ENVIRONMENTAL PRODUCT DECLARATION

CEMENT SELF-LEVELING UNDERLAYMENT

LATICRETE SELF-LEVELING UNDERLAYMENT REPORT
PRODUCTS MANUFACTURED IN NORTH AMERICA

This Environmental Product Declaration, provided by LATICRETE International, contains a comprehensive environmental analysis of approximately 35 million kg of self-leveling underlayment produced in North America.

This is a company-specific EPD commissioned by LATICRETE with the goal of further leveraging the business value associated with transparent reporting of its products' environmental impacts.

Established in 1956, LATICRETE International, Inc. is recognized for its manufacture and marketing of green flooring and façade materials, used in a variety of residential, commercial, and industrial applications.

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CERTIFIED ENVIRONMENTAL PRODUCT DECLARATION UL.COM/EPD

ENVIRONMENTAL PRODUCT DECLARATION

LATICRETE

NORTH AMERICAN CEMENT MORTAR FOR TILE INSTALLATION
AS DEFINED BY ANSI A118.1, ANSI A118.4, ANSI A118.11, AND ANSI A118.15

According to ISO 14025 and EN 15804

This declaration is an environmental product declaration (EPD) in accordance with ISO 14025. EPDs rely on Life Cycle Assessment (LCA) to provide information on a number of environmental impacts of products over their life cycle. Exclusions: EPDs do not indicate that any environmental or social performance benchmarks are met, and there may be impacts that they do not encompass. LCAs do not typically address the site-specific environmental impacts of raw material extraction, nor are they meant to assess human health toxicity. EPDs can complement but cannot replace tools and certifications that are designed to address these impacts and/or set performance thresholds – e.g. Type 1 certifications, health assessments and declarations, environmental impact assessments, etc. Accuracy of Results: EPDs regularly rely on estimations of impacts, and the level of accuracy in estimation of effect differs for any particular product line and reported impact. Comparability: EPDs are not comparative assertions and are either not comparable or have limited comparability when they cover different life cycle stages, are based on different product category rules or are missing relevant environmental impacts. EPDs from different programs may not be comparable.

PROGRAM OPERATOR	UL Environment
DECLARATION HOLDER	LATICRETE
DECLARATION NUMBER	4787630163.102.1
DECLARED PRODUCT	Cement self-leveling underlayment
REFERENCE PCR	IBU Part A & B for Mineral Factory-made Mortar, 07.2014, with UL addendum
DATE OF ISSUE	November 29, 2016
EXPIRATION	March 29, 2022
CONTENTS OF THE DECLARATION	Product definition and information about building physics Information about basic material and the material's origin Description of the product's manufacture Indication of product processing Information about the in-use conditions Life cycle assessment results Testing results and verifications

The PCR review was conducted by:	PCR Review Panel Independent Expert Committee (SRV)
This declaration was independently verified in accordance with ISO 14025 by Underwriters Laboratories ☐ INTERNAL ☒ EXTERNAL	Wade Stout, UL Environment
This life cycle assessment was independently verified in accordance with ISO 14044 and the reference PCR by:	Thomas P. Gloria, Industrial Ecology Consultants

This EPD conforms with EN 15804

Product Definition

Product Description

Cement self-leveling underlayment are a blend of cement, very finely graded sand, and water retention compounds that allow the cement to properly hydrate. The primary function of self-leveling underlayments is to provide flat and level floors prior to the installation of tile, stone, large format porcelain panels, carpet, polyaspartic or epoxy floors coatings, vinyl, wood, and other flooring materials.

Self-leveling underlayments are a factory prepared blend of cement, aggregate, and other materials to produce a flowable, fast hardening underlayment to create flat and level floors. Self-leveling underlayments can be used as a surface to which finish flooring can be adhered, or, for use as a wear surface which can be polished, integrally colored or dyed at the surface.

