Puutuoteteollisuus

Generic apartment doorset manufactured in Finland

Program operator, publisher:	Rakennustietosäätiö RTS sr, The Building Information Foundation RTS Malminkatu 16 A, 00100 Helsinki https://cer.rts.fi/
Owner of the declaration:	Puutuoteteollisuus ry, Federation of the Finnish Woodworking Industries Siltasaarenkatu 12 A, 00530 Helsinki https://puutuoteteollisuus.fi/
Name of the product:	Apartment doorset
Declaration number:	RTS_183_22
Registration number:	-
ECO Platform reference number:	-
Issue date:	May 6, 2022
Valid to:	May 6, 2027
Scope of the declaration:	This environmental product declaration covers the environmental impacts of a generic apartment doorset. The declaration has been prepared in accordance with EN 15804:2019 and ISO 14025 standards and the additional requirements stated in the RTS PCR (English version, 26.8.2020). This declaration covers the life cycle stages from cradle-to-gate with options, modules C1-C4 and module D.

Jukka Seppänen
RTS EPD Committee Secretary

Laura Apilo
Managing Director

Verified according to the requirements of EN 15804:2019 (product group rules)	
Independent verification of the declaration and data, according to ISO14025:2010 is carried out by	
☐ Internal	☒ External

Third party verifier:

Sigita Židonienė
Vesta Consulting UAB

GENERAL INFORMATION

Owner of the declaration

Puutuoteteollisuus ry
Siltasaarenkatu 12 A
FI-00530 Helsinki
https://puutuoteteollisuus.fi/

Author of the life cycle assessment and declaration

LCA Consulting Oy
Laserkatu 6
FI-53850 Lappeenranta
https://lca-consulting.fi/

1. Product name

This trade association EPD is created for a generic apartment doorset manufactured in Finland.

2. Manufacturers

The following three manufacturers have contributed data for this trade association EPD: Alavus Ikkunat Oy, Jeld-Wen Suomi Oy and Skaala IFN Oy.

3. Additional information

Puutuoteteollisuus ry: Aila Janatuinen. firstname.lastname@puutuoteteollisuus.fi.
LCA Consulting Oy: Heli Kumpulainen. firstname.lastname@lca-consulting.fi.

4. Product Category Rules and the scope of the declaration

The declaration has been prepared in accordance with EN 15804:2019 and ISO 14025 standards and the additional requirements stated in the RTS PCR (English version, 26.8.2020) and the PCR for windows and doorsets (EN 17213). EPDs of construction materials may not be comparable if they do not comply with EN 15804 and seen in a building context. Year 2020 is the reference year for primary data used in calculation.

5. Verification

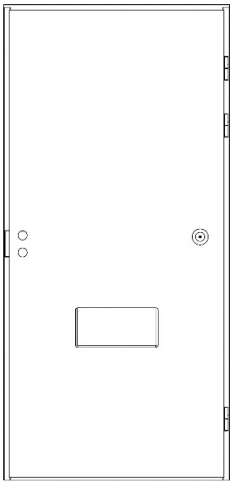
The declaration was verified by Sigita Židonienė from Vesta Consulting UAB according to abovementioned standards and PCR rules. Bebru str. 1, Vilnius, Lithuania, +37068018594, sigita@vestaconsulting.lt.
Third party verification on 18.3.2022. Verification is valid 18.3.2022-18.3.2027.

6. Declaration issue date and validity

Declaration issue date 06.05.2022. The declaration is valid 5 years, 06.05.2022 – 06.05.2027.

PRODUCT INFORMATION

7. Product description and uses



This declaration describes an apartment doorset representing the typical Finnish apartment entrance door. The apartment door provides sufficient security, sound and fire insulation, and enables the delivery of mail into the apartment.

The wooden apartment doorset has dimensions of 0.99x2.08 m, a casing depth of 92 mm and is EI30 fire classified. The frame and door leaf framework are pine and the threshold is hardwood. The apartment door leaf is composed of pine framework, with flax boards and different wood boards forming the inner and outer layers of the door. The apartment door includes an aluminium mailbox and a steel doorbell.

