

General information

Product

Avretting (self-levelling compounds)

Programme Operator

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Declaration Number

EN/EPD

This declaration is based on Product Category Rules

NPCR 009 Part B for Technical - Chemical products for building and construction industry (references to EN15804+A2)

Statements

The owner of the declaration shall be liable for the underlying information and evidence. EPD Norway shall not be liable with respect to manufacturer, life cycle assessment data and evidence.

Declared unit

1 kg of Avretting (self-levelling compounds)

Functional unit

Not relevant

Conversion factor to mass

Not relevant

Verification

Independent verification of the declaration and data, according to ISO14025:2006

internal external

Julie Lyslo Skullestad

Julie Lyslo Skullestad
Independent verifier approved by EPD Norway

Owner of the declaration

Steinhardt AS
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Manufacturer

Steinhardt AS
Pir 2 nr 10, 7010 Trondheim, Norway

Place of production

Gråterudveien 26, 3036 Drammen, Norway

Management system

N/A

Organization no

915 496 059

Issue date

EN/EPD

Valid to

EN/EPD

Year of study

2021/2022

Comparability

EPDs from other programs than EPD-Norway may not be comparable.

The EPD has been worked out by

Modi Michael Elisa & Børge Heggen Johansen of Energiråd AS

Approved

Håkon Havnås

Manager of EPD Norway

Product

Product description

Steinhardt AS is a supplier of products and product systems, like mortars, screeds, membranes, tile adhesive and grout, for new buildings and renovations. We are a Norwegian-owned company with head office in Trondheim and production in Drammen. After over 6 years of industry experience, we are concerned with good customer service, high product quality and delivery efficiency.

Avrettingmasser (self-leveling compounds) is polymer-modified cement that has high flow characteristics, it's used in the preparation of laying most floor coverings to create a smooth and level surface. It does not require large volumes of water and can work on any non-flexible surface, including wood, ceramic tiles, plywood, and concrete. This is an average EPD for self-leveling compounds with a cement content of between 2.5-7%. The maximum difference between the results of the products is less than 10% or precisely 4.80%.

Product specification

The average material inputs used for the analysis are shown below.

Materials	%
Sand	65.00 – 85.00
Cement	2.50 – 7.00
Additives	19.00 – 30.00
Packaging (paper sack)	0.40

Technical data

Avretting (self-levelling compounds) are self-compacting, fast-hardening screed with/without fiber and high compressive strength which can be used indoors and outdoors. Areas of use are for floors with or without heating cables, slopes, garage floors, terraces etc. Can be built up in one or more layers. The thickness of the layers varies among products. It is used on PVC membrane or plastic foil; it will lie like a floating floor. Reinforcement mesh is recommended on soft ground. Suitable Substrates include concrete, plaster, wood, insulation, Styrofoam, and ceramic fillings. Most surfaces must be primed. More info can be found at mortelverket.no

Market

Norway, Sweden

Reference service life, product

Not relevant

Reference service life, building

Not relevant

LCA: Calculation rules

Declared unit

1 kg of Avretting (self-levelling compounds)

Data quality

Both primary and secondary data were used in the LCA. Site-specific foreground data were provided by Steinhardt AS and is based on the production activities of 2022. These data were obtained from the bill of materials. For materials with valid EPDs that conform to the EN15804+A2, environmental impacts for the respective materials were used for the analysis. For all processes for which primary data was not available, generic data from the ecoinvent database v3.8 (2021) were assumed. All generic data used for the analysis are not older than 10 years old. Where necessary, the used generic data were modified to ensure technological, temporal, and geographical consistency. Modelling and calculations were conducted via OpenLCA equipped with v.3.8 of the Ecoinvent database with LCIA and classification factors conforming to EN 15804+A2.

The LCA results presented in this EPD reflects the average environmental profiles of the included products. Tests were conducted to investigate the variations in the GWP-total indicator among the products. whereby products with a $\pm 10\%$ variation in the results have been excluded and/or included in a separate EPD.

Allocation

The allocation is made in accordance with the requirements of EN 15804: A2. Energy and water inputs and waste generation during production were allocated equally among all products on mass basis. The effects of primary production of recycled materials were allocated to the main product in which the material is used. No recycled materials are used in the manufacture of this product.

