epd-norway

Global Program Operator

ENVIRONMENTAL PRODUCT DECLARATION

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

Owner of the Declaration	Sika Deutschland GmbH
Publisher	The Norwegian EPD Foundation
Registration number	NEPD-20-21-MRA
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-SIK-20240008-IBA1-EN
Issue date	11.03.2024
Valid to	10.03.2029

Sikaplan VG

Sika Manufacturing AG

Institut Bauen und Umwelt e.V.

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BUILDING TRUST

1. General Information

Sika Manufacturing AG

Programme holder

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

Declaration number

EPD-SIK-20240008-IBA1-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

11.03.2024

Valid to

10.03.2029

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

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

Sikaplan VG

Owner of the declaration

Sika Deutschland GmbH
Kornwestheimer Straße 103 - 107
70439 Stuttgart
Germany

Declared product / declared unit

1 m² Sikaplan VG polymeric waterproofing membrane

Scope:

This document represents a specific EPD for Sikaplan VG polymeric waterproofing membrane with 1.2 mm thickness manufactured by Sika Manufacturing AG in Troisdorf, Germany. Formula to calculate impacts for other thicknesses is provided. The life cycle assessment data are based on production data from 2022 collected by Sika Deutschland GmbH.
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

Mr Olivier Muller,
(Independent verifier)

2. Product

2.1 Product description/Product definition

Sikaplan VG is a multi-layer synthetic roof waterproofing sheet based on polyvinyl chloride (PVC) with embedded polyester scrim reinforcing (DE/E1 PVC-P-NB-V-PG).

Sikaplan VG waterproofing sheets are available in these thicknesses: 1.2 mm, 1.5 mm and 1,8 mm.

All values given in the LCA result section apply to Sikaplan VG-12; a formula for individually calculating values for other thicknesses is given in Chapter 5.
For the placing on the market in the European Union/European Free Trade Association (EU/EFTA) (except for Switzerland) is subject to Regulation (EU) No. 305/2011 (CPR). The product requires a Declaration of Performance in accordance with the harmonised standard *EN 13956:2012* 'Flexible sheets for waterproofing' and the CE marking. Application is subject to the regulations of each specific country; in Germany the application standard *DIN SPEC 20000-201*.

2.2 Application

Sikaplan VG waterproofing sheets are used mainly for waterproofing flat roofs. The sheets can be loosely laid and mechanically fastened to roofs with any slope.

2.3 Technical Data

In the following table, only technical data relevant to Sikaplan VG waterproofing sheets are given.

Technical data

Name	Value	Unit
Watertightness as per EN 1928	Passed	
Tensile strain as per EN 12311-2	≥ 15	%
Peel resistance of the seam joint as per EN 12316-2	No failure	-
Shear resistance of the seam joint as per EN 12317-2	≥ 600	N/50mm
Artificial ageing as per EN 1297	Passed (> 5000 h)	-
Dimensional stability as per EN 1107-2	≤ |0.5|	%
Folding in the cold as per EN 495-5	≤ - 25	°C
Resistance to impact loads nach EN 12691 (Dichtungsbahnen)	300	mm

Performance data of the product in accordance with the declaration of performance with respect to its essential characteristics according to *EN 13956:2012*, Flexible sheets for waterproofing.

2.4 Delivery status

The products are delivered palletised: 20 m x 2 m or 20 m x 1.54 m, each 21 rolls per pallet.

2.5 Base materials/Ancillary materials

The base materials and ancillary materials of Sikaplan VG polymeric waterproofing membrane are:

- Polyvinyl chloride / PVC: 40 - 50%
- Plasticiser (Phthalate): 25 - 32%
- Stabiliser (UV/Heat): 1 - 2%
- Fire retardant (inorganic): 20 - 25%
- Carrier (Polyester scrim): 1 - 3%
- Pigments: 0 - 8%

This product contains substances listed in the Candidate List of Substances of Very High Concern for Authorisation (SVHC) (date: 17.01.2023) exceeding 0.1 percentage by mass: no
This product/article/at least one partial article contains other Carcinogenic, mutagenic, reprotoxic (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

Sikaplan VG polymeric waterproofing sheets are manufactured in the following steps:

- Dosing of the various raw materials and plastification of the mixture in an extruder
- Rolling the melt into sheets by calendar processing
- Cooling and reeling the sheets
- Heat fusing of two sheets (top and bottom layers), embedding a polyester mesh, on a lamination machine
- Trimming the sheets and winding them onto cardboard spools made of recycled paper
- Wrapping the rolls in PE stretch film, palletising

Production waste such as scrap is recycled by feeding it directly back into the manufacturing process.

