# ENVIRONMENTAL PRODUCT DECLARATION

AS PER NF EN ISO 14025, NF EN 15804+A1 AND NF EN 15804/CN



FIBROFOR GREEN
Contec Fiber



# **INTRODUCTION**

#### **GENERALITIES**

The information contained in this declaration is given under the responsibility of the declarer. Any use of the information thus provided, whether in full or in part, must always at least be accompanied by the full reference of the original declaration: "Producer, Full title, Publication date". For any further information concerning the drawing up of this EPD or the products it covers, please contact the declarer.

This document is an Environmental product declaration for a building material drawn up in compliance with the NF EN ISO 14025 (August 2010) standard. This EPD is supplemented by additional information in compliance with the NF EN 15804+A1 (April 2014) standard and French legal requirements on EPDs.

#### **EDP TERMINOLOGY**

#### ABBREVIATIONS USED IN THE DOCUMENT

| LCA | Life Cycle Assessment  |
|-----|------------------------|
| LCA | THE CACIE WOOGSOILIGHT |

EPD Environmental Product Declaration

LCI Life Cycle Inventory

LCIA Life Cycle Impact Assessment
MNA Module Not Assessed
PCR Product Category Rule

#### UNITS OF MEASURE USED IN THE DOCUMENT

| MJ    | Megajoule (unit of energy)     |
|-------|--------------------------------|
| kWh   | Kilowatt-hour (unit of energy) |
| kg    | Kilogram (unit of weight)      |
| g     | Gram (unit of weight)          |
| m     | Metre (unit of length)         |
| mm    | Millimetre (unit of length)    |
| m²    | Square metre (unit of area)    |
| $m^3$ | Cubic metre (unit of volume)   |

### RESULT DISPLAY FORMAT

The LCIA results are displayed in scientific format with three significant digits: 1.23E+02 reads 1.23x10².

#### PRECAUTIONS WHEN USING THE EPD TO COMPARE PRODUCTS

EPDs for building materials may not be comparable if they do not comply with NF EN 15804+A1, are not drawn up on the same harmonised scientific basis, do not cover the same functional units, are not based on the use of the products and their impacts on the building, and do not take into account the complete life cycle (all information modules).

## 1. GENERAL INFORMATION

Declarer Contec Fiber AG

Via Innovativa 21,

CH 7013

Domat-Switzerland

Production Esteana

26 rue Mège

83220 Le Pradet - France

Type of LCA "Cradle-to-gate"

Products covered The products covered by this EPD are Fibrofor Green jute fibres manufactured by Contec

Fiber and available from Viersen, Germany.

Declared impacts The declared impacts are those of Fibrofor Green jute fibres.

# 2. FUNCTIONAL UNIT AND TYPICAL PRODUCT DESCRIPTION

Declared unit Composed of 1 kg of packed jute fibre, available from Viersen, Germany, ready to be shipped

to the customer. This choice of declared unit makes it easy to multiply the environmental

results by the amount of fibre corresponding to a specific application.

Technical specifications not included in the functional unit

Crack prevention in concrete (recommended use)

Unit kg

Typical product description The typical product subject of this EPD is a natural jute fibre. Jute fibre, commonly known as

jute, comes from jute bark. The product comes in the form of multi filaments of this natural bio-sourced fibre. The fibres are about ten millimetres long and have a unit diameter of 20

to 250 μm.

Once assembled, the fibres form this multi filament of a density equal to 200kg/m3

Description of use

Green Fibre can be included to eliminate plastic shrinkage from cement-based formulations.

Green Fibre is used for the production of concrete floors, precast elements, screeds, stucco, shotcrete and renders. The recommended dosage is 300 to  $600~g/m^3$  depending on the

materials and applications.

