

Environmental Product Declaration



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

Arbor[®]

from

Koroseal[®]



Programme:	The International EPD [®] System, www.environdec.com
Programme operator:	EPD International AB
EPD registration number:	S-P-11975
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Valid until:	2028-12-19

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
E-mail:	info@environdec.com

Accountabilities for PCR, LCA and independent, third-party verification

Product Category Rules (PCR)

CEN standard EN 15804 serves as the Core Product Category Rules (PCR)

Product Category Rules (PCR):
PCR 2019:14 Construction products, version 1.2.5
c-PCR-006, 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: EcoAct, an Atos company

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: Chris Foster, EuGeos

Approved by: The International EPD® System

OR

Independent third-party verification of the declaration and data, according to ISO 14025:2006, via:

EPD verification by accredited certification body

Third-party verification: *<name, organisation>* is an approved certification body accountable for the third-party verification

The certification body is accredited by: *<name of accreditation body & accreditation number, where applicable>*

OR

Independent third-party verification of the declaration and data, according to ISO 14025:2006 via:

EPD verification by EPD Process Certification*

Internal auditor: *<name, organisation>*

Third-party verification: *<name, organisation>* is an approved certification body accountable for third-party verification

Third-party verifier is accredited by: *<name of accreditation body & accreditation number, where applicable>*

*For EPD Process Certification, an accredited certification body certifies and reviews the management process and verifies EPDs published on a regular basis. For details about third-party verification procedure of the EPDs, see GPI v.4, Section 7.5.

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, 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: Koroseal[®]

Contact: Tom Whittelsey, Tai Scheurer

Description of the organisation: Koroseal[®] is an international leading manufacturer and provider of architectural wood veneers with global operations. Along with their partner Hokusan, Ltd., the organization has developed a micro-thin veneer named Arbor[®].

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E-mail: tscheurer@jacaranda.com

Phone number: 720-749-7011

Product-related or management system-related certifications: FSC, US Green Building Council Certificate,

Name and location of production site(s): Hokusan, Ltd. 1-7-6 Shinkiba, Koto-Ku, Tokyo, 136-0082, Japan.

Product information

Product name: Arbor[®] Wood Wallcovering

Product identification: Arbor[®] Wood Wallcovering

Product description: Arbor[®] is a prefinished real wood veneer wallcovering 0.3 mm thick. The standard sheet sizes are 3x9 ft and 3x10 ft. Wood from the White oak and Walnut species are used to manufacture the product. The product is made of three main layers: wood veneer, paper, and aluminium foil. Adhesive is also used to stick the layers together, in addition to the hot press that occurs in the manufacturing stage. The veneer has multiple applications for indoor finishes, being flexible for projects with large wall and ceiling areas. It is broadly used both in residential and commercial contexts, including hospitality, retail, health care, corporate and transportation interiors

UN CPC code: 315: Veneer sheets; sheets for plywood; densified wood

Geographical scope: Raw materials are sourced from the USA (A1) and then transported to Japan where the manufacture of Arbor[®] occurs (A3). The final product is distributed to the USA (A5), where it is then used (B) and disposed at the end-of-life (C)

Density: 0.80 - 0.94

Moisture: 5% - 10%

LCA information

Functional unit / declared unit: 1m² of Arbor[®] wood veneer, applied as wallcovering.

