ENVIRONMENTAL PRODUCT DECLARATION

DALSAN

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

GRİO BoardeX Render

Basecoat Render

Programme:
The International EPD® System
www.environdec.com

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EPD International AB

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TURKEY EPD®
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ECO PLATFORM EPD
EN 15804 VERIFIED

Programme Information

Programme

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Product Category Rules (PCR): 2019:14 Version 1.11, 2021-02-05, Construction Products and CPC 54 Construction Services, 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 X

Third party verifier: Prof. Vladimír Kocí

Approved by: The International EPD® System

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

Yes No X

Note: The Version 1.01 update contains only editorial changes related to product name updates.

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.

About the Company

DALSAN is an ineradicable company almost as old as Turkish Republic, commenced the fabrication of plaster in industrial level for our country that plaster was formerly used as a healthy, durable and material of construction individually since 9000's B.C. in Anatolia.

DALSAN has developed first workshop establishment from fabrication of teeth plaster by baking and pestling them in neighborhood bakery oven, commenced on 1932.

Today, DALSAN Alçı has fabrication capacity of more then 1 million ton of gypsum and cement based products by using modern and high technology in facilities location in Gebze and Ankara. Additionally, galvanized profiles used in drywall systems are also fabricated in these facilities.

DALSAN increases the share in market by the aim of true and qualified product delivery to customers as well as qualified and honesty based fabrication.

DALSAN succeeded to become a constantly learning institution by caring and monitoring tendencies, expectations, different acknowledges of sector. Importance given on learning among structure of company provides a basis to variety of product range and meet demands of consumers effectively. Continuous learning habit dominant in DALSAN accompanied with information and talent constitutes the most important dynamic of a better and eco-friendly fabrication.

DALSAN is a manufacturer with high export potential due to its location. Today, DALSAN exports to almost 70 countries in the world from both Gebze and Ankara plants.

DALSAN certifies that the goods and services to its customers are supplied with the internationally accepted ISO 9001 Quality Management System. Together with ISO 9001 Quality Management, DALSAN follows and applies ISO 14001 Environmental Management System.

Prior aim of DALSAN for the future is, to be on the top of the line in the technological competition made in plaster and plaster board fabrication by developing the fabrication more and more. Under favour of accumulation of knowledge and importance given to research and development studies, we offer all the needs of a construction from floor to roof.

DALSAN

Product Information

A polymer modified, fiber reinforced, single-component, cement-based joint filler and basecoat used for rendering of insulating boards, exterior boards exterior boards joints and surfaces as a basecoat.

Applications

Houses, office and administration buildings, business and shopping centers, hotels, repair and renewal works.

Composition

Dalsan **GRİO BoardeX Render** is produced from filling materials, cement and additives. The distribution of the composition is given in the table on the right.

After production, the final products are packed. Different packaging materials such as polypropylene and polyethylene can be used as secondary packaging.

Raw Material	% by weight
Filler	75-80
Cement	20-25
Additives	0-5

Technical Specifications

Propoerties	Unit	Standard	Value
Type	-	EN 998-1	CS IV
Reaction to fire	class	EN 998-1	A1
Dry density	kg/m^3	EN 998-1	~ 1250 ± 250

LCA Information

Declared Unit	1 kg of **GRİO BoardeX Render** Basecoat Render
Time Representativeness	2020
Database(s) and LCA Software Used	Ecoinvent 3.6, SimaPro 9.1

The inventory for the LCA study is based on the 2020 production figures for **GRİO BoardeX Render** by DALSAN production plant in Ankara, Turkey.

