ARVOLISTA

WOODEN INTERIOR MOULDING AND PANEL PRODUCTS

ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025 / ISO 21930

ARVOLISTA

Granlund

GENERAL INFORMATION

MANUFACTURER INFORMATION

Manufacturer	Arvolista Oy
Address	Jäsperintie 5, Myllykoski, Finland
Contact details	Antti Koskinen, Arvolista Oy
Website	https://www.arvolista.fi

PRODUCT IDENTIFICATION

Product name	Wooden interior moulding and panel products
Additional label(s)	-
Product number / reference	-
Place(s) of production	Myllykoski, Finland

The manufacturer has the sole ownership, liability, and responsibility for the EPD. EPDs within the same product category but registered in different EPD programmes 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.

EPD INFORMATION

EPD program operator	Rakennustieto EPD, Malminkatu 16 A, 00100 Helsinki, Finland
EPD standards	This EPD is in accordance with EN 15804+A2 and ISO 14025 standards.
Product category rules	The CEN standard EN 15804 serves as the core PCR. RTS PCR 2020
EPD author	Natalia Pennanen, Anni Viitala, Granlund Oy, Malminkaari 21, 00701 Helsinki, Finland
EPD verification	Independent verification of this EPD and data, according to ISO 14025: External verification
Verification date	
EPD verifier	Heini Koutonen, Nordic Impact Oy, Keilaniementie 1, 02150 Espoo
EPD number	RTS_335_24
Publishing date	18.12.2024
EPD valid until	18.12.2029

Jukka Seppänen
RTS EPD Committee Secretary

Laura Apilo
Managing Director

PRODUCT INFORMATION

PRODUCT DESCRIPTION

The studied product: Arvolista, Wooden interior moulding and panel products. This EPD covers wood-ready and surface treated products.

PRODUCT APPLICATION

The products are suitable for all types of buildings. Finishing products for interior parts of buildings. Purpose of use, e.g. skirting board, cover board, ceiling board and paneling.

PRODUCT STANDARDS

Not spesified

PRODUCT RAW MATERIAL COMPOSITION

Main substances of the products are presented in table below presenting raw materials of per 1 m^3 of studied product. Wood raw materials are procured 100 % from PEFC-certified forests. Origins of raw materials are presented in following tables

Wood-ready	Mass per 1m^3 (%)	Origin	Renewable material content (%)	Non-renewable content (%)	Recycled material content (%)
Wood, pine	98 %	FIN/ESTONIA	100	0	0
Wood, spruce	2%	FIN	100	0	0
Total mass of materials	470 kg				

Surface treated	Mass per 1m^3 (%)	Origin	Renewable material content (%)	Non-renewable content (%)	Recycled material content (%)
Wood, pine	89,5 %	FIN/ESTONIA	100	0	0
Wood, spruce	6,1 %	FIN	100	0	0
Surface treatment	4,4 %	FIN	0	100	0
Total mass of materials	491 kg				

PACKAGING MATERIAL COMPOSITION

Main packaging materials of products per declared unit are presented in table below.

Packaging material	% of weight
Plastic	88,6 %
Cardboard	11,4 %
Total mass of packaging materials	8,1 kg

SUBSTANCES, REACH - VERY HIGH CONCERN

The product does not contain any REACH SVHC substances in amounts greater than 0,1 % (1000 ppm).

LIFE-CYCLE ASSESSMENT

LIFE-CYCLE ASSESSMENT INFORMATION

Period for data	1 year, 2022

DECLARED AND FUNCTIONAL UNIT

Declared unit	1 m^3
Mass per declared unit	Wood-ready products: 470 kg Surface treated products: 491 kg
Moisture content	18 %
Functional unit	-
Reference service life	-

This declaration covers the life cycle stages from cradle to gate with options (A4 and A5), modules C1–C4, and module D

