

NEW

High-Adhesion Diamond Coating

D-EPDB

(Ball : RE0.2~RE5mm)

D-EPDR

(Radius : DC0.5~DC10mm)

Epoch HD Coating Deep End Mill



Diamond coating for superior wear resistance and peeling resistance

Ideal for extended machining of items like graphite electrodes!

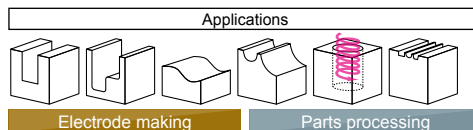
Features of HD Coating

- 01** Coating formed from high-purity diamond provides high hardness of at least 80 GPa.
- 02** A special substrate used for the diamond coating ensures improved adhesion and outstanding peeling resistance.
- 03** The HD Coating uses high-quality crystalline diamond for superior wear resistance, making it ideal for machining graphite and high-silicon aluminum alloys.



Compatible
work
materials

- Graphite
- High-silicon aluminum alloys, etc.



D-EPDB: Ball End Mill
RE0.2~RE5mm [44 Items]

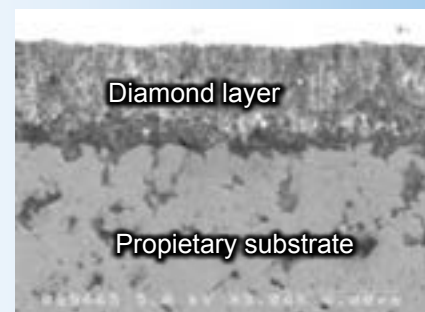
D-EPDR: Radius End Mill
DC0.5~DC10mm [46 Items]

Characteristics

HD Coating

- Coated with CVD diamond, making it ideal for machining graphite and high-silicon aluminum alloys
- Anchor effect provides improved adhesion.
- Utilizes a special substrate designed specifically for diamond coatings.

Coating cross section



Machining Case Studies



Machining graphite material with ball end mill

Tool : D-EPDB2010-5 (DC1.0×RE0.5×LU5mm)
Work material : Graphite electrode material
Cutting condition : $n=20,000\text{min}^{-1}$ $v_c=63\text{m/min}$ (207 SFM), $v_f=1,500\text{mm/min}$ (59 IPM), $f_z=0.0375\text{mm/t}$ (.0015 IPT),
 $a_p=0.5\text{mm}$ (.020"), $a_e=0.1\text{mm}$ (.004"), Air
Cutting time : 4 hrs 30 mins, Cutting length : 405m(1,329 feet)

Tool wear after machining for 4 hrs 30 mins

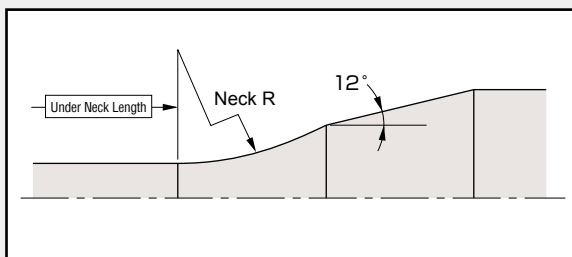


Flank wear width : 0.032mm(.0013")

Under neck shape

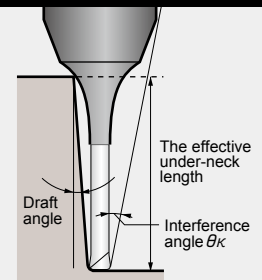


Details of under neck shape



[Note]

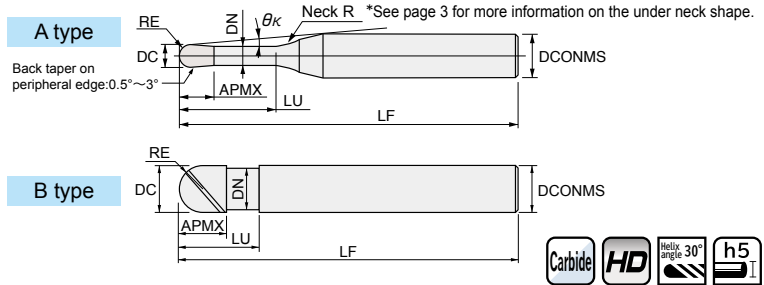
If the workpiece has draft angle, the interference length will be longer than the under-neck length. Please refer to the effective under-neck length for the various draft angles. In addition, the angle at which the tool will interfere with the workpiece is shown as the "interference angle θ_k ", and should also be referred to.



Line Up

- Further additions to the range of long-neck tools
- The sharp cutting edge geometry is ideal for graphite machining and ensures long tool life.

Epoch HD Coating Deep Ball End Mill



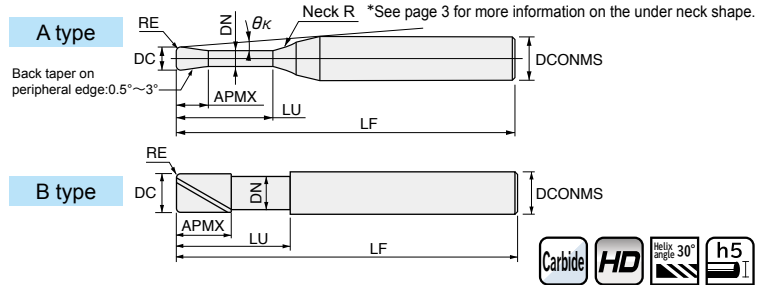
D-EPDB2○○○○-○○○(-○○)