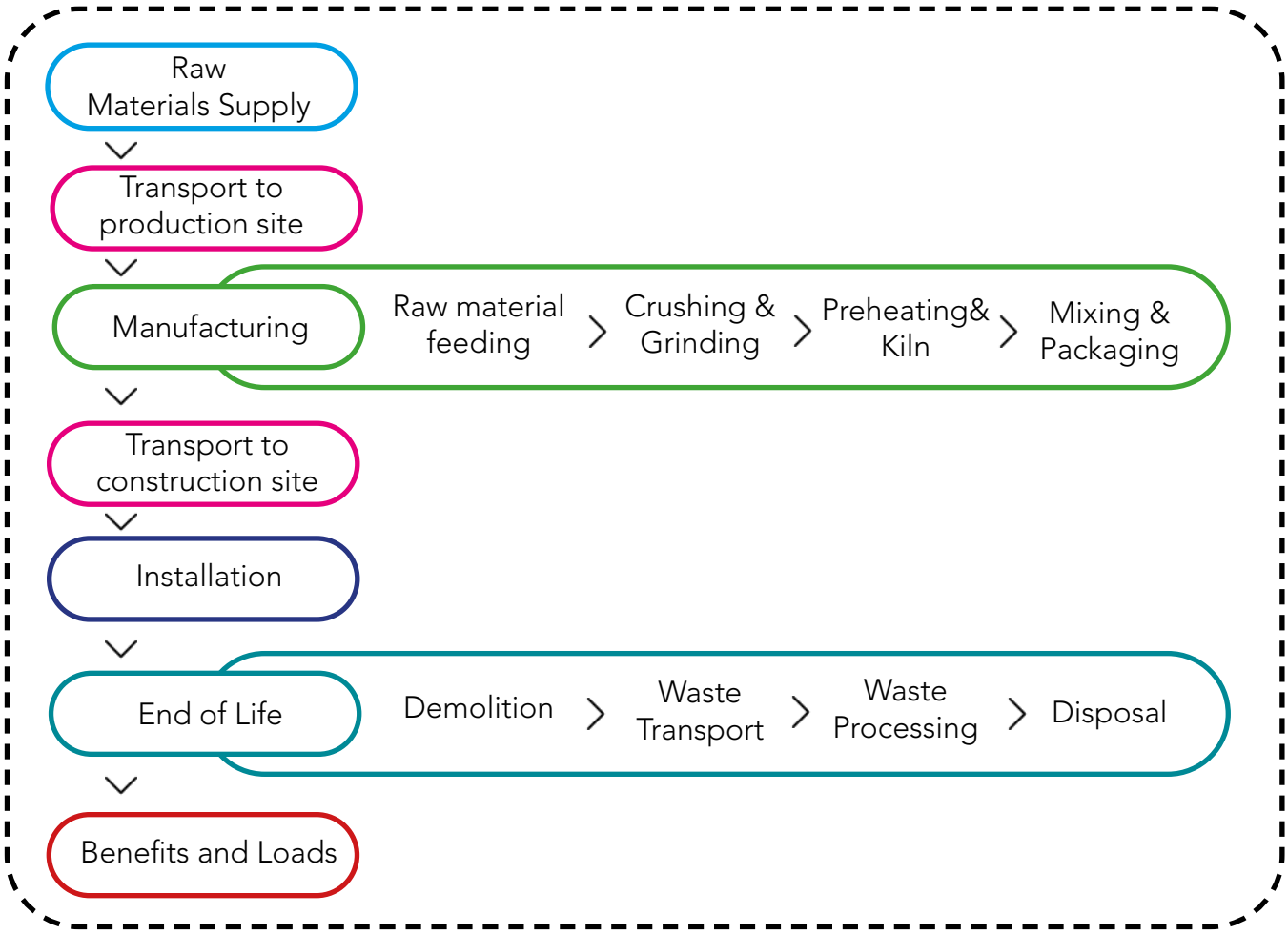
This EPD's system boundary is cradle to grave. The results of the LCA with the indicators as per EPD requirement are given in the following tables for product manufacture (A1, A2, A3), construction process stage (A4, A5), end of life stage (C1, C2, C3, C4) and benefits and load stage (D).

The system boundaries in tabular form for all modules are shown in the table above.

Product Stage			Constrcution Process Stage		Use Stage							End of Life Stage				Benefits and Loads
Raw Material Supply	Transport	Manufacturing	Transport	Construction Installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational Energy Use	Operational Water Use	Deconstruction, demolition	Transport	Waste Processing	Disposal	Future reuse, recycling or energy recovery potentials
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X

X = Included in LCA, ND = Not Declared

System Boundary



System Boundary

A1: Raw Material Supply
Production starts with raw materials mainly locally sourced but some transported from other parts of the world. 'Raw material supply' includes raw material extraction and pre-treatment processes before production.

