

Background report - laminated veneer lumber (LVL)

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1 General description

LVL is a beam or wood panel product made by gluing coniferous veneers. The used resin is phenol formaldehyde resin.

Laminated veneer lumber (LVL) is defined as a wood-based composite consisting of veneers, glued together predominantly parallel to the grain in adjacent layers, which may have crossband veneers. Several panels of such “primary” LVL can be bonded by face-gluing to achieve an LVL product with larger thicknesses, called glued laminated LVL (GLVL).¹

It is suitable for a wide range of structural applications, such as studs, post and beam frames, wall, floor, and roof panels.²

Stora Enso and Metsä Wood manufacture also GLVL. These are intended to be used as beam elements, column elements or wall applications in buildings.

2 Market and description

2.1 Market

LVL and GLVL are produced by MetsäWood and Stora Enso in Finland. LVL and GLVL has been imported from Russia and small amounts from Germany and Poland. The share of domestic production is assumed to be high.

Metsä Wood has the biggest manufacturing capacity for LVL in Europe. Two other big manufacturers are Steico and Stora Enso³:

- Metsä Wood, 2 mills capacity 300 000 m³/year (Finland)

¹ [StgHB Merkblatt LVL 2020 IHB+ GB print 200924.pdf \(puutuoteteollisuus.fi\)](#)

² [LVL-Käsikirja - Puutuoteteollisuuden edunvalvoja ja yhteinen ääni | Puutuoteteollisuus](#)

³ [LVL Handbook EUROPE 2020XXX \(faktor.fi\)](#)

- Steico 1, mill Capacity 160 000 m³/year (Poland)
- Stora Enso, 1 mill Capacity 100 000 m³/year. (Finland).

2.2 Description

In Finland, LVL is produced by gluing 3 mm thick coniferous veneers. After gluing LVL boards are machined to the correct size and shaped using a CNC cutter. GLVL production is similar, but in addition several LVL are glued to each other. The energy-efficiency and the type of fuels used in manufacturing process, transportation of raw materials and the carbon footprint of resins have the biggest influence on the GWP value of the product.

3 Selected typical values

Average value based on the EPDs reported by MetsäWood and StoraEnso is selected for the generic value of LVL. Generic values are given separately for two different densities 510 kg/m³ and 440 kg/m³. A separate value is also given for GLVL. This is based on the results published in EPD by Stora Enso and MetsäWood.

Selected values are averages of the EPDs presented in the Table 1. Following indicators were determined according to *selected EPD(s)*:

- GWP fossil (A1-A3)
- Conversion factor
- Content of renewable materials
- Content of recycled materials
- Content and type of harmful substances (SVHC)

Waste processing (C3) emissions and carbon handprints are declared as stand-alone items within other database sections. See those sections⁴, including background reports, for more information.

Table 1. Relevant EPDs LVL and GLVL

Source	Manufacturer	GWP (fossil) (A1-A3), kg CO ₂ e/kg	Density, kg/m ³
Metsä Wood Kertokäsikirja tammikuu 2017	Metsä Wood, Finland	0,16	789
Environdec S-P-09942	Stora Enso, Finland	0,24	510
Environdec S-P-02802	Metsä Wood, Finland	0,56	504
Environdec S-P-01731	Stora Enso, Finland	0,34	510

MetsäWood published only one EPD, which describes annual production volume of LVL and GLVL products together. It is not known how much each product types are manufactured. As MetsäWood is a major manufacturer of GLVL and LVL products in Finland, the EPD values

⁴ [Rakentamisen päästötietokanta](#) (see sections: waste process & carbon handprint)

published by it cannot be ignored, despite the inaccuracy in product categorizing. MetsäWood has higher CO² (fossil) emission values and to have more conservative approach, results of this EPD is utilized for both LVL and GLVL product averages.

LVL and GLVL wood content is consistently announced in the EPD's to be 93 % and amount of adhesive around 7 %. This is decided to be material content of each product.

MetsäWood Kertokäsikirja information is outdated.

3.1 LVL, laminated veneer lumber for wall studs

Typical value is given on average of EPD by Stora Enso (S-P-09942) and MetsäWood (S-P-02802). Density 440 kg/m³ is decided as typical value for LVL products used as wall studs.

Table 2. The summary of the selected typical values

Aspect	Result
Moisture content (%)	9 %
Density (kg/m ³)	440
GWP (fossil) (A1-A3), kg CO ₂ e/kg	0.40
Content of renewable raw materials, %	93 %
The content of secondary materials, %	0 %
Content of harmful substances (substances of very high concern), %	<0.1 %

3.2 LVL, laminated veneer lumber for beams, posts, and panels

Typical value is given on average of EPD by Stora Enso (S-P-09942) and MetsäWood (S-P-02802). Density 510 kg/m³ is decided as typical value for LVL products used as beams, posts, columns, and panels.

Table 3. The summary of the selected typical values

Aspect	Result
Moisture content (%)	9 %
Density (kg/m ³)	510
GWP (fossil) (A1-A3), kg CO ₂ e/kg	0.40
Content of renewable raw materials, %	93 %
The content of secondary materials, %	0 %
Content of harmful substances (substances of very high concern), %	<0.1 %

3.3 GLVL, multiple glued laminated veneer lumber

Typical value is given on average of EPD by Stora Enso (S-P-01731) and MetsäWood (S-P-02802). Density 510 kg/m³ is decided as typical value for GLVL products used for load-bearing structures.

Table 4. The summary of the selected typical values

Aspect	Result
Moisture content (%)	9 %
Density (kg/m ³)	510
GWP (fossil) (A1-A3), kg CO ₂ e/kg	0.45

Aspect	Result
Content of renewable raw materials, %	94 %
The content of secondary materials, %	0 %
Content of harmful substances (substances of very high concern), %	<0.1 %