

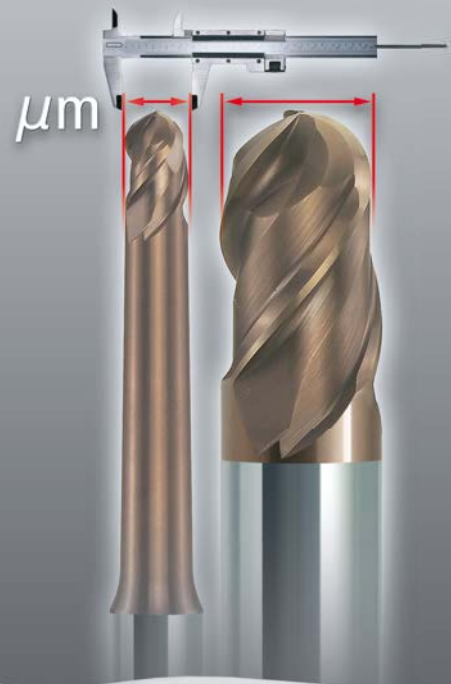
# **EMB/P**

## **Epoch Mega Feed Ball/Pencil Neck**

### **Solid Carbide 3-Flute End Mill for High Efficient Milling**

**D2mm ~ D12mm**

- For Materials  $\leq 65\text{HRC}$
- Diameter checked:  
Labeled on box



## EMB-TH/EMBP-TH | Epoch Mega Feed Ball End Mill / Pencil Neck

### 🇬🇧 The performance of three – the accuracy of two flutes!

#### 1. The Triangle Effect

For radius accuracy and excellent finishing. Center point area is formed by "Triangle Face" that is different from relief angle on the radius section. This "Triangle Effect" improves radius accuracy.

#### 2. 3 Flute Effect

For high efficiency with improved chip evacuation.

#### 3. Unequal Division Effect

Unequal division is effective to avoid chatter and vibration especially in deep milling and high hardness materials.

### 🇩🇪 Die Leistung von drei Schneiden mit der Präzision eines Zweischneiders!

#### 1. Der Dreiecks-Effekt

Für hohe Radiusgenauigkeit und exzellente Oberflächen-güte. Die Fräuserspitze ist wie ein Dreieck geformt, welches sich vom Freiwinkel in der Radius-Sektion unterscheidet. Dieser "Dreiecks-Effekt" verbessert die Radiusgenauigkeit.

#### 2. Der 3-Schneiden-Effekt

Für höchste Effizienz bei verbesserter Späneabfuhr.

#### 3. Die unterschiedliche Winkelaufteilung

Die Aufteilung in drei verschieden große Winkel vermeidet Rattern und Vibration, besonders beim tiefen Fräsen in sehr hartem Material.

### 🇮🇹 La potenza di tre taglienti abbinata alla precisione di un utensile a due taglienti!

#### 1. Effetto triangolo

Per un'elevata precisione del raggio e un'eccellente finitura superficiale. La punta della fresa è a forma triangolare e si differenzia dall'angolo di incidenza nella sezione del raggio. Questo "effetto triangolo" migliora notevolmente la precisione del raggio.

#### 2. L'effetto 3 denti

Garantisce la massima efficienza migliorando la rimozione dei trucioli.

#### 3. La differente suddivisione angolare

La suddivisione in tre differenti angoli impedisce le vibrazioni e i saltellamenti, soprattutto durante le operazioni di fresatura eseguite in profondità nei materiali molto duri.

### 🇪🇸 ¡El rendimiento de una fresa de tres labios con la precisión de una de dos labios!

#### 1. El efecto triangular.

Para una alta precisión de radio y una excelente calidad superficial. La punta de la fresa tiene un área triangular con diferente ángulo de incidencia que en la sección del radio. Este "efecto triangular" mejora la precisión del radio.

#### 2. El efecto de 3 labios.

Garantiza una máxima eficiencia y mejora la evacuación de viruta.

#### 3. La distinta subdivisión angular.

La división en tres ángulos de distinto tamaño evita las vibraciones, especialmente en el fresado profundo de materiales duros.

### 🇫🇷 Les performances d'une fraise à trois dents – la précision d'une deux dents !

#### 1. L'effet triangulaire

Pour les tolérances du rayon et une excellente finition. Le point central est constitué d'une « surface triangulaire », différente de l'angle de dépouille à l'intersection du rayon. « L'effet triangulaire » améliore la précision du rayon.

#### 2. L'effet trois dents

Pour une efficacité maximale avec amélioration de l'évacuation des copeaux.

#### 3. L'effet des angles différentiels

La différence de l'angle entre chaque dent évite les phénomènes de broutage et de résonance, particulièrement lors de passes profondes et dans l'usinage de matériaux durs.

### 🇵🇹 O rendimento de uma fresa de três navalhas com a precisão de duas.

#### 1. O efeito triangular

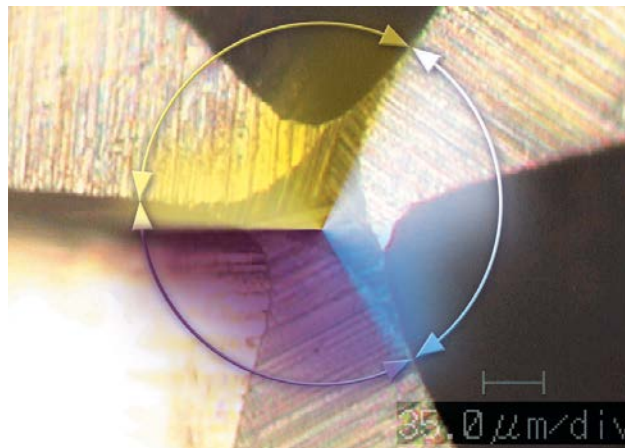
Para uma alta precisão do raio e uma excelente qualidade superficial a ponta da fresa têm uma área triangular com diferentes ângulos de incidência com a secção do raio. Este "efeito triangular" melhora a precisão do raio.

