



ENVIRONMENTAL PRODUCT DECLARATION

In accordance with ISO 14025 for

Silancolor Primer
Silancolor Base Coat
Silancolor Pittura
Silancolor Tonachino



Programme: The International EPD[®] System; www.environdec.com	Programme operator: EPD International AB	EPD registration number: S-P-01014	Publication date: 2017-12-05	Valid until: 2024-03-20	Geographical scope: International	Revision: 2019-03-21
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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, products for underground constructions and for the restoration of concrete and historical buildings.

There are currently 85 subsidiaries in the Mapei Group, with a total of 80 production facilities located around the world in 35 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's strategy of internationalization is based on two main objectives: being closer to local needs and lowering transportation costs. With the declared objective of being close to buyers and clients, Mapei's presence in the five continents enables the company to comply with the requirements of each location, and to use only locally-based managers and qualified personnel, without changing the approach of Mapei.

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.

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 Environdec (version 2.2, 2017-05-30) under EN 15804:2014 and to have more comprehension about the environmental impacts related to Silancolor Primer, Silancolor Base Coat, Silancolor Pittura and Silancolor Tonachino manufactured in Mapei S.p.A. located in Robbiano di Mediglia (Italy), in year 2017, including packaging of the finished products.

Target audiences of the study are customers and other parties with an interest in the environmental impacts of **Silancolor Primer**, **Silancolor Base Coat**, **Silancolor Pittura** and **Silancolor Tonachino**.

This analysis shall not support comparative assertions intended to be disclosed to the public.

2. PRODUCT DESCRIPTION

Silancolor Primer is a transpirant siloxane primer with a uniformly smooth finish.

Silancolor Base Coat is a water-repellent, coloured, siloxane undercoat with a uniformly rough finish and good filling properties, for internal and external surfaces.

Silancolor Pittura is a transpirant, water-repellent siloxane paint, resistant to aggressive environments, for internal and external surfaces.

Silancolor Tonachino is a transpirant, water-repellent, thick-layered siloxane coating with high filling properties, for internal and external surfaces. Available in the following grain-sizes: 0,7 mm – 1,2 mm, 1,5 mm e 2,0 mm. It complies with the requirements of EN 15824 ("Specifications for external renders and internal plasters based on organic binders") for internal and external use.

The products studied are all in white version and supplied as follows:

Silancolor Primer: bucket with 10 kg of paint on wooden pallet wrapped with LDPE.

Silancolor Base Coat, **Silancolor Pittura** and **Silancolor Tonachino**: bucket with 20 kg of product delivered on wooden pallet wrapped with LDPE.

3. CONTENT DECLARATION

The main components and ancillary materials of products studied are the following:

Table 1: Composition

Materials	Percentage (%)
Polymer dispersions	< 30
Fillers	< 70
Biocides	< 0,1
Pigments	< 15
Water	< 85
Other (additives & packaging)	< 5

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



Silancolor Primer
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SILANCOLOR SYSTEM: APPLICATION CYCLES EXAMPLES

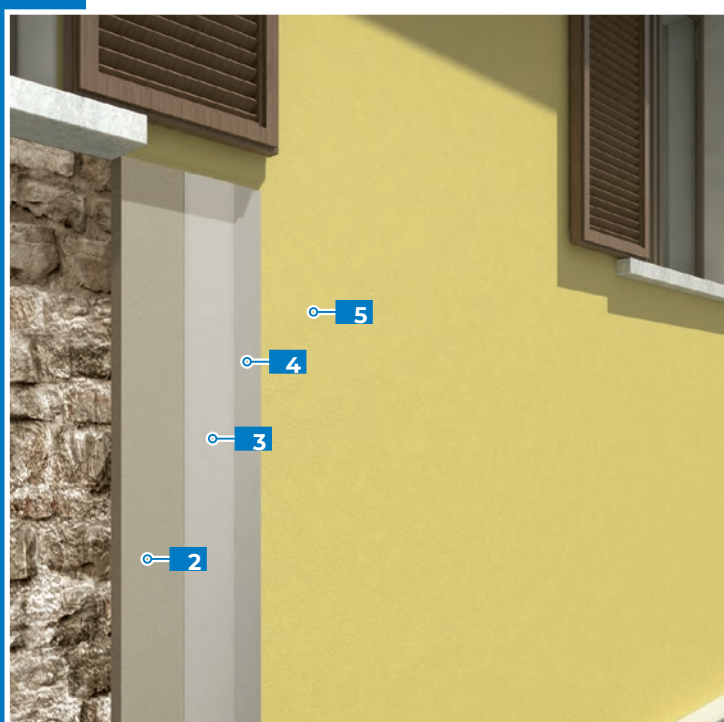


Finishing system for rendered brick walls

- 1 Brick wall
- 2 Render
Mape Wall Intonaco Base
- 3 Smoothing compound
Planitop 540
- 4 Coloured siloxane base coat
Silancolor Base Coat
- 5 Coloured siloxane coating
Silancolor Tonachino



