

FH series high-speed, high-hard processing



Dot matrix heterogeneous coating

■ TiNCO₃, provides better wear recognition. Processing hardness below to HRC68 degrees

■ The addition of a special elemental lattice of heterogeneous coatings, high coating hardness and excellent high temperature oxidation resistance is more suitable for high hardness materials and high-speed machining applications.

■ Excellent coating treatment technology combined with the substrate more closely.

■ The unique tool structure and reasonable groove design result in excellent cutting performance.



■ The special surface post-treatment can effectively reduce the friction, make the chip evacuation more smooth, and the surface quality is better.



FH series



ACompany product

Perfect high temperature oxidation resistance:

After oxidation at 1100 ° C, the coating of FH series milling cutters only shows very thin oxide layer, while the coating of similar products of company A has been completely oxidized

FH series high hardness HRC52 pure sidewall milling

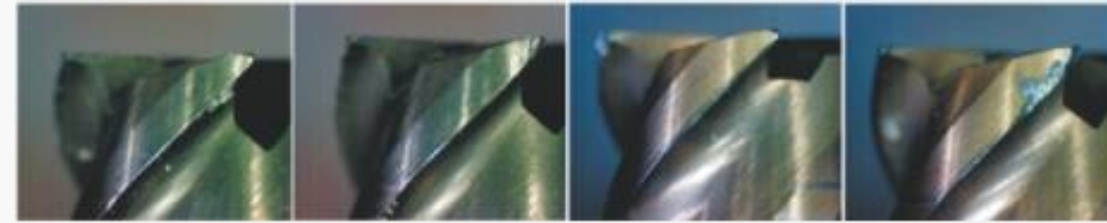
Model: FH-4E-D6.0

Tool	FH-4E-D6.0
Workpiece Material	2344 Heat treatment HRC52
Speed	N=4500r/min(Vc:84.8m/min)
Feed	F:900mm/min(fz=0.05mm/Z)
Ap. Ae	Ap:3mm Ae:0.2mm
Cutting Method	Facing
Machine	DMG High-speed machine

Wear picture
(1 hour)

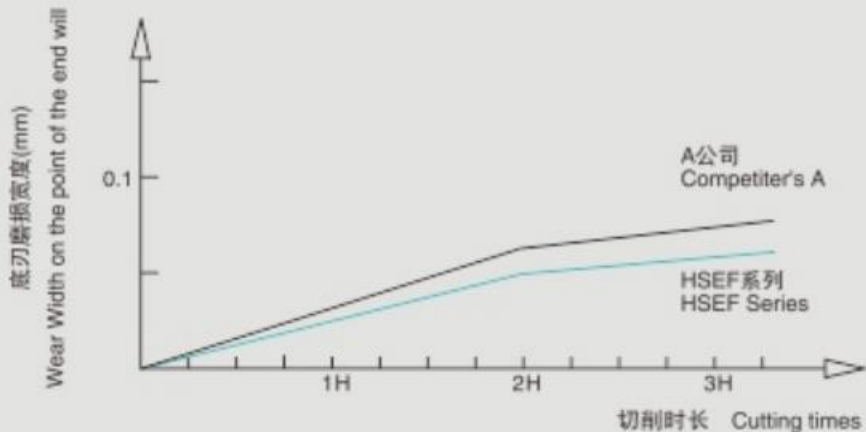


Wear picture
(3.5 hours)



