

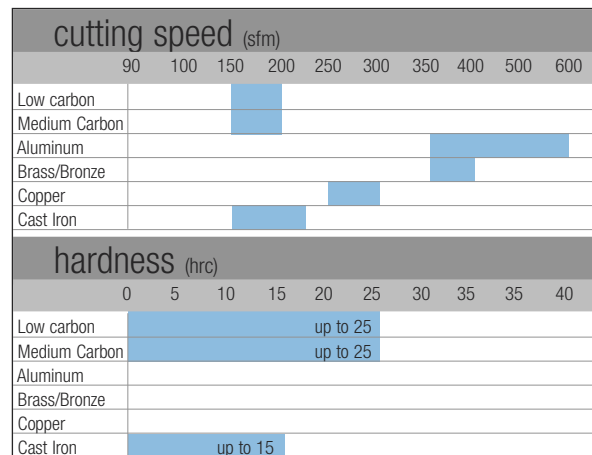
A general purpose carbide end mill with maximum chip clearance.

For: End milling
Slotting
Sinking

On: Variety of Steels
Cast iron
Non-Ferrous metals
Plastics
Abrasive type materials

2 FLUTE REGULAR LENGTH - INCH						
Cutting Diameter	Shank Diameter	Flute Length	Overall Length	Code No.	Price \$	
(in.)	(in.)	(in.)	(in.)			
1/32	1/8	1/8	1-1/2	103-770	13.10	
3/64	1/8	9/64	1-1/2	103-772	9.20	
1/16	1/8	3/16	1-1/2	103-848	8.40	
5/64	1/8	1/4	1-1/2	103-773	8.40	
3/32	1/8	5/16	1-1/2	103-849	8.40	
7/64	1/8	3/8	1-1/2	103-775	8.40	
1/8	1/8	1/2	1-1/2	103-850	8.40	
9/64	3/16	1/2	2	103-776	10.50	
5/32	3/16	9/16	2	103-851	10.50	
11/64	3/16	9/16	2	103-777	11.70	
3/16	3/16	5/8	2	103-852	11.70	
13/64	1/4	5/8	2-1/2	103-778	14.80	
7/32	1/4	5/8	2-1/2	103-853	14.80	
1/4	1/4	3/4	2-1/2	103-854	14.80	
9/32	5/16	3/4	2-1/2	103-855	19.20	
5/16	5/16	13/16	2-1/2	103-856	19.20	
11/32	3/8	7/8	2-1/2	103-779	24.00	
3/8	3/8	1	2-1/2	103-857	24.00	
13/32	7/16	1	2-3/4	103-780	36.80	
7/16	7/16	1	2-3/4	103-858	36.80	
1/2	1/2	1	3	103-859	44.50	
9/16	9/16	1-1/8	3-1/2	103-886	64.20	
5/8	5/8	1-1/4	3-1/2	103-887	79.90	
11/16	3/4	1-3/8	4	103-888	112.70	
3/4	3/4	1-1/2	4	103-889	112.90	
7/8	7/8	1-1/2	4	103-890	158.30	
1	1	1-1/2	4	103-891	181.40	

cutting conditions				
Materials				Cutting Speed
Main Group	Sub-Group	Condition	Hardness (HRC)	(SFM)
Low carbon	1018, 1010, 1035	Normalized	<25	150-200
Medium carbon	1045, 1050, 1065	Normalized	<25	150-200
Aluminum	Unalloyed, cast	-	-	350-600
Brass/bronze	-	-	-	350-400
Copper	-	-	-	250-300
Cast iron	-	As cast	<15	150-225

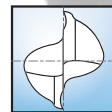


SPEEDS & FEEDS P. 28

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



2 FLUTE REGULAR LENGTH-METRIC 2 FLUTE 1/8 SHANK CARBIDE ENDMILLS

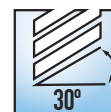
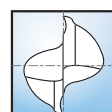


A general purpose carbide end mill with maximum chip clearance.

