ENVIRONMENTAL PRODUCT DECLARATION

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

Solid stairs (massiva trappor)
Nya Norbergstrappan AB

EPD HUB, EPD number HUB-0028
Publishing date 27 Apr. 2022, last updated 23 Apr. 2026, valid until 27 Apr. 2027

Created with One Click LCA

GENERAL INFORMATION

MANUFACTURER

Manufacturer	Nya Norbergstrappan AB
Address	Svarvargatan 22, 738 33 Norberg, Sweden
Contact details	Johanna Rask
Website	https://www.norbergstrappan.se/

EPD STANDARDS, SCOPE AND VERIFICATION

Program operator	EPD Hub, hub@epdhub.com
Reference standard	EN 15804+A2:2019 and ISO 14025
PCR	EPD Hub Core PCR version 1.0, 1 Feb 2022
Sector	Construction product
Category of EPD	Third party verified EPD
Scope of the EPD	Cradle to gate with options, A4-A5, and B1 and modules C1-C4 and D
EPD author	Anna Ahlgren and Erica Bender, Benders Byggsystem AB
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal certification ☑ External verification
EPD verifier	Elma Avdyli, as authorized verifier acting for EPD HUB Limited

The manufacturer has the sole ownership, liability, and responsibility for the EPD. EPDs within the same product category but from different programs may not be comparable. EPDs of construction products may

not be comparable if they do not comply with EN 15804 and if they are not compared in a building context.

PRODUCT

Product name	Solid stairs (massiva trappor)
Additional labels	Straight, curved and round stairs
Product reference	N/A
Place of production	Norberg, Sweden
Period for data	2020
Averaging in EPD	No Averaging
Variation in GWP-fossil for A1-A3	- %

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 tonne
Declared unit mass	1000 kg
GWP-fossil, A1-A3 (kgCO2e)	1,38E2
GWP-total, A1-A3 (kgCO2e)	1,37E2
Secondary material, inputs (%)	3,73E0
Secondary material, outputs (%)	8,04E1
Total energy use, A1-A3 (kWh)	5,91E2
Total water use, A1-A3 (m3e)	2,18E0

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

Ever since starting in 1960, our ambition has been to satisfy customer needs. Our operations are permeated by a local presence and a local responsiveness to the business climate. Together with receptiveness, this provides the foundations for long and strong relations with customers, suppliers and, not least, personnel. From the start onwards, positive development has contributed to Benders now being active in several different business areas and establishing itself as one of the market-leading producers of concrete and natural stone products in the Nordic countries. At the same time, our shares of the new markets in Europe are ever increasing and our ranges in construction products and construction systems grow with every season.

PRODUCT DESCRIPTION

Concrete stairs without cladding or tiling, railings or bannisters. The prefabricated concrete stairs from Benders are more than just a construction intended to facilitate the passage between two levels. With stairs in concrete, you get a solid and beautiful staircase that fits into the buildings environment at the same time as it is durable and feels comfortable to walk on.

Benders offers stairs in three different designs - Straight, Curved and Round, for different types of constructions. Our concrete stairs are durable and are coated with terrazzo as standard. The stairs can also be delivered in gray concrete as a finished surface, or gray concrete for other cladding such as tiles, granite or carpet. The stairs are used indoor in buildings such as apartment buildings, office buildings, parking garages, shopping malls.

Further information can be found at https://www.norbergstrappan.se/.

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass- %	Material origin
Metals	2,9	Sweden
Minerals	97,1	Sweden
Fossil materials	-	-
Bio-based materials	-	-

BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate.

Biogenic carbon content in product, kg C	0
Biogenic carbon content in packaging, kg C	0,6919

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1 tonne
Mass per declared unit	1000 kg

SUBSTANCES, REACH - VERY HIGH CONCERN

The product does not contain any REACH SVHC substances in amounts greater than 0,1 % (1000 ppm).

PRODUCT LIFE-CYCLE

SYSTEM BOUNDARY

This EPD covers the life-cycle modules listed in the following table.

