Statement of Verification

BREG EN EPD No.: 000343 Issue 01

This is to verify that the

Environmental Product Declaration

provided by:

Cupa Pizarras S.A

is in accordance with the requirements of:

EN 15804:2012+A1:2013

and

BRE Global Scheme Document SD207

This declaration is for:

CUPACLAD® 101

Company Address

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Signed for BRE Global Ltd	Emma Baker Operator	16 September 2021 Date of this Issue
16 September 2021 Date of First Issue		15 September 2026 Expiry Date

Environmental Product Declaration

EPD Number: 000343

General Information

EPD Programme Operator	Applicable Product Category Rules
BRE Global Watford, Herts WD25 9XX United Kingdom	BRE Environmental Profiles 2013 Product Category Rules for Type III environmental product declaration of construction products to EN 15804:2012+A1:2013
Commissioner of LCA study	**LCA consultant/Tool**
Cupa Pizarras	María Lago Cupa Innovación SLU Calle Macal nº 32 36213 Vigo
Declared/Functional Unit	**Applicability/Coverage**
1m^2 of ventilated rainscreen cladding with natural slate, CUPACLAD® 101, installed on an exterior façade, during a temporary period of 60 years in a geographic and technological environment of the United Kingdom.	Product Average.
EPD Type	**Background database**
Cradle to Grave	Ecoinvent

Demonstration of Verification
CEN standard EN 15804 serves as the core PCR [a]
Independent verification of the declaration and data according to EN ISO 14025:2010 ☐Internal ☒ External
(Where appropriate [b])Third party verifier: Pat Hermon
a: Product category rules b: Optional for business-to-business communication; mandatory for business-to-consumer communication (see EN ISO 14025:2010, 9.4)

Comparability
Environmental product declarations from different programmes may not be comparable if not compliant with EN 15804:2012+A1:2013. Comparability is further dependent on the specific product category rules, system boundaries and allocations, and background data sources. See Clause 5.3 of EN 15804:2012+A1:2013 for further guidance

Information modules covered

Product			Construction		Use stage							End-of-life					Benefits and loads beyond the system boundary
					Related to the building fabric					Related to the building							
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4		D
Raw materials supply	Transport	Manufacturing	Transport to site	Construction – Installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction demolition	Transport	Waste processing	Disposal		Reuse, Recovery and/or Recycling potential
☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑		☐

Note: Ticks indicate the Information Modules declared.

Manufacturing site(s)

Cupa Pizarras
La Medua s/n
32330 Sobradelo de Valdeorras (Ourense)
Spain

Construction Product:

Product Description

CUPACLAD® 101 is a rainscreen cladding with CUPA natural slate. CUPACLAD® offers a horizontal installation of slate, creating a modern, natural, and durable aesthetic. The system adapts to any type of architectural project, both new and renovation.

CUPACLAD® 101, is a horizontal installation of slate with invisible fixing. The slate is laid horizontally and is secured with two stainless steel screws. The screw heads are covered by the slate of the upper row and remain invisible.

CUPACLAD® ventilated rainscreen cladding have been designed to adapt to any type of project, combining different fixing systems and natural slate formats.

The declared product 1 m2 of ventilated rainscreen cladding for the covering of façades, with the following characteristics: average thickness 7.6 mm, and average mass 30.26 kg / m2. The calculation of the average is based on the worst case.

CUPACLAD® 101 comprises three different kind of systems:

- 101 Logic: the CUPACLAD® 101 Logic system utilizes 40x20cm or 50x25cm slates fitted horizontally with invisible fixings.

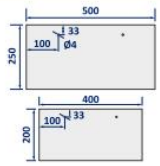
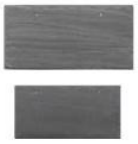
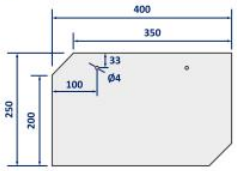
COMPONENT		CHARACTERISTIC
SLATE 		**Slate size** : 400x200 / 500x250 mm **Nominal thickness** : 7,65 mm **Slates per m²** : 16,7 / 10 **Weight per m² (slate)** : ≤30 kg/m² **Overlap (vertical)** : 50 mm

Figure 1. CUPACLAD® 101 Logic system.

