



Self-Adhesive SOPRASEAL STICK 130 & 130-S and SOPRASEAL 60 & 60 FF Thermofusible Air/Vapour Barrier Membranes



SOPREMA Inc.

ENVIRONMENTAL PRODUCT DECLARATION

ISO 14025:2006 and ISO 21930:2017



ASTM INTERNATIONAL

SOPREMA is pleased to present this Environmental Product Declaration (EPD) for the SOPRASEAL STICK 130 & 130-S and SOPRASEAL 60 & 60 FF. This EPD was developed in compliance with ISO 14025 and ISO 21930 and has been verified by Lindita Bushi, Ph.D., Athena Sustainable Materials Institute.

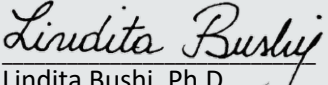
The LCA and the EPD were prepared by Vertima Inc. The EPD includes cradle-to-gate life cycle assessment (LCA) results.

For more information about SOPREMA, visit
www.soprema.ca.

For any explanatory material regarding this EPD, please contact the program operator.

1. GENERAL INFORMATION

PCR GENERAL INFORMATION			
Reference PCR	Water-Resistive and Air Barriers ASTM International September 2017 to September 2023 (validity period)		
The PCR review was conducted by:	Thomas P. Gloria (chair) Industrial Ecology Consultants t.gloria@industrial-ecology.com	Graham Finch RDH Building Science, Inc.	Paul H. Shipp USG Corporation

EPD GENERAL INFORMATION			
Program Operator	ASTM International 100 Barr Harbor Drive, West Conshohocken, PA 19428 www.astm.org		
Declared Products	SOPRASEAL STICK 130 SOPRASEAL STICK 130-S SOPRASEAL STICK 60 SOPRASEAL STICK 60 FF		
EPD Registration Number EPD 511	EPD Date of Issue July 20, 2023	EPD Period of Validity July 19, 2028	
EPD Recipient Organization	SOPREMA Inc. 1688, Jean-Berchmans-Michaud Drummondville (Quebec) J2C 8E9 Canada www.soprema.ca		
EPD Type/Scope and Declared Unit Product specific cradle-to-gate EPD with declared unit of 1 m ² of membrane			Year of Reported Manufacturer Primary Data 2021
Geographical Scope North America	LCA Software OpenLCA v.1.11.0	LCI Databases Ecoinvent 3.9.1 and US LCI	LCIA Methodology TRACI 2.1, CED LHV v1.0 and HHV v.1.01
This LCA and EPD were prepared by:		Chantal Lavigne, M.A Sc Vertima Inc. www.vertima.ca	
This EPD and LCA were independently verified in accordance with ISO 14025:2006, ISO 14040:2006, ISO 14044:2006 and ISO 21930:2017, as well as the ASTM International PCR "Water-Resistive and Air Barriers." <input type="checkbox"/> Internal <input checked="" type="checkbox"/> External		 Lindita Bushi, Ph.D. Athena Sustainable Materials Institute	

LIMITATIONS

Environmental declarations from different programs (ISO 14025) may not be comparable.[1]

Furthermore, *“comparison of construction products using an EPD shall be carried out in the context of the construction works. Consequently, comparisons of the environmental performance of construction products using the EPD shall consider all the relevant information modules over the full life cycle of the products within the construction works. Such a comparison requires scenarios in the construction works context. The provision of ISO 14025:2066, 6.7.2 on comparability shall apply.”*[2] In sum, “EPDs based on a declared unit shall not be used for comparisons.”[3]

The EPDs prepared from this report are not comparable as they are cradle-to-gate EPDs.



[Photo courtesy of SOPREMA]

2. PRODUCT SYSTEM DESCRIPTION

SOPREMA is an international manufacturer specializing in the production of innovative products for waterproofing, insulation, soundproofing and vegetated solutions for the roofing, building envelope and civil engineering sectors. SOPREMA manufactures several types of water barriers and air barriers.

2.1. PRODUCT DESCRIPTION



SOPRASEAL STICK 130 & 130-S membranes
[Photo courtesy of SOPREMA].

SOPRASEAL STICK 130 and SOPRASEAL STICK 130-S¹ are self-adhesive air/vapour barrier membranes composed of SBS modified bitumen and a strong glass mat reinforcement used on walls. They can also be used as a through-wall flashing membrane and transition membrane. The top surface is either sanded or covered with a thermofusible plastic film. A silicone release film covers the self-adhesive underface.

SOPRASEAL 60 and SOPRASEAL 60 FF¹ are thermofusible air/vapour barrier membranes composed of SBS modified bitumen and a glass mat reinforcement used on walls. The top surface of the membrane is either sanded or covered with a thermofusible plastic film.



SOPRASEAL 60 & 60 FF membranes
[Photo courtesy of SOPREMA].

¹ SOPRASEAL STICK 130, SOPRASEAL STICK 130 S, SOPRASEAL 60 and SOPRASEAL 60 FF are classified under the Construction Specification Institute (CSI) MasterFormat code 07 27 13 Modified Bituminous Sheet Air Barriers.



2.2. TECHNICAL DATA

Properties	Standards	SOPRASEAL STICK 130 & 130-S	SOPRASEAL 60 & 60 FF
Breaking strength, MD/XD	CAN/CGSB-37.56-M, 9th	19.5 / 12.7 kN/m	10 / 7.5 kN/m
Ultimate elongation, MD/XD	CAN/CGSB-37.56-M, 9th	10 / 8%	4 / 4%
Water vapour permeance	ASTM E96 (Procedure B)	< 2.5 ng/Pa•s•m ² (< 0.04 perm)	< 2.5 ng/Pa•s•m ² (< 0.04 perm)
Air permeability, 75 Pa	ASTM E283 (75 Pa)	No Measurable Air	No Measurable Air
Air permeability, 75 Pa	ASTM E2178	<0.001 L/s•m ²	<0.001 L/s•m ²
Air permeance of membrane	CAN/ULC S741	< 0.001 L/s•m ²	< 0.001 L/s•m ²

