MOLDINO
The Edge To Innovation

Ball End Mill for Hardened Steel

EPDBEH-TH3

Epoch Deep Ball Evolution Hard-TH3

New short shank type for shrink-fit tool holders

Introduction of labeling showing actual tool diameter (for all sizes up to RE1.25)

MOLDINO Tool Engineering, Ltd.

New Product News | No.1701E-17 | 2026-2

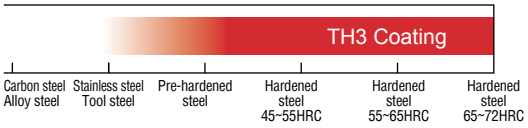
Applies newly developed next-generation hard coating "TH3 Coating" Excellent wear resistance when machining hardened steel

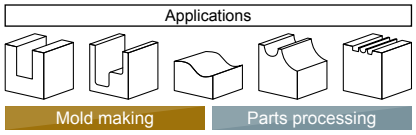
Features of EPDBEH-TH3

01 "TH3 Coating" for hardened steel machining

02 Double-face cutting edge geometry for hardened steel machining

03 Tool design to pursue high-accuracy machining





EPDBEH-TH3

RE0.05～RE6 [331 Items]

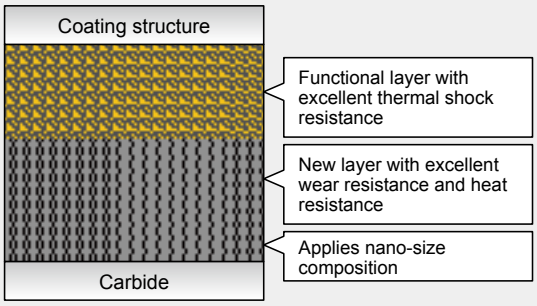
Features 01 "TH3 Coating" for hardened steel machining

Features and performance

- High hardness coating with excellent wear resistance and heat resistance
- Has excellent thermal shock resistance enables to suppress sudden chipping
- Long tool life when cutting high-hardness materials (50HRC or higher) such as hardened steel

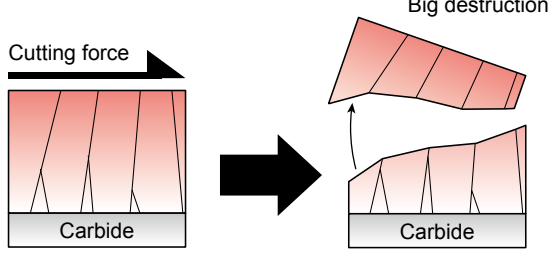
Target steel grade

- Hardened steel (especially 50HRC or higher), high-speed steel

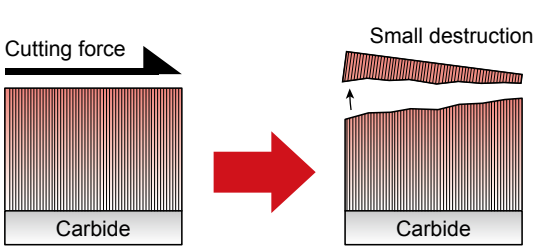


! Point New coating achieves to reduce destruction unit of layer by applying "nano-size composition".

Conventional coating



New coating



Features 02 Optimized cutting edge geometry "double-face" for hardened steel machining.

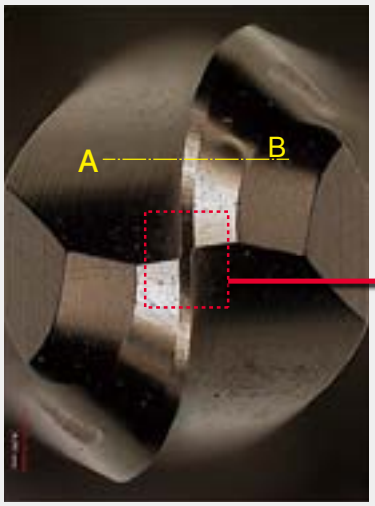
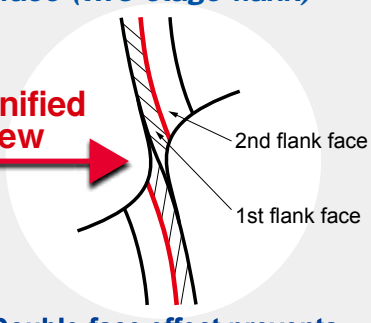


Figure Double Face geometry

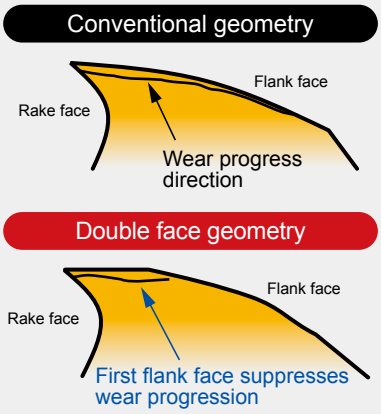
Flank of ball area has double face (two-stage flank)

Magnified view



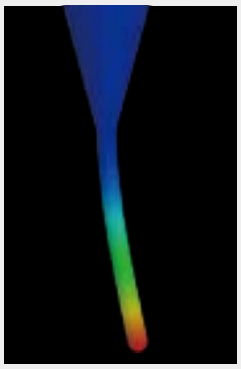
Double-face effect prevents shape from deteriorating

Figure A-B cross section view



※Double face geometry is not applied to RE2 or larger size

Features 03 Tool design to pursue high-accuracy machining

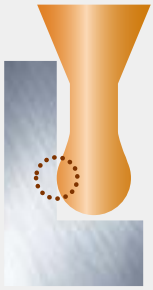


In case of RE0.5
- under neck length 10mm,

10% of deflection is suppressed compared to conventional neck shape

(Theoretical value by our calculation)

Back draft effect

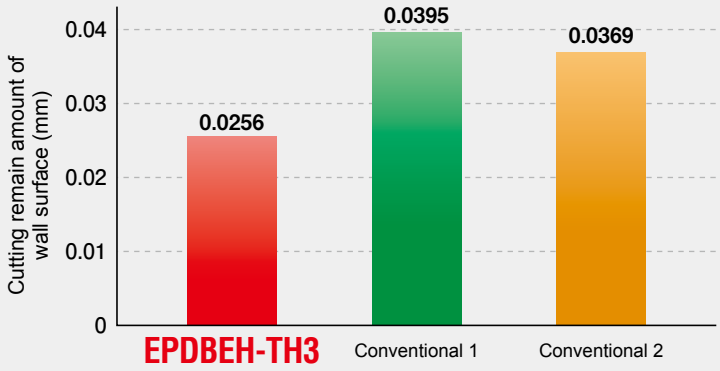


Backdraft effect enables good-quality processed surfaces to be achieved.

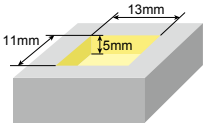
Inherits the reliable backdraft shape to enable chattering to be reduced by performing point cutting.

Evaluation of cutting remain in pocket wall finishing test

Figure Cutting remain amount of wall surface



Work material : YXR33(58HRC)
Machine : Vertical MC(HSK-E32)
Tool : EPDBEH2010-6-TH3
Cutting conditions : n=22,600min^{-1}
(v_c=71m/min)
v_f=820mm/min
(f_z=0.018mm/t)
a_p=0.03mm a_e=0.01mm
OH=18mm Mist



Pocket size :
13×11×5mm(Wall)

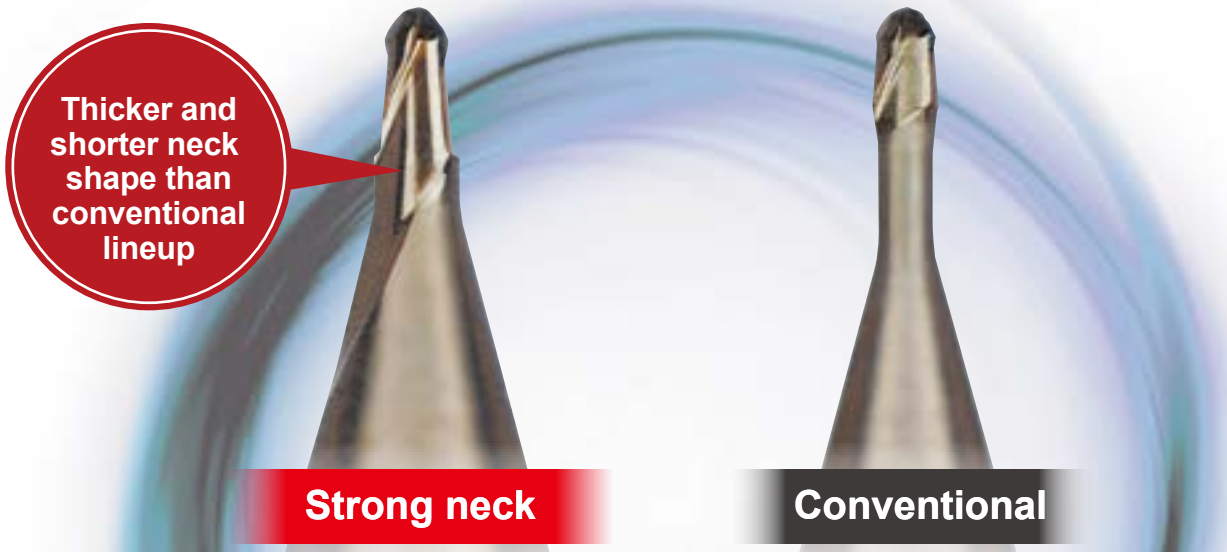
By increasing the neck rigidity, it is possible to suppress deflection and reduce the cutting remain by 30% than conventional design

Effective neck length is shorter than existing Epoch Deep Evolution series (EPDBEH, EPDBE).
Please use with checking interference area.

⇒Please use CAD/CAM Support Data Pack for checking interference area. For details, please visit our web site.
https://www.moldino.com/en/

Variation

Shortest neck length, Strong neck type



Please utilize for machining various precision molds and dies

Lineup expanded with shortest under-neck length range that emphasizes rigidity in order to realize higher precision and stable machining

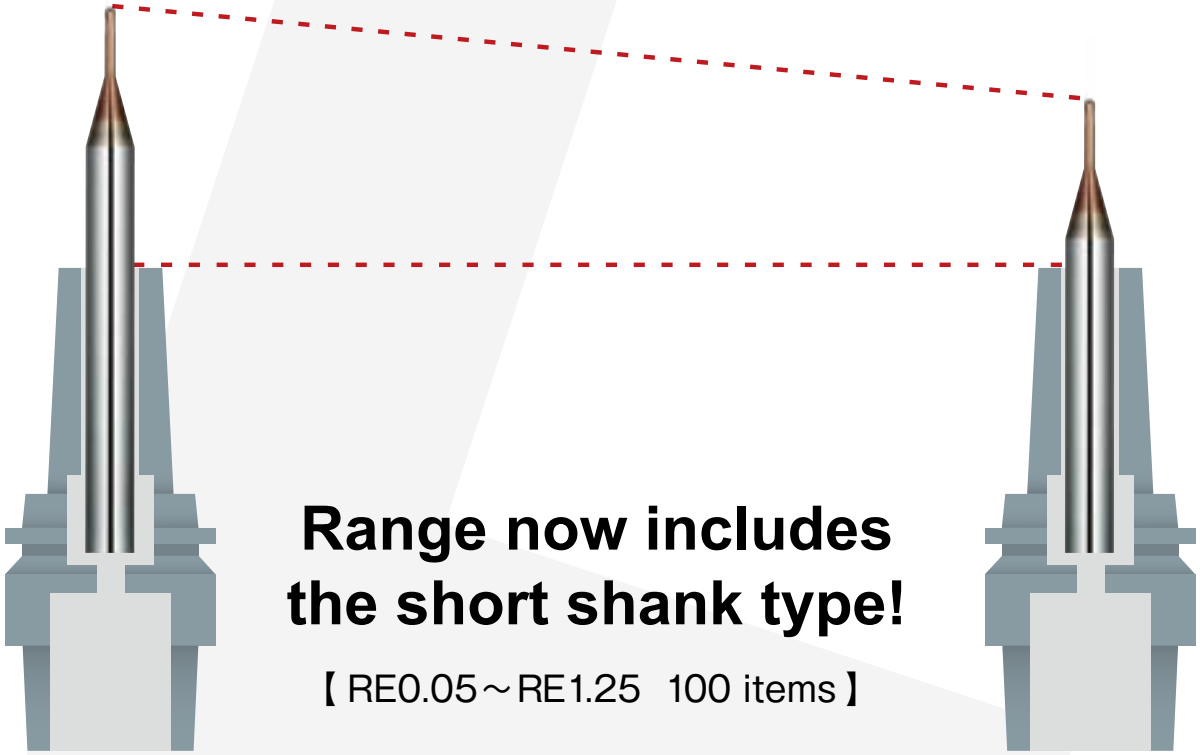
Needs to use tools with shorter neck length since small diameter end mills have a risk of breakage

Strong neck type with the shortest neck length

High tool rigidity improves stability and reliability.
Especially, it is more effective as the tool diameter becomes smaller.

Short shank type

EPDBEH2○○○F-○○-TH3



Range now includes the short shank type!

【 RE0.05～RE1.25　100 items 】

Regular shank

Short shank

Full-length design that fits shrink-fit holders

Now featuring labeling of actual tool diameter (for all sizes up to RE1.25)

Actual size indicated here.

※ Example product label

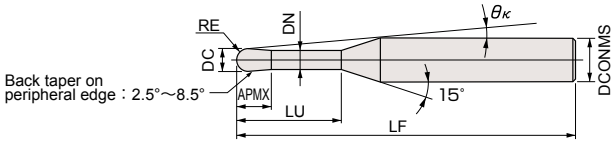
Allows use of actual size in CAM
without the need for measurement,
for improved machining accuracy!

For initial introduction on short shank type products

Line Up

Short shank type

2Flutes 



A type

(mm)

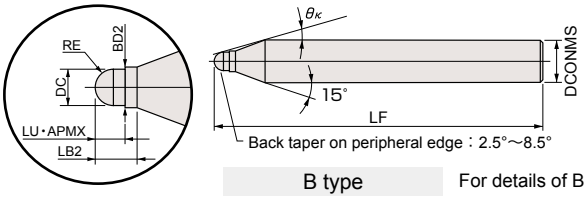
Ball radius	Tolerance on RE
0.05～0.25	±0.003
0.3～1.25	±0.005

