ENVIRONMENTAL PRODUCT DECLARATION No. 091/2019

In accordance with EN 15804 and ISO 14025

RIGIPS PRO and 4PRO™
6,5 mm to 18 mm

Date of issue:01/07/2019
Validity: 5 years
Valid until:01/07/2024
Scope of the EPD®: POLAND

Rigips
SAINT-GOBAIN

General information

This declaration is the type III Environmental Product Declaration (EPD) based on EN 15804 and verified according to ISO 14025 by external auditor. It contains the information on the impacts of declared construction materials on environment and their aspects verified by the independent Body according to ISO 14025. Basically, a comparison or evaluation of EPD data is possible only if all the compared data were created according to EN 15804 (see point 5.3 of the standard).
Life cycle: A1-D modules in accordance with EN 15804 (Cradle to grave)
Declared durability: Under normal conditions, Rigips plasterboards products are expected to last the service life of a building (50 years)
PCR: ITB - GENERAL PCR v1.4 and PN-EN 15804+A1:2014-04 based
European Standard: EN 520:2004 +A1:2009 Gypsum plasterboards - Definitions, requirements and test methods
Declared unit: The declared unit is 1 m^2 of plasterboard with a weight of 8.1 kg /m^2 and a density of 648 kg/m^3
Reasons for performing LCA: B2B
Representativeness: Polish product
EPD Prepared by: Central Team, Saint Gobain Gypsum. **Contact:** Yves.coquelet@saint-gobain.com

EPD program operator:
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ITB is the verified member of The European Platform for EPD program operators and LCA practicioners. www.eco-platform.org

Product description

Product / product family name and manufacturer represented: RIGIPS PRO and 4PRO™

Product description and use: Rigips plasterboard consists of gypsum encased in paper liners.

Designed for use in the residential sector, Rigips regular plasterboard.

Description of the main product components and or materials:
Plasterboard is made up of a gypsum core (calcium sulphate dihydrate) with additive and a paper liner.

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

Technical data/physical characteristics:

REACTION TO FIRE	Euroclass A2-s1,d0 (EN 520:2004)
THERMAL CONDUCTIVITY	0,25 W/(m.K)

Description of the main components and/or materials for 1 m² of product for the calculation of the EPD:

PARAMETER	VALUE
Quantity of plaster for 1 m² of product	8.1 Kg
Thickness	12.5 mm
Density	648 kg/m³
Surfacing	Paper 190 g/m²
Packaging for the transportation and distribution	Polyethylene: 1.93 g/m² Cardboard : 0.34 g/m²
Product used for the Installation	Paper tape, jointing compound, screws

All Rigips plasterboard have been assessed down to 100 ppm (0,01%) of product weight, and do not contain any substances listed:

- Authorization list – REACH Annex XIV
- Restriction list – REACH Annex XVII
- Candidate List of Substances of Very High Concern (SVHC) for authorization

The candidate list is updated regularly and we are required to update the information if necessary.

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

LCA calculation information

EPD TYPE DECLARED	Cradle to grave
DECLARED UNIT	1 m^2 of plasterboard with a weight of 8.1 kg /m^2 and a density of 648 kg/m^3.
SYSTEM BOUNDARIES	Cradle to grave: stages A1 – 3, A4, A5, B1 – 7, C1 – 4 ,D
REFERENCE SERVICE LIFE (RSL)	50 years by default, it corresponds to standard building design life
CUT-OFF RULES	Life Cycle Inventory data for a minimum of 99% of total inflows to the upstream and core module shall be included
ALLOCATIONS	Production data. Recycling, energy and waste data have been calculated on a mass basis. All emissions to air, water, and soil, and all materials and energy used have been included.
GEOGRAPHICAL COVERAGE AND TIME PERIOD	Data included is collected from one production site, Pińczów. Data collected for the year 2018 Background data: Ecoinvent (2015) and Gabi (2013 - 2016)
PRODUCT CPC CODE	37530 (Articles of plaster or of compositions based on plaster)
DATA QUALITY	The values determined to calculate the LCA originate from verified Saint-Gobain Construction Products Polska Sp. z o.o inventory data.
DATABASES	The data for the processes come from the following databases: Ecoinvent, specific EPDs, Ullmann's, ITB-Data. Specific data quality analysis was a part of external ISO 14001 audit. Characterization factors are CML ver. 4.2 based on PN-EN 15804+A1:2014-04

According to EN 15804, 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 programmes.