(All values are nominal)

2.3. PROPERTIES OF DECLARED PRODUCT AS DELIVERED

Specifications	SOPRASEAL STICK 130	SOPRASEAL STICK 130-S
Thickness	2.5 mm (79 mil)	
Dimensions	1 m x 10 m (3.3 ft x 33 ft)	
Roll weight	30 kg (66 lb)	29 kg (64 lb)
Reinforcement type	Glass mat	
Top face	Thermofusible plastic film	Sand
Underface	Silicone release film	
More details are available at	https://www.soprema.ca/en/products-systems/sopraseal-stick-130	https://www.soprema.ca/en/products-systems/sopraseal-stick-130-s

(All values are nominal)

Specifications	SOPRASEAL 60	SOPRASEAL 60 FF
Thickness	2.7 mm (79 mil)	
Dimensions	1 m x 10 m (3.3 ft x 33 ft)	
Roll weight	32 kg (71 lb)	31 kg (68 lb)
Reinforcement type	Glass mat	
Top face	Sand	Thermofusible plastic film
Underface	Thermofusible plastic film	
More details are available at	https://www.soprema.ca/en/products-systems/sopraseal-60	

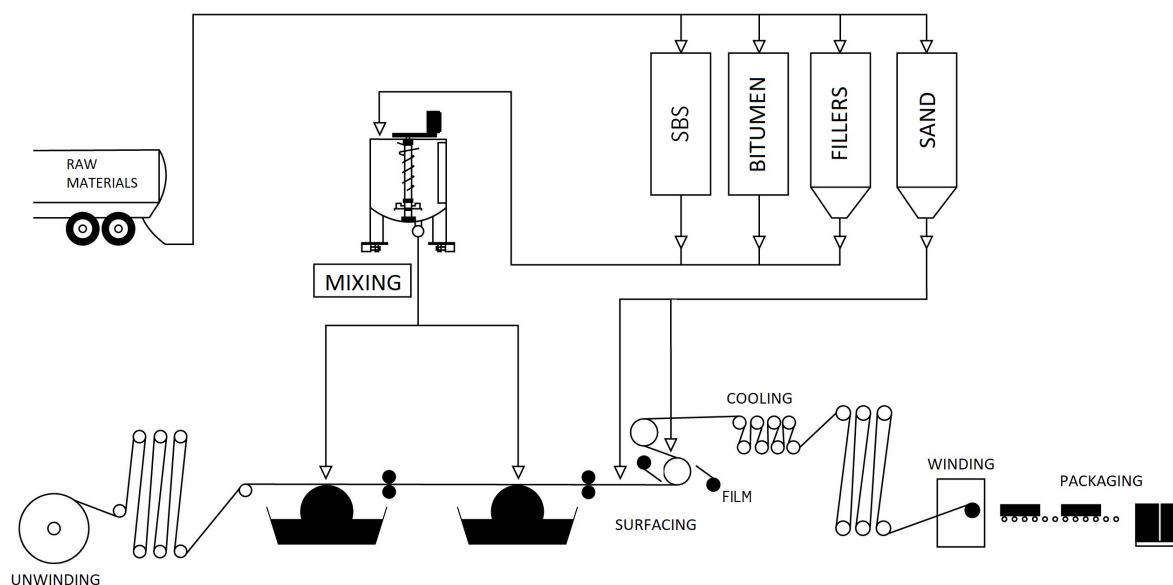
(All values are nominal)

2.4. MATERIAL COMPOSITION

Component/Material	SOPRASEAL STICK 130 & 130-S (production average)	SOPRASEAL 60 & 60 FF (production average)
SBS-modified bitumen mixture	89.1%	96.1%
Glass fibre reinforcing mat	4.4%	2.0%
Sand	5.4%	1.4%
Silicone-coated release film	1.0%	0.0%
Thermofusible plastic film	0.1%	0.3%
Coloured sand	0.1%	0.2%
TOTAL	100.0%	100.0%

2.5. MANUFACTURING

Manufacturing SBS-modified bitumen air barrier sheet materials, as shown in the figure below, involves impregnating and coating a fibreglass mat with SBS-modified asphalt and/or oxidized asphalt. The SBS-modified asphalt is produced by mixing the appropriate proportions of polymer (SBS), asphalt (also called bitumen), and limestone (fillers). Appropriate surfacing materials are applied on both surfaces of the sheets, such as sand and/or polymeric burn-off film, and a silicone-coated release film on the underface of self-adhesive products. The product is cooled, wound into rolls, and packaged for shipment.



SOPRASEAL STICK 130 & 130-S and SOPRASEAL 60 & 60 FF manufacturing process.



2.6. PACKAGING

Products are rolled on a cardboard tube on which a cardboard lip has been glued to add protection to the end of the roll. Tape, under which a polypropylene ribbon is placed in part, is applied on the rolls to keep them from unrolling. Thirty rolls are stacked on a wooden pallet which is protected by a labelled pallet bag.

SOPRASEAL STICK 130 & 130-S and SOPRASEAL 60 & 60 FF Packaging Materials per DU

Packaging	Material	SOPRASEAL STICK 130 & 130-S	SOPRASEAL 60 & 60 FF
Pallet	Wood (kg/m ²)	8.49E-02	7.19E-02
Cardboard tube, tube lip	Cardboard (kg/m ²)	2.15E-02	2.44E-02
Pallet bag	LDPE (kg/m ²)	3.60E-03	4.37E-03
Adhesive tape	PVC (kg/m ²)	8.32E-04	7.47E-04
Pallet labels	Paper (kg/m ²)	1.04E-05	1.18E-05
Ribbon	PP (kg/m ²)	8.49E-02	2.35E-02
Glue	PVA (kg/m ²)	2.01E-04	2.39E-04

2.7. PRODUCT INSTALLATION

SOPRASEAL STICK 130 & 130-S are self-adhesive membranes. To apply, peel off the top portion of the silicone release film/paper and adhere the membrane to the substrate, making sure that the membrane is well aligned. Gradually peel off the remaining silicone release film, making sure the membrane is kept tight and adheres completely to avoid air pockets and wrinkles. Once the membrane is installed, use a hard roller to apply pressure over the entire surface to ensure uniform adhesion to the substrate. Refer to the table below for details on gross/net coverage per roll and application temperatures.