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		
SE	SE	SE	SE	SE	EU	-	-	-	-	-	-	SE	SE	SE	SE	SE		
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstr./demol.	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. Also, fuels used by machines, and handling of waste formed in the production processes at the manufacturing facilities are included in this stage. The study also considers the material losses occurring during the manufacturing processes as well as losses during electricity transmission.

The production of the solid stairs begins with the preparation of the mould, which includes cleaning and applying form oil. Reinforcement steel is placed in the right place after drawing. After casting the stairs are left to cure. After curing, the stairs are lift out from the mould and refurbished. The stairs are placed on wooden beams during storage. Eventually, the elements are moved out and transported to the construction site.

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 the PCR. Average distance of transportation from production plant to building site is assumed as 170 km and the transportation method is assumed to be lorry. Vehicle fuels varies from diesel to biodiesel. Vehicle capacity utilization volume factor is assumed to be 100 % which means full load. In reality, it may vary but as role of transportation emissions in total results is small, 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 the transportation company to serve the needs of other clients. Transportation does not cause losses as product are fastened properly.

Installation includes the energy use and material consumption as well as the packaging waste generated. Production loss at installation is assumed negligible as the precast elements are delivered ready made from the factory. Energy consumption of a construction process for a precast element is on the average 132.5 MJ/m3 (Abey and Anand, 2019). Therefore, energy consumption is 132,5/2,4=55,2 MJ/ton product. (Concrete density 2,4 ton/m3). The source of energy is diesel fuel used by work machines.

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)

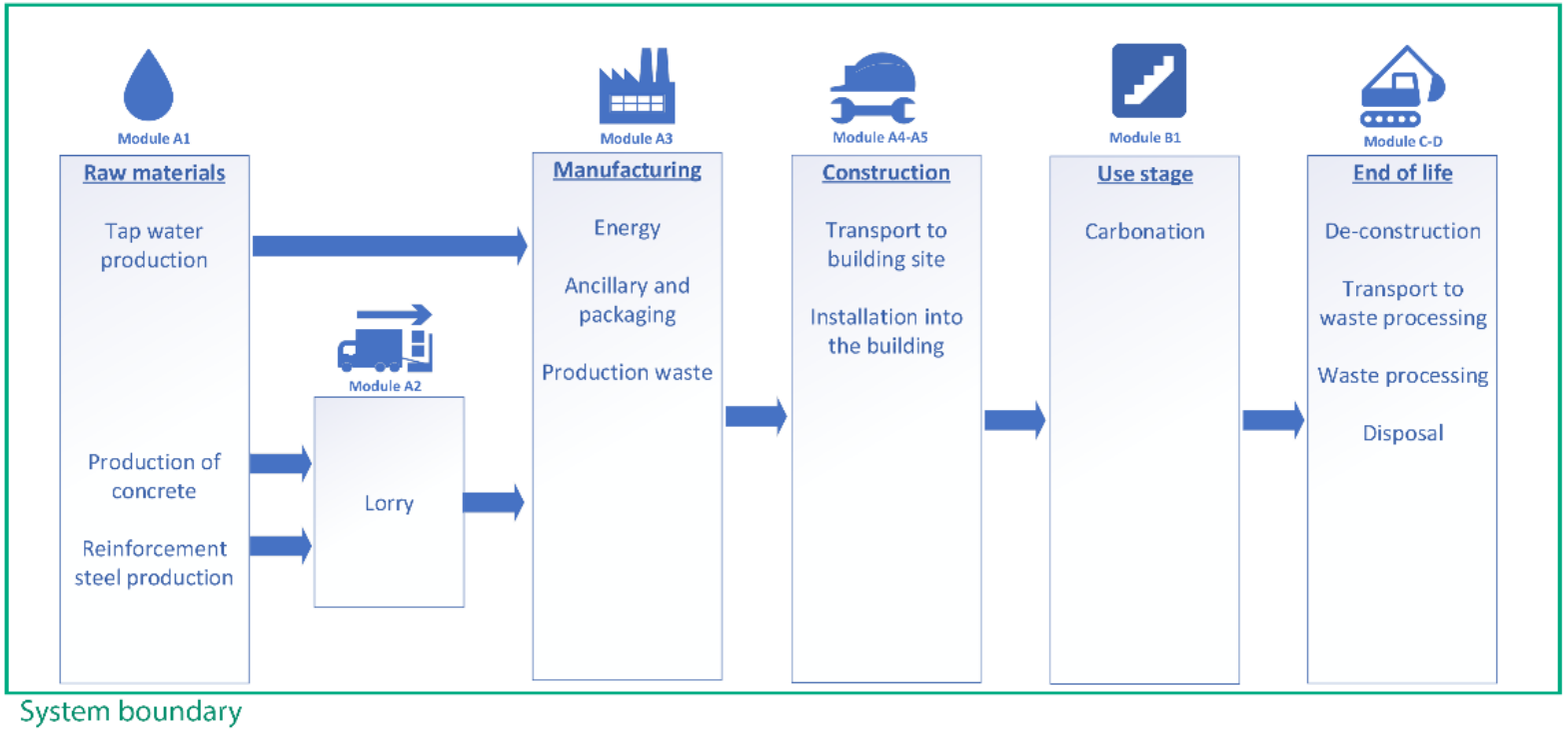
At the end-of-life, in the demolition phase 100% of the waste is assumed to be collected as separate construction waste. The demolition process consumes energy in the form of diesel fuel used by building machines. Energy consumption of a demolition process is on the average 10 kWh/m2 (Bozdağ, Ö & Seçer, M. 2007). Basing on a Level(s) project, an average mass of a reinforced concrete building is about 1000 kg/m2. Therefore, energy consumption demolition is assumed to be 10 kWh/1000 kg = 0,01 kWh/kg. The source of energy is diesel fuel used by work machines (C1).

