ENVIRONMENTAL PRODUCT DECLARATION

as per *ISO 14025* and *EN 15804+A2*

Owner of the Declaration	Sika Deutschland CH AG & Co KG
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-SIK-20240388-CBA3-EN
Issue date	21/01/2025
Valid to	20/01/2030

Sarnafil® AT/ SikaRoof® AT

Sika Services AG

Institut Bauen und Umwelt e.V.

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ECO PLATFORM EPD VERIFIED

1. General Information

Sika Services AG

Programme holder

IBU – Institut Bauen und Umwelt e.V.
Hegelplatz 1
10117 Berlin
Germany

Declaration number

EPD-SIK-20240388-CBA3-EN

This declaration is based on the product category rules:

Plastic and elastomer roofing and sealing sheet systems,
01/08/2021
(PCR checked and approved by the SVR)

Issue date

21/01/2025

Valid to

20/01/2030

Dipl.-Ing. Hans Peters
(Chairman of Institut Bauen und Umwelt e.V.)

Florian Pronold
(Managing Director Institut Bauen und Umwelt e.V.)

Sarnafil® AT/ SikaRoof® AT

Owner of the declaration

Sika Deutschland CH AG & Co KG
Kornwestheimer Straße 103 - 107
70439 Stuttgart
Germany

Declared product / declared unit

1 m^2 Sarnafil® AT polymeric waterproofing membrane installed.

Scope:

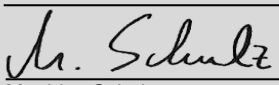
This document applies to Sarnafil® AT (SikaRoof® AT) polymeric waterproofing membrane in thicknesses of 1.5, 1.8, 2.0 and 2.5 mm manufactured by Sika AG in CH-6060 Sarnen (Switzerland).

The EPD covers the production of the waterproofing membrane, transport of the product to the construction site, installation of the waterproofing membrane, disposal, as well as benefits and loads outside the system boundaries. The model was calculated on the basis of production data for the thickness 1.8 mm provided by Sika Technology AG from the year 2023. The owner of the declaration shall be liable for the underlying information and evidence; the IBU shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

The EPD was created according to the specifications of EN 15804+A2. In the following, the standard will be simplified as *EN 15804*.

Verification

The standard EN 15804 serves as the core PCR
Independent verification of the declaration and data according to ISO 14025:2011
☐ internally ☒ externally



Matthias Schulz,
(Independent verifier)

2. Product

2.1 Product description/Product definition

Sarnafil® AT polymeric waterproofing membrane is made of elastomer modified flexible polyolefin (FPO) and is treated with stabilizers against UV radiation. An inlay of glass-fleece, polyester and a polymer nonwoven backing serves as reinforcing. Sarnafil® AT is also sold under the name SikaRoof® AT. All information in this EPD is valid for SikaRoof® AT as well.

Sarnafil® AT polymeric waterproofing membrane is available in the following thicknesses:

- 1.5 mm (Sarnafil® AT-15)
- 1.8 mm (Sarnafil® AT-18)
- 2.0 mm (Sarnafil® AT-20)
- 2.5 mm (Sarnafil® AT-25)

For the placing on the market of the product in the EU/EFTA (with the exception of Switzerland) *Regulation (EU) No. 305/2011* (CPR) applies. The product needs a Declaration of Performance in accordance with *EN 13956:2012*, Flexible sheets for waterproofing, and the CE marking. For the application and use the respective national provisions apply, in Germany the application standard *DIN SPEC 20000-201*.

2.2 Application

Sarnafil® AT polymeric waterproofing membrane is used chiefly to seal flat roofs. The roofing sheets can be loose laid and mechanically fastened to roofs with a slope of up to < 20°. Application on ballasted roofs or in green roof systems is also possible.

2.3 Technical Data

Building material data

Additional technical data are not relevant for this product.

Name	Value	Unit
Waterproof as per EN 1928	passed	-
Tensile strain as per EN 12311-2	≥ 15	%
Peel resistance of seam joint as per EN 12316-2	failure mode: C, no failure of the joint	-
Shear resistance of the seam joint as per EN 12317-2	≥ 400	N/50mm
Tear resistance as per EN 12310-2	≥ 300	N
Artificial ageing as per EN 1297	passed (> 5,000 hrs.)	-
Dimensional stability as per EN 1107-2	≤ 0.4 to ≤ 0.2	%
Folding in the cold as per EN 495-5	≤ -50	°C
Bitumen compatibility as per EN 1548	passed	-
Resistance to root penetration (for green roofs) as per EN 13948 or FLL method	passed	-

Performance values of the product in accordance with the Declaration of Performance with regard to its essential characteristics as defined by *DIN EN 13956:2012*, Flexible sheets for waterproofing.

