

Environmental Product Declaration

according to ISO 14025 and EN 15804



This declaration is for:
Flagon EP/PV

Provided by:
SOPREMA SRL



program operator

Stichting MRPI®

publisher

Stichting MRPI®

www.mrpi.nl

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1.1.00183.2021

date of first issue

18-01-2021

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18-01-2026



Nationale

MilieuDATABASE



COMPANY INFORMATION



SOPREMA SRL
Via Industriale dell'Isola 3
24040
Chignolo

www.soprema.it

MRPI® REGISTRATION

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PRODUCT

Flagon EP/PV

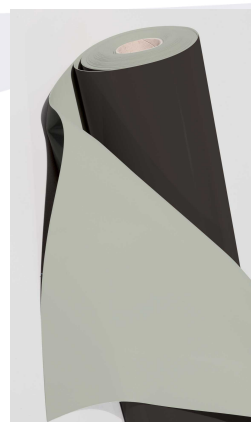
DECLARED UNIT/FUNCTIONAL UNIT

1 m² of installed membrane

DESCRIPTION OF PRODUCT

flexible sheets for roof waterproofing

VISUAL PRODUCT



MORE INFORMATION

www.soprema.it

SCOPE OF DECLARATION

This MRPI®-EPD certificate is verified by **Pieter Stadhouders, Ecoreview**.

The LCA study has been done by **Riccardo Novelli/Davide Burlon, LCE**.

The certificate is based on an LCA-dossier according to ISO14025 and NEN-EN15804+A1. It is verified according to the 'EPD-MRPI® verification protocol May 2017.v3.1'. EPDs of construction products may not be comparable if they do not comply with NEN-EN15804+A1. Declaration of SVHC that are listed on the 'Candidate List of Substances of Very High Concern for authorisation' when content exceeds the limits for registration with ECHA.

PROGRAM OPERATOR

Stichting MRPI®
Kingsfordweg 151
1043GR
Amsterdam

ir. J-P den Hollander, Managing director MRPI®

DEMONSTRATION OF VERIFICATION

CEN standard EN15804 serves as the core PCR[a]

Independent verification of the declaration and data,
according to EN ISO 14025:2010:

internal: external: X

Third party verifier:

Pieter Stadhouders, Ecoreview

[a] PCR = Product Category Rules

DETAILED PRODUCT DESCRIPTION

The product is reinforced with polyester net and coupled with a polyester non-woven fabric (EP/PR-F) and UV-resistant. Suitable for flat or sloped roofing. The waterproofing system is mechanically fixed to the support, in order to prevent the wind from removing or damaging it. Such system must resist to atmospheric agents and UV rays, as well as to a moderate pedestrian use due to maintenance.

COMPONENT (> 1%)	[kg / %]
TPO	62%
Additives and charges	36%
Reinforcing material	2%
Polyester non-woven fabric	<1%

(*) > 1% of total mass

SCOPE AND TYPE

The product is manufactured in the Chignolo d'Isola plant in Italy and sold worldwide. The software used is Simapro 9 with the Ecoinvent 3.5 and the Plastics Europe databases.

PRODUCT STAGE			CONSTRUCTION			USE STAGE							END OF LIFE			BENEFITS AND	
			PROCESS										STAGE			LOADS BEYOND THE	
			STAGE													SYSTEM BOUNDARIES	
Raw material supply	Transport	Manufacturing	Transport gate to site	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse- Recovery- Recycling- potential	
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D	
X	X	X	X	X	MNA	MNA	MNA	X	MNA	MNA	MNA	MNA	X	X	X		X

X = Module assessed

MNA = Module not assessed

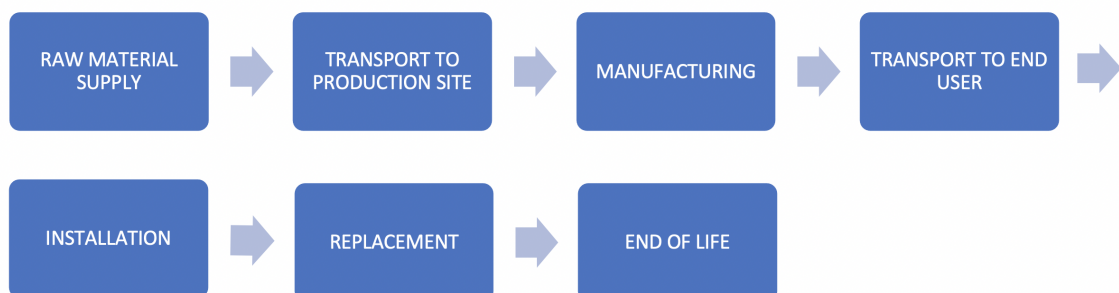


Figure: LCA process diagram according to EN 15804(7.2.1)

REPRESENTATIVENESS

The EPD is representative for products manufactured in Chignolo d'Isola (Italy) plant and sold worldwide.

