

# DECLARACIÓN AMBIENTAL DE PRODUCTO ENVIRONMENTAL PRODUCT DECLARATION

DAPcons® 100.024

According to ISO 14025  
and UNE EN 15804 + A1



COL·LEGI D'APARELLADORS,  
ARQUITECTES TÈCNICS  
I ENGINYERS D'EDIFICACIÓ  
DE BARCELONA

## Product

## CURTAIN WALL SYSTEMS

## Owner



## Product description

This DAP shows different curtain wall systems assembled from anodized/coated extruded aluminum profiles with thermal break manufactured by CORTIZO. The declared products are specific to the different series designed by the company, among which are hinged and sliding windows with different glazing.

## PCR Reference

RCP100. Productos de construcción en general. Version 2 – 29.02.2016

## Production plant

The production of the aluminum profiles is carried out at the CORTIZO facilities in Padrón (La Coruña). Part of the aluminum billet used in the manufacture of the profiles is produced in Mieres (Asturias). The assembly of the facades is carried out in carpentry throughout Spain.

## Validity

From: 22/10/2020 To: 22/10/2025

The validity of DAPcons® 100.024 is subject to the conditions of the DAPcons® regulation. The current edition of this DAPcons® is the one that appears in the registry maintained by CAATEEB; for information purposes, it is incorporated into the website of the Program [www.csostenible.net](http://www.csostenible.net)

# ENVIRONMENTAL PRODUCT DECLARATION

## CURTAIN WALL SYSTEMS

### EXECUTIVE SUMMARY

<b>PROGRAMME OPERATOR DAPconstrucción®</b>	
Environmental product declarations of construction sector <a href="http://www.csostenible.net">www.csostenible.net</a>	
<b>Administrator of Programme Operator</b>	
Col·legi d'Aparelladors, Arquitectes Tècnics de Barcelona i Enginyers de l'Edificació (CAATEEB) Bon Pastor, 5 · 08021 Barcelona <a href="http://www.apabcn.cat">www.apabcn.cat</a>	
<b>Owner of the Declaration</b>	
ALUMINIOS CORTIZO, S.A.U. - Extramundi, S/N. 15910 - Padrón (A Coruña) España	
<b>Declaration carried out by:</b>	
IDNÓVAM - Ferraz, 56, Bajo, 28008 Madrid	
<b>Declaration Number</b>	
DAPcons®. 100.024	
<b>Declared Product</b>	
CURTAIN WALL SYSTEMS	
<b>Product description</b>	
The declared curtain wall systems include various series manufactured with coated/anodized aluminum profiles.	
<b>Registration date</b>	
22/10/2020	
<b>Validity</b>	
This verified declaration authorises the owner to use the DAPcons® eco-label logo. The declaration is applicable exclusively to the product in question and for five years as of the date of registration. The responsible for the information contained in this declaration is: CORTIZO	
<b>Endorsed by CAATEEB</b>	<b>Endorsed by authorised verifier</b>
Celestí Ventura Cisternas, President of the CAATEEB	Mr. Ferran Pérez, Verifier accredited by the DAPconstruction Program
<p>This environmental product declaration complies with standards ISO 14025 and UNE EN 15804 + A1 and contains information of an environmental nature about the life cycle of Curtain wall systems. The aluminum profiles is carried out at the CORTIZO facilities in Padrón (La Coruña). Part of the aluminum billet used in the manufacture of the profiles is produced in Mieres (Asturias). This declaration is based on the document RCP100 - v2 [2016] - Productos de la construcción en general. The environmental product declaration (DAPcons®) may not be comparable to another EPD if it is not based on the UNE EN 15804 + A1 standard.</p>	

## ENVIRONMENTAL PRODUCT DECLARATION

### 1. PRODUCT DESCRIPTION AND APPLICATION

CORTIZO's stick-type curtain wall systems are configured with a base system with a wide range of aluminum mullions and transoms. Both its base profiles - uprights from 16 mm to 250 mm and crossbars from 22.5 mm to 255.5 mm - as well as the complementary accessories are common to all new generation CORTIZO curtain walls. So is the 52 mm internal view section of the profiles, although there is the possibility of using uprights and cross members of only 18 mm, thus obtaining greater luminosity and a minimalist aesthetic within the building.

The wide variety of profiles and mechanical joints available enable the execution of all types of curtain walls (vertical, inclined, 90 ° corner, corner, polygonal), as well as the resolution of modulations with large glass and weight. In addition, the uprights and cross members flush and at different levels allow for cascade drains and together with the continuity pieces, the pipettes, the sectionable rubbers or the total vulcanized angle guarantee the absolute tightness, drainage and evacuation of the enclosure.

Excellent thermal and acoustic performance based mainly on 2 aspects: an thermal bridge break (TBB) of up to 66 mm resulting from the combination of 6, 12 and 30 mm TBB coextrusion profiles and a maximum glazing capacity of 56 mm. All of this gives it thermal transmittance values from 0.6 W / m²K.

The results of this EPD are representative for the facades of the series TP 52, SG 52, TPV 52 and TPH 52.

**TP 52 Facade:** This traditional or stick curtain wall system has an identical 52 mm section, seen inside and outside. In it, the glass is fixed to the supporting structure by means of a continuous pressure profile, screwing from the outside to a screw holder incorporated in uprights and crossbars. Through this profile, the glass is held on all four sides, incorporating separating rubbers that prevent its contact with the metal. The pressor profile and the screws are covered with a continuous exterior trim profile called a cap that can be of different shapes: elliptical, H, rectangular or pyramidal.

**SG 52 Facade:** This is a stick system curtain wall that presents a "glass only" aesthetic on the outside. In this facade, the glass is fixed to the supporting profile on all four sides by means of the combination of clips and the insert or U-profile placed in the glass chamber.

**TPH 52 Facade:** This mixed system was born from the combination of the TP 52 and SG 52 systems. In it, the pressure-flap binomial is maintained in the horizontal joints, highlighting the frame in this sense, while in the vertical edges the fixing of the Glass is produced using staples and the U-profile. It has various possibilities of flap: H-shaped, elliptical and rectangular.

**TPV 52 Facade:** Mixed system with characteristics similar to the TPH 52 facade. The difference lies in the fact that, in this case, the pressure-flap binomial is applied in the vertical joints while the horizontal fixing of the glass is produced by means of clips and U-profile. "



