

## ENVIRONMENTAL PRODUCT DECLARATION

in accordance with ISO 14025, ISO 21930 and EN 15804

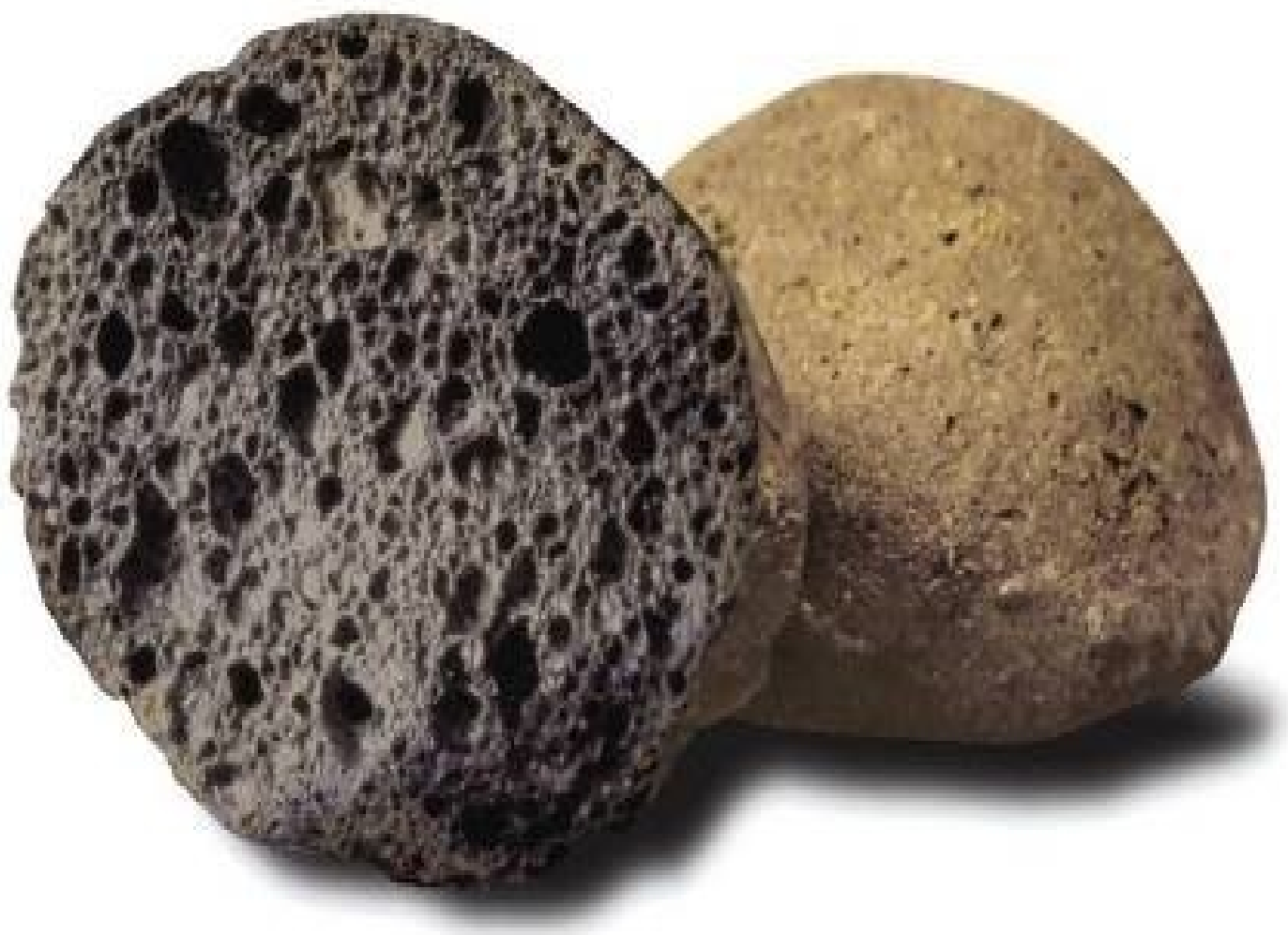
Owner of the declaration:	Leca International
Program operator:	The Norwegian EPD Foundation
Publisher:	The Norwegian EPD Foundation
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Valid to:	18.11.2025

