



## ENVIRONMENTAL PRODUCT DECLARATION

### ENVIRONMENTAL PRODUCT DECLARATION

In accordance with standard **NF EN 15804+A2**

And its national complement **NF EN 15804/CN**

Reflective Under-roof and Rainscreen  
membranes

Tremco CPG  
ILLBRUCK ME050



Version : V1.1

Registration number: Under verification

Date Published: December 2022



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## I. WARNING

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The information contained in this declaration is provided under the responsibility of Tremco CPG (producer of EPD) according to NF EN 15804 +A2 and the national supplement NF EN 15804/CN.

Any use, total or partial, of the information provided in this document must at least be accompanied by the full reference to the original EPD as well as its producer, who may submit a complete copy.

The standard EN 15804+A2 of the CEN, the national supplement NF EN 15804/CN serve as rules for defining product categories (PCR).

## II. READING GUIDE

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Example reading:  $-9.0 \text{ E } -03 = -9.0 \times 10^{-3}$

The following display rules apply:

- When the inventory calculation result is zero, then the zero value is displayed.
- Abbreviation used:
  - N/A: Not applicable
  - UF: Functional Unit
  - LCA: Life Cycle Assessment
  - NCV: Net calorific value
  - PCR: Product Category Rules
  - RLT: Reference Lifetime
  - VOC: Volatile organic compound
- The units used are specified in front of each flow: the kilogram "kg", the gram "g", the kilowatt-hour "kWh", the mega joule "MJ", the square meter "m<sup>2</sup>", the watt "W", the kilometer "km", the millimeter "mm", the cubic meter "m<sup>3</sup>".

## III. PRECAUTIONARY USE OF THE FDES FOR PRODUCT COMPARISON

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The EPD of construction products may not be comparable if they do not comply with standard NF EN 15804+A2.

The standard NF EN 15804+A2 defined in § 5.3 Comparability of EPD\* for construction products, the conditions under which construction products can be compared, based on the information provided by the EPD:

"Therefore, a comparison of the environmental performance of construction products using EPD information must be based on the use of the products and their impacts on the building, and must take into account the entire life cycle (all information modules)"

NOTE 1 Outside the framework of the environmental assessment of a building, EPD are not tools for comparing construction products and services.

NOTE 2 For the assessment of the contribution of buildings to sustainable development, a comparison of environmental aspects and impacts shall be undertaken together with socio-economic aspects and impacts relating to the building.

NOTE 3 For the interpretation of a comparison, reference values are required.

## I. GENERAL INFORMATION

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### 1. Name and address of the declarant

Tremco CPG Germany GmbH  
Werner-Haepf-Strasse 1,  
92493 Bodenwöhr Germany  
Manufacturer: Tremco CPG

### 2. The site(s), manufacturer or group of manufacturers or their representatives for which the EPD is representative

Manufacture of the product ILLBRUCK ME050:  
5, rue Sophie Germain, 22440, Ploufragan, France.

### 3. Type of EPD:

"Cradle to grave"

### 4. Type of EPD:

Individual

### 5. Identification of the product by name or by an explicit designation or by the commercial reference(s):

ILLBRUCK ME050

### 6. Value framework:

#### **FDES INIES**

4, avenue du Recteur Poincaré  
75016 Paris, France  
Site web : [www.base-inies.fr](http://www.base-inies.fr)

### 7. Independent external verification carried out according to the ISO 14025 (Version 1.1) environmental declaration program by:

The CEN standard EN 15 804 serves as PCR <sup>a)</sup>
Independent verification of the declaration and of data according EN ISO 14025: 2010
Internal                      X    External
Depending on the case <sup>b)</sup> Third Party Audit: Marion Sié – VERSo – 5, quai Victor Augagneur 69003 Lyon marion.sie@verso-acv.com (Verifier authorized by the INIES verification program)
Program registration number according to ISO 14025:
Date of first publication: December 2022
Update date:
Date of verification: December 2022
Validity period: 5 years
a) Rules for defining product categories b) Optional for communication between companies, mandatory for communication between a company and its customers (Reference: EN ISO 14025:2010, 9.4)

## II. DESCRIPTION OF THE PRODUCT AND FUNCTIONAL UNIT

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### 1. Description of the functional unit

The product covered by this EPD makes it possible to ensure the thermal insulation function (associated with an insulating material) on the roofing and on the facade while also having a under-roof and rainscreen function. The functional unit chosen is as follows: "Ensure the function of waterproofing and airtightness, of water vapor permeability and thermal radiation reflectivity, with a weight of 420 g, on 1 m<sup>2</sup> of wall, over a reference lifetime of 50 years".

### 2. Main performances of the functional unit

The performances retained in the functional unit are in accordance with the characteristics of flexible under-roof screens and rainscreens, which are intended to be used in order to avoid the penetration of wind and water from the outside as stated in EN13859-1 and EN13859-2. All these performances justify the functions of the product.

