

ACHTTECK









www.achtecktool.com/en

THE EXPERTS OF DIFFICULT MACHINING















Solid End Mills








Solid Carbide End Mills

Series	Pictures	Category	Teeth	Helix angles	Application	Cutting edge tolerance (in)	Diameter (in)	Material	Information
M200-4ES		ECO line	Z=4	35°/38°		+0.00 -0.0028	0.125-1	Universal type	Used in carbon steel, tool steel, alloyed steel machining. 4 cutting edges can achieve better surface finishing. Differential helix and tooth distance eliminate vibration. The workpiece hardness is up to HRC45
M200-4RS		ECO line	Z=4	35°/38°		+0.00 -0.0028	0.125-1	Universal type	Used in carbon steel, tool steel, alloyed steel machining. The round corner can prevent edge breakage during high speed cutting. Differential helix and tooth distance eliminate vibration. With 4 cutting edge design. The workpiece hardness is up to HRC45
M200-2BS		ECO line	Z=2	30°		+0.00 -0.0028	0.125-1	Universal type	Used in carbon steel, tool steel, alloyed steel machining. For profile milling, good toughness. The workpiece hardness is up to HRC45
M245-2ES		ECO line	Z=2	45°		+0.00 -0.0028	0.125-1	Aluminium alloy	Design for vibration resistance. With special edge treatment. It can achieve better surface finish.

Icons Description

Icons	Description
	Slot milling and square shoulder milling
	Square shoulder rough milling
	Square shoulder finish milling
	High feed milling
	Dynamic milling cycloid milling
	Profile milling
	Chamfering and deburring

Icons	Description
	AlTiN Coating
	AlCrN Coating
	Uncoated
	30° Helix angle
	35° Helix angle
	35°/38° Helix angle
	45° Helix angle

Icons	Description
	Cylindrical shank
	Square
	Round corner
	Ball-nose
	Corner chamfer
	Chamfer
	Waved edge

Solid Carbide end Mill Denomination

M	1	00	-	2	E	S	-	060	002	N
1	2	3	-	4	5	6	-	7	8	9

1-Tool category M End mill	2-Generations 1	3-Series 00-09 Universal end mills HRC45 10-19 Universal end mills HRC55 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 machining material 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 Round corner C Chamfer P With waved edges W Forming end mills T Taper end mill H High feed milling
--------------------------------------	---------------------------	---	--	--

6-Length
S Standard total length
L Long version
XL Super long version
XXL Extra long version
SN Short cutting edge
SP Long cutting edge

7-Tool diameter
0.125 in=1/8 in
0.188 in=3/16 in

8-Chamfer / nose radius size
R015=0.015 in

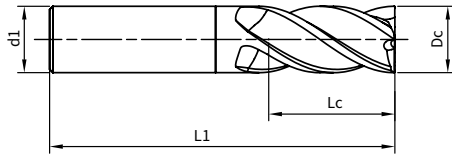
9-Structure type
N Straight necking
C Conical necking
P Special shank
Default: No necking

Solid Endmill

Solid Carbide End Mill M200

Eco line

Square shoulder mill with 4 cutting edges



Solid carbide end mill

Workpiece materials < HRC45

End Mill Tolerances			
Dc(in)	Tolerance(in)	d1	Tolerance
≤0.188	+0.00/-0.0008	all	h6
0.25-0.313	+0.00/-0.0011		
0.375-0.438	+0.00/-0.0019		
0.500-1.000	+0.00/-0.0028		



P	M	K	N	S	H	O
●●	●	●●				

●● 1st choice ● 2nd choice

Product code	Dc in No	Dc in	Dc mm	d1 in No	d1 in	Lc in	L1 in	Z	Stock
M200-4ES-0.125	1/8	0.125	3.175	1/8	0.125	0.500	2.250	4	●
M200-4ES-0.188	3/16	0.188	4.763	3/16	0.188	0.500	2.000	4	●
M200-4ES-0.250	1/4	0.250	6.350	1/4	0.250	0.750	2.500	4	●
M200-4ES-0.313	5/16	0.313	7.938	5/16	0.313	0.813	2.500	4	●
M200-4ES-0.375	3/8	0.375	9.525	3/8	0.375	1.125	3.000	4	●
M200-4ES-0.438	7/16	0.438	11.113	7/16	0.438	1.000	2.500	4	●
M200-4ES-0.500	1/2	0.500	12.700	1/2	0.500	1.000	3.000	4	●
M200-4ES-0.750	3/4	0.750	19.050	3/4	0.750	1.500	4.000	4	●
M200-4ES-1.000	1	1.000	25.400	1	1.000	2.000	4.000	4	●

