

ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025

Synmix® EZ54

N.V. Bekaert S.A. Bekaertstraat 2, 8550 Zwevegem, Belgium



EPD HUB, HUB-3742

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GENERAL INFORMATION

MANUFACTURER

Manufacturer	N.V. Bekaert S.A.
Address	Bekaertstraat 2, 8550 Zwevegem, Belgium
Contact details	infobuilding@bekaert.com
Website	www.bekaert.com

EPD STANDARDS, SCOPE AND VERIFICATION

Program operator	EPD Hub, hub@epdhub.com
Reference standard	EN 15804:2012+A2:2019/AC:2021 and ISO 14025
PCR	EPD Hub Core PCR version 1.1, 5 Dec 2023
Sector	Construction product
Category of EPD	Third party verified EPD
Scope of the EPD	Cradle to gate
EPD author	Green Lab - Khadija Benis
EPD verification	Independent verification of this EPD and data, according to ISO 14025: <input type="checkbox"/> Internal verification <input checked="" type="checkbox"/> External verification
EPD verifier	Imane Uald Lamkaddam as an authorized verifier for EPD Hub

This EPD is intended for business-to-business and/or business-to-consumer communication. 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	Synmix® EZ54
Place of production	Cortegaça, Portugal
Period for data	2021
Averaging in EPD	No grouping
Variation in GWP-fossil for A1-A3 (%)	-
A1-A3 Specific data (%)	16,2

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 kg
Declared unit mass	1 kg
GWP-fossil, A1-A3 (kgCO ₂ e)	3,66E+00
GWP-total, A1-A3 (kgCO ₂ e)	3,62E+00
Secondary material, inputs (%)	1,38
Secondary material, outputs (%)	0
Total energy use, A1-A3 (kWh)	15,6
Net freshwater use, A1-A3 (m ³)	0,03

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

Bekaert (Euronext Brussels: BEKB) was established in 1880 and is a global company with approximately 30 000 employees worldwide. From tiny steel fibers for concrete structures to steel cord mesh for masonry, Bekaert offers the construction industry a wide range of Steel wire reinforcement solutions.

PRODUCT DESCRIPTION

Synmix® EZ54 is a Bekaert brand for concrete reinforcement macrofibres. It turns concrete into a reinforced composite material that slows crack propagation and reduces plastic shrinkage cracking. Impact and corrosion resistance are also enhanced.

Further information can be found at:

<https://construction.bekaert.com/resources>

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass %	Material origin
Metals	0	-
Minerals	0	-
Fossil materials	100	Greece, South Korea, Portugal
Bio-based materials	0	-

BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

Biogenic carbon content in product, kg C	-
Biogenic carbon content in packaging, kg C	0,043

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1 kg
Mass per declared unit	1 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		
x	x	x	MND	x	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND		MND	
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction/ demolition	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 manufacturing process is shown in the flow diagram on page 5. It consists of the following steps:

Extrusion. At this stage, all raw materials are heated and melted to form a homogeneous mixture. The desired shape is given to the monofilament.

Cooling. After passing through the extruder, the monofilament is cooled down in a tub of cold water. This cooling process allows to preserve its geometry, as well as its physical and structural properties.

Torsion. Subsequently, bundles of monofilaments are grouped and twisted together in order to give the yarn its final shape. It is also at this stage that the spool that will feed the following processes is formed.

Cutting. The spools of twisted monofilaments go to the cutting stage, where each strand is sectioned with a predetermined length, by a set of cutting blades.

Packaging. All the cut fibres go to the packaging line where the bags with the desired dosages are automatically made, which are later placed in boxes and finally on the wooden pallets.

TRANSPORT AND INSTALLATION (A4-A5)

Impacts from modules A4-A5 are not included in the scope of this EPD.

PRODUCT USE AND MAINTENANCE (B1-B7)

These modules are not relevant for this family of products and are not covered in this EPD. Air, soil, and water impacts during the use phase have not been studied.

