

# TECHNICAL NOTES

FOREST PRODUCTS LABORATORY

U. S. FOREST SERVICE

MADISON, WISCONSIN

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## EFFECT OF WRAPPING ON THE STRENGTH OF AIRPLANE STRUTS

The practice of wrapping airplane struts or wing beams with canvas developed under the supposition that such wrapping increased the strength of the members at critical points, prevented sudden failures, and kept out moisture. Wrapping has been advocated especially for cross-grained material in order to make available for airplane construction stock which would otherwise be rejected

Extensive tests have been made at the Forest Products Laboratory for the United States Air Service to determine the reinforcing value of such wrapping. These tests were made upon cross-grained struts of Sitka spruce and Douglas fir partly or entirely covered with Bakelized canvas or the standard cotton tape, and upon some of the same struts with the wrapping removed.

The conclusions reached from the tests were as follows:

The addition of Bakelized canvas to cross-grained struts increases the load somewhat but decreased the load per unit weight; it also increases the deflection and work to final failure and hence the shock-resisting capacity of the struts.

Wrapping cross-grained struts with cotton tape according to standard methods has no appreciable effect on their strength. It is doubtful if any other methods of wrapping such as cording would increase the strength properties very greatly. There is also the probability that any wrapping or covering will be loosened by weather changes.

It is believed that canvas, tape, or cord covering is of less value than the same volume of wood, and since such a covering is likely to be heavier than wood it is of still less value when compared with the same weight of wood.