Environmental Product Declaration

ENVIRONMENTAL FOOTPRINT INSTITUTE

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

ECRA-SHM / SKM Shield Coat (WB Hybrid Epoxy Coating)

From

OZKEM INTERNATIONAL ME TRADING L.L.C

Programme :	**The EFI Program**
Programme Operator :	**The Environment Footprint Institute**
EPD Registration No :	**260501EPD CPR-3100**
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Geographical Scope :	United Arab Emirates
Reference Year :	2026

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 Ozkem International ME Trading L.L.C.

General Information

Programme :	The EFI Programme
Address :	The Environment Footprint Institute Calle Circe 49A Madrid, Spain
Website : Email :	www.environmentalfootprintinstitute.com info@environmentalfootprintinstitute.com

Product Category Rules (PCR)
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PCR review was conducted by: The Environmental Footprint Institute.
Product category rules (PCR): Under the general rules of the Environmental Footprint Institute and PCR P-3100: Construction products in general (EN-15804)
PCR review was conducted by: Environmental Footprint Institute
Life Cycle Assessment (LCA)
LCA accountability: Mehmood Khan, CQES International LLC
☐ **Internal Verification** ☑ **Third Party Verification**
Accredited by: THE ENVIRONMENTAL FOOTPRINT INSTITUTE **Third party verifier:** Iván Jiménez Calle Circe 49A Madrid, Spain www.environmentalfootprintinstitute.com info@environmentalfootprintinstitute.com
Procedure for follow-up of data during EPD validity involves Internal verifier: ☐ Yes ☑ No

The EPD owner has the sole ownership, liability and responsibility for the EPD.

EPDs within the same product category but registered in different EPD programs 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 characterization factors); have equivalent content declarations; and be valid at the time of comparison.

Company Information

Owner of the EPD :

OZKEM INTERNATIONAL ME TRADING L.L.C

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Ozkem International ME Trading L.L.C is a specialty chemical manufacturer and supplier focused on high-performance protective coatings for HVAC (Heating, Ventilation, and Air Conditioning) systems. The company develops and distributes advanced resin technologies, including water-based, self-etching hybrid epoxies designed to extend the operational life of heat transfer equipment.

OzKem serves OEM (Original Equipment Manufacturer) coil manufacturers, providing engineered solutions for corrosion management, moisture control, and antimicrobial protection in demanding environments, including marine, offshore, and industrial applications.

The ECRA-SHM product line represents a commitment to sustainable coating solutions that reduce energy consumption through maintained heat exchange efficiency while eliminating the need for frequent coil replacements.

Certifications

OzKem's approach focuses on developing protective coating systems designed to support operational efficiency, asset durability, and reduced maintenance requirements across industrial applications. Products such as ECRA-SHM (also known as SKM Shield Coat) are intended to improve equipment performance and extend service life in HVAC and related systems. ECRA-SHM is NSF registered under Registration #156948 for nonfood compounds.

The ECRA-SHM coating is designed with the following functional characteristics:

- Energy Performance: Intended to support heat exchange efficiency and reduce compressor workload in HVAC systems, which may contribute to lower energy consumption during operation.

- Corrosion Protection: Designed to reduce corrosion and extend equipment service life, potentially reducing maintenance frequency and replacement requirements over time.

- Operational Efficiency: Improved system performance may contribute to reduced operational energy demand and associated emissions depending on system conditions and usage.

ECRA-SHM, ECRA-E3, and Delta6T are developed for industrial and commercial applications where asset protection, operational efficiency, and equipment longevity are important performance considerations.

NSF
Nonfood Compounds
Program Listed
(Registration # 156948)

Product Information

Product Name :	**ECRA-SHM / SKM Shield Coat (WB Hybrid Epoxy Coating)**
Product identification :	Water-based, self-etching hybrid epoxy coating
UN CPC Code	35411 - Paints and varnishes, based on polymers
Reference Service Life (RSL)	10 years (industry averages for industrial coatings)
Geographical Scope	United Arab Emirates
Location of Production Site :	Industrial Area 13, Sharjah (UAE)

Product Description :

ECRA-SHM / SKM Shield Coat (WB Hybrid Epoxy Coating) is a water-based, self-etching hybrid epoxy coating engineered specifically for the protection of ferrous and non-ferrous metals used in the manufacture of HVAC (Heating, Ventilation, and Air Conditioning) coils. The formulation utilizes a hybrid resin matrix that creates a tightly crosslinked coating capable of bonding directly to all metal substrates including internal tube walls without the need for a separate primer.

