

## ENVIRONMENTAL PRODUCT DECLARATION

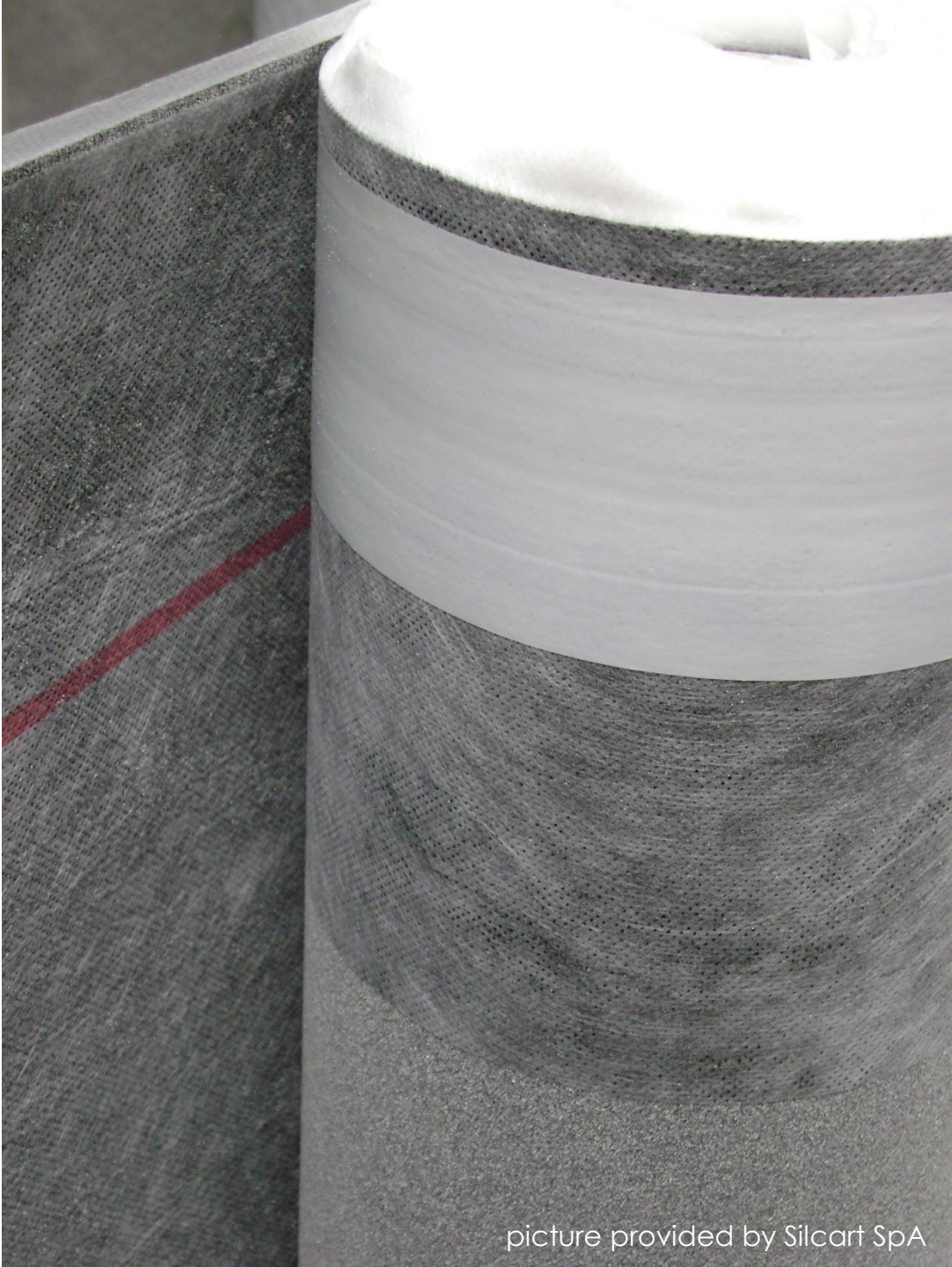
# Lightweight underlays For Roof Waterproofing – sector EPD

The product declared is an average that is not available for purchase on the market.

