

Nine9®

Power Mill

Smallest milling cutter 10mm.
Patented Dual Relief Angle Insert !
Higher feed rate !
Higher wearing resistance !!





Nine 9 Power Mill offers you High Rigidity & High Feed Rate milling cutter.

*Precision ground insert performs efficient repeatability and excellent accuracy.
Special geometry design helps the strength of cutting edge in shoulder milling application.
Patented Dual relief angle (7° and 15°) increases the stiffness of the insert for absorbing cutting force.*

On insert size to optimize the number of teeth for feed operation.

Nine 9 Power Mill has minimal size insert type, it helps you to manage your tool stock in low cost to compare other milling cutter with various size inserts.

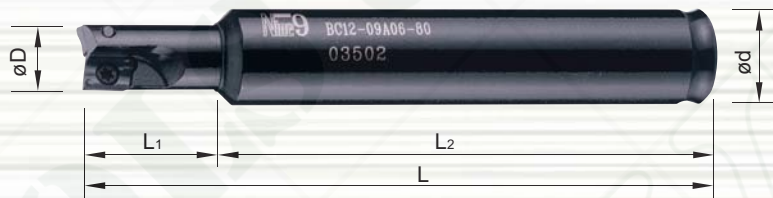
*Smallest indexable milling cutter from 10mm.
Low tool cost to compare with solid carbide end mill.*

Reliable quality ! Valuable product !

Patented Precision Ground Insert **A** :

- Sub-micron carbide, fully ground to ensure efficient repeatability.
- Inserts are designed with high positive geometry and helical cutting edge.
- Inserts perform good shoulder milling operation.

Cylindrical Shank Milling Cutter



| Order No. | Part No. | $\varnothing D$ ± 0.05 | L | L ₁ | L ₂ | $\varnothing d$ h6 | No. of teeth | Insert | Screw / key | | |
|---------------------|----------------|-------------------------------|-----|----------------|----------------|-----------------------|--------------|---|-----------------------------|-----------------------------|----------------------------|
| 00-99802-BC10-10A06 | BC10-10A06-100 | 10 | 100 | 40 | 60 | 10 | 2 | A9FT060205H A9GT060205H A9GT060210H | NS-18037 0.9 Nm NK-T6 | | |
| 00-99802-BC12-10A06 | BC12-10A06-80 | 10 | 80 | 20 | 60 | 12 | 2 | | | | |
| 00-99802-BC12-11A06 | BC12-11A06-80 | 11 | 80 | 22 | 58 | 12 | 2 | | | | |
| 00-99802-BC12-12A06 | BC12-12A06-80 | 12 | 80 | 24 | 56 | 12 | 2 | | | | |
| 00-99802-BC16-13A06 | BC16-13A06-100 | 13 | 100 | 26 | 74 | 16 | 2 | | | | |
| 00-99802-BC16-14A06 | BC16-14A06-100 | 14 | 100 | 28 | 72 | 16 | 2 | | | | |
| 00-99802-BC16-15A06 | BC16-15A06-100 | 15 | 100 | 30 | 70 | 16 | 3 | | | | |
| 00-99802-BC16-16A06 | BC16-16A06-100 | 16 | 100 | 32 | 68 | 16 | 3 | | | | |
| 00-99802-BC16-16A10 | BC16-16A10-100 | 16 | 100 | 32 | 68 | 16 | 2 | | | A9MT1035 A9FT103505H | NS-25060 1.0Nm NK-T7 |
| 00-99802-BC20-20A10 | BC20-20A10-120 | 20 | 120 | 40 | 80 | 20 | 3 | | | | |
| 00-99802-BC25-25A10 | BC25-25A10-150 | 25 | 150 | 50 | 100 | 25 | 3 | | | | |

A Series Milling Insert

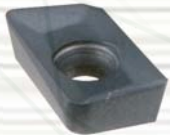


■ A9MT :

High rigidity, special edge honing, resistance of impact during milling operation, good for milling of carbon steel and alloy steel.

-NC2032 :

- K20F grade, AlTiN coated.
- Special chip breaker design.
- High surface hardness for high wearing resistance.
- Good for hard cutting carbon steel and alloy steel.



■ A9GT :

Sharp cutting edge and high positive rake angle, good for finishing milling and surface roughness.

-NC2033 :

- K20F grade, TiAlN coated.
- For better surface roughness.
- Good for all kind of steel.



