FLATTENING WAVY EUCALYPTUS VENEER THROUGH PRESSURE AND TEMPERATURE - A PRELIMINARY LABORATORY STUDY

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ABSTRACT

A study was conducted to identify the variables that play a key role in flattening partially dry, wavy eucalyptus veneer 0.5 mm thick and to determine the magnitude of these variables in a laboratory hot-press, in order to help in the development of a finish-dryer/press-dryer for industrial use. A graph based on regression data was developed in order to predict the reduction of veneer waviness and improvement of grade via hot-pressing.

Sliced eucalyptus veneer plays an important role in the forest products economy of the southern hemisphere. It is valued in the production of fine furniture, panels, and doors, both for domes-tic use and for export.

In a typical Chilean veneer mill pro-ducing annually 5 million m2 of sliced eucalyptus veneer 0.5 mm thick, a serious problem is the tendency of the veneer to buckle during conventional, non-pressure drying. About 10 percent of the dry veneer, most of it containing some portion of juvenile wood, is excessively wavy and must be rejected. This results in an estimated loss of $600,000 ($U.S.) per year to the mill.

One possible method to reduce the potential for waviness is to dry the veneer under pressure from the green condition to the dry condition (1-3,5,6). Another method, perhaps preferable when a conventional non-pressure dryer is available, should be to use this dryer to pre-dry and then use a relatively inexpensive finish-dryer/press-dryer that "hot-irons" the partially dry veneer until target moisture content (MC) is met and the veneer is sufficiently flat. Preferably, the finish-dryer is continuous and works in-line with the pre-dryer.

This paper discusses a preliminary laboratory study conducted in Chile to 1) identify the variables that play a key role in flattening wavy eucalyptus veneer by hot-ironing; and 2) determine the magnitude of these variables. This research may help in the development of a finish-dryer/press-dryer for industrial use.

PROCEDURE

Sliced 0.5-mm-thick *Eucalyptus globulus* veneer, 2.5 m long and up to 0.15 m wide, with a random degree of buckling, was pulled from an industrial veneer dryer of the conventional, non-pressure type. Because veneer sheets came from various sections of the dryer, they differed in MC and in waviness, which is inversely related to MC. Veneer sheets from a given dryer section were assembled into a package and wrapped in plastic for moisture equilibration. The veneer sheets were then cut to size (0.5 m in length and 0.1 m in width; one piece per sheet). We placed two pieces side by side on the platen of a laboratory hot-platen press; the press area measured 0.2 m across and 0.4 m along the pieces. We then applied pressure and heat.

Tests were conducted over a range in press pressure: 200 to 500 kPa (200 kPa given by the lower limit of the press capacity); press temperature: 80° to 200°C; press time duration: 5 to 40 seconds; and initial veneer MC: 6 to 87 percent (dry basis), hi total, 146 pieces were processed in this study.

Following standard practice of Chilean veneer mills, veneer waviness was defined as the ratio of wave thickness to veneer thickness, in mm/mm. Wave thickness and veneer thickness were measured before and after finish-drying as proposed by Lutz (4), with an accuracy of ±0.01 mm.

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