#### 2. O efeito de três navalhas

Garantia de uma máxima eficácia e melhoria na remoção das aparas.

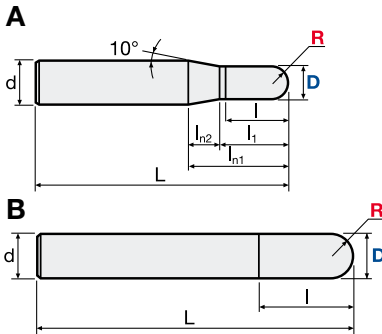
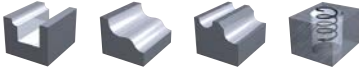
#### 3. A diferente subdivisão angular

A divisão em três ângulos de diferente tamanho evita as vibrações, especialmente em fresagem profunda de materiais duros.



## EMB-TH | Epoch Mega Feed Ball

<b>V max</b> High Speed	<b>Q max</b> High Efficient	<b>▽</b> Roughing	<b>▽▽</b> Semi-Finishing	<b>▽▽▽</b> Finishing	<b>HRC</b> 65	<b>No. of Teeth</b> 3
----------------------------	--------------------------------	----------------------	-----------------------------	-------------------------	------------------	--------------------------

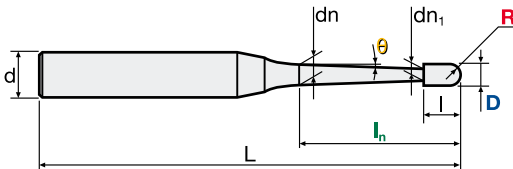


<b>Carbide</b> Micro Grain	<b>TH45+</b> Nano-PVD Coating	<b>Rake Angle</b> Negative
-------------------------------	----------------------------------	-------------------------------

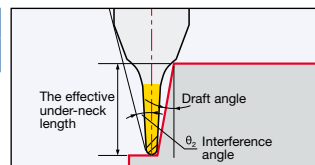
Helix Angle	R Tol. [mm]	d Tol.
<b>40°</b>	<b>+/- 0.010</b>	<b>h5</b>

ID Code	Item Code	D	R	I	I <sub>1</sub>	I <sub>n1</sub>	I <sub>n2</sub>	L	d	Type
EP633	<b>EMB-3020TH</b>	2	1	3	4	15.3	11.3	50	6	A
EP634	<b>EMB-3030TH</b>	3	1.5	4.5	5.5	14	8.5	70		
EP635	<b>EMB-3040TH</b>	4	2	6	7	12.7	5.7	80		
EP636	<b>EMB-3050TH</b>	5	2.5	7.5	8.5	11.3	2.8	90		
EP637	<b>EMB-3060TH</b>	6	3	9	-	-	-	100	8	B
EP638	<b>EMB-3080TH</b>	8	4	12				100	10	
EP639	<b>EMB-3100TH</b>	10	5	15				110	12	
EP640	<b>EMB-3120TH</b>	12	6	18				110	12	

## EMBP-TH | Epoch Mega Feed Ball Pencil Neck



Helix Angle	R Tol. [mm]	d Tol.
<b>40°</b>	<b>+/- 0.010</b>	<b>h5</b>


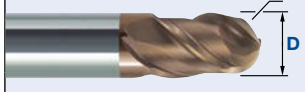




Size											Actual Effective Length in Incline Angles			
ID Code	Item Code	D	I <sub>n</sub>	R	θ	I	dn <sub>1</sub>	dn	L	d	1°	2°	3°	
EP641	EMBP-3040-30-10TH	4	30	2	1°	6	3.9	4.738	80	6	31.41	x	x	
EP642	EMBP-3040-40-10TH		40					5.087	90		41.72	x	x	
EP643	EMBP-3040-50-10TH		50					5.436	100		51.72	x	x	
EP644	EMBP-3040-60-10TH		60					5.785			x	x	x	
EP645	EMBP-3050-40-10TH	5	40	2.5		7.5	4.9	6.035	90	8	41.50	44.46	x	
EP646	EMBP-3050-60-10TH		60					6.733	110		61.83	x	x	
EP647	EMBP-3060-50-10TH	6	50	3		9	5.9	7.331	100		51.58	x	x	
EP648	EMBP-3060-60-10TH		60					7.680	110		x	x	x	
EP649	EMBP-3060-70-10TH		70					8.030	120		71.93	x	x	
EP650	EMBP-3060-80-10TH		80					8.379	130	81.93	x	x		
EP651	EMBP-3080-60-10TH	8	60	4		12	7.9	9.576	120	10	x	x	x	
EP652	EMBP-3080-70-10TH		70					9.925	130		x	x	x	
EP653	EMBP-3080-80-10TH		80					10.274	140		82.11	x	x	
EP654	EMBP-3100-60-10TH	10	60	5		15	9.9	11.471	130		12	61.88	x	x
EP655	EMBP-3100-75-10TH		75					11.995	140	x		x	x	

