



# ENVIRONMENTAL PRODUCT DECLARATION

*In accordance with EN 15804:2012+A2:2019 and ISO 14025*

## MARIS Solvent-based products



Date of issue: 2023-01-11

Validity: 5 years

Valid until: 2028-01-10

Version: 1

Scope of the EPD®: Global

The **environmental impacts** of this product have been assessed over its **whole life cycle**. Its Environmental Product Declaration has been verified by an **independent third party**.

Registration number  
The International EPD® System:  
S-P-07978

## General information

**Manufacturer:** MARIS POLYMERS S.M.S.A.

**Programme used:** International EPD System <http://www.environdec.com/>

**EPD registration number:** S-P-07978.

**PCR identification:** PCR 2019:14 Construction products version 1.11.

**Site of manufacture:** Thesi Roumani Inofyta Viotia, 32011, Greece.

**Owner of the declaration:** MARIS POLYMERS S.M.S.A.

**Product / product family name and manufacturer represented:** MARIS Solvent-based products manufactured by Maris Saint-Gobain: MARISEAL 250° FLASH, MARISEAL° 255, MARISEAL° DETAIL, MARISEAL° 260, MARISEAL° 270, MARISEAL° 420, MARISEAL° 450, MARISEAL° 460, MARITRANS°, MARITRANS° MD, MARITRANS° FINISH, MARISEAL° 600, MARISEAL° 650, MARISEAL° 670, MARISEAL° 550, MARIFAST° 570, MARIPOOL°, MARIPOOL° EP, MARIPUR° 7100, MARIPUR° 7200, MARIPUR° 7300, MARISEAL° 7350, MARIPUR° 7500, MARIPUR° 7600, MARIPUR° 7700, MARISEAL° 710, MARIPUR° 7000, MARISEAL° 800, MARITRANS° TILE-PRIMER and MARISEAL° TPO PRIMER.

**UN CPC code:** 35110 - Paints and varnishes and related products.

**EPD Prepared by:** LCA Central Team, Saint-Gobain.

**Contact:** Loukia Bousia (Loukia.Bousia@saint-gobain.com).

**Declaration issued:** 2023/01/11, valid until: 2028/01/10.

**Declared Unit:** 1 kg of product installed and with a service life between 10 and 25 years (depending on product).

All inventory data, as well as all indicator results expressed in this report, are declared for 1 kg of materials. Additionally, based on the standard product application, **as additional information** the equivalent results from the LCA study may be applicable to:

**Table 1. Consumption scenarios**

Average consumption	Minimum consumption	Maximum consumption
kg/m2	kg/m2	kg/m2
1.55E+00	1.00E-01	3.00E+00

**Declaration of Hazardous substances:** during the life cycle of the product any hazardous substance listed in the "Candidate List of Substances of Very High Concern (SVHC) for authorization" has been used in a percentage higher than 0.1% of the weight of the product.

**Geographical scope of the EPD®:** Global  
The intended use of this EPD is for B2B communication.

**Demonstration of verification:** an independent verification of the declaration was made, according to ISO 14025:2010. This verification was external and conducted by the following third party based on the PCR mentioned above.

**ISO standard ISO 21930 and CEN standard EN 15804 serves as the core Product Category Rules (PCR)**

<b>EPD program operator</b>	The international EPD® System
<b>Address:</b>	EPD® International AB Box 210 60 SE-100 31 Stockholm Sweden
<b>Website:</b>	<a href="http://www.environdec.com">www.environdec.com</a>
<b>E-mail:</b>	<a href="mailto:info@environdec.com">info@environdec.com</a>
<b>Product Category Rules (PCR)</b>	PCR 2019:14 Construction products (version 1.11)
<b>PCR review was conducted by</b>	The Technical Committee of the International EPD® System. See <a href="http://www.environdec.com/TC">www.environdec.com/TC</a> for a list of members. Review chair: Claudia A. Peña, University of Concepción, Chile. The review panel may be contacted via the Secretariat <a href="http://www.environdec.com/contact">www.environdec.com/contact</a> .

Independent third-party verification of the declaration and data, according to ISO 14025:2006:

- External                       Internal  
 EPD process certification     EPD verification

Third party verifier: Marcel Gómez

Marcel Gómez Consultoria Ambiental, Tlf: 0034 630 64 35 93 - email: [info@marcelgomez.com](mailto:info@marcelgomez.com)

Approved by: The International EPD® System

Procedure for follow-up of data during EPD validity involves third part verifier:

- Yes     No

## Product description

### Product's name:

MARIS Solvent-based products. See the exact list of the products included just below.

See technical characteristics of the products at: <https://www.marispolymers.com> and chrome-extension://efaidnbnmnnibpcjpcglclefindmkaj/<https://www.marispolymers.com/wp-content/uploads/2021/07/catalogue-2020-gr-en.pdf>

### Product description and use:

Product name	Technical description	Product description
<b>MARISEAL® 255</b>	Liquid-Applied Polyurethane Waterproofing Membrane	MARISEAL® 255 is a liquid-applied, highly permanent elastic, cold applied and cold curing, one component polyurethane membrane used for long-lasting waterproofing. Cures by reaction with ground and air moisture. EN 1504-2 Consumption: 1.2 – 2.0 kg/m <sup>2</sup> applied in two or three layers.
<b>MARISEAL® 250 FLASH</b>	Liquid-Applied Polyurethane Waterproofing Membrane	MARISEAL® 250 FLASH is a premium, semi-thixotropic, liquid-applied, highly permanent elastic,

		<p>cold applied and cold curing, one component polyurethane membrane used for long-lasting waterproofing.</p> <p>Certified for 10 years expected life span (EOTA) &amp; EN 1504-2, EN 14891</p> <p>Consumption: 1.4 – 2.5 kg/m<sup>2</sup> applied in two or three layers.</p>
<b>MARISEAL® DETAIL</b>	Liquid-Applied Polyurethane Waterproofing Membrane For Complex Roof Details. Fiber-Reinforced	<p>MARISEAL® DETAIL is a liquid-applied, thixotropic, permanent elastic, fiber-reinforced, cold applied and cold curing, polyurethane membrane used for long-lasting waterproofing.</p> <p>Certified for 25 years expected life span (EOTA) &amp; EN 1504-2</p> <p>Consumption: 2 - 3 kg/m<sup>2</sup> depending on application.</p>
<b>MARISEAL® 260</b>	Liquid-Applied Polyurethane Waterproofing Membrane	<p>MARISEAL® 260 is a premium, liquid-applied, highly permanent elastic, cold applied and cold curing, one component polyurethane membrane used for long-lasting waterproofing.</p> <p>EN 1504-2</p> <p>Consumption: 1.2 - 2 kg/m<sup>2</sup> applied in two or three layers.</p>
<b>MARISEAL® 270</b>	Liquid-Applied Polyurethane Waterproofing Membrane	<p>MARISEAL® 270 is a liquid-applied, permanent elastic, cold applied and cold curing, one component polyurethane membrane used for long-lasting waterproofing.</p> <p>EN 14891</p> <p>Consumption: 1.2 – 1.5 kg/m<sup>2</sup> applied in two or three layers.</p>
<b>MARISEAL® 420</b>	Aliphatic Polyurethane Top-Coat, UV-stable Public pedestrian & Vehicular traffic areas	<p>MARISEAL® 420 is a pigmented, wear resistant, semi-rigid, colour- and UV-stable, weather-stable, cold applied and cold curing, one component aliphatic polyurethane coating used as a top-coat for protection over exposed waterproofing coatings, subject to high wear conditions.</p> <p>Cures by reaction with ground and air moisture over a unique moisture triggered chemical reaction.</p> <p>EN 13813</p> <p>Consumption: 0.4 – 0.6 kg/m<sup>2</sup> applied in two layers.</p>
<b>MARISEAL® 450</b>	Aliphatic Polyurethane Waterproofing UV-stable Membrane for Balconies	<p>MARISEAL® 450 is a premium, liquid-applied, flexible, cold applied and cold curing, polyurethane membrane, used for long-lasting waterproofing. It offers exceptional UV stability and resistance to mechanical exposure.</p> <p>MARISEAL® 450 is based on pure elastomeric hydrophobic aliphatic polyurethane resins, which result in excellent mechanical, chemical, thermal, UV and natural element resistance properties.</p> <p>EN 1504-2</p>

		Consumption: 1.4 – 2.5 kg/m <sup>2</sup> applied in two or three layers.
<b>MARISEAL® 460</b>	Aliphatic Waterproofing Membrane for Roofs      UV-Stable	MARISEAL® 460 is a liquid-applied, permanent elastic, polyurethane membrane used for long-lasting waterproofing. It offers UV stability and yellowing resistance. It contains special catalyst that gives fast curing and defect free membrane, even at thick layers. EN 1504-2 Consumption: 1.4 – 2.5 kg/m <sup>2</sup> applied in two or three layers.
<b>MARITRANS®</b>	Transparent, Polyurethane Waterproofing Membrane      Liquid-Applied	MARITRANS® is a transparent, hard-elastic, one component, aliphatic polyurethane, high-solids coating, used for long-lasting waterproofing. This high-technology coating is UV-stable, non-yellowing, weather stable, alkali and chemical resistant and even after aging it remains transparent and elastic. MARITRANS® protects and waterproofs mineral surfaces against water penetration, frost, smog and acid rain. Aged and oxidized plastic surfaces look more transparent after coating with MARITRANS®. It waterproofs damaged glass surfaces and protects of glass fragments in case of breaking. It is used also as a transparent binder resin for sand carpet floor coating applications, especially in exterior applications where flexibility and UV stability is required. Using a unique curing system (moisture triggered), and unlike other similar systems it does not react with moisture (moisture-cured) and does not form bubbles. EN 1504-2 Consumption: 0.8 – 1.2 kg/m <sup>2</sup> applied in two or three layers.
<b>MARITRANS® MD</b>	Transparent, Polyurethane Waterproofing Membrane      Liquid-Applied	MARITRANS® MD is a transparent, hard-elastic, polyurethane, high-solids coating, used for long-lasting waterproofing. This high-technology coating is UV-stable, non-yellowing, weather stable, alkali and chemical resistant and even after aging it remains transparent and elastic. It protects and waterproofs mineral surfaces against water penetration, frost, smog and acid rain. Aged and oxidized plastic surfaces look more transparent after coating with. It waterproofs damaged glass surfaces and is used also as a transparent binder resin for sand carpet floor coating applications, especially in exterior applications where flexibility and UV stability is required.



