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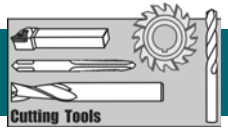
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Cutting Tools



JOBBERS DRILLS

High Speed Steel, 118° Point



Fractional Sizes

Size	Flute Length	Overall Length	Rolled Black Oxide Model No.	Rolled Polished Model No.	Milled Black Oxide Model No.	Milled Polished Model No.	Ground Black Oxide Model No.	Ground Bright Model No.	Ground Tin-Coated Model No.
1/64	3/16	3/4	234-4001	234-6001	434-4001	434-6001	334-4001	334-3001	334-5001
1/32	1/2	1-3/8	234-4002	234-6002	434-4002	434-6002	334-4002	334-3002	334-5002
3/64	3/4	1-3/4	234-4003	234-6003	434-4003	434-6003	334-4003	334-3003	334-5003
1/16	7/8	1-7/8	234-4004	234-6004	434-4004	434-6004	334-4004	334-3004	334-5004
5/64	1 "	2 "	234-4005	234-6005	434-4005	434-6005	334-4005	334-3005	334-5005
3/32	1-1/4	2-1/4	234-4006	234-6006	434-4006	434-6006	334-4006	334-3006	334-5006
7/64	1-1/2	2-5/8	234-4007	234-6007	434-4007	434-6007	334-4007	334-3007	334-5007
1/8	1-5/8	2-3/4	234-4008	234-6008	434-4008	434-6008	334-4008	334-3008	334-5008
9/64	1-3/4	2-7/8	234-4009	234-6009	434-4009	434-6009	334-4009	334-3009	334-5009
5/32	2 "	3-1/8	234-4010	234-6010	434-4010	434-6010	334-4010	334-3010	334-5010
11/64	2-1/8	3-1/4	234-4011	234-6011	434-4011	434-6011	334-4011	334-3011	334-5011
3/16	2-5/16	3-1/2	234-4012	234-6012	434-4012	434-6012	334-4012	334-3012	334-5012
13/64	2-7/16	3-5/8	234-4013	234-6013	434-4013	434-6013	334-4013	334-3013	334-5013
7/32	2-1/2	3-3/4	234-4014	234-6014	434-4014	434-6014	334-4014	334-3014	334-5014
15/64	2-5/8	3-7/8	234-4015	234-6015	434-4015	434-6015	334-4015	334-3015	334-5015
1/4	2-3/4	4 "	234-4016	234-6016	434-4016	434-6016	334-4016	334-3016	334-5016
17/64	2-7/8	4-1/8	234-4017	234-6017	434-4017	434-6017	334-4017	334-3017	334-5017
9/32	2-5/16	4-1/4	234-4018	234-6018	434-4018	434-6018	334-4018	334-3018	334-5018
19/64	3-1/16	4-3/8	234-4019	234-6019	434-4019	434-6019	334-4019	334-3019	334-5019
5/16	3-3/16	4-1/2	234-4020	234-6020	434-4020	434-6020	334-4020	334-3020	334-5020
21/64	3-5/16	4-5/8	234-4021	234-6021	434-4021	434-6021	334-4021	334-3021	334-5021
11/32	3-7/16	4-3/4	234-4022	234-6022	434-4022	434-6022	334-4022	334-3022	334-5022
23/64	3-1/2	4-7/8	234-4023	234-6023	434-4023	434-6023	334-4023	334-3023	334-5023
3/8	3-5/8	5 "	234-4024	234-6024	434-4024	434-6024	334-4024	334-3024	334-5024
25/64	3-3/4	5-1/8	234-4025	234-6025	434-4025	434-6025	334-4025	334-3025	334-5025
13/32	3-7/8	5-1/4	234-4026	234-6026	434-4026	434-6026	334-4026	334-3026	334-5026
27/64	3-5/16	5-3/8	234-4027	234-6027	434-4027	434-6027	334-4027	334-3027	334-5027
7/16	4-1/16	5-1/2	234-4028	234-6028	434-4028	434-6028	334-4028	334-3028	334-5028
29/64	4-3/16	5-5/8	234-4029	234-6029	434-4029	434-6029	334-4029	334-3029	334-5029
15/32	4-5/16	5-3/4	234-4030	234-6030	434-4030	434-6030	334-4030	334-3030	334-5030
31/64	4-3/8	5-7/8	234-4031	234-6031	434-4031	434-6031	334-4031	334-3031	334-5031
1/2	4-1/2	6 "	234-4032	234-6032	434-4032	434-6032	334-4032	334-3032	334-5032
33/64	4-3/16	6-5/8	234-4033	234-6033	434-4033	434-6033	334-4033	334-3033	334-5033
17/32	4-3/16	6-5/8	234-4034	234-6034	434-4034	434-6034	334-4034	334-3034	334-5034
35/64	4-3/16	6-5/8	234-4035	234-6035	434-4035	434-6035	334-4035	334-3035	334-5035
9/16	4-3/16	6-5/8	234-4036	234-6036	434-4036	434-6036	334-4036	334-3036	334-5036
37/64	4-3/16	6-5/8	234-4037	234-6037	434-4037	434-6037	334-4037	334-3037	334-5037
19/32	5-3/16	7-1/8	234-4038	234-6038	434-4038	434-6038	334-4038	334-3038	334-5038
39/64	5-3/16	7-1/8	234-4039	234-6039	434-4039	434-6039	334-4039	334-3039	334-5039
5/8	5-3/16	7-1/8	234-4040	234-6040	434-4040	434-6040	334-4040	334-3040	334-5040
41/64	5-3/16	7-1/8	234-4041	234-6041	434-4041	434-6041	334-4041	334-3041	334-5041
21/32	5-3/16	7-1/8	234-4042	234-6042	434-4042	434-6042	334-4042	334-3042	334-5042
43/64	5-5/8	7-5/8	234-4043	234-6043	434-4043	434-6043	334-4043	334-3043	334-5043
11/16	5-5/8	7-5/8	234-4044	234-6044	434-4044	434-6044	334-4044	334-3044	334-5044
3/4		7-5/8	234-4048	234-6048	434-4048	434-6048	334-4048	334-3048	334-5048
25/32		8-1/8	234-4050	234-6050	434-4050	434-6050	334-4050	334-3050	334-5050

Letter Sizes

Size	Overall Length	Rolled Black Oxide Model No.	Rolled Polished Model No.	Milled Black Oxide Model No.	Milled Polished Model No.	Ground Black Oxide Model No.	Ground Bright Model No.	Ground Tin-Coated Model No.
A	3-7/8	234-4201	234-6201	434-4201	434-6201	334-4201	334-3201	334-5201
B	4 "	234-4202	234-6202	434-4202	434-6202	334-4202	334-3202	334-5202
C	4 "	234-4203	234-6203	434-4203	434-6203	334-4203	334-3203	334-5203
D	4 "	234-4204	234-6204	434-4204	434-6204	334-4204	334-3204	334-5204
E	4 "	234-4205	234-6205	434-4205	434-6205	334-4205	334-3205	334-5205
F	4-1/8	234-4206	234-6206	434-4206	434-6206	334-4206	334-3206	334-5206
G	4-1/8	234-4207	234-6207	434-4207	434-6207	334-4207	334-3207	334-5207
H	4-1/8	234-4208	234-6208	434-4208	434-6208	334-4208	334-3208	334-5208
I	4-1/8	234-4209	234-6209	434-4209	434-6209	334-4209	334-3209	334-5209
J	4-1/8	234-4210	234-6210	434-4210	434-6210	334-4210	334-3210	334-5210
K	4-1/4	234-4211	234-6211	434-4211	434-6211	334-4211	334-3211	334-5211
L	4-1/4	234-4212	234-6212	434-4212	434-6212	334-4212	334-3212	334-5212
M	4-3/8	234-4213	234-6213	434-4213	434-6213	334-4213	334-3213	334-5213
N	4-3/8	234-4214	234-6214	434-4214	434-6214	334-4214	334-3214	334-5214
O	4-1/2	234-4215	234-6215	434-4215	434-6215	334-4215	334-3215	334-5215
P	4-5/8	234-4216	234-6216	434-4216	434-6216	334-4216	334-3216	334-5216
Q	4-3/4	234-4217	234-6217	434-4217	434-6217	334-4217	334-3217	334-5217
R	4-3/4	234-4218	234-6218	434-4218	434-6218	334-4218	334-3218	334-5218
S	4-7/8	234-4219	234-6219	434-4219	434-6219	334-4219	334-3219	334-5219
T	4-7/8	234-4220	234-6220	434-4220	434-6220	334-4220	334-3220	334-5220
U	5 "	234-4221	234-6221	434-4221	434-6221	334-4221	334-3221	334-5221
V	5 "	234-4222	234-6222	434-4222	434-6222	334-4222	334-3222	334-5222
W	5-1/8	234-4223	234-6223	434-4223	434-6223	334-4223	334-3223	334-5223
X	5-1/8	234-4224	234-6224	434-4224	434-6224	334-4224	334-3224	334-5224
Y	5-1/4	234-4225	234-6225	434-4225	434-6225	334-4225	334-3225	334-5225
Z	5-1/4	234-4226	234-6226	434-4226	434-6226	334-4226	334-3226	334-5226



Cutting Tools

JOBBER'S DRILLS continued

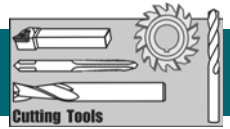
Number Sizes



Size	Flute Length	Overall Length	Rolled Black Oxide Model No.	Rolled Polished Model No.	Milled Black Oxide Model No.	Milled Polished Model No.	Ground Black Oxide Model No.	Ground Bright Model No.	Ground Tin-Coated Model No.
1	2-5/8	3-7/8	234-4101	234-6101	434-4101	434-6101	334-4101	334-3101	334-5101
2	2-5/8	3-7/8	234-4102	234-6102	434-4102	434-6102	334-4102	334-3102	334-5102
3	2-1/2	3-3/4	234-4103	234-6103	434-4103	434-6103	334-4103	334-3103	334-5103
4	2-1/2	3-3/4	234-4104	234-6104	434-4104	434-6104	334-4104	334-3104	334-5104
5	2-1/2	3-3/4	234-4105	234-6105	434-4105	434-6105	334-4105	334-3105	334-5105
6	2-1/2	3-3/4	234-4106	234-6106	434-4106	434-6106	334-4106	334-3106	334-5106
7	2-7/16	3-5/8	234-4107	234-6107	434-4107	434-6107	334-4107	334-3107	334-5107
8	2-7/16	3-5/8	234-4108	234-6108	434-4108	434-6108	334-4108	334-3108	334-5108
9	2-7/16	3-5/8	234-4109	234-6109	434-4109	434-6109	334-4109	334-3109	334-5109
10	2-7/16	3-5/8	234-4110	234-6110	434-4110	434-6110	334-4110	334-3110	334-5110
11	2-5/16	3-1/2	234-4111	234-6111	434-4111	434-6111	334-4111	334-3111	334-5111
12	2-5/16	3-1/2	234-4112	234-6112	434-4112	434-6112	334-4112	334-3112	334-5112
13	2-5/16	3-1/2	234-4113	234-6113	434-4113	434-6113	334-4113	334-3113	334-5113
14	2-3/16	3-3/8	234-4114	234-6114	434-4114	434-6114	334-4114	334-3114	334-5114
15	2-3/16	3-3/8	234-4115	234-6115	434-4115	434-6115	334-4115	334-3115	334-5115
16	2-3/16	3-3/8	234-4116	234-6116	434-4116	434-6116	334-4116	334-3116	334-5116
17	2-3/16	3-3/8	234-4117	234-6117	434-4117	434-6117	334-4117	334-3117	334-5117
18	2-1/8	3-1/4	234-4118	234-6118	434-4118	434-6118	334-4118	334-3118	334-5118
19	2-1/8	3-1/4	234-4119	234-6119	434-4119	434-6119	334-4119	334-3119	334-5119
20	2-1/8	3-1/4	234-4120	234-6120	434-4120	434-6120	334-4120	334-3120	334-5120
21	2-1/8	3-1/4	234-4121	234-6121	434-4121	434-6121	334-4121	334-3121	334-5121
22	2"	3-1/8	234-4122	234-6122	434-4122	434-6122	334-4122	334-3122	334-5122
23	2"	3-1/8	234-4123	234-6123	434-4123	434-6123	334-4123	334-3123	334-5123
24	2"	3-1/8	234-4124	234-6124	434-4124	434-6124	334-4124	334-3124	334-5124
25	1-7/8	3"	234-4125	234-6125	434-4125	434-6125	334-4125	334-3125	334-5125
26	1-7/8	3"	234-4126	234-6126	434-4126	434-6126	334-4126	334-3126	334-5126
27	1-7/8	3"	234-4127	234-6127	434-4127	434-6127	334-4127	334-3127	334-5127
28	1-3/4	2-7/8	234-4128	234-6128	434-4128	434-6128	334-4128	334-3128	334-5128
29	1-3/4	2-7/8	234-4129	234-6129	434-4129	434-6129	334-4129	334-3129	334-5129
30	1-5/8	2-3/4	234-4130	234-6130	434-4130	434-6130	334-4130	334-3130	334-5130
31	1-5/8	2-3/4	234-4131	234-6131	434-4131	434-6131	334-4131	334-3131	334-5131
32	1-5/8	2-3/4	234-4132	234-6132	434-4132	434-6132	334-4132	334-3132	334-5132
33	1-1/2	2-5/8	234-4133	234-6133	434-4133	434-6133	334-4133	334-3133	334-5133
34	1-1/2	2-5/8	234-4134	234-6134	434-4134	434-6134	334-4134	334-3134	334-5134
35	1-1/2	2-5/8	234-4135	234-6135	434-4135	434-6135	334-4135	334-3135	334-5135
36	1-7/16	2-1/2	234-4136	234-6136	434-4136	434-6136	334-4136	334-3136	334-5136
37	1-7/16	2-1/2	234-4137	234-6137	434-4137	434-6137	334-4137	334-3137	334-5137
38	1-7/16	2-1/2	234-4138	234-6138	434-4138	434-6138	334-4138	334-3138	334-5138
39	1-3/8	2-3/8	234-4139	234-6139	434-4139	434-6139	334-4139	334-3139	334-5139
40	1-3/8	2-3/8	234-4140	234-6140	434-4140	434-6140	334-4140	334-3140	334-5140
41	1-3/8	2-3/8	234-4141	234-6141	434-4141	434-6141	334-4141	334-3141	334-5141
42	1-1/4	2-1/4	234-4142	234-6142	434-4142	434-6142	334-4142	334-3142	334-5142
43	1-1/4	2-1/4	234-4143	234-6143	434-4143	434-6143	334-4143	334-3143	334-5143
44	1-1/8	2-1/4	234-4144	234-6144	434-4144	434-6144	334-4144	334-3144	334-5144
45	1-1/8	2-1/8	234-4145	234-6145	434-4145	434-6145	334-4145	334-3145	334-5145
46	1-1/8	2-1/8	234-4146	234-6146	434-4146	434-6146	334-4146	334-3146	334-5146
47	1"	2"	234-4147	234-6147	434-4147	434-6147	334-4147	334-3147	334-5147
48	1"	2"	234-4148	234-6148	434-4148	434-6148	334-4148	334-3148	334-5148
49	1"	2"	234-4149	234-6149	434-4149	434-6149	334-4149	334-3149	334-5149
50	1"	2"	234-4150	234-6150	434-4150	434-6150	334-4150	334-3150	334-5150
51	1"	2"	234-4151	234-6151	434-4151	434-6151	334-4151	334-3151	334-5151
52	7/8	1-7/8	234-4152	234-6152	434-4152	434-6152	334-4152	334-3152	334-5152
53	7/8	1-7/8	234-4153	234-6153	434-4153	434-6153	334-4153	334-3153	334-5153
54	7/8	1-7/8	234-4154	234-6154	434-4154	434-6154	334-4154	334-3154	334-5154
55	7/8	1-7/8	234-4155	234-6155	434-4155	434-6155	334-4155	334-3155	334-5155
56	3/4	1-3/4	234-4156	234-6156	434-4156	434-6156	334-4156	334-3156	334-5156
57	3/4	1-3/4	234-4157	234-6157	434-4157	434-6157	334-4157	334-3157	334-5157
58	11/16	1-5/8	234-4158	234-6158	434-4158	434-6158	334-4158	334-3158	334-5158
59	11/16	1-5/8	234-4159	234-6159	434-4159	434-6159	334-4159	334-3159	334-5159
60	11/16	1-5/8	234-4160	234-6160	434-4160	434-6160	334-4160	334-3160	334-5160
61	11/16	1-5/8	234-4161	234-6161	434-4161	434-6161	334-4161	334-3161	334-5161
62	5/8	1-1/2	234-4162	234-6162	434-4162	434-6162	334-4162	334-3162	334-5162
63	5/8	1-1/2	234-4163	234-6163	434-4163	434-6163	334-4163	334-3163	334-5163
64	5/8	1-1/2	234-4164	234-6164	434-4164	434-6164	334-4164	334-3164	334-5164
65	5/8	1-1/2	234-4165	234-6165	434-4165	434-6165	334-4165	334-3165	334-5165
66	1/2	1-3/8	234-4166	234-6166	434-4166	434-6166	334-4166	334-3166	334-5166
67	1/2	1-3/8	234-4167	234-6167	434-4167	434-6167	334-4167	334-3167	334-5167
68	1/2	1-3/8	234-4168	234-6168	434-4168	434-6168	334-4168	334-3168	334-5168
69	1/2	1-3/8	234-4169	234-6169	434-4169	434-6169	334-4169	334-3169	334-5169
70	3/8	1-1/4	234-4170	234-6170	434-4170	434-6170	334-4170	334-3170	334-5170
71	3/8	1-1/4	234-4171	234-6171	434-4171	434-6171	334-4171	334-3171	334-5171
72	5/16	1-1/8	234-4172	234-6172	434-4172	434-6172	334-4172	334-3172	334-5172
73	5/16	1-1/8	234-4173	234-6173	434-4173	434-6173	334-4173	334-3173	334-5173
74	1/4	1"	234-4174	234-6174	434-4174	434-6174	334-4174	334-3174	334-5174
75	1/4	1"	234-4175	234-6175	434-4175	434-6175	334-4175	334-3175	334-5175
76	3/16	7/8	234-4176	234-6176	434-4176	434-6176	334-4176	334-3176	334-5176
77	3/16	7/8	234-4177	234-6177	434-4177	434-6177	334-4177	334-3177	334-5177
78	3/16	7/8	234-4178	234-6178	434-4178	434-6178	334-4178	334-3178	334-5178
79	1/8	3/4	234-4179	234-6179	434-4179	434-6179	334-4179	334-3179	334-5179
80	1/8	3/4	234-4180	234-6180	434-4180	434-6180	334-4180	334-3180	334-5180

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Cutting Tools



SOLID CARBIDE JOBBERS LENGTH TWIST DRILLS

118° Point, C2 Grade, Right Hand

- Precision ground to close diameter tolerances.
- Recommended for general purpose drilling in Cast Iron, Aluminum, Magnesium, Bronze, Masonite and Resin-Fiberglass Laminates.



Fractional Sizes

Size	Flute Length	Overall Length	Model No.
1/32	3/8	1-1/8	342-0002
3/64	3/4	1-1/2	342-0003
1/16	3/4	1-1/2	342-0004
5/64	7/8	1-3/4	342-0005
3/32	1"	2"	342-0006
7/64	1-1/4	2-1/4	342-0007
1/8	1-1/4	2-1/4	342-0008
9/64	1-3/8	2-1/2	342-0009
5/32	1-3/8	2-1/2	342-0010
11/64	1-5/8	2-3/4	342-0011

Size	Flute Length	Overall Length	Model No.
3/16	1-5/8	2-3/4	342-0012
13/64	1-3/4	3"	342-0013
7/32	1-3/4	3"	342-0014
15/64	2"	3-1/4	342-0015
1/4	2"	3-1/4	342-0016
17/64	2-1/8	3-1/2	342-0017
9/32	2-1/8	3-1/2	342-0018
19/64	2-3/8	3-3/4	342-0019
5/16	2-3/8	3-3/4	342-0020
21/64	2-1/2	4"	342-0021

Size	Flute Length	Overall Length	Model No.
11/32	2-1/2	4"	342-0022
23/64	2-3/4	4-1/4	342-0023
3/8	2-3/4	4-1/4	342-0024
25/64	2-7/8	4-1/2	342-0025
13/32	2-7/8	4-1/2	342-0026
27/64	2-7/8	4-1/2	342-0027
7/16	2-7/8	4-1/2	342-0028
29/64	3"	4-3/4	342-0029
15/32	3"	4-3/4	342-0030
31/64	3"	4-3/4	342-0031
1/2	3"	4-3/4	342-0032

Number Sizes

Size	Flute Length	Overall Length	Model No.
1	1-3/4	3"	342-0101
2	1-3/4	3"	342-0102
3	1-3/4	3"	342-0103
4	1-3/4	3"	342-0104
5	1-3/4	3"	342-0105
6	1-3/4	3"	342-0106
7	1-3/4	3"	342-0107
8	1-3/4	3"	342-0108
9	1-3/4	3"	342-0109
10	1-5/8	2-3/4	342-0110
11	1-5/8	2-3/4	342-0111
12	1-5/8	2-3/4	342-0112
13	1-5/8	2-3/4	342-0113
14	1-5/8	2-3/4	342-0114
15	1-5/8	2-3/4	342-0115
16	1-5/8	2-3/4	342-0116
17	1-5/8	2-3/4	342-0117
18	1-5/8	2-3/4	342-0118
19	1-5/8	2-3/4	342-0119
20	1-3/8	2-1/2	342-0120
21	1-3/8	2-1/2	342-0121
22	1-3/8	2-1/2	342-0122
23	1-3/8	2-1/2	342-0123
24	1-3/8	2-1/2	342-0124
25	1-3/8	2-1/2	342-0125
26	1-3/8	2-1/2	342-0126
27	1-3/8	2-1/2	342-0127

Size	Flute Length	Overall Length	Model No.
28	1-3/8	2-1/2	342-0128
29	1-3/8	2-1/2	342-0129
30	1-1/4	2-1/4	342-0130
31	1-1/4	2-1/4	342-0131
32	1-1/4	2-1/4	342-0132
33	1-1/4	2-1/4	342-0133
34	1-1/4	2-1/4	342-0134
35	1-1/4	2-1/4	342-0135
36	1-1/4	2-1/4	342-0136
37	1-1/4	2-1/4	342-0137
38	1-1/4	2-1/4	342-0138
39	1-1/4	2-1/4	342-0139
40	1"	2"	342-0140
41	1"	2"	342-0141
42	1"	2"	342-0142
43	1"	2"	342-0143
44	1"	2"	342-0144
45	7/8	1-3/4	342-0145
46	7/8	1-3/4	342-0146
47	7/8	1-3/4	342-0147
48	7/8	1-3/4	342-0148
49	7/8	1-3/4	342-0149
50	7/8	1-3/4	342-0150
51	3/4	1-1/2	342-0151
52	3/4	1-1/2	342-0152
53	3/4	1-1/2	342-0153
54	3/4	1-1/2	342-0154

Size	Flute Length	Overall Length	Model No.
55	3/4	1-1/2	342-0155
56	3/4	1-1/2	342-0156
57	3/4	1-1/2	342-0157
58	3/4	1-1/2	342-0158
59	3/4	1-1/2	342-0159
60	3/4	1-1/2	342-0160
61	1/2	1-1/4	342-0161
62	1/2	1-1/4	342-0162
63	1/2	1-1/4	342-0163
64	1/2	1-1/4	342-0164
65	3/8	1-1/8	342-0165
66	3/8	1-1/8	342-0166
67	3/8	1-1/8	342-0167
68	3/8	1-1/8	342-0168
69	5/16	1"	342-0169
70	5/16	1"	342-0170
71	5/16	1"	342-0171
72	5/16	1"	342-0172
73	1/4	7/8	342-0173
74	1/4	7/8	342-0174
75	1/4	7/8	342-0175
76	1/4	7/8	342-0176
77	3/16	3/4	342-0177
78	3/16	3/4	342-0178
79	3/16	3/4	342-0179
80	3/16	3/4	342-0180

Letter Sizes

Size	Flute Length	Overall Length	Model No.
A	2"	3-1/4	342-0201
B	2"	3-1/4	342-0202
C	2"	3-1/4	342-0203
D	2"	3-1/4	342-0204
E	2"	3-1/4	342-0205
F	2"	3-1/4	342-0206
G	2-1/8	3-1/2	342-0207
H	2-1/8	3-1/2	342-0208
I	2-1/8	3-1/2	342-0209

Size	Flute Length	Overall Length	Model No.
J	2-1/8	3-1/2	342-0210
K	2-1/8	3-1/2	342-0211
L	2-1/8	3-1/2	342-0212
M	2-3/8	3-3/4	342-0213
N	2-3/8	3-3/4	342-0214
O	2-3/8	3-3/4	342-0215
P	2-3/8	3-3/4	342-0216
Q	2-1/2	4"	342-0217
R	2-1/2	4"	342-0218

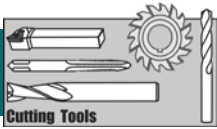
Size	Flute Length	Overall Length	Model No.
S	2-1/2	4"	342-0219
T	2-3/4	4-1/4	342-0220
U	2-3/4	4-1/4	342-0221
V	2-3/4	4-1/4	342-0222
W	2-7/8	4-1/2	342-0223
X	2-7/8	4-1/2	342-0224
Y	2-7/8	4-1/2	342-0225
Z	2-7/8	4-1/2	342-0226

Metric Sizes

Size	Flute Length	Overall Length	Model No.
2	22	44mm	342-0301
2.5	25	50mm	342-0302
3	32	57mm	342-0303
3.5	35	63mm	342-0304
4	35	63mm	342-0305
4.5	41	70mm	342-0306
5	44	75mm	342-0307

Size	Flute Length	Overall Length	Model No.
5.5	44	75mm	342-0308
6	50	82mm	342-0309
6.5	50	82mm	342-0310
7	54	89mm	342-0311
7.5	60	95mm	342-0312
8	60	95mm	342-0313
8.5	63	100mm	342-0314

Size	Flute Length	Overall Length	Model No.
9	70	100mm	342-0315
9.5	70	108mm	342-0316
10	73	114mm	342-0317
10.5	73	114mm	342-0318
11	73	114mm	342-0319
11.5	76	120mm	342-0320
12	76	120mm	342-0321

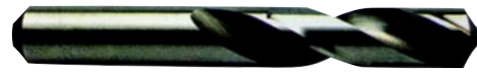


Cutting Tools

SCREW MACHINE DRILLS

High Speed Steel, 118° Point, Right Hand

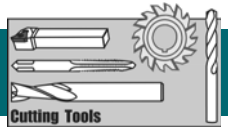
Fractional Sizes



Size	Overall Length	Rolled Black Oxide Model No.	Rolled Polished Model No.	Milled Black Oxide Model No.	Milled Polished Model No.	Ground Black Oxide Model No.	Ground Bright Model No.	Ground Tin-Coated Model No.
3/64	1-9/16	234-0003	234-1003	334-6003	334-7003	334-1003	334-8003	334-2003
1/16	1-5/8	234-0004	234-1004	334-6004	334-7004	334-1004	334-8004	334-2004
5/64	1-11/16	234-0005	234-1005	334-6005	334-7005	334-1005	334-8005	334-2005
3/32	1-3/4	234-0006	234-1006	334-6006	334-7006	334-1006	334-8006	334-2006
7/64	1-13/16	234-0007	234-1007	334-6007	334-7007	334-1007	334-8007	334-2007
1/8	1-7/8	234-0008	234-1008	334-6008	334-7008	334-1008	334-8008	334-2008
9/64	1-15/16	234-0009	234-1009	334-6009	334-7009	334-1009	334-8009	334-2009
5/32	2-1/16	234-0010	234-1010	334-6010	334-7010	334-1010	334-8010	334-2010
11/64	2-1/8	234-0011	234-1011	334-6011	334-7011	334-1011	334-8011	334-2011
3/16	2-3/16	234-0012	234-1012	334-6012	334-7012	334-1012	334-8012	334-2012
13/64	2-1/4	234-0013	234-1013	334-6013	334-7013	334-1013	334-8013	334-2013
7/32	2-3/8	234-0014	234-1014	334-6014	334-7014	334-1014	334-8014	334-2014
15/64	2-7/16	234-0015	234-1015	334-6015	334-7015	334-1015	334-8015	334-2015
1/4	2-1/8	234-0016	234-1016	334-6016	334-7016	334-1016	334-8016	334-2016
17/64	2-5/8	234-0017	234-1017	334-6017	334-7017	334-1017	334-8017	334-2017
9/36	2-11/16	234-0018	234-1018	334-6018	334-7018	334-1018	334-8018	334-2018
19/64	2-3/4	234-0019	234-1019	334-6019	334-7019	334-1019	334-8019	334-2019
5/16	2-13/16	234-0020	234-1020	334-6020	334-7020	334-1020	334-8020	334-2020
21/64	2-15/16	234-0021	234-1021	334-6021	334-7021	334-1021	334-8021	334-2021
11/32	3 "	234-0022	234-1022	334-6022	334-7022	334-1022	334-8022	334-2022
23/64	3-1/16	234-0023	234-1023	334-6023	334-7023	334-1023	334-8023	334-2023
3/8	3-1/8	234-0024	234-1024	334-6024	334-7024	334-1024	334-8024	334-2024
25/64	3-1/4	234-0025	234-1025	334-6025	334-7025	334-1025	334-8025	334-2025
13/32	3-5/16	234-0026	234-1026	334-6026	334-7026	334-1026	334-8026	334-2026
27/64	3-3/8	234-0027	234-1027	334-6027	334-7027	334-1027	334-8027	334-2027
7/16	3-7/16	234-0028	234-1028	334-6028	334-7028	334-1028	334-8028	334-2028
29/64	3-9/16	234-0029	234-1029	334-6029	334-7029	334-1029	334-8029	334-2029
15/32	3-5/8	234-0030	234-1030	334-6030	334-7030	334-1030	334-8030	334-2030
31/64	3-11/16	234-0031	234-1031	334-6031	334-7031	334-1031	334-8031	334-2031
1/2	3-3/4	234-0032	234-1032	334-6032	334-7032	334-1032	334-8032	334-2032
33/64	3-7/8	234-0033	234-1033	334-6033	334-7033	334-1033	334-8033	334-2033
17/32	3-7/8	234-0034	234-1034	334-6034	334-7034	334-1034	334-8034	334-2034
35/64	4 "	234-0035	234-1035	334-6035	334-7035	334-1035	334-8035	334-2035
9/16	4 "	234-0036	234-1036	334-6036	334-7036	334-1036	334-8036	334-2036
37/64	4-1/8	234-0037	234-1037	334-6037	334-7037	334-1037	334-8037	334-2037
19/32	4-1/8	234-0038	234-1038	334-6038	334-7038	334-1038	334-8038	334-2038
39/64	4-1/4	234-0039	234-1039	334-6039	334-7039	334-1039	334-8039	334-2039
5/8	4-1/4	234-0040	234-1040	334-6040	334-7040	334-1040	334-8040	334-2040
41/64	4-1/2	234-0041	234-1041	334-6041	334-7041	334-1041	334-8041	334-2041
21/32	4-1/2	234-0042	234-1042	334-6042	334-7042	334-1042	334-8042	334-2042
43/64	4-5/8	234-0043	234-1043	334-6043	334-7043	334-1043	334-8043	334-2043
11/16	4-5/8	234-0044	234-1044	334-6044	334-7044	334-1044	334-8044	334-2044
45/64	4-3/4	234-0045	234-1045	334-6045	334-7045	334-1045	334-8045	334-2045
23/32	4-3/4	234-0046	234-1046	334-6046	334-7046	334-1046	334-8046	334-2046
47/64	5 "	234-0047	234-1047	334-6047	334-7047	334-1047	334-8047	334-2047
3/4	5 "	234-0048	234-1048	334-6048	334-7048	334-1048	334-8048	334-2048
49/64	5-1/8	234-0049	234-1049	334-6049	334-7049	334-1049	334-8049	334-2049
25/32	5-1/8	234-0050	234-1050	334-6050	334-7050	334-1050	334-8050	334-2050
51/64	5-1/8	234-0051	234-1051	334-6051	334-7051	334-1051	334-8051	334-2051
13/16	5-1/4	234-0052	234-1052	334-6052	334-7052	334-1052	334-8052	334-2052
53/64	5-3/8	234-0053	234-1053	334-6053	334-7053	334-1053	334-8053	334-2053
27/32	5-3/8	234-0054	234-1054	334-6054	334-7054	334-1054	334-8054	334-2054
55/64	5-1/2	234-0055	234-1055	334-6055	334-7055	334-1055	334-8055	334-2055
7/8	5-1/2	234-0056	234-1056	334-6056	334-7056	334-1056	334-8056	334-2056
57/64	5-5/8	234-0057	234-1057	334-6057	334-7057	334-1057	334-8057	334-2057
29/32	5-5/8	234-0058	234-1058	334-6058	334-7058	334-1058	334-8058	334-2058
59/64	5-3/4	234-0059	234-1059	334-6059	334-7059	334-1059	334-8059	334-2059
15/16	5-3/4	234-0060	234-1060	334-6060	334-7060	334-1060	334-8060	334-2060
61/64	5-7/8	234-0061	234-1061	334-6061	334-7061	334-1061	334-8061	334-2061
31/32	5-7/8	234-0062	234-1062	334-6062	334-7062	334-1062	334-8062	334-2062
63/64	6 "	234-0063	234-1063	334-6063	334-7063	334-1063	334-8063	334-2063
1 "	6 "	234-0100	234-1100	334-6100	334-7100	334-1100	334-8100	334-2100
1-1/16	6-1/4	234-0104	234-1104	334-6104	334-7104	334-1104	334-8104	334-2104
1-1/8	6-3/8	234-0108	234-1108	334-6108	334-7108	334-1108	334-8108	334-2108
1-3/16	6-5/8	234-0112	234-1112	334-6112	334-7112	334-1112	334-8112	334-2112
1-1/4	6-3/4	234-0116	234-1116	334-6116	334-7116	334-1116	334-8116	334-2116
1-5/16	7 "	234-0120	234-1120	334-6120	334-7120	334-1120	334-8120	334-2120
1-3/8	7-1/8	234-0124	234-1124	334-6124	334-7124	334-1124	334-8124	334-2124
1-7/16	7-3/8	234-0128	234-1128	334-6128	334-7128	334-1128	334-8128	334-2128
1-1/2	7-1/2	234-0132	234-1132	334-6132	334-7132	334-1132	334-8132	334-2132
1-9/16	7-3/4	234-0136	234-1136	334-6136	334-7136	334-1136	334-8136	334-2136
1-5/8	7-3/4	234-0140	234-1140	334-6140	334-7140	334-1140	334-8140	334-2140
1-11/16	8 "	234-0144	234-1144	334-6144	334-7144	334-1144	334-8144	334-2144
1-3/4	8 "	234-0148	234-1148	334-6148	334-7148	334-1148	334-8148	334-2148
1-13/16	8-1/4	234-0152	234-1152	334-6152	334-7152	334-1152	334-8152	334-2152
1-7/8	8-1/4	234-0156	234-1156	334-6156	334-7156	334-1156	334-8156	334-2156
1-15/16	8-1/2	234-0160	234-1160	334-6160	334-7160	334-1160	334-8160	334-2160
2 "	8-1/2	234-0200	234-1200	334-6200	334-7200	334-1200	334-8200	334-2200

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Cutting Tools



SCREW MACHINE DRILLS continued

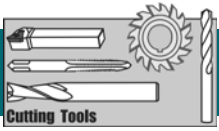


Number Sizes

Size	Overall Length	Rolled Black Oxide Model No.	Rolled Polished Model No.	Milled Black Oxide Model No.	Milled Polished Model No.	Ground Black Oxide Model No.	Ground Bright Model No.	Ground Tin-Coated Model No.
1	2-7/16"	234-0201	234-1201	334-6201	334-7201	334-1201	334-8201	334-2201
2	2-7/16	234-0202	234-1202	334-6202	334-7202	334-1202	334-8202	334-2202
3	2-3/8	234-0203	234-1203	334-6203	334-7203	334-1203	334-8203	334-2203
4	2-3/8	234-0204	234-1204	334-6204	334-7204	334-1204	334-8204	334-2204
5	2-3/8	234-0205	234-1205	334-6205	334-7205	334-1205	334-8205	334-2205
6	2-3/8	234-0206	234-1206	334-6206	334-7206	334-1206	334-8206	334-2206
7	2-1/4	234-0207	234-1207	334-6207	334-7207	334-1207	334-8207	334-2207
8	2-1/4	234-0208	234-1208	334-6208	334-7208	334-1208	334-8208	334-2208
9	2-1/4	234-0209	234-1209	334-6209	334-7209	334-1209	334-8209	334-2209
10	2-1/4	234-0210	234-1210	334-6210	334-7210	334-1210	334-8210	334-2210
11	2-1/4	234-0211	234-1211	334-6211	334-7211	334-1211	334-8211	334-2211
12	2-1/4	234-0212	234-1212	334-6212	334-7212	334-1212	334-8212	334-2212
13	2-3/16	234-0213	234-1213	334-6213	334-7213	334-1213	334-8213	334-2213
14	2-3/16	234-0214	234-1214	334-6214	334-7214	334-1214	334-8214	334-2214
15	2-3/16	234-0215	234-1215	334-6215	334-7215	334-1215	334-8215	334-2215
16	2-3/16	234-0216	234-1216	334-6216	334-7216	334-1216	334-8216	334-2216
17	2-3/16	234-0217	234-1217	334-6217	334-7217	334-1217	334-8217	334-2217
18	2-1/8	234-0218	234-1218	334-6218	334-7218	334-1218	334-8218	334-2218
19	2-1/8	234-0219	234-1219	334-6219	334-7219	334-1219	334-8219	334-2219
20	2-1/8	234-0220	234-1220	334-6220	334-7220	334-1220	334-8220	334-2220
21	2-1/8	234-0221	234-1221	334-6221	334-7221	334-1221	334-8221	334-2221
22	2-1/8	234-0222	234-1222	334-6222	334-7222	334-1222	334-8222	334-2222
23	2-1/16	234-0223	234-1223	334-6223	334-7223	334-1223	334-8223	334-2223
24	2-1/16	234-0224	234-1224	334-6224	334-7224	334-1224	334-8224	334-2224
25	2-1/16	234-0225	234-1225	334-6225	334-7225	334-1225	334-8225	334-2225
26	2-1/16	234-0226	234-1226	334-6226	334-7226	334-1226	334-8226	334-2226
27	2-1/16	234-0227	234-1227	334-6227	334-7227	334-1227	334-8227	334-2227
28	1-15/16	234-0228	234-1228	334-6228	334-7228	334-1228	334-8228	334-2228
29	1-15/16	234-0229	234-1229	334-6229	334-7229	334-1229	334-8229	334-2229
30	1-15/16	234-0230	234-1230	334-6230	334-7230	334-1230	334-8230	334-2230
31	1-7/8	234-0231	234-1231	334-6231	334-7231	334-1231	334-8231	334-2231
32	1-7/8	234-0232	234-1232	334-6232	334-7232	334-1232	334-8232	334-2232
33	1-7/8	234-0233	234-1233	334-6233	334-7233	334-1233	334-8233	334-2233
34	1-7/8	234-0234	234-1234	334-6234	334-7234	334-1234	334-8234	334-2234
35	1-7/8	234-0235	234-1235	334-6235	334-7235	334-1235	334-8235	334-2235
36	1-13/16	234-0236	234-1236	334-6236	334-7236	334-1236	334-8236	334-2236
37	1-13/16	234-0237	234-1237	334-6237	334-7237	334-1237	334-8237	334-2237
38	1-13/16	234-0238	234-1238	334-6238	334-7238	334-1238	334-8238	334-2238
39	1-13/16	234-0239	234-1239	334-6239	334-7239	334-1239	334-8239	334-2239
40	1-13/16	234-0240	234-1240	334-6240	334-7240	334-1240	334-8240	334-2240
41	1-13/16	234-0241	234-1241	334-6241	334-7241	334-1241	334-8241	334-2241
42	1-3/4	234-0242	234-1242	334-6242	334-7242	334-1242	334-8242	334-2242
43	1-3/4	234-0243	234-1243	334-6243	334-7243	334-1243	334-8243	334-2243
44	1-3/4	234-0244	234-1244	334-6244	334-7244	334-1244	334-8244	334-2244
45	1-3/4	234-0245	234-1245	334-6245	334-7245	334-1245	334-8245	334-2245
46	1-3/4	234-0246	234-1246	334-6246	334-7246	334-1246	334-8246	334-2246
47	1-3/4	234-0247	234-1247	334-6247	334-7247	334-1247	334-8247	334-2247
48	1-11/16	234-0248	234-1248	334-6248	334-7248	334-1248	334-8248	334-2248
49	1-11/16	234-0249	234-1249	334-6249	334-7249	334-1249	334-8249	334-2249
50	1-11/16	234-0250	234-1250	334-6250	334-7250	334-1250	334-8250	334-2250
51	1-11/16	234-0251	234-1251	334-6251	334-7251	334-1251	334-8251	334-2251
52	1-11/16	234-0252	234-1252	334-6252	334-7252	334-1252	334-8252	334-2252
53	1-5/8	234-0253	234-1253	334-6253	334-7253	334-1253	334-8253	334-2253
54	1-5/8	234-0254	234-1254	334-6254	334-7254	334-1254	334-8254	334-2254
55	1-5/8	234-0255	234-1255	334-6255	334-7255	334-1255	334-8255	334-2255
56	1-3/8	234-0256	234-1256	334-6256	334-7256	334-1256	334-8256	334-2256
57	1-3/8	234-0257	234-1257	334-6257	334-7257	334-1257	334-8257	334-2257
58	1-3/8	234-0258	234-1258	334-6258	334-7258	334-1258	334-8258	334-2258
59	1-3/8	234-0259	234-1259	334-6259	334-7259	334-1259	334-8259	334-2259
60	1-3/8	234-0260	234-1260	334-6260	334-7260	334-1260	334-8260	334-2260

Letter Sizes

Overall Size/Length	Rolled Black Oxide Model No.	Rolled Polished Model No.	Milled Black Oxide Model No.	Milled Polished Model No.	Ground Black Oxide Model No.	Ground Bright Model No.	Ground Tin-Coated Model No.
A 2-7/16"	234-0301	234-1301	334-6301	334-7301	334-1301	334-8301	334-2301
B 2-1/2	234-0302	234-1302	334-6302	334-7302	334-1302	334-8302	334-2302
C 2-1/2	234-0303	234-1303	334-6303	334-7303	334-1303	334-8303	334-2303
D 2-1/2	234-0304	234-1304	334-6304	334-7304	334-1304	334-8304	334-2304
E 2-1/2	234-0305	234-1305	334-6305	334-7305	334-1305	334-8305	334-2305
F 2-5/8	234-0306	234-1306	334-6306	334-7306	334-1306	334-8306	334-2306
G 2-5/8	234-0307	234-1307	334-6307	334-7307	334-1307	334-8307	334-2307
H 2-11/16	234-0308	234-1308	334-6308	334-7308	334-1308	334-8308	334-2308
I 2-11/16	234-0309	234-1309	334-6309	334-7309	334-1309	334-8309	334-2309
J 2-1/16	234-0310	234-1310	334-6310	334-7310	334-1310	334-8310	334-2310
K 2-1/16	234-0311	234-1311	334-6311	334-7311	334-1311	334-8311	334-2311
L 2-3/4	234-0312	234-1312	334-6312	334-7312	334-1312	334-8312	334-2312
M 2-3/4	234-0313	234-1313	334-6313	334-7313	334-1313	334-8313	334-2313
N 2-3/16	234-0314	234-1314	334-6314	334-7314	334-1314	334-8314	334-2314
O 2-5/16	234-0315	234-1315	334-6315	334-7315	334-1315	334-8315	334-2315
P 2-5/16	234-0316	234-1316	334-6316	334-7316	334-1316	334-8316	334-2316
Q 3"	234-0317	234-1317	334-6317	334-7317	334-1317	334-8317	334-2317
R 3"	234-0318	234-1318	334-6318	334-7318	334-1318	334-8318	334-2318
S 3-1/16	234-0319	234-1319	334-6319	334-7319	334-1319	334-8319	334-2319
T 3-1/16	234-0320	234-1320	334-6320	334-7320	334-1320	334-8320	334-2320
U 3-1/8	234-0321	234-1321	334-6321	334-7321	334-1321	334-8321	334-2321
V 3-1/4	234-0322	234-1322	334-6322	334-7322	334-1322	334-8322	334-2322
W 3-1/4	234-0323	234-1323	334-6323	334-7323	334-1323	334-8323	334-2323
X 3-5/16	234-0324	234-1324	334-6324	334-7324	334-1324	334-8324	334-2324
Y 3-5/16	234-0325	234-1325	334-6325	334-7325	334-1325	334-8325	334-2325
Z 3-3/8	234-0326	234-1326	334-6326	334-7326	334-1326	334-8326	334-2326



Cutting Tools

SPLIT POINT JOBBERS DRILLS

High Speed Steel, 135° Point

- The 135° split point is self centering, and reduces shift at the drill point.



Fractional Sizes

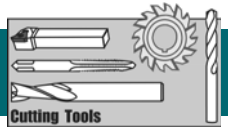
Size	Flute Length	Overall Length	Rolled Black Oxide Model No.	Rolled Polished Model No.	Milled Black Oxide Model No.	Milled Polished Model No.	Ground Black Oxide Model No.	Ground Bright Model No.	Ground Tin-Coated Model No.
1/64	3/16	3/4	134-6001	134-7001	134-4001	134-5001	134-2001	134-3001	134-1001
1/32	1/2	1-3/8	134-6002	134-7002	134-4002	134-5002	134-2002	134-3002	134-1002
3/64	3/4	1-3/4	134-6003	134-7003	134-4003	134-5003	134-2003	134-3003	134-1003
1/16	7/8	1-7/8	134-6004	134-7004	134-4004	134-5004	134-2004	134-3004	134-1004
5/64	1 "	2 "	134-6005	134-7005	134-4005	134-5005	134-2005	134-3005	134-1005
3/32	1-1/4	2-1/4	134-6006	134-7006	134-4006	134-5006	134-2006	134-3006	134-1006
7/64	1-1/2	2-5/8	134-6007	134-7007	134-4007	134-5007	134-2007	134-3007	134-1007
1/8	1-5/8	2-3/4	134-6008	134-7008	134-4008	134-5008	134-2008	134-3008	134-1008
9/64	1-3/4	2-7/8	134-6009	134-7009	134-4009	134-5009	134-2009	134-3009	134-1009
5/32	2 "	3-1/8	134-6010	134-7010	134-4010	134-5010	134-2010	134-3010	134-1010
11/64	2-1/8	3-1/4	134-6011	134-7011	134-4011	134-5011	134-2011	134-3011	134-1011
3/16	2-5/16	3-1/2	134-6012	134-7012	134-4012	134-5012	134-2012	134-3012	134-1012
13/64	2-7/16	3-5/8	134-6013	134-7013	134-4013	134-5013	134-2013	134-3013	134-1013
7/32	2-1/2	3-3/4	134-6014	134-7014	134-4014	134-5014	134-2014	134-3014	134-1014
15/64	2-5/8	3-7/8	134-6015	134-7015	134-4015	134-5015	134-2015	134-3015	134-1015
1/4	2-3/4	4 "	134-6016	134-7016	134-4016	134-5016	134-2016	134-3016	134-1016
17/64	2-7/8	4-1/8	134-6017	134-7017	134-4017	134-5017	134-2017	134-3017	134-1017
9/32	2-5/16	4-1/4	134-6018	134-7018	134-4018	134-5018	134-2018	134-3018	134-1018
19/64	3-1/16	4-3/8	134-6019	134-7019	134-4019	134-5019	134-2019	134-3019	134-1019
5/16	3-3/16	4-1/2	134-6020	134-7020	134-4020	134-5020	134-2020	134-3020	134-1020
21/64	3-5/16	4-5/8	134-6021	134-7021	134-4021	134-5021	134-2021	134-3021	134-1021
11/32	3-7/16	4-3/4	134-6022	134-7022	134-4022	134-5022	134-2022	134-3022	134-1022
23/64	3-1/2	4-7/8	134-6023	134-7023	134-4023	134-5023	134-2023	134-3023	134-1023
3/8	3-5/8	5 "	134-6024	134-7024	134-4024	134-5024	134-2024	134-3024	134-1024
25/64	3-3/4	5-1/8	134-6025	134-7025	134-4025	134-5025	134-2025	134-3025	134-1025
13/32	3-7/8	5-1/4	134-6026	134-7026	134-4026	134-5026	134-2026	134-3026	134-1026
27/64	3-5/16	5-3/8	134-6027	134-7027	134-4027	134-5027	134-2027	134-3027	134-1027
7/16	4-1/16	5-1/2	134-6028	134-7028	134-4028	134-5028	134-2028	134-3028	134-1028
29/64	4-3/16	5-5/8	134-6029	134-7029	134-4029	134-5029	134-2029	134-3029	134-1029
15/32	4-5/16	5-3/4	134-6030	134-7030	134-4030	134-5030	134-2030	134-3030	134-1030
31/64	4-3/8	5-7/8	134-6031	134-7031	134-4031	134-5031	134-2031	134-3031	134-1031
1/2	4-1/2	6 "	134-6032	134-7032	134-4032	134-5032	134-2032	134-3032	134-1032

Letter Sizes

Size	Overall Length	Rolled Black Oxide Model No.	Rolled Polished Model No.	Milled Black Oxide Model No.	Milled Polished Model No.	Ground Black Oxide Model No.	Ground Bright Model No.	Ground Tin-Coated Model No.
A	3-7/8	134-6201	134-7201	134-4201	134-5201	134-2201	134-3201	134-1201
B	4 "	134-6202	134-7202	134-4202	134-5202	134-2202	134-3202	134-1202
C	4 "	134-6203	134-7203	134-4203	134-5203	134-2203	134-3203	134-1203
D	4 "	134-6204	134-7204	134-4204	134-5204	134-2204	134-3204	134-1204
E	4 "	134-6205	134-7205	134-4205	134-5205	134-2205	134-3205	134-1205
F	4-1/8	134-6206	134-7206	134-4206	134-5206	134-2206	134-3206	134-1206
G	4-1/8	134-6207	134-7207	134-4207	134-5207	134-2207	134-3207	134-1207
H	4-1/8	134-6208	134-7208	134-4208	134-5208	134-2208	134-3208	134-1208
I	4-1/8	134-6209	134-7209	134-4209	134-5209	134-2209	134-3209	134-1209
J	4-1/8	134-6210	134-7210	134-4210	134-5210	134-2210	134-3210	134-1210
K	4-1/4	134-6211	134-7211	134-4211	134-5211	134-2211	134-3211	134-1211
L	4-1/4	134-6212	134-7212	134-4212	134-5212	134-2212	134-3212	134-1212
M	4-3/8	134-6213	134-7213	134-4213	134-5213	134-2213	134-3213	134-1213
N	4-3/8	134-6214	134-7214	134-4214	134-5214	134-2214	134-3214	134-1214
O	4-1/2	134-6215	134-7215	134-4215	134-5215	134-2215	134-3215	134-1215
P	4-5/8	134-6216	134-7216	134-4216	134-5216	134-2216	134-3216	134-1216
Q	4-3/4	134-6217	134-7217	134-4217	134-5217	134-2217	134-3217	134-1217
R	4-3/4	134-6218	134-7218	134-4218	134-5218	134-2218	134-3218	134-1218
S	4-7/8	134-6219	134-7219	134-4219	134-5219	134-2219	134-3219	134-1219
T	4-7/8	134-6220	134-7220	134-4220	134-5220	134-2220	134-3220	134-1220
U	5 "	134-6221	134-7221	134-4221	134-5221	134-2221	134-3221	134-1221
V	5 "	134-6222	134-7222	134-4222	134-5222	134-2222	134-3222	134-1222
W	5-1/8	134-6223	134-7223	134-4223	134-5223	134-2223	134-3223	134-1223
X	5-1/8	134-6224	134-7224	134-4224	134-5224	134-2224	134-3224	134-1224
Y	5-1/4	134-6225	134-7225	134-4225	134-5225	134-2225	134-3225	134-1225
Z	5-1/4	134-6226	134-7226	134-4226	134-5226	134-2226	134-3226	134-1226

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Cutting Tools

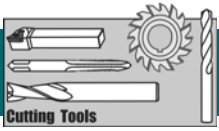


SPLIT POINT JOBBERS DRILLS continued

Number Sizes



Size	Overall Length	Rolled Black Oxide Model No.	Rolled Polished Model No.	Milled Black Oxide Model No.	Milled Polished Model No.	Ground Black Oxide Model No.	Ground Bright Model No.	Ground Tin-Coated Model No.
1	3-7/8	134-6101	134-7101	134-4101	134-5101	134-2101	134-3101	134-1101
2	3-7/8	134-6102	134-7102	134-4102	134-5102	134-2102	134-3102	134-1102
3	3-3/4	134-6103	134-7103	134-4103	134-5103	134-2103	134-3103	134-1103
4	3-3/4	134-6104	134-7104	134-4104	134-5104	134-2104	134-3104	134-1104
5	3-3/4	134-6105	134-7105	134-4105	134-5105	134-2105	134-3105	134-1105
6	3-3/4	134-6106	134-7106	134-4106	134-5106	134-2106	134-3106	134-1106
7	3-5/8	134-6107	134-7107	134-4107	134-5107	134-2107	134-3107	134-1107
8	3-5/8	134-6108	134-7108	134-4108	134-5108	134-2108	134-3108	134-1108
9	3-5/8	134-6109	134-7109	134-4109	134-5109	134-2109	134-3109	134-1109
10	3-5/8	134-6110	134-7110	134-4110	134-5110	134-2110	134-3110	134-1110
11	3-1/2	134-6111	134-7111	134-4111	134-5111	134-2111	134-3111	134-1111
12	3-1/2	134-6112	134-7112	134-4112	134-5112	134-2112	134-3112	134-1112
13	3-1/2	134-6113	134-7113	134-4113	134-5113	134-2113	134-3113	134-1113
14	3-3/8	134-6114	134-7114	134-4114	134-5114	134-2114	134-3114	134-1114
15	3-3/8	134-6115	134-7115	134-4115	134-5115	134-2115	134-3115	134-1115
16	3-3/8	134-6116	134-7116	134-4116	134-5116	134-2116	134-3116	134-1116
17	3-3/8	134-6117	134-7117	134-4117	134-5117	134-2117	134-3117	134-1117
18	3-1/4	134-6118	134-7118	134-4118	134-5118	134-2118	134-3118	134-1118
19	3-1/4	134-6119	134-7119	134-4119	134-5119	134-2119	134-3119	134-1119
20	3-1/4	134-6120	134-7120	134-4120	134-5120	134-2120	134-3120	134-1120
21	3-1/4	134-6121	134-7121	134-4121	134-5121	134-2121	134-3121	134-1121
22	3-1/8	134-6122	134-7122	134-4122	134-5122	134-2122	134-3122	134-1122
23	3-1/8	134-6123	134-7123	134-4123	134-5123	134-2123	134-3123	134-1123
24	3-1/8	134-6124	134-7124	134-4124	134-5124	134-2124	134-3124	134-1124
25	3 "	134-6125	134-7125	134-4125	134-5125	134-2125	134-3125	134-1125
26	3 "	134-6126	134-7126	134-4126	134-5126	134-2126	134-3126	134-1126
27	3 "	134-6127	134-7127	134-4127	134-5127	134-2127	134-3127	134-1127
28	2-7/8	134-6128	134-7128	134-4128	134-5128	134-2128	134-3128	134-1128
29	2-7/8	134-6129	134-7129	134-4129	134-5129	134-2129	134-3129	134-1129
30	2-3/4	134-6130	134-7130	134-4130	134-5130	134-2130	134-3130	134-1130
31	2-3/4	134-6131	134-7131	134-4131	134-5131	134-2131	134-3131	134-1131
32	2-3/4	134-6132	134-7132	134-4132	134-5132	134-2132	134-3132	134-1132
33	2-5/8	134-6133	134-7133	134-4133	134-5133	134-2133	134-3133	134-1133
34	2-5/8	134-6134	134-7134	134-4134	134-5134	134-2134	134-3134	134-1134
35	2-5/8	134-6135	134-7135	134-4135	134-5135	134-2135	134-3135	134-1135
36	2-1/2	134-6136	134-7136	134-4136	134-5136	134-2136	134-3136	134-1136
37	2-1/2	134-6137	134-7137	134-4137	134-5137	134-2137	134-3137	134-1137
38	2-1/2	134-6138	134-7138	134-4138	134-5138	134-2138	134-3138	134-1138
39	2-3/8	134-6139	134-7139	134-4139	134-5139	134-2139	134-3139	134-1139
40	2-3/8	134-6140	134-7140	134-4140	134-5140	134-2140	134-3140	134-1140
41	2-3/8	134-6141	134-7141	134-4141	134-5141	134-2141	134-3141	134-1141
42	2-1/4	134-6142	134-7142	134-4142	134-5142	134-2142	134-3142	134-1142
43	2-1/4	134-6143	134-7143	134-4143	134-5143	134-2143	134-3143	134-1143
44	2-1/4	134-6144	134-7144	134-4144	134-5144	134-2144	134-3144	134-1144
45	2-1/8	134-6145	134-7145	134-4145	134-5145	134-2145	134-3145	134-1145
46	2-1/8	134-6146	134-7146	134-4146	134-5146	134-2146	134-3146	134-1146
47	2 "	134-6147	134-7147	134-4147	134-5147	134-2147	134-3147	134-1147
48	2 "	134-6148	134-7148	134-4148	134-5148	134-2148	134-3148	134-1148
49	2 "	134-6149	134-7149	134-4149	134-5149	134-2149	134-3149	134-1149
50	2 "	134-6150	134-7150	134-4150	134-5150	134-2150	134-3150	134-1150
51	2 "	134-6151	134-7151	134-4151	134-5151	134-2151	134-3151	134-1151
52	1-7/8	134-6152	134-7152	134-4152	134-5152	134-2152	134-3152	134-1152
53	1-7/8	134-6153	134-7153	134-4153	134-5153	134-2153	134-3153	134-1153
54	1-7/8	134-6154	134-7154	134-4154	134-5154	134-2154	134-3154	134-1154
55	1-7/8	134-6155	134-7155	134-4155	134-5155	134-2155	134-3155	134-1155
56	1-3/4	134-6156	134-7156	134-4156	134-5156	134-2156	134-3156	134-1156
57	1-3/4	134-6157	134-7157	134-4157	134-5157	134-2157	134-3157	134-1157
58	1-5/8	134-6158	134-7158	134-4158	134-5158	134-2158	134-3158	134-1158
59	1-5/8	134-6159	134-7159	134-4159	134-5159	134-2159	134-3159	134-1159
60	1-5/8	134-6160	134-7160	134-4160	134-5160	134-2160	134-3160	134-1160
61	1-5/8	134-6161	134-7161	134-4161	134-5161	134-2161	134-3161	134-1161
62	1-1/2	134-6162	134-7162	134-4162	134-5162	134-2162	134-3162	134-1162
63	1-1/2	134-6163	134-7163	134-4163	134-5163	134-2163	134-3163	134-1163
64	1-1/2	134-6164	134-7164	134-4164	134-5164	134-2164	134-3164	134-1164
65	1-1/2	134-6165	134-7165	134-4165	134-5165	134-2165	134-3165	134-1165
66	1-3/8	134-6166	134-7166	134-4166	134-5166	134-2166	134-3166	134-1166
67	1-3/8	134-6167	134-7167	134-4167	134-5167	134-2167	134-3167	134-1167
68	1-3/8	134-6168	134-7168	134-4168	134-5168	134-2168	134-3168	134-1168
69	1-3/8	134-6169	134-7169	134-4169	134-5169	134-2169	134-3169	134-1169
70	1-1/4	134-6170	134-7170	134-4170	134-5170	134-2170	134-3170	134-1170
71	1-1/4	134-6171	134-7171	134-4171	134-5171	134-2171	134-3171	134-1171
72	1-1/8	134-6172	134-7172	134-4172	134-5172	134-2172	134-3172	134-1172
73	1-1/8	134-6173	134-7173	134-4173	134-5173	134-2173	134-3173	134-1173
74	1-1/8	134-6174	134-7174	134-4174	134-5174	134-2174	134-3174	134-1174
75	1-1/8	134-6175	134-7175	134-4175	134-5175	134-2175	134-3175	134-1175
76	7/8	134-6176	134-7176	134-4176	134-5176	134-2176	134-3176	134-1176
77	7/8	134-6177	134-7177	134-4177	134-5177	134-2177	134-3177	134-1177
78	7/8	134-6178	134-7178	134-4178	134-5178	134-2178	134-3178	134-1178
79	3/4	134-6179	134-7179	134-4179	134-5179	134-2179	134-3179	134-1179
80	3/4	134-6180	134-7180	134-4180	134-5180	134-2180	134-3180	134-1180



Cutting Tools

DRILLS BLANK

High Speed Steel, Ground



- Can be used for punches, gages, pins or making for special tools.
- Made of hardened high speed steel and ground.
- Fully hardened to Rc 63-65

Tolerance limits

0" - 0.2500"	+ 0.0000" - 0.0005"
0.251" - 0.3906"	+ 0.0000" - 0.0009"
0.391" - 1.0000"	+0.0000" -0.0010"

Sets

Description	Model No.
115pcs/set (1/16-1/2" by 1/64, A-Z, # 1-#60) with metal index	305-8315
20pcs/set wire size blanks #61-80	305-8320
26pcs/set letter size blanks A to Z	305-8326
29pcs/set blanks 1/16 \bar{O} to 1/2 \bar{O} by 64ths	305-8329
60pcs/set wire size blanks 1 to 60	305-8360

Number Sizes

Size	Overall Length	Model No.
1	3-7/8	305-8001
2	3-7/8	305-8002
3	3-3/4	305-8003
4	3-3/4	305-8004
5	3-3/4	305-8005
6	3-3/4	305-8006
7	3-5/8	305-8007
8	3-5/8	305-8008
9	3-5/8	305-8009
10	3-5/8	305-8010
11	3-1/2	305-8011
12	3-1/2	305-8012
13	3-1/2	305-8013
14	3-3/8	305-8014
15	3-3/8	305-8015
16	3-3/8	305-8016
17	3-3/8	305-8017
18	3-1/4	305-8018
19	3-1/4	305-8019
20	3-1/4	305-8020
21	3-1/4	305-8021
22	3-1/8	305-8022
23	3-1/8	305-8023
24	3-1/8	305-8024
25	3"	305-8025
26	3"	305-8026
27	3"	305-8027
28	2-7/8	305-8028
29	2-7/8	305-8029
30	2-3/4	305-8030
31	2-3/4	305-8031
32	2-3/4	305-8032
33	2-5/8	305-8033
34	2-5/8	305-8034
35	2-5/8	305-8035
36	2-1/2	305-8036
37	2-1/2	305-8037
38	2-1/2	305-8038
39	2-3/8	305-8039
40	2-3/8	305-8040

Size	Overall Length	Model No.
41	2-3/8	305-8041
42	2-1/4	305-8042
43	2-1/4	305-8043
44	2-1/4	305-8044
45	2-1/8	305-8045
46	2-1/8	305-8046
47	2"	305-8047
48	2"	305-8048
49	2"	305-8049
50	2"	305-8050
51	2"	305-8051
52	1-7/8	305-8052
53	1-7/8	305-8053
54	1-7/8	305-8054
55	1-7/8	305-8055
56	1-3/4	305-8056
57	1-3/4	305-8057
58	1-5/8	305-8058
59	1-5/8	305-8059
60	1-5/8	305-8060
61	1-5/8	305-8061
62	1-1/2	305-8062
63	1-1/2	305-8063
64	1-1/2	305-8064
65	1-1/2	305-8065
66	1-3/8	305-8066
67	1-3/8	305-8067
68	1-3/8	305-8068
69	1-3/8	305-8069
70	1-1/4	305-8070
71	1-1/4	305-8071
72	1-1/8	305-8072
73	1-1/8	305-8073
74	1-1/8	305-8074
75	1-1/8	305-8075
76	7/8	305-8076
77	7/8	305-8077
78	7/8	305-8078
79	3/4	305-8079
80	3/4	305-8080

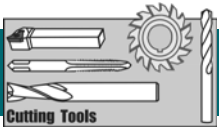
Fractional Sizes

Size	Overall Length	Model No.
33/64	6"	305-8133
17/32	6"	305-8134
35/64	6"	305-8135
9/16	6"	305-8136
37/64	6"	305-8137
19/32	6"	305-8138
39/64	6"	305-8139
5/8	6"	305-8140
41/64	6"	305-8141
21/32	6"	305-8142
43/64	6"	305-8143
11/16	6"	305-8144
45/64	6"	305-8145
23/32	6"	305-8146
47/64	6"	305-8147
3/4	6"	305-8148
49/64	6"	305-8149
25/32	6"	305-8150
51/64	6"	305-8151
13/16	6"	305-8152
53/64	6"	305-8153
27/32	6"	305-8154
55/64	6"	305-8155
7/8	6"	305-8156
57/64	6"	305-8157
29/32	6"	305-8158
59/64	6"	305-8159
15/16	6"	305-8160
61/64	6"	305-8161
31/32	6"	305-8162
63/64	6"	305-8163
1"	6"	305-8164

Size	Overall Length	Model No.
1/64	3/4	305-8101
1/32	1-3/8	305-8102
3/64	1-3/4	305-8103
1/16	1-7/8	305-8104
5/64	2"	305-8105
3/32	2-1/4	305-8106
7/64	2-5/8	305-8107
1/8	2-3/4	305-8108
9/64	2-7/8	305-8109
5/32	3-1/8	305-8110
11/64	3-1/4	305-8111
3/16	3-1/2	305-8112
13/64	3-5/8	305-8113
7/32	3-3/4	305-8114
15/64	3-7/8	305-8115
1/4	4"	305-8116
17/64	4-1/8	305-8117
9/32	4-1/4	305-8118
19/64	4-3/8	305-8119
5/16	4-1/2	305-8120
21/64	4-5/8	305-8121
11/32	4-3/4	305-8122
23/64	4-7/8	305-8123
3/8	5"	305-8124
25/64	5-1/8	305-8125
13/32	5-1/4	305-8126
27/64	5-3/8	305-8127
7/16	5-1/2	305-8128
29/64	5-5/8	305-8129
15/32	5-3/4	305-8130
31/64	5-7/8	305-8131
1/2	6"	305-8132

Letter Sizes

Size	Overall Length	Model No.
A	3-7/8	305-8201
B	4"	305-8202
C	4"	305-8203
D	4"	305-8204
E	4"	305-8205
F	4-1/8	305-8206
G	4-1/8	305-8207
H	4-1/8	305-8208
I	4-1/8	305-8209
J	4-1/8	305-8210
K	4-1/4	305-8211
L	4-1/4	305-8212
M	4-3/8	305-8213
N	4-3/8	305-8214
O	4-1/2	305-8215
P	4-5/8	305-8216
Q	4-3/4	305-8217
R	4-3/4	305-8218
S	4-7/8	305-8219
T	4-7/8	305-8220
U	5"	305-8221
V	5"	305-8222
W	5-1/8	305-8223
X	5-1/8	305-8224
Y	5-1/4	305-8225
Z	5-1/4	305-8226



Cutting Tools

METRIC STRAIGHT SHANK TWIST DRILL continued

High Speed Steel, DIN 338



Size	Flute length	Overall Length	Rolled			Ground			Size	Flute length	Overall Length	Rolled			Ground		
			Black Oxide Model No.	Rolled Polished Model No.	Black Oxide Model No.	Ground Bright Model No.	Ground Tin-Coated Model No.	Black Oxide Model No.				Rolled Polished Model No.	Black Oxide Model No.	Ground Bright Model No.	Ground Tin-Coated Model No.		
9.30mm	81	125	201-0930	215-0930	205-0930	206-0930	207-0930	12.40mm	101	151	201-1240	215-1240	205-1240	206-1240	207-1240		
9.40mm	81	125	201-0940	215-0940	205-0940	206-0940	207-0940	12.50mm	101	151	201-1250	215-1250	205-1250	206-1250	207-1250		
9.50mm	81	125	201-0950	215-0950	205-0950	206-0950	207-0950	12.60mm	101	151	201-1260	215-1260	205-1260	206-1260	207-1260		
9.60mm	87	133	201-0960	215-0960	205-0960	206-0960	207-0960	12.70mm	101	151	201-1270	215-1270	205-1270	206-1270	207-1270		
9.70mm	87	133	201-0970	215-0970	205-0970	206-0970	207-0970	12.75mm	101	151	201-1275	215-1275	205-1275	206-1275	207-1275		
9.75mm	87	133	201-0975	215-0975	205-0975	206-0975	207-0975	12.80mm	101	151	201-1280	215-1280	205-1280	206-1280	207-1280		
9.80mm	87	133	201-0980	215-0980	205-0980	206-0980	207-0980	12.90mm	101	151	201-1290	215-1290	205-1290	206-1290	207-1290		
9.90mm	87	133	201-0990	215-0990	205-0990	206-0990	207-0990	13.00mm	101	151	201-1300	215-1300	205-1300	206-1300	207-1300		
10.00mm	87	133	201-1000	215-1000	205-1000	206-1000	207-1000	13.10mm	101	151	201-1310	215-1310	205-1310	206-1310	207-1310		
10.10mm	87	133	201-1010	215-1010	205-1010	206-1010	207-1010	13.20mm	101	151	201-1320	215-1320	205-1320	206-1320	207-1320		
10.20mm	87	133	201-1020	215-1020	205-1020	206-1020	207-1020	13.25mm	108	160	201-1325	215-1325	205-1325	206-1325	207-1325		
10.25mm	87	133	201-1025	215-1025	205-1025	206-1025	207-1025	13.30mm	108	160	201-1330	215-1330	205-1330	206-1330	207-1330		
10.30mm	87	133	201-1030	215-1030	205-1030	206-1030	207-1030	13.40mm	108	160	201-1340	215-1340	205-1340	206-1340	207-1340		
10.40mm	87	133	201-1040	215-1040	205-1040	206-1040	207-1040	13.50mm	108	160	201-1350	215-1350	205-1350	206-1350	207-1350		
10.50mm	87	133	201-1050	215-1050	205-1050	206-1050	207-1050	13.60mm	108	160	201-1360	215-1360	205-1360	206-1360	207-1360		
10.60mm	94	142	201-1060	215-1060	205-1060	206-1060	207-1060	13.70mm	108	160	201-1370	215-1370	205-1370	206-1370	207-1370		
10.70mm	94	142	201-1070	215-1070	205-1070	206-1070	207-1070	13.75mm	108	160	201-1375	215-1375	205-1375	206-1375	207-1375		
10.75mm	94	142	201-1075	215-1075	205-1075	206-1075	207-1075	13.80mm	108	160	201-1380	215-1380	205-1380	206-1380	207-1380		
10.80mm	94	142	201-1080	215-1080	205-1080	206-1080	207-1080	13.90mm	108	160	201-1390	215-1390	205-1390	206-1390	207-1390		
10.90mm	94	142	201-1090	215-1090	205-1090	206-1090	207-1090	14.00mm	108	160	201-1400	215-1400	205-1400	206-1400	207-1400		
11.00mm	94	142	201-1100	215-1100	205-1100	206-1100	207-1100	14.25mm	114	169	201-1425	215-1425	205-1425	206-1425	207-1425		
11.10mm	94	142	201-1110	215-1110	205-1110	206-1110	207-1110	14.50mm	114	169	201-1450	215-1450	205-1450	206-1450	207-1450		
11.20mm	94	142	201-1120	215-1120	205-1120	206-1120	207-1120	14.75mm	114	169	201-1475	215-1475	205-1475	206-1475	207-1475		
11.25mm	94	142	201-1125	215-1125	205-1125	206-1125	207-1125	15.00mm	114	169	201-1500	215-1500	205-1500	206-1500	207-1500		
11.30mm	94	142	201-1130	215-1130	205-1130	206-1130	207-1130	15.25mm	120	178	201-1525	215-1525	205-1525	206-1525	207-1525		
11.40mm	94	142	201-1140	215-1140	205-1140	206-1140	207-1140	15.50mm	120	178	201-1550	215-1550	205-1550	206-1550	207-1550		
11.50mm	94	142	201-1150	215-1150	205-1150	206-1150	207-1150	15.75mm	120	178	201-1575	215-1575	205-1575	206-1575	207-1575		
11.60mm	94	142	201-1160	215-1160	205-1160	206-1160	207-1160	16.00mm	120	178	201-1600	215-1600	205-1600	206-1600	207-1600		
11.70mm	94	142	201-1170	215-1170	205-1170	206-1170	207-1170	16.50mm	125	187	201-1650	215-1650	205-1650	206-1650	207-1650		
11.75mm	94	142	201-1175	215-1175	205-1175	206-1175	207-1175	17.00mm	125	187	201-1700	215-1700	205-1700	206-1700	207-1700		
11.80mm	94	142	201-1180	215-1180	205-1180	206-1180	207-1180	17.50mm	130	191	201-1750	215-1750	205-1750	206-1750	207-1750		
11.90mm	101	151	201-1190	215-1190	205-1190	206-1190	207-1190	18.00mm	130	191	201-1800	215-1800	205-1800	206-1800	207-1800		
12.00mm	101	151	201-1200	215-1200	205-1200	206-1200	207-1200	18.50mm	135	198	201-1850	215-1850	205-1850	206-1850	207-1850		
12.10mm	101	151	201-1210	215-1210	205-1210	206-1210	207-1210	19.00mm	135	198	201-1900	215-1900	205-1900	206-1900	207-1900		
12.20mm	101	151	201-1220	215-1220	205-1220	206-1220	207-1220	19.50mm	140	205	201-1950	215-1950	205-1950	206-1950	207-1950		
12.25mm	101	151	201-1225	215-1225	205-1225	206-1225	207-1225	20.00mm	140	205	201-2000	215-2000	205-2000	206-2000	207-2000		
12.30mm	101	151	201-1230	215-1230	205-1230	206-1230	207-1230										

WWW.PRECOTOOLS.CN

DRILL STOP SET

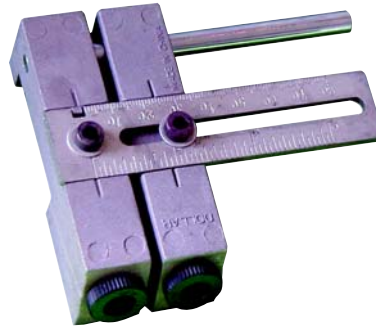
Allows drilling to exact depth. Locks onto the bit for drill press depth precision.