### 3. Product and packaging description

The product covered by this EPD is reflective under-roof screen and rainscreen made from polymer/aluminium and glass yarn. The ILLBRUCK ME050 product is non-combustible, highly permeable to water vapor (HPV), waterproof, airtight and insulating by reflection thanks to its breathable membrane. The product is manufactured and assembled in South Korea in a ISO 9001 and ISO 14001 certified factory. ILLBRUCK ME050 complies with CE 13859-1 and CE 13859-2 marking. The product is composed mainly of inorganic materials, and in particular of glass which has a high resistance to oxidation and is unalterable over time. Its waterproof-breathable membrane, protected by reinforced aluminium siding, is highly resistant to UV and oxidation. This product thus has a high dimensional stability thanks to the glass fiber and aluminium it contains, giving it the ability to absorb mechanical stresses related to installation and use in accordance with the tests of EN13859-1 and EN13859-2.

Each product is wrapped around a cardboard tube. The product is then wrapped in a plastic film covered with a label. Each pallet containing 24 rolls is closed by two wooden boards.

### 4. Description of the use of the product (areas of application)

The rainscreen ensures thermal insulation from the outside in summer by reflection. Its reflective rainscreen function is ensured by the lamination of the aluminium reinforced outer with an impermeable membrane.

### 5. Other technical characteristics not included in the functional unit

In addition to being an HPV breathable rainscreen, ILLBRUCK ME050 has other features not contained in the functional unit. It offers air and water impermeability properties as well as passive fire protection.

- Fire behavior:
  - A2-s1, d0
  - Protects the insulation and the wood frame
- Anti-condensation:
  - HPV = continuous envelope from roof ridge to sewer without risk of condensation
  - Installation in direct contact with insulation

- Reflection :
- Pure aluminium = reflects 95% of thermal radiation

This type of product is compatible with all types of insulation thanks to its HPV function Highly Permeable to Water Vapour (Sd 0.08 m). <sup>1</sup>

## 6. Description of the main components and/or materials of the product

Main components (kg)	For a roll of reflective product; 0,43 mm thick; 35 m long; 1.2 m wide; surface 42 m <sup>2</sup> (kg)	Per functional unit (kg/m <sup>2</sup> )
The ILLBRUCK ME050 product	17,500	0,420
Packaging	2,008	0,047
Accessories (Staples), per unit	378	9

Losses rates related to:

- Production represents 0.2% of by mass of the product
- Installation represents a surface loss of 1.0% during product cutting and 8.3% surface loss during covering

## 7. Specify whether the product contains substances from the candidate list according to the REACH regulation (if greater than 0.1% by mass):

None (03/01/2022)

## 8. Proof of suitability for use

Not applicable.

## 9. Distribution channel

**BtoB**



## 10. Description of the reference service life (if applicable and in accordance with 7.3.3.2 of NF EN 15804)

### Description of the reference service life

Parameter	Units (expressed per functional unit or per unit)
Reference lifetime	50 years
Declared properties of the product (at the factory gate) and finishes, etc.	<p>The products leaving the workshop are finished and ready to be installed.</p> <p>According to Construction products (EU Regulation) 305/2011.</p> <p>Follow the harmonized technical specification EN13859-1<sup>1</sup> and EN13859-2<sup>2</sup>.</p>
Theoretical parameters of application (if imposed by the manufacturer), including references to appropriate practices	<p>The implementation must comply with the recommendations of the technical document of application on the facade.</p>
Presumed quality of the work, when the installation complies with the manufacturer's instructions	
Outdoor environment (for outdoor applications), for example. weather, pollutants, UV and wind exposure, building orientation, shading, temperature	The product is weather resistant, with a resistance of 5000h to UV in accelerated aging, in open-joint cladding; (test success: EN13859-2).
Indoor environment (for indoor applications), for example. temperature, humidity, chemical exposure	The product can be implemented in all types of buildings, anywhere in metropolitan France, and abroad.
Conditions of use, for example. frequency of use, mechanical exposure	Use 1 time; exposure to wind; Complies with the recommendations of the application data sheet.
Maintenance scenario	No maintenance is required during

<sup>1</sup> This European Standard specifies the characteristics of flexible sheets for underlays which are to be used under the roof covering of discontinuous roofs. It specifies the requirements and test methods and provides for the evaluation of conformity of the products with the requirements of this document.

<sup>2</sup> This European Standard specifies the characteristics of flexible rain screens, intended to be used behind the cladding of exterior walls, in order to prevent the ingress of wind and water from outside. It expresses the specifications and test methods for assessing the conformity of products with the requirements of this document.

### Biogenic Carbon Content Information

Biogenic carbon content	Unit (expressed per functional unit or per declared unit)
Biogenic carbon content of the product (at the factory gate)	0 kgC
Biogenic carbon content of associated packaging (at factory exit)	0 kgC

No biomass as raw material is used in this product.

## VI. LIFE CYCLE STAGES

The following figure shows the product life cycle of this FDES.

