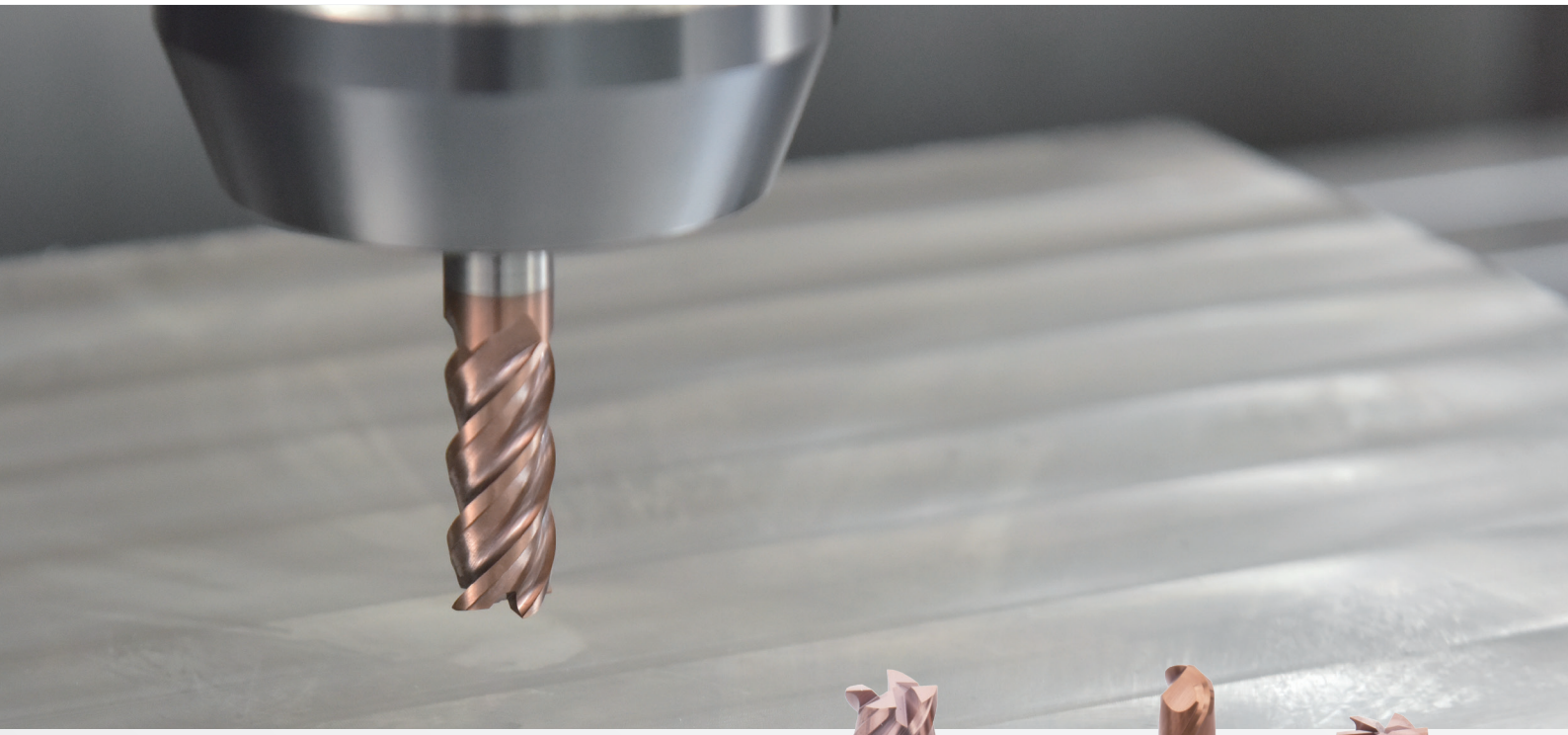
ACHTECK
澳克泰工具

2024.7

Achteck High-efficiency end mills PRO series
——M170 End Mills for High-hardness Steel



