ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH ISO 14025:2006 AND EN 15804+A2:2019/AC:2021

Acrylic paste renders & coatings by NORDIA S.A.

EPD of multiple products, based on the average results of the product group.
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

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Program
The International EPD® system
www.Environdec.com

Program operator
EPD international AB

UN CPC
351 Paints and varnishes and related products

PROGRAM INFORMATION

DETAILS OF PROGRAM OPERATOR

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ACCOUNTABILITIES FOR PCR, LCA & INDEPENDENT, THIRD-PARTY VERIFICATION

PRODUCT CATEGORY RULES (PCR)	▪ CEN Standard EN 15804 serves as the Core Product Category Rules (PCR) ▪ PCR 2019:14 Construction products version 1.3.3 (EN 15804:A2)
PCR REVIEW WAS CONDUCTED BY	The technical Committee of the International EPD System. See www.environdec.com for a list of members.
REVIEW CHAIR	No chair appointed. The review panel may be contacted via the Secretariat www.environdec.com/contact.
LIFE CYCLE ASSESSMENT (LCA)	LCA Accountability **SustChem Technical Consulting S.A.** www.sustchem.gr
THIRD-PARTY VERIFICATION	▪ Independent third-party verification of the declaration and data, according to ISO 14025:2006, via: **EPD verification by accredited certification body** ▪ Third-party verification: **Business Quality Verification P.C.** is an approved certification body accountable for third-party verification www.bqv.gr – info@bqv.gr ▪ Approved by: **Hellenic Accreditation System ESYD with accreditation number 1218**
PROCEDURE FOR FOLLOW-UP OF DATA DURING EPD VALIDITY INVOLVED THIRD PARTY VERIFIER	YES ✓ NO

Nordia S.A. has the sole ownership, liability and responsibility for the EPD.
EPDs within the same product category but registered in different EPD programmes, or not compliant with EN 15804, may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same version number) or be based on fully-aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterisation factors); have equivalent content declarations; and be valid at the time of comparison. For further information about comparability, see EN 15804 and ISO 14025.

VERSION HISTORY

Original version of the EPD: The original version of this EPD was published on 2024-09-09.
Updated version of the EPD: The updated version of the EPD was uploaded on 2025-02-17.

The differences between the original and updated version include the replacement of the photos and the product name from SVR SUPER to SVR MAX.

COMPANY INFORMATION

EPD OWNER

MARMOLINE

NORDIA

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DESCRIPTION OF THE ORGANIZATION

VISION

NORDIA S.A. is a prominent company with extensive expertise in the building materials industry, actively engaged in the following sectors:

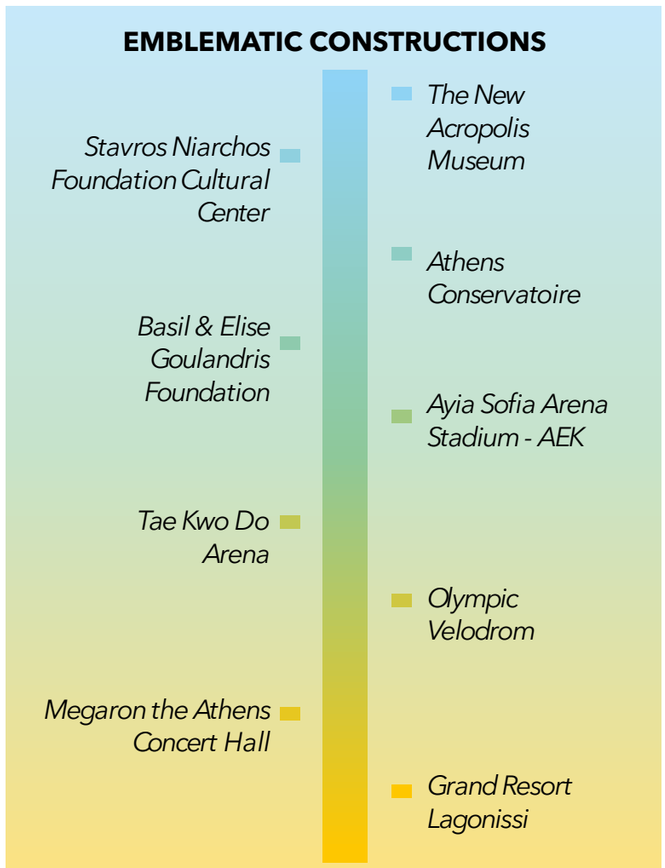
- Production and construction of construction chemicals and mortars under the MARMOLINE brand.
- Production of concrete admixtures as an authorized licensee of the French multinational CHRYSO.
- Quarrying, processing, and sales of marble under the NORDIA MARBLE brand.

The company's objective is to cater to the construction sector's diverse needs, ranging from home renovations to large-scale new developments. Its foundation lays back in 1998 by establishing a manufacturing plant for construction mortars in Dionyssos, Attica. Dionyssos marble dust, a unique raw material featured in most of their products even today, played a significant role in the development of a product line focused on ready-to-use mortars, with particular emphasis on ready-to-use renders and tile adhesives.

ENVIRONMENTAL COMMITMENT

Each product is designed and produced according to the following principles:

- Raw material saving and recycling.
- Energy saving.
- Zero environmental pollution.
- Clean and tidy building site.



VALUES

The company's dedication is to create top-notch, user-friendly materials while maintaining a strong commitment to environmental responsibility. It adheres to the ISO 14001 standard for Environmental Management Systems, implement innovative and secure production processes, and employ state-of-the-art production facilities with ISO 9001-certified Quality Management. These measures ensure the production of high-quality products that conform to European Commission standards and meet the specific requirements of the countries where the products are distributed.

Its primary focus is on delivering safe, user-friendly, and environmentally responsible products for both residential and commercial developments. The company's team stands out for their exceptional scientific knowledge and professional expertise. Its main objective is to continually seek new knowledge to stay at the forefront of technological advancements. Concurrently, it prioritizes the development of its workforce's skills and foster a culture of teamwork and respect.

FACILITY-PRODUCTION SITE & HEADQUARTERS

The Manufacturing site for the products examined in this EPD is located in 1km of provincial road Markopoulos - Oropos, Polydendri, 19011, Greece.