		<p>MARITRANS® MD is using a unique curing system (moisture triggered), and unlike other similar systems it does not react with moisture (moisture-cured) and does not form bubbles.</p> <p>EN 1504-2 Consumption: 0.8 – 1.2 kg/m<sup>2</sup> applied in two or three layers.</p>
<b>MARITRANS® FINISH</b>	Transparent, Polyurethane Finishing Coating Satin Matte	<p>MARITRANS® FINISH is a satin-matte, transparent, semi-rigid, polyurethane coating, used for matt finishing over MARITRANS® polyurethane coatings.</p> <p>MARITRANS® FINISH is using a unique curing system (moisture triggered), and unlike other similar systems it does not react with moisture (moisture-cured) and does not form bubbles.</p> <p>EN 1504-2 Consumption: 0.10 kg/m<sup>2</sup> applied in one layer.</p>
<b>MARISEAL® 600</b>	Liquid-Applied Polyurethane / Bitumen-Extended Waterproofing Membrane	<p>MARISEAL® 600 is a liquid-applied, two-component, highly permanent elastic, polyurethane/ bitumen extended membrane used for long-lasting waterproofing.</p> <p>Based on pure elastomeric hydrophobic polyurethane resins, and is extended with chemically polymerized virgin bitumen, which result in excellent mechanical, chemical, thermal and natural element resistance properties.</p> <p>Cures by reaction (cross linking) of the two components.</p> <p>EN 1504-2 Consumption: 1.2 – 2.0 kg/m<sup>2</sup> applied in more than two layers.</p>
<b>MARISEAL® 650</b>	Liquid-Applied Polyurethane / Bitumen-Extended Waterproofing Membrane	<p>MARISEAL® 650 is a liquid-applied, one-component, highly permanent elastic, polyurethane/ bitumen extended membrane used for long-lasting waterproofing.</p> <p>Based on pure elastomeric hydrophobic polyurethane resins, and is extended with chemically polymerized virgin bitumen, which result in excellent mechanical, chemical, thermal and natural element resistance properties.</p> <p>EN 1504-2, EN 14891 Consumption: 1.2 – 2.0 kg/m<sup>2</sup> applied in more than two layers.</p>
<b>MARISEAL® 670</b>	Liquid-Applied Polyurethane / Bitumen-Extended Waterproofing Membrane	<p>MARISEAL® 670 is a liquid-applied, one-component, highly permanent elastic, polyurethane/ bitumen extended membrane used for long-lasting waterproofing.</p> <p>Based on pure elastomeric hydrophobic polyurethane resins, and is extended with chemically polymerized virgin bitumen, which result in excellent mechanical,</p>

		chemical, thermal and natural element resistance properties. EN 1504-2, EN 14891 Consumption: 1.4 – 2.0 kg/m <sup>2</sup> applied in two or three layers.
<b>MARISEAL® 550</b>	Liquid-Applied Hybrid Waterproofing Membrane Polyurea	MARISEAL® 550 is a liquid-applied, two-component hybrid polyurea membrane, used for long-lasting waterproofing and protection. Based on pure elastomeric hydrophobic polyurethane in combination with polyaspartic polyurea, which result in excellent mechanical, chemical, thermal, UV and natural element resistance properties. It combines the exceptional mechanical properties of polyurea with the high elasticity of PU. Cures by reaction (cross linking) of the two components. EN 1504-2 Consumption: 1.2 – 1.4 kg/m <sup>2</sup> applied in two layers.
<b>MARIFAST® 570</b>	Liquid-Applied Modified Waterproofing Membrane Polyurea	MARIFAST® 570 is a premium, cold applied two-component brushable polyurea used for long-lasting waterproofing. It provides a quick drying time, allowing most projects to be completed within one day. It does not require special application equipment and forms a blister-free non-penetrating against moisture film with zero water absorption. Based on elastomeric hydrophobic resins, which result in excellent mechanical, chemical, thermal, and natural element resistance properties. Application of top-coat (MARISEAL® 400 or MARISEAL® 420) for UV protection, is mandatory. EN 1504-2 Consumption: 1 – 1.2 kg/m <sup>2</sup> applied in two or three layers.
<b>MARIPOOL®</b>	Protective Swimming Pool Coating UV-stable, Non-Chalking	MARIPOOL® is a coloured, chemical resistant, abrasion resistant, thin-layer protective pool coating. It is UV-stable, resistant to usual pool chemicals and weather-stable, so it can be applied also on exterior pools. EN1504-2 Consumption: 0.15 kg/m <sup>2</sup> per layer, applied in three layers.
<b>MARIPOOL® EP</b>	Epoxy-based Protective Swimming Pool Coating	MARIPOOL® EP is a coloured, chemical resistant, abrasion resistant, epoxy based, thin-layer protective pool coating. Resistant to usual pool chemicals. EN1504-2

		Consumption: 0.15 kg/m <sup>2</sup> per layer, applied in 3 layers.
<b>MARIPUR® 7100</b>	Polyurethane Floor Coating	MARIPUR® 7100 is a coloured, highly durable, heavy duty polyurethane floor coating, mainly used on concrete floors, on interior surfaces. Specially designed for use as a thin-layer floor coating, providing high mechanical strength. EN13813 Consumption: 0.3 – 0.4 kg/m <sup>2</sup> applied in two layers.
<b>MARIPUR® 7200</b>	Aliphatic Polyurethane Floor Coating UV-stable	MARIPUR® 7200 is a coloured, highly durable, polyurethane thin-layer floor coating. It is specially designed for use as a floor coating on external surfaces. Using a unique curing system (moisture triggered), and unlike other similar systems it does not react with moisture (moisture-cured) and therefore does not form bubbles or blisters when applied in higher thicknesses. EN13813 Consumption: 0.4 kg/m <sup>2</sup> applied in two layers.
<b>MARIPUR® 7300</b>	Transparent Aliphatic Polyurethane Sealer Glossy, UV stable	MARIPUR® 7300 is a premium, transparent, glossy, semi-rigid, polyurethane sealer coating with high impact and abrasion strength and very good UV stability, used for as a transparent coating for natural stone sealing or as a transparent concrete sealer. EN1504-2 Consumption: 0.2 – 0.4 kg/m <sup>2</sup> applied in two layers.
<b>MARISEAL® 7350</b>	Acrylic, Transparent, Glossy, UV-stable Coating	MARISEAL® 7350 is a premium, transparent, glossy, semi-rigid, coating with impact and abrasion strength and very good UV stability, used as a transparent coating for natural stone sealing or as a transparent concrete sealer. EN1504-2 Consumption: 0.3 – 0.4 kg/m <sup>2</sup> applied in two layers.
<b>MARIPUR® 7500</b>	Aliphatic Polyurethane Glossy Varnish	MARIPUR® 7500 is a premium, transparent, glossy, semi-rigid, polyurethane varnish with high impact & abrasion strength and excellent UV stability, used for protection of decorative micro cement. EN1504-2 Consumption: 0.20 – 0.24 kg/m <sup>2</sup> applied in two layers.
<b>MARIPUR® 7600</b>	Aliphatic Polyurethane Matt Varnish	MARIPUR® 7600 is a premium, transparent, matt, semi-rigid, polyurethane varnish with high impact & abrasion strength and excellent UV stability, used for protection of decorative microcement.



		EN1504-2 Consumption: 0.20 – 0.24 kg/m <sup>2</sup> applied in two layers.
<b>MARIPUR® 7700</b>	Aliphatic Polyurethane Transparent Glossy Coating	MARIPUR® 7700 is a premium, transparent, glossy, semi-rigid, polyurethane coating with high impact & abrasion strength and excellent UV stability. Mainly used in floor coating applications, either as a transparent, solvent based coating over polyurethane or epoxy coatings or as a transparent concrete sealer. Cures by reaction air & ground humidity (moisture cure). EN1504-2 Consumption: 0.15 – 0.20 kg/m <sup>2</sup> applied in one layer.
<b>MARISEAL® 710</b>	Polyurethane Primer, Quick-drying Solvent-based	MARISEAL® 710 is a transparent, rigid, deep penetrating, quick drying, polyurethane primer. EN1504-2 Consumption: 0.2 kg/m <sup>2</sup> applied in one layer.
<b>MARISEAL® 800</b>	Siloxane/Silane Water Repellent	MARISEAL® 800 is a transparent, deep penetrating, non-staining, non-yellowing, non-film-making, siloxane/silane water repellent, on façades and walls. It will prevent water penetration and protect surface from ultraviolet degradation, airborne dirt, smog, industrial fumes, acid rain, chloride ions and will stabilize the surface. EN1504-2 Consumption: 0.2 – 0.3 kg/m <sup>2</sup> applied in one or two layers (flood coats).
<b>MARIPUR® 7000</b>	Polyurethane Floor Primer	MARIPUR® 7000 is a transparent, semi-rigid, deep penetrating, polyurethane primer. EN1504-2 Consumption: 0.2 kg/m <sup>2</sup> applied in one layer.
<b>MARITRANS® TILE-PRIMER</b>	Adhesion Promoter for Glass and Glazed Surfaces	MARITRANS® TILE-PRIMER is a transparent, one-component adhesion promoter that chemically activates ceramic and glass surfaces, providing excellent adhesion to the coating that follows. Solvent based. Cures by reaction with ground and air moisture. EN1504-2 Consumption: 0.05 – 0.08 kg/m <sup>2</sup> applied in one or two layers.
<b>MARISEAL® TPO PRIMER</b>	Adhesion Promoter for TPO, PP and EPDM membranes	MARISEAL® TPO PRIMER is a transparent, one-component adhesion promoter that activates TPO, PP and EPDM membranes, providing excellent adhesion to the coating that follows. Solvent based. Consumption: 0.05 – 0.06 kg/m <sup>2</sup> in one layer.

**Description of the main product components and/or materials:**

MARIS Solvent-based products can have a variable composition range. The composition range of the products is shown below. For its representation in the calculation model, an average product has been represented at the composition level, based on the contribution to the environmental impact of the different raw materials.

Product components	Weight (%)	Post-consumer material weight (%)	Renewable material weight (%)
Xylene	20 - 80	0 %	0 %
Polymer	10 - 45	0 %	0 %
Fillers	10 - 37	0 %	0 %
Pigment	10-20	0 %	0 %
Additives	1 - 2	0 %	0 %
TOTAL	100	0%	0%

Packaging materials	Weight (Kg)	Weight-% (versus the product)
Plastic packaging	0.06 – 0.08	7.64 %
Plastic wrap	0.00 – 0.01	0.90 %
EURO Wood-pallet	0.01 – 0.02	1.02 %

During the life cycle of the product any hazardous substance listed in the “Candidate List of Substances of Very High Concern (SVHC) for authorization” has not been used in a percentage higher than 0.1% of the weight of the product. The verifier and the program operator do not make any claim nor have any responsibility of the legality of the product.

