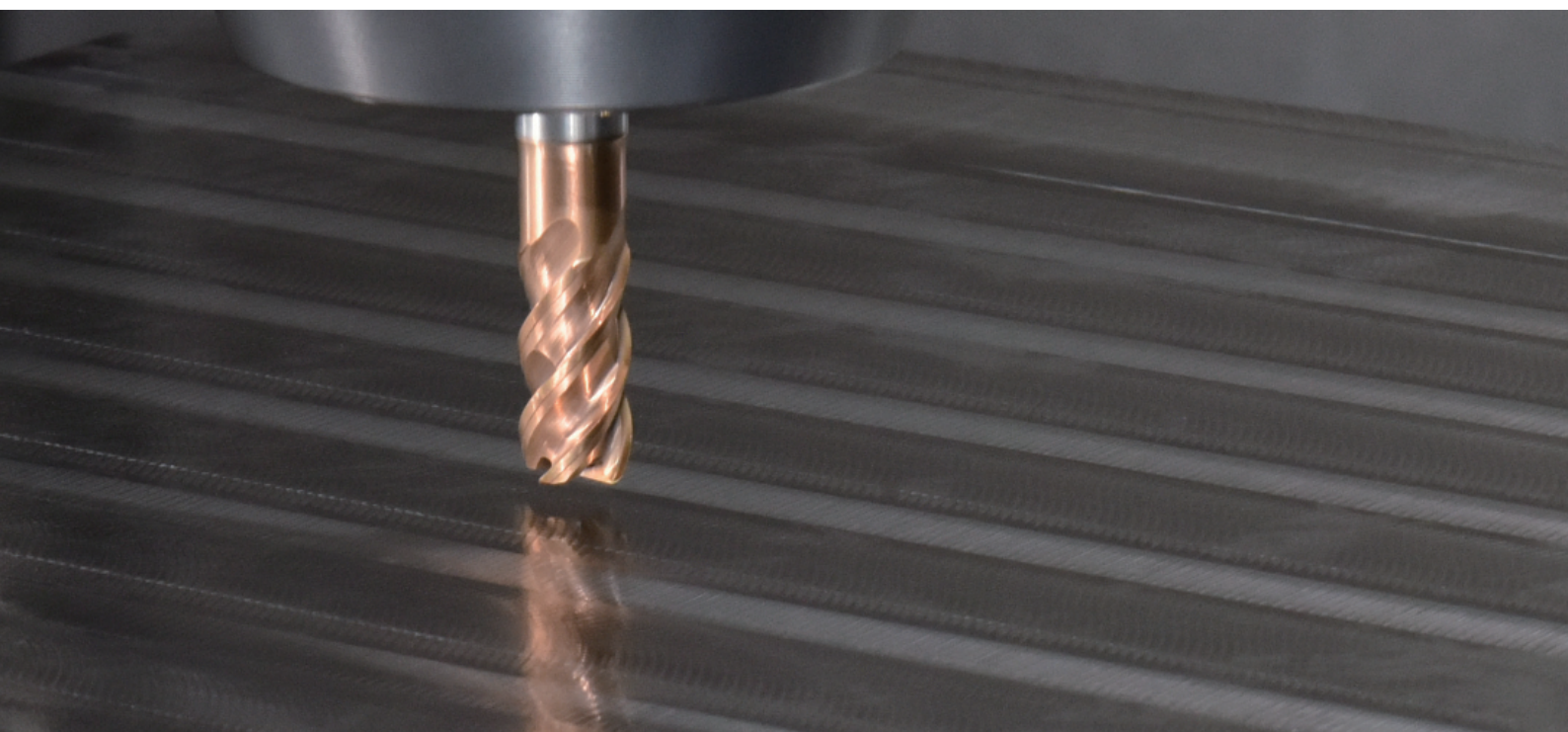
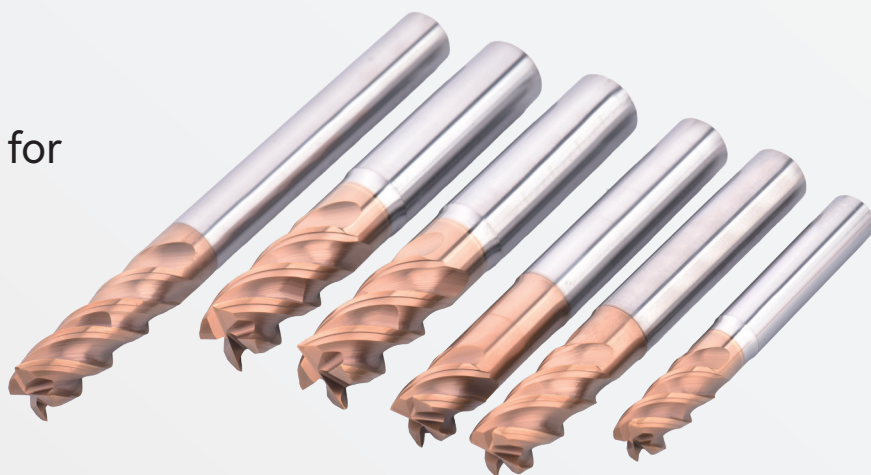


