



ENVIRONMENTAL PRODUCT DECLARATION

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

Rigips Metal Profiles



THE INTERNATIONAL EPD® SYSTEM

The International EPD®

Programme operator: EPD international AB

Registration number:

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Scope of the EPD®: Europe



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

Programme information

PROGRAMME:	The International EPD® System
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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 1.3.2

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: Dr. Andrew Norton, a.norton@renuables.co.uk

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 Rigips GmbH Germany

Production plant(s): Schwerte, Germany

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

PCR identification PCR 2019:14 version 1.3.2 for Construction products

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

UN CPC CODE: 421 – Structural metal products and parts thereof

Owner of the declaration: Saint-Gobain Rigips, Germany

Product name and manufacturer represented: Rigips Metal Profiles

EPD® prepared by: Heike Zehnter (heike.zehnter@saint-gobain.com)

The intended use of this EPD is for B2B communication.

Geographical scope of the EPD®: Europe

EPD® registration number: EPD-IES-0015700

Declaration issued: 2024/07/24 **valid until:** 2029/07/18

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 1 kg of installed Rigips Metal Profiles with a useful life of 50 years.

Rigips Metal Profile is a product group that includes a large range of Rigips framing products, studs, channels, sheet angles and other specialistic profiles that are designed as framing components for gypsum plasterboard systems as well as for the construction of ceiling, adjustment brackets, couplings etc.

These products are all made using the same main raw material, galvanized steel coil graded DX51D+Z, and via the steel profiling technology used at the manufacturing site in Schwerte. While the ranges of product cover thicknesses 0.5 to 2.0 mm and lengths 1200 to 9000 mm, the energy required to manipulate/profile steel coils into the different Rigips products are very similar per mass (kg). Hence, it has been deemed suitable to produce an EPD for an average framing product to represent all metal profiles under the umbrella of Rigips Metal Profiles.

Technical data

Parameter	Value / Description	Classification
Type of material	Galvanised sheet steel	EN 10346
Material	DX51D+Z	
Corrosion protection	Double-sided 100g/m ² (Z100)	EN 14195
Fire behaviour	A1	EN 13501-1
Profile thickness	0.5 – 2.0 mm	

Declaration of the main product components and/or materials

Description of the main components and/or materials:

Product components	Mass [%]	Post-consumer recycled material weight [%]
Galvanised steel	> 99 %	0 %
Other components	< 1 %	0 %
Sum	100%	0 %
Packaging materials	Weight [kg/kg of saleable product]	Weight versus the product [%]
Sawnwood (using 5 times)	9.55E-03	94 %
Polyethylene strips	6.41E-04	6 %

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

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

LCA calculation information

TYPE OF EPD	Cradle to gate with options and optional modules (A+B+C+D)
DECLARED UNIT	1 kg of installed Rigips Metal profile
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 metal profiles 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	<p>In the case that there is not enough information, the process energy and materials representing less than 1% of the whole energy and mass used can be excluded (if they do not cause significant impacts). The addition of all the inputs and outputs excluded cannot be bigger than 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.</p> <p>The construction of production plant, the manufacture of machines, e.g., profiling-/ cutting-machines, and their transportation are excluded. The related are supposed to be negligible compared to the production of the building product when compared at these systems lifetime level.</p>
ALLOCATIONS	<p>Allocation has been avoided when possible and when not possible a mass allocation has been applied.</p> <p>The polluter pays and the modularity principles as well have been followed.</p>
GEOGRAPHICAL COVERAGE AND TIME PERIOD	<p>Scope: Europe</p> <p>Data is collected from one production site 2023 located in Schwerte</p> <p>Data collected for the year 2023</p>
BACKGROUND DATA SOURCE	The databases Sphera 2023.2 and ecoinvent v.3.9.1
SOFTWARE	Sphera LCA for experts (GaBi) 10

LCA scope

System boundaries (X=included. MND=module not declared)

	PRODUCT STAGE			CONSTRUCTION STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARY
	Raw material supply	Transport	Manufacturing	Transport	Construction-Installation process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-recovery
Module	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Modules declared	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Geo graphy	GLO	GLO	DE	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU
Specific data used	1%																
Variation products	0%																
Variation sites	0%																

Life cycle stages



A1-A3. Product stage

The product stage of plaster products is subdivided into 3 modules A1, A2 and A3 respectively “raw material supply”, “transport to manufacturer” and “manufacturing”.

A1. Raw materials supply

This module includes the extraction and transformation of raw materials.

