Statement of Verification

BREG EN EPD No.: 000109 Issue 02

This is to verify that the

Environmental Product Declaration

provided by:

Sika Ltd

is in accordance with the requirements of:

EN 15804:2012+A1:2013

and

BRE Global Scheme Document SD207

This declaration is for:

SikaProof A

Company Address

Watchmean
Welwyn Garden City
AL7 1BQ

BUILDING TRUST

Signed for BRE Global Ltd	Emma Baker Operator	10 June 2021 Date of this Issue
17 March 2016 Date of First Issue		16 March 2023 Expiry Date

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Environmental Product Declaration

EPD Number: 000109

General Information

EPD Programme Operator	Applicable Product Category Rules
BRE Global Watford, Herts WD25 9XX United Kingdom	BRE Environmental Profiles 2013 Product Category Rules for Type III environmental product declaration of construction products to EN 15804:2012+A1:2013
Commissioner of LCA study	**LCA consultant/Tool**
Sika Ltd Watchmead Welwyn Garden City AL7 1BQ United Kingdom	Sika Services AG Tüffenwies 16 8048 Zurich Switzerland
Declared/Functional Unit	**Applicability/Coverage**
1 m^2 of SikaProof A waterproofing system	Product Average.
EPD Type	**Background database**
Cradle to Grave	ecoinvent and GaBi

Demonstration of Verification
CEN standard EN 15804 serves as the core PCR [a]
Independent verification of the declaration and data according to EN ISO 14025:2010 ☐Internal ☒ External
(Where appropriate [b])Third party verifier: Kim Allbury
a: Product category rules b: Optional for business-to-business communication; mandatory for business-to-consumer communication (see EN ISO 14025:2010, 9.4)

Comparability
Environmental product declarations from different programmes may not be comparable if not compliant with EN 15804:2012+A1:2013. Comparability is further dependent on the specific product category rules, system boundaries and allocations, and background data sources. See Clause 5.3 of EN 15804:2012+A1:2013 for further guidance

Information modules covered

Product			Construction		Use stage							End-of-life					Benefits and loads beyond the system boundary
					Related to the building fabric					Related to the building							
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4		D
Raw materials supply	Transport	Manufacturing	Transport to site	Construction – Installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction demolition	Transport	Waste processing	Disposal		Reuse, Recovery and/or Recycling potential
☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑		☑

Note: Ticks indicate the Information Modules declared.

Manufacturing site(s)

Sika Manufacturing CH-Sarnen
Industriestrasse
6060 Sarnen
Switzerland

Construction Product:

Product Description

SikaProof A is a pre-applied fully bonded composite sheet membrane waterproofing system based on high flexible FPO membrane. SikaProof A is available either in 1.0 or 2.0m wide sheets in the following thicknesses: 0.5mm (SikaProof A-05), 0.8mm (SikaProof A-08), 1.2mm (SikaProof A-12). The results in this EPD refer to SikaProof A-08, with a mass of 1.15 kg/m2.

Technical Information

Property	Value, Unit
Visual defects as per EN 1850-2	Pass
Straightness as per EN 1848-2	≤ 50 mm / 10 m
Resistance to impact as per EN 12691	≥ 250 mm
Resistance to tear - nail shank (cross direction) as per EN 12310-1	≥ 450 N
Resistance to tear - nail shank (machine direction) as per EN 12310-1	≥ 400 N
Elongation (cross directional) as per EN 12311-1	≥ 1000%
Elongation (machine direction) as per EN 12311-1	≥ 700%
Joint strength as per EN 12317-2	≥ 200 N / 50 mm
Tensile strength (machine direction) as per EN 12311-1	≥ 450 N / 50 mm
Tensile strength (cross direction) as per EN 12311-1	≥ 450 N / 50 mm
Water vapour transmission as per EN 1931	0.51 g/m^2x24h
Resistance to static load as per EN 12730 (Method B, 24h/20kg)	≥ 20 kg
Reaction to fire as per EN 13501-1:2000	Class E