- 101 Parallel: CUPACLAD® 101 Parallel features 40x25 horizontally aligned slates fitted with invisible screws.

COMPONENT		CHARACTERISTIC
SLATE 		**Slate size** : 400x250 mm **Nominal thickness** : 7,5 mm **Slates per m²** : 14,3 **Weight per m² (slate)** : ≤30 kg/m² **Overlap (vertical)** : 50 mm **Overlap (horizontal)** : 50 mm

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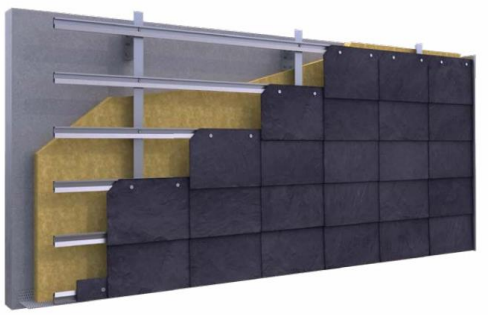

Figure 2. CUPACLAD® 101 Logic system.

- 101 Random: CUPACLAD® 101 Random combines different slate sizes, creating a dynamic and unique design. The system features 50x25, 50x20 and 50x15 slates fitted horizontally with invisible fixings.

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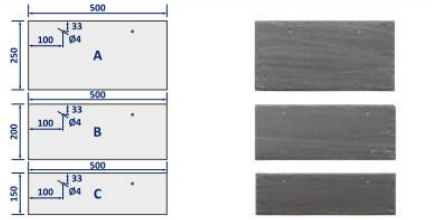
COMPONENT	CHARACTERISTIC
SLATE 	**Slate size** : 500x250 mm 500x200 mm 500x150 mm **Nominal thickness** : 7,65 mm **Slates per m²** : ± 15 **Weight per m² (slate)** : ≤30 kg/m² **Overlap (vertical)** : 50 mm

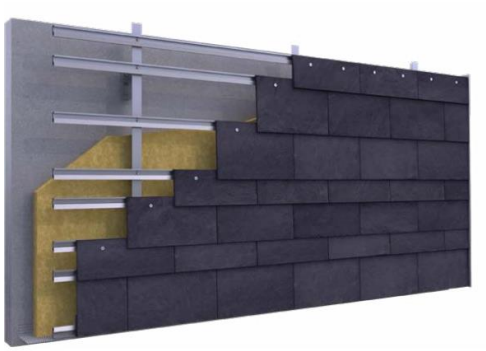


Figure 3. CUPACLAD® 101 Random system.

Technical Information

Characteristic (unit)	Standards	CUPACLAD® 101		CUPACLAD® 101	CUPACLAD® 101
		101 Logic		101 Random	Parallel
Slate size (mm x mm)	BS EN-12326-1	400 x 200	500 x 250	500 x 250 500 x 200 500 x 150	400 x 250
Nominal thickness (mm)		7,65 ± 25%	7,65 ± 25%	7,65 ± 25%	7,5 ± 35%
Mean Water absorption (%)		0,17	0,17	0,17	0,16
Coefficient of linear thermal expansion ($°C^{-1}$)	EN 14581:2006	$4 \cdot 10^{-6}$			
Characteristic Modulus of Rupture (MPa)	BS EN 12326-2 : 2011.	Longitudinal 54	Longitudinal 54	Longitudinal 54	Longitudinal 52
		Transversal 36	Transversal 36	Transversal 36	Transversal 45

Main Product Contents

CUPACLAD® 101 system utilizes slates fitted horizontally with fixings.

