



ENVIRONMENTAL PRODUCT DECLARATION

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

**PLANITOP INTONACO
ARMATO
PLANITOP HDM
RESTAURO
PLANITOP HDM MAXI**



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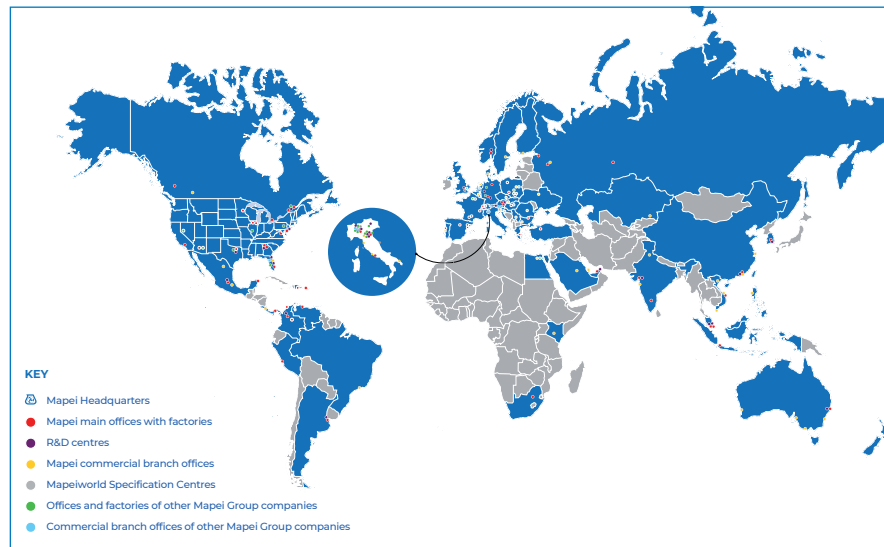


1. COMPANY DESCRIPTION / GOAL & SCOPE

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 100 subsidiaries in the Mapei Group, with a total of 86 production facilities located around the world in 35 different countries and in 5 different continents. Mapei also has 32 central laboratories. Most locations, including Mapei Australia, 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



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.

BREEAM[®] 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.

green rating systems for eco-sustainable buildings such as LEED and BREEAM.

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. The goal of the study is to provide necessary data and documentation to produce an EPD according to the requirements of PCR 2019:14 Environdec (version 1.11, 2021-02-05) under EN 15804:2012+A2:2019/AC:2021 and to have more comprehension about the environmental impacts related to **Planitop Intonaco Armato (A+B)**, **Planitop HDM Restauro (A+B)** and **Planitop HDM Maxi (A+B)**,

manufactured in Mapei S.p.A. located in Robbiano di Mediglia and Latina (Italy), including packaging of the finished products. Target audiences of the study are customers and other parties with an interest in the environmental impacts of the products studied. This analysis shall not support comparative assertions intended to be disclosed to the public.

2. PRODUCT DESCRIPTION

Planitop Intonaco Armato is a two-component ready-mixed high-ductility fibre-reinforced natural hydraulic lime (NHL) and eco-pozzolan mortar.

Planitop HDM Restauro is a two-component, pre-blended, high-ductility, fibre-reinforced, hydraulic lime (NHL) and eco-pozzolan-based light-coloured mortar.

Planitop HDM Maxi is a two-component ready-mixed, high ductility pozzolan reaction, fibre-reinforced mortar.

Products are supplied as follows:

- **Planitop Intonaco Armato (kit A+B)**: 25 kg multiplybag for powder and 5 kg HDPE tank for latex
- **Planitop HDM Restauro (kit A+B)**: 25 kg multiplybag for powder and 5 kg HDPE tank for latex
- **Planitop HDM Maxi (kit A+B)**: 25 kg multiplybag for powder and 6,25 kg HDPE tank for latex

For more information about the products see the TDS (Technical Data Sheet) on Mapei website.

3. CONTENT DECLARATION

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

Table 1: Composition referred to 1kg of packaged product

Materials	Percentage (%) by mass
Inorganic binders	<40% (up to 30% recycled pre-consumer)
Organic binders	<8%
Filler	<80%
Additives	<3%
Water	<20%
Packaging	Percentage (%) by mass
Paper (bag)	<0,3% (0,1% of biogenic carbon)
LDPE (bag and wrapping)	<0,1%
HDPE (canister)	<1%
Pallet (wood)	<2% (0,9% of biogenic carbon)

The products do not contain a concentration higher than 0,1% (by unit weight) of either carcinogenic substances or 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 products is not specified.

