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Forest Products Center

UT Extension
W176

WOOD PRODUCTS INFORMATION

Wood Products Test Results

Properties of 'enhanced' OSB subfloor panels

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'Enhanced' OSB panels

Oriented strandboard (OSB) is a structural panel that can be used in place of plywood. OSB has strength and stiffness properties that are similar to plywood but it is often less expensive. OSB is commonly used in wall and roof sheathing and in subfloor applications.

OSB is intended for dry-use applications and can swell substantially if the panels get wet during construction or in use. Swelling in thickness at the edges of OSB subfloor panels can result in the need to sand the entire subfloor to achieve a flat, uniform surface prior to installation of the flooring. In response to this situation, manufacturers have each developed 'enhanced' OSB subfloor (23/32-inch) products that they claim have improved thickness swell properties.

There are no special standards for enhanced OSB subfloor panels, nor any publicly available data regarding the performance of these more expensive, enhanced panels. Testing at the Forest Products Center was conducted to assess the performance of various brands of enhanced OSB subfloor panels in terms of thickness swell, strength properties and resistance to mold.

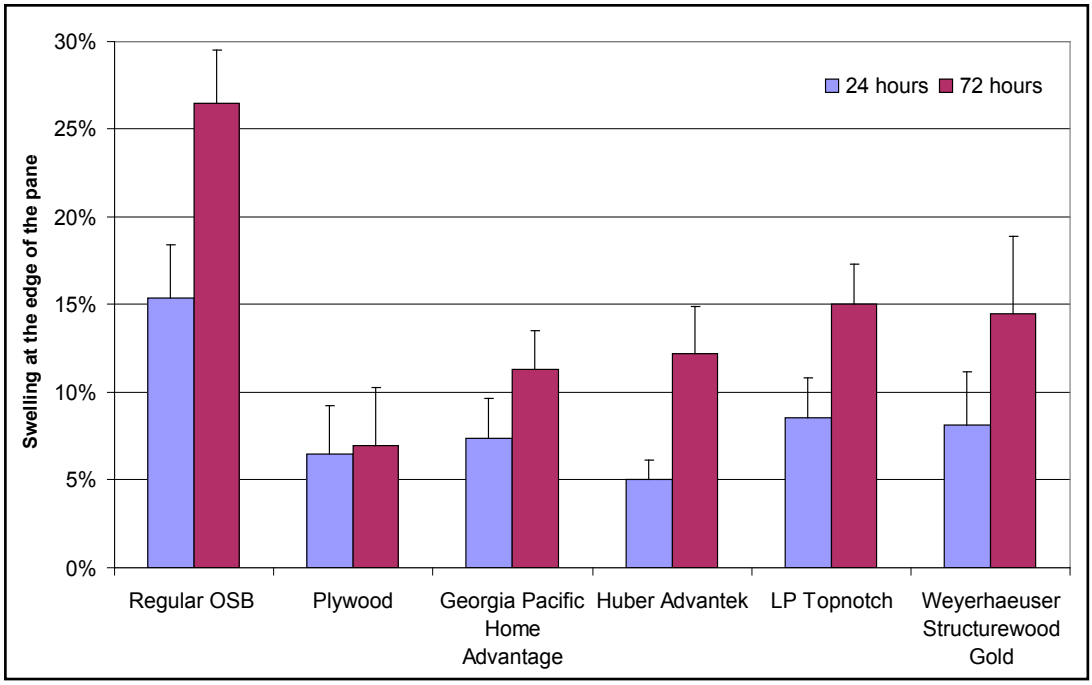
Oriented strandboard (OSB) is made from thin flakes of wood that are glued together. OSB panels are commonly used as wall and roof sheathing and for subflooring.

Our Test

Panels of each of four brands of 'enhanced' OSB subfloor panels were purchased from retailers in Knoxville (see Table 1). All panels were 23/32-inch thick (18 mm), tongue-and-groove subfloor panels. A set of three panels of one brand each of 'un-enhanced' OSB subfloor and southern pine plywood subflooring were also included in

Table 1.

Products Tested (all panels were 23/32" thick tongue-and-groove subfloor)		Price - $/4' x 8'panel (4' x 8' panels purchased from retail stores in Knoxville in June 2006)
Regular OSB		$17.95
Plywood (Georgia Pacific Plytanium)		$19.99
'Enhanced' OSB panels	LP TopNotch OrangePlus	$21.94
	Georgia Pacific Home Advantage	$24.99
	Weyerhauser Structurwood Edge Gold	$22.53
	Huber AdvanTech	$22.73



Edge thickness swelling of the panels after immersion in water for 24 or 72 hours. The error lines on top of each bar are one standard deviation, which is a measure of the variation in the data.

the test for comparison purposes. Samples from each panel were tested for strength, stiffness, internal bond (a measure of how well the board is stuck together) and tendency to swell when wetted according to published standard methods[1]. The standard swelling test involves submerging samples under 1 inch of water and measuring the change in thickness after 24 hours. This is an extreme test, but it is used to measure the relative tendency of the panels to swell if they are exposed to wetting in the construction process. The standard swelling tests also were extended to a 72-hour water-submersion period to assess the ability of these materials to resist prolonged water exposure.

The manufacturers of enhanced OSB do not claim that their products are mold-resistant; however, because mold is an increasingly important issue in housing, the panels were also assessed for their susceptibility to grow mold when exposed to humid conditions.[2]

The Results

As shown in the graph, thickness swell values of the enhanced OSB subfloor panels after a 24-hour soak were at least 40 percent lower than those found with the regular OSB panels. Prolonged soaking (72 hours) resulted in much greater thickness swell for both conventional and enhanced OSBs, but the differences between enhanced and unenhanced OSB remained proportional. The plywood subfloor panels experienced the lowest average thickness swell of any product tested after the 72-hour exposure period.

The enhanced panels all met the appropriate standards for strength, stiffness and internal bond. The mechanical properties (i.e., strength, stiffness, etc.) of the enhanced panels varied among manufacturers, but were not consistently higher or lower than the regular OSB or the plywood.

All the samples readily grew mold when exposed to the warm, humid conditions that promote fungal growth. Mold growth is tied closely to moisture uptake. Thus, while the enhanced panels may be able to resist thickness swelling to some extent after wetting, they do get wet and become susceptible to fungal attack. Thus OSB and plywood, whether regular or 'enhanced," should not be used as a tile backer, or in other situations where wetting will occur.

Take-home Message

'Enhanced' 23/32-inch-thick OSB subfloor panels show reduced thickness swell, compared with regular OSB. The use of these enhanced OSB products may reduce the need for sanding of subfloors prior to installation of flooring during house construction. However, even enhanced OSB panels can swell significantly when wetted, and are at risk of mold and rot while they remain wet. Thus OSB should be protected from wetting during construction whenever possible.

1 Canadian Standards Association (CSA). 2000. Standards on OSB and waferboard. CSA 0437 Series 93 (R2006). CSA, Toronto, Ontario, Canada.

2 Camille Freitag and Jeff Morrell at Oregon State University conducted the mold test. Brad Canfield and Trairat Neimsuwan assisted with the strength tests.

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