Model No.300-0007
7pcs/set 1/8" 3/16", 1/4" 5/16" 3/8"
7/16", 1/2"

Model No.300-0004
4pcs/set 5/8", 3/4", 7/8", 1"

DRILL GUIDE



For drilling perfect pocket holes in face frames quickly and easily.

Model No. 830-2020

Cutting Tools



AIRCRAFT EXTENSIONS DRILLS - 6", 12" LENGTHS

High Speed Steel, 118° Point, Right Hand

Fractional Sizes

Size	Flute Length	6" Overall Length Model No.	12" Overall Length Model No.
1/16	7/8	434-0004	434-1004
5/64	1"	434-0005	434-1005
3/32	1-1/4	434-0006	434-1006
7/64	1-1/2	434-0007	434-1007
1/8	1-5/8	434-0008	434-1008
9/64	1-3/4	434-0009	434-1009
5/32	2"	434-0010	434-1010
11/64	2-1/8	434-0011	434-1011
3/16	2-5/16	434-0012	434-1012
13/64	2-7/16	434-0013	434-1013
7/32	2-1/2	434-0014	434-1014
15/64	2-5/8	434-0015	434-1015
1/4	2-3/4	434-0016	434-1016
17/64	2-7/8	434-0017	434-1017
9/32	2-15/16	434-0018	434-1018
19/64	3-1/16	434-0019	434-1019
5/16	3-3/16	434-0020	434-1020
21/64	3-5/16	434-0021	434-1021
11/32	3-7/16	434-0022	434-1022
23/64	3-1/2	434-0023	434-1023
3/8	3-5/8	434-0024	434-1024
25/64	3-3/4	434-0025	434-1025
13/32	3-7/8	434-0026	434-1026
27/64	3-15/16	434-0027	434-1027
7/16	4-1/16	434-0028	434-1028
29/64	4-3/16	434-0029	434-1029
15/32	4-5/16	434-0030	434-1030
31/64	4-3/8	434-0031	434-1031
1/2	4-1/2	434-0032	434-1032

Letter Sizes

Size	Flute Length	6" Overall Length Model No.	12" Overall Length Model No.
A	2-5/8	434-0201	434-1201
B	2-3/4	434-0202	434-1202
C	2-3/4	434-0203	434-1203
D	2-3/4	434-0204	434-1204
E	2-3/4	434-0205	434-1205
F	2-3/4	434-0206	434-1206
G	2-7/8	434-0207	434-1207
H	2-7/8	434-0208	434-1208
I	2-7/8	434-0209	434-1209
J	2-7/8	434-0210	434-1210
K	2-15/16	434-0211	434-1211
L	2-15/16	434-0212	434-1212
M	3-1/16	434-0213	434-1213
N	3-1/16	434-0214	434-1214
O	3-1/16	434-0215	434-1215
P	3-5/16	434-0216	434-1216
Q	3-7/16	434-0217	434-1217
R	3-7/16	434-0218	434-1218
S	3-1/2	434-0219	434-1219
T	3-1/2	434-0220	434-1220
U	3-5/8	434-0221	434-1221
V	3-5/8	434-0222	434-1222
W	3-3/4	434-0223	434-1223
X	3-3/4	434-0224	434-1224
Y	3-7/8	434-0225	434-1225
Z	3-7/8	434-0226	434-1226

Number Sizes

Size	Flute Length	6" Overall Length Model No.	12" Overall Length Model No.
1	2-5/8	434-0101	434-1101
2	2-5/8	434-0102	434-1102
3	2-1/2	434-0103	434-1103
4	2-1/2	434-0104	434-1104
5	2-1/2	434-0105	434-1105
6	2-1/2	434-0106	434-1106
7	2-7/16	434-0107	434-1107
8	2-7/16	434-0108	434-1108
9	2-7/16	434-0109	434-1109
10	2-7/16	434-0110	434-1110
11	2-5/16	434-0111	434-1111
12	2-5/16	434-0112	434-1112
13	2-5/16	434-0113	434-1113
14	2-3/16	434-0114	434-1114
15	2-3/16	434-0115	434-1115
16	2-3/16	434-0116	434-1116
17	2-3/16	434-0117	434-1117
18	2-1/8	434-0118	434-1118
19	2-1/8	434-0119	434-1119
20	2-1/8	434-0120	434-1120
21	2-1/8	434-0121	434-1121
22	2"	434-0122	434-1122
23	2"	434-0123	434-1123
24	2"	434-0124	434-1124
25	1-7/8	434-0125	434-1125
26	1-7/8	434-0126	434-1126
27	1-7/8	434-0127	434-1127
28	1-3/4	434-0128	434-1128
29	1-3/4	434-0129	434-1129
30	1-5/8	434-0130	434-1130

Size	Flute Length	6" Overall Length Model No.	12" Overall Length Model No.
31	1-5/8	434-0131	434-1131
32	1-5/8	434-0132	434-1132
33	1-1/2	434-0133	434-1133
34	1-1/2	434-0134	434-1134
35	1-1/2	434-0135	434-1135
36	1-7/16	434-0136	434-1136
37	1-7/16	434-0137	434-1137
38	1-7/16	434-0138	434-1138
39	1-3/8	434-0139	434-1139
40	1-3/8	434-0140	434-1140
41	1-3/8	434-0141	434-1141
42	1-1/4	434-0142	434-1142
43	1-1/4	434-0143	434-1143
44	1-1/8	434-0144	434-1144
45	1-1/8	434-0145	434-1145
46	1-1/8	434-0146	434-1146
47	1"	434-0147	434-1147
48	1"	434-0148	434-1148
49	1"	434-0149	434-1149
50	1"	434-0150	434-1150
51	1"	434-0151	434-1151
52	7/8	434-0152	434-1152
53	7/8	434-0153	434-1153
54	7/8	434-0154	434-1154
55	7/8	434-0155	434-1155
56	3/4	434-0156	434-1156
57	3/4	434-0157	434-1157
58	11/16	434-0158	434-1158
59	11/16	434-0159	434-1159
60	11/16	434-0160	434-1160

AIRCRAFT EXTENSION DRILL SETS - 6" ,12" LENGTHS



High Speed Steel, 118° Point, Right Hand

Description	Model No.
1/16 to 1/4" by 64ths, 13pcs, 6" length	434-0301
1/16 to 1/2" by 64ths, 29pcs, 12"length	434-0302
No.1 to 60, 60pcs, 6" length	434-0303
No.1 to 60, 60pcs, 12"length	434-0304



Cutting Tools

CARBIDE TIPPED STRAIGHT SHANK JOBBER DRILLS

- For Cast Iron, or non-ferrous materials.



Fractional Sizes

Size	Flute Length	Overall Length	Model No.
1/8	1-5/8	2-3/4	343-0008
9/64	1-3/4	2-7/8	343-0009
5/32	2"	3-1/8	343-0010
11/64	2-1/8	3-1/4	343-0011
3/16	2-5/16	3-1/2	343-0012
13/64	2-7/16	3-5/8	343-0013
7/32	2-1/2	3-3/4	343-0014
15/64	2-5/8	3-7/8	343-0015
1/4	2-3/4	4"	343-0016
17/64	2-7/8	4-1/8	343-0017
9/32	2-15/16	4-1/4	343-0018
19/64	3-1/16	4-3/8	343-0019
5/16	3-3/16	4-1/2	343-0020
21/64	3-5/16	4-5/8	343-0021
11/32	3-7/16	4-3/4	343-0022
23/64	3-1/2	4-7/8	343-0023
3/8	3-5/8	5"	343-0024
25/64	3-3/4	5-1/8	343-0025
13/32	3-7/8	5-1/4	343-0026
27/64	3-15/16	5-3/8	343-0027
7/16	4-1/16	5-1/2	343-0028
29/64	4-3/16	5-5/8	343-0029
15/32	4-5/16	5-3/4	343-0030
31/64	4-3/8	5-7/8	343-0031
1/2	4-1/2	6"	343-0032

Letter Sizes

Size	Flute Length	Overall Length	Model No.
A	2-5/8	3-7/8	343-0201
B	2-3/4	4"	343-0202
C	2-3/4	4"	343-0203
D	2-3/4	4"	343-0204
E	2-3/4	4"	343-0205
F	2-7/8	4-1/8	343-0206
G	2-7/8	4-1/8	343-0207
H	2-7/8	4-1/8	343-0208
I	2-7/8	4-1/8	343-0209
J	2-7/8	4-1/8	343-0210
K	2-15/16	4-1/4	343-0211
L	2-15/16	4-1/4	343-0212
M	3-1/16	4-3/8	343-0213
N	3-1/16	4-3/8	343-0214
O	3-3/16	4-1/2	343-0215
P	3-5/16	4-5/8	343-0216
Q	3-7/16	4-3/4	343-0217
R	3-7/16	4-3/4	343-0218
S	3-1/2	4-7/8	343-0219
T	3-1/2	4-7/8	343-0220
U	3-5/8	5"	343-0221
V	3-5/8	5"	343-0222
W	3-3/4	5-1/8	343-0223
X	3-3/4	5-1/8	343-0224
Y	3-7/8	5-1/4	343-0225
Z	3-7/8	5-1/4	343-0226

Number Sizes

Size	Flute Length	Overall Length	Model No.
1	2-5/8	3-7/8	343-0101
2	2-5/8	3-7/8	343-0102
3	2-1/2	3-3/4	343-0103
4	2-1/2	3-3/4	343-0104
5	2-1/2	3-3/4	343-0105
6	2-1/2	3-3/4	343-0106
7	2-7/16	3-5/8	343-0107
8	2-7/16	3-5/8	343-0108
9	2-7/16	3-5/8	343-0109
10	2-7/16	3-5/8	343-0110
11	2-5/16	3-1/2	343-0111
12	2-5/16	3-1/2	343-0112
13	2-5/16	3-1/2	343-0113
14	2-3/16	3-3/8	343-0114
15	2-3/16	3-3/8	343-0115
16	2-3/16	3-3/8	343-0116
17	2-3/16	3-3/8	343-0117
18	2-1/8	3-1/4	343-0118
19	2-1/8	3-1/4	343-0119
20	2-1/8	3-1/4	343-0120
21	2-1/8	3-1/4	343-0121
22	2"	3-1/8	343-0122
23	2"	3-1/8	343-0123
24	2"	3-1/8	343-0124
25	1-7/8	3"	343-0125
26	1-7/8	3"	343-0126
27	1-7/8	3"	343-0127
28	1-3/4	2-7/8	343-0128
29	1-3/4	2-7/8	343-0129
30	1-5/8	2-3/4	343-0130
31	1-5/8	2-3/4	343-0131
32	1-5/8	2-3/4	343-0132

SOLID CARBIDE CIRCUIT BOARD DRILLS

Use for drilling epoxy resin-glass fiber circuit boards.

- Solid carbide construction offers great rigidity.
- 1/8" shank 1-1/2" overall length.
- 130° included angle drill point.
- Recommended for use under high drill temperatures and when the drill body must withstand continuous abrasion.



Fractional Sizes

Size	Flute Length	Model No.
1/64	3/16	534-0001
1/32	1/4	534-0002
3/64	3/8	534-0003
1/16	3/8	534-0004
5/64	3/8	534-0005
3/32	3/8	534-0006
7/64	3/8	534-0007
1/8	3/8	534-0008
9/64	.49	534-0009
5/32	.49	534-0010
11/64	.49	534-0011
3/16	.49	534-0012
13/64	.49	534-0013
7/32	.49	534-0014
15/64	.49	534-0015
1/4	.49	534-0016

Number Sizes

Size	Flute Length	Model No.	Size	Flute Length	Model No.	Size	Flute Length	Model No.
31	3/8	534-0131	48	3/8	534-0148	65	3/8	534-0165
32	3/8	534-0132	49	3/8	534-0149	66	3/8	534-0166
33	3/8	534-0133	50	3/8	534-0150	67	3/8	534-0167
34	3/8	534-0134	51	3/8	534-0151	68	3/8	534-0168
35	3/8	534-0135	52	3/8	534-0152	69	3/8	534-0169
36	3/8	534-0136	53	3/8	534-0153	70	3/8	534-0170
37	3/8	534-0137	54	3/8	534-0154	71	3/8	534-0171
38	3/8	534-0138	55	3/8	534-0155	72	3/8	534-0172
39	3/8	534-0139	56	3/8	534-0156	73	3/8	534-0173
40	3/8	534-0140	57	3/8	534-0157	74	3/8	534-0174
41	3/8	534-0141	58	3/8	534-0158	75	3/8	534-0175
42	3/8	534-0142	59	3/8	534-0159	76	3/8	534-0176
43	3/8	534-0143	60	3/8	534-0160	77	3/8	534-0177
44	3/8	534-0144	61	3/8	534-0161	78	3/8	534-0178
45	3/8	534-0145	62	3/8	534-0162	79	3/8	534-0179
46	3/8	534-0146	63	3/8	534-0163	80	3/8	534-0180
47	3/8	534-0147	64	3/8	534-0164			

Metric Sizes

Size	Flute Length	Model No.
.30	5.0mm	534-0200
.35	5.0mm	534-0202
.40	5.0mm	534-0204
.45	5.0mm	534-0206
.45	5.0mm	534-0208
.50	5.0mm	534-0210
.75	5.0mm	534-0212
1.00	9.5mm	534-0214
1.25	9.5mm	534-0216
1.50	9.5mm	534-0218
1.75	9.5mm	534-0220
2.00	9.5mm	534-0222
2.25	9.5mm	534-0224
2.50	9.5mm	534-0226
2.75	9.5mm	534-0228
3.00	9.5mm	534-0230

Cutting Tools



METRIC CENTER DRILLS



Dia	Working Length	Milled Model No.	Ground Model No.
1.0	3.15mm	217-0010	217-1010
1.6	4.0mm	217-0016	217-1016
2.0	5.0mm	217-0020	217-1020
2.5	6.3mm	217-0025	217-1025
3.15	8.0mm	217-0032	217-1032
4.0	10mm	217-0040	217-1040
5.0	12.5mm	217-0050	217-1050
6.3	16.0mm	217-0060	217-1060

METRIC CENTER DRILLS

120° Bell Type



Dia	Working Length	Milled Model No.	Ground Model No.
1.6	4.0mm	217-3016	217-4016
2.0	5.0mm	217-3020	217-4020
2.5	6.3mm	217-3025	217-4025
3.15	8.0mm	217-3032	217-4032
4.0	10.0mm	217-3040	217-4040
5.0	12.5mm	217-3050	217-4050
6.3	16.0mm	217-3060	217-4060

CENTER DRILLS

Ground Plain Style



Size	Body Dia.	Drill Dia.	Overall Length	Milled Model No.	Ground Model No.
1	1/8	3/64	1-1/4	217-4001	217-9001
2	3/16	5/64	1-7/8	217-4002	217-9002
3	1/4	7/64	2"	217-4003	217-9003
4	5/16	1/8	2-1/8	217-4004	217-9004
5	7/16	3/16	2-3/4	217-4005	217-9005
6	1/2	7/32	3"	217-4006	217-9006
7	5/8	1/4	3-1/4	217-4007	217-9007
8	3/4	5/16	3-1/2	217-4008	217-9008

BELL TYPE CENTER DRILLS

120° Angle, High Speed Steel, Ground



Size	Body Dia	Drill Dia.	Bell Dia	Overall Length	Model No.
11	1/8"	3/64"	0.1	1-1/4	217-2011
12	3/16	1/16	0.15	1-7/8	217-2012
13	1/4	3/32	0.2	2"	217-2013
14	5/16	7/64	0.25	2-1/8	217-2014
15	7/16	5/32	0.35	2-3/4	217-2015
16	1/2	3/16	0.4	3"	217-2016
17	5/8	7/32	0.5	3-1/4	217-2017
18	3/4	1/4	0.6	3-1/2	217-2018

LONG SERIES CENTER DRILLS



Size	Body Dia.	Drill Dia.	Overall Length	Milled Model No.	Ground Model No.
1	1/8	3/64	3"	217-8103	217-7103
1	1/8	3/64	4"	217-8104	217-7104
1	1/8	3/64	5"	217-8105	217-7105
1	1/8	3/64	6"	217-8106	217-7106
2	3/16	5/64	3"	217-8203	217-7203
2	3/16	5/64	4"	217-8204	217-7204
2	3/16	5/64	5"	217-8205	217-7205
2	3/16	5/64	6"	217-8206	217-7206
3	1/4	7/64	4"	217-8304	217-7304
3	1/4	7/64	5"	217-8305	217-7305
3	1/4	7/64	6"	217-8306	217-7306

Size	Body Dia.	Drill Dia.	Overall Length	Milled Model No.	Ground Model No.
4	5/16	1/8	4"	217-8404	217-7404
4	5/16	1/8	5"	217-8405	217-7405
4	5/16	1/8	6"	217-8406	217-7406
5	7/16	3/16	4"	217-8504	217-7504
5	7/16	3/16	5"	217-8505	217-7505
5	7/16	3/16	6"	217-8506	217-7506
6	1/2	7/32	4"	217-8604	217-7604
6	1/2	7/32	5"	217-8605	217-7605
6	1/2	7/32	6"	217-8606	217-7606
7	5/8	1/4	6"	217-8706	217-7706
8	3/4	5/16	6"	217-8806	217-7806

MILSSILE & AIRCRAFT MINI-CENTER DRILLS

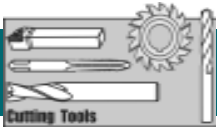


Size	Body Dia.	Drill Dia.	Overall Length	Model No.
000	1/8	0.020	1-1/4	217-5000
00	1/8	0.025	1-1/4	217-5001
0	1/8	1/32	1-1/4	217-5002

BELL TYPE CENTER DRILLS



Size	Body Dia.	Drill Dia.	Bell Dia.	Overall Length	Milled Model No.	Ground Model No.
No.11	1/8	3/54	3/64	1-1/4"	217-7001	217-8001
No.12	3/16	1/16	1/16	1-7/8"	217-7002	217-8002
No.13	1/4	3/32	3/32	2"	217-7003	217-8003
No.14	5/16	7/64	7/64	2-1/8"	217-7004	217-8004
No.15	7/16	5/32	5/32	2-3/4"	217-7005	217-8005
No.16	1/2	3/16	3/16	3"	217-7006	217-8006
No.17	5/8	7/32	7/32	3-1/4"	217-7007	217-8007
No.18	3/4	1/4	1/4	3-1/2"	217-7008	217-8008



Cutting Tools

EXTRA SHORT SPOT DRILLS

High Speed Steel



Size	Flute Length	Overall Length	Model No.
3.1mm	16	40	213-0031
3.2mm	16	40	213-0032
3.3mm	16	41	213-0033
4.1mm	16	44	213-0041
4.2mm	16	44	213-0042
4.7mm	20	48	213-0047
4.8mm	20	48	213-0048
4.9mm	22	50	213-0049
5.0mm	24	52	213-0050
5.2mm	24	52	213-0052

DOUBLE END SHEET METAL DRILLS

High Speed Steel



Size	Flute Length	Overall Length	Model No.
3.0mm	46	11	216-0030
3.1mm	49	11	216-0031
3.2mm	49	11	216-0032
3.25mm	49	11	216-0033
3.3mm	49	11	216-0034
3.5mm	52	14	216-0035
4.0mm	55	14	216-0040
4.1mm	55	14	216-0041
4.2mm	55	14	216-0042
4.5mm	58	17	216-0045
4.8mm	62	17	216-0048
5.0mm	62	17	216-0050
5.2mm	62	17	216-0052

METRIC MASONRY DRILLS

Carbide Tipped



Size	Overall Length	Model No.
3.0	60mm	340-0030
4.0	75mm	340-0040
5.0	85mm	340-0050
5.5	85mm	340-0055
6.0	100mm	340-0060
6.0	150mm	340-0061
6.0	200mm	340-0062
6.0	300mm	340-0063
6.0	400mm	340-0064
6.5	100mm	340-0065
7.0	100mm	340-0070
8.0	120mm	340-0080
8.0	150mm	340-0081
8.0	200mm	340-0082
8.0	300mm	340-0083
8.0	400mm	340-0084
8.0	600mm	340-0085
9.0	120mm	340-0090
10.0	120mm	340-0100
10.0	150mm	340-0101
10.0	200mm	340-0102

Size	Overall Length	Model No.
10.0	300mm	340-0103
10.0	400mm	340-0104
10.0	600mm	340-0105
11.0	150mm	340-0110
12.0	150mm	340-0120
12.0	200mm	340-0121
12.0	300mm	340-0122
12.0	400mm	340-0123
12.0	600mm	340-0124
13.0	150mm	340-0130
13.0	200mm	340-0131
13.0	300mm	340-0132
13.0	400mm	340-0133
13.0	600mm	340-0134
14.0	150mm	340-0140
14.0	200mm	340-0141
14.0	300mm	340-0142
14.0	400mm	340-0143
14.0	600mm	340-0144
15.0	150mm	340-0150
16.0	150mm	340-0160

Size	Overall Length	Model No.
16.0	200mm	340-0161
16.0	300mm	340-0162
16.0	400mm	340-0163
16.0	600mm	340-0164
17.0	160mm	340-0170
18.0	160mm	340-0180
18.0	200mm	340-0181
18.0	300mm	340-0182
18.0	400mm	340-0183
18.0	600mm	340-0184
19.0	160mm	340-0190
19.0	200mm	340-0191
19.0	300mm	340-0192
19.0	400mm	340-0193
19.0	600mm	340-0194
20.0	160mm	340-0200
20.0	200mm	340-0201
20.0	300mm	340-0202
20.0	400mm	340-0203
20.0	600mm	340-0204
21.0	600mm	340-0210

Size	Overall Length	Model No.
22.0	160mm	340-0220
22.0	200mm	340-0221
22.0	300mm	340-0222
22.0	400mm	340-0223
22.0	600mm	340-0224
23.0	160mm	340-0230
24.0	160mm	340-0240
24.0	200mm	340-0241
24.0	300mm	340-0242
24.0	400mm	340-0243
24.0	600mm	340-0244
25.0	160mm	340-0250
25.0	200mm	340-0251
25.0	300mm	340-0252
25.0	400mm	340-0253
25.0	600mm	340-0254
26.0	160mm	340-0260
26.0	200mm	340-0261
26.0	300mm	340-0262
26.0	400mm	340-0263
26.0	600mm	340-0264

INCH MASONRY DRILLS

Carbide Tipped

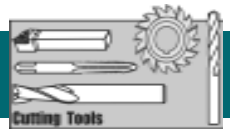


Size	Overall Length	Model No.
1/8	2.5	340-3080
5/32	3"	340-3100
3/16	3.5	340-3120
3/16	6"	340-3121
7/32	3.5	340-3140
1/4	4"	340-3160
1/4	6"	340-3161
1/4	8"	340-3162
1/4	12"	340-3163
1/4	16"	340-3164
17/64	4"	340-3170
9/32	4"	340-3180
5/16	5"	340-3200
5/16	6"	340-3201
5/16	8"	340-3202
5/16	12"	340-3203
5/16	16"	340-3204
5/16	18"	340-3205
11/32	5"	340-3220
3/8	5"	340-3240
3/8	6"	340-3241

Size	Overall Length	Model No.
3/8	8"	340-3242
3/8	12"	340-3243
3/8	16"	340-3244
3/8	18"	340-3245
7/16	6"	340-3280
15/32	6"	340-3300
15/32	8"	340-3301
15/32	12"	340-3302
15/32	16"	340-3303
15/32	18"	340-3304
1/2	6"	340-3320
1/2	8"	340-3321
1/2	12"	340-3322
1/2	16"	340-3323
1/2	18"	340-3324
9/16	6"	340-3360
9/16	8"	340-3361
9/16	12"	340-3362
9/16	16"	340-3363
9/16	18"	340-3364
19/32	6"	340-3380

Size	Overall Length	Model No.
5/8	6"	340-3400
5/8	8"	340-3401
5/8	12"	340-3402
5/8	16"	340-3403
5/8	18"	340-3404
21/32	6"	340-3420
23/32	6"	340-3460
23/32	8"	340-3461
23/32	12"	340-3462
23/32	16"	340-3463
23/32	18"	340-3464
3/4	6"	340-3480
3/4	8"	340-3481
3/4	12"	340-3482
3/4	16"	340-3483
3/4	18"	340-3484
25/32	6"	340-3500
25/32	8"	340-3501
25/32	12"	340-3502
25/32	16"	340-3503
25/32	18"	340-3504

Size	Overall Length	Model No.
27/32	6"	340-3540
7/8	6"	340-3560
1"	12"	340-3561
1"	18"	340-3562
7/8	16"	340-3563
7/8	18"	340-3564
29/32	6"	340-3580
15/16	6"	340-3600
15/16	8"	340-3601
15/16	12"	340-3602
15/16	16"	340-3603
15/16	18"	340-3604
1"	6"	340-3640
1"	8"	340-3641
1"	12"	340-3642
1"	16"	340-3643
1"	18"	340-3644
1-1/32	6"	340-3660
1-1/32	8"	340-3661
1-1/32	12"	340-3662
1-1/32	16"	340-3663
1-1/32	18"	340-3664



HAMMER DRILLS

with Cylindrical Shank and 4 Shank Grooves



Size	Flute Length	Overall Length	Model No.
5.0mm	50	110	211-0050
5.0mm	100	160	211-0051
5.5mm	50	110	211-0055
6.0mm	50	110	211-0060
6.0mm	100	160	211-0061
6.5mm	100	160	211-0065
6.5mm	100	160	211-0066
7.0mm	50	110	211-0070
8.0mm	50	110	211-0080
8.0mm	100	160	211-0081
8.0mm	150	210	211-0082
8.0mm	200	267	211-0083
9.0mm	100	160	211-0090
10.0mm	100	160	211-0100
10.0mm	150	210	211-0101
10.0mm	200	260	211-0102
10.0mm	300	360	211-0103
10.0mm	350	110	211-0105
11.0mm	100	160	211-0110

Size	Flute Length	Overall Length	Model No.
12.0mm	100	160	211-0120
12.0mm	150	260	211-0121
12.0mm	150	210	211-0122
12.0mm	250	305	211-0124
12.0mm	300	350	211-0125
12.0mm	400	460	211-0126
13.0mm	100	160	211-0130
13.0mm	200	267	211-0131
13.0mm	250	305	211-0132
13.0mm	300	350	211-0133
13.0mm	400	460	211-0134
14.0mm	100	160	211-0140
14.0mm	150	210	211-0141
14.0mm	150	260	211-0142
14.0mm	250	305	211-0143
14.0mm	300	350	211-0144
14.0mm	400	460	211-0146
15.0mm	100	160	211-0150
15.0mm	200	260	211-0151

Size	Flute Length	Overall Length	Model No.
16.0mm	150	210	211-0160
16.0mm	100	160	211-0161
16.0mm	250	305	211-0162
16.0mm	300	350	211-0163
16.0mm	400	460	211-0165
18.0mm	200	250	211-0181
18.0mm	250	305	211-0182
18.0mm	300	350	211-0183
18.0mm	400	460	211-0185
19.0mm	250	305	211-0192
19.0mm	400	460	211-0194
20.0mm	200	250	211-0200
20.0mm	250	305	211-0201
20.0mm	300	350	211-0202
20.0mm	400	460	211-0204
22.0mm	300	350	211-0223
22.0mm	400	460	211-0225
25.0mm	300	350	211-0252
25.0mm	400	460	211-0254

MASONRY DRILL AND WOOD DRILL SETS



5 piece Wood Bits
4,5,6,8,10mm in plastic pouch
Model No. 208-2000



8 piece Wood Bits
3,4,5,6,7,8,9,10mm in plastic pouch
Model No. 208-2010



5 piece Masonry Bits
4,5,6,7,8mm in plastic pouch
Model No. 340-2000



7 piece Masonry Drills
4,5,6,7,8,10,12mm in metal box
Model No. 340-2010

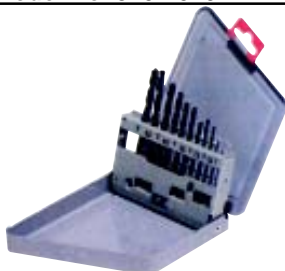


8 piece Masonry Drills
3,4,5,6,7,8,9,10mm in plastic pouch
Model No. 340-2020



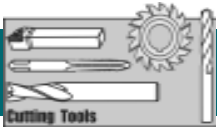
9 piece Drills Combination Set
Steel/Masonry/Wood drill 5,6,8mm in plastic box
Model No. 201-3428

STRAIGHT SHANK TWIST DRILL SETS



Metric 11PCS

Description	Rolled Black Oxide	Rolled Polished	Ground Black Oxide	Ground Bright	Ground Tin-Coated
	Model No.	Model No.	Model No.	Model No.	Model No.
11pcs 1-6mm by 0.5mm in metal box	201-0011	215-0011	205-0011	206-0011	207-0011



Cutting Tools

STRAIGHT SHANK TWIST DRILL SETS

Inch & Metric 13 PCS



Description	Rolled	Rolled	Ground		
	Black Oxide	Polished	Black Oxide	Bright	Tin-Coated
	Model No.	Model No.	Model No.	Model No.	Model No.
13pcs 1/16-1/4" by 1/64th in metal box	201-0004	215-0004	205-0004	206-0004	207-0004
13pcs 1/16-1/4" by 1/64th in plastic box	201-0003	215-0003	205-0003	206-0003	207-0003
13pcs 1.5-6.5mm by 0.5mm in metal box	201-0002	215-0002	205-0002	206-0002	207-0002
13pcs 1.5-6.5mm by 0.5mm in plastic box	201-0001	215-0001	205-0001	206-0001	207-0001



Inch 15 PCS

Description	Rolled	Rolled	Ground		
	Black Oxide	Polished	Black Oxide	Bright	Tin-Coated
	Model No.	Model No.	Model No.	Model No.	Model No.
15pcs 1/16"-1/2" by 32nd in metal box	201-0015	215-0015	205-0015	206-0015	207-0015



Metric 19PCS

Description	Rolled	Rolled	Ground		
	Black Oxide	Polished	Black Oxide	Bright	Tin-Coated
	Model No.	Model No.	Model No.	Model No.	Model No.
19pcs 1 to 10mm by 0.5mm in metal box	201-0005	215-0005	205-0005	206-0005	207-0005



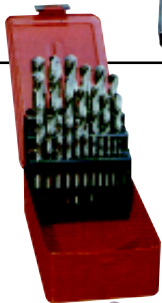
Inch 20 PCS

Description	Rolled	Rolled	Ground		
	Black Oxide	Polished	Black Oxide	Bright	Tin-Coated
	Model No.	Model No.	Model No.	Model No.	Model No.
20pcs #61-80 HSS in metal box	201-0019	215-0019	205-0019	206-0019	207-0019



Inch 21 PCS

Description	Rolled	Rolled	Ground		
	Black Oxide	Polished	Black Oxide	Bright	Tin-Coated
	Model No.	Model No.	Model No.	Model No.	Model No.
21pcs 1/16" to 3/8" by 1/64th in metal box	201-0006	215-0006	205-0006	206-0006	207-0006



Metric 25PCS

Description	Rolled	Rolled	Ground		
	Black Oxide	Polished	Black Oxide	Bright	Tin-Coated
	Model No.	Model No.	Model No.	Model No.	Model No.
25pcs 1-13mm by 0.5mm in metal box	201-0007	215-0007	205-0007	206-0007	207-0007



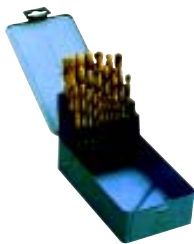
Inch 26 PCS

Description	Rolled	Rolled	Ground	
	Black Oxide	Polished	Black Oxide	Tin-Coated
	Model No.	Model No.	Model No.	Model No.
26pcs A-Z black oxide in metal box	201-0026	215-0026	205-0026	207-0026

Cutting Tools

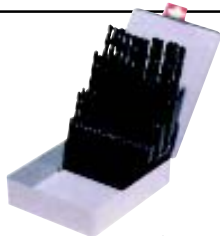


STRAIGHT SHANK TWIST DRILL SETS



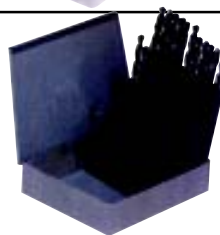
Inch 29 PCS

Description	Rolled	Rolled	Ground		
	Black Oxide	Polished	Black Oxide	Bright	Tin-Coated
	Model No.	Model No.	Model No.	Model No.	Model No.
29pcs 1/16-1/2" by 1/64th in metal box	201-0008	215-0008	205-0008	206-0008	207-0008



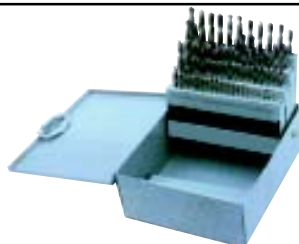
Metric 41PCS

Description	Rolled	Rolled	Ground		
	Black Oxide	Polished	Black Oxide	Bright	Tin-Coated
	Model No.	Model No.	Model No.	Model No.	Model No.
41pcs 6mm-10mm by 0.1mm in metal box	201-0016	215-0016	205-0016	206-0016	207-0016



Metric 50PCS

Description	Rolled	Rolled	Ground		
	Black Oxide	Polished	Black Oxide	Bright	Tin-Coated
	Model No.	Model No.	Model No.	Model No.	Model No.
50pcs 1-5.9mm by 0.1mm in metal box	201-0017	215-0017	205-0017	206-0017	207-0017



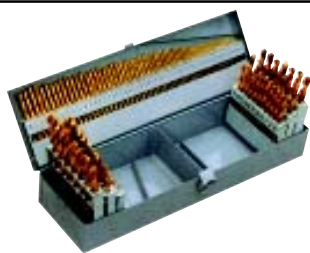
Inch 60 PCS

Description	Rolled	Rolled	Ground		
	Black Oxide	Polished	Black Oxide	Bright	Tin-Coated
	Model No.	Model No.	Model No.	Model No.	Model No.
60pcs #1-60 HSS in metal box	201-0018	215-0018	205-0018	206-0018	207-0018



Inch & Metric 114 PCS

Description	Rolled	Rolled	Ground		
	Black Oxide	Polished	Black Oxide	Bright	Tin-Coated
	Model No.	Model No.	Model No.	Model No.	Model No.
114pcs 1/16-1/2" by 1/64th, #1-60, 1-13mm by 0.5mm in metal box	201-0009	215-0009	205-0009	206-0009	207-0009



115 PCS

Description	Rolled	Rolled	Ground		
	Black Oxide	Polished	Black Oxide	Bright	Tin-Coated
	Model No.	Model No.	Model No.	Model No.	Model No.
115pcs 1/16-1/2" by 1/64th A-Z, #1-60 in metal box	201-0010	215-0010	205-0010	206-0010	207-0010
115pcs, DIN338, 1.0-12.4mm step by 0.1mm, in metal box	201-3115	215-3115	205-3115	206-3115	207-3115



301 PCS COMBINATION DRILL SETS



Specification	Model No.
Tin-Coated drill saw 6mm 2,3,4,5,6,8,10mm Tin-Coated twist drills 4,5,6,8,10mm Tin-Coated masonry drills 4,5,6,8,10mm Tin-Coated wood working drills Bits: 6pcs Magnetic holder: 1pc Wall plugs+Wood screw 276pcs	201-2600



Cutting Tools



303 PCS COMBINATION DRILL SETS

Specification	Model No.
Tin-Coated drill saw 6mm 1-10 19pcs Tin-Coated twist drills Bits: 6pcs Magnetic holder: 1pc Wall plugs+Wood screw 276pcs	201-2602



9 PCS COMBINATION DRILL SETS

Specification	Model No.
5,6,8(mm) H.S.S Twist drills, Masonry Drills and wood working drills each for 5,6,8(mm)	201-2604



13 PCS COMBINATION DRILL SETS

Specification	Model No.
Masonry drills:4,5,6,8,10mm Bits: 6pcs Nail pouch: 1pc Magnetic holder: 1pc	201-2606



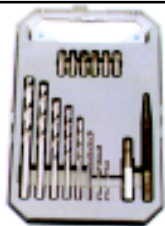
15 PCS COMBINATION DRILL SETS

Specification	Model No.
H.S.S twist drills:4,5,6,8,10mm Masonry drills:4,5,6,8,10mm Wood working drills:4,5,6,8,10mm	201-2608



15 PCS COMBINATION DRILL SETS

Specification	Model No.
Masonry drills:4,5,6,8,10mm Wood working drills:5,6,8,10mm Bits: 6pcs Magnetic holder 1pc	201-2610



16 PCS COMBINATION DRILL SETS

Specification	Model No.
H.S.S Twist drills:1,2,3,4,5,6,7,8mm Bits: 6pcs Nail pouch: 1pc Magnetic holder: 1pc	201-2612



16 PCS COMBINATION DRILL SETS

Specification	Model No.
H.S.S Twist drills:2,3,4,5,6,8mm Masonry drills:4,5,6,8,10mm Wood working drills:4,5,6,8,10mm	201-2614



23 PCS COMBINATION DRILL SETS

Specification	Model No.
H.S.S Twist drills:1.5,2,2.5,3,3.2,3.5,4,4.5,4.8,5.5,5.6,6.5mm Bits: 9pcs Magnetic holder: 1pc	201-2616



18 PCS COMBINATION DRILL SETS

Specification	Model No.
H.S.S Twist drills:3,4,5,6,8,10mm Masonry drills:3,4,5,6,8,10mm Wood working drills:3,4,5,6,8,10mm	201-2618



24 PCS COMBINATION DRILL SETS

Specification	Model No.
H.S.S Twist drills:2,3,4,5,6,8,10mm Masonry drills:4,5,6,8,10mm Wood working drills:4,5,6,8,10mm Bits: 6pcs Magnetic holder: 1pc	201-2620



27 PCS COMBINATION DRILL SETS

Specification	Model No.
H.S.S Twist drills:1-10mmx0.5mm(19pcs) Masonry drills:5,6,8,10mm Wood working drills:5,6,8,10mm	201-2622



34 PCS COMBINATION DRILL SETS

Specification	Model No.
H.S.S TWIST DRILLS:1-10mmx0.5mm(19PCS) WOOD WORKING DRILLS:4,5,6,8,10mm MASONRY DRILLS:5,6,8,10mm COUNTER-SINK: 1PC ADJUSTABLE WRENCH: 1 PC DRILLS STOP: 3PCS NAIL POUCH: 1PC	201-2624



35 PCS COMBINATION DRILL SETS

Specification	Model No.
H.S.S TWIST DRILLS:13PCS (2-8mmx0.5mm) WOOD WORKING DRILLS:4,5,6,8,10mm MASONRY DRILLS:5,6,8,10mm COUNTER-SINK: 1PC ADJUSTABLE WRENCH: 1 PC BITS: 10PCS MAGNETIC HOLDER: 1PC	201-2626



300 PCS COMBINATION DRILL SETS WITH WALL PLUGS

Specification	Model No.
H.S.S TWIST DRILLS:2,3,4,5,6,8,10mm WOOD WORKING DRILLS:4,5,6,8,10mm MASONRY DRILLS:4,5,6,8,10mm BITS: 6PCS MAGNETIC HOLDER: 1PC WALL PLUGS:276 PCS SIZE:4,5,6,8,10mm	201-2628



Cutting Tools

DIAMOND SAW BLADE-WET CUTTING

Out Dia. (mm)	Inner Dia. (mm)	Teeth Thickness (mm)	Teeth Height (mm)	Blade Thickness (mm)	Superfine Model No.	A Grade Model No.	B Grade Model No.	C Grade Model No.	D Grade Model No.
80	20	0.8	5	1.4	107-0000	107-1000	107-2000	107-3000	107-4000
105	20	1.6	5	1.4	107-0002	107-1002	107-2002	107-3002	107-4002
110	20	1.8	5	1.4	107-0004	107-1004	107-2004	107-3004	107-4004
125	20	2	5	1.4	107-0006	107-1006	107-2006	107-3006	107-4006
150	22.23	2.2	5	1.4	107-0008	107-1008	107-2008	107-3008	107-4008
180	22.23	2.4	5	1.8	107-0010	107-1010	107-2010	107-3010	107-4010
200	22.23	2.5	5	1.8	107-0011	107-1011	107-2011	107-3011	107-4011
230	22.23	2.6	5	1.8	107-0012	107-1012	107-2012	107-3012	107-4012
250	25.4	2.6	6	2.2	107-0014	107-1014	107-2014	107-3014	107-4014
300	25.4	3	6	2.2	107-0016	107-1016	107-2016	107-3016	107-4016
350	25.4	3.2	6	2.2	107-0018	107-1018	107-2018	107-3018	107-4018



DIAMOND SAW BLADE-DRY CUTTING

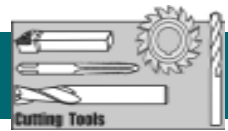
Out Dia. (mm)	Inner Dia. (mm)	Teeth Thickness (mm)	Teeth Height (mm)	Blade Thickness (mm)	Superfine Model No.	A Grade Model No.	B Grade Model No.	C Grade Model No.	D Grade Model No.
105	20	1.8	7	1.4	107-0020	107-1020	107-2020	107-3020	107-4020
110	20	1.8	7	1.4	107-0022	107-1022	107-2022	107-3022	107-4022
115	22.23	2	7	1.4	107-0024	107-1024	107-2024	107-3024	107-4024
125	22.23	2	7	1.4	107-0026	107-1026	107-2026	107-3026	107-4026
150	22.23	2.2	7	1.4	107-0027	107-1027	107-2027	107-3027	107-4027
180	22.23	2.4	7	1.8	107-0028	107-1028	107-2028	107-3028	107-4028
200	22.23	2.6	7	1.8	107-0029	107-1029	107-2029	107-3029	107-4029
230	22.23	2.6	7	1.8	107-0030	107-1030	107-2030	107-3030	107-4030
250	25.4	2.8	7	2.2	107-0032	107-1032	107-2032	107-3032	107-4032
300	25.4	3.2	7	2.2	107-0034	107-1034	107-2034	107-3034	107-4034
350	25.4	3.2	7	2.2	107-0036	107-1036	107-2036	107-3036	107-4036



TURBO DIAMOND SAW BLADE-WET/DRY CUTTING

Out Dia. (mm)	Inner Dia. (mm)	Teeth Thickness (mm)	Teeth Height (mm)	Blade Thickness (mm)	Superfine Model No.	A Grade Model No.	B Grade Model No.	C Grade Model No.	D Grade Model No.
105	22.23	2.2	7.5	1.2	107-0040	107-1040	107-2040	107-3040	107-4040
110	22.23	2.2	7.5	1.2	107-0042	107-1042	107-2042	107-3042	107-4042
115	22.23	2.4	7.5	1.4	107-0044	107-1044	107-2044	107-3044	107-4044
125	22.23	2.4	7.5	1.4	107-0046	107-1046	107-2046	107-3046	107-4046
150	22.23	2.4	7.5	1.4	107-0047	107-1047	107-2047	107-3047	107-4047
180	22.23	2.6	8	1.6	107-0048	107-1048	107-2048	107-3048	107-4048
200	22.23	2.8	8	1.6	107-0049	107-1049	107-2049	107-3049	107-4049
230	22.23	3.1	8	1.6	107-0050	107-1050	107-2050	107-3050	107-4050
250	25.4	3.2	8	2.2	107-0052	107-1052	107-2052	107-3052	107-4052
300	25.4	3.2	8	2.2	107-0054	107-1054	107-2054	107-3054	107-4054
350	25.4	3.2	8	2.2	107-0056	107-1056	107-2056	107-3056	107-4056





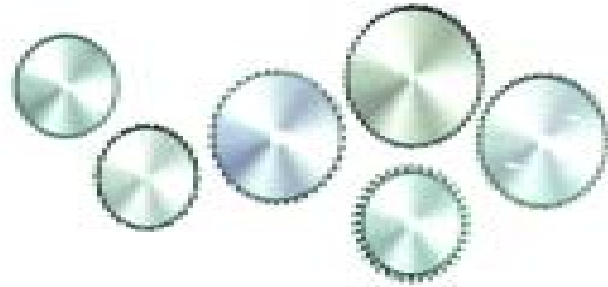
STRENGTHEN TURBO DIAMOND BLADE-WET/DRY CUTTING

Out Dia. (mm)	Inner Dia. (mm)	Teeth Thickness (mm)	Teeth Height (mm)	Blade Thickness (mm)	Superfine Model No.	A Grade Model No.	B Grade Model No.	C Grade Model No.	D Grade Model No.
105	20	2.5	7.5	1.6	107-0080	107-1080	107-2080	107-3080	107-4080
115	22.23	2.5	7.5	1.6	107-0082	107-1082	107-2082	107-3082	107-4082
125	22.23	2.5	7.5	1.6	107-0084	107-1084	107-2084	107-3084	107-4084
150	22.23	2.7	7.5	2	107-0086	107-1086	107-2086	107-3086	107-4086
180	22.23	2.7	8	2	107-0088	107-1088	107-2088	107-3088	107-4088
230	22.23	3.1	8	2.5	107-0090	107-1090	107-2090	107-3090	107-4090



CARBIDE TIPPED SAW BLADE FOR WOOD

Out Dia.	Thickness	Hole Dia.	No.s of teeth	Industry Grade Model No.	Normal Grade Model No.	DIY Grade Model No.
4"	1.2mm	20mm	12	114-0401	114-0411	114-0421
4"	1.2mm	20mm	16	114-0402	114-0412	114-0422
4"	1.2mm	20mm	20	114-0403	114-0413	114-0423
4"	1.2mm	20mm	24	114-0404	114-0414	114-0424
4"	1.2mm	20mm	30	114-0405	114-0415	114-0425
4"	1.2mm	20mm	40	114-0406	114-0416	114-0426
5"	1.2mm	20mm	20	114-0501	114-0511	114-0521
5"	1.2mm	20mm	24	114-0502	114-0512	114-0522
5"	1.2mm	20mm	30	114-0503	114-0513	114-0523
5"	1.2mm	20mm	36	114-0504	114-0514	114-0524
5"	1.2mm	20mm	40	114-0505	114-0515	114-0525
5"	1.5mm	20mm	20	114-0541	114-0551	114-0561
5"	1.5mm	20mm	24	114-0542	114-0552	114-0562
5"	1.5mm	20mm	30	114-0543	114-0553	114-0563
5"	1.5mm	20mm	36	114-0544	114-0554	114-0564
5"	1.5mm	20mm	40	114-0545	114-0555	114-0565
6"	1.2mm	20mm	24	114-0601	114-0611	114-0621
6"	1.2mm	20mm	30	114-0602	114-0612	114-0622
6"	1.2mm	20mm	36	114-0603	114-0613	114-0623
6"	1.2mm	20mm	40	114-0604	114-0614	114-0624
6"	1.2mm	20mm	60	114-0605	114-0615	114-0625
6"	1.5mm	20mm	24	114-0641	114-0651	114-0661
6"	1.5mm	20mm	30	114-0642	114-0652	114-0662
6"	1.5mm	20mm	36	114-0643	114-0653	114-0663
6"	1.5mm	20mm	40	114-0644	114-0654	114-0664
6"	1.5mm	20mm	60	114-0645	114-0655	114-0665
7"	1.5mm	25.4mm	24	114-0701	114-0711	114-0721
7"	1.5mm	25.4mm	36	114-0702	114-0712	114-0722
7"	1.5mm	25.4mm	40	114-0703	114-0713	114-0723
7"	1.5mm	25.4mm	50	114-0704	114-0714	114-0724
7"	1.5mm	25.4mm	60	114-0705	114-0715	114-0725
7"	1.5mm	25.4mm	80	114-0706	114-0716	114-0726
8"	1.6mm	25.4mm	24	114-0801	114-0811	114-0821
8"	1.6mm	25.4mm	30	114-0802	114-0812	114-0822
8"	1.6mm	25.4mm	40	114-0803	114-0813	114-0823
8"	1.6mm	25.4mm	50	114-0804	114-0814	114-0824
8"	1.6mm	25.4mm	60	114-0805	114-0815	114-0825
8"	1.6mm	25.4mm	80	114-0806	114-0816	114-0826
8"	1.8mm	25.4mm	24	114-0841	114-0851	114-0861
8"	1.8mm	25.4mm	30	114-0842	114-0852	114-0862



Out Dia.	Thickness	Hole Dia.	No.s of teeth	Industry Grade Model No.	Normal Grade Model No.	DIY Grade Model No.
8"	1.8mm	25.4mm	40	114-0843	114-0853	114-0863
8"	1.8mm	25.4mm	50	114-0844	114-0854	114-0864
8"	1.8mm	25.4mm	60	114-0845	114-0855	114-0865
8"	1.8mm	25.4mm	80	114-0846	114-0856	114-0866
9"	1.8mm	25.4mm	24	114-0901	114-0911	114-0921
9"	1.8mm	25.4mm	30	114-0902	114-0912	114-0922
9"	1.8mm	25.4mm	36	114-0903	114-0913	114-0923
9"	1.8mm	25.4mm	40	114-0904	114-0914	114-0924
9"	1.8mm	25.4mm	60	114-0905	114-0915	114-0925
9"	1.8mm	25.4mm	80	114-0906	114-0916	114-0926
10"	2.0mm	25.4mm	30	114-1001	114-1011	114-1021
10"	2.0mm	25.4mm	36	114-1002	114-1012	114-1022
10"	2.0mm	25.4mm	40	114-1003	114-1013	114-1023
10"	2.0mm	25.4mm	60	114-1004	114-1014	114-1024
10"	2.0mm	25.4mm	80	114-1005	114-1015	114-1025
10"	2.0mm	25.4mm	100	114-1006	114-1016	114-1026
10"	2.0mm	25.4mm	120	114-1007	114-1017	114-1027
12"	2.0mm	25.4mm	40	114-1201	114-1211	114-1221
12"	2.0mm	25.4mm	60	114-1202	114-1212	114-1222
12"	2.0mm	25.4mm	80	114-1203	114-1213	114-1223
12"	2.0mm	25.4mm	100	114-1204	114-1214	114-1224
12"	2.0mm	25.4mm	120	114-1205	114-1215	114-1225
12"	2.2mm	25.4mm	40	114-1241	114-1251	114-1261
12"	2.2mm	25.4mm	60	114-1242	114-1252	114-1262
12"	2.2mm	25.4mm	80	114-1243	114-1253	114-1263
12"	2.2mm	25.4mm	100	114-1244	114-1254	114-1264
12"	2.2mm	25.4mm	120	114-1245	114-1255	114-1265
14"	2.5mm	25.4mm	40	114-1401	114-1411	114-1421
14"	2.6mm	25.4mm	60	114-1402	114-1412	114-1422
14"	2.7mm	25.4mm	80	114-1403	114-1413	114-1423
14"	2.8mm	25.4mm	100	114-1404	114-1414	114-1424
14"	2.9mm	25.4mm	120	114-1405	114-1415	114-1425
16"	2.10mm	25.4mm	40	114-1601	114-1611	114-1621
16"	2.11mm	25.4mm	60	114-1602	114-1612	114-1622
16"	2.12mm	25.4mm	80	114-1603	114-1613	114-1623
16"	2.13mm	25.4mm	100	114-1604	114-1614	114-1624
16"	2.14mm	25.4mm	120	114-1605	114-1615	114-1625



Cutting Tools

CARBIDE TIPPED SAW BLADE FOR ALUMINIUM

Out Dia.	Thickness	Hole Dia.	No.s of teeth	Industry Grade Model No.	Normal Grade Model No.	DIY Grade Model No.
4"	1.2mm	20mm	12	116-0401	116-0411	116-0421
4"	1.2mm	20mm	16	116-0402	116-0412	116-0422
4"	1.2mm	20mm	20	116-0403	116-0413	116-0423
4"	1.2mm	20mm	24	116-0404	116-0414	116-0424
4"	1.2mm	20mm	30	116-0405	116-0415	116-0425
4"	1.2mm	20mm	40	116-0406	116-0416	116-0426
5"	1.2mm	20mm	20	116-0501	116-0511	116-0521
5"	1.2mm	20mm	24	116-0502	116-0512	116-0522
5"	1.2mm	20mm	30	116-0503	116-0513	116-0523
5"	1.2mm	20mm	36	116-0504	116-0514	116-0524
5"	1.2mm	20mm	40	116-0505	116-0515	116-0525
5"	1.5mm	20mm	20	116-0541	116-0551	116-0561
5"	1.5mm	20mm	24	116-0542	116-0552	116-0562
5"	1.5mm	20mm	30	116-0543	116-0553	116-0563
5"	1.5mm	20mm	36	116-0544	116-0554	116-0564
5"	1.5mm	20mm	40	116-0545	116-0555	116-0565
6"	1.2mm	20mm	24	116-0601	116-0611	116-0621
6"	1.2mm	20mm	30	116-0602	116-0612	116-0622
6"	1.2mm	20mm	36	116-0603	116-0613	116-0623
6"	1.2mm	20mm	40	116-0604	116-0614	116-0624
6"	1.2mm	20mm	60	116-0605	116-0615	116-0625
6"	1.5mm	20mm	24	116-0641	116-0651	116-0661
6"	1.5mm	20mm	30	116-0642	116-0652	116-0662
6"	1.5mm	20mm	36	116-0643	116-0653	116-0663
6"	1.5mm	20mm	40	116-0644	116-0654	116-0664
6"	1.5mm	20mm	60	116-0645	116-0655	116-0665
7"	1.5mm	25.4mm	24	116-0701	116-0711	116-0721
7"	1.5mm	25.4mm	36	116-0702	116-0712	116-0722
7"	1.5mm	25.4mm	40	116-0703	116-0713	116-0723
7"	1.5mm	25.4mm	50	116-0704	116-0714	116-0724
7"	1.5mm	25.4mm	60	116-0705	116-0715	116-0725
7"	1.5mm	25.4mm	80	116-0706	116-0716	116-0726
8"	1.6mm	25.4mm	24	116-0801	116-0811	116-0821
8"	1.6mm	25.4mm	30	116-0802	116-0812	116-0822
8"	1.6mm	25.4mm	40	116-0803	116-0813	116-0823
8"	1.6mm	25.4mm	50	116-0804	116-0814	116-0824
8"	1.6mm	25.4mm	60	116-0805	116-0815	116-0825
8"	1.6mm	25.4mm	80	116-0806	116-0816	116-0826
8"	1.8mm	25.4mm	24	116-0841	116-0851	116-0861
8"	1.8mm	25.4mm	30	116-0842	116-0852	116-0862
8"	1.8mm	25.4mm	40	116-0843	116-0853	116-0863
8"	1.8mm	25.4mm	50	116-0844	116-0854	116-0864
8"	1.8mm	25.4mm	60	116-0845	116-0855	116-0865
8"	1.8mm	25.4mm	80	116-0846	116-0856	116-0866
9"	1.8mm	25.4mm	24	116-0901	116-0911	116-0921
9"	1.8mm	25.4mm	30	116-0902	116-0912	116-0922
9"	1.8mm	25.4mm	36	116-0903	116-0913	116-0923
9"	1.8mm	25.4mm	40	116-0904	116-0914	116-0924
9"	1.8mm	25.4mm	60	116-0905	116-0915	116-0925
9"	1.8mm	25.4mm	80	116-0906	116-0916	116-0926



Out Dia.	Thickness	Hole Dia.	No.s of teeth	Industry Grade Model No.	Normal Grade Model No.	DIY Grade Model No.
10"	2.0mm	25.4mm	30	116-1001	116-1011	116-1021
10"	2.0mm	25.4mm	36	116-1002	116-1012	116-1022
10"	2.0mm	25.4mm	40	116-1003	116-1013	116-1023
10"	2.0mm	25.4mm	60	116-1004	116-1014	116-1024
10"	2.0mm	25.4mm	80	116-1005	116-1015	116-1025
10"	2.0mm	25.4mm	100	116-1006	116-1016	116-1026
10"	2.0mm	25.4mm	120	116-1007	116-1017	116-1027
12"	2.0mm	25.4mm	40	116-1201	116-1211	116-1221
12"	2.0mm	25.4mm	60	116-1202	116-1212	116-1222
12"	2.0mm	25.4mm	80	116-1203	116-1213	116-1223
12"	2.0mm	25.4mm	100	116-1204	116-1214	116-1224
12"	2.0mm	25.4mm	120	116-1205	116-1215	116-1225
12"	2.2mm	25.4mm	40	116-1241	116-1251	116-1261
12"	2.2mm	25.4mm	60	116-1242	116-1252	116-1262
12"	2.2mm	25.4mm	80	116-1243	116-1253	116-1263
12"	2.2mm	25.4mm	100	116-1244	116-1254	116-1264
12"	2.2mm	25.4mm	120	116-1245	116-1255	116-1265
14"	2.5mm	25.4mm	40	116-1401	116-1411	116-1421
14"	2.5mm	25.4mm	60	116-1402	116-1412	116-1422
14"	2.5mm	25.4mm	80	116-1403	116-1413	116-1423
14"	2.5mm	25.4mm	100	116-1404	116-1414	116-1424
14"	2.5mm	25.4mm	120	116-1405	116-1415	116-1425
16"	2.5mm	25.4mm	40	116-1601	116-1611	116-1621
16"	2.5mm	25.4mm	60	116-1602	116-1612	116-1622
16"	2.5mm	25.4mm	80	116-1603	116-1613	116-1623
16"	2.5mm	25.4mm	100	116-1604	116-1614	116-1624
16"	2.5mm	25.4mm	120	116-1605	116-1615	116-1625

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Cutting Tools

REDUCED STRAIGHT SHANK

TWIST DRILLS

3/4" Shank Drills

6" Overall Length, High Speed Steel



Size	Model No.
25/32"	301-1950
13/16	301-1952
27/32	301-1954
7/8	301-1956
29/32	301-1958
15/16	301-1960
31/32	301-1962
1"	301-2000
1-1/32	301-2002
1-1/16	301-2004
1-3/32"	301-2006
1-1/8	301-2008
1-5/32	301-2010
1-3/16	301-2012
1-7/32	301-2014
1-1/4	301-2016
1-9/32	301-2018
1-5/16	301-2020
1-11/32	301-2022

Size	Model No.
1-13/32	301-2026
1-7/16	301-2028
1-15/32	301-2030
1-1/2	301-2032
1-17/32	301-2034
1-9/16	301-2036
1-19/32	301-2038
1-5/8	301-2040
1-21/32	301-2042
1-11/16	301-2044
1-23/32	301-2046
1-3/4	301-2048
1-25/32	301-2050
1-13/16	301-2052
1-27/32	301-2054
1-7/8	301-2056
1-29/32	301-2058
1-15/16	301-2060
1-31/32	301-2062
2"	301-2064

1/2" Shank Drills

6" Overall Length, 3" Flute Length, High Speed Steel Inch



Size	Model No.
1/2"	301-1032
33/64	301-1033
17/32	301-1034
35/64	301-1035
9/16	301-1036
37/64	301-1037
19/32	301-1038
39/64	301-1039
5/8	301-1040
41/64	301-1041
21/32	301-1042
43/64	301-1043
11/16	301-1044
45/64	301-1045
23/32	301-1046
47/64	301-1047
3/4	301-1048

Size	Model No.
49/64"	301-1049
25/32	301-1050
51/64	301-1051
13/16	301-1052
53/64	301-1053
27/32	301-1054
55/64	301-1055
7/8	301-1056
57/64	301-1057
29/32	301-1058
59/64	301-1059
15/16	301-1060
61/64	301-1061
31/32	301-1062
63/64	301-1063
1"	301-1064

Size	Model No.
1-1/64	301-1101
1-1/32	301-1102
1-3/64	301-1103
1-1/16	301-1104
1-5/64	301-1105
1-3/32	301-1106
1-7/64	301-1107
1-1/8	301-1108
1-9/64	301-1109
1-5/32	301-1110
1-11/64	301-1111
1-3/16	301-1112
1-13/64	301-1113
1-7/32	301-1114
1-15/64	301-1115
1-1/4	301-1116

Size	Model No.
1-17/64	301-1117
1-9/32	301-1118
1-19/64	301-1119
1-5/16	301-1120
1-21/64	301-1121
1-11/32	301-1122
1-23/64	301-1123
1-3/8	301-1124
1-25/64	301-1125
1-13/32	301-1126
1-27/64	301-1127
1-7/16	301-1128
1-29/64	301-1129
1-15/32	301-1130
1-31/64	301-1131
1-1/2	301-1132

Metric Shank 13mm ,DIN338

Size	Model No.
12.50mm	301-1025
13.00mm	301-1030
13.80mm	301-1138
14.00mm	301-1140
14.25mm	301-1142
14.50mm	301-1145
15.00mm	301-1150
16.00mm	301-1160
16.50mm	301-1165
16.75mm	301-1167

Size	Model No.
17.00mm	301-1170
17.50mm	301-1175
17.75mm	301-1177
18.00mm	301-1180
19.75mm	301-1197
20.00mm	301-1200
20.50mm	301-1205
21.50mm	301-1215
22.00mm	301-1220
22.50mm	301-1225

Size	Model No.
23.75mm	301-1237
24.00mm	301-1240
25.00mm	301-1250
25.50mm	301-1255
26.00mm	301-1260
26.75mm	301-1267
27.00mm	301-1270
27.50mm	301-1275
28.50mm	301-1285
30.00mm	301-1300

Size	Model No.
30.50mm	301-1305
31.25mm	301-1312
32.00mm	301-1320
32.50mm	301-1325
33.00mm	301-1330
34.00mm	301-1340
34.50mm	301-1345
36.00mm	301-1360
37.00mm	301-1370
38.00mm	301-1380
41.00mm	301-1410

Metric Shank 10mm ,DIN338

Size	Model No.
10.5mm	301-0105
11.0mm	301-0110
11.5mm	301-0115
12.0mm	301-0120
12.5mm	301-0125
13.0mm	301-0130
13.5mm	301-0135
14.0mm	301-0140
14.5mm	301-0145
15.0mm	301-0150

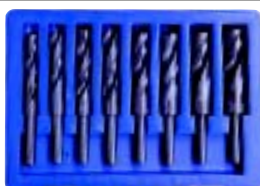
Size	Model No.
15.5mm	301-0155
16.0mm	301-0160
16.5mm	301-0165
17.0mm	301-0170
17.5mm	301-0175
18.0mm	301-0180
18.5mm	301-0185
19.0mm	301-0190
19.5mm	301-0195
20.0mm	301-0200

Metric Shank 8mm ,DIN338

Size	Model No.
8.5mm	301-0485
9.0mm	301-0490
9.5mm	301-0495
10.0mm	301-0500
10.5mm	301-0505
11.0mm	301-0510
11.5mm	301-0515
12.0mm	301-0520
12.5mm	301-0525
13.0mm	301-0530

DRILLS SET, DIN338

Metric Shank 13mm



Pieces/set	Shank	Description	Model No.
8	13mm	Size 13,14,15,16,18,20,22,25mm	301-1438



Cutting Tools

STRAIGHT SHANK 3 FLUTE SINGLE END MILLS

- Center cutting allows for plunge milling.
- Combines the chip carrying ability of 2 flute end mills and the excellent finish produced by 4flute end mills..
- Use in a wide range of ferrous and non-ferrous materials.
- Tin coating improves tool life and allows to elevate speeds and feeds.



Size	Shank Dia.	Flute Length	Overall Length	M2 Model No.	M2AI Model No.	Tin-Coated Model No.
3/32	3/8	5/16	2-5/16	720-3801	721-3801	722-3801
1/8	3/8	3/8	2-5/16	720-3803	721-3803	722-3803
3/16	3/8	1/2	2-3/8	720-3805	721-3805	722-3805
1/4	3/8	5/8	2-7/16	720-3807	721-3807	722-3807
5/16	3/8	3/4	2-1/2	720-3809	721-3809	722-3809
3/8	3/8	3/4	2-1/2	720-3811	721-3811	722-3811
7/16	3/8	1"	2-11/16	720-3813	721-3813	722-3813
7/16	1/2	1"	2-15/16	720-3815	721-3815	722-3815
1/2	3/8	1"	2-11/16	720-3817	721-3817	722-3817
1/2	1/2	1-1/4	3-1/4	720-3819	721-3819	722-3819
9/16	1/2	1-3/8	3-3/8	720-3821	721-3821	722-3821
5/8	1/2	1-3/8	3-3/8	720-3823	721-3823	722-3823
5/8	5/8	1-5/8	3-3/4	720-3825	721-3825	722-3825
11/16	1/2	1-5/8	3-5/8	720-3827	721-3827	722-3827
11/16	5/8	1-5/8	3-3/4	720-3829	721-3829	722-3829
3/4	5/8	1-5/8	3-3/4	720-3831	721-3831	722-3831
3/4	1/2	1-5/8	3-5/8	720-3833	721-3833	722-3833
3/4	3/4	1-5/8	3-7/8	720-3835	721-3835	722-3835
13/16	5/8	1-5/8	3-3/4	720-3837	721-3837	722-3837
13/16	3/4	1-5/8	3-7/8	720-3839	721-3839	722-3839
7/8	5/8	1-7/8	4"	720-3841	721-3841	722-3841

Size	Shank Dia.	Flute Length	Overall Length	M2 Model No.	M2AI Model No.	Tin-Coated Model No.
7/8	3/4	1-7/8	4-1/8	720-3843	721-3843	722-3843
7/8	7/8	1-7/8	4-7/8	720-3845	721-3845	722-3845
7/8	1/2	1-5/8	3-5/8	720-3847	721-3847	722-3847
15/16	7/8	1-7/8	4-1/8	720-3849	721-3849	722-3849
15/16	5/8	1-7/8	4"	720-3851	721-3851	722-3851
1"	5/8	1-7/8	4"	720-3853	721-3853	722-3853
1"	3/4	1-7/8	4-1/8	720-3855	721-3855	722-3855
1"	7/8	1-7/8	4-1/8	720-3857	721-3857	722-3857
1"	1"	2"	4-1/2	720-3859	721-3859	722-3859
1-1/8	1"	2"	4-1/2	720-3861	721-3861	722-3861
1-1/4	1"	2"	4-1/2	720-3863	721-3863	722-3863
1-1/4	1-1/4	2"	4-1/2	720-3865	721-3865	722-3865
1-3/8	1"	2"	4-1/2	720-3867	721-3867	722-3867
1-3/8	1-1/4	2"	4-1/2	720-3869	721-3869	722-3869
1-1/2	1"	2"	4-1/2	720-3871	721-3871	722-3871
1-1/2	1-1/4	2"	4-1/2	720-3873	721-3873	722-3873
1-3/4	1-1/4	2"	4-1/2	720-3875	721-3875	722-3875
2"	1-1/4	2"	4-1/2	720-3877	721-3877	722-3877
2"	2"	3"	5-3/4	720-3879	721-3879	722-3879
2-1/2	2"	4"	7-5/8	720-3881	721-3881	722-3881
2-1/2	2-1/2	4"	8"	720-3883	721-3883	722-3883

1/4" SHANK 3 FLUTE SINGLE END MILLS H.S.S



STUD LENGTH

Size	Shank Dia.	Flute Length	Overall Length	M2 Model No.	M2AI Model No.	Tin-Coated Model No.
1/16"	1/4"	3/32"	31/32"	720-3700	721-3700	722-3700
3/32	1/4	5/32	1-1/64	720-3702	721-3702	722-3702
1/8	1/4	3/16	1-3/32	720-3704	721-3704	722-3704
5/32	1/4	1/4	1-9/32	720-3706	721-3706	722-3706
3/16	1/4	9/32	1-11/32	720-3708	721-3708	722-3708
7/32	1/4	5/16	1-13/32	720-3710	721-3710	722-3710
1/4	1/4	3/8	1-13/32	720-3712	721-3712	722-3712

LONG LENGTH

Size	Shank Dia.	Flute Length	Overall Length	M2 Model No.	M2AI Model No.	Tin-Coated Model No.
1/16"	1/4"	5/32"	1-3/32"	720-3714	721-3714	722-3714
3/32	1/4	1/4	1-1/4	720-3716	721-3716	722-3716
1/8	1/4	5/16	1-11/32	720-3718	721-3718	722-3718
5/32	1/4	3/8	1-17/32	720-3720	721-3720	722-3720
3/16	1/4	7/16	1-21/32	720-3722	721-3722	722-3722
7/32	1/4	1/2	1-3/4	720-3724	721-3724	722-3724
1/4	1/4	5/8	1-3/4	720-3726	721-3726	722-3726

3 FLUTE DOUBLE END MILLS

H.S.S

- Use in a wide range of ferrous and non-ferrous materials.
- Tin coating improves tool life and allows elevated speeds and feeds.



Size	Shank Dia.	Flute Length	Overall Length	M2 Model No.	M2AI Model No.	Tin-Coated Model No.
3/32"	3/8"	5/16"	3-1/16"	720-3002	721-3002	722-3002
1/8	3/8	3/8	3-1/16	720-3004	721-3004	722-3004
5/32	3/8	7/16	3-1/8	720-3006	721-3006	722-3006
3/16	3/8	1/2	3-1/4	720-3008	721-3008	722-3008
7/32	3/8	9/16	3-1/4	720-3010	721-3010	722-3010
1/4	3/8	5/8	3-3/8	720-3012	721-3012	722-3012
9/32	3/8	11/16	3-3/8	720-3014	721-3014	722-3014
5/16	3/8	3/4	3-1/2	720-3016	721-3016	722-3016
11/32	3/8	3/4	3-1/2	720-3018	721-3018	722-3018
3/8	3/8	3/4	3-1/2	720-3020	721-3020	722-3020

Size	Shank Dia.	Flute Length	Overall Length	M2 Model No.	M2AI Model No.	Tin-Coated Model No.
7/16	1/2	1"	4-1/8"	720-3022	721-3022	722-3022
1/2	1/2	1"	4-1/8	720-3024	721-3024	722-3024
9/16	5/8	1-3/8	5"	720-3026	721-3026	722-3026
5/8	5/8	1-3/8	5"	720-3028	721-3028	722-3028
11/16	3/4	1-1/2	5-3/8	720-3030	721-3030	722-3030
3/4	3/4	1-1/2	5-3/8	720-3032	721-3032	722-3032
13/16	7/8	1-3/4	5-7/8	720-3034	721-3034	722-3034
7/8	7/8	1-3/4	5-7/8	720-3036	721-3036	722-3036
15/16	1"	1-3/4	6-1/8	720-3038	721-3038	722-3038
1"	1"	1-3/4	6-1/8	720-3040	721-3040	722-3040



2 FLUTE BALL NOSE SINGLE END MILLS

H.S.S., REGULAR LENGTH



- Designed for milling radius bottom slots, fillets and special contours.
- Center cutting design is used to plunge into solid material at the beginning of a slotting cut.
- 2 Flute design provides excellent chip evacuation.

