



ENVIRONMENTAL PRODUCT DECLARATION

In accordance with ISO 14025 and EN 15804:2012+A2:2019 for

Version 1
Date of issue: 2022-09-29
Validity: 5 years
Valid until: 2027-09-29

Scope of the EPD®: Brazil

Offline Coatings (Magnetron process) on Flat glass 3 mm - 10 mm



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



THE INTERNATIONAL EPD® SYSTEM

International EPD® System / EPD Brasil®
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EPD registration number: S-P-06328
Product composition: Solar Control Products



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General information

Manufacturer : CEBRACE CRISTAL PLANO, Avenida do Cristal 540, 12311-900, Jacarei, Brazil

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

EPD registration/declaration number: S-P-06328

PCR identification: PCR 2019:14 Construction products (EN 15804:2012: A2) version 1.11 (2021-02-05) and its c-PCR-009 (2021-01-25) Flat glass products used in buildings and other construction works (EN17074:2019)

UN CPC code: 371

Product name and manufacturer represented: OFFLINE COATED GLASS produced by CEBRACE CRISTAL PLANO

Owner of the declaration: CEBRACE CRISTAL PLANO

EPD® prepared by: Fábio Bortoloto Valebona (ACV Brasil) and Tiago Barreto Rocha (ACV Brasil)

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Valid: 2027-09-29

ISO standard ISO 21930 and CEN standard EN 15804 serves as the core Product Category Rules (PCR): PCR 2019:14 Construction products, version 1.1	
EPD program operator	The International EPD® System. Operated by EPD® International AB. Box 210 60 SE-100 31 Stockholm Sweden www.environdec.com .
PCR review conducted by	The Technical Committee of the International EPD® System Chair: Claudia A. Peña. Contact via info@environdec.com ”
LCA and EPD performed by ACV Brasil	
Independent verification of the environmental declaration and data according to standard EN ISO 14025:2010	
Internal <input type="checkbox"/>	External <input checked="" type="checkbox"/>
Verifier Edivan Cherubini Email : edivan@enciclo.com.br	
Accredited or approved by: The International EPD® System	
Procedure for follow-up of data during EPD validity involves third party verifier: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	

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

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.

Disclaimer: EPD of construction products may not be comparable if they do not comply with EN 15804

Product description

Product description and description of use

This Environmental Product Declaration (EPD®) describes the environmental impacts of 1 m² of offline coated glass (magnetron process) on Flat glass to 3 mm to 10 mm with a light transmittance of maximum 85%*, for an expected average service life of 30 years.

This range of products is manufactured at Cebrace's Jacareí site, by a process known as "magnetron coating". The coated glass is composed by multiple layers of metals, oxides and nitrides applied to a flat glass (clear or colored) using a magnetically enhanced cathodic sputtering method under vacuum conditions.

Magnetron coated glass can be incorporated into buildings, furnitures, wall coverings, windows, or used in industrial applications, such as freezers doors or oven doors, among other possible applications. The impacts of installation are not taken into account.

This glass is in conformity with the Brazilian standard ABNT NBR 16023-2011.

Depending on the composition of these transparent coating layers, several different products can be produced, distinguishable by the thermal performance, spectrophotometric values, aesthetics and processing characteristics:

List of existing coatings, depending on the glass substrate	On Clear glass	On Extra Clear glass	On Green glass
Cebrace Cool lite: High performance solar control glass	x	x	x
Cebrace Crystal: Reflective coatings for white goods market	x		
Cebrace Thermo Vision: Multiple low-e product to be used on Industrial applications	x		
Cebrace Planitherm: High performance low-e glass coatings	x		

*Check Tables 1 to 4 below, with all the performance data according to the thickness and colour.

Performance data:

The full performance of the magnetron coated glass addressed in this EPD, can be found on Cebrace's website, on the products webpage: <https://www.cebrace.com.br/produtos/> or can be requested to Cebrace's Specification team. The contact is available on the following webpage: <https://www.cebrace.com.br/nossos-consultores/>.

Performance data are presented below for selected product configurations described on this EPD. These configurations may not be representative of the final application configuration, so it is strongly recommended to follow the manufacturer instructions available on our communication materials, website, processing guidelines or with our Specification team. Furthermore, for certain product thicknesses, the manufacturer shall be consulted for the feasibility of production.

The performance data are given according to the EN 410-2011 standard.

Table 1 Performance Data for Different Thickness of Cebrace Cool lite KNT 155 (annealed single glazing) on clear glass

Thickness (mm)	4	5	6	8	10
Visible parameters					
Light transmittance (LT) %	53	52	52	51	51
External light reflection (RLE) %	15	15	15	15	14
Internal light reflection (RLI) %	3	3	3	3	3
Energetic parameters					
Energy transmittance (ET) %	38	37	36	35	34
Energy absorbance (EA)%	44	45	47	49	0.41
Solar factor g	0.44	0.44	0.43	0.42	0.47

Table 2 Performance Data for Different Thickness of Cebrace Cristal Silver

Thickness (mm)	3	3.15	4	6
Visible parameters				
Light transmittance (LT) %	60	60	59	59
External light reflection (RLE) %	36	36	35	35
Internal light reflection (RLI) %	34	34	33	33
Energetic parameters				
Energy transmittance (ET) %	63	62	61	58
Energy absorbance (EA)%	10	11	13	17
Solar factor g	0.65	0.65	0.64	0.62

Table 3 Performance Data for Different Thickness of Cebrace Thermo Vision

Thickness (mm)	3.15	4	6
Visible parameters			
Light transmittance (LT) %	78	78	77
External light reflection (RLE) %	8	8	8
Internal light reflection (RLI) %	5	5	4
Energetic parameters			
Energy transmittance (ET) %	59	58	56
Energy absorbance (EA)%	26	27	31
Solar factor g	0.62	0.62	0.60

Table 4 Performance Data for Different Thickness of Cebrace Planitherm 1.3T

Thickness (mm)	3.15	4
Visible parameters		
Light transmittance (LT) %	85	84
External light reflection (RLE) %	6	6
Internal light reflection (RLI) %	5	5
Energetic parameters		
Energy transmittance (ET) %	62	61
Energy absorbance (EA)%	22	24
Solar factor g	0.65	0.64

Declaration of the main product components and/or materials

The product is 100% glass CAS number 65997-17-3, EINECS number 266-046-0.

Description of the main components and/or materials for 1 m² of MAGNETRON COATED GLASS to 3 mm to 10 mm.

Thickness (mm)	3	3.15	4	5	6	8	10
Quantity of glass for 1 m ² of product (kg)	7.5	7.87	10	12.5	15	20	25

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).

