

High-Speed Steel Drill Speeds and Feeds

Revolutions per minute and feed per revolution for high speed steel twist drills, by drill diameter and by the material being drilled, with the factors that trade cutting speed against the time a drill runs between regrinds. A reference summary of published practice and not an Aobo Steel specification.

Reference only. The drill speeds, the feeds and the cutting speed factors are reproduced from the source named at the foot of this sheet. The figures are a published reference rather than a recommendation of ours, and the sheet carries no tolerances. Read them against your own machine, holder, coolant and workpiece before a job is set up on them.

Revolutions per minute and feed per revolution, by drill diameter

Source, speeds and feeds for drills, printed page 249, and the cutting speed factors for a longer run on printed page 241.

Drill diameter, inch	Mild steel	Malleable iron	Cast iron	Brass	Tool steel	Feed per revolution, inch
1/16	4015	4620	4820	7650	1970	0.001 to 0.002
3/32	1850	1925	2220	3515	906	0.002 to 0.004
1/8	1380	1610	1650	2810	675	0.003 to 0.006
3/16	1040	1190	1250	1970	506	0.004 to 0.008
1/4	855	982	1028	1620	420	0.004 to 0.008
5/16	782	806	836	1330	342	0.005 to 0.010
3/8	604	688	720	1140	295	0.005 to 0.010
7/16	527	605	632	1003	258	0.008 to 0.016
1/2	425	488	512	807	210	0.008 to 0.016
5/8	347	410	420	668	173	0.008 to 0.016
3/4	300	346	360	566	148	0.008 to 0.016
7/8	260	298	312	495	128	0.010 to 0.020
1	228	264	276	436	112	0.010 to 0.020
1 1/8	215	248	260	410	106	0.010 to 0.020
1 1/4	200	230	238	380	98	0.010 to 0.020
1 3/8	178	205	216	342	92	0.010 to 0.020
1 1/2	154	173	180	290	73	0.010 to 0.020
2	130	150	156	246	64	0.010 to 0.020

The five speeds are for a high speed steel twist drill and the column headings are the material being drilled, not the material of the drill. All values are revolutions per minute, and the feed is given per revolution for a two lipped drill. The table is based on a peripheral speed of 60 to 65 feet per minute in soft steel at the medium diameters, and the peripheral speed rises as the diameter falls. Without a lubricant the speeds should be reduced by 15 to 20 per cent. The lighter figure of each feed pair is the preferred value, and the heavier figure is usable where the machine and the setup are rigid. For rose reamers, threading dies and taps about half the speeds shown are to be used. A reference table only, it is not an Aobo Steel recommendation, and the figures should be read against your own machine, holder and coolant.

Factors that carry a tabulated speed to a longer run

Source, cutting speed factors for a longer run between regrinds, printed page 241, adapted from Taylor.

Speed already set for a cut lasting	Speed sought for a cut lasting	Divide the tabulated speed by	or multiply it by
20 minutes	40 minutes	1.09	0.92
40 minutes	80 minutes	1.09	0.92
20 minutes	80 minutes	1.19	0.84
40 minutes	20 minutes	0.92	1.09
80 minutes	40 minutes	0.92	1.09
80 minutes	20 minutes	0.84	1.19

The factors are adapted from Taylor and they carry the run of a drill from one regrind to the next. Dividing the tabulated speed makes the cut last longer and multiplying it makes the cut shorter, so the two directions are the same factor read opposite ways. The middle pair takes the run straight from twenty minutes to eighty minutes, which is a slower cut than the two step change through forty minutes.

Aobo Steel, tool steel supplier

Aobo Steel supplies tool steel to distributors and mold, tool and die shops, including D2, D3, O1, O2, A2, S7, H13, H11, M2, M42, L6, P20 and 420 and 440C stainless. Forged or hot rolled, annealed or pre-hardened, cut to your sizes, with test certificates.

Reference data compiled from High-speed Steel (Otto Matthew Becker, McGraw-Hill, 1916).

The drill table is printed on page 249 of that edition and the cutting speed factors on page 241. Both were read from the page image and not from an automatic text layer.

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