Long version

Product code	Dc in No	Dc in	Dc mm	d1 in No	d1 in	Lc in	L1 in	Z	Stock
M200-4EL-0.313	5/16	0.313	7.938	5/16	0.313	1.125	3.000	4	●
M200-4EL-0.375	3/8	0.375	9.525	3/8	0.375	1.500	3.500	4	●
M200-4EL-0.500	1/2	0.500	12.700	1/2	0.500	2.000	4.000	4	●
M200-4EL-0.625	5/8	0.625	15.875	5/8	0.625	1.250	3.500	4	●

Marked: ● Stocked ○ Limited-stock

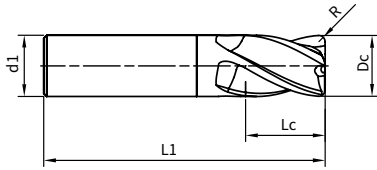
Solid Carbide End Mill M200

Eco line

Round corner mill with 4 cutting edges

Solid carbide end mill

Workpiece materials < HRC45



End Mill Tolerances			
Dc(in)	Tolerance(in)	d1	Tolerance
≤0.188	+0.00/-0.0008	all	h6
0.25-0.313	+0.00/-0.0011		
0.375-0.438	+0.00/-0.0019		
0.500-1.000	+0.00/-0.0028		



P	M	K	N	S	H	O
●●	●	●●				

●● 1st choice ● 2nd choice

Product code	Dc in No	Dc in	Dc mm	d1 in No	d1 in	Lc in	L1 in	Re in Corner radius	Z	Stock
M200-4RS-0.125R015	1/8	0.125	3.175	1/8	0.125	0.500	2.250	0.015	4	●
M200-4RS-0.188R015	3/16	0.188	4.763	3/16	0.188	0.500	2.000	0.015	4	●
M200-4RS-0.250R015	1/4	0.250	6.350	1/4	0.250	0.750	2.500	0.015	4	●
M200-4RS-0.313R015	5/16	0.313	7.938	5/16	0.313	0.813	2.500	0.015	4	●
M200-4RS-0.375R015	3/8	0.375	9.525	3/8	0.375	1.125	3.000	0.015	4	●
M200-4RS-0.375R030	3/8	0.375	9.525	3/8	0.375	1.125	3.000	0.03	4	●
M200-4RS-0.438R015	7/16	0.438	11.113	7/16	0.438	1.000	2.500	0.015	4	●
M200-4RS-0.500R015	1/2	0.500	12.700	1/2	0.500	1.000	3.000	0.015	4	●
M200-4RS-0.500R030	1/2	0.500	12.700	1/2	0.500	1.000	3.000	0.03	4	●
M200-4RS-0.750R015	3/4	0.750	19.050	3/4	0.750	1.500	4.000	0.015	4	●
M200-4RS-0.750R030	3/4	0.750	19.050	3/4	0.750	1.500	4.000	0.03	4	●
M200-4RS-1.000R015	1	1.000	25.400	1	1.000	2.000	4.000	0.015	4	●
M200-4RS-1.000R030	1	1.000	25.400	1	1.000	2.000	4.000	0.03	4	●

