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3rd PARTY VERIFIED

EPD

VERIFIED ENVIRONMENTAL PRODUCT DECLARATION | ISO 14025 & EN 15804



Owner of declaration

HSHansen
Bredgade 4
DK-6950 Lem



Issued:
03-04-2020

Valid to:
05-04-2023

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

Programme operator

Danish Technological Institute
www.dti.dk



Programme

EPD Danmark
www.epddanmark.dk



Declared products

Hansen Fasad® with triple layer glass-REDUXA (160 mm)
Hansen Fasad® with emalite glass-REDUXA (160 mm)
Hansen Fasad® with panel-REDUXA (160 mm)

Production site


Bredgade 4
DK-6950 Lem
Denmark

Products use

Hansen Fasad® curtain walls are used as facade elements for buildings. Hansen Fasad® comprises a range of box- and T-profiles. The profiles can be designed according to the static requirements and the architectural wishes.

Declared unit

1 square meter

CEN standard EN 15804 serves as the core PCR
Independent verification of the declaration and data, according to EN ISO 14025
<input type="checkbox"/> internal <input checked="" type="checkbox"/> external
Third party verifier:  Kim Christiansen


Henrik Fred Larsen
EPD Danmark

Life cycle stages and modules (X = module declared 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

Facade elements with 160 mm Al-profiles based on "Hydro 4.0 Aluminium Extrusion Ingot" (REDUXA) covered by the EPD: NEPD-1840-468-EN, and triple glass of the type 6-18-4-18-4 (regarding Fasad-glass). The main product components are shown in the table below. Values are given as intervals covering the three declared product variations. Specific recipes and some input materials (0-2 mass-%) are not shown in this table due to reasons of confidentiality.

Material	Weight-% of declared product
Glass	0-76
Aluminium	20-43
Plastic	4-6
Mineral wool	0-23
Calcium silicate	0-29
Packaging material*	kg per declared unit
PE film	0,61
Pallets	2,8

Representativity

This declaration, including data collection and the modeled foreground system including results, represents the production of 1 square meter of Hansen Fasad®-REDUXA curtain wall system at the production site located in Denmark. Product specific data are based on average values collected in the period from 01.01.2016 to 31.12.2016. Background data are based mainly on GaBi and are less than 10 years old. Only in one case, GaBi data was supplemented with data from ecoinvent and the consistency of the data used is therefore considered as high. Generally, the used background datasets are of high quality, and the majority of the datasets are only a couple of years old and therefore the requirements in EN15804 are met.

Dangerous substances

Hansen Fasad® curtain walls does not contain substances listed in the "Candidate List of Substances of Very High Concern for authorisation"

(<http://echa.europa.eu/candidate-list-table>)

Essential characteristics (CE)

Hansen Fasad® curtain walls are covered by harmonised technical specification EN 13830:2015. Declaration of performance according to EU regulation 305/2011 is available for all declared product variations.

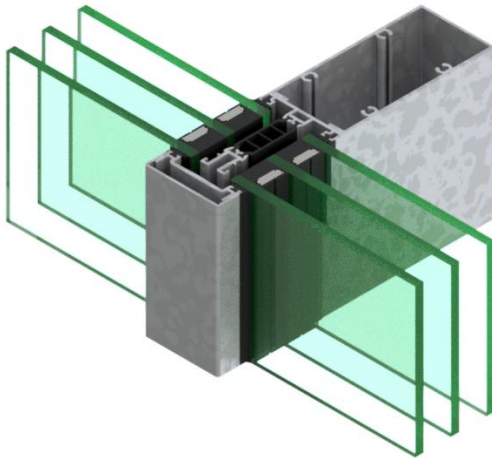
Further technical information can be obtained by contacting the manufacturer or on the manufacturers website:

www.hsh.dk

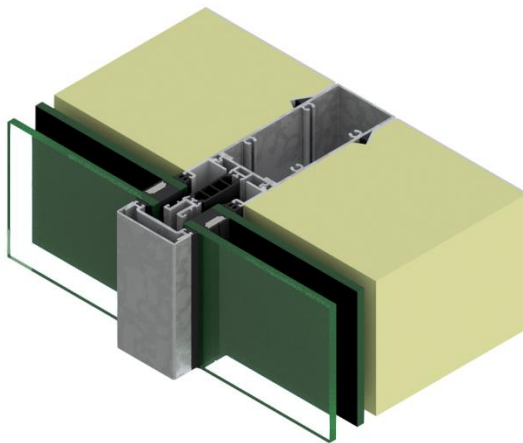
Reference Service Life (RSL)

No RSL is declared. This EPD is based on a cradle-to-gate assessment.