Sika maintains a quality management system certified in accordance with *ISO 9001*.

2.7 Environment and health during manufacturing

In the production of Sikaplan VG polymeric waterproofing membrane, the regulatory standards for exhaust gasses, waste water and solid waste as well as for noise emissions are fully met and the various limits are not exceeded. The health of production personnel is not put at risk during production. Waste gasses from the production process are collected and filtered in exhaust gas scrubbers. Used water is used exclusively for cooling and does not come into contact with the polymeric waterproofing membrane. There are no hazardous goods according to the *REACH* listing.

In addition to national requirements, there are Sika strategic goals for waste, energy and water reduction, as well as for zero personal accidents at work. There are regular meetings with the neighbourhood for feedback regarding, e.g., noise. Employees receive regular training for process standards, and for safety and hazards. Sika maintains an environmental management system certified in accordance with *ISO 14001*.

2.8 Product processing/Installation

Sikaplan VG polymeric waterproofing sheets are loose laid with mechanical fastening for unballasted roofs with any slope. Seams between sheets are hot-air welded; linear fastening is recommended.
In principle, the current product data sheet should be consulted. Please request further information from your local Sika organisation.

2.9 Packaging

The rolls of polymeric waterproofing sheets are wrapped in PE stretch foil and shipped on pallets. The cardboard spools are made of recycled paper. The packaging materials can be sorted and collected for recycling.

2.10 Condition of use

Professionally installed and properly used, the condition of Sikaplan VG polymeric waterproofing membrane remains unchanged throughout its service life. This was confirmed in the study by the *British Board of Agrément (BBA*).

2.11 Environment and health during use

During their service life, Sikaplan VG synthetic waterproofing sheets have no negative influence on the environment and health of users.

2.12 Reference service life

The reference service life of Sikaplan VG synthetic waterproofing sheets is at least 35 years.
The *British Board of Agrément (BBA*) certified Sikaplan VG to 'under normal service conditions (…) provide a durable roof waterproofing with a service life in excess of 35 years.'
This conclusion reflects the high resistance to weathering and ageing of the product when properly used.

2.13 Extraordinary effects

Fire

Sikaplan VG polymeric waterproofing membrane is classified in Construction Material Class E, as defined by *EN 13501-1.*

Fire protection

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

Water

No environmental impact due to water exposure of the installed Sikaplan VG polymeric waterproofing membrane is known.

Mechanical destruction

Sikaplan VG polymeric waterproofing membrane possesses good mechanical strength and is highly robust. No environmental impact is known to result from unexpected mechanical damage.

2.14 Re-use phase

At the end of the service life or when roofing sheets must be replaced, Sikaplan VG waterproofing sheets can be selectively removed and recycled. This allows for a closed-loop material cycle.
Sika Services AG is affiliated with Roofcollect, the recycling system for polymeric roofing and waterproofing membranes. This enables increasingly more material recovery from sorted polymeric waterproofing membranes.

2.15 Disposal

Sikaplan VG polymeric waterproofing sheets can be recycled at the end of the use stage. As part of the Sustainability Strategy, Sika is working on recycling systems where End of Life membranes are collected, treated and then brought into the manufacturing process of new membranes. In this process, recovered materials are replacing parts of the virgin material input.

Sikaplan VG polymeric waterproofing membrane can be classified under Waste Code 170904 as defined by the *European Waste Catalogue*.

2.16 Further information

More information about the company and its products is available on the internet at **www.sika.com**.
Detailed information on the polymeric waterproofing membranes is available at your local Sika organisation's website.

