

High efficiency
cutting condition

High accuracy
cutting condition

Please refer to P.22
about high efficiency cutting conditions

Epoch Deep Square Evolution EPDSE-PN EPDSE-ATH

Recommended range			PN series											
			ATH series											
Work material			1	2	3	4	5	6						
			Coppers	Carbon steels, Alloy steels (180~250HB)	Stainless steels, Tool steels (25~35HRC)	Pre-hardened steels (35~45HRC)	Hardened steels (45~55HRC)	Hardened steels (55~65HRC)						
Ratio to standard depth of cut			120%	100%	90%	70%	50%	45%						
Tool dia. DC (mm)	Under neck length LU (mm)	ap (mm)	Revolution n min ⁻¹	Feed rate vf mm/min	Revolution n min ⁻¹	Feed rate vf mm/min	Revolution n min ⁻¹	Feed rate vf mm/min	Revolution n min ⁻¹	Feed rate vf mm/min	Revolution n min ⁻¹	Feed rate vf mm/min	Revolution n min ⁻¹	Feed rate vf mm/min
0.1	0.3	0.006	50,000	350	50,000	350	50,000	332	48,600	242	42,750	178	40,050	144
	0.5	0.004	50,000	350	50,000	350	50,000	332	48,600	242	42,750	178	40,050	144
	1	0.003	50,000	318	50,000	318	48,600	301	43,700	220	38,500	162	36,050	129
0.2	0.5	0.015	50,000	495	45,000	446	40,500	401	38,250	282	33,750	210	31,500	169
	1	0.011	50,000	495	45,000	446	40,500	401	38,250	282	33,750	210	31,500	169
	1.5	0.006	48,600	441	40,500	367	36,450	330	34,425	253	30,375	189	28,350	152
	2	0.004	43,200	352	36,000	294	32,400	264	30,600	200	27,000	165	25,200	147
0.3	3	0.002	43,200	317	36,000	264	32,400	238	30,600	179	27,000	165	25,200	133
	1	0.021	48,000	544	40,000	453	36,000	408	34,000	286	30,000	240	28,000	193
	1.5	0.021	48,000	544	40,000	453	36,000	408	34,000	286	30,000	240	28,000	193
	2	0.012	43,200	448	36,000	373	32,400	336	30,600	257	27,000	192	25,200	155
	2.5	0.01	43,200	448	36,000	373	32,400	336	30,600	257	27,000	192	25,200	155
0.4	3	0.008	43,200	448	36,000	373	32,400	336	30,600	257	27,000	180	25,200	145
	1	0.04	38,400	762	32,000	635	28,800	571	27,200	401	24,000	297	22,400	241
	1.5	0.028	38,400	762	32,000	635	28,800	571	27,200	401	24,000	297	22,400	241
	2	0.028	38,400	762	32,000	635	28,800	571	27,200	401	24,000	297	22,400	241
	2.5	0.022	34,560	557	28,800	464	25,920	418	24,480	320	21,600	239	20,160	192
	3	0.016	34,560	557	28,800	464	25,920	418	24,480	320	21,600	239	20,160	192
	3.5	0.012	34,560	557	28,800	464	25,920	418	24,480	320	21,600	239	20,160	192
	4	0.01	34,560	557	28,800	464	25,920	418	24,480	320	21,600	239	20,160	192
	5	0.01	30,720	406	25,600	316	23,040	284	21,760	208	19,200	184	17,920	144
	6	0.006	30,720	406	25,600	316	23,040	284	21,760	208	19,200	184	17,920	144
0.5	8	0.003	26,880	289	22,400	240	20,160	217	19,040	160	16,800	141	15,680	128
	10	0.002	23,040	212	19,200	177	17,280	159	16,320	117	14,400	103	13,440	94
	1	0.05	38,400	762	32,000	635	28,800	571	27,200	446	24,000	299	22,400	241
	1.5	0.05	38,400	762	32,000	635	28,800	571	27,200	446	24,000	299	22,400	241
	2	0.035	38,400	762	32,000	635	28,800	571	27,200	446	24,000	299	22,400	241
	2.5	0.03	34,560	557	28,800	464	25,920	418	24,480	354	21,600	239	20,160	192
	3	0.02	34,560	557	28,800	464	25,920	418	24,480	354	21,600	239	20,160	192
	4	0.02	34,560	557	28,800	464	25,920	418	24,480	320	21,600	239	20,160	192
	5	0.013	34,560	557	28,800	464	25,920	418	24,480	320	21,600	239	20,160	192
	6	0.013	30,720	433	25,600	361	23,040	324	21,760	208	19,200	184	17,920	144
0.6	8	0.008	30,720	371	25,600	309	23,040	278	21,760	172	19,200	155	17,920	117
	10	0.004	26,880	288	22,400	240	20,160	216	19,040	121	16,800	105	15,680	79
	2	0.042	38,400	1,089	32,000	907	28,800	816	27,200	572	24,000	427	22,400	344
	3	0.035	34,560	895	28,800	746	25,920	671	24,480	515	21,600	385	20,160	310
	4	0.024	34,560	895	28,800	746	25,920	671	24,480	515	21,600	385	20,160	310
	5	0.02	34,560	796	28,800	663	25,920	596	24,480	458	21,600	342	20,160	276
	6	0.015	34,560	796	28,800	663	25,920	596	24,480	458	21,600	342	20,160	276
	7	0.015	30,720	687	25,600	572	23,040	515	21,760	395	19,200	295	17,920	238
0.7	8	0.015	30,720	595	25,600	516	23,040	464	21,760	297	19,200	262	17,920	206
	9	0.012	30,720	595	25,600	516	23,040	464	21,760	297	19,200	262	17,920	206
	10	0.009	30,720	595	25,600	516	23,040	464	21,760	297	19,200	262	17,920	206
	2	0.07	38,400	1,089	32,000	907	28,800	816	27,200	572	24,000	427	22,400	344
	4	0.049	34,560	796	28,800	663	25,920	596	24,480	458	21,600	342	20,160	276
0.8	6	0.018	34,560	796	28,800	663	25,920	596	24,480	458	21,600	342	20,160	276
	8	0.018	30,720	541	25,600	451	23,040	406	21,760	260	19,200	229	17,920	180
	10	0.018	30,720	541	25,600	451	23,040	406	21,760	260	19,200	229	17,920	180

