Statement of Verification

BREG EN EPD No.: 000150 Issue 01

ECO EPD Ref. No. 00000663

This is to verify that the

Environmental Product Declaration

provided by:

Sika Ltd

BRE Global Verified EPD

is in accordance with the requirements of:

EN 15804:2012+A1:2013

and

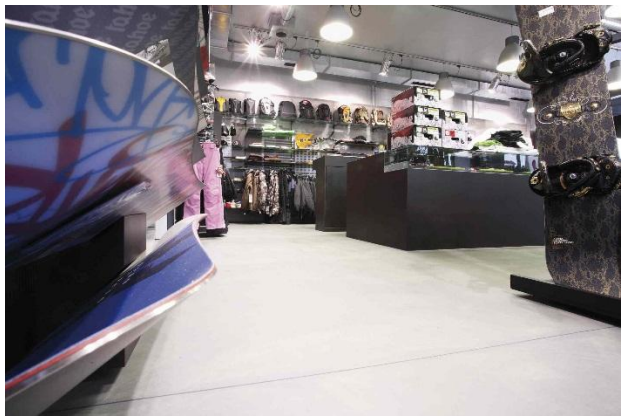
BRE Global Scheme Document SD207

This declaration is for:

Sika ComfortFloor® PS-23 floor finish

Company Address

Watchmead
Welwyn Garden City
AL7 1BQ



BUILDING TRUST

Signed for BRE Global Ltd	Emma Baker Operator	03 April 2018 Date of this Issue
03 April 2018 Date of First Issue		02 April 2023 Expiry Date

BRE Global Verified EPD

BRE Global Ltd., Garston, Watford WD25 9XX.
T: +44 (0)333 321 8811 F: +44 (0)1923 664603 E: Enquiries@breglobal.com

ECO PLATFORM EPD EN 15804 VERIFIED

Environmental Product Declaration

EPD Number: 000150

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	Andrew Dutfield BRE Bucknalls Lane Watford WD25 9XX
Declared/Functional Unit	**Applicability/Coverage**
1 m^2 of Sika ComfortFloor® PS-23 floor finish installed as appropriate, to include regular cleaning and maintenance, and any repair, refurbishment or replacement over a 60 year study period.	Manufacturer specific product system.
EPD Type	**Background database**
Cradle to Grave	ecoinvent

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: Nigel Jones
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 Nederland B.V.
Duurstedeweg 7
7418CK Deventer
Netherlands

Sika Deutschland GmbH
Kornwestheimerstr. 103-107
70439 Stuttgart
Germany

Construction Product:

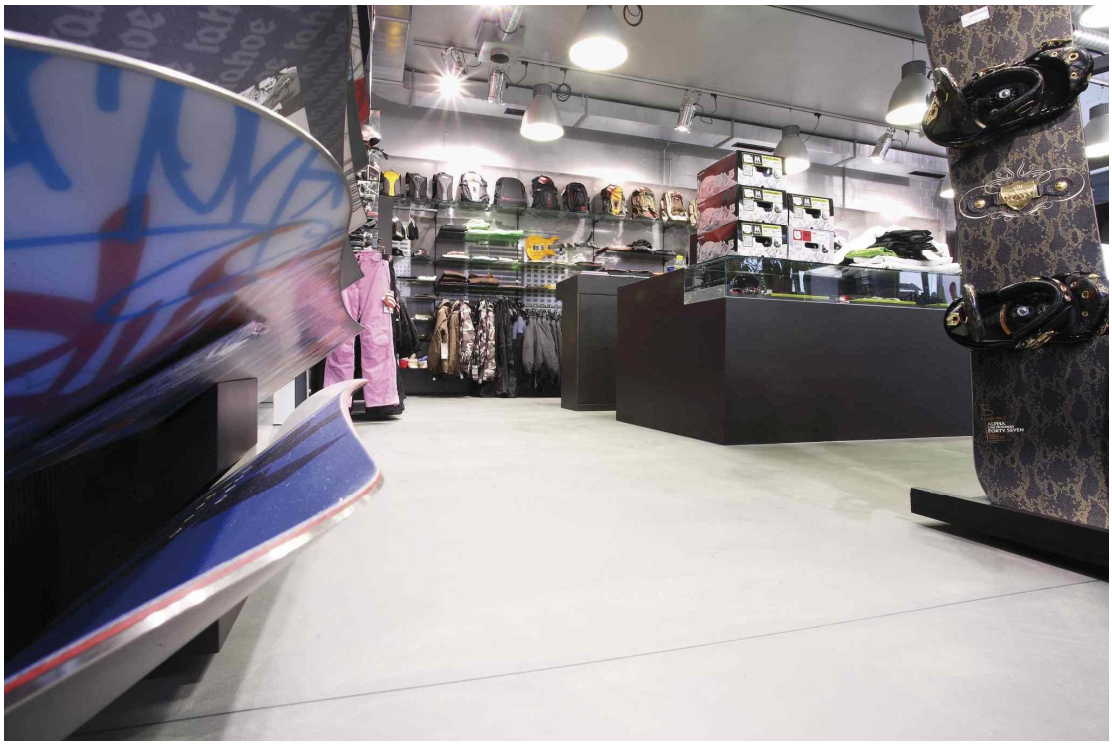
Product Description

Sika ComfortFloor® PS-23 system is a high elastic polyurethane self-smoothening flooring system and is part of the Sika ComfortFloor® system range. The Sika ComfortFloor® PS-23 system is especially designed for decorative areas where high comfort under feet, and soft footfall are required. The system is composed of a highly elastic, crack bridging polyurethane which fulfils the stringent demands for low VOC emitting products

Technical Information

Property	Value, Unit
Shore A Hardness (DIN 53505)	~ 80 (14 days/+23°C)
Resistance to Wearing (EN 660-2:1999)	Wearing group P
Resistance to moving furniture (EN 424:2002)	No damage
Castor chair resistance (EN 425:1994)	No damage (25000 cycles)
Resistance to Impact (ISO 6272)	Class I (~ 4 N/m)
Indentation (EN 433:1994)	0.05 mm
Tensile Strength (DIN 53504)	~ 8.0 N/mm² (14 days/+23°C/Base coat)
Tensile Adhesion Strength (EN 13892-8)	> 1.5 N/mm2
Elongation at Break (DIN 53504)	~ 150% (14 days/+23°C/Base coat)
Reaction to Fire (EN 13501-1)	Bfl-s1
Resistance to Stubbed Cigarettes (EN 1399)	Class 4

Property	Value, Unit
Chemical Resistance	Sika ComfortFloor® PS-23 always has to be sealed with Sikafloor®-305 W. Refer to the chemical resistance of Sikafloor®-305 W.
UV Exposure (EN ISO 105-B02:2002)	8 / Colour fastness
USGBC LEED Rating	Conforms Section EQ (Indoor Environmental Quality), Credit 4.2 Low-Emitting Materials Paints and Coatings. Calculated VOC content ≤ 50 g/l
Sound Insulation (EN ISO 140-8)	2 dB
Skid / Slip Resistance (DIN 51130)	R10 / R11



