gyproc
SAINT-GOBAIN

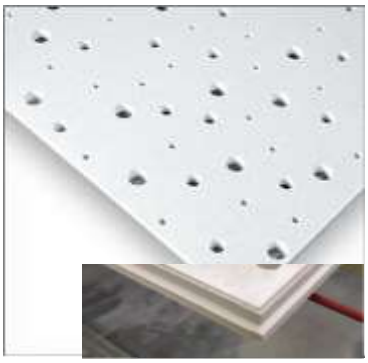
ENVIRONMENTAL PRODUCT DECLARATION

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

Rigitone® Edge Activ'Air® 8-15-20 Super 12.5 mm

(EPD of multiple products, based on worst-case results)

Version: 1
Date of publication: 15/05/2024
Validity: 5 years
Valid until: 14/05/2029
Scope of the EPD®: Europe



EPD®
THE INTERNATIONAL EPD® SYSTEM

The International EPD®
Programme operator: EPD international AB
System Registration number:
S-P: 13900

ECO PLATFORM
EPD
VERIFIED

EPD
VERIFIED

An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at www.environdec.com

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Program information

PROGRAMME:	The International EPD® System
ADRESS:	EPD International AB - Box 210 60 - SE-100 31 Stockholm - Sweden
WEBSITE:	www.environdec.com
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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 1.3.4

PCR review was conducted by: The Technical Committee of the International EPD® System See 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 - Contact via 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: Pierre-Alexis DUVERNOIS - ELYS Consulting

Approved by: The International EPD© System

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

EPDs within the same product category but registered in different EPD programmes 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 characterisation 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 Placoplatre, Tour Saint-Gobain 12, place de l'Iris, 92400 Courbevoie, FRANCE
Production plant: Placoplatre, 456 rue Emile Romanet 73000 Chambéry, FRANCE
Programme used: International EPD System. For more information see www.environdec.com
PCR identification PCR 2019:14 version 1.3.4 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 Placoplatre, Tour Saint-Gobain 12, place de l'Iris, 92400 Courbevoie, FRANCE
Product name and manufacturer represented:

- Rigitone® Edge Activ'Air® 8/18 12.5 mm
- Rigitone® Edge Activ'Air® 12-20/66 12.5 mm
- Rigitone® Edge Activ'Air® 12-25/Q 12.5 mm
- Rigitone® Edge Activ'Air® 8-15-20 Super 12.5 mm (worst case declared)

All manufactured by Placoplatre in France (Chambéry plant).

EPD® prepared by: Saint-Gobain Placoplatre, Tour Saint-Gobain 12, place de l'Iris, 92400 Courbevoie, FRANCE
The intended use of this EPD is for B2B communication.
Geographical scope of the EPD®: Europe, excluding France (EPD available in local program INIES)
EPD® registration number: S-P-13900
Declaration issued: 15/05/2024 **valid until:** 14/05/2029
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^2 of installed gypsum board, 12.5 mm thick, with a weight of 9.09 kg/m^2 with a useful life of 50 years.

Rigitone® Edge Activ'Air® is a **gypsum-based** plasterboard with specially designed acoustic and aesthetics features (non-woven black facing, hole pattern) for use in Gyproc ceiling and where greater levels of sound insulation is required.

If the EPD covers a range of products, the worst case scenario is considered in the declared data and results.

Technical data

Parameter	Value / Description
EN CLASSIFICATION	EN 14190
REACTION TO FIRE	Euroclass A2-s1, d0
ACOUSTIC PROPERTY	αw = 0.5 (L) Test report CSTB AC10-26029022 - E1/E2*
PERFORATION	10%, round and alternate*
EXTERNAL RECYCLING GYPSUM & PAPER	12.4 %

*Other product: see brochure : https://www.placo.fr/documents/brochure-marketing/s20522-catalogue-rigitone-web.pdf

Declaration of the main product components and/or materials

Description of the main components and/or materials based on the worst-case scenario for multiple product EPD:

Product components	Weight (kg)	Post-consumer recycled material weight (%)	Biogenic material, weight-% and kg C/kg product
Gypsum board (without facing)	8.730	10%	See information on biogenic carbon content
Facing (front): Paper liner	0.280	>95%	
Facing (back): Non-woven black tissue	0.080	0%	
Packaging materials	**Weight (kg)**	**Weight versus the product (%)**	**Weight biogenic carbon, kg C/kg material**
Plasterboard protection	1.031	11%	0,164
Wooden pallet	0.468	5%	0.518
Polyethylene film	0.012	0.1%	0
Steel angles	0.005	<0.1%	0
Polyethylene Terephthalate strap	0.001		0
Cardboard angles	3.5E-04		0.436

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.

