

GUHRING



ExclusiveLine Micro-precision drills VA

GUHRING – YOUR WORLDWIDE PARTNER

EXCLUSIVE[®]LINE

by **GUHRING**



NEW carbide grade developed specifically for micro drills

- *Reduced grain size increases hardness while higher cobalt content improves toughness*

Specialized geometry for long-chipping and tough materials such as stainless and Ti/Ni alloys

- *Concave, radiused cutting edge resulting in a stable drilling process with low cutting forces*
- *Improved flute profile and point geometry to produce shorter chips*
- *Optimized surface finish for less friction and superior chip removal*

NEW Perrox coating, using HiPIMS coating technology

- *Tougher, harder and smoother coating than traditional PVD*
- *Maximum wear resistance against abrasive alloys*
- *Ultra smooth coating surface optimizes chip removal and resists built-up edges*

Significantly higher tool life across a wide range of operating parameters
Reduced cycle times due to the increased speeds & feeds

ExclusiveLine micro-precision drills for stainless

NEW

Series

6487
3xD

Cutting depth

**RT 100
VA**

Type

140°

Point angle

m7

Tolerance on Ø



Without
Internal coolant



Cutting direction

Tool material

Carbide

Coating

Perrox

Shank form

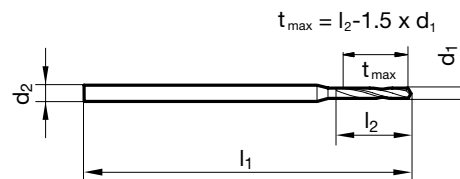
HA

Material		Suitability
P	Steel	○
M	Stainless steel	●
K	Cast iron	
N	Aluminum	○
S	Ni / Ti alloys	●
H	Hardened steel	
●=Optimal ○=Secondary		

- web thinning $\geq \varnothing 0.500$
- facet point grind
- main cutting edge is slightly concave
- optimized cutting geometry

- stainless/acid-/heat-resistant steels
- titanium and titanium alloys
- Inconel, Hastelloy, Monel
- copper, brass and bronze alloys

Operating parameters pg. 13



Diameter (d1)				d2 h6	l1	t _{max}	l2	Code no.	EDP Number
dec. inch	fract. in.	wire/ltr	mm	mm	mm	mm	mm		
0.0197			0.50	3.00	38.00	2.05	2.80	0.500	9064870005000
0.0217			0.55	3.00	38.00	2.28	3.10	0.550	9064870005500
0.0236			0.60	3.00	38.00	2.40	3.30	0.600	9064870006000
0.0256			0.65	3.00	38.00	2.63	3.60	0.650	9064870006500
0.0260			0.66	3.00	38.00	2.71	3.70	0.660	9064870006600
0.0276			0.70	3.00	38.00	2.85	3.90	0.700	9064870007000
0.0291			0.74	3.00	38.00	2.99	4.10	0.740	9064870007400
0.0295			0.75	3.00	38.00	3.08	4.20	0.750	9064870007500
0.0311			0.79	3.00	38.00	3.22	4.40	0.790	9064870007900
0.0315			0.80	3.00	38.00	3.20	4.40	0.800	9064870008000
0.0323			0.82	3.00	38.00	3.37	4.60	0.820	9064870008200
0.0335			0.85	3.00	38.00	3.43	4.70	0.850	9064870008500
0.0354			0.90	3.00	38.00	3.65	5.00	0.900	9064870009000
0.0374			0.95	3.00	38.00	3.88	5.30	0.950	9064870009500
0.0394			1.00	3.00	38.00	4.00	5.50	1.000	9064870010000
0.0402			1.02	3.00	38.00	4.17	5.70	1.020	9064870010200
0.0413			1.05	3.00	38.00	4.23	5.80	1.050	9064870010500
0.0433			1.10	3.00	38.00	4.45	6.10	1.100	9064870011000
0.0453			1.15	3.00	38.00	4.68	6.40	1.150	9064870011500
0.0465			1.18	3.00	38.00	4.73	6.50	1.180	9064870011800
0.0469			1.19	3.00	38.00	4.82	6.60	1.190	9064870011900
0.0472			1.20	3.00	38.00	4.80	6.60	1.200	9064870012000
0.0492			1.25	3.00	38.00	5.03	6.90	1.250	9064870012500
0.0504			1.28	3.00	38.00	5.18	7.10	1.280	9064870012800
0.0512			1.30	3.00	38.00	5.25	7.20	1.300	9064870013000
0.0531			1.35	3.00	38.00	5.48	7.50	1.350	9064870013500
0.0551		#54	1.40	4.00	46.00	5.60	7.70	1.400	9064870014000
0.0571			1.45	4.00	46.00	5.83	8.00	1.450	9064870014500
0.0575			1.46	4.00	46.00	5.91	8.10	1.460	9064870014600
0.0591			1.50	4.00	46.00	6.05	8.30	1.500	9064870015000
0.0610			1.55	4.00	46.00	6.28	8.60	1.550	9064870015500
0.0614			1.56	4.00	46.00	6.26	8.60	1.560	9064870015600
0.0626	1/16		1.59	4.00	46.00	6.42	8.80	1.590	9064870015900



Diameter (d1)				d2 h6	l1	t _{max}	l2	Code no.	EDP Number
dec. inch	fract. in.	wire/ltr	mm	mm	mm	mm	mm		
0.0630			1.60	4.00	46.00	6.40	8.80	1.600	9064870016000
0.0650			1.65	4.00	46.00	6.63	9.10	1.650	9064870016500
0.0654			1.66	4.00	46.00	6.71	9.20	1.660	9064870016600
0.0669		#51	1.70	4.00	46.00	6.85	9.40	1.700	9064870017000
0.0689			1.75	4.00	46.00	7.08	9.70	1.750	9064870017500
0.0709			1.80	4.00	46.00	7.20	9.90	1.800	9064870018000
0.0728		#49	1.85	4.00	46.00	7.43	10.20	1.850	9064870018500
0.0748			1.90	4.00	46.00	7.65	10.50	1.900	9064870019000
0.0768			1.95	4.00	46.00	7.88	10.80	1.950	9064870019500
0.0780	5/64		1.98	4.00	46.00	7.93	10.90	1.980	9064870019800
0.0787			2.00	4.00	46.00	8.00	11.00	2.000	9064870020000
0.0807			2.05	4.00	46.00	8.23	11.30	2.050	9064870020500
0.0827			2.10	4.00	50.00	8.45	11.60	2.100	9064870021000
0.0846			2.15	4.00	50.00	8.68	11.90	2.150	9064870021500
0.0866			2.20	4.00	50.00	8.80	12.10	2.200	9064870022000
0.0886			2.25	4.00	50.00	9.03	12.40	2.250	9064870022500
0.0906			2.30	4.00	50.00	9.25	12.70	2.300	9064870023000
0.0925			2.35	4.00	50.00	9.48	13.00	2.350	9064870023500
0.0937	3/32		2.38	4.00	50.00	9.53	13.10	2.380	9064870023800
0.0945			2.40	4.00	50.00	9.60	13.20	2.400	9064870024000
0.0965			2.45	4.00	50.00	9.83	13.50	2.450	9064870024500
0.0984			2.50	4.00	50.00	10.05	13.80	2.500	9064870025000
0.1004			2.55	4.00	50.00	10.28	14.10	2.550	9064870025500
0.1024			2.60	4.00	50.00	10.40	14.30	2.600	9064870026000
0.1043			2.65	4.00	50.00	10.63	14.60	2.650	9064870026500
0.1063			2.70	4.00	50.00	10.85	14.90	2.700	9064870027000
0.1083			2.75	4.00	50.00	11.08	15.20	2.750	9064870027500
0.1094	7/64		2.78	4.00	50.00	11.13	15.30	2.780	9064870027800
0.1102			2.80	4.00	50.00	11.20	15.40	2.800	9064870028000
0.1122			2.85	4.00	50.00	11.43	15.70	2.850	9064870028500
0.1142			2.90	4.00	50.00	11.65	16.00	2.900	9064870029000
0.1161		#32	2.95	4.00	50.00	11.88	16.30	2.950	9064870029500
0.1181			3.00	4.00	50.00	12.00	16.50	3.000	9064870030000