Life cycle stages

Flow diagram of the Life Cycle

Product stage, A1-A3

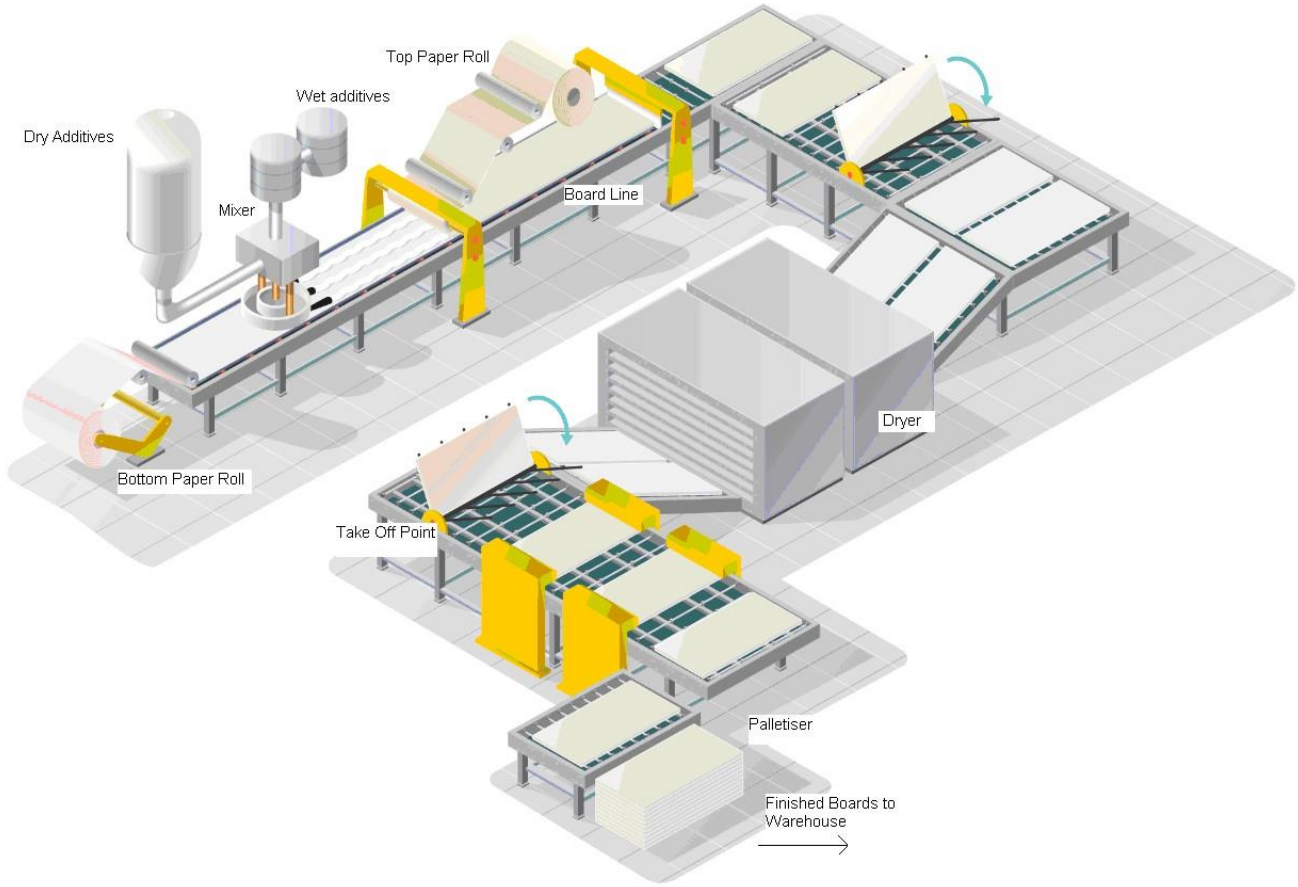
Description of the stage: the product stage of plasterboard products is subdivided into 3 modules A1, A2 and A3 respectively “Raw material supply”, “transport to manufacturer” and “manufacturing”.

