ENVIRONMENTAL PRODUCT DECLARATION

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

PRECAST CONCRETE INSULATED WALL ELEMENTS

EPD HUB, HUB-0895

Publishing date 24 November 2023, last updated date 24 November 2023, valid until 24 November 2028

Created with One Click LCA

GENERAL INFORMATION

MANUFACTURER

Manufacturer	Dzelzsbetons MB (DzMB); Daugavpils Dzelzsbetons (DDz)
Address	Cukura street 34, Liepaja, Latvia LV-3414 Rūpniecibas street 1a, Daugavpils, Latvia LV5404
Contact details	mbbetons@mbbetons.lv
Website	https://www.mbbetons.lv/en

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 modules C1-C4, D
EPD author	AS UPB, Dzintaru street 17, Liepaja, Latvia
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal certification ☑ External verification
EPD verifier	Haiha Nguyen, as an 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	precast concrete insulated wall element
Additional labels	-
Product reference	-
Place of production	Latvia, Liepaja and Daugavpils
Period for data	Calendar year 2022
Averaging in EPD	Multiple factories
Variation in GWP-fossil for A1-A3	3 %

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 ton
Declared unit mass	1000 kg
GWP-fossil, A1-A3 (kgCO2e)	1,49E+02
GWP-total, A1-A3 (kgCO2e)	1,49E+02
Secondary material, inputs (%)	6.06
Secondary material, outputs (%)	87.9
Total energy use, A1-A3 (kWh)	586.0
Total water use, A1-A3 (m3e)	1,09E+00

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

Prefabricated concrete production units of MB Betons group are based in Liepaja and Daugavpils. MB Betons group offers a full nomenclature of precast concrete and concrete in compliance with all European standards for the construction of buildings and infrastructure. MB Betons group is characterized by quality, flexibility and experience, as well as a high level of service and wide range of products. Advantages of prefabricated concrete include high strength, fire resistance, low costs and longevity and significantly reduced health and safety risks at the construction site. Furthermore, precast concrete can be easily used for the production of products of various shapes and configurations.
Quality and Environment Management system of the company is certified according to the requirements of the international standards ISO 9001 and ISO 14001. HSE processes are managed according to the requirements of the international standard ISO 45001.

PRODUCT DESCRIPTION

Precast insulated wall elements consist of two layers of concrete separated by an insulation layer.
Precast insulated wall elements are used in building construction. They can be either load-bearing or non-loadbearing elements of the building. Insulated wall elements can be used in residential as well as non-residential buildings. The increased building speed and minimised health and safety risks at the building site are just a few of the benefits of using precast concrete products when compared to in-situ construction methods.
For precast one-layer elements concrete with various different strength classes can be used, but the minimum concrete strength class is C30/37. The diameter of steel reinforcement used in one-layer precast concrete elements normally varies between 5 and 30 mm. However, it is not limited to these sizes as for certain projects the required adjustments can be made.
The insulation layer is typically made out of EPS or mineral-wool and can be up to 200 mm thick. Depending on the project the insulation material and thickness can be adjusted.
Product is produced in accordance with EN 206, EN 13369, EN 14992 standards. The quality of the products is ensured by taking regular quality control measures including, but not limited to the testing of raw materials, inspection of the manufacturing equipment and thorough inspection of the final product.
Physical properties of the product are dependent on the exact project requirements. The product is available in various sizes and thicknesses of the concrete layers as well as with varying thickness of the insulation layer.
U value 0.18 W/m2K.

MB Betons has two CO2 reduction strategies – emission reduction strategy B and emission reduction strategy C, with applicable coefficients to the results shown in this EPD of: 0.91 and 0.77.

More information about company strategies to preserving environment and reducing emissions, please see here.

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass- %	Material origin
Metals	4	Europe
Minerals	96	Latvia
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

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1 ton of precast concrete insulated wall element
Mass per declared unit	1000 kg
Functional unit	-
Reference service life	-

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		
x	x	x	x	x	MND	MND	MND	MND	MND	MND	MND	x	x	x	x	x		
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 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 prefabricated insulated wall element manufacturing begins with the preparation of the mould. This includes assembly of the mould depending on the element dimensions, cleaning of the mould and application of the form oil. The reinforcement and steel details are then put in place according to the technical element drawing. Wet concrete is then poured into the mould and vibrated into place, and surface finished. After casting, the wall is covered and cured. After curing it is then demoulded and moved out of the factory. Eventually, it is transported to the construction site.