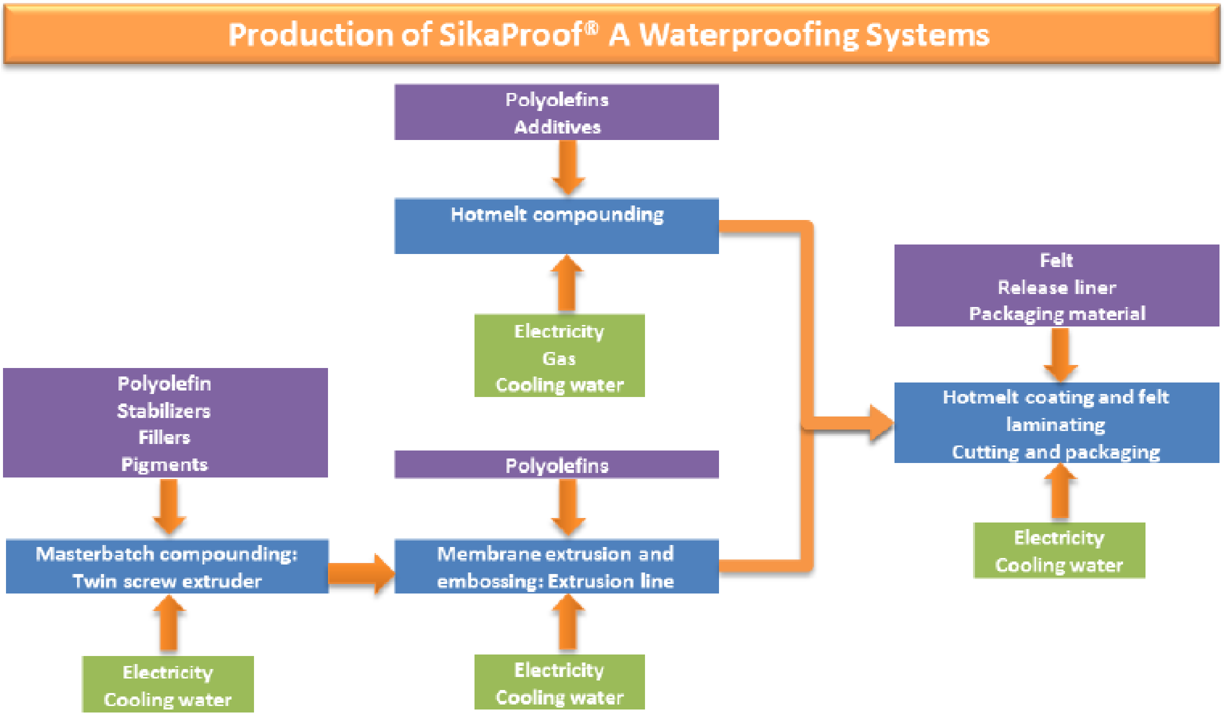
Main Product Contents

Material/Chemical Input	%
Thermoplastic polyolefins	50 – 70
Stabilizers (UV/heat)	0 – 1
Pigments	0 – 1
Fillers	5 – 15
Carrier material (polypropylene)	2 – 10
Surface sealant	10 – 20
Adhesive joint	1 – 5

Manufacturing Process

A master batch is compounded on an extruder using a small part of the polymer and all powdery ingredients as stabilizers, fillers and colours. This master batch is pelletized and blended inline with additional polymers and extruded into the membrane. Line start-up waste and edge trim are inline processed and fed to the extruder again. The membrane is inline embossed and wound to master rolls.
The membrane is inline coated with hotmelt sealant and laminated with a felt. In the same step, the adhesive edge is coated on one side and protected with a release liner, finally the edge is trimmed, the membrane wound to contractor rolls, single-roll packaged and palletized.

Process flow diagram



Construction Installation

SikaProof A is cold-applied and pre-applied, as it is installed without heat or open-flames, and before the steel reinforcement is fixed and the concrete is poured.

The overlaps of the sheets are adhered by the prefabricated self-adhesive edge of the sheets and all roll ends and details are sealed with accessory tapes. Due to the overlaps of the membrane sheets the average consumption of membrane per 1m^2 is approx. plus 7.5%.
Installation work must be carried out only by Sika instructed contractors.
Please see www.sika.co.uk for datasheet.