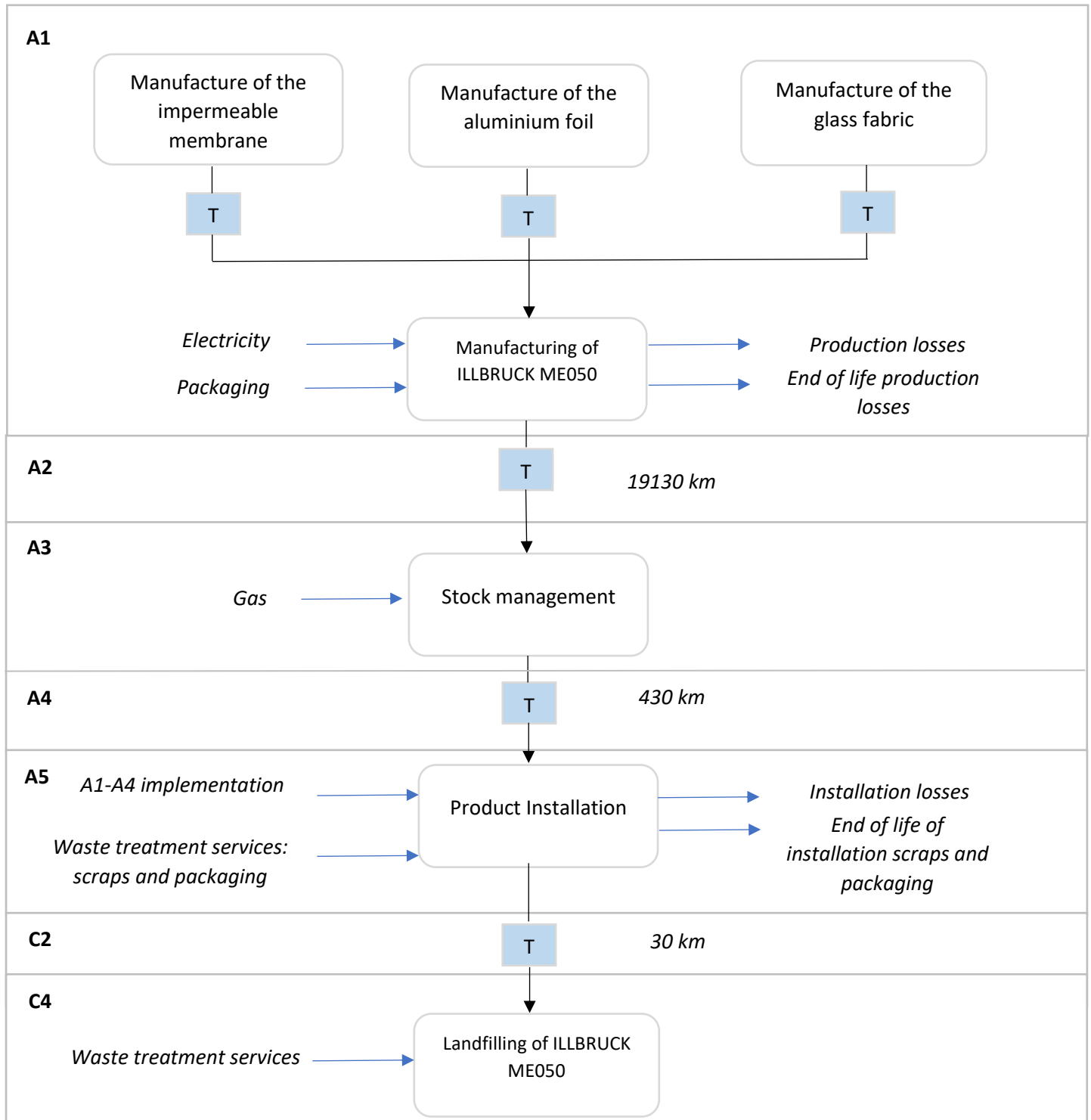


Figure 1: ILLBRUCK ME050 life cycle.

DESCRIPTION OF SYSTEM BOUNDARIES (X = INCLUDED IN THE LCA; MND = MODULE NOT DECLARED)														
PRODUCTION STAGE	CONSTRUCTION PROCESS STAGE		USE STAGE							END-OF-LIFE STAGE				BENEFITS AND CHARGES BEYOND THE FRONTIERS OF THE SYSTEM
Production	Transport	Construction process installation	Usage	Maintenance	Repair	Replacement	Rehabilitation	Use of energy during the use stage	Use of water during the use stage	Demolition / Deconstruction	Transport	Waste treatment	Elimination	Possibility of reuse, recovery, recycling
A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	-	-	-	-	-	-	-	-	X	-	X	-

## 1. Production stage, A1-A3

### A1: Description of the raw material procurement stage

- Extraction and processing of raw materials up to the production of aluminium, glass wire, polymers and packaging.
- Production of the various components.
- Production and transport to the packaging manufacturing site (cardboard box, wooden pallets, stretch film).
- Transport of these raw materials to the ILLBRUCK ME050 manufacturing site.
- Assembly of the product (power consumption of the factory).
- End-of-life of non-recoverable scraps of materials and components during the production of the product including their treatment (losses during production of approximately 0.2%). This includes all processes related to production, treatment and disposal.

### A2: Description of transport to storage site

- Transport of materials and components between their production site and the Tremco CPG storage site.

<b>Capacity utilization (including empty returns)</b>	<p>Sea and land freight: (generic data from ecoinvent) full capacity on the way forward and empty on the way back.</p> <p>The load of the means of transport is constrained by the volume and not by the mass of the product</p> <p>-Which is 977 kg/m<sup>3</sup> (0.4 kg/m<sup>2</sup>)</p> <p>-Surface of product transported in the container: 28224m<sup>2</sup>.</p> <p>-Surface area of product transported in the truck: 40320 m<sup>2</sup>.</p> <p>Truck: 20pallets</p> <p>Container: 14 pallets</p>
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#### A3: Description of the storage step

- Energy inputs (gas) used to move goods within the storage site.

