

GUHRING Navigator

data sheet 345



cutting rates

Main group	Subgroup	Hardness <=	Cutting speed V_c [m/min]	VRC
Steel materials	Common structural steels	500 N/mm ²	35	5
		1000 N/mm ²	30	5
	Free-cutting steels	850 N/mm ²	40	5
		1000 N/mm ²	40	5
	Unalloyed heat-treatable steels	700 N/mm ²	40	5
		850 N/mm ²	40	5
		1000 N/mm ²	35	4
	Alloyed heat-treatable steels	1000 N/mm ²	20	4
		1400 N/mm ²	16	3
	Unalloyed case hardened steels	850 N/mm ²	36	6
	Alloyed case hardened steels	1000 N/mm ²	20	4
		1400 N/mm ²	15	3
	Nitriding steels	1000	16	4

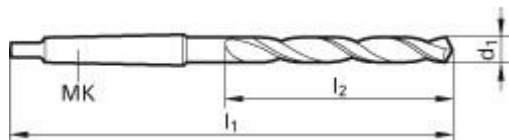
		N/mm ²		
		1400 N/mm ²	12	3
	Tool steels	850 N/mm ²	15	4
		1400 N/mm ²	12	3
	High speed steels	1400 N/mm ²	15	3
	Spring steels	350 HB	8	2
	Stainless steels, sulphured	900 N/mm ²	18	4
	Stainless steels,austenitic	1100 N/mm ²	14	3
	Stainless steels,martensitic	1200 N/mm ²	16	3
Cast materials	Cast iron	240 HB	35	6
		350 HB	30	6
	Spheroidal graphite iron and malleable cast iron	240 HB	30	6
		350 HB	28	6
Chilled cast iron	350 HB	10	3	
Copper, bronze, brass	Copper, low-alloyed	500 N/mm ²	40	5
	Brass, long-chipping	600 N/mm ²	40	5
	Bronze, short-chipping	600 N/mm ²	35	4
		850 N/mm ²	33	4
	Bronze, long-chipping	850 N/mm ²	20	4
		1000 N/mm ²	15	4
Plastics	Duroplastics	150 N/mm ²	20	4

Feed

f_u [mm]	VRC				
$d1$ [mm] <=	2	3	4	5	6
3.15	0.04	0.05	0.063	0.08	0.1
4	0.05	0.063	0.08	0.1	0.125
5	0.05	0.063	0.08	0.1	0.125
6.3	0.063	0.08	0.1	0.125	0.16
8	0.08	0.1	0.125	0.16	0.2
10	0.1	0.125	0.16	0.2	0.25
12.5	0.1	0.125	0.16	0.2	0.25
16	0.125	0.16	0.2	0.25	0.315
20	0.16	0.2	0.25	0.315	0.4
25	0.2	0.25	0.315	0.4	0.5
31.5	0.2	0.25	0.315	0.4	0.5
40	0.25	0.315	0.4	0.5	0.63
50	0.315	0.4	0.5	0.63	0.8
63	0.4	0.5	0.63	0.8	1
110	0.5	0.63	0.8	1	1.25

Master data

Description	Twist drills
Standard	DIN 345
Surface finish	steam tempered
Cutting direction	right hand
Tool material	HSCO
on shank	Morse taper
Coolant	none
Point angle	118°
Type	N
Tolerance zone	h8
Discount group	134



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Dimensions

$d1$ [mm]	$l1$ [mm]	Flute length [mm]	No. of slots	Protruding length [mm]	MT - Morse taper	$d1$ [inch]	Cutting edge length $l4$ [mm]
3.000	114	33	2	52	1		
3.500	120	39	2	58	1		
3.570	120	39	2	58	1	9/64	

d1 [mm]	l1 [mm]	Flute length [mm]	No. of slots	Protruding length [mm]	MT - Morse taper	d1 [inch]	Cutting edge length l4 [mm]
4.000	124	43	2	62	1		
4.200	124	43	2	62	1		
4.370	128	47	2	66	1	11/64	
4.500	128	47	2	66	1		
4.800	133	52	2	71	1		
5.000	133	52	2	71	1		
5.100	133	52	2	71	1		
5.200	133	52	2	71	1		
5.500	138	57	2	76	1		
5.700	138	57	2	76	1		
6.000	138	57	2	76	1		
6.100	144	63	2	82	1		
6.200	144	63	2	82	1		
6.350	144	63	2	82	1	1/4	
6.400	144	63	2	82	1		
6.500	144	63	2	82	1		
6.700	144	63	2	82	1		
6.750	150	69	2	88	1	17/64	
6.800	150	69	2	88	1		
7.000	150	69	2	88	1		
7.100	150	69	2	88	1		
7.250	150	69	2	88	1		
7.500	150	69	2	88	1		
7.600	156	75	2	94	1		
7.700	156	75	2	94	1		
7.750	156	75	2	94	1		
7.800	156	75	2	94	1		
7.900	156	75	2	94	1		
7.940	156	75	2	94	1	5/16	
8.000	156	75	2	94	1		
8.100	156	75	2	94	1		
8.200	156	75	2	94	1		