FH Series

A Company



FH Series Cr12MoV heat treatment HRC58 face milling

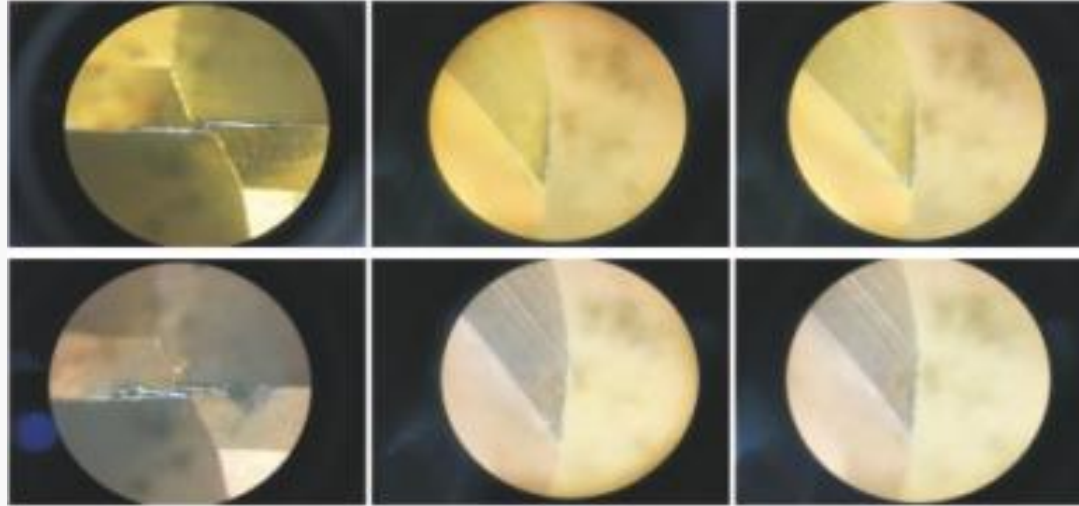
Model: FH-2B-R4.0

Wear picture (2.5 hours)

FH Serious

Wear picture (2.5 hours)

A Company

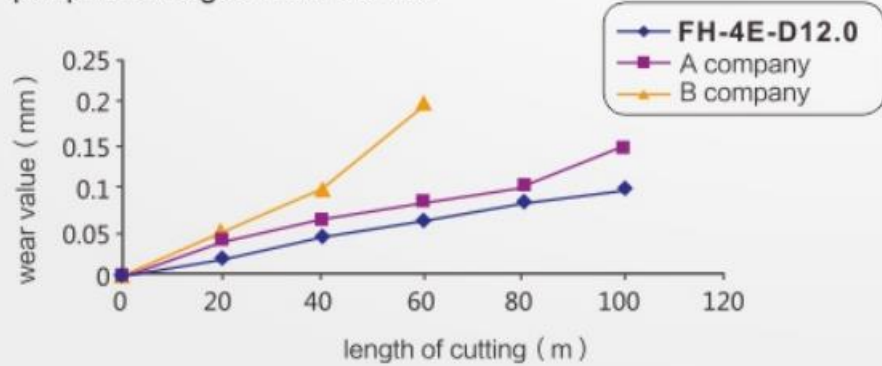


Tool	FH-2B-R4.0
Workpiece Material	Cr12MoV fired HRC58-62)
Speed	N:8000r/min(Vc-20096m/min)
Feed	F:3000mm/min(tx-0.19mm/Z)
Ap. Ae	Ap:0.05mm Ae:0.2mm
Cutting Method	face milling
Machine	DMG High-speed machine

Solid Carbide end milling cutter

Long tool life

peripheral edges wear curves



tool: FH-4EL-D8.0

milling method: end milling

workpiece material: quenched steel(HRC65)

cutting speed: 100m/min

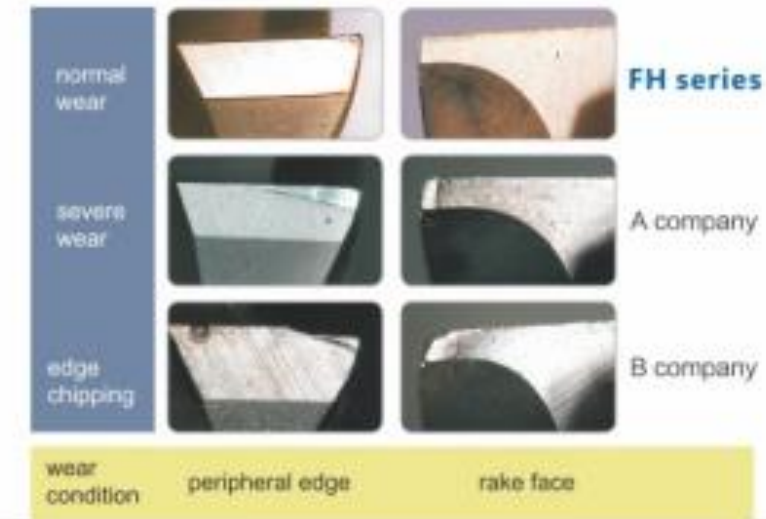
feed per revolution: 0.15mm/r

depth of cut: 0.3mm

cutting width: 5mm

cooling system: air cooling

wear comparison after machining 40min



Tool: FH-4E-D12.0

workpiece material: SKD11(62HRC)

