

DECLARACIÓN AMBIENTAL DE PRODUCTO ENVIRONMENTAL PRODUCT DECLARATION

DAPcons®.100.011

According to ISO 14025
and UNE EN 15804 + A1



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

Product

TECBOR® fireproof rigid boards

Owner



Product description

The product included is the line TECBOR® fireproof rigid boards from Mercor Tecresa

PCR Reference

RCP 100 Declaración Ambiental de Producto sobre productos de construcción (v2 29.02.2016)

Production plant

TECRESA PROTECCION PASIVA, S.L.
Parque Leganés Tecnológico (LEGATEC)
C/ Margarita Salas nº 6
28918 Leganés, Madrid (Spain)

Validity

From: 04/11/2019 To: 04/11/2024

The validity of DAPcons® 100.011 is subject to the conditions of DAPcons® regulations. The relevant version of this DAPcons® is included in the register kept by the CAATEEB; for more information, consult the Program's website www.csostenible.net

ENVIRONMENTAL PRODUCT DECLARATION

TECBOR® FIREPROOF RIGID BOARDS

EXECUTIVE SUMMARY

PROGRAMME OPERATOR DAPconstrucción® Environmental product declarations of construction sector www.csontenible.net	
Administrator of Programme Operator Col·legi d'Aparelladors, Arquitectes Tècnics de Barcelona i Enginyers de l'Edificació (CAATEEB) Bon Pastor, 5 · 08021 Barcelona www.apabcn.cat	
Owner of the Declaration TECRESA PROTECCION PASIVA, S.L. Parque Leganés Tecnológico (LEGATEC) - C/ Margarita Salas nº 6 - 28918 Leganés, Madrid (SPAIN)	
Declaration carried out by: ReMa-INGENIERÍA, S.L. Calle Crevillente 1, entlo - 12005 Castellón - SPAIN	
Declaration Number DAPcons.100.011	
Declared Product TECBOR® FIREPROOF RIGID BOARDS	
Product description Tecbor® is a line of fireproof rigid boards composed of magnesium oxide and other additives and reinforced with fiberglass.	
Registration date 04/11/2019	
Validity 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: TECRESA PROTECCION PASIVA, S.L.	
Endorsed by CAATEEB Celestí Ventura Cisternas, President of the CAATEEB	Endorsed by authorised verifier Mr. Ferran Pérez Ibáñez, Verifier accredited by the DAPconstruction Program
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 TECBOR® fireproof rigid boards produced by MERCOR TECRESA at its plant in Leganes (Madrid, Spain). This declaration is based on the document RCP 100 Declaración Ambiental de Producto sobre productos de construcción (v2 29.02.2016). The environmental product declaration (DAPcons®) may not be comparable to another EPD if it is not based on the UNE EN 15804 + A1 standard	

