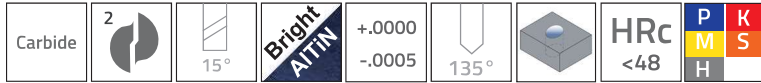
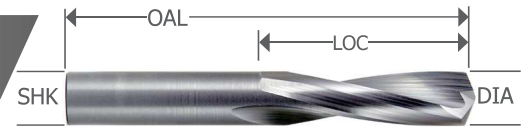


GENERAL PURPOSE CARBIDE DRILLS

2 FLUTE • STUB LENGTH CARBIDE DRILLS



SERIES: IDR

DIAMETER		LOC	OAL	TOOL	BRIGHT EDP	ALTiN EDP
# 56	0.0465	1/2	1-1/2	IDR-56	17249	57249
3/64	0.0469	1/2	1-1/2	IDR-3/64	17138	57138
# 55	0.0520	1/2	1-1/2	IDR-55	17248	57248
# 54	0.0550	1/2	1-1/2	IDR-54	17247	57247
1.5mm	0.0591	13mm	38mm	IDR-1.5MM	17415	57415
# 53	0.0595	1/2	1-1/2	IDR-53	17246	57246
1/16	0.0625	5/8	1-5/8	IDR-1/16	17139	57139
# 52	0.0635	11/16	1-11/16	IDR-52	17245	57245
# 51	0.0670	11/16	1-11/16	IDR-51	17244	57244
# 50	0.0700	11/16	1-11/16	IDR-50	17243	57243
# 49	0.0730	11/16	1-11/16	IDR-49	17242	57242
# 48	0.0760	11/16	1-11/16	IDR-48	17241	57241
5/64	0.0781	11/16	1-11/16	IDR-5/64	17140	57140
# 47	0.0785	3/4	1-3/4	IDR-47	17240	57240
2mm	0.0787	19mm	45mm	IDR-2MM	17416	57416
# 46	0.0810	3/4	1-3/4	IDR-46	17239	57239
# 45	0.0820	3/4	1-3/4	IDR-45	17238	57238
# 44	0.0860	3/4	1-3/4	IDR-44	17237	57237
# 43	0.0890	3/4	1-3/4	IDR-43	17236	57236
# 42	0.0935	3/4	1-3/4	IDR-42	17235	57235
3/32	0.0938	3/4	1-3/4	IDR-3/32	17141	57141
# 41	0.0960	13/16	1-13/16	IDR-41	17234	57234
# 40	0.0980	13/16	1-13/16	IDR-40	17233	57233
2.5mm	0.0984	21mm	46mm	IDR-2.5MM	17417	57417
# 39	0.0995	13/16	1-13/16	IDR-39	17232	57232
# 38	0.1015	13/16	1-13/16	IDR-38	17231	57231
# 37	0.1040	13/16	1-13/16	IDR-37	17230	57230
# 36	0.1065	13/16	1-13/16	IDR-36	17229	57229
7/64	0.1094	13/16	1-13/16	IDR-7/64	17142	57142
# 35	0.1100	7/8	1-7/8	IDR-35	17228	57228
# 34	0.1110	7/8	1-7/8	IDR-34	17227	57227
# 33	0.1130	7/8	1-7/8	IDR-33	17226	57226
# 32	0.1160	7/8	1-7/8	IDR-32	17225	57225
3mm	0.1181	22mm	48mm	IDR-3MM	17418	57418
# 31	0.1200	7/8	1-7/8	IDR-31	17224	57224
1/8	0.1250	7/8	1-7/8	IDR-1/8	17143	57143
# 30	0.1285	15/16	1-15/16	IDR-30	17223	57223
# 29	0.1360	15/16	1-15/16	IDR-29	17222	57222
3.5mm	0.1378	24mm	52mm	IDR-3.5MM	17419	57419
# 28	0.1405	15/16	1-15/16	IDR-28	17221	57221
9/64	0.1406	15/16	1-15/16	IDR-9/64	17144	57144
# 27	0.1440	1	2-1/16	IDR-27	17220	57220
# 26	0.1470	1	2-1/16	IDR-26	17219	57219
# 25	0.1495	1	2-1/16	IDR-25	17218	57218
# 24	0.1520	1	2-1/16	IDR-24	17217	57217
# 23	0.1540	1	2-1/16	IDR-23	17216	57216
5/32	0.1562	1	2-1/16	IDR-5/32	17145	57145
# 22	0.1570	1-1/16	2-1/8	IDR-22	17215	57215
4mm	0.1575	27mm	53mm	IDR-4MM	17420	57420
# 21	0.1590	1-1/16	2-1/8	IDR-21	17214	57214
# 20	0.1610	1-1/16	2-1/8	IDR-20	17213	57213
# 19	0.1660	1-1/16	2-1/8	IDR-19	17212	57212
18	0.1695	1-1/16	2-1/8	IDR-18	17211	57211

