

**NEW  
PRODUCT!**









**M121, M125**

**Achteck Universal Solid Carbide End Mills – XP Line**




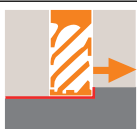






For high performance machining in ISO P, M, K and S material





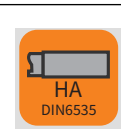
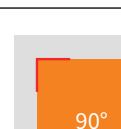







● **Solid carbide end mills-XP Line**

Series	Picture	Category	Tooth	Helix angles	Application	Cutting edge tolerance mm	Diameter mm	Material	Information
M121-4CSP		XP line	Z=4	35°/38°		$\leq 12+0.00/-0.02$ $> 12+0.00/-0.03$	4-20	P, M, K, S	Used in stainless steel, soft steel and cast iron. Special flute geometry and differential helix eliminate vibration. Extended edge. The workpiece hardness is up to HRC40.
M121-4CS		XP line	Z=4	35°/38°		$\leq 12+0.00/-0.02$ $> 12+0.00/-0.03$	4-20	P, M, K, S	Used in stainless steel, soft steel and cast iron. Special flute geometry and differential helix eliminate vibration. The workpiece hardness is up to HRC40.
M121-4ESP		XP line	Z=4	35°/38°		$\leq 12+0.00/-0.02$ $> 12+0.00/-0.03$	4-20	P, M, K, S	Used in stainless steel, soft steel and cast iron. Special flute geometry and differential helix eliminate vibration, with extended 4 cutting edges design. The workpiece hardness is up to HRC40.
M125-6ES		XP line	Z=6	45°		$\leq 12+0.00/-0.02$ $> 12+0.00/-0.03$	6-20	P, M, K, S	Used in stainless steel, soft steel and cast iron. It has close pitch to provide a better surface finish and tool life under the condition of high speed milling and cycloid milling.

## Icon description

Icons	Description
	Slot milling and shoulder milling applications
	Shoulder milling Rough machining
	Shoulder milling Finish machining
	High feed milling
	Dynamic milling cycloid milling
	Profile milling
	Chamfering and deburring
	AlTiN coating
	AlCrN coating
	Uncoated

Icons	Description
	30° Helix angles
	35° Helix angles
	35°/38° Helix angles
	45° Helix angles
	Cylinder shank HA DIN6535
	Square 90°
	Corner radius CR
	Ball-nose End Mill BR
	Corner chamfer 45°
	Chamfer D
	Waved edge P

• **XP line of solid carbide end mills offer complete product range and high performance**

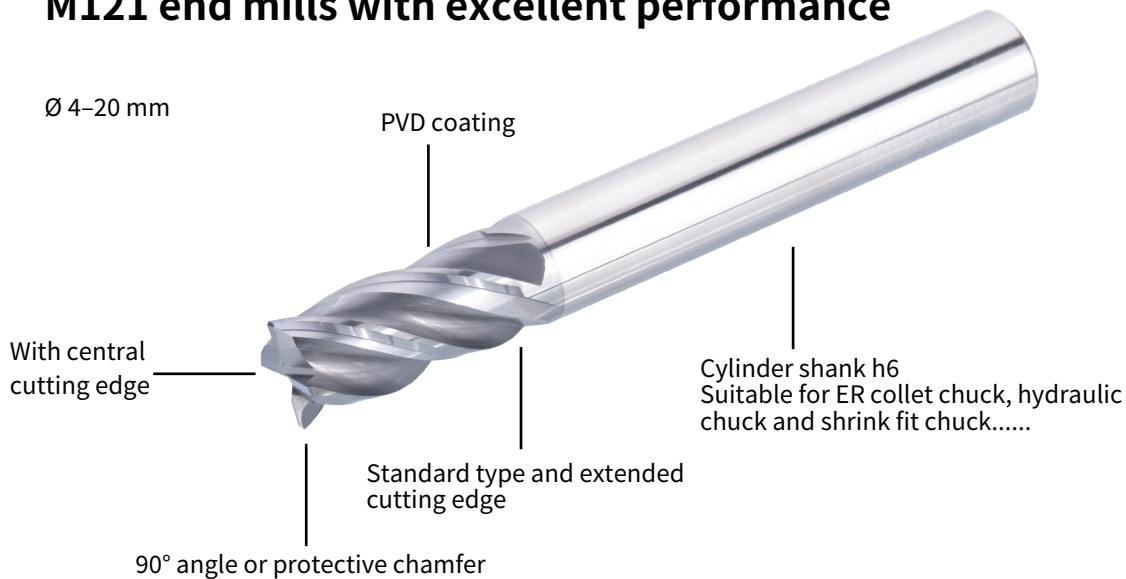
**Tool**

- Solid carbide end mills--XP series
- Metric
- 4 series with 30 dimensions
- Flat bottom, close pitch
- With 4 or 6 cutting edges
- Ø 4mm to 20 mm