Cutting Conditions | Schnittwerte | Condizioni di taglio | Condiciones de Corte | Conditions de coupe | Valores de corte:

Straight Neck Type D2– D12 | Pencil Neck Type D4– D10 : Page 4–5



## EMB-TH | Recommended Cutting Conditions

 Roughing	Carbon Steels. Alloy Steels 180~250HB							Tool Steels 25~35HRC				
	D	R	n (min <sup>-1</sup> )	f <sub>z</sub> (mm)	V <sub>t</sub> (mm/min)	a <sub>p</sub> (mm)	a <sub>e</sub> (mm)	n (min <sup>-1</sup> )	f <sub>z</sub> (mm)	V <sub>t</sub> (mm/min)	a <sub>p</sub> (mm)	a <sub>e</sub> (mm)
 Straight Neck Type	2	1	39,800	0.038	4,540	0.18	0.72	36,600	0.038	4,170	0.18	0.72
	3	1.5	26,500	0.060	4,770	0.27	1.08	24,400	0.060	4,390	0.27	1.08
	4	2	19,900	0.082	4,900	0.36	1.44	18,300	0.082	4,500	0.36	1.44
	5	2.5	15,900	0.110	5,250	0.45	1.80	14,600	0.110	4,820	0.45	1.80
	6	3	13,300	0.137	5,470	0.54	2.16	12,200	0.137	5,010	0.54	2.16
	8	4	10,000	0.192	5,760	0.72	2.88	9,200	0.192	5,300	0.72	2.88
	10	5	8,000	0.260	6,240	0.90	3.60	7,300	0.260	5,690	0.90	3.60
	12	6	6,600	0.285	5,640	1.08	4.32	6,100	0.285	5,220	1.08	4.32

 Finishing	Carbon Steels. Alloy Steels 180~250HB							Tool Steels 25~35HRC				
	D	R	n (min <sup>-1</sup> )	f <sub>z</sub> (mm)	V <sub>t</sub> (mm/min)	a <sub>p</sub> (mm)	a <sub>e</sub> (mm)	n (min <sup>-1</sup> )	f <sub>z</sub> (mm)	V <sub>t</sub> (mm/min)	a <sub>p</sub> (mm)	a <sub>e</sub> (mm)
 Straight Neck Type	2	1	52,500	0.026	4,100	0.05-0.10	0.05-0.10	49,000	0.026	3,820	0.05-0.10	0.05-0.10
	3	1.5	35,000	0.042	4,410	0.05-0.12	0.05-0.12	32,700	0.042	4,120	0.05-0.12	0.05-0.12
	4	2	26,300	0.057	4,500	0.05-0.14	0.05-0.14	24,500	0.057	4,190	0.05-0.14	0.05-0.14
	5	2.5	21,000	0.073	4,600	0.05-0.16	0.05-0.16	19,600	0.073	4,290	0.05-0.16	0.05-0.16
	6	3	17,500	0.092	4,850	0.05-0.18	0.05-0.18	16,300	0.092	4,520	0.05-0.18	0.05-0.18
	8	4	13,100	0.125	4,910	0.05-0.20	0.05-0.20	12,300	0.125	4,610	0.05-0.20	0.05-0.20
	10	5	10,500	0.160	5,040	0.05-0.23	0.05-0.23	9,800	0.160	4,700	0.05-0.23	0.05-0.23
	12	6	8,800	0.190	5,020	0.05-0.25	0.05-0.25	8,200	0.190	4,670	0.05-0.25	0.05-0.25

## EMBP-TH | Recommended Cutting Conditions

<div><div><div>▽</div></div><div>Roughing</div></div>	Carbon Steels. Alloy Steels 180~250HB							Tool Steels 25~35HRC					
	D	I <sub>n</sub>	R	n (min <sup>-1</sup> )	f <sub>z</sub> (mm)	V <sub>f</sub> (mm/min)	a <sub>p</sub> (mm)	a <sub>e</sub> (mm)	n (min <sup>-1</sup> )	f <sub>z</sub> (mm)	V <sub>f</sub> (mm/min)	a <sub>p</sub> (mm)	a <sub>e</sub> (mm)
<div>Pencil Neck Type</div> <div></div>	4	30	2	16,400	0.077	3,780	0.28	1.12	14,600	0.077	3,380	0.24	0.96
		40		14,800	0.077	3,420	0.28	1.12	13,200	0.077	3,060	0.24	0.96
		50		11,500	0.066	2,280	0.28	1.12	10,200	0.066	2,020	0.24	0.96
		60		8,300	0.055	1,370	0.28	1.12	7,400	0.055	1,220	0.24	0.96
	5	40	2.5	13,200	0.099	3,930	0.35	1.40	11,700	0.099	3,470	0.30	1.20
		60		10,600	0.088	2,800	0.35	1.40	9,300	0.088	2,450	0.30	1.20
	6	50	3	10,900	0.132	4,320	0.42	1.68	9,800	0.132	3,880	0.36	1.44
		60		9,900	0.132	3,930	0.42	1.68	8,700	0.132	3,450	0.36	1.44
		70		8,700	0.121	3,160	0.42	1.68	7,800	0.121	2,830	0.36	1.44
		80		7,700	0.110	2,540	0.42	1.68	6,800	0.110	2,240	0.36	1.44
	8	60	4	8,300	0.176	4,390	0.56	2.24	7,400	0.176	3,900	0.48	1.92
		70		7,800	0.176	4,110	0.56	2.24	6,900	0.176	3,640	0.48	1.92
		80		7,400	0.154	3,420	0.56	2.24	6,600	0.154	3,040	0.48	1.92
	10	60	5	7,200	0.220	4,750	0.70	2.80	6,400	0.220	4,220	0.60	2.40
		75		6,600	0.220	4,360	0.70	2.80	5,900	0.220	3,890	0.60	2.40

