

Environmental Product Declaration

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

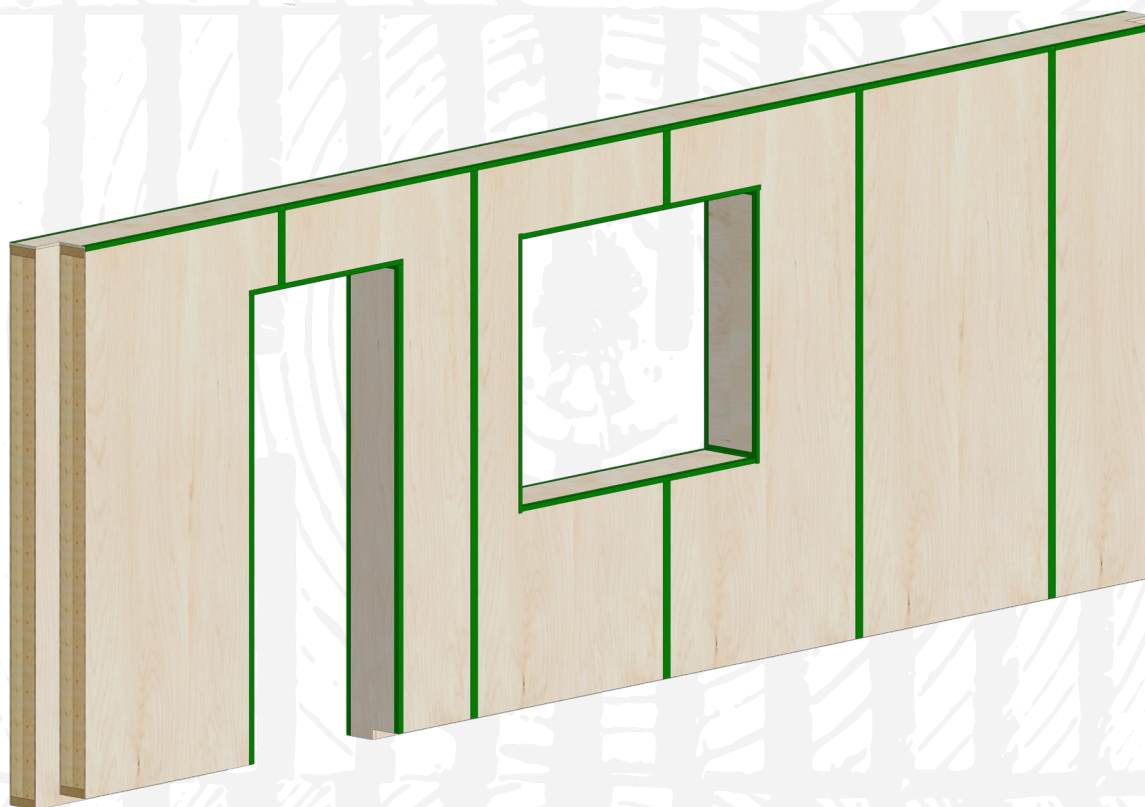
 **EPD**®
THE INTERNATIONAL EPD® SYSTEM



IsoTimber 300 mm wall element

from

IsoTimber Holding AB



Programme:	The International EPD® System, www.environdec.com
Programme operator:	EPD International AB
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An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at www.environdec.com

 **ISO** TIMBER

General information

Programme information

Programme: The International EPD® System
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Address: SE-100 31 Stockholm
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Accountabilities for PCR, LCA and independent, third-party verification
Product Category Rules (PCR)
CEN standard EN 15804 serve as the core Product Category Rules (PCR)
Product category rules (PCR): <i>PCR 2019:14 Construction products (EN 15804:A2) version 1.2.5</i> <i>PCR 2012:01-Sub-PCR-E Sub-PCR-E Wood and wood-based products for use in construction (EN 16485) (2021-11-08)</i>
PCR review was conducted by: The Technical Committee of the International EPD® System. The review panel may be contacted via the Secretariat www.environdec.com/contact .
Life Cycle Assessment (LCA)
LCA accountability: Carmen Cristescu, SLU Swedish University of Agriculture, RISE Research Institutes of Sweden.
Third-party verification
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via: <input checked="" type="checkbox"/> EPD verification by individual verifier Third-party verifier: Viktor Hakkarainen, VästLCA AB Approved by: The International EPD® System
Procedure for follow-up of data during EPD validity involves third party verifier: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

