

ENVIRONMENTAL PRODUCT DECLARATION

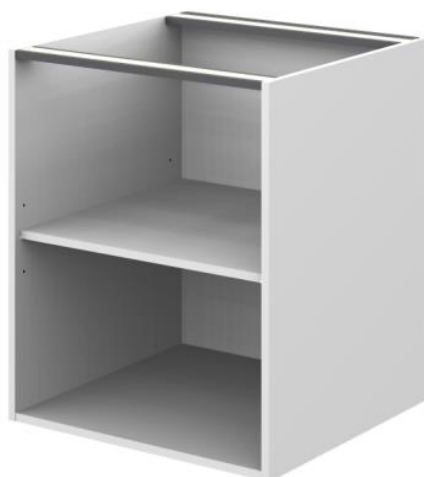
IN ACCORDANCE WITH EN 15804+A2 & ISO 14025 / ISO 21930

Owner of declaration	Puustelli Group Oy
Program operator	The Building Information Foundation RTS sr
Declaration number	RTS_261_23
Publishing date	7.11.2023
EPD valid until	7.11.2028

STANDARD KITCHEN CABINET



LCA SUPPORT



Puustelli®
MADE IN FINLAND

GENERAL INFORMATION

The EPD owner has the sole ownership, liability, and responsibility for the EPD. Construction products EPDs may not be comparable if they do not comply with EN 15804 and if they are not compared in a building context.


EPDs within the same product category but from different programmes may not be comparable.

EPD program operator

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Publishing date

7 November 2023

Valid until

7 November 2028

Product category rules

The CEN standard EN 15804 serves as the core PCR. In addition, the RTS PCR (English version, 26.8.2020) is used.

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Verification date

4 October 2023

Independent verification of this EPD and data, according to ISO 14025:2010:

☐ Internal ☒ External

Manufacturer

Puustelli Group Oy

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Our factory in Harjavalta is on the same grounds as when it was established in 1920. We use certified renewable energy, have installed solar panels and utilise our waste wood for heating. We are ISO 9001, 14001 and 45001 certified through the whole chain. We are planning to be carbon neutral by 2035 and this can be followed in the yearly third-party verified responsibility report.

Place of production

Finland

Products

Standard kitchen cabinet

Declared unit

1 unit

Mass of declared unit

18.37 kg

Data period

2022

PRODUCT INFORMATION

Product name	Standard kitchen cabinet
Place of production	Finland

PRODUCT DESCRIPTION AND APPLICATION

One unit of standard kitchen cabinet with two sides, two shelves, back panel and rails. 600mm x 570mm x 715mm. This EPD only covers the cabinet. The door is excluded.
A cabinet is one element of the kitchen. Kitchen includes several cabinets in which the doors, drawers and accessories are installed.

TECHNICAL SPECIFICATIONS AND PRODUCT STANDARDS

The cabinet is made of 16mm melamine faced chipboard with plastic edging tape and 3 mm MDF. The self supports are metal (4 pcs) and the shelf stoppers (2 pcs) are plastic. Expected life of the cabinet is 25 years. Additional technical information can be found at puustelli.com.

PRODUCT RAW MATERIAL COMPOSITION PER DECLARED UNIT

Raw material category	Amount, mass- % and material origin*
Melamine faced chipboard	88%, Europe
MDF	6%, Europe
Plywood	4%, Europe
Edge banding	2%, Europe
Other materials	<1%, Europe
Total	100%

Raw material category	Amount, mass- % and material origin*
Metals	<1%, Europe
Minerals	-
Fossil materials	2%, Europe
Bio-based materials	98%, Europe
Total	100%

* Order of magnitude, not exact composition

The products and the packaging contains biogenic carbon.

Biogenic carbon content in product	8.51 kg
Biogenic carbon content in packaging	0.003 kg

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

SUBSTANCES, REACH - VERY HIGH CONCERN

The product does not contain any REACH SVHC substances in amounts exceeding 0.1 % (1000 ppm).

PACKAGING

The product is packaged using cardboard and plastic straps. The mass of the packaging is 0.02 kg.