NO.089

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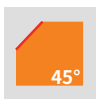
Solid Carbide End Mills M170

Series	Picture	Category	Teeth	Helix angle	Application	Tolerance mm	Diameter mm	Material	Application
M170-4ES		PRO	Z=4	45°		D< 6 0 ~ -0.01 6≤D≤12 0 ~ -0.015 D>12 0 ~ -0.025	4-16	P,H	Used in alloyed steel, pre-hardened steel, high--hardness steel. Cutting edge design for breakage resistance, high-hardness cutting edge, coating for hard materials, large helix angle effectively reduces the cutting resistances. The workpiece hardness is up to HRC60°.
M170-4RS		PRO	Z=4	45°			4-12	P,H	Used in alloyed steel, pre-hardened steel, high--hardness steel, cutting edge design for breakage resistance. The round corner can prevent edge breakage during high-speed milling. With 4 cutting edge, it can get better surface roughness. The workpiece hardness is up to HRC60°.
M170-2BS		PRO	Z=2	30°			2-16	P,H	Used in alloyed steel, pre-hardened steel, high-hardness steel. S type helix cutting design for high efficiency and high-quality surface. Cutting edge design for breakage resistance. The workpiece hardness is up to HRC60°.
M170-6ES		PRO	Z=5-6	45°			4-16	P,H	Used in alloyed steel, pre-hardened steel, high-hardness steel, Cutting edge design for breakage resistance, finish milling in high speed and high feed, good surface roughness, recommended for finishing. The workpiece hardness is up to HRC60°.

Icon Description

Icons	Description
	Slot milling and square shoulder milling
	Square shoulder milling Rough milling
	Square shoulder milling Finsih milling
	High feed milling
	Dynamic milling Cycloid milling
	Profile milling
	Chamfering and deburring
AlTiN	AlTiN coating
UN	Uncoated
AlCrN	AlCrN coating
TiSi	TiSiAlCrN coating
	Cylindrical shank

Icons	Description
	Weldon Shank
	30° helix angle
	35° helix angle
	35°/38° helix angle
	40° helix angle
	45° helix angle
	37°/39°/41° helix angle
	Square
	Round corner
	Ball-nose
	Corner chamfer
	Chamfer
	Waved edge

ACHTECK M170 End Mills

Tool

– Solid carbide end mills M170

– Metric

– 4 types with 36 dimensions

– Square, Corner radius, ball nose, multi-flute

– Cutting diameter range D2-D16

Application

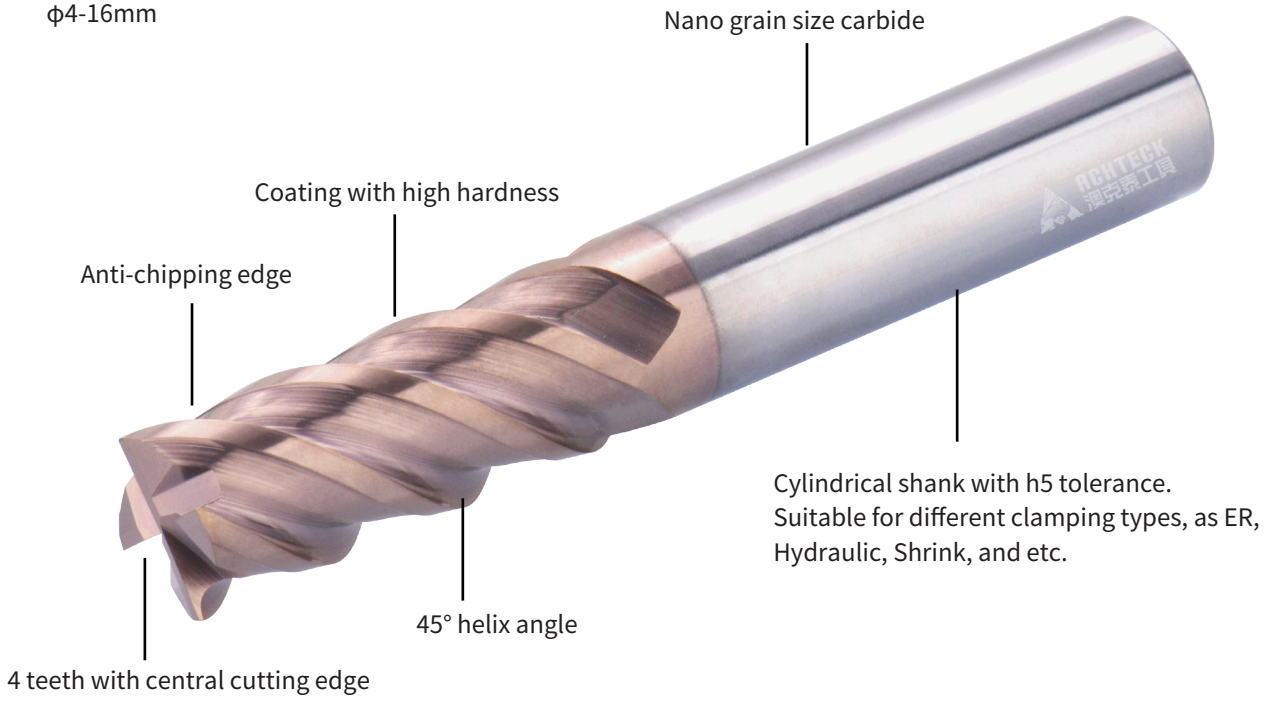
– ISO material group: P, H, Working Hardness HRC 45-60