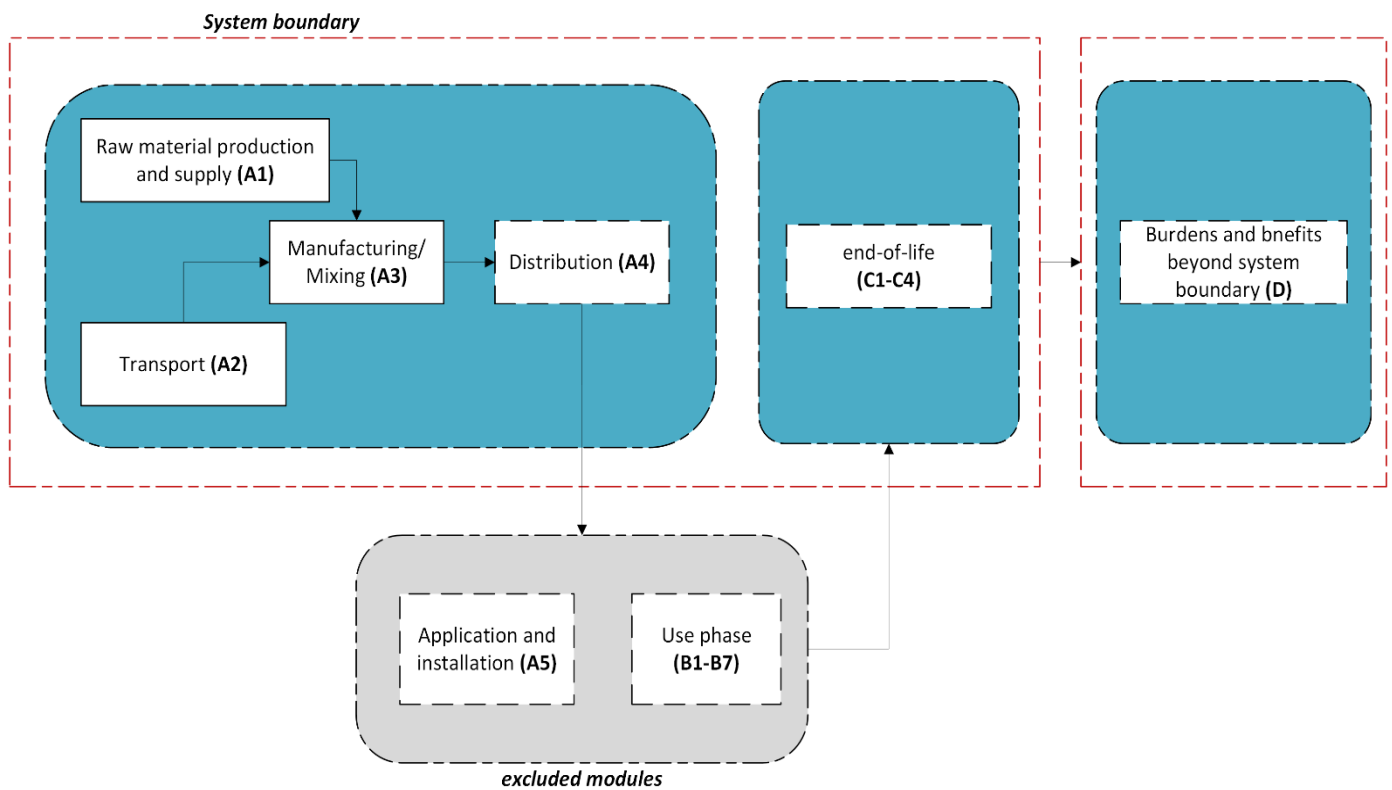
System boundary

The scope of this analysis is cradle-to-grave. The modules covered include extraction and semi-processing of raw required raw materials (A1), transportation of the materials to production site (A2), processing/production of the studied products (A3), transportation of finished products to customers (A4), handling of waste at end-of-life (C1-C4), and potential loads and benefits associated with the products (D). The end-of-life impacts are described in the Norwegian context.

