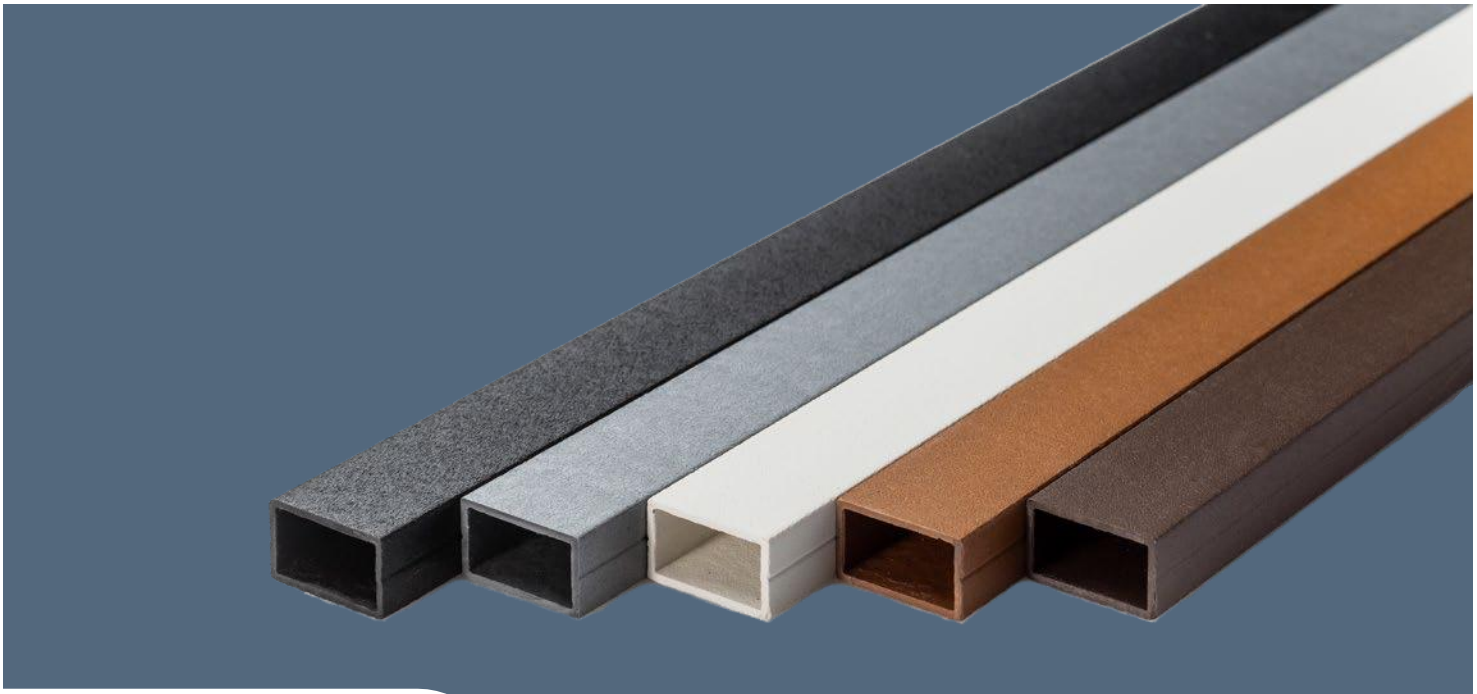

The environmental impacts of this product have been assessed over its whole life cycle. Its Environmental Product Declaration has been verified by an independent third party.

ENVIRONMENTAL PRODUCT DECLARATION

In accordance with ISO 14025 and EN 15804 and
PCR 2012:01 Construction products and construction services, version 2.33 / 2020-09-18

SWISSPACER Georgian bars

Dimensions : 8 mm x 20 mm / 8 mm x 24 mm / 8 mm x 30 mm / 10 mm x 20 mm / 10 mm x 24 mm / 10 mm x 30 mm / 12 mm x 18 mm / 12 mm x 20 mm / 12 mm x 24 mm / 12 mm x 30 mm / 14 mm x 24 mm / 14 mm x 30 mm / 16 mm x 18 mm

Date of publication	2022-01-21
Validity	5 years
Valid until	2027-01-20
Version:	1

Scope of the EPD® Europe

Registration number
The International EPD® System:
S-P-04677

SWISSPACER
The edge of tomorrow.

