

# ENVIRONMENTAL PRODUCT DECLARATION

In accordance with ISO 14025:2006 and  
EN 15804:2012+A2:2019/AC:2021 for:

## Rigidur® H - Gypsum 12.5 mm Fibreboards



THE INTERNATIONAL EPD® SYSTEM

The International EPD® System

Programme operator: EPD international AB

Registration number: EPD-IES-0008298:002

**Version: 2**

**Date of publication: 2023/03/17**

**Date of revision: 2024/08/31**

**Validity: 5 years**

**Valid until: 2029/08/30**

**Scope of the EPD®: Europe**



## Program information

<b>PROGRAM:</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 EN 15804:2012+A2:2019/AC:2021 as the Core Product Category Rules (PCR)

**Product category rules (PCR):** PCR 2019:14 Construction Products, version 1.3.2

**PCR review was conducted by:** The Technical Committee of the International EPD® System  
See [www.environdec.com](http://www.environdec.com) for a list of members.

**President:** Claudia A. Peña, University of Concepción, Chile. The review panel may be contacted via the Secretariat [www.environdec.com/contact](http://www.environdec.com/contact) - 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:** Andrew Norton

Renuables <http://renuables.co.uk> - [a.norton@renuables.co.uk](mailto:a.norton@renuables.co.uk)

Approved by: The International EPD® System

**Procedure for follow-up of data during EPD validity involves third-party verifier:** ☒ Yes    ☐ No

EPDs within the same product category but registered in different EPD programs may not be comparable. For two EPDs to be comparable, they shall be based on the same PCR (including the same version number up to the first two digits) or be based on fully aligned PCRs or versions of PCRs; cover products with identical functions, technical performances, and use (e.g. identical DU/FU); have equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterization factors); have equivalent content declarations; and be valid at the time of Comparison. For further information about comparability, see EN 15804:2012+A2:2019/AC:2021 and ISO 14025:2006.

# Product information

## Company information

**Manufacturer:** Saint-Gobain Rigips GmbH, Schanzenstrasse 84 D-40549 Düsseldorf

**Production plant(s):** Bodenwerder, Germany

**Management system-related certification:** DIN EN ISO 9001:2015 DIN EN ISO 14001:2015 DIN EN ISO 50001:2018

**Program used:** EN 15804:2012+A2:2019/AC:2021 Sustainability of construction works – Environmental product declaration - core rules for the product category of construction product and The International EPD® System

**PCR identification** PCR 2019:14 version 1.3.2 for Construction products

**Prepared by:** IVL Swedish Environmental Research Institute, EPD International Secretariat

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

**Owner of the declaration:** Saint-Gobain Rigips GmbH

**Product name and manufacturer represented:** Rigidur® H - Gypsum 12.5 mm Fibreboards / Gypsum fibre board produced by Saint-Gobain Rigips GmbH in Bodenwerder plant

**EPD® prepared by:** Klaus Schmalbuch (Klaus.Schmalbuch@saint-gobain.com) and Patricia Jimenez (Saint-Gobain LCA central team, Patricia.JimenezDiaz@saint-gobain.com)

The intended use of this EPD is for B2B communication.

**Geographical scope of the EPD®:** Europe (see other locations in additional information chapter)

**EPD® registration number:** EPD-IES-0008298:002

**Declaration issued:** 2023/03/17 **Date of revision:** 2024/08/31 **Valid until:** 2029/08/30.

**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.

The EPD owner has the sole ownership, liability, and responsibility for the EPD.



## Product description

### Product description and description of use

This Environmental Product Declaration (EPD®) describes the environmental impacts of 1m<sup>2</sup> of installed gypsum board 12.5 mm with a weight of 15.67 kg/m<sup>2</sup> with a useful life of 50 years.

Rigidur® boards are made of gypsum, paper fibres, and natural additives. They fulfill all requirements of state-of-the-art drywall construction materials and have a pleasantly smooth and hard surface.

This makes them suitable for universal use as construction, fire-proof, and damp-proof boards while guaranteeing professional sound insulation, high strength, and good processing properties. The Institute for Building Biology (Institut für Baubiologie - IBR) in Rosenheim recommends Rigidur® gypsum fibreboards in terms of building biology.