Leca® L; Arlita 10/20; Geo Leca®; Arlita Light Plus; Leca® Light Plus;  
 Gamma Grano Grande; PUMA GRANO GRUESO

Leca International



[www.epd-norge.no](http://www.epd-norge.no)



## General information

### Product:

Leca® L; Arlita 10/20; Geo Leca®; Arlita Light Plus; Leca® Light Plus; Gamma Grano Grande; PUMA GRANO GRUESO

### Program operator:

The Norwegian EPD Foundation  
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### Declaration number:

NEPD-2540-1277-EN

### ECO Platform reference number:

### This declaration is based on Product Category Rules:

CEN Standard EN 15804:2012+A1:2013 serves as core PCR  
NPCR 012:2018 Part B for Thermal insulation products

### Statement of liability:

The owner of the declaration shall be liable for the underlying information and evidence. EPD Norway shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

### Declared unit:

1 m3 Leca® L; Arlita 10/20; Geo Leca®; Arlita Light Plus; Leca® Light Plus; Gamma Grano Grande; PUMA GRANO GRUESO

### Declared unit with option:

A1,A2,A3,A4

### Functional unit:

### Verification:

Independent verification of data, other environmental information and the declaration according to ISO 14025:2010, § 8.1.3 and § 8.1.4

External

Third party verifier:

Sign



Senior Research Scientist, Anne Rønning

(Independent verifier approved by EPD Norway)

### Owner of the declaration:

Leca International  
Contact person: Tone Storbråten  
Phone: +47 41 43 71 00  
e-mail: [info@leca.no](mailto:info@leca.no)

### Manufacturer:

Leca International

### Place of production:

Leca Portugal, Avelar  
Estrada Nacional N.º 110, s/n  
Tojeira  
3240-356 Avelar  
Portugal

### Management system:

ISO 14001 ISO 9001

### Organisation no:

918 799 141

### Issue date:

18.11.2020

### Valid to:

18.11.2025

### Year of study:

2018

### Comparability:

EPD of construction products may not be comparable if they not comply with EN 15804 and seen in a building context.

### Author of the Life Cycle Assessment:

The declaration is developed using eEPD v4.0 from LCA.no

Approval:

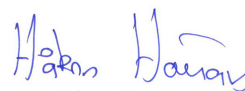
Company specific data are:

Collected/registered by: Tone Storbråten

Internal verification by: Jan Szanser

### Approved:

Sign



Håkon Hauan  
Managing Director of EPD-Norway

## Product

### Product description:

Lightweight expanded clay aggregate is a granular ceramic material made from natural clay. The clay is mixed with organic material, dried and expanded to 4-5 times its original volume in rotary kilns at temperatures of about 1150°C. The output lightweight expanded clay aggregate granules, in the range 0-32 mm, are sieved and blended into different grades of products and distributed in bulk or in bags. Each granule has a hard ceramic shell that surrounds a honeycomb core.

### Product specification

Lightweight expanded clay aggregate is a durable product with an unlimited lifespan and 100% of the installed product can be reused or recycled.

Lightweight expanded clay aggregate has low density (typical loose bulk density range depending on grain size 200-800 kg/m<sup>3</sup>) and relatively high strength.

Materials	%
Clay	92-98 %
Dolomite	1-3 %
Waste	2-5 %

### Technical data:

The relevant technical properties for Geo Leca® are provided below:

Technical property.....Test method.....Typical value  
 Loose bulk density.....(EN 1097-3).....275 kg/m<sup>3</sup>  
 Grading.....(EN 933-1).....10-20 mm  
 Percentage of crushed particles...(EN 13055-1).... <= 25 %  
 Compressibility and  
 confined compressive strength.....(NS-EN 13055-1)....>= 0,7 N/mm<sup>2</sup>  
 Thermal conductivity .....(NS-EN 14063-1)....0,110 W/mK  
 Reaction to fire.....(NS-EN 13820).....A1

Grading - Density [kg/m<sup>3</sup>]  
 Leca® 0/3..... 610  
 Leca® XS..... 455  
 Leca® S..... 430  
 Leca® M..... 330

### Market:

Portugal and Spain

### Reference service life, product

Not relevant

### Reference service life, building

Not relevant

## LCA: Calculation rules

### Declared unit:

1 m3 Leca® L; Arlita 10/20; Geo Leca®; Arlita Light Plus; Leca® Light Plus; Gamma Grano Grande; PUMA GRANO GRUESO

### Cut-off criteria:

All major raw materials and all the essential energy is included. The production processes for raw materials and energy flows with very small amounts (less than 1%) are not included. These cut-off criteria do not apply for hazardous materials and substances.