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

EPDs within the same product category but registered in different EPD programmes, or not compliant with EN 15804, may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same 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 equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterisation factors); have equivalent content declarations; and be valid at the time of comparison. For further information about comparability, see EN 15804 and ISO 14025.

Company information

Owner of the EPD:

IsoTimber Holding AB

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Location of production sites:

IsoTimber Holding AB

Ställverksvägen 1

831 52 Östersund

and

Laminerings teknik i Hammerdal AB

Edevägen 13

833 41 Hammerdal

Description of the organization:

IsoTimber manufactures prefabricated wall elements in Östersund, Jämtland. IsoTimber wall elements are produced with a unique construction technology with patent pending in Europe and Canada and patent granted in Japan. The construction technology enables the production of heat insulating and load bearing walls consisting of mainly wood and air, no wind or plastic membrane or other insulating materials are required. The wall elements are produced in a dry indoor environment. IsoTimber operates in Sweden.

Certifications:

eBVD ID C-556748467901 – IsoTimber wall

BVB ID 136559 – IsoTimber wall

This Environmental Product Declaration is for a specific product: the IsoTimber wall element with a thickness of 300 mm".

Product information

Product name: IsoTimber 300 mm wall element

Weight: 124 kg/m²

U-value: 0,24 W/m²K (according to ISO – 8890)

UN CPC code: 314

The wall element is composed of two layers of IsoTimber panels with 150 mm thickness. The panels are produced from standing timber posts with milled air gaps, surrounded by a frame of solid timber studs, laminated between two sheets of thin (6 mm) plywood glued on both sides. The posts and studs are sourced from pine or spruce from Swedish forest. Two layers of panels are fixed together using screws and formed into wall elements designed for the specific building, with cut outs for doors and windows. All joints of the wall element are taped to stop air leakage.

IsoTimber delivers the wall elements to professional builders for use in all types of buildings, as external and partition walls. The unique wall system enables an effective building process on site. Structural design and assembly drawings for the wall elements are included. The exterior of the wall is supplemented with an air gap and façade material. The inside of the wall is finished with an optional air gap for electrical installations and an internal lining. Façade material and internal linings are not included in this EPD.



LCA information

Declared Unit	1 m ² IsoTimber 300 mm wall element
Conversion factor	1 m ² = 124,3 kg at a moisture content of 12%. 1 kg = 0,008 m ²
Moisture content	12% in average. Wood moisture fluctuates according to environment.
System boundaries	Cradle to gate with modules C1–C4 and module D (A1–A3 + C + D)
Reference service life:	No RSL is defined because the use phase is not included
Cut-off rules	The procedure for the exclusion of inputs and outputs is: 99 % of total inflows (mass and energy) per module has been included. Flows with known significant emissions are included even for amount less than 1% in mass or energy use.
Background data	Specific input data of materials is used from EPDs (S-P- 02537 and S-P-02802). Other generic input data of raw materials and energy and processes is used from Ecoinvent datasets. Ecoinvent is the world's biggest LCI (Life cycle inventory) data library and the latest and most updated version was used. Ecoinvent contains data for the specific geographical regions relevant for this study. The background data from Ecoinvent 3.9.1 is from 2003-2023.
Geographical scope	A1 -A3, C1-C4, D: Sweden
Time representativeness	The LCA is based on production data from 01.10.2021 to 31.09.2022 but is deemed to be representative of an average year of production.
Data quality	The data quality is considered good to very good. Third party verified EPD's from the branch organization was used for the raw material that represents 88% of the final product weight: sawn, dried timber.
Allocations	Allocation is performed according to EN15804:2012. No allocation has been applied to the by-product "wood chips" coming out from the sawing of air channels at Lamtech AB (the supplier of the sawing service). The conservative approach is applied in module A1. The product is part of a family of 11 products. One allocation rule is applied: energy use and waste of manufacturing is allocated between all wall elements manufactured during one year based on product weight (kg).
Comparability	A comparison or an evaluation of EPD data is only possible where EN 15804 has been followed, and the same building context, the same function and the same product-specific characteristics of technical performance are considered as well as if the same stages have been included in the system boundary.
Impact Assessment methods	Potential environmental impacts are calculated with Environmental Footprint 3.0 method as implemented in SimaPro 3.9.1. Resource use values are calculated from Cumulative Energy Demand & Waste with EPD import V1.12.
LCA software	The LCA software is SimaPro version PhD 9.5.0.2

