
# ENVIRONMENTAL PRODUCT DECLARATION

***In accordance with ISO 14025 and EN 15804:2012+A2:2019 for***

## CONPLAN ECO F

EPD® THE INTERNATIONAL EPD® SYSTEM

ECO PLATFORM EPD EN 15804 VERIFIED

epd-norge.no
The Norwegian EPD Foundation

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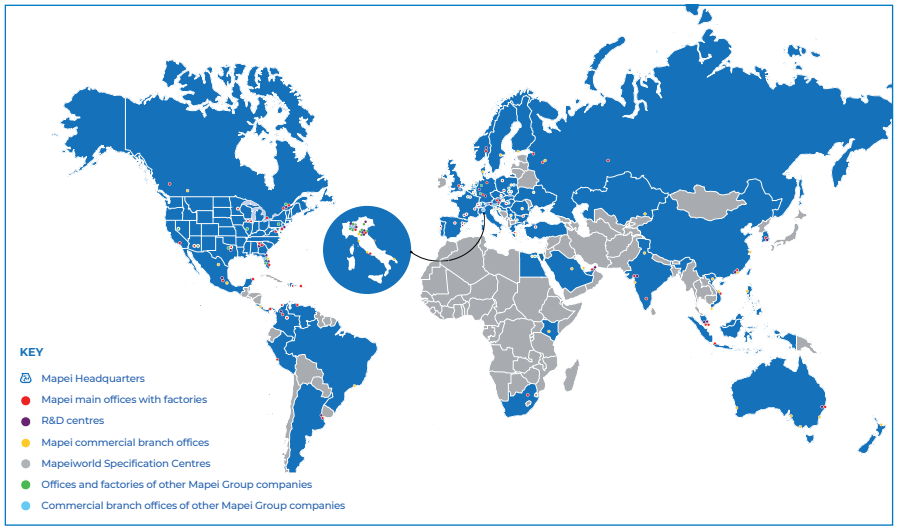
MAPEI®
ADHESIVES · SEALANTS · CHEMICAL PRODUCTS FOR BUILDING

# 1. COMPANY DESCRIPTION / GOAL & SCOPE

Founded in 1937 in Milan, Italy, Mapei produces adhesives and complementary products for laying all types of floor, wall and coating materials, and also specializes in other chemical products used in the building industry, such as waterproofing products, specialty mortars, admixtures for concrete, cement additives, products for underground constructions and for the restoration of concrete and historical buildings.

There are currently 90 subsidiaries in the Mapei Group, with a total of 83 production facilities located around the world in 36 different countries and in 5 different continents. Mapei also has 31 central laboratories. Most locations are ISO 9001 and ISO 14001 or EMAS-certified.

Mapei invests 12% in its company's total work-force and 5% of its turnover in Research & Development; in particular, 70% of its R&D efforts are directed to develop eco-sustainable and environmentally friendly products, which give important contribution to all major green rating systems for eco-sustainable buildings such as LEED and BREEAM.




**LEED V4** is the latest version of Leadership in Environmental and Energy Design, an American protocol that enables buildings to be certified as eco-sustainable according to parameters and credits described in the most widely adopted green building criteria in the world. Issued by the GBC US, it is mandatory for all LEED projects registered after October 2016.

Numerous changes have been made to the previous version: Mapei products play a part in obtaining important credits thanks to their EPD's (type III environmental declarations) and their products with very low emission of VOC.

Launched in the UK in 1990, **BREEAM** (BRE Environmental Assessment Method) is a protocol for sustainable building practices adopted mainly in the United Kingdom and in Scandinavian countries with the version BREEAM NOR.

By adopting this protocol, thanks to their EPD's and very low emission of VOC, Mapei products help towards obtaining relative credits.

Furthermore, Mapei has developed a sales and technical service network with offices all over the world and offers an efficient Technical Assistance Service that is valued by architects, engineers, contractors and owners.

Mapei Nordic production site is located in Sagstua, Norway. The production site consists of 5 factories: two factories for powder-based products, two factories for liquid admixtures and one factory for thermosetting plastic-based products.