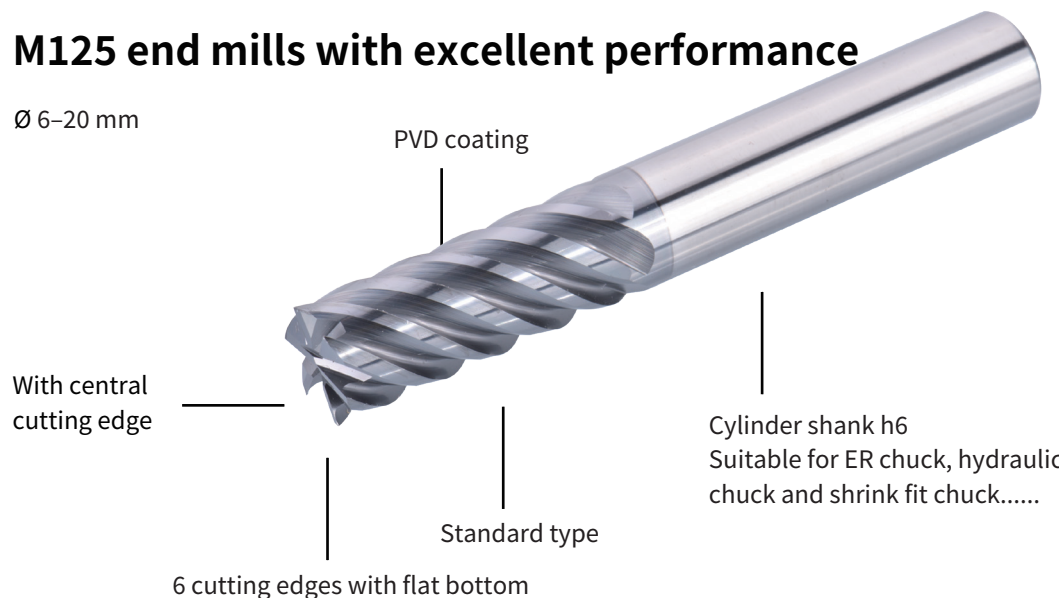
**Application**

- ISO workpiece material groups: P, M, K and S
- Side milling, slot milling, pocket milling, circular interpolated milling, ramping and profile milling
- Application: general machinery, die and mold, aircraft and energy industry

• **M121 end mills with excellent performance**



• **M125 end mills with excellent performance**



## • Solid carbide end mill denomination

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

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
Tool category	Generations	Series	Number of teeth	Tool type
M milling	1	00 General purpose end mills HRC45 10 General purpose end mills HRC55 16 Rough machining end mills 20 High performance end mills HRC40 30 Designed for steel milling 40 Designed for aluminium alloy milling 50 Designed for stainless steel milling 60 Designed for difficult machining material milling 70 Designed for hardened material milling 80&90 others	2, 3, 4, 5, 6.....	E Square B Ball nose R Rounded corner C Chamfer P With waved edges W Forming T Taper milling H High feed milling

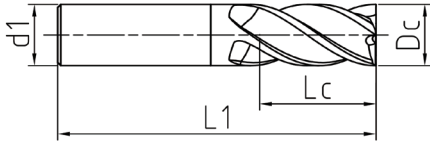
<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>
Length standard	Tool diameter	Chamfer / nose radius size	Structure type
S Standard total length L Long type XL Super long type XXL Extra long type SN Short cutting edge SP Long cutting edge	060=6.0mm 200=20.0mm	002=0.2mm	N Straight shank C Conical necking P Special shank Default: No necking

## ● Solid carbide end mill M121

### XP line

End mill with 4 cutting edges (with protective chamfers)