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LCA calculation information

TYPE OF EPD	Cradle to gate with options and optoinal modules (A+B+C+D)
DECLARED UNIT	1 m² of installed board with a weight of 9.09 kg/m²
SYSTEM BOUNDARIES	Mandatory stages = A1-A3; C1-C4 and D; Optional stages = A4-A5; B1-B7
REFERENCE SERVICE LIFE (RSL)	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.
CUT-OFF RULES	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. Flows related to human activities such as employee transport are excluded. 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.
ALLOCATIONS	Allocation has been avoided when possible and when not possible a mass allocation has been applied. The polluter pays as well the modularity principles have been followed.
GEOGRAPHICAL COVERAGE AND TIME PERIOD	Scope: France/Europe Data is collected from one production site Placoplatre Chambéry located in France Data collected for the year 2023
BACKGROUND DATA SOURCE	The databases GaBi Professional 2023 and ecoinvent v.3.9.1
SOFTWARE	GaBi 10.7.1

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	RER	RER	FR	RER	RER	RER	RER	RER	RER	RER	RER	RER	RER	RER	RER	RER	RER
Specific data used **GWP- GHG**	GWP-GHG 40%																
Variation products	<1%																
Variation sites	N/A																

Life cycle stages

A1-A3, Product stage

Description of the stage:
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”.

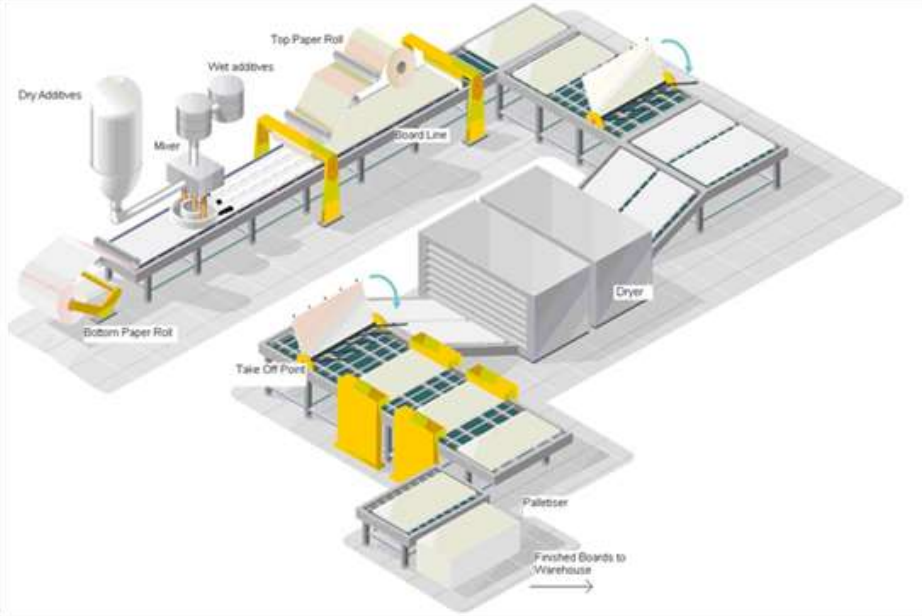
A1, Raw materials supply
This includes the extraction and processing of all raw materials and energy which occur upstream from the manufacturing process.

A2, Transport to the manufacturer
This module includes the transportation of raw materials and packaging to the manufacturing site. The modelling includes road, boat and/or train transportations.

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:
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. In addition, specific operations are applied to Rigitone® Edge ceilings: perforation and edge trimming.

