

# GM

## series general end mills

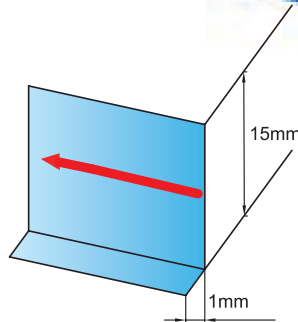
**Wide application** High efficiency machining can be achieved ranging from common steel to pre-hardened steel machining.

**Optimized structure** Appropriate combination of sharp cutting edge and tool strength makes cutting easier and faster, extending tool life.

**Versatile product series** Suitable for rough machining with high metal removal rate to finish machining with high surface quality.

**Complete diameter range** Minimum diameter of 0.3mm for machining of the smallest parts.

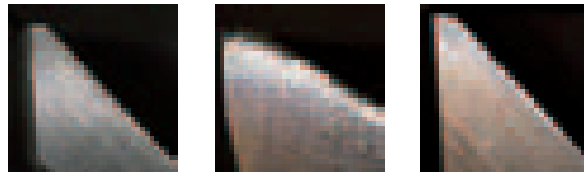
Tool type: GM-4E-D10.0  
 Dimensions:  $\varnothing 10.0\text{mm}$   
 Workpiece material: NAK80(40HRC)  
 Rotating speed: 3200r/min (100m/min)  
 Feed rate: 640mm/min(0.2mm/r)  
 Axial cutting depth:  $a_p=15\text{mm}$   
 Radial cutting depth:  $a_e=1.0\text{mm}$   
 Cutting style: side milling (down milling)  
 Cooling system: air blow  
 Machine tool: MIKRON UCP 1000



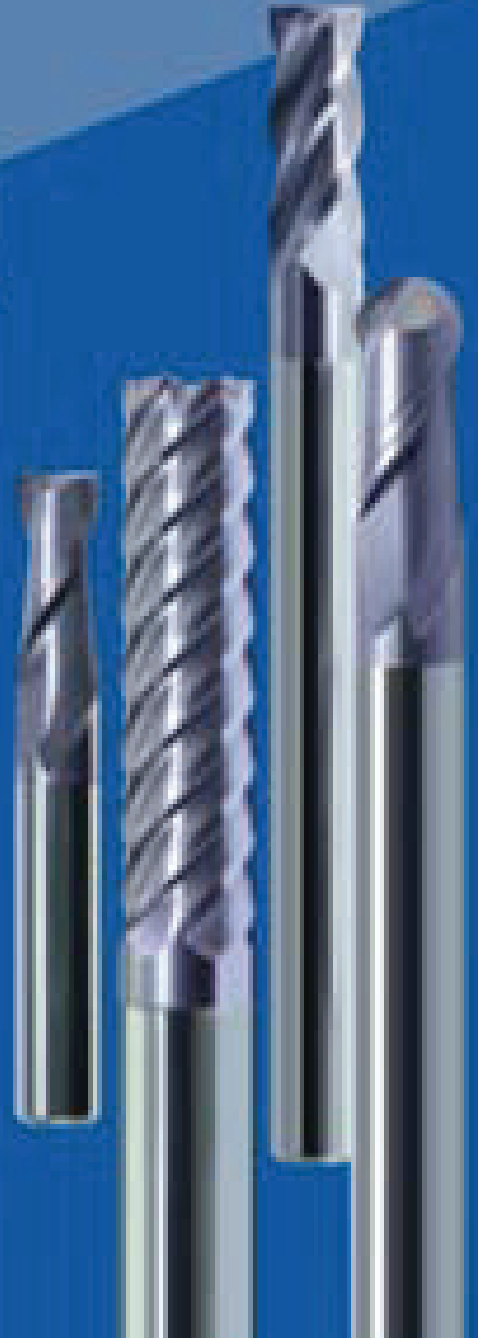
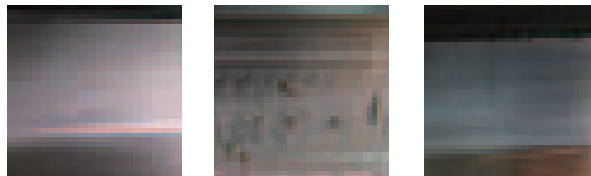
### Cutting edge abrasion and workpiece surface quality

