EQUITONE
Fibre cement facade materials

# EQUITONE [tectiva]
# DECLARATION OF PERFORMANCE

## No. Eq-DOP/tectiva/EN/v20220701

1. Unique identification code of the product-type:

**EQUITONE [tectiva]**

2. Type, batch or serial number or any other element allowing identification of the construction product as required pursuant to Article 11(4):

**[colour code] batch nr DD.MM.YY EQUITONE [type] CE 7000 NT EN 12467 [Class] [Category] A2-s1,d0[1)]**
**[1)]DD.MM.YY: day.month.year of production**

3. Intended use or uses of the construction product, in accordance with the applicable harmonised technical specification, as foreseen by the manufacturer:

**Fibre cement flat sheets for internal and external walls and ceilings finishes**

4. Name, registered trade name or registered trade mark and contact address of the manufacturer as required pursuant to Article 11(5):

**Eternit NV, Kuiermansstraat 1, 1880 Kappelle-op-den-Bos, Belgium**

5. Where applicable, name and contact address of the authorised representative whose mandate covers the tasks specified in Article 12(2):

**not relevant**

6. System or systems of assessment and verification of constancy of performance of the construction product as set out in Annex V:

**a) Fire behaviour testing: 3 ; b) all other type tests: 3**

7. In case of the declaration of performance concerning a construction product covered by a harmonised standard:

**1173 WFRGENT NV, Ottergemsesteenweg-Zuid 711, B-9000 Gent, Belgium**
**1136 WTCB, Avenue P. Holoffe 21, 1342 Limelette, Belgium**

performed **the determination of product type** under system **3**

and issued:

**not relevant**

8. In case of the declaration of performance concerning a construction product for which a European Technical Assessment has been issued:

**not relevant**

9. Declared performance

Notes to the table.

1. Column 1 shall contain the list of essential characteristics as determined in the harmonised technical specifications for the intended use or uses indicated in point 3 above.

2. For each essential characteristic listed in column 1 and in compliance with the requirements of Article 6, column 2 shall contain the declared performance, expressed by level or class, or in a description, related to the corre sponding essential characteristics. The letters 'NPD' (No Performance Determined) shall be indicated where no performance is declared.
3. For each essential characteristic listed in column 1, column 3 shall contain:

(a) dated reference of the corresponding harmonised standard and, where relevant, the reference number of the Specific or Appropriate Technical Documentation used;

or

(b) dated reference of the corresponding European Assessment Document where available and reference number of the European Technical Assessment used.

| Essential characteristics (see Note 1) | Performance (see Note 2) | Harmonised technical specification (see Note 3) |
|---|---|---|
| **Mechanical resistance** | **Class 5, Category A** | **EN 12467:2012+A2:2018** |
| **Reaction to fire** | **A2 - s1, d0** | |
| **Release of dangerous substances** | **'NPD' (no performance determined)** | |
| **Water impermeability** | **Passed** | |
| **Dimensional variation** | **Level I - trimmed sheet**<br>**Level II - untrimmed sheet** | |
| **Durability against warm water** | **Passed** | |
| **Durability against soak / dry** | **Passed** | |
| **Durability against freeze-thaw** | **Passed** | |
| **Durability against heat-rain** | **Passed** | |
| **Type** | **NT** | |

Where pursuant to Article 37 or 38 the Specific Technical Documentation has been used, the requirements with which the product complies:

**not relevant**

10. The performance of the product identified in points 1 and 2 is in conformity with the declared performance in point 9.

This declaration of performance is issued under the sole responsibility of the manufacturer identified in point 4.

Signed for and on behalf of the manufacturer by:

**p.p. Wouter Muysoms**

**plant manager**

**on behalf: Filip Waem**

**Head Quality Management**

**Kapelle-op-den-Bos, 01.07.2022**

www.equitone.com

B-EPD ENVIRONMENTAL PRODUCT DECLARATION

# ETEX
# EQUITONE [tectiva] fibre cement sheets

The production and installation of 1 $m^2$ (thickness 8 mm) of a “EQUITONE [tectiva]” panel and its related impacts over cradle-to-grave life cycle stages, over a reference service life of 60 years.

Issued 07.10.2021
Valid until 07.10.2026

Third party verified
Conform to EN 15804+A2, NBN/DTD B08-001 and ISO 14025

| Modules declared Cradle-to-crave | | | | | |
|---|---|---|---|---|---|
| A123 | A4 | A5 | B | C | D |
| ● | ● | ● | ● | ● | ● |

[B-EPD n° 21-0135-04-00-00-EN]

OWNER OF THIS ENVIRONMENTAL PRODUCT DECLARATION
**Etex services**

EPD PROGRAM OPERATOR
**Federal Public Service of Health, Food Chain Safety and Environment**
www.b-epd.be

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.

# PRODUCT DESCRIPTION

## PRODUCT NAME
EQUITONE [tectiva]

## PRODUCT DESCRIPTION
EQUITONE [tectiva] is an autoclaved calcium silicate fibre cement sheet produced at Kapelle-op-den-Bos production plant, Belgium. It is mainly made of sand, cement, cellulose, wollastonite, clay and lime. This product is used as panel for exterior wall covering. This average product is representative of the following colour range: TE00, TE 10, TE 20, TE 30, TE 40, TE 50, TE 60, TE 85 and TE 90 made in 8mm or 10mm thick panel. Only pigment composition changes from a EQUITONE [tectiva] product to the other.

## INTENDED USE
EQUITONE [tectiva] product is mainly used as a cladding sheet for ventilated exterior claddings and ceilings and insulated lightweight facade-systems. The panel itself is fixed to a back-structure in wood or metal. This back-structure is mounted on a supporting wall in a massive construction (such as bricks, concrete, ...), lightweight skeleton (steel, wood) or prefabricated solutions. The application field is new construction and renovation of low, middle high and high rise buildings. It is also used as exterior ceiling and as a finishing board for roof eaves and verges. In a minor application, the EQUITONE [tectiva] can be used as protection for insulated foundations.

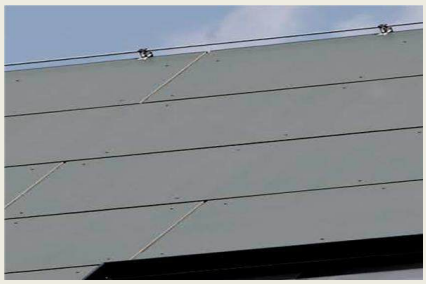
## REFERENCE FLOW / DECLARED UNIT
The functional unit is defined as: the production and installation of 1 $m^2$ (thickness 8 mm) of a “EQUITONE [tectiva]” sheets and its related impacts over cradle-to-grave life cycle stages, where the product’s expected average reference service life is of 60 years.

Packaging is included.

The weight per reference flow is 14,22 kg.
The minimum (dry) density of the product is 1580 kg / $m^3$.
Dimensions of the panel per FU: 1 $m^2$ of thickness 8mm

## INSTALLATION
The product is installed according to the following scenario(s): fixation of the panel to a framework in wood or metal. This EPD declares the screws and energy consumption to fixate the panels, but does not include the framework. This may lead to the need of additional products and materials for which the impact is not included in this EPD and which shall be taken into account at building level. The different frameworks are described in the chapter “Additional technical information for scenario development at building”.

## IMAGES OF THE PRODUCT AND ITS INSTALLATION



## COMPOSITION AND CONTENT

| Components | Composition / content / ingredients | Quantity |
|---|---|---|
| Product | *- Sand*<br>*- Cement*<br>*- Pigments*<br>*- Lime*<br>*- Cellulose*<br>*- Wollastonite*<br>*- Clay*<br>*- Water*<br>*- Other* | *25 - 40%*<br>*25 - 40%*<br>*<10%*<br>*<10%*<br>*<10%*<br>*<10%*<br>*<10%*<br>*5 – 20%*<br>*Appr 5%* |
| Fixation materials | *- Screws for wooden substructure)- Rivets (for metal substructure)* | *6 p* |
| Jointing materials | *NA* | */* |
| Treatments | *NA* | */* |
| Packaging | *- Pallet*<br>*- Carton*<br>*- PE strap* | *0,2278 kg*<br>*0,0146 kg*<br>*0,0012 kg* |

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

## REFERENCE SERVICE LIFE

The reference service life is estimated at 60 years.

EQUITONE [tectiva] is a rather new product on the market (°2007), and there is not yet extensive evidence regarding its reference service life. However there are some studies that suggest that it is feasible to assume that this product lasts for the average lifetime of a building[1].

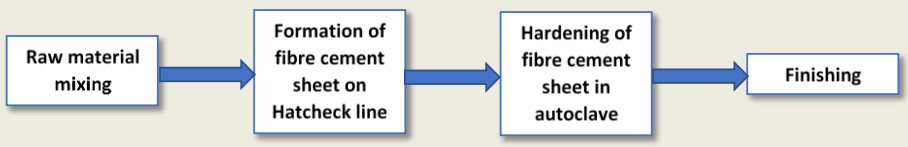
The RSL is valid under normal conditions of use.

## DESCRIPTION OF GEOGRAPHICAL REPRESENTATIVITY

The EPD is representative for the Belgian market.

