KANSAI PAINT

NEROLAC

ECO PLATFORM

EPD VERIFIED

# ENVIRONMENT PRODUCT DECLARATION (EPD) FOR POWDER COATINGS

EPD®

INDIA EPD®

THE INTERNATIONAL EPD SYSTEM


**Environment Product Declaration in accordance with ISO 14025:2006 and EN 15804:2012+A2:2019/AC:2021**

**Program Operator: The Indian Regional Hub of International EPD System**

**Geographical Scope:** Global

**EPD Registration Number: S-P-13444**

**Publication Date:** 2024-04-22

**Valid Until:** 2029-04-21

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

## I. Program Information

The International Organization for Standardization (ISO) 14025 defines an Environmental Product Declaration (EPD) as a Type III declaration that quantifies environmental information about a product's life cycle. Based on ISO series 14040, the Life Cycle Assessment (LCA) forms the basis of the EPD approach. EPDs are primarily meant to assist business-to-business interactions, but they may also be useful to environmentally conscious consumers when purchasing goods or services.

| | |
|---|---|
| **Programme:** | **The International EPD® System** |
| **Declaration Holder:** | Kansai Nerolac Paints Limited |
| **Declaration Number:** | S-P-13444 |
| **Declared Product:** | Nerocoat - Epoxy Rebar Green |
| **Address:** | EPD International AB, Box 21060, SE-100 31 Stockholm, Sweden |
| **Website:** | www.envirodec.com; www.envirodecindia.com |
| **Email:** | Info@envirodec.com |
| **Product Category Rules (PCR):** | PCR 2019:14 Construction products, version 1.3.2 |
| **Verification and reference PCR:** | CEN standard EN 15804 serves as the core Product Category Rules (PCR) |
| **The PCR review was conducted by:** | The Technical Committee of the International EPD System. See www.envirodec.com for list of members. Review chair: Claudia A. Peña, University of Concepción, Chile. The review panel may be contacted via the Secretariate www.environdec.com/contact |
| **Independent third-party verification of the declaration and data, according to ISO 14025:2006:**<br>☐ **EPD process verification** ✓ **EPD verification** | |
| **This declaration was independently verified in accordance with ISO 14025:2006 by:** | **Sunil Kumar**<br>SIPL Pvt Ltd<br>sunil@sipl-sustainability.com |
| **This life cycle assessment and EPD design was conducted by:** | **Suraj Shekhar,**<br>Sustainability Consultant, KoActs<br>suraj@koacts.com;<br>www.koacts.com |
| **Address and Contact of the EPD Owner:** | **Kansai Nerolac Paints Limited**<br>28th floor, A-wing, Marathon Futurex, N. M. Joshi Marg, Lower Parel, Mumbai- 400013, Maharashtra<br>Contact Person: Ms. Varada Sawant<br>Email: varadasawant@nerolac.com |

Kansai Nerolac Paints Limited (KNPL) has the sole ownership, liability, and responsibility of 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 characterization factors); have equivalent content declarations; and be valid at the time of comparison. For further information about comparability, see EN 15804 and ISO 14025.

## II. Company Description

A subsidiary of Kansai Paints Co. Ltd, Japan; Kansai Nerolac Paints Limited (KNPL) is the second largest coating company in India and a market leader in Industrial Coatings. KNPL bespeaks quality and manufacturing excellence which makes it a preferred choice for a growing and ever-evolving customer base.

The company's manufacturing footprint spans eight plants across India located at Jainpur (UP), Lote (Maharashtra), Bawal (Haryana), Hosur (Tamil Nadu), Goindwal Sahib (Punjab), Kakoda (Goa), Sarigam (Gujarat) and Sayakha (Gujarat), all of which are strategically located near key OEMs, thus lending the company a strong competitive edge. It has a state-of-the-art R&D facility in Mumbai. It also has 4 subsidiary companies of which 3 are international subsidiaries with operations in Nepal, Sri Lanka, and Bangladesh. In addition, KNPL has a well-established network of depots spread across key markets.

