ENVIRONMENTAL PRODUCT DECLARATION

ARUM

EPD®

ECO PLATFORM EPD EN 15804 VERIFIED

PROGRAMME:	**THE INTERNATIONAL EPD® SYSTEM, WWW ENVIRONDEC.COM**
PROGRAMME OPERATOR:	**EPD INTERNATIONAL AB**
CODE CPC:	**3511 (PAINTS AND VARNISHES AND RELATED PRODUCTS)**
REFEREMCE GPI:	**GENERAL PROGRAMME INSTRUCTIONS v3.01**
REFERENCE STANDARD:	**ISO 14025:2006 E EN 15804:2012+A2:2019**
REFERENCE PCR:	**2019:14 v1.11**
EPD REGISTRATION NUMBER:	**S-P-01819**
PUBLICATION DATE:	**2018-07-12**
REVISION DATE:	**2021-03-19**
VALID UNTIL:	**2023-07-12**
GEOGRAFICAL SCOPE:	**GLOBAL**

An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at www.environdec.com.

san marco
SISTEMI VERNICIANTI PER L'EDILIZIA

Table of contents

1. The company and the product

San Marco Group SpA is working on the quantification of the environmental impacts of its products in order to improve their technical and environmental performance.

This EPD describes the environmental performance of ARUM in order to promote its application, especially in those building sites that request compliance with Minimum Environmental Requirements. This EPD is for a Business to Business (B2B) communication.

1.1 San Marco Group SpA

San Marco Group, with its 8 manufacturing facilities around the world and 7 brands, has become a leader in the paint and coatings sector for professional construction in Italy [1].

San Marco Group has a capillary distribution network throughout Italy, leading to highly specialized retail stores in Professional Application Centres that can offer high quality products and services to colour professionals.

Outside Italy, the San Marco Group is present in more than 40 countries around the world, through specialized distributors. Thanks to a company policy that focuses on greater internationalization and continuous and significant investments in both production and Research & Development, the company's commercial and manufacturing structure is constantly expanding.

1.2 Mission

- To become one of the top industrial companies in Italy in the paint and coatings sector for professional construction in terms of market share, product quality and territorial coverage.
- To strengthen loyalty with Italian and foreign customers by offering a range of qualified services in terms of content and reliability, in order to guarantee the support needed for the selling of its products through the best partners operating in this segment.
- To be an important reference in the market in terms of business ethics and responsibility for collaborators, customers, suppliers and potential investors.
- To promote the culture of restoration construction in Europe and the value of "Made in Italy" and "Made in Venice" brands throughout the world.

1.3 Environmental policy

Protecting the environment and respecting the workplace for operators are important aspects of San Marco Group's company policy. This is why San Marco Group is continuously trying to improve the quality of its products and its production cycles in order to reduce the overall environmental impact.

San Marco Group was one of the first companies that offered water-based solutions for enamels and stains back in 1982 with the Unimarc Line and since then the pursuit has continued towards eliminating from its formulations raw materials considered hazardous to humans and the environment.

The Greenspirit line was developed in 2009: a selection of high-tech natural products for bioconstruction with low environmental impact.

In 2010 San Marco Group has begun using the LCA methodology to understand the environmental performance of its products and to analyze their strengths and weaknesses. The holistic view of LCA convinced San Marco Group to acquire internally skills on the methodology and its application, with the ambitious goal of carrying out the LCA analysis of all the main products.

The LCA studies conducted enable San Marco Group to get a picture of its products from an environmental point of view, and to take actions of eco-design, both through actions for the improvement of its processes, and through the involvement of the supply chain in a virtuous circle. Moreover, the application of LCA in 2011 has allowed San Marco to achieve the certification EPD, or Environmental Product Declaration, for three products in the International EPD System.

In 2015 the thermal insulation system Marcotherm was certified EPD.

After using the LCA methodology for 4 years and having studied more than 40 products, San Marco Group has created its own LCA calculation system, reviewed by the certification body CSQA in March 2014 and July 2015.

In 2018 the LCA calculation methodology became the San Marco EPD process, certified within the International EPD system. This certification enables San Marco to create EPD autonomously. The EPD process is verified by a third party verifier and, internally, once a year. Each EPD is verified only internally.

