Environmental Product Declaration

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

TS Thermowood Painted

from

Løgstrup Træindustri ApS

Programme:	The International EPD® System, www.environdec.com
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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

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
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Accountabilities for PCR, LCA and independent, third-party verification
Product Category Rules (PCR)
CEN standard EN 15804+A2 serves as the Core Product Category Rules (PCR)
Product Category Rules (PCR): *Construction products 2019:14 Version 1.2.5, 2022-11-20;* *c-PCR: Wood and wood-based products for use in construction (EN 16485:2014) Version 2019-12-20*
PCR review was conducted by: *Martin Erlandsson, IVL Swedish Environmental Research Institute, martin.erlandsson@ivl.se*
Life Cycle Assessment (LCA)
LCA accountability: Augustas Sudaras, Green Survey ApS www.greensurvey.dk
Third-party verification
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via: ☒ EPD verification by individual verifier Third-party verifier: Sigita Židonienė, PhD., Vesta Consulting, Sigita@vestaconsulting.lt Approved by: The International EPD® System
Procedure for follow-up of data during EPD validity involves third party verifier: ☐ Yes ☒ 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+A2, 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+A2 and ISO 14025.

Company information

Owner of the EPD: Løgstrup Træindustri ApS

Contact: Lars Thorlund,
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Email: lt@thorlundskou.dk

Description of the organisation: Løgstrup Træindustri ApS started in 1936 and is a part of the Thorlund Skou A/S group. We currently have approximately 2800m2 under roof and are therefore able to store wood for our customers. Today, we specialise in all types of subcontracting work for the wood industry. The Thorlund Skou A/S group is a modern distributor of timber to a wide range of segments within the professional B2B market. The group imports and distributes more than 250,000 cubic metres of softwood to the Danish, Polish, Baltic and German markets. Imports are made from more than 150 sawmills around the Baltic Sea, with imports from Norway and Sweden accounting for 2/3 of total imports. The group has its own distribution warehouse and wood processing facilities in Brande and Løgstrup, primarily serving Danish customers. We have more than 25 years of experience in wood processing and our facilities include NTR pressure impregnation, bedding, drying, planing and surface painting. 15,000 m3 production facilities and warehouse under roof on 8 hectares of distribution plots.

Product-related or management system-related certifications: The product has the following certificates: PEFC: PEFC ST 2001:2020; PEFC ST 2002:2020
FSC:FSC-STD-40-003 V2-1; FSC-STD-40-004 V3-1; FSC-STD-50-001 V2-0
Name and location of production site: Løgstrup Træindustri ApS, Hovedgaden 11
8831 Løgstrup, Denmark

Product information

Product name: TS Thermowood Painted
Product description: The profiled Thermowood are primarily used as a cladding material for buildings. It serves the function of providing a protective outer layer, covering the exterior walls and enhancing their aesthetics. The boards are installed horizontally or vertically, depending on the desired design, and secured to the building's framework.

As a wall cladding material, the thermowood offers several benefits. It acts as a shield against weather elements, such as rain, wind, and UV radiation, protecting the underlying structure from damage. The thermal treatment process significantly improves the wood's resistance to moisture absorption, reducing the risk of rot and decay.

Additionally, the thermowood's dimensional stability minimizes the occurrence of warping and cracking, ensuring a long-lasting and visually appealing exterior surface.

The profiled wood products can also be used for other applications within the building envelope. It can be integrated into roofs as decorative elements or used to construct exterior facades, giving a natural and warm appearance to the overall building design.