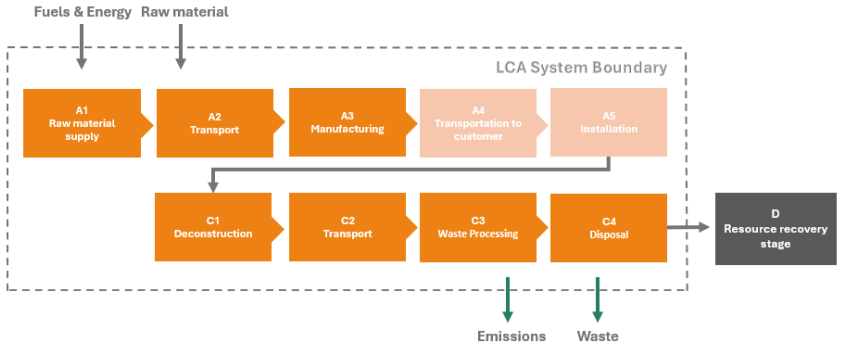
BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

Biogenic carbon content in product, kg C	202,2 kg
Biogenic carbon content in packaging, kg C	0,00045 kg

SYSTEM BOUNDARY

Studied system covers the following steps of life cycle according to EN 15804: **A1** Raw material supply**, A2** Transport, **A3** Manufacturing, **A4** Transportation of the product to construction site, **A5** Installation to building, **C1** Deconstruction, **C2** Transportation of end-of-life **C3** Waste processing and **C4** Disposal. In addition, the benefits and loads beyond the system boundary of stage **D** consist of product reuse, recovery and recycling. System boundary describing the system boundary and the input and output flows is shown below:



LCA System Boundary of studied products

End of waste point of the studied product is the step when material is used as fuel in an incineration plant. End of waste point of the waste flows in A3-module is the step when materials are collected and handled in the sorting plant. End of waste point of the packaging materials collected for recycling in A5 module is the point when materials are collected and handled in the sorting plant.

Production processes on the Arvolista´s supply chain and production site cover following manufacturing processes; raw material supply, planing and finger joint, cutting, surface finishing and packaging the final product. After that, products will be stored and transported.

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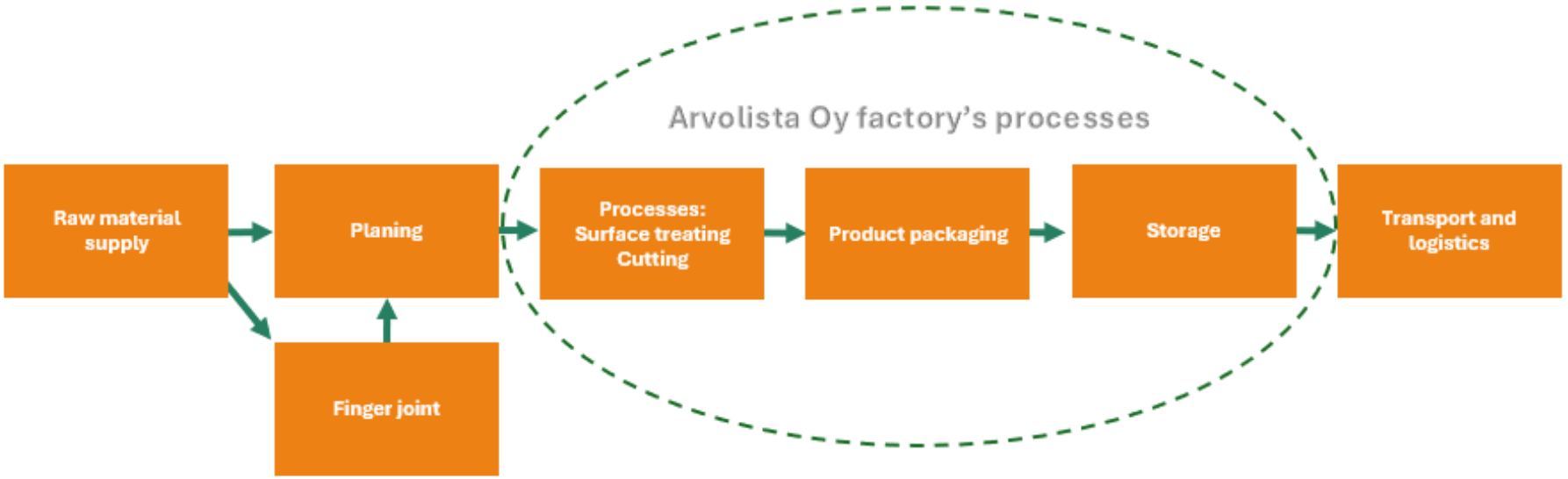
THE PRODUCTION PROCESS OF STUDIED PRODUCT