Item code	Stock	Size (mm)								No. of flutes	Type	Interference angle (°)	Effective under neck length with respect to draft angle				
		Ball radius	Tool dia.	Under neck length	Neck dia.	Flute length	Overall length	Shank dia.	Neck R				0.5°	1°	1.5°	2°	3°
		RE	DC	LU	DN	APMX	LF	DCONMS				θ _K					
D-EPDB2004-2	●	0.2	0.4	2	0.37	0.6	50	4	2	2	A	9.88	2.36	2.46	2.54	2.62	2.75
D-EPDB2004-4	●			4	0.37	0.6	50	4	2	2	A	8.30	4.45	4.59	4.71	4.83	5.33
D-EPDB2004-6	●			6	0.37	0.6	50	4	2	2	A	7.16	6.52	6.70	6.89	7.22	7.99
D-EPDB2005-2	●	0.25	0.5	2	0.47	0.75	50	4	2	2	A	9.88	2.36	2.45	2.54	2.61	2.75
D-EPDB2005-4	●			4	0.47	0.75	50	4	2	2	A	8.27	4.45	4.59	4.71	4.82	5.32
D-EPDB2005-6	●			6	0.47	0.75	50	4	2	2	A	7.10	6.52	6.70	6.88	7.21	7.97
D-EPDB2005-8	●	0.3	0.6	8	0.47	0.75	50	4	2	2	A	6.23	8.58	8.79	9.16	9.60	10.63
D-EPDB2006-4	●			4	0.57	0.9	50	4	4	2	A	8.22	4.64	4.86	5.04	5.20	5.48
D-EPDB2006-6	●			6	0.57	0.9	50	4	4	2	A	7.04	6.75	7.02	7.23	7.42	7.96
D-EPDB2006-8	●	0.4	0.8	8	0.57	0.9	50	4	4	2	A	6.16	8.84	9.15	9.40	9.61	10.61
D-EPDB2006-10	●			10	0.57	0.9	50	4	4	2	A	5.47	10.92	11.26	11.54	11.99	13.27
D-EPDB2008-4	●			4	0.77	1.2	50	4	4	2	A	8.14	4.64	4.85	5.03	5.19	5.47
D-EPDB2008-8	●	0.5	1	8	0.77	1.2	50	4	4	2	A	6.01	8.83	9.14	9.39	9.60	10.58
D-EPDB2008-12	●			12	0.77	1.2	50	4	4	2	A	4.77	12.99	13.36	13.71	14.36	15.89
D-EPDB2010-5	●			5	0.95	1.5	60	4	4	2	A	7.33	5.74	5.97	6.16	6.33	6.63
D-EPDB2010-10	●	0.75	1.5	10	0.95	1.5	60	4	4	2	A	5.15	10.95	11.28	11.55	12.01	13.26
D-EPDB2010-15	●			15	0.95	1.5	60	4	6	2	A	3.96	16.39	16.90	17.31	17.99	19.90
D-EPDB2010-20	●			20	0.95	1.5	60	4	6	2	A	3.22	21.56	22.16	22.87	23.97	26.54
D-EPDB2015-10	●	1	2	10	1.4	2.25	60	4	4	2	A	4.66	11.04	11.35	11.60	12.10	13.34
D-EPDB2015-15	●			15	1.4	2.25	60	4	4	2	A	3.52	16.20	16.58	17.27	18.08	19.98
D-EPDB2015-20	●			20	1.4	2.25	60	4	6	2	A	2.83	21.65	22.21	22.97	24.06	No interference
D-EPDB2015-25	●	1.5	3	25	1.4	2.25	60	4	6	2	A	2.36	26.80	28.67	30.05	No interference	No interference
D-EPDB2020-10	●			10	1.9	3	60	4	4	2	A	4.11	11.04	11.33	11.58	12.05	13.26
D-EPDB2020-15	●			15	1.9	3	60	4	4	2	A	3.03	16.19	16.57	17.23	18.03	19.90
D-EPDB2020-20	●	2	4	20	1.9	3	60	4	4	2	A	2.40	21.32	21.95	22.93	24.02	No interference
D-EPDB2020-25	●			25	1.9	3	80	4	6	2	A	1.98	26.79	27.42	28.64	No interference	No interference
D-EPDB2020-30	●			30	1.9	3	80	4	6	2	A	1.69	31.93	32.85	34.34	No interference	No interference
D-EPDB2020-35	●	3	6	35	1.9	3	80	4	6	2	A	1.48	37.06	38.29	No interference	No interference	No interference
D-EPDB2030-15	●			15	2.9	4.5	60	6	4	2	A	4.13	16.18	16.55	17.16	17.94	19.74
D-EPDB2030-30	●			30	2.9	4.5	80	6	4	2	A	2.40	31.54	32.80	34.27	35.88	No interference
D-EPDB2030-40	●	4	8	40	2.9	4.5	80	6	6	2	A	1.88	42.16	43.70	45.68	No interference	No interference
D-EPDB2040-30	●			30	3.8	8	80	6	4	2	A	1.73	31.68	33.01	34.47	No interference	No interference
D-EPDB2040-40	●			40	3.8	8	80	6	4	2	A	1.33	42.11	43.91	No interference	No interference	No interference
D-EPDB2040-50	●	5	10	50	3.8	8	85	6	6	2	A	1.08	52.54	54.80	No interference	No interference	No interference
D-EPDB2040-60	●			60	3.8	8	120	6	6	2	A	0.91	62.97	No interference	No interference	No interference	No interference
D-EPDB2060-30	●			30	5.7	12	75	6	-	2	B	0	No interference	No interference	No interference	No interference	No interference
D-EPDB2060-40-80	●	6	12	40	5.7	12	80	6	-	2	B	0	No interference	No interference	No interference	No interference	No interference
D-EPDB2060-60-95	●			60	5.7	12	95	6	-	2	B	0	No interference	No interference	No interference	No interference	No interference
D-EPDB2080-40	●			40	7.6	16	80	8	-	2	B	0	No interference	No interference	No interference	No interference	No interference
D-EPDB2080-60	●	8	16	60	7.6	16	100	8	-	2	B	0	No interference	No interference	No interference	No interference	No interference
D-EPDB2080-80	●			80	7.6	16	140	8	-	2	B	0	No interference	No interference	No interference	No interference	No interference
D-EPDB2100-40	●			40	9.5	20	80	10	-	2	B	0	No interference	No interference	No interference	No interference	No interference
D-EPDB2100-60	●	10	20	60	9.5	20	100	10	-	2	B	0	No interference	No interference	No interference	No interference	No interference
D-EPDB2100-100	●			100	9.5	20	150	10	-	2	B	0	No interference	No interference	No interference	No interference	No interference