Material/Chemical Input	%
Natural stone, slate	99.8
Stainless steel screws	0.2

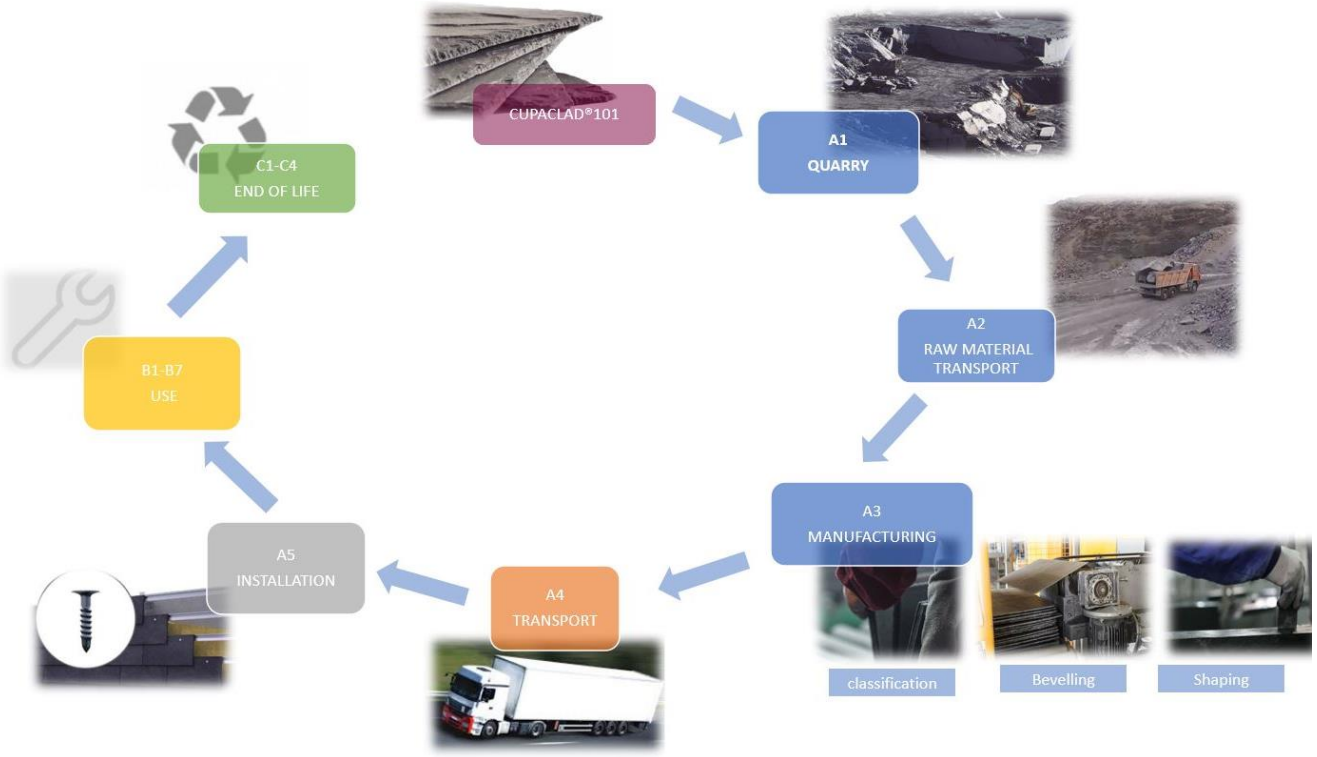
Manufacturing Process

The slate is extracted from the quarry in large blocks that are cut with a diamond blade. The blocks are then transported by truck to the quarry processing plant.
The slate undergoes 3 phases at the processing plant prior to being packaged:

- Sawing: The large blocks of slate extracted from the quarry are sawn into different sizes in accordance with the size of the slate to be produced.
- Shaping: Then, workers cut each block into sheets, treating each item with meticulous care, all of which is done by hand.
- Bevelling: Finally, the corners of each item are bevelled.

After classification, the slates are counted and packaged on wooden pallets for storage and subsequent delivery.

Process flow diagram



Construction Installation

The installation of CUPACLAD® 101 natural slate ventilated rainscreen cladding is carried out by means of self-drilling screws.
Each slate must be aligned with the upper edge of the horizontal profile and fitted with two stainless steel. CUPACLAD® 101 self-drilling screws.
The installation is done with mechanical assistance.
This step includes:

- The production and transport of screws.
- Power consumption of a drill.
- Transport and end of life of site waste.