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GENERAL PURPOSE CARBIDE DRILLS

2 FLUTE • STUB LENGTH CARBIDE DRILLS

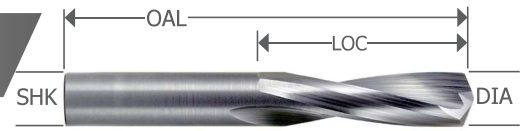
SERIES: IDR

DIAMETER		LOC	OAL	TOOL	BRIGHT EDP	ALTN EDP
11/64	0.1719	1-1/16	2-1/8	IDR-11/64	17146	57146
# 17	0.1730	1-1/8	2-3/16	IDR-17	17210	57210
# 16	0.1770	1-1/8	2-3/16	IDR-16	17209	57209
4.5mm	0.1772	29mm	55mm	IDR-4.5MM	17421	57421
# 15	0.1800	1-1/8	2-3/16	IDR-15	17208	57208
# 14	0.1820	1-1/8	2-3/16	IDR-14	17207	57207
# 13	0.1850	1-1/8	2-3/16	IDR-13	17206	57206
3/16	0.1875	1-1/8	2-3/16	IDR-3/16	17147	57147
# 12	0.1890	1-3/16	2-1/4	IDR-12	17205	57205
# 11	0.1910	1-3/16	2-1/4	IDR-11	17204	57204
# 10	0.1935	1-3/16	2-1/4	IDR-10	17203	57203
# 9	0.1960	1-3/16	2-1/4	IDR-9	17202	57202
5mm	0.1969	30mm	57mm	IDR-5MM	17422	57422
# 8	0.1990	1-3/16	2-1/4	IDR-8	17201	57201
# 7	0.2010	1-3/16	2-1/4	IDR-7	17200	57200
13/64	0.2031	1-3/16	2-1/4	IDR-13/64	17148	57148
# 6	0.2040	1-1/4	2-3/8	IDR-6	17199	57199
# 5	0.2055	1-1/4	2-3/8	IDR-5	17198	57198
# 4	0.2090	1-1/4	2-3/8	IDR-4	17197	57197
# 3	0.2130	1-1/4	2-3/8	IDR-3	17196	57196
5.5mm	0.2165	32mm	60mm	IDR-5.5MM	17423	57423
7/32	0.2188	1-1/4	2-3/8	IDR-7/32	17149	57149
# 2	0.2210	1-5/16	2-7/16	IDR-2	17195	57195
# 1	0.2280	1-5/16	2-7/16	IDR-1	17194	57194
A	0.2340	1-5/16	2-7/16	IDR-A	17168	57168
15/64	0.2344	1-5/16	2-7/16	IDR-15/64	17150	57150
6mm	0.2362	33mm	61mm	IDR-6MM	17424	57424
B	0.2380	1-3/8	2-1/2	IDR-B	17169	57169
C	0.2420	1-3/8	2-1/2	IDR-C	17170	57170
D	0.2460	1-3/8	2-1/2	IDR-D	17171	57171
E	0.2500	1-3/8	2-1/2	IDR-E	17172	57172
1/4	0.2500	1-3/8	2-1/2	IDR-1/4	17151	57151
6.5mm	0.2559	35mm	63mm	IDR-6.5MM	17425	57425
F	0.2570	1-7/16	2-5/8	IDR-F	17173	57173
G	0.2610	1-7/16	2-5/8	IDR-G	17174	57174
17/64	0.2656	1-7/16	2-5/8	IDR-17/64	17152	57152
H	0.2660	1-1/2	2-11/16	IDR-H	17175	57175
I	0.2720	1-1/2	2-11/16	IDR-I	17176	57176
7mm	0.2756	38mm	68mm	IDR-7MM	17426	57426
J	0.2770	1-1/2	2-11/16	IDR-J	17177	57177
K	0.2810	1-1/2	2-11/16	IDR-K	17178	57178
9/32	0.2812	1-1/2	2-11/16	IDR-9/32	17153	57153
L	0.2900	1-9/16	2-3/4	IDR-L	17179	57179
M	0.2950	1-9/16	2-3/4	IDR-M	17180	57180
7.5mm	0.2953	40mm	70mm	IDR-7.5MM	17427	57427
19/64	0.2969	1-9/16	2-3/4	IDR-19/64	17154	57154
N	0.3020	1-5/8	2-13/16	IDR-N	17181	57181
5/16	0.3125	1-5/8	2-13/16	IDR-5/16	17155	57155
8mm	0.3150	41mm	71mm	IDR-8MM	17428	57428
O	0.3160	1-11/16	2-15/16	IDR-O	17182	57182
P	0.3230	1-11/16	2-15/16	IDR-P	17183	57183
21/64	0.3281	1-11/16	2-15/16	IDR-21/64	17156	57156
Q	0.3320	1-11/16	3	IDR-Q	17184	57184
8.5mm	0.3346	24mm	76mm	IDR-8.5MM	17429	57429
R	0.3390	1-11/16	3	IDR-R	17185	57185
11/32	0.3438	1-11/16	3	IDR-11/32	17157	57157
S	0.3480	1-3/4	3-1/16	IDR-S	17186	57186
9mm	0.3543	44mm	78mm	IDR-9MM	17430	57430

