

ENVIRONMENTAL PRODUCT DECLARATION

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

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

WOOD FRAMED GLASS WALLS

FULL GLASS WALLS WITH WOOD PROFILE

ALUMINIUM FRAMED GLASS WALLS

FULL GLASS WALLS WITH ALUMINIUM PROFILE

SOLID ELEMENTS



HSL 
GROUP

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

The Building Information Foundation RTS sr

Manufacturer

HSL Group Oy

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<https://hslgroup.fi/>

Publishing date**Valid until****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

HSL Group has specialized in partition wall systems and we are this industry's leading companies in Finland. Our success is born out of a complete service, that starts from the building property's designing phase and continues from the property's putting in service to the transformation of the spaces throughout the whole lifecycle of the property. Which means that we work in cooperation with architects, developers, construction companies, as well as the property owner and the users of the premises.

Place of production

Myllyoja, Finland

Products

Wood framed glass walls
Full glass walls with wood profile
Aluminium framed glass walls
Full glass walls with aluminium profile
Solid elements

Declared unit

1 m²

Data period

2022

PRODUCT INFORMATION

PRODUCTS INCLUDED

- Wood framed glass walls
 - With oak, pine or birch frame
 - Glass thickness of 6.38 mm, 8.76 mm, 10.76 mm, 12.76 mm or 34 mm
- Full glass walls with wood profile
 - With oak, pine or birch profile
 - Glass thickness of 6.38 mm, 8.76 mm, 10.76 mm, 12.76 mm or 34 mm
- Aluminium framed glass walls
 - Glass thickness of 10.76 mm
- Full glass walls with aluminium profile
 - Glass thickness of 6.38 mm, 8.76 mm, 10.76 mm, 12.76 mm or 34 mm
- Solid elements
 - With particleboard or MDF

PRODUCT DESCRIPTION AND APPLICATION

Wood framed glass walls and full glass walls with wood profile

Wood framed glass wall is module structured and has two benefits: The wall is easy to install and move in case it's needed. The modules width and height can be measured according to the client's wish. The profile can be painted or, for example, coated with a veneer.



Wood framed glass walls and full glass walls with wood profile



Aluminium framed glass walls

Aluminium framed glass walls

Aluminum framed partition wall is designed and made from 34x38mm aluminum profile with elements in the shape and size of the client's specification. The dividing will also be done as needed. The elements are really easy to install and effortless to move with the change of the space needs. Sliding doors are usually installed on the aluminum walls, but also turning-, and hinge doors are possible. The aluminum profiles are available anodized to natural color or powder painted in accordance with the RAL color chart.

Full glass walls with aluminium profile

Full glass wall is a beautiful solution for many kinds of properties. Abundant glass surfaces bring spaciousness and lightness to the space. The aluminum profile surrounds the glass only from the top, down and if needed from the side. Profiles are not needed in the middle of the glasses. The type of tempered safety glass will be used according to the need as the glass on the HSL full glass walls. The visible corners of the glasses will be sanded and the seams between the glasses will either be left open or filled with silicone if needed.



Full glass walls with aluminium profile

Solid element walls

HSL solid element partition wall is module structured, which has two benefits: the wall is easy to install and in case it's needed, to move quickly and dust-free. The element's trunk is made of laminated veneer lumber, and it has mineral wool insulation inside. Building board is on both sides of the structure. The elements don't require any kind of molding.



Solid elements with particleboard



Solid elements with MDF

TECHNICAL INFORMATION

Additional technical information can be found at <https://hslgroup.fi/>.

RAW MATERIALS

Raw material category	Wood framed glass walls and full glass walls with wood profile	Aluminium framed glass walls	Full glass walls with aluminium profile	Solid elements with particleboard	Solid elements with MDF
	Amount, %	Amount, %	Amount, %	Amount, %	Amount, %
Wood-based materials	10%	0%	0%	93%	93%
Glass	89%	88%	96%	0%	0%
Aluminium	0%	12%	4%	0%	0%
Stone wool	0%	0%	0%	7%	7%
Other materials	1%	1%	1%	<1%	<1%
Total	100%	100%	100%	100%	100%

Raw material category	Wood framed glass walls and full glass walls with wood profile	Aluminium framed glass walls	Full glass walls with aluminium profile	Solid elements with particleboard	Solid elements with MDF	Origin
	Amount, %	Amount, %	Amount, %	Amount, %	Amount, %	
Metals	0%	12%	4%	0%	0%	Europe
Minerals	89%	88%	96%	7%	7%	Europe
Fossil materials	1%	1%	1%	0%	0%	Europe
Bio-based materials	10%	0%	0%	93%	93%	Europe
Total						

Biogenic carbon content

kg C per declared unit

Biogenic carbon content in product	1.64 kg (wood framed glass walls and full glass walls with wood profile) 0 kg (aluminium framed glass walls) 0 kg (full glass walls with aluminium profile) 8.61 kg (solid elements with particleboard) 8.72 kg (solid elements with MDF)
Biogenic carbon content in packaging	1.02 kg (glass walls) 0.55 (solid elements)

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 greater than 0.1 % (1000 ppm).

TITLE PAGE IMAGE

The title page image includes aluminum framed glass walls and solid elements with MDF.

PRODUCT LIFE-CYCLE AND LIFE-CYCLE ASSESSMENT

Period for data	2022
Declared unit	1 m2

The results are calculated according to the most sold variation and declared per 1 m2.

Wood framed glass walls and full glass walls with wood profile are declared as one average product. The products are within $\pm 3\%$ of the average.

The products can be produced in various sizes and with ranging glass thickness. The glass and wood/aluminium parts of wood framed glass walls, full glass walls with wood profile and full glass walls with aluminium profile are declared separately. This allows to obtain the results for other sizes and glass thicknesses.

Raw material category	Wood framed glass walls and full glass walls with wood profile	Aluminium framed glass walls	Full glass walls with aluminium profile	Solid elements with particleboard	Solid elements with MDF
	Amount, %	Amount, %	Amount, %	Amount, %	Amount, %
Reference size for DU	0.9 m x 2.09 m for wood framed glass walls 2.7 m x 2.09 m for full glass walls	0.9 m x 2.09 m	2.7 m x 2.09 m	0.6 m x 3.0 m	0.6 m x 3.0 m
Glass thickness	12.76 mm	10.76 mm	12.76 mm	N/A	N/A
Mass per DU*	31.50 kg + 3.90 kg	30.74 kg	31.50 kg + 1.37 kg	20.19 kg	21.32 kg

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 any hazardous materials or substances.

The study includes 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 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 EPDs, 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	MND	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)

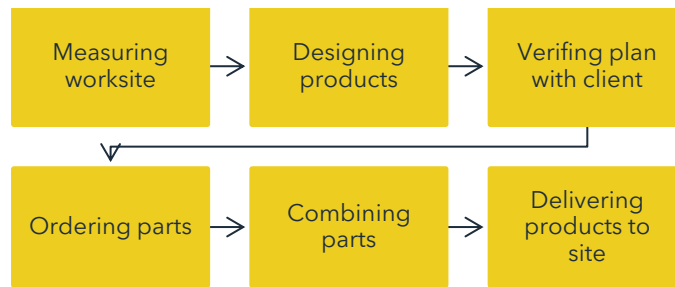
The environmental impacts considered for the product stage cover the manufacturing of raw materials used in the production as well as packaging materials and other ancillary materials.

