ENVIRONMENTAL PRODUCT DECLARATION

B-EPD .BE

025.0308.002-01.00.00

DIAMUR Masonry mortars

1575N & 185N

DIAMUR

ISSUED 20.08.2025
VALID UNTIL 20.08.2030

THIRD PARTY VERIFIED
Compliant with EN 15804+A2 standard
and B-EPD-PCR version 18.10.2022

FUNCTIONNAL UNIT AND MODULES DECLARED
Reference unit: 1 kg of masonry mortar, as installed, distributed in Belgium

A123	A4	A5	B	C	D
•	•	•		•	•

The intended use of this EPD is to communicate scientifically based environmental information for construction products, for the purpose of assessing the environmental performance of buildings. This EPD is only valid when registered on www.b-epd.be. The FPS Public Health cannot be held responsible for the information provided by the owner of the EPD.

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1 PRODUCTS DESCRIPTION

1.1 Products name

Masonry mortar 1575N (M15)
Masonry mortar 185N (M20)

1.2 Products description and intended use

Diamur's masonry mortars, including 1575N (M15 strength class) and 185N (M20 strength class), are pre-mixed industrial blends composed of dried and sieved sand, binders with cement as the primary component, and specific aggregates that enhance workability, water retention, and adhesion. These mortars meet NBN EN 998-2 standards for general masonry applications and bear both BENOR and CE quality marks.

Diamur's masonry mortars are classified as mixtures.

This EPD applies to an average of the 1575N and 185N mortars, produced by Diamur, a company specializing in mortars, cement, and concrete products.

These mortars are formulated for masonry applications with various types of bricks and blocks, providing reliable performance in adhesion and durability for professional construction use.

1.3 Declared unit

1 kg of masonry mortar, as installed, distributed in Belgium. The densities of the products are ± 1940 (1575N) and ± 1980 (185N) kg/m^3.

1.4 Installation

FOR AS INSTALLED:

On-site, the Diamur masonry mortar is mixed with water following specified ratios and applied directly to bricks or blocks. The installation process uses standard construction tools, such as a handheld mixer, to achieve a smooth and workable consistency, ensuring optimal adhesion and coverage. The mortar provides a stable base for masonry applications, requiring no additional fixing materials. Detailed installation guidelines are available in the “Underlying Scenario Data” section”.

1.5 Composition and content

Components	Composition / content / ingredients	Quantity
Product	– Binders – Mineral fillers – Aggregates – Additives	– 15-20% – 5-15% – 65-80% – 0-3%
Fixation materials	– None – None	
Jointing materials	– None – None	
Treatments	– None	
Packaging	– None	

The product does not contain materials listed in the "Candidate list of Substances of Very High Concern for authorization".

1.6 Reference service life

Since the use phase is not considered, the reference service life (RSL) as per ISO 15686-1, -2, -7 and -8 has not been declared.

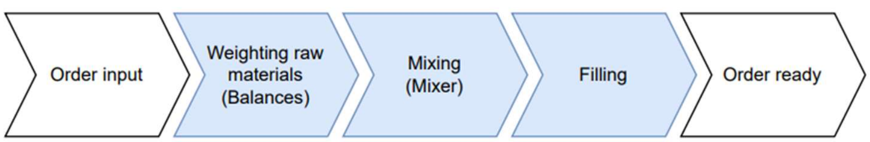
1.7 Description of geographical representativity

The 1575N and 185N masonry mortars are produced in Belgium. The end-of-life (C) and benefits (D) stages in this LCA reflect typical practices within Belgium, ensuring alignment with regional practices and standards. This study maintains consistency across temporal, geographic, and technological representativity, tailored specifically for the Belgian market.

1.8 Description of the production process and technology

This flowchart illustrates the production process for masonry mortars, from raw material preparation to final storage:

- Raw materials: the raw materials are precisely weighed to ensure correct proportions. The sea sand is dried.
- Mixing: The weighed materials are thoroughly combined in a mixer to achieve a consistent mortar blend.
- Silo filling: The mixed mortar is directly transferred into silos for bulk storage.