– Processing methods: Side milling, Bottom milling, Helical interpolation milling, Ramp milling, Profiling milling

– Application industry: Mould & Die, General engineering, Power energy and Construction machinery

M170-4ES

ϕ4-16mm



Advantages:

– Strong cutting edge to reduce chipping during machining.

– Designed with thick core diameter, to improve the rigidity and strength.

– 45° helix angle, to reduce the cutting force.

– Nano grain size carbide and newly developed high-hardness coating, provide excellent wear resistance and thermal stability of the tool.

Solid Carbide End Mill Code keys

M	1	70	—	4	R	S	—	060	002	N
1	2	3		4	5	6		7	8	9

1
Tool Category
M End Mill

2
Generation
1

3	
Series	
00-09	Universal for working hardness under HRC45
10-19	High-efficiency universal end mills
20-29	High performance end mills
30-39	Dedicated for steel
40-49	Dedicated for Aluminium alloy
50-59	Dedicated for stainless steel
60-69	Dedicated for difficult machine materials
70-79	Dedicated for hardened material
80-99	Others

4
number of teeth
2, 3, 4, 5, 6……

5
Tool Type
E Square
B Ball nose
R Corner radius
C Chamfer
P With waved edges
W Forming end mills
T Taper end mills
H High feed milling

6
Length
S Standard
L Long
X Super long
A Extra long
SP Long cutting edge
LP Long overall length& Long cutting edge
SN Short cutting edge

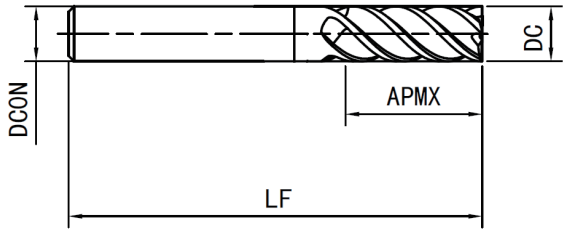
7
Tool Diameter
Inch
0.125=0.125 in=1/8 in
0.188=0.188 in=3/16 in
Metric
060=6.0mm
200=20.0mm