## LCA calculation information

<b>EPD TYPE DECLARED</b>	Cradle to grave and module D Product-specific (one manufacturing site)
<b>DECLARED UNIT</b>	1 kg of product installed and with a service life between 10 and 25 years (depending on product)
<b>SYSTEM BOUNDARIES</b>	Cradle to grave + Module D = (A + B + C) + D
<b>REFERENCE SERVICE LIFE (RSL)</b>	The RSL is considered with a service life between 10 and 25 years (depending on product), due to their nature and composition, these materials are of high quality and proven durability.
<b>CUT-OFF RULES</b>	<p>In general, the cut-off criteria are 1% of the consumption of renewable and non-renewable primary energy and 1% of the total input mass of the manufacturing process (according to the EN 15804 standard). In the evaluation, all available data of the production process is considered, i.e., all raw materials used, auxiliary materials used and energy consumption using the best available datasets in the reference database. The following processes have been excluded:</p> <ul style="list-style-type: none"> <li>• Manufacture of equipment used in production, infrastructure, or any other capital goods.</li> <li>• Transportation of personnel to the plant or from the production site.</li> <li>• Research and development activities.</li> <li>• Long-term emissions.</li> </ul>
<b>ALLOCATIONS</b>	<p>In general, whenever possible, allocation was avoided. Materials production was divided into families, and input and output data related to each were collected, when the data could not be directly attributed to a specific product, they were generally assigned to the total production of materials without differentiation.</p> <p>The allocation of the consumption of common inputs such as water consumption, as well as common production outputs, such as solid waste generation, was made based on the total annual production of materials. The consumption reported for fuels and electricity was made at plant level, the allocation was assumed by total production (by mass). The modularity principle as well as the polluter-payer principle have been followed.</p> <p>The waste management data corresponds to all the waste generated in the facilities of the production plant, considering total generation of residues. Therefore, the reported data includes all the products made in the production plant.</p>
<b>GEOGRAPHICAL COVERAGE AND TIME PERIOD</b>	<p>Production site location: Greece. Use and end-of-life location: Global.</p> <p>Data is collected from one production site in Thesi Roumani Inofyta Viotia, 32011, Greece. Data collected for the year 2021. Background data: Ecoinvent 3.8 and SimaPro 9.3.</p>
<b>PRODUCT UN CPC CODE</b>	35110 - Paints and varnishes and related products.

According to EN 15804:2012+A2:2019, EPDs of construction products may not be comparable if they do not comply with this standard. According to ISO 21930, EPDs might not be comparable if they are from different programmes.

# Life Cycle stages

## Flow diagram of the Life Cycle



## Product stage, A1-A3

Description of the stage: the product stage of plaster products is subdivided into 3 modules A1, A2 and A3 respectively "Raw material supply", "Transport to manufacturer" and "Manufacturing".

### A1. Raw materials extraction

For each product, a model was made and then an average of the calculated models was performed, per kilogram of product. Some products are the result of the combination of 2 or more products, some of them have component A and component B. In these cases, a weighted ratio of products A and B was calculated. The specific consumption per kg of product is calculated in  $\text{kg}/\text{m}^2$ .

For the quantification of impacts associated with raw materials, 100 % of the components reported in the production of materials have been used, including main and secondary raw materials.

### A2. Transportation of raw materials

To determine the transport of raw materials, the data reported by the production plant regarding their raw materials and data referring to their supply have been used. Additionally, the production plant has also reported the road transport distance for each of the secondary materials (consumables) used in the production activities of the year. Consumable materials include: fuels (diesel), oils and others. For each of them, the total quantity transported and the weighted average distance according to the quantity registered by each production center have been determined, to calculate the  $\text{kg} \cdot \text{kilometer}$  ratio, which has been consolidated for each product family.

Greece production center of Maris has reported the average distance and means of transport used for the transportation of raw materials from their production site.

### A3. Production (Manufacturing)

Based on the internal records of the production plant, the amount of materials produced per year, by nature of the product, has been reported.

These products come from the combination of different polymers; some products are the result of more than 5 combined polymer.

The general manufacturing processes within the operational limits of MARIS Solvent-based products production are presented in the following figure and listed below:

- 1) Reception of the raw material
- 2) Quality control
- 3) Storage
- 4) Mix with resins and pigments
- 5) Mass distribution
- 6) Quality control

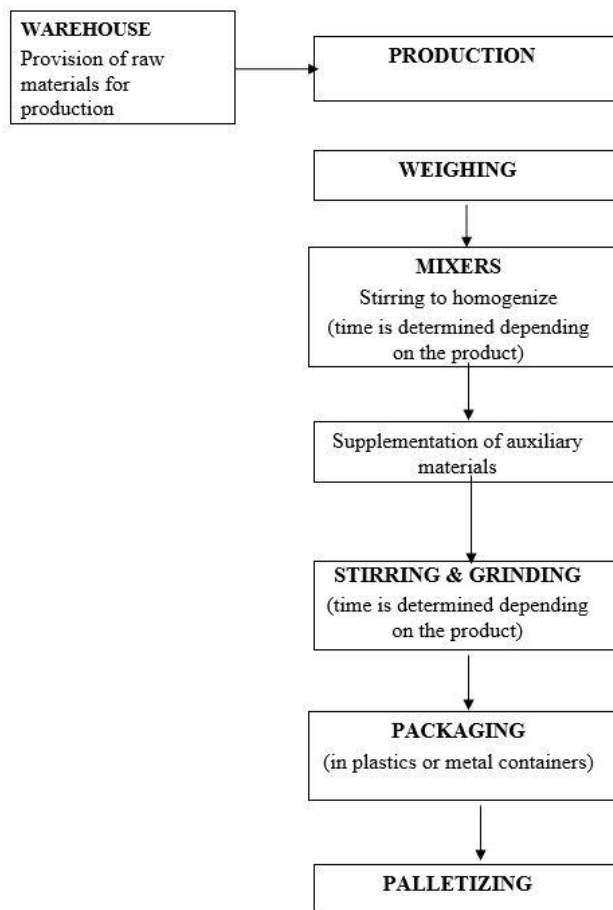


Figure 1. Manufacturing process for Maris products

The main inputs of the manufacturing system are:

- Energy: Electricity and Fuels.
- Water: Well intake or network consumption.
- Consumables: External raw materials, Waste to be processed and/or recovered.
- Transports: Packaging and waste.



The main outputs of the production system are:

- Waste generated: Hazardous, Non-hazardous.
- Emissions to air, water or soil (none).

## Construction process stage, A4-A5

Description of the stage: the construction process is divided into 2 modules: A4, transport to the building site and A5, installation in the building

### A4. Product transport

Considering the wide distribution of products at an international and regional level, based on the sales distribution report, the total production sold by family and by country of destination is recorded. For each of the destinations, according to information for internal use, the export ports in the country of origin and import ports in the destination countries are determined. An average transportation distance to the construction site is determined in each destination country.

For each case, the transport distances are determined and associated with a mode of transport: land freight vehicle, and maritime container ship. The detail of the technical parameters for the transport model is obtained from the Ecoinvent 3.8 database and its reference technical studies. The assumptions of this modeling are summarized below.

PARAMETER	VALUE (expressed per declared unit)	
<b>Type and fuel consumption of the vehicle, type of vehicles used for the transport; for example, trucks for long distances, boat, etc.</b>	Transport, freight, lorry 16-32 metric ton, EURO6 {RER}  transport, freight, lorry 16-32 metric ton, EURO6   Cut-off, U	Transport, freight, sea, container ship {GLO}  transport, freight, sea, container ship   Cut-off, U
<b>Distance</b>	Km by truck: 1644.71	Km by ship: 108.29
<b>Capacity utilization (including empty return trip)</b>	Percentage assumed by Ecoinvent database	Percentage assumed by Ecoinvent database
<b>Apparent density</b>	kg/m <sup>3</sup> : 0.80 – 1.48	
<b>Volume capacity factor</b>	1	1

### A5. Construction-Installation process

Considering the uses and installation, it can be reported that more than 99 % of the cases require a manual installation that does not imply the use of extra resources, neither energy, nor water nor application machines, only spreading on the surfaces where the product is applied and it remains. It is considered that it does not generate extra waste not previously considered, apart from that referring to the packaging in which the product is stored and the packaging in which it is transported from the country of origin to the destination.

There is an estimation of 0.3 % of material loss during the installation process. Regarding waste management, plastic waste (container pots), pallets, metal waste and mixed packaging are considered, which are assumed to be 100 % recycled considering at an average distance scenario of 50 km.

## Use stage, B1-B7

The use stage, related to the application of the product in the building includes:

- B1.** Use or application of the installed product;
- B2.** Maintenance;
- B3.** Repair;
- B4.** Replacement;
- B5.** Refurbishment;
- B6.** Operational energy use;
- B7.** Operational water use.

**Description of scenarios and additional technical information:**

Based on their design features and components, Maris products have a service life between 10 and 25 years (depending on product). Regardless of the installation conditions and multiple applications for final finishing, the maintenance needs are none. Therefore, the impact of these stages is 0.

**End-of-life stage C1-C4**

This stage includes the next modules:

- C1.** Deconstruction, demolition;
- C2.** Transport to waste processing;
- C3.** Waste processing for reuse, recovery and/or recycling;
- C4.** Disposal-

**Description of the scenarios and additional technical information for the end-of-life:**

MODULE	PARAMETER	UNIT (PER DECLARED UNIT)	VALUE
<b>C1 Deconstruction</b>	Process of collection specified by type	Kg collected in a separate way	0
		Kg collected mixed with waste from construction	1
<b>C2 Transport</b>	Type and fuel consumption of the vehicle, type of vehicles used for the transport	Transport, freight, lorry 16-32 metric ton, EURO6	Diesel consumption: 0.0366 tkm
	Distance	km	50
	Use of capacity (including empty returns)	%	Percentage assumed by Ecoinvent database
	Apparent density of transported products	kg / m <sup>3</sup>	800 – 1430
<b>C3 Treatment of waste</b>	System recovery specified by type	kg for reuse	0
		kg for recycle	0
<b>C4 Disposal</b>	Disposal specified by type	kg for energy recovery	0
		kg of product for final deposition	1

**Reuse/recovery/recycling potential, D**

100% of wastes are landfilled. There is no reuse nor recovery nor recycling of this product. Hence, no recycling benefits are reported on Module D.

# LCA results

As specified in EN 15804:2012+A2:2019 and also the Product-Category Rules, the environmental impacts are declared and reported using the baseline characterization factors from the ILCD. Specific data has been supplied by the plant, and generic data comes from Ecoinvent v3.8 databases. All emissions to air, water, and soil, and all materials and energy used have been included.

System boundaries (X=included, MND=module not declared)																		
	PRODUCT STAGE			CONSTRUCTION STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS	
	Raw material supply	Transport	Manufacturing	Transport	Construction-Installation process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction demolition	Transport	Waste processing	Disposal	Reuse-recovery	
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	X	X	X	X	X	X	X	X	X	X	X	X	
Geography	GR	GR	GR	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	
Specific data used	>90 GWP-GHG																	
Variation products	<10% inside of every group of products																	
Variation sites	Not relevant, only one production site																	

Notes: All data results are representative for 1 kg of MARIS Solvent-based products.