2 TECHNICAL DATA / PHYSICAL CHARACTERISTICS

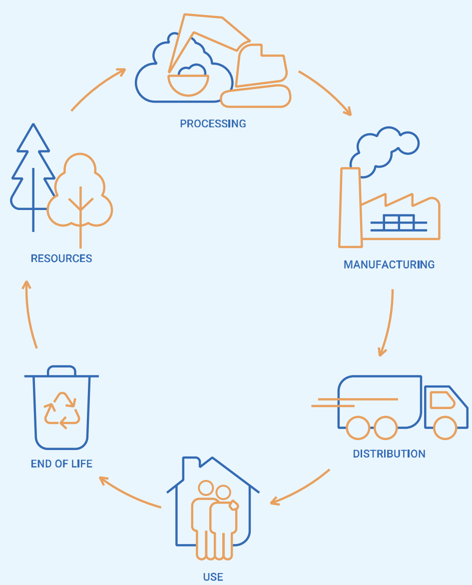
Technical property	Standard	1575N Value	185N Value	Unit
Dry Mortar Properties				
Maximum Dimension	NBN-EN 1015-1	± 4	± 4	mm
Plastic Phase Mortar Properties				
Chloride Content	NBN-EN 1015-17	< 0.1	< 0.1	% (m/m)
Water Demand	PTV 651	± 14	± 15	%
Water Retention	NBN-EN 1015-6	≥ 90	≥ 90	%
Spread	NBN-EN 1015-3	± 175	± 175	mm
Bulk Density	NBN-EN 1015-6	± 1940	± 1980	kg/m³
Air Content	NBN-EN 1015-7	± 10	± 10	%
Workability	NBN-EN 1015-9	± 3 (at 20°C)	± 3 (at 20°C)	hours
Yield (Liters of wet mortar per kg of dry mortar)		≥ 605	≥ 600	L/ton
Hardened Mortar Properties				
Strength Class	NBN-EN 1015-11	M15	M20	
Compressive Strength	NBN-EN 1015-11	± 20	± 25	N/mm²
Bulk Density	NBN-EN 1015-10	Not determined	Not determined	
Shear Adhesion Strength	NBN-EN 1052-3	≥ 0.15	≥ 0.15	MPa
Vertical Masonry Adhesion Strength	NBN B14-221, cross specimen	Not determined	Not determined	
Water Absorption	NBN-EN 1015-18	Not determined	Not determined	
Fire Reaction	NBN-EN 998-2	Class Euro A1	Class Euro A1	
Water Vapor Permeability	NBN EN 1745	15/35	15/35	
Thermal Conductivity	NBN EN 1745	$\lambda_{10, sec} < 0.82$ (P=50)	$\lambda_{10, sec} < 0.90$ (P=50)	W/(m·K)
		$\lambda_{10, sec} < 0.89$ (P=90)	$\lambda_{10, sec} < 0.98$ (P=90)	W/(m·K)

The performance of these products is covered by the Declaration of Performance DIAMUR-0027, and DIAMUR-0043 in accordance with EN 998-2 and the Construction Products Regulation (EU) No 305/2011.

3 LCA-STUDY

3.1 Date of LCA-study

February 2025



3.2 Software

For the calculation of the LCA results, the software program One Click LCA V3 has been used.

3.3 Information on allocation

In this study, as per EN 15804+A2, 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.

Electricity allocation at DIAMUR's plant was based on the mass of the products, with an adjustment for packed goods, which require 30% more electricity than bulk goods. The end-of-life scenario follows the B-EPD guidelines, where credits are assigned for recycling.

3.4 Information on cut off

The cut-off criteria applied in this study specify that any inputs or outputs contributing less than 1% of total mass, energy, or environmental impact may be excluded, with a cumulative exclusion threshold of 5%. Minor components were excluded based on these criteria. Exclusions are justified on the basis that these elements are unlikely to significantly influence the overall LCA results.

3.5 Information on excluded processes

The following processes were excluded from the inventory:
– lighting, heating, and cleaning of production sites
– the administrative department
– employee transport
– manufacturing of production tools and transport systems (where not directly involved in the lifecycle inventory)
– infrastructure related to foreground processes (capital goods and infrastructure are included for background datasets)
– long-term emissions

3.6 Information on biogenic carbon modelling

The biogenic carbon content of the material is calculated using the following formula: (WM = wet matter, DM = dry matter)
kg C = material mass (kg WM) x DM content x C content of DM (kg C/kg DM)

No biogenic carbon content is declared.

FOR EN 15804+A2 INCLUDE FOLLOWING TABLE:

Biogenic carbon content	(kg C / FU)
Biogenic carbon content in product (at the gate)	0
Biogenic carbon content in accompanying packaging (at the gate)	0

3.7 Information on carbon offsetting

Carbon offsetting is not allowed in EN 15804 +A2:2019 and hence not taken into account in the calculations. DIAMUR does not participate in carbon offsetting.

3.8 Information on carbonation of cementitious materials

Carbonation is a natural process that occurs during the use phase of cementitious materials, where the product reacts with carbon dioxide (CO_2) from the atmosphere. This reaction forms calcium carbonate, which can enhance the material's durability over time. However, the installed product is not in contact with the atmosphere. Consequently, carbonation impacts are not considered in the environmental calculations for this study.

