

ENVIRONMENTAL PRODUCT DECLARATION

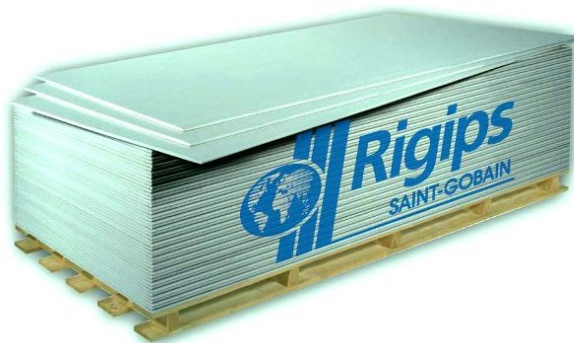
In accordance with EN 15804 and ISO 14025

Rigips RBI 12.5mm Moisture Resistant Board

Date: November 2015

Version : 1

Valid until : November 2020



The **environmental impacts** of this product have been assessed over its **whole life cycle**. Its Environmental Product Declaration has been verified by an **independent third party**.

 **EPD**®

THE INTERNATIONAL EPD® SYSTEM

N° VERIFICATION

SP - 00778

General information

Manufacturer: Saint-Gobain Construction Products Hungary Kft.

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

EPD registration number/declaration number: SP - 00778

PCR identification: EN 15804 as the core PCR, International EPD System CPC Division CONSTRUCTION PRODUCTS AND CONSTRUCTION SERVICES DATED 2015-03-03 Version 2 PCR + Saint Gobain Methodological Guide, which is used for reference but is not a PCR.

Site of manufacture: MÁTRA, Saint-Gobain Construction Products Hungary Kft., Plasterboard Plant, 3273, Halmajugra, Külterület, 047/3 hrsz.

Product / product family name and manufacturer represented: Saint Gobain Rigips RBI 12.5mm Moisture Resistant Board

Declaration issued: November 2015

Valid until: November 2020

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: Andrew Norton, Renuables based on the PCR mentioned above.

EPD Prepared by: Central SHEAR, Saint Gobain Gypsum. Contact. acagen-epd.gypsum@saint-gobain.com

The Declared unit is 1 m2 of Rigips Rigips RBI 12.5mm Moisture Resistant Board with a weight of 8.29 kg /m2.

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

Scope: Hungary, Albania, Kosovo, Macedonia, Serbia, Slovakia

CEN standard EN 15804 serves as the core PCR ^a	
PCR:	International EPD System CPC Division CONSTRUCTION PRODUCTS AND CONSTRUCTION SERVICES DATED 2015-03-03 VERSION 2
PCR review was conducted by:	The Technical Committee of the International EPD® System. Chair:
Independent verification of the declaration, according to EN ISO 14025:2010 <input type="checkbox"/> Internal <input checked="" type="checkbox"/> External	
Third party verifier:	
Accredited or approved by	The International EPD System Chair, Massimo Marino

Product description

Product description and use:

RF 12.5 mm – Fire resistant plasterboard with controlled density core with glass fibre and other additives, firmly bonded to strong paper liners. Fire resistant board is suitable for dry lining internal surfaces.

Description of the main product components and or materials:

Plasterboard is made up of a gypsum core with a paper liner.

