

Environmental Product Declaration

In accordance with ISO 14025:2006 and EN 15804:2012+A2:2019/AC:2021 for:



Kerto LVL
Kerto LVL S-beam
Kerto LVL Q-panel
Kerto LVL Qp-beam
Kerto LVL L-panel
Kerto LVL T-stud
Kerto LVL D-panel
Kerto LVL S-beam PLUS



from
Metsäliitto Cooperative
Metsä Wood

Programme:	The International EPD System, www.environdec.com
Programme operator:	EPD International AB
Licensee:	Not relevant
Type of EPD:	EPD of multiple products, based on the average results of the product group.
EPD registration number:	EPD-IES- 0026805:001
Version date:	2026-02-15
Validity date:	2031-02-15

An EPD may be updated or depublished if conditions change. To find the latest version of the EPD and to confirm its validity, see www.environdec.com

GENERAL INFORMATION

Programme Information	
Programme:	The International EPD® System
Address:	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
Website:	www.environdec.com
E-mail:	support@environdec.com

Product Category Rules (PCR)
CEN standard EN 15804 serves as the Core Product Category Rules (PCR)
Product Category Rules (PCR): PCR 2019:14 VERSION 2.0.1
PCR review was conducted by: <i>The Technical Committee of the International EPD System. A full list of members is available on www.environdec.com. The review panel may be contacted via support@environdec.com. Review chair: Rob Rouwette (chair), Noa Meron (co-chair).</i>
c-PCR, if applicable: C-PCR-006 (TO PCR 2019:14) VERSION 1.0.0.

Third-party Verification
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via:
<input checked="" type="checkbox"/> Individual EPD verification without a pre-verified LCA/EPD tool
Third-party verifier: <i>Andrew Norton - Renewables Ltd</i>
Approved by: International EPD System

The EPD owner has the sole ownership, liability, and responsibility for the EPD.

EPDs within the same product category but published in different EPD programmes, may not be comparable. For two EPDs to be comparable, they shall be based on the same PCR (including the same first-digit version number) or be based on fully aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have identical scope in terms of included life-cycle stages (unless the excluded life-cycle stage is demonstrated to be insignificant); apply identical impact assessment methods (including the same version of characterisation factors); and be valid at the time of comparison.

For further information about comparability, see EN 15804 and ISO 14025.

INFORMATION ABOUT EPD OWNER

Owner of the EPD: Metsäliitto Cooperative, Metsä Wood

Address: P.O. Box 50, 02020 METSÄ, Revontulenpuisto 2, 02100 ESPOO, Finland

Contact: Rosa Zabihian, Rosa.Zabihian@metsagroup.com

Address and contact information of the LCA practitioner commissioned by the EPD owner, if applicable:
Clément Bolle, c.bolle@weloop.org - WeLOOP

Description of the organisation: Metsä Wood, part of Metsä Group, is the largest LVL manufacturer in Europe. Its main products are Kerto® LVL laminated veneer lumber and birch plywood, which are used in the construction, transport, and industrial sectors.

Metsä Group's products are based on renewable wood grown in Northern forests. Metsä Group invests in growth, innovates new bioproducts, and builds a fossil-free future. The Group consists of five business areas that promote the use of renewable products and develop alternatives to fossil-based materials. Its innovation company, Metsä Spring, invests in innovations and technologies that create new uses for northern wood. The parent company, Metsäliitto, is a cooperative owned by more than 90,000 Finnish forest owners.

Product-related or management system-related certifications: Metsä Forest, part of Metsä Group, is the only wood supplier for Metsä Wood mills in Finland. Metsä Forest, as well as Metsä Wood's Lohja and Punkaharju LVL mills, have PEFC and FSC® Chain of Custody certificates. Metsä Wood mills have certified management system including ISO 9001 quality management, ISO 14001 environmental management, ISO 45001 health and safety management and ISO 50001 energy management system.

