

TECHNICAL NOTE NUMBER 188

FOREST PRODUCTS LABORATORY U. S. FOREST SERVICE · MADISON, WISCONSIN.

KILN DRYING DOUGLAS FIR COMMON LUMBER

The kiln drying of Douglas fir common is a problem which differs in several respects from most kiln drying problems. In order that the knots shall not drop out of the wood, the maximum temperature must be limited more or less by the melting point of the resin around the knots, and the humidity kept high enough so as not to allow excessive differential shrinkage between the knots and the body wood. The difficulty of keeping the knots in place is lessened to some extent by the fact that it is usually not necessary to dry common lumber to a moisture content lower than 15 per cent. A new complication is added, however, inasmuch as it is very difficult to bring heartwood and sapwood to a uniform moisture content as high as 15 per cent by any ordinary kiln-drying method.

These unusual requirements demand that a kiln for drying Douglas fir common shall have a very rapid and uniform circulation. Provision must be made for keeping at a minimum the lag in drying rate which exists between the entering-air edge of the lumber pile and the leaving-air edge. Three means to this end are: rapid circulation, shortness of air travel, and periodic reversal of the circulation.

The schedules call for a temperature of 175 degrees F. constant throughout the entire drying period. For 1 by 6, 1 by 8, 2 by 4, and 2 by 6 inch stock, the humidity may be kept constant at 70 per cent. For 1 by 10, 1 by 12, 2 by 8, 2 by 10, and 2 by 12 inch stock, it is better to use a humidity of 80 per cent for the first half of the run, dropping to 70 per cent for the last half. The drying time varies considerably with the size and shape of the stock. For 1 by 8 inch material, dried to 15 per cent moisture, it should be about 32 hours.

Drying much below 15 per cent moisture is not recommended. At this moisture content the underweights are much better than those usually obtained in air seasoning. The total kiln and planing-machine degrade should average not more than 15 per cent if the recommended schedules are followed and the lumber is dried in suitable kilns to a final moisture content of 15 per cent.