



# ENVIRONMENTAL PRODUCT DECLARATION

*In accordance with EN 15804 and ISO 14025*

Company name:	Saint-Gobain Sweden AB
Country:	Sweden
Website:	<a href="http://www.saint-gobain.se">www.saint-gobain.se</a>
EPD® registration number:	S-P-01256
Date of publication:	2018-03-28
Validity:	5 years
Valid until:	2023-03-27
Based on PCR 2012:	Construction products and construction services
Scope of the EPD®:	Nordic countries

## Saint-Gobain Silent wall- steel version

[www.environdec.com](http://www.environdec.com)



## General information

**Manufacturer:** Saint-Gobain Sweden AB, **Gyproc:** Kalmarleden 50, 746 24 Bålsta (Sweden), **Saint-Gobain Sweden AB, Weber :** Norra Malmvägen 76, 191 62 Sollentuna (Sweden), **Saint-Gobain Sweden AB, ISOVER:** Storgatan 29, 267 73 Billesholm (Sweden).

**Programme used:** The International EPD® System. More information at [www.environdec.com](http://www.environdec.com)

**EPD® registration number:** S-P-01256

**PCR identification :** PCR 2012 :01 Construction products and construction services version 2.2. Valid until 2019-03-03

**Product name and manufacturer represented:** Saint-Gobain Silent Wall Steel version; Gyproc Saint-Gobain Sweden, Weber Saint-Gobain Sweden, ISOVER Saint-Gobain Sweden.

**Owner of the declaration:** Saint-Gobain Sweden AB.

**EPD® prepared by:** Patrik Andersson, Saint-Gobain Sweden AB.

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**Declaration issued:** 2018-03-28, **valid until:** 2023-03-27

**Verification date:** 2018-03-27

EPD program operator	The International EPD® System. Operated by EPD® International AB. <a href="http://www.environdec.com">www.environdec.com</a> .
PCR review conducted by	The Technical Committee of the International EPD® System
<b>LCA and EPD® performed by ISOVER Saint-Gobain Sweden, Gyproc Saint-Gobain Sweden and Weber Saint-Gobain Sweden</b>	
<b>Independent verification of the environmental declaration and data according to standard EN ISO 14025:2010</b>	
Internal <input type="checkbox"/>	External <input checked="" type="checkbox"/>
<b>Verifier accredited by The International EPD® System</b> Marcel Gómez Ferrer Marcel Gómez Consultoría Ambiental ( <a href="http://www.marcelgomez.com">www.marcelgomez.com</a> ) Tlf 0034 630 64 35 93 Email: <a href="mailto:info@marcelgomez.com">info@marcelgomez.com</a> Approved by: The International EPD® System	
<a href="http://www.gyproc.se">www.gyproc.se</a> <a href="http://www.weber.se">www.weber.se</a> <a href="http://www.ISOVER.se">www.ISOVER.se</a>	

## Product description

### Product description and description of use:

This Environmental Product Declaration (EPD®) describes the Environmental impacts of 1 m<sup>2</sup> of the product Saint-Gobain Silent Wall Steel version.

**Saint-Gobain SILENT WALL** is an outside, light weight wall element intended for Multi-storey buildings. The wall concept is developed by Saint-Gobain with a combination of innovative products from ISOVER, Weber and Gyproc. It can be used as a non-load bearing exterior wall element. The wall provides a high level acoustic and thermal insulation in the dwellings where the solution is installed. It achieves a significant reduction (up to 48 dB) of exterior sound. The wall can be used in areas with an equivalent outside noise level of 65dB close the façade and still achieve sound class B according to Swedish Building regulations (BBR). Furthermore, the product is economical as it has a low thickness for the given U-value and it has a low weight per m<sup>2</sup>. It is moisture safe and ensures a low energy use in the building due to its good insulating property (U=0,16 W/m<sup>2</sup>/K).