Size	Shank Dia.	Flute Length	Overall Length	M2 Model No.	M2AI Model No.	Tin-Coated Model No.
1/8"	3/8"	3/8"	2-5/16"	720-1401	721-1401	722-1401
5/32	3/8	7/16	2-5/16	720-1402	721-1402	722-1402
3/16	3/8	1/2	2-3/8	720-1403	721-1403	722-1403
7/32	3/8	1/2	2-3/8	720-1404	721-1404	722-1404
1/4	3/8	5/8	2-7/16	720-1405	721-1405	722-1405
9/32	3/8	9/16	2-3/8"	720-1406	721-1406	722-1406
5/16	3/8	3/4	2-1/2	720-1407	721-1407	722-1407
11/32	3/8	3/4	2-1/2	720-1408	721-1408	722-1408
3/8	3/8	3/4	2-1/2	720-1409	721-1409	722-1409
7/16	1/2	1"	3"	720-1411	721-1411	722-1411
1/2	1/2	1"	3"	720-1413	721-1413	722-1413
9/16	1/2	1"	3"	720-1415	721-1415	722-1415
5/8	1/2	1-1/8	3-1/8	720-1417	721-1417	722-1417
5/8	5/8	1-3/8	3-3/8	720-1419	721-1419	722-1419

Size	Shank Dia.	Flute Length	Overall Length	M2 Model No.	M2AI Model No.	Tin-Coated Model No.
3/4"	1/2"	1-5/8"	3-5/8"	720-1421	721-1421	722-1421
3/4	3/4	1-5/8	3-7/8	720-1423	721-1423	722-1423
13/16	3/4	2"	4-1/4	720-1425	721-1425	722-1425
7/8	3/4	2"	4-1/4	720-1427	721-1427	722-1427
7/8	7/8	2"	4-1/4	720-1429	721-1429	722-1429
15/16	3/4	2-1/4	4-1/2	720-1431	721-1431	722-1431
1"	3/4	2-1/4	4-9/16	720-1433	721-1433	722-1433
1"	1"	2-1/4	4-3/4	720-1435	721-1435	722-1435
1-1/8	1"	2-1/4	4-3/4	720-1437	721-1437	722-1437
1-1/4	1-1/4	2-1/2	5"	720-1439	721-1439	722-1439
1-3/8	1-1/4	2-1/2	5"	720-1441	721-1441	722-1441
1-1/2	1-1/4	2-1/2	5"	720-1443	721-1443	722-1443
2"	1-1/4	2-1/2	5"	720-1445	721-1445	722-1445

2 FLUTE BALL NOSE SINGLE END MILLS for ALUMINUM

REGULAR LONG & EXTRA LONG FLUTE LENGTH

- Recommended for mill radius bottom slots and special contours in aluminum and other non-ferrous materials.
- The high helix angle shears the material cleanly and helps eliminate chatter.
- Tin coating add lubricity to minimize chip packing in th flutes.



Size	Shank Dia.	Flute Length	Overall Length	M2 Model No.	M2AI Model No.	Tin-Coated Model No.
1/4"	3/8"	5/8"	2-1/2"	720-1601	721-1601	722-1601
1/4	3/8	1-1/4	3-1/8	720-1603	721-1603	722-1603
1/4	3/8	1-3/4	3-1/2	720-1605	721-1605	722-1605
5/16	3/8	3/4	2-1/2	720-1607	721-1607	722-1607
5/16	3/8	1-3/8	3-1/8	720-1609	721-1609	722-1609
5/16	3/8	2"	3-3/4	720-1611	721-1611	722-1611
3/8	3/8	3/4	2-1/2	720-1613	721-1613	722-1613
3/8	3/8	1-1/2	3-1/4	720-1615	721-1615	722-1615
3/8	3/8	2-1/2	4-1/4	720-1617	721-1617	722-1617
7/16	3/8	1"	2-11/16	720-1619	721-1619	722-1619
7/16	1/2	1-3/4	3-3/4	720-1621	721-1621	722-1621
7/16	1/2	2-3/4	4-3/4	720-1623	721-1623	722-1623
1/2	1/2	1"	3-1/4	720-1625	721-1625	722-1625
1/2	1/2	2"	4"	720-1627	721-1627	722-1627

Size	Shank Dia.	Flute Length	Overall Length	M2 Model No.	M2AI Model No.	Tin-Coated Model No.
1/2"	1/2"	3"	5"	720-1629	721-1629	722-1629
5/8	5/8	1-5/8	3-3/4	720-1631	721-1631	722-1631
5/8	5/8	2-1/2	4-5/8	720-1633	721-1633	722-1633
5/8	5/8	4"	6-1/8	720-1635	721-1635	722-1635
3/4	3/4	1-5/8	3-7/8	720-1637	721-1637	722-1637
3/4	3/4	3"	5-1/4	720-1639	721-1639	722-1639
3/4	3/4	4"	6-1/4	720-1641	721-1641	722-1641
7/8	1-7/8	1-7/8	4-1/8	720-1643	721-1643	722-1643
7/8	7/8	3-1/2	5-3/4	720-1645	721-1645	722-1645
7/8	7/8	5"	7-1/4	720-1647	721-1647	722-1647
1"	3/4	1-7/8	4-1/8	720-1651	721-1651	722-1651
1"	1"	2"	4-1/2	720-1653	721-1653	722-1653
1"	1"	4"	6-1/2	720-1655	721-1655	722-1655
1"	1"	6"	8-1/2	720-1657	721-1657	722-1657

2 FLUTE BALL NOSE SINGLE END MILLS

EXTENDED SHANK



Size	Shank Dia.	Shank Length	Flute Length	Overall Length	M2 Model No.	M2AI Model No.	Tin-Coated Model No.
1/8"	3/8"	13/16"	3/8"	2-3/8"	720-1451	721-1451	722-1451
3/16	3/8	1-1/8	1/2	2-11/16	720-1453	721-1453	722-1453
1/4	3/8	1-1/2	5/8	3-1/16	720-1455	721-1455	722-1455
5/16	3/8	1-3/4	3/4	3-5/16	720-1457	721-1457	722-1457
3/8	3/8	1-3/4	3/4	3-5/16	720-1459	721-1459	722-1459
7/16	1/2	1-7/8	1"	3-11/16	720-1461	721-1461	722-1461
1/2	1/2	2-1/4	1"	4"	720-1463	721-1463	722-1463
5/8	5/8	2-3/4	1-3/8	4-5/8	720-1465	721-1465	722-1465
3/4	3/4	3-3/8	1-5/8	5-3/8	720-1467	721-1467	722-1467
1"	1"	5"	2-1/2	7-1/4	720-1469	721-1469	722-1469



Cutting Tools

MULTIPLE FLUTE SINGLE END MILLS

Long Flute



Size	Shank Flute		Overall Length	No. of Flutes	M2		Tin-Coated Model No.
	Dia.	Length			Model No.	M2AI Model No.	
1/4	3/8	1-1/4	3-1/16	4	720-3501	721-3501	722-3501
5/16	3/8	1-3/8	3-1/8	4	720-3503	721-3503	722-3503
3/8	3/8	1-1/2	3-1/4	4	720-3505	721-3505	722-3505
7/16	1/2	1-3/4	3-3/4	4	720-3507	721-3507	722-3507
1/2	1/2	2"	4"	4	720-3509	721-3509	722-3509
5/8	5/8	2-1/2	4-5/8	4	720-3511	721-3511	722-3511
5/8	1/2	2-1/2	4-5/8	4	720-3512	721-3512	722-3512
3/4	3/4	3"	5-1/4	4	720-3513	721-3513	722-3513
3/4	1/2	3"	5-1/4	4	720-3514	721-3514	722-3514
7/8	7/8	3-1/2	5-3/4	4	720-3515	721-3515	722-3515
7/8	3/4	3-1/2	5-3/4	4	720-3516	721-3516	722-3516
1"	1"	4"	6-1/2	4	720-3517	721-3517	722-3517
1-1/8	1"	4"	6-1/2	6	720-3519	721-3519	722-3519
1-1/4	3/4	4"	6-1/2	6	720-3520	721-3520	722-3520

Size	Shank Flute		Overall Length	No. of Flutes	M2		Tin-Coated Model No.
	Dia.	Length			Model No.	M2AI Model No.	
1-1/4	1"	4"	6-1/2	6	720-3521	721-3521	722-3521
1-1/4	1-1/4	4"	6-1/2	4	720-3523	721-3523	722-3523
1-1/4	1-1/4	4"	6-1/2	6	720-3525	721-3525	722-3525
1-3/8	1"	4"	6-1/2	6	720-3527	721-3527	722-3527
1-1/2	1"	4"	6-1/2	6	720-3529	721-3529	722-3529
1-1/2	1-1/4	4"	6-1/2	4	720-3531	721-3531	722-3531
1-1/2	1-1/4	4"	6-1/2	6	720-3533	721-3533	722-3533
1-3/4	1-1/4	4"	6-1/2	4	720-3534	721-3534	722-3534
1-3/4	1-1/4	4"	6-1/2	6	720-3535	721-3535	722-3535
2"	1-1/4	4"	6-1/2	4	720-3537	721-3537	722-3537
2"	1-1/4	4"	6-1/2	6	720-3539	721-3539	722-3539
2"	1-1/4	4"	6-1/2	8	720-3541	721-3541	722-3541
2-1/2	2"	4"	7-5/8	6	720-3542	721-3542	722-3542

MULTIPLE FLUTE SINGLE END MILLS

EXTRA LONG FLUTE



Size	Shank Flute		Overall Length	No. of Flutes	M2		Tin-Coated Model No.
	Dia.	Length			Model No.	M2AI Model No.	
1/4	3/8	1-3/4	3-9/16	4	720-3601	721-3601	722-3601
5/16	3/8	2"	3-3/4	4	720-3603	721-3603	722-3603
3/8	3/8	2-1/2	4-1/4	4	720-3605	721-3605	722-3605
1/2	1/2	3"	5"	4	720-3607	721-3607	722-3607
5/8	5/8	4"	6-1/8	4	720-3609	721-3609	722-3609
5/8	1/2	4"	6-1/8	4	720-3610	721-3610	722-3610
3/4	3/4	4"	6-1/4	4	720-3611	721-3611	722-3611
3/4	1/2	4"	6-1/4	4	720-3612	721-3612	722-3612

Size	Shank Flute		Overall Length	No. of Flutes	M2		Tin-Coated Model No.
	Dia.	Length			Model No.	M2AI Model No.	
7/8	7/8	5"	7-1/4	4	720-3613	721-3613	722-3613
1"	1"	6"	8-1/2	4	720-3615	721-3615	722-3615
1-1/4	1-1/4	6"	8-1/2	6	720-3617	721-3617	722-3617
1-1/4	1-1/4	6"	8-1/2	4	720-3618	721-3618	722-3618
1-1/2	1-1/4	6"	8-1/2	6	720-3619	721-3619	722-3619
1-1/2	1-1/4	6"	8-1/2	4	720-3620	721-3620	722-3620
1-1/2	1-1/4	8"	10-9/16	6	720-3621	721-3621	722-3621

MULTIPLE FLUTE HEAVY DUTY END MILLS

LARGE DIAMETER, POSITIVE LOCK.

- Designed for rough cutting applications in a wide range of materials.
- Positive lock shank provides the grip needed to withstand the high torque generated.



Size	Shank Flute		Overall Length	No. of Flutes	M2		Tin-Coated Model No.
	Dia.	Length			Model No.	M2AI Model No.	
2"	2"	2"	5-3/4	4	720-3910	721-3910	722-3910
2"	2"	3"	6-3/4	4	720-3912	721-3912	722-3912
2"	2"	4"	7-3/4	4	720-3914	721-3914	722-3914
2"	2"	4"	7-3/4	6	720-3916	721-3916	722-3916
2"	2"	6"	9-3/4	4	720-3918	721-3918	722-3918
2"	2"	6"	9-3/4	6	720-3920	721-3920	722-3920
2"	2"	8"	11-3/4	4	720-3921	721-3921	722-3921
2"	2"	8"	11-3/4	6	720-3922	721-3922	722-3922
2"	2"	10"	13-3/4	4	720-3923	721-3923	722-3923
2"	2"	10"	13-3/4	6	720-3924	721-3924	722-3924
2"	2"	12"	15-3/4	4	720-3925	721-3925	722-3925
2"	2"	12"	15-3/4	6	720-3926	721-3926	722-3926
2-1/2	2-1/2	4"	7-3/4	4	720-3927	721-3927	722-3927
2-1/2	2-1/2	4"	7-3/4	6	720-3928	721-3928	722-3928

Size	Shank Flute		Overall Length	No. of Flutes	M2		Tin-Coated Model No.
	Dia.	Length			Model No.	M2AI Model No.	
2-1/2	2-1/2	6"	9-3/4	4	720-3929	721-3929	722-3929
2-1/2	2-1/2	6"	9-3/4	6	720-3930	721-3930	722-3930
2-1/2	2-1/2	8"	11-3/4	4	720-3931	721-3931	722-3931
2-1/2	2-1/2	8"	11-3/4	6	720-3932	721-3932	722-3932
2-1/2	2-1/2	10"	13-3/4	4	720-3933	721-3933	722-3933
2-1/2	2-1/2	10"	13-3/4	6	720-3934	721-3934	722-3934
3"	2-1/2	4"	8"	4	720-3935	721-3935	722-3935
3"	2-1/2	4"	8"	6	720-3936	721-3936	722-3936
3"	2-1/2	6"	10"	4	720-3937	721-3937	722-3937
3"	2-1/2	6"	10"	6	720-3938	721-3938	722-3938
3"	2-1/2	8"	12"	4	720-3939	721-3939	722-3939
3"	2-1/2	8"	12"	6	720-3940	721-3940	722-3940
3"	2-1/2	10"	14"	4	720-3941	721-3941	722-3941
3"	2-1/2	10"	14"	6	720-3942	721-3942	722-3942



Cutting Tools

4FLUTE CENTERCUTTING DOUBLE END MILLS

High Speed Steel

- Center cutting design allows for plunge milling into solid material at the beginning of a slotting operation.



Size	Shank Dia.	Flute Length	Overall Length	M2 Model No.	M2AI Model No.	TiN-COATED Model No.
1/8	3/8	3/8	3-1/16	720-4102	721-4102	722-4102
3/16	3/8	1/2	3-1/4	720-4104	721-4104	722-4104
1/4	3/8	5/8	3-3/8	720-4106	721-4106	722-4106
5/16	3/8	3/4	3-1/2	720-4108	721-4108	722-4108
3/8	3/8	3/4	3-1/2	720-4110	721-4110	722-4110
1/2	1/2	1"	4-1/8	720-4112	721-4112	722-4112
5/8	5/8	1-3/8	5"	720-4114	721-4114	722-4114
3/4	3/4	1-5/8	5-5/8	720-4116	721-4116	722-4116
7/8	7/8	1-7/8	6-1/8	720-4118	721-4118	722-4118
1"	1"	1-7/8	6-3/8	720-4120	721-4120	722-4120

4FLUTE DOUBLE END MILLS

High Speed Steel

- Recommended for finishing operations in a wide range of ferrous and non-ferrous materials.
- Multiple flutes generate higher surface finish than 2 flute end mills.
- More economical in production milling than single end mills.



Size	Shank Dia.	Flute Length	Overall Length	M2 Model No.	M2AI Model No.	TiN-COATED Model No.
7/64	3/8	3/8	3-1/16	720-4002	721-4002	722-4002
1/8	3/8	3/8	3-1/16	720-4004	721-4004	722-4004
9/64	3/8	7/16	3-1/8	720-4006	721-4006	722-4006
5/32	3/8	7/16	3-1/8	720-4008	721-4008	722-4008
11/64	3/8	7/16	3-1/8	720-4011	721-4011	722-4011
11/64	3/8	1/2	3-1/4	720-4010	721-4010	722-4010
3/16	3/8	1/2	3-1/4	720-4012	721-4012	722-4012
13/64	3/8	1/2	3-1/4	720-4013	721-4013	722-4013
13/64	3/8	9/16	3-1/4	720-4014	721-4014	722-4014
7/32	3/8	9/16	3-1/4	720-4016	721-4016	722-4016
15/64	3/8	9/16	3-1/4	720-4017	721-4017	722-4017
15/64	3/8	5/8	3-3/8	720-4018	721-4018	722-4018
1/4	3/8	5/8	3-3/8	720-4020	721-4020	722-4020
17/64	3/8	11/16	3-3/8	720-4022	721-4022	722-4022
9/32	3/8	11/16	3-3/8	720-4024	721-4024	722-4024
19/64	3/8	11/16	3-3/8	720-4025	720-4025	720-4025
19/64	3/8	3/4	3-1/2	720-4026	721-4026	722-4026
5/16	3/8	3/4	3-1/2	720-4028	721-4028	722-4028
21/64	3/8	3/4	3-1/2	720-4030	721-4030	722-4030
11/32	3/8	3/4	3-1/2	720-4032	721-4032	722-4032
23/64	3/8	3/4	3-1/2	720-4034	721-4034	722-4034
3/8	3/8	3/4	3-1/2	720-4036	721-4036	722-4036
25/64	1/2	1"	4-1/8	720-4038	721-4038	722-4038
13/32	1/2	1"	4-1/8	720-4040	721-4040	722-4040
13/32	1/2	1"	4-3/16	720-4039	721-4039	722-4039
27/64	1/2	1"	4-1/8	720-4042	721-4042	722-4042
7/16	1/2	1"	4-1/8	720-4044	721-4044	722-4044
29/64	1/2	1"	4-1/8	720-4046	721-4046	722-4046
15/32	1/2	1"	4-1/8	720-4048	721-4048	722-4048
31/64	1/2	1"	4-1/8	720-4050	721-4050	722-4050
1/2	1/2	1"	4-1/8	720-4052	721-4052	722-4052
17/32	5/8	1-3/8	5"	720-4054	721-4054	722-4054
9/16	5/8	1-3/8	5"	720-4056	721-4056	722-4056
19/32	5/8	1-3/8	5"	720-4058	721-4058	722-4058
5/8	5/8	1-3/8	5"	720-4060	721-4060	722-4060
21/32	3/4	1-5/8	5-5/8	720-4062	721-4062	722-4062
11/16	3/4	1-5/8	5-5/8	720-4064	721-4064	722-4064
23/32	3/4	1-5/8	5-5/8	720-4066	721-4066	722-4066
3/4	3/4	1-5/8	5-5/8	720-4068	721-4068	722-4068
25/32	7/8	1-7/8	6-1/8	720-4070	721-4070	722-4070
13/16	7/8	1-7/8	6	720-4072	721-4072	722-4072
27/32	7/8	1-7/8	6-1/8	720-4074	721-4074	722-4074
7/8	7/8	1-7/8	6-1/8	720-4076	721-4076	722-4076
29/32	1"	1-7/8	6-3/8	720-4078	721-4078	722-4078
15/16	1"	1-7/8	6-3/8	720-4080	721-4080	722-4080
31/32	1"	1-7/8	6-3/8	720-4082	721-4082	722-4082
1"	1"	1-7/8	6-3/8	720-4084	721-4084	722-4084

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Cutting Tools



ROUGHING END MILLS

High Speed Steel

Regular Length



Size	Shank Dia.	Flute Length	Overall Length	No. Of Flutes	M2 Model No.	M2AI Model No.
1/4	3/8	3/4	2-1/2	4	720-5001	721-5001
1/4	3/8	5/8	2-7/16	4	720-5002	721-5002
1/4	3/8	1-1/4	3-1/16	4	720-5003	721-5003
5/16	3/8	3/4	2-1/2	4	720-5005	721-5005
5/16	3/8	1-3/8	3-1/8	4	720-5007	721-5007
3/8	3/8	3/4	2-1/2	4	720-5008	721-5008
3/8	3/8	7/8	2-5/8	4	720-5009	721-5009
3/8	3/8	1-1/2	3-1/4	4	720-5011	721-5011
7/16	3/8	1"	2-11/16	4	720-5012	721-5012
1/2	1/2	1-1/4	3-1/4	4	720-5013	721-5013
5/8	5/8	1-5/8	3-3/4	4	720-5017	721-5017
11/16	5/8	1-5/8	3-3/4	4	720-5019	721-5019
3/4	5/8	1-5/8	3-3/4	4	720-5020	721-5020
3/4	5/8	1-5/8	3-7/8	4	720-5021	721-5021
3/4	3/4	1-5/8	3-3/4	4	720-5025	721-5025
7/8	3/4	1-5/8	4-1/8	4	720-5027	721-5027
7/8	7/8	1-7/8	4-1/8	4	720-5029	721-5029
15/16	3/4	1-7/8	4-1/8	4	720-5031	721-5031
1"	3/4	2"	4-1/2	6	720-5033	721-5033
1"	1"	2"	4-1/2	6	720-5035	721-5035

Size	Shank Dia.	Flute Length	Overall Length	No. Of Flute	M2 Model No.	M2AI Model No.
1-1/8	3/4	2"	4-1/2	6	720-5037	721-5037
1-1/8	1	2"	4-1/2	6	720-5039	721-5039
1-1/4	3/4	2"	4-1/2	6	720-5041	721-5041
1-1/4	1-1/4	2"	4-1/2	6	720-5043	721-5043
1-1/2	3/4	2"	4-1/2	6	720-5045	721-5045
1-1/2	1-1/4	2"	4-1/2	6	720-5047	721-5047
1-3/4	3/4	2"	4-1/2	6	720-5049	721-5049
1-3/4	1-1/4	2"	4-1/2	6	720-5051	721-5051
2"	3/4	2"	4-1/2	8	720-5053	721-5053
2"	1-1/4	2"	4-1/2	6	720-5054	721-5054
2"	1-1/4	2"	4-1/2	8	720-5055	721-5055
2"	1-1/4	2"	6-1/2	8	720-5056	721-5056
2"	2"	2"	5-3/4	8	720-5057	721-5057
2"	2"	3"	6-3/4	6	720-5058	721-5058
2"	2"	4"	7-3/4	8	720-5059	721-5059
2"	2"	4"	7-3/4	6	720-5060	721-5060
2-1/2	2"	4"	7-3/4	8	720-5061	721-5061
2-1/2	2-1/2	4"	7-3/4	8	720-5063	721-5063
2"	2"	3"	6-3/4	8	720-5065	721-5065

Medium Length

Size	Shank Dia.	Flute Length	Overall Length	No. of flutes	M2 Model No.	M2AI ModelNo.
2"	2"	5"	8-3/4	8	720-5101	721-5101
2"	2"	6"	9-3/4	8	720-5103	721-5103
2-1/2	2"	6"	9-3/4	8	720-5105	721-5105
2-1/2	2-1/2	6"	9-3/4	8	720-5107	721-5107

Long Length

Size	Shank Dia.	Flute Length	Overall Length	No. of flutes	M2 Model No.	M2AI Model No.
1/2	1/2	2"	4"	4	720-5201	721-5201
5/8	5/8	2-1/2	4-5/8	4	720-5203	721-5203
3/4	5/8	3"	5-1/4	4	720-5205	721-5205
3/4	5/8	3"	5-1/8	4	720-5207	721-5207
3/4	3/4	3"	5-1/4	4	720-5209	721-5209
7/8	3/4	3-1/2	5-5/8	4	720-5211	721-5211
7/8	7/8	3-1/2	5-3/4	4	720-5213	721-5213
1"	1"	4"	6-1/2	6	720-5215	721-5215
1"	1"	6"	8-1/2	6	720-5217	721-5217
1-1/4	1-1/4	3"	5-1/2	6	720-5218	721-5218
1-1/4	3/4	4"	6-1/4	6	720-5219	721-5219
1-1/4	1-1/4	4"	6-1/2	6	720-5221	721-5221
1-1/4	1-1/4	6"	8-1/2	6	720-5223	721-5223
1-1/2	1-1/4	3"	5-1/2	6	720-5224	721-5224
1-1/2	3/4	4"	6-1/4	6	720-5225	721-5225

Size	Shank Dia.	Flute Length	Overall Length	No. of flute	M2 Model No.	M2AI Model No.
1-1/2	1-1/4	4"	6-1/2	6	720-5227	721-5227
1-1/2	1-1/4	5"	7-1/2	6	720-5228	721-5228
1-1/2	1-1/4	6"	8-1/2	6	720-5229	721-5229
1-3/4	1-1/4	4"	6-1/2	6	720-5231	721-5231
2"	1-1/4	4"	6-1/2	6	720-5232	721-5232
2"	1-1/4	4"	6-1/2	8	720-5233	721-5233
2"	2"	6"	9-3/4	6	720-5234	721-5234
2"	2"	7"	10-3/4	8	720-5235	721-5235
2"	2"	8"	11-3/4	6	720-5236	721-5236
2"	2"	8"	11-3/4	8	720-5237	721-5237
2"	2"	10"	13-3/4	8	720-5239	721-5239
2"	2"	12"	15-3/4	8	720-5241	721-5241
2-1/2	2"	8"	11-3/4	8	720-5243	721-5243
2-1/2	2-1/2	8"	11-3/4	8	720-5245	721-5245
2-1/2	2-1/2	10"	13-3/4	8	720-5247	721-5247
2-1/2	2-1/2	12"	15-3/4	8	720-5249	721-5249

5 FLUTE ROUGHING END MILLS WITH STRAIGHT SHANK.H.S.S.



Size	Shank Dia.	Flute Length	Overall Length	M2 Model No.	M2AI Model No.
7/8"	3/4"	1-7/8"	4-1/8"	720-5701	721-5701
7/8	3/8	3-1/2	5-3/4	720-5703	721-5703
7/8	7/8	1-7/8	4-1/8	720-5705	721-5705
7/8	7/8	3-1/2	5-3/4	720-5707	721-5707

Size	Shank Dia.	Flute Length	Overall Length	M2 Model No.	M2AI Model No.
1"	3/4	2"	4-1/2	720-5709	721-5709
1"	1"	2"	4-1/2	720-5711	721-5711
1"	1"	4"	6-1/2	720-5713	721-5713
1-1/8	1"	2"	4-1/2	720-5715	721-5715



Cutting Tools

INCH SHANK METRIC SIZE

2FLUTE SINGLE END MILLS



Size	Shank Dia.	Flute Length	Overall Length	M2 Model No.	M2AI Model No.	Tin-Coated Model No.
5mm	3/8	1/2	2-5/16	720-9050	721-9050	722-9050
6mm	3/8	1/2	2-5/16	720-9060	721-9060	722-9060
7mm	3/8	9/16	2-5/16	720-9070	721-9070	722-9070
8mm	3/8	9/16	2-5/16	720-9080	721-9080	722-9080
9mm	3/8	9/16	2-5/16	720-9090	721-9090	722-9090
10mm	3/8	13/16	2-1/2	720-9100	721-9100	722-9100
11mm	3/8	13/16	2-1/2	720-9110	721-9110	722-9110
12mm	1/2	1	3"	720-9120	721-9120	722-9120
13mm	1/2	1-1/8	3-1/8	720-9130	721-9130	722-9130
14mm	1/2	1-1/8	3-1/8	720-9140	721-9140	722-9140
15mm	1/2	1-1/8	3-1/8	720-9150	721-9150	722-9150
16mm	1/2	1-5/16	3-5/16	720-9160	721-9160	722-9160
18mm	1/2	1-5/16	3-5/16	720-9180	721-9180	722-9180
20mm	3/4	1-1/2	3-3/4	720-9200	721-9200	722-9200
22mm	7/8	1-1/2	3-3/4	720-9220	721-9220	722-9220
24mm	7/8	1-1/2	3-3/4	720-9240	721-9240	722-9240
25mm	1"	1-5/8	4-1/8	720-9250	721-9250	722-9250

4FLUTE SINGLE END MILLS



Size	Shank Dia.	Flute Length	Overall Length	M2 Model No.	M2AI Model No.	Tin-Coated Model No.
5mm	3/8	9/16	2-7/16	720-8050	721-8050	722-8050
6mm	3/8	5/8	2-1/2	720-8060	721-8060	722-8060
7mm	3/8	5/8	2-1/2	720-8070	721-8070	722-8070
8mm	3/8	3/4	2-1/2	720-8080	721-8080	722-8080
9mm	3/8	3/4	2-1/2	720-8090	721-8090	722-8090
10mm	3/8	3/4	2-1/2	720-8100	721-8100	722-8100
11mm	3/8	1"	2-11/16	720-8110	721-8110	722-8110
12mm	3/8	1"	2-11/16	720-8120	721-8120	722-8120
13mm	1/2	1-1/4	3-1/4	720-8130	721-8130	722-8130
14mm	1/2	1-3/8	3-3/8	720-8140	721-8140	722-8140
15mm	1/2	1-3/8	3-3/8	720-8150	721-8150	722-8150
16mm	5/8	1-5/8	3-3/4	720-8160	721-8160	722-8160
18mm	3/4	1-5/8	3-3/4	720-8180	721-8180	722-8180
20mm	3/4	1-7/8	4-1/8	720-8200	721-8200	722-8200
22mm	7/8	1-7/8	4-1/8	720-8220	721-8220	722-8220
24mm	7/8	1-7/8	4-1/8	720-8240	721-8240	722-8240
25mm	1"	2"	4-1/2	720-8250	721-8250	722-8250

2FLUTE END MILLS, DIN327 e8



Size (mm)	Shank Dia.	Flute Length	Overall Length	M2HSS		M42HSS	
				M2HSS Model No.	Tin-Coated Model No.	M42HSS Model No.	Tin-Coated Model No.
2	6	4	48	713-1020	713-2020	713-5020	713-6020
2.5	6	5	49	713-1025	713-2025	713-5025	713-6025
3	6	6	50	713-1030	713-2030	713-5030	713-6030
3.5	6	7	51	713-1035	713-2035	713-5035	713-6035
4	6	7	51	713-1040	713-2040	713-5040	713-6040
4.5	6	8	52	713-1045	713-2045	713-5045	713-6045
5	6	8	52	713-1050	713-2050	713-5050	713-6050
5.5	6	8	52	713-1055	713-2055	713-5055	713-6055
6	6	8	52	713-1060	713-2060	713-5060	713-6060
6.5	10	10	60	713-1065	713-2065	713-5065	713-6065
7	10	10	60	713-1070	713-2070	713-5070	713-6070
7.5	10	11	61	713-1075	713-2075	713-5075	713-6075
8	10	11	61	713-1080	713-2080	713-5080	713-6080
8.5	10	13	63	713-1085	713-2085	713-5085	713-6085
9	10	13	63	713-1090	713-2090	713-5090	713-6090
10	10	13	63	713-1100	713-2100	713-5100	713-6100
11	12	16	73	713-1110	713-2110	713-5110	713-6110

Size (mm)	Shank Dia.	Flute Length	Overall Length	M2HSS		M42HSS	
				M2HSS Model No.	Tin-Coated Model No.	M42HSS Model No.	Tin-Coated Model No.
12	12	16	73	713-1120	713-2120	713-5120	713-6120
13	12	16	73	713-1130	713-2130	713-5130	713-6130
14	12	16	73	713-1140	713-2140	713-5140	713-6140
15	12	16	73	713-1150	713-2150	713-5150	713-6150
16	16	19	79	713-1160	713-2160	713-5160	713-6160
17	16	19	79	713-1170	713-2170	713-5170	713-6170
18	16	19	79	713-1180	713-2180	713-5180	713-6180
19	16	19	79	713-1190	713-2190	713-5190	713-6190
20	20	22	88	713-1200	713-2200	713-5200	713-6200
21	20	22	88	713-1210	713-2210	713-5210	713-6210
22	20	22	88	713-1220	713-2220	713-5220	713-6220
23	20	22	88	713-1230	713-2230	713-5230	713-6230
24	25	26	102	713-1240	713-2240	713-5240	713-6240
25	25	26	102	713-1250	713-2250	713-5250	713-6250
26	25	26	102	713-1260	713-2260	713-5260	713-6260
28	25	26	102	713-1280	713-2280	713-5280	713-6280

4FLUTE END MILLS, LONG LENGTH, DIN844 h10



Size (mm)	Shank Dia.	Flute Length	Overall Length	M2HSS		M42HSS	
				M2HSS Model No.	Tin-Coated Model No.	M42HSS Model No.	Tin-Coated Model No.
2	6	10	54	715-1020	715-2020	715-5020	715-6020
3	6	12	56	715-1030	715-2030	715-5030	715-6030
4	6	19	63	715-1040	715-2040	715-5040	715-6040
5	6	24	68	715-1050	715-2050	715-5050	715-6050
6	6	24	68	715-1060	715-2060	715-5060	715-6060
7	10	30	80	715-1070	715-2070	715-5070	715-6070
8	10	38	88	715-1080	715-2080	715-5080	715-6080
10	10	45	95	715-1100	715-2100	715-5100	715-6100
12	12	53	110	715-1120	715-2120	715-5120	715-6120

Size (mm)	Shank Dia.	Flute Length	Overall Length	M2HSS		M42HSS	
				M2HSS Model No.	Tin-Coated Model No.	M42HSS Model No.	Tin-Coated Model No.
14	12	53	110	715-1140	715-2140	715-5140	715-6140
16	16	63	123	715-1160	715-2160	715-5160	715-6160
18	16	63	123	715-1180	715-2180	715-5180	715-6180
20	20	75	141	715-1200	715-2200	715-5200	715-6200
22	20	75	141	715-1220	715-2220	715-5220	715-6220
25	25	90	166	715-1250	715-2250	715-5250	715-6250
28	25	90	166	715-1280	715-2280	715-5280	715-6280
30	25	90	166	715-1300	715-2300	715-5300	715-6300

Cutting Tools



4FLUTE END MILLS, DIN844 h10



Size (mm)	Shank Dia.	Flute Length	Overall Length	M2HSS		M42HSS	
				Model No.	Tin-Coated Model No.	Model No.	Tin-Coated Model No.
2	6	7	51	714-1020	714-2020	714-5020	714-6020
3	6	8	52	714-1030	714-2030	714-5030	714-6030
4	6	11	55	714-1040	714-2040	714-5040	714-6040
5	6	13	57	714-1050	714-2050	714-5050	714-6050
6	6	13	57	714-1060	714-2060	714-5060	714-6060
7	10	16	66	714-1070	714-2070	714-5070	714-6070
8	10	19	69	714-1080	714-2080	714-5080	714-6080
9	10	19	69	714-1090	714-2090	714-5090	714-6090
10	10	22	72	714-1100	714-2100	714-5100	714-6100
11	10	22	79	714-1110	714-2110	714-5110	714-6110
12	10	26	83	714-1120	714-2120	714-5120	714-6120
13	12	26	83	714-1130	714-2130	714-5130	714-6130
14	12	26	83	714-1140	714-2140	714-5140	714-6140
15	12	26	83	714-1150	714-2150	714-5150	714-6150
16	16	32	92	714-1160	714-2160	714-5160	714-6160
17	16	32	92	714-1170	714-2170	714-5170	714-6170
18	16	32	92	714-1180	714-2180	714-5180	714-6180
19	16	32	92	714-1190	714-2190	714-5190	714-6190
20	20	38	104	714-1200	714-2200	714-5200	714-6200
21	20	38	104	714-1210	714-2210	714-5210	714-6210
22	20	38	104	714-1220	714-2220	714-5220	714-6220
23	20	38	104	714-1230	714-2230	714-5230	714-6230
24	25	45	121	714-1240	714-2240	714-5240	714-6240
25	25	45	121	714-1250	714-2250	714-5250	714-6250
26	25	45	121	714-1260	714-2260	714-5260	714-6260
28	25	45	121	714-1280	714-2280	714-5280	714-6280
30	25	45	121	714-1300	714-2300	714-5300	714-6300
32	32	53	133	714-1320	714-2320	714-5320	714-6320

ROUGHING END MILLS, DIN STANDARD



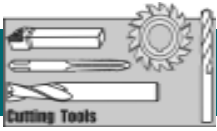
Size (mm)	Shank Dia.	Flute Length	Overall Length	No.s of Flutes	M2HSS		M42HSS	
					Model No.	Tin-Coated Model No.	Model No.	Tin-Coated Model No.
6	6	13	57	4	716-1060	716-2060	716-5060	716-6060
8	10	19	69	4	716-1080	716-2080	716-5080	716-6080
10	10	22	72	4	716-1100	716-2100	716-5100	716-6100
11	12	22	79	4	716-1110	716-2110	716-5110	716-6110
12	12	26	83	4	716-1120	716-2120	716-5120	716-6120
14	12	26	83	4	716-1140	716-2140	716-5140	716-6140
16	16	32	92	4	716-1160	716-2160	716-5160	716-6160
18	16	32	92	4	716-1180	716-2180	716-5180	716-6180
20	20	38	104	4	716-1200	716-2200	716-5200	716-6200
22	20	38	104	4	716-1220	716-2220	716-5220	716-6220
22	20	38	104	5	716-1221	716-2221	716-5221	716-6221
25	25	45	121	4	716-1250	716-2250	716-5250	716-6250
25	25	45	121	5	716-1251	716-2251	716-5251	716-6251
28	25	45	121	6	716-1280	716-2280	716-5280	716-6280
30	25	45	121	5	716-1300	716-2300	716-5300	716-6300
30	25	45	121	6	716-1301	716-2301	716-5301	716-6301
32	32	53	133	5	716-1320	716-2320	716-5320	716-6320
32	32	53	133	6	716-1321	716-2321	716-5321	716-6321
38	32	53	133	6	716-1380	716-2380	716-5380	716-6380
40	40	63	155	6	716-1400	716-2400	716-5400	716-6400
40	40	63	155	8	716-1401	716-2401	716-5401	716-6401
45	40	63	155	6	716-1450	716-2450	716-5450	716-6450
45	40	63	155	8	716-1451	716-2451	716-5451	716-6451
50	50	75	177	6	716-1500	716-2500	716-5500	716-6500
50	50	75	177	8	716-1501	716-2501	716-5501	716-6501
55	50	75	177	6	716-1550	716-2550	716-5550	716-6550
55	50	75	177	8	716-1551	716-2551	716-5551	716-6551
63	63	90	202	6	716-1630	716-2630	716-5630	716-6630
63	63	90	202	8	716-1631	716-2631	716-5631	716-6631
71	63	90	202	6	716-1710	716-2710	716-5710	716-6710
71	63	90	202	8	716-1711	716-2711	716-5711	716-6711

4 FLUTE BALL NOSE END MILLS, DIN STANDARD

Size (mm)	Shank Dia.	Flute Length	Overall Length	M2HSS		M42HSS	
				Model No.	Tin-Coated Model No.	Model No.	Tin-Coated Model No.
2	6	7	51	719-1020	719-2020	719-5020	719-6020
3	6	8	52	719-1030	719-2030	719-5030	719-6030
4	6	11	55	719-1040	719-2040	719-5040	719-6040
5	6	13	57	719-1050	719-2050	719-5050	719-6050
6	6	13	57	719-1060	719-2060	719-5060	719-6060
7	10	16	66	719-1070	719-2070	719-5070	719-6070
8	10	19	69	719-1080	719-2080	719-5080	719-6080
9	10	19	69	719-1090	719-2090	719-5090	719-6090
10	10	22	72	719-1100	719-2100	719-5100	719-6100
11	10	22	79	719-1110	719-2110	719-5110	719-6110
12	10	26	83	719-1120	719-2120	719-5120	719-6120
13	12	26	83	719-1130	719-2130	719-5130	719-6130
14	12	26	83	719-1140	719-2140	719-5140	719-6140
15	12	26	83	719-1150	719-2150	719-5150	719-6150
16	16	32	92	719-1160	719-2160	719-5160	719-6160



Size (mm)	Shank Dia.	Flute Length	Overall Length	M2HSS		M42HSS	
				Model No.	Tin-Coated Model No.	Model No.	Tin-Coated Model No.
17	16	32	92	719-1170	719-2170	719-5170	719-6170
18	16	32	92	719-1180	719-2180	719-5180	719-6180
19	16	32	92	719-1190	719-2190	719-5190	719-6190
20	20	38	104	719-1200	719-2200	719-5200	719-6200
21	20	38	104	719-1210	719-2210	719-5210	719-6210
22	20	38	104	719-1220	719-2220	719-5220	719-6220
23	20	38	104	719-1230	719-2230	719-5230	719-6230
24	25	26	102	719-1240	719-2240	719-5240	719-6240
25	25	26	102	719-1250	719-2250	719-5250	719-6250



Cutting Tools

ROUGHING END MILLS, LONG LENGTH DIN STANDARD



2 FLUTE BALL NOSE END MILLS DIN STANDARD



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Size (mm)	Shank Dia. (mm)	Flute Length	Overall Length	No.s of Flutes	M2HSS			M42HSS
					M2HSS	Tin-Coated	M42HSS	Tin-Coated
6	6	24	68	4	717-1060	717-2060	717-5060	717-6060
8	10	38	88	4	717-1080	717-2080	717-5080	717-6080
10	10	45	95	4	717-1100	717-2100	717-5100	717-6100
11	12	45	102	4	717-1110	717-2110	717-5110	717-6110
12	12	53	110	4	717-1120	717-2120	717-5120	717-6120
14	12	53	110	4	717-1140	717-2140	717-5140	717-6140
16	16	63	123	4	717-1160	717-2160	717-5160	717-6160
18	16	63	123	4	717-1180	717-2180	717-5180	717-6180
20	20	75	141	4	717-1200	717-2200	717-5200	717-6200
22	20	75	141	4	717-1220	717-2220	717-5220	717-6220
22	20	75	141	5	717-1221	717-2221	717-5221	717-6221
25	25	90	166	4	717-1250	717-2250	717-5250	717-6250
25	25	90	166	5	717-1251	717-2251	717-5251	717-6251
28	25	90	166	5	717-1280	717-2280	717-5280	717-6280
30	25	90	166	5	717-1300	717-2300	717-5300	717-6300
30	25	90	166	6	717-1301	717-2301	717-5301	717-6301
32	32	106	186	5	717-1320	717-2320	717-5320	717-6320
32	32	106	186	6	717-1321	717-2321	717-5321	717-6321
35	32	106	186	5	717-1350	717-2350	717-5350	717-6350
40	40	125	217	6	717-1400	717-2400	717-5400	717-6400
40	40	125	217	8	717-1401	717-2401	717-5401	717-6401
45	40	125	217	6	717-1450	717-2450	717-5450	717-6450
45	40	125	217	8	717-1451	717-2451	717-5451	717-6451
50	50	150	252	6	717-1500	717-2500	717-5500	717-6500
50	50	150	252	8	717-1501	717-2501	717-5501	717-6501
55	50	150	252	6	717-1550	717-2550	717-5550	717-6550
55	50	150	252	8	717-1551	717-2551	717-5551	717-6551
63	63	180	292	6	717-1630	717-2630	717-5630	717-6630
63	63	180	292	8	717-1631	717-2631	717-5631	717-6631
71	63	180	292	6	717-1710	717-2710	717-5710	717-6710
71	63	180	292	8	717-1711	717-2711	717-5711	717-6711

Size (mm)	Shank Dia. (mm)	Flute Length	Overall Length	M2HSS			M42HSS
				M2HSS	Tin-Coated	M42HSS	Tin-Coated
2	6	4	48	718-1020	718-2020	718-5020	718-6020
2.5	6	5	49	718-1025	718-2025	718-5025	718-6025
3	6	6	50	718-1030	718-2030	718-5030	718-6030
3.5	6	7	51	718-1035	718-2035	718-5035	718-6035
4	6	7	51	718-1040	718-2040	718-5040	718-6040
4.5	6	8	52	718-1045	718-2045	718-5045	718-6045
5	6	8	52	718-1050	718-2050	718-5050	718-6050
5.5	6	8	52	718-1055	718-2055	718-5055	718-6055
6	8	8	52	718-1060	718-2060	718-5060	718-6060
6.5	10	10	60	718-1065	718-2065	718-5065	718-6065
7	10	10	60	718-1070	718-2070	718-5070	718-6070
7.5	10	11	61	718-1075	718-2075	718-5075	718-6075
8	10	11	61	718-1080	718-2080	718-5080	718-6080
8.5	10	13	63	718-1085	718-2085	718-5085	718-6085
9	10	13	63	718-1090	718-2090	718-5090	718-6090
10	10	13	63	718-1100	718-2100	718-5100	718-6100
11	12	16	73	718-1110	718-2110	718-5110	718-6110
12	12	16	73	718-1120	718-2120	718-5120	718-6120
13	12	16	73	718-1130	718-2130	718-5130	718-6130
14	12	16	73	718-1140	718-2140	718-5140	718-6140
15	12	16	73	718-1150	718-2150	718-5150	718-6150
16	16	19	79	718-1160	718-2160	718-5160	718-6160
17	16	19	79	718-1170	718-2170	718-5170	718-6170
18	16	19	79	718-1180	718-2180	718-5180	718-6180
19	16	19	79	718-1190	718-2190	718-5190	718-6190
20	20	22	88	718-1200	718-2200	718-5200	718-6200
21	20	22	88	718-1210	718-2210	718-5210	718-6210
22	20	22	88	718-1220	718-2220	718-5220	718-6220
23	20	22	88	718-1230	718-2230	718-5230	718-6230
24	25	26	102	718-1240	718-2240	718-5240	718-6240
25	25	26	102	718-1250	718-2250	718-5250	718-6250



CARBIDE TIPPED SINGLE END MILLS

FOR MILD STEELS

Spiral Flute, Right Hand, Straight Shank.



Size	Shank Dia.	Flute Length	Overall Length	No. of Flutes	Model No.
1/4	3/8	1/2	2-1/2	2	243-0020
5/16	3/8	5/8	2-1/2	2	243-0040
3/8	3/8	5/8	2-1/2	2	243-0060
7/16	3/8	1"	2-11/16	2	243-0080
1/2	1/2	1"	3-1/4	2	243-0100
9/16	1/2	1"	3-3/8	2	243-0120
5/8	1/2	1"	3-3/8	4	243-0140
5/8	5/8	1-1/4	3-5/8	3	243-0145
3/4	5/8	1"	3-5/8	4	243-0160
3/4	3/4	1-1/2	4-1/8	3	243-0165
7/8	5/8	1-1/4	4"	4	243-0180
1"	7/8	1-1/4	4"	4	243-0200

Size	Shank Dia.	Flute Length	Overall Length	No. of Flutes	Model No.
1"	1"	1-3/4	4-3/4	4	243-0205
1-1/8	1"	1-1/4	4-1/4	4	243-0220
1-1/8	1"	1-3/4	4-3/4	4	243-0225
1-1/4	1"	1-1/4	4-1/4	4	243-0240
1-1/4	1-1/4	2-1/8	5-1/4	4	243-0245
1-3/8	1-1/4	2-1/8	5-1/4	4	243-0250
1-1/2	1-1/4	1-1/2	4-1/2	4	243-0260
1-1/2	1-1/2	2-1/2	6-1/8	4	243-0265
1-3/4	1-1/2	2-1/2	6-1/8	4	243-0270
2"	1-1/4	1-1/2	4-1/2	6	243-0300
2"	2"	3"	7"	6	243-0305

FOR CAST IRON TYPE

Spiral Flute, Right Hand, Straight Shank.

Size	Shank Dia.	Flute Length	Overall Length	No. of Flutes	Model No.
1/4	3/8	1/2	2-1/2	4	243-1020
5/16	3/8	5/8	2-1/2	4	243-1040
3/8	3/8	5/8	2-1/2	4	243-1060
7/16	3/8	1"	2-11/16	4	243-1080
1/2	1/2	1"	3-1/4	4	243-1100
9/16	1/2	1"	3-3/8	4	243-1120
5/8	1/2	1"	3-3/8	4	243-1140
3/4	5/8	1"	3-5/8	4	243-1160
7/8	5/8	1-1/4	4"	4	243-1180
1"	7/8	1-1/4	4"	4	243-1200
1-1/8	1"	1-1/4	4-1/4	4	243-1220
1-1/4	1"	1-1/4	4-1/4	4	243-1240
1-1/2	1-1/4	1-1/2	4-1/2	4	243-1260
1-3/4	1-1/4	1-1/2	4-1/2	6	243-1280
2"	1-1/4	1-1/2	4-1/2	6	243-1300



TWO FLUTE SINGLE END MILLS

Straight Flute, Positive Rake, 90° Square Shoulder.



Size	Shank Dia.	Flute Length	Overall Length	No. of Flutes	Model No.
5/16	3/8	1/2	2-3/8	2	243-0312
3/8	3/8	5/8	2-5/8	2	243-0375
1/2	1/2	5/8	2-3/4	2	243-0500
9/16	5/8	3/4	2-7/8	2	243-0562
5/8	5/8	3/4	2-7/8	2	243-0625
3/4	3/4	1"	3-5/32	2	243-0750

CARBIDE TIPPED HEAVY DUTY END MILLS

Features:

- All material can be machined with these ultra microgram end mills at high or low cutting speeds, and feeds with increased wear resistance.
- Specially designed with a 25° right hand helix.
- Tough carbide grade allows high speed milling operations.

Ultra Fine. For General Purpose.

Two Flute Center Cutting



- Suited for the rough machining, heavy cutting and grooving machining as this allows larger chip pocket and increased feeding.

Three Flute Center Cutting



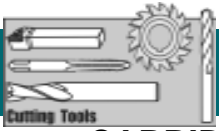
- Especially three flutes type vibrates less when entering and as result can increase feed rate over two flutes type.

Four Flute Center Cutting



- Allows better balance for machining.
- Suited for finish and side surface machining as this is less likely to tilt.

Size	Shank Dia.	Flute Length	Overall Length	Two Flute Model No.	Three Flute Model No.	Four Flute Model No.
5/8	5/8	1-3/16	3-1/2	243-2040	243-2240	
3/4	3/4	1-27/64	3-3/4	243-2048	243-2248	243-2448
7/8	3/4	1-27/64	3-3/4	243-2056	243-2256	243-2456
1"	1	1-29/64	4-1/8	243-2064	243-2264	243-2464
1-1/8	1	1-9/16	4-1/2	243-2072	243-2272	
1-1/4	1-1/4	1-27/32	5-1/8	243-2080	243-2280	243-2480
1-1/2	1-1/4	2-1/4	5-1/2	243-2096	243-2296	243-2496
1-3/4	1-1/4	2-5/8	6-1/8	243-2112	243-2312	243-2512
2"	1-1/4	2-5/8	6-1/8	243-2128	243-2328	243-2528



Cutting Tools

CARBIDE HELICAL END MILL WITH WHISTLE SHANK K30 MATERIAL



DIN 1835/1-1986

D	d	l	L	Z	Rmax	Model No.
16	16	32	92	2	3	243-0400
20	20	38	104	2	3	243-0402
25	25	45	121	2	4	243-0404
32	32	53	133	2	5	243-0406
40	40	63	155	2	6	243-0408
50	50	75	177	2	6	243-0410

ANSI B94.19-1985

D	d	5/ l	L	Z	Rmax	Model No.
8	5/8	1-1/4	3-5/8	2	1/8	243-1400
3/4	3/4	1-1/2	4-1/8	2	1/8	243-1402
1	1	1-3/4	4-3/4	2	5/32	243-1404
1-1/4	1-1/4	2-1/8	5-1/4	2	13/64	243-1406
1-1/2	1-1/2	2-1/2	6-1/8	2	15/64	243-1408
2	2	3	7	2	15/64	243-1410

CENTER CUTTING CARBIDE HELICAL END MILL WITH WHISTLE SHANK K30 MATERIAL



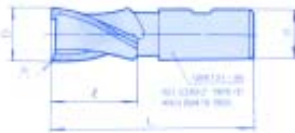
DIN 1835/1-1986

D	d	l	L	Z	Rmax	Model No.
16	16	32	92	2	3	243-0412
20	20	38	104	2	3	243-0414
25	25	45	121	2	4	243-0416
32	32	53	133	2	5	243-0418
40	40	63	155	2	6	243-0420
50	50	75	177	2	6	243-0422

ANSI B94.19-1985

D	d	5/ l	L	Z	Rmax	Model No.
8	5/8	1-1/4	3-5/8	2	1/8	243-1412
3/4	3/4	1-1/2	4-1/8	2	1/8	243-1414
1	1	1-3/4	4-3/4	2	5/32	243-1416
1-1/4	1-1/4	2-1/8	5-1/4	2	13/64	243-1418
1-1/2	1-1/2	2-1/2	6-1/8	2	15/64	243-1420
2	2	3	7	2	15/64	243-1422

CARBIDE HELICAL END MILL WITH WELDON SHANK(FLATTED PARALLEL SHANK)K30 MATERIAL



ISO STANDARD

D	d	l	L	Z	Rmax	Model No.
16	16	32	92	2	3	243-0450
20	20	38	104	2	3	243-0452

ANSI B94.19-1985

D	d	l	L	Z	Rmax	Model No.
5/8	5/8	1-1/4	3-5/8	2	1/8	243-1450
3/4	3/4	1-1/2	4-1/8	2	1/8	243-1452

ISO STANDARD

D	d	l	L	Z	Rmax	Model No.
25	25	45	121	2	4	243-0454
32	32	53	133	2	5	243-0456
40	40	63	155	2	6	243-0458
50	50	75	177	2	6	243-0460

ANSI B94.19-1985

D	d	l	L	Z	Rmax	Model No.
1	1	1-3/4	4-3/4	2	5/32	243-1454
1-1/4	1-1/4	2-1/8	5-1/4	2	13/64	243-1456
1-1/2	1-1/2	2-1/2	6-1/8	2	15/64	243-1458
2	2	3	7	2	15/64	243-1460

CENTER CUTTING CARBIDE HELICAL END MILL WITH WELDON SHANK (FLATTED PARALLEL SHANK) K30 MATERIAL



ISO STANDARD

D	d	l	L	Z	Rmax	Model No.
16	16	32	92	2	3	243-0462
20	20	38	104	2	3	243-0464

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D	d	l	L	Z	Rmax	Model No.
5/8	5/8	1-1/4	3-5/8	2	1/8	243-1462
3/4	3/4	1-1/2	4-1/8	2	1/8	243-1464

ISO STANDARD

D	d	l	L	Z	Rmax	Model No.
25	25	45	121	2	4	243-0466
32	32	53	133	2	5	243-0468
40	40	63	155	2	6	243-0470
50	50	75	177	2	6	243-0472

ANSI B94.19-1985

D	d	l	L	Z	Rmax	Model No.
1	1	1-3/4	4-3/4	2	5/32	243-1466
1-1/4	1-1/4	2-1/8	5-1/4	2	13/64	243-1468
1-1/2	1-1/2	2-1/2	6-1/8	2	15/64	243-1470
2	2	3	7	2	15/64	243-1472

INSTRUCTION

MATERIAL TO BE MACHINED	CARBIDE GRADE
ALUMINUM AND MAGNESIUM ALLOY AND OTHER LIGHT ALLOYS	K30
CAST IRON, TITANIUM ALLOY, CAST STEEL	
HIGH STRENGTH STEEL	M30
HIGH-TEMPERATURE STEEL	

Cutting Tools



CARBIDE HELICAL END MILL WITH MORSE TAPER SHANK(ISO 296) K30 MATERIAL



ISO STANDARD

D	I	L	M	Z	Rmax	Model No.
16	32	117	2#	2	3	243-1500
18	32	117	2#	2	3	243-1502
20	38	123	2#	2	3	243-1504
22	38	140	3#	2	4	243-1506
25	45	147	3#	2	4	243-1508
28	45	147	3#	2	4	243-1510
32	53	178	4#	2	5	243-1512
36	53	178	4#	2	5	243-1514
40	63	188	4#	2	6	243-1516
45	63	221	5#	2	6	243-1518
50	75	233	5#	2	6	243-1520

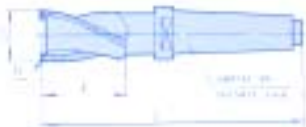
CENTER CUTTING CARBIDE HELICAL END MILL WITH MORSE TAPER SHANK (ISO 296), K30 MATERIAL



ISO STANDARD

D	I	L	M	Z	Rmax	Model No.
16	32	117	2#	2	3	243-1530
18	32	117	2#	2	3	243-1532
20	38	123	2#	2	3	243-1534
22	38	140	3#	2	4	243-1536
25	45	147	3#	2	4	243-1538
28	45	147	3#	2	4	243-1540
32	53	178	4#	2	5	243-1542
36	53	178	4#	2	5	243-1544
40	63	188	4#	2	6	243-1546
45	63	221	5#	2	6	243-1548
50	75	233	5#	2	6	243-1550

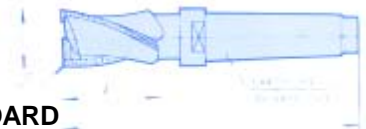
CARBIDE HELICAL END MILL WITH MORSE TAPER SHANK WITH DRIVING FLATS ON COLLAR ,K30 MATERIAL



ISO STANDARD

D	I	L	M	Z	Rmax	Model No.
32	53	201	4#	2	5	243-1560
36	53	201	4#	2	5	243-1562
40	63	211	4#	2	6	243-1564
45	63	249	5#	2	6	243-1566
50	75	261	5#	2	6	243-1568

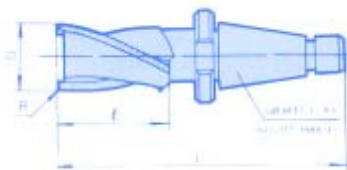
CENTER CUTTING CARBIDE HELICAL END MILL WITH MORSE TAPER SHANK WITH DRIVING FLATS ON COLLAR K30 MATERIAL



ISO STANDARD

D	I	L	M	Z	Rmax	Model No.
32	53	201	4#	2	5	243-1570
36	53	201	4#	2	5	243-1572
40	63	211	4#	2	6	243-1574
45	63	249	5#	2	6	243-1576
50	75	261	5#	2	6	243-1578

CARBIDE HELICAL END MILL WITH 7/24TAPER SHANK (ISO297),K30 MATERIAL



ISO STANDARD

D	I	L	ISO	Z	Rmax	Model No.
40	63	198	40#	2	6	243-1580
50	85	252	50#	2	6	243-1582
63	90	267	50#	2	6	243-1584

CENTER CUTTING CARBIDE HELICAL END MILL WITH 7/24TAPER SHANK (ISO297) K30 MATERIAL



ISO STANDARD

D	I	L	ISO	Z	Rmax	Model No.
40	63	198	40#	2	6	243-1590
50	85	252	50#	2	6	243-1592
63	90	267	50#	2	6	243-1594

INSTRUCTION

MATERIAL TO BE MACHINED	CARBIDE GRADE
ALUMINUM AND MAGNESIUM ALLOY AND OTHER LIGHT ALLOYS	K30
CAST IRON , TITANIUM ALLOY.	
CAST STEEL	M30
HIGH STRENGTH STEEL	
HIGH-TEMPERATURE STEEL	

The corner radius R 0.5mm are used for metric cutters, or they shall have the dimensions of 1,1.5,2,3,4,5,6mm on request, the Rmax is given in tables.

The corner radius R 1/64inch are used for imperial cutters, or they shall have the dimensions of 3/64,1/16,5/64,1/8,5/32,13/64,15/64inch on request, the Rmax is given in tables.



Cutting Tools

BALL-NOSED CARBIDE HELICAL END MILL WITH WHISTLE SHANK K30 MATERIAL



ISO STANDARD

D	d	l	L	Z	Rmax	Model No.
16	16	32	92	2	8	243-1600
20	20	38	104	2	10	243-1602
25	25	45	121	2	12.5	243-1604
32	32	53	133	2	16	243-1606
40	40	63	155	2	20	243-1608
50	50	75	177	2	25	243-1610

BALL-NOSED CARBIDE HELICAL END MILL WITH WELDON SHANK K30 MATERIAL



ISO STANDARD

D	d	l	L	Z	Rmax	Model No.
16	16	32	92	2	8	243-1620
20	20	38	104	2	10	243-1622
25	25	45	121	2	12.5	243-1624
32	32	53	133	2	16	243-1626
40	40	63	155	2	20	243-1628
50	50	75	177	2	25	243-1630

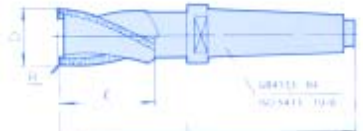
BALL-NOSED CARBIDE HELICAL END MILL WITH MORSE TAPER SHANK K30 MATERIAL



ISO STANDARD

D	l	L	M	Z	Rmax	Model No.
16	32	117	2#	2	8	243-1640
18	32	117	2#	2	9	243-1642
20	38	123	2#	2	10	243-1644
22	38	140	3#	2	11	243-1646
25	45	147	3#	2	12.5	243-1648
28	45	147	3#	2	14	243-1650
32	53	178	4#	2	16	243-1652
36	53	178	4#	2	18	243-1654
40	63	188	4#	2	20	243-1656
45	63	221	5#	2	22.5	243-1658
50	75	233	5#	2	25	243-1660

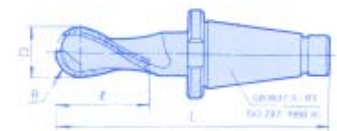
BALL-NOSED CARBIDE END MILL WITH MORSE TAPER SHANK WITH DRIVING FLATS ON COLLAR K30 MATERIAL



ISO STANDARD

D	l	L	M	Z	Rmax	Model No.
32	53	201	4#	2	16	243-1670
36	53	201	4#	2	18	243-1672
40	63	211	4#	2	20	243-1674
45	63	249	5#	2	22.5	243-1676
50	75	261	5#	2	25	243-1678

BALL-NOSED CARBIDE END MILL WITH 7/24 TAPER SHANK (ISO/R297) K30 MATERIAL



ISO STANDARD

D	l	L	ISO	Z	R	Model No.
40	63	198	40#	2	20	243-1680
50	75	252	50#	2	25	243-1682
63	90	267	50#	2	31.5	243-1684

CARBIDE HELICAL END MILL WITH STRAIGHT SHANK (ISO3338),M30 MATERIAL



ISO STANDARD

D	d	l	L	Z	Model No.
16	16	19	79	3	243-1690
16	16	32	92	3	243-1691
18	16	19	79	3	243-1692
20	20	22	88	3	243-1693
20	20	38	104	3	243-1694
22	20	22	88	3	243-1695
25	25	26	102	3	243-1696
25	25	45	121	3	243-1697
25	25	26	102	4	243-1698
25	25	45	121	4	243-1699

INSTRUCTION

MATERIAL TO BE MACHINED	CARBIDE GRADE
ALUMINUM AND MAGNESIUM ALLOY AND OTHER LIGHT ALLOYS	K30
CAST IRON, TITANIUM ALLOY, CAST STEEL	
HIGH STRENGTH STEEL HIGH-TEMPERATURE STEEL	M30



CARBIDE HELICAL END MILL WITH WELDON SHANK (FLATTED PARALLEL SHANK) (ISO3338)M30 MATERIAL



ISO STANDARD

D	d	I	L	Z	C	Model No.
20	20	38	104	3	0.5	243-2900
25	25	45	121	4	0.5	243-2902
32	32	53	133	4	0.5	243-2904
40	40	63	155	4	0.8	243-2906
50	50	75	177	4	0.8	243-2908
40	40	63	155	6	0.8	243-2910
50	50	75	177	6	0.8	243-2912

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D	d	I	L	Z	Rmax	Model No.
3/4	3/4	1-1/2	4-1/8	3	1/64	243-2901
1	1	1-3/4	4-3/4	4	1/64	243-2903
1-1/4	1-1/4	2-1/8	5-1/4	4	1/64	243-2905
1-1/2	1-1/2	2-1/2	6-1/8	4	1/64	243-2907
2	2	3	7	4	1/64	243-2909
1-1/2	1-1/2	2-1/2	6-1/8	6	1/64	243-2911
2	2	3	7	6	1/32	243-2913

CARBIDE HELICAL END MILL WITH MORSE TAPER SHANK M30 MATERIAL



ISO STANDARD

D	I	L	M	Z	C	Model No.
16	19	104	2#	3	0.5	243-2920
16	32	117	2#	3	0.5	243-2922
18	19	104	2#	3	0.5	243-2924
18	32	117	2#	3	0.5	243-2926
20	22	107	2#	3	0.5	243-1628
20	38	123	2#	3	0.5	243-2930
22	22	124	3#	3	0.5	243-2932
22	38	140	3#	3	0.5	243-2934
25	26	128	3#	3	0.5	243-2936
25	45	147	3#	3	0.5	243-2938
28	26	128	3#	3	0.5	243-2940
25	26	128	3#	4	0.5	243-2942
25	45	147	3#	4	0.5	243-2944
28	26	128	3#	4	0.5	243-2946
28	45	147	3#	4	0.5	243-2948
32	32	157	4#	4	0.5	243-2950
32	53	178	4#	4	0.5	243-2952

ISO STANDARD

D	I	L	M	Z	C	Model No.
36	32	157	4#	4	0.5	243-2921
36	53	178	4#	4	0.5	243-2923
40	38	163	4#	4	0.8	243-2925
40	63	188	4#	4	0.8	243-2927
45	38	163	4#	4	0.8	243-1629
45	38	196	5#	4	0.8	243-2931
50	45	170	4#	4	0.8	243-2933
50	45	203	5#	4	0.8	243-2935
50	75	233	5#	4	0.8	243-2937
40	38	163	4#	6	0.8	243-2939
40	63	188	4#	6	0.8	243-2941
45	38	196	5#	6	0.8	243-2943
45	63	188	4#	6	0.8	243-2945
45	63	221	5#	6	0.8	243-2947
50	45	203	5#	6	0.8	243-2949
50	75	200	4#	6	0.8	243-2951
50	75	233	5#	6	0.8	243-2953

CARBIDE HELICAL END MILL WITH 7/24 TAPER SHANK(ISO/R297) M30 MATERIAL

CARBIDE HELICAL END MILL WITH MORSE TAPER SHANK WITH DRIVING FLATS ON COLLAR ,M30 MATERIAL



ISO STANDARD

D	I	L	M	Z	C	Model No.
32	32	180	4#	4	0.5	243-2960
32	53	201	4#	4	0.5	243-2962
36	32	180	4#	4	0.5	243-2964
40	38	186	4#	4	0.8	243-2966
40	63	211	4#	4	0.8	243-1668
45	38	224	5#	4	0.8	243-2970
50	45	231	5#	4	0.8	243-2972
50	75	261	5#	4	0.8	243-2974
40	38	186	4#	6	0.8	243-2976
40	63	211	4#	6	0.8	243-2978
45	38	224	5#	6	0.8	243-2980
50	45	231	5#	6	0.8	243-2982
50	75	261	5#	6	0.8	243-2984

ISO STANDARD

D	D	L	ISO	Z	Model No.
40	63	198	40#	4	243-2990
50	75	252	50#	4	243-2992
40	63	198	40#	6	243-2994
50	75	252	50#	6	243-2996
63	90	267	50#	6	243-2998

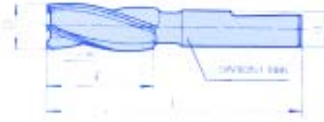
INSTRUCTION

MATERIAL TO BE MACHINED	CARBIDE GRADE
ALUMINUM AND MAGNESIUM ALLOY AND OTHER LIGHT ALLOYS	K30
CAST IRON , TITANIUM ALLOY, CAST STEEL	
HIGH STRENGTH STEEL HIGH-TEMPERATURE STEEL	M30



Cutting Tools

CARBIDE HELICAL END MILL WITH 01° WHISTLE SHANK FLATTED M30 MATERIAL



ANSI STANDARD

DIN STANDARD

D	d	I	L	Z	C	Model No.
16	16	32	92	3	0.5	243-1700
20	20	38	104	3	0.5	243-1702
25	25	45	121	4	0.5	243-1704
32	32	53	133	4	0.5	243-1706
40	40	63	155	4	0.8	243-1708
50	50	75	177	4	0.8	243-1710
40	40	63	155	6	0.8	243-1712
50	50	75	177	6	0.8	243-1714

D	d	I	L	Z	C	Model No.
5/8	5/8	1-1/4	3-5/8	3	1/64	243-1701
3/4	3/4	1-1/2	4-1/8	3	1/64	243-1703
1	1	1-3/4	4-3/4	4	1/64	243-1705
1-1/4	1-1/4	2-1/8	5-1/4	4	1/64	243-1707
1-1/2	1-1/2	2-1/2	6-1/8	4	1/64	243-1709
2	2	3	7	4	1/32	243-1711
1-1/2	1-1/2	2-1/2	6-1/8	6	1/64	243-1713
2	2	3	7	6	1/32	243-1715

CARBIDE HELICAL END MILL WITH THREADED SHANK ,M30 MATERIAL



DIN STANDARD

D	d	G	I	L	Z	C	Model No.
16	16	20T.P.I.(whit)	32	92	3	0.5	243-1720
18	16	20T.P.I.(whit)	32	92	3	0.5	243-1722
20	20	20T.P.I.(whit)	38	104	3	0.5	243-1724
22	20	20T.P.I.(whit)	38	104	3	0.5	243-1726
25	25	20T.P.I.(whit)	45	121	3	0.5	243-1728
28	25	20T.P.I.(whit)	45	121	3	0.5	243-1730
25	25	20T.P.I.(whit)	45	121	4	0.5	243-1732
28	25	20T.P.I.(whit)	45	121	4	0.5	243-1734
32	32	20T.P.I.(whit)	53	133	4	0.5	243-1736

ANSI STANDARD

D	d	G	I	L	Z	C	Model No.
5/8	5/8	20T.P.I.(whit)	1-1/4	3-1/4	3	0.5	243-1721
3/4	5/8	20T.P.I.(whit)	1-1/2	3-21/32	3	0.5	243-1723
7/8	1	20T.P.I.(whit)	1-1/2	4-3/16	3	0.5	243-1725
1	1	20T.P.I.(whit)	1-3/4	4-5/8	3	0.5	243-1727
1-1/8	1	20T.P.I.(whit)	1-3/4	4-5/8	3	0.5	243-1729
1	1	20T.P.I.(whit)	1-3/4	4-5/8	4	0.5	243-1731
1-1/8	1	20T.P.I.(whit)	1-3/4	4-5/8	4	0.5	243-1733
1-1/4	1-1/4	20T.P.I.(whit)	2-1/8	5	4	0.5	243-1735

FORMED CUTTING EDGE CARBIDE HELICAL END MILL WITH WELDON SHANK(FLATTED PARALLEL SHANK) ,M30 MATERIAL



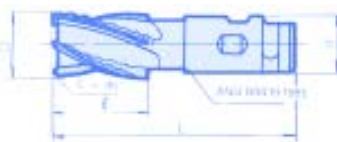
ISO STANDARD

D	d	I	L	Z	C	Model No.
16	16	32	92	3	0.5	243-1740
18	16	32	92	3	0.5	243-1742
20	20	38	104	3	0.5	243-1744
22	20	38	104	3	0.5	243-1746
25	25	45	121	4	0.5	243-1748
28	25	45	121	4	0.5	243-1750
32	32	53	133	4	0.5	243-1752
36	32	53	133	4	0.5	243-1754
40	40	63	155	4	0.8	243-1756
45	40	63	155	4	0.8	243-1758
50	50	75	177	6	0.8	243-1760

ANSI STANDARD

D	d	I	L	Z	C	Model No.
5/8	5/8	1-1/4	3-5/8	3	1/64	243-1741
3/4	3/4	1-1/2	4-1/8	3	1/64	243-1743
7/8	3/4	1-1/2	4-1/8	3	1/64	243-1745
1	1	1-3/4	4-3/4	4	1/64	243-1747
1-1/8	1	1-3/4	4-3/4	4	1/64	243-1749
1-1/4	1-1/4	2-1/8	5-1/4	4	1/64	243-1751
1-3/8	1-1/4	2-1/8	5-1/4	4	1/64	243-1753
1-1/2	1-1/2	2-1/2	6-1/8	4	1/64	243-1755
1-3/4	1-1/2	2-1/2	6-1/8	4	1/32	243-1757
2	2	3	7	6	1/32	243-1759

CARBIDE HELICAL END MILL WITH COMBINATION SHANK M30 MATERIAL



FORMED CUTTING EDGE CARBIDE HE- LICAL END MILL WITH MORSE TAPER SHANK(ISO 296), M30 MATERIAL

ANSI STANDARD

D	I	L	M	Z	Model No.
25	45	147	3#	4	243-1780
28	45	147	3#	4	243-1782

ANSI STANDARD

D	d	I	L	Z	C	Model No.
1-1/2	1-1/2	2-1/2	6-1/8	4	1/64	243-1770
2	2	3	7	6	1/32	243-1772
2-1/2	2-1/2	3-5/8	8	6	1/32	243-1774