Fig. 1



Finishing system for rendered stone walls

- 1 Stone wall
- 2 Structural render
Mape-Antique Strutturale NHL
- 3 Skimming mortar for fine finish
Mape-Antique FC Civile
- 4 Siloxane primer
Silancolor Primer
- 5 Siloxane paint
Silancolor Pittura



Fig. 2

4. DECLARED UNIT AND REFERENCE SERVICE LIFE

The declared unit (DU) is 1 m² of coating (packaging included).

Packaging materials include:

- Wooden pallet
- Polypropylene bucket
- LDPE for wrapping

The following table shows the amount used for DU (1 m²):

Table 2: Amount (kg) used for 1 m² (DU)

Products	Amount used for DU (kg)
Silancolor Primer	0,125
Silancolor Base Coat	0,400
Silancolor Pittura	0,400
Silancolor Tonachino (0,7mm)	1,850
Silancolor Tonachino (1,2 mm)	2,100
Silancolor Tonachino (1,5 mm)	2,400
Silancolor Tonachino (2,0 mm)	2,800

Note: average amount from technical data sheets

According to the system boundary applied the RSL is not specified in this study.

5. SYSTEM BOUNDARIES & ADDITIONAL TECHNICAL INFORMATION

The approach is “cradle to gate”. The following modules have been considered:

- A1-A3 (Product stage): extraction and transport of raw materials, packaging included, production process.

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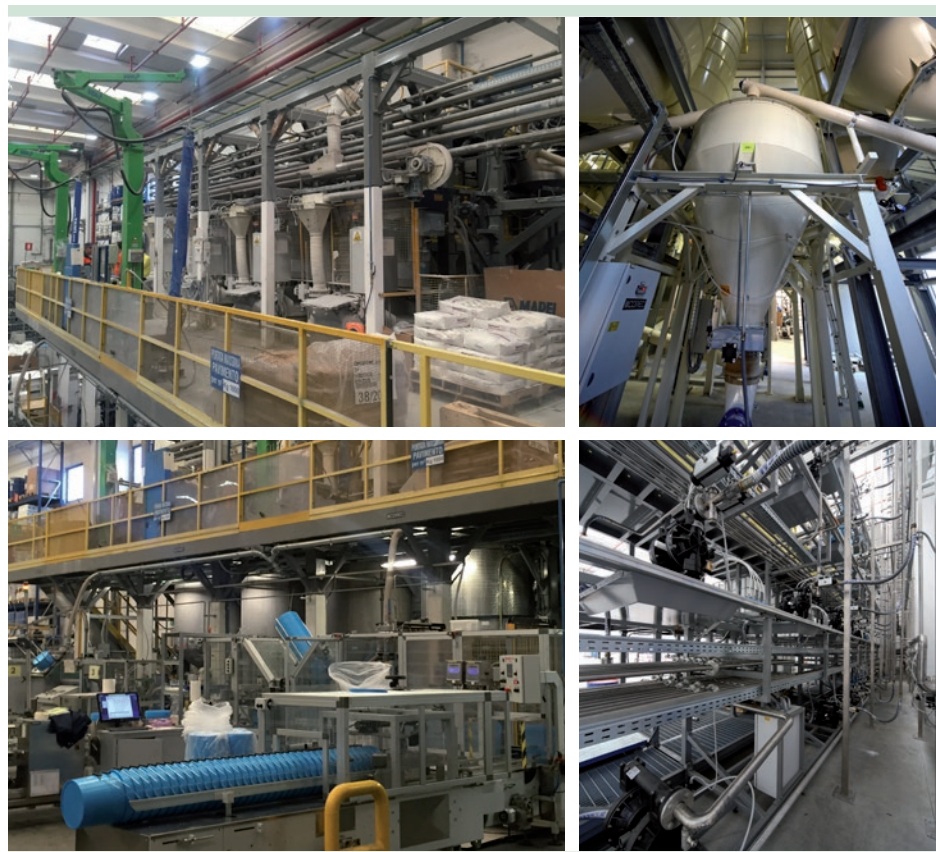
Table 3: System boundaries