Packaging and product used: Aluminium foils (2.47E-03 kg/kg of glass)

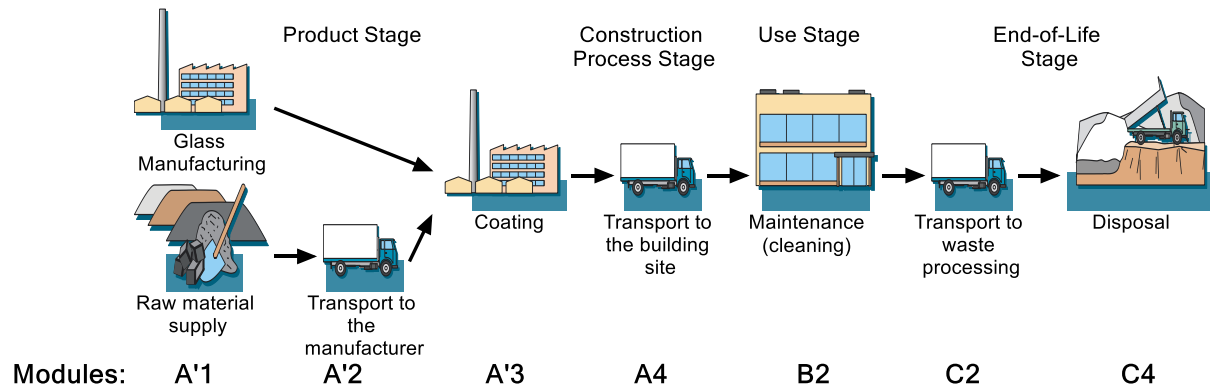
LCA calculation information

FUNCTIONAL UNIT / DECLARED UNIT	1 m ² of MAGNETRON COATED GLASS to 3 mm to 10 mm.
SYSTEM BOUNDARIES	Cradle to grave and module D Mandatory Stages = A1-A3 ; B1-B7 ; C1-C4 and D
REFERENCE SERVICE LIFE (RSL)	According to PCR EN 17074:2019, the reference service life is 30 years
CUT-OFF RULES	<p>All significant parameters 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.</p> <p>The energy used for the installation of 1m² of glass, as well as minor amounts of solid waste flows from the glass manufacturing process are included in the cut-off rules for the LCA model.</p>
ALLOCATIONS	<p>Wastes from the glass manufacturing process to recycling are considered co-products. In a conservative approach, 100% of impacts have been allocated to the reference product. No other allocation procedure has been performed on the foreground processes.</p> <p>The ecoinvent database used to model the background processes applies an economic allocation procedure.</p>
GEOGRAPHICAL COVERAGE AND TIME PERIOD	<p>The information was established over the year 2019.</p> <p>The information collected comes from the site producing MAGNETRON COATED GLASS in Brazil (CEBRACE CRISTAL PLANO)</p>
BACKGROUND DATA SOURCE	Ecoinvent 3.8 (cut-off model) data were used to evaluate the environmental impacts. Primary data from suppliers of sand, lime and dolomite have been collected.
SOFTWARE	SimaPro 9.3

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.

Life cycle stages

Flow diagram of the Life Cycle



Product stage, A1-A3

For OFF-LINE COATED GLASS A'1 to A'3 represents the production of coated glass from cradle to gate.

Description of the stage: the product stage of OFF-LINE COATED GLASS is subdivided into 3 modules A'1, A'2 and A'3 respectively "Raw material supply", "transport to manufacturer" and "manufacturing".

A'1, raw material supply.

This includes the extraction and processing of all raw materials and energy which occur upstream from the glass coating process. The flat glass used as substrate is also considered as a raw-material to the coating process.

A'2, transport to the manufacturer.

The raw materials are transported to the manufacturing site. The modelling includes road and/or boat transportation of each raw material.

A'3, 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 product stage includes the extraction and processing of raw materials and energies, transport to the manufacturer, manufacturing and processing of coated glass.

Manufacturing process flow diagram



1. **BATCH MIXER:** Mix of raw materials (silica, soda ash, lime, feldspar and dolomite) to which is added recycled glass (cullet) and other compounds depending on the desired color and properties.
2. **FUSION FURNACE:** Raw materials are melted at 1,550°C in a furnace.
3. **FLOAT:** The molten glass is fed into a bath of molten tin. The glass floats on this flat surface and is drawn off in a ribbon. Serrated wheels, or top rolls, pull and push the glass sideways depending on the desired thickness (from 3 to 10 millimeters).
4. **ANNEALING LEHR:** The glass is lifted onto conveyor rollers and passes through a controlled cooling tunnel measuring more than 100 meters in length. Approximately 600°C at the start of this step, the glass exits the lehr at room temperature.
5. **CUTTING AND STACKING:** The glass is automatically cut lengthwise and crosswise. The sheets of glass are raised by vacuum frames that then place them on glass stillages.
6. **QUALITY:** Automatic inspections and regular samples are taken to check the quality of the glass at each step in the glassmaking process.
7. **STORAGE AND TRANSPORTATION:** The stillages are placed on storage racks in the warehouse.
8. **ENVIRONMENT:** Use of recycled cullet, installation of pollution abatement systems and closed circuit management of water: every measure is taken to limit the consumption of energy, extraction of natural resources, production of waste and emissions into the atmosphere.

After the steps above, the coatings are applied “off-line”, which means independently of the glass manufacturing process, adding two additional steps before the coating deposition:

1. **CLEANING:** the sheet of glass is cleaned in the automatic washing machine using roller brushes, sprays, scrubbing bridges and air knives, with the main objective of eliminating any dirt on the flat glass surface. It is essential that the surface is perfectly clean to avoid any coating defects.
2. **MAGNETRON COATINGS:** the glass passes through a tightly sealed chamber evacuated to high vacuum. Multiple layers of metals, oxides and nitrides are then deposited on the glass substrate using a magnetically enhanced cathodic sputtering method. The resultant continuous and thin coating offers thermal insulation and solar control properties.

The magnetron coated glass is transported on dedicated racks, used many times. Racks are not included in the life cycle of the product according to the cut-off rules.

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 based on a scenario with the parameters described in the following table. The calculated distance represents Cebrace's weighted average for the products distributed in 2019.

PARAMETER	VALUE
Distance	1267 km
Bulk density of transported products	2500 kg/m ³

A5, Installation in the building:

The accompanying table show the parameters for installing the product at the building site. No installation materials and waste were considered due to the cut-off rule applied.

PARAMETER	VALUE
Ancillary materials for installation (specified by materials)	According to PCR NF EN 17074, none ancillary materials considered
Other resource use	None
Quantitative description of energy type (regional mix) and consumption during the installation process	According to EN 15804+A1, the energy needed during the installation is less than 0.1% of the total life cycle energy. It's include in the cut-off-rules.
Wastage of materials on the building site before waste processing, generated by the product's installation (specified by type)	According to PCR EN 17074, no waste is considered.
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)	None
Direct emissions to ambient air, soil and water	None

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**

The product has a reference service life of 30 years. This assumes that the product will last in situ with no requirements for repair, replacement or refurbishment throughout this period. Therefore, it has no impact at this stage, except for maintenance.

According to PCR EN 17074, only the maintenance by cleaning glass with water and cleaning agent is included in this study.

Maintenance parameters, B2 :

PARAMETER	VALUE (expressed per functional/declared unit)
Maintenance process	Water and cleaning agent
Maintenance cycle	Annual average
Ancillary materials for maintenance (e.g. cleaning agent, specify materials)	cleaning agent : 0.001 kg/m ² of glass/year
Wastage material during maintenance (specify materials)	0 kg
Net fresh water consumption during maintenance	0.2 kg/m ² of glass/year
Energy input during maintenance (e.g. vacuum cleaning), energy carrier type, (e.g. electricity) and amount, if applicable and relevant	None required during product lifetime

End of Life Stage, C1-C4

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

- C1: Deconstruction, demolition**
- C2: Transport to waste processing**
- C3: Waste processing for reuse, recovery and/or recycling**
- C4: Disposal**

End of life scenario used in this study is:

- 100% of glass goes to the average Brazilian solid waste landfill scenario. The distance to the disposal site considered is 50 km. The disposal scenario consists of 60% sanitary landfills, 23% unsanitary landfills and 17% open dumps.

Reuse/recovery/recycling potential, D

Description of the stage: An end-of-life recycling of 0% (100% of glass wastes are landfilled) has been assumed as a conservative approach due to local demolition waste data uncertainties.

LCA results

Product Environmental Footprint (PEF) method has been used as the impact model with the adaptations required by EN 15804:2012+A2:2019. Specific data has been supplied by the plant, as well as by the sand, lime and dolomite suppliers; and generic data come from ecoinvent 3.8 and USLCI (United States Life Cycle Inventory) 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 to 2019).

