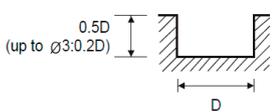
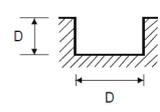


2 FLUTE SLOT DRILL

G9F41 & G9F81 Series

CUTTING DATA

Material	Carbon, Alloy & Tool Steel				Alloy & Pre-Hardened Steel				Stainless Steel				Cast Iron			
Hardness	~ HRC30				HRC30 - HRC50				-				-			
Strength	~ 1000N/mm2				1000 - 1500N/mm2				-				-			
Dia.	RPM	Feed	Vc	Fz	RPM	Feed	Vc	Fz	RPM	Feed	Vc	Fz	RPM	Feed	Vc	Fz
1.0	15450	115	49	0.004	9200	70	29	0.004	7700	55	24	0.004	20200	220	63	0.005
2.0	8500	170	53	0.010	5550	110	35	0.010	4650	85	29	0.009	10100	240	63	0.012
3.0	6600	190	62	0.014	4100	130	39	0.016	3400	110	32	0.016	6550	240	62	0.018
4.0	5550	275	70	0.025	3400	165	43	0.024	2850	140	36	0.025	4950	240	62	0.024
5.0	4650	290	73	0.031	2750	170	43	0.031	2300	145	36	0.032	3950	240	62	0.030
6.0	4100	325	77	0.040	2500	205	47	0.041	2100	165	40	0.039	3200	275	60	0.043
8.0	3100	350	78	0.056	1850	185	46	0.050	1550	165	39	0.053	2400	295	60	0.061
10.0	2350	300	74	0.064	1450	145	46	0.050	1250	145	39	0.058	2000	310	63	0.078
12.0	2000	260	75	0.065	1250	120	47	0.048	1050	120	40	0.057	1550	320	58	0.103
14.0	1850	230	81	0.062	1150	110	51	0.048	900	110	40	0.061	1400	335	62	0.120
16.0	1600	200	80	0.063	1000	100	50	0.050	750	100	38	0.067	1200	345	60	0.144
20.0	1250	155	79	0.062	750	75	47	0.050	600	75	38	0.063	950	365	60	0.192

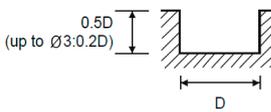
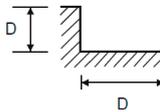



3 FLUTE SLOT DRILL

G9F43 & G9F86 Series

CUTTING DATA

Material	Carbon, Alloy & Tool Steel				Alloy & Pre-Hardened Steel				Stainless Steel				Cast Iron			
Hardness	~ HRC30				HRC30 - HRC50				-				-			
Strength	~ 1000N/mm2				1000 - 1500N/mm2				-				-			
Dia.	RPM	Feed	Vc	Fz	RPM	Feed	Vc	Fz	RPM	Feed	Vc	Fz	RPM	Feed	Vc	Fz
1.0	15450	175	49	0.004	9200	105	29	0.004	7700	85	24	0.004	20200	330	63	0.005
2.0	8500	255	53	0.010	5550	165	35	0.010	4650	130	29	0.009	10100	360	63	0.012
3.0	6600	285	62	0.014	4100	195	39	0.016	3400	165	32	0.016	6550	360	62	0.018
4.0	5550	415	70	0.025	3400	250	43	0.024	2850	210	36	0.025	4950	360	62	0.024
5.0	4650	435	73	0.031	2750	255	43	0.031	2300	220	36	0.032	3950	360	62	0.030
6.0	4100	490	77	0.040	2500	310	47	0.041	2100	220	40	0.039	3200	415	60	0.043
8.0	3100	525	78	0.056	1850	280	46	0.050	1550	220	39	0.053	2400	445	60	0.061
10.0	2350	450	74	0.064	1450	220	46	0.050	1250	220	39	0.058	2000	465	63	0.078
12.0	2000	390	75	0.065	1250	180	47	0.048	1050	180	40	0.057	1550	480	58	0.103
14.0	1850	345	81	0.062	1150	165	51	0.048	900	165	40	0.061	1400	505	62	0.120
16.0	1600	300	80	0.063	1000	150	50	0.050	750	150	38	0.067	1200	520	60	0.144
20.0	1250	235	79	0.062	750	115	47	0.050	600	115	38	0.063	950	550	60	0.192