The coating is designed for factory (OEM) application to new evaporator and condenser coils using either full-immersion dip or spray methods. When applied at the correct viscosity and oven-cured to an ultra-thin dry film thickness (DFT) of just 6-8 microns, ECRA-SHM / SKM Shield Coat produces a uniform, high-gloss finish that optimizes heat exchange performance while providing long-term protection against corrosion, fouling, and biological growth. The coating is available in multiple colors, and all colors are included within the scope of this EPD declaration.

Key Performance Features :

- Salt Spray Resistance: ASTM B117: 30,000 hours
- Cyclic Offshore: ISO 12944-9: 5,000 hours
- Dry Film Thickness (DFT): 6-8 microns (single dip)
- Heat Transfer Reduction: <1% (at recommended DFT)
- Dry Heat Resistance: Withstands 175°C (excursions to 200°C)
- VOC Content: 85 grams/litre (as supplied, less water and exempt solvents)
- Solids by Weight: 29% ±2% (ASTM D2369)
- Solids by Volume: 27% ±1%

Coverage: Dipping theoretical coverage is approximately 50 sqm per litre of heat exchange surface area. Spray theoretical coverage is approximately 2 sqm per litre on coil face ie 1sqm of coil body with FPI of 12- 16 and 15 sqm per litre on flat panels. Coverage rates are only estimates and make no allowance for material loss. Actual rates will vary dependent on application method, surfaces and viscosity of dip product.

LCA Information

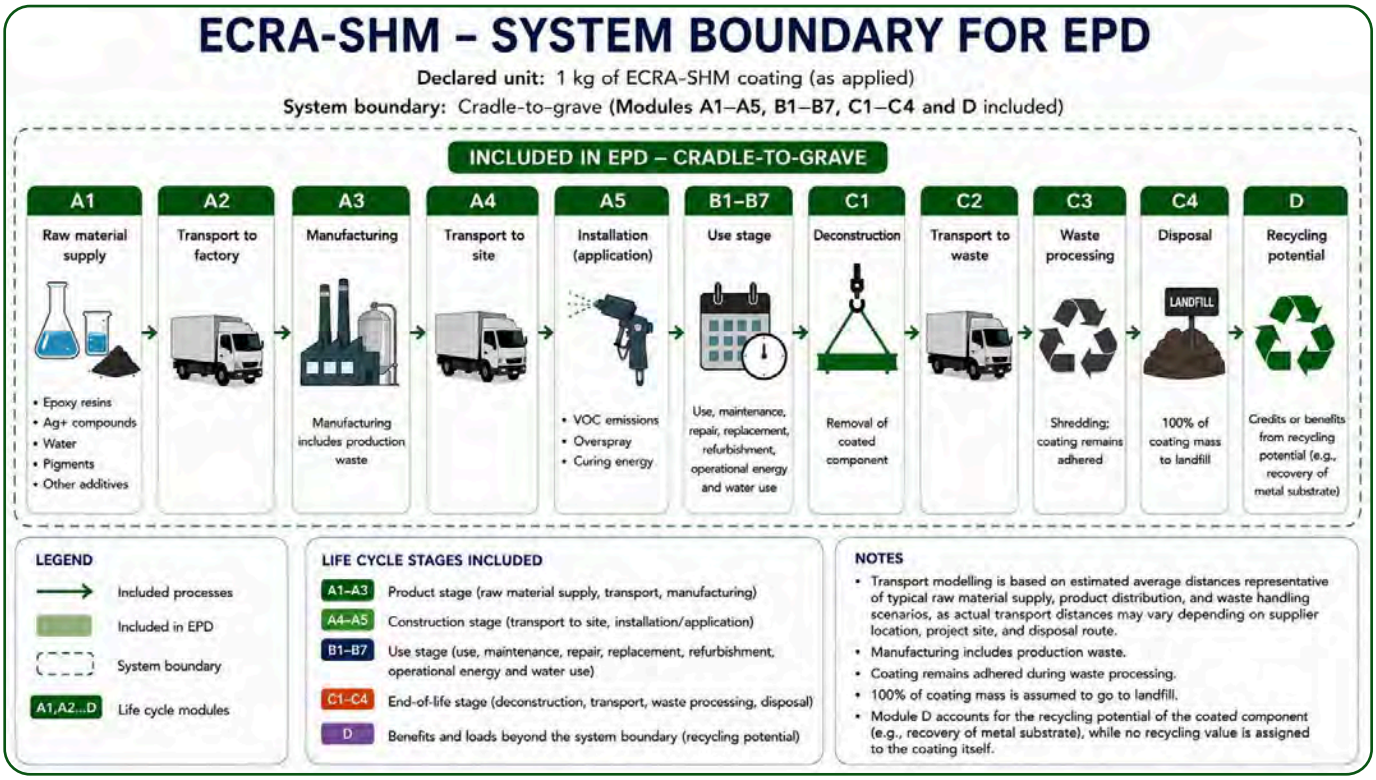
Declared Unit :	The Declared Unit of the Life Cycle Assessment is 1 Kg of ECRA-SHM coating, manufactured and supplied by Ozkem International ME Trading L.L.C. All environmental impacts and resource use are reported with reference to this declared unit, in accordance with EN 15804 requirements.
Time Representativeness :	The Life Cycle Inventory (LCI) data used in this EPD are representative of production activities during the reference period from January 2025 to December 2025.
Database(s) and LCA software used:	The LCA modelling and impact calculations were performed using Air. LCA™ software (version 3.21.0.5) in combination with the Ecoinvent™ database (version 3.12). The EN 15804 system model was applied for the assessment of environmental impacts, using the characterization factors from EN 15804:2012+A2:2019.
Electricity usage in A3 :	A specific dataset with the Life Cycle Inventory (LCI) corresponding to the electricity mix in UAE, has been used for this LCA. 0.6279 kg CO2eq/kWh (GWP-GHG).
Cut-off rules:	More than 99% of the materials and energy consumption have been included. The Polluter Pays Principle and the Modularity Principle have been followed.
Allocation method:	No allocation was required for foreground processes, as the production of ECRA-SHM coating at the Ozkem International ME Trading L.L.C. facility does not generate co-products with economic value. Where background datasets required allocation, the allocation rules applied within the selected databases and system model were followed in accordance with EN 15804.