5. SYSTEM BOUNDARIES AND ADDITIONAL TECHNICAL INFORMATION

The approach is “cradle to gate” (A1–A3) with modules C1–C4 and module D and optional modules (A1–A3 + A4 – A5 + C + D):

- A1, A2, A3 (Product stage): extraction and processing of raw materials and packaging (A1), transportation up to the factory gate (A2), manufacturing of the finished product (A3).
- A4 – A5 (Construction process stage): transport of the finished product to final customers and installation into the building.
- C1, C2, C3, C4 (End of Life stage): 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 product in module C3. The product can be collected and recycled for use in substitution of virgin raw aggregates.

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	X	X	MND	MND	MND	MND	MND	MND	MND	X	X	X	X	X
Geography	IT	IT, EU	IT	EU	EU	-	-	-	-	-	-	-	EU	EU	EU	EU	EU
Specific data	> 90%					-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	Not-relevant					-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	<10%					-	-	-	-	-	-	-	-	-	-	-	-

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 1: production process

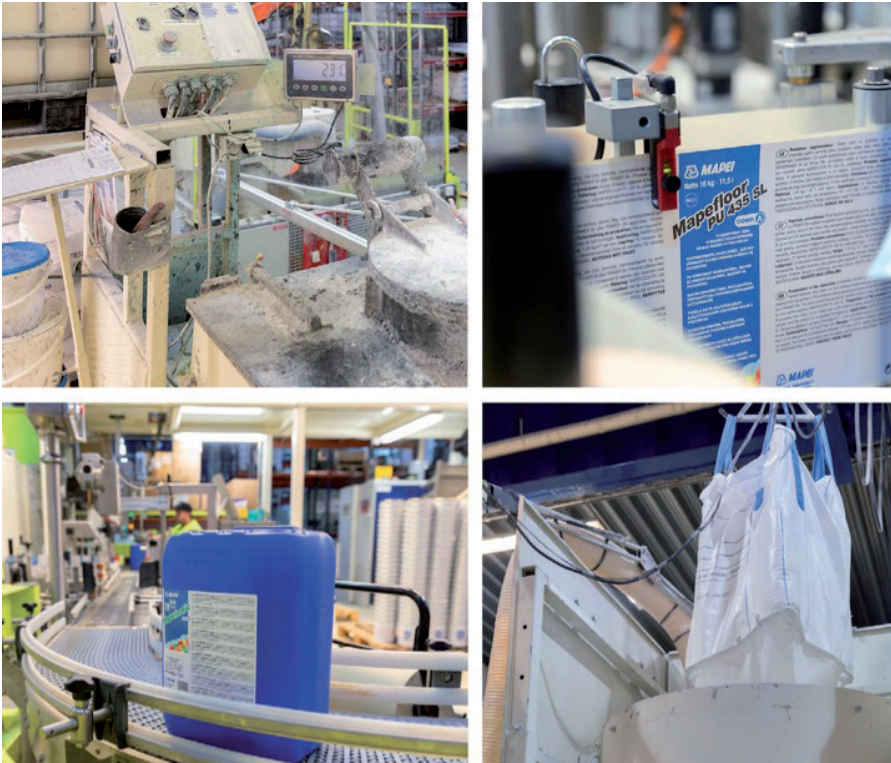


Table 3: Transport to the building site (A4)

Scenario information	Value	Unit
Means of transport: truck-trailer euro 5, gross weight 34-40 t, payload capacity 27 t		
Diesel consumption	0,002	l/100km
Transport distance	1000	km
Capacity utilisation (including empty runs)	85	%
Gross density of products transported	~ 1400	kg/m3
Capacity utilisation volume factor	1	-

Table 4: Installation into the building (A5)