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 Finnish grid energy. The study also considers the material losses occurring during the manufacturing processes as well as losses during electricity transmission. Co-product allocation has not been used.

The Products are packaged using plastic and placed on wooden pallets. The mass of the packaging is 2.7 kg per declared unit for glass walls and 1.5 kg per declared unit for solid elements.

Figure 1. Manufacturing process



Electricity data source and quality	Market for electricity, medium voltage (Reference product: electricity, medium voltage). Source: Ecoinvent 3.8, Finland. Unit: kWh
Electricity CO_{2e} / kWh	0.26

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 140 km by lorry. Vehicle capacity utilization volume factor is assumed to be 1.

Vehicle type used for transport and distance	140 km by lorry
Specific emission	0.17
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)

It is assumed that 100% of products are collected at demolition site.

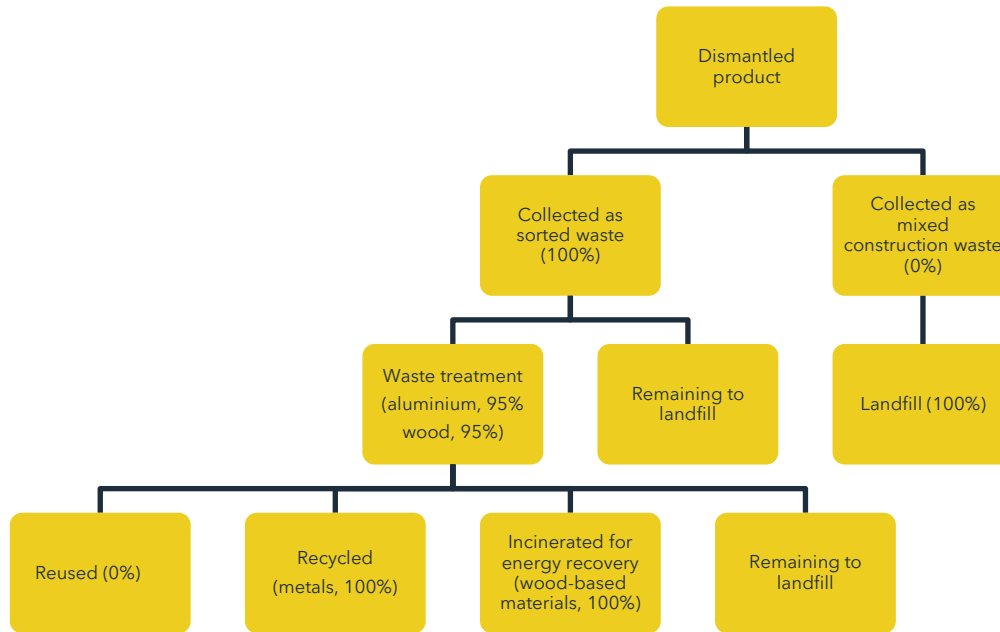
It is assumed that the dismantled product is transported 100 km by lorry (either to recycling facilities or landfill).

It is assumed that 95% of the aluminium in the product is recycled and 95% of the wood material is incinerated for energy recovery.

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

All waste that is not recycled or incinerated gets landfilled.

Figure 2. EOL scenarios



Scenario parameter		Wood framed glass walls and full glass walls with wood profile	Aluminium framed glass walls	Full glass walls with aluminium profile	Solid elements with particleboard	Solid elements with MDF
Collection	Collected separately	35.40	30.74	32.86	20.19	21.32
	Collected with mixed	0.00	0.00	0.00	0.00	0.00
Recovery	Re-use	0.00	0.00	0.00	0.00	0.00
	Recycling	0.00	3.44	1.09	0.00	0.00
	Energy recovery	3.50	0.00	0.00	17.82	18.89
Disposal	Final deposition	31.89	27.30	31.77	2.37	2.42
Scenario assumptions e.g. transportation		Average distance to recycling facility was assumed as 100 km by lorry				

Any material that left the product system in C3 has been considered in module D. Only net benefits are considered. The aluminum was considered to be virgin material in A1. The recycling efficiency is assumed as 90%. The recycled aluminum can be used to produce new aluminium products. The heat and electricity produced as benefit in C3 is considered. The efficiency rate for incineration is 73% (7% us used to produce electricity and 66% to produce heat). Waste packaging from A5 has not been considered. Module D scenario is representative of Europe.

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.
- ISO 21930:2017 Sustainability in buildings and civil engineering works – Core rules for environmental product declarations of construction products and services

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

RTS PCR in line with EN 15804+A2. Published by the Building Information Foundation RTS 26.8.2020.

Eriksson, O., Finnveden, G. (2017). Energies 2017, 10, 539; doi:10.3390/en10040539 www.mdpi.com/journal/energies Article Energy Recovery from Waste Incineration–The Importance of Technology Data and System Boundaries on CO2 Emissions. Energies 10(4)

Glass for Europe (2013). Recycling of end-of-life building glass. <https://glassforeurope.com/recycling-of-end-of-life-building-glass/>

RESULTS AND CONVERSION FACTORS

The results are declared per 1 m². The results for other sizes can be obtained by multiplying the results by the desired area.

The following table indicates the calculation principle along with GWP-fossil and GWP-biogenic results for all products.

Product	Calculation principle	GWP-fossil (kg CO ₂ e)	GWP-biogenic (kg CO ₂ e)
Wood framed glass walls and full glass walls with wood profile (glass thickness 12.76 mm)	Glass walls: glass parts + Glass walls: wood parts	39.07	-5.70
Aluminium framed glass walls (glass thickness 10.76 mm)	Aluminium framed glass walls	89.55	0.38
Full glass walls with aluminium profile (glass thickness 12.76 mm)	Glass walls: glass parts + Glass walls: aluminium parts	56.4	0.4
Solid elements with particleboard	Solid elements with particleboard	14.0	-31.5
Solid elements with MDF	Solid elements with MDF	22.1	-31.9

The results for wood framed glass walls, full glass walls with wood profile and full glass walls with aluminium profile can be obtained by adding the results of the glass parts and the results of the wood/aluminium parts. The results for the glass parts shall be multiplied by the appropriate factor for the desired thickness. The mass of the wood/aluminium parts is the same regardless of the thickness of the glass and shall not be multiplied by the factors.

Glass thickness	Conversion factor
6.38 mm	0.50
8.76 mm	0.69
10.76 mm	0.84
12.76 mm	1.00
34 mm	2.66

The following table shows GWP-fossil results for all glass thicknesses.