8. Raw materials of the product / apartment doorset

The main raw materials of the apartment doorset are pine and wooden or flax boards, and the product also contains aluminium mailbox, metal hardware, plastic components, (fire) gaskets and surface treatment. Mass shares of different materials in the apartment doorset are shown in the table below. Mass shares of materials and the other reported results are calculated as weighted averages between the three manufacturers.

Product composition	Quantity, wt.%	Usability			
		Renewable	Non-renewable	Recycled	Origin
Pine timber	16.5 %	x			Finland, EU
Hardwood timber	6.4 %	x			Finland, EU
Plywood, particle and fiber boards	68.2 %	x			Finland, EU
Aluminium	2.2 %		x		Finland
Metal hardware	2.9 %		x		Finland, non-EU
Gaskets and sealants	0.5 %		x		Finland, EU
Surface treatment and glue	3.3 %				Finland, EU

9. Product standards (c-PCR)

Product category rules for windows and doors (EN 17213) are applied in the calculation.

10. Physical properties

Dimensions 0.99x2.08 m, casing depth 92 mm. Fire class is EI30. Soundproofing is 35 dB.

11. Results of environmental information / 1 kg apartment door

Parameter	Unit	A1-A3	A3	C1	C2	C3	C4	D
Global warming potential – total (GWP-total)	kg CO_2 eq./kg	-3.06E-01		6.25E-04	6.26E-03	1.73E-02	1.58E+00	-5.98E-01
Depletion of abiotic resources – minerals and metals (ADP-M)	kg Sb eq./kg	9.19E-05		5.52E-11	5.49E-10	4.38E-09	4.08E-09	-7.32E-08
Depletion of abiotic resources – fossil fuels (ADP-F)	MJ net calorific value/kg	2.14E+01		8.28E-03	8.25E-02	2.33E-01	4.92E-01	-1.07E+01
Water use (WDP)	m^3 world eq. deprived/kg	2.90E-01		5.76E-06	5.76E-05	1.74E-04	1.60E-01	-1.85E-02
Biogenic carbon content in product	kg C/kg		0.87					
Use of secondary material	kg/kg	0						

12. Substances under European Chemicals Agency's REAH, SVHC restrictions

The product is not known to include substances from ECHA's Candidate List of Substances of Very High Concern.

SCOPE OF THE LIFE CYCLE ASSESSMENT

The type of this declaration is cradle to gate with options, modules C1-C4 and module D. Covered modules are marked with an X in the table below.

Product stage			Construction stage		Use stage							End of life stage				Supplementary information beyond the life cycle		
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D	D	D
☒	☒	☒	☒	☒	☐	☐	☐	☐	☐	☐	☐	☒	☒	☒	☒	☒	☒	☒
Raw material supply	Transport	Manufacturing	Transport	Construction	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse	Recovery	Recycling

	Mandatory modules
	Mandatory as per RTS PCR section 6.2.1 rules and terms
	Optional modules based on scenarios

13. Declared unit

The declared unit is 1 m^2 of apartment doorset. The conversion factor from m^2 to kg is shown in the table below:

Parameter	Value	Unit
Declared unit	1	m^2
Conversion factor	33.3	kg/m^2

14. System boundary

The system boundary is cradle to gate with options, modules C1-C4 and module D and includes the following life cycle stages:

- **A1: Raw material supply** includes raw material extraction, forestry operations and raw material processing to semi-finished product;
- **A2: Raw material transport** from suppliers to manufacturing;
- **A3: Manufacturing** includes direct emissions from the site and the production of energy, fuels, water and packaging materials;
- **A4: Transport to construction;**
- **A5: Construction** – installation of the product into a building and waste treatment of used packaging materials;
- **C1-C4 End of life:** Deconstruction (C1), transport of product to end of life (C2), end of life waste processing for recycling and energy recovery(C3) and the disposal of materials (C4), and;
- **D: Reuse, recycling and recovery potential** outside the system boundaries from material and energy substitution.

