Environmental Product Declaration

In accordance with EN 15804 and ISO 14025

Thistle® SprayFinish

Publication Date:	02.02.2015
Validity:	5 years
Revision Date:	15.10.2021
Valid Until:	20.02.2026
Version:	2
Geographical Scope:	United Kingdom

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.

The International EPD® System Registration Number: S-P-00606

1. General information

Manufacturer: Saint-Gobain Construction Products UK Limited trading as British Gypsum

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

EPD registration number/declaration number: S-P-00606

PCR identification: The International EPD® System PCR 2012:01 version 2.33 for Construction Products. EN 15804 Sustainability of construction works.

Site of manufacture: The production site is Kirkby Thore, United Kingdom**.**
Owner of the declaration: Saint-Gobain House, East Leake, Loughborough, Leicestershire. LE12 6JU
Product / product family name and manufacturer represented: Thistle SprayFinish

Declaration issued:02.02.2015 **Revision date:**15.10.2021 **Valid until:**20.02.2026

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: Yves Coquelet (Saint-Gobain LCA analyst) and Tom Wire (Systems Project Coordinator).
Contact: bgtechnical.enquiries@bpb.com

Scope: The LCA is based on 2019 production data for one site in the United Kingdom.
This EPD covers information modules A1 to C4 + module D (cradle to grave) as defined in EN 15804:2012

Declared unit: 1kg of 25kg bagged Thistle SprayFinish applied to a depth of 2mm, covering 0.44 m² area. Therefore, 1m² area of Thistle SprayFinish applied to a depth of 2mm would require 2.3 kg of plaster.

Declaration of Hazardous substances: (Candidate list of Substances of Very High Concern): Not higher than 0.1% of the weight of the product.

Environmental management systems in place at site:	ISO 14001:2015 Certificate number EMS 543324
Occupational Health and Safety Management:	ISO 45001:2018 Certificate number OHS 550586
Quality management systems in place at site:	ISO 9001:2015 Certificate number FM 550533
Responsible Sourcing of Construction Products:	BES 6001: Issue 3.1 certificate number BES 613170
Energy Management System:	ISO 50001:2018 Certificate number ENMS 606206
Geographical scope of the EPD®:	United Kingdom

CEN standard EN 15804 serves as the core PCR[a]	
PCR:	PCR 2012:01 Construction products and Construction services, Version 2.33
PCR review was conducted by:	The Technical Committee of the International EPD® System. Chair: Massimo Marino. Contact via info@environdec.com
Independent verification of the declaration, according to EN ISO 14025:2010 **Internal ☐ External ☒**	
Third party verifier:	Andrew Norton , Renuables **http://renuables.co.uk**
Accredited or approved by	The International EPD System

2. Product description

2.1 Product description and use:

Thistle SprayFinish is designed for skim finishing large wall areas using a spray machine to automatically mix and apply the finishing plaster more quickly.

2.2 Application

Use it to finish low suction backgrounds like plasterboard, Glasroc F MultiBoard, Glasroc F FireCase, Rigidur H (pre-treated with Thistle GypPrime) and surfaces treated with Thistle Bond-it.

2.3 Technical data

Thistle SprayFinish conforms to EN 13279-1:2008, Gypsum binders and gypsum plasters. Definitions and requirements.

Type B7/50/6: Gypsum plaster for plasterwork with enhanced surface hardness with an initial setting time > 50 minutes and a compressive strength ≥ 6.0 N/mm².

EN Classification	B7/50/6
Fire Classification	A1
Gross Density	1250 kg/m³

2.4 Delivery status

The EPD refers to 1 kg of Thistle SprayFinish.