3.9 Additional or deviating characterisation factors

For the EN 15804+A2 standard, the CML-IA version 4.1 characterization factors were applied. The study does not consider long-term emissions (i.e., over 100 years).

All characterization factors comply with the EN 15804 +A2:2019 and BE-EPD PCR, − which stipulates that when infrastructure data is available as generic data (e.g. ecoinvent) used for upstream or downstream processes, it must be included (A17); − the long-term effects of emissions are excluded (A22).

3.10 Description of the variability

For Diamur mortars 1575N (M15) and 185N (M20), the variability analysis confirms that the environmental impacts of these products can be represented together within a single average EPD, as follows

- Range of variability of the LCIA: Across key impact categories—Climate Change, Acidification, and Resource Use (Fossils)—the individual results for M15 and M20 vary minimally from the M15/M20 average. For instance, in Climate Change, M15 is 4% below the average, while M20 is 14% above, both remaining well within the ±20% maximum threshold advised by B-EPD for grouping products in one EPD.

- Qualitative differences: Both mortars share a similar composition, primarily cement-based, but differ slightly in specific raw material proportions, which influences the impact variation. Despite these small compositional differences, both products follow identical production processes, ensuring consistency in environmental performance.

- Product range: This EPD covers the two products, Diamur Masonry Mortar 1575N (M15) and Diamur Masonry Mortar 185N (M20), based on their technical similarity and stable environmental performance as demonstrated in the variability analysis.

– Influencing parameters: The primary factor affecting variability is the proportion of cement, which significantly drives the environmental impacts across the LCA stages, particularly in raw material extraction and production (Module A1).

3.11 Specificity

The data used for the LCA are specific for these products which are manufactured by a single manufacturer in a single production site.

3.12 Period of data collection

Manufacturer specific data have been collected for the year 2023.

3.13 Information on data collection

For data collection, primary data on material and energy consumption, origin, and transport distances for raw materials were provided directly by DIAMUR to reflect real operational conditions. These primary data points were then integrated with standard datasets from the databases in line with B-EPD guidelines.

As this EPD covers two products, Masonry Mortar 1575N (M15) and Masonry Mortar 185N (M20), a weighted average based on production volumes was used to derive the declared values.

3.14 Database used for background data

For background data, the database used is ecoinvent 3.10.1 These databases provide standardized and geographically relevant information to model environmental impacts in accordance with B-EPD guidelines, supporting consistent and reliable background processes across the LCA stages.

3.15 Energy mix

The electricity residual mix is based on ecoinvent 3.10.1 data, reflecting the shares of electricity technologies for the year 2023. Gas for sand drying is also modeled using ecoinvent 3.10.1 market data for district or industrial heat in Belgium in 2023.

4 PRODUCTION SITES

The DIAMUR production site is a single location, situated at Zwarteweg 47 - Kade 367, BE 2030 Antwerp (Belgium).

5 SYSTEM BOUNDARIES

Product stage			Construction installation stage		Use stage							End of life stage				Beyond the system boundaries
Raw materials	Transport	Manufacturing	Transport	Construction installation stage	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 = included in the EPD
☐ = module not declared

The system boundaries for this EPD are defined as cradle-to-gate with options, covering modules A4-A5, C1-C4, and module D.

- A1-A3 (Product stage): This stage covers the extraction and processing of raw materials (A1), the transportation of these materials to the manufacturing site (A2), and the manufacturing processes of both the mortar and its packaging (A3).
- A4-A5 (Installation Stage): This module addresses the impacts associated with the installation of the mortar on-site.
- C1-C4 (End-of-Life Stage): This stage addresses the end-of-life processes of the product, including deconstruction and demolition (C1), transportation of waste materials (C2), waste processing for recycling (C3), and final disposal (C4).
- D (Benefits and Loads Beyond the System Boundary): Module D accounts for the potential benefits and impacts associated with the reuse, recycling, and recovery of materials beyond the product's life cycle.

The use phase is excluded, as carbonation is expected to have minimal impact due to the limited exposure to air of the adhesive once applied (as it acts as a binder between bricks).

