

One (1) Wheel In - Feed	Knurls Used			
IN - FEED With Side Knurl Holder				
IN - FEED With Top Knurl Holder				
IN - FEED With Top Knurl Holder				

Two (2) Wheel In - Feed	Knurls Used			
IN - FEED With Side Knurl Holder				
IN - FEED With Adjustable Straddle Type Knurl Holder				

Two (2) Wheel End - Feed	Knurls Used			
END-FEED With Adjustable Knurl Holder Actuated from Cross Slide				
END-FEED With Adjustable Knurl Holder				
END-FEED With Adjustable Swivel Type Knurl Holder				
END-FEED With Adjustable Swivel Type Knurl Holder				

### Speeds and Feeds

Knurling is ordinarily performed at the same speeds used as cutting operations. Use the same SFM used for high speed and cobalt tool bits to calculate speeds and feeds. However, where spindle speeds can be reduced without loss of production, it is recommended that spindle speeds be lowered as much as possible to increase knurl life.

For in-feed knurling, the knurl should be fed toward the work gradually until contact is made with the blank, and from there on, the feed should be progressive until the feed is at the high point of the cam. As few work revolutions as possible should be allowed for feeding the knurl into the work. The knurl should be fed to full depth as rapidly as permissible without causing undue pressure on the work, the tools, and the equipment. Too many revolutions may result in a roughened or slivered tooth surface and destruction of the knurl and the knurling tool.

The rate of feed is governed by the type of material being knurled, diameter and rigidity of the work, and the width and pitch of the knurl. Faster feeds are used for the softer materials and slower feeds for harder materials. Although the knurling should be normally completed within 10 to 25 work revolutions, the ability of many machine cross slides to operate at the desired high speeds prohibits the use of the preferred revolutions, especially when high work spindle speeds are used.

The cam rise must be continuous with no dwell or backing away until the high point is reached. It is desirable to have a slight dwell on the cam at the completion of the feeding which allows several revolutions of the work with the knurl at full tooth depth. The amount of dwell depends upon the nature of the work and the material. The knurl should be then withdrawn from the work quickly.

The feeds used for end-feed knurling with the turret vary considerably and are dependent upon the pitch of the knurl, material being knurled, and the nature and diameter of the work.

The tables shown may be used as a guide for determining the amount of end-feed or in-feed per revolution of the work. The rate of the feed for diamond pattern knurling is slower than that for straight or diagonal knurling.

#### Straight or Diagonal END-FEED KNURLING Approximate FEED per REVOLUTION

T.P.I.	Alum. Brass	Mild Steel	Alloy Steel
12	.008	.006	.004
16-20	.010	.008	.005
25-35	.013	.010	.007
40-80	.017	.012	.009

#### Straight or Diagonal IN-FEED KNURLING Approximate REVOLUTION

T.P.I.	Alum. Brass	Mild Steel	Alloy Steel
12	12	15	25
16-20	10	13	22
25-35	8	11	20
40-80	6	9	18