

## General Purpose Drills



## Hole Making

GENERAL PURPOSE DRILLS	SERIES	DESCRIPTION	PAGE
2 Flute	101	2 Flute Slow Spiral	278
Short Length Self Centering (DIN6539)	108M Plus	2 Flute Short Length DIN 6539	283
Straight Flute	106	Straight Flute 140 Point Geometry	290
3 Flute with 150 Point Geometry	103	3 Flute 150 Point Geometry	294
GENERAL PURPOSE COUNTERSINKS	SERIES	DESCRIPTION	PAGE
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	301M	2 Flute Straight Flute Combined Drill and Countersink Metric	301
Single Flute Countersink	601	Single Flute Fractional	306
3 Flute Countersink	603	3 Flute Fractional	309
6 Flute Countersink	606	6 Flute Fractional	312
GENERAL PURPOSE REAMERS	SERIES	DESCRIPTION	PAGE
Straight Flute Accu-Reamer	200	Accu-Reamer	316
Straight Flute Reamer	201M	Metric Reamer	320

*Speed & Feed Recommendations listed after each series*

# Taladrado

TALADROS DE USO GENERAL	SERIE	DESCRIPCIÓN	PÁGINA
2 filos	101	2 filos, espiral de avance lento	278
Autocentrante de longitud corta (DIN6539)	108M Plus	2 filos, longitud corta, DIN 6539	283
Filo recto	106	Filo recto, geometría de 140 puntos	290
3 filos con geometría de 150 puntos	103	3 filos, geometría de 150 puntos	294

TALADROS DE USO AVELLANADORES	SERIE	DESCRIPCIÓN	PÁGINA
Taladro y avellanador combinados	301	2 filos, filo recto, taladro y avellanador combinados, fraccional	300
	301M	2 filos, filo recto, taladro y avellanador combinados, métrico	301
Avellanador de filo único	601	Filo único, fraccional	306
Avellanador de 3 filos	603	3 filos, fraccional	309
Avellanador de 6 filos	606	6 filos, fraccional	312

TALADROS DE USO ESCARIADORES	SERIE	DESCRIPCIÓN	PÁGINA
Escariador Accu de filo recto	200	Escariador Accu	316
Escariador de filo recto	201M	Escariador métrico	320

*Recomendaciones de velocidades y avances mostradas tras cada serie*

## Outils de perçage

FORETS UNIVERSELS	SERIES	DESCRIPTION	PAGE
2 dents	101	2 dents à spirale lente	278
Court autocentrant (DIN 6539)	108M Plus	2 dents court DIN 6539	283
Denture droite	106B17	Denture droite à angle de pointe 140°	290
3 dents à angle de pointe 150°	103	3 dents à angle de pointe 150°	294
FORETS À FRAISER	SERIES	DESCRIPTION	PAGE
Foret et foret à fraiser combinés	301	2 dents denture droite foret et foret à fraiser combinés (fractionnel)	300
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Foret à fraiser à dent simple	601	Foret à dent simple (fractionnel)	306
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FORETS À ALÉSOIRS	SERIES	DESCRIPTION	PAGE
Alésoir denture droite Accu-Reamer	200	Alésoir Accu-Reamer	316
Alésoir denture droite	201M	Alésoir (métrique)	320

*Recommandations de vitesse et avance indiquées après chaque série*

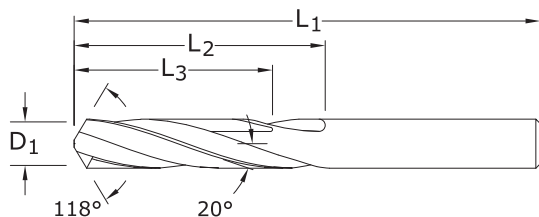
# 2 Flute Drills • Metric: DIN 338



5xD



2



101

FRACTIONAL & METRIC SERIES

CUTTING DIAMETER D <sub>1</sub>	DECIMAL EQUIV.	METRIC EQUIV.	OVERALL LENGTH L <sub>1</sub>	FLUTE LENGTH L <sub>2</sub>	CLEARED LENGTH L <sub>3</sub>	EDP NO.		STOCK
						UNCOATED	Ti-NAMITE-A (AlTiN)	
#80	0.0135	0.34	3/4	3/16	5/32	51080	57076	●
#79	0.0145	0.37	3/4	3/16	5/32	51079	57077	●
1/64	0.0156	0.40	3/4	3/16	5/32	51101	57078	●
#78	0.0160	0.41	3/4	3/16	5/32	51078	57079	●
#77	0.0180	0.46	3/4	3/16	5/32	51077	57080	●
#76	0.0200	0.51	7/8	1/4	13/64	51076	57081	●
#75	0.0210	0.53	7/8	1/4	13/64	51075	57082	●
#74	0.0225	0.57	7/8	1/4	13/64	51074	57083	●
#73	0.0240	0.61	7/8	1/4	13/64	51073	57084	●
#72	0.0250	0.64	1	5/16	1/4	51072	57085	●
#71	0.0260	0.66	1	5/16	1/4	51071	57086	●
0,7 mm	0.0276		28,0	9,0	7,0	61001	68268	●
#70	0.0280	0.71	1-1/4	1/2	13/32	51070	57087	●
#69	0.0292	0.74	1-1/4	1/2	13/32	51069	57088	●
#68	0.0310	0.79	1-1/4	1/2	13/32	51068	57089	●
1/32	0.0312	0.79	1-1/4	1/2	13/32	51102	57090	●
0,8 mm	0.0315		30,0	10,0	8,0	61003	68269	●
#67	0.0320	0.81	1-1/4	1/2	13/32	51067	57091	●
#66	0.0330	0.84	1-1/4	1/2	13/32	51066	57092	●
#65	0.0350	0.89	1-3/8	5/8	1/2	51065	57093	●
0,9 mm	0.0354		32,0	11,0	8,0	61005	68270	●
#64	0.0360	0.91	1-3/8	5/8	1/2	51064	57094	●
#63	0.0370	0.94	1-3/8	5/8	1/2	51063	57095	●
#62	0.0380	0.97	1-3/8	5/8	1/2	51062	57096	●
#61	0.0390	0.99	1-3/8	5/8	1/2	51061	57097	●
1,0 mm	0.0394		34,0	12,0	9,0	61007	68271	●
#60	0.0400	1.02	1-1/2	3/4	39/64	51060	57098	●
#59	0.0410	1.04	1-1/2	3/4	39/64	51059	57099	●
#58	0.0420	1.07	1-1/2	3/4	39/64	51058	57100	●
#57	0.0430	1.09	1-1/2	3/4	39/64	51057	57101	●
1,1 mm	0.0433		36,0	14,0	11,0	61052	68294	●
#56	0.0465	1.18	1-1/2	3/4	39/64	51056	57102	●
3/64	0.0469	1.19	1-1/2	3/4	39/64	51103	57103	●
1,2 mm	0.0472		38,0	16,0	12,0	61053	68295	●
1,3 mm	0.0512		38,0	16,0	12,0	61054	68296	●
#55	0.0520	1.32	1-1/2	3/4	39/64	51055	57104	●
#54	0.0550	1.40	1-1/2	3/4	39/64	51054	57105	●
1,4 mm	0.0551		40,0	18,0	14,0	61055	68297	●
1,5 mm	0.0591		40,0	18,0	14,0	61009	68272	●
#53	0.0595	1.51	1-1/2	3/4	39/64	51053	57106	●
*1/16	0.0625	1.59	1-1/2	3/4	39/64	51104	57107	●
1,6 mm	0.0630		43,0	20,0	16,0	61056	68298	●
#52	0.0635	1.61	1-1/2	3/4	39/64	51052	57108	●
1,7 mm	0.0669		43,0	20,0	17,0	61057	68299	●

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**TOLERANCES (inch)**

D<sub>1</sub> = +.0000/- .0005

**TOLERANCES (mm)**

D<sub>1</sub> = +0,0000/-0,0127

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES

- U.S. Stock Standard
- NOT STOCKED—  
Call for Delivery

For patent information  
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## 2 Flute Drills • Metric: DIN 338

101

FRACTIONAL &amp; METRIC SERIES

CONTINUED

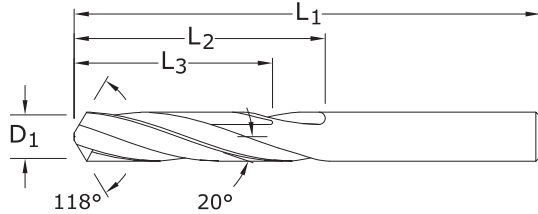
CUTTING DIAMETER D <sub>1</sub>	DECIMAL EQUIV.	METRIC EQUIV.	OVERALL LENGTH L <sub>1</sub>	FLUTE LENGTH L <sub>2</sub>	CLEARED LENGTH L <sub>3</sub>	EDP NO.		STOCK
						UNCOATED	Ti-NAMITE-A (AITiN)	
#51	0.0670	1.70	1-1/2	3/4	39/64	51051	57109	●
#50	0.0700	1.78	1-3/4	7/8	45/64	51050	57110	●
1,8 mm	0.0709		46,0	22,0	17,0	61058	68300	●
#49	0.0730	1.85	1-3/4	7/8	45/64	51049	57111	●
1,9 mm	0.0748		46,0	22,0	17,0	61059	68301	●
#48	0.0760	1.93	1-3/4	7/8	45/64	51048	57112	●
5/64	0.0781	1.98	1-3/4	7/8	45/64	51105	57113	●
#47	0.0785	1.99	1-3/4	7/8	45/64	51047	57114	●
2,0 mm	0.0787		49,0	24,0	19,0	61011	68273	●
#46	0.0810	2.06	1-3/4	7/8	45/64	51046	57115	●
#45	0.0820	2.08	1-3/4	7/8	45/64	51045	57116	●
2,1 mm	0.0827		49,0	24,0	19,0	61060	68302	●
#44	0.0860	2.18	2	1	51/64	51044	57117	●
2,2 mm	0.0866		53,0	27,0	21,0	61061	68303	●
#43	0.0890	2.26	2	1	51/64	51043	57118	●
2,3 mm	0.0906		53,0	27,0	21,0	61062	68304	●
#42	0.0935	2.37	2	1	51/64	51042	57119	●
3/32	0.0938	2.38	2	1	51/64	51106	57120	●
2,4 mm	0.0945		57,0	30,0	24,0	61063	68305	●
#41	0.0960	2.44	2	1	51/64	51041	57121	●
#40	0.0980	2.49	2	1	51/64	51040	57122	●
2,5 mm	0.0984		57,0	30,0	24,0	61013	68274	●
#39	0.0995	2.53	2-1/4	1-1/4	1	51039	57123	●
#38	0.1015	2.58	2-1/4	1-1/4	1	51038	57124	●
2,6 mm	0.1024		57,0	30,0	24,0	61064	68306	●
#37	0.1040	2.64	2-1/4	1-1/4	1	51037	57125	●
2,7 mm	0.1063		61,0	33,0	26,0	61065	68307	●
#36	0.1065	2.71	2-1/4	1-1/4	1	51036	57126	●
7/64	0.1094	2.78	2-1/4	1-1/4	1	51107	57127	●
#35	0.1100	2.79	2-1/4	1-1/4	1	51035	57128	●
2,8 mm	0.1102		61,0	33,0	26,0	61066	68308	●
#34	0.1110	2.82	2-1/4	1-1/4	1	51034	57129	●
#33	0.1130	2.87	2-1/4	1-1/4	1	51033	57130	●
2,9 mm	0.1142		61,0	33,0	26,0	61067	68309	●
#32	0.1160	2.95	2-1/4	1-1/4	1	51032	57131	●
3,0 mm	0.1181		61,0	33,0	26,0	61015	68275	●
#31	0.1200	3.05	2-1/4	1-1/4	1	51031	57132	●
3,1 mm	0.1220		65,0	36,0	28,0	61068	68310	●
*1/8	0.1250	3.18	2-1/4	1-1/4	1	51108	57133	●
3,2 mm	0.1260		65,0	36,0	28,0	61069	68311	●
#30	0.1285	3.26	2-1/4	1-1/4	1	51030	57134	●
3,3 mm	0.1299		65,0	36,0	28,0	61070	68312	●
3,4 mm	0.1339		70,0	39,0	31,0	61071	68313	●
#29	0.1360	3.45	2-1/2	1-3/8	1-7/64	51029	57135	●
3,5 mm	0.1378		70,0	39,0	31,0	61017	68276	●
#28	0.1405	3.57	2-1/2	1-3/8	1-7/64	51028	57136	●
9/64	0.1406	3.57	2-1/2	1-3/8	1-7/64	51109	57137	●
3,6 mm	0.1417		70,0	39,0	31,0	61072	68314	●
#27	0.1440	3.66	2-1/2	1-3/8	1-7/64	51027	57138	●
3,7 mm	0.1457		70,0	39,0	31,0	61073	68315	●
#26	0.1470	3.73	2-1/2	1-3/8	1-7/64	51026	57139	●
#25	0.1495	3.80	2-1/2	1-3/8	1-7/64	51025	57140	●
3,8 mm	0.1496		75,0	43,0	34,0	61074	68316	●
#24	0.1520	3.86	2-1/2	1-3/8	1-7/64	51024	57141	●
3,9 mm	0.1535		75,0	43,0	34,0	61075	68317	●
#23	0.1540	3.91	2-1/2	1-3/8	1-7/64	51023	57142	●

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# 2 Flute Drills • Metric: DIN 338



5xD



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FRACTIONAL & METRIC SERIES

CUTTING DIAMETER D <sub>1</sub>	DECIMAL EQUIV.	METRIC EQUIV.	OVERALL LENGTH L <sub>1</sub>	FLUTE LENGTH L <sub>2</sub>	CLEARED LENGTH L <sub>3</sub>	EDP NO.		STOCK
						UNCOATED	Ti-NAMITE-A (AlTiN)	
5/32	0.1562	3.97	2-1/2	1-3/8	1-7/64	51110	57143	●
#22	0.1570	3.99	2-1/2	1-3/8	1-7/64	51022	57144	●
4,0 mm	0.1575		75,0	43,0	34,0	61019	68277	●
#21	0.1590	4.04	2-1/2	1-3/8	1-7/64	51021	57145	●
#20	0.1610	4.09	2-1/2	1-3/8	1-7/64	51020	57146	●
4,1 mm	0.1614		75,0	43,0	34,0	61076	68318	●
4,2 mm	0.1654		75,0	43,0	34,0	61077	68319	●
#19	0.1660	4.22	2-1/2	1-5/8	1-19/64	51019	57147	●
4,3 mm	0.1693		80,0	47,0	37,0	61078	68320	●
#18	0.1695	4.31	2-3/4	1-5/8	1-19/64	51018	57148	●
11/64	0.1719	4.37	2-3/4	1-5/8	1-19/64	51111	57149	●
#17	0.1730	4.39	2-3/4	1-5/8	1-19/64	51017	57150	●
4,4 mm	0.1732		80,0	47,0	37,0	61079	68321	●
#16	0.1770	4.50	2-3/4	1-5/8	1-19/64	51016	57151	●
4,5 mm	0.1772		80,0	47,0	37,0	61021	68278	●
#15	0.1800	4.57	2-3/4	1-5/8	1-19/64	51015	57152	●
4,6 mm	0.1811		80,0	47,0	37,0	61080	68322	●
#14	0.1820	4.62	2-3/4	1-5/8	1-19/64	51014	57153	●
4,7 mm	0.1850		80,0	47,0	37,0	61081	68323	●
#13	0.1850	4.70	2-3/4	1-5/8	1-19/64	51013	57154	●
*3/16	0.1875	4.76	2-3/4	1-5/8	1-19/64	51112	57155	●
4,8 mm	0.1890		86,0	52,0	41,0	61082	68324	●
#12	0.1890	4.80	2-3/4	1-5/8	1-19/64	51012	57156	●
#11	0.1910	4.85	2-3/4	1-5/8	1-19/64	51011	57157	●
4,9 mm	0.1929		86,0	52,0	41,0	61083	68325	●
#10	0.1935	4.91	2-3/4	1-5/8	1-19/64	51010	57158	●
#9	0.1960	4.98	3	1-3/4	1-13/32	51009	57159	●
5,0 mm	0.1969		86,0	52,0	41,0	61023	68279	●
#8	0.1990	5.05	3	1-3/4	1-13/32	51008	57160	●
5,1 mm	0.2008		86,0	52,0	41,0	61084	68326	●
#7	0.2010	5.11	3	1-3/4	1-13/32	51007	57161	●
13/64	0.2031	5.16	3	1-3/4	1-13/32	51113	57162	●
#6	0.2040	5.18	3	1-3/4	1-13/32	51006	57163	●
5,2 mm	0.2047		86,0	52,0	41,0	61085	68327	●
#5	0.2055	5.22	3	1-3/4	1-13/32	51005	57164	●
5,3 mm	0.2087		86,0	52,0	41,0	61086	68328	●
#4	0.2090	5.31	3	1-3/4	1-13/32	51004	57165	●
5,4 mm	0.2126		93,0	57,0	45,0	61087	68329	●
#3	0.2130	5.41	3	1-3/4	1-13/32	51003	57166	●
5,5 mm	0.2165		93,0	57,0	45,0	61025	68280	●
7/32	0.2188	5.56	3	1-3/4	1-13/32	51114	57167	●
5,6 mm	0.2205		93,0	57,0	45,0	61088	68330	●
#2	0.2210	5.61	3	1-3/4	1-13/32	51002	57168	●
5,7 mm	0.2244		93,0	57,0	45,0	61089	68331	●

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**TOLERANCES (inch)**

D<sub>1</sub> = +.0000/- .0005

**TOLERANCES (mm)**

D<sub>1</sub> = +0,0000/-0,0127

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES

- U.S. Stock Standard
- NOT STOCKED—  
Call for Delivery

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FRACTIONAL &amp; METRIC SERIES

CONTINUED

CUTTING DIAMETER D <sub>1</sub>	DECIMAL EQUIV.	METRIC EQUIV.	OVERALL LENGTH L <sub>1</sub>	FLUTE LENGTH L <sub>2</sub>	CLEARED LENGTH L <sub>3</sub>	EDP NO.		STOCK
						UNCOATED	Ti-NAMITE-A (AITiN)	
#1	0.2280	5.79	3	1-3/4	1-13/32	51001	57169	●
5,8 mm	0.2283		93,0	57,0	45,0	61090	68332	●
5,9 mm	0.2323		93,0	57,0	45,0	61091	68333	●
A	0.2340	5.94	3-1/4	2	1-39/64	51201	57170	●
15/64	0.2344	5.95	3-1/4	2	1-39/64	51115	57171	●
6,0 mm	0.2362		93,0	57,0	45,0	61027	68281	●
B	0.2380	6.05	3-1/4	2	1-39/64	51202	57172	●
6,1 mm	0.2402		101,0	63,0	50,0	61092	68334	●
C	0.2420	6.15	3-1/4	2	1-39/64	51203	57173	●
6,2 mm	0.2441		101,0	63,0	50,0	61093	68335	●
D	0.2460	6.25	3-1/4	2	1-39/64	51204	57174	●
6,3 mm	0.2480		101,0	63,0	50,0	61094	68336	●
1/4	0.2500	6.35	3-1/4	2	1-39/64	51116	57175	●
6,4 mm	0.2520		101,0	63,0	50,0	61095	68337	●
6,5 mm	0.2559		101,0	63,0	50,0	61029	68282	●
F	0.2570	6.53	3-1/4	2	1-39/64	51206	57177	●
6,6 mm	0.2598		101,0	63,0	50,0	61096	68338	●
G	0.2610	6.63	3-1/2	2-1/8	1-45/64	51207	57178	●
6,7 mm	0.2638		101,0	63,0	50,0	61097	68339	●
17/64	0.2656	6.75	3-1/2	2-1/8	1-45/64	51117	57179	●
H	0.2660	6.76	3-1/2	2-1/8	1-45/64	51208	57180	●
6,8 mm	0.2677		109,0	69,0	55,0	61098	68340	●
6,9 mm	0.2717		109,0	69,0	55,0	61099	68341	●
I	0.2720	6.91	3-1/2	2-1/8	1-45/64	51209	57181	●
7,0 mm	0.2756		109,0	69,0	55,0	61031	68283	●
J	0.2770	7.04	3-1/2	2-1/8	1-45/64	51210	57182	●
7,1 mm	0.2795		109,0	69,0	55,0	61100	68342	●
K	0.2810	7.14	3-1/2	2-1/8	1-45/64	51211	57183	●
9/32	0.2812	7.14	3-1/2	2-1/8	1-45/64	51118	57184	●
7,2 mm	0.2835		109,0	69,0	55,0	61101	68343	●
7,3 mm	0.2874		109,0	69,0	55,0	61102	68344	●
L	0.2900	7.37	3-1/2	2-1/8	1-45/64	51212	57185	●
7,4 mm	0.2913		109,0	69,0	55,0	61103	68345	●
M	0.2950	7.49	3-3/4	2-3/8	1-29/32	51213	57186	●
7,5 mm	0.2953		109,0	69,0	55,0	61033	68284	●
19/64	0.2969	7.54	3-3/4	2-3/8	1-29/32	51119	57187	●
7,6 mm	0.2992		117,0	75,0	60,0	61104	68346	●
N	0.3020	7.67	3-3/4	2-3/8	1-29/32	51214	57188	●
7,7 mm	0.3031		117,0	75,0	60,0	61105	68347	●
7,8 mm	0.3071		117,0	75,0	60,0	61106	68348	●
7,9 mm	0.3110		117,0	75,0	60,0	61107	68349	●
*5/16	0.3125	7.94	3-3/4	2-3/8	1-29/32	51120	57189	●
8,0 mm	0.3150		117,0	75,0	60,0	61035	68285	●
O	0.3160	8.03	3-3/4	2-3/8	1-29/32	51215	57190	●
8,1 mm	0.3189		117,0	75,0	60,0	61108	68350	●
8,2 mm	0.3228		117,0	75,0	60,0	61109	68351	●
P	0.3230	8.20	3-3/4	2-3/8	1-29/32	51216	57191	●
8,3 mm	0.3268		117,0	75,0	60,0	61110	68352	●
21/64	0.3281	8.33	4	2-1/2	2	51121	57192	●
8,4 mm	0.3307		117,0	75,0	60,0	61111	68353	●
Q	0.3320	8.43	4	2-1/2	2	51217	57193	●
8,5 mm	0.3346		117,0	75,0	60,0	61037	68286	●
8,6 mm	0.3386		125,0	81,0	64,0	61112	68354	●
R	0.3390	8.61	4	2-1/2	2	51218	57194	●

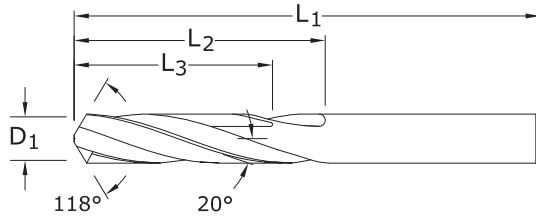
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# 2 Flute Drills • Metric: DIN 338



