# Environmental Product Declaration

BREG EN EPD No.: 000110 Issue: 01

ECO EPD Ref. No.: 000334

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:

**SikaProof P**

## Company Address

Watchmead

Welwyn Garden City
AL7 1BQ

BUILDING TRUST

| Signed for BRE Global Ltd | Laura Critien<br>Operator | 17 March 2016<br>Date of this Issue |
|---|---|---|
| 17 March 2016<br>Date of First Issue | | 16 March 2021<br>Expiry Date |



BRE Global Ltd., Garston, Watford WD25 9XX.
T: +44 (0)333 32188 11 F: +44 (0)1923 664603 E: Enquiries@breglobal.com

## 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<br>☐ Internal ☑ External |
| Third party verifier[b]:<br>**Kim Allbury** |
| a: Product category rules<br>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<br>Tüffenwies 16<br><br>Zurich<br>8048<br>www.sika.com/sustainability | Kim Allbury<br>BRE Global<br>Bucknalls Lane<br>Watford<br>WD25 9XX<br>www.bre.co.uk |

# General Information

## Summary

This environmental product declaration is for 1 square metre of SikaProof P produced by Sika Ltd. at the following manufacturing facilities:

Sika Manufacturing CH-Sarnen
Industriestrasse

Sarnen
6060
Switzerland

This is a Cradle to grave 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 | X | X | X | X | X | X | X | 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

SikaProof P is a cold- and post-applied, self-adhesive, fully bonded composite sheet membrane waterproofing system based on high flexible FPO membrane. SikaProof P is available in 1 m wide and 1.2 mm thickness (SikaProof P-12).

## Technical Information

| Property | Value | Unit |
|---|---|---|
| Visual defects as per EN 1850-2 | Pass | - |
| Straightness as per EN 1848-2 | ≤ 50 | mm/ 10m |
| Resistance to impact as per EN12691 | ≥ 200 | mm |
| Resistance to static load as per EN-12730 | ≥ 20 | Kg |
| Elongation (machine direction) as per EN-12311-2 | ≥ 350 | % |
| Elongation (cross direction) as per EN12311-2 | ≥ 350 | % |
| Tensile strength (machine direction) as per EN 12311-2 | ≥ 6.0 | N/ mm² |
| Tensile strength (cross direction) as per EN 12311-2 | ≥ 6.0 | N/ mm² |
| Resistance to tearing (nail shank) (machine direction) as per EN 12310-1 | ≥ 200 | N |
| Resistance to tearing (nail shank) (cross direction) as per EN 12310-1 | ≥ 200 | N |
| Joint sheer resistance as per EN 12317-2 | ≥ 125 | N/ 50mm |
| Water vapour transmission as per EN 1931 | sd = 78 | M |
| Reaction to fire as per EN13501 | Class E | - |

