

# RAINBOW

## ALTO AVANZAMENTO

**NEW!**



**noma** s.r.l

UTENSILI A FISSAGGIO MECCANICO

## LINEA RAINBOW ALTO AVANZAMENTO

La **fresatura ad alto avanzamento** (HFM o High-Feed Milling) è una tecnica di sgrossatura ad altissima produttività che combina una profondità di taglio assiale molto ridotta con un avanzamento per dente estremamente elevato, massimizzando il volume di metallo rimosso nel minor tempo possibile.

### Principio di funzionamento

La geometria dell'inserto genera un angolo d'attacco molto piccolo, che devia gran parte delle forze di taglio in direzione assiale (verso il mandrino) anziché radiale. Questo permette di aumentare notevolmente l'avanzamento mantenendo sotto controllo le sollecitazioni. Ecco perché queste frese sono adatte anche per macchine poco rigide o con poca potenza.

### Vantaggi

- Utensili molto sporgenti
- Elevata produttività.
- Riduzione dei tempi ciclo.
- Minori vibrazioni su pezzi e utensili.
- Buona durata degli inserti.
- Adatta a sgrossatura di acciai, ghise e superleghe.

Questa tipologia di lavorazione (HFM o FF) è ideale per la sgrossatura di tasche profonde, stampi e superfici complesse. Non è invece indicata per la finitura o per la lavorazione di spallamenti a 90°, poiché il raggio ridotto dell'inserto lascerebbe un sovrametallo non lavorato.

### Parametri tipici

Si utilizzano profondità di passata molto basse (spesso comprese tra 0,3 mm e 1,2 mm), ma avanzamenti che possono raggiungere e superare i 2 mm per dente. In termini pratici, nella fresatura ad alto avanzamento si lavora con **passate poco profonde ma molto veloci**, ottenendo una produttività spesso superiore rispetto alla fresatura convenzionale di sgrossatura.

### RIVESTIMENTO APPLICATO SULLA NOSTRA "LINEA RAINBOW"

|                                        |             |
|----------------------------------------|-------------|
| Durezza in HV 0,05:                    | = / > 4 000 |
| Temperatura di deposito in c°:         | > 400       |
| Massima temperatura di utilizzo in C°: | ≈ 1 100     |
| Coefficiente di attrito:               | 0,6         |

### CARATTERISTICHE PRINCIPALI

Monolayer  
Elevata durezza su spessori sottili  
Basso coefficiente di attrito  
Elevata temperatura di ossidazione  
Scarsa affinità chimica con materiali ferrosi

## RAINBOW HIGH-FEED LINE

**High-feed milling** (HFM) is an extremely high-productivity roughing technique that combines a very shallow axial depth of cut with an extremely high feed per tooth, maximising the volume of metal removed in the shortest possible time.

### Principle of operation

The insert geometry creates a very small rake angle, which diverts most of the cutting forces in the axial direction (towards the spindle) rather than radially. This allows the feed rate to be significantly increased whilst keeping stresses under control. This is why these milling cutters are also suitable for machines with low rigidity or low power.

### Advantages

- Tools with a very long overhang
- High productivity.
- Reduced cycle times.
- Lower vibration on workpieces and tools.
- Good insert life.
- Suitable for roughing steels, cast iron and superalloys.

This type of machining (HFM or FF) is ideal for roughing deep pockets, moulds and complex surfaces. However, it is not suitable for finishing or for machining 90° shoulders, as the small radius of the insert would leave unmachined material.

### Typical parameters

Very low pass depths (often between 0,3 mm and 1,2 mm) are used, but advances that can reach and exceed 2,0 mm per tooth.

In practical terms, high-feed milling is worked with **shallow but very fast passes**, achieving often higher productivity than conventional roughing milling.

### COATING APPLIED ON OUR "RAINBOW LINE"

|                                |             |
|--------------------------------|-------------|
| Hardness in HV 0.05:           | = / > 4 000 |
| Deposit temperature in C°:     | > 400       |
| Maximum use temperature in C°: | ≈ 1 100     |
| Friction coefficient:          | 0,6         |

### MAIN FEATURES

Monolayer  
High hardness on thin thicknesses  
Low coefficient of friction  
High oxidation temperature  
Poor chemical affinity with ferrous materials

# RAINBOW

## HOCHVORSCHUB-LINIE

Das Hochvorschubfräsen (HFM) ist ein extrem produktives Schruppverfahren, das eine sehr geringe axiale Schnitttiefe mit einem extrem hohen Vorschub pro Zahn kombiniert und so das in kürzester Zeit abgetragene Metallvolumen maximiert.

### Funktionsprinzip

Die Geometrie der Wendeschneidplatte erzeugt einen sehr kleinen Spanwinkel, wodurch der Großteil der Schnittkräfte in axialer Richtung (zur Spindel hin) statt radial abgeleitet wird. Dies ermöglicht eine deutliche Erhöhung der Vorschubgeschwindigkeit bei gleichzeitiger Kontrolle der Belastungen. Daher eignen sich diese Fräser auch für Maschinen mit geringer Steifigkeit oder Leistung.

### Vorteile

- Werkzeuge mit sehr großer Auskraglänge.
- Hohe Produktivität.
- Verkürzte Zykluszeiten.
- Geringere Vibrationen an Werkstück und Werkzeug.
- Gute Standzeit der Wendeschneidplatten.
- Geeignet für das Schruppen von Stahl, Gusseisen und Superlegierungen.

Diese Bearbeitungsart (HFM oder FF) eignet sich ideal für das Schruppen tiefer Taschen, von Formen und komplexen Oberflächen. Sie ist jedoch nicht für das Schlichten oder die Bearbeitung von 90°-Schultern geeignet, da der kleine Radius der Wendeschneidplatte unbearbeitetes Material zurücklassen würde.