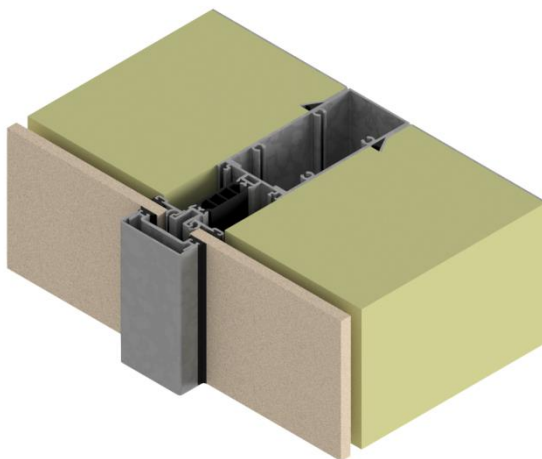
Product illustrations



Fasad® with triple layer glass



Fasad® with emalite glass



Fasad® with panel

LCA background

Declared unit

The LCI and LCIA results in this EPD relates to 1 square meter of Hansen Fasad® curtain wall of the types: Hansen Fasad® with triple layer glass-REDUXA, Hansen Fasad® with emalite glass-REDUXA and Hansen Fasad® with panel-REDUXA.

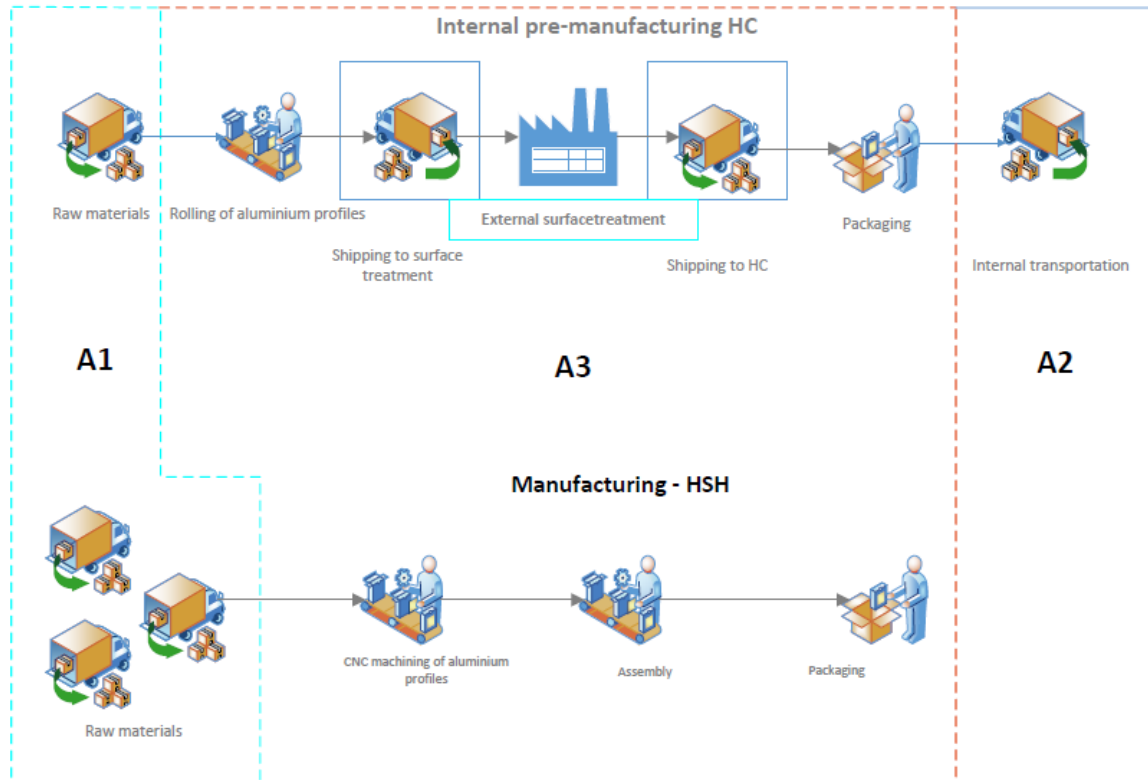
The declared unit (1 m²) is calculated based on a 3x3 m² facade element

Name	Value	Unit
Declared unit	1	m ²
Conversion factor to 1 kg: Fasad® with triple glass	43,6	kg/m ²
Conversion factor to 1 kg: Fasad® with emalite	44,2	kg/m ²
Conversion factor to 1 kg: Fasad® with panel	29,4	kg/m ²

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.

