ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025 / ISO 21930

PPG Tikkurila Furniture & Trim

Representative product:
Tikkurila Everal Aqua Semi Matt 40

EPD HUB, HUB-1035
Publishing date 19 January 2024, last updated on 19 January 2024, valid until 19 January 2029.

Tikkurila

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Decor Klarlack Matt
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Primer Lackfärgsgrund
Universo Pro Emalia do drewna i metalu Matt 10
Universo Pro Emalia do drewna i metalu S-M 40

Vivacolor

Furniture 30
Radiator
Universal Akva Matt

GENERAL INFORMATION

MANUFACTURER

Manufacturer	PPG Tikkurila
Address	Heidehofintie 2, 01300 Vantaa, Finland
Contact details	Sustainability.COE@ppg.com
Website	https://tikkurilagroup.com/

EPD STANDARDS, SCOPE AND VERIFICATION

Program operator	EPD Hub, hub@epdhub.com
Reference standard	EN 15804+A2:2019 and ISO 14025
PCR	EPD Hub Core PCR version 1.0, 1 Feb 2022
Sector	Construction product
Category of EPD	Third party verified EPD
Scope of the EPD	Cradle to gate with options, A4-A5, and modules C1-C4, D
EPD author	Kristjan Saul
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal certification ☑ External verification
EPD verifier	Magaly González Vázquez, as an authorized verifier acting for EPD Hub Limited

The manufacturer has the sole ownership, liability, and responsibility for the EPD. EPDs within the same product category but from different programs may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804 and if they are not compared in a building context.

PRODUCTS

Representative product name	**Everal Aqua Semi Matt 40**
Place of production	Vantaa facility, Finland
Period for data	Calendar year 2022
Averaging in EPD	Multiple products
Variation in GWP-fossil for A1-A3	35 %

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 litre
Declared unit mass	1.185 kg
GWP-fossil, A1-A3 (kgCO2e)	2.40
GWP-total, A1-A3 (kgCO2e)	2.41
Secondary material, inputs (%)	2.33
Secondary material, outputs (%)	0.0
Total energy use, A1-A3 (kWh)	6.37
Total water use, A1-A3 (m3e)	0,0407

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

Tikkurila offers a broad range of decorative paints for consumers and professionals for surface protection and decoration. The product offerings include, among others, interior paints, lacquers and effect products, exterior products for wood, mineral, and metal surfaces, as well as services related to painting. In addition, Tikkurila produces paints and coatings for the metal and wood industries.

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass- %	Material origin
Metals	0%	-
Minerals	19%	EU
Fossil materials	26%	EU, US
Bio-based materials	0%	-
Water	55%	EU

BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

Biogenic carbon content in product, kg C	0
Biogenic carbon content in packaging, kg C	0.0201

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1 litre
Mass per declared unit	1.185 kg
Functional unit	-
Reference service life	-

SUBSTANCES, REACH - VERY HIGH CONCERN

The product does not contain any REACH SVHC substances in amounts greater than 0,1 % (1000 ppm).

PRODUCT DESCRIPTIONS

Tikkurila

Everal Aqua Semi Matt 40 is a universal waterborne matt acrylic enamel with high durability. It leaves a surface that is resistant to mechanical damage, does not yellow over time, and is protected against weather.
It is intended for painting furniture, doors, windows, garden furniture, interior mineral surfaces, baseboards, radiators, etc.
The product is suitable for painting interior and exterior wood, chipboard and previously primed metal surfaces, as well as directly painting appropriately prepared steel, galvanized steel, acid-resistant steel, aluminum, copper, plastic, glass, and tile surfaces. It can also be used for painting interior mineral surfaces and for renovation painting of surfaces previously painted with alkyd or chemically hardening paints. Not recommended for painting metal roofs and facades.

Everal Aqua Matt 10 is a universal waterborne matt acrylic enamel with high durability. It leaves a surface that is resistant to mechanical damage, does not yellow over time, and is protected against weather.
It is intended for painting furniture, doors, windows, garden furniture, interior mineral surfaces, baseboards, radiators, etc.
The product is suitable for painting interior and exterior wood, chipboard and previously primed metal surfaces, as well as directly painting appropriately prepared steel, galvanized steel, acid-resistant steel, aluminum, copper, plastic, glass, and tile surfaces. It can also be used for painting interior mineral surfaces and for renovation painting of surfaces previously painted with alkyd or chemically hardening paints. Not recommended for painting metal roofs and facades.

Everal Aqua Gloss 80 is a universal waterborne glossy acrylic enamel with high durability. It leaves a surface that is resistant to mechanical damage, does not yellow over time, and is protected against weather.
It is intended for painting furniture, doors, windows, garden furniture, interior mineral surfaces, baseboards, radiators, etc.
The product is suitable for painting interior and exterior wood, chipboard and previously primed metal surfaces, as well as directly painting appropriately prepared steel, galvanized steel, acid-resistant steel, aluminum, copper, plastic, glass, and tile surfaces. It can also be used for painting interior mineral surfaces and for renovation painting of surfaces previously painted with alkyd or chemically hardening paints. Not recommended for painting metal roofs and facades.

