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Engineering

Hitachi Tool

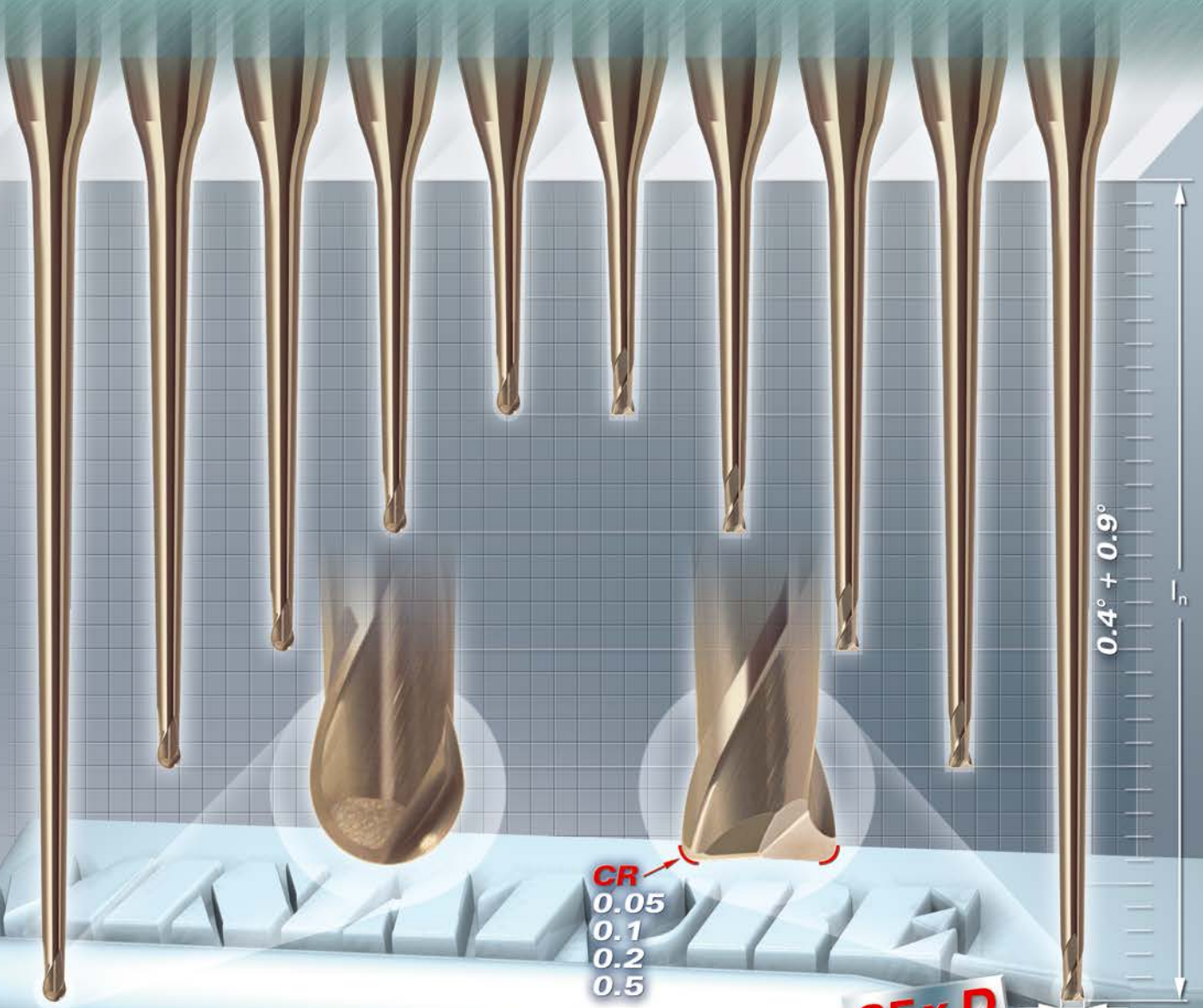
**HITACHI**  
Inspire the Next

**MINIATURE**

Nano-PVD Coating  
**TH45+**

No. 413.3

**EPDBP** Epoch Deep Ball Pencil Neck  
**EPDRP** Epoch Deep Radius Pencil Neck  
High Speed Deep Precision Machining ~ HRC70



