ENVIRONMENTAL PRODUCT DECLARATION

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

PermaQuik – Hot Melt Monolithic Membrane
Radmat Building Products Ltd

EPD HUB, HUB-2345
Published on 17.11.2024, last updated on 17.11.2024, valid until 17.11.2029.

Created with One Click LCA

GENERAL INFORMATION

MANUFACTURER

Manufacturer	Radmat Building Products Ltd
Address	Holland House, Valley Way, Rockingham Road, Market Harborough, Leicestershire, LE16 7PS
Contact details	techenquiries@radmat.com
Website	https://radmat.com/category/product-data/hotmelt-membranes/

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 1.1, 5 Dec 2023
Sector	Construction product
Category of EPD	Third party verified EPD
Scope of the EPD	Cradle to gate with options, A4-A5, and modules C1-C4, D
EPD author	LCA Institut
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal verification ☑ External verification
EPD verifier	Nemanja Nedic, 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	PermaQuik – Hot Melt Monolithic Membrane
Additional labels	-
Product reference	PQ6100
Place of production	Wigan, United Kingdom
Period for data	June 2022 - June 2023
Averaging in EPD	No averaging
Variation in GWP-fossil for A1-A3	-

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 m^2 of PermaQuik
Declared unit mass	6.5 kg
GWP-fossil, A1-A3 ($kgCO_2e$)	2.44
GWP-total, A1-A3 ($kgCO_2e$)	2.25
Secondary material, inputs (%)	0.13
Secondary material, outputs (%)	0
Total energy use, A1-A3 (kWh)	26.9
Net freshwater use, A1-A3 (m^3)	0.01

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

Radmat Building Products is a British, independent company specialising in waterproofing and insulation systems that offer long-term protection for your buildings structure. Our high-performance solutions, including PermaQuik and ProTherm Quantum® PLUS+, are independently certified and provide groundbreaking possibilities for architects, engineers, and surveyors. These products have been incorporated into some of the UKs most iconic buildings. We are dedicated to delivering superior roofing and waterproofing products, supported by exceptional technical assistance to help project teams meet Building Regulations with tailored solutions.

PRODUCT DESCRIPTION

PermaQuik PQ6100 is a single-component, hot-applied, seamless, rubberized, self-healing hot melt monolithic membrane roofing system, applied in two layers that encase a polyester reinforcing fleece. This system offers outstanding waterproofing, toughness, durability, flexibility, and strong adhesion to various substrates. Originally developed in Canada in the 1960s, PermaQuik is now manufactured in the UK after significant RD collaboration with Shell UK in an ISO14001-certified facility. Its unique composition of bitumen, natural rubbers, and polymers gives it self-healing properties and allows installation with zero falls in compliance with BBA Information Bulletin No. 4. PermaQuik is BBA Certified (97/3336) for the roofs design life in protected roof applications, including green roofs. Applied at a minimum thickness of 6mm, the membrane is finished with either a standard or enhanced protection sheet, then electronically tested. For inverted roof applications, Radmat ProTherm Inverted Roof Insulation boards and a water control layer are installed before the final surface finish, which may include paving, ballast, timber decking, or Radmat MedO green roofs. For more details, visit PermaQuik PQ6100. Further information can be found at https://radmat.com/category/product-data/hotmelt-membranes/.

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass %	Material origin
Metals	-	-
Minerals	31	Europe
Fossil materials	69	Europe
Bio-based materials	-	-

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	0.05

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1 m^2 of PermaQuik
Mass per declared unit	6.5 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	x	x	MND	MND	MND	MND	MND	MND	MND	x	x	x	x	x		
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	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.

PermaQuik is a hot melt monolithic membrane consisting of a blend of synthetic rubber and natural rubber in a specially selected compatible bitumen. Cakes of PQ6100 are heated in an insulated and oscillating bitumen roofing kettle (heater) fitted with thermometers to measure the melt and oil temperatures. The nominal temperature range for the molten PQ6100 is 190°C to 205°C. The temperature of the melt should not exceed 215°C.

TRANSPORT AND INSTALLATION (A4-A5)

Transportation impacts occurred from final products delivery to construction site (A4) cover fuel direct exhaust emissions, environmental impacts of fuel production, as well as related infrastructure emissions. Transportation impacts occurred from final products delivery to construction site (A4) cover fuel direct exhaust emissions, environmental impacts of fuel production, as well as related infrastructure emissions. The transportation distance is defined according to market average. Average distance of transportation from production plant to building site is assumed as 100 km and the transportation method is assumed to be lorry. Transportation does not cause losses as products are packaged properly. Installation to be according to guidelines and specifications supplied by Radmat Building Products, no additional materials are needed and packaging waste is modeled in A5.