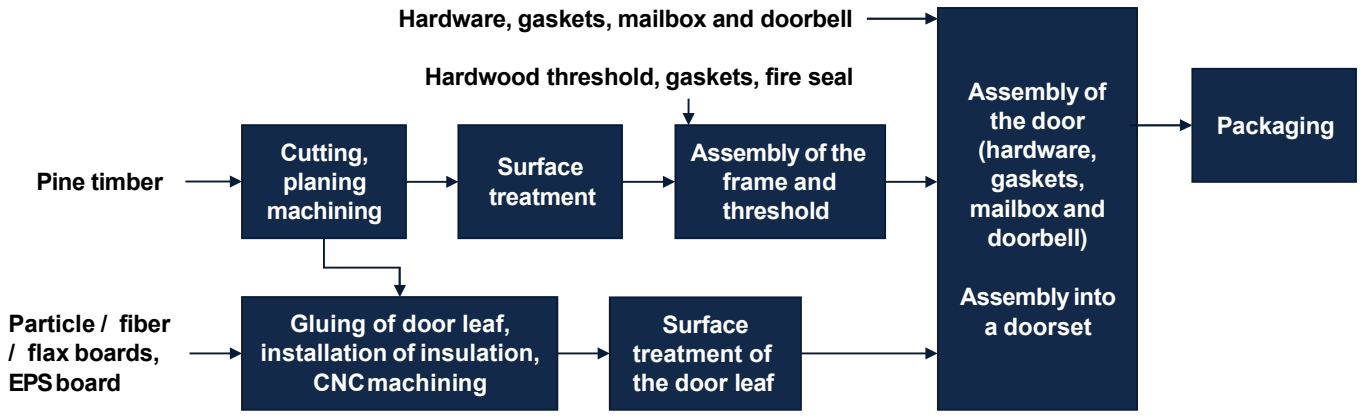
15. Cut-off criteria

Mass-based cut-off criteria is adhered to. The cut-off rule is reflected in the inputs of the product system studied separately for each module. Flows accounting less than 1% of the overall input mass or energy flows are excluded from the study if appropriate LCI data or even proxy data is not available. The sum of excluded flows should not exceed 5% of the total inflows (by mass or by energy). The flows knowingly excluded from the study are as follows:

- Capital equipment, infrastructure and employee commute are excluded.

16. Production process

The framework and door leaf lining and bars are made of pine timber, which may be cut to size and machined before further processing. The framework and the door leaf are manufactured on separate lines. The framework undergoes surface treatment before being assembled with the hardwood threshold which may also undergo pre-processing. Gaskets and fire seals are installed in this step. Wood and flax boards are installed into the door leaf which is glued together. Lockset space is created by CNC (computer numerical control) machining. Hardware, gaskets, mailbox and doorbell are installed into the door, which is assembled into the framework and packaged for shipping. The edges of the doorset are protected with cardboard. The doors are stacked on pallets, typically four to five units together, and covered with plastic wrap.



LIFE CYCLE IMPACT ASSESSMENT

The results of the impact assessment are relative figures and do not predict the effects on the weighted values of the categories, the exceedance limits, safety margins and risks.