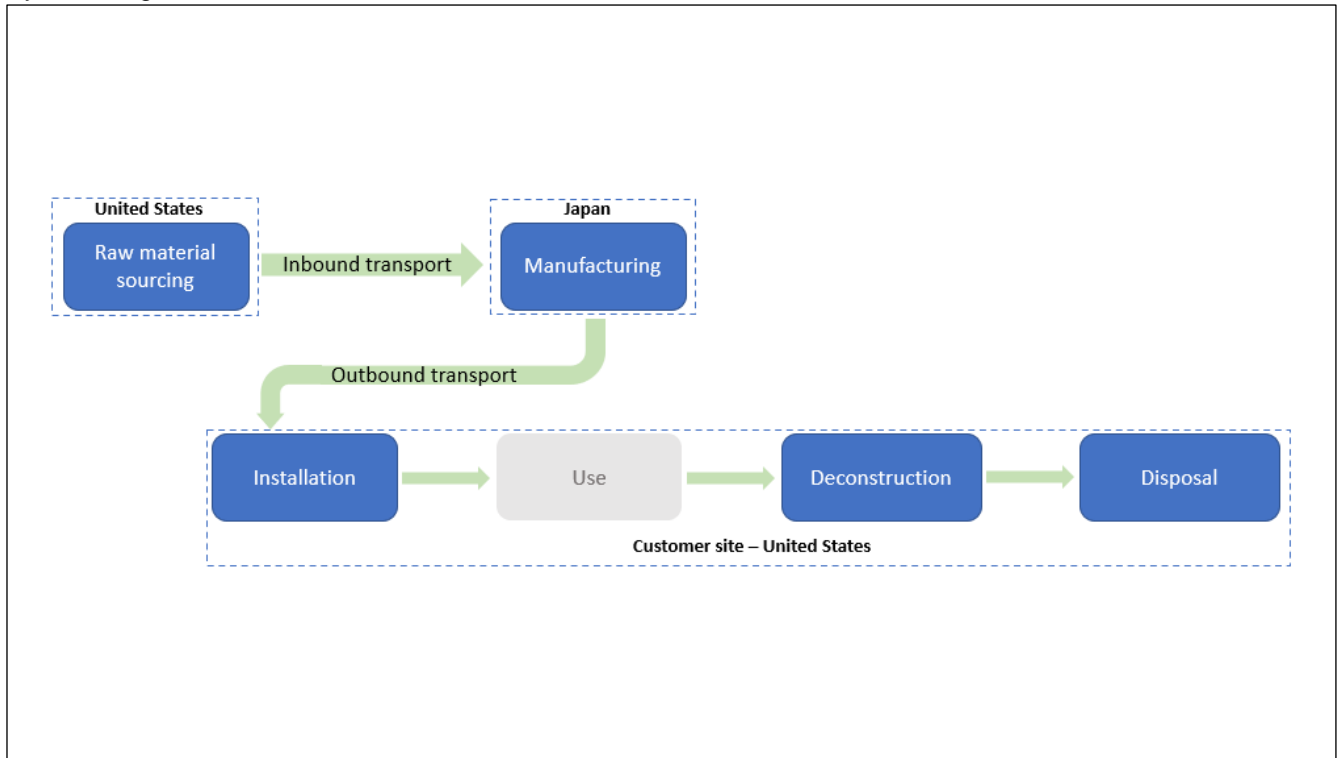
Reference service life: Not Applicable

Time representativeness: 2021

Database(s) and LCA software used: Ecoinvent 3.8 + EN15804 add-on; open LCA

Description of system boundaries: Cradle to gate with options, modules C1–C4, and module D
Lifecycle stages under section B have not been evaluated because after the installation the product does not require any action or maintenance operation. Consequently, there is no environmental impact associated with these lifecycle stages to account for.

System diagram:



More information:

The use phase is left out of scope as it doesn't generate any environmental impact. No actions or operations are required to maintain the product during the use phase until the demolition of the construction. No operational energy or water use is required by the product.

This Environmental Product Declaration considers cradle to gate with options, modules C1–C4, and module D. The list of modules considered are detailed in the table below.

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	X	X	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X	
Geography	US	GLO	JP	GLO	US								US	US	US	US	US	
Specific data used	>90% specific data					-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	Product variation not relevant					-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	Site variation not relevant					-	-	-	-	-	-	-	-	-	-	-	-	-

X = included
 ND = Not Declared

Content information

Product components	Weight, kg	Post-consumer material, weight-%	Biogenic material, weight-% and (kg C/kg)
Wood veneer	0.15	0	49% (0.494)
Paper	0.06	0	44% (0.439)
Aluminium foil	0.02	0	0 (0)
Adhesive	0.07	0	0 (0)
TOTAL	0.30	-	-
Packaging materials	Weight, kg	Weight-% (versus the product)	Weight biogenic carbon, kg C/kg
Kraft paper	0.002	0.67	0.439
Polybags	0.001	0.33	0
Cardboard boxes	0.019	6.33	0.450
TOTAL	0.022	-	-

LCA additional technical information and scenarios

Product stage, A1-A3

The product stage of Arbor is subdivided into three modules: A1- raw material supply, A2- transport, and A3- manufacturing.

