ENVIRONMENTAL PRODUCT DECLARATION

B-EPD .BE
026.0306.001-01.00.00

pro clima / MOLL bauökologische Produkte GmbH

INTELLO PLUS

ISSUED 03/02/2026
VALID UNTIL 03/02/2031

THIRD PARTY VERIFIED
in accordance with EN 15804+A2
and B-EPD-PCR (18.10.2022)

FUNCTIONAL UNIT AND MODULES DECLARED
1m² of INTELLO PLUS airtightness and vapour control membrane and accompanying packaging.

Cradle to gate with options, modules C1-C4 and module D

A123	A4	A5	B	C	D
•	•	•		•	•

The intended use of this EPD is to communicate scientifically based environmental information for construction products, for the purpose of assessing the environmental performance of buildings. This EPD is only valid when registered on www.b-epd.be. The FPS Public Health cannot be held responsible for the information provided by the owner of the EPD.

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1 PRODUCT DESCRIPTION

1.1 Product name

INTELLO PLUS. Reinforced hydrosafe® high-performance vapour control membrane, suitable for all fibrous insulation materials.

1.2 Product description and intended use

Vapour control (alternate terms: vapour check or retarder) membrane for use on roofs, walls, ceilings and floors on structures that are open or closed to diffusion on the exterior, e.g. flat/steep roofs and green roofs, after appropriate design calculations have been carried out.

INTELLO PLUS has the following components:
Fleece: Polypropylene (contains 50% recycled material); Functional Film: polyethylene copolymer; Reinforcement: Polypropylene non-woven fabric.

INTELLO PLUS is a product.

This is an EPD of a specific product.

1.3 Reference flow / Functional unit

Functional unit: 1 m² of INTELLO PLUS airtightness and vapour check membrane and accompanying packaging. Application in Belgium for a service life of 60 years.
Packaging is included.
The weight per reference flow is 0.131 kg/m².

1.4 Installation

Materials for fixation and installation are included. The product is declared “as installed”. The expenses for installation include energy for the pneumatical stapler and the galvanized steel staples. Required TESCON VANA (B-EPD 026.0306.002) tape and ORCON F (B-EPD 026.0306.003) adhesive for sealing and detailing to rough surfaces are also included in the B-EPD.

This B-EPD includes the necessary overlap of membrane to ensure the tightness (8%) and the installation losses (2%) from detailing.
More information on the amounts used for scenario development at building can be found in chapter 14.

1.5 Composition and content

Components	Composition / content / ingredients	Quantity
Product	Non-woven and scrim (PP)	0.072 kg
	Additives and adhesives	0.033 kg
	Printing ink	0.002 kg
	Total product	0.107 kg
Fixation materials	Staples	0.0017 kg
	TESCON VANA tape	0.0239 kg
	ORCON F adhesive	0.0144 kg
Jointing materials	–	–
	–	–
Treatments	–	–
Packaging	Film (PE)	0.002 kg
	Cardboard	0.006 kg
	Pallet	0.017 kg
	Total packaging	0.025 kg

The product does not contain materials listed in the “Candidate list of Substances of Very High Concern for authorization”.

1.6 Reference service life

The reference service life of this product is estimated to be 60 years.
This is based on a European Technical Assessment ETA-18/1146, dated 28 November 2019, issued by the German Institute of Construction Engineering (DIBt). Further information is available at
https://proclima.com/building_science/why_airtight/intelligent_airtightness/long_term_effectiveness/verified_resistance

1.7 Description of geographical representativity

The EPD is representative for the Belgian market for transport to the building site (A4), the installation (A5), and the end-of-life (C and D). Production occurs in Germany (A1-A3).

1.8 Description of the production process and technology

The INTELLO PLUS reinforced hydrosafe® high-performance vapour check membrane is produced by bonding and laminating the fleece layer, the reinforcement and the functional film to create large rolls. These rolls are printed and then cut into smaller rolls, which are the sales units. These rolls are then packaged and sent for storage and distribution, first to the central warehouse in Germany, then to the distributor in Belgium and finally to the construction site.