The dismantled stairs are delivered to the nearest construction waste treatment plant. It is estimated that there is no mass loss during the use of the product, therefore the end-of-life product is assumed that it has the same weight with the declared product. Transportation distance to the closest disposal area is estimated as 50 km and the transportation method is lorry which is the most common (C2).

At the waste treatment plant, waste that can be reused, recycled or recovered for energy is separated and diverted for further use. It can be assumed that 100% of the stairs are transported to a waste treatment plant, where the stairs are crushed and steel is separated. About 95% of steel (World Steel Association. 2020) and 80% of concrete (Betoniteollisuus ry, 2020) are recycled. The process losses of the waste treatment plant are assumed to be negligible (C3). The remaining 20% of concrete and 5% of steel are assumed to be sent to landfill (C4).

Due to the recycling potential of reinforcement steel and concrete, they can be used as secondary raw material, which avoids the use of virgin raw materials. The 80 % of concrete and 95% of steel going to waste processing are converted into secondary raw materials after recycling. The recycled material content in the concrete itself is assumed to be 0 % but in steel is assumed to be >99 % (D).

SYSTEM DIAGRAM



LIFE-CYCLE ASSESSMENT

CUT-OFF CRITERIA

The study does not exclude any modules or processes which are stated mandatory in the reference standard 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.

ALLOCATION, ESTIMATES AND ASSUMPTIONS

Allocation is required if some material, energy, and waste data cannot be measured separately for the product under investigation. In this study, as per the reference standard, allocation is conducted in the following order;

1. Allocation should be avoided.
2. Allocation should be based on physical properties (e.g., mass, volume) when the difference in revenue is small.
3. Allocation should be based on economic values.

Waste materials are generated in the production which is used as filling material for example in roads. A conservative assumption is made that all environmental impact is allocated to the products and not to the co-product (i.e. the filling material). The total amount of filling material is 0.011 ton per declared unit (1,1 %).

Allocation used in environmental data sources is aligned with the above.

AVERAGES AND VARIABILITY

This EPD is product and factory specific and does not contain average calculations.

LCA SOFTWARE AND BIBLIOGRAPHY

This EPD has been created using One Click LCA EPD Generator. The LCA and EPD have been prepared according to the reference standards and ISO 14040/14044. Ecoinvent and One Click LCA databases were used as sources of environmental data.