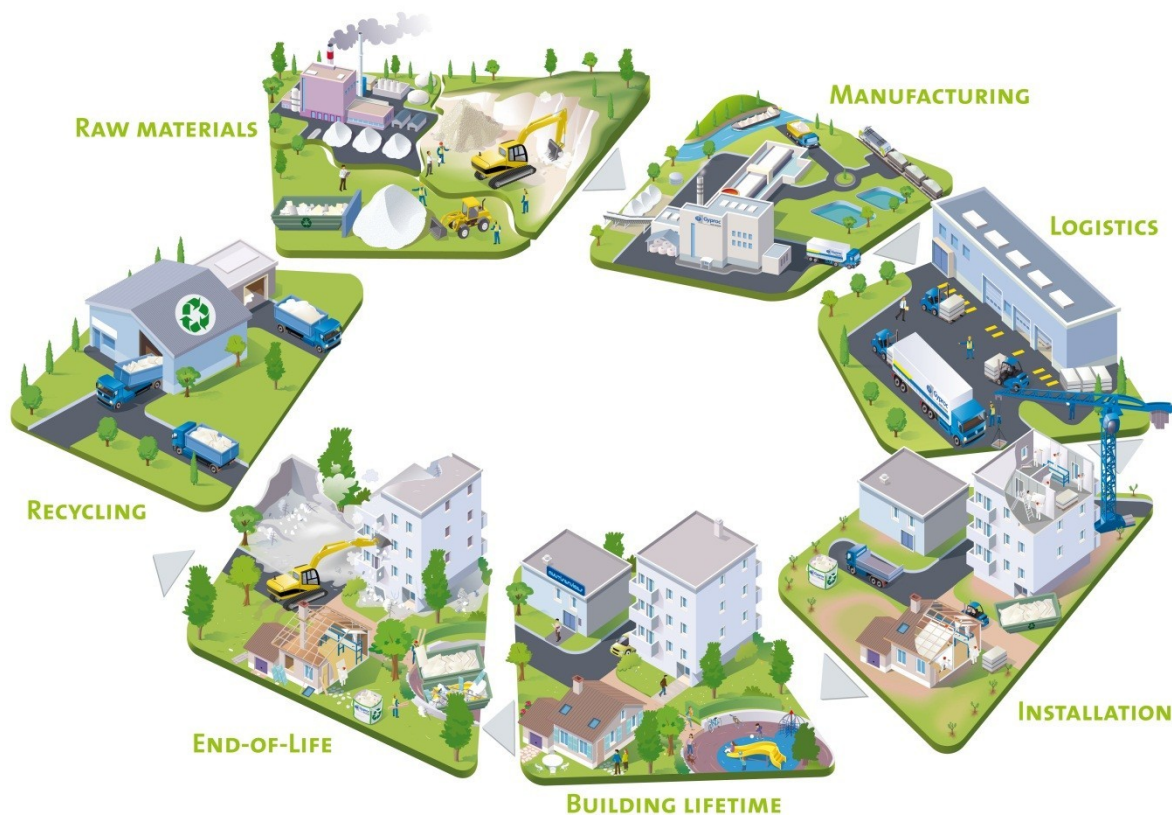
LCA calculation information

EPD TYPE DECLARED	Cradle to Gate with options
DECLARED UNIT	1 m2 of Rigips Rigips RBI 12.5mm Moisture Resistant Board with a weight of 8.29 kg /m2.
SYSTEM BOUNDARIES	Cradle to Gate with options: stages A1 - 3, A4 - A5, B1 - 7, and C1 - 4 .
REFERENCE SERVICE LIFE (RSL)	50 years, as per the Saint Gobain Methodological Guide
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.
GEOGRAPHICAL COVERAGE AND TIME PERIOD	Scope includes Hungary, Albania, Kosovo, Macedonia, Serbia, Slovakia Data included is collected from one production site, Mátra. Cradle to gate with options. Specific data was collected at the site for the reference year 2014.
PRODUCT CPC CODE	37520
CONTENT DECLARATION	No substances of very high concern.

According to ISO 21930, EPDs might not be comparable if they are from different programmes. EPD of construction products may not be comparable if they do not comply with EN 15804

