Environmental Product Declaration

BREG EN EPD No.: 000112 Issue: 01

ECO EPD Ref. No.: 000458

This is to certify that this verified Environmental Product Declaration provided by:

Sika Ltd.

Is in accordance with the requirements of:

EN 15804:2012+A1:2013

This declaration is for:

Sikalastic®-618

Company Address

Watchmead

Welwyn Garden City
AL7 1BQ

BUILDING TRUST

Signed for BRE Global Ltd	Emma Baker Operator	28 November 2016 Date of this Issue
28 November 2016 Date of First Issue		27 November 2021 Expiry Date

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EPD verification and LCA details

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
Third party verifier[b]: **Julia Barnard**
a: Product category rules b: Optional for business-to-business communication; mandatory for business-to-consumer communication (see EN ISO 14025:2010, 9.4)

LCA Consultant	Verifier
Sika Services AG Tüffenwies 16 Zurich 8048 www.sika.com/sustainability	Julia Barnard BRE Global Bucknalls Lane Watford WD25 9XX

General Information

Summary

This environmental product declaration is for 1 square metre of Sikalastic®-618 produced by Sika Ltd. at the following manufacturing facilities:

Sika House
Miller Street

Preston
PR1 1EA
UK

This is a Cradle to gate with options EPD. The life cycle stages included are as shown below (X = included, MND = module not declared):

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	Transport	Waste processing	Disposal		Reuse, Recovery and/or Recycling potential
X	X	X	X	X	MND	MND	MND	MND	MND	MND	MND	X	X	X	X		X

Programme Operator

BRE Global, Watford, Herts, WD25 9XX, United Kingdom.
This declaration is based on the BRE Environmental Profiles 2013 Product Category Rules for Type III environmental product declaration of construction products to EN 15804:2012+A1:2013.

Comparability

Environmental declarations from different programmes may not be comparable if not compliant with EN 15804:2012+A1:2013. Comparability is further dependent on the product category rules used and the source of the data, e.g. the database. See EN 15804:2012+A1:2013 for further guidance.

Construction Product

Product Description

Sikalastic®-618 is a single component, cold applied, moisture-triggered polyurethane membrane. It cures to for a seamless durable and weather resistant waterproofing solution for exposed roof areas. The results in this EPD refer to the standard 1.3 mm system, consisting of an embeddment layer of 1 L/m2 and Sika Reemat Premium reinforcement, and a top coat of 0.75 L/m2.

Technical Information

Property	Value	Unit
Tensile elongation	~20	%
Water vapor transmission	13.9	g/m²/24h
Dry film thickness	~1.3	mm
Density as per EN ISO 2811-1 (at +23°C)	~1.38	kg/L
Flash point	44	°C
Tensile strength	14.5	N/ mm²
Tensile load	660	N/ 30mm
Tear force	15.2	N
Tear strength	~14	N/ mm
Resistance to wind loads	>50	kPa