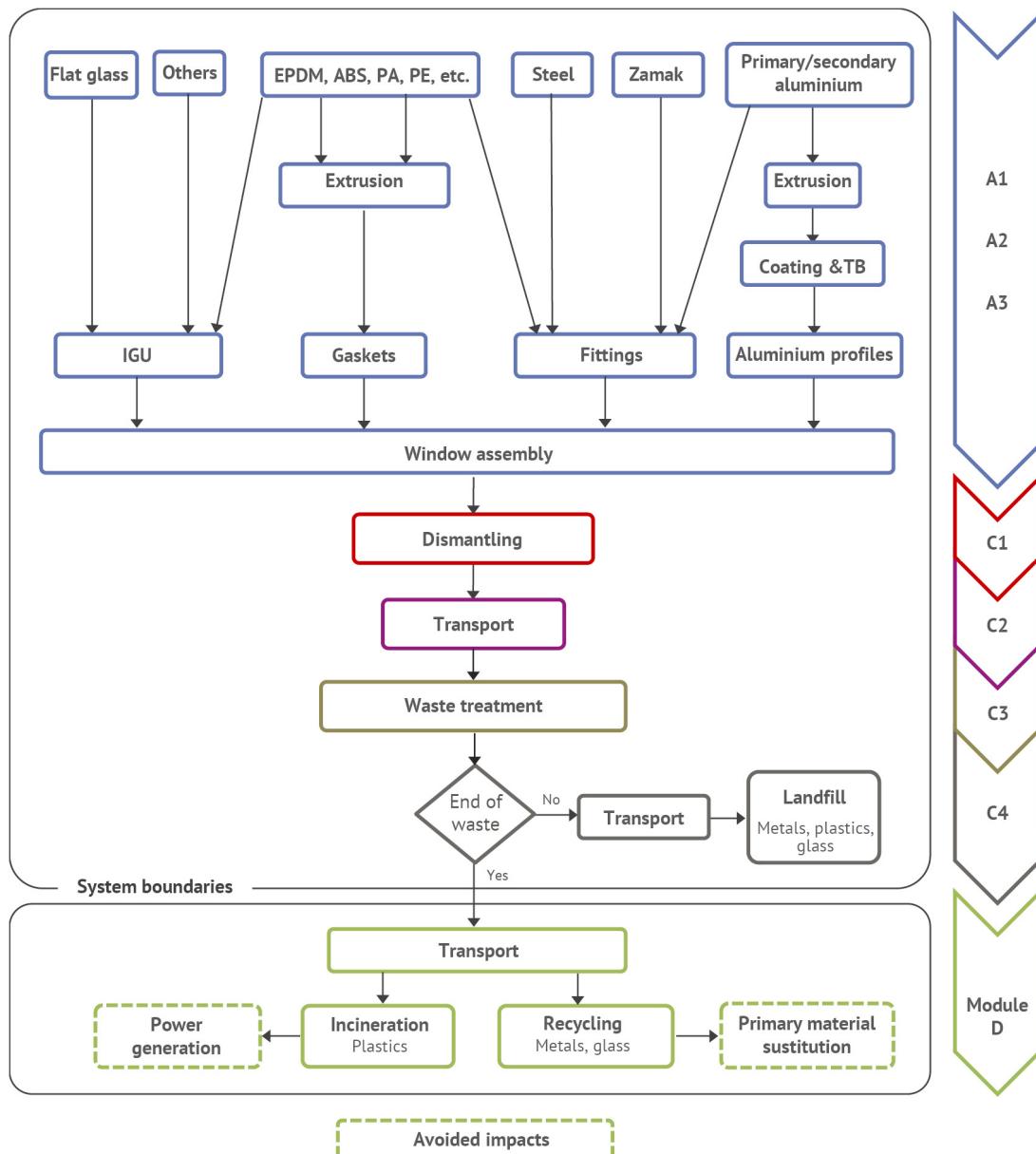
### TECHNICAL CHARACTERISTICS

	<b>IGU</b>	<b>Thermal insulation frame Uf (W/m²K)</b>	<b>Thermal insulation Uw (W/m²K)</b>	<b>Air tightness</b>	<b>Water tightness</b>	<b>Acoustic insulation (Rw)</b>	<b>Wind load resistance</b>
		UNE-EN 10077-2	UNE-EN 12152	UNE-EN 12154	UNE-EN ISO 12354		UNE -EN 13116
<b>TP 52</b>	6/16Arg/ 33.1 BE	3,3	1,9	AE	RE 1500	37 dB	Suitable, Design load 2000Pa, safety 3000 Pa
<b>SG 52</b>	6/16Arg/ 33.1 BE	3,7	1,5	AE	RE 1500	37 dB	Suitable, Design load 2000Pa, safety 3000 Pa
<b>TPV 52</b>	6/16Arg/ 33.1 BE	2,7	1,8	AE	RE 1500	37 dB	Suitable, Design load 2000Pa, safety 3000 Pa
<b>TPH 52</b>	6/16Arg/ 33.1 BE	2,1	1,4	AE	RE 1500	37 dB	Suitable, Design load 2000Pa, safety 3000 Pa

### COMPOSITION

<b>Material (kg)</b>	<b>Component</b>	<b>TP 52</b>	<b>SG 52</b>	<b>TPV 52</b>	<b>TPH 52</b>
<b>Flat glass</b>	<b>IGU</b>	1.368	1.368	1.368	1.368
<b>Flat glass (low-e)</b>	<b>IGU</b>	1.368	1.368	1.368	1.368
<b>Aluminium</b>	<b>Profiles</b>	527,2	456,1	501,5	481,8
<b>Aluminium</b>	<b>Gasket &amp; fittings</b>	19,9	27,9	25,5	22,4
<b>Aluminium</b>	<b>IGU</b>	11,6	11,6	11,6	11,6
<b>Steel</b>	<b>Gasket &amp; fittings</b>	38,5	9,1	28,4	19,2
<b>Stainless steel</b>	<b>Gasket &amp; fittings</b>	8,50	8,50	8,50	8,50
<b>Zamak</b>	<b>Gasket &amp; fittings</b>	1,46	1,46	1,46	1,46
<b>Coating powder</b>	<b>Profiles</b>	17,2	13,7	15,9	15,0
<b>ABS</b>	<b>Gasket &amp; fittings</b>	0,43	0,27	0,43	0,27
<b>EPDM</b>	<b>Gasket &amp; fittings</b>	30,3	30,6	28,0	29,1
<b>PB</b>	<b>IGU</b>	0,87	0,87	0,87	0,87
<b>PE</b>	<b>Gasket &amp; fittings</b>	6,33	0,32	4,13	2,52
<b>PVB</b>	<b>IGU</b>	37,8	37,8	37,8	37,8
<b>PVC</b>	<b>Gasket &amp; fittings</b>	37,0	23,4	28,4	28,4
<b>Polysulfide</b>	<b>IGU</b>	14,8	14,8	14,8	14,8
<b>Neoprene</b>	<b>Gasket &amp; fittings</b>	0,58	0,54	0,54	0,68
<b>Zeolite</b>	<b>IGU</b>	25,1	25,1	25,1	25,1
<b>Argon</b>	<b>IGU</b>	2,38	2,38	2,38	2,38

SYSTEM BOUNDARIES



## 2. LIFE CYCLE PHASES DESCRIPTION

### 2.1. Manufacture (A1, A2 and A3)

#### Raw materials (A1 and A2)

The manufacture of aluminum profiles begins with the extraction and processing of minerals for the production of primary aluminum that constitutes, together with secondary aluminum, the main input. CORTIZO receives primary and secondary aluminum from national and international suppliers, also producing secondary aluminum in the facility in Mieres. The rest of the raw materials necessary for the manufacture of the profiles are also received (TBB, coating powder, etc.)

In turn, the facade systems consist of other components such as isolation glass unit (IGU), fittings and gaskets made with different materials, including glass, aluminum, steel, stainless steel, EPDM, etc. With the exception of IGU, these components are received at the CORTIZO facilities for subsequent distribution together with the manufactured profiles.

#### Manufacturing (A3)

Aluminum profiles are produced by extrusion of preheated aluminum billets which, due to plastic deformation, are forced to pass through a die in order to produce profiles with different sections. The extruded profiles are then cooled while the ends are clamped in order to straighten them during the cooling. Later they are cut to the desired length and go to a ripening oven to increase their hardness.

The profiles can have different surface finishes: anodized and coated. Anodizing is a process carried out by electrolysis by which oxidation of the aluminum surface occurs. Previously, the aluminum surface has to be prepared by immersing the profiles in several baths containing different chemical substances (degreasing, neutralized, etc.). After anodizing, the profiles also undergo another baths with dissolved chemical substances to improve the durability of the oxide layer formed (sealing) as well as change its color (coloration).

In coating the profiles are subjected to baths in different solutions to prepare the surface for the application of the paint (degreasing, acid attack, toning and conversion). Later, coating powder is electrostatically applied to the surface of the profile and then hardened by means of polymerization in ovens at a temperature of around 200 ° C.

Finally the TBB profiles are inserted. The profiles, fittings and joints are transported from the CORTIZO facilities first to distribution centers and later on request to the construction site where the aluminum profiles are cut and machined and assembled with the rest of the components.

The IGU is mounted on the glassware and is sent directly to the construction site where it is mounted once the facade mullions and cross elements have been installed.



## 2.2. Construction (A4 and A5)

Module Not Declared

## 2.3. Product use (B1-B7)

Module Not Declared

## 2.4. End-of-life (C1-C4)

C1 - In the consulted life cycle databases, no information was found for the dismantling operations of elements such as windows, exterior doors or facades Nor has any bibliography been found on the inputs or residues associated with these operations. Therefore it has been estimated that the contribution of this module is null.

C2 - A distance of 200 km has been assumed for transport to scrap metal dealers.

C3 - It has been assumed that the electricity consumed during the scrapping of the facades for the recovery of the different fractions is the same as during their assembly.

C4 - End-of-life scenarios, final destination, recovery rates and recycling efficiencies of the different material fractions have been designed based on the default values of UNE EN 17213.

Metals: recycling, 95% - landfill, 5%

Plastics: energy valorization, 95% - landfill, 5%

Glass: landfill, 70% - recycling, 30%

## 2.5. Benefits and loads beyond the system boundary (D)

When an aluminum construction product reaches the end of its useful life, it is collected extensively and sent to recycling centers for the production of secondary aluminum billet. The recovery rate of aluminum products in the construction sector is by default 95% (UNE EN 17213). The final recycling rate is also dependent on the performance in the smelting furnace which includes metal losses during scrap preparation and melting.

In order to obtain the net exit of aluminum from the system at the end of the useful life of the profiles, the scrap inputs in the production stage are subtracted from the scrap sent for recycling at the end of its useful life. Module D declares the loads and environmental benefits of recycling this net scrap that leaves the system (EN 15804). These environmental aspects have been evaluated up to the point of functional equivalence, that is, the obtaining of secondary aluminum billet that allows the substitution of primary aluminum.

This criterion also applies to the other metals and glass in facades that are sent for recycling.

Metal recovery rate, 95%

Plastics recovery rate, 95%, efficiency in plastics energy valorization, 60%

Glass recovery rate, 30%

### 3. LIFE CYCLE ASSESSMENT

The life cycle analysis on which this statement is based has been carried out following the ISO 14040 and ISO 14044 standards and the document RCP 100 Construction products in general (version 2. 02.29.2016). In the same way, the EN 15804: 2012 + A1: 2014 standard has been met. This EPD is of the “cradle to gate with options” type, stating the stages of manufacture of the product and its end of life.

Specific data from the CORTIZO plants (Padrón in La Coruña and Mieres in Asturias corresponding to the years 2017, 2018 and 2019 have been used for the manufacture of the aluminum profiles. The data for the IGU, fittings, joints and other aspects Environmental conditions during facades assembly are based on information updated to 2020.

#### 3.1. Declared unit

The declared unit is 1 m<sup>2</sup> of facade cladding with the technical characteristics shown in point 1 and a reference useful life of 50 years.

The indicators declared in this EPD have been calculated from a facade of size 13.55 m x 7.05 m. To obtain the environmental impacts and other parameters related to 1 m<sup>2</sup> of product, these indicators were divided by the area of the facade (95.57 m<sup>2</sup>).