### Technical data

Parameter	Value	Unit	Assessment method
Density	1200	kg/m <sup>3</sup>	EN 15283-2
Bending strength	5.5	N/mm <sup>2</sup>	EAD 070006-00-0504
Elastic Modulus	4500	N/mm <sup>2</sup>	EAD 070006-00-0504
Shrinkage and swelling per 30% variation in rel. humidity	≤ 0.45	mm/m	EN 318
Thermal conductivity	0.202	W/(m*K)	EN 12664
Surface hardness	Type GF-I		EN 15283-2
Reaction to fire	Euroclass A2-s1, d0	-	EN 13501-1
Water vapor resistance factor μ	19	-	EN ISO 12572
Water absorption of board surface	Type GF-W2	-	EN 15283-2
Hard body impact resistance	IR = 27	mm/mm	EN 1128
Structure and cohesion of the core at high temperature	Type F	-	EAD 070006-00-0504

### Declaration of the main product components and/or materials

Description of the main components and/or materials:

Product components	Weight (kg)	Post-consumer recycled material weight versus product weight (%)	Biogenic material, kg C/kg product
Gypsum (Natural)	80 - 90 %	0%	0.000
Cellulose fibres	10 - 20 %	15%	0.882
Additives	1 - 5 %	0%	0.000
Sum	100%	15%	0.882
Packaging materials	Weight (kg)	Weight versus the product (%)	Weight biogenic carbon, kg C/kg product
Pallets	0.17	1.1%	0.071

At the date of issue of this declaration, there is no "Substance of Very High Concern" (SVHC) in concentration above 0.1% by weight, and neither does their packaging, following the European REACH regulation (Registration, Evaluation, Authorization and Restriction of Chemicals).

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>TYPE OF EPD</b>	Cradle to gate with options and optional modules (A+B+C+D)
<b>DECLARED UNIT</b>	1 m <sup>2</sup> of installed board with a weight of 15.67 kg/m <sup>2</sup>
<b>SYSTEM BOUNDARIES</b>	Mandatory stages = A1-A3; C1-C4 and D; Optional stages = A4-A5; B1-B7
<b>REFERENCE SERVICE LIFE (RSL)</b>	The Reference Service Life (RSL) of the Gypsum product is 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>	<p>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 5% of the whole mass and energy used, as well as the emissions to the environment occurred.</p> <p>Flows related to human activities such as employee transport are excluded.</p> <p>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.</p>
<b>ALLOCATIONS</b>	<p>Allocation has been avoided when possible and when not possible a mass allocation has been applied.</p> <p>The polluter pays and the modularity principles as well have been followed.</p>
<b>GEOGRAPHICAL COVERAGE AND TIME PERIOD</b>	<p>Scope: Europe</p> <p>Data is collected from one production site Bodenwerder located in Germany</p> <p>Data collected for the year 2023</p>
<b>BACKGROUND DATA SOURCE</b>	The databases Sphera 2023.2 and ecoinvent v.3.9.1
<b>SOFTWARE</b>	Sphera LCA for experts (GaBi) 10

## LCA scope

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	DE	DE	DE	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU
Specific data used	72% GWP- GHG																
Variation products	0 %																
Variation sites	0 %																

Please refer to the table in Additional Information for the calculation of other European destinations, replacing the A4 transport reference value of 100 km.

## Life cycle stages



## A1-A3. Product 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 materials supply

This module includes the extraction and transformation of raw materials.

### A2. Transport to the manufacturer

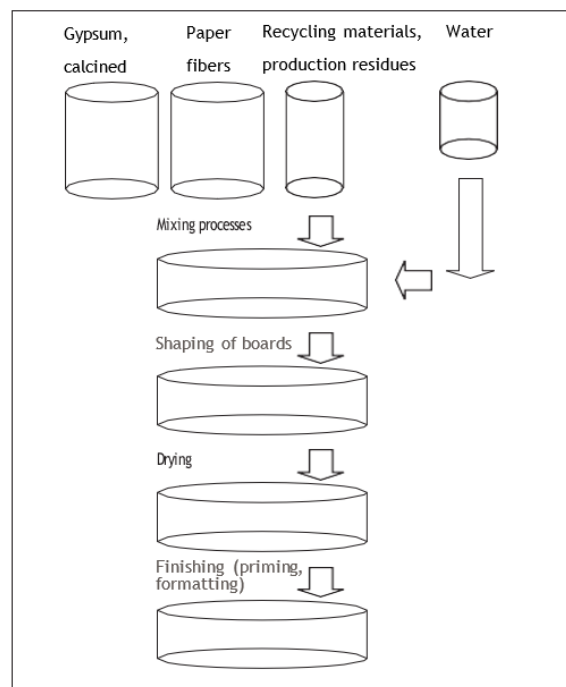
This module includes the transportation of raw materials and packaging to the manufacturing site. The modeling includes road, boat, and/or train transportation.