5xD



## 101

FRACTIONAL & METRIC SERIES

CUTTING DIAMETER D <sub>1</sub>	DECIMAL EQUIV.	METRIC EQUIV.	OVERALL LENGTH L <sub>1</sub>	FLUTE LENGTH L <sub>2</sub>	CLEARED LENGTH L <sub>3</sub>	EDP NO.		STOCK
						UNCOATED	Ti-NAMITE-A (AlTiN)	
8,7 mm	0.3425		125,0	81,0	64,0	61113	68355	●
11/32	0.3438	8.73	4	2-1/2	2	51122	57195	●
8,8 mm	0.3465		125,0	81,0	64,0	61114	68356	●
S	0.3480	8.84	4	2-1/2	2	51219	57196	●
8,9 mm	0.3504		125,0	81,0	64,0	61115	68357	●
9,0 mm	0.3543		125,0	81,0	64,0	61039	68287	●
T	0.3580	9.09	4-1/4	2-3/4	2-13/64	51220	57197	●
9,1 mm	0.3583		125,0	81,0	64,0	61116	68358	●
23/64	0.3594	9.13	4-1/4	2-3/4	2-13/64	51123	57198	●
9,2 mm	0.3622		125,0	81,0	64,0	61117	68359	●
9,3 mm	0.3661		125,0	81,0	64,0	61118	68360	●
U	0.3680	9.35	4-1/4	2-3/4	2-13/64	51221	57199	●
9,4 mm	0.3701		125,0	81,0	64,0	61119	68361	●
9,5 mm	0.3740		125,0	81,0	64,0	61041	68288	●
*3/8	0.3750	9.53	4-1/4	2-3/4	2-13/64	51124	57200	●
V	0.3770	9.58	4-1/4	2-3/4	2-13/64	51222	57201	●
9,6 mm	0.3780		133,0	87,0	69,0	61120	68362	●
9,7 mm	0.3819		133,0	87,0	69,0	61121	68363	●
9,8 mm	0.3858		133,0	87,0	69,0	61122	68364	●
W	0.3860	9.80	4-1/2	2-7/8	2-19/64	51223	57202	●
9,9 mm	0.3898		133,0	87,0	69,0	61123	68365	●
25/64	0.3906	9.92	4-1/2	2-7/8	2-19/64	51125	57203	●
10,0 mm	0.3937		133,0	87,0	69,0	61043	68289	●
X	0.3970	10.08	4-1/2	2-7/8	2-19/64	51224	57204	●
10,2 mm	0.4016		133,0	87,0	69,0	61124	68366	●
Y	0.4040	10.26	4-1/2	2-7/8	2-19/64	51225	57205	●
13/32	0.4062	10.32	4-1/2	2-7/8	2-19/64	51126	57206	●
Z	0.4130	10.49	4-1/2	2-7/8	2-19/64	51226	57207	●
10,5 mm	0.4134		133,0	87,0	69,0	61045	68290	●
27/64	0.4219	10.72	4-1/2	2-7/8	2-19/64	51127	57208	●
11,0 mm	0.4331		142,0	94,0	75,0	61047	68291	●
7/16	0.4375	11.11	4-1/2	2-7/8	2-19/64	51128	57209	●
11,5 mm	0.4528		142,0	94,0	75,0	61049	68292	●
29/64	0.4531	11.51	4-3/4	3	2-13/32	51129	57210	●
15/32	0.4688	11.91	4-3/4	3	2-13/32	51130	57211	●
12,0 mm	0.4724		151,0	101,0	80,0	61051	68293	●
31/64	0.4844	12.30	4-3/4	3	2-13/32	51131	57212	●
1/2	0.5000	12.70	4-3/4	3	2-13/32	51132	57213	●
*Series 101 Set						61175	57351	●

**TOLERANCES (inch)**

D<sub>1</sub> = +.0000/- .0005

**TOLERANCES (mm)**

D<sub>1</sub> = +0,0000/-0,0127

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES

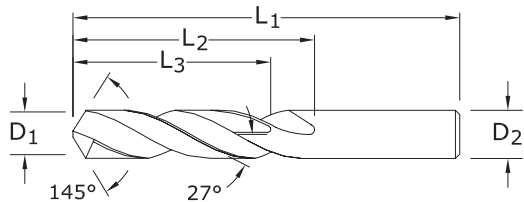
- U.S. Stock Standard
- NOT STOCKED—  
Call for Delivery

For patent information  
visit [www.kyocera-sgtool.com/patents](http://www.kyocera-sgtool.com/patents)

# Short Length Self Centering Drills • DIN 6539



3XD



## 108M Plus METRIC SERIES

**TOLERANCES (mm)**

**≤3 DIAMETER**

D<sub>1</sub> = +0,000/-0,010

D<sub>2</sub> = h<sub>6</sub>

**>3-6 DIAMETER**

D<sub>1</sub> = +0,000/-0,012

D<sub>2</sub> = h<sub>6</sub>

**>6-10 DIAMETER**

D<sub>1</sub> = +0,000/-0,015

D<sub>2</sub> = h<sub>6</sub>

**>10-18 DIAMETER**

D<sub>1</sub> = +0,000/-0,018

D<sub>2</sub> = h<sub>6</sub>

STEELS

STAINLESS STEELS

CAST IRON

HIGH TEMP ALLOYS

TITANIUM

HARDENED STEELS

NON-FERROUS

PLASTICS/COMPOSITES

● U.S. Stock Standard

■ NOT STOCKED—  
Call for Delivery

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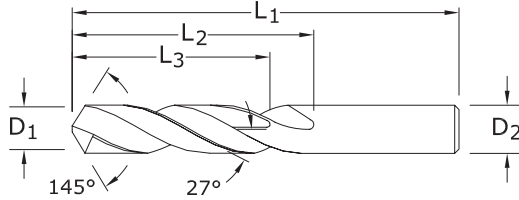
CUTTING DIAMETER D <sub>1</sub> /D <sub>2</sub>	OVERALL LENGTH L <sub>1</sub>	FLUTE LENGTH L <sub>2</sub>	CLEARED LENGTH L <sub>3</sub>	EDP NO.		STOCK
				UNCOATED	Ti-NAMITE-A (AlTiN)	
0,5	20,0	3,0	2,1	62001	68643	●
0,55	21,0	3,5	2,5	62003	68644	●
0,6	21,0	3,5	2,5	62005	68645	●
0,65	22,0	4,0	2,9	62007	68646	●
0,7	23,0	4,5	3,2	62009	68647	●
0,75	23,0	4,5	3,2	62011	68648	●
0,8	24,0	5,0	3,6	62013	68649	●
0,85	24,0	5,0	3,6	62015	68650	●
0,9	25,0	5,5	4,0	62017	68651	●
0,95	25,0	5,5	4,0	62019	68652	●
1,0	26,0	6,0	4,7	62021	68653	●
1,05	26,0	6,0	4,7	62023	68654	●
1,1	28,0	7,0	5,4	62025	68655	●
1,15	28,0	7,0	5,4	62027	68656	●
1,2	30,0	8,0	6,0	62029	68657	●
1,25	30,0	8,0	6,0	62031	68658	●
1,3	30,0	8,0	6,0	62033	68659	●
1,35	32,0	9,0	7,0	62035	68660	●
1,4	32,0	9,0	7,0	62037	68661	●
1,45	32,0	9,0	7,0	62039	68662	●
1,5	32,0	9,0	7,0	62041	68663	●
1,6	34,0	10,0	7,0	62043	68664	●
1,7	34,0	10,0	7,0	62045	68665	●
1,8	36,0	11,0	8,0	62047	68666	●
1,9	36,0	11,0	8,0	62049	68667	●
2,0	38,0	12,0	9,0	62051	68668	●
2,1	38,0	12,0	9,0	62053	68669	●
2,2	40,0	13,0	10,0	62055	68670	●
2,3	40,0	13,0	10,0	62057	68671	●
2,4	43,0	14,0	11,0	62059	68672	●
2,5	43,0	14,0	11,0	62061	68673	●
2,6	43,0	14,0	11,0	62063	68674	●
2,7	46,0	16,0	12,0	62065	68675	●
2,8	46,0	16,0	12,0	62067	68676	●

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# Short Length Self Centering Drills • DIN 6539



3xD



## 108M Plus

METRIC SERIES

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- NON-FERROUS
- PLASTICS/COMPOSITES

CUTTING DIAMETER D <sub>1</sub> /D <sub>2</sub>	mm			EDP NO.		STOCK
	OVERALL LENGTH L <sub>1</sub>	FLUTE LENGTH L <sub>2</sub>	CLEARED LENGTH L <sub>3</sub>	UNCOATED	Ti-NAMITE-A (AlTiN)	
2,9	46,0	16,0	12,0	62069	68677	●
3,0	46,0	16,0	12,0	62071	68678	●
3,1	49,0	18,0	14,0	62073	68679	●
3,2	49,0	18,0	14,0	62075	68680	●
3,3	49,0	18,0	14,0	62077	68681	●
3,4	52,0	20,0	15,0	62079	68682	●
3,5	52,0	20,0	15,0	62081	68683	●
3,6	52,0	20,0	15,0	62083	68684	●
3,7	52,0	20,0	15,0	62085	68685	●
3,8	55,0	22,0	17,0	62087	68686	●
3,9	55,0	22,0	17,0	62089	68687	●
4,0	55,0	22,0	17,0	62091	68688	●
4,1	55,0	22,0	17,0	62093	68689	●
4,2	55,0	22,0	17,0	62095	68690	●
4,3	58,0	24,0	18,0	62097	68691	●
4,4	58,0	24,0	18,0	62099	68692	●
4,5	58,0	24,0	18,0	62101	68693	●
4,6	58,0	24,0	18,0	62103	68694	●
4,7	58,0	24,0	18,0	62105	68695	●
4,8	62,0	26,0	20,0	62107	68696	●
4,9	62,0	26,0	20,0	62109	68697	●
5,0	62,0	26,0	20,0	62111	68698	●
5,1	62,0	26,0	20,0	62113	68699	●
5,2	62,0	26,0	20,0	62115	68700	●
5,3	62,0	26,0	20,0	62117	68701	●
5,4	66,0	28,0	21,0	62119	68702	●
5,5	66,0	28,0	21,0	62121	68703	●
5,6	66,0	28,0	21,0	62123	68704	●
5,7	66,0	28,0	21,0	62125	68705	●
5,8	66,0	28,0	21,0	62127	68706	●
5,9	66,0	28,0	21,0	62129	68707	●
6,0	66,0	28,0	21,0	62131	68708	●

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### TOLERANCES (mm)

#### ≤3 DIAMETER

D<sub>1</sub> = +0,000/-0,010

D<sub>2</sub> = h<sub>6</sub>

#### >3-6 DIAMETER

D<sub>1</sub> = +0,000/-0,012

D<sub>2</sub> = h<sub>6</sub>

#### >6-10 DIAMETER

D<sub>1</sub> = +0,000/-0,015

D<sub>2</sub> = h<sub>6</sub>

#### >10-16 DIAMETER

D<sub>1</sub> = +0,000/-0,018

D<sub>2</sub> = h<sub>6</sub>

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES

- U.S. Stock Standard
- NOT STOCKED—  
Call for Delivery

For patent information  
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## Short Length Self Centering Drills • DIN 6539

## 108M Plus

METRIC SERIES

CUTTING DIAMETER D <sub>1</sub> /D <sub>2</sub>	mm			EDP NO.		STOCK
	OVERALL LENGTH L <sub>1</sub>	FLUTE LENGTH L <sub>2</sub>	CLEARED LENGTH L <sub>3</sub>	UNCOATED	Ti-NAMITE-A (AlTiN)	
6,1	70,0	31,0	23,0	62133	68709	●
6,2	70,0	31,0	23,0	62135	68710	●
6,3	70,0	31,0	23,0	62137	68711	●
6,4	70,0	31,0	23,0	62139	68712	●
6,5	70,0	31,0	23,0	62141	68713	●
6,8	70,0	31,0	23,0	62142	68603	●
7,0	74,0	34,0	25,0	62143	68718	●
7,5	74,0	34,0	25,0	62145	68723	●
7,8	79,0	37,0	27,0	62146	68604	●
8,0	79,0	37,0	27,0	62147	68728	●
8,5	79,0	37,0	27,0	62149	68733	●
9,0	84,0	40,0	29,0	62151	68738	●
9,5	84,0	40,0	29,0	62153	68743	●
9,8	89,0	43,0	31,0	62154	68606	●
10,0	89,0	43,0	31,0	62155	68748	●
10,2	89,0	43,0	31,0	62156	68607	●
10,5	89,0	43,0	31,0	62066	68753	●
11,0	95,0	47,0	33,0	62157	68758	●
11,5	95,0	47,0	33,0	62084	68763	●
11,8	102,0	51,0	35,0	62158	68608	●
12,0	102,0	51,0	35,0	62159	68768	●
12,5	102,0	51,0	35,0	62102	68773	●
13,0	102,0	51,0	35,0	62112	68778	●
13,8	107,0	54,0	37,0	62164	68609	●
14,0	107,0	54,0	37,0	62116	68780	●
14,5	111,0	56,0	38,0	62166	68611	●
14,8	111,0	56,0	38,0	62167	68612	●
15,0	111,0	56,0	38,0	62168	68613	●
15,8	115,0	58,0	38,0	62170	68614	●
16,0	115,0	58,0	38,0	62171	68616	●

CONTINUED

# 2 Flute Drills

Series 101 Fractional	Hardness	Vc (sfm)	Diameter (D <sub>1</sub> ) (inch)								
			1/64	1/32	1/16	1/8	1/4	3/8	1/2		
P  <b>CARBON STEELS</b> 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	≤ 175 Bhn or ≤ 7 HRc	265 (212-318)	RPM	64787	32394	16197	8098	4049	2699	2025	
			Fr	0.00021	0.0004	0.0008	0.0017	0.0033	0.0050	0.0067	
			Feed (ipm)	13.5	13.5	13.5	13.5	13.5	13.5	13.5	
	≤ 300 Bhn or ≤ 32 HRc	125 (100-150)	RPM	30560	15280	7640	3820	1910	1273	955	
			Fr	0.00020	0.0004	0.0008	0.0016	0.0031	0.0047	0.0063	
			Feed (ipm)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
	≤ 425 Bhn or ≤ 45 HRc	85 (68-102)	RPM	20781	10390	5195	2598	1299	866	649	
			Fz	0.00011	0.0002	0.0004	0.0008	0.0017	0.0025	0.0034	
			Feed (ipm)	2.2	2.2	2.2	2.2	2.2	2.2	2.2	
	ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100	≤ 275 Bhn or ≤ 28 HRc	230 (184-276)	RPM	56230	28115	14058	7029	3514	2343	1757
				Fz	0.00019	0.0004	0.0007	0.0015	0.0030	0.0045	0.0060
				Feed (ipm)	10.5	10.5	10.5	10.5	10.5	10.5	10.5
≤ 375 Bhn or ≤ 40 HRc		145 (116-174)	RPM	35450	17725	8862	4431	2216	1477	1108	
			Fr	0.00019	0.0004	0.0007	0.0015	0.0030	0.0045	0.0060	
			Feed (ipm)	6.6	6.6	6.6	6.6	6.6	6.6	6.6	
≤ 450 Bhn or ≤ 48 HRc	60 (48-72)	RPM	14669	7334	3667	1834	917	611	458		
		Fr	0.00008	0.0002	0.0003	0.0007	0.0013	0.0020	0.0026		
		Feed (ipm)	1.2	1.2	1.2	1.2	1.2	1.2	1.2		
H  <b>TOOL STEELS</b> A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 250 Bhn or ≤ 24 HRc	85 (68-102)	RPM	20781	10390	5195	2598	1299	866	649	
			Fr	0.00011	0.0002	0.0004	0.0009	0.0018	0.0027	0.0035	
			Feed (ipm)	2.3	2.3	2.3	2.3	2.3	2.3	2.3	
	≤ 375 Bhn or ≤ 40 HRc	55 (44-66)	RPM	13446	6723	3362	1681	840	560	420	
			Fr	0.00005	0.0001	0.0002	0.0004	0.0008	0.0012	0.0017	
			Feed (ipm)	0.7	0.7	0.7	0.7	0.7	0.7	0.7	
≤ 475 Bhn or ≤ 50 HRc	40 (32-48)	RPM	9779	4890	2445	1222	611	407	306		
		Fr	0.00005	0.0001	0.0002	0.0004	0.0008	0.0012	0.0016		
		Feed (ipm)	0.5	0.5	0.5	0.5	0.5	0.5	0.5		
K  <b>CAST IRONS</b> Gray, Malleable, Ductile	≤ 220 Bhn or ≤ 19 HRc	280 (224-336)	RPM	68454	34227	17114	8557	4278	2852	2139	
			Fr	0.00026	0.0005	0.0010	0.0020	0.0041	0.0061	0.0082	
			Feed (ipm)	17.5	17.5	17.5	17.5	17.5	17.5	17.5	
	≤ 330 Bhn or ≤ 36 HRc	250 (200-300)	RPM	61120	30560	15280	7640	3820	2547	1910	
			Fr	0.00025	0.0005	0.0010	0.0020	0.0041	0.0061	0.0081	
			Feed (ipm)	15.5	15.5	15.5	15.5	15.5	15.5	15.5	
M  <b>STAINLESS STEELS</b> (FREE MACHINING) 303, 416, 420F, 430F 440F	≤ 250 Bhn or ≤ 24 HRc	210 (168-252)	RPM	51341	25670	12835	6418	3209	2139	1604	
			Fr	0.00015	0.0003	0.0006	0.0012	0.0024	0.0036	0.0048	
			Feed (ipm)	7.7	7.7	7.7	7.7	7.7	7.7	7.7	
	≤ 330 Bhn or ≤ 36 HRc	110 (88-132)	RPM	26893	13446	6723	3362	1681	1121	840	
			Fr	0.00009	0.0002	0.0004	0.0007	0.0015	0.0022	0.0030	
			Feed (ipm)	2.5	2.5	2.5	2.5	2.5	2.5	2.5	
<b>STAINLESS STEELS</b> (DIFFICULT) 304, 316, 321, 13-8 PH, 15-5PH, 17-4 PH, Custom 450	≤ 275 Bhn or ≤ 28 HRc	65 (52-78)	RPM	15891	7946	3973	1986	993	662	497	
			Fr	0.00010	0.0002	0.0005	0.0009	0.0018	0.0025	0.0035	
			Feed (ipm)	1.7	1.7	1.7	1.7	1.7	1.7	1.7	
	≤ 375 Bhn or ≤ 40 HRc	55 (44-66)	RPM	13446	6723	3362	1681	840	560	420	
			Fr	0.00010	0.0002	0.0004	0.0008	0.0015	0.0023	0.0031	
			Feed (ipm)	1.3	1.3	1.3	1.3	1.3	1.3	1.3	

continued on next page

# FRACTIONAL 2 Flute Drills

Series 101 Fractional	Hardness	Vc (sfm)	Diameter (D <sub>1</sub> ) (inch)								
			1/64	1/32	1/16	1/8	1/4	3/8	1/2		
<b>SUPER ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 601, 617, 625, Incoloy 800, Monel 400, Rene, Waspaloy</b>	≤ 220 Bhn or ≤ 19 HRc	40 (32-48)	RPM	9779	4890	2445	1222	611	407	306	
			Fr	0.00010	0.0002	0.0004	0.0008	0.0016	0.0025	0.0033	
			Feed (ipm)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
	≤ 320 Bhn or ≤ 34 HRc	25 (20-30)	RPM	6112	3056	1528	764	382	255	191	
			Fr	0.00010	0.0002	0.0004	0.0008	0.0016	0.0024	0.0031	
			Feed (ipm)	0.6	0.6	0.6	0.6	0.6	0.6	0.6	
	≤ 425 Bhn or ≤ 45 HRc	20 (16-24)	RPM	4890	2445	1222	611	306	204	153	
			Fr	0.00004	0.0001	0.0002	0.0003	0.0007	0.0010	0.0013	
			Feed (ipm)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	
	<b>TITANIUM ALLOYS (DIFFICULT) Pure Titanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si, Ti-6Al4V</b>	≤ 275 Bhn or ≤ 28 HRc	85 (68-102)	RPM	20781	10390	5195	2598	1299	866	649
				Fr	0.00020	0.0004	0.0008	0.0016	0.0032	0.0049	0.0065
				Feed (ipm)	4.2	4.2	4.2	4.2	4.2	4.2	4.2
≤ 350 Bhn or ≤ 38 HRc		65 (52-78)	RPM	15891	7946	3973	1986	993	662	497	
			Fr	0.00011	0.0002	0.0004	0.0009	0.0017	0.0026	0.0034	
			Feed (ipm)	1.7	1.7	1.7	1.7	1.7	1.7	1.7	
≤ 440 Bhn or ≤ 47 HRc		55 (44-66)	RPM	13446	6723	3362	1681	840	560	420	
			Fr	0.00010	0.0002	0.0004	0.0008	0.0015	0.0023	0.0031	
			Feed (ipm)	1.3	1.3	1.3	1.3	1.3	1.3	1.3	
<b>ALUMINUM ALLOYS 2017, 2024, 356, 6061, 7075</b>		≤ 80 Bhn or ≤ 47 HRb	540 (432-648)	RPM	132019	66010	33005	16502	8251	5501	4126
				Fr	0.00030	0.0006	0.0012	0.0024	0.0048	0.0073	0.0097
				Feed (ipm)	40.0	40.0	40.0	40.0	40.0	40.0	40.0
	≤ 150 Bhn or ≤ 7 HRc	455 (364-546)	RPM	111238	55619	27810	13905	6952	4635	3476	
			Fr	0.00031	0.0006	0.0013	0.0025	0.0050	0.0076	0.0101	
			Feed (ipm)	35.0	35.0	35.0	35.0	35.0	35.0	35.0	
	<b>COPPER ALLOYS Alum Bronze, C110, Muntz Brass</b>	≤ 140 Bhn or ≤ 3 HRc	190 (152-228)	RPM	46451	23226	11613	5806	2903	1935	1452
				Fr	0.00015	0.0003	0.0006	0.0012	0.0024	0.0036	0.0048
				Feed (ipm)	7.0	7.0	7.0	7.0	7.0	7.0	7.0
		≤ 200 Bhn or ≤ 23 HRc	175 (140-210)	RPM	42784	21392	10696	5348	2674	1783	1337
				Fr	0.00015	0.0003	0.0006	0.0012	0.0024	0.0036	0.0048
				Feed (ipm)	6.4	6.4	6.4	6.4	6.4	6.4	6.4
<b>PLASTICS Polycarbonate, PVC</b>		500 (400-600)	RPM	122240	61120	30560	15280	7640	5093	3820	
			Fr	0.00031	0.0006	0.0012	0.0025	0.0050	0.0075	0.0099	
			Feed (ipm)	38.0	38.0	38.0	38.0	38.0	38.0	38.0	

Bhn (Brinell) HRc (Rockwell C) HRb (Rockwell B)  
 $rpm = Vc \times 3.82 / D_1$   
 $ipm = Fr \times rpm$   
 reduce speed and feed 30 percent when using uncoated drills  
 reduce speed and feed for materials harder than listed  
 refer to the SGS Tool Wizard for complete technical information ([www.kyocera-sgstool.com](http://www.kyocera-sgstool.com))

