



**EPD HUB, HUB-0102**

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# ENVIRONMENTAL PRODUCT DECLARATION

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

FINGER-JOINTED PRODUCT  
AS BARRUS



## GENERAL INFORMATION

### MANUFACTURER

Manufacturer	AS Barrus
Address	Verijärve, Võru, Võru County 65541, Estonia
Contact details	info@barrus.ee
Website	www.barrus.ee

### EPD STANDARDS, SCOPE AND VERIFICATION

Program operator	EPD Hub, hub@epdhub.com
Reference standard	EN 15804+A2:2019 and ISO 14025
PCR	EPD Hub Core PCR version 1.0, 1 Feb 2022
Sector	Construction product
Category of EPD	Third party verified EPD
Scope of the EPD	Cradle to gate with modules A4, C1-C4, D
EPD author	Christof Uisk, Sustinere
EPD verification	Independent verification of this EPD and data, according to ISO 14025: <input type="checkbox"/> Internal certification <input checked="" type="checkbox"/> External verification
EPD verifier	Ipek Goktas & Haiha Nguyen, as authorized verifiers acting for EPD Hub Limited

The manufacturer has the sole ownership, liability, and responsibility for the EPD. EPDs within the same product category but from different programs may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804 and if they are not compared in a building context.

### PRODUCT

Product name	Finger-jointed product
Place of production	Verijärve, Võru, Võru County 65541, Estonia
Period for data	01.01.2023-31.12.2023
Averaging in EPD	No averaging

### ENVIRONMENTAL DATA SUMMARY

Declared unit (m <sup>3</sup> )	1
Declared unit mass (kg)	500
GWP-fossil, A1-A3 (kgCO <sub>2</sub> e)	45.1
GWP-total, A1-A3 (kgCO <sub>2</sub> e)	-850
Secondary material, inputs (%)	0.02
Secondary material, outputs (%)	99
Total energy use, A1-A3 (kWh)	2360
Net freshwater use, A1-A3 (m <sup>3</sup> )	0.74

## PRODUCT AND MANUFACTURER

### ABOUT THE MANUFACTURER

Barrus is a timber company located in Verijärve, amid the forests of south-eastern Estonia. The self-confidence and work ethic associated with this noble beast have made us the European market leaders. With the team of 250 in Barrus we produce and manufacture more than 80,000 m<sup>3</sup> of premium quality finger-jointed and laminated pine components and boards for the market leaders in Scandinavian window and door industry.

### PRODUCT DESCRIPTION

High quality, dried redwood (pine) boards for indoor uses. Our products end up in Scandinavian window and door factories, where market highest standards are expected. The finger-jointed can be used in construction works as structural wood, window and door sashes, stair components etc.

Further information can be found at [www.barrus.ee](http://www.barrus.ee).

### PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass- %	Material origin
Fossil materials	0.35	EU
Bio-based materials	99.65	EU

### TECHNICAL INFORMATION

Properties	Value
Wood species	Pine ( <i>Pinus sylvestris</i> )
Moisture content	12% ± 2%

Biogenic carbon content in product, kg C	225.0
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Biogenic carbon content in packaging, kg C	1.1
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### FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1 m <sup>3</sup>
Mass per declared unit	500 kg
Reference service life	75 yrs

### SUBSTANCES, REACH - VERY HIGH CONCERN

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





## PRODUCT LIFE-CYCLE

### SYSTEM BOUNDARY

This EPD covers the life-cycle modules listed in the following table.

Product stage			Assembly stage		Use stage								End of life stage				Beyond the system boundaries	
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D		
X	X	X	X	MND	MND	MND	MND	MND	MND	MND	MND	X	X	X	X	X		
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstr./demol.	Transport	Waste processing	Disposal	Reuse	Recovery	Recycling

Modules not declared = MND. Modules not relevant = MNR.

### MANUFACTURING AND PACKAGING (A1-A3)

The environmental impacts considered for the product stage cover the manufacturing of raw materials used in the production as well as packaging materials and other ancillary materials. Also, fuels used by machines, and handling of waste formed in the production processes at the manufacturing facilities are included in this stage, however ancillary and packaging material waste generation is cut-off. The study also considers the material losses occurring during the manufacturing processes as well as losses during electricity transmission.

