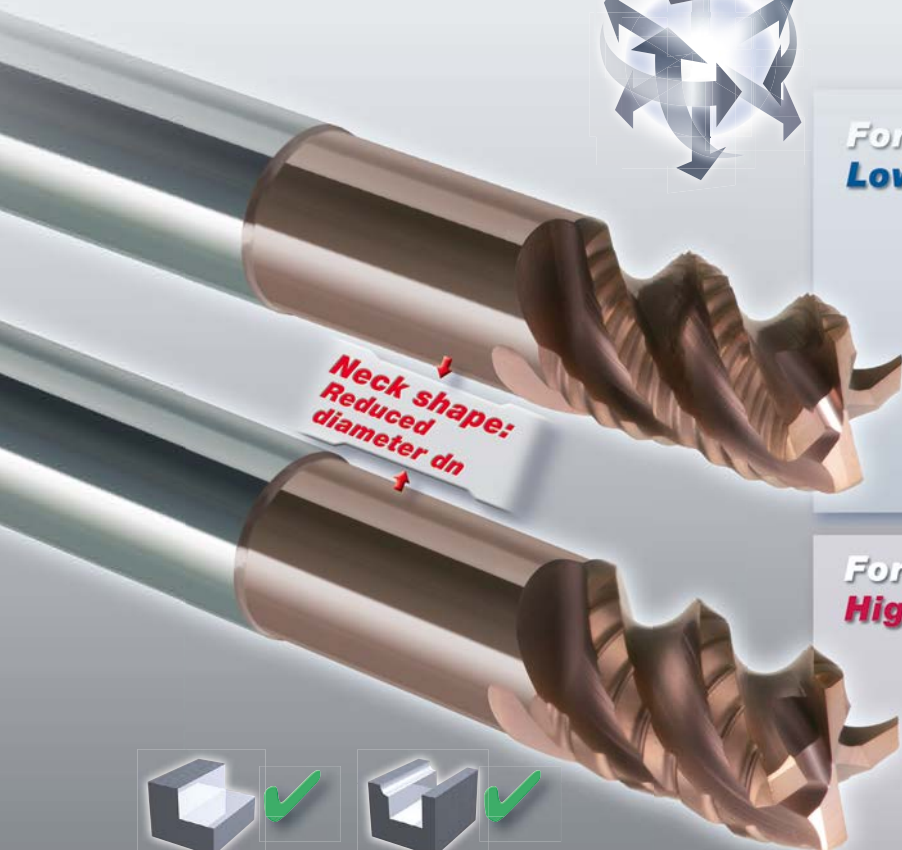
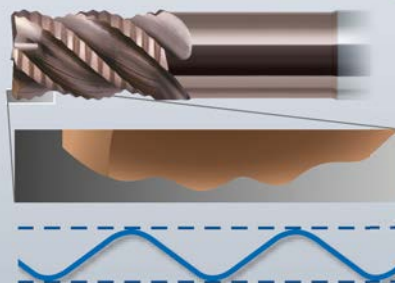


EMX Epoch ATH Mirus Series

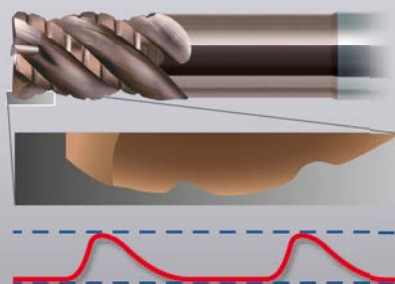
Multi Function „All Way“ Solid Carbide End Mill



**For Die & Mould Milling:
Low cutting force**



**For Parts Milling:
High chipping resistance**



D6 mm ~ D20 mm

- For Materials $\leq 55\text{HRC}$
- $l_n \ 3 \times D$

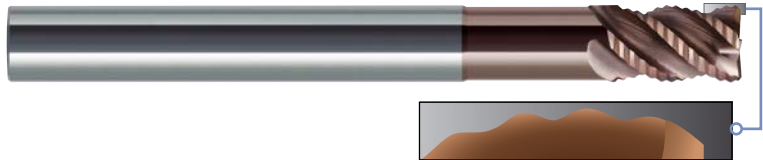
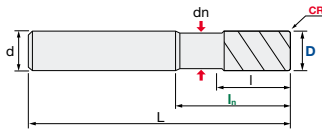
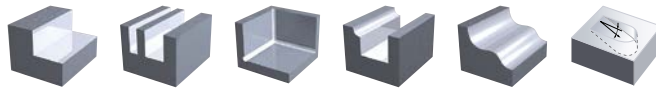
EMXR-TH | EMXN-TH | Epoch Mirus Series

V max
High Speed

Q max
High Efficient

HRC
55

No. of Teeth
4



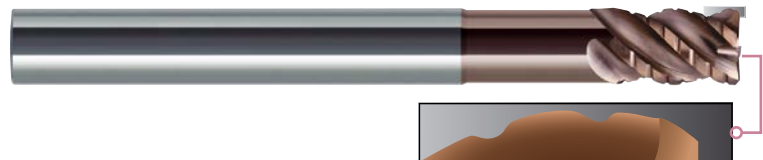
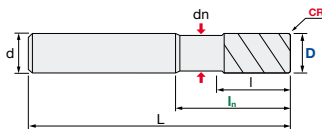
Carbide
Micro Grain

TH60+
Nano-PVD Coating

Rake Angle
Negative

Helix Angle	D Tol. [mm]	d Tol.
45°	0 / -0.050	h5

ID Code	Item Code	Z	D	CAM-R	I_n	I	dn	L	d
EP843	EMXR-4060-18-TH	4	6	0.4	18	9	5.5	60	6
EP844	EMXR-4080-24-TH		8	0.5	24	12	7.3	75	8
EP845	EMXR-4100-30-TH		10	0.5	30	15	9.1	80	10
EP846	EMXR-4120-36-TH		12	0.5	36	18	11.0	100	12
EP847	EMXR-4160-48-TH		16	0.7	48	24	14.5	110	16
EP848	EMXR-4200-60-TH		20	0.7	60	30	18.2	125	20