Metsä Forest fulfils the obligations of European Union Regulation No. 995/2010 (EU Timber Regulation) and European Union Regulation No. 2023/1115 (EU Deforestation regulation), UK Timber Regulation, US Lacey Act and Australian Illegal Logging Prohibition Act, which all prohibit placing on market and trading of illegally harvested timber and timber products. As all the wood raw material is covered by Chain of Custody certification, all the used wood is traceable and comes from certified or controlled forests.

Metsäliitto Cooperative, Metsä Wood PEFC Logo Licence Registration number: PEFC/02-31-381
Metsäliitto Cooperative, Metsä FSC Licence Code: FSC-C209093.

PRODUCT INFORMATION

Product name: Kerto® LVL

Product identification:

Kerto LVL S-beam

Kerto LVL Q-panel

Kerto LVL Qp-beam

Kerto LVL L-panel

Kerto LVL T-stud

Kerto LVL D-panel

Kerto LVL S-beam PLUS



UN CPC code: 314

Other codes for product classification: Not relevant.

Product description: Kerto LVL laminated veneer lumber products are used in all types of construction projects, from new buildings to renovation and repair. Kerto LVL is made from 3 mm thick, rotary-peeled and strength-graded softwood veneers. The veneers are bonded with weather- and boil-resistant phenol formaldehyde adhesive and manufactured as a continuous billet. The bonding process meets the requirements of the EN 14374 standard. The face veneer scarf joints on the front side of the product are glued using colourless adhesive. During hot pressing, the adhesive cures into a thermoset plastic and is therefore inert and non-hazardous to humans and animals. The billet is cut to length and sawn into Kerto LVL beams, planks, or panels according to customer requirements.

In Kerto LVL S-beam and Kerto LVL T-stud, all veneers are oriented in the same direction. In Kerto LVL Q-panel, Kerto LVL Qp-beam, Kerto LVL L-panel, and Kerto LVL D-panel, part of the veneers are oriented crosswise to enhance transverse strength and stiffness. Kerto LVL products are CE-marked in accordance with the EN 14374 standard.

Kerto LVL is suitable for both load-bearing and non-load-bearing structures, such as beams, headers, studs, columns, and panels for roof, wall, and floor elements. It can be used in fully wooden structures or in combination with other building materials. Metsä Wood's partners develop elements and modules using Kerto LVL products and element systems. The service life of Kerto LVL is considered to be equivalent to the lifetime of the building, provided the product is installed according to instructions. For numerical assessment purposes, a service life of 100 years may be used

Name and location of production site(s):

Metsä Wood	Metsä Wood	*Metsä Wood
Lohja Kerto LVL mill	Punkaharju Kerto LVL mill	Äänekoski Kerto LVL mill
Tehtaankatu 1	Tehtaantie 18	Äänekoskentie 683
08100 Lohja	58500 Punkaharju	44100 Äänekoski
Finland	Finland	Finland

*Äänekoski Kerto LVL mill was in construction phase during the year of data collection. Thus, data collection for the LCA calculations has been performed only from Lohja and Punkaharju mills.

References to any relevant websites for more information or explanatory materials, if applicable.

<https://www.metsagroup.com/metsawood/>

CONTENT DECLARATION

The mass (weight) of one unit of a product, as purchased or per declared unit: 500 kg/m³

Content of the product in the form of a list of materials and substances, and their mass:

	%	kg*	
Northern wood	93	465	veneers
Phenol formaldehyde adhesive **	7	35	veneer bonding
Melamine formaldehyde adhesive / melamine urea formaldehyde adhesive **	< 0.1	0.5	surface veneer scarf-joints

The mass and the content of distribution and/or consumer packaging:

Plastics	0,532 kg
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Information on the environmental and hazardous/toxic properties of a substances contained in the product: Metsä Wood Kerto LVL products do not contain more than 0.1% of any the Substances of Very High Concern (SVHC) listed on the Candidate List of the ECHA. Metsä Wood constantly monitors the Candidate List for updates.

Kerto LVL does not contain anything classified as hazardous waste and has the following waste codes under the consolidated European Waste Catalogue (EWC): 170201 Wood (Construction and Demolition Waste) and 030105 (Wastes from wood processing and the production of panels and furniture).