## Composition of the product (from inside to outside) (for real thickness sold=350 mm)

1. Gyproc GNE Gipsskiva 12,5 mm, B 900mm x H 2500mm (Gypsum board)
2. Gyproc GHE Habito 12,5 mm, B 900mm x H 2500mm (Gypsum board)
3. Gyproc THU THERMOmonic U-profil, 45 mm (Steel profile)
4. Gyproc THZ THERMOmonic Z-profil, 45 mm (Steel profile)
5. ISOVER Stålsregelskiva 33 c450 (Glass wool)
6. ISOVER Vario® Xtra (Insulating plastic sheeting)
7. Gyproc THSP THERMOmonic, 170 mm/1 slitsad skena (Steel profile)
8. Gyproc THR THERMOmonic, 170 mm/1 slitsad regel (Steel profile)
9. ISOVER Stålsregelskiva 35 c600 (Glass wool)



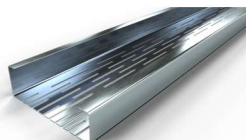
10. Glasroc H Storm, 9,5 mm, 1200 x H 2700mm vindskyddskiva (Wind sheathing composed by gypsum board reinforced with glass fibre)
11. Weber Therm 371 Premium 32 (Glass wool)
12. Weber Therm 340 Underlagsbruk (Stucco)
13. Weber Therm 342 Fasadbruk (Stucco)
- Weber Therm 312 Fäste TB 80 MM (Fixation system composed by stainless steel and polypropylene).
- Weber Therm 406 Skruv Torx (Screw, fixation system)
- Putsnät Weber 323 1000 mm (Metal grid)
- Putsnät Weber 323 250 mm (Metal grid)
- Putsnät Weber 323 500 mm (Metal grid)
- Weber Therm 325 Clips 40 mm (Fixing component made from polyethylene)

## Main components



### GYPROC GYPSUM BOARDS (numbers 1,2, 10)

The Gyproc plasterboard product range provides solutions for enhanced moisture, fire, acoustic, impact and thermal performance.



### GYPROC STEEL PROFILES (numbers 3, 4, 7, 8)

These materials made of galvanized steel are used as structuring elements for walls installation.



### ISOVER GLASS WOOL (numbers 5, 9, 11)

Thermal and acoustic insulation characterized by its light weight, made mainly by recycled glass. Non combustible (Euroclass A1/A2).



### Weber Serporoc Premium stucco system (numbers 12-15)

Mineral stucco system. Diffusion open and non combustible.

## Descriptive report

### Technical data/physical characteristics (for 350 mm thickness of product).

**Thermal resistance of Saint-Gobain Silent Wall steel version:** 6,3 K.m<sup>2</sup>.W<sup>-1</sup> (UNE EN 12667)

**Thermal conductivity of Saint-Gobain Silent Wall steel version:** 0,16 W/(m<sup>2</sup>.K) (UNE EN 12667)

**Resistance to fire:** EI60 (UNE EN 13501-1)

#### Acoustic properties:

- Sound reduction property for a wall without windows (R'Atr, 50-5000 Hz): 48 dB
- Sound reduction property for a wall with 20% window (with 40 dB sound reduction (R'Atr, 50-5000 Hz)): 45 dB

**Description of the main components and/or materials for 1 m<sup>2</sup> of Saint-Gobain Silent Wall (real thickness of the product) with a thermal resistance of 6,3 K\*m<sup>2</sup>\*W<sup>-1</sup> for the calculation of the EPD®.**