ENVIRONMENTAL IMPACT per functional unit or declared unit

	UNIT	A1	A2	A3	A1-A3	A4	A5	B4	C2	C3	C4	D
ADPE	kg Sb-eq.	2.59 E-9	1.25 E-10	1.86 E-10	1.25 E-10	3.68 E-12	1.34 E-09	8.49 E-9	4.79 E-11	2.09 E-09	0.00	-1.34 E-10
ADPF	MJ	1.04 E+0	2.92 E-2	5.93 E-2	2.92 E-2	2.63 E-02	4.05 E-02	2.39 E+0	3.42 E-01	-8.95 E-05	0.00	-4.35 E-01
GWP	kg CO ₂ -eq.	3.81 E-2	2.08 E-3	3.82 E-3	2.08 E-3	1.84 E-03	5.05 E-03	1.02 E-1	2.42 E-02	3.06 E-02	0.00	-2.89 E-02
ODP	kg CFC11-eq.	1.50 E-9	3.87 E-10	4.31 E-11	3.87 E-10	3.48 E-10	3.69 E-10	5.29 E-9	4.53 E-09	3.60 E-12	0.00	-2.87 E-09
POCP	kg ethene-eq.	1.03 E-5	2.06 E-7	4.60 E-7	2.06 E-7	2.73 E-07	5.30 E-07	2.35 E-5	3.46 E-06	7.10 E-08	0.00	-5.19 E-06
AP	kg SO ₂ -eq.	1.16 E-4	7.27 E-6	8.58 E-6	7.27 E-6	8.40 E-06	1.56 E-05	3.12 E-4	1.07 E-04	2.22 E-06	0.00	-1.19 E-04
EP	kg (PO ₄) ₃ -eq.	3.30 E-5	1.38 E-6	7.89 E-7	1.38 E-6	1.73 E-06	2.71 E-06	7.92 E-5	2.19 E-05	5.59 E-07	0.00	-9.46 E-06
Toxicity indicators (Dutch market)												
HTP	kg DCB-eq.	2.05 E-3	5.83 E-4	2.53 E-4	2.89 E-3	5.23 E-4	5.29 E-4	7.88 E-3	5.79 E-3	8.88 E-4	0.00	-1.80 E-3
FAETP	kg DCB-eq.	8.00 E-4	2.10 E-5	1.14 E-5	8.32 E-4	2.25 E-5	2.81 E-5	1.77 E-3	2.64 E-4	1.69 E-4	0.00	-7.11 E-5
MAETP	kg DCB-eq.	4.24 E+0	1.10 E-1	6.97 E-1	5.05 E+0	9.75 E-2	6.62 E-1	1.16 E+1	1.16 E+0	8.34 E-2	0.00	-6.67 E+0
TETP	kg DCB-eq.	9.27 E-6	1.66 E-6	1.22 E-6	1.21 E-5	1.62 E-6	2.66 E-6	3.29 E-5	1.85 E-5	1.60 E-7	0.00	-9.81 E-6
Environmental Cost Indicator (Dutch market)												
ECI	Euro	6.81 E-3	7.11 E-4	6.47 E-4	8.17 E-3	7.40 E-4	1.05 E-3	1.99 E-2	9.33 E-3	1.87 E-3	0.00	-4.89 E-3