Use Information

No maintenance or replacement during the working life is considered.
The slates do not require any special maintenance. CUPACLAD® systems do not require any treatment.

End of Life

The deconstruction / demolition of the building site is done with mechanical assistance. The dismantling of the slates is carried out using a drill.

This step includes the transport of the slate and the screw after the deconstruction of the site to the place of its treatment or deposit.

90% of slate can be recovered from demolition for re-use in new buildings and the remaining 10% is directly sent to landfill as inert disposal.

Thanks to the installation and disassembly method of slate, it is only necessary to clean the slate with water under pressure to recover the product and ensure its performance before being used on another job.

Life Cycle Assessment Calculation Rules

Declared / Functional unit description

The functional unit chosen for the CUPACLAD® 101 system is the amount of material needed to install 1m^2 of natural slate rainscreen cladding, installed on an exterior façade, during a temporary period of 60 years in a geographic and technological environment of the United Kingdom in 2020.

System boundary

In accordance with the modular approach as defined in EN 15804:2012, this cradle-to-grave EPD includes the product stage A1 to C4. Benefits and loads beyond the system boundary (Module D) have not been included.

Data sources, quality and allocation

Manufacturing data is based on specific consumption data from CUPA PIZARRAS in 2019. Generic data is obtained from Ecoinvent v.3.5. Modelling of CUPACLAD® 101 life cycle was performed using SimaPro v9.0.049. LCA software from PRé consultants.

There are no co-products in the production, no allocation criteria were considered, 100% of all the inputs have been considered.

Cut-off criteria

All raw materials, packaging materials and consumable item inputs, and associated transport to the plant, process energy and water use are included. The production process for raw materials and energy flows that show very small amounts (<1%) are not included.

LCA Results

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

Parameters describing environmental impacts									
			GWP	ODP	AP	EP	POCP	ADPE	ADPF
			kg CO_2 equiv.	kg CFC 11 equiv.	kg SO_2 equiv.	kg $(PO_4)^{3-}$ equiv.	kg C_2H_4 equiv.	kg Sb equiv.	MJ, net calorific value.
Product stage	Raw material supply	A1	AGG	AGG	AGG	AGG	AGG	AGG	AGG
	Transport	A2	AGG	AGG	AGG	AGG	AGG	AGG	AGG
	Manufacturing	A3	AGG	AGG	AGG	AGG	AGG	AGG	AGG
	Total (of product stage)	A1-3	3.26E+00	1.42E-06	2.31E-02	5.58E-03	1.15E-03	8.64E-06	1.17E+02
Construction process stage	Transport	A4	3.91E+00	7.62E-07	1.46E-02	2.98E-03	7.26E-04	7.29E-06	6.26E+01
	Construction	A5	5.94E-01	4.70E-08	3.12E-03	2.77E-03	1.89E-04	9.44E-06	6.20E+00
Use stage	Use	B1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Maintenance	B2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Repair	B3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Replacement	B4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Refurbishment	B5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational energy use	B6	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
End of life	Deconstruction, demolition	C1	9.58E-02	1.25E-08	7.62E-04	1.79E-04	2.74E-05	6.22E-08	1.08E+00
	Transport	C2	1.25E+00	2.30E-07	4.01E-03	9.37E-04	2.04E-04	3.74E-06	1.89E+01
	Waste processing	C3	2.16E-02	2.82E-09	1.71E-04	4.02E-05	6.17E-06	1.40E-08	2.43E-01
	Disposal	C4	1.35E-02	5.42E-09	1.00E-04	2.21E-05	3.80E-06	1.47E-08	4.43E-01
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-2.76E+00	-1.26E-06	-1.99E-02	-4.71E-03	-9.46E-04	-7.22E-06	-1.02E+02

GWP = Global Warming Potential;
ODP = Ozone Depletion Potential;
AP = Acidification Potential for Soil and Water;
EP = Eutrophication Potential;
POCP = Formation potential of tropospheric Ozone;
ADPE = Abiotic Depletion Potential – Elements;
ADPF = Abiotic Depletion Potential – Fossil Fuels;

LCA Results (continued)