[Note] Please refer to P.27

Features

Dimensions
Ball PN Coating

Dimensions
Ball ATH Coating

Cutting condition
Ball High efficiency

Cutting condition
Ball High accuracy

Dimensions
Square PN Coating

Dimensions
Square ATH Coating

Cutting condition
Square High efficiency

Cutting condition
Square High accuracy

Technical Data

Recommended Cutting Conditions

High efficiency
cutting condition

High accuracy
cutting condition

Please refer to P.22
about high efficiency cutting conditions

Epoch Deep Square Evolution EPDSE-PN EPDSE-ATH

Recommended range			PN series											
			ATH series											
Work material	1		2		3		4		5		6			
	Coppers		Carbon steels, Alloy steels (180~250HB)		Stainless steels, Tool steels (25~35HRC)		Pre-hardened steels (35~45HRC)		Hardened steels (45~55HRC)		Hardened steels (55~65HRC)			
Ratio to standard depth of cut	120%		100%		90%		70%		50%		45%			
Tool dia. DC (mm)	Under neck length LU (mm)	a_p (mm)	Revolution n min ⁻¹	Feed rate v_f mm/min	Revolution n min ⁻¹	Feed rate v_f mm/min	Revolution n min ⁻¹	Feed rate v_f mm/min	Revolution n min ⁻¹	Feed rate v_f mm/min	Revolution n min ⁻¹	Feed rate v_f mm/min	Revolution n min ⁻¹	Feed rate v_f mm/min
0.8	2	0.08	38,400	1,089	32,000	907	28,800	816	27,200	636	24,000	475	22,400	383
	4	0.056	38,400	1,089	32,000	907	28,800	816	27,200	636	24,000	475	22,400	383
	6	0.032	34,560	796	28,800	663	25,920	596	24,480	573	21,600	428	20,160	345
	8	0.02	34,560	796	28,800	663	25,920	596	24,480	458	21,600	342	20,160	276
	10	0.02	30,720	541	25,600	451	23,040	406	21,760	260	19,200	229	17,920	180
	12	0.012	30,720	541	25,600	451	23,040	406	21,760	260	19,200	229	17,920	180
0.9	2	0.09	38,400	1,206	32,000	1,005	28,800	904	27,200	695	24,000	519	22,400	418
	4	0.063	38,400	1,206	32,000	1,005	28,800	904	27,200	695	24,000	519	22,400	418
	6	0.036	34,560	995	28,800	829	25,920	746	24,480	573	21,600	428	20,160	345
	8	0.023	34,560	995	28,800	746	25,920	746	24,480	573	21,600	428	20,160	345
	10	0.023	30,720	619	25,600	516	23,040	464	21,760	297	19,200	262	17,920	206
	12	0.023	30,720	541	25,600	451	23,040	414	21,760	297	19,200	262	17,920	206
1	2	0.09	34,560	1,465	28,800	1,220	25,920	1,098	24,480	936	21,600	699	20,160	563
	3	0.07	34,560	1,465	28,800	1,220	25,920	1,098	24,480	936	21,600	699	20,160	563
	4	0.065	34,560	1,465	28,800	1,220	25,920	1,098	24,480	936	21,600	699	20,160	563
	5	0.05	34,560	1,465	28,800	1,220	25,920	1,098	24,480	936	21,600	699	20,160	563
	6	0.035	31,104	1,276	25,920	1,008	23,328	907	22,032	773	19,440	577	18,144	418