Description of system boundaries:

This EPD follows a cradle-to-grave approach in accordance with EN 15804. It covers Modules A1–A3 (raw material supply, transport, and manufacturing), Module A4 (transport to customer/OEM facility), and Module A5 (installation at OEM facility). In addition, end-of-life Modules C1–C4 (deconstruction/demolition, transport, waste processing, and disposal) are included based on standardized and scenario-based assumptions applicable to ECRA-SHM coating.

Use-stage Modules B1–B7 are excluded, as the environmental performance during the use phase depends on specific operating conditions, system design, maintenance practices, and service life scenarios that are outside the declared scope of this EPD.

Module D (benefits and loads beyond the system boundary) is included in the assessment; however, the reported value is zero because the coating remains adhered to the metal substrate at end of life and no recyclable or recoverable material value is assigned to the coating system.



Core Processes

Upstream Stage

This stage includes the extraction, production, and transportation of raw materials used in the production of ECRA-SHM at Ozkem International ME Trading L.L.C.

A1-Raw Material Supply: The A1 module covers the extraction, processing, and upstream transportation of raw materials used in the production of ECRA-SHM coating, including hybrid epoxy resins, silver-ion (Ag+) compounds, water, pigments, additives, and packaging materials (20L drums). All raw materials are sourced through international chemical supply chains.

This stage also accounts for energy consumption, emissions, and upstream transport from raw material origin to the OzKem manufacturing facility.

A2 - Transport: The A2 module includes the transportation of raw materials from their point of extraction or processing to the Ozkem International ME Trading L.L.C manufacturing site in UAE. Transport of raw materials to production site is taken as the weight average values for transport from supplier for the year of 2025.

- Vehicle used for transport - 3.5-7.5t & >32t trucks, Euro 5
- Vehicle capacity - 3.5 -7.5 tons and 25 tons
- Fuel type and consumption - Diesel, 0.38 liters per km
- Capacity utilization (including empty poly cartages) - 50% as assumed in Eco invent
- Bulk transportation - Mass of the transported product.

A3 - Manufacturing (Core Stage)
This stage includes the manufacturing of ECRA-SHM coating at the Ozkem International ME Trading L.L.C. production facility, encompassing material consumption, energy use, emissions, and waste treatment. Key activities include mixing and blending of hybrid epoxy resins, silver-ion (Ag+) compounds, water, pigments, and additives; quality control testing; and packaging into 20 Litre drums. This stage also accounts for the 2.9% production waste generated during manufacturing, which is sent to landfill or treatment as per standard industrial waste practices.

