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Technical Leaflet

Manufacturing of EGGER OSB



This document refers to the manufacturing of EGGER OSB boards, in our mills in Wismar and Radauti. Its purpose is to allow anyone interested to get familiar with the manufacturing process, and get a comprehensive insight over each step of the production flow.

Product description

OSB – Oriented Strand Boards – are multi-layered board mainly made from strands of wood together with a synthetic binder. The strands in the external layer are aligned and parallel to the board length or width. The strands in the internal layer can be randomly orientated or aligned, generally perpendicular to the strands in the external layers. OSB boards are specified according to EN 300:2006 for four technical classes. Complying with the technical class the OSB boards are intended for general use in dry conditions (service class SC 1) or load-bearing use in dry or humid conditions (SC 1 or SC 2)

The careful selection of good quality strands and their spatial distribution within the board gives EGGER OSB outstanding mechanical properties that recommend the product for almost all structural applications in construction, and for a wide range of other applications, that includes shelving, packaging, site hoarding, billboards, stage construction, small barns, tools lockers, animal shelters, etc.

OSB - Technical classes according to EN 300 – OSB:2006

- OSB/1 - general use in dry conditions
- OSB/2 – load-bearing use in dry conditions
- OSB/3 – load-bearing use in humid conditions
- OSB/4 – heavy-duty load-bearing use in humid conditions

The manufacturing process

The manufacturing process of EGGER OSB follows the production flow described below:



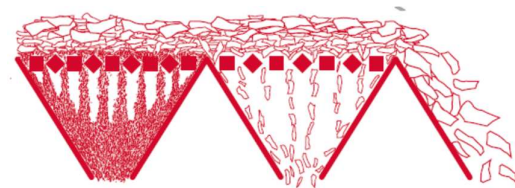
Step 1: Debarking and moisten



Step 2: Flaking



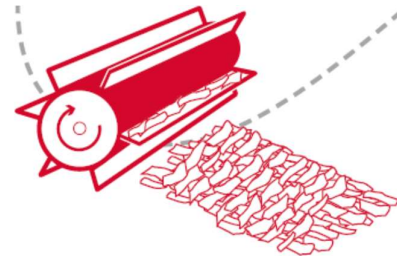
Step 3: Drying



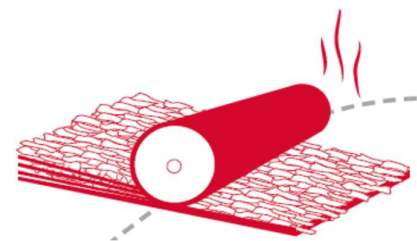
Step 4: Screening



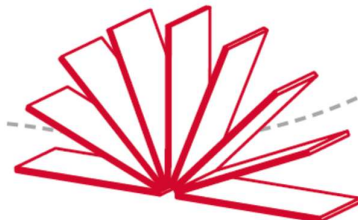
Step 5: Blending



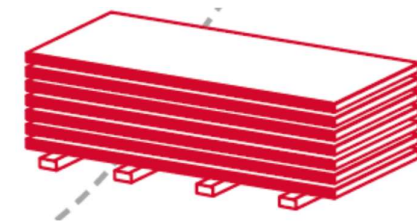
Step 6: Mat forming



Step 7: Pressing



Step 8: Cooling of the masterboard



Step 9: Acclimatization



Step 10: Cutting-to-size and packaging

Detailed process description

Debarking and moisten

The manufacturing of EGGER OSB is based on the use of fresh harvested logs, in a certain mix of species: around 70% is coniferous wood (mainly spruce and pine) and 30% from different broadleaf species, like birch, poplar, larch, linden and alder. The use of recycled post-consumer wood material in manufacturing of EGGER OSB is excluded.

The first step in logs processing is peeling-off the bark, which is a prerequisite condition for a good quality surface of the final product. This is done in the debarking line, equipped with knives which are fixed on the perimeter of the rotary drum (Wismar) or counter-revolving cylinders (Radauti). The combined action of superficial bark peeling generated by the clawing knives with strong logs friction against one another caused by the fast spinning of the equipment components, leads to a complete bark removal from the logs.

Next, the logs are directed to the washing tunnels, where hot water is sprayed over to clean them-up of sand and bark residues, but to moist them before flaking. This is particularly important in the winter season, when the logs are frost, therefore much more difficult to chip.

Flaking

After being washed and moist, the logs go into the chipping machines known as ring-knives flakers. The flakers are peeling-off thin strands, knives are adjusted to thickness range between 0.5 to 0.9 mm thickness and 170 mm length, working pretty much similar as a giant pencil sharpener acting against a bunch of logs kept together.

Conveyor belts transport the strands into wet strands bunkers. A secondary role of these bunkers is to allow the debarking, flaking and strands storage process to proceed further, in case of regular knife exchange or any sudden technical failure that would require immediate process shutdown to fix the problem. In a case of emergency, the production could run for further 4 hours fed by a full bunker. The constant filling level should be 60% ideally

Drying

From the storage bunkers, the wet strands are directed to the gas operated dryers, where their moisture content is dropped from 60-110 % down to 2-3 %. The steam resulted from the drying process is filtered by a wet electrostatic precipitator (which holds all wood dust particles), before being released as clean water vapours into atmosphere via a tall chimney.