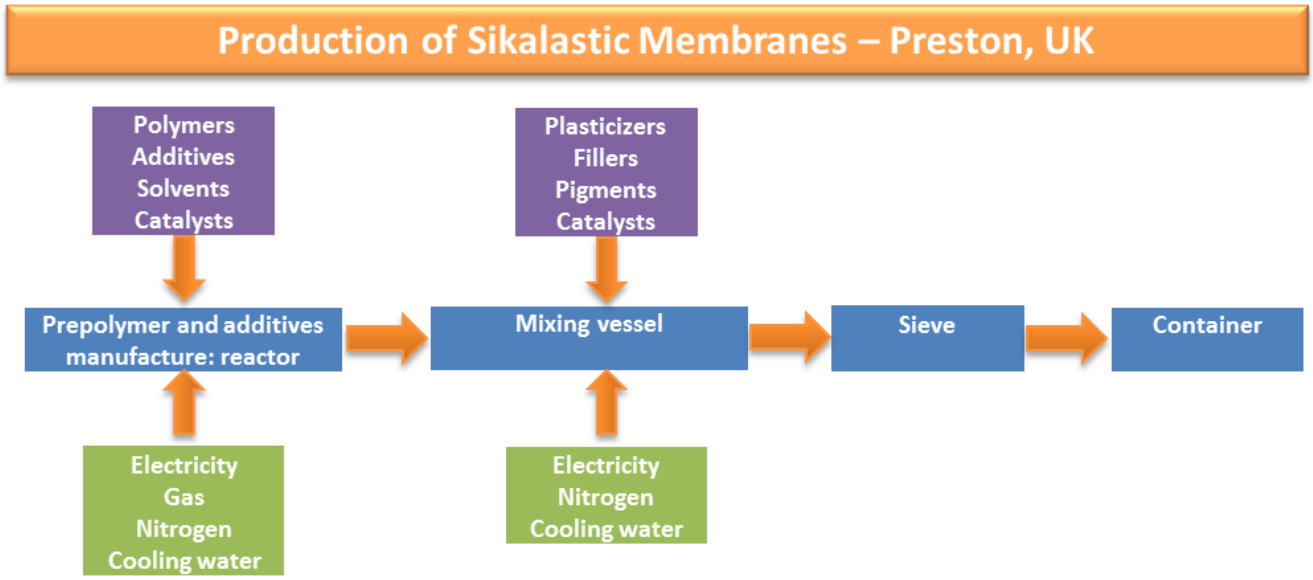
Product Contents

Material/Chemical Input	%
Polymers	20 - 40
Plasticizer	10 - 20
Additives	<5
Pigments	5 - 15
Solvent	15 - 30
Fillers	20 - 40

Manufacturing Process

A computer-generated batch card is raised with details of the required raw material proportions, order of additions and production conditions. This process is followed by the manufacture of a pre-polymer and hardener by Incorez Ltd under the control of Sika Liquid Plastics, in accordance with formal quality plans. The specified ingredients are blended and reacted together in stainless steel cylindrical mixing vessels in accordance with pre-set parameters which include temperature, mixing, time, vacuum pressure, and this is done under a nitrogen blanket to eliminate moisture. Every batch is QC tested both in process and on completion in accordance with formal quality plans. Once completed the batches are gravity fed via a filtering system into filing hoppers and tinned off as specified with nitrogen purging to each container.

The process flow diagram is shown below:



Construction Installation

The Sikalastic®-618 is a single pack polyurethane coating that is cold applied on site; it cures to provide completely seamless waterproofing protection with an aesthetically pleasing finish. The product is available in a range of colours. The membrane is fully reinforced with glass fibre mat, which is easily moulded around detail areas allowing speed of application on complex roofs.

Use Information

Installation works must be carried out only by registered Liquid Plastics Contractors, in accordance with Sika limited Instructions and the liquid plastics project specification. During the service life of the membrane system there is no ordinary maintenance, repair/refurbishment or replacement required, if it is correctly and properly applied. Therefore no scenario for the use phase and maintenance is defined.

Reference Service Life

The reference service life of Sikalastic®-618 membranes is as stated by the ETA Certificate 12/0316.
The provisions made in this ETA are based on an assumed working life of up to 10 years.

End of Life

When the Sikalastic®-618 reaches the end of its life, the system may be primed and further material applied. At the end of its service life the building is demolished, and as the Sikalastic® membrane systems are attached to the substrate it is generally taken to landfill. The demolition process concerns mainly the structure of which the membrane 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

1 m2 installed system for a reference service life of 10 years.