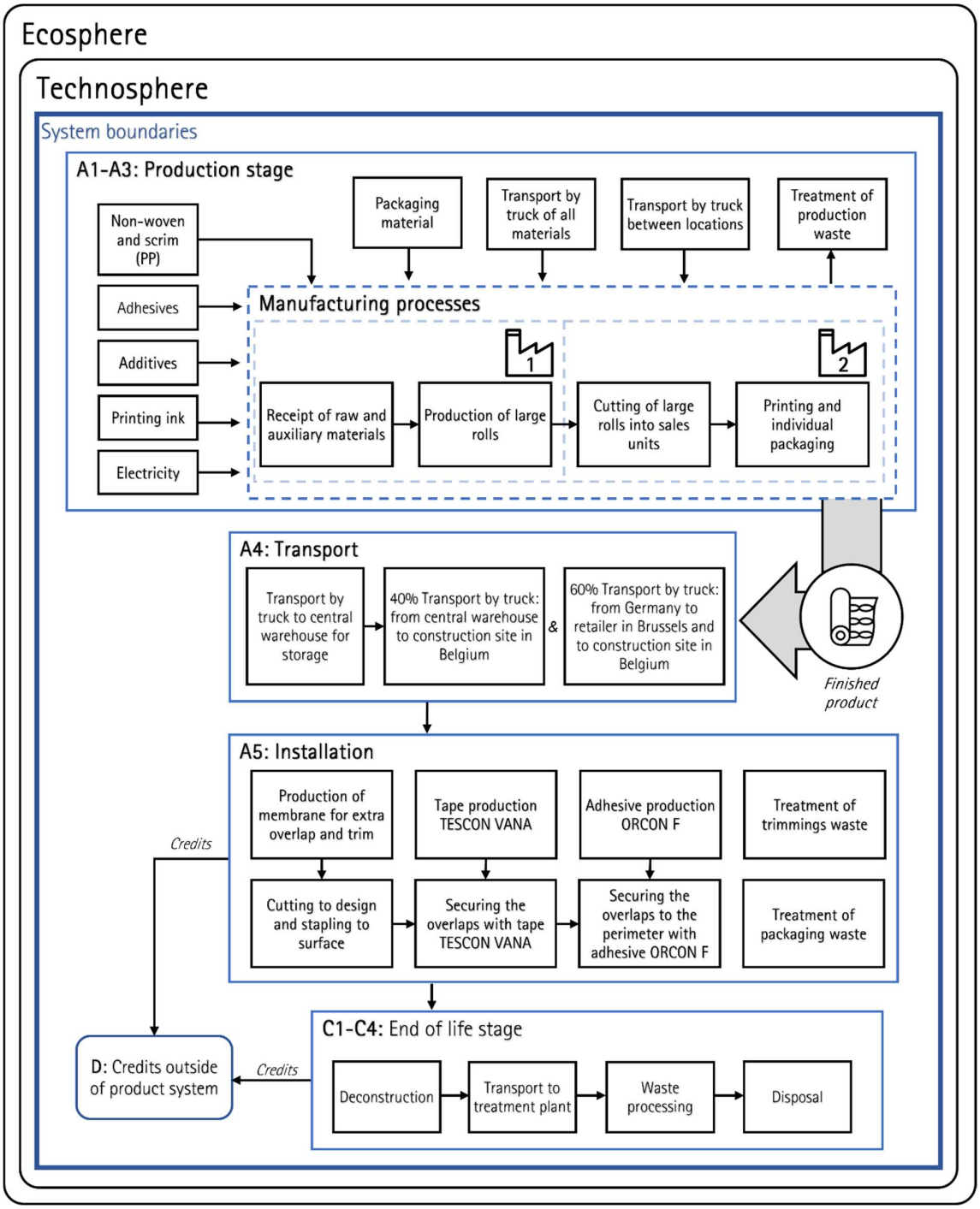


Figure 1: System boundaries for INTELLO PLUS

2 TECHNICAL DATA / PHYSICAL CHARACTERISTICS

Technical property	Standard	Value	Unit	Comment
Colour	N/A	White-translucent	N/A	
Surface weight	EN 1849-2	110	g/m²N/A	
Thickness	EN 1849-2	0.4	mm	
Water vapour resistance factor μ	EN 1931	35 000	N/A	
μ_d value	EN 1931	14	m	
μ_d value, humidity-variable	EN ISO 12572	0.25 - >25	m	
Hydrosafe value (μ_d)	DIN 68800-2	2	m	
Fire rating	EN 13501-1	E	N/A	
Material guarantee, obtained	ZVDH	Yes	N/A	
Airtightness	EN 12114	Tested	N/A	
Tensile strength MD/CD	EN 13859-1 (A)	340 / 220	N/5 cm	
Elongation MD/CD	EN 13859-1 (A)	15 / 15	%	
Nail tear resistance MD/CD	EN 13859-1 (B)	200 / 200	N	
Durability after artificial ageing	ETA-18/1146	Passed	N/A	
Temperature resistance	N/A	Permanent -40 to 80	°C	
Thermal conductivity	N/A	0.04	W/(m·K)	
CE labelling	ETA-18/1146	Yes	N/A	

Declaration of Performance available under https://dop.proclima.com/

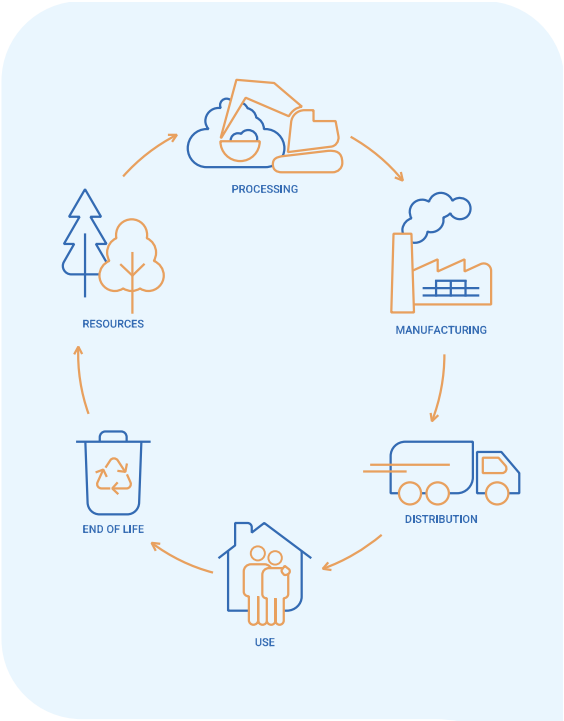
INTELLO PLUS is available in the following formats:

INTELLO PLUS (width: 1.5 m / length: 20 m) GTIN 4026639011237
INTELLO PLUS (width: 1.5 m / length: 50 m) GTIN 4026639011244
INTELLO PLUS (width: 3.0 m / length: 50 m) GTIN 4026639011992
INTELLO PLUS (width: 3.0 m / length: 50 m) GTIN 4026639122223

3 LCA-STUDY

3.1 Date of LCA-study

Based on yearly manufacturing data from 01/01/2023 until 31/12/2023. Date of the EPD study: December 2025.



3.2 Software

For the calculation of the LCA results, the software system for holistic balancing, LCA for Experts (formerly known as GaBi), version 10.9 was used.

3.3 Information on allocation

The manufacturing data was gathered for the specific declared product; no co-product allocation was necessary.

3.4 Information on cut off

The impact associated with the disregarded mass shares is less than 5% of the impact categories per module. In addition, less than 1% of the total mass and the primary energy used is cut off. No substances or processes with high environmental relevance were cut off. Equipment and infrastructure required in production are not included in this LCA.

