



Rakennustietosäätiö RTS Building Information Foundation RTS

RTS EPD, Nro. RTS_36_19
Wood-aluminium window MSE1-A,
Pihla Pro
1.23x1.48 m, frame depth 170 mm

Scope of the declaration

This environmental product declaration covers the environmental impacts of wood-aluminium window MSE1-A. The declaration has been prepared in accordance with EN 15804:2012+A1:2013 and ISO 14025 standards and the additional requirements stated in the RTS PCR (English version, 14.6.2018). This declaration covers the life cycle stages from cradle-to-gate with options including transportation to installation site, deconstruction, transportation, treatment and recovery of the product at its end-of-life.

RAKENNUSTIETO

14.11.2019
Building Information Foundation RTS
Malminkatu 16 A
00100 Helsinki <http://epd.rts.fi>

Laura Sariola
Committee secretary

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General information, declaration scope and verification (7.1)

1. Owner of the declaration, manufacturer

Pihla Group Oy
Teollisuustie 2, 69150 Eskola
Terhi Tervo
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2. Product name and number

Wood-aluminium window MSE1-A

3. Place of production

Eskola, Kannus, Finland

4. Additional information

More information can be found at webpage of the company <https://www.pihlapro.fi>

5. Product Category Rules and the scope of the declaration

This EPD has been prepared in accordance with EN 15804:2012+A1:2013 and ISO 14025 standards together with the RTS PCR (English version, 14.6.2018). Product specific category rules have not been applied in this EPD. EPD of construction materials may not be comparable.

6. Author of the life-cycle assessment and declaration

Anastasia Sipari
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7. Verification

This EPD has been verified according to the requirements of ISO 14025:2010, EN 15804: 2012+A1:2013 and RTS PCR by a third party. The verification has been carried out by Teija Käpynen, Vahanen Environment Oy.

8. Declaration issue date and validity

14.11.2019-12.11.2024

European standard EN 15804: 2014 A1 serves as the core PCR

Independent verification of the declaration and data, according to ISO14025:2010

Internal External

Third party verifier:
Teija Käpynen
Vahanen Environment Oy

Product information

9. Product description

LCA is made for wood-aluminium window MSE1-A with 170 mm frame depth, insulating glass 4SEL-16TGI-4-AR in inner sash and 4mm flat glass in outer sash. Dimensions of the window are 1.23x1.48 m and weight is 77.5 kg. The EPD represents the environmental impact of a window made at Eskola (Kannus) factory.

10. Technical specifications

The basic window for all properties. Lifetime is 60 years. Maintenance measures: gaskets replacement every 10 years, painting every 15 years, washing as needed.

11. Product standards

EN 13163:2015 Thermal insulation products for buildings

12. Physical properties

The inner and outer sashes are made from knot-free finger jointed pine. Outer sash is covered with painted aluminium profile. There are three frame depths: 130mm, 170mm and 210mm. LCA is made for window of 170 mm frame depth and dimensions 1.23x1.48 m. The studied product doesn't include blinds or other accessories. Inner sash has a thick insulating glass unit. The U-value of the window is 1.0 W / m² K.

13. Raw-materials of the product

Raw materials	Share
Glass	56,5%
Wooden sash	32,8%
Aluminium profile	7,3%
Paint	1,3%
Steel parts	1,1%
Plastic, PVC	0,5%
Gaskets	0,5%

14. Substances under European Chemicals Agency's REACH, SVHC restrictions

Name	EC Number	CAS Number
The product does not contain REACH SVHC substances.		

15. Functional / declared unit

1 window unit without packaging. Dimensions of the window 1,23x1,48 m, frame depth 170 mm.

