

# Environmental Product Declaration



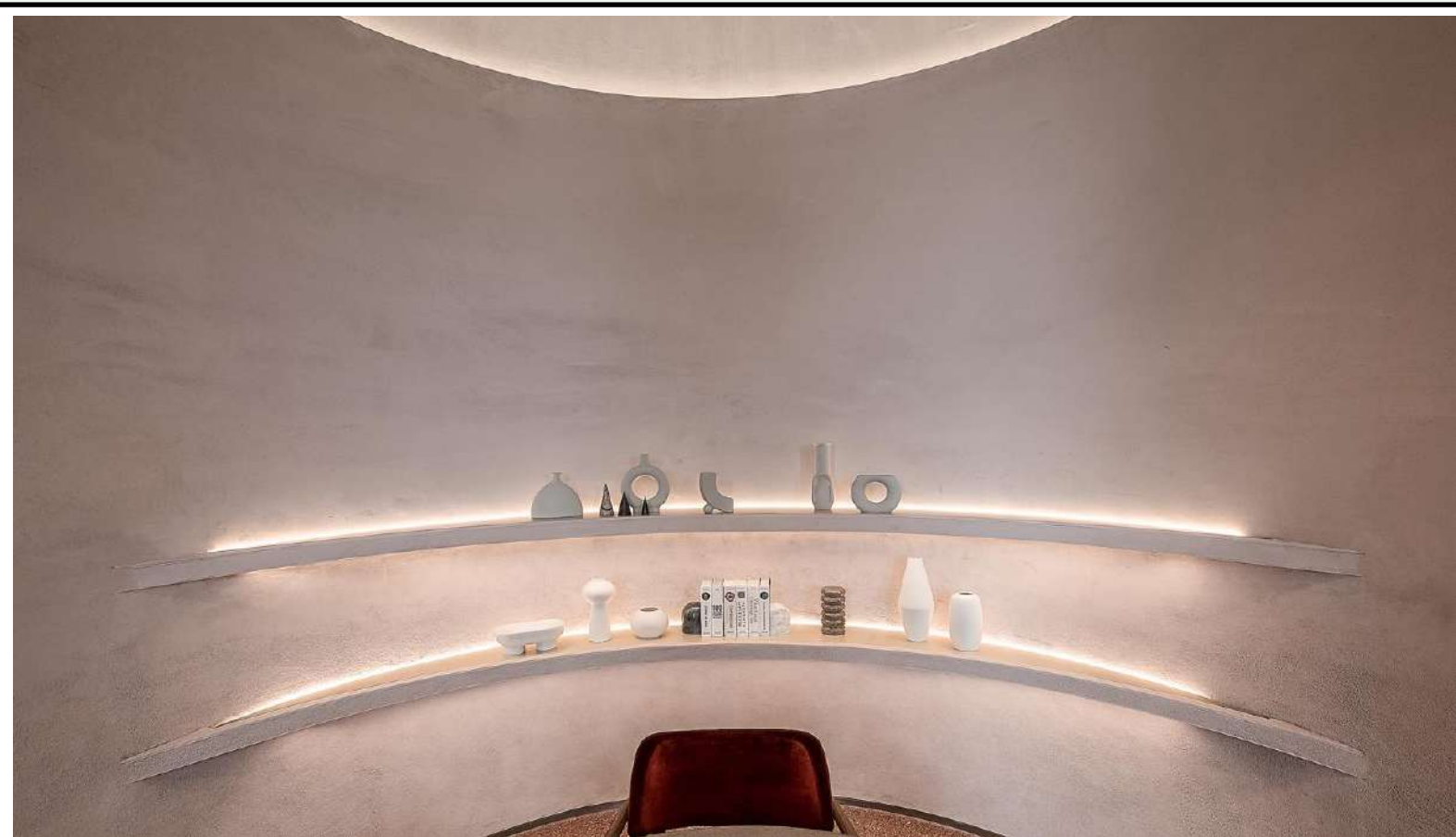
In accordance with ISO 14025 and EN 15804:2012+A1:2013 for:

## Clay Plasters (Rustic, Demi Rustic, Smooth, Tonal)

From

# Clayworks

Programme:	The International EPD® System, <a href="http://www.environdec.com">www.environdec.com</a>
Programme operator:	EPD International AB
EPD registration number:	S-P-02278
Publication date:	2020-11-09
Valid until:	2025-11-08



## General information

### Programme information

<b>Programme:</b>	The International EPD <sup>®</sup> System
<b>Address:</b>	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
<b>Website:</b>	<a href="http://www.environdec.com">www.environdec.com</a>
<b>E-mail:</b>	<a href="mailto:info@environdec.com">info@environdec.com</a>

CEN standard EN 15804 serves as the Core Product Category Rules (PCR)
Product category rules (PCR): PCR 2012:01. Construction Products. Version 2.33. (date 2020-09-18, valid until 2021-12-31). Sub-PCR-A Mortars Applied to a Surface. UN CPC Code 154000 (clays) (date 2020-09-18, valid until 2021-12-31)
PCR review was conducted by: Martin Erlandsson, IVL Swedish Environmental Research Institute
Independent third-party verification of the declaration and data, according to ISO 14025:2006:  <input type="checkbox"/> EPD process certification <input checked="" type="checkbox"/> EPD verification
Third party verifier: Dr. Hudai Kara, Metsims Sustainability Consulting [ <a href="http://www.metsims.com">www.metsims.com</a> ]
Approved by: The International EPD <sup>®</sup> System
Procedure for follow-up of data during EPD validity involves third party verifier:  <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

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

EPDs within the same product category but from different programmes may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804. For further information about comparability, see EN 15804 and ISO 14025.

## Company information

**Owner of the EPD:** Clayworks Ltd

**Contact:** Clare Whitney

**Description of the organisation:** Clayworks was born from a love and belief in natural, sustainable building practices. It stemmed, in 2010, from a decade of restoring old buildings, building new ones and travelling the world to learn about the traditions of clay as a building material. The vision behind, and motivation for our founders' research was to explore the use of natural materials in architecture and earth as a medium to foster the balance in a building that is healthy for the environment and the user and beautiful in its design, structure, technique and use of materials. Clayworks is based on one site on the Lizard Peninsula, Cornwall where all research, development and manufacturing takes place. The company works with architects, designers and individuals around the world to create interior wall finishes and there is an intense focus on developing new colours and textures using only natural materials. The company is also committed to continuous innovation, with experimentation on the formulations ongoing to improve performance, sustainable and health benefits.

Pushing hard at the conventional boundaries of techniques with clay, building on old knowledge in earth architecture, while making use of modern science and testing facilities, our focus became concentrated on creating and delivering natural plasters of the finest quality that speak honestly about the beauty and functionality of raw materials. This culture of learning, discovery and experimentation continues after we launched our own range of natural clay plasters in 2010 and our vision is to play a significant role in the re-imagination of clay as the interior wall finish of the future.

**Product-related or management system-related certifications:** The product has been tested by BRE Global for fire propagation according to BS 476-6 and for surface spread of flame according to BS 476-7. When tested in accordance with BS 476-6 the products achieved: Fire propagation index (I) = 0.0, with sub-indices  $i_1 = 0.0$ ,  $i_2 = 0.0$ ,  $i_3 = 0.0$ . The products are classified as Class 1 (BS 476-7). Reports date 15/10/2019.

**Name and location of production site(s):** Clayworks Limited, Unit 5, Higher Bochym Rural Workshops Cury Cross Lanes, Helston, Cornwall, TR12 7AZ UK

## Product information

**Product name:** Clayworks Clay Plasters

**Product identification:** Smooth, Tonal, Demi Rustic, Rustic. Classic and Custom finishes, pigmented and non-pigmented.

**Product description:** Clayworks Clay plasters are unique blends and formulations of unfired clays mixed with minerals and natural pigments to provide a healthy, breathable finish for internal walls and ceilings.

Naturally pigmented, they provide an alternative to the more conventional wall finish of gypsum plaster and paint. They are supplied in a dried form, ready to mix with water and apply with conventional plastering tools and skills.

