Drilling

Your guide

to the right drill bit.

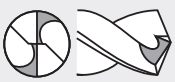
These information pages are designed to help users. They cover the correct use of the appropriate power tool and the various drill bits for commonly-used materials. The charts given below are only intended as recommendations and cannot be regarded as a complete guide. For more detailed queries, please contact Bosch directly. The fact that power tools and drill bits are mutually dependent is often ignored. It is only once this relationship has been identified and taken into account that the service life of both the tool and its drill bit can be optimised.

		Drill/Impact drill up to 600 watts	Drill/Impact drill up to 700 watts	Drill/Impact drill up to 1010 watts	Drill/Impact drill up to 1150 watts	Cordless drill/driver	Cordless drill	Cordless impact drill
Metal drill bits								
Sheet metal cone bit	up to 20 mm	●	●	●	●	●	●	●
	over 30 mm		●	●	●			
Steel drill bit	up to 10 mm	●	●	●	●	●	●	●
	up to 13 mm		●	●	●			●
	up to 20 mm				●			
Wood drill bit								
Wood drill bit	up to 15 mm	●	●	●	●	●	●	●
	up to 25 mm	●	●	●	●			
	up to 32 mm		●	●	●			
Auger bit	up to 18 mm	●	●	●	●			
	up to 32 mm		●	●	●			
Installation and form-work drill bits	18 mm	●	●	●	●			
	30 mm		●	●	●			
Flat drill bits SELECUT	up to 40 mm	●	●	●	●			●
Forstner bit	up to 50 mm	●	●	●	●			
TC-tipped hinge-boring bit	up to 50 mm	●	●	●	●			
Concrete drill bit								
Concrete drill bit	up to 15 mm	●	●	●	●			
BLUE GRANITE	up to 20 mm		●	●	●			
SILVER PERCUSSION	up to 25 mm			●	●			
Masonry drill bit	up to 12 mm	●	●	●	●			●
IMPACT	up to 18 mm	●	●	●	●			
	up to 24 mm		●	●	●			
	up to 30 mm				●			
Core cutters	up to 68 mm		●	●	●			
	up to 82 mm			●	●			
Diamond core edge sinkers	up to 82 mm			●	●			
Multi-purpose and rotary drill bits								
Multi-purpose drill bit MULTICONSTRUCTION	14 mm	●	●	●	●	●	●	●
Glass drill bit	12 mm	●	●	●	●	●	●	●
Holesaws								
	up to 40 mm	●	●	●	●	●	●	●
	up to 60 mm		●	●	●			
	up to 80 mm			●	●			
	up to 152 mm				●			

Working on metal
and plastic.

If possible, you should always work with a coolant. However, this is not always possible when you are using hand-held drills. For this reason our HSS drill bits have been designed to ensure quick swarf removal. In general, when working with hard and tough, or short swarf producing materials you should use drill bits with larger point angles and smaller flute angles. For soft and tough, or long swarf producing materials use drill bits with larger point angles and larger flute angles.

A	B	C
		
Type N Normal version Flute angle γ = 19° to 40°	**Type H** Flute angle γ = 10° to 19°	**Type W** Flute angle γ = 27° to 45°

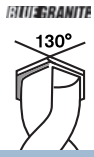
A	B	C	D
			
Split point manufactured to DIN 1412 C	Chisel edge	Acute cross point manufactured to DIN 1412 A	Split point, optimised for very hard steel