#### 3.2. System boundary

**Table 2. Declared modules**

Fabricación			Construction Process Stage		Use stage							End of life stage				Benefits and loads beyond the system boundaries
Raw materials supply	Transport	Manufacturing	Transport	Construction – Installation process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational Energy use	Operational water use	De-construction	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	MND	MND	MND	MND	MND	MND	MND	MND	MND	X	X	X	X	X

X = Included in LCA    MND = Module Not Declared

### 3.3. Data analysis for the life cycle (ACV)

#### INDICATORS OF THE ENVIRONMENTAL IMPACT

**TP 52 ANODIZED CURTAIN WALL 1m<sup>2</sup>**

Parameter	Unit	Life Cycle Phase						
		Manufacture	Construction	Use	End of Life			Module
		A1-A3	A4-A5	B1-B7	C1	C2	C3	C4
Climatic Change - total	kg CO <sub>2</sub> eq	8,53E+01	MND	MND	0	5,63E-01	5,89E-02	2,65E-01
Climatic Change - fossil	kg CO <sub>2</sub> eq	8,51E+01	MND	MND	0	5,63E-01	5,87E-02	2,65E-01
Climate change - biogenic	kg CO <sub>2</sub> eq	9,62E-02	MND	MND	0	0	4,35E-05	3,26E-05
Climate change - land use and land use change	kg CO <sub>2</sub> eq	6,82E-02	MND	MND	0	0	1,88E-04	4,03E-06
Ozone depletion	kg CFC-11 eq	7,33E-06	MND	MND	0	8,62E-10	7,11E-09	5,53E-08
Acidification	mol H <sup>+</sup> eq	6,97E-01	MND	MND	0	3,76E-03	4,79E-04	1,78E-03
Eutrophication aquatic freshwater	kg PO <sub>4</sub> <sup>3-</sup> eq	7,31E-02	MND	MND	0	6,05E-04	8,12E-05	7,22E-04
Eutrophication aquatic marine	kg N eq	1,04E-01	MND	MND	0	1,77E-03	8,69E-05	8,02E-04
Eutrophication terrestrial	mol N eq	1,17E+00	MND	MND	0	1,94E-02	9,11E-04	8,37E-03
Photochemical ozone formation	kg NMVOC eq	3,18E-01	MND	MND	0	4,93E-03	2,52E-04	2,35E-03
Abiotic resource depletion - minerals and metals	kg Sb eq	3,42E-04	MND	MND	0	2,21E-08	8,56E-08	1,64E-07
Abiotic resource depletion - fossils	MJ	1,18E+03	MND	MND	0	7,84E+00	1,06E+00	5,05E+00
Water use	m <sup>3</sup> eq	2,54E+00	MND	MND	0	5,91E-03	3,01E-01	6,85E+00
Particulate matter emissions	disease inc.	5,59E-04	MND	MND	0	3,10E-06	2,52E-07	2,52E-06
Ionising radiation	kBq U235 eq	8,82E+02	MND	MND	0	1,31E-01	2,08E+00	1,32E+00
Ecotoxicity - freshwater	CTUe	4,23E+04	MND	MND	0	1,72E+00	1,09E+02	5,44E+02
Human toxicity, cancer effects	CTUh	4,67E-04	MND	MND	0	2,78E-08	2,45E-07	7,54E-07
Human toxicity, non-cancer effects	CTUh	1,35E-03	MND	MND	0	1,68E-07	1,04E-06	6,78E-06
Land use	Pt	4,03E+04	MND	MND	0	0	8,82E+01	4,84E+02

- A1. Raw materials supply
- A2. Transport
- A3. Manufacturing Product
- A4. Transport
- A5. Construction – Installation process

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

- C1. Decosntruction and demolition
- C2. Transport
- C3. Waste management for reuse, recovery and recycling.
- C4. Disposal

MND. Module not declared



**INDICATORS OF RESOURCES USE**
**TP 52 ANODIZED CURTAIN WALL 1m<sup>2</sup>**

Parameter	Unit	Life Cycle Phase							
		Manufacture	Construction	Use	End of Life				Module
		A1-A3	A4-A5	B1-B7	C1	C2	C3	C4	D
Renewable primary energy as energy carrier	MJ	1,93E+04	MND	MND	0	1,00E+00	1,61E+01	3,37E+00	-9,13E+03
Renewable primary energy resource as material utilization	MJ	0	MND	MND	0	0	0	0	0
Total use of renewable primary energy resources	MJ	1,93E+04	MND	MND	0	1,00E+00	1,61E+01	3,37E+00	-9,13E+03
Non-renewable primary energy as energy carrier	MJ	1,15E+05	MND	MND	0	7,50E+02	1,04E+02	5,02E+02	-2,52E+04
Non-renewable primary energy as material utilization	MJ	0	MND	MND	0	0	0	0	0
Total use of non-renewable primary energy resources	MJ	1,15E+05	MND	MND	0	7,50E+02	1,04E+02	5,02E+02	-2,52E+04
Use of secondary materials	kg	1,84E+02	MND	MND	0	0	0	0	0
Use of renewable secondary fuels	MJ	0	MND	MND	0	0	0	0	0
Use of non-renewable secondary fuels	MJ	0	MND	MND	0	0	0	0	0
Use of net fresh water	m <sup>3</sup>	1,40E+04	MND	MND	0	0	3,10E+01	1,16E+00	-3,90E+03
Hazardous waste disposed	kg	1,49E+02	MND	MND	0	6,59E-05	0	2,14E-05	-8,75E+01
Non-hazardous waste disposed	kg	7,93E+02	MND	MND	0	2,98E-02	0	1,95E+03	-4,06E+02
Radioactive waste disposed	kg	1,73E+00	MND	MND	0	0	0	0	-9,92E-01
Components for re-use	kg	0	MND	MND	0	0	0	0	0
Materials for recycling	kg	3,70E+02	MND	MND	0	0	1,39E+03	0	0
Materials for energy recovery	kg	0	MND	MND	0	0	1,07E+02	0	0
Exported energy	MJ	0	MND	MND	0	0	3,22E+03	0	0

- A1. Raw materials supply
- A2. Transport
- A3 Manufacturing Product
- A4. Transport
- A5. Construction – Installation process

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

- C1. Decosntruction and demolition
- C2. Transport
- C3. Waste management for reuse, recovery and recycling.
- C4. Disposal

MND. Module not declared



**INDICATORS OF THE ENVIRONMENTAL IMPACT**
**TP 52 COATED CURTAIN WALL 1m<sup>2</sup>**

Parameter	Unit	Life Cycle Phase							
		Manufacture		Construction	Use	End of Life			Module
		A1-A3	A4-A5	B1-B7	C1	C2	C3	C4	D
Climatic Change - total	kg CO <sub>2</sub> eq	8,07E+01	MND	MND	0	5,66E-01	5,89E-02	2,69E-01	-1,96E+01
Climatic Change - fossil	kg CO <sub>2</sub> eq	8,05E+01	MND	MND	0	5,66E-01	5,87E-02	2,69E-01	-1,96E+01
Climate change - biogenic	kg CO <sub>2</sub> eq	9,11E-02	MND	MND	0	0	4,35E-05	3,37E-05	-2,21E-02
Climate change - land use and land use change	kg CO <sub>2</sub> eq	6,87E-02	MND	MND	0	0	1,88E-04	4,33E-06	-2,14E-02
Ozone depletion	kg CFC-11 eq	6,10E-06	MND	MND	0	8,66E-10	7,11E-09	5,54E-08	-4,68E-07
Acidification	mol H <sup>+</sup> eq	6,35E-01	MND	MND	0	3,77E-03	4,79E-04	1,78E-03	-2,00E-01
Eutrophication aquatic freshwater	kg PO <sub>4</sub> <sup>3-</sup> eq	6,56E-02	MND	MND	0	6,07E-04	8,12E-05	7,68E-04	-1,35E-02
Eutrophication aquatic marine	kg N eq	1,00E-01	MND	MND	0	1,78E-03	8,69E-05	8,08E-04	-2,91E-02
Eutrophication terrestrial	mol N eq	1,13E+00	MND	MND	0	1,95E-02	9,11E-04	8,38E-03	-3,29E-01
Photochemical ozone formation	kg NMVOC eq	3,04E-01	MND	MND	0	4,95E-03	2,52E-04	2,35E-03	-8,51E-02
Abiotic resource depletion - minerals and metals	kg Sb eq	3,08E-04	MND	MND	0	2,22E-08	8,56E-08	1,65E-07	-1,20E-04
Abiotic resource depletion - fossils	MJ	1,08E+03	MND	MND	0	7,88E+00	1,06E+00	5,06E+00	-2,65E+02
Water use	m <sup>3</sup> eq	2,53E+00	MND	MND	0	5,94E-03	3,01E-01	6,85E+00	7,20E+00
Particulate matter emissions	disease inc.	5,47E-04	MND	MND	0	3,12E-06	2,52E-07	2,52E-06	-1,93E-04
Ionising radiation	kBq U235 eq	6,48E+02	MND	MND	0	1,31E-01	2,08E+00	1,33E+00	-4,02E+02
Ecotoxicity - freshwater	CTUe	3,28E+04	MND	MND	0	1,73E+00	1,09E+02	6,22E+02	-3,80E+03
Human toxicity, cancer effects	CTUh	4,40E-04	MND	MND	0	2,79E-08	2,45E-07	7,65E-07	-6,29E-05
Human toxicity, non-cancer effects	CTUh	1,07E-03	MND	MND	0	1,69E-07	1,04E-06	7,59E-06	-2,81E-04
Land use	Pt	3,51E+04	MND	MND	0	0	8,82E+01	4,85E+02	-7,32E+03