European **W**aterproofing **A**ssociation



<b>BASED ON:</b> PCR 2012:01 (version 2.2). 2017/05/30 Construction products and construction services UN CPC (5453)	<b>VERSION:</b> 2	<b>REGISTRATION NUMBERS</b>  International EPD® System: S-P-01329  ECO EPD REF. No. 00000748	<b>REGISTRATION DATE:</b> 2018/08/30  <b>VALID UNTIL:</b> 2023/08/29	<b>Geographical scope:</b> EWA members in: Denmark, Norway, Sweden, Finland, Italy, Russia
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picture provided by Silcart SpA

## REFERENCES

EPD owner: European Waterproofing Association AISBL Boulevard du Souverain 68B – 1170 Brussels BELGIUM

Program operator: EPD International AB, Box 210 60, SE-100 31 Stockholm, Sweden

## INDEPENDENT VERIFICATION

This declaration has been developed referring to the International EPD System, following the General Programme Instructions version 2.5; further information and the document itself are available at: [www.environdec.com](http://www.environdec.com)

CEN standard EN 15804 served as the core PCR (PCR 2012:01 Construction products and Construction services, Version 2.2, 2017-05-30) PCR review was conducted by: The Technical Committee of the International EPD® System. Chair: Filippo Sessa.

Contact via [info@environdec.com](mailto:info@environdec.com)

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

☐ EPD process certification (Internal)

☒ EPD verification (External): Ugo Pretato (Dr.), [pretato@studiosfieschi.it](mailto:pretato@studiosfieschi.it) [www.studiosfieschi.it](http://www.studiosfieschi.it) Accredited as Individual Verifier by the International EPD® System.

EPD of construction products may not be comparable if they do not comply with EN 15804.

## CONTATTI

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Technical support to EWA was provided by **Life Cycle Engineering**, Italy. ([info@studiolce.it](mailto:info@studiolce.it), [www.lcengineering.eu](http://www.lcengineering.eu))



## THE EWA

The **E**uropean **W**aterproofing **A**ssociation (**EWA**) was created to provide an authoritative voice for the European Waterproofing industry.

The EWA is Europe's central source of advice and information on all roofing and waterproofing matters, both to the industry and to its user groups.

Sustainable and environmental issues are, quite rightly, matters of great importance to us all in construction. A full understanding of environmental concerns – like 'global warming', 'waste recycling' and 'life-cycle analysis' – is core to maintaining our reputation as a responsible industry. For this reason EWA represents manufacturers who are committed to ensuring their industry is sustainable, which means to be environmentally, economically and socially responsible over time.

EWA decided to develop this **E**nvironmental **P**roduct **D**eclaration (**EPD**) for the lightweight bituminous underlays because it is considered an important tool to support manufacturers on the environmental marketing activities from a scientific and holistic perspective. The product declared is an average that is not available for purchase on the market. This document contains key information to help any expert, involved in construction deal, with the assessment of the environmental impact of the building, building materials and systems used.





## BITUMINOUS UNDERLAYS

Bituminous underlays are commonly installed underneath pitched roof coverings (roof tiles, shingles, steel roofs, waterproofing membranes etc) in the Nordic Region. Their function is to be a durable water protecting layer protecting the underlying structure during the life of the roof but also to give an extra protection during the construction phase.

### PRODUCT SPECIFICATIONS AND CONTENT OF MATERIALS

Lightweight bituminous underlays are technically defined by EN 13859-1:2014. Considering the wide variation of the products' recipe covered by the LCA study are clustered based on the specific weight and type of facings used.

EPD reports the environmental performance for 3 product categories of bituminous underlays clustered by specific weight very light (**A**), light (**B**) and heavy light (**C**) where in principle:

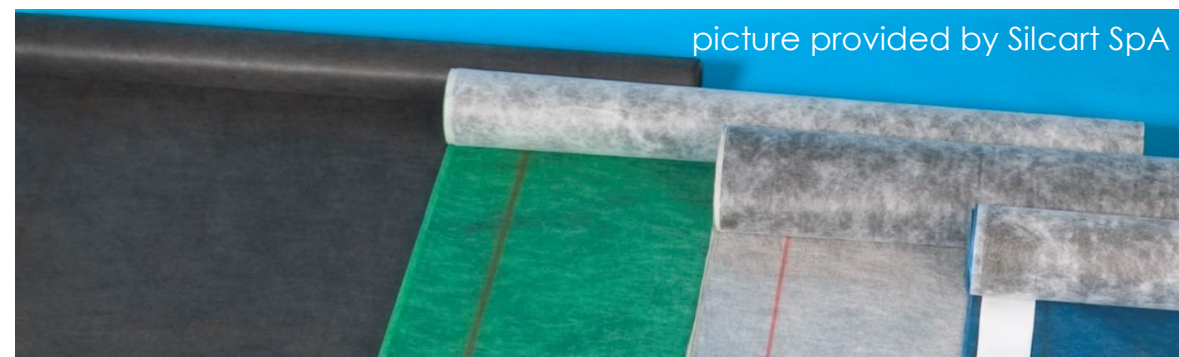
- **Category A** products are covered both sides with thin plastic films or fleeces (or 1 side talcum)
- **Category B** products are covered both sides with thin plastic film or fleece or sand or a combination of
- **Category C** products are covered both sides with sand

