

Il colore italiano dal 1831



# WATER-BASED ENAMEL PAINTS

PROFESSIONAL LINE



## EPD<sup>®</sup> Environmental Product Declaration

In accordance with ISO 14025 and EN 15804

PCR 2019:14: **Construction products**

CPC CODE: **3511 - PAINTS AND VARNISHES AND RELATED PRODUCTS**

- PROGRAMME: **The International EPD<sup>®</sup> System** - [www.environdec.com](http://www.environdec.com)
- PROGRAMME OPERATOR: **EPD International AB**
- GEOGRAPHICAL SCOPE: **Europe**
- REGISTRATION N°: **S-P-01823**
- DATE OF PUBLICATION: **24-9-2020**
- VALID UNTIL: **07-01-2025**

[www.boero.it](http://www.boero.it)



THE INTERNATIONAL EPD<sup>®</sup> SYSTEM



## EPD<sup>®</sup> ENVIRONMENTAL PRODUCT DECLARATION

BOERO believes in environmental sustainability and is proud to reach a new technical milestone: EPD<sup>®</sup> Certification of its finishing products

### The Environmental Product Declaration or EPD<sup>®</sup>

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.

This declaration allows products to be evaluated in the framework of both public tenders and building sustainability certification systems



**OBJECTIVE**



**COMPARABLE**



**CREDIBLE**

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).

**CREDIBLE.** The declaration is verified by a third-party auditor.

# BOERO



“

Il colore italiano  
dal 1831

”

Light and colour  
are Italy's gift to the  
world and **Boero** is  
the brand that more  
than any other, and **for  
almost two centuries,  
has personified the  
country's love of  
colour**

#### **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 block 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



## ENVIRONMENTAL IMPACT ASSESSMENT

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 the main water-based enamel paints, **BOEROHP** and **MAGNUM**



#### AVERAGE PRODUCT COMPOSITION

Water	< 15%
Fillers and pigments	< 20%
Emulsion and resins	< 55%
Additives	< 20%

The products studied are water-based paints produced using different classes of raw materials.

**Enamel paints** are suitable for ferrous and wood-based substrates. They consist of synthetic binders in water emulsion, weathering-resistant pigments and functional additives like matting and anti-sedimenting agents and preservatives.

Average content declaration for the main components in the Boero water-based enamel paint line.



# PRODUCTS



“ **Boero**  
Water-based  
enamel paints ”



**COD. 700.144**

## BOEROHP SATINATO

**A+ HIGH PERFORMANCE WATER-BASED SATIN ENAMEL**

Single-component polyurethane satin enamel with high surface hardness and resistance to weathering, grease, hand marks and scratching. Totally resistant to blocking. With exceptional hiding power, it stands out for its excellent elasticity and flow. Odourless. With "A+" IAQ INDOOR AIR QUALITY certification.

### Intended use

For interiors and exteriors

### Substrates

Wood, metal, masonry, aluminium, PVC, galvanised sheet, metal alloys

S-P-01823 EPD®  
environdec.com



- EXCELLENT SURFACE HARDNESS
- BARRIER EFFECT AGAINST GREASE AND DIRT

**COD. 700.145**

## BOEROHP OPACO

**A+ HIGH PERFORMANCE WATER-BASED MATT ENAMEL**

Single-component polyurethane matt enamel with high surface hardness and resistance to weathering, grease, hand marks and scratching. Totally resistant to blocking. With exceptional hiding power, it stands out for its excellent elasticity and flow. Odourless. With "A+" IAQ INDOOR AIR QUALITY certification.

### Intended use

For interiors and exteriors

### Substrates

Wood, metal, masonry, aluminium, PVC, galvanised sheet, metal alloys

S-P-01823 EPD®  
environdec.com



- EXCELLENT SURFACE HARDNESS
- BARRIER EFFECT AGAINST GREASE AND DIRT

**COD. 700.143**

## BOEROHP BRILLANTE

**A+ HIGH PERFORMANCE WATER-BASED GLOSS ENAMEL**

Single-component alkyd urethane gloss enamel with high surface hardness and resistance to weathering, grease, hand marks and scratching. Totally resistant to blocking. With exceptional hiding power, it stands out for its excellent elasticity and flow. Odourless. With "A+" IAQ INDOOR AIR QUALITY certification.