The total size of the buildings is 24.000 sqm. The energy in these factories are provided from water electricity, geothermal heating and remaining approximately 10 % heated by bio oil.
Mapei Nordic focuses both on energy and on logistic optimisation, as for example the systematic Lean based improvement work. With 60 – 80 trailers per day, and 600 transport lines, requires Mapei to work actively on optimizing our logistic process.
The goal of the study is to provide necessary data and documentation to produce an EPD according to the requirements of PCR Environdec (version 1.11, 2021-02-05) under EN 15804:2012+A2:2019 and to have more comprehension about the environmental impacts related to **Conplan Eco F** manufactured in Mapei AS located in Sagstua (NO), including packaging of the finished products.
Target audiences of the study are customers and other parties with an interest in the environmental impacts of **Conplan Eco F**. This analysis shall not support comparative assertions intended to be disclosed to the public.

## 2. PRODUCT DESCRIPTION

**Conplan Eco F** is a cement-based pumpable, smoothing compound for fine levelling of substrates consisting of concrete. **Conplan Eco F** is supplied as dry mortar and is composed of cement, sand up to 0.4 mm, plasticising and adhesion-improving substances. The product is CE approved and classified as CT-C25-F7 in accordance with EN 13813.
**Conplan Eco F** is available in 20 kg multiply-bag.
For more information about the product see the TDS (Technical Data Sheet) on Mapei AS website (www.mapei.com/NO).

## 3. CONTENT DECLARATION

The main components and ancillary materials of the product included in this EPD are the following:

*Table 1: Composition referred to 1 kg of finished product with packaging*

| Materials | Percentage (%) by mass |
|---|---|
| Inorganic binders | 15 – 30% |
| Organic binders | < 3% |
| Fillers | 60 – 80% |
| Additives | < 2 % |
| **Packaging** | **Percentage (%) by mass** |
| Paper bag (CA/PE/CA) | < 0,5% |
| Wrapping material (LD-PE) | < 0,08% |
| Pallet (WOOD) | < 2,5% |

The product contains in a concentration higher than 0,1% (by unit weight) neither carcinogenic substances nor substances of very high concern (SVHC) on the REACH Candidate List published by the European Chemicals Agency.

## 4. DECLARED UNIT AND REFERENCE SERVICE LIFE

**The declared unit is 1 kg of finished product with packaging.**

Due to the selected system boundary, the reference service life of the product is not specified.

## 5. SYSTEM BOUNDARIES AND ADDITIONAL TECHNICAL INFORMATION

The approach is “cradle to gate with modules C1–C4 and module D” (A1–A3 + C + D):

- A1, A2, A3 (Product stages): extraction and processing of raw materials and packaging (A1), transportation up to the factory gate (A2), manufacturing of the finished product (A3).
- C1, C2, C3, C4 (End of Life stages): with a collection rate of 100% as C&D waste, the transports are carried out by lorry over 100 km (C2). A recycling ratio (C3) of 70% is considered in accordance with the European Directive 2008/98/CE. The remaining 30% is landfilled (C4).
- D (Resource recovery stage): contains credits from the recycling of the mortar in module C3. The mortar is collected and recycled for use in substitution of virgin raw aggregates.

