# Environmental Product Declaration

In accordance with ISO 14025:2006 and EN 15804:2012+A2:2019/AC:2021 for:

## Clay panels

from ***MINERCER S.L.U.***

EPD of multiple products, based on the average results of the product group:
ecoclayPLAC and ecoclayPLACork

| | |
|---|---|
| Programme: | The International EPD® System, www.environdec.com |
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*An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to be continued registration and publication at www.environdec.com*

# Programme information

| | |
|---|---|
| **Programme:** | The International EPD® System |
| **Address:** | EPD International AB<br>Box 210 60<br>SE-100 31 Stockholm<br>Sweden |
| **Website:** | www.environdec.com |
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| **Accountabilities for PCR, LCA and independent, third-party verification** |
|---|
| **Product Category Rules (PCR)** |
| CEN standard EN 15804 serves as the Core Product Category Rules (PCR) |
| *Product Category Rules (PCR): PCR 2019:14 VERSION 1.3.2 CONSTRUCTION PRODUCTS 2023-12-08. Based on CEN standard EN 15804. CEN standard EN 15804 serves as the core Product Category Rules (PCR).* |
| PCR review was conducted by:<br>The Technical Committee of the International EPD® System. A full list of members available on www.environdec.com. Review chair: Claudia A. Peña, University of Concepción, Chile. The review panel may be contacted via info@environdec.com. |
| **Life Cycle Assessment (LCA)** |
| LCA accountability: *Diego Ruiz,* Idnovam |
| **Third-party verification** |
| Independent third-party verification of the declaration and data, according to ISO 14025:2006, via:<br><br>☒ EPD verification by individual verifier<br><br>Third-party verifier: *Eva Martínez Herrero, CTME*<br><br>Approved by: The International EPD® System |
| Procedure for follow-up of data during EPD validity involves third-party verifier:<br><br>☐ Yes ☒ No |

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

EPDs within the same product category but registered in different EPD programmes may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same version number) or be based on fully-aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterisation factors); have equivalent content declarations; and be valid at the time of comparison. For further information about comparability, see ISO 14025.

# Company information

Owner of the EPD:
MINERCER S.L.U.
Penitencia, 47, Vila-real, Castellón 12540.
España.

Contact:
Luis Mata (Sustainability product)
luis@ecoclay.es

Description of the organisation:
ECOCLAY it's a Brand of MINERCER S.L.U dedicated to the production of wall and floor coverings, as well as natural, ecological, and non-toxic paints made from sand, clay, and natural additives. The characteristics of raw clays and limes allow for the creation of finishes and construction solutions that not only represent a valid alternative to conventional options, but also address or prevent many issues related to humidity, energy savings, durability, and aesthetics. The mortars are made from a carefully selected combination of exclusive clays from their quarry in Teruel and selected sands.

Name and location of production site:
Mine: Partida el Collado, s/nº 44557-Crivillén, Teruel. España.
Production site: Las Horcas, 36 – 2, 44600 Alcañiz, Teruel. España

# Product information

Product name: Clay panels

Product identification: Clay panels are used in dry construction of partition walls, wall linings and false ceilings. This EPD also shows the maximum variation between products for the sum of modules A-C for all impacts.

UN CPC code: 314. Boards and panels

Product description:
EPD of multiple products, based on the average results of the product group. The clay panels manufactured and sold by ECOCLAY and represented in this EPD are as follows:

EcoclayPLAC, a panel that offers a 100% natural solution for dry construction of interior partitions and wall linings. Its key properties include regulating the relative humidity of the room, being permeable to water vapor, having low conductivity and high thermal inertia, ensuring maximum comfort with reduced energy costs. Additionally, it helps neutralize odors and toxic particles within its structure to create clean environments, is fully recyclable, and serves as an effective acoustic absorber. EcoclayPLAC combines all the benefits of natural clay without additives. Its presentation in panel form makes EcoclayPLAC a modern and ideal material for eco-friendly architecture, bioconstruction, and use in conventional homes that seek to increase comfort and reduce energy costs.