An attempt was made to take into account all data collected in the operational data collection. Thus, material flows with a mass fraction of less than one percent were also balanced. However, data sets could not be found for all substances used. In those cases, an exhaustive LCI based on scientific literature, industry standards and manufacturer safety sheets was carried out to model all production materials.

3.5 Information on excluded processes

Following processes were excluded for the inventory:
Flows related to human activities such as employee transport and administration activity. Infrastructure for production is also excluded

3.6 Information on biogenic carbon modelling

The product does not contain biogenic carbon. Accompanying packaging does include biogenic carbon, as shown in the table below.

Biogenic carbon content	(kg C / DU)
Biogenic carbon content in product (at the gate)	0
Biogenic carbon content in accompanying packaging (at the gate)	The biogenic carbon content of product and packaging is 0.040 kg CO_2 eq. per declared unit.

3.7 Information on carbon offsetting

Carbon offsetting is not allowed in the EN 15804 and hence not taken into account in the calculations.

3.8 Additional or deviating characterisation factors

For EN 15804+A2: The characterization factors from EC-JRC were applied. No additional or deviating characterisation factors were used.

The estimated impact results are only relative statements which do not indicate the end points of the impact categories, exceeding threshold values, safety margins or risks. According to the EN 15804 standard, the characterization factors of EU-JRC must be applied.

The EN 15804 reference package based on EF 3.1. was used for the LCA calculations. The characterization factors are available at the following internet address: http://eplca.jrc.ec.europa.eu/LCDN/developerEF.xhtml

Disclaimer: The use of the results of modules A1-A3 (A1-A5 for services) without considering the results of module C is discouraged.

3.9 Description of the variability

The variation of the environmental impact indicator results for modules A to C between the included products is 0%. This EPD corresponds to the representative product — INTELLO PLUS — and covers multiple GTINs. These products have the same area of application and differ only in their available format. Their dimensions or sometimes customised printing, such as customer logos; meet specific customer requirements, but do not alter the inherent environmental characteristics of the product, thus justifying a common EPD.

3.10 Specificity

The data used for the LCA are specific for this product which is manufactured by a single manufacturer. When multiple production sites are relevant, these are described as location 1, location 2, etc. Specific distances and modes of transport have been used.

3.11 Period of data collection

Manufacturer specific data have been collected for the year 2023.

3.12 Information on data collection

- Primary data from all production sites are taken into account.
- Based on entire production data of 2023.
- Declared value determined as specific product.

3.13 Database used for background data

The following database was used for background data:
LCA for Experts (GaBi), version 10.9, service pack 2024.2.

3.14 Energy mix

Electricity in A1-A3 accounts for less than 30% of the GWP-GHG results of modules A1-A3. The energy requirements for production were modelled using the Residual electricity mix of the electricity supplier on the market. In this case the LCA for Experts dataset of Residual grid mix; AC, technology mix; consumption mix, to consumer; <1kV in Germany from the reference year 2022.

4 PRODUCTION SITES

The product is manufactured at pro clima / MOLL bauökologische Produkte GmbH – Rheintalstr. 35-43 – 68723 Schwetzingen – Germany. When multiple production sites are relevant, these are described as location 1, location 2. These two suppliers are also located in Germany.

5 SYSTEM BOUNDARIES

Product stage			Construction - installation stage		Use stage							End of life stage				Beyond the system boundaries
Raw materials	Transport	Manufacturing	Transport	Construction installation stage	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 = included in the EPD
☐ = module not declared

Cradle to gate with options: Modules A1-A3, A4, A5, C1–C4, and module D.

- The entirety of non-woven fleece polypropylene was modelled as primary material to account for a worst-case scenario.
- Infrastructure and capital goods are excluded from the system boundaries.
- All processing steps and locations are balanced within the system boundaries.
- The LCI data manufacturing data was gathered for the specific declared product, and no co-product allocation was necessary.
- The allocation of waste follows the polluter-pays principle. The system boundary to the next product system is set when the waste reaches the end-of-waste state. The impacts of waste treatment from production are included in Module A3. The impacts of waste treatment during end-of-life are included in Module C, where the product reaches the end-of-waste status.
- All the LCI data in Modules A1-A3 corresponds to primary data collected from the manufacturing plant and contracted suppliers, including material and energy inputs, and waste and emission outputs.
- Module A4 is modelled based on the default transport scenarios from the B-EPD-PCR (18.10.2022). 40% of the product is transported 444 km directly from the factory gate to the construction site by Truck, Euro V, 20 - 26t. The remaining 60% is transported via intermediary supplier and covers the distance between the gate and Brussels (444 km) via Truck, Euro V, 28 - 32t as well as an extra default 35 km distance from Brussels to the construction site. The intermediary supplier transports 85% of the merchandise from Brussels to the construction site via Truck, Euro V, 20 - 26t and 15% via Truck, Euro V, 12 - 14t.
- Module A5 is modelled based on the default waste treatment scenarios from the B-EPD-PCR (18.10.2022).

