# Environmental Footprint Product Declaration

Under the general rules of the Environmental Footprint Institute.

Environmental Footprint in accordance with ISO 14040, ISO 14044, ISO 14025 and EN 15804+A1 without program registration for:

## Coil Coatings Paint by Beckers Industrial Coatings

| | |
|---|---|
| Diffusion institution: | Environmental Footprint Institute |
| Product group classification: | UN CPC 3511 |
| Registration number: | 130820EFP |
| Issue date: | 13-08-2019 |
| Validity date: | 12-08-2024<br>An Environmental Footprint (EF) 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.environmentalfootprintinstitute.org |
| Geographical scope: | United Arab Emirates (UAE) |

# GENERAL INFORMATION

## Product Provider

**Beckers Industrial Coatings LLC**

Al Khour Port, P. O. Box No. 12795. Ras Al-Khaimah United Arab Emirates

**Beckers Industrial Coatings LLC (Beckers)** is a Swedish private coatings company that develops environmentally compatible paint systems. Beckers workforce comprises almost 1,800 people at 24 manufacturing sites, satellite offices and the corporate headquarters, serving customers in over 50 countries. The company is structured into three business segments: Coil Coatings, Industrial Coatings, and Consumer Design Finishes. This Environmental Product Declaration (EF) refers to the Coil Coating product segment. Coil coatings are high-performance liquid paints applied to metal. As the leading supplier of coil coatings, the Beckers Group sets industry standards for high-performance liquid coatings applied to sheet metal.

Beckers Group has a coil coating paint production plant in Ras Al Khaimah, United Arab Emirates. The Quality and Environment Managers of Ras Al Khaimah Becker´s plant has commissioned the development of this EF to report the environmental assessment of the coil coating paints manufactured in this plant.

## Products

Beckers Coil Coatings products comprise **thermoset liquid paint** in a wide range of colours and finishes that can be applied to continuous steel or aluminium strip. They offer a complete range of topcoats, primers and backing coats.

### Various types of products:

This EF comprises the general environmental assessment of following Beckers products:

- BeckryPrim (Primer): can be used on steel or aluminium substrates for architectural or domestic appliances. The resin systems include epoxy, acrylic and polyurethane in addition to polyester series.
- BeckryCoat (Backing Coat): Epoxy, polyester and polyurethane backing coats are offered, for all situations. Formulations are available giving adhesion to insulation foams, anti-pressure marking, anti-coil collapsing and anti-fretting properties.

Topcoats:

- BeckryPol (Polyester): aminocured polyester-based coatings.
- BeckryTech (High Durable Polyster): architectural coatings based on unique polyester resins. Durability is second only to the fluoropolymers.
- BeckryFluor (PVDF): UV-resistant topcoat system based on a blend of polyvinylidene fluoride and acrylic resins in 70/30 – 80/20 ratios.
- BeckryTherm: thermal control of buildings to reduce the energy demand for heating and/or air conditioning. Utilizes high durability technologies based on BeckryTech or BeckryFluor.
- BeckryDuro: reinforced polyurethane chemistry having excellent UV durability and flexibility, combined with resistance to surface scratches.
- BeckryTan: highly durable polyurethane with excellent flexibility and UV stability.
- BeckryRoll: one-coat system (topcoat direct on substrate). One-coat finish, based on polyurethane chemistry modified with polyamide, for direct adhesion on aluminium substrate. Offers high abrasion resistance and good UV resistance.

## Sustainable practices

Beckers operations are certified in accordance with industry standards to meet regulation. These are some of the sustainable practices throughout their manufacturing operations:

- In Beckers manufacturing plants evaporating solvents are incinerated to generate heat for curing ovens, this also prevents waste generation and pollution.
- In the case of plastisols, Beckers manufacturing method removed heavy metals such as cadmium and lead stabilisers before the 1990s and moved from phthalate plasticisers in the early 2000s. Beckers have now completed the reformulation of PVC Plastisols so that they fit in with customer specifications. The system is now totally free of chromates, heavy metals and phthalate plasticisers.
- Universal chromate-free primers combined with UV durable topcoats that do not require warning labels according to the GHS regulations contribute to site classification according to Seveso and help protect the environment.
- About use of bio-sourced materials in a coil coating environment, Beckers has launched the Ruv2 standard exterior durable topcoat, which is proving to do better than Ruv1 during exterior tests, and Ruv3 standard is on its way. Both have over 25% bio content in a standard white coating.