### Intended use

For interiors and exteriors

### Substrates

Wood, metal, masonry, aluminium, PVC, galvanised sheet, metal alloys

S-P-01823 EPD®  
environdec.com



- EXCELLENT SURFACE HARDNESS
- BARRIER EFFECT AGAINST GREASE AND DIRT

**COD. 700.124**

## MAGNUM SATINATO

**HACCP\* AND A+ WATER-BASED SATIN EMULSION**

This odourless APEO-free water-based satin enamel stands out for its highly stable, non-yellowing whiteness, resulting in outstanding consistency and durability. With an innovative anti-hand mark formula, it is totally resistant to blocking. High coverage and excellent flow. With "A+" IAQ INDOOR AIR QUALITY certification.

### Intended use

For interiors and exteriors

### Substrates

Wood, metal, aluminium, galvanised sheet, PVC

S-P-01823 EPD®  
environdec.com



- PERFECT HIGH-STABILITY WHITE INDEX
- ANTI-FINGERPRINT FORMULA

**COD. 700.127**

## MAGNUM OPACO

**HACCP\* AND A+ WATER-BASED MATT EMULSION**

This odourless APEO-free water-based matt enamel stands out for its highly stable, non-yellowing whiteness, resulting in outstanding consistency and durability. With an innovative anti-hand mark formula, it is totally resistant to blocking. High hiding power and excellent flow. With "A+" IAQ INDOOR AIR QUALITY certification.

### Intended use

For interiors and exteriors

### Substrates

Wood, metal, aluminium, galvanised sheet, PVC

S-P-01823 EPD®  
environdec.com



- PERFECT HIGH-STABILITY WHITE INDEX
- ANTI-FINGERPRINT FORMULA

**COD. 700.125**

## MAGNUM BRILLANTE

**HACCP\* AND A+ WATER-BASED GLOSS EMULSION**

This odourless APEO-free water-based matt enamel stands out for its highly stable, non-yellowing whiteness, resulting in outstanding consistency and durability. With an innovative anti-hand mark formula, it is totally resistant to blocking. High hiding power and excellent flow. With "A+" IAQ INDOOR AIR QUALITY certification.

### Intended use

For interiors and exteriors

### Substrates

Wood, metal, aluminium, galvanised sheet, PVC

S-P-01823 EPD®  
environdec.com



- PERFECT HIGH-STABILITY WHITE INDEX
- ANTI-FINGERPRINT FORMULA

\* Suitable for application in areas containing food products in compliance with standard UNI 11021-2002 (HACCP methodology).

# METHODOLOGY USED



## RULES AND REGULATIONS

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.