ExclusiveLine micro-precision drills for stainless

NEW

Series

6488


Tool material

Carbide

Coating

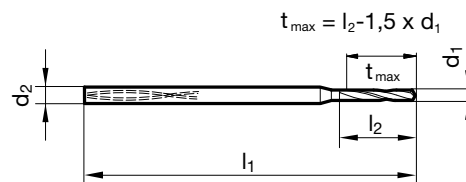
Perrox

Shank form

HA

Material		Suitability
P	Steel	○
M	Stainless steel	●
K	Cast iron	
N	Aluminum	○
S	Ni / Ti alloys	●
H	Hardened steel	
●=Optimal ○=Secondary		

Operating parameters pg. 13



Diameter (d1)				d2 h6	l1	t _{max}	l2	Code no.	EDP Number
dec. inch	fract. in.	wire/ltr	mm	mm	mm	mm	mm		
0.0394			1.00	3.00	38.00	4.00	5.50	1.000	9064880010000
0.0402			1.02	3.00	38.00	4.17	5.70	1.020	9064880010200
0.0413			1.05	3.00	38.00	4.23	5.80	1.050	9064880010500
0.0433			1.10	3.00	38.00	4.45	6.10	1.100	9064880011000
0.0453			1.15	3.00	38.00	4.68	6.40	1.150	9064880011500
0.0465			1.18	3.00	38.00	4.73	6.50	1.180	9064880011800
0.0469			1.19	3.00	38.00	4.82	6.60	1.190	9064880011900
0.0472			1.20	3.00	38.00	4.80	6.60	1.200	9064880012000
0.0492			1.25	3.00	38.00	5.03	6.90	1.250	9064880012500
0.0504			1.28	3.00	38.00	5.18	7.10	1.280	9064880012800
0.0512			1.30	3.00	38.00	5.25	7.20	1.300	9064880013000
0.0531			1.35	3.00	38.00	5.48	7.50	1.350	9064880013500
0.0551		#54	1.40	4.00	46.00	5.60	7.70	1.400	9064880014000
0.0571			1.45	4.00	46.00	5.83	8.00	1.450	9064880014500
0.0575			1.46	4.00	46.00	5.91	8.10	1.460	9064880014600
0.0591			1.50	4.00	46.00	6.05	8.30	1.500	9064880015000
0.0610			1.55	4.00	46.00	6.28	8.60	1.550	9064880015500
0.0614			1.56	4.00	46.00	6.26	8.60	1.560	9064880015600
0.0626	1/16		1.59	4.00	46.00	6.42	8.80	1.590	9064880015900
0.0630			1.60	4.00	46.00	6.40	8.80	1.600	9064880016000
0.0650			1.65	4.00	46.00	6.63	9.10	1.650	9064880016500
0.0654			1.66	4.00	46.00	6.71	9.20	1.660	9064880016600
0.0669		#51	1.70	4.00	46.00	6.85	9.40	1.700	9064880017000
0.0689			1.75	4.00	46.00	7.08	9.70	1.750	9064880017500
0.0709			1.80	4.00	46.00	7.20	9.90	1.800	9064880018000
0.0728		#49	1.85	4.00	46.00	7.43	10.20	1.850	9064880018500
0.0748			1.90	4.00	46.00	7.65	10.50	1.900	9064880019000
0.0768			1.95	4.00	46.00	7.88	10.80	1.950	9064880019500
0.0780	5/64		1.98	4.00	46.00	7.93	10.90	1.980	9064880019800
0.0787			2.00	4.00	46.00	8.00	11.00	2.000	9064880020000
0.0807			2.05	4.00	46.00	8.23	11.30	2.050	9064880020500
0.0827			2.10	4.00	50.00	8.45	11.60	2.100	9064880021000
0.0846			2.15	4.00	50.00	8.68	11.90	2.150	9064880021500



Continued, Series

6488

Diameter (d1)				d2 h6	l1	t _{max}	l2	Code no.	EDP Number
dec. inch	fract. in.	wire/ltr	mm	mm	mm	mm	mm		
0.0866			2.20	4.00	50.00	8.80	12.10	2.200	9064880022000
0.0886			2.25	4.00	50.00	9.03	12.40	2.250	9064880022500
0.0906			2.30	4.00	50.00	9.25	12.70	2.300	9064880023000
0.0925	3/32		2.35	4.00	50.00	9.48	13.00	2.350	9064880023500
0.0937			2.38	4.00	50.00	9.53	13.10	2.380	9064880023800
0.0945			2.40	4.00	50.00	9.60	13.20	2.400	9064880024000
0.0965			2.45	4.00	50.00	9.83	13.50	2.450	9064880024500
0.0984			2.50	4.00	50.00	10.05	13.80	2.500	9064880025000
0.1004			2.55	4.00	50.00	10.28	14.10	2.550	9064880025500
0.1024			2.60	4.00	50.00	10.40	14.30	2.600	9064880026000
0.1043			2.65	4.00	50.00	10.63	14.60	2.650	9064880026500
0.1063			2.70	4.00	50.00	10.85	14.90	2.700	9064880027000
0.1083	7/64		2.75	4.00	50.00	11.08	15.20	2.750	9064880027500
0.1094			2.78	4.00	50.00	11.13	15.30	2.780	9064880027800
0.1102			2.80	4.00	50.00	11.20	15.40	2.800	9064880028000
0.1122			2.85	4.00	50.00	11.43	15.70	2.850	9064880028500
0.1142			2.90	4.00	50.00	11.65	16.00	2.900	9064880029000
0.1161		#32	2.95	4.00	50.00	11.88	16.30	2.950	9064880029500
0.1181			3.00	4.00	50.00	12.00	16.50	3.000	9064880030000

ExclusiveLine micro-precision drills for stainless

NEW

Series

6489
6xD
Cutting depth

**RT 100
VA**
Type

140°
Point angle

m7
Tolerance on Ø


Internal coolant


Cutting direction

Tool material

Carbide

Coating

Perrox

Shank form

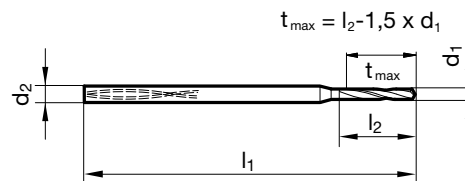
HA

Material	Suitability	
P	Steel	○
M	Stainless steel	●
K	Cast iron	
N	Aluminum	○
S	Ni / Ti alloys	●
H	Hardened steel	
●=Optimal ○=Secondary		

- web thinning $\geq \varnothing 1.000$
- facet point grind
- main cutting edge is slightly concave
- optimized cutting geometry

- stainless/acid-/heat-resistant steels
- titanium and titanium alloys
- Inconel, Hastelloy, Monel
- copper, brass and bronze alloys

Operating parameters pg. 14



Diameter (d1)				d2 h6	l1	t _{max}	l2	Code no.	EDP Number
dec. inch	fract. in.	wire/ltr	mm	mm	mm	mm	mm		
0.0394			1.00	3.00	48.00	7.50	9.00	1.000	9064890010000
0.0413			1.05	3.00	48.00	7.93	9.50	1.050	9064890010500
0.0433			1.10	3.00	48.00	8.25	9.90	1.100	9064890011000
0.0453			1.15	3.00	48.00	8.68	10.40	1.150	9064890011500
0.0469			1.19	3.00	48.00	9.02	10.80	1.190	9064890011900
0.0472			1.20	3.00	51.00	9.00	10.80	1.200	9064890012000
0.0492			1.25	3.00	51.00	9.43	11.30	1.250	9064890012500
0.0512			1.30	3.00	51.00	9.75	11.70	1.300	9064890013000
0.0531			1.35	3.00	51.00	10.18	12.20	1.350	9064890013500
0.0551		#54	1.40	4.00	56.00	10.50	12.60	1.400	9064890014000
0.0571			1.45	4.00	56.00	10.93	13.10	1.450	9064890014500
0.0591			1.50	4.00	56.00	11.25	13.50	1.500	9064890015000
0.0610			1.55	4.00	56.00	11.68	14.00	1.550	9064890015500
0.0626	1/16		1.59	4.00	56.00	12.02	14.40	1.590	9064890015900
0.0630			1.60	4.00	56.00	12.00	14.40	1.600	9064890016000
0.0650			1.65	4.00	56.00	12.43	14.90	1.650	9064890016500
0.0669		#51	1.70	4.00	61.00	12.75	15.30	1.700	9064890017000
0.0689			1.75	4.00	61.00	13.18	15.80	1.750	9064890017500
0.0709			1.80	4.00	61.00	13.50	16.20	1.800	9064890018000
0.0728		#49	1.85	4.00	61.00	13.93	16.70	1.850	9064890018500
0.0748			1.90	4.00	61.00	14.25	17.10	1.900	9064890019000
0.0768			1.95	4.00	61.00	14.68	17.60	1.950	9064890019500
0.0780	5/64		1.98	4.00	61.00	14.93	17.90	1.980	9064890019800
0.0787			2.00	4.00	61.00	15.00	18.00	2.000	9064890020000
0.0807			2.05	4.00	61.00	15.43	18.50	2.050	9064890020500
0.0827			2.10	4.00	66.00	15.75	18.90	2.100	9064890021000
0.0846			2.15	4.00	66.00	16.18	19.40	2.150	9064890021500
0.0866			2.20	4.00	66.00	16.50	19.80	2.200	9064890022000
0.0886			2.25	4.00	66.00	16.93	20.30	2.250	9064890022500
0.0906			2.30	4.00	66.00	17.25	20.70	2.300	9064890023000
0.0925			2.35	4.00	66.00	17.68	21.20	2.350	9064890023500
0.0937	3/32		2.38	4.00	66.00	17.93	21.50	2.380	9064890023800
0.0945			2.40	4.00	66.00	18.00	21.60	2.400	9064890024000