INSTRUCTION

MATERIAL TO BE MACHINED	CARBIDE GRADE
ALUMINUM AND MAGNESIUM ALLOY AND OTHER LIGHT ALLOYS	K30
CAST IRON , TITANIUM ALLOY, CAST STEEL	
HIGH STRENGTH STEEL HIGH-TEMPERATURE STEEL	M30

Cutting Tools



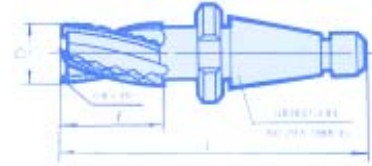
**FORMED CUTTING EDGE CARBIDE
HELICAL END MILL WITH MORSE
TAPER SHANK WITH DRIVING
FLATS ON COLLAR , M30 MATERIAL**



ISO STANDARD

D	I	L	M	Z	C	Model No.
32	53	201	4#	4	0.5	243-1800
36	53	201	4#	4	0.5	243-1802
40	63	211	4#	4	0.8	243-1804
45	63	249	5#	4	0.8	243-1806
50	75	261	5#	6	0.8	243-1808

**FORMED CUTTING EDGE CARBIDE
HELICAL END MILL WITH 7/24 TAPER
SHANK (ISO 297) ,M30 MATERIAL**



ISO STANDARD

D	I	L	ISO	Z	Model No.
40	63	198	40#	4	243-1810
50	75	252	50#	6	243-1812
63	90	267	50#	6	243-1814

**FORMED CUTTING EDGE CARBIDE
HELICAL END MILL OBLIQUE
FLATTED, M30 MATERIAL**



DIN STANDARD

D	d	I	L	Z	C	Model No.
16	16	32	92	3	0.5	243-1820
20	20	38	104	3	0.5	243-1822
25	25	45	121	4	0.5	243-1824
28	25	45	121	4	0.5	243-1826
32	32	53	133	4	0.5	243-1828
36	32	53	133	4	0.5	243-1830
40	40	63	155	4	0.8	243-1832
45	40	63	155	4	0.8	243-1834
50	50	75	177	6	0.8	243-1836

ANSI STANDARD

D	d	I	L	Z	C	Model No.
5/8	5/8	1-1/4	3-5/8	3	1/64	243-1821
3/4	3/4	1-1/2	4-1/8	3	1/64	243-1823
1	1	1-3/4	4-3/4	4	1/64	243-1825
1-1/8	1	1-3/4	4-3/4	4	1/64	243-1827
1-1/4	1-1/4	2-1/8	5-1/4	4	1/64	243-1829
1-3/8	1-1/4	2-1/8	5-1/4	4	1/64	243-1831
1-1/2	1-1/2	2-1/2	6-1/8	4	1/64	243-1833
1-3/4	1-1/2	2-1/2	6-1/8	4	1/32	243-1835
2	2	3	7	6	1/32	243-1837

**FORMED CUTTING EDGE
CARBIDE HELICAL END
MILL WITH STRAIGHT
SHANK , M30 MATERIAL**



ISO STANDARD

D	d	I	L	Z	C	Model No.
16	16	32	92	3	0.5	243-1840
18	16	32	92	3	0.5	243-1842
20	20	38	104	3	0.5	243-1844
22	20	38	104	3	0.5	243-1846
25	25	45	121	4	0.5	243-1848
28	25	45	121	4	0.5	243-1850

D	d	I	L	Z	C	Model No.
32	32	53	133	4	0.5	243-1852
36	32	53	133	4	0.8	243-1854
40	40	63	155	4	0.8	243-1856
45	40	63	155	4	0.8	243-1858
50	50	75	177	6	0.8	243-1860

**FORMED CUTTING EDGE CARBIDE HELI-
CAL END MILL WITH THREADED SHANK
M30 MATERIAL**

DIN STANDARD

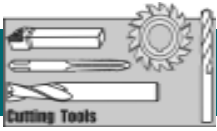
D	d	G	I	L	Z	C	Model No.
16	16	20T.P.I(whit)	32	92	3	0.5	243-1870
18	16	20T.P.I(whit)	32	92	3	0.5	243-1872
20	20	20T.P.I(whit)	38	104	3	0.5	243-1874
22	20	20T.P.I(whit)	38	104	3	0.5	243-1876
25	25	20T.P.I(whit)	45	121	3	0.5	243-1878
28	25	20T.P.I(whit)	45	121	3	0.5	243-1880
25	25	20T.P.I(whit)	45	121	4	0.5	243-1882
28	25	20T.P.I(whit)	45	121	4	0.5	243-1884
32	32	20T.P.I(whit)	53	133	4	0.5	243-1886

ANSI STANDARD

D	d	G	I	L	Z	C	Model No.
5/8	5/8	20T.P.I(whit)	1-1/4	3-1/4	3	1/64	243-1871
3/4	5/8	20T.P.I(whit)	1-1/2	3-21/32	3	1/64	243-1873
7/8	1	20T.P.I(whit)	1-1/2	4-3/16	3	1/64	243-1875
1	1	20T.P.I(whit)	1-3/4	4-5/8	3	1/64	243-1877
1-1/8	1	20T.P.I(whit)	1-3/4	4-5/8	3	1/64	243-1879
1	1	20T.P.I(whit)	1-3/4	4-5/8	4	1/64	243-1881
1-1/8	1	20T.P.I(whit)	1-3/4	4-5/8	4	1/64	243-1883
1-1/4	1-1/4	20T.P.I(whit)	2-1/8	5	4	1/64	243-1885

INSTRUCTION

MATERIAL TO BE MACHINED	CARBIDE GRADE
ALUMINUM AND MAGNESIUM ALLOY AND OTHER LIGHT ALLOYS	K30
CAST IRON , TITANIUM ALLOY. CAST STEEL	
HIGH STRENGTH STEEL HIGH-TEMPERATURE STEEL	M30



Cutting Tools

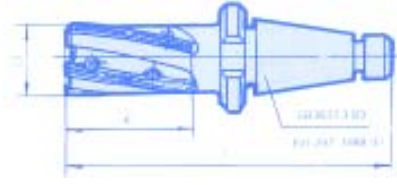
**FORMED CUTTING EDGE
CARBIDE HELICAL END MILL
WITH COMBINATION SHANK
M30 MATERIAL**



ANSI STANDARD

D	d	l	L	Z	C	Model No.
1-1/2	1-1/2	2-1/2	6-1/8	4	1/64	243-1901
2	2	3	7	6	1/32	243-1903
2-1/2	2-1/2	3-5/8	8	6	1/32	243-1905

**HELICAL END MILL WITH MECHANICALLY
CLAMPED INDEXABLE CARBIDE TIPPED
BLADES WITH 7/24 TAPER SHANK
M30 MATERIAL**



ISO STANDARD

D	l	L	ISO	Z	Model No.
63	57	276.8	50#	4	243-1900
63	114	296.8	50#	4	243-1902
90	114	299.8	50#	6	243-1904
90	171	356.8	50#	6	243-1906
90	228	413.8	50#	6	243-1908

**INTERRUPTED CUTTING EDGE CARBIDE
HELICAL END MILL WITH OBLIQUE
FLATTED , M30 MATERIAL**



DIN STANDARD

D	d	l	L	Z	C	Model No.
16	16	32	92	3	0.5	243-1930
20	20	38	104	3	0.5	243-1932
25	25	45	121	4	0.5	243-1934
28	28	45	121	4	0.5	243-1936
32	32	53	133	4	0.5	243-1938
36	36	53	133	4	0.5	243-1940
40	40	63	155	4	0.8	243-1942
45	45	63	155	4	0.8	243-1944
50	50	75	177	6	0.8	243-1946

ANSI STANDARD

D	d	l	L	Z	C	Model No.
5/8	5/8	1-1/4	3-5/8	3	1/64	243-1931
3/4	3/4	1-1/2	4-1/8	3	1/64	243-1933
1	1	1-3/4	4-3/4	4	1/64	243-1935
1-1/8	1	1-3/4	4-3/4	4	1/64	243-1937
1-1/4	1-1/4	2-1/8	5-1/4	4	1/64	243-1939
1-3/8	1-1/4	2-1/8	5-1/4	4	1/64	243-1941
1-1/2	1-1/2	2-1/2	6-1/8	4	1/64	243-1943
1-3/4	1-1/2	2-1/2	6-1/8	4	1/32	243-1945
2	2	3	7	6	1/32	243-1947

**INTERRUPTED CUTTING EDGE CARBIDE
HELICAL END MILL WITH WELDON
SHANK(FLATTED PARALLEL SHANK)
M30 MATERIAL**



DIN STANDARD

D	d	l	L	Z	C	Model No.
25	25	45	121	4	0.5	243-1950
28	25	45	121	4	0.5	243-1952
32	32	53	133	4	0.5	243-1954
36	32	53	133	4	0.5	243-1956
40	40	63	155	4	0.8	243-1958
45	40	63	155	4	0.8	243-1960
50	50	75	177	6	0.8	243-1962

ANSI STANDARD

D	d	l	L	Z	C	Model No.
1	1	1-3/4	4-3/4	4	1/64	243-1951
1-1/8	1	1-3/4	4-3/4	4	1/64	243-1953
1-1/4	1-1/4	2-1/8	5-1/4	4	1/64	243-1955
1-3/8	1-1/4	2-1/8	5-1/4	4	1/64	243-1957
1-1/2	1-1/2	2-1/2	6-1/8	4	1/64	243-1959
1-3/4	1-1/2	2-1/2	6-1/8	4	1/32	243-1961
2	2	3	7	6	1/32	243-1963

**INTERRUPTED CUTTING EDGE CARBIDE
HELICAL END MILL WITH MORSE TAPER
SHANK(ISO 296) , M30 MATERIAL**



ISO STANDARD

D	l	L	M	Z	Model No.
25	45	147	3#	4	243-1970
28	45	147	3#	4	243-1972

INSTRUCTION

MATERIAL TO BE MACHINED	CARBIDE GRADE
ALUMINUM AND MAGNESIUM ALLOY AND OTHER LIGHT ALLOYS	K30
CAST IRON , TITANIUM ALLOY.	
CAST STEEL HIGH STRENGTH STEEL HIGH-TEMPERATURE STEEL	M30



INTERRUPTED CUTTING EDGE CARBIDE HELICAL END MILL WITH MORSE TAPER SHANK WITH DRIVING FLATS ON COLLAR M30 MATERIAL



ISO STANDARD

D	I	L	M	Z	C	Model No.
32	53	201	4#	4	0.5	243-2600
36	53	201	4#	4	0.5	243-2602
40	63	211	4#	4	0.8	243-2604
45	63	249	5#	4	0.8	243-2606
50	75	261	5#	6	0.8	243-2608

INTERRUPTED CUTTING EDGE CARBIDE HELICAL END MILL WITH 7/24 TAPER SHANK (ISO/R297) M30 MATERIAL



ISO STANDARD

D	I	L	M	Z	Model No.
40	63	198	40#	4	243-2610
50	75	252	50#	6	243-2612
63	90	267	50#	6	243-2614

SLOTING END MILL (SOLID CARBIDE)



ISO STANDARD

D	d	L	I	K30	M30
				Model No.	Model No.
3.0	3.0	32	12	243-2620	244-2620
3.0	4.0	37	5	243-2622	244-2622
3.5	3.5	32	12	243-2624	244-2624
3.5	4.0	38	6	243-2626	244-2626
4.0	4.0	40	12	243-2628	244-2628
4.0	4.0	39	7	243-2630	244-2630
4.5	4.5	50	14	243-2632	244-2632
5.0	5.0	42	8	243-2634	244-2634
5.0	5.0	50	14	243-2636	244-2636
6.0	6.0	50	16	243-2638	244-2638
6.0	6.0	52	8	243-2640	244-2640
7.0	7.0	60	20	243-2642	244-2642
7.0	8.0	54	10	243-2644	244-2644
8.0	8.0	55	11	243-2646	244-2646
8.0	8.0	60	20	243-2648	244-2648
9.0	9.0	60	20	243-2650	244-2650
9.0	10.0	61	11	243-2652	244-2652
10.0	10.0	63	13	243-2654	244-2654
10.0	10.0	70	22	243-2656	244-2656
12.0	12.0	70	22	243-2658	244-2658
12.0	12.0	73	16	243-2660	244-2660
14.0	12.0	73	16	243-2662	244-2662
14.0	14.0	75	25	243-2664	244-2664

THREE-FLUTE END MILL (SOLID CARBIDE)

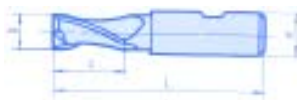


ISO STANDARD

D	d	L	I	K30	M30
				Model No.	Model No.
3.0	3.0	32	12	243-2700	244-2700
3.0	4.0	40	8	243-2702	244-2702
3.5	3.5	32	12	243-2704	244-2704
3.5	4.0	42	10	243-2706	244-2706
4.0	4.0	40	12	243-2708	244-2708
4.0	4.0	43	11	243-2710	244-2710
4.5	4.5	50	14	243-2712	244-2712
5.0	5.0	47	13	243-2714	244-2714
5.0	5.0	50	14	243-2716	244-2716
6.0	6.0	50	16	243-2718	244-2718
6.0	6.0	57	13	243-2720	244-2720
7.0	7.0	60	20	243-2722	244-2722
7.0	8.0	60	16	243-2724	244-2724
8.0	8.0	60	20	243-2726	244-2726
8.0	8.0	63	19	243-2728	244-2728
9.0	9.0	60	20	243-2730	244-2730
9.0	10.0	69	19	243-2732	244-2732
10.0	10.0	63	13	243-2734	244-2734
10.0	10.0	72	22	243-2736	244-2736
12.0	12.0	70	22	243-2738	244-2738
12.0	12.0	83	26	243-2740	244-2740
14.0	12.0	83	26	243-2742	244-2742
14.0	14.0	75	25	243-2744	244-2744

TWO-FLUTE END MILL

(SOLID CARBIDE)



D	d	L	I	K30	M30
				Model No.	Model No.
3.0	6	49	5	243-2750	244-2750
3.5	6	50	6	243-2752	244-2752
4.0	6	51	7	243-2754	244-2754
5.0	6	52	8	243-2756	244-2756
6.0	6	52	8	243-2758	244-2758
7.0	10	60	10	243-2760	244-2760
8.0	10	61	11	243-2762	244-2762
9.0	10	61	11	243-2764	244-2764
10.0	10	63	13	243-2766	244-2766
12.0	12	73	16	243-2768	244-2768
14.0	12	73	16	243-2770	244-2770

ANSI STANDARD

D	d	L	I	K30	M30
				Model No.	Model No.
1/8	3/8	2-5/16	3/8	243-2751	244-2751
3/16	3/8	2-5/16	7/16	243-2753	244-2753
1/4	3/8	2-5/16	1/2	243-2755	244-2755
5/16	3/8	2-5/16	9/16	243-2757	244-2757
3/8	3/8	2-5/16	9/16	243-2759	244-2759
7/16	3/8	2-1/2	13/16	243-2761	244-2761
1/2	3/8	2-1/2	13/16	243-2763	244-2763
1/2	1/2	3	1	243-2765	244-2765
9/16	1/2	3-1/8	1/8	243-2767	244-2767

INSTRUCTION

MATERIAL TO BE MACHINED	CARBIDE GRADE
ALUMINUM AND MAGNESIUM ALLOY AND OTHER LIGHT ALLOYS	K30
CAST IRON, TITANIUM ALLOY, CAST STEEL	
HIGH STRENGTH STEEL	M30
HIGH-TEMPERATURE STEEL	



Cutting Tools

FOUR-FLUTE END MILL

(SOLID CARBIDE)



ANSI STANDARD

D	d	L	I	K30	M30
				Model No.	Model No.
1/8	1/8	1-1/4	5/16	243-2801	244-2801
3/16	3/16	1-3/8	1/2	243-2803	244-2803
1/4	1/4	1-11/16	5/8	243-2805	244-2805
3/8	3/8	1-13/16	3/4	243-2807	244-2807
1/2	1/2	2-1/4	15/16	243-2809	244-2809

ISO STANDARD

D	d	L	I	K30	M30
				Model No.	Model No.
3.0	3.0	32	12	243-2800	244-2800
3.0	4.0	40	8	243-2802	244-2802
3.5	3.5	32	12	243-2804	244-2804
3.5	4.0	42	10	243-2806	244-2806
4.0	4.0	40	12	243-2808	244-2808
4.0	4.0	43	11	243-2810	244-2810
4.5	4.5	50	14	243-2812	244-2812
5.0	5.0	47	13	243-2814	244-2814
5.0	5.0	50	14	243-2816	244-2816
6.0	6.0	50	16	243-2818	244-2818
6.0	6.0	57	13	243-2820	244-2820
7.0	7.0	60	20	243-2822	244-2822
7.0	8.0	60	16	243-2824	244-2824
8.0	8.0	60	20	243-2826	244-2826
8.0	8.0	63	19	243-2828	244-2828
9.0	9.0	60	20	243-2830	244-2830
9.0	10.0	69	19	243-2832	244-2832
10.0	10.0	63	13	243-2834	244-2834
10.0	10.0	72	22	243-2836	244-2836
12.0	12.0	70	22	243-2838	244-2838
12.0	12.0	83	26	243-2840	244-2840
14.0	12.0	83	26	243-2842	244-2842
14.0	14.0	75	25	243-2844	244-2844

CENTER CUTTING FOUR-FLUTE END MILL(SOLID CARBIDE)



ANSI STANDARD

D	d	L	I	K30	M30
				Model No.	Model No.
1/8	3/8	2-5/16	3/8	243-2851	244-2851
3/16	3/8	2-3/8	1/2	243-2853	244-2853
1/4	3/8	2-7/16	5/8	243-2855	244-2855
5/16	3/8	2-1/2	3/4	243-2857	244-2857
3/8	3/8	2-1/2	3/4	243-2859	244-2859
7/16	3/8	2-11/16	1	243-2861	244-2861
1/2	3/8	2-11/16	1	243-2863	244-2863
1/2	1/2	3-1/4	1-1/4	243-2865	244-2865
9/16	1/2	3-3/8	1-3/8	243-2867	244-2867

ISO STANDARD

D	d	L	I	K30	M30
				Model No.	Model No.
3.0	3	32	12	243-2850	244-2850
3.0	6	52	8	243-2852	244-2852
3.5	3.5	32	12	243-2854	244-2854
3.5	6	54	10	243-2856	244-2856
4.0	4	40	12	243-2858	244-2858
4.0	6	55	11	243-2860	244-2860
4.5	4.5	50	14	243-2862	244-2862
5.0	6	57	13	243-2864	244-2864
5.0	5	50	14	243-2866	244-2866
6.0	6	57	13	243-2868	244-2868
6.0	6	50	16	243-2870	244-2870
7.0	10	66	16	243-2872	244-2872
7.0	7	60	20	243-2874	244-2874
8.0	10	69	19	243-2876	244-2876
8.0	8	60	20	243-2878	244-2878
9.0	10	69	19	243-2880	244-2880
9.0	9	60	20	243-2882	244-2882
10.0	10	72	22	243-2884	244-2884
10.0	10	70	22	243-2886	244-2886
12.0	12	83	26	243-2888	244-2888
12.0	12	70	22	243-2890	244-2890
14.0	12	83	26	243-2892	244-2892
14.0	14	75	25	243-2894	244-2894

THREE-FLUTE END MILL WITH CENTER TOOTH

(SOLID CARBIDE)



ISO STANDARD

D	d	L	I	K30	M30
				Model No.	Model No.
3.0	3.0	32	12	243-3100	244-3100
3.0	4.0	40	8	243-3102	244-3102
3.5	3.5	32	12	243-3104	244-3104
3.5	4.0	42	10	243-3106	244-3106
4.0	4.0	40	12	243-3108	244-3108
4.0	4.0	43	11	243-3110	244-3110
4.5	4.5	50	14	243-3112	244-3112
5.0	5.0	47	13	243-3114	244-3114
5.0	5.0	50	14	243-3116	244-3116
6.0	6.0	50	16	243-3118	244-3118
6.0	6.0	57	13	243-3120	244-3120
7.0	7.0	60	20	243-3122	244-3122
7.0	8.0	60	16	243-3124	244-3124
8.0	8.0	60	20	243-3126	244-3126
8.0	8.0	63	19	243-3128	244-3128
9.0	9.0	60	20	243-3130	244-3130
9.0	10.0	69	19	243-3132	244-3132
10.0	10.0	63	13	243-3134	244-3134
10.0	10.0	72	22	243-3136	244-3136
12.0	12.0	70	22	243-3138	244-3138
12.0	12.0	83	26	243-3140	244-3140
14.0	12.0	83	26	243-3142	244-3142
14.0	14.0	75	25	243-3144	244-3144

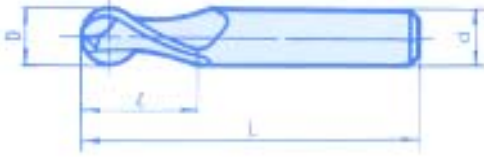
INSTRUCTION

MATERIAL TO BE MACHINED	CARBIDE GRADE
ALUMINUM AND MAGNESIUM ALLOY AND OTHER LIGHT ALLOYS	K30
CAST IRON , TITANIUM ALLOY.	
CAST STEEL	M30
HIGH STRENGTH STEEL	
HIGH-TEMPERATURE STEEL	



ROUND-NOSE END MILL

(SOLID CARBIDE)

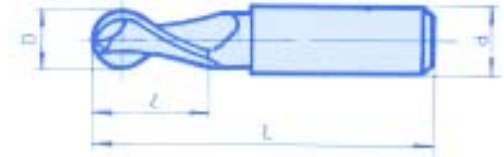


ISO STANDARD

D	d	L	l	K30	M30
				Model No.	Model No.
3.0	3.0	32	12	243-3000	244-3000
3.5	3.5	32	12	243-3002	244-3002
4.0	4.0	40	12	243-3004	244-3004
4.5	4.5	50	14	243-3006	244-3006
5.0	5.0	50	14	243-3008	244-3008
6.0	6.0	50	16	243-3010	244-3010
7.0	7.0	60	20	243-3012	244-3012
8.0	8.0	60	20	243-3014	244-3014
9.0	9.0	60	20	243-3016	244-3016
10.0	10.0	70	22	243-3018	244-3018
12.0	12.0	70	22	243-3020	244-3020
14.0	14.0	75	25	243-3022	244-3022

ROUND-NOSE END MILL

(SOLID CARBIDE)



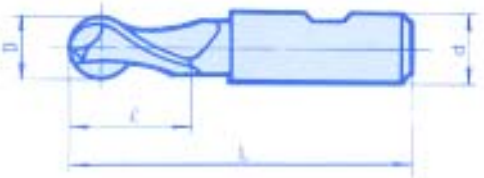
ISO STANDARD

D	d	L	l	K30	M30
				Model No.	Model No.
3.0	4	37	5	243-3030	244-3030
3.5	4	38	6	243-3032	244-3032
4.0	4	39	7	243-3034	244-3034
5.0	5	42	8	243-3036	244-3036
6.0	6	52	8	243-3038	244-3038
7.0	8	54	10	243-3040	244-3040
8.0	8	55	11	243-3042	244-3042
9.0	10	61	11	243-3044	244-3044
10.0	10	63	13	243-3046	244-3046
12.0	12	73	16	243-3048	244-3048
14.0	12	73	16	243-3050	244-3050

ROUND-NOSE END MILL

WITH WELDON SHANK

(SOLID CARBIDE)



ANSI STANDARD

D	d	L	l	K30	M30
				Model No.	Model No.
1/8	3/8	2-5/16	3/8	243-3061	244-3061
3/16	3/8	2-3/8	1/2	243-3063	244-3063
1/4	3/8	2-7/16	5/8	243-3065	244-3065
5/16	3/8	2-1/2	3/4	243-3067	244-3067
3/8	3/8	2-1/2	3/4	243-3069	244-3069
7/16	1/2	3	1	243-3071	244-3071
1/2	1/2	3	1	243-3073	244-3073
9/16	1/2	3-1/8	1-1/8	243-3075	244-3075

ISO STANDARD

D	d	L	l	K30	M30
				Model No.	Model No.
3.0	6	49	5	243-3060	244-3060
3.5	6	50	6	243-3062	244-3062
4.0	6	51	7	243-3064	244-3064
5.0	6	52	8	243-3066	244-3066
6.0	6	52	8	243-3068	244-3068
7.0	10	60	10	243-3070	244-3070
8.0	10	61	11	243-3072	244-3072
9.0	10	61	11	243-3074	244-3074
10.0	10	63	13	243-3076	244-3076
12.0	12	73	16	243-3078	244-3078
14.0	12	73	16	243-3080	244-3080

RECOMMENDED CUTTING PARAMETERS FOR CARBIDE

END MILL HOW TO CHOOSE CARBIDE GRADES

MILLS	CUTTING SPEED (m/min)	FEED PER TOOTH (mm)
2FL END MILL	300-900	0.05-0.15
MULTI END MILL		
ROUGHING	60-80	0.05-0.15
SEMI-FINISHING	70-90	0.04-0.12
FINISHING	70-110	0.03-0.10

INSTRUCTION

MATERIAL TO BE MACHINED	CARBIDE GRADE
ALUMINUM AND MAGNESIUM ALLOY AND OTHER LIGHT ALLOYS	K30
CAST IRON, TITANIUM ALLOY.	
CAST STEEL	M30
HIGH STRENGTH STEEL	
HIGH-TEMPERATURE STEEL	



Cutting Tools

CONVEX ARBOR TYPE MILLING CUTTER



Dia.of Circle	Dia.of Cutter	Hole Size	Model No.
1/16	2-1/4	1	317-0040
3/32	2-1/4	1	317-0065
1/8	2	7/8	317-0081
1/8	2-1/4	1	317-0099
5/32	2-1/4	1	317-0107
3/16	2	7/8	317-0123
3/16	2-1/4	1	317-0131
7/32	2-1/4	1	317-0149
1/4	2	7/8	317-0164
1/4	2-1/2	1	317-0172
1/4	4	1-1/4	317-0178
9/32	2-1/2	1	317-0180
5/16	2-1/4	7/8	317-0206
5/16	2-3/4	1	317-0214
11/32	2-3/4	1	317-0222
3/8	2-1/4	7/8	317-0248
3/8	2-3/4	1	317-0255
3/8	5	1-1/4	317-0260
13/32	2-3/4	1	317-0263
7/16	2-1/4	7/8	317-0278
7/16	3	1	317-0297
1/2	2-1/4	7/8	317-0321
1/2	3	1	317-0339
1/2	5	1-1/4	317-0350
9/16	2-3/4	1	317-0362
9/16	3	1	317-0389
5/8	2-3/4	1	317-0404
5/8	3-1/2	1-1/4	317-0412
11/16	3	1	317-0446
3/4	3	1	317-0487
3/4	3-3/4	1-1/4	317-0495
3/4	6	1-1/4	317-0510
13/16	3-1/4	1	317-0529
13/16	3-1/4	1-1/4	317-0536
7/8	3-1/4	1	317-0569
7/8	4	1-1/4	317-0578
15/16	3-1/2	1	317-0602
1	3-1/4	1	317-0644
1	4-1/4	1-1/4	317-0651
1	6	1-1/4	317-0700
1-1/8	4	1-1/4	317-1089
1-1/4	4	1-1/4	317-1162
1-3/8	4-1/4	1-1/4	317-1246
1-1/2	4-1/4	1-1/4	317-1329
1-5/8	5-1/2	1-1/4	317-1402
1-3/4	5-1/2	1-1/4	317-1485
1-7/8	6	1-1/2	317-1568
2	6	1-1/2	317-2004

CONCAVE ARBOR TYPE MILLING CUTTER



Dia.of Circle	Dia.of Cutter	Hole Size	Model No.
1/16	2-1/4	1	316-0041
3/32	2-1/4	1	316-0066
1/8	2	7/8	316-0090
1/8	2-1/4	1	316-0098
5/32	2-1/4	1	316-0108
3/16	2	7/8	316-0116
3/16	2-1/4	1	316-0132
7/32	2-1/4	1	316-0140
1/4	2	7/8	316-0165
1/4	2-1/2	1	316-0173
9/32	2-1/2	1	316-0181
5/16	2-3/4	1	316-0215
3/8	2-3/4	1	316-0256
7/16	3	1	316-0298
1/2	2-1/4	7/8	316-0322
1/2	3	1	316-0330
9/16	3	1	316-0363
5/8	3	1	316-0378
5/8	3-1/2	1-1/4	316-0413
11/16	3	1	316-0447
3/4	3	1	316-0488
3/4	3-3/4	1-1/4	316-0496
13/16	3-1/4	1	316-0520
7/8	3-1/4	1	316-0561
7/8	4	1-1/4	316-0579
15/16	3-1/2	1	316-0603
1	3-1/4	1	316-0645
1	4-1/4	1-1/4	316-0652
1-1/8	4	1-1/4	316-1080
1-1/4	4	1-1/4	316-1163
1-3/8	4-1/4	1-1/4	316-1247
1-1/2	4-1/4	1-1/4	316-1320
1-5/8	5-1/2	1-1/4	316-1403
1-3/4	5-1/2	1-1/4	316-1486
1-7/8	6	1-1/2	316-1569
2	6	1-1/2	316-2005



CONVEX SHANK TYPE MILLING CUTTER



Radius	Cutter Dia.	Shank Dia.	No. of Flute	Overall Length	Model No.
1/32	3/4	1/2	6	3	317-4026
1/16	3/4	1/2	6	3	317-4042
3/32	7/8	1/2	6	3	317-4067
1/8	1-1/4	3/4	6	3-1/2	317-4083
5/32	1-5/16	3/4	6	3-1/2	317-4109
3/16	1-3/8	3/4	6	3-1/2	317-4125
1/4	1-1/2	3/4	4.6	4	317-4166
5/16	1-5/8	3/4	4.6	4	317-4208
3/8	1-3/4	3/4	4.6	4	317-4240

CONCAVE SHANK TYPE MILLING CUTTER



Radius	Cutter Dia.	Shank Dia.	No. of Flute	Overall Length	Model No.
1/32	3/4	1/2	6	3	316-3028
1/16	3/4	1/2	6	3	316-3044
3/32	3/4	1/2	6	3	316-3069
1/8	1	3/4	6	3-1/2	316-3085
5/32	1	3/4	6	3-1/2	316-3101
3/16	1	3/4	6	3-1/2	316-3127
1/4	1-1/4	3/4	4.6	4	316-3168
5/16	1-1/4	3/4	4.6	4	316-3200
3/8	1-1/2	3/4	4.6	4-3/16	316-3242

ARBOR TYPE SINGLE ANGLE CUTTER

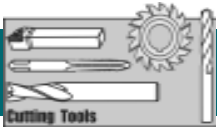


Cutter Dia.	Width of Face	Hole Size	45°		60°	
			Right Hand Model No.	Left Hand Model No.	Right Hand Model No.	Left Hand Model No.
2-1/2	1/2	7/8	328-0110	328-1110	328-2110	328-3110
2-3/4	1/2	1	328-0219	328-1219	328-2219	328-3219
3	1/2	1	328-0316	328-1316	328-2316	328-3316
3	1/2	1-1/4	328-0318	328-1318	328-2318	328-3318
3	5/8	1	328-0326	328-1326	328-2326	328-3326
3	5/8	1-1/4	328-0330	328-1330	328-2330	328-3330
3	3/4	1	328-0334	328-1334	328-2334	328-3334
3	3/4	1-1/4	328-0400	328-1400	328-2400	328-3400
4	1/2	1	328-0417	328-1417	328-2417	328-3417
4	1/2	1-1/4	328-0420	328-1420	328-2420	328-3420
4	3/4	1	328-0433	328-1433	328-2433	328-3433
4	3/4	1-1/4	328-0436	328-1436	328-2436	328-3436
4	1	1-1/4	328-0441	328-1441	328-2441	328-3441
5	3/4	1-1/4	328-0532	328-1532	328-2532	328-3532
5	1	1-1/4	328-0540	328-1540	328-2540	328-3540
6	3/4	1-1/4	328-0631	328-1631	328-2631	328-3631
6	1	1-1/4	328-0649	328-1649	328-2649	328-3649

DOUBLE ANGLE CUTTER ARBOR TYPE



Dia.	Width of Face	Hole Size	45°	60°	90°
			Model No.	Model No.	Model No.
2-3/4	1/2	1	328-4211	328-5211	328-6211
3	5/8	1	328-4328	328-5328	328-6328
3	3/4	1	328-4366	328-5366	328-6366
4	1/2	1-1/4	328-4427	328-5427	328-6427
4	3/4	1	328-4435	328-5435	328-6435
4	3/4	1-1/4	328-4446	328-5446	328-6446
4	1	1-1/4	328-4468	328-5468	328-6468
5	3/4	1-1/4	328-4534	328-5534	328-6534
5	1	1-1/4	328-4542	328-5542	328-6542
6	3/4	1-1/4	328-4633	328-5633	328-6633
6	1	1-1/4	328-4641	328-5641	328-6641
6	1-1/4	1-1/4	328-4649	328-5649	328-6649
6	1-1/2	1-1/4	328-4658	328-5658	328-6658



Cutting Tools

WOODRUFF KEYSEAT CUTTER 1/2" SHANK

Staggered Teeth



Straight Teeth



Dia.	Width of Face	Overall Length	Straight Teeth Model No.	Staggered Teeth Model No.
1/2	1/16	2-1/16	296-0010	297-0010
1/2	3/32	2-3/32	296-0028	297-0028
1/2	1/8	2-1/8	296-0036	297-0036
5/8	3/32	2-3/32	296-0044	297-0044
5/8	1/8	2-1/8	296-0051	297-0051
5/8	5/32	2-5/32	296-0069	297-0069
3/4	1/8	2-1/8	296-0077	297-0077
3/4	5/32	2-5/32	296-0085	297-0085
3/4	3/16	2-3/16	296-0093	297-0093
7/8	5/32	2-5/32	296-0101	297-0101
7/8	3/16	2-3/16	296-0119	297-0119
7/8	7/32	2-7/32	296-0127	297-0127
1	3/16	2-3/16	296-0135	297-0135
1	7/32	2-7/32	296-0143	297-0143
1	1/4	2-1/4	296-0150	297-0150
1-1/8	3/16	2-3/16	296-0168	297-0168
1-1/8	7/32	2-7/32	296-0176	297-0176
1-1/8	1/4	2-1/4	296-0184	297-0184
1-1/4	3/16	2-3/16	296-0192	297-0192
1-1/4	7/32	2-7/32	296-0200	297-0200
1-1/4	1/4	2-1/4	296-0218	297-0218
1-3/8	1/4	2-1/4	296-0226	297-0226
1-3/8	5/16	2-5/16	296-0234	297-0234
1-1/2	1/4	2-1/4	296-0242	297-0242
1-1/2	5/16	2-5/16	296-0259	297-0259
5/8	3/16	2-3/16	296-0614	297-0614
3/4	1/4	2-1/4	296-0911	297-0911
1	3/8	2-3/8	296-1521	297-1521
1/4	1/16	2-1/16	296-2016	297-2016
5/16	1/16	2-1/16	296-2065	297-2065
5/16	3/32	2-3/32	296-2073	297-2073
3/8	1/16	2-1/16	296-2115	297-2115
3/8	3/32	2-3/32	296-2123	297-2123
3/8	1/8	2-1/8	296-2131	297-2131
7/8	1/4	2-1/4	296-9011	297-9011
1	5/16	2-5/16	296-9029	297-9029
1-1/8	5/16	2-5/16	296-9037	297-9037
1-1/4	5/16	2-5/16	296-9045	297-9045
1-1/4	3/8	2-3/8	296-9052	297-9052
1-3/8	3/8	2-3/8	296-9060	297-9060
1-1/2	3/8	2-3/8	296-9078	297-9078

PLAIN MILLING CUTTER LIGHT DUTY



Dia.	Width of Face	Hold Dia.	Model No.
2-1/4	1/2	7/8	304-1323
2-1/4	1	7/8	304-1646
2-1/2	3/16	1	304-2123
2-1/2	1/4	1	304-2164
2-1/2	5/16	1	304-2206
2-1/2	3/8	1	304-2248
2-1/2	7/16	1	304-2289
2-1/2	1/2	1	304-2321
2-1/2	5/8	1	304-2404
2-1/2	3/4	1	304-2487
2-1/2	1	1	304-2644
2-1/2	1-1/2	1	304-2826
2-1/2	2	1	304-2909
2-1/2	2-1/2	1	304-2958
2-1/2	3	1	304-2974
3	3/16	1	304-3121
3	1/4	1	304-3162
3	5/16	1	304-3204
3	3/8	1	304-3246
3	3/8	1-1/4	304-3253
3	7/16	1-1/4	304-3287
3	1/2	1-1/4	304-3329
3	5/8	1-1/4	304-3402

Dia.	Width of Face	Hold Dia.	Model No.
3	3/4	1-1/4	304-3485
3	7/8	1-1/4	304-3568
3	1	1-1/4	304-3642
3	1-1/4	1-1/4	304-3741
3	1-1/2	1-1/4	304-3824
3	2	1-1/4	304-3964
3	3	1-1/4	304-3972
4	1/4	1	304-4160
4	1/4	1-1/4	304-4178
4	5/16	1	304-4202
4	3/8	1	304-4244
4	3/8	1-1/4	304-4251
4	1/2	1-1/4	304-4327
4	5/8	1-1/4	304-4400
4	3/4	1-1/4	304-4483
4	1	1-1/4	304-4640
4	1-1/2	1-1/4	304-4822
4	2	1-1/4	304-4962
4	3	1-1/4	304-4970
4	4	1-1/4	304-4988

PLAIN MILLING CUTTER HEAVY DUTY



Dia.	Width of Face	Hold Dia.	Model No.
2-1/2	2	1	304-2967
2-1/2	4	1	304-2983
3	2	1-1/4	304-3940
3	2	1-1/4	304-3957
3	3	1-1/4	304-3973
3	4	1-1/4	304-3981
3	6	1-1/4	304-3999
4	2	1-1/2	304-4963
4	3	1-1/2	304-4971
4	4	1-1/2	304-4989
4	6	1-1/2	304-4997
4-1/2	6	2	304-5994

Dia.	Width of Face	Hold Helical	Model No.
3	4	1-1/4	304-7347
3	6	1-1/4	304-7362
4	8	1-1/2	304-7487
4-1/2	6	2	304-7560

WWW.PRECOTOOLS.CN



SINGLE END MILL SETS



No. Of PCs	Description	with Wooden Case		with Plastic Case		End Mills Only	
		M2 Model No.	TiN-Coated Model No.	M2 Model No.	TiN-Coated Model No.	M2 Model No.	TiN-Coated Model No.
20	2&4 Flute each of 3/16" to 3/4" by 16ths	320-1000	320-0000	329-1000	329-0000	320-1100	320-0100
10	2Flute 3/16" to 3/4" by 16ths	320-1001	320-0001	329-1001	329-0001	320-1101	320-0101
10	4 Flute 3/16" to 3/4" by 16ths	320-1002	320-0002	329-1002	329-0002	320-1102	320-0102
10	2&4 Flute each of 1/4", 3/8", 1/2", 5/8", 3/4"	320-1003	320-0003	329-1003	329-0003	320-1103	320-0103
20	2&4 Flute each of 3,4,5,6,8,10,12,14,18,20mm	320-1004	320-0004	329-1004	329-0004	320-1104	320-0104
20	2&4 Flute each of 3,4,5,6,8,10,12,14,16,20mm	320-1005	320-0005	329-1005	329-0005	320-1105	320-0105
10	2Flute 3,4,5,6,8,10,12,14,18,20mm	320-1006	320-0006	329-1006	329-0006	320-1106	320-0106
10	4 Flute 3,4,5,6,8,10,12,14,18,20mm	320-1007	320-0007	329-1007	329-0007	320-1107	320-0107
3	2Flute 1/8, 1/4, 3/8"	320-1008	320-0008			320-1108	320-0108
3	4 Flute 1/8, 1/4, 3/8"	320-1009	320-0009			320-1109	320-0109
20	4Flute 2 each of 3/16" to 3/4" by 16ths	320-4001	320-3001	329-4001	329-3001	320-4101	320-3101
15	4Flute 3.4.5.6.8.10.12.14.15.16.18.20.22.24.25	320-0015	320-1015				

END MILL CASES ONLY

Description	Plastic Case Model No.	Wooden Case Model No.
for 3pcs single end mill set		320-WC03
for 10pcs single end mill set	320-CP10	320-WC10
for 20pcs single end mill set	320-CP20	320-WC20
for 10-PCs double end mill set	320-CP01	320-WC01
for 20-PCs double end mill set	320-CP02	320-WC02

SINGLE END SETS WITH STAND

6 Piece 2 or 4 Flute Single End Sets



No. Of Shank			
Flute	Dia.	Descriptions	Model No.
2	3/8"	1/8, 3/16, 1/4, 5/16, 3/8, 1/2"	320-2006
4	3/8"	1/8, 3/16, 1/4, 5/16, 3/8, 1/2"	320-2016
2	3/4"	1", 3/4, 7/8, 1-1/8, 1-1/4, 1-1/2"	320-2066
4	3/4"	1", 3/4, 7/8, 1-1/8, 1-1/4, 1-1/2"	320-2076

4, 9 Piece 2 Flute Ball Nose Single End Sets

No. Of Piece	Descriptions	Model No.
4	7/8, 1, 1-1/4, 1-1/2"	320-2004
9	1/8, 3/16, 1/4, 5/16, 3/8, 7/16, 1/2, 5/8, 3/4"	320-2009



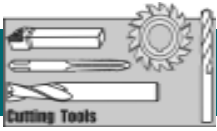
12 Piece 2 and 4 Flute Single End Sets

No. Of Shank			
Flute	Dia.	Descriptions	Model No.
2&4	3/8"	1/8, 3/16, 1/4, 5/16, 3/8, 1/2"	320-2026

DOUBLE END MILL SETS



No. Of Piece	Description	with Wooden Case		with Plastic Case		End Mills Only	
		M2 Model No.	TiN-Coated Model No.	M2 Model No.	TiN-Coated Model No.	M2 Model No.	TiN-Coated Model No.
20pcs	2&4 Flute each of 3/16" to 3/4" by 16ths	320-9001	320-8001	329-9001	329-8001	320-9101	320-8101
10pcs	4 Flute 3/16" to 3/4" by 16ths	320-9002	320-8002	329-9002	329-8002	320-9102	320-8102
10pcs	2Flute 3/16" to 3/4" by 16ths	320-9003	320-8003	329-9003	329-8003	320-9103	320-8103
10pcs	2&4 Flute each of 1/4", 3/8", 1/2", 5/8", 3/4"	320-9004	320-8004	329-9004	329-8004	320-9104	320-8104



Cutting Tools

5, 6 Piece 2 or 4 Flute Double End Sets

No. Of Piece	No. Of Flute	No. Of Shank Dia.	Descriptions	Model No.
5	2	3/16"	1/16,3/32,1/8,5/32,3/16"	320-2305
5	4	3/16"	1/16,3/32,1/8,5/32,3/16"	320-2405
6	2	3/8"	1/8,5/32,3/16,1/4,5/16,3/8"	320-2106
6	4	3/8"	1/8,5/32,3/16,1/4,5/16,3/8"	320-2116



DOUBLE END MILL SETS WITH STAND

14 Piece 2 or 4 Flute Double End Sets

No. Of Flute	No. Of Shank Dia.	Descriptions	Model No.
2	3/8"	1/8,5/32,3/16,1/4,5/16,3/8"	320-2114
	1/2"	1/2,9/16"	
	5/8"	5/8,11/16,3/4"	
	3/4"	13/16,7/8,1"	
4	3/8"	1/8,5/32,3/16,1/4,5/16,3/8"	320-2214
	1/2"	1/2,9/16"	
	5/8"	5/8,11/16,3/4"	
	3/4"	13/16,7/8,1"	

10, 12 Piece 2 and 4 Flute Double End Sets

No. Of Piece	No. Of Flute	No. Of Shank Dia.	Descriptions	Model No.
10	2&4	3/16"	1/16,3/32,1/8,5/32,3/16"	320-2610
12	2&4	3/8"	1/8,5/32,3/16,1/4,5/16,3/8"	320-2036

METRIC SIDE MILLING CUTTERS

Straight Tooth / Staggered Tooth

High Speed Steel



Dia. (mm)	Width of Face (mm)	Hole Size (mm)	Straight Tooth Model No.	Staggered Tooth Model No.
50	4	16	322-0501	322-5501
50	5	16	322-0502	322-5502
50	6	16	322-0503	322-5503
50	8	16	322-0504	322-5504
50	10	16	322-0505	322-5505
63	4	22	322-0631	322-5631
63	5	22	322-0632	322-5632
63	6	22	322-0633	322-5633
63	7	22	322-0634	322-5634
63	8	22	322-0635	322-5635
63	10	22	322-0636	322-5636
63	12	22	322-0637	322-5637
63	14	22	322-0638	322-5638
63	16	22	322-0639	322-5639
80	5	27	322-0801	322-5801
80	6	27	322-0802	322-5802
80	7	27	322-0803	322-5803
80	8	27	322-0804	322-5804
80	10	27	322-0805	322-5805
80	12	27	322-0806	322-5806
80	14	27	322-0807	322-5807
80	16	27	322-0808	322-5808
80	18	27	322-0809	322-5809
80	20	27	322-0810	322-5810
100	5	32	322-1001	322-6001
100	6	32	322-1002	322-6002
100	8	32	322-1003	322-6003
100	10	32	322-1004	322-6004
100	12	32	322-1005	322-6005
100	14	32	322-1006	322-6006
100	16	32	322-1007	322-6007
100	18	32	322-1008	322-6008
100	20	32	322-1009	322-6009
100	22	32	322-1010	322-6010
100	25	32	322-1011	322-6011
125	8	32	322-1251	322-6251
125	10	32	322-1252	322-6252
125	12	32	322-1253	322-6253
125	14	32	322-1254	322-6254
125	16	32	322-1255	322-6255
125	18	32	322-1256	322-6256
125	20	32	322-1257	322-6257

Dia. (mm)	Width of Face (mm)	Hole Size (mm)	Straight Tooth Model No.	Staggered Tooth Model No.
125	22	32	322-1258	322-6258
125	25	32	322-1259	322-6259
125	28	32	322-1260	322-6260
160	8	40	322-1601	322-6601
160	10	40	322-1602	322-6602
160	12	40	322-1603	322-6603
160	14	40	322-1604	322-6604
160	16	40	322-1605	322-6605
160	18	40	322-1606	322-6606
160	20	40	322-1607	322-6607
160	22	40	322-1608	322-6608
160	25	40	322-1609	322-6609
160	28	40	322-1610	322-6610
160	32	40	322-1611	322-6611
200	8	40	322-2001	322-7001
200	10	40	322-2002	322-7002
200	12	40	322-2003	322-7003
200	14	40	322-2004	322-7004
200	16	40	322-2005	322-7005
200	18	40	322-2006	322-7006
200	20	40	322-2007	322-7007
200	22	40	322-2008	322-7008
200	25	40	322-2009	322-7009
200	28	40	322-2010	322-7010
200	32	40	322-2011	322-7011
250	10	40	322-2501	322-7501
250	12	40	322-2502	322-7502
250	14	40	322-2503	322-7503
250	16	40	322-2504	322-7504
250	18	40	322-2505	322-7505
250	20	40	322-2506	322-7506
250	22	40	322-2507	322-7507
250	25	40	322-2508	322-7508
250	28	40	322-2509	322-7509
250	32	40	322-2510	322-7510

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STRAIGHT TOOTH SIDE MILLING CUTTERS

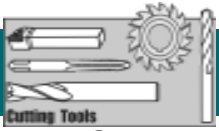
High Speed Steel

Used in slotting, light-duty side milling and straddle milling.



Dia	Width of Face	Hole Size	Model No.
2"	3/16	1/2	301-2127
2"	3/16	5/8	301-2135
2"	1/4	1/2	301-2168
2"	1/4	5/8	301-2176
2"	5/16	1/2	301-2200
2"	5/16	5/8	301-2218
2"	3/8	1/2	301-2242
2"	3/8	5/8	301-2259
2-1/2	1/4	7/8	301-2515
2-1/2	5/16	7/8	301-2523
2-1/2	3/8	7/8	301-2531
2-1/2	1/2	7/8	301-2556
2-1/2	3/16	1"	301-2614
2-1/2	1/4	1"	301-2622
2-1/2	5/16	1"	301-2630
2-1/2	3/8	1"	301-2648
2-1/2	7/16	1"	301-2655
2-1/2	1/2	1"	301-2663
2-1/2	5/8	1"	301-2671
3"	3/16	1"	301-3125
3"	7/32	1"	301-3141
3"	1/4	1"	301-3166
3"	1/4	1-1/4	301-3174
3"	9/32	1"	301-3182
3"	5/16	1"	301-3208
3"	5/16	1-1/4	301-3216
3"	11/32	1"	301-3224
3"	3/8	1"	301-3240
3"	3/8	1-1/4	301-3257
3"	13/32	1"	301-3265
3"	7/16	1"	301-3281
3"	1/2	1"	301-3323
3"	1/2	1-1/4	301-3331
3"	5/8	1"	301-3406
3"	3/4	1"	301-3489
3"	13/16	1"	301-3497
3-1/2	1/4	1"	301-3513
3-1/2	5/16	1"	301-3521
3-1/2	3/8	1"	301-3539
3-1/2	7/16	1"	301-3547
3-1/2	1/2	1"	301-3554
3"	7/8	1"	301-3562
3-1/2	5/8	1"	301-3570
3"	15/16	1"	301-3604
3"	1	1"	301-3646
4"	3/16	1"	301-4123
4"	3/16	1-1/4	301-4131
4"	7/32	1"	301-4149
4"	1/4	1"	301-4164
4"	1/4	1-1/4	301-4172
4"	9/32	1"	301-4180
4"	9/32	1-1/4	301-4198
4"	5/16	1"	301-4206
4"	5/16	1-1/4	301-4214
4"	11/32	1"	301-4222
4"	3/8	1"	301-4248
4"	3/8	1-1/4	301-4255
4"	13/32	1"	301-4263
4"	7/16	1"	301-4289
4"	1/2	1"	301-4321
4"	1/2	1-1/4	301-4339
4"	9/16	1"	301-4362
4"	5/8	1"	301-4404
4"	5/8	1-1/4	301-4412
4"	11/16	1"	301-4446
4"	3/4	1"	301-4487
4"	3/4	1-1/4	301-4495
4"	13/16	1"	301-4529
4"	7/8	1"	301-4560
4"	7/8	1-1/4	301-4578
4"	15/16	1"	301-4602
4"	1	1"	301-4644
4"	1-1/8	1-1/4	301-4701
4"	1-1/4	1-1/4	301-4743
4-1/2	3/8	1-1/4	301-4842
4-1/2	1/2	1-1/4	301-4867

Dia	Width of Face	Hole Size	Model No.
5"	1/4	1"	301-5161
5"	1/4	1-1/4	301-5179
5"	9/32	1"	301-5187
5"	9/32	1-1/4	301-5195
5"	5/16	1"	301-5203
5"	5/16	1-1/4	301-5211
5"	11/32	1"	301-5229
5"	3/8	1"	301-5245
5"	3/8	1-1/4	301-5252
5"	13/32	1"	301-5260
5"	7/16	1"	301-5286
5"	1/2	1"	301-5328
5"	1/2	1-1/4	301-5336
5"	9/16	1"	301-5369
5"	5/8	1"	301-5401
5"	5/8	1-1/4	301-5419
5"	11/16	1"	301-5443
5"	3/4	1"	301-5484
5"	3/4	1-1/4	301-5492
5"	13/16	1"	301-5526
5"	7/8	1"	301-5567
5"	15/16	1"	301-5609
5"	1"	1-1/4	301-5641
6"	1/4	1"	301-6169
6"	1/4	1-1/4	301-6177
6"	9/32	1-1/4	301-6193
6"	5/16	1"	301-6201
6"	5/16	1-1/4	301-6219
6"	3/8	1"	301-6243
6"	3/8	1-1/4	301-6250
6"	7/16	1-1/4	301-6284
6"	1/2	1"	301-6326
6"	1/2	1-1/4	301-6334
6"	9/16	1-1/4	301-6367
6"	5/8	1-1/4	301-6409
6"	11/16	1-1/4	301-6441
6"	3/4	1"	301-6482
6"	3/4	1-1/4	301-6490
6"	13/16	1-1/4	301-6524
6"	7/8	1-1/4	301-6565
6"	15/16	1-1/4	301-6607
6"	1"	1-1/4	301-6649
7"	1/4	1-1/4	301-7167
7"	5/16	1-1/4	301-7209
7"	3/8	1-1/4	301-7241
7"	7/16	1-1/4	301-7282
7"	1/2	1-1/4	301-7324
7"	5/8	1-1/4	301-7407
7"	3/4	1-1/4	301-7480
7"	1"	1-1/4	301-7647
8"	1/4	1"	301-8165
8"	1/4	1-1/4	301-8173
8"	5/16	1"	301-8207
8"	5/16	1-1/4	301-8215
8"	3/8	1"	301-8249
8"	3/8	1-1/4	301-8256
8"	7/16	1"	301-8280
8"	1/2	1"	301-8322
8"	1/2	1-1/4	301-8330
8"	9/16	1-1/4	301-8363
8"	5/8	1-1/4	301-8405
8"	11/16	1-1/4	301-8447
8"	3/4	1-1/4	301-8488
8"	13/16	1-1/4	301-8520
8"	7/8	1-1/4	301-8561
8"	15/16	1-1/4	301-8603
8"	1"	1-1/4	301-8645
10"	1/4	1-1/2	301-9163
10"	5/16	1-1/2	301-9205
10"	3/8	1-1/2	301-9247
10"	1/2	1-1/2	301-9320
10"	5/8	1-1/2	301-9403
10"	3/4	1-1/2	301-9486
10"	7/8	1-1/2	301-9569
10"	1"	1-1/2	301-9643



Cutting Tools

STAGGERED TOOTH SIDE MILLING CUTTERS

High Speed Steel

Used in slotting, light-duty side milling and straddle milling.



Dia.	Width of Face	Hole Size	Model No.
2-1/8	1/4	3/4	306-1168
2-1/8	5/16	3/4	306-1200
2-1/8	3/8	3/4	306-1242
2-1/2	3/16	7/8	306-2505
2-1/2	1/4	7/8	306-2513
2-1/2	5/16	7/8	306-2521
2-1/2	3/8	7/8	306-2539
2-1/2	1/2	7/8	306-2554
2-3/4	1/4	1"	306-2711
2-3/4	5/16	1"	306-2729
2-3/4	3/8	1"	306-2737
2-3/4	7/16	1"	306-2745
2-3/4	1/2	1"	306-2752
3"	1/8	1"	306-2900
3"	5/32	1"	306-3107
3"	3/16	1"	306-3123
3"	3/16	1-1/4	306-3131
3"	7/32	1"	306-3149
3"	1/4	1"	306-3164
3"	1/4	1-1/4	306-3172
3"	9/32	1"	306-3180
3"	5/16	1"	306-3206
3"	5/16	1-1/4	306-3214
3"	11/32	1"	306-3222
3"	3/8	1"	306-3248
3"	3/8	1-1/4	306-3255
3"	13/32	1"	306-3263
3"	7/16	1"	306-3289
3"	1/2	1"	306-3313
3"	1/2	1-1/4	306-3321
3"	9/16	1"	306-3336
3"	9/16	1-1/4	306-3362
3"	5/8	1"	306-3378
3"	5/8	1-1/4	306-3404
3"	3/4	1-1/4	306-3487
3"	7/8	1-1/4	306-3560
3"	1"	1-1/4	306-3644
3-1/2	7/32	1"	306-3670
3-1/2	1/4	1"	306-3685
3-1/2	9/32	1"	306-3701
3-1/2	5/16	1"	306-3727
3-1/2	3/8	1"	306-3735
3-1/2	7/16	1"	306-3743
3-1/2	1/2	1"	306-3750
3-1/2	9/16	1"	306-3768
3-1/2	5/8	1"	306-3776
3-1/2	11/16	1"	306-3784
3-1/2	3/4	1"	306-3792
4"	1/8	1"	306-3856
4"	3/16	1"	306-4121
4"	3/16	1-1/4	306-4139
4"	7/32	1-1/4	306-4147
4"	1/4	1"	306-4154

Dia.	Width of Face	Hole Size	Model No.
4"	1/4	1-1/4	306-4162
4"	9/32	1-1/4	306-4188
4"	5/16	1"	306-4196
4"	5/16	1-1/4	306-4204
4"	11/32	1-1/4	306-4220
4"	3/8	1"	306-4238
4"	3/8	1-1/4	306-4246
4"	13/32	1-1/4	306-4261
4"	7/16	1-1/4	306-4287
4"	7/16	1"	306-4295
4"	1/2	1"	306-4311
4"	1/2	1-1/4	306-4329
4"	9/16	1-1/4	306-4360
4"	5/8	1"	306-4378
4"	5/8	1-1/4	306-4402
4"	3/4	1"	306-4477
4"	3/4	1-1/4	306-4485
4"	7/8	1-1/4	306-4568
4"	1/8	1"	306-4579
4"	5/32	1"	306-4586
4"	1"	1-1/4	306-4642
4"	1-1/8	1-1/4	306-4709
4"	1-1/4	1-1/4	306-4741
4"	1-1/2	1-1/4	306-4824
5"	1/8	1-1/4	306-5036
5"	5/32	1-1/4	306-5089
5"	3/16	1-1/4	306-5118
5"	7/32	1-1/4	306-5134
5"	1/4	1"	306-5151
5"	1/4	1-1/4	306-5169
5"	9/32	1-1/4	306-5176
5"	5/16	1"	306-5193
5"	5/16	1-1/4	306-5201
5"	3/8	1-1/4	306-5243
5"	3/8	1"	306-5250
5"	7/16	1-1/4	306-5284
5"	1/2	1"	306-5318
5"	1/2	1-1/4	306-5326
5"	5/8	1-1/4	306-5409
5"	3/4	1-1/4	306-5482
5"	1"	1-1/4	306-5649
6"	1/8	1-1/4	306-6016
6"	5/32	1-1/4	306-6087
6"	3/16	1-1/4	306-6136
6"	7/32	1-1/4	306-6151
6"	1/4	1"	306-6159
6"	1/4	1-1/4	306-6167
6"	9/32	1-1/4	306-6183
6"	5/16	1"	306-6191
6"	5/16	1-1/4	306-6209
6"	3/8	1"	306-6233
6"	3/8	1-1/4	306-6241
6"	7/16	1-1/4	306-6282

Dia.	Width of Face	Hole Size	Model No.
6"	1/2	1"	306-6316
6"	1/2	1-1/4	306-6324
6"	9/16	1-1/4	306-6365
6"	5/8	1-1/4	306-6407
6"	11/16	1-1/4	306-6449
6"	3/4	1-1/4	306-6480
6"	13/16	1-1/4	306-6522
6"	7/8	1-1/4	306-6563
6"	15/16	1-1/4	306-6605
6"	1"	1-1/4	306-6647
6"	1-1/8	1-1/4	306-6704
6"	1-1/4	1-1/4	306-6746
6"	1-1/2	1-1/4	306-6829
7"	1/4	1-1/4	306-7165
7"	5/16	1-1/4	306-7207
7"	3/8	1-1/4	306-7249
7"	7/16	1-1/4	306-7280
7"	1/2	1-1/4	306-7322
7"	9/16	1-1/4	306-7363
7"	5/8	1-1/4	306-7405
7"	11/16	1-1/4	306-7447
7"	3/4	1-1/4	306-7488
7"	7/8	1-1/4	306-7561
7"	1"	1-1/4	306-7645
8"	1/4	1-1/4	306-8163
8"	5/16	1-1/4	306-8205
8"	3/8	1-1/2	306-8247
8"	7/16	1-1/2	306-8288
8"	1/2	1-1/2	306-8320
8"	9/16	1-1/2	306-8361
8"	5/8	1-1/2	306-8403
8"	11/16	1-1/2	306-8445
8"	3/4	1-1/2	306-8486
8"	13/16	1-1/2	306-8528
8"	7/8	1-1/2	306-8569
8"	1"	1-1/2	306-8643
8"	1-1/8	1-1/2	306-8700
8"	1-1/4	1-1/2	306-8742
8"	1-1/2	1-1/2	306-8825
10"	1/4	1-1/2	306-9161
10"	5/16	1-1/2	306-9203
10"	3/8	1-1/2	306-9245
10"	7/16	1-1/2	306-9286
10"	1/2	1-1/2	306-9328
10"	9/16	1-1/2	306-9369
10"	5/8	1-1/2	306-9401
10"	3/4	1-1/2	306-9484
10"	7/8	1-1/2	306-9567
10"	1"	1-1/2	306-9641
10"	1-1/8	1-1/2	306-9708
10"	1-1/4	1-1/2	306-9740
10"	1-1/2	1-1/2	306-9823

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CARBIDE TIPPED SIDE MILLING CUTTERS



For Steel



For Non-Ferrous



For Cast Iron

Cutter Face Dia.	Arbor Width	Arbor Hole	For Steel		For Non-Ferrous		For Cast Iron		For Stainless Steel	
			No. Of Teeth	Model No.	No. Of Teeth	Model No.	No. Of Teeth	Model No.	No. Of Teeth	Model No.
3"	1/4"	1"	6	245-7001	4	245-6801	6	245-6901	8	245-6601
3"	5/16"	1"	6	245-7002	4	245-6802	6	245-6902	8	245-6602
3"	3/8"	1"	6	245-7003	4	245-6803	6	245-6903	8	245-6603
3"	7/16"	1"	6	245-7004	4	245-6804	6	245-6904		
3"	1/2"	1"	6	245-7005	4	245-6805	6	245-6905	8	245-6604
4"	1/4"	1"	8	245-7006	4	245-6806	8	245-6906	10	245-6605
4"	5/16"	1"	8	245-7007	4	245-6807	8	245-6907	10	245-6606
4"	3/8"	1"	8	245-7008	4	245-6808	8	245-6908	10	245-6607
4"	3/8"	1-1/4"	8	245-7009	4	245-6809	8	245-6909	10	245-6608
4"	1/2"	1"	8	245-7011	4	245-6811	8	245-6911	10	245-6609
4"	1/2"	1-1/4"	8	245-7012	4	245-6812	8	245-6912	10	245-6610
4"	5/8"	1"	8	245-7014	4	245-6814	8	245-6914	10	245-6611
4"	5/8"	1-1/4"			4	245-6815	8	245-6915	10	245-6612
4"	3/4"	1"			4	245-6816	8	245-6916	10	245-6613
4"	3/4"	1-1/4"			4	245-6817	8	245-6917	10	245-6614
5"	1/2"	1"	10	245-7017	6	245-6819	10	245-6919	12	245-6615
5"	1/2"	1-1/4"	10	245-7018	6	245-6820	10	245-6920	12	245-6616
5"	5/8"	1-1/4"	10	245-7020	6	245-6822	10	245-6922	12	245-6617
5"	3/4"	1"			6	245-6823	10	245-6923	12	245-6618
5"	3/4"	1-1/4"			6	245-6824	10	245-6924	12	245-6619
6"	1/2"	1"			6	245-6825	12	245-6925	14	245-6620
6"	1/2"	1-1/4"			6	245-6826	12	245-6926	14	245-6621
6"	5/8"	1-1/4"			6	245-6827	12	245-6927	14	245-6622
6"	3/4"	1"			6	245-6828	12	245-6928	14	245-6623
6"	3/4"	1-1/4"			6	245-6829	12	245-6929	14	245-6624
7"	3/4"	1-1/4"			8	245-6830	12	245-6930		
8"	3/4"	1-1/4"			8	245-6831	12	245-6931		
8"	3/4"	1-1/2"			8	245-6832	12	245-6932		

Staggered Tooth for Steel

Cutter Dia.	Face Width	Arbor Hole	No. Of Teeth	Model No.
4"	3/4"	1"	8	245-7044
4"	3/4"	1-1/4"	8	245-7045
5"	3/4"	1"	10	245-7046
6"	3/4"	1"	12	245-7049
6"	1"	1-1/4"	12	245-7051

Staggered Tooth for Non-Ferrous and Cast Iron

Cutter Dia.	Face Width	Arbor Hole	For Non-Ferrous		For Cast Iron	
			No. Of Teeth	Model No.	No. Of Teeth	Model No.
5"	1"	1-1/4"	8	245-6855	10	245-6955
6"	1"	1-1/4"	8	245-6856	12	245-6956

CARBIDE TIPPED DOVETAIL CUTTERS

Straight Shank. C2 Grade

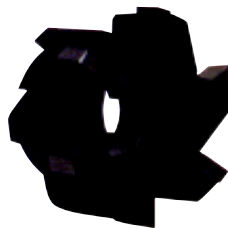


Features:

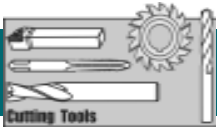
- Used for all dovetail work.
- Convenient for production and tool room work.

Cutter Dia.	Shank Dia.	Overall Length	No. Of Teeth	45°		60°	
				Cutter Width	Model No.	Cutter Width	Model No.
3/4"	3/8"	2-1/4"	3	1/4"	243-5048	1/4"	243-5248
1"	1/2"	2-1/2"	4	5/16"	243-5064	3/8"	243-5264
1-1/4"	5/8"	2-3/4"	4	3/8"	243-5080	1/2"	243-5280
1-1/2"	3/4"	3-1/4"	4	1/2"	243-5096	5/8"	243-5296
2"	1"	4-1/4"	6	5/8"	243-5128	3/4"	243-5328
2-1/2"	1-1/4"	4-3/8"	6	3/4"	243-5160	7/8"	243-5360
3"	1-1/4"	4-1/2"	6	1"	243-5192	1-1/8"	243-5392

CARBIDE TIPPED SHELL END MILLS



Mill Dia.	Hole Dia.	Overall Length	No. Of Teeth	Right hand Helix	Straight Flute	Left Hand Helix
				For Non-Ferrous	For Cast Iron	For Steel
1-1/4"	1"	1/2"	4	244-8601	244-8701	244-8801
1-1/2"	1-1/8"	1/2"	4	244-8602	244-8702	244-8802
1-3/4"	1-1/4"	3/4"	4	244-8603	244-8703	244-8803
2"	1-3/8"	3/4"	4	244-8604	244-8704	244-8804
2-1/4"	1-1/2"	1"	6	244-8605	244-8705	244-8805
2-1/2"	1-5/8"	1"	6	244-8606	244-8706	244-8806
2-3/4"	1-5/8"	1"	6	244-8607	244-8707	244-8807
3"	1-3/4"	1-1/4"	6	244-8608	244-8708	244-8808
3-1/2"	1-7/8"	1-1/4"	6	244-8609	244-8709	244-8809
4"	2-1/4"	1-1/2"	6	244-8610	244-8710	244-8810



Cutting Tools

PLAIN METAL SLITTING SAWS-H.S.S.

Features:

- Used in slitting and slotting.
- Sides are concave for clearance.
- Supplied with Keyway.



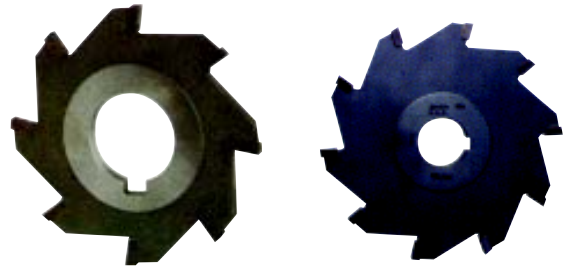
Cutting Diameter	Face Width	Hole Size	No. Of Teeth	Model No.
2"	1/16	1/2	28	370-4004
2"	1/8	1/2	28	370-4008
2-1/2	3/64	3/8	28	370-4013
2-1/2	1/32	7/8	28	370-4102
2-1/2	3/64	7/8	28	370-4103
2-1/2	1/16	7/8	28	370-4104
2-1/2	3/32	7/8	28	370-4106
2-1/2	1/8	7/8	28	370-4108
3"	1/64	1"	30	370-4201
3"	1/32	1"	30	370-4202
3"	3/64	1"	30	370-4203
3"	1/16	1"	30	370-4204
3"	5/64	1"	30	370-4205
3"	3/32	1"	30	370-4206
3"	7/64	1"	30	370-4207
3"	1/8	1"	30	370-4208
3"	9/64	1"	30	370-4209
3"	5/32	1"	30	370-4210
3-1/2	1/32	1"	30	370-4302
3-1/2	3/64	1"	30	370-4303
3-1/2	1/16	1"	30	370-4304
3-1/2	3/32	1"	30	370-4306
3-1/2	1/8	1"	30	370-4308
4"	1/64	1"	36	370-4401
4"	1/32	1"	36	370-4402
4"	3/64	1"	36	370-4403
4"	1/16	1"	36	370-4404
4"	5/64	1"	36	370-4405
4"	3/32	1"	36	370-4406
4"	7/64	1"	36	370-4407
4"	1/8	1"	36	370-4408
4"	9/64	1"	36	370-4409
4"	5/32	1"	36	370-4410
4"	3/16	1"	36	370-4412
4-1/2	1/32	1"	36	370-4502
4-1/2	3/64	1"	36	370-4503
4-1/2	1/16	1"	36	370-4504

Cutting Diameter	Face Width	Hole Size	No. Of Teeth	Model No.
4-1/2	3/32	1"	36	370-4506
4-1/2	1/8	1"	36	370-4508
5"	3/64	1"	40	370-4603
5"	1/16	1"	40	370-4604
5"	5/64	1"	40	370-4605
5"	3/32	1"	40	370-4606
5"	7/64	1"	40	370-4607
5"	1/8	1"	40	370-4608
5"	9/64	1"	40	370-4609
5"	5/32	1"	40	370-4610
5"	3/16	1"	40	370-4612
5"	1/16	1-1/4	40	370-4704
5"	3/32	1-1/4	40	370-4706
5"	1/8	1-1/4	40	370-4708
5"	5/32	1-1/4	40	370-4710
5"	3/16	1-1/4	40	370-4712
6"	3/64	1"	42	370-4803
6"	1/16	1"	42	370-4804
6"	5/64	1"	42	370-4805
6"	3/32	1"	42	370-4806
6"	7/64	1"	42	370-4807
6"	1/8	1"	42	370-4808
6"	9/64	1"	42	370-4809
6"	5/32	1"	42	370-4810
6"	3/16	1"	42	370-4812
6"	1/16	1-1/4	42	370-4904
6"	3/32	1-1/4	42	370-4906
6"	1/8	1-1/4	42	370-4908
6"	5/32	1-1/4	42	370-4910
6"	3/16	1-1/4	42	370-4912
8"	1/8	1"	48	370-5008
8"	3/16	1"	48	370-5012
8"	3/32	1-1/4	48	370-5106
8"	1/8	1-1/4	48	370-5108
8"	3/16	1-1/4	48	370-5112
10"	1/8	1-1/4	48	370-5208
10"	3/16	1-1/4	48	370-5212

WWW.PRECOTOOLS.CN

			For Steel		For Non-Ferrous		For Stainless Steel	
Cutter Dia.	Face Width	Arbor Hole	No. Of Teeth	Model No.	No. Of Teeth	Model No.	No. Of Teeth	Model No.
3"	3/32	1"					8	245-6671
3"	1/8	1"					8	245-6672
3"	3/16	1"					8	245-6673
4"	3/32	1"			6	245-6501	10	245-6674
4"	1/8	1"	8	245-6546	6	245-6502	10	245-6675
4"	3/16	1"	8	245-6547	6	245-6503	10	245-6676
5"	3/32	1"					12	245-6677
5"	3/16	1"					12	245-6678
5"	3/16	1"					12	245-6679
6"	1/8	1-1/4	12	245-6548	8	245-6504	14	245-6680
6"	3/16	1-1/4	12	245-6549			14	245-6681
6"	1/4	1-1/4	12	245-6550			14	245-6682
8"	1/8	1-1/4			10	245-6505		

CARBIDE TIPPED METAL SLITTING SAWS





SCREW SLOTTING SAWS-H.S.S.

Features:

- Used in slotting sheets and tubing.
- Good for shallow cuts and screw heads.
- Supplied with key-way.