■ A9FT :

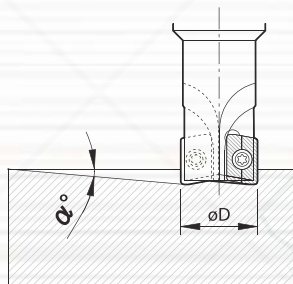
Sharp cutting edge and high positive rake angle, low friction coefficient for Non-Ferrous metal.

-NC9031 :

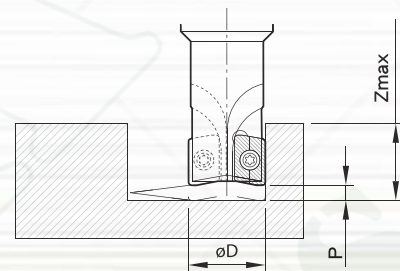
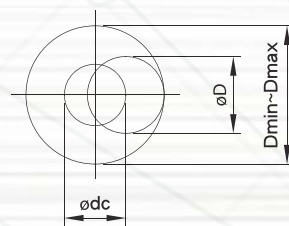
- K20F grade, TiN coated.
- Good for Al, Al-alloy, Copper, Copper alloy and Non-Ferrous metal, etc.

Milling Operation Notice

■ Ramping



■ Helical milling



| $\varnothing D$ | α° | Dmin. (hole diameter) | P (plunge depth) | Zmax. | Dmax. (hole diameter) | P (plunge depth) | Zmax. |
|-----------------|----------------|--------------------------|---------------------|-------|--------------------------|---------------------|-------|
| 10 | 5° | 13 | 0.41 | 5 | 18 | 1.09 | 10 |
| 11 | 4.5° | 15 | 0.50 | 5.5 | 20 | 1.11 | 11 |
| 12 | 4° | 17 | 0.55 | 6 | 22 | 1.09 | 12 |
| 13 | 3.5° | 19 | 0.58 | 6.5 | 24 | 1.05 | 13 |
| 14 | 3° | 21 | 0.58 | 7 | 26 | 0.98 | 14 |
| 15 | 2.5° | 23 | 0.55 | 7.5 | 28 | 0.89 | 15 |
| 16 | 2° | 25 | 0.50 | 8 | 30 | 0.76 | 16 |

Unit : mm

- The ramp angle α° is limited due to the insert edge design.
- Using helical milling method, please take care hole diameter and plunge depth.

A Series Insert Cutting Data (ø10-ø16mm)

| Parts No. | Grade | Coating | | Dimensions | | | |
|----------------------|-------|---------|--|------------|---|------|---------|
| | | | | L | W | S | Re±0.03 |
| A9GT060205H - NC2033 | K20F | TiAlN | | 6.5 | 4 | 2.45 | 0.5 |
| A9GT060210H - NC2033 | K20F | TiAlN | | 6.5 | 4 | 2.45 | 1.0 |
| A9FT060205H - NC9031 | K20F | TiN | | 6.5 | 4 | 2.45 | 0.5 |

| Material | Grade of Insert | Insert Size | Vc(m/min) | fz (mm/tooth) | Cutting Parameters | | |
|---------------------------------------|-----------------|-------------|-----------|---------------|--------------------|---------|--------|
| | | | | | Ap (mm) | Ap (mm) | Ae(mm) |
| Carbon Steel | NC2033 | 06 | 80~150 | 0.03~0.07 | 1.5 | 4 | 1.5 |
| Low-alloy Steel, C≤ 0.3% | NC2033 | 06 | 80~150 | 0.03~0.07 | 1.5 | 4 | 1 |
| High-alloy Steel, C> 0.3% | NC2033 | 06 | 60~120 | 0.03~0.07 | 1.0 | 2.5 | 1 |
| Casting Steel | NC2033 | 06 | 60~120 | 0.03~0.07 | 1.0 | 2.5 | 1 |
| Stainless Steel | NC2033 | 06 | 60~120 | 0.01~0.05 | 0.5 | 2 | 1 |
| Malleable Cast Iron Grey Cast Iron | NC2033 | 06 | 100~150 | 0.03~0.07 | 1.5 | 4 | 1.5 |
| Al, Al-alloy | NC9031 | 06 | 200~500 | 0.03~0.07 | 2 | 4 | 2 |