Scenario information	Value	Unit
Ancillary materials for installation	0	kg
Water use	0	m3
Other resources use	0	kg
Electricity	0,0143	MJ
Waste materials on building site before waste processing, generated by the product's installation (specified by type)	0,01 (C&D) 0,003 (paper) 0,007 - 0,02 (wood) 0,0006 - 0,05 (plastics)	kg
Output materials (specified by type) as result of waste processing at the building site e.g., of collection for recycling, for energy recovery, disposal (specified by route)	0,019 (energy recovery) 0,0016 (recycle) 0,01 (disposal)	kg
Direct emission to ambient air, soil and water	0	kg

Table 5: End of Life (C1-C4)

Scenario information	Value	Unit
Collected separately	0	kg
Collected with mixed construction waste	1	kg
Reuse	0	kg
Recycling	0,70	kg
Energy recovery	0	kg
Landfill	0,30	kg
Transport to recycling	100	km
Transport to landfill	100	km

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 6.

Table 6: 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 (7):

Table 7: Allocation procedure and principles

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

The following tables show the environmental impacts for the products considered according to the requirements of EN15804:2012+A2:2019/AC:2021. The results are referred to the declared unit (see § 4). The additional environmental indicators are not declared.

PLANITOP INTONACO ARMATO (A+B)

(1 kg of product with packaging)

Table 8: Planitop Intonaco Armato (A+B): Potential environmental impact – mandatory indicators according to EN 15804 referred to 1 kg of product with packaging

Indicator	Unit	A1 – A3	A4	A5	C1	C2	C3	C4	D
GWP_{TOTAL}	(kg CO ₂ eq.)	2,72E-01	6,20E-02	3,61E-02	1,86E-03	8,96E-03	2,65E-03	4,36E-03	-1,00E-02
GWP _{FOSSIL}	(kg CO ₂ eq.)	2,79E-01	6,12E-02	2,00E-02	1,83E-03	8,85E-03	2,53E-03	4,33E-03	-9,97E-03
GWP _{BIOGENIC}	(kg CO ₂ eq.)	-9,08E-03	2,20E-04	1,61E-02	3,30E-05	3,17E-05	1,02E-04	1,62E-05	-3,21E-05
GWP _{LULUC}	(kg CO ₂ eq.)	1,80E-03	5,57E-04	3,46E-06	2,39E-07	8,02E-05	1,90E-05	1,34E-05	-6,47E-06
ODP	(kg CFC 11 eq.)	7,79E-08	7,82E-15	3,66E-14	4,10E-14	1,13E-15	4,24E-15	1,10E-14	-1,43E-14
AP	(mol H ⁺ eq.)	9,38E-04	1,94E-04	1,34E-05	2,45E-06	2,91E-05	1,32E-05	3,07E-05	-1,14E-05
EP _{FRESHWATER}	(kg P eq.)	3,01E-05	2,20E-07	1,11E-08	1,00E-08	3,17E-08	8,62E-09	8,71E-09	-6,67E-09
EP _{MARINE}	(kg N eq.)	2,18E-04	8,78E-05	4,99E-06	7,63E-07	1,31E-05	6,06E-06	7,93E-06	-4,96E-06
EP _{TERRESTRIAL}	(mol N eq.)	2,00E-03	9,88E-04	5,65E-05	8,38E-06	1,48E-04	6,70E-05	8,72E-05	-5,47E-05
POCP	(kg NMVOC eq.)	6,37E-04	1,75E-04	1,29E-05	1,99E-06	2,63E-05	1,65E-05	2,39E-05	-1,24E-05
ADP _{MINERALS&METALS} *	(kg Sb eq.)	1,48E-06	3,96E-09	3,24E-10	3,39E-10	5,70E-10	2,71E-09	1,99E-10	-2,50E-10
ADP _{FOSSIL} *	(MJ)	4,81E+00	8,19E-01	3,64E-02	2,75E-02	1,18E-01	4,98E-02	5,76E-02	-1,63E-01
WDP*	(m ³ world eq.)	6,95E-02	7,26E-04	2,90E-03	7,71E-04	1,05E-04	4,92E-04	4,75E-04	-7,22E-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.

