

LUMBER DRYING RESEARCH AT THE UNIVERSITY OF CALIFORNIA  
FOREST PRODUCTS LABORATORY

By  
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The research program of the Forest Products Laboratory calls for investigations in many phases of the entire field of wood utilization. To assist in programming, ten research sections are being activated, each dealing with a rather specific area. One of these ten sections is that of Timber Physics. The Laboratory staff working in this section will carry on studies relating to the physical properties of wood, including wood moisture relations and kiln- and air-drying. In addition, one of the other sections, Chemical Processing, will investigate chemical processes applicable to the removal of moisture from wood. Other research sections will conduct, as part of their activity, studies directly related to the drying of lumber, veneer, and other wood products. Investigations of stain and decay, as well as the relationship of wood extractives to lumber drying, are some of the problems they will attack.

To date our research program in most of these areas has not gotten under way. During this past year equipment has been procured, and recruitment of personnel to carry on the studies has actively moved ahead. Consequently at this stage plans, rather than accomplishments, must be discussed.

Several items of equipment for research in drying have already been received or are on order. Three dry kilns have been purchased, all three being of the internal fan cross-circulation type. Two of these are quite small units holding about 500 board feet each, and will be located in the pilot plant area. The third kiln which will have a capacity of around 6,000 board feet will be housed in a separate kiln building which is to be erected shortly. These kilns are so designed as to make possible the study of certain variables, such as effect of rate of air flow, high temperatures, and steam consumption. Another

piece of equipment which will be erected soon will permit studies of the use of both vapors and solvents in the drying of wood. Of importance also in the study of wood drying and wood moisture relations in general, are the controlled temperature-humidity rooms. These rooms, of which there are four, permit equalizing the moisture content of wood at any one of the number of moisture contents. Other equipment of interest includes moisture meters, a recording potentiometer, an anemometer for determining rate of air movement, as well as the necessary oven and balance equipment which is always so essential.

Present plans for staffing the Timber Physics Section envisages a minimum of three men, consisting of two wood technologists and an assistant. It is hoped that one and possibly two of the three men will have been employed by September of this year. In addition to these men, staff in several of the other research sections, as mentioned above, will be devoting at least part time to problems relating to the drying of wood.

Some of the specific problems which will be investigated are as follows:

1. The development and improvement of drying schedules for native hardwoods. Some very fine work on hardwood schedules has already been done by the Oregon Forest Products Laboratory and the U. S. Forest Products Laboratory. Work will be confined to those species for which schedules are either not available or where the information available is limited in scope.

2. The investigation of the drying properties of second growth and secondary coniferous species. In some instances, fast grown second-growth timber may have a greater tendency to warp than old growth. This and other characteristics are to be investigated. In the case of secondary coniferous species, the situation is much the same as with the hardwoods. The objective will be to develop drying information for those species where information is either lacking or limited.

3. Investigation of moisture content determination methods. Rapid and accurate methods of determining moisture content are needed in the industry. Some very workable devices are already available for checking moisture content below the fibre saturation point. Similar devices or techniques for rapidly checking green moisture content would be extremely helpful.

4. Investigation of various solvent and vapor seasoning methods. These methods hold promise in the drying of some of the hardwoods which are difficult to air dry and kiln dry.

5. Investigation of the economics of air drying, kiln drying, and solvent and vapor drying.

6. Study of factors causing degrade of lumber during the drying operation. Such factors not only include a tendency of wood to warp and check, but also such things as stain and decay. In this connection, the influence of wood extractives on chemical staining in species such as redwood, ponderosa pine and sugar pine will be investigated.

In financing research the Forest Products Laboratory, as part of the University of California, receives support from State funds. In addition, the Laboratory will be in position to conduct sponsored research for private industry. In general, problems which are of widespread interest in the State will be investigated, using State funds. Problems which are of particular interest to an individual firm or to a small segment of the industry are of the type which logically should be carried on under sponsorship.

In addition to the research program, the Forest Products Laboratory plans to conduct various intensive short courses, including courses in kiln drying. The first such course, a one-week session on kiln drying, has been tentatively scheduled for next fall. The Laboratory will also make available to interested companies and individuals copies of publications giving research findings.