



# ROOFING ENVIRONMENTAL PRODUCT DECLARATION - CRADLE-TO-GATE SIKAPLAN FASTENED



**BUILDING TRUST**



# GENERAL INFORMATION

## COMPANY

Sika Corporation – Roofing

## PRODUCT TYPE

Single Ply Roofing Membrane

## PRODUCT

Sikaplan Fastened roofing membrane, with finished thicknesses of 45 and 60 mils.

## MANUFACTURING SITE

Canton, MA 02021

## EPD SCOPE

- Cradle-to-Gate

## EPD LIMITATIONS

- EPDs from different programs (using different PCR) may not be comparable
- Declarations based on the ASTM SPRM PCR [1] are not comparative assertions; that is, no claim of environmental superiority may be inferred or implied for cradle to gate declarations.

## DECLARED UNIT

1 m<sup>2</sup> manufactured, Sikaplan Fastened

## STANDARDS

The two declared Sikaplan Fastened roofing membrane thicknesses (45 and 60 mils) meet the following standards and requirements

- ASTM D4434
- Title 24 Compliant\*
- Cool Roof Rating Council® Listed\*
- FM Approval
- Underwriters Laboratory Inc.
- Underwriters Laboratories of Canada

## ORGANIZATION

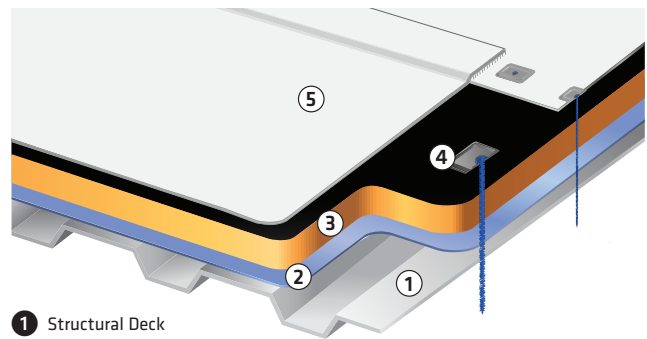
Sika Corporation, based in Lyndhurst, NJ, is a leading manufacturer of products and systems for the construction and motor vehicle markets.

Sika Corporation's roofing division has more than 50 years of experience manufacturing high quality, thermoplastic (PVC), single-ply roofing and waterproofing systems for the non-residential market.

## PRODUCT DESCRIPTION AND USE

With a track record of performance, Sikaplan roofing membranes are the products of choice for architects, specifiers and building owners who want the peace of mind that comes with buying from the performance leader.

Sikaplan Fastened roof membrane is a thermoplastic PVC membrane used in mechanically-attached systems. Sikaplan Fastened is polyester reinforced, which provides the high breaking and tearing strength needed to prevent excessive elongation and sheet deformation under the stresses produced by the wind uplift of the membrane in this type of system. A unique lacquer coating is applied to the top surface of the membrane which helps to reduce soiling.



- 1 Structural Deck
- 2 Vapor Retarder (if required)
- 3 Insulation
- 4 Insulation Fastener
- 5 Sikaplan Fastened Membrane

