In accordance with ISO 14025 and EN 15804:2012+A2:2019/AC:2021 for:

Architectural Powder Coating

manufactured by

BPC KİMYA SANAYİ A.Ş.

Programme: The International EPD® System. www.environdec.com
Programme Operator: EPD International AB
Licensee: EPD Türkiye
EPD Registration Number: EPD-IES-0006221
Version Date: 2025-01-29
Validity Date: 2030-01-28
Geographical Scope: Global

How to Read This EPD?

An Environmental Product Declaration (EPD) is an ISO Type III Environmental Declaration based on ISO 14025 standard. An EPD transparently reports the environmental performance of products or services from a lifecycle perspective. The preparation of an EPD includes different stages, from acquiring raw materials to the end of life of the final product/ service. EPDs are based on international standards and consider the entire value chain. Additionally, EPD is a third-party verified document. This EPD includes several sections described below.

1. General and Program Information

The first part of an EPD has information about the name of the manufacturer and product/service and other general information such as the validity and expiration dates of the document, the name of the program operator, geographical scope, etc. The second page states the standards followed and gives information about the program operator, third-party verifier, etc. The followed Product Category Rule (PCR) is indicated on the second page.

2. Company and Product/Service Information

Information about the company and the investigated product is given in this section. It summarizes the characteristics of the product provided by the manufacturer. It also includes information about the product such as product composition and packaging.

3. LCA Information

LCA information is one of the most important parts of the EPD as it describes the functional/ declared unit, time representativeness of the study. database(s) and LCA software. along with system boundaries.

The table presented in this part has columns for each stage in the life cycle. The considered stages are marked ‘X’ whereas the ones that are not declared are labeled as ‘ND’. Not all EPDs consider the full life cycle assessment for a product’s entire life stages. The ‘System Boundary’ page is also the place where one can find detailed information about the stages and the assumptions made.

4. LCA Results

The results of the Life Cycle Assessment analysis are presented in table format. The first column in each table indicates the name of the impact category and their measurement units are presented in the second column. These tables show an amount at each life cycle stage to see the impact of different indicators on different stages. Each impact can be understood as what is released through the production of the declared unit of the material—in this case, 1 kilogram Architectural Powder Coating. The benefits of reuse/recycling of the declared product is reflected in this section.

The first impact in the table is global warming potential (GWP), which shows how much CO_2 is released at each stage. Other impacts include eutrophication potential, acidification potential, ozone layer depletion, land use related impacts, etc. The second table provides results for resource use and the third table is about the waste produced during the production. The fourth and final table shows the results for the GWP-GHG indicator, which is almost equivalent to the GWP-Total indicator mentioned previously. The only difference is that this indicator excludes the biogenic carbon content by following a certain methodology.

Programme Information

The International EPD® System: EPD International AB Box 210 60 SE-100 31 Stockholm, Sweden, info@environdec.com

“CEN standard EN 15804 serve as the core Product Category Rules (PCR)”

PCR 2019:14 Construction products, version 1.3.4., Construction EN 15804:2012+A2:2019/AC:2021 Sustainability of Construction Works , UN CPC code is 35110 - Paints and varnishes and related products.

PCR review was conducted by: Technical Committee of the International EPD® System. Review chair: Claudia A. Peña, University of Concepción, Chile.

The review panel may be contacted via the Secretariat www.environdec.com/contact.

External and independent (‘third-party’) verification of the declaration and data, according to ISO 14025:2006, via EPD verification through an individual EPD verification

Third party individual verifier: Vijay Thakur
Approved by: The International EPD® System

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

Yes No **X**

BPC Kimya Sanayi A.Ş. has the sole ownership, liability, and responsibility for this EPD.

Life Cycle Assessment (LCA)
LCA accountability: Furkan Can Akalın & Yıldıray Yılmaz - Metsims Sustainability Consulting

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EPDs within the same product category but registered in different EPD programmes 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 cutoff rules and impact assessment methods (including the same version of characterisation factors); have equivalent content declarations; and be valid at the time of comparison.

