標準切削条件表 Recommended Cutting Conditions

高能率切削条件 High efficiency cutting condition

被削材 Work				1 銅 Copper		2 炭素鋼・合金鋼 Carbon Steels, Alloy Steels (180～250HB)		3 ステンレス鋼・工具鋼 Stainless Steels, Tool Steels (25～35HRC)		4 プリハードン鋼 Pre-harden Steels (35～45HRC)		5 焼き入れ鋼 Hardened Steels (45～55HRC)		6 焼き入れ鋼 Hardened Steels (55～65HRC)	
切り込み比率 Ratio to standard depth of cut				120%		100%		90%		80%		65%		60%	
刃径 Mill Dia. (mm)	R (mm)	首下長 Under neck Length (mm)	基本切り込み Standard depth of Cut (mm)	回転数 n min-1	送り速度 Vf mm/min	回転数 n min-1	送り速度 Vf mm/min	回転数 n min-1	送り速度 Vf mm/min	回転数 n min-1	送り速度 Vf mm/min	回転数 n min-1	送り速度 Vf mm/min	回転数 n min-1	送り速度 Vf mm/min
0.2	0.05	0.5	0.02	50,000	922	50,000	922	45,000	829	42,500	705	37,500	553	35,000	452
		1	0.014	50,000	922	50,000	922	45,000	829	42,500	705	37,500	553	35,000	452
		1.5	0.008	50,000	922	47,000	866	42,750	788	40,375	670	35,625	525	33,250	429
		2	0.008	50,000	922	42,000	774	40,500	746	38,250	635	33,750	498	31,500	406
0.3	0.05	1	0.021	50,000	1,208	48,000	1,161	43,200	1,045	40,800	733	36,000	547	33,600	441
		1.5	0.016	47,500	1,147	45,600	1,103	41,040	993	38,760	697	34,200	520	31,920	419
		2	0.012	45,000	998	38,880	860	34,992	774	33,048	594	29,160	443	27,216	357
		2.5	0.01	45,000	998	38,880	860	34,992	774	33,048	594	29,160	443	27,216	357
		3	0.008	42,750	881	36,936	760	33,242	684	31,396	525	27,702	392	25,855	316
0.4	0.05	1	0.025	46,080	1,239	38,300	1,032	34,560	929	32,256	793	28,800	620	26,726	508
		1.5	0.02	46,080	1,239	38,300	1,032	34,560	929	32,256	793	28,800	620	26,726	508
		2	0.016	46,080	1,115	38,300	929	34,560	836	32,256	714	28,800	557	26,726	457
		2.5	0.015	43,200	1,062	36,000	885	32,400	796	30,600	677	27,000	531	25,200	434
		3	0.014	35,250	780	29,325	649	26,437	585	24,675	499	22,031	390	20,445	320
		3.5	0.012	33,048	731	27,540	609	24,786	548	23,409	518	20,655	406	19,278	332
		4	0.008	29,029	642	24,150	535	21,772	481	20,320	411	18,143	321	16,837	263
	0.1	2	0.028	48,000	1,180	40,000	983	36,000	885	34,000	752	30,000	590	28,000	482
		3	0.016	36,720	812	30,600	677	27,540	609	26,010	575	22,950	451	21,420	368
		4	0.01	30,240	669	25,200	557	22,680	502	21,420	474	18,900	372	17,640	303
0.5	0.05	1	0.03	46,080	1,239	38,300	1,032	34,560	929	32,256	793	28,800	620	26,726	508
		2	0.023	46,080	1,239	38,300	1,032	34,560	929	32,256	793	28,800	620	26,726	508
		3	0.017	37,325	1,101	31,104	917	27,994	826	26,438	634	23,328	473	21,773	381
		4	0.017	33,178	978	27,648	815	24,883	734	23,501	563	20,736	420	19,354	339
		5	0.011	29,030	856	24,192	713	21,773	642	20,563	493	18,144	368	16,934	297
		6	0.008	25,805	666	21,504	555	19,354	499	18,278	320	16,128	282	15,053	222
	0.1	1	0.035	46,080	1,239	38,300	1,032	34,560	929	32,256	793	28,800	620	26,726	508
		2	0.03	46,080	1,239	38,300	1,032	34,560	929	32,256	793	28,800	620	26,726	508
		3	0.02	37,325	1,101	31,104	917	27,994	826	26,438	634	23,328	473	21,773	381
		4	0.02	33,178	978	27,648	815	24,883	734	23,501	563	20,736	420	19,354	339
		5	0.013	29,030	856	24,192	713	21,773	642	20,563	493	18,144	368	16,934	297
		6	0.013	25,805	666	21,504	555	19,354	499	18,278	320	16,128	282	15,053	222
0.6	0.1	2	0.035	46,080	1,548	38,300	1,290	34,560	1,161	32,256	991	28,800	774	26,726	635
		4	0.024	37,325	1,376	31,104	1,147	27,994	1,032	26,438	792	23,328	591	21,773	477
		6	0.015	29,030	1,070	24,192	892	21,773	803	20,563	616	18,144	460	16,934	371
		8	0.013	27,579	1,017	22,982	847	20,684	763	19,535	585	17,237	437	16,088	352
		10	0.009	24,676	910	20,563	758	18,507	682	17,479	524	15,422	391	14,394	315
0.8	0.1	4	0.032	48,000	1,769	40,000	1,475	36,000	1,327	34,000	1,128	30,000	885	28,000	723
		6	0.019	36,720	1,218	30,600	1,015	27,540	914	26,010	863	22,950	677	21,420	553
		8	0.015	29,376	906	24,480	755	22,032	680	20,808	642	18,360	504	17,136	411
		12	0.012	26,438	759	22,032	632	19,829	569	18,727	537	16,524	421	15,422	344
	0.2	4	0.056	48,000	1,769	40,000	1,475	36,000	1,327	34,000	1,128	30,000	885	28,000	723
		6	0.032	36,720	1,218	30,600	1,015	27,540	914	26,010	863	22,950	677	21,420	553