Achtech Superalloy End Mills Pro Series ——M160



High-efficiency Machining for
Superalloy

www.achtecktool.com



Product Overview

Product Series	M160			
Machining Application				
Category	PRO	PRO	PRO	PRO
Tool Type	4CSN	4CS	4RSN	4RS
Illustration				
Diameter Range (mm)	5-20	5-20	5-16	5-16
No. of Teeth	4	4	4	4
Corner Radius (mm)	-	-	0.2-3	0.2-3
Length	SN	S	SN	S
Shank type	Cylindrical	Cylindrical	Cylindrical	Cylindrical
Application	Used for machining heat-resistant alloys, superalloys and titanium alloy materials; The design of uneven teeth and 45° helix angle with 4 edges effectively suppresses vibration during the machining process and improves the surface quality of the workpiece; The design of dual core thickness and forming groove achieves a balance between chip removal ability and tool rigidity, optimizing the guidance and discharge of chips.			
P	●	●	●	●
M	●	●	●	●
K				
N				
S	●●	●●	●●	●●
H				

Icon Description

Icon	Description	Icon	Description	Icon	Description	Icon	Description
	Slot Milling And Square Shoulder Milling		AlTiN Coating		Weldon Shank		45° Helix Angle
	Square Shoulder Milling Rough Milling		AlCrN Coating		30° Helix Angle		Square
	Square Shoulder Milling Finish Milling		Uncoated		35° Helix Angle		Round Corner
	High-Feed Milling		TiSiAlCrN Coating		35° /38° Helix Angle		Ball Nose
	Dynamic Milling Cycloid Milling		AlTiN/Zr Coating		36° /38° Helix Angle		Corner Chamfer
	Profile Milling		AlTiSiN Coating		40° Helix Angle		Chamfer
	Chamfering & Deburring		Cylindrical Shank		37° /39° /41° Helix Angle		Waved Edge

Solid Carbide End Mill Denomination System

M	1	60	-	4	R	S	-	100	005	N
1	2	3	-	4	5	6	-	7	8	9

1- Tool Category	2- Gen.	3- Series	4- Number of	5- Tool Type
M milling cutter	1 2	00 Universal milling (HRC45) 10 High-efficiency universal milling 20 High-performance milling 30 Steel-specific milling 40 Aluminum milling 50 S.S. milling 60 Hard-to-cut materials milling 70 Harden steel milling 80&90 Others	2,3,4,5,6.....	E Flat end B Ball nose R Corner radius C Chamfer P Wavy edge W Form milling T Tapered H High-feed

6- Length Standard	7- Tool Diameter	8- Corner Radius	9- Structure Type
S Standard L Long X Extra-long A Ultra-long SN Shortened flute SP Extended flute LP Long & extended flute	060=6.0mm 200=20.0mm	002=0.2mm	N Straight neck C Tapered neck W Side lock shank P Special shank dia. Default: Standard necking