## 2. Construction stage, A4-A5

#### A4: Description of the transportation of the product between the storage site and the installation site:

- Transportation of the packaged insulation from its storage site to its construction site.

Scenario information	Units (expressed per functional unit or per declared unit)
Type of fuel and consumption of the vehicle or type of vehicle used for transport, for example: long-distance truck, boat, etc.	Scenario: The vehicles considered are Euro 6 trucks with an unspecified payload, according to Commission Directive 2007/37/EC (European Emission Standard). Value for the reference product: The vehicles considered are Euro 6 trucks with an unspecified payload.
Distance to construction site	Distance travelled: 400 km from storage site to point of sale and 30 km from point of sale to construction site
Capacity utilization (including empty returns)	Sea and land freight: (ecoinvent generic data) outbound at 100% load and zero at return. The load of the means of transport is constrained by the volume and not by the mass of the product: that is 977 kg/m <sup>3</sup> (0.4 kg/m <sup>2</sup> ). -Surface of product transported in the truck: 40320 m <sup>2</sup> . Truck: 20 pallets
Bulk density of products transported	Product with little compressibility
Volume capacity utilization factor	Unused data

## Installation in the building

The loss rate during implementation is estimated at 9.3%. The product requires no maintenance or replacement during its reference lifetime. The installation of insulation requires installation accessories (fastening staples) contained in the UF.

### A5: Description of the construction-installation process

- Extraction of raw materials, production and transport of components used on site (staples).
- End of life of non-recoverable packaging of insulation and components used on site (plastic film): transport, treatment and disposal.
- End of life of recoverable packaging of components used on site (cardboard box: 100% recycled, wooden pallet: 50% recycled): transport, treatment and disposal.
- End of life of non-recoverable losses of components during the installation of the product including transport (losses during implementation of the order of 0.2%). This includes all processes related to the production, transport, processing and disposal of offcuts.

Scenario information	Units (expressed per functional unit or per declared unit)
Auxiliary inputs for installation (specified by material)	Installation accessories: – Stainless steel staples: 9/m <sup>2</sup> /UF
Water use	0 m <sup>3</sup>
Use of other resources	No
Quantitative description of the type of energy (regional mix) and consumption during the installation process	0 kWh or MJ
Waste generated at the construction site generated by the installation of the product (specified by type) prior to waste treatment	9.3% or 0.093 m <sup>2</sup> of ILLBRUCK ME050 / m <sup>2</sup> of insulation
Materials (specified by type) produced by waste treatment at the construction site, for example. collection for recycling, energy recovery, disposal (specified by route)	Scraps are inert waste and are sent to a landfill. Packaging waste is sent to a landfill.
Direct emissions to ambient air, soil and water	0 kg

### 3. Life stage in operation (exclusion of potential savings), B1-B7

**Description of the step:** During its use ILLBRUCK ME050 does not require any maintenance operation, use of water or energy are necessary during its implementation. Modules from B1 to B7 are not relevant for the product concerned.

#### Maintenance

Scenario information	Units (expressed per functional unit or per declared unit)
Maintenance process	None
Maintenance cycle	0 Number per year
Auxiliary inputs for maintenance (for example. cleaning product, specify materials)	0 kg/cycle
Waste generated during maintenance (specify materials)	0 kg
Net freshwater consumption during maintenance	0 m <sup>3</sup>
Energy input during maintenance (for example. vacuum cleaning), type of energy carrier, for example. electricity, and quantity, if applicable and relevant	0 kWh

## Repair

Scenario information	Units (expressed per functional unit or per declared unit)
Repair process	None
Inspection Process	-
Repair cycle	-
Auxiliary inputs (for example. lubricant, specify materials)	0 kg or kg/cycle
Waste generated during repair (specify materials)	0 kg
Net freshwater consumption during repair	0 m <sup>3</sup>
Energy input during repair (for example. crane activity), type of energy carrier, for example. electricity, and quantity	0 kWh

## Replacement

Scenario information	Units (expressed per functional unit or per declared unit)
Replacement cycle	0 Number per year
Energy input during replacement (for example. crane activity), type of energy carrier (for example. electricity), and quantity, if applicable and relevant	0 kWh
Exchange of worn parts during the life cycle of the product, specify materials	0 kg



## Rehabilitation

Scenario information	Units (expressed per functional unit or per declared unit)
Rehabilitation process	None
Rehabilitation cycle	0 Number per year
Input of materials for rehabilitation (for example. bricks), including auxiliary inputs for the rehabilitation process (for example. lubricant, specify materials)	0 kg or kg/cycle
Waste generated during rehabilitation (specify materials)	0 kg
Energy input during rehabilitation (for example. crane activity), type of energy carrier, for example. electricity, and quantity, if applicable and relevant	0 kWh
Other assumptions for scenario development (for example. frequency and duration of use, number of occupants)	Duration of use of 50 years

Description of scenarios and additional technical information:

- B6: Energy requirements during the operation phase
- B7: Water requirements during the operation phase

Scenario information	Units (expressed per functional unit or per declared unit)
Auxiliary inputs specified by material	0 kg
Net freshwater consumption	0 m <sup>3</sup>
Type of energy carrier (for example. electricity, natural gas, district heating)	0 kWh
Equipment power output	0 kWh
- Performance characteristics (for example: energy efficiency, emissions, performance variation with capacity utilization, etc.) -Other assumptions for scenario development (for example: frequency and duration of use, number of occupants)	Not applicable

#### 4. End of life stage C1-C4

This step includes the following end-of-life modules: C1, deconstruction, demolition; C2, transport to waste treatment; C3, treatment of waste for reuse, recovery and/or recycling; C4, elimination.

