



ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025

ECOCem® Castle

YTL Cement Marketing Sdn Bhd



EPD HUB, HUB-4321

Published on 05.11.2025, last updated on 14.01.2026, valid until 04.11.2030

Life Cycle Assessment study has been performed in accordance with the requirements of EN 15804, EPD Hub PCR version 1.2 (24 Mar 2025) and JRC characterization factors EF 3.1.



Created with One Click LCA



GENERAL INFORMATION

MANUFACTURER

Manufacturer	YTL Cement Marketing Sdn Bhd
Address	Menara YTL, 205 Jalan Bukit Bintang, 55100 Kuala Lumpur, Malaysia
Contact details	communication@ytlcement.com.my
Website	www.ytlcement.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 1.2, 24 Mar 2025 EN 16908 Cement and building lime
Sector	Construction product
Category of EPD	Third party verified EPD
Parent EPD number	-
Scope of the EPD	Cradle to gate
EPD author	Khong Khei Hon, YTL Cement
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal verification ☒ External verification
EPD verifier	Vera Durão, as an authorised verifier acting for EPD Hub Limited

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	Castle
Additional labels	ECOCem®
Product reference	MS EN 197-1:2014 CEM II / B-L 32.5N
Place(s) of raw material origin	Malaysia, Thailand
Place of production	Malaysia
Place(s) of installation and use	Malaysia
Period for data	1 Jan 2024 - 31 Dec 2024
Averaging in EPD	Multiple factories
Variation in GWP-fossil for A1-A3 (%)	<10
GTIN (Global Trade Item Number)	-
NOBB (Norwegian Building Product Database)	-
A1-A3 Specific data (%)	98,2

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 ton
Declared unit mass	1000 kg
Mass of packaging	11,38 kg
GWP-fossil, A1-A3 (kgCO ₂ e)	658
GWP-total, A1-A3 (kgCO ₂ e)	660
Secondary material, inputs (%)	2,41
Secondary material, outputs (%)	0
Total energy use, A1-A3 (kWh)	864
Net freshwater use, A1-A3 (m ³)	1,1

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

YTL Cement is the leading manufacturer of cement in Malaysia, supplying high-quality cement products to both domestic and international markets. The comprehensive portfolio is engineered to meet the performance demands of a wide range of construction applications, including high-rise developments, tunnels, precast elements, marine structures, and other complex infrastructure projects.

In line with our commitment to advancing sustainable construction, we offer ECOcem® — a range low carbon cement with embodied carbon 20% - 50% lower than CEM I Portland Cement. Through these innovative products, we aim to minimize the environmental impact of construction and support the industry's shift toward greener building practices.

PRODUCT DESCRIPTION

Cement is an important binding agent used in all construction. It provides strength and durability to structures across a wide range of building applications.

Castle is a mainstay of our ECOcem®, lower-carbon cement product line. Its excellent versatility makes it suitable for all general-purpose applications, such as bricklaying, screeding, and concreting applications. Castle has excellent workability and is easy to mix.

Castle is produced at the following plants in Malaysia:

1. Perak-Hanjoong Simen Sdn. Bhd.
Lot 2764, Mukim Kg Buaia Batu 14,
33700 Padang Rengas, Perak.
2. Associated Pan Malaysia Cement Sdn. Bhd.
Batu 13 ½, Jalan Kuala Kangsar,
31200 Chemor, Perak.
3. Pahang Cement Sdn. Bhd.
P.O. Box 232, Bukit Sagu 4,
25720 Kuantan, Pahang.

Further information can be found at: www.ytlcement.com

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass %	Material origin
Metals	0	-
Minerals	100	Southeast Asia
Fossil materials	0	-
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	9,27E-05

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1 ton
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	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
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 = ND. Modules not relevant = NR

MANUFACTURING AND PACKAGING (A1-A3)

YTL Cement's Malaysian plants operate with advanced process control and modern emission control systems, supported by ongoing initiatives in energy efficiency, waste heat recovery, and the use of alternative fuels to improve environmental performance. The production process is closely monitored under ISO 9001 and ISO 14001 management systems, ensuring product consistency, safety, and sustainability in line with MS EN 197-1 and YTL Cement's decarbonisation goals.

YTL Cement manufactures bagged cement through an integrated process that converts raw mineral materials into clinker and subsequently grinds it into finished cement. The process begins with the extraction and preparation of raw materials, primarily limestone, clay, and corrective materials, which are

crushed, blended, and homogenised to achieve the desired chemical composition. The prepared raw meal is fed into a multi-stage preheater and rotary kiln system, where it undergoes calcination and clinker formation at around 1450°C. The resulting clinker is rapidly cooled and stored in silos.