d1 [mm]	l1 [mm]	Flute length [mm]	No. of slots	Protruding length [mm]	MT - Morse taper	d1 [inch]	Cutting edge length l4 [mm]
8.250	156	75	2	94	1		
8.300	156	75	2	94	1		
8.400	156	75	2	94	1		
8.500	156	75	2	94	1		
8.600	162	81	2	100	1		
8.700	162	81	2	100	1		
8.750	162	81	2		1		
8.800	162	81	2	100	1		
9.000	162	81	2	100	1		
9.130	162	81	2	100	1	23/64	
9.200	162	81	2	100	1		
9.400	162	81	2		1		
9.500	162	81	2	100	1		
9.520	168	87	2	106	1	3/8	
9.600	168	87	2	106	1		
9.650	168	87	2	106	1		
9.750	168	87	2	106	1		
9.920	168	87	2	106	1	25/64	
9.950	168	87	2	106	1		
10.000	168	87	2	106	1		
10.010	168	87	2	106	1		
10.100	168	87	2	106	1		
10.150	168	87	2	106	1		
10.200	168	87	2	106	1		
10.250	168	87	2	106	1		
10.300	168	87	2	106	1		
10.320	168	87	2	106	1	13/32	
10.400	168	87	2	106	1		
10.500	168	87	2	106	1		
10.600	168	87	2	106	1		
10.650	175	94	2	113	1		
10.700	175	94	2	113	1		

d1 [mm]	l1 [mm]	Flute length [mm]	No. of slots	Protruding length [mm]	MT - Morse taper	d1 [inch]	Cutting edge length l4 [mm]
10.720	175	94	2	113	1	27/64	
10.750	175	94	2	113	1		
10.800	175	94	2	113	1		
10.900	175	94	2	113	1		
11.000	175	94	2	113	1		
11.100	175	94	2	113	1		
11.110	175	94	2	113	1	7/16	
11.200	175	94	2	113	1		
11.250	175	94	2	113	1		
11.500	175	94	2	113	1		
11.510	175	94	2	113	1	29/64	
11.600	175	94	2	113	1		
11.700	175	94	2	113	1		
11.750	175	94	2	113	1		
11.800	175	94	2	113	1		
11.900	182	101	2	120	1		
11.910	182	101	2	120	1	15/32	
12.000	182	101	2	120	1		
12.100	182	101	2	120	1		
12.150	182	101	2	120	1		
12.200	182	101	2	120	1		
12.250	182	101	2	120	1		
12.300	182	101	2	120	1	31/64	
12.400	182	101	2	120	1		
12.500	182	101	2	120	1		
12.600	182	101	2		1		
12.700	182	101	2	120	1	1/2	
12.750	182	101	2	120	1		
12.800	182	101	2	120	1		
13.000	182	101	2	120	1		
13.100	182	101	2	120	1	33/64	
13.200	182	101	2	120	1		

d1 [mm]	l1 [mm]	Flute length [mm]	No. of slots	Protruding length [mm]	MT - Morse taper	d1 [inch]	Cutting edge length l4 [mm]
13.250	189	108	2	127	1		
13.300	189	108	2	127	1		
13.400	189	108	2	127	1		
13.490	189	108	2	127	1	17/32	
13.500	189	108	2	127	1		
13.600	189	108	2	127	1		
13.700	189	108	2	127	1		
13.750	189	108	2	127	1		
13.800	189	108	2	127	1		
13.890	189	108	2	127	1	35/64	
13.900	189	108	2	127	1		
14.000	189	108	2	127	1		
14.100	212	114	2	137	2		
14.200	212	114	2	137	2		
14.250	212	114	2	137	2		
14.290	212	114	2	137	2	9/16	
14.300	212	114	2	137	2		
14.400	212	114	2	137	2		
14.450	212	114	2	137	2		
14.500	212	114	2	137	2		
14.680	212	114	2	137	2	37/64	
14.700	212	114	2	137	2		
14.750	212	114	2	137	2		212
14.800	212	114	2	137	2		
14.900	212	114	2	137	2		
15.000	212	114	2	137	2		
15.080	218	120	2	143	2	19/32	
15.100	218	120	2	143	2		
15.200	218	120	2	143	2		
15.250	218	120	2	143	2		
15.480	218	120	2	143	2	39/64	
15.500	218	120	2	143	2		

