

Plywood Manufacture

Each peeler log is conveyed to a barker where it is rotated against a steel claw that strips the bark from the log. The debarked block is moved to the veneering lathe and centred in the chucks. As the log is rotated, a steel blade peels a continuous sheet of veneer. A large diameter log may yield more than a kilometre (half mile) of veneer.

As veneer is produced, it is directed to semi-automatic clippers that cut it into desired widths. The clipper blade can also be actuated manually to remove defective pieces of veneer. Next, the veneer moves to the sorting area where it is graded and separated into stacks of veneer originating from either the heartwood or sapwood sectors of the tree. This segregation is necessary because the heartwood and sapwood contain very different moisture contents and therefore require different drying times.

Steam or gas-heated ovens are used to dry the veneer to a moisture content of about 5 percent. The speed of passage of veneer through the drying chamber depends on the thickness of the veneer and whether it is of heartwood or sapwood origin.

After drying, electronic moisture detectors are used to verify the moisture content of all pieces. Pieces not meeting dryness requirements are returned for further drying.

Next, the veneer is graded. In some types of plywood, narrow strips are then edge trimmed and edge glued to form a continuous sheet. In other types, only the face plies are made from full sheets, and the interior plies are comprised of loose lain strips placed edge to edge.

Substandard face veneer with oversize imperfections is channelled to patching machines where the imperfections are neatly replaced with sound wooden patches. Sound face and interior veneer moves to the glue spreader or automatic layup line. There the veneers are uniformly coated with phenol-formaldehyde resin glue and laid at right angles to the adjacent face and back veneers.

After layup, the veneer sandwiches go to the hot press, the key operation in the manufacturing process. Here, depending upon the thickness of the plywood panel, one or more sandwiches are loaded into each press opening. The press is then hydraulically closed and the panels subjected to a temperature of 150°C (300°F) and a pressure of 1.38 MPa (200 psi) which cures the glue.

After removal from the hot press, trim saws cut the plywood panels to the required dimensions, usually 1220mm x 2440mm (4 x 8 ft). Panel edges and ends are trimmed in consecutive operations.

Panels are then graded as sheathing or selected for further finishing. Panels to be produced as sanded grades pass to a sander where faces and backs are sanded smooth simultaneously. Any minor imperfections remaining in the face and back veneers are repaired with wood inlays or synthetic filler before the panels are finally graded. Plywood is also manufactured with overlays which improve the appearance and durability of the panel.

The manufacturing process for plywood results in a final moisture content of about 4%. During installation, a 3 mm (1/8 in) gap should be left between panels to allow for expansion during service.

Tongue and Groove Plywood

Tongue and groove plywood is usually a Sheathing or Select grade panel with a factory-machined tongue along one of the long edges and a groove along the other. Where diaphragm action is not an overriding

concern, the tongue and groove profiles can be used to dispense with the need for blocking by maintaining abutting panels in the same plane, thus ensuring the effective transfer of loads across joints.

Tongue and groove plywood panels are usually manufactured in thicknesses of 12.5 mm (1/2 in) or more. Some tongue and groove profiles are designed to butt at the tip of the tongue to leave a 0.8 mm (1/32 in) gap on the face and underside of the joint between panels to allow for swelling caused by exposure to wet conditions before a building's weather membrane has been applied. The tongue and groove lock together to form a better rain barrier from rain during construction.