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PRODUCT INFORMATION

MARMOLINE

SVR PREMIUM is a highly reflective, non-flammable, colored, dispersion render, modified with special silicone additives. It is suitable for final coating in External Thermal Insulation Systems (ETICS), in properly prepared old and new building surfaces. It offers high reflectivity, high elasticity, water repellency and has excellent adhesion to surfaces of concrete, render, cement boards, and plasterboards.
It is used as final coating of the certified ETICS MARMOLINE MONOSIS, or other external thermal insulation systems. In combination with the adhesives/renders FK 201, FK 202. Also used on old or new buildings' surfaces, properly prepared. Ideal for use on surfaces of fair-face concrete, finish-coat renders, old painted surfaces, plasterboards. cement boards, Due to its high elasticity, it covers any mistakes on masonry surfaces (capillary cracks) of old buildings and prevents their reappearance.

SVR VALUE is a ready to use, white or colored, dispersion plaster in paste form. It has been certified as finish coat for external thermal insulation systems, in combination with the adhesives/ plasters FK 201 Value, FK 202 Value and THERMOWHITE. It is also used on old or new buildings' surfaces, properly prepared. Ideal for use on surfaces, properly prepared. Ideal for use on surfaces of fair-face concrete, finish-coat plasters, old painted surfaces, cement boards, plasterboards. Due to its high flexibility, it covers any mistakes on masonry surfaces (capillary cracks) of old buildings and prevents their reappearance.

SVR SILICONE is a ready to use, white or colored, silicone plaster in paste form, with maximum grain size 1.0 & 1.5mm
It is used for highly resistant thin coatings, as finish coating on thermal insulation boards of ETICS systems, on old or new buildings' surfaces, properly prepared. Ideal also for use on surfaces of fair-face concrete, finish-coat plasters, old painted surfaces, cement boards, plasterboards. It is a part of "MARMOLINE MONOSIS" external thermal insulation composite system ETICS.

SVR SPECIAL is a colored polymer-modified, acrylic paste render. Suitable for final coating in ETICS, in properly prepared old and new building surfaces. Offers high elasticity, water repellency and has excellent adhesion to surfaces of concrete, render, cement boards, plasterboard.
It is used as a final coating of the certified external thermal insulation system (ETICS) MARMOLINE MONOSIS, or other external thermal insulation systems. In combination with the adhesives/renders FK 201 Value, FK 202 Value and THERMO WHITE. Also used on old or new buildings' surfaces, properly prepared. Ideal for use on surfaces of fair-face concrete, finish-coat plasters, old painted surfaces, cement boards, plasterboards. Due to its high flexibility, it covers any mistakes on masonry surfaces (capillary cracks) of old buildings and prevents their reappearance.

SVR MAX is a non-flammable, colored polymer-modified, acrylic paste render. Suitable for final coating in ETICS, in properly prepared old and new building surfaces. It offers high elasticity, water repellency and has excellent adhesion to surfaces of concrete, render, plasterboard. It is used as a final coating of the certified ETICS MARMOLINE MONOSIS, or other external thermal insulation systems. In combination with the adhesives/renders FK 201 Value, FK 202 Value and THERMO WHITE. Also used on old or new buildings' surfaces, properly prepared. Ideal for use on surfaces of fair-face concrete, finish-coat plasters, old painted surfaces, cement boards, plasterboards. Due to its high flexibility, it covers any mistakes on masonry surfaces (capillary cracks) of old buildings and prevents their reappearance.

FK202 ORGANIC is a ready to use, fiber-reinforced acrylic paste. It is used for the coating of insulations boards of expanded (EPS) or extruded polystyrene (XPS), or mineral wool (MW), in combination with an appropriate fiberglass mesh. It can also be used for bonding of insulation boards on the outer surfaces of buildings.

For the placement of products on the market within the European Union/European Free Trade Association (EU/EFTA), Regulation No 305/2011 (CPR) is applicable. All products are accompanied by a Declaration of Performance (DoP) in compliance with EN 15824:2017.

ESSENTIAL PROPERTIES BASED ON EN 15824:2017

ESSENTIAL PROPERTIES	SVR PREMIUM	SVR MAX	SVR SPECIAL	SVR SILICONE	SVR VALUE	FK202 ORGANIC
WATER VAPOUR PERMEABILITY	V1 (high)	V2	V2	V1	V1 (high)	V1
WATER ABSORPTION	W3 (low)	W3	W2	W2	W2 (middle)	W1
ADHESION	≥0.80 MPa	≥0.80 MPa	≥0.80 MPa	≥0.60 MPa	≥0.80 MPa	≥2 MPa
THERMAL CONDUCTIVITY	SVR PREMIUM 1 &1.5mm λ10,dry=0.83W/mK SVR PREMIUM 2 &3mm λ10,dry=1.17 W/Mk(tab, man value; P=50%)	λ10,dry=0.83 W/mK (tab, man value; P=50%)	λ10,dry=0.83 W/mK (tab, man value; P=50%)	λ10,dry=0.83 W/mK (tab, man value; P=50%)	λ10,dry=0.83 W/mK (tab, man value; P=50%)	λ10,dry=0.75 W/mK (tab, man value; P=50%)
REACTION TO FIRE	A2-s2,d0	A2-s2,d0	B-s2,d0	A2-s2,d0	A2-s2,d0	A2-s1,d0

More Information regarding the technical characteristics of the products can be acquired from the respective Technical Data Sheets (TDSs) of the products which are available on demand from Nordia's personnel.

According to the UN CPC classification system, these products can be classified under the UN CPC code: 351 Paints and varnishes and related products

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CONTENT DECLARATION

MARMOLINE

This is an EPD of multiple products, based on an average product weighted over production volumes. The composition of the product is expressed in mass per declared unit (kg/kg). The table below displays the content declaration for this average product along with the range in content for all products within the product group.

No substances included in the Candidate List of Substances of Very High Concern for authorization under the REACH Regulations that exceed 0.1% of the total weight are present in the examined systems.

