

# ENVIRONMENTAL PRODUCT DECLARATION

In accordance with EN  
15804:2012+A2:2019 and ISO 14025  
for:

## GYPROC® Robust - Hard Plasterboard

Version 3

Date of revision: 2023/05/09

Validity: 5 years

Valid until: 2028/05/08

Date of issue: 2013/11/26

Scope of the EPD®: Nordic



THE INTERNATIONAL EPD® SYSTEM

Registration number  
The International EPD® System:  
S-P-00431



Manufacturer: Saint-Gobain Denmark A/S - Gyproc

## General information

**Manufacturer:** Saint-Gobain Denmark A/S – Gyproc

**Programme used:** International EPD System <http://www.environdec.com/>

**EPD registration number/declaration number:** S-P-00428

**PCR identification:** EN 15804:2012+A2:2019 Sustainability of construction works – Environmental product declaration - core rules for the product category of construction product and The International EPD® System PCR 2019:14 Construction products (EN 15804:A2) (1.11)

**Site of manufacture:** Kalundborg, Saint-Gobain Denmark A/S – Gyproc

**Owner of the declaration:** Saint-Gobain Denmark A/S – Gyproc

**Product / product family name and manufacturer represented:** Gyproc Robust/Robust Ergo Hard Plasterboard produced by Saint-Gobain Denmark A/S – Gyproc

**UN CPC code:** 37530 Articles of plaster or of composition based on plaster

**Declaration issued:** 2013-11-26 **Revision:** 2023-05-09 **Valid until:** 2028-05-08

**Demonstration of verification:** an independent verification of the declaration was made, according to ISO 14025:2010. This verification was external and conducted by the following third party based on the PCR mentioned above.

**EPD Prepared by:** LCA Central Team, Saint-Gobain and by Eva Hellgren.

**Contact:** Eva Hellgren ([Eva.Hellgren@saint-gobain.com](mailto:Eva.Hellgren@saint-gobain.com)) and Sandra Perez Jimenez ([Sandra.Perez-Jimenez@saint-gobain.com](mailto:Sandra.Perez-Jimenez@saint-gobain.com))

**The Functional Unit is:** 1m<sup>2</sup> of installed plasterboard 12,5 mm with a weight of 11,7 kg/m<sup>2</sup> with a useful life of 50 years

**Declaration of Hazardous substances: (Candidate list of Substances of Very High Concern):** none

**Geographical scope of the EPD®:** Nordic

The intended use of this EPD is for B2B communication.

|                  |                                                              |
|------------------|--------------------------------------------------------------|
| <b>Programme</b> | The international EPD© System                                |
| <b>Address:</b>  | EPD© International AB Box 210 60 SE-100 31 Stockholm Sweden  |
| <b>Website:</b>  | <a href="http://www.environdec.com">www.environdec.com</a>   |
| <b>E-mail:</b>   | <a href="mailto:info@environdec.com">info@environdec.com</a> |

CEN standard UNE-EN 15804 serves as the Core Product Category Rules (PCR)

Product category rules (PCR): PCR 2019:14 Construction Products, version 1.1

PCR review was conducted by: El Comité Técnico del Sistema Internacional EPD©  
President: Claudia A. Peña. Contact via [info@environdec.com](mailto:info@environdec.com)

Independent third-party verification of the declaration and data, according to ISO 14025:2006:

☐ EPD process certification    ☒ EPD verification

Third party verifier: Martin Erlandsson

IVL Swedish Environmental Research Institute

In case of recognized individual verifiers: Approved by: The International EPD© System

Procedure for follow-up of data during EPD validity involves third part verifier:

☒ Yes    ☐ No

# Product description

## Product description and use:

This Environmental Product Declaration (EPD®) describes the environmental impacts of 1 m<sup>2</sup> installed building plasterboard of 12.5 mm thickness and with a weight of 11,7 kg/m<sup>2</sup> and an expected average service life of 50 years.

Gyproc Robust is a hard plasterboard with a fiberglass reinforced gypsum core and a strong surface due to a thick paper liner. The board is made for interior cladding of walls, ceilings, pillars, beams, where, due to strong mechanical impact, greater impact resistance is needed than usual. The board contributes to greater rigidity in a plaster wall, and thereby the wall height can be increased.

The tapered edge allows the use of joint filler to produce a durable joint reinforcement and a smooth, continuous, crack-resistant surface ready for priming and final decoration. The smooth surface of the paper lining is an ideal base for decoration with wallpaper or by painting.

Gyproc Robust is available in 900 mm (GRE 13) and 1200 mm width (GR 13).

## Technical data/physical characteristics:

|                                |                                           |
|--------------------------------|-------------------------------------------|
| <b>EN classification</b>       | DIR-12,5 according EN 520:2004            |
| <b>Reaction to Fire</b>        | Euroclass A2-S1, d0 according EN 520:2004 |
| <b>Water vapour resistance</b> | 10 μ according to EN 520:2004             |
| <b>Thermal conductivity</b>    | 0,25 W/(m.K) according to EN 520:2004     |

## Description of the main product components and/or materials:

| Product components         | Weight (%)        | Post-consumer material weight (%) | Renewable material weight (%) |
|----------------------------|-------------------|-----------------------------------|-------------------------------|
| <b>Gyproc Robust</b>       | <b>100%</b>       | <b>0%</b>                         | <b>0%</b>                     |
| Gypsum (Natural)           | 55% – 85%         | 0%                                | 0%                            |
| Gypsum (Synthetic)         | 0% – 5%           | 0%                                | 0%                            |
| Gypsum (Recycled)          | 15% – 30%         | 100%                              | 0%                            |
| Additives                  | 0% – 5%           | 0%                                | 0%                            |
| Paper liner                | 1% – 3%           | 0%                                | 100%                          |
| <b>Packaging materials</b> | <b>Weight (%)</b> |                                   |                               |
| Gypsum culls               | 1% – 3%           |                                   |                               |

During the life cycle of the product any hazardous substance listed in the “Candidate List of Substances of Very High Concern (SVHC) for authorization” has not been used in a percentage higher than 0,1% of the weight of the product.

The verifier and the program operator do not make any claim nor have any responsibility of the legality of the product.