A4 - Transportation of Goods:
Stage A4 includes the transport of finished ECRA-SHM coating from the Ozkem International ME Trading L.L.C. manufacturing facility to customers or distribution points. Transportation is carried out using Euro 5 diesel trucks, including 3.5–7.5 ton and >32 ton vehicles, with carrying capacities of 3.5–7.5 tons and 25 tons, respectively. Diesel consumption is assumed as 0.38 litres per km. Transport impacts are calculated based on the mass of the product and transport distance (ton-kilometre basis).

A5 - Installation :
Module A5 includes activities related to the application of ECRA-SHM coating at the OEM coil manufacturing facility. This module accounts for the handling and disposal of packaging waste, specifically 20 Litre steel or HDPE drums, which are collected and sent to recycling (50%) or disposal (50%) according to local waste management practices. ECRA-SHM coating is applied using either full-immersion dip or spray application methods. For dip application, coils are immersed for 1-10 minutes depending on coil size, then drained at 50-60 degrees off horizontal. For spray application, coating is applied using standard production spray equipment at approximately 50 PSI, with three spray passes per coat (straight into fins, 45-degree angle right, 45-degree angle left) on both sides of the coil. The coating is then oven-cured at a substrate temperature of 145-165°C for 1 hour, ensuring the metal substrate reaches approximately 155°C before commencing the cure cycle. VOC emission in stage A5 is considered as 85 grams per litre of coating applied, released to air during application and curing. This module also accounts for energy consumption from oven curing, overspray waste from spray application, cleaning water from equipment washing, and any touch-up applications to fix imperfections from dipping.

C1 – Deconstruction / Demolition :
Module C1 covers the removal of coated metal components from their installed location at the end of their service life. This includes dismantling and preparation for transport. No specific energy use for demolition is considered; however, a conservative auxiliary assumption of 0.01 kWh/kg is included to account for minimal mechanical handling and dismantling activities.

C2 – Transport :
Module C2 includes the transportation of deconstructed coated metal components from the demolition site to disposal facilities. Transport is carried out using Euro 5 diesel trucks, including 3.5–7.5 ton and >32 ton vehicles, with carrying capacities of 3.5–7.5 tons and 25 tons, respectively. An average transport distance of 50 km by road is assumed. Transport impacts are calculated based on the mass of the transported material and distance (ton-kilometre basis).

C3 – Waste Processing
Module C3 includes the processing of deconstructed coated metal components for waste treatment or disposal. Activities include sorting and preparation. The coating cannot be removed from the metal substrate; therefore, no separation or recovery of the coating material is possible, and any processing of the coated metal is considered negligible for the coating itself. The coating remains fully adhered to the metal substrate throughout any shredding or crushing activities. As a result, no energy allocation for coating recovery is accounted for in this module.

C4 - Disposal

Module C4 covers the end-of-life treatment of the ECRA-SHM coating system. As the coating is classified as hazardous waste and remains adhered to the metal substrate, end-of-life treatment is modelled using hazardous waste incineration processes representative of paint and coating waste treatment. No recycling value is assigned to the coating material itself.

Module D – Benefits and Loads Beyond the System Boundary :

Module D covers the potential benefits and loads from recycling or recovery of materials beyond the system boundary. For ECRA-SHM coating, recycling is not possible because the coating remains fully adhered to the metal substrate and cannot be separated for recovery. No recycling or energy recovery processes are applicable to the coating material itself. Therefore, any benefits or loads from Module D are considered negligible.

More Information

Modules declared, geographical scope, share of specific data (in GWP-GHG results) and data variation (in GWP-GHG results):

	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 and water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
Module	**A1**	**A2**	**A3**	**A4**	**A5**	**B1-B7**	**C1**	**C2**	**C3**	**C4**	**D**
Modules declared	X	X	X	X	X	ND	X	X	X	X	X
Geography	AE	AE	AE	AE	AE	--	AE	AE	AE	AE	AE
Specific data used	2.8%			--	--	--	--	--	--	--	--

Legend: *X = Included | ND = Not Declared | AE = United Arab Emirates*

Assumptions :

