

ENVIRONMENTAL PRODUCT DECLARATION

In accordance with ISO 14025 and EN 15804:2012+A2:2019 for

Thermal Insulation Plaster from **STYRONIT**



Programme:	EPD Turkey, a fully aligned regional programme www.epdturkey.org	The International EPD® System www.environdec.com
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EPD Registration Number:	S-P-03983	
Publication Date:	20.09.2021	
Validity Date:	19.09.2026	
Geographical Scope:	Global	

Programme Information

Programme	EPD Turkey, a fully aligned regional programme	The International EPD® System
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2019:14 Version 1.1. 2020-09-14 Construction Products
EN 15804:2012 + A2:2019 Sustainability of Construction Works

Independent third-party verification of the declaration and data, according to ISO 14025:2006

EPD process certification EPD verification

Third party verifier: Professor Vladimír Kočí

Approved by: The International EPD® System

Procedure for follow-up of data during EPD validity involves third party verifier:

Yes No

The EPD owner has the sole ownership, liability, and responsibility for the EPD. EPDs within the same product category but from different programmes may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804.

Company Information

Styronit Doğal Yalıtım Malz. San ve Tic A.Ş. minimizes the energy consumption in the buildings with its' natural thermal and acoustic insulation products under Styronit® brand. With experienced technical and administrative staf services set the standard of excellence in domestic and international markets including; thermal insulation and acoustic insulation plasters.

Styronit with EN-ISO 9001: 2015 and EN ISO 14001: 2015 certificates and social responsibilities contributes in the development of environmentally friendly green buildings for the future of Turkey and the world. So far Styronit is the first company in Turkey to certify Type III EPD (Environmental Product Declaration) certification system for thermal, acoustic and fire insulation plaster products. Therefore Styronit provides high scores to its' customer's green building projects from LEED, BREEAM. With its' 5000 m² closed area, the company has more than 10 years experiences in environmentally friendly products in the insulation industry. Thanks to innovative R&D eforts that has increased the quality and variety of products from day to day.

The vision of the Styronit is to make Styronit® a global brand in accordance with experiences and principles. The mission of the Styronit is to expand the natural insulation plaster applications across the country which efects a positive impact on human health and building biology and also to obtain bioclimatic and thermal confort areas with environmentally friendly natural, economic products to the people.



Product Information

Product name: Thermal Insulation Plaster

Product identification: Plasters

UN CPC code: 37410

Geographical scope: Global

Technical Properties

Properties	STY 160	STY 300	STY 325	STY 325 Acoustic	STY 355	STY 550	STY HRSN
Dry Unit Density, kg/m ³	280 ± 25	300 ± 25	325 ± 25	330 ± 25	600 ± 25	550 ± 25	300 ± 25
Compressive strength, N/mm ²	1.78	1.78	1.78	-	-	9	1.0
Adhesive strength, N/mm ²	≥0.04	≥0.04	≥0.04	-	-	≥0.04	≥0.04
Capillary water absorption, kg/m ² sn ^{0.5}	W1 (C≤0.4)	W1 (C≤0.4)	W1 (C≤0.4)	-	-	-	W1 (C≤0.4)
Water vapor permeability, μ	≤15	≤15	≤15	-	-	-	≤15
Reaction to fire	A1	A1	A1	A1	A1	A1	A1
Thermal Conductivity, λ, W/(m.K)	0.048	0.048	0.048	-	-	0.062	0.048
Sound Reduction, dB	-	-	-	49-55	52-60	50-70	-



