

피삭재 Work Material		탄소강, 합금강, 주철 Carbon Steel, Alloy Steel, Cast Iron S50C, SCM, FC250			프리하든강 Prehardened Steel NAK, HPM			열처리강 Hardened Steel SKD61, STAVAX			열처리강 Hardened Steel SKD11		
		~1000 N/mm²			35~45 HRC			45~55 HRC			55~60 HRC		
불반경 Radius	유효장 Effective Length	Spindle Speed (min ⁻¹)	Feed (mm/min)	Depth of Cut ap(mm)	Spindle Speed (min ⁻¹)	Feed (mm/min)	Depth of Cut ap(mm)	Spindle Speed (min ⁻¹)	Feed (mm/min)	Depth of Cut ap(mm)	Spindle Speed (min ⁻¹)	Feed (mm/min)	Depth of Cut ap(mm)
R1.5	10	14,500	2,100	0.180	13,500	1,800	0.160	12,000	1,500	0.130	11,000	1,300	0.120
	12	14,500	2,100	0.180	13,500	1,800	0.160	12,000	1,500	0.130	11,000	1,300	0.120
	14	14,500	2,050	0.180	13,500	1,700	0.160	12,000	1,400	0.130	11,000	1,250	0.120
	16	14,500	2,000	0.180	13,500	1,600	0.160	12,000	1,350	0.130	11,000	1,200	0.120
	20	13,000	1,750	0.108	12,500	1,500	0.096	11,000	1,200	0.078	10,000	1,050	0.070
	25	13,000	1,700	0.072	12,500	1,450	0.064	11,000	1,150	0.052	10,000	1,000	0.048
	30	13,000	1,650	0.063	12,500	1,400	0.056	11,000	1,100	0.046	10,000	950	0.040
	40	11,500	1,350	0.045	10,500	1,100	0.040	9,500	900	0.033	8,500	800	0.030
R2	12	10,500	2,000	0.270	9,500	1,700	0.240	8,500	1,400	0.195	8,000	1,200	0.180
	16	10,500	2,000	0.270	9,500	1,700	0.240	8,500	1,400	0.195	8,000	1,200	0.180
	20	10,500	2,000	0.225	9,500	1,700	0.200	8,500	1,400	0.163	8,000	1,200	0.150
	25	9,500	1,500	0.180	9,000	1,400	0.160	8,000	1,100	0.130	7,500	1,000	0.120
	30	9,500	1,500	0.135	9,000	1,400	0.120	8,000	1,100	0.098	7,500	1,000	0.090
R3	40	9,500	1,500	0.090	9,000	1,400	0.080	8,000	1,100	0.065	7,500	1,000	0.060
	20	8,000	2,000	0.405	7,500	1,650	0.360	6,700	1,500	0.293	6,000	1,100	0.270
	25	8,000	2,000	0.360	7,000	1,400	0.320	6,000	1,200	0.260	5,600	1,000	0.240
	30	7,500	1,700	0.315	7,000	1,400	0.280	6,000	1,200	0.228	5,600	1,000	0.210

NOTE

- 정밀하고 강성이 있는 홀더와 장비를 사용해 주십시오.
- ap는 축방향의 절입량을 표시합니다. .
- 홀 절삭시, 조건표의 ap를 70%이하로 설정해 주십시오.
- 피삭재와 가공형상에 따라 적절한 절삭유를 사용해 주십시오.
- 절삭 조건표는 참고자료 입니다. 실제 가공시에는 가공형상, 기계에 따라 조건을 조정해서 가공하시기 바랍니다.

- Use a rigid and precise machine and holder.
- ap(mm) : Axial Depth of Cut
- For slotting, set ap in the condition table to 70% or less.
- Use the appropriate coolant for the workpiece and machining shape.
- The cutting condition table is a reference. In actual machining, adjust the conditions according to the machining shape and machine.

HMRR230, HMR230 절삭조건 참고 자료

HMRR230, HMR230 Cutting Conditions Reference Table

피삭재 Work Material		프리하든강 Prehardened Steel NAK, HPM			열처리강 Hardened Steel SKD61, STAVAX		
		35~45 HRC			45~55 HRC		
날경 Dia	유효장 Effective Length	Spindle Speed (min ⁻¹)	Feed (mm/min)	Depth of Cut ap(mm)	Spindle Speed (min ⁻¹)	Feed (mm/min)	Depth of Cut ap(mm)
0.2	0.5	30,000	200	0.010	30,000	150	0.004
	1	30,000	150	0.006	30,000	100	0.003
0.3	1	30,000	200	0.015	30,000	150	0.004
	1.5	30,000	150	0.012	30,000	130	0.003
	2	30,000	100	0.008	30,000	100	0.003
0.4	1	30,000	350	0.017	30,000	250	0.006
	2	30,000	300	0.014	30,000	200	0.005
	3	30,000	250	0.010	30,000	180	0.004
	4	30,000	200	0.007	30,000	140	0.003