Vc: 100m/min

f: 0.3mm/r

Ap: 12.0mm

Ae: 0.5mm

Cooling system: air cooling

Wear comparison after 60 mins milling



FH series



A company



B company

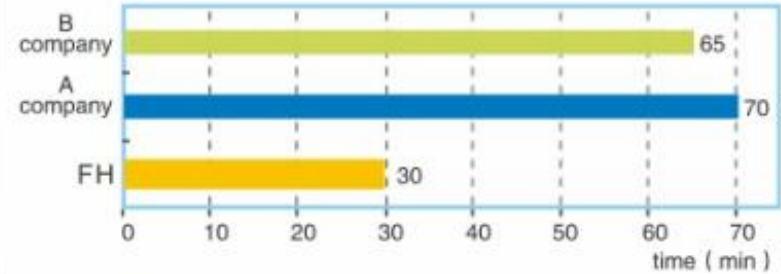
Solid Carbide end milling cutter

It's more efficient

Tool: FH-4R-D6.0R1.0
machining parts: cavity machining
(30mm x 30mm x 10mm)
workpiece material: SKD13(65HRC)
Vc: 200m/min
fz: 0.2mm/r
Ap:5mm
Ae: 0.3mm
cooling system: air cooling



time comparison for complete one cavity

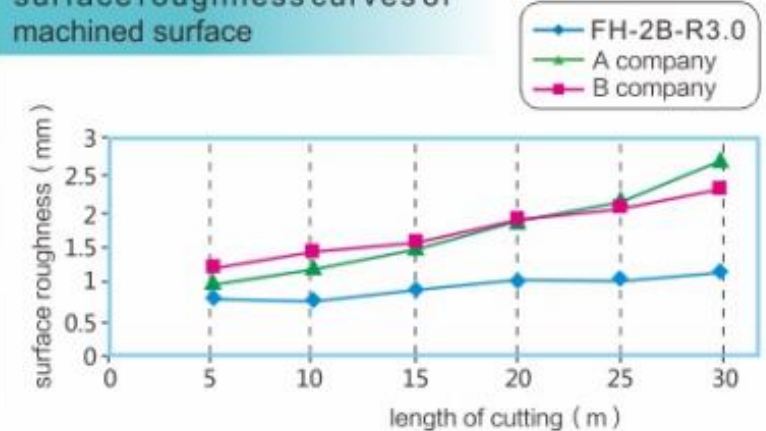


100% improvement of machining efficient on FH than others!

Tool: FH-2B-R3.0
workpiece material: SKD13(65HRC)
Vc: 200m/min
fz: 0.2mm/r
Ap: 0.2mm
Ae: 0.3mm
cooling system. air cooling



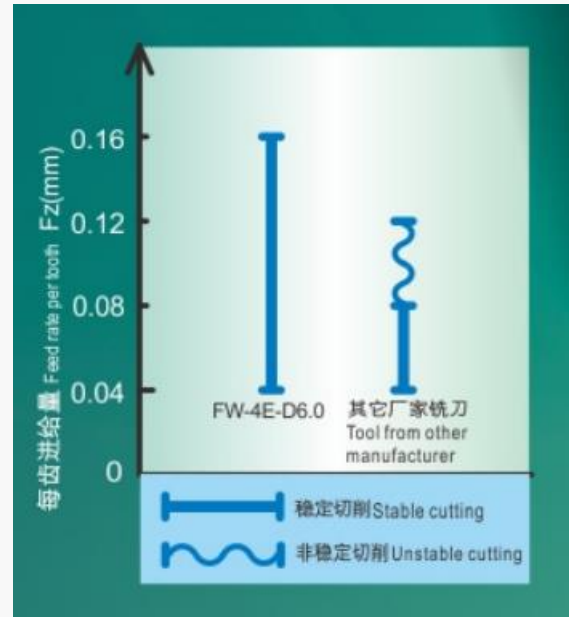
surface roughness curves of machined surface



FW high-performance universal machining



Higher feed rates and improved metal removal rate for efficient machining, due to high stability of cutting edge and rigid tool structure.