PARAMETER	VALUE (kg/m <sup>2</sup> )
Gyproc GNE Gipsskiva 12,5 mm	9,00 Kg
Gyproc GHE Habito 12,5 mm	12,00 Kg
ISOVER Stålsregelskiva 33 c450	1,40 Kg
ISOVER Vario® Xtra	0,10 Kg
Gyproc THU THERMOOnomic U-profil, 45 mm	0,90 Kg
Gyproc THZ THERMOOnomic Z-profil, 45 mm	0,30 Kg
Gyproc THSP THERMOOnomic, 170 mm/1 slitsad skena	1,60 Kg
Gyproc THR THERMOOnomic, 170 mm/1 slitsad regel	4,50 Kg
ISOVER Stålsregelskiva 35 c600	3,40 Kg
Glasroc H Storm, 9,5 mm	7,60 Kg
Weber Therm 371 Premium 32	5,50 Kg
Weber Therm 312 FÄSTE TB 80 MM 100ST/FÖRP	0,50 Kg
Weber Therm 406 SKRUV TORX 4,8X45MM 200 ST	0,03 Kg
Weber 323 PUTSNÄT 1000MM BREDD/25M RULLE 16/P	0,80 Kg
Weber 323 PUTSNÄT 250MM BREDD/25M RULLE 64/P	0,03 Kg
Weber 323 PUTSNÄT 500MM BREDD/25M RULLE 32/P	0,03 Kg
Weber Therm 325 CLIPS 40MM 3000ST/FP	0,04 Kg
Weber Therm 340 Underlagsbruk	20,0 Kg
Weber Therm 342 Fasadbruk	20,0 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<sup>1</sup>” has been used in a percentage higher than 0,1% of the weight of the product.

<sup>1</sup> [http://echa.europa.eu/chem\\_data/authorisation\\_process/candidate\\_list\\_table\\_en.asp](http://echa.europa.eu/chem_data/authorisation_process/candidate_list_table_en.asp)

## LCA calculation information

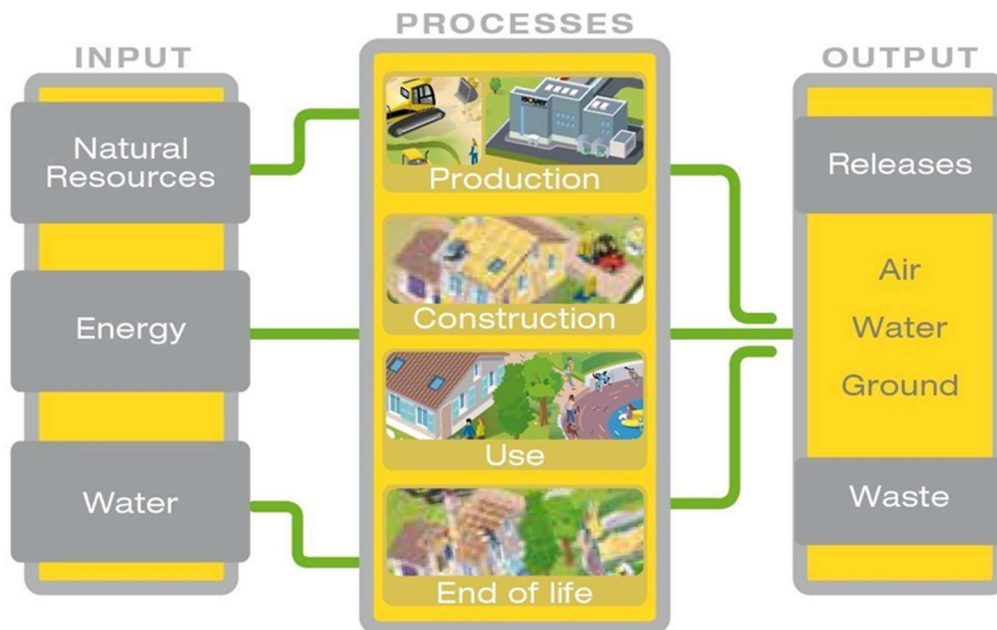
<b>FUNCTIONAL UNIT</b>	The functional unit is the manufacturing, transportation to customer, installation, use and end of life of 1 m <sup>2</sup> Saint-Gobain Silent Wall Steel Version with a thermal resistance of 6,3 K*m <sup>2</sup> *W <sup>-1</sup> .
<b>SYSTEM BOUNDARIES</b>	Cradle to Grave: Included stages = A1-3, A4-5, B1-7, C1-4. Module D has not been considered.
<b>REFERENCE SERVICE LIFE (RSL)</b>	50 years
<b>CUT-OFF RULES</b>	<p>Less than 1% of the whole energy and mass used has been excluded. Flows related to human activities such as employee transport are excluded.</p> <p>The construction of plants, production of machines and transportation systems are excluded since the related flows are supposed to be negligible compared to the production of the building product when compared at these systems lifetime level.</p>
<b>ALLOCATIONS</b>	Allocation criteria are based on mass
<b>GEOGRAPHICAL COVERAGE AND TIME PERIOD</b>	Nordic countries 2017