MANUFACTURING PROCESS

Manufacturing includes processing of wood-based boards by sawing and drilling, edge banding with low emission glue, assembling and packaging the cabinet.

Figure 1. Manufacturing process



PRODUCT LIFE-CYCLE AND LIFE-CYCLE ASSESSMENT

Period for data	2022
Declared unit	1 unit
Mass per declared unit (kg)	18.37
Mass of packaging (kg)	0.02

The study does not exclude any modules or processes which are stated mandatory in the EN 15804:2012+A2:2019 and the applied PCR. The study does not exclude hazardous materials or substances.

The study covers 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 the 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 data sources for the study are Ecoinvent 3.8 (2021) and One Click LCA databases. The tools used for the study were One Click LCA and Open LCA.

SYSTEM BOUNDARY

The scope of the EPD is cradle to gate with options (A1-A4), modules C1-C4 and module D.

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	MDN	MND	MND	MND	MND	MND	MND	MND	x	x	x	x	x	x	x
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction/ demolition	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.

Vehicle capacity utilization volume factor is assumed to be 1, which means full load. In reality, it may vary but as role of transportation emission in total results is small and so the variety in load is assumed to be negligible. Empty returns are not taken into account as it is assumed that return trip is used by transportation company to serve the needs of other clients.

Fuels used by machines, and handling of waste formed in the production processes at the manufacturing facilities are included in this stage. All fuel and energy use was allocated based on production volume. The electricity used in the plant is hydropower and solar power.

The study considers the material losses occurring during the manufacturing processes as well as losses during electricity transmission.

Electricity data source and quality	Electricity production, hydro, reservoir, non-alpine region. Source: Ecoinvent 3.8, Finland Electricity production, photovoltaic, 3kWp slanted-roof installation, multi-Si, panel, mounted. Source: Ecoinvent 3.8, Finland
Specific emissions	0.0058 kg CO ₂ e/kWh (hydropower) 0.077 kg CO ₂ e/kWh (solar energy)

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.

The transportation distance is defined according to RTS PCR - from the place of manufacture to Helsinki, Finland. According to the manufacturer, transportation doesn't cause losses as products are packaged properly. The final product is transported 220 km by lorry. Vehicle capacity utilization volume factor is assumed to be 1.

Vehicle type used for transport and distance	220 km by lorry
Specific transport emissions	0.17 kg CO ₂ e
Capacity utilisation (including empty returns)	100%
Volume capacity utilisation factor	1

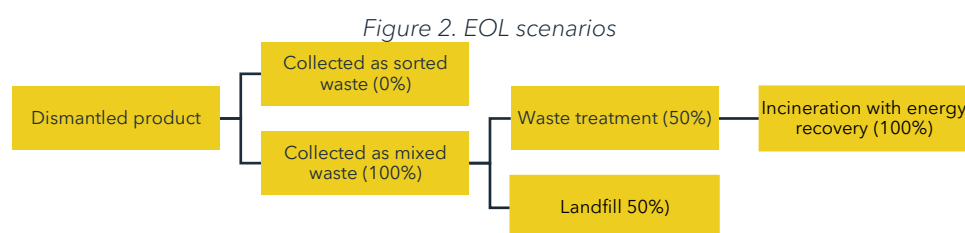
A5 has not been declared.

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)

According to the European Federation of Furniture Manufacturers, 80-90% of furniture waste is dumped in landfills or incinerated. Therefore, it was assumed in the study that 50% of the product is incinerated and 50% is landfilled. EOL and module D scenarios are applicable to Europe.



Demolition is not assumed to require any energy or resources.

The total distance to recycling facilities and landfill was assumed as 100 km, which is travelled by lorry.

50% of the product is incinerated with energy recovery. The efficiency of the process is assumed as 0.73 (Eriksson, O & Finnveden, G. 2017) and 50% is sent to landfill.

All biogenic carbon stored in the product is assumed to be released in C3 and C4.

The heat and electricity recovered from the incineration process of C3 is considered in module D.