피삭재 Work Material		프리하든강 Prehardened Steel NAK, HPM			열처리강 Hardened Steel SKD61, STAVAX		
		35~45 HRC			55~60 HRC		
날경 Dia	유효장 Effective Length	Spindle Speed (min ⁻¹)	Feed (mm/min)	Depth of Cut ap(mm)	Spindle Speed (min ⁻¹)	Feed (mm/min)	Depth of Cut ap(mm)
0.5	1	30,000	500	0.020	24,000	350	0.009
	2	30,000	480	0.017	24,000	330	0.008
	3	30,000	400	0.013	24,000	270	0.006
	4	25,000	270	0.010	20,000	200	0.004
	5	25,000	250	0.007	20,000	180	0.003
	6	25,000	200	0.005	20,000	150	0.002
0.6	2	30,000	600	0.028	25,000	400	0.018
	4	25,000	400	0.019	20,000	250	0.013
	6	20,000	250	0.011	16,000	150	0.007
0.7	8	18,000	180	0.008	14,000	100	0.005
	2	30,000	650	0.030	25,000	450	0.020
	4	25,000	600	0.023	20,000	400	0.017
	6	20,000	450	0.017	16,000	250	0.009
0.8	8	18,000	140	0.008	14,000	100	0.003
	2	30,000	1,100	0.040	25,000	700	0.020
	4	25,000	1,000	0.028	20,000	600	0.017
	6	20,000	700	0.019	16,000	400	0.014
	8	18,000	400	0.014	14,000	250	0.008
	10	18,000	250	0.007	14,000	150	0.005
1	2.5	25,000	1,600	0.060	20,000	900	0.050
	4	25,000	1,400	0.050	20,000	800	0.040
	6	20,000	1,000	0.040	16,000	600	0.020
	8	18,000	700	0.030	14,000	450	0.020
	10	16,000	600	0.020	13,000	350	0.010
	12	14,000	350	0.020	12,000	250	0.008
	14	12,000	300	0.010	10,000	200	0.005
1.2	16	12,000	250	0.010	10,000	150	0.005
	4	22,000	1,500	0.050	18,000	800	0.030
	6	20,000	1,300	0.050	17,000	700	0.030
	8	18,000	1,100	0.040	15,000	600	0.020
	10	16,000	900	0.030	13,000	500	0.020
	12	14,000	700	0.020	11,000	400	0.015
	14	12,000	350	0.010	10,000	200	0.010
1.5	16	12,000	300	0.010	10,000	180	0.008
	4	22,000	1,600	0.090	18,000	1,000	0.050
	6	20,000	1,400	0.080	16,000	850	0.040
	8	18,000	1,200	0.070	15,000	700	0.040
	10	16,000	1,000	0.060	13,000	550	0.030
	12	14,000	800	0.050	11,000	450	0.030
	14	12,000	700	0.040	10,000	400	0.020
2	16	12,000	600	0.030	10,000	350	0.015
	20	10,000	300	0.020	8,000	200	0.005
	6	16,000	2,100	0.120	14,000	900	0.050
	8	16,000	2,000	0.110	13,000	800	0.050
	10	16,000	1,800	0.100	13,000	750	0.040
	12	14,000	1,500	0.090	11,000	600	0.040
	16	12,000	1,200	0.070	10,000	500	0.030
	20	10,000	800	0.050	8,000	350	0.020