A1. Raw materials supply  
 A2. Transport  
 A3 Manufacturing Product  
 A4. Transport  
 A5. Construction – Installation process

B1. Use  
 B2. Maintenance  
 B3. Repair  
 B4. Replacement  
 B5. Refurbishment  
 B6. Operational Energy use  
 B7. Operational water use

C1. Decosntruction and demolition  
 C2. Transport  
 C3. Waste management for reuse, recovery and recycling.  
 C4. Disposal

MND. Module not declared



**INDICATORS OF RESOURCES USE**
**TP 52 COATED CURTAIN WALL 1m<sup>2</sup>**

Parameter	Unit	Life Cycle Phase							
		Manufacture	Construction	Use	End of Life				Module
		A1-A3	A4-A5	B1-B7	C1	C2	C3	C4	D
Renewable primary energy as energy carrier	MJ	1,72E+04	MND	MND	0	1,00E+00	1,61E+01	3,40E+00	-9,35E+03
Renewable primary energy resource as material utilization	MJ	0	MND	MND	0	0	0	0	0
Total use of renewable primary energy resources	MJ	1,72E+04	MND	MND	0	1,00E+00	1,61E+01	3,40E+00	-9,35E+03
Non-renewable primary energy as energy carrier	MJ	1,05E+05	MND	MND	0	7,53E+02	1,04E+02	5,03E+02	-2,57E+04
Non-renewable primary energy as material utilization	MJ	0	MND	MND	0	0	0	0	0
Total use of non-renewable primary energy resources	MJ	1,05E+05	MND	MND	0	7,53E+02	1,04E+02	5,03E+02	-2,57E+04
Use of secondary materials	kg	1,83E+02	MND	MND	0	0	0	0	0
Use of renewable secondary fuels	MJ	0	MND	MND	0	0	0	0	0
Use of non-renewable secondary fuels	MJ	0	MND	MND	0	0	0	0	0
Use of net fresh water	m <sup>3</sup>	1,32E+04	MND	MND	0	0	3,10E+01	1,32E+00	-3,90E+03
Hazardous waste disposed	kg	1,48E+02	MND	MND	0	6,62E-05	0	2,15E-05	-9,00E+01
Non-hazardous waste disposed	kg	7,63E+02	MND	MND	0	2,99E-02	0	1,95E+03	-4,18E+02
Radioactive waste disposed	kg	1,73E+00	MND	MND	0	0	0	0	-1,02E+00
Components for re-use	kg	0	MND	MND	0	0	0	0	0
Materials for recycling	kg	3,68E+02	MND	MND	0	0	1,40E+03	0	0
Materials for energy recovery	kg	0	MND	MND	0	0	1,07E+02	0	0
Exported energy	MJ	0	MND	MND	0	0	3,22E+03	0	0

- A1. Raw materials supply
- A2. Transport
- A3 Manufacturing Product
- A4. Transport
- A5. Construction – Installation process

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

- C1. Deconstruction and demolition
- C2. Transport
- C3. Waste management for reuse, recovery and recycling.
- C4. Disposal

MND. Module not declared



**INDICATORS OF THE ENVIRONMENTAL IMPACT**
**SG 52 ANODIZED CURTAIN WALL 1m<sup>2</sup>**

Parameter	Unit	Life Cycle Phase							
		Manufacture		Construction	Use	End of Life			Module
		A1-A3	A4-A5	B1-B7	C1	C2	C3	C4	D
Climatic Change - total	kg CO <sub>2</sub> eq	8,11E+01	MND	MND	0	5,39E-01	5,89E-02	2,57E-01	-1,75E+01
Climatic Change - fossil	kg CO <sub>2</sub> eq	8,10E+01	MND	MND	0	5,39E-01	5,87E-02	2,57E-01	-1,75E+01
Climate change - biogenic	kg CO <sub>2</sub> eq	9,68E-02	MND	MND	0	0	4,35E-05	3,13E-05	-2,10E-02
Climate change - land use and land use change	kg CO <sub>2</sub> eq	6,96E-02	MND	MND	0	0	1,88E-04	3,69E-06	-1,81E-02
Ozone depletion	kg CFC-11 eq	7,00E-06	MND	MND	0	8,24E-10	7,11E-09	5,51E-08	-3,72E-07
Acidification	mol H <sup>+</sup> eq	6,71E-01	MND	MND	0	3,59E-03	4,79E-04	1,76E-03	-1,84E-01
Eutrophication aquatic freshwater	kg PO <sub>4</sub> <sup>3-</sup> eq	7,10E-02	MND	MND	0	5,78E-04	8,12E-05	6,48E-04	-1,19E-02
Eutrophication aquatic marine	kg N eq	1,00E-01	MND	MND	0	1,70E-03	8,69E-05	7,84E-04	-2,68E-02
Eutrophication terrestrial	mol N eq	1,13E+00	MND	MND	0	1,86E-02	9,11E-04	8,25E-03	-3,05E-01
Photochemical ozone formation	kg NMVOC eq	3,04E-01	MND	MND	0	4,71E-03	2,52E-04	2,32E-03	-7,81E-02
Abiotic resource depletion - minerals and metals	kg Sb eq	3,27E-04	MND	MND	0	2,12E-08	8,56E-08	1,62E-07	-1,16E-04
Abiotic resource depletion - fossils	MJ	1,10E+03	MND	MND	0	7,50E+00	1,06E+00	5,00E+00	-2,30E+02
Water use	m <sup>3</sup> eq	2,24E+00	MND	MND	0	5,65E-03	3,01E-01	6,85E+00	5,85E+00
Particulate matter emissions	disease inc.	5,32E-04	MND	MND	0	2,97E-06	2,52E-07	2,50E-06	-1,78E-04
Ionising radiation	kBq U235 eq	8,00E+02	MND	MND	0	1,25E-01	2,08E+00	1,32E+00	-3,50E+02
Ecotoxicity - freshwater	CTUe	3,92E+04	MND	MND	0	1,65E+00	1,09E+02	4,55E+02	-2,84E+03
Human toxicity, cancer effects	CTUh	4,15E-04	MND	MND	0	2,66E-08	2,45E-07	7,26E-07	-3,40E-05
Human toxicity, non-cancer effects	CTUh	1,22E-03	MND	MND	0	1,61E-07	1,04E-06	5,85E-06	-2,30E-04
Land use	Pt	3,81E+04	MND	MND	0	0	8,82E+01	4,82E+02	-6,63E+03

A1. Raw materials supply  
 A2. Transport  
 A3 Manufacturing Product  
 A4. Transport  
 A5. Construction – Installation process

B1. Use  
 B2. Maintenance  
 B3. Repair  
 B4. Replacement  
 B5. Refurbishment  
 B6. Operational Energy use  
 B7. Operational water use

C1. Decosntruction and demolition  
 C2. Transport  
 C3. Waste management for reuse, recovery and recycling.  
 C4. Disposal

MND. Module not declared



**INDICATORS OF RESOURCES USE**
**SG 52 ANODIZED CURTAIN WALL 1m<sup>2</sup>**

Parameter	Unit	Life Cycle Phase							
		Manufacture	Construction	Use	End of Life				Module
		A1-A3	A4-A5	B1-B7	C1	C2	C3	C4	D
Renewable primary energy as energy carrier	MJ	1,74E+04	MND	MND	0	9,57E-01	1,61E+01	3,31E+00	-8,31E+03
Renewable primary energy resource as material utilization	MJ	0	MND	MND	0	0	0	0	0
Total use of renewable primary energy resources	MJ	1,74E+04	MND	MND	0	9,57E-01	1,61E+01	3,31E+00	-8,31E+03
Non-renewable primary energy as energy carrier	MJ	1,07E+05	MND	MND	0	7,17E+02	1,04E+02	4,97E+02	-2,23E+04
Non-renewable primary energy as material utilization	MJ	0	MND	MND	0	0	0	0	0
Total use of non-renewable primary energy resources	MJ	1,07E+05	MND	MND	0	7,17E+02	1,04E+02	4,97E+02	-2,23E+04
Use of secondary materials	kg	1,52E+02	MND	MND	0	0	0	0	0
Use of renewable secondary fuels	MJ	0	MND	MND	0	0	0	0	0
Use of non-renewable secondary fuels	MJ	0	MND	MND	0	0	0	0	0
Use of net fresh water	m <sup>3</sup>	1,43E+04	MND	MND	0	0	3,10E+01	9,83E-01	-3,27E+03
Hazardous waste disposed	kg	1,31E+02	MND	MND	0	6,31E-05	0	1,93E-05	-8,06E+01
Non-hazardous waste disposed	kg	6,97E+02	MND	MND	0	2,85E-02	0	1,95E+03	-3,74E+02
Radioactive waste disposed	kg	1,53E+00	MND	MND	0	0	0	0	-9,14E-01
Components for re-use	kg	0	MND	MND	0	0	0	0	0
Materials for recycling	kg	3,57E+02	MND	MND	0	0	1,30E+03	0	0
Materials for energy recovery	kg	0	MND	MND	0	0	8,83E+01	0	0
Exported energy	MJ	0	MND	MND	0	0	2,66E+03	0	0