Water (moisture in the fibres) Co-polymerisation products

Jute oil

Declaration of content The typical product does not contain more than 0.1% by weight of substances classified as

substances of very high concern (SVHC) according to the candidate list provided by Annex XIV

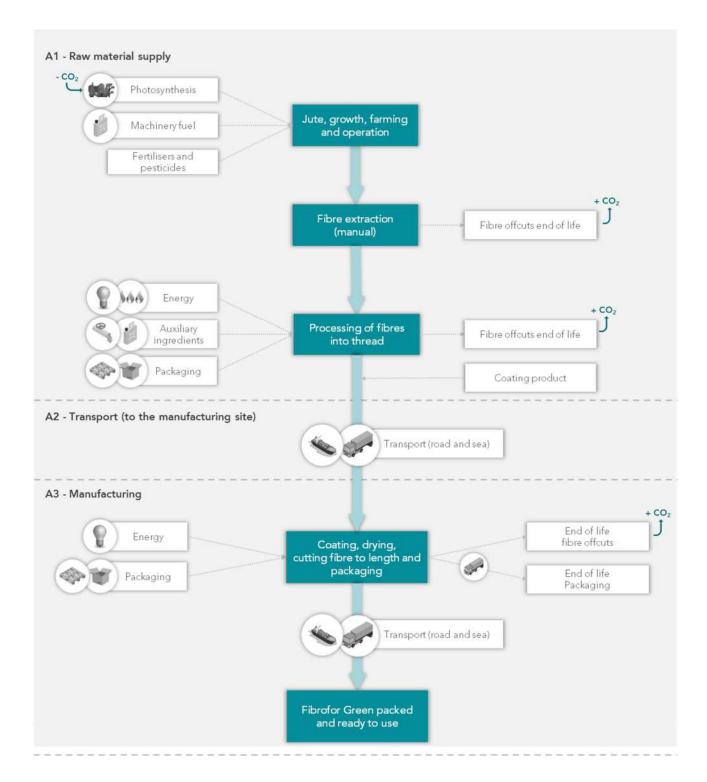
of the REACH Regulation.

| Main constituents                   | Materials | Weight for the reference product (linear m) |
|-------------------------------------|-----------|---|
| Green Fibre                         |           | 1.00 kg                                     |
| Of which jute fibre                 | Fibre     | 0.980 kg                                    |
| Of which co-polymerisation products |           | 0.012 kg                                    |
| Of which jute oil                   | Oil       | 0.008 kg                                    |
| Packaging                           |           | 0.53 kg                                     |
| Of which paper bag                  | Paper     | 0.43 kg                                     |
| Of which cardboard                  | Cardboard | 0.09 kg                                     |
| Of which plastic pallet             | PP        | 0.01 kg                                     |

# EXPLANATIONS COVERING THE REFERENCE SERVICE LIFE (RSL)

| Parameter  | Value  |
|--|--|
| Reference service life duration  | Not concerned  |
| Declared product properties (ex works) and finishes  | Products leaving the plant are finished and ready-to-use |
| Design parameters (if specified by the manufacturer), including references to appropriate practices  |  |
| Quality implementation according to the manufacturer's instructions  | Not concerned  |
| Outdoor environment (for outdoor applications), for example: bad weather, pollutants, UV and wind exposure, building orientation, shade, temperature | Not concerned  |
| Indoor environment (for indoor applications), for example: temperature, humidity, exposure to chemicals  | Not concerned  |
| Conditions of use, for example: frequency of use, mechanical exposure  | Not concerned  |
| Maintenance, for example: required frequency, type and quality of replaceable components   | Not concerned  |

# 3. STEPS, SCENARIOS AND ADDITIONAL INFORMATION



#### A1 - RAW MATERIAL SUPPLY

- Soil preparation (ploughing, harrowing...), jute planting, jute growth, use of fertilisers (N, P, K, lime), pesticides, water, as well as windrowing and bundling. The processes especially include carbon dioxide capture and material renewable energy by photosynthesis, and the production and combustion of fuels for jute growing machinery.
- Transport of the jute (fibres, chaff and seeds) from the harvest location to the fibre extraction location.

- Fibre extraction process carried out entirely manually: from retting to fibre extraction, rinsing and sun drying before batching.
- Transport of the jute fibres from the fibre extraction location to the company processing the fibres into jute threads.
- Sorting according to quality, fibre softening, bundling, carding and drawing of the fibres before batching. The processes
  include electricity consumption as well as machine lubricant consumption.
- End of life of jute fibre off-cuts generated during the fibre extraction process and the processing of the fibres into jute threads. This includes all processes related to their processing up to the waste exit status.
- Extraction of raw materials and production of jute fibre packaging (pallet, paper, cardboard, plastic film and plastic strap).
   The processes are included up to the exit gate from the packaging production site.
- Availability of co-polymerisation products for fibre coating.