EPDBEH2○○○F-○○.○○-TH3

Carbide TH3 Helix angle 30° h4

Item code	Stock	Size(mm)							Type	Interference angle (°)	Effective under neck length with respect to draft angle				
		Ball radius	Tool dia.	Under neck length	Flute length	Neck dia.	Overall length	Shank dia.							
		RE	DC	LU	APMX	DN	LF	DCONMS		θK	0.5°	1°	1.5°	2°	3°
EPDBEH2001F-0.08-TH3	●	0.05	0.1	0.08	0.08	–	35	4	B	20.93	–	–	–	–	–
EPDBEH2001F-0.2-TH3	●			0.2		0.08			A	14.64	0.24	0.25	0.25	0.26	0.28
EPDBEH2001F-0.3-TH3	●			0.3					A	14.46	0.34	0.35	0.36	0.38	0.40
EPDBEH2001F-0.5-TH3	●			0.5					A	14.10	0.55	0.57	0.59	0.61	0.65
EPDBEH20015F-0.12-TH3	●	0.075	0.15	0.12	0.12	–	35	4	B	15.25	–	–	–	–	–
EPDBEH20015F-0.3-TH3	●			0.3		0.13			A	14.50	0.34	0.35	0.36	0.37	0.40
EPDBEH20015F-0.5-TH3	●			0.5					A	14.14	0.55	0.56	0.58	0.60	0.65
EPDBEH20015F-0.75-TH3	●			0.75					A	13.71	0.81	0.83	0.86	0.89	0.96
EPDBEH2002F-0.15-TH3	●	0.1	0.2	0.15	0.15	–	35	4	B	20.23	–	–	–	–	–
EPDBEH2002F-0.3-TH3	●			0.3		0.18			A	14.54	0.34	0.35	0.36	0.37	0.39
EPDBEH2002F-0.5-TH3	●			0.5					A	14.17	0.55	0.56	0.58	0.60	0.64
EPDBEH2002F-0.75-TH3	●			0.75					A	13.73	0.81	0.83	0.86	0.89	0.95
EPDBEH2002F-1-TH3	●			1			38		A	13.32	1.06	1.10	1.13	1.17	1.26
EPDBEH2003F-0.25-TH3	●	0.15	0.3	0.25	0.25	–	35	4	B	14.45	–	–	–	–	–
EPDBEH2003F-0.5-TH3	●			0.5		0.27			A	14.21	0.56	0.58	0.60	0.61	0.65
EPDBEH2003F-0.75-TH3	●			0.75					A	13.76	0.82	0.85	0.87	0.90	0.96
EPDBEH2003F-1-TH3	●			1					A	13.33	1.08	1.11	1.15	1.19	1.27
EPDBEH2003F-1.5-TH3	●			1.5			38		A	12.56	1.60	1.65	1.70	1.76	1.89
EPDBEH2004F-0.3-TH3	●	0.2	0.4	0.3	0.3	–	35	4	B	14.53	–	–	–	–	–
EPDBEH2004F-0.5-TH3	●			0.5		0.37			A	14.28	0.56	0.58	0.59	0.60	0.64
EPDBEH2004F-0.75-TH3	●			0.75					A	13.81	0.82	0.84	0.87	0.89	0.95
EPDBEH2004F-1-TH3	●			1					A	13.37	1.08	1.11	1.14	1.18	1.26
EPDBEH2004F-1.5-TH3	●			1.5			38		A	12.57	1.60	1.65	1.70	1.75	1.88
EPDBEH2004F-2-TH3	●			2					A	11.86	2.11	2.18	2.25	2.33	2.50
EPDBEH2004F-2.5-TH3	●			2.5					A	11.23	2.63	2.72	2.81	2.90	3.13
EPDBEH2004F-3-TH3	●			3					A	10.65	3.15	3.25	3.36	3.48	3.75
EPDBEH2004F-4-TH3	●			4					A	9.67	4.18	4.32	4.47	4.63	4.99
EPDBEH2005F-0.35-TH3	●	0.25	0.5	0.35	0.35	–	35	4	B	14.10	–	–	–	–	–
EPDBEH2005F-0.75-TH3	●			0.75		0.47			A	13.88	0.82	0.84	0.86	0.88	0.94
EPDBEH2005F-1-TH3	●			1					A	13.42	1.08	1.11	1.14	1.17	1.25
EPDBEH2005F-1.5-TH3	●			1.5			38		A	12.59	1.59	1.64	1.69	1.75	1.87
EPDBEH2005F-2-TH3	●			2					A	11.86	2.11	2.18	2.25	2.32	2.49
EPDBEH2005F-2.5-TH3	●			2.5					A	11.21	2.63	2.71	2.80	2.90	3.11
EPDBEH2005F-3-TH3	●			3					A	10.62	3.15	3.25	3.36	3.47	3.73
EPDBEH2005F-4-TH3	●			4					A	9.61	4.18	4.32	4.46	4.62	4.98
EPDBEH2005F-5-TH3	●			5			42		A	8.78	5.21	5.39	5.57	5.77	6.22
EPDBEH2006F-0.4-TH3	●	0.3	0.6	0.4	0.4	–	35	4	B	14.16	–	–	–	–	–
EPDBEH2006F-0.75-TH3	●			0.75		0.57			A	13.94	0.82	0.84	0.86	0.88	0.93
EPDBEH2006F-1-TH3	●			1					A	13.47	1.08	1.10	1.13	1.17	1.24
EPDBEH2006F-1.5-TH3	●			1.5					A	12.61	1.59	1.64	1.69	1.74	1.86
EPDBEH2006F-2-TH3	●			2			38		A	11.86	2.11	2.17	2.24	2.31	2.48
EPDBEH2006F-2.5-TH3	●			2.5					A	11.19	2.63	2.71	2.80	2.89	3.10
EPDBEH2006F-3-TH3	●			3					A	10.59	3.14	3.24	3.35	3.46	3.72
EPDBEH2006F-3.5-TH3	●			3.5					A	10.05	3.66	3.78	3.90	4.04	4.34
EPDBEH2006F-4-TH3	●			4					A	9.56	4.18	4.31	4.46	4.61	4.97
EPDBEH2006F-5-TH3	●			5			42		A	8.71	5.21	5.38	5.57	5.76	6.21
EPDBEH2006F-6-TH3	●			6					A	8.00	6.24	6.45	6.67	6.91	7.45
EPDBEH2007F-0.45-TH3	●	0.35	0.7	0.45	0.45	–	35	4	B	14.13	–	–	–	–	–
EPDBEH2007F-2-TH3	●			2		0.67	38		A	11.85	2.11	2.17	2.24	2.31	2.47
EPDBEH2007F-4-TH3	●			4					A	9.50	4.18	4.31	4.45	4.61	4.95

● : Stocked items.



B type

For details of B type, refer to page 13.

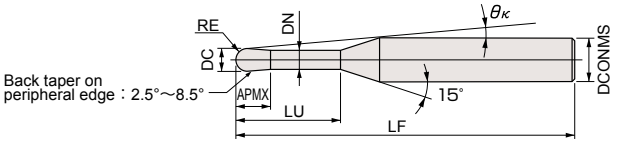
EPDBEH2○○○F-○○.○○-TH3

Item code	Stock	Size(mm)							Type	Interference angle (°)	Effective under neck length with respect to draft angle				
		Ball radius	Tool dia.	Under neck length	Flute length	Neck dia.	Overall length	Shank dia.							
		RE	DC	LU	APMX	DN	LF	DCONMS		θκ	0.5°	1°	1.5°	2°	3°
EPDBEH2008F-0.5-TH3	●	0.4	0.8	0.5	0.5	–	35	4	B	14.20	–	–	–	–	–
EPDBEH2008F-1-TH3	●			1		0.77			A	13.58	1.07	1.10	1.12	1.15	1.21
EPDBEH2008F-1.5-TH3	●			1.5					A	12.66	1.59	1.63	1.68	1.73	1.83
EPDBEH2008F-2-TH3	●			2			38		A	11.85	2.11	2.17	2.23	2.30	2.46
EPDBEH2008F-2.5-TH3	●			2.5					A	11.14	2.62	2.70	2.79	2.88	3.08
EPDBEH2008F-3-TH3	●			3					A	10.51	3.14	3.24	3.34	3.45	3.70
EPDBEH2008F-4-TH3	●			4					A	9.44	4.17	4.31	4.45	4.60	4.94
EPDBEH2008F-5-TH3	●			5			42		A	8.57	5.21	5.38	5.56	5.75	6.19
EPDBEH2008F-6-TH3	●			6					A	7.84	6.24	6.45	6.66	6.90	7.43
EPDBEH2008F-8-TH3	●			8					A	6.70	8.31	8.58	8.88	9.20	9.92
EPDBEH2009F-0.6-TH3	●	0.45	0.9	0.6	0.6	–	35	4	B	13.84	–	–	–	–	–
EPDBEH2009F-2-TH3	●			2		0.87			A	11.85	2.11	2.16	2.23	2.29	2.44
EPDBEH2009F-4-TH3	●			4			38		A	9.38	4.17	4.30	4.44	4.59	4.93
EPDBEH2009F-6-TH3	●			6			42		A	7.75	6.24	6.44	6.66	6.89	7.42
EPDBEH2010F-0.8-TH3	●	0.5	1	0.8	0.8	–	35	4	B	13.47	–	–	–	–	–
EPDBEH2010F-1.5-TH3	●			1.5		0.96			A	12.67	1.61	1.64	1.69	1.73	1.83
EPDBEH2010F-2-TH3	●			2					A	11.82	2.12	2.18	2.24	2.31	2.46
EPDBEH2010F-2.5-TH3	●			2.5			38		A	11.07	2.64	2.71	2.80	2.88	3.08
EPDBEH2010F-3-TH3	●			3					A	10.41	3.16	3.25	3.35	3.46	3.70
EPDBEH2010F-4-TH3	●			4					A	9.29	4.19	4.32	4.46	4.61	4.94
EPDBEH2010F-5-TH3	●			5					A	8.39	5.22	5.39	5.57	5.76	6.19
EPDBEH2010F-6-TH3	●			6			42		A	7.65	6.26	6.46	6.67	6.91	7.43
EPDBEH2010F-7-TH3	●			7					A	7.03	7.29	7.53	7.78	8.06	8.67
EPDBEH2010F-8-TH3	●			8					A	6.50	8.32	8.60	8.89	9.21	9.91
EPDBEH2010F-10-TH3	●			10			45		A	5.65	10.39	10.74	11.11	11.51	12.40
EPDBEH2010F-12-TH3	●			12					A	5.00	12.46	12.88	13.32	13.81	14.89
EPDBEH2015F-2-TH3	●	0.75	1.5	2	1.35	1.45	35	4	A	11.76	2.13	2.18	2.23	2.29	2.42
EPDBEH2015F-2.5-TH3	●			2.5					A	10.88	2.65	2.72	2.79	2.87	3.04
EPDBEH2015F-3-TH3	●			3					A	10.12	3.17	3.25	3.34	3.44	3.66
EPDBEH2015F-4-TH3	●			4			38		A	8.88	4.20	4.32	4.45	4.59	4.91
EPDBEH2015F-5-TH3	●			5					A	7.90	5.23	5.39	5.56	5.74	6.15
EPDBEH2015F-6-TH3	●			6					A	7.12	6.27	6.46	6.67	6.89	7.39
EPDBEH2015F-8-TH3	●			8			42		A	5.95	8.34	8.60	8.88	9.19	9.88
EPDBEH2015F-10-TH3	●			10					A	5.10	10.40	10.74	11.10	11.49	12.36
EPDBEH2015F-12-TH3	●			12			45		A	4.47	12.47	12.88	13.32	13.79	14.85
EPDBEH2020F-2.5-TH3	●	1	2	2.5	1.7	1.94	35	4	A	10.60	2.66	2.72	2.78	2.85	3.01
EPDBEH2020F-3-TH3	●			3					A	9.72	3.18	3.25	3.34	3.43	3.63
EPDBEH2020F-4-TH3	●			4					A	8.32	4.21	4.32	4.45	4.58	4.87
EPDBEH2020F-5-TH3	●			5			38		A	7.27	5.25	5.39	5.55	5.73	6.11
EPDBEH2020F-6-TH3	●			6					A	6.46	6.28	6.46	6.66	6.88	7.36
EPDBEH2020F-8-TH3	●			8			42		A	5.27	8.35	8.60	8.88	9.18	9.84
EPDBEH2020F-10-TH3	●			10					A	4.46	10.41	10.74	11.10	11.48	12.33
EPDBEH2020F-12-TH3	●			12			45		A	3.86	12.48	12.88	13.31	13.77	14.82
EPDBEH2020F-13-TH3	●			13					A	3.62	13.51	13.95	14.42	14.92	16.06
EPDBEH2020F-14-TH3	●			14					A	3.40	14.55	15.02	15.53	16.07	17.30
EPDBEH2020F-16-TH3	●			16			50		A	3.04	16.62	17.16	17.75	18.37	19.79
EPDBEH2020F-20-TH3	●			20			55		A	2.51	20.75	21.44	22.18	22.97	No interference
EPDBEH2025F-6-TH3	●	1.25	2.5	6	2	2.4	38	4	A	5.54	6.35	6.53	6.72	6.92	7.39
EPDBEH2025F-10-TH3	●			10			42		A	3.66	10.48	10.81	11.15	11.52	12.36
EPDBEH2025F-15-TH3	●			15			45		A	2.57	15.65	16.15	16.69	17.27	No interference

Regular shank type

2Flutes

【Note】RE2mm or larger does not have backdraft shape.



A type

(mm)

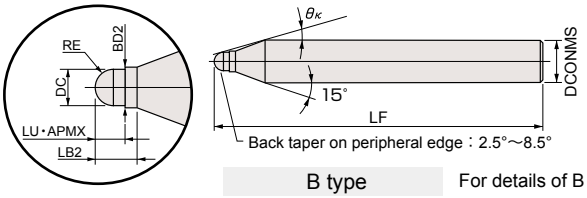
Ball radius RE	Tolerance on RE
0.05～0.25	±0.003
0.3～6	±0.005

EPDBEH2○○○-○○.○○-(S6)-TH3

Carbide TH3 Helix angle 30° h4 (φ4) h5 (φ6～φ12)

Item code	Stock	Size(mm) Ball radius RE	Tool dia. DC	Under neck length LU	Flute length APMX	Neck dia. DN	Overall length LF	Shank dia. DCONMS	Type	Interference angle (°) θκ	Effective under neck length with respect to draft angle 0.5°	1°	1.5°	2°	3°
EPDBEH2001-0.08-TH3	●	0.05	0.1	0.08	0.08	–	45	4	B	20.93	–	–	–	–	–
EPDBEH2001-0.2-TH3	●			0.2		0.08			A	14.64	0.24	0.25	0.25	0.26	0.28
EPDBEH2001-0.3-TH3	●			0.3					A	14.46	0.34	0.35	0.36	0.38	0.40
EPDBEH2001-0.5-TH3	●			0.5					A	14.10	0.55	0.57	0.59	0.61	0.65
EPDBEH20015-0.12-TH3	●	0.075	0.15	0.12	0.12	–	45	4	B	15.25	–	–	–	–	–
EPDBEH20015-0.3-TH3	●			0.3		0.13			A	14.50	0.34	0.35	0.36	0.37	0.40
EPDBEH20015-0.5-TH3	●			0.5					A	14.14	0.55	0.56	0.58	0.60	0.65
EPDBEH20015-0.75-TH3	●			0.75					A	13.71	0.81	0.83	0.86	0.89	0.96
EPDBEH20015-1-TH3	●			1					A	13.30	1.06	1.10	1.14	1.18	1.27
EPDBEH2002-0.15-TH3	●	0.1	0.2	0.15	0.15	–	50	4	B	20.23	–	–	–	–	–
EPDBEH2002-0.3-TH3	●			0.3		0.18			A	14.54	0.34	0.35	0.36	0.37	0.39
EPDBEH2002-0.5-TH3	●			0.5					A	14.17	0.55	0.56	0.58	0.60	0.64
EPDBEH2002-0.75-TH3	●			0.75					A	13.73	0.81	0.83	0.86	0.89	0.95
EPDBEH2002-1-TH3	●			1					A	13.32	1.06	1.10	1.13	1.17	1.26
EPDBEH2002-1.25-TH3	●			1.25					A	12.93	1.32	1.37	1.41	1.46	1.57
EPDBEH2002-1.5-TH3	●			1.5					A	12.56	1.58	1.63	1.69	1.75	1.88
EPDBEH2002-2-TH3	●			2					A	11.89	2.10	2.17	2.24	2.32	2.50
EPDBEH2002-2.5-TH3	●			2.5					A	11.28	2.61	2.70	2.80	2.90	3.13
EPDBEH2002-3-TH3	●			3					A	10.73	3.13	3.24	3.35	3.47	3.75
EPDBEH2003-0.25-TH3	●	0.15	0.3	0.25	0.25	–	50	4	B	14.45	–	–	–	–	–
EPDBEH2003-0.5-TH3	●			0.5		0.27			A	14.21	0.56	0.58	0.60	0.61	0.65
EPDBEH2003-0.75-TH3	●			0.75					A	13.76	0.82	0.85	0.87	0.90	0.96
EPDBEH2003-1-TH3	●			1					A	13.33	1.08	1.11	1.15	1.19	1.27
EPDBEH2003-1.25-TH3	●			1.25					A	12.93	1.34	1.38	1.43	1.47	1.58
EPDBEH2003-1.5-TH3	●			1.5					A	12.56	1.60	1.65	1.70	1.76	1.89
EPDBEH2003-2-TH3	●			2					A	11.86	2.12	2.18	2.26	2.34	2.52
EPDBEH2003-2.5-TH3	●			2.5					A	11.24	2.63	2.72	2.81	2.91	3.14
EPDBEH2003-3-TH3	●			3					A	10.68	3.15	3.25	3.37	3.49	3.76
EPDBEH2003-3.5-TH3	●			3.5					A	10.18	3.67	3.79	3.92	4.06	4.38
EPDBEH2003-4-TH3	●			4					A	9.72	4.18	4.32	4.47	4.64	5.00
EPDBEH2004-0.3-TH3	●	0.2	0.4	0.3	0.3	–	50	4	B	14.53	–	–	–	–	–
EPDBEH2004-0.5-TH3	●			0.5		0.37			A	14.28	0.56	0.58	0.59	0.60	0.64
EPDBEH2004-0.75-TH3	●			0.75					A	13.81	0.82	0.84	0.87	0.89	0.95
EPDBEH2004-1-TH3	●			1					A	13.37	1.08	1.11	1.14	1.18	1.26
EPDBEH2004-1.5-TH3	●			1.5					A	12.57	1.60	1.65	1.70	1.75	1.88
EPDBEH2004-2-TH3	●			2					A	11.86	2.11	2.18	2.25	2.33	2.50
EPDBEH2004-2.5-TH3	●			2.5					A	11.23	2.63	2.72	2.81	2.90	3.13
EPDBEH2004-3-TH3	●			3					A	10.65	3.15	3.25	3.36	3.48	3.75
EPDBEH2004-3.5-TH3	●			3.5					A	10.14	3.66	3.78	3.91	4.05	4.37
EPDBEH2004-4-TH3	●			4					A	9.67	4.18	4.32	4.47	4.63	4.99
EPDBEH2004-4.5-TH3	●			4.5					A	9.24	4.70	4.85	5.02	5.20	5.61
EPDBEH2004-5-TH3	●			5					A	8.85	5.21	5.39	5.58	5.78	6.23
EPDBEH2005-0.35-TH3	●	0.25	0.5	0.35	0.35	–	50	4	B	14.10	–	–	–	–	–
EPDBEH2005-0.75-TH3	●			0.75		0.47			A	13.88	0.82	0.84	0.86	0.88	0.94
EPDBEH2005-1-TH3	●			1					A	13.42	1.08	1.11	1.14	1.17	1.25
EPDBEH2005-1.5-TH3	●			1.5					A	12.59	1.59	1.64	1.69	1.75	1.87
EPDBEH2005-2-TH3	●			2					A	11.86	2.11	2.18	2.25	2.32	2.49

● : Stocked items.