- A1. Raw materials supply
- A2. Transport
- A3 Manufacturing Product
- A4. Transport
- A5. Construction – Installation process

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

- C1. Decosntruction and demolition
- C2. Transport
- C3. Waste management for reuse, recovery and recycling.
- C4. Disposal

MND. Module not declared

**INDICATORS OF THE ENVIRONMENTAL IMPACT**
**SG 52 COATED CURTAIN WALL 1m<sup>2</sup>**

Parameter	Unit	Life Cycle Phase								
		Manufacture		Construction		Use		End of Life		Module
		A1-A3	A4-A5	B1-B7	C1	C2	C3	C4	D	
Climatic Change - total	kg CO <sub>2</sub> eq	7,69E+01	MND	MND	0	5,41E-01	5,89E-02	2,60E-01	-1,79E+01	
Climatic Change - fossil	kg CO <sub>2</sub> eq	7,68E+01	MND	MND	0	5,41E-01	5,87E-02	2,60E-01	-1,78E+01	
Climate change - biogenic	kg CO <sub>2</sub> eq	9,22E-02	MND	MND	0	0	4,35E-05	3,22E-05	-2,10E-02	
Climate change - land use and land use change	kg CO <sub>2</sub> eq	6,94E-02	MND	MND	0	0	1,88E-04	3,93E-06	-1,82E-02	
Ozone depletion	kg CFC-11 eq	5,89E-06	MND	MND	0	8,27E-10	7,11E-09	5,52E-08	-3,72E-07	
Acidification	mol H <sup>+</sup> eq	6,17E-01	MND	MND	0	3,61E-03	4,79E-04	1,76E-03	-1,86E-01	
Eutrophication aquatic freshwater	kg PO <sub>4</sub> <sup>3-</sup> eq	6,42E-02	MND	MND	0	5,80E-04	8,12E-05	6,85E-04	-1,19E-02	
Eutrophication aquatic marine	kg N eq	9,65E-02	MND	MND	0	1,70E-03	8,69E-05	7,89E-04	-2,71E-02	
Eutrophication terrestrial	mol N eq	1,09E+00	MND	MND	0	1,87E-02	9,11E-04	8,26E-03	-3,08E-01	
Photochemical ozone formation	kg NMVOC eq	2,92E-01	MND	MND	0	4,73E-03	2,52E-04	2,32E-03	-7,89E-02	
Abiotic resource depletion - minerals and metals	kg Sb eq	2,97E-04	MND	MND	0	2,12E-08	8,56E-08	1,63E-07	-1,16E-04	
Abiotic resource depletion - fossils	MJ	1,00E+03	MND	MND	0	7,53E+00	1,06E+00	5,00E+00	-2,34E+02	
Water use	m <sup>3</sup> eq	2,23E+00	MND	MND	0	5,67E-03	3,01E-01	6,85E+00	5,81E+00	
Particulate matter emissions	disease inc.	5,21E-04	MND	MND	0	2,98E-06	2,52E-07	2,50E-06	-1,80E-04	
Ionising radiation	kBq U235 eq	5,94E+02	MND	MND	0	1,26E-01	2,08E+00	1,32E+00	-3,54E+02	
Ecotoxicity - freshwater	CTUe	3,08E+04	MND	MND	0	1,65E+00	1,09E+02	5,17E+02	-2,84E+03	
Human toxicity, cancer effects	CTUh	3,90E-04	MND	MND	0	2,67E-08	2,45E-07	7,35E-07	-3,40E-05	
Human toxicity, non-cancer effects	CTUh	9,72E-04	MND	MND	0	1,62E-07	1,04E-06	6,49E-06	-2,31E-04	
Land use	Pt	3,35E+04	MND	MND	0	0	8,82E+01	4,83E+02	-6,63E+03	

- |   |                            |   |                          |
|---|----------------------------|---|--------------------------|
| A1. Raw materials supply                | B1. Use                    | C1. Decosntruction and demolition                       | MND. Module not declared |
| A2. Transport                           | B2. Maintenance            | C2. Transport   |                          |
| A3. Manufacturing Product               | B3. Repair                 | C3. Waste management for reuse, recovery and recycling. |                          |
| A4. Transport                           | B4. Replacement            | C4. Disposal  |                          |
| A5. Construction – Installation process | B5. Refurbishment          |   |                          |
|   | B6. Operational Energy use |   |                          |
|   | B7. Operational water use  |   |                          |



**INDICATORS OF RESOURCES USE**
**SG 52 COATED CURTAIN WALL 1m<sup>2</sup>**

Parameter	Unit	Life Cycle Phase							
		Manufacture	Construction	Use	End of Life				Module
		A1-A3	A4-A5	B1-B7	C1	C2	C3	C4	D
Renewable primary energy as energy carrier	MJ	1,56E+04	MND	MND	0	9,60E-01	1,61E+01	3,34E+00	-8,48E+03
Renewable primary energy resource as material utilization	MJ	0	MND	MND	0	0	0	0	0
Total use of renewable primary energy resources	MJ	1,56E+04	MND	MND	0	9,60E-01	1,61E+01	3,34E+00	-8,48E+03
Non-renewable primary energy as energy carrier	MJ	9,79E+04	MND	MND	0	7,19E+02	1,04E+02	4,98E+02	-2,27E+04
Non-renewable primary energy as material utilization	MJ	0	MND	MND	0	0	0	0	0
Total use of non-renewable primary energy resources	MJ	9,79E+04	MND	MND	0	7,19E+02	1,04E+02	4,98E+02	-2,27E+04
Use of secondary materials	kg	1,51E+02	MND	MND	0	0	0	0	0
Use of renewable secondary fuels	MJ	0	MND	MND	0	0	0	0	0
Use of non-renewable secondary fuels	MJ	0	MND	MND	0	0	0	0	0
Use of net fresh water	m <sup>3</sup>	1,36E+04	MND	MND	0	0	3,10E+01	1,11E+00	-3,28E+03
Hazardous waste disposed	kg	1,30E+02	MND	MND	0	6,33E-05	0	1,93E-05	-8,27E+01
Non-hazardous waste disposed	kg	6,67E+02	MND	MND	0	2,86E-02	0	1,95E+03	-3,84E+02
Radioactive waste disposed	kg	1,52E+00	MND	MND	0	0	0	0	-9,38E-01
Components for re-use	kg	0	MND	MND	0	0	0	0	0
Materials for recycling	kg	3,55E+02	MND	MND	0	0	1,31E+03	0	0
Materials for energy recovery	kg	0	MND	MND	0	0	8,63E+01	0	0
Exported energy	MJ	0	MND	MND	0	0	2,66E+03	0	0

- A1. Raw materials supply
- A2. Transport
- A3 Manufacturing Product
- A4. Transport
- A5. Construction – Installation process

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

- C1. Decosntruction and demolition
- C2. Transport
- C3. Waste management for reuse, recovery and recycling.
- C4. Disposal

MND. Module not declared



**INDICATORS OF THE ENVIRONMENTAL IMPACT**
**TPV 52 ANODIZED CURTAIN WALL 1m<sup>2</sup>**

Parameter	Unit	Life Cycle Phase							
		Manufacture		Construction	Use	End of Life			Module
		A1-A3	A4-A5	B1-B7	C1	C2	C3	C4	D
Climatic Change - total	kg CO <sub>2</sub> eq	8,43E+01	MND	MND	0	5,54E-01	5,89E-02	2,60E-01	-1,87E+01
Climatic Change - fossil	kg CO <sub>2</sub> eq	8,41E+01	MND	MND	0	5,54E-01	5,87E-02	2,60E-01	-1,87E+01
Climate change - biogenic	kg CO <sub>2</sub> eq	9,75E-02	MND	MND	0	0	4,35E-05	3,17E-05	-2,15E-02
Climate change - land use and land use change	kg CO <sub>2</sub> eq	7,09E-02	MND	MND	0	0	1,88E-04	3,80E-06	-1,93E-02
Ozone depletion	kg CFC-11 eq	7,22E-06	MND	MND	0	8,48E-10	7,11E-09	5,52E-08	-4,06E-07
Acidification	mol H <sup>+</sup> eq	6,91E-01	MND	MND	0	3,70E-03	4,79E-04	1,77E-03	-1,92E-01
Eutrophication aquatic freshwater	kg PO <sub>4</sub> <sup>3-</sup> eq	7,30E-02	MND	MND	0	5,95E-04	8,12E-05	6,79E-04	-1,27E-02
Eutrophication aquatic marine	kg N eq	1,03E-01	MND	MND	0	1,75E-03	8,69E-05	7,91E-04	-2,80E-02
Eutrophication terrestrial	mol N eq	1,16E+00	MND	MND	0	1,91E-02	9,11E-04	8,29E-03	-3,17E-01
Photochemical ozone formation	kg NMVOC eq	3,14E-01	MND	MND	0	4,85E-03	2,52E-04	2,33E-03	-8,17E-02
Abiotic resource depletion - minerals and metals	kg Sb eq	3,35E-04	MND	MND	0	2,18E-08	8,56E-08	1,63E-07	-1,18E-04
Abiotic resource depletion - fossils	MJ	1,15E+03	MND	MND	0	7,72E+00	1,06E+00	5,02E+00	-2,47E+02
Water use	m <sup>3</sup> eq	2,44E+00	MND	MND	0	5,82E-03	3,01E-01	6,85E+00	6,24E+00
Particulate matter emissions	disease inc.	5,52E-04	MND	MND	0	3,05E-06	2,52E-07	2,51E-06	-1,86E-04
Ionising radiation	kBq U235 eq	8,55E+02	MND	MND	0	1,29E-01	2,08E+00	1,32E+00	-3,73E+02
Ecotoxicity - freshwater	CTUe	4,17E+04	MND	MND	0	1,69E+00	1,09E+02	4,84E+02	-3,48E+03
Human toxicity, cancer effects	CTUh	4,58E-04	MND	MND	0	2,74E-08	2,45E-07	7,41E-07	-5,26E-05
Human toxicity, non-cancer effects	CTUh	1,32E-03	MND	MND	0	1,66E-07	1,04E-06	6,16E-06	-2,61E-04
Land use	Pt	3,96E+04	MND	MND	0	0	8,82E+01	4,83E+02	-6,91E+03