SOPRASEAL 60 & 60 FF are heat-welded membranes. The membranes are applied using a torch and should never be bonded using hot asphalt. During installation, the membrane can be applied vertically starting at the bottom of the wall or can be applied horizontally. The flame should only be directed at the top surface of the roll in order to heat it just enough to soften the bitumen to obtain a small bead of melted bitumen in front of the membrane as it is unrolled onto the panel. Refer to the table below for details on gross/net coverage per roll and application temperatures.

Specifications	Gross / Net coverage per roll	Application temperature
SOPRASEAL STICK 130 & 130-S	10 / 9.5 m ² (107 / 102 ft ²)	-10 to 40°C (14 to 104°F)
SOPRASEAL 60 & 60 FF	9.1 / 8.6 m ² (97 / 86 ft ²)	> -35°C (-31°F)

2.8. REFERENCE SERVICE LIFE AND CONDITION OF USE

For this EPD, the system boundaries encompass a cradle-to-gate scope. Environmental impacts of products in the use phase are excluded from this declaration, per ASTM PCR Water-Resistive and Air Barriers.[3]

2.9. DISPOSAL

At their end-of-life, the SOPREMA membranes are sent to landfill.

3. LCA CALCULATION RULES

3.1. DECLARED UNIT

The selected declared unit (DU) for this study is **1 m² of membrane**.

SOPRASEAL STICK 130 & 103-S and SOPRASEAL 60 & 60 FF Declared Unit and Reference Flows

Description	SOPRASEAL STICK 130 & 130-S	SOPRASEAL 60 & 60 FF
Declared unit	1 m ²	1 m ²
Mass (kg/m ²)	2.962	3.628
Product density (kg/m ³)	1184.9	1343.9
Thickness (mm)	2.5	2.7

3.2. PRODUCTION AVERAGE

In this EPD, a weighted average is used for the

- SOPRASEAL STICK 130 and SOPRASEAL STICK 130-S, both produced at a facility located in British Columbia (Canada).
- SOPRASEAL 60, produced at a facility located in British Columbia (Canada), and SOPRASEAL 60 FF produced at two facilities, one located in British Columbia (Canada) and the second located in Quebec (Canada).

3.3. SYSTEM BOUNDARIES

According to ASTM's PCR,[3] the LCA modelling system boundaries can be **cradle-to-gate**, i.e., only cover the production life cycle stage as illustrated in **Table 1**. Within this life cycle stage, three (3) modules are considered, namely A-1) Extraction and upstream production, A-2) Transport to factory and A-3) Manufacturing. Construction (A-4; A-5), use (B-1 to B-7) and end-of-life (C-1 to C-4) stages are not included in this EPD. Figure 1 present the process flow diagram for SOPREMA's products. Neither green power nor CO₂ credits are used within the scope of this project.

Table 1: Description of the system boundary life cycle stages and related information modules

PRODUCTION STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE							END-OF-LIFE STAGE			
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
Extraction and Upstream Production	Transport to Factory	Manufacturing	Transport to site	Installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational Energy Use	Operational Water Use	Deconstruction / Demolition	Transport to Waste Processing or Disposal	Waste Processing	Disposal of Waste
X	X	X	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

Key: X = included; MND = module not declared (excluded)

