ENVIRONMENTAL PRODUCT DECLARATION

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

Stainless steel post railing
Q-railing

EPD HUB, HUB-2754
Publishing date 15 February 2025, last updated on 15 February 2025, valid until 14 February 2030.

GENERAL INFORMATION

MANUFACTURER

Manufacturer	Q-railing Europe GmbH & Co. KG
Address	Marie-Curie-Str. 8-14, 46446 Emmerich am Rhein, Germany
UK office	Q-Railing UK
UK address	Unit 1, Tunstall Arrow, James Brindley Way, Stoke-on-Trent, Staffordshire, ST6 5GF, UK
UK contact details	sales.uk@q-railing.com
Website	https://www.q-railing.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 1.1, 5 Dec 2023
Sector	Construction product
Category of EPD	Third party verified EPD
Parent EPD number	n/a
Scope of the EPD	Cradle to gate with modules C1-C4, D
EPD author	Sam McGarrick (Blue Marble Environmental Partnerships Ltd.)
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal verification ☑ 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.

PRODUCT

Product name	Stainless steel post railing
Additional labels	Q-line 42, Q-line 48 Square line 40x40 and Square line 60*30 Top and Fascia mount
Product reference	Dimensions of 1100mm x 1000mm
Place of production	Emmerich am Rhein, Germany
Period for data	2023 (Calendar Year)
Averaging in EPD	Multiple products
Variation in GWP-fossil for A1-A3	-28% / +13%

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 linear metre
Declared unit mass	29.017 kg
GWP-fossil, A1-A3 ($kgCO_2e$)	8.81E+01
GWP-total, A1-A3 ($kgCO_2e$)	8.76E+01
Secondary material, inputs (%)	24.8
Secondary material, outputs (%)	29.3
Total energy use, A1-A3 (kWh)	346
Net freshwater use, A1-A3 (m^3)	0.75

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

Q-railing is the premium brand in railing systems. Combining innovation, quality, functionality and style with a very high-level of safety. The right railing solution can be sourced for every project from private homes to commercial properties, indoor and outdoor use, complete solutions of stylish balustrades or handrails and accessories. A global team of experts support the realisation of every project, deliver unique designs and unmatched product performance.

PRODUCT DESCRIPTION

Stainless steel is a popular choice for balustrades due to its outstanding features. It is a robust material that is both low-maintenance and long-lasting. It is also highly flexible in terms of its potential shapes and designs. Whether wanting to achieve a modern, minimalistic, or classic look, a stainless steel post railing adds an elegant and timeless charm to stairs, balconies, galleries and outdoor spaces. The stainless steel post railings are versatile. The railings can be mounted both on the ground and on the side. The components of the Square Line and Q-line can be combined with each other in a variety of ways and enable simple installation without welding. And a number of infill options are possible.

Note: This EPD applies to railing components used as part of a system. In order to create a representative average, the following product systems were considered:

- Stainless Steel Post Systems with Cable infill
- Stainless Steel Post Systems with Glass infill
- Stainless Steel Post Systems with Crossbar infill

The product system with the glass infill was selected as the representative product and highly typical due to its typical raw material composition and typical GWP (fossil) content within the possible combination of components. The results of this EPD relate to a stainless steel finished product. The dimensions of the railing given in this EPD are 1100mm x 1000mm and will need to be scaled according to the exact specification required. The glass infill used in the representative product has been modelled as 5.5.2 PVB laminated glass.

Further information can be found at https://www.q-railing.com/

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass %	Material origin
Metals	31	Global
Minerals	69	Global
Fossil materials	<1	Global
Bio-based materials	0	n/a

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	0.443

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1 linear metre
Mass per declared unit	29.017 kg
Functional unit	n/a
Reference service life	n/a

SUBSTANCES, REACH - VERY HIGH CONCERN

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

PRODUCT LIFE-CYCLE

SYSTEM BOUNDARY

This EPD covers the life-cycle modules listed in the following table.

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		
X	X	X	MND	MND	MND	MND	MND	MND	MND	MND	MND	X	X	X	X	X		
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

Modules not declared = MND. Modules not relevant = MNR

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 product system is comprised of an assembly of components manufactured from various raw materials including metals (stainless steel), smaller components from fossil-based materials (e.g. synthetic rubber), and components from mineral raw materials (e.g. glass infill). The glass infill is optional within the product system, but has been modelled for the base case in this average EPD as it represents a highly typical specification. (A1).

Components within the product system are sourced globally and transported via road and sea to Q-railing's warehouse in Germany. Transportation via road uses lorries of various sizes and efficiency ratings. Transportation via sea is through a combination of container ship and inland barge. Where multiple suppliers are used during the period the data relates to, a weighted average of transportation distances has been calculated based on quantities supplied and distances travelled during the period. (A2).