Long version

Product code	Dc in No	Dc in	Dc mm	d1 in No	d1 in	Lc in	L1 in	Re in Corner radius	Z	Stock
M200-4RL-0.313R015	5/16	0.313	7.938	5/16	0.313	1.125	3.000	0.015	4	●
M200-4RL-0.375R015	3/8	0.375	9.525	3/8	0.375	1.500	3.500	0.015	4	●
M200-4RL-0.375R030	3/8	0.375	9.525	3/8	0.375	1.500	3.500	0.03	4	●
M200-4RL-0.500R015	1/2	0.500	12.700	1/2	0.500	2.000	4.000	0.015	4	●
M200-4RL-0.500R030	1/2	0.500	12.700	1/2	0.500	2.000	4.000	0.03	4	●
M200-4RL-0.625R015	5/8	0.625	15.875	5/8	0.625	1.250	3.500	0.015	4	●
M200-4RL-0.625R030	5/8	0.625	15.875	5/8	0.625	1.250	3.500	0.03	4	●

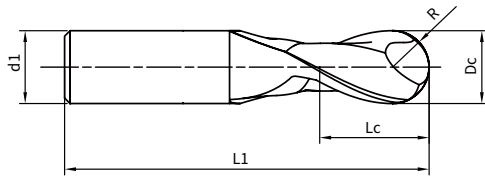
Solid Endmill

Marked: ● Stocked ○ Limited-stock

Solid Carbide End Mill M200

Eco line

Ball-nose mill with 2 cutting edges



Solid carbide end mill
Workpiece materials < HRC45

End Mill Tolerances			
Dc(in)	Tolerance(in)	d1	Tolerance
all	+0.00/-0.0008	all	h6

P	M	K	N	S	H	O
●●	●	●●				

●● 1st choice ● 2nd choice

Product code	Dc in No	Dc in	Dc mm	d1 in No	d1 in	Lc in	L1 in	Z	Stock
M200-2BS-0.125	1/8	0.125	3.175	1/8	0.125	0.500	2.250	2	●
M200-2BS-0.188	3/16	0.188	4.763	3/16	0.188	0.500	2.000	2	●
M200-2BS-0.250	1/4	0.250	6.350	1/4	0.250	0.750	2.500	2	●
M200-2BS-0.313	5/16	0.313	7.938	5/16	0.313	0.813	2.500	2	●
M200-2BS-0.375	3/8	0.375	9.525	3/8	0.375	1.125	3.000	2	●
M200-2BS-0.438	7/16	0.438	11.113	7/16	0.438	1.000	2.500	2	●
M200-2BS-0.500	1/2	0.500	12.700	1/2	0.500	1.000	3.000	2	●
M200-2BS-0.750	3/4	0.750	19.050	3/4	0.750	1.500	4.000	2	●
M200-2BS-1.000	1	1.000	25.400	1	1.000	2.000	4.000	2	●

Long version

Product code	Dc in No	Dc in	Dc mm	d1 in No	d1 in	Lc in	L1 in	Z	Stock
M200-2BL-0.313	5/16	0.313	7.938	5/16	0.313	1.125	3.000	2	●
M200-2BL-0.375	3/8	0.375	9.525	3/8	0.375	1.500	3.500	2	●
M200-2BL-0.500	1/2	0.500	12.700	1/2	0.500	2.000	4.000	2	●
M200-2BL-0.625	5/8	0.625	15.875	5/8	0.625	1.250	3.500	2	●

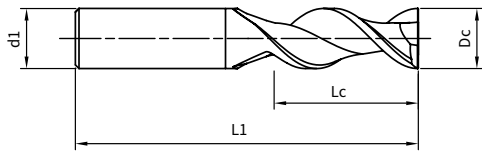
Marked: ● Stocked ○ Limited-stock

Solid Carbide End Mill M245

Solid carbide mill

Eco line

Square shoulder mill with 2 cutting edges dedicated for aluminum alloy



End Mill Tolerances			
Dc(in)	Tolerance(in)	d1	Tolerance
≤0.188	+0.00/-0.0008	all	h6
0.25-0.313	+0.00/-0.0011		
0.375-0.438	+0.00/-0.0019		
0.500-1.000	+0.00/-0.0028		