## DESCRIPTION OF THE PRODUCTION PROCESS AND TECHNOLOGY

Façade panels made of fiber cement are manufactured largely in accordance to an automated winding process: the raw materials are mixed with water to prepare a homogenous mixture. Rotating screen cylinders are immersed in this fiber cement pulp which drain internally. The screen surface is covered in a thin film of fiber cement which is transferred onto an infinite conveyor belt from where it is conveyed to a format roller which is gradually covered in an increasingly thicker layer of fiber cement. Once the requisite material thickness is achieved, the still moist and malleable fiber cement layer (fiber cement fleece) is separated and removed from the format roller. The fiber cement fleece is cut to size. Leftovers are returned to the production process preventing any waste from being incurred. The sheets are then laid on templates, pressed and steam-hardened in an autoclave. The façade panels are then calibrated, sanded and hydrophobated before being packed and shipped to the customer.




[1] ‘Durability of Autoclaved Cellulose Fiber Cement Composites’, A.M.Cooke, Managing Director, Building Materials and Technology Pty Ltd, Sydney, NSW, Australia

# TECHNICAL DATA / PHYSICAL CHARACTERISTICS

| Technical property | Standard | Value | Unit | Comment |
|---|---|---|---|---|
| **Gross density dry (min)** | EN12467 | 1580 | kg/m$^3$ | |
| **Standard panel thickness** | | 8 | mm | |
| **Thermal conductivity** | | 0.39 | W/(mK) | |
| **Water vapour diffusion resistance factor acc. to DIN V 4108-4, EN ISO 12572** | DIN 4108-4, EN ISO 12572 | 214 | - | |
| **Flexural strength parallel** | EN12467 | 32 | N/mm$^2$ | |
| **Flexural strength perpendicular** | EN12467 | 22 | N/mm$^2$ | |
| **Modulus of elasticity parallel** | EN12467 | > 14000 | N/mm$^2$ | |
| **Modulus of elasticity perpendicular** | EN12467 | > 12000 | N/mm$^2$ | |
| **Moisture content at 23 °C, 80% humidity** | | 6 | M.-% | |
| **Coefficient of thermal expansion** | | 10 | 10-6K-1 | |
| **Chemical resistance** | | similar to concrete C 35/45 | - | |
| **Ageing resistance** | | similar to concrete C 35/45 | - | |
| **Permanent temperature resistance** | | 80 | °C | |

# LCA STUDY

## DATE OF LCA STUDY
September 2021

## SOFTWARE
For the calculation of the LCA results, the software program SimaPro 9.1.1.1 (PRé Consultants, 2021) has been used in combination with a specific LCA software program for ETEX.

## INFORMATION ON ALLOCATION
At Etex, different types of cement fiber products are produced. However EQUITONE [tectiva] products are produced only on certain production lines. Only facility level data were available for electricity use, the use of natural gas, etc. The facility level data have been allocated to the analyzed product using their respective annual production volume (physical relationship), therefore volume allocation is applied. Material inputs and outputs which were not available at the product level, such as waste, were allocated similarly, by mass allocation.

## INFORMATION ON CUT OFF
Following processes were considered below the cut-off:

- Transport of packaging of raw materials
- The metal templates in which the boards are produced need to be greased periodically. The template oil is considered below cut-off
- Packaging and transport of ancillary materials used during installation
- Waste treatment of ancillary materials used during installation
- Wearable sieves and cutting knives

## INFORMATION ON EXCLUDED PROCESSES
Following processes were excluded for the inventory:

- 
- Infrastructure and land use of the factory
- Environmental impacts caused by the personnel of the production plants are not included in the LCA, e.g. waste from the cafeteria and sanitary installations, accidental pollution caused by human mistakes, or environmental effects caused by commuter traffic

## INFORMATION ON BIOGENIC CARBON MODELLING
The fibre cement panels contain cellulose, which is a biobased material. Uptake of biogenic $CO_2$ within cellulose is reported in module A1, release of biogenic $CO_2$ related to this flow is reported in C4.
The fibre cement panels are transported using wooden pallets and a carton coverage. Uptake of biogenic $CO_2$ within these pallets and the carton is reported in module A3, release in module A5.

| | Biogenic carbon content (kg C / FU) |
|---|---|
| Biogenic carbon content in product (at the gate) | 4,37E-01 |
| Biogenic carbon content in accompanying packaging (at the gate) | 1,08E-01 |

## INFORMATION ON CARBON OFFSETTING
Carbon offsetting is not allowed in the EN 15804 and hence not taken into account in the calculations.

## ADDITIONAL OR DEVIATING CHARACTERISATION FACTORS
The characterization factors from EC-JRC were applied. No additional or deviating characterization factors were used.

# DATA

## SPECIFICITY

The data used for the LCA are specific for this product which is manufactured by a single manufacturer in a single production site.

## PERIOD OF DATA COLLECTION

Manufacturer specific data have been collected for the year 2016.

## INFORMATION ON DATA COLLECTION

Company specific data for the product stage have been collected by Eternit and were provided to VITO through an excel file. The LCI data has been checked by the EPD verifier (Evert Vermaut, Vinçotte). VITO uses publicly available generic data for all background processes such as the production of electricity, transportation by means of a specific truck, etc. Primary data is used for modules A1, A2, A3, and A5. The rest of the study is based on scenarios (module A4, modules B1-B7, modules C1-C4, and module D).

## DATABASE USED FOR BACKGROUND DATA

The main LCI source used in this study is the Ecoinvent 3.6 database (Wernet et al., 2019).

## ENERGY MIX

The Belgian electricity mix (consumption mix + import) has been used to model electricity use in life cycle stages A3, A5, C1, C3, C4 and D. The used record is the ecoinvent record 'Electricity, low voltage {BE}| market for | Cut-off, U' (Wernet et al., 2016).

## PRODUCTION SITES

The production site is located at Kuiermansstraat 1, 1880 Kapelle-op-den-Bos, Belgium.

## 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
MND = module not declared

EQUITONE [tectiva] does not contain recycled content.

In the default end-of-life scenario as described by the B-PCR 100% is landfilled, so the end-of-waste state is not reached.

The production waste is partly recycled in another production line of the ETEX factory and partly externally recycled. However, it has been assumed that the recycled waste has no economic value, so 100% of the impacts of the production are allocated to the product and 0% to recycled production waste.

# 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 | Total excl module D |
| *GWP total (kg CO2 equiv/FU)* | 5,27E+00 | 8,77E-01 | 8,95E-01 | 2,42E-01 | 1,45E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 2,62E-03 | 1,90E-01 | 1,20E-05 | 1,68E+00 | -6,91E-02 | 1,06E+01 |
| *GWP fossil (kg CO2 equiv/FU)* | 7,01E+00 | 8,76E-01 | 1,12E+00 | 2,42E-01 | 1,05E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 2,60E-03 | 1,90E-01 | 1,19E-05 | 7,88E-02 | -6,88E-02 | 1,06E+01 |
| *GWP biogenic (kg CO2 equiv/FU)* | -1,75E+00 | 3,68E-04 | -2,23E-01 | 1,02E-04 | 4,00E-01 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 1,03E-05 | 7,73E-05 | 4,57E-08 | 1,60E+00 | -9,36E-05 | 2,43E-02 |
| *GWP luluc (kg CO2 equiv/FU)* | 9,71E-03 | 5,13E-04 | 1,61E-03 | 8,49E-05 | 1,28E-03 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 6,19E-06 | 6,63E-05 | 2,73E-08 | 4,33E-05 | -1,74E-04 | 1,33E-02 |
| *ODP (kg CFC 11 equiv/FU)* | 4,67E-07 | 1,79E-07 | 1,84E-07 | 5,53E-08 | 1,03E-07 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 5,43E-10 | 4,31E-08 | 2,44E-12 | 3,34E-08 | -9,73E-09 | 1,07E-06 |
| *AP (mol $H^+$ eq)* | 3,42E-02 | 1,52E-02 | 2,03E-03 | 9,94E-04 | 5,97E-03 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 6,47E-06 | 7,75E-04 | 3,21E-08 | 6,77E-04 | -2,54E-04 | 5,99E-02 |
| *EP - freshwater (kg P-equiv/FU)* | 2,16E-04 | 7,00E-06 | 2,80E-05 | 1,96E-06 | 2,95E-05 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 6,93E-08 | 1,49E-06 | 3,22E-10 | 8,36E-07 | -2,25E-06 | 2,85E-04 |
| *EP - marine (kg N-equiv/FU)* | 5,74E-03 | 4,34E-03 | 7,43E-04 | 2,94E-04 | 1,27E-03 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 1,33E-06 | 2,30E-04 | 6,92E-09 | 2,51E-04 | -7,07E-05 | 1,29E-02 |
| *EP - terrestrial (mol N-equiv/FU)* | 6,41E-02 | 4,81E-02 | 5,96E-03 | 3,25E-03 | 1,39E-02 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 1,63E-05 | 2,54E-03 | 8,37E-08 | 2,77E-03 | -7,87E-04 | 1,41E-01 |
| *POCP (kg NMVOC equiv/FU)* | 1,79E-02 | 1,27E-02 | 1,81E-03 | 1,01E-03 | 3,87E-03 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 4,18E-06 | 7,79E-04 | 2,25E-08 | 7,90E-04 | -2,67E-04 | 3,89E-02 |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *ADP Elements (kg Sb equiv/FU)* | 4,98E-06 | 1,06E-06 | 4,98E-07 | 4,51E-07 | 2,75E-06 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 6,81E-09 | 3,70E-07 | 3,24E-11 | 8,04E-08 | -7,50E-08 | 1,02E-05 |
| *ADP fossil fuels (MJ/FU)* | 5,45E+01 | 1,20E+01 | 2,82E+01 | 3,68E+00 | 1,16E+01 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 1,04E-01 | 2,86E+00 | 4,60E-04 | 2,55E+00 | -1,30E+00 | 1,15E+02 |
| *WDP ($m^3$ water eq deprived /FU)* | 3,63E+00 | 3,30E-02 | -1,87E-01 | 1,11E-02 | 3,67E-01 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 9,88E-04 | 7,96E-03 | 4,40E-06 | 1,10E-02 | -1,96E-02 | 3,88E+00 |