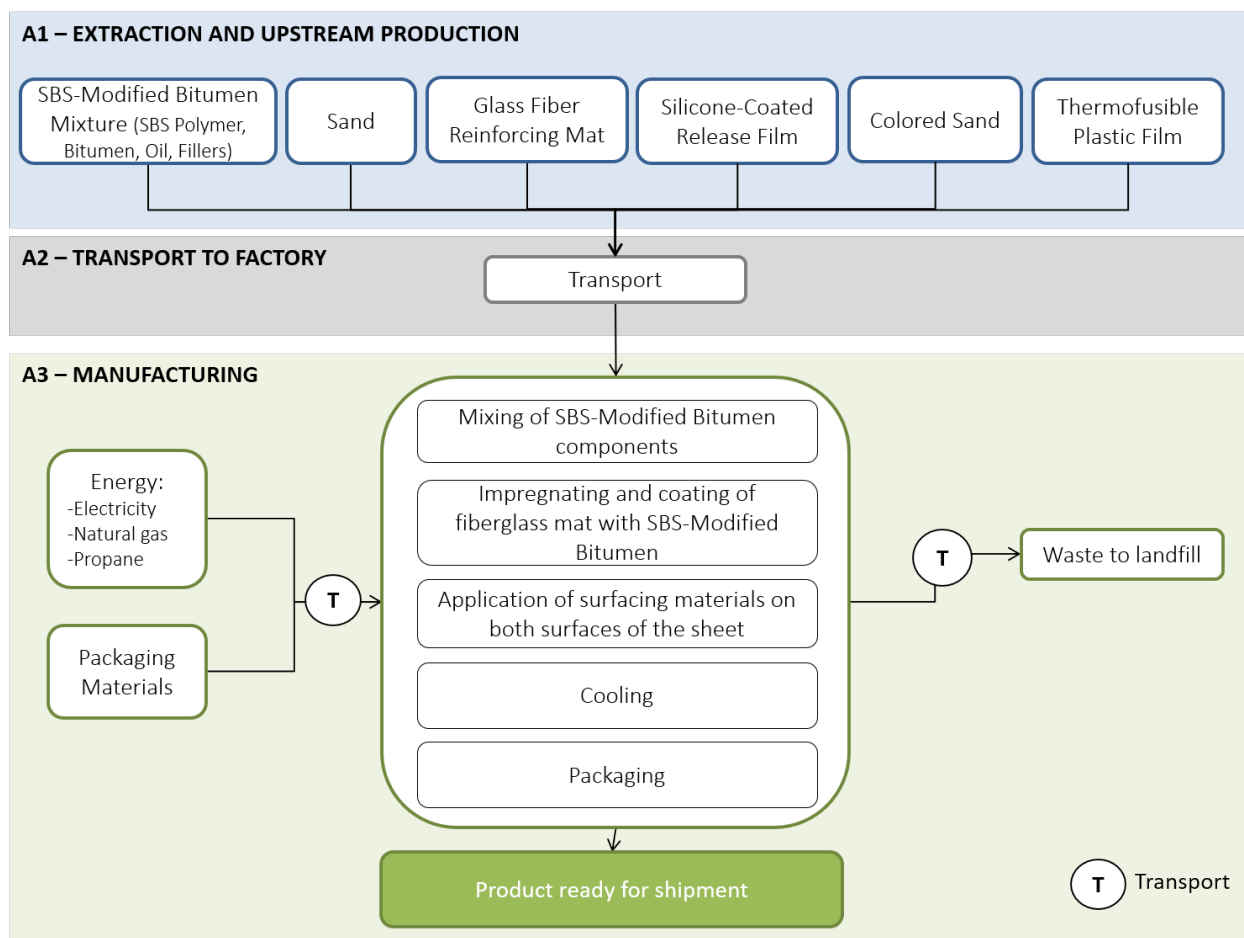


Figure 1: System Boundaries of Cradle-to-Gate LCA of SOPREMA's SOPRASEAL STICK 130 & 130-S and SOPRASEAL 60 & 60 FF membranes.

Extraction and upstream production: This module includes the extraction and transformation of raw materials needed to produce the SOPRASEAL STICK 130 & 130-S and SOPRASEAL 60 & 60 FF air barrier membranes.

Transport to factory: This module includes the transportation of raw materials to the manufacturing facilities located in the provinces of British Columbia and Quebec (Canada).

Manufacturing: This stage includes electricity, natural gas and propane consumption as well as production waste, which is sent to the local landfill. The manufacturing process does not require water, nor does it emit emissions directly to air, water or soil.

Packaging materials to make products ready for shipment, as well as their transport to the manufacturing facility is also covered by this stage.

3.4. CUT-OFF CRITERIA

According to ISO 21930:2017, cut-off rules shall not be applied to hide data. All data shall be included. In the case of insufficient data, the cut-off criteria shall be 1% of energy or 1% of total mass input and 1% of environmental impacts of the unit process. The total cut-off input flows per modules shall be a maximum of 5% energy, mass and environmental impacts.

No known flows are deliberately excluded from this EPD.

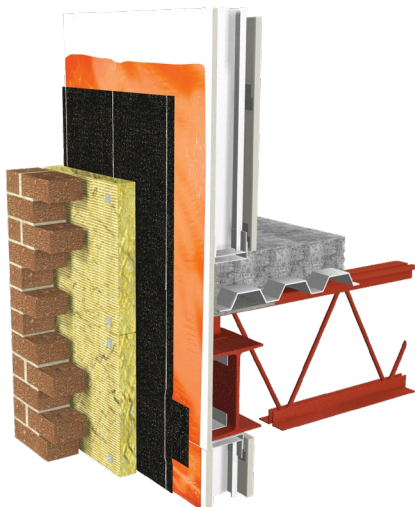
For this EPD, no data on the construction, maintenance or dismantling of the capital assets, daily transport of employees, office work, business trips or other employee activities were included in the model. The model only takes into account the processes associated with infrastructure that are already included in the ecoinvent unit processes.

3.5. ALLOCATION

Allocation, if required, shall follow the requirements and guidance of ISO 14044:2006, Section 4.3.4.[3,4]

Energy data was provided for the entire manufacturing plants; thus, **mass** allocation was used to assign the share of energy consumed in the factory to the product under study.

Waste processing of the material flows undergoing **recycling processes** are included up to the system boundary of the end-of-waste state.[2] In other words, a **cut-off approach** was used as further processing of the recycled material is part of raw material preparation of another product system (open-loop recycling).



[Photo courtesy of SOPREMA]

3.6. DATA SOURCES AND QUALITY REQUIREMENTS

Data Quality Parameter	Data Quality Discussion
Source of manufacturing data	Manufacturing data was collected from specific manufacturing facilities, which represents 100% of product production. This data included total annual mass and area of products under study: raw materials entering the production of the products under study, losses of materials, transport distance of materials, waste treatment, and product packaging. The data also included electricity consumption for the entire manufacturing facility as well as the total annual production of all products produced.
Source of secondary data	Background data were taken from the ecoinvent 3.9.1 “cut-off” database.[5] Datasets were selected based on their representativeness of the products’ composing materials. When appropriate, the dataset’s grid mix was changed for the grid mix of the province or country where production takes places. Otherwise, ecoinvent data representative of the global market or “rest-of-the-world” were selected as proxies.
Geographical representativeness	Electricity consumption is based on the electricity mix provided by the electricity supplier. Geographical correlation of the material composing the product and the selected datasets are largely representative of the same area. When this was not possible, datasets representing a larger geographical area were taken.
Temporal representativeness	Primary data represents the 2021 production year. Life cycle inventory datasets from ecoinvent are not always published within the last 10 years; nevertheless, ecoinvent remains a reference LCI database.
Technological representativeness	Primary data, obtained from the manufacturer, is representative of the current technologies and materials used by this company.
Completeness	All relevant process steps were considered and modelled to satisfy the goal and scope. No known flows were cut off.

4. LIFE CYCLE ASSESSMENT RESULTS

4.1. RESULTS TABLES

It should be noted that Life Cycle Impact Assessment (LCIA) results are relative expressions and do not predict impacts on category endpoints, the exceeding of thresholds, safety margins or risks.

