Statement of Verification

BREG EN EPD No.: 000175 Issue 03

ECO EPD Ref. No. 00000645

This is to verify that the

Environmental Product Declaration

provided by:

Sika Services AG

is in accordance with the requirements of:

EN 15804:2012+A1:2013

and

BRE Global Scheme Document SD207

This declaration is for:

Sika® CoolRoof CET/ Sikalastic®-560

Company Address

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BUILDING TRUST

	Emma Baker	14 April 2023
Signed for BRE Global Ltd	Operator	Date of this Issue
02 February 2018		31 January 2025
Date of First Issue		Expiry Date

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Environmental Product Declaration

EPD Number: 000175

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 Services AG Tüffenwies 16 8048 Zurich www.sika.com/sustainability	Sika Services AG Tüffenwies 16 8048 Zurich www.sika.com/sustainability GaBi Version 7.3.3, Databases 2017 Edition
Declared/Functional Unit	**Applicability/Coverage**
This declaration is for Sika® CoolRoof CET / Sikalastic®-560 - 1m^2 installed system for a reference service life of 10 years.	Other (please specify). Product specific, multi-site
EPD Type	**Background database**
Cradle to Gate with options	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 sites

Multi-site for specific Sika® CoolRoof CET / Sikalastic®-560 produced by Sika in the following countries: Argentina - Buenos Aires, Bahrain – Manama, Colombia – Tocancipá, Indonesia – Bogor, Malaysia – Nilai, Mexico – Queretaro, Peru - Lima , Turkey – Istanbul, Spain – Alcobendas. The multi-site is a mathematical average of production and formulation data of the countries mentioned above.

Construction Product:

Product Description

Sika® CoolRoof CET / Sikalastic®-560 is a cold-applied, UV-stable and highly reflective water-based waterproofing system. It is applied to enhance surface appearance and to reduce cooling and overall energy consumption in conditioned buildings. It conforms with LEED® v2009/ v4 requirements and the attested initial SRI of 106 and three-year aged SRI of 90 exceed the cool roof requirements of LEED®. Furthermore, it cures to form seamless, durable and weather resistant waterproofing solution for the exposed roof areas.

The results in this EDP refer to the standard 1.0 mm system, consisting of an embedment layer of 1 L/m^2 and Sika® Reemat Premium reinforcement, and a top coat of 0.55 L/m^2.

Technical Information

Property		Value, Unit
Tensile Strength as per DIN 53504	Not reinforced Reinforced with Sikalastic® Fleece-120 Reinforced with Sika® Reemat Premium	~1.5 N/mm^2 ~12 N/mm^2 ~4-5 N/mm^2
Elongation at break as per DIN 53504	Not reinforced Reinforced with Sikalastic® Fleece-120 Reinforced with Sika® Reemat Premium	~350 % ~40-60 % ~70-80 %
Solar reflectance as per ASTM C 1549		0.82[1)]
Thermal Emittance as per ASTM E 408		0.93[1)]
Solar Reflectance Index as per ASTM E 1980		106[1)]
Service Temperature	With Fleece Without Fleece	-10 °C min. / +80 °C max. -5 °C min. / +80 °C max.

[1)] All values refer to the initial (properly cured, non-weathered) status of Sika® CoolRoof CET / Sikalastic®-560 white

Main Product Contents

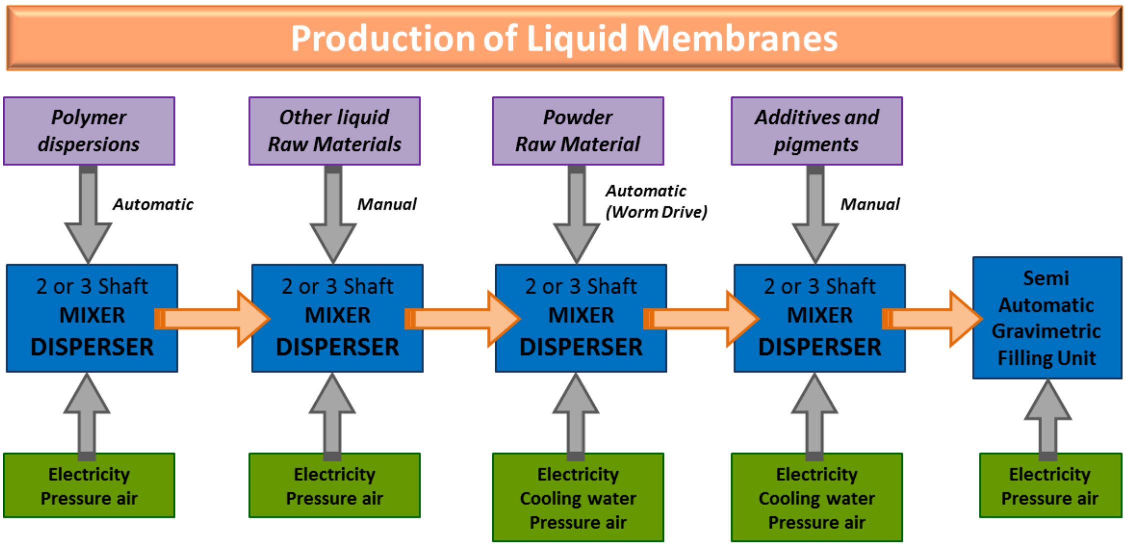
Material/Chemical Input	%
Polymers	40 - 60
Plasticizer	< 1
Additives	< 5
Pigments	5 - 15
Solvent	10 - 20
Fillers	15 - 30

