

CARBIDE END MILL GENERAL CATALOG

초경 엔드밀 종합 카탈로그

 주식회사 유엠
UM CO., LTD.

www.um-tool.com


INTERACTIVE PDF INSTRUCTIONS MANUAL

1


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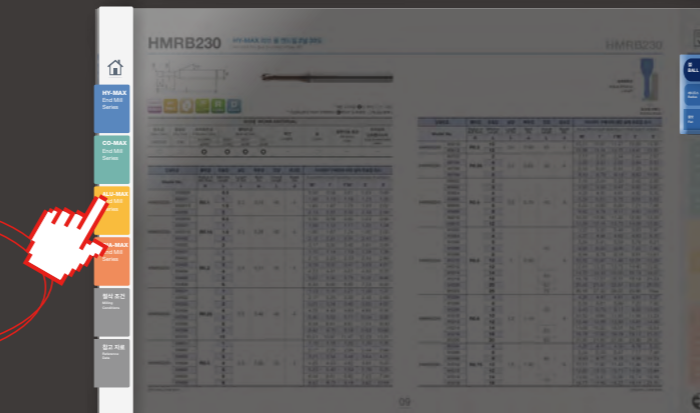
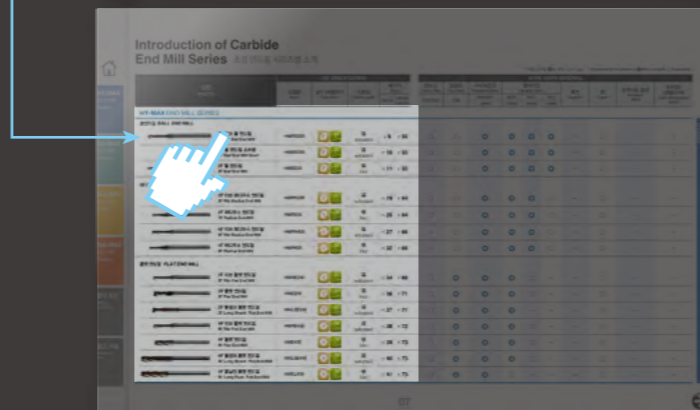
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Please press a button then product, comes out.

2

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3

Using the mouse to move page

Front page



Next page

Interactive PDF는 PDF에 웹기능을 더해 버튼이나 메뉴 클릭시 해당 제품페이지로 이동하여 손쉽게 정보 확인이 가능합니다.





HY-MAX
End Mill
Series

CO-MAX
End Mill
Series

ALU-MAX
End Mill
Series

DIA-MAX
End Mill
Series

절삭 조건
Milling
Conditions

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World-Class Quality Products

유엠은 초경엔드밀 전문 제조기업으로서 세계적 수준의 고정도, 고품질의 제품을 생산하고 있으며, 뛰어난 기술력과 최신의 장비로 만들어 세계적인 품질경쟁력을 인정받고 있습니다.

UM carbide end mill is a world-class company that specializes in manufacturing precision, producing high quality products and the latest technology and equipment to make good quality competitiveness has been recognized worldwide.

최고의 성능
Top performance

최고의 품질
high quality

최고의 효율
Cost efficient process

독창적인 제조공법
Unique process



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END MILL SERIES





아이콘의 설명 Meaning of icons

HY-MAX
End Mill
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CO-MAX
End Mill
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ALU-MAX
End Mill
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DIA-MAX
End Mill
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공구재질 Tool Materials

CARBIDE NANO 나노미립자 초경합금
Nano Grain Carbide

CARBIDE MG 미립자 초경합금
Micro Grain Carbide

코팅 Coating

HY MAX HY-MAX 코팅
HY-MAX Coating

DLC PVD DLC 코팅
DLC Coating

DIA CVD DIAMOND 코팅
DIAMOND Coating

날수 Number of Flutes

2 날
2 Flute

3 날
3 Flute

4 날
4 Flute

비틀림각 Helix Angle

30°
Helix 30°

45°
Helix 45°

볼R공차 Ball Radius Tolerance

R ±0.005 볼R공차 ±0.005
Ball Radius Tolerance ±0.005

R ±0.01 볼R공차 ±0.01
Ball Radius Tolerance ±0.01

코너R공차 Corner Radius Tolerance

CR ±0.01 코너반경 공차 ±0.01
Corner Radius Tolerance ±0.01

날부외경공차 Out Diameter Tolerance

D 0/-0.015 외경공차 0 ~ -0.015
Diameter Tolerance is 0 ~ -0.015

D 0/-0.02 외경공차 0 ~ -0.02
Diameter Tolerance is 0 ~ -0.02

코팅의 특징 Features of Coating

종류	색상	경도(HV)	열저항	마찰계수	코팅막 두께 (µm)	권장분야
Type	Color	Hardness	Heat Resistance	Coefficient of Friction	Coating Thickness	Recommended Parts
HY MAX	구리색 COPPER	3500~3600(HV)	매우우수 Very Good	보통 (0.4) Normal	2~4	강 Steel
	진회색 Dark Gray		보통 Normal	매우우수 (0.1) Very Good		1
DIA CVD	검정색 Black	9000~10,000(HV)	보통 Normal	매우우수 (<0.1) Very Good	4~18	흑연, 유리섬유 강화플라스틱 Graphite, Copper, Glass-fiberreinforced plastic

HY MAX

- 결정질 TiN 매트릭스에 비정질 Si3N4로 둘러싸여진 nano-composite의 다층구조 코팅입니다.
- 이 코팅은 산화 와 마모 및 열전달로부터 절삭날의 날끝을 보호하도록 설계되었습니다.
- 코팅은 절삭날끝의 온도가 1100°C까지 가능하도록 설계되었습니다.

- A multi-layer coating with a nano-composite outer layer with Si3N4 nano-crystallites in a crystalline TiN matrix.
- This coating is designed to protect the cutting edge from heat transfer, oxidation and abrasion.
- The coating is designed to allow a cutting edge temperature of up to 1100°C.

DLC

- 수소를 포함하지 않은 DLC 코팅입니다.
- 얇고 매우 단단한 코팅으로써 절삭날끝의 예리함을 최대한으로 유지하도록 설계되었습니다.
- 매우 낮은 마찰계수는 광범위한 점착성 소재를 가공하는데 있어서 탁월한 성능을 나타냅니다.

- Non-hydrogenated DLC Coating.
- The thin, extremely hard coating is designed to maintain maximum cutting edge sharpness.
- Its very low coefficient of friction exhibits excellent performance in machining a wide range of sticky materials.

DIAMOND

- 순수한 다이아몬드 특성을 가지고 있는 다결정 다이아몬드 코팅입니다.
- 다이아몬드 코팅의 높은 열 전도성은 빠르게 열을 방출합니다. 이는 탄소와 유리섬유 강화 플라스틱 같은 온도에 민감한 재료를 가공시 속도를 높일 수 있습니다.
- 매우 낮은 마찰계수는 광범위한 점착성 소재를 가공하는데 있어서 탁월한 성능을 나타냅니다.
- 또한 높은 인장강도와 압축강도를 가집니다.

- A polycrystalline diamond coating that has the characteristics of pure diamond.
- The diamond coating's high heat conductivity makes for fast heat dissipation. When processing temperature-sensitive materials such as carbon and glass-fiberreinforced plastics, and allows higher processing speed during machining.
- Its very low coefficient of friction exhibits excellent performance in machining a wide range of sticky materials.
- It also has the highest tensile and compressive strength.



볼
Ball

라디우스
Radius

플랫
Flat

볼
Ball

라디우스
Radius

플랫
Flat

플랫
Flat

볼
Ball

라디우스
Radius

플랫
Flat



엔드밀의 모델명 내용 Designation of End Mills

모델명 Model	시리즈 종류	리브(R)/ 롱샹크 (LS)	형상 (볼/레디우스 /플랫)	길이형태	날수	헬릭스 각도	공구 외경	코너R	유효장	날장	전장	샹크경
	SERIES	Rib (R)/ Long Shank(LS)	Geometry (Ball/Radius/ Flat)	Length Type	Flutes	Helix Angle	Dia	Corner R	Effective Length	Length of cut	Overall Length	Shank Dia
HMRB230-06025	HM (HY-MAX)	R (Rib)	B (Ball)		2	30	060 (D6)		25			
HMBS230-08020	HM		B	S	2	30	080		20			
HMB230-06012-090-S06	HM		B		2	30	060			12	090 (90L)	S06 (d6)
HMRR230-060R05-20	HM	R	R (Radius)		2	30	060 (D6)	R05 (R0.5)	20			
HMR230-060R10-090-S06	HM		R		2	30	060 (D6)	R10 (R1)			090	S06
HMRR430-060R05-20	HM	R	R		4	30	060	R05	20			
HMR430-060R10-090-S06	HM		R		4	30	060	R10			090	S06
HMRE230-03016	HM	R	E (Flat)		2	30	030		16			
HME230-06015-060-S06	HM		E		2	30	060			15	060	S06
HMLSE230-06030-090-S06	HM	LS	E		2	30	060		30		090	S06
HMRE430-04016	HM	R	E		4	30	040		16			
HME430-06015-060-S06	HM		E		4	30	060			15	060	S06
HMLSE430-06030-090-S06	HM	LS	E		4	30	060		30		090	S06
HMEL430-12060-130-S12	HM		E	L	4	30	120			60	130	S12
CMRB230-06030	CM (CO-MAX)	R	B		2	30	060		30			
CMRR230-060R10-20	CM	R	R		2	30	060	R10	20			
CMRE230-04016	CM	R	E		2	30	040		16			
CME230-06015-060-S06	CM		E		2	30	060			15	060	S06
ALE345-06015-060-S06	AL (ALU-MAX)		E		3	45	060			15	060	S06
DMRB230-03030-100-S04	DM (DIA-MAX)	R	B		2	30	030		30		100	S04
DMRR430-060R05-30-105-S06	DM	R	R		4	30	060	R05	30		105	S06
DMRE230-02030-080-S04	DM	R	E		2	30	020		30		080	S04
DME430-06020-070-S06	DM		E		4	30	060			20	070	S06
DMLSE430-06030-105-S06	DM	LS	E		4	30	060		30		105	S06

CARBIDE END MILL General Catalog

초경 엔드밀 종합 카탈로그



주식회사 유엠
UM CO., LTD.



볼 엔드밀
Ball

라디우스 엔드밀
Radius

플랫 엔드밀
Flat

HY-MAX

볼 엔드밀
Ball

라디우스 엔드밀
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플랫 엔드밀
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ALU-MAX

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Introduction of Carbide End Mill Series


초경 엔드밀 시리즈별 소개

* 적용 피삭재 (●는 최적, ○는 가능) * Applicable Work Material (●Most Suitable, ○Applicable)









사진 PHOTO	사양 SPECIFICATION					피삭재 WORK MATERIAL									
	모델명 Model	날수/비틀림각 Flutes/Helix	유효장 Effective Length	페이지 (Page)		탄소강 Carbon Steels	합금강 Alloy Steels	프리하든강 Prehardened Steels	열처리강 Hardened Steels			흑연 Graphite	동 Copper	알루미늄 합금 Aluminium Alloys	유리섬유 강화플라스틱 Glass fiberreinforced plastic
				Size List	Milling Condition				SKD61	SKD11	SKH				
						S45C/S50C	SCM	NAK/HPM -40HRC	SKD61 -55HRC	SKD11 -60HRC	SKH -65HRC				

HY-MAX END MILL SERIES















볼엔드밀 BALL END MILL

	2F 리브 볼 엔드밀 2F Rib Ball End Mill	HMRB230		유 adopted	P. 9	P. 32	○	○	●	●	●	-	○	-	-
	2F 볼 엔드밀 쇼트형 2F Ball End Mill Short	HMBS230		유 adopted	P. 10	P. 33	○	○	●	●	●	-	○	-	-
	2F 볼 엔드밀 2F Ball End Mill	HMB230		무 Not	P. 11	P. 33	○	○	●	●	●	-	○	-	-

라디우스 엔드밀 RADIUS END MILL

	2F 리브 라디우스 엔드밀 2F Rib Radius End Mill	HMRR230		유 adopted	P. 11	P. 34	○	○	●	●	○	-	○	-	-
	2F 라디우스 엔드밀 2F Radius End Mill	HMR230		무 Not	P. 14	P. 34	○	○	●	●	○	-	○	-	-
	4F 리브 라디우스 엔드밀 4F Rib Radius End Mill	HMRR430		유 adopted	P. 15	P. 35	-	○	●	●	○	-	○	-	-
	4F 라디우스 엔드밀 4F Radius End Mill	HMR430		무 Not	P. 18	P. 35	-	○	●	●	○	-	○	-	-

플랫 엔드밀 FLAT END MILL

	2F 리브 플랫 엔드밀 2F Rib Flat End Mill	HMRE230		유 adopted	P. 19	P. 36	○	●	●	○	-	-	○	-	-
	2F 플랫 엔드밀 2F Flat End Mill	HME230		무 Not	P. 20	P. 37	○	○	●	○	-	-	○	-	-
	2F 롱샹크 플랫 엔드밀 2F Long Shank Flat End Mill	HMLSE230		유 adopted	P. 20	P. 37	○	○	●	○	-	-	○	-	-
	4F 리브 플랫 엔드밀 4F Rib Flat End Mill	HMRE430		유 adopted	P. 21	P. 38	○	○	●	○	-	-	○	-	-
	4F 플랫 엔드밀 4F Flat End Mill	HME430		무 Not	P. 22	P. 38	○	○	●	○	-	-	○	-	-
	4F 롱샹크 플랫 엔드밀 4F Long Shank Flat End Mill	HMLSE430		유 adopted	P. 22	P. 38	○	○	●	○	-	-	○	-	-
	4F 롱날장 플랫 엔드밀 4F Long Flute Flat End Mill	HMEL430		무 Not	P. 22	P. 38	○	○	●	○	-	-	○	-	-



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HY-MAX




사진 PHOTO	사양 SPECIFICATION				피삭재 WORK MATERIAL									
	모델명 Model	날수/비틀림각 Flutes/Helix	유효장 Effective Length	페이지 (Page)	탄소강 Carbon Steels	합금강 Alloy Steels	프리하든강 Prehardened Steels	열처리강 Hardened Steels			흑연 Graphite	동 Copper	알루미늄 합금 Aluminium Alloys	유리섬유 강화플라스틱 Glass fiberreinforced plastic
					S45C/S50C	SCM	NAK/HPM -40HRC	SKD61 -55HRC	SKD11 -60HRC	SKH -65HRC				











CO-MAX END MILL SERIES

블렌드밀 BALL END MILL															
	2F 리브 볼 엔드밀 2F Rib Ball End Mill	CMRB230		유 adopted	P. 23	P. 39	-	-	-	-	-	○	●	○	-
라디우스 엔드밀 RADIUS END MILL															
	2F 리브 라디우스 엔드밀 2F Rib Radius End Mill	CMRR230		유 adopted	P. 24	P. 40	-	-	-	-	-	○	●	○	-
플랫 엔드밀 FLAT END MILL															
	2F 리브 플랫 엔드밀 2F Rib Flat End Mill	CMRE230		유 adopted	P. 25	P. 41	-	-	-	-	-	○	●	○	-
	2F 플랫 엔드밀 2F Flat End Mill	CME230		무 Not	P. 26	P. 42	-	-	-	-	-	○	●	○	-

ALU-MAX END MILL SERIES

플랫 엔드밀 FLAT END MILL															
	3F 플랫 엔드밀 3F Flat End Mill	ALE345		무 Not	P. 26	P. 42	-	-	-	-	-	-	-	○	-

DIA-MAX END MILL SERIES

블렌드밀 BALL END MILL															
	2F 리브 볼 엔드밀 2F Rib Ball End Mill	DMRB230		무 Not	P. 27	P. 42	-	-	-	-	-	○	○	○	○
라디우스 엔드밀 RADIUS END MILL															
	4F 리브 라디우스 엔드밀 4F Rib Radius End Mill	DMRR430		유 adopted	P. 28	P. 43	-	-	-	-	-	○	○	○	○
플랫 엔드밀 FLAT END MILL															
	2F 리브 플랫 엔드밀 2F Rib Flat End Mill	DMRE230		유 adopted	P. 28	P. 43	-	-	-	-	-	○	○	○	○
	4F 플랫 엔드밀 4F Flat End Mill	DME430		무 Not	P. 29	P. 44	-	-	-	-	-	○	○	○	○
	4F 롱샹크 플랫 엔드밀 4F Long Shank Flat End Mill	DMLSE430		유 adopted	P. 30	P. 44	-	-	-	-	-	○	○	○	○



HMRB230

HY-MAX 리브 볼 엔드밀 2날 30도
HY-MAX Rib Ball End Mill 2-Flute 30°

HMRB230



HY-MAX End Mill Series

CO-MAX End Mill Series

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볼 BALL
라디우스 Radius
플랫 Flat

볼 Ball
라디우스 Radius

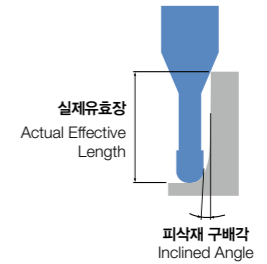
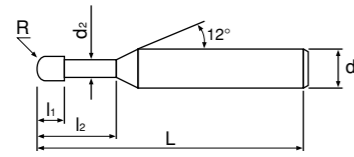
플랫 Flat

플랫 Flat

볼 Ball

라디우스 Radius

플랫 Flat



CARBIDE NANO HY MAX 2 30° Helix R ±0.005 D 0/-0.015

* 적용 피삭재 (●는 최적, ○는 가능)
* Applicable Work Material (●Most Suitable, ○Applicable)

피삭재 WORK MATERIAL									
탄소강 Carbon Steels	합금강 Alloy Steels	프리하든강 Prehardened Steels	열처리강 Hardened Steels			흑연 Graphite	동 Copper	알루미늄 합금 Aluminium Alloys	유리섬유 강화플라스틱 Glass fiberreinforced plastic
S45C/S50C	SCM	NAK/HPM -40HRC	SKD61 -55HRC	SKD11 -60HRC	SKH -65HRC	-	○	-	-

모델번호 Model No.	볼반경 Radius of Ball Nose	유효장 Effective Length	날장 Length of Cut	목부경 Neck Dia	전장 Overall Length	샙크경 Shank Dia	피삭재의 구배각에 대한 실제 유효장 표시 Actual effective length depending on inclined angle of workpiece				
							30°	1°	1°30'	2°	3°
HMRB230-	R0.1	0.5	0.2	0.18	45	4	0.56	0.58	0.61	0.63	0.69
		1					1.08	1.13	1.18	1.23	1.35
		1.5					1.60	1.67	1.75	1.83	2.02
		2					2.13	2.22	2.32	2.43	2.68
HMRB230-	R0.15	0.5	0.3	0.28	45	4	0.56	0.58	0.60	0.63	0.68
		1					1.08	1.12	1.17	1.22	1.34
		1.5					1.60	1.67	1.74	1.82	2.00
		2					2.12	2.21	2.31	2.42	2.66
HMRB230-	R0.2	1	0.4	0.37	45	4	1.10	1.14	1.19	1.24	1.35
		2					2.15	2.23	2.33	2.43	2.68
		3					3.19	3.32	3.47	3.63	4.01
		4					4.23	4.41	4.61	4.83	5.33
HMRB230-	R0.25	1	0.5	0.46	45	4	1.13	1.16	1.21	1.26	1.37
		2					2.17	2.25	2.35	2.45	2.69
		3					3.21	3.34	3.49	3.65	4.02
		4					4.25	4.43	4.63	4.85	5.35
HMRB230-	R0.3	1	0.6	0.56	45	4	1.12	1.16	1.20	1.25	1.35
		2					2.17	2.25	2.34	2.44	2.68
		3					3.21	3.34	3.48	3.64	4.01
		4					4.25	4.43	4.62	4.84	5.33
HMRB230-	R0.35	2	0.7	0.66	45	4	2.17	2.25	2.34	2.44	2.67
		4					4.25	4.43	4.62	4.84	5.33
		6					6.34	6.61	6.91	7.23	8.00
		8					8.43	8.79	9.19	9.63	10.66
HMRB230-	R0.4	2	0.8	0.76	45	4	2.16	2.24	2.33	2.42	2.65
		3					3.20	3.33	3.47	3.62	3.97
		4					4.25	4.42	4.61	4.82	5.30
		5					5.29	5.51	5.75	6.01	6.63
HMRB230-	R0.5	2	1	0.95	45	4	3.22	3.35	3.48	3.63	3.97
		3					4.27	4.44	4.62	4.83	5.30
		4					5.24	5.41	5.59	5.78	6.21
		5					6.35	6.62	6.90	7.22	7.96
HMRB230-	R0.6	3	1.2	1.15	45	4	6.35	6.62	6.90	7.22	7.96
		4					8.44	8.79	9.18	9.61	10.61
		6					10.52	10.97	11.46	12.01	13.26
		8					12.61	13.15	13.75	14.40	15.92
HMRB230-	R0.75	4	1.5	1.45	45	4	14.70	15.33	16.03	16.79	18.57
		6					16.78	17.51	18.31	19.18	21.23
		8					20.95	21.87	22.87	23.97	26.54
		10					26.16	27.32	28.55	29.96	Free

단위 (mm) / Unit (mm)

단위 (mm) / Unit (mm)