- A1. Raw materials supply
- A2. Transport
- A3. Manufacturing Product
- A4. Transport
- A5. Construction – Installation process

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

- C1. Decosntruction and demolition
- C2. Transport
- C3. Waste management for reuse, recovery and recycling.
- C4. Disposal

MND. Module not declared



**INDICATORS OF RESOURCES USE**
**TPV 52 ANODIZED CURTAIN WALL 1m<sup>2</sup>**

Parameter	Unit	Life Cycle Phase							
		Manufacture	Construction	Use	End of Life				Module
		A1-A3	A4-A5	B1-B7	C1	C2	C3	C4	D
Renewable primary energy as energy carrier	MJ	1,87E+04	MND	MND	0	9,84E-01	1,61E+01	3,33E+00	-8,88E+03
Renewable primary energy resource as material utilization	MJ	0	MND	MND	0	0	0	0	0
Total use of renewable primary energy resources	MJ	1,87E+04	MND	MND	0	9,84E-01	1,61E+01	3,33E+00	-8,88E+03
Non-renewable primary energy as energy carrier	MJ	1,12E+05	MND	MND	0	7,38E+02	1,04E+02	4,99E+02	-2,40E+04
Non-renewable primary energy as material utilization	MJ	0	MND	MND	0	0	0	0	0
Total use of non-renewable primary energy resources	MJ	1,12E+05	MND	MND	0	7,38E+02	1,04E+02	4,99E+02	-2,40E+04
Use of secondary materials	kg	1,73E+02	MND	MND	0	0	0	0	0
Use of renewable secondary fuels	MJ	0	MND	MND	0	0	0	0	0
Use of non-renewable secondary fuels	MJ	0	MND	MND	0	0	0	0	0
Use of net fresh water	m <sup>3</sup>	1,44E+04	MND	MND	0	0	3,10E+01	1,04E+00	-3,54E+03
Hazardous waste disposed	kg	1,43E+02	MND	MND	0	6,49E-05	0	2,06E-05	-8,63E+01
Non-hazardous waste disposed	kg	7,61E+02	MND	MND	0	2,93E-02	0	1,95E+03	-4,00E+02
Radioactive waste disposed	kg	1,67E+00	MND	MND	0	0	0	0	-9,78E-01
Components for re-use	kg	0	MND	MND	0	0	0	0	0
Materials for recycling	kg	3,68E+02	MND	MND	0	0	1,36E+03	0	0
Materials for energy recovery	kg	0	MND	MND	0	0	9,43E+01	0	0
Exported energy	MJ	0	MND	MND	0	0	2,84E+03	0	0

- A1. Raw materials supply
- A2. Transport
- A3 Manufacturing Product
- A4. Transport
- A5. Construction – Installation process

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

- C1. Decosntruction and demolition
- C2. Transport
- C3. Waste management for reuse, recovery and recycling.
- C4. Disposal

MND. Module not declared



**INDICATORS OF THE ENVIRONMENTAL IMPACT**
**TPV 52 COATED CURTAIN WALL 1m<sup>2</sup>**

Parameter	Unit	Life Cycle Phase							
		Manufacture		Construction	Use	End of Life			Module
		A1-A3	A4-A5	B1-B7	C1	C2	C3	C4	D
Climatic Change - total	kg CO <sub>2</sub> eq	7,98E+01	MND	MND	0	5,57E-01	5,89E-02	2,64E-01	-1,91E+01
Climatic Change - fossil	kg CO <sub>2</sub> eq	7,97E+01	MND	MND	0	5,57E-01	5,87E-02	2,64E-01	-1,90E+01
Climate change - biogenic	kg CO <sub>2</sub> eq	9,26E-02	MND	MND	0	0	4,35E-05	3,28E-05	-2,16E-02
Climate change - land use and land use change	kg CO <sub>2</sub> eq	7,11E-02	MND	MND	0	0	1,88E-04	4,08E-06	-1,94E-02
Ozone depletion	kg CFC-11 eq	6,02E-06	MND	MND	0	8,52E-10	7,11E-09	5,53E-08	-4,06E-07
Acidification	mol H <sup>+</sup> eq	6,32E-01	MND	MND	0	3,71E-03	4,79E-04	1,77E-03	-1,94E-01
Eutrophication aquatic freshwater	kg PO <sub>4</sub> <sup>3-</sup> eq	6,58E-02	MND	MND	0	5,97E-04	8,12E-05	7,21E-04	-1,27E-02
Eutrophication aquatic marine	kg N eq	9,92E-02	MND	MND	0	1,75E-03	8,69E-05	7,96E-04	-2,83E-02
Eutrophication terrestrial	mol N eq	1,12E+00	MND	MND	0	1,92E-02	9,11E-04	8,31E-03	-3,21E-01
Photochemical ozone formation	kg NMVOC eq	3,01E-01	MND	MND	0	4,87E-03	2,52E-04	2,33E-03	-8,27E-02
Abiotic resource depletion - minerals and metals	kg Sb eq	3,02E-04	MND	MND	0	2,19E-08	8,56E-08	1,64E-07	-1,18E-04
Abiotic resource depletion - fossils	MJ	1,05E+03	MND	MND	0	7,75E+00	1,06E+00	5,03E+00	-2,52E+02
Water use	m <sup>3</sup> eq	2,43E+00	MND	MND	0	5,84E-03	3,01E-01	6,85E+00	6,20E+00
Particulate matter emissions	disease inc.	5,40E-04	MND	MND	0	3,06E-06	2,52E-07	2,51E-06	-1,89E-04
Ionising radiation	kBq U235 eq	6,30E+02	MND	MND	0	1,29E-01	2,08E+00	1,32E+00	-3,78E+02
Ecotoxicity - freshwater	CTUe	3,25E+04	MND	MND	0	1,70E+00	1,09E+02	5,57E+02	-3,48E+03
Human toxicity, cancer effects	CTUh	4,32E-04	MND	MND	0	2,75E-08	2,45E-07	7,51E-07	-5,26E-05
Human toxicity, non-cancer effects	CTUh	1,04E-03	MND	MND	0	1,66E-07	1,04E-06	6,91E-06	-2,62E-04
Land use	Pt	3,46E+04	MND	MND	0	0	8,82E+01	4,84E+02	-6,91E+03

- A1. Raw materials supply
- A2. Transport
- A3. Manufacturing Product
- A4. Transport
- A5. Construction – Installation process

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

- C1. Decosntruction and demolition
- C2. Transport
- C3. Waste management for reuse, recovery and recycling.
- C4. Disposal

MND. Module not declared



**INDICATORS OF RESOURCES USE**
**TPV 52 COATED CURTAIN WALL 1m<sup>2</sup>**

Parameter	Unit	Life Cycle Phase							
		Manufacture	Construction	Use	End of Life				Module
		A1-A3	A4-A5	B1-B7	C1	C2	C3	C4	D
Renewable primary energy as energy carrier	MJ	1,67E+04	MND	MND	0	9,88E-01	1,61E+01	3,36E+00	-9,08E+03
Renewable primary energy resource as material utilization	MJ	0	MND	MND	0	0	0	0	0
Total use of renewable primary energy resources	MJ	1,67E+04	MND	MND	0	9,88E-01	1,61E+01	3,36E+00	-9,08E+03
Non-renewable primary energy as energy carrier	MJ	1,02E+05	MND	MND	0	7,41E+02	1,04E+02	5,00E+02	-2,44E+04
Non-renewable primary energy as material utilization	MJ	0	MND	MND	0	0	0	0	0
Total use of non-renewable primary energy resources	MJ	1,02E+05	MND	MND	0	7,41E+02	1,04E+02	5,00E+02	-2,44E+04
Use of secondary materials	kg	1,72E+02	MND	MND	0	0	0	0	0
Use of renewable secondary fuels	MJ	0	MND	MND	0	0	0	0	0
Use of non-renewable secondary fuels	MJ	0	MND	MND	0	0	0	0	0
Use of net fresh water	m <sup>3</sup>	1,37E+04	MND	MND	0	0	3,10E+01	1,18E+00	-3,54E+03
Hazardous waste disposed	kg	1,42E+02	MND	MND	0	6,51E-05	0	2,06E-05	-8,86E+01
Non-hazardous waste disposed	kg	7,31E+02	MND	MND	0	2,94E-02	0	1,95E+03	-4,11E+02
Radioactive waste disposed	kg	1,66E+00	MND	MND	0	0	0	0	-1,00E+00
Components for re-use	kg	0	MND	MND	0	0	0	0	0
Materials for recycling	kg	3,66E+02	MND	MND	0	0	1,37E+03	0	0
Materials for energy recovery	kg	0	MND	MND	0	0	9,43E+01	0	0
Exported energy	MJ	0	MND	MND	0	0	2,84E+03	0	0