【注意】29ページを参照してください。 【Note】Please refer to P.29

EPDR-TH エポックディープラジアス
Epoch Deep Radius

バックドラフト効果 Back Draft Effect

■ 標準切削条件表 Recommended Cutting Conditions

高能率切削条件 High efficiency cutting condition

被削材 Work				1 銅 Copper		2 炭素鋼・合金鋼 Carbon Steels, Alloy Steels (180～250HB)		3 ステンレス鋼・工具鋼 Stainless Steels, Tool Steels (25～35HRC)		4 プリハードン鋼 Pre-harden Steels (35～45HRC)		5 焼き入れ鋼 Hardened Steels (45～55HRC)		6 焼き入れ鋼 Hardened Steels (55～65HRC)	
切り込み比率 Ratio to standard depth of cut				120%		100%		90%		80%		65%		60%	
刃径 Mill Dia. (mm)	R (mm)	首下長 Under neck Length (mm)	基本切り込み Standard depth of Cut (mm)	回転数 n min-1	送り速度 Vf mm/min	回転数 n min-1	送り速度 Vf mm/min	回転数 n min-1	送り速度 Vf mm/min	回転数 n min-1	送り速度 Vf mm/min	回転数 n min-1	送り速度 Vf mm/min	回転数 n min-1	送り速度 Vf mm/min
1	0.1	4	0.038	43,200	2,588	36,000	2,157	32,400	1,941	30,600	1,650	27,000	1,294	25,200	1,057
		6	0.024	34,992	1,887	29,160	1,572	26,244	1,415	24,786	1,336	21,870	1,048	20,412	856
		8	0.024	31,104	1,677	25,920	1,397	23,328	1,258	22,032	1,188	19,440	932	18,144	761
		10	0.015	27,216	1,467	22,680	1,223	20,412	1,100	19,278	1,039	17,010	815	15,876	666
		12	0.015	24,192	1,159	20,160	966	18,144	870	17,136	719	15,120	634	14,112	507
		16	0.009	24,192	1,014	20,160	845	18,144	761	17,136	667	15,120	543	14,112	423
		20	0.006	18,144	761	15,120	634	13,608	571	12,852	500	11,340	408	10,584	317
	0.2	4	0.07	43,200	2,588	36,000	2,157	32,400	1,941	30,600	1,650	27,000	1,294	25,200	1,057
		6	0.04	34,992	1,887	29,160	1,572	26,244	1,415	24,786	1,336	21,870	1,048	20,412	856
		8	0.04	31,104	1,677	25,920	1,397	23,328	1,258	22,032	1,188	19,440	932	18,144	761
		10	0.025	27,216	1,467	22,680	1,223	20,412	1,100	19,278	1,039	17,010	815	15,876	666
		12	0.025	24,192	1,159	20,160	966	18,144	870	17,136	719	15,120	634	14,112	507
		16	0.015	24,192	1,014	20,160	845	18,144	761	17,136	667	15,120	543	14,112	423
		20	0.01	18,144	761	15,120	634	13,608	571	12,852	500	11,340	408	10,584	317
	0.3	6	0.04	34,992	1,887	29,160	1,572	26,244	1,415	24,786	1,336	21,870	1,048	20,412	856
		10	0.025	27,216	1,467	22,680	1,223	20,412	1,100	19,278	1,039	17,010	815	15,876	666
		16	0.015	24,192	1,014	20,160	845	18,144	761	17,136	667	15,120	543	14,112	423
		20	0.01	18,144	761	15,120	634	13,608	571	12,852	500	11,340	408	10,584	317
1.5	0.1	4	0.042	33,264	2,153	27,700	1,793	24,948	1,614	23,285	1,378	20,790	1,076	19,293	883
		8	0.036	30,240	1,956	25,200	1,630	22,680	1,467	21,420	1,386	18,900	1,087	17,640	888
		12	0.036	24,192	1,565	20,160	1,304	18,144	1,174	17,136	1,109	15,120	870	14,112	710
		15	0.023	18,816	1,082	15,680	902	14,112	812	13,328	671	11,760	592	10,976	473
		20	0.018	18,816	1,082	15,680	902	14,112	812	13,328	671	11,760	592	10,976	473
	0.2	4	0.07	33,264	2,153	27,700	1,793	24,948	1,614	23,285	1,378	20,790	1,076	19,293	883
		8	0.06	30,240	1,956	25,200	1,630	22,680	1,467	21,420	1,386	18,900	1,087	17,640	888
		12	0.06	24,192	1,565	20,160	1,304	18,144	1,174	17,136	1,109	15,120	870	14,112	710
		15	0.038	18,816	1,082	15,680	902	14,112	812	13,328	671	11,760	592	10,976	473
		20	0.03	18,816	1,082	15,680	902	14,112	812	13,328	671	11,760	592	10,976	473
	0.3	8	0.06	30,240	1,956	25,200	1,630	22,680	1,467	21,420	1,386	18,900	1,087	17,640	888
		15	0.038	18,816	1,082	15,680	902	14,112	812	13,328	671	11,760	592	10,976	473
		20	0.03	18,816	1,082	15,680	902	14,112	812	13,328	671	11,760	592	10,976	473

