

standard twist drills have proper angles for general-purpose work. Only high-speed or super high-speed steel drills should be used, with polished flutes. Sulphurized cutting oils give best results. Recommended speeds for regular monel and nickel are between 40 to 60 feet per minute with the same feeds for mild steel. R monel may be drilled at a speed of 60 to 75 feet per minute. Lower the drilling speed to 30 to 45 feet per minute for Inconel and to 20 to 30 feet per minute for soft K monel.

TABLE 9.—RECOMMENDED SPEEDS AND FEEDS FOR AUTOMATIC SCREW MACHINING OF GRADE R MONEL

Operation	Width of Cut, in Inches	Feed, in Inches	Speed, in Feet per Minute
Box tool:			
Roughing.....	$\frac{1}{16}$ to $\frac{1}{8}$	0.006	125
Finishing.....	0.005	0.005	125
Cut-off:			
Circular tool.....	$\frac{1}{16}$ to $\frac{1}{8}$	0.001	125
Straight tool.....	$\frac{1}{16}$ to $\frac{1}{8}$	0.0005	125
Forming tool:			
Circular.....	$\frac{1}{16}$ to $\frac{1}{8}$	0.0006	125
	$\frac{1}{16}$ to $\frac{1}{8}$	0.0005	125
	$\frac{1}{16}$ to $\frac{1}{8}$	0.0004	125
	$\frac{1}{16}$ to $\frac{1}{8}$	0.00025	125
Balance turning tool:			
Turned diameter under $\frac{1}{8}$ inch.....	$\frac{1}{16}$ to $\frac{1}{8}$	0.006	125
Over $\frac{1}{8}$ inch.....	$\frac{1}{16}$ to $\frac{1}{8}$	0.012	125

speed to 30 to 45 feet per minute for Inconel and to 20 to 30 feet per minute for soft K monel.

Helical-fluted high-speed steel reamers with narrow lands and well-polished flutes are best. Reamers must be kept sharp. Speeds for reaming are 25 to 35 feet per minute for monel and nickel and to 15 feet per minute for K monel and Inconel. Reaming feeds are about twice the drill feed for the same size hole.

Thread chasing should be done with self-opening dies, which should have a 15-degree hook, as shown in M, Fig. 14. In thread chasing, turn the rod slightly smaller than standard as the high-nickel materials will flow into the grooves of the dies, giving full size threads. A speed of 20 to 25 feet per minute is suggested for thread chasing monel and nickel. For K monel and Inconel 10 to 15 feet per minute. For R, speeds are 25 to 35 feet.

In lathe threading monel, the tool should have a back rake angle of 6 to 9 degrees and a side rake angle of 9 to 12 degrees, as at N, Fig. 14. V threads may be machined in monel and nickel at approximately 10 to 15 feet per minute. For K monel and Inconel, reduce these speeds to 15 feet per minute for V threads and to 5 to 10 feet per minute for straight or Acme threads.

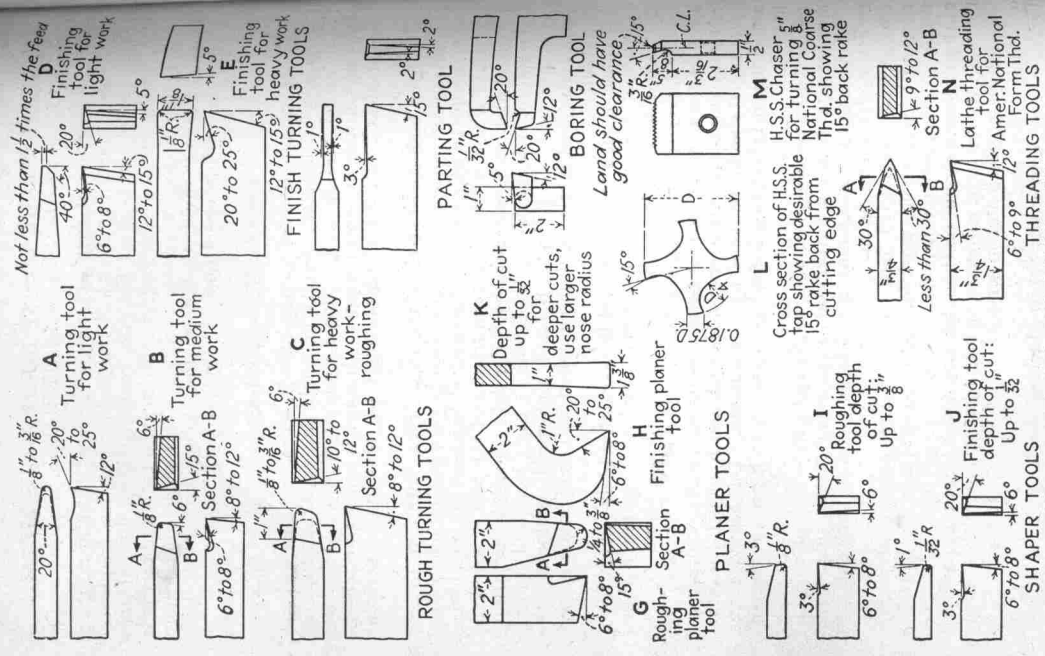


Fig. 14.—Tools for High-Nickel Alloys