#### A2 - TRANSPORT TO THE MANUFACTURING SITE

- Transport of the packed jute fibres between their production site and the manufacturing site in South Korea. The processes
  especially include the production and combustion of the fuel consumed by the ships and trucks.
- Transport of fibre coating co-polymerisation products from their production site and the manufacturing site in South Korea.
   The processes especially include the production and combustion of the fuel consumed by the trucks.

#### A3 - MANUFACTURING

- Provision of electricity for fibre coating, drying, fibre cutting, sorting and packaging (raw material extraction, production, transport).
- Extraction of raw materials and production of Fibrofor Green packaging (plastic pallet, cardboard, paper and water-soluble bags). The processes are included up to the exit gate from the packaging production site.
- End of life of the jute fibre waste generated during the Fibrofor Green production process. This includes all processing-related processes up to the waste exit status.
- End of life of recyclable jute thread packaging (wooden pallets). Includes all packaging waste transport and processing related processes to the waste exit status (before recycling). "Materials for Recycling" flows are declared.
- End of life of non-recyclable jute thread packaging (paper, cardboard, strapping and plastic film). This includes all processes
  related to the transport of packaging waste and its processing until complete elimination (landfill or incineration). "Exported
  energy" flows are declared for the incinerated part.
- Transport of the packed Fibrofor Green from the manufacturing site to Viersen, Germany. The processes especially include the production and combustion of the fuel consumed by the ships and trucks.

#### PCR used

NF EN 15804+A1 standard "Sustainability of construction works. Environmental product declarations. Core rules for the product category of construction products", accompanied by its national supplement NF EN 15804/CN.

#### **System Boundaries**

The system boundaries have been set in compliance with the EN 15804+A1 standard, in particular concerning the "modularity" rules (processes are allocated to the module in which they take place) and "polluter pays" rules (waste treatment processes are allocated to the processes that generate the waste).

The processes included in each life cycle step are summarised in the life cycle diagram and the paragraphs in section 3.

By convention, the following processes have been considered outside the boundaries:

- For step A1: production site lighting
- For step A2: employee transport
- For all the steps: manufacturing and heavy maintenance of the production tool and transport systems (trucks, roads, electricity pylons, buildings and heavy equipment on the manufacturing site, etc.). However, some generic data used for this work has been included with the infrastructure contributions.

#### Cut-off rule

The cut-off rules set out in EN 15804+A1 have been complied with (1% per process, 5% per module, in terms of weight and primary energy consumption). The unreported flows for this EPD are as follows:

- Provision of jute oil
- Provision of sodium salt

## Assignments

The co-product allocation rules defined by the EN 15804+A1 standard have been complied with:

- Allocation avoided as much as possible;
- Allocation based on physical properties (e.g. weight, volume) when the difference in revenue generated by co-products is small;
- In all other cases, allocation based on economic values;
- Flows of materials with specific inherent properties, e.g. energy content, elemental composition (for example biogenic carbon content), always allocated to reflect the physical flows, regardless of the selected allocation for the process.

# Representativeness

Most of the generic LCI data used is taken from the Ecoinvent V3.5 "allocation, cut-off by classification", database which was last updated in August 2018. It corresponds to processes taking place in the countries concerned or around the world, the most precise data having been given priority, and adjustments having been made if necessary.

# Result variability

Calculations were carried out on all sensitive parameters related to the manufacture of Green Fibre covered by this EPD in order to assess result variability for the following control indicators:

- Global warming
- Non-renewable primary energy technique
- Non-hazardous waste

The results of these calculations show that all products covered have indicators less than 1.4 times the declared value.