EcoclayPLACork, a panel that offers a 100% natural solution for the construction of interior false ceilings. Its key properties include regulating the room's relative humidity, being permeable to water vapor, and having low conductivity to ensure maximum comfort with lower energy costs. Additionally, it helps neutralize odors and toxic particles within its structure to create clean environments, is fully recyclable, and serves as an effective acoustic absorber. Its panel form makes EcoclayPLACork a completely modern and ideal material for healthy architecture. It is recommended for use in both new construction homes and in renovations, refurbishments, and commercial spaces.

The results of this EPD correspond to the arithmetic mean of the results for each product in the group.

Geographical scope: Europe

Technical data of Clay panels:

| Indicator | ecoclayPLAC | ecoclayPLACork | Standard |
|---|---|---|---|
| Coefficient of vapor permeability in humid-dry environment μ | 4.8-11.2 | - | UNE-EN 1015-19:1999 |
| Acoustic insulation $R_{e=20\ mm+3mm\ BASE}$ | 29 dB | - | UNE-EN ISO 6946:2021 |
| Thermal conductivity λ | 0.18 W/mK | - | UNE-EN ISO 13787:2003 |
| Thermal resistance $R_{e=20\ mm}$ | 0.11 $m^2K/W$ | - | UNE-EN ISO 6946:2021 |
| Thermal transmittance $U_{e=20\ mm}$ | 9 $W/m^2K$ | - | UNE-EN ISO 6946:2021 |
| Reaction to fire | A2-s1, d0 | A2-s1, d0 | UNE-EN 13823:2012+A1 2016 |
| Water vapor absorption | 86 water $g/m^2$ x cm | - | UNE-EN 1015-19:1999. |
| Volatile Organic Compounds (VOCs) | 0 | 0 | |

# LCA information

Functional unit / declared unit: The declared unit is 1$m^2$ of clay panel.

The conversion factor to obtain the environmental impact per kg of product is 38 kg/m2 for ecoclayPLAC panels and 11 kg/m2 for ecoclayPLACork panels.

Reference service life: not applicable.

Description of system boundaries:
According to the standard EN 15804:2012+A2:2019 and PCR 2019:14 CONSTRUCTION PRODUCTS the system boundary is cradle to gate with modules C1–C4 and module D (A1–A3 + C + D). The life cycle stages A4-A5, B1-B7 were excluded from the LCA study.

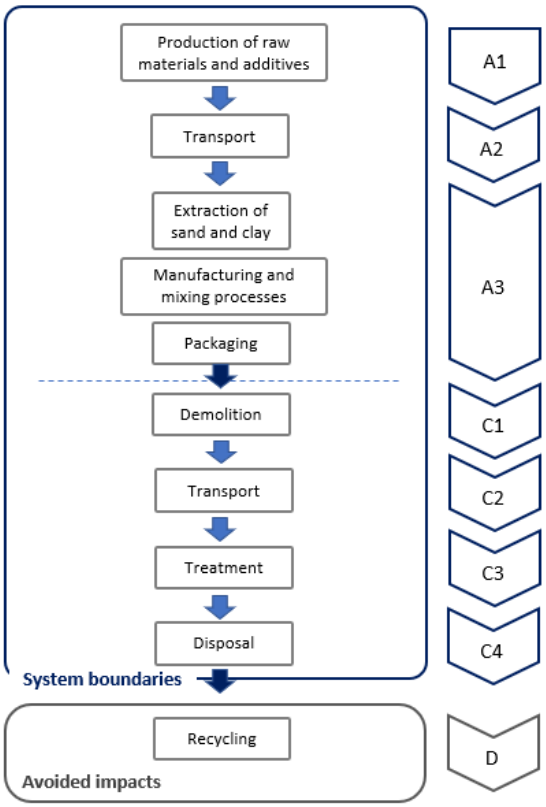
The aggregation of the modules A1, A2 and A3 is allowed by EN 15804. This rule is applied in this EPD and denoted by A1-3.