*Figure 1: Restaurant Under (Lindesnes, Norge)*

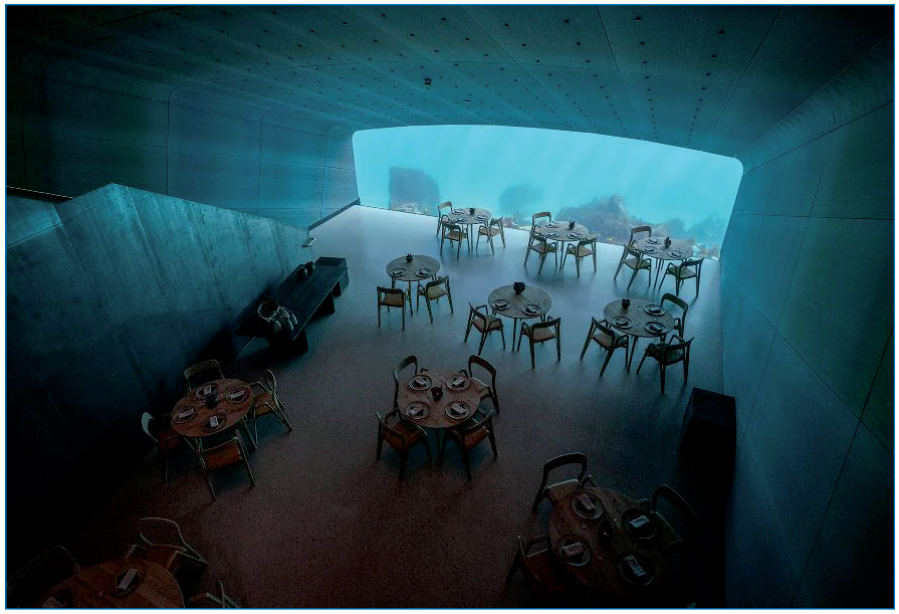


*Table 2: System boundaries*

| | 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 | MND | MND | MND | MND | MND | MND | MND | MND | MND | X | X | X | X | X |
| Geography | EU, NO | EU, NO | NO | - | - | - | - | - | - | - | - | - | EU | EU | EU | EU | EU |
| Specific data | > 90% | | | | | - | - | - | - | - | - | - | - | - | - | - | - |
| Variation – products | Not-relevant | | | | | - | - | - | - | - | - | - | - | - | - | - | - |
| Variation – sites | Not-relevant | | | | | - | - | - | - | - | - | - | - | - | - | - | - |

*MND: Module Not Declared*

A brief description of production process is the following:

The production process starts from raw materials, that are purchased from external and intercompany suppliers and stored in the plant. Bulk raw materials are stored in specific silos and added automatically in the production mixer, according to the formula of the product. Other raw materials, supplied in bags, big bags or tanks, are stored in the warehouse and added automatically or manually in the mixer. The production is a discontinuous process, in which all the components are mechanically mixed in batches. The semi-finished product is then packaged, put on wooden pallets and stored in the finished products warehouse. The quality of final products is controlled before the sale.

*Figure 2: Production process detail - © Photo Halvor Gudim*

## 6. CUT-OFF RULES AND ALLOCATION

Criteria for the exclusion of inputs and outputs (cut-off rules) in the LCA, information modules and any additional information are intended to support an efficient calculation procedure. They are not applied in order to hide data. Cut-off criteria, where applied, are described in Table 3.

*Table 3: Cut-off criteria*

| Process excluded from study | Cut-off criteria | Quantified contribution from process |
|---|---|---|
| A3: production (auxiliary materials) | Less than $10^{-5}$ kg/kg of finished product | Sensitivity study demonstrates a relative contribution lower than 0,5% |
| A3: particle emission | Less than $10^{-4}$ kg/kg of finished product | Sensitivity study demonstrates a relative contribution lower than 0,5% |

For the allocation procedure and principles consider the following table (Table 4):

*Table 4: Allocation procedure and principles*

| Module | Allocation Principle |
|---|---|
| A1 | All data are referred to 1 kg of product<br>A1: electricity is allocated to the specific production line |
| A3 | All data are referred to 1 kg of packaged product<br>A3-wastes: all data are allocated to the whole production plant |

# 7. ENVIRONMENTAL PERFORMANCE AND INTERPRETATION

**GWP**

### Climate change

GWPtotal - Global Warming Potential refers to the emission/presence of GHGs (greenhouse gases) in the atmosphere (mainly $CO_2$, $N_2O$, $CH_4$) which contribute to the increase in the temperature of the planet.
GWP-total considers:
- GWP-fossil
- GWP-biogenic
- GWP-LULUC (land use and land use change)

**ODP**

### Ozone Depletion

Ozone Depletion Potential refers to the degradation of the stratospheric layer of the ozone involved in blocking the UV component of sunrays. Depletion is due to particularly reactive components that originate from chlorofluorocarbon (CFC) or chlorofluoromethane (CFM).