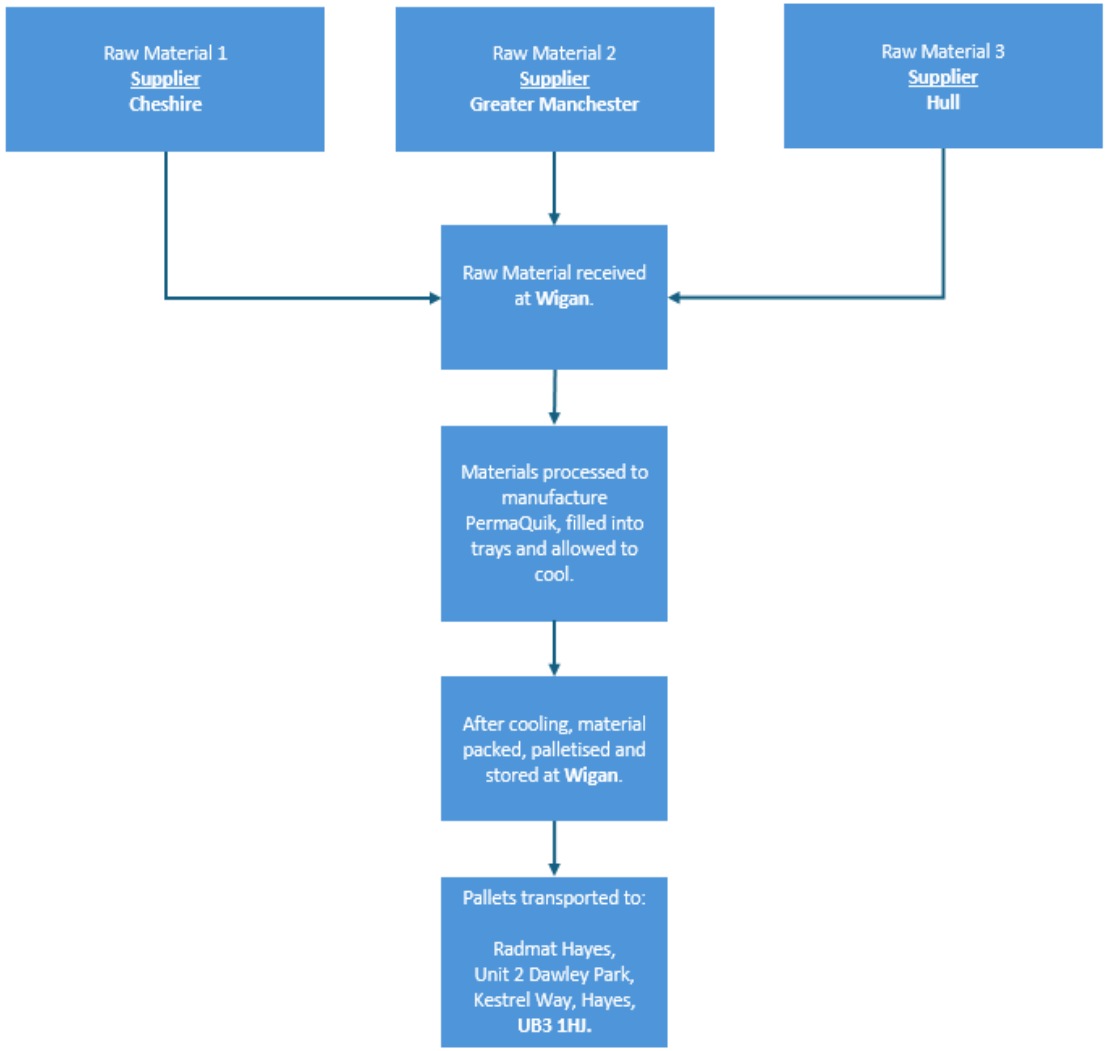
PRODUCT USE AND MAINTENANCE (B1-B7)

This EPD does not cover the use phase.

PRODUCT END OF LIFE (C1-C4, D)

At the end-of-life, in the demolition phase 100% of the waste is assumed to be collected as separate construction waste. The consumption of energy and natural resources is negligible for disassembling of the end-of-life product as the dissassembly is mainly done by hand, so the impacts of demolition are assumed zero (C1). The PermaQuik is delivered to the nearest construction waste treatment plant (C2). Conservative approach is considered for end-of-life and unusable materials are disposed of in a landfill (C4), hence no benefits in module 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	Allocated by mass or volume
Packaging material	Allocated by mass or volume
Ancillary materials	Not applicable
Manufacturing energy and waste	Allocated by mass or volume

AVERAGES AND VARIABILITY

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

This EPD is product and factory specific and does not contain average calculations.