This EPD is based on primary production data collected for the 2025 production period at the Ozkem International ME Trading L.L.C. facility in the UAE. Production waste is assumed at 2.9% of input mass, comprising grinding residue and off-specification batches. Transport distances are modelled using estimated average values of 500 km for raw materials and finished products, and 50 km for waste transport. VOC emissions during installation are assumed as 85 g/L released to air.
Based on the manufacturer's Technical Data Sheet, the water-based coating contains approximately 29% solids by weight. Accordingly, it is assumed that approximately 29% of the wet-applied coating mass remains on the product after drying and curing, while the remaining 71% is released during the manufacturing curing process as water evaporation and volatile emissions. Therefore, only the dry coating mass is considered in downstream life cycle stages and end-of-life modelling (A4–C4).
The coating remains adhered to the metal substrate at end-of-life and is modelled using hazardous waste treatment representative of paint and coating waste processes. Use stage modules (B1–B7) are excluded from the assessment scope. Module D is included in the assessment; however, no recycling benefits or loads are assigned to the coating material itself.

Content Information

Product Content:

Product Components	Weight %	Post-Consumer material weight -%	Biogenic material, kg C/kg
Solvents	50-55	0	0
Binders	25-30	0	0
Additives	15-20	0	0
Pigments	2-3	0	0
Preservatives	0.01-0.02	0	0
Total	100	0	0

Packaging Material Content:

Packaging Material	Weight (kg)/DU	Weight % (Versus the Product)	Weight biogenic carbon, kg C/kg
Wooden Pallets	2.80E-02	2.80E+00	9.16E-03
Nylon Straps	8.00E-04	7.91E+00	0.00E+00
IBCs	2.00E-02	2.00E+00	0.00E+00
Steel Tins/Drums	3.75E-02	3.75E+00	0.00E+00

Dangerous substances from the candidate list of SVHC for Authorisation:

Dangerous substances from the candidate list of SVHC for Authorisation:	EC No.	CAS No.	Weight-% per declared unit
None	--	--	--
None	--	--	--

Biogenic carbon content:

Biogenic carbon content	A1-A3/Unit
Biogenic carbon content in product	0.00E+00 kg C
Biogenic carbon content in accompanying packaging	9.16E-03 kg C

Manufacturing Process:

All raw materials including hybrid epoxy resins, silver-ion (Ag+) compounds, water, pigments, and additives are received at the Ozkem International ME Trading L.L.C. manufacturing facility and stored according to their specific requirements. Raw materials are precisely weighed according to the proprietary formulation, then pigments, fillers, and additives are dispersed into a portion of water using a high-speed disperser operating at 1200-1700 rpm to achieve proper wetting and deagglomeration of solid particles, forming a uniform colour paste.

The colour paste is then passed through a grinding mill (bead or sand mill) operating at 1000-1600 rpm to reduce particle size to a fineness of 15-40 microns, with approximately 2.9% of raw materials lost as production waste during grinding and equipment cleaning. The ground paste is transferred to a letdown tank where the epoxy emulsion is added, and the mixture is blended at slow speed with additional water and additives to adjust the formulation to target specifications. Samples are taken from each batch for quality testing including viscosity, pH (target 8.0-9.2), solids content (29% ±2% by weight), and grind fineness. Approved coating is then filled into 20 Liter steel or HDPE drums, sealed, labelled with batch number and date of manufacture, and stored in a warehouse out of direct sunlight with temperature maintained below 35°C. VOC emissions during manufacturing are controlled by local exhaust ventilation, and wastewater from equipment cleaning is treated to remove solids before discharge. This manufacturing process description aligns with Module A3 requirements under EN 15804, covering all activities from raw material input at factory gate to finished product ready for dispatch.