About the Company

Owner of the EPD: BPC Kimya Sanayi A.Ş.
Production Plant: Anbar Serbest Bölge Mah. Kayseri Serbest Bölgesi 8. Cadde No:2 Melikgazi/ Kayseri/TÜRKİYE

BPC KİMYA was founded in 1969 as marketing comp any in Kayseri and sales of industrial paints actively started in 1975. In 1995 we took our place on the marketing of electrostatic powder coating as distributor. In 2004, electrostatic powder coating production started in the total area of 5000 square meters located in Kayseri Organized Industrial Zone. In 2005, our brand name BPC was licensed to Boyasan.In 2006,we started to export our product. And now our export activities are developing rapidly in Russia, Ukraine, Tunisia, Algeria, and has been exporting to many countries, especially in Iran In 2007 We get both ISO and Qualicoat quality certificates. By the years 2011 and 2012, with the new lines, our production capacity has increased to 8000 tons. By the year 2015, our logo is designed specifically to our company's 45th year. In 2020, we moved to our new factory in Kayseri free zone with 15,000 square meters of open area 9,000 square meters of closed area. With new investments in production capacity increased to 10,000 tons per year.

About The Product

Color and effect are the most important elements required for an architectural design to attract attention. Colors, effects, application methods, resistance to environmental factors play a major role in product selection. As Bpc Kimya, we design paints with unlimited options for both your interior and exterior projects. While choosing your products in the colors and textures you want, we contribute to the longevity of your projects since you have also chosen products that are resistant to climate conditions.

Our products;
- Industrial powder coating
- Architectural powder coating

Application Area

Our architectural products usage areas are aluminium profile, garden and park furniture, facade elements, steel door, exterior lighting equipment, traffic signs, automotive accessories and agricultural machinery.

Application Method

The first step involves preparing the substrate by cleaning and removing any contaminants, such as grease, oil, dirt or rust. The surface must be free from imperfections to ensure proper adhesion of the powder coating. This can involve various methods like sandblasting, chemical cleaning, or mechanical abrasion.
Once the substrate is properly prepared, the powder coating material is applied using an electrostatic spray gun. The powder particles are electrostatically charged and attracted to the grounded substrate, forming a uniform layer. The thickness of the coating can be controlled by adjusting the spray gun's settings and the distance from the substrate.
The coated part is heated to a specific temperature for a certain duration, causing the powder particles to melt and fuse together, creating a smooth, durable, and protective coating. The curing temperature and time vary depending on the type of powder coating and the desired properties of the final finish.

Advantages

- All decorative surfaces can be obtained with powder coating. Surfaces with smooth, texture rough, sandpaperlike, and varnished appearance can be easily achieved with powder coating
- No waste is produced during production and consumption; therefore, it does not cause air or water pollution. In terms of environmental protection, powder coating does not contain the volatile organic compounds (VOC) found in wet paint.
- The amount of energy required for powder to ignite is much higher than liquid paints. Therefore, its lower explosive limit is higher.
- Powder is ready to use. It does not require any mixing or dilution with liquid. The gun hose can be inserted into the powder bag and used immediately.
- The powder coating technique is easy to use and the operator can be trained in a very short period. It is very suitable for being used in manual and robotic systems.

Technical Specifications

Curing Time	5 - 25 minutes
Curing Temperature	160 - 200 °C
Density EN ISO 8130-2	1.2 - 1.9 g/cm³
Gloss @ 60° EN ISO 2813	5 - 90
Impact Resistance EN ISO 6272 / ASTM D2794	2.5 Nm / 22 inch-pound
Exterior durability EN ISO 2810	>50% residual gloss
Salt Spray (Chromate) EN ISO 9227	1000 hours

Architectural Powder Coating product has 1.77 g/cm^3 density and 9.4 m^2/L coating capacity. Thus, 1 kilogram architectural powder coating product can cover 5.3 m^2 of area.

System Boundaries & Description

A1 - Raw Material Supply

This stage includes the extraction and pre-treatment processes of raw materials before production. These raw materials are polyester resin, hardener, additives, pigments, barium sulfate and titanium dioxide.

