

JHF980 Solid carbide High Feed cutter with MEGA coating

Product information



| | |
|-----------------------|---|
| Tolerance: D_{c2} : | - 0,02 / -0,1 mm |
| Run-out: | D_{c2} : 0,01 mm |
| Tolerance: r_{e1} : | +/- 0,05 mm |
| Coating: | MEGA (TiAlN - Monolayer) |
| Helix angle: | 0° |
| Rake angle: | 0° |
| Carbide: | XMG (Ultrafine, Wc 90% Co 10%, grain size 0,8 μ m) |
| Centre cutting: | No |
| Machining Strategy: | High Feed Machining |

Application Area


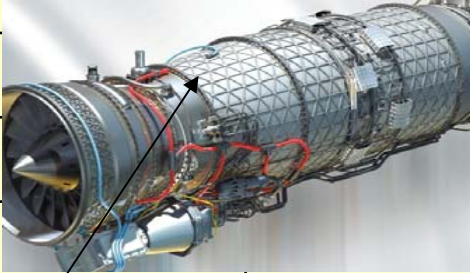


| | Soft Steel | Normal steel | Tool steel <48 HRC | Hardened steel >48-56 HRC | Hardened steel >56-62 HRC | Stainless steel | Difficult stainless steel | Superalloys | Difficult superalloys | Titanium based alloys |
|----------------------------|------------|--------------|--------------------|---------------------------|---------------------------|-----------------|---------------------------|-------------|-----------------------|-----------------------|
| SecoMaterial GroupNo | 12 | 34 | 56 | 7a | 7b | 8-9 | 10-11 | 20 | 21 | 22 |
| Machining Strategies | | | | | | | | | | |
| General Machining | | | | | | | | | | |
| High Speed Machining | | | | | | | | | | |
| High Performance Machining | | | | | | | | | | |
| High Feed Machining | | | | | | | | | | |
| High Precision Machining | | | | | | | | | | |
| Macro Machining | | | | | | | | | | |

Sales arguments

- Complements the *Mini Master High Feed* program
- Wide applications area: from steel, stainless up to exotic materials
- Very easy to program with “Z leveling” for opening pockets and slots
- Primary a solid carbide “High Feed” tool, but it has also excellent “Plunging” performance
- Due to small ap the normal extra semi-finish operation might be skipped in some occasions
- An ideal tool for opening 3D cavities from shallow up to deep shapes

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Application positioning

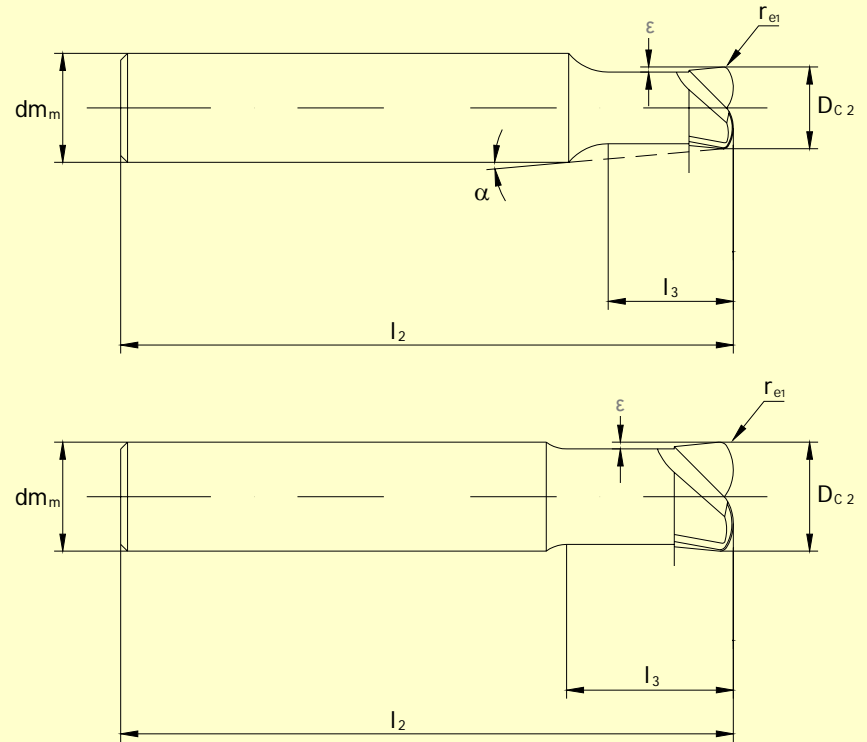
| Product range / Segments | M&D | Aerospace | Powergen. | Medical | General machining |
|--------------------------|--|--|---|--|---|
| TORNADO | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| HPM | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| HFM* | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| MINI | <input checked="" type="checkbox"/> | | | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| VHM |  |  | |  |  |
| DIAMOND | | | | | |
| SPECIALS | | | | | |
| Components | <ul style="list-style-type: none"> • Runners • shallow 3D cavities • deep slots | <ul style="list-style-type: none"> • Casing pockets • Ti engine brackets | <ul style="list-style-type: none"> • Nozzle Guide Vanes • Blade finishing | <ul style="list-style-type: none"> • Knee caps | <ul style="list-style-type: none"> • Any 3D cavity application where a fast machine is available |