**AP**

### Acidification

Acidification Potential refers to the emission of specific acidifying substances (i.e. NOx, SOx) in the air. These substances decrease the pH of the rainfall with predictable damages to the ecosystem.

**EP**

### Eutrophication

Eutrophication Potential refers to the nutrient enrichment, which determines unbalance in ecosystems and causes the death of the fauna and decreased biodiversity in flora.
It considers:
- EP-freshwater: acquatic freshwater
- EP-marine: acquatic marine
- EP-terrestrial

**POCP**

### Photochemical ozone formation

The Photochemical Ozone Creation Potential is the ozone formation in low atmosphere. This is quite common in the cities where a great amount of pollutants (like VOC and NOx) are emitted every day (industrial emissions and vehicles). It is mainly diffused during the summertime.

**ADP minerals&metals**

### Depletion of abiotic resources – minerals and metals

Abiotic Depletion Potential elements refers to the depletion of the mineral resources.

**ADP - fossil**

### Depletion of abiotic resources – fossil fuel

Abiotic Depletion Potential fossil fuel refers to the depletion of the fossil fuel resources.

**WDP**

### Water use

It expresses the potential deprivation of water, that consists in not having the water needs satisfied.

The following tables show the environmental impacts for the products considered according to the requirements of EN15804:2012+A2:2019. The results are referred to the declared unit (see § 4). The additional environmental indicators are not declared.

## CONPLAN ECO F

(1 kg of product in multiply-bag)

*Table 5: Conplan Eco F: Potential environmental impact – mandatory indicators according to EN 15804 referred to 1 kg of product in multiply-bag*

| Indicator | Unit | A1-A3 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|
| **$GWP_{TOTAL}$** | (kg $CO_2$ eq.) | 2,86E-01 | 2,71E-03 | 6,88E-03 | 1,84E-03 | 4,53E-03 | -1,03E-02 |
| $GWP_{FOSSIL}$ | (kg $CO_2$ eq.) | 3,14E-01 | 2,67E-03 | 6,83E-03 | 1,82E-03 | 4,54E-03 | -1,03E-02 |
| $GWP_{BIOGENIC}$ | (kg $CO_2$ eq.) | -2,83E-02 | 3,65E-05 | -8,14E-06 | 5,95E-07 | -1,32E-04 | -3,21E-05 |
| $GWP_{LULUC}$ | (kg $CO_2$ eq.) | 2,92E-04 | 7,29E-06 | 5,59E-05 | 1,26E-05 | 1,33E-05 | -7,67E-06 |
| ODP | (kg CFC 11 eq.) | 5,25E-10 | 1,05E-16 | 1,35E-18 | 4,73E-18 | 1,76E-17 | -2,15E-17 |
| AP | (mol $H^+$ eq.) | 1,49E-03 | 3,53E-06 | 7,25E-06 | 1,76E-05 | 3,23E-05 | -1,07E-05 |
| $EP_{FRESHWATER}$ | (kg P eq.) | 2,52E-06 | 1,21E-08 | 2,03E-08 | 5,20E-09 | 7,62E-09 | -5,92E-09 |
| $EP_{FRESHWATER}$ | (kg $(PO_4)^{3-}$ eq.) | 7,72E-06 | 3,71E-08 | 6,23E-08 | 1,60E-08 | 2,34E-08 | -1,82E-08 |
| $EP_{MARINE}$ | (kg N eq.) | 2,72E-04 | 1,12E-06 | 2,30E-06 | 8,65E-06 | 8,39E-06 | -4,54E-06 |
| $EP_{TERRESTRIAL}$ | (mol N eq.) | 3,03E-03 | 1,18E-05 | 2,74E-05 | 9,51E-05 | 9,22E-05 | -5,01E-05 |
| POCP | (kg NMVOC eq.) | 8,34E-04 | 3,03E-06 | 6,24E-06 | 2,52E-05 | 2,54E-05 | -1,20E-05 |
| $ADP_{MINERALS\&METALS}$ | (kg Sb eq.) | 3,57E-08 | 1,19E-09 | 6,06E-10 | 2,00E-09 | 4,28E-10 | -1,01E-09 |
| $ADP_{FOSSIL}$ | (MJ) | 4,10E+00 | 3,85E-02 | 9,10E-02 | 3,56E-02 | 6,02E-02 | -1,73E-01 |
| WDP | ($m^3$ world eq.) | 3,93E-02 | 8,14E-04 | 6,34E-05 | 3,41E-04 | 4,87E-04 | -6,71E-05 |