Steam filtering before release into thin air occurs in every EGGER plant and is part of our commitment for clean environment, as well as of our care and respect for the local communities where our plants are operating.

Screening

Screening is a sieving process, where strands are separated according to their size into surface layer (SL) and core layer material (CL). The equipment includes a set of rotary shafts with square discs, whose spacing to one another grows wider, from top to the bottom of the machine. As the strands are free falling through these discs, the larger-size SL strands are held at the top, whereas the thinner CL strands are collected at the bottom. See figures on page 3.

Once sorted by size, the strands are transported by conveyor belts and stored into separate dry chip bunkers.

Blending (gluing)

Next step is to spray the dry strands with a synthetic resin, meant to bind the strands together during pressing. Depending on the mill, the resin used could be either MUF (melamine-urea-formaldehyde) or PMDI (polymeric Diphenylmethane-diisocyanate).

The EGGER OSB mill in Romania is currently using MUF glue (Melamine-Urea-Formaldehyde) produced in our own glue factory in Radauti, whereas Wismar mill is exclusively using PMDI resin for a formaldehyde free bonding..

Despite the higher glue content (12-13 %) needed for an effective bonding, the MUF resin EGGER OSB from Radauti safely fulfils the E1 emission requirements. The use of in-house produced MUF has the advantage that it allows a predictable and accurate cost control.

Instead, with PMDI, were the glue content is much less (around 4 % only), but the price is more volatile, as it largely depend on the free quotations for crude oil on the international stock exchange markets.

Mat forming

The glue-sprayed strands are feeding four orienting machines: units 1 and 4 (called “disc orienters”) are laying-down the SL strands lengthwise (in the advancing direction of the line), while the middle units 2 and 3 (the “fan orienters”) are orienting the CL strands randomly in crosswise direction. While the mat is getting thicker and thicker starting from bottom to top, it is passing the forming machines and advancing toward the press. The specific ratio share of the surface layer and core layer, along with the line speed, pressing parameters (pressure, temperature, time) specific glue content, are the determining factors for the performance of each OSB board planned for production.

Pressing

At the end of the forming line, the mat enters the hot-rolled continuous press (ContiRoll®), where it is progressively pressed down for about 6 times the initial thickness, in high temperature conditions, which commonly ranges from approx. 240° C (inlet) to approx. 190° C (outlet). The press parameters are pre-set for each product type and thickness. The glue is curing rapidly inside the press due to high temperature, providing excellent bonding for strands and impressive sturdiness to the final OSB board. In contrast to multi-daylight press technology, which is hardly ever used anymore, EGGER has relied on flexible and modern continuous press technology from the very beginning of OSB production. Continuous press technology is far more efficient and gives the OSB surface the characteristic smooth and shiny look.

Cutting and cooling

Right at exiting from the press, the side edges of the ready board are trimmed and the boards are cross-cut by a diagonal saw to the master-panel size.

The temperature of the boards at this stage is approx. 100 °C, therefore each panel must be cooled down to approx. 40 °C before stacking, to avoid the risk of self-ignition. This is done with the help of the “star coolers”, which swing each panel half-circle forth and back, thus dropping their temperature and relieving much of the panel’s stress.

Acclimatization

Once the master-size panels are cooled, they are stacked in big stacks and sent in the semi-finished products warehouse for being conditioned. The panels get conditioned for at least 48 hours, in order to relieve the stresses in the OSB panels. This time is required by the plant’s Quality Department to assess the product testing according to the relevant specification standards.

Cut-to-size, edge processing and packaging

When lab testing (FPC) is completed, the master-size panels are released for further final processing, which includes either cutting to size, as square edged panel or cutting to size the sanded / unsanded panel and routing tongue and groove or shiplap edge profiling.

Finally, each panel is marked with trade name, technical class, CE-mark, recipe no. production coding for traceability. OSB boards are removed at regular intervals for inspection of dimensional tolerances and visual appearance. The boards are stacked in packages, covered with cardboard and strapped together with underlays. The packages are labelled with the necessary information and are prepared for shipment in the warehouse.

General note

Further information on wood assortment and technical capabilities of each mill is provided in “EGGER OSB Mills insight” information leaflet.

Provisional note:

These installation instructions have been carefully drawn up to the best of our knowledge. The information provided is based on practical experience, in-house testing and reflects our current level of knowledge. It is intended for information only and does not constitute a guarantee in terms of product properties or its suitability for specific applications. We accept no liability for any mistakes, errors in standards, or printing errors. In addition, technical modifications may result from the continuous further development of EGGER OSB product range, as well as from changes to standards and public law documents. The contents of this guideline should therefore not be considered as instructions for use or as legally binding. Our General Terms and Conditions apply.