epddanmark

ECO PLATFORM EPD EN 15804 VERIFIED

Owner: Lafuco A/S
No.: MD-20025-EN
ECO EPD: 00001260
Issued: 03-07-2020
Valid to: 03-07-2025

3rd PARTY **VERIFIED**

EPD

VERIFIED ENVIRONMENTAL PRODUCT DECLARATION | **ISO 14025 & EN 15804**

Owner of declaration
Lafuco A/S
Baldershøj 26B, 1.sal
2635 Ishøj
VAT no. 19810003

Programme operator
Danish Technological Institute
www.dti.dk

Programme
EPD Danmark
www.epddanmark.dk

Declared products

1. Toughened glass wall with a full glass door
2. Toughened glass wall with a Q-frame door
3. Toughened glass wall with a sound insulating glass door
4. Laminated glass wall with a full glass door
5. Laminated glass wall with a Q-frame door
6. Laminated glass wall with a sound insulating glass door
7. Termoglass wall with a full glass door
8. Termoglass wall with a Q-frame door
9. Termoglass wall with a sound insulating glass door
10. EI 30 glass wall with framed glass door
11. EI 60 glass wall with framed glass door

Production site
The production site is located in Tåstrup in Denmark.

Products use
The EPD covers interior glass walls, including a door, which are used as room separations inside buildings.

Declared unit
The declared unit is defined as 1 m^2 of interior glass wall, including a door, ready to be delivered and installed at a building site.

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Basis of calculation
This EPD is developed in accordance with the European standard EN 15804+A1.

Comparability
EPDs of construction products may not be comparable if they do not comply with the requirements in EN 15804. EPD data may not be comparable if the datasets used are not developed in accordance with EN 15804 and if the background systems are not based on the same database.

Validity
This EPD has been verified in accordance with ISO 14025 and is valid for 5 years from the date of issue.

Use
The intended use of an EPD is to communicate scientifically based environmental information for construction products, for the purpose of assessing the environmental performance of buildings.

EPD type
☒Cradle-to-gate
☐Cradle-to-gate with options
☐Cradle-to-grave

CEN standard EN 15804 serves as the core PCR

Independent verification of the declaration and data, according to EN ISO 14025

☐ internal ☒ external

Third party verifier:

Ninkie Bendtsen, NIRAS

Henrik Fred Larsen
EPD Danmark

Life cycle stages and modules (MND = module not declared)																
Product			Construction process		Use							End of life				Beyond the system boundary
Raw material supply	Transport	Manufacturing	Transport	Installation process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Re-use, recovery and recycling potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

Product information

Product description

The main product components are shown in the table below.

Material	Non-fire-resistant glass walls	Fire-resistant glass walls
Glass	80-90%	70-80%
Aluminium profiles	6-11%	8-12%
Sealants	4-5%	~1%
Gypsum	0%	8-12%
Locks and handles	<1%	<1%
Steel materials	<1%	<2%
Other plastics	<1%	<1%

The thickness of the glass walls is approximately 12 mm for the non-fire-resistant glass wall types, 17 mm for the EI30 wall and 27 mm for the EI60 wall. The non-fire-resistant interior glass walls have three different door configurations: Full glass door, Q-frame door and sound insulating glass door. The full glass door is 10 mm thick and has a WSS Studio lock. The sound insulating glass door is 12 mm thick and has a Connect 310 lock. The Q-frame door is 8 mm thick for the toughened and termoglass variations of the wall and 10 mm thick for the laminated glass variation of the wall. The Q-frame doors are fitted with a DL 712 lock.

The width of the glass walls are 3000 mm and the height are 2700 mm.

Representativity

This declaration, including data collection and the modeled foreground system including results, represents 1 m^2 of interior glass wall, including a door. The Lafuco facility is located in Tåstrup in Denmark. Product specific data has been collected for the year 2019. Background data are based supplier specific EPDs, GaBi ts 9.2.0.58 incl. databases 2019 Edition and Ecoinvent 3.5 and are less than 10 years old, with one exception where no other data was available.

Dangerous substances

The product does not contain substances listed in the ”Candidate List of Substances of Very High Concern for authorization”. (http://echa.europa.eu/candidate-list-table)

Essential characteristics (CE)

The products are not covered by harmonized technical specifications. The letters EI in the fire rated products stands for “Integrity + Insulation”, with reference to the standard DS/EN 13501.

Further technical information can be obtained by contacting the manufacturer or on the manufacturer’s website: https://www.lafuco.dk/

Reference Service Life (RSL)

The reference service life is not declared, as this EPD is based on a cradle-to-gate assessment where the service life is not relevant.