Life cycle stages

Flow diagram of the Life Cycle



Product stage, A1-A3

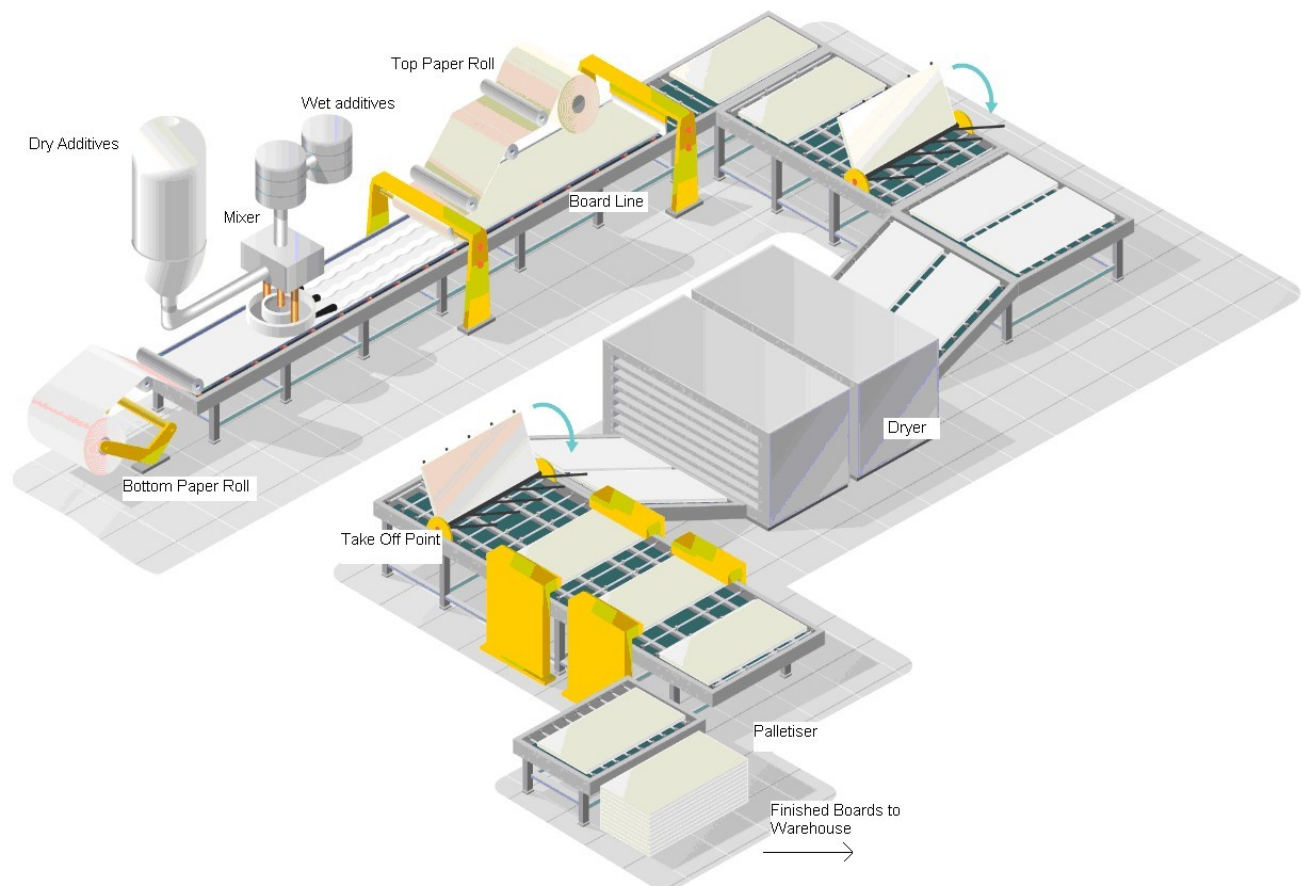
Description of the stage:

A1, raw material extraction and processing, processing of secondary material input (e.g. recycling processes). 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 transportation of each raw material.

A3, manufacturing, including provision of all materials, products and energy, as well as waste processing up to the end-of-waste state or disposal of final residues during the product stage. 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



Manufacture:

The initial materials are homogeneously 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:

A4, transport to the building site,

A5, installation into the building, including provision of all materials, products and energy, as well as waste processing up to the end-of-waste state or disposal of final residues during the construction process stage. These information modules also include all impacts and aspects related to any losses during this construction process stage (i.e. production, transport, and waste processing and disposal of the lost products and materials).