CONTENT DECLARATION OF AN AVERAGE ACRYLIC PASTE RENDER & COATING EXPRESSED IN KG PER D.U. (KG/KG)

PRODUCT COMPONENTS	WEIGHT KG/KG	RANGE	POST-CONSUMER RECYCLED MATERIAL (%)	BIOGENIC MATERIAL, WEIGHT- % AND KG C/KG
Aggregates	0.75	0.465-0.757	0%	0%
Polymers and Copolymers	0.10	0.0937-0.343	0%	0%
Fillers and Pigments	0.03	0.0013-0.031	0%	0%
Solvents and Water	0.09	0.072-0.114	0%	0%
Additives and Modifiers	0.04	0.015-0.077	0%	0%
TOTAL	**1.00**	**-**	**0%**	**0%**

PACKAGING MATERIALS	WEIGHT KG/KG	RANGE	WEIGHT (%) VERSUS THE PRODUCT FOR THE AVERAGE PRODUCT	WEIGHT, BIOGENIC CARBON, KG C/KG AVERAGE PRODUCT
Polypropylene (PP)	0.0003	0.0001-0.005	0.03%	0.0000
Wood	0.0003	0.00003-0.00837	0.03%	0.00000514
Polyethylene (PE)	0.0000082	0.000002- 0.000234	0.0008%	0
TOTAL	**0.0006**		**0.06%**	**0.00000514**

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LCA INFORMATION

MARMOLINE

SYSTEM BOUNDARIES

This LCA study follows a "cradle-to-gate" approach with modules C1-C4 & module D.

DECLARED UNIT

The declared unit used in this EPD is **one (1) kilogram (kg) of an average Acrylic Paste Render & Coating.**

TIME REPRESENTATIVENESS

The data used for the analysis are based on one-year average production data, from 1st of January 2023 to 31st of December 2023.

GEOGRAPHICAL SCOPE

For Modules A1-A2, the geographic scope is global. Module A3 focuses on Greece, while Module C encompasses the European Union's region (EU-27)

DATABASES USED

Ecoinvent 3.9.1 & Managed LCA Content

SOFTWARE USED

LCA for experts provided by Sphera

	PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				RESOURCE RECOVERY STAGE
	RAW MATERIAL SUPPLY	TRANSPORT	MANUFACTURING	TRANSPORT	CONSTRUCTION INSTALLATION	USE	MAINTENANCE	REPAIR	REPLACEMENT	REFURBISHMENT	OPERATIONAL ENERGY USE	OPERATIONAL WATER USE	DE-CONSTRUCTION DEMOLITION	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	ND	ND	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
GEOGRAPHY	GLO	GLO	GR	-	-	-	-	-	-	-	-	-	EU-27	EU-27	EU-27	EU-27	EU-27
SHARE OF SPECIFIC DATA	<3%																
VARIATION – PRODUCTS	Variation – products up to 64.69%																
VARIATION - SITES	0%																

The variation above corresponds to the differences in GWP-GHG indicator results in A1-A3 between an average acrylic paste render & coating and FK202 ORGANIC.

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SYSTEM DIAGRAM

MARMOLINE

MODULES A1-A3

MODULE D

PRODUCT STAGE

- Aggregates
- Solvents
- Modifiers
- Fillers
- Pigments
- Additives
- Polymers & Co-polymers
- Polyethylene Film
- Polypropylene Buckets
- Wooden pallets

Transportation of Raw Materials to manufacturing plant

Diesel

Water

Transportation of Packaging Materials to manufacturing plant

Diesel

Production of an Average Acrylic Paste Render& Coating

RECOVERY STAGE

Potential benefits from recycling and /or energy recovery of waste flows from Module C3

MODULE C1

MODULE C2

MODULE C3

MODULE C4

END-OF-LIFE STAGE

Demolition / deconstruction of the building

Diesel

Transportation of Raw Materials to manufacturing plant

Diesel

Treatment of deconstructed waste

Disposal of Inert waste

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DESCRIPTION OF EXAMINED MODULES

MARMOLINE

As shown in the preceding diagram, the study includes specific life cycle stages: **Product, End-of-life**, and **Resource Recovery**. Information modules A4-A5 (Construction stage) and B1-B7 (Use phase stage) are excluded. These excluded modules are scenario-based, while the purpose of this EPD is to communicate the environmental aspects across life cycle stages where the company has influence.

PRODUCT STAGE

MODULE A1

This module includes all activities related to the production of input commodities, covering the generation of raw materials used in the manufacturing of the evaluated products and the supply of utilities, which in this context, is confined to electricity and propane used for drying aggregates. The electricity utilized in production is obtained from the Greek medium voltage electricity grid, with the company having a contractual agreement with the electricity provider 'Protergia'. For electricity modeling, the provider's residual electricity mix is considered, based on the latest report from the Greek Administrator of Renewable Energy and Guarantees of Origin (DAPEEP), reflecting the year 2022. The emission intensity of electricity production, calculated using the LCA Software 'LCA for Experts' for the provider's residual electricity mix for 2022, results in a GWP-GHG value of 0.546 kg CO2 eq./kWh.

MODULE A2

In Module A2, the transport of input commodities to the manufacturing plant is covered, including both raw and packaging materials. The transportation routes and distances in kilometers are based on assumptions considering the actual locations of the producers. Transportation modes were modeled using selected LCI datasets from the Managed LCA Database (MLC database), taking into account technological and temporal specifics. Due to the varying densities of the goods transported, two different datasets were used for heavy and light goods for road transportation, while a Boeing 737-800 aircraft was used for air transportation.

