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NEWS AND VIEWS OF THIS KILN DRYING BUSINESS

THE QUESTION: What are the principal advantages in seasoning lumber?

The Answer:

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I recently visited an automotive plant in Detroit, Mich. where trucks are dismantled and packed for export shipment. It came as quite a surprise to find that a carload of 2-inch resawn southern yellow pine that was being unloaded was so wet that it had begun to heat in the car and blue stain was spreading. The material is used for crates, and blue-stained stock probably will not influence crate performance; but certainly somebody paid some extra freight costs to ship excess water. The stock had supposedly been air dried. The customer is satisfied with air-dried stock at about 18 percent, but the stock received was much wetter than that. In addition to the blue stain that will develop until the stock is dry, with the possibility of decay also developing, the customer was forced to take losses due to warp, as good facilities for piling for air drying were not available. The wet condition of this so-called air-dried lumber and reports of other green lumber shipments at this time recalled to mind the 10 advantages of seasoning:

Ten Advantages

1. Seasoning reduces the likelihood of stain, mildew or decay developing in transit, storage or subsequent use. Blue stain fungi and wood-destroying fungi cannot grow in wood with a moisture content of less than 20 percent.

2. The shrinkage that accompanies seasoning can take place before the wood is put to use. The importance of this feature varies greatly with the use.

3. Wood increases in most strength properties as it dries below the fiber saturation point. The increase in strength with seasoning is much greater in small, clear specimens of wood than in large timbers containing defects. Due allowance is made for the increase in strength resulting from seasoning in stress-graded material 4 inches and less in thickness. In thicker

material the increase in strength to a large extent is offset by the influence of defects that develop in seasoning.

4. The strength of common fasteners, such as nails and screws, is greater in seasoned wood than in green wood seasoned after assembly. Panels made by nailing green lumber to a frame and allowed to season indoors 1 month before being tested were found to be about one-half as rigid as similar panels made of seasoned lumber and tested immediately. When bolts and connectors are used in green wood lower stresses are required than for dry material. Also, due to shrinkage, bolted joints in green material require retightening after the material seasons. However, it must be remembered that the availability of dry lumber is related to size. Where large size timbers are required, due consideration must be given to the effect of seasoning and shrinkage unless it has been predetermined that the material is available in a suitable seasoned condition.

Better Performance

5. Glued wood products can be expected to perform better when the moisture content of the wood at the time of gluing is as near as practicable to the average moisture content which the product is expected to have in service, provided it is below some 15 to 18 percent. Moisture changes in glued wood products induce stresses that favor warping and checking. These stresses reduce the strength of the glued joints and should, therefore, be avoided as far as possible.

6. Seasoning reduces the possible damage from insects that bore holes in wood in either the larval or adult stage. Seasoning protects wood from attack of most of these insects. The Lyctus or powder-post beetles work in dry wood, but exclusively in hardwoods and mostly in the sapwood only. If the dry wood is coated with the usual finishes, this beetle cannot lay its eggs in the wood, preventing pinholing. If the wood becomes infected before fabrication and finishing, losses can be prevented by a heat treatment, treatment with chem-

icals, or fumigation. Damage from Ambrosia beetles, which bore pinholes in green wood, can be prevented by heat sterilization in kiln-drying or by rapid air-drying immediately after the logs have been converted into lumber.

7. Successful treatment of wood with preservatives to extend its use under conditions favorable to decay required seasoning prior to treatment for best results. Applying surface treatments of preservative oils to green or wet wood is not very effective, because preservatives so applied cannot penetrate wood that is already full of water. In treating timber by pressure processes, however, artificial means of conditioning green timber to make it more absorptive can be used and thus avoid the long delay incident to air drying. Nevertheless, air drying, despite the greater time, labor, and storage space required, is the most widely used method of conditioning.

8. The electrical resistance of wood changes greatly as it dries. With a change in moisture content from about 30 percent to an oven-dry condition, the resistance increases a millionfold. Wood used in electrical equipment as an insulator or a dielectric should be kept dry.

9. Dry wood is a better thermal insulating material than wet wood. The thermal conductivity of wood is dependent upon a number of factors, of which moisture content is one of the most significant.

10. The appreciable reduction in weight accomplished by seasoning is an important factor in reducing shipping costs by rail.

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