Transport to the building site:

PARAMETER	VALUE (expressed per functional/Functional unit)
Fuel type and consumption of vehicle or vehicle type used for transport e.g. long distance truck, boat, etc.	Truck, diesel , 0.33 litres per km
Distance	250 (km)
Capacity utilisation (including empty returns)	100 %
Bulk density of transported products	848 (kg/m3)
Volume capacity utilisation factor	1

Installation in the building:

PARAMETER	VALUE (expressed per functional/Functional unit)
Ancillary materials for installation (specified by materials)	Jointing compound 0.33 kg/m2 board, tape 1.60m /m2 board, screws 11 /m2 board
Water use	0.165 litres/m2 board
Other resource use	None
Quantitative description of energy type (regional mix) and consumption during the installation process	None modelled
Wastage of materials on the building site before waste processing, generated by the product's installation (specified by type)	Board: 0.41 kg (5 % scrap rate at installation) Screws: 0 kg Jointing Compound: 0.0165 kg Jointing Tape 0.0003 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: 0.41 kg to landfill Screws: 0 kg Jointing Compound: 0.0165 kg to landfill Jointing Tape: 0.0003 kg to landfill
Direct emissions to ambient air, soil and water	No direct emissions during installation.

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, including provision and transport of all materials, products and related energy and water use, as well as waste processing up to the end-of-waste state or disposal of final residues during this part of the use stage. These information modules also include all impacts and aspects related to the losses during this part of the use stage (i.e. production, transport, and waste processing and disposal of the lost products and materials).

Maintenance:

PARAMETER	VALUE (expressed per functional/Functional unit) / DESCRIPTION
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/Functional unit) / DESCRIPTION
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/Functional unit) / DESCRIPTION
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/Functional unit) / DESCRIPTION
Refurbishment process	None required during plasterboard lifetime
Refurbishment cycle	None required during plasterboard lifetime
Material input for refurbishment (e.g. bricks),	None required during plasterboard lifetime

including ancillary materials for the refurbishment process (e.g. lubricant, specify materials)	
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/Functional unit) / DESCRIPTION
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;

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/Functional unit) / DESCRIPTION
Collection process specified by type	8.29 kg collected with mixed construction
Recovery system specified by type	None
Disposal specified by type	8.29 kg disposed of in landfill
Assumptions for scenario development (e.g. transportation)	Gypsum waste is transported the following distances by road from construction / demolition sites to end of life treatment or disposal. Hungary; 20 km Slovakia; 50 km Serbia; 50 km Macedonia; 50 km Kosovo; 35 km

LCA results








The Declared unit is 1 m² of Rigips Rigips RBI 12.5mm Moisture Resistant Board with a weight of 8.29 kg /m².









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




CML 2001 has been used as the impact model. Specific data has been supplied by the plant for the manufacturing year 2014, and generic data come from the DEAM and Ecoinvent databases. The latest available modules have been used wherever possible, and all modules are linked to an Electricity factor for the year 2011.

All emissions to air, water, and soil, and all materials and energy used have been included, with the exception of long-term emissions (>100 years).





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
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	MNA

ENVIRONMENTAL IMPACTS															
Parameters		Product stage	Construction process stage		Use stage							End-of-life stage			
		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) - <i>kg CO₂equiv/FU</i>	1.9E+00	4.0E-03	1.8E-01	0	0	0	0	0	0	0	2.7E-02	3.9E-02	0	0
	Ozone Depletion (ODP) <i>kg CFC 11 equiv/FU</i>	5.9E-08	2.8E-09	2.1E-08	0	0	0	0	0	0	0	3.4E-09	2.7E-08	0	0
	Acidification potential (AP) <i>kg SO₂ equiv/FU</i>	5.5E-03	2.4E-05	6.4E-04	0	0	0	0	0	0	0	2.1E-04	2.4E-04	0	0
	Eutrophication potential (EP) <i>kg (PO₄)³⁻ equiv/FU</i>	1.2E-03	5.9E-06	1.5E-04	0	0	0	0	0	0	0	4.9E-05	5.8E-05	0	5.5E-04
	Photochemical ozone creation (POPC) <i>kg Ethylene equiv/FU</i>	4.9E-04	1.8E-06	6.1E-05	0	0	0	0	0	0	0	6.1E-05	1.7E-05	0	0
	Abiotic depletion potential for non-fossil resources (ADP-elements) - <i>kg Sb equiv/FU</i>	4.7E-07	3.4E-11	2.8E-08	0	0	0	0	0	0	0	4.3E-09	9.0E-11	0	0
	Abiotic depletion potential for fossil resources (ADP-fossil fuels) - <i>MJ/FU</i>	3.5E+01	5.0E-02	3.3E+00	0	0	0	0	0	0	0	3.8E-01	4.9E-01	0	0