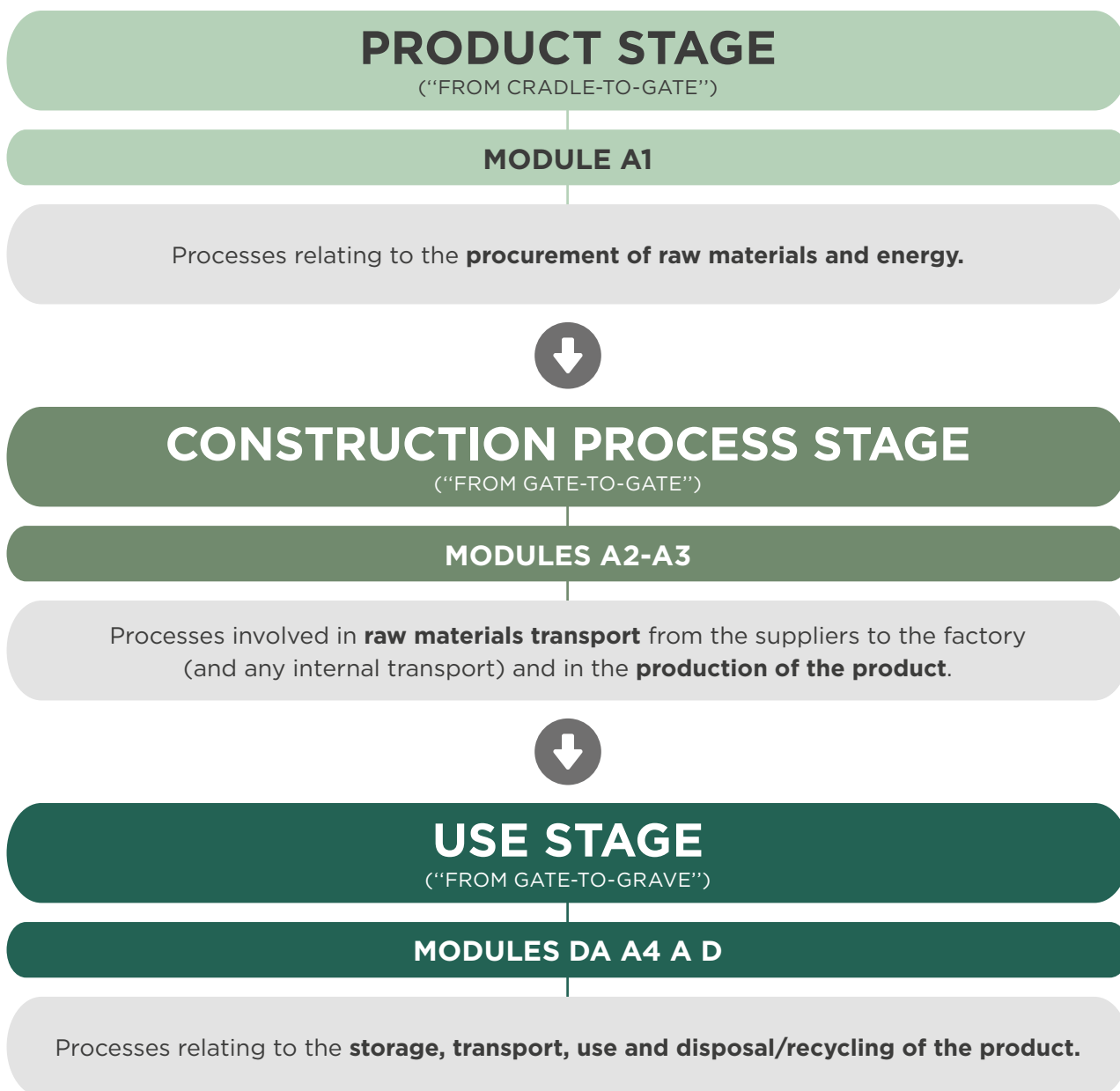
**The stated unit is 1 kg of product (including packaging).**

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.