### A3. Manufacturing

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

## Manufacturing process flow diagram

System diagram:



### Manufacturing in detail:

Gypsum fibreboards are composed of gypsum and recycled paper fibres. These two natural raw materials are blended, and upon the addition of water - without the need for any other binders - are moulded into boards and dried. The water causes the gypsum to set, permeating and enveloping the fibres. This results in the high stability and non-combustibility of the gypsum fibreboards. Due to their material composition, the boards are versatile and suitable for use as general construction and fire protection boards, as well as in domestic damp areas.

Gypsum fibreboards contain no substances that are harmful to health. The absence of glues eliminates any risk of odour nuisance. They meet the requirements of building biology. The manufacturing companies have a quality management system and are certified according to DIN EN ISO 9001.



## A4-A5. Construction process 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 based on a scenario with the parameters described in the following table.

PARAMETER	VALUE
Fuel type and consumption of vehicle or vehicle type used for transport e.g., long distance truck, boat, etc.	Freight truck, maximum load weight of 27 t, real load is 24 t, and consumption of 0.38 liters per km
Distance	100 km
Capacity utilization (including empty returns)	68% (30% empty returns)
Bulk density of transported products*	1200 kg/m <sup>3</sup>
Volume capacity utilisation factor	1

### A5. Installation in the building:

This module includes the parameters for installing the product at the building site. All installation materials and their waste processing are included.

PARAMETER	VALUE
Ancillary materials for installation (specified by materials)	None
Water use	None
Other resource use	None
Quantitative description of energy type (regional mix) and consumption during the installation process	None
Wastage of materials on the building site before waste processing, generated by the product's installation (specified by type)	Rigidur board: 0.78 kg / m <sup>2</sup> (5 %) Pallet: 0.17 kg / m <sup>2</sup>
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)	Rigidur board: 0.78 kg / m <sup>2</sup> to landfill Pallet: 0.17 kg / m <sup>2</sup> to incineration with energy recovery
Direct emissions to ambient air, soil, and water	None



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

The use stage is divided into the following modules:

- **B1:** Use
- **B2:** Maintenance
- **B3:** Repair
- **B4:** Replacement
- **B5:** Refurbishment
- **B6:** Operational energy use
- **B7:** Operational water use

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.

## C1-C4. End of Life Stage

This stage includes the next modules:

**C1:** Deconstruction, demolition: The de-construction and/or dismantling of the product take part of the demolition of the entire building. In our case, the energy is considered is 0.05 MJ/m<sup>2</sup>.

**C2:** Transport to waste processing

**C3:** Waste processing for reuse, recovery and/or recycling

**C4:** Waste disposal; including physical pre-treatment and site management.

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

PARAMETER	VALUE/DESCRIPTION
<b>Collection process specified by type</b>	100% collected with mixed deconstruction and demolition waste sent to landfill (including board, screws, and jointing tape/compound)
<b>Recovery system specified by type</b>	0 kg recycled
<b>Disposal specified by type</b>	15.67 kg to landfill
<b>Assumptions for scenario development (e.g. transportation)</b>	Gypsum waste is transported 50 km by truck from deconstruction/demolition sites to landfill

## D. Reuse/recovery/recycling potential

Building wastes are landfilled. Pallets are incinerated with energy recovery. Internal waste is reused in the board.

## LCA results

As specified in EN 15804:2012+A2:2019/AC:2021 and the Product-Category Rules, the environmental impacts are declared and reported using the baseline characterization factors are from the ILCD. Raw materials and energy consumption, as well as transport distances have been taken directly from the manufacturing plant. Characterization factors EN15804 based on EF 3.1.

The estimated impact results are only relative statements which do not indicate the end points of the impact categories, exceeding threshold values, safety margins or risks.








All emissions to air, water, and soil, and all materials and energy used have been included.