Carbide
Micro Grain

TH60+
Nano-PVD Coating

Rake Angle
Negative

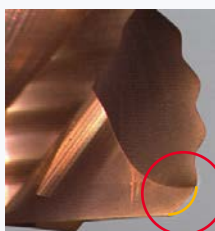
Helix Angle	D Tol. [mm]	d Tol.
45°	0 / -0.030	h5

ID Code	Item Code	Z	D	CAM-R	I_n	I	dn	L	d
EP849	EMXN-4060-18-TH	4	6	0.4	18	9	5.5	60	6
EP850	EMXN-4080-24-TH		8	0.5	24	12	7.3	75	8
EP851	EMXN-4100-30-TH		10	0.5	30	15	9.1	80	10
EP852	EMXN-4120-36-TH		12	0.5	36	18	11.0	100	12
EP853	EMXN-4160-48-TH		16	0.7	48	24	14.5	110	16
EP854	EMXN-4200-60-TH		20	0.7	60	30	18.2	125	20

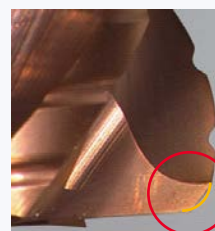
CAM (Programming Radius)

Special geometry is adopted on tip of square type, for chipping resistance. Please set up tool corner R with Approx Radius for both type listed in following tables.

Um die Schneide zu stabilisieren, wurde sie mit einer Schutzfase versehen. Daher sollten Sie das Werkzeug, wie in den folgenden Tabellen aufgeführt, mit einem Eckenradius (CAM) programmieren.