B type

For details of B type, refer to page 13.

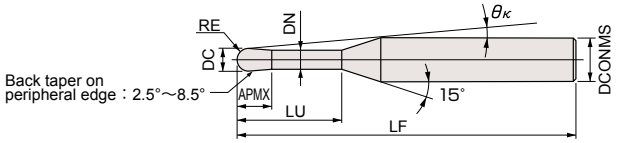
EPDBEH2○○○-○○.○○-(S6)-TH3

Item code	Stock	Size(mm) Ball radius RE	Tool dia. DC	Under neck length LU	Flute length APMX	Neck dia. DN	Overall length LF	Shank dia. DCONMS	Type	Interference angle (°) θκ	Effective under neck length with respect to draft angle 0.5°	1°	1.5°	2°	3°
EPDBEH2005-2.5-TH3	●	0.25	0.5	2.5	0.35	0.47	50	4	A	11.21	2.63	2.71	2.80	2.90	3.11
EPDBEH2005-3-TH3	●			3					A	10.62	3.15	3.25	3.36	3.47	3.73
EPDBEH2005-4-TH3	●			4					A	9.61	4.18	4.32	4.46	4.62	4.98
EPDBEH2005-5-TH3	●			5					A	8.78	5.21	5.39	5.57	5.77	6.22
EPDBEH2005-5.5-TH3	●			5.5					A	8.41	5.73	5.92	6.13	6.35	6.84
EPDBEH2005-6-TH3	●			6					A	8.08	6.25	6.46	6.68	6.92	7.46
EPDBEH2005-7-TH3	●			7					A	7.48	7.28	7.53	7.79	8.07	8.71
EPDBEH2005-8-TH3	●			8					A	6.96	8.31	8.60	8.90	9.22	9.95
EPDBEH2006-0.4-TH3	●	0.3	0.6	0.4	0.4	–	50	4	B	14.16	–	–	–	–	–
EPDBEH2006-0.75-TH3	●			0.75		0.57			A	13.94	0.82	0.84	0.86	0.88	0.93
EPDBEH2006-1-TH3	●			1					A	13.47	1.08	1.10	1.13	1.17	1.24
EPDBEH2006-1.5-TH3	●			1.5					A	12.61	1.59	1.64	1.69	1.74	1.86
EPDBEH2006-2-TH3	●			2					A	11.86	2.11	2.17	2.24	2.31	2.48
EPDBEH2006-2.5-TH3	●			2.5					A	11.19	2.63	2.71	2.80	2.89	3.10
EPDBEH2006-3-TH3	●			3					A	10.59	3.14	3.24	3.35	3.46	3.72
EPDBEH2006-3.5-TH3	●			3.5					A	10.05	3.66	3.78	3.90	4.04	4.34
EPDBEH2006-4-TH3	●			4					A	9.56	4.18	4.31	4.46	4.61	4.97
EPDBEH2006-4.5-TH3	●			4.5					A	9.12	4.69	4.85	5.01	5.19	5.59
EPDBEH2006-5-TH3	●			5					A	8.71	5.21	5.38	5.57	5.76	6.21
EPDBEH2006-5.5-TH3	●			5.5					A	8.34	5.73	5.92	6.12	6.34	6.83
EPDBEH2006-6-TH3	●			6					A	8.00	6.24	6.45	6.67	6.91	7.45
EPDBEH2006-7-TH3	●			7					A	7.40	7.28	7.52	7.78	8.06	8.70
EPDBEH2006-8-TH3	●			8					A	6.88	8.31	8.59	8.89	9.21	9.94
EPDBEH2006-9-TH3	●			9					A	6.43	9.35	9.66	10.00	10.36	11.18
EPDBEH2006-10-TH3	●			10					A	6.03	10.38	10.73	11.11	11.51	12.43
EPDBEH2006-12-TH3	●			12					A	5.37	12.45	12.87	13.32	13.81	14.91
EPDBEH2007-0.45-TH3	●	0.35	0.7	0.45	0.45	–	50	4	B	14.13	–	–	–	–	–
EPDBEH2007-2-TH3	●			2		0.67			A	11.85	2.11	2.17	2.24	2.31	2.47
EPDBEH2007-4-TH3	●			4					A	9.50	4.18	4.31	4.45	4.61	4.95
EPDBEH2007-6-TH3	●			6					A	7.92	6.24	6.45	6.67	6.91	7.44
EPDBEH2007-8-TH3	●			8					A	6.79	8.31	8.59	8.89	9.21	9.93
EPDBEH2008-0.5-TH3	●	0.4	0.8	0.5	0.5	–	50	4	B	14.20	–	–	–	–	–
EPDBEH2008-1-TH3	●			1		0.77			A	13.58	1.07	1.10	1.12	1.15	1.21
EPDBEH2008-1.5-TH3	●			1.5					A	12.66	1.59	1.63	1.68	1.73	1.83
EPDBEH2008-2-TH3	●			2					A	11.85	2.11	2.17	2.23	2.30	2.46
EPDBEH2008-2.5-TH3	●			2.5					A	11.14	2.62	2.70	2.79	2.88	3.08
EPDBEH2008-3-TH3	●			3					A	10.51	3.14	3.24	3.34	3.45	3.70
EPDBEH2008-4-TH3	●			4					A	9.44	4.17	4.31	4.45	4.60	4.94
EPDBEH2008-5-TH3	●			5					A	8.57	5.21	5.38	5.56	5.75	6.19
EPDBEH2008-6-TH3	●			6					A	7.84	6.24	6.45	6.66	6.90	7.43
EPDBEH2008-8-TH3	●			8					A	6.70	8.31	8.58	8.88	9.20	9.92
EPDBEH2008-10-TH3	●			10					A	5.85	10.38	10.72	11.10	11.50	12.40
EPDBEH2008-12-TH3	●			12					A	5.19	12.44	12.86	13.31	13.80	14.89
EPDBEH2009-0.6-TH3	●	0.45	0.9	0.6	0.6	–	50	4	B	13.84	–	–	–	–	–
EPDBEH2009-2-TH3	●			2		0.87			A	11.85	2.11	2.16	2.23	2.29	2.44
EPDBEH2009-4-TH3	●			4					A	9.38	4.17	4.30	4.44	4.59	4.93
EPDBEH2009-6-TH3	●			6					A	7.75	6.24	6.44	6.66	6.89	7.42
EPDBEH2009-8-TH3	●			8					A	6.61	8.31	8.58	8.88	9.19	9.90

Regular shank type

2Flutes

【Note】RE2mm or larger does not have backdraft shape.



A type

(mm)

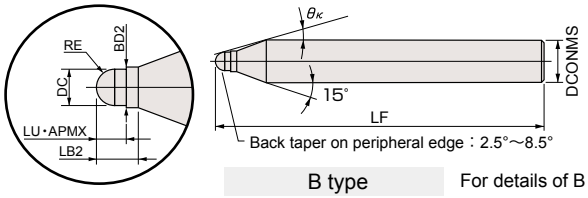
Ball radius RE	Tolerance on RE
0.05～0.25	±0.003
0.3～6	±0.005

EPDBEH2○○○-○○.○○-(S6)-TH3

Carbide TH3 Helix angle 30° h4 (ϕ4) h5 (ϕ6～ϕ12)

Item code	Stock	Size(mm) Ball radius RE	Tool dia. DC	Under neck length LU	Flute length APMX	Neck dia. DN	Overall length LF	Shank dia. DCONMS	Type	Interference angle (°) θK	Effective under neck length with respect to draft angle 0.5°	1°	1.5°	2°	3°
EPDBEH2010-0.8-TH3	●	0.5	1	0.8	0.8	–	50	4	B	13.47	–	–	–	–	–
EPDBEH2010-1.5-TH3	●			1.5		0.96			A	12.67	1.61	1.64	1.69	1.73	1.83
EPDBEH2010-2-TH3	●			2					A	11.82	2.12	2.18	2.24	2.31	2.46
EPDBEH2010-2.5-TH3	●			2.5					A	11.07	2.64	2.71	2.80	2.88	3.08
EPDBEH2010-3-TH3	●			3					A	10.41	3.16	3.25	3.35	3.46	3.70
EPDBEH2010-4-TH3	●			4					A	9.29	4.19	4.32	4.46	4.61	4.94
EPDBEH2010-5-TH3	●			5					A	8.39	5.22	5.39	5.57	5.76	6.19
EPDBEH2010-6-TH3	●			6					A	7.65	6.26	6.46	6.67	6.91	7.43
EPDBEH2010-7-TH3	●			7					A	7.03	7.29	7.53	7.78	8.06	8.67
EPDBEH2010-8-TH3	●			8					A	6.50	8.32	8.60	8.89	9.21	9.91
EPDBEH2010-9-TH3	●			9					A	6.05	9.36	9.67	10.00	10.36	11.16
EPDBEH2010-10-TH3	●			10					A	5.65	10.39	10.74	11.11	11.51	12.40
EPDBEH2010-12-TH3	●			12			55		A	5.00	12.46	12.88	13.32	13.81	14.89
EPDBEH2010-13-TH3	●			13					A	4.72	13.49	13.95	14.43	14.96	16.13
EPDBEH2010-14-TH3	●			14					A	4.48	14.53	15.02	15.54	16.11	17.37
EPDBEH2010-16-TH3	●			16					A	4.06	16.59	17.16	17.76	18.40	19.86
EPDBEH2010-18-TH3	●			18			60		A	3.71	18.66	19.29	19.97	20.70	22.35
EPDBEH2010-20-TH3	●			20					A	3.42	20.73	21.43	22.19	23.00	24.83
EPDBEH2010-2-S6-TH3	●			2			50	6	A	12.92	2.12	2.18	2.24	2.31	2.46
EPDBEH2010-3-S6-TH3	●			3					A	11.86	3.16	3.25	3.35	3.46	3.70
EPDBEH2010-6-S6-TH3	●			6					A	9.53	6.26	6.46	6.67	6.91	7.43
EPDBEH2010-8-S6-TH3	●			8					A	8.42	8.32	8.60	8.89	9.21	9.91
EPDBEH2010-10-S6-TH3	●			10					A	7.54	10.39	10.74	11.11	11.51	12.40
EPDBEH2011-2-TH3	●	0.55	1.1	2	1	1.05	50	4	A	11.78	2.14	2.20	2.26	2.32	2.47
EPDBEH2011-4-TH3	●			4					A	9.20	4.21	4.34	4.47	4.62	4.95
EPDBEH2011-6-TH3	●			6					A	7.54	6.28	6.47	6.69	6.92	7.44
EPDBEH2011-8-TH3	●			8					A	6.39	8.34	8.61	8.91	9.22	9.93
EPDBEH2011-10-TH3	●			10					A	5.54	10.41	10.75	11.12	11.52	12.41
EPDBEH2012-2-TH3	●	0.6	1.2	2	1.1	1.15	50	4	A	11.78	2.14	2.19	2.25	2.31	2.46
EPDBEH2012-3-TH3	●			3					A	10.29	3.17	3.26	3.36	3.46	3.70
EPDBEH2012-4-TH3	●			4					A	9.13	4.21	4.33	4.47	4.61	4.94
EPDBEH2012-6-TH3	●			6					A	7.45	6.27	6.47	6.68	6.91	7.43
EPDBEH2012-8-TH3	●			8					A	6.29	8.34	8.61	8.90	9.21	9.91
EPDBEH2012-10-TH3	●			10					A	5.44	10.41	10.75	11.12	11.51	12.40
EPDBEH2012-12-TH3	●			12			55		A	4.79	12.48	12.89	13.33	13.81	14.89
EPDBEH2012-2-S6-TH3	●			2			50	6	A	12.94	2.14	2.19	2.25	2.31	2.46
EPDBEH2012-4-S6-TH3	●			4					A	10.92	4.21	4.33	4.47	4.61	4.94
EPDBEH2014-3-TH3	●	0.7	1.4	3	1.3	1.34	50	4	A	10.15	3.19	3.28	3.37	3.47	3.70
EPDBEH2014-8-TH3	●			8					A	6.06	8.36	8.62	8.91	9.22	9.91
EPDBEH2014-12-TH3	●			12			55		A	4.58	12.49	12.90	13.34	13.82	14.89
EPDBEH2014-16-TH3	●			16					A	3.68	16.63	17.18	17.78	18.42	19.86
EPDBEH2015-2-TH3	●	0.75	1.5	2	1.35	1.45	50	4	A	11.76	2.13	2.18	2.23	2.29	2.42
EPDBEH2015-2.5-TH3	●			2.5					A	10.88	2.65	2.72	2.79	2.87	3.04
EPDBEH2015-3-TH3	●			3					A	10.12	3.17	3.25	3.34	3.44	3.66
EPDBEH2015-4-TH3	●			4					A	8.88	4.20	4.32	4.45	4.59	4.91
EPDBEH2015-5-TH3	●			5					A	7.90	5.23	5.39	5.56	5.74	6.15

● : Stocked items.



B type For details of B type, refer to page 13.

EPDBEH2○○○-○○.○○-(S6)-TH3

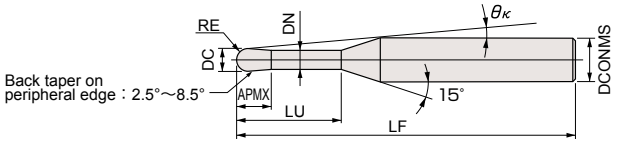
Item code	Stock	Size(mm) Ball radius RE	Tool dia. DC	Under neck length LU	Flute length APMX	Neck dia. DN	Overall length LF	Shank dia. DCONMS	Type	Interference angle (°) θκ	Effective under neck length with respect to draft angle 0.5°	1°	1.5°	2°	3°
EPDBEH2015-6-TH3	●	0.75	1.5	6	1.35	1.45	50	4	A	7.12	6.27	6.46	6.67	6.89	7.39
EPDBEH2015-8-TH3	●			8					A	5.95	8.34	8.60	8.88	9.19	9.88
EPDBEH2015-10-TH3	●			10					A	5.10	10.40	10.74	11.10	11.49	12.36
EPDBEH2015-12-TH3	●			12			55		A	4.47	12.47	12.88	13.32	13.79	14.85
EPDBEH2015-14-TH3	●			14					A	3.98	14.54	15.02	15.53	16.09	17.34
EPDBEH2015-16-TH3	●			16					A	3.58	16.60	17.16	17.75	18.39	19.82
EPDBEH2015-18-TH3	●			18			60		A	3.26	18.67	19.30	19.97	20.69	22.31
EPDBEH2015-20-TH3	●			20					A	2.99	20.74	21.44	22.18	22.99	No interference
EPDBEH2015-3-S6-TH3	●			3			50	6	A	11.84	3.17	3.25	3.34	3.44	3.66
EPDBEH2015-5-S6-TH3	●			5					A	10.02	5.23	5.39	5.56	5.74	6.15
EPDBEH2015-8-S6-TH3	●			8					A	8.14	8.34	8.60	8.88	9.19	9.88
EPDBEH2015-12-S6-TH3	●			12					A	6.51	12.47	12.88	13.32	13.79	14.85
EPDBEH2016-4-TH3	●	0.8	1.6	4	1.4	1.54	50	4	A	8.76	4.22	4.34	4.47	4.61	4.92
EPDBEH2016-8-TH3	●			8					A	5.82	8.35	8.62	8.90	9.20	9.89
EPDBEH2016-12-TH3	●			12			55		A	4.35	12.49	12.90	13.33	13.80	14.86
EPDBEH2016-16-TH3	●			16					A	3.47	16.62	17.17	17.77	18.40	19.84
EPDBEH2016-20-TH3	●			20			60		A	2.89	20.76	21.45	22.20	23.00	No interference
EPDBEH2018-4-TH3	●	0.9	1.8	4	1.6	1.73	50	4	A	8.53	4.23	4.35	4.48	4.61	4.92
EPDBEH2018-8-TH3	●			8					A	5.55	8.37	8.63	8.91	9.21	9.89
EPDBEH2018-12-TH3	●			12			55		A	4.11	12.50	12.91	13.34	13.81	14.86
EPDBEH2018-16-TH3	●			16					A	3.26	16.64	17.19	17.78	18.41	19.83
EPDBEH2018-20-TH3	●			20			60		A	2.70	20.77	21.47	22.21	23.01	No interference
EPDBEH2020-2.5-TH3	●	1	2	2.5	1.7	1.94	50	4	A	10.60	2.66	2.72	2.78	2.85	3.01
EPDBEH2020-3-TH3	●			3					A	9.72	3.18	3.25	3.34	3.43	3.63
EPDBEH2020-4-TH3	●			4					A	8.32	4.21	4.32	4.45	4.58	4.87
EPDBEH2020-5-TH3	●			5					A	7.27	5.25	5.39	5.55	5.73	6.11
EPDBEH2020-6-TH3	●			6					A	6.46	6.28	6.46	6.66	6.88	7.36
EPDBEH2020-8-TH3	●			8					A	5.27	8.35	8.60	8.88	9.18	9.84
EPDBEH2020-10-TH3	●			10					A	4.46	10.41	10.74	11.10	11.48	12.33
EPDBEH2020-12-TH3	●			12			55		A	3.86	12.48	12.88	13.31	13.77	14.82
EPDBEH2020-13-TH3	●			13					A	3.62	13.51	13.95	14.42	14.92	16.06
EPDBEH2020-14-TH3	●			14					A	3.40	14.55	15.02	15.53	16.07	17.30
EPDBEH2020-16-TH3	●			16					A	3.04	16.62	17.16	17.75	18.37	19.79
EPDBEH2020-18-TH3	●			18			60		A	2.75	18.68	19.30	19.96	20.67	No interference
EPDBEH2020-20-TH3	●			20					A	2.51	20.75	21.44	22.18	22.97	No interference
EPDBEH2020-22-TH3	●			22					A	2.31	22.82	23.58	24.40	25.27	No interference
EPDBEH2020-25-TH3	●			25			65		A	2.06	25.92	26.79	27.72	28.72	No interference
EPDBEH2020-30-TH3	●			30			70		A	1.75	31.09	32.14	33.26	No interference	No interference
EPDBEH2020-35-TH3	●			35			75		A	1.52	36.26	37.48	38.80	No interference	No interference
EPDBEH2020-40-TH3	●			40			80		A	1.34	41.42	42.83	No interference	No interference	No interference
EPDBEH2020-3-S6-TH3	●			3			50	6	A	11.80	3.18	3.25	3.34	3.43	3.63
EPDBEH2020-6-S6-TH3	●			6					A	9.04	6.28	6.46	6.66	6.88	7.36
EPDBEH2020-8-S6-TH3	●			8					A	7.82	8.35	8.60	8.88	9.18	9.84
EPDBEH2020-12-S6-TH3	●			12					A	6.15	12.48	12.88	13.31	13.77	14.82
EPDBEH2020-16-S6-TH3	●			16					A	5.07	16.62	17.16	17.75	18.37	19.79
EPDBEH2020-20-S6-TH3	●			20			60		A	4.31	20.75	21.44	22.18	22.97	24.76

Line Up

Regular shank type

2Flutes

【Note】RE2mm or larger does not have backdraft shape.