# 2 Flute Drills

## Short Length Self Centering Drills • DIN 6539

Series 101M, 108M Metric	Hardness	Vc (m/min)	Diameter (D <sub>1</sub> ) (mm)									
			1	3	6	8	10	12	16			
<b>P</b>	<b>CARBON STEELS</b> 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	≤ 175 Bhn or ≤ 7 HRc	81	RPM	25690	8563	4282	3211	2569	2141	1606	
			(65-97)	Fr	0.014	0.041	0.082	0.109	0.136	0.163	0.218	
			Feed (mm/min)	350	350	350	350	350	350	350		
		≤ 300 Bhn or ≤ 32 HRc	38	RPM	12118	4039	2020	1515	1212	1010	757	
			(30-46)	Fr	0.012	0.036	0.072	0.096	0.120	0.144	0.191	
			Feed (mm/min)	145	145	145	145	145	145	145		
	≤ 425 Bhn or ≤ 45 HRc	26	RPM	8240	2747	1373	1030	824	687	515		
		(21-31)	Fz	0.007	0.020	0.040	0.053	0.067	0.080	0.107		
		Feed (mm/min)	55	55	55	55	55	55	55			
	<b>ALLOY STEELS</b> 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100	≤ 275 Bhn or ≤ 28 HRc	70	RPM	22297	7432	3716	2787	2230	1858	1394	
			(56-84)	Fz	0.012	0.036	0.073	0.097	0.121	0.145	0.194	
			Feed (mm/min)	270	270	270	270	270	270	270		
≤ 375 Bhn or ≤ 40 HRc		44	RPM	14057	4686	2343	1757	1406	1171	879		
		(35-53)	Fr	0.012	0.036	0.073	0.097	0.121	0.145	0.194		
		Feed (mm/min)	170	170	170	170	170	170	170			
≤ 450 Bhn or ≤ 48 HRc	18	RPM	5816	1939	969	727	582	485	364			
	(15-22)	Fr	0.005	0.015	0.030	0.040	0.050	0.060	0.080			
	Feed (mm/min)	29	29	29	29	29	29	29				
<b>H</b>	<b>TOOL STEELS</b> A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 250 Bhn or ≤ 24 HRc	26	RPM	8240	2747	1373	1030	824	687	515	
			(21-31)	Fr	0.007	0.020	0.040	0.053	0.067	0.080	0.107	
			Feed (mm/min)	55	55	55	55	55	55	55		
		≤ 375 Bhn or ≤ 40 HRc	17	RPM	5332	1777	889	666	533	444	333	
			(13-20)	Fr	0.003	0.010	0.020	0.027	0.034	0.041	0.054	
			Feed (mm/min)	18	18	18	18	18	18	18		
	≤ 475 Bhn or ≤ 50 HRc	12	RPM	3878	1293	646	485	388	323	242		
		(10-15)	Fr	0.003	0.009	0.019	0.025	0.031	0.037	0.050		
		Feed (mm/min)	12	12	12	12	12	12	12			
	<b>K</b>	<b>CAST IRONS</b> Gray, Malleable, Ductile	≤ 220 Bhn or ≤ 19 HRc	85	RPM	27144	9048	4524	3393	2714	2262	1696
				(68-102)	Fr	0.016	0.049	0.097	0.130	0.162	0.195	0.259
				Feed (mm/min)	440	440	440	440	440	440	440	
≤ 330 Bhn or ≤ 36 HRc			76	RPM	24235	8078	4039	3029	2424	2020	1515	
			(61-91)	Fr	0.017	0.050	0.099	0.132	0.165	0.198	0.264	
			Feed (mm/min)	400	400	400	400	400	400	400		
<b>M</b>	<b>STAINLESS STEELS</b> (FREE MACHINING) 303, 416, 420F, 430F 440F	≤ 250 Bhn or ≤ 24 HRc	64	RPM	20358	6786	3393	2545	2036	1696	1272	
			(51-77)	Fr	0.010	0.029	0.059	0.079	0.098	0.118	0.157	
			Feed (mm/min)	200	200	200	200	200	200	200		
		≤ 330 Bhn or ≤ 36 HRc	34	RPM	10664	3555	1777	1333	1066	889	666	
			(27-40)	Fr	0.006	0.017	0.034	0.045	0.056	0.068	0.090	
			Feed (mm/min)	60	60	60	60	60	60	60		
	<b>STAINLESS STEELS</b> (DIFFICULT) 304, 316, 321, 13-8 PH, 15-5PH, 17-4 PH, Custom 450	≤ 275 Bhn or ≤ 28 HRc	20	RPM	6301	2100	1050	788	630	525	394	
			(16-24)	Fr	0.007	0.021	0.043	0.057	0.071	0.086	0.114	
			Feed (mm/min)	45	45	45	45	45	45	45		
		≤ 375 Bhn or ≤ 40 HRc	17	RPM	5332	1777	889	666	533	444	333	
			(13-20)	Fr	0.007	0.020	0.039	0.053	0.066	0.079	0.105	
			Feed (mm/min)	35	35	35	35	35	35	35		

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# 2 Flute Drills

## Short Length Self Centering Drills • DIN 6539

Series 101M, 108M Metric	Hardness	Vc (m/min)	Diameter (D <sub>1</sub> ) (mm)								
			1	3	6	8	10	12	16		
<b>S</b>  <b>SUPER ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 601, 617, 625, Incoloy 800, Monel 400, Rene, Waspaloy</b>	≤ 220 Bhn or ≤ 19 HRc	12  (10-15)	RPM	3878	1293	646	485	388	323	242	
			Fr	0.006	0.019	0.039	0.052	0.064	0.077	0.103	
			Feed (mm/min)	25	25	25	25	25	25	25	
	≤ 320 Bhn or ≤ 34 HRc	8  (6-9)	RPM	2424	808	404	303	242	202	151	
			Fr	0.006	0.019	0.037	0.050	0.062	0.074	0.099	
			Feed (mm/min)	15	15	15	15	15	15	15	
	≤ 425 Bhn or ≤ 45 HRc	6  (5-7)	RPM	1939	646	323	242	194	162	121	
			Fr	0.005	0.015	0.031	0.041	0.052	0.062	0.083	
			Feed (mm/min)	10	10	10	10	10	10	10	
	<b>S</b>  <b>TITANIUM ALLOYS (DIFFICULT) Pure Titanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si, Ti-6Al4V</b>	≤ 275 Bhn or ≤ 28 HRc	26  (21-31)	RPM	8240	2747	1373	1030	824	687	515
				Fr	0.013	0.040	0.080	0.107	0.133	0.160	0.214
				Feed (mm/min)	110	110	110	110	110	110	110
≤ 350 Bhn or ≤ 38 HRc		20  (16-24)	RPM	6301	2100	1050	788	630	525	394	
			Fr	0.007	0.021	0.043	0.057	0.071	0.086	0.114	
			Feed (mm/min)	45	45	45	45	45	45	45	
≤ 440 Bhn or ≤ 47 HRc		17  (13-20)	RPM	5332	1777	889	666	533	444	333	
			Fr	0.007	0.020	0.039	0.053	0.066	0.079	0.105	
			Feed (mm/min)	35	35	35	35	35	35	35	
<b>N</b>  <b>ALUMINUM ALLOYS 2017, 2024, 356, 6061, 7075</b>		≤ 80 Bhn or ≤ 47 HRb	165  (132-198)	RPM	52348	17449	8725	6544	5235	4362	3272
				Fr	0.020	0.060	0.120	0.160	0.200	0.240	0.319
				Feed (mm/min)	1045	1045	1045	1045	1045	1045	1045
	≤ 150 Bhn or ≤ 7 HRc	139  (111-166)	RPM	44108	14703	7351	5514	4411	3676	2757	
			Fr	0.020	0.060	0.120	0.160	0.200	0.239	0.319	
			Feed (mm/min)	880	880	880	880	880	880	880	
	<b>COPPER ALLOYS Alum Bronze, C110, Muntz Brass</b>	≤ 140 Bhn or ≤ 3 HRc	58  (46-69)	RPM	18419	6140	3070	2302	1842	1535	1151
				Fr	0.010	0.030	0.060	0.080	0.100	0.121	0.161
				Feed (mm/min)	185	185	185	185	185	185	185
		≤ 200 Bhn or ≤ 23 HRc	53  (43-64)	RPM	16965	5655	2827	2121	1696	1414	1060
				Fr	0.010	0.030	0.060	0.080	0.100	0.120	0.160
				Feed (mm/min)	170	170	170	170	170	170	170
<b>PLASTICS Polycarbonate, PVC</b>	152  (122-183)	RPM	48471	16157	8078	6059	4847	4039	3029		
		Fr	0.020	0.060	0.120	0.160	0.200	0.240	0.320		
		Feed (mm/min)	970	970	970	970	970	970	970		

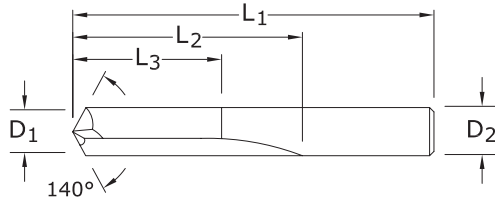
Bhn (Brinell) HRc (Rockwell C) HRb (Rockwell B)  
 $rpm = (Vc \times 1000) / (D_1 \times 3.14)$   
 $mm/min = Fr \times rpm$   
 reduce speed and feed 30 percent when using uncoated drills  
 reduce speed and feed for materials harder than listed  
 refer to the SGS Tool Wizard for complete technical information ([www.kyocera-sgstoool.com](http://www.kyocera-sgstoool.com))



# Straight Flute Drills • Metric: DIN 6539



3xD



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FRACTIONAL & METRIC SERIES

CUTTING DIAMETER D <sub>1</sub> /D <sub>2</sub>	DECIMAL EQUIV.	METRIC EQUIV.	OVERALL LENGTH L <sub>1</sub>	FLUTE LENGTH L <sub>2</sub>	CLEARED LENGTH L <sub>3</sub>	EDP NO.		STOCK
						UNCOATED	Ti-NAMITE-A (AlTiN)	
1,0 mm	0.0394		26,0	6,0	4,5	66001	66002	●
#60	0.0400	1.02	1-1/2	1/2	13/32	56060	56269	●
#59	0.0410	1.04	1-1/2	1/2	13/32	56059	56268	●
#58	0.0420	1.07	1-1/2	1/2	13/32	56058	56267	●
#57	0.0430	1.09	1-1/2	1/2	13/32	56057	56266	●
#56	0.0465	1.18	1-1/2	1/2	13/32	56056	56265	●
3/64	0.0469	1.19	1-1/2	1/2	13/32	56103	56135	●
#55	0.0520	1.32	1-1/2	1/2	13/32	56055	56264	●
#54	0.0550	1.40	1-1/2	1/2	13/32	56054	56263	●
1,5 mm	0.0591		32,0	9,0	7,0	66003	66004	●
#53	0.0595	1.51	1-1/2	1/2	13/32	56053	56262	●
1/16	0.0625	1.59	1-1/2	5/8	1/2	56104	56136	●
#52	0.0635	1.61	1-11/16	11/16	35/64	56052	56261	●
#51	0.0670	1.70	1-11/16	11/16	35/64	56051	56260	●
#50	0.0700	1.78	1-11/16	11/16	35/64	56050	56259	●
#49	0.0730	1.85	1-11/16	11/16	35/64	56049	56258	●
#48	0.0760	1.93	1-11/16	11/16	35/64	56048	56257	●
5/64	0.0781	1.98	1-11/16	11/16	35/64	56105	56137	●
#47	0.0785	1.99	1-3/4	3/4	39/64	56047	56256	●
2,0 mm	0.0787		38,0	12,0	9,0	66005	66006	●
#46	0.0810	2.06	1-3/4	3/4	39/64	56046	56255	●
#45	0.0820	2.08	1-3/4	3/4	39/64	56045	56254	●
#44	0.0860	2.18	1-3/4	3/4	39/64	56044	56253	●
#43	0.0890	2.26	1-3/4	3/4	39/64	56043	56252	●
#42	0.0935	2.37	1-3/4	3/4	39/64	56042	56251	●
3/32	0.0938	2.38	1-3/4	3/4	39/64	56106	56138	●
#41	0.0960	2.44	1-13/16	13/16	21/32	56041	56250	●
#40	0.0980	2.49	1-13/16	13/16	21/32	56040	56249	●
2,5 mm	0.0984		43,0	14,0	11,0	66007	66008	●
#39	0.0995	2.53	1-13/16	13/16	21/32	56039	56248	●
#38	0.1015	2.58	1-13/16	13/16	21/32	56038	56247	●
#37	0.1040	2.64	1-13/16	13/16	21/32	56037	56246	●
#36	0.1065	2.71	1-13/16	13/16	21/32	56036	56245	●
7/64	0.1094	2.78	1-13/16	13/16	21/32	56107	56139	●
#35	0.1100	2.79	1-7/8	7/8	45/64	56035	56244	●
#34	0.1110	2.82	1-7/8	7/8	45/64	56034	56243	●

### TOLERANCES (inch)

D<sub>1</sub> = +.0000/- .0005  
D<sub>2</sub> = h6

### TOLERANCES (mm)

D<sub>1</sub> = +0,0000/-0,0127  
D<sub>2</sub> = h6

STEELS

CAST IRON

HARDENED STEELS

- U.S. Stock Standard
- NOT STOCKED—  
Call for Delivery

For patent information  
visit [www.kyocera-sgstoool.com/patents](http://www.kyocera-sgstoool.com/patents)

continued on next page

## Straight Flute Drills • Metric: DIN 6539

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FRACTIONAL &amp; METRIC SERIES

CUTTING DIAMETER D <sub>1</sub> / D <sub>2</sub>	DECIMAL EQUIV.	METRIC EQUIV.	OVERALL LENGTH L <sub>1</sub>	FLUTE LENGTH L <sub>2</sub>	CLEARED LENGTH L <sub>3</sub>	EDP NO.		STOCK
						UNCOATED	Ti-NAMITE-A (AITiN)	
#33	0.1130	2.87	1-7/8	7/8	45/64	56033	56242	●
#32	0.1160	2.95	1-7/8	7/8	45/64	56032	56241	●
3,0 mm	0.1181		46,0	16,0	12,0	66009	66010	●
#31	0.1200	3.05	1-7/8	7/8	45/64	56031	56240	●
1/8	0.1250	3.18	1-7/8	7/8	45/64	56108	56140	●
#30	0.1285	3.26	1-15/16	15/16	3/4	56030	56239	●
#29	0.1360	3.45	1-15/16	15/16	3/4	56029	56238	●
3,5 mm	0.1378		52,0	20,0	15,0	66011	66012	●
#28	0.1405	3.57	1-15/16	15/16	3/4	56028	56237	●
9/64	0.1406	3.57	1-15/16	15/16	3/4	56109	56141	●
#27	0.1440	3.66	2-1/16	1	51/64	56027	56236	●
#26	0.1470	3.73	2-1/16	1	51/64	56026	56235	●
#25	0.1495	3.80	2-1/16	1	51/64	56025	56234	●
#24	0.1520	3.86	2-1/16	1	51/64	56024	56233	●
#23	0.1540	3.91	2-1/16	1	51/64	56023	56232	●
5/32	0.1562	3.97	2-1/16	1	51/64	56110	56142	●
#22	0.1570	3.99	2-1/8	1-1/16	55/64	56022	56231	●
4,0 mm	0.1575		55,0	22,0	17,0	66013	66014	●
#21	0.1590	4.04	2-1/8	1-1/16	55/64	56021	56230	●
#20	0.1610	4.09	2-1/8	1-1/16	55/64	56020	56229	●
#19	0.1660	4.22	2-1/8	1-1/16	55/64	56019	56228	●
#18	0.1695	4.31	2-1/8	1-1/16	55/64	56018	56227	●
11/64	0.1719	4.37	2-1/8	1-1/16	55/64	56111	56143	●
#17	0.1730	4.39	2-3/16	1-1/8	29/32	56017	56226	●
#16	0.1770	4.50	2-3/16	1-1/8	29/32	56016	56225	●
4,5 mm	0.1772		58,0	24,0	18,0	66015	66016	●
#15	0.1800	4.57	2-3/16	1-1/8	29/32	56015	56224	●
#14	0.1820	4.62	2-3/16	1-1/8	29/32	56014	56223	●
#13	0.1850	4.70	2-3/16	1-1/8	29/32	56013	56222	●
3/16	0.1875	4.76	2-3/16	1-1/8	29/32	56112	56144	●
#12	0.1890	4.80	2-3/16	1-1/8	29/32	56012	56221	●
#11	0.1910	4.85	2-3/16	1-1/8	29/32	56011	56220	●
#10	0.1935	4.91	2-3/16	1-1/8	29/32	56010	56219	●
#9	0.1960	4.98	2-1/4	1-3/16	61/64	56009	56218	●
5,0 mm	0.1969		62,0	26,0	20,0	66017	66018	●
#8	0.1990	5.05	2-1/4	1-3/16	61/64	56008	56217	●
#7	0.2010	5.11	2-1/4	1-3/16	61/64	56007	56216	●
13/64	0.2031	5.16	2-1/4	1-3/16	61/64	56113	56145	●
#6	0.2040	5.18	2-3/8	1-1/4	1	56006	56215	●
#5	0.2055	5.22	2-3/8	1-1/4	1	56005	56214	●
#4	0.2090	5.31	2-3/8	1-1/4	1	56004	56213	●
#3	0.2130	5.41	2-3/8	1-1/4	1	56003	56212	●
5,5 mm	0.2165		66,0	28,0	21,0	66019	66020	●
7/32	0.2188	5.56	2-3/8	1-1/4	1	56114	56146	●
#2	0.2210	5.61	2-7/16	1-5/16	1-3/64	56002	56211	●
#1	0.2280	5.79	2-7/16	1-5/16	1-3/64	56001	56210	●

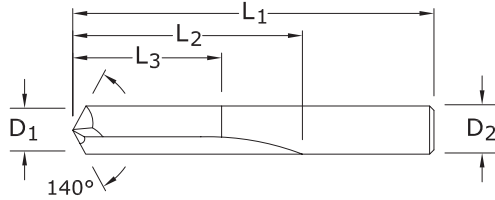
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CONTINUED

# Straight Flute Drills • Metric: DIN 6539



3xD



**106**

FRACTIONAL & METRIC SERIES

CUTTING DIAMETER D <sub>1</sub> /D <sub>2</sub>	DECIMAL EQUIV.	METRIC EQUIV.	OVERALL LENGTH L <sub>1</sub>	FLUTE LENGTH L <sub>2</sub>	CLEARED LENGTH L <sub>3</sub>	EDP NO.		STOCK
						UNCOATED	Ti-NAMITE-A (AlTiN)	
15/64	0.2344	5.95	2-7/16	1-5/16	1-3/64	56115	56147	●
6,0 mm	0.2362		66,0	28,0	21,0	66021	66045	●
1/4	0.2500	6.35	2-1/2	1-3/8	1-7/64	56116	56148	●
6,5 mm	0.2559		70,0	31,0	23,0	66022	66046	●
17/64	0.2656	6.75	2-5/8	1-7/16	1-7/64	56117	56149	●
7,0 mm	0.2756		74,0	34,0	25,0	66023	66024	●
9/32	0.2812	7.14	2-11/16	1-1/2	1-13/64	56118	56150	●
7,5 mm	0.2953		74,0	34,0	25,0	66025	66026	●
19/64	0.2969	7.54	2-3/4	1-9/16	1-1/4	56119	56151	●
5/16	0.3125	7.94	2-13/16	1-5/8	1-19/64	56120	56152	●
8,0 mm	0.3150		79,0	37,0	27,0	66027	66028	●
21/64	0.3281	8.33	2-15/16	1-11/16	1-23/64	56121	56153	●
8,5 mm	0.3346		79,0	37,0	27,0	66029	66030	●
11/32	0.3438	8.73	3	1-11/16	1-23/64	56122	56154	●
9,0 mm	0.3543		84,0	40,0	29,0	66031	66032	●
23/64	0.3594	9.13	3-1/16	1-3/4	1-13/32	56123	56155	●
9,5 mm	0.3740		84,0	40,0	29,0	66033	66034	●
3/8	0.3750	9.53	3-1/8	1-13/16	1-29/64	56124	56156	●
25/64	0.3906	9.92	3-1/4	1-7/8	1-1/2	56125	56157	●
10,0 mm	0.3937		89,0	43,0	31,0	66035	66036	●
13/32	0.4062	10.32	3-5/16	1-15/16	1-35/64	56126	56158	●
10,5 mm	0.4134		95,0	43,0	31,0	66037	66038	●
27/64	0.4219	10.72	3-3/8	2	1-39/64	56127	56159	●
11,0 mm	0.4331		95,0	43,0	31,0	66039	66040	●
7/16	0.4375	11.11	3-7/16	2-1/16	1-21/32	56128	56160	●
11,5 mm	0.4528		95,0	43,0	31,0	66041	66042	●
29/64	0.4531	11.51	3-9/16	2-1/8	1-45/64	56129	56161	●
15/32	0.4688	11.91	3-5/8	2-1/8	1-45/64	56130	56162	●
12,0 mm	0.4724		102,0	51,0	35,0	66043	66044	●
31/64	0.4844	12.30	3-11/16	2-3/16	1-3/4	56131	56163	●
1/2	0.5000	12.70	3-3/4	2-1/4	1-51/64	56132	56164	●

**TOLERANCES (inch)**

D<sub>1</sub> = +.0000/-0.0005  
D<sub>2</sub> = h6

**TOLERANCES (mm)**

D<sub>1</sub> = +0,0000/-0,0127  
D<sub>2</sub> = h6

STEELS

CAST IRON

HARDENED STEELS

- U.S. Stock Standard
- NOT STOCKED—  
Call for Delivery

For patent information  
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# FRACTIONAL & METRIC Straight Flute Drills

Series	106	Hardness	Vc (sfm)	Diameter (D <sub>1</sub> ) (inch)						
				1/16	1/8	3/16	1/4	3/8	1/2	
P	ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100	≤ 500 Bhn or ≤ 52 HRc	60 (48-72)	RPM	3667	1834	1222	917	611	458
				Fz	0.0004	0.0007	0.0011	0.0014	0.0021	0.0028
				Feed (ipm)	1.3	1.3	1.3	1.3	1.3	1.3
		≤ 615 Bhn or ≤ 58 HRc	50 (40-60)	RPM	3056	1528	1019	764	509	382
				Fr	0.0004	0.0008	0.0012	0.0016	0.0024	0.0031
				Feed (ipm)	1.2	1.2	1.2	1.2	1.2	1.2
H	TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 500 Bhn or ≤ 52 HRc	60 (48-72)	RPM	3667	1834	1222	917	611	458
				Fr	0.0004	0.0007	0.0011	0.0014	0.0021	0.0028
				Feed (ipm)	1.3	1.3	1.3	1.3	1.3	1.3
		≤ 615 Bhn or ≤ 58 HRc	50 (40-60)	RPM	3056	1528	1019	764	509	382
				Fr	0.0004	0.0008	0.0012	0.0016	0.0024	0.0031
				Feed (ipm)	1.2	1.2	1.2	1.2	1.2	1.2
K	CAST IRONS Gray, Malleable, Ductile	≤ 220 Bhn or ≤ 19 HRc	250 (200-300)	RPM	15280	7640	5093	3820	2547	1910
				Fr	0.0010	0.0020	0.0030	0.0041	0.0061	0.0081
				Feed (ipm)	15.5	15.5	15.5	15.5	15.5	15.5
		≤ 330 Bhn or ≤ 36 HRc	195 (156-234)	RPM	11918	5959	3973	2980	1986	1490
				Fr	0.0010	0.0020	0.0030	0.0040	0.0060	0.0081
				Feed (ipm)	12.0	12.0	12.0	12.0	12.0	12.0