KNPL's product proposition is designed to cater to the evolving needs of customers in the Decorative and Industrial segments. KNPL's technological leadership in the powder coatings segment has helped the company become a market leader serving a wide range of industries such as white goods, furniture, auto ancillaries, and electricals. The company's collaboration with customers in the auto industry has enabled it to convert a range of liquid coatings to powder coatings and develop super functionality powder which offers high abrasion resistance for accessories to enhance the durability of coating by 2x times.

The major KNPL plants are certified with ISO 14001, ISO 9001, ISO 45001, and IAFT 16949 certification. KNPL is the recipient of the Golden Peacock & Greentech awards for Environment Management. It has also received a Sustainability award from Frost & Sullivan and customers like Tata, Maruti, Honda, and Mahindra & Mahindra.

KNPL has achieved top ESG rankings in various assessments, including the S&P Corporate Sustainability Assessment with a rating achievement in the top 10% globally within the Chemical Industry Group and rated in the Top Quartile in the FTSE4Good Index. In the CRISIL ESG Rating, KNPL was featured in the leadership category and amongst the top 14 out of 575+ companies and rated #1 in the Paint Sector.

At an organizational level, KNPL has set carbon emissions reduction targets for 2030 to limit global warming below 1.5 degrees celsius with a validation from the Science Based Targets initiative (SBTi). KNPL has adopted the Task Force on Climate-related Financial Disclosures (TCFD) framework for risk assessment due to climate change. It has sustainability deeply ingrained in its business objectives, the focus is on prioritizing protecting and nurturing its triple bottom line of People, Planet, and Profit by adopting sustainable growth practices. The company has identified key materiality areas such as de-carbonization, resource use, quality of life, diversity, and governance to drive its sustainability strategy.

## III. Product Description

Powder Coatings are a blend of resins, curing agents, and pigments, which are melt-mixed (extruded) and pulverized into finely divided particles. There are two basic classifications of powder coating materials. They are "thermoplastic" and "thermoset" powders.

Thermoplastic powders: Thermoplastic powders are generally applied to a surface that has been preheated to a temperature significantly higher than the melting point of the powder. It melts and flows when heat is applied but continues to have the


**Figure 1: Nerocoat - Epoxy Rebar Green**

same chemical composition when it solidifies on cooling. Nylon powder coating materials are the most used thermoplastic powders. Thermoplastic coatings are known for their wear and chemical resistance.

Thermoset powders: Thermoset powders are 100% solvent-less and are generally applied using electrostatic spray equipment that provides each powder particle with a small electric charge, which in turn sticks to the earthed substrate. Thermoset powder coating systems offer broad formulation flexibility. They are very durable and are widely used.

**Table 1: Nerocoat - Epoxy Rebar Green Product Technical Data**

| Sr. No. | Product Description | Product Properties |
|---|---|---|
| 1. | **Nerocoat - Epoxy Rebar Green** is an epoxy coating for steel reinforcing bars that complies with the requirements of standard specifications for epoxy-coated steel reinforcing bars (refer to Figure 1). | Colour: Green<br>Binder System: Epoxy-based<br>Particle size distribution:<br><63 µm = 78-85%<br><125 µm = 98-100%<br>Film thickness: 180 – 280 µm |

*Note: For more technical data please contact the EPD owner.*

**Table 2: Product Content Declaration**

| Sr. No. | Product Name | Material Content of the Product |
|---|---|---|
| 1. | **Nerocoat - Epoxy Rebar Green** | Resin Flakes: 800g<br>Pigments & Extenders: 150g<br>Additives: 50g |