System Boundaries													
A1 – A3			A4 – A5		B1 – B7					C1 – C4			
PRODUCT STAGE			CONSTRUCTION STAGE		USE STAGE					END OF LIFE STAGE			
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	C1	C2	C3	C4
Raw Material Supply	Transport	Manufacturing	Transport	Installation Process	Use	Maintenance	Repair	Replacement	Refurbishment	Deconstruction/ Demolition	Transport	Waste Processing	Disposal
					B6	Operational Energy Use							
					B7	Operational Water Use							

includedexcluded

A brief description of the production process, is the following:

Figure 3: Production process detail



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 4: Mediglia Plant



Silancolor Primer
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6. CUT-OFF RULES & 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. The procedure of exclusion of inputs and outputs is the following:

- All inputs and outputs to a unit process, for which data are available, are included in the calculation
- Cut-off criteria, where applied, are described in Table 4.

Input flows are covered for the whole formula.

Table 4: 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 contribute lower than 0,5%
A3: waste	less than 10^{-5} kg/kg of finished product	Sensitivity study demonstrates a contribute lower than 0,5%

For the allocation procedure and principles, consider the following table (Table 5):

Table 5: Allocation procedure and principles

Module	Allocation Principle
A1	All data are referred to 1 m ² of product • A1: electricity is allocated to the coating department
A3	All data are referred to 1 m ² of packaged product • A3-wastes: all data are allocated to the whole plant production

7. ENVIRONMENTAL PERFORMANCE & INTERPRETATION



GWP₁₀₀

Global Warming Potential refers to the emission/presence of GHGs (greenhouse gases) in the atmosphere (mainly CO₂, N₂O, CH₄) which contribute to the increase in the temperature of the planet.



AP

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



EP

Eutrophication Potential refers to the nutrient enrichment of flowing water, which determines unbalance in aquatic ecosystems and causes the death of the aquatic fauna.



ODP

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 chlorofluoromethanes (CFM).



POCP

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 NO_x) are emitted every day (industrial emissions and vehicles). It is mainly diffused during the summertime.



ADP_e (elements)

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



ADP_f (fossil fuel)

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

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Following tables show environmental impacts for the products considered according to CML methodology (2001 – Jan. 2016 ver. 4.7). All the results are referred to the declared unit (see § 4).

Silancolor Primer

Table 6: **Silancolor Primer**: Environmental categories referred to the declared unit

Environmental category	Unit	A1 – A3
 GWP₁₀₀	(kg CO ₂ eq.)	4,88E-02
 ADPe (element)	(kg Sb eq.)	7,68E-05
 ADPf (fossil)	(MJ)	1,06E+00
 AP	(kg SO ₂ eq.)	2,25E-04
 EP	(kg (PO ₄) ³ -eq.)	2,18E-05
 ODP	(kg R-11 eq.)	2,19E-08
 POCP	(kg ethylene eq.)	2,20E-05

GWP₁₀₀: Global Warming Potential; **ADPe**: Abiotic Depletion Potential (elements); **EP**: Eutrophication Potential; **AP**: Acidification Potential; **POCP**: Photochemical Ozone Creation Potential; **ODP**: Ozone Depletion Potential; **ADPf**: Abiotic Depletion Potential (fossil)

Table 7: **Silancolor Primer**: other environmental indicators referred to the declared unit

Environmental Indicator	Unit	A1-A3
RPEE	MJ	9,64E-02
RPEM	MJ	-
TPE	MJ	9,64E-02
NRPE	MJ	1,14E+00
NRPM	MJ	-
TRPE	MJ	1,14E+00
SM	kg	-
RSF	MJ	-
NRSF	MJ	-
W	m ³	6,49E-04

RPEE Renewable primary energy as energy carrier; **RPEM** Renewable primary energy as material utilisation; **TPE** Total use of renewable primary energy sources; **NRPE** Non-renewable primary energy as energy carrier; **NRPM** Non-renewable primary energy as material utilization; **TRPE** Total use of non-renewable primary energy sources; **SM** Use of secondary materials; **RSF** Renewable secondary fuels; **NRSF** Non-renewable secondary fuels; **W** Net use of fresh water

Table 8: **Silancolor Primer**: waste production and other output flows referred to the declared unit