In the cement grinding stage, the cooled clinker is finely ground together with gypsum to control setting time and mineral additions such as limestone or to produce Portland Composite Cement under the Castle brand. These mineral components enhance durability while reducing the clinker content and overall carbon footprint of the product.

The finished cement is stored in silos before being packed into 50 kg Castle paper bags using automated packing systems and distributed to the market.

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 electricity used in common facilities at the manufacturing facilities are included in this stage. A market-based approach is used in modelling the electricity mix utilized in the factory. There are no material losses during the production process.

TRANSPORT AND INSTALLATION (A4-A5)

This EPD does not cover transport (A4) and installation (A5).

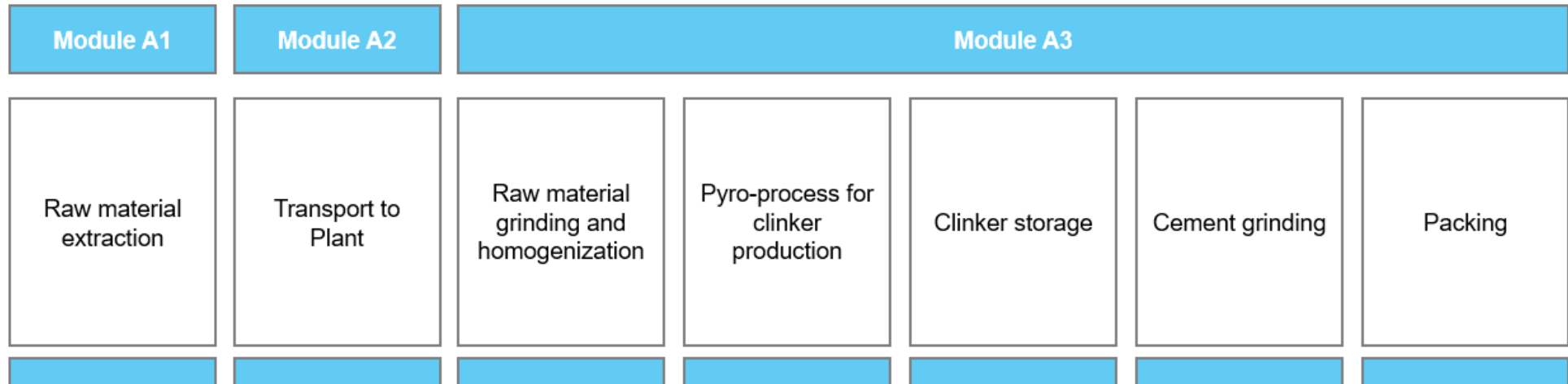
PRODUCT USE AND MAINTENANCE (B1-B7)

This EPD does not cover the use phase.

PRODUCT END OF LIFE (C1-C4, D)

The end-of-life phase (modules C1-C4, and D) is excluded as per EN 15804+A2 exclusion criteria for products that become chemically bonded and inseparable with other products. For an end-of-life scenario for cement that becomes a part of either concrete, plaster, or mortar, please refer to an EPD representing the respective products.

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.

All industrial processes from raw material acquisition to the factory gates are included. For easier modelling and because of lack of accuracy in available modelling resources many constituents under 0,1% of product mass are excluded. These include some cement constituents (some secondary fuels, trace metals and mineral constituents) which are all present in the product only in very small amounts and have no serious impact on the emissions of the product.

Further, water used for cleaning and maintenance of the equipment, transportation and waste streams of the packaging materials used for delivering the raw materials to the factory are omitted since the quantified mass contribution is less than 0,1%. The production of capital equipment, construction activities, and infrastructure, 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 where material and energy 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 material	No allocation
Ancillary materials	No allocation
Manufacturing energy and waste	Allocated by mass or volume

PRODUCT & MANUFACTURING SITES GROUPING

Type of grouping	Multiple factories
Grouping method	Based on average results of product group - by total volume
Variation in GWP-fossil for A1-A3, %	<10

Representativeness of the Grouping

This EPD represents Castle bagged cement manufactured by YTL Cement across three production facilities located in Malaysia: Perak-Hanjoong Simen Sdn Bhd in Perak, Associated Pan Malaysia Cement Sdn Bhd in Perak and Pahang Cement Sdn Bhd in Pahang. The grouping is based on the plants' use of similar raw materials, similar production technologies, and same product specifications defined under the Malaysian Standard MS EN 197 and internal quality controls. The declared environmental impacts in this EPD are considered representative of the average performance of the product produced by the three plants during the reference period. The grouping approach follows the requirements for representativeness under ISO 14025, as well as EN 15804:2012+A2:2019.