LCA background

Declared **unit**

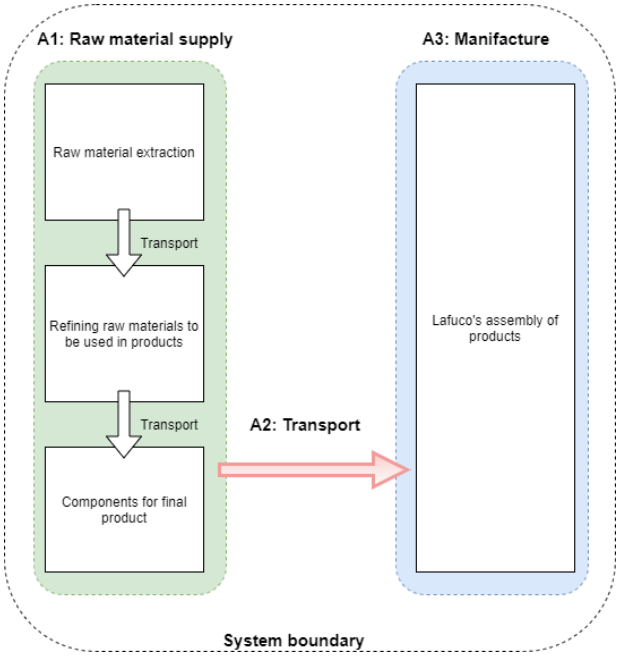
The LCI and LCIA results in this EPD relates to 1 m^2 of interior glass wall, including a door, ready to be delivered and installed at a building site.

Product	Declared unit [m^2]	Weight per m^2 [kg/m^2]	Conversion factor to 1 kg [m^2/kg]
Toughened glass, full glass door	1	32,8	0,0305
Toughened glass, Q-frame door	1	32,0	0,0312
Toughened glass, sound insulating glass door	1	34,9	0,0287
Laminated glass, full glass door	1	32,8	0,0305
Laminated glass, Q-frame door	1	32,9	0,0304
Laminated glass, sound insulating glass door	1	34,9	0,0287
Termoglass, full glass door	1	33,4	0,0300
Termoglass, Q-frame door	1	32,8	0,0305
Termoglass, sound insulating glass door	1	35,6	0,0281
EI30 glasswall, framed glass door	1	44,4	0,0225
EI60 glasswall, framed glass door	1	65,3	0,0153

PCR

This EPD is developed according to the core rules for the product category of construction products in EN 15804.

Flow diagram



System boundary

This EPD is based on a cradle-to-gate LCA, in which >99 weight-% has been accounted for. The general rules for the exclusion of inputs and outputs follows the requirements in EN 15804, 6.3.5, where the total of neglected input flows per module shall be a maximum of 5 % of energy usage and mass and 1 % of energy usage and mass for unit processes.

Product stage (A1-A3) includes:

A1 – Extraction and processing of raw materials
A2 – Transport to the production site
A3 – Manufacturing processes

The product stage comprises the acquisition of all raw materials, products and energy, transport to the production site, packaging and waste processing up to the ”end-of-waste” state or final disposal. The LCA results are declared in aggregated form for the product stage, which means, that the sub-modules A1, A2 and A3 are declared as one module A1-A3.

Lafuco assembles the required components for the glass walls as glass, aluminum profiles, sealants and fittings from suppliers. Some components are further processed at Lafufo's site in Tåstrup in Denmark to the required specification by cutting, drilling or the use of a CNC machine. Several components are repackaged for the transport to the building site.

No co-products are produced in Lafuco’s production. In case of recycling or other recovery of generated waste, impacts are borne by the product until it enters the facility gate where the process takes place in accordance with the Polluter Pays Principle. The same method is applied for incoming raw materials of recycled origin, where the product carries the processes required to produce the raw materials from the recycled material, but not the upstream production of the virgin material.

LCA results

ENVIRONMENTAL IMPACTS PER M²							
Parameter	**Unit**	**Toughened glass wall with a full glass door A1-A3**	**Toughened glass wall with a Q-frame door A1-A3**	**Toughened glass wall with a sound insulating glass door A1-A3**	**Laminated glass wall with a full glass door A1-A3**	**Laminated glass wall with a Q-frame door A1-A3**	**Laminated glass wall with a sound insulating glass door A1-A3**
GWP	[kg CO_2-eq.]	7,40E+01	8,25E+01	8,63E+01	8,70E+01	9,94E+01	9,93E+01
ODP	[kg CFC11-eq.]	9,67E-08	8,63E-08	8,78E-08	1,19E-07	1,13E-07	1,10E-07
AP	[kg SO_2-eq.]	3,02E-01	3,22E-01	3,40E-01	3,93E-01	4,33E-01	4,29E-01
EP	[kg PO_4^{3-}-eq.]	5,21E-02	5,33E-02	5,68E-02	5,73E-02	5,96E-02	6,14E-02
POCP	[kg ethene-eq.]	1,72E-02	1,82E-02	1,91E-02	2,39E-02	2,65E-02	2,61E-02
ADPE	[kg Sb-eq.]	1,10E-03	9,59E-04	9,78E-04	1,20E-03	1,08E-03	1,08E-03
ADPF	[MJ]	1,02E+03	1,16E+03	1,21E+03	1,20E+03	1,35E+03	1,36E+03
Caption	GWP = Global warming potential; ODP = Ozone depletion potential; AP = Acidification potential of soil and water; EP = Eutrophication potential; POCP = Photochemical ozone creation potential; ADPE = Abiotic depletion potential for non fossil resources; ADPF = Abiotic depletion potential for fossil resources						