	7	0.035	31,104	1,276	25,920	1,008	23,328	907	22,032	773	19,440	577	18,144	418
	8	0.035	31,104	1,209	25,920	1,008	23,328	907	22,032	773	19,440	577	18,144	418
	9	0.03	31,104	1,209	25,920	1,008	23,328	907	22,032	695	19,440	461	18,144	372
	10	0.022	31,104	1,209	25,920	896	23,328	816	22,032	695	19,440	461	18,144	372
	12	0.022	27,648	836	23,040	696	20,736	627	19,584	401	17,280	354	16,128	278
	14	0.022	27,648	836	23,040	696	20,736	627	19,584	401	17,280	354	16,128	278
	16	0.012	27,648	716	23,040	596	20,736	537	19,584	380	17,280	298	16,128	226
	20	0.008	24,828	586	20,690	488	18,621	439	17,587	278	15,518	213	14,483	158
	25	0.005	21,000	455	17,500	379	15,750	341	14,875	216	13,125	165	12,250	122
1.2	4	0.09	30,720	1,306	25,600	1,089	23,040	980	21,760	760	19,200	513	17,920	414
	6	0.084	30,720	1,306	25,600	1,089	23,040	980	21,760	760	19,200	513	17,920	414
	8	0.048	27,648	1,074	23,040	895	20,736	806	19,584	684	17,280	461	16,128	372
	10	0.03	27,648	1,074	23,040	895	20,736	806	19,584	684	17,280	461	16,128	372
	12	0.03	27,648	955	23,040	716	20,736	642	19,584	549	17,280	410	16,128	331
	16	0.02	24,576	848	20,480	707	18,432	557	17,408	488	15,360	364	14,336	294
1.4	6	0.1	26,880	1,143	22,400	952	20,160	857	19,040	601	16,800	449	15,680	361
	12	0.035	24,192	940	20,160	783	18,144	705	17,136	540	15,120	404	14,112	325
1.5	4	0.11	26,880	1,270	22,400	1,058	20,160	953	19,040	668	16,800	499	15,680	402
	6	0.11	26,880	1,143	22,400	952	20,160	866	19,040	668	16,800	499	15,680	402
	8	0.06	24,192	1,045	20,160	871	18,144	784	17,136	601	15,120	449	14,112	362
	10	0.06	24,192	1,045	20,160	783	18,144	705	17,136	601	15,120	449	14,112	362
	12	0.06	24,192	940	20,160	783	18,144	705	17,136	601	15,120	404	14,112	325
	14	0.038	24,192	940	20,160	783	18,144	705	17,136	601	15,120	404	14,112	325
	16	0.038	21,504	731	17,920	609	16,128	549	15,232	351	13,440	310	12,544	243
	18	0.038	21,504	731	17,920	609	16,128	549	15,232	351	13,440	310	12,544	243
	20	0.038	21,504	731	17,920	609	16,128	488	15,232	312	13,440	276	12,544	216
	25	0.023	16,128	470	13,440	391	12,096	313	11,424	222	10,080	174	9,408	132
	30	0.015	13,440	319	11,200	266	12,096	212	9,520	149	8,400	111	7,840	89
	35	0.01	13,440	284	11,200	236	12,096	186	9,520	149	8,400	111	7,840	89
1.6	6	0.11	24,960	1,179	20,800	977	18,720	884	17,680	690	15,600	515	14,560	415
	8	0.11	24,960	1,179	20,800	977	18,720	884	17,680	621	15,600	515	14,560	415
1.8	6	0.13	24,960	1,179	20,800	997	18,720	884	17,680	690	15,600	515	14,560	415
	8	0.13	24,960	1,179	20,800	997	18,720	884	17,680	621	15,600	515	14,560	415

