ENVIRONMENTAL PRODUCT DECLARATION

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

MasterFlow 9600

Master Builders Solutions Belgium nv

EPD HUB, EPDHUB-0178

Publishing date 11 November 2022, last updated date 11 November 2022, valid until 11 November 2027

Created with One Click LCA

GENERAL INFORMATION

MANUFACTURER

Manufacturer	Master Builders Solutions Belgium nv
Address	Nijverheidsweg 89, 3945 Ham, Belgium
Contact details	mbs-cc-be@mbcc-group.com
Website	https://www.master-builders-solutions.com

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, A5, and modules C1-C4 and D
EPD author	Annika Bantle - Master Builders Solutions Deutschland GmbH
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal certification ☑ External verification
EPD verifier	I.G, 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	MasterFlow 9600
Place of production	Ham, Belgium
Period for data	2021
Averaging in EPD	No averaging

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 kg
Declared unit mass	1 kg
GWP-fossil, A1-A3 (kgCO2e)	0.332
GWP-total, A1-A3 (kgCO2e)	0.338
Secondary material, inputs (%)	0.631
Secondary material, outputs (%)	0.0
Total energy use, A1-A3 (kWh)	0.544
Total water use, A1-A3 (m3e)	0.0127

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

The Master Builders Solutions brand brings all of our expertise together to create chemical solutions for new construction, maintenance, repair and renovation of structures. Master Builders Solutions is built on the experience gained from more than a century in the construction industry. The know-how and experience of a global community of construction experts form the core of Master Builders Solutions. We combine the right elements from our portfolio to solve your specific construction challenges. We collaborate across areas of expertise and regions and draw on the experience gained from countless construction projects worldwide. We leverage global technologies, as well as our in-depth knowledge of local building needs, to develop innovations that help make you more successful and drive sustainable construction. The comprehensive portfolio under the Master Builders Solutions brand encompasses concrete admixtures, cement additives, solutions for underground construction, waterproofing solutions, sealants, concrete repair & protection solutions, performance grouts, performance flooring and solutions for on- and offshore wind energy.

PRODUCT DESCRIPTION

MasterFlow 9600 is a shrinkage compensated grout which when mixed with water, produces a homogeneous, flowable and pumpable grout. Latest best binder packing models and applied cementitious nanotechnology produces a grout with superior technical performance, and exceptional rheological properties.

MasterFlow 9600 has been especially formulated for large scale, pump applications:

- Grouting of the non-structural parts of offshore wind turbine installations
- For use as high strength grout in offshore foundations like monopiles using bolted connections
- For skirt backfilling in offshore applications
- Grouting under very harsh conditions, e.g. at temperatures as low as 2°C.

Further information can be found at https://www.master-builders-solutions.com.

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass- %	Material origin
Metals	0	-
Minerals	98.26	EU & ASIA
Fossil materials	1.74	EU & ASIA
Bio-based materials	0	-

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 kg
Mass per declared unit	1 kg
Reference service life	25 years

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	MND	x	MND	MND	MND	MND	MND	MND	MND	x	x	MNR	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 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.

MasterFlow 9600 is the revolutionary offshore grout specially developed for use as volume stable skirt backfill for monopile foundations with bolted connections. The product is packed and transported by different bulk container types.

TRANSPORT AND INSTALLATION (A4-A5)

Transportation impacts occurred from final products delivery to the Port of Loading (PoL) and the offshore site (A4) are not considered.

The installation of MasterFlow 9600 is not considered (cut-off) in A5.
In Module A5, only the treatment of packaging waste is taken into consideration; losses, energy consumption and other sources are negligible.