Bhn (Brinell)    HRc (Rockwell C)  
 $rpm = Vc \times 3.82 / D_1$   
 $ipm = Fr \times rpm$   
 reduce speed and feed 30 percent when using uncoated drills  
 refer to the SGS Tool Wizard for complete technical information ([www.kyocera-sgstool.com](http://www.kyocera-sgstool.com))

Series	106M	Hardness	Vc (m/min)	Diameter (D <sub>1</sub> ) (mm)						
				1	3	6	8	10	12	
P	ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100	≤ 500 Bhn or ≤ 52 HRc	18 (15-22)	RPM	5816	1939	969	727	582	485
				Fz	0.006	0.018	0.035	0.047	0.058	0.070
				Feed (mm/min)	34	34	34	34	34	34
		≤ 615 Bhn or ≤ 58 HRc	15 (12-18)	RPM	4847	1616	808	606	485	404
				Fr	0.006	0.017	0.033	0.045	0.056	0.067
				Feed (mm/min)	27	27	27	27	27	27
H	TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 500 Bhn or ≤ 52 HRc	18 (15-22)	RPM	5816	1939	969	727	582	485
				Fr	0.006	0.018	0.035	0.047	0.058	0.070
				Feed (mm/min)	34	34	34	34	34	34
		≤ 615 Bhn or ≤ 58 HRc	15 (12-18)	RPM	4847	1616	808	606	485	404
				Fr	0.006	0.017	0.033	0.045	0.056	0.067
				Feed (mm/min)	27	27	27	27	27	27
K	CAST IRONS Gray, Malleable, Ductile	≤ 220 Bhn or ≤ 19 HRc	76 (61-91)	RPM	24235	8078	4039	3029	2424	2020
				Fr	0.016	0.048	0.096	0.128	0.160	0.192
				Feed (mm/min)	395	395	395	395	395	395
		≤ 330 Bhn or ≤ 36 HRc	59 (48-71)	RPM	18904	6301	3151	2363	1890	1575
				Fr	0.016	0.048	0.096	0.128	0.160	0.192
				Feed (mm/min)	305	305	305	305	305	305

Bhn (Brinell)    HRc (Rockwell C)  
 $rpm = (Vc \times 1000) / (D_1 \times 3.14)$   
 $mm/min = Fr \times rpm$   
 reduce speed and feed 30 percent when using uncoated drills  
 refer to the SGS Tool Wizard for complete technical information ([www.kyocera-sgstool.com](http://www.kyocera-sgstool.com))

# 3 Flute Drills • Metric: DIN 6539

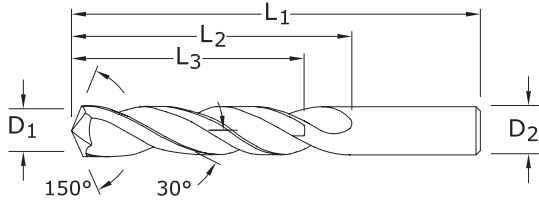


3xD  
(mm)

5xD  
(inch)



3



## 103

FRACTIONAL & METRIC SERIES

CUTTING DIAMETER D <sub>1</sub> /D <sub>2</sub>	DECIMAL EQUIV.	METRIC EQUIV.	OVERALL LENGTH L <sub>1</sub>	FLUTE LENGTH L <sub>2</sub>	CLEARED LENGTH L <sub>3</sub>	EDP NO.		STOCK
						UNCOATED	Ti-NAMITE-A (AlTiN)	
#36	0.1065	2.71	2-1/4	1-1/4	1	53036	58011	●
7/64	0.1094	2.78	2-1/4	1-1/4	1	53107	58012	●
#35	0.1100	2.79	2-1/4	1-1/4	1	53035	58013	●
#34	0.1110	2.82	2-1/4	1-1/4	1	53034	58014	●
#33	0.1130	2.87	2-1/4	1-1/4	1	53033	58015	●
#32	0.1160	2.95	2-1/4	1-1/4	1	53032	58016	●
3,0 mm	0.1181		46,0	16,0	12,0	63000	68965	●
#31	0.1200	3.05	2-1/4	1-1/4	1	53031	58017	●
3,1 mm	0.1220		49,0	18,0	14,0	63044	68966	●
1/8	0.1250	3.18	2-1/4	1-1/4	1	53108	58018	●
3,2 mm	0.1260		49,0	18,0	14,0	63045	68967	●
#30	0.1285	3.26	2-1/4	1-1/4	1	53030	58019	●
3,3 mm	0.1299		49,0	18,0	14,0	63001	68968	●
3,4 mm	0.1339		52,0	20,0	15,0	63046	68969	●
#29	0.1360	3.45	2-1/2	1-3/8	1-7/64	53029	58020	●
3,5 mm	0.1378		52,0	20,0	15,0	63002	68970	●
#28	0.1405	3.57	2-1/2	1-3/8	1-7/64	53028	58021	●
9/64	0.1406	3.57	2-1/2	1-3/8	1-7/64	53109	58022	●
3,6 mm	0.1417		52,0	20,0	15,0	63047	68971	●
#27	0.1440	3.66	2-1/2	1-3/8	1-7/64	53027	58023	●
3,7 mm	0.1457		52,0	20,0	15,0	63003	68972	●
#26	0.1470	3.73	2-1/2	1-3/8	1-7/64	53026	58024	●
#25	0.1495	3.80	2-1/2	1-3/8	1-7/64	53025	58025	●
3,8 mm	0.1496		55,0	22,0	17,0	63048	68973	●
#24	0.1520	3.86	2-1/2	1-3/8	1-7/64	53024	58026	●
3,9 mm	0.1535		55,0	22,0	17,0	63049	68974	●
#23	0.1540	3.91	2-1/2	1-3/8	1-7/64	53023	58027	●
5/32	0.1562	3.97	2-1/2	1-3/8	1-7/64	53110	58028	●
#22	0.1570	3.99	2-1/2	1-3/8	1-7/64	53022	58029	●
4,0 mm	0.1575		55,0	22,0	17,0	63004	68975	●
#21	0.1590	4.04	2-1/2	1-3/8	1-7/64	53021	58030	●
#20	0.1610	4.09	2-1/2	1-3/8	1-7/64	53020	58031	●
4,1 mm	0.1614		55,0	22,0	17,0	63050	68976	●
4,2 mm	0.1654		55,0	22,0	17,0	63005	68977	●
#19	0.1660	4.22	2-3/4	1-5/8	1-19/64	53019	58032	●
4,3 mm	0.1693		58,0	24,0	18,0	63051	68978	●
#18	0.1695	4.31	2-3/4	1-5/8	1-19/64	53018	58033	●
11/64	0.1719	4.37	2-3/4	1-5/8	1-19/64	53111	58034	●
#17	0.1730	4.39	2-3/4	1-5/8	1-19/64	53017	58035	●
4,4 mm	0.1732		58,0	24,0	18,0	63052	68979	●

**TOLERANCES (inch)**

D<sub>1</sub> = +.0000/-0.0005  
D<sub>2</sub> = h6

**TOLERANCES (mm)**

D<sub>1</sub> = +0,0000/-0,0127  
D<sub>2</sub> = h6

- STEELS
- CAST IRON
- HARDENED STEELS
- NON-FERROUS

- U.S. Stock Standard
- NOT STOCKED—  
Call for Delivery

For patent information  
visit [www.kyocera-sgstool.com/patents](http://www.kyocera-sgstool.com/patents)

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## 3 Flute Drills • Metric: DIN 6539

103

FRACTIONAL &amp; METRIC SERIES

CUTTING DIAMETER D <sub>1</sub> /D <sub>2</sub>	DECIMAL EQUIV.	METRIC EQUIV.	OVERALL LENGTH L <sub>1</sub>	FLUTE LENGTH L <sub>2</sub>	CLEARED LENGTH L <sub>3</sub>	EDP NO.		STOCK
						UNCOATED	Ti-NAMITE-A (AITiN)	
#16	0.1770	4.50	2-3/4	1-5/8	1-19/64	53016	58036	●
4,5 mm	0.1772		58,0	24,0	18,0	63006	68980	●
#15	0.1800	4.57	2-3/4	1-5/18	1-19/64	53015	58037	●
4,6 mm	0.1811		58,0	24,0	18,0	63053	68981	●
#14	0.1820	4.62	2-3/4	1-5/8	1-19/64	53014	58038	●
#13	0.1850	4.70	2-3/4	1-5/8	1-19/64	53013	58039	●
4,7 mm	0.1850		62,0	24,0	18,0	63054	68982	●
3/16	0.1875	4.76	2-3/4	1-5/8	1-19/64	53112	58040	●
#12	0.1890	4.80	2-3/4	1-5/8	1-19/64	53012	58041	●
4,8 mm	0.1890		62,0	26,0	20,0	63055	68983	●
#11	0.1910	4.85	2-3/4	1-5/8	1-19/64	53011	58042	●
4,9 mm	0.1929		62,0	26,0	20,0	63056	68984	●
#10	0.1935	4.91	2-3/4	1-5/8	1-19/64	53010	58043	●
#9	0.1960	4.98	3	1-3/4	1-13/32	53009	58044	●
5,0 mm	0.1969		62,0	26,0	20,0	63007	68985	●
#8	0.1990	5.05	3	1-3/4	1-13/32	53008	58045	●
5,1 mm	0.2008		62,0	26,0	20,0	63057	68986	●
#7	0.2010	5.11	3	1-3/4	1-13/32	53007	58046	●
13/64	0.2031	5.16	3	1-3/4	1-13/32	53113	58047	●
#6	0.2040	5.18	3	1-3/4	1-13/32	53006	58048	●
5,2 mm	0.2047		62,0	26,0	20,0	63008	68987	●
#5	0.2055	5.22	3	1-3/4	1-13/32	53005	58049	●
5,3 mm	0.2087		62,0	26,0	20,0	63058	68988	●
#4	0.2090	5.31	3	1-3/4	1-13/32	53004	58050	●
5,4 mm	0.2126		66,0	28,0	21,0	63059	68989	●
#3	0.2130	5.41	3	1-3/4	1-13/32	53003	58051	●
5,5 mm	0.2165		66,0	28,0	21,0	63009	68990	●
7/32	0.2188	5.56	3	1-3/4	1-13/32	53114	58052	●
5,6 mm	0.2205		66,0	28,0	21,0	63060	68991	●
#2	0.2210	5.61	3	1-3/4	1-13/32	53002	58053	●
5,7 mm	0.2244		66,0	28,0	21,0	63061	68992	●
#1	0.2280	5.79	3	1-3/4	1-13/32	53001	58054	●
5,8 mm	0.2283		66,0	28,0	21,0	63062	68993	●
5,9 mm	0.2323		66,0	28,0	21,0	63063	68994	●
A	0.2340	5.94	3-1/4	2	1-39/64	53201	58055	●
15/64	0.2344	5.95	3-1/4	2	1-39/64	53115	58056	●
6,0 mm	0.2362		66,0	28,0	21,0	63010	68995	●
B	0.2380	6.05	3-1/4	2	1-39/64	53202	58057	●
6,1 mm	0.2402		70,0	31,0	23,0	63064	68996	●
C	0.2420	6.15	3-1/4	2	1-39/64	53203	58058	●
6,2 mm	0.2441		70,0	31,0	23,0	63011	68997	●
D	0.2460	6.25	3-1/4	2	1-39/64	53204	58059	●
6,3 mm	0.2480		70,0	31,0	23,0	63065	68998	●
1/4	0.2500	6.35	3-1/4	2	1-39/64	53116	58061	●
6,4 mm	0.2520		70,0	31,0	23,0	63066	68999	●
6,5 mm	0.2559		70,0	31,0	23,0	63012	69000	●
F	0.2570	6.53	3-1/4	2	1-39/64	53206	58062	●
6,6 mm	0.2598		70,0	31,0	23,0	63067	69001	●
G	0.2610	6.63	3-1/2	2-1/8	1-45/64	53207	58063	●
6,7 mm	0.2638		70,0	31,0	23,0	63068	69002	●
17/64	0.2656	6.75	3-1/2	2-1/8	1-45/64	53117	58064	●
H	0.2660	6.76	3-1/2	2-1/8	1-45/64	53208	58065	●

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# 3 Flute Drills • Metric: DIN 6539



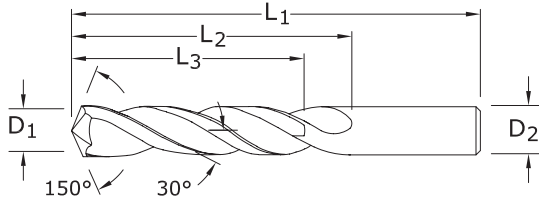
3xD  
(mm)

5xD  
(inch)



## 103

FRACTIONAL & METRIC SERIES



CUTTING DIAMETER D <sub>1</sub> /D <sub>2</sub>	DECIMAL EQUIV.	METRIC EQUIV.	OVERALL LENGTH L <sub>1</sub>	FLUTE LENGTH L <sub>2</sub>	CLEARED LENGTH L <sub>3</sub>	EDP NO.		STOCK
						UNCOATED	Ti-NAMITE-A (AlTiN)	
6,8 mm	0.2677		74,0	34,0	25,0	63013	69003	●
6,9 mm	0.2717		74,0	34,0	25,0	63069	69004	●
I	0.2720	6.91	3-1/2	2-1/8	1-45/64	53209	58066	●
7,0 mm	0.2756		74,0	34,0	25,0	63014	69005	●
J	0.2770	7.04	3-1/2	2-1/8	1-45/64	53210	58067	●
7,1 mm	0.2795		74,0	34,0	25,0	63070	69006	●
K	0.2810	7.14	3-1/2	2-1/8	1-45/64	53211	58068	●
9/32	0.2812	7.14	3-1/2	2-1/8	1-45/64	53118	58069	●
7,2 mm	0.2835		74,0	34,0	25,0	63015	69007	●
7,3 mm	0.2874		74,0	34,0	25,0	63071	69008	●
L	0.2900	7.37	3-1/2	2-1/8	1-45/64	53212	58070	●
7,4 mm	0.2913		74,0	34,0	25,0	63072	69009	●
M	0.2950	7.49	3-3/4	2-3/8	1-29/32	53213	58071	●
7,5 mm	0.2953		74,0	34,0	25,0	63016	69010	●
19/64	0.2969	7.54	3-3/4	2-3/8	1-29/32	53119	58072	●
7,6 mm	0.2992		79,0	37,0	27,0	63073	69011	●
N	0.3020	7.67	2-3/8	2-3/8	1-29/32	53214	58073	●
7,7 mm	0.3031		79,0	37,0	27,0	63074	69012	●
7,8 mm	0.3071		79,0	37,0	27,0	63075	69013	●
7,9 mm	0.3110		79,0	37,0	27,0	63076	69014	●
5/16	0.3125	7.94	3-3/4	2-3/8	1-29/32	53120	58074	●
8,0 mm	0.3150		79,0	37,0	27,0	63017	69015	●
O	0.3160	8.03	3-3/4	2-3/8	1-29/32	53215	58075	●
8,1 mm	0.3189		79,0	37,0	27,0	63077	69016	●
8,2 mm	0.3228		79,0	37,0	27,0	63018	69017	●
P	0.3230	8.20	3-3/4	2-3/8	1-29/32	53216	58076	●
8,3 mm	0.3268		79,0	37,0	27,0	63078	69018	●
21/64	0.3281	8.33	4	2-1/2	2	53121	58077	●
8,4 mm	0.3307		79,0	37,0	27,0	63019	69019	●
Q	0.3320	8.43	4	2-1/2	2	53217	58078	●
8,5 mm	0.3346		79,0	37,0	27,0	63020	69020	●
8,6 mm	0.3386		84,0	40,0	29,0	63021	69021	●
R	0.3390	8.61	4	2-1/2	2	53218	58079	●
8,7 mm	0.3425		89,0	40,0	29,0	63079	69022	●
11/32	0.3438	8.73	4	2-1/2	2	53122	58080	●
8,8 mm	0.3465		89,0	40,0	29,0	63022	69023	●
S	0.3480	8.84	4	2-1/2	2	53219	58081	●
8,9 mm	0.3504		84,0	40,0	29,0	63080	69024	●
9,0 mm	0.3543		84,0	40,0	29,0	63023	69025	●
T	0.3580	9.09	4-1/4	2-3/4	2-13/64	53220	58082	●

**TOLERANCES (inch)**

D<sub>1</sub> = +.0000/-0.0005  
D<sub>2</sub> = h6

**TOLERANCES (mm)**

D<sub>1</sub> = +0,0000/-0,0127  
D<sub>2</sub> = h6

- STEELS
- CAST IRON
- HARDENED STEELS
- NON-FERROUS

- U.S. Stock Standard
- NOT STOCKED—  
Call for Delivery

For patent information visit [www.kyocera-sgstool.com/patents](http://www.kyocera-sgstool.com/patents)

continued on next page

## 3 Flute Drills • Metric: DIN 6539

103

FRACTIONAL &amp; METRIC SERIES

CONTINUED

CUTTING DIAMETER D <sub>1</sub> /D <sub>2</sub>	DECIMAL EQUIV.	METRIC EQUIV.	OVERALL LENGTH L <sub>1</sub>	FLUTE LENGTH L <sub>2</sub>	CLEARED LENGTH L <sub>3</sub>	EDP NO.		STOCK
						UNCOATED	Ti-NAMITE-A (AITiN)	
9,1 mm	0.3583		84,0	40,0	29,0	63081	69026	●
23/64	0.3594	9.13	4-1/4	2-3/4	2-13/64	53123	58083	●
9,2 mm	0.3622		84,0	40,0	29,0	63024	69027	●
9,3 mm	0.3661		84,0	40,0	29,0	63082	69028	●
U	0.3680	9.35	4-1/4	2-3/4	2-13/64	53221	58084	●
9,4 mm	0.3701		84,0	40,0	29,0	63083	69029	●
9,5 mm	0.3740		84,0	40,0	29,0	63025	69030	●
3/8	0.3750	9.53	4-1/4	2-3/4	2-13/64	53124	58085	●
V	0.3770	9.58	4-1/4	2-3/4	2-13/64	53222	58086	●
9,6 mm	0.3780		89,0	43,0	31,0	63084	69031	●
9,7 mm	0.3819		89,0	43,0	31,0	63085	69032	●
9,8 mm	0.3858		89,0	43,0	31,0	63086	69033	●
W	0.3860	9.80	4-1/2	2-7/8	2-19/64	53223	58087	●
9,9 mm	0.3898		89,0	43,0	31,0	63087	69034	●
25/64	0.3906	9.92	4-1/2	2-7/8	2-19/64	53125	58088	●
10,0 mm	0.3937		89,0	43,0	31,0	63026	69035	●
X	0.3970	10.08	4-1/2	2-7/8	2-19/64	53224	58089	●
10,1 mm	0.3976		89,0	43,0	31,0	63088	69036	●
10,2 mm	0.4016		89,0	43,0	31,0	63027	69037	●
Y	0.4040	10.26	4-1/2	2-7/8	2-19/64	53225	58090	●
13/32	0.4062	10.32	4-1/2	2-7/8	2-19/64	53126	58091	●
10,4 mm	0.4094		89,0	43,0	31,0	63028	69038	●
Z	0.4130	10.49	4-1/2	2-7/8	2-19/64	53226	58092	●
10,5 mm	0.4134		89,0	43,0	31,0	63029	69039	●
10,7 mm	0.4213		95,0	47,0	33,0	63030	69040	●
27/64	0.4219	10.72	4-1/2	2-7/8	2-19/64	53127	58093	●
10,8 mm	0.4252		95,0	47,0	33,0	63031	69041	●
11,0 mm	0.4331		95,0	47,0	33,0	63032	69042	●
7/16	0.4375	11.11	4-1/2	2-7/8	2-19/64	53128	58094	●
11,5 mm	0.4528		95,0	47,0	33,0	63033	69043	●
29/64	0.4531	11.51	4-3/4	3	2-13/32	53129	58095	●
15/32	0.4688	11.91	4-3/4	3	2-13/32	53130	58096	●
12,0 mm	0.5039		102,0	51,0	35,0	63034	69044	●
31/64	0.4844	12.30	4-3/4	3	2-13/32	53131	58097	●
12,5 mm	0.4921		102,0	51,0	35,0	63035	69045	●
1/2	0.5000	12.70	4-3/4	3	2-13/32	53132	58098	●
12,8 mm	0.5039		102,0	51,0	35,0	63036	69046	●
13,0 mm	0.5118		102,0	51,0	35,0	63089	69047	●
33/64	0.5156	13.10	4-3/4	3	2-13/32	53135	58099	●
13,1 mm	0.5157		102,0	51,0	35,0	63037	69048	●
13,5 mm	0.5315		107,0	54,0	37,0	63090	69049	●
14,0 mm	0.5512		107,0	54,0	37,0	63038	69050	●
9/16	0.5625	14.29	4-3/4	3	2-13/32	53136	58100	●
14,3 mm	0.5630		111,0	56,0	38,0	63039	69051	●
14,5 mm	0.5709		111,0	56,0	38,0	63040	69052	●
15,0 mm	0.5906		111,0	56,0	38,0	63091	69053	●
5/8	0.6250	15.88	5-3/4	3-1/2	2-51/64	53133	58101	●
11/16	0.6875	17.46	5-3/4	3-1/2	2-51/64	53137	58102	●
17,5 mm	0.6890		123,0	62,0	40,0	63041	69054	●
3/4	0.7500	19.05	5-3/4	4-1/4	3 13/32	53134	58103	●
19,5 mm	0.7677		131,0	66,0	42,0	63042	69055	●
20,0 mm	0.7874		131,0	66,0	42,0	63043	69056	●