**$GWP_{TOTAL}$**: Global Warming Potential total; **$GWP_{FOSSIL}$**: 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; **$EP_{FRESHWATER}$**: Eutrophication Potential, freshwater; **$EP_{MARINE}$**: Eutrophication Potential, marine; **$EP_{TERRESTRIAL}$**: Eutrophication Potential, terrestrial; **POCP**: Formation potential of tropospheric ozone; **$ADP_{MINERALS\&METALS}$**: Abiotic Depletion Potential for non-fossil resources; **$ADP_{FOSSIL}$**: Abiotic Depletion Potential for fossil resources; **WDP**: Water Deprivation Potential.

*Table 6: Conplan Eco F: Potential environmental impact – additional mandatory and voluntary indicators referred to 1 kg of product in multiply-bag*

| Indicator | Unit | A1-A3 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|
| **GWP-GHG** | (kg $CO_2$ eq.) | 2,97E-01 | 2,68E-03 | 6,91E-03 | 1,82E-03 | 4,56E-03 | -1,01E-02 |

**GWP-GHG**: The indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. This indicator is thus equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.

*Table 7: Conplan Eco F: Use of resources referred to 1 kg of product in multiply-bag*

| Indicator | Unit | A1-A3 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|
| PERE | MJ | 9,42E-02 | 2,73E-02 | 5,24E-03 | 2,62E-03 | 8,11E-03 | -6,12E-03 |
| PERM | MJ | 4,47E-01 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| PERT | MJ | 5,41E-01 | 2,73E-02 | 5,24E-03 | 2,62E-03 | 8,11E-03 | -6,12E-03 |
| PENRE | MJ | 4,08E+00 | 3,85E-02 | 9,14E-02 | 3,56E-02 | 6,02E-02 | -1,73E-01 |
| PENRM | MJ | 2,88E-02 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| PENRT | MJ | 4,11E+00 | 3,85E-02 | 9,14E-02 | 3,56E-02 | 6,02E-02 | -1,73E-01 |
| SM* | kg | 4,84E-03 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| RSF | MJ | 4,24E-02 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| NRSF | MJ | 5,16E-02 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| FW | $m^3$ | 9,98E-04 | 2,20E-05 | 6,00E-06 | 9,81E-06 | 1,49E-05 | -2,10E-05 |

**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 (primary energy and primary energy resources used as raw materials); **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 (primary energy and primary energy resources used as raw materials); **SM**: Use of secondary material; **RSF**: Use of renewable secondary fuels; **NRSF**: Use of non-renewable secondary fuels; **FW**: Net use of fresh water.

**Referred only to 1 kg of product without packaging*

*Table 8: Conplan Eco F: Waste production and output flows referred to 1 kg of product in multiply-bag*

| Indicator | Unit | A1-A3 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|
| HWD | kg | 7,50E-05 | 1,81E-11 | 4,81E-12 | 1,99E-12 | 6,39E-12 | -4,67E-11 |
| NHWD | kg | 2,72E-02 | 4,07E-05 | 1,43E-05 | 9,54E-06 | 3,00E-01 | -1,39E-02 |
| RWD | kg | 9,02E-05 | 1,37E-06 | 1,66E-07 | 4,60E-07 | 6,32E-07 | -6,62E-07 |
| Components for re-use | kg | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| Materials for recycling | kg | 1,20E-03 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| Materials for energy recovery | kg | 1,06E-03 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| Exported energy, electricity | MJ | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| Exported energy, thermal | MJ | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |

**HWD**: Hazardous waste disposed; **NHWD**: Non-Hazardous waste disposed; **RWD**: Radioactive waste disposed

*Table 9: Conplan Eco F: Information on biogenic carbon content at the factory gate referred to 1 kg of product in multiply-bag*

| Biogenic Carbon Content | Unit | Quantity |
|---|---|---|
| Biogenic carbon content in product | kg C | 0,00E+00 |
| Biogenic carbon content in packaging | kg C | 1,02E-02 |

Tables from 5 to 9 show absolute results for all the environmental categories considered.
The main environmental impacts of the products life cycle come from extraction and processing of raw materials (**module A1**). The Product stage (**module A3**) doesn't affect considerably the results.
The specific amounts of **recycled materials** used in the formulation of the Conplan Eco F are shown in the tables above as **SM** (Secondary Material) indicator.
An overview about the average contribution of the different modules considered in the system boundaries are shown in Table 10.

*Table 10: Some environmental impacts of Conplan Eco F*

| CONPLAN ECO F | A1-A3 | C1 | C2 | C3 | C4 | TOT |
|---|---|---|---|---|---|---|
| **CLIMATE CHANGE (total)** | 2,86E-01 | 2,71E-03 | 6,88E-03 | 1,84E-03 | 4,42E-03 | 0,301 kg $CO_2$ eq. |
| **ACIDIFICATION** | 1,49E-03 | 3,53E-06 | 7,25E-06 | 1,76E-05 | 3,23E-05 | 1,55E-03 mol $H^+$ eq. |
| **DEPLETION OF ABIOTIC RESOURCES (fossil)** | 4,10 | 3,985E-02 | 9,10E-02 | 3,56E-02 | 6,02E-02 | 4,33 MJ |
| **WATER USE** | 3,93E-02 | 8,14E-04 | 6,34E-05 | 3,41E-04 | 4,987E-04 | 4,10E-02 $m^3$ world eq. |

More details about electrical mix used in this EPD, is shown below

| | Data source | $GWP_{TOTAL}$ | Unit |
|---|---|---|---|
| Residual electricity grid mix (IT) – 2019 | AIB | 0,479* | kg $CO_2$-eqv/kWh |

**According to CML2001 - Apr. 2013*

# 8. DATA QUALITY

*Table 11: Data quality*

| Dataset & Geographical reference | Database (source) | Temporary reference |
|---|---|---|
| **A1; A3** | | |
| Inorganic Binders (NO, EU) | NEPD – 2275-1028-NO; Ecoinvent 3.6 | 2018 |
| Filler (EU) | Sphera Database; | 2020 |
| Additives (EU) | Sphera Database; ecoinvent 3.6 | 2020 |
| Electricity grid mix (NO) | Sphera Database | 2017 |
| Packaging components (EU) | Sphera Database; PlasticsEurope | 2005 - 2020 |
| **A2** | | |
| Truck, Euro 5, 27t payload (GLO) | Sphera Database | 2020 |
| Oceanic ship (27500 DWT – GLO) | Sphera Database | 2020 |
| Rail transport cargo (363t payload capacity – GLO) | Sphera Database | 2020 |
| Diesel for transport (EU) | Sphera Database | 2017 |
| Heavy Fuel Oil (EU) | Sphera Database | 2017 |
| Electricity grid mix (EU) | Sphera Database | 2017 |
| **C1 - C4** | | |
| Construction waste treatment (EU) | Sphera Database | 2020 |
| Construction waste dumping (EU) | Sphera Database | 2020 |
| Electricity grid mix (EU) | Sphera Database | 2017 |
| Truck, Euro 6, 9.3t payload (GLO) | Sphera Database | 2020 |
| Diesel for transport (EU) | Sphera Database | 2017 |

All data included in table above refer to a period between 2005 and 2020; the most relevant ones are specific from supplier, while the others (i.e. transport and minor contribution dataset), come from European and global databases.

All dataset are not more than 10 years old according to EN 15804 §6.3.8.2 “Data quality requirements”. Primary data concern the year 2020 and represent the whole annual production.