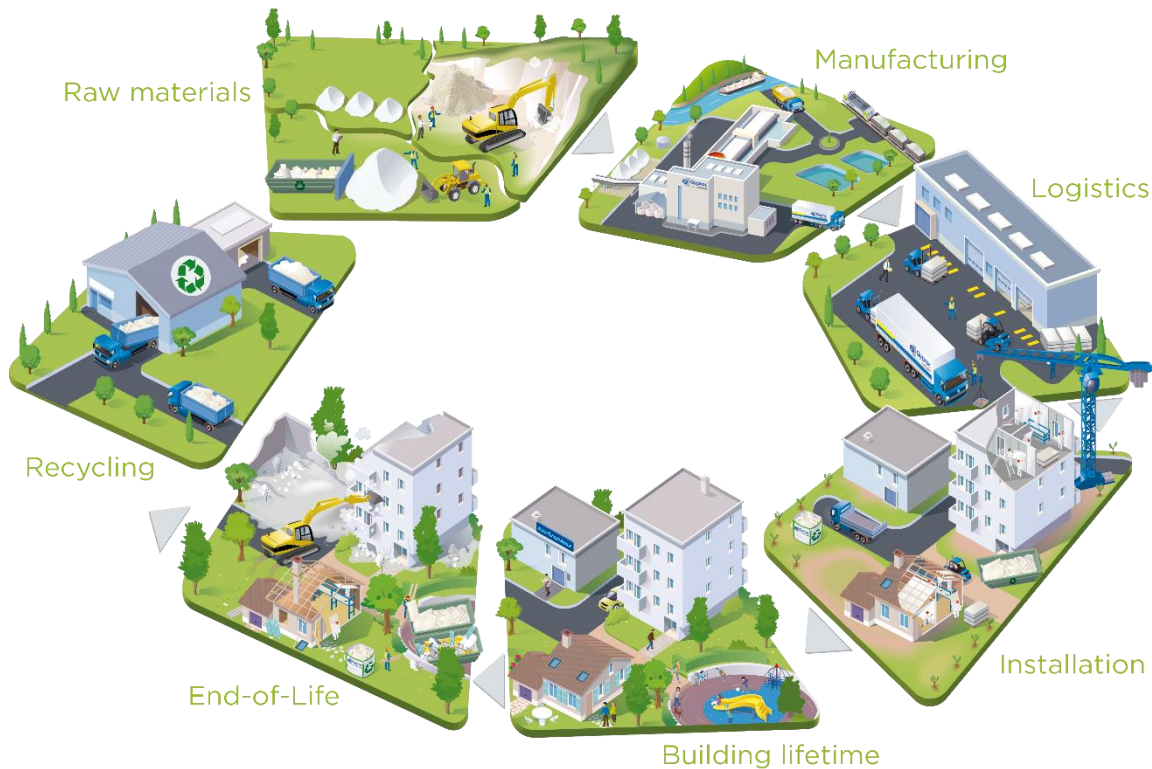
## LCA calculation information

|                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|----------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>EPD TYPE DECLARED</b>                     | Cradle to grave and module D<br>Product-specific (one product, one manufacturing site)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>FUNCTIONAL UNIT</b>                       | 1 m <sup>2</sup> of installed board with a weight of 11,7 kg/m <sup>2</sup> and an expected average service life of 50 years                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>SYSTEM BOUNDARIES</b>                     | Cradle to grave + Module D = (A + B + C) +D                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>REFERENCE SERVICE LIFE (RSL)</b>          | The Reference Service Life (RSL) of the Gypsum product is considered to be 50 years. This 50 - year value is the amount of time that we recommend our products last for without refurbishment and corresponds to standard building design life.                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>CUT-OFF RULES</b>                         | In the case that there is not enough information, the process energy and materials representing less than 1% of the whole energy and mass used can be excluded (if they do not cause significant impacts). The addition of all the inputs and outputs excluded cannot be bigger than the 5% of the whole mass and energy used, as well of the emissions to environment occurred.<br>Flows related to human activities such as employee transport are excluded.<br>The construction of plants, production of machines and transportation systems are excluded since the related flows are supposed to be negligible compared to the production of the building product when compared at these systems lifetime level. |
| <b>ALLOCATIONS</b>                           | Production data, recycling, energy and waste data have been calculated on a mass basis. The polluter pays as well as the modularity principles have been followed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>GEOGRAPHICAL COVERAGE AND TIME PERIOD</b> | Scope includes: Nordic<br>Data is collected from one production site in Kalundborg, Saint-Gobain Denmark A/S – Gyproc<br>Data collected for the year 2022.<br>Background data: Background data: Ecoinvent 3.6 and GaBi ts 9.2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>PRODUCT CPC CODE</b>                      | 37530 Articles of plaster or of composition based on plaster                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

According to EN 15804:2012+A2:2019, EPDs of construction products may not be comparable if they do not comply with this standard. According to ISO 21930, EPDs might not be comparable if they are from different programs.

# Life cycle stages

## Flow diagram of the Life Cycle



### Product stage, A1-A3

Description of the stage: the product stage of plaster products is subdivided into 3 modules A1, A2 and A3 respectively “Raw material supply”, “transport to manufacturer” and “manufacturing”.

#### A1, raw material supply.

This includes the extraction and processing of all raw materials and energy which occur upstream from the manufacturing process.

#### A2, transport to the manufacturer.

The raw materials are transported to the manufacturing site. The modelling includes road, boat and/or train transportations of each raw material.