HMRB230

HY-MAX
End Mill
Series

CO-MAX
End Mill
Series

ALU-MAX
End Mill
Series

DIA-MAX
End Mill
Series

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모델번호	볼반경	유효장	날장	목부경	전장	생크경	피삭재의 구배각에 대한 실제 유효장 표시				
Model No.	Radius of Ball Nose	Effective Length	Length of Cut	Neck Dia	Overall Length	Shank Dia	Actual effective length depending on inclined angle of workpiece				
	R	l ₂	l ₁	d ₂	L	d	30°	1°	1°30'	2°	3°
HMRB230-01520	R0.75	20	1.5	1.45	60	4	20.94	21.85	22.84	23.92	Free
HMRB230-02006	R1	6	2	1.90	50	4	6.36	6.60	6.86	7.15	7.83
		8					8.44	8.78	9.14	9.54	10.48
		10					10.53	10.95	11.42	11.94	13.14
		12					12.61	13.13	13.70	14.33	15.79
		14					14.70	15.31	15.98	16.72	18.45
HMRB230-02016	R1	16	2	1.90	60	4	16.78	17.49	18.27	19.12	Free
HMRB230-02020	20	20.96			21.85		22.83	23.90	Free		
HMRB230-02025	25	26.17			27.30		28.53	29.89	Free		
HMRB230-02030	30	31.38			32.74		34.23	Free	Free		
HMRB230-02035	35	36.60			38.19		39.93	Free	Free		
HMRB230-02040	40	41.81	43.64	Free	Free	Free					
HMRB230-02506	R1.25	6	2.5	2.35	45	4	6.44	6.68	6.93	7.21	7.87
HMRB230-02508		8					8.52	8.86	9.21	9.60	10.52
HMRB230-02510		10					10.62	1.04	11.49	12.00	13.18
HMRB230-02512		12					12.69	13.21	13.77	14.39	15.83
HMRB230-02516		16					16.87	17.57	18.34	Free	Free
HMRB230-02520	20	21.04	21.93	22.90	Free	Free					
HMRB230-02525	25	26.26	27.38	28.60	Free	Free					
HMRB230-03010	R1.5	10	3	2.85	60	6	10.73	11.14	11.59	12.09	3.26
HMRB230-03012		12					12.81	13.32	13.88	14.49	15.91
HMRB230-03014		14					14.90	15.50	16.16	16.88	18.57
HMRB230-03016		16					16.98	17.68	18.44	19.27	21.22
HMRB230-03020		20					21.16	22.04	23.00	24.06	26.53
HMRB230-03025		25			26.37		27.48	28.70	30.04	Free	
HMRB230-03030		30			31.58		32.93	34.40	36.03	Free	
HMRB230-03035		35			36.80		38.38	40.11	42.01	Free	
HMRB230-03040		40			42.01		43.83	45.81	Free	Free	
HMRB230-04012		R2			12		4	3.85	60	6	12.91
HMRB230-04016	16		17.09	17.76	18.50	19.32					21.22
HMRB230-04020	20		21.26	22.12	23.06	24.10					Free
HMRB230-04025	25		26.47	27.57	28.77	30.09			Free		
HMRB230-04030	30		31.68	33.01	34.47	Free			Free		
HMRB230-04035	35		36.90	38.46	40.17	Free			Free		
HMRB230-04040	40	42.11	43.9	Free	Free	Free					
HMRB230-05020	R2.5	20	5	4.80	60	6	21.24	22.08	Free	Free	Free
HMRB230-05030		30			31.66		Free	Free	Free	Free	
HMRB230-06020	R3	20	7	5.70	60	6	Free	Free	Free	Free	Free
HMRB230-06025		25			Free		Free	Free	Free	Free	
HMRB230-06030		30			Free		Free	Free	Free	Free	

단위 (mm) / Unit (mm)

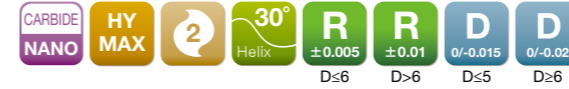
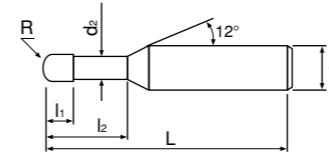
NOTE

생크테이퍼 각도는 약12도입니다. 정확한 값이 아니므로 피삭재와 간섭의 염려가 있을 경우에는 반드시 확인해 주십시오.

The shank taper angle is about 12°. This angle is not an exact value and to avoid contact with the workpiece, we recommend the user check the precise value of this angle.

HMBS230

HY-MAX 볼 엔드밀 쇼트형 2날 30도
HY-MAX Ball End Mill Short 2-Flute 30°



* 적용 피삭재 (●는 최적, ○는 가능)
* Applicable Work Material (●Most Suitable, ○Applicable)

피삭재 WORK MATERIAL									
탄소강 Carbon Steels	합금강 Alloy Steels	프리하든강 Prehardened Steels	열처리강 Hardened Steels			흑연 Graphite	동 Copper	알루미늄 합금 Aluminium Alloys	유리섬유 강화플라스틱 Glass fiberreinforced plastic
S45C/S50C	SCM	NAK/HPM -40HRC	SKD61 -55HRC	SKD11 -60HRC	SKH -65HRC				
○	○	●	○	○	○	-	○	-	-

모델번호	볼반경	유효장	날장	목부경	전장	생크경
Model No.	Radius of Ball Nose	Effective Length	Length of Cut	Neck Dia	Overall Length	Shank Dia
	R	l ₂	l ₁	d ₂	L	d
HMBS230 - 010025 -S06	R0.5	2.5	1	0.95	50	6
HMBS230 - 01504 -S06	R0.75	4	1.5	1.45	50	6
HMBS230 - 02006 -S06	R1	6	2	1.9	50	6
HMBS230 - 02506 -S06	R1.25	6	2.5	2.35	50	6
HMBS230 - 03008 -S06	R1.5	8	3	2.85	50	6
HMBS230 - 04010 -S06	R2	10	4	3.85	50	6
HMBS230 - 05012 -S06	R2.5	12	5	4.8	50	6
HMBS230 - 06015 -S06	R3	15	7	5.7	60	6
HMBS230 - 08020 -S08	R4	20	10	7.7	60	8
HMBS230 - 10025 -S10	R5	25	12	9.7	70	10
HMBS230 - 12030 -S12	R6	30	14	11.7	80	12

단위 (mm) / Unit (mm)



볼
BALL

라디우스
Radius

플랫
Flat

볼
Ball

라디우스
Radius

플랫
Flat

플랫
Flat

볼
Ball

라디우스
Radius

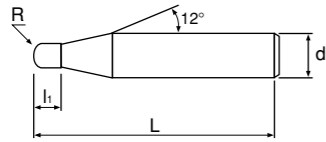
플랫
Flat





HMB230

HY-MAX 볼 엔드밀 2날 30도
HY-MAX Ball End Mill 2-Flute 30°



CARBIDE NANO HY MAX 2 Helix 30° R ±0.005 D≤6 R ±0.01 D>6 D 0/-0.015 D≤5 D 0/-0.02 D≥6

* 적용 피삭재 (●는 최적, ○는 가능)
* Applicable Work Material (●Most Suitable, ○Applicable)

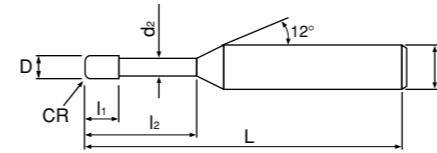
피삭재 WORK MATERIAL									
탄소강 Carbon Steels	합금강 Alloy Steels	프리하든강 Prehardened Steels	열처리강 Hardened Steels			흑연 Graphite	동 Copper	알루미늄 합금 Aluminium Alloys	유리섬유 강화플라스틱 Glass fiberreinforced plastic
S45C/S50C	SCM	NAK/HPM ~40HRC	SKD61 ~55HRC	SKD11 ~60HRC	SKH ~65HRC				
○	○	○	○	○	○	-	○	-	-

모델번호 Model No.	볼반경 Radius of Ball Nose R	날장 Length of Cut l ₁	전장 Overall Length L	샙크경 Shank Dia d
HMB230-01002-050-S06	R0.5	2	50	6
HMB230-01504-050-S06	R0.75	4	50	6
HMB230-02005-060-S06	R1	5	60	6
HMB230-02506-060-S06	R1.25	6	60	6
HMB230-03008-060-S06	R1.5	8	60	6
HMB230-03508-060-S06	R1.75	8	60	6
HMB230-	04007-050-S06	7	50	6
	04008-070-S06	8	70	
	04008-080-S04	8	80	
HMB230-	05008-060-S06	8	60	6
	05010-090-S06	10	90	
HMB230-	06010-060-S06	10	60	6
	06012-090-S06	12	90	
HMB230-	07014-090-S08	14	100	8
HMB230-	08012-060-S08	12	60	8
	08013-080-S08	13	80	
	08014-100-S08	14	100	
HMB230-	10016-070-S10	16	70	10
	10018-100-S10	18	100	
	10020-130-S10	20	130	
HMB230-	12018-080-S12	18	80	12
	12022-100-S12	22	100	
	12026-130-S12	26	130	
	12030-150-S12	30	150	
HMB230-	16030-130-S16	30	130	16

단위 (mm) / Unit (mm)

HMRR230

HY-MAX 리브 래디우스 엔드밀 2날 30도
HY-MAX Rib Radius End Mill 2-Flute 30°



CARBIDE NANO HY MAX 2 Helix 30° CR ±0.01 D 0/-0.015 D≤5 D 0/-0.02 D≥6

* 적용 피삭재 (●는 최적, ○는 가능)
* Applicable Work Material (●Most Suitable, ○Applicable)

피삭재 WORK MATERIAL									
탄소강 Carbon Steels	합금강 Alloy Steels	프리하든강 Prehardened Steels	열처리강 Hardened Steels			흑연 Graphite	동 Copper	알루미늄 합금 Aluminium Alloys	유리섬유 강화플라스틱 Glass fiberreinforced plastic
S45C/S50C	SCM	NAK/HPM ~40HRC	SKD61 ~55HRC	SKD11 ~60HRC	SKH ~65HRC				
○	○	○	○	○	○	-	○	-	-

모델번호 Model No.	인선직경 Dia of Mill D	코너반경 Coner Radius CR	유효장 Effective Length l ₂	날장 Length of Cut l ₁	목부경 Neck Dia d ₂	전장 Overall Length L	샙크경 Shank Dia d	
HMRR230-	003R005-01	0.3	0.05	1	0.3	0.27	45	4
	003R005-015			1.5				
	003R005-02			2				
HMRR230-	004R005-01	0.4	0.05	1	0.4	0.37	45	4
	004R005-02			2				
	004R005-03			3				
	004R005-04			4				
HMRR230-	005R005-01	0.5	0.05	1	0.5	0.46	45	4
	005R005-02			2				
	005R005-03			3				
	005R005-04			4				
	005R005-05			5				
	005R005-06			6				
	005R01-01			1				
	005R01-02			2				
	005R01-03			3				
	005R01-04			4				
005R01-05	5							
005R01-06	6							
HMRR230-	006R005-01	0.6	0.05	1	0.6	0.56	45	4
	006R005-02			2				
	006R005-04			4				
	006R005-06			6				
	006R005-08			8				
	006R01-01			1				
	006R01-02			2				
	006R01-04			4				
	006R01-06			6				
	006R01-08			8				

단위 (mm) / Unit (mm)



볼
Ball

래디우스
RADIUS

플랫
Flat

볼
Ball

래디우스
Radius

플랫
Flat

플랫
Flat

볼
Ball

래디우스
Radius

플랫
Flat



HY-MAX
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모델번호		인선직경	코너반경	유효장	날장	목부경	전장	샙크경	
Model No.		Dia of Mill	Coner Radius	Effective Length	Length of Cut	Neck Dia	Overall Length	Shank Dia	
		D	CR	l ₂	l ₁	d ₂	L	d	
HMRR230-	007R01-02	0.7	0.1	2	0.7	0.66	45	4	
	007R01-04			4					
	007R01-06			6					
	007R01-08			8					
HMRR230-	008R01-02	0.8	0.1	2	0.8	0.76	45	4	
	008R01-04			4					
	008R01-06			6					
	008R01-08			8					
	008R01-10			10					
	008R02-02		0.2	2					
	008R02-04			4					
	008R02-06			6					
	008R02-08			8					
	008R02-10			10					
HMRR230-	010R01-025	1	0.1	2.5	1.5	0.95	45	4	
	010R01-04			4					
	010R01-06			6					
	010R01-08			8					
	010R01-10			10					
	010R01-12			12					
	010R01-14			14					
	010R01-16			16					
	010R02-025			0.2					2.5
	010R02-04								4
	010R02-06		6						
	010R02-08		8						
	010R02-10		10						
	010R02-12		12						
	010R02-14		14						
	010R02-16		16						
	010R03-025		0.3				2.5		
	010R03-04						4		
	010R03-06			6					
	010R03-08			8					
010R03-10	10								
010R03-12	12								
010R03-14	14								
010R03-16	16								
HMRR230-	012R01-04	1.2	0.1	4	1.8	1.15	45	4	
	012R01-06			6					

단위 (mm) / Unit (mm)

모델번호		인선직경	코너반경	유효장	날장	목부경	전장	샙크경	
Model No.		Dia of Mill	Coner Radius	Effective Length	Length of Cut	Neck Dia	Overall Length	Shank Dia	
		D	CR	l ₂	l ₁	d ₂	L	d	
HMRR230-	012R01-08	1.2	0.1	8	1.8	1.15	45	4	
	012R01-10			10					
	012R01-12			12					
	012R01-14			14					
	012R01-16			16					
	012R02-04			0.2					4
	012R02-06		6						
	012R02-08		8						
	012R02-10		10						
	012R02-12		12						
	012R02-14		14						
	HMRR230-		012R02-16	1.5			0.2		16
015R01-04		0.1	4						
015R01-06			6						
015R01-08			8						
015R01-10			10						
015R01-12			12						
015R01-14			14						
015R01-16		16							
015R01-20		20							
015R02-04		0.2	4						
015R02-06			6						
015R02-08			8						
015R02-10	10								
015R02-12	12								
015R02-14	14								
015R02-16	16								
015R02-20	20								
015R03-04	0.3	4							
015R03-06		6							
015R03-08		8							
015R03-10		10							
015R03-12		12							
015R03-14		14							
015R03-16	16								
015R03-20	20								
015R05-04	0.5	4							
015R05-06		6							
015R05-08		8							
015R05-10		10							

단위 (mm) / Unit (mm)

볼
Ball

라디우스
RADIUS

플랫
Flat

볼
Ball

라디우스
Radius

플랫
Flat

플랫
Flat

볼
Ball

라디우스
Radius

플랫
Flat





HMRR230



HY-MAX
End Mill
Series

CO-MAX
End Mill
Series

ALU-MAX
End Mill
Series

DIA-MAX
End Mill
Series

절삭 조건
Milling
Conditions

참고 자료
Reference
Data

모델번호		인선직경	코너반경	유효장	날장	목부경	전장	샙크경									
Model No.		Dia of Mill	Coner Radius	Effective Length	Length of Cut	Neck Dia	Overall Length	Shank Dia									
		D	CR	l ₂	l ₁	d ₂	L	d									
HMRR230-	015R05-12	1.5	0.5	12	2.3	1.45	45	4									
	015R05-14			14			50										
	015R05-16			16			60										
	015R05-20			20			60										
HMRR230-	020R01-06	2	0.1	6	3	1.9	45	4									
	020R01-08			8					50								
	020R01-10			10						60							
	020R01-12			12							45						
	020R01-14			14								50					
	020R01-16			16									60				
	020R01-20			20										45			
	020R02-06			6											0.2	50	
	020R02-08			8													60
	020R02-10			10													
	020R02-12		12	50													
	020R02-14		14				60										
	020R02-16		16						45								
	020R02-20		20							50							
	020R03-06		6								0.3	60					
	020R03-08		8										45				
	020R03-10		10											50			
	020R03-12		12												60		
	020R03-14		14													45	
	020R03-16		16														50
020R03-20	20	60															
020R05-06	6		0.5	45													
020R05-08	8				50												
020R05-10	10					60											
020R05-12	12						45										
020R05-14	14							50									
020R05-16	16								60								
020R05-20	20									45							
HMRR230-	025R02-10										2.5	0.2	10	4	2.35	45	
	025R02-16												16			50	
	025R02-20	20											60				
	025R05-10	10	45														
	025R05-16	16	50														
025R05-20	20	60															
HMRR230-	030R02-10	3	0.2	10	4.5	2.85	60				6						
	030R02-12			12			60										

단위 (mm) / Unit (mm)

모델번호		인선직경	코너반경	유효장	날장	목부경	전장	샙크경											
Model No.		Dia of Mill	Coner Radius	Effective Length	Length of Cut	Neck Dia	Overall Length	Shank Dia											
		D	CR	l ₂	l ₁	d ₂	L	d											
HMRR230-	030R02-16	3	0.2	16	4.5	2.85	60	6											
	030R02-20			20					70										
	030R02-25			25						80									
	030R02-30			30							60								
	030R02-35			35								70							
	030R03-10		10	80															
	030R03-12		12				60												
	030R03-16		16						70										
	030R03-20		20							80									
	030R03-25		25								60								
	030R03-30		30	70															
	030R03-35		35				80												
	030R05-10		10						0.3			4.5	2.85	6					
	030R05-12		12							60									
	030R05-16		16								70								
	030R05-20		20	80															
	030R05-25		25				60												
	030R05-30		30						70										
	030R05-35		35							80									
	030R10-10		10								0.5	4.5	2.85	6					
030R10-12	12	60																	
030R10-16	16		70																
030R10-20	20			80															
030R10-25	25				60														
030R10-30	30					70													
030R10-35	35	80																	
HMRR230-	040R02-12		4				0.2	12	6	3.85	60	6							
	040R02-16			16				70											
	040R02-20			20	80														
	040R02-25			25		60													
	040R02-30	30		70															
	040R02-35	35											80						
	040R03-12	12												0.3	6	3.85	60		
	040R03-16	16																70	
	040R03-20	20					80												
	040R03-25	25						60											
	040R03-30	30			70														
	040R03-35	35				80													
	040R05-12	12		0.5							6								3.85
	040R05-16	16											60						

단위 (mm) / Unit (mm)

볼
Ball

라디우스
RADIUS

플랫
Flat

볼
Ball

라디우스
Radius

플랫
Flat

플랫
Flat

볼
Ball

라디우스
Radius

플랫
Flat





HMRR230

HY-MAX End Mill Series

CO-MAX End Mill Series

ALU-MAX End Mill Series

DIA-MAX End Mill Series

절삭 조건
Milling Conditions

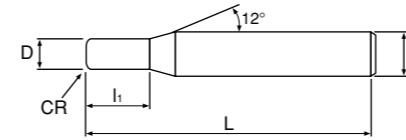
참고 자료
Reference Data

모델번호	인선직경	코너반경	유효장	날장	목부경	전장	생크경				
Model No.	Dia of Mill	Coner Radius	Effective Length	Length of Cut	Neck Dia	Overall Length	Shank Dia				
	D	CR	l ₂	l ₁	d ₂	L	d				
HMRR230-040R05-20	4	0.5	20	6	3.85	60	6				
040R05-25			25								
040R05-30			30								
040R05-35			35								
040R10-12		1	12								
040R10-16			16								
040R10-20			20								
040R10-25			25								
040R10-30			30								
040R10-35			35								
HMRR230-050R02-20	5	0.2	20	7.5	4.8	60	6				
050R03-20		0.3									
050R05-20		0.5									
050R10-20		1									
HMRR230-060R02-20	6	0.2	20	9	5.7	60	6				
060R02-30			30	12		90					
060R03-20		0.3	20	9		60					
060R03-30			30	12		90					
060R05-20			0.5	20		9		60			
060R05-30				30		12		90			
060R10-20			1	20		9		60			
060R10-30				30		12		90			
HMRR230-080R03-24			8	0.3		24		12	7.7	65	8
080R03-40						40		16		90	
080R05-24	0.5	24		12	65						
080R05-40		40		16	90						
080R10-24	1	24		12	65						
080R10-40		40		16	90						
HMRR230-100R03-30	10	0.3	30	15	9.7	70	10				
100R03-50			50	20		100					
100R05-30		0.5	30	15		70					
100R05-50			50	20		100					
100R10-30		1	30	15		70					
100R10-50			50	20		100					
HMRR230-120R05-30	12	0.5	30	18	11.7	80	12				
120R05-55			55	24		100					
120R10-30		1	30	18		80					
120R10-55			55	24		100					

단위 (mm) / Unit (mm)

HMR230

HY-MAX 라디우스 엔드밀 2날 30도
HY-MAX Radius End Mill 2-Flute 30°



CARBIDE NANO HY MAX 2 30° Helix CR ±0.01 D 0/-0.015 D 0/-0.02 D≤5 D≥6

* 적용 피삭재 (●는 최적, ○는 가능)
* Applicable Work Material (●Most Suitable, ○Applicable)

피삭재 WORK MATERIAL									
탄소강 Carbon Steels	합금강 Alloy Steels	프리하든강 Prehardened Steels	열처리강 Hardened Steels			흑연 Graphite	동 Copper	알루미늄 합금 Aluminium Alloys	유리섬유 강화플라스틱 Glass fiberreinforced plastic
S45C/S50C	SCM	NAK/HPM -40HRC	SKD61 -55HRC	SKD11 -60HRC	SKH -65HRC				
○	○	●	●	●	○	-	○	-	-

모델번호	인선직경	코너반경	날장	전장	생크경
Model No.	Dia of Mill	Coner Radius	Length of Cut	Overall Length	Shank Dia
	D	CR	l ₁	L	d
HMR230-010R005-045-S04	1	0.05	2.5	45	4
010R01-045-S04		0.1			
010R02-045-S04		0.2			
010R03-045-S04		0.3			
HMR230-012R01-045-S04	1.2	0.1	3	45	4
012R02-045-S04		0.2			
012R03-045-S04		0.3			
HMR230-015R01-045-S04	1.5	0.1	4	45	4
015R02-045-S04		0.2			
015R03-045-S04		0.3			
015R05-045-S04		0.5			
HMR230-020R01-045-S04	2	0.1	6	45	4
020R02-045-S04		0.2			
020R03-045-S04		0.3			
020R05-045-S04		0.5			
HMR230-025R01-045-S04	2.5	0.1	7	45	4
025R02-045-S04		0.2			
025R03-045-S04		0.3			
025R05-045-S04		0.5			
HMR230-030R01-060-S06	3	0.1	8	60	6
030R02-060-S06		0.2			
030R03-060-S06		0.3			
030R05-060-S06		0.5			
030R10-060-S06		1			
HMR230-040R01-070-S06		4			
040R02-070-S06	0.2				
040R03-070-S06	0.3				
040R05-070-S06	0.5				
040R10-070-S06	1				

단위 (mm) / Unit (mm)