Description of scenarios and additional technical information:

- C1: Deconstruction, Demolition: MND
- C2: Transport of the dismantled insulation product to the building's waste sorting center.
- C3: Treatment of waste for reuse, recovery and/or recycling: MND
- C4: Disposal (of non-recoverable waste): Storage in a landfill of non-hazardous waste (aluminium, glass wire, polymers).

Process	Units (expressed per functional unit or per declared unit of components, products or materials specified by material type)
Collection process specified by type	<p>Value for reference product: 4.20E-01 kg</p> <p>The waste from the product represents 4.20E-01 kg of inert non-hazardous waste.</p> <p>This process is collected individually</p> <p>There is no sorting/recycling</p>
Recovery system specified by type	Not applicable
Type-specified elimination	4.20E-01 kg of product destined for landfill
Hypothesis for scenario development	<p>C1: ILLBRUCK ME050 can dissociate itself from its installation site. The product is fixed with staples that can be disassembled. Module C1 has no impact at this stage of the life cycle.</p> <p>C2: The transport distance considered from the demolition site and the storage site is 30 km.</p> <p>C3/4: ILLBRUCK ME050 belongs to the category of non-inert and non-hazardous waste. Landfill waste is Class II non-hazardous waste. In this study, this scenario is taken into account. Module C3 therefore has no impact.</p>

## 5. Potential for recycling/reuse/recovery, D

The potential for recycling, reuse, or recovery is not considered as of today.

Materials/materials recovered outside the boundaries of the system	Recycling process across system boundaries	Materials/materials/energy saved	Associated quantities
0	0	0	0

## VII. INFORMATION FOR THE CALCULATION OF LIFE CYCLE ASSESSMENT

<b>PCR used (Rules Categories product)</b>	Standard NF EN 15804+A2 (2019) "Contribution of construction works to sustainable development - Environmental product declarations - Rules governing categories of construction products", accompanied by its national supplement NF EN 15804/CN (2022)
<b>System boundaries</b>	From cradle to grave, in accordance with the rules of the PCR.
<b>Allowances</b>	Physical allocation: Power consumption made in proportion to the surface area of each Tremco-CPG product. Other allocations are managed by the database ecoinvent 3.8 (recycled content allocation).
<b>Geographical representativeness</b>	Specific data concerning modules A1 to C4 is collected from Tremco CPG. These primary data relate to the production and implementation technology of the declared product. They correspond to the raw materials used, as well as the distances between production sites (up to Tier 4 subcontractors) and end-of-life subcontractors.
<b>Temporal</b>	<p>Generic LCI data are taken from the ecoinvent database. They correspond to processes taking place in France, Europe or the world, the most accurate data having been preferred, and adjustments having been made if necessary. They are used, for example: manufacturing processes of subcontractors before assembly, and the EURO type/class of vehicles.</p> <p>Country of production: products made in Korea for the international market</p> <p>Year of production data: 2021</p> <p>Secondary database: ecoinvent (3.8) EUGEOS 15804 + A2 (allocation recycled content)</p>
<b>Variability (for non-specific FDES, that is collective, range, multi-site FDES)</b>	Not applicable

## **VIII. RESULTS OF THE LIFE CYCLE ASSESSMENT**

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Below are the tables that summarize the results of the LCA.

Totals may not add due to rounding.

MND: Undeclared module

For energy indicators used as raw materials: a negative value corresponds to the change in use from raw materials to fuels (for example. In the case of incineration). Application of Annex I of NF EN 15804/CN.

BASELINE ENVIRONMENTAL IMPACT INDICATORS															
Environmental impacts	Production stage	Construction process stage		Use stage							End of life stage				D Benefits and expenses Beyond the boundaries of the System
	A1 / A2 / A3	A4 Transport	A5 Installation	B1 Usage	B2 Maintenance	B3 Repair	B4 Replacement	B5 Rehabilitation	B6 Energy use	B7 Water use	C1 Deconstruction/de molition	C2 Transport	C3 Waste treatment	C4 Elimination	
Climate change – total kg CO <sub>2</sub> equiv/UF	4,36E+00	4,38E-02	4,48E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,05E-03	0,00E+00	3,65E-02	0,00E+00
Climate change – fossil fuels kg CO <sub>2</sub> equiv/UF	4,39E+00	4,37E-02	4,48E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,04E-03	0,00E+00	1,12E-03	0,00E+00
Climate change – biogenic Kg CO <sub>2</sub> equiv/UF	-3,49E-02	7,53E-05	-5,21E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,63E-06	0,00E+00	3,54E-02	0,00E+00
Climate change – land cover and land cover transformation kg <sub>CO2</sub> equiv/UF	5,38E-03	1,74E-05	5,37E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	8,17E-07	0,00E+00	1,23E-07	0,00E+00
Depletion of the ozone layer Kg of CFC 11 equiv / Uf	2,30E-07	1,17E-08	2,43E-08	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,73E-10	0,00E+00	2,23E-10	0,00E+00
Acidification mole of H <sup>+</sup> equiv /UF	2,91E-02	1,30E-04	2,93E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,79E-06	0,00E+00	1,12E-05	0,00E+00