The Quality level concerning datasets used in the EPD can be considered as ”very good” or ”good” according to Annex E of the EN 15804 (current version); the only exception is represented by a packaging component which has a quality level classified as ”poor” in terms of time representativeness.

# 9. REQUISITE EVIDENCE

## 9.1 Indication for the calculation of Module A4 (Transport from the factory to the jobsite)

In order to calculate the impact related to the transport of 1 kg of product from the factory gate (Sagstua) to the jobsite, you can use the following formula:

*Transport Impact = EF (kg/DU) * distance (km)*

*Table 12: The EFs are related to 1 kg of product with packaging transported with truck Euro5*

| Impact Category | Unit | EF (Emission Factor) |
|---|---|---|
| **$GWP_{TOTAL}$** | (kg $CO_2$ eq.) | 4,83E-05 |
| $GWP_{FOSSIL}$ | (kg $CO_2$ eq.) | 4,80E-05 |
| $GWP_{BIOGENIC}$ | (kg $CO_2$ eq.) | -5,70E-08 |
| $GWP_{LULUC}$ | (kg $CO_2$ eq.) | 3,91E-07 |
| ODP | (kg CFC 11 eq.) | 9,45E-21 |
| AP | (mol $H^+$ eq.) | 1,44E-07 |
| $EP_{FRESHWATER}$ | (kg $(PO_4)^{3-}$ eq.) | 1,42E-10 |
| $EP_{MARINE}$ | (kg N eq.) | 6,53E-08 |
| $EP_{TERRESTRIAL}$ | (mol N eq.) | 7,30E-07 |
| POCP | (kg NMVOC eq.) | 1,30E-07 |
| $ADP_{MINERALS\&METALS}$ | (kg Sb eq.) | 4,24E-12 |
| $ADP_{FOSSIL}$ | (MJ) | 6,38E-04 |
| WDP | ($m^3$ world eq.) | 4,44E-07 |

Example:
If the product is delivered from Sagstua (production plant) to Oslo (Jobsite) for around 90 km, the GWP impact result is:

$$GWP_{TOTAL} = 4,83E\text{-}05 * 90\ km = 4,35E\text{-}03\ kg\ CO_2eq$$

## 9.2 VOC EMISSIONS

Volatile Organic Compounds (VOC) special tests and evidence have been carried out on the two products, according to ISO 16000 parts 3, 6, 9 and 11 and EN 16516.

The product has been evaluated in emission chambers, in order to detect their VOC emissions after 3 and 28 days storage in the ventilated chambers, according to GEV (Gemeinschaft Emissionskontrollierte Verlegewerkstoffe, Klebstoffe und Bauprodukte e.V.) test method. The following product meets the requirements for the emission class EMICODE® **EC1$^{PLUS}$**, as "very low emission", released by GEV:

- **Conplan Eco F**: license number 3473

Next table describes the limits for the EMICODE® EC1 class:

*Table 13: EC1 VOC limits*

| Indicator | 3 days µg/m³ | 28 days µg/m³ |
|---|---|---|
| **TVOC (C6-C16)** | ≤ 750 µg/m³ | ≤ 60 µg/m³ |
| **TSVOC (C16-C22)** | | ≤ 40 µg/m³ |
| **C1A-C1B substances** | Total ≤ 10 µg/m³ | Single substance ≤ 1 µg/m³ |
| **Formaldehyde/ acetaldehyde** | ≤ 50 µg/m³ | |
| **Sum of formaldehyde/acetaldehyde** | ≤ 50 ppb | |
| **sum of non-assessable VOCs** | | ≤ 40 |
| **R value** | | ≤ 1 |

# 10. DIFFERENCES VERSUS PREVIOUS VERSIONS

In this version, new primary data referred to 2020 has been adopted; more info regarding the end of life stages and module D has been added in chapter 5. Moreover, additional data quality information has been included in chapter 8. Minor editorial changes have been made in the document.