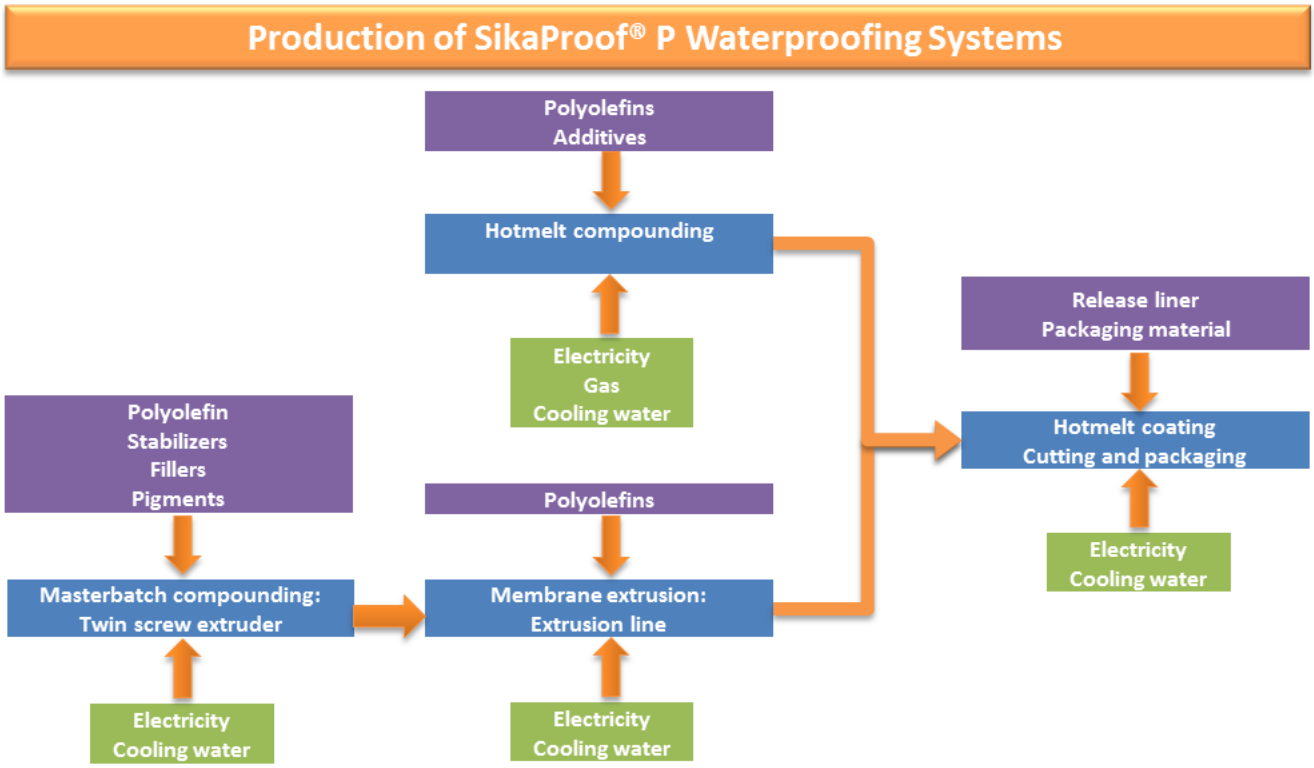
## Product Contents

| Material/Chemical Input | % |
|---|---|
| Thermoplastic polyolefins | 35 – 50 |
| Stabilizers (UV/heat) | 0 – 1 |
| Pigments | 0 – 1 |
| Fillers | 5 – 10 |
| Sealant adhesive | 40 – 50 |

## 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 wound to master rolls. The membrane is inline coated with hotmelt sealant and protected with a release liner. Finally the edge is trimmed, the membrane wound to contractor rolls, single-roll packaged and palletized.

## The process flow diagram is shown below:




## Construction Installation

SikaProof P is cold-applied and post-applied, as it is installed without heat or open-flames, by peel and stick onto the existing harden concrete structure. Therefore the substrate have to be prepared according to the requirements of the method statement for SikaProof P system, which includes the use of primer system SikaProof Primer-01.
The overlaps of the sheets are adhered by overlap the sheets 90 mm, therefore the average consumption of membrane per 1 m2 is approx. plus 9%.
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 limited any repair work to a minimum, if a membrane damage occur.
The fully 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. SikaProof P-12 membrane is made of the same material and will provide an effective barrier to the transmission of water and water vapour for the life of the structure. 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