Aquatic eutrophication, freshwater kg of P equiv / UF	1,56E-03	3,04E-06	1,58E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,35E-07	0,00E+00	5,85E-08	0,00E+00
Aquatic eutrophication, marine kg of N equiv / UF	5,58E-03	2,58E-05	5,65E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,18E-06	0,00E+00	4,81E-06	0,00E+00
Terrestrial eutrophication mole of N equiv/ UF	5,82E-02	2,80E-04	5,81E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,28E-05	0,00E+00	5,27E-05	0,00E+00
Photochemical ozone formation kg NMCOV equiv/UF	1,58E-02	1,10E-04	1,60E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,79E-06	0,00E+00	1,44E-05	0,00E+00

BASELINE ENVIRONMENTAL IMPACT INDICATORS															
Environmental impacts	Production stage	Construction process stage		Use stage							End of life stage				D Benefits and expenses Beyond the boundaries of the System
	A1 / A2 / A3	A4 Transport	A5 Installation	B1 Usage	B2 Maintenance	B3 Repair	B4 Replacement	B5 Rehabilitation	B6 Energy use	B7 Water use	C1 Deconstruction /demolition	C2 Transport	C3 Waste treatment	C4 Elimination	
Depletion of abiotic resources (minerals & metals) kg Sb equiv/UF	9,50E-05	1,32E-07	9,80E-06	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	6,95E-09	0,00E+00	5,24E-10	0,00E+00
Depletion of abiotic resources (fuels & fossils) MJ/UF	4,15E+01	5,52E-02	4,17E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,36E-03	0,00E+00	1,47E-03	0,00E+00
Water requirement m3 of deprivation equiv in the world /UF	8,13E-01	3,21E-03	9,14E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,50E-04	0,00E+00	3,84E-05	0,00E+00

ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS															
Environmental impacts	Production stage	Construction process stage		Use stage							End of life stage				D Benefits and expenses Beyond the boundaries of the System
	A1 / A2 / A3	A4 Transport	A5 Installation	B1 Usage	B2 Maintenance	B3 Repair	B4 Replacement	B5 Rehabilitation	B6 Energy use	B7 Water use	C1 Deconstruction/de molition	C2 Transport	C3 Waste treatment	C4 Elimination	
Fine particulate matter emissions Disease index / UF	2,83E-07	2,52E-09	2,92E-08	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,29E-10	0,00E+00	1,29E-10	0,00E+00
Insulating radiation (human health) kBq of U235 equiv/UF	1,92E-01	3,13E-03	2,15E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,60E-04	0,00E+00	1,60E-04	0,00E+00
Ecotoxicity (freshwater) CTUh/UF	8,65E-01	2,20E-02	1,02E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,04E-03	0,00E+00	1,04E-03	0,00E+00
Human toxicity, carcinogenic effects CTUh/UF	3,35E-09	1,47E-11	1,08E-09	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	6,59E-13	0,00E+00	6,59E-13	0,00E+00
Human toxicity, non-cancer effects CTUh/UF	4,82E-07	8,38E-10	4,69E-08	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,84E-11	0,00E+00	3,84E-11	0,00E+00
Land use impacts / Dimensionless soil quality / UF	6,65E+00	4,89E-01	8,01E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,62E-02	0,00E+00	2,62E-02	0,00E+00



RESOURCE UTILIZATION															
Environmental impacts	Production stage	Construction process stage		Use stage							End of life stage				D Profits and expenses Beyond the boundaries of the System
	A1 / A2 / A3	A4 Transport	A5 Installation	B1 Usage	B2 Maintenance	B3 Repair	B4 Replacement	B5 Rehabilitation	B6 Energy use	B7 Water use	C1 Deconstruction/de molition	C2 Transport	C3 Waste treatment	C4 Elimination	
Use of renewable primary energy, excluding renewable primary energy resources used as raw materials MJ/UF	2,05E+00	0,00E+00	-2,05E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of renewable primary energy resources as raw materials MJ/UF	-1,48E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials) MJ/UF	5,69E-01	0,00E+00	-2,05E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Use of non-renewable primary energy, excluding non-renewable primary energy resources used as raw materials MJ/UF	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of non-renewable primary energy resources as feedstocks MJ/UF	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