Everal Aqua Primer is a waterborne acrylic primer that leaves a very level base for applying topcoats.
It is intended for priming interior wood and wood-like surfaces. It can also be used on metal surfaces in dry areas that do not require corrosion protection, and for renovation priming of surfaces previously painted with alkyd or chemically hardening paints.

Helmi 10 is a high-quality multipurpose matt furniture paint.
It is intended for painting doors, skirting boards, window frames, radiators, cabinets, furniture etc.
The product is suitable for interior painting of wooden, wood fiberboard, chipboard and metal surfaces. Suitable for touch-up and first application painting and repainting of surfaces previously coated with an alkyd or acid-curing paint. Not suitable for repainting of surfaces painted with nitrocellulose lacquer.

Helmi 30 is a high quality multipurpose semimatt furniture paint.
It is intended for painting doors, skirting boards, window frames, radiators, cabinets, furniture etc.
The product is suitable for interior painting of wooden, wood fiberboard, chipboard and metal surfaces. Suitable for touch-up and first application painting and repainting of surfaces previously coated with an alkyd or acid-curing paint. Not suitable for repainting of surfaces painted with nitrocellulose lacquer.

Helmi 80 is a high quality multipurpose glossy furniture paint.
It is intended for painting doors, skirting boards, window frames, radiators, cabinets, furniture etc.
The product is suitable for interior painting of wooden, wood fiberboard, chipboard and metal surfaces. Suitable for touch-up and first application painting and repainting of surfaces previously coated with an alkyd or acid-curing paint. Not suitable for repainting of surfaces painted with nitrocellulose lacquer.

Helmi Furniture Lacquer 30 is a semimatt waterborne non-yellowing acrylic lacquer for indoor use.
It is intended for painting furniture such as tables, chairs, bookshelves, etc., toys, wall panels, wooden ceilings, doors and other similar wooden objects.
The product is suitable for painting wooden surfaces in dry interior rooms. Also suitable for protective lacquering of stained surfaces. Not suitable for painting floors.

Helmi Listavalkoinen is a durable semimatt acrylic paint with good hiding power and a color that is commonly used for industrial painting of doors, skirting boards, and windows.
It is intended for painting doors, skirting boards, window frames, cabinets, furniture etc.
The product is suitable for interior painting of wood and metal surfaces. Suitable for touch-up and first application painting and repainting of surfaces previously coated with alkyd paints.

Helmi Patterimaali is a non-yellowing heat-resistant paint for radiators.
It is intended for painting water-to-air radiators, piping, sheet metal wood-burning stoves, etc.
The product is suitable for metal surfaces indoors. Also suitable for surfaces previously painted with powder or alkyd paints. Not recommended for painting electric radiators.

Helmi Pohjamaali is a waterborne acrylic primer for interior furniture.
It is intended for painting furniture, cabinets, doors, window sashes, skirting boards, radiators, sheet metal stoves, etc.
The product is suitable for interior painting of wooden, wood fiberboard, chipboard and metal surfaces. Also suitable for repainting surfaces previously coated with an alkyd or acid-curing paint. Not suitable for repainting of surfaces painted with nitrocellulose lacquer.

Intact Primer is a quick-drying waterborne universal and adhesion primer for interior use.
It is intended for use on especially smooth and hard substrates indoors. Also for wood and metal surfaces in dry interior premises.
The product is suitable as a primer and intermediate coat for both new and previously painted surfaces. It adheres well to surfaces that require special adhesion, such as melamine, fiberglass, industrially coated surfaces (excluding PVDF), hard PVC, tile, aluminum, zinc-coated sheet metal, and surfaces coated with alkyd and acid-curing paints.

Intact 8 is a fast-drying matt waterborne enamel paint for interior use that leaves a smooth and hard surface.
It is inteded for painting trim, doors, window frames, furniture, banisters, columns etc. in dry and humid premises.
The product is suitable for wood and metal surfaces indoors. It is suitable for touch-up and first application painting.

Intact 40 is a fast-drying waterborne enamel paint for interior use that leaves a smooth and hard surface.
It is inteded for painting trim, doors, window frames, furniture, banisters, columns etc. in dry and humid premises.
The product is suitable for wood and metal surfaces indoors. It is suitable for touch-up and first application painting.

Intact Laq 10 is a waterborne non-yellowing matt lacquer for indoor use.
It is intended for painting doors, trim, window frames, furniture, panel walls, wooden ceilings and similar wood surfaces.
It is suitable for wood surfaces in dry interior spaces and for the protective lacquering of stained surfaces.

Intact Laq 30 is a waterborne non-yellowing semimatt lacquer for indoor use.
It is intended for painting doors, trim, window frames, furniture, panel walls, wooden ceilings and similar wood surfaces.
It is suitable for wood surfaces in dry interior spaces and for the protective lacquering of stained surfaces.

