

ENVIRONMENTAL PRODUCT DECLARATION

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

Geopolymer

EcoUp Oy



EPD HUB, HUB-1762

Published on 16.08.2024, last updated on 16.08.2024, valid until 16.02.2026

GENERAL INFORMATION

MANUFACTURER

Manufacturer	EcoUp Oy
Address	Kyröntie 504, 21450 Tarvasjoki
Contact details	ilari.hirvensalo@ecoup.fi
Website	www.ecoup.fi

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	Design phase EPD
Scope of the EPD	Cradle to gate with options, A4
EPD author	Jori Jokela, Macon Oy
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

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	Geopolymer
Place of production	Tarvasjoki, Finland
Period for data	1.10.2023-1.11.2023
Averaging in EPD	No averaging

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 kg
Declared unit mass	1 kg
GWP-fossil, A1-A3 (kgCO ₂ e)	0,0563
GWP-total, A1-A3 (kgCO ₂ e)	0,0546
Secondary material, inputs (%)	11,5
Secondary material, outputs (%)	100
Total energy use, A1-A3 (kWh)	0,26
Net freshwater use, A1-A3 (m ³)	0

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

EcoUps objective is to advance green construction industry by providing solutions to the sector's rapidly growing need for low-carbon materials and solutions for enhancing circularity.

We produce genuinely ecological building materials and raw materials for construction operators and infrastructure operators, meeting strict quality criteria and actively developing them even further.

Solving The Waste Problem is a part of our core business. For the need of waste treatment and recycling operators, we have developed technology and method for grinding C/D-waste into new ecological raw materials in an energy-efficient manner. Waste fractions that traditionally have been difficult to utilize are now resources for new building and infrastructure products. We license the technology to our customers and partners, thus multiplying the environmental benefit.

PRODUCT DESCRIPTION

Geopolymer is a material based on patented recycling technology, which turns recycled mineral wool into new recycled raw material.

Further information can be found at www.ecoup.fi.

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass- %	Material origin
Metals	-	
Minerals	100	Finland
Fossil materials	-	
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	-

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	X	MND	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	Deconstr./demol.	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 environmental impacts of raw material supply (A1) include emissions generated when raw materials are taken from nature, transported to industrial units for processing and processed, along with waste handling from the various production processes. All major upstream processes are taken into consideration, including infrastructure. This stage includes all the aforementioned for the raw materials which end up in the final product

(Geopolymer) as well as the electricity and heat production which are consumed during the manufacturing at the plant.

TRANSPORT AND INSTALLATION (A4-A5)

Transportation impacts occurred from final products delivery to manufacturing site (A4) cover fuel direct exhaust emissions, environmental impacts of fuel production, as well as related infrastructure emissions.

This EPD does not cover installation phase (A5).

PRODUCT USE AND MAINTENANCE (B1-B7)

This EPD does not cover the use phase. Air, soil, and water impacts during the use phase have not been studied.

PRODUCT END OF LIFE (C1-C4, D)