Cutting Dia	Thickness	Hole Size	No. Of Teeth	Model No.
1-3/4	.006	5/8	90	370-7006
1-3/4	.008	5/8	90	370-7008
1-3/4	.010	5/8	90	370-7010
1-3/4	.012	5/8	90	370-7012
1-3/4	.014	5/8	90	370-7014
1-3/4	.016	5/8	90	370-7016
1-3/4	.018	5/8	90	370-7018
1-3/4	.020	5/8	90	370-7020
1-3/4	.023	5/8	90	370-7023
1-3/4	.025	5/8	90	370-7025
1-3/4	.028	5/8	90	370-7028
1-3/4	.032	5/8	90	370-7032
1-3/4	.036	5/8	90	370-7036
1-3/4	.040	5/8	90	370-7040
1-3/4	.045	5/8	90	370-7045
1-3/4	.051	5/8	90	370-7051
1-3/4	.057	5/8	90	370-7057
1-3/4	.064	5/8	90	370-7064
2-1/4	.010	5/8	60	370-7110
2-1/4	.012	5/8	60	370-7112
2-1/4	.014	5/8	60	370-7114
2-1/4	.016	5/8	60	370-7116
2-1/4	.018	5/8	60	370-7118
2-1/4	.020	5/8	60	370-7120
2-1/4	.023	5/8	60	370-7123
2-1/4	.025	5/8	60	370-7125
2-1/4	.028	5/8	60	370-7128
2-1/4	.032	5/8	60	370-7132
2-1/4	.036	5/8	60	370-7136
2-1/4	.040	5/8	60	370-7140
2-1/4	.045	5/8	60	370-7145
2-1/4	.051	5/8	60	370-7151
2-1/4	.057	5/8	60	370-7157
2-1/4	.064	5/8	60	370-7164
2-1/4	.072	5/8	60	370-7172
2-1/4	.081	5/8	60	370-7181
2-1/4	.091	5/8	60	370-7191
2-1/4	.102	5/8	60	370-7202
2-3/4	.010	3/4	72	370-8010
2-3/4	.012	3/4	72	370-8012
2-3/4	.014	3/4	72	370-8014
2-3/4	.016	3/4	72	370-8016
2-3/4	.018	3/4	72	370-8018

Cutting Dia	Thickness	Hole Size	No. Of Teeth	Model No.
2-3/4	0.020	3/4	72	370-8020
2-3/4	0.023	3/4	72	370-8023
2-3/4	0.025	3/4	72	370-8025
2-3/4	0.028	3/4	72	370-8028
2-3/4	0.032	3/4	72	370-8032
2-3/4	0.036	3/4	72	370-8036
2-3/4	0.040	3/4	72	370-8040
2-3/4	0.045	3/4	72	370-8045
2-3/4	0.051	3/4	72	370-8051
2-3/4	0.057	3/4	72	370-8057
2-3/4	0.064	3/4	72	370-8064
2-3/4	0.072	3/4	72	370-8072
2-3/4	0.081	3/4	72	370-8081
2-3/4	0.091	3/4	72	370-8091
2-3/4	0.102	3/4	72	370-8102
2-3/4	0.114	3/4	72	370-8114
2-3/4	0.128	3/4	72	370-8128
2-3/4	0.010	1"	72	370-8210
2-3/4	0.012	1"	72	370-8212
2-3/4	0.014	1"	72	370-8214
2-3/4	0.016	1"	72	370-8216
2-3/4	0.018	1"	72	370-8218
2-3/4	0.020	1"	72	370-8220
2-3/4	0.023	1"	72	370-8223
2-3/4	0.025	1"	72	370-8225
2-3/4	0.028	1"	72	370-8228
2-3/4	0.032	1"	72	370-8232
2-3/4	0.036	1"	72	370-8236
2-3/4	0.040	1"	72	370-8240
2-3/4	0.045	1"	72	370-8245
2-3/4	0.051	1"	72	370-8251
2-3/4	0.057	1"	72	370-8257
2-3/4	0.064	1"	72	370-8264
2-3/4	0.072	1"	72	370-8272
2-3/4	0.081	1"	72	370-8281
2-3/4	0.091	1"	72	370-8291
2-3/4	0.102	1"	72	370-8302
2-3/4	0.114	1"	72	370-8314
2-3/4	0.128	1"	72	370-8328
2-3/4	0.144	1"	72	370-8344
2-3/4	0.162	1"	72	370-8362
2-3/4	0.182	1"	72	370-8382

SLITTING & SLOTTING SAW ARBORS

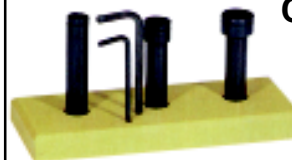


- Spring loaded mechanism readily accepts saw blades with hole diameters from 1/2" to 1"
- Black oxide finish

Shank Dia.	Overall Length	Inside Hole Dia.	Model No.
1/2"	2-9/16"	1/2, 5/8, 3/4, 7/8, 1"	712-0005
1/2"	4-3/4"	3/8"	712-1010
R8	5-3/32"	1/2, 5/8, 3/4, 7/8, 1"	712-0010

- A hex head screw makes saws firmly in position.

CIRCULAR SAW ARBOR



Use with saw blades.
001" to 3/16" thick. black oxide finish

Circular Saw Arbor Set

Model No.712-0300

3pcs /set, 1/2", 5/8", 3/4" in wooden stand

Individual

Flange Size	Shank	Inside Hole Dia.	Model No.
1/2	1/2	1/4"	712-0205
5/8	1/2	3/8"	712-0210
3/4	1/2	1/2"	712-0215
1	5/8	5/8"	712-0220



Cutting Tools

METRIC PLAIN METAL SLOTING SAWS

DIN 1838B, H.S.S.

Features

- For general purpose slotting and cut-off operations.
- The number of teeth given is the standard number which is supplied for general purpose work.



Width of Face	Cutter Dia.	Arbor Dia	No. Of Teeth	Model No.
0.3	50	13	48	373-0003
0.4	50	13	48	373-0004
0.5	50	13	48	373-0005
0.6	50	13	48	373-0006
0.8	50	13	40	373-0008
1.0	50	13	40	373-0010
1.2	50	13	40	373-0012
1.6	50	13	32	373-0016
2.0	50	13	32	373-0020
2.5	50	13	32	373-0025
3.0	50	13	24	373-0030
4.0	50	13	24	373-0040
5.0	50	13	24	373-0050
6.0	50	13	20	373-0060
0.5	63	16	64	373-0105
0.6	63	16	48	373-0106
0.8	63	16	48	373-0108
1.0	63	16	48	373-0110
1.2	63	16	40	373-0112
1.6	63	16	40	373-0116
1.7	63	16	40	373-0117
2.0	63	16	40	373-0120
2.5	63	16	32	373-0125
3.0	63	16	32	373-0130
4.0	63	16	32	373-0140
5.0	63	16	24	373-0150
6.0	63	16	24	373-0160
0.5	80	22	64	373-0205
0.6	80	22	64	373-0206
0.8	80	22	64	373-0208
1.0	80	22	48	373-0210
1.2	80	22	48	373-0212
1.6	80	22	48	373-0216
2.0	80	22	40	373-0220
2.5	80	22	40	373-0225
3.0	80	22	40	373-0230
4.0	80	22	32	373-0240
5.0	80	22	32	373-0250
6.0	80	22	32	373-0260
0.6	80	27	64	373-0306
0.8	80	27	64	373-0308
1.0	80	27	48	373-0310
1.2	80	27	48	373-0312
1.6	80	27	48	373-0316
2.0	80	27	40	373-0320
2.5	80	27	40	373-0325
3.0	80	27	40	373-0330
4.0	80	27	32	373-0340
0.6	100	22	80	373-0406
0.8	100	22	64	373-0408
1.0	100	22	64	373-0410
1.2	100	22	64	373-0412
1.6	100	22	48	373-0416
2.0	100	22	48	373-0420
2.5	100	22	48	373-0425
3.0	100	22	40	373-0430
4.0	100	22	40	373-0440
5.0	100	22	40	373-0450

Width of Face	Cutter Dia.	Arbor Dia	No. Of Teeth	Model No.
6.0	100	22	32	373-0460
0.8	100	27	64	373-0508
1.0	100	27	64	373-0510
1.2	100	27	64	373-0512
1.6	100	27	48	373-0516
2.0	100	27	48	373-0520
2.5	100	27	48	373-0525
3.0	100	27	40	373-0530
4.0	100	27	40	373-0540
5.0	100	27	40	373-0550
0.8	125	22	80	373-0608
1.0	125	22	80	373-0610
1.2	125	22	64	373-0612
1.6	125	22	64	373-0616
2.0	125	22	64	373-0620
2.5	125	22	48	373-0625
3.0	125	22	48	373-0630
4.0	125	22	48	373-0640
5.0	125	22	40	373-0650
6.0	125	22	40	373-0660
0.8	125	27	80	373-0708
1.0	125	27	80	373-0710
1.2	125	27	64	373-0712
1.6	125	27	64	373-0716
2.0	125	27	64	373-0720
2.5	125	27	48	373-0725
3.0	125	27	48	373-0730
4.0	125	27	48	373-0740
5.0	125	27	40	373-0750
1.0	160	32	80	373-0810
1.2	160	32	80	373-0812
1.6	160	32	80	373-0816
2.0	160	32	64	373-0820
2.5	160	32	64	373-0825
3.0	160	32	64	373-0830
4.0	160	32	48	373-0840
5.0	160	32	48	373-0850
6.0	160	32	48	373-0860
1.2	200	32	100	373-0912
1.6	200	32	80	373-0916
2.0	200	32	80	373-0920
2.5	200	32	80	373-0925
3.0	200	32	64	373-0930
4.0	200	32	64	373-0940
5.0	200	32	64	373-0950
6.0	200	32	48	373-0960
1.6	250	32	100	373-1016
2.0	250	32	100	373-1020
2.5	250	32	80	373-1025
3.0	250	32	80	373-1030
4.0	250	32	80	373-1040
5.0	250	32	64	373-1050
6.0	250	32	64	373-1060
2.5	315	40	100	373-1125
3.0	315	40	100	373-1130
4.0	315	40	80	373-1140
5.0	315	40	80	373-1150
6.0	315	40	80	373-1160

WWW.PRECOTOOLS.CN



Cutting Tools

4 FLUTE CORNER ROUNDING END MILLS

These end mills are of the formed relieved type and can be resharpened many times without changing the form.



Radius Size	Shank Diameter	Largest Diameter	Overall Length	M2HSS Model No.	M2AL Model No.	Tin-Coated Model No.	Radius Size	Shank Diameter	Largest Diameter	Overall Length	M2HSS Model No.	M2AL Model No.	Tin-Coated Model No.
1/32	3/8	3/8	2-1/2	182-6023	181-6023	183-6023	3/8	7/8	1-1/4	3-3/4	182-6254	181-6254	183-6254
3/64	3/8	7/16	2-1/2	182-6031	181-6031	183-6031	13/32	3/4	1-1/4	3-1/2	182-6262	181-6262	183-6262
1/16	3/8	7/16	2-1/2	182-6049	181-6049	183-6049	7/16	3/4	1-3/8	4"	182-6280	181-6280	183-6280
5/64	3/8	1/2	2-1/2	182-6056	181-6056	183-6056	7/16	1"	1-3/8	4"	182-6288	181-6288	183-6288
3/32	3/8	1/2	2-1/2	182-6064	181-6064	183-6064	15/32	3/4	1-3/8	3-3/4	182-6304	181-6304	183-6304
7/64	3/8	5/8	2-1/2	182-6072	181-6072	183-6072	1/2	3/4	1-1/2	3-7/8	182-6791	181-6791	183-6791
1/8	1/2	5/8	3"	182-6080	181-6080	183-6080	1/2	1"	1-1/2	4-1/8	182-6320	181-6320	183-6320
1/8	3/8	5/8	3"	182-6668	181-6668	183-6668	17/32	3/4	1-1/2	3-7/8	182-6338	181-6338	183-6338
9/64	1/2	3/4	3"	182-6098	181-6098	183-6098	17/32	1"	1-1/2	4-1/8	182-6346	181-6346	183-6346
5/32	1/2	3/4	3"	182-6106	181-6106	183-6106	9/16	3/4	1-5/16	4"	182-6353	181-6353	183-6353
11/64	1/2	3/4	3"	182-6114	181-6114	183-6114	9/16	1"	1-5/16	4-1/4	182-6361	181-6361	183-6361
3/16	1/2	7/8	3"	182-6122	181-6122	183-6122	19/32	3/4	1-15/16	4"	182-6379	181-6379	183-6379
3/16	3/4	7/8	3-1/8	182-6130	181-6130	183-6130	19/32	1"	1-15/16	4-1/4	182-6387	181-6387	183-6387
13/64	1/2	7/8	3-1/8	182-6676	181-6676	183-6676	5/8	3/4	1-15/16	4"	182-6403	181-6403	183-6403
13/64	3/4	7/8	3-1/8	182-6684	181-6684	183-6684	5/8	1"	1-15/16	4-1/4	182-6395	181-6395	183-6395
7/32	3/4	7/8	3-1/4	182-6692	181-6692	183-6692	21/32	3/4	1-15/16	4"	182-6411	181-6411	183-6411
7/32	1/2	7/8	3-1/4	182-6148	181-6148	183-6148	21/32	1"	1-15/16	4-1/4	182-6429	181-6429	183-6429
15/64	1/2	7/8	3-1/8	182-6155	181-6155	183-6155	11/16	3/4	2-1/4	4-1/8	182-6437	181-6437	183-6437
1/4	1/2	1"	3-1/8	182-6163	181-6163	183-6163	11/16	1"	2-1/4	4-5/16	182-6445	181-6445	183-6445
1/4	3/4	1"	3-1/4	182-6171	181-6171	183-6171	23/32	3/4	2-1/4	4-1/8	182-6452	181-6452	183-6452
17/64	3/4	1"	3-1/8	182-6718	181-6718	183-6718	23/32	1"	2-1/4	4-5/16	182-6460	181-6460	183-6460
9/32	1/2	1-1/8	3-1/4	182-6189	181-6189	183-6189	3/4	3/4	1-7/8	4"	182-6486	181-6486	183-6486
9/32	3/4	1-1/8	3-1/4	182-6197	181-6197	183-6197	3/4	1"	2-1/4	4-5/16	182-6478	181-6478	183-6478
19/64	1/2	1-1/8	3-1/4	182-6726	181-6726	183-6726	25/32	3/4	2-1/4	4-1/8	182-6494	181-6494	183-6494
19/64	3/4	1-1/8	3-1/4	182-6734	181-6734	183-6734	25/32	1"	2-1/4	4-5/16	182-6502	181-6502	183-6502
5/16	1/2	1-1/8	3-1/4	182-6205	181-6205	183-6205	13/16	3/4	2-1/4	4-1/8	182-6510	181-6510	183-6510
5/16	3/4	1-1/8	3-1/4	182-6742	181-6742	183-6742	13/16	1"	2-1/4	4-5/16	182-6528	181-6528	183-6528
5/16	7/8	1-1/8	3-1/2	182-6213	181-6213	183-6213	27/32	3/4	2-1/2	4-1/2	182-6536	181-6536	183-6536
5/16	5/8	1-1/8	3-1/2	182-6215	181-6215	183-6215	27/32	1"	2-1/2	4-1/2	182-6544	181-6544	183-6544
21/64	1/2	1-1/8	3-1/4	182-6759	181-6759	183-6759	7/8	3/4	2-1/2	4-1/2	182-6551	181-6551	183-6551
21/64	3/4	1-1/8	3-1/4	182-6767	181-6767	183-6767	7/8	1"	2-1/2	4-1/2	182-6569	181-6569	183-6569
11/32	1/2	1-1/8	3-1/2	182-6221	181-6221	183-6221	15/16	3/4	2-5/8	4-1/2	182-6593	181-6593	183-6593
11/32	3/4	1-1/8	3-1/2	182-6775	181-6775	183-6775	15/16	1"	2-5/8	4-3/4	182-6601	181-6601	183-6601
3/8	1/2	1-1/4	3-1/2	182-6247	181-6247	183-6247	1"	3/4	2-5/8	4-1/2	182-6635	181-6635	183-6635
3/8	3/4	1-1/4	3-1/2	182-6783	181-6783	183-6783	1"	1"	2-5/8	4-3/4	182-6643	181-6643	183-6643

4 FLUTE CORNER ROUNDING END MILL SETS



4 PIECE SETS

WITH STAND

One each Size: 1/2, 9/16, 5/8, 3/4 have 3/4" shank

Descriptions	Model No.
M2HSS	182-6908
M2AL	181-6908
Tin-Coated	183-6908

8 PIECE SETS

WITH STAND

These end mills are of the formed relieved type and can be resharpened many times without changing the form.

One each size: 1/16, 3/32, 1/8, 5/32,

3/16, 1/4, 5/16, 3/8

1/16 thru 1/8" have 3/8" shank

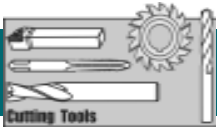
5/32 thru 3/8" have 1/2" shank

One each size: 3/16, 1/4, 5/16, 3/8, 7/16,

1/2, 5/8, 3/4 have 3/4 shk.

Descriptions	Model No.
M2	182-6007
M2AL	181-6007
Tin-Coated	183-6007

Descriptions	Model No.
M2	182-6008
M2AL	181-6008
Tin-Coated	183-6008



Cutting Tools

SPIRAL POINT TAPS-PLUG STYLE

Ground Thread, High Speed Steel



Size	No. Of Flute	H Limit	Model No.
0-80NF	2	H-1	311-9002
0-80NF	2	H-2	311-9004
1-64NC	2	H-1	311-9006
1-64NC	2	H-2	311-9008
1-72NF	2	H-1	311-9010
1-72NF	2	H-2	311-9012
2-56NC	2	H-2	311-9014
2-64NF	2	H-2	311-9016
3-48NC	2	H-2	311-9018
3-56NF	2	H-2	311-9020
4-40NC	2	H-2	311-9022
4-40NC	2	H-7	311-9024
4-48NF	2	H-2	311-9026
5-40NC	2	H-2	311-9028
5-40NC	2	H-7	311-9030
5-44NF	2	H-2	311-9032
6-32NC	2	H-2	311-9034
6-32NC	2	H-3	311-9036
6-32NC	2	H-7	311-9038
6-40NF	2	H-2	311-9040
8-32NC	2	H-2	311-9042
8-32NC	2	H-3	311-9044
8-32NC	2	H-7	311-9046
8-36NF	2	H-2	311-9048
10-24NC	2	H-2	311-9050
10-24NC	2	H-3	311-9052
10-24NC	2	H-7	311-9054
10-32NF	2	H-2	311-9056
10-32NF	2	H-3	311-9058
10-32NF	2	H-7	311-9060
12-24NC	2	H-3	311-9062
12-28NF	2	H-3	311-9064
1/4"-20NC	2	H-2	311-9066
1/4"-20NC	2	H-3	311-9068
1/4"-20NC	2	H-5	311-9070
1/4"-20NC	3	H-2	311-9072
1/4"-20NC	3	H-3	311-9074
1/4"-20NC	3	H-5	311-9076
1/4"-28NF	2	H-2	311-9078
1/4"-28NF	2	H-3	311-9080
1/4"-28NF	3	H-2	311-9082
1/4"-28NF	3	H-3	311-9084
5/16"-18NC	2	H-2	311-9086
5/16"-18NC	2	H-3	311-9088

Size	No. Of Flute	H Limit	Model No.
5/16"-18NC	2	H-5	311-9090
5/16"-18NC	3	H-2	311-9092
5/16"-18NC	3	H-3	311-9094
5/16"-18NC	3	H-5	311-9096
5/16"-24NF	2	H2	311-9098
5/16"-24NF	2	H3	311-9100
5/16"-24NF	3	H3	311-9102
3/8"-16NC	3	H2	311-9104
3/8"-16NC	3	H3	311-9106
3/8"-16NC	3	H5	311-9108
3/8"-24NF	3	H2	311-9110
3/8"-24NF	3	H3	311-9112
7/16"-14NC	3	H3	311-9114
7/16"-14NC	3	H5	311-9116
7/16"-20NF	3	H3	311-9118
7/16"-20NF	3	H5	311-9120
1/2"-13NC	3	H3	311-9122
1/2"-13NC	3	H5	311-9124
1/2"-20NF	3	H3	311-9126
1/2"-20NF	3	H5	311-9128
9/16"-12NC	3	H3	311-9130
9/16"-12NC	3	H5	311-9132
9/16"-18NF	3	H3	311-9134
9/16"-18NF	3	H5	311-9136
5/8"-11NC	3	H3	311-9138
5/8"-11NC	3	H5	311-9140
5/8"-18NF	3	H3	311-9142
5/8"-18NF	3	H5	311-9144
11/16"-11NS	3	H3	311-9146
11/16"-16NS	3	H3	311-9148
3/4"-10NC	3	H3	311-9150
3/4"-10NC	3	H5	311-9152
3/4"-16NF	3	H3	311-9154
3/4"-16NF	3	H5	311-9156
7/8"-9NC	3	H4	311-9158
7/8"-9NC	4	H4	311-9160
7/8"-14NF	3	H4	311-9162
7/8"-14NF	4	H4	311-9164
1"-8NC	3	H4	311-9166
1"-8NC	4	H4	311-9168
1"-12NF	4	H4	311-9170
1"-14NS	4	H4	311-9172
1"-12NF	3	H4	311-9174
1"-14NS	3	H4	311-9176

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+ 0.005" OVERSIZED SPIRAL POINTED TAPS

High Speed Steel, Ground Steel, Plug Type



Size	No. Of Flute	Model No.
4-40	2	312-7102
5-40	2	312-7104
6-32	2	312-7106
8-32	2	312-7108
10-24	2	312-7110
10-32	2	312-7112
1/4"-20	2	312-7114
1/4"-28	2	312-7116
5/16"-18	2	312-7118
5/16"-24	2	312-7120
3/8"-16	3	312-7122
3/8"-24	3	312-7124
7/16"-14	3	312-7126

Size	No. Of Flute	Model No.
7/16"-20	3	312-7128
1/2"-13	3	312-7130
1/2"-20	3	312-7132
9/16"-12	3	312-7134
9/16"-18	3	312-7136
5/8"-11	3	312-7138
5/8"-18	3	312-7140
3/4"-10	3	312-7142
3/4"-16	3	312-7144
7/8"-9	3	312-7146
7/8"-14	3	312-7148
1-8	3	312-7150

+ 0.005" OVERSIZED TAPS

High Speed Steel, Ground Steel, Plug Type



Size	No. Of Flute	Model No.
6-32	4	312-7001
8-32	4	312-7002
10-24	4	312-7003
10-32	4	312-7004
1/4"-20	4	312-7005
1/4"-28	4	312-7006
5/16"-18	4	312-7007
5/16"-24	4	312-7008
3/8"-16	4	312-7009
3/8"-24	4	312-7010
7/16"-14	4	312-7011
7/16"-20	4	312-7012
1/2"-13	4	312-7013
1/2"-20	4	312-7014

Size	No. Of Flute	Model No.
9/16"-12	4	312-7015
9/16"-18	4	312-7016
5/8"-11	4	312-7017
5/8"-18	4	312-7018
3/4"-10	4	312-7019
3/4"-16	4	312-7020
7/8"-9	4	312-7021
7/8"-14	4	312-7022
1-8	4	312-7023
1-12	4	312-7024
1-14	4	312-7025
4-40	3	312-7030
5-40	3	312-7035

Cutting Tools



TIN COATED HAND TAPS -PLUG STYLE Fractional Sizes

Machine Screw Sizes



Size	No. Of Flute	Thread Length	Tin Coated Model No.
0-80	2	5/16"	311-1979
1-64	2	3/8"	311-1982
1-72	2	3/8"	311-1985
2-56	3	7/16"	311-1988
2-64	3	7/16"	311-1993
3-48	3	1/2"	311-1994
3-56	3	1/2"	311-1997
4-30	3	9/16"	311-2001
4-40	3	5/8"	311-2003
4-48	3	9/16"	311-2006
5-40	3	5/8"	311-2009
5-44	3	5/8"	311-2012
6-32	3	11/16"	311-2015
6-40	3	11/16"	311-2018
8-32	4	3/4"	311-2023
8-36	4	3/4"	311-2024
10-24	4	7/8"	311-2027
10-32	4	7/8"	311-2030
12-24	4	15/16"	311-2033
12-28	4	15/16"	311-2036

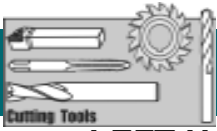
Size	No. Of Flute	Thread Length	Tin Coated Model No.
1/4"-20	4	1"	311-2039
1/4"-28	4	1"	311-2042
5/16"-18	4	1-1/8"	311-2045
5/16"-24	4	1-1/8"	311-2048
3/8"-16	4	1-1/4"	311-2053
3/8"-24	4	1-1/4"	311-2054
7/16"-14	4	1-7/16"	311-2057
7/16"-20	4	1-7/16"	311-2060
1/2"-13	4	1-21/32"	311-2063
1/2"-20	4	1-21/32"	311-2066
9/16"-12	4	1-21/32"	311-2067
9/16"-18	4	1-21/32"	311-2068
5/8"-11	4	1-13/16"	311-2069
5/8"-18	4	1-13/16"	311-2072
3/4"-10	4	2"	311-2074
3/4"-16	4	2"	311-2078
7/8"-9	4	2-7/32"	311-2083
7/8"-14	4	2-7/32"	311-2084
1"-8	4	2-1/2"	311-2087
1"-12	4	2-1/2"	311-2090
1-1/8"-7	4	2-9/16"	311-2093
1-1/8"-12	4	2-9/16"	311-2096
1-1/4"-7	4	2-9/16"	311-2099
1-1/4"-12	4	2-9/16"	311-2102
1-3/8"-6	6	3"	311-2105
1-3/8"-12	6	3"	311-2108
1-1/2"-6	4	3"	311-2113
1-1/2"-12	6	3"	311-2114

SPECIAL THREAD HAND TAP-PLUG STYLE

Ground Thread, High Speed Steel



Size	Model No.	Size	Model No.	Size	Model No.	Size	Model No.	Size	Model No.	Size	Model No.
1/4-24	311-4600	11/16-32	311-4668	1-1/8-16	311-4738	1-7/16-16	311-4798	1-13/16-8	311-4858	2-1/4"-20	311-4917
1/4-32	311-4602	3/4-12	311-4670	1-1/8-18	311-4740	1-7/16-18	311-4800	1-13/16-16	311-4860	2-3/8-4-1/2	311-4918
1/4-40	311-4604	3/4-18	311-4672	1-1/8-32	311-4742	1-1/2-8	311-4802	1-13/16-18	311-4862	2-3/8-8	311-4920
5/16-20	311-4606	3/4-20	311-4674	1-3/16-8	311-4744	1-1/2-10	311-4804	1-13/16-20	311-4863	2-3/8-12	311-4922
5/16-32	311-4608	3/4-24	311-4676	1-3/16-10	311-4746	1-1/2"-14	311-4805	1-7/8-5	311-4864	2-3/8-14	311-4924
5/16-40	311-4610	3/4-27	311-4678	1-3/16-12	311-4748	1-1/2-16	311-4806	1-7/8-7	311-4866	2-1/2-4	311-4926
3/8-14	311-4612	3/4-32	311-4680	1-3/16-14	311-4750	1-1/2-18	311-4808	1-7/8-8	311-4868	2-1/2-6	311-4928
3/8-18	311-4614	13/16-16	311-4682	1-3/16-16	311-4752	1-1/2-20	311-4810	1-7/8-10	311-4870	2-1/2-8	311-4930
3/8-20	311-4616	13/16-20	311-4684	1-3/16-18	311-4754	1-1/2"-24	311-4811	1-7/8-12	311-4872	2-1/2-12	311-4932
3/8-32	311-4618	13/16-32	311-4686	1-3/16-20	311-4756	1-9/16-12	311-4812	1-7/8-16	311-4874	2-1/2-16	311-4934
7/16-24	311-4620	7/8-12	311-4688	1-3/16-24	311-4758	1-9/16"-16	311-4813	1-7/8-18	311-4876	2-1/2-18	311-4936
7/16-27	311-4622	7/8-16	311-4690	1-3/16-32	311-4760	1-9/16-18	311-4814	1-7/8-20	311-4878	2-5/8-8	311-4938
15/32-32	311-4624	7/8-18	311-4692	1-1/4-8	311-4762	1-9/16-20	311-4816	1-15/16-12	311-4880	2-5/8-12	311-4940
1/2-12	311-4626	7/8-20	311-4694	1-1/4-10	311-4764	1-5/8-5-1/2	311-4818	1-15/16-16	311-4882	2-5/8-16	311-4942
1/2-14	311-4628	15/16-12	311-4696	1-1/4-14	311-4766	1-5/8-8	311-4820	2"-4-1/2	311-4884	2-5/8-18	311-4944
1/2-16	311-4630	15/16-16	311-4698	1-1/4-16	311-4768	1-5/8-10	311-4822	2"-6	311-4886	2-3/4-4	311-4946
1/2-18	311-4632	15/16-20	311-4700	1-1/4-18	311-4770	1-5/8-12	311-4824	2"-8	311-4888	2-3/4-8	311-4948
1/2-28	311-4633	15/16-27	311-4702	1-1/4-20	311-4772	1-5/8-14	311-4826	2"-10	311-4890	2-3/4-12	311-4950
1/2-24	311-4634	15/16-32	311-4704	1-1/4-24	311-4773	1-5/8-16	311-4828	2"-12	311-4892	2-3/4-16	311-4952
1/2-32	311-4636	1"-10	311-4706	1-1/4"-32	311-4774	1-5/8-18	311-4830	2"-14	311-4894	2-3/4-18	311-4954
9/16-10	311-4638	1"-16	311-4708	1-1/4"-40	311-4775	1-5/8-20	311-4832	2"-16	311-4896	2-7/8-8	311-4956
9/16-16	311-4640	1"-18	311-4710	1-5/16-8	311-4776	1-5/8-24	311-4834	2"-20	311-4898	2-7/8-12	311-4958
9/16-20	311-4642	1"-20	311-4712	1-5/16-12	311-4778	1-11/16-12	311-4836	2-1/8-8	311-4900	2-7/8-16	311-4960
9/16-24	311-4644	1"-32	311-4714	1-5/16-16	311-4780	1-11/16-16	311-4837	2-1/8-10	311-4901	3"-4	311-4962
5/8-12	311-4646	1-1/16-8	311-4716	1-5/16-18	311-4782	1-11/16"-18	311-4838	2-1/8-12	311-4902	3"-8	311-4964
5/8-16	311-4648	1-1/16-10	311-4718	1-5/16-20	311-4783	1-11/16"-20	311-4839	2-1/8"-16	311-4903	3"-12	311-4966
5/8-20	311-4650	1-1/16-12	311-4720	1-3/8-8	311-4784	1-3/4-5	311-4840	2-1/8"-18	311-4904	3-1/4"-4	311-4968
5/8-24	311-4652	1-1/16-14	311-4722	1-3/8-10	311-4786	1-3/4-6	311-4842	2-1/8"-20	311-4905	3-1/4"-8	311-4970
5/8-32	311-4654	1-1/16-16	311-4724	1-3/8-14	311-4788	1-3/4-8	311-4844	2-3/16-20	311-4906	3-1/4"-12	311-4972
5/8-36	311-4656	1-1/16-18	311-4726	1-3/8-16	311-4790	1-3/4-10	311-4846	2-1/4-4-1/2	311-4908	3-1/2"-4	311-4974
11/16-11	311-4658	1-1/16-20	311-4728	1-3/8-18	311-4792	1-3/4-12	311-4848	2-1/4-8	311-4910	3-1/2"-8	311-4976
11/16-16	311-4660	1-1/16-24	311-4730	1-3/8-20	311-4794	1-3/4-16	311-4850	2-1/4-12	311-4912	3-1/2"-12	311-4978
11/16-18	311-4662	1-1/16-32	311-4732	1-3/8"-24	311-4795	1-3/4-18	311-4852	2-1/4-14	311-4914	3-3/4"-4	311-4980
11/16-20	311-4664	1-1/8-8	311-4734	1-7/16-8	311-4796	1-3/4-20	311-4854	2-1/4-16	311-4915	3-3/4"-12	311-4982
11/16-24	311-4666	1-1/8-10	311-4736	1-7/16-12	311-4797	1-3/4-24	311-4856	2-1/4"-18	311-4916	4"-8	311-4984
										4"-12	311-4986



Cutting Tools

LEFT HAND TAPS-PLUG STYLE

Ground Thread, High Speed Steel



Size	H.S.S. Model No.	Carbon Steel Model No.
0-80	311-5002	312-5002
1-64	311-5012	312-5012
1-72	311-5022	312-5022
2-56	311-5032	312-5032
2-64	311-5042	312-5042
3-48	311-5052	312-5052
3-56	311-5062	312-5062
4-40	311-5072	312-5072
4-48	311-5082	312-5082
5-40	311-5092	312-5092
5-44	311-5102	312-5102
6-32	311-5112	312-5112
6-40	311-5122	312-5122
8-32	311-5132	312-5132
8-36	311-5142	312-5142
10-24	311-5152	312-5152
10-32	311-5162	312-5162
12-24	311-5172	312-5172
12-28	311-5182	312-5182
14-24	311-5192	312-5192
1/4-20	311-5202	312-5202
1/4-28	311-5212	312-5212
5/16-18	311-5222	312-5222
5/16-24	311-5232	312-5232
3/8-16	311-5242	312-5242
3/8-24	311-5252	312-5252
7/16-14	311-5262	312-5262
7/16-20	311-5272	312-5272
1/2-13	311-5282	312-5282

Size	H.S.S. Model No.	Carbon Steel Model No.
1/2-20	311-5292	312-5292
9/16-12	311-5302	312-5302
9/16-18	311-5312	312-5312
5/8-11	311-5322	312-5322
5/8-18	311-5332	312-5332
3/4-10	311-5342	312-5342
3/4-16	311-5352	312-5352
7/8-9	311-5362	312-5362
7/8-14	311-5372	312-5372
1-8	311-5382	312-5382
1-12	311-5392	312-5392
1-14	311-5402	312-5402
1-1/8-7	311-5412	312-5412
1-1/8-12	311-5422	312-5422
1-1/4-7	311-5432	312-5432
1-1/4-10	311-5442	312-5442
1-1/4-12	311-5452	312-5452
1-3/8-6	311-5462	312-5462
1-3/8-12	311-5472	312-5472
1-1/2-6	311-5482	312-5482
1-1/2-12	311-5492	312-5492
1-5/8-5	311-5502	312-5502
1-3/4-5	311-5512	312-5512
2-6	311-5522	312-5522
2-1/4-4	311-5532	312-5532
2-1/4-1/2	311-5542	312-5542
2-1/4-8	311-5552	312-5552
2-1/2-4	311-5562	312-5562
2-1/2-6	311-5572	312-5572

METRIC HAND TAPS-TAPER,BOTTOMING & SET

High Speed Steel, Ground Thread



Size	Bottoming Model No.	Taper Model No.	Set Model No.
2.0x.20mm	311-4003	311-4001	311-4004
2.0x.25mm	311-4013	311-4011	311-4014
2.0x.40mm	311-4023	311-4021	311-4024
2.0x.45mm	311-4033	311-4031	311-4034
2.2x.45mm	311-4043	311-4041	311-4044
2.5x.45mm	311-4053	311-4051	311-4054
3.0x.35mm	311-4063	311-4061	311-4064
3.0x.50mm	311-4073	311-4071	311-4074
3.5x.35mm	311-4083	311-4081	311-4084
3.5x.60mm	311-4093	311-4091	311-4094
4.0x.50mm	311-4103	311-4101	311-4104
4.0x.70mm	311-4113	311-4111	311-4114
4.0x.75mm	311-4123	311-4121	311-4124
4.5x.75mm	311-4133	311-4131	311-4134
5.0x.50mm	311-4143	311-4141	311-4144
5.0x.90mm	311-4153	311-4151	311-4154
5.0x.80mm	311-4163	311-4161	311-4164
5.5x.90mm	311-4173	311-4171	311-4174
6.0x.50mm	311-4183	311-4181	311-4184
6.0x.75mm	311-4193	311-4191	311-4194
6.0x1.00mm	311-4203	311-4201	311-4204
7.0x.75mm	311-4213	311-4211	311-4214
7.0x1.00mm	311-4223	311-4221	311-4224
8.0x1.00mm	311-4233	311-4231	311-4234
8.0x1.25mm	311-4243	311-4241	311-4244
9.0x1.00mm	311-4253	311-4251	311-4254
9.0x1.25mm	311-4263	311-4261	311-4264
10.0x1.00mm	311-4273	311-4271	311-4274
10.0x1.25mm	311-4283	311-4281	311-4284

Size	Bottoming Model No.	Taper Model No.	Set Model No.
10.0x1.00mm	311-4293	311-4291	311-4294
10.0x1.50mm	311-4303	311-4301	311-4304
11.0x1.00mm	311-4313	311-4311	311-4314
11.0x1.50mm	311-4323	311-4321	311-4324
12.0x1.25mm	311-4333	311-4331	311-4334
12.0x1.50mm	311-4343	311-4341	311-4344
12.0x1.75mm	311-4353	311-4351	311-4354
14.0x1.25mm	311-4363	311-4361	311-4364
14.0x1.50mm	311-4373	311-4371	311-4374
14.0x2.00mm	311-4383	311-4381	311-4384
16.0x1.00mm	311-4393	311-4391	311-4394
16.0x1.50mm	311-4403	311-4401	311-4404
16.0x2.00mm	311-4413	311-4411	311-4414
18.0x1.50mm	311-4423	311-4421	311-4424
18.0x2.00mm	311-4433	311-4431	311-4434
18.0x2.50mm	311-4443	311-4441	311-4444
20.0x2.00mm	311-4453	311-4451	311-4454
20.0x2.50mm	311-4463	311-4461	311-4464
22.0x2.00mm	311-4473	311-4471	311-4474
22.0x2.50mm	311-4483	311-4481	311-4484
24.0x2.00mm	311-4493	311-4491	311-4494
24.0x3.00mm	311-4503	311-4501	311-4504
26.0x1.50mm	311-4513	311-4511	311-4514
28.0x2.00mm	311-4523	311-4521	311-4524
30.0x2.00mm	311-4533	311-4531	311-4534
30.0x3.50mm	311-4543	311-4541	311-4544
33.0x2.00mm	311-4553	311-4551	311-4554
39.0x3.00mm	311-4563	311-4561	311-4564
42.0x2.00mm	311-4573	311-4571	311-4574
48.0x2.00mm	311-4583	311-4581	311-4584

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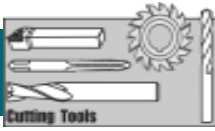
METRIC HAND TAPS-PLUG TAPS

High Speed Steel- Ground Thread



Size	Thread Limits	No. Of Flute	Model No.
1.50x0.35mm	D-1	2	411-2004
1.60x0.35mm	D-1	2	411-2006
1.60x0.35mm	D-3	2	411-2008
1.80x0.35mm	D-1	2	411-2010
1.80x0.35mm	D-2	2	411-2012
1.80x0.35mm	D-3	2	411-2014
2.00x0.40mm	D-1	3	411-2018
2.00x0.40mm	D-3	3	411-2020
2.00x0.45mm	D-2	3	411-2022
2.20x0.45mm	D-1	3	411-2024
2.20x0.45mm	D-2	3	411-2026
2.20x0.45mm	D-3	3	411-2028
2.30x0.40mm	D-3	3	411-2030
2.50x0.45mm	D-1	3	411-2032
2.50x0.45mm	D-3	3	411-2034
2.60x0.45mm	D-2	3	411-2036
2.60x0.45mm	D-3	3	411-2037
3.00x0.50mm	D-1	3	411-2040
3.00x0.50mm	D-3	3	411-2042
3.00x0.60mm	D-3	3	411-2046
3.50x0.60mm	D-1	3	411-2050
3.50x0.60mm	D-4	3	411-2052
4.00x0.50mm	D-4	4	411-2054
4.00x0.70mm	D-1	4	411-2056
4.00x0.70mm	D-4	4	411-2058
4.00x0.75mm	D-4	4	411-2060
4.50x0.75mm	D-2	4	411-2066
4.50x0.75mm	D-4	4	411-2068
5.00x0.50mm	D-4	4	411-2070
5.00x0.8 mm	D-2	4	411-2076
5.00x0.8 mm	D-4	4	411-2078
5.00x0.90mm	D-3	4	411-2080
6.00x0.50mm	D-4	4	411-2084
6.00x0.75mm	D-3	4	411-2086
6.00x0.75mm	D-4	4	411-2087
6.00x1.00mm	D-3	4	411-2088
6.00x1.00mm	D-5	4	411-2090
6.30x1.00mm	D-5	4	411-2094
7.00x1.00mm	D-3	4	411-2100
7.00x1.00mm	D-5	4	411-2102
8.00x0.75mm	D-4	4	411-2108
8.00x1.00mm	D-3	4	411-2110
8.00x1.00mm	D-5	4	411-2112
8.00x1.25mm	D-3	4	411-2114
8.00x1.25mm	D-5	4	411-2116
9.00x1.25mm	D-4	4	411-2122
10.00x0.75mm	D-5	4	411-2128
10.00x1.00mm	D-5	4	411-2130
10.00x1.25mm	D-3	4	411-2132
10.00x1.25mm	D-5	4	411-2134
10.00x1.50mm	D-3	4	411-2136
10.00x1.50mm	D-6	4	411-2138
11.00x1.00mm	D-3	4	411-2142
11.00x1.50mm	D-5	4	411-2146
11.00x1.50mm	D-6	4	411-2147
12.00x1.00mm	D-5	4	411-2150
12.00x1.25mm	D-3	4	411-2152
12.00x1.25mm	D-5	4	411-2154
12.00x1.50mm	D-5	4	411-2156
12.00x1.75mm	D-3	4	411-2158
12.00x1.75mm	D-6	4	411-2160
14.00x1.00mm	D-6	4	411-2178
14.00x1.25mm	H-4	4	411-2180
14.00x1.25mm	D-6	4	411-2181

Size	Thread Limits	No. Of Flute	Model No.
14.00x1.50mm	D-3	4	411-2182
14.00x1.50mm	D-6	4	411-2184
14.00x2.00mm	D-3	4	411-2188
14.00x2.00mm	D-7	4	411-2190
16.00x1.00mm	D-6	4	411-2198
16.00x1.50mm	D-3	4	411-2202
16.00x1.50mm	D-6	4	411-2204
16.00x2.00mm	D-4	4	411-2206
16.00x2.00mm	D-7	4	411-2208
18.00x1.00mm	D-6	4	411-2214
18.00x1.50mm	D-3	4	411-2218
18.00x1.50mm	H-4	4	411-2220
18.00x1.50mm	D-6	4	411-2222
18.00x2.00mm	D-6	4	411-2223
18.00x2.50mm	D-4	4	411-2224
18.00x2.50mm	D-7	4	411-2226
20.00x1.00mm	D-7	4	411-2230
20.00x1.50mm	D-3	4	411-2234
20.00x1.50mm	D-6	4	411-2236
20.00x2.00mm	D-6	4	411-2238
20.00x2.50mm	D-4	4	411-2240
20.00x2.50mm	D-7	4	411-2242
22.00x1.00mm	D-6	4	411-2244
22.00x1.50mm	D-3	4	411-2246
22.00x1.50mm	D-6	4	411-2248
22.00x2.00mm	D-6	4	411-2249
22.00x2.50mm	D-4	4	411-2250
22.00x2.50mm	D-6	4	411-2252
22.00x2.50mm	D-7	4	411-2254
24.00x1.00mm	D-7	4	411-2256
24.00x1.50mm	D-7	4	411-2258
24.00x2.00mm	D-4	4	411-2260
24.00x2.00mm	D-7	4	411-2262
24.00x3.00mm	D-4	4	411-2264
24.00x3.00mm	D-8	4	411-2266
27.00x1.50mm	D-7	4	411-2272
27.00x2.00mm	D-5	4	411-2274
27.00x2.00mm	D-7	4	411-2276
27.00x3.00mm	D-8	4	411-2278
27.00x3.00mm	D-9	4	411-2280
30.00x1.50mm	D-7	4	411-2284
30.00x2.00mm	D-5	4	411-2286
30.00x2.00mm	D-7	4	411-2288
30.00x3.50mm	D-5	4	411-2292
30.00x3.50mm	D-9	4	411-2294
32.00x2.00mm	D-7	4	411-2296
32.00x2.00mm	D-7	6	411-2298
33.00x2.00mm	D-5	4	411-2300
33.00x2.00mm	D-7	6	411-2302
33.00x3.50mm	D-5	4	411-2304
33.00x3.50mm	D-9	4	411-2306
36.00x3.00mm	D-5	4	411-2308
36.00x3.00mm	D-8	4	411-2310
36.00x3.60mm	D-9	4	411-2312
36.00x4.00mm	D-5	4	411-2314
36.00x4.00mm	D-9	4	411-2316
38.00x4.00mm	D-9	4	411-2317
39.00x3.00mm	D-6	4	411-2318
39.00x3.00mm	D-8	6	411-2320
39.00x4.00mm	D-6	4	411-2322
39.00x4.00mm	D-9	4	411-2324
42.00x4.5mm	D-1	6	411-2326
45.00x4.50mm	D-1	6	411-2328
48.00x4.50mm	D-1	6	411-2330
48.00x5.00mm	D-1	6	411-2332



Cutting Tools

RIGHT & LEFT HAND ACME TAPS

High Speed Steel

Right Hand

Size	Right Hand Model No.
3/8-12	312-9001
7/16-12	312-9002
1/2-10	312-9003
5/8-8	312-9004
3/4-6	312-9005
1"-5	312-9007
1-1/8-5	312-9008
1-1/4-5	312-9009
1-3/8-4	312-9010
1-1/2-4	312-9011
1-3/4-4	312-9012

Left Hand

Size	Left Hand Model No.
5/8-8	312-9020
3/4-6	312-9021
7/8-6	312-9022
1"-5	312-9023
1-1/8-5	312-9024
1-1/4-5	312-9025



SINGLE PASS ACME TAPS

Tandem Style, High Speed Steel, Ground Thread



Size	Thread Length	Overall length	Maximum Depth of Bronze or Steel Nut	Maximum Depth of Brass or Cast Iron Nut	Model No.
1/2"-10	2-9/16"	5"	1"	1-1/2"	312-0306
5/8"-8	3-3/16"	6-1/4"	1-1/4"	1-7/8"	312-0308
3/4"-6	4-5/16"	7-15/16"	1-1/2"	2-1/4"	312-0310
7/8"-6	4-3/8"	8-5/8"	1-3/4"	2-5/8"	312-0312
1"-5	5-1/4"	10-1/8"	2"	3"	312-0314
1-1/8"-5	5-1/4"	10"-3/4"	2-1/4"	3-3/8"	312-0316
1-1/4"-5	5-1/4"	11-1/8"	2-1/2"	3-3/4"	312-0318
1-3/8"-4	5-7/8"	12-1/4"	2-3/4"	4-1/8"	312-0320
1-1/2"-4	5-7/8"	12-5/8"	3"	4-1/2"	312-0322

PULLEY TAPS

Size	No. Of Flute	H limit	Overall Length	Model No.
1/4"-20NC	4	H-3	4"	312-0402
5/16"-18NC	4	H-3	4"	312-0404
3/8"-16NC	4	H-3	4"	312-0406
6-32NC	3	H-3	6"	312-0502
6-40NF	3	H-2	6"	312-0504
8-32NC	3	H-3	6"	312-0506
8-36NF	3	H-3	6"	312-0508
10-24NC	3	H-3	6"	312-0510
10-32NF	3	H-3	6"	312-0512
1/4"-20NC	4	H-3	6"	312-0514
1/4"-28NF	4	H-3	6"	312-0516
5/16"-18NC	4	H-3	6"	312-0518
5/16"-24NF	4	H-3	6"	312-0520
3/8"-16NC	4	H-3	6"	312-0522
3/8"-24NF	4	H-3	6"	312-0524
7/16"-14NC	4	H-3	6"	312-0526
7/16"-20NF	4	H-3	6"	312-0528
1/2"-13NC	4	H-3	6"	312-0530
1/2"-20NF	4	H-3	6"	312-0532
5/8"-11NC	4	H-3	6"	312-0534
5/8"-18NF	4	H-3	6"	312-0536
3/4"-10NC	4	H-3	6"	312-0538
7/8"-9NC	4	H-4	6"	312-0540
1/4"-20NC	4	H-3	8"	312-0602
1/4"-28NF	4	H-3	8"	312-0604
5/16"-18NC	4	H-3	8"	312-0606



Size	No. Of Flute	H limit	Overall Length	Model No.
5/16"-24NF	4	H-3	8"	312-0608
3/8"-16NC	4	H-3	8"	312-0610
3/8"-24NF	4	H-3	8"	312-0612
7/16"-14NC	4	H-3	8"	312-0614
7/16"-20NF	4	H-3	8"	312-0616
1/2"-13NC	4	H-3	8"	312-0618
1/2"-20NF	4	H-3	8"	312-0620
5/8"-11NC	4	H-3	8"	312-0622
5/8"-18NF	4	H-3	8"	312-0624
3/4"-10NC	4	H-3	8"	312-0626
7/8"-9NC	4	H-4	8"	312-0628
1"-8NC	4	H-4	8"	312-0630
3/8"-16NC	4	H-3	10"	312-0702
3/8"-24NF	4	H-3	10"	312-0704
7/16"-14NC	4	H-3	10"	312-0706
7/16"-20NF	4	H-3	10"	312-0708
1/2"-13NC	4	H-3	10"	312-0709
5/8"-11NC	4	H-3	10"	312-0710
3/4"-10NC	4	H-3	10"	312-0712
7/8"-9NC	4	H-4	10"	312-0714
3/8"-16NC	4	H-3	12"	312-0802
7/16"-14NC	4	H-3	12"	312-0804
1/2"-13NC	4	H-3	12"	312-0806
5/8"-11NC	4	H-3	12"	312-0808
5/8"-18NF	4	H-3	12"	312-0810
3/4"-10NC	4	H-3	12"	312-0812
1"-8NC	4	H-4	12"	312-0814

SINGLE PASS COMBINATION DRILL & TAPS

High Speed Steel, Ground Thread



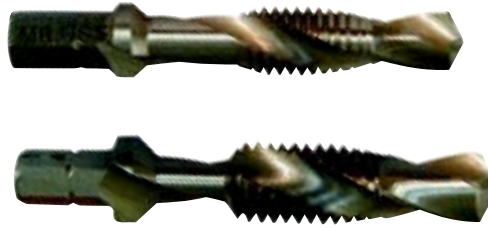
Size	Thread Limit	Drill Length	Drill Length	Drill Size	Overall Length	H.S.S Model No.	Tin Coated Model No.
3x.5mm	D-3	9/32"	.1015"	13/32"	1-15/16"	312-0162	312-0262
3.5x.6mm	D-4	5/16"	.1180"	7/16"	2"	312-0164	312-0264
4x.7mm	D-4	3/8"	.1340"	1/2"	2-1/8"	312-0166	312-0266
4.5x.75mm	D-4	13/32"	.1520"	5/8"	2-3/8"	312-0168	312-0268
5x.8mm	D-4	13/32"	.1700"	5/8"	2-3/8"	312-0170	312-0270
6x1.00mm	D-5	17/32"	.2030"	25/32"	2-1/2"	312-0172	312-0272
7x1.00mm	D-5	11/16"	.2420"	15/16"	2-27/32"	312-0174	312-0274
8x1.25mm	D-5	11/16"	.2735"	15/16"	2-27/32"	312-0176	312-0276
10x1.5mm	D-6	13/16"	.3440"	1-1/16"	3-3/8"	312-0178	312-0278
12x1.75mm	D-6	1-1/8"	.4140"	1-3/8"	4-1/16"	312-0180	312-0280

Size	H Limit	Thread Length	Drill Length	Drill Size	Overall Length	H.S.S Model No.	Tin Coated Model No.
4-40NC	H-2	9/16"	1/4"	.0890"	1-7/8"	312-0102	312-0202
4-48NF	H-2	9/16"	1/4"	.0930"	1-7/8"	312-0104	312-0204
5-40NC	H-2	5/8"	9/32"	.1015"	1-15/16"	312-0106	312-0206
5-44NF	H-2	5/8"	9/32"	.1040"	1-15/16"	312-0108	312-0208
6-32NC	H-3	11/16"	5/16"	.1095"	2"	312-0110	312-0210
6-40NF	H-2	11/16"	5/16"	.1150"	2"	312-0112	312-0212
8-32NC	H-3	3/4"	3/8"	.1360"	2-1/8"	312-0114	312-0214
8-36NF	H-3	3/4"	3/8"	.1385"	2-1/8"	312-0116	312-0216
10-24NC	H-3	7/8"	13/32"	.1520"	2-3/8"	312-0118	312-0218
10-32NF	H-3	7/8"	13/32"	.1610"	2-3/8"	312-0120	312-0220
12-24NC	H-3	7/8"	15/32"	.1770"	2-3/8"	312-0122	312-0222
12-28NF	H-3	7/8"	15/32"	.1835"	2-3/8"	312-0124	312-0224
1/4"-20NC	H-3	15/16"	17/32"	.2010"	2-1/2"	312-0126	312-0226
1/4"-28NF	H-3	15/16"	17/32"	.2175"	2-1/2"	312-0128	312-0228
5/16"-18NC	H-3	1-1/8"	11/16"	.2570"	3"	312-0130	312-0230
5/16"-24NF	H-3	1-1/8"	11/16"	.2720"	3"	312-0132	312-0232
3/8"-16NC	H-3	1-1/4"	13/16"	.3125"	3-1/2"	312-0134	312-0234
3/8"-24NF	H-3	1-1/4"	13/16"	.3345"	3-1/2"	312-0136	312-0236
7/16"-14NC	H-3	1-7/16"	1"	.3680"	3-7/8"	312-0138	312-0238
7/16"-20NF	H-3	1-7/16"	1"	.3890"	3-7/8"	312-0140	312-0240
1/2"-13NC	H-3	1-21/32"	1-1/8"	.4250"	4-1/4"	312-0142	312-0242
1/2"-20NF	H-3	1-21/32"	1-1/8"	.4510"	4-1/4"	312-0144	312-0244



SINGLE PASS COMBINATION DRILL & TAPS

High Speed Steel,
Ground Thread,
German Pattern



Size	Drill Length	Thread Length	Overall Length	H.S.S Model No.	Tin Coated Model No.
M3	5mm	6mm	36mm	312-8003	312-8103
M4	6mm	8mm	39mm	312-8004	312-8104
M5	7mm	9mm	41mm	312-8005	312-8105
M6	8mm	11mm	44mm	312-8006	312-8106
M8	11mm	14mm	51mm	312-8008	312-8108
M10	15mm	17mm	59mm	312-8010	312-8110

METRIC NUT TAP

High Speed Steel,
Right Hand,
DIN 357

Size	Model No.
M3x0.5mm	311-1503
M4x0.7mm	311-1504
M5x0.8mm	311-1505
M6x1.0mm	311-1506
M8x1.25mm	311-1508
M10x1.50mm	311-1510
M12x1.75mm	311-1512



DIN352 HAND TAP

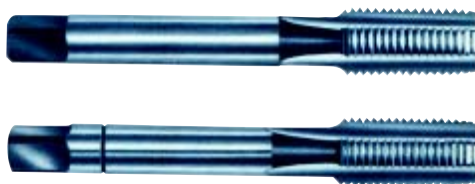
3 Piece,
High Speed Steel,



Size	Individual			Set
	Taper "A"	Taper "B"	Taper "C"	Model No.
M2-0.4mm	324-1020	324-2020	324-3020	311-1219
M2.5-0.45mm	324-1025	324-2025	324-3025	311-1221
M2.6-0.45mm	324-1026	324-2026	324-3026	311-1226
M3-0.5mm	324-1030	324-2030	324-3030	311-1203
M3.5-0.6mm	324-1035	324-2035	324-3035	311-1235
M4-0.7mm	324-1040	324-2040	324-3040	311-1204
M5-0.8mm	324-1050	324-2050	324-3050	311-1205
M6-1.0mm	324-1060	324-2060	324-3060	311-1206
M7-1.0mm	324-1070	324-2070	324-3070	311-1207
M8-1.25mm	324-1080	324-2080	324-3080	311-1208
M10-1.50mm	324-1100	324-2100	324-3100	311-1210
M12-1.75mm	324-1120	324-2120	324-3120	311-1212
M14-2.0mm	324-1140	324-2140	324-3140	311-1214
M16-2.0mm	324-1160	324-2160	324-3160	311-1216
M18-2.5mm	324-1180	324-2180	324-3180	311-1218
M20-2.5mm	324-1200	324-2200	324-3200	311-1220
M22-2.5mm	324-1220	324-2220	324-3220	311-1222
M24-3.0mm	324-1240	324-2240	324-3240	311-1224
M27-3.0mm	324-1270	324-2270	324-3270	311-1227
M30-3.5mm	324-1300	324-2300	324-3300	311-1230
M33-3.5mm	324-1330	324-2330	324-3330	311-1233
M36-4.0mm	324-1360	324-2360	324-3360	311-1236
M39-4.0mm	324-1390	324-2390	324-3390	311-1239
M42-4.5mm	324-1420	324-2420	324-3420	311-1242
M45-4.5mm	324-1450	324-2450	324-3450	311-1245
M48-5.0mm	324-1480	324-2480	324-3480	311-1248
M52-5.0mm	324-1520	324-2520	324-3520	311-1252
M56-5.5mm	324-1560	324-2560	324-3560	311-1256
M60-5.5mm	324-1600	324-2600	324-3600	311-1260
M64-6.0mm	324-1640	324-2640	324-3640	311-1264
M68-6.0mm	324-1680	324-2680	324-3680	311-1268

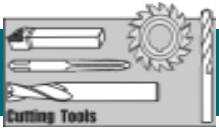
MF DIN2181 HAND TAP

2 Piece
High Speed Steel



Size	Model No.
M3-0.35mm	311-1302
M4-0.35mm	311-1304
M4-0.5mm	311-1306
M5-0.5mm	311-1308
M6-0.75mm	311-1310
M8-0.75mm	311-1312
M8-1.0mm	311-1314
M10-1.0mm	311-1316
M10-1.25mm	311-1318
M12-1.0mm	311-1320
M12-1.25mm	311-1322

Size	Model No.
M12-1.5mm	311-1324
M14-1.0mm	311-1326
M14-1.25mm	311-1328
M14-1.5mm	311-1330
M16-1.0mm	311-1332
M16-1.5mm	311-1334
M18-1.5mm	311-1336
M20-1.5mm	311-1338
M22-1.5mm	311-1340
M24-1.5mm	311-1342



Cutting Tools

DIN 351 HAND TAP SETS

3 Piece,
High Speed Steel,
Right Hand

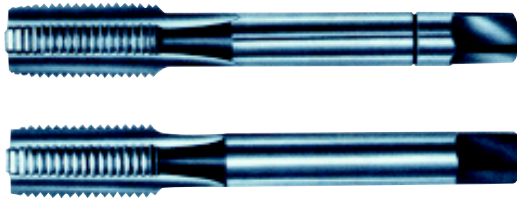


Size	Overall Length	Model No.
1/16"-60	32mm	311-3004
3/32"-48	36mm	311-3006
1/8"-40	40mm	311-3008
5/32"-32	45mm	311-3010
3/16"-24	50mm	311-3012
7/32"-24	50mm	311-3014
1/4"-20	56mm	311-3016
5/16"-18	63mm	311-3020
3/8"-16	70mm	311-3024
7/16"-14	75mm	311-3028
1/2"-12	80mm	311-3032
9/16"-12	80mm	311-3036

Size	Overall Length	Model No.
5/8"-11	90mm	311-3040
3/8"-10	105mm	311-3048
7/8"-9	110mm	311-3056
1"-8	110mm	311-3100
1-1/8"-7	132mm	311-3108
1-1/4"-7	132mm	311-3116
1-3/8"-6	150mm	311-3124
1-1/2"-6	150mm	311-3132
1-5/8"-5	160mm	311-3140
1-3/4"-5	160mm	311-3148
1-7/8"-4-1/2	190mm	311-3156
2"-4-1/2	190mm	311-3200

DIN5157/DIN353 HAND TAP

2 Piece set, High Speed, Right Hand



Size	Overall Length	Thread Length	Model No.
1/8"	63	18	311-1008
1/4"	63	20	311-1016
3/8"	70	20	311-1024
1/2"	80	22	311-1032
5/8"	90	25	311-1040
3/4"	100	28	311-1048
7/8"	100	28	311-1056
1"	110	32	311-1064
1-1/8"	110	32	311-1065
1-1/4"	125	32	311-1066
1-3/8"	125	32	311-1067
1-1/2"	140	32	311-1068
1-3/4"	160	36	311-1069
2"	160	36	311-1070
2-1/4"	160	36	311-1071
2-1/2"	160	36	311-1072
2-3/4"	160	40	311-1073
3"	160	40	311-1074
3-1/4"	180	45	311-1075
3-1/2"	180	45	311-1076
3-3/4"	180	45	311-1077
4"	180	45	311-1078

DIN371 METRIC MACHINE TAP

High Speed Steel, Thread Ground

Right Hand



H. S. S.	Straight Flute Taper "A"	Straight Flute Bottom "C"	Spiral Point	Spiral Flute 15° Flute	Spiral Flute 35° Flute
Size	Model No.	Model No.	Model No.	Model No.	Model No.
M2-0.4mm	311-1602	311-1702	311-1612	311-1622	311-1722
M3-0.5mm	311-1603	311-1703	311-1613	311-1623	311-1723
M4-0.7mm	311-1604	311-1704	311-1614	311-1624	311-1724
M5-0.8mm	311-1605	311-1705	311-1615	311-1625	311-1725
M6-1.0mm	311-1606	311-1706	311-1616	311-1626	311-1726
M8-1.25mm	311-1608	311-1708	311-1618	311-1628	311-1728
M10-1.5mm	311-1610	311-1710	311-1620	311-1630	311-1730

Tin Coated	Straight Flute Taper "A"	Straight Flute Bottom "C"	Spiral Point	Spiral Flute 15° Flute	Spiral Flute 35° Flute
Size	Model No.	Model No.	Model No.	Model No.	Model No.
M2-0.4mm	311-1632	311-1732	311-1642	311-1652	311-1752
M3-0.5mm	311-1633	311-1733	311-1643	311-1653	311-1753
M4-0.7mm	311-1634	311-1734	311-1644	311-1654	311-1754
M5-0.8mm	311-1635	311-1735	311-1645	311-1655	311-1755
M6-1.0mm	311-1636	311-1736	311-1646	311-1656	311-1756
M8-1.25mm	311-1638	311-1738	311-1648	311-1658	311-1758
M10-1.5mm	311-1640	311-1740	311-1650	311-1660	311-1760

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DIN371 METRIC MACHINE TAP, M35HSS

Co5 High Speed Steel, Thread Ground

Right Hand



M35 HSS	Straight Flute		Spiral Flute	Straight Flute	
	Taper "A" Model No.	Bottom "C" Model No.	Model No.	15Flute Model No.	35° Flute Model No.
M2-0.4mm	311-1802	311-1902	311-1812	311-1922	311-1822
M3-0.5mm	311-1803	311-1903	311-1813	311-1923	311-1823
M4-0.7mm	311-1804	311-1904	311-1814	311-1924	311-1824
M5-0.8mm	311-1805	311-1905	311-1815	311-1925	311-1825
M6-1.0mm	311-1806	311-1906	311-1816	311-1926	311-1826
M8-1.25mm	311-1808	311-1908	311-1818	311-1928	311-1828
M10-1.5mm	311-1810	311-1910	311-1820	311-1920	311-1820

M35 HSS Tin-Coated	Straight Flute		Spiral Flute	Straight Flute	
	Taper "A" Model No.	Bottom "C" Model No.	Model No.	15Flute Model No.	35° Flute Model No.
M2-0.4mm	311-1832	311-1932	311-1842	311-1952	311-1822
M3-0.5mm	311-1833	311-1933	311-1843	311-1953	311-1823
M4-0.7mm	311-1834	311-1934	311-1844	311-1954	311-1824
M5-0.8mm	311-1835	311-1935	311-1845	311-1955	311-1825
M6-1.0mm	311-1836	311-1936	311-1846	311-1956	311-1826
M8-1.25mm	311-1838	311-1938	311-1848	311-1958	311-1828
M10-1.5mm	311-1840	311-1940	311-1850	311-1960	311-1820

DIN376 METRIC MACHINE TAP

H. S. S.

High Speed Steel, Thread Ground

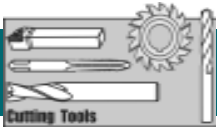
Right Hand



H. S. S.	Straight Flute Taper "A" Model No.	Straight Flute Bottom "C" Model No.	Spiral Point Model No.	SpiralFlute 15° Flute Model No.	SpiralFlute 35° Flute Model No.
M3-0.5mm	311-1403	311-2403	311-1433	311-1463	311-2463
M4-0.7mm	311-1404	311-2404	311-1434	311-1464	311-2464
M5-0.8mm	311-1405	311-2405	311-1435	311-1465	311-2465
M6-1.0mm	311-1406	311-2406	311-1436	311-1466	311-2466
M8-1.25mm	311-1408	311-2408	311-1438	311-1468	311-2468
M10-1.5mm	311-1410	311-2410	311-1440	311-1470	311-2470
M12-1.75mm	311-1412	311-2412	311-1442	311-1472	311-2472
M14-2.0mm	311-1414	311-2414	311-1444	311-1474	311-2474
M16-2.0mm	311-1416	311-2416	311-1446	311-1476	311-2476
M18-2.5mm	311-1418	311-2418	311-1448	311-1478	311-2478
M20-2.5mm	311-1420	311-2420	311-1450	311-1480	311-2480
M22-2.5mm	311-1422	311-2422	311-1452	311-1482	311-2482
M24-3.0mm	311-1424	311-2424	311-1454	311-1484	311-2484
M27-3.0mm	311-1427	311-2427	311-1457	311-1487	311-2487
M30-3.5mm	311-1430	311-2430	311-1460	311-1490	311-2490

Tin Coated

Tin Coated	Straight Flute Taper "A" Model No.	Straight Flute Bottom "C" Model No.	Spiral Point Model No.	Spiral Flute 15° Flute Model No.	Spiral Flute 35° Flute Model No.
M3-0.5mm	311-2503	311-2603	311-2633	311-2563	311-2663
M4-0.7mm	311-2504	311-2604	311-2634	311-2564	311-2664
M5-0.8mm	311-2505	311-2605	311-2635	311-2565	311-2665
M6-1.0mm	311-2506	311-2606	311-2636	311-2566	311-2666
M8-1.25mm	311-2508	311-2608	311-2638	311-2568	311-2668
M10-1.5mm	311-2510	311-2610	311-2640	311-2570	311-2670
M12-1.75mm	311-2512	311-2612	311-2642	311-2572	311-2672
M14-2.0mm	311-2514	311-2614	311-2644	311-2574	311-2674
M16-2.0mm	311-2516	311-2616	311-2646	311-2576	311-2676
M18-2.5mm	311-2518	311-2618	311-2648	311-2578	311-2678
M20-2.5mm	311-2520	311-2620	311-2650	311-2580	311-2680
M22-2.5mm	311-2522	311-2622	311-2652	311-2582	311-2682
M24-3.0mm	311-2524	311-2624	311-2654	311-2584	311-2684
M27-3.0mm	311-2527	311-2627	311-2657	311-2587	311-2687
M30-3.5mm	311-2530	311-2630	311-2660	311-2590	311-2690



Cutting Tools

DIN376 METRIC MACHINE TAP,M35HSS

Co5 High Speed,Thread Ground
Right Hand



M35 HSS	Straight Flute		Spiral Point	Straight Flute	
	Taper "A" Model No.	Bottom "C" Model No.		15° Flute Model No.	35° Flute Model No.
Size			Model No.		
M3-0.5mm	311-2703	311-2903	311-2733	311-2963	311-2763
M4-0.7mm	311-2704	311-2904	311-2734	311-2964	311-2764
M5-0.8mm	311-2705	311-2905	311-2735	311-2965	311-2765
M6-1.0mm	311-2706	311-2906	311-2736	311-2966	311-2766
M8-1.25mm	311-2708	311-2908	311-2738	311-2968	311-2768
M10-1.5mm	311-2710	311-2910	311-2740	311-2970	311-2770
M12-1.75mm	311-2712	311-2912	311-2742	311-2972	311-2772
M14-2.0mm	311-2714	311-2914	311-2744	311-2974	311-2774
M16-2.0mm	311-2716	311-2916	311-2746	311-2976	311-2776
M18-2.5mm	311-2718	311-2918	311-2748	311-2978	311-2778
M20-2.5mm	311-2720	311-2920	311-2750	311-2980	311-2780
M22-2.5mm	311-2722	311-2922	311-2752	311-2982	311-2782
M24-3.0mm	311-2724	311-2924	311-2754	311-2984	311-2784
M27-3.0mm	311-2727	311-2927	311-2757	311-2987	311-2787
M30-3.5mm	311-2730	311-2930	311-2760	311-2990	311-2790

M35 HSS Tin-Coated	Straight Flute		Spiral Point	Straight Flute	
	Taper "A" Model No.	Bottom "C" Model No.		15° Flute Model No.	35° Flute Model No.
Size			Model No.		
M3-0.5mm	311-2803	311-3303	311-2833	311-3363	311-2863
M4-0.7mm	311-2804	311-3304	311-2834	311-3364	311-2864
M5-0.8mm	311-2805	311-3305	311-2835	311-3365	311-2865
M6-1.0mm	311-2806	311-3306	311-2836	311-3366	311-2866
M8-1.25mm	311-2808	311-3308	311-2838	311-3368	311-2868
M10-1.5mm	311-2810	311-3310	311-2840	311-3370	311-2870
M12-1.75mm	311-2812	311-3312	311-2842	311-3372	311-2872
M14-2.0mm	311-2814	311-3314	311-2844	311-3374	311-2874
M16-2.0mm	311-2816	311-3316	311-2846	311-3376	311-2876
M18-2.5mm	311-2818	311-3318	311-2848	311-3378	311-2878
M20-2.5mm	311-2820	311-3320	311-2850	311-3380	311-2880
M22-2.5mm	311-2822	311-3322	311-2852	311-3382	311-2882
M24-3.0mm	311-2824	311-3324	311-2854	311-3384	311-2884
M27-3.0mm	311-2827	311-3327	311-2857	311-3387	311-2887
M30-3.5mm	311-2830	311-3330	311-2860	311-3390	311-2890

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NPT & NPTF TAPER PIPE TAPS

H.S.S, Ground Thread.