ENVIRONMENTAL PRODUCT DECLARATION

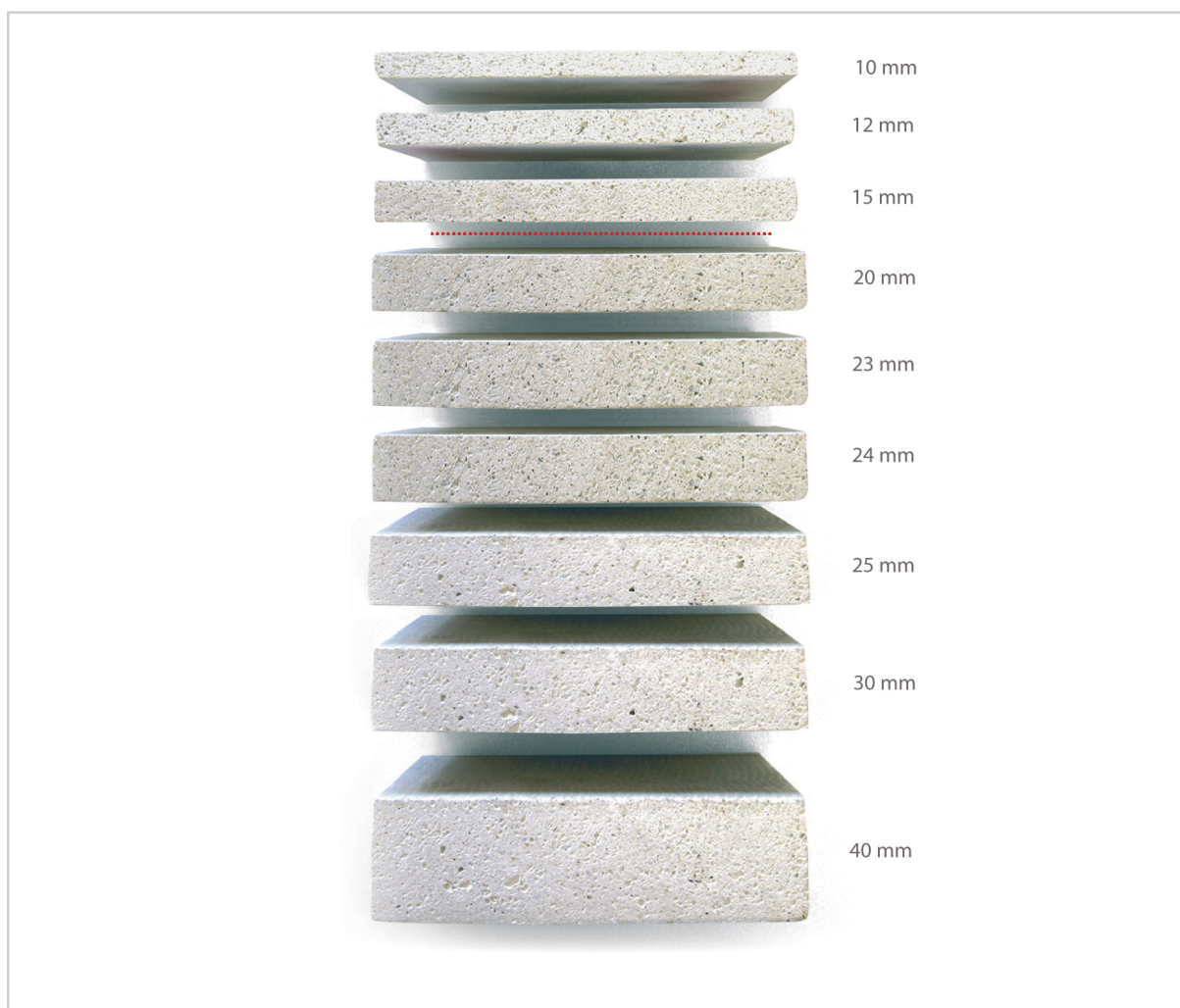
1. PRODUCT DESCRIPTION AND APPLICATION

Tecbor® fireproof rigid boards are composed of magnesium oxide and other additives, reinforced with fiberglass and have a ready-to-paint finish.

Depending on the required solution and the type of support to be protected, Mercor Tecresa® offers Tecbor® Panels with different thicknesses: 5, 10, 12, 15, 20, 23, 24, 30 and 40mm.

Tecbor® boards offer various constructive solutions suitable to protect against fire, depending on the thickness of the panels used. Passive protection is carried out specifically for all types of structures and walls that occur in construction, as well as protection in industries and tunnels.

Tecbor® boards are applied quickly and easily to facilitate the work of installers and become one of the most competitive options on the market.



Main technical characteristics of TECBOR product.

