

Advanced  
Engineering

Hitachi Tool

HITACHI  
Inspire the Next

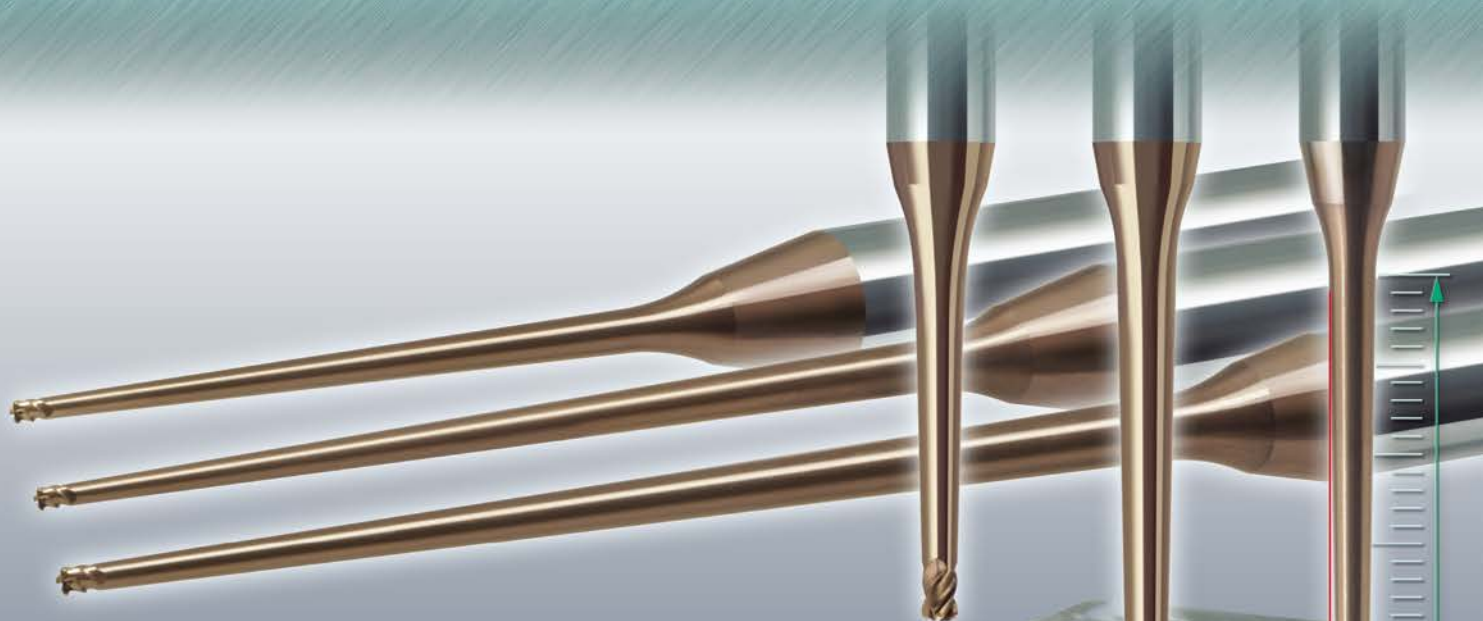
MINIATURE

Nano-PVD Coating  
TH45+

No. 423

# ETRP Epoch Turbo Rib Pencil Neck

Ø 1-3 mm **Deeper+Faster**



- 4-Flute Deep Cutting End Mill
- Diameters:  
1.0 · 1.25 · 1.5 · 1.75  
2.0 · 2.5 · 3.0 mm