RESOURCE UTILIZATION															
Environmental impacts	Production stage	Construction process stage		Use stage							End of life stage				D Benefits and expenses Beyond the boundaries of the System
	A1 / A2 / A3	A4 Transport	A5 Installation	B1 Usage	B2 Maintenance	B3 Repair	B4 Replacement	B5 Rehabilitation	B6 Energy use	B7 Water use	C1 Deconstruction/de molition	C2 Transport	C3 Waste treatment	C4 Elimination	
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials) MJ/UF	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of secondary material kg/UF	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of secondary renewable fuels MJ/UF	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of non-renewed secondary fuels	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Net freshwater use m <sup>3</sup> / UF	2,14E-02	7,64E-05	2,36E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,58E-06	0,00E+00	9,19E-07	0,00E+00

WASTE CATEGORY															
Environmental impacts	Production stage	Construction process stage		Use stage							End of life stage				D Benefits and expenses Beyond the boundaries of the System
	A1 / A2 / A3	A4 Transport	A5 Installation	B1 Usage	B2 Maintenance	B3 Repair	B4 Replacement	B5 Rehabilitation	B6 Energy use	B7 Water use	C1 Deconstruction /demolition	C2 Transport	C3 Waste treatment	C4 Elimination	
Hazardous waste disposed of kg/UF	7,59E+00	1,55E-02	8,17E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	6,90E-04	0,00E+00	2,80E-04	0,00E+00
Non-hazardous waste kg/UF	2,13E-01	2,99E-02	1,14E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,61E-03	0,00E+00	1,23E-05	0,00E+00
Radioactive waste disposed of kg/UF	1,70E-03	1,29E-05	1,91E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	6,21E-07	0,00E+00	1,71E-07	0,00E+00

OUTFLOWS															
Environmental impacts	Production stage	Construction process stage		Use stage							End of life stage				D Benefits and expenses Beyond the boundaries of the System
	A1 / A2 / A3	A4 Transport	A5 Installation	B1 Usage	B2 Maintenance	B3 Repair	B4 Replacement	B5 Rehabilitation	B6 Energy use	B7 Water use	C1 Deconstruction/de molition	C2 Transport	C3 Waste treatment	C4 Elimination	
Components for reuse kg/UF	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for recycling kg/UF	4,00E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for energy recovery kg/UF	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Electrical energy supplied outside MJ/UF - Steam energy supplied outside MJ/UF - Process gas energy supplied outside MJ/UF	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

<b>ENVIRONMENTAL IMPACTS</b> Aggregation of the different modules to achieve a "Total of Steps" or "Total Life Cycle"						
Impacts / Flows	Production stage	Installation step	Use stage	End of life stage	Total Life Cycle	Benefits and expenses beyond the boundaries of the system
Baseline environmental impact indicators						
Climate change - total kg CO2 equiv/UF	4,36E+00	4,91E-01	0	3,85E-02	4,89E+00	0
Climate change – fossil fuel kg CO2 equiv/UF	4,39E+00	4,91E-01	0	3,16E-03	4,88E+00	0
Climate change - biogenic kg CO2 equiv/UF	-3,49E-02	-4,45E-04	0	3,54E-02	0	0
Climate change - land use and land cover transformation kg CO2 equiv/UF	5,38E-03	5,55E-04	0	9,40E-07	5,94E-03	0
Depletion of the ozone layer Kg of CFC 11 equiv / UF	2,30E-07	3,60E-08	0	6,97E-10	2,67E-07	0
Acidification mole of H+ equiv /UF	2,91E-02	3,06E-03	0	1,70E-05	3,22E-02	0
Aquatic eutrophication, freshwater kg P equiv / UF	1,56E-03	1,62E-04	0	1,93E-07	1,72E-03	0
Aquatic eutrophication, marine kg of N equiv / UF	5,58E-03	5,90E-04	0	5,99E-06	6,18E-03	0
Terrestrial eutrophication mole of N equiv/ UF	5,82E-02	6,09E-03	0	6,55E-05	6,43E-02	0

<b>Photochemical ozone formation</b> kg NMCOVequiv/UF	1,58E-02	1,71E-03	0	1,91E-05	1,75E-02	0
<b>Depletion of abiotic resources (minerals &amp; metals)</b> kg Sb equiv/UF	9,50E-05	9,93E-06	0	7,47E-09	1,05E-04	0
<b>Depletion of abiotic resources (fuels &amp; fossils)</b> MJ/UF	4,15E+01	4,22E+00	0	3,83E-03	4,57E+01	0
<b>Water requirements</b> m3 of deprivation equiv in the world /UF	8,13E-01	9,46E-02	0	1,88E-04	9,08E-01	0
<b>Additional environmental impact indicators</b>						
<b>Emissions of fine particles</b> Disease Index / UF	2,83E-07	3,17E-08	0	2,58E-10	3,15E-07	0
<b>Insulating radiation (human health)</b> kBq de U235 equiv/UF	1,92E-01	2,46E-02	0	3,20E-04	2,17E-01	0
<b>Ecotoxicity (freshwater)</b> CTUh/UF	8,65E-01	1,24E-01	0	2,08E-03	9,91E-01	0
<b>Human toxicity, carcinogenic effects</b> CTUh/UF	3,35E-09	1,10E-09	0	1,32E-12	4,45E-09	0
<b>Human toxicity, non-cancer effects</b> CTUh/UF	4,82E-07	4,77E-08	0	7,68E-11	5,30E-07	0
<b>Land use impacts / Land quality</b> <i>Dimensionless / UF</i>	6,65E+00	1,29E+00	0	5,25E-02	7,99E+00	0
<b>Resource Utilization</b>						
<b>Use of renewable primary energy, excluding renewable primary energy resources used as raw materials</b> MJ/UF	2,05E+00	-2,05E+00	0	0	0	0