2.4 Delivery status

Sarnafil® AT is delivered in various sizes, depending on the material thickness, on pallets:

- Sarnafil® AT-15: 20 m x 1 m or 20 m x 2 m
- Sarnafil® AT-18: 15 m x 1 m or 15 m x 2 m
- Sarnafil® AT-20: 15 m x 1 m or 15 m x 2 m
- Sarnafil® AT-25: 10 m x 1 m or 10 m x 2 m

2.5 Base materials/Ancillary materials

The raw materials and additives of Sarnafil® AT polymeric waterproofing membrane can be given as follows:

- Thermoplastic polyolefins including elastomer: 50–70 %
- Stabilizers (UV/heat): 0–1 %
- Flame retardant (inorganic): 25–35 %
- Carrier material (glass nonwoven/polyester): 5–7 %
- Pigment: 0–5 %
- Polypropylene (PP) felt: 0–3 %
- Additives: 0–2 %

This product/article/at least one partial article contains substances listed in the *candidate list* (date 15.08.2024) exceeding 0.1 percentage by mass: no.

This product/article/at least one partial article contains other CMR substances in categories 1A or 1B which are not on the candidate list, exceeding 0.1 percentage by mass: no.

Biocide products were added to this construction product or it has been treated with biocide products (this then concerns a treated product as defined by the (EU) *Ordinance on Biocide Products No. 528/2012*): no.

2.6 Manufacture

Sarnafil® AT polymeric waterproofing sheets are manufactured on production lines developed in-house in the following stages:

- Melting of the polymeric components and additives in extruders
- Dispersing of the molten materials
- Coating of the carrier or the reinforcing in layers, producing homogeneous encapsulation
- Cooling of the polymeric waterproofing sheet
- Winding of the sheets onto cardboard spools made of recycled material
- Individual wrapping of each roll

The quality management system of the Sarnen plant has been *ISO 9001* certified since 1993.

2.7 Environment and health during manufacturing

The environmental management system of the Sarnen plant is *ISO 14001* certified.

2.8 Product processing/Installation

Sarnafil® AT polymeric waterproofing membrane is loose laid and mechanically fastened without ballast to roofs with a slope up to < 20°. It is also suitable on roofs with ballast (e.g. gravel, concrete pavers) and in green roof systems (intensive and extensive). The individual sheets are joined by means of hot-air welding.The Sika fastening systems Sarnabar® or Sarnafast® are recommended for fastening. As a rule, the latest locally applicable product data sheet for each product is to be observed.

2.9 Packaging

The rolls of polymeric waterproofing membrane are individually wrapped in polyethylene (PE) film and shipped on pallets. The cardboard spools are made of recycled material. The packaging materials can be sorted and collected for recycling.

2.10 Condition of use

Based on the third-party study *Durability of Sarnafil® T Polymeric Waterproofing Membranes* from 2014, it is reasonable to expect that the condition and material composition of Sarnafil® AT polymeric waterproofing membrane

will remain unchanged throughout its service life, assuming professional installation and proper use and maintenance.

2.11 Environment and health during use

The product contains no substances that are released during normal use. Neither the environment nor the health of users is negatively influenced during the service life. No environmental emissions are known to occur.

2.12 Reference service life

The service life depends on climatic conditions, the thickness of the polymeric waterproofing membrane, the color and the application. Based on the study *Durability of Sarnafil® T Polymeric Waterproofing Membranes* from 2014, it is reasonable to expect a service life of up to 50 years for the new generation of Sarnafil® AT, assuming correct application and maintenance.

This finding reflects the product's high resistance to weathering and ageing when used properly.

2.13 Extraordinary effects

Fire

Sarnafil® AT polymeric waterproofing membrane is classified in Construction Product Class E, as defined by *EN 13501-1*.

Fire resistance

Name	Value
Building material class	E
Burning droplets	-
Smoke gas development	-

Water

No environmental impact is known due to water exposure of installed Sarnafil® AT polymeric waterproofing membrane.

Mechanical destruction

Sarnafil® AT polymeric waterproofing membrane possesses good mechanical strength and is highly robust. No environmental impact is known to result from unexpected mechanical damage.
Based on the study *Durability of Sarnafil® T Polymeric Waterproofing Membranes* from 2014, no significant change in the mechanical properties of the roofing membrane is to be expected even after 25 years.

2.14 Re-use phase

At the end of the service life or when roofing sheets must be replaced, Sarnafil® AT waterproofing sheets can be selectively removed and recycled. This allows a closed-loop material cycle and increasingly greater material recovery from used polymeric waterproofing membranes.

2.15 Disposal

Sarnafil® AT polymeric waterproofing sheets should be recycled in order to keep the material cycle intact. The used waterproofing sheets can be removed, cleaned and ground in a shredding plant. Within Sika's efforts towards material circularity, extensive activities are ongoing to build up the recycling infrastructure and commence research activities for incorporating recycled materials into products. Due the described efforts and the long life span of the membrane, a recycling scenario was considered suitable. As an alternative scenario, the waterproofing sheets are to be used for thermal energy recovery.

