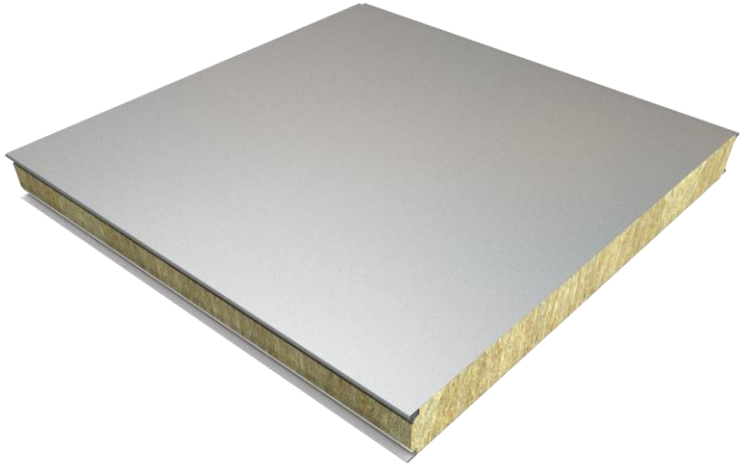
ENVIRONMENTAL PRODUCT DECLARATION

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

Trimoterm NEXT FTV sandwich panel with low carbon mineral wool core, thickness 240 mm
Trimo, architectural solutions, d.o.o.



EPD HUB, HUB-2235
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Created with One Click LCA

GENERAL INFORMATION

MANUFACTURER

Manufacturer	Trimo, architectural solutions, d.o.o.
Address	Prijateljeva cesta 12, 8210 Trebnje, Slovenia
Contact details	trimo@trimo-group.com
Website	www.trimo-group.com

EPD STANDARDS, SCOPE AND VERIFICATION

Program operator	EPD Hub, hub@epdhub.com
Reference standard	EN 15804+A2:2019 und ISO 14025
PCR	EPD Hub Core PCR Version 1.1, 5 Dec 2023
Sector	Construction product
Category of EPD	Sister EPD
Parent EPD number	HUB-2207
Scope of the EPD	Cradle to gate with options, A4-A5, and modules C1-C4, D
EPD author	Jan Tisu, LCA Expert; Trimo d.o.o.
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal verification ☑ External verification
EPD verifier	Haiha Nguyen, 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	Trimoterm NEXT FTV sandwich panel with low carbon mineral wool core, thickness 240 mm
Additional labels	-
Product reference	-
Place of production	Trebnje, Slovenia
Period for data	Calendar year 2023
Averaging in EPD	No averaging
Variation in GWP-fossil for A1-A3	-

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 m^2 of a sandwich panel, 240 mm thick, with low carbon mineral wool having a density of 90 kg/m^3 installed and with an estimated service life of 60 years
Declared unit mass (kg)	31,00
GWP-fossil, A1-A3 ($kgCO_2e$)	4,01E+01
GWP-total, A1-A3 ($kgCO_2e$)	3,99E+01
Secondary material, inputs (%)	22,26
Secondary material, outputs (%)	27,14
Total energy use, A1-A3 (kWh)	203,00
Net freshwater use, A1-A3 (m^3)	5,29

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

Since its formation in 1961, Trimo has established itself as one of Europe's leading companies developing original and complete building envelope systems (facades and roofs) and modular space solutions.

PRODUCT DESCRIPTION

Trimoterm NEXT represents the latest evolution in Trimo panels, developed with a clear mission: to build a greener future. It retains all the superior performance features that Trimoterm panels are known for. Trimoterm NEXT stands out with a significantly lower carbon footprint, helping to greatly lower the environmental impact of the buildings where these panels are installed.

Trimoterm NEXT FTV and FTV HL thermally insulating and fireproof panels cover a total envelope system solution for flat roofs, facades, soffits, internal walls, and ceilings. The Trimoterm NEXT FTV and FTV HL panels function as acoustic panels, carrier backing walls for secondary cladding, blast panels with protection against 1 bar blast, hygienic panels with smooth surfaces, and powerful fire panels with fire resistance up to 4 hours.

Basic details:
Thickness: 240 mm,
Mineral wool density: 90 kg/m^3,
U-Value: 0,16 W/m^{2}K,
Reaction to fire: A2-s1, d0.

Further information can be found at www.trimo-group.com.

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass %	Material origin
Metals	28,8	Europe, Asia
Minerals	69,4	Europe
Fossil materials	1,8	Europe
Bio-based materials	0	-

BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate.