8
Corner radius/Chamfer Size
Inch
R015=0.015 in
Metric
002-0.2mm

9
Geometry Type
N straight neck diameter
C Conical necking
P Special shank
W Weldon shank
Default: No necking

Solid Carbide End Mills M170

Square end mills with 4 flutes



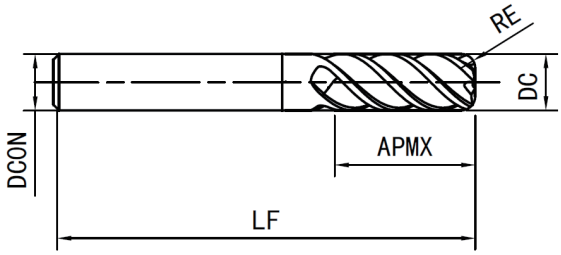
P	M	K	N	S	H
●					●●

Product Code	Dc(mm)	tolerance (mm)	DCON (mm) h5	APMX (mm)	LF (mm)	ZEFP	Stock
M170-4ES-040	4	0~-0.01	4	12	50	4	●
M170-4ES-060	6	0~-0.015	6	16	50	4	●
M170-4ES-080	8	0~-0.015	8	20	60	4	●
M170-4ES-100	10	0~-0.015	10	25	75	4	●
M170-4ES-120	12	0~-0.015	12	30	75	4	●
M170-4ES-160	16	0~-0.025	16	36	100	4	●

Remark: ● Stocked ○ Non-stocked

Solid Carbide End Mills M170

Corner radius end mills with 4 flutes



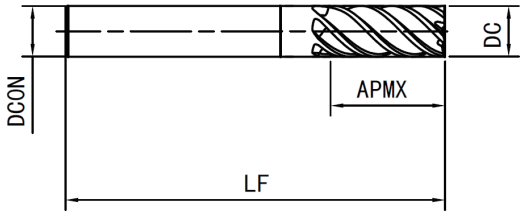
P	M	K	N	S	H
●					●●

Product Code	Dc(mm)	tolerance (mm)	DCON (mm) h5	RE (mm) ±0.02	APMX (mm)	LF (mm)	ZEFP	Stock
M170-4RS-040002	4	0~-0.01	4	0.2	12	50	4	●
M170-4RS-040005	4	0~-0.01	4	0.5	12	50	4	●
M170-4RS-060002	6	0~-0.015	6	0.2	16	50	4	●
M170-4RS-060005	6	0~-0.015	6	0.5	16	50	4	●
M170-4RS-060010	6	0~-0.015	6	1	16	50	4	●
M170-4RS-080002	8	0~-0.015	8	0.2	20	60	4	●
M170-4RS-080005	8	0~-0.015	8	0.5	20	60	4	●
M170-4RS-080010	8	0~-0.015	8	1	20	60	4	●
M170-4RS-100002	10	0~-0.015	10	0.2	25	75	4	●
M170-4RS-100005	10	0~-0.015	10	0.5	25	75	4	●
M170-4RS-100010	10	0~-0.015	10	1	25	75	4	●
M170-4RS-100020	10	0~-0.015	10	2	25	75	4	●
M170-4RS-120005	12	0~-0.015	12	0.5	30	75	4	●
M170-4RS-120010	12	0~-0.015	12	1	30	75	4	●
M170-4RS-120020	12	0~-0.015	12	2	30	75	4	●
M170-4RS-120030	12	0~-0.015	12	3	30	75	4	●

Remark: ● Stocked ○ Non-stocked

Solid Carbide End Mills M170

Square end mills with 5/6 flutes



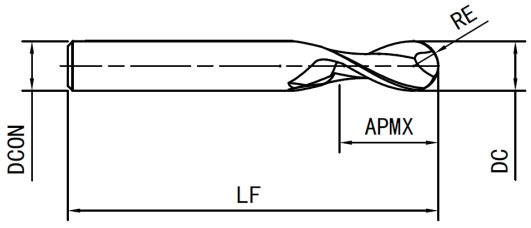
P	M	K	N	S	H
●					●●

Product Code	Dc(mm)	tolerance (mm)	DCON (mm) h5	APMX (mm)	LF (mm)	ZEFP	Stock
M170-5ES-040	4	0~-0.01	4	12	50	5	●
M170-5ES-060	6	0~-0.015	6	16	50	5	●
M170-6ES-080	8	0~-0.015	8	20	60	6	●
M170-6ES-100	10	0~-0.015	10	25	75	6	●
M170-6ES-120	12	0~-0.015	12	30	75	6	●
M170-6ES-160	16	0~-0.025	16	36	100	6	●