Sarnafil® AT polymeric waterproofing membrane can be classified under Waste Code 170213 of the *European Waste Catalogue*.

2.16 Further information

More information about the company and its products is available in the internet (**www.sika.com**).

3. LCA: Calculation rules

3.1 Declared Unit

This declaration applies to 1 m^2 of installed Sarnafil® AT polymeric waterproofing membrane with a thickness of 1.8 mm. A formula is given in Chapter 5 for independent calculation of the values for other thicknesses.

Declared unit

Name	Value	Unit
Declared unit	1	m^2
Grammage	2.22	kg/m^2
Type of sealing	hot-air weld	-
Conversion factor to 1 kg	0.42	-
Layer thickness	0.0018	m

3.2 System boundary

This EPD is based on the system boundary cradle to gate with options, modules C1–C4, and module D (A1–A3 + C + D and additional modules. The additional modules are A4 and A5).

The system boundaries of the EPD followed the modular structure set forth by *EN 15804+A2*.
The LCA takes into account the following modules:

- A1–A3: Extraction, processing and transport of raw materials (e.g. polymers, pigments, processing aids, stabilizers, fillers, flame retardants and carrier materials) used for the production of intermediate products and the waterproofing membrane and the packaging materials used to package the waterproofing membranes, such as wooden pallets, cardboard and PE film, for transport from the plant
- Waste processing of production waste (edge trim), which occurs during the production of the waterproofing membrane
- A4: Transport of the waterproofing membrane to the building site
- A5: Installation of the waterproofing membrane into the building by means of hot-air welding (including welding energy), disposal or recycling of packaging, and waterproofing membrane scrap, additional production processes to compensate for the loss of wastage and overlap of products, metallic screws for fixing the membrane
- C1: Manual deconstruction and removal of the waterproofing membrane with no environmental burdens (recovery)
- C2: Transport of the recovered waterproofing membrane to waste-processing facility
- C3: Processing of the recovered waterproofing membrane for material recycling (Scenario 1 - C3) or

thermal energy recovery (Scenario 2 - C3/1)

- C4 and C4/1: Disposal of the recovered waterproofing membrane in landfill (which is not a relevant waste scenario for this study)
- D: Benefits for reuse, recovery and/or recycling from waste incineration of packaging and losses in the installation phase, burdens from the recycling process of the membrane, and benefits from the avoided production of virgin material
- D/1: Benefits for reuse, recovery and/or recycling from waste incineration of packaging and losses in the installation phase, and the incineration of the membrane at end of life

3.3 Estimates and assumptions

At the end of life, either 100% material recycling (Scenario 1) or 100 % thermal energy recovery (Scenario 2) is assumed.

3.4 Cut-off criteria

All data were taken into account (recipe constituents, thermal energy used, electricity used). Transport expenses were considered for all inputs and outputs. The manufacturing of the production machines and systems and associated infrastructure was not taken into account in the LCA. Additionally, inputs (solvents, lubricant oils) needed for maintenance of the production line, lighting, hygiene-related water use, transportation of employees were considered negligible and excluded from the analysis.

3.5 Background data

The underlying data were extracted from the databases of *Sphera's LCA For Experts Version 10.8* software with the underlying database *Sphera Managed LCA* Content *CUP 2024.1* as primary database and *ecoinvent Version 3.10*.

3.6 Data quality

To simulate the product stage, data recorded by Sika from the production year 2023 were used. All other relevant background datasets were taken from generic data not older than 10 years, using as many as datasets possible for raw materials and processes with technological and geographical representativeness.

3.7 Period under review

The period of study is the year 2023 (1 January – 31 December 2023).

3.8 Geographic Representativeness

Land or region, in which the declared product system is manufactured, used or handled at the end of the product´s lifespan: Europe

3.9 Allocation

Production waste that was reclaimed and reused internally has been modeled as closed-loop recycling in Modules A1-A3. Regarding the recycling of the polymeric waterproofing sheets, the amount of recyclable membrane was treated as a corresponding polymer benefit. Benefits for the disposal of packaging (incineration), installation scrap and roofing membrane are credited in Module D; this also applies to the reuse of wooden pallets.

3.10 Comparability

Basically, a comparison or an evaluation of EPD data is only possible if all the data sets to be compared were created according to *EN 15804* and the building context, respectively the product-specific characteristics of performance, are taken into account. The underlying data were extracted from the databases of *Sphera's LCA For Experts* Version 10.8 software with the underlying database *Sphera Managed LCA Content CUP 2024.1* as primary database and *ecoinvent Version 3.10*. For calculating the impact from electricity consumption, the Swiss residual mix was applied with a GWP of 0.5 kg CO_2-eq/kWh. For calculating the impact from thermal energy, data for thermal energy from natural gas was applied with a GWP of 0.07 kg CO_2-eq/kWh.