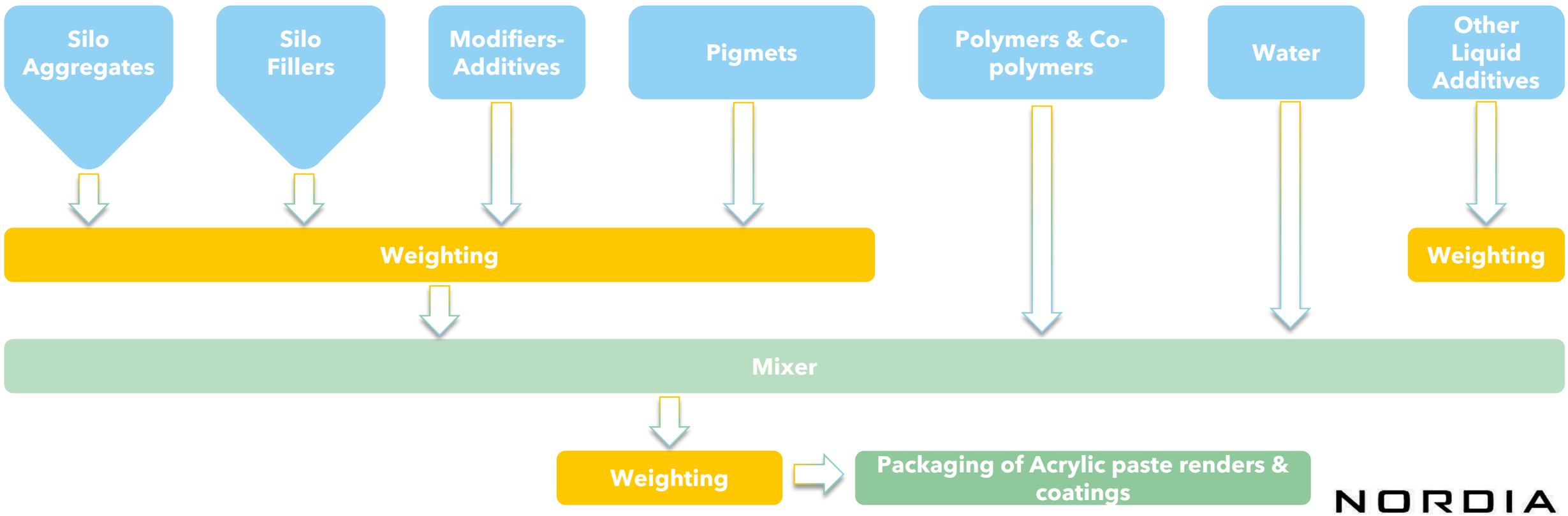
MODULE A3

This module includes the manufacturing of packaging materials, the operation of dryer, as well as the production of the examined products. The production of acrylic paste renders and coatings involves several key steps to ensure quality, durability, and application properties. First, raw materials are selected and prepared, including copolymers and polymers for adhesion and weather resistance, aggregates for texture and durability, fillers and pigments for bulk and color, and various additives for enhanced properties. These materials are then premixed and dispersed using high-speed mixers for a uniform blend. The acrylic polymer is prepared via emulsion polymerization, creating a stable emulsion. The pre-blended mixture is combined with the polymer emulsion through high shear mixing for a consistent paste. Rigorous quality control tests ensure the product meets specifications.

SCENARIOS FOR PROVISION OF INPUT COMMODITIES

TRANSPORTATION ROUTE	TYPE OF TRANSFERRED GOOD	TRANSPORTATION MODE
Road	Heavyweight cargo transferred in bulk	Lorry, Euro 6, 28 - 32t gross weight / 22t payload capacity/ Fuel type: Diesel
Road	Lightweight cargo	Truck, Euro 6, 12 - 14t gross weight / 9.3t payload capacity/ Fuel type: Diesel
Air	Lightweight cargo	Boeing 737-800, up to 23tonnes revenue payload/ Fuel type: Kerosene

PRODUCTION PROCESS OVERVIEW



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DESCRIPTION OF EXAMINED MODULES

MARMOLINE

END-OF-LIFE STAGE

The end-of-life stage for the construction product begins when it is replaced, dismantled, or removed from the building or construction project, ceasing to serve any function. This stage can also commence at the building's end-of-life, based on the chosen end-of-life scenario for the product. In this study, the end-of-life stage for acrylic paste renders and coatings is considered to start when they are deconstructed along with the building, as they become an integrated part of the structure once installed.

ACRYLIC PASTE RENDERS & COATINGS	
PROCESSES	**UNIT (EXPRESSED PER DECLARED UNIT)**
Collection process specified by type	0kg collected separately 1kg collected with mixed construction waste
Recovery system specified by type	0kg for re-use 0kg for recycling 0kg for energy recovery
Disposal specified by type	1kg product or material for final deposition
Assumptions for scenario development (transportation)	Distance of waste disposal facilities: 100km

MODULE C1

The deconstruction of acrylic paste renders and coatings is expected to take place concurrently with the demolition of the building structure. In particular, the removal of the acrylic paste renders & coatings, along with the rest of the building, is assumed to be carried out by a 100kW diesel-powered excavator.

MODULE C2

This module considers the transportation of dismantled acrylic paste renders and coatings to final waste handling facilities. It assumes an average distance of 100 km between construction sites and landfill facilities. Road route is chosen as the primary mode of transportation.

MODULE C3

This module does not include any emissions since the end-of-life scenario assumes that all dismantled acrylic paste renders & coatings are sent to landfill.

MODULE C4

This module reports the emissions associated with the landfilling of acrylic paste renders & coatings designated for disposal. Selection of disposal was conducted based on the most plausible scenario for inert waste management in Greece.

RESOURCE/ RECOVERY STAGE

MODULE D

Generally, this module accounts for the net benefits from recovery processes. However, in this study, the product is assumed to be fully landfilled after use, yielding no recovery benefits. Additionally, Module A5 is outside the system boundary, so potential benefits from recycling or reusing packaging materials cannot be considered.

ADDITIONAL LCA INFORMATION

ALLOCATIONS:

- Identifying 39% of the total consumed electricity specifically allocated to aggregates, where drying and breaking of aggregates takes place, while 2.5% of total electricity consumption is attributed to paste products, including paste renders & coatings, was achieved by measuring the kWh consumption across each machinery within each production line throughout the reference period.
- Propane, employed exclusively in the drying process, is dedicated solely to the aggregates production line. As a result, the entire propane consumption, amounting to 100%, is allocated to aggregates, i.e. limestone from the quarry.

CUT-OFFS:

The study incorporates data for processes, accounting for at least 99% of the stated environmental impacts. Excluded processes are:

- Production of infrastructure and capital goods
- End-of-life of waste packaging from raw materials and problematic batches of plastic buckets may occur, resulting in their disposal as out-of-spec packaging materials.
- Wooden pallets and IBCs management introduced as packaging of the raw materials is not included since these packaging materials are designed for reuse

ASSUMPTIONS:

- A distance of 100 kilometers (km) between construction sites and waste treatment facilities was considered in within the study's calculations. This assumption takes into account the hypothetical distance that materials would need to be transported to access the treatment facilities necessary for their processing or disposal. It serves as a baseline assumption for logistical planning and environmental impact assessments
- It is assumed that all of the waste generated from the deconstruction process will be disposed of in landfills as part of its waste handling procedure.