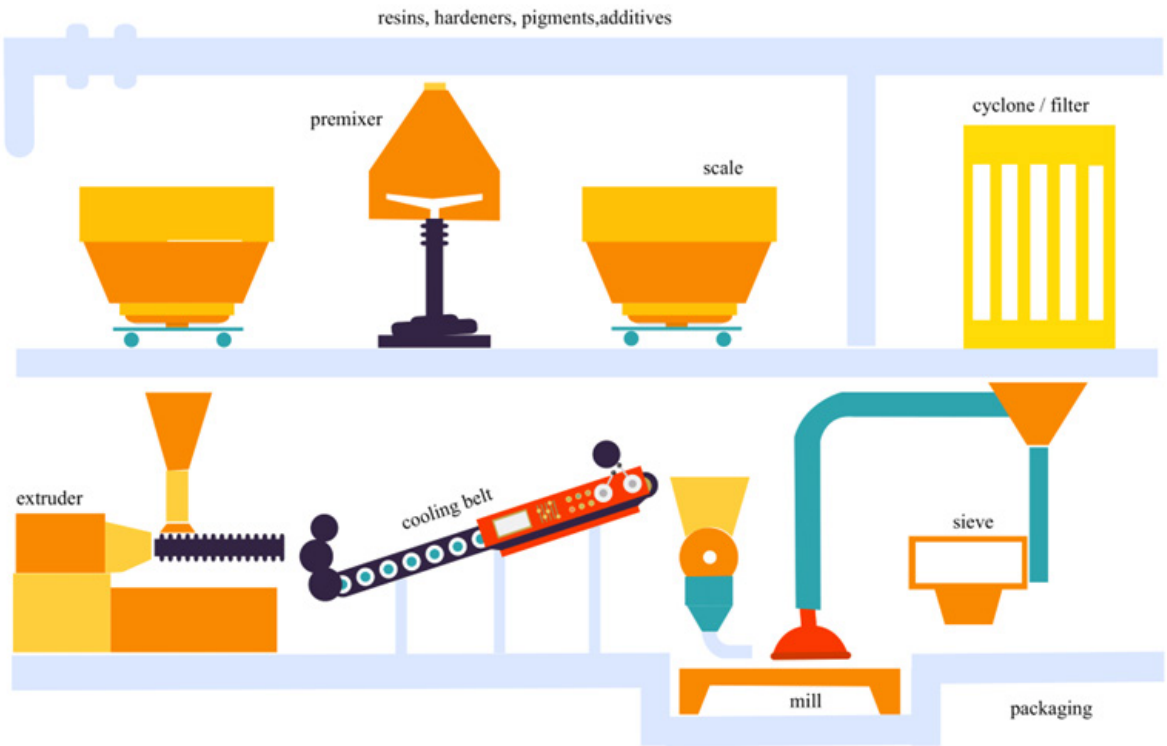
A2 - Raw Material Transport

Raw material transport from supplier to manufacturer is considered in raw material supply stage. The distances and routes are calculated accordingly. While highway is used for products supplied from domestic and neighboring countries, sea transportation is used for products coming from long distances.

Transport Mode	Type
Road	Vehicle: Lorry Size Class: >32 metric ton Emission Standard: EURO5 Fuel Type: Diesel
Sea	Vehicle: Container Ship DWT (Load Capacity): 43000 tonnes Fuel Type: Heavy Fuel Oil

A3 - Manufacturing

This stage includes production-related environmental impacts of the investigated product. All energy-related inputs are supplied by the manufacturer. Also effects of packaging is included in this stage. The manufacturing stage includes the following processes;



- The raw materials of powder coating are prepared by weighing according to the formulation.
- The raw materials are homogenized using the “dry mixing” technique. This process is carried out using mixers.
- The prepared homogeneous mixture is given to the feeding section of hot extruders.
- Hot extruders increase the contact of mixed and homogenized raw materials with each other and allow resins to combine with other raw materials. Extruders operate at high temperatures (100°C to 140°C).
- After the hot extrusion and homogenization are completed, the powder is extruded in molten form from the extruder and passes through chill rolls.
- The powder, which is formed into a thin layer, passes through the cooling belt and cools to room temperature. The cooled material passes under the crusher and is transformed into fine chips.
- The grinding process is carried out with suitable mills. Powder size is very important for the user. With mills and classifiers, powder sizes can be brought to desired ranges according to use and powder type.
- After very fine powders are collected with air, they are passed through suitable filters and cyclones by separating from the air to prevent them from polluting the air.
- Coarse powders are also separated from the product using the sieving process.
- Powders which are ground and brought to desired sizes are packaged in appropriate weights and presented to the user.