Carbide End Mills - Nano PVD Coated

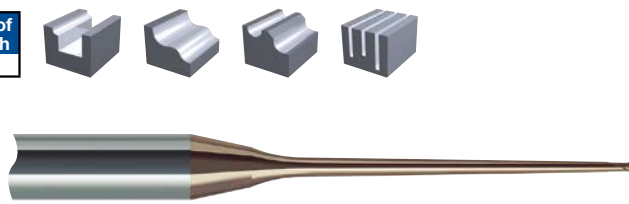
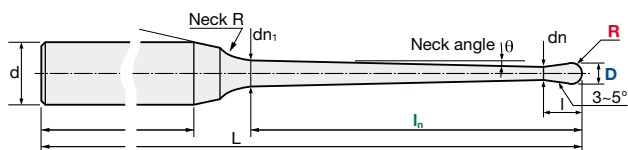
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# High Speed Deep Precision Machining

## EPDBP | Epoch Deep Ball Pencil Neck

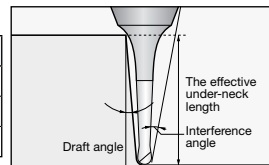
<b>V max</b> High Speed	<b>▽▽</b> Semi-Finishing	<b>▽▽▽</b> Finishing	<b>HRC</b> 70	<b>▮</b> Rib. Miniature	<b>No. of Teeth</b> 2
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※ Back Draft is not available for Diameters 4–6mm

<b>Carbide</b> Micro Grain	<b>TH45+</b> Nano-PVD Coating	<b>Rake Angle</b> Positive
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Helix angle	30°
R	± 0.005 mm
D	(0/-0.01 mm)
d	h5



