epd-norge
Global program operatør

Environmental product declaration

in accordance with ISO 14025 and EN 15804+A2

bARK Timber Façade System (Glazed Module)

bARK
TIMBER FACADE SYSTEM

The Norwegian EPD Foundation

Owner of the declaration:
Fasadglas Bäcklin AB

Product:
bARK Timber Façade System (Glazed Module)

Declared unit:
1 pcs

This declaration is based on Product Category Rules:
CEN Standard EN 15804:2012+A2:2019 serves as core PCR
PCR, Part B: Requirements on the EPD for Curtain walling

Program operator:
The Norwegian EPD Foundation

Declaration number:
NEPD-8393-7945-EN

Registration number:
NEPD-8393-7945-EN

Issue date:
06.12.2024

Valid to:
16.12.2029

EPD software:
LCAno EPD generator ID: 406971

General information

Product

bARK Timber Façade System (Glazed Module)

Program operator:

The Norwegian EPD Foundation
Post Box 5250 Majorstuen, 0303 Oslo, Norway
Phone: +47 977 22 020
web: www.epd-norge.no

Declaration number:

NEPD-8393-7945-EN

This declaration is based on Product Category Rules:

CEN Standard EN 15804:2012+A2:2019 serves as core PCR
PCR, Part B: Requirements on the EPD for Curtain walling

Statement of liability:

The owner of the declaration shall be liable for the underlying information and evidence. EPD Norway shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

Declared unit:

1 pcs bARK Timber Façade System (Glazed Module)

Declared unit with option:

A1-A3,A4,A5,C1,C2,C3,C4,D

Functional unit:

1 unit of a bARK Timber Façade System Module (glazed) with a grammage of 49.57 kg/m². The actual reference size of the declared façade module has dimensions of 2535 x 4641 mm.

General information on verification of EPD from EPD tools:

Independent verification of data, other environmental information and the declaration according to ISO 14025:2010, § 8.1.3 and § 8.1.4. Verification of each EPD is made according to EPD-Norway's guidelines for verification and approval requiring that tools are i) integrated into the company's environmental management system, ii) the procedures for use of the EPD tool are approved by EPD-Norway, and iii) the process is reviewed annually by an independent third party verifier. See Appendix G of EPD-Norway's General Programme Instructions for further information on EPD tools

Verification of EPD tool:

Independent third party verification of the EPD tool, background data and test-EPD in accordance with EPDNorway's procedures and guidelines for verification and approval of EPD tools.

Third party verifier:

Alexander Borg, Asplan Viak AS

(no signature required)

Owner of the declaration:

Fasadglas Bäcklin AB
Contact person:
Phone:
e-mail: Nicola.peterson@fasadglas.se

Manufacturer:

Fasadglas Bäcklin AB
P.O. Box 111 87
SE-161 11 Bromma, Sweden

Place of production:

Fasadglas Bäcklin Produktion AB
Norra Oskarsgatan 66
SE-577 35 Hultsfred, Sweden

Management system:

Organisation no:

SE 556325-9547

Issue date:

06.12.2024

Valid to:

06.12.2029

Year of study:

2023

Comparability:

EPD of construction products may not be comparable if they do not comply with EN 15804 and seen in a building context.

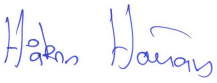
Development and verification of EPD:

The declaration is created using EPD tool lca.tools ver EPD2022.03, developed by LCA.no. The EPD tool is integrated in the company's management system, and has been approved by EPD Norway.

Developer of EPD: Nicola Peterson

Reviewer of company-specific input data and EPD: Hans Svärd

Approved:



Håkon Hauan, CEO EPD-Norge

Product

Product description:

bARK Module is a versatile, pre-fabricated façade system made from high-quality Swedish glulam wood, combined with insulating glass and stone wool insulation. The proportions between glazed and insulated sections is fully customizable to suit design- and project requirements. The bARK Module system allows for extensive design flexibility, offering options for size, glass configurations, integrated spandrel glass, metal or wood fillers. As well as various ventilated exterior cladding choices, including wood panels, stone, ceramic or metal elements.

The insulated sections, as detailed in this declaration, are compossed of a vapor barrier on the interior, stone wool insulation and exterior wind protection. Typically, the glazed areas make up for 40-60% of the module surface. Installation is completed using steel fittings, tailored to the building's structural needs.