### Data quality:

Specific data for the product composition are provided by the manufacturer. They represent the production of the declared product and were collected for EPD development in the year of study. Background data is based on registered EPDs according to EN 15804, Ostfold Research databases, ecoinvent and other LCA databases. The data quality of the raw materials in A1 is presented in the table below.

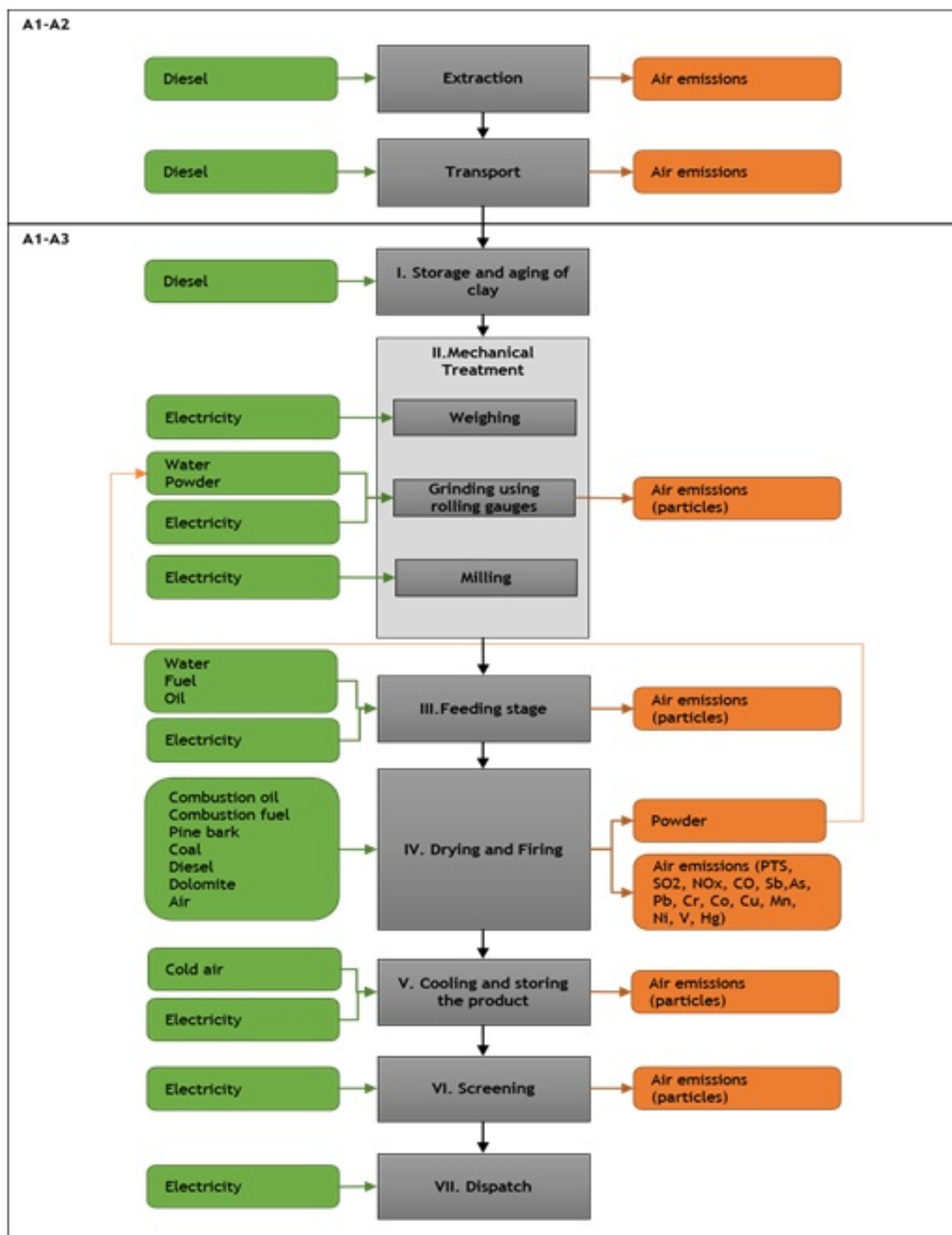
Materials	Source	Data quality	Year
Dolomite	ecoinvent 3.4	Database	2017
Oxygen	ecoinvent 3.4	Database	2017
Additives	ecoinvent 3.5	Database	2018
Clay	Specific data	Database	2018
Waste products	LCA.no	Database	2019