4. LCA: Scenarios and additional technical information

Characteristic product properties of biogenic carbon

Name	Value	Unit
Biogenic carbon content in product	-	kg C
Biogenic carbon content in accompanying packaging	0.025	kg C

Note: 1 kg of biogenic carbon is equivalent to 44/12 kg of CO_2.

The following technical information serves as a basis for the declared modules or can be used for the development of specific scenarios in the context of a building assessment.

Transport to the building site (A4)

Name	Value	Unit
Litres of fuel	0.0055	l/100km
Transport distance	600	km

Installation into the building (A5)

Name	Value	Unit
Electricity consumption	0.015	kWh
Material loss (membrane scrap)	2	%
Overlaps (membrane joints)	6	%

Reference service life

Name	Value	Unit
Reference service life	50	a

The reference service life of Sarnafil® AT is at least east 50 years. According to the study mentioned in 2.12, experience to date with polymeric membranes indicates that a service life of over 50 years can be expected, provided the standard requirements and the application and maintenance recommendations are observed. This conclusion reflects the high resistance to weathering and aging of the product when properly used.

End-of-life stage (C1 – C4)

For modeling the end-of-life stage, two different scenarios are calculated, each of which represents a 100 % scenario but also allows pro-rata calculation (for example, Scenario 1 = 80 % / Scenario
2 = 20 %).

Name	Value	Unit
For material recycling (Scenario 1: C1, C2, C3, C4)	100	%
Transport to material recycling facility (Scenario 1: C1, C2, C3, C4)	600	km
For thermal energy recovery (Scenario 2: C1, C2/1, C3/1, C4/1)	100	%
Transport to energy recovery facility (Scenario 2: C1, C2/1, C3/1, C4/1)	50	km

5. LCA: Results

The results displayed below apply to Sarnafil®AT-18. To calculate results forother thicknesses, please use this formula:

$I_x = ((x-0.17)/1.63) * I_{1.8}$

[Ix = the unknown parameter value for Sarnafil® AT products with a thickness of "x" mm (e.g. 2.0mm)]

DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; MND = MODULE OR INDICATOR NOT DECLARED; MNR = MODULE NOT RELEVANT)

Product stage			Construction process stage		Use stage							End of life stage				Benefits and loads beyond the system boundaries
Raw material supply	Transport	Manufacturing	Transport from the gate to the site	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	X	MND	MND	MNR	MNR	MNR	MND	MND	X	X	X	X	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A2: 1 m² Sarnafil®AT-18

Parameter	Unit	A1-A3	A4	A5	C1	C2	C2/1	C3	C3/1	C4	C4/1	D	D/1
GWP-total	kg CO_2 eq	4.8E+00	1.3E-01	1.25E+00	0	1.35E-01	1.3E-02	4.96E-03	5.61E+00	0	0	-2.73E+00	-2.25E+00
GWP-fossil	kg CO_2 eq	4.85E+00	1.2E-01	1.23E+00	0	1.26E-01	1.21E-02	2.22E-03	5.61E+00	0	0	-2.79E+00	-2.32E+00
GWP-biogenic	kg CO_2 eq	-5.73E-02	6.59E-03	9.18E-02	0	6.89E-03	6.61E-04	2.75E-03	0	0	0	6.37E-02	6.84E-02
GWP-luluc	kg CO_2 eq	3.58E-03	2E-03	1.15E-03	0	2.09E-03	2E-04	0	8.74E-05	0	0	-8.86E-04	-2.78E-04
ODP	kg CFC11 eq	6.47E-09	1.19E-14	9.97E-10	0	1.25E-14	1.2E-15	4.74E-10	4.75E-10	0	0	-3.35E-10	-3.47E-10
AP	mol H^+ eq	1.69E-02	1.61E-04	6.04E-03	0	1.68E-04	1.62E-05	1.54E-05	1.08E-03	0	0	-5.33E-03	-2.52E-03
EP-freshwater	kg P eq	1.06E-04	5.07E-07	1.24E-05	0	5.31E-07	5.09E-08	2.62E-06	2.79E-06	0	0	-8.94E-06	-8.49E-06
EP-marine	kg N eq	4.73E-03	5.81E-05	8.55E-04	0	6.09E-05	5.85E-06	4.82E-06	3.45E-04	0	0	-1.46E-03	-7.67E-04
EP-terrestrial	mol N eq	3.77E-02	6.94E-04	8.34E-03	0	7.26E-04	6.98E-05	5.07E-05	4.94E-03	0	0	-1.55E-02	-8.23E-03
POCP	kg NMVOC eq	1.56E-02	1.52E-04	2.77E-03	0	1.59E-04	1.53E-05	1.62E-05	9.41E-04	0	0	-6.01E-03	-2.21E-03
ADPE	kg Sb eq	5.5E-06	1.01E-08	2.79E-05	0	1.06E-08	1.02E-09	5.68E-09	1.08E-08	0	0	-3.41E-07	-2.78E-07
ADPF	MJ	1.33E+02	1.56E+00	1.95E+01	0	1.62E+00	1.56E-01	4E-02	1.12E+00	0	0	-1.03E+02	-4.15E+01
WDP	m^3 world eq deprived	3.33E-01	1.77E-03	1.65E-01	0	1.85E-03	1.78E-04	-2.1E-03	5.55E-01	0	0	-1.58E-01	-2.65E-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; WDP = Water (user) deprivation potential)