A type

(mm)

Ball radius RE	Tolerance on RE
0.05～0.25	±0.003
0.3～6	±0.005

EPDBEH2○○○-○○.○○-(S6)-TH3

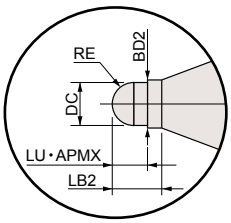
Carbide TH3 Helix angle 30° h4 (ϕ4) h5 (ϕ6～ϕ12)

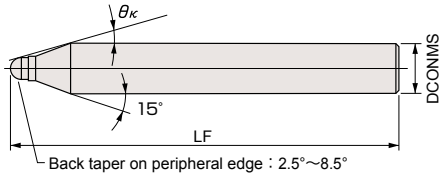
Item code	Stock	Size(mm)							Type	Interference angle (°)	Effective under neck length with respect to draft angle				
		Ball radius	Tool dia.	Under neck length	Flute length	Neck dia.	Overall length	Shank dia.							
		RE	DC	LU	APMX	DN	LF	DCONMS		θK	0.5°	1°	1.5°	2°	3°
EPDBEH2025-6-TH3	●	1.25	2.5	6	2	2.4	50	4	A	5.54	6.35	6.53	6.72	6.92	7.39
EPDBEH2025-10-TH3	●			10					A	3.66	10.48	10.81	11.15	11.52	12.36
EPDBEH2025-15-TH3	●			15			55		A	2.57	15.65	16.15	16.69	17.27	No interference
EPDBEH2025-20-TH3	●			20			60		A	1.98	20.82	21.50	22.23	No interference	No interference
EPDBEH2025-25-TH3	●			25			65		A	1.61	25.99	26.85	27.78	No interference	No interference
EPDBEH2025-30-TH3	●			30			70		A	1.36	31.16	32.20	No interference	No interference	No interference
EPDBEH2030-6-TH3	●	1.5	3	6	2.5	2.88	50	6	A	8.27	6.38	6.55	6.73	6.93	7.38
EPDBEH2030-8-TH3	●			8			55		A	6.95	8.45	8.69	8.95	9.23	9.86
EPDBEH2030-10-TH3	●			10					A	5.98	10.51	10.83	11.17	11.53	12.35
EPDBEH2030-13-TH3	●			13			60		A	4.95	13.61	14.04	14.49	14.98	16.08
EPDBEH2030-16-TH3	●			16					A	4.23	16.71	17.25	17.82	18.43	19.81
EPDBEH2030-20-TH3	●			20			65		A	3.53	20.85	21.52	22.25	23.03	24.78
EPDBEH2030-25-TH3	●			25			70		A	2.93	26.02	26.87	27.79	28.78	No interference
EPDBEH2030-30-TH3	●			30			75		A	2.51	31.19	32.22	33.33	34.53	No interference
EPDBEH2030-35-TH3	●			35			80		A	2.19	36.35	37.57	38.87	40.28	No interference
EPDBEH2035-10-TH3	●	1.75	3.5	10	2.75	3.35	55	6	A	5.42	10.56	10.87	11.20	11.56	12.36
EPDBEH2035-15-TH3	●			15			60		A	3.94	15.73	16.22	16.74	17.31	18.58
EPDBEH2035-25-TH3	●			25			70		A	2.54	26.07	26.92	27.83	28.81	No interference
EPDBEH2035-35-TH3	●			35			80		A	1.88	36.40	37.61	38.91	No interference	No interference
EPDBEH2035-45-TH3	●			45			90		A	1.49	46.74	48.31	No interference	No interference	No interference
EPDBEH2040-8-TH3	●	2	4	8	3	3.85	55	6	A	5.71	8.49	8.71	8.96	9.22	9.81
EPDBEH2040-10-TH3	●			10					A	4.76	10.55	10.85	11.17	11.52	12.30
EPDBEH2040-12-TH3	●			12			60		A	4.09	12.62	12.99	13.39	13.82	14.79
EPDBEH2040-13-TH3	●			13					A	3.82	13.65	14.06	14.50	14.97	16.03
EPDBEH2040-16-TH3	●			16					A	3.18	16.76	17.27	17.82	18.42	19.76
EPDBEH2040-20-TH3	●			20			65		A	2.61	20.89	21.55	22.26	23.02	No interference
EPDBEH2040-25-TH3	●			25			70		A	2.13	26.06	26.90	27.80	28.77	No interference
EPDBEH2040-30-TH3	●			30			75		A	1.79	31.23	32.25	33.34	No interference	No interference
EPDBEH2040-35-TH3	●			35			80		A	1.55	36.40	37.60	38.88	No interference	No interference
EPDBEH2040-40-TH3	●			40					A	1.37	41.56	42.94	No interference	No interference	No interference
EPDBEH2040-45-TH3	●			45			90		A	1.22	46.73	48.29	No interference	No interference	No interference
EPDBEH2040-50-TH3	●			50			100		A	1.11	51.90	53.64	No interference	No interference	No interference
EPDBEH2050-10-TH3	●	2.5	5	10	3.5	4.85	55	6	A	2.97	10.54	10.82	11.12	11.45	No interference
EPDBEH2050-20-TH3	●			20			65		A	1.46	20.87	21.52	No interference	No interference	No interference
EPDBEH2050-25-TH3	●			25			70		A	1.17	26.04	26.86	No interference	No interference	No interference
EPDBEH2050-30-TH3	●			30			75		A	0.97	31.21	No interference	No interference	No interference	No interference
EPDBEH2050-40-TH3	●			40			80		A	0.73	41.55	No interference	No interference	No interference	No interference
EPDBEH2060-12-TH3	●	3	6	12	6	5.85	60	6	A	0	No interference	No interference	No interference	No interference	No interference
EPDBEH2060-20-TH3	●			20			65		A	0	No interference	No interference	No interference	No interference	No interference
EPDBEH2060-30-TH3	●			30			75		A	0	No interference	No interference	No interference	No interference	No interference
EPDBEH2060-50-TH3	●			50			100		A	0	No interference	No interference	No interference	No interference	No interference
EPDBEH2080-24-TH3	●	4	8	24	12	7.6	100	8	A	0	No interference	No interference	No interference	No interference	No interference
EPDBEH2100-30-TH3	●	5	10	30	15	9.5	100	10	A	0	No interference	No interference	No interference	No interference	No interference
EPDBEH2120-36-TH3	●	6	12	36	18	11.5	110	12	A	0	No interference	No interference	No interference	No interference	No interference

● : Stocked items.

Strong neck type × Short shank type

2Flutes





EPDBEH2○○○F-○○.○○-TH3

Carbide TH3 Helix angle 30° h4

(mm)

Ball radius RE	Tolerance on RE
0.05～0.25	±0.003
0.3～0.5	±0.005

Item code	Stock	Size(mm)								Interference angle (°)
		Ball radius	Tool dia.	Under neck length	Flute length	Overall length	Shank dia.	Neck size		
		RE	DC	LU	APMX	LF	DCONMS	LB2	BD2	θκ
EPDBEH2001F-0.08-TH3	●	0.05	0.1	0.08	0.08	35	4	0.2	0.13	20.93
EPDBEH20015F-0.12-TH3	●	0.075	0.15	0.12	0.12	35	4	0.3	0.18	15.25
EPDBEH2002F-0.15-TH3	●	0.1	0.2	0.15	0.15	35	4	0.3	0.25	20.23
EPDBEH2003F-0.25-TH3	●	0.15	0.3	0.25	0.25	35	4	0.5	0.35	14.45
EPDBEH2004F-0.3-TH3	●	0.2	0.4	0.3	0.3	35	4	0.5	0.45	14.53
EPDBEH2005F-0.35-TH3	●	0.25	0.5	0.35	0.35	35	4	0.75	0.55	14.10
EPDBEH2006F-0.4-TH3	●	0.3	0.6	0.4	0.4	35	4	0.75	0.65	14.16
EPDBEH2007F-0.45-TH3	●	0.35	0.7	0.45	0.45	35	4	0.8	0.75	14.13
EPDBEH2008F-0.5-TH3	●	0.4	0.8	0.5	0.5	35	4	0.8	0.85	14.20
EPDBEH2009F-0.6-TH3	●	0.45	0.9	0.6	0.6	35	4	1	0.95	13.84
EPDBEH2010F-0.8-TH3	●	0.5	1	0.8	0.8	35	4	1.2	1.05	13.47

Strong neck type

2Flutes

EPDBEH2○○○-○○.○○-TH3

Item code	Stock	Size(mm)								Interference angle (°)
		Ball radius	Tool dia.	Under neck length	Flute length	Overall length	Shank dia.	Neck size		
		RE	DC	LU	APMX	LF	DCONMS	LB2	BD2	θκ
EPDBEH2001-0.08-TH3	●	0.05	0.1	0.08	0.08	45	4	0.2	0.13	20.93
EPDBEH20015-0.12-TH3	●	0.075	0.15	0.12	0.12	45	4	0.3	0.18	15.25
EPDBEH2002-0.15-TH3	●	0.1	0.2	0.15	0.15	50	4	0.3	0.25	20.23
EPDBEH2003-0.25-TH3	●	0.15	0.3	0.25	0.25	50	4	0.5	0.35	14.45
EPDBEH2004-0.3-TH3	●	0.2	0.4	0.3	0.3	50	4	0.5	0.45	14.53
EPDBEH2005-0.35-TH3	●	0.25	0.5	0.35	0.35	50	4	0.75	0.55	14.10
EPDBEH2006-0.4-TH3	●	0.3	0.6	0.4	0.4	50	4	0.75	0.65	14.16
EPDBEH2007-0.45-TH3	●	0.35	0.7	0.45	0.45	50	4	0.8	0.75	14.13
EPDBEH2008-0.5-TH3	●	0.4	0.8	0.5	0.5	50	4	0.8	0.85	14.20
EPDBEH2009-0.6-TH3	●	0.45	0.9	0.6	0.6	50	4	1	0.95	13.84
EPDBEH2010-0.8-TH3	●	0.5	1	0.8	0.8	50	4	1.2	1.05	13.47

Recommended Cutting Conditions

High efficiency cutting condition | High accuracy cutting condition

Please refer to P.18 about high accuracy cutting conditions

Work material				1		2		3		4		5	
				Pre-hardened steels (35～45HRC)		Hardened steels (45～55HRC)		Hardened steels (55～65HRC)		Hardened steels (65～68HRC)		Hardened steels (68～72HRC)	
Ratio to standard depth of cut				100%		85%		80%		65%		55%	
Ball radius RE (mm)	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
0.05	0.1	**0.08**	0.006	50,000	230	50,000	200	50,000	190	45,000	170	42,500	130
		0.2	0.006	50,000	230	50,000	200	50,000	190	45,000	170	42,500	130
		0.3	0.005	50,000	230	50,000	200	50,000	190	45,000	170	42,500	130
		0.5	0.003	50,000	230	50,000	200	50,000	190	45,000	170	42,500	130
0.075	0.15	**0.12**	0.009	50,000	280	46,000	230	42,000	180	37,500	160	35,500	120
		0.3	0.009	50,000	280	46,000	230	42,000	180	37,500	160	35,500	120
		0.5	0.008	50,000	280	46,000	230	42,000	180	37,500	160	35,500	120
		0.75	0.007	50,000	280	46,000	230	42,000	180	37,500	160	35,500	120
		1	0.005	46,000	230	41,400	190	37,800	150	33,750	130	31,950	100
0.1	0.2	**0.15**	0.016	50,000	330	45,500	270	42,000	210	37,800	190	35,700	150
		0.3	0.016	50,000	330	45,500	270	42,000	210	37,800	190	35,700	150
		0.5	0.016	50,000	330	45,500	270	42,000	210	37,800	190	35,700	150
		0.75	0.014	50,000	330	45,500	270	42,000	210	37,800	190	35,700	150
		1	0.011	50,000	330	45,500	270	42,000	210	37,800	190	35,700	150
		1.25	0.009	45,900	270	40,500	220	37,800	170	34,020	150	32,130	120
		1.5	0.006	45,900	270	40,500	220	37,800	170	34,020	150	32,130	120
		2	0.006	45,900	270	40,500	220	37,800	170	34,020	150	32,130	120
		2.5	0.005	40,800	210	36,000	170	33,600	130	30,240	120	28,560	90
		3	0.003	40,800	210	36,000	170	33,600	130	30,240	120	28,560	90
0.15	0.3	**0.25**	0.022	50,000	450	45,000	380	42,000	340	37,800	300	35,700	240
		0.5	0.022	50,000	450	45,000	380	42,000	340	37,800	300	35,700	240
		0.75	0.019	50,000	450	45,000	380	42,000	340	37,800	300	35,700	240
		1	0.017	50,000	450	45,000	380	42,000	340	37,800	300	35,700	240
		1.25	0.015	50,000	450	45,000	380	42,000	340	37,800	300	35,700	240
		1.5	0.013	50,000	450	45,000	380	42,000	340	37,800	300	35,700	240
		2	0.01	45,900	370	40,500	310	37,800	270	34,020	250	32,130	190
		2.5	0.008	45,900	370	40,500	310	37,800	270	34,020	250	32,130	190
		3	0.006	45,900	370	40,500	310	37,800	270	34,020	250	32,130	190
		3.5	0.004	36,720	260	29,400	210	26,400	180	23,760	160	22,440	130
		4	0.003	36,720	260	29,400	210	26,400	180	23,760	160	22,440	130
0.2	0.4	**0.3**	0.034	50,000	770	46,800	660	43,680	610	39,310	550	37,130	430
		0.5	0.034	50,000	770	46,800	660	43,680	610	39,310	550	37,130	430
		0.75	0.034	50,000	770	46,800	660	43,680	610	39,310	550	37,130	430
		1	0.032	50,000	770	46,800	660	43,680	610	39,310	550	37,130	430
		1.5	0.027	50,000	660	46,800	470	43,680	440	39,310	390	37,130	310
		2	0.022	50,000	550	46,800	470	43,680	440	39,310	390	37,130	310
		2.5	0.018	36,720	360	32,400	290	36,290	270	32,660	250	30,850	190
		3	0.013	36,720	360	32,400	290	36,290	270	32,660	250	30,850	190
		3.5	0.01	36,720	360	32,400	290	36,290	270	32,660	250	30,850	190
		4	0.008	36,720	360	32,400	290	36,290	270	32,660	250	30,850	190
		4.5	0.006	32,640	310	28,800	250	26,880	230	24,190	210	22,850	160
		5	0.004	32,640	310	28,800	250	26,880	230	24,190	210	22,850	160
0.25	0.5	**0.35**	0.036	50,000	1,190	47,130	1,050	43,930	740	39,820	670	37,560	520
		0.75	0.036	50,000	1,190	47,130	1,050	43,930	740	39,820	670	37,560	520
		1	0.036	50,000	1,190	47,130	1,050	43,930	740	39,820	670	37,560	520
		1.5	0.032	50,000	1,190	47,130	1,050	43,930	680	39,820	610	37,560	480
		2	0.028	50,000	960	47,130	840	43,930	680	39,820	610	37,560	480
		2.5	0.026	45,450	650	42,840	570	39,940	500	36,220	450	34,180	350
		3	0.024	45,450	650	42,840	570	39,940	390	36,220	350	34,180	270
		4	0.016	34,970	500	32,950	520	30,730	390	28,540	350	26,290	270
		5	0.014	34,970	500	32,950	520	30,730	390	28,540	350	26,290	270
		5.5	0.012	31,080	420	29,300	370	27,310	320	24,770	290	23,370	230
		6	0.01	31,080	420	29,300	370	27,310	320	24,770	290	23,370	230
		7	0.008	31,080	420	29,300	370	27,310	320	24,770	290	23,370	230
		8	0.006	31,080	420	29,300	370	27,310	320	24,770	290	23,370	230
0.3	0.6	**0.4**	0.06	50,000	1,950	48,000	1,730	44,800	1,340	40,320	1,210	38,080	940
		0.75	0.06	50,000	1,950	48,000	1,730	44,800	1,340	40,320	1,210	38,080	940