6 POTENTIAL ENVIRONMENTAL IMPACTS PER REFERENCE FLOW

	Production			Construction process stage		Use stage							End-of-life stage				
	A1 Raw material	A2 Transport	A3 manufacturing	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	D Reuse, recovery, recycling
GWP total (kg CO2 equiv/FU)	2.40E-01	7.77E-03	5.24E-02	8.04E-03	1.43E-01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	1.81E-03	2.90E-01	3.43E-04	-1.09E-01
GWP fossil (kg CO2 equiv/FU)	2.51E-01	7.61E-03	5.22E-02	7.84E-03	1.28E-01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	1.78E-03	2.90E-01	3.41E-04	-1.09E-01
GWP biogenic (kg CO2 equiv/FU)	-1.10E-02	2.44E-05	9.48E-05	5.20E-05	1.29E-02	ND	ND	ND	ND	ND	ND	ND	0.00E+00	5.49E-06	-3.28E-05	1.15E-06	-2.88E-04
GWP luluc (kg CO2 equiv/FU)	3.20E-05	1.29E-04	1.63E-04	1.45E-04	1.26E-03	ND	ND	ND	ND	ND	ND	ND	0.00E+00	2.91E-05	2.00E-05	1.26E-06	-9.03E-06
ODP (kg CFC 11 equiv/FU)	3.59E-12	1.13E-15	6.67E-14	2.34E-15	9.17E-10	ND	ND	ND	ND	ND	ND	ND	0.00E+00	2.55E-16	-7.96E-14	1.12E-15	-1.07E-12
AP (mol H+ eq/FU)	4.50E-04	5.49E-05	1.02E-04	3.46E-05	2.62E-04	ND	ND	ND	ND	ND	ND	ND	0.00E+00	9.11E-06	2.95E-05	2.04E-06	-1.17E-04
EP - freshwater (kg P- equiv/FU)	4.33E-07	3.28E-08	1.61E-07	2.12E-08	4.63E-07	ND	ND	ND	ND	ND	ND	ND	0.00E+00	7.38E-09	7.54E-09	1.94E-07	-5.39E-07
EP - marine (kg N- equiv/FU)	1.33E-04	2.71E-05	4.29E-05	1.65E-05	8.86E-05	ND	ND	ND	ND	ND	ND	ND	0.00E+00	4.41E-06	7.47E-06	4.39E-07	-3.96E-05
EP - terrestrial (mol N- equiv/FU)	1.42E-03	3.00E-04	4.62E-04	1.85E-04	8.44E-04	ND	ND	ND	ND	ND	ND	ND	0.00E+00	4.91E-05	1.73E-04	4.82E-06	-4.21E-04
POCP (kg Ethene equiv/FU)	5.42E-04	5.30E-05	9.58E-05	3.37E-05	9.20E-04	ND	ND	ND	ND	ND	ND	ND	0.00E+00	8.99E-06	2.00E-05	1.41E-06	-1.15E-04
ADP Elements (kg Sb equiv/FU)	7.07E-08	6.70E-10	5.45E-09	1.26E-09	1.19E-07	ND	ND	ND	ND	ND	ND	ND	0.00E+00	1.51E-10	-7.89E-10	2.26E-11	-2.52E-08
ADP fossil fuels (MJ/FU)	8.09E+00	1.01E-01	6.63E-01	9.97E-02	2.71E+00	ND	ND	ND	ND	ND	ND	ND	0.00E+00	2.28E-02	-2.43E-01	5.75E-03	-2.41E+00
WDP (m^3 water eq deprived /FU)	3.06E-02	1.19E-04	1.50E-03	5.71E-05	1.70E-02	ND	ND	ND	ND	ND	ND	ND	0.00E+00	2.68E-05	2.75E-02	4.40E-05	-8.36E-03

GWP TOTAL = TOTAL GLOBAL WARMING POTENTIAL (CLIMATE CHANGE); GWP-LULUC = GLOBAL WARMING POTENTIAL (CLIMATE CHANGE) LAND USE AND LAND USE 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; WDP = WATER USE (WATER (USER) DEPRIVATION POTENTIAL, DEPRIVATION-WEIGHTED WATER CONSUMPTION)

7 RESOURCE USE

	Production			Construction process stage		Use stage							End-of-life stage				
	A1 Raw material	A2 Transport	A3 manufacturing	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	D Reuse, recovery, recycling
PERE (MJ/FU, net calorific value)	1.51E-02	8.72E-03	2.06E-01	1.09E-02	8.32E-01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	1.96E-03	-5.29E-02	8.70E-04	-5.03E-01
PERM (MJ/FU, net calorific value)	4.40E-01	0.00E+00	0.00E+00	0.00E+00	-4.40E-01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT (MJ/FU, net calorific value)	4.55E-01	8.72E-03	2.06E-01	1.09E-02	3.92E-01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	1.96E-03	-5.29E-02	8.70E-04	-5.03E-01
PENRE (MJ/FU, net calorific value)	3.99E+00	1.01E-01	6.63E-01	9.97E-02	2.84E+00	ND	ND	ND	ND	ND	ND	ND	0.00E+00	2.28E-02	3.53E+00	2.06E-01	-2.41E+00
PENRM (MJ/FU, net calorific value)	4.10E+00	0.00E+00	0.00E+00	0.00E+00	-1.30E-01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	0.00E+00	-3.77E+00	-2.00E-01	0.00E+00
PENRT (MJ/FU, net calorific value)	8.09E+00	1.01E-01	6.63E-01	9.97E-02	2.71E+00	ND	ND	ND	ND	ND	ND	ND	0.00E+00	2.28E-02	-2.43E-01	5.75E-03	-2.41E+00
SM (kg/FU)	0.00E+00	0.00E+00	6.03E-03	0.00E+00	5.20E-03	ND	ND	ND	ND	ND	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF (MJ/FU, net calorific value)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	ND	ND	ND	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF (MJ/FU, net calorific value)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	ND	ND	ND	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW (m^3 water eq/FU)	1.30E-03	9.72E-06	1.39E-04	1.03E-05	5.76E-04	ND	ND	ND	ND	ND	ND	ND	0.00E+00	2.19E-06	6.16E-04	1.32E-06	-6.42E-04