### Allocation:

The allocation is made in accordance with the provisions of EN 15804. Incoming energy and water and waste production in-house is allocated equally among all products through mass allocation. Effects of primary production of recycled materials is allocated to the main product in which the material was used. The recycling process and transportation of the material is allocated to this analysis.

# System boundary:

The system boundary of the EPD follows the modular structure in line with EN 15804. This section describes the modules which are contained within the scope of this study. As the scope of the assessment is up to the point at which the lightweight clay aggregate is manufactured modules A1- A4 have been considered in this LCA



## Additional technical information:

## LCA: Scenarios and additional technical information

The following information describe the scenarios in the different modules of the EPD.

### Transport from production place to user (A4)

Type	Capacity utilisation (incl. return) %	Type of vehicle	Distance km	Fuel/Energy consumption	Unit	Value (l/t)
Truck	55,0 %	Truck, lorry over 32 tonnes, EURO 6	300	0,022606	l/tkm	6,78
Railway					l/tkm	
Boat					l/tkm	
Other Transportation					l/tkm	

### Assembly (A5)

.	Unit	Value
Auxiliary	kg	
Water consumption	m <sup>3</sup>	
Electricity consumption	kWh	
Other energy carriers	MJ	
Material loss	kg	
Output materials for waste treatment	kg	
Dust in the air	kg	
VOC emissions	kg	

### Use (B1)

.	Unit	Value

### Maintenance (B2)/Repair (B3)

.	Unit	Value
Maintenance cycle*		
Auxiliary		
Other resources		
Water consumption	m <sup>3</sup>	
Electricity consumption	kWh	
Other energy carriers	MJ	
Material loss	kg	
VOC emissions	kg	

### Replacement (B4)/Refurbishment (B5)

.	Unit	Value
Replacement cycle*		
Electricity consumption	kWh	
Replacement of worn parts		

\* Described above if relevant

### Operational energy (B6) and water consumption (B7)

.	Unit	Value
Water consumption	m <sup>3</sup>	
Electricity consumption	kWh	
Other energy carriers	MJ	
Power output of equipment	kW	

### End of Life (C1, C2)

.	Unit	Value
Hazardous waste disposed	kg	
Collected as mixed construction waste	kg	
Reuse	kg	
Recycling		
Energy recovery		
To landfill	kg	

### Transport to waste processing (C2)

Type	Capacity utilisation (incl. return) %	Type of vehicle	Distance km	Fuel/Energy consumption	Unit	Value (l/t)
Truck					l/tkm	
Railway					l/tkm	
Boat					l/tkm	
Other Transportation					l/tkm	

Scenarios after A1-A4 are not included

## LCA: Results

### System boundaries (X=included, MND=module not declared, MNR=module not relevant)

Product stage				Construction installation stage	User stage							End of life stage				Beyond the system boundaries
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction demolition	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	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

### Environmental impact

Parameter	Unit	A1	A2	A3	A4
GWP	kg CO <sub>2</sub> -eq	7,33E-01	7,91E-01	6,40E+01	6,83E+00
ODP	kg CFC11 -eq	9,97E-07	0,00E+00	1,19E-06	1,40E-06
POCP	kg C <sub>2</sub> H <sub>4</sub> -eq	3,10E-04	1,27E-04	2,44E-02	1,07E-03
AP	kg SO <sub>2</sub> -eq	7,28E-03	2,57E-03	4,53E-01	1,76E-02
EP	kg PO <sub>4</sub> <sup>3-</sup> -eq	1,78E-03	4,31E-04	5,03E-02	2,43E-03
ADPM	kg Sb -eq	1,49E-06	2,00E-06	6,54E-06	1,63E-05
ADPE	MJ	7,87E+01	1,24E+01	4,26E+02	1,12E+02