Type R	CAM (Approx Radius)
D 6	0.4 mm
D 8-12	0.5 mm
D 16-20	0.7 mm



Type N	CAM (Approx Radius)
D 6	0.4 mm
D 8-12	0.5 mm
D 16-20	0.7 mm

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

EMXR-TH / EMXN-TH D6-12: Page 6 - 7

EMXR-TH / EMXN-TH D16-20: Page 8

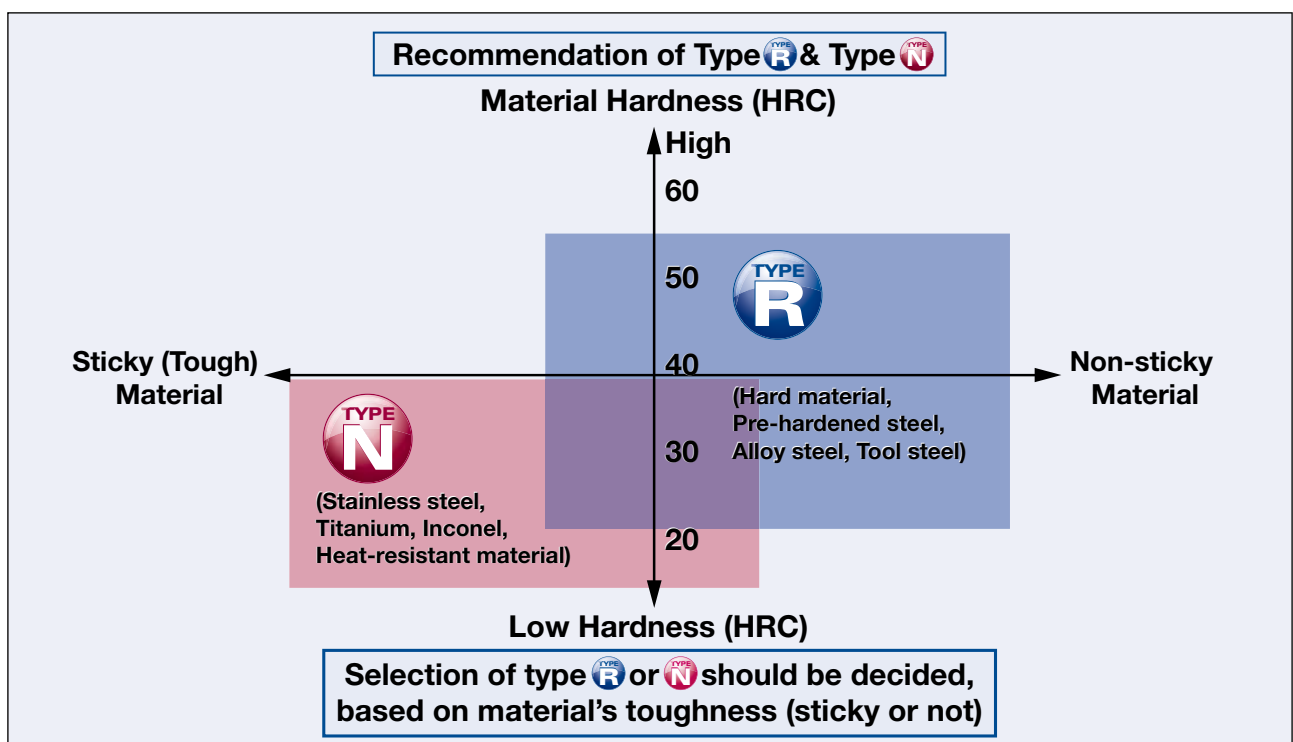


EMXR-TH | EMXN-TH | Epoch Mirus Series



Mirus recommendation field based on work material type		Process	Roughing	Roughing & Semi Finishing
Work piece material		Cutting force	less than Type N	less than conventional
		Surface roughness	Semi (▽ – ▽▽)	Finishing (▽▽ – ▽▽▽)
I	Carbon Steels, Alloy Steels Cast Irons: EN-JL(GG) Ductile Cast Iron): EN-JS(GGG) (~300HB)	Side milling	●	●
		Slotting	●	●
		Ramping	●	●
		2 way profiling	●	●
		Plunging (Drilling)	●	●
		Ramping angle	0 ~ 20° recommendable (max 30°)	0 ~ 15° recommendable (max 20°)
II	Tool Steels Alloy Steels (30~45HRC)	Side milling	●	●
		Slotting	●	●
		Ramping	●	●
		2 way profiling	●	●
		Plunging (Drilling)	○	●
		Ramping angle	0 ~ 10° recommendable (max 15°)	0 ~ 7° recommendable (max 10°)
III	Tool Steels Pre-Hardened Steels (45~55HRC)	Side milling	●	○
		Slotting	○	×
		Ramping	●	○
		2 way profiling	○	○
		Plunging (Drilling)	×	×
		Ramping angle	0 ~ 3° recommendable (max 5°)	0 ~ 3° recommendable (max 5°)
IV	Stainless Steels (20~40HRC)	Side milling	×	●
		Slotting	×	○
		Ramping	×	○
		2 way profiling	×	○
		Plunging (Drilling)	×	×
		Ramping angle	×	0 ~ 3° recommendable (max 5°)
V	Heat Resisting Steels Titanium, Inconel Nickel & Cobalt Alloys	Side milling	×	○
		Slotting	×	○
		Ramping	×	○
		2 way profiling	×	○
		Plunging (Drilling)	×	×
		Ramping angle	×	0 ~ 3° recommendable (max 5°)

● = Good – recommendable
○ = Possible
× = Not good – not recommendable



The Mirus Types & – optimized Geometries for Roughing,

Features **EpochMirus** :

- ① 2 types optimized geometry (Type R & Type N, for various materials)

MIRUS has 2 types of wave form on peripheral edge, for selection of various materials.

- ② Un-equal phase geometry

To avoid vibration, “Un-equal phase” was adopted for both of Type R & Type N.

- ③ Double gash geometry

For good chip evacuation and rigidity in heavy roughing application, “Double gash geometry” give stable process.

- ④ ATH coating

“ATH coating” realizes longer tool life in heavy roughing application. (Oxidation temperature: 1200 °C, Hardness: 3800Hv).

Features **EpochMirus** :

- ① Due tipi di geometria ottimizzata (Tipo R & Tipo N, per vari materiali)

MIRUS ha due tipi di forma ad onda sul tagliente periferico da selezionare in base ai vari materiali.

- ② Geometria a fase differenziata

Per eliminare le vibrazioni è stata adottata una “fase differenziata” per entrambi i tipi (Tipo R & Tipo N).

- ③ Geometria a doppio scarico

Il doppio scarico permette rigidità in applicazioni di sgrossatura ed un processo affidabile grazie all’ottimale evacuazione del truciolo.

- ④ Rivestimento ATH

Il rivestimento ATH raggiunge una più elevata resistenza all’usura nelle applicazioni di sgrossatura. (Temperatura di ossidazione: 1200 °C, Durezza: 3800 Hv).

Besonderheiten **EpochMirus** :

- ① 2 Fräser Typen mit optimierten Geometrien (Typ R & Typ N) für verschiedene Materialien

MIRUS ist in 2 Typen mit unterschiedlichen Wellenformen der Schneidkanten verfügbar, für die Bearbeitung verschiedenster Materialarten.

- ② Schneidgeometrie mit ungleichförmigen Phasen

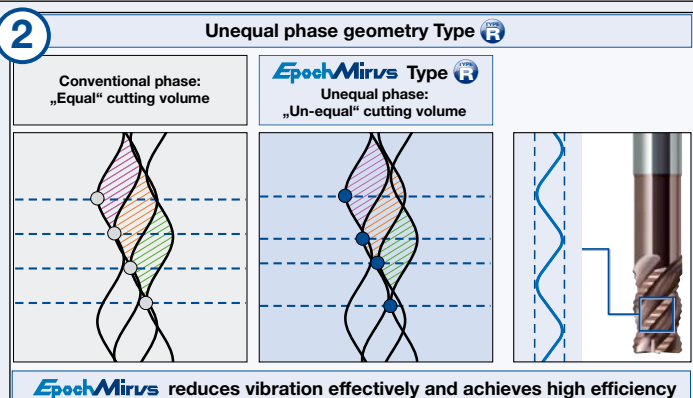
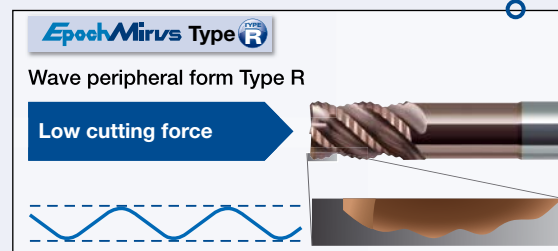
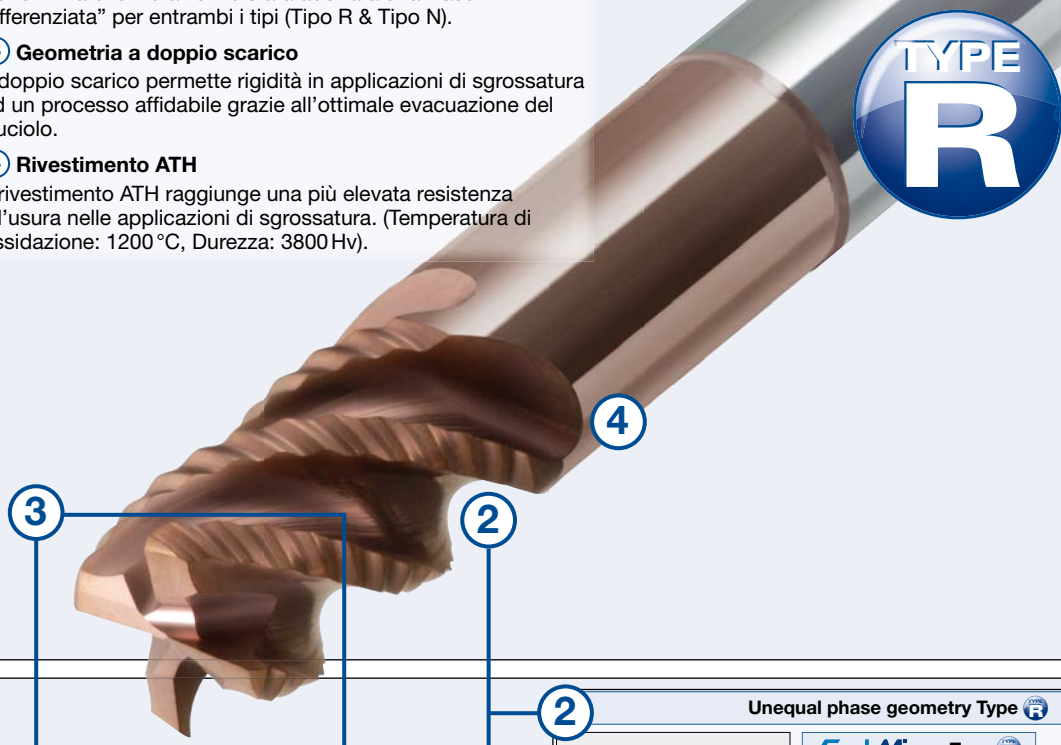
Um Vibrationen zu vermeiden, verfügen beide Typen R & N über eine ungleichförmige Phasengeometrie an den Schneidkanten.