# 5. LIFE CYCLE IMPACT ASSESSMENT RESULTS

#### TABLE 1 - PARAMETERS DESCRIBING ENVIRONMENTAL IMPACTS

|  | A1-A3                       | - Productio    | on step         | A4-<br>Implemen | A5 -<br>tation step                        |          |                  |             | B - Use step     | )                   |                 |                |                                    |                | dens<br>daries           |                           |  |
|--|-----------------------------|----------------|-----------------|-----------------|--|----------|------------------|-------------|------------------|---------------------|-----------------|----------------|------------------------------------|----------------|--------------------------|---------------------------|--|
|  | A1 - Raw material<br>supply | A2 - Transport | A3 - Production | A4 - Transport  | A5 - Construction-<br>installation process | B1 - Use | B2 - Maintenance | B3 - Repair | B4 - Replacement | B5 - Rehabilitation | B6 - Energy use | B7 - Water Use | C1 - Demolition-<br>deconstruction | C2 - Transport | C3 - Waste<br>processing | C4 - Waste<br>elimination | D - Benefits and burdens<br>beyond system boundaries |
| Global warming in eq. kg CO <sub>2</sub> /FU               | 6.75E-01                    | 1.06E-01       | 1.03E+00        | MNA             | MNA  | MNA      | MNA              | MNA         | MNA              | MNA                 | MNA             | MNA            | MNA                                | MNA            | MNA                      | MNA                       | MNA  |
| Ozone layer depletion in eq. kg CFC 11 /FU                 | 3.20E-07                    | 1.83E-08       | 1.10E-07        | MNA             | MNA  | MNA      | MNA              | MNA         | MNA              | MNA                 | MNA             | MNA            | MNA                                | MNA            | MNA                      | MNA                       | MNA  |
| Soil and water acidification in eq. kg SO <sub>2</sub> /FU | 8.62E-03                    | 1.24E-03       | 8.50E-03        | MNA             | MNA  | MNA      | MNA              | MNA         | MNA              | MNA                 | MNA             | MNA            | MNA                                | MNA            | MNA                      | MNA                       | MNA  |
| Eutrophication in eq. kg PO <sub>4</sub> 3- /FU            | 1.16E-03                    | 1.15E-04       | 1.30E-03        | MNA             | MNA  | MNA      | MNA              | MNA         | MNA              | MNA                 | MNA             | MNA            | MNA                                | MNA            | MNA                      | MNA                       | MNA  |
| Photochemical ozone formation in eq. kg Ethene/FU          | 4.18E-04                    | 5.03E-05       | 3.60E-04        | MNA             | MNA  | MNA      | MNA              | MNA         | MNA              | MNA                 | MNA             | MNA            | MNA                                | MNA            | MNA                      | MNA                       | MNA  |
| Abiotic resource depletion - elements in eq. kg Sb /FU     | 3.37E-06                    | 1.93E-07       | 1.37E-06        | MNA             | MNA  | MNA      | MNA              | MNA         | MNA              | MNA                 | MNA             | MNA            | MNA                                | MNA            | MNA                      | MNA                       | MNA  |
| Abiotic resource depletion - fossil fuels in MJ PCI /FU    | 3.89E+01                    | 1.59E+00       | 1.72E+01        | MNA             | MNA  | MNA      | MNA              | MNA         | MNA              | MNA                 | MNA             | MNA            | MNA                                | MNA            | MNA                      | MNA                       | MNA  |
| Air Pollution<br>in m³ /FU                                 | 1.15E+02                    | 1.29E+01       | 1.34E+02        | MNA             | MNA  | MNA      | MNA              | MNA         | MNA              | MNA                 | MNA             | MNA            | MNA                                | MNA            | MNA                      | MNA                       | MNA  |
| Water pollution in m³ /FU                                  | 4.70E-01                    | 1.99E-01       | 1.05E+00        | MNA             | MNA  | MNA      | MNA              | MNA         | MNA              | MNA                 | MNA             | MNA            | MNA                                | MNA            | MNA                      | MNA                       | MNA  |

