

# CUTTING TOOLS

## End Mills - Slot Drills - - - - Solid Carbide

- series 112 - 2 flute slot drill



Two flute slot drills offer the maximum stock removal and with over-centre end cutting offer optimum performance when plunging and slotting, particularly on soft materials such as light alloys, aluminium, non-ferrous metals and plastics.

- series 113 - 3 flute slot drill



Three flute slot drills represent a compromise between two and four flute benefits, offering slotting and plunging facilities due to their over-centre cutting capability as well as profiling. Their increased flute clearance capability compared with the four flute, together with a stronger tooth form than a two flute, often makes them the optimum tool for medium range materials.

- series 114 - 4 flute end mill



Four flute end mills have one of the strongest tooth forms available and as such are suited to peripheral and profile milling operations on harder and tougher materials where the excellent swarf clearance properties of the two flute are not critical. Series 114-4 flute end mills are centre cutting.

### METRIC SIZES

Cutter dia (mm)	Shank dia (mm)	Flute length (mm)	Overall length (mm)	Part Number		
				2 flute	3 flute	4 flute
1	3	3	38	AG03001	AG03022	AG03043
1.5	3	5	38	AG03002	AG03023	AG03044
2	3	6	38	AG03003	AG03024	AG03045
2.5	3	7	38	AG03004	AG03025	AG03046
3	3	12	38	AG03005	AG03026	AG03047
3.5	4	12	50	AG03006	AG03027	AG03048
4	4	14	50	AG03007	AG03028	AG03049
4.5	5	14	50	AG03008	AG03029	AG03050
5	5	16	50	AG03009	AG03030	AG03051
6	6	19	63	AG03010	AG03031	AG03052
7	8	19	63	AG03011	AG03032	AG03053
8	8	19	63	AG03012	AG03033	AG03054
9	10	22	70	AG03013	AG03034	AG03055
10	10	22	70	AG03014	AG03035	AG03056
11	11	25	70	AG03015	AG03036	AG03057
12	12	25	75	AG03016	AG03037	AG03058
14	14	30	88	AG03017	AG03038	AG03059
16	16	32	88	AG03018	AG03039	AG03060
18	18	36	100	AG03019	AG03040	AG03061
20	20	38	100	AG03020	AG03041	AG03062
25	25	38	100	AG03021	AG03042	AG03063

### IMPERIAL SIZES

Cutter dia (mm)	Shank dia (mm)	Flute length (mm)	Overall length (mm)	Part Number		
				2 flute	3 flute	4 flute
1/16	1/8	3/16	1 1/2	AG03064	AG03080	AG03096
3/32	1/8	9/32	1 1/2	AG03065	AG03081	AG03097
1/8	1/8	7/16	1 1/2	AG03066	AG03082	AG03098
5/32	3/16	1/2	2	AG03067	AG03083	AG03099
3/16	3/16	9/16	2	AG03068	AG03084	AG03100
7/32	1/4	5/8	2 1/2	AG03069	AG03085	AG03101
1/4	1/4	3/4	2 1/2	AG03070	AG03086	AG03102
9/32	5/16	3/4	2 1/2	AG03071	AG03087	AG03103
5/16	5/16	13/16	2 1/2	AG03072	AG03088	AG03104
3/8	3/8	7/8	2 1/2	AG03073	AG03089	AG03105
7/16	7/16	1	2 3/4	AG03074	AG03090	AG03106
1/2	1/2	1	3	AG03075	AG03091	AG03107
9/16	9/16	1 1/8	3 1/2	AG03076	AG03092	AG03108
5/8	5/8	1 1/4	3 1/2	AG03077	AG03093	AG03109
3/4	3/4	1 1/2	4	AG03078	AG03094	AG03110
1	1	1 1/2	4	AG03079	AG03095	AG03111

## Ball Nosed - End Mills - - - - Solid Carbide

Ball nosed end mills in two, three and four flute configurations may be used for contour milling of three-dimensional components.

- series 122 - 2 flute slot drill ball nosed



- series 123 - 3 flute slot drill ball nosed



- series 124 - 4 flute end mill ball nosed



### METRIC SIZES

Cutter dia (mm)	Shank dia (mm)	Flute length (mm)	Overall length (mm)	Part Number		
				2 flute	3 flute	4 flute
1	3	2	38	AG03112	AG03132	AG03152
1.5	3	5	38	AG03113	AG03133	AG03153
2	3	6	38	AG03114	AG03134	AG03154
2.5	3	7	38	AG03115	AG03135	AG03155
3	3	12	38	AG03116	AG03136	AG03156
3.5	4	12	50	AG03117	AG03137	AG03157
4	4	14	50	AG03118	AG03138	AG03158
4.5	5	14	50	AG03119	AG03139	AG03159
5	5	16	50	AG03120	AG03140	AG03160
6	6	19	63	AG03121	AG03141	AG03161
7	8	19	63	AG03122	AG03142	AG03162
8	8	19	63	AG03123	AG03143	AG03163
9	10	22	70	AG03124	AG03144	AG03164
10	10	22	70	AG03125	AG03145	AG03165
11	11	25	70	AG03126	AG03146	AG03166
12	12	25	75	AG03127	AG03147	AG03167
14	14	30	88	AG03128	AG03148	AG03168
16	16	32	88	AG03129	AG03149	AG03169
18	18	36	100	AG03130	AG03150	AG03170
20	20	38	100	AG03131	AG03151	AG03171

