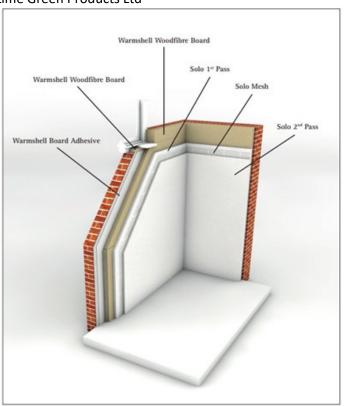




ENVIRONMENTAL PRODUCT DECLARATION

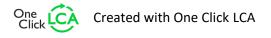
IN ACCORDANCE WITH EN 15804+A2 & ISO 14025 / ISO 21930

Solo One Coat Lime Plaster (Warmshell System Scenario) Lime Green Products Ltd



EPD HUB, HUB-1927

Published on 16.08.2024, last updated on 16.08.2024, valid until 16.08.2029









GENERAL INFORMATION

MANUFACTURER

Manufacturer	Lime Green Products Ltd
Address	Coates Kilns, Stretton Road TF13 6DG
Contact details	build@lime-green.co.uk
Website	https://www.lime-green.co.uk/

EPD STANDARDS, SCOPE AND VERIFICATION

Program operator	EPD Hub, hub@epdhub.com
Reference standard	EN 15804+A2:2019 and ISO 14025
PCR	EPD Hub Core PCR version 1.1, 5 Dec 2023
Sector	Construction product
Category of EPD	Third party verified EPD
Scope of the EPD	Cradle to gate with options, A4-A5, and modules C1-C4, D
EPD author	Rachael Hughes
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal verification ☐ External verification
EPD verifier	Imane Uald Lamkaddam as an authorized verifier for EPD Hub

The manufacturer has the sole ownership, liability, and responsibility for the EPD. EPDs within the same product category but from different programs may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804 and if they are not compared in a building context.

PRODUCT

Product name	Solo One Coat Lime Plaster (Warmshell System Scenario)
Additional labels	-
Product reference	-
Place of production	Much Wenlock, Shropshire, United Kingdom
Period for data	01 - January2022 - 31 December 2022
Averaging in EPD	No averaging
Variation in GWP-fossil for A1-A3	%

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 kg of solo product
Declared unit mass	1 kg
GWP-fossil, A1-A3 (kgCO2e)	2.61E-01
GWP-total, A1-A3 (kgCO2e)	2.19E-01
Secondary material, inputs (%)	0.06
Secondary material, outputs (%)	81.5
Total energy use, A1-A3 (kWh)	0.71
Net fresh water use, A1-A3 (m3)	0





PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

Since its formation in 2002, Lime Green has established itself as the UKs foremost manufacturer of hydraulic lime mortar, lime plaster and lime render.

PRODUCT DESCRIPTION

A one-coat lime plaster for interior use on masonry, undercoats and boards. Can be finished to a smooth surface suitable for decoration.

Developed to give a high-quality finish, Lime Green Solo® one coat lime plaster is a perfect labour and time saving interior lime plaster. Unlike standard lime plasters, Lime Green Solo doesn't always need an initial base coat.

Applied as normal, it can be finished in many different styles, from a smooth regular finish through to rustic or textured plaster finishes. With no waiting for a first coat to go off, this makes it faster to apply so more wall area can be completed in a day, making Solo One-coat the perfect product, especially for smaller projects where it's not possible to use 'waiting time to work elsewhere.

Further information can be found at https://www.lime-green.co.uk/.

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass- %	Material origin
Metals	0	-
Minerals	99.8	UK, France
Fossil materials	0	-
Bio-based materials	0.113	Germany, Europe

BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

Biogenic carbon content in product, kg C	-
Biogenic carbon content in packaging, kg C	0.0115

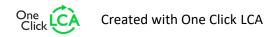
FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1 kg of solo product
Mass per declared unit	1 kg
Functional unit	-
Reference service life	-

SUBSTANCES, REACH - VERY HIGH CONCERN

3

The product does not contain any REACH SVHC substances in amounts greater than 0,1 % (1000 ppm).







PRODUCT LIFE-CYCLE

SYSTEM BOUNDARY

This EPD covers the life-cycle modules listed in the following table.

Pro	duct st	tage		embly age		Use stage End of life stage									Use stage								End of life stage				
A1	A2	А3	A4	A5	B1	B2	В3	B4	B5	B6 B7 C1 C2 C3						D											
x	х	x	x	x	MND	MND	MND	MND	MND	MND	MND	x	x	x	x	х											
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstr./demol.	Transport	Waste processing	Disposal	Reuse	Recovery	Recycling									

Modules not declared = MND. Modules not relevant = MNR.