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 transportation 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.

Manufacturing process flow diagram



Manufacturing in detail:

To produce RIGIPS plasterboard, gypsum is milled and calcined to produce calcium sulfate hemihydrates ($CaSO_4$, $\frac{1}{2}H_2O$), commonly called Stucco. Calcination occurs at approximately 120 to 150°C and 0,908 Megagrams (Mg) (1 ton) of gypsum calcines to about 0,77 Mg (0,85 ton) of stucco. In calciner, the gypsum is heated by hot combustion gas passed through flues in the kettle, and the stucco product is separated in the bug filter and finally stored in the silo. Ready for use stucco is transferred from one process to next (gypsum board and blocks production) by means of screw conveyors. Later in the manufacture of plasterboard, stucco from calcinator is first mixed with dry additives such as starch, fiberglass and others. This dry mix is combined with water, foam, accelerators and pulpwood in a pin mixer at the head of a board forming line. The slurry is then spread on the moving belt conveyor between 2 paper sheets. The edges of the paper are scored to allow precise folding of the paper to form the edges of the board. As the wet board travels the length of a conveying line, the calcium sulfate hemihydrate combines with the water in the slurry to form solid calcium sulfate dihydrate, resulting in rigid board. The board is rough-cut to length, and it enters a multideck dryer, where it is dried by direct contact with hot combustion gases The dried plasterboard is conveyed to the board end sawing area and it is trimmed and bundled for shipment.

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/declared unit)
Fuel type and consumption of vehicle or vehicle type used for transport e.g. long distance truck, boat, etc.	0.38 liters per km
Distance	797 km
Capacity utilisation (including empty returns)	58.7 %
Bulk density of transported products	648 kg/m³
Volume capacity utilisation factor	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/declared unit)
Ancillary materials for installation (specified by materials)	Jointing compound 0.33kg/m^2 board, tape 1.23m /m^2 board, screws 8 /m^2 board
Water use	0.165 liters/m^2 board
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)	Board: 0.431 kg Screws: 0 kg Jointing Compound: 0.035 kg Jointing Tape: 0.000063 kg
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)	Board: 0.431 kg to landfill 95% to recycling 5% Screws: 0 kg Jointing Compound: 0.035 kg to landfill Jointing Tape: 0.000063 kg to landfill
Direct emissions to ambient air, soil and water	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:

Once installed correctly according to the RIGIPS PRO and 4PRO™ manufactures technical documents needs no further maintenance, repair, replacement or refurbishment during the full life span of the product.
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/declared unit)
Maintenance process	None required during plasterboard lifetime
Maintenance cycle	None required during plasterboard lifetime
Ancillary materials for maintenance (e.g. cleaning agent, specify materials)	None required during plasterboard lifetime
Wastage material during maintenance (specify materials)	None required during plasterboard lifetime
Net fresh water consumption during maintenance	None required during plasterboard lifetime
Energy input during maintenance (e.g. vacuum cleaning), energy carrier type, (e.g. electricity) and amount, if applicable and relevant	None required during plasterboard lifetime

Repair:

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

Replacement:

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

Refurbishment:

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

Use of energy and water:

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

End-of-life stage C1-C4

Description of the stage: The end-of-life stage includes:
C1, de-construction, demolition;
C2, transport to waste processing;
C3, waste processing for reuse, recovery and/or recycling: the entire product is assumed here to be sent to landfill
C4, disposal, including provision and all transport, provision of all materials, products and related energy and water use.