High efficiency cutting condition | High accuracy cutting condition

Please refer to P.18 about high accuracy cutting conditions

Work material				1		2		3		4		5	
				Pre-hardened steels (35～45HRC)		Hardened steels (45～55HRC)		Hardened steels (55～65HRC)		Hardened steels (65～68HRC)		Hardened steels (68～72HRC)	
Ratio to standard depth of cut				100%		85%		80%		65%		55%	
Ball radius RE (mm)	Tool dia. DC (mm)	Under neck length LU (mm)	ap (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
0.3	0.6	1	0.06	50,000	1,950	48,000	1,730	44,800	1,340	40,320	1,210	38,080	940
		1.5	0.055	50,000	1,950	48,000	1,730	44,800	1,340	40,320	1,210	38,080	940
		2	0.05	50,000	1,950	48,000	1,730	44,800	1,340	40,320	1,210	38,080	940
		2.5	0.036	50,000	1,560	48,000	1,380	44,800	990	40,320	890	38,080	690
		3	0.033	50,000	1,560	48,000	1,380	44,800	990	40,320	890	38,080	690
		3.5	0.028	48,960	1,450	43,200	1,180	40,320	840	36,290	760	34,270	590
		4	0.021	48,960	1,450	43,200	1,180	40,320	770	36,290	690	34,270	540
		4.5	0.018	45,900	1,070	40,500	880	37,800	680	34,020	610	32,130	480
		5	0.016	39,780	930	35,100	760	32,760	590	29,480	530	27,850	410
		5.5	0.014	39,780	930	35,100	760	32,760	590	29,480	530	27,850	410
		6	0.012	39,780	930	35,100	760	32,760	590	29,480	530	27,850	410
		7	0.012	27,200	600	24,000	490	22,400	420	20,160	370	19,040	290
		8	0.012	27,200	600	24,000	490	22,400	380	20,160	340	19,040	270
		9	0.01	27,200	600	24,000	490	22,400	380	20,160	340	19,040	270
		10	0.007	23,800	530	21,000	430	19,600	330	17,640	300	16,660	230
		12	0.006	20,400	420	18,000	350	16,800	270	15,120	240	14,280	190
0.35	0.7	0.45	0.073	50,000	2,160	48,000	1,930	44,800	1,190	40,320	1,070	38,080	830
		2	0.073	50,000	2,160	48,000	1,930	44,800	1,190	40,320	1,070	38,080	830
		4	0.033	48,960	1,600	43,200	1,320	43,870	850	39,480	760	37,370	590
		6	0.022	39,780	1,030	35,100	850	35,650	640	32,080	580	30,370	450
		8	0.016	27,200	630	24,000	520	24,370	420	21,940	380	20,760	300
0.4	0.8	0.5	0.12	50,000	2,400	48,000	2,590	44,800	1,880	40,320	1,690	38,080	1,320
		1	0.12	50,000	2,400	48,000	2,590	44,800	1,880	40,320	1,690	38,080	1,320
		1.5	0.12	50,000	2,400	48,000	2,590	44,800	1,880	40,320	1,690	38,080	1,320
		2	0.096	50,000	2,400	48,000	2,590	44,800	1,880	40,320	1,690	38,080	1,320
		2.5	0.088	50,000	2,400	48,000	2,590	44,800	1,880	40,320	1,690	38,080	1,320
		3	0.08	50,000	2,400	48,000	2,590	44,800	1,880	40,320	1,690	38,080	1,320
		4	0.063	50,000	2,400	48,000	2,590	44,800	1,880	40,320	1,690	38,080	1,320
		5	0.047	48,960	2,110	43,200	2,120	40,320	1,520	36,290	1,370	34,270	1,070
		6	0.033	42,840	1,730	37,800	1,430	35,280	1,250	31,750	1,120	29,990	870
		8	0.016	35,360	1,020	31,200	840	29,120	730	26,210	660	24,750	510
		10	0.016	27,200	740	24,000	610	22,400	530	20,160	480	19,040	370
		12	0.01	27,200	740	24,000	610	22,400	530	20,160	480	19,040	370
0.45	0.9	0.6	0.108	50,000	2,820	45,600	2,410	42,560	2,140	38,300	1,930	36,180	1,500
		2	0.108	50,000	2,820	45,600	2,410	42,560	2,140	38,300	1,930	36,180	1,500
		4	0.065	48,450	2,370	42,750	1,960	39,900	1,740	35,910	1,560	33,920	1,220
		6	0.044	40,700	1,520	35,910	1,250	33,520	1,110	30,160	1,000	28,490	780
		8	0.029	31,010	1,050	27,360	870	25,540	770	22,980	690	21,710	540
0.5	1	0.8	0.18	45,900	3,100	43,200	2,720	37,800	2,270	34,020	2,040	32,130	1,590
		1.5	0.18	45,900	3,100	43,200	2,720	37,800	2,270	34,020	2,040	32,130	1,590
		2	0.16	45,900	3,100	43,200	2,720	37,800	2,270	34,020	2,040	32,130	1,590
		2.5	0.16	45,900	3,100	43,200	2,720	37,800	2,270	34,020	2,040	32,130	1,590
		3	0.16	45,900	3,100	43,200	2,720	37,800	2,270	34,020	2,040	32,130	1,590
		4	0.112	45,900	3,100	43,200	2,720	37,800	2,270	34,020	2,040	32,130	1,590
		5	0.072	39,780	2,600	43,200	2,540	32,760	1,840	29,480	1,650	27,850	1,280
		6	0.048	38,560	2,320	38,880	2,350	29,480	1,380	26,540	1,240	25,060	970
		7	0.048	33,050	1,340	31,590	1,320	27,220	1,060	24,490	960	23,130	740
		8	0.048	33,050	1,340	31,590	1,320	27,220	980	24,490	880	23,130	690
		9	0.036	33,050	1,340	31,590	1,320	27,220	980	24,490	880	23,130	690
		10	0.03	33,050	1,340	31,590	1,320	27,220	980	24,490	880	23,130	690
		12	0.02	24,480	940	21,600	770	20,160	690	18,140	620	17,140	480
		13	0.018	24,480	940	21,600	770	20,160	690	18,140	620	17,140	480
		14	0.016	24,480	940	21,600	770	20,160	690	18,140	620	17,140	480
		16	0.012	24,480	940	21,600	770	20,160	690	18,140	620	17,140	480
		18	0.01	21,420	770	18,900	640	17,640	560	15,880	510	14,990	400
		20	0.008	18,360	660	16,200	540	15,120	480	13,610	440	12,850	340

【Note】 Upon usage, please refer to comments and notes below table on page 17.

Recommended Cutting Conditions

High efficiency cutting condition | High accuracy cutting condition

Please refer to P.18 about high accuracy cutting conditions

Work material				1		2		3		4		5	
				Pre-hardened steels (35～45HRC)		Hardened steels (45～55HRC)		Hardened steels (55～65HRC)		Hardened steels (65～68HRC)		Hardened steels (68～72HRC)	
Ratio to standard depth of cut				100%		85%		80%		65%		55%	
Ball radius RE (mm)	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
0.55	1.1	2	0.16	42,840	2,930	37,800	2,450	35,280	2,180	31,750	1,960	29,990	1,520
		4	0.112	42,840	2,930	37,800	2,450	35,280	2,180	31,750	1,960	29,990	1,520
		6	0.048	33,810	1,710	29,840	1,430	27,850	1,270	25,060	1,140	23,670	890
		8	0.048	31,210	1,310	27,540	1,100	25,700	980	23,130	880	21,850	680
		10	0.03	31,210	1,310	27,540	1,100	25,700	980	23,130	880	21,850	680
0.6	1.2	2	0.154	39,230	2,720	36,920	2,560	32,310	1,860	29,080	1,670	27,460	1,300
		3	0.154	39,230	2,720	36,920	2,560	32,310	1,860	29,080	1,670	27,460	1,300
		4	0.128	39,230	2,720	36,920	2,560	32,310	1,860	29,080	1,670	27,460	1,300
		6	0.088	39,230	2,720	36,920	2,560	32,310	1,860	29,080	1,670	27,460	1,300
		8	0.048	31,820	2,070	30,240	2,060	26,210	1,050	23,590	940	22,280	730
		10	0.042	29,380	1,320	27,000	1,070	24,190	870	21,770	780	20,560	610
		12	0.036	29,380	1,320	25,920	1,030	24,190	870	21,770	780	20,560	610
0.7	1.4	3	0.158	33,420	2,350	29,480	1,990	27,520	1,790	24,770	1,610	23,390	1,250
		8	0.088	27,850	1,810	24,570	1,530	22,930	1,380	20,640	1,240	19,490	960
		12	0.042	25,700	1,250	22,680	1,060	21,170	950	19,050	860	17,990	670
		16	0.028	19,040	870	16,800	740	15,680	670	14,110	600	13,330	470
0.75	1.5	2	0.192	35,700	3,210	31,500	2,550	29,400	2,210	26,460	1,990	24,990	1,540
		2.5	0.192	35,700	3,210	31,500	2,550	29,400	2,210	26,460	1,990	24,990	1,540
		3	0.192	35,700	3,210	31,500	2,550	29,400	2,210	26,460	1,990	24,990	1,540
		4	0.16	35,700	3,210	31,500	2,550	29,400	2,210	26,460	1,990	24,990	1,540
		5	0.16	35,700	3,210	31,500	2,550	29,400	2,210	26,460	1,990	24,990	1,540
		6	0.16	35,700	3,210	31,500	2,550	29,400	2,210	26,460	1,990	24,990	1,540
		8	0.072	27,850	1,810	24,570	1,430	22,930	1,240	20,640	1,120	19,490	870
		10	0.072	25,700	1,670	22,680	1,320	21,170	1,140	19,050	1,030	17,990	800
		12	0.072	25,700	1,390	22,680	1,100	21,170	950	19,050	860	17,990	670
		14	0.06	22,850	1,170	20,160	930	18,820	800	16,930	720	15,990	560
		16	0.03	19,040	970	16,800	770	15,680	670	14,110	600	13,330	470
		18	0.03	19,040	970	16,800	770	15,680	670	14,110	600	13,330	470
		20	0.03	19,040	970	16,800	770	15,680	670	14,110	600	13,330	470
0.8	1.6	4	0.23	33,110	3,340	29,210	2,850	25,320	2,130	22,780	1,920	21,520	1,490
		8	0.176	30,940	2,490	27,300	2,130	23,660	1,590	21,290	1,430	20,110	1,110
		12	0.078	27,850	2,180	24,570	1,860	21,290	1,290	19,170	1,160	18,100	900
		16	0.048	23,870	1,330	21,060	1,140	19,660	990	17,690	890	16,710	690
		20	0.032	17,680	930	15,600	800	14,560	690	13,100	620	12,380	490
0.9	1.8	4	0.29	28,730	2,410	25,350	2,010	23,660	1,700	21,290	1,530	20,110	1,190
		8	0.208	28,730	2,410	25,350	2,010	23,660	1,700	21,290	1,530	20,110	1,190
		12	0.084	23,870	1,500	21,060	1,250	19,660	1,060	17,690	960	16,710	740
		16	0.054	23,870	1,500	21,060	1,250	19,660	1,060	17,690	960	16,710	740
		20	0.036	17,680	1,050	15,600	880	14,560	740	13,100	670	12,380	520
1	2	2.5	0.32	26,780	3,620	23,630	3,050	22,050	2,650	19,850	2,380	18,740	1,850
		3	0.32	26,780	3,620	23,630	3,050	22,050	2,650	19,850	2,380	18,740	1,850
		4	0.32	26,780	3,620	23,630	3,050	22,050	2,650	19,850	2,380	18,740	1,850
		5	0.32	26,780	3,620	23,630	3,050	22,050	2,650	19,850	2,380	18,740	1,850
		6	0.32	26,780	3,210	23,630	2,690	22,050	2,380	19,850	2,140	18,740	1,670
		8	0.224	26,780	3,210	23,630	2,690	22,050	2,380	19,850	2,140	18,740	1,670
		10	0.168	24,990	2,700	22,050	2,250	19,110	1,470	17,200	1,320	16,240	1,030
		12	0.096	22,490	2,430	19,850	2,050	17,200	1,320	15,480	1,190	14,620	930
		13	0.096	22,490	2,430	19,850	2,020	15,880	1,020	14,290	920	13,500	710
		14	0.096	22,490	2,110	18,430	1,630	15,880	1,020	14,290	920	13,500	710
		16	0.096	20,890	1,350	18,430	1,470	15,880	910	14,290	820	13,500	640
		18	0.072	19,280	1,250	18,430	1,350	15,880	910	14,290	820	13,500	640
		20	0.06	19,280	1,250	18,430	1,130	15,880	910	14,290	820	13,500	640
		22	0.04	15,170	930	13,390	770	14,990	820	13,500	730	12,750	570
		25	0.04	14,280	870	12,600	730	14,110	770	12,700	690	12,000	540
		30	0.024	14,280	870	12,600	730	14,110	770	12,700	690	12,000	540
		35	0.02	12,500	720	11,030	600	10,290	530	9,260	470	8,750	370
		40	0.018	10,710	620	9,450	510	8,820	450	7,940	410	7,500	320