PRODUCT USE AND MAINTENANCE (B1-B7)

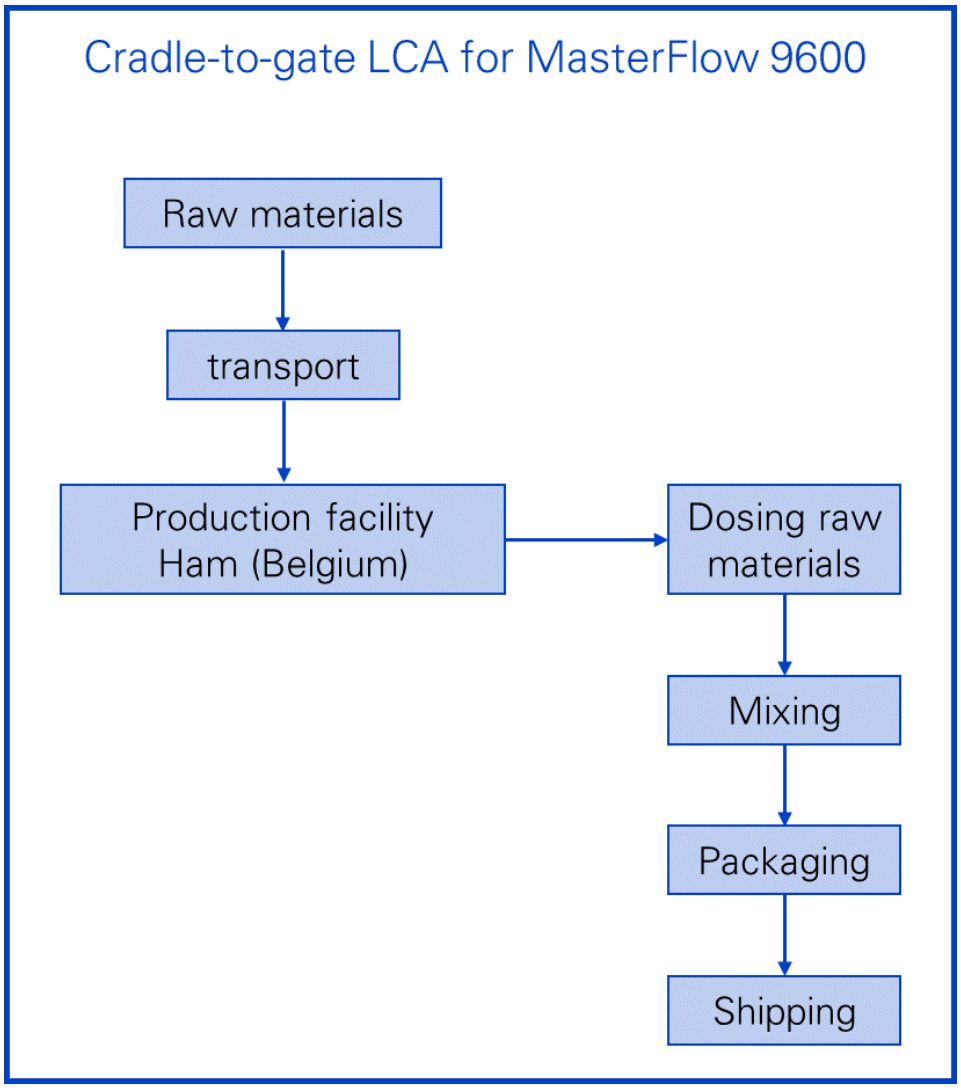
This EPD does not cover the use phase. Air, soil, and water impacts during the use phase have not been studied.

PRODUCT END OF LIFE (C1-C4, D)

The end-of-life modules (C1+C2) include deconstruction and dismantling as well as transport back to shore. The mineral waste is discharged as landfill following a worst-case approach in (C4).

The benefits and loads of recycled packaging are modelled and included beyond the system boundary (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.

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	No allocation
Ancillary materials	No allocation
Manufacturing energy and waste	Allocated by mass or volume

The following assumptions were made:

- 0% weight loss (Module A5) due to reuse of powder
- 100% of polyethylene waste is recycled (Module A5)
- Polypropylene waste is incinerated (Module A5)
- Consumed energy for demolition is based on: EUR 29123 EN Model for Life Cycle Assessment (LCA) of buildings (Module C1)
- Transport distance for the end-of-life is considered 50 km, based on the distance of off-shore wind farms to the coast (Module C2)
- The mineral waste is discharged as landfill following a worst-case approach (Module C4)

AVERAGES AND VARIABILITY

Type of average	No averaging
Averaging method	Not applicable
Variation in GWP-fossil for A1-A3	-

This EPD is for a specific product MasterFlow 9600 where no average data for the production of the product was collected or utilized.