# 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**:

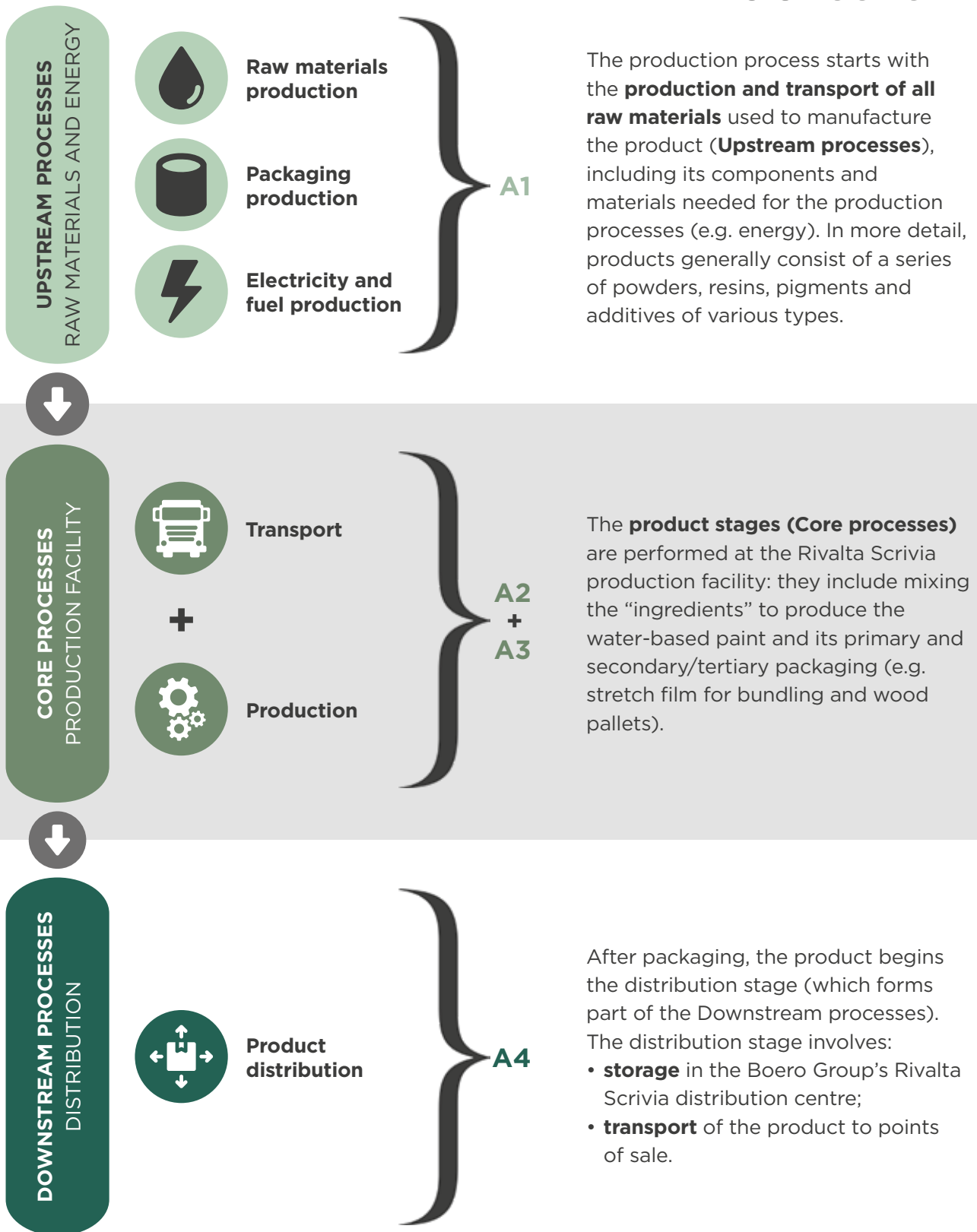


The approach used for this study is of the “**cradle-to-gate with options**” type.

**The approach used for this study is of the “cradle-to-gate with options” type.**

(Figure 1 and Table 2)

## DESCRIPTION OF THE PROCESSES



**Figure 1**  
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 (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					-	-	-	-	-	-	-	-	-	-	-	-

**Table 2**  
System boundaries (“X” = included in study; “-” = module not declared)

# USE OF RESOURCES



## PRIMARY ENERGY RESOURCES - RENEWABLE

PARAMETER	UNIT	A1	A2	A3	A4	TOTAL
Use as energy carrier	MJ, net calorific value	10.557	0.016	0.006	0.013	<b>10.592</b>
Use as raw materials	MJ, net calorific value	4.418	0.004	0.003	0.003	<b>4.429</b>
<b>TOTAL</b>	<b>MJ, net calorific value</b>	<b>14.975</b>	<b>0.020</b>	<b>0.010</b>	<b>0.016</b>	<b>15.021</b>



## PRIMARY ENERGY RESOURCES - NON-RENEWABLE

PARAMETER	UNIT	A1	A2	A3	A4	TOTAL
Use as energy carrier	MJ, net calorific value	45.040	1.084	0.081	1.245	<b>47.450</b>
Use as raw materials	MJ, net calorific value	0.053	0.003	0.001	0.003	<b>0.060</b>
<b>TOTAL</b>	<b>MJ, net calorific value</b>	<b>45.093</b>	<b>1.087</b>	<b>0.082</b>	<b>1.248</b>	<b>47.510</b>



## SECONDARY ENERGY RESOURCES

PARAMETER	UNIT	A1	A2	A3	A4	TOTAL
Secondary material	kg	-	-	-	-	-
Renewable secondary fuels	MJ	-	-	-	-	-
Non-renewable secondary fuels	MJ	-	-	-	-	-
Non-renewable secondary fuels	m <sup>3</sup>	0.000	0.000	0.056	0.000	<b>0.056</b>

**Table 3**

Use of resources (the data refer to the stated unit)