● : Inventory maintained in US

- Further additions to the range of long-neck tools
- The sharp cutting edge geometry is ideal for graphite machining and ensures long tool life.

Epoch HD Coating Deep Radius End Mill



D-EPDR○○○○○-○○○(-○○)

Item code	Stock	Size (mm)								No. of flutes	Type	Interference angle (°)	Effective under neck length with respect to draft angle				
		Tool dia.	Corner radius	Under neck length	Neck dia.	Flute length	Overall length	Shank dia.	Neck R				0.5°	1°	1.5°	2°	3°
		DC	RE	LU	DN	APMX	LF	DCONMS					θ_K				
D-EPDR2005-2-005	●	0.5	0.05	2	0.47	0.75	50	4	2	2	A	9.69	2.37	2.47	2.56	2.64	2.77
D-EPDR2005-4-005	●			4	0.47	0.75	50	4	2	2	A	8.13	4.45	4.60	4.72	4.86	5.38
D-EPDR2005-6-005	●			6	0.47	0.75	50	4	2	2	A	7.00	6.53	6.71	6.91	7.25	8.04
D-EPDR2006-4-005	●	0.6	0.05	4	0.57	0.9	50	4	4	2	A	8.06	4.66	4.88	5.07	5.23	5.52
D-EPDR2006-6-005	●			6	0.57	0.9	50	4	4	2	A	6.92	6.76	7.03	7.26	7.45	8.04
D-EPDR2008-4-005	●	0.8	0.05	4	0.77	1.2	50	4	4	2	A	7.89	4.66	4.88	5.07	5.23	5.52
D-EPDR2008-6-005	●			6	0.77	1.2	50	4	4	2	A	6.74	6.76	7.03	7.26	7.45	8.04
D-EPDR2008-8-005	●			8	0.77	1.2	50	4	4	2	A	5.88	8.85	9.16	9.41	9.64	10.69
D-EPDR2010-5-01	●	1	0.1	5	0.95	1.5	60	4	4	2	A	7.09	5.76	6.00	6.20	6.37	6.76
D-EPDR2010-10-01	●			10	0.95	1.5	60	4	4	2	A	5.03	10.97	11.31	11.58	12.08	13.39
D-EPDR2010-15-01	●			15	0.95	1.5	60	4	6	2	A	3.89	16.40	16.92	17.34	18.07	20.03
D-EPDR2010-20-01	●		0.2	20	0.95	1.5	60	4	6	2	A	3.18	21.58	22.18	22.93	24.05	26.66
D-EPDR2010-5-02	●			5	0.95	1.5	60	4	4	2	A	7.14	5.76	5.99	6.19	6.36	6.72
D-EPDR2010-10-02	●			10	0.95	1.5	60	4	4	2	A	5.05	10.96	11.30	11.57	12.06	13.36
D-EPDR2010-15-02	●	1.5	0.2	15	0.95	1.5	60	4	6	2	A	3.91	16.40	16.92	17.33	18.05	20.00
D-EPDR2010-20-02	●			20	0.95	1.5	60	4	6	2	A	3.19	21.57	22.17	22.91	24.03	26.63
D-EPDR2015-10-02	●			10	1.4	2.25	60	4	4	2	A	4.50	11.06	11.37	11.64	12.20	13.52
D-EPDR2015-15-02	●			15	1.4	2.25	60	4	4	2	A	3.43	16.21	16.60	17.34	18.19	20.15
D-EPDR2015-20-02	●	2	0.2	20	1.4	2.25	60	4	6	2	A	2.77	21.67	22.24	23.05	24.17	No interference
D-EPDR2015-25-02	●			25	1.4	2.25	60	4	6	2	A	2.32	26.81	27.47	28.75	30.15	No interference
D-EPDR2020-10-02	●			10	1.9	3	60	4	4	2	A	3.89	11.06	11.37	11.64	12.20	13.52
D-EPDR2020-15-02	●			15	1.9	3	60	4	4	2	A	2.91	16.21	16.60	17.34	18.19	No interference
D-EPDR2020-20-02	●			20	1.9	3	60	4	4	2	A	2.32	21.34	22.02	23.05	24.17	No interference
D-EPDR2020-25-02	●			25	1.9	3	80	4	6	2	A	1.93	26.81	27.47	28.75	No interference	No interference
D-EPDR2020-30-02	●	3	0.2	30	1.9	3	80	4	6	2	A	1.65	31.95	32.92	34.45	No interference	No interference
D-EPDR2020-35-02	●			35	1.9	3	80	4	6	2	A	1.45	37.07	38.36	No interference	No interference	No interference
D-EPDR2030-15-02	●			15	2.9	4.5	60	6	4	2	A	3.89	16.21	16.60	17.34	18.19	20.15
D-EPDR2030-30-02	●			30	2.9	4.5	80	6	4	2	A	2.32	31.57	32.97	34.45	36.14	No interference
D-EPDR2030-40-02	●	4	0.5	40	2.9	4.5	80	6	6	2	A	1.83	42.19	43.81	45.86	No interference	No interference
D-EPDR2040-20-05	●			20	3.8	8	80	6	4	2	A	2.33	21.47	22.25	23.27	24.39	No interference
D-EPDR2040-30-05	●			30	3.8	8	80	6	4	2	A	1.66	31.75	33.15	34.68	No interference	No interference
D-EPDR2040-40-05	●			40	3.8	8	80	6	4	2	A	1.29	42.18	44.04	No interference	No interference	No interference
D-EPDR2040-50-05	●			50	3.8	8	85	6	6	2	A	1.05	52.61	54.94	No interference	No interference	No interference
D-EPDR2060-30-05	●	6	0.5	60	3.8	8	120	6	6	2	A	0.89	63.03	No interference	No interference	No interference	No interference
D-EPDR2060-40-05	●			40	5.7	12	80	6	-	2	B	0	No interference	No interference	No interference	No interference	No interference
D-EPDR2060-60-05-95	●			60	5.7	12	95	6	-	2	B	0	No interference	No interference	No interference	No interference	No interference
D-EPDR4060-30-10	●		1	30	5.7	12	75	6	-	4	B	0	No interference	No interference	No interference	No interference	No interference
D-EPDR4060-40-10	●			40	5.7	12	80	6	-	4	B	0	No interference	No interference	No interference	No interference	No interference
D-EPDR4060-60-10-95	●			60	5.7	12	95	6	-	4	B	0	No interference	No interference	No interference	No interference	No interference
D-EPDR4080-40-10	●	8	1	40	7.6	16	80	8	-	4	B	0	No interference	No interference	No interference	No interference	No interference
D-EPDR4080-60-10	●			60	7.6	16	100	8	-	4	B	0	No interference	No interference	No interference	No interference	No interference
D-EPDR4080-80-10	●			80	7.6	16	140	8	-	4	B	0	No interference	No interference	No interference	No interference	No interference
D-EPDR4100-40-10	●	10	1	40	9.5	20	80	10	-	4	B	0	No interference	No interference	No interference	No interference	No interference
D-EPDR4100-60-10	●			60	9.5	20	100	10	-	4	B	0	No interference	No interference	No interference	No interference	No interference
D-EPDR4100-100-10	●			100	9.5	20	150	10	-	4	B	0	No interference	No interference	No interference	No interference	No interference