The manufacturing of panels takes place in the workshop, starting with the extraction of sand and clay from the mine. These raw materials are mixed with other natural additives according to the type of panel to be produced. Energy is used for the machinery employed in the various stages of the process. Finally, the product is stacked in its packaging to be sent to the construction site. Throughout the entire production process, there is no waste, and no pollutants are released into the air. The leftover material can be kept for repairs or disposed of in the ground. In the following table is shown EoL applied scenario in the LCA.

| Parameters | Unit |
|---|---|
| Collection process | 0 kg collected separately |
| | 38 kg collected with mixed construction waste |
| Recovery system | 0 kg for reuse |
| | 0 kg for recycling |
| | 0 kg for energy recovery |
| Landfill | 38 kg of product for final disposal |
| **Assumptions for the development of scenarios** | |
| Transport by road | Transport, freight, lorry 16-32 t |
| Diesel consumption(1) | 0.037 kg/tkm |
| Distance to CDW treatment, recycling, EoL | 150 km |

(1) Ecoinvent database

System diagram:




The construction processes and production of capital goods, maintenance and support activities, production of packaging raw materials, transportation of finished products to the installation site (A4), installation of the product (A5), and the use phase (B1-B7) have been excluded.

Time representativeness:
First-hand data provided directly by ECOCLAY on its production process was used in all cases where this information was available. The data provided by the company corresponds to production during 2023.

Database(s) and LCA software used:
The LCA modelling was carried out using an excel spreadsheet. All background LCI datasets were sourced from the Ecoinvent database v3.8. In certain cases, the original Ecoinvent datasets were adapted to the specific conditions of ECOCLAY processes. The environmental information of background processes was generated by LCA software SimaPro 9.3 and were entered into the spreadsheet. The impact assessment results were calculated using characterization factors of EN 15804+A2 standard (based on EF 3.1).

Data quality:
In order to achieve precision, consistency and representativeness and to ensure reliable results, first-hand data from ECOCLAY activities were used. The activity data provided by ECOCLAY are less than 2 years old. All information comes from operational data and from calculations, so the quality of these data can be described as very good.

By other hand, regionally specific datasets were used to model the energy consumption. For the processes of transport and production of raw materials, datasets were chosen according to their technological and geographical representation of the actual process.

In accordance with Annex E of the EN 15804 + A2, a data quality assessment was performed. For technical representativeness, processes with a quality level of "very good" account for 99% of the value for climate change indicator. For geographical and time representativeness, processes with a quality level of "very good" account for 95% and 100% respectively.

Cut-off rules:
All the environmental aspects provided by ECOCLAY's management have been included in the study, i.e., all raw materials and packaging as well as the energy for manufacturing. In the same way, all manufacturing waste and air emissions are accounted for.

Allocation
- LCA Model: An allocation has been carried out using a bottom-up approach, starting with the composition of the products and directly assigning the quantities of raw materials present in the product.
- Energy: Since allocation using the traditional top-down approach was not feasible, a bottom-up approach was employed based on equipment nominal power, operating times, and productivity.

Main assumptions:
- The biogenic carbon content of straw and natural fibres is the result of the CO2 that has been absorbed from the atmosphere by the photosynthesis of the plants during their growth. The biogenic carbon in the product and packaging has been calculated according to EN 16485 and 16449. A carbon content of 50% of the dry mass of the straw and natural fibres was assumed.
- The biogenic carbon contained in the products used in the packaging has been compensated for in the total of the A1-3 modules.
- Infrastructure or capital goods have not been included in the analysis.

Greenhouse gas emission from the use of electricity in the manufacturing phase
The electricity mix used is based in the year 2023. Specific supplier electricity mix has been taken into consideration in the LCA model with a carbon footprint (GWP-GHG) of 3.06E-01 Kg $CO_2$eq/kWh.

More information

Author of the Life Cycle Assessment:
Idnovam. Ferranz 56, Bajo, 28008 Madrid (Spain).