For: End milling
Slotting
Sinking

On: Variety of Steels
Cast iron
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Plastics
Abrasive type materials

■ 2 FLUTE REGULAR LENGTH-METRIC					
Cutting Diameter	Shank Diameter	Flute Length	Overall Length	Code No.	Price \$
(mm)	(mm)	(mm)	(mm)		
.5	3	1.5	39	101-552	30.90
1	3	3	39	101-553	22.60
1.5	3	5	39	101-432	14.60
2	3	7	39	102-696	8.90
2.5	3	7	39	102-697	8.90
3	3	9	39	102-698	8.90
3.5	4	12	51	102-699	10.70
4	4	14	51	102-700	10.70
4.5	5	14	51	102-701	13.00
5	5	16	51	102-702	13.00
6	6	19	64	102-703	15.50
7	8	19	64	102-704	20.20
8	8	21	64	102-705	20.20
9	10	22	70	102-706	30.20
10	10	22	70	102-707	30.20
11	11	25	70	102-708	46.80
12	12	25	76	102-709	46.80
14	14	30	89	102-711	67.50
16	16	32	89	102-712	84.30
18	18	35	102	102-713	109.00
20	20	38	102	102-714	130.90
22	22	38	102	101-451	285.40
25	25	38	102	102-715	199.90



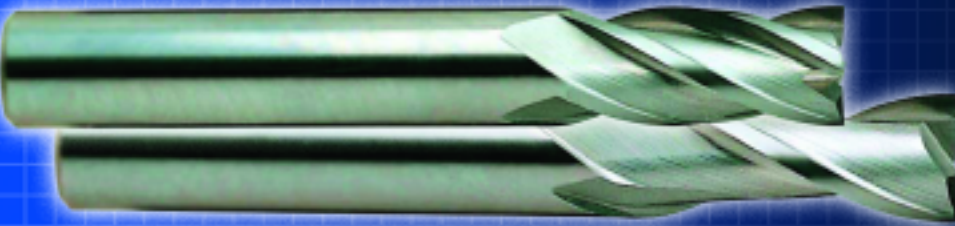
Designed for milling small precision components in a variety of materials

■ 2 FLUTE 1/8 SHANK MINIATURE-INCH					
Cutting Diameter	Shank Diameter	Flute Length	Overall Length	Code No.	Price \$
(in.)	(in.)	(in.)	(in.)		
.015	1/8	.047	1-1/2	101-210	34.80
.020	1/8	.063	1-1/2	101-211	30.90
.025	1/8	.078	1-1/2	101-212	26.30
.030	1/8	.094	1-1/2	101-213	18.10
.035	1/8	.109	1-1/2	101-214	15.20
.040	1/8	.125	1-1/2	101-215	15.20
.045	1/8	.140	1-1/2	101-216	15.20
.050	1/8	.156	1-1/2	101-217	15.90
.055	1/8	.171	1-1/2	101-218	16.60
.060	1/8	.188	1-1/2	101-219	16.60

SPEEDS & FEEDS P. 28

**We have taken the guess work
out of your Endmill selection!**

Micrograin Carbide Bright Finish Blue Series Pg. 5



For general ductile materials including:

- :: LOW AND MEDIUM CARBON STEEL
- :: BRASS
- :: COPPER AND CAST IRON
- :: ALUMINUM

Micrograin Carbide TiAlN Coated Yellow Series Pg. 31



For tough materials including:

- :: STAINLESS STEEL
- :: HIGH CARBON STEEL
- :: HIGH ALLOY
- :: TITANIUM
- :: ALUMINUM

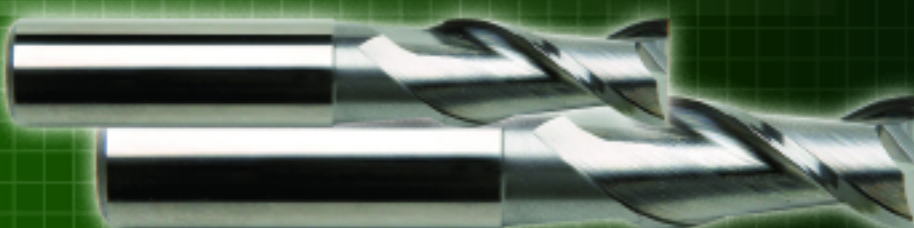
Sub Micro Grain Carbide Typhoon Coated Red Series Pg. 45



For high tensile materials including:

- :: TOOL STEELS
- :: TITANIUM
- :: NICKEL ALLOYS
- :: STAINLESS STEEL

Micrograin Carbide Bright for Aluminium Green Series Pg. 58



For Aluminum and Die Cast Aluminum

Recommended Table



Blue Series Micrograin Carbide Bright Finish - Cutting Conditions				
Materials Main Group	Materials Sub-Group	Condition	Hardness (HRC)	Cutting Speed (SFM)
Low Carbon	1018, 1010, 1035	Normalized	<25	150-200
Medium Carbon	1045, 1050, 1065	Normalized	<25	150-200
Aluminum	Unalloyed, cast	–	–	350-600
Brass/bronze	–	–	–	350-400
Copper	–	–	–	250-300
Cast iron	–	As cast	<15	150-225

