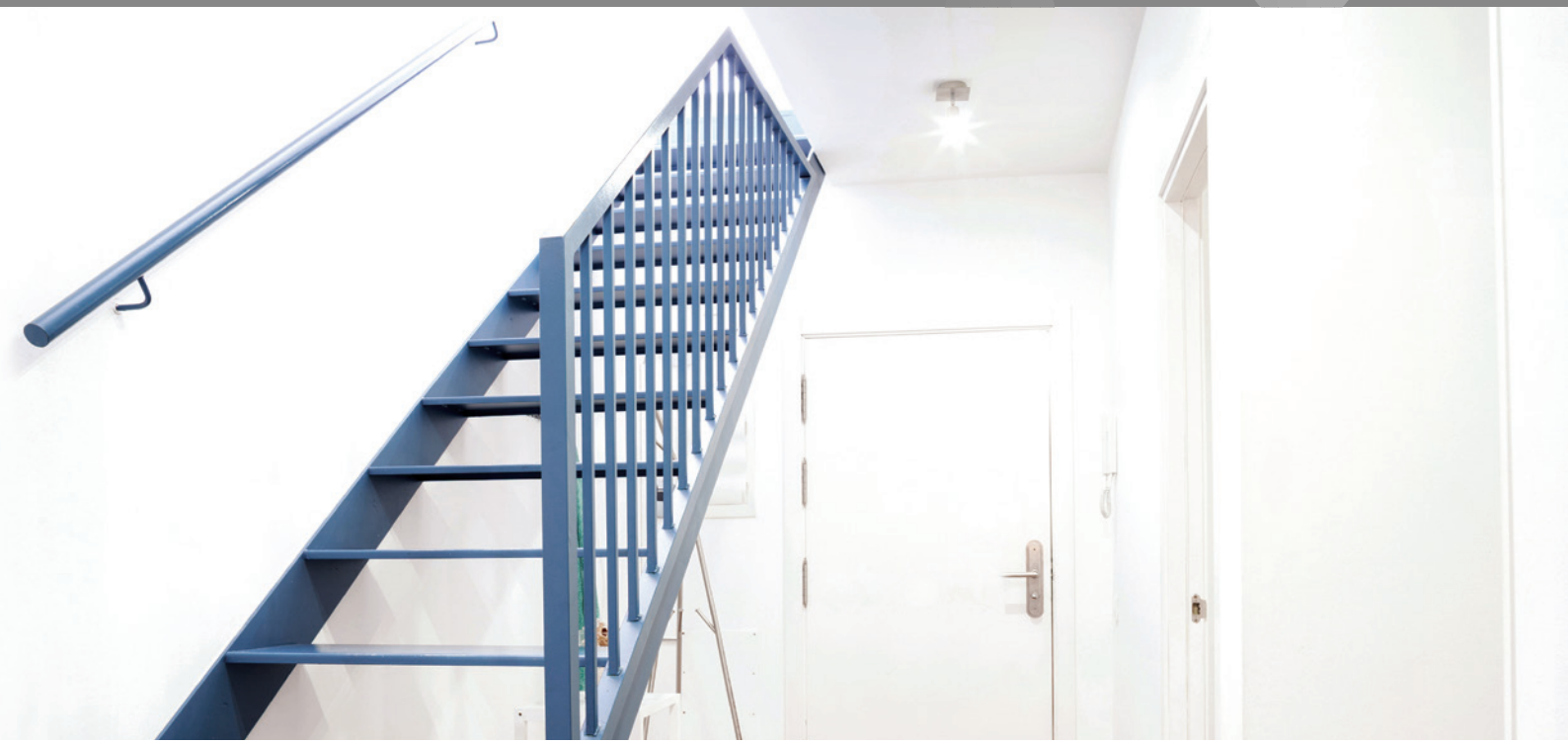
WATER-BASED ENAMELS



EPD® ENVIRONMENTAL PRODUCT DECLARATION
In accordance with ISO 14025 and EN 15804

EPD®
THE INTERNATIONAL EPD® SYSTEM

- **PCR 2019:14** - Construction products
- **CPC CODE:** 3511 - PAINTS AND VARNISHES AND RELATED PRODUCTS