CR:  
0.2  
0.3  
0.5  
0.8

Neck angle  $\theta = 0.9^\circ$

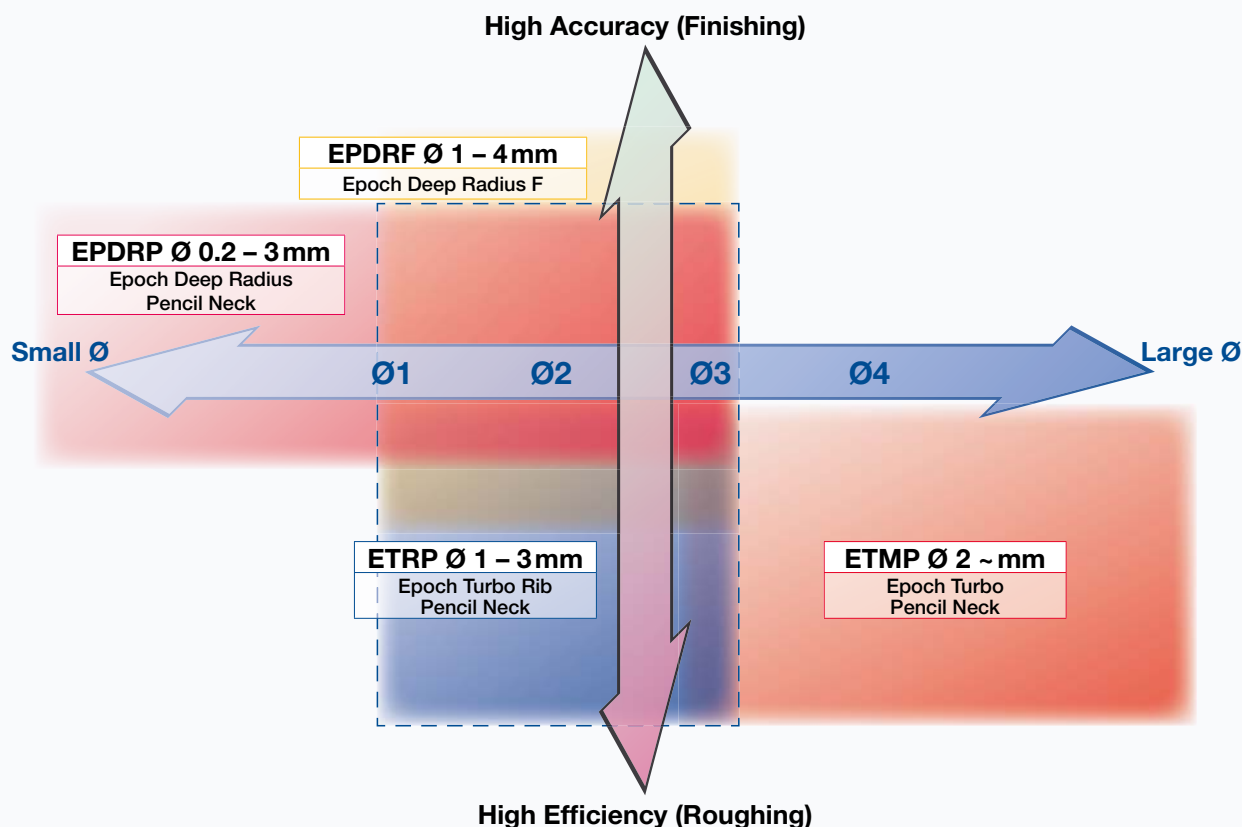
Carbide End Mills · Nano PVD Coated

Ø 1x50D



## High Speed Deep Precision Machining

### Positioning of small diameter deep cutting Corner R End mills



#### OVAL EFFECT

- The special oval shape with reduced diameter connects to end cutting flutes, vibrations are reduced when cutting corner or deep sections. This gives a higher level of cutting efficiency than previously achieved.
- Please be careful when measuring the tool to take the diameter of the main flute and not the diameter of the reduced slave flute.