All result tables refer to a functional unit of 1 m² of offline coated glass and an expected average service life of 30 years.














The core indicators from the PEF method are reported in this EPD (i.e. Climate Change, Climate change – Fossil, Climate change – Biogenic, Climate change - Land use and LU change, Ozone depletion, Acidification, Eutrophication – freshwater, Eutrophication – marine, Eutrophication – terrestrial, Photochemical ozone formation, Resource use – minerals and metals¹, Resource use – fossil¹, and Water Use¹). The additional indicators for the categories Ionizing Radiation², Particulate Matter, Land Use¹, Human Toxicity – cancer¹, Human Toxicity – Non-cancer¹, and Ecotoxicity – freshwater¹ are 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	B 1	B 2	B 3	B 4	B 5	B6	B7	C1	C2	C3	C4	D	
Module declared	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Geography	Brazil																	
Specific data used	<90%																	
Variation products	Not relevant			-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Variation sites	-			-	-	-	-	-	-	-	-	-	-	-	-	-	-	



¹ Disclaimer 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.

² Disclaimer 2 – This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.








ENVIRONMENTAL IMPACTS 3 mm

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	
 Climate Change [kg CO2 eq.]	8.80E+00	1.03E+00	0	0	1.79E-01	0	0	0	0	0	0	4.07E-02	0	4.36E-02	0
 Climate Change (fossil) [kg CO2 eq.]	8.13E+00	9.02E-01	0	0	4.96E-02	0	0	0	0	0	0	3.56E-02	0	4.31E-02	0
 Climate Change (biogenic) [kg CO2 eq.]	5.51E-01	3.10E-02	0	0	3.63E-02	0	0	0	0	0	0	1.22E-03	0	3.93E-04	0
 Climate Change (land use change) [kg CO2 eq.]	1.10E-01	9.76E-02	0	0	9.22E-02	0	0	0	0	0	0	3.85E-03	0	3.89E-05	0
 Ozone depletion [kg CFC-11 eq.]	9.99E-07	4.98E-08	0	0	8.09E-09	0	0	0	0	0	0	1.96E-09	0	1.52E-08	0
 Acidification terrestrial and freshwater [Mole of H+ eq.]	2.40E-02	2.31E-03	0	0	6.26E-04	0	0	0	0	0	0	9.13E-05	0	4.19E-04	0
 Eutrophication freshwater [kg P eq.]	1.73E-04	3.94E-05	0	0	4.93E-04	0	0	0	0	0	0	1.56E-06	0	2.77E-07	0
 Eutrophication marine [kg N eq.]	4.95E-03	1.36E-03	0	0	7.43E-04	0	0	0	0	0	0	5.37E-05	0	1.59E-04	0
 Eutrophication terrestrial [Mole of N eq.]	6.04E-02	1.01E-02	0	0	2.31E-03	0	0	0	0	0	0	3.98E-04	0	1.74E-03	0
 Photochemical ozone formation - human health [kg NMVOC eq.]	1.49E-02	2.88E-03	0	0	3.65E-04	0	0	0	0	0	0	1.14E-04	0	4.91E-04	0
 Resource use, mineral and metals [kg Sb eq.]	4.68E-04	1.82E-07	0	0	2.05E-07	0	0	0	0	0	0	7.17E-09	0	5.22E-09	0
 Resource use, energy carriers [MJ]	9.87E+01	1.24E+01	0	0	4.96E-01	0	0	0	0	0	0	4.88E-01	0	1.06E+00	0
 Water scarcity [m³ world equiv.]	9.62E-01	2.37E-02	0	0	3.20E-01	0	0	0	0	0	0	9.36E-04	0	4.51E-02	0




ENVIRONMENTAL IMPACTS 3 mm

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	
 IPCC 2013 Global Warming Potential 100a (kg CO2 eq)	8.31E+00	9.92E-01	0	0	1.49E-01	0	0	0	0	0	0	3.91E-02	0	4.28E-02	0
 Eutrophication - Freshwater (kg PO4 eq)	5.32E-04	1.21E-04	0	0	1.51E-03	0	0	0	0	0	0	4.78E-06	0	8.52E-07	0






RESOURCE USE 3 mm

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 (PERE) [MJ]	1.22E+01	1.06E+00	0	0	2.72E+00	0	0	0	0	0	0	4.19E-02	0	6.73E-03	0
 Primary energy resources used as raw materials (PERM) [MJ]	7.50E-01	0	0	0	0	0	0	0	0	0	0	0	0	0.00E+00	0
Total use of renewable primary energy resources (PERT) [MJ]	1.29E+01	1.06E+00	0	0	2.72E+00	0	0	0	0	0	0	4.19E-02	0	6.73E-03	0
Use of non-renewable primary energy (PENRE) [MJ]	9.22E+01	1.31E+01	0	0	6.08E-01	0	0	0	0	0	0	5.15E-01	0	1.06E+00	0
 Non-renewable primary energy resources used as raw materials (PENRM) [MJ]	0.00E+00	0.00E+00	0	0	0	0	0	0	0	0	0	0	0	0.00E+00	0
Total use of non-renewable primary energy resources (PENRT) [MJ]	9.22E+01	1.31E+01	0	0	6.08E-01	0	0	0	0	0	0	5.15E-01	0	1.06E+00	0
 Input of secondary material (SM) [kg]	3.35E-01	0	0	0	0	0	0	0	0	0	0	0	0	0.00E+00	0
 Use of renewable secondary fuels (RSF) [MJ]	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00E+00	0
 Use of non-renewable secondary fuels (NRSF) [MJ]	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00E+00	0
 Use of net fresh water (FW) [m3]	9.24E-02	2.39E-03	0	0	1.54E-02	0	0	0	0	0	0	9.42E-05	0	1.07E-03	0














WASTE CATEGORIES 3 mm

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 (HWD) [kg]	2.50E-07	0	0	0	0	0	0	0	0	0	0	0	0	0	0
 Non-hazardous waste disposed (NHWD) [kg]	4.05E-06	0	0	0	0	0	0	0	0	0	0	0	0	7.52	0
 Radioactive waste disposed (RWD) [kg]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



OUTPUT FLOWS 3 mm

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 (CRU) [kg]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
 Materials for Recycling (MFR) [kg]	1.19E-03	0	0	0	0	0	0	0	0	0	0	0	0	0	0
 Material for Energy Recovery (MER) [kg]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
 Exported electrical energy (EEE) [MJ]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
 Exported thermal energy (EET) [MJ]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0