- **PROGRAMME:** The International EPD® System - www.environdec.com
- **PROGRAMME OPERATOR:** EPD International AB
- **GEOGRAPHICAL SCOPE:** EUROPE
- **REGISTRATION N°:** S-P-02074

- **DATE OF PUBLICATION:** 24-09-2020
- **VALID UNTIL:** 07-01-2025

www.attivacolori.it

ENVIRONMENTAL PRODUCT DECLARATION

For Attiva, the search for increasingly eco-friendly solutions, in line with recent Italian and European legislation, translates into **formulations characterised by advanced technology and minimum environmental impact and with important international certifications.**

The Environmental Product Declaration or EPD® is a document issued by an **independent entity** that, based on a **Life Cycle Assessment (LCA)** of the products, provides relevant, verified and comparable information about their environmental impact in accordance with **ISO 14025**.

This declaration is classified as **"type III labelling"** according to ISO series 14020. It allows products to be evaluated in the framework of both public tenders and building sustainability certification systems.

The **EPD®** is:

- **OBJECTIVE:** Environmental performance is calculated using the life cycle analysis methodology, based on the standards set out in ISO 14040.
- **COMPARABLE:** EPD®'s in the same product category are comparable because they are developed on the basis of the same rules and requirements (Product Category Rules - PCR).
- **CREDIBILE:** The declaration is verified by a third-party auditor.

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ENAMEL PAINTS AND VARNISHES FOR PROFESSIONALS

The history of **Attiva** is one of ongoing research into **cutting-edge products and targeted solutions** for treating and decorating various interior and exterior substrates.

A strategic brand since 2001 for **Boero Group**, Italy's leading player in the industry, Attiva offers a **technical and functional range of specialist coating systems formulated for specific needs**, with the aim of facilitating and enhancing the work of **application professionals**.

GROUP SITES

The **"Federico Mario Boero" production facility** located in Rivalta Scrivia in the province of Alessandria in northern Italy, built using cutting-edge criteria and operating since 2009, covers 120,000 square meters, of which 18,000 under cover, with average annual production of 27,000,000 kg/year.

Technological development is performed at the **"Riccardo Cavalleroni" Research and Development Center** in bloc F at the Rivalta Scrivia Science and Technology Park (PST), where teams of highly qualified engineers work with the main goal of developing innovative product formulation technologies, involving ongoing assessment of latest generation raw materials and upgrading tinting systems.

The **registered office and sales organisation** are in Genoa, where the Group and brand began life.

THE GOAL OF THE STUDY

The goal of the study is to **assess environmental impact** in relation to the production of Boero Group **WATER-BASED PAINTS**, using an approach based on life cycle analysis, in order to communicate the results obtained through an **Environmental Product Declaration (EPD®)** in the framework of the International EPD® System.

The recipients of this document are end customers and all stakeholders affected by the environmental impact of water-based enamels **RELAX EXTRA** and **RELAX ALL'ACQUA**.

PRODUCTS

The products studied are **enamel paints produced using different classes of raw materials.**
Enamel paints are suitable for ferrous and wood substrates, and contain synthetic binders in water emulsion, pigments resistant to weathering and functional additives like mattifiers, preservatives, etc.

PRODUCT COMPOSITION:

COMPONENTS	PERCENTAGES (%)
WATER	< 15%
FILLERS AND PIGMENTS	< 20%
EMULSION AND RESINS	< 55%
ADDITIVES	< 20%

TABLE 1 - Average content declaration for the main components in the water-based enamel paints line

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RELAX EXTRA BRILLANTE

COD.777003

High performance water-based **gloss** enamel

S-P-02074 **EPD®**
environdec.com

INTERIORS AND EXTERIORS
Iron and wood

- **EXTREME SURFACE HARDNESS**
- **RESISTANT TO SCRATCHING AND DIRT PICK-UP**
- **INNOVATIVE ALKYD URETHANE RESINS**

Water-based alkyd urethane gloss enamel, with extreme surface hardness and excellent resistance to weathering, surface stresses, scratching and dirt pick-up, without sacrificing elasticity and ease of application. With excellent hiding power and flow, the product is ideal for hardwearing finishes in both interior and exterior environments. With “A+” IAQ (Indoor Air Quality) certification.