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ENVIRONMENTAL PERFORMANCE

MARMOLINE

ENVIRONMENTAL RESULTS NORMALIZED TO 1KG OF AVERAGE ACRYLIC PASTE RENDER & COATING

In this EPD, the selected impact categories and respective indicators describing them, as defined by International EPD System, default indicator list version 2.0. and PCR 2019:14 "Construction products" v.1.3.3 are declared. In addition, the results of a supplementary indicator for climate impact is declared. The characterization factors (CFs) used, are aligned with the EF-JRC package for EN 15804 based on EF reference package 3.1.

Please note that the estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks. The LCIA results are normalized to the selected declared unit, **1kg of average acrylic paste render & coating.**

Please be advised that the inclusion of module C in the Environmental Product Declaration (EPD) mandates a comprehensive consideration of its results alongside modules A1-A3. It is strongly discouraged to utilize the outcomes of modules A1-A3 without duly integrating the results of module C.

POTENTIAL ENVIRONMENTAL IMPACTS / 1 KG OF AVERAGE ACRYLIC PASTE RENDER & COATING

CORE ENVIRONMENTAL IMPACT INDICATORS		UNIT	A1-A3	C1	C2	C3	C4	D
Global Warming Potential – total	GWP-total	kg CO2 eq.	5.72E-01	6.60E-04	1.45E-02	0.00E+00	1.03E-02	0.00E+00
Global Warming Potential – fossil	GWP-fossil	kg CO2 eq.	5.69E-01	6.50E-04	1.43E-02	0.00E+00	1.03E-02	0.00E+00
Global Warming Potential – biogenic[1]	GWP-biogenic	kg CO2 eq.	-5.14E-06	0.00E+00	0.00E+00	0.00E+00	5.14E-06	0.00E+00
Global Warming Potential – land use and land use change	GWP-luluc	kg CO2 eq.	2.79E-03	1.05E-05	2.33E-04	0.00E+00	1.05E-05	0.00E+00
Ozone Depletion Potential	ODP	kg CFC 11 eq.	4.68E-06	9.19E-17	2.04E-15	0.00E+00	3.20E-09	0.00E+00
Acidification Potential	AP	Mole of H+ eq.	2.94E-03	3.22E-06	1.94E-05	0.00E+00	8.88E-05	0.00E+00
Eutrophication Potential – freshwater	EP-freshwater	kg P eq.	1.68E-04	2.67E-09	5.92E-08	0.00E+00	3.06E-06	0.00E+00
Eutrophication Potential – marine	EP-marine	kg N eq.	5.50E-04	1.52E-06	7.08E-06	0.00E+00	3.06E-05	0.00E+00
Eutrophication Potential – terrestrial	EP-terrestrial	mol N eq.	5.61E-03	1.68E-05	8.43E-05	0.00E+00	3.33E-04	0.00E+00
Photochemical Oxidant Formation Potential	POCP	kg NMVOC eq.	2.10E-03	4.30E-06	1.93E-05	0.00E+00	9.65E-05	0.00E+00
Abiotic Depletion Potential – elements[2]	ADPe	kg Sb eq.	8.28E-06	5.44E-11	1.21E-09	0.00E+00	3.44E-08	0.00E+00
Abiotic Depletion Potential. fossil resources[2]	ADPf	MJ net calorific value	1.30E+01	8.22E-03	1.83E-01	0.00E+00	2.53E-01	0.00E+00
Water Deprivation Potential[2]	WDP	m^3 world eq. deprived	4.15E-01	9.67E-06	2.15E-04	0.00E+00	1.12E-02	0.00E+00

[1] Negative results of GWP-biogenic corresponding biogenic carbon dioxide which is stored in the wood packaging are already balanced out in modules A1-A3 since Module A5 is out of the system boundaries.

[2] 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.

ENVIRONMENTAL PERFORMANCE

MARMOLINE

ENVIRONMENTAL RESULTS NORMALIZED TO 1KG OF ACRYLIC PASTE RENDER & COATING

POTENTIAL ENVIRONMENTAL IMPACTS / 1 KG OF AVERAGE ACRYLIC PASTE RENDER & COATING

CLIMATE CHANGE		UNIT	A1-A3	C1	C2	C3	C4	D
Global Warming Potential – GHG[3]	GWP-GHG	kg CO2 eq.	5.72E-01	6.60E-04	1.45E-02	0.00E+00	1.03E-02	0.00E+00

[3] This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such. the indicator is identical to GWP-total except that the CF for biogenic CO_2 is set to zero.

POTENTIAL ENVIRONMENTAL IMPACTS / 1 KG OF AVERAGE ACRYLIC PASTE RENDER & COATING

RESOURCE USE INDICATORS		UNIT	A1-A3	C1	C2	C3	C4	D
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	PERE	MJ. net calorific value	9.24E-01	7.08E-04	1.57E-02	0.00E+00	4.27E-03	0.00E+00
Use of renewable primary energy resources used as raw materials	PERM	MJ. net calorific value	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of renewable primary energy resources	PERT	MJ. net calorific value	9.24E-01	7.08E-04	1.57E-02	0.00E+00	4.27E-03	0.00E+00
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	PENRE	MJ. net calorific value	1.30E+01	8.22E-03	1.83E-01	0.00E+00	2.53E-01	0.00E+00
Use of non-renewable primary energy resources used as raw materials	PENRM	MJ. net calorific value	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of non-renewable primary energy resources	PENRT	MJ. net calorific value	1.30E+01	8.22E-03	1.83E-01	0.00E+00	2.53E-01	0.00E+00
Use of secondary material	SM	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of renewable secondary fuels	RSF	MJ. net calorific value	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of non-renewable secondary fuels	NRSF	MJ. net calorific value	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of net fresh water	FW	m3	9.67E-03	7.89E-07	1.75E-05	0.00E+00	2.62E-04	0.00E+00