Main Product Contents

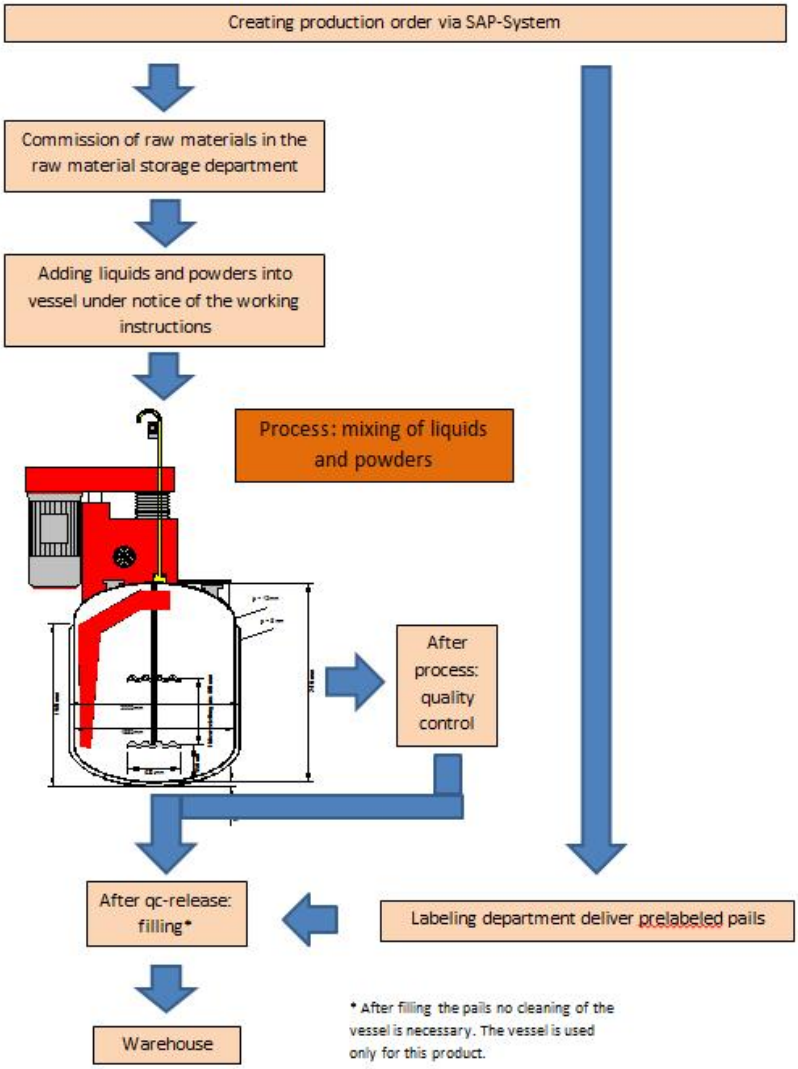
The table below shows the SIKA component layers that make up the Sika ComfortFloor® PS-23 system. The actual chemical inputs are not disclosed due to confidentiality reasons, but the product does not contain substances on the SVHC list of chemicals

Material/Chemical Input	Kg/m^2
Sikafloor®-161 primer	1.0
Sikafloor®-330 base coat	2.8
Sikafloor®-305W top sealer	0.27
Total product weight	4.07

Manufacturing Process

A flooring product from the ComfortFloor® family (e.g. Sikafloor®-330) is compounded as a master-batch by mixing the base polymer with all additives, fillers, stabilizers and pigments. The production starts with the printing of the process order and the respective labels. Next, the raw materials are collected, sent to the dissolvers and charged under slow power mixing. Following a proper mixing the dispersing process is sped up for the next five minutes. Finally under a slow mixing the disperser is put on vacuum mode and the contents are drawn off by gravity. Once packed in the correct type of pails or canisters they are labelled and then sent on to the installation where they are applied in required layers to complete the flooring system.

Process flow diagram



Construction Installation

The selected method of preparation will depend on the surface condition, environmental constraints and availability of services. The method may be selected on the basis of trial areas, approved by the Contract Administrator.

Throughout the application process, a substrates preparation is integral to successful application. Pull off tests, measuring the moisture content, surface levelling and industrial vacuuming are the areas that must be paid special attention. For the specific mixing and application information please see the Sika Information Manual Mixing & Application of Flooring Systems.

Sika ComfortFloor® PS-23 system has to be sealed with a pigmented topcoat. Refer to chemical resistance chart of Sikafloor®-305 W or Sikafloor®-304 W which can be used as extra protective layer. For detailed information contact our Technical Service.

Use Information

Sika ComfortFloor® PS-23 is odourless during installation and use, and it meets all indoor air quality regulations regarding volatile organic compound (VOC) emissions, which can be harmful to human health and the environment.

The constitution of Sika ComfortFloor® PS-23 also means it will not support the growth of bacteria or fungus, and because it is completely seamless it is also very easy to clean and thus maintain a hygienic environment.

End of Life

When the ComfortFloor® system reaches its end of life it can be lightly sanded back to the base coat, then refurbished with the application of a fresh topcoat to produce a new system. The system can be disposed of in an incinerator or sent to landfill when building reaches its end of life

Life Cycle Assessment Calculation Rules

Declared / Functional unit description

1 m^2 of Sika ComfortFloor® PS-23 floor finish installed as appropriate, to include regular cleaning and maintenance, and any repair, refurbishment or replacement over a 60 year study period.

System boundary

This is a cradle-to-grave EPD. Modules A1 to C4 inclusive are assessed. Benefits and loads beyond the system boundary (Module D) have not been included.