Estimates and assumptions:

- For all timber components, the density of 489 kg / m³ is assumed at a moisture content of 16%, as indicated by EPD Swedish sawn dried timber of spruce and pine, Svenskt trä. S-P-02537.
- A share of 51 % pine and 49 % spruce is assumed for the timber used.
- For all plywood components, a density of 490 kg / m³ is assumed at a moisture content of 6 %, as usually delivered by construction plywood manufacturers.
- For all LVL (laminated veneer lumber) components, a density of 510 kg / m³ is assumed at a moisture content between 8 to 10%, as indicated by EPD Kerto LVL Laminated Veneer Lumber, Metsä, S-P-02802.

- The electricity used at the production site Lamtech AB in Hammerdal is assumed to be the Swedish electricity mix, as in Ecoinvent 2021 (reference year 2014).
- The electricity used at the production site IsoTimber AB i Lugnvik, Östersund for the studied period contain 69,3 % wind power, 24,2 % hydropower, 5,7 % biomass, 0,7 % solar power. This information has been collected directly from the energy supplier.

- Transport distances that are not specified have been assumed using city or country.
- Unspecified modes of transport have been assumed to be trucks or trucks and ferries (when the transport is assumed to cross the Baltic Sea).
- Truck transports within Finland and Sweden are assumed to have environmental class EURO 6. For all transports, the reduction obligation of greenhouse gases emissions has not been taken into account.

- In the C module the end-of-life scenario considered is that the wall element is demolished during the deconstruction process and separate energy from machine is required for this process. The parts of wall element are transported to a municipal waste collection and sorting station, the average transport distance from the demolition place to the station is assumed to be 30 km. It is considered that 95% of the wall element gets to the station where a material separation process takes place. Wooden parts will be incinerated and the distance of the transport of the wooden content from the sorting station to the CHP plant for energy recovery is assumed to be 50 km. The processes of chipping and incineration are not included. The steel screws and clams are sent for recycling, the distance for the reclaimed steel products from the waste collection to the recycling facilities is assumed to be 200 km.

- In the D module the benefits and loads beyond the system boundary are calculated. Wood energy recovery and aluminum and steel recycling are considered. Energy recovery of the wood product in CHP plants produces district heating and electricity and thus replaces Swedish medium district heating (mixed combustion of wooden products and waste) and Swedish electricity mix. It is assumed that 95 % of the wood material included in the product is incinerated for energy recovery at CHP plant. When calculating module D, it is assumed that 100 % of the wood is treated in a CHP plant with an efficiency of 80%. It is also assumed that 14% of the inherent energy provides electricity and 86% of the energy provides district heating.

