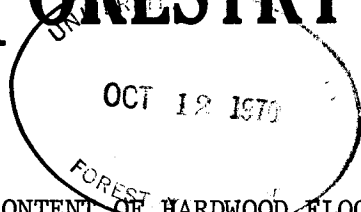


MINNESOTA FORESTRY NOTES

COPY 2

No. 151

July 15, 1964



FACTORS INFLUENCING MOISTURE CONTENT OF HARDWOOD FLOORING PRIOR TO APPLICATION IN THE TWIN CITIES AREA

Robert D. Thompson ^{1/}

A large amount of the lower grades of oak and hard maple lumber are utilized in the manufacture of flooring. Oak flooring mill shipments declined approximately one-third during the period 1955 to 1962 (from 1.2 billion bd. ft. to 0.8 billion bd. ft.).^{2/} The losses in this market could result from a number of factors and are of concern to those responsible for management of the forest resources as well as to the businesses directly involved in processing and selling flooring.

Cracks and buckling in hardwood floors have been a persistent problem and could be contributing to the reduction in markets. Cracks and buckling occur when flooring is laid at a moisture content (M.C.) which is either too high or too low. The U. S. Forest Products Laboratory recommends that the material be laid, in this climate, at a 7 to 8 percent M.C. unless laid over a concrete slab. The M.C. of the flooring should then be slightly higher.^{3/}

Flooring is normally kiln dried at the mills to 5 to 6 percent M.C.^{4/} It is then shipped by rail or truck to wholesalers, retailers, or large flooring contractors where it is stored until delivery.

Very little flooring is packaged; in a few cases, pallets of about 1000 bd. ft. are placed in corrugated boxes or wrapped in kraft paper. Even when such precautions are taken, the product can absorb moisture while in storage.

A survey of the Twin Cities area lumber dealers and flooring contractors was made during the summer of 1963, to determine if handling, storage, and laying methods are such that the M.C. of hardwood flooring is at or near the recommended 7 to 8 percent when installed. A random sample of these businesses listed in the telephone directories of Minneapolis and St. Paul was drawn. Data were collected using interview schedules in personal contact with thirty lumber dealers and six flooring contractors. Moisture meter readings were taken from flooring in storage and storage sheds were rated by the author. Criteria for rating was based on information contained in Tips on Hardwood Flooring by National Oak Flooring Manufacturer's Association. Sheds were rated excellent if completely enclosed, weather tight, and 18 inches or more above the ground and ventilated underneath; a rating of good, if weather tight but built on a concrete or asphalt slab on the ground; and poor, if open or alleyway type storage and dirt floor.

Only one dealer in thirty (3%) was found to specify the M.C. of flooring bought and he specified 12 percent. Four dealers (13%) said that they occasionally check the M.C. of flooring shipments which they receive.

Table 1. M. C. Readings of Hardwood Flooring Under Three Shed Conditions

	Low M.C. (Under 6.0%)	Good M.C. (6.0% to 8.0%)	High M.C. (Over 8.0%)	Total
Excellent Storage	0	3	3	6
Good Storage	0	5	2	7
Poor Storage	0	4	8	12
Total	0	12	13	25

^{1/} Instructor, School of Forestry, University of Minnesota.

Three of six (50%) of the floor laying contractors said that they occasionally check M.C. of the flooring they lay. When asked what they considered the "ideal" M.C. at which to lay flooring, one applicator reported 8 percent, another 9 percent, a third 12 percent and three didn't know. Four (67%) of the applicators followed no specifications from flooring manufacturers or associations in their laying method. A lack of information or instructions at the retail level for floor laying was apparent. Manufacturer and association literature is available because a collection of this was made from wholesalers after the survey of retail dealers and applicators was completed.

If a large proportion of dealers and applicators never specify or check the M.C. of their flooring and no one checks regularly, it is possible that much of the flooring is installed at non-recommended M.C. Of the dealers checked, thirteen (52%) had flooring in stock which was over 8 percent M.C. (Table 1). From the cross tabulation of M.C. and shed conditions, it is obvious that even excellent storage doesn't insure low M.C. so under present conditions of storage and handling it is doubtful that flooring can be kept at the desired M.C. It is possible that individual bundles of flooring could be packed in vapor proof packages after drying at the mills to the correct M.C. Assuming the bundles were then carefully handled and not opened until time for installation, the M.C. would be controlled at the correct level.

Table 2. Survey Results of Dealer Complaints and Opinions as to Effect of Cracks and Buckling on Hardwood Flooring Sales.

	Dealer Thought Cracks and Buckling of Flooring				Total
	Are Affecting Sales		Are Not Affecting Sales		
Minimizing Complaints Would	Result in More Sales	Not Result in More Sales	Result in More Sales	Not Result in More Sales	
Dealers With Complaints	1	3	3	13	20
Dealers With No Complaints	2	0	1	7	10
Total	3	3	4	20	30

There is a definite need for more information among the floor laying contractors and the lumber dealers regarding the effect of M.C. on the finished floor as well as other technical aspects of floor laying and handling. This is apparent from Table 2. Eight dealers (27%) have had complaints from customers about cracks and buckling. Seven dealers (23%) thought that if the problem of cracks and buckling could be minimized more flooring would be sold. Most dealers (80%) did not believe cracks and buckling were affecting the sale of hardwood flooring.

Other aspects of the marketing of hardwood such as finishing, advertising and promotion, distribution channels, and consumer acceptance need to be investigated if hardwood flooring is to maintain its competitive market position.

LITERATURE CITED

- 2/ National Oak Flooring Manufacturer's Association. Trends of oak flooring. Memphis, Tenn. June 28, 1963.
- 3/ Forest Products Laboratory. Wood floors for dwellings. Agriculture Handbook No. 204. U. S. Dept. of Agriculture, Forest Service. Sept. 1961. P. 1.
- 4/ O'Connor, Bernard J. Hardwood flooring, its history and development. Wood Working Digest. Vol. 51, No. 12. Dec. 1949.