Other information on substances with hazardous and toxic properties: The formaldehyde emissions of Kerto LVL are well below the Class E1 requirement of ≤ 0.100 ppm and fulfils the most stringent requirements in the world (≤ 0.030 ppm) as well as the requirements of EU Regulation 2023/1464. The release of formaldehyde emission of Kerto LVL is approximately 0.018 ppm, equal to 0,022 mg/m³ determined according to EN 717-1 standard.

German formaldehyde requirements allow the use of EN 717-1 test results in parallel with the EN 16516 but requiring the results according to EN 717-1 to be multiplied by a factor of two (2). The multiplied emission value of Kerto LVL corresponds to max 0.036 ppm (2 x 0.018ppm) and is therefore well below the requirement of ≤ 0.100 ppm.

The declared share of biogenic/recycled materials: Carbon stored in Kerto LVL is around 790 kg CO₂ eq/m³ which has been calculated according to EN 16449. As long as Kerto LVL is used, carbon stays stored. Reuse and recycling ensure prolonged carbon storage. When energy recovery is used as the final disposal method for Kerto LVL material, renewable wood material is substituting fossil fuels in energy production. Once the material is disposed, biogenic carbon is released back to the atmosphere. The released carbon is again absorbed by trees from in the form of CO₂ and used to produce new carbohydrates.

The stored carbon originates from the atmosphere as trees absorb CO₂ and water to produce carbohydrates by utilizing the energy from sunlight. These carbohydrates are part of the tree structure in which the carbon stays stored.

Product content	Mass, kg	Post-consumer recycled material, mass-% of product	Biogenic material, mass-% of product	Biogenic material, C/product declared unit	kg or
Northern wood	465	0	93	213.3	
TOTAL	465	0	93	213.3	

LCA INFORMATION

Declared unit: 1 m³ of Kerto LVL

Conversion factor to mass if mass is not used as functional/declared unit:

500 kg/m³

Reference service life: 100 years

Time representativeness: The data for this EPD is collected from the year 2024 and covers Lohja and Punkaharju Kerto LVL mills (Finland). An average product according to the production volume of both mills has been declared. The data includes raw materials, energy consumption, water consumption, packaging, Kerto LVL products, by-products, waste and all the related transportation. Generic data has been modelled using ecoinvent 3.11. The applied allocation (physical, economic and energy) follows EN 15804 requirements.

Geographical scope: The study has been carried out for the European market. Except module A3, modelled specifically for Finland, the rest of the modules have a European geographical scope.

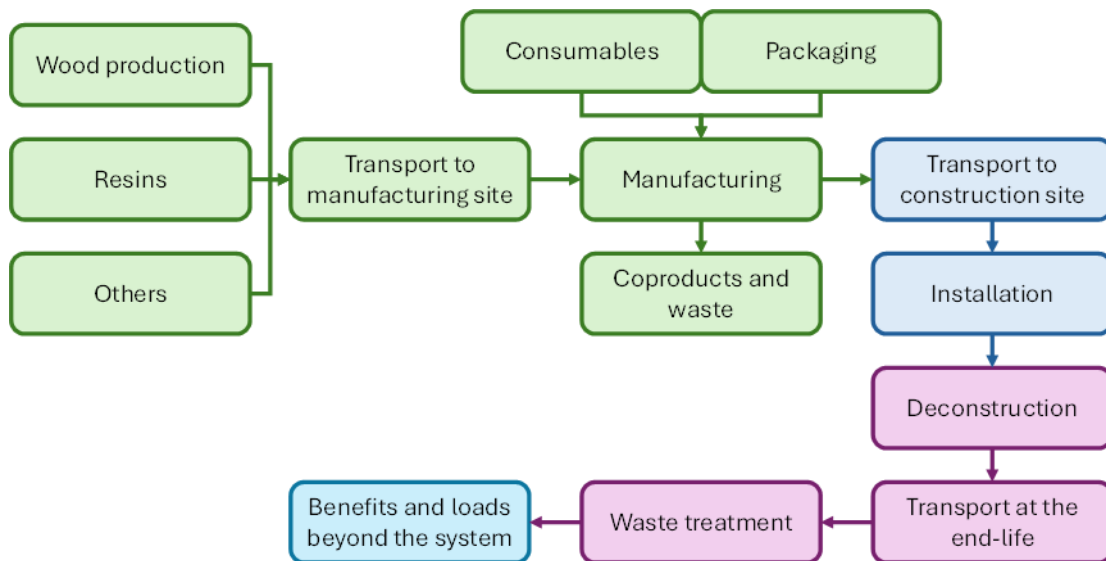
Database(s) and LCA software used: The LCA model is created using the SimaPro 10.2.0.3 Software and ecoinvent 3.11 (2024). Environmental footprint assessment from suppliers were used when available.