## IV. Manufacturing Process

The manufacturing process for powder coating is depicted in **Figure 2**.
The raw materials (resin, hardener, pigments, and additives) in powder/ flake form are weighed and added in a premixer for mechanical blending. The mixture from premixer, known as 'Premix' is fed into the extruder. The extruder ensures uniform dispersion of the material at elevated temperatures (upto 100 ºC) and converts it into paste form. The paste coming out of the extruder is squeezed between two rollers. Rollers are cooled by using chilled water circulation inside the rollers. The paste on squeezing forms a thin uniform film and is laid on a conveyor belt for cooling. The cooled film is crushed into small flakes of size approximately 1 sq. cm. by the pre-breaker. These flakes are charged into a double-cone blender (DCM). Small quantity of additive is added to the flakes and blending is done for proper mixing of additive. Blended flakes are then fed into a micro pulverizer (air classifying mill) which grinds the flakes into fine powder. The powder is then sieved and packed for dispatch. The micro pulverizers are provided with dust collectors and blowers to prevent dust pollution.

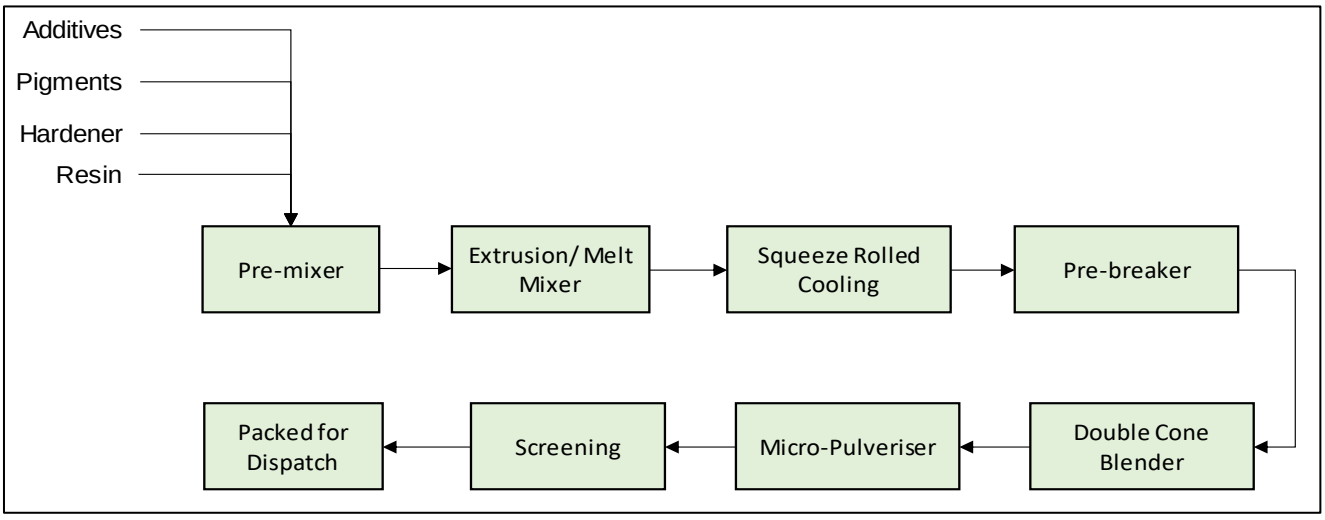


**Figure 2: Powder Coating - Process Flow Diagram**

## V. Life Cycle Assessment Information

This assessment aims to communicate the environmental aspects of products objectively and transparently according to their life cycle stages for developing a Type III - Environmental Product Declaration (EPD) that is compliant with the ISO 14025 and ISO 14040 series of standards. The results of the present LCA study conform to the Product Category Rules (PCR) for construction products 2019:14/ version 1.3.2. PCR facilitates the identification of possible environmental impacts at each stage of the product's life cycle and provides scope for the development of the products