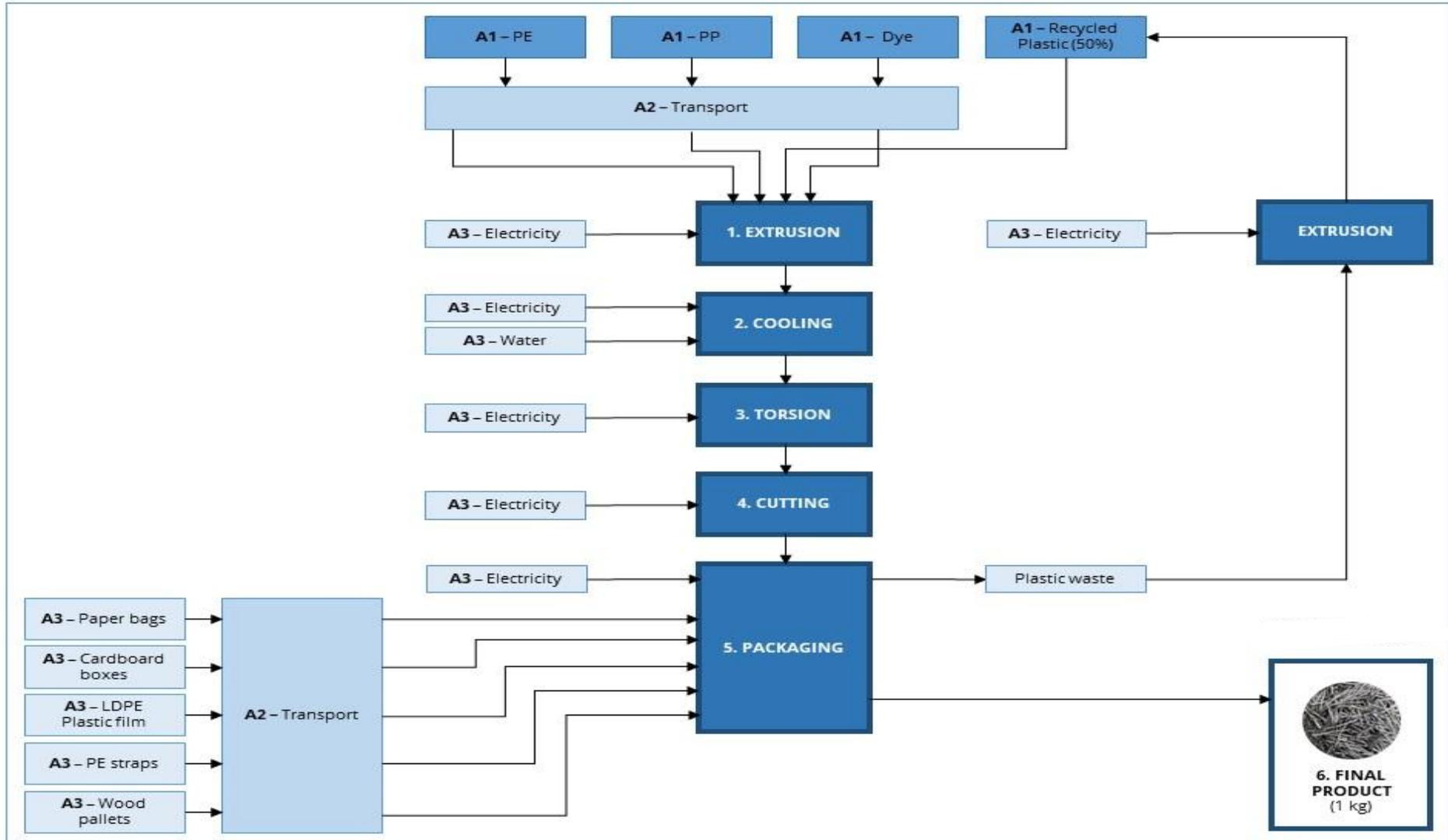
PRODUCT END OF LIFE (C1-C4, D)

The product end of life stages are not included in this EPD based on the EN 15804 standard special provision for construction products and materials which fulfill the conditions for exemption based on the product being integrated and not capable of separation from concrete at end of life, the product not being identifiable as original based on the physical change after deconstruction and the omission of any biogenic carbon in the product.