Solid Carbide End Mills M160

Tool

Solid carbide end mills Pro line

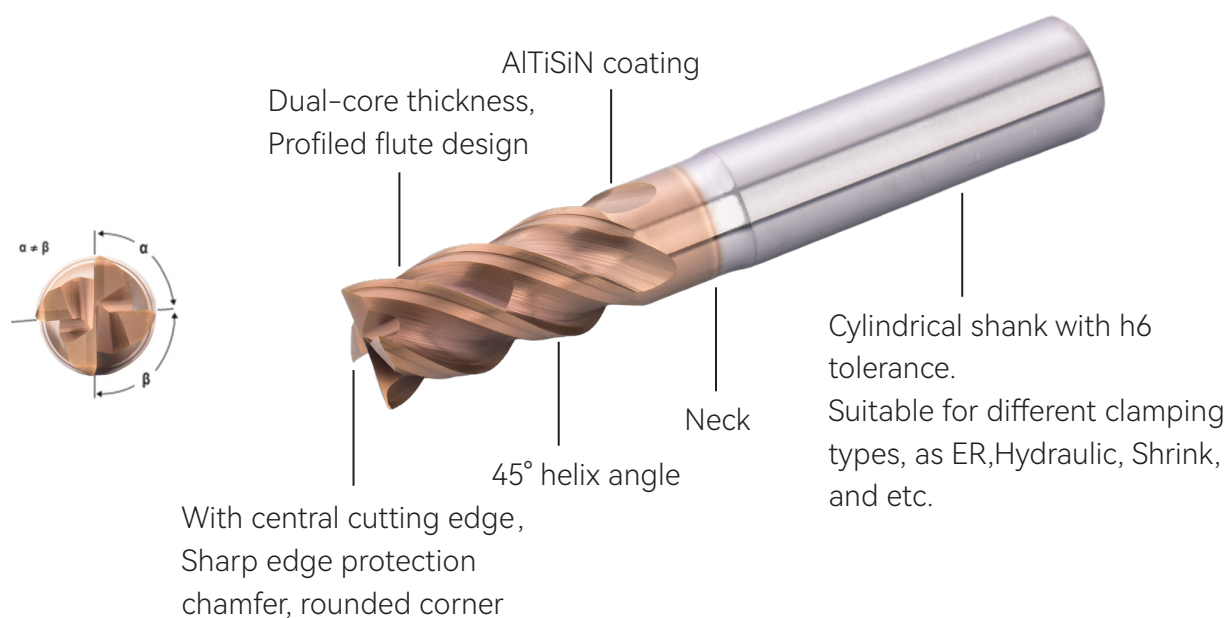
- Metric
- 4 Tool types with 43 dimensions
- Corner chamfer, corner radius
- No. of teeth: 4
- Cutting diameter range D5-D20 mm