- ③ „Double-Gash“-Geometrie

Der zusätzliche Freischliff gewährleistet Stabilität und gute Spanabfuhr auch bei Schruppbearbeitungen.

- ④ ATH-Beschichtung

Die ATH Beschichtung TH60+ (Oxidationstemperatur: 1.200 °C, Härte: 3800Hv) sorgt für höhere Standzeiten bei der Schwerzerspannung.



EpochMirus reduces vibration effectively and achieves high efficiency

Semi-Finishing, for Die-Mould and Parts Machining

Características **EpochMirvus** :

① Dos geometrías optimizadas (Serie R y serie N, para diferentes materiales)

MIRUS posee dos modelos diferentes de ondulaciones en la periferia del corte, según el material a mecanizar.

② Geometría de fase desigual

Para evitar vibraciones, se ha desarrollado un diseño de fase desigual para ambas geometrías.

③ Geometría de Doble-Gash

Para una buena evacuación de viruta y rigidez en aplicaciones de gran desbaste, el acanalado frontal doble aporta una gran estabilidad al proceso.

④ Recubrimiento ATH

El recubrimiento ATH deriva en una mayor vida de herramienta en operaciones de gran desbaste. (Temperatura de oxidación: 1200 °C, Dureza: 3800 Hv).

Particularité **EpochMirvus** :

① 2 Types de géométries optimisées (Type R & Type N, selon les types de matières)

L'Epoch MIRUS a deux types de brises copeaux sur ses arrêtes de coupe, adaptées à une grande variété de matières.

② Hélice et denture asymétrique

Afin d'éviter les vibrations, nous avons adoptés une "géométrie asymétrique" différentes pour le Type R & Type N.

③ Double Goujures

Pour optimiser l'évacuation des copeaux et accroître la rigidité lors de grosses ébauches. Les doubles goujures garantissent la stabilité de l'usinage.

④ Revêtement ATH (Advanced TH)

Le revêtement "ATH" permet d'avoir de très bonnes durées de vie lors de grosses ébauches. (Température d'oxydation: 1200 °C, Dureté : 3800 Hv).

1

TYPE
N

4

2

3

Características de **EpochMirvus** :

① Geometria de 2 tipos otimizada (Tipo R e Tipo N, para vários materiais)

Mirus tem 2 tipos de formas onduladas na aresta periférica, para a seleção de vários materiais.

② Geometria de desenho desigual

Para evitar vibrações, desenvolvemos um desenho de concepção desigual para as duas geometrias Tipo R e Tipo N.

③ Geometria de duplo corte

A Geometria de duplo corte proporciona um processo estável, para uma boa remoção de aparas e rigidez em aplicações de desbaste pesado.

④ Revestimento ATH

O revestimento ATH proporciona maior tempo de vida em aplicações de desbaste pesado. (Temperatura de oxidação: 1200°C, Dureza: 3800Hv).

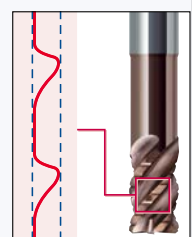
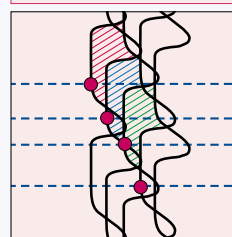
2

Unequal phase geometry Type

Conventional phase:
„Equal“ cutting volume



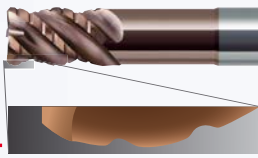
EpochMirvus Type 
Unequal phase:
„Un-equal“ cutting volume