Output flow	Unit	A1-A3
NHW	kg	9,56E-04
HW	kg	5,60E-07
RW	kg	0,00E+00
Components for re-use	kg	-
Materials for recycling	kg	-
Materials for energy recovery	kg	-
Exported energy	MJ	-

HW Hazardous waste disposed; **NHW** Non Hazardous waste disposed; **RW** Radioactive waste disposed

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Silancolor Base Coat

Table 9: **Silancolor Base Coat**: Environmental categories referred to the declared unit

Environmental category		Unit	A1 – A3
	GWP₁₀₀	(kg CO ₂ eq.)	2,18E-01
	ADPe (element)	(kg Sb eq.)	8,74E-04
	ADPf (fossil)	(MJ)	4,90E+00
	AP	(kg SO ₂ eq.)	2,72E-03
	EP	(kg (PO ₄) ³⁻ eq.)	1,31E-04
	ODP	(kg R-11 eq.)	9,93E-08
	POCP	(kg ethylene eq.)	1,43E-04

GWP₁₀₀: Global Warming Potential; **ADPe**: Abiotic Depletion Potential (elements); **EP**: Eutrophication Potential; **AP**: Acidification Potential; **POCP**: Photochemical Ozone Creation Potential; **ODP**: Ozone Depletion Potential; **ADPf**: Abiotic Depletion Potential (fossil)

Table 10: **Silancolor Base Coat**: other environmental indicators referred to the declared unit

Environmental Indicator	Unit	A1-A3
RPEE	MJ	3,18E-01
RPEM	MJ	-
TPE	MJ	3,18E-01
NRPE	MJ	5,20E+00
NRPM	MJ	-
TRPE	MJ	5,20E+00
SM	kg	-
RSF	MJ	-
NRSF	MJ	-
W	m ³	2,57E-03

RPEE Renewable primary energy as energy carrier; **RPEM** Renewable primary energy as material utilisation; **TPE** Total use of renewable primary energy sources; **NRPE** Non-renewable primary energy as energy carrier; **NRPM** Non-renewable primary energy as material utilization; **TRPE** Total use of non-renewable primary energy sources; **SM** Use of secondary materials; **RSF** Renewable secondary fuels; **NRSF** Non-renewable secondary fuels; **W** Net use of fresh water

Table 11: **Silancolor Base Coat**: waste production and other output flows referred to the declared unit

Output flow	Unit	A1-A3
NHW	kg	3,01E-03
HW	kg	1,77E-06
RW	kg	0,00E+00
Components for re-use	kg	-
Materials for recycling	kg	-
Materials for energy recovery	kg	-
Exported energy	MJ	-

HW Hazardous waste disposed; **NHW** Non Hazardous waste disposed; **RW** Radioactive waste disposed

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Silancolor Pittura

Table 12: **Silancolor Pittura**: Environmental categories referred to the declared unit

Environmental category		Unit	A1 – A3
	GWP₁₀₀	(kg CO ₂ eq.)	4,74E-01
	ADPe (element)	(kg Sb eq.)	1,29E-03
	ADPf (fossil)	(MJ)	8,73E+00
	AP	(kg SO ₂ eq.)	9,75E-03
	EP	(kg (PO ₄) ³⁻ eq.)	2,26E-04
	ODP	(kg R-11 eq.)	1,31E-07
	POCP	(kg ethylene eq.)	4,17E-04

GWP₁₀₀: Global Warming Potential; **ADPe**: Abiotic Depletion Potential (elements); **EP**: Eutrophication Potential; **AP**: Acidification Potential; **POCP**: Photochemical Ozone Creation Potential; **ODP**: Ozone Depletion Potential; **ADPf**: Abiotic Depletion Potential (fossil)

Table 13: **Silancolor Pittura**: other environmental indicators referred to the declared unit

Environmental Indicator	Unit	A1-A3
RPEE	MJ	6,41E-01
RPEM	MJ	-
TPE	MJ	6,41E-01
NRPE	MJ	9,47E+00
NRPM	MJ	-
TRPE	MJ	9,47E+00
SM	kg	-
RSF	MJ	-
NRSF	MJ	-
W	m ³	3,84E-03

RPEE Renewable primary energy as energy carrier; **RPEM** Renewable primary energy as material utilisation; **TPE** Total use of renewable primary energy sources; **NRPE** Non-renewable primary energy as energy carrier; **NRPM** Non-renewable primary energy as material utilization; **TRPE** Total use of non-renewable primary energy sources; **SM** Use of secondary materials; **RSF** Renewable secondary fuels; **NRSF** Non-renewable secondary fuels; **W** Net use of fresh water