\* white only

## PRODUCT SPECIFICATIONS

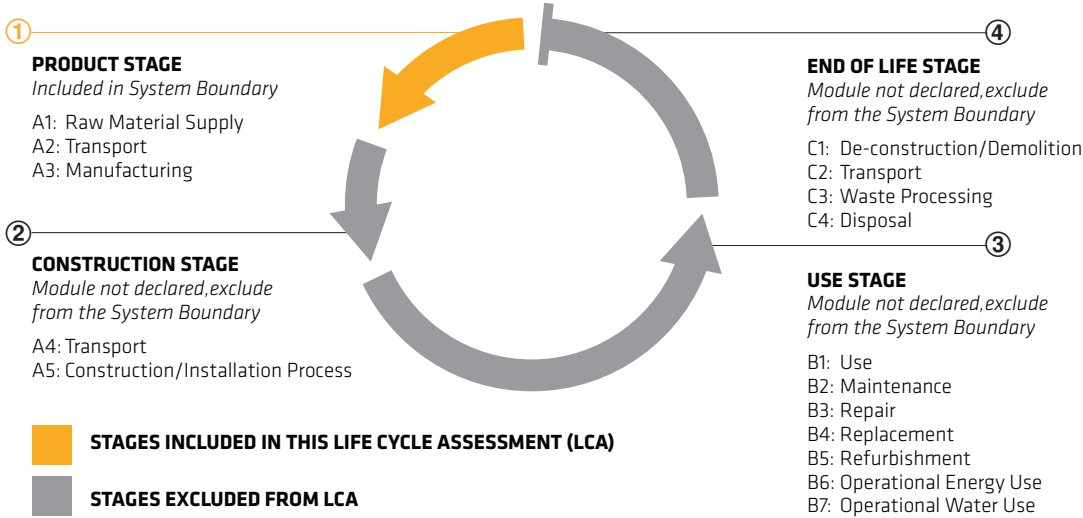
TECHNICAL DATA	UNITS	ASTM TEST METHOD	ASTM D4434 TYPE III REQUIREMENT	VALUE/TEST RESULTS	
				45 MILS (NOMINAL)	60 MILS (NOMINAL)
Weight	[kg/m <sup>2</sup> ]	–	–	1.40	1.77
Total Recycled Content (both pre- and post-consumer) <sup>3</sup>	[%]	–	–	10 <sup>3</sup>	
Reinforcing Material	–	–	–	Polyester	
Overall Thickness	[mil]	D751	45	45 (nominal)	60 (nominal)
Reflectivity (white)	[%]	ASTM C1549	–	0.83 <sup>4</sup> - 0.64 <sup>5</sup>	0.85 <sup>4</sup> - 0.66 <sup>5</sup>
Emissivity (white)	[%]	ASTM C1371	–	0.89 <sup>4</sup> - Pending	
Solar reflective index (white)	–	–	–	104 <sup>4</sup> - Pending	107 <sup>4</sup> - Pending
Breaking Strength (M.D.), min.	[lbf/in]. (KN/m)	D751	200 (35)	230 (40)	303 (53)
Elongation at Break, min	–	D751	–		
Machine Direction	[%]		15	20	20
Cross Direction	[%]		15	20	20
Seam Strength, min., (% of original) <sup>6</sup>	[%]	D751	75	Pass	
Retention of Properties After Heat Aging	[%]	D3045	–	–	
Tensile Strength, min., (% of original)	[%]	D751	90	Pass	
Elongation, min., (% of original)	[%]	D751	90	Pass	
Tearing Strength (C.D.), min	[lbf] (N)	D1004	45 (200)	45 (200)	45 (200)
Low Temperature Bend, –40 °F (–40 °C)	–	D2136	Pass	Pass	
Accelerated Weathering Test (Fluorescent Light, UV exposure)	–	G154	5,000 hours	10,000 hours	
Cracking (7x magnification)		None	None	None	
Discoloration (by observation)		Negligible	Negligible	Negligible	
Crazing (7x magnification)		None	None	None	
Linear Dimensional Change (C.D.), %		D1204	0.5% max.	0.31	0.24
Weight Change After Immersion in Water,	%	D570	±3.0% max.	2.9	2.5
Static Puncture Resistance	Lbf (N)	D5602	Pass	Pass	
Dynamic Puncture Resistance	ft-lbf (J)	D5635	14.7 (20)	Pass	

<sup>3</sup> Pre-consumer material: roofing membrane trimmings from Sika's manufacturing process and market supplied post-industrial PVC scrap material. Post-consumer material: post-consumer Sika Sikaplan scrap material and old roofs (10% minimum content)

<sup>4</sup> New Membrane

<sup>5</sup> 3 year aged. Derived using the California Title 24 calculation method for aged solar reflectance per Section 110.8(i)2. of the 2013 Building Energy Efficiency Standard, page 102.

