

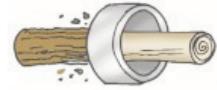
# How LVL is made



**Forests:** The Nelson region of New Zealand has 175,000 hectares of plantation forests, primarily radiata pine. 100% of our raw material comes from these plantation forests. We own 2100 hectares of forests ourselves, and buy the remainder of our needs from other forest owners.



**Log Yard:** Pulp and Veneer logs are delivered to our log yard for both the MDF and LVL processes. We receive close to one million m3 of logs per year, which is an average of 170 log trucks per day. Logs used for LVL manufacture are A and J grade logs, suitable for peeling. We have two log handling cranes each with a 14 tonne lift capacity to a maximum height of 38m. Equipment Supplier: Fulghum.



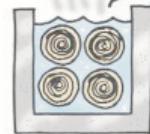
**Debark Logs:** All bark is removed from the logs in a tandem ring debarker that uses knives to strip the bark from the trees. The maximum capacity of the debarker is a log of approximately 850mm diameter. After the debarker the logs are cut to lengths suitable for the lathe. Equipment Supplier: Nicholson.



**Clipped to Size:** The ribbon of veneer is scanned by camera for defects, analysed for moisture content and clipped to width by a rotary clipper. Veneers are clipped to a wet width of approximately 1.4m then stacked according to their moisture content. Equipment Supplier: Raute Wood.



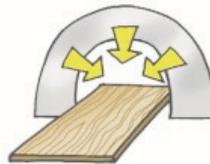
**Lathe Peeling:** The Raute Wood Lathe scans the log profile using 7 lasers, then centres the log for the most efficient recovery of material and peels the logs to a core diameter of 78mm. All round-up, waste veneer and cores are converted into chip, which is used in the manufacture of MDF. Equipment Supplier: Raute Wood.



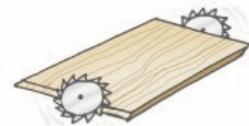
**Hot Log Bath:** The logs are conditioned in hot (85 degrees Celsius) water for 24 hours. This brings the core temperature of the logs up to 65 degrees Celsius and allows a smoother peel to be achieved. When logs have reached the required core temperature the gantry crane loads a conveying system to the lathe infeed. Equipment Supplier: Southern Cross Engineering



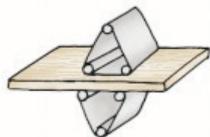
**Veneer Drying:** Veneer sheets are dried in the Babcock BSH, 22 bar, steam heated, six deck, roller veneer drier. The veneers are dried in three stages to a target moisture content of between 8 and 10%. Equipment Supplier: Babcock.



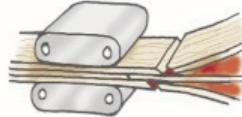
**Structurally & Visually Graded:** As the veneers come out of the drier they are automatically graded by an eight option system for specific customer requirements and for LVL production in our own plant by:  
Babcock NovaScan 4000 camera for surface appearance  
Metriguard 2650 DFX for ultrasonic propagation time  
Elliot Bay Cypress 2000 moisture detection system. This is a completely automated grading system. Some veneer may be exported for further processing, while most is used for production of LVL. Equipment supplier: Babcock



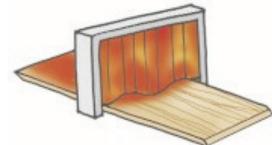
**Scarfig:** The veneer edge is scarfed for a uniform thickness at the joints between veneers in the layup process. All veneers used in NelsonPine LVL are scarf jointed. This results in a stronger product than when butt or overlap joints are used.



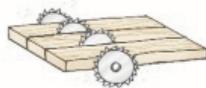
**Sanding:** The online four-head sander is an optional part of the production process for products that require a sanded finish.



**Continuous Press:** Once the veneers have had the glue applied the veneers are skew aligned then laid up into a mat. The veneer mat passes through a 300kW microwave to begin the heating process from the inside the veneer mat and then into the continuous 45 metre hot press where the hot oil platens complete resin cure and an LVL billet is formed. The billet can vary in size between 12 and 120mm thick, is produced to a width of 1.2m, and can be up to 18m long. Equipment supplier: Dieffenbacher



**Glue Applied:** At the layup station stacks of core sheets, face sheets and make-up sheets (able to be placed in any position) are vacuum lifted onto the processing line according to the press recipe. The veneers are then curtain coated with phenol formaldehyde, an exterior grade adhesive. Equipment supplier: Koch (1400mm curtain coater). Resin supplier: Dynea NZ Ltd.



**Cut to Width:** The billets are ripped to widths required by the customer. We can cut to widths of between 63 and 1220mm. Each piece of LVL is also marked with an inkjet print marking and paint spraying system with the NelsonPine logo and grade for clear visual identification. Equipment supplier: Paul



**Packed and Wrapped:** NelsonPine LVL is packed into sizes of packs of approximately 300mm (high)x 1000mm (wide) for forklift handling. The packs are wrapped with plastic wrap showing the NelsonPine logo. Packs are transported to the Port of Nelson for shipment to our customers around the world. Equipment supplier: Dieffenbacher, Signode.