RESOURCE USE PER M²							
Parameter	**Unit**	**Toughened glass wall with a full glass door A1-A3**	**Toughened glass wall with a Q-frame door A1-A3**	**Toughened glass wall with a sound insulating glass door A1-A3**	**Laminated glass, WSS Studio, full glass door A1-A3**	**Laminated glass wall with a Q-frame door A1-A3**	**Laminated glass wall with a sound insulating glass door A1-A3**
PERE	[MJ]	1,70E+02	2,22E+02	2,23E+02	2,65E+02	3,34E+02	3,17E+02
PERM	[MJ]	1,50E-01	1,50E-01	1,52E-01	1,50E-01	1,50E-01	1,52E-01
PERT	[MJ]	1,70E+02	2,22E+02	2,23E+02	2,65E+02	3,34E+02	3,17E+02
PENRE	[MJ]	1,09E+03	1,21E+03	1,26E+03	1,34E+03	1,52E+03	1,51E+03
PENRM	[MJ]	5,95E+01	6,05E+01	6,04E+01	5,95E+01	6,05E+01	6,04E+01
PENRT	[MJ]	1,15E+03	1,27E+03	1,32E+03	1,40E+03	1,58E+03	1,57E+03
SM	[kg]	3,77E+00	4,13E+00	4,39E+00	3,57E+00	3,84E+00	4,18E+00
RSF	[MJ]	3,72E-10	3,57E-10	4,48E-10	3,34E-10	3,10E-10	4,10E-10
NRSF	[MJ]	4,35E-09	4,17E-09	5,23E-09	3,90E-09	3,62E-09	4,79E-09
FW	[m^3]	2,40E-01	3,29E-01	3,29E-01	2,39E-01	3,27E-01	3,28E-01
Caption	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 resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non renewable secondary fuels; FW = Use of net fresh water						

WASTE CATEGORIES AND OUTPUT FLOWS PER M²							
Parameter	**Unit**	**Toughened glass wall with a full glass door A1-A3**	**Toughened glass wall with a Q-frame door A1-A3**	**Toughened glass wall with a sound insulating glass door A1-A3**	**Laminated glass, WSS Studio, full glass door A1-A3**	**Laminated glass wall with a Q-frame door A1-A3**	**Laminated glass wall with a sound insulating glass door A1-A3**
HWD	[kg]	1,84E-01	1,59E-01	1,59E-01	1,84E-01	1,59E-01	1,59E-01
NHWD	[kg]	1,82E+01	1,88E+01	1,99E+01	1,90E+01	2,01E+01	2,08E+01
RWD	[kg]	3,37E-02	4,25E-02	4,30E-02	7,57E-02	9,22E-02	8,50E-02
CRU	[kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	[kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MER	[kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EEE	[MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EET	[MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Caption	HWD = Hazardous waste disposed; NHWD = Non hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy						

ENVIRONMENTAL IMPACTS PER M^2						
Parameter	**Unit**	**Termoglass wall with a full glass door A1-A3**	**Termoglass wall with a Q-frame door A1-A3**	**Termoglass wall with a sound insulating glass door A1-A3**	**EI 30 glass wall A1-A3**	**EI 60 glass wall A1-A3**
GWP	[kg CO_2-eq.]	7,29E+01	8,36E+01	8,74E+01	1,19E+02	1,43E+02
ODP	[kg CFC11-eq.]	9,80E-08	8,76E-08	8,91E-08	5,26E-07	9,60E-07
AP	[kg SO_2-eq.]	3,04E-01	3,28E-01	3,46E-01	5,51E-01	6,98E-01
EP	[kg PO_4^{3-}-eq.]	5,31E-02	5,43E-02	5,78E-02	7,06E-02	9,00E-02
POCP	[kg ethene-eq.]	1,69E-02	1,85E-02	1,94E-02	2,95E-02	3,67E-02
ADPE	[kg Sb-eq.]	1,11E-03	9,66E-04	9,86E-04	1,07E-03	1,15E-03
ADPF	[MJ]	1,05E+03	1,18E+03	1,23E+03	1,57E+03	1,92E+03
Caption	GWP = Global warming potential; ODP = Ozone depletion potential; AP = Acidification potential of soil and water; EP = Eutrophication potential; POCP = Photochemical ozone creation potential; ADPE = Abiotic depletion potential for non fossil resources; ADPF = Abiotic depletion potential for fossil resources					