**Table 3: Life Cycle Assessment Scope**

| | |
|---|---|
| **Geographical scope:** | Global |
| **Declared unit:** | 1 Kg |
| **Time representativeness:** | Primary data from the manufacturing site, suppliers, and the electricity mix were collected for the period starting from April 2022 to March 2023. |
| **Database(s) and LCA software used:** | Ecoinvent v3.9 (allocation, cut-off by classification) database and SimaPro v9.5 software have been used for the LCA calculations. LCA methods used are EN 15804: A2 compliant, based on EF 3.0. |
| **Description of system boundaries** | Cradle to gate with modules C1–C4 and module D (A1–A5 + C + D). |
| **Data quality and data collection:** | According to EN 15804:2012+A2:2019, based on EF 3.0, specific data was used for module A3 (Processes the manufacturer has influence over) and was gathered from KNPL's Lote plant. The data includes actual product weights, amounts of raw materials used, product content, energy consumption, transportation distances, water consumption, and waste generation.<br>The infrastructure/capital goods are excluded in the LCA |
| **Allocation of co-products or waste:** | Allocation has not been applied. |
| **Cut-off rules:** | A minimum of 99% of the total mass, energy, and environmental relevance data of the system was considered. Processes/ materials contributing to less than 1% of the environmental impact have not been considered. However, efforts have been made to include the majority of input materials and their transportation. No known flows are deliberately excluded from this LCA. |

The life cycle of a product is divided into life cycle stages, information modules, and the requirements for cradle-to-grave type of EPD. **Table 4** provides an overview of the life cycle stages. The components in a life cycle stage can be described as follows:

1. **Product Stage (A):**
   a. Raw Material Supply (A1): Extraction and processing of raw materials like pigments, water, additives, solvents, etc. Generation of electricity and heat from primary energy resources.
   b. Transportation (A2): Transportation of Raw materials to the manufacturing plant where the respective paint will be manufactured.
   c. Manufacturing (A3): This stage includes the manufacture of products and packaging. It has considered all the energy consumption and waste generated in the production plant. The electricity data used for the modelling were taken from Ecoinvent. Electricity mix was of North India- 80% coal, 2.5 % nuclear, and 17.5 % renewable sources

***For 1 kWh of Electricity the GWP-GHG value is 1.3 Kg $CO_2$ eq.***

2. **Construction stage (A):**
   a. Transportation (A4): This stage includes transport from the production gate to the construction site where the product shall be installed. In this stage assumption was made regarding transportation, considering that finished goods are supplied to the supplier located 100 km away in a 10-tyre truck with a capacity of 16 to 32 tons.
   b. Installation (A5): During the final installation, any energy or water use will come under this module.

3. **End-of-life stage (C):**
   a. Demolition (C1): It involves the removal of paint; as manual removal was considered in this assessment; no energy or material input was required.
   b. Transportation (C2): Includes the transport of the waste paint to final waste treatment. In this stage, the below assumptions were made on the collection process of dry mass of paint which is mixed with the building waste.
      i. There is no reuse, recycling, or energy recovery at this stage.
      ii. It is assumed that the dry mass of paint is disposed of in a landfill.
      iii. Similarly, it is assumed that a 10-tyre truck with an average load of 7.5-10 MT is used for transportation. The average distance to the landfill site was considered as 50 km.
   c. Reuse, recovery, and/or recycling (C3): Includes all activities regarding reuse, recovery, and/or recycling after transportation.
   d. Disposal (C4): Includes disposal, i.e., waste handling that does not give a useful product.

4. **Resource recovery stage (D), if relevant**: Resource recovery is the process of recovering materials or energy from waste for reuse.

**Table 4: System boundary, Life cycle stages, modules declared and geography scope.**

| | Product Stage | | | Construction 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 | Recycling potential |
| **Module** | **A1** | **A2** | **A3** | **A4** | **A5** | **B1** | **B2** | **B3** | **B4** | **B5** | **B6** | **B7** | **C1** | **C2** | **C3** | **C4** | **D** |
| **Modules declared** | X | X | X | X | X | ND | ND | ND | ND | ND | ND | ND | X | X | X | X | X |
| **Geography** | IN | IN | IN | IN | IN | - | - | - | - | - | - | - | IN | IN | IN | IN | IN |
| **Specific data used** | Manufacturing Plant data taken. | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