RELAX EXTRA SATINATO

COD.777004

High performance water-based **satin** enamel

S-P-02074 **EPD®**
environdec.com

INTERIORS AND EXTERIORS
Iron and wood

- **EXTREME SURFACE HARDNESS**
- **RESISTANT TO SCRATCHING AND DIRT PICK-UP**
- **INNOVATIVE ACRYLIC POLYURETHANE RESINS**

Water-based acrylic polyurethane satin enamel, with extreme surface hardness and excellent resistance to weathering, surface stresses, scratching and dirt pick-up, without sacrificing elasticity and ease of application. With excellent hiding power and flow, the product is ideal for hardwearing finishes in both interior and exterior environments. With “A+” IAQ (Indoor Air Quality) certification.

RELAX EXTRA OPACO

COD.777005

High performance water-based **matt** enamel

S-P-02074 **EPD®**
environdec.com

INTERIORS AND EXTERIORS
Iron and wood

- **EXTREME SURFACE HARDNESS**
- **RESISTANT TO SCRATCHING AND DIRT PICK-UP**
- **INNOVATIVE ACRYLIC POLYURETHANE RESINS**

Water-based acrylic polyurethane matt enamel, with extreme surface hardness and excellent resistance to weathering, surface stresses, scratching and dirt pick-up, without sacrificing elasticity and ease of application. With excellent hiding power and flow, the product is ideal for hardwearing finishes in both interior and exterior environments. With “A+” IAQ (Indoor Air Quality) certification.

RELAX ALL'ACQUA BRILLANTE

COD.777006

Gloss enamel for iron and wood

S-P-02074 **EPD®**
environdec.com

INTERIORS AND EXTERIORS
Iron, wood, aluminium, PVC and galvanised sheet, suitably prepared

- **UNIFORM FLOW WITH NO BEADING**
- **TOTALLY FREE FROM BLOCKING**
- **MAXIMUM RESISTANCE TO YELLOWING**

Water-based acrylic gloss enamel, odourless, non-yellowing and with outstanding whiteness. Optimised applicability and uniform flow with no beading. Free from blocking. Excellent adhesion to all substrates. Eco-friendly with APEO FREE formula (no ethoxylated alkylphenols) and "A+" IAQ (Indoor Air Quality) certification. Suitable for application in areas containing food products in compliance with standard UNI 11021-2002 in relation to the HACCP methodology.

RELAX ALL'ACQUA SATINATO

COD.777007

Satin enamel for iron and wood

S-P-02074 **EPD®**
environdec.com

INTERIORS AND EXTERIORS
Iron, wood, aluminium, PVC and galvanised sheet, suitably prepared

- **UNIFORM FLOW WITH NO BEADING**
- **TOTALLY FREE FROM BLOCKING**
- **MAXIMUM RESISTANCE TO YELLOWING**

Water-based acrylic satin enamel, odourless, non-yellowing and with outstanding whiteness. Optimised applicability and uniform flow with no beading. No blocking. Excellent adhesion to all substrates. Eco-friendly with APEO FREE formula (no ethoxylated alkylphenols) and "A+" IAQ (Indoor Air Quality) certification. Suitable for application in areas containing food products in compliance with standard UNI 11021-2002 in relation to the HACCP methodology.

RELAX ALL'ACQUA OPACO

COD.777008

Matt enamel for iron and wood

S-P-02074 **EPD®**
environdec.com

INTERIORS AND EXTERIORS
Iron, wood, aluminium, PVC and galvanized sheet, suitable prepared

- **UNIFORM FLOW WITH NO BEADING**
- **TOTALLY RESISTANT TO BLOCKING**
- **MAXIMUM RESISTANCE TO YELLOWING**

Water-based acrylic matt enamel, odourless, non-yellowing and with outstanding whiteness. Optimised applicability and uniform flow with no beading. No blocking. Excellent adhesion to all substrates. Eco-friendly with APEO FREE formula (no ethoxylated alkylphenols) and "A+" IAQ (Indoor Air Quality) certification. Suitable for application in areas containing food products in compliance with standard UNI 11021-2002 in relation to the HACCP methodology.