Manufactured in Cornwall from abundant raw materials, they are amongst the most sustainable wall finishes available. They are recyclable, compostable, re-useable, and contain no toxic ingredients. Or VOCs (harmful chemicals released during and after application).

As well as being 100% natural, Clayworks clay plasters are also high performance. They regulate indoor relative humidity, allow buildings to breathe, and absorb toxins, odours and acoustics, they can also passively regulate temperature and are easily repaired. They are applied with the same skills and tools as other wall plasters.

## Manufacturing

Clayworks Clay Plasters are simply blends of raw, readily abundant materials. In a world where building products undergo a long chain of transformation – embedding carbon, toxins and releasing pollutants and waste at every stage – clay plasters remain in a raw state throughout their entire life cycle. There is no water, heat, additives, synthetics or processes used during the blending, only a little energy for mixing. Hence there is zero waste in the process and no pollutants released into the air. Clay plasters contain or release no contaminants including VOCs and formaldehydes. They do not off-gas. There is no waste on construction site: left over material can be kept for repairs or disposed of into the ground contributing to a Zero Construction waste economy. Naturally through-pigmented, clay plasters will never require painting, thereby avoiding the environmental impact associated with paints.



## Packaging

Our plasters are sold in brown paper, sewn, sacks which are recyclable or compostable.

## Transportation

Blended in Cornwall, Clayworks Clay Plasters are transported by road and then by ship if going overseas.

## Product Use and Maintenance

Clayworks Clay Plasters do not require painting, varnishing or sealing during their lifespan. Once applied they simply require occasional wiping with a non-toxic cleaner. Any damage can simply be replastered.

## End of Life & Waste Management

If applied onto sustainable, natural backing boards the surfaces can be composted at end of life, a concept known as Cradle to Grave.

**UN CPC code:** 154000 (clay)

## LCA information

**Functional unit / declared unit:** 1 kg of packaged clay plaster product

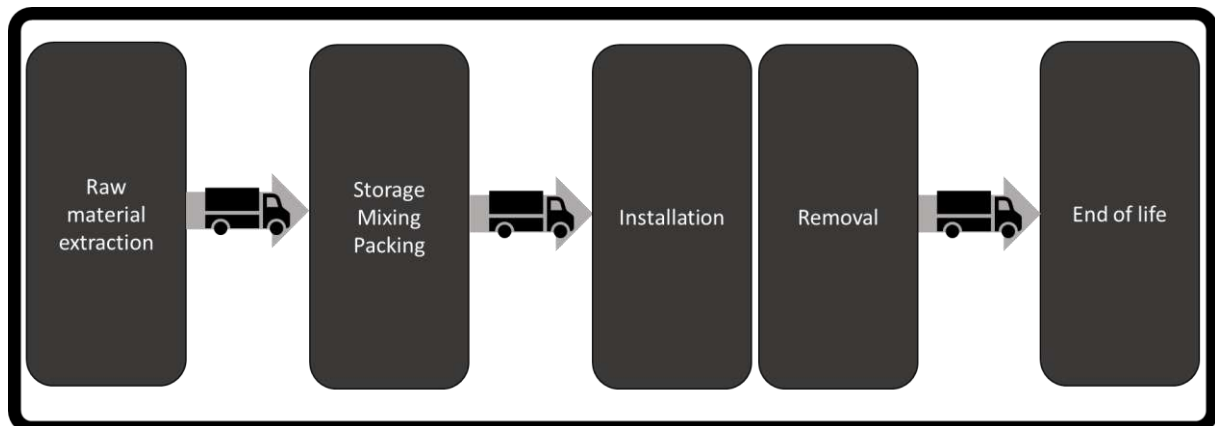
**Reference service life:** Mortars exposed to minor environmental load are expected to last for the lifetime of the building construction, that for common European buildings is estimated to be 60 years (Referring to ISO 15686-1, based on considered commercial lifetime of domestic, retail, office or industry buildings, indoor use and experiences in Sweden, Norway and France).