Size	No. Of Flute	Flute Length	Overall Length	NPT Model No.	NPTF Model No.
1/16"-27	4	11/16"	2-1/8"	311-6005	311-6205
1/8"-27	4	3/4"	2-1/8"	311-6010	311-6208
1/8"-27	4	3/4"	2-1/8"	311-6011	311-6210
1/4"-18	4	1-1/16"	2-7/16"	311-6015	311-6215
3/8"-18	4	1-1/16"	2-9/16"	311-6020	311-6220
1/2"-14	4	1-3/8"	3-1/8"	311-6025	311-6225
3/4"-14	5	1-3/8"	3-1/4"	311-6030	311-6230
1"-11-1/2	5	1-3/4"	3-1/4"	311-6035	311-6235
1-1/4"-11-1/2	5	1-3/4"	4"	311-6040	311-6240
1-1/2"-11-1/2	7	1-3/4"	4-1/4"	311-6045	311-6245
2"-11-1/2	7	1-3/4"	4-1/2"	311-6050	311-6250
2-1/2-8	8	2-9/16"	5-1/2"	311-6055	311-6255
3"-8	8	2-5/8"	6"	311-6060	311-6260
3-1/2"-8	8	2-11/16"	6-1/2"	311-6065	311-6265

NPT TAPER PIPE TAPS

Carbon Steel, Ground Thread



Size	Model No.
1/8-27	312-6010
1/4-18	312-6015
3/8-18	312-6020
1/2-14	312-6025
3/4-14	312-6030
1"-11-1/2	312-6035
1-1/4-11-1/2	312-6040
1-1/2-11-1/2	312-6045
2"-11-1/2	312-6050
2-1/2-8	312-6055
3"-8	312-6060
3-1/2-8	312-6065
4"-8	312-6070



NPT TAPER PIPE TAP- INTERRUPTED THREAD

High Speed Steel.
Ground Thread



Size	No. OF Flute	Thread Length	Overall Length	Model No.
1/16"-27	5	3/4"	2-1/8"	311-6105
1/8"-27 Small Shank	5	3/4"	2-1/8"	311-6110
1/8"-27	5	3/4"	2-1/8"	311-6111
1/4"-18	5	1-1/16"	2-7/16"	311-6115
3/8"-18	5	1-1/16"	2-9/16"	311-6120
1/2"-14	5	1-3/8"	3-1/8"	311-6125
3/4"-14	5	1-3/8"	3-1/4"	311-6130
1"-11-1/2	5	1-3/4"	3-3/4"	311-6135
1-1/4"-11-1/2	5	1-3/4"	4"	311-6140
1-1/2"-11-1/2	7	1-3/4"	4-1/4"	311-6145
2"-11-1/2	7	1-3/4"	4-1/2"	311-6150

NPS STRAIGHT PIPE TAPS

High Speed Steel.
Ground Thread



Size	Model No.
1/8-27	311-6310
1/4-18	311-6315
3/8-18	311-6320
1/2-14	311-6325
3/4-14	311-6330
1"-11-1/2	311-6335
1-1/4-11-1/2	311-6340
1-1/2-11-1/2	311-6345
2"-11-1/2	311-6350
3"-8	311-6360

TIN COATED TAPER PIPE TAP



Tap Size	No. Of Flute	Thread Length	Overall Length	Model No.
1/16-27	5	11/16	2-1/8	318-3305
1/8-27	5	3/4	2-1/8	318-3310
1/4-18	5	1-1/16	2-7/8	318-3315
3/8-18	5	1-1/16	2-9/16	318-3320
1/2-14	5	1-3/8	3-1/8	318-3325
3/4-14	5	1-3/8	3-1/4	318-3330
1-11-1/2	5	1-3/4	1-3/4	318-3335

TIN COATED STRAIGHT PIPE TAP



Tap Size	Thread Length	Overall Length	No. Of Flute	Model No.
1/8-27	3/4	2-1/8	4"	318-3403
1/4-18	1-1/16	2-1/8	4"	318-3406
1/4-18	1-1/16	2-9/16	4"	318-3409
3/8-18	1-1/16	2-9/16	4"	318-3412
1/2-14	1-3/8	3-1/8	4"	318-3415

STRAIGHT PIPE TAPS

High Speed Steel, DIN 5156



Size	Overall Length	Thread Length	Model No.
G1/16-28	90	22	311-0400
G1/8-28	90	20	311-0402
G1/4-19	100	22	311-0404
G3/8-19	100	22	311-0406
G1/2-14	125	25	311-0408
G5/8-14	125	25	311-0410
G3/4-14	140	28	311-0412
G7/8-14	150	28	311-0414
G1-11	160	30	311-0416
G1-1/8-11	170	30	311-0418
G1-1/4-11	170	30	311-0420
G1-1/2-11	190	32	311-0422
G1-3/4-11	190	32	311-0424
G2-11	220	40	311-0426



ADJUSTABLE ROUND DIES

Carbon Steel, Standard Thread

13/16" O.D.	
Size	Model No.
2-56	314-3000
5-40	314-3001
2-64	314-3002
8-32	314-3003
6-40	314-3004
8-36	314-3005
10-32	314-3006
12-24	314-3008
12-28	314-3010
14-20	314-3012
14-24	314-3014
1/4-20	314-3016
1/4-28	314-3018
5/16-24	314-3020

1" O.D.		1" O.D.	
Size	Model No.	Size	Model No.
5-40	314-3102	3/16-18	314-3121
5-44	314-3104	1/4-20	314-3122
6-32	314-3106	1/4-28	314-3123
8-32	314-3108	5/16-18	314-3124
8-36	314-3110	5/16-24	314-3126
10-32	314-3111	3/8-16	314-3127
12-24	314-3112	3/8-24	314-3128
12-28	314-3114	7/16-14	314-3130
14-20	314-3116	7/16-20	314-3132
14-24	314-3118	1/2-13	314-3134
3/16-24	314-3120	1/2-20	314-3136

1-1/2" O.D.	
Size	Model No.
12-24	314-3208
12-28	314-3210
14-20	314-3212
14-24	314-3214
1/4-20	314-3216
1/4-28	314-3218
5/16-18	314-3220
5/16-24	314-3222
3/8-24	314-3224
7/16-14	314-3225
7/16-20	314-3226
1/2-13	314-3227
9/16-18	314-3228
5/8-11	314-3229
5/8-18	314-3230

2" O.D.	
Size	Model No.
3/4-16	314-3232
14-20	314-3312
14-28	314-3314
5/16-24	314-3315
5/16-18	314-3316
3/8-24	314-3318
3/8-16	314-3319
7/16-20	314-3320
7/16-28	314-3322
1/2-13	314-3324
1/2-20	314-3326
3/4-10	314-3328
3/4-16	314-3330
7/8-14	314-3332
1-8	314-3334

2-1/2" O.D.	
Size	Model No.
9/16-12	314-3428
9/16-18	314-3430
5/8-11	314-3432
5/8-18	314-3434
1-12	314-3436
1-1/4-7	314-3438
1-1/4-12	314-3440
1-1/2-12	314-3442

3" O.D.	
Size	Model No.
1-1/4-12	314-3538
1-1/4-7	314-3539
1-1/8-7	314-3540
1-3/8-6	314-3542
1-3/8-12	314-3544
1-1/2-6	314-3545
1-5/8-5	314-3546

ADJUSTABLE ROUND DIES

High Speed Steel, Standard Thread



13/16" O.D.	
Size	Model No.
0-80	314-1000
1-64	314-1002
1-72	314-1004
2-56	314-1006
2-64	314-1008
3-48	314-1010
3-56	314-1012
4-40	314-1014
4-48	314-1016
5-40	314-1018
5-44	314-1020
6-32	314-1022
6-40	314-1024
8-32	314-1026
8-36	314-1028
10-24	314-1030
10-32	314-1032
12-24	314-1034
12-28	314-1036
14-24	314-1038
1/4-20	314-1040
1/4-28	314-1042
5/16-18	314-1044
5/16-24	314-1046

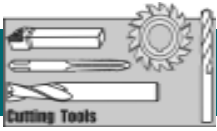
1" O.D.	
Size	Model No.
1-64	314-1102
1-72	314-1104
2-56	314-1106
2-64	314-1108
3-48	314-1110
3-56	314-1112
4-40	314-1114
4-48	314-1116
5-40	314-1118
5-44	314-1120
6-32	314-1122
6-40	314-1124
8-32	314-1126
8-36	314-1128
10-24	314-1130
10-32	314-1132
12-24	314-1134
12-28	314-1136
14-24	314-1138
1/4-20	314-1140
1/4-28	314-1142
5/16-18	314-1144
5/16-24	314-1146
3/8-16	314-1148
3/8-24	314-1150
7/16-14	314-1152
7/16-20	314-1154
1/2-13	314-1156
1/2-20	314-1158

1-1/2" O.D.	
Size	Model No.
1/4-20	314-1240
1/4-28	314-1242
5/16-18	314-1244
5/16-24	314-1246
3/8-16	314-1248
3/8-24	314-1250
7/16-14	314-1252
7/16-20	314-1256
1/2-13	314-1258
1/2-20	314-1260
9/16-12	314-1262
9/16-18	314-1264
5/8-11	314-1266
5/8-18	314-1268
3/4-10	314-1270
3/4-16	314-1272

2" O.D.	
Size	Model No.
1/4-20	314-1340
1/4-28	314-1342
5/16-18	314-1344
5/16-24	314-1346
3/8-16	314-1348
3/8-24	314-1350
7/16-14	314-1352
7/16-20	314-1354
1/2-13	314-1356
1/2-20	314-1358
9/16-12	314-1360
9/16-18	314-1362
5/8-11	314-1364
5/8-18	314-1366
3/4-10	314-1368
3/4-16	314-1370
7/8-9	314-1372
7/8-14	314-1374
1-8	314-1378
1-12	314-1380

2-1/2" O.D.	
Size	Model No.
3/4-10	314-1468
3/4-16	314-1470
7/8-9	314-1472
7/8-14	314-1474
1-8	314-1476
1-14	314-1478
1-1/8-7	314-1480
1-1/8-12	314-1482
1-1/4-7	314-1484
1-1/4-12	314-1486
1-3/8-6	314-1488
1-3/8-12	314-1490
1-1/2-6	314-1492
1-1/2-12	314-1494

3" O.D.	
Size	Model No.
1-1/4-12	314-1505
1-1/4-7	314-1507
1-1/2-6	314-1509



Cutting Tools

13/16" O.D.

Size	Model No.
0-80	314-4000
1-64	314-4002
1-72	314-4004
2-56	314-4006
2-64	314-4008
3-48	314-4010
3-56	314-4012
4-40	314-4014
4-48	314-4016
5-40	314-4018
5-44	314-4020
6-32	314-4022
6-40	314-4024
8-32	314-4026
8-36	314-4028
10-24	314-4030
10-32	314-4032
12-24	314-4034
12-28	314-4036
1/4-20	314-4040
1/4-28	314-4042

1" O.D.

Size	Model No.
5-44	314-4120
6-32	314-4122
6-40	314-4124
8-32	314-4126
8-36	314-4128
10-24	314-4130
10-32	314-4132
12-24	314-4134
12-28	314-4136
14-24	314-4138
1/4-20	314-4140
1/4-28	314-4142
5/16-18	314-4144
5/16-24	314-4146
3/8-16	314-4148
3/8-24	314-4150
7/16-14	314-4152
7/16-20	314-4154
1/2-13	314-4156
1/2-20	314-4158

1-1/2" O.D.

Size	Model No.
1/4-20	314-4240
1/4-28	314-4242
5/16-18	314-4244
5/16-24	314-4246
3/8-16	314-4248
3/8-24	314-4252
3/8-32	314-4254
7/16-14	314-4256
7/16-20	314-4258
1/2-13	314-4260
1/2-20	314-4262
9/16-12	314-4264
9/16-18	314-4266
5/8-11	314-4268
5/8-18	314-4270
3/4-10	314-4272
3/4-16	314-4274

2" O.D.

Size	Model No.
3/4-10	314-4370
3/4-16	314-4372
7/8-9	314-4374
7/8-14	314-4376
1-8	314-4378
1-12	314-4379
1-14	314-4380

2-1/2" O.D.

Size	Model No.
1-1/8-7	314-4480
1-1/8-12	314-4482
1-1/4-7	314-4484
1-1/4-12	314-4486
1-3/8-16	314-4488
1-3/8-12	314-4490
1-1/2-6	314-4492
1-1/2-12	314-4494
1-3/4-18	314-4496

LEFT HAND ROUND ADJUSTABLE DIES

High Speed, NC&NF Threads



LEFT HAND ROUND ADJUSTABLE DIES

Carbon Steel, NC&NF Threads

13/16"

OUTSIDE DIAMETER

Size	Model No.	Size	Model No.
1-72	314-5002	6-32	314-5018
2-64	314-5004	6-40	314-5020
3-48	314-5006	8-32	314-5022
3-56	314-5008	8-36	314-5024
4-40	314-5010	10-24	314-5026
4-48	314-5012	10-32	314-5028
5-40	314-5014	12-24	314-5030
5-44	314-5016	12-28	314-5032

1-1/2"

OUTSIDE DIAMETER

Size	Model No.
1/4-20	314-5140
5/16-18	314-5142
5/16-24	314-5144
7/16-14	314-5146
7/16-20	314-5148
9/16-12	314-5150
9/16-16	314-5152
5/8-11	314-5154

2" OUTSIDE DIAMETER

Size	Model No.	Size	Model No.
1/4-20	314-5240	9/16-12	314-5258
1/4-24	314-5242	9/16-18	314-5260
1/16-18	314-5244	5/8-11	314-5262
1/16-24	314-5246	5/8-18	314-5264
3/8-16	314-5248	3/4-10	314-5266
3/8-24	314-5250	3/4-16	314-5268
7/16-14	314-5252	7/8-9	314-5270
1/2-13	314-5254	7/8-14	314-5272
1/2-20	314-5256	1-8	314-5274



ROUND DIES

DIN 223

HSS



For B.S.W Thread as per DIN 11

Thread	Per inch	Outside	ModelNo.
1/16"	60	16mm	314-1101
3/32"	48	16mm	314-1103
1/8"	40	20mm	314-1105
5/32"	32	20mm	314-1107
3/16"	24	20mm	314-1109
7/32"	24	20mm	314-1111
1/4"	20	20mm	314-1113
5/16"	18	25mm	314-1115
3/8"	16	30mm	314-1117
7/16"	14	30mm	314-1119
1/2"	12	38mm	314-1121
9/16"	12	38mm	314-1123

Thread	Per inch	Outside	ModelNo.
5/8"	11	45mm	314-1125
3/4"	10	45mm	314-1127
7/8"	9	55mm	314-1129
1"	8	55mm	314-1131
1-1/8"	7	65mm	314-1133
1-1/4"	7	65mm	314-1135
1-3/8"	6	65mm	314-1137
1-1/2"	6	75mm	314-1139
1-5/8"	5	75mm	314-1141
1-3/4"	5	90mm	314-1143
1-7/8"	4-1/2	90mm	314-1145
2"	4-1/2	90mm	314-1147

ROUND DIES

DIN 5158

HSS



For B.S.P. thread as per DIN 228

Thread	Per Inch	Outside	Model No.
G1/16	28	25mm	314-1023
G1/8	28	30mm	314-1001
G1/4	19	38mm	314-1003
G3/8	19	45mm	314-1005
G1/2	14	45mm	314-1007
G5/8	14	55mm	314-1009
G3/4	14	55mm	314-1011
G7/8	14	65mm	314-1013
G1	11	65mm	314-1015
G1-1/8	11	75mm	314-1017
G1-1/4	11	75mm	314-1019
G1-1/2	11	90mm	314-1021

Cutting Tools



ROUND DIES

DIN 223 B
HSS



For ISO metric thread as per DIN 13

Thread mm	Pitch mm	Outside	Model No.
M2	.4	16x5mm	314-9001
M2.5	.45	16x5mm	314-9003
M3	.5	20x5mm	314-9005
M3.5	.6	20x5mm	314-9007
M4	.7	20x5mm	314-9009
M5	.8	20x7mm	314-9011
M6	1.0	20x7mm	314-9013
M7	1.0	25x9mm	314-9015
M8	1.25	25x9mm	314-9017
M10	1.5	30x11mm	314-9019
M12	1.75	38x14mm	314-9021
M14	2.0	38x14mm	314-9023
M16	2.0	45x14mm	314-9025

Thread mm	Pitch mm	Outside	Model No.
M18	2.5	45x18mm	314-9027
M20	2.5	45x18mm	314-9029
M22	2.5	55x22mm	314-9031
M24	3.0	55x22mm	314-9033
M27	3.0	65x25mm	314-9035
M30	3.5	65x25mm	314-9037
M33	3.5	65x25mm	314-9039
M36	4.0	65x25mm	314-9041
M39	4.0	75x30mm	314-9043
M42	4.5	75x30mm	314-9045
M45	4.5	90x36mm	314-9047
M48	5.0	90x36mm	314-9049
M52	5.0	90x36mm	314-9051

ROUND DIES

DIN 223 B
HSS



For
DIY-kits,
25mm
outside diameter,
for all sizes of threads

Thread (mm)	Pitch (mm)	Outside (mm)	ModelNo.
M3	0.5	25 x 9	314-9103
M4	0.7	25 x 9	314-9104
M5	0.8	25 x 9	314-9105
M6	1.0	25 x 9	314-9106
M8	1.25	25 x 9	314-9108
M10	1.5	25 x 9	314-9110
M12	1.75	25 x 9	314-9112

ROUND DIES

MF DIN223 B
HSS



For ISO metric fine thread
as per DIN 13

Thread mm	Pitch mm	Outside	Model No.
M3	.35	20x5mm	314-9201
M4	.35	20x5mm	314-9203
M4	.50	20x5mm	314-9205
M5	.50	20x5mm	314-9207
M6	.50	20x5mm	314-9208
M6	.75	25x7mm	314-9209
M8	.50	25x9mm	314-9210
M8	.75	25x9mm	314-9211
M8	1.0	25x9mm	314-9212
M10	1.0	30x11mm	314-9213
M10	.75	30x11mm	314-9214

Thread mm	Pitch mm	Outside	Model No.
M10	1.25	30x11mm	314-9215
M12	1.0	30x11mm	314-9217
M12	1.25	38x11mm	314-9219
M12	1.5	38x10mm	314-9221
M14	1.0	38x10mm	314-9223
M14	1.25	38x10mm	314-9225
M14	1.5	38x10mm	314-9227
M16	1.0	45x14mm	314-9229
M16	1.5	45x14mm	314-9231
M18	1.0	45x14mm	314-9232
M18	1.5	45x14mm	314-9233

Thread mm	Pitch mm	Outside	Model No.
M20	1.0	45x14mm	314-9234
M20	1.5	45x14mm	314-9235
M22	1.0	55x16mm	314-9236
M22	1.5	55x16mm	314-9237
M22	2.0	55x16mm	314-9238
M24	1.5	55x16mm	314-9239
M24	2.0	55x16mm	314-9241
M27	1.5	65x18mm	314-9243
M27	2.0	65x18mm	314-9245
M30	1.5	65x18mm	314-9247
M30	2.0	65x18mm	314-9249



Model No. 318-0007



Model No. 318-0003

HAND TAPPERS

E-Z TAPPER MINITAPPER

Perpendicular tapped holes.

Both units are furnished complete with tap guide, machined work table, tap spindle wrench, and steel tap adapters for use with spiral point taps.

	Model No. 318-0007	Model No. 318-0003
Large Tapper		
Table length	13"	8-1/2"
Table width	8"	6"
Height	14"	9"
Clearance height	7"	3-3/4"
Depth of throat	7-1/2"	4-1/2"
Approx. Weight	35 lbs	12 lbs
Tap Adapters	9 (#8-3/4")	7 (#0-5/16")

HAND TAPPERS

- Equipped with tap guide, precision ground work table, tap spindle, wrench & nine steel tap adapters: 6, 8, 10, 1/4", 5/16", 3/8", 7/16", 1/2" & 5/8".
- Assures straight perpendicular tapped holes.
- Can be used vertical, horizontal or inverted.

Descriptions	Model No. 318-0001
Table length	12-1/2"
Table width	6-1/2"
Table area	6-1/2" x 10"
Height	13"
Clearance height	7"
Depth of throat	7-1/2"
Weight (Approx.)	37 lbs.

Model No. 318-0001



DIE HOLDERS

- Ideal for short or medium run threading at shafts
- Used safely on lathes, milling machines and tapping heads

Die Holders Set
Model No. 318-2333
Set include all three sizes

Body	Shank	Die dia.	Model No.
1- 1/2" D X 1"	1/2" D X 2"	13/16"	318-2031
1- 1/2" D X 1"	1/2" D X 2"	1"	318-2032
2"D X 1-1/4"	3/4" D X 2"	1-1/2"	318-2033



Cutting Tools

TAP WRENCHES

DIN 1814

Adjustable zinc die casting made



Size	Length	For Taps	Model No.
0	130mm	M 1-8	318-0200
1	188mm	M 1-10	318-0215
1-1/2	215mm	M 1-12	318-0220
2	280mm	M 3.5-12	318-0225
3	380mm	M 5-20	318-0230
4	500mm	M 11-27	318-0235
5	700mm	M 13-32	318-0240

DIE STOCKS

DIN 225,

Zinc die casting made



Size	Length	For Taps	Model No.
16 x 5mm	160mm	M 1-2.6	318-2025
20 x 5mm	200mm	M 3-4	318-2030
20 x 7mm	200mm	M 4.5-6	318-2035
25 x 9mm	224mm	M 7-9	318-2040
30 x 11mm	280mm	M 10-11	318-2045
38 x 14mm	315mm	M 12-14	318-2050
45 x 18mm	450mm	M 16-20	318-2055
55 x 22mm	560mm	M 22-24	318-2060
65 x 25mm	630mm	M 27-36	318-2065

SOCKET TAP WRENCHES

DIN 377



Size	Description	Model No.
2.1x60mm	for tap DIN352 M1-2.6	318-5021
2.4x70mm		318-5024
2.7x80mm	for tap DIN352 M3	318-5027
3.0x90mm	for tap DIN352 M3.5	318-5030
3.4x95mm	for tap DIN352 M4	318-5034
3.8x100mm		318-5038
4.3x105mm	for tap DIN351NO.10UNC	318-5043
4.9x110mm	for tap DIN352 M4.5-8	318-5049
5.5x115mm	for tap DIN352 M9-10	318-5055
6.2x120mm	for tap DIN352 M11	318-5062
7.0x125mm	for tap DIN352 M12	318-5070

Size	Description	Model No.
8.0x125mm		318-5080
9.0x130mm	for tap DIN352 M13-16	318-5090
10.0x140mm		318-5100
11.0x150mm	for tap DIN352 M18	318-5110
12.0x155mm	for tap DIN352 M20	318-5120
13.0x160mm		318-5130
14.5x175mm	for tap DIN352 M22-24	318-5145
16.0x180mm	for tap DIN352 M27	318-5160
18.0x200mm	for tap DIN352 M30	318-5180
20.0x220mm	for tap DIN352 M32	318-5200
22.0x230mm	for tap DIN352 M36	318-5220

EXTENSION TAP WRENCHES



- Attractive finish.
- Made of steel.
- Precision tap extension.
- 4 jaw chuck.

Tap Capacity	Length	Model No.
# 0-1/4" (1.5-6mm)	7"/175mm	318-0140
# 12-1/2" (6-12mm)	10-3/4"/273mm	318-0145

MINI TAP HANDLE

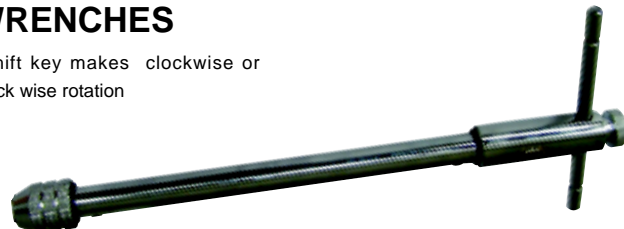


- Handy tapping tool.
- Ideally suitable for jewelers, watch makers, and small tapping application

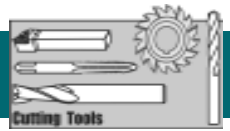
Tap Capacity	Model No.
1/4" (6mm)	318-0251
1/2" (12mm)	318-0252
2 piece set	318-0254

T- HANDLE TAP WRENCHES

European Style Ratchet shift key makes clockwise or counter clock wise rotation



Description	Plain Model No.	Ratchet Model No.
Length 85mm, for tap DIN M3-10	318-5305	318-5315
Length 110mm, for tap DIN M5-12	318-5310	318-5320
length 250mm, for tap DINM3-10	318-5306	318-5335
length 300mm, for tap DIN M5-12	318-5311	318-5340



TAP AND DIE SETS



3 Pieces NPT Taper Pipe Taps Set

Ground Thread

Descriptions	Wooden Case
High Speed Steel	Model No. 314-9503
Alloy Tool Steel	Model No. 314-9603

Set includes one each: Taps

Size
1-1/4"-11-1/2
1-1/2"-11-1/2
2"-11-1/2



6 Piece NPT Taper Pipe Taps Set

Ground Thread

Descriptions	Wooden Case
High Speed Steel	Model No. 314-9506
Alloy Tool Steel	Model No. 314-9606

Set includes one each: Taps

Size
1/4"-18
3/8"-18
1/2"-14
3/4"-14
1"-11-1/2
1-1/4"-11-1/2



7 Pieces Set, Single Pass Combination Drill & Tap Sets

HSS, packed in plastic case

Set includes one each:

- 6 pcs taps
- 1 pc linked shank

Model No.314-9507

Size of Taps
M3
M4
M5
M6
M8
M10



7 Pieces Set, Spiral Point Taps, DIN371/DIN376

HSS, packed in plastic case

Set includes one each:

- 7 pcs taps, DIN371/DIN376

Model No.314-9407

Size of Taps
M3
M4
M5
M6
M8
M10
M12



7 Pieces Set, HSS DIN371/DIN376

Spiral Fluted Taps

Packed in plastic case

Set includes one each:

- 7 pcs taps, DIN371/DIN376

Model No.314-9408

Size of Taps
M3
M4
M5
M6
M8
M10
M12



8 Pieces Set, HSS DIN371/DIN376

Spiral Fluted Tap Set

Packed in metal case

Set includes one each:

- 7 pcs taps, DIN371/DIN376
- 1 pc tap wrench

Model No.314-9308

Size of Taps
M3
M4
M5
M6
M8
M10
M12



8 Pieces Set, HSS DIN371/DIN376

Spiral Pointed Tap Set

Packed in metal case

Set includes one each:

- 7 pcs taps, DIN371/DIN376
- 1 pc tap wrench

Model No.314-9309

Size of Taps
M3
M4
M5
M6
M8
M10
M12



9 Pieces Metric Set, HSS

Packed in wooden case

Set includes one each:

- 4 pcs taper taps
- 4 pcs plug taps (bottoming)
- 1 pc ratchet wheel wrench

Model No.314-9409

Size of Taps
M6
M8
M10
M12



Cutting Tools

TAP AND DIE SETS

11 Pieces Metric Set, HSS

Packed in wooden case

Model No.314-9411

Size of Taps
M3
M4
M5
M6
M8

Set includes one each:

- 5 pcs taper taps
- 5 pcs plug taps (bottoming)
- 1 pc ratchet wheel wrench

12 Pieces Set

Packed in plastic or metal case

Description	In plastic case		In metal case	
	Model No.	Model No.	Model No.	Model No.
HSS Ground Thread	314-9512	314-9513		
Alloy Tool Steel	314-9612	314-9613		

Set includes one each:

- 5 pcs taps
- 5 pcs round dies
- 1 pc dies stock
- 1 pc tap wrench

Size of Taps & Dies
1/4-20UNC
5/16-18UNC
3/8-16UNC
7/16-14UNC
1/2-13UNC



14 Pieces Set, Spiral Point or Fluted Tap and Drill Set

HSS, DIN371/DIN376/DIN338

Packed in metal case

Set includes one each:

- 7 pcs taps, DIN371/DIN376/DIN338
- 7 pcs drills

Size of Taps	Size of drills
M3	φ2.5
M4	φ3.3
M5	φ4.2
M6	φ5
M8	φ6.8
M10	φ8.5
M12	φ10.2



Model No.314-9414
Spiral Point Tap and Drill Set



Model No.314-9415
Spiral Fluted Tap and Drill Set

14 Pieces Set, Spiral Fluted Taps and Spiral Point Taps

HSS, DIN371/DIN376

Packed in metal case

Set includes one each:

- 7 pcs spiral fluted taps
- 7 pcs spiral point taps

Model No.314-9416



Size of Taps
M3
M4
M5
M6
M8
M10
M12

18 Pieces Tap and Drill Set

Packed in metal case

Set includes one each:

- 9 pcs taps
- 9 pcs drills

Model No.314-9417

Size of Taps	Size of drills
M2.5	φ2.05
M3	φ2.5
M3.5	φ2.9
M4	φ3.3
M5	φ4.2
M6	φ5
M8	φ6.7
M10	φ8.5
M12	φ10.2

Model No.314-9418

Size of Taps	Size of drills
6-32UNC	27/64
8-32UNC	U
10-24UNC	5/16
10-32UNC	F
1/4-20UNC	7
5/16-18UNC	21
3/8-16UNC	25
7/16-14UNC	29
1/2-13UNC	36

Model No.314-9419

Size of Taps	Size of drills
6-40UNF	29/64
8-36UNF	25/64
10-24UNC	Q
10-32UNF	T
1/4-28UNF	3
5/16-24UNF	21
3/8-24UNF	25
7/16-20UNF	29
1/2-20UNF	36

18 Pieces Set HSS, ISO standard

Packed in metal case

Set includes one each:

- 12 pcs taper, plug, bottoming taper tap
- 4 pcs round dies
- 1 pc dies stock
- 1 pc tap wrench

Size of Taps	Size of drills
M12X1.5	M14
M12X1.25	M16
M13X1.5	M18
M14X1.5	M20

Model No.314-9318





TAP AND DIE SETS

20 Pieces Metric Set Packed in plastic case

Set includes one each:

- 9 pcs round dies
- 9 pcs taps
- 1 pc dies stock
- 1 pc tap wrench

Description	Model No.
HSS Ground Thread	314-9420
Alloy Tool Steel	314-9720



Size of Die & Taps
M3
M4
M5
M6
M7
M8
M9
M10
M12

21 Pieces Metric Set, DIN352 Packed in metal case

Set includes one each: taps

Remark: DIN 352 V= Coarse Tap, M= Middle Tap, F= Fine Tap.

Descriptions	Metal Box
H.S.S(Ground Thread)	Model No.314-9521

Size	Size	Size
M3(V)	M3(M)	M3(F)
M4(V)	M4(M)	M4(F)
M5(V)	M5(M)	M5(F)
M6(V)	M6(M)	M6(F)
M8(V)	M8(M)	M8(F)
M10(V)	M10(M)	M10(F)
M12(V)	M12(M)	M12(F)



22 Pieces Metric Set, DIN352 Packed in metal case

Set includes one each:

- 21 pc taps, DIN352
- 1 pc adjustable handle tap wrench

Size of Taps	Thread size & pitch		
M3	M3(V)	M3(M)	M3(F)
M4	M4(V)	M4(M)	M4(F)
M5	M5(V)	M5(M)	M5(F)
M6	M6(V)	M6(M)	M6(F)
M8	M8(V)	M8(M)	M8(F)
M10	M10(V)	M10(M)	M10(F)
M12	M12(V)	M12(M)	M12(F)

* V=Coarse Tap, M=Middle Tap F=Fine Tap



Model No.314-9525

24 Pieces Set

Packed in metal case

Set includes one each:

- 11 pcs round dies
- 11 pcs taps
- 1 pc dies stock
- 1 pc tap wrench

Metric Set	
Description	Model No.
HSS Ground Thread	314-9424
Alloy Tool Steel	314-9724

Size of Dies & Taps	
M5x0.8	M10x1.5
M5x0.9	M10x1.25
M6x1	M12x1.5
M6x0.75	M12x1.75
M8x1	NPT1/8-27
M8x1.25	

ANSI Set	
Description	Model No.
HSS Ground Thread	314-9424
Alloy Tool Steel	314-9724

Size of Dies & Taps	
1/4-20UNC	7/16-14UNC
1/4-28UNF	7/16-20UNF
5/16-18UNC	1/2-13UNC
5/16-24UNF	1/2-20UNF
3/8-16UNC	1/8-27NPT
3/8-24UNF	



28 Pieces Metric Set

Packed in metal case

Description	Model No.
HSS Ground Thread	314-9428
Alloy Tool Steel	314-9478

Set includes one each:

- 8 pcs adjustable round dies
- 8 pcs taper taps
- 8 pcs plug taps(bottoming)
- 1 pc dies stock
- 1 pc tap wrench
- 1 pc T-type wrench
- 1 pc screw pitch gauge

Size of Dies & Taps
M3x0.5
M3.5x0.6
M4x0.7
M5x0.8
M6x1.0
M8x1.25
M10x1.5
M12x1.75



28 Pieces Metric Set, DIN352/DIN338

Packed in metal case

Set includes one each:

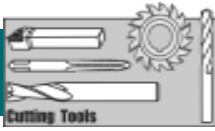
- 21 pcs taps, DIN352
- 7 pcs drills, DIN338



Model No.314-9528

Size of Taps	Thread size & pitch			Sizes of Drills
M3	M3(V)	M3(M)	M3(F)	ø2.5
M4	M4(V)	M4(M)	M4(F)	ø3.3
M5	M5(V)	M5(M)	M5(F)	ø4.2
M6	M6(V)	M6(M)	M6(F)	ø5
M8	M8(V)	M8(M)	M8(F)	ø6.8
M10	M10(V)	M10(M)	M10(F)	ø8.5
M12	M12(V)	M12(M)	M12(F)	ø10.2

* V=Coarse Tap, M=Middle Tap F=Fine Tap



Cutting Tools

TAP AND DIE SETS

29 Pieces Metric Set, DIN Standard

Packed in metal case

Set includes one each:

- 1 pc adjustable handle tap wrench
- 21 pcs taps
- 7 pcs drills

Descriptions	Metal Box
H.S.S Ground Thread	Model No.314-9529

Size of Drills	Thread size & pitch			Size of Drills
M3	M3(V)	M3(M)	M3(F)	ø2.5
M4	M4(V)	M4(M)	M4(F)	ø3.3
M5	M5(V)	M5(M)	M5(F)	ø4.2
M6	M6(V)	M6(M)	M6(F)	ø5
M8	M8(V)	M8(M)	M8(F)	ø6.8
M10	M10(V)	M10(M)	M10(F)	ø8.5
M12	M12(V)	M12(M)	M12(F)	ø10.2

* V=Coarse Tap, M=Middle Tap F=Fine Tap



31 Pieces Mini Metric Set

Packed in plastic case

Set includes one each:

- Each 2 pcs taps M1,M1.1,M1.2,M1.4,M1.6, M1.8,M2,M2.2,M2.5
- Each 1 pc dies,sizes same as above
- 1 pc dies stock
- 1 pc dies lining
- 2 pcs tap lining

Model No.314-9730



31 Pieces Metric Set,HSS DIN Standard

Packed in plastic case

Set includes one each:

- 7 pcs round dies
- 21 pc taps,DIN352
- 1 pc dies stock
- 1 pc tap wrench
- 1 pc screw driver

Size of Taps	Thread size & pitch		
M3	M3(V)	M3(M)	M3(F)
M4	M4(V)	M4(M)	M4(F)
M5	M5(V)	M5(M)	M5(F)
M6	M6(V)	M6(M)	M6(F)
M8	M8(V)	M8(M)	M8(F)
M10	M10(V)	M10(M)	M10(F)
M12	M12(V)	M12(M)	M12(F)

* V=Coarse Tap, M=Middle Tap F=Fine Tap



Model No.314-9431

32Piece Metric Set,DIN Standard

Packed in metal case

Set includes one each:

- 21 pcs taps
- 7 pcs round dies
- 1 pc dies stock
- 1 pc tap wrench
- 1 pc screw pitch gauge
- 1 pc screw driver

Descriptions	In Plastic Case	In Metal Case
H.S.S Ground Thread	Model No.314-9532	Model No.314-9533
Alloy Tool Steel	Model No.314-9632	Model No. 314-9633

Size of taps & Dies	Thread size & pitch		
M3	M3(V)	M3(M)	M3(F)
M4	M4(V)	M4(M)	M4(F)
M5	M5(V)	M5(M)	M5(F)
M6	M6(V)	M6(M)	M6(F)
M8	M8(V)	M8(M)	M8(F)
M10	M10(V)	M10(M)	M10(F)
M12	M12(V)	M12(M)	M12(F)

* V=Coarse Tap, M=Middle Tap F=Fine Tap



In Plastic Case

In Metal Case

33 Pieces Set

Packed in metal case

Descriptions	Model No.
HSS Ground Thread	314-9433
Alloy Tool Steel	314-9733

Set includes one each:

- 14 pcs round dies
- 14 pc taps
- 1 pc dies stock
- 1 pc tap wrench
- 1 pc screw pitch gauge
- 1 pc screw driver
- 1 pc T-type wrench

Size of Dies & Taps	
M3	1/4-28UNF
M4	5/16-24UNF
M5	3/8-24UNF
M6	7/16-20UNF
M8	1/2-20UNF
M10	1/8-27NPT
m12	1/4-18NPT



33 Pieces Metric Set,HSS DIN Standard

Packed in plastic case

Set includes one each:

- 7 pcs round dies
- 21 pcs taps,DIN352
- 1 pc dies stock
- 1 pc tap wrench
- 1 pc screw driver
- 1 pc screw pitch gauge
- 1 pc ratchet wheel wrench

Size of Taps	Thread size & pitch		
M3	M3(V)	M3(M)	M3(F)
M4	M4(V)	M4(M)	M4(F)
M5	M5(V)	M5(M)	M5(F)
M6	M6(V)	M6(M)	M6(F)
M8	M8(V)	M8(M)	M8(F)
M10	M10(V)	M10(M)	M10(F)
M12	M12(V)	M12(M)	M12(F)

* V=Coarse Tap, M=Middle Tap F=Fine Tap



39 Pieces Set

Packed in metal or plastic case

Set includes one each:

- 17 pcs round dies
- 17 pcs taps
- 1 pc dies stock
- 1 pc tap wrench
- 1 pc screw driver
- 1 pc T-type wrench
- 1 pc screw pitch gauge

Descriptions	In metal case	In plastic case
	Model No.	Model No.
HSS Ground Thread	314-9440	314-9542
Alloy Tool Steel	314-9740	314-9642

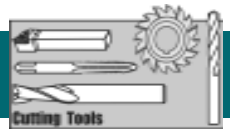
In metal case

In plastic case

Size of Dies & Taps	
M3x0.5	M7x0.75
M3x0.6	M8x1
M4x0.7	M8x1.25
M4x0.75	M10x1.5
M5x0.8	M10x1.25
M5x0.9	M12x1.5
M6x1	M12x1.75
M6x0.75	NPT1/8-27
M7x1	



Cutting Tools



40 Pieces Metric Set

Packed in plastic case

Set includes one each:

- 17 pcs taps
- 17 pcs round dies
- 1 pc dies stock
- 1 pc tap wrench
- 1 pc screw driver
- 2 pcs T-type wrench
- 1 pc screw pitch gauge

TAP AND DIE SETS

Size of Dies & Taps	
M3x0.5	M7x0.75
M3x0.6	M8x1
M4x0.7	M8x1.25
M4x0.75	M10x1.5
M5x0.8	M10x1.25
M5x0.9	M12x1.5
M6x1	M12x1.75
M6x0.75	NPT1/8-27
M7x1	



Descriptions	Model No.
HSS Ground Thread	314-9549
Alloy Tool Steel	314-9649

44 Pieces Metric Set, HSS DIN Standard

Packed in plastic case

Set includes one each:

- 7pcs DIN338 twist drills: 2.5, 3.3, 4.2, 5.0, 6.8, 8.5, 10.2mm
- 21pcs DIN352 hand taps: M3x0.5, M4x0.7, M5x0.8, M6x1.0, M8x1.25, M10x1.5, M12x1.75 each 3 pcs
- 7pcs DIN223 round dies: M3, M4, M5, M6, M8, M10, M12
- 5pcs DIN225 die stocks: 20x5mm, 20x7mm, 25x9mm, 30x11mm, 38x14mm
- 2pcs DIN1814 tap wrenches: No.1, No.2
- 1pc screw pitch gage and 1pc screw driver



Model No.314-9550

44 Pieces Metric Set, HSS DIN Standard

Packed in variety of metal case



Model No.314-9553



Model No.314-9554



Model No.314-9555

Set includes one each:

- 21 pcs taps, DIN352
- 7 pcs round dies
- 7 pcs drills
- 5 pcs dies stock
- 2 pcs tap wrench
- 1 pc screw driver
- 1 pc screw pitch gauge

Size of Taps & Dies	Thread size & pitch			Size of drills
M3	M3(V)	M3(M)	M3(F)	φ2.5
M4	M4(V)	M4(M)	M4(F)	φ3.3
M5	M5(V)	M5(M)	M5(F)	φ4.2
M6	M6(V)	M6(M)	M6(F)	φ5
M8	M8(V)	M8(M)	M8(F)	φ6.8
M10	M10(V)	M10(M)	M10(F)	φ8.5
M12	M12(V)	M12(M)	M12(F)	φ10.2

* V=Coarse Tap, M=Middle Tap F=Fine Tap

45 Pieces Set

Packed in metal or plastic box

Set includes one each:

- 21 pcs round dies
- 20 pcs taps
- 1 pc dies stock
- 1 pc tap wrench
- 1 pc screw driver
- 1 pc T-type wrench
- 1 pc lining



Metric

Inch

Size of Taps & Dies	
M6x1	M16x2
M6x0.75	M16x1.5
M8x1.25	M18x2.5
M8x1	M18x1.5
M10x1.5	M20x2.5
M10x1.25	M20x1.5
M12x1.75	M22x2.5
M12x1.5	M22x1.5
M14x2	M24x3
M14x1.5	M24x1.5

Size of Taps & Dies	
1/4-20NC	1/4-18NF
5/16-18NC	5/16-24NF
3/8-16NC	3/8-24NF
7/16-14NC	7/16-20NF
1/2-13NC	1/2-20NF
9/16-12NC	9/16-18NF
5/8-11NC	5/8-18NF
3/4-10NC	3/4-16NF
7/8-9NC	7/8-14NF
1-8NC	1-14NS

Description	Metric		Inch	
	In plastic case	In metal case	In plastic case	In metal case
H.S.S.Ground Thread	314-9547	314-9548	314-9545	314-9561
Alloy Tool Steel	314-9647	314-9648	314-9660	314-9661

54 Pieces Metric Set, HSS DIN Standard

Packed in metal case

Set includes one each:

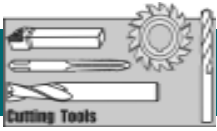
- 11 pcs round dies
- 33 pcs taps
- 6 pcs dies stock
- 2 pcs tap wrench
- 1 pc screw driver
- 1 pc screw pitch gauge



Model No.314-9454

Size of Taps	Thread size & pitch		
M3	M3(V)	M3(M)	M3(M)
M4	M4(V)	M4(M)	M4(M)
M5	M5(V)	M5(M)	M5(M)
M6	M6(V)	M6(M)	M6(M)
M8	M8(V)	M8(M)	M8(M)
M10	M10(V)	M10(M)	M10(M)
M12	M12(V)	M12(M)	M12(M)
M14	M14(V)	M14(M)	M14(M)
M16	M16(V)	M16(M)	M16(M)
M18	M18(V)	M18(M)	M18(M)
M20	M20(V)	M20(M)	M20(M)

* V=Coarse Tap, M=Middle Tap F=Fine Tap



Cutting Tools

TAP AND DIE SETS

56 Pieces Metric Set, HSS DIN Standard

Packed in metal case

Set includes one each:

- 11 pcs round dies
- 33 pcs taps
- 6 pcs dies stock
- 2 pcs tap wrench
- 2 pcs ratchet wheel wrench
- 1 pc screw driver
- 1 pc screw pitch gauge



Model No.314-9456

Size of Taps	Thread size & pitch		
M3	M3(V)	M3(M)	M3(M)
M4	M4(V)	M4(M)	M4(M)
M5	M5(V)	M5(M)	M5(M)
M6	M6(V)	M6(M)	M6(M)
M8	M8(V)	M8(M)	M8(M)
M10	M10(V)	M10(M)	M10(M)
M12	M12(V)	M12(M)	M12(M)
M14	M14(V)	M14(M)	M14(M)
M16	M16(V)	M16(M)	M16(M)
M18	M18(V)	M18(M)	M18(M)
M20	M20(V)	M20(M)	M20(M)

* V=Coarse Tap, M=Middle Tap F=Fine Tap

Set includes one each:

- 18 pcs round dies
- 17 pcs taper taps
- 17 pcs plug taps (bottoming)
- 1 pc 1/8 BSP tap
- 1 pc dies stock
- 1 pc tap wrench
- 1 pc screw driver
- 1 pc T-type wrench
- 1 pc screw pitch gauge

58 Pieces Set

Packed in metal case



Description	Model No.
HSS Ground Thread	314-9458
Alloy Tool Steel	314-9758

Size of Dies & Taps	
M2x0.25	M6x1
M3x0.5	M6x0.75
M3x0.35	M8x1.25
M3.5x0.6	M8x1.25
M4x0.7	M10x1.5
M4x0.5	M10x1.25
M4.5x0.75	M12x1.75
M5x0.8	M12x1.25
M5x0.5	1/8BSP

60 Pieces Metric and Inch Set

Packed in metal or plastic case

Set includes one each:

- 27 pcs taps
- 27 pcs round dies
- 1pc dies stock
- 1 pc tap wrench
- 1 pc screw driver
- 1 pc T-type wrench
- 2 pcs screw pitch gauge



Descriptions	In Plastic Box	In Metal Box
H.S.S.(Ground Thread)	Model No.314-9560	Model No.314-9561
Carbon Steel	Model No.314-9660	Model No.314-9666

Size of Inch	Size of Inch	Size
1/4-20NC	1/4-18NF	M3x.5
5/16-18NC	5/16-24NF	M4x.7
3/8-16NC	3/8-24NF	M5x.8
7/16-14NC	7/16-20NF	M6x1.0
1/2-13NC	1/2-20NF	M7x1.0
4-40NC	10-32NF	M8x1.25
6-32NC	1/8-27 NPT	M9x1.25
8-32NC		M10x1.5
10-24NC		M10x1.0
12-24NC		M12x1.75

110 Pieces Metric Set

Packed in wooden case

Set includes one each:

- 35 pcs round dies
- 70 pcs taps
- 2 pcs dies stock
- 2 pcs tap wrench
- 1 pc T-type wrench



Description	Model No.
HSS Ground Thread	314-9590
Alloy Tool Steel	314-9690

Size of Taps & Dies			
M2x0.4	M8x1	M11x0.75	M14x1
M3x0.5	M8x1.25	M11x1	M14x1.25
M4x0.7	M9x0.75	M11x1.25	M14x1.5
M5x0.8	M9x1	M11x1.5	M14x2
M6x0.75	M9x1.25	M12x0.75	M16x1
M6x1	M10x0.75	M12x1	M16x1.5
M7x0.75	M10x1	M12x1.25	M16x2
M7x1	M10x1.25	M12x1.5	M18x1.5
M8x0.75	M10x1.5	M12x1.75	

110 Pieces Metric Set

Packed in wooden case

Set includes one each:

- 35 pcs round dies
- 35 pcs taper taps
- 35 pcs bottom taps
- 2 pcs dies stock
- 2 pcs tap wrench
- 1 pc T-type wrench



Description	Model No.
HSS Ground Thread	314-9596
Alloy Tool Steel	314-9696

Size of Taps & Dies		
4-40UNC	7/16-14UNC	1/8-27NPT
6-32UNC	7/16-20UNF	1/4-18NPT
8-32UNC	1/2-13UNC	
10-24UNC	1/2-20UNF	M6x1
10-32UNF	9/16-12UNC	M8x1.25
12-24UNC	9/16-18UNF	M10x1.5
1/4-20UNC	5/8-11UNC	M10x1.5
1/4-28UNF	5/8-18UNF	M11x1.5
5/16-18UNC	3/4-10UNC	M12x1.5
5/16-24UNF	3/4-16UNF	M12x1.75
3/8-16UNC	1/4-24NS	M14x1.25
3/8-24UNF	1/4-32NS	M18x1.5



KEYWAY BROACHES WITH SHIMS

HSS



Broach Size	Type	Broach Dimensions	Shims Required	Length of Cut Min.	Length of Cut Max.	Tolerances	Model No.
1/16	A	1/8x5	0	13/64	1-1/8	0.0625-0.0635	395-1004
3/32	A	1/8x5	0	13/64	1-1/8	0.0938-0.0948	395-1006
1/8	A	1/8x5	1	13/64	1-1/8	0.1252-0.1262	395-1008
3/32	B	3/16x6-3/4	0	19/64	1-11/16	0.0937-0.0947	395-1106
1/8	B	3/16x6-3/4	1	19/64	1-11/16	0.1252-0.1262	395-1108
5/32	B	3/16x6-3/4	1	19/64	1-11/16	0.1564-0.1574	395-1110
3/16	B	3/16x6-3/4	1	19/64	1-11/16	0.1877-0.1887	395-1112
3/16	C	3/8x11-3/4	1	25/64	2-1/2	0.1877-0.1887	395-1212
1/4	C	3/8x11-3/4	1	25/64	2-1/2	0.2502-0.2512	395-1216
5/16	C	3/8x11-3/4	2	25/64	2-1/2	0.3127-0.3137	395-1220
3/8	C	3/8x11-3/4	2	25/64	2-1/2	0.3755-0.3765	395-1224
5/16	D	9/16x13-7/8	2	1	6	0.3127-0.3137	395-1324
3/8	D	9/16x13-7/8	2	1	6	0.3755-0.3765	395-1328
7/16	D	9/16x13-7/8	3	1	6	0.4380-0.4390	395-1332
1/2	D	9/16x13-7/8	3	1	6	0.5006-0.5016	395-1336
5/8	E	3/4x15-1/2	4	1	6	0.6260-0.6270	395-1440
3/4	E	3/4x15-1/2	5	1	6	0.7515-0.7525	395-1448
7/8	F	1x20-14	6	1	6	0.8765-0.8775	395-1556
1	F	1x20-14	7	1	6	1.0015-1.0025	395-1564
1-1/8		1-1/8x20-1/4	8	1	6	1.1265-1.1275	395-1570
1-1/4		1-1/4x20-1/4	9	1-1/2	8	1.2520-1.2530	395-1572
1-3/8		1-3/8x20-1/4	10	1-1/2	8	1.3770-1.3780	395-1574
1-1/2		1-1/2x20-1/4	11	1-1/2	8	1.5020-1.5030	395-1576

METRIC KEYWAY BROACHES

ISO, HSS

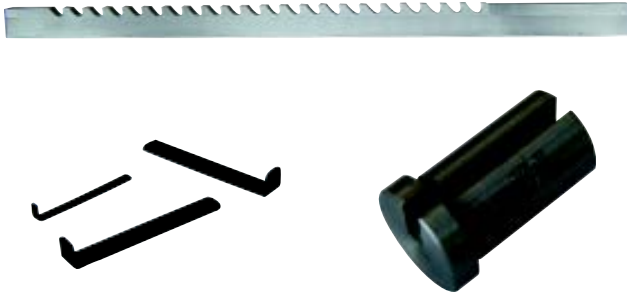


Size	S.Keys	Piece of Shim	Dimension	Tooth Pitch	Teeth	Length of Cut Min.	Length of cut Max.	Tolerance	Model No.
2-A mm	2x2mm		1/8x5"	3/16"	18	13/64"	1-1/8"	0.0782-0.0791	395-2006
3-A mm	3x3mm	1	1/8x5"	3/16"	18	13/64"	1-1/8"	0.1176-0.1185	395-2008
4-B-1 mm	4x4mm	1	1/4x6-3/4"	9/32"	16	19/64"	1-11/16"	0.1569-0.1579	395-2110
5-B-1 mm	5x5mm	1	1/4x6-3/4"	9/32"	16	19/64"	1-11/16"	0.1963-0.1972	395-2112
5-C mm	5x5mm	1	3/8x11-3/4"	3/8"	22	25/64"	2-1/2"	0.1963-0.1972	395-2212
6-C-1 mm	6x6mm	1	3/8x11-3/4"	3/8"	22	25/64"	2-1/2"	0.2356-0.2366	395-2216
8-C-1 mm	8x7mm	2	3/8x11-3/4"	3/8"	22	25/64"	2-1/2"	0.3143-0.3155	395-2220
10-D-1 mm	10x8mm	2	9/16x13-7/8"	5/8"	17	1"	6"	0.3930-0.3942	395-2224
12-D-1 mm	12x8mm	2	9/16x13-7/8"	5/8"	17	1"	6"	0.4716-0.4730	395-2324
14-D-1 mm	14x9mm	2	9/16x13-7/8"	5/8"	17	1"	6"	0.5503-0.5517	395-2328
16-E-1 mm	16x10mm	3	3/4x15-1/2"	5/8"	20	1"	6"	0.6290-0.6304	395-2332
18-E-1 mm	18x11mm	3	3/4x15-1/2"	5/8"	20	1"	6"	0.7078-0.7092	395-2336
20-F-1 mm	20x12mm	3	1x20-1/4"	5/8"	26	1"	6"	0.7864-0.7880	395-2440
22-F-1 mm	22x14mm	4	1x20-1/4"	5/8"	26	1"	6"	0.8651-0.8667	395-2448
24-F mm	24x14mm	5	1x20-1/4"	5/8"	26	1"	6"	0.9439-0.9455	395-2556
25-F-1 mm	25x14mm	4	1x20-1/4"	5/8"	26	1"	6"	0.9832-0.9848	395-2564



Cutting Tools

INCH KEYWAY BROACH SETS



Pieces	No. Of Broachs	No. Of Shim	No. Of Bushings	Keyway Combinations	Model No.
9	3 Broachs: 1/16-A, 3/32-A, 1/8-A	1	5 Bushings: 1/4, 5/16, 3/8, 7/16, 1/2"	15	395-0109
17	2 Broachs: 5/8, 3/4"	9	6 Bushings: 2-5/16, 2-7/16, 2-9/16, 2-11/16, 2-13/16, 2-15/16"	12	395-0217
17	2 Broachs: 5/8-E, 3/4-E	9	6 Bushings: 2-3/8, 2-1/2, 2-5/8, 2-3/4, 2-7/8, 3"	12	395-0218
22	4 Broachs: 5/16-D, 3/8-D, 7/16-D, 1/2-D	10	8 Bushings: 1-7/16, 1-9/16, 1-11/16, 1-13/16, 1-15/16, 2-3/16, 2-7/16, 2-15/16	32	395-0322
22	4 Broachs: 5/16-D, 3/8-D, 7/16-D, 1/2-D	10	8 Bushings: 1-1/2, 1-5/8, 1-3/4, 1-7/8, 2, 2-1/8, 2-1/4, 2-1/2"	32	395-0323
32	3 Broachs: 1/2-D, 5/8-E, 3/4-E	12	17 Bushings: 2, 2-1/16, 2-1/8, 2-3/16, 2-1/4, 2-5/16, 2-3/8, 2-7/16, 2-1/2, 2-9/16, 2-5/8, 2-11/16, 2-3/4, 2-13/16, 2-7/8, 2-15/16, 3	26	395-0432
75	8 Broachs: 1/8, 3/16"(B), 1/4, 5/16"(C), 3/8, 7/16, 1/2"(D), 5/8, (E) 3/4"	22	44 Bushings: 1/2, 9/16, 5/8, 11/16, 3/4, 13/16, 7/8, 15/16, 1, 1-1/16, 1-1/8, 1-3/16, 1-1/4, 1-5/16, 1-3/8, 1-7/16, 1-1/2, 1-9/16, 1-7/16, 1-1/2, 1-9/16, 1-5/8, 1-11/16, 1-3/4, 1-13/16, 1-7/8, 1-15/16, 2", 2-1/16, 2-1/8, 2-3/16, 2-1/4, 2-5/16, 2-3/8, 2-7/16, 2-1/2, 2-9/16, 2-5/8, 2-11/16, 2-3/4, 2-13/16, 2-7/8, 2-15/16, 3"	102	395-0575
18	4 Broachs: 1/8-B, 3/16-B, 1/4-C, 3/8-C	5	9 Bushings: 1/2, 5/8, 3/4, 7/8, 1, 1-1/8, 1-1/4, 1-3/8, 1-1/2"	18	395-0718
18	4 Broachs: 1/8-B, 3/16-B, 1/4-C, 3/8-C	5	9 Bushings: 9/16, 11/16, 13/16, 15/16, 1-1/16, 1-3/16, 1-5/16, 1-7/16, 1-9/16	18	395-0719
27	4 Broachs: 1/8-B, 3/16-B, 1/4-C, 3/8-C	5	18 Bushings: 1/2, 9/16, 5/8, 11/16, 3/4, 13/16, 7/8, 15/16, 1, 1-1/16, 1-1/8, 1-3/16, 1-1/4, 1-5/16, 1-3/8, 1-7/16, 1-1/2, 1-9/16	36	395-0727
30	5 Broachs: 1/8", 3/16"(B), 1/4", 5/16", 3/8"(C)	7	18 Bushings: 1/2, 9/16, 5/8, 11/16, 3/4, 13/16, 7/8, 15/16, 1, 1-1/16, 1-1/8, 1-3/16, 1-1/4, 1-5/16, 1-3/8, 1-7/16, 1-1/2, 1-9/16	47	395-0730

METRIC KEYWAY BROACH SETS

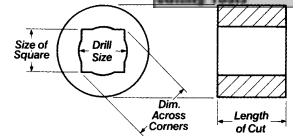
Piece	No. Of Broaches	No. Of Shim	No. Of Bushings	Keyway Combinations	Model No.
6	2 Broachs: 2mm, 3mm (A)	1	3 Bushings: 6, 8, 10mm	6	395-0806
16	2 Broachs 16mm, 18mm (E-1)	6	8 Bushings: 52, 54, 55, 56, 58, 60, 62, 65mm	16	395-0816
21	3 Broachs 10mm, 12mm, 14mm (D-1)	6	12 Bushings: 32, 34, 35, 36, 38, 40, 42, 44, 45, 46, 48, 50mm	36	395-0821
22	4 Broachs 4mm, 5mm (B-1), 6mm, 8mm (C-1)	5	13 Bushings: 12, 14, 15, 16, 18, 19, 20, 22, 24, 25, 26, 28, 30mm	26	395-0822

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Cutting Tools

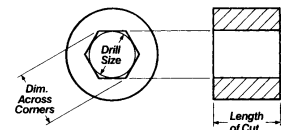


SQUARE PUSH BROACHES



Broach Size	Broach Length	Pilot Dia.	Drill size	Length of Cut		Tolerance	Model No.
				Min.	Max.		
1/8"	4-1/8	0.1285	#30	3/16	1/2	0.1250-0.1260	395-4002
3/16"	5-9/16	0.1935	#10	1/4	5/8	0.1880-0.1890	395-4006
7/32"	6-3/8	0.2280	#1	1/4	3/4	0.2190-0.2200	395-4010
1/4"	6-1/2	17/64	17/64	1/4	3/4	0.2505-0.2515	395-4014
5/16"	7-7/8	21/64	21/64	5/16	1	0.3130-0.3140	395-4018
3/8"	9-3/8	25/64	25/64	3/8	1-1/4	0.3755-0.3765	395-4022
1/2"	12	17/32	17/32	1/2	1-3/8	0.5005-0.5015	395-4026
5/8"	16-5/16	21/32	21/32	5/8	1-5/8	0.6260-0.6270	395-4030
11/16"	17-3/4	3/4	3/4	5/8	1-5/8	0.6885-0.6895	395-4034
3/4"	17-3/4	13/16	13/16	5/8	1-5/8	0.7510-0.7520	395-4038

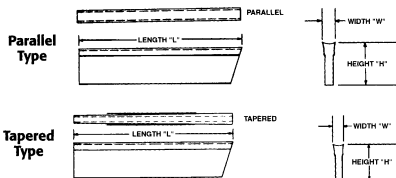
HEXAGON PUSH BROACHES



Broach Size	Broach Length	Pilot Dia.	Drill size	Length of Cut		Tolerance	Model No.
				Min.	Max.		
3/16"	5-1/16	3/16	3/16	1/4	5/8	0.1880-0.1890	395-6002
1/4"	6	1/4	1/4	1/4	3/4	0.2505-0.2515	395-6006
5/16"	7-3/4	5/16	5/16	3/8	1	0.3130-0.3140	395-6010
3/8"	8-1/2	3/8	3/8	3/8	1-1/4	0.3755-0.3765	395-6014
7/16"	10-5/8	7/16	7/16	1/2	1-3/8	0.4385-0.4395	395-6018
1/2"	11-7/8	1/2	1/2	1/2	1-3/8	0.5005-0.5015	395-6022
5/8"	16-1/4	5/8	5/8	5/8	2	0.6260-0.6270	395-6026
11/16"	16-3/4	11/16	11/16	5/8	2	0.6880-0.6890	395-6030
7/8"	18-1/2	7/8	7/8	5/8	2	0.8765-0.8775	395-6034
1"	19-3/4	1	1	5/8	2	1.002-1.003	395-6038

T - TYPE CUT-OFF BLADES

H.S.S



Parallel Type

Tapered Type

Tool No.	W	H	L	Model No.
P1N	0.04"	1/2"	3-1/2"	363-6005
P1	1/16"	1/2"	4-1/2"	363-6010
P2N	5/64"	1/2"	4-1/2"	363-6015
P2	3/32"	1/2"	4-1/2"	363-6020
P3S	1/8"	1/2"	4-1/2"	363-6025
P3N	3/32"	11/16"	5"	363-6030
P3	1/8"	11/16"	5"	363-6035
P4	5/32"	11/16"	5"	363-6040
P5S	3/16"	11/16"	5"	363-6045
P3W	1/8"	3/4"	5"	363-6050
P4W	5/32"	3/4"	5"	363-6055
P5W	3/16"	3/4"	5"	363-6060
P5	1/8"	7/8"	6"	363-6065
P5N	5/32"	7/8"	6"	363-6070
P5	3/16"	7/8"	6"	363-6075
P6	1/4"	7/8"	6"	363-6080
P8	1/8"	1-1/8"	6-1/2"	363-6085
P8	5/32"	1-1/8"	6-1/2"	363-6090
P8	3/16"	1-1/8"	6-1/2"	363-6095
P9	1/4"	1-1/8"	6-1/2"	363-6100
P10	5/16"	1-1/8"	6-1/2"	363-6105

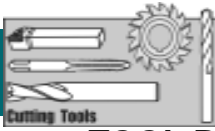
Tool No.	W	H	L	Model No.
T1-N	.040	1/2	3-1/2"	363-5005
T-1	1/16	1/2	4-1/4"	363-5010
T-2-N	5/64	1/2	4-1/4"	363-5015
T-2	3/32	1/2	4-1/4"	363-5020
T3-S	1/8"	1/2	4-1/4"	363-5025
T3-N	3/32	11/16	4-1/4"	363-5030
T3	1/8"	11/16	4-1/4"	363-5035
T4	5/32"	11/16	4-1/4"	363-5040
T5-S	3/16"	11/16	5"	363-5045
T3-W	1/8	3/4	5"	363-5050
T4-W	5/32	3/4	5"	363-5055
T5-W	3/16	3/4	5"	363-5060
T5-X	1/8	7/8	5"	363-5065
T5-N	5/32	7/8	5"	363-5070
T5	3/16"	7/8	5"	363-5075
T6	1/4"	7/8"	5"	363-5080
T8-X	1/8	1-1/8	5-1/2"	363-5085
T8-N	5/32	1-1/8	5-1/2"	363-5090
T8	3/16"	1-1/8	5-1/2"	363-5095
T9	1/4	1-1/8	5-1/2"	363-5100
T10	5/16	1-1/8	5-1/2"	363-5105

CUT-OFF BLADES

H.S.S



W	H	L	Model No.
1/16	11/16	5"	363-0001
3/32	1/2	4-1/2"	363-0002
3/32	5/8	5"	363-0003
1/8	3/4	5"	363-0004
1/8	7/8	6"	363-0005
3/16	1	6-1/2"	363-0006
3/16	1-1/8	7"	363-0007
1/4	1-1/8	7"	363-0008
1/4	1-1/4	7"	363-0009
1/4	1-3/8	7"	363-0010



Cutting Tools

TOOL BITS

High Speed Steel, Precision Ground



Rectangular

Inch Rectangular	Metric Rectangular
Size Model No.	Size Model No.
1/8x1/2x4"	361-0000
1/4x3/8x3"	361-0003
1/4x3/8x4"	361-0005
1/4x3/8x6"	361-0010
1/4x1/2x3"	361-0015
1/4x1/2x4"	361-0020
1/4x1/2x6"	361-0025
1/4x3/4x4"	361-0030
1/4x3/4x5"	361-0035
1/4x3/4x6"	361-0040
1/4x1x6"	361-0045
5/16x3/8x4"	361-0050
5/16x7/16x3"	361-0055
5/16x1/2x4"	361-0060
5/16x3/4x4"	361-0065
5/16x1x6"	361-0070
3/8x1/2x3"	361-0075
3/8x1/2x4"	361-0080
3/8x5/8x4"	361-0085
3/8x5/8x5"	361-0090
3/8x5/8x6"	361-0095
3/8x3/4x4"	361-0100
3/8x3/4x5"	361-0105
3/8x3/4x6"	361-0110
3/8x1x6"	361-0115
3/8x1-1/4x6-1/2"	361-0120
1/2x3/4x4"	361-0125
1/2x3/4x5"	361-0130
1/2x3/4x6"	361-0135
1/2x1x7"	361-0140
1/2x1-1/4x7"	361-0145
1/2x1-1/2x7"	361-0150
5/8x3/4x5"	361-0155
5/8x7/8x6"	361-0160
5/8x1x6"	361-0165
5/8x1-1/4x6"	361-0170
5/8x1-1/4x7"	361-0175
5/8x1-1/2x7"	361-0180
3/4x1x6"	361-0185
3/4x1x7"	361-0190
3/4x1-1/4x6"	361-0195
3/4x1-1/4x7"	361-0200
3/4x1-1/2x7"	361-0205
1x1-1/4x6"	361-0210
1x1-1/4x7"	
1x1-1/2x7"	

Square

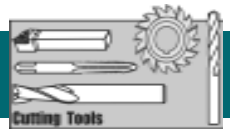
Inch Square	Metric Square
Size Model No.	Size Model No.
1/8x2-1/2"	360-0010
1/8x4"	360-0014
1/8x6"	360-0016
1/8x8"	360-0018
3/16x2"	360-0020
3/16x2-1/2"	360-0021
3/16x3"	360-0022
3/16x4"	360-0023
3/16x5"	360-0024
3/16x6"	360-0026
3/16x8"	360-0028
1/4x2-1/2"	360-0033
1/4x3"	360-0034
1/4x4"	360-0035
1/4x6"	360-0037
1/4x8"	360-0039
5/16x2-1/2"	360-0049
5/16x3"	360-0050
5/16x3-1/2"	360-0051
5/16x4"	360-0052
5/16x6"	360-0054
5/16x8"	360-0057
3/8x3"	360-0067
3/8x4"	360-0069
3/8x6"	360-0071
3/8x8"	360-0073
7/16x3-1/2"	360-0090
7/16x4"	360-0091
7/16x6"	360-0095
7/16x8"	360-0097
1/2x3"	360-0109
1/2x4"	360-0111
1/2x6"	360-0113
1/2x8"	360-0115
5/8x4"	360-0127
5/8x4-1/2"	360-0128
5/8x6"	360-0131
5/8x8"	360-0135
3/4x4"	360-0147
3/4x5"	360-0148
3/4x6"	360-0149
3/4x8"	360-0163
7/8x6"	360-0165
1x4"	360-0175
1x6"	360-0177
1x7"	360-0179
1x8"	360-0180
1-1/8x8"	360-0185
1-1/4x6"	360-0200
1-1/4x8"	360-0202
1-1/2x8"	360-0204
1-1/2x10"	360-0208
2x8"	360-0210

Round

Inch Round	Metric Round
Size Model No.	Size Model No.
1/8x2-1/2"	362-0030
1/8x2-3/4"	362-0031
1/8x4"	362-0034
1/8x6"	362-0036
1/8x8"	362-0038
5/32x2-1/2"	362-0040
3/16x2"	362-0050
3/16x2-1/2"	362-0051
3/16x3"	362-0052
3/16x3-1/2"	362-0053
3/16x4"	362-0054
3/16x6"	362-0056
3/16x8"	362-0058
7/32x3-1/2"	362-0064
1/4x2-1/2"	362-0074
1/4x3"	362-0075
1/4x4"	362-0077
1/4x6"	362-0078
1/4x8"	362-0079
9/32x4"	362-0090
5/16x2-1/2"	362-0100
5/16x3"	362-0101
5/16x4"	362-0102
5/16x4-1/2"	362-0103
5/16x6"	362-0104
5/16x8"	362-0107
3/8x3"	362-0117
3/8x4"	362-0119
3/8x5"	362-0121
3/8x6"	362-0123
3/8x8"	362-0124
7/16x4"	362-0133
7/16x5-1/2"	362-0135
1/2x3"	362-0143
1/2x4"	362-0145
1/2x6"	362-0147
1/2x8"	362-0149
9/16x6"	362-0153
5/8x4"	362-0160
5/8x6"	362-0163
5/8x8"	362-0168
3/4x4"	362-0173
3/4x6"	362-0175
3/4x8"	362-0178
1x4"	362-0191
1x6"	362-0193
1x8"	362-0198
2x50mm	362-1030
2.5x50mm	362-1040
3x60mm	362-1050
3x100mm	362-1051
3x150mm	362-1052
3x200mm	362-1053
3.5x60mm	362-1055
4x80mm	362-1060
4x100mm	362-1065
4.5x80mm	362-1070
5x80mm	362-1080
5x100mm	362-1085
5x150mm	362-1086
5x200mm	362-1087
5.5x90mm	362-1095
6x80mm	362-1105
6x100mm	362-1107
6x150mm	362-1109
6x200mm	362-1111
6.5x100mm	362-1115
7x100mm	362-1120
7.5x100mm	362-1130
8x60mm	362-1140
8x100mm	362-1142
8x150mm	362-1144
8x200mm	362-1146
9x125mm	362-1152
10x100mm	362-1160
10x150mm	362-1162
10x200mm	362-1164
12x100mm	362-1170
12x150mm	362-1172
12x200mm	362-1174
14x150mm	362-1180
14x200mm	362-1182
16x100mm	362-1189
16x150mm	362-1190
16x200mm	362-1192
18x200mm	362-1202
20x100mm	362-1209
20x150mm	362-1210
20x200mm	362-1212
18x150mm	362-1219
25x100mm	362-1220
25x150mm	362-1221
25x200mm	362-1222

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Cutting Tools



COBALT HSS TOOL BITS

- Co5/M35 or Co8/M42
- High Precision Ground



Rectangular

Size(mm)	Co5/M35	Co8/M42
3x5x150	361-3011	361-5011
3x8x150	361-3012	361-5012
3x10x150	361-3013	361-5013
3x12x150	361-3014	361-5014
3x16x150	361-3015	361-5015
3x18x150	361-3016	361-5016
3x5x200	361-3021	361-5021
3x8x200	361-3022	361-5022
3x10x200	361-3023	361-5023
3x12x200	361-3024	361-5024
3x16x200	361-3025	361-5025
3x18x200	361-3026	361-5026
4x6x150	361-3031	361-5031
4x8x150	361-3032	361-5032
4x10x150	361-3033	361-5033
4x12x150	361-3034	361-5034
4x16x150	361-3035	361-5035
4x18x150	361-3036	361-5036
4x20x150	361-3037	361-5037
4x6x200	361-3041	361-5041
4x8x200	361-3042	361-5042
4x10x200	361-3043	361-5043
4x12x200	361-3044	361-5044
4x16x200	361-3045	361-5045
4x18x200	361-3046	361-5046
4x20x200	361-3047	361-5047
5x8x150	361-3051	361-5051
5x10x150	361-3052	361-5052
5x12x150	361-3053	361-5053
5x16x150	361-3054	361-5054
5x18x150	361-3055	361-5055
5x20x150	361-3056	361-5056
5x8x200	361-3061	361-5061
5x10x200	361-3062	361-5062
5x12x200	361-3063	361-5063
5x16x200	361-3064	361-5064
5x18x200	361-3065	361-5065
5x20x200	361-3066	361-5066
6x8x150	361-3071	361-5071
6x10x150	361-3072	361-5072
6x12x150	361-3073	361-5073
6x16x150	361-3074	361-5074
6x18x150	361-3075	361-5075
6x20x150	361-3076	361-5076
6x8x200	361-3081	361-5081
6x10x200	361-3082	361-5082
6x12x200	361-3083	361-5083
6x16x200	361-3084	361-5084
6x18x200	361-3085	361-5085
6x20x200	361-3086	361-5086
8x10x150	361-3091	361-5091
8x12x150	361-3092	361-5092
8x16x150	361-3093	361-5093
8x18x150	361-3094	361-5094
8x20x150	361-3095	361-5095
8x10x200	361-3101	361-5101
8x12x200	361-3102	361-5102
8x16x200	361-3103	361-5103
8x18x200	361-3104	361-5104
8x20x200	361-3105	361-5105
10x12x150	361-3111	361-5111
10x16x150	361-3112	361-5112
10x18x150	361-3113	361-5113
10x20x150	361-3114	361-5114
10x12x200	361-3121	361-5121
10x16x200	361-3122	361-5122
10x18x200	361-3123	361-5123
10x20x200	361-3124	361-5124
12x16x150	361-3131	361-5131
12x18x150	361-3132	361-5132
12x20x150	361-3133	361-5133
12x16x200	361-3141	361-5141
12x18x200	361-3142	361-5142
12x20x200	361-3143	361-5143
14x16x150	361-3151	361-5151
14x18x150	361-3152	361-5152
14x20x150	361-3153	361-5153
14x16x200	361-3161	361-5161
14x18x200	361-3162	361-5162
14x20x200	361-3163	361-5163
16x18x150	361-3171	361-5171
16x20x150	361-3172	361-5172
16x18x200	361-3181	361-5181
16x20x200	361-3182	361-5182
18x20x150	361-3191	361-5191
18x20x200	361-3201	361-5201

Square

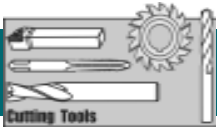
Size(mm)	Co5/M35	Co8/M42
3x100	360-3031	360-5031
3x150	360-3032	360-5032
3x200	360-3033	360-5033
4x100	360-3041	360-5041
4x150	360-3042	360-5042
4x200	360-3043	360-5043
5x100	360-3051	360-5051
5x150	360-3052	360-5052
5x200	360-3053	360-5053
6x100	360-3061	360-5061
6x150	360-3062	360-5062
6x200	360-3063	360-5063
7x100	360-3071	360-5071
7x150	360-3072	360-5072
7x200	360-3073	360-5073
8x100	360-3081	360-5081
8x150	360-3082	360-5082
8x200	360-3083	360-5083
10x100	360-3101	360-5101
10x150	360-3102	360-5102
10x200	360-3103	360-5103
12x100	360-3121	360-5121
12x150	360-3122	360-5122
12x200	360-3123	360-5123
14x100	360-3141	360-5141
14x150	360-3142	360-5142
14x200	360-3143	360-5143
16x100	360-3161	360-5161
16x150	360-3162	360-5162
16x200	360-3163	360-5163
18x100	360-3181	360-5181
18x150	360-3182	360-5182
18x200	360-3183	360-5183
20x100	360-3201	360-5201
20x150	360-3202	360-5202
20x200	360-3203	360-5203
22x100	360-3221	360-5221
22x150	360-3222	360-5222
22x200	360-3223	360-5223
25x100	360-3251	360-5251
25x150	360-3252	360-5252
25x200	360-3253	360-5253
28x100	360-3281	360-5281
28x150	360-3282	360-5282
28x200	360-3283	360-5283
30x100	360-3301	360-5301
30x150	360-3302	360-5302
30x200	360-3303	360-5303
32x100	360-3321	360-5321
32x150	360-3322	360-5322
32x200	360-3323	360-5323
50x100	360-3501	360-5501
50x150	360-3502	360-5502
50x200	360-3503	360-5503

Round

Size(mm)	Co5/M35	Co8/M42
0.5x100	362-3011	362-5011
0.5x150	362-3012	362-5012
0.5x200	362-3013	362-5013
1x100	362-3021	362-5021
1x150	362-3022	362-5022
1x200	362-3023	362-5023
1.5x100	362-3031	362-5031
1.5x150	362-3032	362-5032
1.5x200	362-3033	362-5033
2x100	362-3041	362-5041
2x150	362-3042	362-5042
2x200	362-3043	362-5043
2.5x100	362-3051	362-5051
2.5x150	362-3052	362-5052
2.5x200	362-3053	362-5053
3x100	362-3061	362-5061
3x150	362-3062	362-5062
3x200	362-3063	362-5063
3.5x100	362-3071	362-5071
3.5x150	362-3072	362-5072
3.5x200	362-3073	362-5073
4x100	362-3081	362-5081
4x150	362-3082	362-5082
4x200	362-3083	362-5083
4.5x100	362-3091	362-5091
4.5x150	362-3092	362-5092
4.5x200	362-3093	362-5093
5x100	362-3101	362-5101
5x150	362-3102	362-5102
5x200	362-3103	362-5103
5.5x100	362-3111	362-5111
5.5x150	362-3112	362-5112
5.5x200	362-3113	362-5113
6x100	362-3121	362-5121
6x150	362-3122	362-5122
6x200	362-3123	362-5123
6.5x100	362-3131	362-5131
6.5x150	362-3132	362-5132
6.5x200	362-3133	362-5133
7x100	362-3141	362-5141
7x150	362-3142	362-5142
7x200	362-3143	362-5143
7.5x100	362-3151	362-5151
7.5x150	362-3152	362-5152
7.5x200	362-3153	362-5153
8x100	362-3161	362-5161
8x150	362-3162	362-5162
8x200	362-3163	362-5163
8.5x100	362-3171	362-5171
8.5x150	362-3172	362-5172
8.5x200	362-3173	362-5173
9x100	362-3181	362-5181
9x150	362-3182	362-5182
9x200	362-3183	362-5183
9.5x100	362-3191	362-5191
9.5x150	362-3192	362-5192
9.5x200	362-3193	362-5193
10x100	362-3201	362-5201
10x150	362-3202	362-5202
10x200	362-3203	362-5203

Size(mm)	Co5/M35	Co8/M42
10.5x100	362-3211	362-5211
10.5x150	362-3212	362-5212
10.5x200	362-3213	362-5213
11x100	362-3221	362-5221
11x150	362-3222	362-5222
11x200	362-3223	362-5223
11.5x100	362-3231	362-5231
11.5x150	362-3232	362-5232
11.5x200	362-3233	362-5233
12x100	362-3241	362-5241
12x150	362-3242	362-5242
12x200	362-3243	362-5243
12.5x100	362-3251	362-5251
12.5x150	362-3252	362-5252
12.5x200	362-3253	362-5253
13x100	362-3261	362-5261
13x150	362-3262	362-5262
13x200	362-3263	362-5263
13.5x100	362-3271	362-5271
13.5x150	362-3272	362-5272
13.5x200	362-3273	362-5273
14x100	362-3281	362-5281
14x150	362-3282	362-5282
14x200	362-3283	362-5283
14.5x100	362-3291	362-5291
14.5x150	362-3292	362-5292
14.5x200	362-3293	362-5293
15x100	362-3301	362-5301
15x150	362-3302	362-5302
15x200	362-3303	362-5303
15.5x100	362-3311	362-5311
15.5x150	362-3312	362-5312
15.5x200	362-3313	362-5313
16x100	362-3321	362-5321
16x150	362-3322	362-5322
16x200	362-3323	362-5323
16.5x100	362-3331	362-5331
16.5x150	362-3332	362-5332
16.5x200	362-3333	362-5333
17x100	362-3341	362-5341
17x150	362-3342	362-5342
17x200	362-3343	362-5343
17.5x100	362-3351	362-5351
17.5x150	362-3352	362-5352
17.5x200	362-3353	362-5353
18x100	362-3361	362-5361
18x150	362-3362	362-5362
18x200	362-3363	362-5363
18.5x100	362-3371	362-5371
18.5x150	362-3372	362-5372
18.5x200	362-3373	362-5373
19x100	362-3381	362-5381
19x150	362-3382	362-5382
19x200	362-3383	362-5383
19.5x100	362-3391	362-5391
19.5x150	362-3392	362-5392
19.5x200	362-3393	362-5393
20x100	362-3401	362-5401
20x150	362-3402	362-5402
20x200	362-3403	362-5403

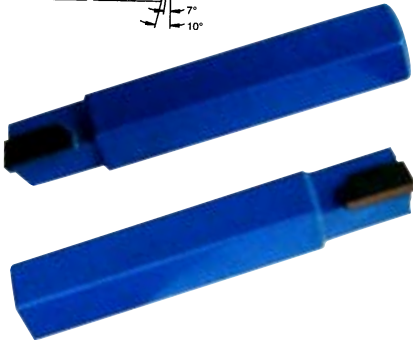
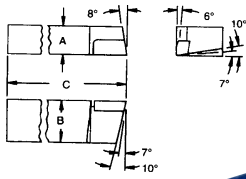
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Cutting Tools

CARBIDE TIPPED TOOL BITS

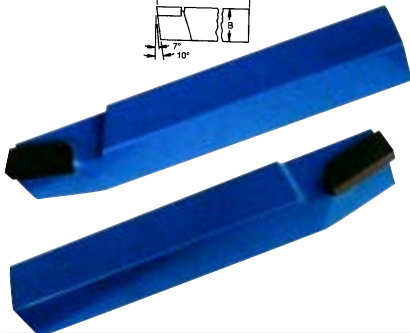
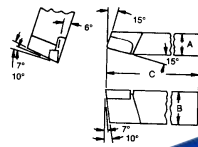
Grade C-2 for Cast Iron and Non-Ferrous Materials, Grade C-6 for Steel and Steel Alloys Premium Carbide



STYLE AR & AL

Straight Turning-for general machining applications such as turning, boring, facing and chamfering. Suitable for machining to a 90° shoulder.