6 POTENTIAL ENVIRONMENTAL IMPACTS PER REFERENCE FLOW

	Production			Construction process stage		Use stage							End-of-life stage				
	A1 Raw material	A2 Transport	A3 manufacturing	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	D Reuse, recovery, recycling
GWP total (kg CO2 equiv/FU)	7,51E-02	6,83E-03	3,88E-02	1,89E-02	1,57E-02	MND	MND	MND	MND	MND	MND	MND	2,05E-03	6,38E-03	9,21E-04	5,11E-04	-3,79E-03
GWP fossil (kg CO2 equiv/FU)	7,51E-02	6,83E-03	3,88E-02	1,89E-02	1,57E-02	MND	MND	MND	MND	MND	MND	MND	2,05E-03	6,38E-03	9,19E-04	5,10E-04	-3,78E-03
GWP biogenic (kg CO2 equiv/FU)	0,00E+00	0,00E+00	0,00E+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
GWP luluc (kg CO2 equiv/FU)	3,22E-05	5,75E-06	7,82E-06	6,74E-06	8,37E-06	MND	MND	MND	MND	MND	MND	MND	5,49E-06	2,25E-06	2,46E-06	1,41E-07	-2,46E-06
ODP (kg CFC 11 equiv/FU)	6,09E-10	1,21E-10	1,17E-09	3,77E-10	2,86E-10	MND	MND	MND	MND	MND	MND	MND	8,75E-11	1,27E-10	3,93E-11	1,60E-11	-4,74E-11
AP (mol H+ eq/FU)	2,20E-04	4,76E-05	5,48E-05	5,94E-05	4,42E-05	MND	MND	MND	MND	MND	MND	MND	6,52E-06	1,99E-05	2,93E-06	5,63E-06	-3,02E-05
EP - freshwater (kg (PO4)3- equiv/FU)	9,50E-06	5,47E-07	3,38E-06	1,26E-06	1,85E-06	MND	MND	MND	MND	MND	MND	MND	4,52E-07	4,23E-07	2,03E-07	8,57E-07	-7,25E-07
EP - marine (kg N- equiv/FU)	5,42E-05	2,08E-05	1,15E-05	2,00E-05	1,22E-05	MND	MND	MND	MND	MND	MND	MND	1,36E-06	6,72E-06	6,09E-07	1,40E-06	-8,92E-06
EP - terrestrial (mol N- equiv/FU)	6,06E-04	2,28E-04	1,20E-04	2,18E-04	1,33E-04	MND	MND	MND	MND	MND	MND	MND	1,39E-05	7,31E-05	6,23E-06	1,51E-05	-1,20E-04
POCP (kg Ethene equiv/FU)	1,79E-04	6,80E-05	1,90E-04	9,36E-05	5,89E-05	MND	MND	MND	MND	MND	MND	MND	4,39E-06	3,13E-05	1,97E-06	5,52E-06	-3,00E-05
ADP Elements (kg Sb equiv/FU)	2,43E-07	1,28E-08	1,26E-07	6,05E-08	7,06E-08	MND	MND	MND	MND	MND	MND	MND	4,71E-08	2,09E-08	2,11E-08	1,00E-09	-5,29E-08
ADP fossil fuels (MJ/FU)	4,67E-01	8,80E-02	6,52E-01	2,67E-01	1,99E-01	MND	MND	MND	MND	MND	MND	MND	8,09E-02	8,95E-02	3,63E-02	1,19E-02	-5,44E-02
WDP (m³ water eq deprived /FU)	1,13E-02	5,21E-04	3,68E-03	1,32E-03	2,24E-03	MND	MND	MND	MND	MND	MND	MND	9,54E-04	4,40E-04	4,28E-04	7,18E-05	-1,66E-02

GWP TOTAL = TOTAL GLOBAL WARMING POTENTIAL (CLIMATE CHANGE); GWP-LULUC = GLOBAL WARMING POTENTIAL (CLIMATE CHANGE) LAND USE AND LAND USE CHANGE; ODP = OZONE DEPLETION POTENTIAL; AP = ACIDIFICATION POTENTIAL FOR SOIL AND WATER; EP = EUTROPHICATION POTENTIAL; POCP = PHOTOCHEMICAL OZONE CREATION; ADPE = ABIOTIC DEPLETION POTENTIAL – ELEMENTS; ADPF = ABIOTIC DEPLETION POTENTIAL – FOSSIL FUELS; WDP = WATER USE (WATER (USER) DEPRIVATION POTENTIAL, DEPRIVATION-WEIGHTED WATER CONSUMPTION), MND = NODULE NON DECLARED