Application

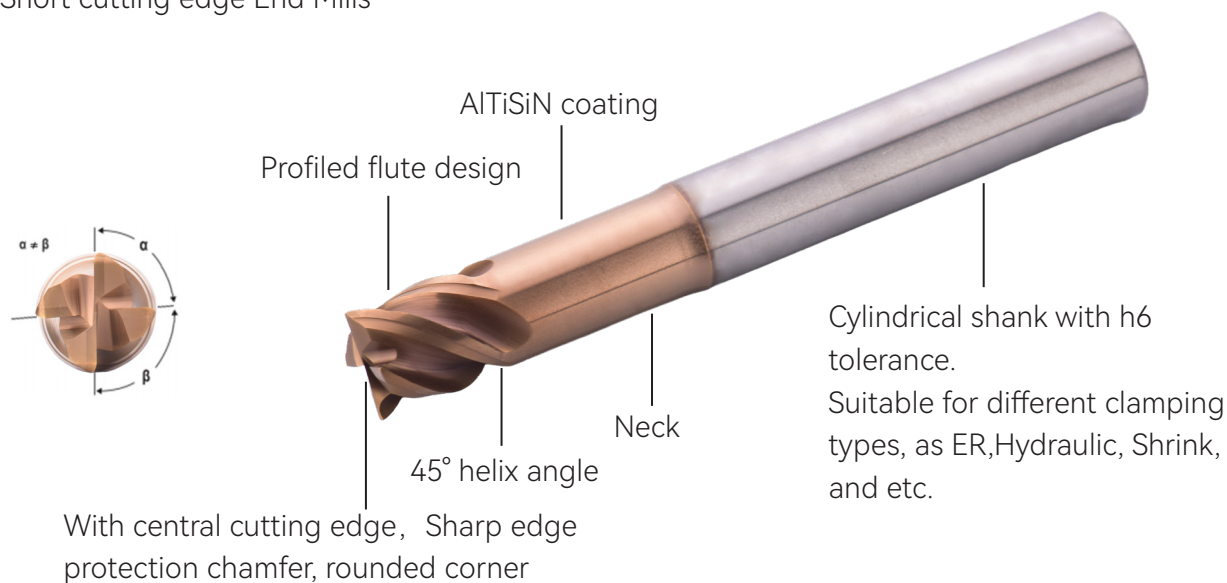
- ISO material group: P,M,S
- Square shoulder milling, Slot milling, Pocket milling, Helical interpolated milling, Dynamic milling
- Application industry: Aerospace and energy

Superalloy End Mills M160

S-Standard Length End Mills



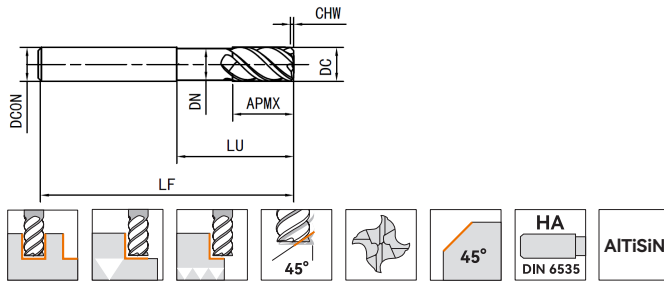
SN-Short cutting edge End Mills



End Mills M160

Pro line

End Mills with 4 flutes (Corner chamfer)



P	M	K	N	S	H
•	•			••	

•• 1st choice • 2nd choice

Product code	DC (mm)	DCON (mm) h6	CHW(mm)	APMX(mm)	DN(mm)	LU(mm)	LF (mm)	ZEFP	Stock
M160-4CSN-050N	5	6	0.06	6	4.7	15	50	4	○
M160-4CSN-060N	6	6	0.08	6	5.7	18	50	4	●
M160-4CSN-080N	8	8	0.1	8	7.6	25	60	4	●
M160-4CSN-100N	10	10	0.12	10	9.5	29	75	4	●
M160-4CSN-120N	12	12	0.15	12	11.4	35	75	4	●
M160-4CSN-160N	16	16	0.18	16	15.2	42	100	4	●
M160-4CSN-200N	20	20	0.2	20	19	51	100	4	○

Product code	DC (mm)	DCON (mm) h6	CHW(mm)	APMX(mm)	DN(mm)	LU(mm)	LF (mm)	ZEFP	Stock
M160-4CS-050N	5	6	0.06	10	4.7	15	50	4	○
M160-4CS-060N	6	6	0.08	12	5.7	18	50	4	●
M160-4CS-080N	8	8	0.1	16	7.6	25	60	4	●
M160-4CS-100N	10	10	0.12	20	9.5	29	75	4	●
M160-4CS-120N	12	12	0.15	24	11.4	35	75	4	●
M160-4CS-160N	16	16	0.18	32	15.2	42	100	4	●
M160-4CS-200N	20	20	0.2	40	19	51	100	4	○

