Advanced Engineering

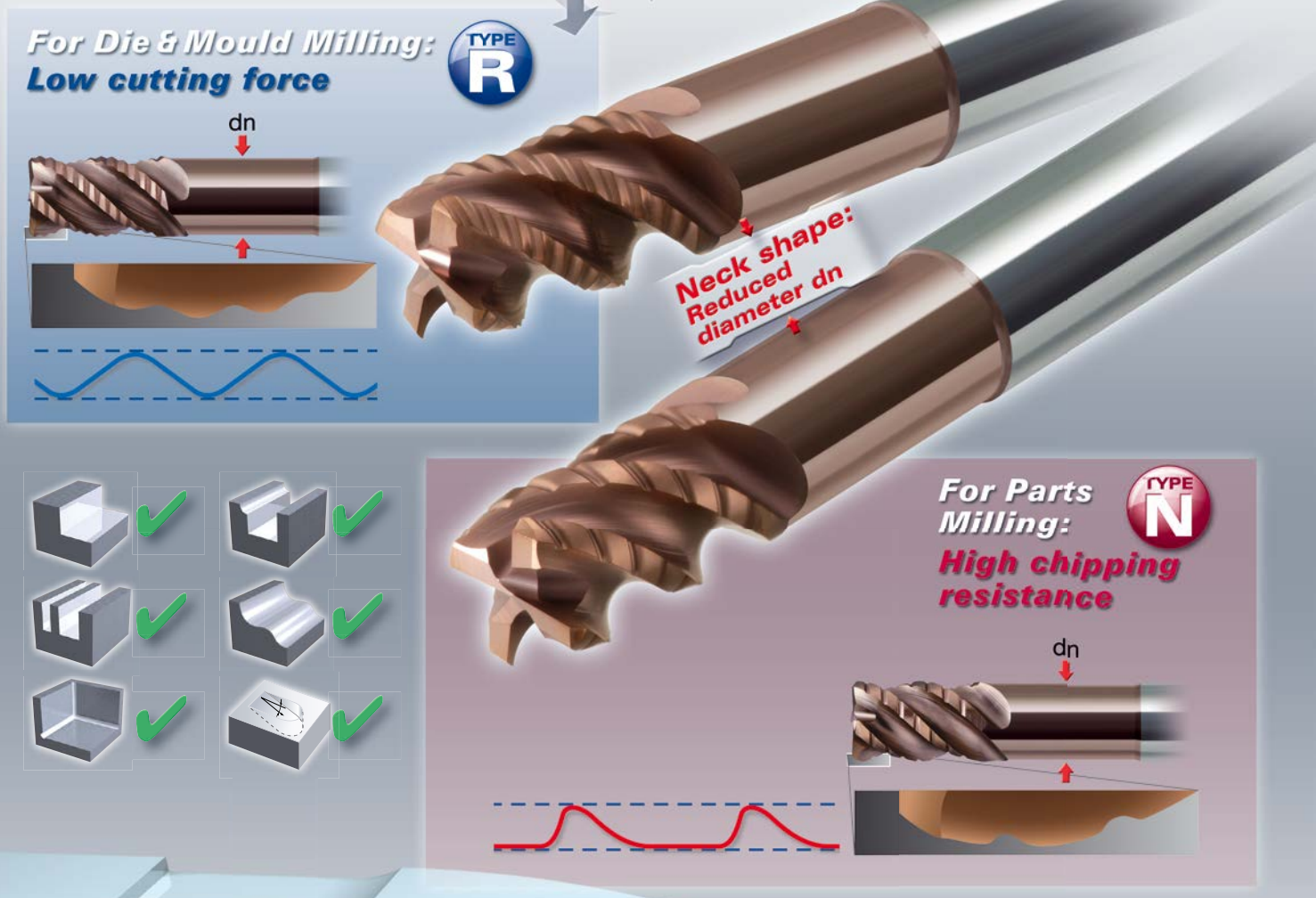
MMC Hitachi Tool

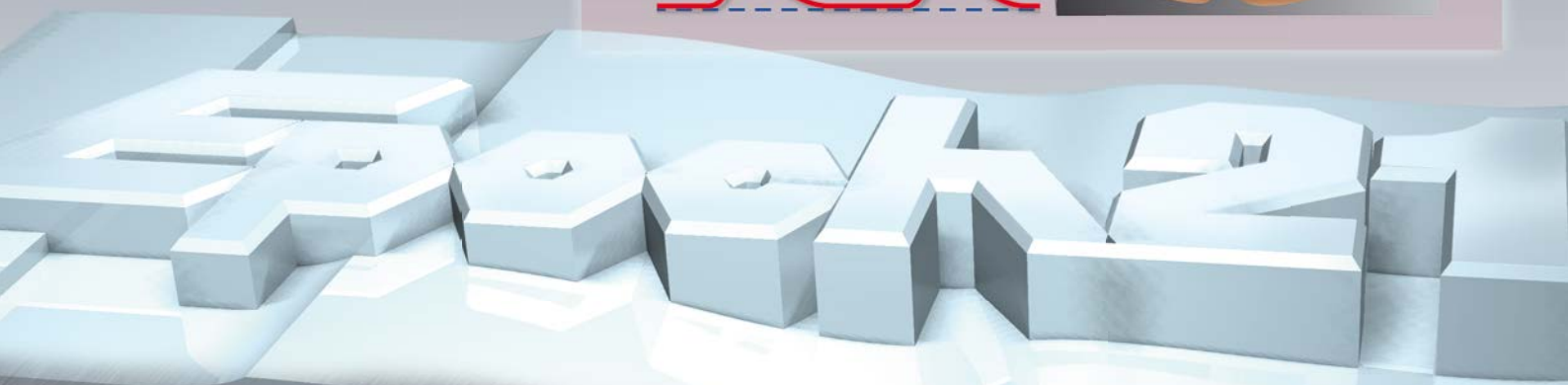
No. 429.2

EpochMirus Nano-PVD Coating TH60+

EMX Epoch ATH Mirus Series

Multi Function „All Way" Solid Carbide End Mill





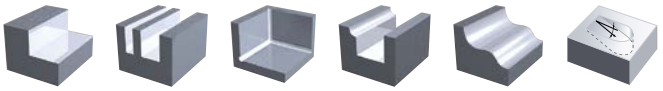
MMC Hitachi Tool Engineering Europe GmbH

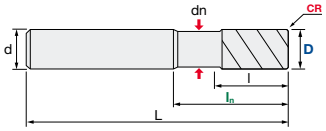
www.high-speed-cutting.com

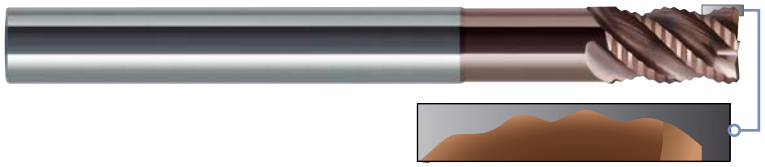
Micro Grain Solid Carbide End Mill

TYPE R

V max	Q max	HRC	No. of Teeth
High Speed	High Efficient	55	4





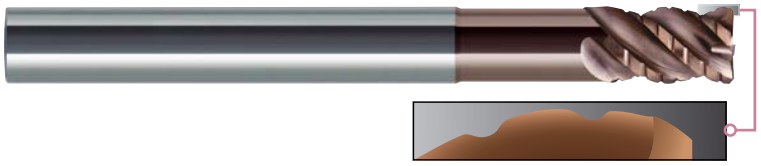


Carbide	TH60+	Rake Angle
Micro Grain	Nano-PVD Coating	Negative

D	0 / -0.05 mm
d	h5
Helix angle	45°