*=new range

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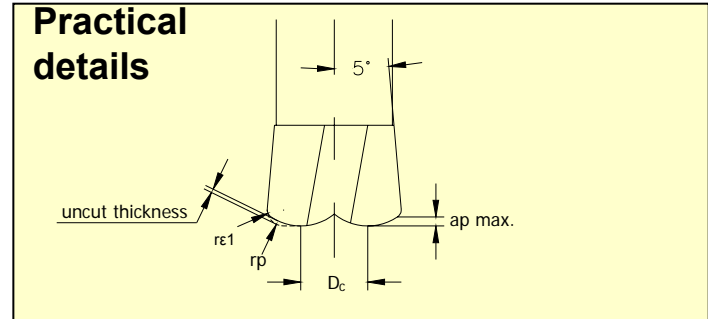
Dimensions, explanation:

- High Feed Radius gives maximum a_p
- Lengths l_3 :
 - $3 \times D_{c2}$, $5 \times D_{c2}$ and $7 \times D_{c2}$
 - $3 \times D_{c2}$: maximum stability
 - $5 \times D_{c2}$: middle range
 - $7 \times D_{c2}$: over $7 \times D_{c2}$ not applicable and profitable
- Stable neck radius
- Shank $\varnothing 6$ for stability reason & easy shrinking



