

ENVIRONMENTAL DECLARATION

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VTT Building and Transport, Finland

COMPANY

Producer

As Repo Vabrikud
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Company Description

AS Repo Vabrikud is Estonia's biggest manufacturer of wooden boards and is one of the country's biggest exporters. The company manufactures high quality particle-board for use in the furniture industry. Particle-board can also be used in floor-, roof- and wall structures. Figure 1 shows particle-board processing.

PRODUCT

Particle-board is made from wood, formaldehyde resin, ammonium chloride, urea, talc and paraffin. In Figure 2 the raw-material amount per 1000 m² of particle-board produced is given.

Technical data

Height and width:
5500 x 1830 mm²

Thickness:

12,5; 16; 18 and 22 mm

Density: 680 - 720 kg/m³

PRODUCTION

Particle-board production takes place according to the processes shown in Figure 3. In Factory raw-materials are procured first, chipped and screened. In the chip- and drying division mixing, screening and drying take place.

Oversized chips are milled and screened again and the raw-materials are hopped into two bunker for outer and inner layer production. In the forming- and compressing division wooden raw material is mixed with binder (adhesive resin) and Inner and outer layer forming takes place. With the help of the compression process the air is removed and a denser material results. Then the particle-board sheet will be measured, cut and hot pressed. In the finishing division the product is cooled and the final cut is performed. The surface is ground to the accurate thickness and roughness.

LIFE CYCLE ASSESSMENT

The environmental impact of particle-board is comprised of "life-cycle assessments" (LCA) based on ISO 14040 and 14041. A LCA contains information on all the significant environmental effects of the product, from raw-material extraction and manufacturing to the customer use. The information about material production is supplied by the producer.

ENVIRONMENTAL PROFILE

According to the LCA calculations the environmental profile for the particle-board production has been shown in Figure 4.

Estonian energy

Estonian electricity and heat values have been used in the particle-board production.

Particle-board As Repo Vabrikud, Estonia

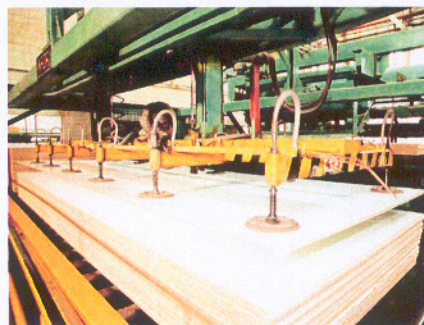


Figure 1. Material processing.

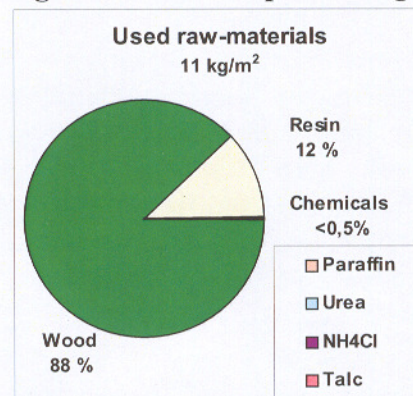


Figure 2. Used raw-materials; kg/ m² particle-board.

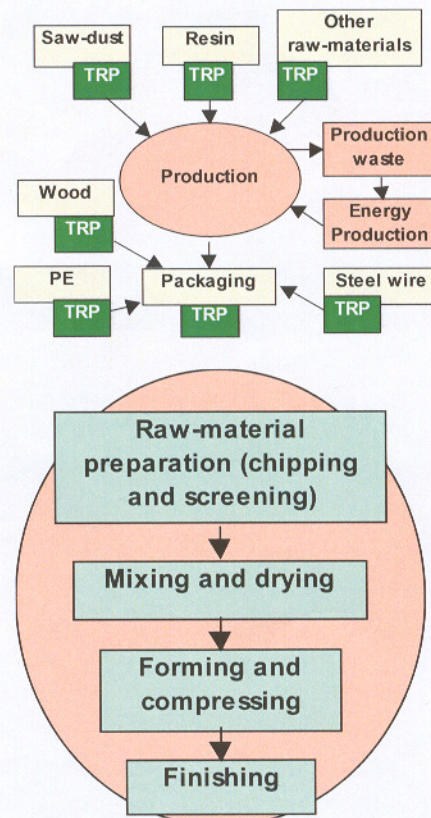


Figure 3. Process tree for particle-board production (TRP = transportation).