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.
EUR 29123 EN Model for Life Cycle Assessment (LCA) of buildings.
EFCA Generic EPD for “Concrete admixture - plasticisers and superplasticizers” (EPD number: EPD-EFC-20210198-IBG1-EN).
Product-specific EPD for Aluminate cement, i.tech ALI CEM GREEN, Italcementi Group (2021) (EPD number: S-P-00404, rev. 2.2021).

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	3,19E-1	1,51E-2	3,48E-3	3,38E-1	MND	1,16E-4	MND	MND	MND	MND	MND	MND	MND	6,41E-3	3,8E-3	MNR	5,28E-3	8,6E-4
GWP – fossil	kg CO_2e	3,14E-1	1,51E-2	3,43E-3	3,32E-1	MND	1,16E-4	MND	MND	MND	MND	MND	MND	MND	6,41E-3	3,8E-3	MNR	5,27E-3	8,52E-4
GWP – biogenic	kg CO_2e	4,93E-3	9,06E-6	4,65E-5	4,98E-3	MND	-2,19E-7	MND	MND	MND	MND	MND	MND	MND	1,78E-6	1,17E-6	MNR	1,04E-5	8,24E-6
GWP – LULUC	kg CO_2e	6,05E-5	5,41E-6	7,48E-6	7,34E-5	MND	3,1E-8	MND	MND	MND	MND	MND	MND	MND	5,42E-7	1,56E-6	MNR	1,56E-6	1,7E-8
Ozone depletion pot.	kg CFC_{-11}e	1,39E-8	3,5E-9	7,72E-10	1,81E-8	MND	4,02E-12	MND	MND	MND	MND	MND	MND	MND	1,38E-9	8,19E-10	MNR	2,17E-9	-6,93E-12
Acidification potential	mol H^+e	7,86E-4	1,03E-4	7,03E-6	8,96E-4	MND	1,64E-7	MND	MND	MND	MND	MND	MND	MND	6,7E-5	2,39E-5	MNR	5E-5	-5,69E-7
EP-freshwater[2)]	kg Pe	6,4E-6	1,18E-7	9,04E-8	6,61E-6	MND	8,91E-10	MND	MND	MND	MND	MND	MND	MND	2,59E-8	3,56E-8	MNR	6,36E-8	-3,36E-10
EP-marine	kg Ne	2,02E-4	2,74E-5	1,7E-6	2,31E-4	MND	4,75E-8	MND	MND	MND	MND	MND	MND	MND	2,96E-5	6,34E-6	MNR	1,72E-5	-4,51E-8
EP-terrestrial	mol Ne	2,4E-3	3,04E-4	2,05E-5	2,72E-3	MND	5,16E-7	MND	MND	MND	MND	MND	MND	MND	3,25E-4	7,03E-5	MNR	1,9E-4	-5,6E-7
POCP ("smog")[3)]	kg NMVOCe	6,13E-4	9,12E-5	5,63E-6	7,1E-4	MND	1,66E-7	MND	MND	MND	MND	MND	MND	MND	8,93E-5	2,04E-5	MNR	5,51E-5	-5,82E-7
ADP-minerals & metals[4)]	kg Sbe	1,42E-6	2,45E-7	1,1E-8	1,68E-6	MND	6,69E-10	MND	MND	MND	MND	MND	MND	MND	9,79E-9	9,42E-8	MNR	4,81E-8	-1,19E-9
ADP-fossil resources	MJ	1,49E0	2,31E-1	1,39E-1	1,86E0	MND	5,33E-4	MND	MND	MND	MND	MND	MND	MND	8,82E-2	5,53E-2	MNR	1,47E-1	-9,41E-3
Water use[5)]	m^3e depr.	2,83E-2	8,34E-4	1,45E-3	3,06E-2	MND	1,14E-5	MND	MND	MND	MND	MND	MND	MND	1,65E-4	2,07E-4	MNR	6,81E-3	-1,81E-4

[1)] GWP = Global Warming Potential; [2)] EP = Eutrophication potential; [3)] POCP = Photochemical ozone formation; [4)] ADP = Abiotic depletion potential
For EP-freshwater, the required characterization method and data are in kg P-eq. Multiply by 3,07 to get PO4e
[4,5)] 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 experienced with the indicator