2.5 Base materials/Ancillary materials

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

Parameter	Part
Gypsum And Minerals	97%
Additives	3%
Total	**100%**
Packaging: Wooden Pallet	0.024kg per kg
Packaging: Bags	Bags are made of Paper and a small amount of PE, respectively 1,7 g of paper /kg and 0,4 g of PE/kg

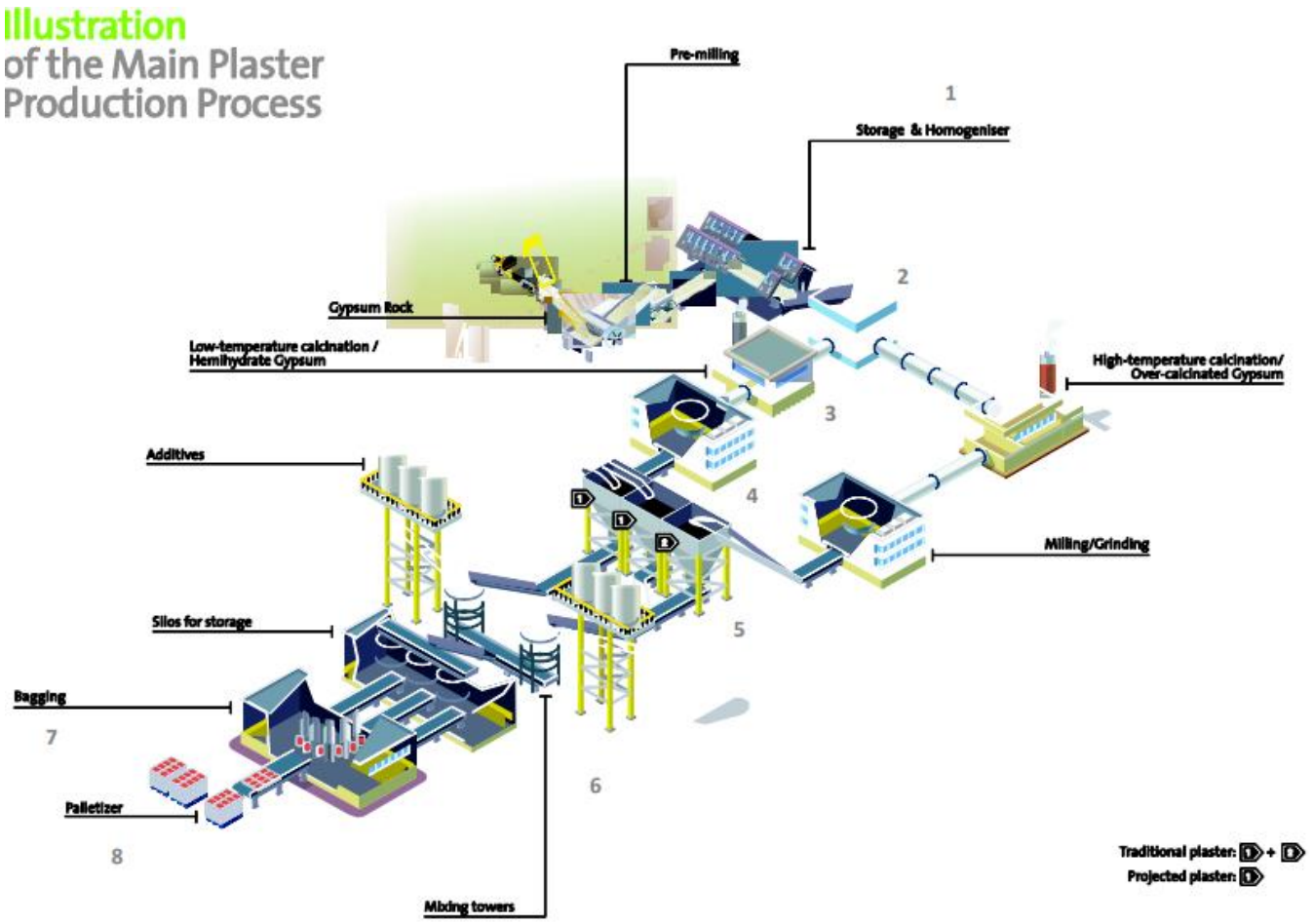
During the life cycle of the product any hazardous substance listed in the “Candidate List of Substances of Very High Concern (SVHC) for authorization” has not been used in a percentage higher than 0.1% of the weight of the product.

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

2.6 Manufacture

Thistle SprayFinish is manufactured using a continuous production process.