ENVIRONMENTAL IMPACTS 3.15 mm

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	
 Climate Change [kg CO2 eq.]	9.25E+00	1.08E+00	0	0	1.79E-01	0	0	0	0	0	0	4.27E-02	0	4.57E-02	0
 Climate Change (fossil) [kg CO2 eq.]	8.53E+00	9.47E-01	0	0	4.96E-02	0	0	0	0	0	0	3.74E-02	0	4.53E-02	0
 Climate Change (biogenic) [kg CO2 eq.]	5.78E-01	3.25E-02	0	0	3.63E-02	0	0	0	0	0	0	1.28E-03	0	4.13E-04	0
 Climate Change (land use change) [kg CO2 eq.]	1.15E-01	1.02E-01	0	0	9.22E-02	0	0	0	0	0	0	4.04E-03	0	4.08E-05	0
 Ozone depletion [kg CFC-11 eq.]	1.05E-06	5.23E-08	0	0	8.09E-09	0	0	0	0	0	0	2.06E-09	0	1.60E-08	0
 Acidification terrestrial and freshwater [Mole of H+ eq.]	2.52E-02	2.43E-03	0	0	6.26E-04	0	0	0	0	0	0	9.58E-05	0	4.40E-04	0
 Eutrophication freshwater [kg P eq.]	1.82E-04	4.14E-05	0	0	4.93E-04	0	0	0	0	0	0	1.63E-06	0	2.91E-07	0
 Eutrophication marine [kg N eq.]	5.20E-03	1.43E-03	0	0	7.43E-04	0	0	0	0	0	0	5.64E-05	0	1.67E-04	0
 Eutrophication terrestrial [Mole of N eq.]	6.34E-02	1.06E-02	0	0	2.31E-03	0	0	0	0	0	0	4.18E-04	0	1.83E-03	0
 Photochemical ozone formation - human health [kg NMVOC eq.]	1.57E-02	3.02E-03	0	0	3.65E-04	0	0	0	0	0	0	1.19E-04	0	5.16E-04	0
 Resource use, mineral and metals [kg Sb eq.]	4.91E-04	1.91E-07	0	0	2.05E-07	0	0	0	0	0	0	7.53E-09	0	5.48E-09	0
 Resource use, energy carriers [MJ]	1.04E+02	1.30E+01	0	0	4.96E-01	0	0	0	0	0	0	5.13E-01	0	1.12E+00	0
 Water scarcity [m³ world equiv.]	1.01E+00	2.49E-02	0	0	3.20E-01	0	0	0	0	0	0	9.82E-04	0	4.74E-02	0




ENVIRONMENTAL IMPACTS 3.15 mm

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	
 IPCC 2013 Global Warming Potential 100a (kg CO2 eq)	8.72E+00	1.04E+00	0	0	1.49E-01	0	0	0	0	0	0	4.11E-02	0	4.49E-02	0
 Eutrophication - Freshwater (kg PO4 eq)	5.59E-04	1.27E-04	0	0	1.51E-03	0	0	0	0	0	0	5.02E-06	0	8.94E-07	0






RESOURCE USE 3.15 mm

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 (PERE) [MJ]	2.14E+01	1.12E+00	0	0	2.72E+00	0	0	0	0	0	0	4.40E-02	0	7.52E-03	0
 Primary energy resources used as raw materials (PERM) [MJ]	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0.00E+00	0
Total use of renewable primary energy resources (PERT) [MJ]	2.14E+01	1.12E+00	0	0	2.72E+00	0	0	0	0	0	0	4.40E-02	0	7.52E-03	0
Use of non-renewable primary energy (PENRE) [MJ]	1.04E+02	1.37E+01	0	0	6.08E-01	0	0	0	0	0	0	5.41E-01	0	1.12E+00	0
 Non-renewable primary energy resources used as raw materials (PENRM) [MJ]	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00E+00	0
Total use of non-renewable primary energy resources (PENRT) [MJ]	1.04E+02	1.37E+01	0	0	6.08E-01	0	0	0	0	0	0	5.41E-01	0	1.12E+00	0
 Input of secondary material (SM) [kg]	3.94E-01	0	0	0	0	0	0	0	0	0	0	0	0	0.00E+00	0
 Use of renewable secondary fuels (RSF) [MJ]	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00E+00	0
 Use of non-renewable secondary fuels (NRSF) [MJ]	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00E+00	0
 Use of net fresh water (FW) [m3]	1.51E-01	2.51E-03	0	0	1.54E-02	0	0	0	0	0	0	9.89E-05	0	1.12E-03	0














WASTE CATEGORIES 3.15 mm

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 (HWD) [kg]	2.63E-07	0	0	0	0	0	0	0	0	0	0	0	0	0	0
 Non-hazardous waste disposed (NHWD) [kg]	4.25E-06	0	0	0	0	0	0	0	0	0	0	0	0	7.89	0
 Radioactive waste disposed (RWD) [kg]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



OUTPUT FLOWS 3.15 mm

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 (CRU) [kg]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
 Materials for Recycling (MFR) [kg]	1.25E-03	0	0	0	0	0	0	0	0	0	0	0	0	0	0
 Material for Energy Recovery (MER) [kg]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
 Exported electrical energy (EEE) [MJ]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
 Exported thermal energy (EET) [MJ]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0








ENVIRONMENTAL IMPACTS 4 mm

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	
 Climate Change [kg CO2 eq.]	1.17E+01	1.37E+00	0	0	1.79E-01	0	0	0	0	0	0	5.42E-02	0	5.81E-02	0
 Climate Change (fossil) [kg CO2 eq.]	1.08E+01	1.20E+00	0	0	4.96E-02	0	0	0	0	0	0	4.75E-02	0	5.75E-02	0
 Climate Change (biogenic) [kg CO2 eq.]	7.34E-01	4.13E-02	0	0	3.63E-02	0	0	0	0	0	0	1.63E-03	0	5.24E-04	0
 Climate Change (land use change) [kg CO2 eq.]	1.46E-01	1.30E-01	0	0	9.22E-02	0	0	0	0	0	0	5.14E-03	0	5.18E-05	0
 Ozone depletion [kg CFC-11 eq.]	1.33E-06	6.64E-08	0	0	8.09E-09	0	0	0	0	0	0	2.62E-09	0	2.03E-08	0
 Acidification terrestrial and freshwater [Mole of H+ eq.]	3.19E-02	3.08E-03	0	0	6.26E-04	0	0	0	0	0	0	1.22E-04	0	5.59E-04	0
 Eutrophication freshwater [kg P eq.]	2.31E-04	5.26E-05	0	0	4.93E-04	0	0	0	0	0	0	2.08E-06	0	3.70E-07	0
 Eutrophication marine [kg N eq.]	6.60E-03	1.81E-03	0	0	7.43E-04	0	0	0	0	0	0	7.16E-05	0	2.12E-04	0
 Eutrophication terrestrial [Mole of N eq.]	8.05E-02	1.34E-02	0	0	2.31E-03	0	0	0	0	0	0	5.31E-04	0	2.32E-03	0
 Photochemical ozone formation - human health [kg NMVOC eq.]	1.99E-02	3.84E-03	0	0	3.65E-04	0	0	0	0	0	0	1.51E-04	0	6.55E-04	0
 Resource use. mineral and metals [kg Sb eq.]	6.24E-04	2.42E-07	0	0	2.05E-07	0	0	0	0	0	0	9.56E-09	0	6.96E-09	0
 Resource use. energy carriers [MJ]	1.32E+02	1.65E+01	0	0	4.96E-01	0	0	0	0	0	0	6.51E-01	0	1.42E+00	0
 Water scarcity [m³ world equiv.]	1.28E+00	3.16E-02	0	0	3.20E-01	0	0	0	0	0	0	1.25E-03	0	6.01E-02	0

ENVIRONMENTAL IMPACTS 4 mm

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	
 IPCC 2013 Global Warming Potential 100a (kg CO2 eq)	1.11E+01	1.32E+00	0	0	1.49E-01	0	0	0	0	0	0	5.22E-02	0	5.71E-02	0
 Eutrophication - Freshwater (kg PO4 eq)	7.10E-04	1.61E-04	0	0	1.51E-03	0	0	0	0	0	0	6.37E-06	0	1.14E-06	0