	Tensile strength N/mm²	Hardness Rockwell	Optimum drill bit tip	Optimum flute angle	HSS-R DIN 338	HSS-R DIN 1897	HSS-G DIN 338	HSS-G DIN 340	HSS-Co DIN 338	HSS-TiN DIN 338	Recommended cooling
Metal											
Non-alloyed structural steel	**350**	**HRB 62**	**A**	**N**		●	●	●		●	Drill emulsion, cutting oil
Non-alloyed structural steel	**750**	**HRC 21**	**A/B/C**	**N**	●	●	●	●		●	Drill emulsion, cutting oil
Sheet steel	**800**	**HRC 22**	**A**	**N**		●	●			●	Drill emulsion, ester oil
Non-alloyed tool steel	**800**	**HRC 22**	**A/B/C**	**N**	●	●	●	●		●	Drill emulsion, cutting oil
Alloyed tool steel	**880**	**HRC 26**	**A**	**N**		●	●	●	●	●	Drill emulsion, ester oil
Alloyed tool steel	**1000**	**HRC 31**	**A/D**	**N**			●		●	●	Drill emulsion, ester oil
Stainless steel	**550**	**HRB 85**	**A/D**	**N**			●	●		●	Ester oil, cutting oil
Stainless steel	**1100**	**HRC 34**	**D**	**N**					●		Ester oil, cutting oil
Fire-proof steel	**800**	**HRC 22**	**D**	**N**					●		Ester oil, cutting oil
Spring steel	**1100**	**HRC 34**	**A/D**	**N**					●		Ester oil, cutting oil
Cast iron	**800**	**HRC 22**	**A/C/ D**	**N**	●		●	●	●	●	Dry
Malleable cast iron	**700**	**HRB 95**	**A/C/ D**	**N**	●		●	●	●	●	Drill emulsion, cutting oil
Cast steel	**770**	**HRC 20**	**A/C/ D**	**N**	●		●	●	●	●	Drill emulsion, cutting oil
Cast steel	**1100**	**HRC 34**	**D**	**N**					●		Drill emulsion, cutting oil
Non-alloyed aluminium	**180**		**D**	**W**							Drill emulsion, cutting oil
Alloyed aluminium	**350**		**A**	**N/W**			●				Drill emulsion, cutting oil
Non-alloyed copper			**D**	**W**							Drill emulsion, cutting oil
Alloyed copper			**A/B**	**N/W**		●	●			●	Drill emulsion, cutting oil
Bronze			**A/B**	**N**	●	●	●			●	Dry
Brass			**A/B**	**H**						●	Drill emulsion
Magnesium			**D**	**N**					●		Dry, never water

	Tensile strength N/mm²	Hardness Rockwell	Optimum drill bit tip	Optimum flute angle	HSS-R DIN 338	HSS-R DIN 1897	HSS-G DIN 338	HSS-G DIN 340	HSS-Co DIN 338	HSS-TiN DIN 338	Recommended cooling
Plastics											
PVC, polyamide			**A/B/C**	**N/W**	●	●	●	●			Water
Perspex			**A/B/C**	**N**	●	●	●	●		●	Water
Bakelite			**A/B/C**	**N**	●	●	●	●		●	Water
Pertinax			**A/B/C**	**N**	●	●	●	●			Dry
Formica			**A/B/C**	**N**	●	●	●	●			Dry
Hard rubber			**A/B/C**	**N**	●	●	●	●			Dry

Working in stone and wood.

For working on stone or concrete, Bosch recommends you use its hammer drill bits with SDS-plus, SDS-top or SDS-max fitting. A wide range of straight shank TC-tipped drill bits is available for concrete, natural stone and masonry. A wide range of wood drill bits is available for wood and board materials.

Drill bit tip			
			
Spiral flute			
			
U-shape, spiral flute	U-shape, spiral flute	Semi-round shape, spiral flute	Steep spiral

	Concrete drill bit GRANITE	Concrete drill bit PERCUSSION	Masonry drill bit IMPACT	Multi-purpose drill bit CONSTRUCTION	Glass and tile drill bit	Core edge sinker	Diamond core edge sinker	Diamond wet core cutters	Diamond dry core cutters	Diamond drill bits
Masonry										
Concrete B35	●	●	●	●		●		●		
Concrete B45	●					●		●		
Solid brick	●	●	●	●		●	*●	●	●	
Hollow core brick				●		*●	*●	●	●	
Roofing tiles				●	●		*●	●	●	
Limestone	●	●	●	●		●	*●	●	●	
Masonry	●	●	●	●		●	*●	●	●	
Artificial stone	●	●		●		●	*●	●	●	
Plasterboard				●			*●			
Plasterboard				●			*●			
Rockwool boards				●						
Cement bonded chip-board				●						
Slate				●	●			●		
Marble	●			●	●			●		
Marble, hard				●				●		
Diorite	●							●		
Granite	●							●		
Cement-bonded fibre boards				●	●		*●			
Clinker				●	●		*●	●	●	
Tiles				●	●		*●			*●
Tiles, hard				●						*●
Glass				●	●					
Ceramics				●	●		*●			*●