Cut-off criteria

All major raw materials and essential energy are included. The production processes for raw materials and energy flows with less than 1% contributions are excluded. This cut-off criteria do not apply for hazardous materials and substances. Machines and facilities or capital goods required to produce the declared unit are excluded.

Figure 1 System boundaries (cradle-to-gate with options)



System boundaries (X=included, MND= module not declared, MNR=module not relevant)

Product stage			Assembly stage		Use stage								End of life stage				Benefits & loads beyond system boundary
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential	
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	X	X	X	X	X	

LCA: Scenarios and additional technical information

Product stage is reported in one model A1-A3. The considered scenarios after gate are described as follows. It is assumed that the manufactured products are transported by truck to a customer located 300 km away. The recovered material is transported by truck to a waste processing facility 50 km from the demolition site. The collected waste is managed according to the Norwegian management practices of construction and demolition waste such as bricks and concrete and other heavy building materials ([Statistics Norway, 2021](#)). Detailed information for the scenarios is summarized as follows.

Transport from production site to potential customer (A4)	Capacity (%)	Distance (km)	Fuel/Energy efficiency	Unit	Value (L/t)
Truck, over 32 tons, EURO 5	53.30%	100	0.023	l/tkm	2.30

Deconstruction/Demolition (C1)	Unit	Value
Demolition of building per kg of product	kg	1.00

Transport from production site to potential customer (C2)	Capacity (%)	Distance (km)	Fuel/Energy efficiency	Unit	Value (L/t)
truck, over 32 tons, EURO 5	53.30%	20.00	0.023	l/tkm	0.46

Waste Processing (C3)	Unit	Value
Waste treatment of products after demolition	Kg	0.70

Disposal (C4)	Unit	Value
Substitution of primary aggregates with crushed recycled inert products	kg	0.30

Re-use, recovery, and recycling potential (D)	Unit	Value
Substitution of primary aggregates with crushed recycled inert products	kg	0.70

LCA: Results

The LCA results are per 1 kg of Avretting (self-levelling compounds) for various environmental impacts categories are presented as follows.

Core environmental impacts

Indicator	Unit	A1-A3	A4	C1	C2	C3	C4	D
GWP - total	kg CO2 eq	2.22E-01	4.89E-02	2.25E-04	1.76E-02	4.12E-03	6.94E-04	-2.23E-03
GWP - fossil	kg CO2 eq	2.25E-01	4.88E-02	2.25E-04	1.75E-02	4.10E-03	6.88E-04	-2.15E-03
GWP - biogenic	kg CO2 eq	-3.58E-03	8.65E-05	1.85E-07	5.39E-05	1.33E-05	5.09E-06	-7.91E-05
GWP - luluc	kg CO2 eq	1.92E-04	2.02E-05	2.43E-08	4.77E-06	9.01E-07	7.14E-08	-1.79E-06
ODP	kg CFC11 eq	2.16E-08	1.13E-08	4.79E-11	1.73E-08	8.85E-10	1.47E-10	-2.90E-10
AP	molc H+ eq	9.88E-04	1.39E-04	2.28E-06	1.36E-04	4.25E-05	7.03E-06	-1.89E-05
EP- freshwater	kg P eq	2.19E-05	3.22E-06	1.09E-08	1.08E-06	1.91E-07	2.22E-08	-4.99E-07
EP -marine	kg N eq	2.91E-04	2.82E-05	1.00E-06	1.75E-05	1.86E-05	3.10E-06	-5.42E-06
EP -terrestrial	molc N eq	3.43E-03	3.07E-04	1.10E-05	1.91E-04	2.03E-04	3.40E-05	-7.26E-05
POCP	kg NMVOC eq	8.06E-04	1.15E-04	2.99E-06	7.54E-05	5.53E-05	9.26E-06	-1.66E-05
ADP - M&M	kg Sb-Eq	1.57E-06	1.66E-07	1.45E-10	3.65E-08	1.24E-08	3.66E-10	-4.20E-08
ADP - fossil	MJ	8.77E+00	7.45E-01	3.09E-03	1.03E+00	5.65E-02	9.40E-03	-3.55E-02
WDP	m3	9.26E-02	3.59E-03	9.41E-06	8.96E-04	4.86E-03	2.58E-05	-9.95E-03