ENVIRONMENTAL IMPACT DATA

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP – total	kg CO_2e	1,31E2	3,12E0	2,93E0	1,37E2	2,46E1	1,13E1	-9,35E0	MND	MND	MND	MND	MND	MND	3,3E0	4,55E0	5,68E0	1,03E0	-4,99E0
GWP – fossil	kg CO_2e	1,29E2	3,11E0	5,51E0	1,38E2	2,5E1	8,68E0	-9,35E0	MND	MND	MND	MND	MND	MND	3,3E0	4,54E0	5,67E0	1,03E0	-6,18E0
GWP – biogenic	kg CO_2e	1,38E0	2,26E-3	-2,58E0	-1,19E0	-3,65E0	2,57E0	0E0	MND	MND	MND	MND	MND	MND	9,17E-4	3,3E-3	8,55E-3	2,04E-3	1,2E0
GWP – LULUC	kg CO_2e	6,05E-2	9,37E-4	1,82E-3	6,33E-2	2,11E-2	2,48E-3	0E0	MND	MND	MND	MND	MND	MND	2,79E-4	1,37E-3	1,35E-3	3,06E-4	-1,15E-2
Ozone depletion pot.	kg CFC_{-11}e	8,62E-6	7,32E-7	1,2E-6	1,05E-5	4,24E-6	1,32E-6	0E0	MND	MND	MND	MND	MND	MND	7,12E-7	1,07E-6	2,03E-6	4,24E-7	-7,02E-7
Acidification potential	mol H^+e	5,97E-1	1,31E-2	5,32E-2	6,64E-1	4,05E-1	6,84E-2	0E0	MND	MND	MND	MND	MND	MND	3,45E-2	1,91E-2	5,53E-2	9,78E-3	-4,78E-2
EP-freshwater[3)]	kg Pe	2,1E-3	2,53E-5	5,26E-5	2,17E-3	2,15E-3	1,07E-4	0E0	MND	MND	MND	MND	MND	MND	1,33E-5	3,7E-5	5,58E-5	1,24E-5	-4,9E-4
EP-marine	kg Ne	1,76E-1	3,94E-3	2,24E-2	2,02E-1	2,83E-1	2,67E-2	0E0	MND	MND	MND	MND	MND	MND	1,52E-2	5,75E-3	2,07E-2	3,37E-3	-1,04E-2
EP-terrestrial	mol Ne	2E0	4,35E-2	2,46E-1	2,29E0	1,79E0	2,93E-1	0E0	MND	MND	MND	MND	MND	MND	1,67E-1	6,35E-2	2,27E-1	3,71E-2	-1,44E-1
POCP (“smog”)	kg NMVOCe	5,29E-1	1,4E-2	7,26E-2	6,16E-1	2,64E-1	8,12E-2	0E0	MND	MND	MND	MND	MND	MND	4,59E-2	2,04E-2	6,48E-2	1,08E-2	-2,9E-2
ADP-minerals & metals	kg Sbe	8,79E-5	5,39E-5	3,19E-5	1,74E-4	1,15E-3	3,58E-4	0E0	MND	MND	MND	MND	MND	MND	5,03E-6	7,75E-5	3,98E-5	9,41E-6	-8,85E-4
ADP-fossil resources	MJ	6,42E2	4,91E1	8,19E1	7,73E2	3,15E2	1E2	0E0	MND	MND	MND	MND	MND	MND	4,54E1	7,07E1	1,36E2	2,88E1	-1,02E2
Water use[2)]	m^3e depr.	2,3E1	1,8E-1	2,36E-1	2,34E1	8,8E0	1,46E0	0E0	MND	MND	MND	MND	MND	MND	8,46E-2	2,63E-1	5,33E0	1,33E0	-1,41E1