P	M	K	N	S	H	O
			●●			

●● 1st choice ● 2nd choice

Product code	Dc in No	Dc in	Dc mm	d1 in No	d1 in	Lc in	L1 in	Z	Stock
M245-2ES-0.125	1/8	0.125	3.175	1/8	0.125	0.500	2.250	2	●
M245-2ES-0.188	3/16	0.188	4.763	3/16	0.188	0.500	2.000	2	●
M245-2ES-0.250	1/4	0.250	6.350	1/4	0.250	0.750	2.500	2	●
M245-2ES-0.313	5/16	0.313	7.938	5/16	0.313	0.813	2.500	2	●
M245-2ES-0.375	3/8	0.375	9.525	3/8	0.375	1.125	3.000	2	●
M245-2ES-0.438	7/16	0.438	11.113	7/16	0.438	1.000	2.500	2	●
M245-2ES-0.500	1/2	0.500	12.700	1/2	0.500	1.000	3.000	2	●
M245-2ES-0.625	5/8	0.625	15.875	5/8	0.625	1.250	3.500	2	●
M245-2ES-0.750	3/4	0.750	19.050	3/4	0.750	1.500	4.000	2	●
M245-2ES-1.000	1	1.000	25.400	1	1.000	2.000	4.000	2	●

Long version

Product code	Dc in No	Dc in	Dc mm	d1 in No	d1 in	Lc in	L1 in	Z	Stock
M245-2EL-0.313	5/16	0.313	7.938	5/16	0.313	1.125	3.000	2	●
M245-2EL-0.375	3/8	0.375	9.525	3/8	0.375	1.500	3.500	2	●
M245-2EL-0.500	1/2	0.500	12.700	1/2	0.500	2.000	4.000	2	●

Solid Endmill

Marked: ● Stocked ○ Limited-stock

Solid Carbide End Mill Eco Line Cutting Parameters

Materials							
ISO	Material classification			Brinell hardness (HB)	Tensile strength Rm(lbs/in ²)	Cutting speed Vc(SFM)	
P	Unalloyed steel	C≤0.25%	Annealed	125	62000	150~260	
		0.25 < C ≤ 0.55%	Annealed	190	92700	150~260	
		0.25 < C ≤ 0.55%	Heat-treated	210	103000	150~260	
		C > 0.55%	Annealed	190	92700	150~260	
		C > 0.55%	Heat-treated	300	147000	130~200	
		Free cutting steel (short-chip)	Annealed	220	108000	150~210	
	Low-alloyed steel	Annealed			175	85700	150~250
		Heat-treated			300	146900	130~200
		Heat-treated			380	186000	130~200
		Heat-treated			430	214200	100~130
	High-alloyed steel and high-alloyed tool steel	Annealed			200	97900	150~250
		Hardened and tempered			300	147000	130~200
		Hardened and tempered			400	197000	130~200
	Stainless steel	Ferritic/martensitic, annealed			200	97900	110~130
Martensitic, heat-treated			330	162000	100~110		
M	Stainless steel	Austenitic, quench hardened		200	97900	100~110	
		Austenitic, precipitation hardened (PH)		300	147000	100	
		Austenitic/ferritic, duplex		230	113000	100~110	
K	Malleable cast iron	Ferritic		200	58000	180~200	
		Pearlitic		260	101000	180~200	
	Grey cast iron	Low tensile strength		180	29000	180~200	
		High tensile strength/austenitic		245	50800	180~200	
	Nodular cast iron	Ferritic		155	58000	180~200	
		Pearlitic		265	101000	150~180	
GGV(CGI)				230	58000	180~200	
N	Wrought aluminium alloys	Non-aging		30	-		
		Aged		100	49300		
	Cast aluminium alloys	≤ 12% Si, non-aging		75	37700		
		≤ 12% Si, aged		90	45000		
		> 12% Si, non-aging		130	65300		
	Magnesium alloys			70	36300		
	Copper and copper alloys	Unalloyed, electrolytic copper		100	49300		
		Brass, bronze, red brass		90	45000		
Cu alloys, short-chipping		110	55100				
High-tensile, Ampco alloy		300	146500				
S	Heat-resistant alloys	Fe-based	Annealed	200	98600		
			Hardened	280	136000		
		Ni or Co based	Annealed	250	122000		
			Hardened	350	171000		
			Cast	320	156600		
	Titanium alloys	Pure titanium		200	98600		
		α and β alloys, hardened		375	182700		
		β alloys		410	203000		
Tungsten alloys			300	146500			
Molybdenum alloys			300	146500			
H	Hardened steel	Hardened and tempered		50HRC	-		
		Hardened and tempered		55HRC	-		
		Hardened and tempered		60HRC	-		
	Chilled cast iron	Hardened and tempered		50HRC	-		