U-values typically range from 0.25- to 0.8 $W/m^2 \cdot K$ (depending on the ratio between glazed to insulated areas).

Product specification

Materials	Value	Unit
Insulation	8,69	%
Rubber	0,62	%
Thermowood	0,74	%
Glulam	21,42	%
Glass	62,31	%
Steel	2,08	%
Aluminum	1,9	%
PVC	2,25	%

Technical data:

Test	Standard	Class
Watertightness	EN 12154	RE 750
Wind load	EN 13116	2000 Pa
Curtain Walling	SS-EN 13830:2015+A1:2020	
Air Permeability	EN 12152	AE750

Market:

Scandinavia.

Reference service life, product

Only applicable when modules in the use phase is declared (modules B1-B6).

Reference service life, building or construction works

For commercial or industrial buildings, the service life is estimated around 30 to 60 years depending on various factors; such as quality of construction, usage, maintenance and technological solutions.

LCA: Calculation rules

Declared unit:

1 pcs bARK Timber Façade System (Glazed Module)

Cut-off criteria:

All major raw materials and all the essential energy is included. The production processes for raw materials and energy flows with very small amounts (less than 1%) are not included. These cut-off criteria do not apply for hazardous materials and substances.

Allocation:

The allocation is made in accordance with the provisions of EN 15804. Incoming energy and water and waste production in-house is allocated equally among all products through mass allocation. Effects of primary production of recycled materials is allocated to the main product in which the material was used. The recycling process and transportation of the material is allocated to this analysis.

Data quality:

Specific data for the product composition are provided by the manufacturer. The data represent the production of the declared product and were collected for EPD development in the year of study. Background data is based on EPDs according to EN 15804 and different LCA databases. The data quality of the raw materials in A1 is presented in the table below.

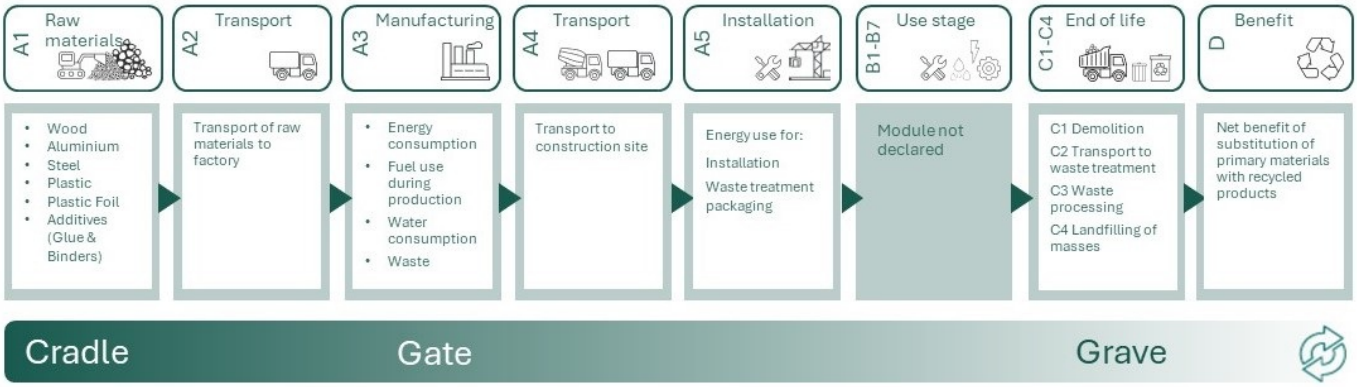
Materials	Source	Data quality	Year
Glass	S-P-00933	EPD	2019
Insulation	NEPD-3414-2027-EN	EPD	2021
Metal - Aluminium	Modified ecoinvent 3.6	Database	2019
Metal - Steel	ecoinvent 3.6	Database	2019
Plastic	ecoinvent 3.6	Database	2019
Rubber, synthetic	ecoinvent 3.6	Database	2019
Wood	Ecoinvent 3.6	Database + EPD (A1 info)	2019
Wood	RTS EPD nro: RTS_44_19	EPD	2019

System boundaries (X=included, MND=module not declared, MNR=module not relevant)

Product stage			Construction installation stage		Use stage							End of life stage				Beyond the system boundaries
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-potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	MND	MND	MND	MND	MND	MND	MND	X	X	X	X	X

System boundary:

Modules A1-A5 are included in the analysis. It includes the extraction and production of raw materials, transportation to the factory, the production process itself and transportation to market, and installation at construction site.