LCA Information

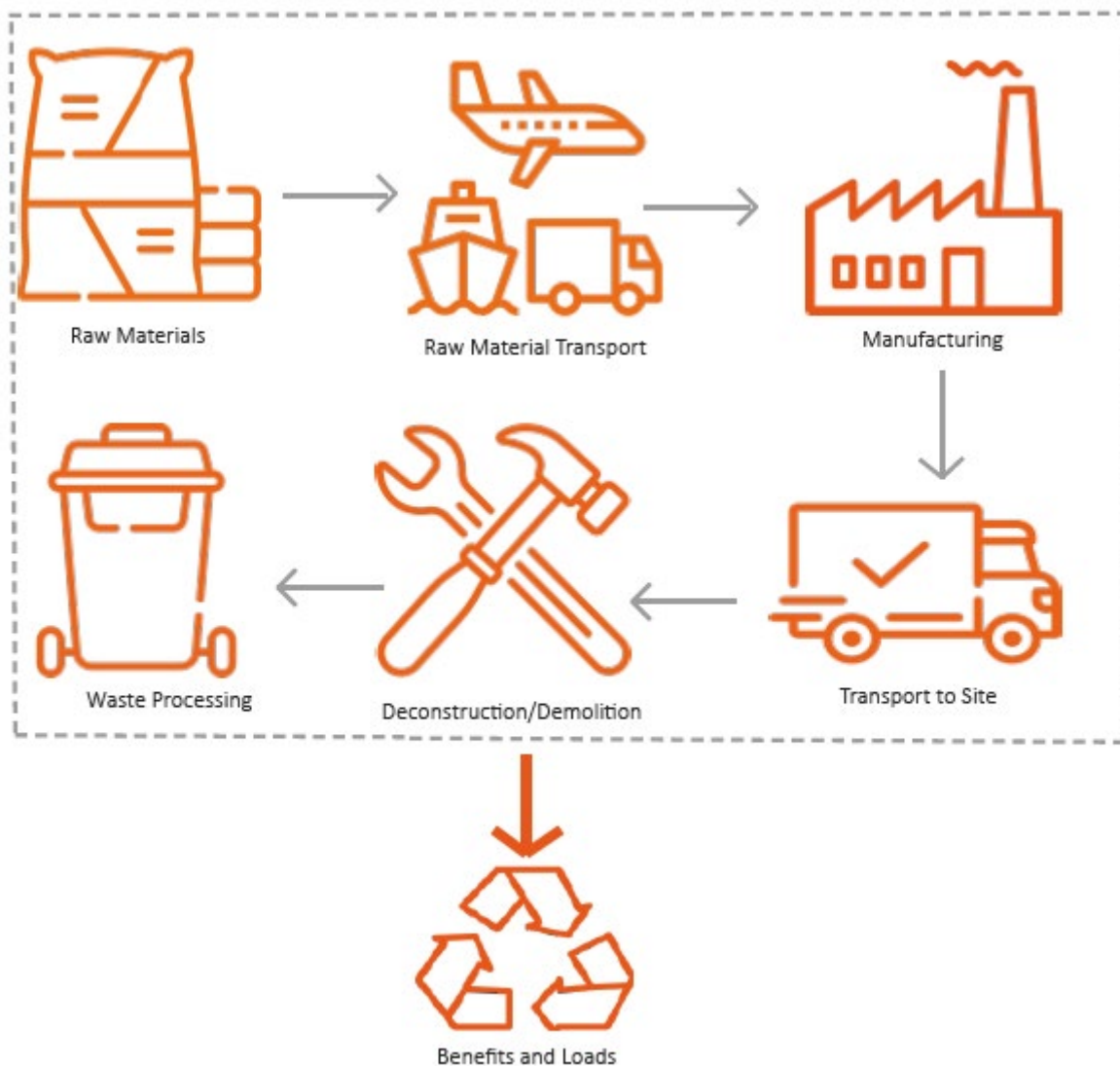
Declared Unit 1 kg of thermal insulation plaster

Time Representativeness 2020

Database(s) and LCA Software Used Ecoinvent 3.5 SimaPro 9.0

The inventory for the LCA study is based on the average production figures for thermal insulation plaster by STYRONIT production plants in İstanbul, Turkey for the time period of 2020.

System Boundary



Description of System Boundary

The scope of this EPD is from cradle to grave including compulsory modules A1-A3, C1-C4 and module D and the optional module of A4.