- “EPDs of construction products may be not comparable if they do not comply with EN 15804”
- “Environmental Product Declarations within the same product category from different programs may not be comparable”



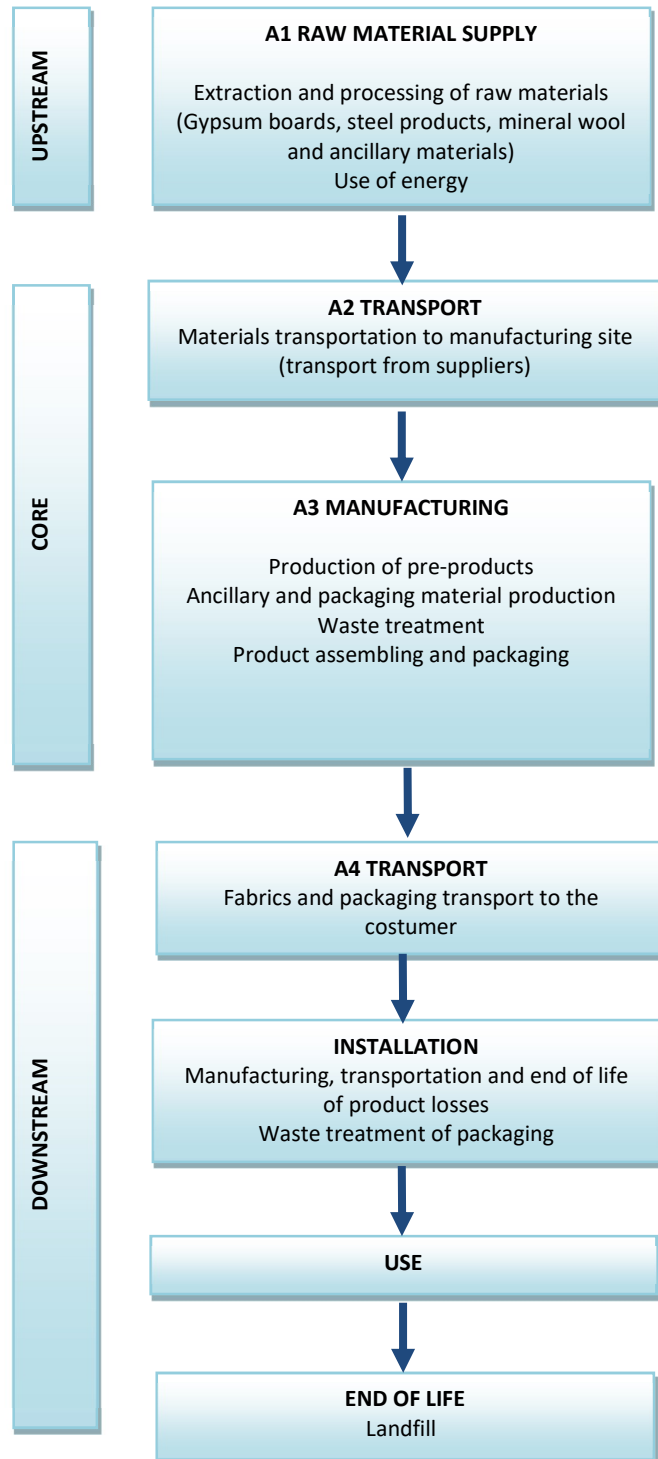
## Life cycle stages

### *Flow diagram of the Life Cycle*



Below is presented a diagram showing the system boundaries, and the stages and processes to produce 1m<sup>2</sup> of Saint-Gobain Silent Wall steel version.

## SYSTEM BOUNDARIES



## Product stage, A1-A3

**Description of the stage:** the product stage of Saint-Gobain Silent Wall is subdivided into 3 modules A1, A2 and A3 respectively “Raw material supply”, “Transport” and “Manufacturing”.