#### POCH TURBO RIB AXIAL CROSS SECTION DIAGRAM

- Main flute (nominal diameter)
- Slave flute (reduced diameter)
- Clearance (free space between main- and slave flute)
- Cross-section is oval

#### DER OVAL-EFFEKT

- Durch die spezielle ovale Geometrie mit zwei im Durchmesser reduzierten Schneiden werden Vibrationen vermindert, speziell bei Bearbeitungen in Ecken / Umschlingungen und in tiefen Einsatzbereichen. Dies steigert die Effizienz Ihrer Fräsbearbeitungen auf ein vorher nicht erreichbares Niveau
- Bitte achten Sie bei der Werkzeugeinmessung darauf, dass der Nenndurchmesser gemessen wird und nicht der Durchmesser der reduzierten Schneiden

#### QUERSCHNITT DES EPOCH TURBO RIB

- Hauptschneide (Nenndurchmesser)
- Nebenschneide (Reduzierter Durchmesser)
- Differenzbereich (Freiraum zwischen Haupt- und Nebenschneide)
- Querschnitt (Ovale Form)

#### EFFETTO OVALE

- La speciale affilatura con riduzione di diametro su due taglienti, consente la diminuzione delle vibrazioni quando con il percorso utensile si arriva sugli spigoli e nelle lavorazioni in profondità. Questo porta ad avere un'efficienza in fresatura mai vista precedentemente.
- Occorre fare attenzione quando si misura il diametro della fresa, in quanto due denti formano un diametro mentre gli altri due sono scaricati.

#### SEZIONE ASSIALE DI UNA FRESE EPOCH TURBO RIB

- Tagliante principale (Diametro nominale)
- Tagliante secondario (Diametro scaricato)
- Scarico (Differenza tra diametro principale e secondario)
- La sezione risultante è ovale

#### EFECTO OVAL

- La especial geometría oval reduce las vibraciones tanto en las esquinas como en las zonas profundas. Esto permite conseguir un elevado nivel de eficiencia nunca antes logrado.
- Al medir el diámetro de la herramienta hay que tener la precaución de hacerlo en los labios principales y no en los secundarios.

#### DIAGRAMA DE LA SECCIÓN AXIAL.

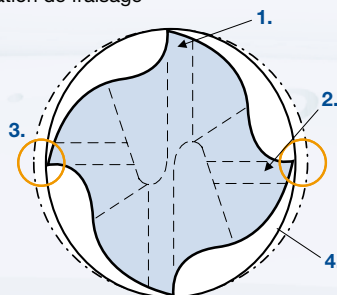
- Labios principales (Diámetro nominal)
- Labios secundarios (Diámetro reducido)
- Diferencial entre labios
- La sección es ovalada

#### EFFET DE L'OVALE

- La double forme ovale due au diamètre réduit des dents esclaves ajoutées aux rayons suppriment les vibrations lors d'usinage instables d'angles ou d'opération de fraisage profond, ceci permet d'être plus efficace que jamais.
- Faites attention en mesurant l'oscillation et le diamètre de l'outil.

#### DIAGRAMME AXIAL DE COUPE DE LA FRAISE EPOCH TURBO RIB

- Dent principale
- Dent esclave
- Dégagement
- La forme croisée ovale

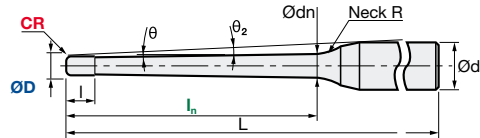
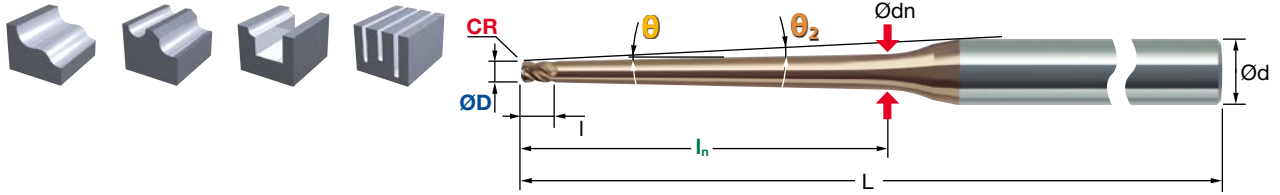


Recommended Cutting Conditions: p. 3 – 4

High Speed Deep Precision Machining

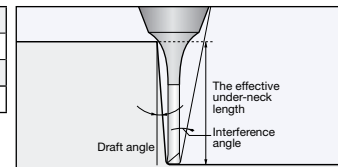
ETRP | Epoch Turbo Rib Pencil Neck

V max High Speed
Roughing
Semi-Finishing
Finishing
HRC 65
Rib. Miniature
No. of Teeth 4