Manufacturing Process

Two or three shaft mixer-dispersers are used to manufacture this product (Anchor blade with scrappers, disperser shaft and shaft with screw blade whether it is available). The batch Size can be between 1.600 to 2.400 kg or between 6.000 to 9.000 kg, depending on the disperser used.

First, the polymer dispersion is automatically added from the Raw material tanks choosing the correct formulation from ERP system. Then, the other liquid raw materials are added by hand or using a manual pneumatic pump. The powder raw materials (fillers) are added in automatic by a worm drive system. In order to avoid problems with the product and the packaging, it is recommended to cool the disperser since this moment (the disperser has a cooling jacket). Finally, the rest of the raw materials are added manually. The standard time to manufacture a batch is 2 to 2.5 hours. Every batch is QC tested, both in process and on completion in accordance with formal control specifications. Plastic or metal pails are filled using a semi-automatic gravimetric filling unit.

Process flow diagram



Construction Installation

The Sika® CoolRoof CET / Sikalastic®-560 is a single pack acrylic polyurethane hybrid 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 colors. The membrane can be reinforced if need it, with glass fiber mat, which is easily molded around detail areas allowing speed of application on complex roofs.

Use Information

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.

End of Life

When the Sika® CoolRoof CET / Sikalastic®-560 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 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 description

1 m^2 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 a multi-site average which covers all major sites and includes the plants at Argentina, Bahrain, Colombia, Indonesia, Malaysia, Mexico, Peru, Turkey and Spain for 2016. The multi-site average is a mathematical average of all the countries data, production and formulation. Background LCI datasets are taken from the databases of GaBi software Version 7.3.3 with Database 2017 and ecoinvent Version 3.3. The model is created for the multi-site average and a global electricity dataset is used in it. All datasets are less than 6 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

(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	2.37	1.76E-07	1.36E-02	5.29E-03	1.42E-03	5.50E-05	42.3
Construction process stage	Transport	A4	9.55E-02	3.20E-14	4.45E-04	1.10E-04	4.07E-05	7.67E-09	1.32
	Construction	A5	2.44	1.76E-8	2.04E-03	2.63E-03	9.53E-03	5.53E-06	6.30
Use stage	Use	B1	MND	MND	MND	MND	MND	MND	MND
	Maintenance	B2	MND	MND	MND	MND	MND	MND	MND
	Repair	B3	MND	MND	MND	MND	MND	MND	MND
	Replacement	B4	MND	MND	MND	MND	MND	MND	MND
	Refurbishment	B5	MND	MND	MND	MND	MND	MND	MND
	Operational energy use	B6	MND	MND	MND	MND	MND	MND	MND
	Operational water use	B7	MND	MND	MND	MND	MND	MND	MND
End of life	Deconstruction, demolition	C1	0	0	0	0	0	0	0
	Transport	C2	3.21E-02	5.26E-16	1.43E-04	3.67E-05	1.19E-05	1.26E-10	2.17E-2
	Waste processing	C3	0	0	0	0	0	0	0
	Disposal	C4	6.53E-01	8.18E-14	3.45E-04	3.94E-05	2.24E-05	1.05E-07	6.82E-01
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-3.51E-01	-2.24E-09	-9.82E-04	-1.04E-03	-9.67E-05	-1.96E-07	-6.48

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	3.17	2.55E-01	4.15	1.33E+01	3.18E+01	4.51E+01
Construction process stage	Transport	A4	0	0	6.64E-02	0	0	1.32
	Construction	A5	3.17E-01	9.74E-02	0.57	0.69	10.24	6.65
Use stage	Use	B1	MND	MND	MND	MND	MND	MND
	Maintenance	B2	MND	MND	MND	MND	MND	MND
	Repair	B3	MND	MND	MND	MND	MND	MND
	Replacement	B4	MND	MND	MND	MND	MND	MND
	Refurbishment	B5	MND	MND	MND	MND	MND	MND
	Operational energy use	B6	MND	MND	MND	MND	MND	MND
	Operational water use	B7	MND	MND	MND	MND	MND	MND
End of life	Deconstruction, demolition	C1	0	0	0	0	0	0
	Transport	C2	0	0	1.09E-3	0	0	2.17E-2
	Waste processing	C3	0	0	0	0	0	0
	Disposal	C4	0	0	1.14E-01	0	0	7.30E-01
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	0	0	-3.14	0	0	-8.28