Data sources, quality and allocation

Manufacturer-specific data from Sika Ltd covering a production period of 1 year [01/01/2013 to 31/12/2013] from the Deventer and Stuttgart sites has been used for this EPD. Apart from raw material input, other site data were allocated appropriately.

The technological coverage reflects the physical reality of the declared product system, and the secondary data in the modelling was from ecoinvent v3 using SimaPro, and this generic data has been checked for plausibility.

Cut-off criteria

Data collected at the Sika Deventer and Stuttgart manufacturing sites was used. The inventory process in this LCA includes all data related to raw material, packaging material and consumable items, and the associated transport to the manufacturing site. Process energy and water use, direct production waste and emissions to air and water are included. Scenarios have been developed to account for downstream processes such as demolition and waste treatment in accordance with the requirements of EN 15804.

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	10.1	7.13E-07	0.0638	0.0190	0.0103	0.000166	226
Construction process stage	Transport	A4	0.067	1.23E-08	0.00017	4.45E-05	3.51E-05	1.79E-07	1.01
	Construction	A5	0.529	3.68E-08	0.00321	0.00226	0.000524	8.31E-06	11.4
Use stage	Use	B1	MNR	MNR	MNR	MNR	MNR	MNR	MNR
	Maintenance	B2	19.3	1.23E-06	0.103	0.0240	0.00945	3.30E-05	333
	Repair	B3	MNR	MNR	MNR	MNR	MNR	MNR	MNR
	Replacement	B4	MNR	MNR	MNR	MNR	MNR	MNR	MNR
	Refurbishment	B5	11.8	1.13E-06	0.0907	0.0481	0.0105	0.000202	222
	Operational energy use	B6	MNR	MNR	MNR	MNR	MNR	MNR	MNR
	Operational water use	B7	MNR	MNR	MNR	MNR	MNR	MNR	MNR
End of life	Deconstruction, demolition	C1	0	0	0	0	0	0	0
	Transport	C2	0.067	1.23E-08	0.00017	4.45E-05	3.51E-05	1.79E-07	1.01
	Waste processing	C3	0	0	0	0	0	0	0
	Disposal	C4	0.358	1.14E-08	0.00033	0.030	0.000109	6.35E-08	1.04
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	MND	MND	MND	MND	MND	MND	MND

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	38.2	0.0173	38.2	235	0	235
Construction process stage	Transport	A4	0.0139	5.23E-08	0.0139	1.00	0	1.00
	Construction	A5	1.91	0.000866	1.91	11.8	0	11.8
Use stage	Use	B1	MNR	MNR	MNR	MNR	MNR	MNR
	Maintenance	B2	24.6	7.57E-05	24.6	420	0	420
	Repair	B3	MNR	MNR	MNR	MNR	MNR	MNR
	Replacement	B4	MNR	MNR	MNR	MNR	MNR	MNR
	Refurbishment	B5	38.7	0.0123	38.7	235	0	235
	Operational energy use	B6	MNR	MNR	MNR	MNR	MNR	MNR
	Operational water use	B7	MNR	MNR	MNR	MNR	MNR	MNR
End of life	Deconstruction, demolition	C1	0	0	0	0	0	0
	Transport	C2	0.0139	5.23E-08	0.0139	1.00	0	1.00
	Waste processing	C3	0	0	0	0	0	0
	Disposal	C4	0.0379	9.90E-08	0.0379	1.07	0	1.072
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	MND	MND	MND	MND	MND	MND

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	0.358
Construction process stage	Transport	A4	0	0	0	0.000222
	Construction	A5	0	0	0	0.018
Use stage	Use	B1	MNR	MNR	MNR	MNR
	Maintenance	B2	0	0	0	0.370
	Repair	B3	MNR	MNR	MNR	MNR
	Replacement	B4	MNR	MNR	MNR	MNR
	Refurbishment	B5	0	0	0	0.461
	Operational energy use	B6	MNR	MNR	MNR	MNR
	Operational water use	B7	MNR	MNR	MNR	MNR
End of life	Deconstruction, demolition	C1	0	0	0	0
	Transport	C2	0	0	0	0.000222
	Waste processing	C3	0	0	0	0
	Disposal	C4	0	0	0	0.00119
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	MND	MND	MND	MND

