

Plywood vs. OSB: Which Is Better?

Q.

Is there a real difference in performance between plywood and OSB for coastal applications? Which is a better product, plywood or OSB, for floor, wall, and roof sheathing?

A.

Steve Easley responds: First, let me state that I think OSB is an “okay” product. However, for it to perform properly over a long period of time, you must keep it dry and pay careful attention to how you install it. Having said that, in my opinion, plywood is a “better” product, or at least a more forgiving one. After studying building problems for more than 25 years, I believe four- or five-ply exterior-grade plywood performs better in wet and humid climates for a variety of reasons.

DURABILITY

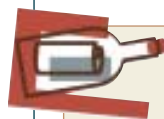
Based on my experience of performing in-the-field forensics on homes for builders, plywood holds up much better in the face of common water intrusion. I’ve seen many more instances of OSB deterioration from even minor amounts of moisture over relatively short periods of time. OSB is often made from aspen, which studies have shown is prone to attack from decay fungi. I also believe OSB holds more water and is slower to dry.

But let’s be very clear: Not all OSB is created equal. We shouldn’t confuse run-of-the-mill OSB sheathing panels with some of the OSB siding and trim products or with some of the newer OSB panel products. Unlike ordinary panels, many trim and siding products are manufactured with special resins and borates, which make them resistant to decay. I have had Louisiana-Pacific SmartSide (www.lpcorp.com) OSB trim on my own home for several years, and it still looks like it did the day I put it on. And some of the new floor sheathing products, such as Huber Engineered Woods’ AdvanTech (www.huberwood.com), hold up better than ordinary OSB panels. Also, some of the newer OSB wall sheathings from Huber Engineered Woods, Norbord Inc. (www.norbord.com),



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FIGURE 1. Saturated OSB (top) swells considerably, and does not shrink back to its original dimension when it dries out. Plywood soaked in the same way (above) does not swell to the same degree, remaining dimensionally stable.



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Percentage of Swelling

Plywood	Average swell = 6% to 8%, depending on thickness
OSB	Average swell = 10% to 15%, depending on thickness



FIGURE 2. Panel swell is most sensitive along the edges where it is critical for flooring and roof sheathing to match up and not show through the finish flooring or roofing materials. At left, the edges of an OSB subfloor swelled significantly from rainwater blowing through window openings during construction. Below, the swelled edges of OSB sheathing show prominently through the shingles.



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and Roy O. Martin Lumber Management (www.martco.com) are reportedly made with a high resin content and with southern yellow pine, which is more dimensionally stable than fast-growing aspen.

DIMENSIONAL STABILITY

When ordinary OSB gets wet, it expands significantly more than plywood. To test this, I put a piece OSB in a bucket of water for a few days. The photo in **Figure 1** (page 1) shows how much the OSB swelled.

This extreme swelling is a problem when OSB panels get exposed to heavy rain during construction. Over a period of time, when subjected to high humidity or a series of dramatic wetting events, ordinary OSB, in my opinion, is more prone to panel swell than plywood. This tendency is especially pronounced at the edges, which can telegraph through roof shingles, stucco, and cladding (**Figure 2**). Some manufacturers make subfloor products with grooves to drain the water and extra-long tongues to help provide clearance for expansion.

Whereas wet plywood dries out, returning to nearly its original size, when OSB dries out, it does not shrink back to its original dimension. If a subfloor constructed from ordinary OSB gets wet, you often have to grind the raised edges smooth before applying finished flooring (**Figure 2**).

On wall-sheathing applications, a common mistake is not leaving enough space between OSB panels for expansion. This can cause wavy siding syndrome or “oil canning” (**Figure 3**, page 3).

Plywood is not immune to moisture problems, however. It has had some history with delamination in conditions of

repeated wetting and drying. I recommend a four-ply or greater product for wall and roof sheathing, as it resists delamination better than three-ply panels. Georgia-Pacific makes a very durable plywood product called Plytanium DryPly, which is specially treated to resist deterioration from moisture. According to the manufacturer, it absorbs 40% less water and has a 100% guarantee against delamination, joint swell, and edge sanding.

CREEP

Creep is the measurement of the sustained deflection, or sag, between two supports, such as the sheathing span between two floor joists or two trusses. Creep usually results from a sustained load that gradually deforms the panel.

Research done by the USDA Forest Products Laboratory (Research Paper FLP-RP-574) shows that over a period of time at low temperatures under constant loads such as snow, and in a stable environment at 50% relative humidity, the performance of plywood and OSB is about the same. But



FIGURE 3. All wall and roof panels should be gapped to accommodate expansion of the panels. If installed too tightly, the panels can buckle the siding — a condition called “oil canning.”



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under the same sustained loads in wet conditions, OSB will sag or “creep” more than plywood. This could be an issue for a subfloor in a bathroom that supports a tile floor, for example. In my opinion, plywood would be the better choice for the subfloor in any wet location.

RACKING STRENGTH

Wood panels create a safer, stronger structure. OSB and plywood test about the same with regards to shear strength. Whether plywood or OSB is used, sheathed walls do an excellent job of helping structures resist wind and seismic forces (see “Wall Bracing and the IRC,” July/August 2006, available at coastalcontractor.net).

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