A4-A5, Construction process stage

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 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.	Truck, maximum load weight of 24 tons, real load is 9.978 tons and consumption of 0.38 liters per km
Distance	Truck: 1 000 km
Capacity utilisation (including empty returns)	100% for truck 30% empty return
Bulk density of transported products	47 m^2 for one pallet and 20 pallets in truck
Volume capacity utilisation factor	<1

A5, Installation in the building: this module includes:
The accompanying table quantifies the parameters for installing the product at the building site. All installation materials and their waste processing are included. Rigitone® Edge installation requires dedicated jointing product to fill in the edge (Rigitone® Mix and Rigitone® Kit). Specific tools are included.

PARAMETER	VALUE/DESCRIPTION
Ancillary materials for installation (specified by materials)	Accessories: • 34.7 g of Rigitone® Mix jointing compound • 10 g of steel screws (8 units of 1.25 g each) Rigitone® Kit tools: • 7.2 g of steel • 0.3 g of polypropylene
Water use	Tool cleaning: 0.1 liter
Other resource use	None
Quantitative description of energy type (regional mix) and consumption during the installation process	0.008 kWh electrical energy for screwing, European geographical mix
Wastage of materials on the building site before waste processing, generated by the product's installation (specified by type)	None
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)	5% of plasterboard sent to landfill (see C1-C4) 30% of Rigitone® mix after leveling and sanding, sent to landfill Packaging of the plasterboard: • Plasterboard protection 1.031 kg (see C1-C4) • Wooden pallet 0.468 kg • Polyethylene film 0.012 kg • Steel angles 0.005 kg

PARAMETER	VALUE/DESCRIPTION
	• Polyethylene Terephthalate strap 0.001 kg • Cardboard angles 3.5E-04 kg Packaging of the coating: • Aluminium-PE-PP tube 0.0062 kg • Steel clip 0.0086 kg • Printed PE film 0.0025 kg • Cardboard 0.0021 kg • Wooden pallet 0.0014 kg • Transparent PE film 1,83E-05 kg Ancillary: • 7.2 g of steel • 0.3 g of polypropylene Packaging waste treatment (except plaster): 100% treated for recycling and disposal. Waste scenarios are based on default European Union recycling rates from the PEF LCA methods (Annex C May 2020). The table below provides applied recycling and disposal rates for each packaging stream. Plaster based waste and tools are sent to landfill (100%).
Direct emissions to ambient air, soil, and water	None

- Waste transport distance to landfill/incineration and treatment site respectively 50 km and 250 km
- Recycling rate according to PEF (Annex C): “R2” factor

	Material recycling	Incineration (with energy recovery*)	Landfill
Wooden pallets	30%	32%*	38%
Polyethylene films	25%	35%	40%
Cardboard box	75%	12%	14%
Steel clip	0%	0%	100%
Rigitone® Kit tools	0%	0%	100%
Alu-PE-PP tube	0%	46%	54%
Plasterboard, plaster	0%	0%	100%

B1-B7, Use stage (excluding potential savings)

Description of the stage: 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

Description of the 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.

C1-C4, End of Life Stage

Description of the 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 demolition energy is neglected as it is taken into account at the building scale.
C2: Transport to waste processing
C3: Waste processing for reuse, recovery and/or recycling. In our case, the product is incompatible with recycling.
C4: disposal, including 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/DESCRIPTION
Collection process specified by type	100% collected with mixed deconstruction and demolition waste sent to landfill (including board, screws and jointing tape/compound)
Recovery system specified by type	N/A
Disposal specified by type	Material sent to landfill: Product: 9.090 kg (plasterand facing) Accessories: 0.045 kg (joint and screws)
Assumptions for scenario development (e.g. transportation)	Gypsum waste is transported 50 km by truck from deconstruction/demolition sites to landfill

D, Reuse/recovery/recycling potential

Since 100% of the product is landfilled (C4), no module D applies. However, some of the packaging disposed of at the installation stage (A5) is recovered:

Flow	Processes beyond the system	Avoided material/energy	Quantity leaving the system
Polyethylene film	Sorting and reprocessing of PE pellets	Primary PE pellet	3,49E-03
Wooden pallet	Sorting and cutting wood chips for material recovery (e.g. particle board)	Primary wood chips	1,41E-01
Wooden pallet	Thermal/Electrical energy recovery in incineration plant (23% yield)	Substitution to elctricity and thermal energy from natural gas on national energy networks	1,51E-01
Cardboard box and edges	Chemical pulp paper recovery	Primary paper pulp from chemical process	1,86E-03
Steel corners	Scrap sorting/cutting/melting in arc furnace	Primary pig rion steel	3,84E-03

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 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 including module C, we strongly advise against using the results of modules A1-A3 without considering the results of module C

All figures refer to a declared unit of 1m² as per the declared unit. Since the declaration covers the whole life cycle results shall be intended as total module A to C, and not just A1-A3 for instance.