GWP-total: Global Warming Potential; GWP-fossil: Global Warming Potential fossil fuels; GWP-biogenic: Global Warming Potential biogenic; GWP-LULUC: Global Warming Potential land use and land use change; ODP: Depletion potential of the stratospheric ozone layer; AP: Acidification potential, Accumulated Exceedance; EP-freshwater: Eutrophication potential, fraction of nutrients reaching freshwater end compartment; See "additional requirements" for indicator given as PO4 eq. EP-marine: Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-terrestrial: Eutrophication potential, Accumulated Exceedance; POCP: Formation potential of tropospheric ozone; ADP-M&M: Abiotic depletion potential for non-fossil resources (minerals and metals); ADP-fossil: Abiotic depletion potential for fossil resources; WDP: Water deprivation potential, deprivation weighted water consumption.

Additional environmental impact indicators

Indicator	Unit	A1-A3	A4	C1	C2	C3	C4	D
PM	Disease incidence	9.27E-09	3.09E-09	6.00E-11	1.09E-09	5.07E-09	1.89E-10	-3.77E-10
IRP	kBq U235 eq.	9.23E-03	3.82E-03	1.41E-05	4.73E-03	3.18E-04	4.37E-05	-6.28E-04
ETP-fw	CTUe	4.65E-02	2.48E-02	1.77E-05	7.76E-03	4.47E-04	5.26E-05	-5.13E-04
HTP-c	CTUh	4.05E-11	1.58E-11	9.28E-14	6.00E-12	1.31E-12	1.78E-13	-3.42E-12
HTP-nc	CTUh	2.84E-09	9.19E-10	1.25E-12	2.71E-10	3.77E-11	3.00E-12	-1.14E-10
SQP	Dimensionless	9.16E-01	6.28E-01	9.61E-05	2.20E-02	1.75E-03	2.72E-02	-4.80E-02

PM: Particulate matter emissions; IRP: Ionising radiation, human health; ETP-fw: Ecotoxicity (freshwater); ETP-c: Human toxicity, cancer effects; HTP-nc: Human toxicity, non-cancer effects; SQP: Land use related impacts / soil quality

Resource use

Indicator	Unit	A1-A3	A4	C1	C2	C3	C4	D
RPEE	MJ	2.15E-01	7.97E-03	2.01E-05	2.63E-03	1.52E-02	6.07E-05	-8.08E-03
RPEM	MJ	2.09E-01	2.62E-03	5.39E-06	9.73E-04	2.13E-04	2.23E-04	-2.41E-03
TPE	MJ	4.24E-01	1.06E-02	2.55E-05	3.61E-03	1.54E-02	2.84E-04	-1.05E-02
NRPE	MJ	6.93E+00	7.21E-02	2.63E-04	2.48E-02	4.51E-03	5.37E-04	-1.66E-02
NRPM	MJ	1.84E+00	6.73E-01	2.83E-03	1.01E+00	5.20E-02	8.86E-03	-1.90E-02
TRPE	MJ	8.77E+00	7.45E-01	3.09E-03	1.03E+00	5.65E-02	9.40E-03	-3.55E-02
SM	kg	1.77E-02	7.59E-04	3.51E-06	2.25E-04	7.44E-05	8.40E-06	-7.00E-04
RSF	MJ	4.11E-02	2.26E-04	3.89E-07	6.53E-05	1.29E-05	1.56E-06	-2.28E-04
NRSF	MJ	5.87E-02	9.18E-04	5.86E-07	2.29E-04	5.74E-05	1.10E-06	-3.07E-05
W	m3	2.18E-03	8.55E-05	2.24E-07	2.14E-05	3.99E-05	6.12E-07	-2.33E-04

RPEE Renewable primary energy resources used as energy carrier; RPEM Renewable primary energy resources used as raw materials; TPE Total use of renewable primary energy resources; NRPE Non-renewable primary energy resources used as energy carrier; NRPM Non-renewable primary energy resources used as materials; TRPE Total use of non-renewable primary energy resources; SM Use of secondary materials; RSF Use of renewable secondary fuels; NRSF Use of non-renewable secondary fuels; W Use of net fresh water.