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)

# RESOURCE USE

| | Production | | | Construction process | | 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 | Total excl module D |
| *PERE (MJ/FU, net calorific value)* | 2,95E+01 | 1,68E-01 | 3,96E+00 | 5,15E-02 | 5,85E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 1,12E-02 | 3,95E-02 | 4,93E-05 | 8,59E-02 | -4,10E+00 | 3,97E+01 |
| *PERM (MJ/FU, net calorific value)* | 1,53E+01 | 0,00E+00 | 3,42E+00 | 0,00E+00 | -3,49E-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 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 1,84E+01 |
| *PERT (MJ/FU, net calorific value)* | 4,48E+01 | 1,68E-01 | 7,37E+00 | 5,15E-02 | 5,51E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 1,12E-02 | 3,95E-02 | 4,93E-05 | 8,59E-02 | -4,10E+00 | 5,81E+01 |
| *PENRE (MJ/FU, net calorific value)* | 6,29E+01 | 1,21E+01 | 3,03E+01 | 3,71E+00 | 1,29E+01 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 1,09E-01 | 2,88E+00 | 4,87E-04 | 2,56E+00 | -1,44E+00 | 1,28E+02 |
| *PENRM (MJ/FU, net calorific value)* | 6,19E-02 | 0,00E+00 | 1,29E-02 | 0,00E+00 | -2,63E-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 | 4,85E-02 |
| *PENRT (MJ/FU, net calorific value)* | 6,30E+01 | 1,21E+01 | 3,04E+01 | 3,71E+00 | 1,29E+01 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 1,09E-01 | 2,88E+00 | 4,87E-04 | 2,56E+00 | -1,44E+00 | 1,28E+02 |
| *SM (kg/FU)* | 5,40E-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 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 9,37E-01 | 5,40E-03 |
| *RSF (MJ/FU, net calorific value)* | 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 | 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 | 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 |
| *FW ($m^3$ water eq/FU)* | 9,22E-02 | 8,03E-04 | 5,04E-03 | 2,85E-04 | 1,06E-02 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 2,97E-05 | 2,07E-04 | 1,32E-07 | 2,46E-03 | -4,87E-04 | 1,12E-01 |

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

# 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 | Total excl module D |
| *Hazardous waste disposed (kg/FU)* | 5,01E-05 | 2,41E-05 | 2,36E-05 | 9,45E-06 | 1,39E-05 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 7,99E-08 | 7,50E-06 | 3,80E-10 | 2,79E-06 | -3,30E-06 | 1,31E-04 |
| *Non-hazardous waste disposed (kg/FU)* | 1,28E+00 | 2,63E-01 | 6,77E-02 | 2,18E-01 | 1,71E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 1,87E-04 | 1,37E-01 | 9,04E-07 | 1,42E+01 | -1,02E-02 | 1,79E+01 |
| *Radioactive waste disposed (kg/FU)* | 2,61E-04 | 8,05E-05 | 1,78E-04 | 2,50E-05 | 6,30E-05 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 9,99E-07 | 1,95E-05 | 4,41E-09 | 1,88E-05 | -6,47E-06 | 6,47E-04 |
| *Components for re-use (kg/FU)* | 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 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| *Materials for recycling (kg/FU)* | 0,00E+00 | 0,00E+00 | 7,42E-01 | 0,00E+00 | 1,89E-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 | 0,00E+00 | 1,25E-02 | 0,00E+00 | -9,43E-01 | 9,43E-01 |
| *Materials for energy recovery (kg/FU)* | 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 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| *Exported energy (MJ/FU)* | 0,00E+00 | 0,00E+00 | 1,15E-02 | 0,00E+00 | 3,95E-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 | 0,00E+00 | 0,00E+00 | 0,00E+00 | -4,07E-01 | 4,07E-01 |

# IMPACT CATEGORIES ADDITIONAL TO EN 15804

| | | Production | | | Construction process | | 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 | Total excl module D |
|  | *PM (disease incidence)* | 2,59E-07 | 5,67E-08 | 1,85E-08 | 1,81E-08 | 4,52E-08 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 3,19E-11 | 1,32E-08 | 2,12E-13 | 1,41E-08 | -3,62E-09 | 4,25E-07 |
|  | *IRHH (kg U235 eq/FU)* | 2,58E-01 | 5,14E-02 | 2,04E-01 | 1,61E-02 | 6,06E-02 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 1,17E-03 | 1,25E-02 | 5,17E-06 | 1,47E-02 | -6,74E-03 | 6,18E-01 |
|  | *ETF (CTUe/FU)* | 1,60E+02 | 9,55E+00 | 1,32E+01 | 2,98E+00 | 2,20E+01 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 4,54E-02 | 2,29E+00 | 2,15E-04 | 1,36E+00 | -9,89E-01 | 2,12E+02 |
|  | *HTCE (CTUh/FU)* | 1,16E-08 | 4,96E-10 | 4,25E-10 | 8,26E-11 | 2,53E-09 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 1,07E-12 | 6,44E-11 | 7,65E-15 | 3,28E-11 | -8,15E-11 | 1,52E-08 |
|  | *HTnCE (CTUh/FU)* | 1,17E-07 | 9,84E-09 | 6,72E-09 | 3,28E-09 | 1,82E-08 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 2,94E-11 | 2,50E-09 | 1,48E-13 | 7,91E-10 | -8,83E-10 | 1,58E-07 |
|  | *Land Use Related impacts (dimensionless)* | 2,63E+02 | 5,65E+00 | 4,76E+01 | 3,03E+00 | 3,32E+01 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 2,74E-02 | 1,97E+00 | 3,08E-04 | 4,69E+00 | -3,13E+01 | 3,59E+02 |

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 );

| | | |
|---|---|---|
|  | *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.*<br><br>*It is split up in 4:*<br><br>- *Global Warming Potential total (GWP-total) which is the sum of GWP-fossil, GWP-biogenic and GWP-luluc*<br>- *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).*<br>- *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.[2]*<br>- *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 (chlorofluorocarbonsor 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.*<br><br>*It is split up in 3:*<br><br>- *Eutrophication potential – freshwater: The potential to cause over-fertilization of freshwater, which can result in increased growth of biomass and following adverse effects.*<br>- *Eutrophication potential – marine: The potential to cause over-fertilization of marine water, which can result in increased growth of biomass and following adverse effects.*<br>- *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).*<br><br>*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).*<br><br>*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).*<br><br>*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.* |

[2] Carbon exchanges from native forests shall be modelled under GWP - luluc (including connected soil emissions, derived products or residues), while their CO2 uptake is excluded.

| | | |
|---|---|---|
| | | *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.*<br><br>*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:*<br>- *Biotic production*<br>- *Erosion resistance*<br>- *Mechanical filtration*<br>- *Groundwater*<br>*The aggregation is done based on a JRC model. The four aspects are quantified through the LANCA model for land use.*<br><br>*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.* |

# DETAILS OF THE UNDERLYING SCENARIOS USED TO CALCULATE THE IMPACTS

## 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.

ETEX uses different pigments to colour their fibre cement panels. Due to the lack of appropriate proxies for many of the pigments the model prorated the content up to 100% for the Titanium dioxide and Ferrite, which are available in Ecoinvent.. Considering that Titanium dioxide has an overall higher contribution than the other pigments, this is a worst case scenario. The impacts of the pigments will be thus overestimated.

## A2 – TRANSPORT TO THE MANUFACTURER

The raw materials are transported to the manufacturing site.

## A3 – MANUFACTURING

This module takes into account the production process.