Additional technical information:

LCA: Scenarios and additional technical information

The following information describe the scenarios in the different modules of the EPD.

Module A4 = Transport from our factory in Hultsfred to the construction site. Generic distance of 280 km.

Module C1 = includes use of energy for de-construction activities for the different material groups used in the system. C1 thus allocates energy usage to sorting and demolition activities before each material group undergoes its respective waste treatment processes for the year 2021 as defined by Statistikkbanken (SSB 2021), Table 09781: Treatment of waste from construction, rehabilitation and demolition of buildings (tonnes), by material, contents, year and treatment.

Module C2 = A default transport distance of 85 km is recommended for the Swedish market.

Modules C3 and C4 = Waste treatment of the product follows the default values provided in Statistikbanken (SSB 2021), Table 09781: Treatment of waste from construction, rehabilitation and demolition of buildings (tonnes), by material, contents, year and treatment. This table specified how different types of raw materials used in A1 will likely be treated during the end-of-life of the product. Waste treatments in C3 include material recycling and incineration with energy recovery and fly ash extraction. Disposal in C4 consist of landfilling of different waste fractions and of ashes.

Module D = The recyclability of metals, plastics, and electronic components allows the producers a credit for the net scrap that is produced at the end of a product's life. The benefits from recycling of net scrap are described in formula from EN 15804:2012+A2:2019. Substitution of heat and electricity generated by the incineration with energy recovery of plastic insulation and other parts is also calculated in module D.

Transport from production place to user (A4)	Capacity utilisation (incl. return) %	Distance (km)	Fuel/Energy Consumption	Unit	Value (Liter/tonne)
Truck, 16-32 tonnes, EURO 6 (km) - Europe	36,7 %	250	0,043	l/tkm	10,75

Assembly (A5)	Unit	Value			
Electricity, Sweden (kWh)	kWh/DU	15,00			

De-construction demolition (C1)	Unit	Value			
Demolition of glass per kg	kg	363,71			
Demolition of hazardous waste per kg	kg	50,70			
Demolition of plastic per kg	kg	16,77			
Demolition of wood per kg	kg	129,31			
Demolition of steel per kg	kg	12,14			
Demolition of aluminium per kg	kg	11,08			

Transport to waste processing (C2)	Capacity utilisation (incl. return) %	Distance (km)	Fuel/Energy Consumption	Unit	Value (Liter/tonne)
Truck, 16-32 tonnes, EURO 6 (km) - Europe	36,7 %	85	0,043	l/tkm	3,66

Waste processing (C3)	Unit	Value			
Materials to recycling (kg)	kg	432,14			
Waste treatment per kg Glass, incineration with fly ash extraction (kg)	kg	9,97			
Waste treatment per kg Plastic, Mixture, municipal incineration with fly ash extraction (kg)	kg	4,48			
Waste treatment per kg Wood, from incineration (kg)	kg	75,00			

Disposal (C4)	Unit	Value			
Landfilling of ashes from incineration of Glass, process of ashes and residues (kg)	kg	10,02			
Waste, inert waste, to landfill (kg) - C4	kg	11,42			
Waste, hazardous waste, to landfill (kg)	kg	50,70			
Landfilling of ashes from incineration of Plastics, Mixture, municipal incineration with fly ash extraction, process per kg ashes and residues - C4 (kg)	kg	0,16			
Landfilling of ashes from incineration of Wood, process per kg ashes and residues - C4 (kg)	kg	0,86			

Benefits and loads beyond the system boundaries (D)	Unit	Value			
Substitution of electricity, in Norway (MJ)	MJ	59,17			
Substitution of thermal energy, district heating, in Norway (MJ)	MJ	895,19			
Substitution of primary glass with net scrap (kg) - GLO	kg	343,89			
Substitution of plastic granulates (kg) - Global	kg	10,85			
Substitution of wood chips (kg)	kg	54,31			
Substitution of primary steel with net scrap (kg)	kg	12,13			
Substitution of primary aluminium with net scrap (kg)	kg	11,07			

LCA: Results

The LCA results are presented below for the declared unit defined on page 2 of the EPD document.