MANUFACTURING AND PACKAGING (A1-A3)

The environmental impacts considered for the product stage cover the manufacturing of raw materials used in the production as well as packaging materials and other ancillary materials. Also, fuels used by machines, and handling of waste formed in the production processes at the manufacturing facilities are included in this stage. The study also considers the material losses occurring during the manufacturing processes as well as losses during electricity transmission.

Raw materials such as natural Lime, Silica sand, limestone are mixed with additives. After being mixed, the plaster is tested and packaged in plastic packaging film. The production site is supplied with electricity from the English power grid and Solar panels on site.

Any product that does not pass the quality test (failed) is transported to recycling facilities for aggregates. Failed products are estimated as 0.2% of the total annual production volume.

TRANSPORT AND INSTALLATION (A4-A5)

Transportation impacts occurred from final products delivery to construction site (A4) cover fuel direct exhaust emissions, environmental impacts of fuel production, as well as related infrastructure emissions.

Solo is blended in our factory in the UK and is sent by road to our UK distributor centres. Transportation impacts occurred from final products delivery to construction site (A4) to cover fuel, direct exhaust emissions, environmental impacts of fuel production as well as related infrastructure emissions. Distance from manufacturing site to distributors are based on the average distance of our top UK customers (248km by lorry) as they account for over 90% of our sales. It is then assumed that Customers travel 50km, by road, to their nearest distribution centre to get the production to the construction site.

The Solo Installation requires no machinery or energy for installation, only water. This project creates a scenario where solo is installed together in our Warmshell insulation system please see description below.

The Wood-fibre Warmshell Insulation is bonded to the wall using Warmshell Board Adhesive. The internal plaster, Solo, is applied in two passes directly onto the Warmshell Insulation. The first pass of Solo plaster, approximately 4mm in depth, is applied to the Warmshell insulation, then the surface is fully meshed using a fibre glass mesh. Then a second 4-5mm pass of Solo plaster to be made over the first. As a result, the mesh is now within the centre of the full Solo build up. The solo is mixed up with 28% water.

Installation Loss Assumed to be 5%.

Reference: https://www.gov.uk/government/statistics/uk-waste-data/uk-statistics-on-waste







The end-of-waste scenario for the pallet is assumed to be 99% recycling and 1% landfilling according to UK statistics. Following, plastic packaging materials was assumed 56% incineration and 44% recycling. Also based on UK Statistics. See reference above.

PRODUCT USE AND MAINTENANCE (B1-B7)

Impacts in B1-B7 stage have not been studied and not considered in this EPD.

Air, soil, and water impacts during the use phase have not been studied.

PRODUCT END OF LIFE (C1-C4, D)

In the demolition phase, It was assumed that the solo product had the following scenario. 93.6% of the waste is assumed to be collected recycled and 6.4% will go to landfill. Wood fibre Boards are pulled of the wall and the adhesive is removed so 93.6% of wood fibre and adhesive is recycled. Solo pulled of the Wood-fibre board and broken up and 93% recycled for gravel production and Glass fibre mesh sent to land fill. The transport to the recycling centres and landfill is estimated as 50 km. The diesel used for the demolition machine was considered in this stage.







MANUFACTURING PROCESS

• Raw materials incoming • Major ingredients in bulk silos Minors in sacks • Main ingredients automatically weighed to main scales • Minor additions weighed by hand • Blending in ploughshare mixer • 45 to 90 seconds with energy use optimisation. Inital product QC Colour Fresh properties 4 Packing • Turbopacker into valve sacks • Robot palletised and wrapped 5 •Warehoused until despatched 6

6





LIFE-CYCLE ASSESSMENT

CUT-OFF CRITERIA

The study does not exclude any modules or processes which are stated mandatory in the reference standard and the applied PCR. The study does not exclude any hazardous materials or substances. The study includes all major raw material and energy consumption. All inputs and outputs of the unit processes, for which data is available for, are included in the calculation. There is no neglected unit process more than 1% of total mass or energy flows. The module specific total neglected input and output flows also do not exceed 5% of energy usage or mass.