METHODOLOGY USED

The environmental performance of products is calculated in accordance with the requirements of the **International EPD® System** and the Product Category Rules (PCR) 2019:14 Version 1.0 - Construction Products.

The methodology used to quantify environmental performance is **Life Cycle Assessment (LCA)**, as regulated by **ISO 14040-14044.**

The goal of the LCA study is to assess environmental impact in relation to the production of the Boero Group water-based paints examined.
To this end, specific data has been collected for the **Rivalta Scrivia production facility** and refers to 2018. Proxy data (i.e. generic data based on estimates and average values) represents less than 10% of the total.

The stated unit is 1 kg of product (including packaging).

As the products have different industrial formulas, the environmental performance declaration reports an **average value weighted for production by product class.** In accordance with the applicable PCR and EN 15804, the variation for the potential greenhouse effect is given below.

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SYSTEM BOUNDARIES

In accordance with the applicable PCR and standard EN 15804, the system boundaries refer to the following **three stages in the product life cycle:**

- **UPSTREAM PROCESSES**
  (''from cradle-to-gate'') – Module **A1**
  Processes relating to the procurement of raw materials and energy.
- **CORE PROCESSES, MANUFACTURING PROCESSES**
  (''from gate-to-gate'') – Modules **A2+A3**
  Processes involved in raw materials transport from suppliers to the factory (and any internal transport) and in the production of the product.
- **DOWNSTREAM PROCESSES**
  (''from gate-to-grave'') – Modules from **A4 to D**
  Processes relating to the storage, transport, use and disposal/recycling of the product.

The approach used for this study is of the **''cradle-to-gate with options''** type. Modules from A1 to A3 are included, plus optional module A4 (Figure 1 and Table 2).

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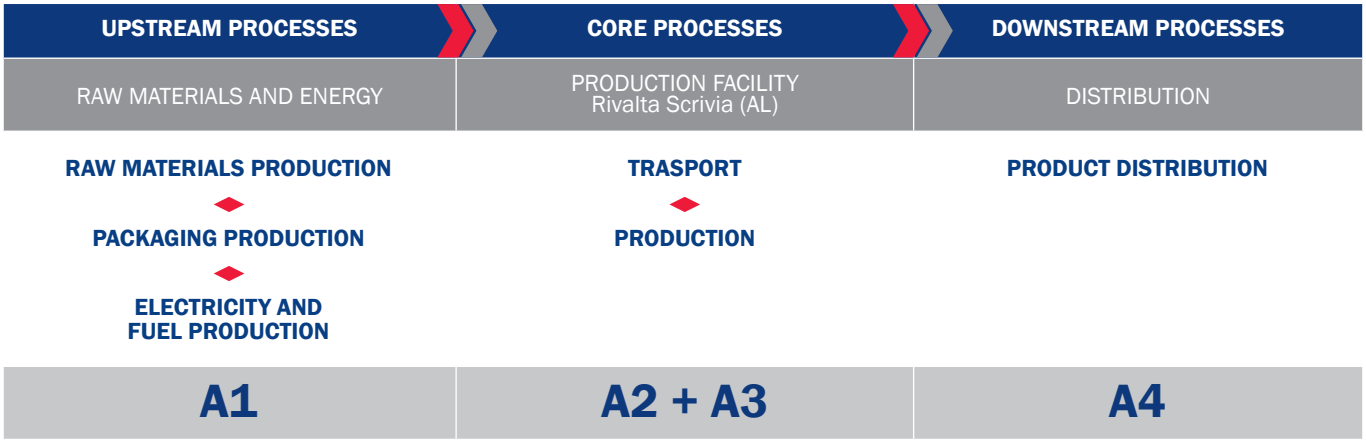
SYSTEM BOUNDARIES - FIGURE 1