End mill	GM-4E-D10.0	Similar product of company A	Similar product of company B
Cutting length	60m	20m	60m

Cutting edge abrasion



Workpiece surface quality



# Multipurpose 3-flute end mills

## GM-3E GM-3EL

Excellent vibration resistance, able to achieve various machining operations such as slot milling, side milling, drilling, etc.!

### GM-3E-D10.0 slot milling 718H(32HRC)

Machine tool: MIKRON UCP1000

Tool holder: HSK63-A

Workpiece material: 718H(32HRC)

Cutting speed: 80(m/min)

Feed rate per tooth: 0.06(mm/tooth)

Axial cutting depth: 5(mm)

Radial cutting depth: 10(mm)

Cooling system: air blow

Milling style: slot milling

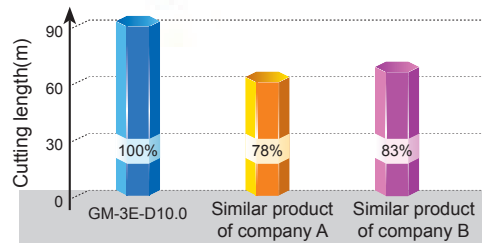
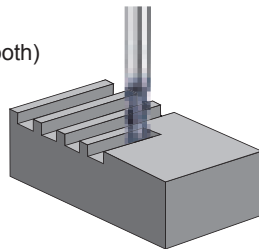
Overhang: 35mm

Failure identification:

(A) Severe breakage occurs with a breakage value above 0.2mm.

(B) Even abrasion value of flank reaches 0.1mm.

Either situation is regarded as tool failure.



Slot milling cutting length comparison

### GM-3E-D10.0 combined machining 718H(32HRC)

Machine tool: MIKRON UCP1000

Tool holder: HSK63-A

Workpiece material: 718H(32HRC)

Cutting speed: 80(m/min)

Feed rate per tooth: 0.06(mm/tooth)

Axial cutting depth: 5(mm)

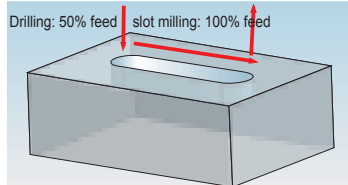
Radial cutting depth: 10(mm)

Cooling system: air blow

Milling style: combined cutting

Overhang: 35mm

Overhang: 35mm



### GM-3E-D6.0 side milling NAK80(37HRC)

Machine tool: MIKRON UCP1000

Tool holder: HSK63-A

Workpiece material: NAK80(37HRC)

Cutting speed: 100(m/min)

Feed rate per tooth: 0.06(mm/tooth)

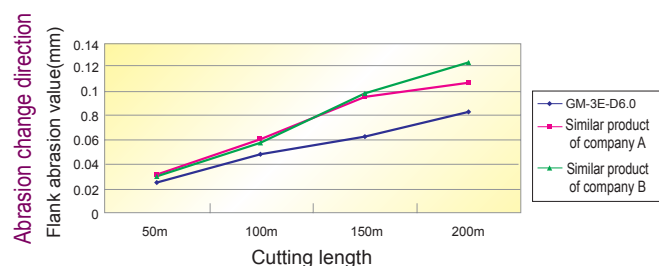
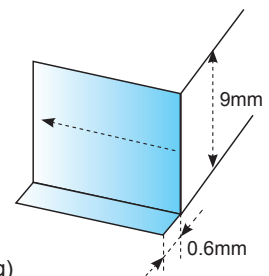
Axial cutting depth: 9(mm)

Radial cutting depth: 0.6(mm)

Cooling system: air blow

Milling style: side milling (down milling)