A1 Raw material supply

This module accounts for the extraction and processing of all raw materials upstream of the manufacturing process. It includes the sourcing of White Oak and Walnut logs from Kentucky USA.

A2 Transport to manufacturer

Transport of the raw material to the manufacturing facility are considered in this module. This includes transport by ship and freight lorry.

A3 Manufacturing

The manufacturing process of Arbor consists of the conversion of the logs that are sourced into cants, further processing of the cants into veneers followed by the use of a hot press, trimming, sanding and varnishing to obtain the final product.

The third module considers the whole manufacturing process including energy consumption, emissions generated during manufacturing, and treatment of waste generated during the manufacturing process (including waste varnish, paper and wood).

Construction process stage, A4-A5

A4 Transport to site

This considers the transport of Arbor from the manufacturing facility to Tokyo Narita Airport by freight lorry and then to Miami International airport via aircraft. Actual distances have been considered for these legs. This is followed by transport to a climate-controlled storage space where it is stored for a while before it's delivered to the final customer. The distance between the airport to the storage facility and then to the final customer is assumed to be 100km, it is carried out by freight lorry.

Scenario information	Value	Unit
Vehicle type	16-32t truck	EURO5
Distance	100	km
Capacity utilisation	100	%
Bulk density	0.8 – 0.94	kg/m ³
Volume capacity	Not applicable	Not applicable

A5 Installation

Installation considers the impact of the material used to package Arbor, the use of adhesive to install Arbor and waste produced during this stage.

Scenario information	Value	Unit
Ancillary materials	0.377	kg
Water use	0	m3
Electricity	0	kWh
Waste	0.516	kg
Direct emissions	0	kg

End of Life stage, C1-C4

We have developed a dedicated model for End of Life treatment of the product. Scenario information has been summarised below.

Process	Value	Unit
Collected with mixed construction waste	100	%
Material for reuse	0	%
Material for recycling	0	%
Material energy recovery	19	%
Material for final disposal	81	%
Transport distance	71.7	km

C1 De-construction, demolition

Because of the lack of primary data on the deconstruction of Arbor, it was necessary to estimate the impacts of this stage by using secondary data sourced from literature.

C2 Transport

This is the transport distance from the site to the waste processing facility. Average distance was estimated based on country specific ecoinvent waste treatment.

C3 Waste processing

Due to the compacted nature of Arbor, all waste material has been assumed disposed in landfill or incineration with no materials being recycled. With the US as the market under study, the veneer has been classified as wood waste (non-hazardous waste) and the proportion of incineration to landfill was obtained from the US Environmental Protection Agency statistics on waste disposal (EPA, 2020).

C4 Disposal

We have estimated that 81.0% of waste is disposed in landfills, the rest is modelled as incineration of treated wood.

Benefits, D

Benefits considered in this module includes the avoided impact associated with energy from recovery from the incineration and landfilling processes the wood in the product is assumed to go through at the end of it's life.

Scenario Information	Value	Unit
Lower heating value		
Wood	10.045	MJ/Kg
Incineration efficiency		
Electric	15.84	%
Thermal	28.51	%
Landfill gas utilization		
Electric	27.8	%
Thermal	13.5	%
Landfill gas recovery		
Gas emitted directly	47.00	%
Gas captured and flared	18.02	%
Gas captured and utilized for energy	34.98	%

Environmental Information

For construction services, the total value of A1-A3 shall be replaced with the total value of A1-A5.