7 RESOURCE USE

	Production			Construction process stage		Use stage							End-of-life stage				
	A1 Raw material	A2 Transport	A3 manufacturing	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	D Reuse, recovery, recycling
PERE (MJ/FU, net calorific value)	4,94E-02	2,24E-03	1,74E-02	4,58E-03	1,52E-02	MND	MND	MND	MND	MND	MND	MND	1,48E-02	1,55E-03	6,65E-03	2,50E-04	-1,83E-02
PERM (MJ/FU, net calorific value)	0,00E+00	0,00E+00	0,00E+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
PERT (MJ/FU, net calorific value)	4,94E-02	2,24E-03	1,74E-02	4,58E-03	1,52E-02	MND	MND	MND	MND	MND	MND	MND	1,48E-02	1,55E-03	6,65E-03	2,50E-04	-1,83E-02
PENRE (MJ/FU, net calorific value)	4,72E-01	8,80E-02	2,78E-01	2,67E-01	1,62E-01	MND	MND	MND	MND	MND	MND	MND	8,09E-02	8,96E-02	3,63E-02	1,19E-02	-5,44E-02
PENRM (MJ/FU, net calorific value)	0,00E+00	0,00E+00	0,00E+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
PENRT (MJ/FU, net calorific value)	4,72E-01	8,80E-02	2,78E-01	2,67E-01	1,62E-01	MND	MND	MND	MND	MND	MND	MND	8,09E-02	8,96E-02	3,63E-02	1,19E-02	-5,44E-02
SM (kg/FU)	1,35E-04	5,64E-05	1,06E-04	1,21E-04	5,48E-05	MND	MND	MND	MND	MND	MND	MND	1,15E-05	4,10E-05	5,16E-06	3,95E-06	-1,38E-04
RSF (MJ/FU, net calorific value)	1,98E-06	2,63E-07	4,31E-06	1,53E-06	9,27E-07	MND	MND	MND	MND	MND	MND	MND	1,21E-07	5,18E-07	5,43E-08	7,14E-08	-9,73E-07
NRSF (MJ/FU, net calorific value)	0,00E+00	0,00E+00	0,00E+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
FW (m^3 water eq/FU)	1,29E-03	1,56E-05	1,01E-04	3,64E-05	2,85E-04	MND	MND	MND	MND	MND	MND	MND	2,63E-05	1,21E-05	1,18E-05	-1,44E-04	-3,87E-04

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 = NET USE OF FRESH WATER, MND = MODULE NON DECLARED

8 WASTE CATEGORIES & OUTPUT FLOWS

	Production			Construction process stage		Use stage							End-of-life stage				
	A1 Raw material	A2 Transport	A3 manufacturing	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	D Reuse, recovery, recycling
Hazardous waste disposed (kg/FU)	1,72E-03	1,63E-04	6,49E-04	3,83E-04	3,50E-04	MND	MND	MND	MND	MND	MND	MND	7,69E-05	1,28E-04	3,45E-05	2,00E-05	-3,62E-04
Non-hazardous waste disposed (kg/FU)	5,68E-02	3,45E-03	1,44E-02	8,03E-03	2,93E-02	MND	MND	MND	MND	MND	MND	MND	2,34E-03	2,71E-03	1,05E-03	1,82E-01	-5,84E-03
Radioactive waste disposed (kg/FU)	3,70E-06	5,10E-08	1,18E-06	8,40E-08	8,85E-07	MND	MND	MND	MND	MND	MND	MND	7,34E-07	2,84E-08	3,30E-07	3,88E-09	-1,81E-07
Components for re-use (kg/FU)	0,00E+00	0,00E+00	0,00E+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
Materials for recycling (kg/FU)	0,00E+00	0,00E+00	0,00E+00	0,00E+00	9,50E-02	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	9,60E-01	0,00E+00	0,00E+00
Materials for energy recovery (kg/FU)	0,00E+00	0,00E+00	0,00E+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
Exported energy (MJ/FU)	0,00E+00	0,00E+00	0,00E+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

9 IMPACT CATEGORIES ADDITIONAL TO EN 15804

	Production			Construction process stage		Use stage							End-of-life stage				
	A1 Raw material	A2 Transport	A3 manufacturing	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	D Reuse, recovery, recycling
PM (disease incidence)	2,10E-09	2,86E-10	5,03E-10	1,54E-09	5,26E-10	MND	MND	MND	MND	MND	MND	MND	4,89E-11	5,01E-10	2,19E-11	8,56E-11	-6,84E-10
IRHH (kg U235 eq/FU)	4,04E-03	2,01E-04	4,93E-03	3,38E-04	2,53E-03	MND	MND	MND	MND	MND	MND	MND	3,03E-03	1,14E-04	1,36E-03	1,58E-05	-7,90E-04
ETF (CTUe/FU)	2,27E-01	9,42E-03	4,10E-02	3,46E-02	3,68E-02	MND	MND	MND	MND	MND	MND	MND	6,94E-03	1,18E-02	3,12E-03	7,94E-03	-1,50E-02
HTCE (CTUh/FU)	2,36E-11	1,01E-12	5,51E-12	3,21E-12	3,93E-12	MND	MND	MND	MND	MND	MND	MND	8,13E-13	1,09E-12	3,65E-13	2,20E-13	-2,00E-12
HTnCE (CTUh/FU)	5,71E-10	3,36E-11	1,64E-10	1,68E-10	1,24E-10	MND	MND	MND	MND	MND	MND	MND	4,14E-11	5,62E-11	1,86E-11	1,42E-11	-4,87E-11
Land Use Related impacts (dimensionless)	2,00E-01	6,20E-02	4,97E-02	1,75E-01	6,61E-02	MND	MND	MND	MND	MND	MND	MND	1,84E-02	5,33E-02	8,25E-03	2,92E-02	-1,13E-01