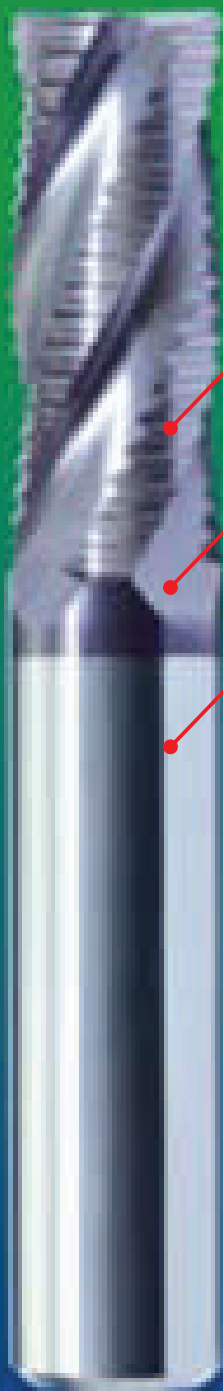
Overhang: 22mm



High-efficiency roughing of steel

# GM-4W

## Corrugated edge end mills



Optimized corrugation specially designed for P-type material with proper control of chips size, improving tool life and stability.

Nano coating with excellent lubrication property can reduce vibration as well as resist wear.

Ultra fine cemented carbide substrate with high toughness can easily achieve heavy roughing.



### End mills for high-efficiency roughing GM-4W-D8.0 cutting die steel NAK55(33HRC)

Machine tool: MIKRON UCP1000

Tool holder: HSK63-A

Workpiece material: NAK55(33HRC)

Cutting speed: 100(m/min)

Feed rate per tooth: 0.06(mm/tooth)

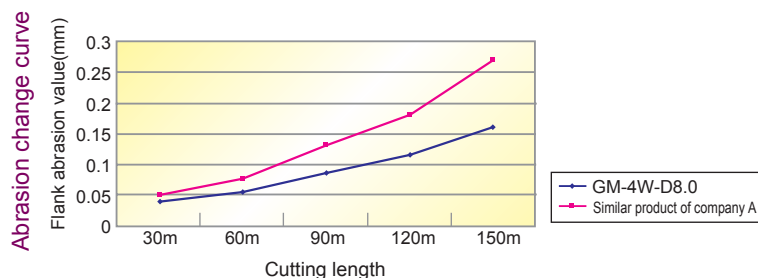
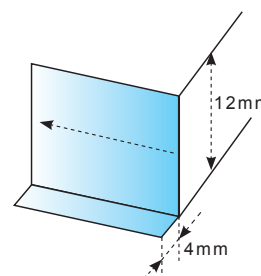
Axial cutting depth: 12(mm)

Radial cutting depth: 4(mm)

Cooling system: air blow

Milling style: side milling (down milling)

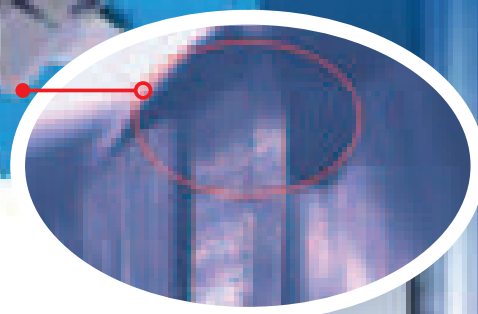
Overhang: 30mm



# High-precision R end mill series

GM-4R  
GM-4RL  
GM-2R

High-precision seamless connection of nose and peripheral cutting edge reduces the abrasion at the juncture and improves tool life.



## GM-4R-D6.0R1.0 cavity milling 42CrMo(35HRC)

Machine tool: MIKRON UCP1000

Tool holder: HSK63-A

Workpiece material: 42CrMo(35HRC)

Cutting speed: 100(m/min)

Feed rate per tooth: 0.06(mm/tooth)

Axial cutting depth: 0.3(mm)

Radial cutting depth: 2(mm)

Cooling system: air blow

Milling style: cavity milling

Overhang: 30mm