Collection	Collected separately	0 kg
	Collected with mixed waste	18.37 kg
Recovery	Re-use	0 kg
	Recycling	0 kg
	Energy recovery	9.18 kg
Disposal	Final deposition	9.18 kg
	Scenario assumptions e.g. transportation	Dismantled product is transported 100 km by lorry

*Due to rounding, the numbers presented for each process flow may not add up precisely to the totals.

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STANDARD KITCHEN CABINET (1 cabinet, 18.37 kg)

Due to rounding, the numbers presented for Global Warming Potential and Use of Renewable and Non-renewable Primary Energy Resources may not add up precisely to the totals. The totals are, however, correct.

ENVIRONMENTAL IMPACTS - CORE INDICATORS, EN 15804+A2, PEf

Impact category	Unit	A1-A3	A4	C1	C2	C3	C4	D
Global warming potential - total	kg CO2e	-1.61E+1	6.90E-1	0.00E+0	1.68E-1	2.04E+1	1.57E+1	-6.86E+0
Global warming potential - fossil	kg CO2e	1.50E+1	6.87E-1	0.00E+0	1.67E-1	4.78E+0	1.01E-1	-6.85E+0
Global warming potential - biogenic	kg CO2e	-3.12E+1	2.30E-3	0.00E+0	5.33E-4	1.56E+1	1.56E+1	-8.79E-3
Global warming potential - LULUC	kg CO2e	5.66E-2	2.63E-4	0.00E+0	6.06E-5	1.65E-4	1.01E-4	-3.18E-3
Ozone depletion pot.	kg CFC-11e	1.58E-6	1.54E-7	0.00E+0	4.04E-8	3.21E-8	2.94E-8	-9.24E-7
Acidification potential	mol H+e	8.20E-2	2.71E-3	0.00E+0	6.98E-4	2.94E-3	8.17E-4	-1.20E-2
Eutrophication potential - freshwater	kg Pe	3.67E-4	4.85E-6	0.00E+0	1.14E-6	5.60E-6	1.47E-6	-1.44E-4
Eutrophication potential - marine	kg Ne	1.98E-2	8.08E-4	0.00E+0	2.02E-4	1.29E-3	2.76E-4	-2.43E-3
Eutrophication potential - terrestrial	mol Ne	2.30E-1	8.89E-3	0.00E+0	2.39E-3	1.29E-2	3.03E-3	-2.66E-2
Photochemical ozone formation ("smog")	kg NMVOCe	7.05E-2	2.75E-3	0.00E+0	7.53E-4	3.21E-3	8.82E-4	-8.45E-3
Abiotic depletion potential - minerals & metals	kg Sbe	1.12E-4	2.38E-6	0.00E+0	3.86E-7	1.29E-6	3.21E-7	-3.08E-6
Abiotic depletion potential - fossil resources	MJ	2.83E+2	9.98E+0	0.00E+0	2.55E+0	2.85E+0	2.20E+0	-1.20E+2
Water use	m3e depr.	1.25E+1	4.45E-2	0.00E+0	1.18E-2	6.34E-1	1.29E-2	-8.35E-1

EN 15804+A2 disclaimer for Abiotic depletion and Water use and optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.

USE OF NATURAL RESOURCES

Impact category	Unit	A1-A3	A4	C1	C2	C3	C4	D
Renewable PER as energy	MJ	1.80E+02	1.41E-01	0.00E+00	3.31E-02	1.42E+02	3.86E-02	-4.82E+00
Renewable PER as material	MJ	2.85E+02	0.00E+00	0.00E+00	0.00E+00	-1.42E+02	-1.42E+02	0.00E+00
Total use of renewable PER	MJ	4.64E+02	1.41E-01	0.00E+00	3.31E-02	9.18E-02	-1.42E+02	-4.82E+00
Non-renewable PER as energy	MJ	2.40E+02	9.98E+00	0.00E+00	2.55E+00	2.36E+01	2.20E+00	-1.20E+02
Non-renewable PER as material	MJ	4.20E+01	0.00E+00	0.00E+00	0.00E+00	-2.08E+01	-2.08E+01	0.00E+00
Total use of non-renewable PER	MJ	2.82E+02	9.98E+00	0.00E+00	2.55E+00	2.85E+00	-1.86E+01	-1.20E+02
Secondary materials	kg	4.73E+00	3.35E-03	0.00E+00	7.16E-04	3.40E-03	8.08E-04	0.00E+00
Renewable secondary fuels	MJ	2.36E+01	3.68E-05	0.00E+00	6.43E-06	6.34E-05	3.12E-05	-1.65E-05
Non-renewable secondary fuels	MJ	1.33E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of net fresh water	m3	3.08E-01	1.25E-03	0.00E+00	3.31E-04	1.10E-02	2.39E-03	-2.53E-02