	Product Stage			Construction Process Stage		Use Stage							End-of-Life Stage				Benefits and loads beyond the system boundary		
	Raw material supply	Transport	Manufacturing	Transport to building	Installation to building	Use/applications	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction/demolition	Transport	Waste processing	Disposal	Reuse	Recovery	Recycling
	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D	D	D
Included	X	X	X	X	x								X	X	X	X	X	X	X
Relevancy	R	R	R	R	R	NR	NR	NR	NR	NR	NR	NR	R	R	R	R	R	R	R

Mandatory

Mandatory as per the RTS PCR section 6.2.1 rules and terms

Optional modules based on scenarios

The study does not omit any life cycle stages, processes or data needs that are mandatory according to EN 15804 and RTS PCR. The study excludes following life cycle stages which are optional according to EN 15804 and RTS PCR.

- B1 Use
- B2 Maintenance
- B3 Repairs
- B4 Replacement
- B5 Refurbishment
- B6 Operational energy use
- B7 Operational water use

CUT-OFF CRITERIA

This study follows the cut-off criteria stated in RTS PCR and EN 15804 -standard. This study does not exclude anu modules or processes which represent more than 1 % of the emissions of studied life cycle stage. The study does not exclude any hazardous materials or substances.

Excluded processes and the criteria for exclusion are given in following table. Machines and facilities (capital goods) required for and during production are excluded, as is transportation of employees.

Process excluded from study	Cut-off criteria	Quantified contribution from process
B1-B7, use stage	Not mandatory according to the RTS instructions	-

ALLOCATION, ESTIMATES AND ASSUMPTIONS

Allocation rules used are made according to the ISO14044:2006. Allocation is avoided when possible and when necessary, allocation is made based on physical shares and also avoiding double calculations. Allocation is required if the production process produces more than one product and the flows of materials, energy and waste cannot be separately measured for the studied product. Allocation used in generic data sources follow the requirements of the EN 15804 -standard. It should be noticed that the allocation method ‘allocation, cut-off by classification’ has been used for Ecoinvent 3.8 data, which complies with EN 15804. Avoiding allocation could not be avoided for following inputs as the information was only measured on factory process level.

Electricity consumption and district heating: only measured on factory level.

Fuel consumption: only measured on factory level.

Waste: only measured on factory level.

Packaging materials: only measured on factory level.

The inputs were allocated to studied product based on production volume (mass in kilograms). The allocated flows included both the energy and material flows of Arvolista's own production site and the flows of production site in the value chain (supplier) where planing and finter joint processes occur.

According to EN 15804, flows leaving the system at the end-of-waste boundary of the product stage (A1-A3) are allocated as co-products. The environmental effects of wood material waste due to the production losses have been allocated to co-products based on masses (kg) in accordance with the standard. According to EN 15804, process that has a very low contribution to the overall revenue may be neglected in co-product allocation. Other materials sent for recycling or energy recovery from manufacturing were not allocated, as it was estimated that their contribution to the overall revenue is very marginal. No other allocations were made in this assessment.

KEY ASSUMPTIONS

The scenarios included are currently in use and are representative for one of the most likely scenario alternatives.

A4 Transport to building : The transportation from the manufacturer to the market area of Finland was included to the study. Transport distance 142 km from production site to Helsinki was used as a reference transport distance. It was assumed that no losses are generated during transportation.

A5 Installation to building: It can be assumed that there are no significant environmental impacts (energy or water use) caused by installation phase. Waste materials generated by product installation are packaging materials of the product. Waste flows are assessed by using following assumptions.

- Waste transportation distance is 75 km road driving by lorry (SYKE 2021).
- It was assumed that packaging materials (paper, cardboard and plastics) are collected, and the materials are separated. Cardboard and paper materials are assumed to be recycled. It was assumed that 40 % of plastic waste is recycled and 60 % treated in the incineration plant. This scenario was assumed to describe the typical treatment methods in Finland and product's market area in Europe. (Eurostat 2023.)