Packaging does not include any biogenic carbon as product is only packaged using reusable tie down straps.

All materials are already optimized at the initial stage. In case of waste generation, prefabricated waste or other offcuts from factory are diverted to crushing operations and the coarse aggregates can be reused in other products, such as ready-mixed concrete or in the creation of roads, but steel waste are diverted to recycling. Automated cutting equipment is used in the cutting of reinforcement, thus reducing steel waste but steel waste is possible to recycle.

TRANSPORT AND INSTALLATION (A4-A5)

Transportation impacts occurred from final products delivery to construction sites (A4) cover fuel direct exhaust emissions, environmental impacts of fuel production, as well as related infrastructure emissions.

Transportation from the manufacturing plants to the building site has been calculated using a most likely scenario for the export of the declared unit to Sweden by a lorry and by a ferry. The average distance of transportation from both production plants to construction site is assumed as 270 km by ferry and 333 km by lorry. Scenario (A5) is modelled as installation of a typical concrete product in a building. Fossil fuel for building machinery and auxiliary materials (mortar, ready mixed concrete, reinforcement) are included.

PRODUCT USE AND MAINTENANCE (B1-B7)

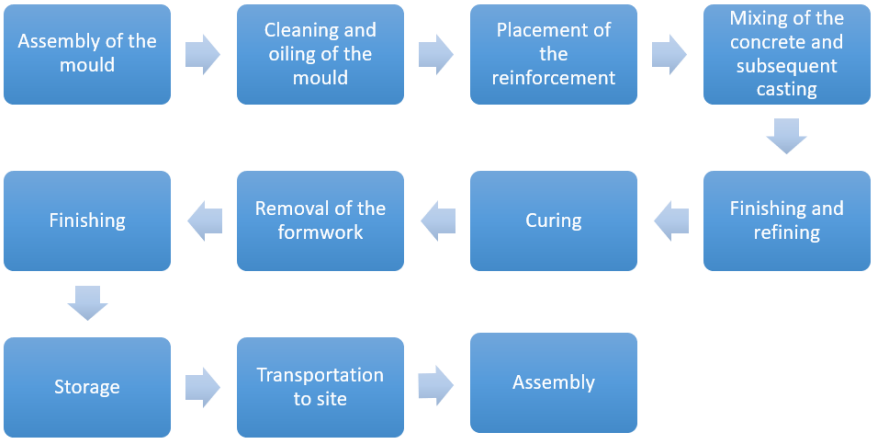
This EPD does not cover the use phase.

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 (C1). The dismantled concrete elements are delivered to the nearest construction waste treatment plant (C2). At the waste treatment plant waste that can be reused, recycled or recovered for energy is separated and diverted for further use (C3). Unusable materials are disposed of in a landfill (C4). Due to the recycling potential of reinforcement steel and concrete, they can be used as secondary raw material. 95 % of the steel and 80 % of the concrete are recycled, this avoids the use of virgin raw materials (World Steel Association. 2020, Betoniteollisuus ry,2020). Unusable materials are disposed in a landfill (C4). It is assumed that 20 % of concrete and 5 % of steel is disposed in a landfill. Due to the recycling potential of reinforcement steel, concrete, insulation they can be used as secondary raw materials. This avoids the use of the virgin raw materials (D).

MANUFACTURING PROCESS



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.

Packaging does not include any biogenic carbon as product is only packaged using reusable tie down straps.

The production of capital equipment, construction activities, and infrastructure, maintenance and operation of capital equipment, personnel-related activities, energy, and water use related to company management and sales activities are excluded.

Carbonation is not taken into account in the calculations. Carbonation is a natural process occurring when carbon dioxide is emitted during cement production is rebound to the concrete during the use and end of life stages of a building.