Parameters describing resource use, primary energy								
			PERE	PERM	PERT	PENRE	PENRM	PENRT
			MJ	MJ	MJ	MJ	MJ	MJ
Product stage	Raw material supply	A1	AGG	AGG	AGG	AGG	AGG	AGG
	Transport	A2	AGG	AGG	AGG	AGG	AGG	AGG
	Manufacturing	A3	AGG	AGG	AGG	AGG	AGG	AGG
	Total (of product stage)	A1-3	2.38E+01	6.69E+00	3.04E+01	0.00E+00	8.79E+01	8.79E+01
Construction process stage	Transport	A4	. 8.76E-01	0.00E+00	. 8.76E-01	0.00E+00	0.00E+00	0.00E+00
	Construction	A5	1.70E+00	4.54E-01	2.15E+00	0.00E+00	5.54E-01	5.54E-01
Use stage	Use	B1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Maintenance	B2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Repair	B3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Replacement	B4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Refurbishment	B5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational energy use	B6	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
End of life	Deconstruction, demolition	C1	5.09E-01	4.54E-01	9.63E-01	0.00E+00	5.54E-01	5.54E-01
	Transport	C2	2.36E-01	0.00E+00	2.36E-01	0.00E+00	0.00E+00	0.00E+00
	Waste processing	C3	1.15E-01	1.02E-01	2.17E-01	0.00E+00	1.25E-01	1.25E-01
	Disposal	C4	6.22E-03	0.00E+00	6.22E-03	0.00E+00	0.00E+00	0.00E+00
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-7.66E+00	-6.02E+00	-1.37E+01	0.00E+00	-7.91E+01	-7.91E+01

PERE = Use of renewable primary energy excluding renewable primary energy used as raw materials;
PERM = Use of renewable primary energy resources used as raw materials;
PERT = Total use of renewable primary energy resources;
PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials;
PENRM = Use of non-renewable primary energy resources used as raw materials;
PENRT = Total use of non-renewable primary energy resource

LCA Results (continued)

Parameters describing resource use, secondary materials and fuels, use of water						
			SM	RSF	NRSF	FW
			kg	MJ net calorific value	MJ net calorific value	m^3
Product stage	Raw material supply	A1	AGG	AGG	AGG	AGG
	Transport	A2	AGG	AGG	AGG	AGG
	Manufacturing	A3	AGG	AGG	AGG	AGG
	Total (of product stage)	A1-3	0.00E+00	0.00E+00	0.00E+00	4,02E-02
Construction process stage	Transport	A4	0.00E+00	0.00E+00	0.00E+00	1.20E-02
	Construction	A5	0.00E+00	0.00E+00	0.00E+00	3.26E-03
Use stage	Use	B1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Maintenance	B2	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Repair	B3	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Replacement	B4	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Refurbishment	B5	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational energy use	B6	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00	0.00E+00
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00	8.65E-04
	Transport	C2	0.00E+00	0.00E+00	0.00E+00	3.11E-03
	Waste processing	C3	0.00E+00	0.00E+00	0.00E+00	1.64E-02
	Disposal	C4	0.00E+00	0.00E+00	0.00E+00	5.29E-04
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	0.00E+00	0.00E+00	0.00E+00	-3.45E-02

SM = Use of secondary material;
RSF = Use of renewable secondary fuels;
NRSF = Use of non-renewable secondary fuels;
FW = Net use of fresh water

LCA Results (continued)

