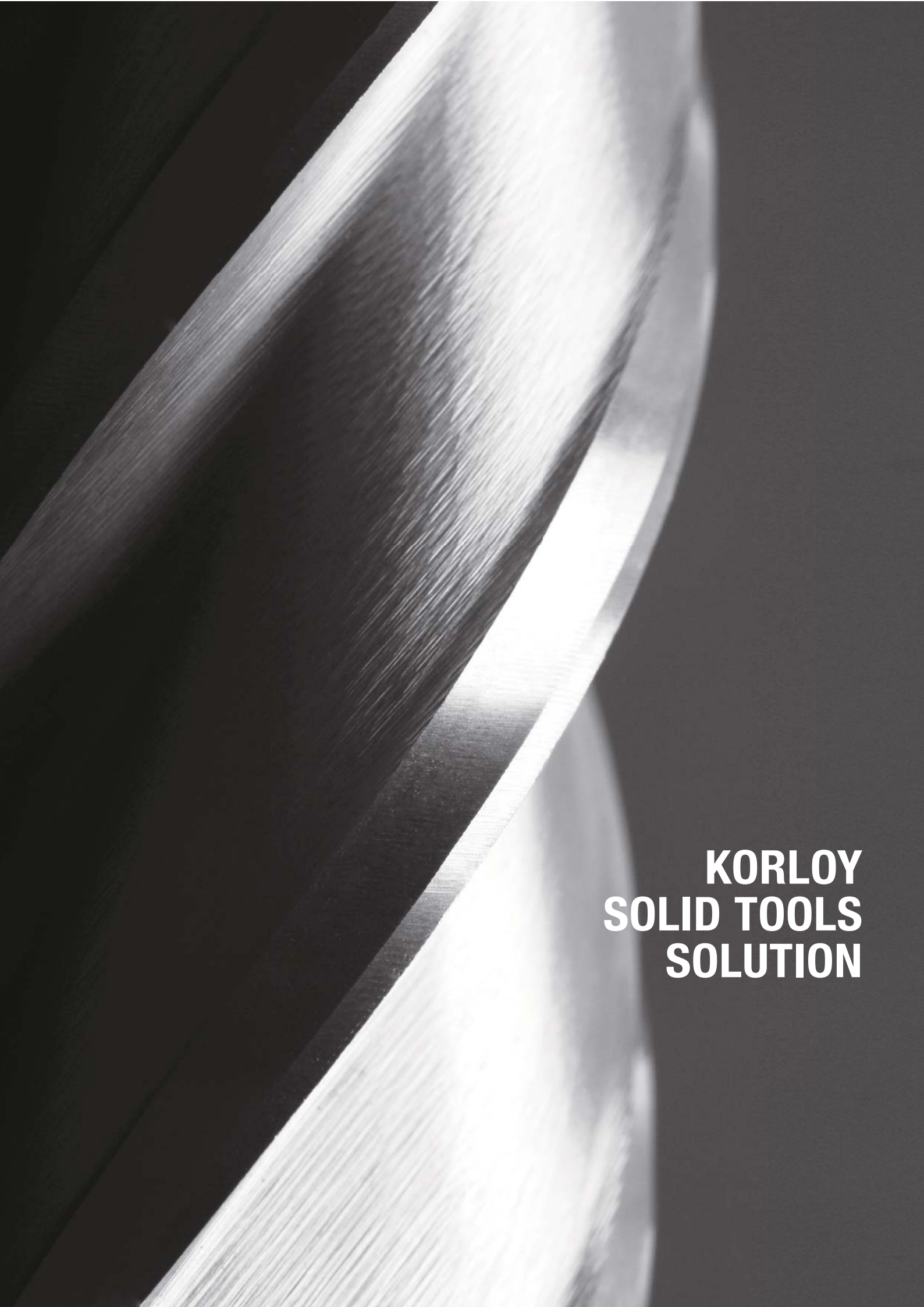
공구직경 (Ø)	탄소강, 합금강 HRC30 이하		프리하든강 HRC30~45		스테인리스강		알루미늄합금		플라스틱	
	절삭속도 (m/min)	이송속도 (mm/min)	절삭속도 (m/min)	이송속도 (mm/min)	절삭속도 (m/min)	이송속도 (mm/min)	절삭속도 (m/min)	이송속도 (mm/min)	절삭속도 (m/min)	이송속도 (mm/min)
~ 10.0	10~15	60	8~12	35	4~6	30	50~60	255	35~70	400
10.0 ~ 20.0		30		25		16		180		300
20.0 ~ 30.0		20		15		10		150		250