The estimated impact results are only relative statements which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins or risks.

## Environmental impacts - Group 5. MARISEAL® TPO Primer, MARISEAL® 710 and MARISEAL® 800.

All data results are representative for 1 kg of MARIS Solvent-based products (Group 5) MARISEAL® TPO Primer, MARISEAL® 710 and MARISEAL® 800, as declared unit.

	Environmental indicators	Product stage	Constructi on stage		Use stage							End of life stage				Reuse, Recovery Recycling
		A1 / A2 / A3	A4 Transport		A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal
	Climate Change [kg CO <sub>2</sub> eq.]	1.60 E+00	1.44E-01	5.58E-03	0	0	0	0	0	0	0	0	8.15E-03	0	5.35E-03	0
	Climate Change (fossil) [kg CO <sub>2</sub> eq.]	1.63E+00	1.44E-01	5.66E-03	0	0	0	0	0	0	0	0	8.14E-03	0	5.27E-03	0
	Climate Change (biogenic) [kg CO <sub>2</sub> eq.]	-3.03E-02	1.52E-04	-9.02E-05	0	0	0	0	0	0	0	0	7.42E-06	0	7.97E-05	0
	Climate Change (land use change) [kg CO <sub>2</sub> eq.]	2.08E-03	5.44E-05	6.54E-06	0	0	0	0	0	0	0	0	3.26E-06	0	1.91E-06	0
	Ozone depletion [kg CFC-11 eq.]	4.45E-07	3.59E-08	1.51E-09	0	0	0	0	0	0	0	0	1.89E-09	0	9.36E-10	0
	Acidification terrestrial and freshwater [Mole of H <sup>+</sup> eq.]	5.38E-02	4.89E-04	1.64E-04	0	0	0	0	0	0	0	0	2.31E-05	0	4.91E-05	0
	Eutrophication freshwater [kg P eq.]	1.21E-04	1.02E-06	3.67E-07	0	0	0	0	0	0	0	0	5.81E-08	0	6.33E-08	0
	Eutrophication marine [kg N eq.]	5.05E-03	1.08E-04	1.56E-05	0	0	0	0	0	0	0	0	4.59E-06	0	2.03E-05	0
	Eutrophication terrestrial [Mole of N eq.]	7.56E-02	1.21E-03	2.32E-04	0	0	0	0	0	0	0	0	5.12E-05	0	2.23E-04	0
	Photochemical ozone formation - human health [kg NMVOC eq.]	1.74E-02	4.63E-04	5.42E-05	0	0	0	0	0	0	0	0	1.97E-05	0	6.16E-05	0
	Resource use, mineral and metals [kg Sb eq.]	1.74E-03	3.44E-07	5.21E-06	0	0	0	0	0	0	0	0	2.89E-08	0	2.40E-10	0
	Resource use, energy carriers [MJ]	4.16E+01	2.34E+00	1.36E-01	0	0	0	0	0	0	0	0	1.23E-01	0	7.01E-02	0
	Water deprivation potential [m <sup>3</sup> world equiv.]	1.01E+00	8.03E-03	3.08E-03	0	0	0	0	0	0	0	0	3.76E-04	0	1.75E-04	0

The results of this environmental impact indicator should be used with caution, as the uncertainties of the results are high and experience with this parameter is limited.











## Potential environmental impact – additional mandatory and voluntary indicators

Environmental indicators	Product stage	Construction stage		Use stage							End of life stage				Reuse, Recovery Recycling
	A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	D Reuse, recovery, recycling
<u>GWP-GHG</u> <sup>1</sup> [kg CO <sub>2</sub> eq.]	1.61E+00	1.43E-01	5.58E-03	0	0	0	0	0	0	0	0	8.07E-03	0	5.20E-03	0

<sup>1</sup> 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 almost equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.











## Resources Use



Resources Use indicators		Product stage	Construction stage		Use stage							End of life stage				Reuse, recovery, recycling
		A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	D Reuse, recovery, recycling
	Use of renewable primary energy (PERE) [MJ]	4.04E+00	2.97E-02	1.23E-02	0	0	0	0	0	0	0	0	1.76E-03	0	1.65E-03	0
	Primary energy resources used as raw materials (PERM) [MJ]	2.99E-02	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total use of renewable primary energy resources (PERT) [MJ]	4.07E+00	2.97E-02	1.23E-02	0	0	0	0	0	0	0	0	1.76E-03	0	1.65E-03	0
	Use of non-renewable primary energy (PENRE) [MJ]	4.39E+01	2.49E+00	1.44E-01	0	0	0	0	0	0	0	0	1.31E-01	0	7.45E-02	0
	Non-renewable primary energy resources used as raw materials (PENRM) [MJ]	2.53E-02	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total use of non-renewable primary energy resources (PENRT) [MJ]	4.39E+01	2.49E+00	1.44E-01	0	0	0	0	0	0	0	0	1.31E-01	0	7.45E-02	0
	Input of secondary material (SM) [kg]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Use of renewable secondary fuels (RSF) [MJ]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Use of non-renewable secondary fuels (NRSF) [MJ]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Use of net fresh water (FW) [m <sup>3</sup> ]	3.24E-02	2.78E-04	9.86E-05	0	0	0	0	0	0	0	0	1.40E-05	0	8.42E-06	0

\*For this study, both the product and its packaging are reported in the indicators "Use of renewable primary energy resources used as raw materials" ("PERM") and "Use of non-renewable primary energy resources used as raw materials" ("PENRM"). PERM and PENRM are reported as negative values when materials are recycled or recovered, but not when landfilled.

## Waste Category & Output flows








Waste Category & Output Flows		Product stage	Construction stage		Use stage							End of life stage				Reuse, recovery, recycling
		A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruct	C2 Transport	C3 Waste processing	C4 Disposal	D Reuse, recovery, recycling
	Hazardous waste disposed (HWD) [kg]	4.61E-05	5.65E-06	1.68E-07	0	0	0	0	0	0	0	0	3.22E-07	0	1.50E-07	0
	Non-hazardous waste disposed (NHWD) [kg]	1.20E-01	2.18E-01	9.65E-04	0	0	0	0	0	0	0	0	6.46E-03	0	1.00 E+00	0
	Radioactive waste disposed (RWD) [kg]	2.82E-04	1.59E-05	9.25E-07	0	0	0	0	0	0	0	0	8.34E-07	0	4.42E-07	0
	Components for re-use (CRU) [kg]	0	0	2.30E-03	0	0	0	0	0	0	0	0	0	0	0	0
	Materials for Recycling (MFR) [kg]	0	0	1.94E-01	0	0	0	0	0	0	0	0	0	0	0	0
	Material for Energy Recovery (MER) [kg]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Exported electrical energy (EEE) [MJ]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Exported thermal energy (EET) [MJ]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

## Information on biogenic carbon content

Biogenic Carbon Content		Product stage
		A1 / A2 / A3
	Biogenic carbon content in product [kg]	0
	Biogenic carbon content in packaging [kg]	2.98E-03

Note: 1 kg biogenic carbon is equivalent to 44/12 (approx. 3.67) kg CO<sub>2</sub>.

## Environmental impacts - Group 6. MARISEAL® 670, MARISEAL® 270 and MARISEAL® 260

	Environmental indicators	Product stage	Constructi on stage	A5 Installation	Use stage							End of life stage				Reuse, Recovery Recycling
		A1 / A2 / A3	A4 Transport		B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	D Reuse, recovery, recycling
	Climate Change [kg CO <sub>2</sub> eq.]	3.01E+00	1.44E-01	9.56E-03	0	0	0	0	0	0	0	0	8.15E-03	0	5.35E-03	0
	Climate Change (fossil) [kg CO <sub>2</sub> eq.]	2.99E+00	1.44E-01	9.51E-03	0	0	0	0	0	0	0	0	8.14E-03	0	5.27E-03	0
	Climate Change (biogenic) [kg CO <sub>2</sub> eq.]	1.27E-02	1.52E-04	3.86E-05	0	0	0	0	0	0	0	0	7.42E-06	0	7.97E-05	0
	Climate Change (land use change) [kg CO <sub>2</sub> eq.]	1.72E-03	5.44E-05	5.39E-06	0	0	0	0	0	0	0	0	3.26E-06	0	1.91E-06	0
	Ozone depletion [kg CFC-11 eq.]	2.19E-07	3.59E-08	7.81E-10	0	0	0	0	0	0	0	0	1.89E-09	0	9.36E-10	0
	Acidification terrestrial and freshwater [Mole of H <sup>+</sup> eq.]	4.58E-02	4.89E-04	1.39E-04	0	0	0	0	0	0	0	0	2.31E-05	0	4.91E-05	0
	Eutrophication freshwater [kg P eq.]	1.91E-04	1.02E-06	5.76E-07	0	0	0	0	0	0	0	0	5.81E-08	0	6.33E-08	0
	Eutrophication marine [kg N eq.]	5.41E-03	1.08E-04	1.65E-05	0	0	0	0	0	0	0	0	4.59E-06	0	2.03E-05	0
	Eutrophication terrestrial [Mole of N eq.]	6.86E-02	1.21E-03	2.09E-04	0	0	0	0	0	0	0	0	5.12E-05	0	2.23E-04	0
	Photochemical ozone formation - human health [kg NMVOC eq.]	1.77E-02	4.63E-04	5.45E-05	0	0	0	0	0	0	0	0	1.97E-05	0	6.16E-05	0
	Resource use, mineral and metals [kg Sb eq.]	1.23E-03	3.44E-07	3.68E-06	0	0	0	0	0	0	0	0	2.89E-08	0	2.40E-10	0
	Resource use, energy carriers [MJ]	5.95E+01	2.34E+00	1.87E-01	0	0	0	0	0	0	0	0	1.23E-01	0	7.01E-02	0
	Water deprivation potential [m <sup>3</sup> world equiv.]	2.43E+00	8.03E-03	7.32E-03	0	0	0	0	0	0	0	0	3.76E-04	0	1.75E-04	0











The results of this environmental impact indicator should be used with caution, as the uncertainties of the results are high and experience with this parameter is limited.

## Potential environmental impact – additional mandatory and voluntary indicators

Environmental indicators	Product stage	Construction stage		Use stage							End of life stage			Reuse, Recovery Recycling	
	A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	D Reuse, recovery, recycling
<u>GWP-GHG<sup>2</sup></u> [kg CO <sub>2</sub> eq.]	2.88E+00	1.43E-01	9.18E-03	0	0	0	0	0	0	0	0	8.07E-03	0	5.20E-03	0

<sup>2</sup> 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 almost equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.