Use Information

During the service life of the building there is no ordinary maintenance, repair/refurbishment or replacement required, if the SikaProof membrane system is correctly and properly applied.
On the other hand, the high durability and reliability of the fully bond waterproofing system SikaProof will limit any repair work to a minimum, if a membrane damage occurs.
The full bond characteristic will prevent any lateral water underflow of the membrane in the event of any leakage. Therefore, no scenario for repair work is defined.

Reference Service LIfe

The reference service life of SikaProof A is as stated by the BBA Agrement Certificate 13/5075 for the life of the structure in which they have been incorporated. See BBA for details. Therefore a 60-year building service life can be assumed.

End of Life

At the end of its service life the building is demolished, and as the SikaProof systems are attached to the concrete it is generally taken to landfill. The demolition process concerns mainly the concrete structure of which the SikaProof system is a minor part. Therefore, for this stage no other steps are considered necessary except for the transportation to landfill and landfilling.

Life Cycle Assessment Calculation Rules

Declared / Functional unit description

1 m^2 of SikaProof A waterproofing system for a reference service life of 60 years.

System boundary

In accordance with the modular approach as defined in EN 15804, this cradle to grave EPD includes the product stage (A1-A3), construction process stage (A4-A5), use stage (B1-B7) and end-of-life stage (C1-C4).

Data sources, quality and allocation

The primary data provided by Sika derive from the plant at Sarnen, Switzerland for 2013. Background LCI datasets are taken from the databases of GaBi software and ecoinvent Version 3.1. All datasets are less than 10 years old.
Production waste that was reclaimed and reused internally was simulated as closed-loop recycling in Modules A1-A3. Benefits from incineration of product loses and for the disposal of packaging are credited in Module D; this also applies to the reuse of wooden pallets.

Cut-off criteria

All data was taken into consideration (recipe constituents, thermal energy used, electricity used). Transportation was considered for all inputs and outputs. The manufacturing of the production machines and systems and associated infrastructure were not taken into account in the LCA.

LCA Results

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

Parameters describing environmental impacts									
			GWP	ODP	AP	EP	POCP	ADPE	ADPF
			kg CO_2 equiv.	kg CFC 11 equiv.	kg SO_2 equiv.	kg $(PO_4)^{3-}$ equiv.	kg C_2H_4 equiv.	kg Sb equiv.	MJ, net calorific value.
Product stage	Raw material supply	A1	AGG	AGG	AGG	AGG	AGG	AGG	AGG
	Transport	A2	AGG	AGG	AGG	AGG	AGG	AGG	AGG
	Manufacturing	A3	AGG	AGG	AGG	AGG	AGG	AGG	AGG
	Total (of product stage)	A1-3	3.23	2.41E-09	0.00771	0.00158	0.00124	2.35E-06	92.2
Construction process stage	Transport	A4	0.0815	3.35E-13	0.000403	0.000101	4.38E-05	3.20E-09	1.12
	Construction	A5	0.842	2.06E-10	0.000773	0.000158	0.000116	2.06E-07	8.05
Use stage	Use	B1	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Maintenance	B2	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Repair	B3	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Replacement	B4	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Refurbishment	B5	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Operational energy use	B6	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Operational water use	B7	0.00	0.00	0.00	0.00	0.00	0.00	0.00
End of life	Deconstruction, demolition	C1	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Transport	C2	0.0176	0.00	7.80E-05	2.01E-05	7.94E-06	0.00	0.00
	Waste processing	C3	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Disposal	C4	0.0195	3.12E-13	0.000118	1.63E-05	1.11E-05	7.25E-09	0.255
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-0.2	-1.42E-09	-7.89E-04	-6.17E-04	-7.84E-05	-7.78E-08	-3.94

GWP = Global Warming Potential;
ODP = Ozone Depletion Potential;
AP = Acidification Potential for Soil and Water;
EP = Eutrophication Potential;
POCP = Formation potential of tropospheric Ozone;
ADPE = Abiotic Depletion Potential – Elements;
ADPF = Abiotic Depletion Potential – Fossil Fuels;

LCA Results (continued)