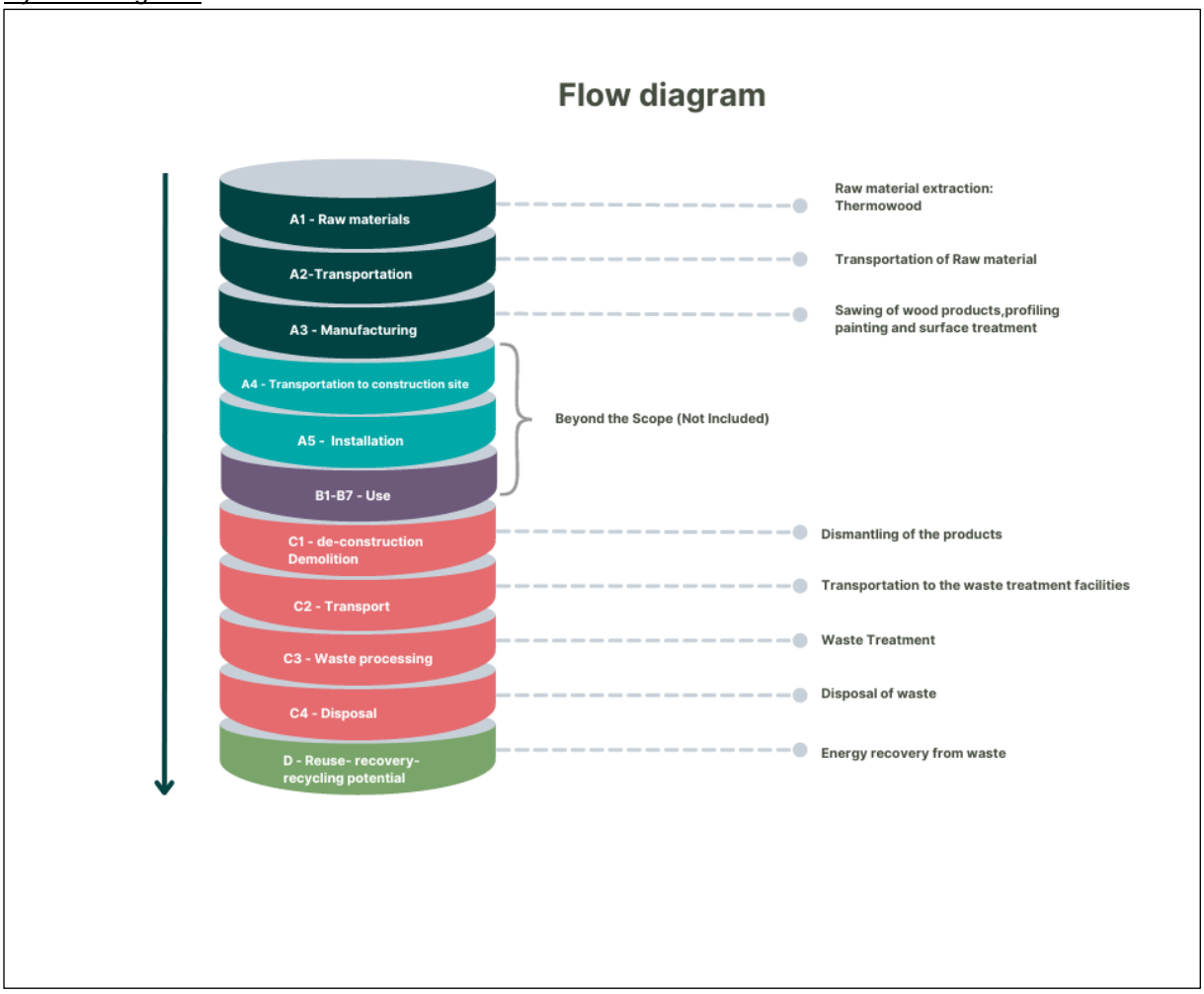
UN CPC code: 31600 Builders' joinery and carpentry of wood (including cellular wood panels, assembled parquet panels, shingles and shakes

Geographical scope: Europe

LCA information

Declared unit: 1 m3 thermowood painted for cladding and decking of varying dimensions. With average density of 439.43 kg/m3
Reference service life: 100 years
Time representativeness: 2022
Database(s) and LCA software used: Ecoinvent 3.9.1 and SimaPro 9.5.0.2
Description of system boundaries:
Cradle to gate with modules C1–C4 and module D (A1–A3 + C + D); A1 (Raw material supply), A2 (Transport) and A3 (Manufacturing) as well as C1 (Deconstruction), C2 (transport at end-of-life), C3 (Waste processing) and C4 (Disposal) in addition, module D – benefits and loads beyond the system boundary is included.

System diagram:



Data quality: The foreground data collected internally is based on yearly production amounts and extrapolations of measurements on specific machines and plants. Overall, the data quality can be described as good. The primary data collection has been done thoroughly.
Cut-off criteria: Life cycle inventory data for a minimum of 99% of total material and energy inputs flows have been included in the life cycle analysis.