Biogenic carbon content in product, kg C	0,0316
Biogenic carbon content in packaging, kg C	0,0344

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1 m^2 of a sandwich panel, 240 mm thick, with low carbon mineral wool having a density of 90 kg/m^3 installed and with an estimated service life of 60 years
Mass per declared unit	31,00 kg
Functional unit	-
Reference service life	60 years

SUBSTANCES, REACH - VERY HIGH CONCERN

The product is free from any substances of very high concern (SVHC) under Reach regulations in concentrations exceeding 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 production, along with packaging and other ancillary materials. Fuels consumed by machines and waste handling during production at the manufacturing facilities are part of this stage as well. The study takes into account material losses during manufacturing processes and electricity transmission losses.

The panel consists of a core of low carbon mineral wool insulation (stone wool) sandwiched between two steel sheets, bonded with a PUR adhesive. The components are shipped to Trimo's manufacturing facility in Trebnje, Slovenia. The manufacturing process involves steel de-coiling, roll forming, sheet alignment, mineral wool cutting, adhesive application, panel pressing, cutting, and packaging. These processes necessitate electricity and heating. Lubricating oil is applied to specific machines to extend the lifespan of parts. Standard packaging materials, including protective PE foil, EPS blocks, and cardboard, are used for transporting the finished product. Production losses in the raw materials used have been taken into account.

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. The assumed standard transportation distance from the production plant to the building site is 100 km, using lorries. We assume a vehicle capacity utilization volume factor of 1, indicating full load, as the impact of transportation emissions on the overall results is considered minor, and load variation is deemed negligible. To be on the safe side, we consider the possibility of empty returns in this study, incorporating them by using an average load factor in the ecoinvent transport data points. Transportation is assumed not to cause losses as the product is appropriately packaged. Environmental impacts during installation (A5) include disposal of packaging materials and energy consumption for the assumed scenario of product installation. Installation waste resulting from cuts is disregarded due to the inherent modularity and prefabrication characteristics of sandwich panels.

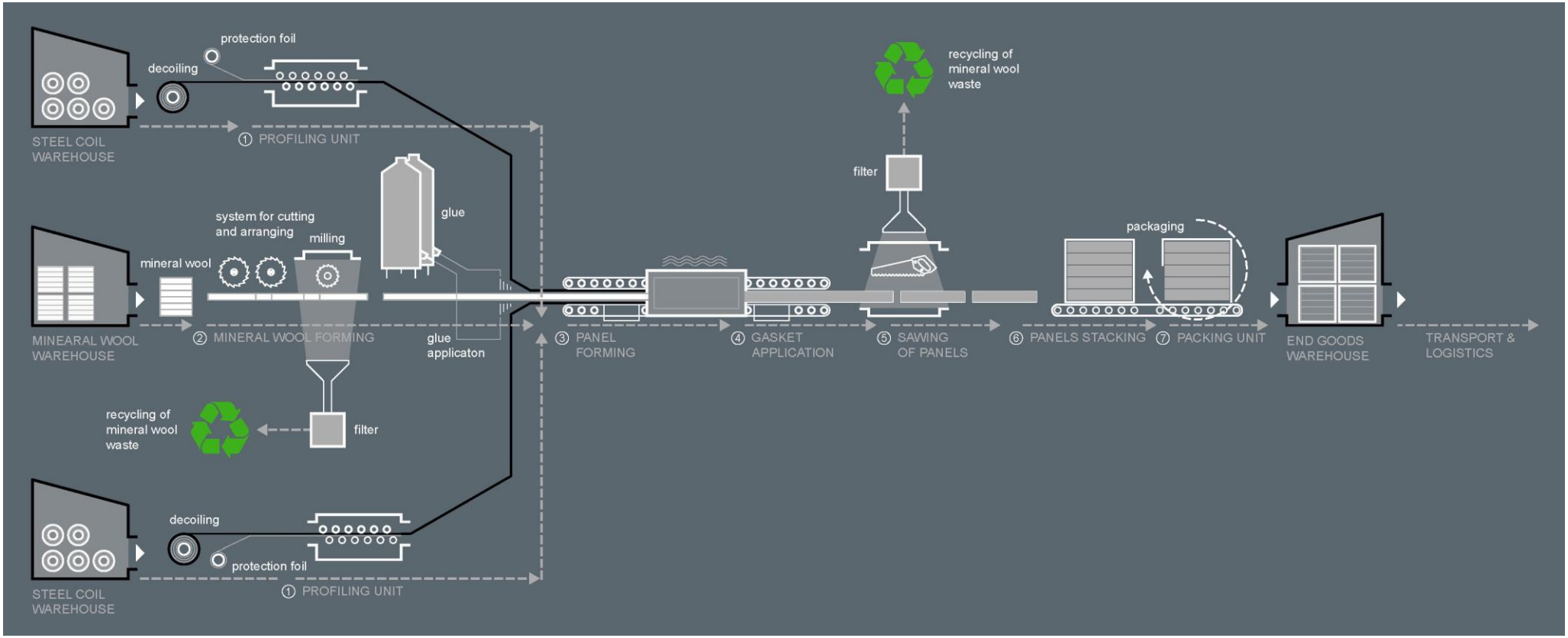
PRODUCT USE AND MAINTENANCE (B1-B7)

Module not declared.