Remark: ● Stocked○ Non-stocked

Solid Carbide End Mills M170

Ball nose end mills with 2 flutes



P	M	K	N	S	H
●					●●

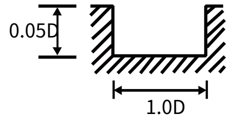
Product Code	Dc(mm)	tolerance (mm)	DCON (mm) h5	RE (mm) ±0.02	APMX (mm)	LF (mm)	ZEFP	Stock
M170-2BS-020	2	0~-0.01	4	1	4	50	2	○
M170-2BS-030	3	0~-0.01	4	1.5	6	50	2	○
M170-2BS-040	4	0~-0.01	4	2	8	50	2	○
M170-2BS-060	6	0~-0.01	6	3	12	50	2	○
M170-2BS-080	8	0~-0.015	8	4	16	60	2	○
M170-2BS-100	10	0~-0.015	10	5	18	75	2	○
M170-2BS-120	12	0~-0.015	12	6	22	75	2	○
M170-2BS-160	16	0~-0.025	16	8	30	100	2	○

Remark: ● Stocked ○ Non-stocked

M170 Cutting Parameter

Recommended cutting data is based on universal working conditions, please adjust as appropriate.

Workpiece Materials					
ISO	Material classification			Brinell hardness (HB)	Tensile strength Rm(N/ mm²)
P	Non-alloyed steel	C≤0.25%	Annealed	125	428
		0.25<C≤0.55%	Annealed	190	639
		0.25<C≤0.55%	Heat-treated	210	708
		C>0.55%	Annealed	190	639
		C>0.55%	Heat-treated	300	1013
		Easy cutting steel (short-chipping)	Annealed	220	745
	Low-alloyed steel	Annealed		175	591
		Heat-treated		300	1013
		Heat-treated		380	1282
		Heat-treated		430	1477
	High-alloyed steel and high-alloyed tool steel	Annealed		200	675
		Hardened and tempered		300	1013
		Hardened and tempered		400	1361
	Stainless steel	Ferritic/martensitic, annealed		200	675
		Martensitic, heat-treated		330	1114
M	Stainless steel	Austenitic, quench hardened		200	675
		Austenitic, precipitation hardened (PH)		300	1013
		Austenitic/ferritic, duplex		230	778
K	Malleable cast iron	Ferritic		200	400
		Pearlitic		260	700
	Grey cast iron	Low tensile strength		180	200
		High tensile strength/austenitic		245	350
	Cast iron with spheroidal graphite	Ferritic		155	400
		Pearlitic		265	700
	GGV(CGI)			230	400
N	Wrought aluminium alloys	non-aging		30	-
		aged		100	340
	Cast aluminium alloys	≤ 12% Si, non-aging		75	260
		≤ 12% Si, aged		90	310
		> 12% Si, non-aging		130	450
	Magnesium-based alloys			70	250
	Copper and copper alloys (bronze/brass)	Unalloyed, electrolytic copper		100	340
		Brass, bronze, red brass		90	310
		Cu alloys, short-chipping		110	380
		High tensile, Ampco		300	1010
S	Heat-resistant alloys	Fe-based	Annealed	200	680
			Hardened	280	940
		Ni or Co based	Annealed	250	840
			Hardened	350	1180
			Cast	320	1080
	Titanium alloys	Pure titanium		200	680
		α and β alloys, hardened		375	1260
		β alloys		410	1400
	Tungsten alloys			300	1010
	Molybdenum alloys			300	1010
H	Hardened steel	Hardened and tempered		50HRC	
		Hardened and tempered		55HRC	
		Hardened and tempered		60HRC	
	Quenching cast steel	Hardened and tempered		50HRC	