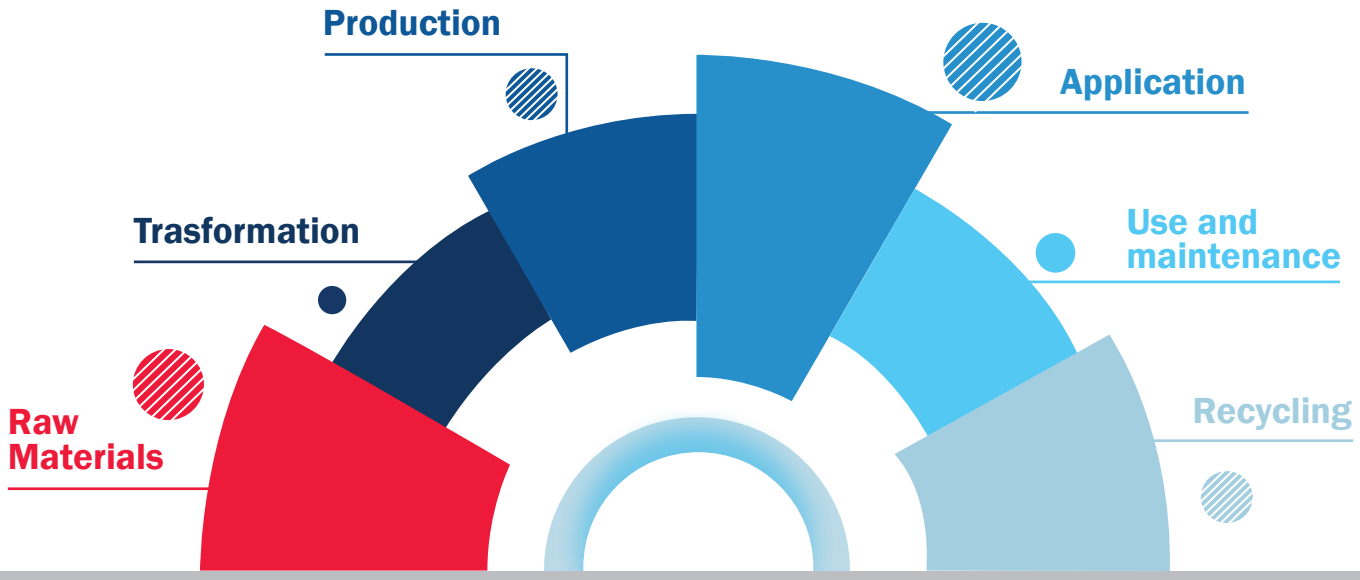
DECRIPTION OF THE PROCESSES

The production process starts with **the production and transport of all raw materials** used to manufacture the product **(Upstream processes)**, including its components and materials needed for the production processes (e.g. energy). In more detail, products generally consist of a series of powders, resins, pigments and additives of various types.

The **product stages (Core processes)** are performed at the **Rivalta Scrivia production facility**: they include mixing the "ingredients" to produce the water-based paint and its primary and secondary/tertiary packaging (e.g. stretch film for bundling and wood pallets).

After packaging, the product begins the distribution stage (which forms part of the **Downstream processes**).
The distribution stage involves:

- **storage** in the Boero Group's Rivalta Scrivia distribution centre;
- **transport** of the product to points of sale.



SYSTEM BOUNDARIES - TABLE 2*

	PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE								END OF LIFE STAGE			RESOURCE RECOVERY STAGE
	UP STREAM	CORE		DOWNSTREAM													DOWNSTREAM
	Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition (total/partial)	Transport (disposal /recycling centre)	Waste processing	Disposal	Reuse-Recovery-Recycling potential
Modules	**A1**	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Modules declared	X	X	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-
Geography	EU 27	EU 27	EU 27	EU 27	-	-	-	-	-	-	-	-	-	-	-	-	-
Specific data	>90%					-	-	-	-	-	-	-	-	-	-	-	-
Variation - Products	74,0%-127,3%					-	-	-	-	-	-	-	-	-	-	-	-
Variation - Sites	Not relevant					-	-	-	-	-	-	-	-	-	-	-	-

*(X = included in the study | - = module not declared)

USE OF RESOURCES - TABLE 3*

PARAMETER		UNIT	A1	A2	A3	A4	TOTAL
Primary energy resources Renewable	Use as energy carrier	MJ, net calorific value	10,557	0,016	0,006	0,013	10,592
	Use as raw materials	MJ, net calorific value	4,418	0,004	0,003	0,003	4,429
	TOTAL	**MJ, net calorific value**	**14,975**	**0,020**	**0,010**	**0,016**	**15,021**
Primary energy resources Non-renewable	Use as energy carrier	MJ, net calorific value	45,040	1,084	0,081	1,245	47,450
	Use as raw materials	MJ. net calorific value	0,053	0,003	0,001	0,003	0,060
	TOTAL	**MJ. net calorific value**	**45,093**	**1,087**	**0,082**	**1,248**	**47,510**
Secondary materials		kg	-	-	-	-	-
Renewable secondary fuels		MJ	-	-	-	-	-
Non-renewable secondary fuels		MJ	-	-	-	-	-
Net use of fresh water		M^3	0,000	0,000	0,056	0,000	0,056