Upstream			Core						Downstream								Other Environmental Information
Raw Material	Raw Material Transport	Manufacturing	Transport to Construction Site	Construction / Installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational Energy Use	Operational Water Use	Deconstruction / Demolition	Transport to Disposal Site	Waste Processing	Disposal	Future reuse, recycling or energy recovery potential	
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D	
X	X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X	

Description of the system boundary (X = Included in LCA, ND=Not Declared)

A1: Raw Material

Production starts with raw materials. Raw material stage includes raw material extraction/preparation and pre-treatment processes before production.

A2: Raw Material Transport

Transport is relevant for delivery of raw materials and other materials to the plant and the transport of materials within the plant. Transport of raw materials to production site is taken as the weight average values for transport from raw materials supplier for 2020.

A3: Manufacturing

Manufacturing processes include all the production activities within the plant with all the associated impacts.

A4: Transport to Site

Transport of final product to the construction site is taken as average values for transport to plant for 2020.

C1 : Deconstruction / Demolition

The environmental impact is assumed to be very small and can be neglected since the de-construction and/or dismantling of insulation products take part of the demolition of the entire building.

C2 : Transport to Disposal Site

This stage includes the transportation of the discarded construction products to final disposal. Average distance from demolition site to final disposal site is assumed to be 100 km.

C3 : Waste Processing

Demolition waste is assumed not to be further processed and sent to landfill for final disposal.

C4 : Disposal

The insulation plaster is part of demolition waste and assumed to be 100% landfilled.

D : Benefits and Loads

There is no potential benefit as the products go completely to the landfill at the end of life. Only the benefit from packaging recycling is taken into account in this LCA model.

More Information



The results of the LCA with the indicators as per EPD requirement are given in the LCA result tables.

All energy calculations were obtained using Cumulative Energy Demand (LHV) methodology, while fresh water use is calculated with selected inventory flows in SimaPro according to the PCR.

There are no co-products in the production. Hence, there is no need for co-product allocation.

Energy consumption and transport datasets were allocated based on the average production figures for 2020, and weighted average of environmental impacts were presented.

Accordingly, waste amounts were also allocated based on the average waste arisings for the period of 2020.

Thermal insulation plasters are theoretically outlasting/lifetime products. However, when they are scrapped or discarded, they are disposed as part of construction demolition waste.