C1-4 End of life scenario: End of life scenario was assumed based on the common practises of construction products in Finland and product's market area in Europe (SYKE 2021.)

- C1: It was assumed that the products are disassembled and processed. It was assumed that energy use (diesel usage) in the demolition stage is 1,30 kWh/t (Erlandsson, M. & Pettersson, D., 2015.)
- C2: Transportation distance 75 km road driving by lorry (SYKE 2021).
- C3-4: It was assumed that the products are collected and processed as following:
    - In the end-of-life stage, the wood product is chipped in the waste treatment plant. It was assumed that the products can be used for energy recovery. It is assumed that 95% of the product ends up in energy recovery and 5% of the product ends up as material loss and in final disposal.
- Module D covers the net benefits and loads arising from the reuse of products or the recycling or recovery of energy from end-of-waste state materials. It was assumed that the energy recovery of wood material mitigates the use of fossil fuels in the energy production. The scenario replaces the use of natural gas for energy production.When a product is incinerated at its end-of-life and the produced heat is recovered, the benefits can include avoiding the production of energy. Net calorific value as received of the construction waste was assumed to be 1.98 kWh/kg and efficiency of heat and power co-generation was 90 %.

DATA COLLECTION AND QUALITY

The quality requirements for the life cycle assessment were set according to the EN ISO 14044 standard (4.2.3.6) and EN 15804 standard (6.3.7).

This LCA study follows the standard EN 15804:2012+A2:2019 and PCR and no decisions are made based on the values.

PROCEDURED FOR COLLECTION PROCESS SPECIFIC DATA

Production specific data was collected directly from manufacturer's production plant. The data represents the production of the studied product at the plant from the materials transported to the facility and represents 1 year average. The data represents year 2022, which was the latest year with full year data. All gathered data was used without excluding categories in advance following the system boundaries set in earlier chapters.

CRITERIA FOR CHOOSING THE GENERIC DATA

Generic data that was used for upstream and downstream processes represents complementary data from Ecoinvent 3.8 database.

The datasets were chosen to represent the studied system as closely as possible. When available supplier specific information was used for instance in form of EN 15804 EPDs or emissions profile of local energy supplier. When supplier specific information was not available the information sources were chosen based on their technical and geographical representativeness. Only when country

specific or European data has not been available has global level data been used (concerns mainly data from ecoinvent 3.8)

As up-to-date data as possible was chosen and no more than five-year-old for producer specific data and ten years for generic data was used.

ENVIRONMENTAL IMPACT DATA

ARVOLISTA OY, WOOD-READY PRODUCT, DECLARED UNIT 1 M^3

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP – total	kg CO_2e	-6,20E+02	6,37E+00	1,50E+01	2,04E+00	3,31E+00	7,20E+02	3,77E+01	-2,36E+02
GWP – fossil	kg CO_2e	1,27E+02	6,37E+00	1,36E+01	2,04E+00	3,31E+00	1,05E+01	3,61E-01	-2,36E+02
GWP – biogenic	kg CO_2e	-7,48E+02	0,00E+00	1,42E+00	0,00E+00	0,00E+00	7,09E+02	3,73E+01	-3,92E-02
GWP – LULUC	kg CO_2e	1,08E+00	2,35E-03	3,71E-04	2,03E-04	1,22E-03	1,06E-02	1,18E-04	-9,52E-03
Ozone depletion pot.	kg $CFC_{-11}e$	1,83E-05	1,47E-06	3,42E-08	4,36E-07	7,61E-07	6,61E-07	2,50E-08	-3,53E-05
Acidification potential	mol H^+e	9,80E-01	2,70E-02	2,81E-03	2,12E-02	1,40E-02	9,29E-02	3,85E-03	-1,95E-01
EP-freshwater[3)]	kg Pe	5,33E-03	5,22E-05	8,84E-06	6,76E-06	2,71E-05	4,70E-04	4,89E-06	-3,08E-04
EP-marine	kg Ne	3,08E-01	8,02E-03	1,13E-03	9,39E-03	4,16E-03	3,74E-02	1,82E-03	-5,20E-02
EP-terrestrial	mol Ne	3,61E+00	8,85E-02	1,21E-02	1,03E-01	4,59E-02	4,00E-01	1,94E-02	-5,70E-01
POCP (“smog”)	kg NMVOCe	1,02E+00	2,83E-02	3,14E-03	2,83E-02	1,47E-02	9,96E-02	4,78E-03	-2,03E-01
ADP-minerals & metals	kg Sbe	9,02E-04	1,49E-05	3,72E-06	1,03E-06	7,76E-06	2,89E-05	9,87E-07	-3,85E-05
ADP-fossil resources	MJ	3,24E+03	9,57E+01	3,66E+00	2,75E+01	4,97E+01	1,35E+02	3,08E+00	-4,03E+03
Water use[2)]	m^3e depr.	7,00E+01	4,28E-01	4,47E-01	7,38E-02	2,22E-01	3,19E+01	1,57E+00	-2,93E+00