Diameter (d1)				d2 h6	l1	t _{max}	l2	Code no.	EDP Number
dec. inch	fract. in.	wire/ltr	mm	mm	mm	mm	mm		
0.0965			2.45	4.00	66.00	18.43	22.10	2.450	9064890024500
0.0984			2.50	4.00	66.00	18.75	22.50	2.500	9064890025000
0.1004			2.55	4.00	66.00	19.18	23.00	2.550	9064890025500
0.1024			2.60	4.00	71.00	19.50	23.40	2.600	9064890026000
0.1043			2.65	4.00	71.00	19.93	23.90	2.650	9064890026500
0.1063			2.70	4.00	71.00	20.25	24.30	2.700	9064890027000
0.1083			2.75	4.00	71.00	20.68	24.80	2.750	9064890027500
0.1094	7/64		2.78	4.00	71.00	20.93	25.10	2.780	9064890027800
0.1102			2.80	4.00	71.00	21.00	25.20	2.800	9064890028000
0.1122			2.85	4.00	71.00	21.43	25.70	2.850	9064890028500
0.1142			2.90	4.00	71.00	21.75	26.10	2.900	9064890029000
0.1161		#32	2.95	4.00	71.00	22.18	26.60	2.950	9064890029500
0.1181			3.00	4.00	71.00	22.50	27.00	3.000	9064890030000

ExclusiveLine micro-precision drills for stainless

NEW

Series

6490

Cutting depth


Type


Point angle


Tolerance on Ø


Internal coolant


Cutting direction

Tool material

Carbide

Coating

Perrox

Shank form

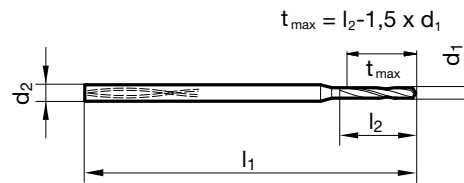
HA

Material		Suitability
P	Steel	○
M	Stainless steel	●
K	Cast iron	
N	Aluminum	○
S	Ni / Ti alloys	●
H	Hardened steel	
●=Optimal ○=Secondary		

- web thinning $\geq \varnothing 1.000$
- facet point grind
- main cutting edge is slightly concave
- optimized cutting geometry

- stainless/acid-/heat-resistant steels
- titanium and titanium alloys
- Inconel, Hastelloy, Monel
- copper, brass and bronze alloys

Operating parameters pg. 14



Diameter (d1)				d2 h6	l1	t _{max}	l2	Code no.	EDP Number
dec. inch	fract. in.	wire/ltr	mm	mm	mm	mm	mm		
0.0394			1.00	3.00	48.00	11.50	13.00	1.000	9064900010000
0.0413			1.05	3.00	48.00	12.13	13.70	1.050	9064900010500
0.0433			1.10	3.00	48.00	12.65	14.30	1.100	9064900011000
0.0453			1.15	3.00	48.00	13.28	15.00	1.150	9064900011500
0.0469			1.19	3.00	48.00	13.72	15.50	1.190	9064900011900
0.0472			1.20	3.00	51.00	13.80	15.60	1.200	9064900012000
0.0492			1.25	3.00	51.00	14.43	16.30	1.250	9064900012500
0.0512			1.30	3.00	51.00	14.95	16.90	1.300	9064900013000
0.0531			1.35	3.00	51.00	15.58	17.60	1.350	9064900013500
0.0551		#54	1.40	4.00	56.00	16.10	18.20	1.400	9064900014000
0.0571			1.45	4.00	56.00	16.73	18.90	1.450	9064900014500
0.0591			1.50	4.00	56.00	17.25	19.50	1.500	9064900015000
0.0610			1.55	4.00	56.00	17.88	20.20	1.550	9064900015500
0.0626	1/16		1.59	4.00	56.00	18.32	20.70	1.590	9064900015900
0.0630			1.60	4.00	56.00	18.40	20.80	1.600	9064900016000
0.0650			1.65	4.00	56.00	19.03	21.50	1.650	9064900016500
0.0669		#51	1.70	4.00	61.00	19.55	22.10	1.700	9064900017000
0.0689			1.75	4.00	61.00	20.18	22.80	1.750	9064900017500
0.0709			1.80	4.00	61.00	20.70	23.40	1.800	9064900018000
0.0728		#49	1.85	4.00	61.00	21.33	24.10	1.850	9064900018500
0.0748			1.90	4.00	61.00	21.85	24.70	1.900	9064900019000
0.0768			1.95	4.00	61.00	22.48	25.40	1.950	9064900019500
0.0780	5/64		1.98	4.00	61.00	22.83	25.80	1.980	9064900019800
0.0787			2.00	4.00	61.00	23.00	26.00	2.000	9064900020000
0.0807			2.05	4.00	61.00	23.63	26.70	2.050	9064900020500
0.0827			2.10	4.00	66.00	24.15	27.30	2.100	9064900021000
0.0846			2.15	4.00	66.00	24.78	28.00	2.150	9064900021500
0.0866			2.20	4.00	66.00	25.30	28.60	2.200	9064900022000
0.0886			2.25	4.00	66.00	25.93	29.30	2.250	9064900022500
0.0906			2.30	4.00	66.00	26.45	29.90	2.300	9064900023000
0.0925			2.35	4.00	66.00	27.08	30.60	2.350	9064900023500
0.0937	3/32		2.38	4.00	66.00	27.43	31.00	2.380	9064900023800
0.0945			2.40	4.00	66.00	27.60	31.20	2.400	9064900024000
0.0965			2.45	4.00	66.00	28.23	31.90	2.450	9064900024500



Diameter (d1)				d2 h6	l1	t _{max}	l2	Code no.	EDP Number
dec. inch	fract. in.	wire/ltr	mm	mm	mm	mm	mm		
0.0984			2.50	4.00	66.00	28.75	32.50	2.500	9064900025000
0.1004			2.55	4.00	66.00	29.38	33.20	2.550	9064900025500
0.1024			2.60	4.00	71.00	29.90	33.80	2.600	9064900026000
0.1043			2.65	4.00	71.00	30.53	34.50	2.650	9064900026500
0.1063			2.70	4.00	71.00	31.05	35.10	2.700	9064900027000
0.1083			2.75	4.00	71.00	31.68	35.80	2.750	9064900027500
0.1094	7/64		2.78	4.00	71.00	32.03	36.20	2.780	9064900027800
0.1102			2.80	4.00	71.00	32.20	36.40	2.800	9064900028000
0.1122			2.85	4.00	71.00	32.83	37.10	2.850	9064900028500
0.1142			2.90	4.00	71.00	33.35	37.70	2.900	9064900029000
0.1161		#32	2.95	4.00	71.00	33.98	38.40	2.950	9064900029500
0.1181			3.00	4.00	71.00	34.50	39.00	3.000	9064900030000