Material hardness HRC40



P	M	K	N	S	H	O
●	●	●		●		

Product code	Dc mm +0.00/-0.03	d1 mm	Chamfer mm	Lc mm	L1 mm	Z	Stock
M121-4CS-040002	4	4	0.2	8	50	4	●
M121-4CS-040002P	4	6	0.2	8	50	4	●
M121-4CS-060002	6	6	0.2	12	50	4	●
M121-4CS-080002	8	8	0.2	16	60	4	●
M121-4CS-100003	10	10	0.3	20	75	4	●
M121-4CS-120004	12	12	0.4	24	75	4	●
M121-4CS-160004	16	16	0.4	32	100	4	●
M121-4CS-200005	20	20	0.5	40	100	4	●

Product code	Dc mm +0.00/-0.03	d1 mm	Chamfer mm	Lc mm	L1 mm	Z	Stock
M121-4CSP-040002P	4	6	0.2	10	50	4	●
M121-4CSP-060002	6	6	0.2	15	60	4	●
M121-4CSP-080002	8	8	0.2	20	70	4	●
M121-4CSP-100003	10	10	0.3	25	75	4	●
M121-4CSP-120004	12	12	0.4	30	80	4	●
M121-4CSP-140004	14	16	0.4	35	100	4	●
M121-4CSP-160004	16	16	0.4	40	100	4	●
M121-4CSP-180005P	18	16	0.5	45	100	4	●
M121-4CSP-200005	20	20	0.5	45	100	4	●

Marked: ● Stocked ○ Non-stocked

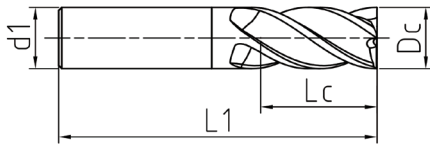
The non-standard product can be ordered

## ● Solid carbide end mill M121

XP line

4 cutting edges with a flat bottom

Material hardness HRC40



P	M	K	N	S	H	O
●	●	●		●		

Product code	Dc mm +0.00/-0.03	d1 mm	Lc mm	L1 mm	Z	Stock
M121-4ESP-040P	4	6	10	50	4	●
M121-4ESP-060	6	6	15	60	4	●
M121-4ESP-080	8	8	20	70	4	●
M121-4ESP-100	10	10	25	75	4	●
M121-4ESP-120	12	12	30	80	4	●
M121-4ESP-160	16	16	40	100	4	●
M121-4ESP-200	20	20	45	100	4	●

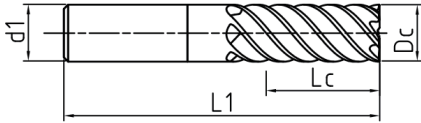
Marked: ● Stocked ○ Non-stocked  
 The non-standard product can be ordered

## ● Solid carbide end mill M125

XP line

6 cutting edges with a flat bottom

Material hardness HRC40



P	M	K	N	S	H	O
●	●	●		●		

Product code	Dc mm +0.00/-0.03	d1 mm	Lc mm	L1 mm	Z	Stock
M125-6ES-060	6	6	15	60	6	●
M125-6ES-080	8	8	20	70	6	●
M125-6ES-100	10	10	25	75	6	●
M125-6ES-120	12	12	30	80	6	●
M125-6ES-160	16	16	40	100	6	●
M125-6ES-200	20	20	45	100	6	●

Marked: ● Stocked ○ Non-stocked

The non-standard product can be ordered

## ● Solid carbide end mill XP Line cutting parameters

The recommended cutting parameters are theoretical values, it can be adjusted according to the application conditions.

Machining Materials						
ISO	Material classification			Brinell hardness (HB/HRC)	Tensile strength (N/mm <sup>2</sup> )	
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 (short chip)	Annealed	220	745	
	Low-alloy steel	Annealing			175	591
		Heat-treated			300	1013
		Heat-treated			380	1282
		Heat-treated			430	1477
	High-alloy steel and high-alloy 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	Ferrite		200	400	
		Pearlite		260	700	
	Gray cast iron	Low tensile strength		180	200	
		High tensile strength / austenite		245	350	
	Nodular Cast iron	Ferrite		155	400	
		Pearlite		265	700	
	GGV (CGI)		230	400		
N	Wrought aluminium alloys	Non-aging		30	-	
		Aged		100	340	
	Cast aluminium alloys	≤1.2% Si, Non-aging		75	260	
		≤1.2% Si, aging		90	310	
		>1.2% Si, Non-aging		130	450	
	Magnesium 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 alloy		300	1010			
S	Fe base 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		
	Hardened cast steel	Hardened and tempered		50HRC		