1)GWP = Global Warming Potential; EP = Eutrophication potential; POCP = Photochemical ozone formation; ADP = Abiotic depletion potential. 2) EN 15804+A2 disclaimer for Abiotic depletion and Water use and optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator. 3) Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO_4e.

USE OF NATURAL RESOURCES

Impact category	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
Renew. PER as energy	MJ	6,81E+03	1,08E+00	2,28E-01	1,57E-01	5,60E-01	1,47E+01	7,51E-02	-1,21E+01
Renew. PER as material	MJ	8,10E+03	0,00E+00	-1,02E+01	0,00E+00	0,00E+00	-7,68E+03	-4,04E+02	0,00E+00
Total use of renew. PER	MJ	1,49E+04	1,08E+00	-9,99E+00	1,57E-01	5,60E-01	-7,67E+03	-4,04E+02	-1,21E+01
Non-re. PER as energy	MJ	3,16E+03	9,57E+01	3,66E+00	2,75E+01	4,97E+01	1,35E+02	3,08E+00	-4,03E+03
Non-re. PER as material	MJ	2,20E+02	0,00E+00	-1,49E+02	0,00E+00	0,00E+00	-6,75E+01	-3,55E+00	0,00E+00
Total use of non-ren. PER	MJ	3,38E+03	9,57E+01	-1,45E+02	2,75E+01	4,97E+01	6,73E+01	-4,72E-01	-4,03E+03
Secondary materials	kg	1,56E+00	2,66E-02	1,21E-02	1,07E-02	1,38E-02	1,69E-01	7,38E-03	-1,91E-01
Renew. secondary fuels	MJ	1,35E+00	2,68E-04	9,08E-05	3,51E-05	1,39E-04	3,76E-04	1,74E-05	-1,98E-04
Non-ren. secondary fuels	MJ	2,21E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water	m^3	3,08E+00	1,24E-02	2,98E-03	1,67E-03	6,44E-03	-3,01E-02	-4,96E-03	-7,93E-02

1)PER = primary energy resources; Non-ren = Non renewable

END OF LIFE – WASTE

Impact category	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
Hazardous waste	kg	5,98E+00	1,27E-01	3,44E-02	3,67E-02	6,59E-02	0,00E+00	0,00E+00	-6,40E-01
Non-hazardous waste	kg	1,27E+02	2,08E+00	4,82E+00	2,58E-01	1,08E+00	0,00E+00	2,35E+01	-1,29E+01
Radioactive waste	kg	2,28E-02	6,40E-04	1,31E-05	1,93E-04	3,32E-04	0,00E+00	0,00E+00	-2,49E-03

END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1-A3	A4	A5	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
Materials for recycling	kg	4,54E-01	0,00E+00	3,83E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for energy recycling	kg	3,17E-02	0,00E+00	4,30E+00	0,00E+00	0,00E+00	4,46E+02	0,00E+00	0,00E+00
Exported energy	MJ	2,03E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

