

# Environmental Product Declaration

as per ISO 14025 and EN 15804

|                           |                         |
|---------------------------|-------------------------|
| Owner of the declaration: | MINIERA SAN ROMEDIO SRL |
| Publisher:                | Kiwa-Ecobility Experts  |
| Programme operator:       | Kiwa-Ecobility Experts  |
| Registration number:      | EPD-Kiwa-EE-338-EN      |
| Issue date:               | 24.10.2023              |
| Valid to:                 | 24.10.2028              |



## Cement light mortar: T MIM

A ready-to-use thermal-insulating bedding mortar based on dolomia, light inert and cement.

## 1. General information

### Miniera San Romedio

**Programme operator**

Kiwa-Ecobility Experts  
 Kiwa GmbH, Ecobility Experts  
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 13355 Berlin  
 Germany

**Registration number**

EPD-Kiwa-EE-338-EN

**This declaration is based on the Product Category Rules**

EN 16908:2017+A1:2022

**Issue date**

24.10.2023

**Valid to**

24.10.2028



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 (Head of Kiwa-Ecobility Experts)



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 (Chairman of the independent expert committee –  
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### Cement light mortar

**Owner of the declaration**

Miniera San Romedio Srl  
 Località alla Miniera  
 38012 Predaia (TN)  
 Italy

**Declared product / declared unit**

1 ton (1000 kg) of Cement light mortar

**Scope**

This EPD refers to a product category (Cement light mortar) produced by Miniera San Romedio Srl in its plants in the province of Trento (Italy). The data used to perform the LCA analysis were provided by Miniera San Romedio Srl and referred to the production of one year, and the information are relative to the period 2021-2022. The geographical area assumed for the application and end-of-life of the product is Italy. The study was performed following the so-called from-cradle-to-gate approach with modules C1-C4 and D.

This EPD is intended to be used for business-to-consumer communications. The owner of the declaration is liable for the underlying information and evidence.

Kiwa-Ecobility Experts assumes no liability for manufacturer's information, LCA data and evidence.

**Verification**

The European standards EN 15804+A2:2019 (10/2021) serve as PCR.

Independent verification of the declaration and data according to ISO 14025:2006.

 internal

 external



Dr.-Ing. Morteza Nikravan  
 (External verifier of Kiwa GmbH)

## 2. Product

### 2.1 Product description

The premixed Miniera San Romedio's products are inorganic finely grinded materials, obtained by means of the combinations at different relative concentrations of cement, dolomia and expanded perlite. In this EPD the Cement light mortar is considered.

### 2.2 Application

Cement light mortar: a ready-to-use thermal-insulating bedding mortar based on dolomia, light inert and cement. Products of this category are subjected to CE marking according to EN 998-2 (T MIM).

### 2.3 Technical data

In Table 1 the main physical and applicative properties of the considered product are reported.

Table 1: Physical and applicative properties of the Cement light mortar.

| Characteristic   | Unit              | Value  | Standard       |
|------------------|-------------------|--------|----------------|
| Density          | kg/m <sup>3</sup> | ~1310* | UNI EN 1015-10 |
| Mixing water     | l/kg              | 0.35   | -              |
| Max granulometry | mm                | 3      | EN 1015-1      |

### 2.4 Placing on the market/ Application rules

The pre-mixed Miniera San Romedio's products are powder or granulates and therefore they have to be transported to the building site by using 25 kg paper bags, collected over a pallet. Pallets range from 50 to 60 bags each one, and can be mechanically moved. Once the product reaches the building site the bags can be used to mix the product with the specified amount of water and either be manually stirred or mechanically mixed. It can be also transported to the construction site unpackaged and directly pumped into a silo already settled on a nearby position.

### 2.5 Base materials / Ancillary materials

In order to apply this product, it must be premixed combining at different relative concentrations cement and fillers (i.e dolomia, light inert). Water and small amounts of additives (less than 3 wt%) are then added to the mix, in order to develop innovative materials with very peculiar properties and suitable for a wide range of applications in the constructions field. The relative composition of the Cement light mortar is summarized in Table 2.

