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Effects of Smoke Drying in Traditional Lacquer Work on the Physical Properties of Wood

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Abstract: The objective of the present study is to clarify the effects of smoke drying, this method of which has been used for drying plain wood for making lacquer ware, on wood property. Logs 35 cm in length were smoke-dried for 30 to 90 days. After drying, moisture content (MC), equilibrium moisture content (EMC), relative degree of crystallinity (RDC) of cellulose, mean shrinkage at 1% MC decrease, and static bending property and impact bending properties were investigated. During smoke drying for 90 days, mean and maximum temperature inside the treatment chamber were 33°C and 58°C, respectively, while mean and maximum temperature inside the log were 30°C and 45°C, respectively. Heartwood and sapwood showed almost the same MC of about 10%. There were no significant differences in EMC and RDC between naturally dried wood and smoke-dried wood. Mean shrinkage at 1% MC decrease in the radial and tangential directions of smoke-dried wood showed low values compared to those of naturally dried wood. In addition, specific Young's modulus in static bending increased with increasing duration of smoke-drying. These results suggest that decreased shrinkage in the radial direction and increased specific Young's modulus in static bending may result in increased quality of plain wood for lacquer ware.

Keywords: smoke drying, plain wood, lacquer ware, shrinkage, specific Young's modulus

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