ExclusiveLine micro-precision drills for stainless

NEW

Series

6491


Tool material

Carbide

Coating

Perrox

Shank form

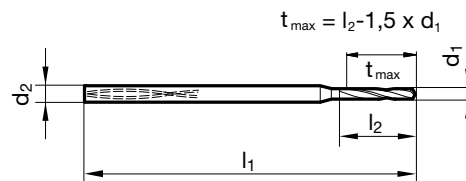
HA

Material		Suitability
P	Steel	○
M	Stainless steel	●
K	Cast iron	
N	Aluminum	○
S	Ni / Ti alloys	●
H	Hardened steel	
●=Optimal ○=Secondary		

- web thinning $\geq \varnothing 1.000$
- facet point grind
- main cutting edge is slightly concave
- optimized cutting geometry

- stainless/acid-/heat-resistant steels
- titanium and titanium alloys
- Inconel, Hastelloy, Monel
- copper, brass and bronze alloys

Operating parameters pg. 15



Diameter (d1)				d2 h6	l1	t _{max}	l2	Code no.	EDP Number
dec. inch	fract. in.	wire/ltr	mm	mm	mm	mm	mm		
0.0394			1.00	3.00	54.00	16.50	18.00	1.000	9064910010000
0.0413			1.05	3.00	54.00	17.33	18.90	1.050	9064910010500
0.0433			1.10	3.00	54.00	18.15	19.80	1.100	9064910011000
0.0453			1.15	3.00	54.00	18.98	20.70	1.150	9064910011500
0.0469			1.19	3.00	54.00	19.72	21.50	1.190	9064910011900
0.0472			1.20	3.00	58.00	19.80	21.60	1.200	9064910012000
0.0492			1.25	3.00	58.00	20.63	22.50	1.250	9064910012500
0.0512			1.30	3.00	58.00	21.45	23.40	1.300	9064910013000
0.0531			1.35	3.00	58.00	22.28	24.30	1.350	9064910013500
0.0551		#54	1.40	4.00	64.00	23.10	25.20	1.400	9064910014000
0.0571			1.45	4.00	64.00	23.93	26.10	1.450	9064910014500
0.0591			1.50	4.00	64.00	24.75	27.00	1.500	9064910015000
0.0610			1.55	4.00	64.00	25.58	27.90	1.550	9064910015500
0.0626	1/16		1.59	4.00	64.00	26.32	28.70	1.590	9064910015900
0.0630			1.60	4.00	64.00	26.40	28.80	1.600	9064910016000
0.0650			1.65	4.00	64.00	27.23	29.70	1.650	9064910016500
0.0669		#51	1.70	4.00	71.00	28.05	30.60	1.700	9064910017000
0.0689			1.75	4.00	71.00	28.88	31.50	1.750	9064910017500
0.0709			1.80	4.00	71.00	29.70	32.40	1.800	9064910018000
0.0728		#49	1.85	4.00	71.00	30.53	33.30	1.850	9064910018500
0.0748			1.90	4.00	71.00	31.35	34.20	1.900	9064910019000
0.0768			1.95	4.00	71.00	32.18	35.10	1.950	9064910019500
0.0780	5/64		1.98	4.00	71.00	32.73	35.70	1.980	9064910019800
0.0787			2.00	4.00	71.00	33.00	36.00	2.000	9064910020000
0.0807			2.05	4.00	71.00	33.83	36.90	2.050	9064910020500
0.0827			2.10	4.00	79.00	34.65	37.80	2.100	9064910021000
0.0846			2.15	4.00	79.00	35.48	38.70	2.150	9064910021500
0.0866			2.20	4.00	79.00	36.30	39.60	2.200	9064910022000
0.0886			2.25	4.00	79.00	37.13	40.50	2.250	9064910022500
0.0906			2.30	4.00	79.00	37.95	41.40	2.300	9064910023000
0.0925			2.35	4.00	79.00	38.78	42.30	2.350	9064910023500
0.0937	3/32		2.38	4.00	79.00	39.33	42.90	2.380	9064910023800
0.0945			2.40	4.00	79.00	39.60	43.20	2.400	9064910024000



Diameter (d1)				d2 h6	l1	t _{max}	l2	Code no.	EDP Number
dec. inch	fract. in.	wire/ltr	mm	mm	mm	mm	mm		
0.0965			2.45	4.00	79.00	40.43	44.10	2.450	9064910024500
0.0984			2.50	4.00	79.00	41.25	45.00	2.500	9064910025000
0.1004			2.55	4.00	79.00	42.08	45.90	2.550	9064910025500
0.1024			2.60	4.00	87.00	42.90	46.80	2.600	9064910026000
0.1043			2.65	4.00	87.00	43.73	47.70	2.650	9064910026500
0.1063			2.70	4.00	87.00	44.55	48.60	2.700	9064910027000
0.1083			2.75	4.00	87.00	45.38	49.50	2.750	9064910027500
0.1094	7/64		2.78	4.00	87.00	45.93	50.10	2.780	9064910027800
0.1102			2.80	4.00	87.00	46.20	50.40	2.800	9064910028000
0.1122			2.85	4.00	87.00	47.03	51.30	2.850	9064910028500
0.1142			2.90	4.00	87.00	47.85	52.20	2.900	9064910029000
0.1161		#32	2.95	4.00	87.00	48.68	53.10	2.950	9064910029500
0.1181			3.00	4.00	87.00	49.50	54.00	3.000	9064910030000

142° NC spot drills - perfect for 140° VA micro-drills**NEW**

Series

6029



Tool material

Carbide

Coating

FIREX

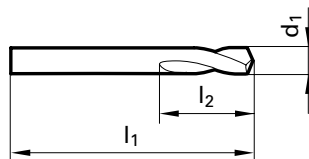
Shank form

w/flat

facet point grinding
only suitable for spotting

Shank diameter = cut diameter

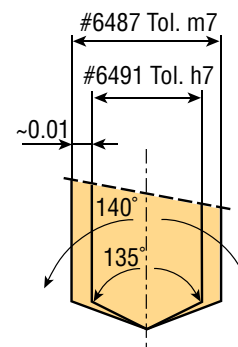
* Weldon flat on drills ≥ 6mm diameter



Diameter (d1)				l1	l2	Code no.	EDP Number
inch	wire	ltr	mm	mm	mm		
0.0364			1.00	50.00	3.00	1.000	9060290010000
0.0787			2.00	50.00	6.00	2.000	9060290020000
0.1181			3.00	50.00	9.00	3.000	9060290030000
0.1575			4.00	55.00	12.00	4.000	9060290040000
0.1969			5.00	62.00	14.00	5.000	9060290050000
0.2362			6.00	66.00	16.00	6.000	9060290060000
0.3150			8.00	79.00	21.00	8.000	9060290080000
0.3937			10.00	89.00	25.00	10.000	9060290100000
0.4724			12.00	102.00	30.00	12.000	9060290120000
0.6299			16.00	115.00	37.50	16.000	9060290160000
0.7874			20.00	131.00	45.00	20.000	9060290200000

To ensure a stable drilling process and achieve the most accurate hole conditions it is recommended to utilize a spot drill or pilot drill for the series 6491 deep hole micro drill.
For spotting use the series 6029 spot drill with 142° point (shown above).

For pilot drilling use series 6487 or 6488 drills with m7 diameter tolerance and 140° point to drill a minimum of 1xD deep. Start high-pressure coolant, then enter the pilot hole with the deep hole drill at max. 500 - 1000PM and 20 - 40IPM stopping shy of the bottom of the pilot hole. Start high pressure coolant and increase RPM to recommended operating speed. Drill at recommended feed rate to hole depth without pecking. Slow to max. 500 - 1000RPM before retracting.