Currently, there are no ANSI or ISO standards for self-leveling underlayments for performance or installation. The Tile Council of North America (TCNA) has a number of methods which utilize self-leveling underlayments in the Handbook for Ceramic, Glass and Stone Tile Installation which provide lighter weight alternatives to traditional mortar bed methods for many applications.

As is the case with tile, cement self-leveling underlayment is capable of withstanding a wide range of environmental stresses. Once cured, it is durable (lasts a lifetime), fire- and heat-resistant, non-combustible, non-sensitive to moisture, and maintenance-free.

Range of Applications

Self-leveling underlayment products are commonly used in interior, commercial, institutional, and residential tile installations.

Product Standards

Fire performance: cement mortar is non-flammable and non-combustible.

No environmental burdens are expected for unforeseen flooding or mechanical destruction.

Information on leaching performance: No industry-wide data available as this EPD represents a broad range of cement self-leveling underlayment products. Consult with manufacturers and/or reference product-specific EPDs for additional information.

Product Characteristics

Table 1: Construction data of cement self-leveling underlayment included in this EPD

	Value	Unit
Compressive strength	Industry-Wide Data Not Available*	
Adhesive shear strength	Industry-Wide Data Not Available*	
Water absorption	Industry-Wide Data Not Available*	
Water vapor diffusion equivalent air layer thickness	Industry-Wide Data Not Available*	
Thermal conductivity	Industry-Wide Data Not Available*	
Tensile bond strength	Industry-Wide Data Not Available*	
Flexural strength	Industry-Wide Data Not Available*	

*Industry-wide data are not available as this property is not relevant and/or not standardized for cement self-leveling underlayment.

**This product specific EPD represents a range of cement self-leveling underlayment products. For specific performance characteristics of the LATICRETE self-leveling underlayments, please refer to the respective product data sheets. Compressive, flexural strength, and tensile bond strength can vary depending on the environmental conditions (during installation and cure time), proper substrate preparation, substrate the self-leveling underlayment is poured onto, and its intended application. Consult with LATICRETE and/or reference product-specific EPDs for additional information.

Material Content

Table 2: Average material content of the self-leveling underlayment included in this EPD

Material	Mass [kg]
Self-leveling underlayment	
Sand	0.37
Grey cement	0.051
Calcium Aluminate Cement	0.13
Recycled Content	0.33
E/VA	0.0056
Other additives	0.013
Packaging	
Composite plastic and paper film	0
Corrugate	0
Paper	0.00014
Plastic film	0.0021
Wooden pallets	0.0098
Installation solution*	
Tap Water	0.228

*Installation solution concentration based on manufacturer recommendations

Self-Leveling Underlayment Production

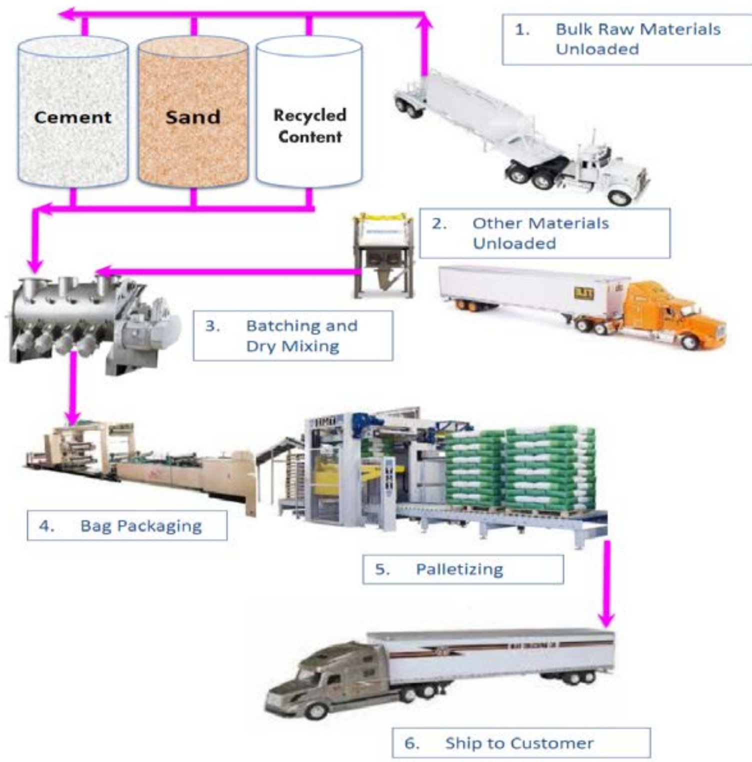

Figure 1: Process flow diagram for cement self-leveling underlayment (for tile installation) manufacturing