- The ECCA coil coating model predicts that high-solid coatings use less energy on a coil coating line.

# Declared Unit

**This EF presents the environmental impacts of the production and distribution by Becker´s plant in Ras Al Khaimah, UAE of 1 litre of coil coating paint.**

The EF only covers the Cradle to Gate stage plus transportation stage because other stages are very dependent on scenarios and are better developed for specific building or construction works.

Considering that the manufacturing processes are very similar regardless the type of product or if the product is a topcoat, a primer or a backing coat, the environmental impacts reported in this EF correspond to the production and distribution of a **generic type paint** for coil coating. The number and amount of components of the generic type paint was calculated in the EF using allocation rules based on the total amount of components supplied to the plant divided by the total production of each type of product manufactured and distributed between September 2017 and August 2018.

# System boundaries.

A simplified model of the manufacture process of coil coating paint is described, enumerating the main activities included in the system boundaries.

In the boundaries of this EF the end of the product life cycle is the gate of the plant that will do the coil coating process.

It is important to consider that this EF refers to the paint manufacturing process, not the steel coil manufacture nor the coil coating process. For this reason, raw materials in Module A1 do not include the coils themselves, and process in module A4 do not include the coil coating processes.

**The scope of this EF is "cradle to gate with options".**

Possible scopes of the LCA defined in EN 15804:2012+A1:2014

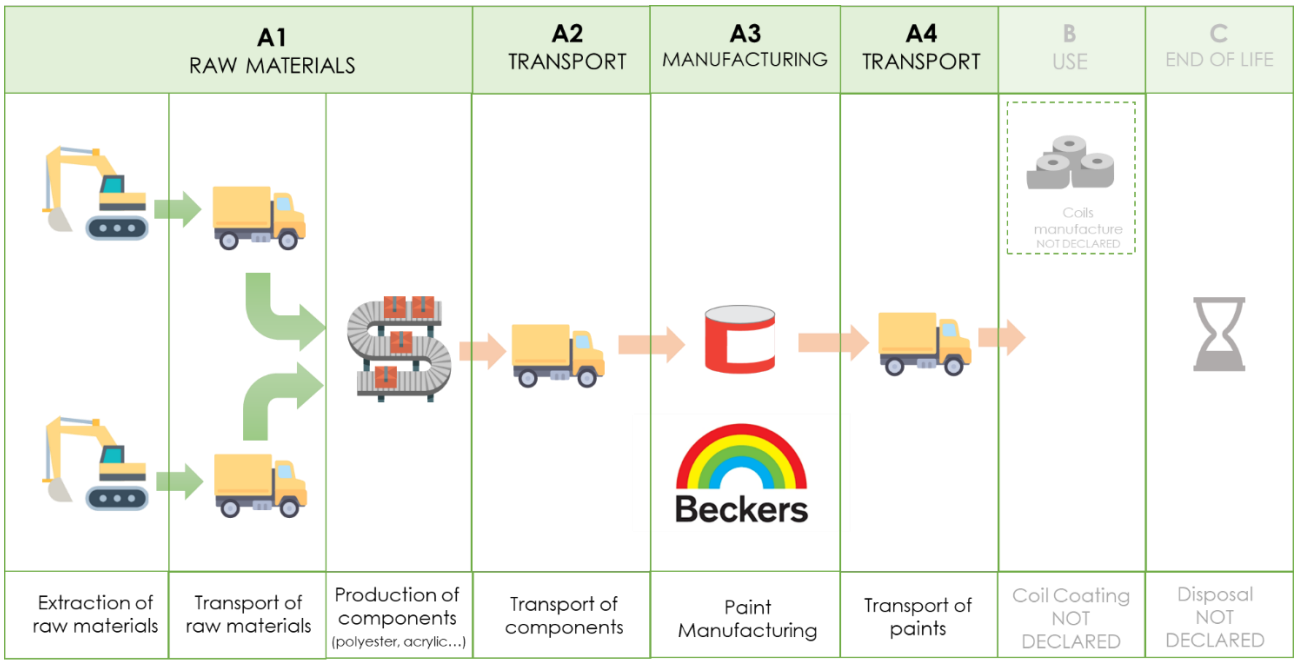
| **Product stage** | | | **Construction process stage** | | Use stage | | | | | | End of life stage | | | | | Resource Recovery Stage |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Raw materials | Transport | Manufacturing | Transport | Construction installation | Use | Maintenance | Repair | Replacement | Refurbishment | Operational energy use | Operational water use | De-construction demolition | Transport | Waste processing | Disposal | Reuse Recovery Recycling potential |
| **A1** | **A2** | **A3** | **A4** | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
| **X** | **X** | **X** | **X** | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |

X = Included, ND=Module not declared, NR= Module not relevant

Modules from A5 to D are not declared (X refers to considered stage, NR refers to not relevant stage and ND to not declared stage).