*X- Declared modules, ND- Not declared modules.*

## VI.Environmental Performance:

Results of the LCA - environmental impacts according to EN 15804+A2: 1Kg of "**Nerocoat - Epoxy Rebar Green**" product. [1]

### Table 5: Core Environmental Impacts

| Impact category | Unit | Product Stage | Construction Stage | | End of Life Stage | | | | Resource Recovery Stage |
|---|---|---|---|---|---|---|---|---|---|
| | | A1-A3 | A4 | A5 | C1 | C2 | C3 | C4 | D |
| GWP | kg $CO_2$ eq | 4.30E+00 | 5.43E-02 | 0.00E+00 | 0.00E+00 | 2.72E-02 | 0.00E+00 | 2.63E-03 | 0.00E+00 |
| GWP - Biogenic | kg $CO_2$ eq | 1.14E-02 | 2.71E-05 | 0.00E+00 | 0.00E+00 | 1.35E-05 | 0.00E+00 | 6.30E-06 | 0.00E+00 |
| GWP- LU & LU change | kg $CO_2$ eq | 3.51E-03 | 3.37E-05 | 0.00E+00 | 0.00E+00 | 1.69E-05 | 0.00E+00 | 2.49E-06 | 0.00E+00 |
| GWP - Total | kg $CO_2$ eq | 4.31E+00 | 5.44E-02 | 0.00E+00 | 0.00E+00 | 2.72E-02 | 0.00E+00 | 2.64E-03 | 0.00E+00 |
| ODP | kg CFC11 eq | 5.57E-07 | 1.08E-08 | 0.00E+00 | 0.00E+00 | 5.41E-09 | 0.00E+00 | 1.07E-09 | 0.00E+00 |
| AP | mol H+ eq | 2.17E-02 | 1.64E-04 | 0.00E+00 | 0.00E+00 | 8.22E-05 | 0.00E+00 | 2.48E-05 | 0.00E+00 |
| EP- FW | kg P eq | 1.16E-03 | 5.44E-06 | 0.00E+00 | 0.00E+00 | 2.72E-06 | 0.00E+00 | 2.41E-07 | 0.00E+00 |
| EP - marine | kg N eq | 3.85E-03 | 3.08E-05 | 0.00E+00 | 0.00E+00 | 1.54E-05 | 0.00E+00 | 8.61E-06 | 0.00E+00 |
| EP - terrestrial | mol N eq | 3.96E-02 | 3.34E-04 | 0.00E+00 | 0.00E+00 | 1.67E-04 | 0.00E+00 | 9.42E-05 | 0.00E+00 |
| POCP | kg NMVOC eq | 1.51E-02 | 1.25E-04 | 0.00E+00 | 0.00E+00 | 6.24E-05 | 0.00E+00 | 2.74E-05 | 0.00E+00 |
| ADP non-fossil | kg Sb eq | 5.32E-05 | 3.22E-07 | 0.00E+00 | 0.00E+00 | 1.61E-07 | 0.00E+00 | 6.01E-09 | 0.00E+00 |
| ADP fossil fuels | MJ | 7.45E+01 | 7.77E-01 | 0.00E+00 | 0.00E+00 | 3.89E-01 | 0.00E+00 | 7.35E-02 | 0.00E+00 |
| WDP | $m^3$ W eq. Dep | 2.05E+00 | 3.39E-03 | 0.00E+00 | 0.00E+00 | 1.69E-03 | 0.00E+00 | 3.31E-03 | 0.00E+00 |
| GWP-GHG | kg $CO_2$ eq | 4.22E+00 | 5.39E-02 | 0.00E+00 | 0.00E+00 | 2.69E-02 | 0.00E+00 | 2.61E-03 | 0.00E+00 |