ECO PLATFORM EPD EN 15804 VERIFIED

EPD®
THE INTERNATIONAL EPD® SYSTEM

General information

The EPD owner has the sole ownership, liability and responsibility for the EPD.

Manufacturer
Vetrotech Saint-Gobain (Int.) AG
Zweigniederlassung Kreuzlingen SWISSPACER
Sonnenwiesenstrasse 15
8280 Kreuzlingen, Switzerland

Programme used
The International EPD® System
More information at www.environdec.com

EPD registration number
S-P-04677

PCR identification
EN 15804 Sustainability of construction works – Environmental product declaration – core rules for the product category of construction product and PCR 2012:01 Construction products and construction services, version 2.33 / 2020-09-18

Owner of the declaration
Vetrotech Saint-Gobain (Int.) AG
Zweigniederlassung Kreuzlingen SWISSPACER
Sonnenwiesenstrasse 15
8280 Kreuzlingen, Switzerland

CPC Classification
37113 “Float glass and surface ground or polished glass, in sheets.”

Product name and manufacturer represented
SWISSPACER Georgian bars
Manufacturer:
Vetrotech Saint-Gobain (Int.) AG
Zweigniederlassung Kreuzlingen SWISSPACER
Sonnenwiesenstrasse 15
8280 Kreuzlingen, Switzerland

Plants
Kreuzlingen (Switzerland)

EPD prepared by
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Declaration issued
2022-01-21, valid until: 2027-01-20

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Accredited or approved by
The International EPD® System

CEN standard EN 15804 and standard EN 17074 serve as the core Product Category Rules (PCR)

LCA and EPD performed by	Saint-Gobain LCA central team
EPD program operator **Operated by**	The International EPD® System. EPD International AB, www.environdec.com
PCR review conducted by	Technical Committee of the International EPD® System International EPD® System: Massimo Marino Contact via info@environdec.com

Independent verification of the Environmental Product Declaration and data according to standard EN ISO 14025:2010

○ Internal ● External

EPDs within the same product category but from different programs may not be comparable.
EPDs of construction products may not be comparable if they do not comply with EN 15804.
For further information about comparability, see EN 15804 and ISO 14025.

Product description

Product description and description of use
This Environmental Product Declaration (EPD®) describes the environmental impacts of 1 linear metre of Georgian bars with the dimension of 12 mm x 24 mm and with a weight of 100,6 grams.

With Georgian bars from SWISSPACER you can offer windows that are both aesthetically highly appealing and also of the very finest quality. The Georgian bars are made from the same proven material as the SWISSPACER spacer bar and available in all the popular SWISSPACER colours. They therefore improve not only the look but in particular the energy efficiency of every window. Cold bridging in the insulated glass unit is avoided, and unlike bars made from aluminium, the thermally optimised bars from SWISSPACER have only a minor impact on the Uw value of the window.

The SWISSPACER Georgian bars last for the average building's lifetime (which is often set at 50 years as a default), or as long as the insulated building component is part of the building.

Physical characteristics
Metal bars inside the insulated glass unit have a negative impact on energy efficiency. According to EN 1435-1, a figure of up to 0.3 W/m²K should be added to the U w value when using SWISSPACER Georgian bars.

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

Parametre	Value
Weight for 1 linear metre of the product	100.6 g
Dimension	12 mm x 24 mm

Components	Weight (in %)
Polymer resin	More than 98 %
Color pigment	Less than 2 %

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 been used in a percentage higher than 0,1% of the weight of the product.

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

LCA calculation information

DECLARED UNIT
1 linear metre of 12 mm x 24 mm with a weight of 100,6 grams of a SWISSPACER Georgian bar

SYSTEM BOUNDARIES
Cradle to Gate. Mandatory stages = A1-A3

REFERENCE SERVICE LIFE (RSL)
N/A; boundaries are cradle-to-gate – Thinkstep 2020

CUT-OFF RULES
All significant parametres shall be included. According to EN 15804, mass flows under 1% of the total mass input; and/or energy flows representing less than 1% of the total primary energy usage of the associated unit process may be omitted. However, the total amount of energy and mass omitted must not exceed 5% per module.

Substances of Very High Concern (SVHC), as defined in the REACH Regulation (article 57), in a concentration above 0.1% by weight, in glass final products, shall be included in the Life Cycle Inventory and the cut-off rules shall not apply.

