

# Environmental Product Declaration

In accordance with ISO 14025 and EN 15804:2012+A2:2019 for:

## Hammerglass Noise barrier system GROUND-2 (Mark-2) from Hammerglass AB

### Programme

The International EPD® System, [www.environdec.com](http://www.environdec.com)

### Programme operator

EPD International AB

### EPD registration number

S-P-05712

### Company information/Owner of the EPD

Hammerglass AB  
Åkagårdsvägen 9  
SE-269 71 Förslöv  
Sweden

An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at [www.environdec.com](http://www.environdec.com)

### Publication date:

2022-05-16

### Valid until:

2027-05-16



## GENERAL INFORMATION

### Programme information

**Programme:** The International EPD® System  
**Address:** EPD International AB  
Box 210 60  
SE-100 31 Stockholm  
Sweden  
**Website:** www.environdec.com  
**E-mail:** info@environdec.com

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CEN standard EN 15804:2012+A2:2019 serves as the Core Product Category Rules (PCR)  
Product Category Rules: PCR 2019:14 Construction products, version 1.11. No complementary PCR (c-PCR) has been used as no such document was available for the declared products at the time of this study

PCR review was conducted by: The Technical Committee of the International EPD® System. Chair of the PCR review: Claudia A. Peña, University of Concepción, Chile. The review panel may be contacted via info@environdec.com.

Independent third-party verification of the declaration and data, according to ISO 14025:2006:

- External  Internal  
 EPD process certification  EPD verification

Third party verifier: Martyna Mikusinska, Sweco

Individual verifier approved by the International EPD® System Technical Committee, supported by the Secretariat.  
Procedure for follow-up of data during EPD validity involves third party verifier:

- Yes  No

*The EPD owner has the sole ownership, liability, and responsibility for the EPD.*

*EPDs within the same product category but from different programmes may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804. For further information about comparability, see EN 15804 and ISO 14025.*

## COMPANY INFORMATION/OWNER OF THE EPD

Hammerglass AB  
Åkagårdsvägen 9  
SE-269 71 Förslöv  
Sweden

### Contact:

Peter Hultberg, Head of Quality, Purchase and Production  
E-mail: peter.hultberg@hammerglass.se  
Website: www.hammerglass.se

### Description of the organisation:

Hammerglass AB's product development began in 1993, with the mission to reduce the ongoing costs of replacing broken glass. After producing add-on systems for the external fitting of unbreakable window glass we began to think about developing an insulating glass with the same unbreakable characteristics. The project was successful and Hammerglass AB is today able to provide a 5-year full warranty on Hammerglass Insulate. Today the company consists of three main business areas: Property, Infrastructure and Automotive. With subsidiaries in Norway, Denmark, and Germany, we supply our products to both European countries as well as selected overseas export markets with selected business areas.

### Product-related or management system-related certifications:

Hammerglass AB is certified according to ISO 9001:2015, ISO 14001:2015 and ISO 45001:2018, Secured By Design, as well as PPAP for the automotive industry

### Manufacturing site:

Förslöv, Sweden

## PRODUCT INFORMATION

### Product name and identification:

Hammerglass Noise barrier system GROUND-2

*This EPD covers the version of Hammerglass Noise barrier system GROUND-2 that is 2,3 meters high.*

### Product description

A complete CE-marked system using bolt groups for installation in the ground or onto walls, along roads or railways. The use of nanotechnology minimises the maintenance costs as waste is rinsed off by the rain, and graffiti does not stick as on ordinary glass. The Hammerglass panels are clamped between an HFRHS post and a robust clamping profile, and secured with wire at the top. When installed with bolt groups in the ground it is advisable to bury the panels to a depth of about 20 cm in order to prevent the transmission of noise beneath the barrier. The noise reducing screens usually consist of 12 mm Hammerglass, and can be supplied with patterns, in order to prevent bird collisions

### UN CPC code:

53290 Other civil engineering works.

### GTIN:

Not applicable

# LCA INFORMATION

**Declared unit:**

1 m of Hammerglass Noise barrier system with a height of 2,3 meters. Conversion factor to 1 kg: 74,3 kg per m.

**Reference service life:**

Not applicable.

**Time representativeness:**

2021

**Databases and LCA software:**

Ecoinvent version 3.8, industry data from PlasticsEurope, and SimaPro version 9.3.