A2. Transport to the manufacturer

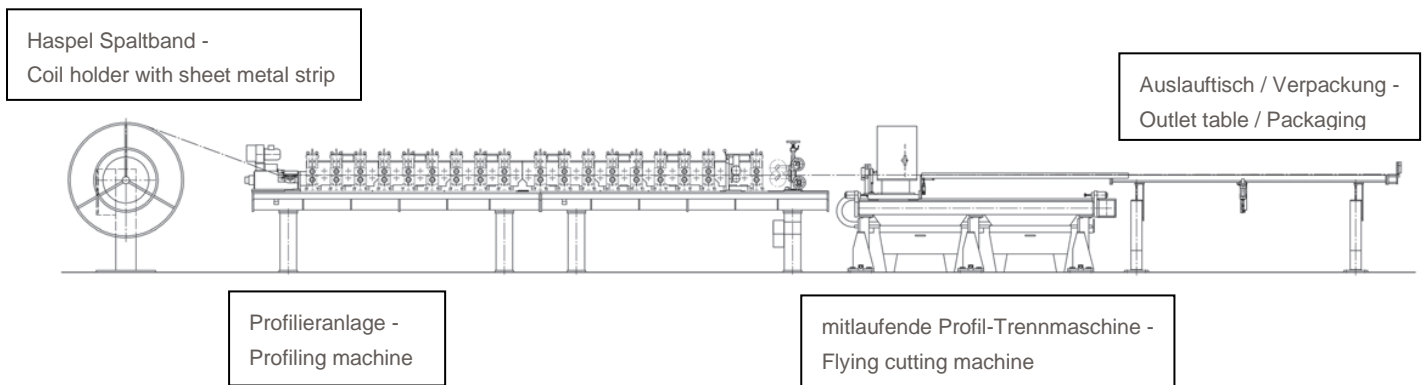
This module includes the transportation of raw materials and packaging to the manufacturing site. The modelling includes road, boat and/or train transportations.

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 figure above shows the main processes associated from Rigips Metal Profiles.

The manufacture of metal profiles for drywall is a continuous process in which steel coils are fed into a moulding line. The steel coil is passed through a series of contoured rollers to produce the desired profile, whereby a wide range of sub-materials can be produced. The number of rollers depends on the complexity of the profile to be produced.

A series of perforations are also made along the profile, which are necessary for the profile to be used during installation.

The profiles formed in this way are cut into different lengths, strapped with plastic tape in packs of several units depending on the profile type and finally grouped onto sawnwood.

A4-A5. Construction process stage

The construction process is divided into 2 modules: A4, Transport to the building site and A5, Installation in the building.

A4. Transport to the building site: This module includes transport from the production gate to the building site. Transport is calculated based on a scenario with the parameters described in the following table.

PARAMETER	VALUE
Fuel type and consumption of vehicle or vehicle type used for transport e.g., long distance truck, boat, etc	Freight truck, maximum load weight of 27 t, real load is 24 t and consumption of 0.38 liters per km
Distance	100 km
Capacity utilisation (including empty returns)	85% (30% empty returns)
Volume capacity utilisation factor	1

A5. Installation in the building:

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

PARAMETER	VALUE
Scrap rate at installation	5% for metal profiles 100% for packaging
Other resource use	None
Quantitative description of energy type (regional mix) and consumption during the installation process	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)	Metal profile scrap: 95% recycling, 5% landfill. Wooden squares (after using five times): 9.55E-03 kg (incineration with energy recovery). Polyethylene strips: 6.41E-04 kg (incineration with energy recovery). Paper labels: 2.12E-05 kg (incineration with energy recovery).
Direct emissions to ambient air, soil, and water	None

B1-B7. Use stage (excluding potential savings)

The use stage is divided into the following modules:

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

The product has a reference service life of 50 years. This assumes that the product will last in situ with no requirements for maintenance, repair, replacement, or refurbishment throughout this period. Therefore, it has no impact at this stage.

C1-C4. End of Life Stage

This stage includes the next modules:

C1: Deconstruction, demolition: The de-construction and/or dismantling of the product take part of the demolition of the entire building. In our case, the energy is considered is 0.05 MJ/m².

C2: Transport to waste processing

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

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

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

PARAMETER	VALUE/DESCRIPTION
Collection process specified by type	95% collected separately for recycling and 5% collected with mixed deconstruction and demolition waste sent to landfill (including e.g., screws)
Assumptions for scenario development (e.g. transportation)	Waste is transported 50 km by truck from deconstruction/demolition sites to landfill and 50 km by truck to recycling plant

D. Reuse/recovery/recycling potential

It was assumed that recovered steel scraps are used to produce steel billets/slabs produced via electric arc furnaces, which replace steel billets and slabs produced via blast furnaces.

Considering all the above, no benefits or loads are reported on stage D.