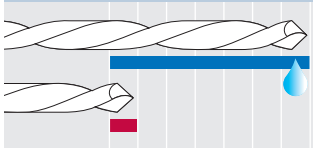
*without impact

	Wood drill bits	HSS-R DIN 1897	Forstner bit	Tungsten carbide drill bits	Cantilever hinge bit	CONSTRUCTION Multi-purpose drill bits	Installation/formwork drill bit	Flat drill bits
Wood and board materials								
Soft wood	●	●	●	●		●	●	●
Hard wood	●		●	●	●	●	●	●
Tropical wood	●			●	●			
Plywood	●	●	●	●	●	●	●	●
Veneered chipboard	●		●	●				●
Laminated chipboard and fibre board	●			●	●	●	●	●
Formica	●			●	●	●		
Formica	●			●	●	●		
Cement bonded chipboard				●	●	●		
Plasterboard						●	●	●
Rockwool boards						●	●	●
Porous concrete						●	●	●
Thermoplasts				●	●	●		
Duroplasts	●			●	●	●		
Hard foam materials	●			●	●	●	●	●

Speed and coolant recommendation.

The ideal RPM is calculated from an average cutting speed. Both drill geometry and forward pressure have a crucial influence on the correct speed. The chart shown below is therefore only a recommendation. However, it is based our experience gained from a wide range of user feedback.

Operational life



Bit life is extended when used with the appropriate cooling system. Maximum factor approx. 6.

	Tensile strength N/mm²	Hardness Rockwell	Optimum drill bit tip	Optimum drill bit type	Cutting speed m/min	D 2 mm	D 5 mm	D 10 mm	D 15 mm	D 20 mm	Recommended cooling
Metal											
Non-alloyed structural steel	350	HRB 62	A	N	28–30	4780	1910	960	640	480	Drill emulsion, cutting oil
Non-alloyed structural steel	750	HRC 21	A/B/C	N	26–28	4460	1780	890	590	440	Drill emulsion, cutting oil
Sheet steel	800	HRC 22	A	N	26–28	4480	1780	890	590	440	Drill emulsion
Non-alloyed tool steel	800	HRC 22	A/B/C	N	26–28	4460	1780	890	590	440	Drill emulsion, cutting oil
Alloyed tool steel	880	HRC 26	A	N	22–24	3980	1600	800	530	400	Drill emulsion, ester oil
Alloyed tool steel	1000	HRC 31	A/D	N	12–14	2000	830	400	280	210	Drill emulsion, ester oil