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

8 WASTE CATEGORIES & OUTPUT FLOWS

	Production			Construction process stage		Use stage							End-of-life stage				
	A1 Raw material	A2 Transport	A3 manufacturing	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	D Reuse, recovery, recycling
Hazardous waste disposed (kg/FU)	3.90E-06	3.88E-12	1.14E-09	4.81E-12	5.56E-06	ND	ND	ND	ND	ND	ND	ND	0.00E+00	8.72E-13	-9.96E-11	1.42E-12	-1.14E-09
Non-hazardous waste disposed (kg/FU)	3.10E-03	1.65E-05	9.16E-04	1.68E-05	8.49E-03	ND	ND	ND	ND	ND	ND	ND	0.00E+00	3.72E-06	2.25E-02	1.16E-02	-7.65E-04
Radioactive waste disposed (kg/FU)	8.82E-05	1.84E-07	1.94E-05	1.60E-07	5.44E-05	ND	ND	ND	ND	ND	ND	ND	0.00E+00	4.15E-08	-1.66E-05	8.12E-08	-1.69E-04
Components for re-use (kg/FU)	0.00E+00	0.00E+00	3.08E-03	0.00E+00	2.12E-02	ND	ND	ND	ND	ND	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling (kg/FU)	0.00E+00	0.00E+00	1.08E-03	0.00E+00	1.36E-02	ND	ND	ND	ND	ND	ND	ND	0.00E+00	0.00E+00	9.76E-03	0.00E+00	0.00E+00
Materials for energy recovery (kg/FU)	0.00E+00	0.00E+00	3.40E-03	0.00E+00	9.98E-03	ND	ND	ND	ND	ND	ND	ND	0.00E+00	0.00E+00	1.16E-01	0.00E+00	0.00E+00
Exported energy (MJ/FU)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.19E-01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	0.00E+00	1.72E+00	0.00E+00	0.00E+00

9 IMPACT CATEGORIES ADDITIONAL TO EN 15804

	Production			Construction process stage		Use stage							End-of-life stage				
	A1 Raw material	A2 Transport	A3 manufacturing	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	D Reuse, recovery, recycling
PM (disease incidence)	5.46E-09	2.32E-10	9.77E-10	1.97E-10	3.98E-09	ND	ND	ND	ND	ND	ND	ND	0.00E+00	4.99E-11	3.48E-10	2.11E-11	-9.90E-10
IRHH (kg U235 eq/FU)	1.42E-02	2.68E-05	1.81E-03	1.72E-05	8.65E-03	ND	ND	ND	ND	ND	ND	ND	0.00E+00	6.02E-06	-2.44E-03	1.11E-05	-1.49E-02
ETF (CTUe/FU)	4.11E+00	7.52E-02	2.24E-01	7.72E-02	1.48E+00	ND	ND	ND	ND	ND	ND	ND	0.00E+00	1.69E-02	-7.38E-03	1.24E-02	-1.51E-01
HTCE (CTUh/FU)	9.70E-11	1.52E-12	6.30E-12	1.54E-12	5.43E-11	ND	ND	ND	ND	ND	ND	ND	0.00E+00	3.42E-13	3.30E-13	1.84E-13	-1.72E-11
HTnCE (CTUh/FU)	3.47E-09	6.81E-11	3.25E-10	6.51E-11	1.43E-09	ND	ND	ND	ND	ND	ND	ND	0.00E+00	1.53E-11	1.06E-10	3.86E-12	-2.06E-10
Land Use Related impacts (dimensionless)	2.86E-01	4.98E-02	6.52E-01	6.56E-02	7.96E-01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	1.12E-02	-1.65E-02	9.78E-04	-4.72E-01

HTCE = HUMAN TOXICITY – CANCER EFFECTS; HTNCE = HUMAN TOXICITY – NON-CANCER EFFECTS; ETF = ECOTOXICITY – FRESHWATER; (POTENTIAL COMPARATIVE TOXIC UNIT)
PM = PARTICULATE MATTER (POTENTIAL INCIDENCE OF DISEASE DUE TO PM EMISSIONS);
IRHH = IONIZING RADIATION – HUMAN HEALTH EFFECTS (POTENTIAL HUMAN EXPOSURE EFFICIENCY RELATIVE TO U235);

9.1 Environmental impact categories explained

 Global Warming Potential	The global warming potential of a gas refers to the total contribution to global warming resulting from the emission of one unit of that gas relative to one unit of the reference gas, carbon dioxide, which is assigned a value of 1. It is split up in 4: – Global Warming Potential total (GWP-total) which is the sum of GWP-fossil, GWP-biogenic and GWP-luluc – Global Warming Potential fossil fuels (GWP-fossil) : The global warming potential related to greenhouse gas (GHG) emissions to any media originating from the oxidation and/or reduction of fossil fuels by means of their transformation or degradation (e.g. combustion, digestion, landfilling, etc). – Global Warming Potential biogenic (GWP-biogenic) : The global warming potential related to carbon emissions to air (CO2, CO and CH4) originating from the oxidation and/or reduction of aboveground biomass by means of its transformation or degradation (e.g. combustion, digestion, composting, landfilling) and CO2 uptake from the atmosphere through photosynthesis during biomass growth - i.e. corresponding to the carbon content of products, biofuels or above ground plant residues such as litter and dead wood. – Global Warming Potential land use and land use change (GWP-luluc): The global warming potential related to carbon uptakes and emissions (CO2, CO and CH4) originating from carbon stock changes caused by land use change and land use. This sub-category includes biogenic carbon exchanges from deforestation, road construction or other soil activities (including soil carbon emissions).
 Ozone Depletion	Destruction of the stratospheric ozone layer which shields the earth from ultraviolet radiation harmful to life. This destruction of ozone is caused by the breakdown of certain chlorine and/or bromine containing compounds (chlorofluorocarbons or halons), Which break down when they reach the stratosphere and then catalytically destroy ozone molecules.
 Acidification potential	Acid depositions have negative impacts on natural ecosystems and the man-made environment incl. buildings. The main sources for emissions of acidifying substances are agriculture and fossil fuel combustion used for electricity production, heating and transport.
 Eutrophication potential	The potential to cause over-fertilization of water and soil, which can result in increased growth of biomass and following adverse effects. It is split up in 3: – Eutrophication potential - freshwater: The potential to cause over-fertilization of freshwater, which can result in increased growth of biomass and following adverse effects. – Eutrophication potential - marine: The potential to cause over-fertilization of marine water, which can result in increased growth of biomass and following adverse effects. – Eutrophication potential - terrestrial: The potential to cause over-fertilization of soil, which can result in increased growth of biomass and following adverse effects.
 Photochemical ozone creation	Chemical reactions brought about by the light energy of the sun creating photochemical smog. The reaction of nitrogen oxides with hydrocarbons in the presence of sunlight to form ozone is an example of a photochemical reaction.
 Abiotic depletion potential for non-fossil ressources	Consumption of non-renewable resources, thereby lowering their availability for future generations. Expressed in comparison to Antimonium (Sb). The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.
 Abiotic depletion potential for fossil ressources	Measure for the depletion of fossil fuels such as oil, natural gas, and coal. The stock of the fossil fuels is formed by the total amount of fossil fuels, expressed in Megajoules (MJ). The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.