The modules B1-B7 have not been calculated nor included in the LCA calculations as that is not mandatory for this LCA report

ALLOCATION, ESTIMATES AND ASSUMPTIONS

Allocation is required if some material, energy, and waste data cannot be measured separately for the product under investigation. All allocations are done as per the reference standards and the applied PCR. In this study, allocation has been done in the following ways:

Data type	Allocation
Raw materials	No allocation
Packaging materials	Not applicable
Ancillary materials	Allocated by mass or volume
Manufacturing energy and waste	Allocated by mass or volume

AVERAGES AND VARIABILITY

Type of average	Multiple factories
Averaging method	Averaged by shares of total mass
Variation in GWP-fossil for A1-A3	3 %

The averaging of the data between both of the factories for similar products for modules A1-A3 is done by doing all of the calculations and data gathering for both factories separately and then averaging the obtained data depending on the proportion of the total output each factory has generated of each of the products over the period covered in this study. For all of the rest of the modules covered in this study, the product is assumed to be the same across both of the factories. For calculations in the module A4 the distance to the building site is assumed to be the average distance from both of the factories to the building site. The obtained results for both of the factories differ less than 3 % as the manufacturing processes, raw materials and technologies are similar across both of the factories.

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, PEF

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP – total[1)]	kg CO_2e	1,39E+02	5,86E+00	4,11E+00	1,49E+02*	2,54E+01	1,91E+01	MND	MND	MND	MND	MND	MND	MND	3,31E+00	4,97E+00	4,24E+00	1,24E+00	-5,91E+01
GWP – fossil	kg CO_2e	1,39E+02	5,86E+00	4,09E+00	1,49E+02	2,54E+01	1,91E+01	MND	MND	MND	MND	MND	MND	MND	3,31E+00	4,97E+00	4,24E+00	1,24E+00	-5,91E+01
GWP – biogenic	kg CO_2e	-2,24E-02	0,00E+00	2,24E-02	-1,51E-17	0,00E+00	0,00E+00	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
GWP – LULUC	kg CO_2e	5,28E-02	2,69E-03	2,09E-04	5,57E-02	1,34E-02	1,80E-02	MND	MND	MND	MND	MND	MND	MND	3,30E-04	1,87E-03	1,46E-03	1,10E-03	-1,76E-02
Ozone depletion pot.	kg CFC_{-11}e	4,68E-06	1,31E-06	6,11E-07	6,60E-06	5,64E-06	1,63E-06	MND	MND	MND	MND	MND	MND	MND	7,07E-07	1,24E-06	8,30E-07	4,80E-07	-3,77E-06
Acidification potential	mol H^+e	7,50E-01	2,26E-02	5,53E-03	7,78E-01	4,90E-01	9,87E-02	MND	MND	MND	MND	MND	MND	MND	3,44E-02	1,58E-02	4,60E-02	1,18E-02	-5,53E-01
EP-freshwater[2)]	kg Pe	3,72E-02	4,64E-05	7,19E-06	3,73E-02	1,29E-04	1,12E-04	MND	MND	MND	MND	MND	MND	MND	1,10E-05	3,55E-05	5,70E-05	1,22E-05	-2,01E-03
EP-marine	kg Ne	1,36E+00	6,34E-03	1,91E-03	1,37E+00	1,21E-01	3,39E-02	MND	MND	MND	MND	MND	MND	MND	1,52E-02	3,50E-03	1,79E-02	4,19E-03	-5,67E-02
EP-terrestrial	mol Ne	1,76E+00	6,99E-02	2,05E-02	1,85E+00	1,35E+00	3,78E-01	MND	MND	MND	MND	MND	MND	MND	1,67E-01	3,88E-02	1,97E-01	4,61E-02	-9,92E-01
POCP ("smog")[3)]	kg NMVOCe	5,22E-01	2,34E-02	6,40E-03	5,52E-01	3,60E-01	1,01E-01	MND	MND	MND	MND	MND	MND	MND	4,59E-02	1,53E-02	5,43E-02	1,33E-02	-3,03E-01
ADP-minerals & metals[4)]	kg Sbe	3,49E-04	1,79E-05	1,39E-06	3,69E-04	4,56E-05	2,06E-05	MND	MND	MND	MND	MND	MND	MND	1,68E-06	1,22E-05	1,17E-04	2,66E-06	-7,83E-04
ADP-fossil resources	MJ	8,98E+02	8,91E+01	6,76E+01	1,05E+03	3,59E+02	8,64E+01	MND	MND	MND	MND	MND	MND	MND	4,45E+01	7,95E+01	5,71E+01	3,24E+01	-7,15E+02
Water use[5)]	m^3e depr.	9,84E+03	4,46E-01	2,77E-01	9,84E+03	1,33E+00	4,44E+00	MND	MND	MND	MND	MND	MND	MND	1,20E-01	3,67E-01	3,47E-01	1,03E-01	-3,54E+01