### IMPERIAL SIZES

Cutter dia (mm)	Shank dia (mm)	Flute length (mm)	Overall length (mm)	Part Number		
				2 flute	3 flute	4 flute
1/16	1/8	3/16	1 1/2	AG03172	AG03187	AG03202
3/32	1/8	9/32	1 1/2	AG03173	AG03188	AG03203
1/8	1/8	7/16	1 1/2	AG03174	AG03189	AG03204
5/32	3/16	1/2	2	AG03175	AG03190	AG03205
3/16	3/16	9/16	2	AG03176	AG03191	AG03206
7/32	1/4	5/8	2 1/2	AG03177	AG03192	AG03207
1/4	1/4	3/4	2 1/2	AG03178	AG03193	AG03208
9/32	5/16	3/4	2 1/2	AG03179	AG03194	AG03209
5/16	5/16	13/16	2 1/2	AG03180	AG03195	AG03210
3/8	3/8	7/8	2 1/2	AG03181	AG03196	AG03211
7/16	7/16	1	2 3/4	AG03182	AG03197	AG03212
1/2	1/2	1	3	AG03183	AG03198	AG03213
9/16	9/16	1 1/8	3 1/2	AG03184	AG03199	AG03214
5/8	5/8	1 1/4	3 1/2	AG03185	AG03200	AG03215
3/4	3/4	1 1/2	4	AG03186	AG03201	AG03216

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# CUTTING TOOLS

## Long Series- End Mills—Solid Carbide

Long series end mills have the same geometry and end cut configuration as our standard two, three and four flute end mills but have longer flutes and greater overall lengths.

- series 146 - 2 flute slot drill long series



- series 147 - 3 flute slot drill long series



- series 148 - 3 flute end mill long series



### METRIC SIZES

Cutter dia (mm)	Shank dia (mm)	Flute length (mm)	Overall length (mm)	Part Number		
				2 flute	3 flute	4 flute
3	3	25	65	AG03332	AG03342	AG03352
4	4	25	65	AG03333	AG03343	AG03353
5	5	25	75	AG03334	AG03344	AG03354
6	6	25	75	AG03335	AG03345	AG03355
8	8	25	75	AG03336	AG03346	AG03356
10	10	38	100	AG03337	AG03347	AG03357
12	12	50	100	AG03338	AG03348	AG03358
16	16	75	150	AG03339	AG03349	AG03359
20	20	75	150	AG03340	AG03350	AG03360
25	25	75	150	AG03341	AG03351	AG03361

### IMPERIAL SIZES

Cutter dia (mm)	Shank dia (mm)	Flute length (mm)	Overall length (mm)	Part Number	
				2 flute	4 flute
1/8	1/8	1	2 1/4	AG03362	AG03372
3/16	3/16	1 1/8	3	AG03363	AG03373
1/4	1/4	1 1/8	3	AG03364	AG03374
5/16	5/16	1 1/8	3	AG03365	AG03375
3/8	3/8	1 3/4	4	AG03366	AG03376
7/16	7/16	2	4 1/2	AG03367	AG03377
1/2	1/2	2	4 1/2	AG03368	AG03378
5/8	5/8	2 1/4	5	AG03369	AG03379
3/4	3/4	2 1/4	5	AG03370	AG03380
1	1	2 1/4	5	AG03371	AG03381

## Long Series- End Mills—Solid Carbide

Long Series ball nosed end mills have the same geometry and end cut configuration as our standard two, three and four flute ball nosed cutters but have longer flutes and greater overall lengths.

These cutters are ideal for deep three dimensional contour milling.