Tool diameter : $\text{Ø}6.0\text{mm}$

Tool type :

a) FW-4E-D6.0

b) Milling Cutter (Tools from overseas manufacturer)

Mmachine tool : Mikron UCP1000

Workpiece material : NAK80(40HRC)

Cooling system: air blow

Machining operation :

side milling (down milling)

Cutting parameters :

$V_c = 100\text{m/min}$

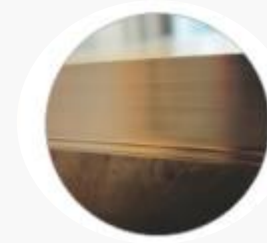
$a_p = 9\text{mm}$

$a_e = 0.6\text{mm}$

$F_z = 0.04\text{mm} \sim 0.16\text{mm}$

FW series

FW-4E-D6.0 Application of machining 45# steel
Tool: FW-4E-D6.0
workpiece material: 45#steel (HB180) cutting data.
 V_c :150m/min, f_z :0.05mm/z, A_p :6mm, A_e =0.5mm
Machine: machining center
coolingsystem air cooling

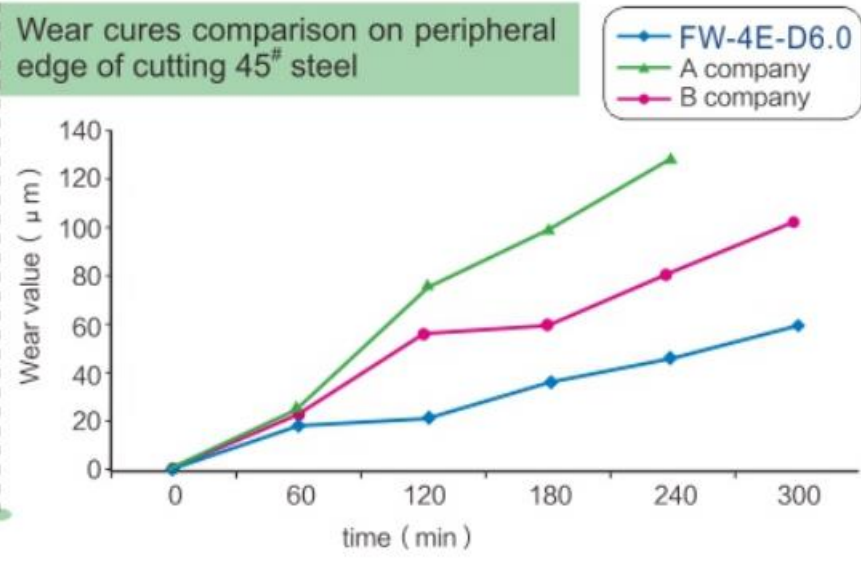


FW-2E-D20.0 Application of machining carbon steel

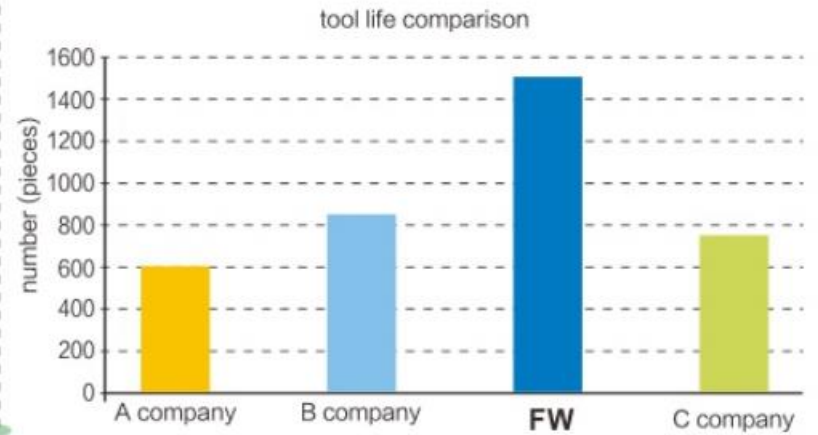
workpiece: valve
workpiece material: carbon steel (HB220)
machining parts: kidney slots(Ø24mm×40mm×20mm)
tool: FW-2E-D20.0
cutting data: V_c =130m/min, f_r =0.15mm/r, a_p =10mm
machine: machining center
cooling system: water soluble cooling