Table 2: Composition of Cement light mortar.

| Product             | Dolomia [wt%] | Expanded perlite [wt%] | NHL* [wt%] | Cement [wt%] | Polystyrene [wt%] | Additives [wt%] |
|---------------------|---------------|------------------------|------------|--------------|-------------------|-----------------|
| Cement light mortar | 35-40         | 10-15                  | -          | 50-55        |                   | < 3             |

\* Comprising setting retardant (4 wt% of the total NHL content)

The paper bag used as packaging (2.74 kg for 1 ton of product) contains 1.77 kg of biogenic carbon. The product does not contain biogenic carbon.

### 2.6 Manufacturing

#### 2.6.1 Manufacturing process of the inert

The Dolomia is extracted in the Rio Maggiore pit through a mixed explosive. The material is then collected through a Diesel bulldozer and transported to Mollaro (TN) with a Diesel lorry where the

material is subjected to a first crushing. The material is then dried and crushed for a second time using an hammer mill.

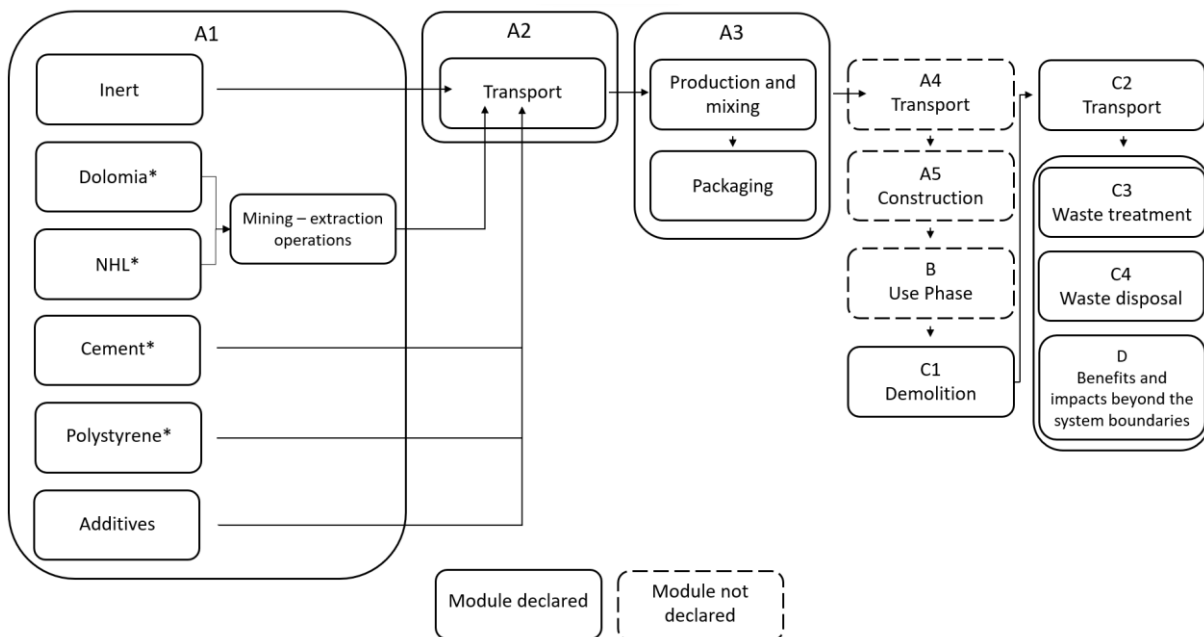
## 2.6.2 Manufacturing of the premixed products

The powders (cement, expanded perlite and dolomia) are then mixed and packed through a bagging system, by using a paper bag with capacity of 25 kg, palletized and then directly distributed.

According to the EN 15804:2012+A2:2019 standard, the present LCA study was performed following the so-called from-cradle-to-gate approach with modules C1-C4 and D considering thus the following steps:

- Extraction and processing of the raw materials (A1);
- Transport of the acquired raw materials to the manufacturer and internal transport of the extracted raw materials (A2);
- Production of the materials and mixing operations (A3).
- Deconstruction/demolition (C1)
- Transport of demolition wastes (C2)
- Waste treatment (C3)
- Waste disposal (C4)
- Benefits and impacts beyond the system boundaries (D)

A schematic process flow diagram is shown in Figure 1.



**Figure 1: [Graphic schematic process flow diagram for the analysed product.]**

\* dolomia, NHL, cement and polystyrene are not present in all the compositions, please refer to Table 2.

## 2.7 Packaging

Paper bags are used to stow 25 kg of premixed product.

## 2.8 Reference Service Life (RSL)

Since the use phase is not considered, the reference service life (RSL) as per ISO 15686-1, -2, -7 and -8 has not been declared.