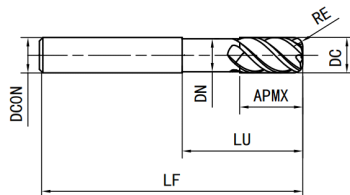
DC	Tolerance
5 ≤ DC ≤ 12	0 -0.03
DC > 12	0 -0.04

● : Standard stock ○ : Made-to-Order

End Mills M160

Pro line

End mills with 4 flutes (Corner radius)



P	M	K	N	S	H
•	•			••	

•• 1st choice • 2nd choice

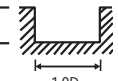
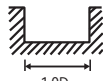
Product code	DC (mm)	DCON (mm) h6	RE(mm)	APMX(mm)	DN(mm)	LU(mm)	LF (mm)	ZEFP	Stock
M160-4RSN-050002N	5	6	0.2	6	4.7	15	50	4	○
M160-4RSN-060002N	6	6	0.2	6	5.7	18	50	4	○
M160-4RSN-060005N	6	6	0.5	6	5.7	18	50	4	●
M160-4RSN-080005N	8	8	0.5	8	7.6	25	60	4	●
M160-4RSN-100005N	10	10	0.5	10	9.5	29	75	4	●
M160-4RSN-100010N	10	10	1	10	9.5	29	75	4	●
M160-4RSN-120005N	12	12	0.5	12	11.4	35	75	4	●
M160-4RSN-120010N	12	12	1	12	11.4	35	75	4	●
M160-4RSN-160005N	16	16	0.5	16	15.2	42	100	4	○
M160-4RSN-160010N	16	16	1	16	15.2	42	100	4	○

Product code	DC (mm)	DCON (mm) h6	RE(mm)	APMX(mm)	DN(mm)	LU(mm)	LF (mm)	ZEFP	Stock
M160-4RS-050002N	5	6	0.2	10	4.7	15	50	4	○
M160-4RS-060002N	6	6	0.2	12	5.7	18	50	4	●
M160-4RS-060005N	6	6	0.5	12	5.7	18	50	4	●
M160-4RS-060010N	6	6	1	12	5.7	18	50	4	●
M160-4RS-080005N	8	8	0.5	16	7.6	25	60	4	●
M160-4RS-080010N	8	8	1	16	7.6	25	60	4	●
M160-4RS-100005N	10	10	0.5	20	9.5	29	75	4	●
M160-4RS-100010N	10	10	1	20	9.5	29	75	4	●
M160-4RS-100015N	10	10	1.5	20	9.5	29	75	4	○
M160-4RS-100020N	10	10	2	20	9.5	29	75	4	●
M160-4RS-120005N	12	12	0.5	24	11.4	35	75	4	●
M160-4RS-120010N	12	12	1	24	11.4	35	75	4	●
M160-4RS-120015N	12	12	1.5	24	11.4	35	75	4	●
M160-4RS-120020N	12	12	2	24	11.4	35	75	4	●
M160-4RS-120030N	12	12	3	24	11.4	35	75	4	○
M160-4RS-160005N	16	16	0.5	32	15.2	42	100	4	○
M160-4RS-160010N	16	16	1	32	15.2	42	100	4	●
M160-4RS-160020N	16	16	2	32	15.2	42	100	4	○
M160-4RS-160030N	16	16	3	32	15.2	42	100	4	●