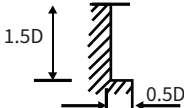
Cutting speed Vc(m/min)		fz[mm/tooth]							
		End mill diameter (mm)							
		4	6	8	10	12	14	16	20
M121-4CSP M121-4CS M121-4ESP		Slot milling							
152~168	0.008	0.016	0.027	0.038	0.047	0.049	0.053	0.065	
152~166	0.008	0.016	0.027	0.038	0.047	0.049	0.053	0.065	
152~166	0.008	0.016	0.027	0.038	0.047	0.049	0.053	0.065	
157~166	0.008	0.016	0.027	0.038	0.047	0.049	0.053	0.065	
152~160	0.006	0.014	0.023	0.030	0.037	0.040	0.043	0.055	
155~162	0.006	0.014	0.023	0.038	0.047	0.049	0.053	0.065	
152~168	0.008	0.016	0.027	0.038	0.047	0.049	0.053	0.065	
107~117	0.007	0.015	0.023	0.032	0.040	0.041	0.043	0.056	
107~117	0.007	0.015	0.023	0.032	0.040	0.041	0.043	0.056	
87~107	0.005	0.013	0.019	0.027	0.035	0.036	0.038	0.050	
64~70	0.006	0.011	0.019	0.027	0.032	0.034	0.037	0.045	
60~64	0.005	0.011	0.016	0.022	0.024	0.025	0.027	0.036	
60~64	0.004	0.007	0.013	0.017	0.019	0.020	0.022	0.030	
50~55	0.005	0.011	0.019	0.027	0.032	0.034	0.037	0.045	
45~50	0.005	0.011	0.016	0.022	0.024	0.025	0.027	0.036	
106	0.008	0.018	0.028	0.048	0.055	0.059	0.062	0.077	
95	0.008	0.018	0.028	0.048	0.055	0.059	0.062	0.077	
106	0.008	0.018	0.028	0.048	0.055	0.059	0.062	0.077	
112~123	0.010	0.020	0.034	0.048	0.058	0.064	0.065	0.081	
112~123	0.010	0.020	0.034	0.048	0.058	0.064	0.065	0.081	
112~123	0.010	0.020	0.034	0.048	0.058	0.064	0.065	0.081	
112~123	0.010	0.020	0.034	0.048	0.058	0.064	0.065	0.081	
112~123	0.008	0.016	0.029	0.040	0.050	0.052	0.057	0.071	
96~112	0.006	0.014	0.026	0.036	0.046	0.048	0.052	0.066	
112~120	0.008	0.016	0.029	0.040	0.050	0.052	0.057	0.071	
26	0.007	0.012	0.019	0.033	0.038	0.040	0.043	0.054	
24	0.007	0.012	0.017	0.029	0.033	0.034	0.037	0.046	
24	0.007	0.012	0.017	0.029	0.033	0.034	0.037	0.046	
22	0.006	0.010	0.015	0.027	0.030	0.031	0.033	0.041	
22	0.006	0.010	0.015	0.027	0.030	0.031	0.033	0.041	
58	0.007	0.016	0.025	0.042	0.050	0.053	0.055	0.068	
45	0.006	0.014	0.021	0.035	0.040	0.044	0.050	0.060	
45	0.006	0.014	0.021	0.035	0.040	0.044	0.050	0.060	
22	0.006	0.010	0.015	0.027	0.030	0.031	0.033	0.041	
22	0.006	0.010	0.015	0.027	0.030	0.031	0.033	0.041	

## ● Solid carbide end mill XP Line cutting parameters

The recommended cutting parameters are theoretical values, it can be adjusted according to the application conditions.

Machining Materials						
ISO	Material classification			Brinell hardness (HB/HRC)	Tensile strength (N/mm <sup>2</sup> )	
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 (short chip)	Annealed	220	745	
	Low-alloy steel	Annealing			175	591
		Heat-treated			300	1013
		Heat-treated			380	1282
		Heat-treated			430	1477
	High-alloy steel and high-alloy 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	Ferrite		200	400	
		Pearlite		260	700	
	Gray cast iron	Low tensile strength		180	200	
		High tensile strength / austenite		245	350	
	Nodular Cast iron	Ferrite		155	400	
		Pearlite		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, aging		90	310	
		> 12 % Si, Non-aging		130	450	
	Magnesium 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 alloy		300	1010			
S	Fe base 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		
	Hardened cast steel	Hardened and tempered		50HRC		