Environmental Indicator		Unit
TRACI 2.1		
GWP ₁₀₀ -AR5 ⁽¹⁾	Global warming potential	kg CO ₂ eq.
GWP ₁₀₀ -AR4 ⁽²⁾	Global warming potential	kg CO ₂ eq.
AP	Acidification potential	kg SO ₂ eq.
EP	Eutrophication potential	kg N eq
ODP	Ozone layer depletion potential	kg CFC-11 eq.
SFP	Smog formation potential	kg O ₃ eq
RDP	Resource depletion potential – fossil fuels	MJ Surplus
Resource Use		
PENR-fossil	Primary energy non-renewable, fossil	MJ, HHV
PENR-nuclear	Primary energy non-renewable, nuclear	MJ, HHV
PER-biomass	Primary energy renewable, biomass	MJ, HHV
PER-swhg	Primary energy renewable, solar, wind, hydroelectric and geothermal energy	MJ, HHV
Material Resources Consumption and Waste		
NRMR ⁽³⁾	Non-renewable material resources	kg
RMR ⁽⁴⁾	Renewable material resources	kg
NFW ⁽⁵⁾	Net fresh water	L
HWD ⁽⁶⁾	Hazardous waste disposed	kg
NHWD ⁽⁷⁾	Non-hazardous waste disposed	kg

Table Notes – TRACI 2.1

- (1) GWP 100, excludes biogenic CO₂ removals and emissions associated with biobased products and packaging; 100-year time horizon GWP factors are provided by the IPCC 2013 Fifth Assessment Report (AR5).
 (2): GWP 100, excludes biogenic CO₂ removals and emissions associated with biobased products and packaging; 100-year time horizon GWP factors are provided by the IPCC 2007 Fourth Assessment Report (AR4).

Table Notes – Material Resource Consumption and Waste

- (3): Calculated based on the product's material.
 (4): The product does not contain renewable material in its composition.
 (5): Represents the use of net fresh water calculated from life cycle inventory results, i.e., water consumption using ReCiPe Midpoint (E) 2016.
 (6): Calculated from life cycle inventory results, based on datasets classified under "treatment and disposal of hazardous waste." The manufacturer does not generate hazardous waste during the manufacturing process.
 (7): Calculated from life cycle inventory results, based on waste that is neither "hazardous" nor "radioactive."

Additional Environmental Indicators		Unit
Resource Use		
RPR _E ⁽¹⁾	Renewable primary resources used as energy carrier (fuel)	MJ, LHV
RPR _M ⁽²⁾	Renewable primary resources with energy content used as material	MJ, LHV
RPR _T	Renewable primary resources total	MJ, LHV
NRPR _E ⁽³⁾	Non-renewable primary resources used as energy carrier (fuel)	MJ, LHV
NRPR _M ⁽⁴⁾	Non-renewable primary resources with energy content used as material	MJ, LHV
NRPR _T	Non-renewable primary resources total	MJ, LHV
SM	Secondary materials	kg
RSF	Renewable secondary fuels	MJ, LHV
NRSF	Non-renewable secondary fuels	MJ, LHV
FW ⁽⁵⁾	Use of net freshwater resources	m ³
Output Flows and Waste Categories		
HWD ⁽⁶⁾	Hazardous waste disposed	kg
NHWD ⁽⁷⁾	Non-hazardous waste disposed	kg
HLRW ⁽⁸⁾	High-level radioactive waste, conditioned, to final repository	m ³
ILLRW ⁽⁹⁾	Intermediate- and low-level radioactive waste, conditioned to final repository	m ³
CRU	Components for re-use	kg
MFR	Materials for recycling	kg
MER	Materials for energy recovery	kg
EE	Exported energy	MJ, LHV

Table Notes – Resource Use

- (1): $RPR_E = RPR_T - RPR_M$, where RPR_T is equal to the value for renewable energy obtained using the CED LHV methodology.
- (2): Calculated as per ACLCA ISO 21930 Guidance, 6.2 Renewable primary resources with energy content used as a material, RPR_M .
- (3): $NRPR_E = NRPR_T - NRPR_M$, where $NRPR_T$ is equal to the value for non-renewable energy obtained using the CED LHV methodology.
- (4): Calculated as per ACLCA ISO 21930 Guidance, 6.4 Non-renewable primary resources with energy content used as a material, $NRPR_M$.
- (5): Represents the use of net freshwater calculated from life cycle inventory results, i.e., water consumption using ReCiPe Midpoint (E) 2016.

Table Notes – Output Flows and Waste Categories

- (6): Calculated from life cycle inventory results, based on datasets classified under "treatment and disposal of hazardous waste." The manufacturer does not generate hazardous waste during the manufacturing process.
- (7): Calculated from life cycle inventory results, based on waste that is neither "hazardous" nor "radioactive."
- (8): Calculated from life cycle inventory results, based onecoinvent waste flow "high-level radioactive waste for final repository."
- (9): Calculated from life cycle inventory results, based onecoinvent waste flow "low-level radioactive waste for final repository."

SOPRASEAL STICK 130 & 130-S (Production average)					
Environmental Indicator	Unit	A1 (per m ²)	A2 (per m ²)	A3 (per m ²)	A1 - A3 (per m ²)
TRACI 2.1					
GWP ₁₀₀ -AR5 ⁽¹⁾	kg CO ₂ eq.	2.51E+00	3.38E-01	1.72E-01	3.02E+00
GWP ₁₀₀ -AR4 ⁽²⁾	kg CO ₂ eq.	2.49E+00	3.37E-01	1.69E-01	3.00E+00
AP	kg SO ₂ eq.	8.49E-03	3.52E-03	4.64E-04	1.25E-02
EP	kg N eq	1.53E-03	2.55E-04	2.61E-04	2.05E-03
ODP	kg CFC-11 eq.	9.47E-06	1.10E-09	5.44E-09	9.48E-06
SFP	kg O ₃ eq	1.47E-01	1.06E-01	1.04E-02	2.64E-01
RDP	MJ Surplus	1.28E+01	5.99E-01	5.50E-02	1.34E+01
Resource Use					
PENR-fossil	MJ, HHV	1.36E+02	4.81E+00	2.67E+00	1.44E+02
PENR-nuclear	MJ, HHV	4.20E-01	4.24E-04	9.96E-02	5.20E-01
PER-biomass	MJ, HHV	1.34E-01	9.19E-04	3.85E-01	5.20E-01
PER-swhg	MJ, HHV	8.65E-01	6.97E-03	8.64E-01	1.74E+00
Material Resource Consumption and Waste					
NRMR ⁽³⁾	kg	2.96E+00	0.00E+00	0.00E+00	2.96E+00
RMR ⁽⁴⁾	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NFW ⁽⁵⁾	L	9.94E+00	5.08E-02	6.05E+00	1.60E+01
HWD ⁽⁶⁾	kg	5.68E-01	2.68E-03	1.22E-01	6.92E-01
NHWD ⁽⁷⁾	kg	1.83E-01	4.15E-03	3.66E-02	2.24E-01