 Ecotoxicity for aquatic fresh water	The impacts of chemical substances on ecosystems (freshwater). The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.
 Human toxicity (carcinogenic effects)	The impacts of chemical substances on human health via three parts of the environment: air, soil and water. The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.
 Human toxicity (non-carcinogenic effects)	The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.
 Particulate matter	Accounts for the adverse health effects on human health caused by emissions of Particulate Matter (PM) and its precursors (NOx, SOx, NH3)
 Resource depletion (water)	Accounts for water use related to local scarcity of water as freshwater is a scarce resource in some regions, while in others it is not. The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.
 Ionizing radiation - human health effects	This impact category deals mainly with the eventual impact on human health of low dose ionizing radiation of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.
 Land use related impacts	The indicator is the “soil quality index” which is the result of an aggregation of following four aspects: – Biotic production – Erosion resistance – Mechanical filtration – Groundwater The aggregation is done based on a JRC model. The four aspects are quantified through the LANCA model for land use. The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.

10 DETAILS OF THE UNDERLYING SCENARIOS USED TO CALCULATE THE IMPACTS

10.1 A1 - Raw material supply

This module takes into account the extraction and processing of all raw materials and energy which occur upstream to the studied manufacturing process.

- Extraction and processing of raw materials required for manufacturing the defined airtightness and vapour check membrane: Non-woven (PP), film (HDPE), additives and printing ink.

10.2 A2 – Transport to the manufacturer

- Transportation of the raw materials was modelled based on the providers specific locations and transportation via truck to the production location 1 in Germany. All materials are procured from providers within less than 800 km.
- After production, the large rolls are transported to the production location 2 for cutting of the large rolls into sales units, printing, individual packaging and labelling of the sales units. The sales units are then packed with film (PE) for transportation on pallets. The transportation of raw materials for packaging as well as the transportation of the large rolls from the production location 1 for finishing manufacturing in the production location 2 is modelled in Module A2.

10.3 A3 – Manufacturing

This module takes into account the following production processes.

- Manufacturing of the defined airtightness and vapour check membrane occurs in Germany.
- Extraction and processing of raw materials required for packaging the 1 m² of finished product, airtightness, and vapour check membrane: Cardboard, film (PE) and wood pallet.
- Extraction and processing of raw materials of internal packaging, used for transportation between all production locations. Internal packaging includes film (PE), cardboard and wood pallet.
- The production of the large membrane roll is done in the production location 1, by bonding and laminating the polymers and the non-woven. The rolls are cut into sale units, after printing and confection in the production location 2. The products are then packed on pallets for further transportation.
- Treatment of waste generated from the manufacturing processes is included in the model. The model includes processing up to the end-of-waste status or disposal of final residues including any packaging not leaving the factory gate.
- Electricity for production in module A3 is modelled with the German Residual electricity mix.

10.4 A4 – Transport to the building site

Description	Transport to warehouse	40% transport direct to building site	60% transport to intermediary	(of which 85% from intermediary to building site)	(of which 15% from intermediary to building site)
Fuel type and vehicle type used for transport	Lorry 20-26 ton (EURO 5). DE: Diesel mix at filling station	Lorry 20-26 ton (EURO 5). RER: Diesel mix at filling station	Lorry 28-32 Ton (EURO 5) RER: Diesel mix at filling station	Lorry 20-26 ton (EURO 5) RER: Diesel mix at filling station	Lorry 12-14 Ton (EURO 5) RER: Diesel mix at filling station
Distance	108 km	444 km	444 km	35 km	35 km
Capacity utilisation (includes empty returns)	55%	55%	55%	55%	55%
Bulk density of transported products	LCA for experts default value	LCA for experts default value	LCA for experts default value	LCA for experts default value	LCA for experts default value
Volume capacity utilisation factor	LCA for experts default value	LCA for experts default value	LCA for experts default value	LCA for experts default value	LCA for experts default value

- The transport to the building site was modelled based on the default transport scenarios declared in the PCR and on the distance between the gate and Brussels (444 km).
- Based on the PCR, 40% of the product is transported 444 km directly from the factory gate to the construction site by Lorry 20-26 ton (EURO 5). The remaining 60% is transported via intermediary supplier and covers the distance between the gate and Brussels (444 km) via Lorry 28-32 Ton (EURO 5) as well as an extra default 35 km distance from Brussels to the construction site. The intermediary supplier transports 85% of the merchandise from Brussels to the construction site via Lorry 20-26 ton (EURO 5) and 15% via Lorry 12-14 Ton (EURO 5).