16. System boundary

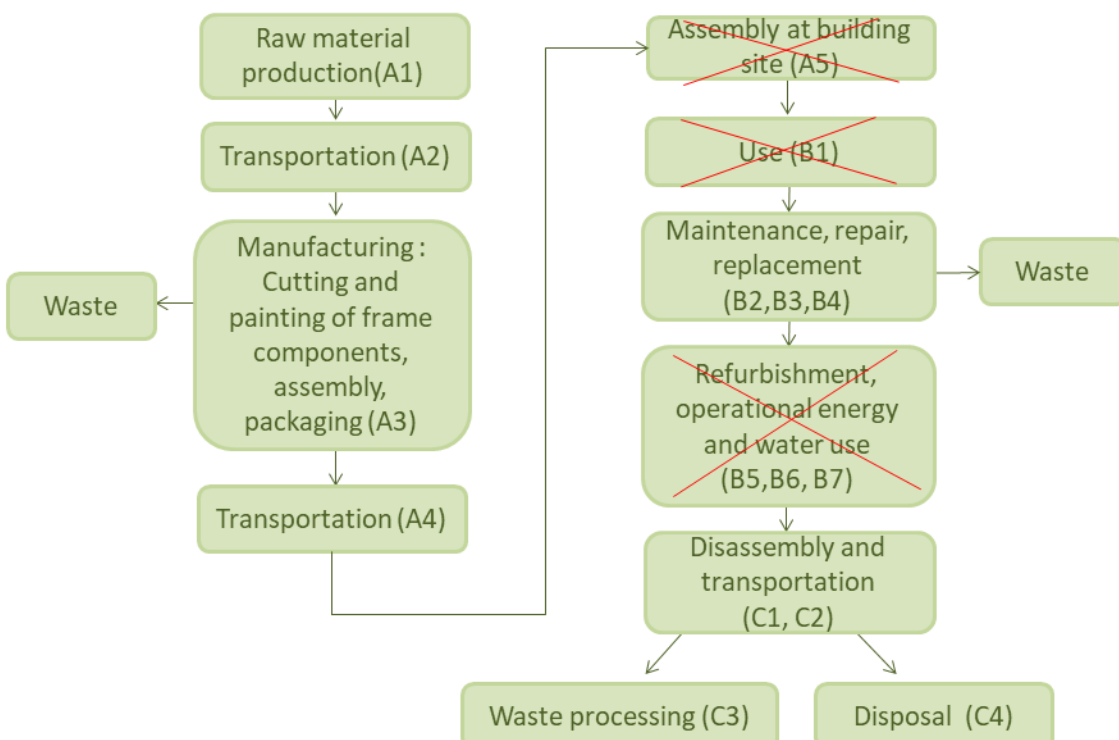
This EPD covers the following modules; A1 (Raw material supply), A2 (Transport), A3 (Manufacturing) and A4 (Transportation of the product to the building site), maintenance (B2), repair (B3), replacement of gaskets (B4) as well as C1 (Deconstruction), C2 (Transport at end-of-life), C3 (Waste processing) and C4 (Disposal). In addition, module D - benefits and loads beyond the system boundary - have been included. Only primary materials were taken into account in benefits calculations. This assessment does not exclude any modules or processes which should be part of this according to EN 15804 and RTS PCR. No hazardous materials or substances have been excluded from the assessment.

17. Cut-off criteria

All used materials, energy , packaging, transportation fuel and waste treatment until the end-of waste state have been included in the product stage (A1-A3). Results for the product stage have been provided as an aggregate. A4 transportation has been estimated to be 500 km, the return trip has not been considered. Use stage includes only modules B2, B3 and B4, that covers emissions from materials generated during maintenance, repair and replacements as well as waste disposal of replaced parts. The environmental impacts of modules C1- C4 include window demolition, transport to the treatment plant, energy consumption during the crushing and sorting stage, and emissions from final disposal. Module D contains the benefits that occur from material recycling in modules B and C.

18. Production process

The main raw materials are wood, aluminium and glass. Pre-cut glass, painted aluminium profiles and finger-jointed pine parts arrive to the manufacturing unit where further processing and assembly and packaging are taking place. Finished products are stored away from rain.



Scope of the Life-Cycle Assessment (7.2.1-2)

Mark all the covered modules of the EPD with X. Mandatory modules are marked with blue in the table below. This declaration covers “cradle-to-gate with options”. For other fields mark MND (module not declared) or MNR (module not relevant)

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	D	D
x	x	x	x	MND	MNR	x	x	x	MNR	MNR	MNR	x	x	x	x	x	x	x
Raw materials	Transport	Manufacturing	Transport	Assembly	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 the RTS PCR section 6.2.1 rules and terms
	Optional modules based on scenarios

Environmental impacts and raw-material use (7.2.3-7.2.4)

19. Environmental impacts

The results of a life cycle assessment are relative. They do not predict impact on category endpoints, exceeding of limit values, safety margins, or risks. The impacts are presented per declared unit, 1 window. Raw materials have the highest contribution to product stage emissions.