PRODUCT END OF LIFE (C1-C4, D)

The de-construction process (C1) accounts for energy consumption. We assume that waste is collected separately and then transported to a waste treatment center, with a presumed distance of 50 km using a lorry (C2). In module C3, we factor in the energy and resource inputs for sorting and treating waste streams, assuming a 95% recycling rate for steel and incineration with energy recovery (PUR adhesive) at an efficiency of 38%. Module C4 addresses the landfilling of waste, including 5% steel. Considering the potential for material and energy recovery at the end of the product and packaging life cycle (D), recycled raw materials contribute to avoiding virgin material production. Simultaneously, energy recovered from incineration displaces electricity and heat production. The analysis encompasses the benefits and environmental impacts associated with packaging materials.

MANUFACTURING PROCESS



LIFE-CYCLE ASSESSMENT

CUT-OFF CRITERIA

The study does not exclude any modules or processes which are stated mandatory in the reference standard and the applied PCR. The study does not exclude any hazardous materials or substances. The study includes all major raw material and energy consumption. All inputs and outputs of the unit processes, for which data is available for, are included in the calculation. There is no neglected unit process more than 1% of total mass or energy flows. The module specific total neglected input and output flows also do not exceed 5% of energy usage or mass.

ALLOCATION, ESTIMATES AND ASSUMPTIONS

Allocation is required if some material, energy, and waste data cannot be measured separately for the product under investigation. All allocations are done as per the reference standards and the applied PCR. In this study, allocation has been done in the following ways:

Data type	Allocation
Raw materials	No allocation
Packaging material	No allocation
Ancillary materials	Allocated by mass or volume
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	-

There is no average result considered in this study since this EPD refers to one production plant.