*(the data refer to the stated unit)

POLLUTANT EMISSIONS - TABLE 4*

PARAMETER		UNIT	A1	A2	A3	A4	TOTAL
Global Warming Potential (GWP)	Fossil	kg CO_2 eq	2,542	0,067	0,061	0,076	**2,747**
	Biogenic	kg CO_2 eq	0,466	0,000	0,000	0,003	**0,467**
	Land use	kg CO_2 eq	0,003	0,000	0,000	0,077	**0,003**
	TOTAL	**kg CO_2 eq**	**3,011**	**0,067**	**0,062**	**0,077**	**3,216**
Total GWP (without biogenic CO_2)		**kg CO_2 eq**	**2,550**	**0,067**	**0,061**	**0,076**	**2,755**
GWP-GHG		**kg CO_2 eq**	**2,550**	**0,067**	**0,061**	**0,076**	**2,755**
Acidification Potential (AP)		kg SO_2 eq	0,030	0,000	0,000	0,000	**0,031**
Acidification Potential (AP)		mol H+ eq	0,031	0,000	0,000	0,000	**0,032**
Eutrophication aquatic freshwater (EP-freshwater)		kg PO43-eq	0,006	0,000	0,000	0,000	**0,007**
Eutrophication aquatic marine (EP-marine)		kg N eq	0,005	0,000	0,000	0,000	**0,005**
Eutrophication terrestrial (EP)		mol N eq	0,037	0,001	0,000	0,001	**0,040**
Ozone depletion (ODP)		kg CFC-11 eq	$2,44 \cdot 10^{-7}$	$1,21 \cdot 10^{-8}$	$7,30 \cdot 10^{-10}$	$1,41 \cdot 10^{-8}$	**$2,71 \cdot 10^{-7}$**
Photochemical oxidant formation (POFP)		kg NMVOC eq	0,010	0,000	0,000	0,000	**0,011**
Abiotic depletion potential - Elements		kg Sb eq	$3,57 \cdot 10^{-5}$	$1,79 \cdot 10^{-7}$	$1,51 \cdot 10^{-8}$	$2,41 \cdot 10^{-7}$	**$3,61 \cdot 10^{-5}$**
Abiotic depletion potential - Fossil fuels		MJ, net calorific value	37,764	0,996	0,075	1,156	**39,990**
Water scarcity potential (WSI)		m^3 eq	1,809	0,006	0,003	0,006	**1,824**

*(the data refer to the stated unit. See glossary on page 15)

WASTE PRODUCTION AND OTHER INDICATORS - TABLE 5*

PARAMETER	UNIT	A1	A2	A3	A4	TOTAL
Hazardous waste disposed	kg	0,019	0,000	0,008	0,000	**0,028**
Non-hazardous waste disposed	kg	1,603	0,046	0,016	0,055	**0,031**
Radioactive waste disposed	kg	$1,07 \cdot 10^{-4}$	$6,92 \cdot 10^{-6}$	$3,23 \cdot 10^{-7}$	$7,97 \cdot 10^{-6}$	**$1,22 \cdot 10^{-4}$**

*(the data refer to average results per stated unit)

INTERPRETATION OF RESULTS

By way of example, **the contribution of the various life cycle stages to Global Warming Potential (GWP)** is reported in the figure.

As can be seen, the most significant stage (over 93%) consists of the **Upstream processes (A1)**, i.e. procurement processes for raw materials (product components or materials needed for production processes) performed upstream of manufacturing processes in the factory.