Table Notes – TRACI 2.1

- (1) GWP 100, excludes biogenic CO₂ removals and emissions associated with biobased products and packaging; 100-year time horizon GWP factors are provided by the IPCC 2013 Fifth Assessment Report (AR5).
- (2): GWP 100, excludes biogenic CO₂ removals and emissions associated with biobased products and packaging; 100-year time horizon GWP factors are provided by the IPCC 2007 Fourth Assessment Report (AR4).

Table Notes – Material Resource Consumption and Waste

- (3): Calculated based on the product's material.
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- (5): Represents the use of net fresh water calculated from life cycle inventory results, i.e., water consumption using ReCiPe Midpoint (E) 2016.
- (6): Calculated from life cycle inventory results, based on datasets classified under "treatment and disposal of hazardous waste." The manufacturer does not generate hazardous waste during the manufacturing process.
- (7): Calculated from life cycle inventory results, based on waste that is neither "hazardous" nor "radioactive."

SOPRASEAL STICK 130 & 130-S (Production average)					
Environmental Indicator	Unit	A1 (per m ²)	A2 (per m ²)	A3 (per m ²)	A1 - A3 (per m ²)
Resource Use					
RPR _E ⁽¹⁾	MJ, LHV	1.00E+00	7.89E-03	1.25E+00	2.26E+00
RPR _M ⁽²⁾	MJ, LHV	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RPR _T	MJ, LHV	1.00E+00	7.89E-03	1.25E+00	2.26E+00
NRPR _E ⁽³⁾	MJ, LHV	4.59E+01	4.31E+00	7.48E-01	5.10E+01
NRPR _M ⁽⁴⁾	MJ, LHV	8.01E+01	0.00E+00	0.00E+00	8.01E+01
NRPR _T	MJ, LHV	1.26E+02	4.31E+00	7.48E-01	1.31E+02
SM	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	MJ, LHV	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ, LHV	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW ⁽⁵⁾	m ³	9.94E-03	5.08E-05	6.05E-03	1.60E-02
Output Flows and Waste Categories					
HWD ⁽⁶⁾	kg	5.68E-01	2.68E-03	1.22E-01	6.92E-01
NHWD ⁽⁷⁾	kg	1.83E-01	4.15E-03	3.66E-02	2.24E-01
RWD	kg	1.15E-07	1.13E-10	2.85E-08	1.44E-07
HLRW ⁽⁸⁾	m ³	3.17E-10	3.11E-13	7.85E-11	3.95E-10
ILLRW ⁽⁹⁾	m ³	2.04E-09	1.84E-12	4.20E-10	2.47E-09
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	3.80E-03	0.00E+00	0.00E+00	3.80E-03
MER	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EE	MJ, LHV	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table Notes – Resource Use

- (1): $RPR_E = RPR_T - RPR_M$, where RPR_T is equal to the value for renewable energy obtained using the CED LHV methodology.
- (2): Calculated as per ACLCA ISO 21930 Guidance, 6.2 Renewable primary resources with energy content used as a material, RPR_M .
- (3): $NRPR_E = NRPR_T - NRPR_M$, where $NRPR_T$ is equal to the value for non-renewable energy obtained using the CED LHV methodology.
- (4): Calculated as per ACLCA ISO 21930 Guidance, 6.4 Non-renewable primary resources with energy content used as a material, $NRPR_M$.
- (5): Represents the use of net freshwater calculated from life cycle inventory results, i.e., water consumption using ReCiPe Midpoint (E) 2016.

Table Notes – Output Flows and Waste Categories

- (6): Calculated from life cycle inventory results, based on datasets classified under "treatment and disposal of hazardous waste." The manufacturer does not generate hazardous waste during the manufacturing process.
- (7): Calculated from life cycle inventory results, based on waste that is neither "hazardous" nor "radioactive."
- (8): Calculated from life cycle inventory results, based on ecoinvent waste flow "high-level radioactive waste for final repository."
- (9): Calculated from life cycle inventory results, based on ecoinvent waste flow "low-level radioactive waste for final repository."

SOPRASEAL 60 & 60 FF (Production average)					
Environmental Indicator	Unit	A1 (per m ²)	A2 (per m ²)	A3 (per m ²)	A1 - A3 (per m ²)
TRACI 2.1					
GWP ₁₀₀ -AR5 ⁽¹⁾	kg CO ₂ eq.	2.34E+00	2.96E-01	1.73E-01	2.81E+00
GWP ₁₀₀ -AR4 ⁽²⁾	kg CO ₂ eq.	2.33E+00	2.95E-01	1.70E-01	2.80E+00
AP	kg SO ₂ eq.	7.09E-03	3.11E-03	4.31E-04	1.06E-02
EP	kg N eq	9.33E-04	2.26E-04	2.18E-04	1.38E-03
ODP	kg CFC-11 eq.	3.95E-09	1.01E-09	5.78E-09	1.07E-08
SFP	kg O ₃ eq	1.35E-01	9.42E-02	9.39E-03	2.39E-01
RDP	MJ Surplus	1.31E+01	5.48E-01	5.79E-02	1.37E+01
Resource Use					
PENR-fossil	MJ, HHV	1.39E+02	4.40E+00	2.69E+00	1.46E+02
PENR-nuclear	MJ, HHV	1.83E-01	3.89E-04	1.27E-01	3.11E-01
PER-biomass	MJ, HHV	5.10E-02	8.42E-04	4.17E-01	4.69E-01
PER-swhg	MJ, HHV	8.30E-01	7.23E-03	1.65E+00	2.49E+00
Material Resource Consumption and Waste					
NRMR ⁽³⁾	kg	3.63E+00	0.00E+00	0.00E+00	3.63E+00
RMR ⁽⁴⁾	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NFW ⁽⁵⁾	L	7.16E+00	4.66E-02	6.91E+00	1.41E+01
HWD ⁽⁶⁾	kg	2.99E-01	2.46E-03	8.66E-02	3.88E-01
NHWD ⁽⁷⁾	kg	5.64E-02	3.80E-03	9.23E-02	1.53E-01