	Tensile strength N/mm²	Hardness Rockwell	Optimum drill bit tip	Optimum drill bit type	Cutting speed m/min	D 2 mm	D 5 mm	D 10 mm	D 15 mm	D 20 mm	Recommended cooling
Metal											
Stainless steel	550	HRB 85	A/D	N	14–16	2390	960	480	320	240	Ester oil, cutting oil
Stainless steel	1100	HRC 34	D	N	8–10	1450	570	290	190	140	Ester oil, cutting oil
Fire-proof steel	800	HRC 22	D	N	10–12	1750	700	350	230	170	Ester oil, cutting oil
Spring steel	1100	HRC 34	A/D	N	8–10	1450	570	290	190	140	Ester oil, cutting oil
Cast iron	800	HRC 22	A/C/D	N	25–30	4460	1780	890	590	450	Dry
Malleable cast iron	700	HRC 95	A/C/D	N	25–30	4460	1780	890	590	450	Drill emulsion, cutting oil
Cast steel	770	HRC 20	A/C/D	N	20–24	3500	1400	700	460	350	Drill emulsion, cutting oil
Cast steel	1100	HRC 34	D	N	14–16	2390	960	480	320	240	Drill emulsion, cutting oil
Non-alloyed aluminium	180		D	W	60–80	9560	3820	1910	1270	960	Drill emulsion, cutting oil
Alloyed aluminium	350		A	N/W	50–60	7950	3180	1590	1060	790	Drill emulsion, cutting oil
Non-alloyed copper			D	W	30–35	5250	2100	1050	700	520	Drill emulsion, cutting oil
Alloyed copper			A/B	N/W	28–30	4780	1910	960	640	480	Drill emulsion, cutting oil
Bronze			A/B	N	40–60	7960	3180	1500	1060	790	Dry
Brass			A/B	H	40–60	7960	3180	1500	1080	790	Drill emulsion
Magnesium			D	N	60–80	9560	3820	1910	1270	980	Dry, never water
Plastics											
PVC, polyamide			A/B/C	N/W							Water
Perspex			A/B/C	N							Water
Bakelite			A/B/C	N							Water
Pertinax			A/B/C	N							Dry
Formica			A/B/C	N							Dry
Hard rubber			A/B/C	N							Dry

Speed table for wood drill bits						
Standard wood drill bits	3–6 1000	13–18 700	20–30 500			Diameter in mm Speed/rpm
Machine wood drill bit with M-tip Length 250 Length 400	6 1600	8 1400 1000	10–12 1000 800	14–18 700 500	20 500 500	Diameter in mm Speed/rpm Speed/rpm
Flat drill bits	6–25 1000	26–35 750	36–40 600			Diameter in mm Speed/rpm
Wood drill bits with 90° countersink bit	3–12 500–1000					Diameter in mm Speed/rpm
Formwork and installation drill bits	6 600	8–14 500	16–22 400	24–26 300	28–30 200	Diameter in mm Speed/rpm
Formwork and installation drill bits with SDS-plus shank	10–14 500	16–22 400	24–26 300	28–30 200		Diameter in mm Speed/rpm
Auger bit Length 235 Length 450	6–15 1600 1300	16–22 1400 1000	24–26 1000 800	28–32 800 800		Diameter in mm Speed/rpm Speed/rpm
Cantilever hinge bit	26 1100	30–35 800				Diameter in mm Speed/rpm
Hinge cutting bit	15–18 1500	20–26 1400	28–35 1000	36–50 600–800		Diameter in mm Speed/rpm
Forstner bit	10–20 1500	22–25 1100	26–30 900	32–35 800	36–50 600	Diameter in mm Speed/rpm

Diameters for thread holes.