C1-C4 – these stages are not covered in this EPD.

D – this is not covered in this EPD.

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.

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.

VALIDATION OF DATA

Data collection for production, transport, and packaging was conducted using time and site-specific information, as defined in the general information section on page 1 and 2. Upstream process calculations rely on generic data as defined in the Bibliography section. Manufacturer-provided specific and generic data were used for the product's manufacturing stage. The analysis was performed in One Click LCA EPD Generator, with the 'Cut-Off, EN 15804+A2' allocation method, and characterization factors according to EN 15804:2012+A2:2019/AC:2021 and JRC EF 3.1.

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	Allocated by mass or volume
Packaging material	Allocated by mass or volume
Ancillary materials	Allocated by mass or volume
Manufacturing energy and waste	Allocated by mass or volume

PRODUCT & MANUFACTURING SITES GROUPING

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

This EPD is product and factory specific.

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. The EPD Generator uses Ecoinvent v3.10.1 and One Click LCA databases as sources of environmental data. Allocation used in Ecoinvent 3.10.1 environmental data sources follow the methodology 'allocation, Cut-off, EN 15804+A2'.

ENVIRONMENTAL IMPACT DATA

The estimated impact results are only relative statements which do not indicate the end points of the impact categories, exceeding threshold values, safety margins or risks.

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, EF 3.1

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 ₂ e	2,98E+00	2,90E-01	3,54E-01	3,62E+00	MND	1,36E-01	MND											
GWP – fossil	kg CO ₂ e	2,97E+00	2,89E-01	4,02E-01	3,66E+00	MND	4,97E-03	MND											
GWP – biogenic	kg CO ₂ e	2,02E-03	5,33E-05	-5,28E-02	-5,08E-02	MND	1,31E-01	MND											
GWP – LULUC	kg CO ₂ e	1,81E-03	1,23E-04	4,33E-03	6,26E-03	MND	2,66E-06	MND											
Ozone depletion pot.	kg CFC ₋₁₁ e	9,37E-08	5,17E-09	1,22E-08	1,11E-07	MND	7,82E-11	MND											
Acidification potential	mol H ⁺ e	1,00E-02	3,51E-03	1,95E-03	1,55E-02	MND	4,16E-05	MND											
EP-freshwater ²⁾	kg Pe	5,90E-04	1,57E-05	3,53E-04	9,58E-04	MND	8,95E-07	MND											
EP-marine	kg Ne	1,96E-03	8,70E-04	6,86E-04	3,51E-03	MND	8,72E-05	MND											
EP-terrestrial	mol Ne	2,04E-02	9,63E-03	3,25E-03	3,33E-02	MND	1,63E-04	MND											
POCP (“smog”) ³⁾	kg NMVOCe	1,39E-02	2,97E-03	1,12E-03	1,80E-02	MND	7,16E-05	MND											
ADP-minerals & metals ⁴⁾	kg Sbe	2,23E-05	7,13E-07	1,09E-06	2,41E-05	MND	1,22E-08	MND											
ADP-fossil resources	MJ	8,03E+01	3,88E+00	8,69E+00	9,29E+01	MND	6,22E-02	MND											
Water use ⁵⁾	m ³ e depr.	7,61E-01	1,64E-02	2,45E-01	1,02E+00	MND	3,15E-03	MND											

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

ADDITIONAL (OPTIONAL) ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, EF 3.1

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	1,04E-07	1,66E-08	1,23E-08	1,33E-07	MND	4,75E-10	MND											
Ionizing radiation ⁶⁾	kBq 11235e	1,24E-01	3,91E-03	2,13E-01	3,41E-01	MND	1,11E-04	MND											
Ecotoxicity (freshwater)	CTUe	1,75E+01	4,38E-01	3,20E+00	2,11E+01	MND	2,14E+00	MND											
Human toxicity, cancer	CTUh	5,86E-10	5,33E-11	1,60E-10	7,99E-10	MND	2,81E-11	MND											
Human tox. non-cancer	CTUh	2,27E-08	1,95E-09	4,83E-09	2,95E-08	MND	2,87E-09	MND											
SQP ⁷⁾	-	7,89E+00	1,66E+00	6,61E+00	1,62E+01	MND	6,91E-02	MND											