Series # 6487

Material group	Hardness		SFM	Feed Rate - IPR						
	HRC	BHN		0.0197 in. 0.5 mm	0.0315 in. 0.8 mm	0.0394 in. 1.0 mm	0.0591 in. 1.5 mm	0.0787 in. 2.0 mm	0.0984 in. 2.5 mm	0.1181 in. 3.0 mm
Common structural steels	-	≤ 150	295	0.0016	0.0025	0.0031	0.0047	0.0063	0.0079	0.0094
	≤ 32	≤ 301	295	0.0016	0.0025	0.0031	0.0047	0.0063	0.0079	0.0094
Free-cutting steels	≤ 25	≤ 255	295	0.0016	0.0025	0.0031	0.0047	0.0063	0.0079	0.0094
	≤ 32	≤ 301	295	0.0016	0.0025	0.0031	0.0047	0.0063	0.0079	0.0094
Unalloyed heat-treatable steels	≤ 20	≤ 220	295	0.0016	0.0025	0.0031	0.0047	0.0063	0.0079	0.0094
	≤ 25	≤ 255	295	0.0016	0.0025	0.0031	0.0047	0.0063	0.0079	0.0094
	≤ 32	≤ 301	295	0.0016	0.0025	0.0031	0.0047	0.0063	0.0079	0.0094
Alloyed heat-treatable steels	≤ 32	≤ 301	215	0.0014	0.0022	0.0028	0.0041	0.0055	0.0069	0.0083
	≤ 43	≤ 402	190	0.0014	0.0022	0.0028	0.0041	0.0055	0.0069	0.0083
Unalloyed case hardened steels	≤ 25	≤ 255	295	0.0016	0.0025	0.0031	0.0047	0.0063	0.0079	0.0094
Alloyed case hardened steels	≤ 32	≤ 301	215	0.0014	0.0022	0.0028	0.0041	0.0055	0.0069	0.0083
	≤ 43	≤ 402	190	0.0014	0.0022	0.0028	0.0041	0.0055	0.0069	0.0083
Nitriding steels	≤ 32	≤ 301	215	0.0014	0.0022	0.0028	0.0041	0.0055	0.0069	0.0083
	≤ 43	≤ 402	190	0.0014	0.0022	0.0028	0.0041	0.0055	0.0069	0.0083
Tool steels	≤ 25	≤ 255	195	0.0014	0.0022	0.0028	0.0041	0.0055	0.0069	0.0083
	≤ 43	≤ 402	140	0.0012	0.0020	0.0025	0.0037	0.0050	0.0062	0.0074
High speed steels	≤ 43	≤ 402	195	0.0014	0.0022	0.0028	0.0041	0.0055	0.0069	0.0083
Spring steels	≤ 38	≤ 354	195	0.0014	0.0022	0.0028	0.0041	0.0055	0.0069	0.0083
Hardened steels	≤ 48	≤ 460								
	≤ 66	-								
Stainless steels, sulphured austenitic	≤ 28	≤ 273	60	0.0002	0.0003	0.0004	0.0006	0.0009	0.0011	0.0013
	≤ 36	≤ 337	80	0.0003	0.0005	0.0006	0.0009	0.0012	0.0015	0.0018
	≤ 46	≤ 435	105	0.0004	0.0006	0.0008	0.0012	0.0016	0.0020	0.0024
Cast iron	≤ 23	≤ 242								
	≤ 38	≤ 354								
Spheroidal graphite iron and malleable cast iron	≤ 23	≤ 242								
	≤ 38	≤ 354								
Chilled cast iron	≤ 38	≤ 354								
New cast materials GGV	≤ 20	≤ 220								
	≤ 32	≤ 301								
New cast materials ADI	≤ 32	≤ 301								
	≤ 43	≤ 402								
Special alloys	≤ 54	≤ 549	50	0.0002	0.0003	0.0004	0.0006	0.0008	0.0010	0.0012
Ti and Ti-alloys	≤ 25	≤ 255	80	0.0003	0.0005	0.0006	0.0009	0.0012	0.0015	0.0018
	≤ 43	≤ 402	60	0.0002	0.0003	0.0004	0.0006	0.0009	0.0011	0.0013
Aluminium and Al-alloys	-	≤ 120	885	0.0012	0.0019	0.0024	0.0035	0.0047	0.0059	0.0071
Al wrought alloys	-	≤ 200	885	0.0012	0.0019	0.0024	0.0035	0.0047	0.0059	0.0071
Al cast alloys ≤ 10 % Si	-	≤ 180	590	0.0016	0.0025	0.0031	0.0047	0.0063	0.0079	0.0094
≤ 24 % Si	-	≤ 180	470	0.0016	0.0025	0.0031	0.0047	0.0063	0.0079	0.0094
Magnesium alloys	-	≤ 120								
Copper, low-alloyed	-	≤ 150	410	0.0012	0.0019	0.0024	0.0035	0.0047	0.0059	0.0071
Brass, short-chipping	-	≤ 180								
long-chipping	-	≤ 180								
Bronze, short-chipping	-	≤ 180								
	≤ 25	≤ 255								
Bronze, long-chipping	≤ 25	≤ 255								
	≤ 32	≤ 301								
Duroplastics, Thermoplastics										
Reinforced plastics										

Series # 6488

Material group	Hardness		SFM	Feed Rate - IPR						
	HRC	BHN		0.0197 in. 0.5 mm	0.0315 in. 0.8 mm	0.0394 in. 1.0 mm	0.0591 in. 1.5 mm	0.0787 in. 2.0 mm	0.0984 in. 2.5 mm	0.1181 in. 3.0 mm
Common structural steels	-	≤ 150	330	0.0012	0.0019	0.0024	0.0035	0.0047	0.0059	0.0071
	≤ 32	≤ 301	330	0.0012	0.0019	0.0024	0.0035	0.0047	0.0059	0.0071
Free-cutting steels	≤ 25	≤ 255	330	0.0012	0.0019	0.0024	0.0035	0.0047	0.0059	0.0071
	≤ 32	≤ 301	330	0.0012	0.0019	0.0024	0.0035	0.0047	0.0059	0.0071
Unalloyed heat-treatable steels	≤ 20	≤ 220	330	0.0012	0.0019	0.0024	0.0035	0.0047	0.0059	0.0071
	≤ 25	≤ 255	330	0.0012	0.0019	0.0024	0.0035	0.0047	0.0059	0.0071
	≤ 32	≤ 301	330	0.0012	0.0019	0.0024	0.0035	0.0047	0.0059	0.0071
Alloyed heat-treatable steels	≤ 32	≤ 301	240	0.0012	0.0019	0.0024	0.0035	0.0047	0.0059	0.0071
	≤ 43	≤ 402	215	0.0012	0.0019	0.0024	0.0035	0.0047	0.0059	0.0071
Unalloyed case hardened steels	≤ 25	≤ 255	330	0.0012	0.0019	0.0024	0.0035	0.0047	0.0059	0.0071
Alloyed case hardened steels	≤ 32	≤ 301	240	0.0012	0.0019	0.0024	0.0035	0.0047	0.0059	0.0071
	≤ 43	≤ 402	215	0.0012	0.0019	0.0024	0.0035	0.0047	0.0059	0.0071
Nitriding steels	≤ 32	≤ 301	240	0.0012	0.0019	0.0024	0.0035	0.0047	0.0059	0.0071
	≤ 43	≤ 402	215	0.0012	0.0019	0.0024	0.0035	0.0047	0.0059	0.0071
Tool steels	≤ 25	≤ 255	230	0.0012	0.0019	0.0024	0.0035	0.0047	0.0059	0.0071
	≤ 43	≤ 402	160	0.0011	0.0017	0.0021	0.0032	0.0043	0.0053	0.0064
High speed steels	≤ 43	≤ 402	230	0.0012	0.0019	0.0024	0.0035	0.0047	0.0059	0.0071
Spring steels	≤ 38	≤ 354	230	0.0012	0.0019	0.0024	0.0035	0.0047	0.0059	0.0071
Hardened steels	≤ 48	≤ 460								
	≤ 66	-								
Stainless steels, sulphured austenitic	≤ 28	≤ 273	185	0.0005	0.0008	0.0010	0.0015	0.0020	0.0025	0.0030
	≤ 36	≤ 337	260	0.0007	0.0011	0.0014	0.0021	0.0028	0.0034	0.0041
	≤ 46	≤ 435	265	0.0006	0.0010	0.0013	0.0019	0.0025	0.0031	0.0038
Cast iron	≤ 23	≤ 242								
	≤ 38	≤ 354								
Spheroidal graphite iron and malleable cast iron	≤ 23	≤ 242								
	≤ 38	≤ 354								
Chilled cast iron	≤ 38	≤ 354								
New cast materials GGV	≤ 20	≤ 220								
	≤ 32	≤ 301								
New cast materials ADI	≤ 32	≤ 301								
	≤ 43	≤ 402								
Special alloys	≤ 54	≤ 549	85	0.0002	0.0003	0.0004	0.0006	0.0008	0.0010	0.0012
Ti and Ti-alloys	≤ 25	≤ 255	150	0.0003	0.0005	0.0006	0.0009	0.0012	0.0015	0.0018
	≤ 43	≤ 402	105	0.0002	0.0003	0.0004	0.0006	0.0009	0.0011	0.0013
Aluminium and Al-alloys	-	≤ 120	985	0.0012	0.0019	0.0024	0.0035	0.0047	0.0059	0.0071
Al wrought alloys	-	≤ 200	985	0.0012	0.0019	0.0024	0.0035	0.0047	0.0059	0.0071
Al cast alloys ≤ 10 % Si	-	≤ 180	655	0.0016	0.0025	0.0031	0.0047	0.0063	0.0079	0.0094
≤ 24 % Si	-	≤ 180	525	0.0016	0.0025	0.0031	0.0047	0.0063	0.0079	0.0094
Magnesium alloys	-	≤ 120								
Copper, low-alloyed	-	≤ 150	490	0.0012	0.0019	0.0024	0.0035	0.0047	0.0059	0.0071
Brass, short-chipping	-	≤ 180								
long-chipping	-	≤ 180								
Bronze, short-chipping	-	≤ 180								
	≤ 25	≤ 255								
Bronze, long-chipping	≤ 25	≤ 255								
	≤ 32	≤ 301								
Duroplastics, Thermoplastics										
Reinforced plastics										