볼
Ball

라디우스
RADIUS

플랫
Flat

볼
Ball

라디우스
Radius

플랫
Flat

플랫
Flat

볼
Ball

라디우스
Radius

플랫
Flat





HMR230

HY-MAX End Mill Series

CO-MAX End Mill Series

ALU-MAX End Mill Series

DIA-MAX End Mill Series

절삭 조건
Milling Conditions

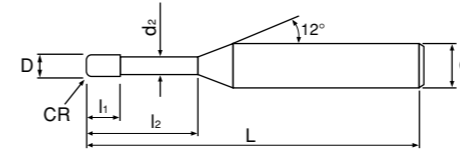
참고 자료
Reference Data

모델번호	인선직경	코너반경	날장	전장	샙크경
Model No.	Dia of Mill	Coner Radius	Length of Cut	Overall Length	Shank Dia
	D	CR	l ₁	L	d
HMR230-	050R02-070-S06	0.2	10	70	6
	050R03-070-S06	0.3			
	050R05-070-S06	0.5			
	050R10-070-S06	1			
HMR230-	060R02-090-S06	0.2	12	90	6
	060R03-090-S06	0.3			
	060R05-090-S06	0.5			
	060R10-090-S06	1			
HMR230-	080R03-090-S08	0.3	16	90	8
	080R05-090-S08	0.5			
	080R10-090-S08	1			
HMR230-	100R03-100-S10	0.3	20	100	10
	100R03-130-S10		25	130	
	100R05-100-S10	0.5	20	100	
	100R05-130-S10		25	130	
	100R10-100-S10	1	20	100	
	100R10-130-S10		25	130	
HMR230-	120R05-100-S12	0.5	24	100	12
	120R05-130-S12		30	130	
	120R10-100-S12	1	24	100	
	120R10-130-S12		30	130	

단위 (mm) / Unit (mm)

HMRR430

HY-MAX 리브 래디우스 엔드밀 4날 30도
HY-MAX Rib Radius End Mill 4-Flute 30°



CARBIDE NANO HY MAX 4 Helix 30° CR ±0.01 D 0/-0.015 D 0/-0.02 D≤5 D≥6

* 적용 피삭재 (●는 최적, ○는 가능)
* Applicable Work Material (●Most Suitable, ○Applicable)

피삭재 WORK MATERIAL									
탄소강 Carbon Steels	합금강 Alloy Steels	프리하든강 Prehardened Steels	열처리강 Hardened Steels			흑연 Graphite	동 Copper	알루미늄 합금 Aluminium Alloys	유리섬유 강화플라스틱 Glass fiberreinforced plastic
S45C/S50C	SCM	NAK/HPM -40HRC	SKD61 -55HRC	SKD11 -60HRC	SKH -65HRC	-	○	-	-

모델번호	인선직경	코너반경	유효장	날장	목부경	전장	샙크경
Model No.	Dia of Mill	Coner Radius	Effective Length	Length of Cut	Neck Dia	Overall Length	Shank Dia
	D	CR	l ₂	l ₁	d ₂	L	d
HMRR430-	010R005-025	0.05	2.5	1.5	0.95	45	4
	010R005-04		4				
	010R005-06		6				
	010R005-08		8				
	010R005-10		10				
	010R005-12		12				
	010R01-025	0.1	2.5				
	010R01-04		4				
	010R01-06		6				
	010R01-08		8				
	010R01-10		10				
	010R01-12		12				
	010R02-025	0.2	2.5				
	010R02-04		4				
	010R02-06		6				
	010R02-08		8				
	010R02-10		10				
	010R02-12		12				
	010R03-025	0.3	2.5				
	010R03-04		4				
	010R03-06		6				
	010R03-08		8				
	010R03-10		10				
	010R03-12		12				
HMRR430-	015R01-04	0.1	4	2.3	1.45	45	4
	015R01-06		6				
	015R01-08		8				
	015R01-10		10				
	015R01-12		12				

단위 (mm) / Unit (mm)



볼
Ball

래디우스
RADIUS

플랫
Flat

볼
Ball

래디우스
Radius

플랫
Flat

플랫
Flat

볼
Ball

래디우스
Radius

플랫
Flat





HMRR430



HY-MAX
End Mill
Series

CO-MAX
End Mill
Series

ALU-MAX
End Mill
Series

DIA-MAX
End Mill
Series

절삭 조건
Milling
Conditions

참고 자료
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모델번호	인선직경	코너반경	유효장	날장	목부경	전장	샙크경
Model No.	Dia of Mill	Coner Radius	Effective Length	Length of Cut	Neck Dia	Overall Length	Shank Dia
	D	CR	l ₂	l ₁	d ₂	L	d
HMRR430-015R01-14	1.5	0.1	14	2.3	1.45	50	4
015R01-16			16				
015R01-20			20				
015R02-04			4				
015R02-06		6					
015R02-08		8					
015R02-10		10					
015R02-12		12					
015R02-14		14					
015R02-16		16					
015R02-20		20					
015R03-04		0.3	4				
015R03-06			6				
015R03-08			8				
015R03-10			10				
015R03-12			12				
015R03-14			14				
015R03-16			16				
015R03-20			20				
015R05-04		0.5	4				
015R05-06	6						
015R05-08	8						
015R05-10	10						
015R05-12	12						
015R05-14	14						
015R05-16	16						
015R05-20	20						
HMRR430-020R01-06	2	0.1	6	3	1.9	45	4
020R01-08			8				
020R01-10			10				
020R01-12			12				
020R01-14		14					
020R01-16		16					
020R01-20		20					
020R02-06		0.2	6				
020R02-08			8				
020R02-10			10				
020R02-12			12				
020R02-14			14				
020R02-16			16				
020R02-18			18				
020R02-20			20				

단위 (mm) / Unit (mm)

모델번호	인선직경	코너반경	유효장	날장	목부경	전장	샙크경				
Model No.	Dia of Mill	Coner Radius	Effective Length	Length of Cut	Neck Dia	Overall Length	Shank Dia				
	D	CR	l ₂	l ₁	d ₂	L	d				
HMRR430-020R02-14	2	0.2	14	3	1.9	50	4				
020R02-16			16								
020R02-20			20								
020R03-06			6								
020R03-08		8									
020R03-10		10									
020R03-12		12									
020R03-14		14									
020R03-16		16									
020R03-20		20									
020R05-06		0.5	6								
020R05-08			8								
020R05-10			10								
020R05-12			12								
020R05-14			14								
020R05-16			16								
020R05-20			20								
025R02-10			2.5			0.2		10	4	2.35	60
025R02-16		16									
025R02-20		20									
025R05-10	0.5	10									
025R05-16		16									
025R05-20		20									
HMRR430-030R02-10	3	0.2	10	4.5	2.85	60	6				
030R02-12			12								
030R02-16			16								
030R02-20			20								
030R02-25		25									
030R02-30		30									
030R02-35		35									
030R03-10		0.3	10								
030R03-12			12								
030R03-16			16								
030R03-20			20								
030R03-25			25								
030R03-30			30								
030R03-35			35								

단위 (mm) / Unit (mm)

볼
Ball

라디우스
RADIUS

플랫
Flat

볼
Ball

라디우스
Radius

플랫
Flat

플랫
Flat

볼
Ball

라디우스
Radius

플랫
Flat





HMRR430



HY-MAX
End Mill
Series

CO-MAX
End Mill
Series

ALU-MAX
End Mill
Series

DIA-MAX
End Mill
Series

절삭 조건
Milling
Conditions

참고 자료
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Data

모델번호	인선직경	코너반경	유효장	날장	목부경	전장	생크경
Model No.	Dia of Mill	Coner Radius	Effective Length	Length of Cut	Neck Dia	Overall Length	Shank Dia
	D	CR	l ₂	l ₁	d ₂	L	d
HMRR430-	3	0.5	10	4.5	2.85	60	6
			12				
			16				
			20				
			25				
			30				
		35					
		0.3	10			60	
			12				
			16				
			20				
			25				
			30				
			35				
35							
HMRR430-	4	0.2	12	6	3.85	60	6
			16				
			20				
			25				
			30				
			35				
		0.3	12			60	
			16				
			20				
			25				
			30				
			35				
			35				
			35				
0.5	12	60					
	16						
	20						
	25						
	30						
	35						
	35						
	35						
1	12	70					
	16						
	20						
	25						
	30						
	35						
	35						
	35						
1	12	80					
	16						
	20						
	25						
	30						
	35						
	35						
	35						

모델번호	인선직경	코너반경	유효장	날장	목부경	전장	생크경
Model No.	Dia of Mill	Coner Radius	Effective Length	Length of Cut	Neck Dia	Overall Length	Shank Dia
	D	CR	l ₂	l ₁	d ₂	L	d
HMRR430-	5	0.2	20	7.5	4.8	60	6
		0.3					
		0.5					
		1					
		1					
HMRR430-	6	0.2	20	5.7	5.7	60	6
			30				
		30					
		30					
		30					
		30					
		30					
		30					
		30					
		30					
HMRR430-	8	0.3	24	7.7	7.7	65	8
			40				
		40					
		40					
		40					
		40					
		40					
		40					
		40					
		40					
HMRR430-	10	0.3	30	9.7	9.7	70	10
			50				
		50					
		50					
		50					
		50					
		50					
		50					
		50					
		50					
HMRR430-	12	0.5	30	11.7	11.7	80	12
			55				
		60					
		60					
		60					
		60					
		60					
		60					
		60					
		60					
HMRR430-	12	1	30	11.7	11.7	80	12
			55				
		55					
		55					
		55					
		55					
HMRR430-	12	2	30	11.7	11.7	80	12
			55				
		55					
		55					

단위 (mm) / Unit (mm)

단위 (mm) / Unit (mm)

볼
Ball

라디우스
RADIUS

플랫
Flat

볼
Ball

라디우스
Radius

플랫
Flat

플랫
Flat

볼
Ball

라디우스
Radius

플랫
Flat





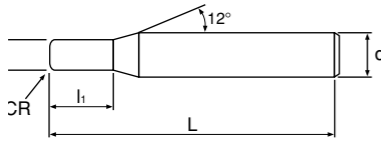
HMR430

HY-MAX 라디우스 엔드밀 4날 30도
HY-MAX Radius End Mill 4-Flute 30°

HMR430



HY-MAX
End Mill
Series



CARBIDE NANO
HY MAX
4
30° Helix
CR ±0.01
D 0/-0.015 D≤5
D 0/-0.02 D≥6

* 적용 피삭재 (●는 최적, ○는 가능)
* Applicable Work Material (●Most Suitable, ○Applicable)

피삭재 WORK MATERIAL									
탄소강 Carbon Steels	합금강 Alloy Steels	프리하든강 Prehardened Steels	열처리강 Hardened Steels			흑연 Graphite	동 Copper	알루미늄 합금 Aluminium Alloys	유리섬유 강화플라스틱 Glass fiberreinforced plastic
S45C/S50C	SCM	NAK/HPM ~40HRC	SKD61 ~55HRC	SKD11 ~60HRC	SKH ~65HRC	-	○	-	-

모델번호 Model No.	인선직경 Dia of Mill	코너반경 Coner Radius	날장 Length of Cut	전장 Overall Length	샤홅크경 Shank Dia	
	D	CR	l ₁	L	d	
HMR430-	1	010R005-045-S04	2.5	45	4	
		010R01-045-S04				
		010R02-045-S04				
HMR430-	1.5	010R03-045-S04	4	45	4	
		015R01-045-S04				
		015R02-045-S04				
		015R03-045-S04				
HMR430-	2	015R05-045-S04	6	45	4	
		020R01-045-S04				
		020R02-045-S04				
		020R03-045-S04				
HMR430-	2.5	020R05-045-S04	7	45	4	
		025R01-045-S04				
		025R02-045-S04				
		025R03-045-S04				
HMR430-	3	025R05-045-S04	8	60	6	
		030R01-060-S06				
		030R02-060-S06				
		030R03-060-S06				
		030R05-060-S06				
HMR430-	4	030R10-060-S06	10	50	6	
		040R01-050-S06		70	6	
		040R01-070-S06		80	4	
		040R01-080-S04		50	6	
		040R02-050-S06		70	6	
		040R02-070-S06		80	4	
		040R02-080-S04		50	6	
		040R03-050-S06		70	6	
		040R03-070-S06		80	4	
		040R03-080-S04		50	6	
		040R05-050-S06		70	6	
		040R05-070-S06		80	4	
					50	6
					70	6

단위 (mm) / Unit (mm)

모델번호 Model No.	인선직경 Dia of Mill	코너반경 Coner Radius	날장 Length of Cut	전장 Overall Length	샤홅크경 Shank Dia				
	D	CR	l ₁	L	d				
HMR430-	4	040R05-080-S04	10	80	4				
		040R10-050-S06		50	6				
		040R10-070-S06		70	6				
		040R10-080-S04		80	4				
HMR430-	5	050R02-070-S06	10	70	6				
		050R03-070-S06		0.2					
		050R05-070-S06		0.3					
		050R10-070-S06		0.5					
HMR430-	6	060R02-060-S06	12	60	6				
		060R02-090-S06		90					
		060R03-060-S06		60					
		060R03-090-S06		90					
		060R05-060-S06		60					
		060R05-090-S06		90					
		060R10-060-S06		60					
		060R10-090-S06		90					
		080R03-060-S08		60		8			
		080R03-090-S08		90					
080R05-060-S08	60								
080R05-090-S08	90								
080R10-060-S08	60								
080R10-090-S08	90								
080R20-060-S08	60								
080R20-090-S08	90								
HMR430-	10	100R03-070-S10	20	70	10				
		100R03-100-S10		100					
		100R03-130-S10		130					
		100R05-070-S10		70					
		100R05-100-S10		100					
		100R05-130-S10		130					
		100R10-070-S10		70					
		100R10-100-S10		100					
		100R10-130-S10		130					
		100R20-070-S10		70					
		100R20-100-S10		100					
		100R20-130-S10		130					
		HMR430-		12		120R05-080-S12	24	80	12
						120R05-100-S12		100	
120R05-130-S12	130								
120R10-080-S12	80								
120R10-100-S12	100								
120R10-130-S12	130								
120R20-080-S12	80								
120R20-100-S12	100								
120R20-130-S12	130								

단위 (mm) / Unit (mm)

CO-MAX
End Mill
Series

ALU-MAX
End Mill
Series

DIA-MAX
End Mill
Series

절삭 조건
Milling
Conditions

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볼
Ball

라디우스
RADIUS

플랫
Flat

볼
Ball

라디우스
Radius

플랫
Flat

플랫
Flat

볼
Ball

라디우스
Radius

플랫
Flat

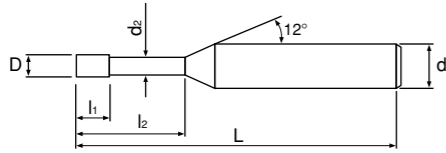




HMRE230

HY-MAX 리브 플랫 엔드밀 2날 30도
HY-MAX Rib Flat End Mill 2-Flute 30°

HMRE230



*적용 피삭재 (●는 최적, ○는 가능)
* Applicable Work Material (●Most Suitable, ○Applicable)

피삭재 WORK MATERIAL									
탄소강 Carbon Steels	합금강 Alloy Steels	프리하든강 Prehardened Steels	열처리강 Hardened Steels			흑연 Graphite	동 Copper	알루미늄 합금 Aluminium Alloys	유리섬유 강화플라스틱 Glass fiberreinforced plastic
S45C/S50C	SCM	NAK/HPM ~40HRC	SKD61 ~55HRC	SKD11 ~60HRC	SKH ~65HRC	-	-	-	-
○	○	○	○	○	-	-	○	-	-

모델번호 Model No.	인선직경 Dia of Mill	유효장 Effective Length	날장 Length of Cut	목부경 Neck Dia	전장 Overall Length	샙크경 Shank Dia
	D	l ₂	l ₁	d ₂	L	d
HMRE230-	0.2	002005	0.5	0.2	0.18	45
		00201	1			
		002015	1.5			
		00202	2			
HMRE230-	0.3	00301	1	0.3	0.27	45
		003015	1.5			
		00302	2			
		00303	3			
HMRE230-	0.4	00401	1	0.4	0.37	45
		00402	2			
		00403	3			
		00404	4			
		00405	5			
		00406	6			
HMRE230-	0.5	00502	2	0.5	0.46	45
		00503	3			
		00504	4			
		00505	5			
		00506	6			
		00508	8			
HMRE230-	0.6	00602	2	0.6	0.56	45
		00603	3			
		00604	4			
		00605	5			
		00606	6			
		00608	8			
		00610	10			
		00612	12			
HMRE230-	0.7	00702	2	0.7	0.65	45
		00704	4			
		00706	6			

단위 (mm) / Unit (mm)

모델번호 Model No.	인선직경 Dia of Mill	유효장 Effective Length	날장 Length of Cut	목부경 Neck Dia	전장 Overall Length	샙크경 Shank Dia					
	D	l ₂	l ₁	d ₂	L	d					
HMRE230-	0.8	00802	2	0.8	0.76	45					
		00803	3								
		00804	4								
		00805	5								
		00806	6								
		00808	8								
		00810	10								
		00812	12								
		HMRE230-	1				01003	3	1.5	0.95	4
							01004	4			
							01005	5			
							01006	6			
01008	8										
01010	10										
01012	12										
01014	14										
01016	16										
01020	20										
HMRE230-	1.2	01204	4	1.8	1.15	4					
		01206	6								
		01208	8								
		01210	10								
		01212	12								
		01214	14								
HMRE230-	1.5	01504	4	2.3	1.45	4					
		01506	6								
		01508	8								
		01510	10								
		01512	12								
		01514	14								
		01516	16								
		01520	20								
		HMRE230-	2				02006	6	3	1.90	4
							02008	8			
02010	10										
02012	12										
02014	14										
02016	16										
02020	20										
HMRE230-	3			03010	10	4.5	2.85	6			
				03012	12						
				03014	14						
		03016	16								
		03020	20								
		03025	25								
		03030	30								
		HMRE230-	4	04012	12				6	3.85	6
04016	16										
04020	20										
04025	25										
04030	30										

단위 (mm) / Unit (mm)



볼
Ball

라디우스
Radius

플랫
FLAT

볼
Ball

라디우스
Radius

플랫
Flat

플랫
Flat

볼
Ball

라디우스
Radius

플랫
Flat



HY-MAX
End Mill
Series

CO-MAX
End Mill
Series

ALU-MAX
End Mill
Series

DIA-MAX
End Mill
Series

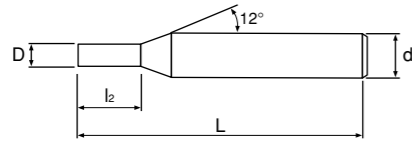
절삭 조건
Milling
Conditions

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HME230

HY-MAX 플랫 엔드밀 2날 30도
HY-MAX Flat End Mill 2-Flute 30°



CARBIDE NANO HY MAX 2 Helix 30° D 0/-0.015 D 0/-0.02 D≤5 D≥6

* 적용 피삭재 (●는 최적, ○는 가능)
* Applicable Work Material (●Most Suitable, ○Applicable)

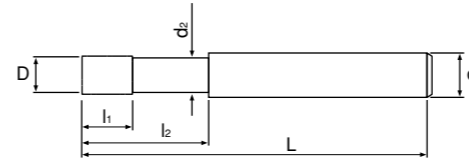
피삭재 WORK MATERIAL									
탄소강 Carbon Steels	합금강 Alloy Steels	프리하든강 Prehardened Steels	열처리강 Hardened Steels			흑연 Graphite	동 Copper	알루미늄 합금 Aluminium Alloys	유리섬유 강화플라스틱 Glass fiberreinforced plastic
S45C/S50C	SCM	NAK/HPM ~40HRC	SKD61 ~55HRC	SKD11 ~60HRC	SKH ~65HRC	-	-	-	-
○	○	○	○	○	-	-	○	-	-

모델번호 Model No.	인선직경 Dia of Mill	날장 Length of Cut	전장 Overall Length	생크경 Shank Dia
	D	l ₂	L	d
HME230 - 003006-045-S04	0.3	0.6	45	4
HME230 - 004008-045-S04	0.4	0.8	45	4
HME230 - 00501-045-S04	0.5	1	45	4
HME230 - 006012-045-S04	0.6	1.2	45	4
HME230 - 007014-045-S04	0.7	1.4	45	4
HME230 - 008016-045-S04	0.8	1.6	45	4
HME230 - 010025-045-S04	1	2.5	45	4
HME230 - 01203-045-S04	1.2	3	45	4
HME230 - 01504-045-S04	1.5	4	45	4
HME230 - 02006-045-S04	2	6	45	4
HME230 - 02508-045-S04	2.5	8	45	4
HME230 - 03008-050-S06	3	8	50	6
HME230 - 04010-050-S06	4	10	50	6
HME230 - 05015-060-S06	5	15	60	6
HME230 - 06015-060-S06	6	15	60	6
HME230 - 07020-065-S08	7	20	65	8
HME230 - 08020-065-S08	8	20	65	8
HME230 - 10025-070-S10	10	25	70	10
HME230 - 12030-080-S12	12	30	80	12
HME230 - 16040-100-S16	16	40	100	16

단위 (mm) / Unit (mm)

HMLSE230

HY-MAX 롱샹크 플랫 엔드밀 2날 30도
HY-MAX Long Shank Flat End Mill 2-Flute 30°



CARBIDE NANO HY MAX 2 Helix 30° D 0/-0.02

* 적용 피삭재 (●는 최적, ○는 가능)
* Applicable Work Material (●Most Suitable, ○Applicable)

피삭재 WORK MATERIAL									
탄소강 Carbon Steels	합금강 Alloy Steels	프리하든강 Prehardened Steels	열처리강 Hardened Steels			흑연 Graphite	동 Copper	알루미늄 합금 Aluminium Alloys	유리섬유 강화플라스틱 Glass fiberreinforced plastic
S45C/S50C	SCM	NAK/HPM ~40HRC	SKD61 ~55HRC	SKD11 ~60HRC	SKH ~65HRC	-	-	-	-
○	○	○	○	-	-	-	○	-	-