# 3 Flute Drills

Series 103 Fractional	Hardness	Vc (sfm)	Diameter (D <sub>1</sub> ) (inch)							
			1/8	1/4	3/8	1/2	5/8	3/4		
<b>P</b>  <b>CARBON STEELS</b> 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	≤ 175 Bhn or ≤ 7 HRc	295 (236-354)	RPM	9015	4508	3005	2254	1803	1503	
			Fr	0.0026	0.0051	0.0077	0.0102	0.0128	0.0153	
			Feed (ipm)	23.0	23.0	23.0	23.0	23.0	23.0	
	≤ 300 Bhn or ≤ 32 HRc	260 (208-312)	RPM	7946	3973	2649	1986	1589	1324	
			Fr	0.0023	0.0045	0.0068	0.0091	0.0113	0.0136	
			Feed (ipm)	18.0	18.0	18.0	18.0	18.0	18.0	
	≤ 425 Bhn or ≤ 45 HRc	150 (120-180)	RPM	4584	2292	1528	1146	917	764	
			Fz	0.0013	0.0026	0.0039	0.0052	0.0065	0.0079	
			Feed (ipm)	6.0	6.0	6.0	6.0	6.0	6.0	
	<b>H</b>  <b>ALLOY STEELS</b> 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100	≤ 275 Bhn or ≤ 28 HRc	230 (184-276)	RPM	7029	3514	2343	1757	1406	1171
				Fz	0.0019	0.0038	0.0058	0.0077	0.0096	0.0115
				Feed (ipm)	13.5	13.5	13.5	13.5	13.5	13.5
≤ 375 Bhn or ≤ 40 HRc		145 (116-174)	RPM	4431	2216	1477	1108	886	739	
			Fr	0.0019	0.0038	0.0058	0.0077	0.0096	0.0115	
			Feed (ipm)	8.5	8.5	8.5	8.5	8.5	8.5	
≤ 450 Bhn or ≤ 48 HRc		115 (92-138)	RPM	3514	1757	1171	879	703	586	
			Fr	0.0005	0.0010	0.0015	0.0020	0.0026	0.0031	
			Feed (ipm)	1.8	1.8	1.8	1.8	1.8	1.8	
<b>K</b>  <b>TOOL STEELS</b> A2, D2, H13, L2, M2, P20, S7, T15, W2		≤ 250 Bhn or ≤ 24 HRc	85 (68-102)	RPM	2598	1299	866	649	520	433
				Fr	0.0013	0.0026	0.0039	0.0052	0.0065	0.0079
				Feed (ipm)	3.4	3.4	3.4	3.4	3.4	3.4
	≤ 375 Bhn or ≤ 40 HRc	65 (52-78)	RPM	1986	993	662	497	397	331	
			Fr	0.0007	0.0013	0.0020	0.0026	0.0033	0.0039	
			Feed (ipm)	1.3	1.3	1.3	1.3	1.3	1.3	
	≤ 475 Bhn or ≤ 50 HRc	50 (40-60)	RPM	1528	764	509	382	306	255	
			Fr	0.0007	0.0013	0.0020	0.0026	0.0033	0.0039	
			Feed (ipm)	1.0	1.0	1.0	1.0	1.0	1.0	
	<b>N</b>  <b>CAST IRONS</b> Gray, Malleable, Ductile	≤ 220 Bhn or ≤ 19 HRc	250 (200-300)	RPM	7640	3820	2547	1910	1528	1273
				Fr	0.0026	0.0052	0.0079	0.0105	0.0131	0.0157
				Feed (ipm)	20.0	20.0	20.0	20.0	20.0	20.0
≤ 330 Bhn or ≤ 36 HRc		195 (156-234)	RPM	5959	2980	1986	1490	1192	993	
			Fr	0.0026	0.0052	0.0078	0.0104	0.0130	0.0156	
			Feed (ipm)	15.5	15.5	15.5	15.5	15.5	15.5	
<b>N</b>  <b>ALUMINUM ALLOYS</b> 2017, 2024, 356, 6061, 7075		≤ 80 Bhn or ≤ 47 HRb	540 (432-648)	RPM	16502	8251	5501	4126	3300	2750
				Fr	0.0032	0.0064	0.0096	0.0128	0.0161	0.0193
				Feed (ipm)	53.0	53.0	53.0	53.0	53.0	53.0
		≤ 150 Bhn or ≤ 7 HRc	455 (364-546)	RPM	13905	6952	4635	3476	2781	2317
				Fr	0.0032	0.0065	0.0097	0.0129	0.0162	0.0194
				Feed (ipm)	45.0	45.0	45.0	45.0	45.0	45.0
	<b>N</b>  <b>COPPER ALLOYS</b> Alum Bronze, C110, Muntz Brass	≤ 140 Bhn or ≤ 3 HRc	305 (244-366)	RPM	9321	4660	3107	2330	1864	1553
				Fr	0.0019	0.0039	0.0058	0.0077	0.0097	0.0116
				Feed (ipm)	18.0	18.0	18.0	18.0	18.0	18.0
		≤ 200 Bhn or ≤ 23 HRc	160 (128-192)	RPM	4890	2445	1630	1222	978	815
				Fr	0.0016	0.0033	0.0049	0.0065	0.0082	0.0098
				Feed (ipm)	8.0	8.0	8.0	8.0	8.0	8.0

Bhn (Brinell) HRc (Rockwell C) HRb (Rockwell B)  
 rpm = Vc x 3.82 / D<sub>1</sub>  
 ipm = Fr x rpm  
 reduce speed and feed 30 percent when using uncoated drills  
 reduce speed and feed for materials harder than listed  
 refer to the SGS Tool Wizard for complete technical information ([www.kyocera-sgstool.com](http://www.kyocera-sgstool.com))

# 3 Flute Drills

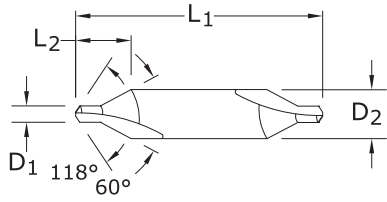
Series 103M Metric	Hardness	Vc (m/min)	Diameter (D <sub>1</sub> ) (mm)							
			3	6	10	12	16	20		
<b>P</b>  <b>CARBON STEELS</b> 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	≤ 175 Bhn or ≤ 7 HRc	90 (72-108)	RPM	9533	4766	2860	2383	1787	1430	
			Fr	0.062	0.124	0.206	0.248	0.330	0.413	
			Feed (mm/min)	590	590	590	590	590	590	
	≤ 300 Bhn or ≤ 32 HRc	79 (63-95)	RPM	8402	4201	2520	2100	1575	1260	
			Fr	0.055	0.110	0.183	0.219	0.292	0.365	
			Feed (mm/min)	460	460	460	460	460	460	
	≤ 425 Bhn or ≤ 45 HRc	46 (37-55)	RPM	4847	2424	1454	1212	909	727	
			Fz	0.032	0.064	0.107	0.128	0.171	0.213	
			Feed (mm/min)	155	155	155	155	155	155	
	<b>H</b>  <b>ALLOY STEELS</b> 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100	≤ 275 Bhn or ≤ 28 HRc	70 (56-84)	RPM	7432	3716	2230	1858	1394	1115
				Fz	0.046	0.093	0.155	0.186	0.248	0.309
				Feed (mm/min)	345	345	345	345	345	345
≤ 375 Bhn or ≤ 40 HRc		44 (35-53)	RPM	4686	2343	1406	1171	879	703	
			Fr	0.046	0.092	0.153	0.184	0.245	0.306	
			Feed (mm/min)	215	215	215	215	215	215	
≤ 450 Bhn or ≤ 48 HRc		35 (28-42)	RPM	3716	1858	1115	929	697	557	
			Fr	0.012	0.024	0.040	0.048	0.065	0.081	
			Feed (mm/min)	45	45	45	45	45	45	
<b>K</b>  <b>TOOL STEELS</b> A2, D2, H13, L2, M2, P20, S7, T15, W2		≤ 250 Bhn or ≤ 24 HRc	26 (21-31)	RPM	2747	1373	824	687	515	412
				Fr	0.031	0.062	0.103	0.124	0.165	0.206
				Feed (mm/min)	85	85	85	85	85	85
	≤ 375 Bhn or ≤ 40 HRc	20 (16-24)	RPM	2100	1050	630	525	394	315	
			Fr	0.017	0.033	0.056	0.067	0.089	0.111	
			Feed (mm/min)	35	35	35	35	35	35	
≤ 475 Bhn or ≤ 50 HRc	15 (12-18)	RPM	1616	808	485	404	303	242		
		Fr	0.015	0.031	0.052	0.062	0.083	0.103		
		Feed (mm/min)	25	25	25	25	25	25		
<b>N</b>  <b>CAST IRONS</b> Gray, Malleable, Ductile	≤ 220 Bhn or ≤ 19 HRc	76 (61-91)	RPM	8078	4039	2424	2020	1515	1212	
			Fr	0.063	0.126	0.210	0.253	0.337	0.421	
			Feed (mm/min)	510	510	510	510	510	510	
	≤ 330 Bhn or ≤ 36 HRc	59 (48-71)	RPM	6301	3151	1890	1575	1181	945	
			Fr	0.052	0.105	0.175	0.209	0.279	0.349	
			Feed (mm/min)	330	330	330	330	330	330	
<b>N</b>  <b>ALUMINUM ALLOYS</b> 2017, 2024, 356, 6061, 7075	≤ 80 Bhn or ≤ 47 HRb	165 (132-198)	RPM	17449	8725	5235	4362	3272	2617	
			Fr	0.078	0.156	0.260	0.312	0.416	0.520	
			Feed (mm/min)	1360	1360	1360	1360	1360	1360	
	≤ 150 Bhn or ≤ 7 HRc	139 (111-166)	RPM	14703	7351	4411	3676	2757	2205	
			Fr	0.078	0.156	0.261	0.313	0.417	0.521	
			Feed (mm/min)	1150	1150	1150	1150	1150	1150	
<b>N</b>  <b>COPPER ALLOYS</b> Alum Bronze, C110, Muntz Brass	≤ 140 Bhn or ≤ 3 HRc	93 (74-112)	RPM	9856	4928	2957	2464	1848	1478	
			Fr	0.047	0.094	0.157	0.189	0.252	0.315	
			Feed (mm/min)	465	465	465	465	465	465	
	≤ 200 Bhn or ≤ 23 HRc	49 (39-59)	RPM	5170	2585	1551	1293	969	776	
			Fr	0.039	0.077	0.129	0.155	0.206	0.258	
			Feed (mm/min)	200	200	200	200	200	200	

Bhn (Brinell) HRc (Rockwell C) HRb (Rockwell B)  
 rpm = (Vc x 1000) / (D<sub>1</sub> x 3.14)  
 mm/min = Fr x rpm  
 reduce speed and feed 30 percent when using uncoated drills  
 reduce speed and feed for materials harder than listed  
 refer to the SGS Tool Wizard for complete technical information ([www.kyocera-sgstool.com](http://www.kyocera-sgstool.com))

# Combined Drill & Countersink



## 301 FRACTIONAL SERIES



SIZE	inch				EDP NO.		STOCK
	DRILL DIAMETER D <sub>1</sub>	BODY DIAMETER D <sub>2</sub>	OVERALL LENGTH L <sub>1</sub>	FLUTE LENGTH L <sub>2</sub>	UNCOATED	Ti-NAMITE-A (AlTiN)	
00*	.025	1/8	1-1/2	.125	57005	57015	●
0*	1/32	1/8	1-1/2	.130	57006	57016	●
1*	3/64	1/8	1-1/2	.135	57007	57017	●
2*	5/64	3/16	1-7/8	.200	57008	57018	●
3*	7/64	1/4	2	.280	57009	57019	●
4*	1/8	5/16	2-1/8	.340	57010	57020	●
5*	3/16	7/16	2-3/4	.475	57011	57021	●
6*	7/32	1/2	3	.540	57012	57022	●
Series 301 Set	—	—	—	—	57075	—	●

\*Included in Series 301 Set (EDP No. 57075)

### TOLERANCES (inch)

D<sub>1</sub> = +.003/- .000

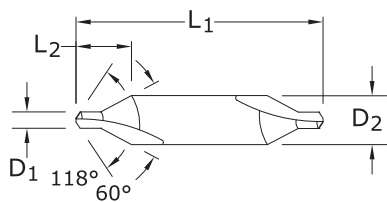
D<sub>2</sub> = -.0001/- .0005

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES

- U.S. Stock Standard
- NOT STOCKED—  
Call for Delivery

For patent information  
visit [www.kyocera-sgstool.com/patents](http://www.kyocera-sgstool.com/patents)

# Combined Drill & Countersink



**TOLERANCES (mm)**

$D_1 = +0,076/-0,000$   
 $D_2 = -0,0025/-0,0127$

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES

- U.S. Stock Standard
- NOT STOCKED—  
Call for Delivery

For patent information  
 visit [www.kyocera-sgtool.com/patents](http://www.kyocera-sgtool.com/patents)

**301M**  
 METRIC SERIES

mm				EDP NO.		STOCK
DRILL DIAMETER $D_1$	BODY DIAMETER $D_2$	OVERALL LENGTH $L_1$	FLUTE LENGTH $L_2$	UNCOATED	Ti-NAMITE-A (AlTiN)	
0,5	3,15	20,0	3,0	67005	67035	●
0,8	3,15	20,0	3,5	67007	67037	●
1	3,15	31,5	3,5	67009	67039	●
1,25	3,15	31,5	4,0	67011	67041	●
1,6	4,0	35,5	5,0	67013	67043	●
2	5,0	40,0	6,0	67015	67045	●
2,5	6,3	45,0	7,0	67017	67047	●
3,15	8,0	50,0	9,0	67019	67049	●
4	10,0	56,0	11,0	67021	67051	●
5	12,5	63,0	14,0	67023	67053	●

# Combined Drill & Countersink

Series 301 Fractional	Hardness	Vc (sfm)	Diameter (D <sub>1</sub> ) (inch)						
			1/32	5/64	1/8	3/16	7/32		
<b>P</b>  <b>CARBON STEELS</b> 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	≤ 175 Bhn or ≤ 7 HRc	265	RPM	8098	5399	3239	2314	2025	
		(212-318)	Fr	0.00068	0.0010	0.0017	0.0024	0.0027	
			Feed (ipm)	5.5	5.5	5.5	5.5	5.5	
	≤ 300 Bhn or ≤ 32 HRc	125	RPM	3820	2547	1528	1091	955	
		(100-150)	Fr	0.00065	0.0010	0.0016	0.0023	0.0026	
			Feed (ipm)	2.5	2.5	2.5	2.5	2.5	
	≤ 425 Bhn or ≤ 45 HRc	85	RPM	2598	1732	1039	742	649	
		(68-102)	Fz	0.00038	0.0006	0.0010	0.0013	0.0015	
			Feed (ipm)	1.0	1.0	1.0	1.0	1.0	
	<b>ALLOY STEELS</b> 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100	≤ 275 Bhn or ≤ 28 HRc	230	RPM	7029	4686	2812	2008	1757
			(184-276)	Fz	0.00064	0.0010	0.0016	0.0022	0.0026
				Feed (ipm)	4.5	4.5	4.5	4.5	4.5
≤ 375 Bhn or ≤ 40 HRc		145	RPM	4431	2954	1772	1266	1108	
		(116-174)	Fr	0.00059	0.0009	0.0015	0.0021	0.0023	
			Feed (ipm)	2.6	2.6	2.6	2.6	2.6	
≤ 450 Bhn or ≤ 48 HRc		60	RPM	1834	1222	733	524	458	
		(48-72)	Fr	0.00027	0.0004	0.0007	0.0010	0.0011	
			Feed (ipm)	0.5	0.5	0.5	0.5	0.5	
<b>H</b>  <b>TOOL STEELS</b> A2, D2, H13, L2, M2, P20, S7, T15, W2		≤ 250 Bhn or ≤ 24 HRc	85	RPM	2598	1732	1039	742	649
			(68-102)	Fr	0.00035	0.0005	0.0009	0.0012	0.0014
				Feed (ipm)	0.9	0.9	0.9	0.9	0.9
	≤ 375 Bhn or ≤ 40 HRc	55	RPM	1681	1121	672	480	420	
		(44-66)	Fr	0.00016	0.0002	0.0004	0.0006	0.0006	
			Feed (ipm)	0.3	0.3	0.3	0.3	0.3	
	≤ 475 Bhn or ≤ 50 HRc	40	RPM	1222	815	489	349	306	
		(32-48)	Fr	0.00016	0.0002	0.0004	0.0006	0.0007	
			Feed (ipm)	0.2	0.2	0.2	0.2	0.2	
	<b>K</b>  <b>CAST IRONS</b> Gray, Malleable, Ductile	≤ 220 Bhn or ≤ 19 HRc	280	RPM	8557	5705	3423	2445	2139
			(224-336)	Fr	0.00084	0.0013	0.0021	0.0029	0.0034
				Feed (ipm)	7.2	7.2	7.2	7.2	7.2
≤ 330 Bhn or ≤ 36 HRc		250	RPM	7640	5093	3056	2183	1910	
		(200-300)	Fr	0.00084	0.0013	0.0021	0.0029	0.0034	
			Feed (ipm)	6.4	6.4	6.4	6.4	6.4	
<b>M</b>  <b>STAINLESS STEELS</b> (FREE MACHINING) 303, 416, 420F, 430F 440F	≤ 250 Bhn or ≤ 24 HRc0	210	RPM	6418	4278	2567	1834	1604	
		(168-252)	Fr	0.00048	0.0007	0.0012	0.0017	0.0019	
			Feed (ipm)	3.1	3.1	3.1	3.1	3.1	
	≤ 330 Bhn or ≤ 36 HRc	110	RPM	3362	2241	1345	960	840	
		(88-132)	Fr	0.00028	0.0004	0.0007	0.0010	0.0011	
			Feed (ipm)	0.9	0.9	0.9	0.9	0.9	
	<b>STAINLESS STEELS</b> (DIFFICULT) 304, 316, 321, 13-8 PH, 15-5PH, 17-4 PH, Custom 450	≤ 275 Bhn or ≤ 28 HRc	65	RPM	1986	1324	795	568	497
			(52-78)	Fr	0.00036	0.0005	0.0009	0.0013	0.0014
				Feed (ipm)	0.7	0.7	0.7	0.7	0.7
		≤ 375 Bhn or ≤ 40 HRc	55	RPM	1681	1121	672	480	420
			(44-66)	Fr	0.00032	0.0005	0.0008	0.0011	0.0013
				Feed (ipm)	0.5	0.5	0.5	0.5	0.5

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# Combined Drill & Countersink

Series 301 Fractional	Hardness	Vc (sfm)	Diameter (D <sub>1</sub> ) (inch)						
			1/32	5/64	1/8	3/16	7/32		
<b>S</b>  <b>SUPER ALLOYS</b> (NICKEL, COBALT, IRON BASE) Inconel 601, 617, 625, Incoloy 800, Monel 400, Rene, Waspaloy	≤ 220 Bhn or ≤ 19 HRc	40  (32-48)	RPM	1222	815	489	349	306	
			Fr	0.00036	0.0005	0.0009	0.0013	0.0014	
			Feed (ipm)	0.4	0.4	0.4	0.4	0.4	
	≤ 320 Bhn or ≤ 34 HRc	25  (20-30)	RPM	764	509	306	218	191	
			Fr	0.00033	0.0005	0.0008	0.0011	0.0013	
			Feed (ipm)	0.3	0.3	0.3	0.3	0.3	
	≤ 425 Bhn or ≤ 45 HRc	20  (16-24)	RPM	611	407	244	175	153	
			Fr	0.00016	0.0002	0.0004	0.0006	0.0007	
			Feed (ipm)	0.1	0.1	0.1	0.1	0.1	
	<b>TITANIUM ALLOYS</b> Pure Titanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si, Ti-6Al4V	≤ 275 Bhn or ≤ 28 HRc	85  (68-102)	RPM	2598	1732	1039	742	649
				Fr	0.00064	0.0010	0.0016	0.0022	0.0026
				Feed (ipm)	1.7	1.7	1.7	1.7	1.7
≤ 350 Bhn or ≤ 38 HRc		65  (52-78)	RPM	1986	1324	795	568	497	
			Fr	0.00036	0.0005	0.0009	0.0013	0.0014	
			Feed (ipm)	0.7	0.7	0.7	0.7	0.7	
≤ 440 Bhn or ≤ 47 HRc		55  (44-66)	RPM	1681	1121	672	480	420	
			Fr	0.00032	0.0005	0.0008	0.0011	0.0013	
			Feed (ipm)	0.5	0.5	0.5	0.5	0.5	
<b>N</b>  <b>ALUMINUM ALLOYS</b> 2017, 2024, 356, 6061, 7075		≤ 80 Bhn or ≤ 47 HRb	540  (432-648)	RPM	16502	11002	6601	4715	4126
				Fr	0.00100	0.0015	0.0025	0.0035	0.0040
				Feed (ipm)	16.5	16.5	16.5	16.5	16.5
	≤ 150 Bhn or ≤ 7 HRc	455  (364-546)	RPM	13905	9270	5562	3973	3476	
			Fr	0.00100	0.0015	0.0025	0.0035	0.0040	
			Feed (ipm)	13.9	13.9	13.9	13.9	13.9	
	≤ 140 Bhn or ≤ 3 HRc	190  (152-228)	RPM	5806	3871	2323	1659	1452	
			Fr	0.00048	0.0007	0.0012	0.0017	0.0019	
			Feed (ipm)	2.8	2.8	2.8	2.8	2.8	
	≤ 200 Bhn or ≤ 23 HRc	175  (140-210)	RPM	5348	3565	2139	1528	1337	
			Fr	0.00048	0.0007	0.0012	0.0017	0.0019	
			Feed (ipm)	2.6	2.6	2.6	2.6	2.6	
<b>PLASTICS</b> Polycarbonate, PVC	500  (400-600)	RPM	15280	10187	6112	4366	3820		
		Fr	0.00100	0.0015	0.0025	0.0035	0.0040		
		Feed (ipm)	15.3	15.3	15.3	15.3	15.3		

Bhn (Brinell) HRc (Rockwell C) HRb (Rockwell B)  
 $rpm = Vc \times 3.82 / D_1$   
 $ipm = Fr \times rpm$   
 reduce speed and feed 30 percent when using uncoated drills  
 reduce speed and feed for materials harder than listed  
 refer to the SGS Tool Wizard for complete technical information ([www.kyocera-sgstool.com](http://www.kyocera-sgstool.com))