ENVIRONMENTAL PERFORMANCE

MARMOLINE

ENVIRONMENTAL RESULTS NORMALIZED TO 1KG OF AVERAGE ACRYLIC PASTE RENDER & COATING

POTENTIAL ENVIRONMENTAL IMPACTS/ 1 KG OF AVERAGE ACRYLIC PASTE RENDER & COATING

WASTE INDICATORS		UNIT	A1-A3	C1	C2	C3	C4	D
Hazardous waste disposed	HWD	kg	2.54E-10	3.15E-13	6.99E-12	0.00E+00	0.00E+00	0.00E+00
Non-hazardous waste disposed	NHWD	kg	2.22E-04	1.34E-06	2.98E-05	0.00E+00	0.00E+00	0.00E+00
Radioactive waste disposed	RWD	kg	1.27E-05	1.50E-08	3.33E-07	0.00E+00	0.00E+00	0.00E+00

POTENTIAL ENVIRONMENTAL IMPACTS/ 1 KG OF AVERAGE ACRYLIC PASTE RENDER & COATING

OUTPUT FLOWS		UNIT	A1-A3	C1	C2	C3	C4	D
Components for re-use	CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Material for recycling	MFR	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for energy recovery	MER	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy. Electricity	EEe	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy. Thermal	EEt	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

POTENTIAL ENVIRONMENTAL IMPACTS/ 1 KG OF AVERAGE ACRYLIC PASTE RENDER & COATING

ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS		UNIT	A1-A3	C1	C2	C3	C4	D
Particulate matter emissions	PM	Disease incidence	2.32E-08	3.84E-11	1.97E-10	0.00E+00	1.72E-09	0.00E+00
Ionizing radiation human[4]	IRP	kBq U235 eq.	5.24E-02	2.17E-06	4.83E-05	0.00E+00	1.17E-03	0.00E+00
Eco-toxicity. Freshwater[2]	ETP-fw	CTUe	9.28E+00	6.10E-03	1.36E-01	0.00E+00	6.38E-02	0.00E+00
Human toxicity. cancer effects[2]	HTP-c	CTUh	4.74E-10	1.23E-13	2.74E-12	0.00E+00	7.60E-12	0.00E+00
Human toxicity. non-cancer effects[2]	HTP-nc	CTUh	7.19E-09	5.54E-12	1.23E-10	0.00E+00	6.40E-11	0.00E+00
Land use related impacts/Soil quality[2]	SQP	dimensionless	3.61E+00	3.84E-11	1.97E-10	0.00E+00	1.72E-09	0.00E+00

[2] 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.

[4] 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

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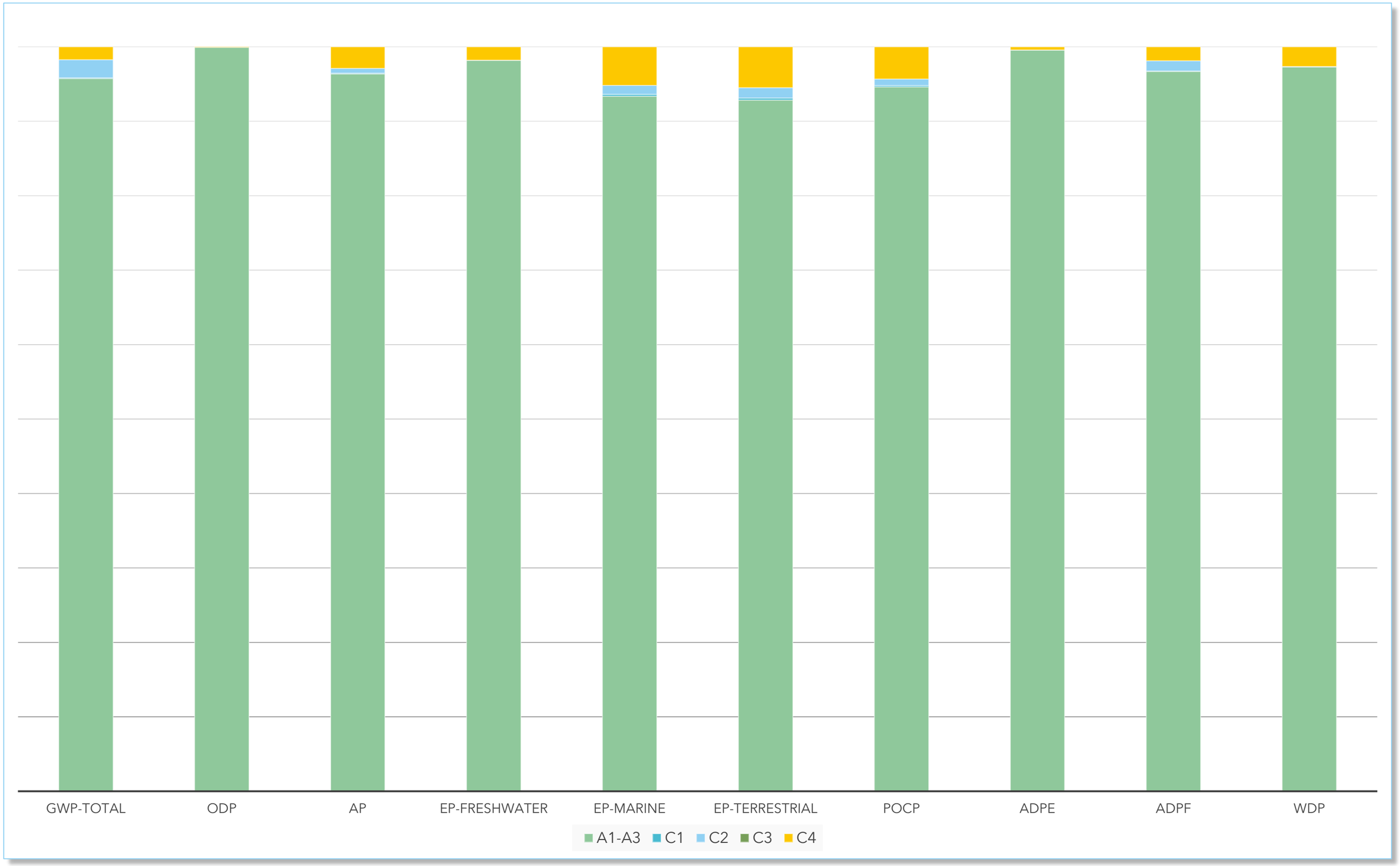
INTERPRETATION

As illustrated in the diagram, it is evident that the production stage (Modules A1-A3) makes the most substantial contribution to the results of each of the examined impact indicators. More specifically the following observations are pointed out:

- The total Global Warming Potential is allocated across Modules A1-A3, accounting for 95.73% of the overall potential environmental impacts.
- The contribution of disposal in Module C4 is significant of Eutrophication potential-marine and Eutrophication-Potential terrestrial, accounting for 5.20% and 5.51% respectively.
- Contribution of remaining Modules (C1, C2 & C3) is rather negligible.