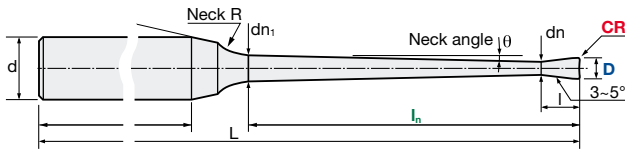
ID Code	Item Code	Z	Size										Actual Effective Length in Incline angles				
			D	R	I <sub>n</sub>	Neck angle θ	l	dn	dn <sub>1</sub>	Neck R	L	d	0.5°	1°	2°	3°	
EP 469	EPDBP-2002-1-04	2	0.2	0.1	1	0.4	0.15	0.17	0.182	10	50	4	1.55	1.72	2.03	2.31	
EP 470	EPDBP-2002-1.5-04				1.5								0.189	2.06	2.28	2.64	2.97
EP 471	EPDBP-2002-2-09				2								0.228	2.81	3.42	3.92	
EP 472	EPDBP-2002-2.5-09				2.5								0.244	-	3.32	4.01	4.54
EP 473	EPDBP-2004-2-04		0.4	0.2	2	0.4	0.3	0.37	0.394	10	50	4	2.57	2.82	3.23	3.57	
EP 474	EPDBP-2004-3-04				3								0.408	3.60	3.92	4.40	4.80
EP 475	EPDBP-2004-4-09				4								0.486	-	4.87	5.72	6.34
EP 476	EPDBP-2004-5-09				5								0.518	-	5.90	6.85	7.53
EP 477	EPDBP-2006-2-04		0.6	0.3	2	0.4	0.4	0.57	0.592	7	55	4	2.42	2.59	2.85	3.08	
EP 478	EPDBP-2006-4-04				4								0.620	4.62	5.00	5.54	5.98
EP 479	EPDBP-2006-6-09				6								0.746	-	6.92	7.96	8.68
EP 480	EPDBP-2006-8-09				8								0.809	-	8.96	10.18	10.98
EP 481	EPDBP-2006-10-09		0.8	0.4	10	0.9	0.5	0.77	0.872	10	50	4	-	11.01	12.37	13.25	
EP 482	EPDBP-2006-12-09				12								0.934	10	13.05	14.54	15.49
EP 483	EPDBP-2006-15-09				15								1.029	7	16.10	17.78	18.81
EP 484	EPDBP-2008-4-04				4								0.819	4.61	4.99	5.53	5.97
EP 485	EPDBP-2008-6-04		0.8	0.4	6	0.9	0.5	0.77	0.847	10	50	4	6.66	7.14	7.79	8.30	
EP 486	EPDBP-2008-8-09				8								1.006	-	8.96	10.17	10.97
EP 487	EPDBP-2008-12-09				12								1.131	7	13.04	14.54	15.48
EP 488	EPDBP-2008-16-09				16								1.257	7	17.12	18.85	19.90
EP 489	EPDBP-2010-6-04	1	0.5	6	0.4	0.8	0.94	1.013	10	50	4	6.82	7.24	7.85	8.34		
EP 490	EPDBP-2010-8-04			8								1.041	8.85	9.36	10.07	10.62	
EP 491	EPDBP-2010-10-09			10								1.229	-	11.20	12.44	13.28	
EP 492	EPDBP-2010-15-09			15								1.386	4	16.28	17.84	18.84	
EP 493	EPDBP-2010-20-09	1	0.5	20	0.9	0.8	0.94	1.543	10	65	4	-	21.35	23.18	24.68		
EP 494	EPDBP-2010-25-09			25								1.700	7	26.42	28.48	30.83	
EP 495	EPDBP-2010-30-09			30								1.857	7	31.49	33.75	36.98	
EP 496	EPDBP-2010-35-09			35								2.015	7	36.55	39.00	43.12	
EP 497	EPDBP-2015-8-04	1.5	0.75	8	0.4	1.35	1.42	1.513	10	55	4	8.95	9.41	10.09	10.62		
EP 498	EPDBP-2015-10-04			10								1.541	7	10.97	11.52	12.28	12.90
EP 499	EPDBP-2015-12-04			12								1.569	7	13.00	13.62	14.45	15.47
EP 500	EPDBP-2015-15-09			15								1.849	4	16.40	17.88	18.86	
EP 501	EPDBP-2015-20-09	1.5	0.75	20	0.9	1.35	1.42	2.006	7	65	4	-	21.47	23.21	24.72		
EP 502	EPDBP-2015-30-09			30								2.320	7	31.59	33.78	37.01	
EP 503	EPDBP-2020-8-04			8								2.008	50	8.70	9.03	9.50	10.27
EP 504	EPDBP-2020-12-04			12								2.064	55	13.00	13.61	14.43	15.40
EP 505	EPDBP-2020-16-04	2	1	16	0.4	1.7	1.92	2.120	10	60	4	17.05	17.79	18.74	20.54		
EP 506	EPDBP-2020-20-09			20								2.495	7	21.48	23.20	24.68	
EP 507	EPDBP-2020-25-09			25								2.652	7	26.54	28.50	30.82	
EP 508	EPDBP-2020-30-09			30								2.809	10	31.60	33.77	36.97	
EP 509	EPDBP-2020-35-09	2	1	35	0.9	1.7	1.92	2.966	7	75	4	-	36.66	39.02	x		
EP 510	EPDBP-2020-40-09			40								3.123	7	41.72	44.50	x	
EP 511	EPDBP-2020-50-09			50								3.438	7	51.82	55.58	x	
EP 512	EPDBP-2030-8-04			8								2.937	10	8.87	9.13	9.55	10.33
EP 513	EPDBP-2030-16-04	3	1.5	16	0.4	2.5	2.86	3.048	7	55	4	17.25	17.89	18.79	20.60		
EP 514	EPDBP-2030-20-04			20								3.104	7	21.29	22.04	23.34	25.74
EP 515	EPDBP-2030-30-09			30								3.724	70	-	31.82	33.84	x
EP 516	EPDBP-2030-40-09			40								4.038	80	-	41.92	x	x
EP 517	EPDBP-2030-50-09	3	1.5	50	0.9	2.5	2.86	4.352	10	90	4	-	52.01	x	x		
EP 518	EPDBP-2030-60-09			60								4.667	100	-	62.10	x	x



# High Speed Deep Precision Machining

## EPDRP | Epoch Deep Radius Pencil Neck

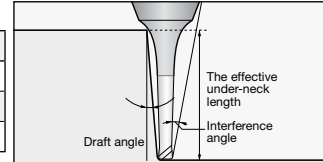
<b>V max</b> High Speed	<b>▽▽▽</b> Finishing	<b>HRC</b> 70	<b>Rib. Miniature</b>	<b>No. of Teeth</b> 2
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※ Back Draft is not available for Diameters 4–6mm

<b>Carbide</b> Micro Grain	<b>TH45+</b> Nano-PVD Coating	<b>Rake Angle</b> Positive
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Helix angle	30°
CR	0.005 mm
D	(0/-0.01 mm)
d	h5