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

	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**	**MND**	**MND**	**MND**	**MND**	**MND**	**MND**	**MND**	**MND**	**MND**	**X**	**X**	**X**	**X**	**X**
Geography	EU	EU	DK	-	-	-	-	-	-	-	-	-	DK	GLO	DK	DK	DK
Specific data used	>90%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	<10%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	0			-	-	-	-	-	-	-	-	-	-	-	-	-	-
System boundary (X = included in LCA; MND = module not declared)																	

Product stage:
A1: This module considers the extraction and processing of raw materials and energy consumption.
A2: The raw materials are transported to the manufacturing plant. In this case the model includes road and sea transportation for the raw materials.
A3: This module outlines the manufacturing process of Thermowood, covering both product fabrication and packaging. It also considers energy consumption and waste production at the manufacturing facility. The key steps include:

- Cutting: Thermowood is precisely cut to specific requirements, defining its final dimensions and form.
- Profiling: After cutting, the wood is profiled using machinery to achieve the desired design.
- Vacuuming: The wood is then thoroughly vacuumed to remove any debris and impurities, ensuring cleanliness for further processing.
- Applying Primer: A primer is applied to the Thermowood, preparing it for the final painting step and enhancing the adhesion and longevity of the paint.
- Painting: profiled Thermowood is painted, providing an additional layer of protection, and giving it the desired aesthetic finish.
- Treatment with Water-based Wood Preservative: To enhance durability and resistance to decay and fungal attacks, wood is treated with a water-based preservative, extending its overall lifespan.

End of Life stage:
C1: The product can disassemble and collect manually therefore, there are no emissions in the C1.
C2. Transport of the discarded product to the processing site. It is estimated that there is no mass loss during the used of the product, therefore, the end-of-life product is assumed that it has the same weight as the declared product. All the end-of-life products are being sent to the incineration according to the Danish waste management infrastructure on average is assumed to be 70 km distance and the transportation method is lorry which is the most common.
C3: Waste processing for reuse and/ or recycling. Wood is a highly recyclable material: it is assumed that 100% of the product is collected separately and demolition site and send directly to incineration facility with energy recovery.
C4: It is assumed that 100% of the product is collected at the construction site and sent for incineration, so no input in module C4.
Benefits and loads beyond the system boundary (D): The benefits of recyclable waste generated in module C3 are considered in module D. Heat and energy production as a benefit when the product is incinerated in module C3 is considered.

Content information

Product components	**Weight, kg**	**Post-consumer material, weight-%**	**Biogenic material, weight-% and kg C/kg**
Thermowood (Spruce *(Picea abies)*, Pine *(Pinus sylvestris))*	382.2	0	91
Water content (9%)	37.8	0	0
Topcoat	8	0	0
Primer	11.428	0	0
TOTAL	439.428	0	91
Packaging materials	**Weight, kg**	**Weight-% (versus the product)**	**Weight biogenic carbon, kg C/kg**
Suspenders	0.003	7.14E-6	0
PVC Cover	0.16	3.8E-4	0
TOTAL	0.163	0	0

No dangerous substances from the candidate list of SVHC for Authorisation are present in concentrations greater than 0.1% by weight in the product

Results of the environmental performance indicators

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. Note: it is discouraged to use the results of modules A1-A3 without considering the results of module C when module C is declared.