피삭재 Work Material		프리하든강 Prehardened Steel NAK, HPM			열처리강 Hardened Steel SKD61, STAVAX		
		35~45 HRC			55~60 HRC		
날경 Dia	유효장 Effective Length	Spindle Speed (min ⁻¹)	Feed (mm/min)	Depth of Cut ap(mm)	Spindle Speed (min ⁻¹)	Feed (mm/min)	Depth of Cut ap(mm)
2.5	10	15,000	1,800	0.130	12,000	900	0.070
	16	12,000	1,200	0.080	9,000	550	0.050
	20	10,000	1,000	0.070	8,000	450	0.050
3	12	13,000	1,800	0.150	10,000	950	0.080
	16	12,000	1,500	0.120	9,000	800	0.070
	20	11,000	1,200	0.100	8,000	600	0.060
	25	10,000	1,000	0.080	7,500	500	0.050
	30	9,000	800	0.060	6,500	400	0.030
	35	8,000	500	0.030	5,500	300	0.010
4	12	10,000	2,300	0.200	9,000	1,000	0.100
	16	8,000	2,000	0.160	7,000	800	0.090
	20	7,000	1,700	0.140	6,000	750	0.080
	25	7,000	1,500	0.120	5,500	700	0.070
	30	6,000	900	0.080	4,500	500	0.040
	35	5,000	500	0.050	4,000	400	0.020
6	20	12,000	1,300	0.100	12,000	1,100	0.090
	30	11,000	1,100	0.090	11,000	900	0.070
8	24	12,000	1,300	0.100	12,000	1,100	0.090
	40	11,000	1,100	0.090	11,000	900	0.070
10	30	12,000	1,400	0.100	12,000	1,200	0.090
	50	11,000	1,200	0.090	11,000	1,000	0.070
12	30	10,000	1,600	0.100	10,000	1,400	0.090
	55	9,000	1,400	0.090	9,000	1,200	0.070

- NOTE
1. 정밀하고 강성이 있는 홀더와 장비를 사용해 주십시오.

2. ap는 축방향의 절입량을 표시합니다. ae는 반경방향의 절입량을 표시합니다.

3. ae의 설정은 [날경-(2x코너R값)] x 20~40% 범위로 권장합니다.

4. 홈 절삭시, 조건표의 ap와 피드를 50%이하로 설정해 주십시오.

5. 피삭재와 가공형상에 따라 적절한 절삭유를 사용해 주십시오.

6. 절삭 조건표는 참고자료 입니다. 실제 가공시에는 가공형상, 기계에 따라 조건을 조정해서 가공하시기 바랍니다.

1. Use a rigid and precise machine and holder.

2. ap(mm) : Axial Depth of Cut / ae(mm) : Radial Depth of Cut

3. We recommend setting ae in the range of [Dia-(2xCorner R value)] x 20~40%

4. For slotting, set ap and Feed in the condition table to 50% or less.

5. Use the appropriate coolant for the workpiece and machining shape.

6. The cutting condition table is a reference. In actual machining, adjust the conditions according to the machining shape and machine.
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- # HMRR430, HMR430, WMRR430, WMR430 절삭조건 참고 자료