모델번호 Model No.	인선직경 Dia of Mill	유효장 Effective Length	날장 Length of Cut	목부경 Neck Dia	전장 Overall Length	생크경 Shank Dia
	D	l ₂	l ₁	d ₂	L	d
HMLSE230 - 06030-090-S06	6	30	12	5.7	90	6
HMLSE230 - 08040-090-S08	8	40	16	7.7	90	8
HMLSE230 - 10050-100-S10	10	50	20	9.7	100	10
HMLSE230 - 12055-100-S10	12	55	24	11.7	100	12

단위 (mm) / Unit (mm)



볼
Ball

라디우스
Radius

플랫
FLAT

볼
Ball

라디우스
Radius

플랫
Flat

플랫
Flat

볼
Ball

라디우스
Radius

플랫
Flat



HY-MAX
End Mill
Series

CO-MAX
End Mill
Series

ALU-MAX
End Mill
Series

DIA-MAX
End Mill
Series

절삭 조건
Milling
Conditions

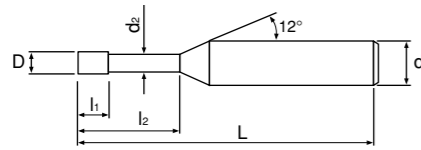
참고 자료
Reference
Data





HMRE430

HY-MAX 리브 플랫 엔드밀 4날 30도
HY-MAX Rib Flat End Mill 4-Flute 30°



* 적용 피삭재 (●는 최적, ○는 가능)
* Applicable Work Material (●Most Suitable, ○Applicable)

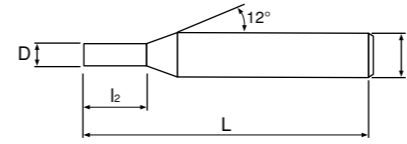
피삭재 WORK MATERIAL									
탄소강 Carbon Steels	합금강 Alloy Steels	프리하든강 Prehardened Steels	열처리강 Hardened Steels			흑연 Graphite	동 Copper	알루미늄 합금 Aluminium Alloys	유리섬유 강화플라스틱 Glass fiberreinforced plastic
S45C/S50C	SCM	NAK/HPM ~40HRC	SKD61 ~55HRC	SKD11 ~60HRC	SKH ~65HRC	-	-	-	-
○	○	○	○	○	-	-	○	-	-

모델번호 Model No.	인선직경 Dia of Mill	유효장 Effective Length	날장 Length of Cut	목부경 Neck Dia	전장 Overall Length	생크경 Shank Dia
	D	l ₂	l ₁	d ₂	L	d
HMRE430-	1	01004	4	1.5	0.95	45
		01006	6			
		01008	8			
		01010	10			
		01012	12			
HMRE430-	1.5	01506	6	2.3	1.45	45
		01508	8			
		01510	10			
		01512	12			
HMRE430-	2	02006	6	3	1.90	45
		02008	8			
		02010	10			
		02012	12			
		02016	16			
HMRE430-	3	03012	12	4.5	2.85	60
		03016	16			
		03020	20			
		03025	25			
HMRE430-	4	04012	12	6	3.85	60
		04016	16			
		04020	20			
		04025	25			
		04030	30			

단위 (mm) / Unit (mm)

HME430

HY-MAX 플랫 엔드밀 4날 30도
HY-MAX Flat End Mill 4-Flute 30°



* 적용 피삭재 (●는 최적, ○는 가능)
* Applicable Work Material (●Most Suitable, ○Applicable)

피삭재 WORK MATERIAL									
탄소강 Carbon Steels	합금강 Alloy Steels	프리하든강 Prehardened Steels	열처리강 Hardened Steels			흑연 Graphite	동 Copper	알루미늄 합금 Aluminium Alloys	유리섬유 강화플라스틱 Glass fiberreinforced plastic
S45C/S50C	SCM	NAK/HPM ~40HRC	SKD61 ~55HRC	SKD11 ~60HRC	SKH ~65HRC	-	-	-	-
○	○	○	○	○	-	-	○	-	-

모델번호 Model No.	인선직경 Dia of Mill	날장 Length of Cut	전장 Overall Length	생크경 Shank Dia
	D	l ₂	L	d
HME430 - 010025-050-S06	1	2.5	50	6
HME430 - 01504-050-S06	1.5	4	50	6
HME430 - 02006-050-S06	2	6	50	6
HME430 - 02508-050-S06	2.5	8	50	6
HME430 - 03008-050-S06	3	8	50	6
HME430 - 04010-050-S06	4	10	50	6
HME430 - 05015-060-S06	5	15	60	6
HME430 - 06015-060-S06	6	15	60	6
HME430 - 07020-065-S08	7	20	65	8
HME430 - 08020-065-S08	8	20	65	8
HME430 - 10025-070-S10	10	25	70	10
HME430 - 11030-080-S12	11	30	80	12
HME430 - 12030-080-S12	12	30	80	12
HME430 - 16040-100-S16	16	40	100	16

단위 (mm) / Unit (mm)



볼
Ball

라디우스
Radius

플랫
FLAT

볼
Ball

라디우스
Radius

플랫
Flat

플랫
Flat

볼
Ball

라디우스
Radius

플랫
Flat



HY-MAX
End Mill
Series

CO-MAX
End Mill
Series

ALU-MAX
End Mill
Series

DIA-MAX
End Mill
Series

절삭 조건
Milling
Conditions

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HMLSE430 | HY-MAX 통생크 플랫 엔드밀 4날 30도

HY-MAX Long Shank Flat End Mill 4-Flute 30°



* 적용 피삭재 (●는 최적, ○는 가능)
* Applicable Work Material (●Most Suitable, ○Applicable)

피삭재 WORK MATERIAL									
탄소강 Carbon Steels	합금강 Alloy Steels	프리하든강 Prehardened Steels	열처리강 Hardened Steels			흑연 Graphite	동 Copper	알루미늄 합금 Aluminium Alloys	유리섬유 강화플라스틱 Glass fiberreinforced plastic
S45C/S50C	SCM	NAK/HPM ~40HRC	SKD61 ~55HRC	SKD11 ~60HRC	SKH ~65HRC	-	-	-	-
○	●	○	○	○	-	-	○	-	-

모델번호 Model No.	인선직경 Dia of Mill	유효장 Effective Length	날장 Length of Cut	목부경 Neck Dia	전장 Overall Length	생크경 Shank Dia
	D	l ₂	l ₁	d ₂	L	d
HMLSE430-04020-080-S04	4	20	8	3.85	80	4
HMLSE430-06030-090-S06	6	30	12	5.7	90	6
HMLSE430-08040-090-S08	8	40	16	7.7	90	8
HMLSE430-10050-100-S10	10	50	20	9.7	100	10
HMLSE430-12055-100-S12	12	55	24	11.7	100	12
		60			150	

단위 (mm) / Unit (mm)

HMEL430 | HY-MAX 롱날장 플랫 엔드밀 4날 30도

HY-MAX Long Flute Flat End Mill 4-Flute 30°



* 적용 피삭재 (●는 최적, ○는 가능)
* Applicable Work Material (●Most Suitable, ○Applicable)

피삭재 WORK MATERIAL									
탄소강 Carbon Steels	합금강 Alloy Steels	프리하든강 Prehardened Steels	열처리강 Hardened Steels			흑연 Graphite	동 Copper	알루미늄 합금 Aluminium Alloys	유리섬유 강화플라스틱 Glass fiberreinforced plastic
S45C/S50C	SCM	NAK/HPM ~40HRC	SKD61 ~55HRC	SKD11 ~60HRC	SKH ~65HRC	-	-	-	-
○	●	○	○	-	-	-	○	-	-

모델번호 Model No.	인선직경 Dia of Mill	날장 Length of Cut	전장 Overall Length	생크경 Shank Dia
	D	l ₂	L	d
HMEL430-06020-070-S06	6	20	70	6
HMEL430-08030-080-S08	8	30	80	8
		40	90	
HMEL430-10040-100-S10	10	40	100	10
		50	120	
HMEL430-12050-120-S12	12	40	100	12
		50	120	
		60	130	
		70	150	
HMEL430-16060-130-S16	16	60	130	16
		80	160	

단위 (mm) / Unit (mm)

HY-MAX
End Mill
Series

CO-MAX
End Mill
Series

ALU-MAX
End Mill
Series

DIA-MAX
End Mill
Series

절삭 조건
Milling
Conditions

참고 자료
Reference
Data



볼
Ball

라디우스
Radius

플랫
FLAT

볼
Ball

라디우스
Radius

플랫
Flat

플랫
Flat

볼
Ball

라디우스
Radius

플랫
Flat





CMRB230

CO-MAX 리브 볼 엔드밀 2날 30도
CO-MAX Rib Ball End Mill 2-Flute 30°

CMRB230



HY-MAX
End Mill
Series

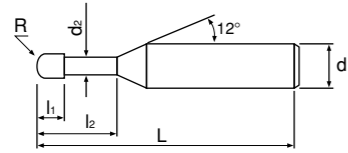
CO-MAX
End Mill
Series

ALU-MAX
End Mill
Series

DIA-MAX
End Mill
Series

절삭 조건
Milling
Conditions

참고 자료
Reference
Data



CARBIDE NANO | DLC PVD | 2 Helix | 30° | R ±0.005 | D 0/-0.015 D≤5 | D 0/-0.02 D≥6

*적용 피삭재 (●는 최적, ○는 가능)
* Applicable Work Material (●Most Suitable, ○Applicable)

피삭재 WORK MATERIAL									
탄소강 Carbon Steels	합금강 Alloy Steels	프리하든강 Prehardened Steels	열처리강 Hardened Steels			흑연 Graphite	동 Copper	알루미늄 합금 Aluminium Alloys	유리섬유 강화플라스틱 Glass fiberreinforced plastic
S45C/S50C	SCM	NAK/HPM ~40HRC	SKD61 ~55HRC	SKD11 ~60HRC	SKH ~65HRC	○	○	○	-

모델번호 Model No.	볼반경 Radius of Ball Nose R	유효장 Effective Length l ₂	날장 Length of Cut l ₁	목부경 Neck Dia d ₂	전장 Overall Length L	샙크경 Shank Dia d
CMRB230-	R0.1	00201	1	0.2	0.18	45
		002015	1.5			
		00202	2			
CMRB230-	R0.15	00301	1	0.3	0.27	45
		003015	1.5			
		00302	2			
CMRB230-	R0.2	00303	3	0.4	0.37	45
		00401	1			
		00402	2			
CMRB230-	R0.25	00403	3	0.5	0.46	45
		00404	4			
		00405	5			
CMRB230-	R0.3	00406	6	0.6	0.56	45
		00502	2			
		00503	3			
CMRB230-	R0.3	00504	4	0.6	0.56	45
		00505	5			
		00506	6			
CMRB230-	R0.3	00508	8	0.6	0.56	45
		00510	10			
		00602	2			
CMRB230-	R0.3	00604	4	0.6	0.56	45
		00606	6			
		00608	8			
CMRB230-	R0.3	00610	10	0.6	0.56	45
		00612	12			

단위 (mm) / Unit (mm)

모델번호 Model No.	볼반경 Radius of Ball Nose R	유효장 Effective Length l ₂	날장 Length of Cut l ₁	목부경 Neck Dia d ₂	전장 Overall Length L	샙크경 Shank Dia d
CMRB230-	R0.4	00802	2	0.8	0.76	45
		00804	4			
		00806	6			
		00808	8			
		00810	10			
CMRB230-	R0.5	00812	12	1	0.95	45
		01004	4			
		01006	6			
		01008	8			
		01010	10			
CMRB230-	R0.5	01012	12	1	0.95	50
		01014	14			
		01016	16			
		01506	6			
		01508	8			
CMRB230-	R0.75	01510	10	1.5	1.45	45
		01512	12			
		01514	14			
		01516	16			
		01520	20			
CMRB230-	R1	02006	6	2	1.90	45
		02008	8			
		02010	10			
		02012	12			
		02014	14			
CMRB230-	R1	02016	16	2	1.90	50
		02020	20			
		03012	12			
		03014	14			
		03016	16			
CMRB230-	R1.5	03020	20	3	2.85	60
		03025	25			
		03030	30			
		04016	16			
		04020	20			
CMRB230-	R2	04025	25	4	3.85	60
		04030	30			
		06020	20			
CMRB230-	R3	06030	30	7	5.70	60
		06030	30			80

단위 (mm) / Unit (mm)

볼
Ball

라디우스
Radius

플랫
Flat

볼
BALL

라디우스
Radius

플랫
Flat

플랫
Flat

볼
Ball

라디우스
Radius

플랫
Flat

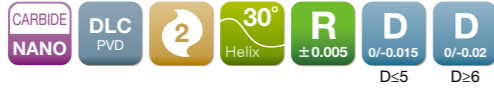
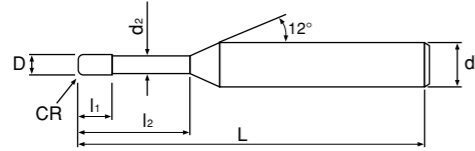




CMRR230

CO-MAX 리브 라디우스 엔드밀 2날 30도
CO-MAX Rib Radius End Mill 2-Flute 30°

CMRR230



* 적용 피삭재 (●는 최적, ○는 가능)
* Applicable Work Material (●Most Suitable, ○Applicable)

피삭재 WORK MATERIAL									
탄소강 Carbon Steels	합금강 Alloy Steels	프리하든강 Prehardened Steels	열처리강 Hardened Steels			흑연 Graphite	동 Copper	알루미늄 합금 Aluminium Alloys	유리섬유 강화플라스틱 Glass fiberreinforced plastic
S45C/S50C	SCM	NAK/HPM ~40HRC	SKD61 ~55HRC	SKD11 ~60HRC	SKH ~65HRC	○	○	○	-

모델번호 Model No.	인선직경 Dia of Mill	코너반경 Coner Radius	유효장 Effective Length	날장 Length of Cut	목부경 Neck Dia	전장 Overall Length	샙크경 Shank Dia
	D	CR	l ₂	l ₁	d ₂	L	d
CMRR230-	0.3	0.05	1.5	0.3	0.27	45	4
			2				
			3				
CMRR230-	0.4	0.05	2	0.4	0.37	45	4
			3				
			4				
CMRR230-	0.5	0.05	2	0.5	0.46	45	4
			4				
			6				
CMRR230-	0.6	0.05	4	0.6	0.56	45	4
			6				
			8				
CMRR230-	0.8	0.1	4	0.8	0.76	45	4
			6				
			8				
CMRR230-	1	0.1	4	1.5	0.95	45	4
			6				
			8				
			10				
			12				
			4				
			6				
			8				
			10				
			12				
CMRR230-	1.5	0.1	8	2.3	1.45	45	4
			10				
			12				
		0.2	8				
		10					
		12					

단위 (mm) / Unit (mm)

모델번호 Model No.	인선직경 Dia of Mill	코너반경 Coner Radius	유효장 Effective Length	날장 Length of Cut	목부경 Neck Dia	전장 Overall Length	샙크경 Shank Dia
	D	CR	l ₂	l ₁	d ₂	L	d
CMRR230-	2	0.2	8	3	1.9	45	4
			10				
			12				
			14				
			16				
			8				
			10				
			12				
			14				
			16				
			8				
			10				
			12				
			14				
			16				
CMRR230-	3	0.2	12	4.5	2.85	60	6
			16				
			20				
			12				
			16				
			20				
			12				
			16				
			20				
			12				
16							
20							
CMRR230-	4	0.2	16	6	3.85	60	6
			20				
			25				
			16				
			20				
			25				
			16				
			20				
			25				
			16				
20							
CMRR230-	6	0.3	20	9	5.7	60	6
			20				
			20				
CMRR230-	8	0.5	24	12	7.7	65	8
			24				
CMRR230-	10	0.5	30	20	9.7	70	10
			30				
CMRR230-	12	0.5	30	20	11.7	80	12
			30				

단위 (mm) / Unit (mm)



볼
Ball

라디우스
Radius

플랫
Flat

볼
Ball

라디우스
RADIUS

플랫
Flat

플랫
Flat

볼
Ball

라디우스
Radius

플랫
Flat



HY-MAX
End Mill
Series

CO-MAX
End Mill
Series

ALU-MAX
End Mill
Series

DIA-MAX
End Mill
Series

절삭 조건
Milling
Conditions

참고 자료
Reference
Data



CMRE230

CO-MAX 리브 플랫 엔드밀 2날 30도
CO-MAX Rib Flat End Mill 2-Flute 30°

CMRE230



HY-MAX
End Mill
Series

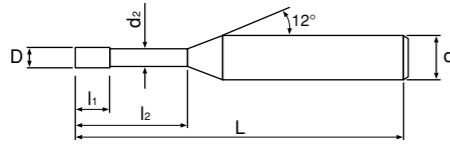
CO-MAX
End Mill
Series

ALU-MAX
End Mill
Series

DIA-MAX
End Mill
Series

절삭 조건
Milling
Conditions

참고 자료
Reference
Data



* 적용 피삭재 (●는 최적, ○는 가능)
* Applicable Work Material (●Most Suitable, ○Applicable)

피삭재 WORK MATERIAL									
탄소강 Carbon Steels	합금강 Alloy Steels	프리하든강 Prehardened Steels	열처리강 Hardened Steels			흑연 Graphite	동 Copper	알루미늄 합금 Aluminium Alloys	유리섬유 강화플라스틱 Glass fiberreinforced plastic
S45C/S50C	SCM	NAK/HPM ~40HRC	SKD61 ~55HRC	SKD11 ~60HRC	SKH ~65HRC	○	●	○	-

모델번호 Model No.	인선직경 Dia of Mill	유효장 Effective Length	날장 Length of Cut	목부경 Neck Diameter	전장 Overall Length	샙크경 Shank Diameter
	D	l ₂	l ₁	d ₂	L	d
CMRE230-	0.2	1	0.2	0.18	45	4
		1.5				
		2				
CMRE230-	0.3	1	0.3	0.27	45	4
		1.5				
		2				
		3				
CMRE230-	0.4	2	0.4	0.37	45	4
		3				
		4				
CMRE230-	0.5	2	0.5	0.46	45	4
		3				
		4				
		6				
CMRE230-	0.6	2	0.6	0.56	45	4
		4				
		6				
		8				
CMRE230-	0.8	2	0.8	0.76	45	4
		4				
		6				
		8				
CMRE230-	1	4	1.5	0.95	45	4
		6				
		8				
		10				

단위 (mm) / Unit (mm)

모델번호 Model No.	인선직경 Dia of Mill	유효장 Effective Length	날장 Length of Cut	목부경 Neck Diameter	전장 Overall Length	샙크경 Shank Diameter
	D	l ₂	l ₁	d ₂	L	d
CMRE230-	01012	12	1.5	0.95	45	4
CMRE230-	01506	6	2.3	1.45	45	4
		8				
		10				
		12				
CMRE230-	02006	6	3	1.90	45	4
		8				
		10				
		12				
		16			50	
		20			60	
		CMRE230-			03012	
16						
20						
25						
CMRE230-	04016	16	6	3.85	60	6
		20				
		25				
		30				

단위 (mm) / Unit (mm)

볼
Ball

라디우스
Radius

플랫
Flat

볼
Ball

라디우스
Radius

플랫
FLAT

플랫
Flat

볼
Ball

라디우스
Radius

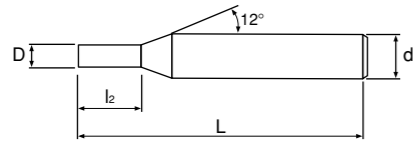
플랫
Flat





CME230

CO-MAX 플랫 엔드밀 2날 30도
CO-MAX Flat End Mill 2-Flute 30°



CARBIDE NANO DLC PVD 2 Helix 30° D D
D≤5 D≥6

* 적용 피삭재 (●는 최적, ○는 가능)
* Applicable Work Material (●Most Suitable, ○Applicable)

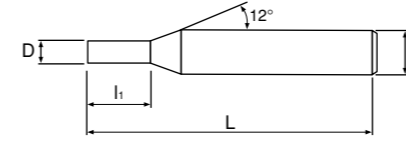
피삭재 WORK MATERIAL									
탄소강 Carbon Steels	합금강 Alloy Steels	프리하든강 Prehardened Steels	열처리강 Hardened Steels			흑연 Graphite	동 Copper	알루미늄 합금 Aluminium Alloys	유리섬유 강화플라스틱 Glass fiberreinforced plastic
S45C/S50C	SCM	NAK/HPM ~40HRC	SKD61 ~55HRC	SKD11 ~60HRC	SKH ~65HRC	○	○	○	-
-	-	-	-	-	-	○	○	○	-

모델번호 Model No.	인선직경 Dia of Mill	날장 Length of Cut	전장 Overall Length	생크경 Shank Diameter
	D	l ₂	L	d
CME230 - 04016-050-S06	4	16	50	6
CME230 - 06015-060-S06	6	15	60	6
CME230 - 08020-065-S08	8	20	65	8
CME230 - 10025-070-S10	10	25	70	10
CME230 - 12030-080-S12	12	30	80	12

단위 (mm) / Unit (mm)

ALE345

ALU-MAX 플랫 엔드밀 3날 45도
ALU-MAX Flat End Mill 3-Flute 45°



CARBIDE NANO 3 Helix 45° D D
D≤5 D≥6

* 적용 피삭재 (●는 최적, ○는 가능)
* Applicable Work Material (●Most Suitable, ○Applicable)

피삭재 WORK MATERIAL									
탄소강 Carbon Steels	합금강 Alloy Steels	프리하든강 Prehardened Steels	열처리강 Hardened Steels			흑연 Graphite	동 Copper	알루미늄 합금 Aluminium Alloys	유리섬유 강화플라스틱 Glass fiberreinforced plastic
S45C/S50C	SCM	NAK/HPM ~40HRC	SKD61 ~55HRC	SKD11 ~60HRC	SKH ~65HRC	-	-	○	-
-	-	-	-	-	-	-	-	○	-