LCA RESULTS

Environmental Impacts

for 1 kg of Thermal Insulation Plaster

Impact Category	Unit	A1- A3	A4	C1	C2	C3	C4	D
GWP - Fossil	kg CO ₂ eq	8.47E-01	2.99E-02	0	9.09E-03	0	5.38E-03	-4.80E-03
GWP - Biogenic	kg CO ₂ eq	-2.96E-02	2.17E-05	0	6.60E-06	0	9.20E-06	4.01E-03
GWP - Luluc	kg CO ₂ eq	5.92E-04	8.73E-06	0	2.65E-06	0	1.45E-06	-2.92E-05
GWP - Total	kg CO ₂ eq	8.18E-01	2.99E-02	0	9.10E-03	0	5.39E-03	-8.27E-04
ODP	kg CFC-11 eq	6.88E-08	7.03E-09	0	2.14E-09	0	2.40E-09	-2.91E-10
AP	mol H+ eq	6.46E-03	1.26E-04	0	3.82E-05	0	5.22E-05	-2.70E-05
EP - Freshwater	kg PO ₄ eq	7.77E-04	6.48E-06	0	1.97E-06	0	1.84E-06	-5.74E-06
EP - Freshwater	kg P eq	2.54E-04	2.12E-06	0	6.43E-07	0	6.02E-07	-1.87E-06
EP - Marine	kg N eq	1.11E-03	3.82E-05	0	1.16E-05	0	1.72E-05	-6.35E-06
EP - Terrestrial	mol N eq	1.07E-02	4.18E-04	0	1.27E-04	0	1.90E-04	-6.33E-05
POCP	kg NMVOC	2.89E-03	1.34E-04	0	4.08E-05	0	5.52E-05	-1.90E-05
ADPE	kg Sb eq	1.46E-05	5.10E-07	0	1.55E-07	0	5.94E-09	-5.05E-08
ADPF	MJ	8.55E+00	4.65E-01	0	1.41E-01	0	1.62E-01	-7.25E-02
WDP	m ³ depriv.	2.37E-01	1.51E-03	0	4.59E-04	0	7.16E-03	-6.64E-03
PM	disease inc.	8.59E-08	2.70E-09	0	8.22E-10	0	9.77E-10	-4.47E-10
IR	kBq U-235 eq	2.70E-02	2.37E-03	0	7.20E-04	0	7.38E-04	-6.86E-04
ETP - FW	CTUe	3.03E+01	3.70E-01	0	1.13E-01	0	9.59E-02	-2.84E-01
HTTP - C	CTUh	3.62E-10	9.13E-12	0	2.77E-12	0	2.11E-12	-2.46E-12
HTTP - NC	CTUh	1.07E-08	4.22E-10	0	1.28E-10	0	6.84E-11	-7.89E-11
SQP	Pt	8.22E+00	5.33E-01	0	1.62E-01	0	3.10E-01	-6.25E-01
Acronyms	GWP-total: Climate change, GWP-fossil: Climate change- fossil, GWP-biogenic: Climate change - biogenic, GWP-luluc: Climate change - land use and transformation, ODP: Ozone layer depletion, AP: Acidification terrestrial and freshwater, EP-freshwater: Eutrophication freshwater, EP-marine: Eutrophication marine, EP-terrestrial: Eutrophication terrestrial, POCP: Photochemical oxidation, ADPE: Abiotic depletion - elements, ADPF: Abiotic depletion - fossil resources, WDP: Water scarcity, PM: Respiratory inorganics - particulate matter, IR: Ionising radiation, ETP-FW: Ecotoxicity freshwater, HTP-c: Cancer human health effects, HTP-nc: Non-cancer human health effects, SQP: Land use related impacts, soil quality.							
Legend	A1: Raw Material, A2: Raw Material Transport, A3: Manufacturing, A4: Transport to Site, C1: Deconstruction/Demolition, C2: Transport to Disposal Site, C3: Waste Processing, C4: Disposal, D: Benefits and Loads Beyond the System Boundary.							
Disclaimer	EP-freshwater indicator has also been calculated as "kg P eq" as required in the characterization model (EUTREND model, Struijs et al., 2009b, as implemented in ReCiPe; http://eplca.jrc.ec.europa.eu/LCDN/developerEF.xhtml) in addition to "kg PO4 eq" as stated in the standard.							

Resource Use for 1 kg of Thermal Insulation Plaster

Impact Category	Unit	A1 - A3	A4	C1	C2	C3	C4	D
PERE	MJ	1.71	0.006	0	0.002	0	0.001	-0.113
PERM	MJ	0	0	0	0	0	0	0
PERT	MJ	1.71	0.006	0	0.002	0	0.001	-0.113
PENRE	MJ	8.55	0.465	0	0.141	0	0.162	-0.073
PENRM	MJ	0	0	0	0	0	0	0
PENRT	MJ	8.55	0.465	0	0.141	0	0.162	-0.073
SM	kg	0	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0
FW	m ³	0.003	96.8E-6	0	29.4E-6	0	1610E-6	-96.9E-6
Acronyms	PERE: Use of renewable primary energy excluding resources used as raw materials, PERM: Use of renewable primary energy resources used as raw materials, PERT: Total use of renewable primary energy, PENRE: Use of non-renewable primary energy excluding resources used as raw materials, PENRM: Use of non-renewable primary energy resources used as raw materials, PENRT: Total use of non-renewable primary energy, SM: Secondary material, RSF: Renewable secondary fuels, NRSF: Non-renewable secondary fuels, FW: Net use of fresh water, HWD: Hazardous waste disposed, NHWD: Non-hazardous waste disposed, RWD: Radioactive waste disposed, CRU: Components for reuse, MFR: Material for recycling, MER: Materials for energy recovery, EE (Electrical): Exported energy electrical, EE (Thermal): Exported energy, Thermal.							
Legend	A1: Raw Material, A2: Raw Material Transport, A3: Manufacturing, A4: Transport to Site, C1: Deconstruction/ Demolition, C2: Transport to Disposal Site, C3: Waste Processing, C4: Disposal, D: Benefits and Loads Beyond the System Boundary.							