**Time representativeness:** 2019.

**Database(s) and LCA software used:** Ecoinvent 3.7 was used for the background data with Simapro 9.1.0.7.

**Description of system boundaries:** Construction product EPD: Cradle to grave with modules A1-A5, B1-B7, C1-C4 and module D. Some modules have nil entries because there is no impact.

## System diagram:



## More information:

<https://clay-works.com/product-descriptions/>

This EPD is based upon an underlying LCA of the Clayworks manufacturing facility, with operational data obtained for 2019. The underlying LCA was conducted by Dr Andrew Norton, Renuables Ltd (<http://renuables.co.uk/>).

Cut-off criteria were based upon input flows being less than 1% of the total individually, subject to the sum of all flows being less than 5% of the total, and subject to verification that the impacts associated with such flows were not of a magnitude to affect the reported data significantly (less than 5% in total). For characterization factors: the characterization factors stated in EN 15804+A2:2019 were used.

Electricity supply: Scottish Power Green Tariff 100% renewable.

(<https://www.scottishpower.co.uk/about-us/performance/fuel-mix>)

The assumption for module A4 is for transport to construction site of 100 km by logistics company, which is representative. Actual distances should be used as appropriate. Assumptions for Module A5 are adding water according to instructions, mechanical mixing with electric drill.

The assumption for module A4 is for transport to construction site of 100 km by logistics company, which is representative. Actual distances should be used as appropriate. Assumptions for Module A5 are adding water according to instructions, mechanical mixing with electric drill.

No maintenance is required during the lifetime of the product and the product will have an expected lifetime equal to that of the building. There is no requirement for operational energy or water. Manual removal at end of life is assumed and no waste processing is necessary. Nil entries are therefore recorded for modules B1-B7, C1 and C3. Disposal scenario for Module D involves transport to a site where the clay product is used as a soil amendment. A transport distance of 10 km is assumed. Other scenarios are possible, the waste clay product at end of life is inert and can be safely added to the soil or as an inert filler for compost.

Modules declared, geographical scope, share of specific data (in GWP-GHG indicator) and data variation:

	Product stage		Construction process stage			Use stage							End of life stage				Resource recovery stage
	Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
Module	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Modules declared	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Geography	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Specific data						0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Variation – products						0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Variation – sites						N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

## Content information

Product components (Rustic, Demi-Rustic)	Weight, kg	Post-consumer material, weight-%	Renewable material, weight-%
Earthen Material	1.0*	0	0
Product components (Smooth, Tonal)	Weight, kg	Post-consumer material, weight-%	Renewable material, weight-%
Earthen Material	1.0*	0	0
Packaging materials	Weight, kg	Weight-% (versus the product)	
Unbleached kraft paper	0.0064	0.64	
TOTAL	0.0064	0.64	

Dangerous substances from the candidate list of SVHC for Authorisation	EC No.	CAS No.	Weight-% per functional or declared unit
None	N/A	N/A	N/A

\*Composition of final products has been deemed commercially sensitive information so no further details are provided here.

Note: the product as supplied contains dry powder and it is essential to wear an appropriate mask when opening the packaging and mixing the product.