HTCE = HUMAN TOXICITY – CANCER EFFECTS; HTNCE = HUMAN TOXICITY – NON CANCER EFFECTS; ETF = ECOTOXICITY – FRESHWATER; (POTENTIAL COMPARATIVE TOXIC UNIT)
PM = PARTICULATE MATTER (POTENTIAL INCIDENCE OF DISEASE DUE TO PM EMISSIONS);
IRHH = IONIZING RADIATION – HUMAN HEALTH EFFECTS (POTENTIAL HUMAN EXPOSURE EFFICIENCY RELATIVE TO U235);

9.1 Environmental impact categories explained

Global Warming Potential

The global warming potential of a gas refers to the total contribution to global warming resulting from the emission of one unit of that gas relative to one unit of the reference gas, carbon dioxide, which is assigned a value of 1.

It is split up in 4:

- Global Warming Potential total (GWP-total) which is the sum of GWP-fossil, GWP-biogenic and GWP-luluc
- Global Warming Potential fossil fuels (GWP-fossil) : The global warming potential related to greenhouse gas (GHG) emissions to any media originating from the oxidation and/or reduction of fossil fuels by means of their transformation or degradation (e.g. combustion, digestion, landfilling, etc).
- Global Warming Potential biogenic (GWP-biogenic) : The global warming potential related to carbon emissions to air (CO2, CO and CH4) originating from the oxidation and/or reduction of aboveground biomass by means of its transformation or degradation (e.g. combustion, digestion, composting, landfilling) and CO2 uptake from the atmosphere through photosynthesis during biomass growth - i.e. corresponding to the carbon content of products, biofuels or above ground plant residues such as litter and dead wood.
- Global Warming Potential land use and land use change (GWP-luluc): The global warming potential related to carbon uptakes and emissions (CO2, CO and CH4) originating from carbon stock changes caused by land use change and land use. This sub-category includes biogenic carbon exchanges from deforestation, road construction or other soil activities (including soil carbon emissions).

Ozone Depletion

Destruction of the stratospheric ozone layer which shields the earth from ultraviolet radiation harmful to life. This destruction of ozone is caused by the breakdown of certain chlorine and/or bromine containing compounds (chlorofluorocarbonsor halons), Which break down when they reach the stratosphere and then catalytically destroy ozone molecules.

Acidification potential

Acid depositions have negative impacts on natural ecosystems and the man-made environment incl. buildings. The main sources for emissions of acidifying substances are agriculture and fossil fuel combustion used for electricity production, heating and transport.

Eutrophication potential

The potential to cause over-fertilization of water and soil, which can result in increased growth of biomass and following adverse effects.

It is split up in 3:

- Eutrophication potential - freshwater: The potential to cause over-fertilization of freshwater, which can result in increased growth of biomass and following adverse effects.
- Eutrophication potential - marine: The potential to cause over-fertilization of marine water, which can result in increased growth of biomass and following adverse effects.
- Eutrophication potential - terrestrial: The potential to cause over-fertilization of soil, which can result in increased growth of biomass and following adverse effects.

Photochemical ozone creation

Chemical reactions brought about by the light energy of the sun creating photochemical smog. The reaction of nitrogen oxides with hydrocarbons in the presence of sunlight to form ozone is an example of a photochemical reaction.

Abiotic depletion potential for non-fossil ressources

Consumption of non-renewable resources, thereby lowering their availability for future generations. Expressed in comparison to Antimonium (Sb).

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.

Abiotic depletion potential for fossil ressources

Measure for the depletion of fossil fuels such as oil, natural gas, and coal. The stock of the fossil fuels is formed by the total amount of fossil fuels, expressed in Megajoules (MJ).

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.