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

| | 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 | ND | ND | ND | ND | ND | ND | ND | ND | ND | X | X | X | X | X |
| Geography | ES | ES | ES | - | - | - | - | - | - | - | - | - | EU | EU | EU | EU | EU |
| Specific data used | 51.5% | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Variation – products | +/- 41% | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Variation – sites | - | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# Content information

The following table presents information regarding the content of 1m$^2$ of clay panel.

| **Product components** | **Weight, kg** | **Post-consumer material, weight-%** | **Biogenic material, weight-% and kg C/kg** |
|---|---|---|---|
| Sand | 2.8 - 11.4 | 0% | 0% |
| Clay | 7.2 - 25.8 | 0% | 0% |
| Straw | 0.2 - 0.8 | 0% | 100% - 0.5 kg C/kg |
| Natural fibre | 0.001 - 0.004 | 0% | 100% - 0.5 kg C/kg |
| Cork | 0 – 0.8 | 0% | 100% - 0.5 kg C/kg |
| TOTAL | 11.0 – 38.0 | 0% | 2% - 9.5%<br>0.38 – 0.52 kg C |
| **Packaging materials** | **Weight, kg** | **Weight-% (versus the product)** | **Weight biogenic carbon, kg C/kg** |
| Pallet | 0.06 - 0.10 | 0.25% - 0.54% | 100% - 0.5 kg C/kg |
| Plastic film | 0.002 - 0.003 | 0.01% - 0.02% | 0 |
| TOTAL | 0.06 - 0.10 | 0.26% - 0.56% | 0.01 - 0.05 kg C |

Composition of final products has been deemed commercially sensitive information so no further details are provided here.
Products do not contain any of the substances listed on the “Candidate List of Substances of Very High Concern (SVHC) for authorization".

# Results of the environmental performance indicators

The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks. The use of the results of modules A1 to A3 without considering the results of modules C1 to C4 is discouraged. The results table is derived from the arithmetic mean of the results obtained for each of the products described in this EPD.

## Mandatory impact category indicators according to EN 15804 (1)

| Results per 1m² of clay panel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Indicator** | **Unit** | **A1-A3** | **C1** | **C2** | **C3** | **C4** | **D** | **A-C Variation %** |
| GWP-fossil | kg $CO_2$ eq. | 3.12E+00 | 7.62E-02 | 1.72E-01 | 2.19E-02 | 1.28E-01 | 0.00E+00 | 85% |
| GWP-biogenic | kg $CO_2$ eq. | -1.66E+00 | 6.06E-06 | 1.19E-05 | 1.51E-04 | 1.69E+00 | 0.00E+00 | 118% |
| GWP-luluc | kg $CO_2$ eq. | 6.25E-03 | 1.13E-06 | 1.34E-06 | 2.26E-05 | 2.18E-06 | 0.00E+00 | 24% |
| GWP-total | kg $CO_2$ eq. | 1.47E+00 | 7.62E-02 | 1.72E-01 | 2.21E-02 | 1.82E+00 | 0.00E+00 | 85% |
| ODP | kg CFC 11 eq. | 6.09E-07 | 1.69E-08 | 3.76E-08 | 4.58E-09 | 2.87E-08 | 0.00E+00 | 83% |
| AP | mol $H^+$ eq. | 1.91E-02 | 8.16E-04 | 3.27E-04 | 1.88E-04 | 9.83E-04 | 0.00E+00 | 46% |
| EP-freshwater | kg P eq. | 6.16E-05 | 5.92E-08 | 9.85E-08 | 9.16E-07 | 9.62E-08 | 0.00E+00 | 93% |
| EP-marine | kg N eq. | 7.17E-03 | 3.51E-04 | 5.27E-05 | 6.84E-05 | 4.15E-04 | 0.00E+00 | 32% |
| EP-terrestrial | mol N eq. | 7.99E-02 | 4.17E-03 | 6.24E-04 | 8.01E-04 | 4.78E-03 | 0.00E+00 | 29% |
| POCP | kg NMVOC eq. | 2.05E-02 | 1.14E-03 | 2.21E-04 | 2.15E-04 | 1.25E-03 | 0.00E+00 | 22% |
| ADP-minerals&metals* | kg Sb eq. | 1.41E-06 | 3.27E-08 | 9.37E-09 | 1.72E-08 | 2.93E-08 | 0.00E+00 | 107% |
| ADP-fossil* | MJ | 6.61E+01 | 1.06E+00 | 2.44E+00 | 6.11E-01 | 1.84E+00 | 0.00E+00 | 96% |
| WDP* | $m^3$ | 1.24E+00 | 2.09E-04 | -5.21E-04 | 3.37E-03 | 9.91E-05 | 0.00E+00 | 87% |
| 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 | | | | | | | |