Series # 6489

Material group	Hardness		SFM	Feed Rate - IPR						
	HRC	BHN		0.0197 in. 0.5 mm	0.0315 in. 0.8 mm	0.0394 in. 1.0 mm	0.0591 in. 1.5 mm	0.0787 in. 2.0 mm	0.0984 in. 2.5 mm	0.1181 in. 3.0 mm
Common structural steels	-	≤ 150	330	0.0010	0.0016	0.0020	0.0030	0.0039	0.0049	0.0059
	≤ 32	≤ 301	330	0.0010	0.0016	0.0020	0.0030	0.0039	0.0049	0.0059
Free-cutting steels	≤ 25	≤ 255	330	0.0010	0.0016	0.0020	0.0030	0.0039	0.0049	0.0059
	≤ 32	≤ 301	330	0.0010	0.0016	0.0020	0.0030	0.0039	0.0049	0.0059
Unalloyed heat-treatable steels	≤ 20	≤ 220	330	0.0010	0.0016	0.0020	0.0030	0.0039	0.0049	0.0059
	≤ 25	≤ 255	330	0.0010	0.0016	0.0020	0.0030	0.0039	0.0049	0.0059
	≤ 32	≤ 301	330	0.0010	0.0016	0.0020	0.0030	0.0039	0.0049	0.0059
Alloyed heat-treatable steels	≤ 32	≤ 301	240	0.0010	0.0016	0.0020	0.0030	0.0039	0.0049	0.0059
	≤ 43	≤ 402	215	0.0010	0.0016	0.0020	0.0030	0.0039	0.0049	0.0059
Unalloyed case hardened steels	≤ 25	≤ 255	330	0.0010	0.0016	0.0020	0.0030	0.0039	0.0049	0.0059
Alloyed case hardened steels	≤ 32	≤ 301	240	0.0010	0.0016	0.0020	0.0030	0.0039	0.0049	0.0059
	≤ 43	≤ 402	215	0.0010	0.0016	0.0020	0.0030	0.0039	0.0049	0.0059
Nitriding steels	≤ 32	≤ 301	240	0.0010	0.0016	0.0020	0.0030	0.0039	0.0049	0.0059
	≤ 43	≤ 402	215	0.0010	0.0016	0.0020	0.0030	0.0039	0.0049	0.0059
Tool steels	≤ 25	≤ 255	230	0.0010	0.0016	0.0020	0.0030	0.0039	0.0049	0.0059
	≤ 43	≤ 402	160	0.0009	0.0014	0.0018	0.0027	0.0035	0.0044	0.0053
High speed steels	≤ 43	≤ 402	230	0.0010	0.0016	0.0020	0.0030	0.0039	0.0049	0.0059
Spring steels	≤ 38	≤ 354	230	0.0010	0.0016	0.0020	0.0030	0.0039	0.0049	0.0059
Hardened steels	≤ 48	≤ 460								
	≤ 66	-								
Stainless steels, sulphured	≤ 28	≤ 273	185	0.0004	0.0007	0.0008	0.0012	0.0017	0.0021	0.0025
austenitic	≤ 36	≤ 337	260	0.0006	0.0009	0.0012	0.0018	0.0024	0.0030	0.0035
martensitic	≤ 46	≤ 435	265	0.0006	0.0009	0.0012	0.0018	0.0024	0.0030	0.0035
Cast iron	≤ 23	≤ 242								
	≤ 38	≤ 354								
Spheroidal graphite iron and malleable cast iron	≤ 23	≤ 242								
	≤ 38	≤ 354								
Chilled cast iron	≤ 38	≤ 354								
New cast materials GGV	≤ 20	≤ 220								
	≤ 32	≤ 301								
New cast materials ADI	≤ 32	≤ 301								
	≤ 43	≤ 402								
Special alloys	≤ 54	≤ 549	85	0.0002	0.0003	0.0004	0.0006	0.0008	0.0010	0.0012
Ti and Ti-alloys	≤ 25	≤ 255	150	0.0003	0.0005	0.0006	0.0009	0.0012	0.0015	0.0018
	≤ 43	≤ 402	105	0.0002	0.0003	0.0004	0.0006	0.0009	0.0011	0.0013
Aluminium and Al-alloys	-	≤ 120	985	0.0012	0.0019	0.0024	0.0035	0.0047	0.0059	0.0071
Al wrought alloys	-	≤ 200	985	0.0012	0.0019	0.0024	0.0035	0.0047	0.0059	0.0071
Al cast alloys ≤ 10 % Si	-	≤ 180	655	0.0016	0.0025	0.0031	0.0047	0.0063	0.0079	0.0094
≤ 24 % Si	-	≤ 180	525	0.0016	0.0025	0.0031	0.0047	0.0063	0.0079	0.0094
Magnesium alloys	-	≤ 120								
Copper, low-alloyed	-	≤ 150	490	0.0010	0.0016	0.0020	0.0030	0.0039	0.0049	0.0059
Brass, short-chipping	-	≤ 180								
long-chipping	-	≤ 180								
Bronze, short-chipping	-	≤ 180								
	≤ 25	≤ 255								
Bronze, long-chipping	≤ 25	≤ 255								
	≤ 32	≤ 301								
Duroplastics, Thermoplastics										
Reinforced plastics										