# POLLUTANT EMISSIONS

		POLLUTANT EMISSIONS					
PARAMETER		UNIT	A1	A2	A3	A4	TOTAL
Global Warming Potential (GWP)	Fossil	kg CO <sub>2</sub> eq	2.542	0.067	0.061	0.076	2.747
	Biogenic	kg CO <sub>2</sub> eq	0.466	0.000	0.000	0.000	0.467
	Land use	kg CO <sub>2</sub> eq	0.003	0.000	0.000	0.000	0.003
	<b>TOTAL</b>	<b>kg CO<sub>2</sub> eq</b>	<b>3.011</b>	<b>0.067</b>	<b>0.062</b>	<b>0.077</b>	<b>3.216</b>
Total GWP (without biogenic CO <sub>2</sub> )		<b>kg CO<sub>2</sub> eq</b>	<b>2.550</b>	<b>0.067</b>	<b>0.061</b>	<b>0.076</b>	<b>2.755</b>
GWP-GHG		<b>kg CO<sub>2</sub> eq</b>	<b>3.011</b>	<b>0.067</b>	<b>0.062</b>	<b>0.077</b>	<b>3.216</b>
Acidification Potential (AP)		kg SO <sub>2</sub> eq	0.030	0.000	0.000	0.000	0.031
Acidification Potential (AP)		mol H <sup>+</sup> eq	0.031	0.000	0.000	0.000	0.032
Eutrophication aquatic freshwater (EP-freshwater)		kg PO <sub>4</sub> <sup>3-</sup> 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•10 <sup>-7</sup>	1.21•10 <sup>-8</sup>	7.30•10 <sup>-10</sup>	1.41•10 <sup>-8</sup>	2.71•10 <sup>-7</sup>
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•10 <sup>-5</sup>	1.79•10 <sup>-7</sup>	1.51•10 <sup>-8</sup>	2.14•10 <sup>-7</sup>	3.61•10 <sup>-5</sup>
Abiotic depletion potential Fossil fuels		MJ, net calorific value	37.764	0.996	0.075	1.156	39.990
Water scarcity potential (WSI)		m <sup>3</sup> eq	1.809	0.006	0.003	0.006	1.824