A2: Transportation to Production Site
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 in 2020.

A3: Manufacturing
Manufacturing starts with grinding filling materials. The process continues with mixing filling materials, cement and other additives. The end products are then packaged or sold as bulk. Electric energy, natural gas and diesel for generators are consumed during the manufacturing. Part of the electrical energy used is provided by solar panels.

A4: Transport From the Gate to the Site
Transport of final product to construction site is taken as the weight average values for transport to customers in 2020. According to DALSAN sales figures, the transportation distance is assumed as 350 km roadway with a lorry.

A5: Installation
This stage includes the **GRİO BoardeX Render** application on the construction site. For the installation of **GRİO BoardeX Render**, 0.24 L/kg water is used according to the product technical datasheet. Prepare the **GRİO BoardeX Render** mortar for spreading and repair work by hand mixing in a plaster trough.

C1 : Deconstruction and Demolition
There is no energy use during uninstallation, manpower and some tools are sufficient.

C2 : Transport
This stage includes the transportation of the discarded plasters to final disposal. Average distance from demolition site to waste processing site for final disposal is assumed to be 100 km.

C3 : Waste Processing
If the wastes are going to landfill or to be inert filler, there is no need for any waste process.

C4 : Disposal
Since cement-based plasters cannot be physically separated from the applied surface, they go to the inert waste site with the applied surface or part. For this reason, 100% landfill scenario has been assumed. However, packaging materials can be recycled.

D : Benefits and Loads
In this stage, inert filler benefits and recycling of packaging materials were calculated specified in the disposal stage.

More Information

Allocations
Water consumption, energy consumption and raw material transportation were weighted according to 2020 production figures.

In addition, hazardous and non-hazardous waste amounts were also allocated from the 2020 total waste generation.

Cut-Off Criteria
1% cut-off applied. Data for elementary flows to and from the product system contributing to a minimum of 99% of the declared environmental impacts have been included.

REACH Regulation
No substances included in the Candidate List of Substances of Very High Concern for authorization under the REACH regulations are present in this product either above the threshold for registration with the European Chemicals Agency or above 0.1% (wt/wt).

LCA Modelling, Calculation and Data Quality
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-product allocations within the LCA study underlying this EPD.

The SimaPro 9.1 LCA software and the Ecoinvent 3.6 LCA database were used to calculate the environmental impacts. The regional energy datasets were used for all energy calculations.

Geographical Scope
The geographical scope of this EPD is global.

For more information and related documents as technical data sheet, application manuel, declarations of performance and any certificates, please click or scan the QR code.