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

- Rigitone® Edge Activ'Air® 8-15-20 Super 12.5 mm - plant located in Chambéry, France

The reference product choice is justified as the worst case scenario across the product sample. Mostly due to the mass of the finished product (lower perforation rate).

Environmental Impacts

Environmental 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
Climate Change [kg CO2 eq.]	1,17E+00	1,41E+00	1,36E+00	0	0	0	0	0	0	0	0	4,28E-02	0	8,00E-01	-1,70E-01
Climate Change (fossil) [kg CO2 eq.]	2,18E+00	1,41E+00	5,33E-01	0	0	0	0	0	0	0	0	4,28E-02	0	6,30E-02	-1,52E-01
Climate Change (biogenic) [kg CO2 eq.]	-1,02E+00	4,06E-04	8,27E-01	0	0	0	0	0	0	0	0	1,24E-05	0	7,37E-01	-1,76E-02
Climate Change (land use change) [kg CO2 eq.]	2,58E-03	8,01E-05	2,54E-03	0	0	0	0	0	0	0	0	2,43E-06	0	3,33E-05	-9,17E-05
Ozone depletion [kg CFC-11 eq.]	5,41E-08	3,01E-08	1,07E-08	0	0	0	0	0	0	0	0	9,14E-10	0	1,67E-09	-5,16E-10
Acidification terrestrial and freshwater [Mole of H+ eq.]	3,96E-03	3,63E-03	1,77E-03	0	0	0	0	0	0	0	0	1,10E-04	0	4,70E-04	-1,94E-04
Eutrophication freshwater [kg P eq.]	3,58E-05	2,23E-06	9,76E-06	0	0	0	0	0	0	0	0	6,78E-08	0	5,63E-07	-2,64E-06
Eutrophication freshwater [kg $(PO_4)^3$ eq.]	1,26E-03	5,66E-04	1,27E-03	0	0	0	0	0	0	0	0	1,72E-05	0	1,38E-03	-6,37E-05
Eutrophication marine [kg N eq.]	1,37E-03	1,39E-03	5,86E-04	0	0	0	0	0	0	0	0	4,23E-05	0	7,28E-04	-4,62E-05
Eutrophication terrestrial [Mole of N eq.]	1,40E-02	1,47E-02	5,19E-03	0	0	0	0	0	0	0	0	4,47E-04	0	1,81E-03	-5,83E-04
Photochemical ozone formation - human health [kg NMVOC eq.]	4,44E-03	5,76E-03	1,89E-03	0	0	0	0	0	0	0	0	1,75E-04	0	6,88E-04	-2,74E-04
Resource use, mineral and metals [kg Sb eq.][1]	4,10E-06	2,12E-07	1,53E-06	0	0	0	0	0	0	0	0	6,46E-09	0	9,86E-08	-3,89E-08
Resource use, energy carriers [MJ][1]	4,42E+01	1,82E+01	8,51E+00	0	0	0	0	0	0	0	0	5,54E-01	0	1,44E+00	-2,86E+00
Water deprivation potential [m^3 world equiv.][1]	1,15E+00	4,06E-02	1,65E-01	0	0	0	0	0	0	0	0	1,23E-03	0	6,74E-02	-1,04E-02

[1] 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

Optional indicators[2]