M170-4ES、M170-4RS	Slot Milling 					
Cutting Speed Vc(m/min)	fz[mm/Teeth]					
	Diameter[mm]					
	4	6	8	10	12	16
110~150	0.013	0.018	0.023	0.028	0.033	0.038
110~150	0.013	0.018	0.023	0.028	0.033	0.038
100~140	0.012	0.016	0.021	0.025	0.030	0.034
95 ~135	0.012	0.016	0.021	0.025	0.030	0.034
110~150	0.013	0.018	0.023	0.028	0.033	0.038
100~140	0.012	0.016	0.021	0.025	0.030	0.034
90~130	0.012	0.016	0.021	0.025	0.030	0.034
80~120	0.011	0.015	0.020	0.024	0.028	0.032
70~100	0.010	0.014	0.017	0.021	0.025	0.029
80~120	0.011	0.015	0.020	0.024	0.028	0.032

M170 Cutting Parameter

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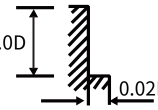
Workpiece Materials					
ISO	Material classification			Brinell hardness (HB)	Tensile strength Rm(N/ mm²)
P	Non-alloyed steel	C≤0.25%	Annealed	125	428
		0.25<C≤0.55%	Annealed	190	639
		0.25<C≤0.55%	Heat-treated	210	708
		C>0.55%	Annealed	190	639
		C>0.55%	Heat-treated	300	1013
		Easy cutting steel (short-chipping)	Annealed	220	745
	Low-alloyed steel	Annealed		175	591
		Heat-treated		300	1013
		Heat-treated		380	1282
		Heat-treated		430	1477
	High-alloyed steel and high-alloyed tool steel	Annealed		200	675
		Hardened and tempered		300	1013
		Hardened and tempered		400	1361
	Stainless steel	Ferritic/martensitic, annealed		200	675
		Martensitic, heat-treated		330	1114
M	Stainless steel	Austenitic, quench hardened		200	675
		Austenitic, precipitation hardened (PH)		300	1013
		Austenitic/ferritic, duplex		230	778
K	Malleable cast iron	Ferritic		200	400
		Pearlitic		260	700
	Grey cast iron	Low tensile strength		180	200
		High tensile strength/austenitic		245	350
	Cast iron with spheroidal graphite	Ferritic		155	400
		Pearlitic		265	700
	GGV(CGI)			230	400
N	Wrought aluminium alloys	non-aging		30	-
		aged		100	340
	Cast aluminium alloys	≤ 12% Si, non-aging		75	260
		≤ 12% Si, aged		90	310
		> 12% Si, non-aging		130	450
	Magnesium-based alloys			70	250
	Copper and copper alloys (bronze/brass)	Unalloyed, electrolytic copper		100	340
		Brass, bronze, red brass		90	310
		Cu alloys, short-chipping		110	380
		High tensile, Ampco		300	1010
S	Heat-resistant alloys	Fe-based	Annealed	200	680
			Hardened	280	940
		Ni or Co based	Annealed	250	840
			Hardened	350	1180
			Cast	320	1080
	Titanium alloys	Pure titanium		200	680
		α and β alloys, hardened		375	1260
		β alloys		410	1400
	Tungsten alloys			300	1010
	Molybdenum alloys			300	1010
H	Hardened steel	Hardened and tempered		50HRC	
		Hardened and tempered		55HRC	
		Hardened and tempered		60HRC	
	Quenching cast steel	Hardened and tempered		50HRC	

M170-4ES、M170-4RS、M170-6ES

Shoulder Milling
(Finishing)



Cutting Speed Vc(m/min)	fz[mm/Teeth]					
	Diameter[mm]					
	4	6	8	10	12	16
100~250	0.025	0.040	0.055	0.065	0.073	0.095
100~250	0.025	0.040	0.055	0.065	0.073	0.095
90~200	0.023	0.036	0.050	0.059	0.066	0.086
85~190	0.021	0.033	0.045	0.054	0.063	0.083
100~250	0.025	0.040	0.055	0.065	0.073	0.095
90~200	0.023	0.036	0.050	0.059	0.066	0.086
80~150	0.020	0.030	0.040	0.050	0.060	0.080
80~140	0.017	0.026	0.034	0.043	0.051	0.068
70~130	0.015	0.023	0.030	0.038	0.045	0.060
80~140	0.017	0.026	0.034	0.043	0.051	0.068