Product	GWP-fossil (kg Co ₂ e) per 1 m ²	GWP-fossil (kg Co ₂ e) per 1 m ²	GWP-fossil (kg Co ₂ e) per 1 m ²	GWP-fossil (kg Co ₂ e) per 1 m ²	GWP-fossil (kg Co ₂ e) per 1 m ²
	Glass thickness 6.38 mm	Glass thickness 8.76 mm	Glass thickness 10.76 mm	Glass thickness 12.76 mm	Glass thickness 34 mm
Wood framed glass walls and full glass walls with wood profile	20.2	27.2	33.2	39.1	101.9
Full glass walls with aluminium profile	37.5	44.6	50.5	56.4	119.2

GLASS WALLS: WOOD PARTS

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

Impact category	Unit	A1-A3	A4	C1	C2	C3	C4	D
Global warming potential - total	kg CO ₂ e	-4.33E+00	9.32E-02	0.00E+00	6.66E-02	5.78E+00	3.06E-01	-1.57E+00
Global warming potential - fossil	kg CO ₂ e	1.36E+00	9.29E-02	0.00E+00	6.63E-02	5.25E-02	4.38E-03	-1.57E+00
Global warming potential - biogenic	kg CO ₂ e	-6.02E+00	3.11E-04	0.00E+00	2.22E-04	5.73E+00	3.01E-01	-6.38E-04
Global warming potential - LULUC	kg CO ₂ e	3.38E-01	3.55E-05	0.00E+00	2.54E-05	1.75E-05	4.38E-06	-1.57E-04
Ozone depletion pot.	kg CFC ₁₁ e	1.92E-07	2.08E-08	0.00E+00	1.48E-08	3.85E-09	1.28E-09	-1.50E-07
Acidification potential	mol H ⁺ e	1.75E-02	3.66E-04	0.00E+00	2.61E-04	5.61E-04	3.55E-05	-2.58E-03
Eutrophication potential - freshwater	kg Pe	1.39E-04	6.55E-07	0.00E+00	4.68E-07	7.36E-07	6.38E-08	-2.58E-06
Eutrophication potential - marine	kg Ne	3.12E-03	1.09E-04	0.00E+00	7.80E-05	2.73E-04	1.20E-05	-5.48E-04
Eutrophication potential - terrestrial	mol Ne	2.50E-02	1.20E-03	0.00E+00	8.58E-04	2.91E-03	1.31E-04	-6.00E-03
Photochemical ozone formation ("smog")	kg NMVOCe	9.59E-03	3.71E-04	0.00E+00	2.65E-04	7.01E-04	3.83E-05	-2.09E-03
Abiotic depletion potential - minerals & metals	kg Sbe	1.21E-05	3.22E-07	0.00E+00	2.30E-07	1.47E-07	1.39E-08	-7.46E-07
Abiotic depletion potential - fossil resources	MJ	2.08E+01	1.35E+00	0.00E+00	9.64E-01	4.55E-01	9.56E-02	-2.47E+01
Water use	m ³ e depr.	1.10E+00	6.01E-03	0.00E+00	4.29E-03	2.35E-01	5.58E-04	-1.29E-01

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	7.09E+01	1.91E-02	0.00E+00	1.37E-02	5.08E+01	1.67E-03	-4.88E-02
Renewable PER as material	MJ	5.35E+01	0.00E+00	0.00E+00	0.00E+00	-5.08E+01	-2.67E+00	0.00E+00
Total use of renewable PER	MJ	1.24E+02	1.91E-02	0.00E+00	1.37E-02	3.15E-02	-2.67E+00	-4.88E-02
Non-renewable PER as energy	MJ	1.98E+01	1.35E+00	0.00E+00	9.64E-01	1.39E+00	9.56E-02	-2.47E+01
Non-renewable PER as material	MJ	9.89E-01	0.00E+00	0.00E+00	0.00E+00	-9.39E-01	-4.94E-02	0.00E+00
Total use of non-renewable PER	MJ	2.08E+01	1.35E+00	0.00E+00	9.64E-01	4.55E-01	4.62E-02	-2.47E+01
Secondary materials	kg	2.05E-02	4.53E-04	0.00E+00	3.24E-04	1.09E-03	3.51E-05	-2.30E-03
Renewable secondary fuels	MJ	5.86E-04	4.97E-06	0.00E+00	3.55E-06	2.59E-06	1.35E-06	-3.17E-06
Non-renewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of net fresh water	m ³	2.66E-02	1.69E-04	0.00E+00	1.21E-04	-7.36E-04	1.04E-04	-2.97E-03

PER = Primary energy resources

END OF LIFE - WASTE

Impact category	Unit	A1-A3	A4	C1	C2	C3	C4	D
Hazardous waste	kg	1.92E-01	1.53E-03	0.00E+00	1.09E-03	0.00E+00	0.00E+00	-1.12E-02
Non-hazardous waste	kg	4.52E+00	2.68E-02	0.00E+00	1.91E-02	3.50E+00	3.98E-01	-1.01E-01
Radioactive waste	kg	9.52E-05	9.29E-06	0.00E+00	6.63E-06	0.00E+00	0.00E+00	-3.28E-06

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	7.56E+01	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 CO ₂ e	1.65E+00	8.74E-02	0.00E+00	6.24E-02	5.25E-02	3.98E-03	-1.50E+00
Ozone depletion Potential	kg CFC ₁₁ e	1.68E-07	1.64E-08	0.00E+00	1.17E-08	3.22E-09	9.96E-10	-1.22E-07
Acidification	kg SO ₂ e	1.48E-02	2.84E-04	0.00E+00	2.03E-04	4.20E-04	2.67E-05	-2.09E-03
Eutrophication	kg PO ₄ ³ e	5.20E-03	6.55E-05	0.00E+00	4.68E-05	4.55E-04	8.77E-06	-3.07E-04
POCP ("smog")	kg C ₂ H ₄ e	1.27E-03	1.15E-05	0.00E+00	8.19E-06	1.33E-05	1.08E-06	-1.81E-04
ADP-elements	kg Sbe	1.16E-05	3.17E-07	0.00E+00	2.26E-07	1.30E-07	1.35E-08	-7.09E-07
ADP-fossil	MJ	2.07E+01	1.35E+00	0.00E+00	9.64E-01	4.55E-01	9.56E-02	-2.47E+01

KEY INFORMATION PER KG OF PRODUCT

Impact category	Unit	A1-A3	A4	C1	C2	C3	C4	D
GWP - total	kg CO ₂ e	-1.11E+00	2.39E-02	0.00E+00	1.71E-02	1.48E+00	7.84E-02	-4.03E-01
GWP - fossil	kg CO ₂ e	3.47E-01	2.38E-02	0.00E+00	1.70E-02	1.35E-02	1.12E-03	-4.02E-01
GWP - biogenic	kg CO ₂ e	-1.54E+00	7.98E-05	0.00E+00	5.70E-05	1.47E+00	7.72E-02	-1.64E-04
ADP-minerals & metals	kg Sbe	3.10E-06	8.26E-08	0.00E+00	5.90E-08	3.77E-08	3.57E-09	-1.91E-07
ADP-fossil	MJ	5.32E+00	3.46E-01	0.00E+00	2.47E-01	1.17E-01	2.45E-02	-6.33E+00
Water use	m ³ e depr.	2.82E-01	1.54E-03	0.00E+00	1.10E-03	6.02E-02	1.43E-04	-3.31E-02
Secondary materials	kg	5.27E-03	1.16E-04	0.00E+00	8.30E-05	2.78E-04	8.99E-06	-5.90E-04
Biogenic C in product (A3)	kg C	4.21E-01	N/A	N/A	N/A	N/A	N/A	N/A
Biogenic C in packaging (A3)	kg C	0.00E+00	N/A	N/A	N/A	N/A	N/A	N/A