DC	Tolerance
5 ≤ DC ≤ 12	0 -0.03
DC > 12	0 -0.04

● : Standard stock ○ : Made-to-Order

Pro Line Cutting Parameter

Materials					M160-4CSN M160-4CS M160-4RSN M160-4RS	Slot milling 0.8D (ISO P/M)		Slot milling 0.4D (ISO S)							
ISO	Workpiece Materials			Brinell Hardness(HB)	Tensile strength (N/mm ²)	Cutting speed Vc(m/min)	fz [mm/Tooth]								
							Mill diameter [mm]								
							5	6	8	10	12	14	16	18	20
P	Unalloyed 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										
		Free cutting steel	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 highalloyed tool steel	Annealed		200	675	110-150	0.030	0.035	0.050	0.060	0.072	0.085	0.100	0.110	0.120
		Hardened and tempered		300	1013	80-110	0.020	0.025	0.032	0.040	0.048	0.056	0.065	0.072	0.080
		Hardened and tempered		400	1361	70-100	0.018	0.022	0.030	0.036	0.042	0.050	0.060	0.065	0.072
	Stainless steels	Ferritic/Martensite,Annealed		200	675	90-135	0.025	0.030	0.038	0.048	0.058	0.068	0.078	0.086	0.096
		Martensite,Heat-treated		330	1114	85-120	0.022	0.026	0.035	0.044	0.053	0.062	0.072	0.079	0.088
M	Stainless steels	Austenitic,hardened		200	675	75-110	0.020	0.024	0.032	0.040	0.048	0.056	0.065	0.072	0.080
		Austenitic,precipitation hardened stainless steel(PH stainless steel)		300	1013	60-90	0.016	0.019	0.026	0.032	0.038	0.045	0.052	0.058	0.064
		Austenitic,ferritic,duplex		230	778	70-100	0.019	0.023	0.030	0.038	0.046	0.053	0.062	0.068	0.076
K	Malleable cast iron	Ferritic		200	400										
		Pearlitic		260	700										
	Grey cast iron	Low tensile strength		180	200										
		High tensile strength/Austenitic		245	350										
	Nodular cast iron	Ferritic		155	400										
		Pearlitic		265	700										
	GGV(CGI)			230	400										
N	Wrought aluminum alloy	Non-aging alloy		30	-										
		Aged alloy		100	340										
	Cast aluminum alloy	≤ 12% Si, non-aging alloy		75	260										
		≤ 12% Si, aged alloy		90	310										
		> 12% Si, non-aging alloy		130	450										
	Magnesium alloy			70	250										
	Copper and copper alloy(bronze/ brass)	Unalloyed,electrolytic copper		100	340										
		Brass,bronze,red brass		90	310										
		Cu alloy,short chip		110	380										
High tensile,Ampco alloy		300	1010												
S	Superalloy	Fe-based	Annealed	200	680	35-55	0.015	0.019	0.025	0.030	0.038	0.044	0.050	0.055	0.060
			Aged	280	940	25-45	0.012	0.015	0.020	0.024	0.030	0.035	0.040	0.044	0.048
		Ni or Co based	Annealed	250	840	30-50	0.015	0.019	0.025	0.030	0.038	0.044	0.050	0.055	0.060
			Aged	350	1180	20-40	0.012	0.015	0.020	0.024	0.030	0.035	0.040	0.044	0.048
			Cast	320	1080	20-40	0.012	0.015	0.020	0.024	0.030	0.035	0.040	0.044	0.048
	Titanium alloy	Pure Titanium		200	680	40-65	0.017	0.021	0.028	0.033	0.042	0.048	0.055	0.061	0.066
		α and β alloy, aged		375	1260	35-65	0.017	0.021	0.028	0.033	0.042	0.048	0.055	0.061	0.066
		β alloy		410	1400	20-38	0.011	0.014	0.019	0.023	0.029	0.033	0.038	0.041	0.045
	Tungsten alloy			300	1010	45-75	0.018	0.023	0.030	0.036	0.046	0.053	0.060	0.066	0.072
	Molybdenum alloy			300	1010	45-75	0.018	0.023	0.030	0.036	0.046	0.053	0.060	0.066	0.072
H	Hardened steel	Hardened and tempered		50HRC	-										
		Hardened and tempered		55HRC	-										
		Hardened and tempered		60HRC	-										
	Chilled cast iron		Hardened and tempered		55HRC	-									

The cutting data are average recommended values. For special applications, adjustment is needed.