**Type of EPD:**

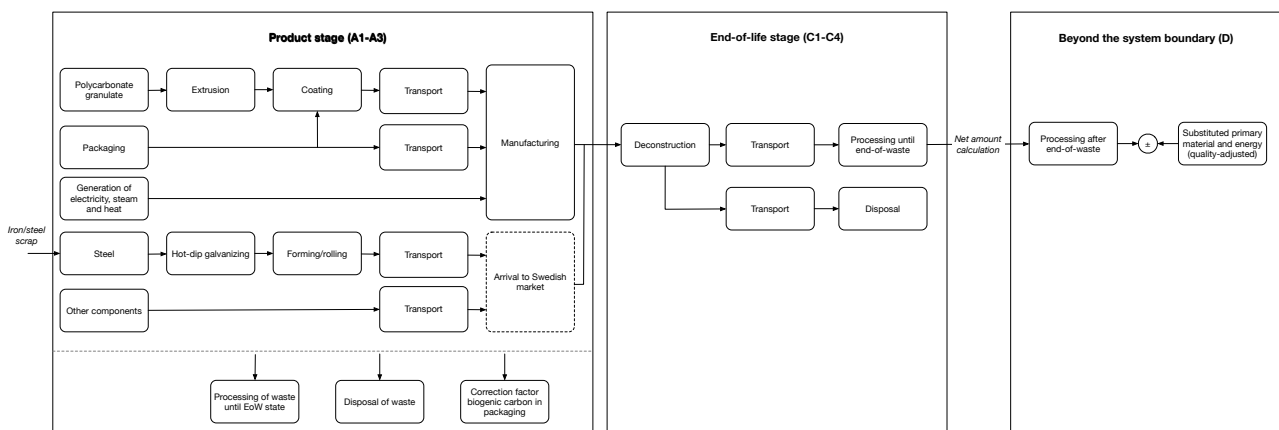
Specific

**System boundary and geographical scope:**

Cradle to gate with modules C1–C4 and module D (A1–A3 + C + D). The construction process stage (modules A4–A5), and use stage (modules B1–B7) are not declared. The geographical scope of the EPD is for production in Sweden and used on the Swedish market.

	Raw material supply	Transport	Manu- facturing	De- construc- tion, demolition	Transport	Waste pro- cessing	Disposal	Reuse, recovery, recycling potential
<b>Module</b>	A1	A2	A3	C1	C2	C3	C4	D
<b>Modules declared</b>	X	X	X	X	X	X	X	X
<b>Geography</b>	GLO	GLO	SE	SE	SE	SE	SE	SE
<b>Specific data used</b>	7%	-	-	-	-	-	-	-
<b>Variation – products</b>	Not relevant	-	-	-	-	-	-	-
<b>Variation – sites</b>	Not relevant	-	-	-	-	-	-	-

Note: "Specific data" here refers to the definition used in the reference PCR. The low numbers reflect the fact that the operations of Hammerglass only contribute to a smaller share of the carbon footprint of the products, where most of the impact comes from the upstream raw material supply, which is based on representative industry-average data.



**LCA practitioner:**

Greendesk AB, www.greendesk.se

Scenarios and additional technical information:

The carbon footprint of electricity mix used in manufacturing: 6 g CO<sub>2</sub> eq./kWh.

Allocation in Hammerglass manufacturing was done on a mass basis.

After the useful life in an infrastructure application in Sweden, the calculations for the end-of-life stage are made for a scenario assuming recycling for the main components as the most representative scenario.

Scenario information	Unit	Amount
Collected separately	kg	72,6
Collected with mixed waste	kg	0,8
For re-use	kg	0
For recycling	kg	72,6
For energy recovery	kg	0
For final disposal	kg	0,8
Further information about assumptions	-	Assumed recycling scenario, transport of 500 km by lorry in Europe, 500 km by lorry in China and 18000 km by ship.

**Content declaration**

Material/component	Amount (kg per m)	Post-consumer recycled material in product components
<b>Product components</b>		
Polycarbonate	32,5	0%
Hot-dip galvanized steel	40,1	N/A*
Rubber	0,8	0%
Plastic	0,01	0%
<b>Packaging materials for polycarbonate sheets**</b>		
Protective film	0,3	-
Wooden pallet	4,2	-
<b>Total</b>		
Total, including packaging	77,8	-
Total, excluding packaging	73,4	-

\* Data about the share of post-consumer recycled of steel was not available from the supplier.

\*\* Only packaging materials for the polycarbonate sheets are included. In the LCA model, an assumed amount of packaging for other components has also been added.

The product does not contain any dangerous substances from the candidate list of Substances of Very High Concern (SVHC) for Authorisation >0,1% of the weight of the product.

## Environmental information

All results are displayed using three significant figures. The comma sign (",") is used to denote the decimal point in the results.