- A1. Raw materials supply
- A2. Transport
- A3 Manufacturing Product
- A4. Transport
- A5. Construction – Installation process

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

- C1. Deconstruction and demolition
- C2. Transport
- C3. Waste management for reuse, recovery and recycling.
- C4. Disposal

MND. Module not declared



**INDICATORS OF THE ENVIRONMENTAL IMPACT**
**TPH 52 ANODIZED CURTAIN WALL 1m<sup>2</sup>**

Parameter	Unit	Life Cycle Phase							
		Manufacture		Construction	Use	End of Life			Module
		A1-A3	A4-A5	B1-B7	C1	C2	C3	C4	D
Climatic Change - total	kg CO <sub>2</sub> eq	8,17E+01	MND	MND	0	5,47E-01	5,89E-02	2,59E-01	-1,79E+01
Climatic Change - fossil	kg CO <sub>2</sub> eq	8,16E+01	MND	MND	0	5,47E-01	5,87E-02	2,59E-01	-1,79E+01
Climate change - biogenic	kg CO <sub>2</sub> eq	9,52E-02	MND	MND	0	0	4,35E-05	3,17E-05	-2,12E-02
Climate change - land use and land use change	kg CO <sub>2</sub> eq	6,67E-02	MND	MND	0	0	1,88E-04	3,79E-06	-1,90E-02
Ozone depletion	kg CFC-11 eq	7,07E-06	MND	MND	0	8,36E-10	7,11E-09	5,52E-08	-4,01E-07
Acidification	mol H <sup>+</sup> eq	6,74E-01	MND	MND	0	3,65E-03	4,79E-04	1,76E-03	-1,87E-01
Eutrophication aquatic freshwater	kg PO <sub>4</sub> <sup>3-</sup> eq	7,08E-02	MND	MND	0	5,87E-04	8,12E-05	6,71E-04	-1,24E-02
Eutrophication aquatic marine	kg N eq	1,01E-01	MND	MND	0	1,72E-03	8,69E-05	7,89E-04	-2,73E-02
Eutrophication terrestrial	mol N eq	1,14E+00	MND	MND	0	1,89E-02	9,11E-04	8,28E-03	-3,10E-01
Photochemical ozone formation	kg NMVOC eq	3,06E-01	MND	MND	0	4,78E-03	2,52E-04	2,33E-03	-7,96E-02
Abiotic resource depletion - minerals and metals	kg Sb eq	3,30E-04	MND	MND	0	2,15E-08	8,56E-08	1,63E-07	-1,17E-04
Abiotic resource depletion - fossils	MJ	1,12E+03	MND	MND	0	7,61E+00	1,06E+00	5,01E+00	-2,37E+02
Water use	m <sup>3</sup> eq	2,33E+00	MND	MND	0	5,73E-03	3,01E-01	6,85E+00	6,28E+00
Particulate matter emissions	disease inc.	5,38E-04	MND	MND	0	3,01E-06	2,52E-07	2,50E-06	-1,80E-04
Ionising radiation	kBq U235 eq	8,23E+02	MND	MND	0	1,27E-01	2,08E+00	1,32E+00	-3,62E+02
Ecotoxicity - freshwater	CTUe	3,97E+04	MND	MND	0	1,67E+00	1,09E+02	4,82E+02	-3,17E+03
Human toxicity, cancer effects	CTUh	4,21E-04	MND	MND	0	2,70E-08	2,45E-07	7,35E-07	-4,39E-05
Human toxicity, non-cancer effects	CTUh	1,25E-03	MND	MND	0	1,63E-07	1,04E-06	6,13E-06	-2,46E-04
Land use	Pt	3,86E+04	MND	MND	0	0	8,82E+01	4,83E+02	-6,83E+03

A1. Raw materials supply  
 A2. Transport  
 A3 Manufacturing Product  
 A4. Transport  
 A5. Construction – Installation process

B1. Use  
 B2. Maintenance  
 B3. Repair  
 B4. Replacement  
 B5. Refurbishment  
 B6. Operational Energy use  
 B7. Operational water use

C1. Decosntruction and demolition  
 C2. Transport  
 C3. Waste management for reuse, recovery and recycling.  
 C4. Disposal

MND. Module not declared



**INDICATORS OF RESOURCES USE**
**TPH 52 ANODIZED CURTAIN WALL 1m<sup>2</sup>**

Parameter	Unit	Life Cycle Phase							
		Manufacture	Construction	Use	End of Life				Module
		A1-A3	A4-A5	B1-B7	C1	C2	C3	C4	D
Renewable primary energy as energy carrier	MJ	1,79E+04	MND	MND	0	9,70E-01	1,61E+01	3,33E+00	-8,49E+03
Renewable primary energy resource as material utilization	MJ	0	MND	MND	0	0	0	0	0
Total use of renewable primary energy resources	MJ	1,79E+04	MND	MND	0	9,70E-01	1,61E+01	3,33E+00	-8,49E+03
Non-renewable primary energy as energy carrier	MJ	1,09E+05	MND	MND	0	7,27E+02	1,04E+02	4,99E+02	-2,30E+04
Non-renewable primary energy as material utilization	MJ	0	MND	MND	0	0	0	0	0
Total use of non-renewable primary energy resources	MJ	1,09E+05	MND	MND	0	7,27E+02	1,04E+02	4,99E+02	-2,30E+04
Use of secondary materials	kg	1,62E+02	MND	MND	0	0	0	0	0
Use of renewable secondary fuels	MJ	0	MND	MND	0	0	0	0	0
Use of non-renewable secondary fuels	MJ	0	MND	MND	0	0	0	0	0
Use of net fresh water	m <sup>3</sup>	1,38E+04	MND	MND	0	0	3,10E+01	1,04E+00	-3,47E+03
Hazardous waste disposed	kg	1,36E+02	MND	MND	0	6,40E-05	0	2,00E-05	-8,19E+01
Non-hazardous waste disposed	kg	7,26E+02	MND	MND	0	2,89E-02	0	1,95E+03	-3,80E+02
Radioactive waste disposed	kg	1,59E+00	MND	MND	0	0	0	0	-9,29E-01
Components for re-use	kg	0	MND	MND	0	0	0	0	0
Materials for recycling	kg	3,56E+02	MND	MND	0	0	1,33E+03	0	0
Materials for energy recovery	kg	0	MND	MND	0	0	9,38E+01	0	0
Exported energy	MJ	0	MND	MND	0	0	2,82E+03	0	0

- A1. Raw materials supply  
A2. Transport  
A3 Manufacturing Product  
A4. Transport  
A5. Construction – Installation process

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

- C1. Decosntruction and demolition  
C2. Transport  
C3. Waste management for reuse, recovery and recycling.  
C4. Disposal

MND. Module not declared



**INDICATORS OF THE ENVIRONMENTAL IMPACT**
**TPH 52 COATED CURTAIN WALL 1m<sup>2</sup>**

Parameter	Unit	Life Cycle Phase							
		Manufacture		Construction	Use	End of Life			Module
		A1-A3	A4-A5	B1-B7	C1	C2	C3	C4	D
Climatic Change - total	kg CO <sub>2</sub> eq	7,74E+01	MND	MND	0	5,49E-01	5,89E-02	2,63E-01	-1,83E+01
Climatic Change - fossil	kg CO <sub>2</sub> eq	7,73E+01	MND	MND	0	5,49E-01	5,87E-02	2,63E-01	-1,82E+01
Climate change - biogenic	kg CO <sub>2</sub> eq	9,05E-02	MND	MND	0	0	4,35E-05	3,27E-05	-2,13E-02
Climate change - land use and land use change	kg CO <sub>2</sub> eq	6,67E-02	MND	MND	0	0	1,88E-04	4,05E-06	-1,91E-02
Ozone depletion	kg CFC-11 eq	5,93E-06	MND	MND	0	8,39E-10	7,11E-09	5,53E-08	-4,01E-07
Acidification	mol H <sup>+</sup> eq	6,18E-01	MND	MND	0	3,66E-03	4,79E-04	1,77E-03	-1,89E-01
Eutrophication aquatic freshwater	kg PO <sub>4</sub> <sup>3-</sup> eq	6,38E-02	MND	MND	0	5,89E-04	8,12E-05	7,11E-04	-1,24E-02
Eutrophication aquatic marine	kg N eq	9,70E-02	MND	MND	0	1,73E-03	8,69E-05	7,95E-04	-2,76E-02
Eutrophication terrestrial	mol N eq	1,10E+00	MND	MND	0	1,89E-02	9,11E-04	8,30E-03	-3,13E-01
Photochemical ozone formation	kg NMVOC eq	2,94E-01	MND	MND	0	4,80E-03	2,52E-04	2,33E-03	-8,05E-02
Abiotic resource depletion - minerals and metals	kg Sb eq	2,99E-04	MND	MND	0	2,16E-08	8,56E-08	1,64E-07	-1,17E-04
Abiotic resource depletion - fossils	MJ	1,02E+03	MND	MND	0	7,64E+00	1,06E+00	5,02E+00	-2,42E+02
Water use	m <sup>3</sup> eq	2,32E+00	MND	MND	0	5,76E-03	3,01E-01	6,85E+00	6,24E+00
Particulate matter emissions	disease inc.	5,27E-04	MND	MND	0	3,02E-06	2,52E-07	2,51E-06	-1,83E-04
Ionising radiation	kBq U235 eq	6,08E+02	MND	MND	0	1,27E-01	2,08E+00	1,32E+00	-3,67E+02
Ecotoxicity - freshwater	CTUe	3,09E+04	MND	MND	0	1,68E+00	1,09E+02	5,50E+02	-3,17E+03
Human toxicity, cancer effects	CTUh	3,96E-04	MND	MND	0	2,71E-08	2,45E-07	7,44E-07	-4,39E-05
Human toxicity, non-cancer effects	CTUh	9,92E-04	MND	MND	0	1,64E-07	1,04E-06	6,83E-06	-2,48E-04
Land use	Pt	3,38E+04	MND	MND	0	0	8,82E+01	4,84E+02	-6,84E+03