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|   | A1-A3                       | - Productio    | on step         | A1-A3 - Production step  A4-A5 - Implementation step |  |          |                  |             |                  | )                   |                 |                |                                    | lens           |                          |                           |  |
|---|-----------------------------|----------------|-----------------|--|--|----------|------------------|-------------|------------------|---------------------|-----------------|----------------|------------------------------------|----------------|--------------------------|---------------------------|--|
|   | A1 - Raw material<br>supply | A2 - Transport | A3 - Production | A4 - Transport                                       | A5 - Construction-<br>installation process | B1 - Use | B2 - Maintenance | B3 - Repair | B4 - Replacement | B5 - Rehabilitation | B6 - Energy use | B7 - Water Use | C1 - Demolition-<br>deconstruction | C2 - Transport | C3 - Waste<br>processing | C4 - Waste<br>elimination | D - Benefits and burdens<br>beyond system boundaries |
| Use of renewable primary energy, excluding renewable primary energy resources used as raw materials in MJ /FU                     | 4.96E-01                    | 2.58E-02       | 5.49E-01        | MNA  | MNA  | MNA      | MNA              | MNA         | MNA              | MNA                 | MNA             | MNA            | MNA                                | MNA            | MNA                      | MNA                       | MNA  |
| Use of renewable primary energy resources as raw materials in MJ /FU  | 1.56E+01                    | 0.00E+00       | 1.80E+01        | MNA  | MNA  | MNA      | MNA              | MNA         | MNA              | MNA                 | MNA             | MNA            | MNA                                | MNA            | MNA                      | MNA                       | MNA  |
| Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials) in MJ /FU     | 1.61E+01                    | 2.58E-02       | 1.85E+01        | MNA  | MNA  | MNA      | MNA              | MNA         | MNA              | MNA                 | MNA             | MNA            | MNA                                | MNA            | MNA                      | MNA                       | MNA  |
| Use of non-renewable primary energy, excluding non-renewable primary energy resources used as raw materials in MJ /FU             | 3.89E+01                    | 1.62E+00       | 1.85E+01        | MNA  | MNA  | MNA      | MNA              | MNA         | MNA              | MNA                 | MNA             | MNA            | MNA                                | MNA            | MNA                      | MNA                       | MNA  |
| Use of non-renewable primary energy resources as raw materials in MJ /FU  | 3.64E-01                    | 0.00E+00       | 5.01E-01        | MNA  | MNA  | MNA      | MNA              | MNA         | MNA              | MNA                 | MNA             | MNA            | MNA                                | MNA            | MNA                      | MNA                       | MNA  |
| Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials) in MJ /FU | 3.93E+01                    | 1.62E+00       | 1.90E+01        | MNA  | MNA  | MNA      | MNA              | MNA         | MNA              | MNA                 | MNA             | MNA            | MNA                                | MNA            | MNA                      | MNA                       | MNA  |

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|  | A1-A3                       | A1-A3 - Production step |                 |                | A5 -<br>tation step                        | B - Use step |                  |             |                  |                     |                 |                |                                    | C - End of life step |                          |                           |  |  |
|--|-----------------------------|-------------------------|-----------------|----------------|--|--------------|------------------|-------------|------------------|---------------------|-----------------|----------------|------------------------------------|----------------------|--------------------------|---------------------------|--|--|
|  | A1 - Raw material<br>supply | A2 - Transport          | A3 - Production | A4 - Transport | A5 - Construction-<br>installation process | B1 - Use     | B2 - Maintenance | B3 - Repair | B4 - Replacement | B5 - Rehabilitation | B6 - Energy use | B7 - Water Use | C1 - Demolition-<br>deconstruction | C2 - Transport       | C3 - Waste<br>processing | C4 - Waste<br>elimination | D - Benefits and burdens<br>beyond system boundaries |  |
| Use of secondary material in MJ /FU            | 0.00E+00                    | 0.00E+00                | 0.00E+00        | MNA            | MNA  | MNA          | MNA              | MNA         | MNA              | MNA                 | MNA             | MNA            | MNA                                | MNA                  | MNA                      | MNA                       | MNA  |  |
| Use of renewable secondary fuels in MJ /FU     | 0.00E+00                    | 0.00E+00                | 0.00E+00        | MNA            | MNA  | MNA          | MNA              | MNA         | MNA              | MNA                 | MNA             | MNA            | MNA                                | MNA                  | MNA                      | MNA                       | MNA  |  |
| Use of non-renewable secondary fuels in MJ /FU | 0.00E+00                    | 0.00E+00                | 0.00E+00        | MNA            | MNA  | MNA          | MNA              | MNA         | MNA              | MNA                 | MNA             | MNA            | MNA                                | MNA                  | MNA                      | MNA                       | MNA  |  |
| Net fresh water use in m³ /FU                  | 7.81E-03                    | 2.43E-04                | 1.63E-02        | MNA            | MNA  | MNA          | MNA              | MNA         | MNA              | MNA                 | MNA             | MNA            | MNA                                | MNA                  | MNA                      | MNA                       | MNA  |  |