BIOGENIC CARBON CONTENT

Biogenic carbon content	Unit (expressed per functional unit or per declared unit) NOTE 1 kg biogenic carbon is equivalent to 44/12 kg of CO2
Biogenic carbon content in product	202,2kg
Biogenic carbon content in accompanying packaging	0,00045 kg

ARVOLISTA OY, SURFACE TREATED PRODUCT, DECLARED UNIT 1 M^3

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP – total	kg CO_2e	-4,90E+02	6,65E+00	1,50E+01	2,04E+00	3,46E+00	7,20E+02	3,77E+01	-2,35E+02
GWP – fossil	kg CO_2e	2,27E+02	6,65E+00	1,36E+01	2,04E+00	3,46E+00	1,10E+01	3,77E-01	-2,35E+02
GWP – biogenic	kg CO_2e	-7,48E+02	0,00E+00	1,42E+00	0,00E+00	0,00E+00	7,09E+02	3,73E+01	-3,90E-02
GWP – LULUC	kg CO_2e	3,05E+01	2,45E-03	3,71E-04	2,03E-04	1,27E-03	1,10E-02	1,23E-04	-9,45E-03
Ozone depletion pot.	kg CFC_{-11}e	3,00E-05	1,53E-06	3,42E-08	4,36E-07	7,95E-07	6,90E-07	2,61E-08	-3,51E-05
Acidification potential	mol H^+e	2,56E+00	2,82E-02	2,81E-03	2,12E-02	1,46E-02	9,70E-02	4,02E-03	-1,94E-01
EP-freshwater[3)]	kg Pe	1,23E-02	5,45E-05	8,84E-06	6,76E-06	2,83E-05	4,92E-04	5,11E-06	-3,06E-04
EP-marine	kg Ne	4,86E-01	8,37E-03	1,13E-03	9,39E-03	4,35E-03	3,91E-02	1,91E-03	-5,17E-02
EP-terrestrial	mol Ne	4,67E+00	9,23E-02	1,21E-02	1,03E-01	4,80E-02	4,18E-01	2,03E-02	-5,66E-01
POCP (“smog”)	kg NMVOCe	1,44E+00	2,95E-02	3,14E-03	2,83E-02	1,53E-02	1,04E-01	4,99E-03	-2,01E-01
ADP-minerals & metals	kg Sbe	1,92E-03	1,56E-05	3,72E-06	1,03E-06	8,10E-06	3,02E-05	1,03E-06	-3,82E-05
ADP-fossil resources	MJ	4,77E+03	9,99E+01	3,66E+00	2,75E+01	5,19E+01	1,41E+02	3,22E+00	-4,00E+03
Water use[2)]	m^3e depr.	1,64E+02	4,47E-01	4,47E-01	7,38E-02	2,32E-01	3,33E+01	1,64E+00	-2,91E+00

1)GWP = Global Warming Potential; EP = Eutrophication potential; POCP = Photochemical ozone formation; ADP = Abiotic depletion potential. 2) EN 15804+A2 disclaimer for Abiotic depletion and Water use and optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator. 3) Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO_4e.

USE OF NATURAL RESOURCES

Impact category	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
Renew. PER as energy	MJ	7,10E+03	1,13E+00	2,28E-01	1,57E-01	5,85E-01	1,53E+01	7,85E-02	-1,20E+01
Renew. PER as material	MJ	8,21E+03	0,00E+00	-1,02E+01	0,00E+00	0,00E+00	-7,79E+03	-4,10E+02	0,00E+00
Total use of renew. PER	MJ	1,53E+04	1,13E+00	-9,99E+00	1,57E-01	5,85E-01	-7,78E+03	-4,10E+02	-1,20E+01
Non-re. PER as energy	MJ	4,39E+03	9,99E+01	3,66E+00	2,75E+01	5,19E+01	1,41E+02	3,22E+00	-4,00E+03
Non-re. PER as material	MJ	5,28E+02	0,00E+00	-1,49E+02	0,00E+00	0,00E+00	-3,60E+02	-1,90E+01	0,00E+00
Total use of non-ren. PER	MJ	4,91E+03	9,99E+01	-1,45E+02	2,75E+01	5,19E+01	-2,19E+02	-1,57E+01	-4,00E+03
Secondary materials	kg	3,28E+00	2,77E-02	1,21E-02	1,07E-02	1,44E-02	1,77E-01	7,71E-03	-1,90E-01
Renew. secondary fuels	MJ	1,37E+00	2,80E-04	9,08E-05	3,51E-05	1,45E-04	3,93E-04	1,81E-05	-1,97E-04
Non-ren. secondary fuels	MJ	2,21E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water	m^3	5,53E+00	1,29E-02	2,98E-03	1,67E-03	6,72E-03	-3,14E-02	-5,18E-03	-7,87E-02