Thread	Drill bit diameter in mm	Thread	Drill bit diameter in mm	Thread	Drill bit diameter in mm	Thread	Drill bit diameter in mm	Thread	Drill bit diameter in mm
Metric ISO-regular thread to DIN 13									
M 1.0	0.75	M 2.3	1.90	M 6	5.00	M 18	15.50	M 42	37.50
M 1.1	0.85	M 2.5	2.00	M 7	6.00	M 20	17.50	M 45	40.50
M 1.2	0.95	M 2.6	2.10	M 8	6.80	M 22	19.50	M 48	43.00
M 1.4	1.10	M 3.0	2.50	M 9	7.80	M 24	21.00	M 52	47.00
M 1.4	1.25	M 3.5	2.90	M 10	8.50	M 27	24.00	M 56	50.50
M 1.7	1.30	M 4.0	3.30	M 11	9.50	M 30	26.50	M 60	54.50
M 1.7	1.40	M 4.5	3.80	M 12	10.20	M 33	29.50	M 64	58.00
M 2.0	1.60	M 5.0	4.20	M 14	12.00	M 36	32.00	M 68	62.00
Metric ISO-fine thread to DIN 13									
M 3 x 0.35	2.6	M 7 x 0.75	6.2	M 18 x 1.5	16.5	M 30 x 1.5	28.5	M 42 x 1.5	40.50
M 3.5 x 0.35	3.1	M 8 x 0.75	7.2	M 20 x 1.5	18.5	M 32 x 1.5	30.5	M 45 x 1.5	43.50
M 4 x 0.35	3.6	M 9 x 1	8.0	M 22 x 1.5	20.5	M 33 x 1.5	31.5	M 48 x 1.5	46.50
M 4 x 0.5	3.5	M 10 x 1	9.0	M 24 x 1.5	22.5	M 35 x 1.5	33.5	M 50 x 1.5	48.50
M 4.5 x 0.5	4.0	M 11 x 1	10.0	M 25 x 1.5	23.5	M 36 x 1.5	34.5		
M 5 x 0.5	4.5	M 12 x 1.5	10.5	M 26 x 1.5	24.5	M 38 x 1.5	36.5		
M 5.5 x 0.5	5.0	M 14 x 1.5	12.5	M 27 x 1.5	25.5	M 39 x 1.5	37.5		
M 6 x 0.75	5.2	M 16 x 1.5	14.5	M 28 x 1.5	26.5	M 40 x 1.5	38.5		
Whitworth thread to DIN 11									
W 1/16″	1.15	W 7/32″	4.60	W 1/2″	10.50	W 1″	22.00	W 1 5/8″	35.50
W 3/32″	1.90	W 1/4″	5.10	W 9/16″	12.10	W 1 1/8″	24.75	W 1 3/4″	39.00
W 1/8″	2.60	W 5/16″	6.50	W 5/8″	13.50	W 1 1/4″	27.75	W 1 7/8″	41.50
W 5/32″	3.20	W 3/8″	7.90	W 3/4″	16.50	W 1 3/8″	30.50	W 2″	44.50
W 3/16″	3.70	W 7/16″	9.30	W 7/8″	19.25	W 1 1/2″	33.50		
Whitworth pipe thread to DIN-ISO 228									
G 1/8″	8.80	G 3/4″	24.50	G 1 3/8″	42.00	G 2 1/2″	72.50	G 3 3/4″	104.00
G 1/4″	11.80	G 7/8″	28.25	G 1 1/2″	45.50	G 2 3/4″	79.00	G 4″	110.50
G 3/8″	15.25	G 1″	30.75	G 1 3/4″	51.50	G 3″	85.50		
G 1/2″	19.00	G 1 1/8″	35.50	G 2″	57.00	G 3 1/4″	91.50		
G 5/8″	21.00	G 1 1/4″	39.50	G 2 1/4″	63.00	G 3 1/2″	98.00		

Bolt thread as per ISO 724 (metric):

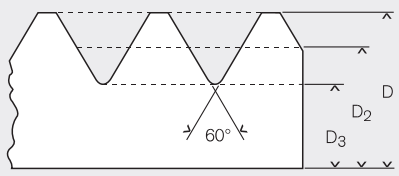
- Metric ISO threads have flank angles of 60°.
- The threads are divided into regular and fine threads.

Whitworth nut thread (inch):

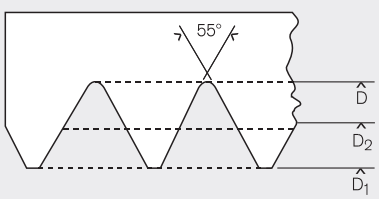
- The Whitworth thread has a flank angle of 55°.
- The rated dimensions are usually in inches.

Nut thread as per ISO 724 (metric):

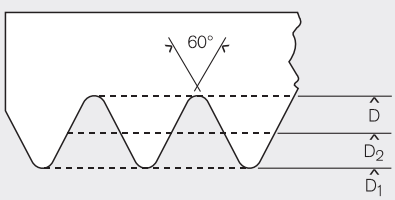
- For an ISO-regular thread, only the outer diameter is given, e.g. M 12.
- Both the incline and the outer diameter are given for a fine thread, e.g. M 12 x 1.5.



D_3 Core diameter
D_2 Flank diameter
D Outer diameter



D_1 Core diameter
D_2 Flank diameter
D Rated dimension of the thread/ outer diameter



D_1 Core diameter
D_2 Flank diameter
D Rated dimension of the thread/ outer diameter