

Oriented Strand Board (OSB) Manufacture

The process described here is general and may vary in detail from one manufacturer to another. The OSB manufacturing process is comprised of log conditioning, waferizing, drying, blending, forming, pressing, and final processing.

Freshly cut logs are taken from the log storage yard and placed in hot water ponds. The soaking softens the wood to facilitate debarking and making of strands and wafers, thereby reducing the amount of fines and slivers generated. To maintain effectiveness, hot pond temperatures are increased in cold weather conditions.

After conditioning, the logs are debarked and are fed into a machine with sharp knives which cuts the log pieces into strands or wafers along the grain. The strands or wafers are conveyed to wet storage bins and are screened after drying to remove fine particles. Most mills process core and surface strands and wafers separately and then deposit them together in layers to form the mat. The strands or wafers are placed in large cylindrical dryers where they are dried to a moisture content of three to seven percent. While in the dryer, the strands or wafers are shifted in a manner which minimizes breakage of the wafers while ensuring consistent moisture content. When dry, the strands or wafers proceed to the blender where they are mixed with resin and wax. The small quantity of hot wax (about 1.5 percent of the weight of wafers) sprayed on the wafers helps to distribute evenly the powdered phenol-formaldehyde resin (2 percent to 2.75 percent by weight).

The strands or wafers are continuously weight metered to ensure the proper quantities enter the blenders so that the correct resin coverage is achieved. The forming machine arranges the strands or wafers in several layers to form a mat on stainless steel press sheets or on a continuous belt. For waferboard, the wafers are randomly deposited. For OSB, the strands for the faces are oriented parallel with the long direction of the panel and the core layers are either oriented or random. The size of the mats varies but generally, one mat will be large enough to produce several standard sized finished panels.

The mats are placed in a press accommodating up to 24 sheets at a time. Each mat sits between a pair of heated platens. When all the mats have been inserted, the press is closed under heavy pressure. The layup of the mat and the press operation are important in ensuring proper panel thickness. The duration of the press cycle varies from plant to plant and with the desired thickness of the board. For example, a press cycle of 3-1/2 minutes might be required for 6.35 mm (1/4 in) thick panels, and eight minutes for 15.5 mm (5/8 in) panels. The heat and pressure polymerize the resin which binds the strands or wafers together strongly into a rigid panel.

After pressing, the panels are conveyed to trim saws where they are edge-trimmed into 1220 x 2440 mm (4 x 8 ft) panels or to special order sizes. Lastly, the panels are inspected, graded, and sorted. Final curing of the resin occurs during the time the panels are in heated storage. Further processing such as tongue and grooving may also be done at this stage. In some cases, panels may be sanded to attain required thickness. The manufacturing process for OSB results in a final moisture content of about 4%.