Estonian electricity is produced using mainly oil shale (95%). The LCA electricity profile is based on the Estonian Energetic annual values (1998). The heat has been produced in the factory heating plant, where heat results from burning heavy fuel oil, waste wood and dust.

Material profiles

The LCA profile for formaldehyde resin is based on the Neste production (1997) of UREX resin.

Environmental profiles for chemicals such as ammonium chloride, urea and paraffin have not been taken into account because of the lack of the data. The total amount of these chemicals was < 1%.

The product is covered with polythene sheets, bound with steel wire and stored on a wooden pallet. The LCA of the polyethylene sheets used as packaging material are based on literature (Boustead, I. 1999). The profile for the steel wire has not been taken into account. The environmental profile for the wooden pellets is based on the Finnish sawn timber.

QUALITY SYSTEM

The manufacturer is responsible for the quality and continuous quality control of the product. Repo particle-boards and their manufacturing are controlled by VTT Building Technology according to the German regulations (ETB-Richtlinie über Klassifizierung und Überwachung von Holzwerkstoffplatten bezüglich der Formaldehydabgabe). According to the formaldehyde content, particle-board produced by As Repo Vabrikud meets the

E1 requirements within VTT Certificate NR. C36/99 valid until 31.12.2004.

ENVIRONMENTAL POLICY

During the production of particle-board and laminated board the main emissions affecting occupational health are sawdust and formaldehyde (CH_2O). With regard to the production process the most important aspects are the efficient use of materials and reduced carbon dioxide emissions. Close attention has been paid to lower emissions with the help of quantitative goals and by implementing the following methods:

- adoption of a method which removes saw dust caused within processing (removed dust is utilised in combustion);
- use of low formaldehyde resins to lower emissions by 2 tonnes per year;
- increasing productivity and lowering dust and fine particle emissions by changing the chipping machines and by covering conveyor belt;
- 75% of the chips and saw dust have been bought outside instead of producing it;
- the grinding layer has been changed from 1,5 mm to 1 mm and grinding dust amount lowered 30% due to more sawdust being used;
- use of sawdust from coniferous wood allows a lower resin content from 86 kg/m^3 to 74 kg/m^3 , which also lowers formaldehyde emissions by 16 %.

RECYCLING

Particle-board can be reused as a board or if this is not possible

then the advantage of inherent energy can be utilised in the energy production processes.

LITERATURE

Boustead, J. 1999. Eco-profiles of the European plastics industry. Polyethylene.

Estonian Energy 1998. Tallinn 1999.

ISO 14040. Environmental management. Life cycle assessment. Principles and framework.

ISO 14041. Environmental management. Life cycle assessment. Inventory analysis.

Climate Change report from Estonian Statistical Office.

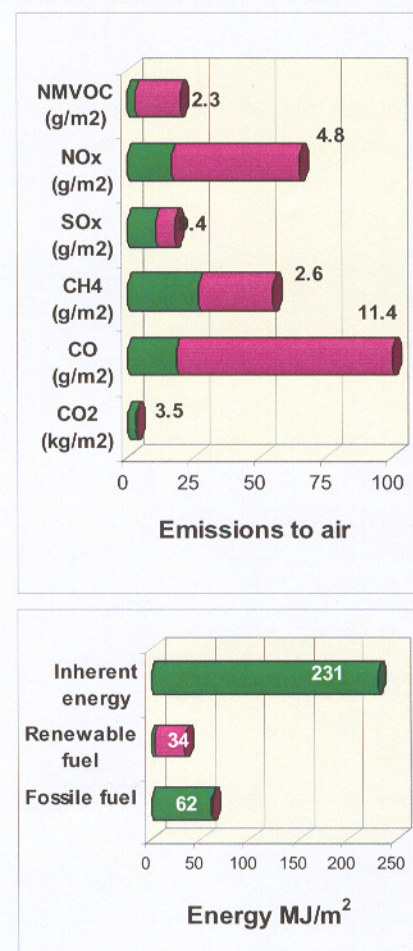


Figure 4. Environmental profile for producing 1m^2 particleboard (■ emissions and energy use from fibreboard production process, ■ -from other processes).