Parameters describing resource use, primary energy			PERE	PERM	PERT	PENRE	PENRM	PENRT
			MJ	MJ	MJ	MJ	MJ	MJ
Product stage	Raw material supply	A1	AGG	AGG	AGG	AGG	AGG	AGG
	Transport	A2	AGG	AGG	AGG	AGG	AGG	AGG
	Manufacturing	A3	AGG	AGG	AGG	AGG	AGG	AGG
	Total (of product stage)	A1-3	3.32	3.05	6.37	49.5	48.2	97.7
Construction process stage	Transport	A4	0.00	0.00	0.0629	0.00	0.00	1.12
	Construction	A5	0.332	0.259	0.559	4.21	4.10	8.54
Use stage	Use	B1	0.00	0.00	0.00	0.00	0.00	0.00
	Maintenance	B2	0.00	0.00	0.00	0.00	0.00	0.00
	Repair	B3	0.00	0.00	0.00	0.00	0.00	0.00
	Replacement	B4	0.00	0.00	0.00	0.00	0.00	0.00
	Refurbishment	B5	0.00	0.00	0.00	0.00	0.00	0.00
	Operational energy use	B6	0.00	0.00	0.00	0.00	0.00	0.00
	Operational water use	B7	0.00	0.00	0.00	0.00	0.00	0.00
End of life	Deconstruction, demolition	C1	0.00	0.00	0.00	0.00	0.00	0.00
	Transport	C2	0.00	0.00	0.00	0.00	0.00	0.00
	Waste processing	C3	0.00	0.00	0.00	0.00	0.00	0.00
	Disposal	C4	0.00	0.00	0.0261	0.00	0.00	0.265
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	0.00	0.00	-1.92	0.00	0.00	-4.79

PERE = Use of renewable primary energy excluding renewable primary energy 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 resource

LCA Results (continued)

Parameters describing resource use, secondary materials and fuels, use of water			SM	RSF	NRSF	FW
			kg	MJ net calorific value	MJ net calorific value	m^3
Product stage	Raw material supply	A1	AGG	AGG	AGG	AGG
	Transport	A2	AGG	AGG	AGG	AGG
	Manufacturing	A3	AGG	AGG	AGG	AGG
	Total (of product stage)	A1-3	0.00	0.00	0.00	0.0686
Construction process stage	Transport	A4	0.00	0.00	0.00	0.000111
	Construction	A5	0.00	0.00	0.00	0.00722
Use stage	Use	B1	0.00	0.00	0.00	0.00
	Maintenance	B2	0.00	0.00	0.00	0.00
	Repair	B3	0.00	0.00	0.00	0.00
	Replacement	B4	0.00	0.00	0.00	0.00
	Refurbishment	B5	0.00	0.00	0.00	0.00
	Operational energy use	B6	0.00	0.00	0.00	0.00
	Operational water use	B7	0.00	0.00	0.00	0.00
End of life	Deconstruction, demolition	C1	0.00	0.00	0.00	0.00
	Transport	C2	0.00	0.00	0.00	0.00
	Waste processing	C3	0.00	0.00	0.00	0.00
	Disposal	C4	0.00	0.00	0.00	5.02E-05
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	0.00	0.00	0.00	-0.037

SM = Use of secondary material;
RSF = Use of renewable secondary fuels;
NRSF = Use of non-renewable secondary fuels;
FW = Net use of fresh water

LCA Results (continued)

Other environmental information describing waste categories			HWD	NHWD	RWD
			kg	kg	kg
Product stage	Raw material supply	A1	AGG	AGG	AGG
	Transport	A2	AGG	AGG	AGG
	Manufacturing	A3	AGG	AGG	AGG
	Total (of product stage)	A1-3	0.000609	0.0587	0.00198
Construction process stage	Transport	A4	5.35E-07	0.00016	1.54E-06
	Construction	A5	5.19E-05	0.011	0.000176
Use stage	Use	B1	0.00	0.00	0.00
	Maintenance	B2	0.00	0.00	0.00
	Repair	B3	0.00	0.00	0.00
	Replacement	B4	0.00	0.00	0.00
	Refurbishment	B5	0.00	0.00	0.00
	Operational energy use	B6	0.00	0.00	0.00
	Operational water use	B7	0.00	0.00	0.00
End of life	Deconstruction , demolition	C1	0.00	0.00	0.00
	Transport	C2	0.00	0.00	0.00
	Waste processing	C3	0.00	0.00	0.00
	Disposal	C4	8.24E-08	1.21	4.22E-06
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-1.32E-06	-0.00137	-0.000330