<div> Finishing</div>	Carbon Steels. Alloy Steels 180~250HB								Tool Steels 25~35HRC				
	D	I <sub>n</sub>	R	n (min <sup>-1</sup> )	f <sub>z</sub> (mm)	V <sub>f</sub> (mm/min)	a <sub>p</sub> (mm)	a <sub>e</sub> (mm)	n (min <sup>-1</sup> )	f <sub>z</sub> (mm)	V <sub>f</sub> (mm/min)	a <sub>p</sub> (mm)	a <sub>e</sub> (mm)
<div> Pencil Neck Type</div>	4	30	2	19,300	0.053	3,000	0.05-0.14	0.05-0.14	17,500	0.053	2,800	0.05-0.14	0.05-0.14
		40		17,400	0.053	2,700	0.05-0.14	0.05-0.14	15,700	0.053	2,500	0.05-0.14	0.05-0.14
		50		13,500	0.053	2,100	0.05-0.14	0.05-0.14	12,200	0.053	1,900	0.05-0.14	0.05-0.14
		60		9,700	0.042	1,200	0.05-0.14	0.05-0.14	8,800	0.042	1,100	0.05-0.14	0.05-0.14
	5	40	2.5	15,400	0.063	2,900	0.05-0.16	0.05-0.16	14,000	0.063	2,700	0.05-0.16	0.05-0.16
		60		12,300	0.053	1,900	0.05-0.16	0.05-0.16	11,200	0.053	1,800	0.05-0.16	0.05-0.16
	6	50	3	12,900	0.074	2,800	0.05-0.18	0.05-0.18	11,700	0.074	2,600	0.05-0.18	0.05-0.18
		60		11,600	0.074	2,600	0.05-0.18	0.05-0.18	10,500	0.074	2,300	0.05-0.18	0.05-0.18
		70		10,200	0.063	1,900	0.05-0.18	0.05-0.18	9,400	0.063	1,800	0.05-0.18	0.05-0.18
		80		9,000	0.053	1,400	0.05-0.18	0.05-0.18	8,100	0.053	1,300	0.05-0.18	0.05-0.18
	8	60	4	9,700	0.098	2,800	0.05-0.20	0.05-0.20	8,800	0.105	2,800	0.05-0.20	0.05-0.20
		70		9,100	0.105	2,900	0.05-0.20	0.05-0.20	8,400	0.105	2,600	0.05-0.20	0.05-0.20
		80		8,700	0.094	2,500	0.05-0.20	0.05-0.20	7,900	0.094	2,200	0.05-0.20	0.05-0.20
	10	60	5	8,500	0.126	3,200	0.05-0.23	0.05-0.23	7,700	0.126	2,900	0.05-0.23	0.05-0.23
		75		7,700	0.126	2,900	0.05-0.23	0.05-0.23	7,000	0.126	2,600	0.05-0.23	0.05-0.23

### NOTE

1. Use the machine with the highest rigidity and accuracy as possible.
2. The pick feed in the table is a general condition; please select the a<sub>p</sub> according to the cusp height requested.

3. These conditions are for general guidance; in actual machining conditions adjust the parameters according to your actual machine and work-piece conditions.
4. If the rpm available is lower than that recommended please reduce the feed rate to the same ratio.



Pre-Hardened Steels 35~45HRC					Hardened Steels 45~55HRC					Hardened Steels 55~65HRC				
n (min <sup>-1</sup> )	f <sub>z</sub> (mm)	V <sub>f</sub> (mm/min)	a <sub>p</sub> (mm)	a <sub>e</sub> (mm)	n (min <sup>-1</sup> )	f <sub>z</sub> (mm)	V <sub>f</sub> (mm/min)	a <sub>p</sub> (mm)	a <sub>e</sub> (mm)	n (min <sup>-1</sup> )	f <sub>z</sub> (mm)	V <sub>f</sub> (mm/min)	a <sub>p</sub> (mm)	a <sub>e</sub> (mm)
32,600	0.036	3,530	0.18	0.72	27,900	0.030	2,540	0.12	0.48	24,500	0.023	1,680	0.08	0.32
21,800	0.057	3,730	0.27	1.08	18,600	0.048	2,680	0.18	0.72	16,300	0.036	1,760	0.12	0.48
16,300	0.078	3,810	0.36	1.44	13,900	0.066	2,740	0.24	0.96	12,300	0.049	1,820	0.16	0.64
13,100	0.105	4,110	0.45	1.80	11,100	0.088	2,930	0.30	1.20	9,800	0.066	1,940	0.20	0.80
10,900	0.130	4,260	0.54	2.16	9,300	0.110	3,060	0.36	1.44	8,200	0.082	2,020	0.24	0.96
8,200	0.182	4,490	0.72	2.88	7,000	0.154	3,230	0.48	1.92	6,100	0.115	2,110	0.32	1.28
6,500	0.247	4,820	0.90	3.60	5,600	0.208	3,490	0.60	2.40	4,900	0.156	2,290	0.40	1.60
5,400	0.271	4,390	1.08	4.32	4,600	0.228	3,150	0.72	2.88	4,100	0.171	2,100	0.48	1.92