3. LCA: Calculation rules

3.1 Declared Unit

This declaration applies to 1 m^2 of Sikaplan VG polymeric waterproofing membrane, thickness 1.2 mm. A formula is given for an independent calculation of the values for other thicknesses.

Declared unit

Name	Value	Unit
Declared unit	1	m^2
Grammage	1.6	kg/m^2
Type of sealing	Hot-air weld	-
Layer thickness	0.0012	m

Other declared units are allowed if the conversion is shown transparently.

3.2 System boundary

Type of EPD: Cradle-to-gate with options

The system boundaries of the EPD follow the modular construction system described by *EN 15804+A2*. The LCA takes into account the following modules:

- A1-A3: Manufacturing of pre-products, packaging, ancillary materials, transport to the factory, production including energy supply and waste handling
- A4: Transport to the building site
- A5: Installation into the building (welding energy, disposal of packaging, fasting screws)
- C1: Deconstruction and demolition
- C2/1: Transport to the recycling facility
- C2/2: Transport to the incineration facility
- C3/1: Waste processing for recycling
- C3/2: Waste incineration
- C4: Disposal
- D: Potential for reuse, recovery and/or recycling as net flows and benefits

3.3 Estimates and assumptions

The membrane is assumed to be removed by hand at the end of life, so no inputs/outputs are considered.

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 primary data provided by Sika was derived from the plant in Troisdorf, Germany. The underlying data were collected in the databases of *GaBi software* (version CUP2023.1) and *ecoinvent Version 3.8*. The green German electrical energy mix was applied.

3.6 Data quality

To simulate the product stage, data recorded by Sika from the production year 2022 (partly 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 under review is the year 2022.

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: Germany

3.9 Allocation

Production waste that was reclaimed and reused internally has been modelled 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 PVC benefit. Benefits for the disposal of packaging (incineration), 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.

4. LCA: Scenarios and additional technical information

Characteristic product properties of biogenic carbon

Information on describing the biogenic Carbon Content at factory gate

Name	Value	Unit
Biogenic carbon content in product	-	kg C
Biogenic carbon content in accompanying packaging	0.055	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
Transport distance (truck)	1000	km
Litres of fuel (truck)	0.004	l/100km

Installation into the building (A5)

Name	Value	Unit
Electricity consumption	0.016	kWh
Material loss (membrane)	2	%
Overlaps (membrane)	8	%

Reference service life

Name	Value	Unit
Reference service life	35	a

The *British Board of Agrément (BBA)* certified Sikaplan VG to provide durable roof waterproofing with a service life in excess of 35 years.

End of life (C1-C4)

Name	Value	Unit
Recycling Scenario 1	100	%
Transport to recycling (truck)	1000	km
Incineration Scenario 2	100	%
Transport to incineration (truck)	50	

Reuse, recovery and/or recycling potentials (D), relevant scenario information

The benefits from the incineration of waste produced during installation are credited in Module D as avoided generation of electricity and thermal energy, since in modern incineration plants the energy of combustion is used to produce power and thermal energy. The membrane material recycled at the end of life is credited as avoided production of PVC, while the partial reuse of pallets from packaging is also included in Module D as avoided production of new pallets. The scenario D1/D2 are connected with the corresponding end-of-life scenarios.

5. LCA: Results

The results displayed below apply to Sikaplan VG-12. To calculate results for other thicknesses, please use this formula:

$I_x = ((x+0.62)/1.82) * I_{1.2}$

[I_x = the unknown parameter value for Sikaplan VG products with a thickness of "x" mm (e.g., 1.5 mm)]