[Note] Please refer to P.27

Recommended range			PN series											
			ATH series											
Work material			1	2	3	4	5	6						
			Coppers	Carbon steels, Alloy steels (180~250HB)	Stainless steels, Tool steels (25~35HRC)	Pre-hardened steels (35~45HRC)	Hardened steels (45~55HRC)	Hardened steels (55~65HRC)						
Ratio to standard depth of cut			120%	100%	90%	70%	50%	45%						
Tool dia. DC (mm)	Under neck length LU (mm)	ap (mm)	Revolution n min ⁻¹	Feed rate vf mm/min	Revolution n min ⁻¹	Feed rate vf mm/min	Revolution n min ⁻¹	Feed rate vf mm/min	Revolution n min ⁻¹	Feed rate vf mm/min	Revolution n min ⁻¹	Feed rate vf mm/min	Revolution n min ⁻¹	Feed rate vf mm/min
2	4	0.2	20,160	1,270	16,800	952	15,120	861	14,280	655	12,600	499	11,760	402
	6	0.2	20,160	1,270	16,800	952	15,120	861	14,280	655	12,600	499	11,760	402
	8	0.14	20,160	1,270	16,800	952	15,120	861	14,280	655	12,600	499	11,760	402
	10	0.14	20,160	1,270	16,800	952	15,120	861	14,280	655	12,600	499	11,760	402
	12	0.08	18,144	1,045	15,120	871	13,608	784	12,852	590	11,340	449	10,584	362
	14	0.08	18,144	1,045	15,120	871	13,608	784	12,852	590	11,340	449	10,584	325
	16	0.08	18,144	940	15,120	783	13,608	707	12,852	540	11,340	426	10,584	325
	18	0.05	18,144	940	15,120	783	13,608	707	12,852	540	11,340	404	10,584	289
	20	0.05	18,144	888	15,120	696	13,608	627	12,852	480	11,340	359	10,584	289
	25	0.05	16,128	731	13,440	609	12,096	549	11,424	312	10,080	310	9,408	232
	30	0.03	16,128	650	13,440	541	12,096	488	11,424	273	10,080	276	9,408	216
	35	0.02	14,112	466	11,760	388	10,584	349	9,996	225	8,820	182	8,232	148
	40	0.01	14,112	408	11,760	340	10,586	306	9,996	197	8,820	159	8,232	129
	50	0.005	12,096	284	10,080	236	9,072	186	8,568	120	7,560	97	7,056	78
2.5	8	0.18	17,280	1,361	14,400	1,134	12,960	1,021	12,240	716	10,800	535	10,080	431
	12	0.18	17,280	1,134	14,400	1,020	12,960	933	12,240	644	10,800	520	10,080	387
	16	0.1	15,552	1,008	12,960	839	11,664	758	11,016	579	9,720	450	9,072	349
	20	0.1	15,552	840	12,960	794	11,664	711	11,016	515	9,720	450	9,072	310
	30	0.06	13,824	696	11,520	580	10,368	457	9,792	348	8,640	272	8,064	220
	40	0.03	12,096	437	10,080	364	9,072	328	8,568	250	7,560	196	7,056	158
3	50	0.01	12,096	375	10,080	338	9,072	304	8,568	203	7,560	171	7,056	138
	8	0.3	15,360	1,210	12,800	1,008	11,520	907	10,880	636	9,600	475	8,960	383
	12	0.21	15,360	1,210	12,800	1,008	11,520	907	10,880	636	9,600	475	8,960	383
	16	0.12	13,824	995	11,520	829	10,368	746	9,792	573	8,640	428	8,064	344
	20	0.12	13,824	895	11,520	787	10,368	705	9,792	573	8,640	428	8,064	344
	25	0.08	13,824	895	11,520	787	10,368	705	9,792	573	8,640	428	8,064	344
	30	0.08	13,824	796	11,520	663	10,368	601	9,792	573	8,640	428	8,064	310
4	40	0.05	12,288	618	10,240	515	9,216	464	8,704	356	7,680	304	7,168	245
	50	0.02	10,752	389	8,960	347	8,064	291	7,616	194	6,720	152	6,272	123
	12	0.4	11,500	2,070	9,400	1,692	8,460	1,370	7,990	1,222	7,050	811	6,580	654
	16	0.28	11,500	2,070	9,400	1,692	8,460	1,370	7,990	1,222	7,050	811	6,580	654
	20	0.28	10,350	1,863	8,460	1,522	7,614	1,233	7,191	1,099	6,345	730	5,922	588
	25	0.16	10,350	1,676	8,460	1,370	7,614	1,109	7,191	990	6,345	730	5,922	588
	30	0.16	10,350	1,676	8,460	1,370	7,614	1,109	7,191	880	6,345	649	5,922	588
5	35	0.1	9,137	1,316	7,614	1,096	6,853	888	6,472	792	5,711	584	5,330	471
	40	0.1	9,137	1,151	7,614	959	6,853	777	6,472	693	5,711	511	5,330	412
	50	0.06	7,896	789	6,580	658	7,106	592	5,593	460	4,935	309	4,606	249
	20	0.3	9,014	1,621	7,512	1,351	6,761	1,216	6,385	945	5,634	635	5,258	513
	25	0.3	8,112	1,458	6,760	1,215	6,084	1,094	5,746	850	5,070	571	4,732	461
6	30	0.2	8,112	1,313	6,760	1,094	6,084	984	5,746	765	5,070	514	4,732	415
	40	0.15	7,301	1,052	6,084	876	5,476	788	5,171	613	4,563	412	4,259	332
	50	0.1	7,301	986	6,084	876	5,476	690	5,171	575	4,563	360	4,259	291
	20	0.5	7,418	1,481	6,182	1,234	5,564	1,111	5,255	864	4,637	580	4,327	469
	30	0.4	6,744	1,346	5,620	1,122	5,058	1,010	4,777	785	4,215	527	3,934	426
6	40	0.3	6,744	1,211	5,620	1,009	5,058	908	4,777	706	4,215	474	3,934	383
	50	0.2	6,000	981	5,000	817	4,500	735	4,250	636	3,750	427	3,500	345