LCA SOFTWARE AND BIBLIOGRAPHY

This EPD has been created using One Click LCA EPD Generator for EPD Hub V3 v3.2.3. The LCA and EPD have been prepared according to the reference standards and ISO 14040/14044. The EPD Generator uses Ecoinvent v3.10.1/3.11 and One Click LCA databases as sources of environmental data. Allocation used in Ecoinvent 3.10.1/3.11 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-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP – total ¹⁾	kg CO ₂ e	6,60E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GWP – fossil	kg CO ₂ e	6,58E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GWP – biogenic	kg CO ₂ e	1,76E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GWP – LULUC	kg CO ₂ e	6,33E-02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ozone depletion pot.	kg CFC-11e	2,98E-06	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acidification potential	mol H ⁺ e	2,92E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
EP-freshwater ²⁾	kg Pe	8,83E-02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
EP-marine	kg Ne	4,83E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
EP-terrestrial	mol Ne	5,21E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
POCP (“smog”) ³⁾	kg NMVOCe	1,43E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ADP-minerals & metals ⁴⁾	kg Sbe	1,77E-03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ADP-fossil resources	MJ	3,04E+03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Water use ⁵⁾	m ³ e depr.	4,83E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

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-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Particulate matter	Incidence	3,73E-05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ionizing radiation ⁶⁾	kBq U235e	2,95E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ecotoxicity (freshwater)	CTUe	2,88E+03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Human toxicity, cancer	CTUh	1,37E-07	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Human tox. non-cancer	CTUh	2,01E-06	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SQP ⁷⁾	-	3,12E+03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

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-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Renew. PER as energy ⁸⁾	MJ	2,48E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Renew. PER as material	MJ	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total use of renew. PER	MJ	2,48E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Non-re. PER as energy	MJ	2,86E+03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Non-re. PER as material	MJ	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total use of non-re. PER	MJ	2,86E+03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Secondary materials	kg	2,51E+01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Renew. secondary fuels	MJ	7,58E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Non-ren. secondary fuels	MJ	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Use of net fresh water	m ³	1,10E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

8) PER = Primary energy resources.

END OF LIFE – WASTE

Impact category	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste	kg	2,31E+01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Non-hazardous waste	kg	3,89E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Radioactive waste	kg	6,55E-04	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for re-use	kg	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Materials for recycling	kg	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Materials for energy rec	kg	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Exported energy	MJ	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Exported energy – Electricity	MJ	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Exported energy – Heat	MJ	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

ENVIRONMENTAL IMPACTS – EN 15804+A1, CML

Impact category	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Global Warming Pot.	kg CO ₂ e	6,57E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ozone depletion Pot.	kg CFC ₁₁ e	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acidification	kg SO ₂ e	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Eutrophication	kg PO ₄ ³ e	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
POCP (“smog”)	kg C ₂ H ₄ e	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ADP-elements	kg Sbe	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ADP-fossil	MJ	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

ADDITIONAL INDICATOR – GWP-GHG

Impact category	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-GHG ⁹⁾	kg CO ₂ e	6,58E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

9) This indicator includes all greenhouse gases excluding biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. In addition, the characterisation factors for the flows – CH₄ fossil, CH₄ biogenic and Dinitrogen monoxide – were updated. This indicator is identical to the GWP-total of EN 15804:2012+A2:2019 except that the characterisation factor for biogenic CO₂ is set to zero.

SCENARIO DOCUMENTATION

DATA SOURCES

Manufacturing energy scenario documentation

Scenario parameter	Value
Electricity data source and quality	One Click LCA Energy LCA Electricity, consumption mix w/o renewables, Malaysia (2023)
Electricity CO ₂ e / kWh	0,98
District heating data source and quality	Not applicable
District heating CO ₂ e / kWh	Not applicable

THIRD-PARTY VERIFICATION STATEMENT

EPD Hub declares that this EPD is verified in accordance with ISO 14025 by an independent, third-party verifier. The project report on the Life Cycle Assessment and the report(s) on features of environmental relevance are filed at EPD Hub. EPD Hub PCR and ECO Platform verification checklist are used.

EPD Hub is not able to identify any unjustified deviations from the PCR and EN 15802+A2 in the Environmental Product Declaration and its project report.

EPD Hub maintains its independence as a third-party body; it was not involved in the execution of the LCA or in the development of the declaration and has no conflicts of interest regarding this verification.

The company-specific data and upstream and downstream data have been examined as regards plausibility and consistency. The publisher is responsible for ensuring the factual integrity and legal compliance of this declaration.

The software used in creation of this LCA and EPD is verified by EPD Hub to conform to the procedural and methodological requirements outlined in ISO 14025:2010, ISO 14040/14044, EN 15804+A2, and EPD Hub Core Product Category Rules and General Program Instructions.

Verified tools

Tool verifier: Magaly Gonzalez Vazquez

Tool verification validity: 27 March 2025 - 26 March 2028

Vera Durão, as an authorised verifier acting for EPD Hub Limited

14.01.2026

Vera Durão