Kiva 10 is a waterborne non-yellowing tintable matt acrylic lacquer for indoor use.
It is intended for painting furniture such as tables, chairs, bookshelves, etc., toys, panel walls, wooden ceilings, doors and similar wood surfaces.
The product is suitable for lacquering wood surfaces in dry interior spaces. Also suitable for the protective lacquering of stained surfaces. Not suitable for lacquering floors.

Kiva 30 is a waterborne non-yellowing tintable semimatt acrylic lacquer for indoor use.
It is intended for painting furniture such as tables, chairs, bookshelves, etc., toys, panel walls, wooden ceilings, doors and similar wood surfaces.
The product is suitable for lacquering wood surfaces in dry interior spaces. Also suitable for the protective lacquering of stained surfaces. Not suitable for lacquering floors.

Kiva 70 is a waterborne non-yellowing tintable glossy acrylic lacquer for indoor use.
It is intended for painting furniture such as tables, chairs, bookshelves, etc., toys, panel walls, wooden ceilings, doors and similar wood surfaces.
The product is suitable for lacquering wood surfaces in dry interior spaces. Also suitable for the protective lacquering of stained surfaces. Not suitable for lacquering floors.

Lastu Paneelimaali is an acrylate paint for panelled walls indoors that has good adhesion and leaves an extra smooth surface.
The product is suitable for interior painting of wooden surfaces. Suitable for touch-up and first application painting, and repainting of surfaces previously coated with an alkyd paint.

Multistop is a sealing primer for interior wooden surfaces that prevents discoloring wood extracts and other yellowing substances such as tar, etc. from entering the topcoat.
It is intended for priming ceiling and wall panels, wooden floors, skirting, doors, windows and furniture.
The product is suitable as a primer and intermediate coat for both untreated and previously painted or varnished, new and old wood surfaces in dry interior premises. Also suitable for bathroom panel ceilings when the surface is finished with Luja topcoat.

Otex Akva is a quick-drying waterborne adhesion primer.
It is intended for interior surfaces that require special adhesion and also for exterior window frames painted with polyurethane or acid-curing paints.
The product is suitable as a primer and intermediate coat for both new and previously painted surfaces. It adheres well to surfaces that require special adhesion, such as glass, tile, fiberglass, melamine, PVC plastic, aluminum, zinc-coated sheet metal, and surfaces coated with alkyd and acid-curing paint. The product is also suitable for wood, wood fiber board, chipboard, and metal surfaces in dry interior premises. It is not suitable for maintenance painting of surfaces painted with nitrocellulose lacquer.

Alcro

ad.finess Blank Lackfärg is an extremely durable premium quality glossy topcoat with excellent application properites that leaves a hard and beautiful surface.
The product is suitable for e.g. joinery, doors, hatches and metal surfaces indoors.

ad.finess Halvblank Lackfärg is an extremely durable premium quality semigloss topcoat with excellent application properites that leaves a hard and beautiful surface.
The product is suitable for e.g. joinery, doors, hatches and metal surfaces indoors.

ad.finess Helmatt Lackfärg is an extremely durable premium quality full matt topcoat with excellent application properites that leaves a hard and beautiful surface.
The product is suitable for e.g. joinery, doors, hatches and metal surfaces indoors.

Element Täckfärg is a semigloss topcoat that adheres well to old painted surfaces and gives a hard and durable surface. The paint flows well and does not yellow.
It is intended for painting radiators and pipes used to maintain normal temperatures in living and office spaces (max 80-90°C), as well as sheet metal details such as cabinets and ceiling panels.

Häfta Grundfärg is an acrylate primer for hard, nonabsorbent surfaces. It has very good adhesion and good flowability.
It is primarily intended for indoor surfaces but can also be used on outdoor details that do not require anti-corrosion treatment.
With its very good flowability, it is especially well suited for smooth industrially lacquered interior details such as strips, kitchen doors and door leafs but also works well on aluminium, copper, galvanized/zinced surfaces and hard PVC.

Klar Trälack Blank is a very light, glossy clear lacquer. It dries quickly and provides a hard and durable surface.
It is suitable for painting bare wood and previously lacquered or varnished wood surfaces indoors. Klar Trälack is not suitable for waxed or oiled surfaces or stabilized wood.

Klar Trälack Halvblank is a very light, semigloss clear lacquer. It dries quickly and provides a hard and durable surface.
It is suitable for painting bare wood and previously lacquered or varnished wood surfaces indoors. Klar Trälack is not suitable for waxed or oiled surfaces or stabilized wood.

Klar Trälack Matt is a very light, matt clear lacquer. It dries quickly and provides a hard and durable surface.
It is suitable for painting bare wood and previously lacquered or varnished wood surfaces indoors. Klar Trälack is not suitable for waxed or oiled surfaces or stabilized wood.

Milltex Multistopp Grundfärg is a sealing primer for the prevention of discoloration on interior wooden surfaces. It prevents bleed-through from wood knots and other dark spots and covers yellowed and darkened wood surfaces. A special technology binds wood extracts to the primer layer, leaving the topcoat clean.
It is intended for priming wall and ceiling panels, wooden floors, wood furniture, skirting, doors, and windows.
The product is suitable for new and previously painted or lacquered, knotty, and yellowed wood surfaces in dry interior spaces.