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	0	0	4.30E-02
Construction process stage	Transport	A4	0	0	0	1.23E-04
	Construction	A5	0	0	0	4.71E-03
Use stage	Use	B1	MND	MND	MND	MND
	Maintenance	B2	MND	MND	MND	MND
	Repair	B3	MND	MND	MND	MND
	Replacement	B4	MND	MND	MND	MND
	Refurbishment	B5	MND	MND	MND	MND
	Operational energy use	B6	MND	MND	MND	MND
	Operational water use	B7	MND	MND	MND	MND
End of life	Deconstruction, demolition	C1	0	0	0	0
	Transport	C2	0	0	0	2.02E--6
	Waste processing	C3	0	0	0	0
	Disposal	C4	0	0	0	1.61E-03
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	0	0	0	-2.56E-3

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	2.04E-06	1.01E-01	1.64E-04
Construction process stage	Transport	A4	6.95E-08	1.01E-04	1.80E-06
	Construction	A5	2.30E-07	1.76	4.52E-05
Use stage	Use	B1	MND	MND	MND
	Maintenance	B2	MND	MND	MND
	Repair	B3	MND	MND	MND
	Replacement	B4	MND	MND	MND
	Refurbishment	B5	MND	MND	MND
	Operational energy use	B6	MND	MND	MND
	Operational water use	B7	MND	MND	MND
End of life	Deconstruction, demolition	C1	0	0	0
	Transport	C2	1.14E-09	1.66E-06	2.98E-08
	Waste processing	C3	0	0	0
	Disposal	C4	8.82E-09	2.17	1.88E-05
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-2.22E-09	-3.40E-03	-7.02E-04

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	0	0	0
Construction process stage	Transport	A4	0	0	0	0
	Construction	A5	0	0	0	1.062
Use stage	Use	B1	MND	MND	MND	MND
	Maintenance	B2	MND	MND	MND	MND
	Repair	B3	MND	MND	MND	MND
	Replacement	B4	MND	MND	MND	MND
	Refurbishment	B5	MND	MND	MND	MND
	Operational energy use	B6	MND	MND	MND	MND
	Operational water use	B7	MND	MND	MND	MND
End of life	Deconstruction, demolition	C1	0	0	0	0
	Transport	C2	0	0	0	0
	Waste processing	C3	0	0	0	0
	Disposal	C4	0	0	0	4.05
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	0	0	0	0

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	Truck	L/km	0.000051
	Distance:	km	700
	Capacity utilisation (incl. empty returns)	%	85
	Bulk density of transported products	kg/m^3	1340
A5 – Installation in the building	Ancillary materials for installation: Sika® Reemat Premium reinforcement	kg/m^2	0.225
	Ancillary materials for installation: Overlap reinforcement	%	9
	Waste materials from installation wastage: Losses	%	10
	Direct emission to air, soil and water: VOC	kg/m^2	0.102
B2 – Maintenance	Module not declared	MND	MND
B3 – Repair	Module not declared	MND	MND
B4 – Replacement	Module not declared	MND	MND
B5 – Refurbishment	Module not declared	MND	MND
Reference service life	The reference service life of Sika CoolRoof® CET / Sikalastic®-560 membranes is a stated by the ETA Certificate 12/0308. The provisions made in this ETA are based on an expected working life of 10 years.	years	10
B6 – Use of energy; B7 – Use of water	Module not declared	MND	MND
C1 to C4 End of life	Waste for final disposal: Landfill	%	100
	Transport to waste processing: Truck, fuel consumption	L/km	0.000051
	Transport to waste processing: Distance	km	700
	Transport to waste processing: Capacity utilisation	%	85
	Transport to waste processing: Density of product	kg/m3	1340
Module 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.		

Interpretation

The 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, 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.