EpochMirvus Type

Chip breaker peripheral form Type N

High chipping resistance





Epoch Mirus Type R



		EMXR-TH D6				EMXR-TH D8			
		Side milling	Slotting	Ramping	2-Way Profiling	Side milling	Slotting	Ramping	2-Way Profiling
I	Carbon Steels.	V _c (m/min)	170	145	145	170	170	145	145
	Alloy Steels	n (min ⁻¹)	9,000	7,700	7,700	9,000	6,800	5,800	5,800
	Cast Irons: EN-JL(GG)	f _z (mm/tooth)	0.043	0.035	0.027	0.054	0.061	0.049	0.038
	Ductile Cast Iron: EN-JS(GGG) (~300HB)	V _f (mm/min)	1,550	1,080	830	1,940	1,660	1,140	880
		a _p (mm)	6	6	20° recommendable (max. 30°)	6	8	8	20° recommendable (max. 30°)
		a _e (mm)	3	6	6	3	4	8	8
		Q (cm ³ /min)	27.9	38.9	-	34.9	53.1	73.0	-
II	Tool Steels	V _c (m/min)	140	110	110	140	140	110	110
	Alloy Steels (30~45HRC)	n (min ⁻¹)	7,400	5,800	5,800	7,400	5,600	4,400	4,400
		f _z (mm/tooth)	0.028	0.022	0.018	0.035	0.039	0.031	0.025
		V _f (mm/min)	830	510	420	1040	870	550	440
		a _p (mm)	6	3	10° recommendable (max. 15°)	3	8	4	10° recommendable (max. 15°)
		a _e (mm)	1.5	6	6	1.5	2	8	8
		Q (cm ³ /min)	7.5	9.2	-	4.7	13.9	17.6	-
III	Tool Steels	V _c (m/min)	105	85	85	105	105	85	85
	Pre-Hardened Steels (45~55HRC)	n (min ⁻¹)	5,600	4,500	4,500	5,600	4,200	3,400	3,400
		f _z (mm/tooth)	0.022	0.018	0.014	0.028	0.031	0.024	0.019
		V _f (mm/min)	490	320	250	630	520	330	260
		a _p (mm)	6	1.8	3° recommendable (max. 5°)	1.5	8	2.4	3° recommendable (max. 5°)
		a _e (mm)	0.75	6	6	0.75	1	8	8
		Q (cm ³ /min)	2.2	3.5	-	0.7	4.2	6.3	-

For Stainless Steels (20~40HRC), Heat Resisting Steels, Titanium, Inconel, Nickel & Cobalt Alloys: Epoch Mirus Type N is recommended



Epoch Mirus Type N



		EMXN-TH D6				EMXN-TH D8			
		Side milling	Slotting	Ramping	2-Way Profiling	Side milling	Slotting	Ramping	2-Way Profiling
I	Carbon Steels.	V _c (m/min)	160	130	130	160	160	130	130
	Alloy Steels	n (min ⁻¹)	8,500	6,900	6,900	8,500	6,400	5,200	5,200
	Cast Irons: EN-JL(GG)	f _z (mm/tooth)	0.043	0.034	0.027	0.054	0.061	0.049	0.038
	Ductile Cast Iron: EN-JS(GGG) (~300HB)	V _f (mm/min)	1,460	940	750	1,840	1,560	1,020	790
		a _p (mm)	6	6	15° recommendable (max. 20°)	6	8	8	15° recommendable (max. 20°)
		a _e (mm)	3	6	6	3	4	8	8
		Q (cm ³ /min)	26.3	33.8	-	33.1	49.9	65.3	-
II	Tool Steels	V _c (m/min)	125	100	100	125	125	100	100
	Alloy Steels (30~45HRC)	n (min ⁻¹)	6,600	5,300	5,300	6,600	5,000	4,000	4,000
		f _z (mm/tooth)	0.028	0.022	0.017	0.035	0.039	0.031	0.024
		V _f (mm/min)	740	470	360	920	780	500	380
		a _p (mm)	6	3	7° recommendable (max. 10°)	3	8	4	7° recommendable (max. 10°)
		a _e (mm)	1.5	6	6	1.5	2	8	8
		Q (cm ³ /min)	6.7	8.5	-	4.1	12.5	16.0	-
III	Tool Steels	V _c (m/min)	95	75	75	95	95	75	75
	Pre-Hardened Steels (45~55HRC)	n (min ⁻¹)	5,000	4,000	4,000	5,000	3,800	3,000	3,000
		f _z (mm/tooth)	0.023	0.018	0.014	0.028	0.031	0.025	0.019
		V _f (mm/min)	460	290	220	560	470	300	230
		a _p (mm)	6	1.8	3° recommendable (max. 5°)	1.5	8	2.4	3° recommendable (max. 5°)
		a _e (mm)	0.75	6	6	0.75	1	8	8
		Q (cm ³ /min)	2.1	3.1	-	0.6	3.8	5.8	-
IV	Stainless Steels (20~40HRC)	V _c (m/min)	55	40	40	55	55	40	40
		n (min ⁻¹)	2,900	2,100	2,100	2,900	2,200	1,600	1,600
		f _z (mm/tooth)	0.017	0.014	0.011	0.020	0.023	0.018	0.014
		V _f (mm/min)	190	110	90	230	200	120	90
		a _p (mm)	6	4.8	3° recommendable (max. 5°)	1.5	8	6.4	3° recommendable (max. 5°)
		a _e (mm)	2.25	6	6	0.75	3	8	8
		Q (cm ³ /min)	2.6	3.2	-	0.3	4.8	6.1	-
V	Heat Resisting Steels	V _c (m/min)	40	30	30	40	40	30	30
	Titanium, Inconel	n (min ⁻¹)	2,100	1,600	1,600	2,100	1,600	1,200	1,200
	Nickel & Cobalt Alloys	f _z (mm/tooth)	0.011	0.009	0.007	0.013	0.015	0.012	0.009
		V _f (mm/min)	90	60	40	110	100	60	40
		a _p (mm)	6	1.8	3° recommendable (max. 5°)	1.5	8	2.4	3° recommendable (max. 5°)
		a _e (mm)	0.75	6	6	0.75	1	8	8
		Q (cm ³ /min)	0.4	0.6	-	0.1	0.8	1.2	-