A Series Insert Cutting Data (ø16-ø25mm)

| Parts No. | Grade | Coating | | Dimensions | | | |
|----------------------|-------|---------|--|------------|-----|-----|---------|
| | | | | L | W | S | Re±0.03 |
| A9FT103505H - NC9031 | K20F | TiN | | 10 | 6.6 | 3.5 | 0.5 |
| A9MT1035 - NC2032 | K20F | AlTiN | | 10 | 6.6 | 3.5 | 0.4 |

| Material | Grade of Insert | Insert Size | Vc(m/min) | fz (mm/tooth) | Cutting Parameters | | |
|---------------------------------------|-----------------|-------------|-----------|---------------|--------------------|---------|--------|
| | | | | | Ap (mm) | Ap (mm) | Ae(mm) |
| Carbon Steel | NC2032 | 10 | 150~250 | 0.08~0.15 | 3 | 8 | 3 |
| Low-alloy Steel ≤ 0.3% C | NC2032 | 10 | 150~250 | 0.08~0.15 | 3 | 8 | 2 |
| High-alloy Steel > 0.3% C | NC2032 | 10 | 120~200 | 0.08~0.15 | 2 | 4 | 2 |
| Casting Steel | NC2032 | 10 | 120~200 | 0.08~0.12 | 2 | 5 | 2 |
| Stainless Steel | NC2032 | 10 | 80~120 | 0.04~0.08 | 1 | 4 | 2 |
| Malleable Cast Iron Grey Cast Iron | NC2032 | 10 | 100~150 | 0.06~0.10 | 3 | 8 | 3 |
| Al, Al-alloy | NC9031 | 10 | 200~1000 | 0.06~0.12 | 5 | 8 | 3 |

• Reduce the feed rate 30% from the above table for slotting operation.

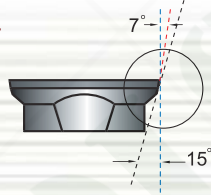
R Series-Round Insert

Patented Precision Ground Insert R :

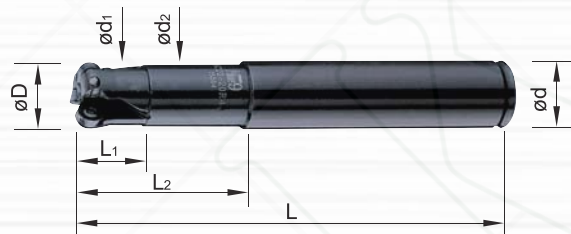
- Submicron carbide inserts are fully ground.
- Round insert with square seating pocket for exact positioning, especially for unstable cutting condition.
- Maximum number of teeth for feed operation.
- High feed rate capability.

- Patented Dual Relief Angle Insert !
- Higher feed rate!
- Higher wearing resistance!

- Dual Relief



Cylindrical Shank Milling Cutter



| Order No. | Part No. | øD | L | L1 | L2 | ød _{h6} | ød1 | ød2 | No. of teeth | Insert | Screw / key |
|------------------------|-------------------|----|-----|----|----|------------------|-----|------|--------------|-----------|-----------------------------|
| 00-99802-BC16-16R4 | BC16-16R4-120 | 16 | 120 | - | 40 | 16 | - | 14.5 | 2 | R9MT0803 | NS-30056, NK-T9 |
| 00-99802-BC20-20R4 | BC20-20R4-130 | 20 | 130 | 20 | 50 | 20 | 17 | 18 | 3 | R9MT0803F | |
| 00-99802-BC25-25R4-45° | BC25-25R4-150-45° | 25 | 150 | 30 | 60 | 25 | 21 | 23 | 3 | R9MT0803P | NS-30072 2.0 Nm NK-T9 |
| 00-99802-BC32-35R4 | BC32-35R4-200 | 35 | 200 | - | 80 | 32 | - | 30 | 3 | | |

* The insert pocket of the cutter 25R4-45° has rotated 45°. The cutter can take advantage of the reversed side of the used insert for second use .

■ **R9MT :**

Corner radius especial good for 3D corner milling, high reliability performance and long tool life.



■ **-NC40 :**

TiN coated, K20 grade. Sharp cutting edge and high positive angle. Good for stainless steel.



■ **F-NC2032 :**

AlTiN coated, K20F grade. Special chip breaker design, sharp cutting edge. Good for carbon steel, low alloy steel.