- series 126 - 2 flute slot drill long series - ball nosed



- series 127 - 3 flute slot drill long series - ball nosed



- series 128 - 4 flute end mill long series - ball nosed



### METRIC SIZES

Cutter dia (mm)	Shank dia (mm)	Flute length (mm)	Overall length (mm)	Part Number		
				2 flute	3 flute	4 flute
3	3	25	75	AG03382	AG03393	AG03404
4	4	25	75	AG03383	AG03394	AG03405
5	5	25	75	AG03384	AG03395	AG03406
6	6	25	75	AG03385	AG03396	AG03407
8	8	25	75	AG03386	AG03397	AG03408
10	10	38	100	AG03387	AG03398	AG03409
12	12	50	100	AG03388	AG03399	AG03410
14	14	60	125	AG03389	AG03400	AG03411
16	16	75	150	AG03390	AG03401	AG03412
18	18	75	150	AG03391	AG03402	AG03413
20	20	75	150	AG03392	AG03403	AG03414

### IMPERIAL SIZES

Cutter dia (mm)	Shank dia (mm)	Flute length (mm)	Overall length (mm)	Part Number	
				2 flute	4 flute
1/4	1/4	1 1/8	3	AG03415	AG03422
5/16	5/16	1 1/8	3	AG03416	AG03423
3/8	3/8	1 3/4	4	AG03417	AG03424
7/16	7/16	2	4 1/2	AG03418	AG03425
1/2	1/2	2	4 1/2	AG03419	AG03426
5/8	5/8	2 1/4	5	AG03420	AG03427
3/4	3/4	2 1/4	5	AG03421	AG03428

## Drills—Solid Carbide

This drill has a stronger web and shallower flute than the Jobber Drill. Whilst still exhibiting the four facet end geometry, it is web thinned at the point to facilitate accurate penetration. This reduces heat build up on high temperature alloys and work hardening materials. The Slow Helix Drill offers more mechanical strength during drilling operations, enabling harder and tougher materials to be drilled effectively whilst providing excellent hole size retention together with a high surface finish. High Alloy steels, inconel, titanium and stainless steels (austenitic) are the materials where the Slow Helix Drill performs at its best.

- series 212 - slow helix 135° angle



### METRIC SIZES

Cutter dia (mm)	Flute length (mm)	Overall length (mm)	Part Number
1.5	16	41	AG03611
1.6	16	41	AG03612
1.7	17	43	AG03613
1.8	17	43	AG03614
1.9	17	43	AG03615
2.0	19	44	AG03616
2.1	19	44	AG03617
2.2	19	44	AG03618
2.3	19	44	AG03619
2.4	19	44	AG03620
2.5	21	46	AG03621
2.6	21	46	AG03622
2.7	21	46	AG03623
2.8	22	48	AG03624
2.9	22	48	AG03625
3.0	22	48	AG03626
3.1	22	48	AG03627
3.2	22	48	AG03628
3.3	24	50	AG03629
3.4	24	50	AG03630
3.5	24	50	AG03631
3.6	24	50	AG03632

### METRIC SIZES

Cutter dia (mm)	Flute length (mm)	Overall length (mm)	Part Number
3.7	25	52	AG03633
3.8	25	52	AG03634
3.9	25	52	AG03635
4.0	27	54	AG03636
4.1	27	54	AG03637
4.2	27	54	AG03638
4.3	27	54	AG03639
4.4	29	56	AG03640
4.5	29	56	AG03641
4.6	29	56	AG03642
4.7	29	56	AG03643
4.8	30	57	AG03644
4.9	30	57	AG03645
5.0	30	57	AG03646
5.1	30	57	AG03647
5.2	32	60	AG03648
5.3	32	60	AG03649
5.4	32	60	AG03650
5.5	32	60	AG03651
5.6	33	62	AG03652
5.7	33	62	AG03653

### METRIC SIZES

Cutter dia (mm)	Flute length (mm)	Overall length (mm)	Part Number
5.8	33	62	AG03654
5.9	33	62	AG03655
6.0	35	63	AG03656
6.1	35	63	AG03657
6.2	35	63	AG03658
6.3	35	63	AG03659
6.4	35	63	AG03660
6.5	37	67	AG03661
7.0	38	68	AG03662
7.5	40	70	AG03663
8.0	41	71	AG03664
8.5	43	75	AG03665
9.0	44	78	AG03666
9.5	46	80	AG03667
10.0	49	83	AG03668
10.5	50	84	AG03669
11.0	52	87	AG03670
11.5	54	92	AG03671
12.0	56	94	AG03672
12.5	57	95	AG03673

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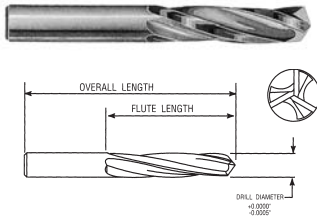


# CUTTING TOOLS

## Drills—Solid Carbide

Designed for tough materials including stainless steel, nickel based alloys and titanium, this is also suitable for use on cast iron, alloys steels and non-ferrous metals. As well as providing an accurate self-centring and core drilling capability the three flute geometry enables improved hole roundness and surface finish whilst maintaining a superior hole size. The three flutes also reduce the chip load per cutting edge, thereby increasing tool life and enabling higher feed rates to be achieved.