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|  | A1-A3                       | - Production step |                 | A4-A5 -<br>Implementation step |  | B - Use step |                  |             |                  |                     |                 |                |                                    | ens<br>aries   |                          |                           |  |
|--|-----------------------------|-------------------|-----------------|--------------------------------|--|--------------|------------------|-------------|------------------|---------------------|-----------------|----------------|------------------------------------|----------------|--------------------------|---------------------------|--|
|  | A1 - Raw material<br>supply | A2 - Transport    | A3 - Production | A4 - Transport                 | A5 - Construction-<br>installation process | B1 - Use     | B2 - Maintenance | B3 - Repair | B4 - Replacement | B5 - Rehabilitation | B6 - Energy use | B7 - Water Use | C1 - Demolition-<br>deconstruction | C2 - Transport | C3 - Waste<br>processing | C4 - Waste<br>elimination | D - Benefits and burdens<br>beyond system boundaries |
| Eliminated hazardous waste in kg /FU     | 1.52E-01                    | 1.23E-03          | 4.46E-02        | MNA                            | MNA  | MNA          | MNA              | MNA         | MNA              | MNA                 | MNA             | MNA            | MNA                                | MNA            | MNA                      | MNA                       | MNA  |
| Eliminated non-hazardous waste in kg /FU | 2.62E-01                    | 5.57E-02          | 5.52E-01        | MNA                            | MNA  | MNA          | MNA              | MNA         | MNA              | MNA                 | MNA             | MNA            | MNA                                | MNA            | MNA                      | MNA                       | MNA  |
| Eliminated radioactive waste in kg /FU   | 8.05E-05                    | 1.05E-05          | 7.82E-05        | MNA                            | MNA  | MNA          | MNA              | MNA         | MNA              | MNA                 | MNA             | MNA            | MNA                                | MNA            | MNA                      | MNA                       | MNA  |

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|  | A1-A3                       | - Productio    | on step         |                | -A5 -<br>Itation step                      |          | B - Use step     |             |                  |                     |                 |                |                                    |                | C - End of life step     |                           |  |  |  |
|--|-----------------------------|----------------|-----------------|----------------|--|----------|------------------|-------------|------------------|---------------------|-----------------|----------------|------------------------------------|----------------|--------------------------|---------------------------|--|--|--|
|  | A1 - Raw material<br>supply | A2 - Transport | A3 - Production | A4 - Transport | A5 - Construction-<br>installation process | B1 - Use | B2 - Maintenance | B3 - Repair | B4 - Replacement | B5 - Rehabilitation | B6 - Energy use | B7 - Water Use | C1 - Demolition-<br>deconstruction | C2 - Transport | C3 - Waste<br>processing | C4 - Waste<br>elimination | D - Benefits and burdens<br>beyond system boundaries |  |  |
| Components for reuse in kg /FU                     | 0.00E+00                    | 0.00E+00       | 0.00E+00        | MNA            | MNA  | MNA      | MNA              | MNA         | MNA              | MNA                 | MNA             | MNA            | MNA                                | MNA            | MNA                      | MNA                       | MNA  |  |  |
| Materials for recycling in kg /FU                  | 0.00E+00                    | 0.00E+00       | 1.72E-02        | MNA            | MNA  | MNA      | MNA              | MNA         | MNA              | MNA                 | MNA             | MNA            | MNA                                | MNA            | MNA                      | MNA                       | MNA  |  |  |
| Materials for energy recovery in kg /FU            | 0.00E+00                    | 0.00E+00       | 0.00E+00        | MNA            | MNA  | MNA      | MNA              | MNA         | MNA              | MNA                 | MNA             | MNA            | MNA                                | MNA            | MNA                      | MNA                       | MNA  |  |  |
| Externally supplied energy - electricity in MJ /FU | 0.00E+00                    | 0.00E+00       | 0.00E+00        | MNA            | MNA  | MNA      | MNA              | MNA         | MNA              | MNA                 | MNA             | MNA            | MNA                                | MNA            | MNA                      | MNA                       | MNA  |  |  |
| Externally supplied energy - steam in MJ /FU       | 0.00E+00                    | 0.00E+00       | 1.86E-01        | MNA            | MNA  | MNA      | MNA              | MNA         | MNA              | MNA                 | MNA             | MNA            | MNA                                | MNA            | MNA                      | MNA                       | MNA  |  |  |
| Externally supplied energy - gas in MJ /FU         | 0.00E+00                    | 0.00E+00       | 0.00E+00        | MNA            | MNA  | MNA      | MNA              | MNA         | MNA              | MNA                 | MNA             | MNA            | MNA                                | MNA            | MNA                      | MNA                       | MNA  |  |  |