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	3,35E+01	5,19E+00	1,24E+00	3,99E+01	5,10E-01	1,78E+00	MND	MND	MND	MND	MND	MND	MND	3,01E-01	1,39E-01	1,42E+00	2,32E-01	-5,96E+00
GWP – fossil	kg CO_2e	3,36E+01	5,18E+00	1,36E+00	4,01E+01	5,10E-01	1,66E+00	MND	MND	MND	MND	MND	MND	MND	3,01E-01	1,39E-01	1,42E+00	1,16E-01	-6,08E+00
GWP – biogenic	kg CO_2e	-1,16E-01	0,00E+00	-1,26E-01	-2,41E-01	0,00E+00	1,26E-01	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	1,16E-01	1,13E-01
GWP – LULUC	kg CO_2e	2,62E-02	2,11E-03	1,15E-03	2,95E-02	2,04E-04	1,14E-04	MND	MND	MND	MND	MND	MND	MND	3,00E-05	5,42E-05	2,58E-04	1,10E-04	5,39E-03
Ozone depletion pot.	kg $CFC\text{-}_{11}$e	2,12E-06	1,20E-06	4,85E-08	3,36E-06	1,18E-07	1,49E-07	MND	MND	MND	MND	MND	MND	MND	6,43E-08	3,28E-08	2,88E-08	4,70E-08	-1,74E-07
Acidification potential	mol H^+e	1,07E-01	1,62E-02	8,12E-03	1,32E-01	1,45E-03	1,04E-02	MND	MND	MND	MND	MND	MND	MND	3,13E-03	4,54E-04	3,43E-03	1,09E-03	-2,39E-02
EP-freshwater[2)]	kg Pe	2,64E-03	3,77E-05	6,80E-05	2,74E-03	3,64E-06	3,07E-05	MND	MND	MND	MND	MND	MND	MND	9,97E-07	1,18E-06	1,06E-05	1,22E-06	-7,69E-05
EP-marine	kg Ne	2,27E-02	3,30E-03	1,03E-03	2,70E-02	2,89E-04	3,46E-03	MND	MND	MND	MND	MND	MND	MND	1,38E-03	9,98E-05	1,09E-03	3,78E-04	-4,49E-04
EP-terrestrial	mol Ne	2,97E-01	3,67E-02	1,01E-02	3,43E-01	3,21E-03	3,78E-02	MND	MND	MND	MND	MND	MND	MND	1,52E-02	1,11E-03	1,14E-02	4,16E-03	-6,16E-02
POCP ("smog")[3)]	kg NMVOCe	8,59E-02	1,35E-02	3,95E-03	1,03E-01	1,23E-03	1,04E-02	MND	MND	MND	MND	MND	MND	MND	4,17E-03	4,29E-04	2,93E-03	1,21E-03	-3,31E-02
ADP-minerals & metals4)	kg Sbe	6,88E-04	1,88E-05	5,27E-06	7,12E-04	1,84E-06	1,70E-06	MND	MND	MND	MND	MND	MND	MND	1,53E-07	3,39E-07	2,53E-05	2,67E-07	-1,75E-04
ADP-fossil resources	MJ	3,68E+02	7,70E+01	3,07E+01	4,76E+02	7,59E+00	1,87E+01	MND	MND	MND	MND	MND	MND	MND	4,05E+00	2,18E+00	3,20E+00	3,18E+00	-5,83E+01
Water use[5)]	m^3e depr.	8,05E+00	3,64E-01	5,57E-01	8,97E+00	3,55E-02	1,23E-01	MND	MND	MND	MND	MND	MND	MND	1,09E-02	9,75E-03	9,42E-02	1,01E-02	2,07E+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	2,89E+02	1,14E+00	1,91E+00	2,92E+02	1,10E-01	7,57E-01	MND	MND	MND	MND	MND	MND	MND	2,31E-02	2,46E-02	4,60E-01	2,76E-02	-8,05E+00
Renew. PER as material	MJ	9,63E-01	0,00E+00	1,41E+00	2,37E+00	0,00E+00	-1,41E+00	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	-9,63E-01	1,13E+00
Total use of renew. PER	MJ	2,89E+02	1,14E+00	3,33E+00	2,94E+02	1,10E-01	-6,54E-01	MND	MND	MND	MND	MND	MND	MND	2,31E-02	2,46E-02	4,60E-01	-9,35E-01	-6,92E+00
Non-re. PER as energy	MJ	3,44E+02	7,70E+01	1,93E+01	4,40E+02	7,59E+00	1,22E+01	MND	MND	MND	MND	MND	MND	MND	4,05E+00	2,18E+00	3,20E+00	3,18E+00	-5,45E+01
Non-re. PER as material	MJ	1,19E+01	0,00E+00	9,96E+00	2,18E+01	0,00E+00	-9,96E+00	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	-1,02E+01	-1,70E+00	2,86E+00
Total use of non-re. PER	MJ	3,56E+02	7,70E+01	2,93E+01	4,62E+02	7,59E+00	2,27E+00	MND	MND	MND	MND	MND	MND	MND	4,05E+00	2,18E+00	-6,99E+00	1,49E+00	-5,16E+01
Secondary materials	kg	6,90E+00	2,65E-02	9,67E-02	7,03E+00	2,58E-03	5,17E-03	MND	MND	MND	MND	MND	MND	MND	1,58E-03	6,05E-04	3,04E-03	6,69E-04	3,95E+00
Renew. secondary fuels	MJ	1,73E-03	2,87E-04	1,34E-02	1,54E-02	2,84E-05	1,68E-05	MND	MND	MND	MND	MND	MND	MND	5,18E-06	6,11E-06	1,55E-04	1,75E-05	-7,69E-04
Non-ren. secondary fuels	MJ	-1,20E-02	0,00E+00	0,00E+00	-1,20E-02	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	3,48E+00	9,91E-03	1,80E+00	5,29E+00	9,68E-04	2,79E-03	MND	MND	MND	MND	MND	MND	MND	2,46E-04	2,82E-04	3,80E-03	3,49E-03	-1,62E-01

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	8,40E-01	8,90E-02	3,59E-02	9,64E-01	8,64E-03	2,30E-02	MND	MND	MND	MND	MND	MND	MND	5,42E-03	2,88E-03	1,73E-02	0,00E+00	-3,47E+00
Non-hazardous waste	kg	1,10E+01	1,59E+00	4,24E+00	1,68E+01	1,53E-01	1,58E+00	MND	MND	MND	MND	MND	MND	MND	3,81E-02	4,72E-02	9,99E-01	2,21E+01	-1,31E+01
Radioactive waste	kg	5,10E-03	5,30E-04	5,18E-05	5,68E-03	5,22E-05	8,50E-05	MND	MND	MND	MND	MND	MND	MND	2,85E-05	1,47E-05	1,48E-05	0,00E+00	-3,57E-05

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	3,01E-02	0,00E+00	3,14E-01	3,44E-01	0,00E+00	1,45E-01	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	8,50E+00	0,00E+00	0,00E+00
Materials for energy rec	kg	2,41E-03	0,00E+00	0,00E+00	2,41E-03	0,00E+00	1,07E-01	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	2,88E-01	2,88E-01	0,00E+00	1,46E+00	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	3,84E+00	0,00E+00	0,00E+00

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.

HaiHa Nguyen, as an authorized verifier acting for EPD Hub Limited

07.11.2024

VERIFIED ISO 14025