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Dimensions



| | | Dimensions in mm | | | | | | | | | | | |
|---------------|---------------|------------------|----------------|-----------------|----------------|----------------|------|------|--------|------|-----------------|---------|----------------|
| Type | Part No. | D _{c2} | D _c | dm _m | l ₂ | l ₃ | ε | rε1 | ap max | rp | uncut thickness | α° | Z _n |
| JHF980-MEGA | 980015-MEGA | 1,5 | 0,75 | 6 | 40 | 4,5 | 0,1 | 0,10 | 0,10 | 0,18 | 0,04 | 14° 30' | 2 |
| | 980ML015-MEGA | 1,5 | 0,75 | 6 | 40 | 7,5 | 0,1 | 0,10 | 0,10 | 0,18 | 0,04 | 11° | 2 |
| | 980TL015-MEGA | 1,5 | 0,75 | 6 | 40 | 10,5 | 0,1 | 0,10 | 0,10 | 0,18 | 0,04 | 8° 30' | 2 |
| | 980020-MEGA | 2 | 1 | 6 | 40 | 6 | 0,15 | 0,15 | 0,15 | 0,27 | 0,06 | 11° 15' | 2 |
| | 980ML020-MEGA | 2 | 1 | 6 | 40 | 10 | 0,15 | 0,15 | 0,15 | 0,27 | 0,06 | 8° | 2 |
| | 980TL020-MEGA | 2 | 1 | 6 | 50 | 14 | 0,15 | 0,15 | 0,15 | 0,27 | 0,06 | 6° 15' | 2 |
| | 980030-MEGA | 3 | 1,5 | 6 | 50 | 9 | 0,2 | 0,20 | 0,20 | 0,37 | 0,09 | 6° 45' | 2 |
| | 980ML030-MEGA | 3 | 1,5 | 6 | 50 | 15 | 0,2 | 0,20 | 0,20 | 0,37 | 0,09 | 4° 30' | 2 |
| | 980TL030-MEGA | 3 | 1,5 | 6 | 60 | 21 | 0,2 | 0,20 | 0,20 | 0,37 | 0,09 | 3° 30' | 2 |
| | 980040-MEGA | 4 | 2 | 6 | 60 | 12 | 0,25 | 0,30 | 0,25 | 0,50 | 0,11 | 3° 45' | 2 |
| | 980ML040-MEGA | 4 | 2 | 6 | 70 | 20 | 0,25 | 0,30 | 0,25 | 0,50 | 0,11 | 2° 30' | 2 |
| | 980TL040-MEGA | 4 | 2 | 6 | 80 | 28 | 0,25 | 0,30 | 0,25 | 0,50 | 0,11 | 1° 45' | 2 |
| | 980050-MEGA | 5 | 2,5 | 6 | 60 | 15 | 0,3 | 0,40 | 0,30 | 0,64 | 0,13 | 1° 30' | 2 |
| | 980ML050-MEGA | 5 | 2,5 | 6 | 80 | 25 | 0,3 | 0,40 | 0,30 | 0,64 | 0,13 | 1° | 2 |
| | 980TL050-MEGA | 5 | 2,5 | 6 | 90 | 35 | 0,3 | 0,40 | 0,30 | 0,64 | 0,13 | 0° 45' | 2 |
| | 980060-MEGA | 6 | 3 | 8 | 60 | 18 | 0,4 | 0,50 | 0,35 | 0,78 | 0,15 | 2° 45' | 2 |
| | 980ML060-MEGA | 6 | 3 | 8 | 80 | 30 | 0,4 | 0,50 | 0,35 | 0,78 | 0,15 | 1° 45' | 2 |
| | 980TL060-MEGA | 6 | 3 | 8 | 100 | 42 | 0,4 | 0,50 | 0,35 | 0,78 | 0,15 | 1° 15' | 2 |
| | 980080-MEGA | 8 | 4 | 8 | 70 | 24 | 0,5 | 0,60 | 0,40 | 0,94 | 0,20 | - | 2 |
| | 980ML080-MEGA | 8 | 4 | 8 | 80 | 40 | 0,5 | 0,60 | 0,40 | 0,94 | 0,20 | - | 2 |
| | 980TL080-MEGA | 8 | 4 | 8 | 100 | 56 | 0,5 | 0,60 | 0,40 | 0,94 | 0,20 | - | 2 |
| | 980100-MEGA | 10 | 5 | 10 | 80 | 30 | 0,6 | 0,80 | 0,45 | 1,18 | 0,23 | - | 2 |
| | 980100Z3-MEGA | 10 | 5 | 10 | 80 | 30 | 0,6 | 0,80 | 0,45 | 1,18 | 0,23 | - | 3 |
| | 980ML100-MEGA | 10 | 5 | 10 | 90 | 50 | 0,6 | 0,80 | 0,45 | 1,18 | 0,23 | - | 2 |
| 980TL100-MEGA | 10 | 5 | 10 | 110 | 70 | 0,6 | 0,80 | 0,45 | 1,18 | 0,23 | - | 2 | |
| 980120-MEGA | 12 | 6 | 12 | 80 | 36 | 0,7 | 1,00 | 0,50 | 1,42 | 0,27 | - | 2 | |
| 980120Z3-MEGA | 12 | 6 | 12 | 80 | 36 | 0,7 | 1,00 | 0,50 | 1,42 | 0,27 | - | 3 | |
| 980ML120-MEGA | 12 | 6 | 12 | 110 | 60 | 0,7 | 1,00 | 0,50 | 1,42 | 0,27 | - | 2 | |
| 980TL120-MEGA | 12 | 6 | 12 | 130 | 84 | 0,7 | 1,00 | 0,50 | 1,42 | 0,27 | - | 2 | |