The results of the impact categories abiotic depletion of minerals and metals, land use, human toxicity (cancer), human toxicity, noncancer and ecotoxicity (freshwater) may be highly uncertain in LCAs that include capital goods/infrastructure in generic datasets in case infrastructure/capital goods contribute greatly to the total results. This is because the LCI data of infrastructure/capital goods used to quantify these indicators in currently available generic datasets sometimes lack temporal, technological, and geographical representativeness. Caution should be exercised when using the results of these indicators for decision-making purposes.

This EPD includes module C, we strongly advise against using the results of modules A1-A3 without considering the results of module C.











Results refer to a declared unit of 1m<sup>2</sup> of installed gypsum board 12.5 mm with a weight of 15.67 kg/m<sup>2</sup>. The following results refer to a single product manufactured in a single plant:

## Environmental Impacts

		PRODUCT STAGE	CONSTRUCTION STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE LIFE CYCLE
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 [kg CO2 eq.]	-4.63E-01	1.11E-01	4.21E-01	0	0	0	0	0	0	0	7.00E-02	5.86E-02	0	3.36E+00	-2.32E-02
	Climate Change (fossil) [kg CO2 eq.]	2.99E+00	1.10E-01	1.60E-01	0	0	0	0	0	0	0	7.00E-02	5.79E-02	0	1.23E-01	-2.31E-02
	Climate Change (biogenic) [kg CO2 eq.]	-3.45E+00	2.87E-04	2.61E-01	0	0	0	0	0	0	0	8.83E-06	1.51E-04	0	3.24E+00	-2.47E-05
	Climate Change (land use change) [kg CO2 eq.]	1.82E-03	1.02E-03	1.33E-04	0	0	0	0	0	0	0	7.87E-06	5.36E-04	0	1.81E-04	-2.58E-05
	Ozone depletion [kg CFC-11 eq.]	7.28E-06	9.62E-15	3.64E-07	0	0	0	0	0	0	0	1.11E-09	5.06E-15	0	2.36E-09	-4.40E-10
	Acidification terrestrial and freshwater [Mole of H+ eq.]	7.52E-03	1.24E-04	4.36E-04	0	0	0	0	0	0	0	6.49E-04	6.66E-05	0	9.15E-04	-8.80E-05
	Eutrophication freshwater [kg P eq.]	2.58E-04	4.01E-07	1.33E-05	0	0	0	0	0	0	0	2.15E-06	2.11E-07	0	6.88E-06	-6.50E-06
	Eutrophication marine [kg N eq.]	1.76E-03	4.24E-05	1.09E-04	0	0	0	0	0	0	0	3.01E-04	2.29E-05	0	3.14E-04	-1.66E-05
	Eutrophication terrestrial [Mole of N eq.]	1.85E-02	5.01E-04	1.16E-03	0	0	0	0	0	0	0	3.27E-03	2.71E-04	0	3.38E-03	-1.67E-04
	Photochemical ozone formation - human health [kg NMVOC eq.]	5.53E-03	1.08E-04	3.45E-04	0	0	0	0	0	0	0	9.68E-04	5.79E-05	0	1.11E-03	-6.03E-05
	Resource use, mineral and metals [kg Sb eq.] <sup>1</sup>	1.25E-04	7.14E-09	6.24E-06	0	0	0	0	0	0	0	2.44E-08	3.76E-09	0	1.15E-07	-1.42E-08
	Resource use, energy carriers [MJ] <sup>1</sup>	4.70E+01	1.49E+00	2.54E+00	0	0	0	0	0	0	0	9.13E-01	7.86E-01	0	2.61E+00	-3.48E-01
	Water deprivation potential [m³ world equiv.] <sup>1</sup>	6.77E-01	1.27E-03	4.34E-02	0	0	0	0	0	0	0	3.09E-03	6.66E-04	0	9.74E-02	-4.04E-03