1.4 Product description

The object of this EPDis the hypoallergenic breathable water-based paint ARUM, VOC emissions free, for internal use. The analysis is in line with the PCR 2019:14 v1.11 "Construction products" [3] and the EN 15804:2012+A2:2019 [4].

The product is available in one option: white in the package of 14 and 5 l.
In this study only the package of 14 l is assessed, that is usually applied by professional users.

1.5 Content information

		White, 14 Lt package		Declared Unit
		Weight (kg)	**%**	**Weight (kg)**
Product	Water	5,805	23,96	0,259
	Addotives	1,062	4,39	0,047
	Pigments and fillers	13,419	55,39	0,599
	Dispersion and resins	2,113	8,72	0,094
	Total bulk product	**22,400**	**92,46**	**1,000**
1° packaging	Steel	0,055	0,23	0,002
	Paper	0,000	0,00	0,000
	Polyethylene	0,004	0,02	0,000
	Virgin polypropylene	0,509	2,10	0,023
	Recycled polypropylene	0,218	0,90	0,010
	Total primary packaging	**0,644**	**3,24**	**0,035**
3° packaging	Wood	1,023	4,22	0,046
	Polyethylene	0,018	0,08	0,001
	Total tertiary packaging (22 pieces per pallet)	**1,041**	**4,30**	**0,046**
	Total	**24,227**	**100,00**	**1,082**

Table 1 – ARUM Composition.

ARUM contains no SVHC (substances of very high concern) on the Candidate List published by ECHA (European Chemicals Agency) in a concentration more than 0,1 % (w/w).

2. Environmental performance declaration

2.1 Declared unit

The declared unit is 1 kg of paint that enables to paint a certain number of m^2.

The average consumption of the product ARUM is 0,356 kg/m^2.

2.2 System boundaries

The present EPD is a declaration “from cradle to gate with module C1-C4, module D and optional module” (type “b” EPD). The system boundaries include production phase (A1-A2-A3), the application phase (A4-A5), the end of life phase (C2-C3-C4) and the recovery phase (D). For completeness, the product packaging and its disposal are included.

The use (B1-B7) and demolition phases (C1) are excluded because they are strongly characterized by the conditions in which the system is used. B1, B2, B3, B4, B5, B6, B7 and C1 modules are not declared.

As shown in Table 3,the **upstream** processes for San Marco manufacturing include:

- A1 - Raw materials and their packaging: raw materials extraction and production of product components and packagings;
- A2 – Transport: transportation of raw materials and packaging to San Marco plant.

The following **core** processes are considered:

- A3 – Manufacturing: (through the use of a mechanical mixer for liquid products), internal transfers with electric vehicles, washing operations, packaging with primary packaging materials, palletisation, product storage, production and disposal of scrap, energy and water consumption and waste treatment.

Downstream processes include (after the production process):

- A4 - Transport: product distribution,
- A5 - Construction installation: product application, water dilution, waste and packaging end-of-life,
- C2 - EOL Transport: transport to landfill of the de-constructed product,
- C3 - Waste processing: collection and treatment of material flow for reuse, recycling and energy recovery. No waste processing for ARUM are expected.
- C4 - Disposal: the complete landfill disposal has been assumed for the product.

The impact of the reuse and recovery phase is assessed separately:

- D - Recovery, reuse and recycling potential.

	Product stage			Construction process stage		Use stage							End of life stage				Resource recovery stage
	Raw materials	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	ND	ND	ND	ND	ND	ND	ND	ND	x	x	x	x
Geography	GLO	GLO	IT	IT	IT	-	-	-	-	-	-	-	-	IT	IT	IT	IT
Specific data used	>90%																
Variation – products	not relevant																
Variation - sites	not relevant																