RESOURCE USE															
Parameters		Product stage	Construction process stage		Use stage							End-of-life stage			
		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
	Use of renewable primary energy excluding renewable primary energy	2.2E+00	1.3E-04	4.3E-01	0	0	0	0	0	0	0	1.6E-03	3.3E-04	0	0
	Use of renewable primary energy used as raw materials MJ/FU	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials) MJ/FU		2.2E+00	1.3E-04	4.3E-01	0	0	0	0	0	0	0	1.6E-03	3.3E-04	0	0
	Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials MJ/FU	3.3E+01	5.0E-02	3.1E+00	0	0	0	0	0	0	0	3.8E-01	4.9E-01	0	0
	Use of non-renewable primary energy used as raw materials MJ/FU	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials) MJ/FU		3.3E+01	5.0E-02	3.1E+00	0	0	0	0	0	0	0	3.8E-01	4.9E-01	0	0
	Use of secondary material kg/FU	8.8E+00	0	4.6E-01	0	0	0	0	0	0	0	0	0	0	0
	Use of renewable secondary fuels- MJ/FU	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Use of non-renewable secondary fuels - MJ/FU	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Use of net fresh water - m³/FU	9.2E-03	4.7E-06	1.3E-03	0	0	0	0	0	0	0	5.1E-05	4.6E-05	0	0

WASTE CATEGORIES															
Parameters		Product stage	Construction process stage		Use stage						End-of-life stage				
		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 <i>kg/FU</i>	3.9E-02	1.1E-06	2.4E-03	0	0	0	0	0	0	0	0	1.1E-05	0	0
	Non-hazardous (excluding inert) waste disposed <i>kg/FU</i>	4.2E-01	1.2E-05	5.1E-01	0	0	0	0	0	0	0	0	5.2E-05	0	8.4E+00
	Radioactive waste disposed <i>kg/FU</i>	3.6E-05	7.9E-07	6.9E-06	0	0	0	0	0	0	0	0	7.8E-06	0	0

OUTPUT FLOWS

Parameters	Product stage	Construction process stage		Use stage							End-of-life stage			
	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 <i>kg/FU</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
 Materials for recycling <i>kg/FU</i>	3.4E-02	4.8E-08	2.8E-01	0	0	0	0	0	0	0	0	2.2E-07	5.0E-03	0
 Materials for energy recovery <i>kg/FU</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
 Exported energy, detailed by energy carrier <i>MJ/FU</i>	4.2E-05	1.6E-10	3.2E-05	0	0	0	0	0	0	0	0	4.0E-10	0	0

LCA results interpretation

The Declared unit is 1 m² of Rigips Rigips RBI 12.5mm Moisture Resistant Board with a weight of 8.29 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.

Comments

- Boards are bevelled during production to minimize material and water usage while jointing. The manufacturer's application instructions should be adhered to in order to attain maximum performance from systems built with this board and to maximize the lifetime of the product.
- Installed product needs no maintenance. Surface should be primed and/or plastered with gypsum based finishing plaster before applying paint or wall-paper on the surface. Surface can be painted several times during lifetime.
- Product should not be applied outdoor or in wet areas.
- Product shouldn't be mixed with communal waste when landfilling.
- There is an on-going project in the production plant to minimize water and energy consumption during production
- For further information please refer to Safety Data Sheet of the product at www.rigips.hu.

References;

General Program instructions of the International EPD System VERSION 2.5. DATE 2015-05-11

BS 15804: 2012 + A1 2013 Sustainability of construction works, - Environmental Product declarations Core rules for the product category of construction products

Environmental Product Declaration: Saint Gobain Methodological Guide for Construction products. April 2013.

ISO 14025:2006 Environmental labels and declarations -- Type III environmental declarations -- Principles and procedures

CONSTRUCTION PRODUCTS AND CONSTRUCTION SERVICES 2012:01 VERSION 2.0 VALID UNTIL: 2019-03-03

ISO 21930:2007 Sustainability in building construction -- Environmental declaration of building products