Servalac Grundfärg is an acrylate primer that reduces the absorption in the substrate and provides good conditions for painting with a topcoat. It gives the top paint a smooth and fine surface. It is easy to work and has a fast drying time.
The product is suitable for e.g. joinery, doors, hatches and furniture.

Servalac Blank Lackfärg is a glossy laquer that leaves a hard and smooth surface. The paint is easy to apply and dries quickly.
It is intended for painting e.g. joinery, doors, hatches and furniture.

Servalac Halvblank Lackfärg is a semigloss laquer that leaves a hard and smooth surface. The paint is easy to apply and dries quickly.
It is intended for painting e.g. joinery, doors, hatches and furniture.

Servalac Matt Lackfärg is a matt laquer that leaves a hard and smooth surface. The paint is easy to apply and dries quickly.
It is intended for painting e.g. joinery, doors, hatches and furniture.

Studio Golvfärg is a high-quality waterborne floor paint intended for wooden floors indoors.
The product is also suitable for painting stairs and skirting boards indoors.

Beckers

Decor Klarlack Blank is a transparent glossy lacquer that leaves a beautiful, strong, and durable surface.
It is intended for furniture, woodwork and other interior wooden surfaces. The product can also be used to protect decorative effects made with water-thinnable wood stains.

Decor Klarlack Halvblank is a transparent semigloss lacquer that leaves a beautiful, strong, and durable surface.
It is intended for furniture, woodwork and other interior wooden surfaces. The product can also be used to protect decorative effects made with water-thinnable wood stains.

Decor Klarlack Matt is a transparent matt lacquer that leaves a beautiful, strong, and durable surface.
It is intended for furniture, woodwork and other interior wooden surfaces. The product can also be used to protect decorative effects made with water-thinnable wood stains.

Elementfärg V is a semigloss paint that is used for painting heating elements and pipes indoors. It has good coverage, is completely yellowing proof, dries quickly, and gives an even surface.

Golvfärg Trä is a high-quality waterborne floor paint intended for the indoor painting of wooden floors. The paint contains no strong solvents and is therefore gentle on both you and the environment. The paint is easy to apply, has good coverage, and gives a durable surface.

Häftgrund is a quick-drying acrylic primer with very good adhesion to hard and non-absorbent surfaces.
It is primarily intended for industrially painted indoors surfaces, and galvanized, aluminium, copper and hard PVC surfaces. Häftgrund can also be used as a primer on small external parts that are not subject to corrosion protection requirements.

Kvist- och Spärrgrund is a sealing primer that prevents bleed-through from wood knots and other dark spots and covers yellowed and darkened wood surfaces. A special technology binds wood extracts to the primer layer, leaving the topcoat clean.
It is intended for priming wooden wall and ceiling panels, floors, furniture, skirting boards, doors, and windows.

Living Lackfärg Blank is a glossy enamel paint intended for painting furniture and joinery indoors. It is easy to paint with, levels well and dries quickly. The paint gives a smooth and beautiful surface that does not turn yellow. Because the paint is waterborne it has an insignificant odor during painting and drying.

Living Lackfärg Halvblank is a semigloss enamel paint intended for painting furniture and joinery indoors. It is easy to paint with, levels well and dries quickly. The paint gives a smooth and beautiful surface that does not turn yellow. Because the paint is waterborne it has an insignificant odor during painting and drying.

Living Lackfärg Matt is a matt enamel paint intended for painting furniture and joinery indoors. It is easy to paint with, levels well and dries quickly. The paint gives a smooth and beautiful surface that does not turn yellow. Because the paint is waterborne it has an insignificant odor during painting and drying.

Mood Professional Finish Lackfärg 05 is a full matt enamel paint intended for joinery and metal surfaces indoors. It is very nice to paint with and gives a very even, hard and durable surface.

Mood Professional Finish Lackfärg 40 is a semigloss enamel paint intended for joinery and metal surfaces indoors. It is very nice to paint with and gives a very even, hard and durable surface.

Mood Professional Finish Lackfärg 70 is a glossy enamel paint intended for joinery and metal surfaces indoors. It is very nice to paint with and gives a very even, hard and durable surface.

Primer Lackfärgsgrund is a high-quality waterborne primer suitable for woodwork, doors, trim and furniture indoors. It improves the adhesion of the topcoat and gives a rich and fine finish. Priming makes the surface look smoother and fuller by reducing the surfaces absorption.

Universo Pro Emalia do drewna i metalu Matt [10] is a waterborne matt enamel paint. It is non-yellowing, has a fast drying time, has good hiding power, and leaves a durable surface.
It is intended for indoor and outdoor painting of wooden and metal surfaces such as furniture, radiators, doors, and windows.

Universo Pro Emalia do drewna i metalu S-M [40] is a waterborne semimatt enamel paint. It is non-yellowing, has a fast drying time, has good hiding power, and leaves a durable surface.
It is intended for indoor and outdoor painting of wooden and metal surfaces such as furniture, radiators, doors, and windows.