Results reported for each category (A, B and C) are representative of products covered by the study and reported in Annex (p.19-24)

CATEGORY	A	B	C
Specific weight (g/m <sup>2</sup> )	400 ÷ 1100	1500 ÷ 1900	2000 ÷ 2200
Thickness (mm)	0.6 ÷ 0.9	1.3 ÷ 1.8 *	1.6* ÷ 2.0
Reinforcement (PET fleece, glass mat)	10÷22%	3÷8%	3.5÷6%
Facings (polyolefin and polyester film, talcum, slate)	6÷10%	3÷25%	10÷20%
Bitumen (bitumen, oxidised, recycled)	42÷75%	42÷58%	46÷54%
Polymer (polyolefins, SBS)	3÷9%	5÷8%	6÷7%
Filler (sand, limestone)	0÷25%	20÷28%	22÷26%
Others (resins)	1÷2%	<1%	<1%

\*Thicknesses of category products B and C overlap due to the different facing types used in the bill of material.

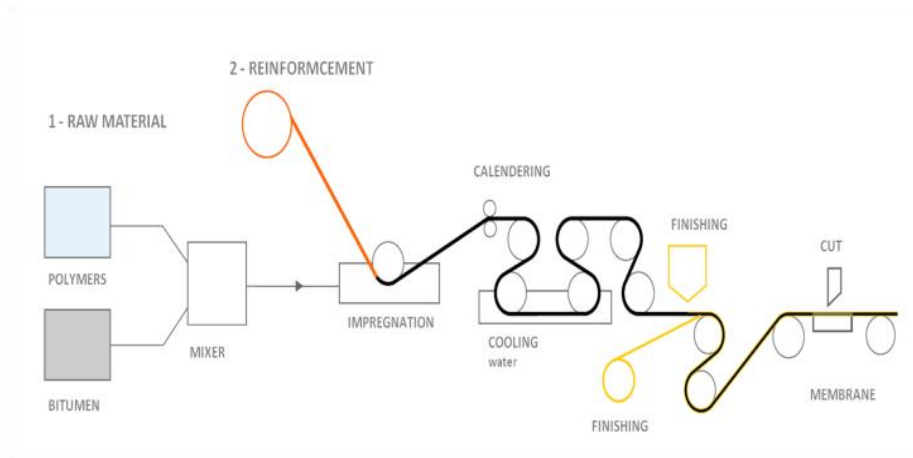
Products do not contain substances listed in the "Candidate List of Substances of Very High Concern" (SVHC).



picture provided by Silcart SpA

## PRODUCTION PROCESS

Bituminous underlay sheets are produced by a continuous process as illustrated below.



Raw materials (bitumen and polymers) are mixed separately at a specific range of temperature and successively reinforced with polyester fleece or glass mat (Glass mat, glass grid, glass fabric) by impregnation. After calendering and cooling, the membrane could be finished by means of different alternative materials, such as lightweight plastic films or fleeces or sand or talcum or peeling films or a combination of. Products have tacky edges to ensure a continuous water protecting layer, these edges are protected by siliconized PE, PP or PET films.

## PARTICIPANTS

A total of 8 plants participated to the EPD data collection phase (further details reported in Appendix). The averaged Eco-profile involves 6 member producers placed in Denmark, Norway, Sweden, Finland, Italy and Russia. The EPD may not be representative for EWA members/production locations from other countries.



## SCOPE AND EPD® TYPE

The Eco-profile corresponds to a “cradle-to-gate” system; taking into account the PCR 2012:01 v2.2 document, the “Product stage” modules will be considered. The following table traces (with a cross) which modules have been taken into account. The other modules are marked as “Module Not Declared” or MND.

Product stage			Construction process stage		Use stage							End of life stage				Recovery stage
Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Decostruction, demolition	Transport	Waste processing	Disposal	Future, reuse, recycling or energy recovery potentials
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

**SOFTWARE:** SimaPro version 8.5.2.0 ([www.pre.nl](http://www.pre.nl))

**DATABASE:** Ecoinvent 2.2, Industry data

## EWA ONLINE LCA TOOL AND DATA GATHERING

EWA has developed, in close co-operation with Life Cycle Engineering (LCE, Italy), a customized Life Cycle Analysis (LCA) on-line software tool for all EWA members.