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Definitions

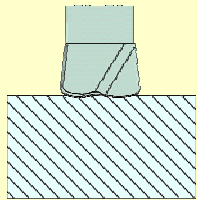
- **Machining Strategy:**

- **High Feed Machining:**

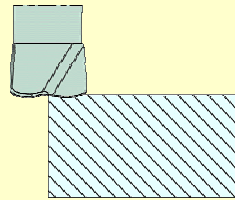
Is a machining strategy where high feed rates can be reached with full tool diameter (a_e) in engagement in combination with a small a_p .

With HFM you achieve high metal removal rate and / or semi surface finish by using a much higher table feed compared to General Machining. Tool characteristics: Special developed frontal teeth, very short cutting length, and coating. Machine requirements: Good stability, CNC, possibility for high table feed (v_f). Big advantage of this technology is that it is very user friendly, easy, safe and quick to program in CAM. By using the so called Z-leveling strategy it is relatively easy to program complex forms without the necessity of having big experience in programming. The application area is from soft to hardened steel, titanium and stainless steel and is very good as pre-finishing operation before the HSM technology. Is also applicable for deep pockets.

- **Basic Operations:**

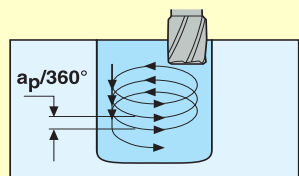


Slot Milling

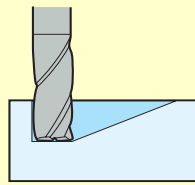


Side Milling

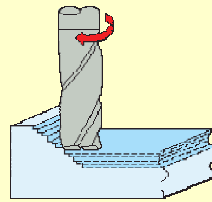
- **Advanced Machining Methods:**



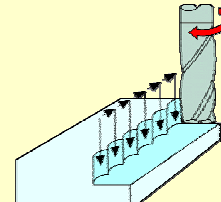
Helical Interpolation



Ramping



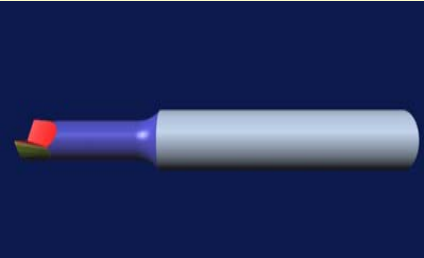
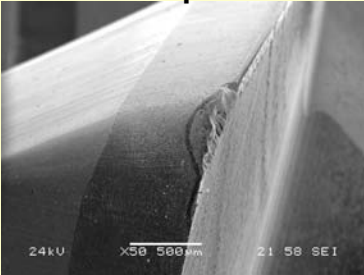
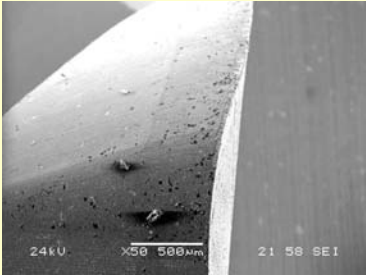
Z-leveling