Vivacolor

Furniture 30 is a semimatt waterborne wear-resistant acrylate paint for wooden and metal surfaces indoors. The paint is easy to apply, has very good levelling and the final surface is tough and non-yellowing.
It is intended for painting furniture, doors, wooden walls and panels, moldings, interior parts of windows, toys.
The product is suitable for painting new and previously painted fiberboard, cardboard, wooden and metal surfaces, also surfaces previously painted with alkyd and catalytic paints.

Radiator is a semimatt waterborne heat-resistant acrylate paint specially designed for painting radiators. The paint has very good levelling and the final surface is wear-resistant, easily washable, and non-yellowing.
It is intended for painting radiators, metal pipes etc. indoors.
The product is suitable for repainting surfaces previously painted with powder and alkyd paints. Not suitable for painting electric batteries.

Universal Akva Matt is a matt waterborne paint for wood and metal. It forms a durable decorative coating, has excellent adhesion to different types of substrates, is quick-drying and non-yellowing.
It is intended for the interior and exterior painting of furniture, doors, window frames, garden furniture etc.
The product is suitable for painting new and previously painted fiberboard, cardboard, wooden and metal surfaces. It is also suitable for repainting previously lacquered, painted or industrially painted wooden surfaces with no priming. Not recommended for painting powder coated aluminum surfaces.

Further information can be found at:
https://tikkurila.com/
https://tikkurila.pl/
https://alcro.dk/
https://alcro.no/
https://alcro.se/
https://beckers.dk/
https://beckers.no/
https://beckers.pl/
https://beckers.se/
https://vivacolor.ee/

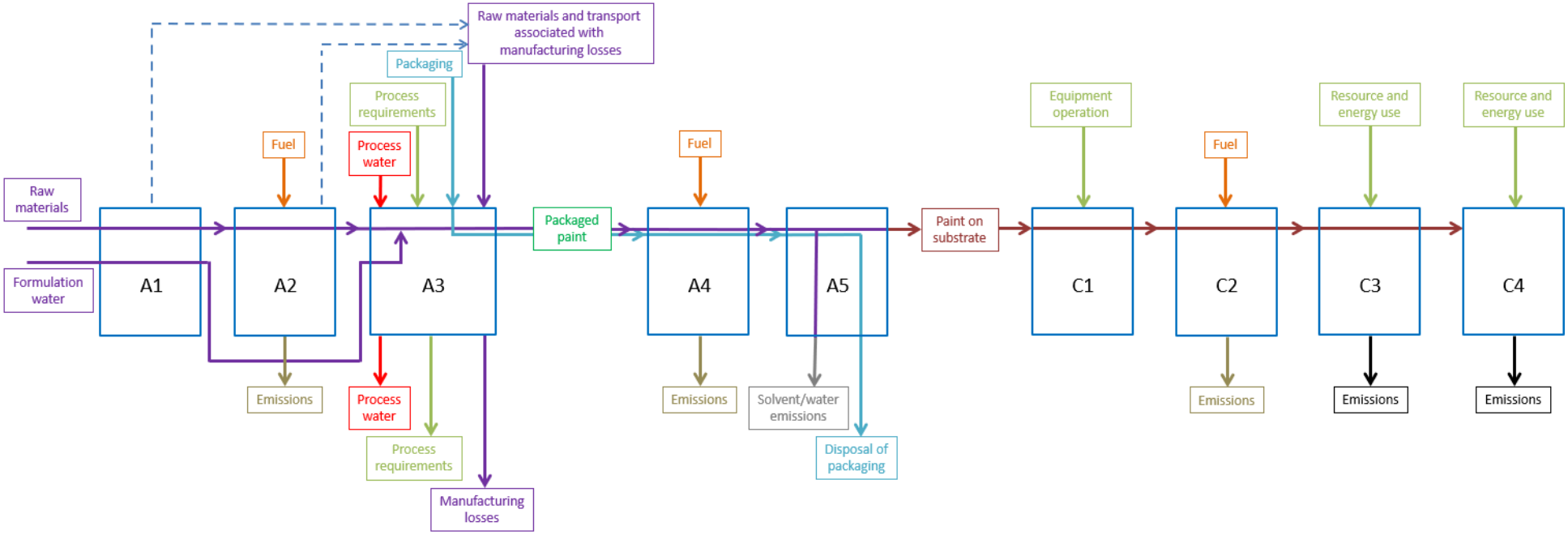
PRODUCT LIFE-CYCLE

SYSTEM BOUNDARY

This EPD covers the life-cycle modules listed in the following table. *Modules not declared = MND. Modules not relevant = MNR.*

Product stage			Assembly stage		Use stage							End of life stage				Beyond the system boundaries
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction Demolition	Transport	Waste processing	Disposal	Reuse Recovery Recycling
✓	✓	✓	✓	✓	MND	MND	MND	MND	MND	MND	MND	✓	✓	✓	✓	✓

LIFE-CYCLE STAGES DIAGRAM



MANUFACTURING AND PACKAGING (A1-A3)

The environmental impacts considered for the product stage cover the manufacturing of raw materials used in the production as well as packaging materials and other ancillary materials. Also, fuels used by machines, and handling of waste formed in the production processes at the manufacturing facilities are included in this stage. The study also considers the material losses occurring during the manufacturing processes as well as losses during electricity transmission.