ALLOCATION, ESTIMATES AND ASSUMPTIONS

Allocation is required if some material, energy, and waste data cannot be measured separately for the product under investigation. All allocations are done as per the reference standards and the applied PCR. In this study, allocation has been done in the following ways:

Data type	Allocation
Raw materials	No allocation
Packaging materials	No allocation
Ancillary materials	Not applicable
Manufacturing energy and waste	Allocated by mass or volume

AVERAGES AND VARIABILITY

Type of average	No averaging
Averaging method	Not applicable
Variation in GWP-fossil for A1-A3	%

This EPD is product and factory specific and does not contain average calculations.

LCA SOFTWARE AND BIBLIOGRAPHY

This EPD has been created using One Click LCA EPD Generator. The LCA and EPD have been prepared according to the reference standards and ISO 14040/14044. The EPD Generator uses Ecoinvent v3.8, Plastics Europe, Federal LCA Commons and One Click LCA databases as sources of environmental data.





ENVIRONMENTAL IMPACT DATA

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP – total ¹⁾	kg CO₂e	2.08E-01	3.44E-02	-2.33E-02	2.19E-01	1.29E-01	-4.20E-01	MND	3.31E-03	1.25E-02	1.71E+00	1.16E-01	-2.25E-01						
GWP – fossil	kg CO₂e	2.09E-01	3.43E-02	1.80E-02	2.61E-01	1.29E-01	1.33E+00	MND	3.31E-03	1.25E-02	3.06E-02	1.60E-03	-2.21E-01						
GWP – biogenic	kg CO₂e	-1.48E-03	0.00E+00	-4.13E-02	-4.28E-02	0.00E+00	-1.75E+00	MND	0.00E+00	0.00E+00	1.68E+00	1.15E-01	0.00E+00						
GWP – LULUC	kg CO₂e	2.42E-04	1.37E-05	5.64E-05	3.12E-04	7.55E-05	1.40E-03	MND	3.30E-07	4.60E-06	3.61E-05	1.16E-06	-4.25E-03						
Ozone depletion pot.	kg CFC ₋₁₁ e	8.68E-09	8.03E-09	1.67E-09	1.84E-08	2.76E-08	1.03E-07	MND	7.07E-10	2.87E-09	4.65E-09	5.79E-10	-3.86E-08						
Acidification potential	mol H†e	5.92E-04	1.52E-04	8.85E-05	8.32E-04	6.88E-04	1.00E-02	MND	3.44E-05	5.28E-05	1.98E-04	1.43E-05	-1.30E-03						
EP-freshwater ²⁾	kg Pe	2.56E-06	2.84E-07	9.28E-07	3.77E-06	1.65E-06	9.96E-05	MND	1.10E-08	1.02E-07	1.43E-06	2.10E-08	-3.38E-05						
EP-marine	kg Ne	1.52E-04	3.48E-05	2.34E-05	2.10E-04	2.06E-04	1.62E-03	MND	1.52E-05	1.57E-05	5.87E-05	7.11E-06	-4.31E-04						
EP-terrestrial	mol Ne	1.77E-03	3.86E-04	2.53E-04	2.41E-03	2.29E-03	1.81E-02	MND	1.67E-04	1.73E-04	6.58E-04	5.57E-05	-4.63E-03						
POCP ("smog") ³⁾	kg NMVOCe	4.60E-04	1.34E-04	8.44E-05	6.78E-04	7.42E-04	5.07E-03	MND	4.59E-05	5.54E-05	1.83E-04	1.77E-05	-2.24E-03						
ADP-minerals & metals ⁴⁾	kg Sbe	3.13E-06	8.20E-08	1.17E-07	3.33E-06	1.64E-06	2.23E-05	MND	1.68E-09	2.92E-08	1.20E-07	5.01E-09	-8.16E-07						
ADP-fossil resources	MJ	1.22E+00	5.34E-01	4.08E-01	2.16E+00	1.89E+00	1.93E+01	MND	4.45E-02	1.87E-01	5.26E-01	4.13E-02	-3.33E+00						
Water use ⁵⁾	m³e depr.	2.63E-02	2.36E-03	1.08E-02	3.94E-02	1.29E-02	9.82E-01	MND	1.20E-04	8.38E-04	1.38E-02	2.59E-04	-1.18E-01						

¹⁾ GWP = Global Warming Potential; 2) EP = Eutrophication potential. Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO4e; 3) POCP = Photochemical ozone formation; 4) ADP = Abiotic depletion potential; 5) EN 15804+A2 disclaimer for Abiotic depletion and Water use and optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.