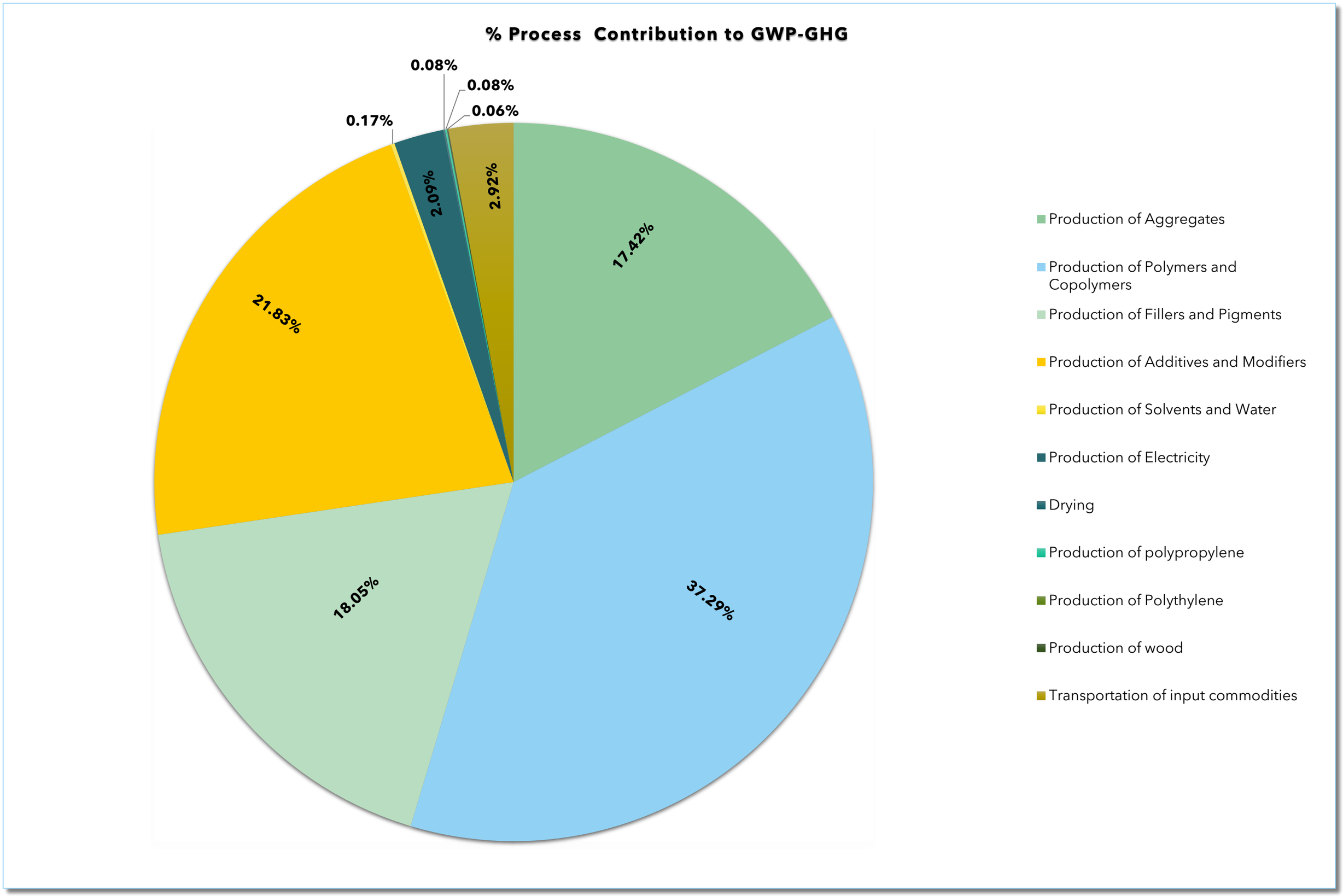
% MODULES CONTRIBUTION TO THE ENVIRONMENTAL PERFORMANCE INDICATORS OF THE DECLARED PRODUCT



INTERPRETATION

PROCESS CONTRIBUTION TO GWP-GHG FOR MODULES A1-A3 FOR AN AVERAGE ACRYLIC PASTE RENDER & COATING

Most of the examined impact indicators, including Global Warming Potential (GWP-GHG), are mainly influenced by Modules A1-A3. Specifically, 37.29% of the impact is due to the production of polymers and copolymers. The production of additives & modifiers and the production of fillers & pigments also have significant impacts, contributing 21.83% and 18.05%, respectively. The production of aggregates accounts for 17.42% of the total GWP-GHG emissions, with the remaining processes contributing minimally to the overall impact.



ADDITIONAL ENVIRONMENTAL INFORMATION

The following tables offer a detailed overview of the differences observed across all examined products, covering all considered environmental impact aspects. These differences are compared to the expected environmental impacts of an average product. The tables provide in-depth insight into how each product's environmental footprint diverges from the benchmark of an average product.