Considering that the analysis has a "cradle to gate with options" scope (A1-A3 and A4) the Reference Product Life is nor relevant and has not been included.

In the following schemes, the modules are linked to the real phases of the manufacturing and distribution process.

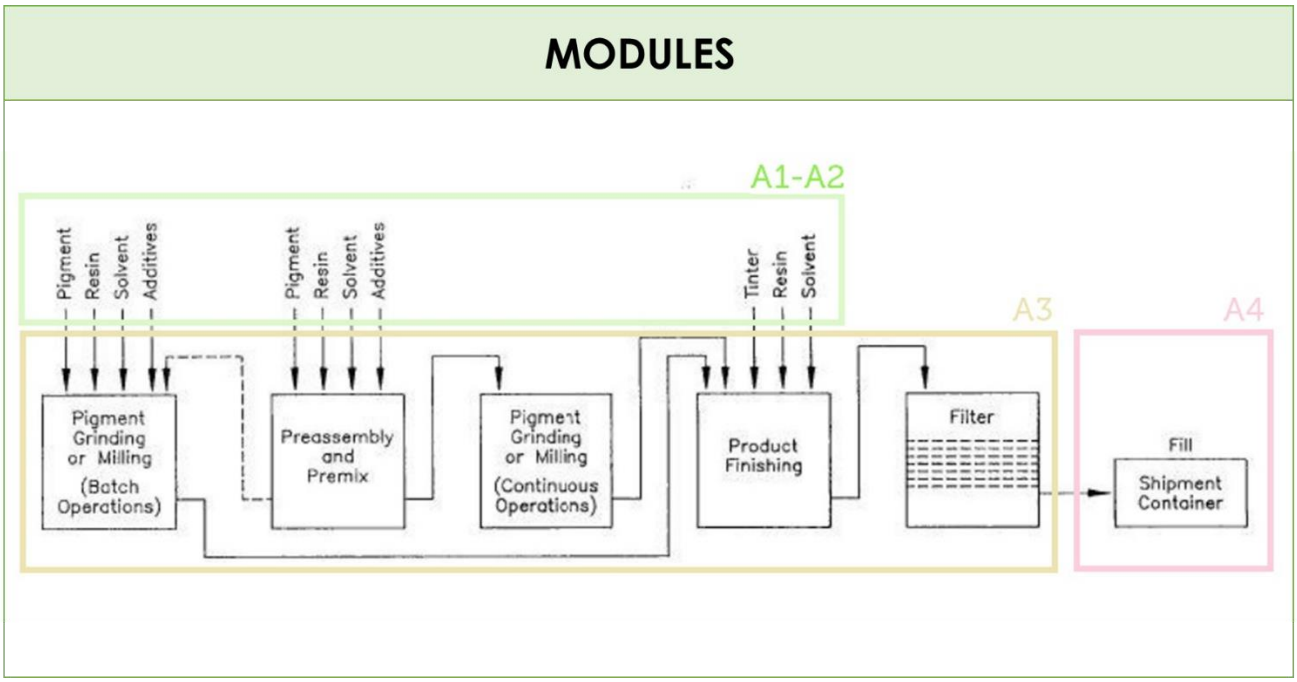


# Product Stage

The raw materials such as resins (PVC), solvents, alcohols and other components are transported to the plant where coil coating paints are manufactured. The manufacture of the coils is out of the system boundaries.

Once the raw material and other components are manufactured, they are transported to the facilities of Beckers plant in Ras Al Khaimah, where the paint production is performed.

The following diagram is a more detailed description of the modules included.




Here we include a brief description of the coil coating paint manufacture process (A3 module):

1. **Preassembly and Premix:** The first step in the manufacturing process is preassembly and premix. In this step, the liquid raw materials (e.g., resins, solvents, alcohols) are "assembled" and mixed in containers to form a viscous material to which pigments are added.