* the results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is a limited experience with the indicator

Table 9: Planitop Intonaco Armato (A+B): Potential environmental impact – additional mandatory and voluntary indicators referred to 1 kg of product with packaging

Indicator	Unit	A1 – A3	A4	A5	C1	C2	C3	C4	D
GWP-GHG	(kg CO ₂ eq.)	2,76E-01	6,04E-02	1,99E-02	1,81E-03	8,72E-03	2,49E-03	4,26E-03	-9,87E-03

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 10: Planitop Intonaco Armato (A+B): Use of resources referred to 1 kg of product with packaging

Indicator	Unit	A1 – A3	A4	A5	C1	C2	C3	C4	D
PERE	MJ	4,56E-01	5,96E-02	2,31E-02	2,56E-02	8,58E-03	4,63E-03	9,39E-03	-8,16E-03
PERM	MJ	1,53E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	6,09E-01	5,96E-02	2,31E-02	2,56E-02	8,58E-03	4,63E-03	9,39E-03	-8,16E-03
PENRE	MJ	3,23E+00	8,22E-01	3,64E-02	2,75E-02	1,18E-01	5,00E-02	5,77E-02	-1,63E-01
PENRM	MJ	5,22E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ	3,75E+00	8,22E-01	3,64E-02	2,75E-02	1,18E-01	5,00E-02	5,77E-02	-1,63E-01
SM*	kg	2,50E-01	0,00E+00	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	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	0,00E+00	0,00E+00
FW	m3	1,38E-03	6,53E-05	7,05E-05	2,03E-05	9,40E-06	1,42E-05	1,46E-05	-2,15E-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 11: Planitop Intonaco Armato (A+B): Waste production and output flows referred to 1 kg of product with packaging

Indicator	Unit	A1 – A3	A4	A5	C1	C2	C3	C4	D
HWD	kg	4,94E-05	2,54E-12	3,38E-12	3,76E-12	3,67E-13	-1,29E-13	1,25E-12	-3,17E-11
NHWD	kg	9,87E-03	1,25E-04	1,25E-02	3,09E-05	1,80E-05	1,31E-05	2,88E-01	-1,40E-02
RWD	kg	2,34E-05	1,54E-06	1,35E-06	1,17E-06	2,22E-07	6,70E-07	6,57E-07	-7,40E-07
Components for re-use	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for recycling	kg	2,87E-03	0,00E+00	5,36E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for energy recovery	kg	0,00E+00	0,00E+00	1,43E-02	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	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	0,00E+00	0,00E+00

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

Table 12: Planitop Intonaco Armato (A+B): Information on biogenic carbon content at the factory gate referred to 1 kg of product with packaging

Biogenic Carbon Content	Unit	Quantity
Biogenic carbon content in product	kg C	0,00E+00
Biogenic carbon content in packaging	kg C	3,51E-03

PLANITOP HDM RESTAURO (A+B)

(1 kg of product with packaging)

Table 13: Planitop HDM Restauro (A+B): Potential environmental impact – mandatory indicators according to EN 15804 referred to 1 kg of product with packaging

Indicator	Unit	A1 – A3	A4	A5	C1	C2	C3	C4	D
GWP_{TOTAL}	(kg CO2 eq.)	2,51E-01	6,19E-02	3,58E-02	1,86E-03	8,96E-03	2,65E-03	4,36E-03	-1,00E-02
GWP_{FOSSIL}	(kg CO2 eq.)	2,63E-01	6,12E-02	1,96E-02	1,83E-03	8,85E-03	2,53E-03	4,33E-03	-9,97E-03
GWP_{BIOGENIC}	(kg CO2 eq.)	-1,42E-02	2,20E-04	1,62E-02	3,30E-05	3,17E-05	1,02E-04	1,62E-05	-3,21E-05
GWP_{LULUC}	(kg CO2 eq.)	1,75E-03	5,56E-04	3,42E-06	2,39E-07	8,02E-05	1,90E-05	1,34E-05	-6,47E-06
ODP	(kg CFC 11 eq.)	7,48E-08	7,82E-15	3,65E-14	4,10E-14	1,13E-15	4,24E-15	1,10E-14	-1,43E-14
AP	(mol H ⁺ eq.)	9,90E-04	1,94E-04	1,32E-05	2,45E-06	2,91E-05	1,32E-05	3,07E-05	-1,14E-05
EP_{FRESHWATER}	(kg P eq.)	3,00E-05	2,20E-07	1,11E-08	1,00E-08	3,17E-08	8,62E-09	8,71E-09	-6,67E-09
EP_{MARINE}	(kg N eq.)	2,12E-04	8,78E-05	4,91E-06	7,63E-07	1,31E-05	6,06E-06	7,93E-06	-4,96E-06
EP_{TERRESTRIAL}	(mol N eq.)	2,02E-03	9,87E-04	5,56E-05	8,38E-06	1,48E-04	6,70E-05	8,72E-05	-5,47E-05
POCP	(kg NMVOC eq.)	5,78E-04	1,75E-04	1,27E-05	1,99E-06	2,63E-05	1,65E-05	2,39E-05	-1,24E-05
ADP_{MINERALS&METALS}*	(kg Sb eq.)	1,43E-06	3,96E-09	3,24E-10	3,39E-10	5,70E-10	2,71E-09	1,99E-10	-2,50E-10
ADP_{FOSSIL}*	(MJ)	4,40E+00	8,18E-01	3,61E-02	2,75E-02	1,18E-01	4,98E-02	5,76E-02	-1,63E-01
WDP*	(m3 world eq.)	6,86E-02	7,26E-04	2,85E-03	7,71E-04	1,05E-04	4,92E-04	4,75E-04	-7,22E-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.