## Resources Use

Resources Use indicators		Product stage	Construction stage		Use stage							End of life stage				Reuse, recovery, recycling
		A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	D Reuse, recovery, recycling
	Use of renewable primary energy (PERE) [MJ]	4.14E+00	2.97E-02	1.25E-02	0	0	0	0	0	0	0	0	1.76E-03	0	1.65E-03	0
	Primary energy resources used as raw materials (PERM) [MJ]	2.99E-02	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total use of renewable primary energy resources (PERT) [MJ]	4.17E+00	2.97E-02	1.25E-02	0	0	0	0	0	0	0	0	1.76E-03	0	1.65E-03	0
	Use of non-renewable primary energy (PENRE) [MJ]	6.35E+01	2.49E+00	1.99E-01	0	0	0	0	0	0	0	0	1.31E-01	0	7.45E-02	0
	Non-renewable primary energy resources used as raw materials (PENRM) [MJ]	2.53E-02	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total use of non-renewable primary energy resources (PENRT) [MJ]	6.36E+01	2.49E+00	1.99E-01	0	0	0	0	0	0	0	0	1.31E-01	0	7.45E-02	0
	Input of secondary material (SM) [kg]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Use of renewable secondary fuels (RSF) [MJ]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Use of non-renewable secondary fuels (NRSF) [MJ]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Use of net fresh water (FW) [m³]	6.33E-02	2.78E-04	1.91E-04	0	0	0	0	0	0	0	0	1.40E-05	0	8.42E-06	0



\*For this study, both the product and its packaging are reported in the indicators "Use of renewable primary energy resources used as raw materials" ("PERM") and "Use of non-renewable primary energy resources used as raw materials" ("PENRM"). PERM and PENRM are reported as negative values when materials are recycled or recovered, but not when landfilled.



## Waste Category & Output flows



Waste Category & Output Flows		Product stage	Construction stage		Use stage							End of life stage				Reuse, recovery, recycling
		A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction /	C2 Transport	C3 Waste processing	C4 Disposal	D Reuse, recovery, recycling
	Hazardous waste disposed (HWD) [kg]	3.01E-05	5.65E-06	1.12E-07	0	0	0	0	0	0	0	0	3.22E-07	0	1.50E-07	0
	Non-hazardous waste disposed (NHWD) [kg]	2.79E-01	2.18E-01	1.26E-03	0	0	0	0	0	0	0	0	6.46E-03	0	1.00E+00	0
	Radioactive waste disposed (RWD) [kg]	1.54E-04	1.59E-05	5.17E-07	0	0	0	0	0	0	0	0	8.34E-07	0	4.42E-07	0
	Components for re-use (CRU) [kg]	0	0	2.30E-03	0	0	0	0	0	0	0	0	0	0	0	0
	Materials for Recycling (MFR) [kg]	0	0	1.94E-01	0	0	0	0	0	0	0	0	0	0	0	0
	Material for Energy Recovery (MER) [kg]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Exported electrical energy (EEE) [MJ]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Exported thermal energy (EET) [MJ]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

## Information on biogenic carbon content

		Product stage
<b>Biogenic Carbon Content</b>		A1 / A2 / A3
	Biogenic carbon content in product [kg]	0
	Biogenic carbon content in packaging [kg]	2.98E-03

Note: 1 kg biogenic carbon is equivalent to 44/12 (approx. 3.67) kg CO<sub>2</sub>.

**Environmental impacts - Group 1. MARISEAL® 255, MARISEAL® Detail, MARISEAL® 7350, MARISEAL® 250 Flash, MARISEAL® 460, MARISEAL® 600, MARISEAL® 550 and MARISEAL® 650**

	Environmental indicators	Product stage	Constructi on stage	A5 Installation	Use stage							End of life stage				Reuse, Recovery Recycling
		A1 / A2 / A3	A4 Transport		B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	D Reuse, recovery, recycling
	Climate Change [kg CO <sub>2</sub> eq.]	3.81E+00	1.44E-01	1.21E-02	0	0	0	0	0	0	0	0	8.15E-03	0	5.35E-03	0
	Climate Change (fossil) [kg CO <sub>2</sub> eq.]	3.79E+00	1.44E-01	1.20E-02	0	0	0	0	0	0	0	0	8.14E-03	0	5.27E-03	0
	Climate Change (biogenic) [kg CO <sub>2</sub> eq.]	2.06E-02	1.52E-04	6.23E-05	0	0	0	0	0	0	0	0	7.42E-06	0	7.97E-05	0
	Climate Change (land use change) [kg CO <sub>2</sub> eq.]	2.18E-03	5.44E-05	6.78E-06	0	0	0	0	0	0	0	0	3.26E-06	0	1.91E-06	0
	Ozone depletion [kg CFC-11 eq.]	2.72E-07	3.59E-08	9.62E-10	0	0	0	0	0	0	0	0	1.89E-09	0	9.36E-10	0
	Acidification terrestrial and freshwater [Mole of H <sup>+</sup> eq.]	5.55E-02	4.89E-04	1.68E-04	0	0	0	0	0	0	0	0	2.31E-05	0	4.91E-05	0
	Eutrophication freshwater [kg P eq.]	2.27E-04	1.02E-06	6.86E-07	0	0	0	0	0	0	0	0	5.81E-08	0	6.33E-08	0
	Eutrophication marine [kg N eq.]	6.59E-03	1.08E-04	2.01E-05	0	0	0	0	0	0	0	0	4.59E-06	0	2.03E-05	0
	Eutrophication terrestrial [Mole of N eq.]	8.25E-02	1.21E-03	2.51E-04	0	0	0	0	0	0	0	0	5.12E-05	0	2.23E-04	0
	Photochemical ozone formation - human health [kg NMVOC eq.]	2.16E-02	4.63E-04	6.63E-05	0	0	0	0	0	0	0	0	1.97E-05	0	6.16E-05	0
	Resource use, mineral and metals [kg Sb eq.]	1.44E-03	3.44E-07	4.33E-06	0	0	0	0	0	0	0	0	2.89E-08	0	2.40E-10	0
	Resource use, energy carriers [MJ]	7.62E+01	2.34E+00	2.38E-01	0	0	0	0	0	0	0	0	1.23E-01	0	7.01E-02	0
	Water deprivation potential [m <sup>3</sup> world equiv.]	3.16E+00	8.03E-03	9.52E-03	0	0	0	0	0	0	0	0	3.76E-04	0	1.75E-04	0











The results of this environmental impact indicator should be used with caution, as the uncertainties of the results are high and experience with this parameter is limited.

## Potential environmental impact – additional mandatory and voluntary indicators

Environmental indicators	Product stage	Constructi on stage		Use stage							End of life stage			Reuse, Recovery Recycling	
	A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	D Reuse, recovery, recycling
<u>GWP-GHG<sup>3</sup></u> [kg CO2 eq.]	3.65E+00	1.43E-01	1.16E-02	0	0	0	0	0	0	0	0	8.07E-03	0	5.20E-03	0








<sup>3</sup> 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 almost equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.

## Resources Use



Resources Use indicators		Product stage	Construction stage		Use stage							End of life stage				Reuse, recovery, recycling
		A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	D Reuse, recovery, recycling
	Use of renewable primary energy (PERE) [MJ]	4.99E+00	2.97E-02	1.51E-02	0	0	0	0	0	0	0	0	1.76E-03	0	1.65E-03	0
	Primary energy resources used as raw materials (PERM) [MJ]	2.99E-02	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total use of renewable primary energy resources (PERT) [MJ]	5.02E+00	2.97E-02	1.51E-02	0	0	0	0	0	0	0	0	1.76E-03	0	1.65E-03	0
	Use of non-renewable primary energy (PENRE) [MJ]	8.14E+01	2.49E+00	2.54E-01	0	0	0	0	0	0	0	0	1.31E-01	0	7.45E-02	0
	Non-renewable primary energy resources used as raw materials (PENRM) [MJ]	2.53E-02	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total use of non-renewable primary energy resources (PENRT) [MJ]	8.14E+01	2.49E+00	2.54E-01	0	0	0	0	0	0	0	0	1.31E-01	0	7.45E-02	0
	Input of secondary material (SM) [kg]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Use of renewable secondary fuels (RSF) [MJ]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Use of non-renewable secondary fuels (NRSF) [MJ]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Use of net fresh water (FW) [m³]	8.17E-02	2.78E-04	2.46E-04	0	0	0	0	0	0	0	0	1.40E-05	0	8.42E-06	0

\*For this study, both the product and its packaging are reported in the indicators "Use of renewable primary energy resources used as raw materials" ("PERM") and "Use of non-renewable primary energy resources used as raw materials" ("PENRM"). PERM and PENRM are reported as negative values when materials are recycled or recovered, but not when landfilled.

## Waste Category & Output flows

Waste Category & Output Flows		Product stage	Construction stage		Use stage							End of life stage				Reuse, recovery, recycling
		A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replace	B5 Refurbishment	B6 Operational energy	B7 Operational water	C1 Deconstruction /	C2 Transport	C3 Waste processing	C4 Disposal	D Reuse, recovery, recycling
	Hazardous waste disposed (HWD) [kg]	3.72E-05	5.65E-06	1.37E-07	0	0	0	0	0	0	0	0	3.22E-07	0	1.50E-07	0
	Non-hazardous waste disposed (NHWD) [kg]	4.08E-01	2.18E-01	1.72E-03	0	0	0	0	0	0	0	0	6.46E-03	0	1.00E+00	0
	Radioactive waste disposed (RWD) [kg]	1.92E-04	1.59E-05	6.40E-07	0	0	0	0	0	0	0	0	8.34E-07	0	4.42E-07	0
	Components for re-use (CRU) [kg]	0	0	2.30E-03	0	0	0	0	0	0	0	0	0	0	0	0
	Materials for Recycling (MFR) [kg]	0	0	1.94E-01	0	0	0	0	0	0	0	0	0	0	0	0
	Material for Energy Recovery (MER) [kg]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Exported electrical energy (EEE) [MJ]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Exported thermal energy (EET) [MJ]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0








## Information on biogenic carbon content

		Product stage
Biogenic Carbon Content		A1 / A2 / A3
	Biogenic carbon content in product [kg]	0
	Biogenic carbon content in packaging [kg]	2.98E-03

Note: 1 kg biogenic carbon is equivalent to 44/12 (approx. 3.67) kg CO<sub>2</sub>.



