

TECHNICAL NOTES

FOREST PRODUCTS LABORATORY

U. S. FOREST SERVICE

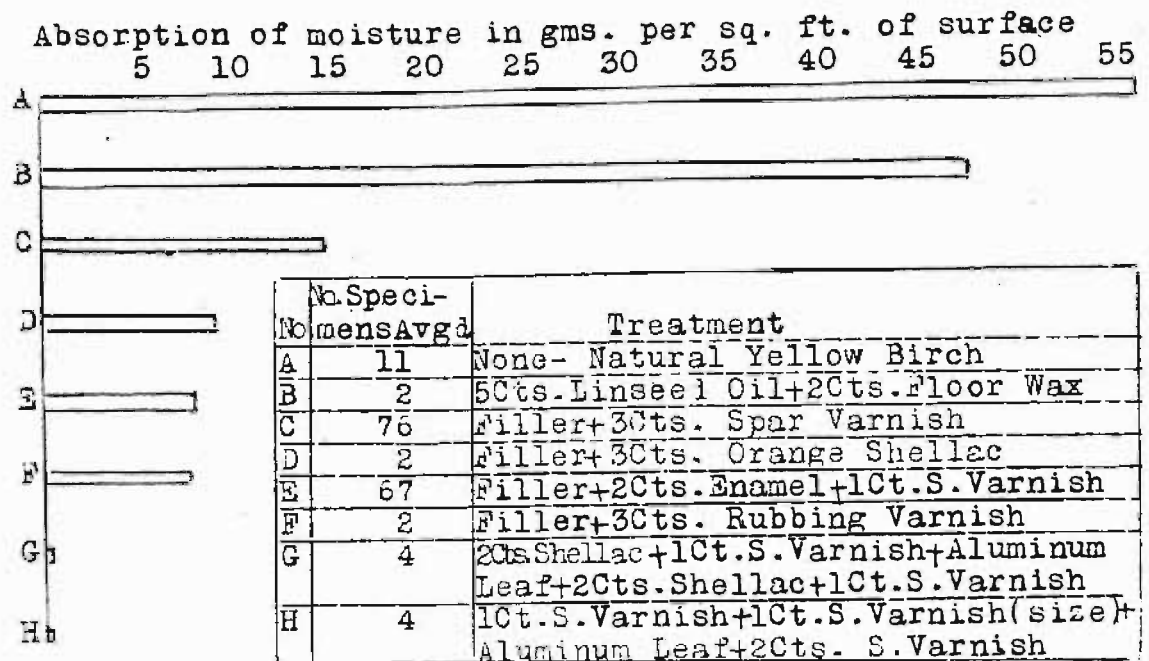
MADISON, WISCONSIN

No. F-3

ALUMINUM LEAF TO MOISTURE PROOF WOOD

A very effective agent for moisture proofing wood has been found in an aluminum leaf coating. This coating practically insulates the wood against any change in atmospheric conditions, and is therefore particularly valuable for use where exceedingly accurate form and balance must be maintained, as in an airplane propeller.

The comparative effectiveness of aluminum leaf, spar varnishes, enamels, and other water resistant finishes tried out by the Forest Products Laboratory, is shown in the accompanying graph.



Average Absorption of Moisture by Wood through Different Coatings when Exposed for 17 days to 95-100% Humidity

Aluminum leaf coating, it will be seen, is about 25 times as moisture resistant as the average spar varnish.

Two types of aluminum leaf finishes have been used, which are about equally impervious to moisture. One makes use of spirit varnish and the other of oil varnish, the successive coats being as follows:

Spirit Varnish Type.- Filler +1
or 2 coats orange shellac +1 coat spar var-
nish used as a size +1 coat aluminum leaf +
2 coats of orange shellac with desired color
+1 coat spar varnish.

Oil Varnish Type.- Filler +1 or 2
coats spar or rubbing varnish +1 coat spar
varnish used as a size +1 coat aluminum leaf
+ 2 coats spar varnish or enamel.

Coating wood with metal leaf is not nearly so slow a process as laying leaf in sign-making. As soon as the size reaches the right condition, the leaf can be applied directly from the book without the aid of gilders' tips or necessity of skilled workmanship. The time required to apply leaf to a propeller should not be more than 40 or 50 minutes, and this could be reduced as the finisher becomes more experienced.

It is important to allow the size to reach the proper condition before attempting to lay the leaf; the right point is just before the varnish sets dust free. The time required to reach this condition varies with the type of varnish used, but for spar varnishes it is usually from 1-1/2 to 2 hours after application. The workman will soon learn how to judge the condition of the size by touching it lightly with his fingers. The size will dry much quicker if it is thinned about one-fourth with turpentine. It should be applied as sparingly as possible.

To apply the complete finish of the spirit varnish type requires in the neighborhood of 10 hours and to dry the various coats about 90 hours making the total time about 100 hours. The oil varnish finish takes longer to dry and would probably total 240 hours. The latter finish is possibly the more durable coating.