The production process of the Hansen Fasad® curtain walls starts with rolling together the aluminium profiles with the thermal break. This happens at a production facility in Lem, Denmark (HC) either before or after surface treatment (anodizing or powder coating) of the aluminum profile. The profiles are then transported (1 km) to the other production facility in Lem (HSH).

After this short internal transport, the profiles are CNC machined into correct lengths, holes are drilled etc. and the frames are put together and mounted with triple glass, emalite glas (enamelled glass), mineral wool, wind panel etc. depending on the type of Fasad.

The facade elements are now ready for quality control and packaging before leaving the production facility

LCA results

ENVIRONMENTAL IMPACTS PER SQUARE METER				
Parameter	Unit	Fasad® with triple glass-REDUXA	Fasad® with emalite glass-REDUXA	Fasad® with panel-REDUXA
		A1-A3	A1-A3	A1-A3
GWP	[kg CO ₂ -eq.]	1,28E+02	1,66E+02	1,41E+02
ODP	[kg CFC11-eq.]	3,39E-06	4,32E-06	3,45E-06
AP	[kg SO ₂ -eq.]	4,77E-01	6,80E-01	5,74E-01
EP	[kg PO ₄ ³⁻ -eq.]	6,69E-02	9,85E-02	5,36E-02
POCP	[kg ethene-eq.]	3,02E-02	4,17E-02	3,56E-02
ADPE	[kg Sb-eq.]	4,66E-04	7,92E-04	1,92E-04
ADPF	[MJ]	1,58E+03	2,00E+03	1,68E+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 SQUARE METER				
Parameter	Unit	Fasad® with triple glass-REDUXA	Fasad® with emalite glass-REDUXA	Fasad® with panel-REDUXA
		A1-A3	A1-A3	A1-A3
PERE	[MJ]	7,70E+02	1,03E+03	1,02E+03
PERM*	[MJ]	5,00E+01	9,23E+01	1,13E+02
PERT	[MJ]	8,20E+02	1,12E+03	1,13E+03
PENRE	[MJ]	1,68E+03	2,25E+03	1,86E+03
PENRM**	[MJ]	7,00E+01	7,00E+01	7,00E+01
PENRT	[MJ]	1,75E+03	2,32E+03	1,93E+03
SM	[kg]	-	-	-
RSF	[MJ]	2,71E-15	2,71E-15	2,71E-15
NRSF	[MJ]	3,18E-14	3,18E-14	3,18E-14
FW	[m ³]	2,42E+00	3,04E+00	2,90E+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			

* Contribution from packaging material per product type: All

** Contribution from packaging material per product type: 3,48E+01 MJ

OUTPUT FLOWS AND WASTE CATEGORIES PER SQUARE METER				
Parameter	Unit	Fasad® with triple glass-REDUXA	Fasad® with emalite glass-REDUXA	Fasad® with panel-REDUXA
		A1-A3	A1-A3	A1-A3
HWD	[kg]	2,83E-01	2,83E-01	2,84E-01
NHWD	[kg]	1,34E+01	1,34E+01	1,35E+01
RWD	[kg]	1,54E-03	1,54E-03	1,54E-03
CRU	[kg]	-	-	-
MFR	[kg]	-	-	-
MER	[kg]	-	-	-
EEE	[MJ]	-	-	-
EET	[MJ]	-	-	-
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			

Additional information

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	Danish Technological Institute Buildings & Environment Gregersensvej DK-2630 Taastrup http://www.teknologisk.dk
LCA software / background data	Thinkstep GaBi 9.2 2019 incl. databases (8.7) + Ecoinvent 3 2017 http://www.gabi-software.com http://www.ecoinvent.org
3rd party verifier	Kim Christiansen – kimconsult.dk

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"