# Combined Drill & Countersink

Series 301M Metric	Hardness	Vc (m/min)	Diameter (D <sub>1</sub> ) (mm)						
			1	1.6	2.5	4	5		
<b>P</b>  <b>CARBON STEELS</b> 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	≤ 175 Bhn or ≤ 7 HRc	81	RPM	8155	6422	4078	2569	2055	
		(65-97)	Fr	0.017	0.022	0.034	0.054	0.068	
			Feed (mm/min)	139	139	139	139	139	
	≤ 300 Bhn or ≤ 32 HRc	38	RPM	3847	3029	1923	1212	969	
		(30-46)	Fr	0.016	0.020	0.032	0.051	0.064	
			Feed (mm/min)	62	62	62	62	62	
	≤ 425 Bhn or ≤ 45 HRc	26	RPM	2616	2060	1308	824	659	
		(21-31)	Fz	0.010	0.013	0.020	0.032	0.039	
			Feed (mm/min)	26	26	26	26	26	
	<b>ALLOY STEELS</b> 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100	≤ 275 Bhn or ≤ 28 HRc	70	RPM	7078	5574	3539	2230	1784
			(56-84)	Fz	0.016	0.020	0.032	0.051	0.063
				Feed (mm/min)	113	113	113	113	113
≤ 375 Bhn or ≤ 40 HRc		44	RPM	4462	3514	2231	1406	1125	
		(35-53)	Fr	0.015	0.019	0.030	0.048	0.060	
			Feed (mm/min)	67	67	67	67	67	
≤ 450 Bhn or ≤ 48 HRc		18	RPM	1847	1454	923	582	465	
		(15-22)	Fr	0.007	0.009	0.014	0.022	0.028	
			Feed (mm/min)	13	13	13	13	13	
<b>H</b>  <b>TOOL STEELS</b> A2, D2, H13, L2, M2, P20, S7, T15, W2		≤ 250 Bhn or ≤ 24 HRc	26	RPM	2616	2060	1308	824	659
			(21-31)	Fr	0.009	0.012	0.018	0.029	0.036
				Feed (mm/min)	24	24	24	24	24
	≤ 375 Bhn or ≤ 40 HRc	17	RPM	1693	1333	846	533	427	
		(13-20)	Fr	0.004	0.005	0.008	0.013	0.016	
			Feed (mm/min)	7	7	7	7	7	
	≤ 475 Bhn or ≤ 50 HRc	12	RPM	1231	969	616	388	310	
		(10-15)	Fr	0.004	0.005	0.008	0.013	0.016	
			Feed (mm/min)	5	5	5	5	5	
	<b>K</b>  <b>CAST IRONS</b> Gray, Malleable, Ductile	≤ 220 Bhn or ≤ 19 HRc	85	RPM	8617	6786	4309	2714	2171
			(68-102)	Fr	0.021	0.027	0.042	0.067	0.083
				Feed (mm/min)	181	181	181	181	181
≤ 330 Bhn or ≤ 36 HRc		76	RPM	7694	6059	3847	2424	1939	
		(61-91)	Fr	0.021	0.027	0.042	0.067	0.084	
			Feed (mm/min)	162	162	162	162	162	
<b>M</b>  <b>STAINLESS STEELS</b> (FREE MACHINING) 303, 416, 420F, 430F 440F	≤ 250 Bhn or ≤ 24 HRc	64	RPM	6463	5089	3231	2036	1629	
		(51-77)	Fr	0.012	0.015	0.024	0.038	0.048	
			Feed (mm/min)	78	78	78	78	78	
	≤ 330 Bhn or ≤ 36 HRc	34	RPM	3385	2666	1693	1066	853	
		(27-40)	Fr	0.007	0.009	0.014	0.023	0.028	
			Feed (mm/min)	24	24	24	24	24	
	<b>STAINLESS STEELS</b> (DIFFICULT) 304, 316, 321, 13-8 PH, 15-5PH, 17-4 PH, Custom 450	≤ 275 Bhn or ≤ 28 HRc	20	RPM	2000	1575	1000	630	504
			(16-24)	Fr	0.009	0.011	0.018	0.029	0.036
				Feed (mm/min)	18	18	18	18	18
		≤ 375 Bhn or ≤ 40 HRc	17	RPM	1693	1333	846	533	427
			(13-20)	Fr	0.008	0.011	0.017	0.026	0.033
				Feed (mm/min)	14	14	14	14	14

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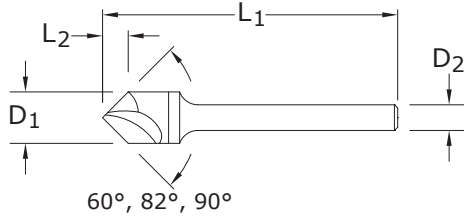
# Combined Drill & Countersink

Series 301M Metric	Hardness	Vc (m/min)	Diameter (D <sub>1</sub> ) (mm)						
			1	1.6	2.5	4	5		
<b>SUPER ALLOYS</b> (NICKEL, COBALT, IRON BASE) Inconel 601, 617, 625, Incoloy 800, Monel 400, Rene, Waspaloy	≤ 220 Bhn or ≤ 19 HRc	12  (10-15)	RPM	1231	969	616	388	310	
			Fr	0.009	0.011	0.018	0.028	0.035	
			Feed (mm/min)	11	11	11	11	11	
	≤ 320 Bhn or ≤ 34 HRc	8  (6-9)	RPM	769	606	385	242	194	
			Fr	0.008	0.010	0.016	0.025	0.031	
			Feed (mm/min)	6	6	6	6	6	
	≤ 425 Bhn or ≤ 45 HRc	6  (5-7)	RPM	616	485	308	194	155	
			Fr	0.003	0.004	0.006	0.010	0.013	
			Feed (mm/min)	2	2	2	2	2	
	<b>TITANIUM ALLOYS</b> Pure Titanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si, Ti-6Al4V	≤ 275 Bhn or ≤ 28 HRc	26  (21-31)	RPM	2616	2060	1308	824	659
				Fr	0.016	0.020	0.032	0.051	0.064
				Feed (mm/min)	42	42	42	42	42
≤ 350 Bhn or ≤ 38 HRc		20  (16-24)	RPM	2000	1575	1000	630	504	
			Fr	0.009	0.011	0.018	0.029	0.036	
			Feed (mm/min)	18	18	18	18	18	
≤ 440 Bhn or ≤ 47 HRc		17  (13-20)	RPM	1693	1333	846	533	427	
			Fr	0.008	0.011	0.017	0.026	0.033	
			Feed (mm/min)	14	14	14	14	14	
<b>ALUMINUM ALLOYS</b> 2017, 2024, 356, 6061, 7075		≤ 80 Bhn or ≤ 47 HRb	165  (132-198)	RPM	16619	13087	8309	5235	4188
				Fr	0.025	0.032	0.050	0.079	0.099
				Feed (mm/min)	415	415	415	415	415
	≤ 150 Bhn or ≤ 7 HRc	139  (111-166)	RPM	14003	11027	7001	4411	3529	
			Fr	0.025	0.032	0.050	0.079	0.099	
			Feed (mm/min)	350	350	350	350	350	
<b>COPPER ALLOYS</b> Alum Bronze, C110, Muntz Brass	≤ 140 Bhn or ≤ 3 HRc	58  (46-69)	RPM	5847	4605	2924	1842	1474	
			Fr	0.012	0.015	0.024	0.038	0.048	
			Feed (mm/min)	70	70	70	70	70	
	≤ 200 Bhn or ≤ 23 HRc	53  (43-64)	RPM	5386	4241	2693	1696	1357	
			Fr	0.012	0.015	0.024	0.038	0.048	
			Feed (mm/min)	65	65	65	65	65	
<b>PLASTICS</b> Polycarbonate, PVC	152  (122-183)	RPM	15388	12118	7694	4847	3878		
		Fr	0.025	0.032	0.050	0.079	0.099		
			Feed (mm/min)	385	385	385	385	385	

Bhn (Brinell) HRc (Rockwell C) HRb (Rockwell B)  
 $rpm = (Vc \times 1000) / (D_1 \times 3.14)$   
 $mm/min = Fr \times rpm$   
 reduce speed and feed 30 percent when using uncoated drills  
 reduce speed and feed for materials harder than listed  
 refer to the SGS Tool Wizard for complete technical information ([www.kyocera-sgstool.com](http://www.kyocera-sgstool.com))



# Single Flute Countersink



**601**

FRACTIONAL SERIES

CUTTING DIAMETER D <sub>1</sub>	SHANK DIAMETER D <sub>2</sub>	inch		EDP NO.			STOCK
		OVERALL LENGTH L <sub>1</sub>	FLUTE LENGTH L <sub>2</sub>	UNCOATED 60°	UNCOATED 82°	UNCOATED 90°	
1/8	1/8	1-1/2	.062	—	—	74201	●
1/8	1/8	1-1/2	.072	—	74101	—	●
1/8	1/8	1-1/2	.108	74001	—	—	●
3/16	3/16	2	.094	—	—	74204	●
3/16	3/16	2	.108	—	74104	—	●
3/16	3/16	2	.163	74004	—	—	●
1/4	1/4	2	.125	—	—	74207	●
1/4	1/4	2	.144	—	74107	—	●
1/4	1/4	2	.217	74007	—	—	●
3/8*	1/4	2-13/16	.188	—	—	74210	●
3/8*	1/4	2-13/16	.216	—	74110	—	●
3/8*	1/4	2-13/16	.325	74010	—	—	●
1/2*	1/4	2-7/8	.250	—	—	74213	●
1/2*	1/4	2-7/8	.288	—	74113	—	●
1/2*	1/4	2-7/8	.433	74013	—	—	●
5/8*	3/8	3	.313	—	—	74216	●
5/8*	3/8	3	.360	—	74116	—	●
5/8*	3/8	3	.541	74016	—	—	●
3/4*	1/2	3	.375	—	—	74219	●
3/4*	1/2	3	.431	—	74119	—	●
3/4*	1/2	3	.650	74019	—	—	●
1*	1/2	3-1/4	.500	—	—	74222	●
1*	1/2	3-1/4	.575	—	74122	—	●
1*	1/2	3-1/4	.866	74022	—	—	●

\*Steel Shank / Con mango de acero / Avec queue en acier

**TOLERANCES (inch)**

**1/8–1/4 DIAMETER**  
D<sub>1</sub> = +.0000/–.0005

**3/8–1 DIAMETER**  
D<sub>1</sub> = +.003/–.000

Included Angle  
+1°/–1°

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS

- U.S. Stock Standard
- NOT STOCKED—  
Call for Delivery

For patent information  
visit [www.kyocera-sgstool.com/patents](http://www.kyocera-sgstool.com/patents)

# Single Flute Countersink

Series 601 Fractional	Hardness	Vc (sfm)	Diameter (D1) (inch)								
			1/8	3/16	1/4	3/8	1/2	3/4	1		
<b>P</b>  <b>CARBON STEELS</b> 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	≤ 175 Bhn or ≤ 7 HRc	125  (100-150)	RPM	3820	2547	1910	1273	955	637	478	
			Fr	0.0005	0.0008	0.0010	0.0016	0.0021	0.0031	0.0042	
			Feed (ipm)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
	≤ 300 Bhn or ≤ 32 HRc	60  (48-72)	RPM	1834	1222	917	611	458	306	229	
			Fr	0.0005	0.0007	0.0010	0.0015	0.0020	0.0029	0.0039	
			Feed (ipm)	0.9	0.9	0.9	0.9	0.9	0.9	0.9	
	≤ 425 Bhn or ≤ 45 HRc	45  (36-54)	RPM	1375	917	688	458	344	229	172	
			Fz	0.0003	0.0004	0.0006	0.0009	0.0012	0.0017	0.0023	
			Feed (ipm)	0.4	0.4	0.4	0.4	0.4	0.4	0.4	
	≤ 275 Bhn or ≤ 28 HRc	95  (76-114)	RPM	2903	1935	1452	968	726	484	363	
			Fz	0.0004	0.0007	0.0009	0.0013	0.0018	0.0027	0.0036	
			Feed (ipm)	1.3	1.3	1.3	1.3	1.3	1.3	1.3	
≤ 375 Bhn or ≤ 40 HRc	60  (48-72)	RPM	1834	1222	917	611	458	306	229		
		Fr	0.0004	0.0007	0.0009	0.0013	0.0017	0.0026	0.0035		
		Feed (ipm)	0.8	0.8	0.8	0.8	0.8	0.8	0.8		
≤ 450 Bhn or ≤ 48 HRc	35  (28-42)	RPM	1070	713	535	357	267	178	134		
		Fr	0.0003	0.0004	0.0006	0.0008	0.0011	0.0017	0.0022		
		Feed (ipm)	0.3	0.3	0.3	0.3	0.3	0.3	0.3		
<b>H</b>  <b>TOOL STEELS</b> A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 250 Bhn or ≤ 24 HRc	35  (28-42)	RPM	1070	713	535	357	267	178	134	
			Fr	0.0003	0.0004	0.0006	0.0008	0.0011	0.0017	0.0022	
			Feed (ipm)	0.3	0.3	0.3	0.3	0.3	0.3	0.3	
	≤ 375 Bhn or ≤ 40 HRc	25  (20-30)	RPM	764	509	382	255	191	127	96	
			Fr	0.0001	0.0002	0.0003	0.0004	0.0005	0.0008	0.0010	
			Feed (ipm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
	≤ 475 Bhn or ≤ 50 HRc	20  (16-24)	RPM	611	407	306	204	153	102	76	
			Fr	0.0002	0.0002	0.0003	0.0005	0.0007	0.0010	0.0013	
			Feed (ipm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
	<b>K</b>  <b>CAST IRONS</b> Gray, Malleable, Ductile	≤ 220 Bhn or ≤ 19 HRc	105  (84-126)	RPM	3209	2139	1604	1070	802	535	401
				Fr	0.0006	0.0009	0.0012	0.0018	0.0024	0.0036	0.0047
				Feed (ipm)	1.9	1.9	1.9	1.9	1.9	1.9	1.9
≤ 330 Bhn or ≤ 36 HRc		75  (60-90)	RPM	2292	1528	1146	764	573	382	287	
			Fr	0.0006	0.0009	0.0012	0.0018	0.0024	0.0037	0.0049	
			Feed (ipm)	1.4	1.4	1.4	1.4	1.4	1.4	1.4	
<b>M</b>  <b>STAINLESS STEELS</b> (FREE MACHINING) 303, 416, 420F, 430F 440F	≤ 250 Bhn or ≤ 24 HRc	53  (42-64)	RPM	1620	1080	810	540	405	270	202	
			Fr	0.0003	0.0005	0.0006	0.0009	0.0012	0.0019	0.0025	
			Feed (ipm)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	
	≤ 330 Bhn or ≤ 36 HRc	46  (37-55)	RPM	1406	937	703	469	351	234	176	
			Fr	0.0002	0.0003	0.0004	0.0006	0.0009	0.0013	0.0017	
			Feed (ipm)	0.3	0.3	0.3	0.3	0.3	0.3	0.3	
≤ 275 Bhn or ≤ 28 HRc	28  (22-34)	RPM	856	570	428	285	214	143	107		
		Fr	0.0004	0.0005	0.0007	0.0011	0.0014	0.0021	0.0028		
		Feed (ipm)	0.3	0.3	0.3	0.3	0.3	0.3	0.3		
≤ 375 Bhn or ≤ 40 HRc	21  (17-25)	RPM	642	428	321	214	160	107	80		
		Fr	0.0002	0.0002	0.0003	0.0005	0.0006	0.0009	0.0012		
		Feed (ipm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1		

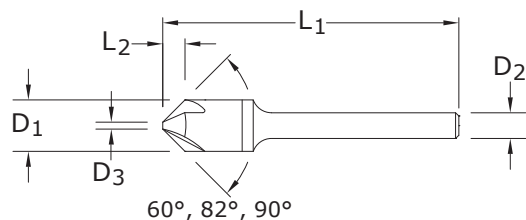
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# Single Flute Countersink

Series 601 Fractional	Hardness	Vc (sfm)	Diameter (D <sub>1</sub> ) (inch)								
			1/8	3/16	1/4	3/8	1/2	3/4	1		
<b>S</b>  <b>SUPER ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 601, 617, 625, Incoloy 800, Monel 400, Rene, Waspaloy</b>	≤ 220 Bhn or ≤ 19 HRc	18	RPM	550	367	275	183	138	92	69	
		(14-22)	Fr	0.0002	0.0003	0.0004	0.0005	0.0007	0.0011	0.0015	
			Feed (ipm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
	≤ 320 Bhn or ≤ 34 HRc	14	RPM	428	285	214	143	107	71	53	
		(11-17)	Fr	0.0002	0.0004	0.0005	0.0007	0.0009	0.0014	0.0019	
			Feed (ipm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
	≤ 425 Bhn or ≤ 45 HRc	12	RPM	367	244	183	122	92	61	46	
		(10-14)	Fr	0.0003	0.0004	0.0005	0.0008	0.0011	0.0016	0.0022	
			Feed (ipm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
	<b>N</b>  <b>TITANIUM ALLOYS Pure Titanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si, Ti-6Al4V</b>	≤ 275 Bhn or ≤ 28 HRc	36	RPM	1100	733	550	367	275	183	138
			(29-43)	Fr	0.0005	0.0007	0.0009	0.0014	0.0018	0.0027	0.0036
				Feed (ipm)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
≤ 350 Bhn or ≤ 38 HRc		28	RPM	856	570	428	285	214	143	107	
		(22-34)	Fr	0.0004	0.0005	0.0007	0.0011	0.0014	0.0021	0.0028	
			Feed (ipm)	0.3	0.3	0.3	0.3	0.3	0.3	0.3	
≤ 440 Bhn or ≤ 47 HRc		21	RPM	642	428	321	214	160	107	80	
		(17-25)	Fr	0.0002	0.0002	0.0003	0.0005	0.0006	0.0009	0.0012	
			Feed (ipm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
<b>ALUMINUM ALLOYS 2017, 2024, 356, 6061, 7075</b>		≤ 80 Bhn or ≤ 47 HRb	225	RPM	6876	4584	3438	2292	1719	1146	860
			(180-270)	Fr	0.0008	0.0011	0.0015	0.0023	0.0030	0.0045	0.0061
				Feed (ipm)	5.2	5.2	5.2	5.2	5.2	5.2	5.2
	≤ 150 Bhn or ≤ 7 HRc	190	RPM	5806	3871	2903	1935	1452	968	726	
		(152-228)	Fr	0.0008	0.0011	0.0015	0.0023	0.0030	0.0045	0.0061	
			Feed (ipm)	4.4	4.4	4.4	4.4	4.4	4.4	4.4	
<b>COPPER ALLOYS Alum Bronze, C110, Muntz Brass</b>	≤ 140 Bhn or ≤ 3 HRc	95	RPM	2903	1935	1452	968	726	484	363	
		(76-114)	Fr	0.0004	0.0006	0.0008	0.0011	0.0015	0.0023	0.0030	
			Feed (ipm)	1.1	1.1	1.1	1.1	1.1	1.1	1.1	
	≤ 200 Bhn or ≤ 23 HRc	80	RPM	2445	1630	1222	815	611	407	306	
		(64-96)	Fr	0.0004	0.0006	0.0008	0.0012	0.0016	0.0025	0.0033	
			Feed (ipm)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	

Bhn (Brinell) HRc (Rockwell C) HRb (Rockwell B)  
 $rpm = Vc \times 3.82 / D_1$   
 $ipm = Fr \times rpm$   
 reduce speed and feed for materials harder than listed  
 refer to the SGS Tool Wizard for complete technical information ([www.kyocera-sgstool.com](http://www.kyocera-sgstool.com))

# 3 Flute Countersink



**603**  
FRACTIONAL SERIES

**TOLERANCES (inch)**

**1/8–1/4 DIAMETER**

D<sub>1</sub> = +.0000/-.0005

**3/8–1 DIAMETER**

D<sub>1</sub> = +.003/-.000

Included Angle

+1°/-1°

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS

- U.S. Stock Standard
- NOT STOCKED—  
Call for Delivery

For patent information  
visit [www.kyocera-sgstool.com/patents](http://www.kyocera-sgstool.com/patents)

inch				EDP NO.			STOCK
CUTTING DIAMETER D <sub>1</sub>	SHANK DIAMETER D <sub>2</sub>	OVERALL LENGTH L <sub>1</sub>	TIP DIAMETER D <sub>3</sub>	UNCOATED 60°	UNCOATED 82°	UNCOATED 90°	
1/8	1/8	1-1/2	.040	—	—	74225	●
1/8	1/8	1-1/2	.040	—	74125	—	●
1/8	1/8	1-1/2	.035	74025	—	—	●
3/16	3/16	2	.060	—	—	74228	●
3/16	3/16	2	.060	—	74128	—	●
3/16	3/16	2	.045	74028	—	—	●
1/4	1/4	2	.100	—	—	74231	●
1/4	1/4	2	.100	—	74131	—	●
1/4	1/4	2	.070	74031	—	—	●
3/8*	1/4	2-13/16	.108	—	—	74234	●
3/8*	1/4	2-13/16	.108	—	74134	—	●
3/8*	1/4	2-13/16	.100	74034	—	—	●
1/2*	1/4	2-7/8	.122	—	—	74237	●
1/2*	1/4	2-7/8	.122	—	74137	—	●
1/2*	1/4	2-7/8	.113	74037	—	—	●
5/8*	3/8	3	.138	—	—	74240	●
5/8*	3/8	3	.138	—	74140	—	●
5/8*	3/8	3	.128	74040	—	—	●
3/4*	1/2	3	.153	—	—	74243	●
5/8*	3/8	3	.153	—	74143	—	●
5/8*	3/8	3	.153	74043	—	—	●
1*	1/2	3-1/4	.168	—	—	74246	●
1*	1/2	3-1/4	.168	—	74146	—	●
1*	1/2	3-1/4	.158	74046	—	—	●

\*Steel Shank / Con mango de acero / Avec queue en acier  
NOTE: D<sub>3</sub> dimension varies based on angle. Contact KSPT representative or consult Tool Wizard for dimension information.