17. Core environmental impacts / 1 m^2 apartment door

Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
Global warming potential – total (GWP-total)	kg CO_2 eq.	-1.02E+01	7.45E-01	2.67E+00	2.08E-02	2.08E-01	5.75E-01	5.26E+01	-1.99E+01
Global warming potential – fossil (GWP-fossil)	kg CO_2 eq.	4.28E+01	7.40E-01	6.06E-01	2.16E-02	2.07E-01	5.71E-01	1.56E+00	-2.00E+01
Global warming potential – biogenic (GWP-biogenic)	kg CO_2 eq.	-5.31E+01	-8.79E-04	2.06E+00	-9.34E-04	-2.46E-04	3.29E-03	5.11E+01	7.08E-02
Global warming potential – land use and land use change (GWP-LULUC)	kg CO_2 eq.	1.37E-01	6.03E-03	1.34E-04	1.69E-04	1.69E-03	7.14E-04	6.62E-04	-5.69E-03
Ozone depletion (ODP)	kg CFC-11 eq.	1.29E-06	1.46E-16	1.06E-12	4.09E-18	4.08E-17	1.31E-12	9.15E-11	-3.75E-11
Acidification (AP)	mol H^+ eq.	3.95E-01	2.38E-03	4.60E-04	1.04E-04	7.62E-04	1.38E-03	2.22E-02	-4.46E-02
Eutrophication – aquatic freshwater (EP-F)	kg P eq.	6.11E-03	2.19E-06	1.38E-06	6.16E-08	6.13E-07	1.22E-06	6.27E-06	-1.33E-05
Eutrophication – aquatic marine (EP-M)	kg N eq.	4.11E-02	1.09E-03	1.59E-04	4.87E-05	3.55E-04	3.85E-04	1.02E-02	-9.87E-03
Eutrophication – terrestrial (EP-T)	mole N eq.	4.25E-01	1.22E-02	2.15E-03	5.39E-04	3.96E-03	4.15E-03	1.19E-01	-1.07E-01
Photochemical ozone formation (POCP)	kg NMVOC eq.	5.57E-01	2.15E-03	3.98E-04	1.36E-04	6.88E-04	1.30E-03	2.73E-02	-2.97E-02
Depletion of abiotic resources – minerals and metals (ADP-M) [1)]	kg Sb eq.	3.06E-03	6.54E-08	2.77E-08	1.84E-09	1.83E-08	1.46E-07	1.36E-07	-2.44E-06
Depletion of abiotic resources – fossil fuels (ADP-F) [1)]	MJ net calorific value	7.12E+02	9.83E+00	1.26E+00	2.76E-01	2.75E+00	7.77E+00	1.64E+01	-3.55E+02
Water use (WDP) [1)]	m^3 world eq. deprived	9.65E+00	6.85E-03	2.63E-01	1.92E-04	1.92E-03	5.81E-03	5.34E+00	-6.15E-01
Disclaimer 1 – The results of the environmental impact indicators ADP-M, ADP-F and WDP shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.									

Reading example:

1.00E-03 = 0.001

1.00E+03 = 1000

18. Use of natural resources / 1 m² apartment door

Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
Use of renewable primary energy excluding renewable primary energy resources used as raw materials (PERE)	MJ	7.34E+02	5.66E-01	2.08E+01	1.59E-02	1.58E-01	2.38E+00	4.50E+02	-9.91E+01
Use of renewable primary energy resources used as raw materials (PERM)	MJ	4.93E+02	0.00E+00	-2.18E+01	0.00E+00	0.00E+00	0.00E+00	-4.47E+02	0.00E+00
Total use of renewable primary energy resources (PERT)	MJ	1.23E+03	5.66E-01	-9.97E-01	1.59E-02	1.58E-01	2.38E+00	2.56E+00	-9.91E+01
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials (PENRE)	MJ	7.25E+02	9.87E+00	8.48E+00	2.77E-01	2.76E+00	7.77E+00	2.30E+01	-3.55E+02
Use of non-renewable primary energy resources used as raw materials (PENRM)	MJ	1.42E+01	0.00E+00	-7.22E+00	0.00E+00	0.00E+00	0.00E+00	-6.61E+00	0.00E+00
Total use of non-renewable primary energy resources (PENRT)	MJ	7.39E+02	9.87E+00	1.26E+00	2.77E-01	2.76E+00	7.77E+00	1.64E+01	-3.55E+02
Use of secondary materials (SM)	kg	1.66E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of renewable secondary fuels (RSF)	MJ	4.26E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of non-renewable secondary fuels (NRSF)	MJ	3.48E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Net use of fresh water (FW)	m^3	8.52E-01	6.48E-04	6.85E-03	1.82E-05	1.81E-04	1.62E-03	1.26E-01	-1.49E-01

19. Disposed wastes / 1 m² apartment door

Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
Hazardous waste disposed (HWD)	kg	6.85E-01	5.20E-10	2.30E-08	1.46E-11	1.45E-10	2.19E-09	3.28E-09	-1.77E-07
Non-hazardous waste disposed (NHWD)	kg	1.58E+01	1.55E-03	1.90E-02	4.35E-05	4.33E-04	1.70E-02	1.39E+00	-1.50E+00
Radioactive waste disposed (RWD)	kg	3.82E-02	1.79E-05	4.30E-05	5.03E-07	5.01E-06	4.02E-04	6.95E-04	-3.67E-02

