

Full Length Research Paper

Drying schedules calculation of Camiyani Black Pine (*Pinus nigra* Arn. subsp. *pallasiana* var. *pallasiana*) by computer programming

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In this study, computer aided drying schedules were developed for Camiyani Black Pine (*Pinus nigra* var. *pallasiana*) lumber for less than 30 mm thick, between 30-60 mm thick and larger than 60 mm. Schedules were calculated on drying gradient basis. In this software (named KILNBRAIN), users can find more than one hundred other species' data (density, fiber saturation point, temperatures for warming up and drying periods, drying gradients for moisture contents above and less than 20%). Users can choose lumber thickness, initial and final moisture content, kiln type, air velocity and drying quality. One of the advantages of KILNBRAIN is that the drying schedule can be operated manually according to this data. Moreover, possible total drying duration can be predicted.

Key words: Camiyani Black Pine, computer software, drying schedule.

INTRODUCTION

The wood of a living tree contains large quantities of water. When this wood is converted to lumber, it requires the removal of some of the water to enhance the attributes and physical properties of the lumber. This in turn increases the value of the lumber.

This increased value may allow the seller to obtain a higher selling price or provide entry into otherwise inaccessible market segments. If the value can be enhanced to the point where the total cost of delivering dried lumber is less than the difference in the selling price between green and dry lumber, a net contribution to profit can be realized. Drying may still be warranted even if a net contribution is not realized. If drying opens up new market segments, a zero or short-term negative contribution to profit may be forgiven in favor of the long-term viability of the operation (Peter, 2001).

Increasing the value of lumber requires improving its usefulness while minimizing quality losses. Usefulness can be increased through drying by improving the:

- resistance to biological attack by insects, bacteria, and fungus
- volume/weight ratio
- strength and stiffness
- appearance
- gluing properties
- finishing properties
- machining and assembly properties
- dimensional stability
- phyto-sanitary reasons stable product to store and ship

Although wood has many advantages, it also has some unwanted properties. Because of being organic material, it decays and burns easily. If it is dry it can absorb water (absorption) or if it is wet it can lose water (desorption) and change its dimensions depending on its environment (Kantay, 1993). Between 0 and 25-33% relative humidity levels described as hygroscopic humidity level, dimensions of wood material can change, swelling occurs as a result of absorption of water and shrinkage happens because of drying (Kantay, 1993; Ucuncu, 1992; Ors, 1986).

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