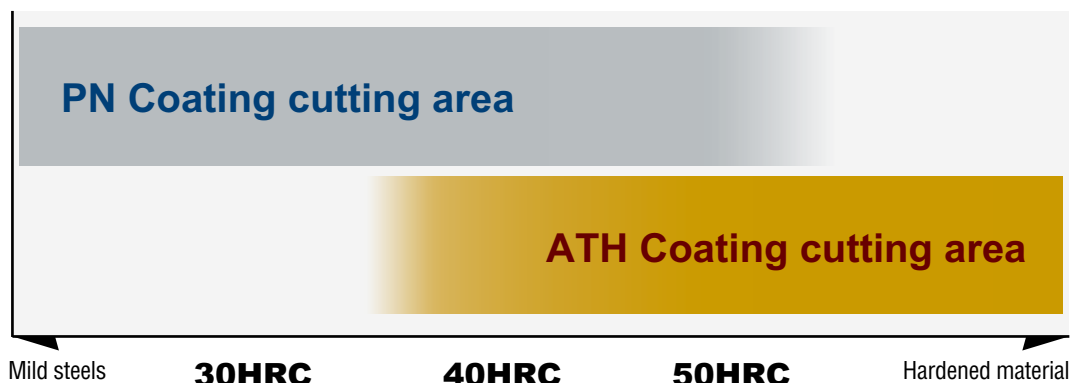
※ap is shown as the criteria for Group 2 workpieces. For other groups, adjust the cutting depth according to the cutting depth factors in the above table.

- [Note]** ① PN coating is less electro conductive. Therefore, electric transmitted measuring systems may not work.
 ② Use the appropriate coolant for the work material and machining shape.
 ③ 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.
 ④ If the rpm of the machine is low, lower the feed rate also to put the rpm and feed rate in the same ratio.

New PVD Technology

2 types of coatings to handle a variety of work materials.

Recommended machining areas for each coating



Cutting Data 1

Work material : **SCM440[®] 30HRC**
 Holder : HSK-F63
 Tool dia. : R0.5×Under neck 6mm
 Coolant : Air-blow
 $n=28,000\text{min}^{-1}$ ($v_c=88\text{m/min}$)
 $v_f=1,200\text{mm/min}$ ($f_z=0.02\text{mm/t}$)
 $a_p=0.036\text{mm}$ $a_e=0.108\text{mm}$ OH=18mm
 Cutting length 10m

PN Coating



ATH Coating



Cutting Data 2

Work material : **HPM-MAGIC 40HRC**
 Holder : HSK-F63
 Tool dia. : R0.5×Under neck 10mm
 Coolant : Air-blow
 $n=24,300\text{min}^{-1}$ ($v_c=76\text{m/min}$)
 $v_f=900\text{mm/min}$ ($f_z=0.018\text{mm/t}$)
 $a_p=0.04\text{mm}$ Cutting reciprocating slot.
 OH=18mm

PN Coating



ATH Coating



Cutting Data 3

Work material : **DAC[®] 45HRC**
 Holder : HSK-F63
 Tool dia. : R0.5×Under neck 6mm
 Coolant : Air-blow
 $n=27,540\text{min}^{-1}$ ($v_c=86\text{m/min}$)
 $v_f=1,115\text{mm/min}$ ($f_z=0.02\text{mm/t}$)
 $a_p=0.032\text{mm}$ $a_e=0.096\text{mm}$ OH=18mm
 Cutting length 10m