This online tool allows EWA to collect specific data among EWA members and to improve the environmental performance of the waterproofing systems.

Primary data was collected from the 8 production plants by means of the EWA on-line tool and then processed through a weighted average by each product categories based on the production volume.

The allocation procedure follows the rules established by PCR 2012:01 v2.2 (ch. 7.7).

The reference year is **2017**.

## DECLARED UNIT (DU)

Eco-profile results are presented **per 1 square meter (m<sup>2</sup>)** of roof element manufactured and ready to be delivered to the client.

## GENERAL HYPOTHESIS

For bitumen, which is the main raw material of the membrane, the Eurobitume Life Cycle Inventory (LCI) without infrastructure was used to be consistent with other datasets used; however taking into account the critical review of such study we notice that bitumen LCI with infrastructure would lead to increase environmental impacts for the main impact categories analysed (e.g. GWP up to 3% per DU, AP up to 4% per DU, EP up to 5% per DU). Further details are available on [www.eurobitume.eu](http://www.eurobitume.eu).

For polymers, the Plastics Europe LCI studies were used as reference data. In some other cases, already published EPDs were used (i.e. polyester fleece). No primary data was directly collected from the raw material suppliers.

Electricity mix has been modelled considering the total production in the state where members' plants are located. The contribution of the electricity energy mix on the overall impact of stages A1 to A3 is less than 30%, so the documentation is not necessary here.

Proxy data contribution on the overall results is <10%.

LIFE CYCLE IMPACT ASSESSMENT

Potential environmental impacts for A category product (400 ÷ 1 100 g/m²)

POTENTIAL ENVIRONMENTAL IMPACTS	UNITS PER DU	A1	A2	A3	TOTAL
GWP	kg CO <sub>2</sub> eq	5.79E-01	1.36E-02	8.96E-02	6.82E-01
ODP	kg CFC 11 eq	2.54E-07	2.06E-09	6.45E-09	2.62E-07
AP	kg SO <sub>2</sub> eq	2.18E-03	6.48E-05	1.15E-04	2.36E-03
EP	kg PO <sub>4</sub> <sup>3-</sup> eq	4.11E-04	1.49E-05	2.72E-05	4.53E-04
POCP	kg C <sub>2</sub> H <sub>4</sub> eq	6.27E-04	9.83E-06	1.04E-04	7.41E-04
ADPE	kg Sb eq	4.95E-08	8.62E-12	4.38E-09	5.38E-08
ADPF	MJ	3.03E+01	1.94E-01	9.96E-01	3.15E+01

Declared Unit (DU) = 1 square meter (m²) of roof element manufactured and ready to be delivered to the client.

CAPTION

GWP Global Warming Potential

ODP Depletion potential of the stratospheric ozone layer

AP Acidification potential of land and water

EP Eutrophication potential

POCP Formation potential of tropospheric ozone photochemical oxidants

ADPE Abiotic depletion potential for non-fossil resources

ADPF Abiotic depletion potential for fossil resources



## LIFE CYCLE IMPACT ASSESSMENT

Use of resources for A category product (400 ÷ 1100 g/m<sup>2</sup>)

USE OF RESOURCES	UNITS PER DU	A1	A2	A3	TOTAL
PERE	MJ	1.89E+00	2.77E-04	2.93E-01	2.19E+00
PERM	MJ	0.00E+00	0.00E+00	5.62E-01	5.62E-01
PERT	MJ	1.89E+00	2.77E-04	8.55E-01	2.75E+00
PENRE	MJ	9.65E+00	1.96E-01	9.40E-01	1.08E+01
PENRM	MJ	2.10E+01	0.00E+00	1.27E-01	2.12E+01
PENRT	MJ	3.07E+01	1.96E-01	1.07E+00	3.20E+01
SM	kg	4.82E-02	0.00E+00	9.48E-04	4.91E-02
RSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m <sup>3</sup>	0.00E+00	0.00E+00	4.76E-04	4.76E-04

Declared Unit (DU) = 1 square meter (m<sup>2</sup>) of roof element manufactured and ready to be delivered to the client.

### CAPTION

**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 raw materials

**RSF** Use of renewable secondary fuels

**NRSF** Use of non-renewable secondary fuels

**FW** Use of net fresh water

LIFE CYCLE IMPACT ASSESSMENT

Other indicators describing waste categories for A category product (400 ÷ 1 100 g/m²)

OUTPUT FLOWS	UNITS PER DU	A1	A2	A3	TOTAL
HWD	kg	2.21E-04	1.60E-06	2.80E-05	2.50E-04
NHWD	kg	5.86E-02	1.60E-06	4.58E-02	1.04E-01
RWD	kg	3.21E-05	5.47E-08	1.64E-06	3.38E-05
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	0.00E+00	0.00E+00	6.69E-04	6.69E-04
MER	kg	0.00E+00	0.00E+00	2.36E-02	2.36E-02
EE	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Declared Unit (DU) = 1 square meter (m²) of roof element manufactured and ready to be delivered to the client.