ADPE = Abiotic Depletion Potential for non-fossil resources

ADPF = Abiotic Depletion Potential for fossil resources

GWP = Global Warming Potential

ODP = Depletion potential of the stratospheric ozone layer

POCP = Formation potential of tropospheric ozone photochemical oxidants

AP = Acidification Potential of land and water

EP = Eutrophication Potential

HTP = Human Toxicity Potential

FAETP = Fresh water aquatic ecotoxicity potential

MAETP = Marine aquatic ecotoxicity potential

TETP = Terrestrial ecotoxicity potential

ECI = Environmental Cost Indicator

RESOURCE USE per functional unit or declared unit

	UNIT	A1	A2	A3	A1-A3	A4	A5	B4	C2	C3	C4	D
PERE	MJ	1.76 E-02	2.09 E-5	1.42 E-03	2.09 E-5	4.16 E-05	1.08 E-02	5.98 E-2	5.42 E-04	1.42 E-04	0.00	-3.18 E-02
PERM	MJ	1.99 E-02	2.10 E-5	1.02 E-03	2.10 E-5	2.73 E-05	5.37 E-04	4.30 E-2	3.56 E-04	6.86 E-06	0.00	-1.25 E-03
PERT	MJ	3.74 E-02	4.19 E-5	2.44 E-03	4.19 E-5	6.89 E-05	1.13 E-02	1.03 E-1	8.98 E-04	1.49 E-04	0.00	-3.31 E-02
PENRE	MJ	4.29 E-01	2.92 E-2	1.55 E-02	2.92 E-2	2.64 E-02	9.80 E-02	1.20 E+0	3.44 E-01	-2.52 E-04	0.00	-4.78 E-01
PENRM	MJ	6.93 E-01	0.00	5.11 E-02	0.00	0.00	0.00	1.49 E+0	0.00	0.00	0.00	0.00
PENRT	MJ	1.12 E+00	2.92 E-2	6.66 E-02	2.92 E-2	2.64 E-02	9.80 E-02	2.68 E+0	3.44 E-01	-2.52 E-04	0.00	-4.78 E-01
SM	kg	1.13 E-03	0.00	0.00	0.00	0.00	0.00	2.26 E-3	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	0.00	0.00
NRSF	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FW	m3	1.11 E-01	1.24 E-6	9.57 E-03	1.24 E-6	1.24 E-03	1.28 E+00	2.81 E-3	1.62 E-02	3.53 E-03	0.00	-9.77 E-02

PERE = Use of renewable energy excluding renewable primary energy resources

PERM = Use of renewable energy resources used as raw materials

PERT = Total use of renewable primary energy resources

PENRE = Use of non-renewable primary energy resources excluding non-renewable 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 materials

RSF = Use of renewable secondary fuels

NRSF = Use of non renewable secondary fuels

FW = Use of net fresh water

OUTPUT FLOWS AND WASTE CATEGORIES per functional unit or declared unit

	UNIT	A1	A2	A3	A1-A3	A4	A5	B4	C2	C3	C4	D
HWD	kg	4.98 E-11	0.00	0.00	0.00	0.00	0.00	9.96 E-11	0.00	0.00	0.00	0.00
NHWD	kg	3.05 E-03	0.00	5.76 E-04	0.00	0.00	0.00	7.25 E-03	0.00	-1.90 E-03	0.00	0.00
RWD	kg	1.66 E-06	0.00	0.00	0.00	0.00	0.00	3.32 E-06	0.00	-8.96 E-06	0.00	0.00
CRU	kg	0.00	0.00	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	2.96 E-02	0.00	0.00
MER	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.63 E-02	0.00	0.00
EEE	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ETE	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

HWD = Hazardous Waste Disposed

NHWD = Non Hazardous Waste Disposed

RWD = Radioactive Waste Disposed

CRU = Components for reuse

MFR = Materials for recycling

MER = Materials for energy recovery

EEE = Exported Electrical Energy

ETE = Exported Thermal Energy

CALCULATION RULES

CUT-OFF RULES

LCA model has been processed considering all main input/output associated with core process in accordance with the threshold valued stated in PCR 2012:01 v2.3 (ch. 7.6), namely the sum of the excluded material flows to the core module shall not exceed 1% of mass and energy. Hence, the following aspects were considered negligible:

- Production of packaging for the raw materials input process, except for PE packaging film;
- Drill electricity consumption related to mechanical installation;
- Water emissions from core process.

ALLOCATION

Allocation occurs anytime a system is producing more than a single output. In this case it is necessary to choose a technique to proper split the environmental burdens among the output flows; international standards ISO 14044 and PCR 2012:01 v2.3 provide guidelines about how to deal with this issue, that have been implemented in this project as well.

Soprema produces several product types that are not object of the study. Therefore, it is important to establish an allocation method based on physical variables to split input and output flows to the multi-products: allocation by square-metre of membrane produced has been chosen as most representative tool for the system understudy.

TRANSPORTATIONS

Impacts calculations related to transports in SimaPro are performed according to the Ecolnvent model. All the transports is assumed by truck or by ship. For Module A2, since no specific data are available, 500 km is used as average value (provided by Soprema) for raw materials transportation from suppliers to the plant. For module A4, specific information are provided, such as quantity transported and destination per each trip.