모델번호 Model No.	인선직경 Dia of Mill	날장 Length of Cut	전장 Overall Length	생크경 Shank Diameter
	D	l ₁	L	d
ALE345 - 010025-050-S06	1	2.5	50	6
ALE345 - 01504-050-S06	1.5	4	50	6
ALE345 - 02006-050-S06	2	6	50	6
ALE345 - 02508-050-S06	2.5	8	50	6
ALE345 - 03009-050-S06	3	9	50	6
ALE345 - 04012-050-S06	4	12	50	6
ALE345 - 05015-060-S06	5	15	60	6
ALE345 - 06015-060-S06	6	15	60	6
ALE345 - 08020-065-S08	8	20	65	8
ALE345 - 10025-070-S08	10	25	70	10
ALE345 - 12030-080-S08	12	30	80	12
ALE345 - 16040-100-S16	16	40	100	16

단위 (mm) / Unit (mm)



볼
Ball

라디우스
Radius

플랫
Flat

볼
Ball

라디우스
Radius

플랫
Flat

플랫
FLAT

볼
Ball

라디우스
Radius

플랫
Flat



HY-MAX
End Mill
Series

CO-MAX
End Mill
Series

ALU-MAX
End Mill
Series

DIA-MAX
End Mill
Series

절삭 조건
Milling
Conditions

참고 자료
Reference
Data

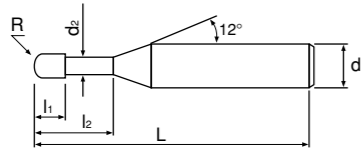




DMRB230

DIA-MAX 리브볼 엔드밀 2날 30도/ 다이아몬드코팅
DIA-MAX Rib Ball End Mill 2-Flute 30°/ Diamond coated

DMRB230



CARBIDE MG DIA CVD 2 Helix 30° R ±0.01 D 0/-0.015 D>1 D 0/-0.02 D>1

* 적용 피삭재 (●는 최적, ○는 가능)
* Applicable Work Material (●Most Suitable, ○Applicable)

피삭재 WORK MATERIAL									
탄소강 Carbon Steels	합금강 Alloy Steels	프리하든강 Prehardened Steels	열처리강 Hardened Steels			흑연 Graphite	동 Copper	알루미늄 합금 Aluminium Alloys	유리섬유 강화플라스틱 Glass fiberreinforced plastic
S45C/S50C	SCM	NAK/HPM ~40HRC	SKD61 ~55HRC	SKD11 ~60HRC	SKH ~65HRC				
-	-	-	-	-	-	○	○	○	○

모델번호 Model No.	볼반경 Radius of Ball Nose R	유효장 Effective Length l ₂	날장 Length of Cut l ₁	목부경 Neck Dia d ₂	전장 Overall Length L	샙크경 Shank Dia d
DMRB230-00201-045-S04	R0.1	1	0.2	0.18	45	4
DMRB230-003015-045-S04		1.5				
DMRB230-00302-045-S04	R0.15	2	0.3	0.25	45	4
DMRB230-00303-045-S04		3				
DMRB230-00402-045-S04		2				
DMRB230-00403-045-S04	R0.2	3	0.4	0.35	45	4
DMRB230-00404-045-S04		4				
DMRB230-00504-045-S04		4				
DMRB230-00506-045-S04	R0.25	6	1	0.45	45	4
DMRB230-00508-045-S04		8				
DMRB230-00604-045-S04		4				
DMRB230-00606-045-S04	R0.3	6	1.2	0.55	45	4
DMRB230-00608-045-S04		8				
DMRB230-00610-045-S04		10				
DMRB230-00806-045-S04		6				
DMRB230-00808-045-S04	R0.4	8	1.6	0.75	45	4
DMRB230-00810-045-S04		10				
DMRB230-01006-050-S04		6				
DMRB230-01008-050-S04		8				
DMRB230-01010-050-S04	R0.5	10	2	0.95	50	4
DMRB230-01012-050-S04		12				
DMRB230-01014-050-S05		14				

단위 (mm) / Unit (mm)

모델번호 Model No.	볼반경 Radius of Ball Nose R	유효장 Effective Length l ₂	날장 Length of Cut l ₁	목부경 Neck Dia d ₂	전장 Overall Length L	샙크경 Shank Dia d
DMRB230-01016-050-S04		16				
DMRB230-01018-050-S04		18			50	
DMRB230-01020-080-S04	R0.5	20	2	0.95		4
DMRB230-01025-080-S04		25			80	
DMRB230-01030-080-S04		30				
DMRB230-01508-050-S04		8				
DMRB230-01510-050-S04		10			50	
DMRB230-01512-050-S04		12				
DMRB230-01514-050-S05		14				
DMRB230-01516-050-S04	R0.75	16	3	1.45		4
DMRB230-01520-080-S04		20			80	
DMRB230-01525-080-S04		25				
DMRB230-01530-080-S04		30				
DMRB230-02010-050-S04		10				
DMRB230-02012-050-S04		12			50	
DMRB230-02016-050-S04		16				
DMRB230-02020-080-S04	R1	20	4	1.9		4
DMRB230-02025-080-S04		25			80	
DMRB230-02030-080-S04		30				
DMRB230-02040-100-S04		40			100	
DMRB230-02050-100-S04		50				
DMRB230-03012-060-S04		12				
DMRB230-03016-060-S04		16			60	
DMRB230-03020-060-S04		20				
DMRB230-03020-100-S04	R1.5	20	6	2.8		4
DMRB230-03030-100-S04		30			100	
DMRB230-03040-100-S04		40				
DMRB230-03050-100-S04		50				
DMRB230-04020-060-S04		20			60	
DMRB230-04025-080-S04	R2	25	12	3.7		4
DMRB230-04030-100-S04		30			100	
DMRB230-06025-080-S06		25			80	
DMRB230-06030-105-S06	R3	30	15	5.7		6
DMRB230-06040-150-S06		40			150	
DMRB230-08030-080-S08		30			80	
DMRB230-08040-105-S08	R4	40	20	7.7		8
DMRB230-08050-150-S08		50			150	
DMRB230-10050-105-S10		50			105	
DMRB230-10060-160-S10	R5	60	22	9.7		10
DMRB230-12055-105-S12		55			105	
DMRB230-12060-160-S12	R6	60	25	11.7		12

단위 (mm) / Unit (mm)



볼
Ball

라디우스
Radius

플랫
Flat

볼
Ball

라디우스
Radius

플랫
Flat

플랫
Flat

볼
BALL

라디우스
Radius

플랫
Flat





DMRR430

DIA-MAX 리브 코너라디우스 엔드밀 4날 30도/ 다이아몬드코팅
DIA-MAX Rib Radius End Mill 4-Flute 30°/ Diamond Coated



* 적용 피삭재 (●는 최적, ○는 가능)
* Applicable Work Material (●Most Suitable, ○Applicable)

피삭재 WORK MATERIAL									
탄소강 Carbon Steels	합금강 Alloy Steels	프리하든강 Prehardened Steels	열처리강 Hardened Steels			흑연 Graphite	동 Copper	알루미늄 합금 Aluminium Alloys	유리섬유 강화플라스틱 Glass fiberreinforced plastic
S45C/S50C	SCM	NAK/HPM ~40HRC	SKD61 ~55HRC	SKD11 ~60HRC	SKH ~65HRC				
-	-	-	-	-	-	○	○	○	○

모델번호 Model No.	인선직경 Dia of Mill	코너반경 Coner Radius	유효장 Effective Length	날장 Length of Cut	목부경 Neck Dia	전장 Overall Length	생크경 Shank Dia
	D	CR	l ₂	l ₁	d ₂	L	d
DMRR430-	3	0.2	20	6	2.85	80	4
			30				
			40				
			20				
			30				
			40				
DMRR430-	4	0.5	30	8	3.85	100	4
			30				
DMRR430-	6	1	30	12	5.7	105	6
			30				
DMRR430-	8	1	40	16	7.7	105	8
			40				
DMRR430-	10	1	50	20	9.7	105	10
			60				
			50				
			60				
DMRR430-	12	1	55	24	11.7	105	12
			60				
			55				
			60				

단위 (mm) / Unit (mm)

DMRE230

DIA-MAX 리브 플랫 엔드밀 2날 30도/ 다이아몬드코팅
DIA-MAX Rib Flat End Mill 2-Flute 30°/ Diamond coated



* 적용 피삭재 (●는 최적, ○는 가능)
* Applicable Work Material (●Most Suitable, ○Applicable)

피삭재 WORK MATERIAL									
탄소강 Carbon Steels	합금강 Alloy Steels	프리하든강 Prehardened Steels	열처리강 Hardened Steels			흑연 Graphite	동 Copper	알루미늄 합금 Aluminium Alloys	유리섬유 강화플라스틱 Glass fiberreinforced plastic
S45C/S50C	SCM	NAK/HPM ~40HRC	SKD61 ~55HRC	SKD11 ~60HRC	SKH ~65HRC				
-	-	-	-	-	-	○	○	○	○

모델번호 Model No.	인선직경 Dia of Mill	유효장 Effective Length	날장 Length of Cut	목부경 Neck Diameter	전장 Overall Length	생크경 Shank Diameter
	D	l ₂	l ₁	d ₂	L	d
DMRE230-	0.2	1	0.2	0.18	45	4
		1.5				
DMRE230-	0.3	2	0.3	0.25	45	4
		3				
DMRE230-	0.4	2	0.4	0.35	45	4
		3				
DMRE230-	0.5	2	1	0.45	45	4
		4				
DMRE230-	0.6	2	1.2	0.55	45	4
		4				
DMRE230-	0.8	4	1.6	0.75	45	4
		6				
DMRE230-	1	6	2	0.95	50	4
		8				
		10				
		12				
		16				
		18				
		10				
		12				

단위 (mm) / Unit (mm)



볼
Ball

라디우스
Radius

플랫
Flat

볼
Ball

라디우스
Radius

플랫
Flat

플랫
Flat

볼
Ball

라디우스
Radius

플랫
FLAT

HY-MAX
End Mill
Series

CO-MAX
End Mill
Series

ALU-MAX
End Mill
Series

DIA-MAX
End Mill
Series

절삭 조건
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DMRE230

HY-MAX
End Mill
Series

CO-MAX
End Mill
Series

ALU-MAX
End Mill
Series

DIA-MAX
End Mill
Series

절삭 조건
Milling
Conditions

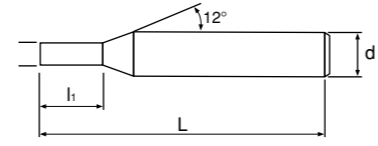
참고 자료
Reference
Data

모델번호	인선직경	유효장	날장	목부경	전장	샙크경	
Model No.	Dia of Mill	Effective Length	Length of Cut	Neck Diameter	Overall Length	Shank Diameter	
	D	l ₂	l ₁	d ₂	L	d	
DMRE230-	01508-050-S04	1.5	8	3	1.45	50	4
	01510-050-S04		10				
	01512-050-S04		12				
	01516-050-S04		16				
	01518-050-S04		18				
DMRE230-	02010-050-S04	2	10	4	1.9	50	4
	02012-050-S04		12				
	02016-050-S04		16				
	02018-050-S04		18				
	02020-080-S04		20				
	02025-080-S04		25				
	02030-080-S04		30				
	02040-080-S04		40				
DMRE230-	03020-080-S04	3	20	6	2.8	80	4
	03030-080-S04		30				
	03040-080-S04		40				
DMRE230-	04030-080-S04	4	30	8	3.8	80	4

단위 (mm) / Unit (mm)

DME430

DIA-MAX 플랫 엔드밀 4날 30도/ 다이아몬드코팅
DIA-MAX Flat End Mill 4-Flute 30° Diamond coated



CARBIDE MG DIA CVD 4 Helix 30° D 0/-0.015 D>1 D 0/-0.02 D>1

* 적용 피삭재 (●는 최적, ○는 가능)
* Applicable Work Material (●Most Suitable, ○Applicable)

피삭재 WORK MATERIAL									
탄소강 Carbon Steels	합금강 Alloy Steels	프리하든강 Prehardened Steels	열처리강 Hardened Steels			흑연 Graphite	동 Copper	알루미늄 합금 Aluminium Alloys	유리섬유 강화플라스틱 Glass fiberreinforced plastic
S45C/S50C	SCM	NAK/HPM -40HRC	SKD61 -55HRC	SKD11 -60HRC	SKH -65HRC				
-	-	-	-	-	-	○	○	○	○

모델번호	인선직경	날장	전장	샙크경
Model No.	Dia of Mill	Length of Cut	Overall Length	Shank Diameter
	D	l ₁	L	d
DME430 - 01003-045-S04	1	3	50	4
DME430 - 01504-045-S04	1.5	4	50	4
DME430 - 02006-045-S04	2	6	50	4
DME430 - 03012-060-S06	3	12	60	6
DME430 - 04016-060-S06	4	16	60	6
DME430 - 05020-070-S06	5	20	70	6
DME430 - 06020-070-S06	6	20	70	6
DME430 - 08024-070-S08	8	24	70	8
DME430 - 10025-080-S10	10	25	80	10
DME430 - 12025-080-S12	12	25	80	12

단위 (mm) / Unit (mm)



볼
Ball

라디우스
Radius

플랫
Flat

볼
Ball

라디우스
Radius

플랫
Flat

플랫
Flat

볼
Ball

라디우스
Radius

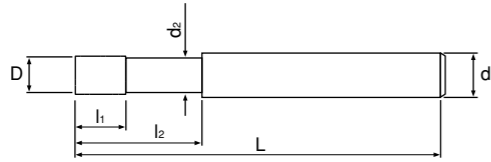
플랫
FLAT





DMLSE430

DIA-MAX 롱샹크 플랫 엔드밀 4날 30도/ 다이아몬드코팅
DIA-MAX Long Shank Flat End Mill 4-Flute 30°/ Diamond coated



* 적용 피삭재 (●는 최적, ○는 가능)
* Applicable Work Material (●Most Suitable, ○Applicable)

피삭재 WORK MATERIAL									
탄소강 Carbon Steels	합금강 Alloy Steels	프리하든강 Prehardened Steels	열처리강 Hardened Steels			흑연 Graphite	동 Copper	알루미늄 합금 Aluminium Alloys	유리섬유 강화플라스틱 Glass fiberreinforced plastic
S45C/S50C	SCM	NAK/HPM ~40HRC	SKD61 ~55HRC	SKD11 ~60HRC	SKH ~65HRC	○	○	○	○
-	-	-	-	-	-	○	○	○	○

모델번호 Model No.	인선직경 Dia of Mill	유효장 Effective Length	날장 Length of Cut	목부경 Neck Dia	전장 Overall Length	샹크경 Shank Dia
	D	l ₂	l ₁	d ₂	L	d
DMLSE430 - 06030-105-S06	6	30	20	5.7	105	6
DMLSE430 - 08040-105-S08	8	40	24	7.7	105	8
DMLSE430 - 10050-105-S10	10	50	25	9.7	105	10
DMLSE430 - 12055-105-S12	12	55	25	11.7	105	12

단위 (mm) / Unit (mm)



CAUTION

초경엔드밀 사용시 주의사항

- 엔드밀 케이스를 열고 케이스로 부터 공구를 분리할때 조심해 주십시오.
- 맨손으로 공구의 날을 직접적으로 만지지 마십시오.
- 절삭가공 중에는 엔드밀이 매우 뜨거워서, 가공이 끝난 직후 엔드밀을 만지지 마십시오. 가공이 끝난 직후 절삭칩 또한 뜨겁기에 맨손으로 만지지 마십시오.
- 보호장갑 또는 보호안경과 같은 안전 장비를 갖추시기 바랍니다.
- 절삭가공 전에 반드시 공구치수를 확인해 주시기 바랍니다.
- 엔드밀 절삭 조건은 가공물 형상과 기계용량, 그리고 작업환경에 따라서 조정할 필요가 있습니다.



CAUTION

Precautions for safe use of Carbide End Mill

- Be careful when you open the end mill cases and remove the tools from cases.
- Do not touch directly the cutting edges with bare hands.
- During cutting operation, end mills get very hot. Do not touch end mills immediately after cutting. Do not touch cutting chips with bare hands. Chips will be hot after cutting.
- Please equip safety items, such as safety glasses and protective gloves.
- Please use correct end mills before starting cutting operation.
- It is necessary to adjust milling conditions according to the milling shape, machine capability and the operation environment.

HY-MAX
End Mill
Series

CO-MAX
End Mill
Series

ALU-MAX
End Mill
Series

DIA-MAX
End Mill
Series

절삭 조건
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HY-MAX END MILL SERIES

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HMBS230	P 33
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RADIUS END MILL

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FLAT END MILL

HMRE230	P 36
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CO-MAX END MILL SERIES

BALL END MILL

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RADIUS END MILL

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FLAT END MILL

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ALU-MAX END MILL SERIES

FLAT END MILL

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DIA-MAX END MILL SERIES

BALL END MILL

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RADIUS END MILL

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FLAT END MILL

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CUTTING CONDITIONS

Milling Conditions List



HMRB230 절삭조건표

HMRB230

Milling Conditions for HMRB230

Work Material		Prehardened Steels NAK / HPM			Hardened Steels SKD61 / STAVAX			Hardened Steels SKD11		
Hardness (HRC)		HRC35 ~ 45			HRC45 ~ 55			HRC55 ~ 65		
R	Effective Length	SPEED (min ⁻¹)	FEED (mm/min ¹)	Depth of Cut ap(mm)	SPEED (min ⁻¹)	FEED (mm/min ¹)	Depth of Cut ap(mm)	SPEED (min ⁻¹)	FEED (mm/min ¹)	Depth of Cut ap(mm)
R0.1	0.5	40,000	350	0.008	40,000	280	0.005	40,000	190	0.002
	1	40,000	260	0.003	40,000	150	0.002	40,000	130	0.001
	1.5	40,000	170	0.003	40,000	110	0.002	40,000	80	0.001
	2	40,000	120	0.002	40,000	80	0.001	40,000	40	0.001
R0.15	0.5	40,000	360	0.007	40,000	300	0.005	40,000	250	0.003
	1	40,000	330	0.007	40,000	250	0.005	40,000	200	0.003
	1.5	40,000	250	0.005	40,000	180	0.003	40,000	120	0.002
	2	40,000	160	0.003	40,000	120	0.002	40,000	90	0.002
R0.2	3	40,000	90	0.001	40,000	70	0.001	40,000	50	0.001
	1	40,000	900	0.02	40,000	750	0.02	40,000	600	0.008
	2	40,000	600	0.01	40,000	400	0.01	40,000	300	0.005
	3	40,000	400	0.007	40,000	250	0.005	40,000	200	0.003
R0.25	4	40,000	170	0.005	40,000	130	0.003	40,000	90	0.002
	5	40,000	80	0.002	40,000	60	0.001	40,000	40	0.001
	6	40,000	60	0.001	40,000	40	0.001	40,000	30	0.001
	1	40,000	1,000	0.03	40,000	850	0.02	40,000	650	0.01
R0.3	2	40,000	750	0.02	40,000	650	0.01	40,000	400	0.007
	3	40,000	500	0.01	40,000	450	0.007	40,000	300	0.005
	4	40,000	350	0.007	40,000	300	0.005	40,000	250	0.003
	5	40,000	250	0.005	40,000	200	0.003	40,000	150	0.002
R0.3	6	40,000	120	0.002	40,000	80	0.001	40,000	70	0.001
	8	40,000	80	0.002	40,000	60	0.001	40,000	50	0.001
	2	40,000	1,400	0.03	40,000	900	0.02	40,000	650	0.02
	3	40,000	1,200	0.03	40,000	800	0.02	40,000	550	0.02
R0.3	4	40,000	1,000	0.02	40,000	600	0.01	40,000	350	0.01
	5	30,000	700	0.01	30,000	500	0.01	30,000	300	0.01
	6	30,000	500	0.008	30,000	350	0.005	30,000	280	0.004
	8	25,000	300	0.003	25,000	250	0.003	20,000	200	0.002
R0.3	10	20,000	150	0.002	20,000	120	0.002	18,000	100	0.001
	2	40,000	2,000	0.05	40,000	1,600	0.04	30,000	1,000	0.03
	3	40,000	1,900	0.05	40,000	1,500	0.04	30,000	900	0.03
	4	40,000	1,500	0.04	40,000	1,000	0.03	30,000	800	0.02
R0.4	5	40,000	1,300	0.04	40,000	850	0.03	30,000	600	0.02
	6	30,000	1,100	0.03	30,000	700	0.02	25,000	500	0.01
	8	30,000	700	0.01	30,000	550	0.006	25,000	400	0.005
	10	25,000	400	0.005	25,000	300	0.003	25,000	300	0.002
R0.4	12	20,000	300	0.002	20,000	200	0.002	-	-	-