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 membrane

Parameter	Unit	A1-A3	A4	A5	C1	C2/1	C2/2	C3/1	C3/2	C4	D/1	D/2
GWP-total	kg CO_2 eq	3.38E+00	7.38E-02	9.38E-01	0	2.36E-02	-3.87E-05	4.07E-01	3.41E+00	0	-2.99E+00	-1.18E+00
GWP-fossil	kg CO_2 eq	3.59E+00	7.37E-02	7.71E-01	0	3.25E-02	3.16E-04	3.99E-01	3.41E+00	0	-2.96E+00	-1.17E+00
GWP-biogenic	kg CO_2 eq	-2.12E-01	-2.8E-05	1.65E-01	0	-1.06E-02	-4.15E-04	8.38E-03	9.12E-04	0	-2.54E-02	-1.17E-02
GWP-luluc	kg CO_2 eq	7.12E-03	1.39E-04	9.23E-04	0	1.67E-03	6E-05	2.22E-05	2.6E-04	0	-1.98E-03	-1.15E-04
ODP	kg CFC11 eq	2.36E-09	7.46E-15	2.38E-10	0	1.61E-14	5.67E-16	5.47E-13	2.03E-10	0	-2.15E-11	-1.62E-11
AP	mol H^+ eq	6.42E-03	1.78E-03	3.13E-03	0	2.91E-04	3.55E-06	3.84E-04	7.66E-04	0	-4.43E-03	-1.24E-03
EP-freshwater	kg P eq	2.99E-05	6.52E-08	3.59E-06	0	6.57E-07	2.36E-08	1.38E-07	1.8E-06	0	-7.57E-06	-3.58E-06
EP-marine	kg N eq	1.95E-03	4.23E-04	4.9E-04	0	6.51E-05	5.7E-07	1.47E-04	2.5E-04	0	-1.38E-03	-4.52E-04
EP-terrestrial	mol N eq	2.15E-02	4.65E-03	5.44E-03	0	7.7E-04	8.18E-06	1.64E-03	3.29E-03	0	-1.52E-02	-4.78E-03
POCP	kg NMVOC eq	1E-02	1.2E-03	1.89E-03	0	2.06E-04	2.63E-06	3.69E-04	7.09E-04	0	-7.57E-03	-1.15E-03
ADPE	kg Sb eq	4.15E-06	2.09E-09	1.29E-05	0	1.17E-08	4.18E-10	5.72E-09	2.47E-08	0	-2.11E-06	-1.14E-07
ADPF	MJ	8.48E+01	9.27E-01	1.31E+01	0	2.51E+00	8.81E-02	1.99E+00	5.41E+00	0	-7.51E+01	-1.8E+01
WDP	m^3 world eq deprived	1.69E-01	2.04E-04	1.05E-01	0	2.08E-03	7.47E-05	1.44E-02	3.34E-01	0	-1.29E-01	-1.74E-02

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 membrane

Parameter	Unit	A1-A3	A4	A5	C1	C2/1	C2/2	C3/1	C3/2	C4	D/1	D/2
PERE	MJ	1.52E+01	2.29E-02	3.47E+00	0	1.73E-01	6.23E-03	2.72E-01	1.26E+00	0	-1.1E+01	-7.87E+00
PERM	MJ	2.05E+00	0	-2.25E+00	0	0	0	0	0	0	0	0
PERT	MJ	1.73E+01	2.29E-02	1.21E+00	0	1.73E-01	6.23E-03	2.72E-01	1.26E+00	0	-1.1E+01	-7.87E+00
PENRE	MJ	5.65E+01	9.27E-01	1.11E+01	0	2.51E+00	8.83E-02	3.25E+01	3.59E+01	0	-7.51E+01	-1.8E+01
PENRM	MJ	2.84E+01	0	4.67E-01	0	0	0	-3.05E+01	-3.05E+01	0	0	0
PENRT	MJ	8.48E+01	9.27E-01	1.16E+01	0	2.51E+00	8.83E-02	1.99E+00	5.41E+00	0	-7.51E+01	-1.8E+01
SM	kg	0	0	0	0	0	0	0	0	0	1.64E+00	0
RSF	MJ	0	0	0	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0	0	0	0
FW	m^3	1.86E-02	2.2E-05	4.28E-03	0	1.91E-04	6.87E-06	6.81E-04	8.39E-03	0	-1.28E-02	-2.79E-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

RESULTS OF THE LCA – WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A2: 1 m2 membrane