A1. Raw materials supply  
 A2. Transport  
 A3 Manufacturing Product  
 A4. Transport  
 A5. Construction – Installation process

B1. Use  
 B2. Maintenance  
 B3. Repair  
 B4. Replacement  
 B5. Refurbishment  
 B6. Operational Energy use  
 B7. Operational water use

C1. Decosntruction and demolition  
 C2. Transport  
 C3. Waste management for reuse, recovery and recycling.  
 C4. Disposal

MND. Module not declared

**INDICATORS OF RESOURCES USE**
**TPH 52 COATED CURTAIN WALL 1m<sup>2</sup>**

Parameter	Unit	Life Cycle Phase							
		Manufacture	Construction	Use	End of Life			Module	
		A1-A3	A4-A5	B1-B7	C1	C2	C3	C4	D
Renewable primary energy as energy carrier	MJ	1,60E+04	MND	MND	0	9,74E-01	1,61E+01	3,36E+00	-8,68E+03
Renewable primary energy resource as material utilization	MJ	0	MND	MND	0	0	0	0	0
Total use of renewable primary energy resources	MJ	1,60E+04	MND	MND	0	9,74E-01	1,61E+01	3,36E+00	-8,68E+03
Non-renewable primary energy as energy carrier	MJ	9,94E+04	MND	MND	0	7,30E+02	1,04E+02	4,99E+02	-2,35E+04
Non-renewable primary energy as material utilization	MJ	0	MND	MND	0	0	0	0	0
Total use of non-renewable primary energy resources	MJ	9,94E+04	MND	MND	0	7,30E+02	1,04E+02	4,99E+02	-2,35E+04
Use of secondary materials	kg	1,61E+02	MND	MND	0	0	0	0	0
Use of renewable secondary fuels	MJ	0	MND	MND	0	0	0	0	0
Use of non-renewable secondary fuels	MJ	0	MND	MND	0	0	0	0	0
Use of net fresh water	m <sup>3</sup>	1,30E+04	MND	MND	0	0	3,10E+01	1,17E+00	-3,47E+03
Hazardous waste disposed	kg	1,36E+02	MND	MND	0	6,42E-05	0	2,00E-05	-8,41E+01
Non-hazardous waste disposed	kg	6,96E+02	MND	MND	0	2,90E-02	0	1,95E+03	-3,91E+02
Radioactive waste disposed	kg	1,59E+00	MND	MND	0	0	0	0	-9,54E-01
Components for re-use	kg	0	MND	MND	0	0	0	0	0
Materials for recycling	kg	3,54E+02	MND	MND	0	0	1,34E+03	0	0
Materials for energy recovery	kg	0	MND	MND	0	0	9,38E+01	0	0
Exported energy	MJ	0	MND	MND	0	0	2,82E+03	0	0

- A1. Raw materials supply
- A2. Transport
- A3 Manufacturing Product
- A4. Transport
- A5. Construction – Installation process

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

- C1. Decosntruction and demolition
- C2. Transport
- C3. Waste management for reuse, recovery and recycling.
- C4. Disposal

MND. Module not declared

### 3.4. Potential environmental benefits and impacts derived from activities of reuse, recovery and recycling

**Table. Indicators of impact evolution. Reuse, recovery and recycling**

Data included in the point tables 3.3. (pages 9 - 24):

<b>TP 52 ANODIZED CURTAIN WALL 1m<sup>2</sup></b>	page	9
<b>TP 52 COATED CURTAIN WALL 1m<sup>2</sup></b>	page	11
<b>SG 52 ANODIZED CURTAIN WALL 1m<sup>2</sup></b>	page	13
<b>SG 52 COATED CURTAIN WALL 1m<sup>2</sup></b>	page	15
<b>TVP 52 ANODIZED CURTAIN WALL 1m<sup>2</sup></b>	page	17
<b>TVP 52 COATED CURTAIN WALL 1m<sup>2</sup></b>	page	19
<b>TPH 52 ANODIZED CURTAIN WALL 1m<sup>2</sup></b>	page	21
<b>TPH 52 COATED CURTAIN WALL 1m<sup>2</sup></b>	page	23

**Table. Life cycle inventory data. Reuse, recovery and recycling**

Data included in the point tables 3.3. (pages 9 - 24):

<b>TP 52 ANODIZED CURTAIN WALL 1m<sup>2</sup></b>	page	10
<b>TP 52 COATED CURTAIN WALL 1m<sup>2</sup></b>	page	12
<b>SG 52 ANODIZED CURTAIN WALL 1m<sup>2</sup></b>	page	14
<b>SG 52 COATED CURTAIN WALL 1m<sup>2</sup></b>	page	16
<b>TVP 52 ANODIZED CURTAIN WALL 1m<sup>2</sup></b>	page	18
<b>TVP 52 COATED CURTAIN WALL 1m<sup>2</sup></b>	page	20
<b>TPH 52 ANODIZED CURTAIN WALL 1m<sup>2</sup></b>	page	22
<b>TPH 52 COATED CURTAIN WALL 1m<sup>2</sup></b>	page	24

### 3.5. Recommendations of this DAP

The comparison of construction products can only be carried out under the same functional unit and once the product is performing its function within the building throughout its entire life cycle.

The EPD of different systems may not be directly comparable due to a gap between the product category rules and regulations on which the calculation of the impact categories and the input and output parameters is based.

### 3.6. Cut-off rules

More than 95% of all the mass and energy inputs and outputs of the system have been included, leaving out, among other things, diffuse factory emissions.

### 3.7. Additional environmental information

The product does not contain substances included on the European Chemicals Agency's Candidate List of Substances of Very High Concern for Authorization.

### 3.8. Other data

Module Not Declared

## 4. TECHNICAL INFORMATION AND SCENARIOS

### 4.1. Transport from the factory to the building site (A4)

Module Not Declared

### 4.2. Installation processes (A5)

Module Not Declared

### 4.3. Reference service life (B1)

Module Not Declared

### 4.4. Maintenance (B2), repair (B3), replacement (B4) or refurbishment (B5)

Module Not Declared

### 4.5. Operational use of energy (B6) and water (B7)

Module Not Declared

### 4.6. End of life (C1-C4)

Process	Parameter expressed for declared unit of the components, products or materials
Collection processes	Metals 95%. Plástics 95%. Glass 30%.
Recycling systems	Metals 95%. Glass 30%.
Disposal	Metals 5%. Plástics 5%. Glass 70%.

## 5. ADDITIONAL INFORMATION

The products do not release hazardous substances during the use phase nor do they contain any substances included in the Candidate List of Substances of Very High Concern for Authorization with a concentration greater than 0.1% by weight.

- The Uf Thermal Transmittance values have been obtained by calculation according to EN-ISO 10077-2 and those of Uw by calculation according to EN-ISO 10077-1.
- Air permeability, water tightness and wind resistance have been obtained through tests under the EN 1026, EN1027 and EN 12211 standards and classified according to EN 12207, EN 12208 and EN12210 standards respectively.
- The acoustic performance Rw has been obtained by calculation according to the EN-ISO 12354-3 standard

CORTIZO has the following quality certificates and management systems implemented:

- Qualanod Certificate. License No. 1027. Qualicoat Certificate "SEASIDE". License No. 402. Qualideco Certificate License No. ES-0014F
- ISO 9001 Exp No. ES093238-2. ISO 14001 Exp No. ES079012-. OSHAS 18001 Exp No. ES092017-1

## 6. PCR AND VERIFICATION

### This declaration is based on the Document

RCP100. Productos de construcción en general. Version 2 – 29.02.2016

### Independent verification of the declaration and data according to ISO 14025 and UNE EN15804 + A1

Internal       External

### Independent verifier appointed

Ferran Pérez, ITEC verifier



### Fecha de la verificación:

21 / 10 / 2020

### Referencias

- Informe de ACV para DAP de productos CORTIZO: Ventanas, puertas de exterior y muros cortina. IDNÓVAM, julio 2020
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