The paint production process at the manufacturing facility consists of several separate steps. In the initial step water, powders, and additives are mixed together and then dispersed to a homogeneous paste. The following step is the let-down stage: binders, water, additives, etc. are mixed with the paste to obtain a ready-to-use paint. At the next stage, compliance of the product with specified quality parameters is checked. In the packaging stage, paint is filled into cans of various sizes on filling machines, loaded onto pallets by robots, and transferred to the warehouse. Eventually, the paint is transported to retailers and construction sites.

TRANSPORT AND INSTALLATION (A4-A5)

Transportation impacts occurred from final products delivery to construction site cover fuel direct exhaust emissions, environmental impacts of fuel production, as well as related infrastructure emissions.

The transportation distance is defined according to EPD Hub PCR. Average distance of transportation from production plant to building site is assumed to be 179 km and the transportation method is assumed to be lorry. Transportation does not cause losses as products are packaged properly.

PRODUCT USE AND MAINTENANCE (B1-B7)

This EPD does not cover the use phase.
Air, soil, and water impacts during the use phase have not been studied.

PRODUCT END OF LIFE (C1-C4, D)

Paint is usually not removed from substrates at end-of life, so the consumption of energy, natural resources, and the impacts of demolition are assumed to be negligible. All of the end-of-life product is assumed to be sent to the closest waste treatment facilities.
It is assumed that 75 % of the paint is disposed of by incineration with energy recovery. The remaining 25 % of paint is taken to landfill for final disposal.
The packaging materials (wooden pallets, metal and plastic cans, cardboard, and packaging film) are sent to recycling and have benefits beyond the system boundary.

LIFE-CYCLE ASSESSMENT

CUT-OFF CRITERIA

The study does not exclude any modules or processes which are stated mandatory in the reference standard and the applied PCR. The study does not exclude any hazardous materials or substances. The study includes all major raw material and energy consumption. All inputs and outputs of the unit processes, for which data is available for, are included in the calculation. There is no neglected unit process more than 1% of total mass or energy flows. The module specific total neglected input and output flows also do not exceed 5% of energy usage or mass.

ALLOCATION, ESTIMATES AND ASSUMPTIONS

Allocation is required if some material, energy, and waste data cannot be measured separately for the product under investigation. All allocations are done as per the reference standards and the applied PCR. In this study, allocation has been done in the following ways:

Data type	Allocation
Raw materials	No allocation
Packaging materials	Allocated by mass or volume
Ancillary materials	Allocated by mass or volume
Manufacturing energy and waste	Allocated by mass or volume

AVERAGES AND VARIABILITY

Type of average	Multiple products
Averaging method	Represented by the highest production volume product
Variation in GWP-fossil for A1-A3	35%

This EPD is made for a representative product with the highest production volume. The variation in GWP-fossil impact for A1-A3 modules among the products is +29% for the highest impact product and -17% for the lowest impact product.

LCA SOFTWARE AND BIBLIOGRAPHY

This EPD has been created using One Click LCA EPD Generator. The LCA and EPD have been prepared according to the reference standards and ISO 14040/14044. Ecoinvent v3.8 and One Click LCA databases were used as sources of environmental data.

ENVIRONMENTAL IMPACT DATA

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP – total[1)]	kg CO_2e	1,78E+00	9,69E-02	5,30E-01	2,41E+00	3,14E-02	1,21E-02	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	9,99E-01	5,42E-03	-1,21E-01
GWP – fossil	kg CO_2e	1,77E+00	9,68E-02	5,35E-01	2,40E+00	3,14E-02	5,92E-03	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	1,01E+00	7,43E-03	-1,24E-01
GWP – biogenic	kg CO_2e	8,13E-03	1,14E-05	-6,21E-03	1,93E-03	0,00E+00	6,13E-03	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	-6,03E-03	-2,01E-03	3,06E-03
GWP – LULUC	kg CO_2e	6,37E-04	4,39E-05	3,27E-04	1,01E-03	1,32E-05	4,96E-06	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	1,98E-04	1,45E-06	-1,56E-05
Ozone depletion pot.	kg $CFC_{-11}e$	1,80E-07	2,28E-08	3,48E-08	2,38E-07	7,43E-09	4,15E-10	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	1,45E-07	4,30E-10	-4,35E-09
Acidification potential	mol H^+e	2,85E-02	1,05E-03	2,50E-03	3,21E-02	9,37E-05	1,77E-05	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	1,98E-03	1,20E-05	-4,95E-04
EP-freshwater[2)]	kg Pe	1,39E-03	5,95E-07	2,23E-05	1,41E-03	2,38E-07	1,25E-07	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	6,26E-06	2,30E-08	-4,50E-06
EP-marine	kg Ne	1,71E-03	2,56E-04	4,86E-04	2,45E-03	1,93E-05	5,72E-06	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	3,35E-04	4,08E-06	-9,96E-05
EP-terrestrial	mol Ne	1,62E-02	2,85E-03	5,33E-03	2,44E-02	2,14E-04	4,79E-05	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	3,78E-03	4,48E-05	-1,16E-03
POCP ("smog")[3)]	kg NMVOCe	6,80E-03	8,09E-04	1,75E-03	9,36E-03	8,32E-05	3,45E-05	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	1,13E-03	1,44E-05	-5,91E-04
ADP-minerals & metals[4)]	kg Sbe	6,48E-06	2,14E-07	3,51E-06	1,02E-05	1,12E-07	7,90E-08	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	3,54E-06	4,79E-09	-2,11E-06
ADP-fossil resources	MJ	1,07E+01	1,45E+00	4,92E+00	1,71E+01	4,80E-01	4,11E-02	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	7,43E+00	3,28E-02	-1,65E+00
Water use[5)]	m^3e depr.	1,33E+00	6,14E-03	4,76E-01	1,81E+00	2,34E-03	9,29E-04	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	1,08E-01	1,96E-04	-2,73E-02