## Environmental Information

### Potential environmental impact – mandatory indicators according to EN 15804

Results per 1 kg of Rustic or Demi-Rustic clay plaster																			
Indicator	Unit	A1	A2	A3	Tot. A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-fossil	kg CO <sub>2</sub> eq.	6.44 E-03	4.35 E-02	7.59 E-03	5.75 E-02	8.74 E-03	2.29 E-03	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	8.74 E-04	0.00 E+00	2.04 E-03	-1.03 E-02
GWP-biogenic	kg CO <sub>2</sub> eq.	4.62 E-05	2.58 E-05	-9.28 E-03	-9.21 E-03	5.20 E-06	5.24 E-05	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	5.20 E-07	0.00 E+00	-4.26 E-05	6.33 E-05
GWP-luluc	kg CO <sub>2</sub> eq.	4.47 E-06	1.47 E-05	6.31 E-05	8.22 E-05	2.95 E-06	4.26 E-06	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	2.95 E-07	0.00 E+00	7.91 E-07	-1.18 E-05
GWP-total	kg CO <sub>2</sub> eq.	6.49 E-03	4.35 E-02	-1.63 E-03	4.84 E-02	8.75 E-03	2.35 E-03	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	8.75 E-04	0.00 E+00	2.00 E-03	-1.02 E-02
ODP	kg CFC 11 eq.	1.24 E-09	1.06 E-08	7.65 E-10	1.26 E-08	2.14 E-09	2.10 E-10	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	2.14 E-10	0.00 E+00	4.08 E-10	-1.54 E-09
AP	mol H <sup>+</sup> eq.	4.94 E-05	1.41 E-04	5.45 E-05	2.45 E-04	2.80 E-05	1.29 E-05	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	2.80 E-06	0.00 E+00	2.01 E-05	-9.17 E-05
EP-freshwater	kg PO <sub>4</sub> <sup>3-</sup> eq.	1.05 E-05	2.46 E-05	2.06 E-05	5.57 E-05	4.92 E-06	6.12 E-06	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	4.92 E-07	0.00 E+00	3.66 E-06	-2.29 E-05
EP-marine	kg N eq.	1.63 E-05	3.16 E-05	1.34 E-05	6.13 E-05	6.29 E-06	2.51 E-06	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	6.29 E-07	0.00 E+00	8.49 E-06	-2.53 E-05
EP-terrestrial	mol N eq.	1.88 E-04	3.45 E-04	1.37 E-04	6.70 E-04	6.86 E-05	2.35 E-05	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	6.86 E-06	0.00 E+00	9.29 E-05	-3.10 E-04
POCP	kg NMVOC eq.	5.01 E-05	1.34 E-04	3.66 E-05	2.21 E-04	2.68 E-05	7.26 E-06	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	2.68 E-06	0.00 E+00	2.50 E-05	-7.91 E-05
ADP-minerals&metals*	kg Sb eq.	4.75 E-07	7.17 E-07	1.72 E-07	1.36 E-06	1.44 E-07	6.69 E-08	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	1.44 E-08	0.00 E+00	7.32 E-08	-1.68 E-06
ADP-fossil*	MJ	9.64 E-02	7.02 E-01	9.99 E-02	8.99 E-01	1.41 E-01	3.76 E-02	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	1.41 E-02	0.00 E+00	2.73 E-02	-1.27 E-01
WDP	m <sup>3</sup>	2.56 E-03	2.43 E-03	1.35 E-02	1.85 E-02	4.88 E-04	2.80 E-01	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	4.88 E-05	0.00 E+00	7.40 E-05	-1.92 E-03
Acronyms	GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption																		

\* Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.

## Use of resources

Results per 1 kg of Rustic or Demi-Rustic clay plaster																			
Indicator	Unit	A1	A2	A3	Tot. A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	MJ	1.09 E-02	9.35 E-03	3.94 E-01	4.14 E-01	1.88 E-03	5.33 E-03	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	1.88 E-04	0.00 E+00	1.01 E-03	-6.87 E-03
PERM	MJ	1.77 E-03	1.83 E-03	1.73 E-01	1.76 E-01	3.68 E-04	9.81 E-04	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	3.68 E-05	0.00 E+00	5.27 E-04	-2.16 E-03
PERT	MJ	1.27 E-02	1.12 E-02	5.67 E-01	5.91 E-01	2.25 E-03	6.31 E-03	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	2.25 E-04	0.00 E+00	1.54 E-03	-9.04 E-03
PENRE	MJ	9.83 E-02	6.90 E-01	1.16 E-01	9.05 E-01	1.39 E-01	4.35 E-02	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	1.39 E-02	0.00 E+00	2.71 E-02	-1.36 E-01
PENRM	MJ.	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00
PENRT	MJ	9.83 E-02	6.90 E-01	1.16 E-01	9.05 E-01	1.39 E-01	4.35 E-02	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	1.39 E-02	0.00 E+00	2.71 E-02	-1.36 E-01
SM	kg	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00
RSF	MJ	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00
NRSF	MJ	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00
FW	m <sup>3</sup>	1.27 E-03	6.54 E-05	3.23 E-04	1.65 E-03	1.32 E-05	5.16 E-03	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	1.32 E-06	0.00 E+00	4.50 E-06	-4.56 E-05
Acronyms	PERE = Use of renewable primary energy excluding renewable primary energy resources 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 re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water																		