Manufacturing process flow diagram



1. Natural gypsum rock is stored in a layer formation in the homogenizer via the stacker conveyor. The reclaimer takes a cross section of the face and feeds this into the plant to regulate gypsum purity variation in the final product. The homogonised gypsum is conveyed to the process stream.
2. The Lopulco mill crushes the gypsum so that 75 - 95% passes through a 150µm mesh.
3. The natural gypsum is dehydrated in the kettle at around 150°C to produce the plaster powder.
4. The plaster powder is further milled into tube mills to a specific surface area within a range of 390 – 840m² /kg dependent upon the finish plaster required.
5. After the tube mill, the plaster powder passes through a screen to remove any particles larger than 750µm.
6. Minor additives are weighed, added and blended with the plaster powder in the mixing tower.
7. The finished product is packed into product specific bags. The plaster sacks are weighed and printed with unique codes detailing location, date, time of manufacture and use by date.
8. Each layer of plaster sacks is stacked in a 7 bag pattern.

2.7 Environment and health during manufacture

At British Gypsum, Health and Safety is a core value. The Company's aim is always to be injury-free. A target of zero accidents at work for employees, visitors and contractors is set by the business.

British Gypsum is managed to ISO 45001:2018 occupational Health and Safety Management Systems. To ensure that the Company's objectives are achieved, documented safety management systems are employed at each operational site and within the central functions. These include a systematic identification of hazards, assessment of the risks and the development of safe systems of work to eliminate or reduce any risks to an acceptable level. Audits and inspections are used to monitor standards of safety management, adherence to the law and Company procedures.

British Gypsum plants are managed through ISO 14001:2015 Certificate number EMS 543324 certified Environmental Management Systems. Saint-Gobain believes that climate change is one of the major threats to this generation and future generations. The organisation is committed to being part of the solution and consider two important distinct areas: Firstly, to reduce carbon emissions which come from buildings, in particular as they are used. It is currently estimated that between 35-40% of total UK & Irish greenhouse gas emissions come from buildings; and secondly, in reducing direct and indirect emissions which come from the operational footprint and activities.

The building sector produces one third of solid waste each year, and consumes half of Europe's natural resources. Moving away from a culture of take-use-dispose is one of the biggest challenges construction faces, and one of the biggest opportunities. To embrace a circular economy in construction action is needed in a number of areas, in particular: Focussing on deconstruction – not demolition, encouraging selective sorting of waste streams, moving away from landfill – including government legislation to make landfilling waste the least attractive option, training and education of contractors and other construction professionals, and making much greater use of secondary resources.

2.8 Product processing/Installation

General:
It is important to observe appropriate health and safety legislation when working on site, i.e. personal protective clothing and equipment, etc. The following notes are intended as general guidance only. In practice, consideration must be given to design criteria requiring specific project solutions.

Mixing:
The most common way to mix and apply Thistle SprayFinish is using a worm pump plastering machine. To learn how to do this with your chosen machine, please refer to the machine manufacturer's guidance. In general, the plaster's consistency should be slightly softer than that used for hand application.

Hand operation:
You can mix Thistle SprayFinish by hand or using a mechanical whisk with a slow speed and high torque. While mechanical mixing speeds up the process, there's no need to continue mixing after you've dispersed the lumps and reached the right consistency. Over-mixing wastes time and energy, and can affect setting times, reduce workability, and make it difficult to achieve a flat finish

2.9 Packaging

Thistle SprayFinish is supplied on returnable 100% recyclable pallets. All pallets are FSC certified. The pallet is supplied with a 100% recyclable pallet liner which the bags of plaster sit upon. The plaster bags are composed of bleached virgin and recycled paper fibres with an inner plastic film containing the plaster.

2.10 Condition of use

Thistle SprayFinish on plasterboard or an undercoat plaster provides a plastering system suitable for high wear areas. If the plaster is correctly applied, it should not require any form of maintenance.

2.11 Environment and health during use

Thistle SprayFinish is not classified as hazardous according to CLP.
Plaster may form an alkaline solution on contact with body moistures or when mixed with water.

