

Specific energy consumption in industrial drying of radiata pine

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Abstract

This work was performed at a sawmill that dries radiata pine in a wood industry cluster located in the 8th region of Chile (Bio-Bio). The study evaluated the specific consumption of heat and electricity, and it proposed improvements to optimize energy consumption for drying of radiata pine. Experimental runs were conducted at accelerated conventional-temperature and high-temperature schedules in kiln-driers with a capacity of 100 m³. The experiments were designed by taking into consideration a control-run and then proposing modifications to the drying conditions. The heat and electricity specific consumptions were determined with data collected during the industrial runs and calculations based on physical relationships. The results showed that the energy consumption during the industrial drying of radiata pine was optimized by reducing the consumption of both thermal and electrical energies. It was found that in the high-temperature and accelerated conventional-temperatures drying runs respectively, the specific consumption of thermal energy was reduced in 5% and 14%, the specific consumption of electricity was reduced in 34% and 17%, and the drying time was reduced in 15% and 13%.

Keywords: Wood drying. Energy efficiency. Heat consumption. Electrical consumption