## Waste production and output flows

### Waste production

Results per 1 kg of Rustic or Demi-Rustic clay plaster																			
Indicator	Unit	A1	A2	A3	Tot. A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste disposed	kg	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00
Non-hazardous waste disposed	kg	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00
Radioactive waste disposed	kg	2.04 E-08	2.43 E-08	2.53 E-08	7.00 E-08	4.88 E-09	2.39 E-08	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	4.88 E-10	0.00 E+00	6.57 E-10	-9.56 E-09

## Output flows

Results per 1 kg of Rustic or Demi-Rustic clay plaster																			
Indicator	Unit	A1	A2	A3	Tot. A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for re-use	kg	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00
Material for recycling	kg	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00
Materials for energy recovery	kg	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00
Exported energy, electricity	MJ	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00
Exported energy, thermal	MJ	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00

## Information on biogenic carbon content

Results per 1 kg of Rustic or Demi-Rustic clay plaster		
BIOGENIC CARBON CONTENT	Unit	QUANTITY
Biogenic carbon content in product	kg C	0
Biogenic carbon content in packaging	kg C	0.0032

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO<sub>2</sub>.

## Potential environmental impact – mandatory indicators according to EN 15804

Results per 1 kg of Smooth Finish or Tonal clay plaster																			
Indicator	Unit	A1	A2	A3	Tot. A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-fossil	kg CO <sub>2</sub> eq.	9.65 E-03	5.96 E-02	7.59 E-03	7.68 E-02	8.74 E-03	3.52 E-03	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	8.74 E-04	0.00 E+00	2.04 E-03	-1.03 E-02
GWP-biogenic	kg CO <sub>2</sub> eq.	-5.42 E-04	3.53 E-05	-9.28 E-03	-9.79 E-03	5.20 E-06	8.06 E-05	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	5.20 E-07	0.00 E+00	-4.26 E-05	6.33 E-05
GWP-luluc	kg CO <sub>2</sub> eq.	6.54 E-04	2.01 E-05	6.31 E-05	7.37 E-04	2.95 E-06	6.55 E-06	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	2.95 E-07	0.00 E+00	7.91 E-07	-1.18 E-05
GWP-total	kg CO <sub>2</sub> eq.	9.76 E-03	5.96 E-02	-1.63 E-03	6.78 E-02	8.75 E-03	3.61 E-03	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	8.75 E-04	0.00 E+00	2.00 E-03	-1.02 E-02
ODP	kg CFC 11 eq.	1.40 E-09	1.46 E-08	7.65 E-10	1.67 E-08	2.14 E-09	3.23 E-10	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	2.14 E-10	0.00 E+00	4.08 E-10	-1.54 E-09
AP	mol H <sup>+</sup> eq.	9.43 E-05	1.93 E-04	5.45 E-05	3.42 E-04	2.80 E-05	1.99 E-05	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	2.80 E-06	0.00 E+00	2.01 E-05	-9.17 E-05
EP-freshwater	kg PO <sub>4</sub> <sup>3-</sup> eq.	2.34 E-05	3.37 E-05	2.06 E-05	7.76 E-05	4.92 E-06	9.42 E-06	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	4.92 E-07	0.00 E+00	3.66 E-06	-2.29 E-05
EP-marine	kg N eq.	3.33 E-05	4.33 E-05	1.34 E-05	9.01 E-05	6.29 E-06	3.86 E-06	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	6.29 E-07	0.00 E+00	8.49 E-06	-2.53 E-05
EP-terrestrial	mol N eq.	3.69 E-04	4.72 E-04	1.37 E-04	9.79 E-04	6.86 E-05	3.62 E-05	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	6.86 E-06	0.00 E+00	9.29 E-05	-3.10 E-04
POCP	kg NMVOC eq.	6.86 E-05	1.84 E-04	3.66 E-05	2.89 E-04	2.68 E-05	1.12 E-05	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	2.68 E-06	0.00 E+00	2.50 E-05	-7.91 E-05
ADP-minerals&metals*	kg Sb eq.	4.89 E-07	9.81 E-07	1.72 E-07	1.64 E-06	1.44 E-07	1.03 E-07	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	1.44 E-08	0.00 E+00	7.32 E-08	-1.68 E-06
ADP-fossil*	MJ	1.33 E-01	9.62 E-01	9.99 E-02	1.19 E+00	1.41 E-01	5.79 E-02	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	1.41 E-02	0.00 E+00	2.73 E-02	-1.27 E-01
WDP	m <sup>3</sup>	8.06 E-03	3.32 E-03	1.35 E-02	2.49 E-02	4.88 E-04	4.31 E-01	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	4.88 E-05	0.00 E+00	7.40 E-05	-1.92 E-03
Acronyms	GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption																		

\* Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.

## Use of resources

Results per 1 kg of Smooth Finish or Tonal clay plaster																			
Indicator	Unit	A1	A2	A3	Tot. A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	MJ	3.25 E-02	1.28 E-02	3.94 E-01	4.39 E-01	1.88 E-03	8.20 E-03	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	1.88 E-04	0.00 E+00	1.01 E-03	-6.87 E-03
PERM	MJ	3.00 E-03	2.50 E-03	1.73 E-01	1.78 E-01	3.68 E-04	1.51 E-03	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	3.68 E-05	0.00 E+00	5.27 E-04	-2.16 E-03
PERT	MJ	3.55 E-02	1.53 E-02	5.67 E-01	6.17 E-01	2.25 E-03	9.71 E-03	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	2.25 E-04	0.00 E+00	1.54 E-03	-9.04 E-03
PENRE	MJ	1.38 E-01	9.45 E-01	1.16 E-01	1.20 E+00	1.39 E-01	6.69 E-02	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	1.39 E-02	0.00 E+00	2.71 E-02	-1.36 E-01
PENRM	MJ	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00
PENRT	MJ	1.38 E-01	9.45 E-01	1.16 E-01	1.20 E+00	1.39 E-01	6.69 E-02	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	1.39 E-02	0.00 E+00	2.71 E-02	-1.36 E-01
SM	kg	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00
RSF	MJ	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00
NRSF	MJ	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00
FW	m <sup>3</sup>	1.02 E-03	8.96 E-05	3.23 E-04	1.43 E-03	1.32 E-05	7.95 E-03	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	1.32 E-06	0.00 E+00	4.50 E-06	-4.56 E-05
Acronyms	PERE = Use of renewable primary energy excluding renewable primary energy resources 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 re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water																		

## Waste production and output flows

### Waste production

Results per 1 kg of Smooth Finish or Tonal clay plaster																			
Indicator	Unit	A1	A2	A3	Tot. A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste disposed	kg	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00
Non-hazardous waste disposed	kg	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00
Radioactive waste disposed	kg	2.16 E-08	3.32 E-08	2.53 E-08	8.01 E-08	4.88 E-09	3.68 E-08	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	4.88 E-10	0.00 E+00	6.57 E-10	-9.56 E-09