Series # 6490

Material group	Hardness		SFM	Feed Rate - IPR						
	HRC	BHN		0.0197 in. 0.5 mm	0.0315 in. 0.8 mm	0.0394 in. 1.0 mm	0.0591 in. 1.5 mm	0.0787 in. 2.0 mm	0.0984 in. 2.5 mm	0.1181 in. 3.0 mm
Common structural steels	-	≤ 150	330	0.0010	0.0016	0.0020	0.0030	0.0039	0.0049	0.0059
	≤ 32	≤ 301	330	0.0010	0.0016	0.0020	0.0030	0.0039	0.0049	0.0059
Free-cutting steels	≤ 25	≤ 255	330	0.0010	0.0016	0.0020	0.0030	0.0039	0.0049	0.0059
	≤ 32	≤ 301	330	0.0010	0.0016	0.0020	0.0030	0.0039	0.0049	0.0059
Unalloyed heat-treatable steels	≤ 20	≤ 220	330	0.0010	0.0016	0.0020	0.0030	0.0039	0.0049	0.0059
	≤ 25	≤ 255	330	0.0010	0.0016	0.0020	0.0030	0.0039	0.0049	0.0059
	≤ 32	≤ 301	330	0.0010	0.0016	0.0020	0.0030	0.0039	0.0049	0.0059
Alloyed heat-treatable steels	≤ 32	≤ 301	240	0.0010	0.0016	0.0020	0.0030	0.0039	0.0049	0.0059
	≤ 43	≤ 402	215	0.0010	0.0016	0.0020	0.0030	0.0039	0.0049	0.0059
Unalloyed case hardened steels	≤ 25	≤ 255	330	0.0010	0.0016	0.0020	0.0030	0.0039	0.0049	0.0059
Alloyed case hardened steels	≤ 32	≤ 301	240	0.0010	0.0016	0.0020	0.0030	0.0039	0.0049	0.0059
	≤ 43	≤ 402	215	0.0010	0.0016	0.0020	0.0030	0.0039	0.0049	0.0059
Nitriding steels	≤ 32	≤ 301	240	0.0010	0.0016	0.0020	0.0030	0.0039	0.0049	0.0059
	≤ 43	≤ 402	215	0.0010	0.0016	0.0020	0.0030	0.0039	0.0049	0.0059
Tool steels	≤ 25	≤ 255	230	0.0010	0.0016	0.0020	0.0030	0.0039	0.0049	0.0059
	≤ 43	≤ 402	160	0.0009	0.0014	0.0018	0.0027	0.0035	0.0044	0.0053
High speed steels	≤ 43	≤ 402	230	0.0010	0.0016	0.0020	0.0030	0.0039	0.0049	0.0059
Spring steels	≤ 38	≤ 354	230	0.0010	0.0016	0.0020	0.0030	0.0039	0.0049	0.0059
Hardened steels	≤ 48	≤ 460								
	≤ 66	-								
Stainless steels, sulphured	≤ 28	≤ 273	185	0.0004	0.0007	0.0008	0.0012	0.0017	0.0021	0.0025
austenitic	≤ 36	≤ 337	260	0.0006	0.0009	0.0012	0.0018	0.0024	0.0030	0.0035
martensitic	≤ 46	≤ 435	265	0.0006	0.0009	0.0012	0.0018	0.0024	0.0030	0.0035
Cast iron	≤ 23	≤ 242								
	≤ 38	≤ 354								
Spheroidal graphite iron and malleable cast iron	≤ 23	≤ 242								
	≤ 38	≤ 354								
Chilled cast iron	≤ 38	≤ 354								
New cast materials GGV	≤ 20	≤ 220								
	≤ 32	≤ 301								
New cast materials ADI	≤ 32	≤ 301								
	≤ 43	≤ 402								
Special alloys	≤ 54	≤ 549	85	0.0002	0.0003	0.0004	0.0006	0.0008	0.0010	0.0012
Ti and Ti-alloys	≤ 25	≤ 255	150	0.0003	0.0005	0.0006	0.0009	0.0012	0.0015	0.0018
	≤ 43	≤ 402	105	0.0002	0.0003	0.0004	0.0006	0.0009	0.0011	0.0013
Aluminium and Al-alloys	-	≤ 120	985	0.0012	0.0019	0.0024	0.0035	0.0047	0.0059	0.0071
Al wrought alloys	-	≤ 200	985	0.0012	0.0019	0.0024	0.0035	0.0047	0.0059	0.0071
Al cast alloys ≤ 10 % Si	-	≤ 180	655	0.0016	0.0025	0.0031	0.0047	0.0063	0.0079	0.0094
≤ 24 % Si	-	≤ 180	525	0.0016	0.0025	0.0031	0.0047	0.0063	0.0079	0.0094
Magnesium alloys	-	≤ 120								
Copper, low-alloyed	-	≤ 150	490	0.0010	0.0016	0.0020	0.0030	0.0039	0.0049	0.0059
Brass, short-chipping	-	≤ 180								
long-chipping	-	≤ 180								
Bronze, short-chipping	-	≤ 180								
	≤ 25	≤ 255								
Bronze, long-chipping	≤ 25	≤ 255								
	≤ 32	≤ 301								
Duroplastics, Thermoplastics										
Reinforced plastics										

Series # 6491

Material group	Hardness		SFM	Feed Rate - IPR						
	HRC	BHN		0.0197 in. 0.5 mm	0.0315 in. 0.8 mm	0.0394 in. 1.0 mm	0.0591 in. 1.5 mm	0.0787 in. 2.0 mm	0.0984 in. 2.5 mm	0.1181 in. 3.0 mm
Common structural steels	-	≤ 150	330	0.0006	0.0009	0.0012	0.0018	0.0024	0.0030	0.0035
	≤ 32	≤ 301	330	0.0006	0.0009	0.0012	0.0018	0.0024	0.0030	0.0035
Free-cutting steels	≤ 25	≤ 255	330	0.0006	0.0009	0.0012	0.0018	0.0024	0.0030	0.0035
	≤ 32	≤ 301	330	0.0006	0.0009	0.0012	0.0018	0.0024	0.0030	0.0035
Unalloyed heat-treatable steels	≤ 20	≤ 220	330	0.0006	0.0009	0.0012	0.0018	0.0024	0.0030	0.0035
	≤ 25	≤ 255	330	0.0006	0.0009	0.0012	0.0018	0.0024	0.0030	0.0035
	≤ 32	≤ 301	330	0.0006	0.0009	0.0012	0.0018	0.0024	0.0030	0.0035
Alloyed heat-treatable steels	≤ 32	≤ 301	240	0.0006	0.0009	0.0012	0.0018	0.0024	0.0030	0.0035
	≤ 43	≤ 402	215	0.0006	0.0009	0.0012	0.0018	0.0024	0.0030	0.0035
Unalloyed case hardened steels	≤ 25	≤ 255	330	0.0006	0.0009	0.0012	0.0018	0.0024	0.0030	0.0035
Alloyed case hardened steels	≤ 32	≤ 301	240	0.0006	0.0009	0.0012	0.0018	0.0024	0.0030	0.0035
	≤ 43	≤ 402	215	0.0006	0.0009	0.0012	0.0018	0.0024	0.0030	0.0035
Nitriding steels	≤ 32	≤ 301	240	0.0006	0.0009	0.0012	0.0018	0.0024	0.0030	0.0035
	≤ 43	≤ 402	215	0.0006	0.0009	0.0012	0.0018	0.0024	0.0030	0.0035
Tool steels	≤ 25	≤ 255	230	0.0006	0.0009	0.0012	0.0018	0.0024	0.0030	0.0035
	≤ 43	≤ 402	160	0.0005	0.0009	0.0011	0.0016	0.0021	0.0027	0.0032
High speed steels	≤ 43	≤ 402	230	0.0006	0.0009	0.0012	0.0018	0.0024	0.0030	0.0035
Spring steels	≤ 38	≤ 354	230	0.0006	0.0009	0.0012	0.0018	0.0024	0.0030	0.0035
Hardened steels	≤ 48	≤ 460								
	≤ 66	-								
Stainless steels, sulphured	≤ 28	≤ 273	185	0.0004	0.0007	0.0008	0.0012	0.0017	0.0021	0.0025
austenitic	≤ 36	≤ 337	260	0.0006	0.0009	0.0012	0.0018	0.0024	0.0030	0.0035
martensitic	≤ 46	≤ 435	265	0.0006	0.0009	0.0012	0.0018	0.0024	0.0030	0.0035
Cast iron	≤ 23	≤ 242								
	≤ 38	≤ 354								
Spheroidal graphite iron and malleable cast iron	≤ 23	≤ 242								
	≤ 38	≤ 354								
Chilled cast iron	≤ 38	≤ 354								
New cast materials GGV	≤ 20	≤ 220								
	≤ 32	≤ 301								
New cast materials ADI	≤ 32	≤ 301								
	≤ 43	≤ 402								
Special alloys	≤ 54	≤ 549	85	0.0002	0.0003	0.0004	0.0006	0.0008	0.0010	0.0012
Ti and Ti-alloys	≤ 25	≤ 255	150	0.0003	0.0005	0.0006	0.0009	0.0012	0.0015	0.0018
	≤ 43	≤ 402	105	0.0002	0.0003	0.0004	0.0006	0.0009	0.0011	0.0013
Aluminium and Al-alloys	-	≤ 120	985	0.0008	0.0013	0.0016	0.0024	0.0031	0.0039	0.0047
Al wrought alloys	-	≤ 200	985	0.0008	0.0013	0.0016	0.0024	0.0031	0.0039	0.0047
Al cast alloys ≤ 10 % Si	-	≤ 180	655	0.0012	0.0019	0.0024	0.0035	0.0047	0.0059	0.0071
≤ 24 % Si	-	≤ 180	525	0.0012	0.0019	0.0024	0.0035	0.0047	0.0059	0.0071
Magnesium alloys	-	≤ 120								
Copper, low-alloyed	-	≤ 150	490	0.0008	0.0013	0.0016	0.0024	0.0031	0.0039	0.0047
Brass, short-chipping	-	≤ 180								
long-chipping	-	≤ 180								
Bronze, short-chipping	-	≤ 180								
	≤ 25	≤ 255								
Bronze, long-chipping	≤ 25	≤ 255								
	≤ 32	≤ 301								
Duroplastics, Thermoplastics										
Reinforced plastics										