#### A3, manufacturing.

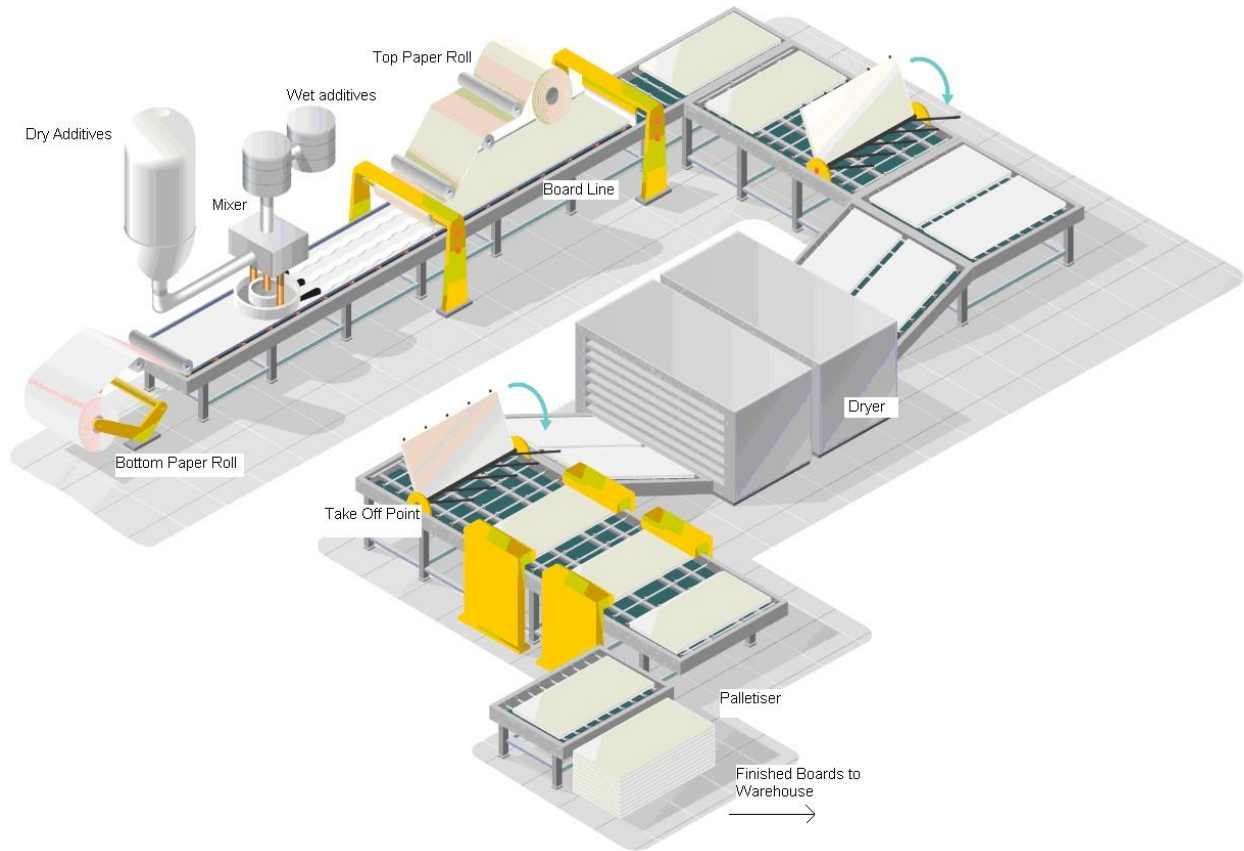
This module includes the manufacture of products and the manufacture of packaging. The production of packaging material is taken into account at this stage. The processing of any waste arising from this stage is also included.

| Object                                                                                   | Value | Data quality                                                                                               |
|------------------------------------------------------------------------------------------|-------|------------------------------------------------------------------------------------------------------------|
| A3 data quality of electricity and CO <sub>2</sub> emission kg CO <sub>2</sub> eq. / kWh | 0.006 | The emission of Danish electricity is based on Thinkstep 2016 dataset and Guarantee of Origin certificate. |

The LCA calculation has been made taking into account the fact that during the manufacturing process it is used 100% renewable electricity. This 100% renewable electricity bought is evidenced by Guarantee of Origin certificates (GOs) from LOS.



## Manufacturing process flow diagram



### Manufacturing in detail:

The initial materials are homogenously mixed to form a gypsum slurry that is spread via multiple hose outlets onto a paper liner on a moving conveyor belt. A second paper liner is fed onto the production line from above to form the plasterboard. The plasterboard continues along the production line where it is finished, dried, and cut to size.

## Construction process stage, A4-A5

Description of the stage: the construction process is divided into 2 modules: A4, transport to the building site and A5, installation in the building

### A4, transport to the building site.

This module includes transport from the production gate to the building site. Transport is calculated on the basis of a scenario with the parameters described in the following table.

| PARAMETER                                                                                                           | VALUE (expressed per functional unit)                                                  |
|---------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|
| <b>Fuel type and consumption of vehicle or vehicle type used for transport e.g. long distance truck, boat, etc.</b> | Long distance truck, maximum load weight of 27 t and consumption of 0.38 liters per km |
| <b>Distance</b>                                                                                                     | 202 km                                                                                 |
| <b>Capacity utilisation (including empty returns)</b>                                                               | 85% (30% empty returns): default values in Gabi                                        |
| <b>Bulk density of transported products</b>                                                                         | 957 kg/m <sup>3</sup>                                                                  |
| <b>Volume capacity utilisation factor</b>                                                                           | < 1                                                                                    |

**A5, installation into the building.**

The accompanying table quantifies the parameters for installing the product at the building site. All installation materials and their waste processing are included.

| PARAMETER                                                                                                                                                                              | VALUE (expressed per functional unit)                                                                                                                                                                                      |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Ancillary materials for installation (specified by materials)</b>                                                                                                                   | Jointing compound 0.33 kg/m <sup>2</sup> board, jointing tape 1.23 m/m <sup>2</sup> board, screws 8 units /m <sup>2</sup> board                                                                                            |
| <b>Water use</b>                                                                                                                                                                       | 0.165 liters/m <sup>2</sup> (added to the jointing compound during installation)                                                                                                                                           |
| <b>Other resource use</b>                                                                                                                                                              | None                                                                                                                                                                                                                       |
| <b>Quantitative description of energy type (regional mix) and consumption during the installation process</b>                                                                          | None                                                                                                                                                                                                                       |
| <b>Wastage of materials on the building site before waste processing, generated by the product's installation (specified by type)</b>                                                  | Plasterboard: 0,585 kg (5% loses)<br>Jointing Compound: 0,017 kg<br>Jointing Tape: 0,0002 kg                                                                                                                               |
| <b>Output materials (specified by type) as results of waste processing at the building site e.g. of collection for recycling, for energy recovering, disposal (specified by route)</b> | Plasterboard: 0,585 kg (5% loses) to landfill<br>Screws: 0,001 kg to landfill<br>Jointing Compound: 0,017 kg to landfill<br>Jointing Tape: 0,0002 kg to landfill<br>High-density polyethylene: 0,023 kg<br>Culls: 0,310 kg |
| <b>Direct emissions to ambient air, soil and water</b>                                                                                                                                 | None                                                                                                                                                                                                                       |