Potential environmental impact – mandatory 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-fossil	kg CO ₂ eq.	4.34 E+00	3.11 E+00	1.33 E+00	ND	ND	ND	ND	ND	ND	ND	1.37 E-02	3.73 E-03	1.90 E-03	3.55 E-03	-2.17E-02
GWP-biogenic	kg CO ₂ eq.	3.40 E-01	1.97 E-03	6.00 E-02	ND	ND	ND	ND	ND	ND	ND	2.20 E-05	5.94 E-06	1.64 E-01	2.21 E-02	-2.51E-05
GWP-luluc	kg CO ₂ eq.	6.55 E-03	1.94 E-04	1.30 E-01	ND	ND	ND	ND	ND	ND	ND	6.08 E-06	1.55 E-06	5.52 E-07	2.97 E-06	-6.77E-06
GWP-total	kg CO ₂ eq.	4.72 E+00	3.12 E+00	1.39 E+00	ND	ND	ND	ND	ND	ND	ND	1.37 E-02	3.74 E-03	1.66 E-01	2.56 E-02	-5.46E-01
ODP	kg CFC 11 eq.	2.89 E-07	7.08 E-07	1.19 E-07	ND	ND	ND	ND	ND	ND	ND	7.69 E-10	8.23 E-10	1.16 E-10	8.48 E-10	-1.60E-09
AP	mol H ⁺ eq.	3.64 E-02	1.61 E-02	8.63 E-03	ND	ND	ND	ND	ND	ND	ND	4.34 E-05	1.54 E-05	2.32 E-05	2.40 E-05	-5.60E-05
EP-freshwater	kg P eq.	1.24 E-03	4.29 E-05	3.90 E-04	ND	ND	ND	ND	ND	ND	ND	1.02 E-05	2.82 E-07	4.42 E-07	6.18 E-07	-1.05E-05
EP-marine	kg N eq.	1.29 E-02	5.89 E-03	1.82 E-03	ND	ND	ND	ND	ND	ND	ND	8.10 E-06	4.56 E-06	2.62 E-05	1.11 E-04	-1.10E-05
EP-terrestrial	mol N eq.	1.20 E-01	6.00 E-02	2.00 E-02	ND	ND	ND	ND	ND	ND	ND	6.68 E-05	4.97 E-05	1.01 E-04	8.93 E-05	-9.80E-05
POCP	kg NMVOC eq.	3.26 E-02	1.66 E-02	4.28 E-03	ND	ND	ND	ND	ND	ND	ND	1.98 E-05	1.48 E-05	4.86 E-05	3.14 E-05	-3.12E-05
ADP-minerals&metals*	kg Sb eq.	2.43 E-05	7.96 E-07	1.94 E-05	ND	ND	ND	ND	ND	ND	ND	2.22 E-08	1.22 E-08	3.28 E-09	9.06 E-09	-2.89E-08
ADP-fossil*	MJ	2.58 E+01	9.00 E-01	9.87 E+00	ND	ND	ND	ND	ND	ND	ND	1.14 E-01	6.37 E-03	3.78 E-03	9.27 E-03	-1.25E-01
WDP*	m ³	1.81 E+00	6.00 E-02	1.46 E+00	ND	ND	ND	ND	ND	ND	ND	3.51 E-03	2.60 E-04	- 2.57 E-04	3.00 E-03	-4.02E-03
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.

Potential environmental impact – additional mandatory and voluntary 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.	4.35 E+00	3.11 E+00	1.45 E+00	ND	ND	ND	ND	ND	ND	ND	1.37 E-02	3.73 E-03	1.90 E-03	3.55 E-03	-2.13E-02
Particulate Matter emissions	Disease incidence	1.02 E-06	2.96 E-08	8.78 E-08	ND	ND	ND	ND	ND	ND	ND	2.18 E-10	2.57 E-10	5.91 E-09	4.63 E-10	-2.56E-10
Ionizing radiation, human health	kBd U235e	2.81 E-01	1.96 E-01	4.99 E-02	ND	ND	ND	ND	ND	ND	ND	4.94 E-03	2.50 E-04	3.78 E-05	3.16 E-04	-5.07E-03
Eco-toxicity (freshwater)	CTUe	7.77 E+00	2.31 E-01	1.67 E+00	ND	ND	ND	ND	ND	ND	ND	7.40 E-04	1.79 E-03	1.18 E-02	6.05 E-04	-1.43E-03
Human toxicity cancer effect	CTUh	1.15 E-08	2.64 E-10	1.87 E-09	ND	ND	ND	ND	ND	ND	ND	3.42 E-12	1.18 E-12	1.35 E-10	1.82 E-12	-4.09E-12
Human toxicity, non-cancer effect	CTUh	2.00 E-07	3.84 E-08	5.70 E-08	ND	ND	ND	ND	ND	ND	ND	3.77 E-10	7.66 E-11	7.57 E-10	6.92 E-11	-4.21E-10
Land use related impact/soil quality	Pt	1.37 E+01	9.12 E-01	8.91 E+00	ND	ND	ND	ND	ND	ND	ND	1.02 E-02	4.53 E-02	1.55 E-02	2.34 E-01	-1.21E-02