● : Inventory maintained in US

Recommended Cutting Conditions

Inch

D-EPDB

Epoch HD Coating Deep Ball End Mill

					Graphite				Cast aluminum alloys AC4A, ADC12, etc.			
Item code	Ball radius RE	Tool dia. DC	Under neck length LU	L/D	Revolution n min ⁻¹	Feed rate v_f IPM	a_p inch	a_e inch	Revolution n min ⁻¹	Feed rate v_f IPM	a_p inch	a_e inch
D-EPDB2004-4	0.2mm (.008")	0.4mm (.016")	4mm(.157")	10	26,300	23	.0016	.0047	21,000	18	.0014	.0043
D-EPDB2004-6			6mm(.236")	15	20,300	18	.0013	.0038	16,200	14	.0011	.0034
D-EPDB2005-2			2mm(.079")	4	31,200	30	.0024	.0073	25,000	24	.0022	.0066
D-EPDB2005-4	0.25mm (.010")	0.5mm (.020")	4mm(.157")	8	27,400	26	.0021	.0064	21,900	21	.0019	.0058
D-EPDB2005-6			6mm(.236")	12	23,600	22	.0018	.0054	18,900	18	.0016	.0048
D-EPDB2005-8			8mm(.315")	16	19,700	19	.0015	.0045	15,800	15	.0013	.0040
D-EPDB2006-4			4mm(.157")	7	27,600	28	.0027	.0080	22,100	23	.0024	.0072
D-EPDB2006-6	0.3mm (.012")	0.6mm (.024")	6mm(.236")	10	24,900	26	.0024	.0071	19,900	20	.0021	.0064
D-EPDB2006-8			8mm(.315")	13	22,300	23	.0020	.0061	17,800	18	.0019	.0056
D-EPDB2006-10			10mm(.394")	17	19,600	20	.0017	.0052	15,700	16	.0016	.0047
D-EPDB2008-4	0.4mm (.016")	0.8mm (.031")	4mm(.157")	5	27,300	30	.0038	.0113	21,800	24	.0034	.0102
D-EPDB2008-8			8mm(.315")	10	24,300	27	.0031	.0094	19,400	21	.0028	.0085
D-EPDB2008-12			12mm(.472")	15	21,300	24	.0025	.0076	17,000	19	.0023	.0069
D-EPDB2010-5			5mm(.197")	5	26,300	31	.0047	.0142	21,000	25	.0043	.0128
D-EPDB2010-10	0.5mm (.020")	1mm (.039")	10mm(.394")	10	23,900	28	.0039	.0118	19,100	23	.0035	.0106
D-EPDB2010-15			15mm(.591")	15	21,500	26	.0031	.0094	17,200	20	.0028	.0085
D-EPDB2010-20			20mm(.787")	20	19,100	22	.0024	.0071	15,300	18	.0021	.0064
D-EPDB2015-10			10mm(.394")	7	24,400	31	.0067	.0201	19,500	24	.0060	.0181
D-EPDB2015-15	0.75mm (.030")	1.5mm (.059")	15mm(.591")	10	23,300	30	.0059	.0177	18,600	24	.0053	.0159
D-EPDB2015-20			20mm(.787")	13	22,300	28	.0051	.0154	17,800	22	.0046	.0138
D-EPDB2015-25			25mm(.984")	17	21,200	27	.0043	.0130	17,000	21	.0039	.0117
D-EPDB2020-10			10mm(.394")	5	24,300	33	.0094	.0283	19,400	26	.0085	.0255
D-EPDB2020-15			15mm(.591")	8	23,700	32	.0087	.0260	19,000	26	.0078	.0234
D-EPDB2020-20	1mm (.039")	2mm (.079")	20mm(.787")	10	23,100	31	.0079	.0236	18,500	25	.0071	.0213
D-EPDB2020-25			25mm(.984")	13	22,500	30	.0071	.0213	18,000	24	.0064	.0191
D-EPDB2020-30			30mm(1.181")	15	21,900	29	.0063	.0189	17,500	23	.0057	.0170
D-EPDB2020-35			35mm(1.378")	18	21,300	28	.0055	.0165	17,000	23	.0050	.0149
D-EPDB2030-15	1.5mm (.059")	3mm (.118")	15mm(.591")	5	23,600	33	.0142	.0425	18,900	27	.0128	.0383
D-EPDB2030-30			30mm(1.181")	10	22,800	32	.0118	.0354	18,200	26	.0106	.0319
D-EPDB2030-40			40mm(1.575")	13	22,300	31	.0102	.0307	17,800	25	.0092	.0276
D-EPDB2040-30			30mm(1.181")	8	13,200	78	.0173	.0520	10,600	62	.0156	.0468
D-EPDB2040-40	2mm (.079")	4mm (.157")	40mm(1.575")	10	11,800	70	.0157	.0472	9,400	56	.0142	.0425
D-EPDB2040-50			50mm(1.969")	13	10,300	61	.0142	.0425	8,200	49	.0128	.0383
D-EPDB2040-60			60mm(2.362")	15	8,800	52	.0126	.0378	7,000	42	.0113	.0340
D-EPDB2060-30			30mm(1.181")	5	9,900	62	.0283	.0850	7,900	50	.0255	.0765
D-EPDB2060-40-80	3mm (.118")	6mm (.236")	40mm(1.575")	7	9,300	59	.0268	.0803	7,400	47	.0241	.0723
D-EPDB2060-60-95			60mm(2.362")	10	8,000	50	.0236	.0709	6,400	40	.0213	.0638
D-EPDB2080-40			40mm(1.575")	5	7,600	51	.0378	.1134	6,100	41	.0340	.1020
D-EPDB2080-60	4mm (.157")	8mm (.315")	60mm(2.362")	8	6,800	46	.0346	.1039	5,400	37	.0312	.0935
D-EPDB2080-80			80mm(3.150")	10	6,100	41	.0315	.0945	4,900	33	.0283	.0850
D-EPDB2100-40			40mm(1.575")	4	6,400	45	.0488	.1465	5,100	36	.0439	.1318
D-EPDB2100-60	5mm (.197")	10mm (.394")	60mm(2.362")	6	5,900	42	.0457	.1370	4,700	33	.0411	.1233
D-EPDB2100-100			100mm(3.937")	10	4,900	35	.0394	.1181	3,900	28	.0354	.1063