1.0	15450	210	49	0.005	9200	125	29	0.005	7700	100	24	0.004	20200	365	63	0.006
2.0	8500	305	53	0.012	5550	200	35	0.012	4650	155	29	0.011	10100	395	63	0.013
3.0	6600	340	62	0.017	4100	235	39	0.019	3400	200	32	0.020	6550	395	62	0.020
4.0	5550	500	70	0.030	3400	300	43	0.029	2850	250	36	0.029	4950	395	62	0.027
5.0	4650	520	73	0.037	2750	305	43	0.037	2300	265	36	0.038	3950	395	62	0.033
6.0	4100	590	77	0.048	2500	370	47	0.049	2100	265	40	0.042	3200	455	60	0.047
8.0	3100	630	78	0.068	1850	335	46	0.060	1550	265	39	0.057	2400	490	60	0.068
10.0	2350	540	74	0.077	1450	265	46	0.061	1250	265	39	0.071	2000	510	63	0.085
12.0	2000	470	75	0.078	1250	215	47	0.057	1050	215	40	0.068	1550	530	58	0.114
14.0	1850	415	81	0.075	1150	200	51	0.058	900	200	40	0.074	1400	555	62	0.132
16.0	1600	360	80	0.075	1000	180	50	0.060	750	180	38	0.080	1200	570	60	0.158
20.0	1250	280	79	0.075	750	140	47	0.062	600	140	38	0.078	950	605	60	0.212

NOTE: For long & extra long types the feed should be reduced by around 50%.

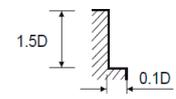
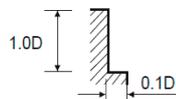
RPM: revolutions per minute Feed: mm per minute Vc: surface speed (metres per minute) Fz: feed per tooth

4 FLUTE END MILL

CUTTING DATA

G9F42, G9F82 & G9F84 Series

Material	Carbon, Alloy & Tool Steel				Alloy & Pre-Hardened Steel				Stainless Steel				Cast Iron			
Hardness	~ HRC30				HRC30 ~ HRC50				-				-			
Strength	~ 1000N/mm ²				1000 ~ 1500N/mm ²				-				-			
Dia.	RPM	Feed	Vc	Fz	RPM	Feed	Vc	Fz	RPM	Feed	Vc	Fz	RPM	Feed	Vc	Fz
1.0	19000	160	60	0.002	11050	90	35	0.002	9350	80	29	0.002	20200	670	63	0.008
2.0	10650	260	67	0.006	6950	155	44	0.006	5800	130	36	0.006	10100	690	63	0.017
3.0	8200	290	77	0.009	5150	185	49	0.009	4250	155	40	0.009	6550	690	62	0.026
4.0	6950	525	87	0.019	4250	325	53	0.019	3550	260	45	0.018	4950	690	62	0.035
5.0	5800	550	91	0.024	3450	330	54	0.024	2900	275	46	0.024	3950	690	62	0.044
6.0	5100	605	96	0.030	3100	380	58	0.031	2600	300	49	0.029	3200	830	60	0.065
8.0	3850	655	97	0.043	2300	350	58	0.038	1950	325	49	0.042	2400	880	60	0.092
10.0	2950	560	93	0.047	1850	275	58	0.037	1500	275	47	0.046	2000	930	63	0.116
12.0	2550	475	96	0.047	1550	230	58	0.037	1250	220	47	0.044	1550	970	58	0.156
14.0	2250	425	99	0.047	1400	210	62	0.038	1150	205	51	0.045	1400	1020	62	0.182
16.0	2000	380	101	0.048	1250	185	63	0.037	1050	185	53	0.044	1200	1050	60	0.219
20.0	1550	290	97	0.047	950	145	60	0.038	750	140	47	0.047	950	1120	60	0.295



NOTE: For long & extra long types the feed should be reduced by around 50%.