Included is the production and harvesting of pine from sustainable forest management and the transport of sawlogs to the sawmill.

Sawlogs enter the production line, are measured, debarked and sorted. Logs are then cut and sorted again, after which they are placed in the drying facility. The sawn and dried material is pressed, finger-jointed and then sent to packaging.

Packaging consists of 100% recycled PET ribbons, corners and manufacturing waste wood. Manufacturing wood that is not used in packaging is used to heat the drying facility. Packaging waste of incoming packaging assumed to be negligible.

### TRANSPORT AND INSTALLATION (A4-A5)

Transportation impacts occurred from final products delivery to construction site (A4) cover fuel direct exhaust emissions, environmental impacts of fuel production, as well as related infrastructure emissions.

Based on yearly averages a transportation distance of 75 km with a truck is used in the model. The environmental impacts of construction processes and packaging waste of the delivered product are not reported in this EPD, since there are multiple possible applications. As such, packaging wastes are modelled to leave the system in the EOL stage.

### PRODUCT USE AND MAINTENANCE (B1-B7)

This EPD does not cover the use phase.

Air, soil, and water impacts during the use phase have not been studied.

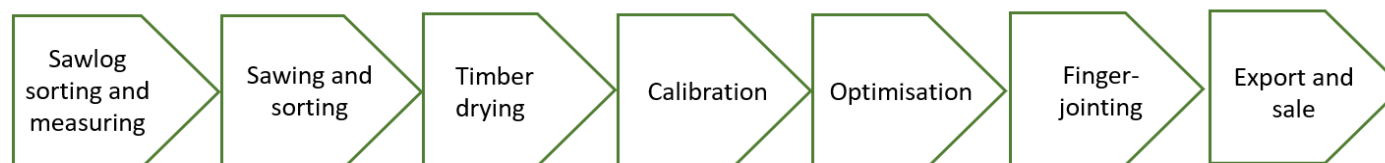
### PRODUCT END OF LIFE (C1-C4, D)

At the end-of-life, in the demolition phase 100% of the waste is assumed to be collected as separate construction waste (C1) and

transported to the nearest treatment facilities (C2). Demolition is assumed to take 0.01 kWh/kg (Bozdağ, Ö & Seçer, M (2007) and the Level(s) project). As such, there are no specific emissions in the later phase that relate to waste separation. Based on industry association data, it is assumed that 99% of the product reaching end of life stage is incinerated for heat generation and 1% is landfilled (C3, C4) (Source: Ehitus- ja lammutusjäätmete sortimisuuring (Construction and demolition waste sorting and recycling) by the Estonian Ministry of Environment).

Module D includes the benefits of energy generation from incineration.

## MANUFACTURING PROCESS



## LIFE-CYCLE ASSESSMENT

### CUT-OFF CRITERIA

The study does not exclude any modules or processes which are stated mandatory in the reference standard and the applied PCR. The study does not exclude any hazardous materials or substances. The study includes all major raw material and energy consumption. All inputs and outputs of the unit processes, for which data is available for, are included in the calculation. There is no neglected unit process more than 1% of total mass or energy flows. The module specific total neglected input and output flows also do not exceed 5% of energy usage or mass.

The impact of the transportation to the site (A4) and installation (A5) emissions have been cut off. Ancillary and packaging material waste is cut-off. At the end-of-life stage, impacts of disassembly and ash from incineration are omitted in accordance with the cut-off requirements.

### ALLOCATION, ESTIMATES AND ASSUMPTIONS

Allocation is required if some material, energy, and waste data cannot be measured separately for the product under investigation. In this study, as per the reference standard, allocation is conducted in the following order;

1. Allocation should be avoided.
2. Allocation should be based on physical properties (e.g., mass, volume) when the difference in revenue is small.
3. Allocation should be based on economic values.