End-of-life:

PARAMETER	VALUE (expressed per functional/declared unit)
Collection process specified by type	8.61 kg collected with mixed construction waste
Recovery system specified by type	1.38 kg for recycling
Disposal specified by type	7.23 kg to municipal landfill
Assumptions for scenario development (e.g. transportation)	On average, Gypsum waste is transported 25 km by road from construction / demolition sites to end of life treatment or disposal.

Reuse/recovery/recycling potential, D

Description of the stage:
An end of life recycling rate of 16% has been assumed using local Demolition waste data. Figures displayed in Module D account for this recycling.

LCA results

Description of the system boundary (MD = Module Declared in LCA, MND = Module Not Declared)
The declared unit is 1 m^2 of plasterboard with a weight of 8.1 kg /m^2 and a density of 648 kg/m^3

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
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
MD	MD	MD	MD	MD	MD	MD	MD	MD	MD	MD	MD	MD	MD	MD	MD	MD

Influence of particular thicknesses (see annex I)

ENVIRONMENTAL IMPACTS

Parameters	Product stage	Construction process stage		Use stage							End-of-life stage				D Re us e,
	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	
Global Warming Potential (GWP 100) - *kg CO_2 equiv/FU*	1,88E+00	3,03E-01	1,37E-01	0	0	0	0	0	0	0	3,78E-02	1,74E-02	1,48E-02	1,13E-01	-1,34E-02
The global warming potential of a gas refers to the total contribution to global warming resulting from the emission of one unit of that gas relative to one unit of the reference gas, carbon dioxide, which is assigned a value of 1.															
Ozone Depletion (ODP) *kg CFC 11 equiv/FU*	2,76E-08	4,63E-17	1,38E-09	0	0	0	0	0	0	0	5,15E-18	4,77E-13	1,67E-10	6,32E-16	-2,13E-13
Destruction of the stratospheric ozone layer which shields the earth from ultraviolet radiation harmful to life. This destruction of ozone is caused by the breakdown of certain chlorine and/or bromine containing compounds (chlorofluorocarbonsor halons), which break down when they reach the stratosphere and then catalytically destroy ozone molecules.															
Acidification potential (AP) *kg SO_2 equiv/FU*	4,60E-03	1,21E-03	3,56E-04	0	0	0	0	0	0	0	1,33E-04	7,12E-05	9,68E-05	6,45E-04	4,66E-05
Acid depositions have negative impacts on natural ecosystems and the man-made environment incl. buildings. The main sources for emissions of acidifying substances are agriculture and fossil fuel combustion used for electricity production, heating and transport.															
Eutrophication potential (EP) *kg $(PO_4)^{3-}$ equiv/FU*	4,46E-03	2,95E-04	2,39E-04	0	0	0	0	0	0	0	7,72E-06	1,81E-05	6,20E-05	7,31E-05	1,16E-05
Excessive enrichment of waters and continental surfaces with nutrients, and the associated adverse biological effects.															
Photochemical ozone creation (POPC) *kg Ethylene equiv/FU*	1,36E-04	4,43E-05	2,99E-05	0	0	0	0	0	0	0	8,92E-06	2,91E-06	9,23E-07	5,31E-05	9,34E-06
Chemical reactions brought about by the light energy of the sun. The reaction of nitrogen oxides with hydrocarbons in the presence of sunlight to form ozone is an example of a photochemical reaction.															
Abiotic depletion potential for non-fossil ressources (ADP-elements) - *kg Sb equiv/FU*	1,81E-06	4,03E-09	1,98E-06	0	0	0	0	0	0	0	9,39E-10	1,50E-09	1,57E-09	3,85E-08	4,93E-09
Abiotic depletion potential for fossil ressources (ADP-fossil fuels) - *MJ/FU*	2,96E+01	4,22E+00	1,92E+00	0	0	0	0	0	0	0	4,71E-01	2,35E-01	2,15E-01	1,51E+00	-2,06E-01
Consumption of non-renewable resources, thereby lowering their availability for future generations.															