CAPTION

- HWD Hazardous waste disposed
- NHWD Non-hazardous waste disposed
- RWD Radioactive waste disposed

- CRU Components for re-use
- MFR Materials for recycling
- MER Materials for energy recovery
- EE Exported Energy

LIFE CYCLE IMPACT ASSESSMENT

Potential environmental impacts for B category product (1500 ÷ 1900 g/m²)

POTENTIAL ENVIRONMENTAL IMPACTS	UNITS PER DU	A1	A2	A3	TOTAL
GWP	kg CO <sub>2</sub> eq	7.64E-01	3.25E-02	1.89E-01	9.86E-01
ODP	kg CFC 11 eq	1.59E-07	4.90E-09	1.88E-08	1.82E-07
AP	kg SO <sub>2</sub> eq	3.74E-03	1.54E-04	2.18E-04	4.12E-03
EP	kg PO <sub>4</sub> <sup>3-</sup> eq	5.10E-04	3.56E-05	5.23E-05	5.98E-04
POCP	kg C <sub>2</sub> H <sub>4</sub> eq	9.63E-04	2.34E-05	1.36E-04	1.12E-03
ADPE	kg Sb eq	1.24E-07	2.05E-11	1.01E-08	1.34E-07
ADPF	MJ	4.89E+01	4.62E-01	2.81E+00	5.22E+01

Declared Unit (DU) = 1 square meter (m²) of roof element manufactured and ready to be delivered to the client.

CAPTION

GWP Global Warming Potential

ODP Depletion potential of the stratospheric ozone layer

AP Acidification potential of land and water

EP Eutrophication potential

POCP Formation potential of tropospheric ozone photochemical oxidants

ADPE Abiotic depletion potential for non-fossil resources

ADPF Abiotic depletion potential for fossil resources

## LIFE CYCLE IMPACT ASSESSMENT

Use of resources for B category product (1500 ÷ 1900 g/m<sup>2</sup>)

USE OF RESOURCES	UNITS PER DU	A1	A2	A3	TOTAL
PERE	MJ	8.35E-01	6.59E-04	3.83E-01	1.22E+00
PERM	MJ	0.00E+00	0.00E+00	1.16E+00	1.16E+00
PERT	MJ	8.35E-01	6.59E-04	1.54E+00	2.38E+00
PENRE	MJ	3.59E+01	0.00E+00	2.65E-01	3.62E+01
PENRM	MJ	3.59E+01	0.00E+00	2.65E-01	3.62E+01
PENRT	MJ	7.18E+01	0.00E+00	5.29E-01	7.23E+01
SM	kg	7.92E-03	0.00E+00	1.26E-03	9.17E-03
RSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m <sup>3</sup>	0.00E+00	0.00E+00	3.35E-04	3.35E-04

Declared Unit (DU) = 1 square meter (m<sup>2</sup>) of roof element manufactured and ready to be delivered to the client.

### CAPTION

**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 raw materials

**RSF** Use of renewable secondary fuels

**NRSF** Use of non-renewable secondary fuels

**FW** Use of net fresh water



## LIFE CYCLE IMPACT ASSESSMENT

Other indicators describing waste categories for B category product (1500 ÷ 1900 g/m<sup>2</sup>)

OUTPUT FLOWS	UNITS PER DU	A1	A2	A3	TOTAL
HWD	kg	8.91E-04	3.81E-06	5.51E-05	9.50E-04
NHWD	kg	2.21E-02	3.81E-06	6.33E-02	8.54E-02
RWD	kg	8.55E-05	1.30E-07	2.50E-06	8.82E-05
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	0.00E+00	0.00E+00	3.41E-03	3.41E-03
MER	kg	0.00E+00	0.00E+00	2.40E-02	2.40E-02
EE	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Declared Unit (DU) = 1 square meter (m<sup>2</sup>) of roof element manufactured and ready to be delivered to the client.