RESOURCE USE 4 mm

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 (PERE) [MJ]	2.71E+01	1.42E+00	0	0	2.72E+00	0	0	0	0	0	0	5.59E-02	0	9.55E-03	0
 Primary energy resources used as raw materials (PERM) [MJ]	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0.00E+00	0
Total use of renewable primary energy resources (PERT) [MJ]	2.71E+01	1.42E+00	0	0	2.72E+00	0	0	0	0	0	0	5.59E-02	0	9.55E-03	0
Use of non-renewable primary energy (PENRE) [MJ]	1.32E+02	1.74E+01	0	0	6.08E-01	0	0	0	0	0	0	6.87E-01	0	1.42E+00	0
 Non-renewable primary energy resources used as raw materials (PENRM) [MJ]	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00E+00	0
Total use of non-renewable primary energy resources (PENRT) [MJ]	1.32E+02	1.74E+01	0	0	6.08E-01	0	0	0	0	0	0	6.87E-01	0	1.42E+00	0
 Input of secondary material (SM) [kg]	5.00E-01	0	0	0	0	0	0	0	0	0	0	0	0	0.00E+00	0
 Use of renewable secondary fuels (RSF) [MJ]	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00E+00	0
 Use of non-renewable secondary fuels (NRSF) [MJ]	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00E+00	0
 Use of net fresh water (FW) [m3]	1.91E-01	3.18E-03	0	0	1.54E-02	0	0	0	0	0	0	1.26E-04	0	1.43E-03	0














WASTE CATEGORIES 4 mm

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 (HWD) [kg]	3.34E-07	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Non-hazardous waste disposed (NHWD) [kg]	5.40E-06	0	0	0	0	0	0	0	0	0	0	0	0	10.0	0
Radioactive waste disposed (RWD) [kg]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



OUTPUT FLOWS 4 mm

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 (CRU) [kg]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Materials for Recycling (MFR) [kg]	1.59E-03	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Material for Energy Recovery (MER) [kg]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exported electrical energy (EEE) [MJ]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0








ENVIRONMENTAL IMPACTS 5 mm

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	
 Climate Change [kg CO2 eq.]	1.47E+01	1.72E+00	0	0	1.79E-01	0	0	0	0	0	0	6.78E-02	0	7.26E-02	0
 Climate Change (fossil) [kg CO2 eq.]	1.35E+01	1.50E+00	0	0	4.96E-02	0	0	0	0	0	0	5.93E-02	0	7.19E-02	0
 Climate Change (biogenic) [kg CO2 eq.]	9.18E-01	5.16E-02	0	0	3.63E-02	0	0	0	0	0	0	2.04E-03	0	6.56E-04	0
 Climate Change (land use change) [kg CO2 eq.]	1.83E-01	1.63E-01	0	0	9.22E-02	0	0	0	0	0	0	6.42E-03	0	6.48E-05	0
 Ozone depletion [kg CFC-11 eq.]	1.66E-06	8.30E-08	0	0	8.09E-09	0	0	0	0	0	0	3.27E-09	0	2.53E-08	0
 Acidification terrestrial and freshwater [Mole of H+ eq.]	3.99E-02	3.86E-03	0	0	6.26E-04	0	0	0	0	0	0	1.52E-04	0	6.99E-04	0
 Eutrophication freshwater [kg P eq.]	2.89E-04	6.57E-05	0	0	4.93E-04	0	0	0	0	0	0	2.59E-06	0	4.62E-07	0
 Eutrophication marine [kg N eq.]	8.25E-03	2.27E-03	0	0	7.43E-04	0	0	0	0	0	0	8.95E-05	0	2.65E-04	0
 Eutrophication terrestrial [Mole of N eq.]	1.01E-01	1.68E-02	0	0	2.31E-03	0	0	0	0	0	0	6.63E-04	0	2.90E-03	0
 Photochemical ozone formation - human health [kg NMVOC eq.]	2.49E-02	4.80E-03	0	0	3.65E-04	0	0	0	0	0	0	1.89E-04	0	8.18E-04	0
 Resource use. mineral and metals [kg Sb eq.]	7.80E-04	3.03E-07	0	0	2.05E-07	0	0	0	0	0	0	1.20E-08	0	8.70E-09	0
 Resource use. energy carriers [MJ]	1.65E+02	2.06E+01	0	0	4.96E-01	0	0	0	0	0	0	8.14E-01	0	1.77E+00	0
 Water scarcity [m³ world equiv.]	1.60E+00	3.95E-02	0	0	3.20E-01	0	0	0	0	0	0	1.56E-03	0	7.52E-02	0




ENVIRONMENTAL IMPACTS 5 mm

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	
 IPCC 2013 Global Warming Potential 100a (kg CO2 eq)	1.38E+01	1.65E+00	0	0	1.49E-01	0	0	0	0	0	0	6.52E-02	0	7.13E-02	0
 Eutrophication - Freshwater (kg PO4 eq)	8.87E-04	2.02E-04	0	0	1.51E-03	0	0	0	0	0	0	7.96E-06	0	1.42E-06	0






RESOURCE USE 5 mm

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 (PERE) [MJ]	3.39E+01	1.77E+00	0	0	2.72E+00	0	0	0	0	0	0	6.98E-02	0	1.19E-02	0
 Primary energy resources used as raw materials (PERM) [MJ]	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0.00E+00	0
Total use of renewable primary energy resources (PERT) [MJ]	3.39E+01	1.77E+00	0	0	2.72E+00	0	0	0	0	0	0	6.98E-02	0	1.19E-02	0
Use of non-renewable primary energy (PENRE) [MJ]	1.65E+02	2.18E+01	0	0	6.08E-01	0	0	0	0	0	0	8.59E-01	0	1.77E+00	0
 Non-renewable primary energy resources used as raw materials (PENRM) [MJ]	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00E+00	0
Total use of non-renewable primary energy resources (PENRT) [MJ]	1.65E+02	2.18E+01	0	0	6.08E-01	0	0	0	0	0	0	8.59E-01	0	1.77E+00	0
 Input of secondary material (SM) [kg]	6.25E-01	0	0	0	0	0	0	0	0	0	0	0	0	0.00E+00	0
 Use of renewable secondary fuels (RSF) [MJ]	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00E+00	0
 Use of non-renewable secondary fuels (NRSF) [MJ]	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00E+00	0
 Use of net fresh water (FW) [m3]	2.39E-01	3.98E-03	0	0	1.54E-02	0	0	0	0	0	0	1.57E-04	0	1.78E-03	0














WASTE CATEGORIES 5 mm

WASTE CATEGORIES 5 mm															
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 (HWD) [kg]	4.17E-07	0	0	0	0	0	0	0	0	0	0	0	0	0	0
 Non-hazardous waste disposed (NHWD) [kg]	6.75E-06	0	0	0	0	0	0	0	0	0	0	0	0	12.5	0
 Radioactive waste disposed (RWD) [kg]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



OUTPUT FLOWS 5 mm

OUTPUT FLOWS 5 mm															
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 (CRU) [kg]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
 Materials for Recycling (MFR) [kg]	1.99E-03	0	0	0	0	0	0	0	0	0	0	0	0	0	0
 Material for Energy Recovery (MER) [kg]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
 Exported electrical energy (EEE) [MJ]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
 Exported thermal energy (EET) [MJ]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0