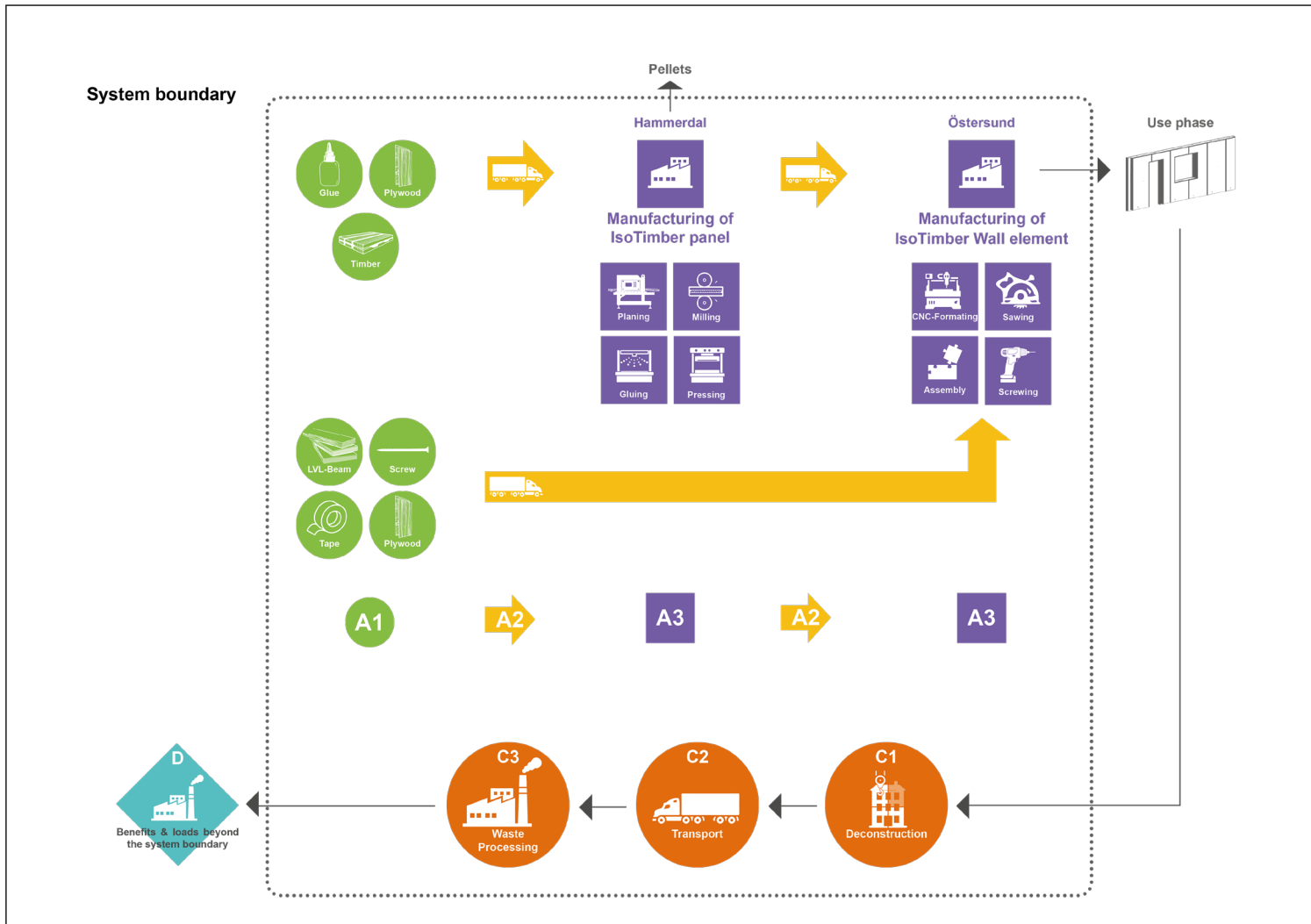
System boundaries:

Included	Excluded
Production and distribution <ul style="list-style-type: none"> • Production of all consumed raw materials and goods, including waste/spill material from production process, packaging etc. • Energy and fuels. • Transports of raw material and consumed goods to production site. • Production processes. • Transport of and disposal of waste from production stage. • Transport to receiver of recyclable waste and spill material derived from the production stage. 	Production and distribution <ul style="list-style-type: none"> • Transport of ready-made wall elements from production site to customer.
Operation and maintenance <ul style="list-style-type: none"> - 	Operation and maintenance <ul style="list-style-type: none"> • All maintenance of the wall is excluded.
End-of-life (C1-C4) <ul style="list-style-type: none"> • Transport from building to site for demolition/dismantling, waste processing and further transport to facility for energy recovery and recycling. 	End-of-life (C1-C4) <ul style="list-style-type: none"> • Environmental impact from incineration for energy recovery at CHP plant for wood.
<ul style="list-style-type: none"> • Benefits and loads beyond the system boundary (D). 	



IsoTimber Panel

System diagram



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

Product stage				Construction process stage		Use stage								End of life stage				Resource recovery stage
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	ND	ND	N D	ND	ND	ND	ND	ND	ND	X	X	X	X	X	
Geography	EU	EU	SE	ND	ND	N D	ND	ND	ND	ND	ND	ND	SE	SE	SE	SE	SE	
Specific data used			40%			-	-	-	-	-	-	-	-	-	-	-	-	
Variation – products			0%			-	-	-	-	-	-	-	-	-	-	-	-	
Variation – sites			0%			-	-	-	-	-	-	-	-	-	-	-	-	

Content information

Product components	Weight, kg	Post-consumer recycled material, weight-%	Biogenic material, weight-% and kg C/m ²
Timber	108,14	0	100 resp 47
Plywood	13,68	0	90,92 resp 5,9
LVL (Laminated Veneer Lumber)	1,56	0	93% resp 0,6
Adhesive + Hardner	0,59	0	0 resp 0
Steel	0,33	0	0 resp 0
Building tape	0,02	0	0 resp 0
SUM	124,32	0	98,16% resp 53,4
Packaging materials	Weight, kg	Weight-% (versus the product)	Weight biogenic carbon, kg C/m ²
Plywood	0,12	0,1%	0,05
LVL	0,94	0,8%	0,36
Steel	0,12	0,1%	0
SUM	1,18	1%	0,41

The product does not contain any dangerous substances from the candidate list of SVHC for Authorisation, in quantities that exceed the limits for registration with the European Chemicals Agency.

Environmental Information

Potential environmental impact – mandatory indicators according to EN 15804

Results per 1 m ² IsoTimber 300 mm wall element							
Indicator	Unit	A1-A3	C1	C2	C3	C4	D
GWP-fossil	kg CO ₂ eq.	3,21E+01	6,71E-02	1,87E+00	2,70E-01	0,00E+00	-1,64E+01
GWP-biogenic	kg CO ₂ eq.	-1,95E+02	2,71E-05	4,84E-03	1,95E+02	0,00E+00	-1,30E+00
GWP-luluc	kg CO ₂ eq.	1,58E-01	7,41E-06	9,08E-04	3,90E-05	0,00E+00	-2,61E-02
GWP-total	kg CO ₂ eq.	-1,63E+02	6,71E-02	1,88E+00	1,95E+02	0,00E+00	-1,78E+01
ODP	kg CFC 11 eq.	2,51E-06	1,04E-09	3,97E-08	4,16E-09	0,00E+00	2,08E-07
AP	mol H ⁺ eq.	2,23E-01	6,07E-04	3,99E-03	2,38E-03	0,00E+00	-2,28E-02
EP-freshwater	kg P eq.	9,01E-03	2,01E-06	1,30E-04	1,19E-05	0,00E+00	-1,40E-03
EP-marine	kg N eq.	7,96E-02	2,82E-04	1,01E-03	1,10E-03	0,00E+00	-3,20E-02
EP-terrestrial	mol N eq.	3,51E+01	3,06E-03	1,02E-02	1,18E-02	0,00E+00	-9,85E-02
POCP	kg NMVOC eq.	2,28E-01	7,36E-04	2,77E-03	2,85E-03	0,00E+00	-8,40E-02
ADP-minerals&metals*	kg Sb eq.	4,09E-04	2,29E-08	5,96E-06	2,84E-07	0,00E+00	-6,12E-05
ADP-fossil*	MJ	7,67E+02	8,58E-01	2,59E+01	3,41E+00	0,00E+00	-8,86E+02
WDP*	m ³	2,92E+01	1,75E-03	1,05E-01	8,30E-03	0,00E+00	-9,01E+00
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 of these results are high or as there is limited experience with the indicator. The impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