GLASS WALLS: GLASS PARTS

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

Impact category	Unit	A1-A3	A4	C1	C2	C3	C4	D
Global warming potential - total	kg CO ₂ e	3.81E+1	8.17E-1	0.00E+0	5.37E-1	0.00E+0	3.48E-1	0.00E+0
Global warming potential - fossil	kg CO ₂ e	3.77E+1	8.14E-1	0.00E+0	5.35E-1	0.00E+0	3.46E-1	0.00E+0
Global warming potential - biogenic	kg CO ₂ e	3.28E-1	2.73E-3	0.00E+0	1.80E-3	0.00E+0	1.29E-3	0.00E+0
Global warming potential - LULUC	kg CO ₂ e	2.99E-2	3.11E-4	0.00E+0	2.05E-4	0.00E+0	3.46E-4	0.00E+0
Ozone depletion pot.	kg CFC ₁₁ e	4.40E-6	1.82E-7	0.00E+0	1.20E-7	0.00E+0	1.01E-7	0.00E+0
Acidification potential	mol H ⁺ e	3.67E-1	3.21E-3	0.00E+0	2.11E-3	0.00E+0	2.80E-3	0.00E+0
Eutrophication potential - freshwater	kg Pe	6.72E-4	5.74E-6	0.00E+0	3.78E-6	0.00E+0	5.04E-6	0.00E+0
Eutrophication potential - marine	kg Ne	6.05E-2	9.57E-4	0.00E+0	6.30E-4	0.00E+0	9.45E-4	0.00E+0
Eutrophication potential - terrestrial	mol Ne	7.51E-1	1.05E-2	0.00E+0	6.93E-3	0.00E+0	1.04E-2	0.00E+0
Photochemical ozone formation ("smog")	kg NMVOCe	1.84E-1	3.26E-3	0.00E+0	2.14E-3	0.00E+0	3.02E-3	0.00E+0
Abiotic depletion potential - minerals & metals	kg Sbe	3.65E-4	2.82E-6	0.00E+0	1.86E-6	0.00E+0	1.10E-6	0.00E+0
Abiotic depletion potential - fossil resources	MJ	4.51E+2	1.18E+1	0.00E+0	7.78E+0	0.00E+0	7.56E+0	0.00E+0
Water use	m ³ e depr.	9.63E+0	5.27E-2	0.00E+0	3.46E-2	0.00E+0	4.41E-2	0.00E+0

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	4.51E+01	1.68E-01	0.00E+00	1.10E-01	0.00E+00	1.32E-01	0.00E+00
Renewable PER as material	MJ	3.27E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of renewable PER	MJ	7.78E+01	1.68E-01	0.00E+00	1.10E-01	0.00E+00	1.32E-01	0.00E+00
Non-renewable PER as energy	MJ	4.45E+02	1.18E+01	0.00E+00	7.78E+00	0.00E+00	7.56E+00	0.00E+00
Non-renewable PER as material	MJ	6.41E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of non-renewable PER	MJ	4.51E+02	1.18E+01	0.00E+00	7.78E+00	0.00E+00	7.56E+00	0.00E+00
Secondary materials	kg	1.88E-01	3.97E-03	0.00E+00	2.61E-03	0.00E+00	2.77E-03	0.00E+00
Renewable secondary fuels	MJ	1.13E+00	4.36E-05	0.00E+00	2.87E-05	0.00E+00	1.07E-04	0.00E+00
Non-renewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of net fresh water	m ³	2.48E-01	1.48E-03	0.00E+00	9.76E-04	0.00E+00	8.19E-03	0.00E+00

PER = Primary energy resources

END OF LIFE - WASTE

Impact category	Unit	A1-A3	A4	C1	C2	C3	C4	D
Hazardous waste	kg	7.10E-01	1.34E-02	0.00E+00	8.82E-03	0.00E+00	0.00E+00	0.00E+00
Non-hazardous waste	kg	2.16E+01	2.35E-01	0.00E+00	1.54E-01	0.00E+00	3.15E+01	0.00E+00
Radioactive waste	kg	1.64E-03	8.14E-05	0.00E+00	5.35E-05	0.00E+00	0.00E+00	0.00E+00

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	0.00E+00	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 CO ₂ e	3.77E+01	7.66E-01	0.00E+00	5.04E-01	0.00E+00	3.15E-01	0.00E+00
Ozone depletion Potential	kg CFC ₁₁ e	3.64E-06	1.44E-07	0.00E+00	9.45E-08	0.00E+00	7.87E-08	0.00E+00
Acidification	kg SO ₂ e	3.11E-01	2.49E-03	0.00E+00	1.64E-03	0.00E+00	2.11E-03	0.00E+00
Eutrophication	kg PO ₄ ³ e	4.24E-02	5.74E-04	0.00E+00	3.78E-04	0.00E+00	6.93E-04	0.00E+00
POCP ("smog")	kg C ₂ H ₄ e	1.07E-02	1.01E-04	0.00E+00	6.61E-05	0.00E+00	8.50E-05	0.00E+00
ADP-elements	kg Sbe	3.02E-04	2.78E-06	0.00E+00	1.83E-06	0.00E+00	1.07E-06	0.00E+00
ADP-fossil	MJ	4.50E+02	1.18E+01	0.00E+00	7.78E+00	0.00E+00	7.56E+00	0.00E+00

KEY INFORMATION PER KG

Impact category	Unit	A1-A3	A4	C1	C2	C3	C4	D
GWP - total	kg CO ₂ e	1.21E+00	2.59E-02	0.00E+00	1.71E-02	0.00E+00	1.11E-02	0.00E+00
GWP - fossil	kg CO ₂ e	1.20E+00	2.58E-02	0.00E+00	1.70E-02	0.00E+00	1.10E-02	0.00E+00
GWP - biogenic	kg CO ₂ e	1.04E-02	8.66E-05	0.00E+00	5.70E-05	0.00E+00	4.10E-05	0.00E+00
ADP-minerals & metals	kg Sbe	1.16E-05	8.97E-08	0.00E+00	5.90E-08	0.00E+00	3.50E-08	0.00E+00
ADP-fossil	MJ	1.43E+01	3.75E-01	0.00E+00	2.47E-01	0.00E+00	2.40E-01	0.00E+00
Water use	m ³ e depr.	3.06E-01	1.67E-03	0.00E+00	1.10E-03	0.00E+00	1.40E-03	0.00E+00
Secondary materials	kg	5.97E-03	1.26E-04	0.00E+00	8.30E-05	0.00E+00	8.80E-05	0.00E+00
Biogenic C in product (A3)	kg C	0.00E+00	N/A	N/A	N/A	N/A	N/A	N/A
Biogenic C in packaging (A3)	kg C	3.23E-02	N/A	N/A	N/A	N/A	N/A	N/A