System boundary

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

Data sources, quality and allocation

The primary data provided by Sika derive from the plant at Preston, UK for 2014, with total site mass-weighted allocation to product, as the process is similar for all membranes produced there. Background LCI datasets are taken from the databases of GaBi software and ecoinvent Version 3.1. All datasets are less than 10 years old.
Benefits from incineration and landfilling of product losses 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

(INA = Indicator not assessed, AGG = Aggregated, NA = Not Applicable)

Indicator	Unit	A1	A2	A3	A1-A3	A4
		Raw Material supply	Transport to factory	Manufacturing	Merged A1/A2/A3	Transport to site
Environmental impacts per declared/functional unit						
GWP	kg CO_2 eq.	AGG	AGG	AGG	8.33	0.0413
ODP	kg CFC 11 eq.	AGG	AGG	AGG	2.51E-07	1.90E-13
AP	kg SO_2 eq.	AGG	AGG	AGG	0.0336	0.0002
EP	kg $(PO_4)^{3-}$ eq.	AGG	AGG	AGG	1.13	4.86E-05
POCP	kg C_2H_4 eq.	AGG	AGG	AGG	0.00439	2.24E-05
ADPE	kg Sb eq.	AGG	AGG	AGG	3.44E-05	2.75E-09
ADPF	MJ eq.	AGG	AGG	AGG	159	0.569
GWP = Global Warming Potential (Climate Change); ODP = Ozone Depletion Potential; AP = Acidification Potential for Soil and Water; EP = Eutrophication Potential; POCP = Photochemical Ozone Creation; ADPE = Abiotic Depletion Potential – Elements; ADPF = Abiotic Depletion Potential – Fossil Fuels						
Resource use						
PERE	MJ	AGG	AGG	AGG	13.4	0.00
PERM	MJ	AGG	AGG	AGG	1.37	0.00
PERT	MJ	AGG	AGG	AGG	14.8	0.0324
PENRE	MJ	AGG	AGG	AGG	132	0.00
PENRM	MJ	AGG	AGG	AGG	32.1	0.00
PENRT	MJ	AGG	AGG	AGG	171	0.571
SM	kg	AGG	AGG	AGG	0.00	0.00
RSF	MJ	AGG	AGG	AGG	0.00	2.04E-06
NRSF	MJ	AGG	AGG	AGG	0.00	3.11E-05
FW	m^3	AGG	AGG	AGG	0.072	8.10E-05
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 = Net use of fresh water						
Waste to disposal						
HWD	kg	AGG	AGG	AGG	0.0015	4.32E-08
NHWD	kg	AGG	AGG	AGG	0.644	4.80E-05
TRWD	kg	AGG	AGG	AGG	0.00367	8.16E-07
RWDHL	kg	AGG	AGG	AGG	4.83E-06	1.19E-09
HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; TRWD = Total Radioactive waste disposed; RWDHL = Radioactive waste disposed (high-level nuclear waste)						
Other output flows						
CRU	kg	AGG	AGG	AGG	0.00	0.00
MFR	kg	AGG	AGG	AGG	0.00	0.00
MER	kg	AGG	AGG	AGG	0.00	0.00
EE	MJ	AGG	AGG	AGG	0.00	0.00
CRU = Components for reuse; MFR = Materials for recycling; MER = Materials for energy recovery; EE = Export energy						

LCA Results (continued)

(INA = Indicator not assessed, AGG = Aggregated, NA = Not Applicable)