Parameter	Unit	A1-A3	A4	A5	C1	C2/1	C2/2	C3/1	C3/2	C4	D/1	D/2
HWD	kg	7.75E-07	2.77E-12	7.76E-08	0	9.27E-12	3.27E-13	3.83E-11	1.84E-11	0	-1.53E-06	-6.37E-10
NHWD	kg	2.04E-01	1.02E-04	9.28E-02	0	3.59E-04	1.27E-05	1.53E-02	1.44E+00	0	-3.75E-02	-1.04E-02
RWD	kg	1.35E-03	1.05E-06	3.15E-04	0	3.24E-06	1.14E-07	1.66E-04	1.5E-04	0	-1.53E-03	-8.15E-04

CRU	kg	0	0	0	0	0	0	0	0	0	0	0
MFR	kg	0	0	0	0	0	0	1.64E+00	0	0	0	0
MER	kg	0	0	0	0	0	0	0	0	0	0	0
EEE	MJ	0	0	3.75E-01	0	0	0	1.21E-01	4.5E+00	0	0	0
EET	MJ	0	0	6.77E-01	0	0	0	2.28E-01	8.16E+00	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 membrane

Parameter	Unit	A1-A3	A4	A5	C1	C2/1	C2/2	C3/1	C3/2	C4	D/1	D/2
PM	Disease incidence	5.93E-08	3.08E-08	4.62E-08	0	3.88E-09	2.47E-11	3.81E-09	1.72E-08	0	-4.02E-08	-9.15E-09
IR	kBq U235 eq	1.76E-01	1.36E-04	4.13E-02	0	4.68E-04	1.65E-05	1.37E-02	1.82E-02	0	-1.97E-01	-8.61E-02
ETP-fw	CTUe	3.96E+01	6.6E-01	5.86E+00	0	1.75E+00	6.15E-02	5.02E-01	3.58E+00	0	-3.7E+01	-3.5E+00
HTP-c	CTUh	1.72E-09	1.25E-11	1.35E-07	0	3.55E-11	1.25E-12	2.05E-11	1.5E-10	0	-1.1E-09	-2.32E-10
HTP-nc	CTUh	1.21E-07	5.95E-10	1.7E-08	0	1.84E-09	6.47E-11	1.92E-09	1.41E-08	0	-3.74E-08	-6.83E-09
SQP	SQP	2.97E+01	1.14E-01	3.93E+00	0	1.02E+00	3.68E-02	2.14E-01	1.17E+00	0	-8.18E+00	-5.47E+00