Description of system boundaries:

Description of the EPD system boundary as “Cradle to gate with module C1-C4 and module D”.

Process flow diagram:

Process flow diagram of the product system, divided into the life-cycle stages and modules (or other division of the product life cycle, if defined in the PCR), showing the main processes included and the system boundary of the LCA. The diagram shall make it clear when the end-of-waste state is reached for main input flows of reused/recycled materials and recovered energy, and for output flows of reused/recycled materials and recovered energy exiting the end-of-life stage.



More information:

Module A1 integrates all the inputs and outputs related to the extraction and processing of the raw materials necessary for the manufacture of the product. This includes the extraction and processing of various materials, such as wood and resins.

Module A2 supports the transportation of the raw materials needed to manufacture the product to the manufacturing sites.

Module A3 includes all the energy inputs required for manufacturing, as well as packaging for shipment to the assembly site. It also includes the supply of the packaging of finished products when they leave the factory. In addition, this module takes into account the outputs generated (end of life of the packaging used for shipment to the assembly site, emissions, water, losses).

No recycled material is a main input to, or output from the product system. Outputs from modules A1-A3 only include coproducts.

The climate impact of electricity or biogas purchased in the manufacturing process in A3 is 0,007 kg CO2 eq./kWh.

The transport stage of the construction process in A4 includes the average transportation of Kerto LVL to European customers. The distance used in this EPD has been determined as a weighted average according to delivered volumes for certain market areas in the year of data collection. The product is transported over 202,8 km to be loaded on a boat. 1125,48 km by boat are considered, and 331,2 km by truck at the end is included.

The construction installation phase includes the manufacturing, packaging and transportation of the installation losses, as well as the used energy and auxiliary materials (metallic screws) to install the product. The end-of-life treatment of the losses, the product packaging and the installation auxiliary materials related to installation are also accounted for under this module.

For deconstruction, the same amount of energy used for installation is considered. The main end-of-life scenario considered in the study is 100% incineration with energy recovery. Transport over 100 km is considered for incineration, 150 km for recycling. The efficiency considered is 25,56% recovered as heat, and 13% as electricity, as described inecoinvent data. Additional environmental assessment is presented for 100% recycling, substituting wood chips in module D.

The characterisation methods used for all declared environmental performance indicators is the EN 15804+A2 package with EF3.1.

In case of insufficient input data or data gaps for a unit process, the cut-off criteria shall be 1% of renewable and non-renewable primary energy usage and 1% of the total mass input of that unit process. The total of neglected input flows per module (e.g. A1-A3, A4-A5, B1-B5, B6-B7, C1-C4, Module D) shall be a maximum of 5% of energy usage and mass. In all cases, it is assumed that the cut-off criteria of EN 15804+A2 are met.

The nature of the flows that can be omitted from the boundaries of the system without verification of compliance with the cut-off criteria are:

- Lighting, heating and cleaning of workshops.
- The administrative department.
- Transportation of employees.

Production and end-of-life processes of infrastructure and capital goods used in the product system are not included within the system boundaries. However, infrastructure/capital from generic data are considered in the calculation.