## Use stage (excluding potential savings), B1-B7

Description of the stage:

The use stage, related to the building fabric includes:

**B1**, use or application of the installed product;

**B2**, maintenance;

**B3**, repair;

**B4**, replacement;

**B5**, refurbishment;

**B6**, operational energy use

**B7**, operational water use

### Description of scenarios and additional technical information:

The product has a reference service life of 50 years. This assumes that the product will last in situ with no requirements for maintenance, repair, replacement or refurbishment throughout this period. Therefore, it has no impact at this stage.

#### Maintenance:

| PARAMETER                                                                                                                              | VALUE (expressed per functional unit) |
|----------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|
| Maintenance process                                                                                                                    | None required during product lifetime |
| Maintenance cycle                                                                                                                      | None required during product lifetime |
| Ancillary materials for maintenance (e.g. cleaning agent, specify materials)                                                           | None required during product lifetime |
| Wastage material during maintenance (specify materials)                                                                                | None required during product lifetime |
| Net fresh water consumption during maintenance                                                                                         | None required during product lifetime |
| Energy input during maintenance (e.g. vacuum cleaning), energy carrier type, (e.g. electricity) and amount, if applicable and relevant | None required during product lifetime |

#### Repair:

| PARAMETER                                                                                                                       | VALUE (expressed per functional unit) |
|---------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|
| Repair process                                                                                                                  | None required during product lifetime |
| Inspection process                                                                                                              | None required during product lifetime |
| Repair cycle                                                                                                                    | None required during product lifetime |
| Ancillary materials (e.g. lubricant, specify materials)                                                                         | None required during product lifetime |
| Wastage material during repair (specify materials)                                                                              | None required during product lifetime |
| Net fresh water consumption during repair                                                                                       | None required during product lifetime |
| Energy input during repair (e.g. crane activity), energy carrier type, (e.g. electricity) and amount if applicable and relevant | None required during product lifetime |



**Replacement:**

| PARAMETER                                                                                                                                   | VALUE (expressed per functional unit) |
|---------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|
| <b>Replacement cycle</b>                                                                                                                    | None required during product lifetime |
| <b>Energy input during replacement (e.g. crane activity), energy carrier type, (e.g. electricity) and amount if applicable and relevant</b> | None required during product lifetime |
| <b>Exchange of worn parts during the product's life cycle (e.g. zinc galvanized steel sheet), specify materials</b>                         | None required during product lifetime |

**Refurbishment:**

| PARAMETER                                                                                                                                              | VALUE (expressed per functional unit) |
|--------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|
| <b>Refurbishment process</b>                                                                                                                           | None required during product lifetime |
| <b>Refurbishment cycle</b>                                                                                                                             | None required during product lifetime |
| <b>Material input for refurbishment (e.g. bricks), including ancillary materials for the refurbishment process (e.g. lubricant, specify materials)</b> | None required during product lifetime |
| <b>Wastage material during refurbishment (specify materials)</b>                                                                                       | None required during product lifetime |
| <b>Energy input during refurbishment (e.g. crane activity), energy carrier type, (e.g. electricity) and amount</b>                                     | None required during product lifetime |
| <b>Further assumptions for scenario development (e.g. frequency and time period of use, number of occupants)</b>                                       | None required during product lifetime |

**Use of energy and water:**

| PARAMETER                                                                                                                      | VALUE (expressed per functional unit) |
|--------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|
| Ancillary materials specified by material                                                                                      | None required during product lifetime |
| <b>Net fresh water consumption</b>                                                                                             | None required during product lifetime |
| <b>Type of energy carrier (e.g. electricity, natural gas, district heating)</b>                                                | None required during product lifetime |
| <b>Power output of equipment</b>                                                                                               | None required during product lifetime |
| <b>Characteristic performance (e.g. energy efficiency, emissions, variation of performance with capacity utilisation etc.)</b> | None required during product lifetime |
| <b>Further assumptions for scenario development (e.g. frequency and time period of use, number of occupants)</b>               | None required during product lifetime |

## End-of-life stage C1-C4

Description of the stage: This stage includes the next modules:

**C1**, de-construction, demolition;

**C2**, transport to waste processing;

**C3**, waste processing for reuse, recovery and/or recycling;

**C4**, disposal, including provision and all transport, provision of all materials, products and related energy and water use.

### Description of the scenarios and additional technical information for the end-of-life:

| PARAMETER                                                  | VALUE (expressed per functional unit)                                                                                                    |
|------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| Collection process specified by type                       | 55% collected separately for recycling and 45% collected with mixed deconstruction and demolition waste to landfill                      |
| Recovery system specified by type                          | 6,72 kg recycled includes paper liner, board, screws, jointing tape, jointing compound                                                   |
| Disposal specified by type                                 | 5,49 kg to landfill                                                                                                                      |
| Assumptions for scenario development (e.g. transportation) | Gypsum board waste is transported 135 km by truck from deconstruction/demolition sites to recycling plant and 32 km by truck to landfill |

## Reuse/recovery/recycling potential, D

An end of life recycling 55% (45% of wastes are landfilled) has been assumed using local demolition waste data and adjusted considering the recyclability of the product.

## LCA results

As specified in EN 15804:2012+A2:2019 and also the Product-Category Rules, the environmental impacts are declared and reported using the baseline characterization factors from the ILCD. Specific data has been supplied by the plant, and generic data come from GaBi ts 9.2 and Ecoinvent 3.6 databases. All emissions to air, water, and soil, and all materials and energy used have been included.

All figures refer to a functional unit of 1 m<sup>2</sup> of installed plasterboard 12,5 mm with a weight of 11,7 kg/m<sup>2</sup> and an expected average service life of 50 years.