Raw materials, including cement sand, recycled content and other modifiers are unloaded and temporarily stored. When needed for production, materials are retrieved from storage, placed into specific batches based on formulation, dry-mixed, and then placed into packaging (usually bags). Packaged materials are then palletized, subjected to quality assurance inspections, placed into warehouse storage, and finally shipped to customer warehouse or job site. LATICRETE is governed by federal and local requirements for dust control. Where applicable, they have incorporated dust collection systems in their processes to optimize material usage and mitigate airborne dust and particulate matter within the factory.

Production Waste

The vast majority of scrap and waste is recycled back into the product. Dust emissions during the mixing of the self-leveling underlayment are collected through a dust collection system and recycled back into the production line.

Manufacturers of cement self-leveling underlayment offer varieties of products with pre- consumer recycled content. This can contribute to overall building recycled content and help achieve compliance with recycled content targets in green building projects. Additionally, high levels of responsibly recovered waste, including dust and powder, are commonly reincorporated into self-leveling underlayment manufacturing. Waste reclamation in such processes is a vital component to minimizing waste and maximizing resources. Reducing waste to zero and fully utilizing all inputs is paramount to efficient manufacturing.

Delivery and Installation of the Self-leveling underlayment

Delivery Status

For purposes of this study, the average transport distance from manufacturing to construction site was assumed to be 500 miles (805 km) by truck. The cementitious self-leveling underlayment included in this study is packaged in units of 50 lbs (22.7 kg).

Installation

Cement self-leveling underlayment is installed by hand, with substantial use of pumps to mix and pour the self-leveling underlayment prior to application. An energy of 0.0023 MJ per 1 kg of product installed was estimated based on concrete pouring energy. Due to its material composition, self-leveling underlayment is typically quite alkaline and, as such, eye and skin contact should be avoided, especially for prolonged periods. In addition, precautions should be taken to reduce dust emissions and inhalation during installation. The installation safety instructions of a given self-leveling underlayment product should be followed during application. During installation, self-leveling underlayment is applied at approximately 5.5 lb. / $ft.^2$ @ ½" thick (12.8 kg / m2 @ 6.35mm thick) with around 0.625% of the total material lost as waste. This scrap is modeled as being disposed of in a landfill.

Packaging

Primary packaging is a recyclable plastic bag, with secondary/tertiary packaging of shrink film, corrugate and pallets, or, in a "super sack" made from woven polyethylene with secondary/tertiary packaging of shrink film, corrugate and pallets. Packaging is assumed to be sent to landfill after installation. Landfill emissions from packaging are allocated to installation, while electricity generated from landfill gas (produced from the decomposition of bio-based packaging) is credited to the installation phase of the life cycle.

Use stage

The service life of self-leveling underlayment is unique in that it does not depend on the amount of floor traffic and the type and frequency of maintenance. A building's Reference Service Life (RSL) is typically assumed to be 60 years. Since self-leveling underlayment is expected to last at least as long as the building itself, the product will also have an RSL of 60 years.

The EPD must present results for the full 60 year RSL of the product, including the use stage impacts associated with that service life. Other scenarios, such as the impacts for a 1-year service life or per m^2 of installed tile that are also of interest are included in the appendix.

Cleaning and Maintenance

Flooring finish products should be cleaned routinely with tap water or as required by finished floor product manufacturer. However, as the self-leveling underlayment is typically completely covered by installed tile and grout or other finish flooring, it thus does not require cleaning or maintenance over its lifetime. As such, no cleaning or maintenance was modeled for self-leveling underlayment.