## 11. VERIFICATION AND REGISTRATION

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.

| CEN standard EN15804 served as the Core Product Category Rules (PCR) | |
|---|---|
| PCR: | PCR 2019:14 Construction products (EN 15804:A2), Version 1.11, 2021-02-05, UN CPC code 54 |
| PCR review was conducted by: | The Technical Committee of the International EPD® System. See www.environdec.com/TC for a list of members.<br>Review chair: Claudia A. Peña, University of Concepción, Chile. The review panel may be contacted via the Secretariat www.environdec.com/contact. |
| Independent third-party verification of the declaration and data, according to ISO 14025:2006: | ☒ EPD Process Certification<br>☐ EPD Verification |
| Third party verifier: | Certiquality S.r.l.<br>Number of accreditation: 003H rev15 |
| Accredited or approved by: | Accredia |
| Procedure for follow-up of data during EPD validity involves third-party verifier | ☒ Yes<br>☐ No |

## 12. REFERENCES


- EN 13813 SCREED MATERIAL AND FLOOR SCREEDS - SCREED MATERIAL - PROPERTIES AND REQUIREMENTS
- EN 15804: SUSTAINABILITY OF CONSTRUCTION WORKS - ENVIRONMENTAL PRODUCT DECLARATIONS - CORE RULES FOR THE PRODUCT CATEGORY OF CONSTRUCTION PRODUCTS
- EUROPEAN DIRECTIVE 2008/98/EC
- GENERAL PROGRAMME INSTRUCTIONS OF THE INTERNATIONAL EPD® SYSTEM. VERSION 3.01
- ISO 14025 ENVIRONMENTAL LABELS AND DECLARATIONS - TYPE III ENVIRONMENTAL DECLARATIONS - PRINCIPLES AND PROCEDURES
- ISO 14044 ENVIRONMENTAL MANAGEMENT – LIFE CYCLE ASSESSMENT – REQUIREMENTS AND GUIDELINES
- PCR 2019:14 CONSTRUCTION PRODUCTS (EN 15804: A2), UN CPC CODE 54; VERSION 1.11
- EUROPEAN RESIDUAL MIXES VERSION 1.1, 2020-09-08 (AIB: ASSOCIATION OF ISSUING BODIES

# CONTACT INFORMATION

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# ANNEX 1

# ANNEX 1*:* Self declaration from EPD owner

# Specific Norwegian requirements

## 1 Applied electricity data set used in the manufacturing phase

The electricity mix for the electricity used in manufacturing (A3) is the electricity grid mix

<0,479 kg $CO_2$ eqv/kWh>

## 2 Content of dangerous substances

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

☐ The product contains substances that are less than 0.1% by weight given by the REACH Candidate or the Norwegian priority list.

☐ The product contains dangerous substances more than 0.1% by weight given in the REACH candidate list or the Norwegian Priority List, concentrations is given in the EPD:

| **Dangerous substances from the REACH candidate list or the Norwegian Priority List** | **CAS No.** | **Quantity (concentration, wt%/FU(DU)).** |
|---|---|---|
| Substance 1 | | |
| Substance n | | |

## 3 Transport from the place of manufacture to a central warehouse

Transport distance, and $CO_2$-eqv./DU from transport of the product from factory gate to central warehouse in Oslo shall be given. The following table shall be included in the EPD:

| Type | Capacity utilisation (incl. return) % | Type of vehicle | Distance km | Fuel/Energy use | Unit | Value (l/t) | kg CO2-eqv./DU |
|---|---|---|---|---|---|---|---|
| Boat | | | | | | | |
| Truck | 85 | 27 tonn, EURO 5 | 95 | 0,0165 | l/tkm | 1,591 | 4,64E-03 |
| Railway | | | | | | | |
| Rail | | | | | | | |
| Air | | | | | | | |
| Total | 85 | 27 tonn, EURO 5 | 95 | 0,0165 | l/tkm | 1,591 | 4,64E-03 |

# 4 Impact on the indoor environment

☐ Indoor air emission testing has been performed; specify test method and reference:
☒ No test has being performed
☐ Not relevant; specify : the product is a waterproofing membranes for underground structures. It does not affect the indoor air quality.