Plunge milling

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Competitor comparison information

| | | |
|-----------------------------------|---|---|
| Competitors of the JHF980: | PWZ, Fette, OSG, Hitachi | |
| R&D tool result: | JHF 980120-MEGA |  |
| Toolwear after 30 minutes | <p style="text-align: center;">Competitor</p>  | <p style="text-align: center;">Jabro</p>  |
| Material: | 1.2344, SMG 7a | |
| Hardness: | 53 HRc | |
| Vc: | 110 m/min | |
| fz: | 0,3 mm | |
| a_e: | 6 mm | |
| a_p: | 0,4 mm | |
| Machine: | Makino A55ε | |
| Clamping: | Shrinkfit EPB | |
| Coolant: | Air | |
| Conclusion: | Strong performance of JHF980 in hardened steel benchmarked to the competition. In all the other SMG the JHF980 shows also a stronger performance than the tested competitors. | |

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Cutting data

| Slot milling Roughing | | | | | | |
|---------------------------|-------|----------|---------|-----------------------|-----------|-----------------|
| Seco Material Group | | *coolant | Vc | **fz | **ap max. | ae |
| | | | m/min | mm/tooth | | |
| Soft Steel | 1-2 | M | 350-250 | 0,033xD _{c2} | 1 x ap | D _{c2} |
| Normal Steel | 3-4 | M | 250-200 | 0,030xD _{c2} | 1 x ap | D _{c2} |
| Tool Steel <48 HRc | 5-6 | M | 200-150 | 0,027xD _{c2} | 1 x ap | D _{c2} |
| Hardened Steel >48-56 HRc | 7a | M | 110-80 | 0,024xD _{c2} | 0,8 x ap | D _{c2} |
| Hardened Steel >56-62 HRc | 7b | M | 80-60 | 0,018xD _{c2} | 0,6 x ap | D _{c2} |
| Stainless Steel | 8-9 | M | 140-110 | 0,024xD _{c2} | 0,8 x ap | D _{c2} |
| Difficult stainless Steel | 10-11 | M | 110-80 | 0,024xD _{c2} | 0,8 x ap | D _{c2} |
| Soft cast iron | 12-13 | M | 200-150 | 0,024xD _{c2} | 1 x ap | D _{c2} |
| Hard cast iron | 14-15 | M | 150-100 | 0,018xD _{c2} | 1 x ap | D _{c2} |
| Superalloys | 20 | E | 60-40 | 0,018xD _{c2} | 0,5 x ap | D _{c2} |
| Difficult superalloys | 21 | E | 40-20 | 0,018xD _{c2} | 0,5 x ap | D _{c2} |
| Titanium based alloys | 22 | E | 130-100 | 0,021xD _{c2} | 0,5 x ap | D _{c2} |

| ap table | |
|-----------------|------|
| D _{c2} | ap |
| 1,5 | 0,10 |
| 2 | 0,15 |
| 3 | 0,20 |
| 4 | 0,25 |
| 5 | 0,30 |
| 6 | 0,35 |
| 8 | 0,40 |
| 10 | 0,45 |
| 12 | 0,50 |

Ramping angle: 1-1,5 degrees

** Reduce ap - 20% and Feed per tooth with - 15% at ML version
 ** Reduce ap - 40% and Feed per tooth with - 30% at L version