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| Parameter/information   | Unit                          | TOTAL<br>Production<br>step | TOTAL<br>Implementa<br>tion step | TOTAL<br>Use step | TOTAL<br>End of Life<br>step | TOTAL<br>A1-A3 | Module D |
|---|-------------------------------|-----------------------------|----------------------------------|-------------------|------------------------------|----------------|----------|
| ■ Environmental Impacts   |                               |                             |                                  |                   |                              |                |          |
| Global warming  | eq. kg CO <sub>2</sub> /FU    | 1.81E+00                    | MNA                              | MNA               | MNA                          | 1.81E+00       | MNA      |
| Ozone layer depletion   | eq. kg CFC 11 /FU             | 4.48E-07                    | MNA                              | MNA               | MNA                          | 4.48E-07       | MNA      |
| Soil and water acidification  | eq. kg SO₂ /FU                | 1.84E-02                    | MNA                              | MNA               | MNA                          | 1.84E-02       | MNA      |
| Eutrophication  | eq. kg PO <sub>4</sub> 3- /FU | 2.57E-03                    | MNA                              | MNA               | MNA                          | 2.57E-03       | MNA      |
| Photochemical ozone formation   | eq. kg Ethene/FU              | 8.28E-04                    | MNA                              | MNA               | MNA                          | 8.28E-04       | MNA      |
| Abiotic resource depletion - elements   | eq. kg Sb /FU                 | 4.93E-06                    | MNA                              | MNA               | MNA                          | 4.93E-06       | MNA      |
| Abiotic resource depletion - fossil fuels   | MJ PCI /FU                    | 5.77E+01                    | MNA                              | MNA               | MNA                          | 5.77E+01       | MNA      |
| Air Pollution   | m³ /FU                        | 2.62E+02                    | MNA                              | MNA               | MNA                          | 2.62E+02       | MNA      |
| Water pollution   | m³ /FU                        | 1.72E+00                    | MNA                              | MNA               | MNA                          | 1.72E+00       | MNA      |
| ■ Use of primary energy resources   |                               |                             |                                  |                   |                              |                |          |
| Use of renewable primary energy, excluding renewable primary energy resources used as raw materials                       | MJ/FU                         | 1.07E+00                    | MNA                              | MNA               | MNA                          | 1.07E+00       | MNA      |
| Use of renewable primary energy resources as raw materials  | MJ/FU                         | 3.36E+01                    | MNA                              | MNA               | MNA                          | 3.36E+01       | MNA      |
| Total use of renewable primary energy resources<br>(primary energy and primary energy resources used as<br>raw materials) | MJ/FU                         | 3.47E+01                    | MNA                              | MNA               | MNA                          | 3.47E+01       | MNA      |
| Use of non-renewable primary energy, excluding non-<br>renewable primary energy resources used as raw<br>materials        | MJ/FU                         | 5.91E+01                    | MNA                              | MNA               | MNA                          | 5.91E+01       | MNA      |
| Use of non-renewable primary energy resources as raw materials  | MJ/FU                         | 8.65E-01                    | MNA                              | MNA               | MNA                          | 8.65E-01       | MNA      |
| Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)   | MJ/FU                         | 5.99E+01                    | MNA                              | MNA               | MNA                          | 5.99E+01       | MNA      |
| ■ Use of secondary resources and water  |                               |                             |                                  |                   |                              |                |          |
| Use of secondary material   | kg/FU                         | 0.00E+00                    | MNA                              | MNA               | MNA                          | 0.00E+00       | MNA      |
| Use of renewable secondary fuels  | MJ/FU                         | 0.00E+00                    | MNA                              | MNA               | MNA                          | 0.00E+00       | MNA      |
| Use of non-renewable secondary fuels  | MJ/FU                         | 0.00E+00                    | MNA                              | MNA               | MNA                          | 0.00E+00       | MNA      |
| Net fresh water use   | m³ /FU                        | 2.43E-02                    | MNA                              | MNA               | MNA                          | 2.43E-02       | MNA      |
| ■ Waste categories  |                               |                             |                                  |                   |                              | ,              |          |
| Eliminated hazardous waste  | kg/FU                         | 1.98E-01                    | MNA                              | MNA               | MNA                          | 1.98E-01       | MNA      |
| Eliminated non-hazardous waste  | kg/FU                         | 8.69E-01                    | MNA                              | MNA               | MNA                          | 8.69E-01       | MNA      |
| Eliminated radioactive waste  | kg/FU                         | 1.69E-04                    | MNA                              | MNA               | MNA                          | 1.69E-04       | MNA      |
| Outgoing flows  |                               |                             |                                  |                   |                              |                |          |
| Components for reuse  | kg/FU                         | 0.00E+00                    | MNA                              | MNA               | MNA                          | 0.00E+00       | MNA      |
| Materials for recycling   | kg/FU                         | 1.72E-02                    | MNA                              | MNA               | MNA                          | 1.72E-02       | MNA      |
| Materials for energy recovery   | kg/FU                         | 0.00E+00                    | MNA                              | MNA               | MNA                          | 0.00E+00       | MNA      |
| Externally supplied energy - electricity  | MJ/FU                         | 0.00E+00                    | MNA                              | MNA               | MNA                          | 0.00E+00       | MNA      |
| Externally supplied energy - steam  | MJ/FU                         | 1.86E-01                    | MNA                              | MNA               | MNA                          | 1.86E-01       | MNA      |
| Externally supplied energy - gas  | MJ/FU                         | 0.00E+00                    | MNA                              | MNA               | MNA                          | 0.00E+00       | MNA      |