Other environmental information describing waste categories					
			HWD	NHWD	RWD
			kg	kg	kg
Product stage	Raw material supply	A1	AGG	AGG	AGG
	Transport	A2	AGG	AGG	AGG
	Manufacturing	A3	AGG	AGG	AGG
	Total (of product stage)	A1-3	9.57E-01	9.96E-01	9.22E-04
Construction process stage	Transport	A4	3.90E-01	5.54E+00	4.34E-04
	Construction	A5	7.01E-01	2.63E+00	3.62E-05
Use stage	Use	B1	0.00E+00	0.00E+00	0.00E+00
	Maintenance	B2	0.00E+00	0.00E+00	0.00E+00
	Repair	B3	0.00E+00	0.00E+00	0.00E+00
	Replacement	B4	0.00E+00	0.00E+00	0.00E+00
	Refurbishment	B5	0.00E+00	0.00E+00	0.00E+00
	Operational energy use	B6	0.00E+00	0.00E+00	0.00E+00
	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00
End of life	Deconstruction, demolition	C1	3.59E-02	3.69E-02	1.55E-05
	Transport	C2	1.17E-01	9.97E-01	1.30E-04
	Waste processing	C3	8.08E-03	8.30E-03	3.49E-06
	Disposal	C4	1.11E-03	3.18E+00	3.10E-06
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-7.90E-01	-7.97E-01	-8.20E-04

HWD = Hazardous waste disposed;
NHWD = Non-hazardous waste disposed;
RWD = Radioactive waste disposed

LCA Results (continued)

Other environmental information describing output flows – at end of life						
			CRU	MFR	MER	EE
			kg	kg	kg	MJ per energy carrier
Product stage	Raw material supply	A1	AGG	AGG	AGG	AGG
	Transport	A2	AGG	AGG	AGG	AGG
	Manufacturing	A3	AGG	AGG	AGG	AGG
	Total (of product stage)	A1-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Construction process stage	Transport	A4	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Construction	A5	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use stage	Use	B1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Maintenance	B2	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Repair	B3	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Replacement	B4	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Refurbishment	B5	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational energy use	B6	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00	0.00E+00
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Waste processing	C3	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Disposal	C4	2.72E+01	0.00E+00	0.00E+00	0.00E+00
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	0.00E+00	0.00E+00	0.00E+00	0.00E+00

CRU = Components for reuse;
MFR = Materials for recycling

MER = Materials for energy recovery;
EE = Exported Energy

Scenarios and additional technical information

Scenarios and additional technical information			
Scenario	Parameter	Units	Results
A4 – Transport to the building site	CUPACLAD® 101 systems are transported from the factory to the building site by lorry and by boat. CUPACLAD@101 is transported from the factory gate to the building site. Transport from the factory to the various sites in UK is carried out by heavy goods vehicle and by boat: • 52% of the material is transported from the factory to the various sites in UK by lorry and train. • 48% of the material is transported from the O Barco plant (Spain) to Vigo (Spain) by heavy truck. The material is then transported from Vigo (Spain) to United Kingdom by boat. Finally, the material is transported to the different sites in the United Kingdom by truck		
	Fuel type/ Vehicle type	Transport, freight, lorry >32 metric ton, EURO MIX	Diesel
	Distance:	km	2561km
	Capacity utilisation (incl. empty returns)	%	50
	Bulk density of transported products	kg/m^3	2800
	Fuel type/ Vehicle type	Transport, freight, sea, transoceanic	38 % Diesel 62 % steam turbine
	Distance:	km	1464 km
	Capacity utilisation (incl. empty returns)	%	65%
	Bulk density of transported products	kg/m^3	2800
	Fuel type/ Vehicle type	Transport, freight train {Europe without Switzerland}| electricity | Cut-off, U	electric
	Distance:	km	50.45
	Capacity utilisation (incl. empty returns)	%	50
	Bulk density of transported products	kg/m^3	2800
A5 – Installation in the building	The installation of the CUPACLAD®101 natural slate rainscreen cladding system is carried out by means of self-drilling screws. The installation is done with mechanical assistance, The waste from this stage consists of the slates broken during installation (5 %) and the packaging products of the slates (polypropylene labels and wood pallet) These residues are landfilled.		
	Screws needed to install 1 m2 façade	kg/m^2	0.06
	Power consumption of a drill	kWh/m2	0.28
	packaging residues: Wood	kg/m^2	0.64
	packaging residues: Polypropylene label	kg/m^2	0.0057