Environmental 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
	Particulate matter [Disease incidences]	4,88E-08	1,01E-07	2,67E-08	0	0	0	0	0	0	0	0	3,07E-09	0	9,24E-09	-1,52E-09
	Ionising radiation, human health [kBq U235 eq.]	1,37E-01	3,32E-03	3,00E-02	0	0	0	0	0	0	0	0	1,01E-04	0	7,80E-04	-1,82E-03
	Ecotoxicity, freshwater [CTUe]	5,92E+00	8,23E+00	2,59E+00	0	0	0	0	0	0	0	0	2,50E-01	0	2,13E+00	-4,27E-03
	Human toxicity, cancer [CTUh]	2,14E-09	1,92E-10	1,26E-09	0	0	0	0	0	0	0	0	5,85E-12	0	3,00E-11	2,51E-10
	Human toxicity, non-cancer [CTUh]	2,70E-08	9,79E-09	5,20E-09	0	0	0	0	0	0	0	0	2,98E-10	0	8,00E-10	-6,11E-10
	Land Use [Pt]	7,07E+01	1,02E+00	5,46E+00	0	0	0	0	0	0	0	0	3,09E-02	0	2,87E+00	-1,99E+00

[2] See disclaimers below

Resources Use

Resources Use indicators	PRODUCT STAGE	CONSTRUCTION STAGE		USE STAGE							END OF LIFE STAGE				D 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]	1,09E+01	6,55E-02	4,03E+00	0	0	0	0	0	0	0	0	1,99E-03	0	2,84E-02	-9,34E-02
Primary energy resources used as raw materials (PERM) [MJ]	1,49E+01	0,00E+00	-4,34E+00	0	0	0	0	0	0	0	0	0,00E+00	0	0,00E+00	4,46E-01
Total use of renewable primary energy resources (PERT) [MJ]	2,58E+01	6,55E-02	-3,07E-01	0	0	0	0	0	0	0	0	1,99E-03	0	2,84E-02	3,53E-01
Use of non-renewable primary energy (PENRE) [MJ]	4,23E+01	1,82E+01	7,61E+00	0	0	0	0	0	0	0	0	5,54E-01	0	1,44E+00	-2,58E+00
Non-renewable primary energy resources used as raw materials (PENRM) [MJ]	2,03E+00	0,00E+00	8,49E-01	0	0	0	0	0	0	0	0	0,00E+00	0	0,00E+00	1,44E-01
Total use of non-renewable primary energy resources (PENRT) [MJ]	4,43E+01	1,82E+01	8,46E+00	0	0	0	0	0	0	0	0	5,54E-01	0	1,44E+00	-2,44E+00
Input of secondary material (SM) [kg]	1,38E+00	0,00E+00	6,90E-02	0	0	0	0	0	0	0	0	0,00E+00	0	0,00E+00	0,00E+00
Use of renewable secondary fuels (RSF) [MJ]	2,68E-02	0,00E+00	1,34E-03	0	0	0	0	0	0	0	0	0,00E+00	0	0,00E+00	0,00E+00
Use of non-renewable secondary fuels (NRSF) [MJ]	2,68E-02	0,00E+00	1,34E-03	0	0	0	0	0	0	0	0	0,00E+00	0	0,00E+00	0,00E+00
Use of net fresh water (FW) [m3]	2,10E-02	9,46E-04	4,20E-03	0	0	0	0	0	0	0	0	2,87E-05	0	1,57E-03	-2,36E-04

Waste Category

Waste Category & Output Flows	PRODUCT STAGE	CONSTRUCTION STAGE		USE STAGE							END OF LIFE STAGE				D 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
Hazardous waste disposed (HWD) [kg]	1,2E-04	1,2E-04	2,7E-05	0	0	0	0	0	0	0	0	3,79E-06	0	7,50E-06	-2,44E-06
Non-hazardous waste disposed (NHWD) [kg]	2,9E-01	3,4E-02	2,0E+00	0	0	0	0	0	0	0	0	1,04E-03	0	9,24E+00	-1,52E-02
Radioactive waste disposed (RWD) [kg]	2,2E-04	1,8E-06	9,7E-05	0	0	0	0	0	0	0	0	5,61E-08	0	4,28E-07	-1,97E-06