Environmental impact											
Parameter	Unit	A1-A3	A4	B2	B3	B4	C1	C2	C3	C4	D
Global warming potential	kg CO2 -eqv	1,74E+2	1,98E+0	7,14E-3	5,00E+0	1,34E+0	0E0	3,07E-1	1,43E+0	3,48E-1	-9,08E+1
Depletion of stratospheric ozone layer	kg CFC11-eqv	8,60E-6	4,47E-7	7,81E-10	4,41E-7	8,13E-11	0E0	6,94E-8	1,07E-7	8,92E-8	-5,32E-6
Formation of photochemical ozone	kg C2H4 -eqv	6,28E-2	3,22E-4	1,74E-6	3,42E-3	3,18E-4	0E0	5,01E-5	2,33E-4	1,12E-4	-4,65E-2
Acidification	kg SO2 -eqv	8,15E-1	1,02E-2	3,86E-5	6,45E-2	3,03E-3	0E0	1,58E-3	5,40E-3	2,39E-3	-5,33E-1
Eutrophication	kg PO4 3--eqv	2,55E-1	2,36E-3	1,96E-5	7,83E-3	2,69E-4	0E0	3,67E-4	1,02E-3	7,22E-4	-1,15E-1
Abiotic depletion of non fossil resources	kg Sb-eqv	5,31E-3	6,26E-6	2,52E-8	2,25E-4	2,67E-6	0E0	9,73E-7	1,37E-5	4,59E-7	-7,16E-5
Abiotic depletion of fossil resources	MJ	2,13E+3	5,33E+1	7,97E-2	7,20E+1	3,83E+1	0E0	8,28E+0	1,37E+1	8,20E+0	-1,15E+3

Scenarios and additional technical information (7.3)

23. Electricity in the manufacturing phase (A3)

A3 data quality of electricity and CO2 emission kg CO2 eq. / kWh	FI 0,23	Based on country specific fuel mixes for the production year 2017 from Statistics Finland and Finnish Energy. Imported electricity has been considered. The environmental impacts of the fuels are based on ecoinvent 3.4 database. The impacts include all upstream processes as well as transmission losses.
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24. Transport from production place to user, use phase(A4, B2-B4)

Process	Description	Value
Transportation to construction site, km (A4)	Freight, lory 40 t. load capacity 100 %	500 km
Volume weight of transported products, kg/m ³	The capacity utilization rate is 1 (capacity = 1 or <1 or ≥1 for compressed or nested products)	1
Service life /maintenance period/replacement period, years (B2-B4)	Window	60 a.
	Gasket	10 a.
	Paint	15 a.
	Window washing	0,5 a.
Use phase transportation, km (B2-B4)	Freight, lory 9 t. load capacity 100 %	20 km

25. End-of-life process description (C1-C4)

Processes	Description	Value, kg/window
Collection process specified by type	kg collected separately, 58%	45 kg
	kg collected with mixed construction waste, 42%	33 kg
Recovery system specified by type	kg for re-use	0 kg
	kg for recycling	29 kg
	kg for energy recovery	16 kg
Disposal specified by type	kg product or material for final deposition	33 kg
Assumptions for scenario development, e.g. transportation	Transportation of windows for recycling	120 km
	Transportation of windows for disposal	20km

26. Additional technical information

Wooden sashes of studied window include biogenic carbon equal to 44,29 kgCO₂-e/window. Biogenic carbon will release at the end of life of the product. The amount of biogenic carbon is calculated according to EN 16449:2014 and EN 16485:2014.

27. Product data sheet

More information on the products can be found in the product card via the following link:

https://www.pihlapro.fi/wp-content/uploads/PihlaPRO_MSE1A_tuotekortti.pdf

28. Additional information (7.4)

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

29. Bibliography

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

Principles and procedures. ISO 14040:2006 Environmental management. Life cycle assessment.

Principles and frameworks. ISO 14044:2006 Environmental management. Life cycle assessment.

Requirements and guidelines. EN 15804:2012+A1 Sustainability in construction works – Environmental product declarations – Core rules for the product category of construction products.

RTS PCR 14.6.2018 RTS PCR protocol: EPDs published by the Building Information Foundation RTS sr. PT 18 RT EPD Committee. (English version)

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

EN 16485:2014 Round and sawn timber - Environmental Product Declarations - Product category rules for wood and wood-based products for use in construction