ADDITIONAL (OPTIONAL) ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Particulate matter	Incidence	4,68E-6	2,82E-7	1,34E-6	6,31E-6	3,57E-6	1,54E-6	0E0	MND	MND	MND	MND	MND	MND	9,14E-7	4,11E-7	1,19E-6	1,9E-7	-5,15E-7
Ionizing radiation[5)]	kBq U235e	2,97E0	2,12E-1	3,41E-1	3,52E0	1,22E0	3,82E-1	0E0	MND	MND	MND	MND	MND	MND	1,94E-1	3,09E-1	5,62E-1	1,18E-1	-7,57E-1
Ecotoxicity (freshwater)	CTUe	1,64E3	3,7E1	5,71E1	1,74E3	5,65E2	1,1E2	0E0	MND	MND	MND	MND	MND	MND	2,66E1	5,4E1	8,49E1	1,82E1	-1,05E2
Human toxicity, cancer	CTUh	9,73E-8	9,47E-10	3,19E-9	1,01E-7	2,64E-8	2,83E-9	0E0	MND	MND	MND	MND	MND	MND	9,53E-10	1,38E-9	2,17E-9	4,3E-10	-7,04E-9
Human tox. non-cancer	CTUh	3,08E-6	4,39E-8	5,67E-8	3,18E-6	1,23E-6	9,32E-8	0E0	MND	MND	MND	MND	MND	MND	2,35E-8	6,4E-8	6,4E-8	1,33E-8	-5,06E-7
SQP	-	1,73E3	7,31E1	3,8E0	1,8E3	9,22E2	2,37E1	0E0	MND	MND	MND	MND	MND	MND	1,16E0	1,07E2	1,95E2	4,9E1	-7,68E1

USE OF NATURAL RESOURCES

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Renew. PER as energy	MJ	2,83E2	6,18E-1	5,34E2	8,18E2	2,49E2	2,27E0	0E0	MND	MND	MND	MND	MND	MND	2,45E-1	8,9E-1	1,04E0	2,33E-1	-3,35E1
Renew. PER as material	MJ	3,03E-1	0E0	2,26E1	2,29E1	0E0	0E0	0E0	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Total use of renew. PER	MJ	2,83E2	6,18E-1	5,57E2	8,41E2	2,49E2	2,27E0	0E0	MND	MND	MND	MND	MND	MND	2,45E-1	8,9E-1	1,04E0	2,33E-1	-3,35E1
Non-re. PER as energy	MJ	9,57E2	4,91E1	8,19E1	1,09E3	3,15E2	1E2	0E0	MND	MND	MND	MND	MND	MND	4,54E1	7,07E1	1,36E2	2,88E1	-1,02E2
Non-re. PER as material	MJ	4,07E0	0E0	0E0	4,07E0	0E0	0E0	0E0	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Total use of non-re. PER	MJ	9,61E2	4,91E1	8,19E1	1,09E3	3,15E2	1E2	0E0	MND	MND	MND	MND	MND	MND	4,54E1	7,07E1	1,36E2	2,88E1	-1,02E2
Secondary materials	kg	3,73E1	0E0	2,47E-3	3,73E1	0E0	9,72E-3	0E0	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	-8,98E-1
Renew. secondary fuels	MJ	8,89E1	0E0	0E0	8,89E1	0E0	0E0	0E0	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Non-ren. secondary fuels	MJ	1,31E2	0E0	0E0	1,31E2	0E0	0E0	0E0	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Use of net fresh water	m^3	2,14E0	1,02E-2	2,78E-2	2,18E0	1,11E0	5,88E-2	0E0	MND	MND	MND	MND	MND	MND	4,01E-3	1,47E-2	1,27E-1	3,15E-2	-1,13E0

6) PER = Primary energy resources

END OF LIFE – WASTE

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste	kg	1,99E-1	4,77E-2	1,63E-1	4,1E-1	1,12E0	3,08E-1	0E0	MND	MND	MND	MND	MND	MND	4,88E-2	6,87E-2	0E0	2,69E-2	-3,67E-1
Non-hazardous waste	kg	9,37E0	5,28E0	3,05E0	1,77E1	5,03E1	4,67E0	0E0	MND	MND	MND	MND	MND	MND	5,22E-1	7,6E0	0E0	1,96E2	-2,11E1
Radioactive waste	kg	3,38E-2	3,37E-4	5,4E-4	3,46E-2	1,72E-3	5,77E-4	0E0	MND	MND	MND	MND	MND	MND	3,18E-4	4,85E-4	0E0	1,91E-4	-5,47E-4