Flows related to human activities such as employee transport are excluded. 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.

GEOGRAPHICAL COVERAGE AND TIME PERIOD
The information was established over the year 2020. The information collected comes from the European sites producing SWISSPACER.

Background data – ecoinvent 3.6

SOFTWARE
GaBi 9.2.0 – GaBi Envision

ALLOCATIONS
Allocation criteria are based on mass. The polluter pays principle as well the modularity principles have been followed.

According to EN 15804, EPD of construction products may not be comparable if they do not comply with this standard. According to ISO 21930, EPD might not be comparable if they are from different programmes. The EPD owner has the sole ownership, liability, and responsibility for the EPD. The pretended use of the EPD is for B2B and B2C communication.

Life cycle stages

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	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	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

Product stage, life cycle modules A1-A3

Description of the stage:
The product stage is subdivided into the three modules A1, A2 and A3 or “Raw material supply”, “Transport” and “Manufacturing”. Declaration of these modules in an aggregated module A1-A3 is one possibility considered by the standard EN 15804. This rule was applied for this EPD.

Description of the scenarios and other additional technical information:

A1 Raw materials supply
This module takes into account the extraction and processing of all raw materials and energy consumption upstream of the studied manufacturing process.

A2 Transport
The raw materials are transported to the manufacturing site. The modelling includes: road, boat and train (average values).

A3 Manufacturing
This module includes the production as well as the packaging of the Georgian bars. In this step, the loss rate and the amount of packaging waste (cardboard and packaging foil) are taken into account.
SWISSPACER is not only a manufacturer of high quality spacer bars for the insulating glass production, but also manufactures of high quality Georgian bars. The Georgian bars are manufactured on extrusion lines that have been specially designed to achieve the highest quality standards. After the incoming good inspection of the required raw materials, the production process begins with the drying of the SAN (Styrene-AcrylNitrile). After the SAN has the appropriate quality by adding dry air, the granulate is fed to the weighing-/mixer-unit where, if necessary, color pigments are also added to the granulate to produce different colours. After weighing/mixing, the automatic transfer to the extruder takes place where the homogeneous fusion takes place with the addition of heat. The homogeneously prepared molten mass is conveyed through the extrusion tool by means of pressure, where the first shape of the Georgian bar geometry is created. The final shaping of the Georgian bar takes place in the calibration tools with the help of targeted cooling. After this process step, the cutting takes place to the required length with subsequent packaging of the Georgian bars in cardboard boxes.

Construction stage, A4-A5
Not taken into account in this EPD.

End-of-life stage, C1-C4
Not taken into account in this EPD

Use stage (excluding potential savings), B1-B7
Not taken into account in this EPD.

Reuse/recovery/recycling potential, D
Not taken into account in this EPD.

LCA results

The table below present the environmental impacts associated with the production of 1 linear metre of a SWISSPACER Georgian bar, as a mix of every coating. This is a Cradle-to-Gate EPD. The environmental impacts of all the other stages in the life cycle of the SWISSPACER Georgian bar product are not declared (MND).

CML 2001 has been used as the impact model. Specific data has been supplied by the plant, and generic data came from GaBi and Ecoinvent databases.

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

Raw materials and energy consumption, as well as transport distances have been taken directly from the manufacturing plant (Production data according 2019).

All figures refer to a declared unit of 1 linear metre of 12 mm x 24 mm with a weight of 100,6 grams of a SWISSPACER Georgian bar.

LCA results are relative expressions and do not predict impacts on category endpoints, the exceeding of thresholds, safety margins or risks.

ENVIRONMENTAL IMPACTS of a 12 x 24 mm SWISSPACER Georgian bar	
Parametres	**Product stage**
	A1 / A2 / A3
Global Warming Potential (GWP) *[in kg CO_2 equiv/FU]*	3,61E-01
Ozone Depletion (ODP) *[in kg CFC 11 equiv/FU]*	3,28E-09
Acidification potential (AP) *[in kg SO_2 equiv/FU]*	1,10E-03
Eutrophication potential (EP) *[in kg $(PO_4)^{3-}$ equiv/FU]*	1,33E-04
Photochemical ozone creation potential (POPC) *[in kg ethene equiv/FU]*	9,89E-05
Abiotic depletion potential of non-fossil resources (ADP elements) *[in kg Sb equiv/FU]*	2,09E-06
Abiotic depletion potential of fossil resources (ADP fossil fuels) *[in MJ/FU]*	9,37E+00