GWP Global warming potential; ODP Depletion potential of the stratospheric ozone layer; POCP Formation potential of tropospheric photochemical oxidants; AP Acidification potential of land and water; EP Eutrophication potential; ADPM Abiotic depletion potential for non fossil resources; ADPE Abiotic depletion potential for fossil resources

Reading example: 9,0 E-03 = 9,0\*10<sup>-3</sup> = 0,009

\*INA Indicator Not Assessed

## Resource use

Parameter	Unit	A1	A2	A3	A4
RPEE	MJ	1,34E+00	2,24E-01	6,44E+02	2,04E+00
RPEM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00
TPE	MJ	1,34E+00	2,24E-01	6,44E+02	2,04E+00
NRPE	MJ	8,20E+01	1,28E+01	4,41E+02	1,16E+02
NRPM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00
TRPE	MJ	8,20E+01	1,28E+01	4,41E+02	1,16E+02
SM	kg	1,13E+01	0,00E+00	0,00E+00	0,00E+00
RSF	MJ	0,00E+00	0,00E+00	1,77E-03	0,00E+00
NRSF	MJ	0,00E+00	0,00E+00	1,42E+02	0,00E+00
W	m <sup>3</sup>	6,08E-03	3,01E-03	1,13E-01	2,74E-02

RPEE Renewable primary energy resources used as energy carrier; RPEM Renewable primary energy resources used as raw materials; TPE Total use of renewable primary energy resources; NRPE Non renewable primary energy resources used as energy carrier; NRPM Non renewable primary energy resources used as materials; TRPE Total use of non renewable primary energy resources; SM Use of secondary materials; RSF Use of renewable secondary fuels; NRSF Use of non renewable secondary fuels; W Use of net fresh water

Reading example: 9,0 E-03 =  $9,0 \times 10^{-3}$  = 0,009

\*INA Indicator Not Assessed

## End of life - Waste

Parameter	Unit	A1	A2	A3	A4
HW	kg	2,64E-05	7,00E-06	2,55E-02	6,16E-05
NHW	kg	2,20E-01	1,16E+00	2,27E+01	1,06E+01
RW	kg	INA*	INA*	INA*	INA*

HW Hazardous waste disposed; NHW Non hazardous waste disposed; RW Radioactive waste disposed

Reading example: 9,0 E-03 =  $9,0 \times 10^{-3}$  = 0,009

\*INA Indicator Not Assessed

## End of life - Output flow

Parameter	Unit	A1	A2	A3	A4
CR	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MR	kg	0,00E+00	0,00E+00	2,05E-01	0,00E+00
MER	kg	0,00E+00	0,00E+00	3,85E-04	0,00E+00
EEE	MJ	INA*	INA*	INA*	INA*
ETE	MJ	INA*	INA*	INA*	INA*

CR Components for reuse; MR Materials for recycling; MER Materials for energy recovery; EEE Exported electric energy; ETE Exported thermal energy

Reading example: 9,0 E-03 =  $9,0 \times 10^{-3}$  = 0,009

\*INA Indicator Not Assessed

## Additional Norwegian requirements

### Greenhouse gas emissions from the use of electricity in the manufacturing phase

National production mix from import, low voltage (production of transmission lines, in addition to direct emissions and losses in grid) of applied electricity for the manufacturing process (A3).

Electricity mix	Data source	Amount	Unit
Electricity, Portugal (kWh)	ecoinvent 3.6	417,72	g CO2-ekv/kWh

### Dangerous substances

The product contains no substances given by the REACH Candidate list or the Norwegian priority list.

### Indoor environment

## Bibliography

ISO 14025:2010 Environmental labels and declarations - Type III environmental declarations - Principles and procedures.

ISO 14044:2006 Environmental management - Life cycle assessment - Requirements and guidelines.

EN 15804:2012+A1:2013 Environmental product declaration - Core rules for the product category of construction products.

ISO 21930:2017 Sustainability in buildings and civil engineering works - Core rules for environmental product declarations of construction products.

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Iversen et al., (2018) EPD generator for Leca - Background information for customer application, LCA.no report number 06.18

NPCR Part A: Construction products and services. Ver. 1.0. April 2017, EPD-Norge.

NPCR 012 Part B for Thermal insulation products. Ver. 2.0 June 2018, EPD-Norge

NPCR 012:2018 Part B for Thermal insulation products

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