Ecotoxicity for aquatic fresh water	The impacts of chemical substances on ecosystems (freshwater). 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.
Human toxicity (carcinogenic effects)	The impacts of chemical substances on human health via three parts of the environment: air, soil and water. 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.
Human toxicity (non-carcinogenic effects)	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.
Particulate matter	Accounts for the adverse health effects on human health caused by emissions of Particulate Matter (PM) and its precursors (NOx, SOx, NH3)
Resource depletion (water)	Accounts for water use related to local scarcity of water as freshwater is a scarce resource in some regions, while in others it is not. 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.
Ionizing radiation - human health effects	This impact category deals mainly with the eventual impact on human health of low dose ionizing radiation 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.
Land use related impacts	The indicator is the “soil quality index” which is the result of an aggregation of following four aspects: – Biotic production – Erosion resistance – Mechanical filtration – Groundwater The aggregation is done based on a JRC model. The four aspects are quantified through the LANCA model for land use. 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.

10 DETAILS OF THE UNDERLYING SCENARIOS USED TO CALCULATE THE IMPACTS

10.1 A1 - Raw materials supply

This module takes into account the extraction and processing of all raw materials and energy which occur upstream to the studied manufacturing process.

Minor additives are not included due to their minimal proportions in the formulation and low overall impact on the results.

10.2 A2 – Transport to the manufacturer

The transport of raw materials to the production site is carried out using EURO5 trucks of unspecified sizes for all road journeys. Certain key raw materials are already available on-site, while others are sourced from suppliers of the Benelux region and transported by road or ferry. Transport impacts were modeled using the corresponding ecoinvent entries, applying default load factors and utilization rates to reflect standard conditions.

10.3 Manufacturing

This module covers the manufacturing process for DIAMUR mortars, including the receipt and weighing of raw materials, sand drying, mixing, filling into bags, and final steps of storage of the finished product.

10.4 A4 – Transport to the building site

The transport of 1 kg of masonry mortar to the building site involves multiple stages, with each stage modeled using relevant ecoinvent records:

- Direct Factory-to-Site Transport: 0.75 kg of mortar is transported 100 km directly from the factory to the site using a EURO5 truck with a 16-32 ton capacity (ecoinvent record: 'Transport, freight, lorry 16-32 metric ton, EURO5 {RER}| transport, freight, lorry 16-32 metric ton, EURO5 | Cut-off, U')

- Factory-to-Supplier Transport: 0.25 kg is first transported 100 km from the factory to a supplier using a larger EURO5 truck with a capacity over 32 tons (ecoinvent record: 'Transport, freight, lorry >32 metric ton, EURO5 {RER}| transport, freight, lorry >32 metric ton, EURO5 | Cut-off, U').

- Supplier-to-Site Transport: From the supplier, the remaining 0.25 kg of mortar is delivered to the site over a distance of 35 km. For this leg, 90% of the transport is by EURO5 truck (16-32 ton), and the remaining 10% uses a smaller EURO5 truck (7.5-16 ton capacity) (ecoinvent records: 'Transport, freight, lorry 16-32 metric ton, EURO5 {RER}| transport, freight, lorry 16-32 metric ton, EURO5 | Cut-off, U' and 'Transport, freight, lorry 7.5-16 metric ton, EURO5 {RER}| transport, freight, lorry 7.5-16 metric ton, EURO5 | Cut-off, U').

10.5 A5 – Installation in the building

On site, the installation process involves the use of:

- Water usage: For each 25 kg bag of mortar, 3.5 liters of clean tap water are required. This water is added in two stages to ensure a consistent, lump-free mix. The initial 80% of water is added to a clean mixing container, with the remainder gradually incorporated during the mixing process.

- Mixing process: The mortar is mixed with a 1400W mechanical paint/cement mixer for 5 minutes to achieve a homogeneous mixture. This type of equipment is typically used on construction sites to ensure efficient and thorough blending. The mixer's power rating provides the basis for calculating the energy consumption during the mixing phase.

Ancillary materials for installation (specified by material)	Insert information		
Water use	0.14 kg/FU	Mixing water	
Other resource use			
Quantitative description of energy type (regional mix) and consumption during the installation process	0.00467 kWh/FU	Mixing energy - Regional electricity mix	
Waste materials on the building site before waste processing, generated by the product's installation (specified by type)	10% of mortar		
Output materials (specified by type) as result of waste processing at the building site e.g. of collection for recycling, for energy recovery, disposal (specified by route)	Installation losses: 95% goes to recycling, 5% to landfill.		
Direct emissions to ambient air, soil and water	0.126 kg/FU	Direct emission to air: Water vapour	

10.6 B – Use stage (excluding potential savings)

No scenario. These modules are not declared. DIAMUR Mortars 1575N and 185N are integrated into structural elements and require no maintenance or repair.