10.5 A5 – Installation in the building

- The packaging waste resulting from the installation of the product in the construction site is sent for waste treatment.
- The expenses for installation and the transport expenses for disposal are also considered in module A5.
- The expenses for installation include energy for the pneumatic stapler and the galvanized steel staples.
- The incineration of packaging waste receives credits for electricity and thermal energy generation, which are allocated in Module D.
- Includes the impacts of producing 10% membrane necessary for installation.
- Includes the 2% mass lost during installation as trimming, which is sent for waste treatment.
- The use of adhesive tape and adhesive for detailing is included in the B-EPD.
- At the construction site, packaging materials are released. 2% material losses have been taken into account.

Parts of the installation	Quantity	Unit	Description
Belgian electricity mix	0.02	kWh/m²	This process requires energy. This is then consumed by a stapler device, which is required for the installation of the product.
Staples	0.0017 kg	kg	Galvanized steel staples for attachment to surface
TESCON VANA tape	0.0239 kg	kg	Tape TESCON VANA for overlap sealing
ORCON F adhesive	0.0144 kg	kg	Adhesive ORCON F for detailing to rough surfaces
Material losses	0.009	kg	The quantity of material lost due to cutting the product it in the right shape.
Packaging	0.025	kg	Packaging waste at the construction site

Ancillary materials for installation (specified by material)	Insert information		
Water use	Not relevant	Not relevant	Not relevant
Other resource use	clips from stapler	0.002 kg/m2	–
Quantitative description of energy type (regional mix) and consumption during the installation process	Energy consumed by a stapler device, which is	0.02 kWh/DU	Regional electricity mix

	required for the installation of the product		
Waste materials on the building site before waste processing, generated by the product's installation (specified by type)	Trimming waste	0.009 kg/DU	Trimming waste
Output materials (specified by type) as result of waste processing at the building site e.g. of collection for recycling, for energy recovery, disposal (specified by route)	Packaging waste, Trimming waste	0.034 kg/DU	95% recycled, 5% sorted waste going into incineration (Cardboard) 5% recycled, 60% sorted waste going into incineration, 35% sorted waste going into landfill (Film PE)
Direct emissions to ambient air, soil and water	Evaporation of ethanol and water from ORCON F adhesive	0.0042 kg/DU (0.0010 kg Ethanol/DU) (0.0032 kg water /DU)	Modelled as Ethanol [Group NMVOC to air] and Water vapour [Inorganic emissions to air]"
Distance	Recycling	50 km	0.0059 kg/DU
	Sorting Centre	30 km	0.0059 kg/DU
	Landfill	50 km	0.0009 kg/DU
	Incineration	100 km	0.0019 kg/DU

10.6 B – Use stage (excluding potential savings)

Module not declared.

10.7 C – End of life

- The airtightness and vapour control membrane, overlap and staples required for installation are treated as waste in modules C1-C4.
- The airtightness and vapour control membrane and overlap are treated 85% via incineration with energy recovery (Module C3), 10% via landfill (Module C4) and 5% via recycling (Expenses for recycling in Module C3 and credits for recycled material in Module D).
- Module C3 includes the Electricity use (Belgian electricity mix) for a sorting plant without crusher of 0.0022 kWh/kg waste.
- The staples are treated 5% via landfill (Module C4) and 95% via recycling (Module C3).
- Module C2 contains the environmental impact of transportation of the product to the waste treatment plant.
- Module C4 contains the necessary processes for waste treatment at the end of the product life cycle. The loads for waste treatment are mapped here until the end of the waste property is reached.

Type of vehicle (truck/boat/etc.)	Fuel consumption (litres/km)	Distance (km)	Capacity utilisation (%)	Density of products (kg/m3)	Assumptions
Lorry	16-32 t EURO5	50 km	55%	328 kg/m³	Recycling Centre
Lorry	16-32 t EURO5	30 km	55%	328 kg/m³	Sorting Centre
Lorry	16-32 t EURO5	50 km	55%	328 kg/m³	Landfill
Lorry	16-32 t EURO5	100 km	55%	328 kg/m³	Incineration

End-of-life modules – C3 and C4	
Parameter	Value (kg)
Wastes collected separately	0.138 kg/DU
Wastes collected as mixed construction waste	Not relevant
Waste for re-use	Not relevant
Waste for recycling	0.007 kg/DU
Waste for energy recovery	0.119 kg/DU
Waste for final disposal	0.0116 kg/DU

D – Benefits and loads beyond the system boundaries

- This product has no considerable benefits due to reuse, but considerable benefits from material and energy recovery.
- The value flows resulting from the treatment of production waste in module A3 and C3, which can potentially serve as material or energy input for a downstream product system in the form of the energy recovered from the waste-to-energy treatment and material recovery, are accounted for completely in module D as credits outside of product system.

QUANTITATIVE DESCRIPTION OF THE LOADS BEYOND THE SYSTEM BOUNDARIES	- Recycling process for membrane waste - Transport for reused pallets: 50 km
QUANTITATIVE DESCRIPTION OF THE BENEFITS BEYOND THE SYSTEM BOUNDARIES	GWP-fossil: -1.09E-01 GWP-biogenic:-2.88E-04

11 RELEASE OF DANGEROUS SUBSTANCES TO INDOOR AIR, SOIL AND WATER DURING THE USE STAGE

11.1 Indoor air

This product can be installed for interior use. It has no impact on the health quality of indoor spaces.
The assessed product is an airtightness membrane composed primarily of polypropylene (PP) and polyethylene (PE). Both materials are chemically inert, non-reactive, and non-emissive under normal indoor conditions. They do not contain or release volatile organic compounds (VOCs), plasticizers, halogens, or other substances known to affect indoor air quality.

The membrane is designed for interior installation as part of the building envelope. Since it does not undergo chemical curing, does not emit odorous or harmful substances, and remains encapsulated behind internal finishes (e.g., plasterboard or insulation), it has no adverse impact on the health quality of indoor spaces.