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	1,87E+00	5,50E-02	2,35E+00	4,28E+00	MND	-2,08E+00	MND											
Renew. PER as material	MJ	0,00E+00	0,00E+00	5,79E-01	5,79E-01	MND	9,79E-01	MND											
Total use of renew. PER	MJ	1,87E+00	5,50E-02	2,93E+00	4,86E+00	MND	-1,10E+00	MND											
Non-re. PER as energy	MJ	3,97E+01	3,88E+00	8,11E+00	5,17E+01	MND	6,21E-02	MND											
Non-re. PER as material	MJ	4,05E+01	0,00E+00	1,85E-01	4,07E+01	MND	-1,85E-01	MND											
Total use of non-re. PER	MJ	8,03E+01	3,88E+00	8,30E+00	9,25E+01	MND	-1,23E-01	MND											
Secondary materials	kg	1,38E-02	1,82E-03	2,42E-03	1,81E-02	MND	3,70E-05	MND											
Renew. secondary fuels	MJ	1,18E-04	1,65E-05	1,12E-02	1,13E-02	MND	4,64E-07	MND											
Non-ren. secondary fuels	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	0,00E+00	MND											
Use of net fresh water	m ³	1,92E-02	4,39E-04	7,49E-03	2,72E-02	MND	-2,20E-04	MND											

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	1,61E-01	5,47E-03	2,13E-02	1,88E-01	MND	1,36E-03	MND											
Non-hazardous waste	kg	1,37E+01	1,02E-01	1,92E+01	3,30E+01	MND	4,13E-01	MND											
Radioactive waste	kg	3,07E-05	9,68E-07	5,51E-05	8,67E-05	MND	2,75E-08	MND											

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	0,00E+00	0,00E+00	MND	0,00E+00	MND											
Materials for recycling	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	0,00E+00	MND											
Materials for energy rec	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	0,00E+00	MND											
Exported energy	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	0,00E+00	MND											
Exported energy – Electricity	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	0,00E+00	MND											
Exported energy – Heat	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	0,00E+00	MND											

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 ₂ e	2,94E+00	2,88E-01	4,09E-01	3,64E+00	MND	7,13E-02	MND											
Ozone depletion Pot.	kg CFC ₁₁ e	7,64E-08	4,11E-09	9,51E-09	9,01E-08	MND	6,40E-11	MND											
Acidification	kg SO ₂ e	8,31E-03	2,80E-03	1,64E-03	1,28E-02	MND	3,09E-05	MND											
Eutrophication	kg PO ₄ ³ e	3,71E-02	3,51E-04	1,11E-03	3,86E-02	MND	6,56E-05	MND											
POCP (“smog”)	kg C ₂ H ₄ e	9,92E-04	1,56E-04	1,12E-04	1,26E-03	MND	1,88E-05	MND											
ADP-elements	kg Sbe	2,20E-05	6,98E-07	1,07E-06	2,38E-05	MND	1,09E-08	MND											
ADP-fossil	MJ	7,83E+01	3,81E+00	4,95E+00	8,70E+01	MND	6,04E-02	MND											

ENVIRONMENTAL IMPACTS – GWP-GHG

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-GHG ⁹⁾	kg CO ₂ e	2,97E+00	2,90E-01	4,07E-01	3,67E+00	MND	4,97E-03	MND											

9) This indicator includes all greenhouse gases excluding biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product as defined by IPCC AR 5 (IPCC 2013). In addition, the characterisation factors for the flows - CH₄ fossil, CH₄ biogenic and Dinitrogen monoxide - were updated in line with the guidance of IES PCR 1.2.5 Annex 1. This indicator is identical to the GWP-total of EN 15804:2012+A2:2019 except that the characterization factor for biogenic CO₂ is set to zero.

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.

Imane Uald Lamkaddam as an authorized verifier for EPD Hub Limited
31.07.2025