ID Code	Item Code	Z	D	CAM-R	l_n	l	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

TYPE N



D	0 / -0.03 mm
d	h5
Helix angle	45°

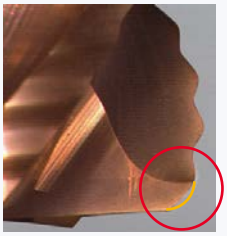
ID Code	Item Code	Z	D	CAM-R	l_n	l	dn	L	d
EP849	**EMXN-4060-18-TH**	4	6	0.4	18	9	5.5	60	6
EP850	**EMXN-4080-24-TH**		8	0.5	24	12	7.3	75	8
EP851	**EMXN-4100-30-TH**		10	0.5	30	15	9.1	80	10
EP852	**EMXN-4120-36-TH**		12	0.5	36	18	11.0	100	12
EP853	**EMXN-4160-48-TH**		16	0.7	48	24	14.5	110	16
EP854	**EMXN-4200-60-TH**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

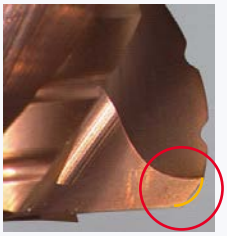
Um die Schneide zu stabilisieren, wurde sie mit einer Schutzfase versehen. Daher sollten Sie das Werkzeug, wie in den folgenden Tabellen aufgeführt, mit einem Eckenradius (CAM) programmieren.