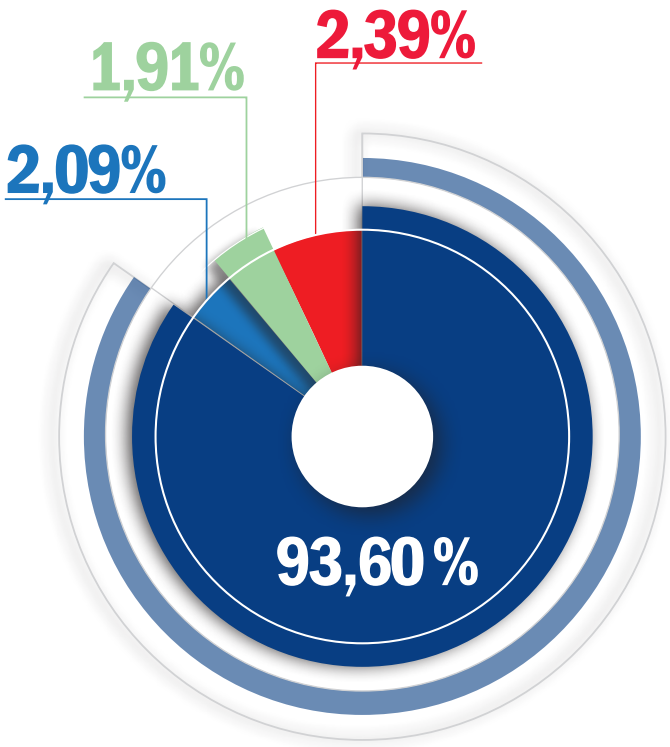


FIG.2: Global Warming Potential (GWP)

EN 15804 STANDARD USED AS CORE PCR

PCR:	PCR 2019:14 Version 1.0 Construction products
PCR review by:	International EPD® System Technical Committee. Contact details: info@environdec.com.
Independent verification of the declaration and data performed in accordance with ISO 14025:	EPD® verification
Third-party auditor:	**Guido Croce** Approved by: The International EPD® System Technical Committee, supported by the Secretariat
The data follow-up procedure during the period of validity of the EPD® involves verification by a third party:	Yes

EPD® valid until **02-12-2024**

CERTIFICATION ENTITY

This EPD® has been approved by an independent auditor in accordance with the rules and regulations published by the **International EPD® System** (General Programme Instructions for the International EPD® System) and with **PCR 2019:14 Version 1.0, Construction Products.**

NOTES

- EPD®'s developed in accordance with different programmes may not be comparable.
- EPD®'s for construction products may not be comparable if they are not in compliance with standard EN 15804.

All stages in the life cycle have been analysed and accounted for in the study.
This EPD® and additional information about it are available on the International EPD® System website:
www.environdec.com

REFERENCES

General Programme Instructions for the International EPD® System, v.3.0.

PCR 2019:14 Version 1.0 Construction Products EN 15804:2012+A2:2019
ISO 21930 Environmental Declaration of Building Products.
Database Ecoinvent v.3.5 (www.ecoinvent.org).
LCA study “Water-based, Quartz and Enamel Paints” Rev.0 - BOERO BARTOLOMEO S.P.A.

GLOSSARY

- **LIFE CYCLE ASSESSMENT (LCA):** this is a technique regulated by standard ISO 14040 to quantify the energetic and environmental load of a product system's life cycle by quantifying the energy and materials used and the air, liquid and solid emissions released into the environment, from raw material extraction to disposal of final waste.

- **PRODUCT CATEGORY RULES (PCR):** Specific product requirements.

- **GLOBAL WARMING POTENTIAL (GWP):** Global warming due to the emission into the atmosphere of greenhouse gases (GHG) such as carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), etc.