## 2.9 Other Information

For further information on this product please visit the webpage under the following link: <https://www.tassullo.it/it/>

## 3. LCA: Calculation rules

### 3.1 Declared unit

In accordance with the EN 15804+A2:2019 and EN 16908:2017+A1 1 ton of product is chosen as the declared unit (see Table 3).

Table 3: Declared unit used for the calculations.

| Product                   | Unit | Value |
|---------------------------|------|-------|
| Declared Unit             | ton  | 1     |
| Conversion factor to 1 kg | kg   | 1000  |

### 3.2 System boundary

In accordance with the EN 15804+A2:2019 this study was performed following the so-called from-cradle-to-gate approach with modules C1-C4 and D. In Table 4 the system boundaries of the considered product are listed.

Table 4: system boundaries of the Cement light mortar.

| Module   | Modul declared | within the system boundary | Outside the system boundary |
|--|----------------|----------------------------|-----------------------------|
| A1 Raw Material  | Yes            | X                          |                             |
| A2 Transport   | Yes            | X                          |                             |
| A3 Manufacturing   | Yes            | X                          |                             |
| A4 Transport   | No             |                            | X                           |
| A5 Installation  | No             |                            | X                           |
| B1 Use Phase   | No             |                            | X                           |
| B2 Maintance   | No             |                            | X                           |
| B3 Repair  | No             |                            | X                           |
| C1 De-Construction   | Yes            | X                          |                             |
| C2 Transport   | Yes            | X                          |                             |
| C3 Waste treatment   | Yes            | X                          |                             |
| C4 Landfill  | Yes            | X                          |                             |
| D Considered loads and benefits outside of the system boundary in Module D | Yes            | X                          |                             |

### 3.3 Estimates and assumptions

The electrical energy consumed in Miniera San Romedio Srl plants is a fully renewable certified energy. The electrical energy is derived from renewable energy source (hydropower) that have obtained certification with the renewable energy certification. The electrical energy is converted from high voltage to low voltage using an electrical transformer located close to the plants. The certification of the renewability of the energy covers to whole period analysed in this study (2021-2022). For the internal transportations, gasoline with a calorific power of 45 MJ/kg was considered.

For as concerns the end-of-life stage, the demolition, transport, treatment, and disposal of wastes were modelled using processes present in the Ecoinvent database and modified to the specific case. In particular,

- for the C1 stage (demolition/deconstruction) the use of a diesel operating machine with a productivity of 16.6 min/ton of demolished material and a diesel consumption of 0.9 lt/m<sup>3</sup> was considered. A water consumption of 0.018 m<sup>3</sup>/m<sup>3</sup> was considered. Both references were taken from Ivanica et al.
- for the C2 stage a distance of 15 km was assumed according to data provided by Italia del Riciclo referred to the year 2021.
- for the C3 and C4 stages, despite the Cement light mortar can be fully recycled and due to the lack of specific information regarding the end-of-life of this product, it was assumed that, after a sorting and crushing process, 78.1 wt% of inert wastes is recycled (reaching the end-of-waste state) while the remaining part is landfilled (data provided by Italia del Riciclo referred to the year 2021). For the sorting and crushing process an existing Ecoinvent process was adapted to the specific case.
- for the stage D it was considered that the secondary materials were used as alternative to gravel for the production of concrete and for road construction (the background process used refers to the period 2013-2021). Benefits and impacts associated to these operations were therefore evaluated.

According to EN 16908:2017+A1 the carbonation of cement and natural hydraulic lime can be very relevant after demolition with consistent carbon dioxide uptake. The evaluation of carbon dioxide uptake was carried out according to the procedure described in EN 16757. In particular it was considered that:

- for the C1-C3 stages no carbonation occurs due to the limited time of exposure to air or to the lack of information regarding the duration of air exposure.
- for the C4 stage it was considered a carbon dioxide uptake equal to 75 % of the maximum theoretical carbon dioxide uptake for landfilled wastes. No uptake was considered for recycled wastes.
- for the D stage it was considered a carbon dioxide uptake equal to 100 % of the maximum theoretical carbon dioxide uptake.

The following values (evaluated according to stoichiometry) were used as maximum uptake values:

- Natural hydraulic lime: 440 kg CO<sub>2</sub>/ton;
- Cement: 490 kg CO<sub>2</sub>/ton.