2.12 Reference service life

Thistle SprayFinish is expected to last the service life of a building 50 years.

2.13 Re-use phase

Thistle SprayFinish can be recycled through British Gypsum's dedicated Plasterboard Recycling Service: 0800 6335040, bgprs@saint-gobain.com

2.14 Disposal

Waste from gypsum plasters is normally classified as 'non-hazardous, non-inert' and is fully recyclable. Please refer to the British Gypsum Plasterboard Recycling Service literature or contact the Plasterboard Recycling Customer Service Centre for details. Other methods of disposal are available. If a container of gypsum is sent to landfill, it must be deposited in a separate Monocell. The European waste catalogue code is 17 08 02. Always seek the advice of a trained and competent professional.

2.15 Further information

T: +44 (0) 115 945 6123
E: bgtechnical.enquiries@bpb.com

3. LCA calculation information

	EPD Type Declared	Cradle to Grave
3.1	**Declared Unit**	The declared unit is 1 kg Gyproc Thistle SprayFinish
3.2	**System Boundaries**	Cradle to Gate: stages A1 – 3, A4 – A5, B1 – 7, C1 – 4 and Module D
3.3	**Estimates And Assumptions**	Primary data was gathered from one production site in the UK. The distance to a waste disposal site is assumed to be 32km. The end of life and installation waste handling is taken from the Environment Agency's draft report 'An investigation into the disposal and recovery of gypsum waste'.
3.4	**Cut-Off Criteria**	Life Cycle Inventory data for a minimum of 99% of total inflows to the upstream and core module shall be included.
3.5	**Background Data**	All primary product data was provided by British Gypsum. All secondary data was retrieved using Gabi LCA software using Ecoinvent 3.6 (July 2018) and the Thinkstep Construction Products databases.
3.6	**Data Quality**	Primary data was gathered from British Gypsum production figures from one site in the United Kingdom during the production period 2019.
3.7	**Period Under Review**	The data is representative of the manufacturing processes of 2019.
3.8	**Allocations**	All production, recycling, energy and waste data has been calculated on a mass basis.
3.9	**Comparability**	EPD of construction products may not be comparable if they do not comply with EN15804.

4. 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 three modules A1, A2 and A3 respectively “raw material supply”, “transport to manufacturer” and “manufacturing”.

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

A2, transport to the manufacturer
The raw materials are transported to the manufacturing site. The modelling includes road, boat and/or train transportations of each raw material.

A3, manufacturing
This module includes the manufacture of products and the manufacture of packaging. The production of packaging material is taken into account at this stage. The processing of any waste arising from this stage is also included.

The LCA calculation has been made taking into account the fact that British Gypsum purchase 100% renewable electricity. The origin of the renewable electricity status is evidenced by Guarantee of Origin certificates (GOs), valid for the period chosen in the calculation (2019).

Construction process stage, A4-A5

Description of the stage: the construction process is divided into two 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. The distance quoted is a weighted average from the production site to the building site, calculated using post codes of our customers and quantity of product travelled.

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.	44 tonne articulated large goods vehicle (including payload of 24 tonnes) Diesel consumption 38 litres per 100 km travelled
Distance	Truck: 363 km
Capacity utilisation (including empty returns)	100% Capacity (89% empty returns)
Bulk density of transported products	1250 kg/m^3
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.

Figures quoted in the table are based on the Environment Agency's draft report 'An investigation into the disposal and recovery of gypsum waste'. This states that 83% of construction and demolition waste is sent to landfill with the remaining 17% recycled. British Gypsum encourages recycling construction waste. Construction sites use waste handlers, although we do not have representative data of how construction waste is dealt with. The figures quoted in the table are therefore likely to be a 'worst case scenario'.

Parameter	Value (expressed per functional/declared unit)
Ancillary materials for installation (specified by materials)	Non
Water use	0.7 litres/kg
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)	Plaster: 0,05 kg (5%)
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)	0,051 kg Thistle SprayFinish to landfill Packaging: Bags 1.7g paper and 0.4 g PE to landfill Pallet: 0.024 kg to recycling
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:
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.