10.7 C: End of life

At the end-of-life, 100% of the mortar is assumed to be collected as mixed construction waste during demolition. The mortar remains adhered to bricks and is removed mechanically, consuming 0.01 kWh/kg of electricity (C1).

The full waste load is transported 30 km to a sorting facility using a 16–32 ton EURO 5 truck (C2). There, the material is mechanically sorted and crushed to recover mineral fractions. This includes loading/unloading operations modelled with diesel use, and electricity for rock crushing (C3).

Non-recyclable residues, representing 5% of the waste, are sent to landfill, involving an additional 50 km of truck transport (C4).

End-of-life modules – C3 and C4

Parameter	Value (kg)
Wastes collected separately	
Wastes collected as mixed construction waste	1.01
Waste for re-use	
Waste for recycling	0.96+0.095
Waste for energy recovery	
Waste for final disposal	0.05+0.005

Module C2 – Transport to waste processing

Type of vehicle (truck/boat/etc.)	Fuel consumption (litres/km)	Distance (km)	Capacity utilisation (%)	Density of products (kg/m3)	Assumptions
Truck	16-32 t EURO5	30	EI	1720 - 1740	0.030 tkm
Truck	16-32 t EURO5	50	EI	1720 - 1740	0.00250t km

EI : Ecoinvent default value

10.8 D – Benefits and loads beyond the system boundaries

Module D accounts for the benefits associated with material recycling and recovery beyond the product's life cycle. The crushed masonry waste, consisting of bricks with adhered mortar, is assumed to result in recycled aggregates corresponding to a 0/31.5 mm fraction of mixed debris gravel, which is commonly used in road base layers. The primary equivalent is natural limestone aggregates 0/31.5.

The avoided impact of gravel production is reflected as a negative value, representing the environmental savings from using recycled material instead of virgin resources.

The data used for these calculations is based on ecoinvent datasets, aligned with standard modeling practices for material recovery scenarios.

QUANTITATIVE DESCRIPTION OF THE LOADS BEYOND THE SYSTEM BOUNDARIES	Rock crushing is included in C3.
QUANTITATIVE DESCRIPTION OF THE BENEFITS BEYOND THE SYSTEM BOUNDARIES	Recycled gravel: 0.96+0.095 kg per kg of waste mortar, serving as a substitute for natural limestone aggregate.

11 RELEASE OF DANGEROUS SUBSTANCES TO INDOOR AIR, SOIL AND WATER DURING THE USE STAGE

11.1 Indoor air

Not applicable.

11.2 Soil and water

The product is not classified as environmentally hazardous and does not contain substances that pose a significant risk to soil or water during use. More information can be found in the product's Safety Data Sheet, available on the manufacturer's website at www.diamur.be

12 DEMONSTRATION OF VERIFICATION

EN 15804+A2:2019 serves as the core PCR.

Independent verification of the environmental declaration and data according to standard EN ISO 14025:2010
Internal ☐ External ☒

Third party verifiers: Bob Roijen, bob.roijen@sgs.com and Agnes Schuurmans, agnes.schuurmans@sgs.com

13 ADDITIONAL INFORMATION ON REVERSIBILITY

Description	Type of fixing	Level of reversibility	Simplicity of disassembly	Speed of disassembly	Ease of handling (size and weight)	Robustness of material (material resistance to disassembly)	Comment
The product is installed to: bricks joined together to form an external wall	Cement mortar for masonry joints (R joint ≥ Rmat)	Non-reversible connections	More complex, requires specific tools (e.g., chisel, hammer)	Disassembly is slow due to the strength of bond and dimensions	Requires at least two workers with specific equipment	Disassembly will likely cause damage to the material due to its solidified nature	Mortar cannot be reused after disassembly due to curing and bonding with masonry
...	...	...					

14 BIBLIOGRAPHY

ISO 14040:2006: Environmental Management-Life Cycle Assessment-Principles and framework.
ISO 14044:2006: Environmental Management-Life Cycle Assessment-Requirements and guidelines.
ISO 14025:2006: Environmental labels and Declarations-Type III Environmental Declarations-Principles and procedures.
NBN EN 15804+A2:2019
B-EPD PCR

General information

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Verifier

SGS Intron B.V – Agnes Stehmann-Schuurmans
Date of verification: 25.06.2025
External independent verification of the declaration and data according to EN ISO 14025 and relevant PCR documents

Comparing EPDs is not possible unless they are conform to the same PCR and taking into account the building context. The program operator cannot be held responsible for the information supplied by the owner of the EPD nor LCA practitioner.

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