Table Notes – TRACI 2.1

- (1) GWP 100, excludes biogenic CO₂ removals and emissions associated with biobased products and packaging; 100-year time horizon GWP factors are provided by the IPCC 2013 Fifth Assessment Report (AR5).
- (2): GWP 100, excludes biogenic CO₂ removals and emissions associated with biobased products and packaging; 100-year time horizon GWP factors are provided by the IPCC 2007 Fourth Assessment Report (AR4).

Table Notes – Material Resource Consumption and Waste

- (3): Calculated based on the product's material.
- (4): The product does not contain renewable material in its composition.
- (5): Represents the use of net fresh water calculated from life cycle inventory results, i.e., water consumption using ReCiPe Midpoint (E) 2016.
- (6): Calculated from life cycle inventory results, based on datasets classified under "treatment and disposal of hazardous waste." The manufacturer does not generate hazardous waste during the manufacturing process.
- (7): Calculated from life cycle inventory results, based on waste that is neither "hazardous" nor "radioactive."

SOPRASEAL 60 & 60 FF (Production average)					
Environmental Indicator	Unit	A1 (per m ²)	A2 (per m ²)	A3 (per m ²)	A1 - A3 (per m ²)
Resource use					
RPR _E ⁽¹⁾	MJ, LHV	8.30E-01	7.23E-03	1.65E+00	2.49E+00
RPR _M ⁽²⁾	MJ, LHV	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RPR _T	MJ, LHV	8.30E-01	7.23E-03	1.65E+00	2.49E+00
NRPR _E ⁽³⁾	MJ, LHV	5.06E+01	3.95E+00	7.63E-01	5.53E+01
NRPR _M ⁽⁴⁾	MJ, LHV	7.99E+01	0.00E+00	0.00E+00	7.99E+01
NRPR _T	MJ, LHV	1.30E+02	3.95E+00	7.63E-01	1.35E+02
SM	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	MJ, LHV	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ, LHV	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW ⁽⁵⁾	m ³	7.16E-03	4.66E-05	6.91E-03	1.41E-02
Output flows and waste categories					
HWD ⁽⁶⁾	kg	2.99E-01	2.46E-03	8.66E-02	3.88E-01
NHWD ⁽⁷⁾	kg	5.64E-02	3.80E-03	9.23E-02	1.53E-01
RWD	kg	5.06E-08	1.04E-10	8.60E-08	1.37E-07
HLRW ⁽⁸⁾	m ³	1.39E-10	2.85E-13	2.37E-10	3.76E-10
ILLRW ⁽⁹⁾	m ³	7.01E-10	1.68E-12	4.95E-10	1.20E-09
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	4.13E-03	0.00E+00	0.00E+00	4.13E-03
MER	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EE	MJ, LHV	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table Notes – Resource use

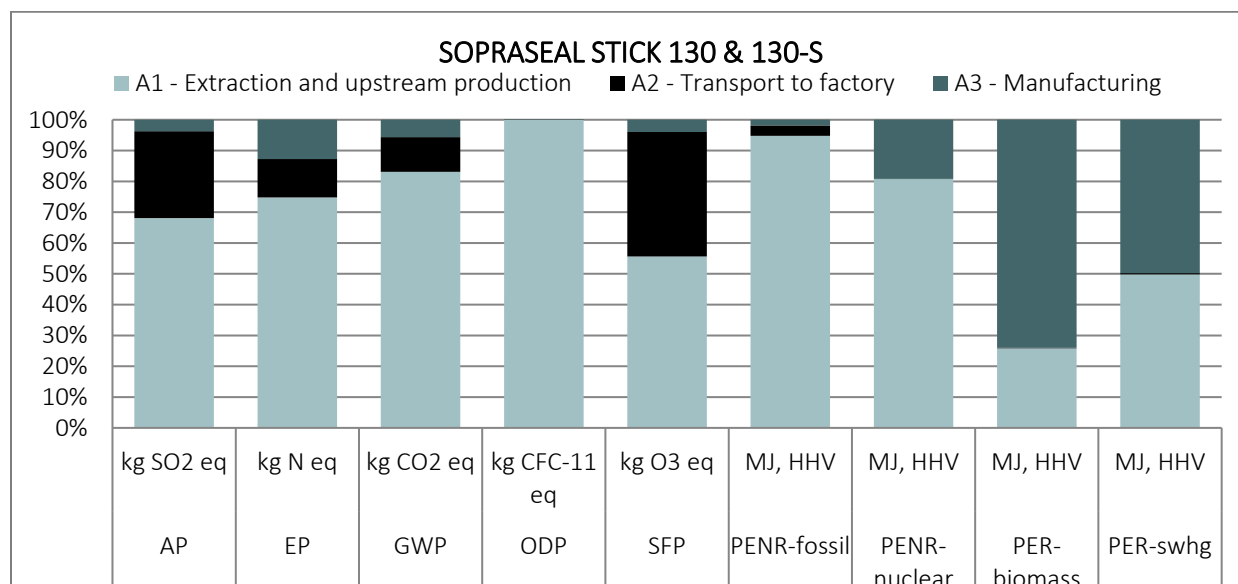
- (1): $RPR_E = RPR_T - RPR_M$, where RPR_T is equal to the value for renewable energy obtained using the CED LHV methodology.
- (2): Calculated as per ACLCA ISO 21930 Guidance, 6.2 Renewable primary resources with energy content used as a material, RPR_M .
- (3): $NRPR_E = NRPR_T - NRPR_M$, where $NRPR_T$ is equal to the value for non-renewable energy obtained using the CED LHV methodology.
- (4): Calculated as per ACLCA ISO 21930 Guidance, 6.4 Non-renewable primary resources with energy content used as a material, $NRPR_M$.
- (5): Represents the use of net fresh water calculated from life cycle inventory results, i.e., water consumption using ReCiPe Midpoint (E) 2016.