SPECIFICATIONS	TECBOR®	NORMATIVE
Composition	Magnesium oxide and other additives	-
Fire classification	Non combustible Euroclass A1	UNE - EN 13501-1:2002
Dry density (40°C)	900 kg/m³ ±10%	UNE - EN 12467
Density (23°C y 50% HR)	925 kg/m³	UNE - EN 12467
Thermal conductivity	0,31 W/mk	UNE - EN 12664
Alkalinity pH	8-10	UNE - EN 13468
Water absorption capacity	4,5 kg/m²	EN 1609
Permeability to water vapour	3 x 10 ⁻⁹ (Kg/m²sPa)	UNE - EN ISO 12572
Length tolerance	± 5 mm	UNE - EN 12467
Width tolerance	± 3 mm	UNE - EN 12467
Thermal expansion (20-100°C)	3	UNE - EN ISO 10.545-8/97
Thickness tolerance	+2 mm -1 mm	UNE - EN 12467
Straightness of edges	Level I - 0,1%	UNE - EN 12467
Organic matter content	3,30%	UNE 103 204/93
Resistance caused by water	RL < 0,75	UNE - EN 12467
Modulus of elasticity (MPa)	475 MPa	UNE - EN 12089 UNE - EN 310
Resistance to bending MOR (MPa)	4,74 Mpa	EN- 12467
Perpendicular tensile strength to fiber (MPa)	1,47 MPa	EN - 1607
Compressive strength (MPa)	9,61 MPa	EN - 826
Dimensional stability	≤ 0,25%	UNE - EN 326-1
Parallel tensile strength to fiber (MPa)	0,99 MPa	EN 1608
Microbial growth	No	EN 13403
Lifetime	25 yeras Z2 (indoor use)	ETA 18/1017

2. LIFE CYCLE PHASES DESCRIPTION

2.1. Manufacture (A1, A2 and A3)

Raw materials (A1 and A2)

Phase A1 includes the extraction of raw and secondary materials.

The main raw materials are listed below:

- MgO
- MgCl₂
- Perlite
- Fiberglass

It has been estimated that these raw materials are transported by road in a truck of between 14-20 t of payload an average distance calculated taking into account the distances to the different suppliers and weighting with the quantities served in 2018.

Manufacturing (A3)

Phase A3 includes the energy consumption of the production process, the production and transport of the packaging of the finished product and the transport and treatment of waste generated during production.

The production process of TECBOR® fireproof rigid boards consists of:

1. Reception of raw materials (Mg oxide, MgCl₂, etc.)
2. Grinding, dosing and mixing of raw materials
3. Preparation and shaping with water, fiberglass and additives
4. Laminated and dried
5. Packing

2.2. Construction (A4 and A5)

Product transport to the building site (A4)

Using the data provided by the company from the country sales of the products, an average transport distance has been calculated.

The truck used complies with the Euro VI standard, consumes 1,25E-05 kg of diesel / kg of transported cargo and km traveled.

For transcontinental transport an average transoceanic freighter has been estimated.

Table 1. Transport scenarios of product to the building site

Destination	Type of transport	Percentage (%)	Average Km
Spain	27 t truck	35,16	390
Europe	27 t truck	35,59	2863
Rest of the world	27 t truck freighter	29,25	784 3818
		Total 100%	

Construction and instalation process (A5)

The Tecbor board is fixed to the support to be protected by a series of components (mainly steel). Depending on the type of plate and support to protect the components will be different. In this case the most usual method has been studied.

The components used for the assembly of the system are:

- Omega Profile
- X-dni nails
- 3.5x45mm self-tapping screws

2.3. Product use (B1-B7)

Once installed, the product does not require any energy input for its use nor does it need maintenance after its commissioning. Throughout its service life (25 years), the product does not need any repair or replacement.

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

- Deconstruction and demolition (C1): Once it reaches the end of its life cycle, the product will be removed, either in the framework of rehabilitation of the building or during its demolition. In the case of the demolition of a building, the impacts attributable to the removal of the product are negligible.

- Transport (C2): The product waste is transported by truck in compliance with Euro VI norms, to its destination at a distance of 50 km.

- Waste management for reuse, recovery and recycling (C3) and Disposal (C4): The following end-of-life scenarios have been studied:

	Spain	Europe	Rest
Recycling (%)	00	00	00
Landfill (%)	100	100	100

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

The net impacts of recycling of the following wastes have been considered:

A5:

- Carboard
- Plastics
- Wood (palets)

3. LIFE CYCLE ASSESSEMENT

The life cycle assessment on which this declaration is based was carried out in keeping with ISO standards 14040 and 14044 and the document RCP 002 Productos de revestimiento cerámico Version 2 – 2015.09.18.