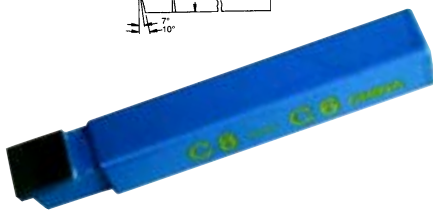
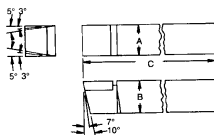
Square	Length	Right Hand		Left Hand			
		Industry Number	C-2 Model No.	C-6 Model No.	Industry number	C-2 Model No.	C-6 Model No.
1/4"	2"	AR-4	383-0012	383-0016	AL-4	383-0112	383-0116
5/16"	2-1/4"	AR-5	383-0022	383-0026	AL-5	383-0122	383-0126
3/8"	2-1/2"	AR-6	383-0032	383-0036	AL-6	383-0132	383-0136
7/16"	3"	AR-7	383-0042	383-0046	AL-7	383-0142	383-0146
1/2"	3-1/2"	AR-8	383-0052	383-0056	AL-8	383-0152	383-0156
5/8"	4"	AR-10	383-0062	383-0066	AL-10	383-0162	383-0166
3/4"	4-1/2"	AR-12	383-0072	383-0076	AL-12	383-0172	383-0176
1"	6"	AR-16	383-0082	383-0086	AL-16	383-0182	383-0186



STYLE BR & BL

Lead Angle turning - for general applications on turning, boring, and facing where a lead angle is either required or acceptable.

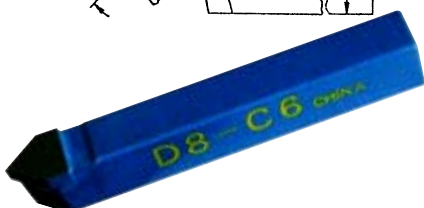
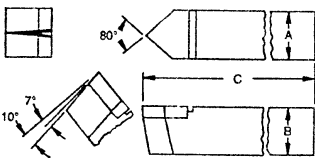
Square	Length	Right Hand		Left Hand			
		Industry number	C-2 Model No.	C-6 Model No.	Industry Number	C-2 Model No.	C-6 Model No.
1/4"	2"	BR-4	383-1012	383-1016	BL-4	383-1112	383-1116
5/16"	2-1/4"	BR-5	383-1022	383-1026	BL-5	383-1122	383-1126
3/8"	2-1/2"	BR-6	383-1032	383-1036	BL-6	383-1132	383-1136
7/16"	3"	BR-7	383-1042	383-1046	BL-7	383-1142	383-1146
1/2"	3-1/2"	BR-8	383-1052	383-1056	BL-8	383-1152	383-1156
5/8"	4"	BR-10	383-1062	383-1066	BL-10	383-1162	383-1166
3/4"	4-1/2"	BR-12	383-1072	383-1076	BL-12	383-1172	383-1176
1"	6"	BR-16	383-1082	383-1086	BL-16	383-1182	383-1186



STYLE C:

Broad nose - a general purpose tool of great utility for facing, chamfering, and turning. This tool is generally used for making special form tools.

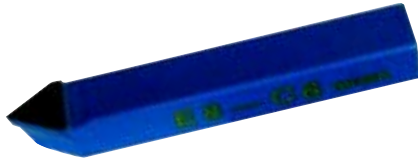
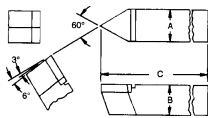
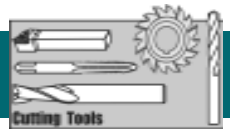
Square	Length	Industry No.	C-2	C-6
			Model No.	Model No.
1/4"	2"	C-4	383-2002	383-2006
5/16"	2-1/4"	C-5	383-2012	383-2016
3/8"	2-1/2"	C-6	383-2022	383-2026
7/16"	3"	C-7	383-2032	383-2036
1/2"	3-1/2"	C-8	383-2042	383-2046
5/8"	4"	C-10	383-2052	383-2056
3/4"	4-1/2"	C-12	383-2062	383-2066
1"	6"	C-16	383-2072	383-2076



STYLE D

80° Round nose - an 80° included angle round nose tool for turning, boring, facing, chamfering and other miscellaneous machining operations.

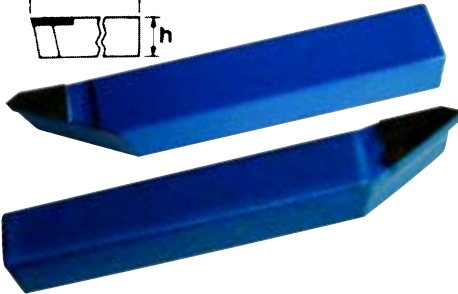
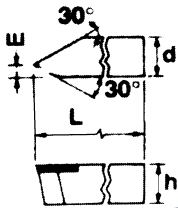
Square	Length	Industry No.	C-2 Model No.	C-6 Model No.
1/4"	2"	D-4	383-3012	383-3016
5/16"	2-1/4"	D-5	383-3022	383-3026
3/8"	2-1/2"	D-6	383-3032	383-3036
7/16"	3"	D-7	383-3042	383-3046
1/2"	3-1/2"	D-8	383-3052	383-3056
5/8"	4"	D-10	383-3062	383-3066
3/4"	4-1/2"	D-12	383-3072	383-3076
1"	6"	D-16	383-3082	383-3086



STYLE E

Threading - conforms with the U.S. Standard 60° included angle thread, also used for V-grooving chamfering, turning, boring and facing.

Square	Length	Industry No.	C-2 Model No.	C-6 Model No.
1/4"	2"	E-4	383-4002	383-4006
5/16"	2-1/4"	E-5	383-4012	383-4016
3/8"	2-1/2"	E-6	383-4022	383-4026
7/16"	3"	E-7	383-4032	383-4036
1/2"	3-1/2"	E-8	383-4042	383-4046
5/8"	4"	E-10	383-4052	383-4056
3/4"	4-1/2"	E-12	383-4062	383-4066
1"	6"	E-16	383-4072	383-4076

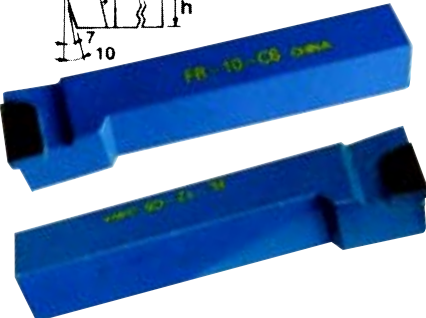
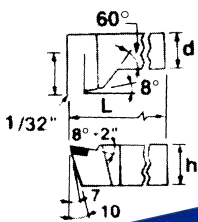


STYLES ER-RIGHT AND EL-LEFT

60° Offset Tool, Right hand for facing to square shoulder. Used mainly for turret lathe operations. Right and left hand tools are used together for straddle facing. Left hand for turning.

				R.H. Industry No.	ER.R.H. C-2 Model No.	ER.R.H. C-6 Model No.	L. H. Industry No.	EL.L.H. C-2 Model No.	EL.L.H. C-6 Model No.
E	D	H	L	No.	Model No.	Model No.	No.	Model No.	Model No.
1/16"	1/4"	1/4"	2"	ER-4	383-6202	383-6206	EL-4	383-6302	383-6306
1/16"	5/16"	5/16"	2-1/4"	ER-5	383-6232	383-6236	EL-5	383-6332	383-6336
1/16"	3/8"	3/8"	2-1/2"	ER-6	383-6212	383-6216	EL-6	383-6312	383-6316
1/8"	1/2"	1/2"	3-1/2"	ER-8	383-6222	383-6226	EL-8	383-6322	383-6326
1/8"	5/8"	5/8"	4"	ER-10	383-6242	383-6246	EL-10	383-6342	383-6346

FR & FL

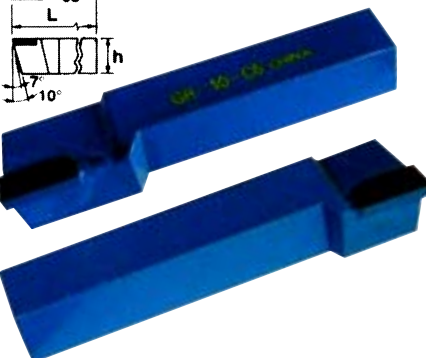
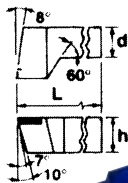


STYLES FR-RIGHT AND FL-LEFT

End Cutting Offset Tool, right hand for facing to square shoulder. Used mainly for turret lathe operations. Right and left hand tools are used together for straddle facing. Left hand for turning.

				R. H. Industry No.	FR.R.H. C-2 Model No.	FR.R.H. C-6 Model No.	L. H. Industry No.	FL.L.H. C-2 Model No.	FL.L.H. C-6 Model No.
E	D	H	L	No.	Model No.	Model No.	No.	Model No.	Model No.
1/32"	1/2"	1/2"	3-1/2"	FR-8	383-8002	383-8006	FL-8	383-8102	383-8106
1/32"	5/8"	5/8"	4"	FR-10	383-8012	383-8016	FL-10	383-8112	383-8116
1/32"	3/4"	3/4"	4-1/2"	FR-12	383-8022	383-8026	FL-12	383-8122	383-8126
1/32"	1"	1"	6"	FR-16	383-8032	383-8036	FL-16	383-8132	383-8136

GR & GL



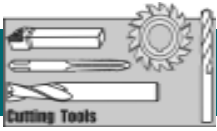
STYLES GR-RIGHT AND GL-LEFT

Right, left hand for facing to square shoulder.

Side cutting offset tools.

Ideal for facing work close to chuck jaws on engine lathes, turret lathes, boring mills and vertical turret lathes.

				R. H. Industry No.	GR.R.H. C-2 Model No.	GR.R.H. C-6 Model No.	L. H. Industry No.	GL.L.H. C-2 Model No.	GL.L.H. C-6 Model No.
E	D	H	L	No.	Model No.	Model No.	No.	Model No.	Model No.
1/32"	1/2"	1/2"	3-1/2"	GR-8	383-8202	383-8206	GL-8	383-8302	383-8306
1/32"	5/8"	5/8"	4"	GR-10	383-8212	383-8216	GL-10	383-8312	383-8316
1/32"	3/4"	3/4"	4-1/2"	GR-12	383-8232	383-8236	GL-12	383-8332	383-8336
1/32"	1"	1"	6"	GR-16	383-8222	383-8226	GL-16	383-8322	383-8326



Cutting Tools

Style TSA

Square Shank Boring Tools,
For boring to a square shoulder
in 90° boring bars.



Size	Radius	Industry No.	C-2	C-6
			Model No.	Model No.
5/16"	1/64"	TSA5	383-8402	383-8406
3/8"	1/64"	TSA6	383-8412	383-8416
1/2"	1/32"	TSA8	383-8422	383-8426
5/8"	1/32"	TSA10	383-8432	383-8436
3/4"	1/32"	TSA12	383-8442	383-8446

Style TSC

For boring to a square shoulder
in a 30° boring bar, or internal
Chamfering (30°) in a 0° .



Size	Radius	Industry No.	C-2	C-6
			Model No.	Model No.
1/5"	1/64"	TSC5	383-8502	383-8506
3/8"	1/64"	TSC6	383-8512	383-8516
1/2"	1/32"	TSC8	383-8522	383-8526
5/8"	1/32"	TSC10	383-8532	383-8536
3/4"	1/32"	TSC12	383-8542	383-8546

Style TSE

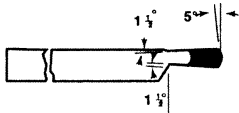
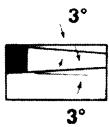
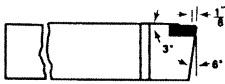
For boring to square shoulder in a
45° boring bar, or boring with a
15° lead angle in a 30° boring bar.



Size	Radius	Industry No.	C-2	C-6
			Model No.	Model No.
5/16"	1/64"	TSE5	383-8602	383-8606
3/8"	1/64"	TSE6	383-8612	383-8616
1/2"	1/32"	TSE8	383-8622	383-8626
5/8"	1/32"	TSE10	383-8632	383-8636
3/4"	1/32"	TSE12	383-8642	383-8646

Styles CTR & CTL:

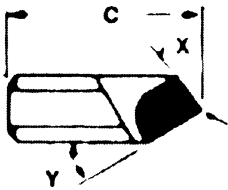
Cut-off-designed for cut-off or grooving solid bars and tube parting.



Shank Size	Tip Dia.	Overall Length	Industry No.	Style CTR		Industry No.	Style CTL	
				C-2 Model No.	C-6 Model No.		C-2 Model No.	C-6 Model No.
1/2 x 1	1/8	5	CTR-111	383-4602	383-4606	CTL-111	383-4702	383-4706
1/2 x 1	3/16	5	CTR-122	383-4612	383-4616	CTL-122	383-4712	383-4716
1/2 x 1	5/16	5	CTR-120	383-4622	383-4626	CTL-120	383-4722	383-4726
1/2 x 1	1/4	5	CTR-121	383-4632	383-4636	CTL-121	383-4732	383-4736
5/8 x 1-1/4	3/8	5	CTR-130	383-4642	383-4646	CTL-130	383-4742	383-4746
3/4 x 1-1/2	3/8	6	CTR-140	383-4652	383-4656	CTL-140	383-4752	383-4756

ROUND BORING TOOLS

Round Boring Tools. For boring to a square shoulder in 45° boring bars or with 15° lead angle in 30° boring bars. For recessing and internal chamfering in 90° boring bar.



Style TRC & TRE

Specify Type

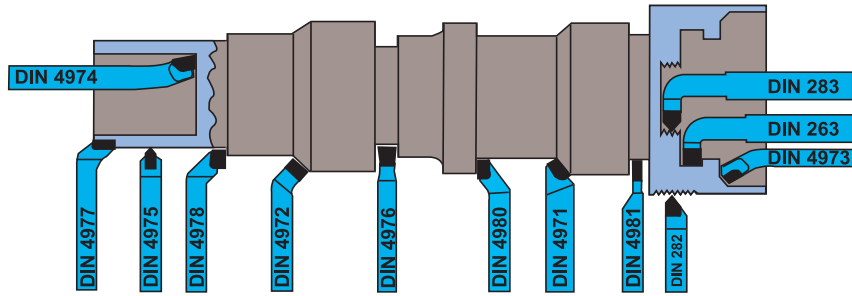
Type	Description
TRC	For Boring to Square Shoulder in 30° Bars
TRE	For Boring to a Square Shoulder in 45° Bars or with 15° Lead in 30° Bars.



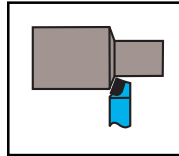
Size	Radius	Dia.	Length	Industry Number	Style TRC		Industry Number	Style TRE	
					C-2 Model No.	C-6 Model No.		C-2 Model No.	C-6 Model No.
0.3120	1/64"	5/16	1-1/2	TRC 5	383-8702	383-8706	TRE 5	383-8802	383-8806
0.3745	1/64	3/8	1-3/4	TRC 6	383-8712	383-8716	TRE 6	383-8812	383-8816
0.4995	1/64	1/2	2-1/2	TRC 8	383-8722	383-8726	TRE 8	383-8822	383-8826



DIN & ISO CARBIDE TIPPED TOOL BITS

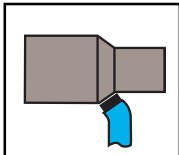


Carbide Tipped Tool Bits, DIN4971-ISO1



Size	K10/20 right Model No.	K10/20 left Model No.	P25/30 right Model No.	P25/30 left Model No.
8x8x80mm	4971-0000	4971-1000	4971-2000	4971-3000
10x10x90mm	4971-0001	4971-1001	4971-2001	4971-3001
12x12x100mm	4971-0003	4971-1003	4971-2003	4971-3003
16x16x110mm	4971-0005	4971-1005	4971-2005	4971-3005
20x20x125mm	4971-0007	4971-1007	4971-2007	4971-3007
25x25x140mm	4971-0009	4971-1009	4971-2009	4971-3009
32x32x170mm	4971-0011	4971-1011	4971-2011	4971-3011

Carbide Tipped Tool Bits, DIN4972-ISO2

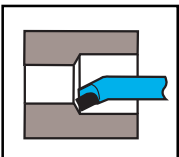


Size	K10/20 right Model No.	K10/20 left Model No.	P25/30 right Model No.	P25/30 left Model No.
8x8x80mm	4972-0000	4972-1000	4972-2000	4972-3000
10x10x90mm	4972-0001	4972-1001	4972-2001	4972-3001
12x12x100mm	4972-0003	4972-1003	4972-2003	4972-3003
16x16x110mm	4972-0005	4972-1005	4972-2005	4972-3005
20x20x125mm	4972-0007	4972-1007	4972-2007	4972-3007
25x25x140mm	4972-0009	4972-1009	4972-2009	4972-3009
32x32x170mm	4972-0011	4972-1011	4972-2011	4972-3011

Carbide Tipped Tool Bits, DIN4973-ISO8



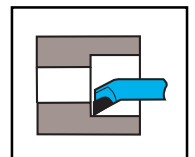
Size	K10/20 Model No.	P25/30 Model No.
8x8x14x125mm	4973-0001	4973-2001
10x10x18x150mm	4973-0003	4973-2003
12x12x21x180mm	4973-0005	4973-2005
16x16x27x210mm	4973-0007	4973-2007
20x20x34x250mm	4973-0009	4973-2009
25x25x43x300mm	4973-0011	4973-2011
32x32x52x355mm	4973-0013	4973-2013



Carbide Tipped Tool Bits DIN4974-ISO9



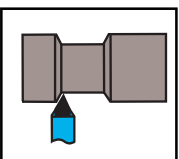
Size	K10/20 Model No.	P25/30 Model No.
8x8x14x125mm	4974-0001	4974-2001
10x10x18x150mm	4974-0003	4974-2003
12x12x21x180mm	4974-0005	4974-2005
16x16x27x210mm	4974-0007	4974-2007
20x20x34x250mm	4974-0009	4974-2009
25x25x43x300mm	4974-0011	4974-2011
32x32x52x355mm	4974-0013	4974-2013



Carbide Tipped Tool Bits. DIN 4975-ISO10



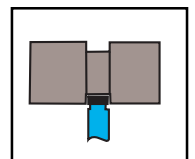
Size	K10/20 Model No.	P25/30 Model No.
16x10x110mm	4975-0001	4975-2001
20x12x125mm	4975-0003	4975-2003
25x16x140mm	4975-0005	4975-2005
32x20x170mm	4975-0007	4975-2007

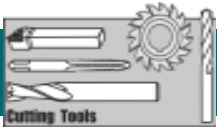


Carbide Tipped Tool Bits. DIN 4976-ISO4



Size	K10/20 Model No.	P25/30 Model No.
8x8x80mm	4976-0000	4976-2000
10x10x90mm	4976-0001	4976-2001
12x12x100mm	4976-0003	4976-2003
16x16x110mm	4976-0005	4976-2005
20x20x125mm	4976-0007	4976-2007
25x25x140mm	4976-0009	4976-2009
32x32x170mm	4976-0011	4976-2011

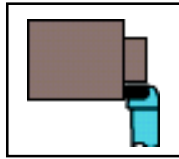




Cutting Tools

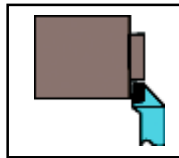
DIN & ISO CARBIDE TIPPED TOOL BITS

Carbide Tipped Tool Bits. DIN 4977-ISO5



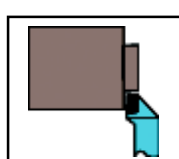
Size	K10/20 right Model No.	K10/20 left Model No.	P25/30 right Model No.	P25/30 left Model No.
16x16x110mm	4977-0001	4977-1001	4977-2001	4977-3001
20x20x125mm	4977-0003	4977-1003	4977-2003	4977-3003
25x25x140mm	4977-0005	4977-1005	4977-2005	4977-3005
32x32x170mm	4977-0007	4977-1007	4977-2007	4977-3007

Carbide Tipped Tool Bits. DIN 4978-ISO3



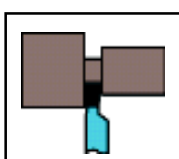
Size	K10/20 right Model No.	K10/20 left Model No.	P25/30 right Model No.	P25/30 left Model No.
16x10x110mm	4978-0001	4978-1001	4978-2001	4978-3001
20x12x125mm	4978-0003	4978-1003	4978-2003	4978-3003
25x16x140mm	4978-0005	4978-1005	4978-2005	4978-3005
32x20x170mm	4978-0007	4978-1007	4978-2007	4978-3007

Carbide Tipped Tool Bits. DIN 4980-ISO6



Size	K10/20 right Model No.	K10/20 left Model No.	P25/30 right Model No.	P25/30 left Model No.
10x10x90mm	4980-0001	4980-1001	4980-2001	4980-3001
12x12x100mm	4980-0003	4980-1003	4980-2003	4980-3003
16x16x110mm	4980-0005	4980-1005	4980-2005	4980-3005
20x20x125mm	4980-0007	4980-1007	4980-2007	4980-3007
25x25x140mm	4980-0009	4980-1009	4980-2009	4980-3009
32x32x170mm	4980-0011	4980-1011	4980-2011	4980-3011

Carbide Tipped Tool Bits. DIN 4981-ISO7

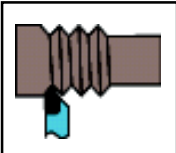


Size	K10/20 right Model No.	K10/20 left Model No.	P25/30 right Model No.	P25/30 left Model No.
12x8x100mm	4981-0001	4981-1001	4981-2001	4981-3001
16x10x110mm	4981-0003	4981-1003	4981-2003	4981-3003
20x12x125mm	4981-0005	4981-1005	4981-2005	4981-3005
25x16x140mm	4981-0007	4981-1007	4981-2007	4981-3007
32x20x170mm	4981-0009	4981-1009	4981-2009	4981-3009

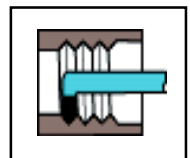
Carbide Tipped Tool Bits. DIN 282-60 Degree



Size	K10/20 Model No.	P25/30 Model No.
10x10x100mm	2820-0001	2820-2001
12x12x110mm	2820-0003	2820-2003
16x16x125mm	2820-0005	2820-2005
20x20x140mm	2820-0007	2820-2007
25x25x160mm	2820-0009	2820-2009
32x32x180mm	2820-0011	2820-2011

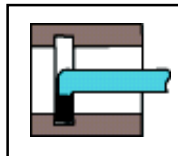


Carbide Tipped Tool Bits. DIN 283-60 Degree



Size	K10/20 Model No.	P25/30 Model No.
10x10x24x140mm	2830-0001	2830-2001
12x12x30x160mm	2830-0003	2830-2003
16x16x36x180mm	2830-0005	2830-2005
20x20x45x210mm	2830-0007	2830-2007
25x25x55x250mm	2830-0009	2830-2009
32x32x70x300mm	2830-0011	2830-2011

Carbide Tipped Tool Bits. DIN 263



Size	K10/20 Model No.	P25/30 Model No.
10x10x25x140mm	2630-0001	2630-2001
12x12x30x160mm	2630-0003	2630-2003
16x16x40x180mm	2630-0005	2630-2005
20x20x50x210mm	2630-0007	2630-2007
25x25x60x250mm	2630-0009	2630-2009
32x32x85x300mm	2630-0011	2630-2011

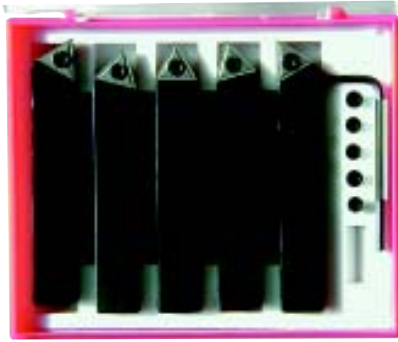
Carbide Tipped Turning Tool Set



Pieces/Set	Shank	Model No.
11	10mm	387-1810
8	12mm	387-1812
8	16mm	387-1816
8	20mm	387-1820

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Cutting Tools



INDEXABLE CARBIDE TURNING TOOLS SET

Efficiency:

- An inexpensive way to replace carbide tipped tool bits.
- Versatile and economical.
- Available in 5 shank size and styles.
- Each tool cuts right, left or plunges.
- Positive rake cutting and built in chip breaker groove.
- Available with 3 different radii.

5 Piece Sets

- Set includes: 5 tools in styles-AR, AL, BR, BL and E insert, with 5 extra screws and 2 wrenches, set also comes in 1/4", 3/8", 1/2", 5/8", 3/4" and 1" sets.

Shank (Square)	Set No.	Descriptions.	C-2 Model No.	C-6 Model No.
1/4"	ST-4	AR-4, AL-4, BR-4, BL-4, E-4	250-1399	251-1399
3/8"	ST-6	AR-6, AL-6, BR-6, BL-6, E-6	250-1400	251-1400
1/2"	ST-8	AR-8, AL-8, BR-8, BL-8, E-8	250-1401	251-1401
5/8"	ST-10	AR-10, AL-10, BR-10, BL-10, E-10	250-1402	251-1402
3/4"	ST-12	AR-12, AL-12, BR-12, BL-12, E-12	250-1404	251-1404
1"	ST-16	AR-16, AL-16, BR-16, BL-16, E-16	250-1406	251-1406

Indexable Carbide Turning Tools



AR



AL



BR



BL



E

1/4" Shank, 7/32" I.C. Insert

Type	Model No.
AR 4	250-1391
AL 4	250-1392
BR 4	250-1393
BL 4	250-1394
E 4	250-1395

3/8" Shank, 1/4" I.C. Insert

Type	Model No.
AR 6	250-1411
AL 6	250-1412
BR 6	250-1413
BL 6	250-1414
E 6	250-1415

1/2" Shank, 3/8" I.C. Insert

Type	Model No.
AR 8	250-1421
AL 8	250-1422
BR 8	250-1423
BL 8	250-1424
E 8	250-1425

5/8" Shank, 3/8" I.C. Insert.

Type	Model No.
AR 10	250-1431
AL 10	250-1432
BR 10	250-1433
BL 10	250-1434
E 10	250-1435

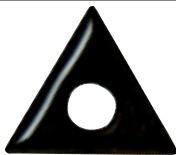
3/4" Shank, 3/8" I.C. Insert

Type	Model No.
AR 12	250-1441
AL 12	250-1442
BR 12	250-1443
BL 12	250-1444
E 12	250-1445

1" Shank, 1/2" I.C. Insert

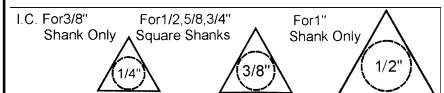
Type	Model No.
AR 16	250-1451
AL 16	250-1452
BR 16	250-1453
BL 16	250-1454
E 16	250-1455

CARBIDE INSERTS



Insert I.C.	Radius	Insert No.	C2 Model No.	C6 Model No.	Tin Coated Model No.
3/16"	—	—	340-0097	340-0098	340-0099
1/4"	0.015	TT-221	340-1000	340-1002	340-1003
1/4"	0.032	TT-222	340-1004	340-1006	340-1007
3/8"	0.015	TT-321	340-1008	340-1010	340-1011
3/8"	0.032	TT-322	340-1012	340-1014	340-1015
3/8"	0.046	TT-323	340-1016	340-1018	340-1019
1/2"	0.015	TT-431	340-1020	340-1022	340-1023
1/2"	0.032	TT-432	340-1024	340-1026	340-1027
1/2"	0.046	TT-433	340-1028	340-1030	340-1031

REPLACEMENT SCREWS



Descriptions	Model No.
M2.5 screw for 1/4", 3/8" shank	250-1297
M4 screw for 1/2, 5/8, 3/4" shank	250-1298
M5 screw for 1" shank	250-1299



Cutting Tools

METRIC INDEXABLE CARBIDE TURNING TOOLS SET



5 Piece Sets

- Set includes: 5 tools in styles-AR, AL, BR, BL and E insert, with 5 extra screws and 2 wrenches, set also comes in 6mm, 8mm, 10mm, 12mm, 14mm, 16mm, 18mm, 20mm, and 25mm sets.

Shank (Square)	Length	Description	ISO K20 Model No.	ISO P20 Model No.
6mm		AR, AL, BR, BL, E	250-5398	251-5398
8mm		AR, AL, BR, BL, E	250-5399	251-5399
10mm	63mm	AR, AL, BR, BL, E	250-5400	251-5400
12mm	76mm	AR, AL, BR, BL, E	250-5401	251-5401
16mm	102mm	AR, AL, BR, BL, E	250-5402	251-5402
14mm	76mm	AR, AL, BR, BL, E	250-5403	251-5403
20mm	120mm	AR, AL, BR, BL, E	250-5404	251-5404
18mm	115mm	AR, AL, BR, BL, E	250-5405	251-5405
25mm	150mm	AR, AL, BR, BL, E	250-5406	251-5406

Indexable Carbide Turning Tools



AR

10mm Shank 6.5mm I.C. Insert

Type	Model No.
AR	250-1591
AL	250-1592
BR	250-1593
BL	250-1594
E	250-1595



AL



BR



BL



E

18mm Shank 9.5mm I.C. Insert

Type	Model No.
AR	250-1641
AL	250-1642
BR	250-1643
BL	250-1644
E	250-1645

14mm Shank 9.5mm I.C. Insert

Type	Model No.
AR	250-1621
AL	250-1622
BR	250-1623
BL	250-1624
E	250-1625

12mm Shank 9.5mm I.C. Insert

Type	Model No.
AR	250-1611
AL	250-1612
BR	250-1613
BL	250-1614
E	250-1615

16mm Shank 9.5mm I.C. Insert

Type	Model No.
AR	250-1631
AL	250-1632
BR	250-1633
BL	250-1634
E	250-1635

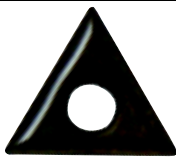
20mm Shank 9.5mm I.C. Insert

Type	Model No.
AR	250-1651
AL	250-1652
BR	250-1653
BL	250-1654
E	250-1655

25mm Shank 12.5mm I.C. Insert

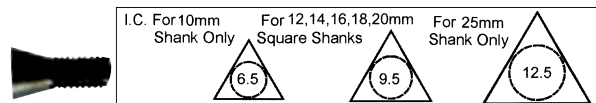
Type	Model No.
AR	250-1661
AL	250-1662
BR	250-1663
BL	250-1664
E	250-1665

CARBIDE INSERTS



Insert I.C.	Radius	ISO K20	ISO P20
6.5mm	0.8mm	340-1102	340-1100
9.5mm	0.8mm	340-1108	340-1106
12.5mm	0.8mm	340-1112	340-1110

REPLACEMENT SCREWS



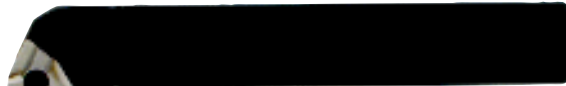
Descriptions	Model No.
6.5mm I.C. for 10mm shank	250-1287
9.5mm I.C. for 12, 14, 16, 18, 20 mm square shank	250-1288
12.5mm I.C. for 25mm shank only	250-1289



CARBIDE INSERT TOOLHOLDERS

Lathe Toolholders

For turning or facing with trigon chip breaker inserts



Left Hand Model No. 250-7029



Right Hand Model No. 250-7028



Inserts



Description	Inserts of Right Hand Model No.	Inserts of Left Hand Model No.
For Steel	250-7039	250-7040
For Cast Iron	250-7047	250-7048

Turning Toolholders

For turning or facing with triangle chip breaker inserts



Left Hand Model No. 250-7035



Right Hand Model No. 250-7034



Inserts



Description	Inserts of Right Hand Model No.	Inserts of Left Hand Model No.
For Steel	250-7043	250-7044
For Cast Iron	250-7051	250-7052

Turning Toolholders

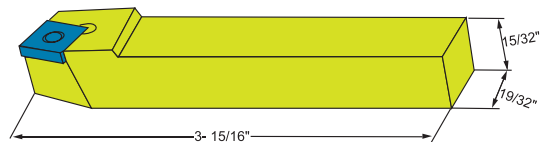
For facing end of tubing and front and back flanges, with square inserts



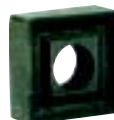
Right Hand Model No. 250-7036



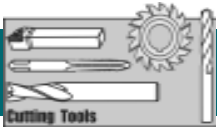
Left Hand Model No. 250-7037



Inserts



Description	Inserts of Right Hand Model No.	Inserts of Left Hand Model No.
For Steel	250-7045	250-7046
For Cast Iron	250-7053	250-7054



Cutting Tools

CARBIDE INSERT TOOLHOLDERS *continued*

Threading Toolholders

For all external threading, with adjustable insert



Model No. 250-7030

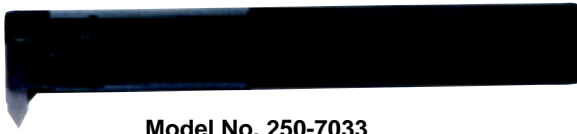
Inserts



Description	Inserts Model No.
For Steel	250-7041
For Cast Iron	250-7049

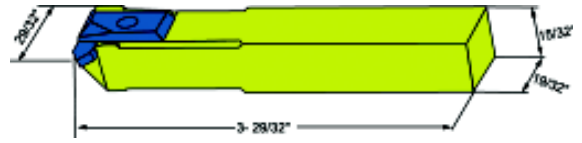
Internal Threading Toolholders

For internal threading, with adjustable insert



Model No. 250-7033

Inserts



Description	Inserts Model No.
For Steel	250-7042
For Cast Iron	250-7050

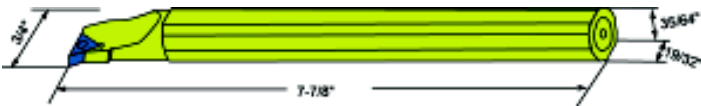
Boring Bar

For all your boring bar works, with triangle inserts



Model No. 250-7038

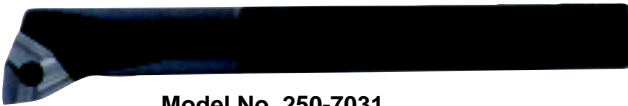
Inserts



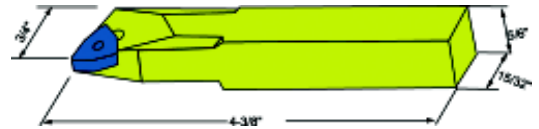
Description	Inserts Model No.
For Steel	250-7055
For Cast Iron	250-7056

Boring Tool Holders

For boring bar works, with trigon chip breaker inserts

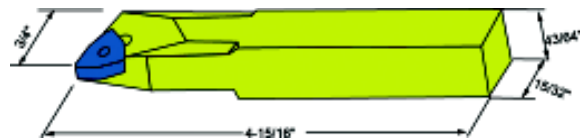


Model No. 250-7031



Model No. 250-7032

Inserts



Description	Inserts Model No.
For Steel	250-7040
For Cast Iron	250-7048

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Cutting Tools

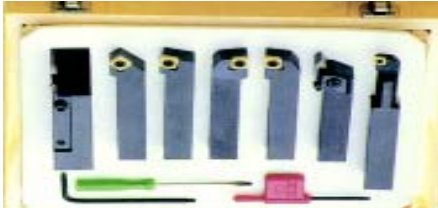


MANUAL TURNING TOOL SET



Type	Figure	Tip Height 12mm	Tip Height 15mm	Tip Height 16mm	Tip Height 20mm	Tip Height 25mm	Tip Height 32mm
External Turning Tools		PSSNR1215H09	PSSNR1516H09	PSSNR1616H09	PSSNR2020-12	PSSNR2525-15	PSSNR3225-19
		Insert 41005V	Insert 41005V	Insert 41005V	Insert 41310V	Insert 41610V	Insert 41910V
		PSBNR1215H09	PSBNR1516H09	PSBNR1616H09	PSRNR2020-12	PSRNR2525-15	PSRNR3225-19
		Insert 41005V	Insert 41005V	Insert 41005V	Insert 41310V	Insert 41610V	Insert 41910V
		PWGNR1215H06	PWGNR1516H06	PWGNR1616H06	PWGNR2020-08	PWGNR2525-10	PWGNR3225-10
		Insert T31005A	Insert T31005A	Insert T31005A	Insert T3K1305A	Insert T3K1605A	Insert T3K1910A
Internal turning Tools		PSSNR1012J09	PSSNR1412J09	PSSNR1412K09	PSSNR1518M12	PSSNR2020R15	PSSNR2525S15
		Insert 41005Fb	Insert 41005Fb	Insert 41005Fb	Insert 41305Fb	Insert 41605Fb	Insert 41605Fb
		PWKNR1012J06	PWKNR1412K06	PWKNR1412K06	PWKNR1518M08	PWKNR2020R10	PWKNR2525S10
		Insert 31005Az	Insert 31005Az	Insert 31005Az	Insert T31305Fb	Insert T31605Fb	Insert T31605Fb
		PWUNR1012J06	PWUNR1412K06	PWUNR1412K06	PWUNR1518M08	PWUNR2020R10	PWUNR2525S10
		Insert T31005Fb	Insert T31005Fb	Insert T31005Fb	Insert T31305Fb	Insert T31605Fb	Insert T31605Fb
Internal & External Threading Tools		LN1215R-04	LN1216R-04	LN1616R-04	LN2520R-06	LN2020R-06	LN3225R-06
		Insert JCL15-120	Insert JCL15-120	Insert JCL15-120	Insert M606	Insert M606	Insert M608
		LW1215R-06	LW1516R-06	LW1616R-06	LW2020R-08	LW2520R-08	LW3225R-08
		Insert M606	Insert M606	Insert M606	JcL25-120	JcL25-120	JcL25-120
Cut-off Tools		QA1222R-03	QA1522R-03	QA1622R-03	QA2027A-04	QA2527R-05	QA3234R-05
		J200	J200	J200	J201	J203	J203
Model No.		250-0000	250-0010	250-0020	250-0030	250-0040	250-0050

MANUAL TURNING TOOL SET



Type	Figure	Tip Height 16mm
External Turning Tools		SSSCR1616H09
		Insert SCMT09T308
		SSRCR1616H09
		Insert SCMT09T308
		SCGCR1616H09
		Insert CCMT09T308
	SCGCL1616H09	
	Insert CCMT09T308	
Internal turning Tools		SCLCR1616K06
		Insert CCMT060204
External Threading Tools		LW1616R-04
		Insert M606
Cut-off Tools		QA1622R-03
		Insert J200
Model No.		250-0100

Type	Figure	Tip Height 8mm	Tip Height 10mm
External Turning Tools		SWGCR0810D05	SWGCR1010E05
		Insert WCMx050308	Insert WCMx050308
		SCLCR0810D06	SCLCR0810D06
		Insert CCMT060204	Insert CCMT060204
		SDJCR0810D07	SDJCR1010E07
		Insert DCMT070202	Insert DCMT070202
	SDNCN0810D07	SDNCN1010E07	
	Insert DCMT070202	Insert DCMT070202	
Internal turning Tools		SCLCL0810D06	SCLCL1010E06
		Insert CCMT060204	Insert CCMT060204
External Threading Tools		LW0810R-04	LW1010R-04
		Insert JcL15-120	Insert JcL15-120
Cut-off Tools		QA0812R-03	QA1012R-03
		Insert JCQ3	Insert JCQ3
Model No.		250-0200	250-0300



Cutting Tools

STRAIGHT SHANK CHUCKING REAMER

Straight Flute

Wire Gage Sizes



Size	Model No.	Size	Model No.	Size	Model No.	Size	Model No.
No.1 1-1/2x6"	331-0201	No.16 1-1/8x4-1/2"	331-0216	No.31 7/8x3-1/2"	331-0231	No.46 3/4x3"	331-0246
No.2 1-1/2x6"	331-0202	No.17 1-1/8x4-1/2"	331-0217	No.32 7/8x3-1/2"	331-0232	No.47 3/4x3"	331-0247
No.3 1-1/4x5"	331-0203	No.18 1-1/8x4-1/2"	331-0218	No.33 7/8x3-1/2"	331-0233	No.48 3/4x3"	331-0248
No.4 1-1/4x5"	331-0204	No.19 1-1/8x4-1/2"	331-0219	No.34 7/8x3-1/2"	331-0234	No.49 3/4x3"	331-0249
No.5 1-1/4x5"	331-0205	No.20 1-1/8x4-1/2"	331-0220	No.35 7/8x3-1/2"	331-0235	No.50 3/4x3"	331-0250
No.6 1-1/4x5"	331-0206	No.21 1-1/8x4-1/2"	331-0221	No.36 7/8x3-1/2"	331-0236	No.51 3/4x3"	331-0251
No.7 1-1/4x5"	331-0207	No.22 1x4"	331-0222	No.37 7/8x3-1/2"	331-0237	No.52 1/2x2-1/2"	331-0252
No.8 1-1/4x5"	331-0208	No.23 1x4"	331-0223	No.38 7/8x3-1/2"	331-0238	No.53 1/2x2-1/2"	331-0253
No.9 1-1/4x5"	331-0209	No.24 1x4"	331-0224	No.39 7/8x3-1/2"	331-0239	No.54 1/2x2-1/2"	331-0254
No.10 1-1/4x5"	331-0210	No.25 1x4"	331-0225	No.40 7/8x3-1/2"	331-0240	No.55 1/2x2-1/2"	331-0255
No.11 1-1/4x5"	331-0211	No.26 1x4"	331-0226	No.41 7/8x3-1/2"	331-0241	No.56 1/2x2-1/2"	331-0256
No.12 1-1/8x4-1/2"	331-0212	No.27 1x4"	331-0227	No.42 3/4x3"	331-0242	No.57 1/2x2-1/2"	331-0257
No.13 1-1/8x4-1/2"	331-0213	No.28 1x4"	331-0228	No.43 3/4x3"	331-0243	No.58 1/2x2-1/2"	331-0258
No.14 1-1/8x4-1/2"	331-0214	No.29 1x4"	331-0229	No.44 3/4x3"	331-0244	No.59 1/2x2-1/2"	331-0259
No.15 1-1/8x4-1/2"	331-0215	No.30 7/8x3-1/2"	331-0230	No.45 3/4x3"	331-0245	No.60 1/2x2-1/2"	331-0260

STRAIGHT SHANK CHUCKING REAMER

Straight Flute

Fractional Sizes



Size	Flute Length	Overall Length	Model No.	Size	Flute Length	Overall Length	Model No.	Size	Flute Length	Overall Length	Model No.
3/64"	1/2	2-1/2"	331-1003	29/64"	1-3/4	7"	331-1029	55/64"	2-5/8	9-1/2"	331-1055
1/16"	1/2	2-1/2"	331-1004	15/32"	1-3/4	7"	331-1030	7/8"	2-5/8	10"	331-1056
5/64"	3/4	3"	331-1005	31/64"	2	8"	331-1031	57/64"	2-5/8	10"	331-1057
3/32"	3/4	3"	331-1006	1/2"	2	8"	331-1032	29/32"	2-5/8	10"	331-1058
7/64"	7/8	3-1/2"	331-1007	33/64"	2	8"	331-1033	59/64"	2-5/8	10"	331-1059
1/8"	7/8	3-1/2"	331-1008	17/32"	2	8"	331-1034	15/16"	2-5/8	10"	331-1060
9/64"	1	4"	331-1009	35/64"	2	8"	331-1035	61/64"	2-5/8	10"	331-1061
5/32"	1	4"	331-1010	9/16"	2	8"	331-1036	31/32"	2-5/8	10"	331-1062
11/64"	1-1/8	4-1/2"	331-1011	37/64"	2	8"	331-1037	63/64"	2-3/4	10"	331-1063
3/16"	1-1/8	4-1/2"	331-1012	19/32"	2	8"	331-1038	1"	2-3/4	10-1/2"	331-1100
13/64"	1-1/4	5"	331-1013	39/64"	2-1/4	9"	331-1039	1-1/32"	2-3/4	10-1/2"	331-1102
7/32"	1-1/4	5"	331-1014	5/8"	2-1/4	9"	331-1040	1-1/16"	2-3/4	10-1/2"	331-1104
15/64"	1-1/2	6"	331-1015	41/64"	2-1/4	9"	331-1041	1-3/32"	2-7/8	10-1/2"	331-1106
1/4"	1-1/2	6"	331-1016	21/32"	2-1/4	9"	331-1042	1-1/8"	2-7/8	11"	331-1108
17/64"	1-1/2	6"	331-1017	43/64"	2-1/4	9"	331-1043	1-5/32"	2-7/8	11"	331-1110
9/32"	1-1/2	6"	331-1018	11/16"	2-1/4	9"	331-1044	1-3/16"	2-7/8	11"	331-1112
19/64"	1-1/2	6"	331-1019	45/64"	2-1/4	9"	331-1045	1-7/32"	2-7/8	11"	331-1114
5/16"	1-1/2	6"	331-1020	23/32"	2-1/4	9"	331-1046	1-1/4"	3	11-1/2"	331-1116
21/64"	1-1/2	6"	331-1021	47/64"	2-1/2	9-1/2"	331-1047	1-5/16"	3	11-1/2"	331-1120
11/32"	1-1/2	6"	331-1022	3/4"	2-1/2	9-1/2"	331-1048	1-3/8"	3-1/4	12"	331-1124
23/64"	1-3/4	7"	331-1023	49/64"	2-1/2	9-1/2"	331-1049	1-7/16"	3-1/2	12-1/2"	331-1128
3/8"	1-3/4	7"	331-1024	25/32"	2-1/2	9-1/2"	331-1050	1-1/2"	3-1/2	12-1/2"	331-1132
25/64"	1-3/4	7"	331-1025	51/64"	2-1/2	9-1/2"	331-1051	1-9/16"	3-1/2	12-1/2"	331-1136
13/32"	1-3/4	7"	331-1026	13/16"	2-1/2	9-1/2"	331-1052	1-5/8"	3-1/2	13"	331-1140
27/64"	1-3/4	7"	331-1027	53/64"	2-1/2	9-1/2"	331-1053	1-11/16"	3-1/2	13"	331-1144
7/16"	1-3/4	7"	331-1028	27/32"	2-1/2	9-1/2"	331-1054	1-3/4"	4	13-1/2"	331-1148
								1-7/8"	4	14"	331-1156
								2"	4	14"	331-1200

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TAPER SHANK CHUCKING REAMER

Straight Flute/Spiral Fluted

High Speed Steel



Size	M.T. Taper Shank	Flute Length	Overall Length	Model No.	
				Straight Shank	Taper Shank
1/4	1	1-1/2	6	331-2400	331-2401
9/32	1	1-1/2	6	331-2402	331-2403
5/16	1	1-1/2	6	331-2404	331-2405
11/32	1	1-1/2	6	331-2406	331-2407
3/8	1	1-3/4	7	331-2408	331-2409
13/32	1	1-3/4	7	331-2410	331-2411
7/16	1	1-3/4	7	331-2412	331-2413
15/32	1	1-3/4	7	331-2414	331-2415
1/2	1	2	8	331-2416	331-2417
17/32	1	2	8	331-2418	331-2419
9/16	1	2	8	331-2420	331-2421
19/32	1	2	8	331-2422	331-2423
5/8	2	2-1/4	9	331-2424	331-2425
21/32	2	2-1/4	9	331-2426	331-2427
11/16	2	2-1/4	9	331-2428	331-2429

Size	M.T. Taper Shank	Flute Length	Overall Length	Model No.	
				Straight Shank	Taper Shank
23/32	2	2-1/4	9	331-2430	331-2431
3/4	2	2-1/2	9-1/2	331-2432	331-2433
25/32	2	2-1/2	9-1/2	331-2434	331-2435
13/16	2	2-1/2	9-1/2	331-2436	331-2437
27/32	2	2-1/2	9-1/2	331-2438	331-2439
7/8	2	2-5/8	10	331-2440	331-2441
29/32	2	2-5/8	10	331-2442	331-2443
15/16	3	2-5/8	10	331-2444	331-2445
31/32	3	2-5/8	10	331-2446	331-2447
1	3	2-3/4	10-1/2	331-2448	331-2449
1-1/32	3	2-3/4	10-1/2	331-2450	331-2451
1-1/16	3	2-3/4	10-1/2	331-2452	331-2453
1-1/8	3	2-7/8	11	331-2454	331-2455
1-3/16	3	2-7/8	11	331-2456	331-2457
1-1/4	4	3	11-1/2	331-2458	331-2459
1-5/16	4	3	11-1/2	331-2460	331-2461
1-3/8	4	3-1/4	12	331-2462	331-2463
1-7/16	4	3-1/4	12	331-2464	331-2465
1-1/2	4	3-1/2	12-1/2	331-2466	331-2467
1-9/16	4	3-1/2	12-1/2	331-2468	331-2469
1-5/8	4	3-1/2	13	331-2470	331-2471
1-11/16	4	4	13-1/2	331-2472	331-2473
1-3/4	4	4	13-1/2	331-2474	331-2475
2	4	4	14-1/2	331-2476	331-2477

TAPER SHANK JIBBERS LENGTH REAMER

Straight Flute

High Speed Steel



Size	M.T. Shank	Flute Length	Overall Length	Model No.
1/4	1	2	5-3/16	331-2600
9/32	1	2	5-3/16	331-2602
5/16	1	2-1/4	5-1/2	331-2604
11/32	1	2-1/4	5-1/2	331-2606
3/8	1	2-1/2	5-13/16	331-2608
13/32	1	2-1/2	5-13/16	331-2610
7/16	1	2-3/4	6-1/8	331-2612
15/32	1	2-3/4	6-1/8	331-2614
1/2	1	3	6-7/16	331-2616
17/32	1	3	6-7/16	331-2618
9/16	1	3-1/4	6-3/4	331-2620
19/32	1	3-1/4	6-3/4	331-2622
5/8	2	3-1/2	7-9/16	331-2624
21/32	2	3-1/2	7-9/16	331-2626
11/16	2	3-7/8	8	331-2628

Size	M.T. Shank	Flute Length	Overall Length	Model No.
23/32	2	3-7/8	8	331-2630
3/4	2	4-3/16	8-3/8	331-2632
13/16	2	4-9/16	8-13/16	331-2634
7/8	2	4-7/8	9-3/16	331-2636
15/16	3	5-1/8	10	331-2638
1	3	5-7/16	10-3/8	331-2640
1-1/16	3	5-5/8	10-5/8	331-2642
1-1/8	3	5-13/16	10-7/8	331-2644
1-3/16	3	6	11-1/8	331-2646
1-1/4	4	6-1/8	12-9/16	331-2648
1-5/16	4	6-1/4	12-11/16	331-2650
1-3/8	4	6-5/16	12-13/16	331-2652
1-7/16	4	6-7/16	13	331-2654
1-1/2	4	6-1/2	13-1/8	331-2656

MORSE TAPER HAND REAMER

Straight Shank, High Speed Steel



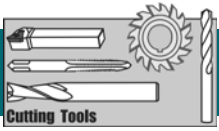
Size	Diameter		Shank	Flute Length	Overall Length	ModelNo.	
	Small End	Large End				Roughing	Finishing
0	0.2503	0.3673	5/16	2-1/4	3-3/4	331-2800	331-2801
1	0.3674	0.5170	7/16	3	5	331-2802	331-2803
2	0.5696	0.7444	5/8	3-1/2	6	331-2804	331-2805
3	0.7748	0.9881	7/8	4-1/4	7-1/4	331-2806	331-2807
4	1.0167	1.2893	1-1/4	5-1/4	8-1/4	331-2808	331-2809
5	1.4717	1.8005	1-1/2	6-1/4	9-3/4	331-2810	331-2811
6	2.1120	2.5550	2	8-1/2	12-1/4	331-2812	331-2813

MORSE TAPER MACHINE REAMER

Taper Shank, High Speed Steel



Size	Diameter		Flute Length	Overall Length	ModelNo.	
	Small End	Large End			Roughing	Finishing
0	0.2503	0.3673	2-1/4	5-11/32	331-2900	331-2901
1	0.3674	0.5170	3	6-5/16	331-2902	331-2903
2	0.5696	0.7444	3-1/2	7-3/8	331-2904	331-2905
3	0.7748	0.9881	4-1/4	8-7/8	331-2906	331-2907
4	1.0167	1.2893	5-1/4	10-7/8	331-2928	331-2909
5	1.4717	1.8005	6-1/4	13-1/4	331-2910	331-2911
6	2.1120	2.5550	8-1/2	17-13/16	331-2912	331-2913



Cutting Tools

SOLID COUNTERBORE

2 Flute Straight Shank \ High Speed Steel
For Fillister Head Screws-Fractional Size



Pilot And Cutting Size	Shank	Thread Length	Model No.
1/4x13/32	5/16	3-5/8	331-1600
5/16x15/32	3/8	4	331-1602
3/8x19/32	7/16	4-3/8	331-1604
7/16x21/32	1/2	4-3/4	331-1606
1/2x25/32	9/16	5-1/8	331-1608

SOLID COUNTERBORE

3 Flute Straight Shank \ High Speed Steel
For Cup Screws-Machine Screw And Fractional Size



Size	Pilot Dia.	Cutting Dia.	Shank Dia.	Overall Length	Model No.
No.5	0.141	0.221	3/16	3	331-1700
No.6	0.150	0.242	7/32	3	331-1702
No.8	11/64	19/64	1/4	3	331-1704
No.10	13/64	21/64	5/16	3-1/2	331-1706
1/4	9/32	13/32	3/8	3	331-1708
5/16	11/32	1/2	7/16	5	331-1710
3/8	13/32	19/32	1/2	6	331-1712
7/16	15/32	11/16	1/2	7	331-1714
1/2	17/32	25/32	1/2	7-1/2	331-1716
5/8	21/32	31/32	3/4	7-1/2	331-1718
3/4	13/16	1-3/16	1	8	331-1720
7/8	15/16	1-3/8	1	8	331-1722
1	1-1/16	1-9/16	1	10	331-1724

REPAIREMAN'S TAPER REAMER

Crabon Steel

- Removes burrs from small holes.
- Enlarges and countersinks holes in soft metals.
- Range: 1/8-1/2"

Range	Model No.
1/8-1/2	331-0100
1/8-5/8	331-0110



TAPER PIPE REAMER

High Speed Steel

Straight Flute

Spiral Flute



Size	Diameter		Flute Length	Overall Length	Model No.	
	Small End	Large End			Roughing	Finishing
1/8	0.316	0.362	3/4	2-1/8	331-1400	331-1401
1/4	0.406	0.472	1-1/16	2-7/16	331-1402	331-1403
3/8	0.540	0.606	1-1/16	2-9/16	331-1404	331-1405
1/2	0.665	0.751	1-3/8	3-1/8	331-1406	331-1407
3/4	0.876	0.962	1-3/8	3-1/4	331-1408	331-1409
1	1.103	1.212	1-3/4	3-3/4	331-1410	331-1411
1-1/4	1.444	1.553	1-3/4	4	331-1412	331-1413
1-1/2	1.684	1.793	1-3/4	4-1/4	331-1414	331-1415
2	2.519	2.268	1-3/4	4-1/2	331-1416	331-1417

Straight Flute



Taper Flute



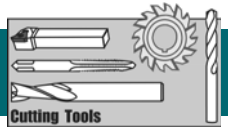
Size	M.T. Taper Shank	Flute Length	Overall Length	Model No.	
				Straight Shank	Taper Shank
21/32	2	1-1/4	9	331-1518	331-1519
11/16	2	1-1/4	9	331-1520	331-1521
23/32	2	1-1/4	9	331-1522	331-1523
3/4	2	1-3/8	9-1/2	331-1524	331-1525
25/32	2	1-3/8	9-1/2	331-1526	331-1527
13/16	2	1-3/8	9-1/2	331-1528	331-1529
27/32	2	1-3/8	9-1/2	331-1530	331-1531
7/8	2	1-1/2	10	331-1532	331-1533
29/32	2	1-1/2	10	331-1534	331-1535
15/16	3	1-1/2	10	331-1536	331-1537
31/32	3	1-1/2	10	331-1538	331-1539
1	3	1-5/8	10-1/2	331-1540	331-1541
1-1/32	3	1-5/8	10-1/2	331-1542	331-1543
1-1/16	3	1-5/8	10-1/2	331-1544	331-1545
1-3/32	3	1-5/8	10-1/2	331-1546	331-1547
1-1/8	3	1-3/4	11	331-1548	331-1549
1-5/32	3	1-3/4	11	331-1550	331-1551
1-3/16	3	1-3/4	11	331-1552	331-1553
1-7/32	4	1-3/4	11	331-1554	331-1555
1-1/4	4	1-7/8	11-1/2	331-1556	331-1557
1-5/16	4	1-7/8	11-1/2	331-1558	331-1559
1-3/8	4	2	12	331-1560	331-1561
1-7/16	4	2	12	331-1562	331-1563
1-1/2	4	2-1/8	12-1/2	331-1564	331-1565
1-9/16	4	2-1/8	12-1/2	331-1566	331-1567
1-5/8	4	2-1/4	13	331-1568	331-1569
1-11/16	4	2-1/4	13	331-1570	331-1571
1-3/4	5	2-3/8	13-1/2	331-1572	331-1573
1-13/16	5	2-3/8	13-1/2	331-1574	331-1575
1-7/8	5	2-1/2	14	331-1576	331-1577
1-15/16	5	2-1/2	14	331-1578	331-1579
2	5	2-1/2	14	331-1580	331-1581

EXPANSION CHUCKING REAMER

High Speed Steel / Straight Flute

Size	M.T. Taper Shank	Flute Length	Overall Length	Model No.	
				Straight Shank	Taper Shank
3/8	1	3/4	7	331-1500	331-1501
13/32	1	3/4	7	331-1502	331-1503
7/16	1	7/8	7	331-1504	331-1505
15/32	1	7/8	7	331-1506	331-1507
1/2	1	1	8	331-1508	331-1509
17/32	1	1	8	331-1510	331-1511
9/16	1	1-1/8	8	331-1512	331-1513
19/32	1	1-1/8	8	331-1514	331-1515
5/8	2	1-1/4	9	331-1516	331-1517

Cutting Tools



STRAIGHT SHANK CHUCKING REAMER

Straight Flute

Size	Decimal Equiv.	Flute Length	Overall Length	No. of Flute	Model No.	Size	Decimal Equiv.	Flute Length	Overall Length	No. of Flute	Model No.
0.1230DP	0.1230	7/8	3-1/2"	4	331-7005	0.3740	0.3740	1-3/4	7"	6	331-7090
0.1240	0.1240	7/8	3-1/2"	4	331-7010	0.3745DP	0.3745	1-3/4	7"	6	331-7095
0.1247DP	0.1247	7/8	3-1/2"	4	331-7015	0.3760	0.3760	1-3/4	7"	6	331-7100
0.1260	0.1260	7/8	3-1/2"	4	331-7020	0.4355DP	0.4355	1-3/4	7"	6	331-7105
0.1855DP	0.1855	1-1/8	4-1/2"	6	331-7025	0.4365	0.4365	1-3/4	7"	6	331-7110
0.1865	0.1865	1-1/8	4-1/2"	6	331-7030	0.4370DP	0.4370	1-3/4	7"	6	331-7115
0.1870DP	0.1870	1-1/8	4-1/2"	6	331-7035	0.4385	0.4385	1-3/4	7"	6	331-7120
0.1885	0.1885	1-1/8	4-1/2"	6	331-7040	0.4980DP	0.4980	2	8"	6	331-7125
0.2480DP	0.2480	1-1/2	6"	6	331-7045	0.4990	0.4990	2	8"	6	331-7130
0.2490	0.2490	1-1/2	6"	6	331-7050	0.4995DP	0.4995	2	8"	6	331-7135
0.2495DP	0.2495	1-1/2	6"	6	331-7055	0.5010	0.5010	2	8"	6	331-7140
0.2510	0.2510	1-1/2	6"	6	331-7060	0.6240	0.6240	2-1/4	9"	6	331-7150
0.3105DP	0.3105	1-1/2	6"	6	331-7065	0.6260	0.6260	2-1/4	9"	8	331-7160
0.3115	0.3115	1-1/2	6"	6	331-7070	0.7490	0.7490	2-1/4	9"	8	331-7170
0.3120DP	0.3120	1-1/2	6"	6	331-7075	0.7510	0.7510	2-1/2	9-1/2"	8	331-7180
0.3135	0.3135	1-1/2	6"	6	331-7080	0.8740	0.8740	2-1/2	9-1/2"	8	331-7190
0.3730DP	0.3730	1-3/4	7"	6	331-7085	0.8760	0.8760	2-5/8	10"	8	331-7200

STRAIGHT SHANK CHUCKING REAMER

Straight Flute

Size	Model No.	Size	Model No.	Size	Model No.
A 1-1/2x6"	331-0001	I 1-1/2x6"	331-0009	R 1-1/2x6"	331-0018
B 1-1/2x6"	331-0002	J 1-1/2x6"	331-0010	S 1-3/4x7"	331-0019
C 1-1/2x6"	331-0003	K 1-1/2x6"	331-0011	T 1-3/4x7"	331-0020
D 1-1/2x6"	331-0004	L 1-1/2x6"	331-0012	U 1-3/4x7"	331-0021
E 1-1/2x6"	331-0005	M 1-1/2x6"	331-0013	V 1-3/4x7"	331-0022
F 1-1/2x6"	331-0006	N 1-1/2x6"	331-0014	W 1-3/4x7"	331-0023
G 1-1/2x6"	331-0007	O 1-1/2x6"	331-0015	X 1-3/4x7"	331-0024
H 1-1/2x6"	331-0008	P 1-1/2x6"	331-0016	Y 1-3/4x7"	331-0025
		Q 1-1/2x6"	331-0017	Z 1-3/4x7"	331-0026

STRAIGHT SHANK CHUCKING

REAMER SETS



3/64" to 1/2" 29 piece **Model No. 331-1000**
 A to Z 26 piece **Model No. 331-0000**
 No.1-60 60piece **Model No. 331-0200**

CARBIDE TIPED CHUCKING REAMER

C2 Grade, Straight Shank

Size	Flute Length	Overall Length	Model No.	Size	Flute Length	Overall Length	Model No.
3/16	1-1/18	4-1/2	241-1012	23/32	2-1/4	9	241-1046
7/32	1-1/4	5	241-1014	3/4	2-1/2	9-1/2	241-1048
1/4	1-1/2	6	241-1016	25/32	2-1/2	9-1/2	241-1050
9/32	1-1/2	6	241-1018	13/16	2-1/2	9-1/2	241-1052
5/16	1-1/2	6	241-1020	27/32	2-1/2	9-1/2	241-1054
11/32	1-1/2	6	241-1022	7/8	2-5/8	10	241-1056
3/8	1-3/4	7	241-1024	29/32	2-5/8	10	241-1058
13/32	1-3/4	7	241-1026	15/16	2-5/8	10	241-1060
7/16	1-3/4	7	241-1028	31/32	2-5/8	10	241-1062
15/32	1-3/4	7	241-1030	1	2-3/4	10-1/2	241-1064
1/2	2	8	241-1032	1-1/16	2-3/4	10-1/2	241-1068
17/32	2	8	241-1034	1-1/8	2-7/8	11	241-1072
9/16	2	8	241-1036	1-3/16	2-7/8	11	241-1076
19/32	2	8	241-1038	1-1/4	3	11-1/2	241-1080
5/8	2-1/4	9	241-1040	1-5/16	3	11-1/2	241-1084
21/32	2-1/4	9	241-1042	1-3/8	3-1/4	12	241-1088
11/16	2-1/4	9	241-1044	1-7/16	3-1/4	12	241-1092
				1-1/2	3-1/2	12-1/2	241-1096



Straight Shank

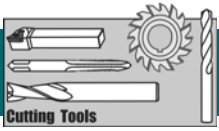


Taper Shank

CARBIDE TIPED CHUCKING REAMER

C2 Grade, Taper Shank

Size	Flute Length	Overall Length	Morse Taper	Model No.
1/2	2	8	MT1	241-1132
9/16	2	8	MT1	241-1136
5/8	2-1/4	9	MT2	241-1140
11/16	2-1/4	9	MT2	241-1144
3/4	2-1/2	9-1/2	MT2	241-1148
13/16	2-1/2	9-1/2	MT2	241-1152
7/8	2-5/8	10	MT2	241-1156
15/16	2-5/8	10	MT3	241-1160
1	2-3/4	10-1/2	MT3	241-1164