Material processing into componentry has been accounted for at the raw material stage (A1).

Manufacturing energy consumption therefore applies to medium-voltage electricity from renewable sources supplied to the German warehouse facility for the purpose of stockpiling and preparing components for onward distribution to customers / regional warehouses. (A3).

Packaging of components includes cardboard, adhesive tape and various types of plastic packaging films and protectors. Packaging is applied at a component level at the point the components are sourced and is not replaced or added to at the German warehouse. (A3).

TRANSPORT AND INSTALLATION (A4-A5)

This EPD does not cover transportation to site and installation.
Packaging end-of-life is considered in modules C3/C4.

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)

At the end-of-life the product is assumed to be removed from the building during deconstruction / demolition (C1).

Transportation to waste treatment is assumed to be 50km via > 32 tonne lorry. (C2). Stainless steel components are assumed to be recycled at a rate of 85% with the remaining 15% assumed to reach landfill (World Steel Association, 2021[1]).

Metals for recycling are collected, sorted and pressed (C3). Metals for landfill receive no further processing prior to waste treatment (C4).

Based on the Glass for Europe's 2024 conclusion that almost all building glass is landfilled[2], this study conservatively assumes that the glass infill reaches landfill with no benefits. This is due to the nature of building demolition and challenges in segregation of flat glass within waste streams. In the future this may be adjusted as recycling practices improve (C4).

Similarly, smaller quantities of rubber components are assumed to not be collected separately and instead assumed to reach landfill with no benefits (C4).

Packaging waste is assumed to reach end-of-life at the point of installation but are accounted for in Module C3/C4 due to Module A5 not being declared in this EPD. Cardboard packaging is assumed to be recycled at a rate of 80% with the remaining 20% assumed to reach landfill (Eurostat, 2022[3]).

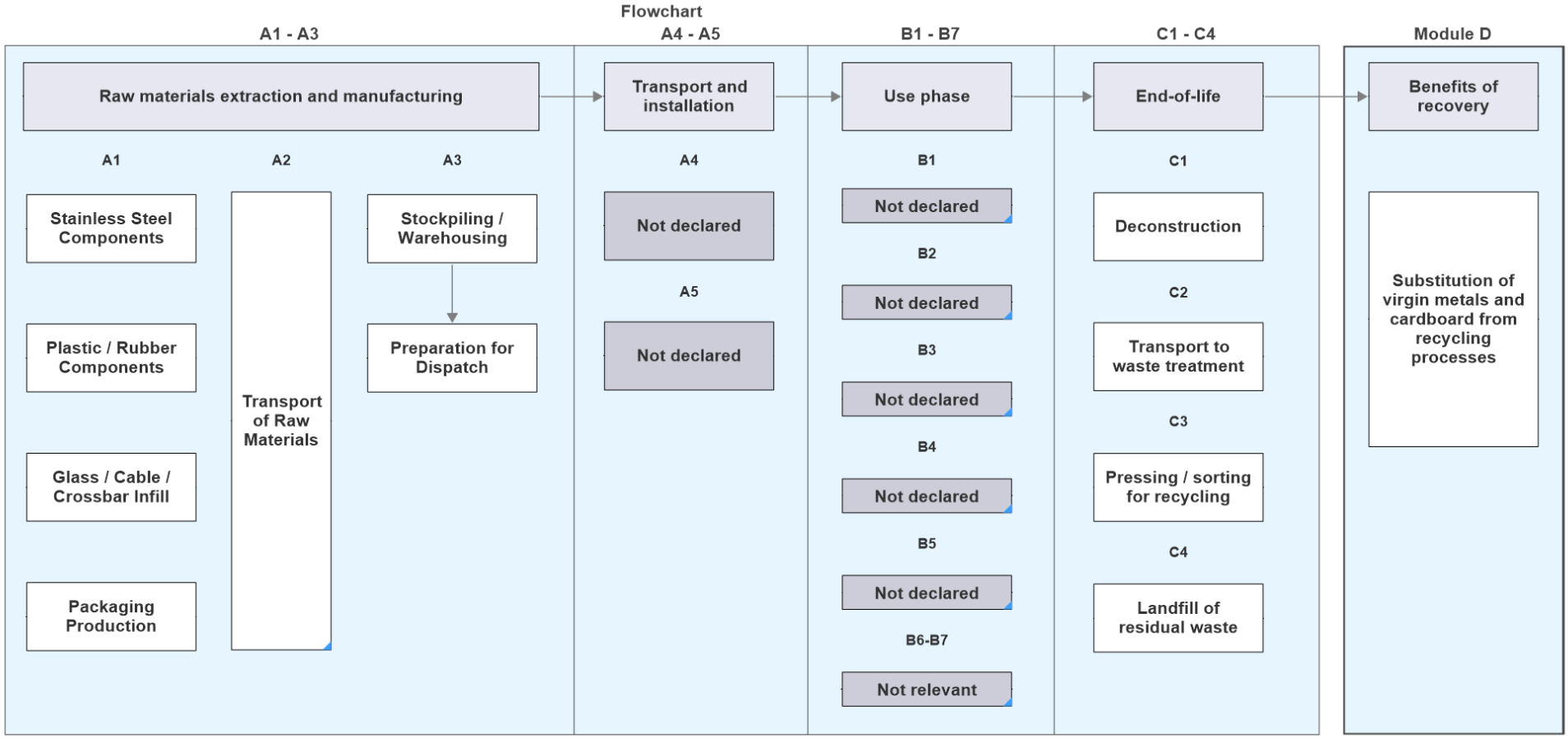
Cardboard for recycling is collected and sorted (C3). Cardboard for landfill receives no further processing prior to waste treatment (C4).