Mandatory impact category indicators according to EN 15804+A2

Results per declared unit							
Indicator	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-fossil	kg CO_2 eq.	2,30E+02	0,00E+00	4,26E+01	6,78E+00	0,00E+00	-2,11E+02
GWP-biogenic	kg CO_2 eq.	-7,37E+02	0,00E+00	7,82E-03	6,42E+02	0,00E+00	-1,27E+03
GWP-luluc	kg CO_2 eq.	7,56E-01	0,00E+00	5,39E-03	1,85E-03	0,00E+00	-1,18E-01
GWP-total	kg CO_2 eq.	-5,06E+02	0,00E+00	4,26E+01	6,49E+02	0,00E+00	-1,48E+03
ODP	kg CFC 11 eq.	1,69E-05	0,00E+00	6,68E-07	1,19E-07	0,00E+00	-7,73E-07
AP	mol H^+ eq.	9,94E-01	0,00E+00	2,33E-01	7,16E-02	0,00E+00	-3,05E+00
EP-freshwater	kg P eq.	3,18E-02	0,00E+00	7,95E-04	2,99E-03	0,00E+00	-6,80E-02
EP-marine	kg N eq.	3,46E-01	0,00E+00	1,01E-01	3,82E-02	0,00E+00	-1,92E-01
EP-terrestrial	mol N eq.	3,24E+00	0,00E+00	1,10E+00	3,66E-01	0,00E+00	-8,21E+00
POCP	kg NMVOC eq.	1,09E+00	0,00E+00	4,29E-01	9,32E-02	0,00E+00	-1,00E+00
ADP-minerals&metals*	kg Sb eq.	7,24E-04	0,00E+00	2,74E-05	1,19E-05	0,00E+00	-6,60E-04
ADP-fossil*	MJ	4,00E+03	0,00E+00	5,53E+02	5,89E+01	0,00E+00	-1,74E+03
WDP*	m^3	1,99E+01	0,00E+00	1,04E+00	-5,11E+00	0,00E+00	-2,04E+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 of these results are high or as there is limited experience with the indicator.*

Additional mandatory and voluntary impact category indicators*

Results per declared unit							
Indicator	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-GHG[1]	kg CO_2 eq.	2,31E+02	0,00E+00	4,26E+01	6,81E+00	0,00E+00	-3,72E+02

*This method is based on the final government distribution version of the IPCC report 'AR6 Climate Change 2021.This version of the method excludes CO2 uptake and biogenic CO2 emissions.

Resource use indicators

Results per declared unit							
Indicator	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	MJ	9,66E+01	0,00E+00	5,48E-01	7,86E+03	0,00E+00	-5,54E+02
PERM	MJ	8,45E+03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-7,86E+03
PERT	MJ	8,54E+03	0,00E+00	5,48E-01	7,86E+03	0,00E+00	-8,42E+03
PENRE	MJ	4,38E+03	0,00E+00	5,87E+02	6,38E+01	0,00E+00	-1,84E+03
PENRM	MJ	8,99E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ	4,39E+03	0,00E+00	5,87E+02	6,38E+01	0,00E+00	-1,84E+03
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	8,68E+00	0,00E+00	3,75E-02	-9,63E-02	0,00E+00	-3,01E-01
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 resources; 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] 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 CO_2 is set to zero.

Waste indicators

Results per 1m3 declared unit							
Indicator	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Hazardous waste disposed	kg	1,03E-01	0,00E+00	5,69E-03	2,64E+00	0,00E+00	-5,41E-02
Non-hazardous waste disposed	kg	1,73E+02	0,00E+00	2,79E+00	4,93E+00	0,00E+00	-2,38E+01
Radioactive waste disposed	kg	1,17E-02	0,00E+00	4,04E-05	1,62E-05	0,00E+00	-1,55E-03

Output flow indicators

Results per 1m3 declared unit							
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	5,75E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for energy recovery	kg	8,24E-01	0,00E+00	0,00E+00	4,39E+02	0,00E+00	0,00E+00
Exported energy, electricity	MJ	4,69E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy, thermal	MJ	6,73E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Information on biogenic carbon content

BIOGENIC CARBON CONTENT PER 1m3 Profiled Thermowood		
Parameter	**Unit**	**At the factory gate**
Biogenic carbon content in product	[kg C]	201,03
Biogenic carbon centent in accompanying packagaing	[kg C]	0
Note	1 kg biogenic carbon is equivalent to 44/12 kg of CO_2	

Additional information

Manufacturing energy scenario documentation

Energy Source	Method	Kg CO2eq/kWh
Danish Electricity country mix	IPCC 2021	0.0587

References

General Programme Instructions of the International EPD® System. Version 4.0.
ISO 14025:2010 Environmental labels and declarations – Type III environmental declarations Principles and procedures.
ISO 14040:2006 Environmental management. Life cycle assessment. Principles and frameworks.
ISO 14044:2006 Environmental management. Life cycle assessment. Requirements and guidelines.
EN 15804+A2 Sustainability in construction works – Environmental product declarations – Core rules for the product category of construction products.
PCR 2019:14 Construction products (version 1.2.5) c-PCR-006 Wood and wood-based products for use in construction (EN 16485:2014) Version 2019-12-20
Profiled Thermowood and Profiled Softwood for construction from Løgstrup Træindustri ApS LCA background report. 2023 November.

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