

Research Summary

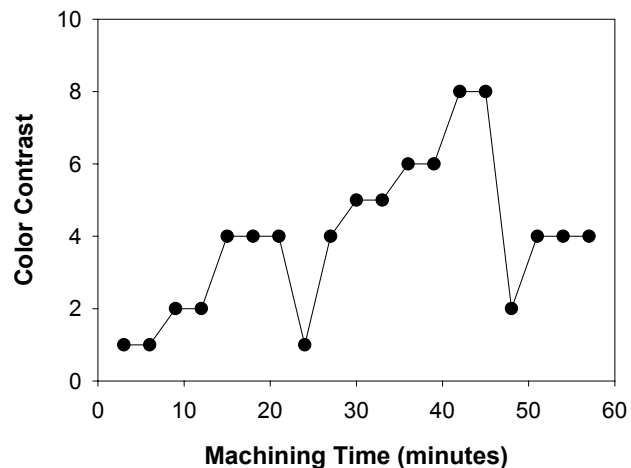
WOOD MACHINING & TOOLING RESEARCH

PROCESS MONITORING RESEARCH - Monitoring Abrasive Belt Condition

The objective of this research is to provide a means of monitoring the state of the abrasive machining process. Abrasives can either become worn or become loaded with wood fiber. A loaded belt is one which has wood fibers compacted into the spaces between and around the abrasive grits. A loaded condition will cause the belt to be unable to cut additional material, as the grits cannot come fully into contact with the wood piece. The result is a situation where rubbing and friction generate heat and the wood becomes burnished. Work is being conducted at the WMTRP to attempt to monitor the state of the abrasive machining process and determine if the abrasives are worn or loaded. This will probably require a multiple sensor approach. Currently work is underway to monitor the loading condition of the belt optically. This would provide an un-intrusive way to control the process and could determine an appropriate time to change the belt. In addition, work is also underway to utilize knowledge obtained from research conducted at the WMTRP on sandblasting to clean abrasives on-line to extend belt life.



Digitized Image of Abrasive Loading



Change in Belt Color Contrast vs. Belt Loading

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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