RESOURCE USE															
Parameters	Product stage	Construction process stage		Use stage							End-of-life stage				D Reuse, recovery, recycling
	A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenanc	B3 Repair	B4 Replaceme	B5 Refurbishm	B6 Operational	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	
Use of renewable primary energy excluding renewable primary energy resources used as raw materials *MJ/FU*	1,02E+01	9,69E-02	7,60E-01	0	0	0	0	0	0	0	1,53E-03	1,40E-02	1,78E-02	1,98E-01	6,59E-01
Use of renewable primary energy used as raw materials *MJ/FU*	2,98E+00	0	1,42E-01	0	0	0	0	0	0	0	0	0	0	0	0
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials) *MJ/FU*	1,62E+01	9,69E-02	9,02E-01	0	0	0	0	0	0	0	1,53E-03	1,40E-02	1,78E-02	1,98E-01	6,59E-01
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials - *MJ/FU*	2,99E+01	4,23E+00	1,97E+00	0	0	0	0	0	0	0	4,72E-01	2,36E-01	2,17E-01	1,56E+00	-1,85E-01
Use of non-renewable primary energy used as raw materials *MJ/FU*	8,15E-01	0	3,88E-02	0	0	0	0	0	0	0	0	0	0	0	0
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials) - *MJ/FU*	3,07E+01	4,23E+00	2,01E+00	0	0	0	0	0	0	0	4,72E-01	2,36E-01	2,17E-01	1,56E+00	-1,85E-01
Use of secondary material *kg/FU*	7,15E-02	0	5,13E-03	0	0	0	0	0	0	0	0	0	0	0	0
Use of renewable secondary fuels- *MJ/FU*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Use of non-renewable secondary fuels - *MJ/FU*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Use of net fresh water - *m^3/FU*	1,94E-02	3,23E-05	1,27E-03	0	0	0	0	0	0	0	2,81E-06	2,47E-05	4,20E-04	3,92E-04	-1,95E-04