Table 2 - Modules evaluated of the life cycle

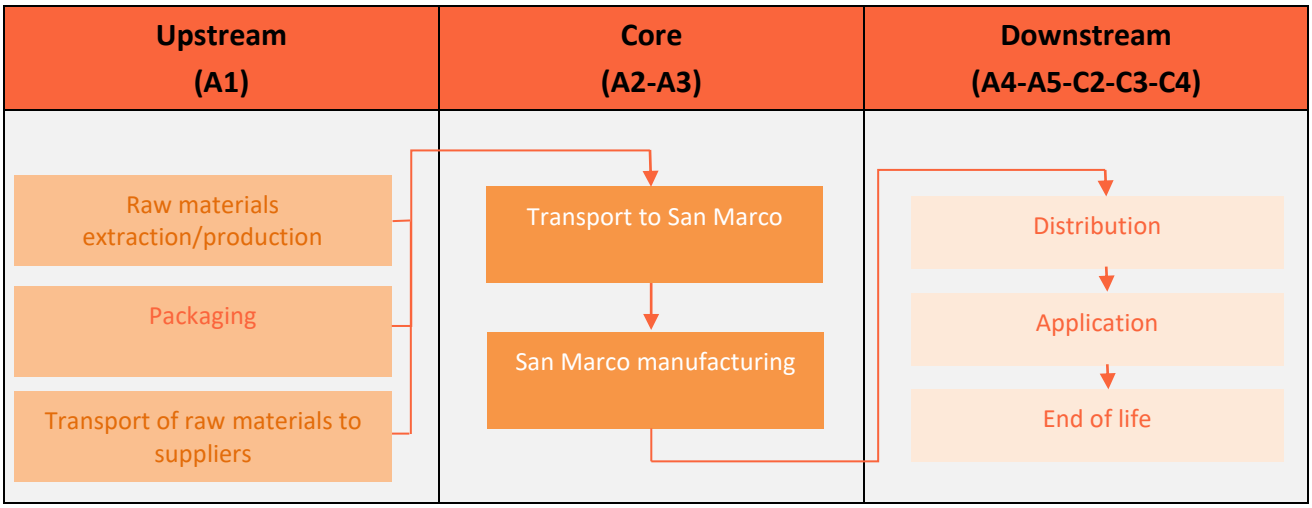

Table 3 - System boundaries ofARUM

2.3 Time boundaries

Primary data come from San Marco Group and refer to the year 2019. Secondary data come from the database ecoinvent v3.6 [5] released in 2019 and available in the LCA software used for calculations SimaPro 9.11 [6].

2.4 Geographic boundaries

The production site San Marco is located in the municipality of Marcon, in the province of Venice. Since ARUM components are mainly produced, sold and used in Italy, the study refers to the Italian situation. End of life scenarios of packaging refer to national data taken from “Rapporto Rifiuti Urbani - Edizione 2019” [7].

Raw materials comes from Italy or from abroad. Some suppliers are located for instance in Cina, Slovenia and India. The most significant database processes have been modified in order to make them more representative of the Italian situation by selecting, where possible, the input processes with Italian processes.

2.5 Life cycle boundaries

In accordance with the options of the PCR for “Construction products”, the following processes are excluded from the LCA: the construction of company buildings, the production of manufacturing equipment and other capital goods, personnel activities.

The contribution of infrastructure has not been excluded from the processes that already contained it, like the ecoinvent secondary processes.

2.6 Boundaries to nature and other systems

Emissions to air, treatment of wastewater, transport and treatment of waste from the production process were included in the LCA.

Biogenic carbon removals and emissions are assessed with the Total Global Warming Potential (GWP-total) (including fossil GWP , biogenic GWP and land use GWP) and separately with the biogenic GWP.

As required by the PCR 2019:14 v1.11, an additional mandatory indicator is included (GWP-GHG), adopting the carbon neutrality approach. This permits comparability with EPDs based on other PCRs, aligned with version 3.01 of the GPI [8].

2.7 Allocation and cut-off rules

Raw materials and manufacturing processes are included for virgin resources. No allocation is made for materials subject to recycling. The recycling process is included for the input of recycled resources. The outputs subject to recycling are considered inputs for the next life cycle.

For the processes subject to close-loop recycling, such as pallets, costs and benefits of the recovery process have been allocated to the life cycle of the ARUM product.