<sup>1</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

## Resource Use


Resources Use indicators	PRODUCT STAGE	CONSTRUCTION STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE LIFE CYCLE
	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] <sup>2</sup>	1.26E+01	1.06E-01	2.97E+00	0	0	0	0	0	0	0	5.22E-03	5.56E-02	0	1.09E-01	-2.23E-02
 Primary energy resources used as raw materials (PERM) [MJ] <sup>2</sup>	3.33E+01	0	-8.32E-01	0	0	0	0	0	0	0	0	0	0	0	0
 Total use of renewable primary energy resources (PERT) [MJ] <sup>2</sup>	4.59E+01	1.06E-01	2.14E+00	0	0	0	0	0	0	0	5.22E-03	5.56E-02	0	1.09E-01	-2.23E-02
 Use of non-renewable primary energy (PENRE) [MJ] <sup>2</sup>	4.70E+01	1.50E+00	2.54E+00	0	0	0	0	0	0	0	9.13E-01	7.88E-01	0	2.61E+00	-3.48E-01
 Non-renewable primary energy resources used as raw materials (PENRM) [MJ] <sup>2</sup>	7.15E-03	0	3.58E-04	0	0	0	0	0	0	0	0	0	0	0	0
 Total use of non-renewable primary energy resources (PENRT) [MJ] <sup>2</sup>	4.70E+01	1.50E+00	2.54E+00	0	0	0	0	0	0	0	9.13E-01	7.88E-01	0	2.61E+00	-3.48E-01
 Input of secondary material (SM) [kg]	2.01E+00	0	1.00E-01	0	0	0	0	0	0	0	0	0	0	0	0
 Use of renewable secondary fuels (RSF) [MJ]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
 Use of non-renewable secondary fuels (NRSF) [MJ]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
 Use of net fresh water (FW) [m3]	1.61E-02	1.17E-04	1.03E-03	0	0	0	0	0	0	0	7.19E-05	6.13E-05	0	2.30E-03	-9.40E-05

<sup>2</sup> From EPD International Construction Product PCR 1.3.2 (Annex 3). The option B was retained to calculate the primary energy use indicators.

## Waste Category & Output flows



Waste Category & Output Flows	PRODUCT STAGE	CONSTRUCTION STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE LIFE CYCLE
	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]	6.29E-03	5.54E-12	3.15E-04	0	0	0	0	0	0	0	6.17E-06	2.92E-12	0	1.08E-05	-8.89E-07
 Non-hazardous waste disposed (NHWD) [kg]	1.62E+00	2.16E-04	8.95E-01	0	0	0	0	0	0	0	5.64E-03	1.14E-04	0	1.63E+01	-1.17E-02
 Radioactive waste disposed (RWD) [kg]	8.41E-05	1.94E-06	5.21E-06	0	0	0	0	0	0	0	1.00E-07	1.02E-06	0	6.73E-06	-4.72E-07
 Components for re-use (CRU) [kg]	0	0	1.55E-01	0	0	0	0	0	0	0	0	0	0	0	0
 Materials for Recycling (MFR) [kg]	2.26E+00	0	1.13E-01	0	0	0	0	0	0	0	0	0	0	0	0
 Material for Energy Recovery (MER) [kg]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
 Exported electrical energy (EEE) [MJ]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
 Exported thermal energy (EET) [MJ]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

## Additional voluntary indicators from EN 15804

		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
	GWP-GHG [kg CO2 eq.] <sup>3</sup>	2.99E+00	1.11E-01	1.60E-01	0	0	0	0	0	0	0	7.00E-02	5.85E-02	0	1.23E-01	0

<sup>3</sup> The indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. This indicator is thus almost equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.

## Information on biogenic carbon content

		PRODUCT STAGE
Biogenic Carbon Content		A1 / A2 / A3
	Biogenic carbon content in product [kg]	8.82E-01
	Biogenic carbon content in packaging [kg]	7.07E-02

*Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO<sub>2</sub>.*

The product contains biogenic carbon due to the cellulose fibre used. Regarding packaging, biogenic carbon is quantified due to wooden pallet production.



## Additional information:

### Influence of transportation to other countries

The result of stage A4 (transportation of product) in the table of this EPD refers to transportation of 100 km. This product might also be delivered to the countries in the table below. To adapt the impact of transportation in the A4 column, the results expressed in this EPD must be multiplied by a corresponding multiplication factor below.