High efficiency cutting condition

High accuracy cutting condition

Please refer to P.18 about high accuracy cutting conditions

Work material				1		2		3		4		5	
				Pre-hardened steels (35～45HRC)		Hardened steels (45～55HRC)		Hardened steels (55～65HRC)		Hardened steels (65～68HRC)		Hardened steels (68～72HRC)	
Ratio to standard depth of cut				100%		85%		80%		65%		55%	
Ball radius RE (mm)	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
1.25	2.5	6	0.4	23,590	3,800	20,810	3,090	19,430	2,530	17,480	2,280	16,610	1,820
		10	0.272	23,590	3,800	20,810	3,090	19,430	2,530	17,480	2,280	16,610	1,820
		15	0.12	18,400	2,130	16,230	2,020	15,150	1,420	13,640	1,280	12,950	1,020
		20	0.096	16,980	1,640	16,230	1,450	13,990	1,090	12,590	980	11,960	790
		25	0.078	16,980	1,480	14,990	1,200	13,990	980	12,590	880	11,960	710
		30	0.044	12,580	1,150	11,100	930	10,360	770	9,320	690	8,860	550
1.5	3	6	0.48	20,400	4,100	18,000	3,400	16,800	3,020	15,120	2,720	14,360	2,180
		8	0.48	20,400	4,100	18,000	3,400	16,800	3,020	15,120	2,720	14,360	2,180
		10	0.336	20,400	4,100	18,000	3,400	16,800	3,020	15,120	2,720	14,360	2,180
		13	0.252	19,040	3,060	16,800	2,540	15,680	2,260	14,110	2,030	13,410	1,630
		16	0.252	19,040	2,760	16,800	2,290	14,560	1,890	13,100	1,700	12,450	1,360
		20	0.144	15,910	1,920	14,040	1,590	12,100	1,310	10,890	1,180	10,340	940
		25	0.096	15,910	1,920	14,040	1,590	12,100	1,310	10,890	1,180	10,340	940
		30	0.096	14,690	1,770	12,960	1,470	12,100	1,310	10,890	1,180	10,340	940
		35	0.064	10,880	1,240	9,600	1,030	10,750	1,100	9,680	990	9,190	790
1.75	3.5	10	0.328	15,190	2,750	13,410	2,240	12,510	1,830	11,260	1,650	10,700	1,320
		15	0.288	15,190	2,750	13,410	2,240	12,510	1,830	11,260	1,650	10,700	1,320
		25	0.168	12,620	1,710	11,140	1,390	10,400	1,140	9,360	1,030	8,890	820
		35	0.072	12,620	1,710	11,140	1,390	10,400	1,140	9,360	1,030	8,890	820
		45	0.072	9,350	1,200	8,250	980	7,700	800	6,930	720	6,580	580
2	4	8	0.48	14,660	3,960	12,940	3,300	12,080	2,900	10,870	2,610	10,320	2,090
		10	0.48	14,660	3,960	12,940	3,300	12,080	2,900	10,870	2,610	10,320	2,090
		12	0.384	14,660	3,960	12,940	3,300	12,080	2,900	10,870	2,610	10,320	2,090
		13	0.384	14,660	3,960	12,940	3,300	12,080	2,900	10,870	2,610	10,320	2,090
		16	0.336	14,660	3,960	12,940	3,300	12,080	2,900	10,870	2,610	10,320	2,090
		20	0.336	12,710	2,750	11,210	2,290	10,470	2,010	9,420	1,810	8,950	1,450
		25	0.192	11,440	2,220	10,090	2,160	9,420	1,630	8,480	1,460	8,050	1,170
		30	0.128	10,560	1,710	9,320	1,430	8,690	1,250	7,820	1,130	7,430	900
		35	0.08	10,560	1,710	9,320	1,430	8,690	1,250	7,820	1,130	7,430	900
		40	0.08	10,560	1,710	9,320	1,430	8,690	1,250	7,820	1,130	7,430	900
		45	0.08	7,820	1,200	6,900	1,000	6,440	880	5,800	790	5,510	630
		50	0.08	7,820	1,200	6,900	1,000	6,440	880	5,800	790	5,510	630
2.5	5	10	0.584	10,710	3,210	9,450	2,840	8,820	2,380	7,940	2,140	7,540	1,710
		20	0.42	10,710	3,210	9,450	2,840	8,820	2,380	7,940	2,140	7,540	1,710
		25	0.42	9,950	2,980	8,780	2,630	8,190	2,210	7,370	1,990	7,000	1,590
		30	0.24	8,950	2,690	7,900	2,370	7,370	1,990	6,630	1,790	6,300	1,430
		40	0.16	8,260	1,490	7,290	1,310	6,800	1,100	6,120	990	5,820	790
3	6	12	0.48	11,480	4,250	10,130	3,460	9,450	2,840	8,510	2,550	8,080	2,040
		20	0.4	10,840	3,730	9,560	3,030	8,930	2,490	8,030	2,240	7,630	1,790
		30	0.336	8,840	2,120	7,800	2,030	7,280	1,570	6,550	1,410	6,220	1,130
		50	0.12	7,340	1,590	6,480	1,400	6,050	1,180	5,440	1,060	5,170	850
4	8	24	0.5	8,750	3,420	7,550	2,600	7,100	2,450	6,390	1,850	5,750	1,270
5	10	30	0.6	7,000	3,000	6,050	2,250	5,680	2,130	5,110	1,610	4,600	1,030
6	12	36	0.8	5,850	2,600	5,050	1,980	4,720	1,840	4,250	1,440	3,820	880

※(1) a_p is shown as the criteria for pre-hardened steel. For other materials, adjust the cutting depth according to the cutting depth factors in the above table.
※(2) When performing cutting where cutting chips may cause clogging, such as for rib cutting, blind grooves, etc., the cutting depth setting should be set by multiplying a_p by a cutting depth factor to calculate the cutting depth amount, and this amount should then be reduced to 80% of the calculated value.
※(3) Adjust by setting a_e to (3 to 5)×(a_p)×(cutting depth ratio). When performing finishing processing, calculate the theoretical cusp height and set accordingly.

Cutting depth setting example: When cutting rib groove contours in hardened steel (50HRC) using an EPDBEH2020-10-TH3 tool:
Cutting depth = 0.168 (a_p) × 0.85 (cutting depth factor for hardened steel [45–55HRC]) × 0.8 (for closed-area cutting) = 0.11mm

【Note】

① Although basically dry (air blow) cutting is recommended, please use appropriate coolant according to the work material and machining shape.
② 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.
③ If the rpm of the machine is low, lower the feed rate also to put the rpm and feed rate in the same ratio.

Recommended Cutting Conditions

High efficiency cutting condition

High accuracy cutting condition

Please refer to P.14 about high efficiency cutting conditions

Work material				1		2		3		4		5	
				Pre-hardened steels (35～45HRC)		Hardened steels (45～55HRC)		Hardened steels (55～65HRC)		Hardened steels (65～68HRC)		Hardened steels (68～72HRC)	
Ratio to standard depth of cut				100%		85%		80%		65%		55%	
Ball radius RE (mm)	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
0.05	0.1	**0.08**	0.003	50,000	230	50,000	200	50,000	190	45,000	170	42,500	130
		0.2	0.003	50,000	230	50,000	200	50,000	190	45,000	170	42,500	130
		0.3	0.002	50,000	230	50,000	200	50,000	190	45,000	170	42,500	130
		0.5	0.002	50,000	230	50,000	200	50,000	190	45,000	170	42,500	130
0.075	0.15	**0.12**	0.007	50,000	280	46,000	230	42,000	180	37,500	160	35,500	120
		0.3	0.007	50,000	280	46,000	230	42,000	180	37,500	160	35,500	120
		0.5	0.006	50,000	280	46,000	230	42,000	180	37,500	160	35,500	120
		0.75	0.005	50,000	280	46,000	230	42,000	180	37,500	160	35,500	120
		1	0.003	46,000	230	41,400	190	37,800	150	33,750	130	31,950	100
0.1	0.2	**0.15**	0.012	50,000	330	45,500	270	42,000	210	37,800	190	35,700	150
		0.3	0.012	50,000	330	45,500	270	42,000	210	37,800	190	35,700	150
		0.5	0.012	50,000	330	45,500	270	42,000	210	37,800	190	35,700	150
		0.75	0.01	50,000	330	45,500	270	42,000	210	37,800	190	35,700	150
		1	0.009	50,000	330	45,500	270	42,000	210	37,800	190	35,700	150
		1.25	0.006	45,900	270	40,500	220	37,800	170	34,020	150	32,130	120
		1.5	0.006	45,900	270	40,500	220	37,800	170	34,020	150	32,130	120
		2	0.005	45,900	270	40,500	220	37,800	170	34,020	150	32,130	120
		2.5	0.004	40,800	210	36,000	170	33,600	130	30,240	120	28,560	90
		3	0.002	40,800	210	36,000	170	33,600	130	30,240	120	28,560	90
0.15	0.3	**0.25**	0.016	50,000	450	45,000	380	42,000	340	37,800	300	35,700	240
		0.5	0.016	50,000	450	45,000	380	42,000	340	37,800	300	35,700	240
		0.75	0.014	50,000	450	45,000	380	42,000	340	37,800	300	35,700	240
		1	0.013	50,000	450	45,000	380	42,000	340	37,800	300	35,700	240
		1.25	0.011	50,000	450	45,000	380	42,000	340	37,800	300	35,700	240
		1.5	0.01	50,000	450	45,000	380	42,000	340	37,800	300	35,700	240
		2	0.007	45,900	370	40,500	310	37,800	270	34,020	250	32,130	190
		2.5	0.006	45,900	370	40,500	310	37,800	270	34,020	250	32,130	190
		3	0.005	45,900	370	40,500	310	37,800	270	34,020	250	32,130	190
		3.5	0.003	36,720	260	29,400	210	26,400	180	23,760	160	22,440	130
		4	0.002	36,720	260	29,400	210	26,400	180	23,760	160	22,440	130
0.2	0.4	**0.3**	0.034	40,800	450	36,000	360	33,600	340	30,240	300	28,560	240
		0.5	0.034	40,800	450	36,000	360	33,600	340	30,240	300	28,560	240
		0.75	0.034	40,800	450	36,000	360	33,600	340	30,240	300	28,560	240
		1	0.032	40,800	450	36,000	360	33,600	340	30,240	300	28,560	240
		1.5	0.027	40,800	450	36,000	360	33,600	340	30,240	300	28,560	240
		2	0.022	40,800	450	36,000	360	33,600	340	30,240	300	28,560	240
		2.5	0.013	36,720	360	32,400	290	30,240	270	27,220	250	25,700	190
		3	0.009	36,720	360	32,400	290	30,240	270	27,220	250	25,700	190
		3.5	0.006	36,720	360	32,400	290	30,240	270	27,220	250	25,700	190
		4	0.004	36,720	360	32,400	290	30,240	270	27,220	250	25,700	190
		4.5	0.003	32,640	310	28,800	250	26,880	230	24,190	210	22,850	160
		5	0.002	32,640	310	28,800	250	26,880	230	24,190	210	22,850	160
0.25	0.5	**0.35**	0.036	34,000	610	30,000	540	28,000	480	25,200	430	23,800	330
		0.75	0.036	34,000	610	30,000	540	28,000	480	25,200	430	23,800	330
		1	0.036	34,000	610	30,000	540	28,000	480	25,200	430	23,800	330
		1.5	0.032	34,000	610	30,000	540	28,000	480	25,200	430	23,800	330
		2	0.028	34,000	610	30,000	540	28,000	480	25,200	430	23,800	330
		2.5	0.026	30,600	500	27,000	440	25,200	390	22,680	350	21,420	270
		3	0.024	30,600	500	27,000	440	25,200	390	22,680	350	21,420	270
		4	0.016	30,600	500	27,000	440	25,200	390	22,680	350	21,420	270
		5	0.014	30,600	500	27,000	440	25,200	390	22,680	350	21,420	270
		5.5	0.006	27,200	420	24,000	370	22,400	320	20,160	290	19,040	230
		6	0.005	27,200	420	24,000	370	22,400	320	20,160	290	19,040	230
		7	0.004	27,200	420	24,000	370	22,400	320	20,160	290	19,040	230
		8	0.003	27,200	420	24,000	370	22,400	320	20,160	290	19,040	230
0.3	0.6	**0.4**	0.04	34,000	880	30,000	720	28,000	560	25,200	500	23,800	390
		0.75	0.04	34,000	880	30,000	720	28,000	560	25,200	500	23,800	390

High efficiency cutting condition

High accuracy cutting condition

Please refer to P.14 about high efficiency cutting conditions

Work material				1		2		3		4		5	
				Pre-hardened steels (35～45HRC)		Hardened steels (45～55HRC)		Hardened steels (55～65HRC)		Hardened steels (65～68HRC)		Hardened steels (68～72HRC)	
Ratio to standard depth of cut				100%		85%		80%		65%		55%	
Ball radius RE (mm)	Tool dia. DC (mm)	Under neck length LU (mm)	ap (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
0.3	0.6	1	0.04	34,000	880	30,000	720	28,000	560	25,200	500	23,800	390
		1.5	0.038	34,000	880	30,000	720	28,000	560	25,200	500	23,800	390
		2	0.034	34,000	880	30,000	720	28,000	560	25,200	500	23,800	390
		2.5	0.03	34,000	880	30,000	720	28,000	560	25,200	500	23,800	390
		3	0.027	34,000	880	30,000	720	28,000	560	25,200	500	23,800	390
		3.5	0.023	30,600	760	27,000	620	25,200	480	22,680	430	21,420	340
		4	0.019	30,600	760	27,000	620	25,200	480	22,680	430	21,420	340
		4.5	0.018	30,600	720	27,000	580	25,200	450	22,680	410	21,420	320
		5	0.016	30,600	720	27,000	580	25,200	450	22,680	410	21,420	320
		5.5	0.014	30,600	720	27,000	580	25,200	450	22,680	410	21,420	320
		6	0.012	30,600	720	27,000	580	25,200	450	22,680	410	21,420	320
		7	0.006	27,200	600	24,000	490	22,400	380	20,160	340	19,040	270
		8	0.006	27,200	600	24,000	490	22,400	380	20,160	340	19,040	270
		9	0.005	27,200	600	24,000	490	22,400	380	20,160	340	19,040	270
		10	0.004	23,800	530	21,000	430	19,600	330	17,640	300	16,660	230
		12	0.003	20,400	420	18,000	350	16,800	270	15,120	240	14,280	190
0.35	0.7	0.45	0.049	34,000	980	30,000	810	28,000	660	25,200	590	23,800	460
		2	0.049	34,000	980	30,000	810	28,000	660	25,200	590	23,800	460
		4	0.027	30,600	840	27,000	690	25,200	560	22,680	510	21,420	400
		6	0.022	30,600	790	27,000	650	25,200	540	22,680	480	21,420	370
		8	0.008	27,200	630	24,000	520	22,400	420	20,160	380	19,040	300
0.4	0.8	0.5	0.08	34,000	1,090	30,000	900	28,000	780	25,200	710	23,800	550
		1	0.08	34,000	1,090	30,000	900	28,000	780	25,200	710	23,800	550
		1.5	0.08	34,000	1,090	30,000	900	28,000	780	25,200	710	23,800	550
		2	0.064	34,000	1,090	30,000	900	28,000	780	25,200	710	23,800	550
		2.5	0.06	34,000	1,090	30,000	900	28,000	780	25,200	710	23,800	550
		3	0.055	34,000	1,090	30,000	900	28,000	780	25,200	710	23,800	550
		4	0.045	34,000	1,090	30,000	900	28,000	780	25,200	710	23,800	550
		5	0.036	30,600	880	27,000	730	25,200	640	22,680	570	21,420	450
		6	0.026	30,600	880	27,000	730	25,200	640	22,680	570	21,420	450
		8	0.016	27,200	780	24,000	650	22,400	560	20,160	510	19,040	400
		10	0.008	27,200	740	24,000	610	22,400	530	20,160	480	19,040	370
		12	0.006	27,200	740	24,000	610	22,400	530	20,160	480	19,040	370
0.45	0.9	0.6	0.072	32,300	1,220	28,500	1,000	26,600	890	23,940	800	22,610	620
		2	0.072	32,300	1,220	28,500	1,000	26,600	890	23,940	800	22,610	620
		4	0.046	32,300	1,220	28,500	1,000	26,600	890	23,940	800	22,610	620
		6	0.034	29,070	980	25,650	810	23,940	720	21,550	650	20,350	510
		8	0.024	25,840	880	22,800	720	21,280	640	19,150	580	18,090	450
0.5	1	0.8	0.09	30,600	1,380	27,000	1,130	25,200	1,010	22,680	910	21,420	710
		1.5	0.09	30,600	1,380	27,000	1,130	25,200	1,010	22,680	910	21,420	710
		2	0.08	30,600	1,380	27,000	1,130	25,200	1,010	22,680	910	21,420	710
		2.5	0.08	30,600	1,380	27,000	1,130	25,200	1,010	22,680	910	21,420	710
		3	0.08	30,600	1,380	27,000	1,130	25,200	1,010	22,680	910	21,420	710
		4	0.056	30,600	1,380	27,000	1,130	25,200	1,010	22,680	910	21,420	710
		5	0.048	30,600	1,380	27,000	1,130	25,200	1,010	22,680	910	21,420	710
		6	0.032	27,540	1,120	24,300	920	22,680	820	20,410	730	19,280	570
		7	0.032	27,540	1,120	24,300	920	22,680	820	20,410	730	19,280	570
		8	0.032	27,540	1,120	24,300	920	22,680	820	20,410	730	19,280	570
		9	0.024	27,540	1,120	24,300	920	22,680	820	20,410	730	19,280	570
		10	0.02	27,540	1,120	24,300	920	22,680	820	20,410	730	19,280	570
		12	0.01	24,480	940	21,600	770	20,160	690	18,140	620	17,140	480
		13	0.009	24,480	940	21,600	770	20,160	690	18,140	620	17,140	480
		14	0.008	24,480	940	21,600	770	20,160	690	18,140	620	17,140	480
		16	0.006	24,480	940	21,600	770	20,160	690	18,140	620	17,140	480
		18	0.005	21,420	770	18,900	640	17,640	560	15,880	510	14,990	400
		20	0.004	18,360	660	16,200	540	15,120	480	13,610	440	12,850	340

【Note】 Upon usage, please refer to comments and notes below table on page 21.