ADDITIONAL (OPTIONAL) ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

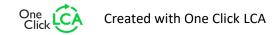
Impact category	Unit	A1	A2	А3	A1-A3	A4	A5	B1	B2	В3	B4	B5	В6	B7	C1	C2	С3	C4	D
Particulate matter	Incidence	5.73E-09	3.80E-09	9.93E-10	1.05E-08	1.42E-08	5.56E-08	MND	9.22E-10	1.44E-09	1.01E-08	2.97E-10	-1.88E-08						
Ionizing radiation ⁶⁾	kBq U235e	4.42E-03	2.56E-03	8.08E-03	1.51E-02	1.16E-02	1.53E-01	MND	2.05E-04	8.92E-04	7.95E-03	2.16E-04	-3.42E-02						
Ecotoxicity (freshwater)	CTUe	4.11E+00	4.70E-01	3.13E-01	4.90E+00	1.97E+00	1.59E+01	MND	2.68E-02	1.68E-01	4.04E-01	3.09E-02	-3.05E+00						
Human toxicity, cancer	CTUh	4.15E-11	1.20E-11	4.78E-11	1.01E-10	1.80E-10	5.57E-10	MND	1.03E-12	4.14E-12	2.24E-11	1.06E-12	-2.77E-10						
Human tox. non-cancer	CTUh	1.65E-09	4.49E-10	2.68E-10	2.37E-09	2.36E-09	1.20E-08	MND	1.94E-11	1.67E-10	4.09E-10	2.65E-11	-5.17E-09						
SQP ⁷⁾	-	1.52E+00	5.97E-01	3.72E+00	5.84E+00	1.17E+00	1.03E+01	MND	5.79E-03	2.16E-01	3.47E-01	1.00E-01	-4.21E+02						

⁶⁾ EN 15804+A2 disclaimer for Ionizing radiation, human health. This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator; 7) SQP = Land use related impacts/soil quality.

USE OF NATURAL RESOURCES

Impact category	Unit	A1	A2	А3	A1-A3	A4	A5	B1	B2	В3	B4	B5	В6	B7	C1	C2	СЗ	C4	D
Renew. PER as energy ⁸⁾	MJ	1.22E-01	5.94E-03	3.43E-01	4.71E-01	4.68E-02	3.54E+00	MND	2.54E-04	2.11E-03	4.77E-02	1.03E-03	-4.52E+01						
Renew. PER as material	MJ	9.10E-03	0.00E+00	3.65E-01	3.74E-01	0.00E+00	1.85E+01	MND	0.00E+00	0.00E+00	-1.77E+01	-1.21E+00	0.00E+00						
Total use of renew. PER	MJ	1.31E-01	5.94E-03	7.08E-01	8.45E-01	4.68E-02	2.20E+01	MND	2.54E-04	2.11E-03	-1.76E+01	-1.21E+00	-4.52E+01						
Non-re. PER as energy	MJ	1.20E+00	5.34E-01	3.45E-01	2.08E+00	1.89E+00	1.92E+01	MND	4.45E-02	1.87E-01	5.26E-01	4.13E-02	-3.32E+00						
Non-re. PER as material	MJ	2.20E-02	0.00E+00	6.29E-02	8.49E-02	0.00E+00	-6.29E-02	MND	0.00E+00	0.00E+00	-2.05E-02	-1.41E-03	0.00E+00						
Total use of non-re. PER	MJ	1.22E+00	5.34E-01	4.08E-01	2.16E+00	1.89E+00	1.91E+01	MND	4.45E-02	1.87E-01	5.05E-01	3.99E-02	-3.32E+00						
Secondary materials	kg	6.30E-04	1.50E-04	3.21E-03	3.99E-03	9.27E-04	3.73E-03	MND	1.74E-05	5.20E-05	2.60E-04	1.32E-05	-2.40E-03						
Renew. secondary fuels	MJ	2.01E-05	1.46E-06	1.06E-02	1.07E-02	8.77E-06	5.10E-03	MND	5.70E-08	5.25E-07	3.36E-06	5.16E-07	-7.35E-05						
Non-ren. secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00						
Use of net fresh water	m³	6.65E-04	6.78E-05	2.58E-04	9.91E-04	3.39E-04	9.31E-03	MND	2.70E-06	2.43E-05	4.14E-04	4.82E-05	-1.96E-03						

⁸⁾ PER = Primary energy resources.