# Life Cycle Stages



## SYSTEM BOUNDARY

	INCLUDED	EXCLUDED
<b>A1-A3</b>	<ul style="list-style-type: none"> <li>Extraction and processing of raw materials, including fuels used in product manufacturing;</li> <li>Transportation of raw materials including empty backhauls;</li> <li>Manufacturing of the product;</li> <li>Packaging of product ready for shipment;</li> <li>Transportation from manufacturing site to recycling/reuse for pre-consumer wastes and unutilized by-products from manufacturing, including empty backhauls; and</li> <li>Recycling/reuse of pre-consumer wastes and by-products of production.</li> </ul>	Capital goods & infrastructure, production equipment, delivery vehicles, lab equipment personnel-related activities and energy and water use related to company management and sales have been excluded in the scope of the study

## MATERIAL CONTENT DECLARATION

The material average percentage by weight for 1m<sup>2</sup> for the Sikaplan Fastened 45 and 60 mils is provided.

MATERIAL AVERAGE PERCENTAGE BY WEIGHT FOR 1 M <sup>2</sup> : SIKAPLAN FASTENED 45 AND 60 [MILS]		PACKAGING MATERIAL	DECLARED PRODUCT [MILS]	
	Total Weight by [%]		45	60
Raw Material Input	Total Weight by [%]			
Lacquer	0.1			
PVC Resin new material	40.6	Cardboard Core [kg]	0.05	0.05
PVC Resin recycled content	12.9	Wooden Pellet [kg]	0.13	0.13
Plasticizer	26.8			
Processing aid	0.2	Shrink Wrap [kg]	0.0002	0.0002
Stabilizer	2.0			
Fire retardants	8.4			
Pigment	2.7	Total [kg/m <sup>2</sup> ]	0.18	0.18
Polyester fabric (scrim reinforcement)	6.3			
<b>Total weight (Input)</b>	<b>100</b>			

## LIFE CYCLE IMPACTS

RESULTS SIKAPLAN FASTENED	DECLARED PRODUCT	
	45 MILS	60 MILS
Global Warming Air, incl. biogenic carbon [kg CO2-eq.]	4.30	5.34
Acidification potential [kg SO2-Equiv.]	3.06E-02	3.88E-02
Eutrophication potential [kg N-Equiv.]	7.20E-04	8.95E-04
Smog creation potential [kg O3-Equiv.]	0.232	0.294
Ozone Depletion Potential [kg ethene-eq.]	5.036E-08	6.444E-08
<b>TOTAL PRIMARY ENERGY CONSUMPTION</b>		
Nonrenewable fossil [MJ]	107.11	133.15
Nonrenewable nuclear [MJ]	6.05	7.32
Renewable (solar, wind, hydropower, geothermal) [MJ]	2.02	2.33
Renewable (biomass) [MJ]	0.02	0.02
<b>MATERIAL RESOURCES CONSUMPTION</b>		
Nonrenewable materials [kg]	1.12	1.43
Renewable materials [kg]	0.18	0.18
Fresh water [l]	16.07	18.96
<b>WASTE GENERATED</b>		
Total [kg]	0.17	0.21

### Additional Environmental Information

- The Sikaplan EnergySmart® membrane has a highly reflective, lacquer-coated surface that can reduce cooling and overall energy consumption in conditioned buildings. Sikaplan roof membranes meet the cool roof requirements of California's Building Energy Code (Title 24), LEED® and Green Globes.™
- Sika Roofing's Roof Recycling Program has diverted more than 45 million pounds of pre-consumer and post-consumer vinyl membrane from landfill, recycling it back into roofing and waterproofing membrane products.
- Sikaplan 5' and 10' membranes have been validated by UL Environment to contain an average of 10% recycled content.
- Sika roofing has been certified as compliant with strict environment, health and safety, and security standards established by the Responsible Care and ISO 14001: 2004.
- Sikaplan roof membranes help building owners achieve LEED and Green Globes certification