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

Solid Carbide End Mill Eco Line Cutting Parameters

Materials							
ISO	Material classification			Brinell hardness (HB)	Tensile strength Rm(lbs/in ²)	Cutting speed Vc(SFM)	
P	Unalloyed steel	C≤0.25%	Annealed	125	62000	260~330	
		0.25 < C ≤ 0.55%	Annealed	190	92700	250~300	
		0.25 < C ≤ 0.55%	Heat-treated	210	103000	250~300	
		C > 0.55%	Annealed	190	92700	250~300	
		C > 0.55%	Heat-treated	300	147000	200~230	
		Free cutting steel (short-chip)	Annealed	220	108000	250~300	
	Low-alloyed steel	Annealed			175	85700	250~300
		Heat-treated			300	146900	200~230
		Heat-treated			380	186000	200~230
		Heat-treated			430	214200	180~200
	High-alloyed steel and high-alloyed tool steel	Annealed			200	97900	250~280
		Hardened and tempered			300	147000	200~230
		Hardened and tempered			400	197000	180~200
	Stainless steel	Ferritic/martensitic, annealed			200	97900	160~230
Martensitic, heat-treated			330	162000	130~160		
M	Stainless steel	Austenitic, quench hardened		200	97900	130~160	
		Austenitic, precipitation hardened (PH)		300	147000	130	
		Austenitic/ferritic, duplex		230	113000	130~160	
K	Malleable cast iron	Ferritic		200	58000	230~260	
		Pearlitic		260	101000	230~260	
	Grey cast iron	Low tensile strength		180	29000	230~260	
		High tensile strength/austenitic		245	50800	230~260	
	Nodular cast iron	Ferritic		155	58000	230~260	
		Pearlitic		265	101000	220~250	
GGV(CGI)				230	58000	230~260	
N	Wrought aluminium alloys	Non-aging		30	-		
		Aged		100	49300		
	Cast aluminium alloys	≤ 12% Si, non-aging		75	37700		
		≤ 12% Si, aged		90	45000		
		> 12% Si, non-aging		130	65300		
	Magnesium alloys			70	36300		
	Copper and copper alloys	Unalloyed, electrolytic copper		100	49300		
		Brass, bronze, red brass		90	45000		
Cu alloys, short-chipping		110	55100				
High-tensile, Ampco alloy		300	146500				
S	Heat-resistant alloys	Fe-based	Annealed	200	98600		
			Hardened	280	136000		
		Ni or Co based	Annealed	250	122000		
			Hardened	350	171000		
			Cast	320	156600		
	Titanium alloys	Pure titanium		200	98600		
		α and β alloys, hardened		375	182700		
		β alloys		410	203000		
Tungsten alloys			300	146500			
Molybdenum alloys			300	146500			
H	Hardened steel	Hardened and tempered		50HRC	-		
		Hardened and tempered		55HRC	-		
		Hardened and tempered		60HRC	-		
	Chilled cast iron	Hardened and tempered		50HRC	-		