TYPE R



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

TYPE N

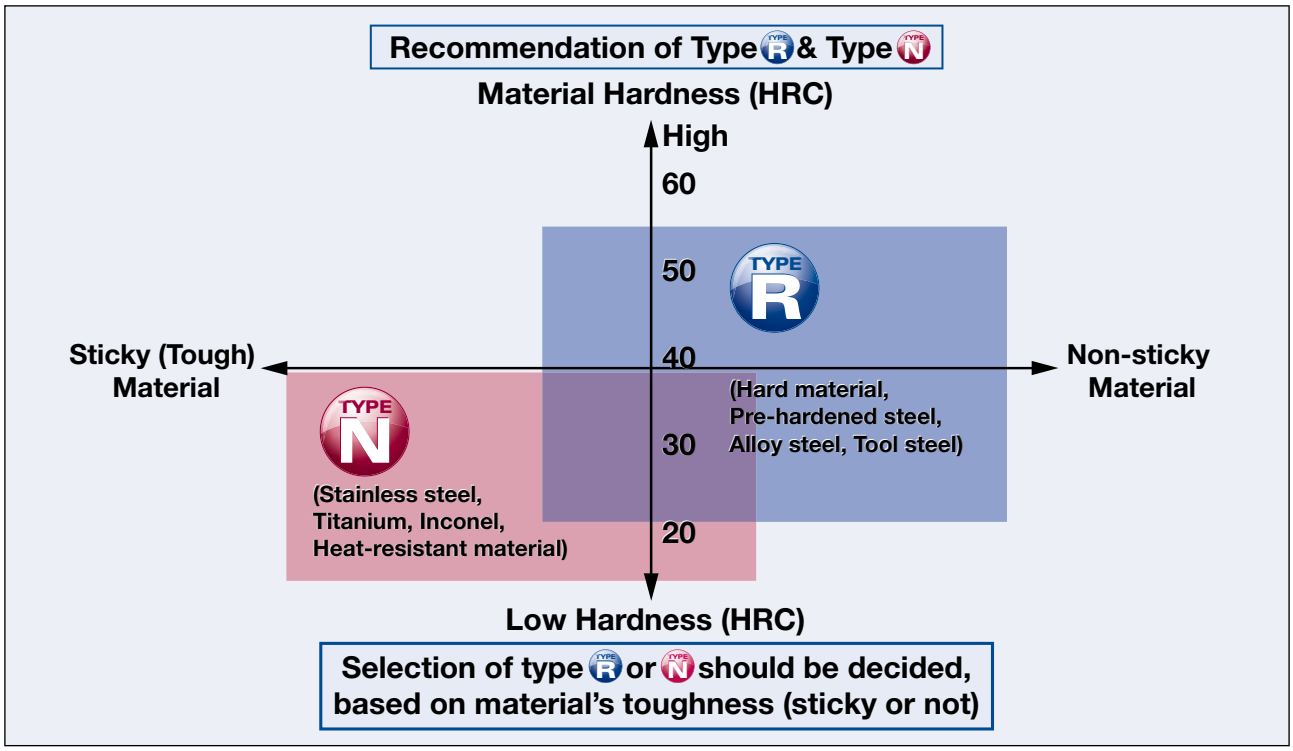


Type N	CAM (Approx Radius)
D 6	0.4 mm
D 8–12	0.5 mm
D 16–20	0.7 mm

Micro Grain Solid Carbide End Mill

Mirus recommendation field based on work material type		Process	Roughing (TYPE R)	Roughing & Semi Finishing (TYPE N)
		Cutting force	less than Type N	less than conventional
Work piece material		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



Micro Grain Solid Carbide End Mill

The Mirus Types TYPE R & TYPE N – 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).

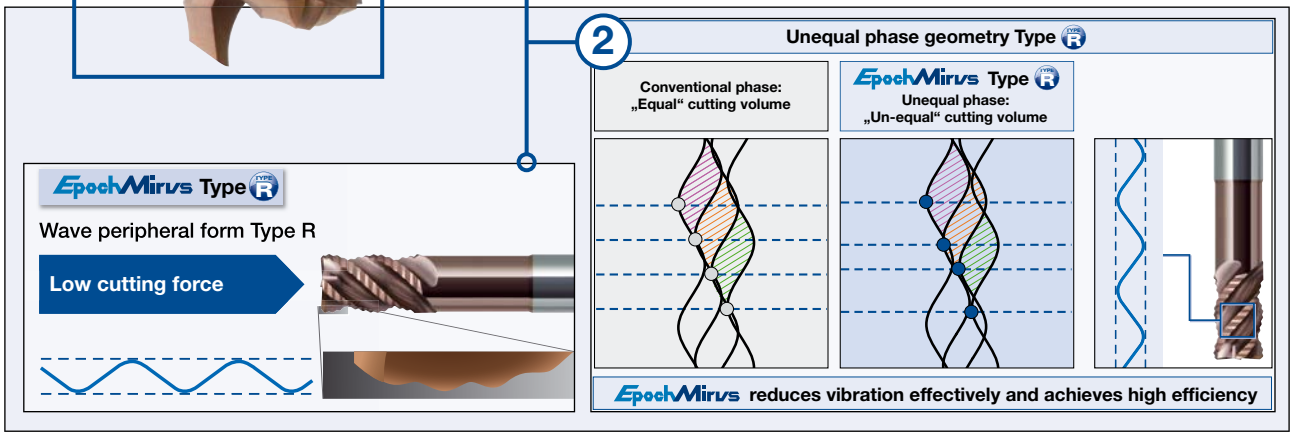
Besonderheiten EpochMirus :

① 2 Fräsertypen 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 Schwerzerspanung.