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GENERAL PURPOSE CARBIDE DRILLS

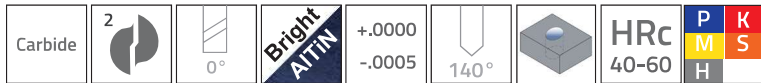
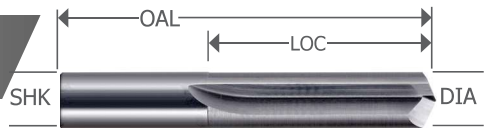
2 FLUTE • STUB LENGTH CARBIDE DRILLS



SERIES: IDR

DIAMETER		LOC	OAL	TOOL	BRIGHT EDP	ALTIN EDP
T	0.3580	1-3/4	3-1/16	IDR-T	17187	57187
23/64	0.3594	1-3/4	3-1/16	IDR-23/64	17158	57158
U	0.3680	1-13/16	3-1/8	IDR-U	17188	57188
9.5mm	0.3740	46mm	79mm	IDR-9.5MM	17431	57431
3/8	0.3750	1-13/16	3-1/8	IDR-3/8	17159	57159
V	0.3770	1-7/8	3-1/4	IDR-V	17189	57189
W	0.3860	1-7/8	3-1/4	IDR-W	17190	57190
25/64	0.3906	1-7/8	3-1/4	IDR-25/64	17160	57160
10mm	0.3937	48mm	83mm	IDR-10MM	17432	57432
X	0.3970	1-15/16	3-5/16	IDR-X	17191	57191
Y	0.4040	1-15/16	3-5/16	IDR-Y	17192	57192
13/32	0.4062	1-15/16	3-5/16	IDR-13/32	17161	57161
Z	0.4130	2	3-3/8	IDR-Z	17193	57193
10.5mm	0.4134	51mm	86mm	IDR-10.5MM	17433	57433
27/64	0.4219	2	3-3/8	IDR-27/64	17162	57162
11mm	0.4331	52mm	87mm	IDR-11MM	17434	57434
7/16	0.4375	2-1/16	3-7/16	IDR-7/16	17163	57163
11.5mm	0.4528	54mm	90mm	IDR-11.5MM	17435	57435
29/64	0.4531	2-1/8	3-9/16	IDR-29/64	17164	57164
15/32	0.4688	2-1/8	3-5/8	IDR-15/32	17165	57165
12mm	0.4724	54mm	92mm	IDR-12MM	17436	57436
31/64	0.4844	2-3/16	3-11/16	IDR-31/64	17166	57166
1/2	0.5000	2-1/4	3-3/4	IDR-1/2	17167	57167
9/16	0.5625	2-1/2	4	IDR-9/16	17993	57993
5/8	0.6250	2-3/4	5	IDR-5/8	17994	57994
3/4	0.7500	3	5	IDR-3/4	17995	57995