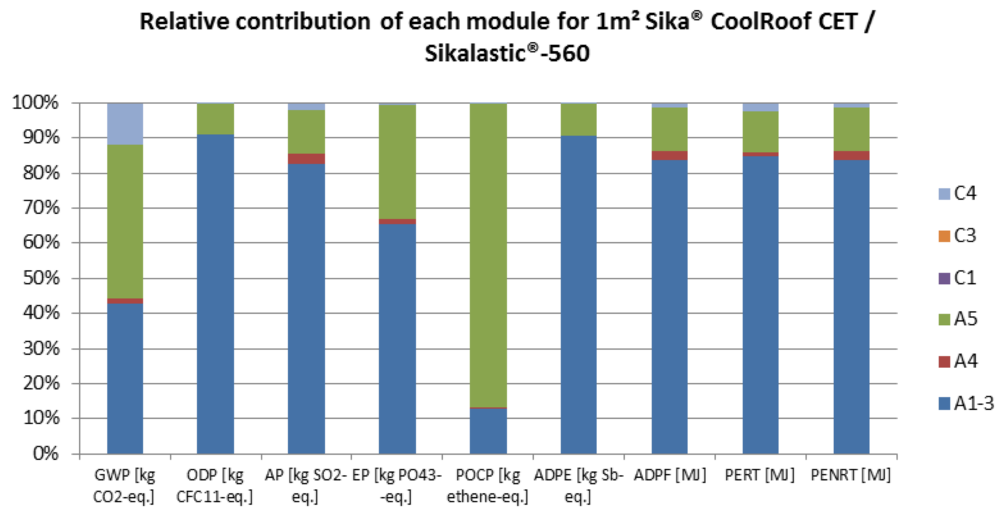


Figure 1

Energy resource use
Pre-product manufacturing (64%) and packaging (36%) account for the total of the use of renewable primary energy resources (PERT). The manufacturing of raw materials (95%) has the greatest impact on the use of non-renewable primary energy resources (PENRT), while the impact of the production process (due to electricity consumption) measures 0.005%.

Environmental impacts
The dominant influence in all impact categories for Module A1-A3 comes from pre-product manufacturing, with at least 93% in each case. Within pre-product manufacturing, polymers play an important role regarding Global Warming Potential (GWP), Acidification Potential (AP), Eutrophication Potential (EP), Photochemical Ozone Creation Potential (POCP), Abiotic Depletion Fossil (ADPF) and Ozone Layer Depletion Creation Potential (ODP), all with values above 83%. The thickeners contribute the most (75%) to Abiotic Depletion Elements (ADPE).

The polymer is the raw material with the greatest effect on the impacts and it has also the greatest percentage by mass of the system. The pigments partake in the impacts to GWP and ADPF with 10% and 11%, respectively.

The packaging materials contribute mostly to EP (17%) The solvents, preservatives and other additives contribution are not significant.

The display results in Figure 1 apply to Sika® CoolRoof CET / Sikalastic®-560 standard system with 3 layers/1.0 mm. To calculate results for other systems (1 layer/0.3 mm, 2 layers/0.5 mm and 4 layers/1.3 mm), please use the following equation:

$$Impact\_x = (x - 0.1496) / 0.8504 * Impact\_SCR\_1.0 \quad (Eq.1)$$

Where:

Impact_x = unknow parameter value for Sika® CoolRoof CET / Sikalastic®-560 systems (e.g. 0.3, 0.5, 1.3 mm)

Impact_SCR_1.0 = impacts for Sika® CoolRoof CET / Sikalastic®-560 system with 3 layers/1.0 mm, presented in this EPD

References

BSI. Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products. BS EN 15804:2012+A1:2013. London, BSI, 2013.

BSI. Environmental labels and declarations – Type III Environmental declarations – Principles and procedures. BS EN ISO 14025:2010 (exactly identical to ISO 14025:2006). London, BSI, 2010.

BSI. Environmental management – Life cycle assessment – Principles and framework. BS EN ISO 14040:2006. London, BSI, 2006.

BSI. Environmental management – Life cycle assessment – requirements and guidelines. BS EN ISO 14044:2006. London, BSI, 2006.

BRE Global. BRE Environmental Profiles 2013: Product Category Rules for Type III environmental product declaration of construction products to EN 15804:2012+A1:2013. PN 514. Watford, BRE, 2014.

thinkstep; GaBi 7.3.3: Software-System and Databases for Life Cycle Engineering. Copyright, TM. Stuttgart, Echterdingen, 1992-2017.

ecoinvent Version 3.3: Database for Life Cycle Assessment. Swiss Centre for Life Cycle Inventories (ecoinvent Centre), 2016.

European Technical Approval, N° ETA 12/0308. Liquid Applied Roof Waterproofing Kits “Sikalastic®-560”. Authorised and notified according to Article 10 of the Council Directive of 21 December 1988 on the approximation of laws, Regulations and administrative Provisions of Member States relating to construction products (89/106/EEC). Holder of approval: Sika, S.A. Spain, 2015.

Product Data Sheet, Sikalastic®-560. April 2017, Version 03.0, 020915151000000004. Sika Services AG, Tüffenwies 16, 8048 Zürich. www.sika.com.

Cool Roof Rating Council, Notification of Product Rating: Solar Reflectance and Thermal Emittance. Sikalastic®-560 white, Related Product ID 0674-0024, 2015.

Cool Roof Rating Council, CRRC-F13 Aged Test Results Report. Sikalastic®-560 white, CRRC Licensed Seller/OM ID 0674, 2012.