Output flows

Waste Category & Output Flows	PRODUCT STAGE	CONSTRUCTION STAGE		USE STAGE							END OF LIFE STAGE				D 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
Components for re-use (CRU) [kg]	0,0E+00	0,0E+00	0,0E+00	0	0	0	0	0	0	0	0	0	0	0	0
Materials for Recycling (MFR) [kg]	1,9E-02	0,0E+00	1,9E-01	0	0	0	0	0	0	0	0	0,00E+00	0	0,00E+00	0,00E+00
Material for Energy Recovery (MER) [kg]	3,6E-07	0,0E+00	1,8E-08	0	0	0	0	0	0	0	0	0	0	0	0
Exported electrical energy (EEE) [MJ]	1,8E-02	0,0E+00	2,4E-01	0	0	0	0	0	0	0	0	0,00E+00	0	0,00E+00	2,98E-04
Exported thermal energy (EET) [MJ]	8,9E-02	0,0E+00	7,3E-01	0	0	0	0	0	0	0	0	0,00E+00	0	0,00E+00	-2,37E-01

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.][3]	1,14E+00	1,39E+00	1,34E+00	0	0	0	0	0	0	0	0	4,23E-02	0	7,71E-01	-1,68E-01

[3] 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

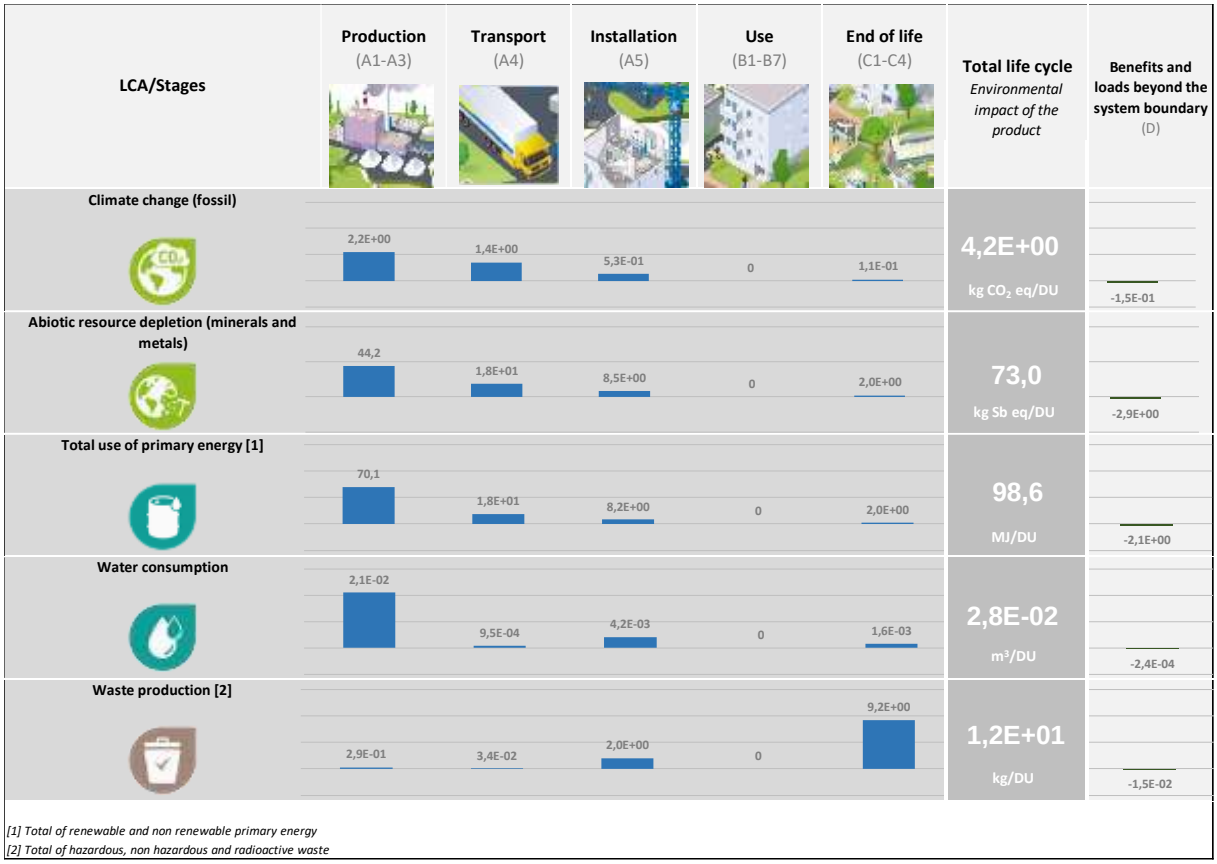
Biogenic Carbon Content	PRODUCT STAGE A1 / A2 / A3
Biogenic carbon content in product [kg]	1,59E-01
Biogenic carbon content in packaging [kg]	1,94E-01

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO_2.