## EPD VERIFICATION

This EPD was independently verified by ASTM in accordance with ISO 14025:

<b>Internal</b> <input type="checkbox"/>	<b>External</b> <input checked="" type="checkbox"/>	Jamie Meil, Research Principal Athena Sustainable Materials Institute 100-119 Ross Avenue Ottawa, Ontario, Canada K1Y0N6		Signed: 
<b>Program Operator</b>		Timothy Brooke ASTM International 100 Bar Harbor Drive West Conshohocken, PA 19428 tbrooke@astm.org		Signed: 
<b>Declaration Holder</b>		Sika Corporation		
<b>Product group</b>		<b>Date of Issue</b>	<b>Period of Validity</b>	<b>Declaration Number</b>
		03/01/2016	5 years	EPD031

<b>DECLARATION TYPE</b> A "Cradle-to-Gate" EPD for two selected thicknesses of the Sikaplan Fastened roofing membrane (45 and 60 mils). The modules included are A1 to A3. The declaration is intended for use in Business to Business (B-B) communication.	<b>PRODUCT APPLICABILITY AND CHARACTERISTICS</b> The declared Sikaplan Fastened roofing membrane thicknesses (45 and 60 mils) are designed for low-slope and steep slope roofing applications. The membranes include an internal polyester reinforcement to provide the tear resistance required for mechanically-fastened roof systems.	<b>CONTENT OF THE DECLARATION</b> This declaration follows Section 11, Content of the EPD, ASTM International Product Category Rules for Preparing an Environmental Product Declaration for Single-Ply Roofing Membranes, November 2013.
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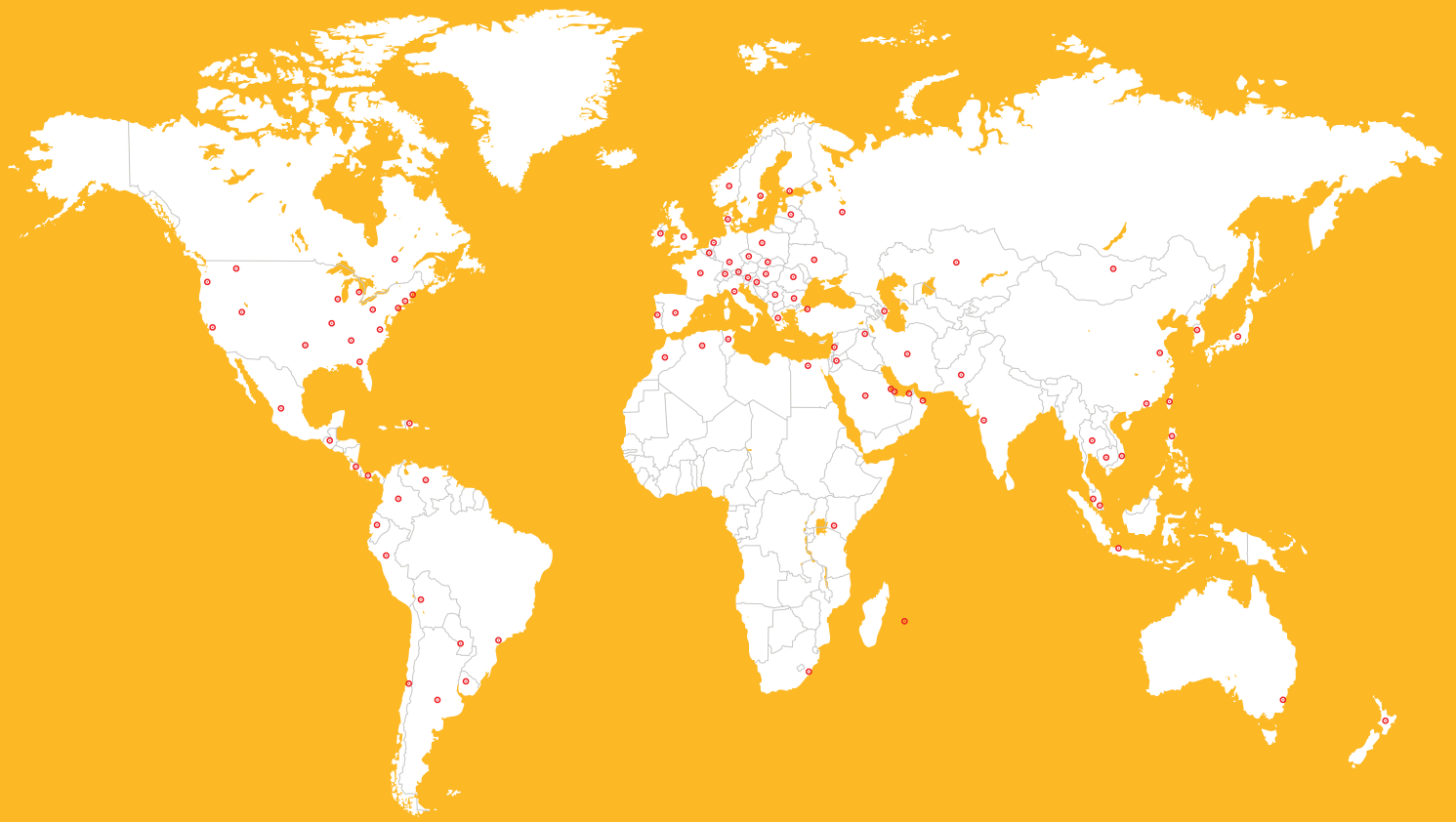
## EPD PROJECT REPORT INFORMATION