1)PER = primary energy resources; Non-ren = Non renewable

END OF LIFE – WASTE

Impact category	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
Hazardous waste	kg	2,53E+01	1,32E-01	3,44E-02	3,67E-02	6,88E-02	0,00E+00	0,00E+00	-6,35E-01
Non-hazardous waste	kg	5,61E+02	2,18E+00	4,82E+00	2,58E-01	1,13E+00	0,00E+00	2,46E+01	-1,28E+01
Radioactive waste	kg	2,73E-02	6,68E-04	1,31E-05	1,93E-04	3,47E-04	0,00E+00	0,00E+00	-2,48E-03

END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1-A3	A4	A5	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
Materials for recycling	kg	4,54E-01	0,00E+00	3,83E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for energy recycling	kg	3,17E-02	0,00E+00	4,30E+00	0,00E+00	0,00E+00	4,67E+02	0,00E+00	0,00E+00
Exported energy	MJ	2,03E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

BIOGENIC CARBON CONTENT

Biogenic carbon content	Unit (expressed per functional unit or per declared unit) NOTE 1 kg biogenic carbon is equivalent to 44/12 kg of CO2
Biogenic carbon content in product	202,2kg
Biogenic carbon content in accompanying packaging	0,00045 kg

SCENARIO DOCUMENTATION

Manufacturing energy scenario documentation

Scenario parameter	Value
Electricity data source and quality	Electricity, guarantee of origin certificated. Heat and power co-generation, wood chips, 6667 kW, state-of-the-art 2014 (Reference product: electricity, high voltage) Electricity production, deep geothermal (Reference product: electricity, high voltage) Electricity production, nuclear, boiling water reactor (Reference product: electricity, high voltage) Electricity production, photovoltaic, 570kWp open ground installation, multi-Si (Reference product: electricity, low voltage) Electricity production, hydro, run-of-river (Reference product: electricity, high voltage) Electricity production, wind, 1-3MW turbine, onshore (Reference product: electricity, high voltage) EN15804+A1, EN15804+A2, Europe, 2021. Ecoinvent 3.8. The processes included in the data set are well representative for the geography (Finland)
Electricity CO_2e / kWh	0,037 kg CO2e /kWh
District heating data source and quality	KSS Energia Oy. 2022. Production-mix. Market for electricity, medium voltage (Reference product: electricity, medium voltage) Heat production, light fuel oil, at industrial furnace 1MW Heat and power co-generation, hard coal Heat production, natural gas, at industrial furnace >100kW Heat production, untreated waste wood, at furnace 1000-5000 kW
	Heat production, softwood chips from forest, at furnace 5000kW EN15804+A1, EN15804+A2, Finland, Europe, 2021. Ecoinvent 3.8.
District heating CO_2e / kWh	0,104 kg CO2e /kWh

Transport scenario documentation (A4)

Scenario parameter	Value
Specific transport CO_2e emissions, kg CO_2e / tkm	Truck: diesel, maximum load capacity 34 t. Specific transport emissions 0,064 kg CO_2 equiv. / tn x km
Transport distance, km	transport distance 142 km
Capacity utilization (including empty return) %	100 % for truck
Bulk density of transported products	Density varies depending on the mass and size of the product type
Volume capacity utilization factor	1

Installation of the product in the building

Parameter	Unit
Ancillary materials for installation (specified by material)	-
Water use	0 m^3
Other resource use	0 kWh (energy use is insignificant)
Quantitative description of energy type (regional mix) and consumption during the installation process	
Waste materials generated by product installation	Packaging materials per 1 m^3 of product Plastics: 7,17 kg, Cardboard: 0,93 kg