The aggregation of the modules A1, A2 and A3 is a possibility considered by the EN 15 804 standard. This rule is applied in this EPD®.

For these modules, the environmental performance results published on the EPD's of the main components of the Saint-Gobain Silent Wall are used as input data. For the components that doesn't have a published EPD, the Ecoinvent database v 3.3 has been used.

### Description of the scenarios and other additional technical information:

#### A1, Raw materials supply

This module considers the extraction and processing of all raw materials and energy which occur upstream of the studied manufacturing.

#### A2, Transport to the manufacturer

The raw materials are transported to the manufacturing site. In our case, the modelling includes: road transportations (average values) of each raw material.

#### A3, Manufacturing

This module includes the manufacturing of the components of the product and their packaging, as well as the assembling of Silent Wall Steel Version façade.

## 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/DESCRIPTION
Fuel type and consumption of vehicle or vehicle type used for transport e.g. long-distance truck, boat, etc.	Average truck trailer EURO6 with a 32t payload, diesel consumption of 31 litres for 100 km
Distance	Due to the large number of products that compose the Saint-Gobain Silent Wall construction system, only the minimum and maximum distances are indicated. 277 km (minimum) 1.324 km (maximum)
Capacity utilisation (including empty returns)	100 % of the capacity % of empty returns assumed in Ecoinvent 3.3
Bulk density of transported products	Saint-Gobain Silent Wall Steel Version whole system: 223 kg/m <sup>3</sup>
Volume capacity utilisation factor	1



**A5, Installation in the building:** this module includes:

- Ancillary materials used during the installation of the product
- Waste produced during the installation of the product
- Transportation to waste manager
- Additional manufacturing processes done to compensate losses
- Packaging waste transportation and processing, which are 100% collected and recycled

PARAMETER	VALUE/DESCRIPTION
Ancillary materials used during installation of the product	Water: 7,2 l/m <sup>2</sup>
Wastage of materials on the building site before waste processing, generated by the product's installation (specified by type)	0 % (pre-fabricated façade)
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)	Product packaging waste is 100% collected and recycled.

## Use stage (excluding potential savings), B1-B7

**Description of the stage:** the use stage is divided into the following modules:

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

**Description of the scenarios and additional technical information:**

Once installation is complete, no actions or technical operations are required during the use stages until the end of life stage. Therefore, Saint-Gobain Silent Wall has no impact (excluding potential energy savings not included in this EPD®) on this stage.

## End of Life Stage, C1-C4

**Description of the stage:** this stage includes the next modules:

### C1, Deconstruction, demolition

The de-construction and/or dismantling of the product take part of the demolition of the entire building. In our case, the environmental impact is assumed to be very small and therefore has been neglected.

### C2, Transport to waste processing

This stage covers the transportation of the arising waste of the product in its end of life (see the next table below for further information about waste transportation assumptions).

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

The product is considered to be landfilled without reuse, recovery or recycling.

### C4, Disposal

Saint-Gobain Silent Wall is assumed to be 100% landfilled as inert waste (non-hazardous).

**Description of the scenarios and additional technical information.**

**End of life:**

PARAMETER	VALUE/DESCRIPTION
Collection process specified by type	87,73 Kg (collected with mixed construction waste)
Recovery system specified by type	No re-use, recycling or energy recovery
Disposal specified by type	87,73 Kg landfilled
Assumptions for scenario development (e.g. transportation)	Average truck trailer EURO6 with a 16-32t payload, diesel consumption of 24 litres for 100 km
	50 km of average distance to landfill

## Reuse/recovery/recycling potential, D

### Description of the stage:

The module D quantifies the environmental benefits of recycling and/or reuse. In this EPD® the Module D has not been considered.

## LCA results

Simapro 8.3 software has been used. CML v 4.1 impact method has been used. EDIP 2003 impact model has been used for the calculation of waste production indicators. Raw materials and energy consumption for ISOVER-Saint Gobain, Gyproc-Saint Gobain and Weber-Saint Gobain products, as well as transport distances have been taken directly from their respective EPDs where available. Ecoinvent 3.3 database has been used to obtain the inventory of generic data.








