THE INFLUENCE OF PRESS TIME AND TEMPERATURE ON THE THICKNESS STABILITY OF PARTICLEBOARDS

by

KINGIRI A. SENELWA

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DEPARTMENT OF FORESTRY AND WOOD SCIENCE

UNIVERSITY COLLEGE OF NORTH WALES

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A B S T R A C T.

The experiments described herein were designed to investigate the independent influence of press time and temperature on particleboard thickness swelling characteristics. Different press time (7 - 19 minutes) and press temperature (125°C - 255°C) combinations were used to manufacture laboratory resin free particleboards with target density of 666 Kg/m^3 using Norway spruce (Picea abies) flakes. The boards were exposed to 90% and 65% relative humidity, and their thickness performance monitored for 21 days.

There was good correlation between final thickness swelling and density, initial thickness swelling, moisture content gain and final moisture content particularly at high RH where the correlation coefficients ranged between 0.523 - 0.798. At low RH, final thickness swelling was highly correlated with density and initial thickness swelling (with correlation coefficients of 0.936 and 0.929 respectively).

Final thickness swelling, which ranged from 25% to 145% was found to be significantly influenced by both press time (95% level) and press temperature (99% level) at 90% RH. Other dimensional stability properties (Density, Initial moisture content, Final moisture content and Moisture content gain) were also influenced. Increasing either of the two variables (for temperature above 125°C) independently reduced thickness swelling of the boards.