1) GWP = Global Warming Potential; 2) EP = Eutrophication potential. Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO4e; 3) POCP = Photochemical ozone formation; 4) ADP = Abiotic depletion potential; 5) EN 15804+A2 disclaimer for Abiotic depletion and Water use and optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

*emission reduction strategies B and C with applicable coefficients: 0.91 and 0.77

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

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	6,47E-06	6,07E-07	1,48E-07	7,23E-06	1,77E-06	1,63E-06	MND	MND	MND	MND	MND	MND	MND	9,22E-07	5,77E-07	7,71E-06	2,45E-07	-3,19E-06
Ionizing radiation[6)]	kBq U235e	4,17E+00	4,67E-01	5,13E-02	4,68E+00	1,75E+00	7,10E-01	MND	MND	MND	MND	MND	MND	MND	2,05E-01	4,09E-01	3,38E-01	1,47E-01	-4,57E+00
Ecotoxicity (freshwater)	CTUe	1,01E+03	7,49E+01	6,69E+00	1,09E+03	2,62E+02	2,55E+02	MND	MND	MND	MND	MND	MND	MND	2,68E+01	6,61E+01	7,98E+01	2,11E+01	-1,36E+03
Human toxicity, cancer	CTUh	2,83E-07	2,48E-09	6,12E-10	2,86E-07	1,17E-08	5,42E-09	MND	MND	MND	MND	MND	MND	MND	1,03E-09	1,72E-09	2,66E-09	5,41E-10	-1,97E-07
Human tox. non-cancer	CTUh	7,86E-07	7,53E-08	5,72E-09	8,67E-07	2,25E-07	1,57E-07	MND	MND	MND	MND	MND	MND	MND	1,94E-08	6,72E-08	9,16E-08	1,39E-08	-8,34E-07
SQP[7)]	-	1,05E+03	8,51E+01	1,25E+00	1,14E+03	2,39E+02	1,24E+02	MND	MND	MND	MND	MND	MND	MND	5,79E+00	9,26E+01	2,92E+01	6,61E+01	-3,72E+02

6) EN 15804+A2 disclaimer for Ionizing radiation, human health. 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; 7) SQP = Land use related impacts/soil quality.

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[8)]	MJ	8,29E+02	1,34E+00	6,72E+01	8,97E+02	3,51E+00	1,40E+01	MND	MND	MND	MND	MND	MND	MND	2,54E-01	1,03E+00	2,31E+00	2,78E-01	-8,44E+01
Renew. PER as material	MJ	0,00E+00	0,00E+00	-1,32E+00	-1,32E+00	0,00E+00	0,00E+00	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of renew. PER	MJ	8,29E+02	1,34E+00	6,59E+01	8,96E+02	3,51E+00	1,40E+01	MND	MND	MND	MND	MND	MND	MND	2,54E-01	1,03E+00	2,31E+00	2,78E-01	-8,44E+01
Non-re. PER as energy	MJ	6,84E+02	8,91E+01	6,76E+01	8,41E+02	3,59E+02	1,45E+02	MND	MND	MND	MND	MND	MND	MND	4,45E+01	7,95E+01	5,71E+01	3,24E+01	-7,15E+02
Non-re. PER as material	MJ	0,00E+00	0,00E+00	-2,95E+00	-2,95E+00	0,00E+00	0,00E+00	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of non-re. PER	MJ	6,84E+02	8,91E+01	6,47E+01	8,38E+02	3,59E+02	1,45E+02	MND	MND	MND	MND	MND	MND	MND	4,45E+01	7,95E+01	5,71E+01	3,24E+01	-7,15E+02
Secondary materials	kg	6,06E+01	3,59E-02	8,46E-03	6,06E+01	1,24E-01	5,52E+00	MND	MND	MND	MND	MND	MND	MND	1,74E-02	2,24E-02	3,07E-02	7,15E-03	2,50E+00
Renew. secondary fuels	MJ	6,31E+01	2,83E-04	1,13E-05	6,31E+01	6,59E-04	1,20E-01	MND	MND	MND	MND	MND	MND	MND	5,70E-05	1,97E-04	7,28E-04	1,71E-04	-1,07E-02
Non-ren. secondary fuels	MJ	3,07E+02	0,00E+00	0,00E+00	3,07E+02	0,00E+00	1,32E+00	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water	m^3	1,07E+00	1,22E-02	6,94E-03	1,09E+00	3,49E-02	2,00E-01	MND	MND	MND	MND	MND	MND	MND	2,70E-03	1,05E-02	9,56E-03	3,38E-02	-8,19E-01