This LCA is “cradle to grave”, that is, it covers the phases of manufacture of the product, construction, use and end of life.

Specific data from the production plant in Leganés, Madrid, Spain corresponding to the year 2018 has been used to inventory the manufacturing phase. For the rest of the phases, generic data has been used, taken mostly from the official database of the DAPc system and the Ecoinvent v3.2 database.

3.1. Functional unit

The functional unit is “1m2 of TECBOR® fireproof rigid board with a mass of 13.50 kg guaranteeing thermal properties (Thermal Conductivity 0.31 W / mk) and fire resistance (A1) for a 25 year useful life”.

3.2. System boundary

Table 2. Declared modules

Product stage			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	X	X	X	X	X	X	X	X	X	X	X	X	X	X

X = Included in LCA MND = Module Not Declared

3.3. Data analysis for the life cycle (ACV)

The impacts indicated in this section refer to the life cycle of 1m2 of 15mm thick TECBOR® fireproof rigid board with a mass of 13.50 kg. The following table indicates the conversion factors to be used to obtain the impact on the environment of the life cycle of TECBOR® products in the marketed thicknesses:

Conversion factors of a product thickness of 15 mm (Functional unit) to the marketed thicknesses

Thickness (mm)	Conversion factor
5mm	0,33
10mm	0,67
12mm	0,80
15mm	1,00
20mm	1,33
23mm	1,53
24mm	1,60
30mm	2,00
40mm	2,67

Table 3. Indicators of the environmental impact

Parameter	Unit	Life Cycle Phase									
		Manufacture	Construction		Use			End of Life			
		A1-A3	A4	A5	B1	B2	B3-B7	C1	C2	C3	C4
Abiotic Resources Depletion Potential (elements)	kg Sb eq	6,23E-06	1,82E-07	1,29E-06	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,78E-10	0,00E+00	9,40E-08
Abiotic Resources Depletion Potential (fossil fuels)	MJ, net calorific value	5,30E+01	1,22E+01	2,97E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,08E-01	0,00E+00	2,13E+00
Acidification potential	Kg SO ₂ eq	2,28E-02	1,29E-02	1,02E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,19E-05	0,00E+00	6,61E-04
Ozone Depletion potential	Kg CFC-11 eq	2,09E-07	1,25E-07	1,60E-08	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,23E-09	0,00E+00	2,20E-08
Global warming	Kg CO ₂ eq	9,14E+00	1,41E+00	2,34E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,55E-02	0,00E+00	7,63E-02
Eutrophication	kg (PO ₄) ³⁻ eq	8,63E-03	1,41E-03	5,29E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,73E-06	0,00E+00	1,18E-04
Photochemical ozone formation, POCP	kg ethene eq	1,70E-03	5,55E-04	8,54E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,11E-06	0,00E+00	2,78E-05

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

Table 4. Indicators of resources use

Parameter	Unit	Life Cycle Phase									
		Manufacture	Construction		Use			End of life			
		A1-A3	A4	A5	B1	B2	B3-B7	C1	C2	C3	C4
Use of renewable primary energy, excluding the resources of non-renewable primary energy used as a raw material	MJ	1,31E+01	2,06E-01	2,96E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,99E-04	0,00E+00	5,10E-02
Use of renewable primary energy used as raw material	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use a renewable primary energy (primary energy and resources of renewable primary energy used as raw materials)	MJ	1,31E+01	2,06E-01	2,96E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,99E-04	0,00E+00	5,10E-02
Use of non-renewable primary energy, excluding the resources of non-renewable primary energy used as a raw material	MJ	5,08E+01	1,31E+01	3,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,17E-01	0,00E+00	2,28E+00
Use of non-renewable primary energy used as raw material	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of non-renewable primary energy (primary energy and resources of renewable primary energy used as raw materials)	MJ	5,08E+01	1,31E+01	3,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,17E-01	0,00E+00	2,28E+00
Use of secondary materials	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of renewable secondary fuels	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of non-renewable secondary fuels	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Net use of fresh water	m ³	2,39E-02	7,46E-04	1,26E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,61E-06	0,00E+00	1,42E-04
Hazardous waste disposed	kg	6,83E-05	5,64E-06	6,31E-06	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,72E-08	0,00E+00	1,44E-06
Non-hazardous waste disposed	kg	2,20E-01	1,09E-02	5,72E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,04E-05	0,00E+00	1,39E+01
Radioactive waste disposed	kg	1,02E-04	8,33E-05	1,16E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,95E-07	0,00E+00	1,42E-05
Components for its reutilisation	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for the recycling	kg	6,38E-01	0,00E+00	1,76E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for the energetic evaluation	kg	0,00E+00	0,00E+00	6,59E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy	MJ	0,00E+00	0,00E+00	1,28E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