Pre-Hardened Steels 35~45HRC					Hardened Steels 45~55HRC					Hardened Steels 55~65HRC				
n (min <sup>-1</sup> )	f <sub>z</sub> (mm)	V <sub>f</sub> (mm/min)	a <sub>p</sub> (mm)	a <sub>e</sub> (mm)	n (min <sup>-1</sup> )	f <sub>z</sub> (mm)	V <sub>f</sub> (mm/min)	a <sub>p</sub> (mm)	a <sub>e</sub> (mm)	n (min <sup>-1</sup> )	f <sub>z</sub> (mm)	V <sub>f</sub> (mm/min)	a <sub>p</sub> (mm)	a <sub>e</sub> (mm)
45,400	0.025	3,360	0.05-0.10	0.05-0.10	36,600	0.021	2,280	0.05-0.10	0.05-0.10	31,500	0.016	1,470	0.05-0.10	0.05-0.10
30,300	0.040	3,630	0.05-0.12	0.05-0.12	24,400	0.034	2,460	0.05-0.12	0.05-0.12	21,000	0.025	1,590	0.05-0.12	0.05-0.12
22,700	0.054	3,690	0.05-0.14	0.05-0.14	18,300	0.046	2,500	0.05-0.14	0.05-0.14	15,800	0.034	1,620	0.05-0.14	0.05-0.14
18,200	0.069	3,790	0.05-0.16	0.05-0.16	14,600	0.058	2,560	0.05-0.16	0.05-0.16	12,600	0.044	1,660	0.05-0.16	0.05-0.16
15,100	0.088	3,980	0.05-0.18	0.05-0.18	12,200	0.074	2,710	0.05-0.18	0.05-0.18	10,500	0.055	1,750	0.05-0.18	0.05-0.18
11,300	0.119	4,030	0.05-0.20	0.05-0.20	9,200	0.100	2,760	0.05-0.20	0.05-0.20	7,900	0.075	1,780	0.05-0.20	0.05-0.20
9,100	0.152	4,150	0.05-0.23	0.05-0.23	7,300	0.128	2,800	0.05-0.23	0.05-0.23	6,300	0.096	1,810	0.05-0.23	0.05-0.23
7,600	0.181	4,120	0.05-0.25	0.05-0.25	6,100	0.152	2,780	0.05-0.25	0.05-0.25	5,300	0.114	1,810	0.05-0.25	0.05-0.25

Pre-Hardened Steels 35~45HRC					Hardened Steels 45~55HRC					Hardened Steels 55~65HRC				
n (min <sup>-1</sup> )	f <sub>z</sub> (mm)	V <sub>f</sub> (mm/min)	a <sub>p</sub> (mm)	a <sub>e</sub> (mm)	n (min <sup>-1</sup> )	f <sub>z</sub> (mm)	V <sub>f</sub> (mm/min)	a <sub>p</sub> (mm)	a <sub>e</sub> (mm)	n (min <sup>-1</sup> )	f <sub>z</sub> (mm)	V <sub>f</sub> (mm/min)	a <sub>p</sub> (mm)	a <sub>e</sub> (mm)
12,800	0.073	2,800	0.20	0.80	10,500	0.062	1,950	0.12	0.48	8,800	0.046	1,220	0.08	0.32
11,500	0.073	2,530	0.20	0.80	9,500	0.061	1,750	0.12	0.48	7,900	0.046	1,100	0.08	0.32
9,000	0.063	1,690	0.20	0.80	7,400	0.053	1,170	0.12	0.48	6,200	0.039	730	0.08	0.32
6,400	0.052	1,010	0.20	0.80	5,300	0.044	700	0.12	0.48	4,400	0.033	440	0.08	0.32
10,200	0.094	2,870	0.25	1.00	8,400	0.079	1,990	0.15	0.60	7,000	0.060	1,250	0.10	0.40
8,200	0.084	2,060	0.25	1.00	6,700	0.070	1,410	0.15	0.60	5,600	0.052	880	0.10	0.40
8,500	0.125	3,200	0.30	1.20	7,000	0.105	2,210	0.18	0.72	5,800	0.079	1,370	0.12	0.48
7,700	0.125	2,890	0.30	1.20	6,300	0.105	1,990	0.18	0.72	5,300	0.079	1,260	0.12	0.48
6,800	0.115	2,350	0.30	1.20	5,600	0.097	1,630	0.18	0.72	4,600	0.072	1,000	0.12	0.48
6,000	0.104	1,880	0.30	1.20	5,000	0.094	1,410	0.18	0.72	4,100	0.066	820	0.12	0.48
6,400	0.167	3,210	0.40	1.60	5,300	0.141	2,230	0.24	0.96	4,400	0.105	1,390	0.16	0.64
6,100	0.167	3,060	0.40	1.60	5,000	0.141	2,110	0.24	0.96	4,200	0.105	1,330	0.16	0.64
5,800	0.147	2,550	0.40	1.60	4,700	0.123	1,730	0.24	0.96	4,000	0.093	1,110	0.16	0.64
5,600	0.209	3,510	0.50	2.00	4,600	0.176	2,430	0.30	1.20	3,900	0.132	1,540	0.20	0.80
5,200	0.209	3,270	0.50	2.00	4,200	0.176	2,210	0.30	1.20	3,500	0.132	1,380	0.20	0.80