1 m2 of 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

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

| Indicator | Unit | A1 | A2 | A3 | A1-A3 | A4 | A5 | B1 | B2 | B3 |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Raw Material supply | Transport to factory | Manufacturing | Merged A1/A2/A3 | Transport to site | Construction - installation | Use | Maintenance | Repair |
| **Environmental impacts per declared/functional unit** | | | | | | | | | | |
| GWP | kg $CO_2$ eq. | AGG | AGG | AGG | 3.67 | 0.0955 | 1.60 | 0.00 | 0.00 | 0.00 |
| ODP | kg CFC 11 eq. | AGG | AGG | AGG | 8.17E-09 | 3.92E-13 | 6.85E-09 | 0.00 | 0.00 | 0.00 |
| AP | kg $SO_2$ eq. | AGG | AGG | AGG | 0.00937 | 0.000471 | 0.00209 | 0.00 | 0.00 | 0.00 |
| EP | kg $(PO_4)^{3-}$ eq. | AGG | AGG | AGG | 0.00189 | 0.000118 | 0.000402 | 0.00 | 0.00 | 0.00 |
| POCP | kg $C_2H_4$ eq. | AGG | AGG | AGG | 0.00147 | 5.11E-05 | 0.0465 | 0.00 | 0.00 | 0.00 |
| ADPE | kg Sb eq. | AGG | AGG | AGG | 2.25E-06 | 3.74E-09 | 5.35E-07 | 0.00 | 0.00 | 0.00 |
| ADPF | MJ eq. | AGG | AGG | AGG | 113 | 1.32 | 24.2 | 0.00 | 0.00 | 0.00 |
| 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 | 3.24 | 0.00 | 0.356 | 0.00 | 0.00 | 0.00 |
| PERM | MJ | AGG | AGG | AGG | 3.82 | 0.00 | 0.421 | 0.00 | 0.00 | 0.00 |
| PERT | MJ | AGG | AGG | AGG | 7.06 | 0.0735 | 0.911 | 0.00 | 0.00 | 0.00 |
| PENRE | MJ | AGG | AGG | AGG | 63.6 | 0.00 | 7.00 | 0.00 | 0.00 | 0.00 |
| PENRM | MJ | AGG | AGG | AGG | 53.5 | 0.00 | 5.88 | 0.00 | 0.00 | 0.00 |
| PENRT | MJ | AGG | AGG | AGG | 117 | 1.32 | 24.9 | 0.00 | 0.00 | 0.00 |
| SM | kg | AGG | AGG | AGG | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| RSF | MJ | AGG | AGG | AGG | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| NRSF | MJ | AGG | AGG | AGG | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| FW | $m^3$ | AGG | AGG | AGG | 0.107 | 0.000129 | 0.108 | 0.00 | 0.00 | 0.00 |
| 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 | 0.000148 | 6.25E-07 | 1.68E-05 | 0.00 | 0.00 | 0.00 |
| NHWD | kg | AGG | AGG | AGG | 0.049 | 0.000187 | 0.0137 | 0.00 | 0.00 | 0.00 |
| TRWD | kg | AGG | AGG | AGG | 0.0016 | 1.80E-06 | 0.000228 | 0.00 | 0.00 | 0.00 |
| RWDHL | kg | AGG | AGG | AGG | 2.05E-06 | 2.60E-09 | 2.69E-07 | 0.00 | 0.00 | 0.00 |
| 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 | 0.00 | 0.00 | 0.00 | 0.00 |
| MFR | kg | AGG | AGG | AGG | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| MER | kg | AGG | AGG | AGG | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| EE | MJ | AGG | AGG | AGG | 0.00 | 0.00 | 0.699 | 0.00 | 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 | B4 Replacement | B5 Refurbishment | B6 Operational energy use | B7 Operational water use | C1 Demolition | C2 Transport | C3 Waste Processing | C4 Disposal | D Reuse/ Recovery/ Recycling Potential |
|---|---|---|---|---|---|---|---|---|---|---|
| **Environmental impacts per declared/functional unit** | | | | | | | | | | |
| GWP | kg $CO_2$ eq. | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0227 | 0.00 | 0.0252 | -0.363 |
| ODP | kg CFC 11 eq. | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 4.03E-13 | -1.86E-09 |
| AP | kg $SO_2$ eq. | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.000101 | 0.00 | 0.000153 | -0.0013 |
| EP | kg $(PO_4)^{3-}$ eq. | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.60E-05 | 0.00 | 2.10E-05 | -0.00081 |
| POCP | kg $C_2H_4$ eq. | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.02E-05 | 0.00 | 1.43E-05 | -1.24E-04 |
| ADPE | kg Sb eq. | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 9.36E-09 | -1.11E-07 |
| ADPF | MJ eq. | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.329 | -6.54 |
| 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 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PERM | MJ | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PERT | MJ | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0337 | -2.64 |
| PENRE | MJ | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PENRM | MJ | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PENRT | MJ | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.342 | -7.96 |
| SM | kg | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| RSF | MJ | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| NRSF | MJ | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| FW | $m^3$ | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 6.48E-05 | -0.0478 |
| 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 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.06E-07 | -2.22E-06 |
| NHWD | kg | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.56 | -0.0023 |
| TRWD | kg | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 5.45E-06 | -5.56E-04 |
| RWDHL | kg | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 7.02E-09 | -8.43E-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 | 0.00 | 0.00 | 0.00 |
| MFR | kg | 0.00 | 0.00 | 0.00 | 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 | 0.00 | 0.00 | 0.00 |
| EE | MJ | 0.00 | 0.00 | 0.00 | 0.00 | 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 | 0.000034 | 915 | 85 | 1000 |

| Module A5 - Installation in the building | | | |
|---|---|---|---|
| **Parameter** | **Description** | **Unit** | **Value** |
| Ancillary materials for installation | Overlap | % | 10 |
| Ancillary materials for installation | Primer | kg/m2 | 0.2 |
| Waste materials from installation wastage | Losses | % | 1 |
| Direct emissions to air, soil and water | VOC | kg/m2 | 0.1 |

| Module B2 - Maintenance | | | |
|---|---|---|---|
| **Parameter** | **Description** | **Unit** | **Value** |
| Maintenance process description or source of information | None necessary | | |