[Note]

- ① Use the appropriate coolant for the work material and machining shape.
- ② These conditions are for general guidance; in actual machining conditions adjust the parameters according to your actual machine and work-piece conditions.

Inch

D-EPDR

Epoch HD Coating Deep Radius End Mill

						Graphite				Cast aluminum alloys AC4A, ADC12, etc.			
Item code	Tool dia. DC	Corner radius RE	Under neck length LU	No. of flutes	L/D	Revolution n min ⁻¹	Feed rate v_f IPM	a_p inch	a_e inch	Revolution n min ⁻¹	Feed rate v_f IPM	a_p inch	a_e inch
D-EPDR2005-2-005	0.5mm (.020")	0.05mm (.002")	2mm(.079")	2	4	21,600	37	.0022	.0157	17,300	26	.0022	.0157
D-EPDR2005-4-005			4mm(.157")	2	8	17,800	31	.0020	.0157	14,200	22	.0020	.0157
D-EPDR2005-6-005			6mm(.236")	2	12	14,000	24	.0019	.0157	11,200	17	.0019	.0157
D-EPDR2006-4-005	0.6mm (.024")	0.05mm (.002")	4mm(.157")	2	7	18,600	38	.0025	.0189	14,900	27	.0025	.0189
D-EPDR2006-6-005			6mm(.236")	2	10	15,900	33	.0024	.0189	12,700	23	.0024	.0189
D-EPDR2008-4-005	0.8mm (.031")	0.05mm (.002")	4mm(.157")	2	5	18,900	42	.0035	.0252	15,100	29	.0035	.0252
D-EPDR2008-6-005			6mm(.236")	2	8	17,400	38	.0033	.0252	13,900	27	.0033	.0252
D-EPDR2008-8-005			8mm(.315")	2	10	15,900	35	.0031	.0252	12,700	24	.0031	.0252
D-EPDR2010-5-01	1mm (.039")	0.1mm (.004")	5mm(.197")	2	5	18,300	43	.0043	.0315	14,600	30	.0043	.0315
D-EPDR2010-10-01			10mm(.394")	2	10	15,900	37	.0039	.0315	12,700	26	.0039	.0315
D-EPDR2010-15-01			15mm(.591")	2	15	13,500	32	.0035	.0315	10,800	22	.0035	.0315
D-EPDR2010-20-01			20mm(.787")	2	20	11,100	26	.0031	.0315	8,900	19	.0031	.0315
D-EPDR2010-5-02		0.2mm (.008")	5mm(.197")	2	5	18,300	43	.0043	.0315	14,600	30	.0043	.0315
D-EPDR2010-10-02			10mm(.394")	2	10	15,900	37	.0039	.0315	12,700	26	.0039	.0315
D-EPDR2010-15-02			15mm(.591")	2	15	13,500	32	.0035	.0315	10,800	22	.0035	.0315
D-EPDR2010-20-02			20mm(.787")	2	20	11,100	26	.0031	.0315	8,900	19	.0031	.0315
D-EPDR2015-10-02	1.5mm (.059")	0.2mm (.008")	10mm(.394")	2	7	17,000	43	.0063	.0413	13,600	30	.0063	.0413
D-EPDR2015-15-02			15mm(.591")	2	10	15,900	40	.0059	.0413	12,700	28	.0059	.0413
D-EPDR2015-20-02			20mm(.787")	2	13	14,900	37	.0055	.0413	11,900	26	.0055	.0413
D-EPDR2015-25-02			25mm(.984")	2	17	13,800	35	.0051	.0413	11,000	24	.0051	.0413
D-EPDR2020-10-02	2mm (.079")	0.2mm (.008")	10mm(.394")	2	5	17,100	46	.0087	.0551	13,700	32	.0087	.0551