GLASS WALLS: ALUMINIUM PARTS

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

Impact category	Unit	A1-A3	A4	C1	C2	C3	C4	D
Global warming potential - total	kg CO ₂ e	1.91E+01	3.26E-02	0.00E+00	2.33E-02	2.19E-01	2.99E-03	-1.33E+01
Global warming potential - fossil	kg CO ₂ e	1.87E+01	3.25E-02	0.00E+00	2.32E-02	2.19E-01	2.99E-03	-1.33E+01
Global warming potential - biogenic	kg CO ₂ e	3.14E-02	1.09E-04	0.00E+00	7.79E-05	1.31E-03	1.11E-05	-1.64E-02
Global warming potential - LULUC	kg CO ₂ e	3.81E-01	1.24E-05	0.00E+00	8.88E-06	1.20E-04	2.99E-06	-3.88E-02
Ozone depletion pot.	kg CFC ₁₁ e	7.33E-07	7.27E-09	0.00E+00	5.19E-09	9.41E-09	8.69E-10	-4.33E-07
Acidification potential	mol H ⁺ e	1.34E-01	1.28E-04	0.00E+00	9.15E-05	8.21E-04	2.42E-05	-8.24E-02
Eutrophication potential - freshwater	kg Pe	6.30E-04	2.29E-07	0.00E+00	1.64E-07	5.25E-06	4.35E-08	-3.83E-04
Eutrophication potential - marine	kg Ne	1.96E-02	3.82E-05	0.00E+00	2.73E-05	8.86E-05	8.15E-06	-1.31E-02
Eutrophication potential - terrestrial	mol Ne	2.14E-01	4.21E-04	0.00E+00	3.01E-04	1.07E-03	8.97E-05	-1.48E-01
Photochemical ozone formation ("smog")	kg NMVOCe	6.24E-02	1.30E-04	0.00E+00	9.29E-05	3.17E-04	2.61E-05	-4.25E-02
Abiotic depletion potential - minerals & metals	kg Sbe	1.02E-04	1.13E-07	0.00E+00	8.06E-08	1.07E-05	9.51E-09	1.37E-04
Abiotic depletion potential - fossil resources	MJ	1.78E+02	4.72E-01	0.00E+00	3.37E-01	1.41E+00	6.52E-02	-1.20E+02
Water use	m ³ e depr.	5.30E+00	2.10E-03	0.00E+00	1.50E-03	3.50E-02	3.80E-04	-3.21E+00

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	2.09E+01	6.69E-03	0.00E+00	4.78E-03	2.08E-01	1.14E-03	-1.25E+01
Renewable PER as material	MJ	1.21E+00	0.00E+00	0.00E+00	0.00E+00	-1.15E+00	-6.05E-02	0.00E+00
Total use of renewable PER	MJ	2.21E+01	6.69E-03	0.00E+00	4.78E-03	-9.42E-01	-5.94E-02	-1.25E+01
Non-renewable PER as energy	MJ	1.77E+02	4.72E-01	0.00E+00	3.37E-01	1.40E+00	6.52E-02	-1.20E+02
Non-renewable PER as material	MJ	9.89E-01	0.00E+00	0.00E+00	0.00E+00	-9.39E-01	-4.94E-02	0.00E+00
Total use of non-renewable PER	MJ	1.78E+02	4.72E-01	0.00E+00	3.37E-01	4.62E-01	1.58E-02	-1.20E+02
Secondary materials	kg	1.10E-01	1.59E-04	0.00E+00	1.13E-04	9.19E-04	2.39E-05	1.03E+00
Renewable secondary fuels	MJ	5.46E-04	1.74E-06	0.00E+00	1.24E-06	3.39E-05	9.24E-07	-1.99E-04
Non-renewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of net fresh water	m ³	1.25E-01	5.93E-05	0.00E+00	4.23E-05	1.01E-03	7.06E-05	-6.24E-02

PER = Primary energy resources

END OF LIFE - WASTE

Impact category	Unit	A1-A3	A4	C1	C2	C3	C4	D
Hazardous waste	kg	3.80E+00	5.35E-04	0.00E+00	3.82E-04	2.19E-02	0.00E+00	-2.74E+00
Non-hazardous waste	kg	2.75E+01	9.37E-03	0.00E+00	6.69E-03	5.03E-01	2.72E-01	-1.53E+01
Radioactive waste	kg	2.92E-04	3.25E-06	0.00E+00	2.32E-06	5.69E-06	0.00E+00	-1.71E-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	1.09E+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	0.00E+00	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 CO ₂ e	1.83E+01	3.06E-02	0.00E+00	2.19E-02	2.19E-01	2.72E-03	-1.28E+01
Ozone depletion Potential	kg CFC ₁₁ e	6.37E-07	5.74E-09	0.00E+00	4.10E-09	8.10E-09	6.79E-10	-3.70E-07
Acidification	kg SO ₂ e	1.13E-01	9.94E-05	0.00E+00	7.10E-05	7.00E-04	1.82E-05	-6.89E-02
Eutrophication	kg PO ₄ ³ e	2.93E-02	2.29E-05	0.00E+00	1.64E-05	2.74E-04	5.98E-06	-1.70E-02
POCP ("smog")	kg C ₂ H ₄ e	6.91E-03	4.02E-06	0.00E+00	2.87E-06	3.28E-05	7.34E-07	-4.35E-03
ADP-elements	kg Sbe	9.90E-05	1.11E-07	0.00E+00	7.92E-08	1.07E-05	9.24E-09	1.39E-04
ADP-fossil	MJ	1.78E+02	4.72E-01	0.00E+00	3.37E-01	1.40E+00	6.52E-02	-1.20E+02

KEY INFORMATION PER KG OF PRODUCT

Impact category	Unit	A1-A3	A4	C1	C2	C3	C4	D
GWP - total	kg CO ₂ e	1.40E+01	2.39E-02	0.00E+00	1.71E-02	1.60E-01	2.19E-03	-9.75E+00
GWP - fossil	kg CO ₂ e	1.37E+01	2.38E-02	0.00E+00	1.70E-02	1.60E-01	2.19E-03	-9.70E+00
GWP - biogenic	kg CO ₂ e	2.30E-02	7.98E-05	0.00E+00	5.70E-05	9.61E-04	8.15E-06	-1.20E-02
ADP-minerals & metals	kg Sbe	7.47E-05	8.26E-08	0.00E+00	5.90E-08	7.85E-06	6.96E-09	1.00E-04
ADP-fossil	MJ	1.30E+02	3.46E-01	0.00E+00	2.47E-01	1.03E+00	4.77E-02	-8.81E+01
Water use	m ³ e depr.	3.88E+00	1.54E-03	0.00E+00	1.10E-03	2.56E-02	2.78E-04	-2.35E+00
Secondary materials	kg	8.09E-02	1.16E-04	0.00E+00	8.30E-05	6.73E-04	1.75E-05	7.52E-01
Biogenic C in product (A3)	kg C	0.00E+00	N/A	N/A	N/A	N/A	N/A	N/A
Biogenic C in packaging (A3)	kg C	0.00E+00	N/A	N/A	N/A	N/A	N/A	N/A