Recommended Cutting Conditions

High efficiency cutting condition

High accuracy cutting condition

Please refer to P.14 about high efficiency cutting conditions

Work material				1		2		3		4		5	
				Pre-hardened steels (35～45HRC)		Hardened steels (45～55HRC)		Hardened steels (55～65HRC)		Hardened steels (65～68HRC)		Hardened steels (68～72HRC)	
Ratio to standard depth of cut				100%		85%		80%		65%		55%	
Ball radius RE (mm)	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
0.55	1.1	2	0.08	28,560	1,300	25,200	1,090	23,520	970	21,170	870	19,990	680
		4	0.056	28,560	1,300	25,200	1,090	23,520	970	21,170	870	19,990	680
		6	0.032	26,010	1,090	22,950	920	21,420	810	19,280	730	18,210	570
		8	0.032	26,010	1,090	22,950	920	21,420	810	19,280	730	18,210	570
		10	0.02	26,010	1,090	22,950	920	21,420	810	19,280	730	18,210	570
0.6	1.2	2	0.077	26,150	1,210	23,080	1,000	21,540	890	19,380	800	18,310	620
		3	0.077	26,150	1,210	23,080	1,000	21,540	890	19,380	800	18,310	620
		4	0.064	26,150	1,210	23,080	1,000	21,540	890	19,380	800	18,310	620
		6	0.048	26,150	1,210	23,080	1,000	21,540	890	19,380	800	18,310	620
		8	0.032	24,480	1,130	21,600	950	20,160	810	18,140	730	17,140	560
		10	0.028	24,480	1,100	21,600	860	20,160	730	18,140	650	17,140	510
		12	0.024	24,480	1,100	21,600	860	20,160	730	18,140	650	17,140	510
0.7	1.4	3	0.088	21,420	1,160	18,900	980	17,640	880	15,880	790	14,990	620
		8	0.044	21,420	1,160	18,900	980	17,640	880	15,880	790	14,990	620
		12	0.028	21,420	1,040	18,900	890	17,640	790	15,880	720	14,990	560
		16	0.014	19,040	870	16,800	740	15,680	670	14,110	600	13,330	470
0.75	1.5	2	0.096	23,800	1,430	21,000	1,130	19,600	980	17,640	880	16,660	690
		2.5	0.096	23,800	1,430	21,000	1,130	19,600	980	17,640	880	16,660	690
		3	0.096	23,800	1,430	21,000	1,130	19,600	980	17,640	880	16,660	690
		4	0.08	23,800	1,430	21,000	1,130	19,600	980	17,640	880	16,660	690
		5	0.08	23,800	1,430	21,000	1,130	19,600	980	17,640	880	16,660	690
		6	0.08	23,800	1,430	21,000	1,130	19,600	980	17,640	880	16,660	690
		8	0.048	21,420	1,160	18,900	920	17,640	790	15,880	720	14,990	560
		10	0.048	21,420	1,160	18,900	920	17,640	790	15,880	720	14,990	560
		12	0.048	21,420	1,160	18,900	920	17,640	790	15,880	720	14,990	560
		14	0.04	19,040	970	16,800	770	15,680	670	14,110	600	13,330	470
		16	0.015	19,040	970	16,800	770	15,680	670	14,110	600	13,330	470
		18	0.015	19,040	970	16,800	770	15,680	670	14,110	600	13,330	470
		20	0.015	19,040	970	16,800	770	15,680	670	14,110	600	13,330	470
0.8	1.6	4	0.11	22,100	1,370	19,500	1,170	18,200	1,020	16,380	920	15,470	710
		8	0.088	22,100	1,370	19,500	1,170	18,200	1,020	16,380	920	15,470	710
		12	0.052	19,890	1,110	17,550	950	16,380	830	14,740	740	13,920	580
		16	0.032	19,890	1,110	17,550	950	16,380	830	14,740	740	13,920	580
		20	0.016	17,680	930	15,600	800	14,560	690	13,100	620	12,380	490
0.9	1.8	4	0.147	22,100	1,550	19,500	1,290	18,200	1,090	16,380	980	15,470	760
		8	0.104	22,100	1,550	19,500	1,290	18,200	1,090	16,380	980	15,470	760
		12	0.056	19,890	1,250	17,550	1,040	16,380	890	14,740	800	13,920	620
		16	0.036	19,890	1,250	17,550	1,040	16,380	890	14,740	800	13,920	620
		20	0.018	17,680	1,050	15,600	880	14,560	740	13,100	670	12,380	520
1	2	2.5	0.16	17,850	1,610	15,750	1,360	14,700	1,180	13,230	1,060	12,500	820
		3	0.16	17,850	1,610	15,750	1,360	14,700	1,180	13,230	1,060	12,500	820
		4	0.16	17,850	1,610	15,750	1,360	14,700	1,180	13,230	1,060	12,500	820
		5	0.16	17,850	1,610	15,750	1,360	14,700	1,180	13,230	1,060	12,500	820
		6	0.16	17,850	1,430	15,750	1,200	14,700	1,060	13,230	950	12,500	740
		8	0.112	17,850	1,430	15,750	1,200	14,700	1,060	13,230	950	12,500	740
		10	0.112	17,850	1,290	15,750	1,070	14,700	940	13,230	850	12,500	660
		12	0.064	16,070	1,160	14,180	960	13,230	850	11,910	760	11,250	590
		13	0.064	16,070	1,160	14,180	960	13,230	850	11,910	760	11,250	590
		14	0.064	16,070	1,160	14,180	960	13,230	850	11,910	760	11,250	590
		16	0.064	16,070	1,040	14,180	870	13,230	760	11,910	690	11,250	530
		18	0.048	16,070	1,040	14,180	870	13,230	760	11,910	690	11,250	530
		20	0.04	16,070	1,040	14,180	870	13,230	760	11,910	690	11,250	530
		22	0.034	15,170	930	13,390	770	12,500	680	11,250	610	10,620	480
		25	0.028	14,280	870	12,600	730	11,760	640	10,580	580	10,000	450
		30	0.012	14,280	870	12,600	730	11,760	640	10,580	580	10,000	450
		35	0.01	12,500	720	11,030	600	10,290	530	9,260	470	8,750	370
		40	0.008	10,710	620	9,450	510	8,820	450	7,940	410	7,500	320

High efficiency cutting condition

High accuracy cutting condition

Please refer to P.14 about high efficiency cutting conditions

Work material				1		2		3		4		5	
				Pre-hardened steels (35～45HRC)		Hardened steels (45～55HRC)		Hardened steels (55～65HRC)		Hardened steels (65～68HRC)		Hardened steels (68～72HRC)	
Ratio to standard depth of cut				100%		85%		80%		65%		55%	
Ball radius RE (mm)	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
1.25	2.5	6	0.2	15,730	1,690	13,880	1,370	12,950	1,130	11,660	1,010	11,070	810
		10	0.136	15,730	1,690	13,880	1,370	12,950	1,130	11,660	1,010	11,070	810
		15	0.08	14,150	1,370	12,490	1,110	11,660	910	10,490	820	9,970	660
		20	0.064	14,150	1,370	12,490	1,110	11,660	910	10,490	820	9,970	660
		25	0.052	14,150	1,230	12,490	1,000	11,660	820	10,490	740	9,970	590
		30	0.035	12,580	1,150	11,100	930	10,360	770	9,320	690	8,860	550
1.5	3	6	0.24	13,600	1,820	12,000	1,510	11,200	1,340	10,080	1,210	9,580	970
		8	0.24	13,600	1,820	12,000	1,510	11,200	1,340	10,080	1,210	9,580	970
		10	0.168	13,600	1,820	12,000	1,510	11,200	1,340	10,080	1,210	9,580	970
		13	0.168	13,600	1,820	12,000	1,510	11,200	1,340	10,080	1,210	9,580	970
		16	0.168	13,600	1,640	12,000	1,360	11,200	1,210	10,080	1,090	9,580	870
		20	0.096	12,240	1,480	10,800	1,230	10,080	1,090	9,070	980	8,620	780
		25	0.064	12,240	1,480	10,800	1,230	10,080	1,090	9,070	980	8,620	780
		30	0.064	12,240	1,480	10,800	1,230	10,080	1,090	9,070	980	8,620	780
		35	0.051	10,880	1,240	9,600	1,030	8,960	910	8,060	820	7,660	660
1.75	3.5	10	0.216	11,690	1,760	10,310	1,430	9,630	1,180	8,660	1,060	8,230	850
		15	0.192	11,690	1,760	10,310	1,430	9,630	1,180	8,660	1,060	8,230	850
		25	0.112	10,520	1,430	9,280	1,160	8,660	950	7,800	860	7,410	680
		35	0.072	10,520	1,430	9,280	1,160	8,660	950	7,800	860	7,410	680
		45	0.058	9,350	1,200	8,250	980	7,700	800	6,930	720	6,580	580
2	4	8	0.32	9,780	1,760	8,630	1,470	8,050	1,290	7,250	1,160	6,880	930
		10	0.32	9,780	1,760	8,630	1,470	8,050	1,290	7,250	1,160	6,880	930
		12	0.256	9,780	1,760	8,630	1,470	8,050	1,290	7,250	1,160	6,880	930
		13	0.256	9,780	1,760	8,630	1,470	8,050	1,290	7,250	1,160	6,880	930
		16	0.224	9,780	1,760	8,630	1,470	8,050	1,290	7,250	1,160	6,880	930
		20	0.224	9,780	1,760	8,630	1,470	8,050	1,290	7,250	1,160	6,880	930
		25	0.128	8,800	1,430	7,760	1,190	7,250	1,040	6,520	940	6,190	750
		30	0.128	8,800	1,430	7,760	1,190	7,250	1,040	6,520	940	6,190	750
		35	0.08	8,800	1,430	7,760	1,190	7,250	1,040	6,520	940	6,190	750
		40	0.08	8,800	1,430	7,760	1,190	7,250	1,040	6,520	940	6,190	750
		45	0.064	7,820	1,200	6,900	1,000	6,440	880	5,800	790	5,510	630
		50	0.056	7,820	1,200	6,900	1,000	6,440	880	5,800	790	5,510	630
2.5	5	10	0.392	7,650	1,530	6,750	1,350	6,300	1,130	5,670	1,020	5,390	820
		20	0.28	7,650	1,530	6,750	1,350	6,300	1,130	5,670	1,020	5,390	820
		25	0.28	7,650	1,530	6,750	1,350	6,300	1,130	5,670	1,020	5,390	820
		30	0.16	6,890	1,380	6,080	1,220	5,670	1,020	5,100	920	4,850	740
		40	0.16	6,890	1,240	6,080	1,090	5,670	920	5,100	830	4,850	660
3	6	12	0.48	7,650	1,890	6,750	1,540	6,300	1,260	5,670	1,130	5,390	910
		20	0.4	7,230	1,660	6,380	1,350	5,950	1,110	5,360	990	5,090	800
		30	0.336	6,800	1,360	6,000	1,200	5,600	1,010	5,040	910	4,790	730
		50	0.12	6,120	1,100	5,400	970	5,040	820	4,540	730	4,310	590
4	8	24	0.5	6,400	1,690	5,720	1,320	4,180	1,170	3,960	870	3,760	700
5	10	30	0.6	5,100	1,460	4,510	1,130	3,520	1,000	3,190	770	3,030	620
6	12	36	0.8	4,200	1,240	3,850	1,000	2,640	880	2,640	660	2,510	530

※(1) a_p is shown as the criteria for pre-hardened steel. For other materials, adjust the cutting depth according to the cutting depth factors in the above table.
※(2) When performing cutting where cutting chips may cause clogging, such as for rib cutting, blind grooves, etc., the cutting depth setting should be set by multiplying a_p by a cutting depth factor to calculate the cutting depth amount, and this amount should then be reduced to 80% of the calculated value.
※(3) Adjust by setting a_e to (3 to 5)×(a_p)×(cutting depth ratio). When performing finishing processing, calculate the theoretical cusp height and set accordingly.

Cutting depth setting example: When cutting rib groove contours in hardened steel (50HRC) using an EPDBEH2020-10-TH3 tool:
Cutting depth = 0.112 (a_p) × 0.85 (cutting depth factor for hardened steel [45–55HRC]) × 0.8 (for closed-area cutting) = 0.076mm

【Note】

① Although basically dry (air blow) cutting is recommended, please use appropriate coolant according to the work material and machining shape.
② 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.
③ If the rpm of the machine is low, lower the feed rate also to put the rpm and feed rate in the same ratio.

Field data

Comparison with cBN tool

Tools

EPDBEH2010-2.5-TH3
(ϕ1 Under neck length 2.5mm)

Machining environment

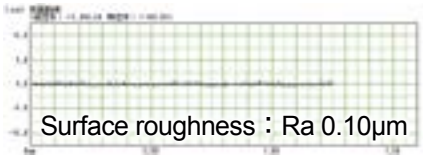
Machine : Vertical MC (HSK-E32)
Work material : PD613 (60HRC)
Coolant : Mist-blow

Cutting conditions

n=40,000min^{-1} (v_c=126m/min)
vf=1,600mm/min (f_z=0.02mm/t)
a_p×a_e=0.02×0.02mm

EPDBEH-TH3

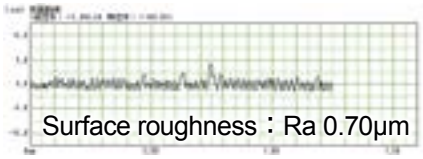
Shiny machined surface



cBN

Measurement point

Cloudy machined surface



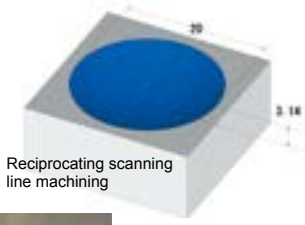
Minimal tip wear

Significant tip wear

**Tool life and machining accuracy approaching cBN;
reduced polishing man-hours due to quality machined surfaces**

Spherical lens profile mirror-finish machining

Tool：EPDBEH2020-4-TH3 (ϕ2 Under neck length 4mm)
Work material：STAVAX(52HRC)　Machine：Vertical MC(HSK-E32)
Cutting conditions：n=40,000min^{-1} (v_c=250m/min) v_f=400mm/min (f_z=0.005mm/t)
Pitch：0.0025mm　Finishing allowance：0.005mm
Coolant：Water base ※Mist blow for cBN only



Reciprocating scanning line machining

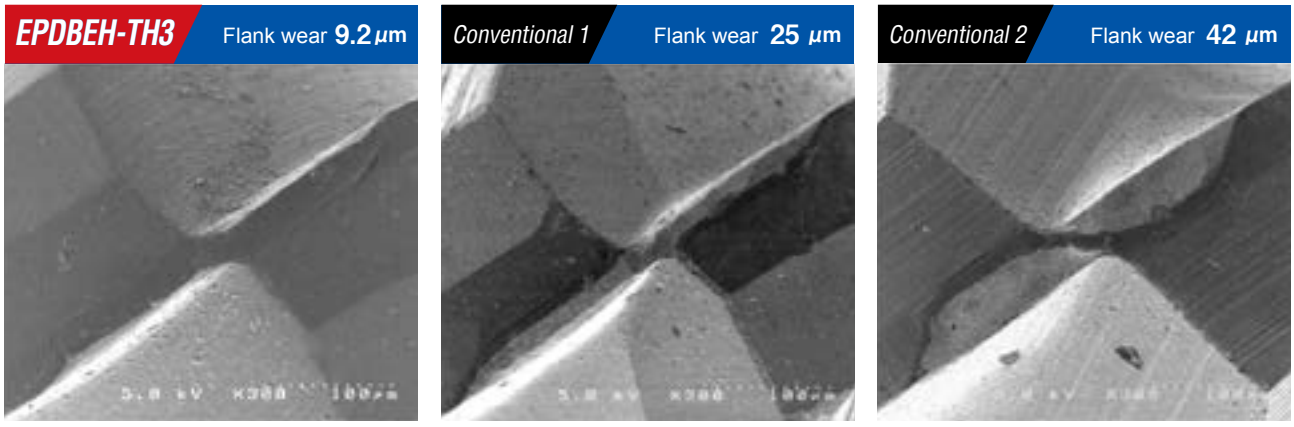
**Uniform visual appearance with minimal irregularities
and surface roughness on same level as PCD**

Field data of High-speed steel cutting

01 Direct cutting of powdered high-speed steel【HAP40 65HRC】

Tool：EPDBEH2010-3-TH3 (ϕ1 Under neck length 3mm)　Work material：HAP40 65HRC
Machine：Vertical MC (HSK-F63)　Cutting method：Contour pocketing
Cutting conditions：n=24,000min^{-1}(v_c=75m/min)　v_f=860mm/min(f_z=0.018mm/t)　a_p 0.04mm　a_e 0.04mm　Dry(Air-blow)

Figure　Wear condition after 30 minutes of machining

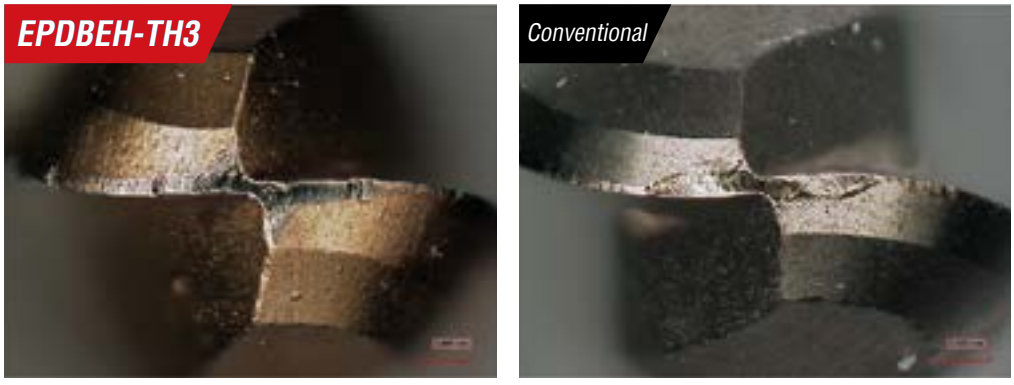


Wear amount is 1/3 that of conventional products!!
Demonstrates excellent wear resistance.