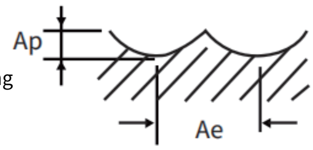
M170 Cutting Parameter

Recommended cutting data is based on universal working conditions, please adjust as appropriate.

Workpiece Materials						
ISO	Material classification				Brinell hardness (HB)	Tensile strength Rm(N/ mm²)
P	Non-alloyed steel	C≤0.25%		Annealed	125	428
		0.25<C≤0.55%		Annealed	190	639
		0.25<C≤0.55%		Heat-treated	210	708
		C>0.55%		Annealed	190	639
		C>0.55%		Heat-treated	300	1013
		Easy cutting steel (short-chipping)		Annealed	220	745
	Low-alloyed steel	Annealed			175	591
		Heat-treated			300	1013
		Heat-treated			380	1282
		Heat-treated			430	1477
	High-alloyed steel and high-alloyed tool steel	Annealed			200	675
		Hardened and tempered			300	1013
		Hardened and tempered			400	1361
	Stainless steel	Ferritic/martensitic, annealed			200	675
		Martensitic, heat-treated			330	1114
M	Stainless steel	Austenitic, quench hardened			200	675
		Austenitic, precipitation hardened (PH)			300	1013
		Austenitic/ferritic, duplex			230	778
K	Malleable cast iron	Ferritic			200	400
		Pearlitic			260	700
	Grey cast iron	Low tensile strength			180	200
		High tensile strength/austenitic			245	350
	Cast iron with spheroidal graphite	Ferritic			155	400
		Pearlitic			265	700
	GGV(CGI)				230	400
N	Wrought aluminium alloys	non-aging			30	-
		aged			100	340
	Cast aluminium alloys	≤ 12% Si, non-aging			75	260
		≤ 12% Si, aged			90	310
		> 12% Si, non-aging			130	450
	Magnesium-based alloys				70	250
	Copper and copper alloys (bronze/brass)	Unalloyed, electrolytic copper			100	340
		Brass, bronze, red brass			90	310
		Cu alloys, short-chipping			110	380
		High tensile, Ampco			300	1010
S	Heat-resistant alloys	Fe-based		Annealed	200	680
				Hardened	280	940
		Ni or Co based		Annealed	250	840
				Hardened	350	1180
				Cast	320	1080
	Titanium alloys	Pure titanium			200	680
		α and β alloys, hardened			375	1260
		β alloys			410	1400
	Tungsten alloys				300	1010
	Molybdenum alloys				300	1010
H	Hardened steel	Hardened and tempered			50HRC	
		Hardened and tempered			55HRC	
		Hardened and tempered			60HRC	
	Quenching cast steel	Hardened and tempered			50HRC	

M170-2BS

Profile Milling
(Finishing)



Cutting Speed Vc(m/min)	fz[mm/Teeth]					
	Diameter[mm]					
	4	6	8	10	12	16
120~220	0.064	0.096	0.136	0.160	0.208	0.272
120~220	0.064	0.096	0.136	0.160	0.208	0.272
108~198	0.061	0.091	0.129	0.152	0.198	0.258
100~190	0.058	0.086	0.122	0.144	0.187	0.245
120~220	0.064	0.096	0.136	0.160	0.208	0.272
108~198	0.061	0.091	0.129	0.152	0.198	0.258
80~160	0.056	0.084	0.115	0.135	0.172	0.230
75~150	0.054	0.082	0.109	0.129	0.150	0.190
70~130	0.048	0.072	0.096	0.114	0.132	0.168
75~150	0.054	0.082	0.109	0.129	0.150	0.190