## A4 – TRANSPORT TO THE BUILDING SITE

| | | | |
|---|---|---|---|
| *Fuel type and consumption of vehicle or vehicle type used for transport* | Truck 16-32 ton EURO 5 (0,260 l/km) | Truck >32 ton EURO 5 (0,366 l/km) | Truck 7.5-16 ton EURO 5 (0,186 l/km) |
| *Distance* | 100 (40% from factory to construction site)<br><br>35 (60%*85% from supplier to construction site) | 100 (60% from factory to supplier) | 35 (60%*15% from supplier to construction site) |
| *Capacity utilisation (including empty returns)* | 50% | 50% | 50% |
| *Bulk density of transported products* | Ecoinvent | Ecoinvent | Ecoinvent |
| *Volume capacity utilisation factor* | Ecoinvent | Ecoinvent | Ecoinvent |

The B-PCR provides default transport scenarios for the transport to the building site for cases where specific data on transport are missing. The B-PCR provides scenario's for this life cycle stage. Fibre cement panels are categorized as 'loose products' in table 5 of the B-PCR. The following transport steps apply:

- 40% directly to the construction site over 100 km with a 16-32 ton lorry (ecoinvent record: 'Transport, freight, lorry 16-32 metric ton, EURO5 {RER}| transport, freight, lorry 16-32 metric ton, EURO5 | Cut-off, U')
- 60% to a supplier over 100 km with a >32 ton lorry (ecoinvent record: 'Transport, freight, lorry >32 metric ton, EURO5 {RER}| transport, freight, lorry >32 metric ton, EURO5 | Cut-off, U')
- 85% of these 60% is transported over 35 km from supplier to construction site with a 16-32 ton lorry (ecoinvent record: 'Transport, freight, lorry 16-32 metric ton, EURO5 {RER}| transport, freight, lorry 16-32 metric ton, EURO5 | Cut-off, U')
- 15% of these 60% is transported over 35 km from supplier to construction site with a 7.5-16 ton lorry (ecoinvent record: 'Transport, freight, lorry 7.5-16 metric ton, EURO5 {RER}| transport, freight, lorry 7.5-16 metric ton, EURO5 | Cut-off, U')

## A5 – INSTALLATION IN THE BUILDING

The installation involves an amount of 0,00176 kWh per screw used to fix the EQUITONE [tectiva] product, where 6 screws are necessary for the functional unit. The dataset used to model the impacts is "Electricity, low voltage {BE}| market for | Cut-off, U".

During the installation, depending on how the EQUITONE [tectiva] sheets are cut, there is a loss rate between 5-30%, depending on the building shape. For this EPD an average loss rate of 10% is used.

All packaging material for the EQUITONE [tectiva] product is transported to End of Life (EoL) and disposed of in line with the B-PCR default EoL scenarios for Belgium.

| Parts of the installation | quantity | Description |
|---|---|---|
| Processes necessary for the installation of the product | *0,01056 kWh* | *energy needed to fix the screws* |
| Fixation materials | *6* | *Screws* |
| Material losses | *10%* | *Average material losses* |
| Packaging | *0,2278 kg*<br>*0,0146 kg*<br>*0,0012 kg* | *Wooden pallet*<br>*Cardboard -*<br>*PE strap* |

| | | | |
|---|---|---|---|
| *Ancillary materials for installation (specified by material);* | 6 Screws | | |
| *Water use* | None | | |
| *Other resource use* | 10% losses | | |
| *Quantitative description of energy type (regional mix) and consumption during the installation process* | 0,01056 kWh electricity, low voltage | | |
| *Waste materials on the building site before waste processing, generated by the product's installation (specified by type)* | packaging waste: *0,2278* kg wood | packaging waste: 0,0146 kg cardboard | packaging waste: 0,0012 kg plastic |
| *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)* | 60% recycling<br>20% incinerated | 95% recycling<br>5% incinerated | 35% recycling<br>60% incinerated<br>5% landfill |
| *Direct emissions to ambient air, soil and water* | None | None | None |
| *Distance* | Not applicable | Not applicable | Not applicable |

## B – USE STAGE (EXCLUDING POTENTIAL SAVINGS)

B1: No emissions during the use phase.
B2: The product does not require maintenance.
B3: The product does not require repair.
B4: No replacement required.
B5: No refurbishment

B6: The product does not require operational energy use.
B7: No operational water use.

## C: End of life

The default scenario for Cement fibre boards from NBN/DTD B08-001 is used to model the End-of-life of the boards. The default scenario for metals from NBN/DTD B08-001 is used to model the End-of-life of the screws.

C1: The dismantling of EQUITONE [tectiva] involves the same amount of energy as for the installation, which is 0,01056 kWh.
C2: The default scenario for fibre cement boards from NBN/DTD B08-001 describes that the end-of-life waste is transported to a sorting facility over a distance of 30 km. Afterwards, 100% of the fibre cement boards and 5% of the metal screws is transported to a landfill over a distance of 50 km.
C3: No recycling/reuse of fibre cement boards, 95% recycling of metal screws
C4: 100% landfill of fibre cement boards, 5% landfill of metal screws

| Module C2 – Transport to waste processing | | | | | |
|---|---|---|---|---|---|
| Type of vehicle (truck/boat/etc.) | Fuel consumption (litres/km) | Distance (km) | Capacity utilisation (%) | Density of products (kg/m$^3$) | Assumptions |
| Truck 16-32 ton | 0,260 l diesel/km | 80 | 50% | Ecoinvent scenario | Ecoinvent scenario |

| End-of-life modules – C3 and C4 | | |
|---|---|---|
| Parameter | Unit | Value |
| Wastes collected separately | kg | 0,0132 |
| Wastes collected as mixed construction waste | kg | 14,22 |
| Waste for re-use | kg | 0 |
| Waste for recycling | kg | 0,0125 |
| Waste for energy recovery | kg | 0 |
| Waste for final disposal | kg | 14,22 |

## D – Benefits and loads beyond the system boundaries

In module D, the benefits and loads beyond the system boundaries are quantified. Following waste streams are considered after their end-of-waste: wooden pallets in A3 and A5 (of which 60% is recycled), plastic packaging in A3 and A5 (of which 35% is recycled), paper and cardboard in A3 and A5 (of which 95% is recycled), steel cables in A3 (of which 95% is recycled) and metal screws in C3 (of which 95% is recycled)

| | |
|---|---|
| *Quantitative description of the loads beyond the system boundaries* | Treatment of 0,01464 kg of scrap steel to prepare it for to prepare it for recycling at the remelter |
| | Sorting and shredding of 0,148 kg of waste wood to prepare it for recycling |
| | Treatment of 0,00093 kg plastic to prepare it for recycling |
| *Quantitative description of the benefits beyond the system boundaries* | Avoided production of 0,29 MJ of heat using natural gas |
| | Avoided production of 0,15 MJ of Belgian electricity mix |
| | Avoided production of 0,01464 kg cast iron |
| | Avoided production of 0,148 kg primary softwood |
| | Avoided production of 0,00093 kg primary polypropylene/ polypropylene granulates |
| | Avoided production of 0,016 kg primary sulfate pulp |

## ADDITIONAL INFORMATION ON RELEASE OF DANGEROUS SUBSTANCES TO INDOOR AIR, SOIL AND WATER DURING THE USE STAGE

### INDOOR AIR

Under normal conditions of use, EQUITONE [tectiva] products do not cause any adverse health effects or release of volatile organic compounds (VOCs) to indoor air.

### SOIL AND WATER

No environmental impact to water, air or soil is expected due to the extremely low metal release from the low maintenance requirements.

## DEMONSTRATION OF VERIFICATION

| |
|---|
| EN 15804+A2 serves as the core PCR |
| Independent verification of the environmental declaration and data according to standard EN ISO 14025:2010<br><br>Internal ☐ External ☒ |
| Third party verifier: Evert Vermaut (Vincotte)<br>Jan Olieslagerslaan 35<br>1800 Vilvoorde, Belgium<br><br>evermaut@vincotte.be |

# ADDITIONAL TECHNICAL INFORMATION FOR SCENARIO DEVELOPMENT

This EPD does not include the framework on which the panels are installed. At building level the impact of the framework should be added. If specific information on quantities is missing, following weights can be used. The values are applicable for exterior wall cladding and ceilings. Note that the screws to attach the boards to the framework are already included in the EPD.

Wooden framework

| Components | quantity | Description |
|---|---|---|
| Wooden frame | *2,4 kg* | |
| EPDM sealing tape | *0,018 kg* | *UV protection of the joints* |

Aluminium framework

| Components | quantity | Description |
|---|---|---|
| Aluminium profiles | *1,61 kg* | |
| PVC foam | *0,02 kg* | *The foam strip is designed to create a watertight seal even with minimal force applied. It also minimizes vibrations from the facade panel and prevents contact between uncoated fiber cement and the aluminum support structure.* |

Steel framework

| Components | quantity | Description |
|---|---|---|
| Steel frame | *2,48 kg* | |
| PVC foam | *0,02 kg* | *The foam strip is designed to create a watertight seal even with minimal force applied. It also minimizes vibrations from the facade panel and prevents contact between uncoated fiber cement and the aluminum support structure.* |

# APPLICATION UNIT

This paragraph gives information on the applied product and how the reference flow and table with impacts relate to different applications. The table below gives an overview of the standard thicknesses, the thickness range and the ratio to the declared unit of 1 $m^2$ for each application. The environmental impact is proportional with the thickness.

| Application | Standard thickness | Thickness range | Ratio to the declared unit of 1 $m^2$ |
|---|---|---|---|
| Exterior wall covering | *8 mm* | *8 and 10 mm* | *1* |
| Ceilings | *8 mm* | *8 and 10 mm* | *1* |