Work Material		Prehardened Steels NAK / HPM			Hardened Steels SKD61 / STAVAX			Hardened Steels SKD11		
Hardness (HRC)		HRC35 ~ 45			HRC45 ~ 55			HRC55 ~ 65		
R	Effective Length	SPEED (min ⁻¹)	FEED (mm/min ¹)	Depth of Cut ap(mm)	SPEED (min ⁻¹)	FEED (mm/min ¹)	Depth of Cut ap(mm)	SPEED (min ⁻¹)	FEED (mm/min ¹)	Depth of Cut ap(mm)
R0.5	3	38,000	2,500	0.06	30,000	2,000	0.06	25,000	1,500	0.04
	4	38,000	2,500	0.06	30,000	1,800	0.05	25,000	1,200	0.03
	5	30,000	2,000	0.04	25,000	1,500	0.03	20,000	900	0.02
	6	30,000	1,800	0.04	25,000	1,100	0.03	20,000	700	0.02
	8	30,000	1,000	0.03	25,000	800	0.02	20,000	500	0.01
	10	25,000	700	0.03	20,000	600	0.02	18,000	400	0.01
	12	20,000	600	0.02	18,000	500	0.008	16,000	350	0.005
	14	20,000	400	0.005	18,000	350	0.003	16,000	300	0.002
	16	18,000	300	0.005	16,000	250	0.003	14,000	200	0.002
	20	16,000	100	0.003	14,000	60	0.002	-	-	-
R0.6	4	30,000	2,500	0.07	30,000	2,000	0.07	25,000	1,600	0.05
	6	30,000	2,000	0.07	25,000	1,500	0.05	20,000	1,100	0.03
	8	30,000	1,500	0.05	25,000	1,100	0.03	20,000	900	0.02
	10	20,000	1,200	0.03	20,000	800	0.02	18,000	600	0.01
R0.6	12	20,000	800	0.02	20,000	600	0.009	18,000	450	0.007
	14	20,000	600	0.015	20,000	500	0.01	16,000	400	0.006
	16	18,000	400	0.01	16,000	350	0.01	14,000	300	0.006
	20	16,000	200	0.005	14,000	150	0.005	12,000	150	0.003
R0.75	4	30,000	3,000	0.13	30,000	2,500	0.1	25,000	2,000	0.09
	6	30,000	3,000	0.13	30,000	2,000	0.09	25,000	1,600	0.08
	8	25,000	2,500	0.09	25,000	1,600	0.05	20,000	1,200	0.05
	10	25,000	2,500	0.09	25,000	1,200	0.05	20,000	800	0.05
	12	20,000	1,800	0.05	20,000	900	0.03	18,000	700	0.02
	14	20,000	1,200	0.05	20,000	800	0.03	18,000	600	0.02
R1	16	18,000	700	0.03	18,000	600	0.02	16,000	500	0.01
	20	16,000	450	0.01	16,000	350	0.01	14,000	300	0.007
	6	25,000	2,500	0.18	25,000	2,000	0.18	20,000	1,500	0.13
	8	20,000	2,000	0.18	18,000	1,500	0.1	16,000	1,100	0.09
	10	18,000	2,000	0.1	16,000	1,500	0.09	12,000	1,000	0.08
	12	16,000	1,500	0.1	14,000	1,200	0.07	12,000	900	0.05
R1	14	16,000	1,500	0.07	14,000	1,200	0.05	12,000	900	0.03
	16	16,000	1,400	0.07	14,000	1,100	0.05	12,000	800	0.03
	20	14,000	1,000	0.05	12,000	800	0.03	10,000	700	0.02
	25	12,000	600	0.03	10,000	500	0.02	8,500	400	0.01
	30	12,000	350	0.02	10,000	300	0.01	8,500	200	0.008
	40	10,000	100	0.005	8,000	80	0.003	6,500	55	0.002



볼 BALL

라디우스 Radius

플랫 Flat

볼 Ball

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플랫 Flat

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HMRB230

Work Material		Prehardened Steels NAK / HPM			Hardened Steels SKD61 / STAVAX			Hardened Steels SKD11		
Hardness (HRC)		HRC35 ~ 45			HRC45 ~ 55			HRC55 ~ 65		
R	Effective Length	SPEED (min ⁻¹)	FEED (mm/min ¹)	Depth of Cut ap(mm)	SPEED (min ⁻¹)	FEED (mm/min ¹)	Depth of Cut ap(mm)	SPEED (min ⁻¹)	FEED (mm/min ¹)	Depth of Cut ap(mm)
R1.25	6	25,000	3,500	0.2	25,000	3,000	0.18	20,000	2,000	0.13
	8	20,000	3,000	0.18	20,000	2,500	0.17	18,000	1,600	0.11
	10	20,000	2,500	0.15	20,000	2,000	0.15	18,000	1,500	0.1
	12	18,000	2,000	0.13	16,000	1,500	0.13	14,000	1,100	0.08
	16	18,000	2,000	0.1	16,000	1,500	0.07	14,000	1,100	0.05
	20	16,000	1,500	0.07	14,000	1,200	0.05	10,000	1,000	0.03
R1.5	10	20,000	2,500	0.2	18,000	2,000	0.2	14,000	1,500	0.1
	12	20,000	2,500	0.2	18,000	2,000	0.2	14,000	1,500	0.1
	14	18,000	2,000	0.1	16,000	1,600	0.1	12,000	1,200	0.1
	16	18,000	2,000	0.1	16,000	1,600	0.1	12,000	1,200	0.1
	20	18,000	1,600	0.1	16,000	1,200	0.1	12,000	900	0.1
	25	16,000	1,200	0.1	14,000	900	0.07	10,000	800	0.05
	30	14,000	800	0.07	12,000	700	0.05	8,500	600	0.03
	40	10,000	450	0.03	8,000	300	0.02	6,500	250	0.01
R2	12	20,000	3,000	0.25	16,000	2,500	0.2	12,000	2,000	0.2
	16	20,000	3,000	0.25	16,000	2,000	0.2	12,000	1,600	0.2
	20	16,000	2,400	0.2	14,000	1,800	0.1	10,000	1,400	0.1
	25	16,000	1,500	0.2	14,000	1,200	0.1	10,000	1,000	0.1
	30	14,000	1,500	0.1	10,000	1,200	0.08	8,000	1,000	0.05
	40	12,000	1,200	0.07	8,500	1,000	0.05	6,500	800	0.03
R3	20	18,000	3,200	0.25	14,000	2,600	0.2	8,000	2,000	0.15
	25	16,000	3,000	0.25	12,000	2,000	0.2	7,000	1,500	0.12
	30	14,000	2,800	0.2	7,000	1,800	0.15	6,500	1,300	0.1

NOTE

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- 절입량의 ap는 축방향의 절입량을 표시합니다.
- 회전수와 테이블이송은 같은 비율로 조정해 주십시오.
- 상기 절삭조건표는 참고자료입니다. 실제 가공시에는 가공형상, 기계용량, 작업환경에 따라 조건을 조정해서 가공하시기 바랍니다.

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- ap(mm) : Axial Depth of Cut
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HMBS230 과 HMB230 절삭조건표

Milling Conditions for HMBS230 and HMB230

Work Material		Prehardened Steels NAK / HPM			Hardened Steels SKD61 / STAVAX			Hardened Steels SKD11		
Hardness (HRC)		HRC35 ~ 45			HRC45 ~ 55			HRC55 ~ 65		
R	Effective Length	SPEED (min ⁻¹)	FEED (mm/min ¹)	Depth of Cut ap(mm)	SPEED (min ⁻¹)	FEED (mm/min ¹)	Depth of Cut ap(mm)	SPEED (min ⁻¹)	FEED (mm/min ¹)	Depth of Cut ap(mm)
R0.5		40,000	2,600	0.1	30,000	2,000	0.1	25,000	1,300	0.08
R0.75		30,000	3,000	0.15	30,000	2,500	0.1	25,000	1,800	0.1
R1		25,000	3,000	0.2	25,000	2,500	0.2	20,000	1,800	0.15
R1.25		25,000	3,000	0.2	20,000	2,500	0.2	16,000	1,800	0.15
R1.5		20,000	3,000	0.2	18,000	2,500	0.2	14,000	2,000	0.15
R2		20,000	3,000	0.25	16,000	2,500	0.2	12,000	2,000	0.15
R2.5		18,000	3,000	0.25	14,000	2,500	0.2	9,000	2,000	0.15
R3		18,000	3,300	0.3	16,000	2,800	0.25	8,000	2,000	0.15
R4		16,000	3,300	0.4	12,000	2,800	0.3	7,000	1,500	0.2
R5		13,000	3,400	0.5	10,000	2,600	0.4	5,000	1,300	0.3
R6		7,000	2,000	0.6	6,000	1,800	0.5	4,000	1,100	0.4
R8		5,000	1,800	0.8	4,000	1,300	0.7	3,000	800	0.5

NOTE

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- Adjust both Spindle speed and Feed rate by the same proportion.
- The above conditions are only for reference. In actual machining conditions adjust these parameters according to the milling shape, machine capability and the operation environment.



볼 BALL

라디우스 Radius

플랫 Flat

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HY-MAX
End Mill
Series

CO-MAX
End Mill
Series

ALU-MAX
End Mill
Series

DIA-MAX
End Mill
Series

절삭 조건
Milling
Conditions

참고 자료
Reference
Data



HMRR230과 HMR230 절삭조건표

Milling Conditions for HMRR230과 HMR230

Work Material		Prehardened Steels NAK / HPM			Hardened Steels SKD61 / STAVAX		
Hardness (HRC)		~HRC45			~HRC55		
D	Effective Length	SPEED (min ⁻¹)	FEED (mm/min ¹)	Depth of Cut ap(mm)	SPEED (min ⁻¹)	FEED (mm/min ¹)	Depth of Cut ap(mm)
0.3	1	30,000	200	0.007	30,000	150	0.004
	1.5	30,000	150	0.007	30,000	130	0.004
	2	30,000	100	0.006	30,000	100	0.003
0.4	1	30,000	350	0.01	30,000	250	0.005
	2	30,000	300	0.01	30,000	200	0.005
	3	30,000	250	0.008	30,000	180	0.004
	4	30,000	200	0.006	30,000	140	0.003
0.5	1	30,000	500	0.02	24,000	350	0.01
	2	30,000	480	0.02	24,000	330	0.01
	3	30,000	400	0.015	24,000	270	0.008
	4	25,000	270	0.015	20,000	200	0.005
	5	25,000	250	0.01	20,000	180	0.004
	6	25,000	200	0.008	20,000	150	0.003
0.6	2	30,000	600	0.03	25,000	400	0.02
	4	25,000	400	0.025	20,000	250	0.015
	6	20,000	250	0.015	16,000	150	0.008
	8	18,000	180	0.01	14,000	100	0.005
0.7	2	30,000	650	0.03	25,000	450	0.02
	4	25,000	600	0.03	20,000	400	0.02
	6	20,000	450	0.02	16,000	250	0.01
	8	18,000	140	0.006	14,000	100	0.003
0.8	2	30,000	1,100	0.045	25,000	700	0.025
	4	25,000	1,000	0.04	20,000	600	0.02
	6	20,000	700	0.03	16,000	400	0.01
	8	18,000	400	0.02	14,000	250	0.008
	10	18,000	250	0.01	14,000	150	0.005
1	2.5	25,000	1,600	0.06	20,000	900	0.05
	4	25,000	1,400	0.05	20,000	800	0.04
	6	20,000	1,000	0.04	16,000	600	0.02
	8	18,000	700	0.03	14,000	450	0.02
	10	16,000	600	0.02	13,000	350	0.01
	12	14,000	350	0.02	12,000	250	0.008
	14	12,000	300	0.01	10,000	200	0.005
	16	12,000	250	0.01	10,000	150	0.005
1.2	4	22,000	1,500	0.05	18,000	800	0.03
	6	20,000	1,300	0.05	17,000	700	0.03
	8	18,000	1,100	0.04	15,000	600	0.02
	10	16,000	900	0.03	13,000	500	0.02
	12	14,000	700	0.02	11,000	400	0.015
	14	12,000	350	0.01	10,000	200	0.01
16	12,000	300	0.01	10,000	180	0.008	

HMRR230 & HMR230

Work Material		Prehardened Steels NAK / HPM			Hardened Steels SKD61 / STAVAX		
Hardness (HRC)		~HRC45			~HRC55		
D	Effective Length	SPEED (min ⁻¹)	FEED (mm/min ¹)	Depth of Cut ap(mm)	SPEED (min ⁻¹)	FEED (mm/min ¹)	Depth of Cut ap(mm)
1.5	4	22,000	1,600	0.09	18,000	1,000	0.05
	6	20,000	1,400	0.08	16,000	850	0.04
	8	18,000	1,200	0.07	15,000	700	0.04
	10	16,000	1,000	0.06	13,000	550	0.03
	12	14,000	800	0.05	11,000	450	0.03
	14	12,000	700	0.04	10,000	400	0.02
	16	12,000	600	0.03	10,000	350	0.015
	20	10,000	300	0.02	8,000	200	0.005
2	6	16,000	2,100	0.12	14,000	900	0.05
	8	16,000	2,000	0.11	13,000	800	0.05
	10	16,000	1,800	0.1	13,000	750	0.04
	12	14,000	1,500	0.09	11,000	600	0.04
	16	12,000	1,200	0.07	10,000	500	0.03
2.5	10	15,000	1,800	0.13	12,000	900	0.07
	16	12,000	1,200	0.08	9,000	550	0.05
	20	10,000	1,000	0.07	8,000	450	0.05
	12	13,000	1,800	0.15	10,000	950	0.08
3	16	12,000	1,500	0.12	9,000	800	0.07
	20	11,000	1,200	0.1	8,000	600	0.06
	25	10,000	1,000	0.08	7,500	500	0.05
	30	9,000	800	0.06	6,500	400	0.03
	35	8,000	500	0.03	5,500	300	0.01
4	12	10,000	2,300	0.2	9,000	1,000	0.1
	16	8,000	2,000	0.16	7,000	800	0.09
	20	7,000	1,700	0.14	6,000	750	0.08
	25	7,000	1,500	0.12	5,500	700	0.07
	30	6,000	900	0.08	4,500	500	0.04
	35	5,000	500	0.05	4,000	400	0.02
6	20	9,000	2,000	0.2	6,500	1,100	0.1
	30	9,000	2,000	0.1	6,500	1,100	0.05
8	24	7,000	1,400	0.2	4,500	1,100	0.1
	40	7,000	1,400	0.1	4,500	1,100	0.05
10	30	6,000	1,200	0.2	4,000	1,000	0.1
	50	6,000	1,200	0.1	4,000	1,000	0.05
12	30	5,000	1,000	0.2	3,000	850	0.1
	55	5,000	1,000	0.1	3,000	850	0.05

NOTE

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볼
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Ball

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Radius

플랫
Flat





HMRR430과 HMR430 절삭조건표

Milling Conditions for HMRR430과 HMR430

Work Material		Prehardened Steels NAK / HPM			Hardened Steels SKD61 / STAVAX			Hardened Steels SKD11		
Hardness (HRC)		~HRC45			~HRC55			~HRC65		
D	Effective Length	SPEED (min ⁻¹)	FEED (mm/min ⁻¹)	Depth of Cut ap(mm)	SPEED (min ⁻¹)	FEED (mm/min ⁻¹)	Depth of Cut ap(mm)	SPEED (min ⁻¹)	FEED (mm/min ⁻¹)	Depth of Cut ap(mm)
1	2.5	25,000	2,100	0.05	20,000	1,900	0.04	16,000	1,000	0.02
	4	23,000	1,800	0.04	18,000	1,500	0.03	14,000	900	0.01
	6	18,000	1,400	0.02	14,000	1,100	0.01	10,000	800	0.007
	8	16,000	1,200	0.02	12,000	950	0.01	8,000	650	0.005
	10	14,000	1,000	0.01	10,000	800	0.007	6,000	500	0.005
	12	12,000	800	0.007	8,000	650	0.005	5,000	400	0.003
1.5	4	25,000	2,000	0.05	20,000	1,600	0.04	15,000	1,100	0.03
	6	20,000	1,600	0.04	18,000	1,400	0.03	14,000	1,000	0.02
	8	18,000	1,200	0.04	14,000	1,200	0.03	10,000	750	0.01
	10	16,000	1,100	0.03	13,000	1,000	0.02	9,000	700	0.007
	12	14,000	1,000	0.03	12,000	850	0.02	8,000	630	0.007
	14	12,000	900	0.02	10,000	800	0.01	7,000	550	0.005
	16	12,000	850	0.02	9,500	700	0.01	6,500	500	0.005
	20	8,500	550	0.01	7,000	400	0.007	5,500	300	0.005
2	6	18,000	1,800	0.06	15,000	1,500	0.05	12,000	1,100	0.03
	8	16,000	1,600	0.05	12,000	1,200	0.04	10,000	950	0.02
	10	14,000	1,400	0.04	12,000	1,100	0.03	9,500	850	0.01
	12	12,000	1,200	0.04	10,000	1,000	0.03	8,000	800	0.01
	16	10,000	1,000	0.03	9,000	800	0.02	7,500	650	0.007
	20	9,000	750	0.02	8,500	700	0.01	6,000	500	0.005
2.5	10	14,000	1,600	0.07	10,000	1,400	0.05	8,000	900	0.03
	16	10,000	1,200	0.05	8,000	1,100	0.02	6,000	700	0.01
	20	8,500	1,100	0.05	7,500	950	0.02	5,000	650	0.01
3	10	18,000	2,200	0.1	13,000	1,800	0.07	10,000	1,200	0.05
	12	12,000	1,600	0.08	10,000	1,400	0.06	8,000	1,000	0.04
	16	10,000	1,400	0.07	8,500	1,200	0.05	7,000	800	0.03
	20	9,000	1,400	0.07	7,500	1,200	0.04	6,000	800	0.02
	25	8,000	1,200	0.06	7,000	1,000	0.03	5,000	700	0.01
	30	7,000	1,200	0.03	6,500	1,000	0.02	4,500	600	0.007

HMRR430 & HMR430

Work Material		Prehardened Steels NAK / HPM			Hardened Steels SKD61 / STAVAX			Hardened Steels SKD11		
Hardness (HRC)		~HRC45			~HRC55			~HRC65		
D	Effective Length	SPEED (min ⁻¹)	FEED (mm/min ⁻¹)	Depth of Cut ap(mm)	SPEED (min ⁻¹)	FEED (mm/min ⁻¹)	Depth of Cut ap(mm)	SPEED (min ⁻¹)	FEED (mm/min ⁻¹)	Depth of Cut ap(mm)
4	12	12,000	2,000	0.1	10,000	1,500	0.06	8,500	1,100	0.05
	16	10,000	1,800	0.1	8,000	1,400	0.06	6,000	900	0.05
	20	9,000	1,500	0.08	7,000	1,300	0.05	5,500	850	0.03
	25	6,500	1,400	0.08	5,500	1,200	0.05	4,500	750	0.03
	30	5,000	1,000	0.05	4,000	800	0.02	4,000	600	0.01
	35	4,500	900	0.03	3,800	750	0.01	3,200	500	0.007
5	20	7,000	1,800	0.1	6,000	1,600	0.07	5,000	1,100	0.05
6	20	10,000	3,400	0.1	8,000	2,800	0.1	6,000	2,000	0.05
	30	8,000	2,700	0.05	6,500	2,200	0.03	4,800	1,600	0.02
8	24	9,000	3,600	0.1	7,000	2,800	0.1	5,500	2,400	0.05
	40	8,000	2,800	0.05	6,000	2,200	0.03	5,000	1,900	0.02
10	30	6,500	2,900	0.1	5,500	2,300	0.1	4,500	2,000	0.05
	50	6,000	2,400	0.05	5,000	1,800	0.03	4,000	1,600	0.02
12	30	5,000	2,200	0.1	4,500	1,900	0.1	4,000	1,600	0.05
	55	4,500	1,700	0.05	4,000	1,500	0.03	3,600	1,200	0.02

NOTE

- 정밀하고 강성이 있는 홀더와 장비를 사용해 주십시오.
- 절입량의 ap는 축방향의 절입량을 표시합니다.
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- Use a rigid and precise machine and holder.
- ap(mm) : Axial Depth of Cut
- Adjust both Spindle speed and Feed rate by the same proportion.
- The above conditions are only for reference. In actual machining conditions adjust these parameters according to the milling shape, machine capability and the operation environment.