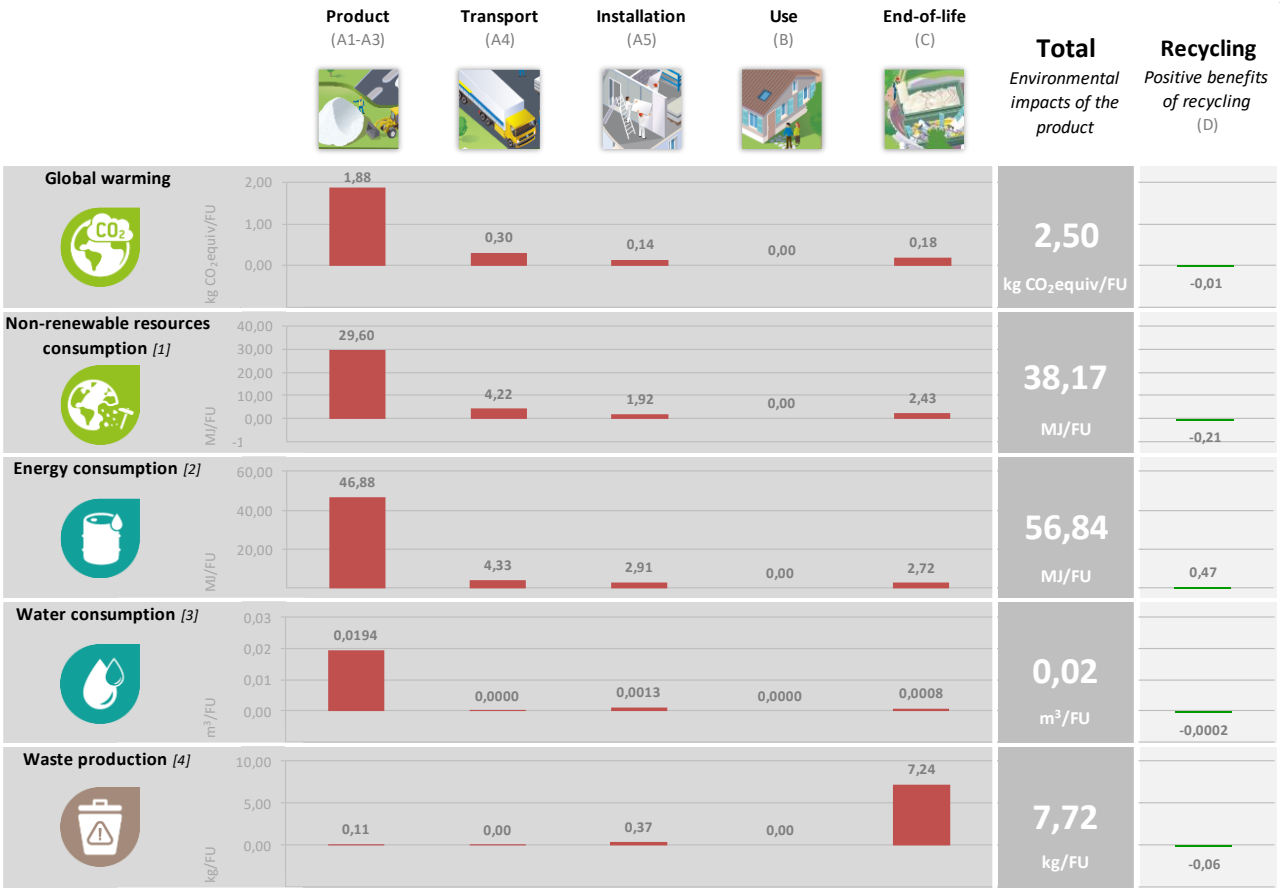
WASTE CATEGORIES																
Parameters		Product stage	Construction process stage		Use stage							End-of-life stage				D Reuse, recovery
		A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	
	Hazardous waste disposed *kg/FU*	5,29E-06	4,32E-09	2,70E-07	0	0	0	0	0	0	0	6,17E-11	7,83E-09	1,51E-11	3,19E-08	1,24E-09
	Non-hazardous (excluding inert) waste disposed *kg/FU*	4,04E-02	1,46E-05	6,85E-01	0	0	0	0	0	0	0	7,37E-05	1,20E-05	3,23E-05	8,69E+00	-6,07E-02
	Radioactive waste disposed *kg/FU*	7,98E-04	1,40E-06	5,48E-05	0	0	0	0	0	0	0	6,18E-07	3,02E-07	4,59E-06	2,48E-05	8,76E-06

OUTPUT FLOWS

Parameters	Product stage	Construction process stage		Use stage							End-of-life stage				D Reu se, rec ove
	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	
Components for re-use *kg/FU*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Materials for recycling *kg/FU*	7,88E-03	0	2,42E-01	0	0	0	0	0	0	0	0	0	1,38E+00	0	0
Materials for energy recovery *kg/FU*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exported energy, detailed by energy carrier *MJ/FU*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

LCA results interpretation

The following figure refers to declared unit of 1m² of plasterboard with a weight of 8.1 kg/m².



[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.

Global Warming Potential (Climate Change) (GWP)

When analyzing the above figure for GWP, it can clearly be seen that the majority of contribution to this environmental impact is from the production modules (A1 – A3). This is primarily because the sources of greenhouse gas emissions are predominant in this part of the life cycle. CO_2 is generated upstream from the production of electricity and is also released on site by the combustion of natural gas. We can see that other sections of the life cycle also contribute to the GWP; however, the production modules contribute to over 80% of the contribution. Combustion of fuel in transport vehicles will generate the second highest percentage of greenhouse gas emissions.

Non-renewable resources consumptions

We can see that the consumption of non – renewable resources is once more found to have the highest value in the production modules. This is because a large quantity of natural gas is consumed within the factory, and non – renewable fuels such as natural gas and coal are used to generate the large amount of electricity we use. The contribution to this impact from the other modules is very small and primarily due to the non – renewable resources consumed during transportation.

Energy Consumptions
As we can see, modules A1 – A3 have the highest contribution to total energy consumption. Energy in the form of electricity and natural gas is consumed in a vast quantity during the manufacture of product so we would expect the production modules to contribute the most to this impact category.

