

Environmental Product Declaration



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

Hardened Wood Floor with Woodura® technology

from

Välinge Innovation Sweden AB



Programme:	The International EPD® System, www.environdec.com
Programme operator:	EPD International AB
EPD registration number:	S-P-07560
Publication date:	2022-11-30
Valid until:	2027-11-30

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 serves as the Core Product Category Rules (PCR)

Product Category Rules (PCR):

PCR 2019:14 Construction products, version 1.2.3,
C-PCR-006 Wood and wood-based products for use in construction and UN CPC code(s) 031, 311, 312, 313, 314, 315, 316, 319

PCR review was conducted by:

The PCR was reviewed by the Technical Committee of the International EPD[®] System, where the chair of the PCR review was Claudia A. Peña. The review panel may be contacted via info@environdec.com. The c-PCR was developed within CEN standardisation and adopted as a c-PCR by the International EPD[®] System.

Life Cycle Assessment (LCA)

LCA accountability: Torun Hammar, RISE Research Institutes of Sweden AB

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: Martyna Mikusinska, Sweco AB, martyna.mikusinska@sweco.se

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

[Procedure for follow-up the validity of the EPD is at minimum required once a year with the aim of confirming whether the information in the EPD remains valid or if the EPD needs to be updated during its validity period (see Sections 7.3.2 and 7.4.9 in the GPI). The follow-up can be organized entirely by the EPD owner or together with the original verifier via an agreement between the two parties. In both approaches, the EPD owner is responsible for the procedure being carried out. If a change that requires an update (see Section 6.5 of the GPI) is identified, the EPD shall be re-verified by a verifier]

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: Välinge Innovation Sweden AB

Contact: Marina Härd, marina.hard@valinge.se, Prästavägen 513, SE-263 65 Viken, Sweden
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Description of the organisation: Välinge Innovation Sweden AB is an IP, R&D and production company in flooring and furniture industries. Founded in 1993, we pioneered the concept of glue-less click flooring and changed the way people install and use floorings. Our worldwide-patented technology introduced a fast and easy way of installing floorboards mechanically, without using glue.

Today, our technology and product portfolio covers all fields related to floating flooring but also to other applications such as furniture and surfaces. Our patent portfolio is one of the most comprehensive in the flooring industry. It comprises more than 3,100 granted patents and a global license base of over 250 licensees. All R&D activities take place at our facility in Viken, which is considered to be the world's most advanced R&D centre related to laminate, resilient flooring, wood and wood-powder based flooring technology.

Each day, we make sure our licensees get access to the latest flooring, furniture, and surface technologies used in people's everyday lives.

Product-related or management system-related certifications: ISO 9001. FSC chain of custody multisite certification (certificate number DNV-COC-001624, licence number FSC-C140725).

Name and location of production site(s): Viken, southern Sweden.

Product information

Product name: Hardened Wood Floor with Woodura[®] technology.

Product identification: Wood flooring for indoor use (EN14342:2013).

Product description: The Woodura[®] surface technology is based on fusing a thin sheet of wood onto a wood fiber core through a powder mix layer. The result is a real wood surface, but stronger. As the powder mix perfectly fills up the natural openings of the wood, it reinforces the strength, enhances the wood appearance and eliminates the need for putty operations.

The Woodura[®] wooden floor is build up by six layers: (1) hardwax or UV lacquer; (2) oak or ash wood covering; (3) wood-based powder layer; (4) high quality moisture-resistant high-density fibreboard (HDF); (5) wood-based powder layer; and (6) wood veneer layer (Figure 1).



Figure 1. Layers of Woodura[®] floorboard

The weight of one m² Woodura® is 10 kg. The moisture content is 5±1% and the biomass content in the finished product is 82%, which with a carbon content of 50% per dry weight biomass gives a biogenic carbon content of 39% for the Woodura® floor (following EN 16449:2014 (CEN, 2014)).

This EPD represents a specific product, which is available in several dimensions and with either oak or ash wood covering. The following dimensions of the product are available and represented by this EPD:

Width: 167-273 mm

Length: 1175-2378 mm

Thickness: 11 mm

For further information and detailed product documentation, please visit:

www.valinge.se/products/woodura

UN CPC code: 315

Geographical scope: Woodura® is manufactured at Välinge Innovation Sweden's factory in Viken, Sweden (module A3). The main raw materials are produced in and transported from Germany, Croatia, Belgium, Austria and Estonia (module A1-A2). The construction, maintenance and end of life was modelled based on Swedish conditions (module A4-A5, B2, C1-C4, D).