2. **Pigment Grinding:** The incorporation of the pigment into the paint to yield a fine particle dispersion is referred to as pigment grinding or milling. This process occurs in three stages (i.e., wetting, grinding, and dispersion) which may overlap in any grinding operation. Grinding is the mechanical breakup and separation of the pigment particle clusters into isolated primary particles. The goal of pigment grinding is to achieve fine, uniformly-ground, smooth, round pigment particles which are permanently separated from other pigment particles.

3. **Product Finishing:** Blending is the process of incorporating the additions into the material in order to meet the desired product specifications. In the case of batch operations, blending may simply consist of additional milling in a ball mill or added mixing and dispersing in a portable mix tank/high-speed disperser set-up.

4. **Filtering:** Filtering acts to screen out impurities (e.g., dust, gelled resin, and pigment aggregates) and to enhance the quality and uniformity of the product. The products are pumped through wound polypropylene or other resin cartridge filters. Bag filters, made from

felts (rayon, polypropylene, or nylon) or gauzes (polypropylene, nylon, or polyester), can be attached to the flanged end of a supply line.

5. **Product filling/packaging**: Once the material has been filtered, it can be transferred into drums. Filling may be accomplished either manually or mechanically depending on the number and size of the containers to be filled.

# Content declaration

The following list includes the main components and materials used in the manufacture of the thermo plastic liquid coil coating paints.

| Material | Percentage (Approx) |
|---|---|
| Solvents Organic | 29% |
| Resines | 28% |
| Water | 23% |
| Titanium | 14% |
| Pigments | 2% |
| Silica Aerosil/Acematt | 2% |
| Isophorone | 2% |
| Isocynates | 1% |
| Additives | 1% |

# Substances listed in the "Candidate List of SVHC"

The following list includes all the substances used to manufacture the product that are included in the Candidate List of Substances of very high concern by European Chemicals Agency Agency and their content exceeds 0,1% of the weight of the product.

| Material Component | Substance | CAS number | Hazard Class and Category Code(s)[1] | Hazard statement Code(s)[1] |
|---|---|---|---|---|
| Paint | Strontium chromate | 7789-06-2 | Carc. 1B<br>Acute Tox. 4 *<br>Aquatic Acute 1<br>Aquatic Chronic 1 | H350<br>H302<br>H400<br>H410 |

[1] REGULATION (EC) N° 1272/2008

| | | | | |
|---|---|---|---|---|
| Paint | Lead Chromate | 7758-97-6 | Carc. 1B<br>Repr. 1A<br>STOT RE 2<br>Aquatic Acute 1<br>Aquatic Chronic 1 | H350<br>H360Df<br>H373<br>H400<br>H410 |

# Technical Information

## Electricity consumption

Electricity consumption is the only type of energy used in the paint production. A specific dataset with the emissions factors corresponding to the UAE electricity mix in 2018 has been developed. The emission factor for electricity consumption used is GWP 100a is 0,576 Kg $CO_2$e/KWh. The total emissions of $CO_2$e due to total electricity consumption are 70,73 gr $CO_2$e/litre of paint.

## Transport to the use site Stage – A4

The coil coating paints are provided to customers in the UAE. To create a scenario of the A4 phase, all the paint sold from September 2017 to August 2018 has been analysed as representative of the international transport. The transport means are >32t trucks, as described in the following table.

| Scenario | Parameter | Units | Value<br>per functional unit |
|---|---|---|---|
| A2 – Cargo Ship | Vehicle type used for transport | Transoceanic cargo ship | n/a |
| | Vehicle load capacity | Kg (dw) | 50.000.000 |
| | Fuel type and consumption | Litres of heavy fuel oil per km | 0,24 |
| | Distance to construction site | Km | See detailed table |
| | Capacity utilization | % | See detailed table |
| | Bulk density of transported products | Kg/m3 | n/a |
| | Volume capacity utilisation factor | ~~n/a~~ | ~~1~~ |
| A2 and A4 – Truck | Vehicle type used for transport | > 32t Truck | n/a |
| | Vehicle load capacity | Kg | 29.960 kg |
| | Fuel type and consumption | Litres of diesel per km | 0,38 |
| | Distance to construction site | Km | See detailed table |
| | Capacity utilization | % | See detailed table |
| | Bulk density of transported products | Kg/m3 | n/a |
| | Volume capacity utilisation factor | n/a | 1 |