* the results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is a limited experience with the indicator

Table 14: Planitop HDM Restauro (A+B): Potential environmental impact – additional mandatory and voluntary indicators referred to 1 kg of product with packaging

Indicator	Unit	A1 – A3	A4	A5	C1	C2	C3	C4	D
GWP-GHG	(kg CO2 eq.)	2,60E-01	6,03E-02	1,96E-02	1,81E-03	8,72E-03	2,49E-03	4,26E-03	-9,87E-03

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 15: Planitop HDM Restauro (A+B): Use of resources referred to 1 kg of product with packaging

Indicator	Unit	A1 – A3	A4	A5	C1	C2	C3	C4	D
PERE	MJ	5,31E-01	5,96E-02	2,31E-02	2,56E-02	8,58E-03	4,63E-03	9,39E-03	-8,16E-03
PERM	MJ	1,54E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	6,85E-01	5,96E-02	2,31E-02	2,56E-02	8,58E-03	4,63E-03	9,39E-03	-8,16E-03
PENRE	MJ	2,89E+00	8,21E-01	3,62E-02	2,75E-02	1,18E-01	5,00E-02	5,77E-02	-1,63E-01
PENRM	MJ	5,01E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ	3,39E+00	8,21E-01	3,62E-02	2,75E-02	1,18E-01	5,00E-02	5,77E-02	-1,63E-01
SM*	kg	2,52E-01	0,00E+00	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	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	0,00E+00	0,00E+00
FW	m3	1,35E-03	6,52E-05	6,94E-05	2,03E-05	9,40E-06	1,42E-05	1,46E-05	-2,15E-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 16: Planitop HDM Restauro (A+B): Waste production and output flows referred to 1 kg of product with packaging

Indicator	Unit	A1 – A3	A4	A5	C1	C2	C3	C4	D
HWD	kg	5,09E-05	2,54E-12	3,37E-12	3,76E-12	3,67E-13	-1,29E-13	1,25E-12	-3,17E-11
NHWD	kg	1,12E-02	1,25E-04	1,25E-02	3,09E-05	1,80E-05	1,31E-05	2,88E-01	-1,40E-02
RWD	kg	1,50E-05	1,54E-06	1,34E-06	1,17E-06	2,22E-07	6,70E-07	6,57E-07	-7,40E-07
Components for re-use	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for recycling	kg	2,89E-03	0,00E+00	5,27E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for energy recovery	kg	0,00E+00	0,00E+00	1,40E-02	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	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	0,00E+00	0,00E+00

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

Table 17: Planitop HDM Restauro (A+B): Information on biogenic carbon content at the factory gate referred to 1 kg of product with packaging

Biogenic Carbon Content	Unit	Quantity
Biogenic carbon content in product	kg C	0,00E+00
Biogenic carbon content in packaging	kg C	3,53E-03

PLANITOP HDM MAXI (A+B)

(1 kg of product with packaging)

Table 18: Planitop HDM Maxi (A+B): Potential environmental impact – mandatory indicators according to EN 15804 referred to 1 kg of product with packaging