The product contains biogenic carbon due to the additives and paper liner used. Regarding packaging, biogenic carbon is quantified due to wooden pallets and cardboard.

LCA interpretation

The following figure refers to a declared unit of 1m^2 of installed gypsum board, 12.5 mm thick, with a weight of 9.09 kg/m^2 with a useful life of 50 years.



[1] Total of renewable and non renewable primary energy
[2] Total of hazardous, non hazardous and radioactive waste

Relative to its whole life cycle, manufacturing of the product (A1-A3) is responsible for 75% or more of all environmental impacts, and up to 80% regarding eutrophication of freshwater, abiotic resource depletion (minerals and metals) and water scarcity.

Similarly, more than 80% resource use, both energy and water, as well as hazardous/radioactive waste production (70%) occur in A1-A3.

Truck delivery to site (A4) account for less than 20-40% of impact considering a default 1 000 km distance. The installation including the Rigitone® Mix upstream life cycle, screws and electricity contributes to significant impacts in A5

Waste production is mostly of non-hazardous nature arising from the landfilling of the product (C4).

Environmental benefit from module D is not consistent through all impact categories, specifically climate change and non-renewable primary energy. Wood and cardboard recycling being more energy intensive than the avoided impacts of virgin wood chips/paper pulp. Module D of polyethylene film and steel parts is negative, meaning environmental benefit, but is marginal on total module D.

Climate Change Total

For climate change, most of the contribution to this environmental impact is from the production modules (A1 – A3). This is primarily due to the extraction and production of raw materials and packaging. Second contribution comes from A4 and A5 in similar proportion respectively due to fuel combustion and packaging end of life. However, the uptake of CO_2 in the pallet wood in A3 followed by its re-emission and degradation as $C/CO_2/CH_4$ in A5 result in relatively close contribution from A3 and A5.

Energy resources

The consumption of non – renewable resources is correlatively found in same proportion as climate change contributors. This is due to raw materials embodied energy (as low heating value) and transformation energy (gypsum calcination and plaster mix drying).

Water Consumption

Water is used within the manufacturing facility (A3) primarily as final constituent in the ready-mix plaster. However, a greater contribution comes from the process water of upstream raw material production (A1).