Modules declared, geographical scope, share of primary data (in GWP-GHG results) and data variation (in GWP-GHG results):

	Product stage			Distribution/ installation stage		Use stage							End-of-life stage				Beyond product life cycle		
	Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential		
Module	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D		
Modules declared	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Geography	EU 27	EU 27	FI	EU 27	EU 27	EU 27	EU 27	EU 27	EU 27	EU 27	EU 27	EU 27	EU 27	EU 27	EU 27	EU 27	EU 27		
Share of primary data	90% for A1-A3					-	-	-	-	-	-	-	-	-	-	-	-	-	
Variation – products	12% for A1-A3					-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	19% for A1-A3					-	-	-	-	-	-	-	-	-	-	-	-	-	-

Process	Source type	Source	Reference year	Data category	Share of primary data, of GWP-GHG results for A1-A3
Resins	LCA from suppliers	Suppliers	2024	Primary data	35%
Wood production	Database	ecoinvent v3.11	2024	Primary data	21%
Transport	Database	ecoinvent v3.11	2024	Primary data	18%
Energy consumption	Database	ecoinvent v3.11	2024	Primary data	15%
Other processes	Databases	ecoinvent v3.11	2024	Secondary data	11%
Total share of primary data, of GWP-GHG results for A1-A3					89%

The share of primary data is calculated based on GWP-GHG results. It is a simplified indicator for data quality that supports the use of more primary data, to increase the representativeness of and comparability between EPDs. Note that the indicator does not capture all relevant aspects of data quality and is not comparable across product categories.

ENVIRONMENTAL PERFORMANCE

LCA results of the product(s) - main environmental performance results

Mandatory impact category indicators according to EN 15804

Results per functional or declared unit

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-total	kg CO ₂ eq.	-6,72E+02	5,66E+01	1,86E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,89E-02	9,53E+00	8,71E+02	0,00E+00	-2,34E+02
GWP-fossil	kg CO ₂ eq.	1,19E+02	5,66E+01	1,76E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,86E-02	9,53E+00	7,95E+01	0,00E+00	-2,34E+02
GWP-biogenic	kg CO ₂ eq.	-7,91E+02	1,06E-02	9,51E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,22E-04	1,82E-03	7,91E+02	0,00E+00	-2,34E-01
GWP-luluc	kg CO ₂ eq.	6,47E-01	1,99E-02	4,20E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,73E-04	3,16E-03	2,22E-03	0,00E+00	-3,24E-01
ODP	kg CFC 11 eq.	1,84E-06	1,19E-06	2,32E-07	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,10E-09	2,08E-07	9,42E-08	0,00E+00	-7,65E-06
AP	mol H ⁺ eq.	4,33E-01	3,33E-01	8,26E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,37E-04	3,06E-02	8,91E-02	0,00E+00	-7,34E-01
EP-freshwater	kg P eq.	3,80E-03	3,95E-04	7,50E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,82E-06	6,98E-05	1,14E-04	0,00E+00	-1,09E-02
EP-marine	kg N eq.	2,46E-01	9,65E-02	2,64E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,15E-05	1,02E-02	4,33E-02	0,00E+00	-1,17E-01
EP-terrestrial	mol N eq.	1,82E+00	1,07E+00	2,43E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,76E-04	1,12E-01	4,57E-01	0,00E+00	-1,31E+00
POCP	kg NMVOC eq.	8,94E-01	3,75E-01	9,52E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,52E-04	4,64E-02	1,15E-01	0,00E+00	-5,09E-01
ADP-minerals&metals*	kg Sb eq.	1,96E-04	1,77E-04	1,97E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,90E-07	3,21E-05	1,44E-05	0,00E+00	-1,50E-03
ADP-fossil*	MJ	4,52E+03	5,98E+01	2,80E+02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	9,90E-01	1,06E+01	1,67E+01	0,00E+00	-1,85E+03
WDP*	m ³	3,55E+01	2,96E+00	2,62E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,42E-02	5,24E-01	3,43E+00	0,00E+00	-3,03E+01

Acronyms
 GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption

* Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.

The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks.

The results of the end-of-life stage (modules C1-C4) should be considered when using the results of the product stage (modules A1-A3).