Water Consumption
We can see that water consumption is mainly during the production phase. For the production phase, water is used within the manufacturing facility and therefore we see the highest contribution here. However, we recycle a lot of the water on site so the contribution is still relatively low.

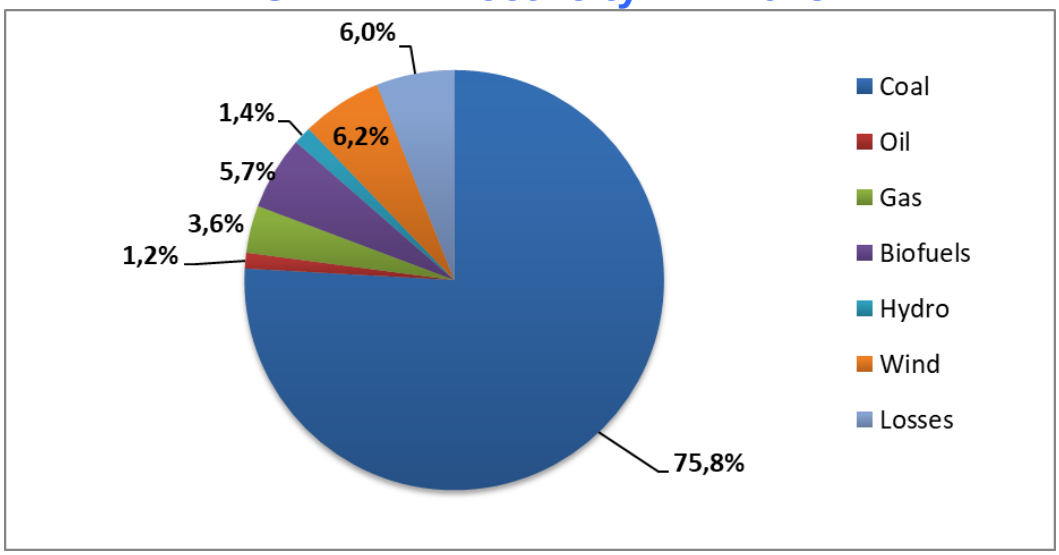
Waste Production
Waste production does not follow the same trend as the above environmental impacts. The largest contributor is the end of life module. This is because the entire product is sent to landfill and recycling treatment once it reaches the end of life state. However, there is a still an impact associated with the production module since we do generate waste on site. The very small impact associated with installation is due to the loss rate of product during implementation.

Additional information

Electricity description

TYPE OF INFORMATION	DESCRIPTION
Location	Representative of average production in Poland
Geographical representativeness description	**Split of energy sources in POLAND** Coal 75,8% Oil 1,2% Gas 3,6% Biofuels 5,7% Hydro 1,4% Wind 6,2% Losses 6,0%
Reference year	2015
Type of data set	Cradle to gate from ECOINVENT 3.5
Source	International Energy Agency -2015
Global Warming potential (excluding biogenic carbon)	1,02 kg eq CO_2 / kWh

POLAND: Electricity Mix 2015



Verification

The process of verification of this EPD is in accordance with EN ISO 14025 and ISO 21930. After verification, this EPD is valid for a 5-year-period. EPD does not have to be recalculated after 5 years, if the underlying data have not changed significantly.

The basis for LCA analysis was EN 15804 and ITB PCR A and EN 16783
Independent verification corresponding to ISO 14025 (subclause 8.1.3) ☒ external ☐ internal
External verification of EPD: PhD. Eng. Halina Prejzner LCA, LCI audit and input data verification: M.Sc. Eng. Dominik Bekierski, d.bekierski@itb.pl Verification of LCA: PhD Eng. Michał Piasecki, m.piasecki@itb.pl

References:

- ITB PCR A- General Product Category Rules for Construction Products
- EN 16783:2017 Thermal insulation products - Product category rules (PCR) for factory made and in-situ formed products for preparing environmental product declarations
  ISO 14025:2006 Environmental labels and declarations -- Type III environmental declarations -- Principles and procedures
- ISO 21930:2017 Sustainability in buildings and civil engineering works -- Core rules for environmental product declarations of construction products and services
- ISO 14044:2006, Environmental management – Life cycle assessment – Requirements and guidelines
- ISO 15686-1:2011 Buildings and constructed assets -- Service life planning -- Part 1: General principles and framework
- ISO 15686-8:2008 Buildings and constructed assets -- Service-life planning -- Part 8: Reference service life and service-life estimation
- PN-EN 15804+A1:2014-04 Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products
- EN 15942:2011 Sustainability of construction works - Environmental product declarations - Communication format business-to-business
- http://echa.europa.eu/chem_data/authorisation_process/candidate_list_table_en.asp

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CERTIFICATE № 091/2019
of TYPE III ENVIRONMENTAL DECLARATION

Product:

Gypsum plasterboard RIGIPS PRO and RIGIPS 4PRO™

Manufacturer:

Saint Gobain Construction Products Polska Sp. z o.o.
Cybernetyki 9, 02-677 Warsaw, Poland

confirms the correctness of the data included in the development of
Type III Environmental Declaration and accordance with the requirements of the standard

PN-EN 15804+A1:2014-04

Sustainability of construction works.
Environmental product declarations.
Core rules for the product category of construction products.

This certificate, issued for the first time on 1st July 2019 is valid for 5 years
or until amendment of mentioned Environmental Declaration

Head of the Thermal Physic, Acoustics
and Environment Department
Barbara Pietruszka, PhD

INSTYTUT TECHNIKI BUDOWLANEJ

Deputy Director
for Research and Innovation
Krzysztof Kuczyński, PhD

Warsaw, July 2019

Annex I

This EPD® includes a range of product with different thickness and density, for every product thickness, using a multiplication factor in order to obtain the environmental performance of every thickness. In order to calculate the multiplication factors, a reference product has been selected (RIGIPS PRO 12.5 mm). All the results refer to RIGIPS PRO 12.5 mm. If there is a need to have a factor for a plasterboard not stated in the table, the mass of the plasterboard [kg/m^2] must be divided by the mass of reference plasterboard Rigips PRO 12.5 mm weight 8,1 [kg/m^2].
In the next table the multiplication factors are shown for every specific product. In order to obtain the environmental performance associated with every product, the results expressed in this EPD® must be multiplied by its corresponding multiplication factor.

	kg / m^2	Factor	
PRO			
RIGIPS PRO typ A, 9,5 mm	7,2	0,89	
RIGIPS PRO typ A, 12,5 mm	8,1	1,00	**Reference product of this EPD**
RIGIPS PRO Hydro typ H2, 12,5 mm	8,4	1,04	
RIGIPS PRO Fire typ F, 12,5 mm	9,4	1,16	
RIGIPS PRO Fire+ typ DF, 12,5mm	10,1	1,25	
RIGIPS PRO Fire+ typ DF, 15 mm	12,2	1,51	
RIGIPS PRO Fire+ typ DF, 18 mm	14,5	1,79	
RIGIPS PRO Fire+ Hydro typ DFH2, 12,5 mm	10,1	1,25	
RIGIPS PRO Fire+ Hydro typ DFH2, 15 mm	12,1	1,49	
RIGIPS PRO Duraline typ DFRIEH1, 12,5 mm	12,0	1,48	
RIGIPS PRO Duraline typ DFRIEH1, 15 mm	14,5	1,79	
4 PRO			
RIGIPS 4PRO typ A, 12,5 mm	8,8	1,09	
RIGIPS 4PRO Active Air, 12,5 mm	8,8	1,09	
RIGIPS 4PRO Hydro typ H2, 12,5 mm	8,8	1,09	
RIGIPS 4PRO Fire typ F, 12,5 mm	9,4	1,16	
PRO Aku			
RIGIPS PRO Aku typ A, 12,5 mm	12,0	1,48	
RIGIPS PRO Aku Hydro typ H2, 12,5 mm	12,1	1,49	
RIGIPS PRO Aku Fire+ typ DF, 12,5 mm	12,2	1,51	