

## Imported Plywood Panels from Brazil Evaluated for Conformance to U.S. Product Standard PS 1-09 Requirements

### SUMMARY

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Brazilian softwood plywood panels recently imported into the United States bear trademarks that state compliance with U.S. Voluntary Product Standard PS-1, *Structural Plywood*. Tests conducted at APA – *The Engineered Wood Association* measured the structural performance of this panel type. Test results indicated that the imported Brazilian panels did not meet the stiffness requirements of the designated species grouping or the referenced Span Rating for roof sheathing, as defined in the Standard.

### APA TEST SERIES

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Structural softwood plywood panels imported from Brazil into the U.S. totaled 721 million square feet (on a 3/8-inch basis) in 2017. Generally, these panels were manufactured using veneers of wood species grown outside of North America. APA conducted a series of tests on nine sets of Brazilian plywood imported from seven manufacturers. The tests were completed at the APA Research Center in Tacoma, Washington, in July 2017 through April 2018. The plywood panels were sampled from multiple distribution yards in the U.S. All panels tested were trademarked as U.S. Product Standard PS 1, *Structural Plywood*.

Figures 1 and 2 show the test results for panel bending stiffness. As shown in Figure 1, the tested plywood panels failed to meet the PS 1 bending stiffness requirements (PS 1, *Table 9 Species Group Classification Test Criteria for Other Than Span-Rated Panels*) for Group 1 by a margin of **23 to 55 percent**. For Span-Rated plywood sheathing, Figure 2 shows that corresponding panel bending stiffness failed to meet the required 0.2-inch deflection criterion (PS 1, *Table 8 Uniform Load Performance Criteria*) for Roof-48 Span-Rated panels at 35 psf by a margin of **15 to 41 percent**.

FIGURE 1

COMPARISON OF TEST RESULTS WITH THE REQUIRED PANEL BENDING STIFFNESS (EI) FOR IMPORTED GROUP 1 PLYWOOD (TABLE 9 OF PS 1) AS TRADEMARKED

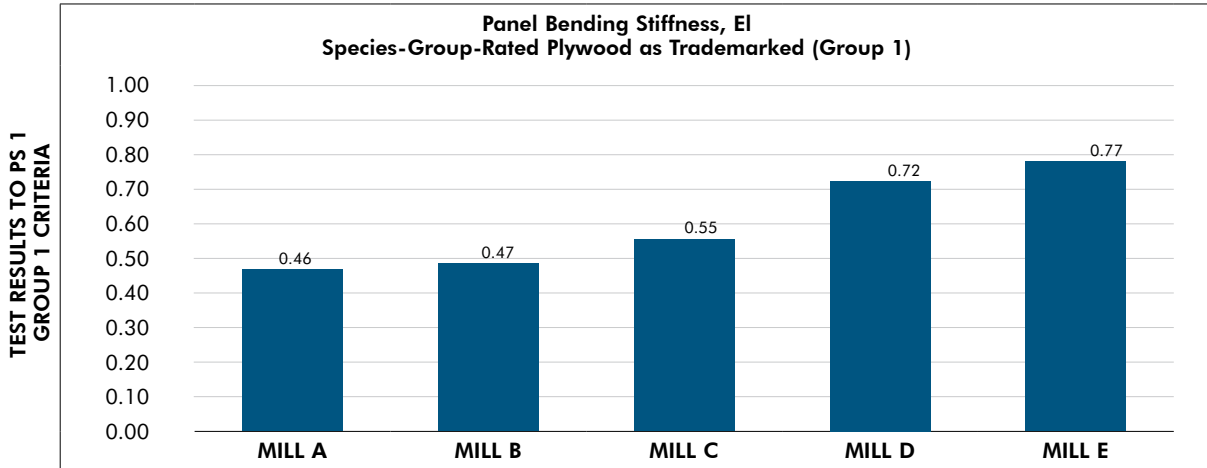
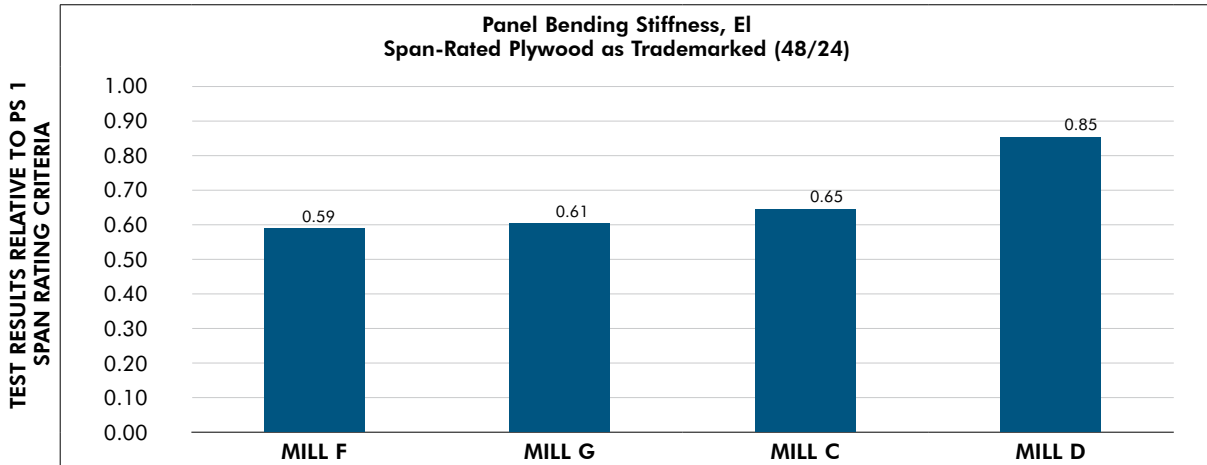