PN Coating



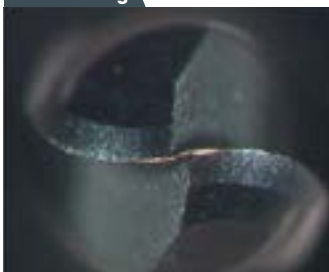
ATH Coating



Cutting Data 4

Work material : **HPM38 52HRC**
 Holder : HSK-F63
 Tool dia. : R0.5×Under neck 10mm
 Coolant : Air-blow
 $n=24,300\text{min}^{-1}$ ($v_c=76\text{m/min}$)
 $v_f=919\text{mm/min}$ ($f_z=0.018\text{mm/t}$)
 $a_p=0.016\text{mm}$ OH=18mm
 Cutting length 20m

PN Coating



ATH Coating



Technical data Ball nose



Enables high-accuracy stable machining with excellent surface quality.

EPDBE-PN

PN Coating

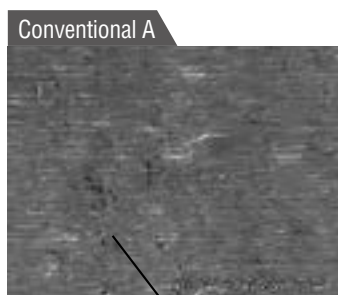
Technical Data **SCM440^H 33HRC rib slot evaluation**

Tool : EPDBE2010-10-PN (R0.5 Under neck10mm)

★This is amazing! Point 1 **Uniformity of machined surface**

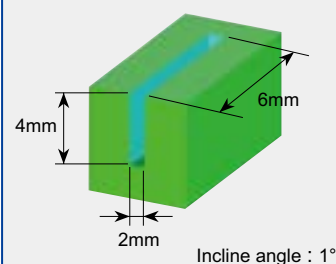


**Forms uniform cutter marks.
No vibrations occurred.**



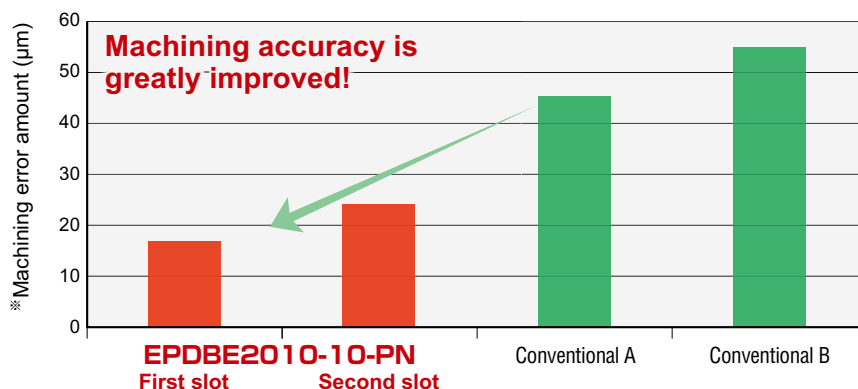
Cutter marks are not uniform.
In addition, friction has collapsed marks

Rib slot evaluation

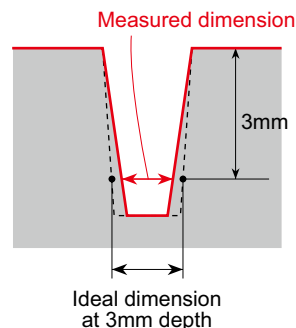


Work material : SCM440^H 33HRC
Holder : HSK-F63
Coolant : Wet
 $n=16,000\text{min}^{-1}$ ($v_c=50\text{m/min}$)
 $v_f=1,000\text{mm/min}$ ($f_z=0.03\text{mm/t}$)
 $a_p \times a_e=0.02\text{mm} \times 0.04\text{mm}$

★This is amazing! Point 2 **Low deflection provides improved machining accuracy!**



Machining accuracy is greatly improved!

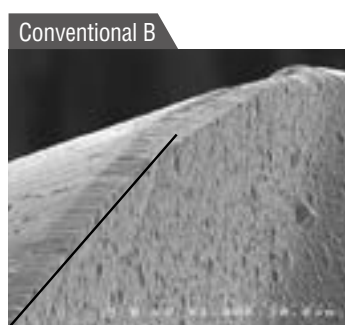
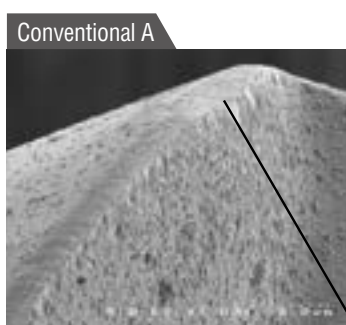


※Machining error amount:
(Ideal dimension)-(Measured dimension after cutting)

★This is amazing! Point 3 **Long life: Wear resistance plus good chipping resistance**



**Enables stable machining
with no vibrations.
Good wear condition.**



Wearing down of tip is fast.
Wear resistance is poor.