Table Notes – Output flows and waste categories

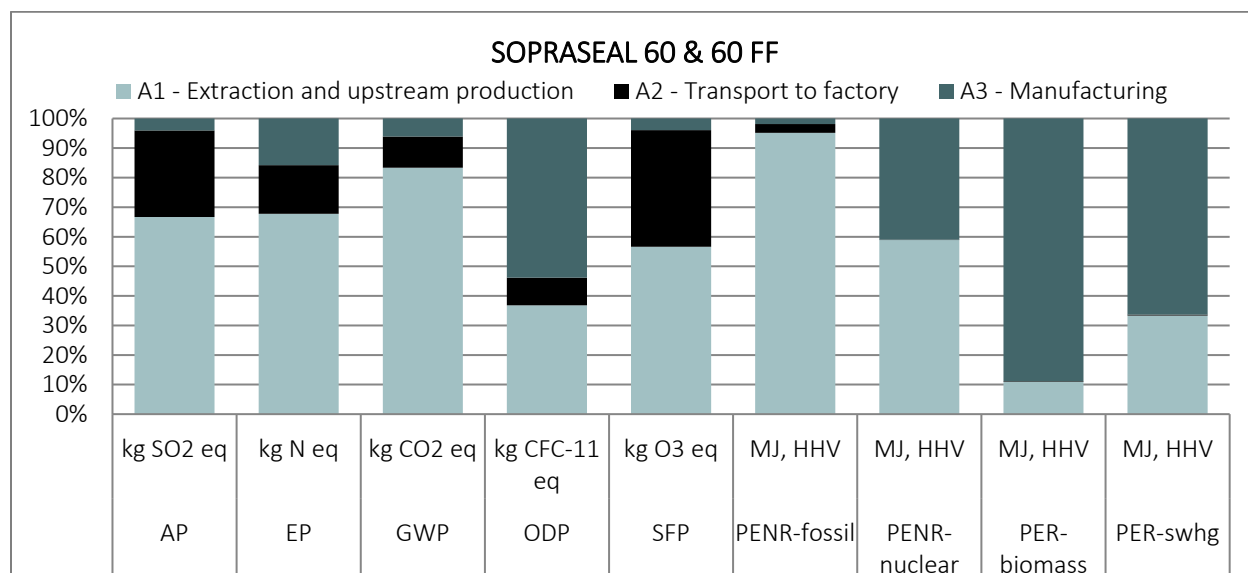
- (6): Calculated from life cycle inventory results, based on datasets classified under "treatment and disposal of hazardous waste." The manufacturer does not generate hazardous waste during the manufacturing process.
- (7): Calculated from life cycle inventory results, based on waste that is neither "hazardous" nor "radioactive."
- (8): Calculated from life cycle inventory results, based on ecoinvent waste flow "high-level radioactive waste for final repository."
- (9): Calculated from life cycle inventory results, based on ecoinvent waste flow "low-level radioactive waste for final repository."

4.2. CONTRIBUTION ANALYSIS

The results for SOPRASEAL STICK 130 & 130-S and SOPRASEAL 60 & 60 FF, as shown in the figures below, are very similar, except for the ozone layer depletion category where extraction and upstream production (A1) is the main contributor for SOPRASEAL STICK 130 & 130-S, while manufacturing (A3) is the greatest contributor for SOPRASEAL 60 & 60 FF.



Contribution analysis of information modules A1-A3 of the SOPRASEAL STICK 130 & 130-S product life cycle stage - TRACI & CED indicators.



Contribution analysis of information modules A1-A3 of the SOPRASEAL 60 & 60 FF product life cycle stage - TRACI & CED indicators

5. ADDITIONAL ENVIRONMENTAL INFORMATION

5.1. REGULATED HAZARDOUS SUBSTANCES

There are no ingredients present in the SOPRASEAL STICK 130 & 130-S and SOPRASEAL 60 & 60 FF, within the current knowledge and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in the product safety data sheet.

5.2. DANGEROUS SUBSTANCES

SOPRESEAL STICK 130 & 130-S are not expected to release dangerous substances during normal use.

SOPRASEAL 60 & 60 FF, which are torched-applied, produce thick black smoke. Irritating and/or toxic gases including hydrogen sulfide and sulphur dioxide, traces of metallic fumes may be generated by thermal decomposition of combustion.

5.3. FURTHER INFORMATION

SOPREMA has also published a Health Product Declaration® for the SOPRASEAL 60 FF. More details are available on the HPDC public repository: <https://www.hpd-collaborative.org/hpd-public-repository/>.

Additional product information can be found on SOPREMA's website:

(<https://www.soprema.ca/en/products-systems/building-components/walls/air-and-vapour-barrier>).

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- [4] International Organization for Standardization (ISO), "ISO 14044:2006/AMD1:2017/AMD 2:2020 Environmental management - Life cycle assessment - Requirements and guidelines," 2006.
- [5] F. R. *et al.*, "Overview and Methodology.ecoinvent report No. 1," Dübendorf, 2007.
- [6] ASTM International, "ASTM Program Operator Rules. Version: 8.0, Revised 04/29/20," 2020 [Online]. Available: www.astm.org.
- [7] Vertima, "Life Cycle Assessment of SOPREMA's Air Barriers," 2023.



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EPD

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