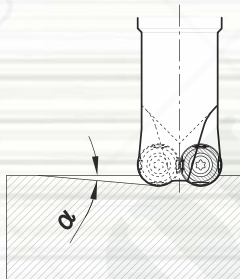


■ **P-NC30 :**

AlTiN coated, K10F grade, flat cutting edge design. Universal type for high-alloy steel and cast iron.

Milling Operation Notice

■ **Ramping**



| øD | α ° |
|----|-----|
| 16 | 4.5 |
| 20 | 2.5 |
| 25 | 1.5 |
| 35 | 1.0 |

R Series Insert

| Parts No. | Grade | Coating | | Dimensions | | |
|--------------------|-------|---------|--|------------|------|-----|
| | | | | Ic | S | Re |
| R9MT0803P - NC30 | K10F | AlTiN | | 8 | 3.17 | 0.4 |
| R9MT0803F - NC2032 | K20F | AlTiN | | 8 | 3.17 | 0.4 |
| R9MT0803 - NC40 | K20F | TiN | | 8 | 3.17 | 0.4 |

| Material | Grade of Insert | Vc(m/min) | fz (mm/tooth) | Cutting Depth Ap (mm) |
|---------------------------------------|-----------------|-----------|---------------|-----------------------|
| Carbon Steel | F-NC2032 | 150~200 | 0.3~0.8 | 0.4~1.0 |
| Low-alloy Steel, C≤ 0.3% | F-NC2032 | 150~200 | 0.3~0.8 | 0.4~0.6 |
| High-alloy Steel, C> 0.3% | P-NC30 | 120~200 | 0.3~0.8 | 0.4~0.6 |
| Casting Steel | P-NC30 | 120~200 | 0.3~0.8 | 0.3~0.6 |
| Stainless Steel | NC40 | 100~140 | 0.3~0.5 | 0.3~0.6 |
| Hardened Steel <HRC52 | P-NC30 | 60~120 | 0.2~0.4 | 0.3~0.4 |
| Malleable Cast Iron Grey Cast Iron | P-NC30 | 120~200 | 0.3~0.8 | 0.4~0.6 |

$$S = \frac{V_c \times 1000}{\pi \times D} \text{ r.p.m. } F = f_z \times S \times n \text{ mm/min.}$$

S: Spindle Speed (rpm) Vc: Cutting Speed (m/min.)
F: Feed Rate (mm/min.) fz: Feed per Tooth D: Drill Dia. n: No. of Flute

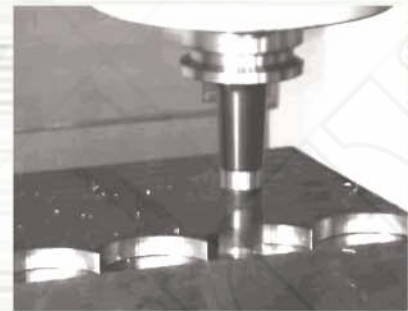
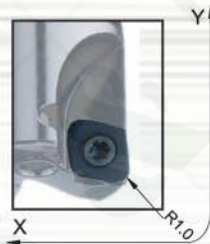
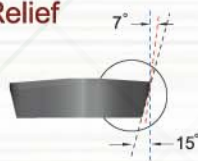
C Series-Torus Radius Insert

Patented Precision Ground Insert C :

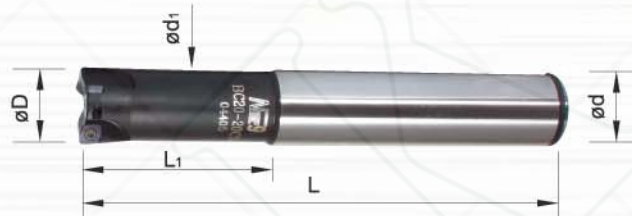
- Submicron carbide inserts are fully ground.
- Good for semi-finishing 3D surface milling for mold industry.
- To replace the other milling cutters with ramp feed.


- Patented Dual Relief Angle Insert !
- Higher feed rate!
- Higher wearing resistance!