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

Solid Carbide End Mill Eco Line Cutting Parameters

Materials							
ISO	Material classification			Brinell hardness (HB)	Tensile strength Rm((lbs/in ²))	Cutting speed Vc(SFM)	
P	Unalloyed steel	C≤0.25%	Annealed	125	62000	300~330	
		0.25 < C ≤ 0.55%	Annealed	190	92700	300~330	
		0.25 < C ≤ 0.55%	Heat-treated	210	103000	300~330	
		C > 0.55%	Annealed	190	92700	300~330	
		C > 0.55%	Heat-treated	300	147000	260~300	
		Free cutting steel (short-chip)	Annealed	220	108000	300~330	
	Low-alloyed steel	Annealed			175	85700	300~330
		Heat-treated			300	146900	260~300
		Heat-treated			380	186000	260~300
		Heat-treated			430	214200	260~300
	High-alloyed steel and high-alloyed tool steel	Annealed			200	97900	300~330
		Hardened and tempered			300	147000	260~300
		Hardened and tempered			400	197000	260~300
	Stainless steel	Ferritic/martensitic, annealed			200	97900	300~330
Martensitic, heat-treated			330	162000	260~300		
M	Stainless steel	Austenitic, quench hardened		200	97900	300~330	
		Austenitic, precipitation hardened (PH)		300	147000	260~300	
		Austenitic/ferritic, duplex		230	113000	260~300	
K	Malleable cast iron	Ferritic		200	58000	300~330	
		Pearlitic		260	101000	300~330	
	Grey cast iron	Low tensile strength		180	29000	300~330	
		High tensile strength/austenitic		245	50800	300~330	
	Nodular cast iron	Ferritic		155	58000	300~330	
		Pearlitic		265	101000	300~330	
GGV(CGI)				230	58000	300~330	
N	Wrought aluminium alloys	Non-aging		30	-		
		Aged		100	49300		
	Cast aluminium alloys	≤ 12% Si, non-aging		75	37700		
		≤ 12% Si, aged		90	45000		
		> 12% Si, non-aging		130	65300		
	Magnesium alloys				70	36300	
	Copper and copper alloys	Unalloyed, electrolytic copper		100	49300		
		Brass, bronze, red brass		90	45000		
Cu alloys, short-chipping		110	55100				
High-tensile, Ampco alloy		300	146500				
S	Heat-resistant alloys	Fe-based	Annealed	200	98600		
			Hardened	280	136000		
		Ni or Co based	Annealed	250	122000		
			Hardened	350	171000		
			Cast	320	156600		
	Titanium alloys	Pure titanium		200	98600		
		α and β alloys, hardened		375	182700		
		β alloys		410	203000		
Tungsten alloys				300	146500		
Molybdenum alloys				300	146500		
H	Hardened steel	Hardened and tempered		50HRC	-		
		Hardened and tempered		55HRC	-		
		Hardened and tempered		60HRC	-		
	Chilled cast iron		Hardened and tempered		50HRC	-	

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

Solid Carbide End Mill Eco Line Cutting Parameters

Materials							
ISO	Material classification			Brinell hardness (HB)	Tensile strength Rm(lbs/in ²)	Cutting speed Vc(SFM)	
P	Unalloyed steel	C≤0.25%	Annealed	125	62000		
		0.25 < C ≤ 0.55%	Annealed	190	92700		
		0.25 < C ≤ 0.55%	Heat-treated	210	103000		
		C > 0.55%	Annealed	190	92700		
		C > 0.55%	Heat-treated	300	147000		
		Free cutting steel (short-chip)	Annealed	220	108000		
	Low-alloyed steel	Annealed			175	85700	
		Heat-treated			300	146900	
		Heat-treated			380	186000	
		Heat-treated			430	214200	
	High-alloyed steel and high-alloyed tool steel	Annealed			200	97900	
		Hardened and tempered			300	147000	
		Hardened and tempered			400	197000	
	Stainless steel	Ferritic/martensitic, annealed			200	97900	
Martensitic, heat-treated			330	162000			
M	Stainless steel	Austenitic, quench hardened		200	97900		
		Austenitic, precipitation hardened (PH)		300	147000		
		Austenitic/ferritic, duplex		230	113000		
K	Malleable cast iron	Ferritic		200	58000		
		Pearlitic		260	101000		
	Grey cast iron	Low tensile strength		180	29000		
		High tensile strength/austenitic		245	50800		
	Nodular cast iron	Ferritic		155	58000		
		Pearlitic		265	101000		
GGV(CGI)				230	58000		
N	Wrought aluminium alloys	Non-aging		30	-	490~660	
		Aged		100	49300	390~490	
	Cast aluminium alloys	≤ 12% Si, non-aging		75	37700	490~660	
		≤ 12% Si, aged		90	45000	430~490	
		> 12% Si, non-aging		130	65300	390~430	
	Magnesium alloys				70	36300	490~660
	Copper and copper alloys	Unalloyed, electrolytic copper		100	49300	390~490	
		Brass, bronze, red brass		90	45000	390~490	
Cu alloys, short-chipping		110	55100	390~490			
High-tensile, Ampco alloy		300	146500				
S	Heat-resistant alloys	Fe-based	Annealed	200	98600		
			Hardened	280	136000		
		Ni or Co based	Annealed	250	122000		
			Hardened	350	171000		
			Cast	320	156600		
	Titanium alloys	Pure titanium		200	98600		
		α and β alloys, hardened		375	182700		
		β alloys		410	203000		
	Tungsten alloys				300	146500	
	Molybdenum alloys				300	146500	
H	Hardened steel	Hardened and tempered		50HRC	-		
		Hardened and tempered		55HRC	-		
		Hardened and tempered		60HRC	-		
	Chilled cast iron		Hardened and tempered		50HRC	-	