# ADDITIONAL INFORMATION ON REVERSIBILITY

*For the application and installation as described in this EPD a qualitative assessment of the reversibility is given. Following 4 indicators shall be used (based on BAMB – buildings as material banks). The assessment is applicable for exterior wall cladding and ceilings and for all frameworks.*

| | | |
|---|---|---|
| Reversibility | - | *Reversible with light repairable damage (fixation with screws, bolts and dowels)* |
| Simplicity of disassembly | - | *simple - no specific dismantling tools required* |
| Speed of disassembly | - | *speedy disassembly* |
| Ease of handling (size and weight) | - | *can be handled manually, but size and/or weight requires two or more workers* |
| Robustness of material (material resistance to disassembly) | - | *the material resists well during disassembly* |

# BIBLIOGRAPHY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- NBN/DTD B 08-001 (BE-PCR)
- CEN/TR 16970:2016. Sustainability of construction works - Guidance for the implementation of EN 15804
- Durability of Autoclaved Cellulose Fiber Cement Composites, A.M.Cooke, Managing Director, Building Materials and Technology Pty Ltd, Sydney, NSW, Australia
- Information sheet http://noam.equitone.com/file.php?id=05baa7d0-7e8c-47af-bd2d-b00a6737a2d2
- EN 12467:2012 + A1:2018 Fibre-cement flat sheets - Product specifications and test methods
- EN 13501-1+A1:2007 Fire classification of construction products and building elements. Classification using test data from reaction to fire test
- Wernet, G., Bauer, C., Steubing, B., Reinhard, J., Moreno-Ruiz, E., and Weidema, B., 2016. The ecoinvent database version 3 (part I): overview and methodology. The International Journal of Life Cycle Assessment, [online] 21(9), pp.1218–1230. Available at: <http://link.springer.com/10.1007/s11367-016-1087-8> .
- Landesanstalt für Umwelt, Messungen und Naturschutz Baden -Württemberg, Steckbrief „Asbestfreie Faserzementprodukte“
- Environment-related material performance of Building elements, project for the Flemish Waste Agency (2012), based on Debacker et. Al., 2012. Milieugerelateerde Materiaalprestatie van Gebouwelementen. In opdracht van OVAM.
- European Life Cycle Database (ELCD) v3.2, April 2018
- Industry 2.0 data: This library contains data as collected by industry associations, such as Plastics Europe, World Steel, ERASM and International Molybdenum Association (IMOA). Several datasets were updated and added in April 2015, September 2015, March 2016, December 2017, April 2018 and December 2019.

# General information

| | |
|---|---|
| Owner of the EPD,<br>Responsible for the data, LCA and information | **Etex services**<br>**Kuiermansstraat 1**<br>**1880 Kapelle-op-den-Bos**<br>**Belgium**<br>Tel : +32 (0) 15 71 82 83;<br>*For more information you can contact Peggy Van De velde, peggy.vandevelde@etexgroup.com* |
| EPD program<br>Program operator<br>Publisher of this EPD | **B-EPD**<br>Federal Public Service of Health / DG Environment<br>Galileelaan 5/2<br>1210 Brussels<br>Belgium<br><br>www.environmentalproductdeclarations.eu |
| Contact programma operator | epd@environment.belgium.be |
| Based on following PCR documents | EN 15804+A2:2019<br>NBN/DTD B 08-001 and its complement |
| PCR review conducted by | Federal Public Service of Health and Environment & PCR Review committee |
| Author(s) of the LCA and EPD | Arthur De Jaegher, arthur@enperas.com |
| Identification of the project report | Life cycle assessment of EQUITONE [tectiva] (VITO, 07-09-21) |
| Verification | External independent verification of the declaration and data according to EN ISO 14025 and relevant PCR documents |
| Name of the third party verifier<br>Date of verification | Evert Vermaut (Vinçotte)<br>08.09.2021 |
| **www.b-epd.be** | **www.environmentalproductdeclarations.eu** |

*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.*

LCA practitioner

www.vito.be
www.enperas.be

Building calculator of the regional authorities

www.totem-building.be

Federal Public Service of Health, Food Chain Safety and Environment

www.b-epd.be

Dieter De Lathauwer
((Signature

EQUITONE
Fibre cement facade materials

# EQUITONE [tectiva]
# Material Information Sheet

## 1. Product Appearance

EQUITONE [tectiva] is a high-density through coloured fibre cement panel with no coating. The panel has an honest, pure and natural appearance with natural colour variations and hues. The natural characteristic of the panel may be accentuated by the production process as well as light or dark inclusions.

The surface of the panel is characterised by fine sanding lines in the longitudinal direction. However, the panels are not considered directional and may be installed in any direction to enhance the natural look of the facade.

The panel has been made water repellent by means of hydrophobation.

## 2. Colour

The colour is throughout the panel. Natural colour variations, accentuated by the orientation of the panel, the viewing angle and the effects of light and moisture, strengthen the natural look of the facade.

Colour variations and random hues are part of the natural characteristics of the material. Each panel has its own individual character.

Colour differences are measured according to a simplified CIELAB colour model, by which only the parameter lightness ΔL of the colour is followed. Tolerated colour differences on a dry facade are $\Delta L^* = \pm 2.5$.

Available colours

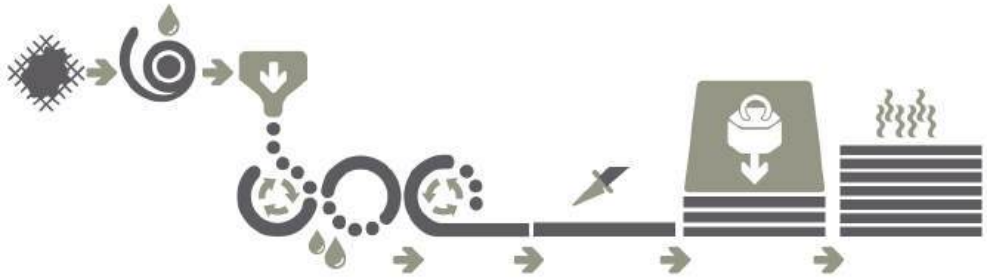

Note: It is not possible to realistically show available colours in literature, therefore the final choice of colours should be made with samples. Please order your samples on the website www.equitone.com

# 3. Product Composition

EQUITONE [tectiva] panels consist of cement, quartz sand, cellulose, natural calcium silicate, inorganic colour pigments, water and additives.

# 4. Production Method

EQUITONE [tectiva] is a highly compressed, autoclaved fibre cement material manufactered in Belgium (Europe).



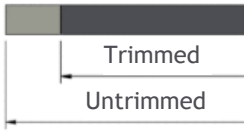
EQUITONE [tectiva] panels are manufactured through the Hatschek process where the base materials which are mainly cement, sand, cellulose, pigments and water are first mixed together to form a slurry. This slurry is then pumped into several vats with rotating cylindrical sieves on the surface of which a film of fibre cement is formed through a sieving mechanism as they rotate, which is then transferred to a felt belt traveling overhead. This thin layer of fibre cement is then dewatered before being transferred via the felt belt to a forming drum on which several layers of fibre cement are collected and squeezed together until the required thickness is achieved. Once this occurs, this fresh sheet of fibre cement is cut by an automatic cutting knife. A conveyor then transports the sheet to where all the sheets are stacked with an interleaving steel plate. The stacked sheets are then highly compressed, resulting in a high density material.

This is followed by a curing process in an autoclave where the panels harden under high temperature and pressure. After curing the panels receive their final finish.

Subsequently and finally, EQUITONE [tectiva] panels receive a hydrophobation making them water repellant.

# 5. Dimensions and Tolerances

EQUITONE [tectiva] is available in a standard thickness of 8 mm and also in 10 mm thickness for specific applications or fixings (minimal order quantities may apply). The panels are available in either untrimmed (production dimension) or trimmed (maximum usable size) formats.




**The panel must not be installed with untrimmed edges.** Approximately 10 mm needs to be trimmed from each of the untrimmed (raw) edges.

| Dimensions | | |
|---|---|---|
| Nominal Thickness | 8 mm | 10 mm |

| Width | |
|---|---|
| Trimmed | 1220 mm |
| Untrimmed | 1240 mm |

| Length | |
|---|---|
| Trimmed | 2500 mm / 3050 mm |
| Untrimmed | 2520 mm / 3070 mm |

| Tolerances[1] (for trimmed panels) | | |
|---|---|---|
| Thickness | -0.5/+0.8 mm | -0.5/+1.0 mm |
| Width | ± 3 mm | |
| Length | ± 3 mm | |
| Squareness | ± 1.0 mm/m | |

| Tolerances[1] (for untrimmed panels) | | |
|---|---|---|
| Thickness | -0.5/+0.8 mm | -0.5/+1.0 mm |
| Width | ± 5 mm | |
| Length | ± 5 mm | |
| Squareness | ± 2.0 mm/m | |

| Weight per m² (nominal, ambient) | | |
|---|---|---|
| | 14.9 kg/m² | 18.6 kg/m² |

| Weight per panel (without pallet) | | |
|---|---|---|
| 2500 x 1220 mm (trimmed) | 45.4 kg | 56.7 kg |
| 3050 x 1220 mm (trimmed) | 55.4 kg | 69.2 kg |
| 2520 x 1240 mm (untrimmed) | 46.6 kg | 58.1 kg |
| 3070 x 1240 mm (untrimmed) | 56.7 kg | 70.8 kg |

| Packaging | | |
|---|---|---|
| Number of panels on pallet | 40 | 30 |

| Usable surface per pallet | | |
|---|---|---|
| 2500 x 1220 mm (trimmed) | 122.0 m² | 91.5 m² |
| 3050 x 1220 mm (trimmed) | 148.8 m² | 111.6 m² |

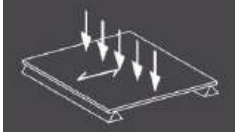
| Colour tolerance (CIELAB) [2] |
|---|
| ΔL*, brightness = ± 2.5 |

[1] Factory tolerances for trimmed and untrimmed panels outperform the requirements of the EN12467 Level I and II dimensional tolerances, respectively.