被削材 Work				1 銅 Copper		2 炭素鋼・合金鋼 Carbon Steels, Alloy Steels (180～250HB)		3 ステンレス鋼・工具鋼 Stainless Steels, Tool Steels (25～35HRC)		4 プリハードン鋼 Pre-harden Steels (35～45HRC)		5 焼き入れ鋼 Hardened Steels (45～55HRC)		6 焼き入れ鋼 Hardened Steels (55～65HRC)	
切り込み比率 Ratio to standard depth of cut				120%		100%		90%		80%		65%		60%	
刃径 Mill Dia. (mm)	R (mm)	首下長 Under neck Length (mm)	基本切り込み Standard depth of Cut (mm)	回転数 n min-1	送り速度 Vf mm/min	回転数 n min-1	送り速度 Vf mm/min	回転数 n min-1	送り速度 Vf mm/min	回転数 n min-1	送り速度 Vf mm/min	回転数 n min-1	送り速度 Vf mm/min	回転数 n min-1	送り速度 Vf mm/min
2	0.2	6	0.08	27,720	3,114	23,100	2,595	20,790	2,335	19,635	2,205	17,325	1,557	16,170	1,271
		8	0.07	25,200	2,830	21,000	2,359	18,900	2,123	17,850	2,005	15,750	1,415	14,700	1,156
		12	0.04	20,412	2,063	17,010	1,720	15,309	1,548	14,459	1,462	12,758	1,146	11,907	936
		16	0.04	18,144	1,834	15,120	1,528	13,608	1,376	12,852	1,299	11,340	1,019	10,584	832
		20	0.035	15,876	1,605	13,230	1,337	11,907	1,204	11,246	1,137	9,923	892	9,261	728
		25	0.025	15,876	1,605	13,230	1,337	11,907	1,204	11,246	1,137	9,923	892	9,261	728
		30	0.017	15,082	1,525	12,569	1,271	11,312	1,143	10,683	1,080	9,426	847	8,798	692
	0.3	8	0.09	25,200	3,145	21,000	2,621	18,900	2,359	17,850	2,228	15,750	1,572	14,700	1,284
		16	0.06	18,144	2,038	15,120	1,698	13,608	1,528	12,852	1,444	11,340	1,132	10,584	925
		20	0.037	15,876	1,783	13,230	1,486	11,907	1,337	11,246	1,263	9,923	991	9,261	809
	0.5	6	0.17	27,720	3,459	23,100	2,883	20,790	2,595	19,635	2,450	17,325	1,730	16,170	1,413
		8	0.14	25,200	3,145	21,000	2,621	18,900	2,359	17,850	2,228	15,750	1,572	14,700	1,284
		12	0.08	20,412	2,293	17,010	1,911	15,309	1,720	14,459	1,624	12,758	1,274	11,907	1,040
		16	0.08	18,144	2,038	15,120	1,698	13,608	1,528	12,852	1,444	11,340	1,132	10,584	925
		20	0.05	15,876	1,783	13,230	1,486	11,907	1,337	11,246	1,263	9,923	991	9,261	809
		25	0.05	15,876	1,783	13,230	1,486	11,907	1,337	11,246	1,263	9,923	991	9,261	809
		30	0.03	15,082	1,694	12,569	1,412	11,312	1,271	10,683	1,200	9,426	941	8,798	769
	0.8	8	0.2	25,200	3,145	21,000	2,621	18,900	2,359	17,850	2,228	15,750	1,572	14,700	1,284
		16	0.1	18,144	2,038	15,120	1,698	13,608	1,528	12,852	1,444	11,340	1,132	10,584	925