## Environmental impacts - Group 3. MARIPOOL®, MARITRANS® Tile-Primer, MARISEAL® 450 and MARIPUR® 7300

	Environmental indicators	Product stage	Constructi on stage	A5 Installation	Use stage							End of life stage			Reuse, Recovery Recycling	
		A1 / A2 / A3	A4 Transport		B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	D Reuse, recovery, recycling
	Climate Change [kg CO <sub>2</sub> eq.]	4.42E+00	1.44E-01	1.41E-02	0	0	0	0	0	0	0	0	8.15E-03	0	5.35E-03	0
	Climate Change (fossil) [kg CO <sub>2</sub> eq.]	4.44E+00	1.44E-01	1.41E-02	0	0	0	0	0	0	0	0	8.14E-03	0	5.27E-03	0
	Climate Change (biogenic) [kg CO <sub>2</sub> eq.]	-2.91E-02	1.52E-04	-8.66E-05	0	0	0	0	0	0	0	0	7.42E-06	0	7.97E-05	0
	Climate Change (land use change) [kg CO <sub>2</sub> eq.]	1.26E-02	5.44E-05	3.80E-05	0	0	0	0	0	0	0	0	3.26E-06	0	1.91E-06	0
	Ozone depletion [kg CFC-11 eq.]	3.83E-07	3.59E-08	1.33E-09	0	0	0	0	0	0	0	0	1.89E-09	0	9.36E-10	0
	Acidification terrestrial and freshwater [Mole of H <sup>+</sup> eq.]	6.77E-02	4.89E-04	2.05E-04	0	0	0	0	0	0	0	0	2.31E-05	0	4.91E-05	0
	Eutrophication freshwater [kg P eq.]	2.04E-04	1.02E-06	6.17E-07	0	0	0	0	0	0	0	0	5.81E-08	0	6.33E-08	0
	Eutrophication marine [kg N eq.]	7.58E-03	1.08E-04	2.32E-05	0	0	0	0	0	0	0	0	4.59E-06	0	2.03E-05	0
	Eutrophication terrestrial [Mole of N eq.]	9.87E-02	1.21E-03	3.01E-04	0	0	0	0	0	0	0	0	5.12E-05	0	2.23E-04	0
	Photochemical ozone formation - human health [kg NMVOC eq.]	2.63E-02	4.63E-04	8.07E-05	0	0	0	0	0	0	0	0	1.97E-05	0	6.16E-05	0
	Resource use, mineral and metals [kg Sb eq.]	1.80E-03	3.44E-07	5.41E-06	0	0	0	0	0	0	0	0	2.89E-08	0	2.40E-10	0
	Resource use, energy carriers [MJ]	9.24E+01	2.34E+00	2.89E-01	0	0	0	0	0	0	0	0	1.23E-01	0	7.01E-02	0
	Water deprivation potential [m <sup>3</sup> world equiv.]	3.70E+00	8.03E-03	1.11E-02	0	0	0	0	0	0	0	0	3.76E-04	0	1.75E-04	0











The results of this environmental impact indicator should be used with caution, as the uncertainties of the results are high and experience with this parameter is limited.

## Potential environmental impact – additional mandatory and voluntary indicators

Environmental indicators	Product stage	Construction stage		Use stage							End of life stage			Reuse, Recovery Recycling	
	A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	D Reuse, recovery, recycling
<u>GWP-GHG<sup>4</sup></u> [kg CO2 eq.]	4.30E+00	1.43E-01	1.37E-02	0	0	0	0	0	0	0	0	8.07E-03	0	5.20E-03	0









<sup>4</sup> 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 almost equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.

## Resources Use



Resources Use indicators		Product stage	Construction stage		Use stage							End of life stage				Reuse, recovery, recycling
		A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	D Reuse, recovery, recycling
	Use of renewable primary energy (PERE) [MJ]	6.19E+00	2.97E-02	1.87E-02	0	0	0	0	0	0	0	0	1.76E-03	0	1.65E-03	0
	Primary energy resources used as raw materials (PERM) [MJ]	2.99E-02	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total use of renewable primary energy resources (PERT) [MJ]	6.22E+00	2.97E-02	1.87E-02	0	0	0	0	0	0	0	0	1.76E-03	0	1.65E-03	0
	Use of non-renewable primary energy (PENRE) [MJ]	9.85E+01	2.49E+00	3.08E-01	0	0	0	0	0	0	0	0	1.31E-01	0	7.45E-02	0
	Non-renewable primary energy resources used as raw materials (PENRM) [MJ]	2.53E-02	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total use of non-renewable primary energy resources (PENRT) [MJ]	9.86E+01	2.49E+00	3.08E-01	0	0	0	0	0	0	0	0	1.31E-01	0	7.45E-02	0
	Input of secondary material (SM) [kg]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Use of renewable secondary fuels (RSF) [MJ]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Use of non-renewable secondary fuels (NRSF) [MJ]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Use of net fresh water (FW) [m³]	9.80E-02	2.78E-04	2.95E-04	0	0	0	0	0	0	0	0	1.40E-05	0	8.42E-06	0

\*For this study, both the product and its packaging are reported in the indicators "Use of renewable primary energy resources used as raw materials" ("PERM") and "Use of non-renewable primary energy resources used as raw materials" ("PENRM"). PERM and PENRM are reported as negative values when materials are recycled or recovered, but not when landfilled.

## Waste Category & Output flows








Waste Category & Output Flows		Product stage	Construction stage		Use stage							End of life stage				Reuse, recovery, recycling
		A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational	B7 Operational water	C1 Deconstruction /	C2 Transport	C3 Waste	C4 Disposal	D Reuse, recovery, recycling
	Hazardous waste disposed (HWD) [kg]	5.54E-05	5.65E-06	1.97E-07	0	0	0	0	0	0	0	0	3.22E-07	0	1.50E-07	0
	Non-hazardous waste disposed (NHWD) [kg]	7.67E-01	2.18E-01	2.93E-03	0	0	0	0	0	0	0	0	6.46E-03	0	1.00E+00	0
	Radioactive waste disposed (RWD) [kg]	2.72E-04	1.59E-05	8.97E-07	0	0	0	0	0	0	0	0	8.34E-07	0	4.42E-07	0
	Components for re-use (CRU) [kg]	0	0	2.30E-03	0	0	0	0	0	0	0	0	0	0	0	0
	Materials for Recycling (MFR) [kg]	0	0	1.94E-01	0	0	0	0	0	0	0	0	0	0	0	0
	Material for Energy Recovery (MER) [kg]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Exported electrical energy (EEE) [MJ]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Exported thermal energy (EET) [MJ]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

## Information on biogenic carbon content

		Product stage
<b>Biogenic Carbon Content</b>		A1 / A2 / A3
	Biogenic carbon content in product [kg]	0
	Biogenic carbon content in packaging [kg]	2.98E-03

Note: 1 kg biogenic carbon is equivalent to 44/12 (approx. 3.67) kg CO<sub>2</sub>.

**Environmental impacts - Group 2. MARIPUR® 7100, MARIPUR® 7600, MARISEAL® 420, MARIPUR® 7000, MARIPUR® 7700, MARITRANS® MD, MARITRANS® Finish, MARITRANS® and MARIPUR® 7200**

	Environmental indicators	Product stage	Constructi on stage	A5 Installation	Use stage							End of life stage				Reuse, Recovery Recycling
		A1 / A2 / A3	A4 Transport		B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	D Reuse, recovery, recycling
	Climate Change [kg CO <sub>2</sub> eq.]	5.39E+00	1.44E-01	1.71E-02	0	0	0	0	0	0	0	0	8.15E-03	0	5.35E-03	0
	Climate Change (fossil) [kg CO <sub>2</sub> eq.]	5.44E+00	1.44E-01	1.73E-02	0	0	0	0	0	0	0	0	8.14E-03	0	5.27E-03	0
	Climate Change (biogenic) [kg CO <sub>2</sub> eq.]	-8.14E-02	1.52E-04	-2.43E-04	0	0	0	0	0	0	0	0	7.42E-06	0	7.97E-05	0
	Climate Change (land use change) [kg CO <sub>2</sub> eq.]	3.04E-02	5.44E-05	9.16E-05	0	0	0	0	0	0	0	0	3.26E-06	0	1.91E-06	0
	Ozone depletion [kg CFC-11 eq.]	4.53E-07	3.59E-08	1.58E-09	0	0	0	0	0	0	0	0	1.89E-09	0	9.36E-10	0
	Acidification terrestrial and freshwater [Mole of H <sup>+</sup> eq.]	8.70E-02	4.89E-04	2.64E-04	0	0	0	0	0	0	0	0	2.31E-05	0	4.91E-05	0
	Eutrophication freshwater [kg P eq.]	3.03E-04	1.02E-06	9.15E-07	0	0	0	0	0	0	0	0	5.81E-08	0	6.33E-08	0
	Eutrophication marine [kg N eq.]	1.06E-02	1.08E-04	3.23E-05	0	0	0	0	0	0	0	0	4.59E-06	0	2.03E-05	0
	Eutrophication terrestrial [Mole of N eq.]	1.26E-01	1.21E-03	3.83E-04	0	0	0	0	0	0	0	0	5.12E-05	0	2.23E-04	0
	Photochemical ozone formation - human health [kg NMVOC eq.]	3.30E-02	4.63E-04	1.01E-04	0	0	0	0	0	0	0	0	1.97E-05	0	6.16E-05	0
	Resource use, mineral and metals [kg Sb eq.]	2.20E-03	3.44E-07	6.60E-06	0	0	0	0	0	0	0	0	2.89E-08	0	2.40E-10	0
	Resource use, energy carriers [MJ]	1.08E+02	2.34E+00	3.38E-01	0	0	0	0	0	0	0	0	1.23E-01	0	7.01E-02	0
	Water deprivation potential [m <sup>3</sup> world equiv.]	4.56E+00	8.03E-03	1.37E-02	0	0	0	0	0	0	0	0	3.76E-04	0	1.75E-04	0











The results of this environmental impact indicator should be used with caution, as the uncertainties of the results are high and experience with this parameter is limited.

## Potential environmental impact – additional mandatory and voluntary indicators

Environmental indicators	Product stage	Construction stage		Use stage							End of life stage			Reuse, Recovery Recycling	
	A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	D Reuse, recovery, recycling
<u>GWP-GHG</u> <sup>5</sup> [kg CO <sub>2</sub> eq.]	5.27E+00	1.43E-01	1.68E-02	0	0	0	0	0	0	0	0	8.07E-03	0	5.20E-03	0

<sup>5</sup> 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 almost equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.









## Resources Use

		Product stage	Construction stage		Use stage							End of life stage				Reuse, recovery, recycling
<b>Resources Use indicators</b>		A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	D Reuse, recovery, recycling
	Use of renewable primary energy (PERE) [MJ]	9.62E+00	2.97E-02	2.91E-02	0	0	0	0	0	0	0	0	1.76E-03	0	1.65E-03	0
	Primary energy resources used as raw materials (PERM) [MJ]	2.99E-02	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total use of renewable primary energy resources (PERT) [MJ]	9.65E+00	2.97E-02	2.91E-02	0	0	0	0	0	0	0	0	1.76E-03	0	1.65E-03	0
	Use of non-renewable primary energy (PENRE) [MJ]	1.15E+02	2.49E+00	3.61E-01	0	0	0	0	0	0	0	0	1.31E-01	0	7.45E-02	0
	Non-renewable primary energy resources used as raw materials (PENRM) [MJ]	2.53E-02	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total use of non-renewable primary energy resources (PENRT) [MJ]	1.15E+02	2.49E+00	3.61E-01	0	0	0	0	0	0	0	0	1.31E-01	0	7.45E-02	0
	Input of secondary material (SM) [kg]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Use of renewable secondary fuels (RSF) [MJ]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Use of non-renewable secondary fuels (NRSF) [MJ]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Use of net fresh water (FW) [m³]	1.29E-01	2.78E-04	3.89E-04	0	0	0	0	0	0	0	0	1.40E-05	0	8.42E-06	0



\*For this study, both the product and its packaging are reported in the indicators "Use of renewable primary energy resources used as raw materials" ("PERM") and "Use of non-renewable primary energy resources used as raw materials" ("PENRM"). PERM and PENRM are reported as negative values when materials are recycled or recovered, but not when landfilled.