LCA results

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

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








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

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

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











Results refer to a declared unit of 1kg of installed Rigips Metal Profile. The following results refer to a single product manufactured in a single plant:

Environmental Impacts

		PRODUCT STAGE	CONSTRUCTION STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE LIFE CYCLE
			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	
	Climate Change [kg CO2 eq.]	3.29E+00	8.23E-03	2.43E-01	0	0	0	0	0	0	0	4.44E-03	2.99E-03	2.41E-03	7.49E-04	-1.33E+00
	Climate Change (fossil) [kg CO2 eq.]	3.25E+00	8.13E-03	2.16E-01	0	0	0	0	0	0	0	4.43E-03	2.95E-03	2.39E-03	7.47E-04	-1.33E+00
	Climate Change (biogenic) [kg CO2 eq.]	2.18E-02	1.89E-05	2.62E-02	0	0	0	0	0	0	0	4.53E-06	6.90E-06	7.65E-07	-4.60E-08	2.11E-03
	Climate Change (land use change) [kg CO2 eq.]	3.21E-03	5.79E-04	1.80E-04	0	0	0	0	0	0	0	8.45E-08	2.79E-05	1.83E-05	2.18E-06	-5.95E-04
	Ozone depletion [kg CFC-11 eq.]	8.43E-08	7.23E-16	4.17E-09	0	0	0	0	0	0	0	3.41E-16	2.64E-16	4.07E-15	2.81E-18	3.95E-12
	Acidification terrestrial and freshwater [Mole of H+ eq.]	7.53E-02	9.51E-06	3.86E-03	0	0	0	0	0	0	0	6.99E-06	1.78E-05	1.27E-05	5.44E-06	-3.03E-03
	Eutrophication freshwater [kg P eq.]	1.71E-03	3.01E-08	8.48E-05	0	0	0	0	0	0	0	8.58E-10	1.10E-08	8.27E-09	1.30E-09	-9.97E-08
	Eutrophication marine [kg N eq.]	5.27E-03	3.28E-06	2.94E-04	0	0	0	0	0	0	0	2.42E-06	8.71E-06	5.82E-06	1.40E-06	-7.28E-04
	Eutrophication terrestrial [Mole of N eq.]	3.04E-01	3.86E-05	1.54E-02	0	0	0	0	0	0	0	2.67E-05	9.66E-05	6.43E-05	1.54E-05	-7.88E-03
	Photochemical ozone formation - human health [kg NMVOC eq.]	1.57E-02	8.27E-06	8.82E-04	0	0	0	0	0	0	0	7.31E-06	1.64E-05	1.58E-05	4.24E-06	-2.43E-03
	Resource use, mineral and metals [kg Sb eq.] ¹	2.08E-04	5.36E-10	1.14E-05	0	0	0	0	0	0	0	4.49E-11	1.96E-10	2.60E-09	6.83E-11	-1.40E-08
	Resource use, energy carriers [MJ] ¹	5.42E+01	1.12E-01	3.23E+00	0	0	0	0	0	0	0	5.91E-02	4.10E-02	4.78E-02	9.95E-03	-9.96E+00
	Water deprivation potential [m³ world equiv.] ¹	1.78E+00	9.52E-05	9.16E-02	0	0	0	0	0	0	0	1.14E-05	3.47E-05	4.73E-04	7.95E-05	-1.92E-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.

Resource Use


Resources Use indicators	PRODUCT STAGE	CONSTRUCTION STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE LIFE CYCLE
	A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	D Reuse, recovery, recycling
 Use of renewable primary energy (PERE) [MJ] ²	3.98E+00	7.95E-03	3.10E-01	0	0	0	0	0	0	0	2.61E-04	2.90E-03	4.45E-03	1.30E-03	1.66E+00
 Primary energy resources used as raw materials (PERM) [MJ] ²	1.44E-01	0.00E+00	-1.05E01	0	0	0	0	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
 Total use of renewable primary energy resources (PERT) [MJ] ²	4.12E+00	7.95E-03	2.05E-01	0	0	0	0	0	0	0	2.61E-04	2.90E-03	4.45E-03	1.30E-03	1.66E+00
 Use of non-renewable primary energy (PENRE) [MJ] ²	5.42E+01	1.13E-01	3.23E+00	0	0	0	0	0	0	0	5.92E-02	4.11E-02	4.80E-02	9.96E-03	-1.01E+01
 Non-renewable primary energy resources used as raw materials (PENRM) [MJ] ²	1.86E-02	0.00E+00	9.24E-04	0	0	0	0	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
 Total use of non-renewable primary energy resources (PENRT) [MJ] ²	5.42E+01	1.13E-01	3.23E+00	0	0	0	0	0	0	0	5.92E-02	4.11E-02	4.80E-02	9.96E-03	-1.01E+01
 Input of secondary material (SM) [kg]	1.32E-01	0.00E+00	6.54E-03	0	0	0	0	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
 Use of renewable secondary fuels (RSF) [MJ]	0.00E+00	0.00E+00	0.00E+00	0	0	0	0	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
 Use of non-renewable secondary fuels (NRSF) [MJ]	0.00E+00	0.00E+00	0.00E+00	0	0	0	0	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
 Use of net fresh water (FW) [m3]	4.15E-02	0.00E+00	2.21E-03	0	0	0	0	0	0	0	4.24E-07	3.20E-06	1.37E-05	2.51E-06	-8.60E-04