EMXR-TH D 10				EMXR-TH D 12			
Side milling	Slotting	Ramping	2-Way Profiling	Side milling	Slotting	Ramping	2-Way Profiling
170	145	145	170	170	145	145	170
5,400	4,600	4,600	5,400	4,500	3,800	3,800	4,500
0.077	0.061	0.048	0.095	0.086	0.070	0.054	0.108
1,660	1,120	880	2,050	1,550	1,060	820	1,940
10	10	20° recommendable (max. 30°)	10	12	12	20° recommendable (max. 30°)	12
5	10	10	5	6	12	12	6
83.0	112.0	-	102.5	111.6	152.6	-	139.7
140	110	110	140	140	110	110	140
4,500	3,500	3,500	4,500	3,700	2,900	2,900	3,700
0.049	0.039	0.031	0.061	0.056	0.044	0.034	0.069
880	550	430	1,100	830	510	390	1,020
10	5	10° recommendable (max. 15°)	5	12	6	10° recommendable (max. 15°)	6
2.5	10	10	2.5	3	12	12	3
22.0	27.5	-	13.8	29.9	36.7	-	18.4
105	85	85	105	105	85	85	105
3,300	2,700	2,700	3,300	2,800	2,300	2,300	2,800
0.039	0.032	0.024	0.049	0.045	0.037	0.028	0.055
510	350	260	650	500	340	260	620
10	3	3° recommendable (max. 5°)	2.5	12	3.6	3° recommendable (max. 5°)	3
1.25	10	10	1.25	1.5	12	12	1.5
6.4	10.5	-	2.0	9.0	14.7	-	2.8

For Stainless Steels (20~40HRC), Heat Resisting Steels, Titanium, Inconel, Nickel & Cobalt Alloys:
Epoch Mirus Type N is recommended

EMXN-TH D 10				EMXN-TH D 12			
Side milling	Slotting	Ramping	2-Way Profiling	Side milling	Slotting	Ramping	2-Way Profiling
160	130	130	160	160	130	130	160
5,100	4,100	4,100	5,100	4,200	3,400	3,400	4,200
0.076	0.061	0.048	0.095	0.087	0.069	0.054	0.108
1,550	1,000	790	1,940	1,460	940	730	1,810
10	10	15° recommendable (max. 20°)	10	12	12	15° recommendable (max. 20°)	12
5	10	10	5	6	12	12	6
77.5	100.0	-	97.0	105.1	135.4	-	130.3
125	100	100	125	125	100	100	125
4,000	3,200	3,200	4,000	3,300	2,700	2,700	3,300
0.049	0.039	0.030	0.061	0.055	0.044	0.034	0.069
780	500	380	980	730	480	370	910
10	5	7° recommendable (max. 10°)	5	12	6	7° recommendable (max. 10°)	6
2.5	10	10	2.5	3	12	12	3
19.5	25.0	-	12.3	26.3	34.6	-	16.4
95	75	75	95	95	75	75	95
3,000	2,400	2,400	3,000	2,500	2,000	2,000	2,500
0.039	0.031	0.024	0.048	0.044	0.035	0.028	0.055
470	300	230	580	440	280	220	550
10	3	3° recommendable (max. 5°)	2.5	12	3.6	3° recommendable (max. 5°)	3
1.25	10	10	1.25	1.5	12	12	1.5
5.9	9.0	-	1.8	7.9	12.1	-	2.5
55	40	40	55	55	40	40	55
1,800	1,300	1,300	1,800	1,500	1,100	1,100	1,500
0.027	0.023	0.018	0.035	0.032	0.026	0.020	0.039
190	120	90	250	190	110	90	230
10	8	3° recommendable (max. 5°)	2.5	12	9.6	3° recommendable (max. 5°)	3
3.75	10	10	1.25	4.5	12	12	1.5
7.1	9.6	-	0.8	10.3	12.7	-	1.0
40	30	30	40	40	30	30	40
1,300	1,000	1,000	1,300	1,100	800	800	1,100
0.018	0.015	0.012	0.023	0.021	0.017	0.013	0.026
90	60	50	120	90	50	40	110
10	3	3° recommendable (max. 5°)	2.5	12	3.6	3° recommendable (max. 5°)	3
1.25	10	10	1.25	1.5	12	12	1.5
1.1	1.8	-	0.4	1.6	2.2	-	0.5

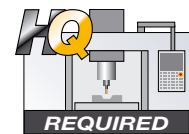


PLEASE NOTE:

The values in these tables (page 6-8) are only recommended under the following conditions:

1. The use of a machining centre and toolholder with highest precision, concentricity and rigidity.

2. All components – including machine and controller – are of the latest technology.



Modification if too high:

- Keep f_z stable.
- Reduce rpm to set best result on non-HQ machines.

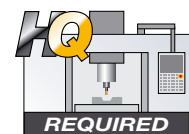


BITTE BEACHTEN SIE:

Die Werte in diesen Tabellen (Seite 6-8) sind nur unter den folgenden Bedingungen empfohlen:

1. Die Verwendung eines Bearbeitungszentrums und Werkzeughalters höchster Präzision, Konzentrität und Stabilität.

2. Alle Komponenten – einschließlich Maschine und Steuerung – sind auf dem neuesten Stand der Technik.



Bei zu hohen Werten:

- Halten Sie f_z konstant.
- Reduzieren Sie die Drehzahl, um auch mit Bearbeitungszentren geringerer Leistung beste Ergebnisse zu erzielen.