| Side milling Roughing | | | | | | |
|---------------------------|-------|----------|---------|-----------------------|-----------|---------------------|
| Seco Material Group | | *coolant | Vc | **fz | **ap max. | ae |
| | | | m/min | mm/tooth | | |
| Soft Steel | 1-2 | M | 350-250 | 0,055xD _{c2} | 1 x ap | 0,5xD _{c2} |
| Normal Steel | 3-4 | M | 250-200 | 0,050xD _{c2} | 1 x ap | 0,5xD _{c2} |
| Tool Steel <48 HRc | 5-6 | M | 200-150 | 0,045xD _{c2} | 1 x ap | 0,5xD _{c2} |
| Hardened Steel >48-56 HRc | 7a | M | 110-80 | 0,040xD _{c2} | 0,8 x ap | 0,5xD _{c2} |
| Hardened Steel >56-62 HRc | 7b | M | 80-60 | 0,030xD _{c2} | 0,6 x ap | 0,5xD _{c2} |
| Stainless Steel | 8-9 | M | 140-110 | 0,040xD _{c2} | 0,8 x ap | 0,5xD _{c2} |
| Difficult stainless Steel | 10-11 | M | 110-80 | 0,040xD _{c2} | 0,8 x ap | 0,5xD _{c2} |
| Soft cast iron | 12-13 | M | 200-150 | 0,040xD _{c2} | 1 x ap | 0,5xD _{c2} |
| Hard cast iron | 14-15 | M | 150-100 | 0,030xD _{c2} | 1 x ap | 0,5xD _{c2} |
| Superalloys | 20 | E | 60-40 | 0,024xD _{c2} | 0,5 x ap | 0,5xD _{c2} |
| Difficult superalloys | 21 | E | 40-20 | 0,024xD _{c2} | 0,5 x ap | 0,5xD _{c2} |
| Titanium based alloys | 22 | E | 130-100 | 0,035xD _{c2} | 0,5 x ap | 0,5xD _{c2} |

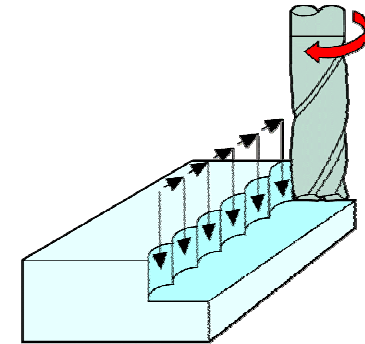
** Reduce ap - 20% and Feed per tooth with - 15% at ML version
 ** Reduce ap - 40% and Feed per tooth with - 30% at L version

* E=Emulsion
 M=Mistspray
 A=Air

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Cutting data

| Plunge milling | | | | | | |
|---------------------------|-------|------------|---------|----------------------|----------------------|--------------------|
| Seco Material Group | | ***coolant | Vc | fz | **Max. plunge depth | ae |
| | | | m/min | mm/tooth | | |
| Soft Steel | 1-2 | M | 250-175 | 0,01xD ₂ | 1 x l ₃ | 0,3xD ₂ |
| Normal Steel | 3-4 | M | 175-140 | 0,01xD ₂ | 1 x l ₃ | 0,3xD ₂ |
| Tool Steel <48 HRc | 5-6 | M | 140-110 | 0,01xD ₂ | 1 x l ₃ | 0,3xD ₂ |
| Hardened Steel >48-56 HRc | 7a | M | 75-55 | 0,007xD ₂ | 0,6 x l ₃ | 0,3xD ₂ |
| Hardened Steel >56-62 HRc | 7b | M | 55-40 | 0,006xD ₂ | 0,6 x l ₃ | 0,3xD ₂ |
| Stainless Steel | 8-9 | M | 100-75 | 0,007xD ₂ | 0,8 x l ₃ | 0,3xD ₂ |
| Difficult stainless Steel | 10-11 | M | 75-55 | 0,007xD ₂ | 0,6 x l ₃ | 0,3xD ₂ |
| Soft cast iron | 12-13 | M | 140-110 | 0,007xD ₂ | 1 x l ₃ | 0,3xD ₂ |
| Hard cast iron | 14-15 | M | 110-70 | 0,006xD ₂ | 1 x l ₃ | 0,3xD ₂ |
| Superalloys | 20 | E | 40-30 | 0,006xD ₂ | 0,6 x l ₃ | 0,3xD ₂ |
| Difficult superalloys | 21 | E | 30-15 | 0,006xD ₂ | 0,6 x l ₃ | 0,3xD ₂ |
| Titanium based alloys | 22 | E | 90-70 | 0,007xD ₂ | 1 x l ₃ | 0,3xD ₂ |



** Max. plunge depth ML and L version => 1 x *Max. plunge depth short version
 *** If mistspray is not available => use emulsion

* E=Emulsion
 M=Mistspray
 A=Air