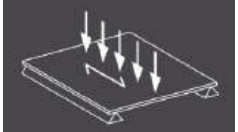
[2] Colour tolerance are only to be measured on dry surfaces.

# 6. Material Properties

EQUITONE [tectiva] cladding panels conform to the requirements of EN 12467:2012+A2:2018 “Fibre cement flat sheets – Product specification and test methods“. The results below are presented as defined by the standard.



[1]Bending strength perpendicular, load perpendicular to the production (longitudinal) direction



[2]Bending strength parallel, load parallel to the production (longitudinal) direction

| Classification | | | | |
|---|---|---|---|---|
| Type of product | | EN12467 | NT | |
| Durability classification | | EN12467 | Category A | |
| Strength classification | | EN12467 | Class 5 | |
| Dimensional tolerances for trimmed panels | | EN12467 | Level I | |
| Dimensional tolerances for untrimmed panels | | EN12467 | Level II | |

| Physical requirements and characteristics | | | | |
|---|---|---|---|---|
| Mean density | dry | EN12467 | 1630 | kg/m³ |
| Moisture movement | 30-90 % | EN12467 | <0.08 | % |
| Mean bending strength perpendicular[1] | ambient | EN12467 | 32.0 | MPa |
| Mean bending strength parallel[2] | ambient | EN12467 | 22.0 | MPa |
| Average bending strength | wet | EN12467 | ≥24.0 | MPa |
| Mean module of elasticity | ambient | EN12467 | 14,000 | MPa |
| Water impermeability test | | EN12467 | No drops/Pass | |

| Durability requirements | | | |
|---|---|---|---|
| Freeze-thaw test for category A panel | EN12467 | Pass | |
| Heat-rain tests for category A panel | EN12467 | Pass | |
| Warm water test | EN12467 | Pass | |
| Soak-dry test | EN12467 | Pass | |

| Fire and safety | | | |
|---|---|---|---|
| Reaction to fire | EN13501-1 | A2-s1,d0 | |

| Other characteristics | | | | |
|---|---|---|---|---|
| Thermal movement | α | - | 0.01 | mm/mK |
| Thermal conductivity | λ | ASTM C518 | 0.39 | W/mK |
| Moisture content at 23°C, 80 % humidity | | - | 6 | M.-% |
| Poisson’s ratio | ν | - | 0.2 | - |

Note to the units: 1 K (degree Kelvin) = 1°C, 1 MPa (Mega Pascal) = 1 N/mm², M.-% = mass percentage

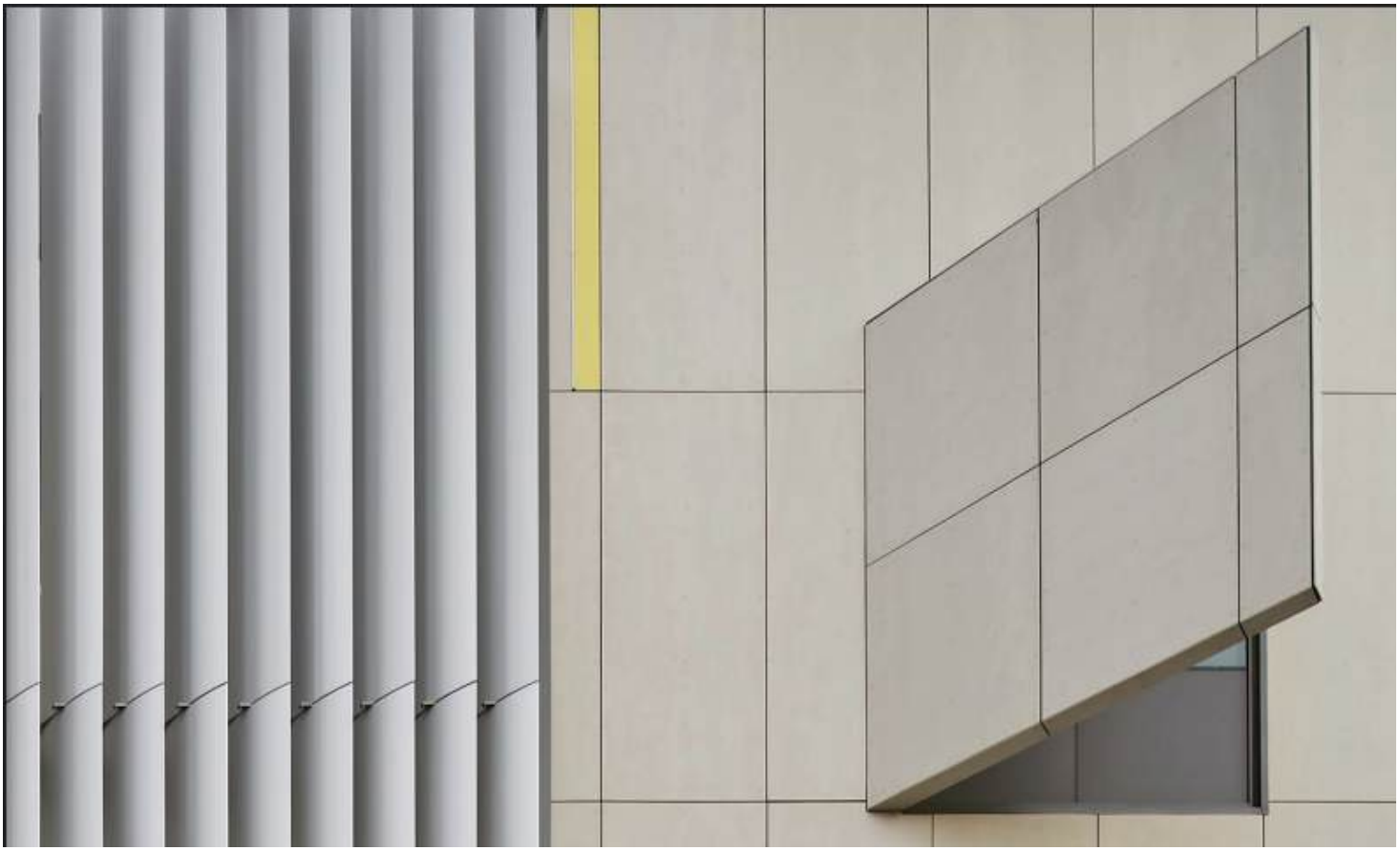
Note: EQUITONE [tectiva] panels also comply with the requirements of ISO8336:2017 “Fibre cement flat sheets – Product specification and test methods“

# Distances of rivet fasteners with respect to wind load

It is the responsibility of the installer to ensure that the metal support frame is installed in accordance to the structural engineer and metal support frame supplier's recommendations, specific to project requirements. EQUITONE panels, however, must be fixed in accordance with guideline below.

| Design wind load | Maximum centre distances of rivet fasteners |
|---|---|
| ≤ 1.2kPa | 600mm |
| 1.2–2.0kPa | 500mm |
| 2.0–2.5kPa | 400mm |
| > 2.5kPa | 300mm |

As a general rule of thumb, above maximum distances between rivet fasteners must be respected.



# 7. Advantages

Providing the application guidelines are followed, EQUITONE [tectiva] fibre cement panels have the following superior mix of properties compared to other materials:

- Recyclable according to Environmental Product Declaration (EPD)
- Expected average reference service life of 50 years (based on EPD)
- Fire safe (no fire ignition, no spread of fire)
- Improved sound insulation of the facade
- UV-resistant
- Resistant to extreme temperatures
- Weather resistant
- Resistant to many living organisms (fungi, bacteria, insects, vermin, etc.)
- Resistant to many chemicals
- Strong and rigid panel
- Hail impact tested
- Can be ideally combined with [lunara] and [linea] in the same colour

Working with the material:

- The material is easy to drill, cut and install with the proper tools
- Cut edges do not need to be sealed
- As the material is uncoated, minor scratches or stains may be sanded off

# 8. Applications

EQUITONE [tectiva] can be used in several ventilated applications, including, but not limited to:

- Ventilated facade or rainscreen cladding
- Window and door reveal
- Exterior ceiling: decorative cladding of ceiling
- Soffits, eaves and verge boards
- Interior wall and ceiling lining (subject to local regulations)

For restrictions on the above-mentioned applications read the specific application guidelines.