End of life scenario documentation

		Wood-ready	Surface treated
Process flow			
Collection process specified by type	kg collected separately	470 kg	491 kg
	kg collected with mixed construction waste		
Recovery system specified by type	kg for reuse		
	kg for recycling		
	kg for energy recovery	446,5 kg	466,5 kg
Disposal specified by type	kg material for final deposition	23,5 kg	24,5 kg
Assumptions for scenario development	units as appropriate	Waste materials are transported 75 km by truck to recycling facility with a truck capacity utilization of 45%	

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Emissions database for construction, Finnish Environmental Institute, 2021. Available at: https://co2data.fi/

Eurostat.2023. https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Packaging_waste_statistics

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LCA EPD Background Report

CONVERSION FACTORS

The products are sold in various dimensions, and there can be hundreds of different conversion factors to convert cubic meter data to meter data. Detailed product-specific factors are available upon request. Meter data can also be calculated through the final product using the formula 1/thickness/width. For example, to convert 1 cubic meter of a 12x42 (mm x mm) wooden list to 1 meter, the conversion factor is 1 m3 / 0.012 m / 0.042 m = 1984 m.

VERIFICATION STATEMENT

EPD: Wooden interior moulding and panel products

OWNER OF THE EPD: Arvolista Oy

AUTHOR OF THE LCA AND DECLARATION: Natalia Pennanen, Anni Viitala Granlund Oy

Verified according to the requirements of EN 15804:2019 and RTS PCR 2020			
Independent verification of the declaration, according to ISO14025:2010			
☐	Internal	☒	External
Third party verifier: Heini Koutonen Senior Consultant, Nordic Impact Oy 11.11.2024			

ANNEX 1: EPD RESULTS BY RTS PCR REQUIREMENTS

WOOD-READY PRODUCT, DECLARED UNIT 1 KG

Impact category	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP – total	kg CO_2e	-1,32E+00	1,34E-02	3,19E-02	4,34E-03	7,04E-03	1,53E+00	8,02E-02	-5,03E-01
ADP-minerals & metals	kg Sbe	1,92E-06	3,17E-08	7,91E-09	2,17E-09	1,60E-08	6,15E-08	2,10E-09	-8,12E-08
ADP-fossil	MJ	6,89E+00	2,04E-01	7,78E-03	5,84E-02	1,06E-01	2,87E-01	6,56E-03	-8,57E+00
Water use	m^3e depr.	1,49E-01	9,11E-04	9,52E-04	1,57E-04	4,73E-04	6,78E-02	3,34E-03	-6,23E-03
Secondary materials	kg	3,32E-03	5,65E-05	2,58E-05	2,29E-05	2,94E-05	3,60E-04	1,57E-05	-4,07E-04
Biogenic carbon content in product	kg C	4,30E-01	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Biogenic carbon content in packaging	kg C	9,57-07	N/A	N/A	N/A	N/A	N/A	N/A	N/A

SURFACE TREATED PRODUCT, DECLARED UNIT 1 KG

Impact category	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP – total	kg CO_2e	-9,98E-01	1,36E-02	3,05E-02	4,16E-03	7,04E-03	1,47E+00	7,68E-02	-4,78E-01
ADP-minerals & metals	kg Sbe	3,91E-06	3,07E-08	7,58E-09	2,07E-09	1,60E-08	6,15E-08	2,10E-09	-7,72E-08
ADP-fossil	MJ	9,71E+00	2,03E-01	7,45E-03	5,59E-02	1,06E-01	2,87E-01	6,56E-03	-8,14E+00
Water use	m^3e depr.	3,33E-01	9,10E-04	9,11E-04	1,50E-04	4,73E-04	6,78E-02	3,34E-03	-5,92E-03
Secondary materials	kg	6,67E-03	5,65E-05	2,47E-05	2,19E-05	2,94E-05	3,60E-04	1,57E-05	-3,87E-04
Biogenic carbon content in product	kg C	4,13E-01	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Biogenic carbon content in packaging	kg C	9,16E-07	N/A	N/A	N/A	N/A	N/A	N/A	N/A