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HMRE230 절삭조건표

HMRE230

Milling Conditions for HMRE230

Work Material		Prehardened Steels NAK / HPM			Hardened Steels SKD61 / STAVAX			Hardened Steels SKD11		
Hardness (HRC)		~HRC45			~HRC55			~HRC60		
D	Effective Length	SPEED (min ⁻¹)	FEED (mm/min ⁻¹)	Depth of Cut ap(mm)	SPEED (min ⁻¹)	FEED (mm/min ⁻¹)	Depth of Cut ap(mm)	SPEED (min ⁻¹)	FEED (mm/min ⁻¹)	Depth of Cut ap(mm)
0.2	0.5	30,000	240	0.005	30,000	200	0.003	30,000	160	0.003
	1	30,000	180	0.005	30,000	150	0.003	30,000	120	0.003
	1.5	30,000	120	0.003	30,000	100	0.002	30,000	80	0.002
	2	30,000	80	0.003	30,000	50	0.002	30,000	40	0.002
0.3	1	30,000	350	0.007	30,000	300	0.003	30,000	250	0.003
	1.5	30,000	260	0.007	30,000	200	0.003	30,000	160	0.003
	2	30,000	180	0.005	30,000	150	0.003	30,000	120	0.003
	3	30,000	70	0.004	25,000	50	0.002	25,000	40	0.002
0.4	1	30,000	450	0.01	30,000	400	0.005	30,000	350	0.005
	2	30,000	360	0.01	30,000	320	0.005	25,000	280	0.005
	3	30,000	320	0.008	25,000	260	0.004	20,000	220	0.003
	4	30,000	250	0.006	25,000	200	0.003	20,000	160	0.002
	5	25,000	250	0.005	22,000	180	0.003	20,000	150	0.002
	6	25,000	200	0.004	22,000	150	0.002	18,000	130	0.002
0.5	2	30,000	500	0.02	25,000	420	0.01	23,000	380	0.007
	3	30,000	420	0.015	25,000	350	0.007	23,000	320	0.005
	4	25,000	380	0.01	25,000	280	0.005	23,000	240	0.003
	5	25,000	320	0.007	20,000	200	0.003	18,000	150	0.003
	6	25,000	300	0.005	20,000	200	0.003	18,000	150	0.002
	8	20,000	200	0.005	16,000	160	0.002	14,000	130	0.002
	10	16,000	170	0.003	13,000	130	0.002	12,000	110	0.001
0.6	2	30,000	550	0.02	25,000	500	0.01	23,000	400	0.007
	3	30,000	500	0.015	25,000	450	0.007	23,000	350	0.005
	4	25,000	450	0.01	25,000	400	0.005	23,000	300	0.003
	5	25,000	400	0.007	20,000	350	0.003	18,000	250	0.003
	6	25,000	350	0.005	20,000	300	0.002	18,000	200	0.002
	8	20,000	200	0.005	16,000	160	0.002	14,000	130	0.002
0.7	2	30,000	750	0.04	25,000	600	0.03	23,000	450	0.02
	4	25,000	690	0.03	25,000	560	0.02	23,000	400	0.015
	6	25,000	550	0.02	20,000	410	0.015	18,000	300	0.012

Work Material		Prehardened Steels NAK / HPM			Hardened Steels SKD61 / STAVAX			Hardened Steels SKD11		
Hardness (HRC)		~HRC45			~HRC55			~HRC60		
D	Effective Length	SPEED (min ⁻¹)	FEED (mm/min ⁻¹)	Depth of Cut ap(mm)	SPEED (min ⁻¹)	FEED (mm/min ⁻¹)	Depth of Cut ap(mm)	SPEED (min ⁻¹)	FEED (mm/min ⁻¹)	Depth of Cut ap(mm)
0.8	2	30,000	900	0.04	25,000	800	0.03	23,000	700	0.02
	3	25,000	850	0.04	25,000	780	0.03	23,000	650	0.02
	4	25,000	800	0.03	25,000	700	0.025	23,000	600	0.015
	5	25,000	700	0.03	23,000	630	0.02	20,000	530	0.012
	6	20,000	620	0.025	20,000	550	0.02	18,000	450	0.01
	8	16,000	500	0.015	16,000	400	0.007	14,000	300	0.005
	10	16,000	400	0.012	16,000	350	0.007	12,000	180	0.005
	12	16,000	300	0.007	13,000	220	0.005	12,000	120	0.003
	3	25,000	1,200	0.06	23,000	1,000	0.05	18,000	900	0.04
	4	25,000	1,000	0.05	23,000	900	0.04	18,000	800	0.03
	5	22,000	1,000	0.04	20,000	800	0.03	16,000	700	0.02
	6	20,000	900	0.03	18,000	700	0.02	14,000	600	0.01
1	8	18,000	800	0.03	16,000	600	0.02	12,000	500	0.01
	10	16,000	600	0.02	14,000	500	0.01	10,000	400	0.007
	12	16,000	500	0.02	13,000	400	0.01	10,000	300	0.005
	14	16,000	450	0.015	13,000	360	0.008	10,000	280	0.005
	16	14,000	400	0.012	12,000	320	0.006	9,000	250	0.004
	18	14,000	300	0.01	12,000	240	0.006	8,000	200	0.004
	20	12,000	200	0.007	10,000	160	0.005	7,000	130	0.003
	25	12,000	100	0.005	10,000	60	0.003	6,000	50	0.002
	4	25,000	1,000	0.05	23,000	900	0.04	18,000	800	0.03
	6	20,000	900	0.04	18,000	700	0.03	14,000	600	0.02
	8	18,000	800	0.04	16,000	600	0.02	12,000	500	0.01
	10	16,000	600	0.03	12,000	500	0.02	10,000	430	0.01
1.2	12	14,000	600	0.02	10,000	500	0.01	9,000	400	0.007
	14	14,000	450	0.015	10,000	360	0.008	9,000	280	0.005
	16	14,000	400	0.012	10,000	320	0.006	9,000	250	0.004
	4	23,000	1,200	0.07	20,000	900	0.05	18,000	800	0.04
1.5	6	23,000	1,000	0.06	20,000	800	0.04	18,000	700	0.03
	8	20,000	900	0.06	18,000	600	0.03	14,000	600	0.03
	10	20,000	800	0.04	16,000	500	0.03	14,000	500	0.02
	12	16,000	700	0.04	14,000	500	0.02	12,000	430	0.02
	14	14,000	600	0.03	12,000	400	0.02	10,000	380	0.01
	16	12,000	500	0.02	10,000	360	0.01	9,000	300	0.007
	20	10,000	400	0.01	9,000	270	0.01	8,500	200	0.005



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HMRE230

Work Material	Prehardened Steels NAK / HPM			Hardened Steels SKD61 / STAVAX			Hardened Steels SKD11			
	Hardness (HRC)	~HRC45			~HRC55			~HRC60		
D	Effective Length	SPEED (min ⁻¹)	FEED (mm/min ⁻¹)	Depth of Cut ap(mm)	SPEED (min ⁻¹)	FEED (mm/min ⁻¹)	Depth of Cut ap(mm)	SPEED (min ⁻¹)	FEED (mm/min ⁻¹)	Depth of Cut ap(mm)
2	6	20,000	1,000	0.08	18,000	900	0.06	15,000	750	0.05
	8	18,000	900	0.07	16,000	800	0.05	12,000	600	0.04
	10	16,000	800	0.06	14,000	700	0.05	12,000	500	0.04
	12	14,000	700	0.05	12,000	600	0.04	10,000	500	0.03
	14	14,000	700	0.04	12,000	600	0.03	10,000	430	0.02
	16	12,000	600	0.04	10,000	500	0.03	9,200	400	0.02
	18	10,000	500	0.03	9,200	410	0.02	8,500	370	0.01
	20	10,000	400	0.03	9,200	380	0.02	8,500	340	0.01
	3	10	16,000	900	0.15	14,000	800	0.1	10,000	700
12		14,000	800	0.1	12,000	700	0.08	9,200	600	0.06
16		12,000	700	0.08	10,000	600	0.07	8,500	500	0.05
20		10,000	700	0.08	9,000	600	0.07	7,800	500	0.04
25		9,000	600	0.07	8,200	500	0.06	7,000	400	0.03
30		8,000	600	0.05	7,000	500	0.03	6,500	400	0.02
4	12	14,000	900	0.1	12,000	800	0.08	9,200	700	0.06
	16	12,000	800	0.08	10,000	700	0.07	8,500	600	0.05
	20	10,000	800	0.08	9,000	700	0.07	7,800	600	0.04
	25	9,000	700	0.07	8,200	600	0.06	7,000	500	0.03
	30	8,000	700	0.05	7,000	600	0.03	6,500	500	0.02
	35	7,000	600	0.04	6,300	500	0.02	5,500	400	0.01

NOTE

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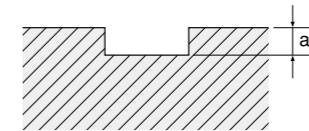
- Use a rigid and precise machine and holder.
- ap(mm) : Axial Depth of Cut
- Adjust both Spindle speed and Feed rate by the same proportion.
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HME230 절삭조건표

Milling Conditions for HME230

Work Material	Alloy Steels SCM			Prehardened Steels NAK / HPM			Hardened Steels SKD61 / STAVAX		
	Hardness (HRC)	~HRC30			~HRC40			~HRC50	
D	SPEED (min ⁻¹)	FEED (mm/min ⁻¹)	Depth of Cut ap(mm)	SPEED (min ⁻¹)	FEED (mm/min ⁻¹)	Depth of Cut ap(mm)	SPEED (min ⁻¹)	FEED (mm/min ⁻¹)	Depth of Cut ap(mm)
1	28,000	500	0.15	19,000	260	0.1	12,500	120	0.05
1.5	20,000	530	0.23	13,000	260	0.15	8,800	120	0.07
2	16,000	530	0.3	10,000	260	0.2	6,600	120	0.1
2.5	13,000	530	0.37	8,000	260	0.25	5,500	120	0.12
3	10,500	550	0.45	6,500	270	0.3	4,800	150	0.15
4	8,500	560	0.8	5,000	270	0.4	3,800	140	0.2
5	7,500	530	1	4,500	250	0.5	3,200	130	0.25
6	6,500	530	1.2	3,800	250	0.6	2,700	130	0.3
8	5,000	530	1.6	2,800	250	1.2	2,000	130	0.8
10	4,000	530	2	2,300	250	1.5	1,600	130	1
12	3,500	530	2.4	1,800	250	1.8	1,300	130	1.2

Depth of Cut (mm)

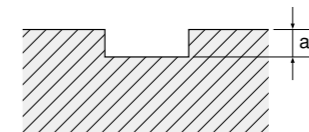


HMLSE230 절삭조건표

Milling Conditions for HMLSE230

Work Material	Alloy Steels SCM			Prehardened Steels NAK / HPM			Hardened Steels SKD61 / STAVAX		
	Hardness (HRC)	~HRC30			~HRC40			~HRC50	
D	SPEED (min ⁻¹)	FEED (mm/min ⁻¹)	Depth of Cut ap(mm)	SPEED (min ⁻¹)	FEED (mm/min ⁻¹)	Depth of Cut ap(mm)	SPEED (min ⁻¹)	FEED (mm/min ⁻¹)	Depth of Cut ap(mm)
6	4,000	270	1.2	2,900	130	0.6	2,500	100	0.3
8	3,000	260	1.6	2,200	120	1.2	1,900	90	0.8
10	2,400	250	2	1,700	120	1.5	1,500	90	1
12	2,000	250	2.4	1,400	120	1.8	1,200	90	1.2

Depth of Cut (mm)



NOTE

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- ap(mm) : Axial Depth of Cut
- Adjust both Spindle speed and Feed rate by the same proportion.
- The above conditions are only for reference. In actual machining conditions adjust these parameters according to the milling shape, machine capability and the operation environment.



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HMRE430 절삭조건표

Milling Conditions for HMRE230

Work Material		Prehardened Steels NAK / HPM			Hardened Steels SKD61 / STAVAX			Hardened Steels SKD11		
Hardness (HRC)		~HRC45			~HRC55			~HRC60		
D	Effective Length	SPEED (min ⁻¹)	FEED (mm/min ⁻¹)	Depth of Cut ap(mm)	SPEED (min ⁻¹)	FEED (mm/min ⁻¹)	Depth of Cut ap(mm)	SPEED (min ⁻¹)	FEED (mm/min ⁻¹)	Depth of Cut ap(mm)
1	4	25,000	2,000	0.05	23,000	1,800	0.04	18,000	1,600	0.03
	6	20,000	1,800	0.03	18,000	1,400	0.02	14,000	1,200	0.01
	8	18,000	1,600	0.03	16,000	1,200	0.02	12,000	1,000	0.01
	10	16,000	1,200	0.02	14,000	1,000	0.01	10,000	800	0.007
	12	14,000	1,000	0.02	14,000	900	0.01	9,000	700	0.007
1.5	6	23,000	2,000	0.06	20,000	1,600	0.04	18,000	1,400	0.03
	8	20,000	1,800	0.06	18,000	1,200	0.03	14,000	1,200	0.03
	10	20,000	1,600	0.04	16,000	1,000	0.03	14,000	1,000	0.02
	12	16,000	1,400	0.04	14,000	1,000	0.02	12,000	850	0.02
2	6	20,000	2,000	0.08	18,000	1,800	0.06	15,000	1,500	0.05
	8	18,000	1,800	0.07	16,000	1,600	0.05	12,000	1,200	0.04
	10	16,000	1,600	0.06	14,000	1,400	0.05	12,000	1,000	0.04
	12	14,000	1,400	0.05	12,000	1,200	0.04	10,000	1,000	0.03
	14	14,000	1,400	0.04	12,000	1,200	0.03	10,000	860	0.02
3	16	12,000	1,200	0.04	10,000	1,000	0.03	9,200	800	0.02
	12	14,000	1,800	0.1	12,000	1,600	0.08	9,200	1,400	0.06
	16	12,000	1,600	0.08	10,000	1,400	0.07	8,500	1,200	0.05
	20	10,000	1,600	0.08	9,000	1,400	0.07	7,800	1,200	0.04
4	25	9,000	1,400	0.07	8,200	1,200	0.06	7,000	1,000	0.03
	12	12,000	2,000	0.2	9,500	2,000	0.15	8,000	1,600	0.08
	16	10,000	2,000	0.15	8,000	1,800	0.1	7,000	1,400	0.06
	20	8,500	1,800	0.12	7,000	1,600	0.08	6,500	1,200	0.05
	25	8,000	1,600	0.1	6,000	1,400	0.07	5,200	1,200	0.04
30	6,800	1,400	0.08	4,800	1,000	0.05	4,200	850	0.03	

NOTE

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- ap(mm) : Axial Depth of Cut
- Adjust both Spindle speed and Feed rate by the same proportion.
- The above conditions are only for reference. In actual machining conditions adjust these parameters according to the milling shape, machine capability and the operation environment.

HME430과 HMLSE430 절삭조건표

Milling Conditions for HME430 and HMLSE430

Work Material		Alloy Steels SCM			Prehardened Steels NAK / HPM			Hardened Steels SKD61 / STAVAX		
Hardness (HRC)		~HRC30			~HRC45			~HRC55		
D	Effective Length	SPEED (min ⁻¹)	FEED (mm/min ⁻¹)	Depth of Cut ap(mm)	SPEED (min ⁻¹)	FEED (mm/min ⁻¹)	Depth of Cut ap(mm)	SPEED (min ⁻¹)	FEED (mm/min ⁻¹)	Depth of Cut ap(mm)
1		20,000	230	0.05	14,000	150	0.05	9,000	160	0.02
2		10,000	300	0.1	7,000	160	0.1	5,000	180	0.04
3		7,500	350	0.15	5,000	180	0.15	3,000	200	0.06
4		5,500	400	0.4	4,000	180	0.4	2,500	230	0.08
5		4,500	430	0.5	3,000	200	0.5	2,000	240	0.1
6		4,000	430	0.6	2,500	200	0.6	1,600	240	0.12
8		2,800	420	0.8	2,000	200	0.8	1,200	240	0.16
10		2,200	420	1	1,500	200	1	1,000	240	0.2
12		1,900	420	1.2	1,300	200	1.2	800	240	0.24

Depth of Cut (mm)

Depth of Cut (mm)

HMEL430 절삭조건표

Milling Conditions for HMEL430

Work Material		Alloy Steels SCM			Tool Steels SKD,SKT,SUS			Prehardened Steels NAK / HPM		
Hardness (HRC)		200~250HB			HRC25~HRC35			~HRC45		
D	Effective Length	SPEED (min ⁻¹)	FEED (mm/min ⁻¹)	Depth of Cut ap(mm)	SPEED (min ⁻¹)	FEED (mm/min ⁻¹)	Depth of Cut ap(mm)	SPEED (min ⁻¹)	FEED (mm/min ⁻¹)	Depth of Cut ap(mm)
6		1,900	170	0.6	1,500	130	0.6	1,200	70	0.6
8		1,400	170	0.8	1,100	130	0.8	900	70	0.8
10		1,100	170	1	900	130	1	700	70	1
12		950	170	1.2	750	130	1.2	550	70	1.2

Depth of Cut (mm)

NOTE

- 정밀하고 강성이 있는 홀더와 장비를 사용해 주십시오.
- 절입량의 ap는 축방향의 절입량을, ae는 반경방향의 절입량을 표시합니다.
- 회전수와 테이블이송은 같은 비율로 조정해 주십시오.
- 상기 절삭조건표는 참고자료입니다. 실제 가공시에는 가공형상, 기계용량, 작업환경에 따라 조건을 조정해서 가공하시기 바랍니다.

- Use a rigid and precise machine and holder.
- ap(mm) : Axial Depth of Cut / ae(mm) : Radial Depth of Cut
- Adjust both Spindle speed and Feed rate by the same proportion.
- The above conditions are only for reference. In actual machining conditions adjust these parameters according to the milling shape, machine capability and the operation environment.



볼
Ball

라디우스
Radius

플랫
FLAT

볼
Ball

라디우스
Radius

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Flat

플랫
Flat

볼
Ball

라디우스
Radius

플랫
Flat





CMRB230 절삭조건표

CMRB230

Milling Conditions for CMRB230

Work Material		동 (COPPER)		
R	Effective Length	SPEED (min ⁻¹)	FEED (mm/min ⁻¹)	Depth of Cut ap(mm)
R0.1	0.5	20,000~50,000	250	0.01
	1	20,000~50,000	250	0.008
	1.5	20,000~50,000	150	0.005
	2	20,000~50,000	100	0.005
R0.15	1	20,000~50,000	250	0.01
	1.5	20,000~50,000	200	0.008
	2	20,000~50,000	150	0.005
	3	20,000~50,000	150	0.005
R0.2	1	20,000~50,000	800	0.03
	2	20,000~50,000	600	0.02
	3	20,000~30,000	400	0.015
	4	20,000~30,000	250	0.008
	5	20,000~30,000	150	0.005
	6	20,000~30,000	80	0.005
R0.25	2	20,000~50,000	600	0.03
	3	20,000~50,000	500	0.02
	4	20,000~50,000	400	0.018
	5	20,000~30,000	250	0.008
	6	20,000~30,000	150	0.008
	8	20,000~30,000	120	0.005
	10	18,000~24,000	80	0.003
R0.3	2	20,000~50,000	1,200	0.04
	4	20,000~50,000	800	0.02
	6	20,000~30,000	450	0.01
	8	18,000~24,000	300	0.008
	10	18,000~24,000	150	0.005
	12	16,000~20,000	80	0.005
R0.4	2	20,000~50,000	2,000	0.05
	4	20,000~50,000	1,500	0.03
	6	20,000~30,000	900	0.02
	8	18,000~24,000	500	0.01
	10	18,000~24,000	350	0.008
	12	16,000~20,000	250	0.008
R0.5	4	20,000~50,000	2,500	0.07
	6	20,000~50,000	1,500	0.05
	8	20,000~30,000	1,200	0.04
	10	20,000~30,000	800	0.03

Work Material		동 (COPPER)		
R	Effective Length	SPEED (min ⁻¹)	FEED (mm/min ⁻¹)	Depth of Cut ap(mm)
R0.5	12	16,000~20,000	600	0.02
	14	16,000~20,000	500	0.015
	16	12,000~16,000	250	0.01
R0.75	6	20,000~30,000	2,500	0.1
	8	20,000~30,000	2,000	0.07
	10	20,000~30,000	1,600	0.05
	12	18,000~24,000	1,200	0.04
	14	18,000~24,000	1,000	0.03
	16	12,000~18,000	800	0.03
	20	12,000~18,000	400	0.02
R1	6	20,000~30,000	3,000	0.2
	8	16,000~20,000	2,500	0.15
	10	16,000~20,000	2,500	0.12
	12	12,000~16,000	1,800	0.1
	14	12,000~16,000	1,600	0.1
	16	10,000~14,000	1,600	0.07
	18	10,000~14,000	1,600	0.05
	20	8,000~12,000	1,000	0.03
	12	16,000~20,000	3,000	0.3
	14	16,000~20,000	3,000	0.3
R1.5	16	16,000~20,000	3,000	0.23
	20	12,000~16,000	1,800	0.23
	25	12,000~16,000	1,200	0.2
	30	8,000~12,000	800	0.15
	16	16,000~20,000	3,000	0.3
R2	20	16,000~20,000	2,800	0.3
	25	12,000~16,000	2,000	0.23
	30	12,000~16,000	2,000	0.2
	20	14,000~18,000	4,000	0.5
R3	30	8,000~12,000	3,000	0.35

NOTE

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- 동 가공시에는 습식가공을 권장합니다.(수용성 절삭유와 비수용성 절삭유)
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볼 Ball

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HY-MAX End Mill Series

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절삭 조건 Milling Conditions

참고 자료 Reference Data



CMRR230 절삭조건표

CMRR230

Milling Conditions for CMRR230

Work Material		동 (COPPER)		
D	Effective Length	SPEED (min ⁻¹)	FEED (mm/min ⁻¹)	Depth of Cut ap(mm)
0.3	1.5	30,000	260	0.018
	2	30,000	250	0.01
	3	30,000	210	0.006
0.4	2	30,000	360	0.024
	3	30,000	300	0.018
	4	30,000	240	0.01
0.5	2	30,000	600	0.03
	4	30,000	430	0.02
	6	25,000	270	0.01
0.6	4	30,000	650	0.03
	6	25,000	400	0.02
	8	20,000	300	0.01
0.8	4	30,000	1,400	0.05
	6	25,000	1,000	0.04
	8	22,000	600	0.02
1	4	30,000	2,000	0.06
	6	25,000	1,500	0.05
	8	22,000	1,000	0.04
	10	20,000	800	0.03
	12	18,000	600	0.02
1.5	8	22,000	1,800	0.08
	10	20,000	1,500	0.07
	12	17,000	1,200	0.06
2	8	20,000	2,600	0.13
	10	20,000	2,300	0.12
	12	17,000	1,900	0.11
	16	15,000	1,600	0.08

Work Material		동 (COPPER)		
D	Effective Length	SPEED (min ⁻¹)	FEED (mm/min ⁻¹)	Depth of Cut ap(mm)
3	12	13,000	3,000	0.2
	16	12,000	2,400	0.14
	20	10,000	2,000	0.1
4	16	10,000	3,200	0.3
	20	9,000	2,600	0.18
	25	8,000	2,300	0.17
6	20	14,000	3,500	0.4
8	24	12,000	3,500	0.4
10	30	9,000	3,500	0.4
12	30	7,000	3,500	0.4

NOTE

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볼 Ball

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볼 Ball

라디우스 RADIUS

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라디우스 Radius

플랫 Flat



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DIA-MAX End Mill Series

절삭 조건 Milling Conditions

참고 자료 Reference Data



CMRE230 절삭조건표

CMRE230

Milling Conditions for CMRE230

Work Material		동 (COPPER)		
D	Effective Length	SPEED (min ⁻¹)	FEED (mm/min ⁻¹)	Depth of Cut ap(mm)
0.2	1	40,000	250	0.01
	1.5	40,000	180	0.006
	2	40,000	100	0.004
0.3	1	40,000	400	0.024
	1.5	40,000	350	0.018
	2	40,000	320	0.012
	3	35,000	250	0.006
0.4	2	40,000	450	0.024
	3	35,000	350	0.018
	4	30,000	240	0.012
0.5	2	35,000	600	0.03
	3	35,000	550	0.024
	4	30,000	420	0.018
0.6	6	25,000	250	0.01
	2	35,000	700	0.04
	4	30,000	550	0.03
	6	25,000	380	0.018
0.8	8	20,000	230	0.012
	2	35,000	850	0.06
	4	30,000	720	0.05
	6	25,000	560	0.04
1	8	22,000	430	0.02
	4	30,000	1,300	0.06
	6	25,000	1,000	0.05
	8	22,000	850	0.04
1.5	10	20,000	750	0.03
	12	18,000	650	0.02
	6	24,000	1,500	0.07
	8	22,000	1,300	0.06
1.5	10	20,000	1,100	0.05
	12	17,000	850	0.04

