




COATING GUIDE





Material	Hardness	TiN	TiCN	TiAlN
Austenitic Stainless Steel	< 35 HRc		*	X
Martinstic Stainless Steel	< 35 HRc		*	X
Martinstic Stainless Steel	>= 35 HRc			X
PH Stainless Steel	< 35 HRc		*	X
PH Stainless Steel	<= 35 HRc		*	X
Ni, Co, Fe Based Super Alloys				X
Titanium				X
Alloy Steel	16-23 HRc	*	*	X
Alloy Steel	23-38 HRc	*	*	X
Alloy Steel	> 38 HRc		*	X
Carbon Steel	16-23 HRc	*	*	X
Carbon Steel	23-38 HRc	*	*	X
Carbon Steel	> 38 HRc		*	X
Low Carbon Steel	13-23 HRc	*	*	X
Low Carbon Steel	23-38 HRc	*	*	X
Low Carbon Steel	> 38 HRc		*	X
Gray Cast Iron	18-22 HRc		*	X
Nodular Cast Iron	22-32 HRc	*	X	
Aluminum	< 10% Si	*	X	
Aluminum	> 10% Si	*	X	
Hardened Steel	>45 HRc			






Additional coating upon request.





X = BEST Performance X₁ = SPECIFIC applications * = Additional recommended coating options




ICON GLOSSARY

SUBSTRATE 

FLUTES    

HELIX     

CORNER    

ROUGHER PROFILE   






ISO MATERIAL GROUP




CODE	MATERIAL GROUP	MATERIAL SELECTION
P	Steels	Carbon Steel, Alloy Steels 1018, 1045, 4140, D-2
M	Stainless	Martensitic & Austenitic 304, 316, 312, 316L, 421, 420, 17-4PH
H	Hardened Steels	D-2, 4340, H-13
K	Cast Iron	Grey-Cast Iron & Ductile Iron Class-20, (60-40-18)
S	Special Alloys	Inconel, Hastelloy, Titanium, etc. Inconel 718, Hastello B, 6Al-4V
N	Non-Ferrous	Aluminum-6060-T6, 7075, Plastics, Detron, Graphite, Fiberglass

COATINGS

MACHINING



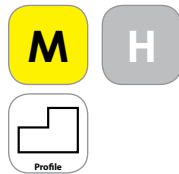
Operating Parameters for High-Performance Roughers

Material	Hardness		Surface Feet per Minute			Chip Load per Tooth	
	Brinell	HRC	Uncoated	TiCN	TiAlN	1/4" to 1/2"	1/2" - 1"
low and plain carbon, alloy, and tool steels	<220 HB	<19	-	325 - 500	430 - 575	.0015 - .0030	.0030 - .0045
plain carbon, alloy and tool steels	225 - 286	20 - 30	-	215 - 375	350 - 430	.0015 - .0030	.0030 - .0045
	294 - 371	31 - 40	-	180 - 280	210 - 320	.0011 - .0021	.0021 - .0032
austenitic stainless steels 200 and 300 series	135 - 275	<28	-	215 - 440	250 - 500	.0010 - .0025	.0025 - .0040
ferritic, martensitic, 400/500 series and PH stainless steels	135 - 330	<35	-	190 - 375	225 - 430	.0015 - .0030	.0030 - .0045
aluminum, low silicon and other non-ferrous alloys	50 -150	600	2000	2400 - 2500	-	.0020 - .0038	.0038 - .0077
aluminum, high silicon			600 - 2000	720 - 2500	-	.0018 - .0035	.0035 - .0071

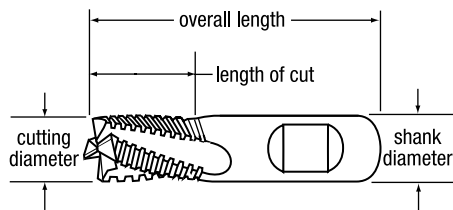
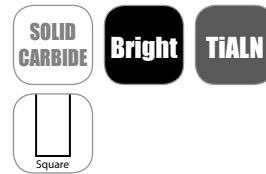
CARBIDE END MILLS

Series CEM-RS Rougher • multi-flute • center cutting • square end

Applications |



Features |



cutting diameter			shank diameter	length of cut	overall length	no. of flutes	corner radius	EDP Number	
fractional	decimal	metric						bright	TiAlN
1/4	.2500	6.35	1/4*	3/8	2	3	0.000	C60148	C80148
1/4	.2500	6.35	1/4*	3/4	2 1/2	3	0.000	C60149	C80149
3/8	.3750	9.53	3/8*	1/2	2	4	0.000	C60150	C80150
3/8	.3750	9.53	3/8*	7/8	2 1/2	4	0.000	C60151	C80151
1/2	.5000	12.70	1/2*	5/8	2 1/2	4	0.000	C60152	C80152
1/2	.5000	12.70	1/2*	1	3	4	0.000	C60153	C80153
5/8	.6250	15.88	5/8*	3/4	3	4	0.000	C60154	C80154
5/8	.6250	15.88	5/8*	1-1/4	3 1/2	4	0.000	C60155	C80155
3/4	.7500	19.05	3/4*	7/8	3 1/2	4	0.000	C60156	C80156
3/4	.7500	19.05	3/4*	1-1/2	4	4	0.000	C60157	C80157
1	1.0000	25.40	1*	1	3 1/2	4	0.000	C60158	C80158
1	1.0000	25.40	1*	1-1/2	4	4	0.000	C60159	C80159

*Weldon shank; all others plain shank