



Comparing Panel Types

The evolution of structural-use wood panel products has delivered a number of different types of product choices to the market. These panel products use wood particles, wafers, strands, or veneers that are pressed and bonded with adhesive to form very strong and dimensionally stable panels for use in a variety of structural and non-structural applications.

The major panel groups are described by their commonly used names. Particleboard¹, for instance, is made of small wood particles and is used as underlayment, mobile home decking, and in industrial applications such as furniture and countertops. Waferboard is a panel made up of thinly sliced rectangular "wafers" that are oriented randomly throughout the panel cross section.

In the late 1960s and 1970s, manufacturing developments led to the development of "oriented strand board" (OSB). OSB strands are thinly sliced and measure approximately 1- to 2-inches wide by 3- to 6-inches long. These strands are "oriented" into layers. Typically, three or four layers of strands comprise an OSB panel, with the majority of the strands in the outside layers oriented with their long dimension parallel to the length of the finished panel and the strands in the interior layer(s) oriented with their long dimension at 90 degrees to the outside faces. This orientation is very similar to that of the veneer used in plywood. Plywood is a panel made of three or more layers of wood veneer bonded together, and usually configured with the grain of adjoining plies at right angles. Because wood is stronger along the grain than across the grain, the outer layers with strand lengths oriented along the panel length, help create panels that are stronger along their length (typically the 8-foot dimension).

Both plywood and OSB used in floor, wall and roof applications are manufactured, tested and certified to one of two U.S. Department of Commerce Voluntary Product Standards:

- PS 1, *Structural Plywood*, and
- PS 2, *Performance Standard for Wood-Based Structural-Use Panels*, which applies to OSB and structural-use plywood.

¹ As a historical note, TECO's laboratory in Washington DC manufactured particleboard for the first time in the US in the early 1950s. Reference: *An Evolutionary History of Oriented Strandboard (OSB)*. USDA FPL-GTR-236.

Each standard undergoes periodic revision and is identified by the standard number and an additional two numbers that signify the year in which the revision was completed and published. For example, PS 1-09 signifies that the PS 1 standard was revised in 2009, while PS 2-10 signifies that the PS 2 standard was revised in 2010.

The minimum strength and stiffness requirements of all products are detailed in these standards along with performance requirements that are independent of product type. Therefore, either OSB or plywood can be used for structural applications when proper attention is given to thickness and span rating.

Each of these products has unique performance and service attributes that may lead to one or the other being more suitable in certain situations. It is advisable to contact a design professional or one of the manufacturers for specific information on your particular project and needs.