ENVIRONMENTAL IMPACTS 6 mm

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	
 Climate Change [kg CO2 eq.]	1.76E+01	2.06E+00	0	0	1.79E-01	0	0	0	0	0	0	8.14E-02	0	8.71E-02	0
 Climate Change (fossil) [kg CO2 eq.]	1.63E+01	1.80E+00	0	0	4.96E-02	0	0	0	0	0	0	7.12E-02	0	8.62E-02	0
 Climate Change (biogenic) [kg CO2 eq.]	1.10E+00	6.19E-02	0	0	3.63E-02	0	0	0	0	0	0	2.44E-03	0	7.87E-04	0
 Climate Change (land use change) [kg CO2 eq.]	2.19E-01	1.95E-01	0	0	9.22E-02	0	0	0	0	0	0	7.70E-03	0	7.78E-05	0
 Ozone depletion [kg CFC-11 eq.]	2.00E-06	9.95E-08	0	0	8.09E-09	0	0	0	0	0	0	3.93E-09	0	3.04E-08	0
 Acidification terrestrial and freshwater [Mole of H+ eq.]	4.79E-02	4.63E-03	0	0	6.26E-04	0	0	0	0	0	0	1.83E-04	0	8.39E-04	0
 Eutrophication freshwater [kg P eq.]	3.47E-04	7.89E-05	0	0	4.93E-04	0	0	0	0	0	0	3.11E-06	0	5.55E-07	0
 Eutrophication marine [kg N eq.]	9.90E-03	2.72E-03	0	0	7.43E-04	0	0	0	0	0	0	1.07E-04	0	3.18E-04	0
 Eutrophication terrestrial [Mole of N eq.]	1.21E-01	2.02E-02	0	0	2.31E-03	0	0	0	0	0	0	7.96E-04	0	3.48E-03	0
 Photochemical ozone formation - human health [kg NMVOC eq.]	2.99E-02	5.76E-03	0	0	3.65E-04	0	0	0	0	0	0	2.27E-04	0	9.82E-04	0
 Resource use. mineral and metals [kg Sb eq.]	9.36E-04	3.63E-07	0	0	2.05E-07	0	0	0	0	0	0	1.43E-08	0	1.04E-08	0
 Resource use. energy carriers [MJ]	1.97E+02	2.47E+01	0	0	4.96E-01	0	0	0	0	0	0	9.77E-01	0	2.13E+00	0
 Water scarcity [m³ world equiv.]	1.92E+00	4.74E-02	0	0	3.20E-01	0	0	0	0	0	0	1.87E-03	0	9.02E-02	0

ENVIRONMENTAL IMPACTS 6 mm

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	
 IPCC 2013 Global Warming Potential 100a (kg CO2 eq)	1.66E+01	1.98E+00	0	0	1.49E-01	0	0	0	0	0	0	7.83E-02	0	8.56E-02	0
 Eutrophication - Freshwater (kg PO4 eq)	1.06E-03	2.42E-04	0	0	1.51E-03	0	0	0	0	0	0	9.56E-06	0	1.70E-06	0

RESOURCE USE 6 mm

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 (PERE) [MJ]	4.07E+01	2.12E+00	0	0	2.72E+00	0	0	0	0	0	0	8.38E-02	0	1.43E-02	0
 Primary energy resources used as raw materials (PERM) [MJ]	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0.00E+00	0
Total use of renewable primary energy resources (PERT) [MJ]	4.07E+01	2.12E+00	0	0	2.72E+00	0	0	0	0	0	0	8.38E-02	0	1.43E-02	0
Use of non-renewable primary energy (PENRE) [MJ]	1.98E+02	2.61E+01	0	0	6.08E-01	0	0	0	0	0	0	1.03E+00	0	2.13E+00	0
 Non-renewable primary energy resources used as raw materials (PENRM) [MJ]	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00E+00	0
Total use of non-renewable primary energy resources (PENRT) [MJ]	1.98E+02	2.61E+01	0	0	6.08E-01	0	0	0	0	0	0	1.03E+00	0	2.13E+00	0
 Input of secondary material (SM) [kg]	7.50E-01	0	0	0	0	0	0	0	0	0	0	0	0	0.00E+00	0
 Use of renewable secondary fuels (RSF) [MJ]	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00E+00	0
 Use of non-renewable secondary fuels (NRSF) [MJ]	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00E+00	0
 Use of net fresh water (FW) [m3]	2.87E-01	4.77E-03	0	0	1.54E-02	0	0	0	0	0	0	1.88E-04	0	2.14E-03	0














WASTE CATEGORIES 6 mm

WASTE CATEGORIES 6 mm															
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 (HWD) [kg]	5.01E-07	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Non-hazardous waste disposed (NHWD) [kg]	8.10E-06	0	0	0	0	0	0	0	0	0	0	0	0	15.03	0
Radioactive waste disposed (RWD) [kg]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



OUTPUT FLOWS 6 mm

OUTPUT FLOWS 6 mm															
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 (CRU) [kg]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Materials for Recycling (MFR) [kg]	2.39E-03	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Material for Energy Recovery (MER) [kg]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exported electrical energy (EEE) [MJ]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0








ENVIRONMENTAL IMPACTS 8 mm

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	
 Climate Change [kg CO2 eq.]	2.35E+01	2.75E+00	0	0	1.79E-01	0	0	0	0	0	0	1.08E-01	0	1.16E-01	0
 Climate Change (fossil) [kg CO2 eq.]	2.17E+01	2.41E+00	0	0	4.96E-02	0	0	0	0	0	0	9.49E-02	0	1.15E-01	0
 Climate Change (biogenic) [kg CO2 eq.]	1.47E+00	8.26E-02	0	0	3.63E-02	0	0	0	0	0	0	3.26E-03	0	1.05E-03	0
 Climate Change (land use change) [kg CO2 eq.]	2.93E-01	2.60E-01	0	0	9.22E-02	0	0	0	0	0	0	1.03E-02	0	1.04E-04	0
 Ozone depletion [kg CFC-11 eq.]	2.66E-06	1.33E-07	0	0	8.09E-09	0	0	0	0	0	0	5.24E-09	0	4.05E-08	0
 Acidification terrestrial and freshwater [Mole of H+ eq.]	6.39E-02	6.17E-03	0	0	6.26E-04	0	0	0	0	0	0	2.43E-04	0	1.12E-03	0
 Eutrophication freshwater [kg P eq.]	4.62E-04	1.05E-04	0	0	4.93E-04	0	0	0	0	0	0	4.15E-06	0	7.40E-07	0
 Eutrophication marine [kg N eq.]	1.32E-02	3.63E-03	0	0	7.43E-04	0	0	0	0	0	0	1.43E-04	0	4.24E-04	0
 Eutrophication terrestrial [Mole of N eq.]	1.61E-01	2.69E-02	0	0	2.31E-03	0	0	0	0	0	0	1.06E-03	0	4.64E-03	0
 Photochemical ozone formation - human health [kg NMVOC eq.]	3.98E-02	7.67E-03	0	0	3.65E-04	0	0	0	0	0	0	3.03E-04	0	1.31E-03	0
 Resource use, mineral and metals [kg Sb eq.]	1.25E-03	4.85E-07	0	0	2.05E-07	0	0	0	0	0	0	1.91E-08	0	1.39E-08	0
 Resource use, energy carriers [MJ]	2.63E+02	3.30E+01	0	0	4.96E-01	0	0	0	0	0	0	1.30E+00	0	2.84E+00	0
 Water scarcity [m³ world equiv.]	2.57E+00	6.32E-02	0	0	3.20E-01	0	0	0	0	0	0	2.49E-03	0	1.20E-01	0




ENVIRONMENTAL IMPACTS 8 mm

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	
 IPCC 2013 Global Warming Potential 100a (kg CO2 eq)	2.21E+01	2.65E+00	0	0	1.49E-01	0	0	0	0	0	0	1.04E-01	0	1.14E-01	0
 Eutrophication - Freshwater (kg PO4 eq)	1.42E-03	3.23E-04	0	0	1.51E-03	0	0	0	0	0	0	1.27E-05	0	2.27E-06	0