PER = Primary energy resources

END OF LIFE - WASTE

Impact category	Unit	A1-A3	A4	C1	C2	C3	C4	D
Hazardous waste	kg	7.07E-01	1.13E-02	0.00E+00	2.76E-03	0.00E+00	0.00E+00	-1.13E-01
Non-hazardous waste	kg	1.35E+01	1.98E-01	0.00E+00	4.78E-02	9.18E+00	9.18E+00	-6.34E+00
Radioactive waste	kg	2.07E-03	6.87E-05	0.00E+00	1.76E-05	0.00E+00	0.00E+00	-2.48E-04

END OF LIFE - OUTPUT FLOWS

Impact category	Unit	A1-A3	A4	C1	C2	C3	C4	D
Components for re-use	kg	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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for energy rec	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.26E+02	0.00E+00	0.00E+00

ENVIRONMENTAL IMPACTS - EN 15804+A1, CML / ISO 21930

Impact category	Unit	A1-A3	A4	C1	C2	C3	C4	D
Global Warming Potential	kg CO2e	1.65E+01	6.47E-01	0.00E+00	1.65E-01	4.78E+00	9.18E-02	-6.74E+00
Ozone depletion Potential	kg CFC-11e	1.89E-06	1.21E-07	0.00E+00	3.12E-08	2.76E-08	2.30E-08	-8.08E-07
Acidification	kg SO2e	8.31E-02	2.10E-03	0.00E+00	5.33E-04	2.11E-03	6.15E-04	-9.79E-03
Eutrophication	kg PO43e	4.44E-02	4.85E-04	0.00E+00	1.21E-04	2.85E-03	2.02E-04	-5.43E-03
POCP ("smog")	kg C2H4e	7.80E-03	8.49E-05	0.00E+00	2.20E-05	6.70E-05	2.48E-05	-5.83E-04
ADP-elements	kg Sbe	1.58E-04	2.34E-06	0.00E+00	3.86E-07	9.18E-07	3.12E-07	-3.08E-06
ADP-fossil	MJ	3.18E+02	9.98E+00	0.00E+00	2.55E+00	2.85E+00	2.20E+00	-1.20E+02

KEY INFORMATION PER KG

Impact category	Unit	A1-A3	A4	C1	C2	C3	C4	D
GWP - total	kg CO2e	-8.77E-01	3.75E-02	0.00E+00	9.13E-03	1.11E+00	8.55E-01	-3.74E-01
GWP - fossil	kg CO2e	8.17E-01	3.74E-02	0.00E+00	9.10E-03	2.60E-01	5.50E-03	-3.73E-01
GWP - biogenic	kg CO2e	-1.70E+00	1.25E-04	0.00E+00	2.90E-05	8.49E-01	8.49E-01	-4.78E-04
ADP-minerals & metals	kg Sbe	6.08E-06	1.30E-07	0.00E+00	2.10E-08	7.00E-08	1.75E-08	-1.68E-07
ADP-fossil	MJ	1.54E+01	5.43E-01	0.00E+00	1.39E-01	1.55E-01	1.20E-01	-6.55E+00
Water use	m3e depr.	6.81E-01	2.42E-03	0.00E+00	6.40E-04	3.45E-02	7.00E-04	-4.55E-02
Secondary materials	kg	2.57E-01	1.83E-04	0.00E+00	3.90E-05	1.85E-04	4.40E-05	-3.63E-04
Biogenic C in product (A3)	kg C	4.63E-01	N/A	N/A	N/A	N/A	N/A	N/A
Biogenic C in packaging (A3)	kg C	1.45E-04	N/A	N/A	N/A	N/A	N/A	N/A