Indicator	Unit	A1 – A3	A4	A5	C1	C2	C3	C4	D
GWP_{TOTAL}	(kg CO ₂ eq.)	4,32E-01	6,22E-02	4,60E-02	1,86E-03	8,95E-03	5,01E-03	4,36E-03	-1,00E-02
GWP _{FOSSIL}	(kg CO ₂ eq.)	4,47E-01	6,14E-02	2,45E-02	1,83E-03	8,84E-03	2,53E-03	4,33E-03	-9,97E-03
GWP _{BIOGENIC}	(kg CO ₂ eq.)	-1,73E-02	2,20E-04	2,15E-02	3,30E-05	3,16E-05	2,46E-03	1,62E-05	-3,21E-05
GWP _{LULUC}	(kg CO ₂ eq.)	2,39E-03	5,58E-04	3,88E-06	2,39E-07	8,02E-05	1,90E-05	1,34E-05	-6,47E-06
ODP	(kg CFC 11 eq.)	1,14E-07	7,85E-15	3,74E-14	4,10E-14	1,13E-15	4,23E-15	1,10E-14	-1,43E-14
AP	(mol H ⁺ eq.)	1,57E-03	1,95E-04	1,59E-05	2,44E-06	2,90E-05	1,32E-05	3,07E-05	-1,14E-05
EP _{FRESHWATER}	(kg P eq.)	3,50E-05	2,20E-07	1,17E-08	1,00E-08	3,16E-08	8,62E-09	8,71E-09	-6,67E-09
EP _{MARINE}	(kg N eq.)	2,10E-04	8,81E-05	5,95E-06	7,62E-07	1,31E-05	6,06E-06	7,93E-06	-4,96E-06
EP _{TERRESTRIAL}	(mol N eq.)	1,76E-03	9,91E-04	6,75E-05	8,37E-06	1,48E-04	6,70E-05	8,72E-05	-5,47E-05
POCP	(kg NMVOC eq.)	7,36E-04	1,76E-04	1,54E-05	1,99E-06	2,63E-05	1,64E-05	2,39E-05	-1,24E-05
ADP _{MINERALS&METALS} *	(kg Sb eq.)	4,83E-06	3,97E-09	3,34E-10	3,39E-10	5,70E-10	2,71E-09	1,99E-10	-2,50E-10
ADP _{FOSSIL} *	(MJ)	5,49E+00	8,21E-01	3,90E-02	2,75E-02	1,18E-01	4,98E-02	5,76E-02	-1,63E-01
WDP*	(m ³ world eq.)	7,68E-02	7,29E-04	3,46E-03	7,70E-04	1,05E-04	4,92E-04	4,75E-04	-7,21E-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.

* the results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is a limited experienced with the indicator

Table 19: Planitop HDM Maxi (A+B): Potential environmental impact – additional mandatory and voluntary indicators referred to 1 kg of product with packaging

Indicator	Unit	A1 – A3	A4	A5	C1	C2	C3	C4	D
GWP-GHG	(kg CO ₂ eq.)	4,45E-01	6,06E-02	2,45E-02	1,81E-03	8,71E-03	2,49E-03	4,26E-03	-9,87E-03

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 20: Planitop HDM Maxi (A+B): Use of resources referred to 1 kg of product with packaging

Indicator	Unit	A1 – A3	A4	A5	C1	C2	C3	C4	D
PERE	MJ	5,34E-01	5,98E-02	2,36E-02	2,56E-02	8,58E-03	4,63E-03	9,39E-03	-8,16E-03
PERM	MJ	2,47E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	7,81E-01	5,98E-02	2,36E-02	2,56E-02	8,58E-03	4,63E-03	9,39E-03	-8,16E-03
PENRE	MJ	2,99E+00	8,25E-01	3,90E-02	2,75E-02	1,18E-01	4,99E-02	5,76E-02	-1,63E-01
PENRM	MJ	4,78E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ	3,46E+00	8,25E-01	3,90E-02	2,75E-02	1,18E-01	4,99E-02	5,76E-02	-1,63E-01
SM*	kg	3,32E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	MJ	1,20E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ	2,29E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m3	1,28E-03	6,55E-05	8,37E-05	2,03E-05	9,40E-06	1,42E-05	1,45E-05	-2,15E-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 21: Planitop HDM Maxi (A+B): Waste production and output flows referred to 1 kg of product with packaging