Indicator	Unit	A5	C1	C2	C3	C4	D
		Construction - installation	Demolition	Transport	Waste Processing	Disposal	Reuse/ Recovery/ Recycling Potential
Environmental impacts per declared/functional unit							
GWP	kg CO_2 eq.	3.90	0.00	0.0352	0.00	0.0388	-0.0106
ODP	kg CFC 11 eq.	2.51E-08	0.00	0.00	0.00	3.81E-13	-2.59E-09
AP	kg SO_2 eq.	0.00704	0.00	0.000156	0.00	0.000232	-5.03E-04
EP	kg $(PO_4)^{3-}$ eq.	0.115	0.00	4.02E-05	0.00	3.16E-05	-0.0011
POCP	kg C_2H_4 eq.	0.132	0.00	1.58E-05	0.00	2.23E-05	-6.35E-05
ADPE	kg Sb eq.	2.58E-05	0.00	0.00	0.00	1.34E-08	-1.38E-07
ADPF	MJ eq.	23.8	0.00	0.00	0.00	0.504	-1.92
GWP = Global Warming Potential (Climate Change); ODP = Ozone Depletion Potential; AP = Acidification Potential for Soil and Water; EP = Eutrophication Potential; POCP = Photochemical Ozone Creation; ADPE = Abiotic Depletion Potential – Elements; ADPF = Abiotic Depletion Potential – Fossil Fuels							
Resource use							
PERE	MJ	1.34	0.00	0.00	0.00	0.00	0.00
PERM	MJ	0.137	0.00	0.00	0.00	0.00	0.00
PERT	MJ	2.65	0.00	0.00	0.00	0.0594	-3.36
PENRE	MJ	13.2	0.00	0.00	0.00	0.00	0.00
PENRM	MJ	10.3	0.00	0.00	0.00	0.00	0.00
PENRT	MJ	25.7	0.00	0.00	0.00	0.522	-2.81
SM	kg	0.00	0.00	0.00	0.00	0.00	0.00
RSF	MJ	0.00	0.00	0.00	0.00	0.000969	-2.65E-05
NRSF	MJ	0.00	0.00	0.00	0.00	0.00198	-4.02E-04
FW	m^3	0.00918	0.00	0.00	0.00	0.000106	-0.00137
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 = Net use of fresh water							
Waste to disposal							
HWD	kg	0.00015	0.00	0.00	0.00	1.19E-08	-1.43E-09
NHWD	kg	2.23	0.00	0.00	0.00	2.42	-0.00136
TRWD	kg	0.000643	0.00	0.00	0.00	7.22E-06	-3.37E-04
RWDHL	kg	8.29E-07	0.00	0.00	0.00	9.10E-09	-5.09E-07
HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; TRWD = Total Radioactive waste disposed; RWDHL = Radioactive waste disposed (high-level nuclear waste)							
Other output flows							
CRU	kg	0.00	0.00	0.00	0.00	0.00	0.00
MFR	kg	0.00	0.00	0.00	0.00	0.00	0.00
MER	kg	0.00	0.00	0.00	0.00	0.00	0.00
EE	MJ	1.08	0.00	0.00	0.00	0.00	0.00
CRU = Components for reuse; MFR = Materials for recycling; MER = Materials for energy recovery; EE = Export energy							

Scenarios and Additional Technical Information

Module A4 – Transport to the building site				
Vehicle Type	**Fuel Consumption (L/km)**	**Distance (km)**	**Capacity Utilisation (%)**	**Density Of Product (kg/m³)**
Truck	0.000051	250	85	1380

Module A5 - Installation in the building			
Parameter	**Description**	**Unit**	**Value**
Ancillary materials for installation	Sika® Reemat Premium reinforcement	kg/m2	0.225
Ancillary materials for installation	Overlap reinforcement	%	9
Waste materials from installation wastage	Losses	%	10
Direct emissions to air, soil and water	VOC	kg/m2	0.361

End-of-life modules – C1, C3, and C4			
Parameter	**Description**	**Unit**	**Value**
Waste for final disposal	Landfill	%	100

Module C2 – Transport to waste processing				
Vehicle Type	**Fuel Consumption (L/km)**	**Distance (km)**	**Capacity Utilisation (%)**	**Density Of Product (kg/m³)**
Truck	0.000051	250	85	1380

Module D – Reuse/Recovery/Recycling Potential
The benefits from incineration and landfilling of waste produced during installation are credited in Module D as avoided generation of electricity and thermal energy. The partial reuse of pallets from packaging is also included in Module D as avoided production of new pallets.

Interpretation

The following chart 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, due to the impacts from the membrane's application (the VOC emissions are visible for POCP - Photochemical Ozone Creation Potential), from the production of the reinforcement (especially for ADPE - Abiotic Depletion Potential – Elements) and due to the disposal of waste to landfill (contributing to GWP -Global Warming Potential). For this reason, the Product Stage is examined more closely in the following interpretation.

Energy resource use
Pre-product manufacturing (72%), packaging (21%) and the manufacturing process (7%) account for the total of the use of renewable primary energy resources (PERT). The manufacturing of raw materials (93%) has the greatest impact on the use of non-renewable primary energy resources (PENRT), while the impact of the production process (due to electricity and nitrogen consumption) measures 7%.