d1 [mm]	l1 [mm]	Flute length [mm]	No. of slots	Protruding length [mm]	MT - Morse taper	d1 [inch]	Cutting edge length l4 [mm]
15.600	218	120	2	143	2		
15.700	218	120	2	143	2		
15.750	218	120	2	143	2		
15.800	218	120	2	143	2		
15.870	218	120	2	143	2	5/8	
15.900	218	120	2		2		
16.000	218	120	2	143	2		
16.100	223	125	2	148	2		
16.250	223	125	2	148	2		
16.270	223	125	2	148	2	41/64	
16.300	223	125	2	148	2		
16.400	223	125	2	148	2		
16.500	223	125	2	148	2		
16.600	223	125	2	148	2		
16.670	223	125	2	148	2	21/32	
16.750	223	125	2	148	2		
16.800	223	125	2		2		
17.000	223	125	2	148	2		
17.070	228	130	2	153	2	43/64	
17.200	228	130	2	153	2		
17.250	228	130	2	153	2		
17.400	228	130	2	153	2		
17.460	228	130	2	153	2	11/16	
17.500	228	130	2	153	2		
17.600	228	130	2	153	2		
17.750	228	130	2	153	2		
17.860	228	130	2	153	2	45/64	
18.000	228	130	2	153	2		
18.100	233	135	2	158	2		
18.200	233	135	2	158	2		
18.250	233	135	2	158	2		
18.260	233	135	2	158	2	23/32	233

d1 [mm]	l1 [mm]	Flute length [mm]	No. of slots	Protruding length [mm]	MT - Morse taper	d1 [inch]	Cutting edge length l4 [mm]
18.300	233	135	2	158	2		
18.400	233	135	2	158	2		
18.500	233	135	2	158	2		
18.600	233	135	2	158	2		
18.650	233	135	2	158	2	47/64	
18.750	233	135	2	158	2		
18.800	233	135	2	158	2		
19.000	233	135	2	158	2		
19.050	238	140	2	163	2	3/4	
19.100	238	140	2	163	2		
19.250	238	140	2	163	2		
19.300	238	140	2	163	2		
19.450	238	140	2	163	2	49/64	
19.500	238	140	2	163	2		
19.600	238	140	2	163	2		
19.650	238	140	2	163	2		
19.750	238	140	2	163	2		
19.840	238	140	2	163	2	25/32	
20.000	238	140	2	163	2		
20.200	243	145	2	168	2		
20.250	243	145	2	168	2		
20.500	243	145	2	168	2		
20.640	243	145	2	168	2	13/16	
20.750	243	145	2	168	2		
21.000	243	145	2	168	2		
21.250	248	150	2	173	2		248
21.500	248	150	2	173	2		
21.750	248	150	2	173	2		248
21.830	248	150	2	173	2	55/64	
22.000	248	150	2	173	2		
22.150	248	150	2	173	2		
22.200	248	150	2	173	2		

d1 [mm]	l1 [mm]	Flute length [mm]	No. of slots	Protruding length [mm]	MT - Morse taper	d1 [inch]	Cutting edge length l4 [mm]
22.220	248	150	2	173	2	7/8	
22.250	248	150	2	173	2		
22.300	248	150	2	173	2		
22.500	253	155	2	178	2		
22.620	253	155	2	178	2	57/64	
22.750	253	155	2	178	2		
23.000	253	155	2	178	2		
23.020	253	155	2	178	2	29/32	
23.100	276	155	2	182	3		
23.200	276	155	2	182	3		
23.250	276	155	2	182	3		
23.420	276	155	2		3	59/64	
23.500	276	155	2	182	3		
23.800	281	160	2		3		
23.810	281	160	2	187	3	15/16	
24.000	281	160	2	187	3		
24.210	281	160	2	187	3	61/64	
24.250	281	160	2	187	3		
24.500	281	160	2	187	3		
24.610	281	160	2	187	3	31/32	
24.750	281	160	2	187	3		
25.000	281	160	2	187	3	63/64	
25.200	286	165	2	192	3		
25.250	286	165	2	192	3		
25.280	286	165	2	192	3		
25.400	286	165	2	192	3	1	
25.500	286	165	2	192	3		
25.600	286	165	2	192	3		
25.750	286	165	2	192	3		
25.800	286	165	2	192	3	1 1/64	
26.000	286	165	2	192	3		
26.100	286	165	2	192	3		