Table 14: **Silancolor Pittura**: waste production and other output flows referred to the declared unit

Output flow	Unit	A1-A3
NHW	kg	3,01E-03
HW	kg	1,77E-06
RW	kg	0,00E+00
Components for re-use	kg	-
Materials for recycling	kg	-
Materials for energy recovery	kg	-
Exported energy	MJ	-

HW Hazardous waste disposed; **NHW** Non Hazardous waste disposed; **RW** Radioactive waste disposed

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Silancolor Tonachino

(Grain Size: 0,7 mm)

Table 15: **Silancolor Tonachino** (0.7 mm): Environmental categories referred to the declared unit

Environmental category	Unit	A1 – A3
 GWP₁₀₀	(kg CO ₂ eq.)	1,05E+00
 ADPe (element)	(kg Sb eq.)	4,03E-03
 ADPf (fossil)	(MJ)	2,27E+01
 AP	(kg SO ₂ eq.)	1,26E-02
 EP	(kg (PO ₄) ³ -eq.)	5,95E-04
 ODP	(kg R-11 eq.)	6,59E-07
 POCP	(kg ethylene eq.)	6,33E-04

GWP₁₀₀: Global Warming Potential; **ADPe**: Abiotic Depletion Potential (elements); **EP**: Eutrophication Potential;
AP: Acidification Potential; **POCP**: Photochemical Ozone Creation Potential; **ODP**: Ozone Depletion Potential;
ADPf: Abiotic Depletion Potential (fossil)

Table 16: **Silancolor Tonachino** (0.7 mm): other environmental indicators referred to the declared unit

Environmental Indicator	Unit	A1-A3
RPEE	MJ	1,66E+00
RPEM	MJ	-
TPE	MJ	1,66E+00
NRPE	MJ	2,40E+01
NRPM	MJ	-
TRPE	MJ	2,40E+01
SM	kg	-
RSF	MJ	-
NRSF	MJ	-
W	m ³	1,17E-02

RPEE Renewable primary energy as energy carrier; **RPEM** Renewable primary energy as material utilisation; **TPE** Total use of renewable primary energy sources; **NRPE** Non-renewable primary energy as energy carrier; **NRPM** Non-renewable primary energy as material utilization; **TRPE** Total use of non-renewable primary energy sources; **SM** Use of secondary materials; **RSF** Renewable secondary fuels; **NRSF** Non-renewable secondary fuels; **W** Net use of fresh water

Table 17: **Silancolor Tonachino** (0.7 mm): waste production and other output flows referred to the declared unit

Output flow	Unit	A1-A3
NHW	kg	1,39E-02
HW	kg	8,17E-06
RW	kg	0,00E+00
Components for re-use	kg	-
Materials for recycling	kg	-
Materials for energy recovery	kg	-
Exported energy	MJ	-

HW Hazardous waste disposed; **NHW** Non Hazardous waste disposed; **RW** Radioactive waste disposed

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Silancolor Tonachino

(Grain Size: 1,2 mm)

Table 18: **Silancolor Tonachino** (1,2 mm): Environmental categories referred to the declared unit

Environmental category	Unit	A1 – A3
 GWP₁₀₀	(kg CO ₂ eq.)	1,13E+00
 ADPe (element)	(kg Sb eq.)	4,57E-03
 ADPf (fossil)	(MJ)	2,51E+01
 AP	(kg SO ₂ eq.)	1,21E-02
 EP	(kg (PO ₄) ³ eq.)	6,49E-04
 ODP	(kg R-11 eq.)	7,25E-07
 POCP	(kg ethylene eq.)	6,38E-04

GWP₁₀₀: Global Warming Potential; **ADPe**: Abiotic Depletion Potential (elements); **EP**: Eutrophication Potential;
AP: Acidification Potential; **POCP**: Photochemical Ozone Creation Potential; **ODP**: Ozone Depletion Potential;
ADPf: Abiotic Depletion Potential (fossil)

Table 19: **Silancolor Tonachino** (1.2 mm): other environmental indicators referred to the declared unit

Environmental Indicator	Unit	A1-A3
RPEE	MJ	1,79E+00
RPEM	MJ	-
TPE	MJ	1,79E+00
NRPE	MJ	2,65E+01
NRPM	MJ	-
TRPE	MJ	2,65E+01
SM	kg	-
RSF	MJ	-
NRSF	MJ	-
W	m ³	1,24E-02