Prevention of Structural Damage

Interior floor covering should not be installed until any and all structural damage to the building has been adequately repaired and determined to be code compliant. Surfaces must be structurally sound, stable, and rigid enough to support the mortar, grout, underlayment, tile, or other finish flooring in addition to any other ancillary tile installation products.

Health Aspects during Usage

Inherently, cement self-leveling underlayments do not emit VOCs. Additionally, some products covered by this EPD have been engineered to minimize airborne dust or other job-site particulates.

End of Life

As tile, stone and other floor finishes are adhered to self-leveling underlayment during application, it is typically disposed together with the tile and as such, can be used in multiple applications—for example, clean fill material in land reclamation/contouring projects, base or substrate material for roadways and/or parking lots, replacement for raw materials used in cement or brick kilns, etc.

However, for purposes of this EPD, the analysis adopts the most conservative approach and assumes that 100% of all removal waste is disposed of in a landfill.

Life Cycle Assessment

A full life cycle assessment (LCA) was carried out according to ISO 14025 (ISO, 2011), ISO 14040 (ISO, 2009), and ISO 14044 (ISO, 2006), per the Product Category Rules (PCR) for Mineral Factory-made Mortar, as published by Institut Bauen und Umwelt e.V. (IBU, 2014), and the addendum as published by UL Environment (UL, 2016).

The main purpose of EPDs is for use in business-to-business communication. As all EPDs are publicly available via the Program Operator and are therefore accessible to the end consumer, they can also be used in business-to-consumer communication.

Declared Unit Description

The declaration refers to the declared unit of 1 kg of product.

Table 3: Declared Unit

	Value	Unit
Declared unit	1	kg
Gross density	2,080 (wet) 1,920 (dry)	kg/m^3
Conversion factor to 1 kg	1	–
Application rate	12.8	kg/m^2 @ 6.35mm

System Boundaries

The chosen system boundary for this study is cradle to gate with options and the life cycle stages considered are summarized in Table 4.

Table 4: Life cycle modules included in EPD

Production			Installation		Use stage							End-of-Life				Next product system
Raw material supply	Transport to manufacturer	Manufacturing	Transport to building site	Installation into building	Use / application	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction / demolition	Transport to end-of-life	Waste processing for reuse, recovery or recycling	Disposal	Reuse, recovery or recycling potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	MND	X	MND	MND	MND	MND	MND	MND	X	MND	X	MND

X = declared module; MND = module not declared

Cut-off Criteria

No cut-off criteria were applied in this study. All reported data were incorporated and modeled using best available life cycle inventory (LCI) data.

Background Data

As a general rule, specific data derived from specific production processes or average data derived from specific production processes shall be the first choice as a basis for calculating LCA results.

For life cycle modeling of the considered products, the GaBi ts Software System for Life Cycle Engineering (thinkstep, 2016), developed by thinkstep AG, was used to model the product systems considered in this assessment. All relevant background datasets were sourced from the GaBi 2016 database. The datasets from the GaBi database are documented in the online documentation (thinkstep, 2016).

Data Quality

A variety of tests and checks were performed throughout the project to ensure high quality of the completed LCA. Checks included an extensive review of project-specific LCA models, as well as the background data used.

Temporal Coverage

Primary data collected from LATICRETE represent a consecutive 12 month averages from July 2014 to July 2015. Background datasets are primarily based on data from the last 5 years (since 2011), with the exception of cement, which dates from 2004. The plurality of datasets are based on data from 2015, with the second largest portion stemming from 2012.

Technological Coverage

Data on material composition and manufacturing are primary data from LATICRETE. The raw material inputs, energy, waste, and emissions in the calculation for this LCA are based on annual purchases divided by annual production during the reference year.

Geographical Coverage

This background LCA represents LATICRETE products produced in Mexico and the United States.