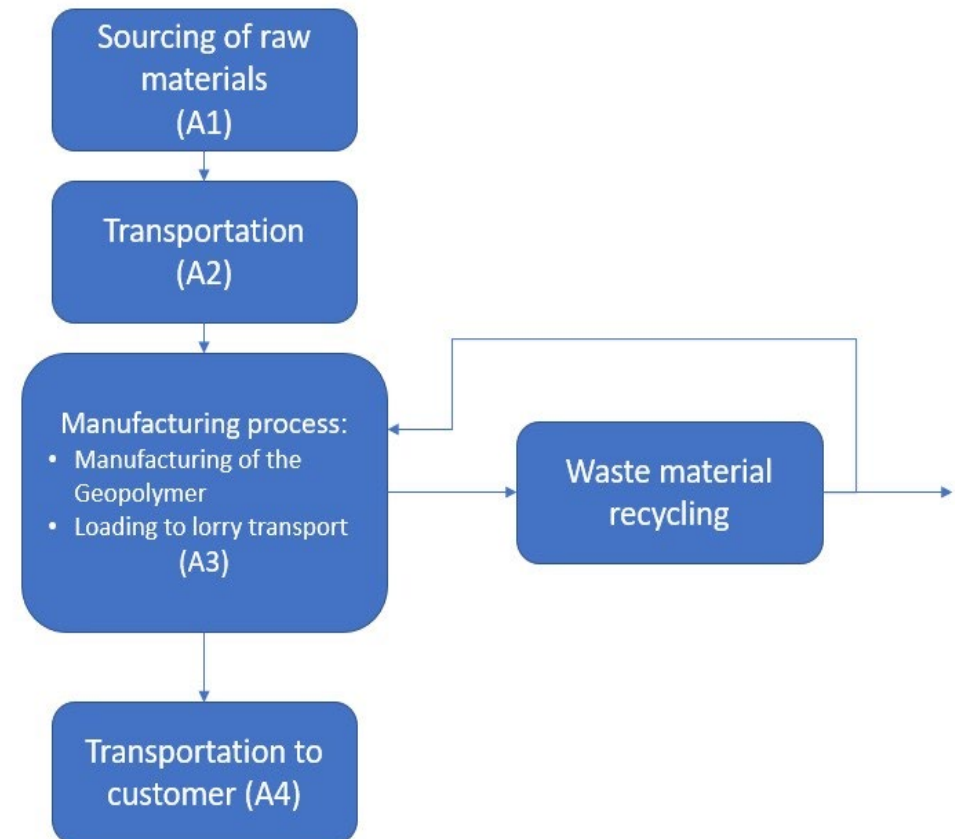
This EPD does not cover end of life phases.

MANUFACTURING PROCESS

Part of the raw materials are collected by EcoUp itself (A1/A2) (recyclable waste mineral wool from building and demolition sites).

In the manufacturing process waste based raw materials are grinded and mixed with additives.

Readymade Geopolymer product is utilized in own EcoUp building product manufacturing or transported to customers by lorry transportation. Packing is not needed.



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 materials	No allocation
Ancillary materials	No allocation
Manufacturing energy and waste	No allocation

AVERAGES AND VARIABILITY

Type of average	No averaging
Averaging method	Not applicable

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
GWP – total ¹⁾	kg CO ₂ e	3,97E-02	1,03E-02	4,68E-03	5,46E-02	1,13E-02
GWP – fossil	kg CO ₂ e	4,14E-02	1,02E-02	4,68E-03	5,63E-02	1,13E-02
GWP – biogenic	kg CO ₂ e	-4,80E-03	0,00E+00	0,00E+00	-4,80E-03	4,70E-06
GWP – LULUC	kg CO ₂ e	3,07E-03	3,84E-06	5,44E-07	3,07E-03	4,24E-06
Ozone depletion pot.	kg CFC ₁₁ e	1,48E-08	2,56E-09	1,06E-09	1,84E-08	2,82E-09
Acidification potential	mol H ⁺ e	2,16E-04	3,27E-05	5,47E-05	3,03E-04	3,60E-05
EP-freshwater ²⁾	kg Pe	1,76E-06	7,32E-08	5,50E-07	2,38E-06	8,08E-08
EP-marine	kg Ne	4,15E-05	7,21E-06	1,66E-05	6,53E-05	7,95E-06
EP-terrestrial	mol Ne	4,60E-04	7,99E-05	2,11E-04	7,50E-04	8,82E-05
POCP (“smog”) ³⁾	kg NMVOCe	2,08E-04	3,15E-05	4,92E-05	2,89E-04	3,47E-05
ADP-minerals & metals ⁴⁾	kg Sbe	5,17E-07	2,51E-08	1,98E-10	5,42E-07	2,77E-08
ADP-fossil resources	MJ	5,86E-01	1,64E-01	2,15E-02	7,71E-01	1,81E-01
Water use ⁵⁾	m ³ e depr.	2,02E-02	7,56E-04	8,32E-03	2,92E-02	8,34E-04