### Table 6: Additional Environmental Impacts

| Impact category | Unit | Product Stage | Construction Stage | | End of Life Stage | | | | Resource Recovery Stage |
|---|---|---|---|---|---|---|---|---|---|
| | | A1-A3 | A4 | A5 | C1 | C2 | C3 | C4 | D |
| PM | Disease inc. | 2.40E-07 | 3.19E-09 | 0.00E+00 | 0.00E+00 | 1.59E-09 | 0.00E+00 | 4.99E-10 | 0.00E+00 |
| IRP | kBq U-235 eq | 2.59E-01 | 3.56E-03 | 0.00E+00 | 0.00E+00 | 1.78E-03 | 0.00E+00 | 3.27E-04 | 0.00E+00 |
| ETP, FW | CTUe | 1.94E+02 | 7.73E-01 | 0.00E+00 | 0.00E+00 | 3.86E-01 | 0.00E+00 | 4.64E-02 | 0.00E+00 |
| HTP, c | CTUh | 2.69E-09 | 1.30E-11 | 0.00E+00 | 0.00E+00 | 6.50E-12 | 0.00E+00 | 6.11E-13 | 0.00E+00 |
| HTP, nc | CTUh | 3.48E-09 | 2.31E-11 | 0.00E+00 | 0.00E+00 | 1.15E-11 | 0.00E+00 | 1.06E-12 | 0.00E+00 |

### Table 7: Stage-wise environmental impact of resource use

| Impact category | Unit | Product Stage | Construction Stage | | End of Life Stage | | | | Resource Recovery Stage |
|---|---|---|---|---|---|---|---|---|---|
| | | A1-A3 | A4 | A5 | C1 | C2 | C3 | C4 | D |
| LURI | Dimensionless | 2.23E+01 | 3.74E-01 | 0.00E+00 | 0.00E+00 | 1.87E-01 | 0.00E+00 | 1.54E-01 | 0.00E+00 |
| PERE | MJ | 3.02E+00 | 1.27E-02 | 0.00E+00 | 0.00E+00 | 6.34E-03 | 0.00E+00 | 6.27E-04 | 0.00E+00 |
| PEREM | MJ | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| PERET | MJ | 3.02E+00 | 1.27E-02 | 0.00E+00 | 0.00E+00 | 6.34E-03 | 0.00E+00 | 6.27E-04 | 0.00E+00 |
| PENRM | MJ | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| PENRE | MJ | 8.06E+01 | 8.27E-01 | 0.00E+00 | 0.00E+00 | 4.14E-01 | 0.00E+00 | 7.83E-02 | 0.00E+00 |

[1] 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 use of the results of modules A1-A3 (A1-A5 for services) without considering the results of module C is not encouraged.

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **PENRT** | **MJ** | 8.06E+01 | 8.27E-01 | 0.00E+00 | 0.00E+00 | 4.14E-01 | 0.00E+00 | 7.83E-02 | 0.00E+00 |
| **SM** | **Kg** | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **RSF** | **MJ** | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **NRSF** | **MJ** | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **FW** | **$m^3$** | 5.03E-02 | 9.71E-05 | 0.00E+00 | 0.00E+00 | 4.86E-05 | 0.00E+00 | 7.83E-05 | 0.00E+00 |

**Table 8: Environmental impact of waste categories**

| Impact category | Unit | Product Stage | Construction Stage | | End of Life Stage | | | | Resource Recovery Stage |
|---|---|---|---|---|---|---|---|---|---|
| | | A1-A3 | A4 | A5 | C1 | C2 | C3 | C4 | D |
| **Hazardous waste disposed** | **Kg** | 6.95E-05 | 2.15E-06 | 0.00E+00 | 0.00E+00 | 1.08E-06 | 0.00E+00 | 1.11E-07 | 0.00E+00 |
| **Non-Hazardous waste disposed** | **Kg** | 1.35E+00 | 2.51E-02 | 0.00E+00 | 0.00E+00 | 1.25E-02 | 0.00E+00 | 5.00E-01 | 0.00E+00 |
| **Radioactive waste disposed** | **Kg** | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