LCA information

Functional unit / declared unit: One m² floor (with a reference flow of 10 kg per m², density of 920 kg per m³ and moisture content of 5±1%).

Reference service life: The reference service life was set to one year (for the specified characteristics application and use areas according to EN 14342:2013), even though the estimated service life is up to 30-50 years.

Time representativeness: This EPD represents primary data from 2021.

Database(s) and LCA software used: SimaPro version 9.4.0.2 and Ecoinvent version 3.8 (released in November 2021).

Description of system boundaries: EPD type b) Cradle to gate with options, module C1-C4, module D and optional modules. The system boundaries include modules A1-A5 + B2 + C1-C4 + D.

System diagram:

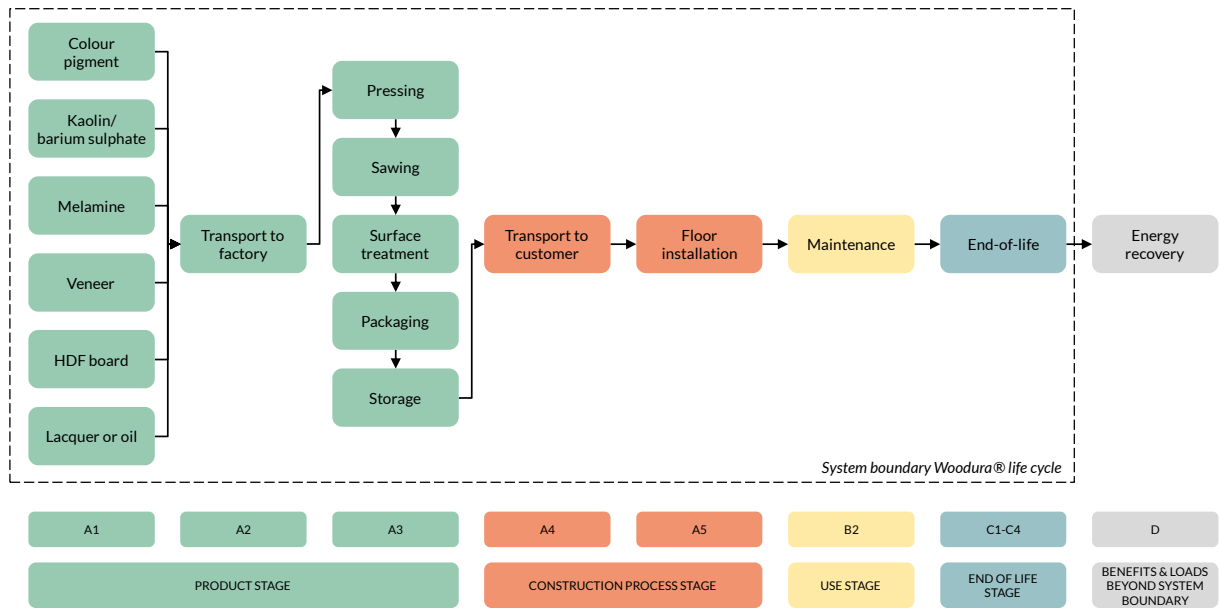


Figure 2. System boundaries

More information:

Product stage (A1-A3):

- Woodura® is mainly produced from primary wood (High-density fibreboard, HDF, and veneer), where a share of the co-produced wood fibre from manufacturing is used for internal wood powder production, while the rest is used for internal heat production or sold as external biofuel.
- The HDF is sourced in Germany and the veneer is sourced in Croatia, Estonia, Belgium and Austria.
- Woodura® is manufactured in Välinge Innovation Sweden's factory in Viken, Sweden, where the electricity used in the manufacturing process was 100% hydropower in 2021.
- The wooden floor is either lacquer or oiled, and an oiled Woodura® floor board was assessed in this EPD.
- The finished floor is packaged with corrugated board, plastic film and transported on pallets.

Construction process stage (A4-A5):

- The Woodura® wooden floor is transported to a retailer and thereafter to a customer for installation, both assumed to be located in Sweden. Besides the Woodura® wooden floor, polyethylene is used for the installation.

Use stage (B2):

- The maintenance (module B2) of the wooden floor included water and soap for cleaning, and oiling of the floor.