It should be highlighted that since Miniera San Romedio produces ready mixed products and has no control and no information regarding their applications it was impossible, due to lack of data, to calculate the contribution of carbonation in the use stage (module B).

Regarding the end-of-life of the packaging paper (100 % recyclable), it was not considered since beyond the boundaries of the system.

### 3.4 Cut-off Criteria

As reported in the EN 15804:2012+A2:2019 standard, all inputs and outputs for which data are available were taken into account in the calculation. Eventual data gaps have been filled with conservative assumptions of average data or generic data available in the Ecoinvent v3.8 database of the SimaPro

software. All flows contributing to more than 1 % of the total mass, energy or environmental impact of the system have been included in the life cycle assessment. Eventual neglected processes do not contribute in total more than 5% to the impact categories considered. Moreover, the manufacture of machinery, plants and other infrastructure required for production of the products under review was not taken into consideration in the present analysis.

### **3.5 Period under review and Geographical reference area**

The specific data were obtained directly by the commissioning company, and are related to the production of one year. The data are referred to the period June 2021-June 2022. They were obtained by means of specific measures related to the energy consumption and mass flows in the plant of Mollaro (Trento), where Dolomia is extracted, mixed with cement and expanded perlite and packed. Manufacturer-specific data are referred to the period 2021-2022, while generic data are less than 10 years old. Moreover, process-specific data are based on the average of an operating year.

### **3.6 Data quality**

For this study, the data quality requirements defined in ISO 14044 regulation have been considered. In order to ensure coherence, data with the same level of detail have been used, as well as under the same methodological considerations. Data and methods used for this study have been described with the purpose of being reproducible by a third independent party. Whenever possible, generic data used for the study are representative of the location where the process belongs (for example, the production of electrical energy). The data has been collected from the plant of Mollaro (in province of Trento). Data were associated to a specific input selected from the database Ecoinvent v3.8 (2021). The inventory analysis has been thus modelled by using the SimaPro software.

### **3.7 Allocation**

In this work, allocations have been avoided as far as possible (e.g. by system expansion, splitting processes into sub-processes). Where it was necessary, an economical allocation principle was utilized. This choice was performed because the economic difference between product and co-products was rather elevated. In this sense, the environmental impacts associated with the inputs have been distributed according to the way they affect the subsequent production process.

A peculiar feature of the cave in Mollaro is that the extraction of the dolomia is performed for two interconnected purposes: obtaining the inerts to be mixed with the NHL in the premixed products of Tassullo, and creating the spaces to store the apples produced in Trentino by Melinda Spa company and creating spaces to store alimentary products or to host other industrial activities, which is planned for the near future. Because of this reason, the extraction of the dolomia from the plant of Mollaro is subjected to a specific mineralogical design which takes into account the development of large chambers. The necessity to apply a different mineralogical excavation technique, very far from the optimized mining technique traditionally used for the extraction of the inerts, involves a larger demand of energy and explosive. In particular the excavation for the storage of apples, taken as reference because prevalent storage activity, compared to the traditional optimized mining technique, implies a surplus of the mining costs of the 79% for Miniera San Romedio Srl company. Therefore, in this study only the 21% of the environmental impact coming from the extraction of the dolomia has been attributed to Miniera San Romedio Srl, following the economical allocation principle, while the remaining part was considered as an input of the LCA system of Melinda Spa. On the other hand, all the operations related to the subsequent crushing and transportation of dolomia have been fully attributed to the present system, as the extracted dolomia is fully utilized by Miniera San Romedio Srl as inert material for the preparation of pre-mixed products.

### 3.8 Comparability

In order to assure the comparability of the obtained results, all datasets to be compared have been created in accordance with EN 15804, and the product-specific performance characteristics have been taken into account. In principle, a comparison or assessment of the environmental impacts of different products is only possible if they have been prepared in accordance with EN 15804.

#### 4. LCA: Scenarios and additional technical information

No scenario or additional technical information to be declared.

#### 5. LCA: Results

Table 5 shows the results of the impact assessment indicators, resource use, waste and other output streams for the declared unit (1 ton of Cement light mortar). The results presented here refer to the declared product. In Table 6 the results of the biogenic carbon content are reported.

Disclaimer on ADP-e, ADP-f, WDP, ETP-fw, HTP-c, HTP-nc, SQP: The results of these environmental impact indicators must be used with caution, as the uncertainties in these results are high or as there is limited experience with the indicator.