2 FLUTE • STRAIGHT FLUTE CARBIDE DRILLS



SERIES: JDR

DIAMETER		LOC	OAL	TOOL	BRIGHT EDP	ALTIN EDP
# 56	0.0465	1/2	1-1/2	JDR-56	17361	57361
3/64	0.0469	1/2	1-1/2	JDR-3/64	17250	57250
# 55	0.0520	1/2	1-1/2	JDR-55	17360	57360
# 54	0.0550	1/2	1-1/2	JDR-54	17359	57359
1.5mm	0.0591	13mm	38mm	JDR-1.5MM	17371	57371
# 53	0.0595	1/2	1-1/2	JDR-53	17358	57358
1/16	0.0625	5/8	1-5/8	JDR-1/16	17251	57251
# 52	0.0635	11/16	1-11/16	JDR-52	17357	57357
# 51	0.0670	11/16	1-11/16	JDR-51	17356	57356
# 50	0.0700	11/16	1-11/16	JDR-50	17355	57355
# 49	0.0730	11/16	1-11/16	JDR-49	17354	57354
# 48	0.0760	11/16	1-11/16	JDR-48	17353	57353
5/64	0.0781	11/16	1-11/16	JDR-5/64	17252	57252
# 47	0.0785	3/4	1-3/4	JDR-47	17352	57352
2mm	0.0787	19mm	45mm	JDR-2MM	17372	57372

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SPEED & FEED INFORMATION

Carbide Drills

SERIES: HDR, IDR, JDR, LDR, HDRNC

MATERIAL	ISO	CARBIDE SFM	HSSCO SFM	FEED RATE PER TOOTH (IPR)			
				1/16"	1/8"	1/4"	1/2"
Stainless Steels-Soft	M	80-300	20-40	0.0005	0.0005	0.0020	0.0040
Stainless Steels-Hard (PH)	M	40-100	15-25	0.0005	0.0005	0.0010	0.0015
Nickel Base Alloys	S	75-200	15-25	0.0005	0.0006	0.0010	0.0015
Inconel/Monel/Hastelloy	S	75-200	15-25	0.0005	0.0005	0.0010	0.0015
Titanium-Soft	S	80-350	20-25	0.0005	0.0020	0.0040	0.0050
Titanium-Hard	S	40-100	20-25	0.0005	0.0008	0.0020	0.0040
Low Carbon Steels	P	150-300	75-130	0.0005	0.0010	0.0020	0.0040
Die Steels	P	60-130	30-45	0.0005	0.0005	0.0020	0.0040
Hardened Steels > HRc 50	H	25-75	-	0.0005	0.0010	0.0020	0.0030
Cast Iron	K	100-300	60-110	0.0010	0.0020	0.0030	0.0050
Malleable Iron	K	65-200	40-80	0.0010	0.0020	0.0030	0.0050
Aluminium Alloys	N	100-400	150-250	0.0010	0.0020	0.0030	0.0050
Brass & Bronze	N	150-300	100-150	0.0005	0.0010	0.0020	0.0040
Copper	N	150-300	75-150	0.0010	0.0030	0.0050	0.0060
Magnesium	N	300-600	200-350	0.0015	0.0030	0.0050	0.0080
Plastics	N	150-450	70-150	0.0015	0.0030	0.0040	0.0060

Countersinks

MATERIAL	ISO	HSS SFM	COUNTERSINK TYPE	
			M42 8% COBALT WITH TiN SFM	CARBIDE SFM
Stainless Steels - Free Machining	M	30-80	40-100	80-125
Stainless Steels - Others	M	15-50	20-65	50-75
Inconels/Monels	S	30-50	40-65	50-75
Titaniums (6Al4V)	S	50-60	60-75	60-90
Steels Annealed	P	40-50	50-65	50-80
Steels HRc 18-24	P	30-40	40-50	40-60
Steels HRc 25-37	P	25-35	30-45	35-55
Mild Steels	P	70-100	85-125	80-170
Cast Iron	K	75-125	95-150	125-225
Malleable Iron	K	80-90	100-115	90-150
Aluminums Alloys	N	150-250	180-300	300-500
Brass (Bronze)	N	75-125	95-150	150-250
Magnesium	N	125-250	150-300	250-400
Plastics	N	100-250	125-300	250-400

► Multiple flute countersinks are designed for increased feed rates. A controlled feed rate will result in better surface finish.