Cutting Tools

STRAIGHT SHANK HAND REAMER DIN206-1979

Flute Dia	Overall Length	Overall Length	DIN 206A	DIN 206B
			Straight Flute	Spiral Flute
8	58	115	241-5008	241-5108
9	62	124	241-5009	241-5109
10	66	133	241-5010	241-5110
11	71	142	241-5011	241-5111
12	76	152	241-5012	241-5112
13	76	152	241-5013	241-5113
14	81	163	241-5014	241-5114
15	81	163	241-5015	241-5115
16	87	175	241-5016	241-5116
17	87	175	241-5017	241-5117
18	93	188	241-5018	241-5118

Flute Dia	Overall Length	Overall Length	DIN 206A	DIN 206B
			Straight Flute	Spiral Flute
19	93	188	241-5019	241-5119
20	100	201	241-5020	241-5120
22	107	215	241-5022	241-5122
24	115	231	241-5024	241-5124
25	115	231	241-5025	241-5125
26	115	231	241-5026	241-5126
28	124	247	241-5028	241-5128
30	124	247	241-5030	241-5130
32	133	265	241-5032	241-5132

Flute Dia	Overall Length	Overall Length	DIN 206A	DIN 206B
			Straight Flute	Spiral Flute
34	142	284	241-5034	241-5134
35	142	284	241-5035	241-5135
36	142	284	241-5036	241-5136
38	152	305	241-5038	241-5138
40	152	305	241-5040	241-5140
42	152	305	241-5042	241-5142
44	163	326	241-5044	241-5144
45	163	326	241-5045	241-5145
46	163	326	241-5046	241-5146
48	174	347	241-5048	241-5148
50	174	347	241-5050	241-5150

STRAIGHT SHANK REAMER DIN 212-1981,HSS

Flute Dia	Overall Length	Overall Length	DIN 212/1		DIN 212/2	
			Straight Flute	Spiral Flute	Straight Flute	Spiral Flute
8	33	117	241-6008	241-6108	241-6208	241-6308
9	36	125	241-6009	241-6109	241-6209	241-6309
10	38	133	241-6010	241-6110	241-6210	241-6310
11	41	142	241-6011	241-6111	241-6211	241-6311
12	44	151	241-6012	241-6112	241-6212	241-6312
13	44	151	241-6013	241-6113	241-6213	241-6313
14	47	160	241-6014	241-6114	241-6214	241-6314

Flute Dia	Overall Length	Overall Length	DIN 212/1		DIN 212/2	
			Straight Flute	Spiral Flute	Straight Flute	Spiral Flute
15	50	162	241-6015	241-6115	241-6215	241-6315
16	52	170	241-6016	241-6116	241-6216	241-6316
17	54	175	241-6017	241-6117	241-6217	241-6317
18	56	182	241-6018	241-6118	241-6218	241-6318
19	58	189	241-6019	241-6119	241-6219	241-6319
20	60	195	241-6020	241-6120	241-6220	241-6320

MORSE TAPER SHANK REAMER DIN 208-1981,HSS

Flute Dia	Overall Length	Overall Length	Straight Flute	Spiral Flute
			Flute	Flute
8	33	156	241-7008	241-7108
9	36	162	241-7009	241-7109
10	38	168	241-7010	241-7110
11	41	175	241-7011	241-7111
12	44	182	241-7012	241-7112
13	44	182	241-7013	241-7113
14	47	189	241-7014	241-7114
15	50	204	241-7015	241-7115
16	52	210	241-7016	241-7116
17	54	214	241-7017	241-7117
18	56	219	241-7018	241-7118
19	58	223	241-7019	241-7119
20	60	228	241-7020	241-7120
22	64	237	241-7022	241-7122
24	68	268	241-7024	241-7124
25	68	268	241-7025	241-7125

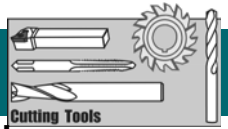
Flute Dia	Overall Length	Overall Length	Straight Flute	Spiral Flute
			Flute	Flute
26	70	273	241-7026	241-7126
28	71	277	241-7028	241-7128
30	75	281	241-7030	241-7130
32	77	317	241-7032	241-7132
34	78	321	241-7034	241-7134
35	78	321	241-7035	241-7135
36	79	325	241-7036	241-7136
38	81	329	241-7038	241-7138
40	81	329	241-7040	241-7140
42	82	333	241-7042	241-7142
44	83	336	241-7044	241-7144
45	83	336	241-7045	241-7145
46	84	340	241-7046	241-7146
48	86	344	241-7048	241-7148
50	86	344	241-7050	241-7150

MORSE TAPER SHANK REAMER DIN311-1975,HSS

Flute Dia	Overall Length	Overall Length	Straight Flute	Spiral Flute
			Flute	Flute
10	95	171	241-8010	241-8110
11	100	176	241-8011	241-8111
13	105	199	241-8013	241-8113
14	115	209	241-8014	241-8114
15	125	219	241-8015	241-8115
16	136	229	241-8016	241-8116
17	136	251	241-8017	241-8117
19	145	261	241-8019	241-8119
21	155	271	241-8021	241-8121

Flute Dia	Overall Length	Overall Length	Straight Flute	Spiral Flute
			Flute	Flute
23	165	281	241-8023	241-8123
25	180	296	241-8025	241-8125
28	195	311	241-8028	241-8128
31	210	326	241-8031	241-8131
32	210	354	241-8032	241-8132
33	210	354	241-8033	241-8133
34	220	364	241-8034	241-8134
37	220	364	241-8037	241-8137
40	230	374	241-8040	241-8140

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STRAIGHT FLUTE TAPER PIN & DIE MAKER REAMER

High Speed Steel,



Straight Flute

Size	Diameter of Small End	Diameter of Large End	Diameter of Flute Length	Overall Length	Model No.
7/0	0.0497	0.0666	13/16	1-13/16"	331-8200
6/0	0.0611	0.0806	15/16	1-15/16"	331-8202
5/0	0.0719	0.0966	1-3/16	2-3/16"	331-8204
4/0	0.0869	0.1142	1-5/16	2-5/16"	331-8206
3/0	0.1029	0.1302	1-5/16	2-5/16"	331-8208
2/0	0.1137	0.1462	1-9/16	2-9/16"	331-8210
0	0.1287	0.1638	1-11/16	2-15/16"	331-8212
1	0.1447	0.1798	1-11/16	2-15/16"	331-8214
2	0.1605	0.2008	1-15/16	3-3/16"	331-8216
3	0.1813	0.2294	2-5/16	3-11/16"	331-8218
4	0.2071	0.2604	2-9/16	4-1/16"	331-8220
5	0.2409	0.2994	2-13/16	4-5/16"	331-8222
6	0.2773	0.354	3-11/16	5-7/16"	331-8224
7	0.3297	0.422	4-7/16	6-5/16"	331-8226
8	0.3971	0.505	5-3/16	7-3/16"	331-8228
9	0.4805	0.6066	6-1/16	8-5/16"	331-8230
10	0.5799	0.7216	6-13/16	9-5/16"	331-8232
11	0.7060	0.8780	8-1/4	11-1/4"	331-8234
12	0.8420	1.0500	10	13-5/8"	331-8236
13	1.0090	1.2590	12	16"	331-8238
14	1.2500	1.5420	14	18-1/4"	331-8240

SPIRAL FLUTE TAPER PIN & DIE MAKER REAMER

High Speed Steel,



Spiral Flute

Size	Diameter of Small End	Diameter of Large End	Diameter of Flute Length	Overall Length	Model No.
7/0	0.0497	0.0666	13/16	1-13/16"	331-8300
6/0	0.0611	0.0806	15/16	1-15/16"	331-8302
5/0	0.0719	0.0966	1-3/16	2-3/16"	331-8304
4/0	0.0869	0.1142	1-5/16	2-5/16"	331-8306
3/0	0.1029	0.1302	1-5/16	2-5/16"	331-8308
2/0	0.1137	0.1462	1-9/16	2-9/16"	331-8310
0	0.1287	0.1638	1-11/16	2-15/16"	331-8312
1	0.1447	0.1798	1-11/16	2-15/16"	331-8314
2	0.1605	0.2008	1-15/16	3-3/16"	331-8316
3	0.1813	0.2294	2-5/16	3-11/16"	331-8318
4	0.2071	0.2604	2-9/16	4-1/16"	331-8320
5	0.2409	0.2994	2-13/16	4-5/16"	331-8322
6	0.2773	0.354	3-11/16	5-7/16"	331-8324
7	0.3297	0.422	4-7/16	6-5/16"	331-8326
8	0.3971	0.505	5-3/16	7-3/16"	331-8328
9	0.4805	0.6066	6-1/16	8-5/16"	331-8330
10	0.5799	0.7216	6-13/16	9-5/16"	331-8332
11	0.7060	0.8780	8-1/4	11-1/4"	331-8334
12	0.8420	1.0500	10	13-5/8"	331-8336
13	1.0090	1.2590	12	16"	331-8338
14	1.2500	1.5420	14	18-1/4"	331-8340

STRAIGHT FLUTE TAPER PIN & DIE MAKER REAMER SETS

Model No. 331-8250

0-5# 6 pcs in vinyl roll pouch

Model No. 331-8255

0-10# 11 pcs in wooden case

SPIRAL FLUTE TAPER PIN & DIE MAKER REAMER SETS

Model No. 331-8350

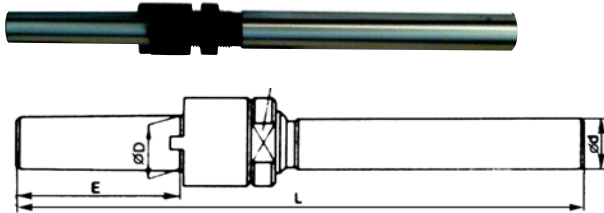
0-5# 6 pcs in vinyl roll pouch

Model No. 331-8355

0-10# 11 pcs in wooden case

E-Z EJECT SHELL REAMER ARBORS

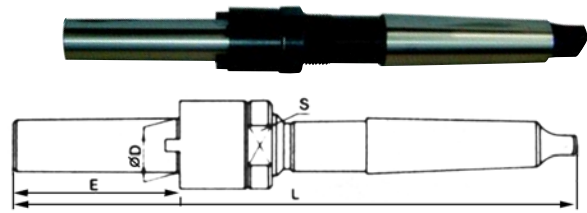
Straight Shank



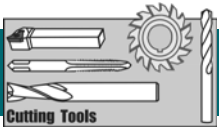
Size	Shank Dia.	Fits Shell Reamer	Overall Length	Model No.
#4	1/2"	21/32"-25/32"	9"	331-2002
#5	5/8"	13/16"-1-1/32"	9-1/2"	331-2004
#6	3/4"	1-1/16"-1-9/32"	10"	331-2006
#7	7/8"	1-5/16"-1-5/8"	11"	331-2008
#8	1-1/8"	1-11/16"-2"	12"	331-2010
#9	1-3/8"	2-1/16"-2-1/2"	13"	331-2012
#10	1-5/8"	2-9/16"-3"	14"	331-2014
#11	2"	3-1/16"-3-1/2"	15"	331-2016
#12	2-1/8"	3-9/16"-4"	16"	331-2018

E-Z EJECT SHELL REAMER ARBORS

Taper Shank



Size	Morse Taper	Arbor Dia.	Fits Shell Reamer	Overall Length	Model No.
#4	MT2	3/8"	21/32"-25/32"	9"	331-2102
#5	MT2	1/2"	13/16"-1-1/32"	9-1/2"	331-2104
#6	MT3	5/8"	1-1/16"-1-9/32"	10"	331-2106
#7	MT3	3/4"	1-5/16"-1-5/8"	11"	331-2108
#8	MT4	1"	1-11/16"-2"	12"	331-2110
#9	MT4	1-1/4"	2-1/16"-2-1/2"	13"	331-2112
#10	MT5	1-1/2"	2-9/16"-3"	14"	331-2114
#11	MT5	1-3/4"	3-1/16"-3-1/2"	15"	331-2116
#12	MT5	2"	3-9/16"-4"	16"	331-2118



Cutting Tools

STRAIGHT SHANK SHELL REAMER ARBOR

Size	Shank Dia.	Fits Shell Reamer	Model No.
#4	1/2"	21/32"-25/32"	331-2204
#5	5/8"	13/16"-1-1/32"	331-2205
#6	3/4"	1-1/16"-1-9/32"	331-2206
#7	7/8"	1-5/16"-1-5/8"	331-2207
#8	1-1/8"	1-11/16"-2"	331-2208
#9	1-3/8"	2-1/16"-2-1/2"	331-2209
#10	1-5/8"	2-9/16"-3"	331-2210
#11	2"	3-1/16"-3-1/2"	331-2211
#12	2-1/8"	3-9/16"-4"	331-2212



TAPER SHANK SHELL REAMER ARBOR

Morse			
Size	Taper	Fits Shell Reamer	Model No.
#4	MT2	21/32"-25/32"	331-2304
#5	MT2	13/16"-1-1/32"	331-2305
#6	MT3	1-1/16"-1-9/32"	331-2306
#7	MT3	1-5/16"-1-5/8"	331-2307
#8	MT4	1-11/16"-2"	331-2308
#9	MT4	2-1/16"-2-1/2"	331-2309
#10	MT5	2-9/16"-3"	331-2310
#11	MT5	3-1/16"-3-1/2"	331-2311
#12	MT5	3-9/16"-4"	331-2312



COUNTERSINKS & DEBURRING TOOL WITH HOLE

High Speed Steel



Sets

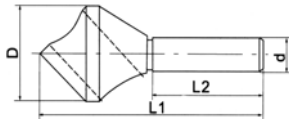
Description	Plastic Stand		Wooden stand Model No.
	Model No.	Model No.	
60j 5Pcs 1 each of: 1/16" to 9/16"	380-0811	380-0810	380-0810
82j 5Pcs 1 each of: 1/16" to 9/16"	380-1811	380-1810	380-1810
90j 5Pcs 1 each of: 1/16" to 9/16"	380-2811	380-2810	380-2810

Individual

Range	Shank		Description	60°	82°	90°
	Dia.	Description		Model No.	Model No.	Model No.
1/16 - 15/64	1/4"	0 double end	380-0815	380-1815	380-2815	
5/32 - 13/32	1/4"	1 single end	380-0816	380-1816	380-2816	
3/16 - 17/32	1/4"	2 single end	380-0817	380-1817	380-2817	
3/16 - 25/32	1/2"	3 single end	380-0818	380-1818	380-2818	
9/16 - 1-1/16	1/2"	4 single end	380-0819	380-1819	380-2819	
5/8 - 1-15/32	1/2"	5 single end	380-0822	380-1822	380-2822	
3/4 - 1-3/4	5/8"	6 single end	380-0823	380-1823	380-2823	
1 - 2	5/8"	7 single end	380-0824	380-1824	380-2824	
1-1/4 - 2-1/2	3/4"	8 single end	380-0825	380-1825	380-2825	

COUNTERSINKS & DEBURRING TOOL WITH HOLE

High Speed Steel



Sets

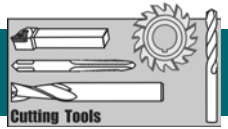
Description	Model No.
60j 4Pcs 1 each of 2/5 - 15/20	380-3402
82j 4Pcs 1 each of 2/5 - 15/20	380-3404
90j 4Pcs 1 each of 2/5 - 15/20	380-3406
60j 5Pcs 1 each of 1/4 - 15/20	380-3502
82j 5Pcs 1 each of 1/4 - 15/20	380-3604
90j 5Pcs 1 each of 1/4 - 15/20	380-3606
60j 5Pcs 1 each of 2/5 - 20/25	380-3602
82j 5Pcs 1 each of 2/5 - 20/25	380-3604
90j 5Pcs 1 each of 2/5 - 20/25	380-3606

Individual

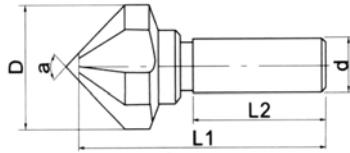
Range	Head Shank			60° Model No.	82° Model No.	90° Model No.
	Dia.	Dia.	Length			
1-4mm	6.35	6.35	45	380-3001	380-3101	380-3201
2-5mm	10	6	45	380-3002	380-3102	380-3202
5-10mm	14	8	48	380-3005	380-3105	380-3205
10-15mm	21	10	65	380-3010	380-3110	380-3210
15-20mm	28	12	85	380-3015	380-3115	380-3215
20-25mm	35	15	102	380-3020	380-3120	380-3220
25-30mm	44	15	115	380-3025	380-3125	380-3225
30-35mm	48	15	127	380-3030	380-3130	380-3230
35-40mm	53	15	136	380-3035	380-3135	380-3235
40-50mm	64	18	166	380-3040	380-3140	380-3240

BLANK FOR COUNTERSINKS 90° WITH HOLE

Size	M2HSS	M35HSS
	Model No.	Model No.
1 - 4mm	351-1001	351-2001
2 - 5mm	351-1002	351-2002
5 - 10mm	351-1005	351-2005
10 - 15mm	351-1010	351-2010
15 - 20mm	351-1015	351-2015
20 - 25mm	351-1020	351-2020
25 - 30mm	351-1025	351-2025
30 - 35mm	351-1030	351-2030
35 - 40mm	351-1035	351-2035
40 - 50mm	351-1040	351-2040



3 FLUTE COUNTERSINK,HSS



Individual

Size	Total Length	Shank ϕ	Angle	M2HSS Model No.
4.3	40	4	90°	353-0043
5	40	4	90°	353-0050
5.3	40	4	90°	353-0053
5.8	45	5	90°	353-0058
6	45	5	90°	353-0060
6.3	45	5	90°	353-0063
7	50	6	90°	353-0070
7.3	50	6	90°	353-0073
8	50	6	90°	353-0080
8.3	50	6	90°	353-0083
9.4	50	6	90°	353-0094
10	50	6	90°	353-0100
10.4	50	6	90°	353-0104
11.5	56	8	90°	353-0115
12.4	56	8	90°	353-0124
13.4	56	8	90°	353-0134
15	60	10	90°	353-0150
16.5	60	8	90°	353-0165
16.5	60	10	90°	353-0166
19	63	10	90°	353-0190
20.5	63	10	90°	353-0205
23	67	10	90°	353-0230
25	67	10	90°	353-0250
26	67	10	90°	353-0260
28	71	12	90°	353-0280
30	71	12	90°	353-0300
31	71	12	90°	353-0310

Sets (packed in wooden box)

Pieces/Set	Size	Angle	Model No.
5	5,6,8,10,12,mm	90°	353-0505
5	15,16.5,20.5,23,25mm	90°	353-0510
6	6.3,8.3,10.4,12.4,16.5,20.5mm	90°	353-0515
10	5.6,8,10,12,15,16.5,20.5,23,25mm	90°	353-0520

BLANKS FOR 3 FLUTE COUNTERSINKS

Note: the angles of 82° and 60° are also available

M2 HSS

Size	Shank ϕ	Model No.
4.3mm	4.0mm	351-0043
4.8mm	4.0mm	351-0048
5.0mm	4.0mm	351-0050
5.3mm	4.0mm	351-0053
5.8mm	5.0mm	351-0058
6.0mm	5.0mm	351-0060
6.3mm	5.0mm	351-0063
7.0mm	6.0mm	351-0070
7.3mm	6.0mm	351-0073
8.0mm	6.0mm	351-0080
8.3mm	6.0mm	351-0083
9.4mm	6.0mm	351-0094
10.0mm	6.0mm	351-0100
10.4mm	6.0mm	351-0104
11.5mm	8.0mm	351-0115

Size	Shank ϕ	Model No.
12.4mm	8.0mm	351-0124
13.4mm	8.0mm	351-0134
15.0mm	10.0mm	351-0150
15.0mm	8.0mm	351-0151
16.5mm	10.0mm	351-0165
16.5mm	8.0mm	351-0166
19.0mm	10.0mm	351-0190
20.5mm	10.0mm	351-0205
23.0mm	10.0mm	351-0230
25.0mm	10.0mm	351-0250
26.0mm	10.0mm	351-0260
28.0mm	12.0mm	351-0280
30.0mm	12.0mm	351-0300
31.0mm	12.0mm	351-0310

M35HSS

Size	Shank ϕ	Model No.
4.3mm	4.0mm	351-2043
4.8mm	4.0mm	351-2048
5.0mm	4.0mm	351-2050
5.3mm	4.0mm	351-2053
5.8mm	5.0mm	351-2058
6.0mm	5.0mm	351-2060
6.3mm	5.0mm	351-2063
7.0mm	6.0mm	351-2070
7.3mm	6.0mm	351-2073
8.0mm	6.0mm	351-2080
8.3mm	6.0mm	351-2083
9.4mm	6.0mm	351-2094
10.0mm	6.0mm	351-2100
10.4mm	6.0mm	351-2104

Size	Shank ϕ	Model No.
11.5mm	8.0mm	351-2115
12.4mm	8.0mm	351-2124
13.4mm	8.0mm	351-2134
15.0mm	1.0mm	351-2150
15.0mm	8.0mm	351-2151
16.5mm	10.0mm	351-2165
16.5mm	8.0mm	351-2190
19.0mm	10.0mm	351-2205
20.5mm	10.0mm	351-2230
23.0mm	10.0mm	351-2250
25.0mm	10.0mm	351-2260
26.0mm	10.0mm	351-2280
28.0mm	12.0mm	351-2300
30.0mm	12.0mm	351-2310
31.0mm	12.0mm	351-2310

SOLID CARBIDE BLANK 90°

Size	Final ϕ	Shank ϕ	Total Length	Model No.
6.6mm	6.3mm	5.0mm	45mm	351-4063
8.6mm	8.3mm	6.0mm	50mm	351-4083
10.7mm	10.4mm	6.0mm	50mm	351-4104

SOLID CARBIDE BLANK 90°

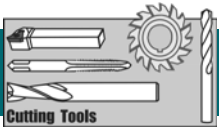
WITH SOLDERED SHANK

Size	Final ϕ	Shank ϕ	Total Length	Model No.
12.8mm	12.4mm	8.0mm	56mm	351-4124
15.4mm	15.0mm	10.0mm	60mm	351-4150
16.9mm	16.5mm	10.0mm	60mm	351-4165
21.1mm	20.5mm	10.0mm	63mm	351-4205
25.6mm	25.0mm	10.0mm	67mm	351-4250
31.6mm	31.0mm	12.0mm	71mm	351-4310

CARBIDE BLANK 60°

WITH SOLDERED SHANK

Size	Final ϕ	Shank ϕ	Total Length	Model No.
12.8mm	12.4mm	8.0mm	56mm	351-5124
16.9mm	16.5mm	10.0mm	60mm	351-5165

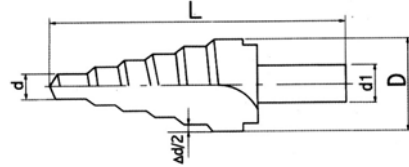


Cutting Tools

STEP DRILLS WITH 2 FLUTES, HSS

Individual

Drilling Range	Total Length	Steps	Steps Dias	Shank	
				¢	Model No.
4-12mm	65.0mm	5	4-12 by 2mm	6	354-5005
4-12mm	65.0mm	9	4-12 by 1mm	6	354-5010
4-20mm	75.0mm	9	4-20 by 2mm	8	354-5011
4-30mm	100.0mm	14	4-30 by 2mm	10	354-5012
4-39mm	107.0mm	13	4,6-39 by 3mm	10	354-5013
4.8-10.65mm	54.0mm	5	4.8,6.4,7.2,9.6,10.65mm	6	354-5014
5-28mm	69.0mm	7	5.0,8.8,11.8,15.3,19,24.5,28.0mm	10	354-5016
6-25mm	65.0mm	7	6,9,12,16,20,22.5,25mm	10	354-5017
6-26.7mm	75.0mm	8	6,9,11.4,14,17.25,19,21.25,26.75mm	10	354-5018
6-30.5mm	80.0mm	13		10	354-5019
6-32mm	75.0mm	8	6-30 by 2mm	10	354-5021
6-37mm	100.0mm	12	6.,9,11.2,14.5,18.2,22.3,27.9,32mm	10	354-5022
			6,9,12.5,15.2,18.6,20.4,22.5,		
6-38mm	100.0mm	12	26,28.3,30.5,34,37mm	10	354-5023
			6,9,13,16,19,21,23,26,29,32,		
6-40mm	105.0mm	16	35,38mm	13	354-5024
			6,11,17,23, 29-40 by 1mm		



Sets (packed in wooden box)

Pieces/Set	Size	Model No.
3	4-12mm (9 steps), 4-20mm(9 steps), 4-30mm (14 steps)	354-5030

INDEXABLE COUNTERSINK & CHAMFERING TOOL

- Overall Length 2-3/8"
- Positive rake for smooth cutting without chatter.
- Use standard inserts.



Sets

Descriptions	3PCS	
	Model No.	
60° with Stand.	380-4000	
82° with Stand.	380-4100	
90° with Stand.	380-4200	

Individual

Cutter body	Shank	Insert	60°	82°	90°
			Model No.	Model No.	Model No.
1/4 - 3/4"	1/2"	TPGH321	380-4010	380-4110	380-4210
1/2 - 1-3/4"	1/2"	SPGH433	380-4015	380-4115	380-4215
1-1/4 - 2-1/2"	3/4"	SPGH433	380-4020	380-4120	380-4220

Insert

	Radius	I.C.	Thickness	Model No.
TPGH321	1/64"	3/8"	1/8"	380-4310
SPGH433	3/16"	1/2"	1/8"	380-4320

Replacement Hold Down Screw

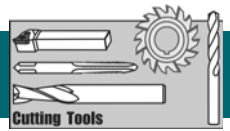
Model No.: 380-4300

HSS COUNTERSINK WITH HEXAGO SHANK

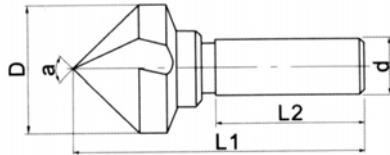


Metric Size

Size	Shank ¢	Shank Length	Total Length	Model No.
6.3	6.35	20	31	351-3063
8.3	6.35	20	32	351-3083
10.4	6.35	20	34	351-3104
12.4	6.35	20	35.5	351-3124
16.5	6.35	20	40	351-3165
20.5	6.35	20	40	351-3205



SINGLE FLUTE COUNTERSINK, HSS



Metric

Size mm	Total Length	Shank ϕ	Angle	M2HSS Model No.
6	45	5	90°	353-8060
8	50	6	90°	353-8080
10	50	6	90°	353-8100
12	56	8	90°	353-8120
16	60	10	90°	353-8160
20	63	10	90°	353-8200
25	67	10	90°	353-8250
30	71	12	90°	353-8300
32	80	12	90°	353-8320
40	89	15	90°	353-8400
50	98	15	90°	353-8500

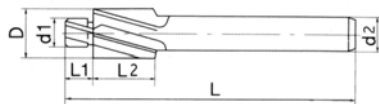
Inch

Size mm	Total Length	Shank ϕ	Angle	Model No.
3/16"	1-1/2"	3/16"	82°	353-8606
1/4"	2"	1/4"	82°	353-8608
5/16"	2"	1/4"	82°	353-8610
3/8"	2"	1/4"	82°	353-8612
1/2"	2"	1/4"	82°	353-8616
5/8"	2-1/4"	1/2"	82°	353-8620
3/4"	2-3/4"	1/2"	82°	353-8624
7/8"	2-3/4"	1/2"	82°	353-8628
1"	2-3/4"	1/2"	82°	353-8632
1-1/4"	3"	3/4"	82°	353-8638
1-1/2"	3-1/2"	3/4"	82°	353-8648
2"	3-1/2"	3/4"	82°	353-8664

Sets (packed in wooden box)

Pieces/Set	Size	Angle	Model No.
7	6-8-10-12-16-20-25mm	90°	353-8701
11	6-8-10-12-12-20-25-30-32-40-50mm	90°	353-8705
7	1/4"-5/16"-3/8"-1/2"-5/8"-3/4"-1"	82°	353-8801
11	1/4"-5/16"-3/8"-1/2"-5/8"-7/8"-3/4" 1"-1-1/4"-1-1/2"-2"	82°	353-8805

CYLINDRICAL COUNTERBORES, HSS



Metric

Size	D	d1	d2	L1	L2	L	Model No.
M3	5.9	3.2	6	3	10	45	354-4003
M4	7.4	4.2	6	4	12	48	354-4004
M5	8.9	5.2	6	5	13	51	354-4005
M6	10.4	6.2	8	6	15	58	354-4006
M8	13.4	8.2	10	8	16	67	354-4008
M10	16.8	10.3	12	10	16	74	354-4010
M12	18.8	12.4	12	12	20	83	354-4012
M14	24	14.4	12	14	25	90	354-4014
M16	26	16.5	16	16	28	100	354-4016

Sets (packed in wooden box)

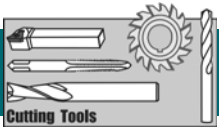
Pieces/Set	Size	Model No.
7	M3, M4, M5, M6, M8, M10, M12	354-4090

BLANK FOR CYLINDRICAL COUNTERBORES

Size	M2HSS Model No.	M35HSS Model No.
M3	354-0003	354-1003
M4	354-0004	354-1004
M5	354-0005	354-1005
M6	354-0006	354-1006
M8	354-0008	354-1008
M10	354-0010	354-1010
M12	354-0012	354-1012

Inch

Size	D	d1	d2	L1	L2	L	Model No.
M1/4	7/16	1/4	5/16	1/4	5/16	2-1/2	354-4050
M5/16	1/2	5/16	3/8	5/16	3/8	2-1/2	354-4055
M3/8	5/8	3/8	3/8	5/16	1/2	3	354-4060
M1/2	3/4	1/2	1/2	3/8	5/8	3	354-4065
M5/8	7/8	5/8	1/2	1/2	5/8	3-1/2	354-4070
M3/4	1	3/4	3/4	1/2	5/8	3-1/2	354-4075



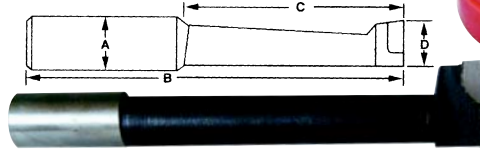
Cutting Tools

CARBIDE TIPPED BORING BARS

- Tool life is extended because each bar has far more steel behind the cutting edge for heavier chatter free cut. Deeper bore and more precise work.
- The same bar can bore flat bottom hole or face. Grind bar on cutting end for special tools such as grooving, threading, or automatic operations.



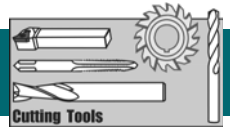
- Up to 100% longer tool life.
- All shanks are ground to +0-0.005".
- All 1/2", 3/4" and 1" shanks fit most boring and facing heads.



C2-Cast Iron C6-Steel

"A" Shank Dia.	"B" Length	"C" Bore Depth	"D" Min. bore	Tool No.	C2 Model No.	C6 Model No.	C2 Set Model No.	C6 Set Model No.	Stand Material
3/8"	2"	3/4"	5/16"	A5S	375-1012	375-1016	9Pcs Set 375-1002	9Pcs Set 375-1006	Wooden Plastic
3/8"	2-3/8"	1-1/8"	5/16"	A5M	375-1022	375-1026	375-1002	375-1006	Wooden Plastic
3/8"	2-3/4"	1-1/2"	5/16"	A5L	375-1032	375-1036	375-1102	375-1106	Wooden Plastic
3/8"	2-3/16"	15/16"	3/8"	A3S	375-1042	375-1046			
3/8"	2-21/32"	1-13/32"	3/8"	A3M	375-1052	375-1056			
3/8"	3-1/8"	1-7/8"	3/8"	A3L	375-1062	375-1066			
3/8"	2-3/8"	1-1/8"	7/16"	A7S	375-1072	375-1076			
3/8"	3-15/16"	1-11/16"	7/16"	A7M	375-1082	375-1086			
3/8"	3-1/2"	2-1/4"	7/16"	A7L	375-1092	375-1096			
1/2"	2-1/4"	3/4"	5/16"	B5S	375-1212	375-1216	9Pcs Set 375-1202	9Pcs Set 375-1206	Wooden Plastic
1/2"	2-5/8"	1-1/8"	5/16"	B5M	375-1222	375-1226	375-1202	375-1206	Wooden Plastic
1/2"	3"	1-1/2"	5/16"	B5L	375-1232	375-1236	375-1302	375-1306	Wooden Plastic
1/2"	2-5/8"	1-1/8"	7/16"	B7S	375-1242	375-1246			
1/2"	3-3/16"	1-11/16"	7/16"	B7M	375-1252	375-1256			
1/2"	3-3/4"	2-1/4"	7/16"	B7L	375-1262	375-1266			
1/2"	3"	1-1/2"	9/16"	B9S	375-1272	375-1276			
1/2"	3-3/4"	2-1/4"	9/16"	B9M	375-1282	375-1286			
1/2"	4-1/2"	3"	9/16"	B9L	375-1292	375-1296			
5/8"	2-1/4"	3/4"	5/16"	D5S	375-1412	375-1416	12Pcs Set 375-1402	12Pcs Set 375-1406	Wooden Plastic
5/8"	2-5/8"	1-1/8"	5/16"	D5M	375-1422	375-1426	375-1402	375-1406	Wooden Plastic
5/8"	3"	1-1/2"	5/16"	D5L	375-1432	375-1436	375-1532	375-1536	Wooden Plastic
5/8"	2-5/8"	1-1/8"	7/16"	D7S	375-1442	375-1446			
5/8"	3-3/16"	1-11/16"	7/16"	D7M	375-1452	375-1456			
5/8"	3-3/4"	2-1/4"	7/16"	D7L	375-1462	375-1466			
5/8"	3"	1-1/2"	9/16"	D9S	375-1472	375-1476			
5/8"	3-3/4"	2-1/4"	9/16"	D9M	375-1482	375-1486			
5/8"	4-1/2"	3"	9/16"	D9L	375-1492	375-1496			
5/8"	3-3/8"	1-7/8"	11/16"	D11S	375-1502	375-1506			
5/8"	4-5/16"	2-13/16"	11/16"	D11M	375-1512	375-1516			
5/8"	5-1/4"	3-3/4"	11/16"	D11L	375-1522	375-1526			
3/4"	3-1/8"	1-1/8"	7/16"	C7S	375-1612	375-1616	12Pcs Set 375-1602	12Pcs Set 375-1606	Wooden Plastic
3/4"	3-11/16"	1-11/16"	7/16"	C7M	375-1622	375-1626	375-1602	375-1606	Wooden Plastic
3/4"	4-1/4"	2-1/4"	7/16"	C7L	375-1632	375-1636	375-1732	375-1736	Wooden Plastic
3/4"	3-1/2"	1-1/2"	9/16"	C9S	375-1642	375-1646			
3/4"	4-1/4"	2-1/4"	9/16"	C9M	375-1652	375-1656			
3/4"	5"	3"	9/16"	C9L	375-1662	375-1666			
3/4"	3-7/8"	1-7/8"	11/16"	C11S	375-1672	375-1676			
3/4"	4-13/16"	2-13/16"	11/16"	C11M	375-1682	375-1686			
3/4"	5-3/4"	3-3/4"	11/16"	C11L	375-1692	375-1696			
3/4"	4-1/4"	2-1/4"	13/16"	C13S	375-1702	375-1706			
3/4"	5-3/8"	3-3/8"	13/16"	C13M	375-1712	375-1716			
3/4"	6-1/2"	4-1/2"	13/16"	C13L	375-1722	375-1726			
1"	5.0"	3.0"	9/16"	E9L	375-1812	375-1816	7Pcs Set 375-1802	7Pcs Set 375-1806	Wooden
1"	5-3/4"	3-3/4"	11/16"	E11L	375-1822	375-1826	375-1802	375-1806	Wooden
1"	6-1/2"	4-1/2"	7/8"	E14L	375-1832	375-1836			
1"	6-1/2"	4-1/2"	1-1/16"	E18L	375-1842	375-1846			
1"	7-3/4"	5-3/4"	1-1/4"	E20L	375-1852	375-1856			
1"	8-1/4"	6-1/4"	1-1/2"	E24L	375-1862	375-1866			
1"	9-1/2"	7-1/2"	1-5/8"	E26L	375-1872	375-1876			

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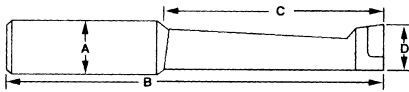


CARBIDE TIPPED METRIC BORING BARS

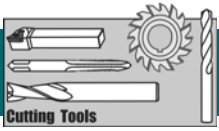
- Up to 100% longer tool life.
- All shanks are grounded to +0-0.01mm.
- Tool life is extended because each bar has far more steel behind the cutting edge for heavier chatter free cut. Deeper bore and more precise work.
- The same bar can bore flat bottom hole or face. Grind bar on cutting end for special tools such as grooving, threading, or automatic operations.

ISOK20-For Cast iron

ISOP20-For Steel



"A" Shank Dia.	"B" Length	"C" Bore Depth	"D" Min. Bore	ISOK20 Model No	ISOP20 Model No	ISOK20 Model No	ISOP20 Model No	Stand Material
10mm	50.8	19	7.9	375-3012	375-3016	9Pcs Set	9Pcs Set	
10mm	60.3	28.5	7.9	375-3022	375-3026	375-3002	375-3006	Wooden
10mm	69.8	38.1	7.9	375-3032	375-3036	375-3102	375-3106	Plastic
10mm	55.5	23.8	9.5	375-3042	375-3046			
10mm	67.46	35.71	9.5	375-3052	375-3056			
10mm	79.3	47.6	9.5	375-3062	375-3066			
10mm	60.3	28.5	11.1	375-3072	375-3076			
10mm	100	42.8	11.1	375-3082	375-3086			
10mm	88.9	57.1	11.1	375-3092	375-3096			
12mm	57.1	19	7.9	375-3212	375-3216	9Pcs Set	9Pcs Set	
12mm	66.6	28.5	7.9	375-3222	375-3226	375-3202	375-3206	Wooden
12mm	76.2	38.1	7.9	375-3232	375-3236	375-3302	375-3306	Plastic
12mm	66.6	28.5	11.1	375-3242	375-3246			
12mm	80.9	42.8	11.1	375-3252	375-3256			
12mm	95.2	57.15	11.1	375-3262	375-3266			
12mm	76.2	38.1	13	375-3272	375-3276			
12mm	95.2	57.1	13	375-3282	375-3286			
12mm	114.3	76.2	13	375-3292	375-3296			
16mm	57.1	19	7.9	375-3412	375-3416	12Pcs Set	12Pcs Set	
16mm	66.6	28.5	7.9	375-3422	375-3426	375-3402	375-3406	Wooden
16mm	76.2	38.1	7.9	375-3432	375-3436	375-3532	375-3536	Plastic
16mm	66.6	28.5	11.1	375-3442	375-3446			
16mm	80.9	42.8	11.1	375-3452	375-3456			
16mm	95.2	57.1	11.1	375-3462	375-3466			
16mm	76.2	38.1	14.2	375-3472	375-3476			
16mm	95.2	57.1	14.2	375-3482	375-3486			
16mm	114.3	76.2	14.2	375-3492	375-3496			
16mm	85.7	47.6	17	375-3502	375-3506			
16mm	109.5	71.4	17	375-3512	375-3516			
16mm	133.3	95.2	17	375-3522	375-3526			
20mm	79.3	28.5	11.1	375-3612	375-3616	12Pcs Set	12Pcs Set	
20mm	93.6	42.8	11.1	375-3622	375-3626	375-3602	375-3606	Wooden
20mm	107.9	57.1	11.1	375-3632	375-3636	375-3732	375-3736	Plastic
20mm	88.9	38.1	14.2	375-3642	375-3646			
20mm	107.9	57.1	14.2	375-3652	375-3656			
20mm	127	76.2	14.2	375-3662	375-3666			
20mm	98.4	47.6	17.4	375-3672	375-3676			
20mm	122.2	71.4	17.4	375-3682	375-3686			
20mm	146	95.2	17.4	375-3692	375-3696			
20mm	107.9	57.1	20.6	375-3702	375-3706			
20mm	136.5	85.7	20.6	375-3712	375-3716			
20mm	165.1	114.3	20.6	375-3722	375-3726			



Cutting Tools

DOUBLE END CALIBRATED BORING BARS



Diameter Of Bar	Overall Length	Tool Bit Size	Model No.
3/8	6"	3/16" round tool bits	378-4302
1/2	6"	3/16" square tool bits	378-4304
1/2	9"	3/16" square tool bits	378-4306
5/8	10"	3/16" square tool bits	378-4308
3/4	12"	1/4" square tool bits	378-4310
1	12"	1/4" square tool bits	378-4312
1-1/4	16"	3/8" square tool bits	378-4314
1-1/2	18"	3/8" square tool bits	378-4316

SINGLE END BORING BARS

45° & 90°



Model No. 378-4240

4pcs set (1/4, 3/8, 1/2, 5/8")90°

Model No. 378-4140

4pcs set (1/4, 3/8, 1/2, 5/8")45°



Diameter of Bar	Overall Length	Bit Size	45° Model No.	90° Model No.
1/4	2-1/2"	5/32" round tool bits	378-4102	378-4202
5/16	2-1/2"	3/16" round tool bits	378-4104	378-4204
3/8	3"	3/16 round tool bits	378-4106	378-4206
1/2	3"	3/16 square tool bits	378-4108	378-4208
9/16	4-12"	3/16 square tool bits	378-4110	378-4210
5/8	5"	1/4 square tool bits	378-4112	378-4212
3/4	6"	1/4 square tool bits	378-4114	378-4214
1"	6"	5/16 square tool bits	378-4116	378-4216
1"	6"	3/8 square tool bits	378-4118	378-4218
1-1/8	7"	7/16 square tool bits	378-4120	378-4220
1-1/4	8"	1/2 square tool bits	378-4122	378-4222
1-1/2	9"	1/2 square tool bits	378-4124	378-4224

DOUBLE END BORING BARS

45° & 90°



Model No.378-4000

5-pc double end set (1/4, 3/8, 1/2, 5/8, 3/4, one of each)

Model No.378-4001

5-pc double end set (3/8, 1/2, 5/8, 3/4, 1" one of each)

Model No.378-4030

4-pc set(1/2x6x1/4", 9/16x6-1/2x1/4", 5/8x10x1/4", 3/4x12x1/4")

Model No.378-4031

4-pc set (1/4, 5/16, 3/8, 1/2")



Size	Tool Bit Size	Model No.
1/4x5"	5/32" round tollbits	378-4002
5/16x5"	3/16" round tollbits	378-4004
3/8x6"	3/16" round tollbits	378-4006
1/2x6"	3/16" square toolbits	378-4008
1/2x6"	1/4"square toolbits	378-4009
1/2x9"	1/4"square toolbits	378-4010
5/8x10"	1/4" square toolbits	378-4012
3/4x12"	1/4" square toolbits	378-4014
1x12"	1/4" square toolbits	378-4015
1x12"	5/16" square toolbits	378-4016
1-1/4x16"	1/2" square toolbits	378-4018
1-1/2x18"	1/2" square toolbits	378-4020
9/16X6-1/2"	1/4"square toolbits	378-4021

FLY-TOOL CUTTER HOLDERS & SETS

Straight Shank



Counter balanced tap get smoother finished.Hardened steel, machines up to 6" wide surface with stand tool bit. Tool bit replaces end mill and resharpening. Sets come complete with wooden stand.

Head Diameter	Shank Size	Tool Bit Size	Model No.	Sets Model No.
3/4"	1/2"	3/16"	225-3031	225-3030
1-1/8"	1/2"	1/4"	225-3032	
1-1/2"	1/2"	5/16"	225-3033	
1-1/2"	3/4"	5/16"	225-3041	225-3040
2"	3/4"	5/16"	225-3042	
2-1/2"	3/4"	5/16"	225-3043	

CIRCULAR CUTTERS

- Cuts steel up to 10mm thick and/or 20mm for two-side work surfaces
- infinitely variable diameter adjustment 30-300mm

MT2, Model No. 286-1002

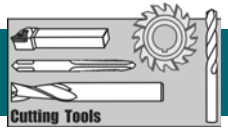
MT3, Model No. 286-1003

Replacement twist drill 5x15mm: **Model No. 286-1101**

Replacement knife : **Model No. 286-1105**



Cutting Tools



CARBIDE BURRS

Shape A- Cylindrical



Style	Cutting Diameter	Cutting Length	Shank Diameter	Single Cut Model No.	Double Cut Model No.
SA-43	1/16	1/2	1/8"	389-0002	389-0102
SA-42	3/32	7/16	1/8"	389-0004	389-0104
SA-41	1/8	9/16	1/8"	389-0006	389-0106
SA-13	5/32	5/8	1/4"	389-0010	389-0110
SA-14	3/16	5/8	1/4"	389-0012	389-0112
SA-1	1/4	5/8	1/4"	389-0014	389-0114
SA-2	5/16	3/4	1/4"	389-0016	389-0116
SA-3	3/8	3/4	1/4"	389-0018	389-0118
SA-4	7/16	1	1/4"	389-0020	389-0120
SA-5	1/2	1	1/4"	389-0022	389-0122
SA-7	3/4	1	1/4"	389-0024	389-0124
SA-9	1	1	1/4"	389-0026	389-0126

Shape B- Cylindrical End Cut



Style	Cutting Diameter	Cutting Length	Shank Diameter	Single Cut Model No.	Double Cut Model No.
SB-42	3/32	7/16	1/8"	389-0504	389-0604
SB-43	1/8	9/16	1/8"	389-0506	389-0606
SB-41	1/16	1/2	1/4"	389-0510	389-0610
SB-13	5/32	5/8	1/4"	389-0512	389-0612
SB-14	3/16	5/8	1/4"	389-0514	389-0614
SB-1	1/4	5/8	1/4"	389-0516	389-0616
SB-2	5/16	3/4	1/4"	389-0518	389-0618
SB-3	3/8	3/4	1/4"	389-0520	389-0620
SB-4	7/16	1	1/4"	389-0522	389-0622
SB-5	1/2	1	1/4"	389-0524	389-0624
SB-7	3/4	1	1/4"	389-0526	389-0626
SB-9	1	1	1/4"	389-0528	389-0628

Shape C- Cylindrical Radius End



Style	Cutting Diameter	Cutting Length	Shank Diameter	Single Cut Model No.	Double Cut Model No.
SC-41	3/32	7/16	1/8"	389-1004	389-1104
SC-42	1/8	9/16	1/8"	389-1006	389-1106
SC-11	1/8	1/2	1/4"	389-1010	389-1110
SC-13	5/32	5/8	1/4"	389-1012	389-1112
SC-14	3/16	5/8	1/4"	389-1014	389-1114
SC-1	1/4	5/8	1/4"	389-1016	389-1116
SC-2	5/16	3/4	1/4"	389-1018	389-1118
SC-3	3/8	3/4	1/4"	389-1020	389-1120
SC-4	7/16	1	1/4"	389-1022	389-1122
SC-5	1/2	1	1/4"	389-1024	389-1124
SC-7	5/8	1	1/4"	389-1026	389-1126
SC-9	3/4	1	1/4"	389-1028	389-1128

Shape D- Ball



Style	Cutting Diameter	Cutting Length	Shank Diameter	Single Cut Model No.	Double Cut Model No.
SD-41	3/32	3/32	1/8"	389-1504	389-1604
SD-42	1/8	1/8	1/8"	389-1506	389-1606
SD-14	3/16	3/16	1/4"	389-1510	389-1610
SD-11	1/8	1/8	1/4"	389-1512	389-1612
SD-1	1/4	1/4	1/4"	389-1514	389-1614
SD-2	5/16	5/16	1/4"	389-1516	389-1616
SD-3	3/8	3/8	1/4"	389-1518	389-1618
SD-5	1/2	1/2	1/4"	389-1520	389-1620
SD-6	5/8	5/8	1/4"	389-1522	389-1622
SD-7	3/4	3/4	1/4"	389-1524	389-1624
SD-9	1	1	1/4"	389-1526	389-1626

Shape E- Oval

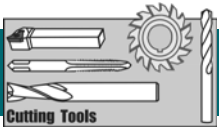


Style	Cutting Diameter	Cutting Length	Shank Diameter	Single Cut Model No.	Double Cut Model No.
SE-53	3/16	9/32	1/8"	389-2004	389-2104
SE-41	1/8	7/32	1/8"	389-2006	389-2106
SE-1	1/4	3/8	1/4"	389-2010	389-2110
SE-3	3/8	5/8	1/4"	389-2012	389-2112
SE-5	1/2	7/8	1/4"	389-2014	389-2114
SE-6	5/8	1	1/4"	389-2016	389-2116
SE-7	3/4	1	1/4"	389-2018	389-2118

Shape F- Three Radius End



Style	Cutting Diameter	Cutting Length	Shank Diameter	Single Cut Model No.	Double Cut Model No.
SF-53	3/16	1/2	1/8"	389-3002	389-3102
SF-41	1/8	1/4	1/8"	389-3004	389-3104
SF-42	1/8	1/2	1/8"	389-3006	389-3106
SF-11	1/8	1/2	1/4"	389-3010	389-3110
SF-1	1/4	5/8	1/4"	389-3012	389-3112
SF-3	3/8	3/4	1/4"	389-3014	389-3114
SF-5	1/2	1	1/4"	389-3016	389-3116
SF-6	5/8	1	1/4"	389-3018	389-3118
SF-7	3/4	1	1/4"	389-3020	389-3120



Cutting Tools

CARBIDE BURRS

Shape G- Three Pointed End



Style	Cutting Diameter	Cutting Length	Shank Diameter	Single Cut Model No.	Double Cut Model No.
SG-43	1/8	3/8	1/8"	389-3502	389-3602
SG-42	1/8	5/16	1/8"	389-3504	389-3604
SG-41	1/8	1/4	1/8"	389-3506	389-3606
SG-1	1/4	5/8	1/4"	389-3510	389-3610
SG-3	3/8	3/4	1/4"	389-3512	389-3612
SG-13	1/2	3/4	1/4"	389-3514	389-3614
SG-5	1/2	1	1/4"	389-3516	389-3616
SG-6	5/8	1	1/4"	389-3518	389-3618
SG-7	3/4	1	1/4"	389-3520	389-3620

Shape H- Flame



Style	Cutting Diameter	Cutting Length	Shank Diameter	Single Cut Model No.	Double Cut Model No.
SH-53	3/16	3/8	1/8"	389-2504	389-2604
SH41	1/8	1/4	1/8"	389-2506	389-2606
SH-1	1/4	5/8	1/4"	389-2510	389-2610
SH-2	5/16	3/4	1/4"	389-2512	389-2612
SH-5	1/2	1-1/4	1/4"	389-2514	389-2614
SH-6	5/8	1-7/16	1/4"	389-2516	389-2616
SH-7	3/4	1-5/8	1/4"	389-2518	389-2618

Shape J- 60° Cone



Style	Cutting Diameter	Cutting Length	Shank Diameter	Single Cut Model No.	Double Cut Model No.
SJ-42	1/8	3/32	1/8"	389-4006	389-4106
SJ-1	1/4	3/16	1/4"	389-4010	389-4110
SJ-2	5/16	3/16	1/4"	389-4012	389-4112
SJ-3	3/8	5/16	1/4"	389-4014	389-4114
SJ-5	1/2	7/16	1/4"	389-4016	389-4116
SJ-6	5/8	9/16	1/4"	389-4018	389-4118
SJ-7	3/4	11/16	1/4"	389-4020	389-4120
SJ-9	1	15/16	1/4"	389-4022	389-4122

Shape K- 90° Cone



Style	Cutting Diameter	Cutting Length	Shank Diameter	Single Cut Model No.	Double Cut Model No.
SK-42	1/8	1/16	1/8"	389-4506	389-4606
SK-1	1/4	1/8	1/4"	389-4510	389-4610
SK-2	5/16	3/16	1/4"	389-4512	389-4612
SK-3	3/8	3/16	1/4"	389-4514	389-4614
SK-5	1/2	1/4	1/4"	389-4516	389-4616
SK-6	5/8	5/16	1/4"	389-4518	389-4618
SK-7	3/4	3/8	1/4"	389-4520	389-4620
SK-9	1	1/2	1/4"	389-4522	389-4622

Shape L- Taper or Cone Radius End



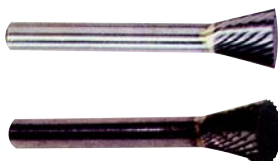
Shape	Style	Cutting Diameter	Cutting Length	Shank Diameter	Single Cut Model No.	Double Cut Model No.
8Deg.Taper	SL-53	3/16	1/2	1/8	389-5002	389-5102
8Deg.Taper	SL-42	1/8	1/2	1/8	389-5004	389-5104
8Deg.Taper	SL-41	1/8	3/8	1/8	389-5006	389-5106
14Deg.Taper	SL-1	1/4	5/8	1/4	389-5010	389-5110
14 Deg.Taper	SL-2	5/16	7/8	1/4	389-5012	389-5112
14 Deg.Taper	SL-3	3/8	1-1/16	1/4	389-5014	389-5114
14 Deg.Taper	SL-4	1/2	1-1/8	1/4	389-5016	389-5116
14 Deg.Taper	SL-5	5/8	1-3/16	1/4	389-5018	389-5118
14 Deg.Taper	SL-6	5/8	1-5/16	1/4	389-5020	389-5120
14 Deg.Taper	SL-7	3/4	1-1/2	1/4	389-5022	389-5122

Shape M- Taper or Cone Flat End



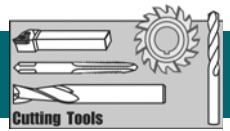
Shape	Style	Cutting Diameter	Cutting Length	Shank Diameter	Single Cut Model No.	Double Cut Model No.
16Deg.Taper	SM-53	3/16	1/2	1/8"	389-5502	389-5602
7Deg.Taper	SM-43	1/8	1/8	1/8"	389-5504	389-5604
14Deg.Taper	SM-42	1/8	7/16	1/8"	389-5506	389-5606
12Deg.Taper	SM-41	1/8	11/32	1/8"	389-5508	389-5608
22Deg.Taper	SM-1	1/4	1/2	1/4"	389-5510	389-5610
14Deg.Taper	SM-2	1/4	3/4	1/4"	389-5512	389-5612
10Deg.Taper	SM-3	1/4	1	1/4"	389-5514	389-5614
28Deg.Taper	SM-4	3/8	5/8	1/4"	389-5516	389-5616
28Deg.Taper	SM-5	1/2	5/8	1/4"	389-5518	389-5618
30Deg.Taper	SM-6	5/8	1	1/4"	389-5520	389-5620

Shape N- Inverted Cone



Shape	Style	Cutting Diameter	Cutting Length	Shank Diameter	Single Cut Model No.	Double Cut Model No.
10Deg.Taper	SN-41	3/32	1/8	1/8"	389-6002	389-6102
10Deg.Taper	SN-42	1/8	3/16	1/8"	389-6004	389-6104
10Deg.Taper	SN-53	3/16	1/4	1/8"	389-6006	389-6106
10Deg.Taper	SN-1	1/4	5/16	1/4"	389-6010	389-6110
13Deg.Taper	SN-2	3/8	3/8	1/4"	389-6012	389-6112
28Deg.Taper	SN-4	1/2	1/2	1/4"	389-6014	389-6114
18Deg.Taper	SN-6	5/8	3/4	1/4"	389-6016	389-6116
30Deg.Taper	SN-7	3/4	5/8	1/4"	389-6018	389-6118

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DIN8032 CARBIDE BURRS

6mm Shank Dia.

Carbide Burrs-ZYA (Cylindrical)



Style	Cutting Dia.	Cutting Length	Model No.
ZYA0413	4mm	13mm	489-0004
ZYA0616	6mm	16mm	489-0006
ZYA0820	8mm	20mm	489-0008
ZYA1013	10mm	13mm	489-0010
ZYA1020	10mm	20mm	489-0011
ZYA1225	12mm	25mm	489-0012
ZYA1625	16mm	25mm	489-0016

Carbide Burrs-ZYAS (Cylindrical End Cut)



Style	Cutting Dia.	Cutting Length	Model No.
ZYAS 0413	4mm	13mm	489-0104
ZYAS 0616	6mm	16mm	489-0106
ZYAS 0820	8mm	20mm	489-0108
ZYAS 1013	10mm	13mm	489-0110
ZYAS 1020	10mm	20mm	489-0111
ZYAS 1225	12mm	25mm	489-0112
ZYAS 1625	16mm	25mm	489-0116

Carbide Burrs-WRC(Cylindrical Radius End)



Style	Cutting Dia.	Cutting Length	Model No.
WRC0413	4mm	13mm	489-0204
WRC0616	6mm	16mm	489-0206
WRC0820	8mm	20mm	489-0208
WRC1020	10mm	20mm	489-0210
WRC1225	12mm	25mm	489-0212
WRC1625	16mm	25mm	489-0216

Carbide Burrs-KUD(Ball)



Style	Cutting Dia.	Cutting Length	Model No.
KUD 0403	4mm	3.6mm	489-0304
KUD 0605	6mm	5.4mm	489-0306
KUD 0807	8mm	7.0mm	489-0308
KUD 1009	10mm	9.0mm	489-0310
KUD 1210	12mm	10.8mm	489-0312
KUD 1614	16mm	14.3mm	489-0316
KUD 2018	20mm	18.0mm	489-0320

Carbide Burrs-SPG(Three Pointed End)



Style	Cutting Dia.	Cutting Length	Model No.
SPG 0618	6mm	18mm	489-0406
SPG 1020	10mm	20mm	489-0410
SPG 1225	12mm	25mm	489-0412
SPG 1230	12mm	30mm	489-0413
SPG 1630	16mm	30mm	489-0416

Carbide Burrs-Tre(Oval)



Style	Cutting Dia.	Cutting Length	Model No.
TRE0610	6mm	10mm	489-0506
TRE0813	8mm	13mm	489-0508
TRE1016	10mm	16mm	489-0510
TRE1220	12mm	20mm	489-0512
TRE1625	16mm	25mm	489-0516

Carbide Burrs-SKM(Taper or Cone Flat End)



Style	Cutting Dia.	Cutting Length	Model No.
SKM0618 18 degree	6mm		489-0606
SKM1020 28 degree	10mm	18mm	489-0610
SKM1225 26 degree	12mm		489-0612

Carbide Burrs-KEL(Taper or Cone Radius End)



Style	Cutting Dia.	Cutting Length	Model No.
KEL1020 14 degree	10mm		489-0710
KEL1225 14 degree	12mm	20mm	489-0712
KEL1230 14 degree	12mm		489-0713
KEL1630 14 degree	16mm	25mm	489-0716

Carbide Burrs-RBF(Three Radius End)

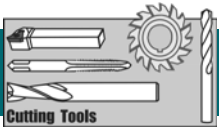


Style	Cutting Dia.	Cutting Length	Model No.
RBF0618	6mm	18mm	489-0806
RBF0820	8mm	20mm	489-0808
RBF1020	10mm	20mm	489-0810
RBF1225	12mm	25mm	489-0812
RBF1630	16mm	30mm	489-0816

Carbide Burrs-B(Flame)



Style	Cutting Dia.	Cutting Length	Model No.
B 0820	8mm	20mm	489-0908
B 1230	12mm	30mm	489-0912
B 1635	16mm	35mm	489-0916



Cutting Tools

CARBIDE INSERTS

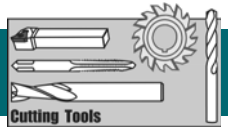
When ordering, please indicate the Types, Sizes, as well the Chip Breakers to us.
Such as CNMG120408, DNMG150608-V2, etc.

INDEXABLE CUTTING INSERTS

S Square (90°)	SNUN	SPUN	SFUN	SPMR-T	SPMR-M	SNMA	SNMM-A	SNMM-H	SNMM-Y
SNMG-ZF1	SNMG-ZF3	SNMG-ZG	SCMT-V	SCMT-ZM	SCMT-ZF3	SCGH-ZR54	SCUW	SPGB	SPMW
SNMG-ZKM	SCMT-HKF	T Triangle(60°)	TNUN	TPUN	TNMA	TPGA	TPUR-T	TNMM-V	TNMG-A
TNMG-ZPF	TNMG-ZPS	TNMG-ZKM	TNMG-ZKF	C Rhombic(80°)	CNMA	CNMM-V	CNMM-M	CNMM-H	CNMM-ZR
CCMT	CNMT-V	CCMT-V	CPGT-ZM	CCMT-ZF	CCMT-ZF3	CNMG-ZPR	CNMM-ZPQ	CNMG-ZPM	CCMT-HPM
CNMG-ZKR	CCMT-HKR	CCMT-HKM	D Rhombic(55°)	DNMA	DNMM-V	DNMM-M	DNMG-V	DNMG-M	DNMM-ZF
DCMT-HMM	DCMT-HKM	K	KOUX-L11	KOUX-R11	KNUX-L11	KNUX-R11	V Rhombic(35°)	VNMA	VNMM-V
WNMG-Y	WCMT-V	WCMT-ZF3	R Round	RNMN	RNMA	RNMM-V	RCMM-ZR51	RCMM-V	RCUT

MILLING INSERTS

S	SNA(C/K)N-ANN	SNA(C/K)N-ENN	SPMW-ANN	SPFN-T	SPA(C/K)N-EDR(L)	SECN-EER/(L)	SFAN-EER(L)	SPMW-EDR(L)	L



CARBIDE INSERTS

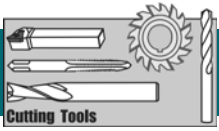
When ordering, please indicate the Types, Sizes, as well the Chip Breakers to us.
Such as CNMG120408, DNMG150608-V2, etc.

INDEXABLE CUTTING INSERTS

SNMM-M	SNMM-V	SNMM-ZM24	SNMG-ZM24	SNMM-ZR	SNMM-ZR51	SNMM-ZR53	SNMG-V	SNMG-ZM	SNMG-ZF
SNMG-ZV1	SCMT-ZPR	SNMG-ZPM	SNMT-ZPF	SNMM-ZMR	SCMT-HMR	SNMG-ZMM	SNMG-ZMF	SNMG-ZKR	SCMT-HKR
TNMG-V	TNMG-ZM	TNMG-ZM54	TNMG-ZG	TNUW	TCGW	TCUW	TCMT-ZM	TCMT-ZF3	TCMT-V
CNMM-ZR51	CNMM-ZM	CNMG-V	CNMG-ZG	CNMG-ZM	CNMG-ZF	CNMG-ZF2	CNMG-ZR54	CNMG-ZR53	CCCW/CCMW
CNMG-ZPF	CCMT-HPF	CNMG-ZPS	CNMM-ZMQ	CNMG-ZMR	CCMT-HMR	CCMT-HMM	CNMG-ZMM	CNMG-ZMF	CCMT-HMF
DNMG-ZF	DNMG-ZF3	DNMG-ZM	DNMG-V	DCMT	DCMT-ZF3	DCMT-V	DCMW	DCMT-HPR	DCMT-HPM
VNMG-V	VAGT-ZF	VBMT-V	VBMT-ZF3	VBMT-ZM	W	WNMM-C	WNMM-V	WNMM-ZM	WNMG-ZM
					Non-equilateral hexagon				
RPMW	RCMT-V	RCMX-ZV	Q	QC14	QC07				

MILLING INSERTS

LPEX-EDR(L)	LPEN	F	FPCN	T	TEC(K)N-PER(L)	TPA(C/K)N-PDR(L)	TPA(C/K)N-PPN		



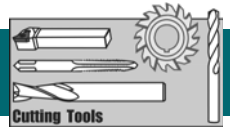
Cutting Tools

CHIP-BREAKER APPLICATION












CONVENTIONAL CHARACTERISTICS OF CHIP SPACE AND SCOPE OF APPLICATION

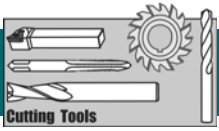
CHOICE STANDARD	TYPE	EXAMPLE	CLASSIFICATION	CHARACTERISTICS AND APPLICATION
BASIC CHOICE	ZF1		Super-finishing	<ul style="list-style-type: none"> • Sharp edge and well finished processing surface. • Suitable for feedrate of 0.03-0.15mm/r and cutting depth of 0.2-0.5 mm • Suitable for shallow cutting depth
	ZF		Finishing	<ul style="list-style-type: none"> • Omnibearing chip space with sharp cutting edge. • Suitable for cutting depth of 0.5-2.0mm • Suitable for feedrate of 0.1-0.25mm/r
	ZF2			
	ZM		Semi-finishing	<ul style="list-style-type: none"> • Conventional chip space for wide scope of application • Suitable for feedrate of 0.2-0.4 mm/r and cutting depth of 1-4mm
	ZF3			
	ZG			
	ZR		Roughing	<ul style="list-style-type: none"> • With good controlling capability of chips, suitable for high feed, feedrate of 0.3-0.6 mm/r and cutting depth of 3-8mm.
	ZR51			
	ZR53			
	ZR54			
	ZM24			
	V		General-purpose	<ul style="list-style-type: none"> • Ranged between finishing and roughing chip breakers with smooth chip-removing.
	M			

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CHARACTERISTICS OF NEW CHIP SPACE AND SCOPE OF APPLICATION

CHOICE STANDARD	TYPE	EXAMPLE	CLASSIFICATION	CHARACTERISTICS AND APPLICATION
BASIC CHOICE	HMM		Semi-finishing	<ul style="list-style-type: none"> A slot designed for stainless steel inner aperture finishing. Cutting Speed: $v=110-160\text{m/min}$ Cutting Feed: $f=0.11-0.25\text{mm/r}$ Cutting Depth: $ap=0.5-2.0\text{mm}$
	ZKM			<ul style="list-style-type: none"> A slot special designed for cast iron semi finishing. Unique wave edge design can reduce splashing of iron scrap. Cutting Speed: $v=130-180\text{m/min}$ Cutting Feed: $f=0.20-0.40\text{mm/r}$ Cutting Depth: $ap=1.5-4.0\text{mm}$
	HKM			<ul style="list-style-type: none"> A slot special designed for cast iron inner aperture semi finishing. The design is in simpleness. Smooth cutting and low cutting resistance. Cutting Speed: $v=150-220\text{m/min}$ Cutting Feed: $f=0.20-0.40\text{mm/r}$ Cutting Depth: $ap=1.0-3.0\text{mm}$
	ZPR		Roughing	<ul style="list-style-type: none"> A slot special designed for steel rough finishing. Low cutting force and wide scrap broken range. It is a very economic choice. Cutting Speed: $v=80-140\text{m/min}$ Cutting Feed: $f=0.30-0.60\text{mm/r}$ Cutting Depth: $ap=3.0-6.0\text{mm}$
	HPR			<ul style="list-style-type: none"> A slot special designed for steel inner aperture rough finishing with low cutting force and wide scrap broken range. Cutting Speed: $v=80-130\text{m/min}$ Cutting Feed: $f=0.20-0.35\text{mm/r}$ Cutting Depth: $ap=1.5-3.5\text{mm}$
	ZPQ			<ul style="list-style-type: none"> A slot special designed for steel high power cutting. It has good edge strength and wide scrap broken range. So working efficiency is high. Cutting Speed: $v=50-100\text{m/min}$ Cutting Feed: $f=0.40-0.75\text{mm/r}$ Cutting Depth: $ap=4.0-10.0\text{mm}$
	ZMR			<ul style="list-style-type: none"> A slot special designed for stainless steel rough finishing. High strength cutting edge, low cutting force, low cutting temperature and rapid processing. Cutting Speed: $v=80-130\text{m/min}$ Cutting Feed: $f=0.30-0.50\text{mm/r}$ Cutting Depth: $ap=3.0-6.0\text{mm}$
	HMR			<ul style="list-style-type: none"> A slot special designed for stainless steel inner aperture rough finishing with high cutting edge strength and good scrap broken. Cutting Speed: $v=80-120\text{m/min}$ Cutting Feed: $f=0.20-0.35\text{mm/r}$ Cutting Depth: $ap=1.5-3.5\text{mm}$
	ZMQ			<ul style="list-style-type: none"> A single slot designed for stainless steel high power mining with high cutting edge strength and wide scrap broken range. High working efficiency. Cutting Speed: $v=50-80\text{m/min}$ Cutting Feed: $f=0.4-0.6\text{mm/r}$ Cutting Depth: $ap=4-8.0\text{mm}$
	ZKR			<ul style="list-style-type: none"> A slot special designed for cast iron rough finishing. High cutting edge strength and low cutting resistance. Cutting Speed: $v=80-150\text{m/min}$ Cutting Feed: $f=0.30-0.60\text{mm/r}$ Cutting Depth: $ap=3.0-7.0\text{mm}$
HKR		<ul style="list-style-type: none"> A slot special designed for cast iron inner aperture rough finishing. High quality and strength on cutting edge, applied low speed and deep feed cutting. Cutting Speed: $v=100-180\text{m/min}$ Cutting Feed: $f=0.25-0.40\text{mm/r}$ Cutting Depth: $ap=1.5-4.0\text{mm}$ 		



Cutting Tools

CHARACTERISTICS OF NEW CHIP SPACE AND SCOPE OF APPLICATION

CHOICE STANDARD	TYPE	EXAMPLE	CLASSIFICATION	CHARACTERISTICS AND APPLICATION
BASIC CHOICE	ZKF		Finishing	<ul style="list-style-type: none"> A slot special designed for cast iron finishing. Low cutting resistance and smooth scrap exhaust. It is applied for gray cast iron and spheroidal graphite cast iron processing. Cutting Speed: v=180-220m/min Cutting Feed: f=0.1 l-0.25mm/r Cutting Depth: ap=0.3-20mm
	HKF			<ul style="list-style-type: none"> A slot special designed for cast iron inner aperture finishing. Sharp cutting edge and low cutting force. Applied for processing of high cutting speed and small feed. Cutting Speed: v=200-300m/min Cutting Feed: f=0.07-0.25mm/r Cutting Depth: ap=0.3-2.0mm
	ZPM		Semi-finishing	<ul style="list-style-type: none"> A slot special designed for steel semi finishing. Low cutting force, wide scrap broken range and good cutting properties. There is just a few scrap splashing during processing, hence reducing consuming of lathe. Cutting Speed: v=130~160m/min Cutting Feed: f=0.15-0.40mm/r Cutting Depth: ap=1.5-4.0mm
	HPM			<ul style="list-style-type: none"> A slot special designed for steel inner aperture semi finishing. Wave shape design is good for scrap splashing control and 2-grade and 3 dimension design are good for scrap breaking. Cutting Speed: v=120~170m/min Cutting Feed: f=0.11~0.25mm/r Cutting Depth: ap=0.5-2.0mm
	ZMM			<ul style="list-style-type: none"> A slot special designed for stainless steel semi finishing. Traditional Taiji design plus friction reducing slot design make iron scrap smooth exhausting, low cutting force and wide scrap broken range. Cutting Speed: v=120~160m/min Cutting Feed: f=0.20-0.40mm/r Cutting Depth: ap=1.5-4.0mm
	ZPS		Super-finishing	<ul style="list-style-type: none"> A slot special designed for steel finishing. Sharp edge and well finished processing surface. Applied for low feed and small cut depth machining with very good scrap broken. Cutting Speed: v=180-220m/min Cutting Feed: f=0.07-0.15mm/r Cutting Depth: ap=0.3-1.5mm
	ZPF		Finishing	<ul style="list-style-type: none"> A slot special designed for steel finishing. No matter cutting in direction of axial and radial, nor end machining, it also has smooth cutting with low and stable cutting force. High finished processing surface and special scrap broken slot design make it very good scrap broken effect. Cutting Speed: v=160-200m/min Cutting Feed: f=0.11-0.25mm/r Cutting Depth: ap=0.5-2.5mm
	HPF			<ul style="list-style-type: none"> A slot special designed for steel inner aperture finishing. Unique three dimension and 2-grade scrap broken design are very good for steel scrap breaking of inner aperture finishing. It cuts very quick and smooth. Cutting Speed: v=160-200m/min Cutting Feed: f=0.07~0.15mm/r Cutting Depth: ap=0.3~1.5mm
	ZMF			<ul style="list-style-type: none"> A slot special designed for stainless steel finishing. Traditional design makes it good looking and wide applications. Cutting Speed: v=150~180m/min Cutting Feed: f=0.11-0.20mm/r Cutting Depth: ap=1.0~2.5mm
	HMF			<ul style="list-style-type: none"> A slot special designed for stainless steel inner aperture finishing. Good scrap broken, sharp cutting edge and low cutting force. Cutting Speed: v=150-180m/min Cutting Feed: f=0.07~0.15mm/r Cutting Depth: ap=0.3~1.5mm

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