Indicator	Unit	A1 – A3	A4	A5	C1	C2	C3	C4	D
HWD	kg	2,86E-03	2,55E-12	3,45E-12	3,76E-12	3,66E-13	-1,29E-13	1,25E-12	-3,17E-11
NHWD	kg	1,14E-02	1,26E-04	1,31E-02	3,09E-05	1,80E-05	1,31E-05	2,88E-01	-1,40E-02
RWD	kg	1,14E-05	1,54E-06	1,44E-06	1,17E-06	2,21E-07	6,70E-07	6,57E-07	-7,39E-07
Components for re-use	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for recycling	kg	4,76E-03	0,00E+00	5,82E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for energy recovery	kg	0,00E+00	0,00E+00	1,79E-02	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	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	0,00E+00	0,00E+00

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

Table 22: Planitop HDM Maxi (A+B): Information on biogenic carbon content at the factory gate referred to 1 kg of product with packaging

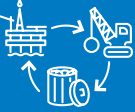
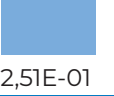
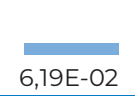
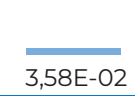
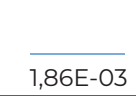
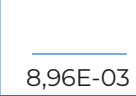
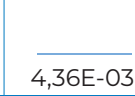
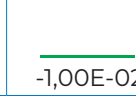
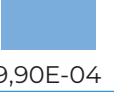
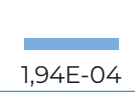
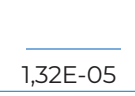
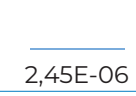
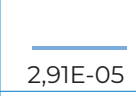
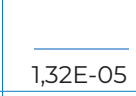
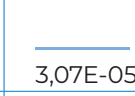
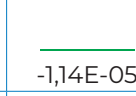
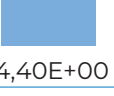
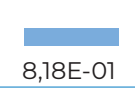
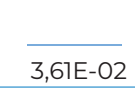
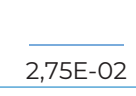
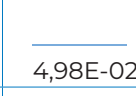
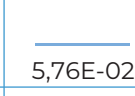
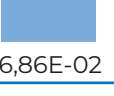
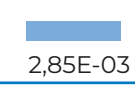
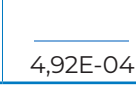
Biogenic Carbon Content	Unit	Quantity
Biogenic carbon content in product	kg C	0,00E+00
Biogenic carbon content in packaging	kg C	5,64 E-03

Tables from 7 to 22 show absolute results for all the environmental categories considered.

The main contribution to the environmental impact categories in the product life cycle comes from **module A1** (extraction and processing of raw materials). Its relative contribution is over 50% in all the categories and in most of them it's higher than 90%. Referring to the biogenic carbon stored in product and packaging, the negative impacts on GWP_{BIOGENIC} (in **modules A1** and **A3**) is compensated in the **modules A5** and **C3**, when the product and packaging reach their end of life. A minor contribution in GWP_{FOSSIL} and ADP_{FOSSIL} is due to the manufacturing process (**Module A3**).

An overview about the contribution to the different modules considered in the system boundaries are shown in Table 23.

Table 23: Some environmental impacts of Planitop HDM Restaura

ENVIRONMENTAL IMPACT	 A1-A3	 A4	 A5	 C1	 C2	 C3	 C4	 D	 TOT
CLIMATE CHANGE 	 2,51E-01	 6,19E-02	 3,58E-02	 1,86E-03	 8,96E-03	 7,61E-02	 4,36E-03	 -1,00E-02	3,61E-01 kg CO2 eq.
ACIDIFICATION 	 9,90E-04	 1,94E-04	 1,32E-05	 2,45E-06	 2,91E-05	 1,32E-05	 3,07E-05	 -1,14E-05	1,26E-03 mol H+ eq.
DEPLETION OF ABIOTIC RESOURCES (FOSSIL) 	 4,40E+00	 8,18E-01	 3,61E-02	 2,75E-02	 1,18E-01	 4,98E-02	 5,76E-02	 -1,63E-01	5,34E+00 MJ
WATER USE 	 6,86E-02	 7,26E-04	 2,85E-03	 7,71E-04	 1,05E-04	 4,92E-04	 4,75E-04	 -7,22E-05	7,40E-02 m3world eq.