Allocation of emissions was based on economic values, prices provided by the manufacturer. Allocation used in environmental data sources is aligned with the above.

Demolition phase emissions are assumed negligible. According to industry association data, it is assumed that 99% of the product reaching end of life stage is incinerated for heat generation and 1% is landfilled (C3, C4) (Source: Ehitus- ja lammutusjäätmete sortimisuurung (Construction and demolition waste sorting and recycling) by the Estonian Ministry of Environment).

The waste is assumed to be transported by lorry truck to a disposal area 50 km away.

## AVERAGES AND VARIABILITY

This EPD is product and factory specific and does not contain average calculations.

## LCA SOFTWARE AND BIBLIOGRAPHY

One Click LCA was used for the generation of this EPD;

The LCA and EPD have been prepared according to the reference standards and ISO 14040/14044. Ecoinvent v3.6 (2019) and One Click LCA databases were used as sources of environmental data;  
EVS-EN 15804:2012+A2:2019 - Sustainability of construction works  
- Environmental product declarations - Core rules for the product category of construction products;

Ehitus- ja lammutusjätmete sortimisuuring (Construction and demolition waste sorting and recycling) by the Estonian Ministry of Environment

## ENVIRONMENTAL IMPACT DATA

### CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP – total	kg CO <sub>2</sub> e	-8.69E+02	1.09E+01	9.50E+00	-8.49E+02	3,52E+00	MND	MND	MND	MND	MND	MND	MND	MND	1,66E+00	2,35E+00	8.97E+02	1,85E+01	-6,35E+02
GWP – fossil	kg CO <sub>2</sub> e	2.60E+01	1.09E+01	8.94E+00	4.51E+01	3,52E+00	MND	MND	MND	MND	MND	MND	MND	MND	1,65E+00	2,35E+00	8.62E+00	5,39E-02	-6,35E+02
GWP – biogenic	kg CO <sub>2</sub> e	-8.96E+02	0.00E+00	5.36E-01	-8.96E+02	0,00E+00	MND	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	8.88E+02	1,84E+01	0,00E+00
GWP – LULUC	kg CO <sub>2</sub> e	3.00E-01	2.00E-03	2.44E-02	3.26E-01	1,30E-03	MND	MND	MND	MND	MND	MND	MND	MND	1,65E-04	8,65E-04	2.48E-03	5,58E-05	-2,15E-01
Ozone depletion pot.	kg CFC <sub>11</sub> e	5,02E-06	2,71E-06	1,33E-06	9,06E-06	8,10E-07	MND	MND	MND	MND	MND	MND	MND	MND	3,54E-07	5,40E-07	5,29E-07	1,60E-08	-6,74E-05
Acidification potential	mol H <sup>+</sup> e	1,73E-01	3,47E-02	1,09E-01	3,16E-01	1,49E-02	MND	MND	MND	MND	MND	MND	MND	MND	1,72E-02	9,93E-03	8,13E-02	4,54E-04	-5,56E+00
EP-freshwater <sup>3)</sup>	kg Pe	4,36E-03	7,78E-05	3,58E-04	4,80E-03	2,88E-05	MND	MND	MND	MND	MND	MND	MND	MND	5,48E-06	1,92E-05	1,03E-04	1,04E-06	-1,82E-02
EP-marine	kg Ne	6,41E-02	7,68E-03	4,37E-02	1,15E-01	4,43E-03	MND	MND	MND	MND	MND	MND	MND	MND	7,61E-03	2,95E-03	3,85E-02	3,00E-04	-7,17E-01
EP-terrestrial	mol Ne	6,73E-01	8,51E-02	4,75E-01	1,23E+00	4,89E-02	MND	MND	MND	MND	MND	MND	MND	MND	8,35E-02	3,26E-02	4,10E-01	1,69E-03	-7,96E+00
POCP (“smog”)	kg NMVOce	2,91E-01	3,35E-02	1,29E-01	4,54E-01	1,56E-02	MND	MND	MND	MND	MND	MND	MND	MND	2,30E-02	1,04E-02	1,01E-01	6,04E-04	-2,35E+00
ADP-minerals & metals	kg Sbe	1,05E-04	2,66E-05	5,28E-05	1,85E-04	8,25E-06	MND	MND	MND	MND	MND	MND	MND	MND	8,39E-07	5,50E-06	2,08E-05	1,82E-07	-3,99E-04
ADP-fossil resources	MJ	4,19E+02	1,74E+02	2,24E+03	2,83E+03	5,29E+01	MND	MND	MND	MND	MND	MND	MND	MND	2,23E+01	3,52E+01	6,51E+01	1,23E+00	-7,01E+03
Water use <sup>2)</sup>	m <sup>3</sup> e depr.	7,14E+00	8,02E-01	2,42E+01	3,21E+01	2,37E-01	MND	MND	MND	MND	MND	MND	MND	MND	5,98E-02	1,58E-01	3,31E+01	7,38E-03	-4,67E+01