All other forms of packaging (plastic, adhesives etc.) are conservatively assumed to reach landfill with no benefits. (C4).

Module D accounts for the benefits and loads beyond the system boundary. The benefits from the provision of recyclates (scrap steel, cardboard packaging) to subsequent lifecycles are expressed as a negative figure, after first deducting the loads of the recycling processes. (D).

[1] World Steel Association (2021). Life cycle inventory (LCI) study. https://worldsteel.org/wp-content/uploads/2021-LCA-Study-Report.pdf
[2] Glass for Europe (2024). https://glassforeurope.com/manifesto-2024-2029-incentivise-the-recycling-of-old-glazing/
[3] Eurostat (2022). https://ec.europa.eu/eurostat/web/waste/database?node_code=env_waspac

MANUFACTURING PROCESS



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 material	No allocation
Ancillary materials	No allocation
Manufacturing energy and waste	Allocated by mass or volume

AVERAGES AND VARIABILITY

Type of average	Multiple products
Averaging method	Representative product
Variation in GWP-fossil for A1-A3	-28% / +13%

This EPD applies to railing components used as part of a system.

In order to create a representative average, the following product systems were considered:

- Stainless Steel Post Systems with Cable infill (taken to be the **minimum** case product system for GWP fossil)
- Stainless Steel Post Systems with Glass infill (the **base case**)
- Stainless Steel Post Systems with Crossbar infill (taken to be the **maximum** case product system for GWP fossil)

The base case product system was selected as highly typical due to its typical raw material composition and typical GWP (fossil) content within the possible combination of components. The glass infill used in the base case has been modelled as 5.5.2 PVB laminated glass.

The combination of components within this average all share an equivalent purpose. Product systems within this range have very similar raw material composition.

For the stainless steel post railing, the variance against the base case GWP fossil is shown below:

MAX GWP (Fossil) value: 104.66 kg CO_2e / m
MIN GWP (Fossil) value: 66.89 kg CO_2e / m
Base Case Product System (Fossil) value: 92.62 kg CO_2e / m

Variance from base case product (max +/- 50%):

+ 13 % Max
- 28 % Min

SENSITIVITY ANALYSIS FOR POWDER COATING

Optionally, the product system is available in a powder coated (PC) finish. A sensitivity analysis has been conducted to assess the effects of a PC finish on the overall results.

For the purpose of the sensitivity analysis the maximum case product system (Stainless steel posts with crossbar infill) was taken for comparison as it contained the largest quantity of components capable of being coated and surface area for coating.

Surface area of PC finish was calculated for each component on the basis of the dimensions and approximate shape of the component and an assumption that only the outside surface area of the component would be coated. The total surface area for coating was then combined with the relevant secondary data for powder coating of the applicable material.

A separate LCA model was then prepared for the PC version of the product system. The results of the sensitivity analysis demonstrate that the application of coating powder did not increase the GWP Fossil (A1-A3) impacts of the product system by more than +/-50%.

See table below for full details.

	A1-A3 fossil GWP (kg CO_2e)	Percentage of Change (%)
Without powder coating	104.66	0
With powder coating	105.72	1