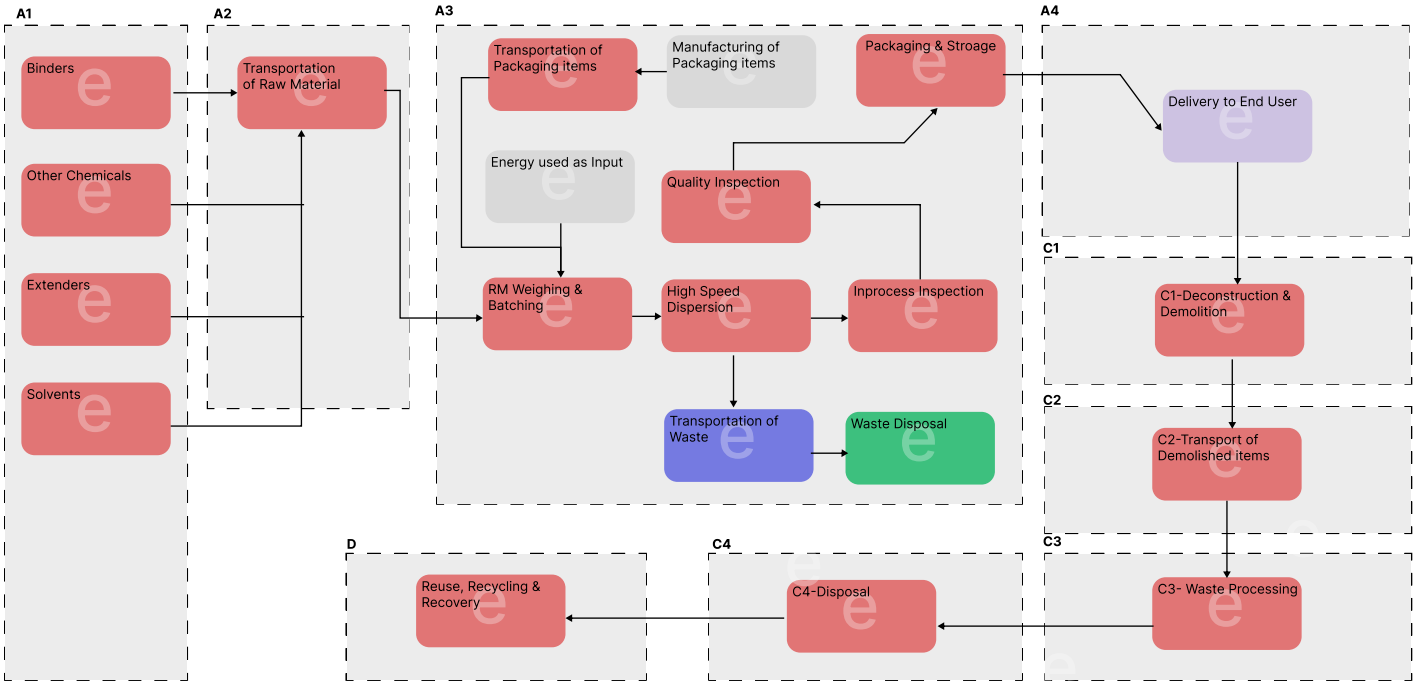
Technical information:

For more technical information about the ECRA-SHM, please refer to the product TDS

Data quality:
This EPD was developed in compliance with ISO 14025, ISO 14040/14044, and the core rules of EN 15804:2012+A2:2019, following relevant PCR for construction products (where applicable). Primary, site-specific data for the 2025 reference period were collected for raw material supply, transport, and manufacturing (Modules A1-A3) at the Ozkem International ME Trading L.L.C. facility in the United Arab Emirates. Background system data were sourced from the Ecoinvent 3.12.0 database.

The LCA was modelled using Air.e LCA software v3.21.0.5, applying EN 15804 characterization factors. Data quality objectives prioritized temporal, geographical, and technological representativeness, with over 90% of the mass and energy flows in Modules A1-A3 based on measured plant data.

Life Cycle Assessment Modelling



Environmental Performance

Potential Environment Impacts

The following tables present the environmental performance for the declared unit of 1 kg of ECRA-SHM coating produced by Ozkem International ME Trading L.L.C. Due to the integrated nature of the production line, it was not feasible to isolate the consumption of electricity, water, and raw materials specifically for this product variant. Consequently, the life cycle inventory (LCI) was calculated by allocating the plant's total annual consumption of these inputs based on the mass share of this product within the total production output.

The environmental impact results are calculated using the EN 15804+A2 characterization factors and are presented for each declared life cycle module (A1-A5, C1-C4). The use stage (B1-B7) and recycling potential module (D) are excluded from this declaration per the defined product boundaries.