**Table 4**  
Pollutant emissions  
(The data refer to average results per stated unit. See glossary, page 22)

# WASTE PRODUCTION



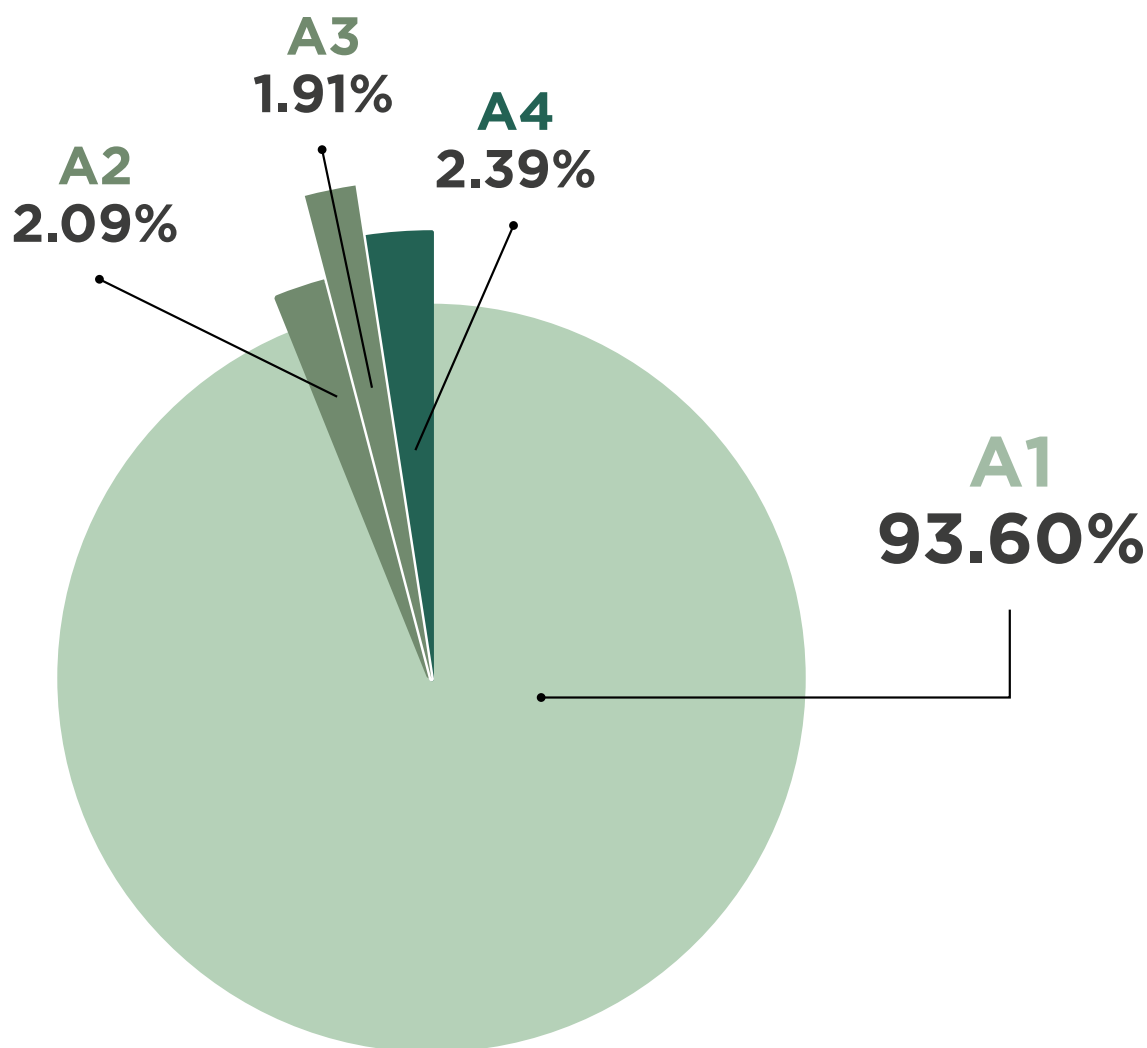
## WASTE PRODUCTION AND OTHER INDICATORS

PARAMETER	UNIT	A1	A2	A3	A4	TOTAL
Hazardous waste disposed	kg	0.019	0.000	0.008	0.000	<b>0.028</b>
Non-hazardous waste disposed	kg	1.603	0.046	0.016	0.055	<b>1.721</b>
Radioactive waste disposed	kg	$1.07 \cdot 10^{-4}$	$6.92 \cdot 10^{-6}$	$3.23 \cdot 10^{-7}$	$7.97 \cdot 10^{-6}$	<b><math>1.22 \cdot 10^{-4}</math></b>

**Table 5**  
Waste production  
(Data refer to average results per stated unit)

# INTERPRETATION OF RESULTS - GWP

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



**Figure 2**  
Global Warming Potential (GWP)

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.

# INFORMATION



## 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**.



## EN 15804 STANDARD USED AS CORE PCR

<b>PCR</b>	PCR 2019:14 Version 1.0 - Construction products
<b>PCR REVIEW BY</b>	International EPD® System Technical Committee: info@environdec.com
<b>INDEPENDENT VERIFICATION OF THE DECLARATION AND DATA PERFORMED IN ACCORDANCE WITH ISO 14025</b>	EPD® verification
<b>THIRD-PARTY AUDITOR</b>	Guido Croce. Approved by: The International EPD® System Technical Committee, supported by the Secretariat
<b>THE DATA FOLLOW-UP PROCEDURE DURING THE PERIOD OF VALIDITY OF THE EPD® INVOLVES VERIFICATION BY A THIRD PARTY</b>	Yes

**Table 6**

Standard EN 15804 serves as the core PCR (**EPD® valid until 07-01-2025**)

### 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](http://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](http://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 (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), 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)

Drop in the pH of soils, lakes and forests due to the emission of acidifying compounds into the atmosphere, with harmful effects on living organisms (e.g. 'acid rain'). The indicator is expressed in kg SO<sub>2</sub> eq (sulphur dioxide) and in mol N eq (moles of nitrogen).

## 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 the subsequent dramatic increase in flora that feed on these nutrients.

The indicator is expressed in kg PO<sub>4</sub><sup>3-</sup> 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.

**Main contacts for the  
Environmental Product  
Declaration**

**Dott. Gino Poli**  
Boero Bartolomeo S.p.A.  
E-mail: gino.poli@boero.it

**Dott. Eraldo Parodi**  
Boero Bartolomeo S.p.A.  
E-mail: eraldo.parodi@boero.it

**Prof. Ing. Adriana Del Borghi**  
TETIS Institute S.R.L.  
(TEchniques for The Impact  
on Sustainability)  
E-mail: delborghi@tetisinstitute.it  
  
[www.tetisinstitute.org](http://www.tetisinstitute.org)



**Boero Bartolomeo S.p.A.**  
Via G. Macaggi, 19  
16121 Genova - Italy  
Tel. +39 010 5500.1  
Fax +39 010 5500.300  
[sales.boero@boero.it](mailto:sales.boero@boero.it)  
[www.boero.it](http://www.boero.it)

 **Boero - Il colore italiano dal 1831**

 **Boero\_coloreitaliano 1831**

  
**GRUPPO BOERO**  
DAL 1831