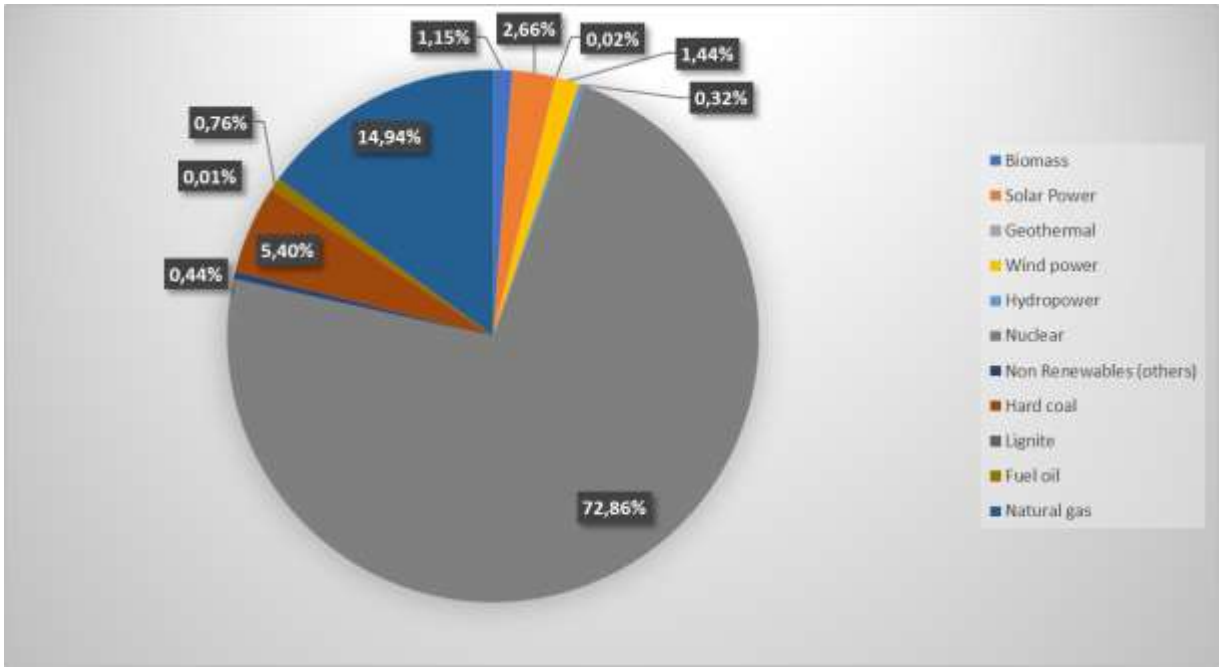
Waste Production

The largest contributor is the end-of-life module. This is because the 100% of the product is assumed to be sent to landfill once it reaches the end-of-life state.

Additional information:

Electricity information

TYPE OF INFORMATION	DESCRIPTION
Location	Representative of Electricity purchased by Saint-Gobain
Geographical representativeness description	Share of energy sources in the **French residual grid mix** • **Nuclear: 72.86%** • **Hydropower: 0.32%** • **Natural gas: 14.94%** • **Wind power: 1.44%** • **Solar power: 2.66%** • **Coal: 5.40%** • **Fuel oil: 0.76%** • **Biomass: 1.15%** • **Other: <0.5%**
Reference year	France: 2022 residual mix*
Type of dataset	Cradle to gate from Gabi databases
Source	AIB 2022
CO_2 emission kg CO_2 eq. / kWh	0.082 kg of CO_2 eq/kWh Based on 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 2021-2023. After evaluating the inventory, according to the defined ranking in the LCA report, the assessment reflects a good inventory data quality.

Specific data	62 % of data has an average rating « very good » 28 % of data has an average rating « good » 10 % of data has an average rating « fair » 0 % of data has an average rating « poor » 0 % of data has an average rating « very poor »
Generic data	44 % of data has an average rating « very good » 36 % of data has an average rating « good » 17 % of data has an average rating « fair » 3 % of data has an average rating « poor » 0 % of data has an average rating « very poor » Generic data validation: 100 % of secondary data are plausible 100 % of secondary data are complete 100 % of secondary data are consistent with EN 15804+A2

Disclaimers

Relevant core and additional environmental impact indicators are ranked based on EN15804+A2:2019-10 (§7.2.3.3)

Indicator	Disclaimer
Global warming potential (GWP)	None
Depletion potential of the stratospheric ozone layer (ODP)	None
Potential incidence of disease due to PM emissions (PM)	None
Acidification potential, Accumulated Exceedance (AP)	None
Eutrophication potential, Fraction of nutrients reaching freshwater end compartment (EP-freshwater)	None
Eutrophication potential, Fraction of nutrients reaching marine end compartment (EP-marine)	None
Eutrophication potential, Accumulated Exceedance (EP-terrestrial)	None
Formation potential of tropospheric ozone (POCP)	None
Potential Human exposure efficiency relative to U235 (IRP)	1
Abiotic depletion potential for non-fossil resources (ADP-minerals&metals)	2
Abiotic depletion potential for fossil resources (ADP-fossil)	2
Water (user) deprivation potential, deprivation-weighted water consumption (WDP)	2
Potential Comparative Toxic Unit for ecosystems (ETP-fw)	2
Potential Comparative Toxic Unit for humans (HTP-c)	2
Potential Comparative Toxic Unit for humans (HTP-nc)	2
Potential Soil quality index (SQP)	2
Disclaimer 1 – This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.	
Disclaimer 2 – 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.	

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.
4. The International EPD System PCR 2019:14 Construction products and Construction services. Version 1.3.4
5. European Chemical Agency, Candidate List of substances of very high concern for Authorization. https://echa.europa.eu/candidate-list-table.