Micro Grain Solid Carbide End Mill

Semi-Finishing, for Die-Mould and Parts Machining

Características EpochMirus :

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).

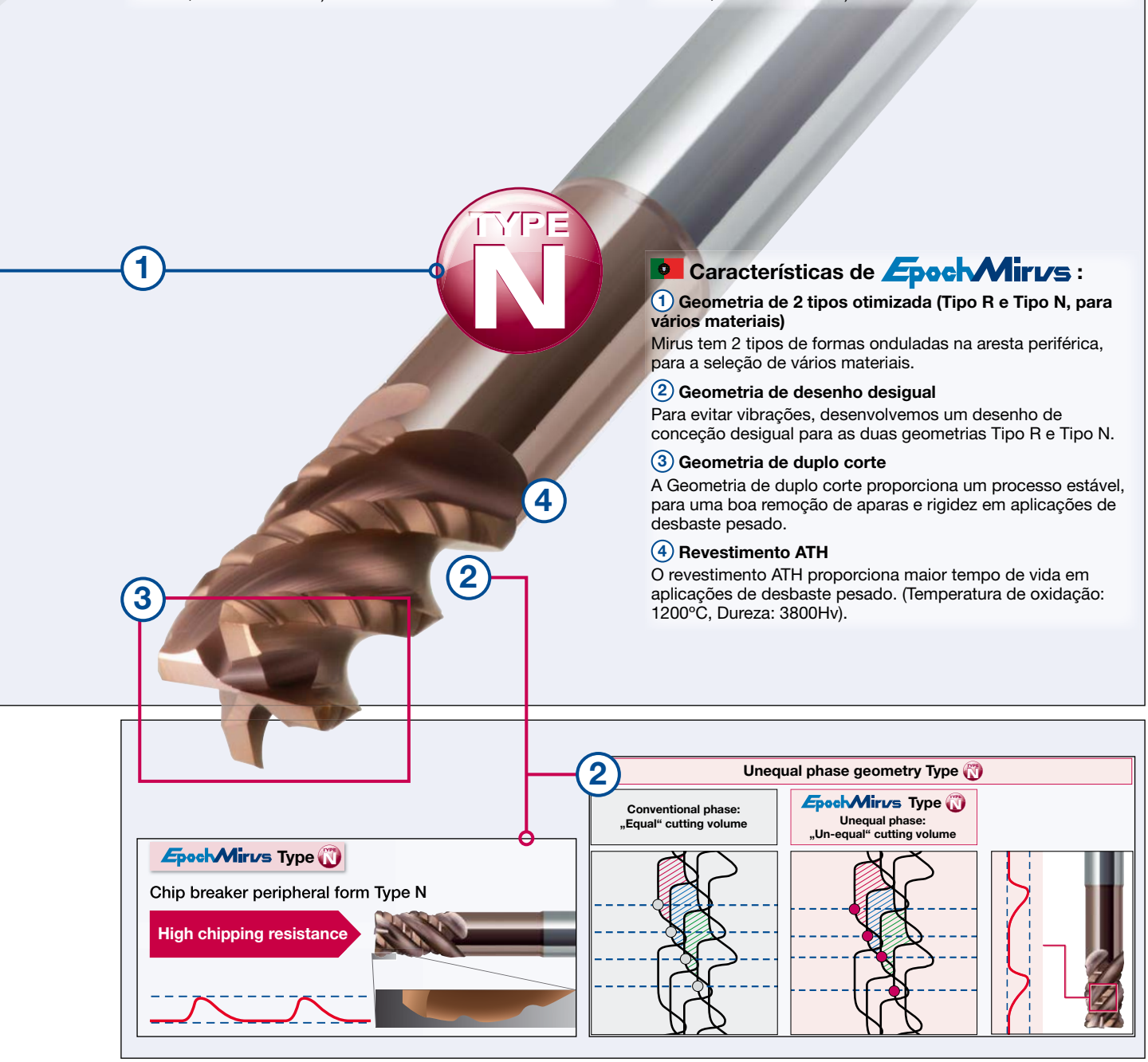
Particularitè EpochMirus :

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).



Características de EpochMirus :

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 conceção 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).

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