HMRR430, HMR430, WMRR430, WMR430 Cutting Conditions Reference Table
- | WIDE-MAX Series | | | | | | | | | | |
|----------------------|-------------------------|--|------------------|------------------------|---|------------------|------------------------|---------------------------------------|------------------|------------------------|
| HY-MAX Series | | | | | | | | | | |
| 피삭재
Work Material | | 프리하든강
Prehardened Steel
NAK, HPM | | | 열처리강
Hardened Steel
SKD61, STAVAX | | | 열처리강
Hardened Steel
SKD11 | | |
| | | 35~45 HRC | | | 45~55 HRC | | | 55~60 HRC | | |
| 날경
Dia | 유효장
Effective Length | Spindle Speed
(min ⁻¹) | Feed
(mm/min) | Depth of Cut
ap(mm) | Spindle Speed
(min ⁻¹) | Feed
(mm/min) | Depth of Cut
ap(mm) | Spindle Speed
(min ⁻¹) | Feed
(mm/min) | Depth of Cut
ap(mm) |
| 0.6 | 2 | 30,000 | 1,200 | 0.030 | 25,000 | 1,000 | 0.020 | 23,000 | 800 | 0.010 |
| | 4 | 25,000 | 900 | 0.020 | 23,000 | 800 | 0.015 | 20,000 | 600 | 0.007 |
| | 6 | 23,000 | 600 | 0.010 | 20,000 | 400 | 0.008 | 18,000 | 300 | 0.005 |
| 0.8 | 2 | 28,000 | 2,000 | 0.040 | 25,000 | 1,600 | 0.030 | 23,000 | 1,400 | 0.020 |
| | 4 | 28,000 | 1,800 | 0.030 | 25,000 | 1,400 | 0.020 | 23,000 | 1,200 | 0.010 |
| | 6 | 23,000 | 1,400 | 0.020 | 20,000 | 1,100 | 0.010 | 18,000 | 900 | 0.007 |
| 1 | 2.5 | 25,000 | 2,100 | 0.050 | 20,000 | 1,900 | 0.040 | 16,000 | 1,000 | 0.020 |
| | 4 | 23,000 | 1,800 | 0.040 | 18,000 | 1,500 | 0.030 | 14,000 | 900 | 0.010 |
| | 6 | 18,000 | 1,400 | 0.020 | 14,000 | 1,100 | 0.010 | 10,000 | 800 | 0.007 |
| | 8 | 16,000 | 1,200 | 0.020 | 12,000 | 950 | 0.010 | 8,000 | 650 | 0.005 |
| | 10 | 14,000 | 1,000 | 0.010 | 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 | 0.050 | 20,000 | 1,600 | 0.040 | 15,000 | 1,100 | 0.030 |
| | 6 | 20,000 | 1,600 | 0.040 | 18,000 | 1,400 | 0.030 | 14,000 | 1,000 | 0.020 |
| | 8 | 18,000 | 1,200 | 0.040 | 14,000 | 1,200 | 0.030 | 10,000 | 750 | 0.010 |
| | 10 | 16,000 | 1,100 | 0.030 | 13,000 | 1,000 | 0.020 | 9,000 | 700 | 0.007 |
| | 12 | 14,000 | 1,000 | 0.030 | 12,000 | 850 | 0.020 | 8,000 | 630 | 0.007 |
| | 14 | 12,000 | 900 | 0.020 | 10,000 | 800 | 0.010 | 7,000 | 550 | 0.005 |
| | 16 | 12,000 | 850 | 0.020 | 9,500 | 700 | 0.010 | 6,500 | 500 | 0.005 |
| | 20 | 8,500 | 550 | 0.010 | 7,000 | 400 | 0.070 | 5,500 | 300 | 0.005 |
| 2 | 6 | 18,000 | 1,800 | 0.060 | 15,000 | 1,500 | 0.050 | 12,000 | 1,100 | 0.030 |
| | 8 | 16,000 | 1,600 | 0.050 | 12,000 | 1,200 | 0.040 | 10,000 | 950 | 0.020 |
| | 10 | 14,000 | 1,400 | 0.040 | 12,000 | 1,100 | 0.030 | 9,500 | 850 | 0.010 |
| | 12 | 12,000 | 1,200 | 0.040 | 10,000 | 1,000 | 0.030 | 8,000 | 800 | 0.010 |
| | 16 | 10,000 | 1,000 | 0.030 | 9,000 | 800 | 0.020 | 7,500 | 650 | 0.007 |
| | 20 | 9,000 | 750 | 0.020 | 8,500 | 700 | 0.010 | 6,000 | 500 | 0.005 |
| 2.5 | 10 | 14,000 | 1,600 | 0.070 | 10,000 | 1,400 | 0.050 | 8,000 | 900 | 0.030 |
| | 16 | 10,000 | 1,200 | 0.050 | 8,000 | 1,100 | 0.020 | 6,000 | 700 | 0.010 |
| | 20 | 8,500 | 1,100 | 0.050 | 7,500 | 950 | 0.020 | 5,000 | 650 | 0.010 |
| 3 | 10 | 18,000 | 2,200 | 0.100 | 13,000 | 1,800 | 0.070 | 10,000 | 1,200 | 0.050 |
| | 12 | 12,000 | 1,600 | 0.080 | 10,000 | 1,400 | 0.060 | 8,000 | 1,000 | 0.040 |
| | 16 | 10,000 | 1,400 | 0.070 | 8,500 | 1,200 | 0.050 | 7,000 | 800 | 0.030 |
| | 20 | 9,000 | 1,400 | 0.070 | 7,500 | 1,200 | 0.040 | 6,000 | 800 | 0.020 |
| | 25 | 8,000 | 1,200 | 0.060 | 7,000 | 1,000 | 0.030 | 5,000 | 700 | 0.010 |
| | 30 | 7,000 | 1,200 | 0.030 | 6,500 | 1,000 | 0.020 | 4,500 | 600 | 0.007 |
| 4 | 12 | 12,000 | 2,000 | 0.100 | 10,000 | 1,500 | 0.060 | 8,500 | 1,100 | 0.050 |
| | 16 | 10,000 | 1,800 | 0.100 | 8,000 | 1,400 | 0.060 | 6,000 | 900 | 0.050 |
| | 20 | 9,000 | 1,500 | 0.080 | 7,000 | 1,300 | 0.050 | 5,500 | 850 | 0.030 |
| | 25 | 6,500 | 1,400 | 0.080 | 5,500 | 1,200 | 0.050 | 4,500 | 750 | 0.030 |
| | 30 | 5,000 | 1,000 | 0.050 | 4,000 | 800 | 0.020 | 4,000 | 600 | 0.010 |
| | 35 | 4,500 | 900 | 0.030 | 3,800 | 750 | 0.010 | 3,200 | 500 | 0.007 |
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