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

Solid Carbide End Mill Eco Line Cutting Parameters

Materials							
ISO	Material classification			Brinell hardness (HB)	Tensile strength Rm(lbs/in ²)	Cutting speed Vc(SFM)	
P	Unalloyed steel	C≤0.25%	Annealed	125	62000		
		0.25 < C ≤ 0.55%	Annealed	190	92700		
		0.25 < C ≤ 0.55%	Heat-treated	210	103000		
		C > 0.55%	Annealed	190	92700		
		C > 0.55%	Heat-treated	300	147000		
		Free cutting steel (short-chip)	Annealed	220	108000		
	Low-alloyed steel	Annealed			175	85700	
		Heat-treated			300	146900	
		Heat-treated			380	186000	
		Heat-treated			430	214200	
	High-alloyed steel and high-alloyed tool steel	Annealed			200	97900	
		Hardened and tempered			300	147000	
		Hardened and tempered			400	197000	
	Stainless steel	Ferritic/martensitic, annealed			200	97900	
Martensitic, heat-treated			330	162000			
M	Stainless steel	Austenitic, quench hardened		200	97900		
		Austenitic, precipitation hardened (PH)		300	147000		
		Austenitic/ferritic, duplex		230	113000		
K	Malleable cast iron	Ferritic		200	58000		
		Pearlitic		260	101000		
	Grey cast iron	Low tensile strength		180	29000		
		High tensile strength/austenitic		245	50800		
	Nodular cast iron	Ferritic		155	58000		
		Pearlitic		265	101000		
GGV(CGI)				230	58000		
N	Wrought aluminium alloys	Non-aging		30	-	490~660	
		Aged		100	49300	390~490	
	Cast aluminium alloys	≤ 12% Si, non-aging		75	37700	490~660	
		≤ 12% Si, aged		90	45000	430~490	
		> 12% Si, non-aging		130	65300	390~430	
	Magnesium alloys				70	36300	490~660
	Copper and copper alloys	Unalloyed, electrolytic copper			100	49300	390~490
		Brass, bronze, red brass			90	45000	390~490
Cu alloys, short-chipping			110	55100	390~490		
High-tensile, Ampco alloy			300	146500			
S	Heat-resistant alloys	Fe-based	Annealed	200	98600		
			Hardened	280	136000		
		Ni or Co based	Annealed	250	122000		
			Hardened	350	171000		
			Cast	320	156600		
	Titanium alloys	Pure titanium		200	98600		
		α and β alloys, hardened		375	182700		
		β alloys		410	203000		
Tungsten alloys				300	146500		
Molybdenum alloys				300	146500		
H	Hardened steel	Hardened and tempered		50HRC	-		
		Hardened and tempered		55HRC	-		
		Hardened and tempered		60HRC	-		
	Chilled cast iron		Hardened and tempered		50HRC	-	

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