Environmental impact										
	Indicator	**Unit**	A1-A3	A4	A5	C1	C2	C3	C4	D
	GWP-total	kg CO_2 -eq	7,14E+02	2,38E+01	8,24E-01	7,70E-01	8,10E+00	2,22E+02	1,11E+01	-5,01E+02
	GWP-fossil	kg CO_2 -eq	9,10E+02	2,38E+01	7,59E-01	7,70E-01	8,09E+00	1,16E+01	1,10E+01	-4,95E+02
	GWP-biogenic	kg CO_2 -eq	-2,00E+02	9,85E-03	1,54E-02	1,44E-04	3,35E-03	2,10E+02	9,69E-03	-3,85E+00
	GWP-luluc	kg CO_2 -eq	2,99E+00	8,47E-03	4,93E-02	6,07E-05	2,88E-03	1,96E-04	9,56E-02	-2,21E+00
	ODP	kg CFC11 -eq	5,81E-05	5,39E-06	3,72E-07	1,66E-07	1,83E-06	1,03E-07	6,21E-07	-3,78E-01
	AP	mol H+ -eq	4,77E+00	6,84E-02	4,94E-03	8,05E-03	2,33E-02	1,42E-02	5,23E-02	-4,57E+00
	EP-FreshWater	kg P -eq	1,52E-02	1,90E-04	5,13E-05	2,80E-06	6,47E-05	1,86E-05	4,85E-04	-1,22E-02
	EP-Marine	kg N -eq	1,00E+00	1,35E-02	8,42E-04	3,55E-03	4,60E-03	6,78E-03	1,08E-02	-7,15E-01
	EP-Terrestial	mol N -eq	1,24E+01	1,51E-01	1,11E-02	3,90E-02	5,15E-02	7,16E-02	1,16E-01	-8,59E+00
	POCP	kg NMVOC -eq	3,01E+00	5,80E-02	2,53E-03	1,07E-02	1,97E-02	1,76E-02	5,56E-02	-2,28E+00
	ADP-minerals&metals[1]	kg Sb-eq	7,20E-02	6,58E-04	3,04E-05	1,18E-06	2,24E-04	5,15E-06	6,53E-05	-3,00E-02
	ADP-fossil[1]	MJ	1,58E+04	3,60E+02	8,90E+01	1,06E+01	1,22E+02	9,17E+00	1,24E+02	-6,00E+03
	WDP[1]	m^3	3,14E+05	3,48E+02	9,03E+03	2,25E+00	1,18E+02	2,99E+01	1,09E+02	-6,02E+04

GWP-total = Global Warming Potential total; GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment: EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption

"Reading example: 9,0 E-03 = 9,0*10-3 = 0,009"
*INA Indicator Not Assessed

1. The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator

Remarks to environmental impacts

Additional environmental impact indicators

Indicator		Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
	PM	Disease incidence	2,71E-05	1,46E-06	3,56E-08	2,13E-07	4,96E-07	1,50E-07	9,55E-07	-4,81E-05
	IRP[2]	kgBq U235 -eq	1,11E+02	1,57E+00	3,05E+00	4,54E-02	5,35E-01	1,91E-02	1,98E-01	-1,55E+01
	ETP-fw[1]	CTUe	7,22E+03	2,67E+02	4,70E+01	5,79E+00	9,07E+01	3,84E+01	3,10E+02	-1,04E+04
	HTP-c[1]	CTUh	7,20E-07	0,00E+00	1,35E-09	0,00E+00	0,00E+00	3,43E-09	4,85E-08	-4,09E-07
	HTP-nc[1]	CTUh	1,02E-05	2,92E-07	3,25E-08	5,25E-09	9,91E-08	1,59E-07	3,42E-07	-4,68E-06
	SQP[1]	dimensionless	1,23E+04	2,52E+02	3,94E+01	1,34E+00	8,56E+01	1,46E+00	3,18E+02	-7,44E+03

PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Potential Soil Quality Index (dimensionless)

"Reading example: 9,0 E-03 = 9,0*10-3 = 0,009"
*INA Indicator Not Assessed

1. The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator
2. This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