RPEE Renewable primary energy as energy carrier; **RPEM** Renewable primary energy as material utilisation;
TPE Total use of renewable primary energy sources; **NRPE** Non-renewable primary energy as energy carrier;
NRPM Non-renewable primary energy as material utilization; **TRPE** Total use of non-renewable primary energy sources;
SM Use of secondary materials; **RSF** Renewable secondary fuels; **NRSF** Non-renewable secondary fuels;
W Net use of fresh water

Table 20: **Silancolor Tonachino** 1.2 mm): waste production and other output flows referred to the declared unit

Output flow	Unit	A1-A3
NHW	kg	1,58E-02
HW	kg	9,27E-06
RW	kg	0,00E+00
Components for re-use	kg	-
Materials for recycling	kg	-
Materials for energy recovery	kg	-
Exported energy	MJ	-

HW Hazardous waste disposed; **NHW** Non Hazardous waste disposed; **RW** Radioactive waste disposed

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Silancolor Tonachino

(Grain Size: 1,5 mm)

Table 21: **Silancolor Tonachino** (1,5 mm): Environmental categories referred to the declared unit

Environmental category	Unit	A1 – A3
 GWP₁₀₀	(kg CO ₂ eq.)	1,34E+00
 ADPe (element)	(kg Sb eq.)	5,19E-03
 ADPf (fossil)	(MJ)	2,91E+01
 AP	(kg SO ₂ eq.)	1,38E-02
 EP	(kg (PO ₄) ³ -eq.)	1,11E-03
 ODP	(kg R-11 eq.)	8,07E-07
 POCP	(kg ethylene eq.)	7,63E-04

GWP₁₀₀: Global Warming Potential; **ADPe**: Abiotic Depletion Potential (elements); **EP**: Eutrophication Potential;
AP: Acidification Potential; **POCP**: Photochemical Ozone Creation Potential; **ODP**: Ozone Depletion Potential;
ADPf: Abiotic Depletion Potential (fossil)

Table 22: **Silancolor Tonachino** (1.5 mm): other environmental indicators referred to the declared unit

Environmental Indicator	Unit	A1-A3
RPEE	MJ	2,00E+00
RPEM	MJ	-
TPE	MJ	2,00E+00
NRPE	MJ	3,07E+01
NRPM	MJ	-
TRPE	MJ	3,07E+01
SM	kg	-
RSF	MJ	-
NRSF	MJ	-
W	m ³	1,83E-02

RPEE Renewable primary energy as energy carrier; **RPEM** Renewable primary energy as material utilisation; **TPE** Total use of renewable primary energy sources; **NRPE** Non-renewable primary energy as energy carrier; **NRPM** Non-renewable primary energy as material utilization; **TRPE** Total use of non-renewable primary energy sources; **SM** Use of secondary materials; **RSF** Renewable secondary fuels; **NRSF** Non-renewable secondary fuels; **W** Net use of fresh water

Table 23: **Silancolor Tonachino** (1.5 mm): waste production and other output flows referred to the declared unit

Output flow	Unit	A1-A3
NHW	kg	1,81E-02
HW	kg	1,06E-05
RW	kg	0,00E+00
Components for re-use	kg	-
Materials for recycling	kg	-
Materials for energy recovery	kg	-
Exported energy	MJ	-

HW Hazardous waste disposed; **NHW** Non Hazardous waste disposed; **RW** Radioactive waste disposed

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Silancolor Tonachino

(Grain Size: 2 mm)

Table 24: **Silancolor Tonachino** (2 mm): Environmental categories referred to the declared unit

Environmental category		Unit	A1 – A3
	GWP₁₀₀	(kg CO ₂ eq.)	1,41E+00
	ADPe (element)	(kg Sb eq.)	6,27E-03
	ADPf (fossil)	(MJ)	3,27E+01
	AP	(kg SO ₂ eq.)	1,49E-02
	EP	(kg (PO ₄) ³ eq.)	8,42E-04
	ODP	(kg R-11 eq.)	6,49E-07
	POCP	(kg ethylene eq.)	7,89E-04

GWP₁₀₀: Global Warming Potential; **ADPe**: Abiotic Depletion Potential (elements); **EP**: Eutrophication Potential; **AP**: Acidification Potential; **POCP**: Photochemical Ozone Creation Potential; **ODP**: Ozone Depletion Potential; **ADPf**: Abiotic Depletion Potential (fossil)