A4 - Product Transport

Product transport from manufacturer to customer is considered in product material supply stage. The distances and routes are calculated accordingly. Depending the customer location, product is transported via trucks and other supplies come through seaway.

Transport Mode	Type
Road	Vehicle: Lorry Size Class: >32 metric ton Emission Standard: EURO5 Fuel Type: Diesel
Sea	Vehicle: Container Ship DWT (Load Capacity): 43000 tonnes Fuel Type: Heavy Fuel Oil

A5 - Installation

Spraying and curing processes are conducted during the installation phase, and the electricity consumption resulting from these activities has been calculated. Electricity emission factors were selected based on the percentage of sales by country, using data from the IEA. Additionally, the impact of packaging disposal has been included in this stage and is assumed to be landfilled.

LCA Information

Declared Unit: 1 kg of Architectural Powder Coating produced by BPC Kimya. (1 kg product can cover an area of 5.3m^2.)

Time Representativeness: Full year of 2023 (01.01.2023 - 31.12.2023).

Database(s) and LCA Software: Ecoinvent 3.10 and SimaPro 9.6

System Boundaries: Cradle to gate with options. (A4, A5)

	Product Stage			Construction Process Stage		Use Stage							End of Life Stage				Benefits and Loads
	Raw Material Supply	Transport	Manufacturing	Transport from the gate to the site	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational Energy Use	Operational Water Use	De-construction	Transport	Waste Processing	Disposal	Reuse-Recycling-Recovery 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	ND	ND	ND	ND	ND
Geography	GLO	GLO	TR	GLO	GLO	-	-	-	-	-	-	-	-	-	-	-	-
Specific Data Used	3%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation - Products	0%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation - Sites	0%			-	-	-	-	-	-	-	-	-	-	-	-	-	-

(ND: Not declared, X:Included in LCA, GLO:Global, TR:Türkiye)

Source of Electricity

The electricity data modelled for the production processes is taken from Ecoinvent 3.10 dataset that represents medium voltage electricity production in Türkiye with the reference year, 2017. The chosen dataset has GWP-GHG impact of 0.575 kg CO2 eq. / kWh. The dataset consist the following production percentages for electricity. Coal, 37%, Hydro, 33%, Natural gas, 17 %, Wind, 8%, Geothermal, 3%, Biogas, 1%, Other, 1%, Biomass, <1%

Allocation

Source of raw material, water consumption, energy consumption and raw material transportation were weighted according to 2023 production figures. In addition, hazardous and non-hazardous waste amounts were also allocated from the 2023 total waste generation.

Cut-Off Criteria

1% cut-off is applied in LCA. Data for elementary flows to and from the product system contributing to a minimum of 99% of the declared environmental impacts have been included.

Reach Regulation

No substances included in the Candidate List of Substances of Very High Concern for authorization under the REACH regulations are present in this product either above the threshold for registration with the European Chemicals Agency or above 0.1% (wt/wt).

Product Composition

The content declaration is provided as intervals due to confidentiality reasons.

Product Component	Weight, %	Post-consumer material, weight-%	Biogenic material. weight-% of product	Biogenic material. kgC/declared unit
Polyester Resin	60%-65%	0	0	0
Titanium Dioxide	25%-30%	0	0	0
Barium Sulfate	0%-5%	0	0	0
Hardener	0%-5%	0	0	0
Additives	0%-5%	0	0	0
Pigments	<1%	0	0	0
Sum	**100%**	**0**	**0**	**0**

Packaging Composition

Corrugated box. plastic bag and plastic clamp are used for packaging. Details are given in the table below.