# 3 Flute Countersink

Series 603 Fractional	Hardness	Vc (sfm)	Diameter (D <sub>1</sub> ) (inch)								
			1/8	3/16	1/4	3/8	1/2	3/4	1		
<b>P</b>  <b>CARBON STEELS</b> 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	≤ 175 Bhn or ≤ 7 HRc	125	RPM	3820	2547	1910	1273	955	637	478	
		(100-150)	Fr	0.0008	0.0012	0.0016	0.0024	0.0031	0.0047	0.0063	
			Feed (ipm)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
	≤ 300 Bhn or ≤ 32 HRc	60	RPM	1834	1222	917	611	458	306	229	
		(48-72)	Fr	0.0007	0.0011	0.0014	0.0021	0.0028	0.0043	0.0057	
			Feed (ipm)	1.3	1.3	1.3	1.3	1.3	1.3	1.3	
	≤ 425 Bhn or ≤ 45 HRc	45	RPM	1375	917	688	458	344	229	172	
		(36-54)	Fz	0.0004	0.0007	0.0009	0.0013	0.0017	0.0026	0.0035	
			Feed (ipm)	0.6	0.6	0.6	0.6	0.6	0.6	0.6	
	<b>H</b>  <b>ALLOY STEELS</b> 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100	≤ 275 Bhn or ≤ 28 HRc	95	RPM	2903	1935	1452	968	726	484	363
			(76-114)	Fz	0.0007	0.0010	0.0014	0.0021	0.0028	0.0041	0.0055
				Feed (ipm)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
≤ 375 Bhn or ≤ 40 HRc		60	RPM	1834	1222	917	611	458	306	229	
		(48-72)	Fr	0.0007	0.0010	0.0013	0.0020	0.0026	0.0039	0.0052	
			Feed (ipm)	1.2	1.2	1.2	1.2	1.2	1.2	1.2	
≤ 450 Bhn or ≤ 48 HRc		35	RPM	1070	713	535	357	267	178	134	
		(28-42)	Fr	0.0004	0.0006	0.0007	0.0011	0.0015	0.0022	0.0030	
			Feed (ipm)	0.4	0.4	0.4	0.4	0.4	0.4	0.4	
<b>K</b>  <b>TOOL STEELS</b> A2, D2, H13, L2, M2, P20, S7, T15, W2		≤ 250 Bhn or ≤ 24 HRc	35	RPM	1070	713	535	357	267	178	134
			(28-42)	Fr	0.0004	0.0006	0.0007	0.0011	0.0015	0.0022	0.0030
				Feed (ipm)	0.4	0.4	0.4	0.4	0.4	0.4	0.4
	≤ 375 Bhn or ≤ 40 HRc	25	RPM	764	509	382	255	191	127	96	
		(20-30)	Fr	0.0003	0.0004	0.0005	0.0008	0.0010	0.0016	0.0021	
			Feed (ipm)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	
	≤ 475 Bhn or ≤ 50 HRc	20	RPM	611	407	306	204	153	102	76	
		(16-24)	Fr	0.0002	0.0002	0.0003	0.0005	0.0007	0.0010	0.0013	
			Feed (ipm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
	<b>M</b>  <b>CAST IRONS</b> Gray, Malleable, Ductile	≤ 220 Bhn or ≤ 19 HRc	105	RPM	3209	2139	1604	1070	802	535	401
			(84-126)	Fr	0.0009	0.0014	0.0018	0.0027	0.0036	0.0054	0.0072
				Feed (ipm)	2.9	2.9	2.9	2.9	2.9	2.9	2.9
≤ 330 Bhn or ≤ 36 HRc		75	RPM	2292	1528	1146	764	573	382	287	
		(60-90)	Fr	0.0009	0.0014	0.0018	0.0027	0.0037	0.0055	0.0073	
			Feed (ipm)	2.1	2.1	2.1	2.1	2.1	2.1	2.1	
<b>M</b>  <b>STAINLESS STEELS</b> (FREE MACHINING) 303, 416, 420F, 430F 440F	≤ 250 Bhn or ≤ 24 HRc	53	RPM	1620	1080	810	540	405	270	202	
		(42-64)	Fr	0.0004	0.0006	0.0009	0.0013	0.0017	0.0026	0.0035	
			Feed (ipm)	0.7	0.7	0.7	0.7	0.7	0.7	0.7	
	≤ 330 Bhn or ≤ 36 HRc	46	RPM	1406	937	703	469	351	234	176	
		(37-55)	Fr	0.0004	0.0005	0.0007	0.0011	0.0014	0.0021	0.0028	
			Feed (ipm)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	
	<b>M</b>  <b>STAINLESS STEELS</b> (DIFFICULT) 304, 316, 321, 13-8 PH, 15-5PH, 17-4 PH, Custom 450	≤ 275 Bhn or ≤ 28 HRc	28	RPM	856	570	428	285	214	143	107
			(22-34)	Fr	0.0005	0.0007	0.0009	0.0014	0.0019	0.0028	0.0037
				Feed (ipm)	0.4	0.4	0.4	0.4	0.4	0.4	0.4
		≤ 375 Bhn or ≤ 40 HRc	21	RPM	642	428	321	214	160	107	80
			(17-25)	Fr	0.0002	0.0002	0.0003	0.0005	0.0006	0.0009	0.0012
				Feed (ipm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1

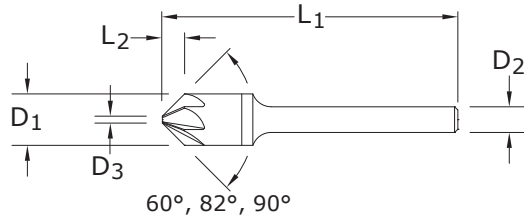
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# 3 Flute Countersink

Series 603 Fractional	Hardness	Vc (sfm)	Diameter (D <sub>1</sub> ) (inch)								
			1/8	3/16	1/4	3/8	1/2	3/4	1		
<b>S</b>  <b>SUPER ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 601, 617, 625, Incoloy 800, Monel 400, Rene, Waspaloy</b>	≤ 220 Bhn or ≤ 19 HRc	18 (14-22)	RPM	550	367	275	183	138	92	69	
			Fr	0.0004	0.0005	0.0007	0.0011	0.0015	0.0022	0.0029	
			Feed (ipm)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	
	≤ 320 Bhn or ≤ 34 HRc	14 (11-17)	RPM	428	285	214	143	107	71	53	
			Fr	0.0002	0.0004	0.0005	0.0007	0.0009	0.0014	0.0019	
			Feed (ipm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
	≤ 425 Bhn or ≤ 45 HRc	12 (10-14)	RPM	367	244	183	122	92	61	46	
			Fr	0.0003	0.0004	0.0005	0.0008	0.0011	0.0016	0.0022	
			Feed (ipm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
	<b>TITANIUM ALLOYS Pure Titanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si, Ti-6Al4V</b>	≤ 275 Bhn or ≤ 28 HRc	36 (29-43)	RPM	1100	733	550	367	275	183	138
				Fr	0.0007	0.0011	0.0015	0.0022	0.0029	0.0044	0.0058
				Feed (ipm)	0.8	0.8	0.8	0.8	0.8	0.8	0.8
≤ 350 Bhn or ≤ 38 HRc		28 (22-34)	RPM	856	570	428	285	214	143	107	
			Fr	0.0006	0.0009	0.0012	0.0018	0.0023	0.0035	0.0047	
			Feed (ipm)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	
≤ 440 Bhn or ≤ 47 HRc		21 (17-25)	RPM	642	428	321	214	160	107	80	
			Fr	0.0002	0.0002	0.0003	0.0005	0.0006	0.0009	0.0012	
			Feed (ipm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
<b>N</b>  <b>ALUMINUM ALLOYS 2017, 2024, 356, 6061, 7075</b>	≤ 80 Bhn or ≤ 47 HRb	225 (180-270)	RPM	6876	4584	3438	2292	1719	1146	860	
			Fr	0.0011	0.0017	0.0023	0.0034	0.0045	0.0068	0.0091	
			Feed (ipm)	7.8	7.8	7.8	7.8	7.8	7.8	7.8	
	≤ 150 Bhn or ≤ 7 HRc	190 (152-228)	RPM	5806	3871	2903	1935	1452	968	726	
			Fr	0.0011	0.0017	0.0022	0.0034	0.0045	0.0067	0.0090	
			Feed (ipm)	6.5	6.5	6.5	6.5	6.5	6.5	6.5	
	≤ 140 Bhn or ≤ 3 HRc	95 (76-114)	RPM	2903	1935	1452	968	726	484	363	
			Fr	0.0006	0.0009	0.0012	0.0018	0.0023	0.0035	0.0047	
			Feed (ipm)	1.7	1.7	1.7	1.7	1.7	1.7	1.7	
	≤ 200 Bhn or ≤ 23 HRc	80 (64-96)	RPM	2445	1630	1222	815	611	407	306	
			Fr	0.0006	0.0009	0.0011	0.0017	0.0023	0.0034	0.0046	
			Feed (ipm)	1.4	1.4	1.4	1.4	1.4	1.4	1.4	
<b>COPPER ALLOYS Alum Bronze, C110, Muntz Brass</b>											

Bhn (Brinell) HRc (Rockwell C) HRb (Rockwell B)  
 rpm = Vc x 3.82 / D<sub>1</sub>  
 ipm = Fr x rpm  
 reduce speed and feed for materials harder than listed  
 refer to the SGS Tool Wizard for complete technical information ([www.kyocera-sgstoool.com](http://www.kyocera-sgstoool.com))

# 6 Flute Countersink



**606**

FRACTIONAL SERIES

CUTTING DIAMETER D <sub>1</sub>	SHANK DIAMETER D <sub>2</sub>	inch		EDP NO.			STOCK
		OVERALL LENGTH L <sub>1</sub>	TIP DIAMETER D <sub>3</sub>	UNCOATED 60°	UNCOATED 82°	UNCOATED 90°	
1/8	1/8	1-1/2	.035	—	—	74249	●
1/8	1/8	1-1/2	.035	—	74149	—	●
1/8	1/8	1-1/2	.035	74049	—	—	●
3/16	3/16	2	.045	—	—	74252	●
3/16	3/16	2	.045	—	74152	—	●
3/16	3/16	2	.045	74052	—	—	●
1/4	1/4	2	.070	—	—	74255	●
1/4	1/4	2	.070	—	74155	—	●
1/4	1/4	2	.070	74055	—	—	●
3/8*	1/4	2-13/16	.100	—	—	74258	●
3/8*	1/4	2-13/16	.100	—	74158	—	●
3/8*	1/4	2-13/16	.100	74058	—	—	●
1/2*	1/4	2-7/8	.160	—	—	74261	●
1/2*	1/4	2-7/8	.160	—	74161	—	●
1/2*	1/4	2-7/8	.160	74061	—	—	●
5/8*	3/8	3	.190	—	—	74264	●
5/8*	3/8	3	.190	—	74164	—	●
5/8*	3/8	3	.190	74064	—	—	●
3/4*	1/2	3	.220	—	—	74267	●
3/4*	1/2	3	.220	—	74167	—	●
3/4*	1/2	3	.220	74067	—	—	●
1*	1/2	3-1/4	.260	—	—	74270	●
1*	1/2	3-1/4	.260	—	74170	—	●
1*	1/2	3-1/4	.260	74070	—	—	●

\*Steel Shank / Con mango de acero / Avec queue en acier

NOTE: D3 dimension varies based on angle. Contact KSPT representative or consult Tool Wizard for dimension information.

**TOLERANCES (inch)**

**1/8–1/4 DIAMETER**

D<sub>1</sub> = +.0000/–.0005

**3/8–1 DIAMETER**

D<sub>1</sub> = +.003/–.000

Included Angle

+1°/–1°

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- NON-FERROUS
- HARDENED STEELS

- U.S. Stock Standard
- NOT STOCKED—  
Call for Delivery

For patent information visit [www.kyocera-sgstool.com/patents](http://www.kyocera-sgstool.com/patents)

# 6 Flute Countersink

Series 606 Fractional	Hardness	Vc (sfm)	Diameter (D <sub>1</sub> ) (inch)								
			1/8	3/16	1/4	3/8	1/2	3/4	1		
<b>P</b>  <b>CARBON STEELS</b> 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	≤ 175 Bhn or ≤ 7 HRc	125	RPM	3820	2547	1910	1273	955	637	478	
		(100-150)	Fr	0.0010	0.0016	0.0021	0.0031	0.0042	0.0063	0.0084	
			Feed (ipm)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
	≤ 300 Bhn or ≤ 32 HRc	60	RPM	1834	1222	917	611	458	306	229	
		(48-72)	Fr	0.0010	0.0015	0.0020	0.0029	0.0039	0.0059	0.0079	
			Feed (ipm)	1.8	1.8	1.8	1.8	1.8	1.8	1.8	
	≤ 425 Bhn or ≤ 45 HRc	45	RPM	1375	917	688	458	344	229	172	
		(36-54)	Fz	0.0006	0.0009	0.0012	0.0017	0.0023	0.0035	0.0047	
			Feed (ipm)	0.8	0.8	0.8	0.8	0.8	0.8	0.8	
	<b>H</b>  <b>ALLOY STEELS</b> 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100	≤ 275 Bhn or ≤ 28 HRc	95	RPM	2903	1935	1452	968	726	484	363
			(76-114)	Fz	0.0009	0.0013	0.0018	0.0027	0.0036	0.0054	0.0072
				Feed (ipm)	2.6	2.6	2.6	2.6	2.6	2.6	2.6
≤ 375 Bhn or ≤ 40 HRc		60	RPM	1834	1222	917	611	458	306	229	
		(48-72)	Fr	0.0009	0.0014	0.0019	0.0028	0.0037	0.0056	0.0074	
			Feed (ipm)	1.7	1.7	1.7	1.7	1.7	1.7	1.7	
≤ 450 Bhn or ≤ 48 HRc		35	RPM	1070	713	535	357	267	178	134	
		(28-42)	Fr	0.0006	0.0008	0.0011	0.0017	0.0022	0.0034	0.0045	
			Feed (ipm)	0.6	0.6	0.6	0.6	0.6	0.6	0.6	
<b>K</b>  <b>TOOL STEELS</b> A2, D2, H13, L2, M2, P20, S7, T15, W2		≤ 250 Bhn or ≤ 24 HRc	35	RPM	1070	713	535	357	267	178	134
			(28-42)	Fr	0.0006	0.0008	0.0011	0.0017	0.0022	0.0034	0.0045
				Feed (ipm)	0.6	0.6	0.6	0.6	0.6	0.6	0.6
	≤ 375 Bhn or ≤ 40 HRc	25	RPM	764	509	382	255	191	127	96	
		(20-30)	Fr	0.0003	0.0004	0.0005	0.0008	0.0010	0.0016	0.0021	
			Feed (ipm)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	
	≤ 475 Bhn or ≤ 50 HRc	20	RPM	611	407	306	204	153	102	76	
		(16-24)	Fr	0.0003	0.0005	0.0007	0.0010	0.0013	0.0020	0.0026	
			Feed (ipm)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	
	<b>K</b>  <b>CAST IRONS</b> Gray, Malleable, Ductile	≤ 220 Bhn or ≤ 19 HRc	105	RPM	3209	2139	1604	1070	802	535	401
			(84-126)	Fr	0.0012	0.0018	0.0024	0.0036	0.0049	0.0073	0.0097
				Feed (ipm)	3.9	3.9	3.9	3.9	3.9	3.9	3.9
≤ 330 Bhn or ≤ 36 HRc		75	RPM	2292	1528	1146	764	573	382	287	
		(60-90)	Fr	0.0012	0.0018	0.0024	0.0037	0.0049	0.0073	0.0098	
			Feed (ipm)	2.8	2.8	2.8	2.8	2.8	2.8	2.8	

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# 6 Flute Countersink

Series 606 Fractional	Hardness	Vc (sfm)	Diameter (D <sub>1</sub> ) (inch)								
			1/8	3/16	1/4	3/8	1/2	3/4	1		
<b>M</b>  <b>STAINLESS STEELS (FREE MACHINING)</b> 304, 416, 420F, 430F 440F	≤ 250 Bhn or ≤ 24 HRc	53	RPM	1620	1080	810	540	405	270	202	
		(42-64)	Fr	0.0006	0.0009	0.0012	0.0019	0.0025	0.0037	0.0049	
			Feed (ipm)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
	≤ 330 Bhn or ≤ 36 HRc	46	RPM	1406	937	703	469	351	234	176	
		(37-55)	Fr	0.0005	0.0007	0.0010	0.0015	0.0020	0.0030	0.0040	
			Feed (ipm)	0.7	0.7	0.7	0.7	0.7	0.7	0.7	
	<b>S</b>  <b>STAINLESS STEELS (DIFFICULT)</b> 304, 316, 321, 13-8 PH, 15-5PH, 17-4 PH, Custom 450	≤ 275 Bhn or ≤ 28 HRc	28	RPM	856	570	428	285	214	143	107
			(22-34)	Fr	0.0007	0.0011	0.0014	0.0021	0.0028	0.0042	0.0056
				Feed (IPM)	0.6	0.6	0.6	0.6	0.6	0.6	0.6
		≤ 375 Bhn or ≤ 40 HRc	21	RPM	642	428	321	214	160	107	80
			(17-25)	Fr	0.0003	0.0005	0.0006	0.0009	0.0012	0.0019	0.0025
				Feed (IPM)	0.2	0.2	0.2	0.2	0.2	0.2	0.2
<b>S</b>  <b>SUPER ALLOYS (NICKEL, COBALT, IRON BASE)</b> Inconel 601, 617, 625, Incoloy 800, Monel 400, Rene, Waspaloy		≤ 220 Bhn or ≤ 19 HRc	18	RPM	550	367	275	183	138	92	69
			(14-22)	Fr	0.0005	0.0008	0.0011	0.0016	0.0022	0.0033	0.0044
				Feed (ipm)	0.3	0.3	0.3	0.3	0.3	0.3	0.3
		≤ 320 Bhn or ≤ 34 HRc	14	RPM	428	285	214	143	107	71	53
			(11-17)	Fr	0.0005	0.0007	0.0009	0.0014	0.0019	0.0028	0.0037
				Feed (ipm)	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	≤ 425 Bhn or ≤ 45 HRc	12	RPM	367	244	183	122	92	61	46	
		(10-14)	Fr	0.0003	0.0004	0.0005	0.0008	0.0011	0.0016	0.0022	
			Feed (ipm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
	<b>S</b>  <b>TITANIUM ALLOYS</b> Pure Titanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si, Ti-6Al4V	≤ 275 Bhn or ≤ 28 HRc	36	RPM	1100	733	550	367	275	183	138
			(29-43)	Fr	0.0009	0.0014	0.0018	0.0027	0.0036	0.0055	0.0073
				Feed (ipm)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
≤ 350 Bhn or ≤ 38 HRc		28	RPM	856	570	428	285	214	143	107	
		(22-34)	Fr	0.0007	0.0011	0.0014	0.0021	0.0028	0.0042	0.0056	
			Feed (ipm)	0.6	0.6	0.6	0.6	0.6	0.6	0.6	
≤ 440 Bhn or ≤ 47 HRc		21	RPM	642	428	321	214	160	107	80	
		(17-25)	Fr	0.0003	0.0005	0.0006	0.0009	0.0012	0.0019	0.0025	
			Feed (ipm)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	

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# 6 Flute Countersink

Series 606 Fractional	Hardness	Vc (sfm)		Diameter (D <sub>1</sub> ) (inch)							
				1/8	3/16	1/4	3/8	1/2	3/4	1	
ALUMINUM ALLOYS 2017, 2024, 356, 6061, 7075	≤ 80 Bhn or ≤ 47 HRb	225 (180-270)	RPM	6876	4584	3438	2292	1719	1146	860	
			Fr	0.0015	0.0022	0.0030	0.0045	0.0060	0.0090	0.0120	
			Feed (ipm)	10.3	10.3	10.3	10.3	10.3	10.3	10.3	
	≤ 150 Bhn or ≤ 7 HRc	190 (152-228)	RPM	5806	3871	2903	1935	1452	968	726	
			Fr	0.0015	0.0022	0.0030	0.0045	0.0060	0.0090	0.0120	
			Feed (ipm)	8.7	8.7	8.7	8.7	8.7	8.7	8.7	
	COPPER ALLOYS Alum Bronze, C110, Muntz Brass	≤ 140 Bhn or ≤ 3 HRc	95 (76-114)	RPM	2903	1935	1452	968	726	484	363
				Fr	0.0008	0.0011	0.0015	0.0023	0.0030	0.0045	0.0061
				Feed (ipm)	2.2	2.2	2.2	2.2	2.2	2.2	2.2
		≤ 200 Bhn or ≤ 23 HRc	80 (64-96)	RPM	2445	1630	1222	815	611	407	306
				Fr	0.0008	0.0012	0.0016	0.0023	0.0031	0.0047	0.0062
				Feed (ipm)	1.9	1.9	1.9	1.9	1.9	1.9	1.9

Bhn (Brinell) HRc (Rockwell C) HRb (Rockwell B)  
 $rpm = Vc \times 3.82 / D_1$   
 $ipm = Fr \times rpm$   
 reduce speed and feed for materials harder than listed  
 refer to the SGS Tool Wizard for complete technical information ([www.kyocera-sgstool.com](http://www.kyocera-sgstool.com))

# Straight Flute Accu-Reamer

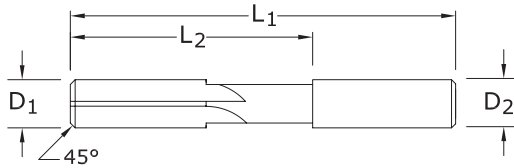


5xD



**200**

FRACTIONAL SERIES



inch					EDP NO.	STOCK
CUTTING DIAMETER D <sub>1</sub>	SHANK DIAMETER D <sub>2</sub>	MAXIMUM REAM LENGTH L <sub>2</sub>	OVERALL LENGTH L <sub>1</sub>	NO. OF FLUTES	UNCOATED	
3/64	3/64	3/4	1-1/2	4	70003	●
1/16	1/16	3/4	1-1/2	4	70004	●
5/64	5/64	1	2	4	70005	●
3/32	3/32	1-1/4	2-1/4	4	70006	●
7/64	7/64	1-1/4	2-1/4	4	70007	●
1/8	1/8	1-1/4	2-1/4	4	70008	●
9/64	9/64	1-1/2	2-1/2	4	70009	●
5/32	5/32	1-1/2	2-1/2	4	70010	●
11/64	11/64	1-3/4	2-3/4	4	70011	●
3/16	3/16	1-3/4	2-3/4	4	70012	●
13/64	13/64	2	3	4	70013	●
7/32	7/32	2	3	4	70014	●
15/64	15/64	2	3	4	70015	●
1/4	1/4	2	3	4	70016	●
17/64	17/64	2-1/4	3-1/4	6	70017	●
9/32	9/32	2-1/4	3-1/4	6	70018	●
19/64	19/64	2-1/4	3-1/4	6	70019	●
5/16	5/16	2-1/4	3-1/4	6	70020	●
21/64	21/64	2-3/8	3-1/2	6	70021	●
11/32	11/32	2-3/8	3-1/2	6	70022	●
23/64	23/64	2-3/8	3-1/2	6	70023	●
3/8	3/8	2-3/8	3-1/2	6	70024	●
25/64	25/64	2-7/8	4	6	70025	●
13/32	13/32	2-7/8	4	6	70026	●
27/64	27/64	2-7/8	4	6	70027	●
7/16	7/16	2-7/8	4	6	70028	●
29/64	29/64	2-7/8	4	6	70029	●
15/32	15/32	2-7/8	4	6	70030	●
31/64	31/64	2-7/8	4	6	70031	●
1/2	1/2	2-7/8	4	6	70032	●

**TOLERANCES (inch)**

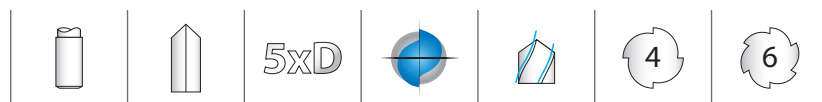
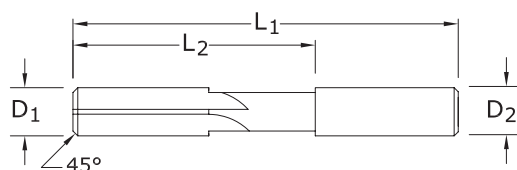
D<sub>1</sub> = +.0002/-0.0000  
D<sub>2</sub> = +.0002/-0.0000

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- NON-FERROUS
- HARDENED STEELS

- U.S. Stock Standard
- NOT STOCKED—  
Call for Delivery

For patent information  
visit [www.kyocera-sgstool.com/patents](http://www.kyocera-sgstool.com/patents)