RESULTS OF THE LCA - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A2: 1 m² Sarnafil®AT-18

Parameter	Unit	A1-A3	A4	A5	C1	C2	C2/1	C3	C3/1	C4	C4/1	D	D/1
PERE	MJ	9.85E+00	1.31E-01	4.48E+00	0	1.37E-01	1.32E-02	1.05E-03	2.93E-01	0	0	-6.55E+00	-1.53E+01
PERM	MJ	1.07E+00	0	-1.07E+00	0	0	0	0	0	0	0	0	0
PERT	MJ	1.09E+01	1.31E-01	3.4E+00	0	1.37E-01	1.32E-02	1.05E-03	2.93E-01	0	0	-6.55E+00	-1.53E+01
PENRE	MJ	7.25E+01	1.56E+00	1.61E+01	0	1.62E+00	1.56E-01	6.43E+01	6.54E+01	0	0	-1.03E+02	-4.15E+01
PENRM	MJ	6.08E+01	0	3.47E+00	0	0	0	-6.43E+01	-6.43E+01	0	0	0	0
PENRT	MJ	1.33E+02	1.56E+00	1.95E+01	0	1.62E+00	1.56E-01	4E-02	1.12E+00	0	0	-1.03E+02	-4.15E+01
SM	kg	0	0	0	0	0	0	0	0	0	0	2.24E+00	0
RSF	MJ	0	0	0	0	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0	0	0	0	0
FW	m^3	5.13E-02	1.47E-04	7.98E-03	0	1.54E-04	1.48E-05	-4.89E-05	1.3E-02	0	0	-1.08E-02	-1.1E-02

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

RESULTS OF THE LCA – WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A2: 1 m² Sarnafil®AT-18

Parameter	Unit	A1-A3	A4	A5	C1	C2	C2/1	C3	C3/1	C4	C4/1	D	D/1
HWD	kg	1.86E-02	5.02E-11	1.49E-03	0	5.25E-11	5.04E-12	0	6.06E-10	0	0	-7.19E-04	-7.19E-04
NHWD	kg	3.75E-01	2.42E-04	1.2E-01	0	2.52E-04	2.42E-05	0	1.8E-01	0	0	-3.41E-01	-2.17E-02
RWD	kg	3.31E-03	2.01E-06	5.16E-04	0	2.1E-06	2.01E-07	0	5.25E-05	0	0	-1.9E-04	-3.1E-03
CRU	kg	0	0	0	0	0	0	0	0	0	0	0	0

MFR	kg	0	0	0	0	0	0	2.35E+00	0	0	0	0	0
MER	kg	0	0	0	0	0	0	0	0	0	0	0	0
EEE	MJ	0	0	3.43E-01	0	0	0	0	1.08E+01	0	0	0	0
EET	MJ	0	0	6.1E-01	0	0	0	0	1.93E+01	0	0	0	0

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 OF THE LCA – additional impact categories according to EN 15804+A2-optional: 1 m² Sarnafil®AT-18