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. Decosrtuction 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 5. Indicators of impact evolution. Reuse, recovery and recycling

Parameter	Unit expressed by functional unit or declared unit	D.
Potential depletion of abiotic resources (ADP-elements)*	Kg Sb eq	-3,53E-08
Potential depletion of abiotic resources (ADP-fossil fuels)*	MJ, net calorific value	-5,02E-01
Potential acidification of the ground and water resources, AP	Kg SO ₂ eq	-4,88E-05
Ozone depletion potential, ODP	Kg CFC-11 eq	-2,07E-09
Global warming potential, GWP	Kg CO ₂ eq	-1,91E-02
Eutrophication potential, EP	Kg (PO ₄) ₃ eq	-4,73E-054
Photochemical ozone creation potential, POCP	Kg ethene eq	-4,13E-06

* ADP-elements: including all the non-renewable abiotic material resources

* ADP-fossil fuels: Including all the fossil resources

Table 6. Life cycle inventory data. Reuse, recovery and recycling

Parameter	Unit expressed by functional unit or declared unit	D.
Use of renewable primary energy, excluding the resources of non-renewable primary energy used as a raw material	MJ	-4,85E-01
Use of renewable primary energy used as raw material	MJ	0,00E+00
Total use a renewable primary energy (primary energy and resources of renewable primary energy used as raw materials)	MJ	-4,85E-01
Use of non-renewable primary energy, excluding the resources of non-renewable primary energy used as a raw material	MJ	-5,18E-01
Use of non-renewable primary energy used as raw material	MJ	0,00E+00
Total use of non-renewable primary energy (primary energy and resources of renewable primary energy used as raw materials)	MJ	-5,18E-01
Use of secondary materials	kg	0,00E+00
Use of renewable secondary fuels	MJ	0,00E+00
Use of non-renewable secondary fuels	MJ	0,00E+00
Net use of fresh water	m ³	-3,98E-04
Hazardous waste disposed	kg	-4,67E-07
Non-hazardous waste disposed	kg	-2,92E-04
Radioactive waste disposed	kg	-3,30E-07
Components for its reutilization	kg	0,00E+00
Materials to recycle	kg	0,00E+00
Materials for the energetic valorization	kg	0,00E+00
Exported energy	MJ	0,00E+00

MJ, net calorific value

3.5. Recommendations of this DAP

Construction products should be compared by applying the same functional unit and level of building, i.e. including the product's behaviour throughout its life cycle.
Environmental product declarations of different systems of type III eco-labelling are not directly comparable, as the rules of calculation may be different.
This declaration represents the average behaviour of the TECBOR® fireproof rigid boards product by MERCOR TECRESA.

3.6. Cut-off rules

Over 95% of all the inputs and outputs of mass and energy of the system have been included, excluding, among others, diffuse emissions in the factory.

3.7. Additional environmental information

Tecbor® boards do not contain hazardous substances according to Commission Database DS041 / 051.

3.8. Other data

Waste generated during the production is included as "non-hazardous waste" in the European List of Waste under LOW code 17 06 04 "insulation materials other than those mentioned in 17 06 01 and 17 06 03".