SCENARIOS AND ADDITIONAL TECHNICAL INFORMATION

A1 - RAW MATERIALS SUPPLY

This module considers the extraction and processing of all raw materials and energy (generation of electricity from national grid and NG supply for internal CHP system) which occur upstream to the Flagon manufacturing process.

A2 - RAW MATERIALS TRANSPORT

This module includes the raw materials transportation to the manufacturing plant, performed via road. Soprema provided the list of suppliers for all raw material, helpful to calculate the distance to the Flagon® manufacturing plant. No information was available for the externally ground PP. Hence, a distance of 50 km was used as hypothesis. Calculations in SimaPro are performed according to the Ecolnvent model.

PARAMETER	TRUCK
Vehicle type	Lorry 16-32 metric ton, EURO 4
Capacity (average load factor)	5.79 ton

A3 - MANUFACTURING

This module covers the manufacturing of the Flagon TPO membranes and includes all processes linked to production. Use of electricity (overall plant energy consumption, namely considering services too), production of electricity and heat from the CHP system, water usage, manufacturing emissions to air and waste treatment (considering also waste transport) are included in this module. All data was provided by Soprema itself, related to the production site in Chignolo d'Isola. For electricity production, the 2017 Italian residual mix was used. Yearly water consumption (from grid and from well) has been allocated to the total Flagon production at the site. Regarding packaging, only PE film was considered, being all other packaging types inside 1% cut-off. Air emission data provided by Soprema per total TPO membranes production, since no specific data at product-level are given. Production waste data is provided by Soprema for the whole plant as well, hence allocated to the whole production. Distance from the manufacturing plant to the waste treatment site assumed equal to 50 km, regardless of the waste type.

A4 - TRANSPORT TO BUILDING SITE

Transports were modelled according to the Ecolnvent model. Quantity transported and destination per each trip provided by Soprema. Depending on the destination, transports were assumed by truck for European destinations (using the ACI italian truck mix for EURO classes). A production-weighted average distance travelled was assessed.

PARAMETER	TRUCK
Transport Type	Lorry, 16-32 ton, mix ACI, Italy
Weighted distance	561 km
Capacity (average load factor)	5.79 ton

A5 - INSTALLATION

This module includes the environmental impacts associated with the products installation on the roof. Installation by full adhesion procedures is considered for this product. Product packaging (PE film) end-of-life municipal incineration is considered in this module.

PARAMETER	FULL ADHESION INSTALLATION
Contiguous membranes overlap	1.08 m2/m2 installed
Rubberfuse - polyurethane glue	0.20 kg/m2
Electricity consumption	0.02 kWh/m2

B4 - REPLACEMENT

According to the PCR 2014:12, a standard reference service lifetime of 30 years for the roof waterproofing system was used for calculations, with a total service lifetime of 90 years. Two replacements were thus considered. Replacement module includes all the previous stages doubled (A1, A2, A3, A4 and A5).

C2 - WASTE TRANSPORTATION

This module includes the out-of-service membranes transportation to waste treatment sites. No specific information were provided by the company, a realistic average distance to the waste treatment site was assumed. Transport assumed by truck (using the ACI italian truck mix for EURO classes).

PARAMETER	TRUCK
Vehicle Type	Lorry, 7.5-16 ton, mix ACI, Italy
Distance	50 km
Capacity (average load factor)	3.29 ton

C4 - WASTE DISPOSAL

This module includes waste processing for product disposal, considering a 100% sanitary landfill scenario. Only plastics and inert materials (including gravel for installation) are considered.

PARAMETER	
Share to Landfill disposal	100%



DECLARATION OF SVHC

The product considered does not contain any of the substances listed in the "Candidate List of Substances of very High Concern for authorisation"



REFERENCES

- General Programme Instructions for the International EPD® System v. 2.5, 2015
- Product Category Rules PCR 2012:01 v 2.3 "Construction products and construction services"
- PCR 2014:12 v 1.0 "Flexible sheets for waterproofing - bitumen , plastic or rubber sheets for roof waterproofing"
- Product Category Rules PCR 2007:08 v 3.1 "Electricity, steam and hot/cold water generation and distribution"
- EN 15804:2012+A1:2013
- ISO 14040:2006
- ISO 14044:2017
- ISO 14025:2010"



REMARKS

None