The table below describes the scope of the inventory performed in the LCA according to PCR 2012:01 Construction products and construction services version 2.2.

Product stage			Construction process stage		Use stage								End of stage				Resource recovery stage
Raw materials Transport Manufacturing	A1	A2	A3	A4	A5	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
	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	MND

X: Module accounted for









MND: Module Not Declared

# ENVIRONMENTAL IMPACTS SILENT STEEL VERSION (350 mm thickness)

Parameters	Product stage	Construction stage	Use stage								End of life stage				D Reuse, recovery, recycling
	A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	
 Global Warming Potential (GWP) - <i>kg CO<sub>2</sub> equiv/FU</i>	4,83E+01	2,93E+00	2,67E-03	0	0	0	0	0	0	0	0	3,86E-01	0,00E+00	4,66E-01	MND <sup>2</sup>
	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) <i>kg CFC 11 equiv/FU</i>	1,75E-06	5,72E-07	2,63E-10	0	0	0	0	0	0	0	0	7,60E-08	0,00E+00	1,57E-07	MND
	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) <i>kg SO<sub>2</sub> equiv/FU</i>	1,99E-01	1,06E-02	1,32E-05	0	0	0	0	0	0	0	0	1,07E-03	0,00E+00	3,51E-03	MND
	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) <i>kg (PO<sub>4</sub>)<sup>3-</sup> equiv/FU</i>	2,67E-02	1,93E-03	6,57E-06	0	0	0	0	0	0	0	0	2,25E-04	0,00E+00	7,47E-04	MND
	Excessive enrichment of waters and continental surfaces with nutrients, and the associated adverse biological effects.														
 Photochemical ozone creation (POPC) <i>Ethene equiv/FU</i>	2,94E-02	5,50E-04	8,56E-07	0	0	0	0	0	0	0	0	6,31E-05	0,00E+00	1,72E-04	MND
	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 resources (ADP-elements) - <i>kg Sb equiv/FU</i>	1,94E-03	5,40E-06	8,86E-09	0	0	0	0	0	0	0	0	7,41E-07	0,00E+00	5,21E-07	MND
 Abiotic depletion potential for fossil resources (ADP-fossil fuels) - <i>MJ/FU</i>	6,60E+02	4,98E+01	3,14E-02	0	0	0	0	0	0	0	0	6,60E+00	0,00E+00	1,40E+01	MND
	Consumption of non-renewable resources, thereby lowering their availability for future generations.														




<sup>2</sup> MND= Module Not Declared

# RESOURCE USE SILENT STEEL VERSION (350 mm thickness)

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	1,23E+02	7,03E-01	4,73E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	9,09E-02	0,00E+00	3,35E-01	MND	
 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	1,23E+02	7,03E-01	4,73E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	9,09E-02	0,00E+00	3,35E-01	MND	
 Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials - MJ/FU	6,60E+02	4,98E+01	3,14E-02	0	0	0	0	0	0	0	0	6,60E+00	0,00E+00	1,40E+01	MND	
 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	6,60E+02	4,98E+01	3,14E-02	0	0	0	0	0	0	0	0	6,60E+00	0,00E+00	1,40E+01	MND	
 Use of secondary material Kg/FU	1,27E+01	0	0	0	0	0	0	0	0	0	0	0	0	0	MND	
 Use of renewable secondary fuels- MJ/FU	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
 Use of non-renewable secondary fuels - MJ/FU	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
 Use of net fresh water - m³/FU³	1,73E-02	1,13E-02	8,43E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,52E-03	0,00E+00	1,46E-02	MND	





<sup>3</sup> Neither the use of water in turbine use or cooling during the production of hydraulic and nuclear electricity have been taken into account.