RESOURCE USE 8 mm

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 (PERE) [MJ]	5.43E+01	2.83E+00	0	0	2.72E+00	0	0	0	0	0	0	1.12E-01	0	1.91E-02	0
 Primary energy resources used as raw materials (PERM) [MJ]	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0.00E+00	0
Total use of renewable primary energy resources (PERT) [MJ]	5.43E+01	2.83E+00	0	0	2.72E+00	0	0	0	0	0	0	1.12E-01	0	1.91E-02	0
Use of non-renewable primary energy (PENRE) [MJ]	2.64E+02	3.48E+01	0	0	6.08E-01	0	0	0	0	0	0	1.37E+00	0	2.84E+00	0
 Non-renewable primary energy resources used as raw materials (PENRM) [MJ]	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00E+00	0
Total use of non-renewable primary energy resources (PENRT) [MJ]	2.64E+02	3.48E+01	0	0	6.08E-01	0	0	0	0	0	0	1.37E+00	0	2.84E+00	0
 Input of secondary material (SM) [kg]	1.00E+00	0	0	0	0	0	0	0	0	0	0	0	0	0.00E+00	0
 Use of renewable secondary fuels (RSF) [MJ]	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00E+00	0
 Use of non-renewable secondary fuels (NRSF) [MJ]	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00E+00	0
 Use of net fresh water (FW) [m3]	3.83E-01	6.36E-03	0	0	1.54E-02	0	0	0	0	0	0	2.51E-04	0	2.85E-03	0














WASTE CATEGORIES 8 mm

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 (HWD) [kg]	6.68E-07	0	0	0	0	0	0	0	0	0	0	0	0	0	0
 Non-hazardous waste disposed (NHWD) [kg]	1.08E-05	0	0	0	0	0	0	0	0	0	0	0	0	20.0	0
 Radioactive waste disposed (RWD) [kg]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



OUTPUT FLOWS 8 mm

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 (CRU) [kg]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
 Materials for Recycling (MFR) [kg]	3.18E-03	0	0	0	0	0	0	0	0	0	0	0	0	0	0
 Material for Energy Recovery (MER) [kg]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
 Exported electrical energy (EEE) [MJ]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0








ENVIRONMENTAL IMPACTS 10 mm

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	
 Climate Change [kg CO2 eq.]	2.93E+01	3.44E+00	0	0	1.79E-01	0	0	0	0	0	0	1.36E-01	0	1.45E-01	0
 Climate Change (fossil) [kg CO2 eq.]	2.71E+01	3.01E+00	0	0	4.96E-02	0	0	0	0	0	0	1.19E-01	0	1.44E-01	0
 Climate Change (biogenic) [kg CO2 eq.]	1.84E+00	1.03E-01	0	0	3.63E-02	0	0	0	0	0	0	4.07E-03	0	1.31E-03	0
 Climate Change (land use change) [kg CO2 eq.]	3.66E-01	3.25E-01	0	0	9.22E-02	0	0	0	0	0	0	1.28E-02	0	1.30E-04	0
 Ozone depletion [kg CFC-11 eq.]	3.33E-06	1.66E-07	0	0	8.09E-09	0	0	0	0	0	0	6.55E-09	0	5.07E-08	0
 Acidification terrestrial and freshwater [Mole of H+ eq.]	7.99E-02	7.71E-03	0	0	6.26E-04	0	0	0	0	0	0	3.04E-04	0	1.40E-03	0
 Eutrophication freshwater [kg P eq.]	5.78E-04	1.31E-04	0	0	4.93E-04	0	0	0	0	0	0	5.19E-06	0	9.25E-07	0
 Eutrophication marine [kg N eq.]	1.65E-02	4.53E-03	0	0	7.43E-04	0	0	0	0	0	0	1.79E-04	0	5.29E-04	0
 Eutrophication terrestrial [Mole of N eq.]	2.01E-01	3.36E-02	0	0	2.31E-03	0	0	0	0	0	0	1.33E-03	0	5.80E-03	0
 Photochemical ozone formation - human health [kg NMVOC eq.]	4.98E-02	9.59E-03	0	0	3.65E-04	0	0	0	0	0	0	3.79E-04	0	1.64E-03	0
 Resource use, mineral and metals [kg Sb eq.]	1.56E-03	6.06E-07	0	0	2.05E-07	0	0	0	0	0	0	2.39E-08	0	1.74E-08	0
 Resource use, energy carriers [MJ]	3.29E+02	4.12E+01	0	0	4.96E-01	0	0	0	0	0	0	1.63E+00	0	3.54E+00	0
 Water scarcity [m³ world equiv.]	3.21E+00	7.90E-02	0	0	3.20E-01	0	0	0	0	0	0	3.12E-03	0	1.50E-01	0

ENVIRONMENTAL IMPACTS 10 mm

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	
 IPCC 2013 Global Warming Potential 100a (kg CO2 eq)	2.77E+01	3.31E+00	0	0	1.49E-01	0	0	0	0	0	0	1.30E-01	0	1.43E-01	0
 Eutrophication - Freshwater (kg PO4 eq)	1.77E-03	4.04E-04	0	0	1.51E-03	0	0	0	0	0	0	1.59E-05	0	2.84E-06	0

RESOURCE USE 10 mm

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 (PERE) [MJ]	6.79E+01	3.54E+00	0	0	2.72E+00	0	0	0	0	0	0	1.40E-01	0	2.39E-02	0
 Primary energy resources used as raw materials (PERM) [MJ]	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0.00E+00	0
Total use of renewable primary energy resources (PERT) [MJ]	6.79E+01	3.54E+00	0	0	2.72E+00	0	0	0	0	0	0	1.40E-01	0	2.39E-02	0
Use of non-renewable primary energy (PENRE) [MJ]	3.30E+02	4.35E+01	0	0	6.08E-01	0	0	0	0	0	0	1.72E+00	0	3.55E+00	0
 Non-renewable primary energy resources used as raw materials (PENRM) [MJ]	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00E+00	0
Total use of non-renewable primary energy resources (PENRT) [MJ]	3.30E+02	4.35E+01	0	0	6.08E-01	0	0	0	0	0	0	1.72E+00	0	3.55E+00	0
 Input of secondary material (SM) [kg]	1.25E+00	0	0	0	0	0	0	0	0	0	0	0	0	0.00E+00	0
 Use of renewable secondary fuels (RSF) [MJ]	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00E+00	0
 Use of non-renewable secondary fuels (NRSF) [MJ]	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00E+00	0
 Use of net fresh water (FW) [m3]	4.78E-01	7.96E-03	0	0	1.54E-02	0	0	0	0	0	0	3.14E-04	0	3.57E-03	0

WASTE CATEGORIES 10 mm

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 (HWD) [kg]	8.35E-07	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Non-hazardous waste disposed (NHWD) [kg]	1.35E-05	0	0	0	0	0	0	0	0	0	0	0	0	25.1	0
Radioactive waste disposed (RWD) [kg]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

OUTPUT FLOWS 10 mm

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 (CRU) [kg]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Materials for Recycling (MFR) [kg]	3.98E-03	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Material for Energy Recovery (MER) [kg]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exported electrical energy (EEE) [MJ]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Information on biogenic carbon content