### Potential environmental impact – mandatory indicators according to EN 15804

Results per 1 m<sup>2</sup>

Indicator	Unit	A1-A3	C1	C2	C3	C4	D
<b>GWP-fossil</b>	kg CO <sub>2</sub> eq.	3,19E+02	9,45E+00	1,25E+01	4,94E+00	2,55E+00	-1,66E+02
<b>GWP-biogenic</b>	kg CO <sub>2</sub> eq.	3,69E+00	3,54E-03	5,76E-03	2,29E-03	2,80E-04	-4,37E-01
<b>GWP-luluc</b>	kg CO <sub>2</sub> eq.	3,03E-01	9,43E-04	6,99E-03	3,04E-03	1,42E-05	-3,03E-02
<b>GWP-total</b>	kg CO <sub>2</sub> eq.	3,23E+02	9,45E+00	1,25E+01	4,95E+00	2,55E+00	-1,66E+02
<b>ODP</b>	kg CFC 11 eq.	1,01E-05	2,02E-06	2,72E-06	4,00E-07	5,39E-09	-2,10E-06
<b>AP</b>	mol H <sup>+</sup> eq.	7,86E-01	9,81E-02	2,06E-01	2,49E-02	3,71E-04	-3,00E-01
<b>EP-freshwater</b>	kg P eq.	7,64E-03	3,13E-05	7,56E-05	1,09E-04	4,97E-07	-6,35E-04
<b>EP-marine</b>	kg N eq.	1,86E-01	4,34E-02	5,12E-02	5,40E-03	1,42E-04	-6,76E-02
<b>EP-terrestrial</b>	mol N eq.	1,99E+00	4,76E-01	5,69E-01	6,06E-02	1,56E-03	-6,94E-01
<b>POCP</b>	kg NMVOC eq.	6,41E-01	1,31E-01	1,53E-01	2,11E-02	3,84E-04	-2,59E-01
<b>ADP-minerals&amp;metals2</b>	kg Sb eq.	8,67E-04	4,86E-06	3,18E-05	2,79E-05	1,42E-07	-1,50E-04
<b>ADP-fossil2</b>	MJ	5,77E+03	1,30E+02	1,79E+02	1,16E+02	3,66E-01	-3,23E+03
<b>WDP</b>	m <sup>3</sup>	7,24E+01	2,03E-01	4,96E-01	2,54E+00	3,02E-02	-3,24E+01

Acronyms 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

Disclaimer 2 – 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 experience with the indicator.

### Potential environmental impact – additional mandatory and voluntary indicators

Results per 1 m<sup>2</sup>

Indicator	Unit	A1-A3	C1	C2	C3	C4	D
<b>GWP-GHG</b>	kg CO <sub>2</sub> eq.	3,13E+02	9,35E+00	1,24E+01	4,77E+00	2,55E+00	-1,62E+02

Note: The voluntary additional environmental indicators from EN 15804 are not declared.



## Use of resources

Results per 1 m<sup>2</sup>

Indicator	Unit	A1-A3	C1	C2	C3	C4	D
PERE	MJ	2,65E+02	7,29E-01	1,97E+00	3,51E+00	1,77E-02	-1,03E+02
PERM	MJ	1,43E+02	0	0	0	0	0
PERT	MJ	4,08E+02	7,29E-01	1,97E+00	3,51E+00	1,77E-02	-1,03E+02
PENRE	MJ	4,73E+03	1,30E+02	1,79E+02	1,16E+02	3,66E-01	-2,32E+03
PENRM	MJ	1,04E+03	0	0	0	0	-9,07E+02
PENRT	MJ	5,77E+03	1,30E+02	1,79E+02	1,16E+02	3,66E-01	-3,23E+03
SM	kg	1,07E+01	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0
FW	m <sup>3</sup>	1,96E+00	6,53E-03	1,57E-02	6,23E-02	0	-7,59E-01

Acronyms 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 PRODUCTION AND OUTPUT FLOWS

### Waste production

Results per 1 m<sup>2</sup>

Indicator	Unit	A1-A3	C1	C2	C3	C4	D
Hazardous waste disposed	kg	1,44E-06	0	0	0	0	-1,03E-06
Non-hazardous waste disposed	kg	1,11E+02	0	0	0	8,10E-01	-7,94E+01
Radioactive waste disposed	kg	5,90E-02	0	0	0	0	-4,23E-02

### Output flows

Results per 1 m<sup>2</sup>

Indicator	Unit	A1-A3	C1	C2	C3	C4	D
Components for re-use	kg	0	0	0	0	0	0
Material for recycling	kg	8,31E+00	0	0	7,26E+01	0	0
Materials for energy recovery	kg	0	0	0	0	0	0
Exported energy, electricity	MJ	0	0	0	0	0	0
Exported energy, thermal	MJ	0	0	0	0	0	0

### Information on biogenic carbon content

Results per 1 m<sup>2</sup>

Biogenic carbon content	Unit	Quantity at the factory gate
Biogenic carbon content in product	kg C	0
Biogenic carbon content in packaging	kg C	5,52E+00

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO<sub>2</sub>.

## References

CEN, 2021. Sustainability of construction works – Environmental Product Declarations – Core rules for the product category of construction products (EN 15804:2012+A2:2019/AC:2021).

EPD International, 2021. PCR 2019:14 Construction products, version 1.11.

EPD International, 2020. General Programme Instructions of the International EPD® System, version 4.0.

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