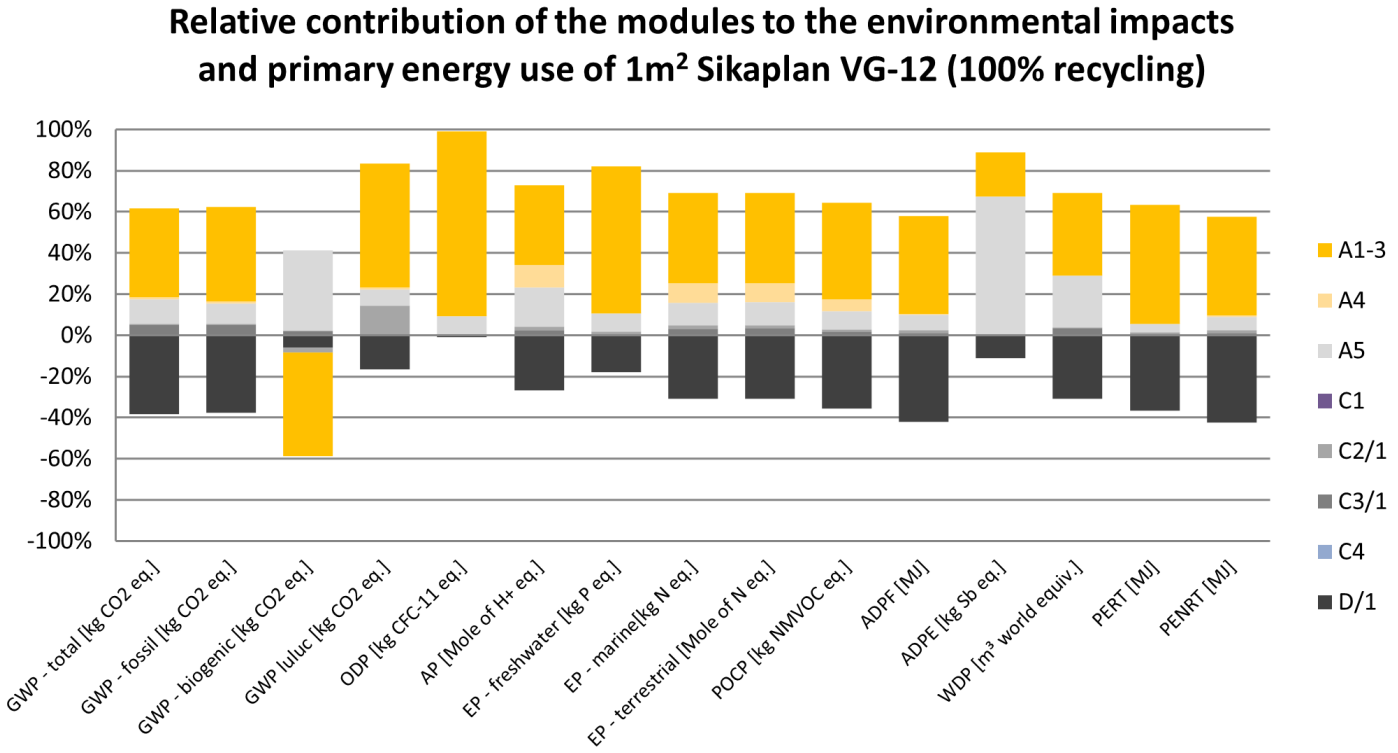
PM = Potential incidence of disease due to PM emissions; IR = Potential Human exposure efficiency relative to U235; ETP-fw = Potential comparative Toxic Unit for ecosystems; HTP-c = Potential comparative Toxic Unit for humans (cancerogenic); HTP-nc = Potential comparative Toxic Unit for humans (not cancerogenic);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

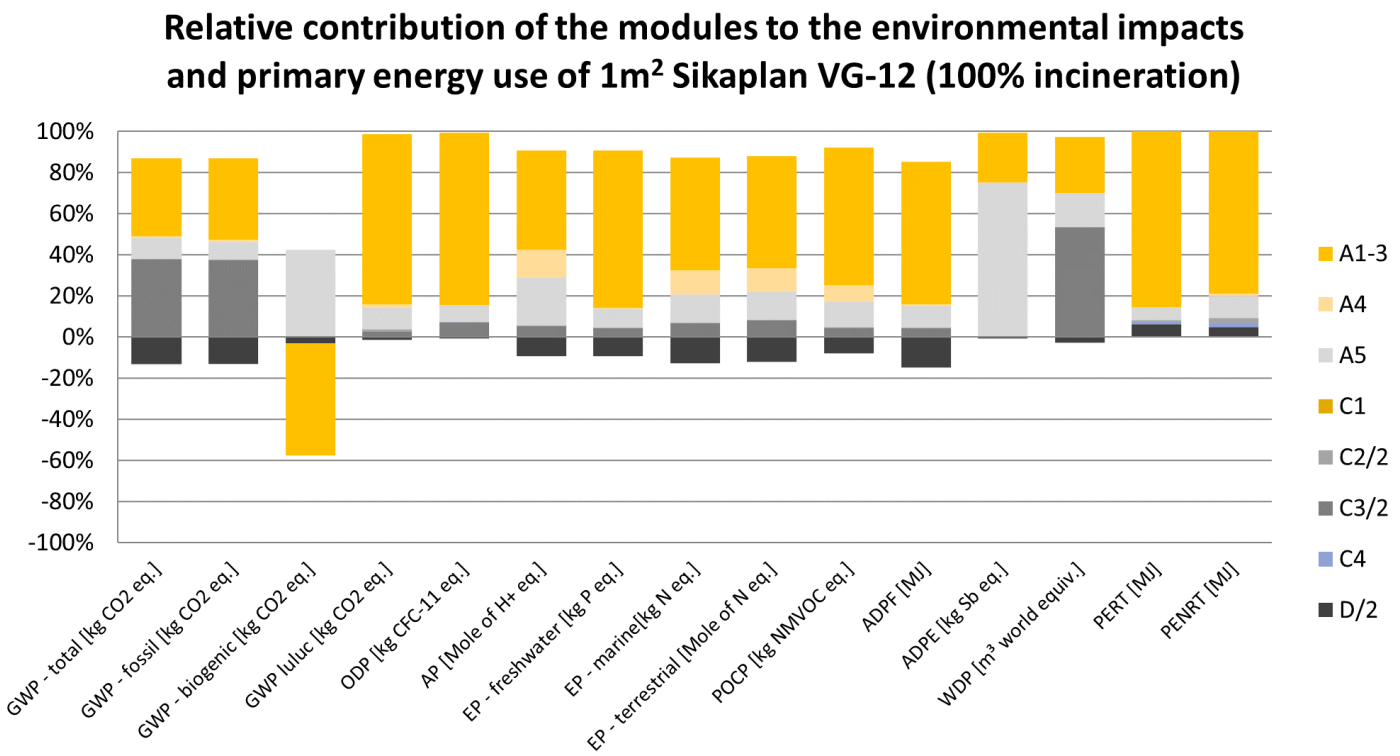
Disclaimer 1 – for the indicator “Potential Human exposure efficiency relative to U235”. This impact category deals mainly with the eventual impact of low-dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure 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