Carbide Micro Grain
TH45+ Nano-PVD Coating
Rake Angle Negative

D	(0 / -0.02)
CR	± 0.01
Ød	h5
Helix angle	45°



ID Code	Item Code	Z	Size										Actual Effective Length in Incline Angles																	
			ØD	CR	l <sub>n</sub>	l	dn	L	d	Neck R	θ°	θ <sub>2</sub> °	0°	1°	1.5°	2°	3°													
EP676	ETRP-4010-5-0902-TH	4	1	0.2	5	1	1.066	60	7	4	0.9°	8.67	2.91	5.70	5.96	6.17	6.51													
EP677	ETRP-4010-10-0902-TH				10									1.223	7	6.78	11.04	11.60	12.03	12.70										
EP678	ETRP-4010-15-0902-TH				15									1.380	7	5.57	16.35	17.25	17.89	18.89										
EP679	ETRP-4010-20-0902-TH				20									1.537	70	4.72	21.42	22.49	23.22	24.80										
EP680	ETRP-4010-25-0902-TH				25									1.694	70	4.10	26.49	27.70	28.52	30.95										
EP681	ETRP-4010-30-0902-TH				30									1.851	80	3.62	31.55	32.90	33.79	37.09										
EP682	ETRP-4010-35-0902-TH				35									2.008	80	3.24	36.61	38.08	39.03	43.24										
EP683	ETRP-4010-40-0902-TH				40									2.165	90	2.94	41.67	43.25	44.54	x										
EP684	ETRP-4010-45-0902-TH				45									2.322	90	2.68	46.73	48.41	50.08	x										
EP685	ETRP-4010-50-0902-TH				50									2.480	100	2.47	51.78	53.56	55.62	x										
EP686	ETRP-40125-10-0902-TH				1.25									0.2	10	1.25	1.455	60	7	7	0.9°	6.62	3.47	11.10	11.65	12.06	12.73			
EP687	ETRP-40125-20-0902-TH														20									1.769	70	4.57	21.49	22.52	23.25	24.86
EP688	ETRP-40125-30-0902-TH														30									2.083	80	3.49	31.61	32.93	33.81	37.15
EP689	ETRP-40125-40-0902-TH				1.5									0.3	40	1.5	2.397	90	10	10	0.9°	2.82	4.04	41.73	43.28	44.59	x			
EP690	ETRP-40125-50-0902-TH														50									2.712	100	2.37	51.83	53.59	55.67	x
EP691	ETRP-4015-10-0903-TH	10	1.687	60		6.47	11.15	11.67	12.08	12.74																				
EP692	ETRP-4015-20-0903-TH	1.75	0.3	20	1.75	2.001	70	7	7	0.9°	4.43	4.93	21.54	22.55	23.27	24.88														
EP693	ETRP-4015-30-0903-TH			30									2.315	80	3.36	31.66	32.95	33.83	37.17											
EP694	ETRP-4015-40-0903-TH			40									2.630	90	2.71	41.77	43.30	44.62	x											
EP695	ETRP-4015-50-0903-TH	1.75	0.3	50	1.75	2.944	100	6	6	0.9°	2.27	4.93	51.88	53.60	55.70	x														
EP696	ETRP-40175-10-0903-TH			10									1.909	60	6.28	11.24	11.74	12.13	12.77											
EP697	ETRP-40175-20-0903-TH			20									2.223	70	4.26	21.64	22.61	23.32	24.97											
EP698	ETRP-40175-30-0903-TH	2	0.5	30	2	2.538	80	10	10	0.9°	3.22	4.54	31.75	33.00	33.86	37.26														
EP699	ETRP-40175-40-0903-TH			40									2.852	90	2.59	41.86	43.34	44.70	x											
EP700	ETRP-40175-50-0903-TH			50									3.166	100	2.16	51.95	53.64	55.78	x											
EP701	ETRP-4020-20-0905-TH	2	0.5	20	2	2.486	70	7	7	0.9°	4.12	4.54	21.29	22.10	22.67	24.86														
EP702	ETRP-4020-30-0905-TH			30									2.800	80	3.10	31.69	32.96	33.83	37.16											
EP703	ETRP-4020-40-0905-TH			40									3.114	90	2.48	41.80	43.31	44.63	x											
EP704	ETRP-4020-50-0905-TH	2.5	0.5	50	2.5	3.428	100	10	10	0.9°	2.07	5.68	51.90	53.16	55.71	x														
EP705	ETRP-4020-60-0905-TH			60									3.742	110	1.77	62.00	63.89	x	x											
EP706	ETRP-4025-20-0905-TH			20									2.950	70	3.76	21.39	22.16	22.72	24.98											
EP707	ETRP-4025-30-0905-TH	2.5	0.5	30	2.5	3.264	80	7	7	0.9°	2.79	5.68	31.80	33.02	33.88	x														
EP708	ETRP-4025-40-0905-TH			40									3.578	90	2.22	41.90	43.36	44.73	x											
EP709	ETRP-4025-50-0905-TH			50									3.892	100	1.85	52.00	53.66	x	x											
EP710	ETRP-4025-60-0905-TH	3	0.8	60	3	4.207	110	10	10	0.9°	1.58	7.45	62.09	63.93	x	x														
EP711	ETRP-4030-20-0908-TH			20									3.394	70	3.39	21.50	22.22	22.76	25.05											
EP712	ETRP-4030-30-0908-TH			30									3.708	80	2.49	31.59	32.54	33.74	x											
EP713	ETRP-4030-40-0908-TH	3	0.8	40	3	4.022	90	7	7	0.9°	1.96	7.45	42.03	43.42	x	x														
EP714	ETRP-4030-50-0908-TH			50									4.337	100	1.62	52.12	53.72	x	x											
EP715	ETRP-4030-60-0908-TH			60									4.651	110	1.37	62.20	x	x	x											