The panels may be face or concealed fixed with Etex proprietary or recommended fixing solutions.

EQUITONE [tectiva] can not be used in the following applications, but not limited to: Internal applications exposed to direct moisture e.g. wet areas, situations with direct contact with standing snow or ice, applications where exposed to long term temperatures exceeding 80°C, and roof applications.

# 9. Health and Safety Aspects

During the mechanical machining of panels, dust can be released which can irritate the airways and eyes. Depending on the working conditions, adequate machinery with dust extraction and/or ventilation should be foreseen. The inhalation of fine (respirable size) quartz containing dust, particularly when in high concentrations or over prolonged periods of time can lead to lung disease and an increased risk of lung cancer. For more information, please visit www.equitone.com for the most recent Safety Information Sheet.

# 10. Maintenance and Cleaning

Refer to the relevant "EQUITONE Cleaning Information" Guide.

# 11. Certification

The manufacturer can - within the framework of the European Regulation N° 305/2011 (CPR) - present the Declaration of Performance (DOP) of the product such confirming that the product has a CE marking. The CE marking guarantees that the product is in accordance with the basic requirements determined by the harmonized European standard and applicable to the product.
The Declaration of Performance is presented in accordance with the CPR and can be found at www.equitone.com.

The manufacturing facility holds the latest versions of the following ISO certificates

- ISO 9001 Quality Management System
- ISO 14001 Environmental Management System
- ISO 45001 Occupational Health and Safety

EQUITONE [tectiva] is certified with an Environmental Product Declaration according to ISO 14025 or EN 15804. The life cycle assessment includes raw material and energy production, the actual manufacturing phase, and the use phase of the fibre cement panels. More information available in the Material Sustainability Datasheet.

# 12. Information

Please visit www.equitone.com for contact details and further information and technical documents.

EQUITONE
Fibre cement facade materials

# Weathering Test

**Architectural Testing Report No: D1647.01-106-31** **Date: 04/04/2014**

ASTM G 155-05a, *Standard Practice for Operating Xenon Arc Light Apparatus for Exposure of Non-Metallic Materials*

ASTM D 2244-09a, *Standard Practice for Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates*

The following overall color changes were recorded.

| Sample Designation | Overall Color Change - ΔE - 2000 Hours |
|---|---|
| | |
| **TE 00 (NW 41-43)** | 1.56 |
| **TE 90 (NW 44-46)** | 2.51 |
| **TE 10 (NW 47-49)** | 1.29 |
| **TE 20 (NW 50-52)** | 1.20 |
| **TE 80 (NW 53-55)** | 0.86 |
| **Grün PU 541 - Y (AW47-49)** | 0.21 |
| **Anthrazit NU 251 (AW 50-52)** | 1.83 |
| **Rot PU 341 - X (AW 53-55)** | 0.37 |
| **Blau PU 441 - Y *"Blue"* (AW 56-58)** | 0.37 |
| **Cremeweiss 154Y (AW 59-61)** | 0.93 |
| **Natural Grey N 250 (AW 62-64)** | 1.17 |
| **Anthrazit N 251 X (AW 65-67)** | 0.57 |
| **Uben N 359 Y *"Robin Red" (AW 68-70)*** | 0.98 |

It is generally considered that a ΔE of 1.0 is the smallest color difference the human eye can see up close. However color difference between 1.0 and 2.0 are perfectly acceptable and depending on color and light can also be unnoticeable. (In accordance to 1976 CIE formula to measure colour difference (CIE76), a ΔE*= 2.3 can be considered Just Noticeable Difference (JND). So anything below 2.3 should not be noticeable by the naked eye.)

TE90, white tectiva has the greatest difference which is still in our tolerance. In fact the value shows the panel has got brighter.

The values for ΔL, Δa and Δb at the end of the report also fall within our manufacturing tolerances for new sheets for the allowable color difference. So, to say that the panels after 2000 hours of weathering exposure would still be acceptable as new panels shows the true level of performance.

EQUITONE
S.A. Etex Group N.V
Kuiermansstraat 1
B-1880 Kapelle-op-den Bos
BELGIUM

AFITI LICOF
Centro de Ensayos e Investigación del Fuego
Center for Fire Testing and Research
Asociación para el Fomento de la Investigación y la Tecnología de la Seguridad contra Incendios
Association for the Promotion of Research and Fire Safety Technology



# Informe de Clasificación
# *Classification Report*

## Laboratorio de Reacción al Fuego
## *Reaction to Fire Laboratory*

**SOLICITANTE:** EUROPANELS OVERSEAS, N.V
*APPLICANT:*

**CLASIFICACIÓN DE LA REACCIÓN AL FUEGO SEGÚN NORMA UNE-EN 13501-1:2007+ A1:2010 (EN 13501-1 :2007+A1 :2009)**
*REACTION TO FIRE CLASSIFICATION ACCORDING TO STANDARD UNE-EN 13501-1:2007+A1:2010 (EN 13501-1:2007+A1:2009).*

- Producto: Plancha de fibrocemento de 8 mm de espesor
  *Product* *Fibrecement sheet of 8 mm of thickness*

  - Fabricante: Eternit N.V.
    *Manufacturer :*
    Gama de producto:
    *Product family*
    Según información incluida en página 5 de 7 (Tabla 1)
    *According to information included on page 5 of 7 (table 1)*

SEDE SOCIAL Y LABORATORIOS *HEAD OFFICE & LABORATORIES* Camino del Estrechillo, 8 E-28500 Arganda del Rey - Madrid (Spain)
SEDE CENTRAL Y LABORATORIOS *CENTRAL OFFICE & LABORATORIES* C/ Río Estenilla, s/n - P.I. Sta. Mª de Benquerencia E-45007 Toledo (Spain)
+34 902 112 942
+34 918 713 524
+34 901 706 587
licof@afiti.com
www.afiti.com

# CLASIFICACIÓN DE LA REACCIÓN AL FUEGO SEGÚN NORMA UNE-EN 13501-1:2007+A1:2010 (EN 13501-1:2007+A1:2009)

*REACTION TO FIRE CLASSIFICATION ACCORDING TO UNE-EN 13501-1:2007+A1:2010 (EN 13501-1:2007+A1:2009) STANDARD*

**Solicitante:**
*Applicant :*

**EUROPANEL OVERSEAS N.V.**
Kuiermansstraat 1
1880 - Kapelle-op-den-Bos, Belgium

**Laboratorio emisor:**
*Issuer Laboratory:*

**AFITI-LICOF**

Organismo notificado nº: 1168
*Notified body Nr*

**Producto:**
*Product :*

Planchas de fibrocemento de 8 mm de espesor.
*Fibrecement sheet of 8 mm of thickness*

Fabricante: Eternit N.V.
*Manufacturer :* Kuiermansstraat 1
1880 - Kapelle-op-den-Bos , Belgium
Referencia: Según información incluida en página 5 de 7 (Tabla 1)
*Reference : Information included on page 5 of 7 (table 1)*

**Informe de Clasificación nº:**
*Classification Report Nr:*

**3397T18-2**

Fecha de emisión: 27-mar-18
*Date of issue :* *27th-Mar-18*

## Contenido del informe - *Content of the report*

## 1.- OBJETO DEL INFORME – *AIM OF THE REPORT*

Este Informe de Clasificación define la clasificación de la Reacción al Fuego asignada a la gama de planchas de fiborcemento con un espesor de 8 mm, de acuerdo con los procedimientos establecidos en la norma UNE-EN 13501-1:2007+A1:2010 (EN 13501-1:2007+A1:2009)"*Clasificación en función del comportamiento frente al Fuego de productos de construcción y elementos para edificación. Parte 1: Clasificación a partir de datos obtenidos en ensayos de Reacción al Fuego".*
*This Classification report defines the Reaction to Fire classification of the product of fibre cement sheet of 8 mm of thickness the basis of the procedures established in UNE-EN 13501-1:2007+A1:2010 (EN 13501-1:2007+A1:2009)"Fire classification of construction products and building elements-Part 1: Classification using data from reaction to fire tests".*

## 2.- DETALLES DEL PRODUCTO OBJETO DE CLASIFICACIÓN
*DETAILS OF CLASSIFIED PRODUCT*

### 2.1.- GENERAL – *GENERAL*

La gama de productos definida por el solicitante según información incluida en página 5 de 7 (Tabla 1) se define como planchas de fiborcemento con un espesor de 8 mm según la especificación técnica correspondiente.
*The product family defined by applicant according information included in page 5 of 7 (Table 1) is defined as fibre cement sheet of 8 mm of thickness according to the relevant technical specification.*

### 2.2.- DESCRIPCIÓN – *DESCRIPTION*

La gama de productos está completamente descrita en el informe de ensayo y en el informe que incluye el campo de aplicación extendido de resultados de ensayo [Informe EXAP] en los que se basa esta clasificación. Dichos informes se identifican en el capítulo 3 del presente informe.
*The product family is fully described on the test report and the extended applications report [EXAP report] on which the classification is based. These reports are indicated on chapter 3 of this report.*