Wear cures comparison on peripheral edge of cutting 45# steel



number of slots comparison



FW series

FW-2B-R3.0 Application of machining pre-hardened steel NAK80
milling method: profile milling
workpiece material: NAK80(HRC36)
Tool:FW-2B-R3.0
Cutting data: $V_c=100\text{m/min}$, $f_r=0.3\text{mm/r}$,
 $A_p=1\text{mm}$, $A_e=1\text{mm}$
Machine: machining center
cooling system: water soluble cooling

rake face wear comparison after 150min machining



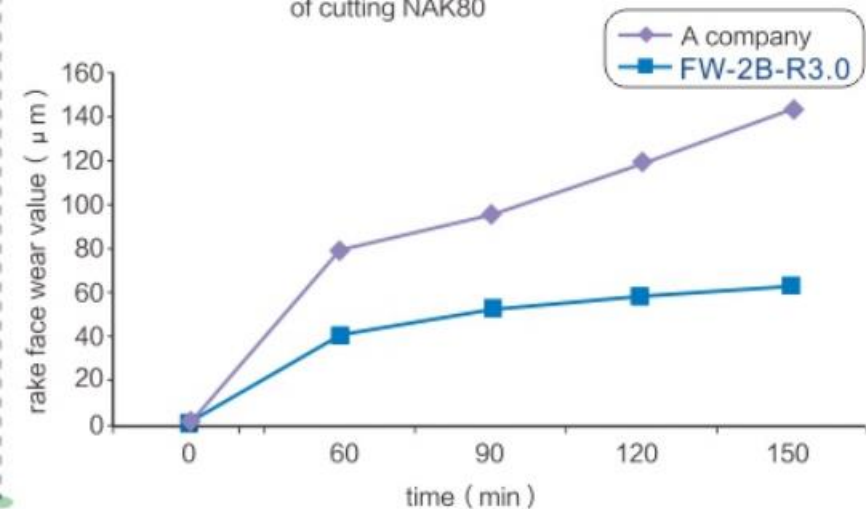
FW-2B-R3.0



A company

wear curves

Wear curves comparison on rake face of cutting NAK80



Ball-nose end mill with four flutes

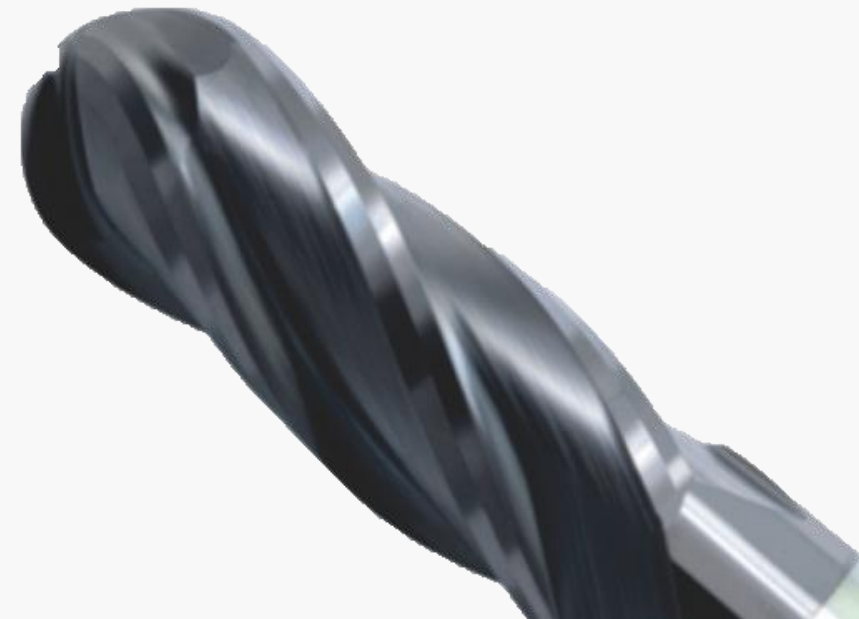


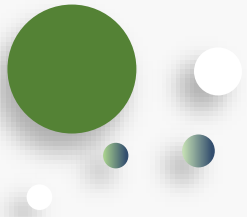
Tool type: FW-4B-R5.0
Diameter: 10.0mm
Workpiece material : Cr12(36HRC)
Rotating speed : 2800r/min (88m/min)
Feed speed: 3000 mm/min
Axial cutting depth : $a_p=1\text{mm}$
Radial cutting depth: $a_e=0.6\text{mm}$
Cutting style: Profile milling
Cooling system : Air-cooled
Machine tool : CNC-1600
Tool overhang : 45mm
Workpiece clamp : SafeWay CV-200V
Tooling systems : BT50-ER40-100

Application of high performance 4-flute ball nose end mill milling Cr12



The center design of ball cutting edge combines high strength and sharpness, and properly manages the chips generated during machining.





Ball-nose end mill with four edges