Resource use										
Indicator		Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
	PERE	MJ	6,82E+03	5,15E+00	4,28E+01	5,73E-02	1,75E+00	3,45E-01	4,19E+01	-2,19E+03
	PERM	MJ	1,87E+03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-1,81E+03	0,00E+00	0,00E+00
	PERT	MJ	8,68E+03	5,15E+00	4,28E+01	5,73E-02	1,75E+00	-1,81E+03	4,19E+01	-2,19E+03
	PENRE	MJ	1,55E+04	3,60E+02	8,92E+01	1,06E+01	1,22E+02	9,17E+00	1,24E+02	-5,61E+03
	PENRM	MJ	5,43E+02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-3,81E+02	0,00E+00	-4,61E+02
	PENRT	MJ	1,61E+04	3,60E+02	8,92E+01	1,06E+01	1,22E+02	-3,72E+02	1,24E+02	-6,07E+03
	SM	kg	5,32E+01	0,00E+00	0,00E+00	5,20E-03	0,00E+00	0,00E+00	1,09E+00	-6,77E-02
	RSF	MJ	1,16E+01	1,84E-01	1,66E-01	1,41E-03	6,27E-02	7,78E-03	9,20E-02	-1,93E-01
	NRSF	MJ	1,27E+01	6,59E-01	5,24E-01	2,07E-02	2,24E-01	0,00E+00	9,77E+00	-1,25E+01
	FW	m^3	8,96E+00	3,85E-02	9,72E-02	5,45E-04	1,31E-02	2,80E-02	6,95E-02	-5,33E+00

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 materials; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Net use of fresh water

"Reading example: 9,0 E-03 = 9,0*10-3 = 0,009"
*INA Indicator Not Assessed

End of life - Waste

Indicator		Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
	HWD	kg	3,96E+00	1,86E-02	4,65E-03	3,12E-04	6,31E-03	0,00E+00	6,13E+01	-9,89E-01
	NHWD	kg	1,23E+02	1,75E+01	2,94E-01	1,25E-02	5,95E+00	9,97E+00	1,17E+01	-6,25E+01
	RWD	kg	5,35E-01	2,45E-03	1,34E-03	7,36E-05	8,34E-04	0,00E+00	1,75E-05	-1,83E-02

HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed

"Reading example: 9,0 E-03 = 9,0*10-3 = 0,009"
*INA Indicator Not Assessed

End of life - Output flow

Indicator		Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
	CRU	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	MFR	kg	7,61E+00	0,00E+00	0,00E+00	5,11E-03	0,00E+00	4,32E+02	0,00E+00	0,00E+00
	MER	kg	1,82E+01	0,00E+00	0,00E+00	1,58E-05	0,00E+00	8,94E+01	0,00E+00	0,00E+00
	EEE	MJ	1,20E+01	0,00E+00	0,00E+00	5,43E-05	0,00E+00	5,92E+01	0,00E+00	0,00E+00
	EET	MJ	1,81E+02	0,00E+00	0,00E+00	8,21E-04	0,00E+00	8,95E+02	0,00E+00	0,00E+00

CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported energy electrical; EET = Exported energy thermal

"Reading example: 9,0 E-03 = 9,0*10-3 = 0,009"
*INA Indicator Not Assessed

Biogenic Carbon Content

Indicator	Unit	At the factory gate
Biogenic carbon content in product	kg C	5,90E+01
Biogenic carbon content in accompanying packaging	kg C	0,00E+00

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

Additional requirements

Greenhouse gas emissions from the use of electricity in the manufacturing phase

National production mix from import, low voltage (production of transmission lines, in addition to direct emissions and losses in grid) of applied electricity for the manufacturing process (A3).

Electricity mix	Source	Amount	Unit
Electricity, Sweden (kWh)	ecoinvent 3.6	54,94	g CO2-eq/kWh

Dangerous substances

The product contains no substances given by the REACH Candidate list.

Indoor environment

Additional Environmental Information

Additional environmental impact indicators required in NPCR Part A for construction products									
Indicator	**Unit**	A1-A3	A4	A5	C1	C2	C3	C4	D
GWPIOBC	kg CO_2 -eq	9,17E+02	2,38E+01	8,23E-01	7,70E-01	8,10E+00	1,16E+01	1,12E+01	-5,01E+02

GWP-IOBC: Global warming potential calculated according to the principle of instantaneous oxidation. In order to increase the transparency of biogenic carbon contribution to climate impact, the indicator GWP-IOBC is required as it declares climate impacts calculated according to the principle of instantaneous oxidation. GWP-IOBC is also referred to as GWP-GHG in context to Swedish public procurement legislation.

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