ADDITIONAL 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	4,25E-9	1,27E-9	3,9E-11	5,57E-9	MND	2,84E-12	MND	MND	MND	MND	MND	MND	MND	1,78E-9	2,49E-10	MNR	9,72E-10	-3,95E-12
Ionizing radiation[6)]	kBq U235e	5,79E-3	1,01E-3	1,65E-3	8,44E-3	MND	1,61E-6	MND	MND	MND	MND	MND	MND	MND	3,78E-4	2,31E-4	MNR	6,04E-4	1,69E-7
Ecotoxicity (freshwater)	CTUe	2,65E0	1,74E-1	4,07E-2	2,86E0	MND	6,01E-4	MND	MND	MND	MND	MND	MND	MND	5,18E-2	4,63E-2	MNR	9,29E-2	3,21E-4
Human toxicity, cancer	CTUh	4,98E-11	5,15E-12	7,08E-13	5,57E-11	MND	6,54E-14	MND	MND	MND	MND	MND	MND	MND	1,85E-12	1,37E-12	MNR	2,2E-12	3,91E-14
Human tox. non-cancer	CTUh	2,91E-9	2,02E-10	1,89E-11	3,13E-9	MND	9,01E-13	MND	MND	MND	MND	MND	MND	MND	4,56E-11	4,75E-11	MNR	6,79E-11	1,06E-12
SQP[7)]	-	2,24E0	3,19E-1	1,52E-3	2,56E0	MND	3,35E-4	MND	MND	MND	MND	MND	MND	MND	2,26E-3	4,22E-2	MNR	2,5E-1	3,22E-4

[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	9,62E-2	2,81E-3	1,11E-2	1,1E-1	MND	2,59E-5	MND	MND	MND	MND	MND	MND	MND	4,77E-4	6,04E-4	MNR	1,19E-3	-2,15E-5
Renew. PER as material	MJ	5,79E-4	0E0	0E0	5,79E-4	MND	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	MNR	-5,79E-4	0E0
Total use of renew. PER	MJ	9,68E-2	2,81E-3	1,11E-2	1,11E-1	MND	2,59E-5	MND	MND	MND	MND	MND	MND	MND	4,77E-4	6,04E-4	MNR	6,11E-4	-2,15E-5
Non-re. PER as energy	MJ	1,49E0	2,31E-1	1,31E-1	1,85E0	MND	5,33E-4	MND	MND	MND	MND	MND	MND	MND	8,82E-2	5,53E-2	MNR	1,47E-1	-2,66E-3
Non-re. PER as material	MJ	1,92E-2	0E0	8,55E-3	2,78E-2	MND	-8,55E-3	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	MNR	-1,92E-2	-1,36E-2
Total use of non-re. PER	MJ	1,51E0	2,31E-1	1,39E-1	1,88E0	MND	-8,02E-3	MND	MND	MND	MND	MND	MND	MND	8,82E-2	5,53E-2	MNR	1,28E-1	-1,63E-2
Secondary materials	kg	6,31E-3	0E0	0E0	6,31E-3	MND	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	MNR	0E0	1,4E-4
Renew. secondary fuels	MJ	0E0	0E0	0E0	0E0	MND	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	MNR	0E0	0E0
Non-ren. secondary fuels	MJ	0E0	0E0	0E0	0E0	MND	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	MNR	0E0	0E0
Use of net fresh water	m^3	7,07E-3	4,59E-5	5,59E-3	1,27E-2	MND	1,74E-7	MND	MND	MND	MND	MND	MND	MND	7,79E-6	9,26E-6	MNR	1,61E-4	-1,88E-7

[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	5,2E-3	2,32E-4	1,25E-4	5,56E-3	MND	3,25E-6	MND	MND	MND	MND	MND	MND	MND	9,49E-5	7,26E-5	MNR	1,37E-4	6,29E-6
Non-hazardous waste	kg	1,68E-1	2,3E-2	3,03E-3	1,94E-1	MND	1,07E-4	MND	MND	MND	MND	MND	MND	MND	1,01E-3	3,8E-3	MNR	1E0	3,7E-4
Radioactive waste	kg	8,72E-6	1,59E-6	1,12E-6	1,14E-5	MND	2,02E-9	MND	MND	MND	MND	MND	MND	MND	6,18E-7	3,67E-7	MNR	9,74E-7	2,75E-10