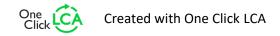


END OF LIFE – WASTE

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	В3	B4	B5	В6	B7	C1	C2	C3	C4	D
Hazardous waste	kg	4.36E-03	7.01E-04	1.29E-03	6.35E-03	3.78E-03	9.80E-02	MND	5.96E-05	2.48E-04	1.62E-03	0.00E+00	-1.14E-02						
Non-hazardous waste	kg	9.66E-02	1.13E-02	2.50E-02	1.33E-01	7.56E-02	1.78E+00	MND	4.19E-04	4.08E-03	2.29E-01	2.14E-01	-2.65E-01						
Radioactive waste	kg	2.08E-05	3.60E-06	2.29E-06	2.67E-05	1.27E-05	8.46E-05	MND	3.13E-07	1.25E-06	3.55E-06	0.00E+00	-2.19E-05						

END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1	A2	А3	A1-A3	A4	A5	B1	B2	В3	B4	В5	В6	В7	C1	C2	С3	C4	D
Components for re-use	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00						
Materials for recycling	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.07E-02	MND	0.00E+00	0.00E+00	2.44E+00	0.00E+00	0.00E+00						
Materials for energy rec	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.79E-04	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00						
Exported energy	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.66E-02	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00						

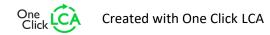






ENVIRONMENTAL IMPACTS – EN 15804+A1, CML / ISO 21930

Impact category	Unit	A1	A2	А3	A1-A3	A4	A5	B1	B2	В3	B4	B5	В6	В7	C1	C2	СЗ	C4	D
Global Warming Pot.	kg CO₂e	2.75E-01	3.14E-02	1.77E-02	3.24E-01	1.27E-01	3.23E-01	MND	3.27E-03	1.23E-02	3.02E-02	6.10E-03	-2.18E-01						
Ozone depletion Pot.	kg CFC ₋₁₁ e	1.52E-08	5.86E-09	1.43E-09	2.25E-08	2.19E-08	1.55E-08	MND	5.60E-10	2.27E-09	3.74E-09	4.59E-10	-3.09E-08						
Acidification	kg SO₂e	7.94E-04	1.16E-04	6.88E-05	9.79E-04	5.33E-04	1.29E-03	MND	2.45E-05	4.10E-05	1.53E-04	1.07E-05	-9.89E-04						
Eutrophication	kg PO ₄ ³e	1.66E-03	2.15E-05	4.30E-05	1.73E-03	1.38E-04	4.06E-04	MND	5.69E-06	9.34E-06	6.85E-05	2.03E-04	-4.74E-04						
POCP ("smog")	kg C₂H₄e	6.42E-05	4.59E-06	6.72E-06	7.55E-05	4.19E-05	6.42E-05	MND	5.36E-07	1.60E-06	5.93E-06	1.39E-06	-2.16E-04						
ADP-elements	kg Sbe	4.15E-06	7.34E-08	1.15E-07	4.34E-06	1.63E-06	1.26E-06	MND	1.65E-09	2.83E-08	1.18E-07	4.84E-09	-8.01E-07						
ADP-fossil	MJ	2.24E+00	4.92E-01	4.07E-01	3.14E+00	1.89E+00	4.04E+00	MND	4.45E-02	1.87E-01	5.25E-01	4.13E-02	-3.33E+00						







VERIFICATION STATEMENT

VERIFICATION PROCESS FOR THIS EPD

This EPD has been verified in accordance with ISO 14025 by an independent, third-party verifier by reviewing results, documents and compliancy with reference standard, ISO 14025 and ISO 14040/14044, following the process and checklists of the program operator for:

- This Environmental Product Declaration
- The Life-Cycle Assessment used in this EPD
- The digital background data for this EPD

Why does verification transparency matter? <u>Read more online</u>
This EPD has been generated by One Click LCA EPD generator, which has been verified and approved by the EPD Hub.

THIRD-PARTY VERIFICATION STATEMENT

I hereby confirm that, following detailed examination, I have not established any relevant deviations by the studied Environmental Product Declaration (EPD), its LCA and project report, in terms of the data collected and used in the LCA calculations, the way the LCA-based calculations have been carried out, the presentation of environmental data in the EPD, and other additional environmental information, as present with respect to the procedural and methodological requirements in ISO 14025:2010 and reference standard.

I confirm that the company-specific data has been examined as regards plausibility and consistency; the declaration owner is responsible for its factual integrity and legal compliance.

I confirm that I have sufficient knowledge and experience of construction products, this specific product category, the construction industry, relevant standards, and the geographical area of the EPD to carry out this verification.

I confirm my independence in my role as verifier; I have not been involved in the execution of the LCA or in the development of the declaration and have no conflicts of interest regarding this verification.

Imane Uald lamkaddam, as an authorized verifier acting for EPD Hub Limited 16.08.2024



