

## Section #1 Acetal, Nylon #5 Polyolefins

Bottom taps should be avoided wherever possible. For maximum strength and dimensional stability, all tapped parts should be annealed to relieve the stresses set up by the tapping.

Chips can be cleared quite effectively, with a minimum of friction, by using large, highly polished flutes. Taps should be nitrated or chromeplated, and all new taps should be honed to remove burrs.

Taps for all thermoplastics should have maximum back clearance. A pitch diameter of 0.005" oversize is recommended, unless a tight fit is needed.

As a rule, spindle speeds for threading and tapping should be below those used for drilling and turning, or the first few threads may tear. This likelihood may be further reduced by chamfering the hole prior to tapping, and by providing a positive feed for the first few threads.

Threads may also be cut with a single point tool. Heavy cuts can be used for the initial pass in which case the depth of cut should be reduced to 0.007" to 0.010" for the final pass.

Class I and II threads can be cut in one pass.

### Coolants

Air, or a lubricant, is not essential in tapping, but it permits faster tapping, by clearing chips away quickly.

### Automatic Threading

Threading can be accomplished quite easily on conventional lathes or automatic screw machines. Self-opening die heads with high speed tangential chasers are recommended for cutting screw threads. Pull out trips in self-opening die heads should be avoided, due to the tendency of this mechanism to tear the threads. Threads should be cut with positive feed, and an external trip should be provided to open the die head.

The chart gives recommended chaser geometry.

### RECOMMENDED GEOMETRY FOR TANGENTIAL CHASERS

Rake Angle—5° to 10°  
Throat Angle—50°  
Cutting Portion—.019" to .021" Above Center  
Lead Nut Portion—.031" to .036" Above Center

Although tangential chasers are recommended, other types are sometimes used when these are not available. When radial chasers are necessary, the tool geometry given in this table is recommended.

### RECOMMENDED GEOMETRY FOR RADIAL CHASERS

Rake Angle—0° to 5°  
Throat Angle—50°  
Speeds—Threading ratio, spindle speed to  
threading speed—3:1.

Formula: Drill size for Tapped Holes

$$D = T - n \times 2d$$

D = drill diameter

T = outside diameter of thread or tap

d = depth of thread

n = percentage of thread depth desired  
(expressed as a decimal)

## Section #3 Fluoroplastics

### Thermal Expansion and Tolerances

Like other plastics, TFE has a high thermal expansion — about ten times that of steel. If tolerances are critical, measurements should be made at room temperature or, where applicable, at the temperature at which the part will be used.

TFE undergoes a transition at approximately 68° F. which results in an abnormally high thermal expansion within the range of 54° to 74° F. Parts