Double-sided positive insert for semi-finishing to finishing
DoMini-Mill features the advantage of an economical 6-cornered double-sided insert with positive cutting edges for profile milling of die & mold.
Multifunctional endmills for semi-finish or finishing operation with profile milling or plunging

Double sided with positive edge - innovative geometry

- The unique twisted peripheral shape provides positive flank clearance for double sided insert.
  - Positive insert positioning and sharper cutting edge improves cutting action and surface finish.
- Highly economical insert with 6 cutting edges.

High stability

- Dove-tail clamping system maintains the rigidity for accurate 3 dimensional machining.
  - Improves reliability in plunging operations.
- Back clearance angle with wall surface avoids chip packing allowing smooth cutting even in machining of square wall.
- Optimized geometry of cutting edge offers resistance to chipping in machining of steel and hardened material.
High versatility

- Modular style endmills with metric and TungMeister thread allows flexibility to be used with various type of shanks or holder in TungHold and TungMeister series.

- Combinations of shank lengths and shank material guarantees versatility in machining operations.

Inserts

- H-class insert with high accuracy provides minimized runout.

- 2 sizes of corner radii available for various type of machining.
  - \( R = 0.5 \text{ mm} \): Suitable for general purpose with low depth and width of cut
  - \( R = 1.0 \text{ mm} \): Ideal for hardened steel machining due to improved corner strength

- AH110 grade with PremiumGTec and high wear resistance is ideal for hardened material machining.
CUTTING PERFORMANCE

Surface finish

**Carbon steel**

- **Surface roughness: Ra (μm)**
  - Good!!
  - Many scratches

- **Cutting length (m)**

**Competitor A**
- Scratches

**Competitor B**

---

Tool life

**Hardened steel**

- **Cutting length (m)**
- **Width of max. corner wear: Vmax (mm)**

**Competitor A**

**Competitor B**

---

**Competitor A**
- Scratches

---

**Cutter** : HFWX04M016M08R02 (qDc = 16 mm, z = 2)
**Insert** : WXHU040305R-MJ
**Workpiece material** : SCM440 / 42CrMo4 (302HB)
**Cutting speed** : Vc = 300 m/min
**Feed per tooth** : fz = 0.15 mm/t
**Depth of cut** : ap = 0.15 mm
**Width of cut** : ae = 0.5 mm

---

**Cutter** : HFWX04M016M08R02 (qDc = 16 mm, z = 2)
**Insert** : WXHU040305R-MJ
**Workpiece material** : SKD11 / X153CrMoV12 (58.5HRC)
**Cutting speed** : Vc = 100 m/min
**Feed per tooth** : fz = 0.15 mm/t
**Depth of cut** : ap = 0.15 mm
**Width of cut** : ae = 0.2 mm

---

**DoMini-Mill**
Small-radius cutter for finishing operation

MODULAR HEAD - METRIC THREAD

DoMini-Mill HFWX04***M

For details of metric shank, please refer to TungFlex series in TR413 TungHold

SPARE PARTS

Clamping screw Wrench
SR34-514 T-7F
**INSERT**

**WXHU-MJ**

<table>
<thead>
<tr>
<th>Designation</th>
<th>Max. ap</th>
<th>IC dia</th>
<th>T</th>
<th>fz</th>
<th>AH110</th>
</tr>
</thead>
<tbody>
<tr>
<td>WXHU040305R-MJ</td>
<td>0.5</td>
<td>6.35</td>
<td>3.18</td>
<td>0.5</td>
<td>P, H</td>
</tr>
<tr>
<td>WXHU040310R-MJ</td>
<td>1</td>
<td>6.35</td>
<td>3.18</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

* For plunging, depth up to 2 mm is possible.

**STANDARD CUTTING CONDITIONS**

<table>
<thead>
<tr>
<th>ISO</th>
<th>Workpiece materials</th>
<th>Hardness (HB)</th>
<th>Grades</th>
<th>Cutting speed Vc (m/min)</th>
<th>Feed per tooth fz (mm/t)</th>
</tr>
</thead>
<tbody>
<tr>
<td>H</td>
<td>High carbon steel</td>
<td>200 - 300</td>
<td>AH110</td>
<td>100 - 300</td>
<td>0.1 - 0.3</td>
</tr>
<tr>
<td>P</td>
<td>(S45C / C45, S55C / C55, etc.)</td>
<td>150 - 300</td>
<td>AH110</td>
<td>100 - 300</td>
<td>0.1 - 0.3</td>
</tr>
<tr>
<td></td>
<td>Alloy steel</td>
<td>150 - 300</td>
<td>AH110</td>
<td>100 - 300</td>
<td>0.05 - 0.3</td>
</tr>
<tr>
<td></td>
<td>(SCM440 / 42CrMo4, SCR145, etc.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Prehardened steel</td>
<td></td>
<td>AH110</td>
<td>100 - 300</td>
<td>0.05 - 0.3</td>
</tr>
<tr>
<td></td>
<td>(NAK60, PX5, etc.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H</td>
<td>Hardened steel</td>
<td></td>
<td>AH110</td>
<td>80 - 130</td>
<td>0.1 - 0.3</td>
</tr>
<tr>
<td></td>
<td>(SKD61 / X40CrMoV5-1, etc.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(SKD11 / X153CrMoV12, etc.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## PRACTICAL EXAMPLES

<table>
<thead>
<tr>
<th>Workpiece type</th>
<th>Mold</th>
<th>Mold</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cutter</td>
<td>HFWX04M020M10R03 (ø20 mm, z = 3)</td>
<td>HFWX04M025M12R04 (ø25 mm, z = 4)</td>
</tr>
<tr>
<td>Insert</td>
<td>WXHU040310R-MJ</td>
<td>WXHU040310R-MJ</td>
</tr>
<tr>
<td>Grade</td>
<td>AH110</td>
<td>AH110</td>
</tr>
</tbody>
</table>

### Workpiece material
- Mold: 2738 (28 – 32 HRC)
- DIN 1.2344 (50 – 52HRC)

### Cutting conditions

<table>
<thead>
<tr>
<th>Cutting speed : $V_c$ (m/min)</th>
<th>195</th>
<th>274</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feed per tooth: $f_z$ (mm/t)</td>
<td>0.16</td>
<td>0.14</td>
</tr>
<tr>
<td>Feed speed : $V_f$ (mm/min)</td>
<td>1500</td>
<td>2000</td>
</tr>
<tr>
<td>Depth of cut : $a_p$ (mm)</td>
<td>0.25</td>
<td>0.11</td>
</tr>
<tr>
<td>Width of cut : $a_e$ (mm)</td>
<td>0.35</td>
<td>-</td>
</tr>
</tbody>
</table>

### Machining
- Profiling
- Profiling

### Coolant
- Wet (internal, 40bar)
- Dry

### Machine
- Vertical M/C
- Vertical M/C

### Results

![Tool life chart](chart.png)

- Tool life 142%!

DoMini-Mill increased tool life by 42% because of lower cutting force compared to competitor's tool and grade with high wear resistance.

### 5 hours machining!

New PremiumGTec grade with improved wear resistance achieved long tool life.
Check our site and our App to get more info!

www.tungaloy.com