• Dual Relief



Cylindrical Shank Milling Cutter



| Order No. | Part No. | $\varnothing D$ ± 0.03 | L | L1 | $\varnothing d$ h6 | $\varnothing d_1$ | No. of teeth | Insert | Screw / key |
|--------------------|-----------|-------------------------------|-----|----|-----------------------|-------------------|-----------------|---|-------------|
| 00-99802-BC12-12C5 | BC12-12C5 | 12 | 100 | 30 | 12 | 10.5 | 2 | C9MT05T105 | NS-20045 |
| 00-99802-BC16-16C5 | BC16-16C5 | 16 | 120 | 40 | 16 | 14.5 | 3 | C9MT05T110 | 0.8 Nm |
| 00-99802-BC20-20C5 | BC20-20C5 | 20 | 130 | 50 | 20 | 18 | 3 | C9MT05T110H | NK-T6 |
| 00-99802-BC25-25C5 | BC25-25C5 | 25 | 150 | 60 | 25 | 23 | 4 |  | |

■ **C9MT :**

Patented insert, fully ground corner radius.



-**NC30 :**

- Submicron carbide insert, AlTiN coated, K10 grade.
- Flat cutting edge design, universal type for all kind of materials.

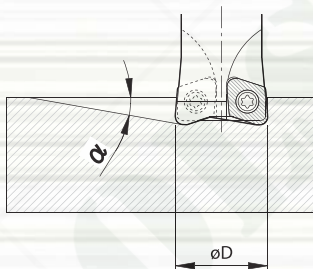


-**NC2032 :**

- Submicron carbide insert, AlTiN coated, K20F grade.
- High positive angle, special chip breaker design, higher wearing resistance.
- Good for carbon steel and low alloy steel.

Milling Operation Notice

■ **Ramping**



| ϕD | α° |
|----------|----------------|
| 12 | 8 |
| 16 | 5.5 |
| 20 | 4 |
| 25 | 3 |

C Series Insert Cutting Data

| Parts No. | Grade | Coating | | Dimensions | | |
|----------------------|-------|---------|--|------------|-----|---------------|
| | | | | L | S | Re ± 0.02 |
| C9MT05T105 - NC30 | K10F | AlTiN | | 5 | 2.0 | 0.5 |
| C9MT05T110 - NC30 | K10F | AlTiN | | 5 | 2.0 | 1.0 |
| C9MT05T110H - NC2032 | K20F | AlTiN | | 5 | 2.0 | 1.0 |

| Material | Grade of Insert | Vc(m/min) | fz (mm/tooth) | Cutting Depth Ap (mm) |
|--------------------------------|-----------------|-----------|---------------|-----------------------|
| Carbon Steel | NC2032 | 150~300 | 0.2~0.5 | 0.2~0.5 |
| | NC30 | 150~300 | 0.2~0.5 | 0.2~0.5 |
| Low-alloy Steel, C \leq 0.3% | NC2032 | 150~300 | 0.2~0.5 | 0.2~0.5 |
| | NC30 | 150~300 | 0.2~0.5 | 0.2~0.5 |
| High-alloy Steel, C > 0.3% | NC30 | 120~200 | 0.2~0.4 | 0.2~0.4 |
| Casting Steel | NC30 | 120~200 | 0.2~0.4 | 0.2~0.4 |
| Hardened Steel <HRC52 | NC30 | 100~150 | 0.1~0.3 | 0.1~0.3 |

- Reduce the feed rate 30% from the above table for slotting operation.

Cylindrical Shank Milling Cutter :