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

	Data source	GWP-GHG	Unit
Residual electricity grid mix (IT) – 2022	AIB	0,564*	kg CO2-eqv/kWh

*CML2001 – Aug. 2016

8. DATA QUALITY

Table 24: Data quality

Dataset & Geographical reference	Database (source)	Temporary reference
A1; A3		
Binders (IT-EU)	Sphera Database; S-P-00880	2020-2022
Fillers (IT)	Sphera Database; Ecoinvent 3.8	2022
Additives (EU)	Ecoinvent 3.8	2022
Residual electricity grid mix (IT)	Sphera Database	2022
Packaging components (EU)	Sphera Database; Ecoinvent 3.8;	2022
A2		
Truck, Euro 5, 27t payload (GLO)	Sphera Database	2022
Light train, gross tonne weight 500t / 363t payload (GLO)	Sphera Database	2022
Oceanic ship (27500 DWT – GLO)	Sphera Database	2022
Diesel for transport (EU)	Sphera Database	2019
Heavy Fuel Oil (EU)	Sphera Database	2019
Electricity grid mix (EU)	Sphera Database	2019
A4		
Truck, Euro 5, 27t payload (GLO)	Sphera Database	2022
Diesel for transport (EU)	Sphera Database	2019
A5		
Commercial waste in municipal waste incineration plant	Sphera Database	2022
Inert matter on landfill	Sphera Database	2022
Electricity grid mix (EU)	Sphera database	2019
C1-C4		
Truck (EURO 6 - 9,3 ton payload – GLO)	Sphera Database	2022
Electricity grid mix (EU)	Sphera Database	2019
Diesel for transport (EU)	Sphera Database	2019
Construction waste dumping (EU)	Sphera Database	2022
Construction waste treatment (EU)	Sphera Database	2022

All data included in table above refer to a period between 2019 and 2022; 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”. 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). Primary data concern the year 2022 and represent the whole annual production.

9.ADDITIONAL INFORMATION

9.1 Recycled Content

Products	Recycled material content (Pre-Consumer)
Planitop Intonaco Armato	30% (in part A)
Planitop HDM Restauro	30% (in part A)
Planitop HDM Maxi	5% (in part A)

9.2 Disassembly

The finished product is potentially suitable for disassembly through selective demolition.

9.3 End of life / Recyclability

Our Multiply bags are recyclable up to 90% (ATICELCA class A) according to UNI 11743.

The finished products can be recycled at the end of life, after demolition, according to the national laws.



9.4 Biogenic Content

For **Planitop Intonaco Armato** the biogenic carbon content in packaging at the factory gate referred to 1 kg of product with packaging is 3,51E-03. For **Planitop HDM Restauro** the biogenic carbon content in packaging at the factory gate referred to 1 kg of product with packaging is 3,53E-03. For **Planitop HDM Maxi** the biogenic carbon content in packaging at the factory gate referred to 1 kg of product with packaging is 5,64 E-03.

10.DIFFERENCES VERSUS PREVIOUS VERSION

This revision has been updated according to the updated standard EN15804+A2AC2021, GPI 3.01 and the PCR 1.11 have been adopted. New primary data (referred to the reference year 2022) has been used for the calculations. These changes result in new content declaration table and new environmental impacts results.

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. 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 ☐ EPD Verification
Third party verifier:	Certiquality S.r.l. Number of accreditation: 003H rev15
Accredited or approved by:	Accredia
Procedure for follow-up of data during EPD validity involves third-party verifier	☒ Yes ☐ No

12. REFERENCES

- EN 15804: SUSTAINABILITY OF CONSTRUCTION WORKS - ENVIRONMENTAL PRODUCT DECLARATIONS - CORE RULES FOR THE PRODUCT CATEGORY OF CONSTRUCTION PRODUCTS
- EUROPEAN DIRECTIVE 2008/98/EC
- EUROPEAN RESIDUAL MIXES VERSION 1.0, 2022-05-31 (AIB: ASSOCIATION OF ISSUING BODIES)
- 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

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