Cutting speed Vc(m/min)		fz[mm/tooth]							
		End mill diameter (mm)							
		4	6	8	10	12	14	16	20
M121-4CSP M121-4CS M121-4ESP		Shoulder milling 							
152~168	0.008	0.016	0.027	0.038	0.047	0.049	0.053	0.065	
152~166	0.008	0.016	0.027	0.038	0.047	0.049	0.053	0.065	
152~166	0.008	0.016	0.027	0.038	0.047	0.049	0.053	0.065	
157~166	0.008	0.016	0.027	0.038	0.047	0.049	0.053	0.065	
152~160	0.006	0.014	0.023	0.030	0.037	0.040	0.043	0.055	
155~162	0.006	0.014	0.023	0.038	0.047	0.049	0.053	0.065	
152~168	0.008	0.016	0.027	0.038	0.047	0.049	0.053	0.065	
107~117	0.007	0.015	0.023	0.032	0.040	0.041	0.043	0.056	
107~117	0.007	0.015	0.023	0.032	0.040	0.041	0.043	0.056	
87~107	0.005	0.013	0.019	0.027	0.035	0.036	0.038	0.050	
64~70	0.006	0.011	0.019	0.027	0.032	0.034	0.037	0.045	
60~64	0.005	0.011	0.016	0.022	0.024	0.025	0.027	0.036	
60~64	0.004	0.007	0.013	0.017	0.019	0.020	0.022	0.030	
50~55	0.005	0.011	0.019	0.027	0.032	0.034	0.037	0.045	
45~50	0.005	0.011	0.016	0.022	0.024	0.025	0.027	0.036	
106	0.008	0.018	0.028	0.048	0.055	0.059	0.062	0.077	
95	0.008	0.018	0.028	0.048	0.055	0.059	0.062	0.077	
106	0.008	0.018	0.028	0.048	0.055	0.059	0.062	0.077	
112~123	0.010	0.020	0.034	0.048	0.058	0.064	0.065	0.081	
112~123	0.010	0.020	0.034	0.048	0.058	0.064	0.065	0.081	
112~123	0.010	0.020	0.034	0.048	0.058	0.064	0.065	0.081	
112~123	0.010	0.020	0.034	0.048	0.058	0.064	0.065	0.081	
112~123	0.008	0.016	0.029	0.040	0.050	0.052	0.057	0.071	
96~112	0.006	0.014	0.026	0.036	0.046	0.048	0.052	0.066	
112~120	0.008	0.016	0.029	0.040	0.050	0.052	0.057	0.071	
26	0.007	0.012	0.019	0.033	0.038	0.040	0.043	0.054	
24	0.007	0.012	0.017	0.029	0.033	0.034	0.036	0.045	
24	0.007	0.012	0.017	0.029	0.033	0.034	0.036	0.045	
22	0.006	0.010	0.015	0.025	0.028	0.029	0.031	0.038	
22	0.006	0.010	0.015	0.025	0.028	0.029	0.031	0.038	
58	0.007	0.016	0.025	0.042	0.050	0.053	0.055	0.068	
45	0.006	0.014	0.021	0.035	0.040	0.044	0.050	0.060	
45	0.006	0.014	0.021	0.035	0.040	0.044	0.050	0.060	
22	0.006	0.010	0.015	0.025	0.028	0.029	0.031	0.038	
22	0.006	0.010	0.015	0.025	0.028	0.029	0.031	0.038	

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<b>Machining Materials</b>						
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		C > 0.55%	Heat-treated	300	1013	
		Free-Cutting Steel (short chip)	Annealed	220	745	
	Low-alloy steel	Annealing			175	591
		Heat-treated			300	1013
		Heat-treated			380	1282
		Heat-treated			430	1477
	High-alloy steel and high-alloy 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	Ferrite		200	400	
		Pearlite		260	700	
	Gray cast iron	Low tensile strength		180	200	
		High tensile strength / austenite		245	350	
	Nodular Cast iron	Ferrite		155	400	
		Pearlite		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, aging		90	310	
		> 12 % Si, Non-aging		130	450	
	Magnesium 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 alloy		300	1010			
S	Fe base alloys	Fe based	Annealed	200	680	
			Hardened	280	940	
		Ni or Co based	Annealed	250	840	
			Hardened	350	1180	
	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		
	Hardened cast steel	Hardened and tempered		50HRC		