Table 25: **Silancolor Tonachino** (2 mm): other environmental indicators referred to the declared unit

Environmental Indicator	Unit	A1-A3
RPEE	MJ	2,30E+00
RPEM	MJ	-
TPE	MJ	2,30E+00
NRPE	MJ	3,46E+01
NRPM	MJ	-
TRPE	MJ	3,46E+01
SM	kg	-
RSF	MJ	-
NRSF	MJ	-
W	m ³	1,68E-02

RPEE Renewable primary energy as energy carrier; **RPEM** Renewable primary energy as material utilisation; **TPE** Total use of renewable primary energy sources; **NRPE** Non-renewable primary energy as energy carrier; **NRPM** Non-renewable primary energy as material utilization; **TRPE** Total use of non-renewable primary energy sources; **SM** Use of secondary materials; **RSF** Renewable secondary fuels; **NRSF** Non-renewable secondary fuels; **W** Net use of fresh water

Table 26: **Silancolor Tonachino** (2 mm): waste production and other output flows referred to the declared unit

Output flow	Unit	A1-A3
NHW	kg	2,11E-02
HW	kg	1,24E-05
RW	kg	0,00E+00
Components for re-use	kg	-
Materials for recycling	kg	-
Materials for energy recovery	kg	-
Exported energy	MJ	-

HW Hazardous waste disposed; **NHW** Non Hazardous waste disposed; **RW** Radioactive waste disposed

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Tables above (from Table 6 to Table 26) and following histograms (from Table 27 to Table 30) show absolute results and relative contribution for the environmental categories considered in this EPD. The module **A1** (raw materials extraction and processing) has the greatest contribution for all the environmental categories included in this study (up to 99%). Exception is represented by Silancolor Primer for which module **A3** has a relative contribution close to 60% in terms of GWP_{100} due to the lower impact of the module **A1**.

Considering ODP and ADPe, module **A1** highlights a relative contribution close to 100% for all the products included in this EPD.

A GWP_{100} detail (Table 31) shows that polymeric dispersions, pigments and additives give a significant contribution; also, biocides have a remarkable importance even though they are included in the formulas with a relative weight lower than 0,1%.

The module **A2** (raw materials transportation) gives a negative contribution to POCP due to the NO and NO₂ emission factors (for more details, see the methodology used: *HBEFA -Handbook Emission Factors for Road Transport*).

Table 27: Environmental Impact as percentage (**Silancolor Primer**)



Table 28: Environmental Impact as percentage (**Silancolor Base Coat**)



Table 29: Environmental Impact as percentage (**Silancolor Pittura**)



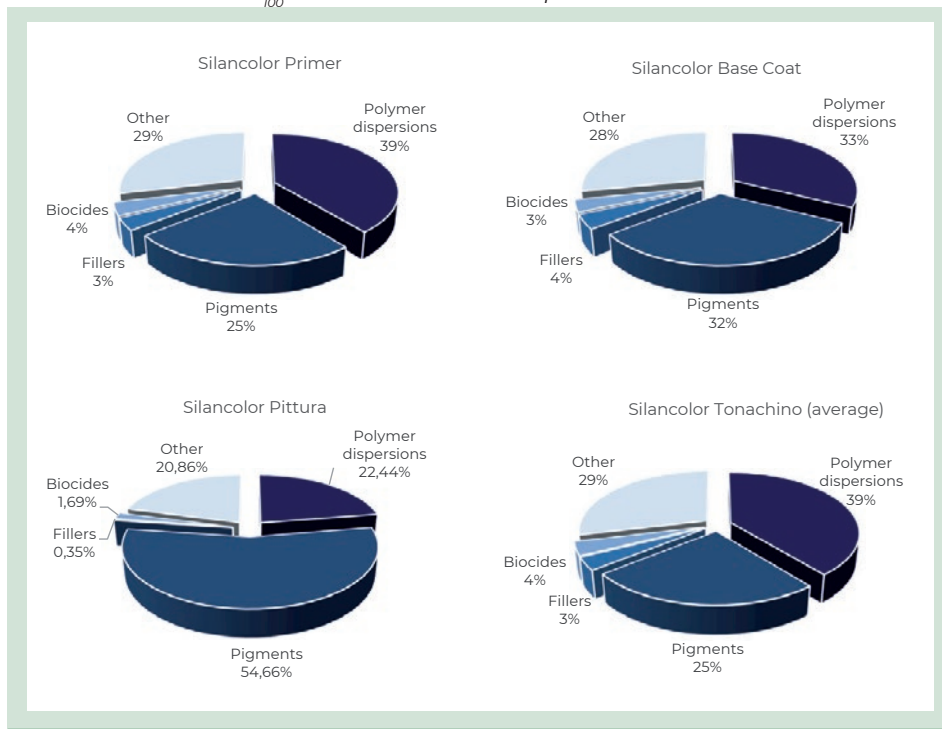
Silancolor Primer
Silancolor Base Coat
Silancolor Pittura
Silancolor Tonachino