x = no contact

## Product Range

Solid Carbide End Mills

micro**EndMill**

**CBN**  
Cubic Boron Nitride

**HD**  
COATING

**Epoch21**

**MINIATURE**

**3D-Cut**

Indexable Milling Tools

**Indexable**  
Milling

ESM Speed End Mills

EMC Power Drills

**ESM**  
**SPEED**

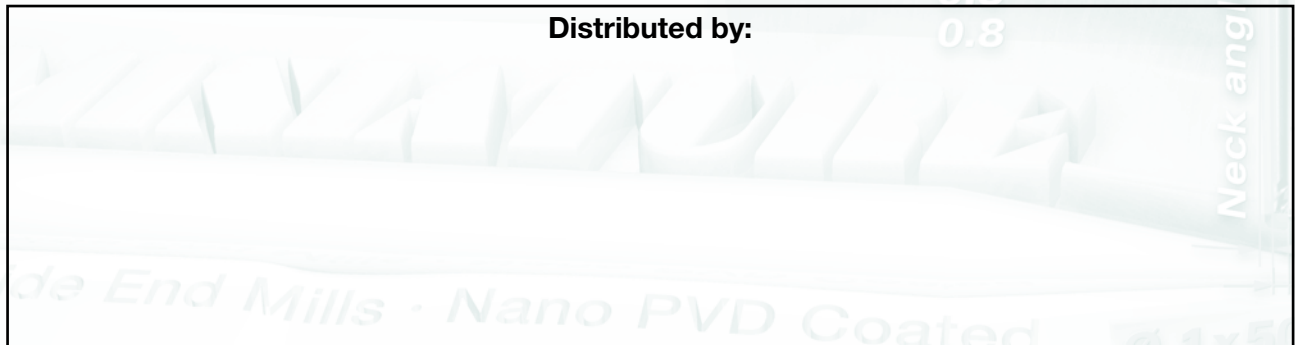
Milling Chucks

1.0 · 1.25 · 1.5 · 1.75

2.0 · 2.5 · 3.0 mm

**Milling**  
**Chucks**

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