ALUMINIUM FRAMED GLASS WALLS

CORE ENVIRONMENTAL IMPACT INDICATORS - EN 15804+A2, PEF

Impact category	Unit	A1-A3	A4	C1	C2	C3	C4	D
GWP - total	kg CO ₂ e	9.04E+01	7.99E-01	0.00E+00	5.25E-01	6.93E-01	3.02E-01	-4.17E+01
GWP - fossil	kg CO ₂ e	8.96E+01	7.96E-01	0.00E+00	5.23E-01	6.89E-01	3.00E-01	-4.16E+01
GWP - biogenic	kg CO ₂ e	3.75E-01	2.67E-03	0.00E+00	1.75E-03	4.13E-03	1.12E-03	-5.17E-02
GWP - LULUC	kg CO ₂ e	5.18E-01	3.04E-04	0.00E+00	2.00E-04	3.79E-04	3.00E-04	-1.22E-01
Ozone depletion pot.	kg CFC ₁₁ e	5.87E-06	1.78E-07	0.00E+00	1.17E-07	2.96E-08	8.73E-08	-1.35E-06
Acidification potential	mol H ⁺ e	7.07E-01	3.14E-03	0.00E+00	2.06E-03	2.58E-03	2.43E-03	-2.59E-01
EP-freshwater	kg Pe	2.42E-03	5.62E-06	0.00E+00	3.69E-06	1.65E-05	4.37E-06	-1.21E-03
EP-marine	kg Ne	1.10E-01	9.36E-04	0.00E+00	6.15E-04	2.79E-04	8.19E-04	-4.11E-02
EP-terrestrial	mol Ne	1.30E+00	1.03E-02	0.00E+00	6.76E-03	3.37E-03	9.01E-03	-4.66E-01
POCP ("smog")	kg NMVOCe	3.48E-01	3.18E-03	0.00E+00	2.09E-03	9.99E-04	2.62E-03	-1.34E-01
ADP-minerals & metals	kg Sbe	6.13E-04	2.76E-06	0.00E+00	1.81E-06	3.37E-05	9.55E-07	4.31E-04
ADP-fossil resources	MJ	9.25E+02	1.16E+01	0.00E+00	7.59E+00	4.44E+00	6.55E+00	-3.77E+02
Water use	m ³ e depr.	2.32E+01	5.15E-02	0.00E+00	3.38E-02	1.10E-01	3.82E-02	-1.01E+01

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	1.01E+02	1.64E-01	0.00E+00	1.08E-01	1.80E+00	1.15E-01	-3.92E+01
Renewable PER as material	MJ	3.39E+01	0.00E+00	0.00E+00	0.00E+00	-1.15E+00	-6.05E-02	0.00E+00
Total use of renewable PER	MJ	1.35E+02	1.64E-01	0.00E+00	1.08E-01	6.54E-01	5.41E-02	-3.92E+01
Non-renewable PER as energy	MJ	9.18E+02	1.16E+01	0.00E+00	7.59E+00	5.35E+00	6.55E+00	-3.77E+02
Non-renewable PER as material	MJ	7.39E+00	0.00E+00	0.00E+00	0.00E+00	-9.39E-01	-4.94E-02	0.00E+00
Total use of non-renewable PER	MJ	9.25E+02	1.16E+01	0.00E+00	7.59E+00	4.41E+00	6.50E+00	-3.77E+02
Secondary materials	kg	4.96E-01	3.89E-03	0.00E+00	2.55E-03	2.89E-03	2.40E-03	3.23E+00
Renewable secondary fuels	MJ	1.13E+00	4.26E-05	0.00E+00	2.80E-05	1.07E-04	9.28E-05	-6.27E-04
Non-renewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of net fresh water	m ³	5.65E-01	1.45E-03	0.00E+00	9.53E-04	3.17E-03	7.10E-03	-1.96E-01

PER = Primary energy resources

END OF LIFE - WASTE

Impact category	Unit	A1-A3	A4	C1	C2	C3	C4	D
Hazardous waste	kg	1.22E+01	1.31E-02	0.00E+00	8.61E-03	6.89E-02	0.00E+00	-8.63E+00
Non-hazardous waste	kg	9.76E+01	2.29E-01	0.00E+00	1.51E-01	1.58E+00	2.73E+01	-4.81E+01
Radioactive waste	kg	2.28E-03	7.96E-05	0.00E+00	5.23E-05	1.79E-05	0.00E+00	-5.37E-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	3.44E+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	0.00E+00	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 Pot.	kg CO ₂ e	8.78E+01	7.49E-01	0.00E+00	4.92E-01	6.89E-01	2.73E-01	-4.01E+01
Ozone depletion Pot.	kg CFC ₁₁ e	4.93E-06	1.40E-07	0.00E+00	9.22E-08	2.55E-08	6.82E-08	-1.16E-06
Acidification	kg SO ₂ e	5.97E-01	2.43E-03	0.00E+00	1.60E-03	2.20E-03	1.83E-03	-2.17E-01
Eutrophication	kg PO ₄ ³ e	1.21E-01	5.62E-04	0.00E+00	3.69E-04	8.61E-04	6.00E-04	-5.34E-02
POCP ("smog")	kg C ₂ H ₄ e	2.93E-02	9.83E-05	0.00E+00	6.46E-05	1.03E-04	7.37E-05	-1.37E-02
ADP-elements	kg Sbe	5.51E-04	2.72E-06	0.00E+00	1.78E-06	3.37E-05	9.28E-07	4.37E-04
ADP-fossil	MJ	9.24E+02	1.16E+01	0.00E+00	7.59E+00	4.41E+00	6.55E+00	-3.77E+02

KEY INFORMATION PER KG OF PRODUCT

Impact category	Unit	A1-A3	A4	C1	C2	C3	C4	D
GWP - total	kg CO ₂ e	2.94E+00	2.60E-02	0.00E+00	1.71E-02	2.26E-02	9.81E-03	-1.36E+00
ADP-minerals & metals	kg Sbe	1.99E-05	8.99E-08	0.00E+00	5.90E-08	1.10E-06	3.11E-08	1.40E-05
ADP-fossil	MJ	3.01E+01	3.76E-01	0.00E+00	2.47E-01	1.45E-01	2.13E-01	-1.23E+01
Water use	m ³ e depr.	7.56E-01	1.68E-03	0.00E+00	1.10E-03	3.58E-03	1.24E-03	-3.29E-01
Secondary materials	kg	1.61E-02	1.26E-04	0.00E+00	8.30E-05	9.41E-05	7.81E-05	1.05E-01
Biogenic C in product (A3)	kg C	0.00E+00	N/A	N/A	N/A	N/A	N/A	N/A
Biogenic C in packaging (A3)	kg C	0.00E+00	N/A	N/A	N/A	N/A	N/A	N/A