The following chart shows the relative contributions of the different modules to the various LCA categories and to primary energy use in a dominance analysis.





Examining the results for Sikaplan® VG, it can be concluded that the most significant contributor to the impact categories is the product stage (Module A1-A3). This is true for all impact categories except GWP (total and fossil) and WDP, where greenhouse gas emissions from the incineration of the membrane in Module C3 of Scenario 2(100 % Incineration) contribute to the results from this impact category.

Examining the results for module A1-3 in further detail, the raw materials involved in the production of Sikaplan® VG represent greater than 77 % across each of the different impact categories. The exceptions are GWP - biogenic, ODP, EP - freshwater and PERT. For GWP -biogenic, 17 % of the impacts arise from the formulation and 86 % of the impacts arise from the packaging. For ODP, 99 % of the impacts arise from the packaging.For EP - freshwater, 63 % of the impacts arise from the formulation, 9 % of the impacts arise from the production and 28 % of the impacts arise from the packaging. For PERT, 52 % of the impacts arise from the formulation, 31 % of the impacts arise from the production and 17 % of the impacts arise from the packaging.

The production process contributes the most to EP-freshwater (9 %) and PERT (31 %).

7. Requisite evidence

No requisite evidence is required for Sikaplan VG polymeric waterproofing membrane.

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ANNEX 1

ANNEX 1: Self declaration from EPD owner

Specific requirements

1 Applied electricity data set used in the manufacturing phase

The electricity mix for the electricity used in manufacturing (A3) is the electricity grid mix

< 0.17 kg CO_2 eqv/MJ>

2 Transport from the place of manufacture to a central warehouse

Transport distance, and CO_2-eqv./DU from transport of the product from factory gate to central warehouse in Oslo shall be given. The following table shall be included in the EPD:

Type	Capacity utilisation (incl. return) %	Type of vehicle	Distance km	Fuel/Energy use	Unit	Value (l/t)	Kg CO2-eqv./DU
Boat	50	Ferry	163	0.63	Kg fuel/t	1.03 *	0.0037 kg CO_2/1 m^2 membrane
Truck	85	Truck 16 tons	1257	0.016	Kg diesel/t.km	23.76 **	0.117 kg CO_2/1 m^2 membrane
Railway							
Rail							
Air							
Total							

* litre fuel oil / t cargo * 163 km

** litre diesel / t * 1257 km

3 Impact on the indoor environment

- ☐ Indoor air emission testing has been performed; specify test method and reference; M1, _____
- ☐ No test has being performed
- ☐ Not relevant; specify _____