Mass-based allocation has been applied to energy and water consumed in the production plants of San Marco in Marcon (VE) in 2019.

Cut-off criteria that exclude materials from the calculation have not been applied.

2.8 Database and LCA software used:

Ecoinvent 3.6, SimaPro 9.11

3. Data quality

Primary data have been used for the fundamental aspects of the study, such as energy and water consumption in production plants of San Marco or the product composition. For all processes for which primary or representative data were not available, the LCA database ecoinvent v3.6, cut-off by classification, was used. The processes selected from the ecoinvent database have been modified, if necessary, to make them more representative of the Italian situation, by selecting, where possible, the input processes with Italian processes. This was done for the production processes of raw materials that take place in Italy, for all the processes related to the production of ARUM paint and for the end-of-life processes of waste.

The incidence of non-representative proxy data is below 10%, as required by the reference PCR. All inputs of the productive process have been evaluated.

For data collection and LCA calculations, the methodology described in the manual "Processo di elaborazione delle EPD del San Marco Group S.P.A." has been used.

Raw materials not available in the ecoinvent database have been modelled from the information contained in the respective safety and technical data sheets or by modifying existing ecoinvent processes of similar chemicals.

For San Marco plant electricity consumption a specific electricity mix has been modelled. The mix is composed by 97% specific electricity mix as purchased and 3% photovoltaic panels installed by the company.

To define the plant consumption (A3) data concerning the consumption of electricity, water and waste production in 2019 have been used.

For the distribution stage (A4) sale data concerning 2019 have been used. The amount of kilometres and the means of transport have been evaluated as reported in the EPD process manual. Road and sea transports have been considered, according to suppliers declarations.

La application stage (A5) includes:

- water consumption due to the paint dilution, as reported in the technical data sheet
- application by hand, without energy consumption
- application scrap end of life
- packaging material end of life

It is assumed that 100% of the scrap is sent to landfill for disposal.

Primary packaging and the plastic film of the tertiary packaging are disposed according to the data taken from "Rapporto Rifiuti Urbani - Edizione 2019". It is assumed that the primary packaging cannot be recycled. The end of life of the tertiary packaging pallet takes into account the fact that most of the pallets used in the shipment return to the company and are reused. The remaining part, made up of the reintegrated pieces, is recycled.

It is assumed that 43.4% of plastic film used in the tertiary packaging is recycled and the remaining 54.5% is disposed in incinerator and in landfill according to Italian average data.

The end of life of pallets has been modelled with company data on pallets used for shipping and on pallets returned to the company and reused. Pallets that are nor reused are sent for recycling.

It is assumed that ARUM product is sent to landfill for disposal(C3-C4). Transport to disposal is assumed to be 50 km (C2).

The C3 module is empty because no treatment of materials for reuse, recycling and energy recovery are expected.

4. Environmental impact indicators

The following environmental impact indicators are considered, according to PCR 2019:14 v1.11 and UNI EN EN 15804:2012+A2:2019.

Nr.	Core environmental impact indicators	Unit
1.1	Global Warming Potential - fossil fuels (GWP-fossil)	kg CO_2 eq.
1.2	Global Warming Potential - biogenic (GWP-biogenic)	kg CO_2 eq.
1.3	Global Warming Potential - land use and land use change (GWP-luluc)	kg CO_2 eq.
1.4	Global Warming Potential - total (GWP-total)	kg CO_2 eq.
1.5	Depletion potential of the stratospheric ozone layer (ODP)	kg CFC-11 eq.
1.6	Acidifcation potential, Accumulated Exceedance (AP)	mol H^+ eq.
1.7	Europhication potential - freshwater (EP-freshwater)	kg PO_4^{3-} eq.
1.8	Europhication potential - freshwater (EP-freshwater)	kg P eq
1.9	Europhication potential - marine (EP-marine)	kg N eq.
1.10	Europhication potential - terrestrial (EP-terrestrial)	mol N eq.
1.11	Photochemical Ozone Creation Potential (POCP)	kg NMVOC eq.
1.12	Abiotic depletion potential - non-fossil resources (ADPE)	kg Sb eq.
1.13	Abiotic depletion potential - fossil resources (ADPF)	MJ
1.14	Water (user) deprivation potential (WDP)	m^3 world eq. deprived
	Additional mandatory environmental impact indicators	
2.1.	Global Warming Potential (GWP-GHG)	kg CO_2 eq.
	Additional voluntary environmental impact indicators	
3.1	Particulate Matter emissions (PM)	Disease incidence
3.2	Ionizing radiation, human health (IRP)	kBq U235 eq.
3.3	Eco-toxicity - freshwater (ETP-fw)	CTUe
3.4	Human toxicity, cancer effect (HTP-c)	CTUh
3.5	Human toxicity, non-cancer effects (HTP-nc)	CTUh
3.6	Land use related impacts/Soil quality (SQP)	dimensionless
	Indicators describing resource use	
4.1	Use of renewable primary energy as energy carrier (PERE)	MJ
4.2	Use of renewable primary energy resources used as raw materials (PERM)	MJ
4.3	Total use of renewable primary energy (PERT)	MJ
4.4	Use of non renewable primary energy as energy carrier (PENRE)	MJ
4.5	Use of non renewable primary energy resources used as raw materials (PENRM)	MJ