The following results corresponds to a single product manufactured in a single plant.

Description of the system boundary (X = Included in LCA, MNA = Module Not Assessed)

| System boundaries (X=included, MND=module not declared) |                                            |           |               |                    |                                   |           |             |        |             |               |                        |                       |                            |           |                  |          |                                               |
|---------------------------------------------------------|--------------------------------------------|-----------|---------------|--------------------|-----------------------------------|-----------|-------------|--------|-------------|---------------|------------------------|-----------------------|----------------------------|-----------|------------------|----------|-----------------------------------------------|
|                                                         | PRODUCT STAGE                              |           |               | CONSTRUCTION STAGE |                                   | USE STAGE |             |        |             |               |                        |                       | END OF LIFE STAGE          |           |                  |          | BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARY |
|                                                         | Raw material supply                        | Transport | Manufacturing | Transport          | Construction-Installation process | Use       | Maintenance | Repair | Replacement | Refurbishment | Operational energy use | Operational water use | De-construction demolition | Transport | Waste processing | Disposal | Reuse-recovery                                |
| Module                                                  | A1                                         | A2        | A3            | A4                 | A5                                | B1        | B2          | B3     | B4          | B5            | B6                     | B7                    | C1                         | C2        | C3               | C4       | D                                             |
| Modules declared                                        | X                                          | X         | X             | X                  | X                                 | X         | X           | X      | X           | X             | X                      | X                     | X                          | X         | X                | X        | X                                             |
| Geography                                               | RER                                        | RER       | RER           | RER                | RER                               | -         | -           | -      | -           | -             | -                      | -                     | RER                        | RER       | RER              | RER      | RER                                           |
| Specific data used                                      | >75% GWP- GHG                              |           |               |                    |                                   |           |             |        |             |               |                        |                       |                            |           |                  |          |                                               |
| Variation products                                      | One site one product                       |           |               |                    |                                   |           |             |        |             |               |                        |                       |                            |           |                  |          |                                               |
| Variation sites                                         | Only one site is reported for this product |           |               |                    |                                   |           |             |        |             |               |                        |                       |                            |           |                  |          |                                               |

### Data quality

Inventory data quality is judged by geographical, temporal, and technological representativeness. To cover these requirements and to ensure reliable results, first-hand industry data crossed with LCA background datasets were used. The data was collected from internal records and reporting documents from Saint-Gobain Denmark A/S – Gyproc. After evaluating the inventory, according to the defined ranking in the LCA report, the assessment reflects good inventory data quality.

## Environmental Impacts

|                                                                                     |                                                             | Product stage | Construction stage |                 | Use stage |                |           |                |                  |                           |                          | End of life stage              |              |                     |             | Reuse, Recovery Recycling    |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------|---------------|--------------------|-----------------|-----------|----------------|-----------|----------------|------------------|---------------------------|--------------------------|--------------------------------|--------------|---------------------|-------------|------------------------------|
|                                                                                     | Environmental indicators                                    | A1 / A2 / A3  | 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 |
|    | Climate Change (total) [kg CO2 eq.]                         | 1,97E+00      | 1,14E-01           | 2,42E-01        | 0         | 0              | 0         | 0              | 0                | 0                         | 0                        | 5,46E-02                       | 5,21E-02     | 4,47E-01            | 4,05E-01    | -8,53E-03                    |
|                                                                                     | Climate Change (fossil) [kg CO2 eq.]                        | 2,71E+00      | 1,13E-01           | 2,10E-01        | 0         | 0              | 0         | 0              | 0                | 0                         | 0                        | 5,45E-02                       | 5,18E-02     | 5,33E-02            | 8,33E-02    | -8,48E-03                    |
|                                                                                     | Climate Change (biogenic) <sup>1</sup> [kg CO2 eq.]         | -7,47E-01     | 0,00E+00           | 3,19E-02        | 0         | 0              | 0         | 0              | 0                | 0                         | 0                        | 7,20E-05                       | 0,00E+00     | 3,93E-01            | 3,22E-01    | -2,06E-05                    |
|                                                                                     | Climate Change (land use change) [kg CO2 eq.]               | 2,10E-03      | 9,22E-04           | 2,84E-04        | 0         | 0              | 0         | 0              | 0                | 0                         | 0                        | 1,20E-06                       | 4,22E-04     | 9,40E-05            | 2,40E-04    | -2,69E-05                    |
|    | Ozone depletion [kg CFC-11 eq.]                             | 1,27E-08      | 1,37E-17           | 6,38E-10        | 0         | 0              | 0         | 0              | 0                | 0                         | 0                        | 5,80E-18                       | 6,80E-18     | 1,96E-09            | 3,09E-16    | -1,10E-16                    |
|    | Acidification terrestrial and freshwater [Mole of H+ eq.]   | 7,44E-03      | 6,51E-04           | 6,87E-04        | 0         | 0              | 0         | 0              | 0                | 0                         | 0                        | 1,61E-04                       | 2,98E-04     | 2,52E-04            | 5,98E-04    | -6,03E-05                    |
|   | Eutrophication freshwater [kg P eq.]                        | 6,08E-05      | 3,46E-07           | 5,45E-06        | 0         | 0              | 0         | 0              | 0                | 0                         | 0                        | 1,21E-08                       | 1,58E-07     | 2,35E-05            | 1,43E-07    | -2,44E-08                    |
|                                                                                     | Eutrophication freshwater [kg (PO4)3 eq.]                   | 1,87E-04      | 1,06E-06           | 1,67E-05        | 0         | 0              | 0         | 0              | 0                | 0                         | 0                        | 3,70E-08                       | 4,86E-07     | 7,20E-05            | 4,39E-07    | -7,50E-08                    |
|                                                                                     | Eutrophication marine [kg N eq.]                            | 2,24E-03      | 3,15E-04           | 2,17E-04        | 0         | 0              | 0         | 0              | 0                | 0                         | 0                        | 2,99E-05                       | 1,44E-04     | 4,91E-05            | 1,54E-04    | -2,81E-05                    |
|                                                                                     | Eutrophication terrestrial [Mole of N eq.]                  | 2,41E-02      | 3,48E-03           | 2,25E-03        | 0         | 0              | 0         | 0              | 0                | 0                         | 0                        | 3,27E-04                       | 1,60E-03     | 4,94E-04            | 1,69E-03    | -3,19E-04                    |
|  | Photochemical ozone formation - human health [kg NMVOC eq.] | 6,29E-03      | 5,93E-04           | 5,75E-04        | 0         | 0              | 0         | 0              | 0                | 0                         | 0                        | 9,39E-05                       | 2,72E-04     | 1,32E-04            | 4,66E-04    | -7,87E-05                    |
|  | Resource use, mineral and metals <sup>2</sup> [kg Sb eq.]   | 2,87E-06      | 8,17E-09           | 2,03E-06        | 0         | 0              | 0         | 0              | 0                | 0                         | 0                        | 1,42E-09                       | 3,81E-09     | 8,20E-08            | 7,49E-09    | -1,72E-09                    |
|                                                                                     | Resource use, energy carriers <sup>2</sup> [MJ]             | 4,38E+01      | 1,52E+00           | 3,10E+00        | 0         | 0              | 0         | 0              | 0                | 0                         | 0                        | 6,66E-01                       | 6,94E-01     | 8,12E-01            | 1,09E+00    | -1,12E-01                    |
|  | Water scarcity <sup>2</sup> [m³ world equiv.]               | 5,66E-01      | 1,02E-03           | 6,38E-02        | 0         | 0              | 0         | 0              | 0                | 0                         | 0                        | 1,13E-04                       | 4,73E-04     | 1,46E-02            | 8,74E-03    | -1,84E-04                    |