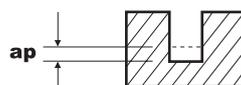
2 FLUTE, RIB PROCESSING

CUTTING DATA

G9F88 Series

Slotting

Material	Non-Alloyed Steel & Alloy Steel					Alloy Steel & Heat Resistant Steel				
Hardness	~ HRC 30					HRC 30 ~ HRC 45				
Strength	~ 1000N/mm ²					1000 ~ 1500N/mm ²				
Dia.	RPM	Feed	Vc	Fz	ap	RPM	Feed	Vc	Fz	ap
0.4	26500-34000	170-370	33-43	0.003-0.005	0.007-0.018	19000-24000	72-290	24-30	0.002-0.006	0.007-0.018
0.5	26500-34000	170-370	42-53	0.003-0.005	0.009-0.022	19000-24000	72-290	30-38	0.002-0.006	0.009-0.022
0.6	26500-34000	210-485	50-64	0.004-0.007	0.011-0.026	19000-24000	95-365	36-45	0.003-0.008	0.011-0.026
0.7	26500-34000	210-485	58-75	0.004-0.007	0.012-0.031	19000-24000	95-365	42-53	0.003-0.008	0.012-0.031
0.8	23000-30000	240-535	58-75	0.005-0.009	0.014-0.035	16500-21000	100-410	41-53	0.003-0.010	0.014-0.035
0.9	21500-27000	240-610	61-76	0.006-0.011	0.030-0.060	15000-19000	135-460	42-54	0.005-0.012	0.030-0.060
1	19000-24000	240-690	60-75	0.006-0.014	0.045-0.090	13500-17000	160-510	42-53	0.006-0.015	0.045-0.090
1.2	15500-19000	240-765	58-72	0.008-0.020	0.055-0.100	11000-14000	160-510	41-53	0.007-0.018	0.055-0.100
1.4	13600-17000	240-765	60-75	0.009-0.023	0.062-0.125	9800-12000	160-510	43-53	0.008-0.021	0.062-0.125
1.5	12500-15500	240-765	59-73	0.010-0.025	0.070-0.135	8950-11500	160-510	42-54	0.009-0.022	0.070-0.135
1.6	12000-15000	240-765	60-75	0.010-0.026	0.075-0.145	8700-10900	160-510	44-55	0.009-0.023	0.075-0.145
1.8	11000-14000	240-765	62-79	0.011-0.027	0.080-0.160	7800-9800	160-510	44-55	0.010-0.026	0.080-0.160
2	10000-12500	240-765	63-79	0.012-0.031	0.090-0.180	7000-8950	160-510	44-56	0.011-0.028	0.090-0.180
2.5	8000-10000	240-765	63-79	0.015-0.038	0.112-0.235	5700-7200	160-510	45-57	0.014-0.035	0.112-0.235
3	6800-8500	240-765	64-80	0.018-0.045	0.135-0.270	4700-6000	160-510	44-57	0.017-0.043	0.135-0.270
4	5100-6500	240-765	64-82	0.024-0.059	0.180-0.360	3500-4500	160-510	44-57	0.023-0.057	0.180-0.360



RPM: revolutions per minute Feed: mm per minute Vc: surface speed (metres per minute) Fz: feed per tooth