*(1) The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks.*

** 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.*

## Additional mandatory and voluntary impact category indicators

| Results per 1m² of clay panel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Indicator** | **Unit** | **A1-A3** | **C1** | **C2** | **C3** | **C4** | **D** | **A-C Variation %** |
| GWP-GHG[1] | kg $CO_2$ eq. | 3.16E+00 | 7.62E-02 | 1.72E-01 | 2.21E-02 | 1.28E-01 | 0.00E+00 | 85% |

## Resource use indicators

| Results per 1m² of product | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Indicator** | **Unit** | **A1-A3** | **C1** | **C2** | **C3** | **C4** | **D** | **A-C Variation %** |
| PERE | MJ | 5.61E+01 | 1.65E-03 | 3.35E-03 | 2.81E-01 | 3.77E-02 | 0.00E+00 | 175% |
| PERM | MJ | 1.59E+01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 70% |
| PERT | MJ | 7.20E+01 | 1.65E-03 | 3.35E-03 | 2.81E-01 | 3.77E-02 | 0.00E+00 | 152% |
| PENRE | MJ | 7.03E+01 | 1.16E+00 | 2.59E+00 | 6.38E-01 | 1.92E+00 | 0.00E+00 | 97% |
| PENRM | MJ | 4.50E-02 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 200% |
| PENRT | MJ | 7.03E+01 | 1.16E+00 | 2.59E+00 | 6.38E-01 | 1.92E+00 | 0.00E+00 | 97% |
| SM | kg | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0% |
| RSF | MJ | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0% |
| NRSF | MJ | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0% |
| FW | $m^3$ | 5.34E+00 | 7.31E-03 | 1.42E-02 | 1.56E+00 | 1.80E-01 | 0.00E+00 | 34% |
| 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 | | | | | | | |

[1] This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic $CO_2$ is set to zero.

## Waste indicators (optional)

| Results per 1m² of clay panel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Indicator** | **Unit** | **A1-A3** | **C1** | **C2** | **C3** | **C4** | **D** | **A-C Variation %** |
| Hazardous waste disposed | kg | 8.21E-05 | 2.79E-06 | 6.39E-06 | 5.53E-07 | 4.74E-06 | 0.00E+00 | 71% |
| Non-hazardous waste disposed | kg | 3.05E+00 | 6.48E-05 | 9.93E-05 | 3.14E-04 | 2.47E+01 | 0.00E+00 | 111% |
| Radioactive waste disposed | kg | 4.71E-04 | 7.37E-06 | 1.63E-05 | 6.16E-06 | 1.25E-05 | 0.00E+00 | 98% |

## Output flow indicators

| Results per 1m² of clay panel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Indicator** | **Unit** | **A1-A3** | **C1** | **C2** | **C3** | **C4** | **D** | **A-C Variation %** |
| Components for re-use | kg | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0% |
| Material for recycling | kg | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0% |
| Materials for energy recovery | kg | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0% |
| Exported energy. electricity | MJ | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0% |
| Exported energy. thermal | MJ | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0% |

# Differences versus previous versions

This is the first version of the EPD.

# References


- General Programme Instructions of the International EPD® System. Version 4.0. 2021-03-28.
- UNE-EN 15804:2012+A2:2020. Sostenibilidad en la construcción. Declaraciones ambientales de producto. Reglas de categoría de productos básicas para productos de construcción. Madrid; 2014.
- PCR 2019:14 version 1.3.2. Construction Products 2023-12-08
- ISO 14025:2011-10 Environmental labels and declarations. Type III environmental declarations. Principles and procedures
- Ecoinvent. 2021. Ecoinvent Database 3.8. http://www.ecoinvent.org/database/

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