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

Core Environmental Impact Indicators

Impact category indicators according to EN 15804 (Results per declared unit)															
Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-Total	kg CO_2 eq.	2.85E+00	1.26E-01	4.71E-01	ND	ND	ND	ND	ND	ND	ND	1.55E-03	2.87E-03	0.00E+00	1.05E+00	0.00E+00
GWP-fossil	kg CO_2 eq.	2.84E+00	1.26E-01	4.42E-01	ND	ND	ND	ND	ND	ND	ND	1.55E-03	2.87E-03	0.00E+00	1.05E+00	0.00E+00
GWP-biogenic	kg CO_2 eq.	6.11E-03	2.65E-05	2.89E-02	ND	ND	ND	ND	ND	ND	ND	2.20E-07	6.48E-07	0.00E+00	4.36E-05	0.00E+00
GWP-luluc	kg CO_2 eq.	6.19E-03	6.28E-05	4.41E-05	ND	ND	ND	ND	ND	ND	ND	1.52E-07	1.29E-06	0.00E+00	4.77E-05	0.00E+00
ODP	kg CFC 11 eq.	1.46E-07	1.75E-09	1.04E-08	ND	ND	ND	ND	ND	ND	ND	3.67E-11	4.17E-11	0.00E+00	5.27E-09	0.00E+00
AP	mol H^+ eq.	1.14E-02	9.86E-04	9.30E-04	ND	ND	ND	ND	ND	ND	ND	3.24E-06	6.86E-06	0.00E+00	7.55E-04	0.00E+00
EP-freshwater	kg P eq.	7.56E-04	1.12E-05	4.62E-05	ND	ND	ND	ND	ND	ND	ND	1.38E-07	3.13E-07	0.00E+00	1.16E-05	0.00E+00
EP-marine	kg N eq.	2.70E-03	3.81E-04	3.05E-04	ND	ND	ND	ND	ND	ND	ND	7.07E-07	1.69E-06	0.00E+00	1.41E-04	0.00E+00
EP-terrestrial	mol N eq.	2.35E-02	4.19E-03	2.08E-03	ND	ND	ND	ND	ND	ND	ND	7.20E-06	1.76E-05	0.00E+00	1.49E-03	0.00E+00
POCP	kg NMVOC eq.	1.06E-02	1.24E-03	1.23E-03	ND	ND	ND	ND	ND	ND	ND	4.25E-06	9.55E-06	0.00E+00	9.14E-04	0.00E+00
ADP-minerals & metals*	kg Sb eq.	2.23E-05	3.52E-07	3.56E-06	ND	ND	ND	ND	ND	ND	ND	1.26E-08	9.65E-09	0.00E+00	3.54E-07	0.00E+00
ADP-fossil*	MJ	3.33E+01	1.54E+00	2.03E+00	ND	ND	ND	ND	ND	ND	ND	7.06E-03	3.63E-02	0.00E+00	4.38E+00	0.00E+00
WDP*	m^3	8.70E-01	8.01E-03	4.66E-02	ND	ND	ND	ND	ND	ND	ND	1.97E-04	2.24E-04	0.00E+00	2.05E-02	0.00E+00
Acronyms	GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption														

Note on Declared Modules:

**CO_2 emissions from fuel combustion in A3 were calculated using standard carbon content factors and the 44/12 molecular weight ratio, in accordance with IPCC guidelines.*

Use of Natural Resources

Resource use indicators (Results per declared unit)															
Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	MJ	2.66E+00	2.10E-02	-1.40E-01	ND	ND	ND	ND	ND	ND	ND	9.66E-04	5.60E-04	0.00E+00	3.09E-02	0.00E+00
PERM	MJ	3.27E-01	0.00E+00	4.14E-01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ	2.98E+00	2.10E-02	2.74E-01	ND	ND	ND	ND	ND	ND	ND	9.66E-04	5.60E-04	0.00E+00	3.09E-02	0.00E+00
PENRE	MJ	4.63E+01	1.67E+00	8.10E+00	ND	ND	ND	ND	ND	ND	ND	2.95E-02	3.96E-02	0.00E+00	1.79E+00	0.00E+00
PENRM	MJ	4.77E+00	0.00E+00	2.71E-01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	0.00E+00	0.00E+00	2.94E+00	0.00E+00
PENRT	MJ	5.11E+01	1.67E+00	8.37E+00	ND	ND	ND	ND	ND	ND	ND	2.95E-02	3.96E-02	0.00E+00	4.73E+00	0.00E+00
SM	kg	4.79E-02	8.01E-04	1.09E-03	ND	ND	ND	ND	ND	ND	ND	3.78E-06	1.77E-05	0.00E+00	1.89E-03	0.00E+00
RSF	MJ	4.41E-01	7.48E-06	7.17E-06	ND	ND	ND	ND	ND	ND	ND	2.40E-08	2.30E-07	0.00E+00	3.49E-06	0.00E+00
NRSF	MJ	1.08E-01	0.00E+00	0.00E+00	ND	ND	ND	ND	ND	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	2.11E-02	1.96E-04	1.11E-03	ND	ND	ND	ND	ND	ND	ND	4.68E-06	5.45E-06	0.00E+00	4.92E-04	0.00E+00
Acronyms	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water														