Features

Dimensions
Ball PN Coating

Dimensions
Ball ATH Coating

Cutting condition
Ball High efficiency

Cutting condition
Ball High accuracy

Dimensions
Square PN Coating

Dimensions
Square ATH Coating

Cutting condition
Square High efficiency

Cutting condition
Square High accuracy

Technical Data

Technical data Ball nose



Rely on ATH Coating for stable machining of even high-hardness materials!

EPDBE-ATH

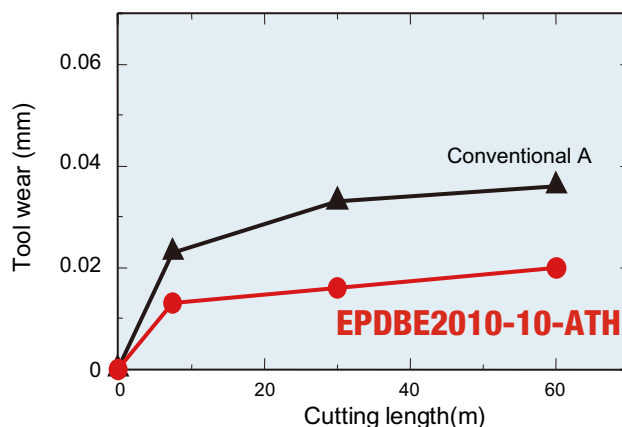
ATH Coating

Technical Data

Tool : EPDBE2010-10-ATH (R0.5 Under neck10mm)

★This is amazing! Point 1 Wear condition is stable. No chipping even on high-hardness materials.

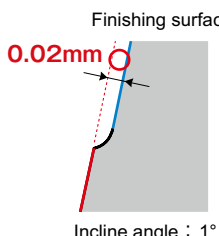
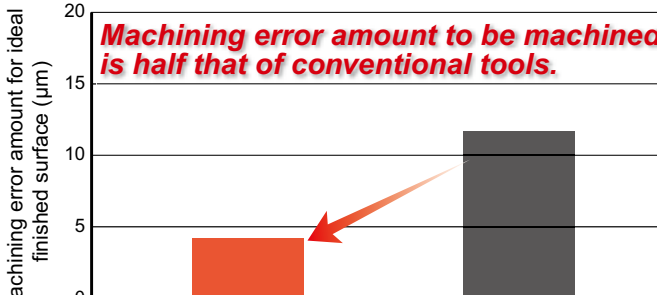
Machining shape	Cutting condition	EPDBE2010-10-ATH	Conventional
	Work material : SLD[®] 60HRC Holder : HSK-F63 Coolant : Air Blow $n=10,000\text{min}^{-1}$ $(v_c=31.4\text{m/min})$ $v_f=800\text{mm/min}$ $(f_z=0.04\text{mm/t})$ $a_p \times a_e=0.02\text{mm} \times 0.02\text{mm}$	 <p>Stable wear condition from chisel to outer perimeter</p>	 <p>Chipping occurred</p>



Technical Data

Tool : EPDBE2010-10-ATH (R0.5 Under neck10mm)

★This is amazing! Point 2 High accuracy achieved due to little deflection.

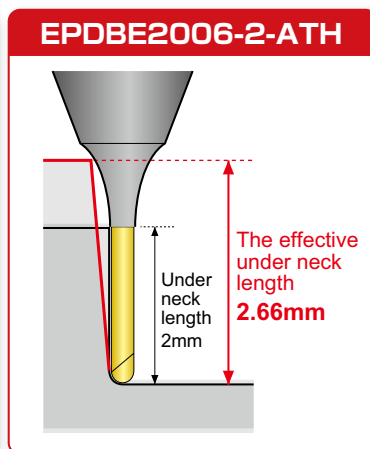
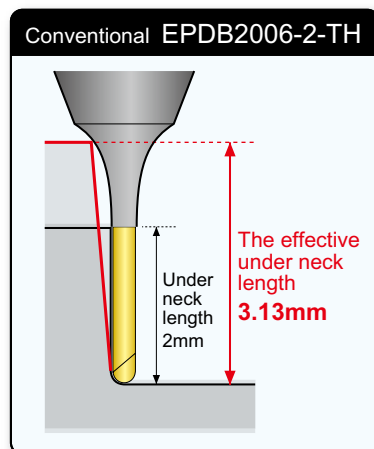
Machining shape	Cutting condition	
 <p>Finishing surface 0.02mm Incline angle : 1°</p>	Work material : SUS420J2[®] 52HRC Holder: HSK-F63 Coolant : Air Blow $n=16,000\text{min}^{-1}$ $(v_c=50\text{m/min})$ $v_f=1,000\text{mm/min}$ $(f_z=0.03\text{mm/t})$ $a_p \times a_e=0.02\text{mm} \times 0.02\text{mm}$	 <p>Machining error amount for ideal finished surface (μm)</p> <p>EPDBE2010-10-ATH: ~4.5 μm</p> <p>Conventional: ~11.5 μm</p> <p>Machining error amount to be machined is half that of conventional tools.</p> <p>Periphery helix angle is strong, improving cutting performance.</p>