End-of-life stage C1-C4

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

C1, de-construction, demolition;
C2, transport to waste processing;
C3, waste processing for reuse, recovery and/or recycling;
C4, disposal, including provision and all transport, provision of all materials, products and related energy and water use.

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

Parameter	Value (expressed per functional/declared unit)
Collection process specified by type	1.186 kg collected with mixed de-construction and demolition waste to landfill
Disposal specified by type	1.186 kg to landfill
Assumptions for scenario development (e.g. transportation)	44 tonne articulated large goods vehicle (including payload of 24 tonnes) Diesel consumption 38 litres per 100 km travelled 32 km from construction/demolition site to waste handler

Reuse/recovery/recycling potential, D

Description of the stage: An end of life recycling rate of 0% has been assumed.

5. LCA results

Description of the system boundary (X = Included in LCA).

CML 2001 has been used as the impact model. Specific data has been supplied by the plant, and generic data comes from GABI and Ecoinvent databases.
All emissions to air, water, and soil, and all materials and energy used have been included.

All figures refer to a declared unit of 1 kg installed plaster and with a specified function and an expected average service life of 50 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	X

Environmental Impacts

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 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*	2,86E-01	2,90E-02	2,48E-04	0	0	0	0	0	0	0	6,83E-03	7,44E-03	0	2,43E-02	0
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*	1,81E-08	4,44E-18	2,08E-14	0	0	0	0	0	0	0	9,31E-19	1,85E-18	0	1,36E-16	0
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 (chlorofluorocarbons or halons), which break down when they reach the stratosphere and then catalytically destroy ozone molecules.															
Acidification potential (AP) *kg SO_2 equiv./FU*	1,15E-03	1,16E-04	8,36E-07	0	0	0	0	0	0	0	2,40E-05	3,02E-05	0	1,39E-04	0
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*	7,26E-03	2,83E-05	1,67E-07	0	0	0	0	0	0	0	1,40E-06	7,66E-06	0	1,57E-05	0
Excessive enrichment of waters and continental surfaces with nutrients, and the associated adverse biological effects.															
Photochemical ozone creation (POPC) *kg Ethylene equiv./FU*	1,63E-05	4,24E-06	6,05E-08	0	0	0	0	0	0	0	1,61E-06	1,23E-06	0	1,14E-05	0
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*	8,05E-07	3,86E-10	1,20E-10	0	0	0	0	0	0	0	1,70E-10	6,45E-10	0	8,27E-09	0
Abiotic depletion potential for fossil ressources (ADP-fossil fuels) - *MJ/FU*	4,92E+00	4,04E-01	3,44E-03	0	0	0	0	0	0	0	8,51E-02	1,00E-01	0	3,24E-01	0
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 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 resources used as raw materials *MJ/FU*	1,31E+01	9,28E-03	3,99E-04	0	0	0	0	0	0	0	2,77E-04	6,00E-03	0	4,26E-02	0
Use of renewable primary energy used as raw materials *MJ/FU*	0	0	0	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*	1,31E+01	9,28E-03	3,99E-04	0	0	0	0	0	0	0	2,77E-04	6,00E-03	0	4,26E-02	0
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials - *MJ/FU*	5,24E+00	4,05E-01	3,63E-03	0	0	0	0	0	0	0	8,54E-02	1,01E-01	0	3,35E-01	0
Use of non-renewable primary energy used as raw materials *MJ/FU*	0	0	0	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*	5,24E+00	4,05E-01	3,63E-03	0	0	0	0	0	0	0	8,54E-02	1,01E-01	0	3,35E-01	0
Use of secondary material *kg/FU*	0	0	0	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 - *m³/FU*	2,88E-03	3,09E-06	5,62E-04	0	0	0	0	0	0	0	5,09E-07	1,01E-05	0	8,44E-05	0