Additional mandatory and voluntary impact category indicators

Results per functional or declared unit

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-GHG ¹	kg CO ₂ eq.	1,19E+02	5,66E+01	1,86E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,89E-02	9,53E+00	7,95E+01	0,00E+00	-2,34E+02
PM	(disease incidence)	7,69E-06	4,22E-06	1,23E-06	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,03E-09	7,58E-07	9,30E-07	0,00E+00	-2,43E-06
IR	kg U235 eq	5,15E+01	3,23E-01	2,85E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,19E-02	5,84E-02	3,13E-02	0,00E+00	-2,21E+01
ETF	CTUe	1,34E+03	1,01E+02	1,62E+02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,93E-01	1,79E+01	8,84E+01	0,00E+00	-4,15E+02
HTCE	CTUh	7,72E-08	9,85E-09	1,40E-08	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,63E-11	1,62E-09	1,60E-08	0,00E+00	-4,51E-08
HTnCE	CTUh	5,96E-06	4,66E-07	5,02E-07	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	9,14E-10	8,42E-08	1,12E-06	0,00E+00	-1,82E-06
Land Use Related impacts	Dimensionless	1,23E+05	4,31E+02	6,23E+03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,64E-01	7,99E+01	2,05E+01	0,00E+00	-5,16E+02
Acronyms	HTCE = human toxicity – cancer effects; HTnCE = human toxicity – non-cancer effects; ETF = ecotoxicity – freshwater; PM = particulate matter; IR = ionizing radiation – human health effects															

Resource use indicators

Results per functional or declared unit

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	MJ	2,17E+04	1,23E+01	1,11E+03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,64E-01	2,20E+00	8,37E+03	0,00E+00	-6,76E+02
PERM	MJ	8,37E+03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-8,37E+03	0,00E+00	0,00E+00
PERT	MJ	3,00E+04	1,23E+01	1,11E+03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,64E-01	2,20E+00	1,89E+00	0,00E+00	-6,76E+02
PENRE	MJ	4,57E+03	8,42E+01	3,28E+02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,17E+00	1,49E+01	9,28E+02	0,00E+00	-2,20E+03
PENRM	MJ	9,27E+02	0,00E+00	-2,35E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-9,03E+02	0,00E+00	0,00E+00
PENRT	MJ	5,50E+03	8,42E+01	3,04E+02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,17E+00	1,49E+01	2,49E+01	0,00E+00	-2,20E+03
SM	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-7,11E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-4,93E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-8,81E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m ³	1,93E+00	8,82E-02	1,37E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	8,77E-04	1,57E-02	1,03E-01	0,00E+00	-1,71E+00

¹ This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO₂ is set to zero.

Acronyms	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water
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Waste indicators

Results per functional or declared unit																
Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste disposed	kg	2,00E+00	2,32E-02	2,88E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,01E-05	4,16E-03	6,28E+00	0,00E+00	-1,43E-01
Non-hazardous waste disposed	kg	5,14E+01	4,30E+01	3,78E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,70E-02	7,95E+00	8,09E+00	0,00E+00	-7,33E+01
Radioactive waste disposed	kg	5,17E-02	2,20E-04	2,78E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	9,70E-06	3,98E-05	2,06E-05	0,00E+00	-1,79E-02

Output flow indicators

Results per functional or declared unit																
Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for re-use	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Material for recycling	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for energy recovery	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy, electricity	MJ	0,00E+00	0,00E+00	3,05E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,17E+03	0,00E+00	0,00E+00
Exported energy, thermal	MJ	0,00E+00	0,00E+00	6,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,30E+03	0,00E+00	0,00E+00

Additional LCA results (other environmental performance results) of the product(s)

Results for additional scenarios for modules A4-D are declared. The most representative scenario (100% incineration with energy recovery) is declared as the main environmental performance results, and the other scenario (100% recycling) are declared below.