<sup>1</sup> GWP biogenic includes renewable carbon stored in packaging materials and the product.

<sup>2</sup> 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.

## Resources Use

| Resources Use indicators                                                            |                                                                            | Product stage | Construction stage |                 | Use stage |                |           |                |                  |                           |                          | End of life stage              |              |                     |             | Reuse, recovery, recycling   |
|-------------------------------------------------------------------------------------|----------------------------------------------------------------------------|---------------|--------------------|-----------------|-----------|----------------|-----------|----------------|------------------|---------------------------|--------------------------|--------------------------------|--------------|---------------------|-------------|------------------------------|
|                                                                                     |                                                                            | A1 / A2 / A3  | 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 |
|    | Use of renewable primary energy (PERE) [MJ]                                | 5,09E+00      | 8,52E-02           | 5,24E-01        | 0         | 0              | 0         | 0              | 0                | 0                         | 0                        | 2,33E-03                       | 3,92E-02     | 6,78E-02            | 1,43E-01    | -2,90E-02                    |
|    | Primary energy resources used as raw materials (PERM)* [MJ]                | 8,10E+00      | 0,00E+00           | 4,05E-01        | 0         | 0              | 0         | 0              | 0                | 0                         | 0                        | 0,00E+00                       | 0,00E+00     | -4,23E+00           | 0,00E+00    | 0,00E+00                     |
|    | Total use of renewable primary energy resources (PERT) [MJ]                | 1,32E+01      | 8,52E-02           | 9,29E-01        | 0         | 0              | 0         | 0              | 0                | 0                         | 0                        | 2,33E-03                       | 3,92E-02     | -4,16E+00           | 1,43E-01    | -2,90E-02                    |
|    | Use of non-renewable primary energy (PENRE) [MJ]                           | 4,34E+01      | 1,52E+00           | 3,08E+00        | 0         | 0              | 0         | 0              | 0                | 0                         | 0                        | 6,67E-01                       | 6,95E-01     | 8,16E-01            | 1,09E+00    | -1,12E-01                    |
|    | Non-renewable primary energy resources used as raw materials (PENRM)* [MJ] | 4,05E-01      | 0,00E+00           | 2,03E-02        | 0         | 0              | 0         | 0              | 0                | 0                         | 0                        | 0,00E+00                       | 0,00E+00     | -2,12E-01           | 0,00E+00    | 0,00E+00                     |
|   | Total use of non-renewable primary energy resources (PENRT) [MJ]           | 4,38E+01      | 1,52E+00           | 3,10E+00        | 0         | 0              | 0         | 0              | 0                | 0                         | 0                        | 6,67E-01                       | 6,95E-01     | 6,04E-01            | 1,09E+00    | -1,12E-01                    |
|  | Input of secondary material (SM) [kg]                                      | 3,31E+00      | 0,00E+00           | 1,67E-01        | 0         | 0              | 0         | 0              | 0                | 0                         | 0                        | 0,00E+00                       | 0,00E+00     | 0,00E+00            | 0,00E+00    | 0,00E+00                     |
|  | Use of renewable secondary fuels (RSF) [MJ]                                | 0,00E+00      | 0,00E+00           | 0,00E+00        | 0         | 0              | 0         | 0              | 0                | 0                         | 0                        | 0,00E+00                       | 0,00E+00     | 0,00E+00            | 0,00E+00    | 0,00E+00                     |
|  | Use of non-renewable secondary fuels (NRSF) [MJ]                           | 0,00E+00      | 0,00E+00           | 0,00E+00        | 0         | 0              | 0         | 0              | 0                | 0                         | 0                        | 0,00E+00                       | 0,00E+00     | 0,00E+00            | 0,00E+00    | 0,00E+00                     |
|  | Use of net fresh water (FW) [m³]                                           | 1,53E-02      | 9,87E-05           | 1,67E-03        | 0         | 0              | 0         | 0              | 0                | 0                         | 0                        | 4,14E-06                       | 4,54E-05     | 3,39E-04            | 2,76E-04    | -1,90E-05                    |

\*For this study, both the product and its packaging are reported in the indicators "Use of renewable primary energy resources used as raw materials" ("PERM") and "Use of non-renewable primary energy resources used as raw materials" ("PENRM"). PERM and PENRM are reported as negative values were materials are recycled or recovered, but not when landfilled.