Manufacturing energy representative for each country was included; proxy datasets were used as needed for raw material inputs to address lack of data for a specific material or for a specific geographical region. These proxy datasets were chosen for their technological representativeness of the actual materials.

Allocation

Co-Product Allocation

No co-product allocation occurs in the product system.

Multi-Input Processes Allocation

No multi-input allocation occurs in the product system.

Reuse, Recycling, and Recovery Allocation

The cut-off allocation approach is adopted in the case of any post-consumer recycled content, which is assumed to enter the system burden-free. Only environmental impacts from the point of recovery and forward (e.g., collection, sorting, processing, etc.) are considered.

Product and packaging waste are modeled as being disposed in a landfill rather than incinerated or recycled. Plastic and other construction waste is assumed to be inert in landfills so no system expansion or allocation is necessary as landfill gas is not produced. In the case of landfill gas generated by the decay of bio-based packaging after installation, credit is given for capture or utilization of the landfill gas.

Scenarios and Additional Technical Information

Information relevant to the life cycle modules included in this study are summarized in the following tables.

Table 5: Transport of 1 kg of self-leveling underlayment to the building site (A4)

Name	Value	Unit
Liters of fuel	0.0024*	L / (100 km.kg)
Transport distance	805	km
Capacity utilization (including empty runs)	78	%

*Equivalent to a fuel consumption of 38.8 L / 100 km or a fuel economy of 6.0 mpg

Table 6: Installation of 1 kg of self-leveling underlayment at the building site (A5)

Name	Value	Unit
Water consumption	2.16E-06	m^3
Material loss (to landfill)	0.05	kg
Dust in the air	unknown	kg

Table 7: Maintenance of 1 kg of self-leveling underlayment (B2)

Name	Value	Unit
Information on maintenance	None required	–

Table 8: Reference service life

Name	Value	Unit
Reference service life	60	a

Table 9: End of life (C1-C4)

Name	Value	Unit
Collected as mixed construction waste	1	kg
Landfilling	1	kg

Life Cycle Assessment – Results and Analysis

Results

Results for one kg installed self-leveling underlayment over the service life of 60 years are presented below. Results for the self-leveling underlayment required in 1 m^2, as well as the impacts of a one-year service life, are included in the appendix.

ENVIRONMENTAL IMPACTS

CML 2001 (Apr 2015)

Parameter	Unit	A1-A3	A4	A5	B2	C2	C4
GWP	kg CO_2 eq	2.73E-01	5.87E-02	1.08E-03	-	2.43E-03	4.48E-02
ODP	kg CFC-11 eq	3.43E-10	4.8E-13	1.56E-13	-	2.00E-14	8.58E-13
AP	kg SO_2 eq	9.08E-04	0.00022	4.93E-06	-	9.02E-06	1.94E-04
EP	kg PO_4^3 eq	8.84E-05	5.6E-05	2.25E-06	-	2.33E-06	2.48E-05
POCP	kg C_2H_4 eq	7.20E-05	2.6E-05	1.15E-06	-	1.07E-06	1.97E-05
ADPE	kg Sb eq	1.94E-06	8.8E-09	2.43E-10	-	3.64E-10	1.72E-08
ADPF	MJ	3.21E+00	0.82517	1.18E-02	-	3.42E-02	6.77E-01

TRACI 2.1

Parameter	Unit	A1-A3	A4	A5	B2	C2	C4
GWP	kg CO_2 eq	2.73E-01	5.87E-02	1.08E-03	-	2.43E-03	4.48E-02
ODP	kg CFC-11 eq	4.01E-10	5.14E-13	1.66E-13	-	2.13E-14	9.12E-13
AP	kg SO_2 eq	9.31E-04	2.85E-04	6.78E-06	-	1.18E-05	2.09E-04
EP	kg N eq	4.37E-05	2.65E-05	2.08E-06	-	1.10E-06	1.16E-05
SFP	kg O_3 eq	1.46E-02	9.06E-03	6.21E-05	-	3.76E-04	4.06E-03