### CAPTION

- HWD Hazardous waste disposed
- NHWD Non-hazardous waste disposed
- RWD Radioactive waste disposed

- CRU Components for re-use
- MFR Materials for recycling
- MER Materials for energy recovery
- EE Exported Energy

## LIFE CYCLE IMPACT ASSESSMENT

Potential environmental impacts for C category product (2000 ÷ 2200 g/m<sup>2</sup>)

POTENTIAL ENVIRONMENTAL IMPACTS	UNITS PER DU	A1	A2	A3	TOTAL
GWP	kg CO <sub>2</sub> eq	7.17E-01	3.29E-02	1.75E-01	9.24E-01
ODP	kg CFC 11 eq	4.94E-07	4.96E-09	1.16E-08	5.11E-07
AP	kg SO <sub>2</sub> eq	3.27E-03	1.56E-04	2.18E-04	3.64E-03
EP	kg PO <sub>4</sub> <sup>3-</sup> eq	4.26E-04	3.60E-05	5.17E-05	5.14E-04
POCP	kg C <sub>2</sub> H <sub>4</sub> eq	9.63E-04	2.37E-05	1.48E-04	1.13E-03
ADPE	kg Sb eq	5.99E-08	2.08E-11	9.68E-09	6.96E-08
ADPF	MJ	4.62E+01	4.67E-01	1.78E+00	4.85E+01

Declared Unit (DU) = 1 square meter (m<sup>2</sup>) of roof element manufactured and ready to be delivered to the client.

### CAPTION

**GWP** Global Warming Potential

**ODP** Depletion potential of the stratospheric ozone layer

**AP** Acidification potential of land and water

**EP** Eutrophication potential

**POCP** Formation potential of tropospheric ozone photochemical oxidants

**ADPE** Abiotic depletion potential for non-fossil resources

**ADPF** Abiotic depletion potential for fossil resources

LIFE CYCLE IMPACT ASSESSMENT

Use of resources for C category product (2000 ÷ 2200 g/m²)

USE OF RESOURCES	UNITS PER DU	A1	A2	A3	TOTAL
PERE	MJ	1.19E+00	6.67E-04	6.02E-01	1.80E+00
PERM	MJ	0.00E+00	0.00E+00	1.23E+00	1.23E+00
PERT	MJ	1.19E+00	6.67E-04	1.83E+00	3.03E+00
PENRE	MJ	1.41E+01	4.71E-01	1.74E+00	1.63E+01
PENRM	MJ	3.38E+01	0.00E+00	1.76E-01	3.40E+01
PENRT	MJ	4.79E+01	4.71E-01	1.92E+00	5.03E+01
SM	kg	4.16E-02	0.00E+00	1.21E-03	4.28E-02
RSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m³	0.00E+00	0.00E+00	3.40E-04	3.40E-04

Declared Unit (DU) = 1 square meter (m²) of roof element manufactured and ready to be delivered to the client.

CAPTION

- 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 raw materials

**RSF** Use of renewable secondary fuels

**NRSF** Use of non-renewable secondary fuels

**FW** Use of net fresh water

LIFE CYCLE IMPACT ASSESSMENT

Other indicators describing waste categories for C category product (2000 ÷ 2200 g/m²)

OUTPUT FLOWS	UNITS PER DU	A1	A2	A3	TOTAL
HWD	kg	4.91E-04	3.85E-06	4.23E-05	5.37E-04
NHWD	kg	6.14E-02	3.85E-06	6.88E-02	1.30E-01
RWD	kg	3.22E-05	1.32E-07	3.45E-06	3.58E-05
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	0.00E+00	0.00E+00	3.35E-03	3.35E-03
MER	kg	0.00E+00	0.00E+00	4.58E-02	4.58E-02
EE	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Declared Unit (DU) = 1 square meter (m²) of roof element manufactured and ready to be delivered to the client.

CAPTION

- HWD Hazardous waste disposed
- NHWD Non-hazardous waste disposed
- RWD Radioactive waste disposed

- CRU Components for re-use
- MFR Materials for recycling
- MER Materials for energy recovery
- EE Exported Energy



## GLOSSARY

**GWP – Global Warming Potential:** measure of potential contribution to climate change due to the amount of greenhouse gases (GHG) released by production chain processes. This contribution is measured in terms of mass of CO<sub>2</sub> equivalent (kg CO<sub>2</sub>eq) and is calculated by multiplying the specific GHG emissions (mainly CO<sub>2</sub>, N<sub>2</sub>O, CH<sub>4</sub>) by the specific conversion factors defined by the IPCC (www.ipcc.ch). Many protocols are available for its calculation.

**AP – Acidification Potential:** phenomenon by which atmospheric rainfall has a pH value below the normal average. It can provoke damage to forests and agriculture, as well as to aquatic ecosystems and manmade structures. It is the result of SO<sub>2</sub>, of NO<sub>x</sub>, and NH<sub>3</sub>, that are included in the Acidification Potential indicator (AP) expressed as kg SO<sub>2</sub>eq.