Destination	Average Distance (Km)	Multiplication Factor
<b>Europe (EPD reference value)</b>	100	1
Germany	350	3.50
Austria	816	8.16
Belgium	450	4.50
Czech Republic	484	4.84
Denmark	631	6.31
England	1013	10.13
Finland	1973	19.72
France	726	7.26
Hungary	1148	11.48
Ireland	1495	14.95
Italy	1654	16.54
Netherlands	360	3.60
Norway	1039	10.39
Poland	948	9.48
Romania	1484	14.84
Slovakia	854	8.54
Slovenia	1000	10.00
Spain	2031	20.31
Switzerland	688	6.88
Turkey	2803	28.03

## Electricity information

The Bodenwerder factory based in Germany uses electricity with a Guarantee of Origin certificate (GO's).

Hence, the electricity mix considered for the manufacturing of the studied product is modelled according to the electricity mix described in the Guarantee of Origin certificate. The amount of electricity purchased with GO's covers 100% of the electricity consumption on the manufacturing site.

Type of information	Description
<b>Location</b>	Electricity purchased by Saint-Gobain Rigips GmbH - Germany
<b>Share of electricity covered by Guarantee of Origin</b>	100% of the energy consumption is covered by the GO
<b>Energy sources for electricity</b>	100% hydroelectric energy
<b>Type of dataset</b>	Cradle to gate from GaBi and ecoinvent databases
<b>Source</b>	Cradle to gate from Gabi and ecoinvent databases Guarantee of Origin certificate: Pfalzwerke 2023 - 2025
<b>CO<sub>2</sub> emission kg CO<sub>2</sub> eq. / kWh</b>	0.006 kg of CO <sub>2</sub> eq/kWh Climate Change - fossil indicator

## 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 Rigips GmbH. After evaluating the inventory, according to the defined ranking in the LCA report, the assessment reflects good inventory data quality.

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

The following tables presents results for 1m<sup>2</sup> of installed gypsum board 12.5 mm with a weight of 15.67 kg/m<sup>2</sup>.

	PRODUCT STAGE	CONSTRUCTION STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE LIFE CYCLE
	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.]	2.99E+00	1.10E-01	1.60E-01	0	0	0	0	0	0	0	7.00E-02	5.79E-02	0	1.23E-01	-2.31E-02
Ozone depletion (ODP) [kg CFC 11eq.]	-3.45E+00	2.87E-04	2.61E-01	0	0	0	0	0	0	0	8.83E-06	1.51E-04	0	3.24E+00	-2.47E-05
Acidification potential (AP) [kg SO <sub>2</sub> eq.]	1.82E-03	1.02E-03	1.33E-04	0	0	0	0	0	0	0	7.88E-06	5.36E-04	0	1.81E-04	-2.58E-05
Eutrophication potential (EP) [kg (PO <sub>4</sub> ) <sub>3</sub> -eq.]	7.28E-06	9.62E-15	3.64E-07	0	0	0	0	0	0	0	1.11E-09	5.06E-15	0	2.36E-09	-4.40E-10
Photochemical ozone creation (POCP) - [kg Ethylene eq.]	7.52E-03	1.24E-04	4.36E-04	0	0	0	0	0	0	0	6.49E-04	6.66E-05	0	9.15E-04	-8.80E-05
Abiotic depletion potential for non-fossil resources (ADP-elements) [kg Sb eq.]	2.58E-04	4.01E-07	1.33E-05	0	0	0	0	0	0	0	2.15E-06	2.11E-07	0	6.88E-06	-6.50E-06
Abiotic depletion potential for fossil resources (ADP-fossil fuels) [MJ]	1.76E-03	4.24E-05	1.09E-04	0	0	0	0	0	0	0	3.01E-04	2.30E-05	0	3.14E-04	-1.66E-05

## References

1. EN 15804:2012+A1:2013 - Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products
2. EN 15804:2012+A2:2019/AC:2021 - Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products
3. EPD International. General Program Instructions (GPI) for the International EPD® System (version 4.0) [www.environdec.com](http://www.environdec.com).
4. The International EPD System PCR 2019:14 Construction products and Construction services. Version 1.3.2
5. European Chemical Agency, Candidate List of substances of very high concern for Authorization. <https://echa.europa.eu/candidate-list-table>
6. LCA report. Information for the Life Cycle Assessment of Gypsum board products produced by Saint-Gobain Rigips GmbH V2 July 2024
7. Product datasheet Rigidur® H - Gypsum 12.5 mm Fibreboards <https://www.rigips.de/documents/produkt-datenblatt/product-datasheet-rigidur-h-ak-12-5.pdf>