► All Melin countersinks are manufactured on CNC grinders to ensure consistent and accurate flute spacing. Carbide countersinks should be used in rigid tool holders to maximize tool life.

All technical data provided are suggested starting points. They may be increased or decreased depending on machine condition, depth of cut, finish required, coolant, etc. Call our TECHNICAL SERVICE TEAM with questions.

SPEED & FEED INFORMATION

Calculations

End mill speed & feed formulas are the various individual equations that determine the proper overall machining setup or more specifically the speed of the cutting tool and the rate which it is fed into the work piece. Each individual formula is distinct in what it determines but coordinates with the others to ensure successful cutting tool application. You can visit the TECHNICAL section on www.melintool.com for more information.

INCH

$$\text{RPM} = \frac{\text{Revolutions Per Minute}}{3.82 \times \text{SFM} / \text{Tool Dia}}$$

$$\text{SFM} = \frac{\text{Surface Foot Per Minute}}{.262 \times \text{RPM} \times \text{Tool Dia}}$$

$$\text{CPT or IPT} = \frac{\text{Chip-Load Per Tooth}}{\text{IPM} / \text{RPM} / \text{No. Of Flutes}}$$

$$\text{IPM} = \frac{\text{Inches Per Minute}}{\text{CPT} \times \text{RPM} \times \text{No. Of Flutes}}$$

$$\text{MRRCI} = \frac{\text{Metal Removal Rate Cubic Inches}}{\text{IPM} \times \text{Axial Doc} \times \text{Radial Woc}}$$

$$\text{IPR} = \frac{\text{Inches Per Revolution}}{\text{IPM} / \text{RPM}}$$

METRIC

$$\text{RPM} = \frac{\text{Revolutions Per Minute}}{1000 \times \text{M/MIN} / (3.14 \times \text{D})}$$

$$\text{M/MIN} = \frac{\text{Meters Per Minute}}{(3.14 \times \text{D} \times \text{RPM}) / 1000}$$

$$\text{Fz OR CPT} = \frac{\text{Chip-Load Per Tooth}}{\text{Feedrate (mm) per MIN} / (\text{Z} \times \text{RPM})}$$

$$\text{VF OR FPM} = \frac{\text{Feedrate (mm) Per Minute}}{\text{Feedrate (mm) per Tooth} \times \text{Z} \times \text{RPM}}$$

D = Cutter Dia.
Z = No. Of Teeth.

EQUIVALENTS & CONVERSIONS:

ABBREVIATIONS

RPM	Revolutions Per Minute
SFM	Surface Feet Per Minute
CPT	Chip Load Per Tooth
IPM	Inches Per Minute
V_f	Millimeters Per Minute
ae	Radial Width of Cut
ap	Axial Depth of Cut
Vc	Surface Meters Per Minute
Fz	Metric Chip Load Per Tooth

$$N, n \text{ or } \text{Min}^{-1} = \text{RPM}$$

$$Vc \text{ or } \text{M/MIN} = \text{SFM}$$

$$Fz \text{ or } \text{mm/TOOTH} = \text{CPT}$$

$$V_f \text{ or } \text{mm/MIN} = \text{IPM}$$

$$\text{SFM} / 3.281 = \text{M/MIN}$$

$$\text{M/MIN} \times 3.281 = \text{SFM}$$

$$\text{mm/MIN} / 25.4 = \text{IPM}$$

$$\text{mm/TOOTH} / 25.4 = \text{CPT}$$



IMPERIAL METRIC

$$\text{Inch} \times 25.4 = \text{Millimeter}$$

$$\text{Millimeter} \times .03937 = \text{Inch}$$