**EP - Eutrophication potential:** nutrient enrichment of flowing water bodies, which determines unbalance in aquatic ecosystems due to excessive flourishing caused by lack of nutrient limitation. The Eutrophication potential (EP) especially includes phosphate and nitrogen salts, and is expressed as kg PO<sub>4</sub><sup>3-</sup> eq.

**ODP – Ozone Depletion Potential:** degradation of the stratospheric layer of the ozone involved in blocking the UV component of sunrays. Depletion is due to particularly reactive components that originate from cCorofluorocarbon (CFC) or cCorofluoromethanes (CFM). The substance employed as benchmark measure for OPD is tricCorofluoromethane, or CFC-11 (kg CFC11 eq).

**POCP - Photochemical Ozone Creation Potential:** production of compounds that foster oxidation due to interaction with light, resulting in ozone formation in the troposphere. The POCP indicator mostly encompasses VOC (volatile organic compounds) and is expressed as grams of ethylene equivalent (kg C<sub>2</sub>H<sub>4</sub>).

**ADP elements – Abiotic Depletion Potential elements:** natural resources, such as iron ore, which are regarded as non-living. ADP is derived for each extraction of elements and is a relative measure with the depletion of the element "antimony" as a reference.

**ADP fossil fuel– Abiotic Depletion Potential fossil fuel:** The sum of the overall fossil resources extracted for both, material and energy purposes. It is measured in MJ. Uranium energy is not taken into account.

## REFERENCE

- ISO 14025: 2010 “Environmental labels and declarations – Type III environmental declarations”
- ISO 14040:2006 Environmental Management, Life Cycle Assessment – Principle and framework
- ISO 14044:2006 Environmental Management, Life Cycle Assessment – Requirements and guidelines
- General Programme Instructions for the International EPD® System 2.5 (2015-05-11)
- EN 15804: 2012 “Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products”
- EN 13859-1:2014 Flexible sheets for waterproofing - Definitions and characteristics of underlays - Part 1: Underlays for discontinuous roofing
- PCR “Construction products and construction services“ – 2012: 01 version 2.2 (date 2017-05-30)
- Report LCA «Eco-profile of lightweight bitumen underlays for EPD purposes»

## LIST OF PARTICIPANTS

COMPANY	PLANT
Icopal	Nygade 13, 7430 Ikast, Denmark
	FjelBamarveien 52, 1472 FjelBamar, Norway
	Lodgatan, Malmö, Sweden
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Katepal	Katepal Oy, Lempäälä, Finland
Nordicwaterproofing	Höganäs, Sweden
Silcart SpA	Silcart Spa Via Spercenigo,5 31030 Carbonera (TV) Italy
Technonicol	«Technoflex» LTD, Ryazan, Russia

LIST OF PRODUCTS - KATEPAL

Product category	Brand name
A	Domo Prima
	Xtreme
	Evo
	Unum
	Litebase
	D-Polyester
	Litebase S
B	Multi
	Epic
	Steelbase
	Viking 800
C	YAP 2200
	Superbase
	Superkraft
	YAM 2000
	XtraBase
	K-EL
	Primebase





LIST OF PRODUCTS - SILCART

Product category	Brand name
A	TERFELT
	TERFELT TAPE
	BIOFELT 2 TAPE
	TERFELT 530 BB TAPE
	SUPERFELT 1100 AS TAPE
	TERFELT GLASS TAPE
C	TERFELT 700 AS TAPE
	YEP 2200
	YEP 2500



picture provided by Silcart SpA



LIST OF PRODUCTS – NORDIC WATERPROOFING

Product category	Nordic brand name
A	Mataki Haloten 280
	Trebolit 117
	Nortett Underlagsbelegg Basis
	Mataki Haloten 380
	Kerabit 700 UB
	Mataki Haloten D1
B	Mataki Haloten Steel
	Trebolit 1800 STEEL
	Mataki Haloten Plan
C	Mataki MB 350
	Trebolit 122
	Mataki MB 320
	Trebolit 221
	Trebolit T-Kraft
	Mataki Haloten Norkraft
	Nortett Underlagsbelegg Pluss