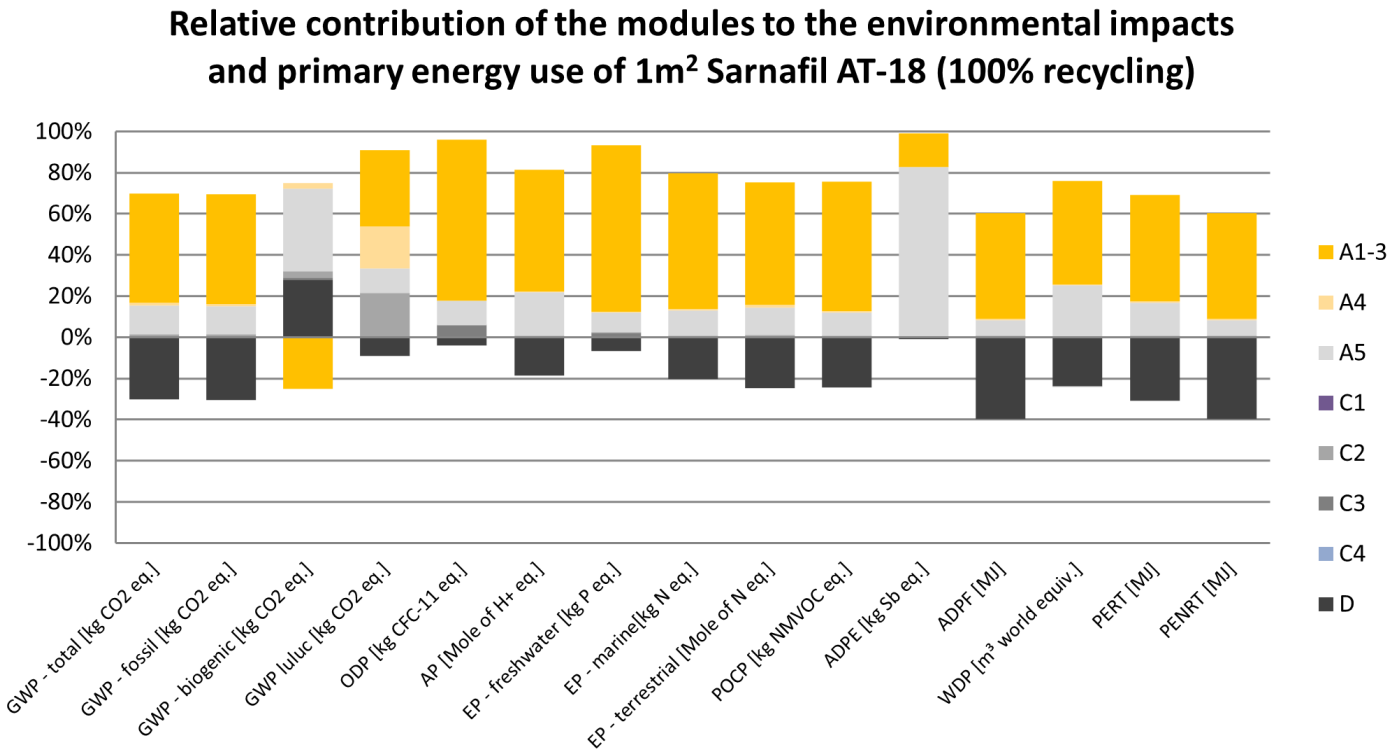
Parameter	Unit	A1-A3	A4	A5	C1	C2	C2/1	C3	C3/1	C4	C4/1	D	D/1
PM	Disease incidence	1.93E-07	1.68E-09	9.42E-08	0	1.75E-09	1.68E-10	6.72E-10	7.62E-09	0	0	-6.09E-08	-2.13E-08
IR	kBq U235 eq	3.91E-01	2.81E-04	6.24E-02	0	2.93E-04	2.81E-05	1.93E-04	8.42E-03	0	0	-4.59E-02	-5.11E-01
ETP-fw	CTUe	5.92E+01	1.14E+00	7.56E+00	0	1.19E+00	1.15E-01	5.29E-02	5.63E-01	0	0	-5.42E+01	-6.04E+00
HTP-c	CTUh	3.93E-09	2.29E-11	2.97E-07	0	2.4E-11	2.3E-12	6.62E-12	5.61E-11	0	0	-1.58E-09	-7.67E-10
HTP-nc	CTUh	1.09E-07	1.02E-09	1.45E-08	0	1.07E-09	1.02E-10	3.64E-11	1.83E-09	0	0	-5.18E-08	-1.13E-08
SQP	SQP	1.43E+01	7.69E-01	3.17E+00	0	8.03E-01	7.71E-02	5.08E-02	3.85E-01	0	0	-1.14E+01	-1.55E+01

