

## **Cutting a New Deal for Lumber Drying**

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Most of the stress-graded dimension lumber of nominal 2" thickness is kiln dried by the use of either an elevated or high temperature schedule and venting to the atmosphere. The end results tend to be high average moisture contents for the charge coupled with high standard deviations. If the wood possessed a high permeability for moisture movement perpendicular to the grain, results would be quite different. However, it is accepted that the rate of moisture movement parallel to the grain is about 15 times that of perpendicular to the grain. Green kerfing capitalizes on this fact by creating cuts perpendicular to the grain on both wide faces of the piece in a manner that converts the structural framing member into a simulated I-joist that retains around 95% of its non-kerfed moment of inertia. The slight reduction in edge-wise bending strength is more than regained by way of lower and more uniform moisture contents. An interesting side effect is higher stiffness for the kerfed. It appears that the kerfing minimizes the influence of shear upon the stiffness of the dried product. Also, the kerfing alters the moisture gradient in the boards during drying such that the resulting drying stresses produce less warp. This is especially evident in the case of crook. A general overview of the drying tests so far completed suggests that a comparatively low temperature, non-vented kiln could achieve an acceptable drying time via an optimum alliance of kerfed lumber permeability, dry and wet bulb temperatures, volume of air moved through the charge plus adequate capability of moisture condensation.

According to Comstock, 70% of the total energy used in the production of softwood dimension lumber is for the drying. In a non-vented kiln the latent heat of vaporization is retained and loss of energy is eliminated along with elimination of voc's. In addition, it is possible to envision a value for the condensate collected. It could likely provide an adequate water supply for some nearby green houses or other useful purposes.