picture provided by Nordic Waterproofing



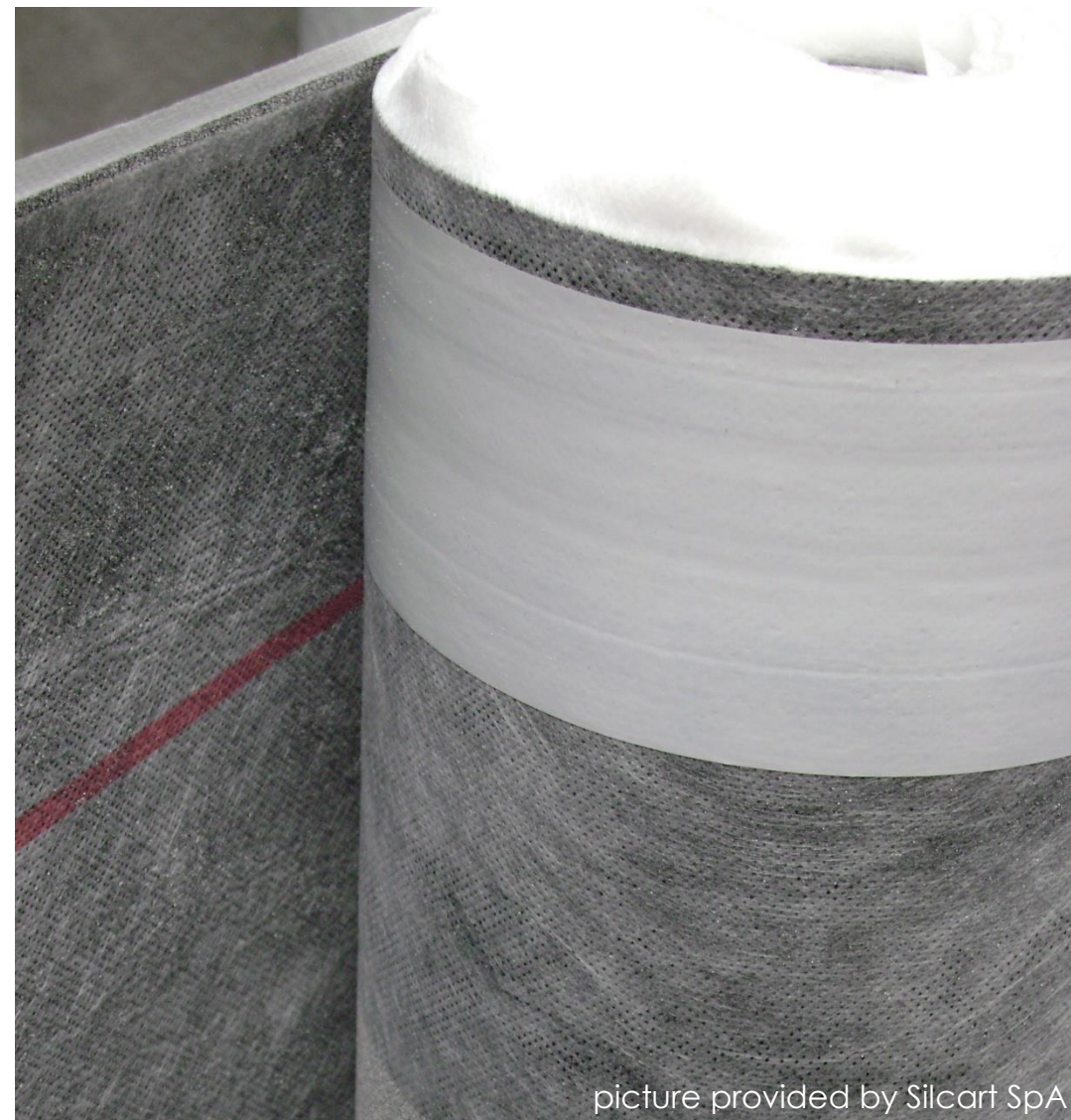
LIST OF PRODUCTS - ICOPAL

Product category	Brand name
A	Flexilight Bas
	Flexilight Pro
	Ultra D
	Flexilight Prima
B	Flexisteel
	D Glass
	Icoboard
C	Micoral
	Macoflex
	Super D



## LIST OF PRODUCTS - ISOLA

Product category	Brand name
A	Iso D xtra
	Iso D
	D Projekt Xtra
B	Isobas
	D Glass
	Isosteel
C	Isonorm
	Isokraft



picture provided by Silcart SpA



LIST OF PRODUCTS - TECHNICAL

Product category	Brand name
A	Underlay PRO 500
	Underlay PRO 500 Stick
	Underlay PRO(S)500 Stick
	Underlay PRO(S)500
	Underlay PRO(S) 700
B	Underlay BASE 1500
	Underlay BASE 1500 Stick



picture provided by Nordic Waterproofing