6 FLUTE 45° HELIX END MILL

G9F85

CUTTING DATA

Side Cutting

Material	Non-Alloyed Steel & Alloy Steel				Alloy Steel & Heat Resistant Steel				Hardened Steel				Cast Iron			
Hardness	~ HRC30				HRC30 - HRC50				HRC50 - HRC60				~ HRC30			
Strength	~ 1000N/mm ²				1000 ~ 1750N/mm ²				1750 ~ 2080N/mm ²				~ 1000N/mm ²			
Dia.	RPM	Feed	Vc	Fz	RPM	Feed	Vc	Fz	RPM	Feed	Vc	Fz	RPM	Feed	Vc	Fz
3	8650	825	82	0.024	5750	555	54	0.024	4750	344	45	0.018	8650	825	82	0.024
4	6600	858	83	0.033	4400	581	55	0.033	3600	357	45	0.025	6600	858	83	0.033
5	6250	990	98	0.026	4150	660	65	0.027	3200	383	50	0.02	6250	990	98	0.026
6	5175	924	98	0.03	3450	627	65	0.03	2650	369	50	0.023	5175	924	98	0.03
8	3900	891	98	0.038	2600	594	65	0.038	2000	344	50	0.029	3900	891	98	0.038
10	3075	831	97	0.045	2050	555	64	0.045	1600	317	50	0.033	3075	831	97	0.045
12	2625	831	99	0.053	1750	555	66	0.053	1825	317	69	0.029	2625	831	99	0.053
14	2230	770	98	0.058	1500	515	66	0.057	1130	280	50	0.041	2230	770	98	0.058
16	1950	726	98	0.062	1300	482	65	0.062	1000	278	50	0.046	1950	726	98	0.062
18	1720	670	97	0.065	1150	455	65	0.066	880	265	50	0.05	1720	670	97	0.065
20	1550	641	97	0.069	1025	429	64	0.07	800	251	50	0.052	1550	641	97	0.069

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3-4 FLUTE FINE PITCH RIPPER

G9F87 Series

CUTTING DATA

Side Cutting

Material	Non-Alloyed Steel Alloy Steel & Tool Steel				Alloy Steel & Heat Resistant Steel				Stainless Steel				HRSA's			
Hardness	~ HRC30				HRC30 - HRC38				HRC38 - HRC45				-			
Strength	~ 1000N/mm ²				1000 ~ 1200N/mm ²				1200 ~ 1400N/mm ²				-			
Dia.	RPM	Feed	Vc	Fz	RPM	Feed	Vc	Fz	RPM	Feed	Vc	Fz	RPM	Feed	Vc	Fz
6	13250	1970	250	0.050	10550	710	200	0.022	7150	480	135	0.022	2050	160	40	0.026
8	9850	1970	250	0.067	7800	710	195	0.023	5350	480	135	0.022	1550	150	40	0.024
10	7800	1970	245	0.063	6450	710	205	0.028	4350	480	135	0.028	1100	160	35	0.036
12	6800	2040	255	0.075	5100	680	190	0.033	3550	480	135	0.034	1000	160	40	0.040
14	5800	2040	255	0.088	4400	710	195	0.040	3050	480	135	0.039	750	110	35	0.037
16	5100	2040	255	0.100	4100	650	205	0.040	2800	430	140	0.038	700	90	35	0.032
18	4400	1970	250	0.112	3750	610	210	0.041	2300	360	130	0.039	600	90	35	0.038
20	4100	1840	260	0.112	3050	480	190	0.039	2050	310	130	0.038	550	90	35	0.041
25	3650	1830	285	0.100	2700	530	210	0.039	1850	350	145	0.038	500	90	40	0.060

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RPM: revolutions per minute Feed: mm per minute Vc: surface speed (metres per minute) Fz: feed per tooth