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, PEF

Impact category	Unit	A1	A2	A3	A1-A3	A4
Particulate matter	Incidence	5,67E-05	1,19E-09	9,52E-10	5,67E-05	1,31E-09
Ionizing radiation ⁶⁾	kBq U235e	5,85E-03	8,44E-04	3,05E-03	9,75E-03	9,31E-04
Ecotoxicity (freshwater)	CTUe	7,78E+00	1,36E-01	6,54E-02	7,98E+00	1,50E-01
Human toxicity, cancer	CTUh	2,70E-05	3,54E-12	1,46E-12	2,70E-05	3,91E-12
Human tox. non-cancer	CTUh	1,53E-09	1,39E-10	4,17E-11	1,71E-09	1,53E-10
SQP ⁷⁾	-	9,68E-01	1,91E-01	5,99E-03	1,16E+00	2,10E-01

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
Renew. PER as energy ⁸⁾	MJ	6,30E-02	2,12E-03	1,42E-02	7,93E-02	2,34E-03
Renew. PER as material	MJ	6,81E-02	0,00E+00	0,00E+00	6,81E-02	0,00E+00
Total use of renew. PER	MJ	1,31E-01	2,12E-03	1,42E-02	1,47E-01	2,34E-03
Non-re. PER as energy	MJ	5,63E-01	1,64E-01	1,13E-01	8,39E-01	1,81E-01
Non-re. PER as material	MJ	2,27E-02	0,00E+00	0,00E+00	2,27E-02	0,00E+00
Total use of non-re. PER	MJ	5,86E-01	1,64E-01	1,13E-01	8,62E-01	1,81E-01
Secondary materials	kg	1,15E-01	4,61E-05	4,48E-06	1,15E-01	5,09E-05
Renew. secondary fuels	MJ	1,94E-05	4,07E-07	4,50E-05	6,48E-05	4,49E-07
Non-ren. secondary fuels	MJ	0,00E+00	0,00E+00	4,77E-04	4,77E-04	0,00E+00
Use of net fresh water	m ³	6,37E-04	2,17E-05	7,07E-05	7,29E-04	2,40E-05

8) PER = Primary energy resources.

END OF LIFE – WASTE

Impact category	Unit	A1	A2	A3	A1-A3	A4
Hazardous waste	kg	3,14E-02	1,76E-04	8,39E-05	3,16E-02	1,94E-04
Non-hazardous waste	kg	7,29E-02	3,05E-03	2,97E-03	7,89E-02	3,37E-03
Radioactive waste	kg	2,36E-06	1,13E-06	1,22E-06	4,71E-06	1,25E-06

END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1	A2	A3	A1-A3	A4
Components for re-use	kg	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
Materials for energy rec	kg	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

ENVIRONMENTAL IMPACTS – EN 15804+A1, CML / ISO 21930

Impact category	Unit	A1	A2	A3	A1-A3	A4
Global Warming Pot.	kg CO ₂ e	4,82E-02	1,01E-02	4,78E-03	6,31E-02	1,12E-02
Ozone depletion Pot.	kg CFC ₋₁₁ e	5,88E-09	2,01E-09	8,43E-10	8,74E-09	2,23E-09
Acidification	kg SO ₂ e	1,97E-04	2,64E-05	2,19E-05	2,46E-04	2,92E-05
Eutrophication	kg PO ₄ ³ e	7,72E-05	5,59E-06	4,53E-06	8,73E-05	6,19E-06
POCP ("smog")	kg C ₂ H ₄ e	1,07E-05	1,23E-06	1,15E-06	1,31E-05	1,36E-06
ADP-elements	kg Sbe	4,09E-07	2,43E-08	1,26E-08	4,46E-07	2,69E-08
ADP-fossil	MJ	6,54E-01	1,63E-01	1,31E-01	9,48E-01	1,81E-01

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 acting for EPD Hub Limited
16.08.2024

