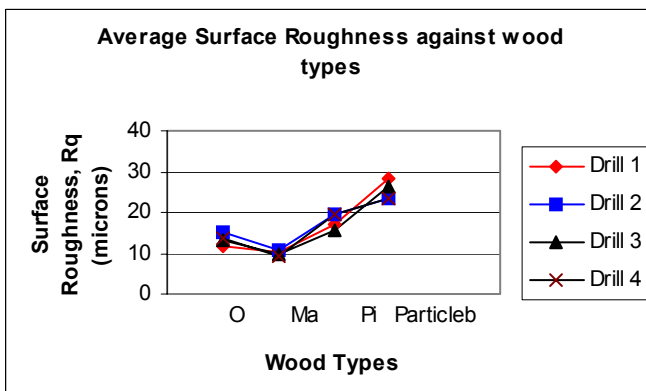


WOOD MACHINING & TOOLING RESEARCH

WOOD BORING RESEARCH - HOLE SURFACE QUALITY

There are several quality characteristics of drilled holes that are of concern in the wood industry and current research has shown several key factors which work in concert to determine the overall quality. Of general concern in hole-making are the size and shape of the hole, the quality of the edge of the hole, and, as was studied here, the roughness of the surface of the interior of the hole. Research at NC State University has shown that the main factor that causes non-circular holes is the use of two, linearly aligned cutting edges, as on a standard twist drill. The effect can be minimized by the use of three-fluted drills, which are, unfortunately, not widely available. The edge quality of the hole is, in general, affected most by type of drill used and feed rates. The overall surface roughness of the interior of the hole has been shown to be primarily a function of the feed rate and species being drilled. Experimentation has shown that drill type has a minimal effect on the surface roughness and that typical RMS values for roughness are 10 – 15 microns for hardwoods, 15 – 20 microns for softwoods, and 22 – 28 microns for particle board.



Where Drill, 1= Saw tooth Forstner, 2=Forstner, 3=Twist, 4=Brad point

The Wood Machining & Tooling Research Program (WMTRP) is a multidisciplinary program involving the fields of Mechanical Engineering, Industrial Engineering, Manufacturing Engineering, Material Science, and Wood Science. The program mission is to provide the woodworking industry with personnel educated in machining and tooling technology and provide applied research results aimed at improving efficiency and wood utilization. Major program support is provided by the U.S. Department of Agriculture.

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