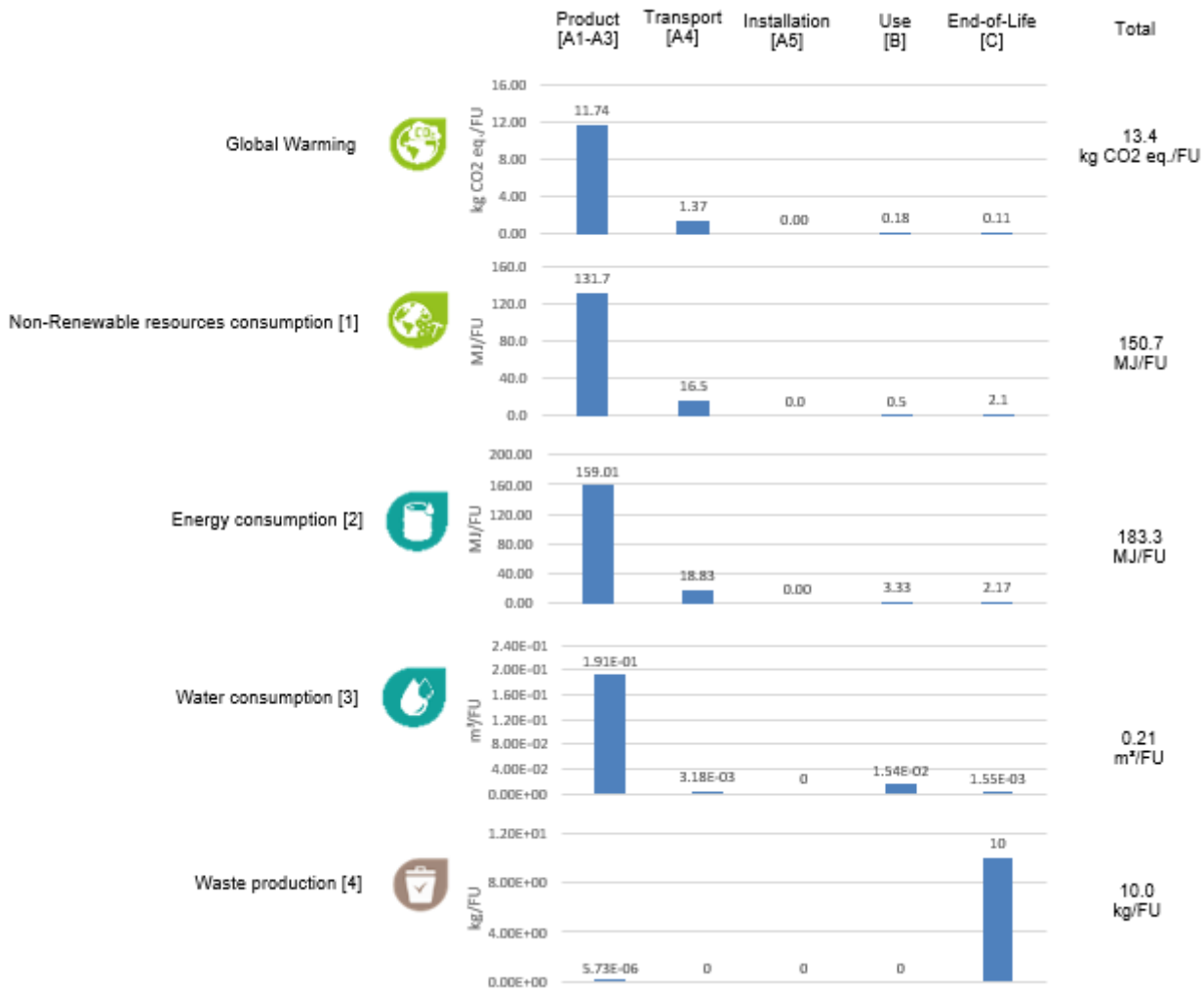
Results per functional or declared unit		
BIOGENIC CARBON CONTENT	Unit	QUANTITY
Biogenic carbon content in product	kg C	0
Biogenic carbon content in packaging	kg C	0

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

There is no biogenic carbon in glass product.

LCA results interpretation for magnetron coated glass 4 mm

The following figure refers to a functional unit of 1 m² of magnetron coated glass product with 4mm thickness.



FU: Functional Unit (or Declared Unit)

Global Warming Potential (Climate Change) (GWP)

When analyzing the above figure for GWP, it can clearly be seen that the majority of contribution to this environmental impact is from the production modules (A1 – A3). This is primarily because the sources of greenhouse gas emissions are predominant in this part of the life cycle. During the flat glass substrate manufacture, CO₂ is released on site by the combustion of natural gas and by the geogenic emissions released by raw materials during the fusion. The production of one of raw material will generate the third highest percentage of greenhouse gas emissions. The production modules contribute to 88% of the contribution and the transportation of the product to the client represents 10% of the category result.

Non-renewable resources consumptions

The consumption of non – renewable resources is once more found to have the highest value in the production modules (87%). This is because a large quantity of natural gas is consumed within the factory for producing the flat glass substrate. The contribution to this impact from the other modules is primarily due to the non–renewable resources consumed during transportation (11%).

Energy Consumptions

Modules A1 – A3 have the highest contribution to total energy consumption (87%). Energy in the form of natural gas is consumed in a vast quantity during the manufacture of flat glass so we would expect the production modules to contribute the most to this impact category.

Water Consumption

For the production phase, water is used within the manufacturing facility and it represents the highest contribution (90%). However, most of water is recycled in the process. Water is also consumed during the use phase to cleaning the product representing 7% of the total consumption.

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 100% of the product is sent to landfill.

Health characteristics

Concerning the indoor air quality, clear flat glass is an inert material that doesn't release any inorganic & organic compounds, in particular no VOC (volatile organic compounds).

Additional Environmental Information

Cebrace's environmental policy

Cebrace's environmental vision is to ensure the sustainable development of its Activities, while preserving the environment from the impacts of its processes and services throughout their life cycle. The Group thus seeks to ensure the preservation of resources, meet the expectations of its relevant stakeholders, and offer its customers the highest added value with the lowest environmental impact.

Our products' contribution to Sustainable Buildings

Cebrace encourages sustainable construction and develops innovative solutions for new and renovated buildings that are energy efficient, comfortable, healthy and esthetically superior, while at the same time protecting natural resources.

The following information might be of help for green building certification programs:

RECYCLED CONTENT

(Required for LEED v4 Building product disclosure and optimization - sourcing of raw materials)

Recycled content: proportion, by mass, of recycled material in a product or packaging. Only pre-consumer and post-consumer materials shall be considered as recycled content.

Pre-consumer material: material diverted from the waste stream during a manufacturing process. Excluded is reutilization of materials such as rework, regrind, or scrap generated in a process and capable of being reclaimed within the same process that generated it.

In the case of flat glass, this waste originates from the processing or re-processing of glass that takes place before the final product reaches the consumer market. Pre-consumer waste flat glass is made of cut-offs, losses during laminating, bending and other processing, including the manufacture of insulating glass units or automotive windscreens.

Cullet generated in the furnace plant and which is reintroduced into the furnace cannot be considered as pre-consumer recycled content, since there was never an intent to discard it and therefore it would never have entered the solid waste stream.

Pre-consumer cullet	5.2%
Post-consumer cullet	~0%

In the future, Cebrace intends to continue the increase of recycled material in its products.

RESPONSIBLE SOURCING

(Required for BREEAM International new construction 2013 – MAT 03 Responsible sourcing)

All Cebrace's sites with a glassmaking furnace, are ISO 14001 certified.

For any other question / document / certification, please contact our local sales teams.

Bibliography

- EN 15804:2012+A1:2013: Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products
- EN 15804:2019+A2 - Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products
- ISO 21930: 2017 Sustainability in building construction - Environmental declaration of building products
- ISO 14040:2006: Environmental Management-Life Cycle Assessment-Principles and framework.
- ISO 14044:2006: Environmental Management-Life Cycle Assessment-Requirements and guidelines.
- ISO 14025:2006: Environmental labels and declarations-Type III Environmental Declarations-Principles and procedures.
- PCR 2019:14 Construction products (EN 15804:2012: A2) version 1.1 and c-PCR-009 Flat glass products (EN 17074)
- General Program Instruction of the International EPD® System, version 2.5
- European Chemical Agency, Candidate List of substances of very high concern for Authorization.

http://echa.europa.eu/chem_data/authorisation_process/candidate_list_table_en.asp