SOLID ELEMENTS WITH PARTICLEBOARD

CORE ENVIRONMENTAL IMPACT INDICATORS - EN 15804+A2, PEF

Impact category	Unit	A1-A3	A4	C1	C2	C3	C4	D
GWP - total	kg CO ₂ e	-1.74E+01	5.18E-01	0.00E+00	3.45E-01	3.02E+01	1.60E+00	-8.60E+00
GWP - fossil	kg CO ₂ e	1.40E+01	5.16E-01	0.00E+00	3.43E-01	2.67E-01	2.60E-02	-8.60E+00
GWP - biogenic	kg CO ₂ e	-3.15E+01	1.73E-03	0.00E+00	1.15E-03	3.00E+01	1.58E+00	-3.49E-03
GWP - LULUC	kg CO ₂ e	3.21E-02	1.97E-04	0.00E+00	1.31E-04	8.91E-05	2.60E-05	-8.60E-04
Ozone depletion pot.	kg CFC ₁₁ e	1.87E-06	1.15E-07	0.00E+00	7.67E-08	1.96E-08	7.58E-09	-8.21E-07
Acidification potential	mol H ⁺ e	1.01E-01	2.03E-03	0.00E+00	1.35E-03	2.85E-03	2.11E-04	-1.41E-02
EP-freshwater	kg Pe	6.47E-04	3.64E-06	0.00E+00	2.42E-06	3.74E-06	3.79E-07	-1.41E-05
EP-marine	kg Ne	2.79E-02	6.07E-04	0.00E+00	4.04E-04	1.39E-03	7.10E-05	-3.00E-03
EP-terrestrial	mol Ne	3.26E-01	6.68E-03	0.00E+00	4.44E-03	1.48E-02	7.81E-04	-3.29E-02
POCP ("smog")	kg NMVOCe	9.64E-02	2.06E-03	0.00E+00	1.37E-03	3.56E-03	2.27E-04	-1.15E-02
ADP-minerals & metals	kg Sbe	1.29E-04	1.79E-06	0.00E+00	1.19E-06	7.49E-07	8.29E-08	-4.09E-06
ADP-fossil resources	MJ	2.77E+02	7.50E+00	0.00E+00	4.99E+00	2.32E+00	5.68E-01	-1.35E+02
Water use	m ³ e depr.	1.76E+01	3.34E-02	0.00E+00	2.22E-02	1.19E+00	3.31E-03	-7.07E-01

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	2.71E+02	1.06E-01	0.00E+00	7.07E-02	2.47E+02	9.94E-03	-2.67E-01
Renewable PER as material	MJ	2.76E+02	0.00E+00	0.00E+00	0.00E+00	-2.47E+02	-1.30E+01	0.00E+00
Total use of renewable PER	MJ	5.47E+02	1.06E-01	0.00E+00	7.07E-02	1.60E-01	-1.30E+01	-2.67E-01
Non-renewable PER as energy	MJ	2.56E+02	7.50E+00	0.00E+00	4.99E+00	3.89E+01	5.68E-01	-1.35E+02
Non-renewable PER as material	MJ	4.14E+01	0.00E+00	0.00E+00	0.00E+00	-3.66E+01	-1.93E+00	0.00E+00
Total use of non-renewable PER	MJ	2.98E+02	7.50E+00	0.00E+00	4.99E+00	2.32E+00	-1.36E+00	-1.35E+02
Secondary materials	kg	2.75E+00	2.52E-03	0.00E+00	1.68E-03	5.53E-03	2.08E-04	-1.26E-02
Renewable secondary fuels	MJ	2.24E+01	2.76E-05	0.00E+00	1.84E-05	1.32E-05	8.05E-06	-1.74E-05
Non-renewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of net fresh water	m ³	4.52E-01	9.41E-04	0.00E+00	6.26E-04	-3.74E-03	6.16E-04	-1.62E-02

PER = Primary energy resources

END OF LIFE - WASTE

Impact category	Unit	A1-A3	A4	C1	C2	C3	C4	D
Hazardous waste	kg	8.35E-01	8.50E-03	0.00E+00	5.65E-03	0.00E+00	0.00E+00	-6.11E-02
Non-hazardous waste	kg	2.62E+01	1.49E-01	0.00E+00	9.89E-02	1.78E+01	2.37E+00	-5.54E-01
Radioactive waste	kg	1.16E-03	5.16E-05	0.00E+00	3.43E-05	0.00E+00	0.00E+00	-1.80E-05

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	4.14E+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 Pot.	kg CO ₂ e	1.45E+01	4.86E-01	0.00E+00	3.23E-01	2.67E-01	2.37E-02	-8.21E+00
Ozone depletion Pot.	kg CFC ₁₁ e	1.68E-06	9.11E-08	0.00E+00	6.06E-08	1.64E-08	5.92E-09	-6.68E-07
Acidification	kg SO ₂ e	8.42E-02	1.58E-03	0.00E+00	1.05E-03	2.14E-03	1.59E-04	-1.15E-02
Eutrophication	kg PO ₄ ³ e	4.23E-02	3.64E-04	0.00E+00	2.42E-04	2.32E-03	5.21E-05	-1.68E-03
POCP ("smog")	kg C ₂ H ₄ e	8.32E-03	6.38E-05	0.00E+00	4.24E-05	6.77E-05	6.39E-06	-9.93E-04
ADP-elements	kg Sbe	1.46E-04	1.76E-06	0.00E+00	1.17E-06	6.59E-07	8.05E-08	-3.88E-06
ADP-fossil	MJ	2.91E+02	7.50E+00	0.00E+00	4.99E+00	2.32E+00	5.68E-01	-1.35E+02

KEY INFORMATION PER KG OF PRODUCT

Impact category	Unit	A1-A3	A4	C1	C2	C3	C4	D
GWP - total	kg CO ₂ e	-8.63E-01	2.57E-02	0.00E+00	1.71E-02	1.50E+00	7.94E-02	-4.26E-01
ADP-minerals & metals	kg Sbe	6.38E-06	8.87E-08	0.00E+00	5.90E-08	3.71E-08	4.10E-09	-2.02E-07
ADP-fossil	MJ	1.37E+01	3.71E-01	0.00E+00	2.47E-01	1.15E-01	2.81E-02	-6.70E+00
Water use	m ³ e depr.	8.71E-01	1.65E-03	0.00E+00	1.10E-03	5.91E-02	1.64E-04	-3.50E-02
Secondary materials	kg	1.36E-01	1.25E-04	0.00E+00	8.30E-05	2.74E-04	1.03E-05	-6.24E-04
Biogenic C in product (A3)	kg C	4.26E-01	N/A	N/A	N/A	N/A	N/A	N/A
Biogenic C in packaging (A3)	kg C	2.71E-02	N/A	N/A	N/A	N/A	N/A	N/A