Waste Categories

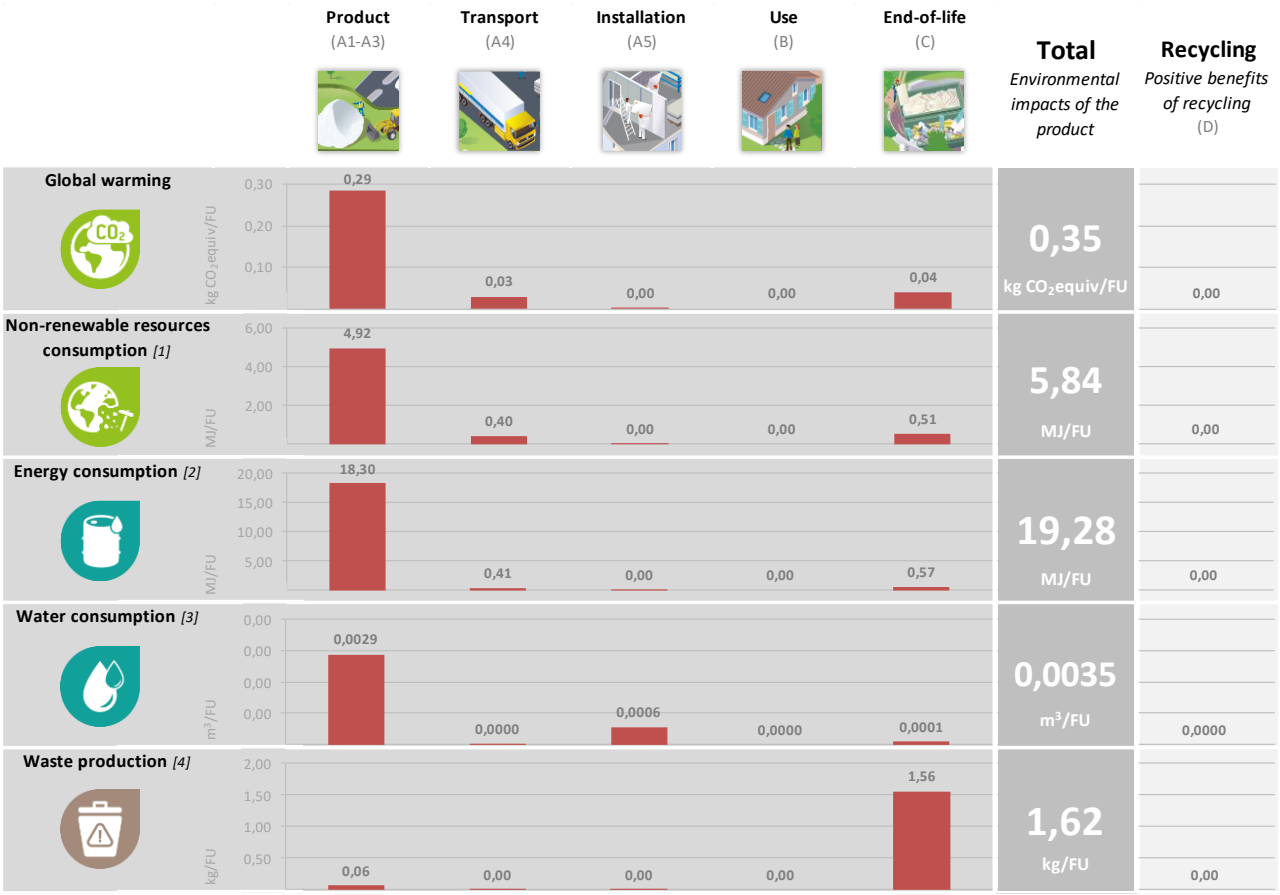
Parameters	Product stage	Construction process stage		Use stage							End-of-life stage				D Reuse, recovery, recycling
	A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	
Hazardous waste disposed *kg/FU*	2,71E-09	1,45E-09	5,57E-12	0	0	0	0	0	0	0	1,05E-11	5,61E-09	0	5,72E-09	0
Non-hazardous (excluding inert) waste disposed *kg/FU*	6,09E-02	4,91E-06	1,13E-04	0	0	0	0	0	0	0	1,26E-05	8,51E-06	0	1,56E+00	0
Radioactive waste disposed *kg/FU*	5,46E-06	4,73E-07	7,76E-08	0	0	0	0	0	0	0	1,05E-07	2,07E-07	0	4,45E-06	0

Output Flows

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 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*	1,54E-02	0	6,43E-01	0	0	0	0	0	0	0	0	0	0	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

6. LCA results interpretation

The following figure refers to a declared unit of 1kg installed plaster and with a specified function and an expected average service life of 50 years.



