

# DRILLS SPEEDS AND FEEDS PROCEDURES

Here is a procedure to follow in grinding the various forms of twist drills. Of course, the right point on a drill is the paramount factor in successful drilling. However, there are other considerations which make for proper manipulation and right end results. The workman must know the proper speed at which to run the drill and the amount of feed; each depends upon the drill and the kind of metal.

When the speed of a drill is referred to, it is the speed of the circumference —called the "peripheral" speed. It is the distance the drill would travel if it were laid on its side and rolled along. For example, if a drill were to have a speed of 25 feet per minute, it would roll 25 feet a minute.

Ordinarily, a drill does not pull itself into the work. It doesn't work like a corkscrew, but it requires a pressure behind it which advances it into the work. This advance is called the "feed," and feed pressure is the force or pressure needed to maintain the feed.

There is a diversity of opinion even among experts regarding the correct speed and feed, and, therefore, it is not possible to give any definite rules on the subject. However, certain suggestions may be offered which may prevent ultimate "grief" to the worker.

In starting a drill, always bring it down to the work by hand feed until it centers itself, after which throw in the power feed. Carbon steel drills may be started with a peripheral speed of 30 feet per minute in soft tool steel. For cast iron they may be started at 35 to 50 feet per minute, and for brass from 60 to 120 feet per minute.

The starting "feed" should vary per rotation of drills according to size. For example: vary from .001 to .002 of an inch for drills 1/8" and smaller; from .002 to .004 of an inch for drills from 1/8" to 1/4"; from .004 to .007 for drills from 1/4" to 1/2"; from .007 to .015 for drills from 1/2" to 1"; for drills larger than 1", from .015 to .025.

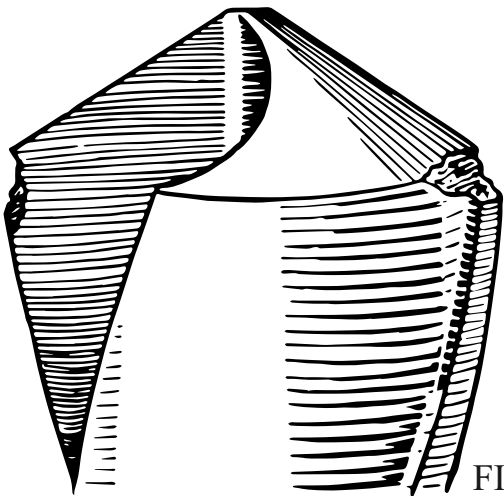


FIG. 1

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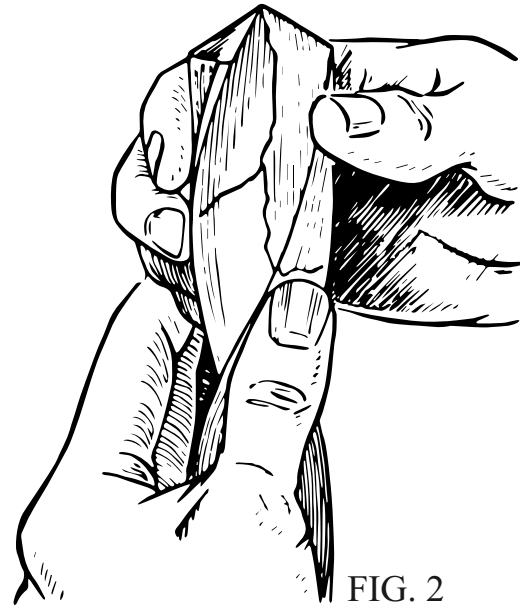


FIG. 2

For high speed drills these suggested speeds will remain unchanged, but the starting speed should be increased to 70-100 feet per minute on soft tool steel; to 70-150 feet for cast iron; to 50-70 feet for alloy steel; and 200-300 feet per minute for brass.

The workman should always start the drill at a moderate speed and feed, increasing either one as the condition of the drill indicates.

Now there are certain signs which must be observed as the drilling progresses which tell whether the drill is operating at too high a speed or feed. If the drill chips at the cutting edge, the feed is probably too heavy. Observe what happens at Fig. 1.

The outer corners of the tool have worn away rapidly because of excessive speed which has drawn the temper. Too much feed will also result in splitting of the web, as shown at Fig. 2

Also, this is indication that there was not sufficient lip clearance. There was, therefore, no cutting edge, and as feed pressure was applied, the drill could not enter the work, and the drill split up the center. Aside from feed, therefore, look to see that the tool is properly ground.

In general, a high speed and light feed is recommended. It is better to make a mistake on the side of too much speed than to make the mistake on too much feed.

Both feed and speed must be given special attention when drilling holes of small diameter. The danger of breakage is great here, particularly at the moment when the drill breaks through the work. This is usually true when the drill is fed by hand, for it is extremely difficult to properly gauge the pressure, and is particularly true when the drill is operated at too low a peripheral speed. A good maxim is to operate at too high a speed, rather than too slow, when using small drills, and keep the feed light.