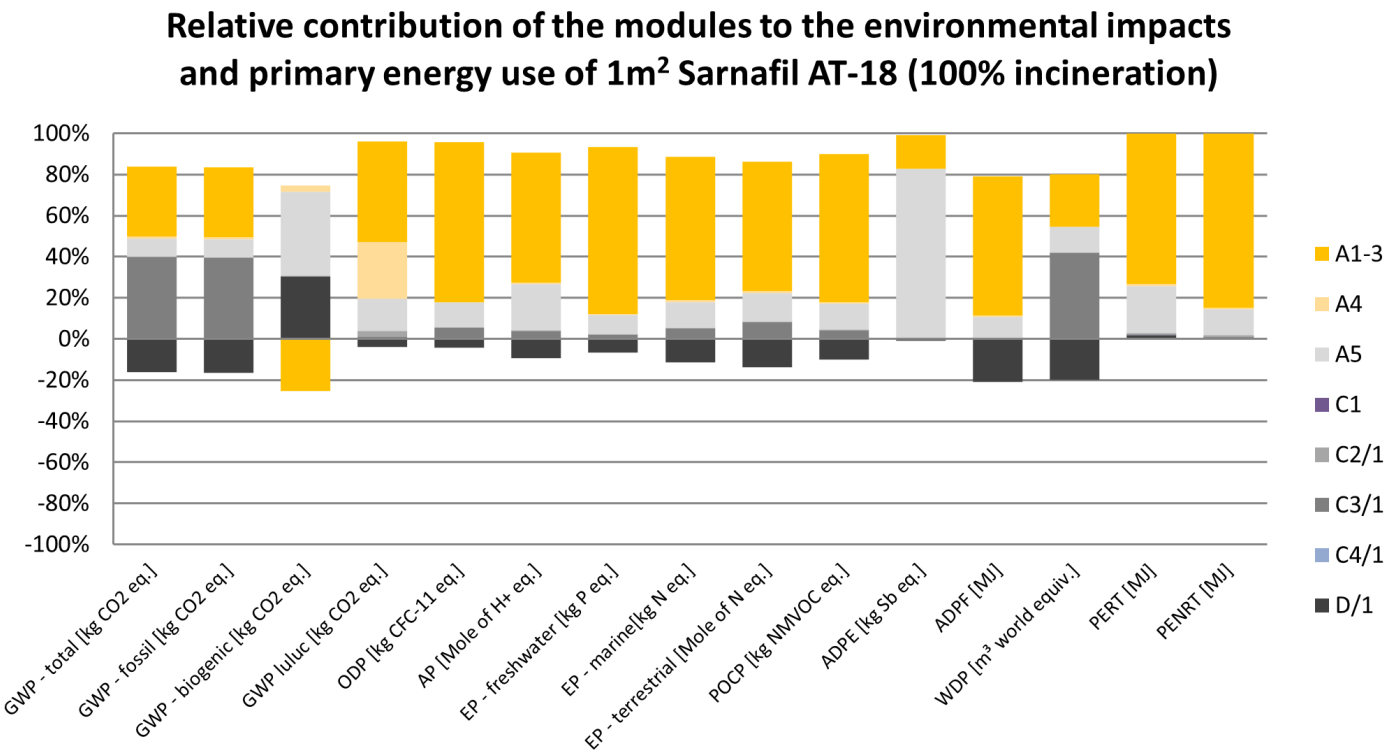
PM = Potential incidence of disease due to PM emissions; IR = Potential Human exposure efficiency relative to U235; ETP-fw = Potential comparative Toxic Unit for ecosystems; HTP-c = Potential comparative Toxic Unit for humans (cancerogenic); HTP-nc = Potential comparative Toxic Unit for humans (not cancerogenic); SQP = Potential soil quality index

Disclaimer 1 – for the indicator “Potential Human exposure efficiency relative to U235”. 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 or radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, radon and from some construction materials is also not measured by this indicator.

Disclaimer 2 – for the indicators “abiotic depletion potential for non-fossil resources”, “abiotic depletion potential for fossil resources”, “water (user) deprivation potential, deprivation-weighted water consumption”, “potential comparative toxic unit for ecosystems”, “potential comparative toxic unit for humans – cancerogenic”, “Potential comparative toxic unit for humans - not cancerogenic”, “potential soil quality index”. The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high as there is limited experience with the indicator.

6. LCA: Interpretation





Examining the results for Sarnafil® AT-18 across all life cycle modules and impact categories, it can be concluded that the majority of the impacts arise from Module A1-3. This is true for all impact categories, with the exception of GWP, where greenhouse gas emissions from the incineration of the membrane in module C3 contribute to the results from this impact category. Another exception is ADPe, where the majority of impacts occur in module A5. This is due to the fixation system components, which consist of iron.
Examining the results for module A1-3 in further detail, the raw materials involved in the production of Sarnafil® AT-18 play a significant role, representing more than 94% of the impacts across the different impact categories. The exceptions are PERT and GWP biogenic and. For PERT, 65% of the impacts arise from the formulation, 13% of the impacts arise from the packaging and 22% of the impacts arise from the production process. For GWP biogenic, all impacts arise from packaging. The polymers are the formulation component that generally contribute the most to the impacts. The polymers also make up the highest share of the total membrane mass. It is not possible to verify which upstream processes are responsible for the impacts for each of these raw materials since the datasets that were selected to model these materials consist of aggregated data.

7. Requisite evidence

No requisite evidence is required for Sarnafil® AT polymeric roofing membrane.

8. References

PCR, Part A
PCR, Part A, Institut Bauen und Umwelt e.V., Berlin (pub.): Product Category Rules for Construction Products from the range of Environmental Product Declarations of Institut Bauen und Umwelt (IBU), Part A: Calculation Rules for the Life Cycle Assessment and Requirements on the Background Report. V 1.4, 2024.

PCR, Part B
PCR, Part B, Requirements on the EPD for plastic and elastomer roofing and ceiling sheet systems, v11, 2024.