Product Component	Weight, kg	Weight-% (versus the product)	Biogenic material. kg C/declared unit
Corrugated box	0.033	3%	0.05
Plastic bag	0.007	<1%	0
Plastic clamp	0.00001	<1%	0
Sum	**0.04**	**<1%**	**0.05**

LCA Modelling. Calculation And Data Quality

The results of the LCA with the indicators as per EPD requirement are given in the LCA result tables. All energy calculations were obtained using Cumulative Energy Demand (LHV) methodology, while fresh water use is calculated with selected inventory flows in SimaPro according to the PCR. There are no co-product allocations within the LCA study underlying this EPD. The regional energy datasets were used for all energy calculations.

Background Data

For all LCA modelling and calculation. Ecoinvent database (v3.10) and SimaPro (v9.6) LCA software were used. Characterization factors of EN 15804 reference package based on EF 3.1 are utilized. Impact of infrastructure and capital goods are excluded from the analysis.

System Boundary

According to PCR 2019:14 v.1.3.4, if the following three criteria are met, “cradle to gate with options (A1–A3 and A4/A5)” system boundaries can be established: The product or material is physically integrated with other products during installation so they cannot be physically separated from them at end of life. The product or material is no longer identifiable at end of life because of a physical or chemical transformation process, and the product or material does not contain biogenic carbon.

LCA Results

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.

CORE ENVIRONMENTAL IMPACTS PER DECLARED UNIT					
Mandatory indicators		**Unit**	**A1-A3**	**A4**	**A5**
Global Warming Potential	Total	kg CO_2 eq.	4.52E+00	1.17E-01	4.09E+00
	Fossil	kg CO_2 eq.	4.56E+00	1.17E-01	3.99E+00
	Biogenic	kg CO_2 eq.	-3.90E-02	2.01E-05	9.71E-02
	Luluc	kg CO_2 eq.	5.39E-03	4.92E-05	3.13E-03
ODP		kg CFC-11 eq.	5.47E-06	1.71E-9	6.66E-08
AP		mol H+ eq.	2.81E-02	9.10E-04	1.30E-02
EP - Freshwater		kg P eq.	1.46E-03	8.25E-06	1.82E-03
EP - Marine		kg N eq.	4.44E-03	2.53E-04	2.38E-03
EP - Terrestrial		mol N eq.	4.52E-02	2.78E-03	2.13E-02
POCP		kg NMVOC	1.89E-02	9.21E-04	1.07E-02
*ADPE		kg Sb eq.	4.00E-05	2.83E-07	4.07E-06
*ADPF		MJ	2.08E+01	1.45E-01	1.43E+01
*WDP		m^3 depriv.	1.86E+00	7.77E-03	3.93E-01
Additional environmental impact indicators per declared unit (Optional)					
PM		disease inc.	2.64E-07	1.03E-8	3.88E-08
**IR		kBq U-235 eq.	1.85E-01	1.35E-03	2.77E-01
*HTP - C		CTUh	1.30E-08	5.65E-10	5.10E-09
*HTP - NC		CTUh	4.64E-08	9.64E-10	1.49E-08
*SQP		Pt	2.20E+01	1.43E+00	1.79E+00
Legend		A1: Raw Material Supply. A2: Transport. A3: Manufacturing. A1-A3: Sum of A1. A2. and A3. A4: Transport to Site A5: Construction.			
Acronyms		GWP-total: Climate change. GWP-fossil: Climate change- fossil. GWP-biogenic: Climate change - biogenic. GWP-luluc: Climate change – land use and transformation. ODP: Ozone layer depletion. AP: Acidification terrestrial and freshwater. EP-freshwater: Eutrophication freshwater. EPmarine: Eutrophication marine. EP-terrestrial: Eutrophication terrestrial. POCP: Photochemical oxidation. ADPE: Abiotic depletion - elements. ADPF: Abiotic depletion - fossil resources. WDP: Water scarcity. PM: Respiratory inorganics - particulate matter. IR: Ionising radiation HTP-c: Cancer human health effects. HTP-nc: Non-cancer human health effects. SQP: Land use related impacts. soil quality			
*Disclaimer 1		The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with			
**Disclaimer 2		This impact category deals mainly with the eventual impact of low dose ionising radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents. occupational exposure. or due to radioactive waste disposal in underground facilities. This indicator also does not measure potential ionising radiation from the soil. from radon and from some construction materials is also not measured by this indicator.			

