Abstract:
Theoretical prediction provides basic understanding and guidance to correctly implement a certain technology in the production process. The present study uses a differential equation to predict the heat transfer time between the surface and core layer of wood during the heat treatment, with applicability in estimating the duration of heat treatments at high temperatures. The obtained prediction was compared with the result of an experimental study performed on Chinese poplar wood with various thicknesses (20, 40 and 60mm). During this experiment, the time necessary for the core of wood to reach a temperature of 100°C, 130°C and finally 180°C was monitored and the recorded values were compared with the predicted ones. The result of this comparison proved that the experimental values matched the theoretically predicted times, validating thus the applicability of the proposed equation as prediction tool.

Key words: heat treatment; poplar wood; heat transfer; theoretical prediction; experimental verification.

Received: April 2011
Accepted: May 2011
Published: June 2011