## 3.- INFORMES Y RESULTADOS DE ENSAYO EN LOS QUE SE BASA LA CLASIFICACIÓN.
*REPORTS AND TEST RESULTS IN SUPPORT OF THIS CLASSIFICATION.*

### 3.1.- ENSAYOS – *TEST*

**Informes de ensayo** – *Test reports*

| Laboratorio emisor<br>*Issuer laboratory* | Solicitante<br>*Applicant* | Informes<br>*Reports* | Norma de ensayo<br>*Test standard* | Condición final de uso<br>*End use application* |
|---|---|---|---|---|
| **AFITI-LICOF**<br>Pol. Ind. Sta. Mª de Benquerencia<br>C/ Río Estenilla, s/n<br>45007-TOLEDO<br><br>Organismo notificado nº:<br>*Notified body Nr:*<br>**1168** | **EUROPANEL OVERSEAS N.V.**<br>Kuiermansstraat 1<br>1880 - Kapelle-op-den-Bos, Belgium | Nº/ *Nr*: **3397T18**<br><br>F. emisión:<br>27-mar-18<br>*Date of issue:*<br>*27th-Mar-18*<br>F ensayo:<br>13-mar-18<br>*Test date:*<br>*13th-Mar-18* | UNE-EN 13823:2012+A1:2016 (EN 13823:2010+A1:2014) | Revestimiento externo / fachadas.<br>*External cladding facade.*<br>. |
| | | | UNE-EN 1716:2011 (EN ISO 1716:2010 | |

**Resultados de ensayo –** *Test results*

***Informe de ensayo nº*** ***3397T18***
*Test report Nr*

| | | | **Resultados** *Results* | |
|---|---|---|---|---|
| **Método de ensayo** *Test method* | **Parámetro** *Parameters* | **Número de ensayos** *Nr. test* | **Media de parámetro continuo (m)** *Continuous parameter mean (m)* | **Parámetros que se tienen que cumplir** *Compliance with parameters* |
| UNE-EN 13823:2012+A1:2016, S.B.I. (EN 13823:2010+A1:2014) | $FIGRA_{0,2MJ}$ (W/s) | 1 | 33,73 | No aplicable *Non applicable* |
| | $FIGRA_{0,4MJ}$ (W/s) | | No aplicable *Non applicable* | No aplicable *Non applicable* |
| | LSF < borde | | No aplicable *Non applicable* | ☒ Sí ☐ No ☒ *Yes* ☐ *No* |
| | $THR_{600s}$ (MJ) | | 2,0 | No aplicable *Non applicable* |
| | SMOGRA ($m^2/s^2$) | | 0,00 | No aplicable *Non applicable* |
| | $TSP_{600\ s}$ ($m^2$) | | 6,3 | No aplicable *Non applicable* |
| | Gotas/ partículas en llamas *Drops / Particles flamed* | | No aplicable *Non applicable* | ☐ Sí ☒ No ☐ *Yes* ☒ *No* |

| | | | **Resultados -** *Results* | |
|---|---|---|---|---|
| **Método de ensayo** *Test method* | **Parámetro** *Parameter* | **Número de ensayos** *Nr. test* | **Media de parámetro continuo (m)** *Continuous parameter mean (m)* | **Parámetros que se tienen que cumplir** *Compliance with parameters* |
| UNE-EN ISO 1716:2011 (EN ISO 1716) Determinación del Potencial Calorífico Superior (PCS) *EN ISO 1716:2011 (EN ISO 1716:2010) Product gross calorific potential (PCS)* | PCS (MJ/kg) | 1 | 0,6594 | No aplicable *Non applicable* |

DOCUMENTO FIRMADO DIGITALMENTE
*DIGITALLY SIGNED DOCUMENT*

3.2.- CAMPO DE APLICACIÓN EXTENDIDO DE RESULTADOS
*EXTEND APPLICATION FIELD*

**Informes –** *Reports*

| Laboratorio emisor<br>*Issue laboratory* | Solicitante<br>*Applicant* | Informes<br>*Reports* | Norma<br>*Standard* |
|---|---|---|---|
| **AFITI-LICOF**<br>Pol. Ind. Sta. Mª de Benquerencia<br>C/ Río Estenilla, s/n<br>45007 – TOLEDO | **EUROPANEL OVERSEAS N.V.**<br>Kuiermansstraat 1<br>1880 - Kapelle-op-den-Bos,<br>Belgium | Nº: **EXAP-3397T18**<br>F. emisión: 27-mar-18<br>*Date of issue:*<br>*27th-Mar-18* | - UNE-EN 15725:2011<br>-ER 003:2016 |
| Organismo notificado nº<br>*Notified body Nr:*<br>**1168** | | | |

**Campo de aplicación extendido de los resultados de ensayo**
*Extended application field of test results*

A continuación se muestra el rango permitido de variabilidad para los distintos parámetros del producto/condiciones finales de uso. El resto de parámetros deben mantenerse conforme a lo descrito en los informes de ensayo de referencia.
*Hereafter it is shown the range of variation allowed for the different parameters of the product/end use conditions. Rest of parameters shall be kept as described on the referenced test reports*.

-Tabla 1-
*-Table 1-*

.

| | **Gama de productos**<br>*Product family* |
|---|---|
| **Tipo de producto**<br>*Type of product* | Planchas de fibrocemento de 8 mm de espesor.<br>*Fibrecement sheet of 8 mm of thickness* |
| **Color**<br>*Colour* | Resultados válidos para cualquier color<br>*Results valid for all colours* |
| **Cámara de aire**<br>*Air gap* | Resultados válidos para cualquier cámara de aire como panel autoportante<br>*Results valid for all air gaps and self – supported panel* |
| **Sustrato**<br>**Substrate** | Sustratos de placa de yeso laminado con densidad igual o superior a 525,5 kg/m3.<br>Sustratos con una euroclase A1 ó A2-s1,d0.<br>Gypsum plasterboard substrates with density equal or higher to 525,5 kg/m3.<br>Substrates with a euroclass A1 or A2-s1,d0 |

## 4.- CLASIFICACIÓN Y CAMPO DE APLICACIÓN
*CLASSIFICATION AND FIELD OF APPLICATION*

### 4.1.- NORMA DE CLASIFICACIÓN – *CLASSIFICATION STANDARD*

La clasificación de la reacción al fuego se ha realizado de acuerdo con lo establecido en la norma UNE-EN 13501-1:2007+A1:2010 (EN 13501-1 :2007+A1 :2009).
*Reaction to Fire classification according to UNE-EN 13501-1:2007+A1:2010 (EN 13501-1:2007+A1:2009) standard*

### 4.2.- CLASIFICACIÓN – *CLASSIFICATION*

La gama de productos de planchas de fibrocemento de 8 mm de espesor. (ver Tabla 1) presenta la siguiente clasificación:
*Product family of fibrecement sheet of 8 mm of thickness (see table 1) reaches the following classification*:

**Clasificación de la Reacción al Fuego –** *Reaction to fire classification*

| **Comportamiento al Fuego** *Fire behaviour* | | **Producción de humo** *Smoke production* | | | **Gotas inflamadas** *Flaming droplets* | |
|---|---|---|---|---|---|---|
| **A2** | — | **s** | **1** | , | **d** | **0** |

**A2 – s1 , d0**

### 4.3.- CAMPO DE APLICACIÓN – *FIELD OF APPLICATION*

Según lo establecido en el informe técnico EXAP nº EXAP-3397T18, la gama de productos (ver tabla 1), tiene el siguiente campo de aplicación.
*According to Technical Report EXAP nr. 3397T18, the product family (see Table 1), has the following field of application.*

La clasificación obtenida sigue siendo válida para las siguientes variaciones en las características de la muestra, sin que la realización de estas modificaciones suponga la ejecución de nuevos ensayos.
*Classification obtained is valid for the following simple characteristic variations, without further testing needed.*

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| Característica/Propiedad<br>*Characteristic/Property* | Variación permitida<br>*Range allowed* |
|---|---|
| – Tipo de producto<br>*Kind of product* | Planchas de fibrocemento de 8 mm de espesor.<br>*Fibrecement sheet of 8 mm of thickness* |
| – Color<br>*colour* | Resultados válidos para cualquier color<br>*Results valid for all colours* |
| – Cámara de aire<br>*Air gap* | Resultados válidos para cualquier cámara de aire y como panel autoportante<br>*Results valid for all air gaps and self – supported panel* |
| - Sustrato<br>Substrate | Sustratos de placa de yeso laminado con densidad igual o superior a 525,5 kg/m3.<br>Sustratos con una euroclase A1 ó A2-s1,d0.<br>Gypsum plasterboard substrates with density equal or higher to 525,5 kg/m3.<br>Substrates with a euroclass A1 or A2-s1,d0 |

## 5.- LIMITACIONES - *LIMITATIONS*

Este informe no representa ninguna aprobación de tipo ni certificación del producto.
*This document does not represent type approval or certification of the product.*

Toledo, 27 de marzo de 2018
*Toledo, 27th of March of 2018*

Documento Firmado Digitalmente
*Digitally Signed Document*

Fdo.: David Sáez García
Director Técnico del Laboratorio
de Reacción al Fuego
*Technical Director of Fire Reaction Laboratory*

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