RESOURCE USE PER M^2						
Parameter	**Unit**	**Termoglass wall with a full glass door A1-A3**	**Termoglass wall with a Q-frame door A1-A3**	**Termoglass wall with a sound insulating glass door A1-A3**	**EI 30 glass wall A1-A3**	**EI 60 glass wall A1-A3**
PERE	[MJ]	1,60E+02	2,22E+02	2,23E+02	3,44E+02	3,63E+02
PERM	[MJ]	1,50E-01	1,50E-01	1,52E-01	2,31E-02	2,31E-02
PERT	[MJ]	1,60E+02	2,22E+02	2,23E+02	3,44E+02	3,63E+02
PENRE	[MJ]	1,07E+03	1,22E+03	1,28E+03	2,66E+03	3,94E+03
PENRM	[MJ]	5,94E+01	6,05E+01	6,04E+01	1,58E+00	1,58E+00
PENRT	[MJ]	1,13E+03	1,28E+03	1,34E+03	2,67E+03	3,94E+03
SM	[kg]	3,72E+00	4,20E+00	4,45E+00	2,83E+00	2,83E+00
RSF	[MJ]	6,86E-10	6,70E-10	7,61E-10	0,00E+00	0,00E+00
NRSF	[MJ]	8,01E-09	7,83E-09	8,89E-09	0,00E+00	0,00E+00
FW	[m^3]	2,24E-01	3,29E-01	3,30E-01	8,07E-01	1,02E+00
Caption	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 resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non renewable secondary fuels; FW = Use of net fresh water					

WASTE CATEGORIES AND OUTPUT FLOWS PER M^2						
Parameter	**Unit**	**Termoglass wall with a full glass door A1-A3**	**Termoglass wall with a Q-frame door A1-A3**	**Termoglass wall with a sound insulating glass door A1-A3**	**EI 30 glass wall A1-A3**	**EI 60 glass wall A1-A3**
HWD	[kg]	1,84E-01	1,59E-01	1,59E-01	1,77E-01	1,77E-01
NHWD	[kg]	1,82E+01	1,92E+01	2,03E+01	1,16E+01	1,20E+01
RWD	[kg]	3,21E-02	4,27E-02	4,33E-02	7,44E-02	8,08E-02
CRU	[kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	[kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MER	[kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EEE	[MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EET	[MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Caption	HWD = Hazardous waste disposed; NHWD = Non hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy					

Indoor air	*The EPD does not give information on release of dangerous substances to indoor air because the horizontal standards on measurement of release of regulated dangerous substances from construction products using harmonised test methods according to the provisions of the respective technical committees for European product standards are not available.*
Soil and water	*The EPD does not give information on release of dangerous substances to soil and water because the horizontal standards on measurement of release of regulated dangerous substances from construction products using harmonised test methods according to the provisions of the respective technical committees for European product standards are not available.*

References

Publisher	http://www.epddanmark.dk
Programme operator	Danish Technological Institute Buildings & Environment Gregersensvej DK-2630 Taastrup http://www.teknologisk.dk
LCA-practitioner	Sara Tollin, Niclas Silvferstrand and David Althoff Palm Ramboll Sweden AB Vädursgatan 6 SE-412 50 Göteborg Email: sara.tollin@ramboll.se Email: niclas.silfverstrand@ramboll.se Email: david.palm@ramboll.se
LCA software /background data	GaBi ts 9.2.0.58 incl. databases 2019 Edition Ecoinvent 3.5
3rd party verifier	Ninkie Bendtsen, NIRAS

General programme instructions
Version 1.9
www.epddanmark.dk

EN 15804
DS/EN 15804 + A1:2013 - "Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products"

EN 15942
DS/EN 15942:2011 – " Sustainability of construction works – Environmental product declarations – Communication format business-to-business"

ISO 14025
DS/EN ISO 14025:2010 – " Environmental labels and declarations – Type III environmental declarations – Principles and procedures"

ISO 14040
DS/EN ISO 14040:2008 – " Environmental management – Life cycle assessment – Principles and framework"

ISO 14044
DS/EN ISO 14044:2008 – " Environmental management – Life cycle assessment – Requirements and guidelines"