## Output flows

Results per 1 kg of Smooth Finish or Tonal clay plaster																			
Indicator	Unit	A1	A2	A3	Tot. A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for re-use	kg	0.0 0E+00	0.0 0E+00	0.0 0E+00	0.0 0E+00	0.0 0E+00	0.0 0E+00	0.0 0E+00	0.0 0E+00	0.0 0E+00	0.0 0E+00	0.0 0E+00	0.0 0E+00	0.0 0E+00	0.0 0E+00	0.0 0E+00	0.0 0E+00	0.0 0E+00	0.0 0E+00
Material for recycling	kg	0.0 0E+00	0.0 0E+00	0.0 0E+00	0.0 0E+00	0.0 0E+00	0.0 0E+00	0.0 0E+00	0.0 0E+00	0.0 0E+00	0.0 0E+00	0.0 0E+00	0.0 0E+00	0.0 0E+00	0.0 0E+00	0.0 0E+00	0.0 0E+00	0.0 0E+00	0.0 0E+00
Materials for energy recovery	kg	0.0 0E+00	0.0 0E+00	0.0 0E+00	0.0 0E+00	0.0 0E+00	0.0 0E+00	0.0 0E+00	0.0 0E+00	0.0 0E+00	0.0 0E+00	0.0 0E+00	0.0 0E+00	0.0 0E+00	0.0 0E+00	0.0 0E+00	0.0 0E+00	0.0 0E+00	0.0 0E+00
Exported energy, electricity	MJ	0.0 0E+00	0.0 0E+00	0.0 0E+00	0.0 0E+00	0.0 0E+00	0.0 0E+00	0.0 0E+00	0.0 0E+00	0.0 0E+00	0.0 0E+00	0.0 0E+00	0.0 0E+00	0.0 0E+00	0.0 0E+00	0.0 0E+00	0.0 0E+00	0.0 0E+00	0.0 0E+00
Exported energy, thermal	MJ	0.0 0E+00	0.0 0E+00	0.0 0E+00	0.0 0E+00	0.0 0E+00	0.0 0E+00	0.0 0E+00	0.0 0E+00	0.0 0E+00	0.0 0E+00	0.0 0E+00	0.0 0E+00	0.0 0E+00	0.0 0E+00	0.0 0E+00	0.0 0E+00	0.0 0E+00	0.0 0E+00

## Information on biogenic carbon content

Results per 1 kg of Smooth Finish or Tonal clay plaster		
BIOGENIC CARBON CONTENT	Unit	QUANTITY
Biogenic carbon content in product	kg C	0
Biogenic carbon content in packaging	kg C	0.0032

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO<sub>2</sub>.

## Additional information

The global warming potential (GWP-total) for A1-A3 of the Rustic or Demi Rustic product is 0.048 kg CO<sub>2</sub>e per kg of dry product. The GWP of the Smooth or Tonal product is 0.068 kg CO<sub>2</sub>e per kg of dry product.

The finished product after application and cure has a density of approximately 1550 kg per m<sup>3</sup>. Assuming an applied thickness of 1.5 mm, this gives a weight of 2.3 kg per m<sup>2</sup> of wall. Based on the above information, the GWP-total for the installed product is:

$$\begin{aligned}\text{Smooth/Tonal} &= 0.136 \text{ kg CO}_2\text{e/m}^2 \\ \text{Rustic/Demi-Rustic} &= 0.185 \text{ kg CO}_2\text{e/m}^2\end{aligned}$$

Transportation from raw materials and delivery transport is the biggest contributor to the overall environmental impact for both product types studied. So little impact (GWP-total) stems from the renewable energy use that it is more than covered by the biogenic carbon stored in the paper bags used so a minus figure is produced in the total for A3.

## Information related to Sector EPD

N/A

## Differences versus previous versions

N/A

## References

- General Programme Instructions of the International EPD® System. Version 3.01
- Construction Products. Version 2.33 (date 2020-09-18, valid until 2021-12-31).
- Sub-PCR-A Mortars Applied to a Surface. UN CPC Code 154000 (clays) (date 2020-09-18, valid until 2021-12-31)
- ISO 14040: 2006 Environmental management - Life cycle assessment – Principles and Framework
- ISO 14044: 2006 Environmental management - Life cycle assessment - Requirements and guidelines
- ISO 14025: 2005 Environmental labels and declarations -- Type III environmental declarations -- Principles and procedures
- EN 15804: 2012+A2:2019 Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products
- EN 15942:2011 Sustainability of construction works – Environmental product declarations – Communication format business-to-business
- CEN /TR 15941:2010 Sustainability of construction works – Environmental product declarations – Methodology for the selection and use of generic data
- Construction Products Regulation, Regulation (EU) No 305/2011 of the European Parliament and of the Council of 9 March 2011

