

Ventilation System of a Microwave Assisted Drying Kiln

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Abstract

The present study reports on the analysis and optimization of ventilation system inside of a drying lumber kiln. For most hardwood users, such as furniture manufacturers, lumber drying is an essential procedure in the manufacturing process. As with any part of the manufacturing process, costs must be controlled. Costs can be magnified by improper drying techniques that cause degrade, resulting in quality losses; mistakes can be made that cause problems in subsequent manufacturing processes; and considerable amount of energy can be wasted. The improvement and optimization of air distribution systems in drying kilns contributes to the preservation of the wood quality. The performance of the air flow field is examined in different situations and configurations. Depending on the fans that are switched on-off, we obtain various air flow distributions. The simulation is performed with the Comsol program using k- ϵ turbulent model and steady-state regime. These results highlight the presence of some recirculation regions and the distribution of the air flow.