Environmental Impact -GWP-GHG

Additional mandatory and voluntary impact category indicators (Results per declared unit)															
Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-GHG	kg CO_2 eq.	2.88E+00	1.27E-01	4.75E-01	ND	ND	ND	ND	ND	ND	ND	1.56E-03	2.89E-03	0.00E+00	1.06E+00	0.00E+00

End of Life - Outflows

Output flow indicators (Results per declared unit)															
Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for re-use	kg	0.00E+00	0.00E+00	0.00E+00	ND	ND	ND	ND	ND	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Material for recycling	kg	3.38E-03	5.51E-04	4.80E-04	ND	ND	ND	ND	ND	ND	ND	1.69E-06	1.06E-06	0.00E+00	8.54E-05	0.00E+00
Materials for energy recovery	kg	1.65E-05	8.89E-08	1.22E-07	ND	ND	ND	ND	ND	ND	ND	4.23E-10	2.61E-09	0.00E+00	5.94E-08	0.00E+00
Exported energy, electricity	MJ	1.68E-02	1.27E-04	2.48E-03	ND	ND	ND	ND	ND	ND	ND	2.13E-06	3.42E-06	0.00E+00	1.60E-04	0.00E+00
Exported energy, thermal	MJ	3.13E-02	1.98E-04	2.29E-04	ND	ND	ND	ND	ND	ND	ND	7.91E-07	6.01E-06	0.00E+00	9.50E-05	0.00E+00

End of Life - waste

Waste indicators (Results per functional or declared unit)															
Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste disposed	kg	8.59E-01	1.11E-02	9.81E-02	ND	ND	ND	ND	ND	ND	ND	3.46E-04	2.78E-04	0.00E+00	3.13E-01	0.00E+00
Non-hazardous waste disposed	kg	5.48E+00	1.21E-01	4.51E-01	ND	ND	ND	ND	ND	ND	ND	7.97E-04	3.64E-03	0.00E+00	7.14E-02	0.00E+00
Radioactive waste disposed	kg	3.10E-05	2.78E-07	1.98E-05	ND	ND	ND	ND	ND	ND	ND	6.99E-08	7.51E-09	0.00E+00	4.22E-07	0.00E+00

Additional information

No additional information is provided.

Information related to Sector EPD

This is not sector EPD.

Differences versus previous versions

This is the first version of the EPD.

References

1. *LCA Report: Life Cycle Inventory of ECRA-SHM Coating manufactured by Ozkem International ME Trading L.L.C., UAE.*

2. *Software: Air.e LCA Version 3.21.0.5 www.solidforest.com*
3. *Main database: Ecoinvent 3.12.0 www.ecoinvent.org*
4. *Geographical scope of the EPD: United Arab Emirates*

5. *Standards and Regulatory Framework*
- *ISO 14040:2006 – "Environmental management – Life cycle assessment – Principles and framework"*
- *ISO 14044:2006 – "Environmental management – Life cycle assessment – Requirements and guidelines"*
- *ISO 14020:2000 – "Environmental labels and declarations – General principles"*
- *ISO 14025:2006 – "Environmental labels and declarations – Type III environmental declarations – Principles and procedures"*
- *EN 15804+A2:2019/AC:2021 – European Committee for Standardization: Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products*

6. *Technical Data and Product Information*
- *ECRA-SHM Technical Data Sheet (2026 Revision) – Ozkem International ME Trading L.L.C.*
- *ECRA-SHM Product Website – https://ozkem.com.au/product/ecra-shm-self-etching-dip-coating/*

7. *Regulatory and Waste Management References*
- *Dubai Municipality. (2019). Construction and Demolition Waste Management in Dubai. Dubai, United Arab Emirates.*
- *Ras Al Khaimah Economic Zone (RAKEZ). (2022). Waste Management Regulations – Hazardous Waste Classification.*
- *UAE Ministry of Climate Change and Environment (MOCCAE). (2020). National Waste Management Database and Sectoral Reports.*
-

8. *LCI Background Data Sources*
- *ecoinvent Association. (2024). ecoinvent Database Version 3.12.0. www.ecoinvent.org*
- *SolidForest. (2025). Air.e LCA Software Version 3.21.0.5. www.solidforest.com*

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