Scenarios and additional technical information			
Scenario	Parameter	Units	Results
	Installation Wastage Rate	%	5
B2 – Maintenance	No maintenance required		
B3 – Repair	No repair process required		
B4 – Replacement	No replacement considerations required		
B5 – Refurbishment	No refurbishment process required		
Reference service life	CUPACLAD® 101 is made of natural slate, which is a durable material, it can last up to 100[1] years, as shown by several studies. However, it was chosen a reference service life is the same as for buildings and normally set to 60 years[2].		
B6 – Use of energy; B7 – Use of water	No use phase requirements of either water or energy required		
C1 to C4 End of life,	The deconstruction of CUPACLAD® 101 external cladding is carried out with a drill. The power consumption of using the drill has been considered in this stage (C1). Thanks to the installation and disassembly method of slate, it is only necessary to clean the slate with water under pressure to recover the product and ensure its performance before being used on another job (C3)		
	Distance of transport to the end of life (C2)	km	250
	Quantity of water used	l/m^2	16.2
	Electricity consummation	kWh/m^2	0.063
	Slate from demolition to landfill	%	10
	Slate from demolition for re-use	%	90

Summary, comments, and additional information

Interpretation

The Figure below represents the complete life cycle assessment of the CUPACLAD® 101 system. The production and transport phases are the major contributors. The environmental burdens for the impact categories (GWP, ODP, AP, EP and POCP) result from the associated emissions directly linked to fossil fuel and electricity consumption in the transport of materials and production process.

[1] J A Walsh. La durabilité des ardoises de couverture Heavy 3 de San Pedro de Trones, Ourense, Espagne. Mars 2007, 18 pages

[2] Dr Jo Mundy. The Green Guide Explained. BRE Centre for sustainable Products. March 2015

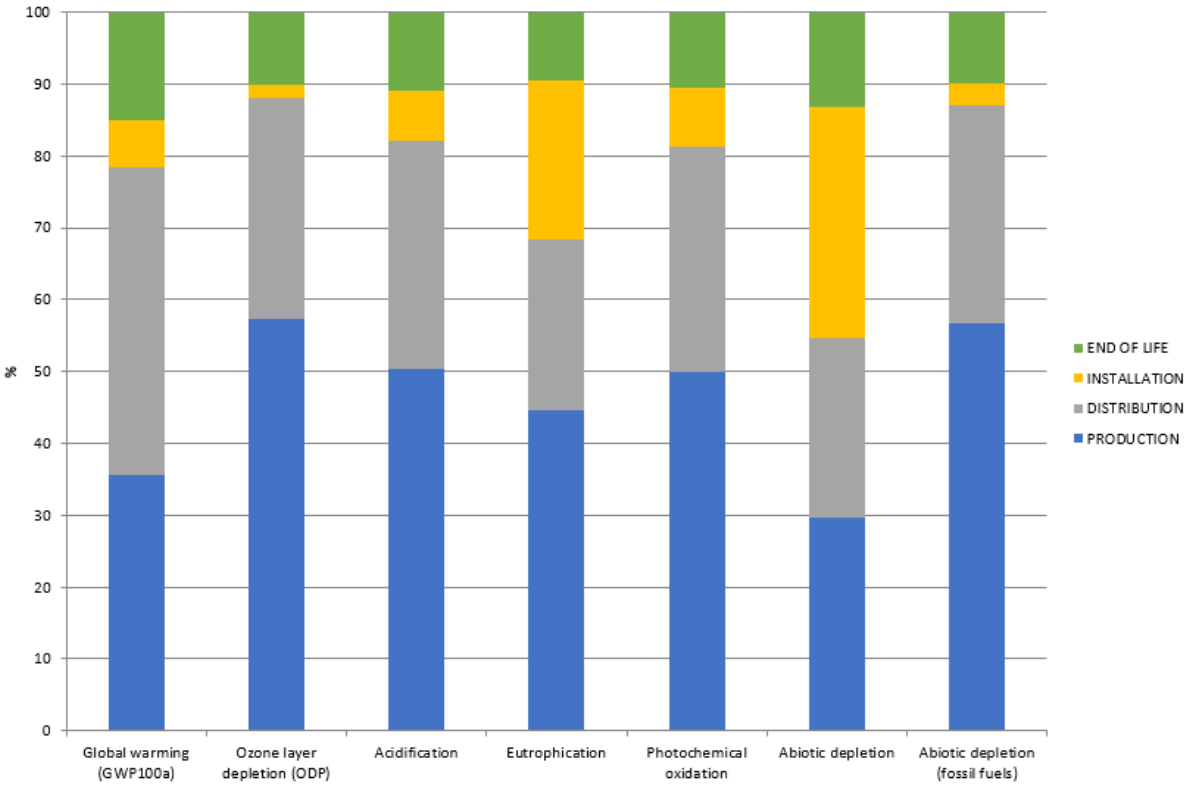


Figure 4. CUPACLAD® 101 System Life Cycle Assessment Results.