End of life stage (C1-C4):

- After the final use, the wooden floor was assumed to be removed by hand (module C1) (with no connected environmental burden) and transported to a waste facility plant (module C2).
- The wooden floor was then assumed to be chipped and combusted for energy recovery (with a conversion efficiency higher than 60%) (module C3). The waste processing of packaging material and installation material was also accounted for in module C3.

- No material was sent to disposal in module C4.

Benefits and loads beyond the system boundaries (D):

- The loads and benefits related to energy recycling (export of secondary fuel) was calculated (module D2), where the recovered energy was assumed to substitute a Swedish electricity mix and European heat mix.
- The module D1 (export of secondary materials), module D3 (waste incineration with efficiency lower than 60%) and module D4 (landfill) was not applicable and therefore excluded.

Cut-off criteria: According to EN15804+A2:2019/AC:2021, the cut-off criteria shall be 1 % of renewable and non-renewable primary energy usage and 1 % of the total mass input of that unit process. The total of neglected input flows per module, e.g. per module A1-A3, A4-A5, B1-B5, B6-B7, C1-C4 and module D shall be a maximum of 5 % of energy usage and mass. In this report, no cut-off was applied, meaning that all available inputs and outputs were considered, and none were excluded.

Allocation: During the manufacturing process, co-products are generated where the largest share is used for internal heat production and for wood powder production, while a smaller share is sold as external biofuel. According to the core PCR, flows leaving the system at the end-of-waste boundary of the manufacturing stage should be allocated as co-products (and as a general rule not declared in module D). The co-products leaving the system boundaries as external biofuel was 2% of the total output, while 98% was either use as raw material for Woodura[®] or recycled as internal heat used in the manufacturing. The difference in revenue between the Woodura[®] floor and the sold biofuel was considered high, and therefore as a conservative approach, 100% of the burden was allocated to the Woodura[®] floor, except biogenic carbon flows which was allocated based on mass, following the PCR.

LCA practitioner: Torun Hammar, RISE Research Institutes of Sweden

Modules declared, geographical scope, share of specific data (in GWP-GHG results) and data variation (in GWP-GHG results) (ND = not declared):

	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	X	ND	ND	ND	ND	ND	X	X	X	X	X	
Geography	DE, HR, ES, NO, SE, AT, BE	DE, HR, ES, NO, SE, AT, BE	SE	SE	SE	ND	SE	ND	ND	ND	ND	ND	SE	SE	SE	SE	SE	
Specific data used	20%					-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	Not relevant					-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	Not relevant					-	-	-	-	-	-	-	-	-	-	-	-	-

Content information

Product components	Weight, kg per m ² Woodura®	Post-consumer material, weight-%	Biogenic material, weight-% and kg C per kg
High density fibreboard (HDF)	8.4 ^a		80% biomass content, 0.4 kg C/kg
Veneer	0.7		100% biomass content, 0.5 kg C/kg
Wood powder	1.0		
Wood fibre (from saw dust)	0.45 ^b		82% biomass content, 0.4 kg C/kg
Melamine	0.5		
Colour pigment	0.025		
Kaolin/barium sulphate	0.025		
Water with wetting and release agent	0.05		
Lacquer ^c	0.1		
Oil ^c	0.02		
TOTAL	10		76% biomass content, 3.9 kg C per kg
Packaging materials	Weight, kg per m ² Woodura®	Weight-% (versus the product)	Weight biogenic carbon, kg C per kg
Corrugated board	0.15	1.5%	0.4 kg C/kg
Plastic film	0.006	0.1%	
Pallets for transport	0.017	0.2%	0.5 kg C/kg
TOTAL	0.17	1.7%	

^aDensity of 920 kg per m³. ^bSawing residues (8% veneer and 92% HDF). ^cWoodura® is either lacquered or oiled.