Size													Actual Effective Length in Incline angles					
ID Code	Item Code	Z	D	CR	I <sub>n</sub>	Neck angle θ	l	dn	dn <sub>1</sub>	Neck R	L	d	0°	0.5°	1°	2°	3°	
EP 437	EPDRP-2002-2-09	2	0.2	0.05	2	0.9	0.15	0.17	0.228	10	50	4	1.10	2.34	2.82	3.44	3.93	
EP 438	EPDRP-2004-4-09		0.4	4	0.3								0.37	0.486	1.25	2.69	4.90	5.74
EP 439	EPDRP-2004-5-09		0.5				0.1	5	0.35						0.47	0.518	1.25	2.69
EP 440	EPDRP-2005-5-09				0.1		8	0.35					0.47	0.710			1.30	2.81
EP 441	EPDRP-2005-8-09		0.6	10	0.4		0.57		0.934		1.30	2.81			11.04	12.40	13.28	
EP 442	EPDRP-2005-10-09							0.6			12	0.4	0.57	1.029	1.35	2.92	13.08	14.57
EP 443	EPDRP-2006-12-09		0.8	15	0.4		0.57	1.029	1.35		2.92				16.14	17.81	18.84	
EP 444	EPDRP-2006-15-09								0.8		6	0.4	0.57	0.847	1.35	2.92	16.14	17.81
EP 445	EPDRP-2008-6-04		0.9	12	0.4		0.57	1.131	1.35		2.92				16.14	17.81	18.84	
EP 446	EPDRP-2008-12-09								0.9		8	0.4	0.57	1.131	1.45	3.02	13.08	14.57
EP 447	EPDRP-2010-8-04		1	10	0.4	0.8	0.94	1.041	7	5.09	8.87				9.39	10.11	10.66	
EP 448	EPDRP-2010-10-09							1		15	0.8	0.94	1.543	1.229	7	2.70	5.84	11.24
EP 449	EPDRP-2010-15-09		1.5	20	0.9	0.8	0.94	1.386	10	2.70				5.84	16.32	17.88	18.88	
EP 450	EPDRP-2010-20-09							1.5		25	0.9	0.8	0.94	1.543	10	2.70	5.84	23.39
EP 451	EPDRP-2010-25-09		2	30	0.9	1.35	1.42	1.700	7	2.70				5.84	26.46	28.51	30.93	
EP 452	EPDRP-2010-30-09							2		35	1.35	1.42	2.163	1.857	7	2.70	5.84	31.53
EP 453	EPDRP-2010-35-09		2.5	25	0.9	1.35	1.42	2.015	7	2.70				5.84	36.59	39.03	43.22	
EP 454	EPDRP-2015-15-09							2.5		15	1.35	1.42	2.163	1.849	7	3.89	8.51	16.47
EP 455	EPDRP-2015-25-09		3	30	0.9	1.7	1.92	2.320	7	3.89				8.51		26.60	28.57	31.04
EP 456	EPDRP-2015-30-09							3		30	1.7	1.92	3.123	2.809	10	3.89	8.51	31.66
EP 457	EPDRP-2020-30-0902	2	0.5	40	1.7	1.92	3.123	10	4.24	9.30				31.69		33.84	37.22	
EP 458	EPDRP-2020-30-0905								2	0.2	40	1.7	1.92	3.123	10	4.24	9.30	41.80
EP 459	EPDRP-2020-40-0902	2	0.5	50	1.7	1.92	3.123	10	4.24	9.30	41.77					44.60	x	
EP 460	EPDRP-2020-40-0905								2	0.2	50	1.7	1.92	3.123	10	4.24	9.30	51.90
EP 461	EPDRP-2020-50-0902	3	0.5	60	2.5	2.86	4.352	10	4.24	9.30	51.87					55.68	x	
EP 462	EPDRP-2020-50-0905								3	0.2	60	2.5	2.86	4.352	10	4.24	9.30	51.87
EP 463	EPDRP-2030-40-0902	3	0.2	40	2.5	2.86	4.352	10	6.95	15.40	42.04					x	x	
EP 464	EPDRP-2030-40-0905								3	0.5	40	2.5	2.86	4.352	10	6.95	15.02	42.01
EP 465	EPDRP-2030-50-0902	3	0.2	50	2.5	2.86	4.352	10	6.95	15.40	52.13					x	x	
EP 466	EPDRP-2030-50-0905								3	0.5	50	2.5	2.86	4.352	10	6.95	15.02	52.10
EP 467	EPDRP-2030-60-0902	3	0.2	60	2.5	2.86	4.667	10	6.95	15.40	62.21					x	x	
EP 468	EPDRP-2030-60-0905								3	0.5	60	2.5	2.86	4.667	10	6.95	15.02	62.19


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