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

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

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

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

Global Warming Potential (Climate Change) (GWP)
When analysing the above figure for GWP, it can clearly be seen that the majority (approximately 80%) of contribution to this environmental impact is from the production modules (A1 – A3). CO_2 is released on site by the combustion of natural gas. Installation (A5) will generate the second highest percentage of greenhouse gas emissions primarily due to the use of jointing materials at this stage.

Non-renewable resources consumptions
We can see for consumption of non – renewable resources that the majority of contribution to this environmental impact is from the production modules (A1 – A3). This is because a large quantity of natural gas is consumed within the factory. The contribution to this impact from the other modules is very small and primarily due to the non – renewable resources consumed during installation (A5).

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 plaster so we would expect the production modules to contribute the most to this impact category. However, British Gypsum buy renewable electricity so there is no impact from this in non-renewable resources consumption.

Water Consumption
Water is used within the manufacturing facility and therefore we see the highest contribution in the production phase. However, British Gypsum's production methods maximise the use of recovered water, such as mine-water and leachate. Water abstracted from boreholes and reservoirs is also utilised so that water withdrawn from the public network is relatively low. The second highest contribution occurs in the installation site due to the water used in the jointing components.

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 83% of the product is assumed to be sent to landfill once it reaches the end of life state. The remaining 17% is recycled. The very small impact associated with installation is due to the loss rate of product during implementation.

7. References

PCR
The International EPD® System PCR 2012:01 version 2.33 for Construction Products and CPC 54 construction services.

Institut Bauen und Umwelt e.V., Königswinter (pub.): Product Category Rules for Building-Related Products and Services from the range of Environmental Product Declarations of Institut Bauen und Umwelt (IBU), Part A: Calculation Rules for the Life Cycle Assessment and Requirements on the Background Report, 1.2, April 2013.

Institut Bauen und Umwelt e.V., Königswinter (pub.): Product Category Rules for Building-Related Products and Services from the range of Environmental Product Declarations of Institut Bauen und Umwelt (IBU), Part B: Requirements on the EPD for Plasterboard. Version 1.7, January 2019.

1. EPD International (2017) General Programme Instructions for the International EPD® System. Version 3.0, dated 2017-12-11. www.environdec.com.
2. EN 15804:2012 + A1:2013 Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products
3. ISO 21930:2007 Sustainability in building construction – Environmental declaration of building products
4. ISO 14025:2011-10 Environmental labels and declarations – Type III environmental declarations – Principles and procedures
5. ISO 14040:2006 Environmental management. Life cycle assessment. Principles and framework
6. ISO 14044:2006 Environmental management. Life cycle assessment. Requirements and guidelines
7. European Chemical Agency, Candidate List of substances of very high concern for Authorisation. http://echa.europa.eu/chem_data/authorisation_process/candidate_list_table_en.asp
8. International Energy Agency IEA World Energy Balances 2013
9. EN 520:2004 + A1:2009 Gypsum plasterboards – Definitions, requirements and test methods

Standards:
BES 6001: Issue 3.1 certificate number BES 613170- Responsible sourcing of construction products.

ISO 45001: 2018 Certificate number OHS 550586- Occupational Health and Safety Management

EA 2012 Draft Report- An investigation into the disposal and recovery of gypsum waste. Environment Agency.

EN 13419 series- Indoor Air – superseded by ISO 16000

EN 15804:2012-04- Sustainability of construction works – Environmental Product Declarations – Core rules for the product category of construction products.

ISO 9001:2015 Certificate number FM 550533- Quality management systems - Requirements.

ISO 14001:2015 Certificate number EMS 543324- Environmental management systems – Requirements with guidance for use.

ISO 16000 series- Indoor Air