CORE ENVIRONMENTAL INDICATORS	VARIATIONS FROM THE DECLARED AVERAGE (A-C)				
	SVR SILICONE	SVR SPECIAL	SVR MAX	SVR PREMIUM	FK202 ORGANIC
Climate Change - Total (kg CO2 eq)	11.80%	22.64%	-12.00%	30.86%	-17.79%
Climate Change - Fossil (kg CO2 eq)	11.83%	22.86%	-12.06%	30.97%	-17.54%
Climate Change - Biogenic (kg CO2 eq)	-	-	-	-	-
Climate Change - Land Use and Land Use Change (kg CO2 eq)	4.68%	-20.21%	-1.47%	8.38%	-66.49%
Ozone Depletion (kg CFC-11 eq.)	-37.11%	-88.90%	-86.34%	281.75%	-95.74%
Acidification (Mole of H+ eq.)	7.84%	-8.82%	-12.64%	39.59%	-14.54%
Eutrophication, fresh water (kg P eq.)	9.12%	-26.78%	-10.07%	35.49%	-34.00%
Eutrophication, marine (kg N eq.)	9.80%	-2.85%	-12.84%	38.84%	-18.49%
Eutrophication, terrestrial (Mole of N eq.)	9.48%	-8.52%	-12.90%	40.21%	-18.42%
Photochemical Ozone Formation, human health (kg NMVOC eq.)	15.58%	-1.67%	-11.38%	33.82%	-22.94%
Resource use, mineral and metals (kg Sb eq.)	-4.79%	-31.16%	-3.72%	18.05%	-33.23%
Resource use, fossils (MJ)	18.17%	7.99%	-8.11%	21.78%	-11.05%
Water Deprivation Potential (m3 world equiv.)	20.47%	5.44%	-5.89%	15.45%	-29.93%

CLIMATE CHANGE	VARIATIONS FROM THE DECLARED AVERAGE (A-C)				
	SVR SILICONE	SVR SPECIAL	SVR MAX	SVR PREMIUM	FK202 ORGANIC
Global Warming Potential- GWP-GHG (kg CO2 eq)	11.80%	22.64%	-12.00%	30.86%	-17.79%

ADDITIONAL ENVIRONMENTAL INFORMATION

MARMOLINE

RESOURCE USE	VARIATIONS FROM THE DECLARED AVERAGE (A-C)				
	SVR SILICONE	SVR SPECIAL	SVR MAX	SVR PREMIUM	FK202 ORGANIC
(PERE) Use of renewable primary energy excluding renewable primary energy resources as raw materials (MJ)	25.77%	-23.67%	-9.07%	30.83%	-45.92%
(PERT) Total use of renewable primary energy resources (primary energy resources used as raw material and primary energy) (MJ)	25.77%	-23.67%	-9.07%	30.83%	-45.92%
(PENRE) Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials (MJ)	18.17%	7.99%	-8.11%	21.78%	-11.05%
(PENRT) Total use of non-renewable primary energy resources (MJ)	18.18%	7.99%	-8.11%	21.78%	-11.05%
Use of net fresh water (m3)	21.40%	5.39%	-5.89%	15.42%	-29.83%

WASTE CATEGORIES	VARIATIONS FROM THE DECLARED AVERAGE (A-C)				
	SVR SILICONE	SVR SPECIAL	SVR MAX	SVR PREMIUM	FK202 ORGANIC
Hazardous waste disposed (kg)	28.87%	-2.36%	-0.02%	-1.16%	-13.43%
Non-hazardous waste disposed (kg)	192.09%	-6.08%	-2.40%	-2.82%	0.33%
Radioactive waste disposed (kg)	21.15%	-5.98%	1.58%	-4.78%	-53.94%

ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS	VARIATIONS FROM THE DECLARED AVERAGE (A-C)				
	SVR SILICONE	SVR SPECIAL	SVR MAX	SVR PREMIUM	FK202 ORGANIC
Particulate Matter emissions (Disease incidence)	8.76%	2.36%	-17.32%	51.33%	15.49%
Ionizing radiation human (kBq U235 eq.)	13.01%	-32.81%	-6.99%	27.22%	-35.06%
Eco-toxicity, freshwater (CTUe)	-6.29%	-37.22%	-36.68%	119.03%	-35.15%
Human toxicity, cancer effects (CTUh)	6.40%	-21.55%	-11.45%	38.73%	4.16%
Human toxicity, non-cancer effects (CTUh)	2.36%	-32.07%	-10.80%	39.20%	31.44%
Land use related impacts/Soil quality (dimensionless)	28.83%	-24.90%	-7.72%	26.84%	-52.95%

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REFERENCES

- Airliners.net, n.d. Detailed Aircraft Data and Performance Metrics. [online] Available at: https://www.airliners.net/ [Accessed 3 June 2024].
- Boeing Commercial Airplanes, n.d. Boeing 737-800 Technical Specifications. [online] Available at: https://www.boeing.com/commercial/737ng/ [Accessed 3 June 2024].
- International EPD® System, PCR 2019:14 Construction Products, version 1.3.3 (EN 15804: A2)
- EN 15804:2012+A2:2019/AC 2021 Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products.
- International EPD® System, General Program Instructions for the International EPD System, version 4.01
- ISO 14020:2000- Environmental Labels and Declarations – General Principles
- ISO 14025:2006 - Environmental labels and declarations – Type III environmental declarations – Principles and procedures
- ISO 14040:2006 - Environmental management – Life Cycle assessment – Principles and framework
- ISO 14044:2006 - Environmental management – Life Cycle assessment – Requirements and guidelines
- International Civil Aviation Organization (ICAO), n.d. Aircraft Engine Emissions. [online] Available at: https://www.icao.int/environmental-protection/Pages/aircraft-engine-emissions.aspx [Accessed 3 June 2024].
- IPCC, 2023: Climate Change 2023: Synthesis Report. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, H. Lee and J. Romero (eds.)]. IPCC, Geneva, Switzerland, pp. 35-115, doi: 10.59327/IPCC/AR6-9789291691647
- The International EPD® System – The International EPD System is a programme for type III environmental declarations, maintaining a system to verify and register EPDs as well as keeping a library of EPDs and PCRs in accordance with ISO 14025. www.environdec.com
- Ecoinvent/ Ecoinvent Centre – www.Eco-invent.org
- Sphera – LCA for Experts Product Sustainability software – www.sphera.com
- Paralike, Maria & Karachaliou, Theodora (2019). Progress and Challenges in C&D Waste Management in Greece. 5. 32-41.
- Residual Energy Mix 2022 from Renewable Energy Sources Operator & Guarantees of Origin (DAPEEP SA)