## USE OF NATURAL RESOURCES

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Renew. PER as energy	MJ	5.39E+03	1.10E+00	5.93E+02	5.98E+03	5,95E-01	MND	MND	MND	MND	MND	MND	MND	MND	1,27E-01	3,97E-01	1.59E+00	2,28E-02	-1,11E+03
Renew. PER as material	MJ	4.73E+03	0.00E+00	0.00E+00	4.73E+03	0,00E+00	MND	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	-4.68E+03	-9,70E+01	0,00E+00
Total use of renew. PER	MJ	1.01E+04	1.10E+00	5.93E+02	1.07E+04	5,95E-01	MND	MND	MND	MND	MND	MND	MND	MND	1,27E-01	3,97E-01	-4.68E+03	-9,70E+01	-1,11E+03
Non-re. PER as energy	MJ	2.12E+02	8.51E+01	2.21E+03	2.51E+03	5,29E+01	MND	MND	MND	MND	MND	MND	MND	MND	2,23E+01	3,52E+01	6.51E+01	1,23E+00	-6,98E+03
Non-re. PER as material	MJ	4.23E+01	0.00E+00	3.29E+01	7.52E+01	0,00E+00	MND	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	-6.34E+01	-6,40E-01	0,00E+00
Total use of non-re. PER	MJ	2.54E+02	8.51E+01	2.24E+03	2.58E+03	5,29E+01	MND	MND	MND	MND	MND	MND	MND	MND	2,23E+01	3,52E+01	1.70E+00	5,91E-01	-6,98E+03
Secondary materials	kg	2,22E-01	4,90E-02	9,84E-02	3,69E-01	1,47E-02	MND	MND	MND	MND	MND	MND	MND	MND	8,71E-03	9,78E-03	1,56E-01	4,40E-04	-7,08E-01
Renew. secondary fuels	MJ	2,02E-03	4,32E-04	1,80E-02	2,05E-02	1,48E-04	MND	MND	MND	MND	MND	MND	MND	MND	2,85E-05	9,87E-05	3,67E-04	1,69E-05	-4,16E-03
Non-ren. secondary fuels	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water	m <sup>3</sup>	1,91E-01	2,30E-02	5,26E-01	7,40E-01	6,85E-03	MND	MND	MND	MND	MND	MND	MND	MND	1,35E-03	4,56E-03	-1,04E-01	1,32E-03	-3,64E+00

6) PER = Primary energy resources

## END OF LIFE – WASTE

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste	kg	1,27E+00	1,86E-01	9,42E-01	2,40E+00	7,01E-02	MND	MND	MND	MND	MND	MND	MND	MND	2,98E-02	4,67E-02	6,90E-03	0,00E+00	-3,67E+01
Non-hazardous waste	kg	1,63E+01	3,24E+00	8,67E+00	2,82E+01	1,15E+00	MND	MND	MND	MND	MND	MND	MND	MND	2,09E-01	7,68E-01	4,95E+02	5,00E+00	-1,44E+03
Radioactive waste	kg	2,28E-03	1,20E-03	3,72E-02	4,07E-02	3,54E-04	MND	MND	MND	MND	MND	MND	MND	MND	1,57E-04	2,36E-04	7,18E-07	0,00E+00	-3,28E-02