FIGURE 2

COMPARISON OF TEST RESULTS WITH THE PANEL BENDING STIFFNESS (EI) REQUIRED TO SATISFY THE 0.2-INCH DEFLECTION CRITERION (TABLE 8 OF PS 1) FOR ROOF-48 SPAN-RATED PANELS AT 35 PSF



## CONCERNS

None of the individual lots of plywood panels performed at the serviceability level documented for Group 1 species within PS 1. In addition, none of the Span-Rated plywood sheathing lots, when used as structural members at the Span Rating shown in the trademark, complied with the roof deflection criteria within PS 1.

## SAMPLING

The nine data sets of panels from seven Brazilian plywood manufacturers are described in Table 1. Each data set included five or more sheets of 4x8-foot panels. All plywood panels were 7-ply 7-layer construction and carried PS 1 trademarks issued by accredited inspection agencies.

TABLE 1

**BRAZILIAN PLYWOOD SAMPLES**

Mill ID	Category	Species Group/Span Rating	Bond Class
A	23/32	B-C Group 1	EXT
B	23/32	B-C Group 1	EXT
C	23/32	B-C Group 1	EXT
D	23/32	B-C Group 1	EXT
E	23/32	B-C Group 1	EXT
F	23/32	48/24 Sheathing	EXP 1
G	3/4	48/24 Sheathing	EXP 1
C	23/32	48/24 Sheathing	EXP 1
D	23/32	48/24 Sheathing	EXP 1

**TESTED PROPERTIES**

Plywood specimens were prepared and tested in accordance with Section 6.2.3, *Test for Panel Bending*, of PS 1 in the flatwise bending along the major panel axis direction. The bending stiffness was determined from the data. For species-group-rated (i.e., non-Span-Rated) panels, the test results are compared directly to the criteria shown in Table 9 of PS 1. To assess compliance with PS 1 for Span-Rated panels (48/24 sheathing shown in Table 1), equivalent deflection under uniform load was calculated for Span-Rated panels based on the roof span of 48 inches o.c. and compared to the criteria shown in Table 8 of PS 1.

**CREDENTIALS**

Founded in 1933, APA – *The Engineered Wood Association* is a not-for-profit trade association located in Tacoma, Washington. APA is a test laboratory accredited under ISO/IEC 17025 and a certification organization accredited under ISO/IEC 17065 for engineered wood products.

**DISCLAIMER**

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## Imported Plywood Panels from Brazil Evaluated for Conformance to U.S. Product Standard PS 1-09 Requirements

We have field representatives in many major U.S. cities and in Canada who can help answer questions involving APA trademarked products. For additional assistance in specifying engineered wood products, contact us:

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