



Investigation of optimum working conditions of cutting rubber wood by using CNC

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Objectives:

In Thailand, a large number of rubber woods can be obtained every year due to the availability of out-of-sap rubber trees. These trees will be cut and used as the raw materials for furniture or carved products. Furniture made of rubber wood is one of the most important agricultural products and its amount of export grows rapidly in recent years. In the furniture manufacturing industry, CNC machines have been introduced induce manufacturing flexibility. The many advantages of using CNC machines are, for 1. They can produce workpieces with variable configuration in relatively short time, 2. The machining precision can controlled within tolerance with the case. The cost of these machines is ,however, quite expensive, therefore, it is necessary to know how to maximize the productivity of the machine through suitable working conditions and optimum working parameters.

In metal cutting processes, working parameters, namely, cutting speed, feeding rate, depth of cut, and tool configuration have strong effects on the quality of products and efficiency of the process. Therefore, it is our belief that these parameters are also important in the wood cutting process. By choosing suitable working conditions for the processes, the benefits such as high quality of surface finished and high efficiency and extension of tool life can be obtained. This leads us to a conclusion that our investigation of optimum

working conditions for cutting rubber wood by using CNC machines are vitally desirable for improving quality of furniture products.

Methodology:

The turning and milling processes are chosen in this research since these two processes are the most simplest processes of wood cutting. To make the experiment simplex, the manual lathe and the manual milling machine are used instead of the CNC machine since the cutting mechanisms can be thought to be the same. Cutting speed, feed rate, depth of cut, and configuration of a tool are the studied parameters since it is generally known that they have great effects on the performance of cutting process. The surface finish of a product, the efficiency of the process and the wear rate of a tool are the variables used to evaluate those parameters. By making use of the theory of experimental design, the suitable number of the experiment has been determined to make sure that the optimum range of these parameters can be obtained.

Expected outputs:

The optimum working parameters of the wood cutting processes can be obtained in the form of the working table which is easy to look up by the machinist. This will lead to the overall improvement of the furniture-manufacturing processes.