Disclaimer on IR: This impact category mainly addresses the potential effect of low dose ionizing radiation on human health in the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents and occupational exposures, nor does it consider radioactive waste disposal in underground facilities. Potential ionizing radiation from soil, radon, and some building materials is also not measured by this indicator.



Table 5: results of the impact assessment indicators, resource use, waste and other output streams for Cement light mortar.

| Description of the system boundary   |                   |               |   |                                    |           |             |          |             |              |                        |                       |                             |           |                  |          |   |
|--|-------------------|---------------|---|------------------------------------|-----------|-------------|----------|-------------|--------------|------------------------|-----------------------|-----------------------------|-----------|------------------|----------|---|
| Product stage  |                   |               | Construction process stage                  |                                    | Use stage |             |          |             |              |                        |                       | End of life stage           |           |                  |          | Benefits and loads beyond the system boundaries |
| Raw material supply  | Transport         | Manufacturing | Transport from manufacturer to place of use | Construction -installation process | Use       | Maintenance | Repair   | Replacement | Refurbishmen | Operational energy use | Operational water use | De-construction /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             | MND   | MND                                | MNR       | MNR         | MNR      | MND         | MND          | MND                    | MND                   | X                           | X         | X                | X        | X   |
| X=Module declared   MND=Module not declared  |                   |               |   |                                    |           |             |          |             |              |                        |                       |                             |           |                  |          |   |
| LCA results - Indicators describing environmental impacts based on the impact assessment (LCIA): 1 ton of Cement light mortar (EN 15804+A2)  |                   |               |   |                                    |           |             |          |             |              |                        |                       |                             |           |                  |          |   |
| Parameter  | Unit              | A1-A3         |   |                                    | C1        |             | C2       |             | C3           |                        | C4                    |                             | D         |                  |          |   |
| Core environmental impact indicators (EN 15804+A2)   |                   |               |   |                                    |           |             |          |             |              |                        |                       |                             |           |                  |          |   |
| GWP-total  | kg CO2 eqv.       | 6.22E+02      |   |                                    | 7.62E+00  |             | 1.37E+00 |             | 1.73E+00     |                        | -3.91E+01             |                             | -1.94E+02 |                  |          |   |
| GWP-f  | kg CO2 eqv.       | 6.13E+02      |   |                                    | 7.61E+00  |             | 1.37E+00 |             | 1.68E+00     |                        | -3.91E+01             |                             | -1.94E+02 |                  |          |   |
| GWP-b  | kg CO2 eqv.       | 9.13E+00      |   |                                    | 5.33E-03  |             | 1.39E-03 |             | 4.62E-02     |                        | 1.25E-03              |                             | -1.11E-01 |                  |          |   |
| GWP-luluc  | kg CO2 eqv.       | 1.65E-01      |   |                                    | 1.13E-03  |             | 4.90E-04 |             | 3.51E-03     |                        | 1.09E-03              |                             | -2.15E-03 |                  |          |   |
| ODP  | kg CFC 11 eqv.    | 3.16E-05      |   |                                    | 3.16E-06  |             | 3.31E-07 |             | 1.16E-07     |                        | 4.67E-07              |                             | -3.55E-07 |                  |          |   |
| AP   | mol H+ eqv.       | 2.36E+00      |   |                                    | 3.65E-02  |             | 9.54E-03 |             | 1.04E-02     |                        | 1.08E-02              |                             | -2.35E-02 |                  |          |   |
| EP-fw  | kg P eqv.         | 9.44E-02      |   |                                    | 3.03E-04  |             | 8.50E-05 |             | 1.50E-03     |                        | 1.06E-04              |                             | -6.12E-04 |                  |          |   |
| EP-m   | kg N eqv.         | 5.03E-01      |   |                                    | 9.56E-03  |             | 3.74E-03 |             | 2.26E-03     |                        | 3.77E-03              |                             | -6.73E-03 |                  |          |   |
| EP-T   | mol N eqv.        | 5.56E+00      |   |                                    | 1.05E-01  |             | 4.10E-02 |             | 2.18E-02     |                        | 4.13E-02              |                             | -9.02E-02 |                  |          |   |
| POCP   | kg NMVOC eqv.     | 1.49E+00      |   |                                    | 3.41E-02  |             | 1.15E-02 |             | 6.05E-03     |                        | 1.20E-02              |                             | -2.11E-02 |                  |          |   |
| ADP-mm   | kg Sb-eqv.        | 1.12E-03      |   |                                    | 4.85E-06  |             | 3.13E-06 |             | 1.47E-05     |                        | 2.63E-06              |                             | -5.65E-05 |                  |          |   |
| ADP-f  | MJ                | 3.71E+03      |   |                                    | 1.99E+02  |             | 2.16E+01 |             | 3.39E+01     |                        | 3.22E+01              |                             | -4.07E+01 |                  |          |   |
| WDP  | m3 world eqv.     | 8.60E+01      |   |                                    | 4.16E+00  |             | 7.31E-02 |             | 3.75E-01     |                        | 1.45E+00              |                             | -8.13E-01 |                  |          |   |
| Additional environmental impact indicators (EN 15804+A2)   |                   |               |   |                                    |           |             |          |             |              |                        |                       |                             |           |                  |          |   |
| CaPM   | disease incidence | ND            |   |                                    | ND        |             | ND       |             | ND           |                        | ND                    |                             | ND        |                  |          |   |
| IR   | kBq U235 eqv.     | ND            |   |                                    | ND        |             | ND       |             | ND           |                        | ND                    |                             | ND        |                  |          |   |
| ETP-fw   | CTUe              | ND            |   |                                    | ND        |             | ND       |             | ND           |                        | ND                    |                             | ND        |                  |          |   |
| HTP-c  | CTUh              | ND            |   |                                    | ND        |             | ND       |             | ND           |                        | ND                    |                             | ND        |                  |          |   |
| HTP-nc   | CTUh              | ND            |   |                                    | ND        |             | ND       |             | ND           |                        | ND                    |                             | ND        |                  |          |   |
| SQP  | Pt                | ND            |   |                                    | ND        |             | ND       |             | ND           |                        | ND                    |                             | ND        |                  |          |   |
| ADP-mm= Abiotic depletion potential for non-fossil resources   ADP-f=Abiotic depletion for fossil resources potential   AP= Acidification potential, Accumulated Exceedance   EP-fw = Eutrophication potential, fraction of nutrients reaching freshwater end compartment   EP-m= Eutrophication potential, fraction of nutrients reaching marine end compartment  EP-T= Eutrophication potential, Accumulated Exceedance   GWP-b=Global Warming Potential biogenic   GWP-f=Global Warming Potential fossil fuels   GWP-luluc=Global Warming Potential land use and land use change   GWP-total=Global Warming Potential total  ODP=Depletion potential of the stratospheric ozone layer  POCP=Formation potential of tropospheric ozone   WDP=Water (user) deprivation potential, deprivation- weighted water consumption   ETP-fw=Potential Comparative Toxic Unit for ecosystems   HTP-c=Potential Toxic Unit for Humans toxicity, cancer   HTP-nc= Potential Toxic Unit for humans, non-cancer   IRP=Potential Human exposure efficiency relative to U235, human health   PM=Potential incidence of disease due to Particulate Matter emissions   SQP=Potential soil quality index |                   |               |   |                                    |           |             |          |             |              |                        |                       |                             |           |                  |          |   |