HWD = Hazardous waste disposed;
NHWD = Non-hazardous waste disposed;
RWD = Radioactive waste disposed

LCA Results (continued)

Other environmental information describing output flows – at end of life			CRU	MFR	MER	EE
			kg	kg	kg	MJ per energy carrier
Product stage	Raw material supply	A1	AGG	AGG	AGG	AGG
	Transport	A2	AGG	AGG	AGG	AGG
	Manufacturing	A3	AGG	AGG	AGG	AGG
	Total (of product stage)	A1-3	0.00	0.00	0.00	0.00
Construction process stage	Transport	A4	0.00	0.00	0.00	0.00
	Construction	A5	0.00	0.00	0.00	0.699
Use stage	Use	B1	0.00	0.00	0.00	0.00
	Maintenance	B2	0.00	0.00	0.00	0.00
	Repair	B3	0.00	0.00	0.00	0.00
	Replacement	B4	0.00	0.00	0.00	0.00
	Refurbishment	B5	0.00	0.00	0.00	0.00
	Operational energy use	B6	0.00	0.00	0.00	0.00
	Operational water use	B7	0.00	0.00	0.00	0.00
End of life	Deconstruction, demolition	C1	0.00	0.00	0.00	0.00
	Transport	C2	0.00	0.00	0.00	0.00
	Waste processing	C3	0.00	0.00	0.00	0.00
	Disposal	C4	0.00	0.00	0.00	0.00
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	0.00	0.00	0.00	0.00

CRU = Components for reuse;
MFR = Materials for recycling

MER = Materials for energy recovery;
EE = Exported Energy

Scenarios and additional technical information

Scenarios and additional technical information			
Scenario	Parameter	Units	Results
A4 – Transport to the building site	Fuel Consumption (truck)	L/km	0.000034
	Distance	km	915
	Capacity	%	85
	Density of Product	kg/m^3	851.8
A5 – Installation in the building	Ancillary materials for installation - Overlap	%	7.5
	Waste materials from installation wastage – Losses	%	1
B2 – Maintenance	Maintenance process description or source of information - None necessary		
B3 – Repair	Repair process description or source of information – None necessary		
B4 – Replacement	Replacement cycle – None necessary		
B5 – Refurbishment	Refurbishment process description or source of information – None necessary		
C1, C3, and C4 – End-of-life modules	Waste for final disposal - Landfill	%	100
C2 – Transport to waste processing	Fuel Consumption (truck)	L/km	0.000034
	Distance	km	250
	Capacity Utilisation	%	85
	Density of Product	kg/m^3	851.8
D – Reuse/Recovery/Recycling Potential	The benefits from 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 partial reuse of pallets from packaging is also included in Module D as avoided production of new pallets.		

Summary, comments and additional information

Interpretation

The displayed results apply to SikaProof A-08. To calculate results for other thicknesses, please use this formula: Ix = ((x+0.34)/1.14)*I0.8
[Ix = the unknown parameter value for SikaProof A systems with a membrane thickness of "x" mm (e.g. 1.2 mm)]

The following chart (Figure 1) shows the relative contributions of the different modules to the various environmental impact categories and to primary energy use in a dominance analysis. It is clear that most impacts come from Module A1-3, though the installation of the system (A5) also contributes, especially for GWP (Global Warming Potential), due to waste disposal and due to the impacts from the losses and overlap. For this reason, the Product Stage is examined more closely in the following interpretation.

More than 60% of the impacts come from the membrane formulation, except for the total of the use of renewable primary energy resources - PERT- (where 54% is from packaging due to the use of carton and wood), EP (Eutrophication Potential) where both membrane and packaging contribute with 40% and ODP (Ozone Depletion Potential), where 58% comes from packaging.

The hotmelt sealants' highest contribution is to ADPF (Abiotic Depletion Potential - Fossil Fuels), with 18% and the total use of non-renewable primary energy resources - PENRT - (17%), from their polymers and resins.

The production processes (mainly the Swiss energy inputs) contribute mostly to GWP (8%), and PERT (17%). Within the membrane's formulation, the main contributor to the impacts is the polymer, which also represents the greatest part of the raw materials, with at least 70%. The highest contribution of the felt is to PERT with 19%. The impacts from the other raw materials (fillers, pigments and stabilizers) are much lower.

References

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