SOLID ELEMENTS WITH MDF

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

Impact category	Unit	A1-A3	A4	C1	C2	C3	C4	D
Global warming potential - total	kg CO ₂ e	-9.75E+00	5.45E-01	0.00E+00	3.64E-01	3.06E+01	1.63E+00	-1.01E+01
Global warming potential - fossil	kg CO ₂ e	2.21E+01	5.43E-01	0.00E+00	3.62E-01	2.83E-01	2.67E-02	-1.01E+01
Global warming potential - biogenic	kg CO ₂ e	-3.19E+01	1.82E-03	0.00E+00	1.22E-03	3.04E+01	1.60E+00	-4.10E-03
Global warming potential - LULUC	kg CO ₂ e	4.05E-02	2.08E-04	0.00E+00	1.39E-04	9.45E-05	2.67E-05	-1.01E-03
Ozone depletion pot.	kg CFC ₁₁ e	2.53E-06	1.21E-07	0.00E+00	8.10E-08	2.08E-08	7.76E-09	-9.63E-07
Acidification potential	mol H ⁺ e	1.56E-01	2.14E-03	0.00E+00	1.43E-03	3.02E-03	2.16E-04	-1.66E-02
Eutrophication potential - freshwater	kg Pe	1.01E-03	3.83E-06	0.00E+00	2.56E-06	3.97E-06	3.88E-07	-1.66E-05
Eutrophication potential - marine	kg Ne	4.14E-02	6.39E-04	0.00E+00	4.26E-04	1.47E-03	7.27E-05	-3.52E-03
Eutrophication potential - terrestrial	mol Ne	4.94E-01	7.03E-03	0.00E+00	4.69E-03	1.57E-02	8.00E-04	-3.85E-02
Photochemical ozone formation ("smog")	kg NMVOCe	1.37E-01	2.17E-03	0.00E+00	1.45E-03	3.78E-03	2.33E-04	-1.34E-02
Abiotic depletion potential - minerals & metals	kg Sbe	1.94E-04	1.88E-06	0.00E+00	1.26E-06	7.94E-07	8.48E-08	-4.79E-06
Abiotic depletion potential - fossil resources	MJ	4.01E+02	7.89E+00	0.00E+00	5.27E+00	2.46E+00	5.82E-01	-1.59E+02
Water use	m ³ e depr.	2.53E+01	3.51E-02	0.00E+00	2.35E-02	1.27E+00	3.39E-03	-8.29E-01

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	3.67E+02	1.12E-01	0.00E+00	7.46E-02	2.85E+02	1.02E-02	-3.13E-01
Renewable PER as material	MJ	3.17E+02	0.00E+00	0.00E+00	0.00E+00	-2.85E+02	-1.50E+01	0.00E+00
Total use of renewable PER	MJ	6.84E+02	1.12E-01	0.00E+00	7.46E-02	1.70E-01	-1.50E+01	-3.13E-01
Non-renewable PER as energy	MJ	3.69E+02	7.89E+00	0.00E+00	5.27E+00	4.95E+01	5.82E-01	-1.59E+02
Non-renewable PER as material	MJ	5.24E+01	0.00E+00	0.00E+00	0.00E+00	-4.70E+01	-2.48E+00	0.00E+00
Total use of non-renewable PER	MJ	4.22E+02	7.89E+00	0.00E+00	5.27E+00	2.46E+00	-1.89E+00	-1.59E+02
Secondary materials	kg	6.81E-01	2.65E-03	0.00E+00	1.77E-03	5.86E-03	2.13E-04	-1.48E-02
Renewable secondary fuels	MJ	2.73E+01	2.91E-05	0.00E+00	1.94E-05	1.40E-05	8.24E-06	-2.04E-05
Non-renewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of net fresh water	m ³	6.55E-01	9.90E-04	0.00E+00	6.61E-04	-3.97E-03	6.30E-04	-1.90E-02

PER = Primary energy resources

END OF LIFE - WASTE

Impact category	Unit	A1-A3	A4	C1	C2	C3	C4	D
Hazardous waste	kg	1.47E+00	8.94E-03	0.00E+00	5.97E-03	0.00E+00	0.00E+00	-7.16E-02
Non-hazardous waste	kg	4.03E+01	1.57E-01	0.00E+00	1.04E-01	1.89E+01	2.42E+00	-6.49E-01
Radioactive waste	kg	1.40E-03	5.43E-05	0.00E+00	3.62E-05	0.00E+00	0.00E+00	-2.10E-05

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	4.85E+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 CO ₂ e	2.24E+01	5.11E-01	0.00E+00	3.41E-01	2.83E-01	2.42E-02	-9.63E+00
Ozone depletion Potential	kg CFC ₁₁ e	2.24E-06	9.58E-08	0.00E+00	6.40E-08	1.74E-08	6.06E-09	-7.83E-07
Acidification	kg SO ₂ e	1.26E-01	1.66E-03	0.00E+00	1.11E-03	2.27E-03	1.62E-04	-1.34E-02
Eutrophication	kg PO ₄ ³ e	6.32E-02	3.83E-04	0.00E+00	2.56E-04	2.46E-03	5.33E-05	-1.97E-03
POCP ("smog")	kg C ₂ H ₄ e	1.12E-02	6.71E-05	0.00E+00	4.48E-05	7.18E-05	6.54E-06	-1.16E-03
ADP-elements	kg Sbe	2.14E-04	1.85E-06	0.00E+00	1.24E-06	6.99E-07	8.24E-08	-4.55E-06
ADP-fossil	MJ	4.15E+02	7.89E+00	0.00E+00	5.27E+00	2.46E+00	5.82E-01	-1.59E+02

KEY INFORMATION PER KG OF PRODUCT

Impact category	Unit	A1-A3	A4	C1	C2	C3	C4	D
GWP - total	kg CO ₂ e	-4.57E-01	2.56E-02	0.00E+00	1.71E-02	1.44E+00	7.62E-02	-4.73E-01
GWP - fossil	kg CO ₂ e	1.04E+00	2.55E-02	0.00E+00	1.70E-02	1.33E-02	1.25E-03	-4.73E-01
GWP - biogenic	kg CO ₂ e	-1.49E+00	8.54E-05	0.00E+00	5.70E-05	1.42E+00	7.50E-02	-1.92E-04
ADP-minerals & metals	kg Sbe	9.09E-06	8.84E-08	0.00E+00	5.90E-08	3.72E-08	3.98E-09	-2.25E-07
ADP-fossil	MJ	1.88E+01	3.70E-01	0.00E+00	2.47E-01	1.15E-01	2.73E-02	-7.44E+00
Water use	m ³ e depr.	1.18E+00	1.65E-03	0.00E+00	1.10E-03	5.94E-02	1.59E-04	-3.89E-02
Secondary materials	kg	3.20E-02	1.24E-04	0.00E+00	8.30E-05	2.75E-04	1.00E-05	-6.93E-04
Biogenic C in product (A3)	kg C	4.09E-01	N/A	N/A	N/A	N/A	N/A	N/A
Biogenic C in packaging (A3)	kg C	2.57E-02	N/A	N/A	N/A	N/A	N/A	N/A