LCA Results

Environmental Impacts

for 1 kg of **GRİO BoardeX Render** Basecoat render

Impact Category	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP - Fossil	kg CO_2 eq	0.255	0.032	82.2E-6	0.059	0.009	0	0.005	-0.002
GWP - Biogenic	kg CO_2 eq	-0.004	23.1E-6	1.68E-6	0.001	6.60E-6	0	10.4E-6	0.003
GWP - Luluc	kg CO_2 eq	246E-6	9.29E-6	134E-9	0.001	2.65E-6	0	1.47E-6	-21.5E-6
GWP - Total	kg CO_2 eq	0.251	0.032	84.1E-6	0.060	0.009	0	0.005	0.001
ODP	kg CFC-11 eq	12.8E-9	7.48E-9	7.29E-12	1.66E-9	2.14E-9	0	2.17E-9	-228E-12
AP	mol H+ eq	0.001	134E-6	480E-9	387E-6	38.2E-6	0	50.0E-6	-15.3E-6
EP - Freshwater	kg P eq	46.5E-6	2.25E-6	60.7E-9	62.1E-6	643E-9	0	541E-9	-1.47E-6
*EP - Freshwater	kg PO_4 eq	142E-6	6.89E-6	186E-9	190E-6	1.97E-6	0	1.65E-6	-4.51E-6
EP - Marine	kg N eq	227E-6	40.6E-6	90.4E-9	63.0E-6	11.6E-6	0	17.3E-6	-3.57E-6
EP - Terrestrial	mol N eq	0.003	445E-6	886E-9	0.001	127E-6	0	190E-6	-35.8E-6
POCP	kg NMVOC	0.001	143E-6	278E-9	156E-6	40.8E-6	0	55.1E-6	-10.4E-6
ADPE	kg Sb eq	20.1E-6	543E-9	2.30E-9	142E-9	155E-9	0	48.2E-9	-25.2E-9
ADPF	MJ	2.14	0.495	0.001	0.647	0.141	0	0.147	-0.043
WDP	m^3 depriv.	0.052	0.002	0.010	0.028	459E-6	0	0.007	-0.005
PM	disease inc.	8.10E-9	2.88E-9	4.17E-12	1.65E-9	823E-12	0	972E-12	-290E-12
IR	kBq U-235 eq	0.007	0.003	28.8E-6	0.001	0.001	0	0.001	-0.001
ETP - FW	CTUe	5.03	0.394	0.002	0.566	0.113	0	0.095	-0.224
HTTP - C	CTUh	104E-12	9.71E-12	225E-15	10.4E-12	2.77E-12	0	2.21E-12	-1.78E-12
HTTP - NC	CTUh	2.13E-9	488E-12	5.03E-12	498E-12	128E-12	0	67.9E-12	-58.9E-12
SQP	Pt	1.62	0.567	397E-6	0.037	0.162	0	0.309	-0.496
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 Supply, A2: Transport, A3: Manufacturing, A1-A3: Sum of A1, A2, and A3, A4: Transport to Site, A5: Installation, C1: De-Construction, C2: Waste Transport, C3: Waste Processing, C4: Disposal, D: Benefits and Loads Beyond the System Boundary.								
Disclaimer 1	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.								
Disclaimer 2	The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.								
*Disclaimer 3	EP-freshwater: This indicator has 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)								

Resource Use

for 1 kg of **GRİO BoardeX Render** Basecoat render

Impact Category	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PERE	MJ	0.278	0.006	191E-6	0.155	0.002	0	0.001	-0.088
PERM	MJ	0	0	0	0	0	0	0	0
PERT	MJ	0.278	0.006	191E-6	0.155	0.002	0	0.001	-0.088
PENRE	MJ	2.14	495E-3	1.41E-3	647E-3	141E-3	0	147E-3	-43.0E-3
PENRM	MJ	0	0	0	0	0	0	0	0
PENRT	MJ	2.14	495E-3	1.41E-3	647E-3	141E-3	0	147E-3	-43.0E-3
SM	kg	0	0	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0
FW	m^3	0.001	103E-6	234E-6	247E-6	29.4E-6	0	161E-6	-69.5E-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.								
Legend	A1: Raw Material Supply, A2: Transport, A3: Manufacturing, A1-A3: Sum of A1, A2, and A3, A4: Transport to Site, A5: Installation, C1: De-Construction, C2: Waste Transport, C3: Waste Processing, C4: Disposal, D: Benefits and Loads Beyond the System Boundary.								

Output Flows

for 1 kg of **GRİO BoardeX Render** Basecoat render

Impact Category	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
HWD	kg	20.5E-6	0	0	0	0	0	0	0
NHWD	kg	191E-6	0	0	0	0	0	0	0
RWD	kg	0	0	0	0	0	0	0	0
CRU	kg	0	0	0	0	0	0	0	0
MFR	kg	0	0	0	0	0	0	0	0
MER	kg	0	0	0	0	0	0	0	0
EE (Electrical)	MJ	0	0	0	0	0	0	0	0
EE (Thermal)	MJ	0	0	0	0	0	0	0	0
Acronyms	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 Supply, A2: Transport, A3: Manufacturing, A1-A3: Sum of A1, A2, and A3, A4: Transport to Site, A5: Installation, C1: De-Construction, C2: Waste Transport, C3: Waste Processing, C4: Disposal, D: Benefits and Loads Beyond the System Boundary.								

References

/GPI/ General Programme Instructions of the International EPD® System. Version 3.0.

/EN ISO 9001/ Quality Management Systems - Requirements

/EN ISO 14001/ Environmental Management Systems - Requirements

/ISO 14020:2000/ Environmental Labels and Declarations — General principles

/EN 15804:2012+A2:2019/ Sustainability of construction works - Environmental Product Declarations — Core rules for the product category of construction products

/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 1.11 DATE 2019-12-20

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