Regulation o. 305/2011
Regulation No. 305/2011, of the European Parliament and of the European Council laying down harmonised conditions for the marketing of construction products and repealing Council Directive 89/106/EEC. 9 March 2011.

Regulation No. 528/2012
Regulation No. 305/2011, of the European Parliament and of the European Council laying down harmonised conditions for the marketing of construction products and repealing Council Directive89/106/EEC. 22 May 2012.

EN 495-5
DIN EN 495:2013-05, Flexible sheets for waterproofing - Determinatin of foldability at low temperature - Part 5: Plastic and rubber sheets for roof waterproofing; German version EN 495- 5:2013.

EN 1107-2
IN EN 1107:2001-02, Flexible sheets for waterproofing - Determination of dimensional stability - Part 2: Plastic and rubber sheets for roof waterproofing; German version EN 1107-2:2001.

EN 1297
DIN EN 1297:2004, Flexible sheets for waterproofing - Bitumen, plastic and rubber sheets for roof waterproofing - Method of artificial ageing by long term exposure to the combination of UV radiation, elevated temperature and water; German version EN 1297:2004.

EN 1928
DIN EN 1928:2000-0, Flexible sheets for waterproofing - Bitumen, plastic and rubber sheets for roof waterproofing - Determination of watertightness; German version EN 1928:2000.

EN ISO 9001
DIN EN ISO 9001:2015, Quality management systems - Requirements; trilingual version (German, English, French) EN ISO 9001:2008-12.

EN ISO 14001
DIN EN ISO 14001:2015, Environmental management systems - Requirements with guidance for use; German and English version EN ISO 14001:2004 + AC:2009.

EN 12310-2
DIN EN 12310:2000-02, Flexible sheets for waterproofing - Determination of resistance to tearing - Part 2: Plastic and rubber sheets for roof waterproofing; German version EN 12310- 2:2000.

EN 12311-2
DIN EN 12311:2010-02, Flexible sheets for waterproofing - Determination of tensile properties - Part 2: Plastic and rubber sheets for roof waterproofing; German version EN 12311-2:2010.

EN 12316-2
DIN EN 12316:2013-02, Flexible sheets for waterproofing - Determination of peel resistance of joints - Part 2: Plastic and rubber sheets for roof waterproofing; German version EN 12316-2:2013.

EN 12317-2
DIN EN 12317:2010-02, Flexible sheets for waterproofing - Determination of shear resistance of joints - Part 2: Plastic and rubber sheets for roof waterproofing; German version EN 12317-2:2010.

EN 13501-1+A1:2009
DIN EN 13501-1:2007 + A1:2009, Fire classification of construction products and building elements - Part 1: Classification using data from reaction to fire tests; German version EN 13501-1:2007+A1:2009.

EN 13948
DIN EN 13948:2007, Flexible sheets for waterproofing - Bitumen, plastic and rubber sheets for roof waterproofing - Determination of resistance to root penetration.

EN 13956
DIN EN 13956:2013-03, Flexible sheets for waterproofing - Plastic and rubber sheets for roof waterproofing - Definitions and characteristics; German version EN 13956:2012.

EN 1548
DIN EN 1548:2007, Flexible sheets for waterproofing - Plastic and rubber sheets for roof waterproofing - Method for exposure to bitumen.

EN 15804+A2
EN 15804:2012+A2:2019:+AC:2021, Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products.

DIN SPEC 20000-201
DIN SPEC 20000-201, Use of building products in construction works - Part 201: Adaption standard for flexible sheets for waterproofing according to European standards for the use as waterproofing of roofs.

ecoinvent Version 3.10
ecoinvent Version 3.10, Database for Life Cycle Assessment. Swiss Centre for Life Cycle Inventories (ecoinvent Centre), 2023.

European Waste Catalogue
European Waste Catalogue, European Waste Catalogue Regulation, AVV, 2001.

REACH Candidate List
REACH Candidate List, List of Candidate Substances of Very High Concern for Authorization, published in accordance with Article 59(10) of the REACH Regulation. Helsinki: European Chemicals Agency. The updated candidate list can be found at: https://echa.europa.eu/candidate-list-table.

Sphera LCA FE 10.8 and Database CUP 2024.1

Software-System and Databases for Life Cycle Engineering. Copyright, TM. Stuttgart, Echterdingen, 1992-2024.

Durability of Sarnafil® T Polymeric Waterproofing Membranes
Study by the Institut für Bautenschutz, Baustoffe und Bauphysik, Dr. Rieche und Dr. Schürger GmbH & Co. KG, Fellbach. Summary Report, 2014.

The literature referred to in the Environmental Product Declaration must be listed in full.Standards already fully quoted in the EPD do not need to be listed here again.
The current version of PCR Part A and PCR Part B of the PCR document on which they are based must be referenced.

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