Epoch Mirus Type R



		EMXR-TH D 16				EMXR-TH D 20			
		Side milling	Slotting	Ramping	2-Way Profiling	Side milling	Slotting	Ramping	2-Way Profiling
I	Carbon Steels.	V _c (m/min)	170	145	145	170	170	145	145
	Alloy Steels	n (min ⁻¹)	3,400	2,900	2,900	3,400	2,700	2,300	2,300
	Cast Irons: EN-JL(GG)	f _z (mm/tooth)	0.110	0.088	0.068	0.136	0.120	0.096	0.075
	Ductile Cast Iron: EN-JS(GGG) (~300HB)	V _f (mm/min)	1,500	1,020	790	1,850	1,300	880	690
		a _p (mm)	16	16	20° recommendable (max. 30°)	12	20	20	20° recommendable (max. 30°)
		a _e (mm)	8	16	16	8	10	20	20
		Q (cm ³ /min)	192.0	261.1	-	177.6	260.0	352.0	-
II	Tool Steels	V _c (m/min)	140	110	110	140	140	110	110
	Alloy Steels (30~45HRC)	n (min ⁻¹)	2,800	2,200	2,200	2,800	2,200	1,800	1,800
		f _z (mm/tooth)	0.070	0.056	0.044	0.088	0.076	0.061	0.049
		V _f (mm/min)	780	490	390	990	670	440	350
		a _p (mm)	16	8	10° recommendable (max. 15°)	6	20	10	10° recommendable (max. 15°)
		a _e (mm)	4	16	16	4	5	20	20
		Q (cm ³ /min)	49.9	62.7	-	23.8	67.0	88.0	-
III	Tool Steels	V _c (m/min)	105	85	85	105	105	85	85
	Pre-Hardened Steels (45~55HRC)	n (min ⁻¹)	2,100	1,700	1,700	2,100	1,700	1,400	1,400
		f _z (mm/tooth)	0.056	0.044	0.036	0.069	0.062	0.050	0.040
		V _f (mm/min)	470	300	240	580	420	280	220
		a _p (mm)	16	4.8	3° recommendable (max. 5°)	3	20	6	3° recommendable (max. 5°)
		a _e (mm)	2	16	16	2	2.5	20	20
		Q (cm ³ /min)	15.0	23.0	-	3.5	21.0	33.6	-

For Stainless Steels (20~40HRC), Heat Resisting Steels, Titanium, Inconel, Nickel & Cobalt Alloys: Epoch Mirus Type N is recommended



Epoch Mirus Type N



		EMXN-TH D 16				EMXN-TH D 20			
		Side milling	Slotting	Ramping	2-Way Profiling	Side milling	Slotting	Ramping	2-Way Profiling
I	Carbon Steels.	V _c (m/min)	160	130	130	160	160	130	130
	Alloy Steels	n (min ⁻¹)	3,200	2,600	2,600	3,200	2,500	2,100	2,100
	Cast Irons: EN-JL(GG)	f _z (mm/tooth)	0.108	0.087	0.068	0.136	0.120	0.096	0.075
	Ductile Cast Iron: EN-JS(GGG) (~300HB)	V _f (mm/min)	1,380	900	710	1,740	1,200	810	630
		a _p (mm)	16	16	15° recommendable (max. 20°)	12	20	20	15° recommendable (max. 20°)
		a _e (mm)	8	16	16	8	10	20	20
		Q (cm ³ /min)	176.6	230.4	-	167.0	240.0	324.0	-
II	Tool Steels	V _c (m/min)	125	100	100	125	125	100	100
	Alloy Steels (30~45HRC)	n (min ⁻¹)	2,500	2,000	2,000	2,500	2,000	1,600	1,600
		f _z (mm/tooth)	0.069	0.055	0.043	0.088	0.077	0.061	0.049
		V _f (mm/min)	690	440	340	880	620	390	310
		a _p (mm)	16	8	7° recommendable (max. 10°)	6	20	10	7° recommendable (max. 10°)
		a _e (mm)	4	16	16	4	5	20	20
		Q (cm ³ /min)	44.2	56.3	-	21.1	62.0	78.0	-
III	Tool Steels	V _c (m/min)	95	75	75	95	95	75	75
	Pre-Hardened Steels (45~55HRC)	n (min ⁻¹)	1,900	1,500	1,500	1,900	1,500	1,200	1,200
		f _z (mm/tooth)	0.055	0.045	0.035	0.070	0.062	0.051	0.038
		V _f (mm/min)	420	270	210	530	370	240	180
		a _p (mm)	16	4.8	3° recommendable (max. 5°)	3	20	6	3° recommendable (max. 5°)
		a _e (mm)	2	16	16	2	2.5	20	20
		Q (cm ³ /min)	13.4	20.7	-	3.2	18.5	28.8	-
IV	Stainless Steels (20~40HRC)	V _c (m/min)	55	40	40	55	55	40	40
		n (min ⁻¹)	1,100	800	800	1,100	900	600	600
		f _z (mm/tooth)	0.039	0.030	0.026	0.050	0.044	0.035	0.027
		V _f (mm/min)	170	100	80	220	160	80	60
		a _p (mm)	16	12.8	3° recommendable (max. 5°)	3	20	16	3° recommendable (max. 5°)
		a _e (mm)	6	16	16	2	7.5	20	20
		Q (cm ³ /min)	16.3	20.5	-	1.3	24.0	25.6	-
V	Heat Resisting Steels	V _c (m/min)	40	30	30	40	40	30	30
	Titanium, Inconel	n (min ⁻¹)	800	600	600	800	600	500	500
	Nickel & Cobalt Alloys	f _z (mm/tooth)	0.026	0.020	0.017	0.033	0.029	0.023	0.018
		V _f (mm/min)	80	50	40	110	70	50	40
		a _p (mm)	16	4.8	3° recommendable (max. 5°)	3	20	6	3° recommendable (max. 5°)
		a _e (mm)	2	16	16	2	2.5	20	20
		Q (cm ³ /min)	2.6	3.8	-	0.7	3.5	6.0	-

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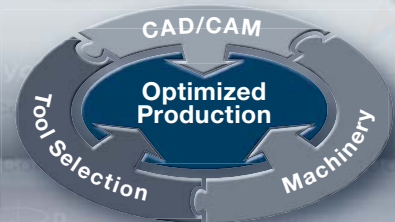
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- Reduzieren Sie die Drehzahl, um auch mit Bearbeitungszentren geringerer Leistung beste Ergebnisse zu erzielen.