D-EPDR2020-15-02			15mm(.591")	2	8	16,500	44	.0083	.0551	13,200	31	.0083	.0551
D-EPDR2020-20-02			20mm(.787")	2	10	15,900	43	.0079	.0551	12,700	30	.0079	.0551
D-EPDR2020-25-02			25mm(.984")	2	13	15,300	41	.0075	.0551	12,200	29	.0075	.0551
D-EPDR2020-30-02			30mm(1.181")	2	15	14,700	39	.0071	.0551	11,800	28	.0071	.0551
D-EPDR2020-35-02			35mm(1.378")	2	18	14,100	38	.0067	.0551	11,300	26	.0067	.0551
D-EPDR2030-15-02	3mm (.118")	0.2mm (.008")	15mm(.591")	2	5	16,700	46	.0130	.0827	13,400	32	.0130	.0827
D-EPDR2030-30-02			30mm(1.181")	2	10	15,900	44	.0118	.0827	12,700	31	.0118	.0827
D-EPDR2030-40-02			40mm(1.575")	2	13	15,400	43	.0110	.0827	12,300	30	.0110	.0827
D-EPDR2040-20-05	4mm (.157")	0.5mm (.020")	20mm(.787")	2	5	12,400	78	.0173	.1102	9,900	55	.0156	.1102
D-EPDR2040-30-05			30mm(1.181")	2	8	10,900	69	.0165	.1102	8,700	48	.0149	.1102
D-EPDR2040-40-05			40mm(1.575")	2	10	9,400	59	.0157	.1102	7,500	41	.0142	.1102
D-EPDR2040-50-05			50mm(1.969")	2	13	7,900	50	.0150	.1102	6,300	35	.0135	.1102
D-EPDR2040-60-05			60mm(2.362")	2	15	6,400	40	.0142	.1102	5,100	28	.0128	.1102
D-EPDR2060-30-05	6mm (.236")	0.5mm (.020")	30mm(1.181")	2	5	8,400	80	.0260	.1654	6,700	56	.0234	.1654
D-EPDR2060-40-05			40mm(1.575")	2	7	7,700	73	.0252	.1654	6,200	51	.0227	.1654
D-EPDR2060-60-05-95			60mm(2.362")	2	10	6,400	61	.0236	.1654	5,100	43	.0213	.1654
D-EPDR4060-30-10		1mm (.039")	30mm(1.181")	4	5	8,400	106	.0260	.1654	6,700	74	.0234	.1654
D-EPDR4060-40-10			40mm(1.575")	4	7	7,700	97	.0252	.1654	6,200	68	.0227	.1654
D-EPDR4060-60-10-95			60mm(2.362")	4	10	6,400	81	.0236	.1654	5,100	57	.0213	.1654
D-EPDR4080-40-10	8mm (.315")	1mm (.039")	40mm(1.575")	4	5	6,300	99	.0346	.2205	5,000	69	.0312	.2205
D-EPDR4080-60-10			60mm(2.362")	4	8	5,600	88	.0331	.2205	4,500	62	.0298	.2205
D-EPDR4080-80-10			80mm(3.150")	4	10	4,800	76	.0315	.2205	3,800	53	.0283	.2205
D-EPDR4100-40-10	10mm (.394")	1mm (.039")	40mm(1.575")	4	4	5,400	102	.0441	.2756	4,300	71	.0397	.2756
D-EPDR4100-60-10			60mm(2.362")	4	6	4,900	93	.0425	.2756	3,900	65	.0383	.2756
D-EPDR4100-100-10			100mm(3.937")	4	10	3,900	74	.0394	.2756	3,100	52	.0354	.2756

[Note]

- ① Use the appropriate coolant for the work material and machining shape.
- ② These conditions are for general guidance; in actual machining conditions adjust the parameters according to your actual machine and work-piece conditions.