Wide Range of applications,
reasonable tool structure,
big product range,
complete product specifications

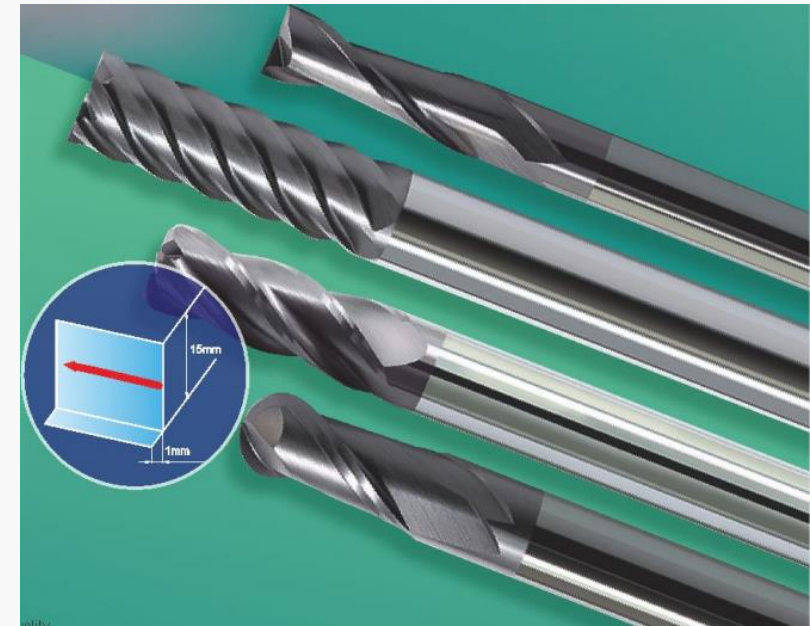
Tool type: FE-4E-D10.0
Diameter: 10.0mm
Workpiece material: NAK80(40HRC)
Rotating speed: 3200r/min (100m/min)
Feed speed: 640mm/min(0.2mm/r)
Axial cutting depth: $a_p=15\text{mm}$
Radial cutting depth: $a_e=1.0\text{mm}$
Cutting style: Side milling (down milling)
Cooling system: Air-cooled
Machine tool: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

Iron Knife	FE-4E-D10.0	SIMILAR PRODUCTS OF COMPANY A	SIMILAR PRODUCTS OF COMPANY B
Cutting length	60m	20m	60m

Finished surface condition



Milling flute edge wear



High rigidity short flute ball nose mill



FE-2BFN-R3.0



A公司同类产品
Similar product of company A



B公司同类产品
Similar product of company B

High rigid structure design, reduce vibration, improve finish machining surface quality!
In the process of cavity milling, necking structure and short edge design not only ensure the rigidity of the cutter but also avoid the danger of interference!

Machine: MIKRON HSM800
Chuck: HSK40-A
Machined material : NAK80(37HRC)
Cutting speed : 200(m/min)
Feed per tooth : 0.05(mm/齿)
Axial cutting depth : 0.2(mm)
Radial cutting depth : 0.4(mm)
Cooling system : Air cooling
Cutting style: Profile
Overhang: 27mm

磨损变化趋势 Variation trend of Abrasion