| Parameter | Unit | A1-A3    | C1       | C2       | C3       | C4       | D         |
|-----------|------|----------|----------|----------|----------|----------|-----------|
| PERE      | MJ   | 4.53E+02 | 8.53E-01 | 2.71E-01 | 6.27E+00 | 2.75E-01 | -1.30E+01 |
| PERM      | MJ   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00  |
| PERT      | MJ   | 4.53E+02 | 8.53E-01 | 2.71E-01 | 6.27E+00 | 2.75E-01 | -1.30E+01 |
| PENRE     | MJ   | 3.93E+03 | 2.12E+02 | 2.29E+01 | 3.56E+01 | 3.42E+01 | -4.27E+01 |
| PENRM     | MJ   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00  |
| PENRT     | MJ   | 3.93E+03 | 2.12E+02 | 2.29E+01 | 3.56E+01 | 3.42E+01 | -4.27E+01 |
| SM        | Kg   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00  |
| RSF       | MJ   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00  |
| NRSF      | MJ   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00  |
| FW        | M3   | 8.42E+01 | 3.99E+00 | 7.35E-02 | 3.69E-01 | 1.45E+00 | -7.11E-01 |
| HWD       | Kg   | 3.87E-03 | 5.41E-04 | 5.23E-05 | 3.25E-05 | 4.87E-05 | -1.76E-04 |
| NHWD      | Kg   | 3.99E+01 | 1.79E-01 | 1.99E+00 | 1.22E-01 | 2.19E+02 | -6.55E-01 |
| RWD       | Kg   | 1.43E-02 | 1.40E-03 | 1.46E-04 | 2.45E-04 | 2.11E-04 | -2.96E-04 |
| CRU       | Kg   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00  |
| MFR       | Kg   | 2.00E-02 | 0.00E+00 | 0.00E+00 | 7.81E+02 | 0.00E+00 | 0.00E+00  |
| MER       | Kg   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00  |
| EET       | MJ   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00  |
| EEE       | MJ   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00  |