4.6	Total use of non renewable primary energy resource (PENRT)	MJ
4.7	Use of secondary material (SM)	kg
4.8	Use of renewable secondary fuels (RSF)	MJ
4.9	Use of non renewable secondary fuels (NRSF)	MJ
4.10	Net use of fresh water (FW)	m^3
	Environmental information describing waste categories	
5.1	Hazardous waste disposed (HWD)	kg
5.2	Non harzardous waste disposed (NHWD)	kg
5.3	Radioactive waste disposed (RWD)	kg
	Environmental information describing output flows	
6.1	Components for re-use (CRU)	kg
6.2	Materials for recycling (MFR)	kg
6.3	Materials for energy recovery (MER)	kg
6.4	Exported electrical energy (EEE)	MJ
6.5	Exported thermal energy (EET)	MJ
	Biogenic carbon content	
7.1	Biogenic carbon content in product	kg C
7.2	Biogenic carbon content in accompanying packaging	kg C

Table 4: Environmental indicators included in the analysis.

5. Environmental impacts

Potential environmental impact – mandatory indicators according to EN 15804

Results for declared unit										
Indicator	**Unit**	**A1**	**A2**	**A3**	**A4**	**A5**	**C2**	**C3**	**C4**	**D**
GWP-fossil	kg CO_2 eq.	0,681	0,0471	0,0546	0,0489	0,0417	0,00818	0	0,0549	-0,00837
GWP-biogenic	kg CO_2 eq.	-0,0386	0,0000220	0,00234	0,0000267	0,00000662	0,00000440	0	0,0000872	0,00844
GWP-luluc	kg CO_2 eq.	0,00157	0,0000180	0,00000750	0,0000196	0.000000311	0,00000288	0	0,00000481	-0,0000169
GWP-total	kg CO_2 eq.	0,644	0,0471	0,0569	0,0489	0,0417	0,00819	0	0,0550	0,0000557
ODP	kg CFC 11 eq.	$6{,}83 \cdot 10^{-8}$	$1{,}07 \cdot 10^{-8}$	$0{,}723 \cdot 10^{-8}$	$1{,}10 \cdot 10^{-8}$	$0{,}0133 \cdot 10^{-8}$	$0{,}187 \cdot 10^{-8}$	0	$0{,}325 \cdot 10^{-8}$	$-0{,}268 \cdot 10^{-8}$