Pre-Hardened Steels 35~45HRC					Hardened Steels 45~55HRC					Hardened Steels 55~65HRC				
n (min <sup>-1</sup> )	f <sub>z</sub> (mm)	V <sub>f</sub> (mm/min)	a <sub>p</sub> (mm)	a <sub>e</sub> (mm)	n (min <sup>-1</sup> )	f <sub>z</sub> (mm)	V <sub>f</sub> (mm/min)	a <sub>p</sub> (mm)	a <sub>e</sub> (mm)	n (min <sup>-1</sup> )	f <sub>z</sub> (mm)	V <sub>f</sub> (mm/min)	a <sub>p</sub> (mm)	a <sub>e</sub> (mm)
15,700	0.050	2,400	0.05-0.14	0.05-0.14	14,000	0.042	1,800	0.05-0.14	0.05-0.14	12,200	0.032	1,200	0.05-0.14	0.05-0.14
14,200	0.050	2,100	0.05-0.14	0.05-0.14	12,700	0.042	1,600	0.05-0.14	0.05-0.14	11,000	0.032	1,000	0.05-0.14	0.05-0.14
11,000	0.050	1,700	0.05-0.14	0.05-0.14	9,800	0.042	1,200	0.05-0.14	0.05-0.14	8,600	0.031	800	0.05-0.14	0.05-0.14
7,900	0.040	900	0.05-0.14	0.05-0.14	7,000	0.033	700	0.05-0.14	0.05-0.14	6,200	0.025	500	0.05-0.14	0.05-0.14
12,700	0.060	2,300	0.05-0.16	0.05-0.16	11,200	0.050	1,700	0.05-0.16	0.05-0.16	9,800	0.038	1,100	0.05-0.16	0.05-0.16
10,100	0.050	1,500	0.05-0.16	0.05-0.16	8,900	0.042	1,100	0.05-0.16	0.05-0.16	7,800	0.032	700	0.05-0.16	0.05-0.16
10,500	0.070	2,200	0.05-0.18	0.05-0.18	9,400	0.059	1,700	0.05-0.18	0.05-0.18	8,100	0.044	1,100	0.05-0.18	0.05-0.18
9,500	0.070	2,000	0.05-0.18	0.05-0.18	8,400	0.059	1,500	0.05-0.18	0.05-0.18	7,400	0.044	1,000	0.05-0.18	0.05-0.18
8,400	0.060	1,500	0.05-0.18	0.05-0.18	7,500	0.050	1,100	0.05-0.18	0.05-0.18	6,500	0.038	700	0.05-0.18	0.05-0.18
7,400	0.050	1,100	0.05-0.18	0.05-0.18	6,500	0.044	900	0.05-0.18	0.05-0.18	5,700	0.032	500	0.05-0.18	0.05-0.18
7,900	0.100	2,400	0.05-0.20	0.05-0.20	7,000	0.084	1,800	0.05-0.20	0.05-0.20	6,200	0.063	1,200	0.05-0.20	0.05-0.20
7,500	0.100	2,200	0.05-0.20	0.05-0.20	6,600	0.084	1,700	0.05-0.20	0.05-0.20	5,800	0.063	1,100	0.05-0.20	0.05-0.20
7,000	0.090	1,900	0.05-0.20	0.05-0.20	6,300	0.076	1,400	0.05-0.20	0.05-0.20	5,500	0.057	900	0.05-0.20	0.05-0.20
6,900	0.119	2,500	0.05-0.23	0.05-0.23	6,200	0.101	1,900	0.05-0.23	0.05-0.23	5,400	0.076	1,200	0.05-0.23	0.05-0.23
6,300	0.120	2,300	0.05-0.23	0.05-0.23	5,600	0.101	1,700	0.05-0.23	0.05-0.23	5,000	0.075	1,100	0.05-0.23	0.05-0.23

#### BEMERKUNG

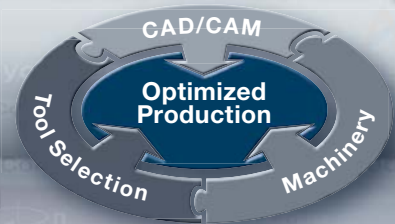
- Nutzen Sie die Maschine mit der höchstmöglichen Präzision und Stabilität.
- Der in der Tabelle angegebene Zeilensprung ist eine allgemeine Empfehlung. Um die jeweiligen Anforderungen an die Oberflächengüte zu erreichen wählen Sie die Bedingungen entsprechend der geforderten Rautiefe.
- Die in der Tabelle angegebenen Schnittbedingungen stellen eine allgemeine Empfehlung dar. Die Werte sollten immer an die jeweilige Bearbeitung, deren Form und die verwendete Maschine angepasst werden.
- Sollte die Ihnen verfügbare Drehzahl niedriger als der in der Tabelle angegebene Wert sein, sollte der Vorschub im gleichen Verhältnis reduziert werden.