For every destination, the total amount of products delivered to customers have been taken to account according to the following detailed table:

| Mean of transport | Destination [2] | Distance | % of UF [3] |
|---|---|---|---|
| A4-Truck | Al Quoz | 129 km | 2,4 % |
| | Al Ghail | 5 km | 76,5 % |
| | Dubai Investment Park | 141 km | 17,4 % |
| | Uma Al Quawain | 151 km | 1,2 % |
| | Hamriyah | 79 km | 2,0 % |
| | Sharjah | 96 km | 0,5 % |

# Calculation rules

Version 3,2 of software Air.e LCA™ with Ecoinvent™ 3.5 database have been used for LCA modelling and impacts calculations.

CML 2001 rev 4.7 has been used for impacts methods.

Annual Statistics 2017 report from Ras Al Khaimah Electricity and Water Authority has been used to create the model of Ras Al Khaimah electricity mix.

All processes in main facilities related to the product have been included in the assessment.

Minor components not directly related to the product, with less than 1% impact, such as office supplies, have been excluded from the assessment.

Only main means of transport have been included for materials purchases and delivery of coil coating paints. "Last mile" transport has been excluded. As far as final destinations of coil coating paints are not known in detail, transport distances have been calculated from factory to city purchaser. Operation in port has also been excluded.

Road distances calculated using Google Maps. Maritime distances calculated using MarineTraffic Voyage Planner.

When allocation rules where needed in the LCA a mass approach has been used. Cut-off rules: more than 99% of the materials and energy consumption have been included.

All transports of components have been included in the LCA considering real distances travelled by materials used from September 2017 to August 2018. Transport of raw materials needed to manufacture components are estimated in a global scale according to Ecoinvent™ criteria.

The Polluter Payer Principle and the Modularity Principle had been followed.

[2] Customer destination name hidden for confidential purposes

# ENVIRONMENTAL PERFORMANCE

In the following tables, the environmental performance of the declared unit is presented for every sub-phase. The environmental impacts calculation follows the environmental footprint methodology.

## Potential Environmental Impact

| | A1-A3 Product stage | A4 Distribution | **Total** |
|---|---|---|---|
| Global Warming Potential (GWP100) (kg of $CO_2$ equivalent) | 2,51 | 4,48e-3 | **2,51** |
| Ozone depletion (kg of CFC11 equivalent) | 5,14e-7 | 8,82e-10 | **5,14e-7** |
| Acidification of land and water (kg of $SO_2$ equivalent) | 1,95e-2 | 12,50e-6 | **1,95e-2** |
| Eutrophication (kg of $PO_4^{3-}$ equivalent) | 6,24e-3 | 2,59e-6 | **6,24e-3** |
| Photochemical ozone creation (kg of $C_2H_4$ equivalent) | 1,84e-3 | 0,73e-6 | **1,84e-3** |
| Depletion of abiotic resources (elements) (kg of Sb equivalent) | 2.308,89 | 885,33e-3 | **2.308,89** |
| Depletion of abiotic resources (fossil) MJ net calorific value | 51,81 | 72,04e-3 | **51,81** |

# Use of resources

| | A1-A3 Product stage | A4 Distribution | **Total** |
|---|---|---|---|
| Use of RENEWABLE primary energy excluding renewable primary energy resources used as raw materials | 2,26 | 7,54 e-3 | **2,26** |
| Use of RENEWABLE primary energy resources used as raw materials | <0,01 | <0,01 | **<0,01** |
| Total use of RENEWABLE primary energy resources (primary energy and primary energy resources used as raw materials) | 2,26 | 7,54 e-3 | **2,26** |

Data in MJ, net calorific value

| | A1-A3 Product stage | A4 Distribution | **Total** |
|---|---|---|---|
| Use of NON- RENEWABLE primary energy excluding non- renewable primary energy resources used as raw materials | 54,80 | 7,32 e-2 | **54,87** |
| Use of NON-RENEWABLE primary energy resources used as raw materials | 6,10 | <0,01 | 6,10 |
| Total use of NON-RENEWABLE primary energy resources (primary energy and primary energy resources used as raw materials) | 60,90 | 7,32 e-2 | **60,97** |

Data in MJ, net calorific value

| | A1-A3 Product stage | A4 Distribution | **Total** |
|---|---|---|---|
| Use of secondary material | <0,01 | <0,01 | **<0,01** |