**Table 9: Environmental impact of output flows**

| Impact category | Unit | Product Stage | Construction Stage | | End of Life Stage | | | | Resource Recovery Stage |
|---|---|---|---|---|---|---|---|---|---|
| | | A1-A3 | A4 | A5 | C1 | C2 | C3 | C4 | D |
| **Components for reuse** | **Kg** | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **Materials for recycling** | **Kg** | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **Materials for energy recovery** | **Kg** | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **Exported Electrical Energy** | **MJ** | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **Exported Thermal Energy** | **MJ** | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

**Table 10: Biogenic Carbon Content According to EN 15804+A2: 2019**

| Biogenic Carbon Content | Unit | Quantity |
|---|---|---|
| Biogenic Carbon Content in product | Kg C | 0.0032 |
| Biogenic Carbon Content in Packaging | Kg C | 0.0000 |

**Table 11: Packaging Contents**

| Product Component | Weight, Kg |
|---|---|
| Plastic Bags | 0.0032 |
| Cardboard Box | 0.0000 |

## VII. Interpretation of Results

The core environmental impact in **Table 5** shows that the GWP-Total of the product **'Nerocoat - Epoxy Rebar Green'** is **4.4 Kg $CO_2$ equivalent**. The raw materials contributing to the GWP-Total are **Epoxy resin 54.9%, Kukdo/ Curing Agent 18.3%, Titanium dioxide 11.8%,** and other chemicals like Barytes JKB BS 222, Iron oxide, etc., are in the range of 0.5-3%. The End-of-Life stage has a relatively lower impact due to its low energy intensity.

# ANNEXURE I

## Acronyms

| Impact Category | Abbreviation |
|---|---|
| GWP - fossil fuels | GWP-fossil |
| Global Warming Potential - Biogenic | GWP-biogenic |
| Global Warming Potential - Land Use and Land Use Change | GWP-luluc |
| Depletion Potential of the Stratospheric Ozone Layer | ODP |
| Acidification Potential | AP |
| Eutrophication potential- FW | EP-FW |
| Eutrophication potential - Marine | EP-marine |
| Eutrophication potential - Terrestrial | EP-terrestrial |
| Formation Potential of Tropospheric Ozone | POCP |
| Ab iotic Depletion for Non-Fossil Resources | ADP-minerals&metals |
| Abiotic Depletion for Fossil Resources Potential | ADP-fossil |
| Water (User) Deprivation Potential | WDP |
| Land use related impacts | LURI |
| Use of Renewable Primary Energy - Excluding Raw Materials | PERE |
| Use of Renewable Primary Energy - Used as Raw Materials | PERM |
| Total Use of Renewable Primary Energy | PERT |
| Use of Non-Renewable Primary Energy - Excluding Raw Materials | PENRE |
| Use of Non-Renewable Primary Energy - Used as Raw Materials | PENRM |
| Total Use of Non-Renewable Primary Energy Resources | PENRT |
| Use of Secondry Material | SM |
| Use of non-renewable secondary fuels | RSF |
| Use of Non-Renewable secondary fuels | NRSF |
| Use of Net Fresh Water | FW |
| Environmental Product Declaration | EPD |
| Life cycle assessment | LCA |
| Product category rule | PCR |
| Life cycle inventory | LCI |
| Global | GLO |

# REFERENCES


**ISO 14020:2000**
Environmental labels and declarations — General principles

**ISO 14040:2006**
Environmental management — Life cycle assessment — Principles and framework

**ISO 14044:2006**
Environmental management — Life cycle assessment — Requirements and guidelines

**ISO 14025:2006**
Environmental labels and declarations — Type III environmental declarations — Principles and procedures

**EN 15804:2012+A2:2019**
Sustainability of construction works — Environmental product declarations — Core rules for the product category of construction product

**The International EPD® System**
www.environdec.com

**The International EPD® System**
The General Programme Instructions v3.01

**The International EPD® System**
PCR 2019:14 Construction products v1.3.2 (EN 15804:A2)

**Ecoinvent 3.9**
www.ecoinvent.org

**SimaPro LCA Software**
www.simapro.com

**Kansai Nerolac Paints Limited**
www.nerolac.com

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