AP	mol H^+eq.	$9{,}94 \cdot 10^{-3}$	$0{,}349 \cdot 10^{-3}$	$0{,}200 \cdot 10^{-3}$	$0{,}185 \cdot 10^{-3}$	$0{,}00792 \cdot 10^{-3}$	$0{,}0417 \cdot 10^{-3}$	0	$0{,}0898 \cdot 10^{-3}$	$-0{,}0454 \cdot 10^{-3}$
EP-freshwater	kg PO_4^{3-} eq.	$7{,}62 \cdot 10^{-4}$	$0{,}103 \cdot 10^{-4}$	$0{,}332 \cdot 10^{-4}$	$0{,}123 \cdot 10^{-4}$	$0{,}00499 \cdot 10^{-4}$	$0{,}0185 \cdot 10^{-4}$	0	$0{,}0522 \cdot 10^{-4}$	$-0{,}0819 \cdot 10^{-4}$
EP-freshwater	kg P eq	$2{,}48 \cdot 10^{-4}$	$0{,}0336 \cdot 10^{-4}$	$0{,}108 \cdot 10^{-4}$	$0{,}0402 \cdot 10^{-4}$	$0{,}00163 \cdot 10^{-4}$	$0{,}00604 \cdot 10^{-4}$	0	$0{,}0170 \cdot 10^{-4}$	$-0{,}0267 \cdot 10^{-4}$
EP-marine	kg N eq.	$7{,}85 \cdot 10^{-4}$	$1{,}06 \cdot 10^{-4}$	$0{,}355 \cdot 10^{-4}$	$0{,}507 \cdot 10^{-4}$	$0{,}101 \cdot 10^{-4}$	$0{,}143 \cdot 10^{-4}$	0	$0{,}306 \cdot 10^{-4}$	$-0{,}0807 \cdot 10^{-4}$
EP-terrestrial	mol N eq.	$7{,}29 \cdot 10^{-3}$	$1{,}17 \cdot 10^{-3}$	$0{,}418 \cdot 10^{-3}$	$0{,}554 \cdot 10^{-3}$	$0{,}0364 \cdot 10^{-3}$	$0{,}156 \cdot 10^{-3}$	0	$0{,}334 \cdot 10^{-3}$	$-0{,}0800 \cdot 10^{-3}$
POCP	kg NMVOC eq.	$2{,}73 \cdot 10^{-3}$	$0{,}325 \cdot 10^{-3}$	$0{,}110 \cdot 10^{-3}$	$0{,}178 \cdot 10^{-3}$	$0{,}0106 \cdot 10^{-3}$	$0{,}0446 \cdot 10^{-3}$	0	$0{,}107 \cdot 10^{-3}$	$-0{,}0745 \cdot 10^{-3}$
ADP-minerals & metals*	kg Sb eq.	$1{,}26 \cdot 10^{-5}$	$0{,}120 \cdot 10^{-5}$	$0{,}0204 \cdot 10^{-5}$	$0{,}0155 \cdot 10^{-5}$	$0{,}000671 \cdot 10^{-5}$	$0{,}022 \cdot 10^{-5}$	0	$0{,}0112 \cdot 10^{-5}$	$-0{,}0118 \cdot 10^{-5}$
ADP-fossil*	MJ	1,108	0,706	0,707	0,738	0,0104	0,124	0	0,247	-0,396
WDP*	m^3	0,749	0,00192	0,00686	0,00228	0,0117	0,000346	0	0,0106	-0,00717
Acronyms	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, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption									

** Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.*

Potential environmental impact – additional mandatory and voluntary indicators

Results for declared unit										
Indicator	**Unit**	**A1**	**A2**	**A3**	**A4**	**A5**	**C2**	**C3**	**C4**	**D**
GWP-GHG[1]	kg CO_2 eq.	0,664	0,0467	0,0536	0,0484	0,0412	0,00811	0	0,0458	-0,00800
PM	Disease incidence	$4{,}55\cdot10^{-8}$	$0{,}325\cdot10^{-8}$	$0{,}0847\cdot10^{-8}$	$0{,}322\cdot10^{-8}$	$0{,}00942\cdot10^{-8}$	$0{,}0592\cdot10^{-8}$	0	$0{,}171\cdot10^{-8}$	$-0{,}0411\cdot10^{-8}$
IRP**	kBq U235 eq.	$6{,}37\cdot10^{-3}$	$3{,}60\cdot10^{-3}$	$3{,}83\cdot10^{-3}$	$3{,}88\cdot10^{-3}$	$0{,}0814\cdot10^{-3}$	$0{,}641\cdot10^{-3}$	0	$1{,}20\cdot10^{-3}$	$-1{,}72\cdot10^{-3}$
ETP-fw*	CTUe	0,184	0,558	0,557	0,614	0,0241	0,0996	0	0,863	-0,334
HTP-c*	CTUh	$1{,}54\cdot10^{-9}$	$0{,}0171\cdot10^{-9}$	$0{,}0244\cdot10^{-9}$	$0{,}0181\cdot10^{-9}$	$0{,}00580\cdot10^{-9}$	$0{,}00280\cdot10^{-9}$	0	$0{,}00662\cdot10^{-9}$	$-0{,}00382\cdot10^{-9}$
HTP-nc*	CTUh	$1{,}77\cdot10^{-8}$	$0{,}0598\cdot10^{-8}$	$0{,}0412\cdot10^{-8}$	$0{,}00651\cdot10^{-8}$	$0{,}00480\cdot10^{-8}$	$0{,}0109\cdot10^{-8}$	0	$0{,}0244\cdot10^{-8}$	$-0{,}0108\cdot10^{-8}$
SQP*	dimensionless	8,32	0,466	0,146	0,527	0,0182	0,0858	0	0,588	-0,290
Acronyms	GWP-GHG = Global Warming Potential neutral; PM = Potential incidence of disease due to PM emissions; IRP = Potential human exposure efficiency relative to U235, ETP,fw = Potential comparative toxic unit for ecosystems; HTP-c = Potential comparative toxic unit for effects; HTP-nc = Potential comparative toxic unit for humans; SQP = Potential soil quality index.									

** Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.*

*** Disclaimer: This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities, Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.*

Use of resources

Results for declared unit										
Indicator	**Unit**	**A1**	**A2**	**A3**	**A4**	**A5**	**C2**	**C3**	**C4**	**D**
PERE	MJ	1,52	0,00959	0,0774	0,0118	0,000521	0,00176	0	0,00436	-0,113
PERM	MJ	0	0	0	0	0	0	0	0	0
PERT	MJ	1,52	0,00959	0,774	0,01182	0,000521	0,00176	0	0,00436	-0,113
PENRE	MJ	$4{,}31\cdot10^{-3}$	$0{,}0178\cdot10^{-3}$	$0{,}00384\cdot10^{-3}$	$0{,}0182\cdot10^{-3}$	$0{,}0000717\cdot10^{-3}$	$0{,}00264\cdot10^{-3}$	0	$0{,}00181\cdot10^{-3}$	$-0{,}0167\cdot10^{-3}$
PENRM	MJ.	11,6	0,749	0,764	0,784	0,0110	0,132	0	0,263	-0,422
PENRT	MJ	11,6	0,749	0,764	0,784	0,0110	0,132	0	0,263	-0,422
SM	kg	0,00950	0	0	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0	0
FW	m^3	134	$1{,}18\cdot10^{-4}$	$6{,}00\cdot10^{-4}$	$1{,}33\cdot10^{-4}$	$3{,}36\cdot10^{-4}$	$0{,}213\cdot10^{-4}$	0	$2{,}78\cdot10^{-4}$	$-0{,}813\cdot10^{-4}$

[1]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.

Acronyms	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; 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 re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water

Waste production and output flows

Waste production

Results for declared unit										
Indicator	**Unit**	**A1**	**A2**	**A3**	**A4**	**A5**	**C2**	**C3**	**C4**	**D**
Hazardous waste disposed	kg	$3{,}29 \cdot 10^{-3}$	$0{,}0360 \cdot 10^{-3}$	$0{,}602 \cdot 10^{-3}$	$0{,}0406 \cdot 10^{-3}$	$0{,}877 \cdot 10^{-3}$	$0{,}00634 \cdot 10^{-3}$	0	$0{,}232 \cdot 10^{-3}$	$-0{,}0145 \cdot 10^{-3}$
Non-hazardous waste disposed	kg	0,357	0,0321	0,0347	0,0367	0,0450	0,00595	0	0,992	0,0000579
Radioactive waste disposed	kg	$2{,}91 \cdot 10^{-5}$	$0{,}481 \cdot 10^{-5}$	$0{,}133 \cdot 10^{-5}$	$0{,}500 \cdot 10^{-5}$	$0{,}00588 \cdot 10^{-5}$	$0{,}0848 \cdot 10^{-5}$	0	$0{,}148 \cdot 10^{-5}$	$-0{,}139 \cdot 10^{-5}$