This assessment aligns with existing knowledge on the use of PP and PE in construction products, which are widely recognized as safe and inert materials for indoor applications. The used adhesive ORCON F is a dispersion based on acrylic acid copolymers and ethanol. Free from plasticisers, halogens and potential VOC emissions are extremely low (<0.00006%).

11.2 Soil and water

The product is not in contact with drinking water or contact with rainwater.

12 DEMONSTRATION OF VERIFICATION

EN 15804: 2012 +A2:2019/AC:2021 serves as the core PCR

Independent verification of the environmental declaration and data according to standard EN ISO 14025:2010
Internal ☐ External ☒

Third party verifier: Agnes Schuurmans
SGS INTRON B.V.
Dr. Nolenslaan 126, 6136 GV Sittard, The Netherlands
Agnes.Schuurmans@sgs.com

13 LCA INTERPRETATION

The environmental impacts were analysed using the example of global warming potential (GWP total) to identify the responsible sources along the life cycle. Modules A1-A3 (40.4%) has dominant influence followed by Module C3 (39%) and Module A5 (19.2%) on GWP total. The main source of impact is the incineration of non-woven. The incineration of non-woven causes the highest environmental impact in all main categories, only surpassed in theAP,EP, POCP, ADPF and WDP by the production of polypropylene. Transportation of raw materials to and between the manufacturing sites (A2) and disposal transportation of the product in EoL (C2) are not very relevant in terms of GWP total.
The production of non-woven in Modules A1-A3 has the largest contribution to the impacts of all main indicators, except for GWP total, GWP fossil, GWP luluc, ODP and ADPE. The use of ORCON F for installation has the highest impact in ODP and GWP-luluc.

14 TECHNICAL INFORMATION FOR SCENARIO DEVELOPMENT

For the assessment, a reference roof area of 10 × 10 m was assumed. Material use during installation includes an additional 7.1% due to overlaps and 0.5% for length adjustments, resulting in a rounded total of 8%. Any remaining rolls or width offcuts are reused and therefore not considered waste. Installation waste arises primarily from penetrations, such as two ventilation pipes, one chimney, and four roof windows, which together result in 1.7 m² of cutouts. This corresponds to approximately 2% of the total roof area.
The installation assumes beams spaced at 0.75 m and staples applied every 10 cm across a 1.5 m membrane width, following the pro clima processing guidelines. For a representative installation of 1,000 m running length (≈ 1,500 m² surface), this results in about 20,000 staples. With an average staple weight of 0.000124 kg, the total galvanized steel demand equals 2.48 kg per 1,500 m², corresponding to 0.00165 kg steel per m² of installed area.
A pneumatic stapler powered by a standard site compressor is used for fastening. The electricity demand associated with compressed-air generation is estimated at 0.020 kWh/m², equivalent to 0.072 MJ/m². This value includes compressor inefficiencies, hose losses, and typical duty cycles during installation.
To install 1 m² of INTELLO PLUS, an additional 0.0239 kg of TESCON VANA and 0.01441 kg of ORCON F (including packaging) are required, based on calculated sealing needs for overlaps, detailing, and edge connections. These quantities are included in the LCA model, with packaging impacts assigned to A5 and end-of-life impacts to C1–C4. Actual material use may vary depending on installer preferences and roof design, which is why both TESCON VANA and ORCON F also have separate EPDs.
Overall, Module A5 accounts for the material input of galvanized steel staples, the corresponding electricity use for pneumatic stapling, the required tape TESCON VANA and adhesive ORCON F for detailing, based on standard site conditions and recommended installation practices.

15 APPLICATION UNIT

The reference quantity for the membrane is 1 m²

16 ADDITIONAL INFORMATION ON REVERSIBILITY

Description	Type of fixing	Level of reversibility	Simplicity of disassembly	Speed of disassembly	Ease of handling (size and weight)	Robustness of material (material resistance to disassembly)	Comment
Vapour control (*alternate terms:* vapour check or retarder) membrane for use on roofs, walls, ceilings and floors on structures that are open or closed to diffusion on the exterior, e.g. flat/pitched roofs and green roofs	The membrane is connected to the surface by staples.	Reversible connections with light repairable damage	Simple – requires the use of specific though common tools	Speed of disassembly varies from quick to slow depending on element dimensions	Material easy to manipulate by hand, one to two workers required depending on dimensions	Disassembly is possible but should be done carefully in order not to generate any damage	

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General information

Owner of the EPD, Responsible for the data, LCA and information

pro clima / MOLL bauökologische Produkte GmbH
Rheintalstraße 35 - 43, 68723 Schwetzingen, Germany
https://proclima.com/
For more information you can contact:
info@proclima.com

Authors of the LCA and EPD

María Díaz Cáceres, Thu Trang Phan, Antonia Willich
brands & values GmbH
Hollerallee 14A, 28209 Bremen, Germany
info@brandsandvalues.com
Project report: 947.2024.08 - pro clima – B-EPDs

BRANDS & VALUES
SUSTAINABILITY CONSULTING

Verifier

Agnes Schuurmans
SGS INTRON B.V.
Dr. Nolenslaan 126, 6136 GV Sittard, The Netherlands
Agnes.Schuurmans@sgs.com

Date of verification: 30/11/2025
External independent verification of the declaration and data according to EN ISO 14025 and relevant PCR documents

Comparing EPDs is not possible unless they are conform to the same PCR and taking into account the building context.
The program operator cannot be held responsible for the information supplied by the owner of the EPD nor LCA practitioner.

B-EPD program operator
Federal Public Service (FPS) of Health,
Food Chain Safety and Environment

Avenue Galilée / Galileelaan 5
box 2, 1210 Brussels

www.b-epd.be
epd@health.fgov.be

B-EPD .BE

Health
Food Chain Safety
Environment

.be