End-of-life waste

Parameter	Unit	A1-A3	A4	C1	C2	C3	C4	D
HW	kg	8.83E-02	1.66E-02	5.09E-05	5.33E-03	1.02E-03	1.02E-04	-2.71E-03
NHW	kg	9.36E-02	3.84E-02	3.27E-06	4.36E-04	1.30E-04	7.71E-06	-4.43E-04
RW	kg	6.07E-05	1.49E-05	4.22E-08	1.10E-05	1.23E-06	1.19E-07	-5.28E-06

HW Hazardous waste disposed; NHW Non-hazardous waste disposed; RW Radioactive waste disposed.

End-of-life outflows

Parameter	Unit	A1-A3	A4	C1	C2	C3	C4	D
CR	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MR	kg	2.20E-03	6.31E-04	2.55E-06	1.84E-04	7.00E-01	5.77E-06	-4.37E-04
MER	kg	3.78E-04	1.74E-04	2.04E-06	5.90E-05	2.11E-05	3.38E-06	-7.35E-05
EEE	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ETE	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

CR Components for reuse; MR Materials for recycling; MER Materials for energy recovery; EEE Exported electric energy; ETE Exported thermal energy.

Reading example: $9,0 E-03 = 9,0 * 10^{-3} = 0,009$

Biogenic carbon content

Indicator	Unit	At the factory gate
Biogenic carbon content in product	Kg C	0.00E+00
Biogenic carbon content in packaging	Kg C	1.04E-03

Note – 1 kg of carbon is equivalent to 44/12 kg CO₂.

Additional Norwegian requirements

Greenhouse gas emission from the use of electricity in the manufacturing phase

The Norwegian national production mix from import, medium voltage (production of transmission lines, in addition to direct emissions and losses in grid) of applied electricity for the manufacturing process (A3).

National electricity grid	Unit	Value
Norwegian mix (market for electricity, ecoinvent 3.8)	g CO ₂ -eq/kWh	28.53

Dangerous substances

The product does not contain substances from the REACH candidate list (per 6.7.2013) of substances of very high concern, substances on the Norwegian priority list (as of 6/7/2013) and substances that cause the product to be classified as hazardous waste (Avfallsforskriften, Annex III). The chemical content of the product is in accordance with the Norwegian product regulations.

Name	CAS/ EC no.	Unit	Value
Portland cement	65997-15-1/266-043-4	kg	2.50 – 7.00%

Hazardous substances

The declaration is based upon reference to threshold values and/or test results and/or material safety data sheets provided to EPD verifiers. Documentation available upon request to EPD owner.

- The product contains no substances given by the REACH Candidate list or the Norwegian priority list.
- The product contains substances given by the REACH Candidate list or the Norwegian priority list that are less than 0,1 % by weight.
- The product contains dangerous substances, more then 0,1% by weight, given by the REACH Candidate List or the Norwegian Priority list, see table.
- The product contains no substances given by the REACH Candidate list or the Norwegian priority list. The product is classified as hazardous waste (Avfallsforskriften, Annex III), see table.

Indoor environment

Not relevant






Additional environmental information

Indicator	Unit	A1-A3	A4	C1	C2	C3	C4	D
GWP-IOBC	kg CO ₂ eq	1.62E-01	4.89E-02	2.25E-04	1.76E-02	4.12E-03	6.94E-04	-2.23E-03

GWP-IOBC: Global warming potential calculated according to the principle of instantaneous oxidation. To increase the transparency of biogenic carbon contribution to climate impact, the indicator GWP-IOBC is required as it declares climate impacts calculated according to the principle of instantaneous oxidation. GWP-IOBC is also referred to as GWP-GHG in context to Swedish public procurement legislation

Bibliography

ISO 14025:2006	Environmental labels and declarations - Type III environmental declarations - Principles and procedures
ISO 14044:2006	Environmental management - Life cycle assessment - Requirements and guidelines
EN 15804:2012+A2:2019	Sustainability of construction works - Environmental product declaration - Core rules for the product category of construction products.
ISO 21930:2017	Sustainability in buildings and civil engineering works – Core rules for environmental product declarations of construction products and services
NPCR PART A	Construction products and services (v.2.0)
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