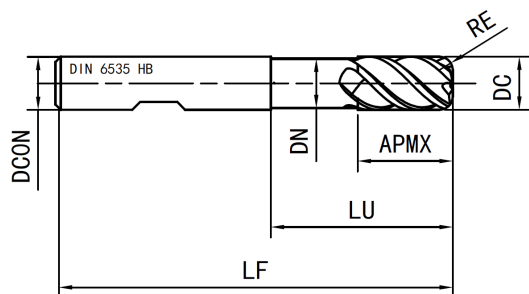
Pro Line Cutting Parameter

Materials					M160-4CSN M160-4CS M160-4RSN M160-4RS	Square shoulder milling 1.0D (ISO P/M)				Square shoulder milling 0.7D (ISO S)						
ISO	Workpiece Materials			Brinell Hardness(HB)	Tensile strength (N/mm ²)	Cutting speed Vc(m/min)	fz [mm/Tooth]									
							Mill diameter [mm]									
							5	6	8	10	12	14	16	18	20	
P	Unalloyed 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											
		Free cutting steel	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 highalloyed tool steel	Annealed		200	675	130-180	0.051	0.060	0.083	0.098	0.120	0.135	0.150	0.158	0.165	
		Hardened and tempered		300	1013	90-130	0.034	0.040	0.055	0.065	0.080	0.090	0.100	0.105	0.110	
		Hardened and tempered		400	1361	80-120	0.031	0.036	0.050	0.059	0.072	0.081	0.090	0.095	0.099	
	Stainless steels	Ferritic/Martensite,Annealed		200	675	110-158	0.041	0.048	0.066	0.078	0.096	0.108	0.120	0.126	0.132	
		Martensite,Heat-treated		330	1114	100-140	0.037	0.044	0.061	0.072	0.088	0.099	0.110	0.116	0.121	
M	Stainless steels	Austenitic,hardened		200	675	80-120	0.034	0.040	0.055	0.065	0.080	0.090	0.100	0.105	0.110	
		Austenitic,precipitation hardened stainless steel(PH stainless steel)		300	1013	65-95	0.027	0.032	0.044	0.052	0.064	0.072	0.080	0.084	0.088	
		Austenitic,ferritic,duplex		230	778	75-112	0.032	0.038	0.052	0.062	0.076	0.086	0.095	0.100	0.105	
K	Malleable cast iron	Ferritic		200	400											
		Pearlitic		260	700											
	Grey cast iron	Low tensile strength		180	200											
		High tensile strength/Austenitic		245	350											
	Nodular cast iron	Ferritic		155	400											
		Pearlitic		265	700											
	GGV(CGI)		230	400												
N	Wrought aluminum alloy	Non-aging alloy		30	-											
		Aged alloy		100	340											
	Cast aluminum alloy	≤ 12% Si, non-aging alloy		75	260											
		≤ 12% Si, aged alloy		90	310											
		> 12% Si, non-aging alloy		130	450											
	Magnesium alloy		70	250												
	Copper and copper alloy(bronze/ brass)	Unalloyed,electrolytic copper		100	340											
		Brass,bronze,red brass		90	310											
		Cu alloy,short chip		110	380											
High tensile,Ampco alloy		300	1010													
S	Superalloy	Fe-based	Annealed	200	680	50-70	0.030	0.040	0.055	0.070	0.085	0.100	0.118	0.125	0.140	
			Aged	280	940	25-50	0.024	0.032	0.044	0.056	0.068	0.080	0.094	0.100	0.112	
		Ni or Co based	Annealed	250	840	50-70	0.030	0.040	0.055	0.070	0.085	0.100	0.118	0.125	0.140	
			Aged	350	1180	25-50	0.024	0.032	0.044	0.056	0.068	0.080	0.094	0.100	0.112	
			Cast	320	1080	25-50	0.024	0.032	0.044	0.056	0.068	0.080	0.094	0.100	0.112	
	Titanium alloy	Pure Titanium		200	680	60-75	0.033	0.044	0.061	0.077	0.094	0.110	0.130	0.138	0.154	
		α and β alloy, aged		375	1260	35-65	0.033	0.044	0.061	0.077	0.094	0.110	0.130	0.138	0.154	
		β alloy		410	1400	20-48	0.023	0.030	0.041	0.053	0.064	0.075	0.089	0.094	0.105	
	Tungsten alloy		300	1010	60-80	0.036	0.048	0.066	0.084	0.102	0.120	0.142	0.150	0.168		
	Molybdenum alloy		300	1010	60-80	0.036	0.048	0.066	0.084	0.102	0.120	0.142	0.150	0.168		
H	Hardened steel	Hardened and tempered		50HRC	-											
		Hardened and tempered		55HRC	-											
		Hardened and tempered		60HRC	-											
	Chilled cast iron		Hardened and tempered		55HRC	-										