<b>EPD PROJECT REPORT</b>	A "Cradle-to-Gate" Life Cycle Assessment for two thicknesses of Sikaplan Fastened (45 and 60 mils), 01/31/2016
<b>LCA AND EPD PREPARED BY:</b>	Corporate Product Sustainability Sika Services AG Tüffenwies 16 8050 Zurich Switzerland <a href="mailto:product.sustainability@ch.sika.com">product.sustainability@ch.sika.com</a>

## PCR INFORMATION

<b>PROGRAM OPERATOR</b>	ASTM International
<b>REFERENCE PCR</b>	ASTM International, Product Category Rules for Preparing an Environmental Product Declaration for Single Ply Roofing Membranes
<b>DATE OF ISSUE</b>	November 2013
<b>PCR REVIEW WAS CONDUCTED BY:</b>	Francois Charron-Doucet Quantis International Email : francois.charron@quantis-intl.com

# GLOBAL BUT LOCAL PARTNERSHIP



## WHO WE ARE

Sika AG, located in Baar, Switzerland, is a specialty chemicals company with a leading position in the development and production of systems and products for bonding, sealing, damping, reinforcing and protecting in the building sector and the motor vehicle industry.

The corporation has subsidiaries in 84 countries, employs 16,000 people worldwide, and has more than 160 manufacturing facilities around the globe.

Our most current General Sales Conditions shall apply.  
Please consult the Product Data Sheet prior to any use and processing.  
ISO 14001: 2004-Compliant



ENERGY STAR® for roofing products is only valid in the United States.  
ENERGY STAR® is a trademark of the U.S. EPA.  
LEED® is a trademark of the U.S. Green Building Council.  
Green Globes® is a trademark of the Green Building Initiative.

## SIKA CORPORATION—ROOFING

100 Dan Road

Canton, MA 02021

Tel: 800-451-2504

Fax: 781-828-5365

[usa.sarnafil.sika.com](http://usa.sarnafil.sika.com)

[webmaster.sarnafil@us.sika.com](mailto:webmaster.sarnafil@us.sika.com)

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