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	MND	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	MNR	0E0	0E0
Materials for recycling	kg	0E0	0E0	0E0	0E0	MND	1,43E-4	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	MNR	0E0	0E0
Materials for energy rec	kg	0E0	0E0	0E0	0E0	MND	2,6E-5	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	MNR	0E0	0E0
Exported energy	MJ	0E0	0E0	0E0	0E0	MND	1,25E-3	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	MNR	0E0	0E0

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	2,99E-1	1,5E-2	3,36E-3	3,17E-1	MND	1,14E-4	MND	MND	MND	MND	MND	MND	MND	6,36E-3	3,76E-3	MNR	5,17E-3	8,76E-4
Ozone depletion Pot.	kg $CFC_{-11}e$	1,36E-8	2,78E-9	9,52E-10	1,73E-8	MND	3,34E-12	MND	MND	MND	MND	MND	MND	MND	1,1E-9	6,5E-10	MNR	1,72E-9	-5,21E-12
Acidification	kg SO_2e	5,56E-4	6,46E-5	5,52E-6	6,26E-4	MND	1,04E-7	MND	MND	MND	MND	MND	MND	MND	9,46E-6	1,84E-5	MNR	2,08E-5	-5,28E-7
Eutrophication	kg PO_4^3e	1,76E-4	9,39E-6	2,83E-6	1,88E-4	MND	2,89E-7	MND	MND	MND	MND	MND	MND	MND	1,67E-6	3,23E-6	MNR	4,03E-6	1,17E-7
POCP (“smog”)	kg C_2H_4e	2,33E-5	2,78E-6	3,52E-7	2,64E-5	MND	1,08E-8	MND	MND	MND	MND	MND	MND	MND	9,74E-7	6,72E-7	MNR	1,53E-6	-7,03E-8
ADP-elements	kg Sbe	1,42E-6	2,45E-7	1,1E-8	1,68E-6	MND	6,69E-10	MND	MND	MND	MND	MND	MND	MND	9,79E-9	9,42E-8	MNR	4,81E-8	-1,19E-9
ADP-fossil	MJ	1,49E0	2,31E-1	1,39E-1	1,86E0	MND	5,33E-4	MND	MND	MND	MND	MND	MND	MND	8,82E-2	5,53E-2	MNR	1,47E-1	-9,41E-3

ENVIRONMENTAL IMPACTS – TRACI 2.1. / 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	2,99E-1	1,5E-2	3,37E-3	3,17E-1	MND	1,14E-4	MND	MND	MND	MND	MND	MND	MND	6,33E-3	3,76E-3	MNR	5,14E-3	8,73E-4
Ozone Depletion	kg $CFC_{-11}e$	1,46E-8	3,7E-9	1,07E-9	1,94E-8	MND	4,39E-12	MND	MND	MND	MND	MND	MND	MND	1,46E-9	8,66E-10	MNR	2,29E-9	-7,2E-12
Acidification	kg SO_2e	6,4E-4	8,81E-5	5,92E-6	7,34E-4	MND	1,46E-7	MND	MND	MND	MND	MND	MND	MND	6,15E-5	2,06E-5	MNR	4,43E-5	-4,52E-7
Eutrophication	kg Ne	8,59E-5	8,64E-6	1,41E-6	9,6E-5	MND	2,16E-8	MND	MND	MND	MND	MND	MND	MND	5,42E-6	2,09E-6	MNR	5,31E-6	3,18E-8
POCP (“smog”)	kg O_3e	1,24E-2	1,74E-3	1,02E-4	1,43E-2	MND	2,93E-6	MND	MND	MND	MND	MND	MND	MND	1,88E-3	4,02E-4	MNR	1,09E-3	-3,59E-6
ADP-fossil	MJ	1,18E-1	3,31E-2	6,4E-3	1,57E-1	MND	6,61E-5	MND	MND	MND	MND	MND	MND	MND	1,3E-2	7,81E-3	MNR	2,13E-2	-1,44E-3

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.

Ipek Goktas, as an authorized verifier acting for EPD Hub Limited
11.11.2022