		20	0.06	15,876	1,783	13,230	1,486	11,907	1,337	11,246	1,263	9,923	991	9,261	809
3	0.2	8	0.09	19,200	2,696	16,000	2,246	14,400	2,022	13,600	1,909	12,000	1,348	11,200	1,101
		12	0.07	19,200	2,696	16,000	2,246	14,400	2,022	13,600	1,909	12,000	1,348	11,200	1,101
		16	0.05	19,200	2,696	16,000	2,246	14,400	2,022	13,600	1,909	12,000	1,348	11,200	1,101
		20	0.05	15,552	2,184	12,960	1,820	11,664	1,638	11,016	1,547	9,720	1,213	9,072	991
		30	0.04	12,096	2,184	10,080	1,820	9,072	1,638	8,568	1,547	7,560	1,213	7,056	991
		35	0.035	12,096	2,184	10,080	1,820	9,072	1,638	8,568	1,547	7,560	1,213	7,056	991
	0.3	8	0.13	19,200	2,995	16,000	2,496	14,400	2,246	13,600	2,122	12,000	1,498	11,200	1,223
		16	0.075	19,200	2,995	16,000	2,496	14,400	2,246	13,600	2,122	12,000	1,498	11,200	1,223
		20	0.075	15,552	2,426	12,960	2,022	11,664	1,820	11,016	1,718	9,720	1,348	9,072	1,101
		30	0.06	12,096	2,426	10,080	2,022	9,072	1,820	8,568	1,718	7,560	1,348	7,056	1,101
	0.5	8	0.18	19,200	2,995	16,000	2,496	14,400	2,246	13,600	2,122	12,000	1,498	11,200	1,223
		12	0.13	19,200	2,995	16,000	2,496	14,400	2,246	13,600	2,122	12,000	1,498	11,200	1,223
		16	0.1	19,200	2,995	16,000	2,496	14,400	2,246	13,600	2,122	12,000	1,498	11,200	1,223
		20	0.1	15,552	2,426	12,960	2,022	11,664	1,820	11,016	1,718	9,720	1,348	9,072	1,101
		30	0.08	12,096	2,426	10,080	2,022	9,072	1,820	8,568	1,718	7,560	1,348	7,056	1,101
		35	0.065	12,096	2,426	10,080	2,022	9,072	1,820	8,568	1,718	7,560	1,348	7,056	1,101

※基本切込みは被削材グループ2での目安を示しています。その他のグループの場合は、上表の切込み比率を目安に調整して下さい。
※Standard cutting depth is shown as the criteria for Group 2 workpieces. For other groups, adjust the cutting depth according to the cutting depth factors in the above table.

【注意】①この標準切削条件表は切削条件の目安を示すものです。実際の加工では加工形状、目的、使用機械等により条件を調整してください。
②機械の回転数が足りない場合は、回転数と送り速度を同じ比率で下げてください。

1. These Recommended Cutting Conditions indicate only the rule of a thumb for the cutting conditions. In actual machining, the condition should be adjusted according to the machining shape, purpose and the machine type.
2. If the rpm of the machine is low, lower the feed rate also to put the rpm and feed rate in the same ratio.