

**THE EFFECTIVENESS OF SPLICING NOTCHED PALLET
STRINGER SEGMENTS WITH METAL CONNECTOR
PLATES**

by

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(ABSTRACT)

Notched stringer segments spliced with metal connector plates (MCPs) and pallets with spliced stringer(s) were tested in static bending in order to determine the relative effectiveness of different stringer splicing methods and under what conditions the process is or is not effective. The species tested were oak, southern yellow pine, yellow-poplar, and two combined species – oak and yellow-poplar, and oak and southern yellow pine. The metal connector plates used were 3 x 4-inch, 3 x 6-inch truss plates, and a 3 x 4-inch plug plate.

The splice methods tested were a vertical splice (VS), a 45° angle splice (AS), and a vertical splice with $\frac{1}{2}$ -inch gap between segments (VSG). The results of bending tests of these specimens were compared to non-spliced whole stringers and pallets containing whole stringers. Multiple comparison, statistical methods were used to analyze all test data. An analysis of the failure locations and types of specimens was also used to analyze test results.

Vertical spliced stringers with 3 x 4 and 3 x 6 inch truss plates were the best designs of those tested. Spliced stringers were an average of 112% and 74% bending strength and stiffness of new non-spliced stringer. These plates were an average of 26%

stronger and 13% stiffer than the 3 x 4 inch plug plate splice stringer. There was no difference between the performance stringers spliced with 3 x 6 and 3 x 4 inch truss plate. An angle splice design and the addition of 1.25 x 6 inch truss plate on the tension side of spliced stringer did not appear to improve the strength and stiffness. A gap between segments significantly reduces splice strength and stiffness by an average of 35% and 16% respectively. When mixing stringer segment species, the performance is determined by the weaker segment.

The average strength and stiffness of pallets containing spliced stringers were similar to that of pallets with whole stringers, however the variation in performance was greater when notched stringer pallets contain splices.