Output flows

Results for declared unit											
Indicator	**Unit**	**A1**	**A2**	**A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
Components for re-use	kg	0	0	0	0	0	0	0	0	0	0
Material for recycling	kg	0,000217	0	0,00880	0	0,0156	0	0	0	0	0,0246
Materials for Energy recovery	kg	0	0	0	0	0	0	0	0	0	0
Exported energy	MJ	0	0	0	0	0	0	0	0	0	0
Exported energy, thermal	MJ	0	0	0	0	0	0	0	0	0	0

Information on biogenic carbon content

Results for declared unit		
BIOGENIC CARBON CONTENT	**Unit**	**QUANTITY**
Biogenic carbon content in product	kg C	0,007
Biogenic carbon content in packaging	kg C	0,123

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO_2.

6. Additional environmental information

ARUM complies with ecological and performance criteria required by 2014/312/UE Decision as requested by D.M. 11/1/2017 “Adozione dei criteri ambientali minimi per gli arredi per interni, per l'edilizia e per i prodotti tessili”. All information concerning the criteria satisfaction are available in the related documentation.

7. General information

7.1 San Marco Group SpA information

The Life Cycle Assessment (LCA) study and this EPD were created by the Product Safety Department of San Marco Group SpA, in collaboration with 2B Srl (www.to-be.it).

The company contact details are:

San Marco Group SpA

Contact: Federico Corò

Via Alta 10, 30020 Marcon (VE), Italy

e-mail: sicurezza.prodotti@sanmarcogroup.it

web-site: www.san-marco.com

7.2 Program information

Programma EPD:	The International EPD® System
Address:	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
Website	www.environdec.com
E-mail	info@environdec.com

CEN standard EN 15804 serves as the Core Product Category Rules (PCR)
Product category rules (PCR): Construction products, PCR 2019:14, v1.11, UN CPC code 3511 (Paints and varnishes and related products)
PCR review was conducted by: The Technical Committee of the International EPD® System. Chair: Massimo Marino (info@environdec.com)
Independent third-party verification of the declaration and data, according to ISO 14025:2006: ☑ EPD process certification ☐EPD verification
Third party verifier: DNV GL Business Assurance – Venezia Via Bruno Maderna, 7, 30174 Venezia VE 041 506 0655 Accredited by: Accredia
Procedure for follow-up of data during EPD validity involves third party verifier: ☑ Yes ☐No

San Marco Group SpA is the exclusive owner of the EPD and is responsible for its content.

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.

8. Bibliography

[1] San Marco Group Spa (www.sanmarcogroup.it).

[2] ISO 14025:2006. Environmental labels and declarations, type 3 environmental declarations, principles and procedures (www.iso.org).

[3] PCR 2019:14 v1.11 “Construction products”. Product Category Rules (PCR) for preparing an environmental product declaration (EPD) for construction products, the Swedish Environmental Management Council (www.environdec.com), 2021.

[4] UNI EN 15804:2012+A2:2019: Sostenibilità delle costruzioni - Dichiarazioni ambientali di prodotto - Regole quadro di sviluppo per categoria di prodotto, Ente Nazionale Italiano di Unificazione, ottobre 2019.

[5] G. Wernet, C. Bauer, B. Steubing, J. Reinhard, E. Moreno-Ruiz, and B. Weidema, The ecoinvent database version 3 (part I): overview and methodology, *Int. J. Life Cycle Assess.*, vol. 21, no. 9, pp. 1218–1230, 2016, doi: 10.1007/s11367-016-1087-8.

[6] PRé Consultants, Software SimaPro 9.11, 2020 (www.simapro.com).

[7] Istituto Superiore per la Protezione e la Ricerca Ambientale, Rapporto Rifiuti Urbani 2020 (www.isprambiente.gov.it).

[8] EPD International, General programme instructions for the International EPD System. Version 3.01, 2019.