TAP

ISO	피삭재		절삭속도 vc(m/min)					절삭유제			
			스트레이트 탭	스파이럴 탭	포인트 탭	초경 탭	롤 탭	불수용성	수용성 (에멀전)	세미 드라이	드라이
P	저탄소강	≥ 0.25 %C	8~13	8~13	15~25	-	8~13	◎	○	△	△
	중탄소강	≥ 0.25~0.45 %C	7~12	7~12	10~15	-	7~10	◎	○	△	△
	고탄소강	≥ 0.45 %C	6~9	6~9	8~13	-	5~8	◎	○	△	△
	합금강	SCM	7~12	7~12	10~15	-	5~8	◎	△	△	△
	조질강	25~45HRC	3~5	3~5	4~6	-	-	◎	△	-	-
	공구강	SKD	6~9	6~9	7~10	-	-	◎	-	-	-
	주강	SCM	6~11	6~11	10~15	-	-	◎	○	-	-
M	스테인레스강	SUS	4~7	5~8	8~13	-	5~10	◎	○	-	-
	석출경화계 스테인레스강	SUS630 SUS631	3~5	3~5	4~6	-	-	◎	-	-	-
K	주철	GC	10~15	-	-	10~20	-	◎	○	○	○
	덕타일주철	GCD	7~12	7~12	10~20	10~20	-	◎	○	○	-
N	동	Cu	6~9	6~11	7~12	10~20	7~12	○	○	-	-
	황동·황동주물	Bs Bsc	10~15	10~20	15~25	15~25	7~12	○	○	○	○
	청동·청동주물	PB PBC	6~11	6~11	10~20	10~20	7~12	○	○	-	-
	알루미늄 압연재	Al	10~20	10~20	15~25	-	10~20	◎	○	△	-
	알루미늄 합금주물	AC ACD	10~15	10~15	15~20	10~20	10~25	◎	○	△	-
	마그네슘 합금주물	MC	7~12	7~12	10~15	10~20	-	◎	○	○	-
	아연합금 주물	ZDC	1~12	7~12	10~15	10~20	7~12	◎	○	△	-
	열경화성 플라스틱	베이클라이트 페놀 에폭시	10~20	-	-	15~25	-	-	○	○	○
	열가소성 플라스틱	염화비닐 나일론	10~20	10~15	10~20	10~20	-	-	○	○	○

◎: 매우적합 ○: 적합 △: 사용가능 – : 사용불가

- 냉간단조, 열간단조, 철계소결 부품의 고이송, 고절입 및 강단속 조건전용
- 우수한 내치핑성, 내결손성 및 내열균열성 확보
- 절삭날의 최적화를 통한 가공물의 면조도 향상



KORLOY
SOLID TOOLS
SOLUTION

⚠ 안전한 사용을 위하여

- 날끝을 직접 손으로 만지면 상처를 입을 수 있으므로 보호장갑 등의 보호구를 사용 바랍니다.
- 잘못된 사용방법이나 사용조건이 부적절할 경우 공구 파손 또는 비산의 위험이 있으므로 안전커버나 보호안경 등의 보호구를 사용해 주십시오.
- 가공물이 움직이지 않도록 단단히 고정하여 주십시오.
- 극심한 부하나 과도한 마모로 공구가 파손되어 상처를 입을 수 있으므로 공구 교환 주기를 빨리하십시오.
- 절삭 가공 시 배출되는 칩(Chip)은 매우 날카롭고 뜨거워 상처나 화상을 입을 수 있으므로 보호구를 사용하여 주시고 칩 제거 시에는 기계를 멈추고 보호장갑을 착용한 후 갈고리 등 전용 공구를 사용 바랍니다.
- 비수용성 절삭유를 사용 시 화재가 발생할 수 있으므로 방화 대책을 세워 주십시오.
- 고속절삭 시 원심력에 의해 부품이나 인써트가 탈락될 수 있으므로 안전보호구를 사용해 주십시오.



코오로이

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