The electronic MOLDINO Tool product catalogue

**Quickly find the tools you need for best performance in machining**

**P50QF PRODUCTION50<sup>®</sup> QuickFinder**

[www.production50.com](http://www.production50.com)



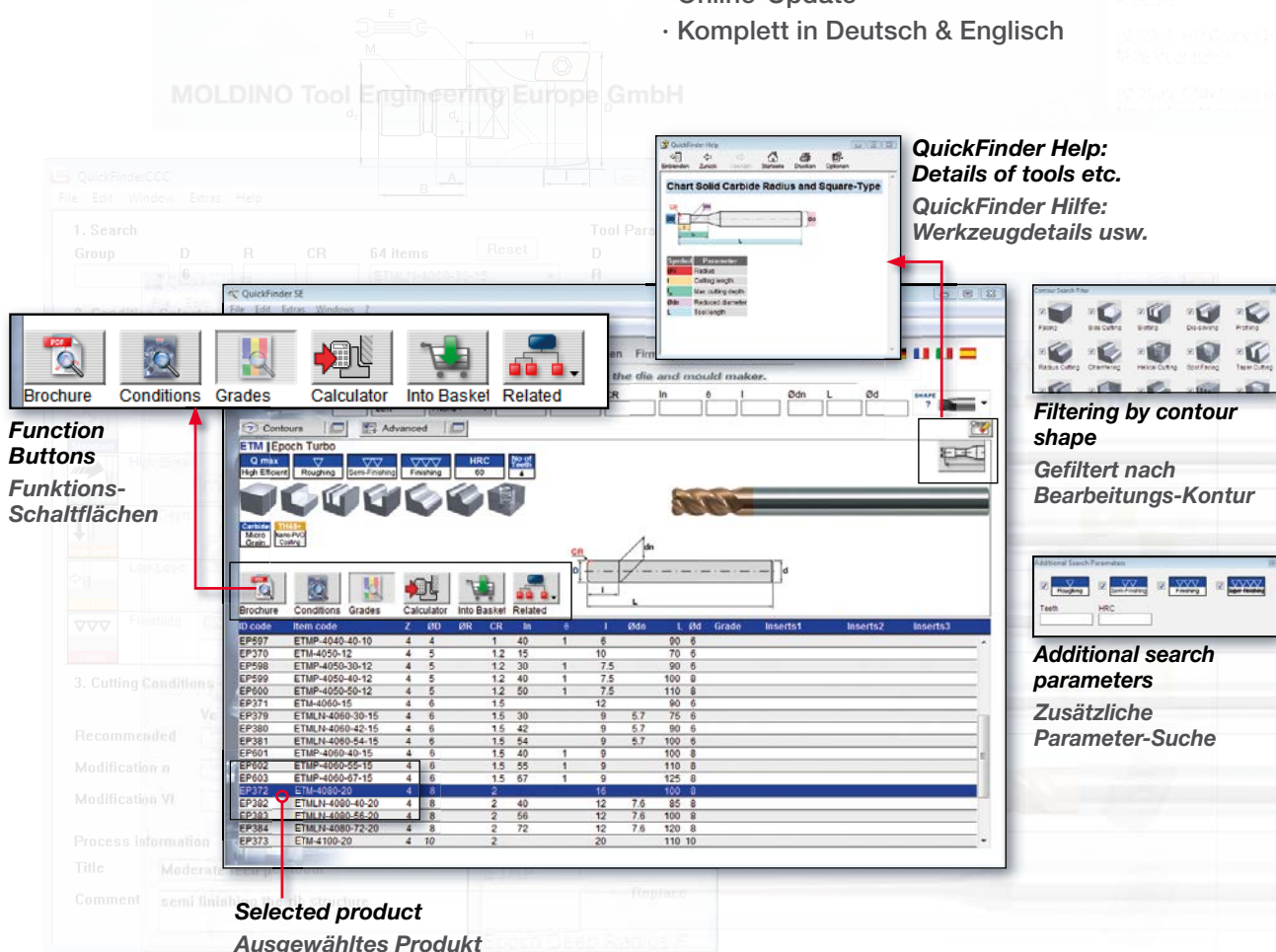
## P50QF | Production50 QuickFinder

**The Quickly-Finding Software for Tools and Tool Accessories**

- Real-time search with catalogue browser
- Cutting conditions calculation with project planning
- Shop system
- Online update

## Die Software zum schnellen Finden von Werkzeugen und Zubehör

- Suche in Echtzeit mit Katalog-Browser
- Schnittwerte-Berechnung mit Projektierung
- Bestellsystem
- Online-Update
- Komplett in Deutsch & Englisch