C9MT
Semi-finishing

- 99802-BC12-12C5
- 99802-BC16-16C5
- 99802-BC20-20C5
- 99802-BC25-25C5



R9MT
Roughing

- 99802-BC16-16R4
- 99802-BC20-20R4
- 99802-BC25-25R4-45°
- 99802-BC32-35R4



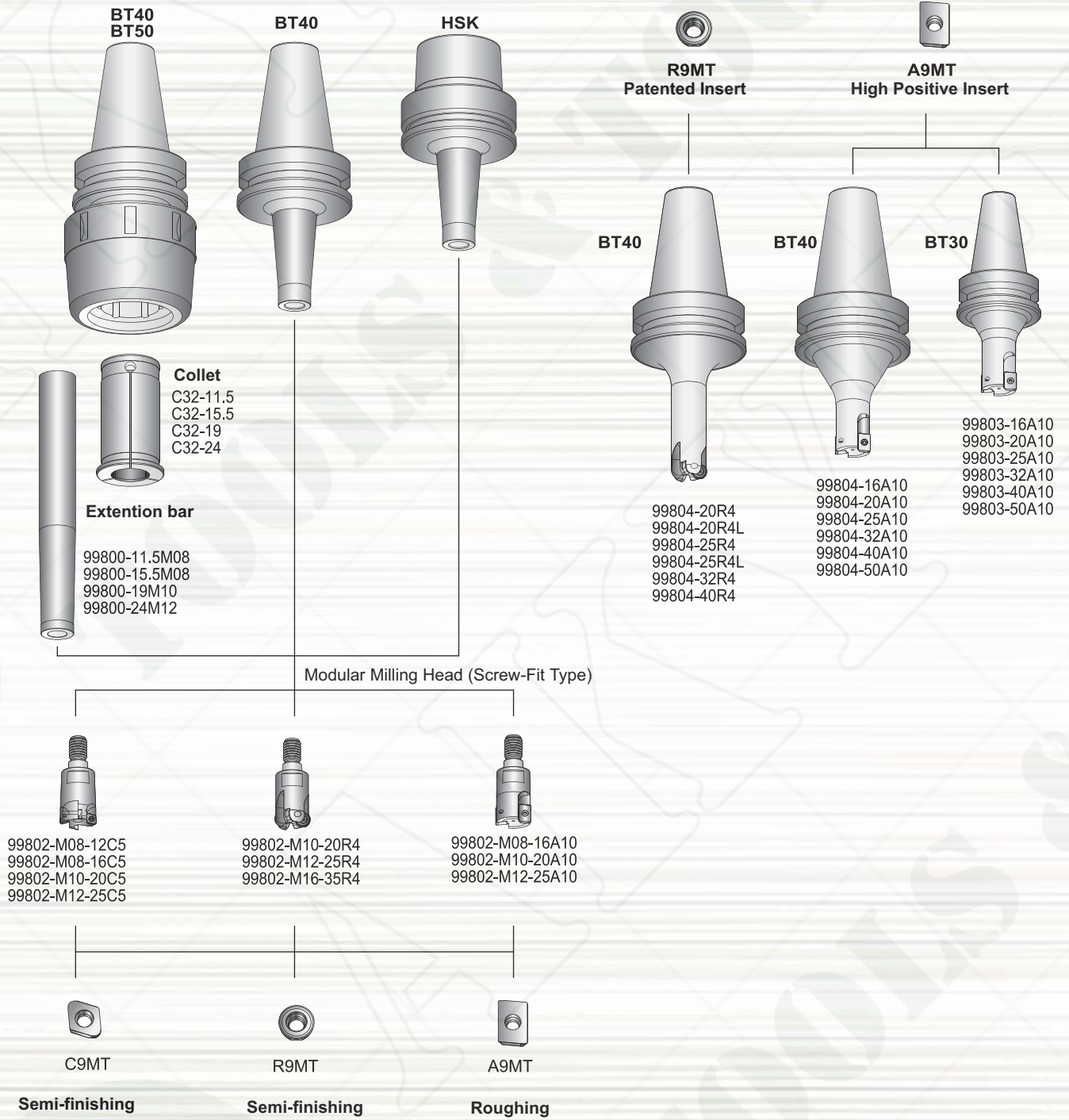
A9MT
Roughing

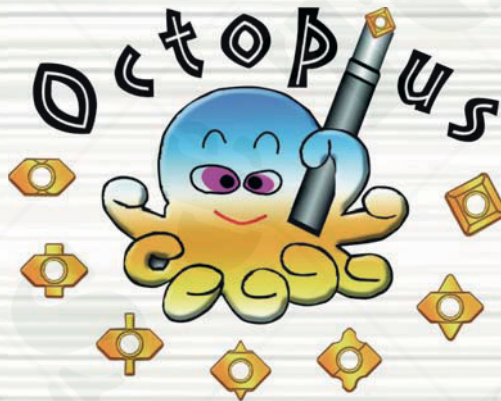
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- 99802-BC12-10A06
- 99802-BC12-11A06
- 99802-BC12-12A06
- 99802-BC16-13A06
- 99802-BC16-14A06
- 99802-BC16-15A06
- 99802-BC16-16A06
- 99802-BC16-16A10
- 99802-BC20-20A10
- 99802-BC25-25A10



■ **Modular Power-Mill System**

■ **Solid Power-Mill**





- *Super Power Drill and Super Drill*
- *High Speed Boring Tool*
- *NC-Spot Drill*
- *Power Mill*
- *Solid Carbide End Mill*
- *Tool Holder*



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