GWP = Global warming potential; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential of land and water; EP = Eutrophication potential; POCP = Formation potential of tropospheric ozone photochemical oxidants; ADPE = Abiotic depletion potential for non-fossil resources; ADPF = Abiotic depletion potential for fossil resources; SFP = Smog formation potential

RESOURCE USE

Parameter	Unit	A1-A3	A4	A5	B2	C2	C4
PERE	[MJ]	3.97E-01	1.37E-02	9.07E-04	-	5.69E-04	4.40E-02
PERM	[MJ]	-	-	-	-	-	-
PERT	[MJ]	3.97E-01	1.37E-02	9.07E-04	-	5.69E-04	4.40E-02
PENRE	[MJ]	3.75E+00	8.30E-01	1.33E-02	-	3.44E-02	6.95E-01
PENRM	[MJ]	-	-	-	-	-	-
PENRT	[MJ]	3.75E+00	8.30E-01	1.33E-02	-	3.44E-02	6.95E-01
SM	[kg]	3.18E-01	-	-	-	-	-
RSF	[MJ]	2.45E-06	-	4.73E-07	-	-	-
NRSF	[MJ]	1.88E-05	-	7.12E-06	-	-	-
FW	[m^3]	1.25E-03	1.68E-04	2.23E-04	-	6.97E-06	1.07E-04

PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy 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 resources; SM= Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water

OUTPUT FLOWS AND WASTE CATEGORIES

Parameter	Unit	A1-A3	A4	A5	B2	C2	C4
HWD	[kg]	1.66E-06	1.05E-09	1.24E-10	-	4.37E-11	1.33E-09
NHWD	[kg]	6.06E-03	2.92E-05	9.31E-03	-	1.21E-06	1.00E+00
RWD	[kg]	2.08E-04	1.75E-06	5.88E-07	-	7.23E-08	7.07E-06
CRU	[kg]	-	-	-	-	-	-
MFR	[kg]	-	-	-	-	-	-
MER	[kg]	-	-	-	-	-	-
EEE	[MJ]	-	-	-	-	-	-
EET	[MJ]	-	-	-	-	-	-

HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy

Interpretation

Both the CML 2001 (Apr. 2013) and TRACI 2.1 methodologies find that the production of raw materials and the energy for manufacturing self-leveling underlayments are the two largest contributors in all impact categories considered. However, due to the input of recycled content, the overall impacts for the underlayment materials are lower compared to the mortar and grout materials. The upstream burdens in particular are driven by the cement required for the production of self-leveling underlayments, and the formulation and manufacturing would be the most effective area to focus burden reduction efforts.

These results do not constitute a comparative assertion, though architects and builders will be able to use them to compare LATICRETE products with similar products presented in other EPDs that follow the same PCR.

References

IBU. (2014). Product Category Rule Guidance - Texts for building-related products and services: Part B: Requirements on the EPD for Mineral Factory-made Mortar. Institut Bauen und Umwelt e.V.

ISO. (2006). ISO 14044: Environmental management - Life cycle assessment - Requirements and guidelines.

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thinkstep. (2016). GaBi ts: Software system and database for life cycle engineering. Stuttgart, Echterdingen, Germany.

UL. (2016, April). Product Category Rules for preparing an environmental product declaration (EPD) for PCR: IBU Product Category Rules Part B: Requirements on the EPD for Mineral factory-made mortar.

Appendix – Additional Results

The following two sections tabulate environmental impacts of self-leveling underlayment use under two additional metrics.

Results for 1 m² of installed self-leveling underlayment over a 60-year service life

The impacts of the life cycle of 1 m² of installed self-leveling underlayment assuming an installation density of 5.5 lbs./ft² @ ½" over a 60-year service life are presented here.