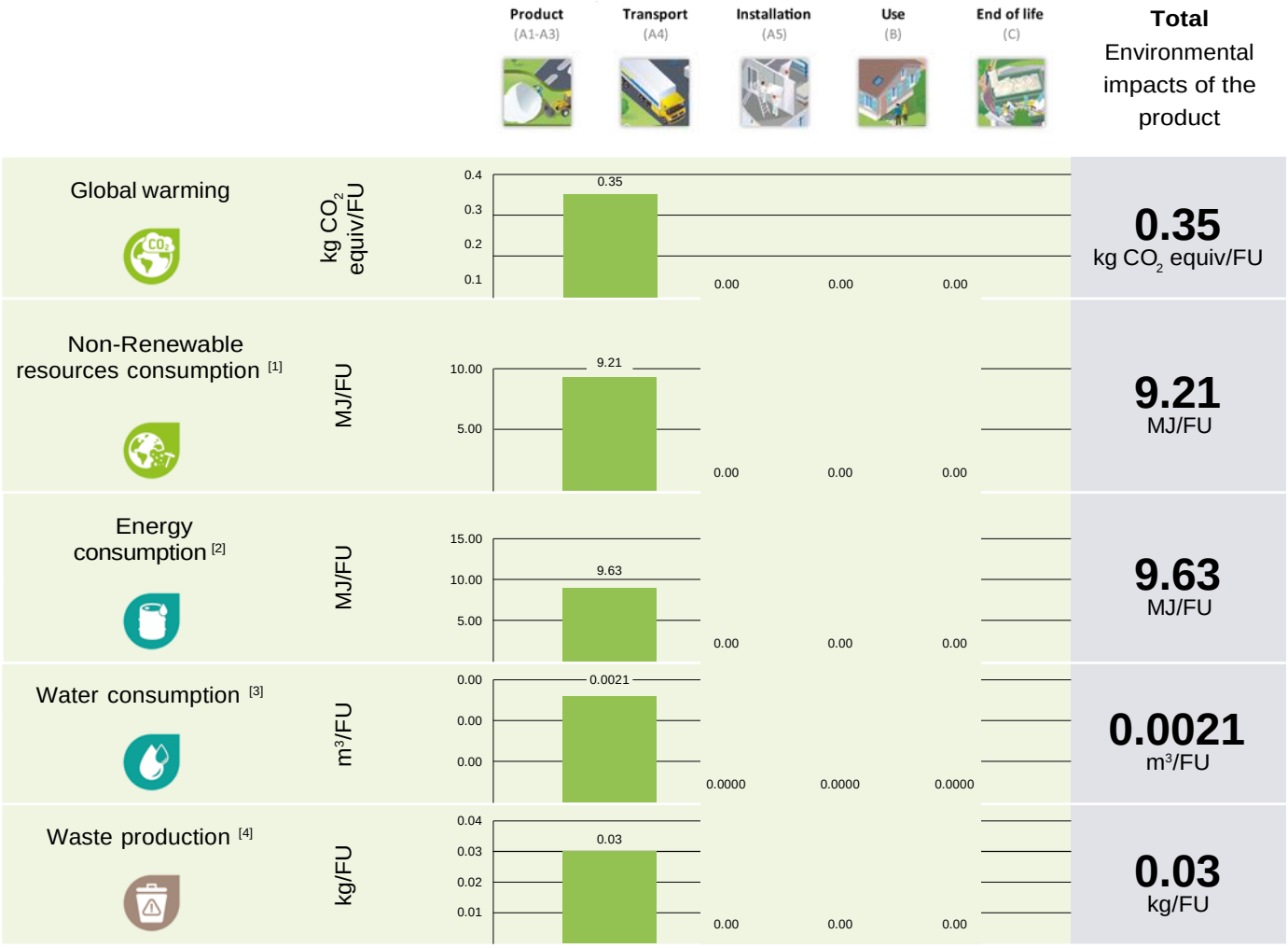
RESOURCE USE 12 x 24 mm	
Parametres	Product stage
	A1 / A2 / A3
Use of renewable primary energy excluding renewable primary energy resources used as raw materials *[in MJ/FU]*	3,09E-01
Use of renewable primary energy used as raw materials *[in MJ/FU]*	1,32E-01
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials) *[in MJ/FU]*	4,41E-01
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials *[in MJ/FU]*	6,15E+00
Use of non-renewable primary energy used as raw materials *[in MJ/FU]*	3,74E+00
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials) *[in MJ/FU]*	9,89E+00
Use of secondary material *[in kg/FU]*	0
Use of renewable secondary fuels *[in MJ/FU]*	0
Use of non-renewable secondary fuels *[in MJ/FU]*	0
Use of net fresh water *[in m^3/FU]*	2,63E-03