d1 [mm]	l1 [mm]	Flute length [mm]	No. of slots	Protruding length [mm]	MT - Morse taper	d1 [inch]	Cutting edge length l4 [mm]
26.250	286	165	2	192	3		
26.300	286	165	2	192	3		
26.500	286	165	2	192	3		
26.750	291	170	2	197	3		
26.990	291	170	2	197	3	1 1/16	
27.000	291	170	2	197	3		
27.250	291	170	2	197	3		
27.500	291	170	2	197	3		
27.600	291	170	2	197	3		
27.700	291	170	2		3		
27.750	291	170	2	197	3		
27.800	291	170	2	197	3		
28.000	291	170	2	197	3		
28.250	296	175	2	202	3		
28.500	296	175	2	202	3		
28.570	296	175	2	202	3	1 1/8	
28.750	296	175	2		3		
29.000	296	175	2	202	3		
29.370	296	175	2	202	3	1 5/32	
29.500	296	175	2	202	3		
29.750	296	175	2		3		
30.000	296	175	2	202	3		
30.500	301	180	2	207	3		
30.750	301	180	2		3		
30.960	301	180	2		3	1 7/32	
31.000	301	180	2	207	3		
31.500	301	180	2	207	3		
31.600	306	185	2	212	3		
31.750	306	185	2	212	3	1 1/4	
32.000	334	185	2	216.5	4		
32.250	334	185	2	216.5	4		
32.500	334	185	2	216.5	4		

d1 [mm]	l1 [mm]	Flute length [mm]	No. of slots	Protruding length [mm]	MT - Morse taper	d1 [inch]	Cutting edge length l4 [mm]
32.540	334	185	2	216.5	4	1 9/32	
33.000	334	185	2	216.5	4		
33.340	334	185	2	216.5	4	1 5/16	
33.500	334	185	2	216.5	4		
34.000	339	190	2	221.5	4		
34.130	339	190	2		4	1 11/32	
34.500	339	190	2	221.5	4		
34.920	339	190	2	221.5	4	1 3/8	
35.000	339	190	2	221.5	4		
35.250	339	190	2	221.5	4		
35.500	339	190	2	221.5	4		
36.000	344	195	2	226.5	4		
36.500	344	195	2	226.5	4		
36.510	344	195	2	226.5	4	1 7/16	
37.000	344	195	2	226.5	4		
37.500	344	195	2	226.5	4		
38.000	349	200	2	231.5	4		
38.890	349	200	2	231.5	4	1 17/32	
39.000	349	200	2	231.5	4		
39.500	349	200	2	231.5	4		
40.000	349	200	2	231.5	4		
40.480	354	205	2	236.5	4	1 19/32	
40.500	354	205	2	236.5	4		
41.000	354	205	2	236.5	4		
41.270	354	205	2	236.5	4	1 5/8	
41.500	354	205	2	236.5	4		
42.000	354	205	2	236.5	4		
42.070	354	205	2	236.5	4	1 21/32	
42.800	359	210	2	241.5	4		

d1 [mm]	l1 [mm]	Flute length [mm]	No. of slots	Protruding length [mm]	MT - Morse taper	d1 [inch]	Cutting edge length l4 [mm]
42.860	359	210	2	241.5	4	1 11/16	
43.000	359	210	2	241.5	4		
43.600	359	210	2		4		
44.000	359	210	2	241.5	4		
44.450	359	210	2	241.5	4	1 3/4	
44.500	359	210	2	241.5	4		
45.000	359	210	2	241.5	4		
45.200	364	215	2	246.5	4		
45.500	364	215	2	246.5	4		
46.000	364	215	2	246.5	4		
46.040	364	215	2	246.5	4	1 13/16	
46.830	364	215	2	246.5	4	1 27/32	
47.000	364	215	2	246.5	4		
47.620	369	220	2	251.5	4	1 7/8	
48.000	369	220	2	251.5	4		
48.420	369	220	2	251.5	4	1 29/32	
49.000	369	220	2	251.5	4		
49.210	369	220	2	251.5	4	1 15/16	
49.500	369	220	2	251.5	4		
50.000	369	220	2	251.5	4		
50.010	374	225	2	256.5	4	1 31/32	
50.800	374	225	2	256.5	4	2	
51.000	412	225	2	262.5	5		
52.000	412	225	2	262.5	5		
54.000	417	230	2	267.5	5		
54.500	417	230	2	267.5	5		
55.000	417	230	2	267.5	5		
57.000	422	235	2	272.5	5		

d1 [mm]	l1 [mm]	Flute length [mm]	No. of slots	Protruding length [mm]	MT - Morse taper	d1 [inch]	Cutting edge length l4 [mm]
58.000	422	235	2	272.5	5		
59.000	422	235	2	272.5	5		
60.000	422	235	2	272.5	5		
62.000	427	240	2	277.5	5		
64.000	432	245	2	282.5	5		
67.000	432	245	2		5		

Smarty compiler active

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