Potential environmental impact - additional mandatory and voluntary indicators

Results per 1 m ² IsoTimber 300 mm wall element							
Indicator	Unit	A1-A3	C1	C2	C3	C4	D
GWP-GHG ¹	kg CO ₂ eq.	3,14E+01	6,56E-02	1,83E+00	2,60E-01	0,00E+00	-1,61E+01
Additional voluntary indicators e.g. the voluntary indicators from EN 15804 or the global indicators according to ISO 21930:2017							

Use of resources

Results per 1 m ² IsoTimber 300 mm wall element							
Indicator	Unit	A1-A3	C1	C2	C3	C4	D
PERE	MJ	8,79E+02	4,45E-01	4,07E-01	3,29E-02	0,00E+00	-1,71E+02
PERM	MJ	2,34E+03	0,00E+00	0,00E+00	-2,34E+03	0,00E+00	0,00E+00
PERT	MJ	3,22E+03	4,45E-01	4,07E-01	-2,34E+03	0,00E+00	-1,71E+02
PENRE	MJ	7,57E+02	9,12E-01	2,75E+01	3,62E+00	0,00E+00	-8,97E+02
PENRM	MJ	2,26E+01	0,00E+00	0,00E+00	-2,26E+01	0,00E+00	0,00E+00
PENRT	MJ	7,79E+02	9,12E-01	2,75E+01	5,97E+00	0,00E+00	-8,97E+02
SM	kg	0,00E+00	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
NRSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m ³	4,91E-02	8,20E-08	5,06E-06	3,55E-07	0,00E+00	5,49E-06
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						

¹ The indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. This indicator is thus almost equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.

Waste production and output flows

Waste production

Results per 1 m ² IsoTimber 300 mm wall element							
Indicator	Unit	A1-A3	C1	C2	C3	C4	D
Hazardous waste disposed	kg	8,31E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Non-hazardous waste disposed	kg	2,16E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Radioactive waste disposed	kg	4,22E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Output flows

Results per 1 m ² IsoTimber 300 mm wall element							
Indicator	Unit	A1-A3	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
Material for recycling	kg	0,00E+00	0,00E+00	0,00E+00	4,30E-01	0,00E+00	0,00E+00
Materials for energy recovery	kg	5,00E+01	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	0,00E+00	2,12E+02	0,00E+00	0,00E+00
Exported energy, thermal	MJ	0,00E+00	0,00E+00	0,00E+00	1,31E+03	0,00E+00	0,00E+00

References

Cristescu C., (2023) Livscykelanalys av IsoTimber 300 mm väggelement, SLU - Forest Biomaterials and Technology's department, Working report 2023:10, SLU Umeå,

EN 15804:2012+A2:2019: Sustainability of construction works - Environmental Product Declarations - Core rules for the product category of construction products.

Environmental product declaration. Swedish sawn dried timber of spruce and pine. Svenskt trä. S-P-02537. Program operator: EPD International AB. www.environdec.com

Environmental product declaration. Kerto LVL Laminated Veneer Lumber, Metsä, S-P-02802. EPD International AB. www.environdec.com

General Program Instructions of the International EPD® System. Version 4.0.

PCR 2019:14 (2022) Construction products (EN 15804:A2) (1.2.5)

PCR 2012:01-Sub-PCR-E Sub-PCR-E Wood and wood-based products for use in construction (EN 16485) (2021-11-08)

Version history:

2023-10-26 The flow of GWP-biogenic has been correctly modelled with output in A3 instead of C3.

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