| Module B3 - Repair | | | |
|---|---|---|---|
| **Parameter** | **Description** | **Unit** | **Value** |
| Repair process description or source of information | None necessary | | |

| Module B4 – Replacement | | | |
|---|---|---|---|
| **Parameter** | **Description** | **Unit** | **Value** |
| Replacement cycle | None necessary | | |

| Module B5 - Refurbishment | | | |
|---|---|---|---|
| **Parameter** | **Description** | **Unit** | **Value** |
| Refurbishment process description or source of information | None necessary | | |

| 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 | 0.000034 | 250 | 85 | 100 |

| 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 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 primer and its application (the VOC emissions are visible for POCP - Photochemical Ozone Creation Potential), and due to the impacts from losses and overlap and waste

disposal as well. For this reason, the Product Stage is examined more closely in the following interpretation.
More than 40% of the impacts come from the membrane formulation, except for the total of the use of renewable primary energy resources - PERT (where 63% is from packaging due to the use of carton and wood), EP (Eutrophication Potential), where packaging contributes with 50%, and ODP (Ozone Depletion Potential), to which the hotmelt sealant is the greatest contributor (70%). The hotmelt sealant has a similar contribution as the membrane formulation (around 40%) to ADPF (Abiotic Depletion Potential - Fossil Fuels), POCP and the total use of non-renewable primary energy resources -PENRT. The production processes (mainly the Swiss energy inputs) contribute mostly to GWP (Global Warming Potential) with 7%, and to PERT (13%).
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 90%. The impacts from the other raw materials (fillers, pigments and stabilizers) are much lower.

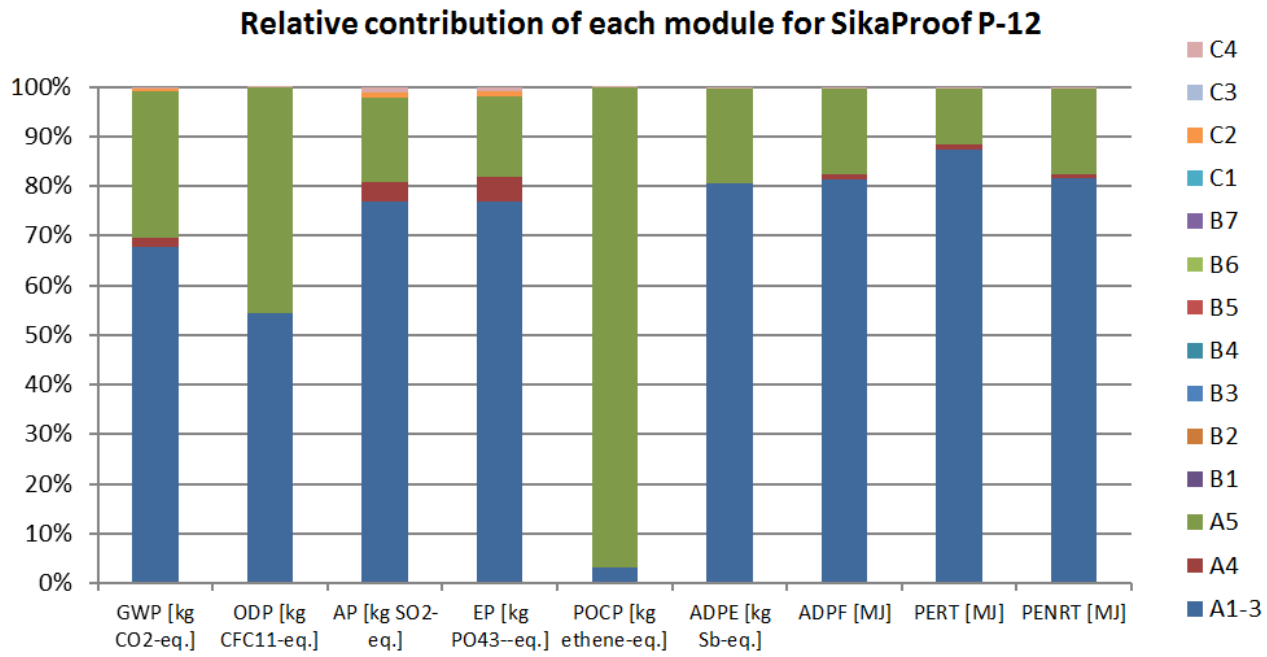



Figure 1

## Sources of additional information


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.

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