Results per functional or declared unit																
Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-total	kg CO ₂ eq.	-6,72E+02	5,66E+01	1,86E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,89E-02	1,43E+01	8,27E+02	0,00E+00	-1,39E+01
GWP-fossil	kg CO ₂ eq.	1,19E+02	5,66E+01	1,76E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,86E-02	1,43E+01	3,56E+01	0,00E+00	-1,37E+01
GWP-biogenic	kg CO ₂ eq.	-7,91E+02	1,06E-02	9,51E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,22E-04	2,73E-03	7,91E+02	0,00E+00	-5,99E-02
GWP-luluc	kg CO ₂ eq.	6,47E-01	1,99E-02	4,20E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,73E-04	4,73E-03	1,19E-02	0,00E+00	-1,69E-01
ODP	kg CFC 11 eq.	1,84E-06	1,19E-06	2,32E-07	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,10E-09	3,12E-07	4,43E-07	0,00E+00	-2,89E-07
AP	mol H ⁺ eq.	4,33E-01	3,33E-01	8,26E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,37E-04	4,59E-02	1,60E-01	0,00E+00	-1,52E-01
EP-freshwater	kg P eq.	3,80E-03	3,95E-04	7,50E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,82E-06	1,05E-04	4,37E-04	0,00E+00	-8,70E-04
EP-marine	kg N eq.	2,46E-01	9,65E-02	2,64E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,15E-05	1,53E-02	5,98E-02	0,00E+00	-5,48E-02
EP-terrestrial	mol N eq.	1,82E+00	1,07E+00	2,43E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,76E-04	1,68E-01	6,53E-01	0,00E+00	-6,19E-01
POCP	kg NMVOC eq.	8,94E-01	3,75E-01	9,52E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,52E-04	6,96E-02	2,45E-01	0,00E+00	-2,03E-01
ADP-minerals&metals*	kg Sb eq.	4,52E+03	5,98E+01	2,80E+02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	9,90E-01	1,59E+01	6,50E+01	0,00E+00	-1,37E+02
ADP-fossil*	MJ	1,96E-04	1,77E-04	1,97E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,90E-07	4,82E-05	1,50E-04	0,00E+00	-9,16E-05
WDP*	m ³	3,55E+01	2,96E+00	2,62E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,42E-02	7,86E-01	1,75E+00	0,00E+00	-1,77E+01
Acronyms	GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption															

* Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.

The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks.

The results of the end-of-life stage (modules C1-C4) should be considered when using the results of the product stage (modules A1-A3).

Results per functional or declared unit

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-GHG ²	kg CO ₂ eq.	1,19E+02	5,66E+01	1,86E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,89E-02	1,43E+01	3,56E+01	0,00E+00	-1,39E+01
PM	(disease incidence)	7,69E-06	4,22E-06	1,23E-06	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,03E-09	1,14E-06	3,26E-06	0,00E+00	-7,52E-06
IR	kg U235 eq	5,15E+01	3,23E-01	2,85E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,19E-02	8,75E-02	4,37E-01	0,00E+00	-1,19E+00
ETF	CTUe	1,34E+03	1,01E+02	1,62E+02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,93E-01	2,69E+01	1,21E+02	0,00E+00	-8,51E+01
HTCE	CTUh	7,72E-08	9,85E-09	1,40E-08	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,63E-11	2,43E-09	1,04E-08	0,00E+00	-1,05E-07
HTnCE	CTUh	5,96E-06	4,66E-07	5,02E-07	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	9,14E-10	1,26E-07	3,44E-07	0,00E+00	-2,28E-07
Land Use Related impacts	Dimensionless	1,23E+05	4,31E+02	6,23E+03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,64E-01	1,20E+02	1,39E+02	0,00E+00	-1,62E+04
Acronyms	HTCE = human toxicity – cancer effects; HTnCE = human toxicity – non-cancer effects; ETF = ecotoxicity – freshwater; PM = particulate matter; IR = ionizing radiation – human health effects															