# 6. ADDITIONAL INFORMATION ON THE RELEASE OF HAZARDOUS SUBSTANCES INTO INDOOR AIR. SOIL AND WATER DURING THE USE STEP

INDOOR AIR EMISSIONS

The studied products do not fall within the scope of French decree No. 2011-321 of 23 March 2011 on the labelling of construction products or wall or floor coverings and paints and varnishes on their emissions of volatile pollutants (see the indicative list of 26 January 2016 issued by the French Ministry of Ecology, Sustainable Development and Energy and the Ministry of Housing, Equality of Territories and Rural Areas).

No tests concerning the health quality of the interior spaces have been carried out.

EMISSIONS IN SOIL AND WATER

No tests for emissions in soil and water were carried out.

# 7. CONTRIBUTION OF THE PRODUCT TO THE ASSESSMENT OF HEALTH RISKS AND QUALITY OF LIFE INSIDE BUILDINGS

In addition to the information required by the NF EN 15804+A1 standard presented in section 6 of this EPD, information concerning health and quality of life aspects is presented below in the format required by the NF EN 15804/CN national supplement.

PRODUCT SPECIFICATIONS CONTRIBUTING TO THE CREATION OF HEAT AND HUMIDITY COMFORT CONDITIONS IN BUILDINGS

 $\label{thm:condition} The \ products \ covered \ by \ this \ EPD \ do \ not \ claim \ any \ performance \ regarding \ heat \ and \ humidity \ comfort.$ 

PRODUCT SPECIFICATIONS CONTRIBUTING TO THE CREATION OF ACOUSTIC COMFORT CONDITIONS IN THE BUILDING

The products covered by this EPD do not claim any performance regarding acoustic comfort.

PRODUCT SPECIFICATIONS THAT CONTRIBUTE TO CREATING THE CONDITIONS FOR VISUAL COMFORT IN THE BUILDING

The products covered by this EPD do not claim any performance regarding visual comfort.

PRODUCT SPECIFICATIONS CONTRIBUTING TO THE CREATION OF OLFACTORY COMFORT CONDITIONS IN BUILDINGS

The products covered by this EPD do not claim any performance regarding olfactory comfort.