20. Output flows / 1 m² balcony door

Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
Components for reuse	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	1.14E-01	0.00E+00	8.42E-02	0.00E+00	0.00E+00	1.61E+00	0.00E+00	0.00E+00
Materials for energy recovery	kg	2.13E+00	0.00E+00	1.31E+00	0.00E+00	0.00E+00	0.00E+00	3.00E+01	0.00E+00
Exported energy, electricity	MJ	3.15E+00	0.00E+00	4.66E+00	0.00E+00	0.00E+00	0.00E+00	4.11E+00	0.00E+00
Exported energy, thermal	MJ	5.65E+00	0.00E+00	8.39E+00	0.00E+00	0.00E+00	0.00E+00	7.35E+00	0.00E+00

OTHER ENVIRONMENTAL INDICATORS

21. Biogenic carbon content / 1 m² apartment door

The apartment door is mostly composed of pine, flax boards and different wood boards and the packaging includes wooden pallets and cardboard. Biogenic carbon content is calculated according to EN 16449.

Parameter	Quantity	Unit
Biogenic carbon content in product	13.9	kg C
Biogenic carbon content in packaging	0.5	kg C

SCENARIOS AND ADDITIONAL TECHNICAL INFORMATION

22. Energy in the manufacturing stage

Parameter	Quantity	Unit	Data quality
Emission factor of electricity consumed in A3	0.135	kg CO_2/kWh	Emissions from electricity production are calculated for the average consumption mix at different manufacturers in 2020, based on data from Energy Authority (2020) and GaBi Professional database 2021.
Emission factor of thermal energy consumed in A3	0.098	kg CO_2/kWh	Emissions from thermal energy production are calculated for the average consumption mix at individual manufacturers in 2020, based on data from Alakangas et al. (2016), Statistics Finland (2021) and GaBi Professional database 2021.

23. Transport to construction

Parameter	Quantity	Unit	Data description
Transport distance, truck	324	km	Truck, Euro 5, 24.7t payload capacity; Diesel; 61% utilization rate. Commercial one-way transport is assumed.
Specific emission, truck	0.066	kg CO_2 eq./tkm	Truck, Euro 5, 24.7t payload capacity; 61% utilization rate. Diesel and upstream emissions.

24. End-of-life stage description – module C

The materials in the apartment doorset are assumed to be treated as follows: 95 % of wood and plastics are directed to energy recovery, whilst 5 % is lost or ends up landfilled; and 95 % of aluminium and steel are recycled, while 2.5 % ends up at incineration and 2.5 % at landfill.

Parameter	Unit	Quantity
Collection process	Collected separately, %	95.1 %
	Collected as mixed construction waste, %	4.9 %
Recovery type	kg for reuse	0
	kg for recycling	1.7
	kg for energy recovery	31.6
Disposal type	kg for final disposal	1.7
Assumptions for scenario development	Transport by truck (Euro 5, 11.4t payload capacity, 53 % utilization rate). Distances: 50 km for materials to landfill and wood to energy recovery, 100 km for other materials to energy recovery and 200 km for materials to recycling.	

25. Other technical information

Not specified for the industry average products.

26. Additional information

No information is available regarding emissions to soil, water or air.

27. LCA modelling software and data

GaBi version 10.6. is used in LCA modelling. Primary data from 2020 is obtained from the three manufacturers. Secondary data from GaBi Professional 2021 and Ecoinvent 3.7.1 (cut-off) databases are used in modelling. As principle, secondary data with maximum 10 years age was used in the modelling when available.

REFERENCES

Standards and PCR

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

EN 16449:2014. Wood and wood-based products - Calculation of the biogenic carbon content of wood and conversion to carbon dioxide.

EN 17213:2020. Windows and doors - Environmental Product Declarations - Product category rules for windows and pedestrian doorsets.

ISO 14025:2010. Environmental labels and declarations – Type III environmental declarations – Principles and procedures.

The Building Information Foundation RTS (RTS EPD Product Category Rules). Rakennustietosäätiö RTS sr (RTS EPD PCR menetelmäohje 15804:2019)

Bibliography

Alakangas et al. 2016. Suomessa käytettävien polttoaineiden ominaisuuksia [Characteristics of fuels used in Finland].

Energy Authority. 2021. Jäännösjakauma 2020 [Residual grid mix 2020]. Dnro 1568/463/2021.

Statistics Finland. 2021. Fuel classification 2021.

Modelling software & databases

GaBi version 10.6

GaBi Professional database 2021.

Ecoinvent 3.7.1 database (cut-off).