## Waste Category & Output flows







Waste Category & Output Flows		Product stage	Construction stage		Use stage							End of life stage				Reuse, recovery, recycling
		A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational	B7 Operational	C1 Deconstruction /	C2 Transport	C3 Waste	C4 Disposal	D Reuse, recovery, recycling
	Hazardous waste disposed (HWD) [kg]	6.11E-05	5.65E-06	2.21E-07	0	0	0	0	0	0	0	0	3.22E-07	0	1.50E-07	0
	Non-hazardous waste disposed (NHWD) [kg]	7.01E-01	2.18E-01	2.86E-03	0	0	0	0	0	0	0	0	6.46E-03	0	1.00E+00	0
	Radioactive waste disposed (RWD) [kg]	2.93E-04	1.59E-05	9.78E-07	0	0	0	0	0	0	0	0	8.34E-07	0	4.42E-07	0
	Components for re-use (CRU) [kg]	0	0	2.30E-03	0	0	0	0	0	0	0	0	0	0	0	0
	Materials for Recycling (MFR) [kg]	0	0	1.94E-01	0	0	0	0	0	0	0	0	0	0	0	0
	Material for Energy Recovery (MER) [kg]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Exported electrical energy (EEE) [MJ]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Exported thermal energy (EET) [MJ]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

## Information on biogenic carbon content

Biogenic Carbon Content		Product stage
		A1 / A2 / A3
	Biogenic carbon content in product [kg]	0
	Biogenic carbon content in packaging [kg]	2.98E-03

Note: 1 kg biogenic carbon is equivalent to 44/12 (approx. 3.67) kg CO<sub>2</sub>.

## Environmental impacts - Group 4. MARIFAST® 570, MARIPOOL® EP and MARIPUR® 7500

	Environmental indicators	Product stage	Constructi on stage	A5 Installation	Use stage							End of life stage				Reuse, Recovery Recycling
		A1 / A2 / A3	A4 Transport		B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	D Reuse, recovery, recycling
	Climate Change [kg CO <sub>2</sub> eq.]	7.80E+00	1.44E-01	2.56E-02	0	0	0	0	0	0	0	0	8.15E-03	0	5.35E-03	0
	Climate Change (fossil) [kg CO <sub>2</sub> eq.]	7.81E+00	1.44E-01	2.56E-02	0	0	0	0	0	0	0	0	8.14E-03	0	5.27E-03	0
	Climate Change (biogenic) [kg CO <sub>2</sub> eq.]	-2.01E-02	1.52E-04	-5.82E-05	0	0	0	0	0	0	0	0	7.42E-06	0	7.97E-05	0
	Climate Change (land use change) [kg CO <sub>2</sub> eq.]	9.34E-03	5.44E-05	2.89E-05	0	0	0	0	0	0	0	0	3.26E-06	0	1.91E-06	0
	Ozone depletion [kg CFC-11 eq.]	6.55E-07	3.59E-08	2.47E-09	0	0	0	0	0	0	0	0	1.89E-09	0	9.36E-10	0
	Acidification terrestrial and freshwater [Mole of H <sup>+</sup> eq.]	1.74E-01	4.89E-04	5.28E-04	0	0	0	0	0	0	0	0	2.31E-05	0	4.91E-05	0
	Eutrophication freshwater [kg P eq.]	3.90E-04	1.02E-06	1.19E-06	0	0	0	0	0	0	0	0	5.81E-08	0	6.33E-08	0
	Eutrophication marine [kg N eq.]	1.73E-02	1.08E-04	5.31E-05	0	0	0	0	0	0	0	0	4.59E-06	0	2.03E-05	0
	Eutrophication terrestrial [Mole of N eq.]	2.39E-01	1.21E-03	7.31E-04	0	0	0	0	0	0	0	0	5.12E-05	0	2.23E-04	0
	Photochemical ozone formation - human health [kg NMVOC eq.]	5.86E-02	4.63E-04	1.81E-04	0	0	0	0	0	0	0	0	1.97E-05	0	6.16E-05	0
	Resource use, mineral and metals [kg Sb eq.]	5.02E-03	3.44E-07	1.51E-05	0	0	0	0	0	0	0	0	2.89E-08	0	2.40E-10	0
	Resource use, energy carriers [MJ]	1.39E+02	2.34E+00	4.51E-01	0	0	0	0	0	0	0	0	1.23E-01	0	7.01E-02	0
	Water deprivation potential [m <sup>3</sup> world equiv.]	5.79E+00	8.03E-03	1.75E-02	0	0	0	0	0	0	0	0	3.76E-04	0	1.75E-04	0











The results of this environmental impact indicator should be used with caution, as the uncertainties of the results are high and experience with this parameter is limited.

## Potential environmental impact – additional mandatory and voluntary indicators

Environmental indicators	Product stage	Construction stage		Use stage							End of life stage			Reuse, Recovery Recycling	
	A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	D Reuse, recovery, recycling
<u>GWP-GHG</u> <sup>6</sup> [kg CO <sub>2</sub> eq.]	7.59E+00	1.43E-01	2.49E-02	0	0	0	0	0	0	0	0	8.07E-03	0	5.20E-03	0









<sup>6</sup> 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 almost equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.

## Resources Use



Resources Use indicators		Product stage	Construction stage		Use stage							End of life stage				Reuse, recovery, recycling
		A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	D Reuse, recovery, recycling
	Use of renewable primary energy (PERE) [MJ]	1.21E+01	2.97E-02	3.68E-02	0	0	0	0	0	0	0	0	1.76E-03	0	1.65E-03	0
	Primary energy resources used as raw materials (PERM) [MJ]	2.99E-02	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total use of renewable primary energy resources (PERT) [MJ]	1.21E+01	2.97E-02	3.68E-02	0	0	0	0	0	0	0	0	1.76E-03	0	1.65E-03	0
	Use of non-renewable primary energy (PENRE) [MJ]	1.48E+02	2.49E+00	4.79E-01	0	0	0	0	0	0	0	0	1.31E-01	0	7.45E-02	0
	Non-renewable primary energy resources used as raw materials (PENRM) [MJ]	2.53E-02	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total use of non-renewable primary energy resources (PENRT) [MJ]	1.48E+02	2.49E+00	4.79E-01	0	0	0	0	0	0	0	0	1.31E-01	0	7.45E-02	0
	Input of secondary material (SM) [kg]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Use of renewable secondary fuels (RSF) [MJ]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Use of non-renewable secondary fuels (NRSF) [MJ]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Use of net fresh water (FW) [m <sup>3</sup> ]	1.62E-01	2.78E-04	4.89E-04	0	0	0	0	0	0	0	0	1.40E-05	0	8.42E-06	0

\*For this study, both the product and its packaging are reported in the indicators "Use of renewable primary energy resources used as raw materials" ("PERM") and "Use of non-renewable primary energy resources used as raw materials" ("PENRM"). PERM and PENRM are reported as negative values when materials are recycled or recovered, but not when landfilled.

## Waste Category & Output flows

Waste Category & Output Flows		Product stage	Construction stage		Use stage							End of life stage				Reuse, recovery, recycling
		A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational	B7 Operational	C1 Deconstruction	C2 Transport	C3 Waste	C4 Disposal	D Reuse, recovery, recycling
	Hazardous waste disposed (HWD) [kg]	1.03E-04	5.65E-06	3.95E-07	0	0	0	0	0	0	0	0	3.22E-07	0	1.50E-07	0
	Non-hazardous waste disposed (NHWD) [kg]	1.05E+00	2.18E-01	4.90E-03	0	0	0	0	0	0	0	0	6.46E-03	0	1.00E+00	0
	Radioactive waste disposed (RWD) [kg]	5.65E-04	1.59E-05	1.92E-06	0	0	0	0	0	0	0	0	8.34E-07	0	4.42E-07	0
	Components for re-use (CRU) [kg]	0	0	2.30E-03	0	0	0	0	0	0	0	0	0	0	0	0
	Materials for Recycling (MFR) [kg]	0	0	1.94E-01	0	0	0	0	0	0	0	0	0	0	0	0
	Material for Energy Recovery (MER) [kg]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Exported electrical energy (EEE) [MJ]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Exported thermal energy (EET) [MJ]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

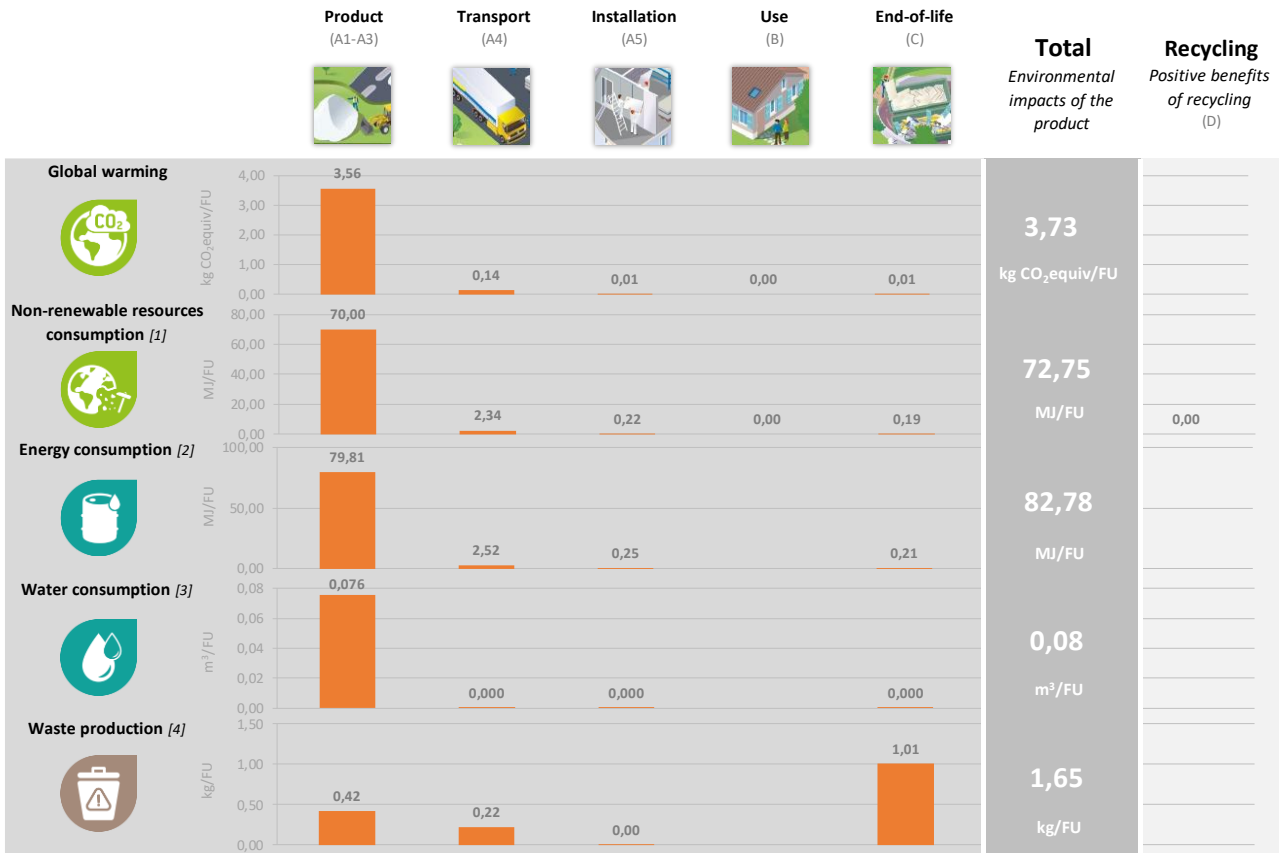
## Information on biogenic carbon content