**Function Buttons**  
Funktions-Schaltflächen

**QuickFinder Help:**  
Details of tools etc.  
**QuickFinder Hilfe:**  
Werkzeugdetails usw.

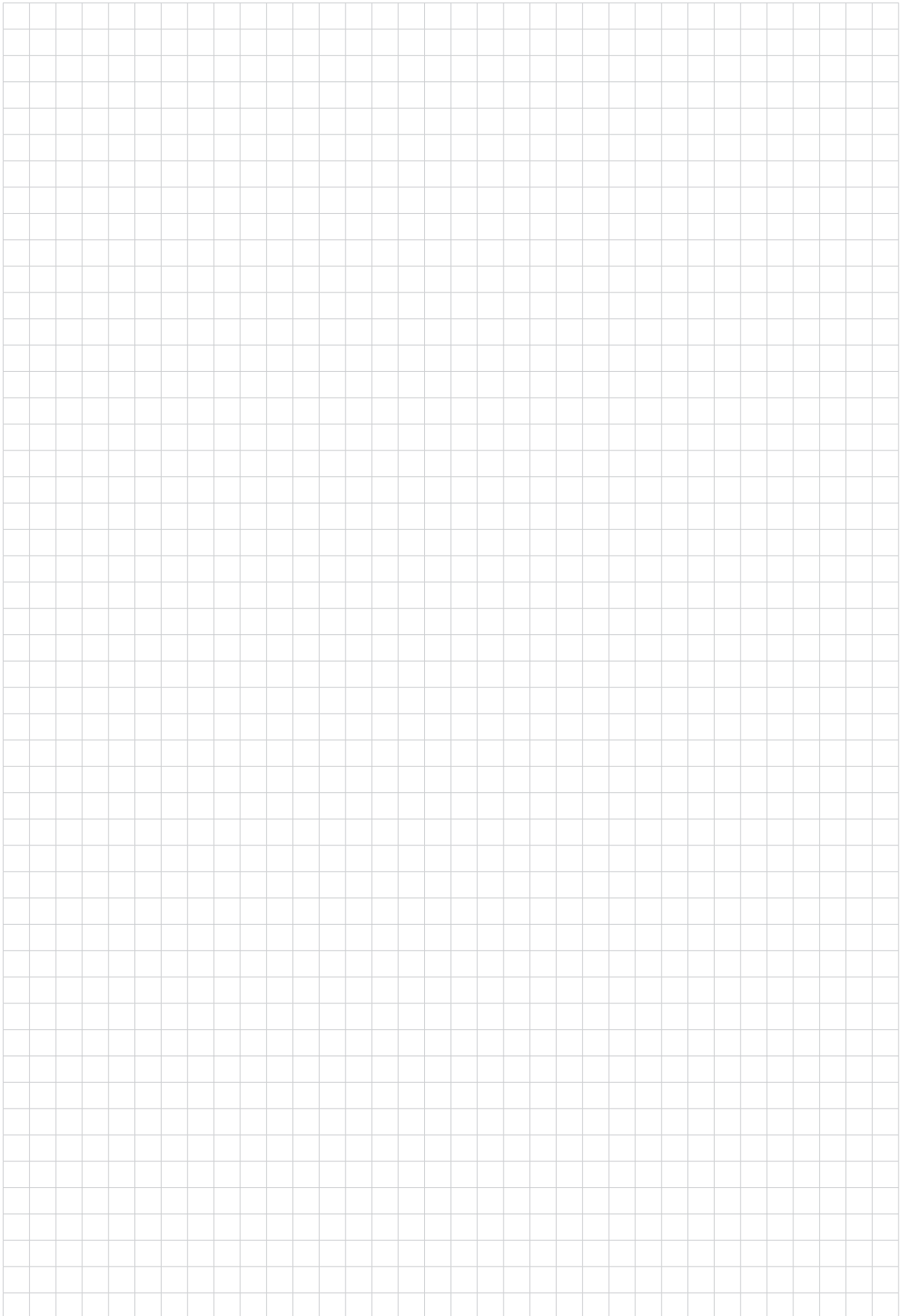
**Filtering by contour shape**  
Gefiltert nach Bearbeitungs-Kontur

**Additional search parameters**  
Zusätzliche Parameter-Suche

**Selected product**  
Ausgewähltes Produkt

ID code	Item code	Z	ØD	ØH	CR	Ln	s	I	Ødn	L	Ød	Grade	Inserts1	Inserts2	Inserts3
EP697	ETMP-4040-40-10	4	4	1	40	1	6	10	90	8					
EP370	ETMP-4050-12	4	5	1.2	15	1	10	70	6						
EP598	ETMP-4050-30-12	4	5	1.2	30	1	7.5	90	6						
EP599	ETMP-4050-40-12	4	5	1.2	40	1	7.5	100	8						
EP600	ETMP-4050-50-12	4	5	1.2	50	1	7.5	110	8						
EP371	ETMP-4050-15	4	6	1.5			12	90	6						
EP379	ETMLN-4060-30-15	4	6	1.5	30	1	9	5.7	75	6					
EP380	ETMLN-4060-42-15	4	6	1.5	42	1	9	5.7	90	6					
EP381	ETMLN-4060-54-15	4	6	1.5	54	1	9	5.7	100	6					
EP601	ETMP-4060-40-15	4	6	1.5	40	1	9	100	8						
EP602	ETMP-4060-55-15	4	6	1.5	55	1	9	110	8						
EP603	ETMP-4060-67-15	4	6	1.5	67	1	9	125	8						
EP372	ETMP-4030-20	4	8	2			16	100	8						
EP382	ETMLN-4080-40-20	4	8	2	40	1	12	7.6	85	8					
EP383	ETMLN-4080-60-20	4	8	2	60	1	12	7.6	100	8					
EP384	ETMLN-4080-72-20	4	8	2	72	1	12	7.6	120	8					
EP373	ETMP-4100-20	4	10	2			20	110	10						

Download: [www.moldino.eu/quickfinder](http://www.moldino.eu/quickfinder)



**Always up to date: Please check our P50 QuickFinder**



### **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) When preparing for use, be sure that the inserts are firmly mounted in place and that they are firmly mounted on the arbor, etc.
- (3) 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” is a registered trademark of MOLDINO Tool Engineering, Ltd. in Japan.

**Specifications for the products listed in this catalog are subject to change without notice due to replacement or modification.**

## **MOLDINO Tool Engineering Europe GmbH**

Itterpark 12 · 40724 Hilden · Germany · Phone +49 (0) 21 03-24 82-0 · Fax +49 (0) 21 03-24 82-30  
E-Mail [info@moldino.eu](mailto:info@moldino.eu) · Internet [www.moldino.eu](http://www.moldino.eu)  
© 2020 by MOLDINO Tool Engineering Europe GmbH · 3rd Edition · Printed in Germany