8) 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	5,37E+00	1,23E-01	3,15E-02	5,53E+00	4,17E-01	1,76E-01	MND	MND	MND	MND	MND	MND	MND	5,96E-02	8,52E-02	1,40E-01	2,57E-03	-5,29E+00
Non-hazardous waste	kg	3,05E+01	1,94E+00	3,07E-01	3,27E+01	5,24E+00	3,80E+00	MND	MND	MND	MND	MND	MND	MND	4,19E-01	1,48E+00	2,94E+00	2,11E+02	-7,97E+01
Radioactive waste	kg	4,12E-03	6,15E-04	5,90E-05	4,80E-03	2,51E-03	1,02E-03	MND	MND	MND	MND	MND	MND	MND	3,13E-04	5,48E-04	3,89E-04	1,34E-05	-1,49E-03

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	0,00E+00	0,00E+00	1,50E+01	1,50E+01	0,00E+00	0,00E+00	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for recycling	kg	6,00E+00	0,00E+00	1,10E+01	1,70E+01	0,00E+00	3,64E-01	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	9,31E+02	0,00E+00	0,00E+00
Materials for energy rec	kg	4,48E-02	0,00E+00	0,00E+00	4,48E-02	0,00E+00	2,20E-03	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy	MJ	2,84E-01	0,00E+00	0,00E+00	2,84E-01	0,00E+00	0,00E+00	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

ENVIRONMENTAL IMPACTS – EN 15804+A1, CML / ISO 21930

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	1,38E+02	5,72E+00	4,02E+00	1,48E+02	2,52E+01	1,83E+01	MND	MND	MND	MND	MND	MND	MND	3,27E+00	4,93E+00	4,19E+00	1,22E+00	-5,72E+01
Ozone depletion Pot.	kg CFC_{-11}e	3,94E-06	1,02E-06	5,33E-07	5,50E-06	4,47E-06	1,15E-06	MND	MND	MND	MND	MND	MND	MND	5,60E-07	9,82E-07	6,59E-07	3,80E-07	-3,74E-06
Acidification	kg SO_2e	4,39E-01	1,75E-02	4,21E-03	4,61E-01	3,92E-01	6,40E-02	MND	MND	MND	MND	MND	MND	MND	2,45E-02	1,29E-02	3,38E-02	8,85E-03	-4,46E-01
Eutrophication	kg PO_4^3e	8,76E-02	4,01E-03	9,16E-04	9,25E-02	4,71E-02	1,35E-02	MND	MND	MND	MND	MND	MND	MND	5,69E-03	2,72E-03	8,71E-03	1,92E-03	-1,19E-01
POCP (“smog”)	kg C_2H_4e	2,81E-02	7,59E-04	2,80E-04	2,91E-02	1,06E-02	2,13E-03	MND	MND	MND	MND	MND	MND	MND	5,36E-04	5,99E-04	8,80E-04	3,54E-04	-2,86E-02
ADP-elements	kg Sbe	4,93E-04	1,73E-05	1,31E-06	5,11E-04	4,45E-05	5,74E-05	MND	MND	MND	MND	MND	MND	MND	1,65E-06	1,18E-05	1,17E-04	2,62E-06	-7,66E-04
ADP-fossil	MJ	8,84E+02	8,78E+01	6,76E+01	1,04E+03	3,58E+02	1,36E+02	MND	MND	MND	MND	MND	MND	MND	4,45E+01	7,95E+01	5,71E+01	3,24E+01	-7,15E+02

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 EPD 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.

HaiHa Nguyen, as an authorized verifier acting for EPD Hub Limited
24.11.2023

VERIFIED ISO 14025