### Typische Parameter

Es werden sehr geringe Schnitttiefen (oft zwischen 0,3 mm und 1,2 mm) verwendet, jedoch Vorschubwerte, die 2,0 mm pro Zahn erreichen oder überschreiten können.

In der Praxis wird beim Hochvorschubfräsen mit flachen, aber sehr schnellen Schnitten gearbeitet, wodurch oft eine höhere Produktivität erzielt wird als beim herkömmlichen Schruppfräsen.

### BESCHICHTUNG UNSERER

„RAINBOW-LINIE“

|                                   |            |
|-----------------------------------|------------|
| Härte in HV 0,05:                 | = / > 4000 |
| Abscheidetemperatur in °C:        | > 400      |
| Maximale Einsatztemperatur in °C: | ~ 1000     |
| Reibungskoeffizient:              | 0.6        |

### HAUPTMERKMALE

Monolage (Einzelschicht)  
Hohe Härte bei geringer Schichtdicke  
Niedriger Reibungskoeffizient  
Hohe Oxidationsbeständigkeitstemperatur  
Geringe chemische Affinität zu eisenhaltigen Werkstoffen

# RAINBOW

## HIGH-FEED LINE

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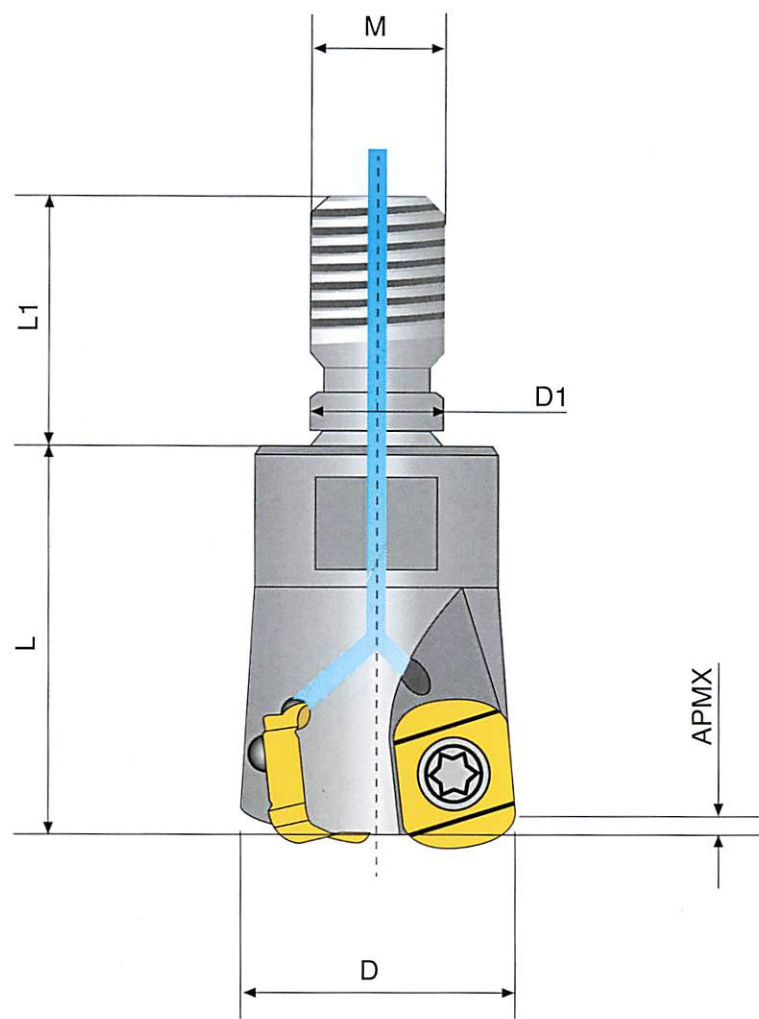
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Rif.

| 750         | ØD | L  | M  | D1   | L1   | Z | APMX |  |  |  |
|-------------|----|----|----|------|------|---|------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| 750.016.206 | 16 | 27 | 8  | 8,5  | 17,5 | 2 | 0,7  | BNMX<br>0603                                                                         | 1001                                                                                  | 2008                                                                                  |
| 750.020.306 | 20 | 30 | 10 | 10,5 | 19,5 | 3 | 0,7  |                                                                                      |                                                                                       |                                                                                       |
| 750.025.406 | 25 | 35 | 12 | 12,5 | 22   | 4 | 0,7  |                                                                                      |                                                                                       |                                                                                       |
| 750.032.506 | 32 | 40 | 16 | 17   | 25   | 5 | 0,7  |                                                                                      |                                                                                       |                                                                                       |
| 750.042.606 | 42 | 40 | 16 | 17   | 25   | 6 | 0,7  |                                                                                      |                                                                                       |                                                                                       |
| 760         |    |    |    |      |      |   |      |                                                                                      |                                                                                       |                                                                                       |
| 760.025.309 | 25 | 35 | 12 | 12,5 | 22   | 3 | 1,2  | BNMX<br>0904                                                                         | 1003-B9                                                                               | 2015                                                                                  |
| 760.032.409 | 32 | 40 | 16 | 17   | 25   | 4 | 1,2  |                                                                                      | 1003-B9                                                                               |                                                                                       |
| 760.035.509 | 35 | 43 | 16 | 17   | 25   | 5 | 1,2  |                                                                                      | 1004                                                                                  |                                                                                       |
| 760.042.509 | 42 | 43 | 16 | 17   | 25   | 5 | 1,2  |                                                                                      | 1003-B9                                                                               |                                                                                       |