Results per functional or declared unit

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	MJ	2,17E+04	1,23E+01	1,11E+03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,64E-01	3,30E+00	1,50E+01	0,00E+00	-3,06E+03
PERM	MJ	8,37E+03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-8,37E+03	0,00E+00	0,00E+00
PERT	MJ	3,00E+04	1,23E+01	1,11E+03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,64E-01	3,30E+00	-8,36E+03	0,00E+00	-3,06E+03
PENRE	MJ	4,57E+03	8,42E+01	3,28E+02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,17E+00	2,24E+01	8,77E+01	0,00E+00	-1,76E+02
PENRM	MJ	9,27E+02	0,00E+00	-2,35E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-9,03E+02	0,00E+00	0,00E+00
PENRT	MJ	5,50E+03	8,42E+01	3,04E+02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,17E+00	2,24E+01	-8,15E+02	0,00E+00	-1,76E+02
SM	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-7,11E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-4,93E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-8,81E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m ³	1,93E+00	8,82E-02	1,37E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	8,77E-04	2,35E-02	6,58E-02	0,00E+00	-4,66E-01

² This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO₂ is set to zero.

Acronyms	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water
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Results per functional or declared unit

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste disposed	kg	2,00E+00	2,32E-02	2,88E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,01E-05	6,25E-03	4,25E-01	0,00E+00	-7,33E-02
Non-hazardous waste disposed	kg	5,14E+01	4,30E+01	3,78E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,70E-02	1,19E+01	2,25E+01	0,00E+00	-8,81E+00
Radioactive waste disposed	kg	5,17E-02	2,20E-04	2,78E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	9,70E-06	5,96E-05	3,40E-04	0,00E+00	-9,58E-04

Results per functional or declared unit

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for re-use	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Material for recycling	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,01E+02	0,00E+00	0,00E+00
Materials for energy recovery	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy, electricity	MJ	0,00E+00	0,00E+00	3,05E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy, thermal	MJ	0,00E+00	0,00E+00	6,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

As the EPD does not claim compliance with ISO 21930, variations above 10% are allowed. The table below inform of the variability between average product and worst-case scenario and details the variation of each impact indicator results for which the variation is above 10%. This variation is due to the variation of share of hard and softwood and the variation of density.

LCA result of one declared unit product (A-C)	Unit	Representative/Average	Max
GWP-fossil	kg CO2 eq.	2,82E+02	3,17E+02
GWP-luluc	kg CO2 eq.	7,14E-01	8,51E-01
GWP-total	kg CO2 eq.	2,84E+02	3,19E+02
AP	mol H+ eq.	9,68E-01	1,07E+00
POCP	kg NMVOC eq.	1,52E+00	1,69E+00

ABBREVIATIONS

All abbreviations used in the EPD must be added. Please add all the abbreviations used.

Abbreviation	Definition
General Abbreviations	
EN	European Norm (Standard)
EF	Environmental Footprint
GPI	General Programme Instructions
ISO	International Organization for Standardization
CEN	European Committee for Standardization
CLC	Co-location centre
CPC	Central product classification
GHS	Globally harmonized system of classification and labelling of chemicals
GRI	Global Reporting Initiative
SVHC	Substances of Very High Concern

REFERENCES

- a) General Programme Instructions of International EPD System. Version 5.0.1
- b) PCR 2019:14. CONSTRUCTION PRODUCTS. VERSION 2.0.1
- c) C-PCR-006 (TO PCR 2019:14). WOOD AND WOOD-BASED PRODUCTS FOR USE IN CONSTRUCTION (EN 16485:2014). VERSION 1.0.0
- d) EN 15804:2012 + A2:2019 Sustainability of construction works –Sustainability of construction works –Core rules for the product category of construction products
- e) EN ISO 14025:2011 Environmental labels and declarations - Type III environmental declarations - Principles and procedures (ISO 14025:2006)
- f) EN ISO 14040:2006 + A1:2020 Environmental management - Life cycle assessment - Principles and framework (ISO 14040:2006 + Amd 1:2020)
- g) EN ISO 14044:2006 + A1 :2018 + A2 :2020 Environmental management - Life cycle assessment - Requirements and guidelines (ISO 14044:2006 + Amd 1:2017 + Amd 2:2020)

VERSION HISTORY

Original version of the EPD 2022-01-21 Kerto® LVL

Update from version 2022-01-21 to 2026-01-30 was done as 1) Metsä Wood has started to buy guarantees of origins for electricity and 2) received more supplier specific data.

2026-01-30