WASTE CATEGORIES 12 x 24 mm	
Parametres	Product stage
	A1 / A2 / A3
Hazardous waste disposed *[in kg/FU]*	1,18E-04
Non-hazardous waste disposed (excluding inert) *[in kg/FU]*	3,25E-02
Radioactive waste disposed *[in kg/FU]*	7,63E-06

OUTPUT FLOWS 12 x 24 mm	
Parametres	Product stage
	A1 / A2 / A3
Components for re-use *[in kg/FU]*	0
Materials for recycling *[in kg/FU]*	3,92E-03
Materials for energy recovery *[in kg/FU]*	0
Exported energy, detailed by energy carrier *[in MJ/FU]*	0

LCA interpretation

The following figure refers to a declared unit of 1 linear metre of 12 mm x 24 mm with a weight of 100,6 grams of SWISSPACER Georgian bars.



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

[2] This indicator corresponds to the total consumption of primary energy (renewable and non renewable)

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

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

Influence of width

This EPD® includes the widths between 8 mm x 20 mm and 14 mm x 30 mm. Results have shown that the environmental impacts are proportionate to the mass weight. Thus every dimension has an associated multiplier to ascertain the environmental impact of any width. All the results refer to a Georgian bar of 12 mm x 24 mm width and its value as references.

The following table shows the multiplication factors for each individual width of the product family. To ascertain the environmental impact of an associated product thickness, the mass weights that are indicated in this EPD® must be multiplied by the corresponding multiplier. A conservative principle was applied to obtain this factor with the real impact of the product being slightly lower than indicated in the table.

PRODUCT DIMENSIONS [mm x mm]	MASS WEIGHT [g]	MULTIPLICATION FACTOR
8 x 20	73,9	0,735
12 x 18	83,2	0,828
10 x 20	84	0,835
8 x 24	84,8	0,843
12 x 20	89	0,885
14 x 24	98,2	0,977
12 x 24	100,6	1,000
16 x 18	101,4	1,008
10 x 24	103	1,024
8 x 30	119,4	1,187
10 x 30	131,8	1,311
12 x 30	134,6	1,338
14 x 30	145,9	1,451

Additional information

SWISSPACER and sustainability

SWISSPACER has been a reliable partner for warm edge spacer bars for many years and its products are among the best on market, as confirmed on a regular basis in tests conducted by the ift Rosenheim (Germany). The results of these tests verified by the Warm Edge Working Group and documented in the official data sheets on spacer bar values of the Bundesverband Flachglas (German Federal Flat Glass Association).

In addition, SWISSPACER products are certified by the Passive House Institute. For years, the renowned institute from Darmstadt (Germany) and SWISSPACER have been working together on studies that provide fundamental information for the market. One of the studies, for example, investigated the influence of spacer bars in the insulating glazing of windows on the total energy demand of buildings in different climate zones (cold climate, cold-moderate climate, warm-moderate climate, warm climate). Compared to aluminium spacer bars, highly efficient warm edge plastic spacer bars ensure significantly less energy consumption, CO_2 emissions and heating costs for buildings. In another study on living comfort, the Passive House Institute investigated the highly positive effects of warm edge spacer bars on well-being, comfort and the prevention of mould formation.

Please refer to www.swisspacer.com for more information about the company, its products and studies.

Sustainable resource management at Saint-Gobain

In light of the global ecological challenges, Saint-Gobain developed its sustainable resource management policy in 2015 to facilitate the transition to a circular economy. Achieving this requires a threefold approach: a maximum of recycled content in the products, a minimum of waste at the workplace and recovering of the remaining waste. Saint-Gobain set itself the target of reducing its unrecovered production waste by 50 % compared to 2010 by the year 2025.

For further information, refer to:
https://www.saint-gobain.com/en/explore-2050

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