Recommended Cutting Conditions

Metric

D-EPDB

Epoch HD Coating Deep Ball End Mill

					Graphite				Cast aluminum alloys AC4A, ADC12, etc.			
Item code	Ball radius RE (mm)	Tool dia. DC (mm)	Under neck length LU (mm)	L/D	Revolution n min ⁻¹	Feed rate v_f mm/min	a_p mm	a_e mm	Revolution n min ⁻¹	Feed rate v_f mm/min	a_p mm	a_e mm
D-EPDB2004-4	0.2	0.4	4	10	26,300	580	0.04	0.12	21,000	460	0.036	0.108
D-EPDB2004-6			6	15	20,300	450	0.032	0.096	16,200	360	0.029	0.087
D-EPDB2005-2	0.25	0.5	2	4	31,200	750	0.062	0.186	25,000	600	0.056	0.168
D-EPDB2005-4			4	8	27,400	660	0.054	0.162	21,900	530	0.049	0.147
D-EPDB2005-6			6	12	23,600	570	0.046	0.138	18,900	460	0.041	0.123
D-EPDB2005-8			8	16	19,700	470	0.038	0.114	15,800	380	0.034	0.102
D-EPDB2006-4	0.3	0.6	4	7	27,600	720	0.068	0.204	22,100	580	0.061	0.183
D-EPDB2006-6			6	10	24,900	650	0.06	0.18	19,900	520	0.054	0.162
D-EPDB2006-8			8	13	22,300	580	0.052	0.156	17,800	460	0.047	0.141
D-EPDB2006-10			10	17	19,600	510	0.044	0.132	15,700	410	0.04	0.12
D-EPDB2008-4	0.4	0.8	4	5	27,300	760	0.096	0.288	21,800	610	0.086	0.258
D-EPDB2008-8			8	10	24,300	680	0.08	0.24	19,400	540	0.072	0.216
D-EPDB2008-12			12	15	21,300	600	0.064	0.192	17,000	480	0.058	0.174
D-EPDB2010-5	0.5	1	5	5	26,300	790	0.12	0.36	21,000	630	0.108	0.324
D-EPDB2010-10			10	10	23,900	720	0.1	0.3	19,100	580	0.09	0.27
D-EPDB2010-15			15	15	21,500	650	0.08	0.24	17,200	520	0.072	0.216
D-EPDB2010-20			20	20	19,100	570	0.06	0.18	15,300	460	0.054	0.162
D-EPDB2015-10	0.75	1.5	10	7	24,400	780	0.17	0.51	19,500	620	0.153	0.459
D-EPDB2015-15			15	10	23,300	750	0.15	0.45	18,600	600	0.135	0.405
D-EPDB2015-20			20	13	22,300	710	0.13	0.39	17,800	570	0.117	0.351
D-EPDB2015-25			25	17	21,200	680	0.11	0.33	17,000	540	0.099	0.297
D-EPDB2020-10	1	2	10	5	24,300	830	0.24	0.72	19,400	660	0.216	0.648
D-EPDB2020-15			15	8	23,700	810	0.22	0.66	19,000	650	0.198	0.594
D-EPDB2020-20			20	10	23,100	790	0.2	0.6	18,500	630	0.18	0.54
D-EPDB2020-25			25	13	22,500	770	0.18	0.54	18,000	620	0.162	0.486
D-EPDB2020-30			30	15	21,900	740	0.16	0.48	17,500	590	0.144	0.432
D-EPDB2020-35			35	18	21,300	720	0.14	0.42	17,000	580	0.126	0.378
D-EPDB2030-15	1.5	3	15	5	23,600	850	0.36	1.08	18,900	680	0.324	0.972
D-EPDB2030-30			30	10	22,800	820	0.3	0.9	18,200	660	0.27	0.81
D-EPDB2030-40			40	13	22,300	800	0.26	0.78	17,800	640	0.234	0.702
D-EPDB2040-30	2	4	30	8	13,200	1,980	0.44	1.32	10,600	1,580	0.396	1.188
D-EPDB2040-40			40	10	11,800	1,770	0.4	1.2	9,400	1,420	0.36	1.08
D-EPDB2040-50			50	13	10,300	1,550	0.36	1.08	8,200	1,240	0.324	0.972
D-EPDB2040-60			60	15	8,800	1,320	0.32	0.96	7,000	1,060	0.288	0.864
D-EPDB2060-30	3	6	30	5	9,900	1,580	0.72	2.16	7,900	1,260	0.648	1.944
D-EPDB2060-40-80			40	7	9,300	1,490	0.68	2.04	7,400	1,190	0.612	1.836
D-EPDB2060-60-95			60	10	8,000	1,280	0.6	1.8	6,400	1,020	0.54	1.62
D-EPDB2080-40	4	8	40	5	7,600	1,290	0.96	2.88	6,100	1,030	0.864	2.592
D-EPDB2080-60			60	8	6,800	1,160	0.88	2.64	5,400	930	0.792	2.376
D-EPDB2080-80			80	10	6,100	1,040	0.8	2.4	4,900	830	0.72	2.16
D-EPDB2100-40	5	10	40	4	6,400	1,150	1.24	3.72	5,100	920	1.116	3.348
D-EPDB2100-60			60	6	5,900	1,060	1.16	3.48	4,700	850	1.044	3.132
D-EPDB2100-100			100	10	4,900	880	1	3	3,900	700	0.9	2.7

[Note]

- ① Use the appropriate coolant for the work material and machining shape.
- ② These conditions are for general guidance; in actual machining conditions adjust the parameters according to your actual machine and work-piece conditions.