## Waste Category & Output flows

|                                                                                    |                                          | Product stage | Construction stage |                 | Use stage |                |           |                |                  |                           |                          | End of life stage              |              |                     |             | Reuse, recovery, recycling   |
|------------------------------------------------------------------------------------|------------------------------------------|---------------|--------------------|-----------------|-----------|----------------|-----------|----------------|------------------|---------------------------|--------------------------|--------------------------------|--------------|---------------------|-------------|------------------------------|
| Waste Category & Output Flows                                                      |                                          | A1 / A2 / A3  | A4 Transport       | A5 Installation | B1 Use    | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Operational energy use | B7 Operational water use | C1 Deconstruction / demolition | C2 Transport | C3 Waste processing | C4 Disposal | D Reuse, recovery, recycling |
|    | Hazardous waste disposed (HWD) [kg]      | 1,92E-07      | 7,06E-08           | 2,28E-08        | 0         | 0              | 0         | 0              | 0                | 0                         | 0                        | 6,76E-11                       | 3,23E-08     | 2,15E-11            | 1,67E-08    | -2,12E-09                    |
|    | Non-hazardous waste disposed (NHWD) [kg] | 3,84E-02      | 2,32E-04           | 9,42E-01        | 0         | 0              | 0         | 0              | 0                | 0                         | 0                        | 1,65E-04                       | 1,07E-04     | 1,06E-05            | 5,50E+00    | -4,64E-05                    |
|    | Radioactive waste disposed (RWD) [kg]    | 1,23E-04      | 1,88E-06           | 1,82E-05        | 0         | 0              | 0         | 0              | 0                | 0                         | 0                        | 7,65E-07                       | 9,29E-07     | 1,28E-07            | 1,25E-05    | -3,90E-06                    |
|    | Components for re-use (CRU) [kg]         | 0,00E+00      | 0,00E+00           | 0,00E+00        | 0         | 0              | 0         | 0              | 0                | 0                         | 0                        | 0,00E+00                       | 0,00E+00     | 0,00E+00            | 0,00E+00    | 0,00E+00                     |
|    | Materials for Recycling (MFR) [kg]       | 7,71E-02      | 0,00E+00           | 3,85E-03        | 0         | 0              | 0         | 0              | 0                | 0                         | 0                        | 0,00E+00                       | 0,00E+00     | 6,72E+00            | 0,00E+00    | 0,00E+00                     |
|    | Material for Energy Recovery (MER) [kg]  | 0,00E+00      | 0,00E+00           | 0,00E+00        | 0         | 0              | 0         | 0              | 0                | 0                         | 0                        | 0,00E+00                       | 0,00E+00     | 0,00E+00            | 0,00E+00    | 0,00E+00                     |
|   | Exported electrical energy (EEE) [MJ]    | 0,00E+00      | 0,00E+00           | 0,00E+00        | 0         | 0              | 0         | 0              | 0                | 0                         | 0                        | 0,00E+00                       | 0,00E+00     | 0,00E+00            | 0,00E+00    | 0,00E+00                     |
|  | Exported thermal energy (EET) [MJ]       | 0,00E+00      | 0,00E+00           | 0,00E+00        | 0         | 0              | 0         | 0              | 0                | 0                         | 0                        | 0,00E+00                       | 0,00E+00     | 0,00E+00            | 0,00E+00    | 0,00E+00                     |



## Information on biogenic carbon content

|                                                                                   |                                           | Product stage |
|-----------------------------------------------------------------------------------|-------------------------------------------|---------------|
|                                                                                   | Biogenic Carbon Content                   | A1 / A2 / A3  |
|  | Biogenic carbon content in product [kg]   | 2,09E-01      |
|  | Biogenic carbon content in packaging [kg] | 0,00E+00      |

*Note: 1 kg biogenic carbon is equivalent to 44/12 (approx. 3,67) kg CO<sub>2</sub>.*

There is a small biogenic carbon content in product, due to the production, starch maize, and paper liner (used in surfacing).

## LCA results interpretation

The following figure refers to a functional unit of 1 m<sup>2</sup> of installed plasterboard 12,5 mm with a weight of 11,7 kg/m<sup>2</sup> and for specific application of external building for an expected average service life of 50 years.



[1] This indicator corresponds to the abiotic depletion potential of fossil resources.

[2] This indicator corresponds to the total use of primary energy.

[3] This indicator corresponds to the use of net fresh water.

[4] This indicator corresponds to the sum of hazardous, non-hazardous and radioactive waste disposed.

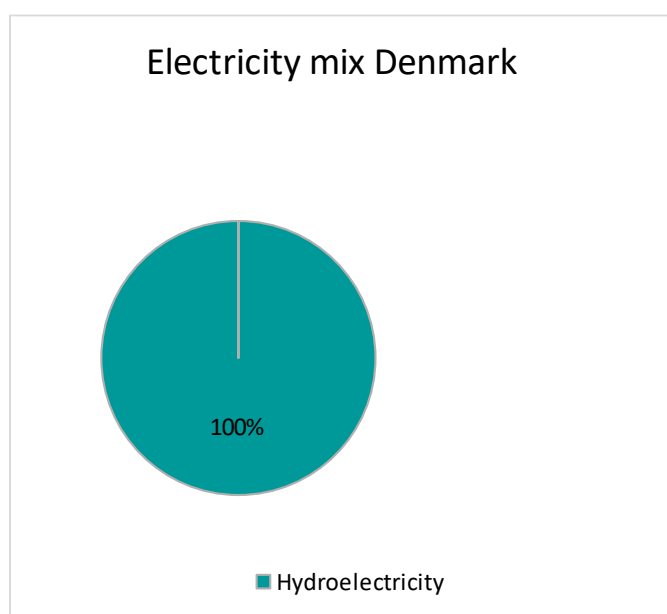
The product stage (A1-A3) is responsible for 50% or more in its lifetime of gypsum plasterboard for climate change, ozone depletion, freshwater, marine and terrestrial eutrophication, resource use, energy carriers and water scarcity. Relevant impacts can also be seen in stage End of life, C3 (waste processing) and C4 (disposal). The impacts are reflected in climate change, freshwater eutrophication, ozone depletion (C3) respectively climate change (C4).

Module D declares the environmental benefits from reusable products, recyclable materials or energy recovery. In this analysis, the benefits come from the recycling process that takes places at the end of life of Gyproc board.