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 resources | SM=Use of secondary material | RSF=Use of renewable secondary fuels | NRSF=Use of non-renewable secondary fuels | FW=Use of fresh water | HWD=Hazardous waste disposed | NHWD=Non-hazardous waste disposed | RWD=Radioactive waste disposed | CRU=Components for re-use | MFR=Materials for recycling | MER=Materials for energy recovery | EET=Exported energy, thermal | EE=Exported energy, electrical

In Table 6 the biogenic content of Cement light mortar is reported.

Table 6: results of the biogenic carbon content of Cement light mortar.

| LCA results - information on biogenic carbon content at the factory gate: 1 ton of Cement light mortar (EN 15804+A2) |      |       |
|--|------|-------|
| Parameter  | Unit | Value |
| biogenic carbon content in product   | kg C | 0     |
| biogenic carbon content in accompanying packaging  | kg C | 1.77  |
| NOTE 1 kg biogenic carbon is equivalent to 44/12 kg CO <sub>2</sub>  |      |       |

**6. References**

ISO 14040:2006, Environmental management - Life cycle assessment - Principles and framework

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**7. ANNEX 1 Requirements of the Minimum Environmental Criteria (DM June 23<sup>th</sup> 2022)**

In Table 7 the requirements imposed by Minimum Environmental Criteria (DM June 23<sup>th</sup> 2022) for the product considered in this project report are summarized. As it can be seen, the product satisfies the legislative requirements imposed by the Italian Legislation on the Minimum Environmental Criteria for construction services.

Table 7: Requirements of the Minimum Environmental Criteria DM June 23<sup>th</sup> 2022) for the Cement light mortar.

|       |  |  |
|-------|--|--|
| 2.5.1 | Emissions in confined environment                  | The required emission limits can not be applied to these materials since their applications are not included in the list provided in the DM June 23 <sup>th</sup> 2022 at the point 2.5.1. |
| 2.5.2 | Premixed concrete or prepared on the building site | The required minimum recycled content is not applicable since the products considered in this EPD can not be considered as “concrete”. According to EN                                     |

|   |   |  |
|---|---|--|
|   |   | 998-1 and EN 998-2 they can be defined as “plasters” or “mortars” depending on the specific application.   |
| 2.5.7 Thermal and acoustic insulating materials |   |  |
| 2.5.7c  | Thermal and acoustic insulating materials | The products considered in this study has a CE mark and a declaration of performance (DoP) that specifies its thermal conductivity ( $\lambda_D$ ).  |
| 2.5.7d  | Thermal and acoustic insulating materials | The products do not contain substances classified as persistent, bioaccumulative and toxic (PBT) and very persistent and very bioaccumulative (vPvB) according to Annex XIII of the regulation EC 1907/2006 (REACH). |
| 2.5.7e  | Thermal and acoustic insulating materials | The products considered in this study are not produced with blowing agents having a reduction potential of the ozone layer higher than zero.   |
| 2.5.7f  | Thermal and acoustic insulating materials | The products considered in this study are not produced, formulated or applied by using lead-based catalysts.   |
| 2.5.7i  | Thermal and acoustic insulating materials | The products considered in this study are not produced using materials that should contain a minimum amount of recycled/reused material according to the list provided in the DM June 23 <sup>th</sup> 2022.         |
|   |   |  |
| 2.6.2   | Dismantling and removal of the materials  | All the products considered in this EPD, after the dismantling operations, can be fully sent to reuse, recovery and recycling operations.  |

Note: the other requirements imposed by the Minimum Environmental Criteria are not reported since not applicable for this specific product.

|   |  |   |  |
|---|--|---|--|
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