Metric

D-EPDR

Epoch HD Coating Deep Radius End Mill

						Graphite				Cast aluminum alloys AC4A, ADC12, etc.			
Item code	Tool dia. DC (mm)	Corner radius RE (mm)	Under neck length LU (mm)	No. of flutes	L/D	Revolution n min ⁻¹	Feed rate v_f mm/min	a_p mm	a_e mm	Revolution n min ⁻¹	Feed rate v_f mm/min	a_p mm	a_e mm
D-EPDR2005-2-005	0.5	0.05	2	2	4	21,600	950	0.056	0.4	17,300	670	0.056	0.4
D-EPDR2005-4-005			4	2	8	17,800	780	0.052	0.4	14,200	550	0.052	0.4
D-EPDR2005-6-005			6	2	12	14,000	620	0.048	0.4	11,200	430	0.048	0.4
D-EPDR2006-4-005	0.6	0.05	4	2	7	18,600	970	0.064	0.48	14,900	680	0.064	0.48
D-EPDR2006-6-005			6	2	10	15,900	830	0.06	0.48	12,700	580	0.06	0.48
D-EPDR2008-4-005	0.8	0.05	4	2	5	18,900	1,060	0.088	0.64	15,100	740	0.088	0.64
D-EPDR2008-6-005			6	2	8	17,400	970	0.084	0.64	13,900	680	0.084	0.64
D-EPDR2008-8-005			8	2	10	15,900	890	0.08	0.64	12,700	620	0.08	0.64
D-EPDR2010-5-01	1	0.1	5	2	5	18,300	1,100	0.11	0.8	14,600	770	0.11	0.8
D-EPDR2010-10-01			10	2	10	15,900	950	0.1	0.8	12,700	670	0.1	0.8
D-EPDR2010-15-01			15	2	15	13,500	810	0.09	0.8	10,800	570	0.09	0.8
D-EPDR2010-20-01			20	2	20	11,100	670	0.08	0.8	8,900	470	0.08	0.8
D-EPDR2010-5-02		0.2	5	2	5	18,300	1,100	0.11	0.8	14,600	770	0.11	0.8
D-EPDR2010-10-02			10	2	10	15,900	950	0.1	0.8	12,700	670	0.1	0.8
D-EPDR2010-15-02			15	2	15	13,500	810	0.09	0.8	10,800	570	0.09	0.8
D-EPDR2010-20-02			20	2	20	11,100	670	0.08	0.8	8,900	470	0.08	0.8
D-EPDR2015-10-02	1.5	0.2	10	2	7	17,000	1,090	0.16	1.05	13,600	760	0.16	1.05
D-EPDR2015-15-02			15	2	10	15,900	1,020	0.15	1.05	12,700	710	0.15	1.05
D-EPDR2015-20-02			20	2	13	14,900	950	0.14	1.05	11,900	670	0.14	1.05
D-EPDR2015-25-02			25	2	17	13,800	880	0.13	1.05	11,000	620	0.13	1.05
D-EPDR2020-10-02	2	0.2	10	2	5	17,100	1,160	0.22	1.4	13,700	810	0.22	1.4
D-EPDR2020-15-02			15	2	8	16,500	1,120	0.21	1.4	13,200	780	0.21	1.4
D-EPDR2020-20-02			20	2	10	15,900	1,080	0.2	1.4	12,700	760	0.2	1.4
D-EPDR2020-25-02			25	2	13	15,300	1,040	0.19	1.4	12,200	730	0.19	1.4
D-EPDR2020-30-02			30	2	15	14,700	1,000	0.18	1.4	11,800	700	0.18	1.4
D-EPDR2020-35-02			35	2	18	14,100	960	0.17	1.4	11,300	670	0.17	1.4
D-EPDR2030-15-02	3	0.2	15	2	5	16,700	1,170	0.33	2.1	13,400	820	0.33	2.1
D-EPDR2030-30-02			30	2	10	15,900	1,110	0.3	2.1	12,700	780	0.3	2.1
D-EPDR2030-40-02			40	2	13	15,400	1,080	0.28	2.1	12,300	760	0.28	2.1
D-EPDR2040-20-05	4	0.5	20	2	5	12,400	1,980	0.44	2.8	9,900	1,390	0.396	2.8
D-EPDR2040-30-05			30	2	8	10,900	1,740	0.42	2.8	8,700	1,220	0.378	2.8
D-EPDR2040-40-05			40	2	10	9,400	1,500	0.4	2.8	7,500	1,050	0.36	2.8
D-EPDR2040-50-05			50	2	13	7,900	1,260	0.38	2.8	6,300	880	0.342	2.8
D-EPDR2040-60-05			60	2	15	6,400	1,020	0.36	2.8	5,100	710	0.324	2.8
D-EPDR2060-30-05	6	0.5	30	2	5	8,400	2,020	0.66	4.2	6,700	1,410	0.594	4.2
D-EPDR2060-40-05			40	2	7	7,700	1,850	0.64	4.2	6,200	1,300	0.576	4.2
D-EPDR2060-60-05-95			60	2	10	6,400	1,540	0.6	4.2	5,100	1,080	0.54	4.2
D-EPDR4060-30-10		1	30	4	5	8,400	2,690	0.66	4.2	6,700	1,880	0.594	4.2
D-EPDR4060-40-10			40	4	7	7,700	2,460	0.64	4.2	6,200	1,720	0.576	4.2
D-EPDR4060-60-10-95			60	4	10	6,400	2,050	0.6	4.2	5,100	1,440	0.54	4.2
D-EPDR4080-40-10	8	1	40	4	5	6,300	2,520	0.88	5.6	5,000	1,760	0.792	5.6
D-EPDR4080-60-10			60	4	8	5,600	2,240	0.84	5.6	4,500	1,570	0.756	5.6
D-EPDR4080-80-10			80	4	10	4,800	1,920	0.8	5.6	3,800	1,340	0.72	5.6
D-EPDR4100-40-10	10	1	40	4	4	5,400	2,590	1.12	7	4,300	1,810	1.008	7
D-EPDR4100-60-10			60	4	6	4,900	2,350	1.08	7	3,900	1,650	0.972	7
D-EPDR4100-100-10			100	4	10	3,900	1,870	1	7	3,100	1,310	0.9	7

[Note]

- ① Use the appropriate coolant for the work material and machining shape.
 ② These conditions are for general guidance; in actual machining conditions adjust the parameters according to your actual machine and work-piece conditions.

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.



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 regrounding 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 regrounding.
- (2) Grinding dust will be created when regrounding a tool. When regrounding, 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 regrounding 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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Tools Specifications subject to change without notice.