1) GWP = Global Warming Potential
2) EP = Eutrophication potential. Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO4e
3) POCP = Photochemical ozone formation
4) ADP = Abiotic depletion potential
5) EN 15804+A2 disclaimer for Abiotic depletion and Water use and optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

ADDITIONAL (OPTIONAL) ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Particulate matter	Incidence	7,97E-08	8,88E-09	2,28E-08	1,11E-07	2,86E-09	3,85E-10	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	1,69E-08	2,39E-10	-7,66E-09
Ionizing radiation[6)]	kBq U235e	7,80E-02	7,32E-03	1,99E-01	2,85E-01	2,53E-03	4,22E-04	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	4,24E-02	1,61E-04	3,39E-03
Ecotoxicity (freshwater)	CTUe	3,57E+01	1,14E+00	1,24E+01	4,92E+01	4,07E-01	2,90E-01	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	1,78E+01	1,16E-01	-3,76E+00
Human toxicity, cancer	CTUh	4,63E-08	3,91E-11	1,84E-09	4,82E-08	1,23E-11	8,27E-12	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	2,65E-10	1,04E-12	8,83E-10
Human tox. non-cancer	CTUh	2,84E-07	1,08E-09	8,08E-09	2,93E-07	4,00E-10	1,09E-10	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	8,88E-09	3,09E-11	-2,61E-09
SQP[7)]	-	5,31E+00	1,33E+00	4,75E+00	1,14E+01	4,16E-01	1,03E-01	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	1,77E+00	7,94E-02	-9,08E-01

6) EN 15804+A2 disclaimer for Ionizing radiation, human health. This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator
7) SQP = Land use related impacts/soil quality.

USE OF NATURAL RESOURCES

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Renew. PER as energy[8)]	MJ	1,00E+00	1,69E-02	1,23E+00	2,24E+00	7,16E-03	3,68E-03	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	1,72E-01	6,04E-04	-2,01E-01
Renew. PER as material	MJ	1,84E-03	0,00E+00	1,00E-01	1,02E-01	0,00E+00	-1,00E-01	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	-1,37E-03	-4,55E-04	-8,10E-02
Total use of renew. PER	MJ	1,00E+00	1,69E-02	1,33E+00	2,35E+00	7,16E-03	-9,68E-02	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	1,71E-01	1,49E-04	-2,82E-01
Non-re. PER as energy	MJ	1,02E+01	1,45E+00	9,05E+00	2,07E+01	4,80E-01	4,11E-02	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	7,43E+00	3,28E-02	-1,27E+00
Non-re. PER as material	MJ	6,50E-01	0,00E+00	6,07E-01	1,26E+00	0,00E+00	-6,13E-01	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	-4,83E-01	-1,61E-01	8,71E-02
Total use of non-re. PER	MJ	1,08E+01	1,45E+00	9,66E+00	2,20E+01	4,80E-01	-5,72E-01	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	6,95E+00	-1,28E-01	-1,18E+00
Secondary materials	kg	2,76E-02	4,58E-04	5,02E-02	7,82E-02	1,65E-04	8,73E-05	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	1,16E-02	1,18E-05	7,29E-02
Renew. secondary fuels	MJ	3,39E-04	3,30E-06	2,66E-03	3,00E-03	1,73E-06	2,53E-06	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	1,55E-05	4,51E-07	-9,83E-06
Non-ren. secondary fuels	MJ	0,00E+00	0,00E+00	4,60E-05	4,60E-05	0,00E+00	0,00E+00	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water	m^3	3,33E-02	1,69E-04	7,18E-03	4,07E-02	6,48E-05	2,36E-05	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	2,77E-03	3,53E-05	-4,26E-04

8) PER = Primary energy resources.