The following figures show the standard desviation from the mean of the LCA results for each value:

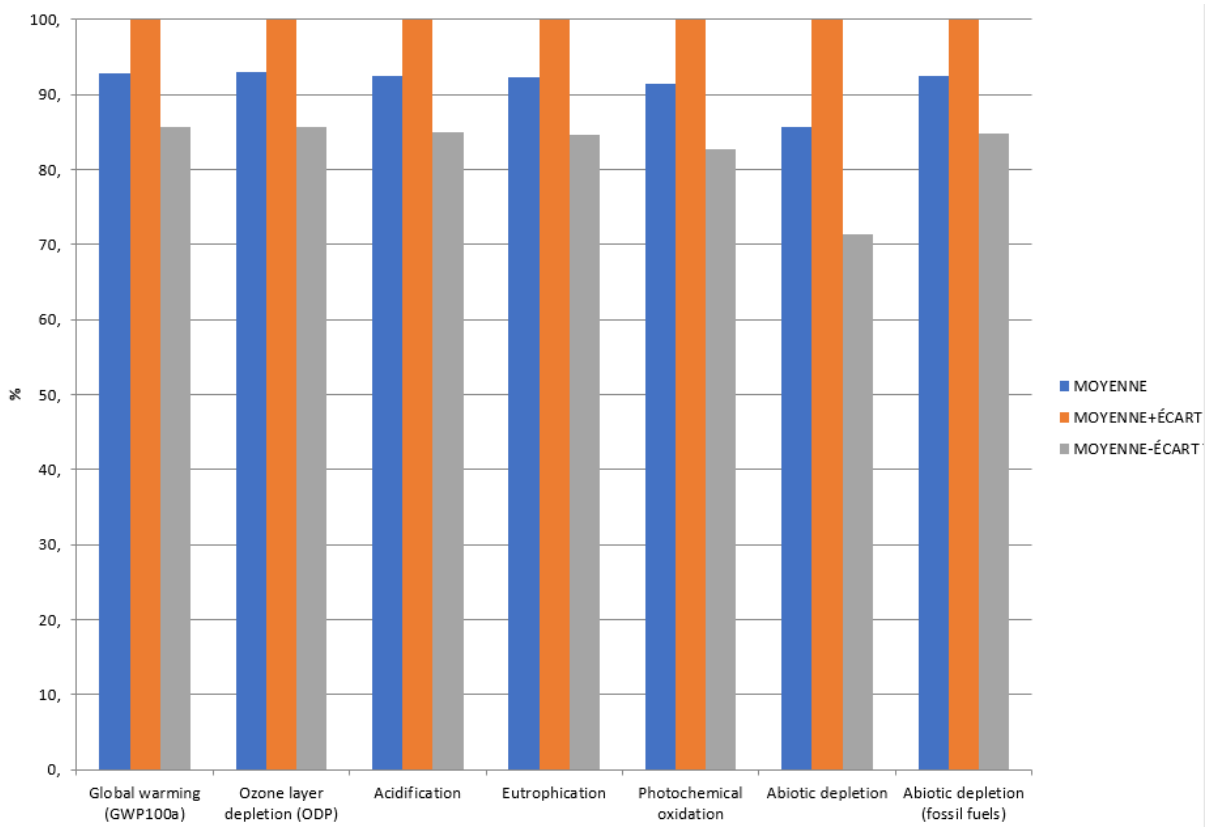


Figure 5. Mean and standard deviation of the CUPACLAD®101 system

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https://www.cupapizarras.com/uk/rainscreen-cladding/downloads/