Tool interference check, Re-grinding

Example of difference in neck interference area

Difference in interference area for $R=0.3 \times$ Under neck length=2mm

(Figures show a slope angle of 1° .)



When a conventional product and new product with $R=0.3 \times$ Under neck length=2mm are compared for a surface with a 1° slope angle, the conventional EPDB2006-2-TH has an effective under neck length of 3.13mm, but for the new EPDBE2006-2-ATH, the effective under neck length is 2.66mm.

The improved neck shape used in these new products results in a different interference area than the EPDB and EPDS conventional models.

For checking interference:

CAD/CAM Support Data Pack

The CAD/CAM Support Data Pack has been updated to include the Epoch Deep Evolution Series. You can search for the latest end mill. Please visit our company's home page for details.



Re-grinding compatibility range table

Item code	Product name	Tool dia. (mm)	Shape	Re-grinding compatibility range (mm)	
				Outer dia.	End
EPDBE-PN	Epoch Deep Ball Evolution (PN Coating)	0.1~6		N/A	1~6
EPDBE-ATH	Epoch Deep Ball Evolution (ATH Coating)	0.1~6		N/A	1~6
EPDSE-PN	Epoch Deep Square Evolution (PN Coating)	0.1~6		6	2~6
EPDSE-ATH	Epoch Deep Square Evolution (ATH Coating)	0.1~6		6	2~6

[Note] Contact our sales office regarding whether or not regrinding is possible for tools where Under neck length/Tool diameter is 10 or greater.

特長

寸法ボール・PN

寸法ボール・ATH

切削条件ボール・高精度

切削条件ボール・高精度

寸法スクエア・PN

寸法スクエア・ATH

切削条件スクエア・高精度

切削条件スクエア・高精度

技術データ

Technical Data



The diagrams and table data are examples of test results, and are not guaranteed values.
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Attentions on Safety

1. Cautions regarding handling

- (1) When removing the tool from its case (packaging), be careful that the tool does not pop out or is dropped. Be particularly careful regarding contact with the tool flutes.
- (2) When handling tools with sharp cutting flutes, be careful not to touch the cutting flutes directly with your bare hands.

2. Cautions regarding mounting

- (1) Before use, check the outside appearance of the tool for scratches, cracks, etc. and that it is firmly mounted in the collet chuck, etc.
- (2) If abnormal chattering, etc. occurs during use, stop the machine immediately and remove the cause of the chattering.

3. Cautions during use

- (1) Before use, confirm the dimensions and direction of rotation of the tool and milling work material.
- (2) The numerical values in the standard cutting conditions table should be used as criteria when starting new work. The cutting conditions should be adjusted as appropriate when the cutting depth is large, the rigidity of the machine being used is low, or according to the conditions of the work material.
- (3) Cutting tools are made of a hard material. During use, they may break and fly off. In addition, cutting chips may also fly off. Since there is a danger of injury to workers, fire, or eye damage from such flying pieces, a safety cover should be attached when work is performed and safety equipment such as safety goggles should be worn to create a safe environment for work.
- (4) There is a risk of fire or inflammation due to sparks, heat due to breakage, and cutting chips. Do not use where there is a risk of fire or explosion. **Please caution of fire while using oil base coolant, fire prevention is necessary.**
- (5) Do not use the tool for any purpose other than that for which it is intended.

4. Cautions regarding regrinding

- (1) If regrinding is not performed at the proper time, there is a risk of the tool breaking. Replace the tool with one in good condition, or perform regrinding.
- (2) Grinding dust will be created when regrinding a tool. When regrinding, be sure to attach a safety cover over the work area and wear safety clothes such as safety goggles, etc.
- (3) This product contains the specified chemical substance cobalt and its inorganic compounds. When performing regrinding or similar processing, be sure to handle the processing in accordance with the local laws and regulations regarding prevention of hazards due to specified chemical substances.

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TOOLSEARCH

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