4. TECHNICAL INFORMATION AND SCENARIOS

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

Parameter	Parameter expressed by declared unit
Type and consumption of fuel or vehicle used	20-27t truck: 1,19E-05 kg diesel/kgkm
Distance	Road transport: 1.375 km Sea transport: 1.116 km
Utilization of the vehicle (including the empty return)	85% for road transport and 100% for freighter
Density of the transported product	1.490 kg/m ³
Factor of calculating the capacity of the volume used	1

4.2. Installation processes (A5)

Parameter	Parameter expressed by declared unit
Auxiliary materials for installation	Anchoring materials (Steel) = 0.48 kg
Water consumption	-
Consumption of other resources	-
Quantitative description of the type of energy and consumption during the installation process	-
Waste in the construction site, generated by the installation of the product (specify types)	Plastic waste: 6,96E-03 kg Wood waste: 2,88E-01 kg Cardboard waste: 3,93E-02 kg
Material output as a result of the waste management processes in the place of installation. For example: collection for recycling, for energetic recovery and final disposal	See previous point, "Waste on the construction site, generated by the installation of the product"
Emissions to the air, ground or water	Not detected

4.3. Reference service life (B1)

Parameter	Parameter expressed by declared unit
Reference service life	25 years
Properties and characteristics of the product	fireproof rigid boards composed of magnesium oxide and other additives and reinforced with fiberglass.
Requirements (maintenance frequency, ways of using, repair, etc.)	-

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

Parameter	Parameter expressed by declared unit
Maintenance, for example: cleaning agent, type of surfactant	-
Maintenance cycle	-
Auxiliar materials for the maintenance process	-
Energy input for the maintenance process	-
Net consumption of fresh water during the maintenance or repair process	-
Inspection, maintenance or repair process	-
Inspection, maintenance or repair cycle	-
Auxiliary materials, e.g. lubricant	-
Changing of parts during the product life cycle	-
Energy input during the process of maintenance, type of energy, e.g. electricity and quantity	-
Energy input during the process of reparation, renovation, replacement, if it is applicable and significant	-
Loss of material during maintenance or repair	-
Service life of the product for inclusion as a basis to calculate the number of times a change is needed in the building	25 years

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

Parameter	Parameter expressed by declared unit
Energy type, for example: electricity, natural gas, use of heat for a district	Does not require water or energy
Output power potential of equipments	-
Net consumption of fresh water	-
Characteristic representation (energy efficiency, emissions...)	-

4.6. End of life (C1-C4)

Process	Parameter expressed for declared unit of the components, products or materials
Collection processes	13,50 kg collected together with construction waste
Recycling systems	0,00 kg
Disposal	13,50 kg

5. ADDITIONAL INFORMATION

- CE Marking (ETE 18/1017)
- Euroclass reaction to fire: Non combustible / Euroclass A1 (EN- 13501-1)

6. PCR AND VERIFICATION

This declaration is based on the Document

RCP 100 Declaración Ambiental de Producto sobre productos de construcción (v2 29.02.2016)

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

☐ Internal ☒ External

Independent verifier appointed

Mr. Ferran Pérez Ibáñez, Verifier accredited by the DAPconstruction® Program



Verification date

22 / 10 / 2019

References

- Informe ACV de Paneles ignífugos TECBOR – MERCOR TECRESA. ReMa-INGENIERÍA, S.L. 2019 (no publicado)
- ISO 14040:2006 Environmental management – Life cycle assessment – Principles and framework y Requirements and guidelines
- ISO 14025:2006 Environmental labels and declarations – Type III environmental declarations – Principles and procedures
- Handbook of Emission Factors for Road Transport (HBEFA). 2016. <http://www.hbefa.net/>
- GaBi Database & Modelling Principles. Version 1.0, November 2013. PE International. 2013.
- CML2001. Handbook on life cycle assessment. Operational guide to the ISO Standards. Dordrecht, The Netherlands. Kluwer.
- Application of Life Cycle Assessment (LCA) methodology for valorization of building demolition materials and products. Balázs, S et al.

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