Table 30: Environmental Impact as percentage (**Silancolor Tonachino** - average)



Table 31: Focus on GWP_{100} of the module A1 for the products studied



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

	Data source	Amount	Unit
Electricity grid mix (IT) – 2014	GaBi database	0,4020	kg CO ₂ -eqv/kWh
Electricity from photovoltaic (IT) – 2014	GaBi database	0,0641	kg CO ₂ -eqv/kWh

8. DATA QUALITY

Table 32: Data quality

Dataset & Geographical reference	Database (source)	Temporary reference
A1; A3		
Fillers (EU)	GaBi Database	2017
Additives (EU)	GaBi Database; ecoinvent 3.3	2013 – 2017
Polymer Dispersions (EU)	EcoProfile EPDLA	2015
Electricity grid mix (IT)	GaBi Database	2014
Electricity from photovoltaic (IT)	GaBi Database	2014
Additives & others (Packaging components)	GaBi Database; ecoinvent 3.3; PlasticsEurope	2005 – 2017
A2		
Truck transport (euro 3, 27t payload – GLO)	GaBi Database	2017
Diesel for transport (EU)	GaBi Database	2014

All data included in table above refer to a period between 2005 and 2017; the most relevant ones are European or 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 § 6.3.7 “Data quality requirements”). Unique exception is due to one packaging component coming from PlasticsEurope database.

Primary data concern the year 2017 and represent the whole annual production.

Silancolor Primer
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Silancolor Pittura
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9. SIGNIFICANT CHANGES FROM THE PREVIOUS VERSION

In this revision new primary data (referred to the reference year 2017) have been adopted and the last update of the CML methodology (version 4.7) has been used for calculation. In addition, GPI update to the 3.0 version has been considered. Due to these updates, Total Freshwater consumption and Primary energy from renewable resources indicators has changed more than 10%.

10. VERIFICATION AND REGISTRATION

EPD of construction products may not be comparable if they do not comply with EN 15804

Environmental product declarations within the same product category from different programs may not be comparable.

CEN standard EN15804 served as the core PCR

PCR:	PCR 2012:01 Construction products and Construction services, Version 2.2, 2017-05-30
PCR review was conducted by:	The Technical Committee of the International EPD® System. Chair: Massimo Marino Contact via info@environdedec.com
Independent verification of the declaration and data, according to ISO 14025	☒ EPD Process Certification (Internal) ☐ EPD Verification (external)
Third party verifier:	Certiquality S.r.l. Number of accreditation: 003H rev14
Accredited or approved by:	Accredia
Procedure for follow-up of data during EPD validity involves third-party verifier	☒ Yes ☐ No

11. REFERENCES

- EN 15804: SUSTAINABILITY OF CONSTRUCTION WORKS - ENVIRONMENTAL PRODUCT DECLARATIONS - CORE RULES FOR THE PRODUCT CATEGORY OF CONSTRUCTION PRODUCTS
- EN 15824: SPECIFICATIONS FOR EXTERNAL RENDERS AND INTERNAL PLASTERS BASED ON ORGANIC BINDERS
- GENERAL PROGRAMME INSTRUCTIONS OF THE INTERNATIONAL EPD® SYSTEM. VERSION 3.0
- HBEFA - HANDBOOK EMISSION FACTORS FOR ROAD TRANSPORT
- ISO 14025 ENVIRONMENTAL LABELS AND DECLARATIONS - TYPE III ENVIRONMENTAL DECLARATIONS - PRINCIPLES AND PROCEDURES
- ISO 14044 ENVIRONMENTAL MANAGEMENT – LIFE CYCLE ASSESSMENT – REQUIREMENTS AND GUIDELINES
- PCR 2012:01; “PRODUCT GROUP CLASSIFICATION: MULTIPLE UN CPC CODES CONSTRUCTION PRODUCTS AND CONSTRUCTION SERVICES”; VERSION 2.2

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