Yellow Series Micrograin Carbide TiAlN Coated - Cutting Conditions				
Materials Main Group	Materials Sub-Group	Condition	Hardness	Cutting Speed (SFM)
Stainless Steels	300, 400 Series	Annealed	<29	200-350
Tool Steels	01, A-2, D-2, H-13, P-20	Annealed	<35	150-250
Medium Carbon	1030, 1035, 1038, 1040, 1045, 1050	Normalized	<28	190-275
Alloyed High Carbon	1065, 1070, 1080, 1090, 1095, 1561, 1572	Normalized	<32	150-250
High Strength	4140, 4340	Normalized	<32	150-250
Titanium	Commercially pure	Annealed	<32	150-250

Red Series Sub-Micrograin Carbide Typhoon Coated-Cutting Conditions				
Materials Main Group	Materials Sub-Group	Condition	Hardness (HRC)	Cutting Speed (SFM)
Stainless Steel	17-4PH, 15-5, 17-7PH, AM350	Hardened	<45	150-250
Tool Steels	01, A-2, D-2, H-13, P-20,	Hardened	<60	80-270
High Strength	4140, 4340, 50100	Hardened	<60	80-270
Nickel Alloys	Inconel, Hastaloy, Waspaloy, Astraloy, Rene, Monel	Annealed and Hardened	<45	150-225
Titanium	6 AL 4	Annealed/hardened	<42	175-275

Green Series Carbide Bright Finish for Aluminum - Cutting Conditions	
Materials Main Group	Cutting Speed (SFM)
Aluminum	600-700
Die Cast Aluminum	600-700

TOOL MATERIALS



PM
High grade powder Metallurgy HSS



SUB MICRON MICRO GRAIN CARBIDE
Sub Micron Micro Grain Carbide



CARBIDE
Micro Grain Carbide



HSSE-V3
Premium HSS 3% Vanadium



HSCO
Cobalt HSS



HSS
High Speed Steel

SURFACE TREATMENTS



TYPHOON
Typhoon Coating
The hard PVD coating allows effective machining of hard mold, die, and tool steels up to 60 HRC in dry or wet conditions



TiAlN
Titanium Aluminum Nitride
This coating is applied by the PVD process and has a higher hardness than TiN and TiCN which greatly increases the service life of the tool and can stand higher temperatures when machining Cast Iron and tough steels



TiCN
Titanium Carbonitride
TiCN coated tools have a very high surface hardness of approx. 90 HRC. This coating is recommended for use in all steels, cast iron and aluminum.



TiN
Titanium Nitride
A gold coloured film with a hardness of approx. 85 HRC is deposited on the tool which extends tool life by reducing friction and enables the tool to be operated at higher speeds and feeds.

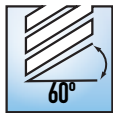


STEAM OXIDE
Steam Oxide Surface
Reduces adhesion of chips to the surface of tool

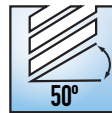


BRIGHT
Bright Finish

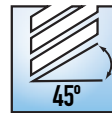
HELIX ANGLES



60°
60 Degree Helix



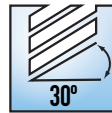
50°
50 Degree Helix



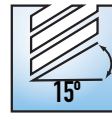
45°
45 Degree Helix



40°
40 Degree Helix



30°
30 Degree Helix



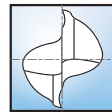
15°
15 Degree Helix



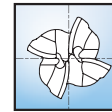
EXTRA LONG
Extra Long Length



MED
Medium Length



Two Flute



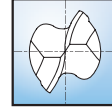
4 Flute Ball Nose



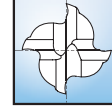
LONG
Long Length



REG
Regular Length



2 Flute Ball Nose



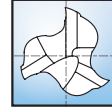
4 Flute Center Cut



JOBBERS
Jobbers Length



STUB
Stub Length



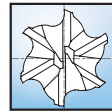
3 Flute



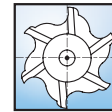
4 Flute



135°
Drill Point Angle



6 Flute



Multi. Flute



HOLE TYPE
Blind Hole



HOLE TYPE
Thru Hole