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 v3.8, Plastics Europe, Federal LCA Commons and One Click LCA databases as sources of environmental data.

ENVIRONMENTAL IMPACT DATA

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP – total[1)]	kg CO_2e	2,23E+00	5,73E-02	-3,71E-02	2,25E+00	8,43E-02	1,89E-01	MND	MND	MND	MND	MND	MND	MND	0,00E+00	3,05E-02	0,00E+00	9,73E-01	0,00E+00
GWP – fossil	kg CO_2e	2,23E+00	5,73E-02	1,49E-01	2,44E+00	8,43E-02	2,01E-03	MND	MND	MND	MND	MND	MND	MND	0,00E+00	3,05E-02	0,00E+00	9,73E-01	0,00E+00
GWP – biogenic	kg CO_2e	0,00E+00	1,87E-10	-1,87E-01	-1,87E-01	0,00E+00	1,87E-01	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
GWP – LULUC	kg CO_2e	7,16E-04	2,24E-05	2,85E-04	1,02E-03	3,37E-05	1,68E-06	MND	MND	MND	MND	MND	MND	MND	0,00E+00	1,13E-05	0,00E+00	7,39E-05	0,00E+00
Ozone depletion pot.	kg CFC-$_{11}$e	3,24E-06	1,33E-08	1,18E-08	3,26E-06	1,97E-08	5,58E-10	MND	MND	MND	MND	MND	MND	MND	0,00E+00	7,02E-09	0,00E+00	2,09E-08	0,00E+00
Acidification potential	mol H^+e	2,31E-02	2,37E-04	5,02E-04	2,39E-02	3,45E-04	1,44E-05	MND	MND	MND	MND	MND	MND	MND	0,00E+00	1,29E-04	0,00E+00	1,04E-03	0,00E+00
EP-freshwater[2)]	kg Pe	2,17E-05	4,32E-07	3,79E-06	2,59E-05	6,13E-07	3,20E-08	MND	MND	MND	MND	MND	MND	MND	0,00E+00	2,50E-07	0,00E+00	1,28E-06	0,00E+00
EP-marine	kg Ne	2,89E-03	7,05E-05	1,41E-04	3,10E-03	1,03E-04	8,56E-06	MND	MND	MND	MND	MND	MND	MND	0,00E+00	3,84E-05	0,00E+00	8,44E-04	0,00E+00
EP-terrestrial	mol Ne	3,16E-02	7,77E-04	1,40E-03	3,38E-02	1,13E-03	5,24E-05	MND	MND	MND	MND	MND	MND	MND	0,00E+00	4,23E-04	0,00E+00	2,23E-03	0,00E+00
POCP ("smog")[3)]	kg NMVOCe	1,90E-02	2,46E-04	4,33E-04	1,97E-02	3,55E-04	1,84E-05	MND	MND	MND	MND	MND	MND	MND	0,00E+00	1,35E-04	0,00E+00	8,77E-04	0,00E+00
ADP-minerals & metals[4)]	kg Sbe	6,73E-06	1,73E-07	5,37E-07	7,44E-06	2,79E-07	6,16E-09	MND	MND	MND	MND	MND	MND	MND	0,00E+00	7,15E-08	0,00E+00	2,48E-07	0,00E+00
ADP-fossil resources	MJ	1,94E+02	8,61E-01	2,95E+00	1,98E+02	1,27E+00	4,12E-02	MND	MND	MND	MND	MND	MND	MND	0,00E+00	4,58E-01	0,00E+00	1,62E+00	0,00E+00
Water use[5)]	m^3e depr.	2,66E-01	4,04E-03	4,51E-02	3,15E-01	6,06E-03	2,33E-04	MND	MND	MND	MND	MND	MND	MND	0,00E+00	2,05E-03	0,00E+00	1,03E-02	0,00E+00

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.