ENVIRONMENTAL IMPACTS

CML 2001 (Apr 2015)

Parameter	Unit	A1-A3	A4	A5	B2	C2	C4
GWP	kg CO_2 eq	7.32E+00	1.58E+00	2.90E-02	-	6.54E-02	1.20E+00
ODP	kg CFC-11 eq	9.21E-09	1.30E-11	4.20E-12	-	5.38E-13	2.30E-11
AP	kg SO_2 eq	2.44E-02	5.84E-03	1.32E-04	-	2.42E-04	5.21E-03
EP	kg PO_4^3 eq	2.37E-03	1.51E-03	6.05E-05	-	6.24E-05	6.65E-04
POCP	kg C_2H_4 eq	1.93E-03	6.95E-04	3.09E-05	-	2.88E-05	5.28E-04
ADPE	kg Sb eq	5.20E-05	2.36E-07	6.52E-09	-	9.78E-09	4.61E-07
ADPF	MJ	7.32E+00	1.58E+00	2.90E-02	-	6.54E-02	1.20E+00

TRACI 2.1

Parameter	Unit	A1-A3	A4	A5	B2	C2	C4
GWP	kg CO_2 eq	7.32E+00	1.58E+00	2.90E-02	-	6.54E-02	1.20E+00
ODP	kg CFC-11 eq	1.08E-08	1.38E-11	4.46E-12	-	5.72E-13	2.45E-11
AP	kg SO_2 eq	2.50E-02	7.66E-03	1.82E-04	-	3.18E-04	5.61E-03
EP	kg N eq	1.17E-03	7.12E-04	5.58E-05	-	2.95E-05	3.12E-04
SP	kg O_3 eq	3.92E-01	2.43E-01	1.67E-03	-	1.01E-02	1.09E-01

GWP = Global warming potential; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential of land and water; EP = Eutrophication potential; POCP = Formation potential of tropospheric ozone photochemical oxidants; ADPE = Abiotic depletion potential for non-fossil resources; ADPF = Abiotic depletion potential for fossil resources; SFP = Smog formation potential

RESOURCE USE

Parameter	Unit	A1-A3	A4	A5	B2	C2	C4
PERE	[MJ]	1.07E+01	3.68E-01	2.44E-02	-	1.53E-02	1.18E+00
PERM	[MJ]	-	-	-	-	-	-
PERT	[MJ]	1.07E+01	3.68E-01	2.44E-02	-	1.53E-02	1.18E+00
PENRE	[MJ]	1.01E+02	2.23E+01	3.58E-01	-	9.23E-01	1.87E+01
PENRM	[MJ]	-	-	-	-	-	-
PENRT	[MJ]	1.01E+02	2.23E+01	3.58E-01	-	9.23E-01	1.87E+01
SM	[kg]	8.55E+00	-	-	-	-	-
RSF	[MJ]	6.57E-05	-	1.27E-05	-	-	-
NRSF	[MJ]	5.05E-04	-	1.91E-04	-	-	-
FW	[m³]	3.35E-02	4.52E-03	6.00E-03	-	1.87E-04	2.87E-03

PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy 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 resources; SM= Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water

OUTPUT FLOWS AND WASTE CATEGORIES

Parameter	Unit	A1-A3	A4	A5	B2	C2	C4
HWD	[kg]	4.46E-05	2.83E-08	3.33E-09	-	1.17E-09	3.58E-08
NHWD	[kg]	1.63E-01	7.84E-04	2.50E-01	-	3.25E-05	2.69E+01
RWD	[kg]	5.58E-03	4.69E-05	1.58E-05	-	1.94E-06	1.90E-04
CRU	[kg]	-	-	-	-	-	-
MFR	[kg]	-	-	-	-	-	-
MER	[kg]	-	-	-	-	-	-
EEE	[MJ]	-	-	-	-	-	-
EET	[MJ]						

HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy

Results for 1 kg of installed self-leveling underlayment over a 1-year service life

As self-leveling underlayment requires no maintenance over its service life, the impacts of the life cycle of 1 kg of installed self-leveling underlayment over a 1-year service life are equal to the impacts of 1 kg of installed self-leveling underlayment over a 60-year service life, as presented in the body of this EPD.

Contact Information

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