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	0.616	1.02	2.09E-06
Construction process stage	Transport	A4	0.000429	0.0479	5.79E-09
	Construction	A5	0.0309	0.233	1.05E-07
Use stage	Use	B1	MNR	MNR	MNR
	Maintenance	B2	0.0766	0.523	2.21E-05
	Repair	B3	MNR	MNR	MNR
	Replacement	B4	MNR	MNR	MNR
	Refurbishment	B5	1.08	6.46	3.65E-06
	Operational energy use	B6	MNR	MNR	MNR
	Operational water use	B7	MNR	MNR	MNR
End of life	Deconstruction, demolition	C1	0	0	0
	Transport	C2	0.000429	0.0479	5.79E-09
	Waste processing	C3	0	0	0
	Disposal	C4	0.000800	4.08	1.66E-08
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	MND	MND	MND

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	0.0699	0	0
Construction process stage	Transport	A4	0	0	0	0
	Construction	A5	0.0244	0.0035	0	0
Use stage	Use	B1	MNR	MNR	MNR	MNR
	Maintenance	B2	0	0	0	0
	Repair	B3	MNR	MNR	MNR	MNR
	Replacement	B4	MNR	MNR	MNR	MNR
	Refurbishment	B5	0.488	0.08	0	0
	Operational energy use	B6	MNR	MNR	MNR	MNR
	Operational water use	B7	MNR	MNR	MNR	MNR
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	0
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	MND	MND	MND	MND

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 (Diesel)	L/km	0.32
	Distance	km	100
	Capacity utilisation (incl. empty returns)	%	35
	Bulk density of transported products	kg/m^3	various
A5 – Installation in the building	Total amount of material wasted during the installation process	%	5
B1 – Use stage	Once installed, the floor finish does not have any impacts associated with its use. Therefore, module B1 is not relevant to this product	n/a	n/a
B2 – Maintenance	Vacuum cleaning	Per week (cycle)	1
		Minutes/m^2 (duration)	0.21
		kW of motor	1.35
	Aqueous cleaning	Per week (cycle)	1
		litres/m^2 (water)	0.062
		kg/m^2 (detergent)	0.0008
	Scenario description: Generic figures based on cleaning and maintenance for PVC cushioned resilient flooring		
B3 – Repair	Once installed, the floor finish is not assumed to be repaired. Therefore, module B3 is not relevant to this product.	n/a	n/a
B4 – Replacement	Once installed, the floor finish does not have any impacts associated with its replacement. Therefore, module B4 is not relevant to this product	n/a	n/a
B5 – Refurbishment	Sanding (10 years etc.)	kWh/m^2	0.02
	Seal coat reapplication (10 years etc.)	kg/m^2	0.135
	Shot blasting (20 years etc.)	kWh/m^2	0.055
	Base coat reapplication (20 years etc.)	kg/m^2	0.7
	Seal coat reapplication (20 years etc.)	kg/m^2	0.27
	Scenario description: This scenario is based on re-topping by sanding and reapplication of 50% of seal coat after 10, 30 & 50 years; shot blasting and reapplication of 25% basecoat & 100% top seal after 20 & 40 years. A complete replacement happens after 60 years.		
B6 – Use of energy; B7 – Use of water	Modules not applicable, and therefore not relevant for declared product.	n/a	n/a

Scenarios and additional technical information			
Scenario	Parameter	Units	Results
C1 to C4 – End of life	Waste collected with mixed construction waste.	kg	4.07
	Distance to final disposal, by road.	km	100
	Waste disposal to landfill	kg	4.07
	This scenario assumes no deconstruction impacts (C1), as the demolition is an insignificant part of the entire building demolition works and cannot be allocated. The scenario also assumes no waste processing requirement (C3).	n/a	0

Summary, comments and additional information

Interpretation

The Figure below represents the sources of kg CO_2 equivalent impacts reported in the GWP for the product stage (A1 to A3) of Sika ComfortFloor® PS-23.

The highest contributing component is Sikafloor®-330 at 5.89 kg CO_2 eq. or 58.2% of the total. It is also the largest component in terms of mass at 2.8 kg per m^2 or 68.8% of the total.

