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APPROXIMATE AIR-DRYING AND KILN-DRYING PERIODS FOR INCH LUMBER

The air-drying periods for 1-inch stock shown in table 1 are based on normal climatic conditions for the region in which the particular species is cut. In air drying those species that require a short drying time, the minimum period shown would be needed for stock piled in the yard in the spring or summer and therefore "on the sticks" during the fastest drying weather of the year. For species requiring one-half year or more of good drying weather, more satisfactory results can be accomplished when the stock is piled in the fall and winter because less checking and stain occur during cold or wet weather, and the moisture content comes to a minimum under effective drying conditions during the following spring or summer. Long periods of cold or wet weather increase the maximum period required, but not necessarily the minimum period. Local yard and weather conditions -- that is, yard site, direction of prevailing winds, and variations in temperature and relative humidity -- should be considered as well as the general seasonal factor in estimating time required for air drying.

In the portion of the table devoted to kiln drying, the minimum periods represent the fastest drying rates actually noted in modern forced-circulation kilns, but are often attained at some sacrifice of quality. Where the product requires precision drying, longer drying periods may be necessary.

Although table 1 lists kiln-drying periods for lumber green from the saw, the hardwoods are for the most part air dried to some extent before entering the kiln, while most softwoods that are kiln dried at the mill are loaded into the kiln green from the saw. Factors affecting the period required for kiln drying are type of kiln, quality or standard of drying, width of stock, type of sawing (plain or quartered), and preponderance of heartwood or sapwood. The time required for kiln drying, as might be expected, also varies with the product being manufactured. The general run of stock used for furniture and interior trim can be dried under somewhat less exacting conditions than special items like saddle-seat and airplane stock, for which moisture distribution and stress requirements are very rigid.

The drying periods given in table 1 apply only to inch lumber. The drying time for thicker stock is more than proportional to the increased thickness. Theoretically, the drying time for thicker stock is very nearly proportional to the square of the thickness for wide boards and planks. This general rule applies more nearly under controlled kiln-drying conditions than under varying air-drying conditions.

A list of other Laboratory publications which give information on the seasoning of lumber is available on request.

TABLE 1.--APPROXIMATE DRYING PERIODS FOR 1-INCH LUMBER¹

| Species | Days required to | | |
|-----------------------|------------------|-------------------------|-------------|
| | ----- | | |
| | Air dry | Kiln dry 4/4 stock from | |
| | 4/4 green | 20 percent | Green to |
| | stock to | to 6 percent | 6 percent |
| | 20 percent | | |
| | | | |
| | | (Commercial | (Commercial |
| | | schedule) | schedule) |
| | | | |
| <u>Hardwoods</u> | | | |
| Ash | 70 to 200 | 4 to 7 | 11 to 15 |
| Aspen | 50 to 150 | 3 to 5 | 7 to 10 |
| Basswood, American | 50 to 150 | 3 to 5 | 7 to 10 |
| Beech, American | 70 to 200 | 5 to 8 | 12 to 15 |
| Birch | 70 to 200 | 5 to 8 | 11 to 15 |
| Cherry | 70 to 200 | 5 to 7 | 10 to 15 |
| Chestnut, American | 60 to 150 | 4 to 8 | 8 to 12 |
| Elm, American | 60 to 150 | 4 to 6 | 10 to 15 |
| Hickory | 70 to 200 | 8 to 14 | 20 to 40 |
| Magnolia | 60 to 150 | 4 to 6 | 10 to 15 |
| Mahogany | 60 to 150 | 4 to 7 | 12 to 15 |
| Maple | 70 to 200 | 5 to 8 | 11 to 15 |
| Oak, lowland | 100 to 300 | 8 to 15 | 25 to 50 |
| Oak, upland red | 70 to 200 | 5 to 10 | 16 to 30 |
| Oak, upland white | 80 to 250 | 6 to 12 | 20 to 35 |
| Sweetgum (red gum) | 100 to 300 | 8 to 12 | 15 to 25 |
| Sweetgum (sap gum) | 70 to 200 | 5 to 7 | 10 to 15 |
| Tupelo, black & water | 70 to 200 | 5 to 7 | 10 to 15 |
| Walnut | 70 to 200 | 6 to 8 | 12 to 20 |
| Yellow-poplar | 60 to 150 | 4 to 6 | 10 to 15 |
| | | | |
| <u>Softwoods</u> | | | |
| Baldcypress | 100 to 300 | 5 to 10 | 10 to 20 |
| Douglas-fir | 20 to 200 | | 2 to 4 |
| Fir, white | 40 to 150 | | 3 to 5 |
| Hemlock, Western | 60 to 200 | | 3 to 5 |
| Pine, Eastern white | 60 to 200 | | 4 to 6 |
| Pine, ponderosa | 40 to 150 | | 3 to 5 |
| Pine, southern yellow | 40 to 150 | | 3 to 5 |
| Pine, sugar | 40 to 150 | | 4 to 6 |
| Pine, Western white | 50 to 200 | | 3 to 5 |
| Redcedar, Western | 50 to 200 | | 10 to 15 |
| Redwood | 60 to 250 | 3 to 7 | 7 to 15 |
| Spruce, Sitka | 40 to 150 | | 4 to 7 |

¹Because of the many factors affecting drying rate and the lack of specific data covering each case, wide variations from these values must be expected. They are intended only as representing a general picture of average drying periods and should not be used as time schedules.