Environmental impacts
The dominant influence in all impact categories for Module A1-A3 comes from pre-product manufacturing, with at least 92% in each case, except for Eutrophication Potential (EP), where the production process contributes the most (76%), from nitrogen released during processing. Within pre-product manufacturing, polymers play an important role regarding GWP, EP, Photochemical Ozone Creation Potential (POCP), ADPE and Abiotic Depletion Potential - Fossil Fuels (ADPF). The pigments and fillers contribute the most to Acidification Potential for Soil and Water (AP) and ADPE. The solvents have a significant role in Ozone Depletion Potential (ODP) and POCP. The plasticiser partakes in the impacts to GWP and ADPF. The thickener and other additives contribution is negligible. The raw materials with the greatest effect on the impacts also show the greatest percentage by mass of the system: polymers, pigments/fillers and solvents. The manufacturing process (mainly the energy inputs, nitrogen input and release) contributes mostly to EP (76%) and GWP (6%).

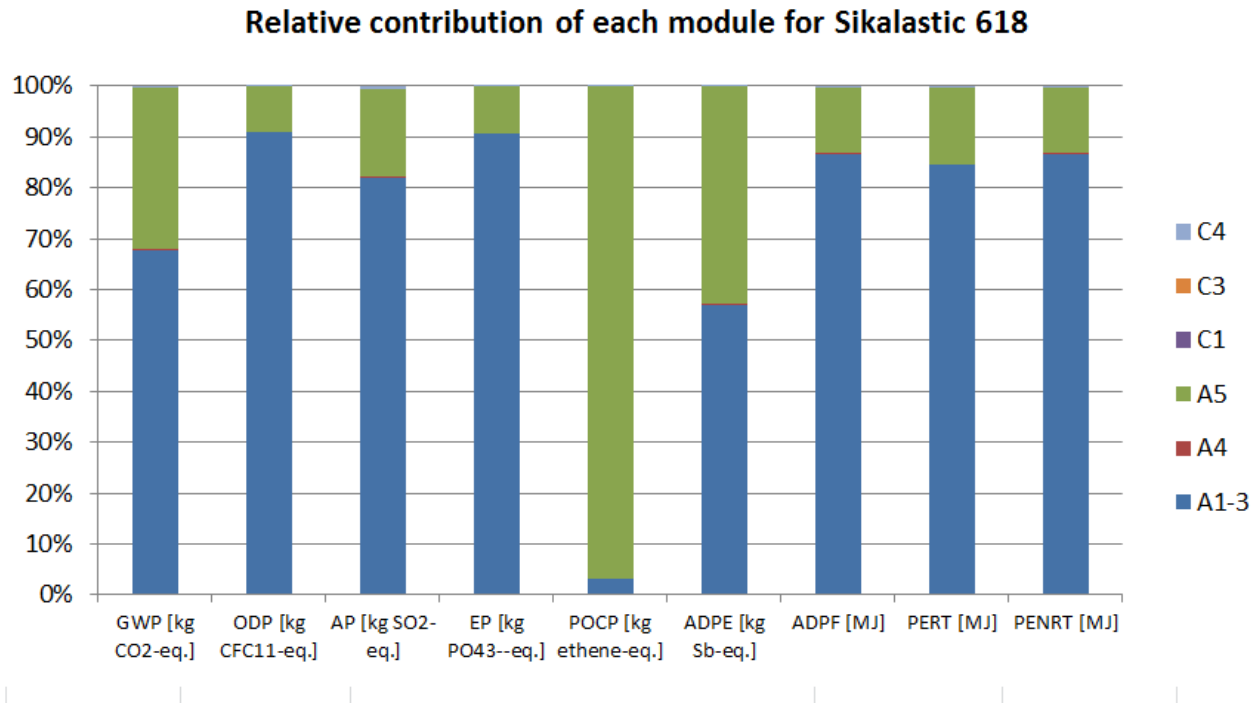


Figure 1

Sources of additional information

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