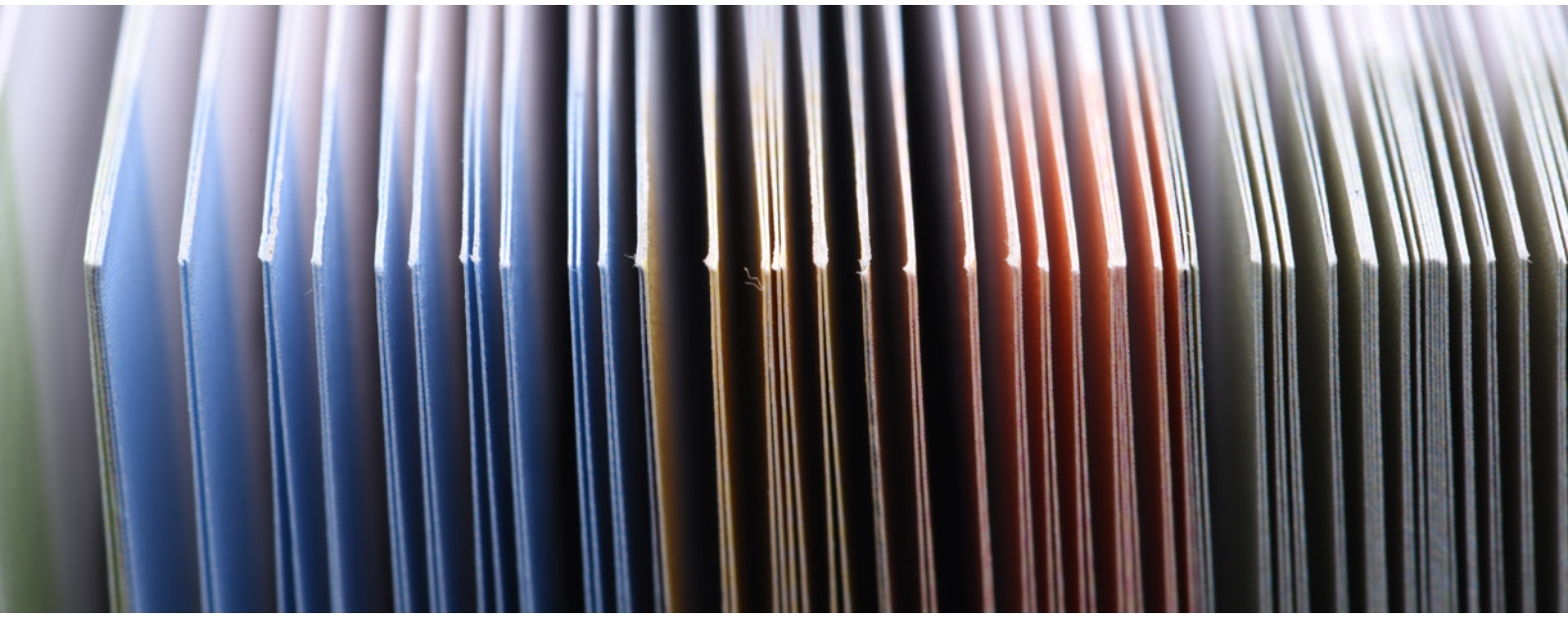
- **OZONE DEPLETION POTENTIAL (ODP):** Degradation and reduction, caused by chlorofluorocarbons (CFC) or chlorofluoromethanes (CFM), of the ozone layer in the stratosphere, which filters the ultraviolet component of the sun's rays thanks to its particularly reactive compounds.

- **ACIDIFICATION POTENTIAL (AP):** Ozone formation on the earth's surface due to the emission of unburnt hydrocarbons and nitrogen oxides into the atmosphere in the presence of solar radiation. This phenomenon is harmful to living organisms and is often present in large urban centres. The indicator is expressed in kg NMVOC eq (Non-Methane Volatile Organic Compounds).

- **EUTROPHICATION POTENTIAL (EP):** Reduction in dissolved oxygen levels in water media, with the collapse of fish and other aquatic species due to excess addition of large quantities of mineral nutrients such as nitrogen and phosphorous and subsequent dramatic increase in flora that feed on these nutrients. The indicator is expressed in kg PO43- eq (phosphate), kg N eq (nitrogen) and mol N eq (moles of nitrogen).

- **PHOTOCHEMICAL OXIDANT FORMATION POTENTIAL (POFP):** Ozone formation on the earth's surface due to the emission of unburnt hydrocarbons and nitrogen oxides into the atmosphere in the presence of solar radiation. This phenomenon is harmful to living organisms and is often present in large urban centres. The indicator is expressed in kg NMVOC eq (Non-Methane Volatile Organic Compounds).

- **WATER SCARCITY INDEX (WSI):** Indicator that represents the equivalent volume of water consumed proportionate to the water availability of single countries.



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