Biogenic Carbon Content		Product stage
		A1 / A2 / A3
	Biogenic carbon content in product [kg]	0
	Biogenic carbon content in packaging [kg]	2.98E-03

Note: 1 kg biogenic carbon is equivalent to 44/12 (approx. 3.67) kg CO<sub>2</sub>.

# LCA results interpretation

The following figures refers to a functional unit of 1 kg of product with a service life between 10 and 25 years (depending on product).



[1] This indicator corresponds to the abiotic depletion potential of fossil resources.  
 [2] This indicator corresponds to the total use of primary energy.  
 [3] This indicator corresponds to the use of net fresh water.  
 [4] This indicator corresponds to the sum of hazardous, non-hazardous and radioactive waste disposed.

The impact results follow a similar trend for all product groups.

## Global Warming Potential (Climate Change) (GWP)

For GWP, the majority of contribution to this environmental impact is from the production modules (A1 – A3). This is primarily because the sources of greenhouse gas emissions are predominant in this part of the life cycle. CO<sub>2</sub> is generated upstream from the production of electricity and is also released on site by the combustion of coke, diesel and natural gas. We can see that other sections of the life cycle also contribute to the GWP. However, the production modules contribute to over 95 % to the impact. Impacts from A4 (transport to clients), waste disposal transportation in A5 (disposal after installation) and C (transport and disposal at the end of life) are much lower than A1-A3. A4 is the second contributor to the impact, with a contribution of 3.8 % to the impact.

## Non-renewable resources consumptions

The consumption of non-renewable resources has the highest value in the production modules, due to the consumption of diesel within the factory. The contribution to the impact of the production modules (A1-A3) is higher than 96 %. The contribution to this impact of the other modules is very small and is mainly due to the non-renewable resources consumed during the transport of the product (A4), contribution to the impact of 3 %. The other stages have a contribution lower than 1 %.

## Energy Consumptions

Modules A1-A3 have the highest contribution to total energy consumption with a contribution to the impact higher than 96 %. Energy is consumed in the form of electricity, and diesel during the manufacturing of the Product. Module A4 has a contribution to the impact of 3 %, the other stages have a contribution to the impact lower than 1 %.

**Water Consumption**

Water is used within the manufacturing facility and therefore we see that almost all the impact is produced in the production phase.

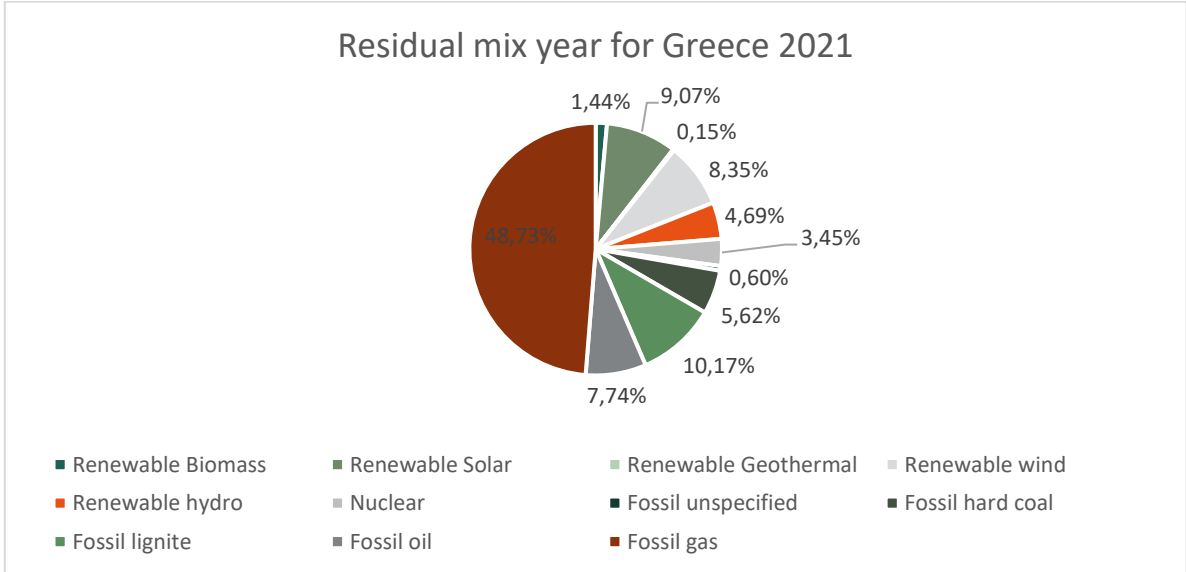
**Waste Production**

The largest contributor is the end of life module. This is because the 100 % of the product is assumed to be sent to landfill once it reaches the end of life state. The contribution to the impact of the end of life phase is of 61 %, followed by the production phase with a contribution to the impact higher than 25 % and the module A4 with a contribution to the impact higher than 13 %.

**Additional information**

**Electricity description**

TYPE OF INFORMATION	DESCRIPTION
Location	Greece
Production mix	Renewable Biomass - 1.44 % Renewable Solar - 9.07 % Renewable Geothermal - 0.15 % Renewable wind - 8.35 % Renewable hydro - 4.69 % Nuclear - 3.45 % Fossil unspecified - 0.60 % Fossil hard coal - 5.62 % Fossil Oil - 7.74 % Fossil lignite - 10.17 % Fossil gas - 48.73 %
Reference year	2021
Type of data set	Cradle to gate from Ecoinvent 3.8 database
Source	European Residual Mixes 2021
CO <sub>2</sub> emissions	444.63 (g /kWh)





## Global warming potential for market application

Based on technical product properties all environmental impact indicators may be quantified for usual market product applications. The following results present the GWP indicator for a typical application of MARIS Solvent based products: MARISEAL 250® FLASH, MARISEAL® 255, MARISEAL® DETAIL, MARISEAL® 260, MARISEAL® 270, MARISEAL® 420, MARISEAL® 450, MARISEAL® 460, MARITRANS®, MARITRANS® MD, MARITRANS® FINISH, MARISEAL® 600, MARISEAL® 650, MARISEAL® 670, MARISEAL® 550, MARIFAST® 570, MARIPOOL®, MARIPOOL® EP, MARIPUR® 7100, MARIPUR® 7200, MARIPUR® 7300, MARISEAL® 7350, MARIPUR® 7500, MARIPUR® 7600, MARIPUR® 7700, MARISEAL® 710, MARIPUR® 7000, MARISEAL® 800, MARITRANS® TILE-PRIMER and MARISEAL® TPO PRIMER on surfaces.

Parameter	Unit	A1+A2+A3	A4	A5	C2	C4	Total
Density min	kg/m <sup>3</sup>	8.00E-01	8.00E-01	8.00E-01	8.00E-01	8.00E-01	8.00E-01
Density max	kg/m <sup>3</sup>	1.50E+00	1.50E+00	1.50E+00	1.50E+00	1.50E+00	1.50E+00
Average application weight	kg/m <sup>2</sup>	1.78E+00	1.78E+00	1.78E+00	1.78E+00	1.78E+00	1.78E+00
Application weight min	kg/m <sup>2</sup>	5.00E-02	5.00E-02	5.00E-02	5.00E-02	5.00E-02	5.00E-02
Application weight max	kg/m <sup>2</sup>	3.00E+00	3.00E+00	3.00E+00	3.00E+00	3.00E+00	3.00E+00
GWP - total	kg CO <sub>2</sub> eq. / kg	3.56E+00	1.44E-01	1.13E-02	8.15E-03	5.35E-03	3.73E+00
GWP - average	kg CO <sub>2</sub> eq. / m <sup>2</sup>	6.34E+00	2.57E-01	2.02E-02	1.45E-02	9.53E-03	6.64E+00
GWP - min	kg CO <sub>2</sub> eq. / m <sup>2</sup>	1.78E-01	7.21E-03	5.66E-04	4.088E-04	2.67E-04	1.86E-01
GWP - max	kg CO <sub>2</sub> eq. / m <sup>2</sup>	1.07E+01	4.33E-01	3.39E-02	2.45E-02	1.60E-02	1.12E+01

## Data quality

Inventory data quality is judged by geographical, temporal, and technological representativeness. To cover these requirements and to ensure reliable results, first-hand industry data crossed with LCA background datasets were used. The data was collected from internal records and reporting documents from Saint-Gobain Maris. After evaluating the inventory, according to the defined ranking in the LCA report, the assessment reflects good inventory data quality.

## Information related to sector EPDs

Individual EPD.

## Differences versus previous versions of the EPD

This is the first version of this EPD.

## References

1. EPD International (2019) General Programme Instructions for the International EPD® System. Version 3.01, dated 2019-09-18.
2. The International EPD System PCR 2019:14 Construction products, Version 1.11.
3. EN 15804:2012+A2:2019 Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products.
4. ISO 21930:2007 Sustainability in building construction – Environmental declaration of building products.
5. ISO 14025:2006 Environmental labels and declarations – Type III environmental declarations – Principles and procedures.
6. ISO 14040:2006 Environmental management. Life cycle assessment. Principles and framework.
7. ISO 14044:2006 Environmental management. Life cycle assessment. Requirements and guidelines.
8. LCA report of Maris Saint-Gobain products (2022).



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