Additional Mandatory Impact Category Indicators Per Declared Unit				
Parameter	**Unit**	**A1-A3**	**A4**	**A5**
***GWP - GHG	kg CO_2 eq.	4.58E+00	1.17E-01	4.05E+00
***Disclaimer 3	GWP-GHG = Global Warming Potential total excl. biogenic carbon following IPCC AR5 methodology. The indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. The GWP-GHG indicator is identical to GWP-total except that the characterisation factor (CF) for biogenic CO_2 is set to zero.			

Resource Use Indicators Per Declared Unit				
Parameter	**Unit**	**A1-A3**	**A4**	**A5**
PERE	MJ	4.72E+00	2.04E-05	4.25E-01
PERM	MJ	4.24E-01	0.00E+00	-4.24E-01
PERT	MJ	5.15E+00	2.04E-05	5.21E-04
PENRE	MJ	2.05E+01	1.45E-04	2.14E-01
PENRM	MJ	2.11E-01	0.00E+00	-2.11E-01
PENRT	MJ	2.08E+01	1.45E-04	3.02E-03
SM	kg	0.00E+00	0.00E+00	0.00E+00
RSF	MJ	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ	0.00E+00	0.00E+00	0.00E+00
FW	m^3	5.70E-02	2.84E-04	1.73E+00
Legend	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			

Waste & Output Indicators				
Parameter	**Unit**	**A1-A3**	**A4**	**A5**
HWD	kg	0.00E+00	0.00E+00	0.00E+00
NHWD	kg	7.88E-03	0.00E+00	4.00E-02
RWD	kg	0.00E+00	0.00E+00	0.00E+00
CRU	kg	0.00E+00	0.00E+00	0.00E+00
MFR	kg	0.00E+00	0.00E+00	0.00E+00
MER	kg	0.00E+00	0.00E+00	0.00E+00
EE (Electrical)	MJ	0.00E+00	0.00E+00	0.00E+00
EE (Thermal)	MJ	0.00E+00	0.00E+00	0.00E+00
Legend	HWD: Hazardous waste disposed, NHWD: Non-hazardous waste disposed, RWD: Radioactive waste disposed, CRU: Components for reuse, MFR: Material for recycling, MER: Materials for energy recovery, EE (Electrical): Exported energy electrical, EE (Thermal): Exported energy, thermal.			

References

Ecoinvent / Ecoinvent Centre, www.ecoinvent.org

EN 15804:2012+A2:2019 / AC:2021 Sustainability of construction works - Environmental Product Declarations - Core rules for the product category of construction products

GPI / General Programme Instructions of the International EPD® System. Version 4.0.

ISO 14020:2000/ Environmental Labels and Declarations — General principles

ISO 14040/44 / DIN EN ISO 14040: 2006-10 / Environmental management - Life cycle assessment - Principles and framework (ISO14040:2006) and Requirements and guidelines (ISO 14044:2006)

ISO 14025 / DIN EN ISO 14025:2009-11 / Environmental labels and declarations - Type III environmental declarations - Principles and procedures

ISO 50001:2018 / Energy Management System

ISO 9001:2015 / Quality Management System

PCR for Construction Products and Construction Services / Prepared by IVL Swedish Environmental Research Institute, Swedish environmental Protection Agency, SP Trä, Swedish Wood Preservation Institute, Swedisol, SCDA, Svenskt Limträ AB, SSAB, The International EPD System, 2019:14 Version 1.3.4

The International EPD® System / The International EPD® System is a programme for type III environmental declarations, maintaining a system to verify and register EPD®s as well as keeping a library of EPD®s and PCRs in accordance with ISO 14025. www.environdec.com

SimaPro / SimaPro LCA Software, Pré Consultants, the Netherlands, www.pre-sustainability.com

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