Series # 6029 - Spot Drill

Material group	Hardness		SFM	Feed Rate - IPR								
	HRC	BHN		1/64 in. 0.500 mm	1/16 in. 1.590 mm	1/8 in. 3.170 mm	1/4 in. 6.350 mm	3/8 in. 9.520 mm	1/2 in. 12.700 mm	5/8 in. 15.870 mm	3/4 in. 19.050 mm	1 in. 25.400 mm
Common structural steels	-	≤ 150	330	0.0005	0.0005	0.0040	0.0065	0.0100	0.0100	0.0125	0.0155	0.0195
	≤ 32	≤ 301	280	0.0005	0.0005	0.0030	0.0050	0.0080	0.0080	0.0100	0.0125	0.0155
Free-cutting steels	≤ 25	≤ 255	345	0.0005	0.0005	0.0040	0.0065	0.0100	0.0100	0.0125	0.0155	0.0195
	≤ 32	≤ 301	330	0.0005	0.0005	0.0030	0.0050	0.0080	0.0080	0.0100	0.0125	0.0155
Unalloyed heat-treatable steels	≤ 20	≤ 220	280	0.0005	0.0005	0.0030	0.0050	0.0080	0.0080	0.0100	0.0125	0.0155
	≤ 25	≤ 255	280	0.0005	0.0005	0.0030	0.0050	0.0080	0.0080	0.0100	0.0125	0.0155
	≤ 32	≤ 301	230	0.0005	0.0005	0.0025	0.0040	0.0065	0.0065	0.0080	0.0100	0.0125
Alloyed heat-treatable steels	≤ 32	≤ 301	180	0.0005	0.0005	0.0025	0.0040	0.0065	0.0065	0.0080	0.0100	0.0125
	≤ 43	≤ 402	150	0.0005	0.0005	0.0020	0.0030	0.0050	0.0050	0.0065	0.0080	0.0100
Unalloyed case hardened steels	≤ 25	≤ 255	330	0.0005	0.0005	0.0040	0.0065	0.0100	0.0100	0.0125	0.0155	0.0195
Alloyed case hardened steels	≤ 32	≤ 301	180	0.0005	0.0005	0.0025	0.0040	0.0065	0.0065	0.0080	0.0100	0.0125
	≤ 43	≤ 402	100	0.0005	0.0005	0.0020	0.0030	0.0050	0.0050	0.0065	0.0080	0.0100
Nitriding steels	≤ 32	≤ 301										
	≤ 43	≤ 402										
Tool steels	≤ 25	≤ 255	180	0.0005	0.0005	0.0025	0.0040	0.0065	0.0065	0.0080	0.0100	0.0125
	≤ 43	≤ 402										
High speed steels	≤ 43	≤ 402										
Spring steels	≤ 38	≤ 354										
Hardened steels	≤ 48	≤ 460	100	0.0005	0.0005	0.0015	0.0025	0.0040	0.0040	0.0050	0.0065	0.0080
	≤ 66	-										
Stainless steels, sulphured	≤ 28	≤ 273	115	0.0005	0.0005	0.0020	0.0030	0.0050	0.0050	0.0065	0.0080	0.0100
austenitic	≤ 36	≤ 337	80	0.0005	0.0005	0.0020	0.0030	0.0050	0.0050	0.0065	0.0080	0.0100
martensitic	≤ 46	≤ 435	100	0.0005	0.0005	0.0020	0.0030	0.0050	0.0050	0.0065	0.0080	0.0100
Cast iron	≤ 23	≤ 242	330	0.0005	0.0005	0.0040	0.0065	0.0100	0.0100	0.0125	0.0155	0.0195
	≤ 38	≤ 354	330	0.0005	0.0005	0.0040	0.0065	0.0100	0.0100	0.0125	0.0155	0.0195
Spheroidal graphite iron and malleable cast iron	≤ 23	≤ 242	280	0.0005	0.0005	0.0040	0.0065	0.0100	0.0100	0.0125	0.0155	0.0195
	≤ 38	≤ 354	230	0.0005	0.0005	0.0040	0.0065	0.0100	0.0100	0.0125	0.0155	0.0195
Chilled cast iron	≤ 38	≤ 354										
New cast materials GGV	≤ 20	≤ 220										
	≤ 32	≤ 301										
New cast materials ADI	≤ 32	≤ 301										
	≤ 43	≤ 402										
Special alloys	≤ 54	≤ 549	80	0.0005	0.0005	0.0015	0.0025	0.0040	0.0040	0.0050	0.0065	0.0080
Ti and Ti-alloys	≤ 25	≤ 255	80	0.0005	0.0005	0.0015	0.0020	0.0030	0.0030	0.0040	0.0050	0.0065
	≤ 43	≤ 402	80	0.0005	0.0005	0.0015	0.0020	0.0030	0.0030	0.0040	0.0050	0.0065
Aluminium and Al-alloys	-	≤ 120	755	0.0005	0.0010	0.0050	0.0080	0.0125	0.0125	0.0155	0.0195	0.0250
Al wrought alloys	-	≤ 200	755	0.0005	0.0010	0.0050	0.0080	0.0125	0.0125	0.0155	0.0195	0.0250
Al cast alloys ≤ 10 % Si	-	≤ 180	540	0.0005	0.0010	0.0050	0.0080	0.0125	0.0125	0.0155	0.0195	0.0250
≤ 24 % Si	-	≤ 180	540	0.0005	0.0005	0.0040	0.0065	0.0100	0.0100	0.0125	0.0155	0.0195
Magnesium alloys	-	≤ 120	755	0.0005	0.0005	0.0040	0.0065	0.0100	0.0100	0.0125	0.0155	0.0195
Copper, low-alloyed	-	≤ 150	655	0.0005	0.0005	0.0030	0.0050	0.0080	0.0080	0.0100	0.0125	0.0155
Brass, short-chipping	-	≤ 180	655	0.0005	0.0005	0.0030	0.0050	0.0080	0.0080	0.0100	0.0125	0.0155
long-chipping	-	≤ 180	445	0.0005	0.0005	0.0030	0.0050	0.0080	0.0080	0.0100	0.0125	0.0155
Bronze, short-chipping	-	≤ 180	330	0.0005	0.0005	0.0025	0.0040	0.0065	0.0065	0.0080	0.0100	0.0125
	≤ 25	≤ 255	280	0.0005	0.0005	0.0025	0.0040	0.0065	0.0065	0.0080	0.0100	0.0125
Bronze, long-chipping	≤ 25	≤ 255	180	0.0005	0.0005	0.0025	0.0040	0.0065	0.0065	0.0080	0.0100	0.0125
	≤ 32	≤ 301	150	0.0005	0.0005	0.0025	0.0040	0.0065	0.0065	0.0080	0.0100	0.0125
Duroplastics			215	0.0005	0.0005	0.0025	0.0040	0.0065	0.0065	0.0080	0.0100	0.0125
Thermoplastics			310	0.0005	0.0005	0.0030	0.0050	0.0080	0.0080	0.0100	0.0125	0.0155

Drilling

Tapping/Thread milling/
Fluteless tapping

Milling

Countersinking

Reaming

PCD

Services

Modular systems

Special solutions

Grooving systems

Guhring, Inc. Main Office

1445 Commerce Avenue
Brookfield, WI 53045
Tel (262) 784-6730 (800) 776-6170
Fax (262) 784-9096

**Michigan Manufacturing and
Reconditioning Facility**

24975 Trans-X Road
Novi, MI 48375

Guhring Corp. (Canada)

20 Steckle Place, Unit #14
Kitchener, ON N2E 2C3
Tel (519) 748-9664 (800) 463-5555
Fax (519) 748-2954