END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for re-use	kg	0E0	0E0	0E0	0E0	0E0	0E0	0E0	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Materials for recycling	kg	2,81E1	0E0	3,06E0	3,11E1	0E0	0E0	0E0	MND	MND	MND	MND	MND	MND	0E0	0E0	8,04E2	0E0	0E0
Materials for energy rec	kg	6,46E-2	0E0	0E0	6,46E-2	0E0	1,32E0	0E0	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Exported energy	MJ	3,85E-3	0E0	0E0	3,85E-3	0E0	0E0	0E0	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0

ENVIRONMENTAL IMPACTS – EN 15804+A1, CML

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Global Warming Pot.	kg CO_2e	1,32E2	3,13E0	5,45E0	1,41E2	2,46E1	8,58E0	-9,35E0	MND	MND	MND	MND	MND	MND	3,27E0	4,5E0	5,58E0	1,01E0	-6,1E0
Ozone depletion Pot.	kg CFC_{-11}e	3,76E-6	5,9E-7	9,54E-7	5,31E-6	3,72E-6	1,09E-6	0E0	MND	MND	MND	MND	MND	MND	5,63E-7	8,49E-7	1,6E-6	3,36E-7	-6,42E-7
Acidification	kg SO_2e	2,66E-1	6,43E-3	1,06E-2	2,83E-1	2,43E-1	1,98E-2	0E0	MND	MND	MND	MND	MND	MND	4,87E-3	9,25E-3	1,85E-2	4,08E-3	-2,82E-2
Eutrophication	kg PO_4^3e	5,91E-2	1,3E-3	2,48E-3	6,29E-2	1,49E-1	5,12E-3	0E0	MND	MND	MND	MND	MND	MND	8,57E-4	1,87E-3	3,54E-3	7,89E-4	-1,46E-2
POCP (“smog”)	kg C_2H_4e	2,12E-2	4,07E-4	9,52E-4	2,26E-2	5,02E-3	1,62E-3	0E0	MND	MND	MND	MND	MND	MND	5,01E-4	5,86E-4	1,43E-3	2,99E-4	-1,2E-3
ADP-elements	kg Sbe	8,79E-5	5,39E-5	3,19E-5	1,74E-4	1,15E-3	3,58E-4	0E0	MND	MND	MND	MND	MND	MND	5,03E-6	7,75E-5	3,98E-5	9,41E-6	-8,85E-4
ADP-fossil	MJ	6,42E2	4,91E1	8,19E1	7,73E2	3,15E2	1E2	0E0	MND	MND	MND	MND	MND	MND	4,54E1	7,07E1	1,36E2	2,88E1	-1,02E2

VERIFICATION STATEMENT

VERIFICATION PROCESS FOR THIS EPD

This EPD has been verified in accordance with ISO 14025 by an independent, third-party verifier by reviewing results, documents and compliancy with reference standard, ISO 14025 and ISO 14040/14044, following the process and checklists of the program operator for:

- This Environmental Product Declaration
- The Life-Cycle Assessment used in this EPD
- The digital background data for this EPD

Why does verification transparency matter? Read more online
This EPD has been generated by One Click LCA EPD generator, which has been verified and approved by the ED Hub.

THIRD-PARTY VERIFICATION STATEMENT

I hereby confirm that, following detailed examination, I have not established any relevant deviations by the studied Environmental Product Declaration (EPD), its LCA and project report, in terms of the data collected and used in the LCA calculations, the way the LCA-based calculations have been carried out, the presentation of environmental data in the EPD, and other additional environmental information, as present with respect to the procedural and methodological requirements in ISO 14025:2010 and reference standard.

I confirm that the company-specific data has been examined as regards plausibility and consistency; the declaration owner is responsible for its factual integrity and legal compliance.

I confirm that I have sufficient knowledge and experience of construction products, this specific product category, the construction industry, relevant standards, and the geographical area of the EPD to carry out this verification.

I confirm my independence in my role as verifier; I have not been involved in the execution of the LCA or in the development of the declaration and have no conflicts of interest regarding this verification.

Elma Avdyli, as authorized verifier acting for EPD HUB Limited 27.04.2022

VERIFIED ISO 14025