# Straight Flute Accu-Reamer


**TOLERANCES (inch)**
 $D_1 = +.0002/-0.0000$ 
 $D_2 = +.0002/-0.0000$ 

**200**  
 FRACTIONAL SERIES

inch				NO. OF FLUTES
CUTTING DIAMETER $D_1$	SHANK DIAMETER $D_2$	MAXIMUM REAM LENGTH $L_2$	OVERALL LENGTH $L_1$	
.0470 – .0625	1/16	3/4	1-1/2	4
.0626 – .0781	5/64	1	2	4
.0782 – .0938	3/32	1-1/4	2-1/4	4
.0939 – .1094	7/64	1-1/4	2-1/4	4
.1095 – .1250	1/8	1-1/4	2-1/4	4
.1251 – .1406	9/64	1-1/2	2-1/2	4
.1407 – .1563	5/32	1-1/2	2-1/2	4
.1564 – .1719	11/64	1-3/4	2-3/4	4
.1720 – .1875	3/16	1-3/4	2-3/4	4
.1876 – .2031	13/64	2	3	4
.2032 – .2188	7/32	2	3	4
.2189 – .2344	15/64	2	3	4
.2345 – .2500	1/4	2	3	4
.2501 – .2656	17/64	2-1/4	3-1/4	6
.2657 – .2813	9/32	2-1/4	3-1/4	6
.2814 – .2969	19/64	2-1/4	3-1/4	6
.2970 – .3125	5/16	2-1/4	3-1/4	6
.3126 – .3281	21/64	2-3/8	3-1/2	6
.3282 – .3438	11/32	2-3/8	3-1/2	6
.3439 – .3594	23/64	2-3/8	3-1/2	6
.3595 – .3750	3/8	2-3/8	3-1/2	6
.3751 – .3906	25/64	2-7/8	4	6
.3907 – .4063	13/32	2-7/8	4	6
.4064 – .4219	27/64	2-7/8	4	6
.4220 – .4375	7/16	2-7/8	4	6
.4376 – .4531	29/64	2-7/8	4	6
.4532 – .4688	15/32	2-7/8	4	6
.4689 – .4844	31/64	2-7/8	4	6
.4845 – .5000	1/2	2-7/8	4	6

SER 200 Fractional reamers can be ordered to specific diameters according to the size range of Cutting Diameter  $D_1$ . Please order as:

- 200. Then the size of the cut diameter in fractional format.
- i.e. 200.0492
- Description: Series 200 size 0.0492
- For Metric sizes convert to fractional inches (i.e.  $\div 25.4$ )
- The above sample would be a 1.25mm size ( $1.25 \div 25.4 = 0.0492$ )

All other dimensions are fractional as per table including the Shank

# Straight Flute Accu-Reamer

Series 200 Fractional	Hardness	Vc (sfm)	Diameter (D <sub>1</sub> ) (inch)								
			1/16	1/8	3/16	1/4	5/16	3/8	1/2		
<b>P</b>  <b>CARBON STEELS</b> 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	≤ 175 Bhn or ≤ 7 HRc	150  (120-180)	RPM	9168	4584	3056	2292	1834	1528	1146	
			Fr	0.0018	0.0035	0.0053	0.0071	0.0088	0.0106	0.0141	
			Feed (ipm)	16.5	16.0	16.2	16.3	16.1	16.2	16.2	
	≤ 300 Bhn or ≤ 32 HRc	75  (60-90)	RPM	4584	2292	1528	1146	917	764	573	
			Fr	0.0016	0.0031	0.0047	0.0062	0.0078	0.0093	0.0124	
			Feed (ipm)	7.3	7.1	7.2	7.1	7.2	7.1	7.1	
	≤ 425 Bhn or ≤ 45 HRc	55  (44-66)	RPM	3362	1681	1121	840	672	560	420	
			Fz	0.0009	0.0019	0.0028	0.0037	0.0046	0.0056	0.0074	
			Feed (ipm)	3.0	3.2	3.1	3.1	3.1	3.1	3.1	
	<b>H</b>  <b>ALLOY STEELS</b> 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100	≤ 275 Bhn or ≤ 28 HRc	115  (92-138)	RPM	7029	3514	2343	1757	1406	1171	879
				Fz	0.0015	0.0030	0.0045	0.0060	0.0075	0.0090	0.0120
				Feed (ipm)	10.5	10.5	10.5	10.5	10.5	10.5	10.5
≤ 375 Bhn or ≤ 40 HRc		70  (56-84)	RPM	4278	2139	1426	1070	856	713	535	
			Fr	0.0015	0.0030	0.0045	0.0060	0.0075	0.0090	0.0120	
			Feed (ipm)	6.4	6.4	6.4	6.4	6.4	6.4	6.4	
≤ 450 Bhn or ≤ 48 HRc		45  (36-54)	RPM	2750	1375	917	688	550	458	344	
			Fr	0.0009	0.0019	0.0028	0.0037	0.0046	0.0056	0.0074	
			Feed (ipm)	2.5	2.6	2.6	2.5	2.5	2.6	2.5	
<b>K</b>  <b>TOOL STEELS</b> A2, D2, H13, L2, M2, P20, S7, T15, W2		≤ 250 Bhn or ≤ 24 HRc	40  (32-48)	RPM	2445	1222	815	611	489	407	306
				Fr	0.0010	0.0020	0.0029	0.0039	0.0049	0.0059	0.0078
				Feed (ipm)	2.4	2.4	2.4	2.4	2.4	2.4	2.4
	≤ 375 Bhn or ≤ 40 HRc	25  (20-30)	RPM	1528	764	509	382	306	255	191	
			Fr	0.0006	0.0013	0.0019	0.0025	0.0031	0.0038	0.0050	
			Feed (ipm)	0.9	1.0	1.0	1.0	0.9	1.0	1.0	
	≤ 475 Bhn or ≤ 50 HRc	20  (16-24)	RPM	1222	611	407	306	244	204	153	
			Fr	0.0004	0.0008	0.0012	0.0016	0.0019	0.0023	0.0031	
			Feed (ipm)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	
	≤ 655 Bhn or ≤ 60 HRc	14  (11-17)	RPM	856	428	285	214	171	143	107	
			Fr	0.0003	0.0007	0.0011	0.0014	0.0018	0.0021	0.0028	
			Feed (ipm)	0.3	0.3	0.3	0.3	0.3	0.3	0.3	
<b>M</b>  <b>CAST IRONS</b> Gray, Malleable, Ductile	≤ 220 Bhn or ≤ 19 HRc	125  (100-150)	RPM	7640	3820	2547	1910	1528	1273	955	
			Fr	0.0020	0.0040	0.0060	0.0081	0.0101	0.0121	0.0161	
			Feed (ipm)	15.3	15.3	15.3	15.5	15.4	15.4	15.4	
	≤ 330 Bhn or ≤ 36 HRc	95  (76-114)	RPM	5806	2903	1935	1452	1161	968	726	
			Fr	0.0020	0.0040	0.0060	0.0081	0.0101	0.0121	0.0161	
			Feed (ipm)	11.6	11.6	11.6	11.8	11.7	11.7	11.7	
<b>M</b>  <b>STAINLESS STEELS</b> (FREE MACHINING) 303, 416, 420F, 430F 440F	≤ 250 Bhn or ≤ 24 HRc	75  (60-90)	RPM	4584	2292	1528	1146	917	764	573	
			Fr	0.0010	0.0020	0.0029	0.0039	0.0049	0.0059	0.0078	
			Feed (ipm)	4.6	4.6	4.4	4.5	4.5	4.5	4.5	
	≤ 330 Bhn or ≤ 36 HRc	55  (44-66)	RPM	3362	1681	1121	840	672	560	420	
			Fr	0.0008	0.0015	0.0023	0.0030	0.0038	0.0045	0.0060	
			Feed (ipm)	2.7	2.5	2.6	2.5	2.6	2.5	2.5	
	<b>M</b>  <b>STAINLESS STEELS</b> (DIFFICULT) 304, 316, 321, 13-8 PH, 15-5PH, 17-4 PH, Custom 450	≤ 275 Bhn or ≤ 28 HRc	35  (28-42)	RPM	2139	1070	713	535	428	357	267
				Fr	0.0010	0.0020	0.0029	0.0039	0.0049	0.0059	0.0078
				Feed (ipm)	2.1	2.1	2.1	2.1	2.1	2.1	2.1
		≤ 375 Bhn or ≤ 40 HRc	25  (20-30)	RPM	1528	764	509	382	306	255	191
				Fr	0.0006	0.0013	0.0019	0.0025	0.0031	0.0038	0.0050
				Feed (ipm)	0.9	1.0	1.0	1.0	0.9	1.0	1.0

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# Straight Flute Accu-Reamer

Series 200 Fractional	Hardness	Vc (sfm)		Diameter (D <sub>1</sub> ) (inch)							
				1/16	1/8	3/16	1/4	5/16	3/8	1/2	
<b>SUPER ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 601, 617, 625, Incoloy 800, Monel 400, Rene, Waspaloy</b>	≤ 220 Bhn or ≤ 19 HRc	20  (16-24)	RPM	1222	611	407	306	244	204	153	
			Fr	0.0008	0.0015	0.0023	0.0030	0.0038	0.0045	0.0060	
			Feed (ipm)	1.0	0.9	0.9	0.9	0.9	0.9	0.9	
	≤ 320 Bhn or ≤ 34 HRc	15  (12-18)	RPM	917	458	306	229	183	153	115	
			Fr	0.0006	0.0013	0.0019	0.0025	0.0031	0.0038	0.0050	
			Feed (ipm)	0.6	0.6	0.6	0.6	0.6	0.6	0.6	
	≤ 425 Bhn or ≤ 45 HRc	10  (8-12)	RPM	611	306	204	153	122	102	76	
			Fr	0.0004	0.0007	0.0011	0.0015	0.0018	0.0022	0.0029	
			Feed (ipm)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	
	<b>TITANIUM ALLOYS Pure Titanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si, Ti-6Al4V</b>	≤ 275 Bhn or ≤ 28 HRc	45  (36-54)	RPM	2750	1375	917	688	550	458	344
				Fr	0.0015	0.0030	0.0045	0.0060	0.0075	0.0090	0.0120
				Feed (ipm)	4.1	4.1	4.1	4.1	4.1	4.1	4.1
≤ 350 Bhn or ≤ 38 HRc		35  (28-42)	RPM	2139	1070	713	535	428	357	267	
			Fr	0.0010	0.0020	0.0029	0.0039	0.0049	0.0059	0.0078	
			Feed (ipm)	2.1	2.1	2.1	2.1	2.1	2.1	2.1	
≤ 440 Bhn or ≤ 47 HRc		25  (20-30)	RPM	1528	764	509	382	306	255	191	
			Fr	0.0006	0.0013	0.0019	0.0025	0.0031	0.0038	0.0050	
			Feed (ipm)	0.9	1.0	1.0	1.0	0.9	1.0	1.0	
<b>ALUMINUM ALLOYS 2017, 2024, 356, 6061, 7075</b>		≤ 80 Bhn or ≤ 47 HRb	270  (216-324)	RPM	16502	8251	5501	4126	3300	2750	2063
				Fr	0.0025	0.0050	0.0075	0.0100	0.0125	0.0150	0.0200
				Feed (ipm)	41.3	41.3	41.3	41.3	41.3	41.3	41.3
	≤ 150 Bhn or ≤ 7 HRc	230  (184-276)	RPM	14058	7029	4686	3514	2812	2343	1757	
			Fr	0.0025	0.0050	0.0075	0.0100	0.0125	0.0150	0.0200	
			Feed (ipm)	35.1	35.1	35.1	35.1	35.1	35.1	35.1	
	<b>COPPER ALLOYS Alum Bronze, C110, Muntz Brass</b>	≤ 140 Bhn or ≤ 3 HRc	115  (92-138)	RPM	7029	3514	2343	1757	1406	1171	879
				Fr	0.0013	0.0026	0.0038	0.0051	0.0064	0.0077	0.0102
				Feed (ipm)	9.1	9.1	8.9	9.0	9.0	9.0	9.0
		≤ 200 Bhn or ≤ 23 HRc	95  (76-114)	RPM	5806	2903	1935	1452	1161	968	726
				Fr	0.0013	0.0026	0.0038	0.0051	0.0064	0.0077	0.0102
				Feed (ipm)	7.5	7.5	7.4	7.4	7.4	7.5	7.4

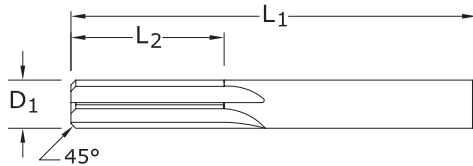
Bhn (Brinell) HRc (Rockwell C) HRb (Rockwell B)  
 rpm = Vc x 3.82 / D<sub>1</sub>  
 ipm = Fr x rpm  
 increase speed and feed 30 percent when using coated reamers  
 reduce speed and feed for materials harder than listed  
 refer to the SGS Tool Wizard for complete technical information ([www.kyocera-sgstool.com](http://www.kyocera-sgstool.com))

METRIC

# Straight Flute Reamer



**201M**  
METRIC SERIES



CUTTING DIAMETER D <sub>1</sub>	mm		NO. OF FLUTES	EDP NO.	
	MAXIMUM REAM LENGTH L <sub>2</sub>	OVERALL LENGTH L <sub>1</sub>		UNCOATED	STOCK
1,0	6,0	32,0	4	81001	●
1,5	9,5	38,0	4	81003	●
2,0	12,7	44,0	4	81005	●
2,5	12,7	50,0	4	81007	●
3,0	16,0	57,0	4	81009	●
3,5	19,0	63,0	4	81011	●
4,0	19,0	63,0	4	81013	●
4,5	22,0	70,0	4	81015	●
5,0	25,0	75,0	4	81017	●
5,5	25,0	75,0	4	81019	●
6,0	25,0	75,0	4	81021	●
7,0	28,0	82,0	6	81023	●
8,0	28,0	82,0	6	81025	●
9,0	31,0	89,0	6	81027	●
10,0	31,0	89,0	6	81029	●

**TOLERANCES (mm)**

**1–6 DIAMETER**

D<sub>1</sub> = +0,008/–0,000

**>6–10 DIAMETER**

D<sub>1</sub> = +0,011/–0,000

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- NON-FERROUS
- HARDENED STEELS

- U.S. Stock Standard
- NOT STOCKED—  
Call for Delivery

For patent information visit [www.kyocera-sgstool.com/patents](http://www.kyocera-sgstool.com/patents)

# Straight Flute Reamer

Series 201M Metric	Hardness	Vc (m/min)	Diameter (D <sub>1</sub> ) (mm)									
			1	2	3	4	6	8	10			
<b>P</b>	<b>CARBON STEELS</b> 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	≤ 175 Bhn or ≤ 7 HRc	46	RPM	14541	7271	4847	3635	2424	1818	1454	
			(37-55)	Fr	0.028	0.056	0.085	0.113	0.169	0.226	0.282	
				Feed (mm/min)	410	410	410	410	410	410	410	
		≤ 300 Bhn or ≤ 32 HRc	23	RPM	7271	3635	2424	1818	1212	909	727	
			(18-27)	Fr	0.025	0.050	0.074	0.099	0.149	0.198	0.248	
				Feed (mm/min)	180	180	180	180	180	180	180	
	≤ 425 Bhn or ≤ 45 HRc	17	RPM	5332	2666	1777	1333	889	666	533		
		(13-20)	Fz	0.015	0.030	0.044	0.059	0.089	0.119	0.148		
			Feed (mm/min)	79	79	79	79	79	79	79		
	<b>H</b>	<b>ALLOY STEELS</b> 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100	≤ 275 Bhn or ≤ 28 HRc	35	RPM	11148	5574	3716	2787	1858	1394	1115
				(28-42)	Fz	0.024	0.048	0.072	0.096	0.144	0.192	0.240
					Feed (mm/min)	268	268	268	268	268	268	268
≤ 375 Bhn or ≤ 40 HRc			21	RPM	6786	3393	2262	1696	1131	848	679	
			(17-26)	Fr	0.024	0.048	0.072	0.096	0.144	0.192	0.240	
				Feed (mm/min)	163	163	163	163	163	163	163	
≤ 450 Bhn or ≤ 48 HRc		14	RPM	4362	2181	1454	1091	727	545	436		
		(11-16)	Fr	0.015	0.030	0.045	0.060	0.089	0.119	0.149		
			Feed (mm/min)	65	65	65	65	65	65	65		
<b>K</b>		<b>TOOL STEELS</b> A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 250 Bhn or ≤ 24 HRc	12	RPM	3878	1939	1293	969	646	485	388
				(10-15)	Fr	0.015	0.031	0.046	0.062	0.093	0.124	0.155
					Feed (mm/min)	60	60	60	60	60	60	60
	≤ 375 Bhn or ≤ 40 HRc		8	RPM	2424	1212	808	606	404	303	242	
			(6-9)	Fr	0.010	0.020	0.030	0.040	0.059	0.079	0.099	
				Feed (mm/min)	24	24	24	24	24	24	24	
	≤ 475 Bhn or ≤ 50 HRc	6	RPM	1939	969	646	485	323	242	194		
		(5-7)	Fr	0.006	0.012	0.019	0.025	0.037	0.050	0.062		
			Feed (mm/min)	12	12	12	12	12	12	12		
	≤ 655 Bhn or ≤ 60 HRc	4	RPM	1272	636	424	318	212	159	127		
		(3-5)	Fr	0.006	0.013	0.019	0.025	0.038	0.050	0.063		
			Feed (mm/min)	8	8	8	8	8	8	8		
<b>CAST IRONS</b> Gray, Malleable, Ductile	≤ 220 Bhn or ≤ 19 HRc	(30-46)	38	RPM	12118	6059	4039	3029	2020	1515	1212	
			Fr	0.032	0.064	0.097	0.129	0.193	0.257	0.322		
			Feed (mm/min)	390	390	390	390	390	390	390		
	≤ 330 Bhn or ≤ 36 HRc	(23-35)	29	RPM	9209	4605	3070	2302	1535	1151	921	
			Fr	0.032	0.064	0.096	0.128	0.192	0.256	0.320		
			Feed (mm/min)	295	295	295	295	295	295	295		

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# Straight Flute Reamer

Series 201M Metric	Hardness	Vc (m/min)	Diameter (D <sub>1</sub> ) (mm)									
			1	2	3	4	6	8	10			
<b>M</b>	<b>STAINLESS STEELS (FREE MACHINING)</b> 304, 316, 420F, 430F 440F	≤ 250 Bhn or ≤ 24 HRc	23	RPM	7271	3635	2424	1818	1212	909	727	
			(18-27)	Fr	0.015	0.030	0.045	0.059	0.089	0.119	0.149	
				Feed (mm/min)	108	108	108	108	108	108	108	
		≤ 330 Bhn or ≤ 36 HRc	(13-20)	17	RPM	5332	2666	1777	1333	889	666	533
				Fr	0.012	0.024	0.036	0.048	0.072	0.096	0.120	
				Feed (mm/min)	64	64	64	64	64	64	64	
	<b>STAINLESS STEELS (DIFFICULT)</b> 304, 316, 321, 13-8 PH, 15-5PH, 17-4 PH, Custom 450	≤ 275 Bhn or ≤ 28 HRc	(9-13)	11	RPM	3393	1696	1131	848	565	424	339
				Fr	0.015	0.029	0.044	0.059	0.088	0.118	0.147	
				Feed (mm/min)	50	50	50	50	50	50	50	
		≤ 375 Bhn or ≤ 40 HRc	(6-9)	8	RPM	2424	1212	808	606	404	303	242
				Fr	0.010	0.020	0.030	0.040	0.059	0.079	0.099	
				Feed (mm/min)	24	24	24	24	24	24	24	
<b>S</b>	<b>SUPER ALLOYS (NICKEL, COBALT, IRON BASE)</b> Inconel 601, 617, 625, Incoloy 800, Monel 400, Rene, Waspaloy	≤ 220 Bhn or ≤ 19 HRc	(5-7)	6	RPM	1939	969	646	485	323	242	194
				Fr	0.012	0.024	0.036	0.047	0.071	0.095	0.119	
				Feed (mm/min)	23	23	23	23	23	23	23	
		≤ 320 Bhn or ≤ 34 HRc	(4-5)	5	RPM	1454	727	485	364	242	182	145
				Fr	0.010	0.021	0.031	0.041	0.062	0.083	0.103	
				Feed (mm/min)	15	15	15	15	15	15	15	
	≤ 425 Bhn or ≤ 45 HRc	(2-4)	3	RPM	969	485	323	242	162	121	97	
			Fr	0.006	0.012	0.019	0.025	0.037	0.050	0.062		
			Feed (mm/min)	6	6	6	6	6	6	6		
	<b>TITANIUM ALLOYS</b> Pure Titanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si, Ti-6Al4V	≤ 275 Bhn or ≤ 28 HRc	(11-16)	14	RPM	4362	2181	1454	1091	727	545	436
				Fr	0.024	0.048	0.072	0.096	0.144	0.193	0.241	
				Feed (mm/min)	105	105	105	105	105	105	105	
≤ 350 Bhn or ≤ 38 HRc		(9-13)	11	RPM	3393	1696	1131	848	565	424	339	
			Fr	0.015	0.029	0.044	0.059	0.088	0.118	0.147		
			Feed (mm/min)	50	50	50	50	50	50	50		
≤ 440 Bhn or ≤ 47 HRc	(6-9)	8	RPM	2424	1212	808	606	404	303	242		
		Fr	0.010	0.020	0.030	0.040	0.059	0.079	0.099			
		Feed (mm/min)	24	24	24	24	24	24	24			

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# Straight Flute Reamer

Series 201M Metric	Hardness	Vc (m/min)		Diameter (D <sub>1</sub> ) (mm)								
				1	2	3	4	6	8	10		
<b>N</b>	ALUMINUM ALLOYS 2017, 2024, 356, 6061, 7075	≤ 80 Bhn or ≤ 47 HRb (66-99)	82	RPM	26174	13087	8725	6544	4362	3272	2617	
				Fr	0.040	0.080	0.120	0.160	0.240	0.320	0.400	
				Feed (mm/min)	1047	1047	1047	1047	1047	1047	1047	1047
	ALUMINUM ALLOYS 2017, 2024, 356, 6061, 7075	≤ 150 Bhn or ≤ 7 HRc (56-84)	70		RPM	22297	11148	7432	5574	3716	2787	2230
					Fr	0.040	0.080	0.120	0.160	0.240	0.320	0.400
					Feed (mm/min)	892	892	892	892	892	892	892
	COPPER ALLOYS Alum Bronze, C110, Muntz Brass	≤ 140 Bhn or ≤ 3 HRc (28-42)	35		RPM	11148	5574	3716	2787	1858	1394	1115
					Fr	0.020	0.041	0.061	0.081	0.122	0.163	0.204
					Feed (mm/min)	227	227	227	227	227	227	227
COPPER ALLOYS Alum Bronze, C110, Muntz Brass		≤ 200 Bhn or ≤ 23 HRc (23-35)	29		RPM	9209	4605	3070	2302	1535	1151	921
					Fr	0.020	0.041	0.061	0.082	0.122	0.163	0.204
					Feed (mm/min)	188	188	188	188	188	188	188

Bhn (Brinell) HRc (Rockwell C) HRb (Rockwell B)  
 rpm = (Vc x 1000) / (D<sub>1</sub> x 3.14)  
 mm/min = Fr x rpm  
 increase speed and feed 30 percent when using coated reamers  
 reduce speed and feed for materials harder than listed  
 refer to the SGS Tool Wizard for complete technical information ([www.kyocera-sgstool.com](http://www.kyocera-sgstool.com))