The cutting data are average recommended values. For special applications, adjustment is needed.

Customized Non-Standard:Weldon and Internal coolant

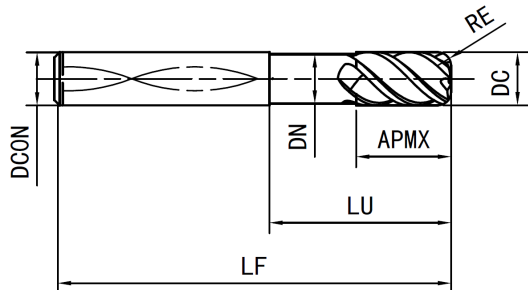
Weldon: DIN 6535 HB



- Diameter Range: DC 10-20mm
- Tool Type: Corner chamfer, Corner radius
- Product Pricing: Qty>100 pcs, Standard product unit price + Weldon shank grinding cost (DCON × 1 RMB)
- Product Code: Compliant with Achteck solid carbide end mill denomination system
For example: Standard product M160-4CSN-100N , Weldon shank code M160-4CSN-100NW

☆ Non-standard stock,Made-to-Order, Achteck reserves the final right of interpretation

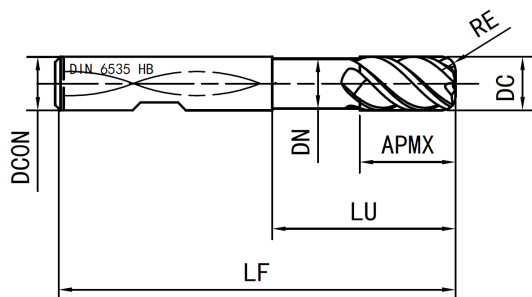
Internal Coolant: Helical internal coolant



- Diameter Range: DC 10-20mm
- Tool Type: Corner chamfer, Corner radius
- Product Pricing: Qty>100 pcs, Standard Product Unit Price ×1.25
- Product Code: Compliant with Achteck solid carbide end mill denomination system
For example: Standard product M160-4CSN-100N, Internal coolant code M160-4CSN-100NIC

☆ Non-standard stock,Made-to-Order, Achteck reserves the final right of interpretation

Internal coolant+Weldon: Helical Internal Coolant + DIN 6535 HB

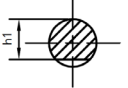


- Diameter Range: DC 10-20mm
- Tool Type: Corner chamfer, Corner radius
- Product Pricing: Qty>100 pcs, Standard product unit price $\times 1.25$ + Weldon shank grinding cost (DCON $\times$ 1 RMB)
- Product Code: Compliant with Achteck solid carbide end mill denomination system
For example: Standard product M160-4CSN-100N, Internal coolant and weldon code M160-4CSN-100NICW

☆ Non-standard stock,Made-to-Order, Achteck reserves the final right of interpretation

Technical Information

Weldon shank, with drive flat,DIN 6535 HB standard

	d1 h6	b1 +0.05 0	e1 0 -1	h1 h11	l1 +2 0
	10	7	20	8.5	40
	12	8	22.5	10.4	45
	14	8	22.5	12.7	45
	16	10	24	14.2	48
	18	10	24	16.2	48
	20	11	25	18.2	50

Dimensions in mm

Helical internal coolant rods