END OF LIFE – WASTE

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste	kg	1,85E-01	1,63E-03	1,17E-01	3,04E-01	5,64E-04	3,94E-04	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	4,02E-01	0,00E+00	-3,52E-02
Non-hazardous waste	kg	2,93E+00	2,46E-02	8,53E-01	3,80E+00	1,00E-02	9,05E-03	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	1,34E-01	-3,45E-01
Radioactive waste	kg	3,73E-05	1,01E-05	7,50E-05	1,22E-04	3,29E-06	2,45E-07	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,25E-07

END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1	A2	A3	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	0,00E+00	0,00E+00	0,00E+00	MND	MND	MND	MND	MND	MND	MND	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	1,60E-01	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for energy rec	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy	MJ	0,00E+00	0,00E+00	5,64E-03	5,64E-03	0,00E+00	0,00E+00	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	1,91E-01	0,00E+00	0,00E+00

ENVIRONMENTAL IMPACTS – EN 15804+A1, CML / ISO 21930

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Global Warming Pot.	kg CO_2e	1,76E+00	9,60E-02	5,27E-01	2,38E+00	3,11E-02	7,02E-03	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	1,00E+00	6,19E-03	-1,17E-01
Ozone depletion Pot.	kg CFC_{-11}e	1,68E-07	1,80E-08	3,09E-08	2,16E-07	5,89E-09	3,37E-10	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	1,23E-07	3,41E-10	-4,78E-09
Acidification	kg SO_2e	2,55E-02	8,45E-04	2,05E-03	2,84E-02	7,66E-05	1,40E-05	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	1,65E-03	9,09E-06	-4,01E-04
Eutrophication	kg PO_4^3e	2,62E-03	1,14E-04	9,23E-04	3,65E-03	1,67E-05	2,17E-05	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	4,33E-04	2,22E-04	-1,85E-04
POCP (“smog”)	kg C_2H_4e	1,73E-03	2,54E-05	1,49E-04	1,91E-03	3,77E-06	1,14E-06	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	6,55E-05	1,20E-06	-6,44E-05
ADP-elements	kg Sbe	1,84E-04	2,08E-07	3,64E-06	1,88E-04	1,09E-07	7,85E-08	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	2,67E-06	4,63E-09	-2,11E-06
ADP-fossil	MJ	3,21E+01	1,45E+00	9,43E+00	4,29E+01	4,80E-01	4,11E-02	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	7,43E+00	3,28E-02	-1,65E+00

ENVIRONMENTAL IMPACTS – TRACI 2.1. / ISO 21930

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Global Warming Pot.	kg CO_2e	7,70E-01	9,60E-02	5,26E-01	1,39E+00	3,11E-02	6,78E-03	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	9,99E-01	5,50E-03	-1,18E-01
Ozone Depletion	kg CFC_{-11}e	6,93E-08	1,80E-08	3,26E-08	1,20E-07	5,89E-09	3,36E-10	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	1,23E-07	3,40E-10	-4,77E-09
Acidification	kg SO_2e	9,04E-01	4,83E-02	7,02E-02	1,02E+00	4,20E-03	8,34E-04	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	8,73E-02	7,74E-04	-2,23E-02
Eutrophication	kg Ne	4,73E-04	5,69E-05	1,76E-04	7,06E-04	1,12E-05	2,70E-06	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	1,73E-04	1,42E-06	-1,71E-05
POCP (“smog”)	kg O_3e	1,81E-03	6,60E-04	1,03E-02	1,28E-02	4,99E-05	1,08E-05	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	8,54E-04	1,10E-05	-2,84E-04
ADP-fossil	MJ	1,11E+00	2,02E-01	5,47E-01	1,86E+00	6,60E-02	4,12E-03	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	9,71E-01	4,36E-03	-1,49E-01

VERIFICATION STATEMENT

VERIFICATION PROCESS FOR THIS EPD

This EPD has been verified in accordance with ISO 14025 by an independent, third-party verifier by reviewing results, documents and compliancy with reference standard, ISO 14025 and ISO 14040/14044, following the process and checklists of the program operator for:

- This Environmental Product Declaration
- The Life-Cycle Assessment used in this EPD
- The digital background data for this EPD

Why does verification transparency matter? Read more online
This EPD has been generated by One Click LCA EPD generator, which has been verified and approved by the EPD Hub.

THIRD-PARTY VERIFICATION STATEMENT

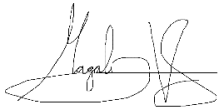
I hereby confirm that, following detailed examination, I have not established any relevant deviations by the studied Environmental Product Declaration (EPD), its LCA and project report, in terms of the data collected and used in the LCA calculations, the way the LCA-based calculations have been carried out, the presentation of environmental data in the EPD, and other additional environmental information, as present with respect to the procedural and methodological requirements in ISO 14025:2010 and reference standard.

I confirm that the company-specific data has been examined as regards to plausibility and consistency; the declaration owner is responsible for its factual integrity and legal compliance.

I confirm that I have sufficient knowledge and experience of construction products, this specific product category, the construction industry, relevant standards, and the geographical area of the EPD to carry out this verification.

I confirm my independence in my role as verifier; I have not been involved in the execution of the LCA or in the development of the declaration and have no conflicts of interest regarding this verification.

Magaly González Vázquez, as an authorized verifier acting for EPD Hub Limited
19.01.2024



VERIFIED ISO 14025