Waste & Output Flows for 1 kg of Thermal Insulation Plaster

Impact Category	Unit	A1 - A3	A4	C1	C2	C3	C4	D
HWD	kg	0	0	0	0	0	0	0
NHWD	kg	1.60E-3	0	0	0	0	0	0
RWD	kg	0	0	0	0	0	0	0
CRU	kg	0	0	0	0	0	0	0
MFR	kg	0	0	0	0	0	0	0
MER	kg	0	0	0	0	0	0	0
EE (Electrical)	MJ	0	0	0	0	0	0	0
EE (Thermal)	MJ	0	0	0	0	0	0	0
HWD: Hazardous waste disposed NHWD: Non-hazardous waste disposed RWD: Radioactive waste disposed CRU: Components for reuse MFR: Material for recycling MER: Materials for energy recovery EE (Electrical): Exported energy, electrical EE (Thermal): Exported energy, Thermal								

References

- /GPI/General Programme Instructions of the International EPD® System. Version 3.0.
- /ISO 14020:2000/ Environmental labels and declarations — General principles
- /EN 15804/ EN 15804:2012 + A2:2019. Sustainability of Construction Works
- /ISO 14025/ DIN EN ISO 14025:2009-11: Environmental labels and declarations - Type III environmental declarations — Principles and procedures
- /ISO 14040/44/ DIN EN ISO 14040:2006-10. Environmental management - Life cycle assessment – Principles and framework (ISO14040:2006) and Requirements and guidelines (ISO 14044:2006)
- /PCR for Construction Products and CPC 54 Construction Services/ Prepared by IVL Swedish Environmental Research Institute. Swedish Environmental Protection Agency. SP Trä. Swedish Wood Preservation Institute. Swedisol. SCDA. Svenskt Limträ AB. SSAB. The International EPD System. 2019:14 Version 1.1. DATE 2019-12-20
- /The International EPD® System/ The International EPD® System is a programme for type III environmental declarations. maintaining a system to verify and register EPD®s as well as keeping a library of EPD®s and PCRs in accordance with ISO 14025.www.environdec.com
- /Ecoinvent / Ecoinvent Centre. www.Eco-invent.org
- /SimaPro/ SimaPro LCA Software. Pré Consultants. the Netherlands. www.pre-sustainability.com
- EN 1745:2004 Masonry and masonry products - Methods for determining thermal properties EN 1015-11:2000 Methods of test for mortar for masonry - part 11: determination of flexural and compressive strength of hardened mortar
- EN 1015-18:2004 Methods of test for mortar for masonry - determination of water absorption coefficient due to capillary action of hardened mortar
- EN 1015-19:2000 Methods of test for mortar for masonry - Part 19: Determination of water vapour permeability of hardened rendering and plastering mortars

Contact Information

Programme

EPD registered through fully aligned regional programme:
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Programme operator

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Owner of the declaration

The logo for Styronit, featuring a stylized "s" in red and yellow, followed by the text "styronit" in black, with a registered trademark symbol. Below it, the text "NATURAL INSULATION TECHNOLOGIES" is written in a smaller font.

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LCA Practitioner & EPD Design

The logo for Metsims, featuring the text "metsims" in a stylized, lowercase font, with "Sustainability Consulting" written below it. To the right of the text are three small circles in yellow, green, and blue.

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3rd party verifier

The logo for LCA studio, featuring the text "LCA studio" in a bold, sans-serif font, with a blue circular graphic element behind the "L".

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