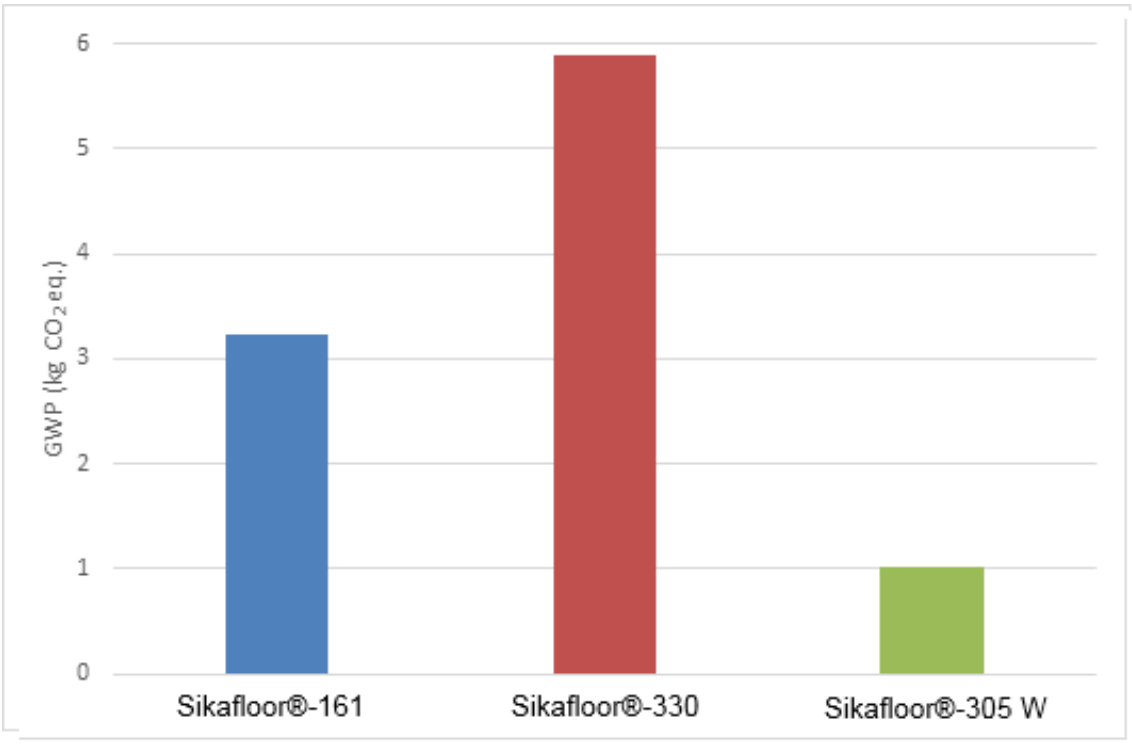


Figure 1: Sources of kg CO_2 equivalent impacts reported in the GWP for the product stage (A1 to A3) of Sika ComfortFloor® PS-23

References

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.

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.

System Data Sheet Sika ComfortFloor® PS-23 system.

DIN 53505: Shore A and Shore D Hardness Testing of Rubber

BS EN 660-2:1999: Resilient floor coverings. Determination of wear resistance. Frick-Taber test

BS EN 424:1993: Resilient floor coverings. Determination of the effect of the simulated movement of a furniture leg

BS EN 425:1994: Resilient floor coverings. Determination of the effect of a castor chair

ISO 6272:1993: Paints and varnishes -- Falling-weight test

BS EN 433:1994: Resilient floor coverings. Determination of residual indentation after static loading

DIN 53504: Testing of rubber - Determination of tensile strength at break, tensile stress at yield, elongation at break and stress values in a tensile test

BS EN 13892-8: Methods of test for screed materials. Determination of bond strength

BS EN 13501-1:2007+A1:2009: Fire classification of construction products and building elements. Classification using test data from reaction to fire tests

BS EN 1399:1998: Resilient floor coverings. Determination of resistance to stubbed and burning cigarettes

BS EN ISO 105-B02:2002: Textiles -- Tests for colour fastness -- Part B02: Colour fastness to artificial light: Xenon arc fading lamp test

BS EN ISO 140-8:1998: Acoustics. Measurement of sound insulation in buildings and of building elements. Laboratory measurements of the reduction of transmitted impact noise by floor coverings on a heavyweight standard floor

DIN 51130: Testing of Floor Coverings - Determination of the Anti-Slip Property - Workrooms and fields of activities with slip danger - Walking method - Ramp test