02 Pocketing of matrix high-speed steel【YXR33 58HRC】

Pocket size：12.8×10.8×5mm
Tool：EPDBEH2010-6-TH3 (ϕ1 Under neck length 6mm)　Work material：YXR33 58HRC
Machine：Vertical MC (HSK-E32)
Cutting conditions：n=22,600min^{-1}(v_c=71m/min)　v_f=820mm/min(f_z=0.018mm/t)
a_p 0.025mm　a_e 0.125mm　OH=18mm　Coolant：Mist blow

Figure　Wear condition after 60 minutes of machining



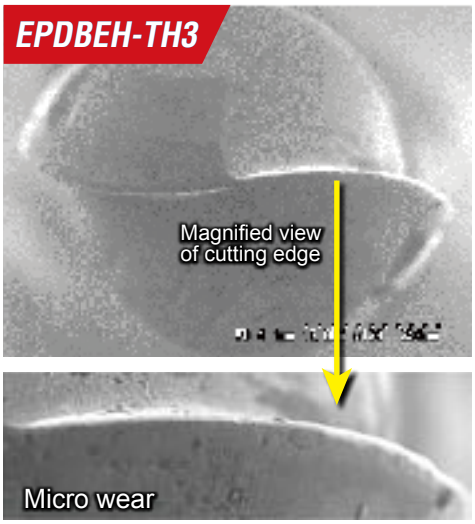
The amount of wear was only 11μm
even after processing for 1 hour.

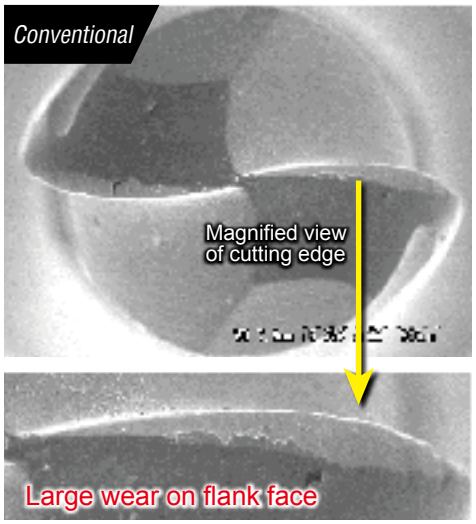
Field data

Field data of High-speed steel cutting

03 Dissolution high-speed steel 【DURO-V5 62-63HRC】

Tool：EPDBEH2010-2-TH3 (ϕ1 Under neck length 2mm) Work material：DURO-V5(62-63HRC) Machine：5-axis MC(BT40)
Cutting conditions：n=17,000min^{-1}(v_c=53m/min) v_f=800mm/min(f_z=0.04mm/t)
a_p 0.023mm a_e 0.05mm Stock material 0.015mm Coolant：Mist blow
Cutting time：45min





Field data of plastic mold steel cutting

01 Cutting of equivalent to SUS420J2 【Relief engraving of "TH3"】

Machine: Vertical MC(HSK-E25) Work material：HPM38 (57HRC) Coolant：Mist-blow

Figure Wear condition after finishing

(R0.75-Under neck length 2mm)

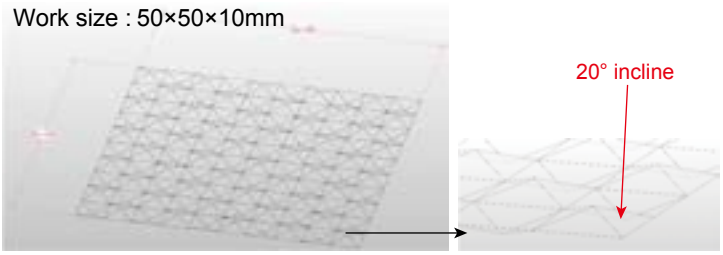
Figure Work

Work size : 50×50×10mm

Process	Item code	Tool dia. (mm)	Under neck length (mm)	Revolution (min^{-1})	Cutting speed (m/min)	Feed rate (mm/min)	Feed per tooth (mm/t)	a_p (mm)	a_e (mm)	Cutting time
Roughing	EPDBEH2030-8-TH3	ϕ3.0	8	21,221	100	2,122	0.05	0.2	0.4	38 min
Finishing	EPDBEH2015-2-TH3	ϕ1.5	2	40,000	188	2,400	0.03	0.04	0.104	76 min
									Total	**1hr 54 min**

02 High speed cutting of equivalent to SUS440C

Figure Work shape



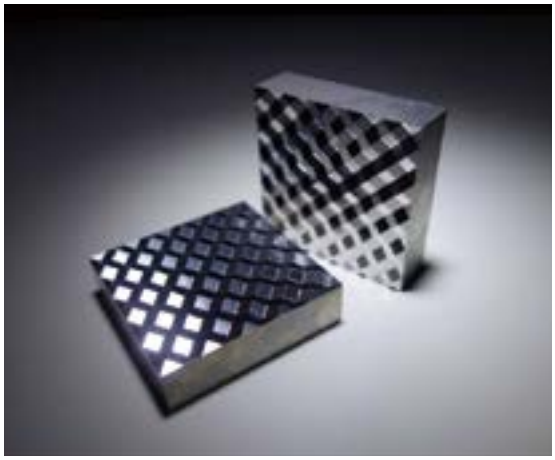
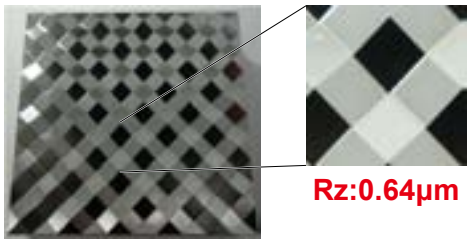


Figure Magnified view

Surface roughness of 20° incline



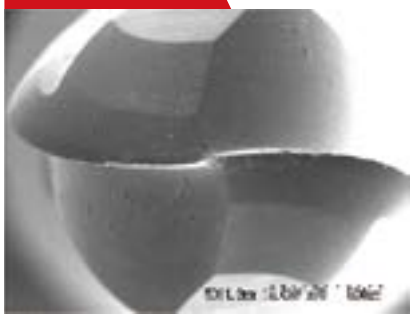
Machine: Vertical MC(HSK-E25) SUS440C(60HRC) Coolant：Mist-blow

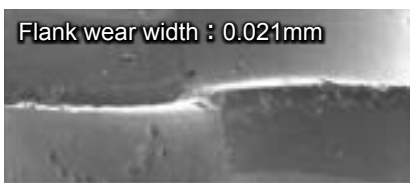
Process	Item code	Tool dia. (mm)	Under neck length (mm)	Revolution (min^{-1})	Cutting speed (m/min)	Feed rate (mm/min)	Feed per tooth (mm/t)	a_p (mm)	a_e (mm)	Cutting time
Roughing	EPDBEH2030-8-TH3	ϕ3.0	8	10,610	100	1,061	0.05	0.3	0.3	60 min
Semi-finishing	EPDBEH2030-8-TH3	ϕ3.0	8	15,915	150	1,592	0.05	0.1	0.1	28 min
Finishing	EPDBEH2010-2-TH3	ϕ1.0	2	31,831	100	1,910	0.03	0.03	0.03	56 min
									Total	**2hr 24 min**

03 Equivalent to SUS440C M340 【M340 57HRC】

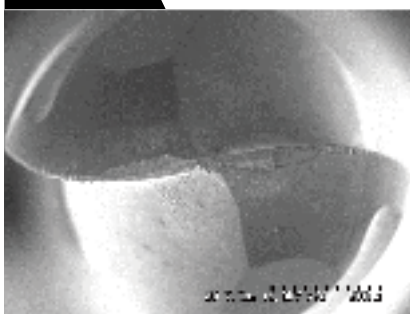
Tool：EPDBEH2020-10-TH3 (ϕ2 Under neck length 10mm) Work material：M340 (57HRC) Machine：Vertical MC (HSK-E32)
Cutting conditions：n=15,000min^{-1}(v_c=94m/min) v_f=600mm/min(f_z=0.02mm/t) a_p 0.12mm a_e 0.15mm Coolant：Mist blow
Cutting time：180min

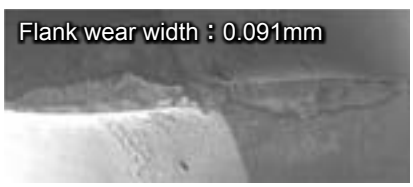
EPDBEH-TH3





Conventional





Multi-cavity model pocketing

Figure Work shape

Pocket size: 8mm×8mm×depth 5mm

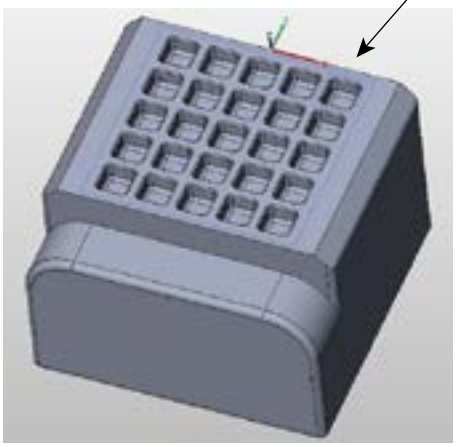


Figure Work after machining

Processed total 100 of pockets

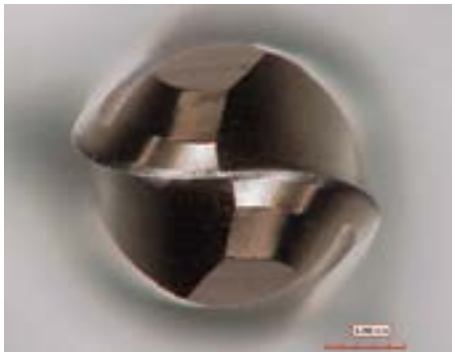
Machine : 5-axis MC(HSK-A63)　Work material : Equivalent to SUS420J2(52HRC)
Coolant : Dry(air)

Process	Item code	Tool dia. (mm)	Revolution (min⁻¹)	Cutting speed (m/min)	Feed rate (mm/min)	Feed per tooth (mm/t)	ap (mm)	ae (mm)	Removal stock (mm)	Cutting time
Contour roughing	EPDBEH2030-8-TH3	ϕ3.0	11,200	105	1,344	0.06	0.3	0.7	0.05	47 min
Contour semi finishing	EPDBEH2020-6-TH3	ϕ2.0	14,700	92	1,058	0.035	0.2	–	0.02	25 min
Contour finishing	EPDBEH2020-6-TH3	ϕ2.0	14,700	92	1,058	0.035	0.1	0.02	0	37 min
Contour bottom finishing	EPDBEH2020-6-TH3	ϕ2.0	14,700	92	1,058	0.035	–	0.02	0	49 min

※Cutting time per work (25 pockets)

■ Tool wear condition

EPDBEH2020-6-TH3



Flank wear width : 0.023mm

■ Amount of cutting remain

Measures pocket width

Cutting remain per one side :
0.0035 ㎜～ 0.012 ㎜
(variation in 100 pockets: 0.0085 ㎜)

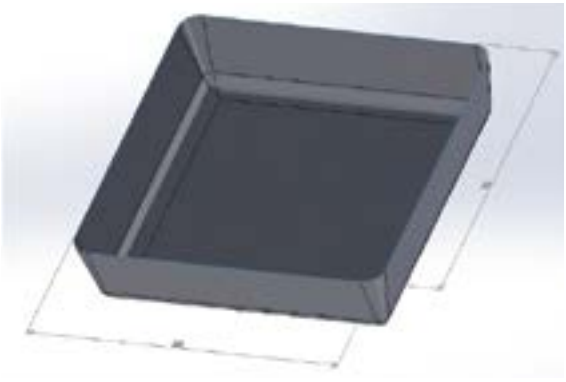
Finalized semi-finishing and finishing by 1 tool.
Machining time is 7 hours and 24 minutes!

Cutting remain is very small, only 0.012mm and achieved very precise machining.

Direct pocketing of powder high-speed steel

Machine : Vertical MC (HSK-E32)
Work material : HAP40 (65HRC)
Coolant : Mist-blow

Figure Work shape

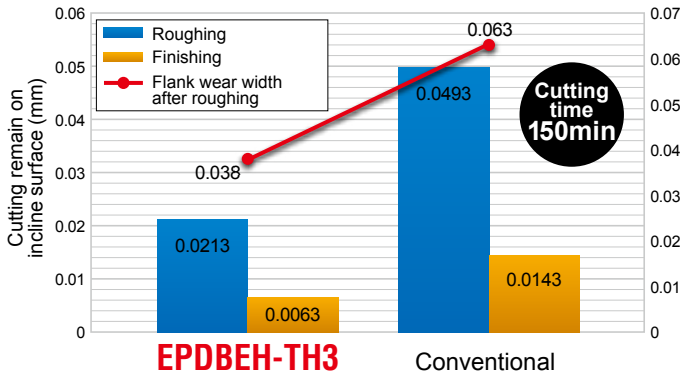


Pocket size : 20×20×5mm (Incline angle 10°)

Process	Item code	Tool dia. (mm)	Revolution (min^{-1})	Cutting speed (m/min)	Feed rate (mm/min)	Feed per tooth (mm/t)	a_p (mm)	a_e (mm)	Removal stock (mm)	Cutting time
Contour roughing	EPDBEH2030-8-TH3	ϕ3.0	11,200	106	1,344	0.06	0.18	0.18	0.05	39 min
Contour finishing	EPDBEH2020-6-TH3	ϕ2.0	22,680	143	816	0.018	0.02	0.02	0	20 min
Parallel finishing	EPDBEH2020-6-TH3	ϕ2.0	22,680	143	816	0.018	0.02	0.02	0	16 min
									Total	**75 min**

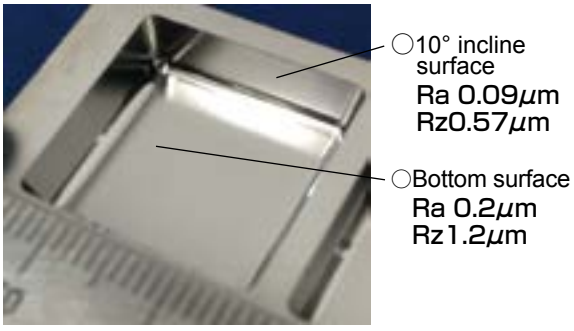
■ Comparison of cutting remain

Figure Correlation chart of cutting remain and tool wear after 2 pockets processing



■ Machined surface roughness

Figure Work after 2 pocketing



Hi-Pre² The synergy of the superior wear resistance of TH3 Coating and high-rigidity cutting edge geometry reduces the cutting remain on direct cutting of powder high-speed steel and realizes good machined surface roughness

Hi-Pre² = "**H**igh **Pre**cision **Pre**-finishing"

Re-grinding compatibility range table

Item code	Product	Shape	Re-grinding compatibility range (mm)	
			Outer dia.	End
EPDBEH-TH3	Epoch Deep Ball Evolution Hard-TH3		N/A	4~12

【Note】Contact our sales office regarding whether or not regrinding is possible for tools where L/D(under neck length / tool diameter) more than 10DC

MOLDINO

The Edge To Innovation

The diagrams and table data are examples of test results, and are not guaranteed values.
"MOLDINO" is a registered trademark of MOLDINO Tool Engineering, Ltd.

⚠ 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.

MOLDINO Tool Engineering, Ltd.

Head Office
Hulic Ryogoku Bldg. 8F, 4-31-11, Ryogoku, Sumida-ku, Tokyo, Japan 130-0026
International Sales Dept. : TEL +81-3-6890-5103 FAX +81-3-6890-5128

Official Web Site
https://www.moldino.com/en/
Database for selection Cutting Tool Products【TOOL SEARCH】
TOOLSEARCH Search Web

Europe **MOLDINO Tool Engineering Europe GmbH**
Itterpark 12, 40724 Hilden,Germany.
Tel +49-(0)2103-24820 Fax +49-(0)2103-248230

America **MITSUBISHI MATERIALS U.S.A. CORPORATION**
Detroit office c/o RFM Inc. Customer service
2001 Orndorf Drive, Brighton, MI 48116 U.S.A.
Tel +1(248) 308-2620 Fax +1(248) 308-2627

Mexico **MITSUBISHI MATERIALS MÉXICO S.A. DE C.V.**
Av. La Cañada No.16, Parque Industrial Bernardo Quintana, El Marques, Querétaro, CP 76246, México
Tel +52-442-1926800

Brazil **MITSUBISHI MATERIALS BRASIL LTDA.**
Rua Cincinato Braga, 340 13° andar.Bela Vista – CEP 01333-010 São Paulo – SP ., Brasil
Tel +55(11)3506-5600 Fax +55(11)3506-5677

Thailand **MITSUBISHI MATERIALS (THAILAND) CO., LTD.**
139/3 Moo 2, Tambon Khlong Chik, Amphoe Bang Pa-in,
Phra Nakhon Si Ayutthaya 13160, Thailand
Tel +66-3525-8024

India **Mitsubishi Materials India Private Limited**
H.O.: Prasad Enclave, #118/119, 1st Floor, 2nd Stage, 5th main, BBMP Ward #11, (New #38),
Industrial Suburb, Yeshwanthpura, Bengaluru, 560 022, Karnataka, India.
Tel +91-80-2204-3600

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