



These fine pitch roughing endmills have an excellent flute design for roughing applications in a variety of materials. TiAlN coating enhances speed-feeds and tool life.

MULTI FL. ROUGHER REG. LENGTH - TiAlN COATED						
Cutting Diameter (in.)	Shank Diameter (in.)	Flute Length (in.)	Overall Length (in.)	No. Flutes	Code No.	Price \$
1/4	1/4	3/4	2-1/2	4	102-185	51.10
5/16	5/16	3/4	2-1/2	4	102-190	59.60
3/8	3/8	1	2-1/2	4	102-200	68.20
1/2	1/2	1-1/4	3	4	102-205	90.70
5/8	5/8	1-5/8	3-1/2	4	102-210	148.90
3/4	3/4	1-5/8	4	4	102-215	175.20
1	1	1-3/4	4	4	102-220	343.00

cutting conditions				
Materials				Cutting Speed (SFM)
Main Group	Sub-Group	Condition	Hardness (HRC)	
Mild & Medium Steels	1010, 1018, 1030, 1040, etc.	Normalized	<28	230-400
Alloy Steel	4140, 4340	Annealed	<30	180-330
Tool Steel	A2, D2, P20			
Hardened Steels	4140, 4340	Hardened	<38	130-270
	A2, D2, P20			
Hardened Steels	4140, 4340	Hardened	<45	95-220
	A2, D2, P20			
Stainless Steels	300, 400 Series	Hardened	<45	95-220
	17-4PH, 15-5 PH			

cutting speed (sfm)	
	100 150 200 250 300 350 400 450
Mild & Medium Steels	100-450
Alloy & Tool Steels	150-350
Hardened Steels <38 hrc	100-250
Hardened Steels <45 hrc	100-200
Stainless Steels	100-250

hardness (hrc)	
	0 10 15 20 25 30 35 40 45
Mild & Medium Steels	up to 28
Alloy & Tool Steels	up to 30
Hardened Steels <38 hrc	up to 38
Hardened Steels <45 hrc	up to 45
Stainless Steels	up to 45

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tolerances		
Size	Diameter	Shank Diameter
3/32 thru 1"	+ .000"-.002"	+ .0000"-.0005"