Use of renewable primary energy resources as feedstocks MJ/UF	-1,48E+00	0,00E+00	0	0	-1,48E+00	0
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials) MJ/UF	5,69E-01	-2,05E+00	0	0	-1,48E+00	0
Use of non-renewable primary energy, excluding non-renewable primary energy resources used as raw materials MJ/UF	0	0	0	0	0	0
Use of non-renewable primary energy resources as raw materials MJ/UF	0	0	0	0	0	0
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials) MJ/UF	0	0	0	0	0	0
Use of secondary material kg/UF	0	0	0	0	0	0
Use of secondary renewable fuels MJ/UF	0	0	0	0	0	0
Use of non-renewed secondary fuels MJ/UF	0	0	0	0	0	0
Net freshwater use m <sup>3</sup> / UF	2,14E-02	2,44E-03	0	4,50E-06	2,38E-02	0
Resource Utilization						
Hazardous waste disposed of kg/UF	7,59E+00	8,33E-01	0	9,70E-04	8,42E+00	0
Non-hazardous waste	2,13E-01	1,44E-01	0	1,62E-03	3,58E-01	0



kg/UF						
Radioactive waste disposed of kg/UF	1,70E-03	2,04E-04	0	7,92E-07	1,90E-03	0
Waste Category						
Components for reuse kg/UF	0	0	0	0	0	0
Materials for recycling kg/UF	4,00E-02	0	0	3,38E-05	4,00E-02	0
Materials for use energy recovery kg/UF	0	0	0	0	0	0
Electrical Energy supplied outdoors MJ/UF	0	0	0	0	0	0
Steam energy supplied outdoors MJ/UF						
Process gas energy supplied externally MJ/UF						

## IX. ADDITIONAL INFORMATION ON THE RELEASE OF HAZARDOUS SUBSTANCES INTO INDOOR AIR, SOIL AND WATER DURING THE USE STAGE

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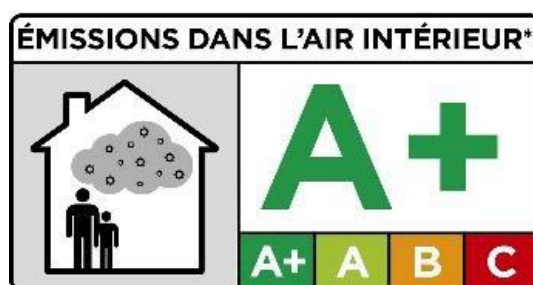
### *Indoor air*

#### *VOCs and formaldehyde*

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The sanitary classification of the product is "A+" according to the decree of 19 April 2011 on the labelling of construction products or wall or floor coverings and paints and varnishes on their emissions of volatile pollutants.

The test was carried out by the WESSLING laboratory (Test report: ULY12-014301-1)



### *Soil and water*

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Not applicable because the product covered by this FDES is neither in contact with the soil, nor water, nor subject to being washed away by rain.

## X. CONTRIBUTION OF THE PRODUCT TO THE QUALITY OF LIFE INSIDE BUILDINGS

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### **1. Product characteristics involved in creating hygrothermal comfort conditions in the building**

The ILLBRUCK ME050 product contributes to the improvement of hygrothermal comfort conditions in the building. When placed outside, it protects against possible penetration of water, dust particles or insects into the wooden frames. It reinforces the airtightness of the building and also has insulation properties in summer (aluminium cladding with 95% thermal radiation contributing to summer comfort) by reducing overheating in case of heat wave.

### **2. Product characteristics involved in creating acoustic comfort conditions in the building**

No acoustic properties.

### **3. Product characteristics involved in creating conditions of visual comfort in the building**

Not applicable because under its normal conditions of use, the product is not visible either in indoor spaces or from the outside. No tests on visual comfort have been conducted.

### **4. Product characteristics contributing to the creation of olfactory comfort conditions in the building**

The product does not affect the olfactory comfort of the building under normal conditions of use. It is therefore not directly concerned with olfactory comfort. No tests on odor comfort have been performed.

#### **XI. POSITIVE ENVIRONMENTAL CONTRIBUTION**

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- The Tremco CPG product is positioned above the higher quality requirements required by the regulations: "Safe products within the meaning of Regulation (EC) No. 1272/2008 or Directive 67/548/EEC." This is reflected in the certificate N ° 223-12569f Excell green zone indoor atmosphere issued following studies and analytical tests in accordance with the requirements of a specification in force attests that: "The sample of material described above has been the subject of a search for various pollutants known, or suspected, to be able to disturb the quality of so-called sensitive environments. The tests carried out according to our analytical protocols and respecting the conditions of use of the material did not allow to detect undesirable elements in significant quantities. Thus, the safety of the material vis-à-vis the quality of products stored in sensitive environments is ensured. The technological effectiveness of the product is not tested. This certification applies only to the design of the material and the resulting descriptive file. »
- At this date, the product is not subject to a recycling process, nor to a calculation of energy savings.