## END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for re-	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for energy	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	4,95E+02	0,00E+00	0,00E+00
Exported energy	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	6,74E+03	0,00E+00	0,00E+00

## ENVIRONMENTAL IMPACTS – EN 15804+A1, CML / ISO 21930

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Global Warming Pot.	kg CO <sub>2</sub> e	2,72E+01	1,08E+01	8,81E+00	4,68E+01	3,48E+00	MND	MND	MND	MND	MND	MND	MND	MND	1,64E+00	2,32E+00	8,24E+00	3,77E-01	-6,24E+02
Ozone depletion Pot.	kg CFC <sub>11</sub> e	4,01E-06	2,15E-06	1,07E-06	7,23E-06	6,41E-07	MND	MND	MND	MND	MND	MND	MND	MND	2,80E-07	4,27E-07	4,56E-07	1,27E-08	-5,45E-05
Acidification	kg SO <sub>2</sub> e	1,30E-01	2,82E-02	7,88E-02	2,37E-01	1,16E-02	MND	MND	MND	MND	MND	MND	MND	MND	1,23E-02	7,72E-03	5,71E-02	3,44E-04	-4,74E+00
Eutrophication	kg PO <sub>4</sub> <sup>3</sup> e	6,06E-02	5,97E-03	2,96E-02	9,61E-02	2,64E-03	MND	MND	MND	MND	MND	MND	MND	MND	2,84E-03	1,76E-03	6,84E-02	1,44E-02	-7,64E-01
POCP ("smog")	kg C <sub>2</sub> H <sub>4</sub> e	2,64E-02	1,31E-03	1,05E-02	3,81E-02	4,52E-04	MND	MND	MND	MND	MND	MND	MND	MND	2,68E-04	3,01E-04	1,91E-03	8,36E-05	-1,99E-01
ADP-elements	kg Sbe	1,04E-04	2,59E-05	5,74E-05	1,88E-04	7,99E-06	MND	MND	MND	MND	MND	MND	MND	MND	8,26E-07	5,33E-06	1,84E-05	1,76E-07	-3,95E-04
ADP-fossil	MJ	4,19E+02	1,74E+02	2,24E+03	2,83E+03	5,29E+01	MND	MND	MND	MND	MND	MND	MND	MND	2,23E+01	3,52E+01	6,51E+01	1,23E+00	-6,98E+03

## VERIFICATION STATEMENT

### VERIFICATION PROCESS FOR THIS EPD

This EPD has been verified in accordance with ISO 14025 by an independent, third-party verifier by reviewing results, documents and compliancy with reference standard, ISO 14025 and ISO 14040/14044, following the process and checklists of the program operator for:

- This Environmental Product Declaration
- The Life-Cycle Assessment used in this EPD
- The digital background data for this EPD

Why does verification transparency matter? Read more online  
This EPD has been generated by One Click LCA EPD generator, which has been verified and approved by the EPD Hub.

### THIRD-PARTY VERIFICATION STATEMENT

I hereby confirm that, following detailed examination, I have not established any relevant deviations by the studied Environmental Product Declaration (EPD), its LCA and project report, in terms of the data collected and used in the LCA calculations, the way the LCA-based calculations have been carried out, the presentation of environmental data in the EPD, and other additional environmental information, as present with respect to the procedural and methodological requirements in ISO 14025:2010 and reference standard.

I confirm that the company-specific data has been examined as regards plausibility and consistency; the declaration owner is responsible for its factual integrity and legal compliance.

I confirm that I have sufficient knowledge and experience of construction products, this specific product category, the construction industry, relevant standards, and the geographical area of the EPD to carry out this verification.

I confirm my independence in my role as verifier; I have not been involved in the execution of the LCA or in the development of the declaration and have no conflicts of interest regarding this verification.

Ipek Goktas, as an authorized verifier acting for EPD Hub Limited  
03.11.2022

HaiHa Nguyen, as an authorized verifier acting for EPD Hub Limited  
09.09.2023

