

Walking the plank: Chinese LVL fails accredited testing

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THE lives of construction workers in Australia and the US are threatened by increasing imports of sub-standard building materials from China that have failed tests in both countries for structural and adhesive performance.

The latest report on product failures comes from the American APA-Engineered Wood Association, which evaluated industrial laminated veneer lumber (LVL) scaffold planks from China. The association said although the sample sizes were limited and did not represent all Chinese LVL plank production, the rise in product failure reports was cause for concern.

The tests compared the adhesive and mechanical properties of the imported planks relative to similar products manufactured in the US and Canada.

“The poor adhesive and low bending performance of the Chinese LVL scaffold planks is not only a serviceability concern, but more importantly a life safety issue,” an APA spokesman said. “These products do not meet certification requirements of the OSHA scaffold plank regulations and ANSI A10.8, Safety Requirements for Scaffolding – American National Standard for Construction and Demolition Operations.”

Similar failures in Australia with some LVL and plywood formwork from China have been recorded by the Engineered Wood Products Association of Australasia.

Results from limited samples tested in the American APA study show that the bending stiffness of the imported Chinese LVL scaffold plank products is 20% below the value labelled on the product. Similarly, the bending strength is about 30% below comparable 2.2E LVL scaffold planks manufactured in the US.

The data also indicates that glue-bonded performance is inconsistent and the bonded durability does not meet the PS1 requirements.

The APA reported that the Chinese LVL planks sampled were labelled as “2.2E proof tested”. Also the products were labelled “OSHA” on each piece, inferring compliance with the OSHA scaffold.

Two lots of 1-1/2 in. (38.1-mm) Chinese manufactured LVL scaffold plank and one lot of 1-1/2 in. (38.1-mm) US manufactured Douglas fir LVL were sample tested. Properties evaluated were adhesive bond quality, bending stiffness and strength.

US LVL products are required to meet glue bond durability requirements. For scaffold plank applications, the PS 1 exterior bond classification is considered appropriate. Samples were cut to 1 in. x 3-1/4 in. strips, kerfed to an inner glue line and exposed to both vacuum-pressure-soak and boil cycles. The samples were sheared and evaluated for wood failure based on PS 1 procedures, the standard method of evaluating exterior bonds in plywood.

Overall, boil cycle results were favourable (95 and 93% compared to the exterior bond requirements of 85%). The Chinese LVL planks failed the vacuum-pressure-soak cycle with a low average wood failure of 78%. The delaminating results indicate that the planks were probably manufactured with water-resistant adhesive(s). However, the failing glue bond durability from each tested lot suggests that the glue bond quality may be inconsistent.



Chinese scaffolding. Just how safe is it!

Test results indicate that the 2.2E scaffold planks, as labelled on each piece of the Chinese product, are only good for 1.8E (20% below the proclaimed value). Based on the procedures for deriving the allowable design values specified in ANSI A10.8, the Chinese LVL scaffold planks achieved a level of only 2100 psi. This performance level is about 30% lower than comparable 2.2E LVL scaffold planks manufactured in the US, which typically have an allowable bending stress of 2900 psi for 1-3/4 in. or less in thickness.

It is required by OSHA regulations and ANSI A10.8 that "all laminated scaffold shall bear the seal of an independent, nationally recognised inspection agency certifying compliance with the design criteria referenced in the standard".

It is clear from the product labelling, that the tested scaffold plank products from China are not certified by an independent agency recognised in the US.

Based in Tacoma, in the northeast state of Washington, APA is an internationally accredited quality testing and inspection organisation representing US and Canadian manufacturers of structural engineered wood products, including plywood, oriented strand board, glulam timber, wood I-joists, and structural composite lumber. Among its functions are market support and development, including support of member interests in global trade issues.

APA earlier this year, voiced support for an International Trade Commission (ITC) review of Chinese hardwood plywood imports.

APA president Dennis Hardman said he believed an ITC review would demonstrate that imported Chinese plywood often is improperly, and in many cases fraudulently, labelled, posing serious potential product performance problems.

The ITC investigation, which began last April, is due to be completed and a report issued in June.

Suspicion has also fallen on Chinese plywood imports to the US following testing by the USA's top health agency found high levels of formaldehyde in government issued travel trailers and mobile homes used as emergency housing in the Gulf Coast region after hurricanes Katrina and Rita in 2005.

After detecting high levels of formaldehyde, the Federal Emergency Management Agency (FEMA) hastened to move people out of 35,000 trailers and into other accommodations.

The US Centre for Disease Control and Prevention, which conducted the testing, said the levels in many of the affected trailers and mobile homes were higher than would be expected indoors. Preliminary evaluation of a random sample of 519 travel trailers and mobile homes tested between December 21, 2007 and January 23, 2008, showed average levels of formaldehyde in all units of about 77 parts per billion, ppb. Some formaldehyde levels in the trailers were more than seven times the average of 77 ppb. Levels measured ranged from three ppb to 590 ppb.



Walking the plank in China: Imported Chinese LVL scaffold planks that have failed rigid testing in Australia and the US are putting lives at risk.

The American APA-Engineered Wood Association has developed a position statement in response to news reports that misleadingly suggest structural wood panels might be responsible for elevated formaldehyde levels found in the travel trailers and mobile homes supplied by FEMA to the hurricane victims.

The statement clarifies the difference between urea and phenol formaldehyde adhesives and explains that structural plywood and oriented strand board manufactured to PS 1 or PS 2 either meet or are exempt from the most stringent standards and regulations in the US and abroad.

FEMA plans to dismantle some of the tested units in an attempt to identify the precise source or sources of the colourless gas

Concerns in Australia about sub-standard imports were strengthened when a leading NSW-based plywood manufacturer was asked to examine the air quality in a warehousing operation.

One of the manufacturer's customers had received several shipments of plywood from China, and the warehousing operator felt that the atmosphere around the plywood was contaminated.

"We ran a few tests and determined that formaldehyde was coming off the plywood," a spokesman said. "We explained to the warehousing operator that urea formaldehyde is a common adhesive used in the manufacturing of plywood. We also noted that we had never heard of the urea formaldehyde deteriorating into formaldehyde gas."

The warehousing operator has since rejected further shipments of this plywood.



Poor showing: Severe delaminating in a Chinese LVL product imported into Australia.