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Function Buttons
Funktions-Schaltflächen

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

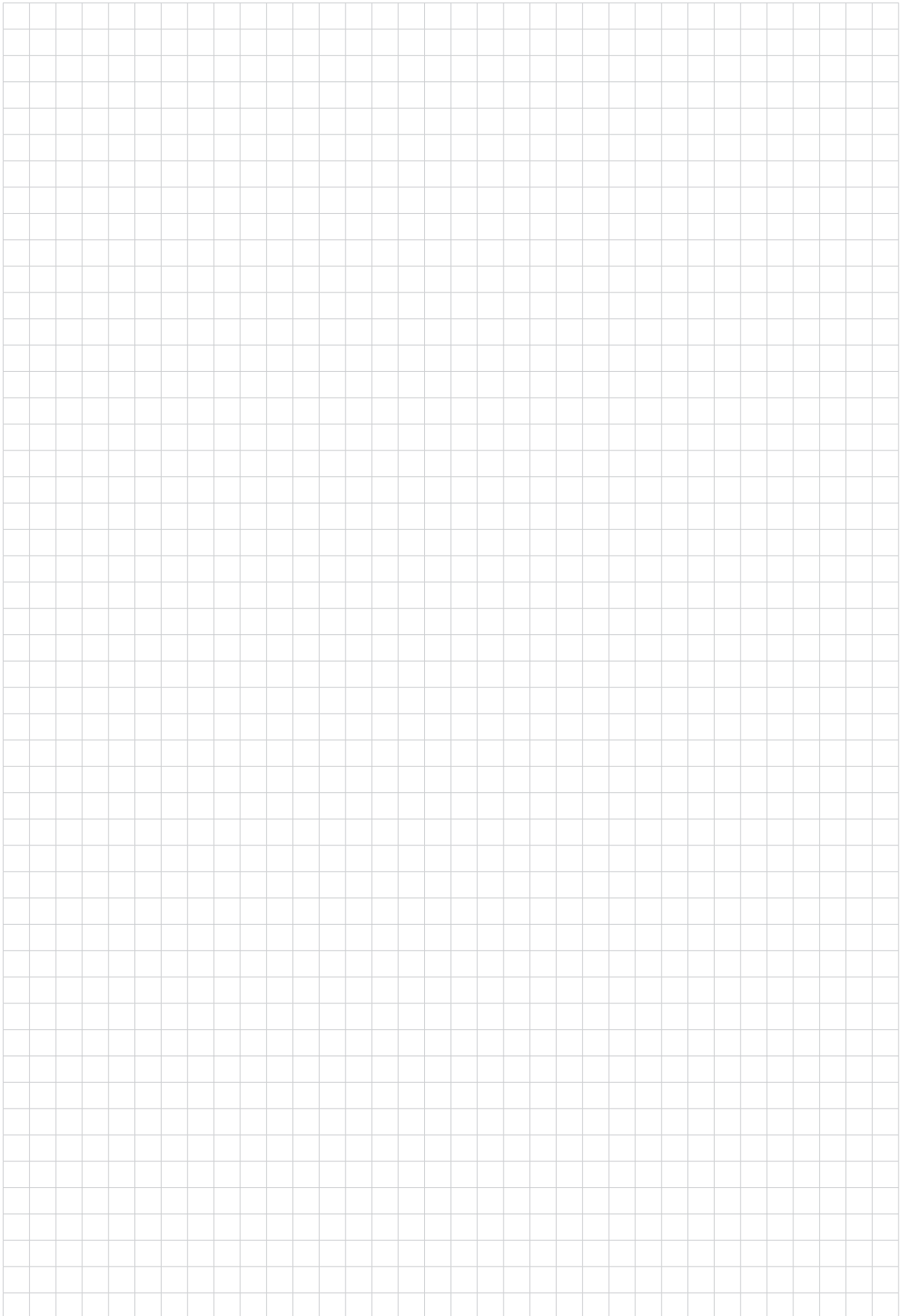
Filtering by contour shape
Gefiltert nach Bearbeitungs-Kontur

Additional search parameters
Zusätzliche Parameter-Suche

Selected product
Ausgewähltes Produkt

ID code	Item code	Z	ØD	ØH	Ln	s	I	Ødn	L	Ød	Grade	Inserts1	Inserts2	Inserts3
EP697	ETMP-4040-40-10	4	4	1	40	1	6		90	6				
EP370	ETMP-4050-12	4	5	1.2	15		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		9	5.7	75	6				
EP380	ETMLN-4060-42-15	4	6	1.5	42		9	5.7	90	6				
EP381	ETMLN-4060-54-15	4	6	1.5	54		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		12	7.6	85	8				
EP383	ETMLN-4080-60-20	4	8	2	60		12	7.6	100	8				
EP384	ETMLN-4080-72-20	4	8	2	72		12	7.6	120	8				
EP373	ETMP-4100-20	4	10	2			20		110	10				

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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.

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