Data in kg

| | A1-A3 Product stage | A4 Distribution | **Total** |
|---|---|---|---|
| Use of net fresh water | 6,45 | 3,53 e-3 | **6,45** |

Data in m3

| | A1-A3 Product stage | A4 Distribution | **Total** |
|---|---|---|---|
| Use of RENEWABLE secondary fuels | <0,01 | <0,01 | **<0,01** |
| Use of NON-RENEWABLE secondary fuels | <0,01 | <0,01 | **<0,01** |

Data in MJ, net calorific value

## Waste disposed

| | A1-A3 Product stage | A4 Distribution | **Total** |
|---|---|---|---|
| Hazardous waste disposed | <0,01 | <0,01 | **<0,01** |
| Non-hazardous waste disposed | <0,01 | <0,01 | **<0,01** |
| Radioactive waste disposed | | | |

Data in kg

## Other output flows

| | A1-A3 Product stage | A4 Distribution | **Total** |
|---|---|---|---|
| Components for re-use (Kg) | 0 | 0 | **0** |

| | | | |
|---|---|---|---|
| Materials for recycling (Kg) | 0 | 0 | **0** |
| Materials for energy recovery (MJ) | 0 | 0 | **0** |
| Exported energy (MJ) | 0 | 0 | **0** |

# DIFFERENCES VERSUS PREVIOUS VERSIONS OF THE EF

This is the first version of the Environmental Footprint (EF) so there is no previous version of this EF.

# DIFFUSION INSTITUTION AND VERIFICATION

| | |
|---|---|
| Diffusion institution: | The Environmental Footprint Institute<br>Calle CIRCE 49ª<br>Madrid 28022<br>Spain<br>www.environmentalfootprintinstitute.org |
| EF registration number: | 130820EFP |
| Published: | 18-07-2019 |
| Valid until: | 12-05-2024 |
| Product Category Rules: | UNE-EN 15804:2012 + A1:2014<br>Sustainability of construction works.<br>Environmental Product Declarations.<br>Core rules for the product category of construction products. |
| Product group classification: | UN CPC 3511 |
| Reference year for data: | September 2017 – August 2018 |
| Geographical scope: | United Arab Emirates (UAE) |

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|---|
| Product category rules (PCR): UNE-EN 15804:2012 |
| Independent verification of the declaration and data, according to ISO 14040 and ISO 14025:<br>☐ Process Certification (internal) **x** Verification (external) |
| Third party verifier:<br>Marcel Gómez Consultoría Ambiental<br>Name of the verifier: Marcel Gómez<br>info@marcelgomez.com<br>Approved by: The Environmental Footprint Institute |

# MANDATORY STATEMENTS

Explanatory material can be obtained from EF owner and/or LCA author. Contact information can be found below.

The verifier and The Environmental Footprint Institute do not make any claim or present any responsibility about the legality of the product.

# CONTACT INFORMATION

| | |
|---|---|
| EF owner: | Santosh Jose<br>Becker Industrial Coatings L.L.C.<br>P.O. Box 12795<br>Al-Khour Port<br>UAE-Ras Al Khaimah<br>Phone: +971 72 27 88 53<br>E-mail: info-uae@beckers-group.com |
| LCA author: | S. Beskirajan, GCAS Quality Certifications<br>P.O.Box 65561, Dubai, UAE<br>www.gcasquality.com<br>info.dubai@gcasquality.com<br><br>Rubén Jiménez, Solid Forest S.L.<br>CP 28703, San Sebastián de los Reyes, SPAIN<br>www.solidforest.com<br>info@solidforest.com |

# REFERENCES

This Environmental Footprint has been developed and diffused following the instructions of the Environmental Footprint Institute. Further information and the document itself with reference 130820EFP are available at: (www.environmentalfootprintinstitute.org)

LCA Report: Life Cycle Inventory of Coil Coating Paints.

Software: Air.e LCA rev. 3.4.12 (www.solidforest.com)

Main database: Ecoinvent 3.5 (www.ecoinvent.org)

Normatives: ISO 14040:2006 "Environmental management -- life cycle assessment -- principles and framework", ISO 14044:2006 "Environmental management -- life cycle assessment -- requirements and guidelines", ISO 14020 "Environmental Labelling: General Principles", ISO 14025:2006 "Environmental labels and declarations -- type III environmental declarations -- principles and procedures" and EN 15804