- series 210 - three flute 135° incl. angle



### METRIC SIZES

Cutter dia (mm)	Flute length (mm)	Overall length (mm)	Part Number
3.0	19	48	AG03772
3.1	19	48	AG03773
3.2	19	48	AG03774
3.3	20	50	AG03775
3.4	20	50	AG03776
3.5	20	50	AG03777
3.6	20	50	AG03778
3.7	21	52	AG03779
3.8	21	52	AG03780
3.9	21	52	AG03781
4.0	22	54	AG03782
4.1	22	54	AG03783
4.2	22	54	AG03784
4.3	22	54	AG03785
4.4	24	56	AG03786
4.5	24	56	AG03787
4.6	24	56	AG03788
4.7	24	56	AG03789
4.8	25	57	AG03790
4.9	25	57	AG03791
5.0	25	57	AG03792
5.1	25	57	AG03793
5.2	27	60	AG03794
5.3	27	60	AG03795

### METRIC SIZES

Cutter dia (mm)	Flute length (mm)	Overall length (mm)	Part Number
5.4	27	60	AG03796
5.5	27	60	AG03798
5.6	29	62	AG03799
5.7	29	62	AG03800
5.8	29	62	AG03801
5.9	29	62	AG03802
6.0	30	63	AG03803
6.1	30	63	AG03804
6.2	30	63	AG03805
6.3	30	63	AG03806
6.4	30	63	AG03807
6.5	32	67	AG03808
7.0	33	68	AG03809
7.5	35	70	AG03810
8.0	37	71	AG03811
8.5	38	75	AG03812
9.0	39	78	AG03813
9.5	40	80	AG03814
10.0	41	83	AG03815
10.5	42	84	AG03816
11.0	44	87	AG03817
11.5	47	92	AG03818
12.0	50	94	AG03819
12.5	50	95	AG03820

## Micro Drill—Solid Carbide

Micro Drill are manufactured to exacting standards of geometry and finish and offer the following special advantages:

- Standard 1/8" shank diameter for all drill eliminates the need for costly range of collets.
- Strength and rigidity of 1/8" shank ensures accurate size and location tolerance of holes.
- TiR is held to 0.0001" to minimise breakages.
- Four facet point and micro finish flutes permit faster drilling of clean accurate holes in single sided and multi layer work.

### Applications

Cast Iron, Light Alloys, Alloy Bronze, Brass, Copper, Stainless Steel, Steels over 35 Rc, Glass Reinforced Plastic.

- series 226 - micro drill



### METRIC SIZES

Size (mm)	Inch equiv. (mm)	Flute length (mm)	Part Number
.50	.0197	6.35	AG03821
.55	.0216	6.35	AG03822
.60	.0236	7.92	AG03823
.65	.0256	7.92	AG03824
.70	.0275	9.92	AG03825
.75	.0295	9.92	AG03826
.80	.0315	9.52	AG03827
.85	.0335	10.66	AG03828
.90	.0354	10.66	AG03829
.95	.0374	10.66	AG03830
1.00	0.394	10.66	AG03831
1.05	.0413	10.66	AG03832
1.10	.0433	10.66	AG03833
1.15	.0453	10.66	AG03834
1.20	.0472	10.66	AG03835
1.25	.0492	10.66	AG03836
1.30	.0512	10.66	AG03837
1.35	.0531	10.66	AG03838
1.40	.0551	10.66	AG03839
1.45	.0571	10.66	AG03840
1.50	.0590	10.66	AG03841
1.55	.0610	10.66	AG03842
1.60	.0630	12.19	AG03843
1.65	.0650	12.19	AG03844

### METRIC SIZES

Size (mm)	Inch equiv. (mm)	Flute length (mm)	Part Number
1.70	.0670	12.19	AG03845
1.75	.0689	12.19	AG03846
1.80	.0709	12.19	AG03847
1.85	.0728	12.19	AG03848
1.90	.0748	12.19	AG03849
1.95	.0768	12.19	AG03850
2.00	.0787	12.19	AG03851
2.05	.0807	12.19	AG03852
2.10	.0827	12.19	AG03853
2.15	.0846	12.19	AG03854
2.20	.0866	12.19	AG03855
2.25	.0886	12.19	AG03856
2.30	.0905	12.19	AG03857
2.35	.0925	12.19	AG03858
2.40	.0945	12.19	AG03859
2.45	.0965	12.19	AG03860
2.50	.0985	12.19	AG03861
2.60	.1024	12.19	AG03862
2.70	.1063	12.19	AG03863
2.80	.1102	12.19	AG03864
2.90	.1142	12.19	AG03865
3.00	.1181	12.19	AG03866
3.10	.1221	12.19	AG03867

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