## Additional information

### Electricity description

| TYPE OF INFORMATION                         | DESCRIPTION                                                                  |
|---------------------------------------------|------------------------------------------------------------------------------|
| Location                                    | Representative of Electricity purchased by Saint-Gobain Denmark A/S – Gyproc |
| Geographical representativeness description | Split of energy sources in Denmark<br>- Hydro 100%                           |
| Reference year dataset                      | 2016                                                                         |
| Type of data set                            | Cradle to gate from Thinkstep database                                       |
| Source                                      | Guarantee of Origin certificates (GOs) - 2021                                |
| CO <sub>2</sub> emissions                   | 0.006 kg CO <sub>2</sub> eq. / kWh                                           |



### Influence of transportation to other countries

The results of stage A4 (transportation of product) in the table of this EPD refer to transportation in Denmark. This product can also be delivered to the countries in the table below. In order to adapt the impact of transportation in the A4 column, figures from the current EPD shall be multiply by the multiplication factors below.

| Country                    | Average distance | Multiplication factor |
|----------------------------|------------------|-----------------------|
| Denmark                    | 202 km (truck)   | 1,0                   |
| Sweden (Malmö/Lund region) | 168 km (truck)   | 0,8                   |
| Sweden (Stockholm region)  | 796 km (truck)   | 3,9                   |
| Norway                     | 600 km (truck)   | 3,0                   |

## Carbon footprint

| Carbon footprint                 | Product stage | Construction stage |                 | End of life stage              |              |                     |             | D Reuse, recovery, recycling |
|----------------------------------|---------------|--------------------|-----------------|--------------------------------|--------------|---------------------|-------------|------------------------------|
|                                  | A1 / A2 / A3  | A4 Transport       | A5 Installation | C1 Deconstruction / demolition | C2 Transport | C3 Waste processing | C4 Disposal | D Reuse, recovery, recycling |
| GWP-GHG [kg CO <sub>2</sub> eq.] | 2,71E+00      | 1,13E-01           | 2,10E-01        | 5,45E-02                       | 5,18E-02     | 5,33E-02            | 8,33E-02    | -8,48E-03                    |

**Note :** The columns with values for the stages B1 – B5 were excluded since all the values are equal to zero (0 kgCO<sub>2</sub> eq.)

## Differences with previous versions of the EPD

This EPD was updated according to the data collected for the year 2022.

## Environmental impacts according to EN 15804:2012 + A1

The following tables presents results of 1 m<sup>2</sup> of installed Gyproc Robust GR 13/GRE 13 with a reference service life of 50 years according to EN 15804:2012 +A1.

|                                                                                 | Product stage | Construction stage |                 | Use stage |                |           |                |                  |                           |                          | End of life stage              |              |                     |             | Reuse, recovery, recycling   |
|---------------------------------------------------------------------------------|---------------|--------------------|-----------------|-----------|----------------|-----------|----------------|------------------|---------------------------|--------------------------|--------------------------------|--------------|---------------------|-------------|------------------------------|
|                                                                                 | A1 / A2 / A3  | 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 |
| Global Warming Potential (GWP) [kg CO <sub>2</sub> eq.]                         | 2,65E+00      | 1,12E-01           | 2,17E-01        | 0         | 0              | 0         | 0              | 0                | 0                         | 0                        | 5,38E-02                       | 5,11E-02     | 5,18E-02            | 8,16E-02    | -8,37E-03                    |
| Ozone depletion (ODP) [kg R11 eq.]                                              | 1,23E-08      | 1,83E-17           | 6,13E-10        | 0         | 0              | 0         | 0              | 0                | 0                         | 0                        | 7,73E-18                       | 9,07E-18     | 2,06E-09            | 4,12E-16    | -1,47E-16                    |
| Acidification potential (AP) [kg R11 eq.]                                       | 5,77E-03      | 4,45E-04           | 5,35E-04        | 0         | 0              | 0         | 0              | 0                | 0                         | 0                        | 1,34E-04                       | 2,04E-04     | 2,17E-04            | 4,80E-04    | -4,18E-05                    |
| Eutrophication potential (EP) [kg Phosphate eq.]                                | 1,25E-03      | 1,12E-04           | 1,25E-04        | 0         | 0              | 0         | 0              | 0                | 0                         | 0                        | 1,06E-05                       | 5,12E-05     | 9,17E-05            | 5,41E-05    | -1,05E-05                    |
| Photochemical ozone creation [kg Ethene eq.]                                    | 5,11E-04      | 1,54E-05           | 5,22E-05        | 0         | 0              | 0         | 0              | 0                | 0                         | 0                        | 9,79E-06                       | 7,09E-06     | 4,10E-06            | 3,87E-05    | -4,10E-06                    |
| Abiotic depletion potential for non-fossil resources (ADP-elements) [kg Sb eq.] | 2,81E-04      | 9,23E-09           | 2,19E-05        | 0         | 0              | 0         | 0              | 0                | 0                         | 0                        | 1,50E-09                       | 4,30E-09     | 8,26E-08            | 2,89E-08    | -1,39E-04                    |
| Abiotic depletion potential for fossil resources (ADP-fossil fuels) [MJ]        | 4,33E+01      | 1,51E+00           | 2,91E+00        | 0         | 0              | 0         | 0              | 0                | 0                         | 0                        | 6,65E-01                       | 6,93E-01     | 7,08E-01            | 1,06E+00    | -1,02E-01                    |

## References

1. EPD International General Program Instructions for the International EPD® System. Version 4.0, dated 2021-03-29. [www.environdec.com](http://www.environdec.com).
2. The International EPD System PCR 2019:14 Construction products (EN 15804:A2) (1.11)
3. EN 15804:2012+A2:2019 Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products
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5. ISO 14025:2006 Environmental labels and declarations – Type III environmental declarations – Principles and procedures
6. ISO 14040:2006 Environmental management. Life cycle assessment. Principles and framework
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8. European Chemical Agency, Candidate List of substances of very high concern for Authorization. [http://echa.europa.eu/chem\\_data/authorisation\\_process/candidate\\_list\\_table\\_en.asp](http://echa.europa.eu/chem_data/authorisation_process/candidate_list_table_en.asp)
9. 2023\_05\_08\_LCA\_REPORT\_EN15804+A2\_Denmark\_v1