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	6,37E-01	1,16E-02	1,54E+00	2,19E+00	1,83E-02	6,96E-04	MND	MND	MND	MND	MND	MND	MND	0,00E+00	5,16E-03	0,00E+00	3,57E-02	0,00E+00
Renew. PER as material	MJ	0,00E+00	0,00E+00	1,63E+00	1,63E+00	0,00E+00	-1,63E+00	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of renew. PER	MJ	6,37E-01	1,16E-02	3,17E+00	3,82E+00	1,83E-02	-1,63E+00	MND	MND	MND	MND	MND	MND	MND	0,00E+00	5,16E-03	0,00E+00	3,57E-02	0,00E+00
Non-re. PER as energy	MJ	9,08E+01	8,61E-01	2,84E+00	9,45E+01	1,27E+00	4,12E-02	MND	MND	MND	MND	MND	MND	MND	0,00E+00	4,58E-01	0,00E+00	1,62E+00	0,00E+00
Non-re. PER as material	MJ	1,03E+02	0,00E+00	7,82E-02	1,03E+02	0,00E+00	-1,09E-01	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	-1,03E+02	0,00E+00
Total use of non-re. PER	MJ	1,94E+02	8,61E-01	2,92E+00	1,98E+02	1,27E+00	-6,80E-02	MND	MND	MND	MND	MND	MND	MND	0,00E+00	4,58E-01	0,00E+00	-1,01E+02	0,00E+00
Secondary materials	kg	8,35E-03	2,71E-04	6,26E-03	1,49E-02	4,19E-04	1,40E-05	MND	MND	MND	MND	MND	MND	MND	0,00E+00	1,27E-04	0,00E+00	5,73E-04	0,00E+00
Renew. secondary fuels	MJ	6,35E-05	2,78E-06	5,51E-02	5,52E-02	4,32E-06	4,65E-07	MND	MND	MND	MND	MND	MND	MND	0,00E+00	1,28E-06	0,00E+00	2,19E-05	0,00E+00
Non-ren. secondary fuels	MJ	0,00E+00	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
Use of net fresh water	m^3	5,87E-03	1,14E-04	1,10E-03	7,08E-03	1,69E-04	3,54E-05	MND	MND	MND	MND	MND	MND	MND	0,00E+00	5,93E-05	0,00E+00	1,74E-03	0,00E+00

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	6,04E-02	1,03E-03	7,16E-03	6,86E-02	1,45E-03	1,22E-05	MND	MND	MND	MND	MND	MND	MND	0,00E+00	6,07E-04	0,00E+00	0,00E+00	0,00E+00
Non-hazardous waste	kg	8,80E-01	1,79E-02	3,08E-01	1,21E+00	2,57E-02	1,30E-01	MND	MND	MND	MND	MND	MND	MND	0,00E+00	9,98E-03	0,00E+00	6,50E+00	0,00E+00
Radioactive waste	kg	1,37E-03	5,87E-06	2,28E-05	1,40E-03	8,70E-06	6,13E-08	MND	MND	MND	MND	MND	MND	MND	0,00E+00	3,06E-06	0,00E+00	0,00E+00	0,00E+00

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	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	0,00E+00	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 energy rec	kg	0,00E+00	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	0,00E+00	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

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	2,18E+00	5,67E-02	1,42E-01	2,37E+00	8,35E-02	1,04E-02	MND	MND	MND	MND	MND	MND	MND	0,00E+00	3,02E-02	0,00E+00	7,90E-01	0,00E+00
Ozone depletion Pot.	kg CFC_{-11}e	2,56E-06	1,05E-08	1,00E-08	2,58E-06	1,56E-08	4,42E-10	MND	MND	MND	MND	MND	MND	MND	0,00E+00	5,56E-09	0,00E+00	1,66E-08	0,00E+00
Acidification	kg SO_2e	1,98E-02	1,84E-04	3,94E-04	2,04E-02	2,68E-04	1,10E-05	MND	MND	MND	MND	MND	MND	MND	0,00E+00	1,00E-04	0,00E+00	8,59E-04	0,00E+00
Eutrophication	kg PO_4^3e	2,58E-03	4,19E-05	1,56E-03	4,18E-03	6,10E-05	3,75E-04	MND	MND	MND	MND	MND	MND	MND	0,00E+00	2,29E-05	0,00E+00	4,68E-02	0,00E+00
POCP (“smog”)	kg C_2H_4e	8,10E-04	7,39E-06	3,46E-05	8,52E-04	1,09E-05	2,25E-06	MND	MND	MND	MND	MND	MND	MND	0,00E+00	3,92E-06	0,00E+00	1,59E-04	0,00E+00
ADP-elements	kg Sbe	6,68E-06	1,69E-07	5,33E-07	7,39E-06	2,72E-07	5,95E-09	MND	MND	MND	MND	MND	MND	MND	0,00E+00	6,92E-08	0,00E+00	2,40E-07	0,00E+00
ADP-fossil	MJ	1,94E+02	8,61E-01	2,95E+00	1,98E+02	1,27E+00	4,12E-02	MND	MND	MND	MND	MND	MND	MND	0,00E+00	4,58E-01	0,00E+00	1,62E+00	0,00E+00

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_2e	2,23E+00	5,73E-02	1,49E-01	2,44E+00	8,43E-02	2,01E-03	MND	MND	MND	MND	MND	MND	MND	0,00E+00	3,05E-02	0,00E+00	9,73E-01	0,00E+00

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.

Nemanja Nedic, as an authorized verifier acting for EPD Hub Limited
17.11.2024