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

Waste Category & Output flows



Waste Category & Output Flows	PRODUCT STAGE	CONSTRUCTION STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE LIFE CYCLE
	A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	D Reuse, recovery, recycling
 Hazardous waste disposed (HWD) [kg]	1.35E-03	4.17E-13	6.71E-05	0	0	0	0	0	0	0	1.71E-13	1.52E-13	-1.24E-13	1.52E-10	-2.54E-11
 Non-hazardous waste disposed (NHWD) [kg]	6.40E+00	1.62E-05	3.19E-01	0	0	0	0	0	0	0	1.22E-05	5.92E-06	1.26E-05	5.00E-02	-2.00E-02
 Radioactive waste disposed (RWD) [kg]	2.09E-03	1.46E-07	1.16E-04	0	0	0	0	0	0	0	6.84E-08	5.31E-08	6.43E-07	1.13E-07	1.77E-04
 Components for re-use (CRU) [kg]	0.00E+00	0.00E+00	7.45E-03	0	0	0	0	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
 Materials for Recycling (MFR) [kg]	2.04E-02	0.00E+00	1.01E-03	0	0	0	0	0	0	0	0.00E+00	0.00E+00	9.50E-01	0.00E+00	0.00E+00
 Material for Energy Recovery (MER) [kg]	0.00E+00	0.00E+00	0.00E+00	0	0	0	0	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
 Exported electrical energy (EEE) [MJ]	0.00E+00	0.00E+00	0.00E+00	0	0	0	0	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
 Exported thermal energy (EET) [MJ]	0.00E+00	0.00E+00	0.00E+00	0	0	0	0	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Additional voluntary indicators from EN 15804

	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
Environmental indicators															
 GWP-GHG [kg CO2 eq.] ³	3.26E+00	8.23E-03	2.17E-01	0	0	0	0	0	0	0	4.44E-03	2.99E-03	2.42E-03	7.51E-04	-1.33E+00

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

		PRODUCT STAGE
Biogenic Carbon Content		A1 / A2 / A3
	Biogenic carbon content in product [kg]	0.00E+00
	Biogenic carbon content in packaging [kg]	3.92E-03

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO2.

The product contains no biogenic carbon. Biogenic carbon content originates in timber packaging.

Additional information:

Electricity information

Saint-Gobain Rigips GmbH Germany based in 100% uses electricity with Guarantee of Origin certificate (GO's).

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

Type of information	Description
Location	Electricity purchased by Saint-Gobain
Share of electricity covered by Guarantee of Origin	100% of the energy consumption is covered by the GO
Energy sources for electricity	Share of energy sources: 100% energy from hydropower plants
Type of dataset	Cradle to gate from GaBi and ecoinvent databases
Source	Cradle to gate from Gabi and ecoinvent databases Guarantee of Origin certificate: Ökostrom Zertifikat Pfalzwerke
CO ₂ emission kg CO ₂ eq. / kWh	0.00614 kg of CO ₂ eq/kWh Climate Change - fossil indicator

Data quality

Inventory data quality is judged by geographical, temporal, and technological representativeness. To cover these requirements and to ensure reliable results, first-hand industry data crossed with LCA background datasets were used. The data was collected from internal records and reporting documents from 2023. After evaluating the inventory, according to the defined ranking in the LCA report, the assessment reflects 2023 inventory data quality.

Differences with previous versions of the EPD

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 1.3.2
5. European Chemical Agency, Candidate List of substances of very high concern for Authorization. <https://echa.europa.eu/candidate-list-table>
6. 2024-06-26 [Metal profile] LCA Report_PCR 1.3.2_Standard-RiDuce-Profile
7. BBSR-Table "Nutzungsdauer von Bauteilen zur Lebenszyklusanalyse nach Bewertungssystem Nachhaltiges Bauen (BNB)" from 2017.02.24: Service life of components for life cycle analysis according to the Sustainable Construction Assessment System (BNB); BBSR = Bundesinstitut für Bau-, Stadt- und Raumforschung (German Federal Institute)
https://www.bbsr.bund.de/BBSR/DE/startseite/_node.html
<https://www.nachhaltigesbauen.de/austausch/nutzungsdauern-von-bauteilen/>
8. Technical data sheets for Saint-Gobain Rigips Metal Profiles:
<https://www.rigips.de/produkte/rigiprofil-multitec-cw-125>
<https://www.rigips.de/produkte/rigiprofil-multitec-uw-125>
<https://www.rigips.de/produkte/rigips-wandprofil-lwa-60-60>
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