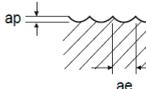
2 FLUTE BALL NOSE

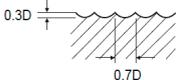
CUTTING DATA

G9F44 & G9F83 Series

Material	Carbon, Alloy & Tool Steel				Alloy & Pre-Hardened Steel				Stainless Steel				Cast Iron			
Hardness	~ HRC30				HRC30 - HRC50				-				-			
Strength	~ 1000N/mm ²				1000 - 1500N/mm ²				-				-			
Dia.	RPM	Feed	Vc	Fz	RPM	Feed	Vc	Fz	RPM	Feed	Vc	Fz	RPM	Feed	Vc	Fz
2.0	13350	690	84	0.026	9900	450	62	0.023	4300	135	27	0.016	11350	240	71	0.011
3.0	12300	620	116	0.025	9250	420	87	0.023	4100	135	39	0.016	7600	250	72	0.016
4.0	9650	680	121	0.035	7700	485	97	0.031	3900	160	49	0.021	5550	310	70	0.028
5.0	8400	755	132	0.045	6700	530	105	0.040	3350	160	53	0.024	4500	355	71	0.039
6.0	7850	940	148	0.060	6350	760	120	0.060	2900	170	55	0.029	3650	390	69	0.053
8.0	6600	1180	166	0.089	5300	850	133	0.080	2200	205	55	0.047	2700	495	68	0.092
10.0	5900	1435	185	0.122	4700	940	148	0.100	1900	205	60	0.054	2200	495	69	0.113
12.0	5400	1620	204	0.150	4250	1026	160	0.121	1600	225	60	0.070	1900	495	72	0.130
16.0	4400	1590	221	0.181	3450	975	173	0.141	1250	225	63	0.090	1400	495	70	0.177
20.0	3850	1540	242	0.200	3000	955	188	0.159	1050	225	66	0.107	1150	450	72	0.196

~ D6=0.2mm
~ D20=0.3mm
D





NOTE: For long & extra long types the feed should be reduced by around 50%.

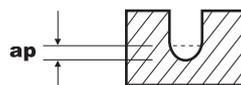
2 FLUTE BALL NOSE, RIB PROCESSING

CUTTING DATA

G9F89 Series

Slotting

Material	Non-Alloyed Steel & Alloy Steel					Alloy Steel & Heat Resistant Steel				
Hardness	~ HRC30					HRC30 - HRC45				
Strength	~ 1000N/mm ²					1000 - 1500N/mm ²				
Dia.	RPM	Feed	Vc	Fz	ap	RPM	Feed	Vc	Fz	ap
0.4	26350~34000	150~415	33~43	0.003~0.006	0.018~0.036	19100~24200	75~230	24~30	0.002~0.005	0.018~0.036
0.5	26350~34000	150~415	41~53	0.003~0.006	0.023~0.045	19100~24200	75~230	30~38	0.002~0.005	0.023~0.045
0.6	26350~34000	190~535	50~64	0.004~0.008	0.027~0.054	19100~24200	95~300	36~46	0.002~0.006	0.027~0.054
0.8	26350~34000	190~535	66~85	0.004~0.008	0.036~0.072	19100~24200	95~300	48~61	0.002~0.006	0.036~0.072
1	24650~31000	210~595	77~97	0.004~0.010	0.045~0.090	17400~22100	105~330	55~69	0.003~0.007	0.045~0.090
1.2	20500~26000	210~665	77~98	0.005~0.013	0.055~0.100	14500~18300	105~330	55~69	0.004~0.009	0.055~0.100
1.4	18000~22000	210~665	79~97	0.006~0.015	0.062~0.125	12800~15300	105~330	56~67	0.004~0.011	0.062~0.125
1.5	16000~20500	210~665	75~97	0.007~0.016	0.070~0.135	11500~14900	105~330	54~70	0.005~0.011	0.070~0.135
1.6	15500~20000	210~665	78~101	0.007~0.017	0.075~0.145	11200~14000	105~330	56~70	0.005~0.012	0.075~0.145
1.8	14500~18200	210~665	82~103	0.007~0.018	0.080~0.160	10200~12800	105~330	58~72	0.005~0.013	0.080~0.160
2	13000~16000	210~665	82~101	0.008~0.021	0.090~0.180	9400~11500	105~330	59~72	0.006~0.014	0.090~0.180
3	9000~11000	210~665	85~104	0.012~0.030	0.135~0.270	6000~11500	105~330	57~108	0.009~0.014	0.135~0.270
4	7200~9350	210~665	90~117	0.015~0.036	0.180~0.360	5000~6600	105~330	63~83	0.011~0.025	0.180~0.360



RPM: revolutions per minute Feed: mm per minute Vc: surface speed (metres per minute) Fz: feed per tooth