WASTE CATEGORIES SILENT STEEL VERSION (350 mm thickness)

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	5,70E-01	2,71E-05	1,06E-07	0	0	0	0	0	0	0	0,00E+00	3,60E-06	0,00E+00	9,20E-06	MND
 Non-hazardous waste disposed kg/FU	5,75E+00	3,87E+00	2,77E-04	0	0	0	0	0	0	0	0,00E+00	5,34E-01	0,00E+00	8,77E+01	MND
 Radioactive waste disposed kg/FU	8,66E-03	3,26E-04	2,48E-07	0	0	0	0	0	0	0	0,00E+00	4,32E-05	0,00E+00	8,91E-05	MND



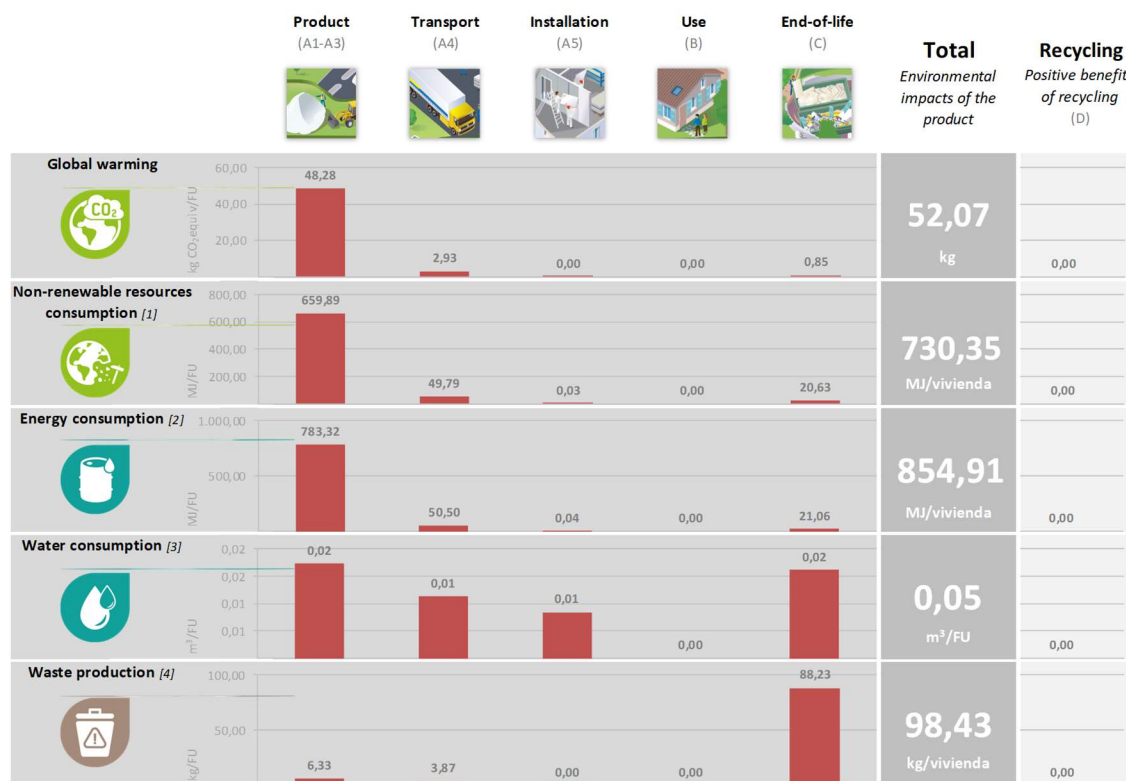
OTHER OUTPUT FLOWS SILENT STEEL VERSION (350 mm thickness)

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	-	-	-	-	-	-	-	-	-	-	-	-	-	-	MND
 Materials for recycling kg/FU	0	0	4,72E+00	0	0	0	0	0	0	0	0	0	0	0	MND
 Materials for energy recovery kg/FU	-	-	-	-	-	-	-	-	-	-	-	-	-	-	MND
 Exported energy MJ/FU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	MND

# LCA interpretation

The Product stage (A1-A3) is the life cycle stage with the biggest impact, since it represents more than 90% of the whole impact of the product for the next impact categories: Global warming, Non-renewable resources consumption and Energy consumption.

Waste production is mainly produced during the End of life stage (89% of the whole impact).



[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.

## Bibliography

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- General Programme Instructions for the International EPD® System, version 2.5.
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