Environmental Information

Potential environmental impact – mandatory indicators according to EN 15804

Results per m ² Woodura®										
Indicator	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
GWP-fossil	kg CO ₂ eq.	7.1E+00	5.2E-01	7.8E-01	7.3E-02	0	8.1E-02	1.3E-01	0	-7.6E+00
GWP-biogenic	kg CO ₂ eq.	-1.3E+01	5.3E-04	2.6E-01	-2.6E-01	0	7.0E-05	1.4E+01	0	-1.3E-02
GWP-luluc	kg CO ₂ eq.	1.3E-01	2.0E-04	5.2E-04	3.5E-04	0	3.3E-05	2.4E-04	0	-4.5E-02
GWP-total	kg CO ₂ eq.	-5.9E+00	5.2E-01	1.0E+00	-1.9E-01	0	8.2E-02	1.4E+01	0	-7.7E+00
ODP	kg CFC 11 eq.	7.6E-07	1.3E-07	1.2E-07	8.4E-09	0	1.9E-08	4.5E-09	0	-4.1E-07
AP	mol H ⁺ eq.	4.2E-02	1.7E-03	4.1E-03	6.1E-04	0	2.3E-04	7.8E-03	0	-6.2E-02
EP-freshwater	kg P eq.	4.1E-03	3.4E-05	1.2E-04	6.2E-05	0	5.3E-06	6.9E-05	0	-2.6E-03
EP- marine	kg N eq.	1.0E-02	3.7E-04	1.2E-03	1.9E-04	0	4.7E-05	2.8E-03	0	-8.0E-03
EP-terrestrial	mol N eq.	1.1E-01	4.1E-03	1.3E-02	1.9E-03	0	5.1E-04	3.4E-02	0	-8.6E-02
POCP	kg NMVOC eq.	2.8E-02	1.6E-03	4.2E-03	5.3E-04	0	2.0E-04	7.2E-03	0	-2.4E-02
ADP-minerals&metals*	kg Sb eq.	5.3E-05	1.2E-06	1.0E-05	6.2E-07	0	2.9E-07	2.2E-07	0	-1.3E-05
ADP-fossil*	MJ	1.1E+02	8.5E+00	1.3E+01	9.4E-01	0	1.2E+00	1.8E+00	0	-1.5E+02
WDP*	m ³	7.7E+00	2.9E-02	1.4E-01	1.5E+00	0	3.8E-03	2.3E-02	0	-1.5E+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.

Potential environmental impact – additional mandatory and voluntary indicators

Results per m ² Woodura®										
Indicator	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
GWP-GHG ¹	kg CO ₂ eq.	7.3E+00	5.2E-01	7.6E-01	7.4E-02	0	8.1E-02	1.3E-01	0	-7.5E+00

Use of resources

Results per m ² Woodura®										
Indicator	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
PERE	MJ	5.6E+01	1.1E-01	3.4E-01	4.9E-02	0	1.8E-02	2.3E-01	0	-4.8E+01
PERM	MJ	1.7E+02	0.0E+00	0.0E+00	4.7E+00	0	0.0E+00	0.0E+00	0	0.0E+00
PERT	MJ	2.3E+02	1.1E-01	3.4E-01	4.8E+00	0	1.8E-02	2.3E-01	0	-4.8E+01
PENRE	MJ	1.1E+02	8.5E+00	8.5E+00	9.4E-01	0	1.2E+00	1.8E+00	0	-1.5E+02
PENRM	MJ	5.5E-01	0.0E+00	5.0E+00	0.0E+00	0	0.0E+00	0.0E+00	0	0.0E+00
PENRT	MJ	1.1E+02	8.5E+00	1.3E+01	9.4E-01	0	1.2E+00	1.8E+00	0	-1.5E+02
SM	kg	0	0	0	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0	0
FW	m ³	1.9E-01	9.4E-04	3.7E-03	3.5E-02	0	1.3E-04	9.1E-04	0	-1.3E-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 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 m ² Woodura®										
Indicator	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
Hazardous waste disposed	kg	0.18	0	0	0	0	0	0	0	0
Non-hazardous waste disposed	kg	0.38	0	0.17	0	0	0	0	0	0
Radioactive waste disposed	kg	0	0	0	0	0	0	0	0	0

Output flows

Results per m ² Woodura®										
Indicator	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
Components for re-use	kg	0	0	0	0	0	0	0	0	0
Material for recycling	kg	0	0	0	0	0	0	0	0	0
Materials for energy recovery	kg	0.5	0	0	0	0	0	0	10	0
Exported energy, electricity	MJ	0	0	0	0	0	0	0	0	51.8
Exported energy, thermal	MJ	0	0	0	0	0	0	0	0	104

Other environmental performance indicators

Biogenic carbon content

Results per m ² Woodura®		
Biogenic carbon content	Unit	Value
Product	kg C	3.9
Packaging	kg C	0.07

1 kg biogenic carbon is equivalent to 44/12 kg of CO₂

References

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

EN 15804:2012+A2:2019/AC2021 Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products

PCR 2019:14 Construction products. Version 1.2.3.

c-PCR-006 (to PCR 2019:14) Wood and wood-based products for use in construction (EN 16485:2014). Version 2019-12-20.