Use of resources

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	2.34 E+00	1.10 E-01	7.20 E-01	ND	ND	ND	ND	ND	ND	ND	1.70 E-02	4.50 E-04	2.27 E-04	9.18 E-04	-1.74E-02
PERM	MJ	4.84 E+01	4.00 E-02	1.36 E+00	ND	ND	ND	ND	ND	ND	ND	5.35 E-03	1.80 E-04	1.05 E-04	2.94 E-04	-5.76E-03
PERT	MJ	5.07 E+01	1.40 E-01	2.08 E+00	ND	ND	ND	ND	ND	ND	ND	2.23 E-02	6.30 E-04	3.32 E-04	1.21 E-03	-2.31E-02
PENRE	MJ	2.99 E+01	1.07 E+00	1.05 E+01	ND	ND	ND	ND	ND	ND	ND	1.90 E-01	1.00 E-02	0.00 E+00	1.00 E-02	-1.96E-01
PENRM	MJ	4.07 E+01	4.18 E+01	1.37 E+01	ND	ND	ND	ND	ND	ND	ND	8.95 E-02	4.92 E-02	9.75 E-03	5.76 E-02	-2.24E-01
PENRT	MJ	7.05 E+01	4.29 E+01	2.43 E+01	ND	ND	ND	ND	ND	ND	ND	0.27 9	0.05 6	0.01 4	0.06 8	-4.20E-01
SM	kg	4.16 E-01	6.69 E-03	1.64 E-02	ND	ND	ND	ND	ND	ND	ND	5.70 E-04	3.88 E-05	6.54 E-05	1.07 E-04	-5.96E-04
RSF	MJ	1.52 E-02	1.83 E-03	4.57 E-03	ND	ND	ND	ND	ND	ND	ND	3.00 E-04	5.50 E-06	1.44 E-06	1.40 E-05	-3.12E-04
NRSF	MJ	2.13 E-01	2.46 E-03	1.60 E-02	ND	ND	ND	ND	ND	ND	ND	3.90 E-04	9.95 E-06	7.50 E-06	1.90 E-05	-4.09E-04
FW	m ³	5.51 E-02	1.46 E-03	3.71 E-02	ND	ND	ND	ND	ND	ND	ND	8.21 E-05	6.43 E-06	-	7.22 E-05	-9.42E-05
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 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.

Waste production and output flows

Waste production

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	5.21 E+00	2.10 E-01	4.43 E+00	ND	ND	ND	ND	ND	ND	ND	5.01 E-02	1.46 E-03	1.06 E-03	2.12 E-03	- 5.18E-02
Non-hazardous waste disposed	kg	1.81 E+00	2.23 E-02	1.76 E-01	ND	ND	ND	ND	ND	ND	ND	5.50 E-04	2.76 E-03	7.79 E-02	2.65 E-01	- 6.01E-04
Radioactive waste disposed	kg	2.24 E-03	4.36 E-04	3.70 E-04	ND	ND	ND	ND	ND	ND	ND	4.69 E-05	7.85 E-07	2.17 E-07	1.30 E-06	- 4.82E-05

Output flows

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	0.00 E+00	0.00E+00	0.00 E+00	ND	ND	ND	ND	ND	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Material for recycling	kg	4.59 E-02	5.07E-03	1.28 E-02	ND	ND	ND	ND	ND	ND	ND	5.20E-04	2.81E-05	2.37E-05	4.11E-05	-5.42E-04
Materials for energy recovery	kg	1.11 E-02	1.72E-03	2.87 E-03	ND	ND	ND	ND	ND	ND	ND	1.18E-05	1.53E-05	1.81E-05	1.86E-05	-1.96E-05
Exported energy, electricity	MJ	0.00 E+00	0.00E+00	0.00 E+00	ND	ND	ND	ND	ND	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy, thermal	MJ	0.00 E+00	0.00E+00	0.00 E+00	ND	ND	ND	ND	ND	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

References

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

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