Work Material		동 (COPPER)		
D	Effective Length	SPEED (min ⁻¹)	FEED (mm/min ⁻¹)	Depth of Cut ap(mm)
2	6	20,000	1,750	0.12
	8	20,000	1,650	0.1
	10	20,000	1,500	0.08
	12	17,000	1,200	0.06
	16	15,000	1,000	0.05
	20	12,000	720	0.03
3	12	15,000	1,600	0.2
	16	14,000	1,200	0.15
	20	12,000	1,000	0.12
	25	10,000	900	0.1
4	30	8,500	730	0.07
	16	13,000	1,400	0.25
	20	11,000	1,200	0.15
	25	8,500	1,100	0.12
4	30	8,500	900	0.1

NOTE

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- ap(mm) : Axial Depth of Cut
- Adjust both Spindle speed and Feed rate by the same proportion.
- For milling copper, water soluble or oil fluids are recommended.
- The above conditions are only for reference. In actual machining conditions



볼 Ball

라디우스 Radius

플랫 Flat

볼 Ball

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플랫 FLAT

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절삭 조건 Milling Conditions

참고 자료 Reference Data



CME230 절삭조건표

Milling Conditions for CME230

Work Material	동 (COPPER)		
	SPEED	측면가공 (0.2D) SIDE MILLING (0.2D)	홈가공 (0.5D) SLOTTING (0.5D)
외경 (D)	(min ⁻¹)	FEED (mm/min ⁻¹)	FEED (mm/min ⁻¹)
4	5,600	390	130
6	3,700	410	130
8	2,800	360	120
10	2,200	330	110
12	1,900	320	110

Depth of Cut (mm)	측면가공 SIDE MILLING		홈가공 SLOTTING	
		$a_p=1.5D$	$a_e=0.2D$	$a_e=1D$

ALE345 절삭조건표

Milling Conditions for ALE345

Work Material	알루미늄 합금 (Aluminum Alloy)		
	SPEED	측면가공 SIDE MILLING	홈가공 SLOTTING
외경 (D)	(min ⁻¹)	FEED (mm/min ⁻¹)	FEED (mm/min ⁻¹)
1	13,000	550	300
2	13,000	750	450
3	13,000	1,100	700
4	13,000	1,200	900
5	13,000	1,500	1,100
6	12,000	1,800	1,200
8	9,000	1,800	1,300
10	7,000	1,900	1,300
12	6,000	1,900	1,300

Depth of Cut (mm)	측면가공 SIDE MILLING		홈가공 SLOTTING	
		$a_p=1.5D$	$a_e=0.15D$	$a_e=1D$

NOTE

- 정밀하고 강성이 있는 홀더와 장비를 사용해 주십시오.
- 절입량의 a_p 는 축방향의 절입량을 표시합니다.
- 회전수와 테이블이송은 같은 비율로 조정해 주십시오.
- 동 가공시에는 습식가공을 권장합니다.(수용성 절삭유와 비수용성 절삭유)
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- Use a rigid and precise machine and holder.
- a_p (mm) : Axial Depth of Cut
- Adjust both Spindle speed and Feed rate by the same proportion.
- For milling copper, water soluble or oil fluids are recommended.
- The above conditions are only for reference. In actual machining conditions

DMRB230 절삭조건표

Milling Conditions for DMRB230

Work Material	Effective Length	흑연 (Graphite)		
		SPEED (min ⁻¹)	FEED (mm/min ⁻¹)	Depth of Cut a_p (mm)
R				
R0.1		20,000~40,000	200~300	0.01
R0.15		20,000~40,000	250~350	0.01
R0.2		20,000~40,000	300~400	0.01
R0.25		20,000~40,000	350~500	0.01
R0.3		20,000~40,000	400~600	0.02
R0.4		20,000~40,000	400~600	0.02
R0.5	6	20,000~40,000	500~1,000	0.03
	8	18,000~30,000	500~800	0.03
	10	18,000~30,000	500~800	0.03
	12	18,000~25,000	400~600	0.03
	16	16,000~22,000	300~500	0.03
	20	16,000~22,000	150~250	0.03
R0.75	25	6,000~9,000	80~140	0.02
	30	5,000~8,000	50~100	0.02
	8	20,000~38,000	800~1,500	0.05
	10	20,000~38,000	700~1,300	0.05
	12	20,000~38,000	600~1,200	0.05
	16	20,000~30,000	500~1,000	0.05
R1	20	18,000~22,000	450~600	0.05
	30	8,000~10,000	150~250	0.03
	10	20,000~40,000	1,000~2,000	0.06
	16	20,000~30,000	800~1,500	0.06
	20	16,000~22,000	700~1,200	0.06
	30	8,000~13,000	400~600	0.05
	40	4,000~6,000	100~200	0.04



볼
Ball

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DMB230 & DMRB230

Work Material		흑연 (Graphite)		
R	Effective Length	SPEED (min ⁻¹)	FEED (mm/min ⁻¹)	Depth of Cut ap(mm)
R1.5	16	15,000~20,000	1,500~2,500	0.09
	20	15,000~20,000	1,000~1,500	0.09
	30	12,000~18,000	600~800	0.09
	40	9,000~12,000	500~700	0.09
	50	5,000~8,000	250~400	0.05
R2		10,000~20,000	2,000~3,000	0.1~0.2
R3		9,000~20,000	2,000~4,500	0.2~0.5
R4		7,000~16,000	2,000~4,000	0.3~0.8
R5		6,000~13,000	2,000~4,000	0.3~1
R6		5,000~10,000	2,000~4,000	0.3~1.2

NOTE

- 정밀하고 강성이 있는 홀더와 장비를 사용해 주십시오.
- 절입량의 ap는 축방향의 절입량을 표시합니다.
- 회전수와 테이블이송은 같은 비율로 조정해 주십시오.
- 상기 절삭조건표는 참고자료입니다. 실제 가공시에는 가공형상, 기계용량, 작업환경에 따라 조건을 조정해서 가공하시기 바랍니다.

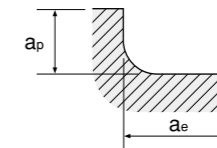
- Use a rigid and precise machine and holder.
- ap(mm) : Axial Depth of Cut
- Adjust both Spindle speed and Feed rate by the same proportion.
- The above conditions are only for reference. In actual machining conditions

DMRR430 절삭조건표

Milling Conditions for DMRR430

Work Material	흑연 (Graphite)			
D	SPEED (min ⁻¹)	FEED (mm/min ⁻¹)	Depth of Cut ap(mm)	Depth of Cut ae(mm)
3XR0.2	4,000~14,000	700~2,000	0.3	2
3XR0.5	4,000~14,000	700~2,000	0.3	1.6
4XR0.2	8,000~14,000	2,000~3,000	0.35	2.8
4XR0.5	8,000~14,000	2,000~3,000	0.35	2.4
6XR0.5	7,000~12,000	2,000~4,000	1.5	4
6XR1	7,000~12,000	2,000~4,000	1.5	3.2
8XR0.5	7,000~10,000	2,000~4,000	2	5.6
8XR1	7,000~10,000	2,000~4,000	2	4.8
10XR0.5	4,000~8,000	1,500~3,000	2.5	7.2
10XR1	4,000~8,000	1,500~3,000	2.5	6.4
12XR0.5	3,000~6,000	1,100~2,500	3	9
12XR1	3,000~6,000	1,100~2,500	3	8

Depth of Cut (mm)



NOTE

- 정밀하고 강성이 있는 홀더와 장비를 사용해 주십시오.
- 절입량의 ap는 축방향의 절입량을 표시합니다.
- 회전수와 테이블이송은 같은 비율로 조정해 주십시오.
- 상기 절삭조건표는 참고자료입니다. 실제 가공시에는 가공형상, 기계용량, 작업환경에 따라 조건을 조정해서 가공하시기 바랍니다.

- Use a rigid and precise machine and holder.
- ap(mm) : Axial Depth of Cut
- Adjust both Spindle speed and Feed rate by the same proportion.
- The above conditions are only for reference. In actual machining conditions



볼
Ball

라디우스
Radius

플랫
Flat

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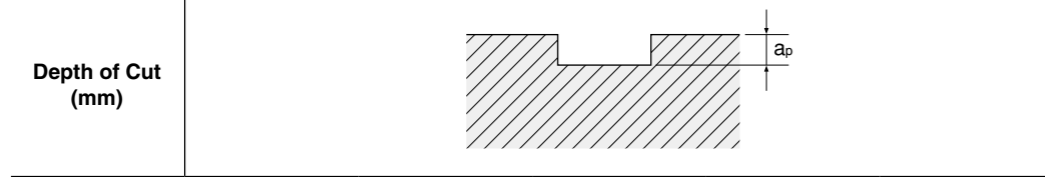




DMRE230 절삭조건표

Milling Conditions for DMRE230

Work Material		흑연 (Graphite)			
D	Effective Length	SPEED	FEED	홀가공 SLOTTING	Feed per Tooth
		(min ⁻¹)	(mm/min ⁻¹)	Depth of Cut ap(mm)	fz (mm/tooth)
0.2	1	40,000	160	<0.1D	0.002
0.3	1.5	40,000	240	<0.1D	0.003
0.4	3	30,000	240	<0.1D	0.004
0.5	4	30,000	300	<0.15D	0.005
0.6	4	30,000	360	<0.15D	0.006
0.8	6	25,000	400	<0.15D	0.008
1	6	16,000	420	<0.15D	0.013
	8	16,000	380	<0.15D	0.012
	10	16,000	320	<0.15D	0.01
	12	16,000	320	<0.15D	0.01
	16	12,000	240	<0.1D	0.01
	20	10,000	200	<0.1D	0.01
1.5	8	16,000	450	<0.15D	0.014
	10	16,000	420	<0.15D	0.013
	12	16,000	420	<0.15D	0.013
	16	12,000	320	<0.1D	0.013
2	20	10,000	260	<0.1D	0.013
	10	16,000	480	<0.15D	0.015
	12	16,000	480	<0.15D	0.015
	16	12,000	360	<0.1D	0.015
3	20	10,000	300	<0.1D	0.015
	20	10,000	400	<0.5D	0.02
	25	9,500	380	<0.5D	0.02
4	30	9,000	360	<0.5D	0.02
	30	9,000	540	<0.5D	0.03



NOTE

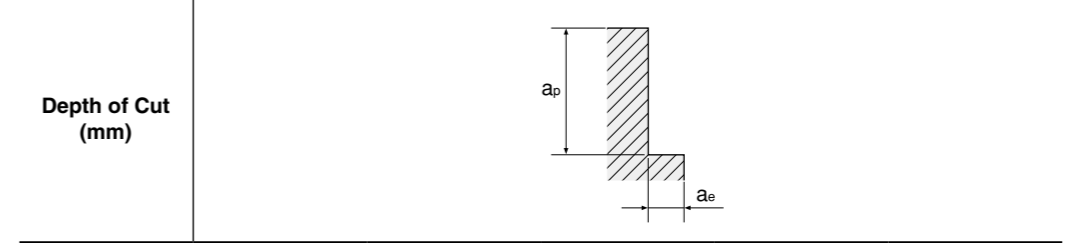
- 정밀하고 강성이 있는 홀더와 장비를 사용해 주십시오.
- 절입량의 ap는 축방향의 절입량을, ae는 반경방향의 절입량을 표시합니다.
- 회전수와 테이블이송은 같은 비율로 조정해 주십시오.
- 동 가공시에는 습식가공을 권장합니다.(수용성 절삭유와 비수용성 절삭유)
- 상기 절삭조건표는 참고자료 입니다. 실제 가공시에는 가공형상, 기계용량, 작업환경에 따라 조건을 조정해서 가공하시기 바랍니다.

- Use a rigid and precise machine and holder.
- ap(mm) : Axial Depth of Cut
- Adjust both Spindle speed and Feed rate by the same proportion.
- For milling copper, water soluble or oil fluids are recommended.
- The above conditions are only for reference. In actual machining conditions

DME430과 DMLSE430 절삭조건표

Milling Conditions for DME430 and DMLSE430

Work Material		흑연 (Graphite)			
D	SPEED	FEED	측면절삭 SIDE MILLING		Feed per Tooth
			Depth of Cut ap(mm)	Depth of Cut ae(mm)	fz (mm/tooth)
1	20,000	880	0.5D	0.05D	0.011
1.5	20,000	1,200	0.5D	0.05D	0.015
2	20,000	1,360	0.5D	0.05D	0.017
3	20,000	2,000	1D	0.05D	0.025
4	18,000	2,300	1.5D	0.05D	0.032
5	13,000	2,600	1.5D	0.05D	0.05
6	12,000	3,000	1.5D	0.05D	0.063
8	10,000	2,800	1.5D	0.05D	0.07
10	8,000	2,500	2D	0.05D	0.078
12	6,500	2,100	2D	0.05D	0.08



NOTE

- 정밀하고 강성이 있는 홀더와 장비를 사용해 주십시오.
- 절입량의 ap는 축방향의 절입량을 표시합니다.
- 회전수와 테이블이송은 같은 비율로 조정해 주십시오.
- 상기 절삭조건표는 참고자료 입니다. 실제 가공시에는 가공형상, 기계용량, 작업환경에 따라 조건을 조정해서 가공하시기 바랍니다.

- Use a rigid and precise machine and holder.
- ap(mm) : Axial Depth of Cut
- Adjust both Spindle speed and Feed rate by the same proportion.
- The above conditions are only for reference. In actual machining conditions



볼 Ball

라디우스 Radius

플랫 Flat

볼 Ball

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절삭조건 계산식 Calculation of milling conditions

절삭속도 (V) Cutting speed	=	$\frac{\pi \times D \times S}{1,000}$
회전수 (S) Spindle speed	=	$V \div \pi \div D \times 1,000$
테이블이송 (F) Feed	=	$S \times f \times N$
한날당이송 (f) feed per tooth	=	$\frac{F}{S \times N}$

V = 절삭속도 (m/min)
Cutting speed

π = 3.14 (원주율)
The circular constant

D = 날경 (mm)
Diameter

S = 회전수 (min⁻¹)
Spindle speed

F = 테이블이송 (mm/min)
Feed

f = 한날당이송 (mm/tooth)
feed per tooth

N = 날수
Number of flutes

절삭조건 사용 요령 Using the milling conditions

- 가공할 피삭재의 종류 또는 그 피삭재 경도에 대한 V값을 결정한다.
- 사용 공구의 외경을 알고 있기에, 계산식에 따라 회전수와 이송을 구한다.
- 축방향의 절입량을 결정한다.
- Decide the cutting speed on the type of work or its hardness.
- Knowing the diameter of tool, we can set spindle speed(S) and Feed(F).
- Set the Z-axis cutting depth.

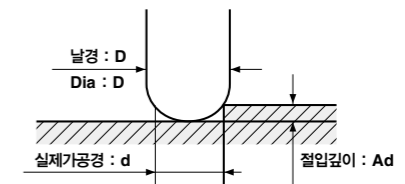
볼 엔드밀의 가공시 실제 가공경 Actual Diameter of Ball End Mill

R	날경 D	절입깊이 (mm) Depth of Cut(Ad)							
		0.01	0.02	0.03	0.04	0.05	0.08	0.1	
0.1	0.2	0.087	0.12	0.143	0.16	0.173	0.196	0.2	
0.2	0.4	0.125	0.174	0.211	0.24	0.265	0.32	0.35	
0.3	0.6	0.154	0.215	0.262	0.299	0.332	0.41	0.45	
0.4	0.8	0.178	0.25	0.304	0.349	0.387	0.48	0.53	
0.5	1	0.199	0.28	0.341	0.392	0.436	0.54	0.6	
1	2	0.282	0.398	0.486	0.56	0.624	0.78	0.87	
1.5	3	0.346	0.488	0.597	0.688	0.768	0.97	1.08	
2	4	0.399	0.564	0.69	0.796	0.889	1.12	1.25	
2.5	5	0.447	0.631	0.722	0.891	0.995	1.25	1.4	
3	6	0.489	0.692	0.846	0.977	1.091	1.38	1.54	
4	8	0.565	0.799	0.978	1.129	1.261	1.59	1.78	
5	10	0.632	0.894	1.094	1.262	1.411	1.78	1.99	
6	12	0.693	0.979	1.198	1.383	1.546	1.95	2.18	
7	14	0.748	1.058	1.295	1.495	1.67	2.11	2.36	
8	16	0.8	1.131	1.384	1.598	1.786	2.26	2.52	
9	18	0.848	1.199	1.468	1.695	1.895	2.39	2.68	
10	20	0.894	1.264	1.548	1.787	1.997	2.52	2.82	

R	날경 D	절입깊이 (mm) Depth of Cut(Ad)							
		0.15	0.2	0.3	0.5	0.8	1	2	3
0.1	0.2								
0.2	0.4	0.39	0.4						
0.3	0.6	0.52	0.57	0.6					
0.4	0.8	0.62	0.69	0.77					
0.5	1	0.71	0.8	0.92	1				
1	2	1.05	1.2	1.43	1.73	1.96	2		
1.5	3	1.31	1.5	1.8	2.24	2.65	2.83		
2	4	1.52	1.74	2.11	2.65	3.2	3.46	4	
2.5	5	1.71	1.96	2.37	3	3.67	4	4.9	
3	6	1.87	2.15	2.62	3.32	4.08	4.47	5.66	6
4	8	2.17	2.5	3.04	3.87	4.8	5.29	6.93	7.75
5	10	2.43	2.8	3.41	4.36	5.43	6	8	9.17
6	12	2.67	3.07	3.75	4.8	5.99	6.63	8.94	10.39
7	14	2.88	3.32	4.05	5.2	6.5	7.21	9.8	11.49
8	16	3.08	3.56	4.34	5.57	6.97	7.75	10.58	12.49
9	18	3.27	3.77	4.61	5.92	7.42	8.25	11.31	13.42
10	20	3.45	3.98	4.86	6.24	7.84	8.72	12	14.28

볼 엔드밀 가공시 실제 가공경의 계산식 Calculation of Actual Diameter

$$d = 2 \sqrt{Ad (D - Ad)}$$



따라서, 볼엔드밀의 끝부분만을 사용할 때에는, 절삭조건에서 공구경 D값을 좀더 작게 설정할 필요가 있다.
when cutting work by using only a ball end cutting part of a ball end mill, set D to a smaller value according to the milling condition.



볼
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Radius

플랫
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경도 환산표 Hardness conversion table

경도 환산표 Hardness conversion table

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로크웰경도 C 스케일 (HRC)	비커스경도 (HV)	브리넬경도 (HB)	로크웰경도 A 스케일 (HRA)	쇼어경도 (HS)	인장강도 N/mm ²
Rockwell Hardness C Scale 50kg Brale (HRC)	Diamond Pyramid Hardness Number Vickers (HV)	Brinell Hardness Standard 10mm Ball 29.42kN (HB)	Rockwell Hardness A Scale 60kg Brale (HRA)	Shore Scleroscope Hardness Number (HS)	Approx Tensile Strength N/mm ²
80.5	1900	-	93.1	-	-
79.2	1800	-	92.6	-	-
77.9	1700	-	91.9	-	-
76.6	1600	-	91.3	-	-
75.3	1500	-	90.5	-	-
74.6	1450	-	90.1	-	-
74.0	1400	-	89.6	-	-
73.4	1350	-	89.1	-	-
72.7	1300	-	88.7	-	-
72.1	1250	-	88.3	-	-
71.5	1200	-	87.9	-	-
70.9	1150	-	87.5	-	-
70.3	1100	-	87.1	-	-
69.6	1050	-	86.6	-	-
68.9	1000	-	86.2	-	-
68	940	-	85.6	97	-
67	900	-	85.5	95	-
66	865	-	84.5	92	-
65	832	-	83.9	91	-
64	800	-	83.4	88	-
63	772	-	82.8	87	-
62	746	-	82.3	85	-
61	720	-	81.8	83	-
60	697	-	81.2	81	-
59	674	-	80.7	80	-
58	653	-	80.1	78	-
57	633	-	79.6	76	-
56	613	-	79.0	75	-
55	595	-	78.5	74	2079
54	577	-	78.0	72	2010
53	560	-	77.4	71	1952
52	544	500	76.8	69	1883
51	528	487	76.3	68	1824
50	513	475	75.9	67	1755
49	498	464	75.2	66	1687
48	484	451	74.7	64	1639
47	471	442	74.1	63	1578
46	458	432	73.6	62	1530
45	446	421	73.1	60	1481
44	434	409	72.5	58	1432
43	423	400	72.0	57	1383
42	412	390	71.5	56	1334
41	402	381	70.9	55	1294
40	392	371	70.4	54	1245

경도 환산표 Hardness conversion table

경도 환산표 Hardness conversion table

로크웰경도 C 스케일 (HRC)	비커스경도 (HV)	브리넬경도 (HB)	로크웰경도 A 스케일 (HRA)	쇼어경도 (HS)	인장강도 N/mm ²
Rockwell Hardness C Scale 50kg Brale (HRC)	Diamond Pyramid Hardness Number Vickers (HV)	Brinell Hardness Standard 10mm Ball 29.42kN (HB)	Rockwell Hardness A Scale 60kg Brale (HRA)	Shore Scleroscope Hardness Number (HS)	Approx Tensile Strength N/mm ²
39	382	362	69.9	52	1216
38	372	353	69.4	51	1177
37	363	344	68.9	50	1157
36	354	336	68.4	49	1118
35	345	327	67.9	48	1079
34	336	319	67.4	47	1059
33	327	311	66.8	46	1030
32	318	301	66.3	44	1000
31	310	294	65.8	43	981
30	302	286	65.3	42	952
29	294	279	64.7	41	932
28	285	271	64.3	41	912
27	279	264	63.8	40	883
26	272	258	63.3	38	863
25	266	253	62.8	38	843
24	260	247	62.4	37	824
23	254	243	62.0	36	804
22	248	237	61.5	35	785
21	243	231	61.0	35	775
20	238	226	60.5	34	755
(18)	230	219	-	33	736
(16)	222	212	-	32	706
(14)	213	203	-	31	677
(12)	204	194	-	29	647
(10)	196	187	-	28	618
(8)	188	179	-	27	598
(6)	180	171	-	26	579
(4)	173	165	-	25	549
(2)	166	158	-	24	530
(0)	160	152	-	24	520



볼
Ball

라디우스
Radius

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볼
Ball

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Specifications for the products listed in this catalog are subject to change without notice due to modification or improvement.



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