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. The EPD Generator uses Ecoinvent v3.10 and One Click LCA databases 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	8.47E+01	2.50E+00	3.78E-01	8.76E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	3.42E-02	1.56E-01	7.49E-01	3.87E-01	-3.24E+00
GWP – fossil	kg CO_2e	8.36E+01	2.50E+00	2.00E+00	8.81E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	3.42E-02	1.56E-01	2.29E-01	2.46E-01	-3.25E+00
GWP – biogenic	kg CO_2e	1.01E+00	0.00E+00	-1.67E+00	-6.61E-01	MND	MND	MND	MND	MND	MND	MND	MND	MND	0.00E+00	0.00E+00	5.20E-01	1.42E-01	0.00E+00
GWP – LULUC	kg CO_2e	6.48E-02	1.29E-03	4.68E-02	1.13E-01	MND	MND	MND	MND	MND	MND	MND	MND	MND	2.00E-06	5.55E-05	2.10E-04	1.28E-04	9.19E-03
Ozone depletion pot.	kg CFC-$_{11}$e	8.06E-07	3.60E-08	6.65E-08	9.08E-07	MND	MND	MND	MND	MND	MND	MND	MND	MND	5.27E-10	3.26E-09	2.32E-09	6.12E-09	-2.03E-08
Acidification potential	mol H^+e	4.74E-01	6.92E-02	6.55E-03	5.50E-01	MND	MND	MND	MND	MND	MND	MND	MND	MND	4.29E-04	3.69E-04	2.32E-03	1.66E-03	-1.76E-02
EP-freshwater[2)]	kg Pe	3.43E-03	1.05E-05	9.22E-05	3.53E-03	MND	MND	MND	MND	MND	MND	MND	MND	MND	5.72E-08	1.26E-06	9.37E-06	2.70E-06	-2.60E-05
EP-marine	kg Ne	8.05E-02	1.72E-02	2.87E-03	1.01E-01	MND	MND	MND	MND	MND	MND	MND	MND	MND	1.98E-04	9.47E-05	5.12E-04	8.63E-04	-2.68E-03
EP-terrestrial	mol Ne	9.14E-01	1.92E-01	2.14E-02	1.13E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	2.17E-03	1.05E-03	5.82E-03	6.81E-03	-4.64E-02
POCP ("smog")[3)]	kg NMVOCe	2.86E-01	5.22E-02	7.07E-03	3.45E-01	MND	MND	MND	MND	MND	MND	MND	MND	MND	6.07E-04	6.41E-04	1.72E-03	2.47E-03	-1.44E-02
ADP-minerals & metals[4)]	kg Sbe	1.74E-03	2.73E-06	8.08E-06	1.75E-03	MND	MND	MND	MND	MND	MND	MND	MND	MND	1.49E-08	4.47E-07	1.24E-05	5.25E-07	-2.85E-06
ADP-fossil resources	MJ	9.78E+02	3.10E+01	3.23E+01	1.04E+03	MND	MND	MND	MND	MND	MND	MND	MND	MND	4.43E-01	2.35E+00	2.63E+00	5.23E+00	-2.25E+01
Water use[5)]	m^3e depr.	2.27E+01	8.96E-02	2.90E+00	2.57E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	5.73E-04	1.18E-02	4.02E-02	2.49E-02	3.56E-01

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	6.42E-06	8.53E-08	6.21E-08	6.57E-06	MND	MND	MND	MND	MND	MND	MND	MND	MND	5.92E-10	1.52E-08	3.13E-08	3.71E-08	-3.17E-07
Ionizing radiation[6)]	kBq U235e	2.46E+00	5.92E-03	4.50E-02	2.52E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	4.60E-05	1.03E-03	3.90E-03	1.97E-03	1.54E-01
Ecotoxicity (freshwater)	CTUe	7.80E+02	5.46E+00	1.39E+01	8.00E+02	MND	MND	MND	MND	MND	MND	MND	MND	MND	3.03E-02	5.56E-01	2.15E+00	2.71E+00	-9.67E+00
Human toxicity, cancer	CTUh	1.69E-06	1.06E-08	6.72E-09	1.71E-06	MND	MND	MND	MND	MND	MND	MND	MND	MND	3.33E-11	1.00E-09	1.97E-09	1.31E-09	-4.93E-09
Human tox. non-cancer	CTUh	1.52E-06	8.89E-09	1.27E-08	1.54E-06	MND	MND	MND	MND	MND	MND	MND	MND	MND	6.86E-11	1.55E-09	1.22E-08	2.30E-09	-3.74E-08
SQP[7)]	-	4.38E+02	4.62E+00	4.78E+01	4.91E+02	MND	MND	MND	MND	MND	MND	MND	MND	MND	2.84E-02	2.36E+00	4.75E+00	1.22E+01	-9.12E+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	1.98E+02	2.43E-01	7.93E+00	2.06E+02	MND	MND	MND	MND	MND	MND	MND	MND	MND	1.40E-03	3.72E-02	-1.38E+01	-3.87E+00	-1.43E+01
Renew. PER as material	MJ	0.00E+00	0.00E+00	1.43E+01	1.43E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	0.00E+00	0.00E+00	-1.14E+01	-2.85E+00	0.00E+00
Total use of renew. PER	MJ	1.98E+02	2.43E-01	2.22E+01	2.20E+02	MND	MND	MND	MND	MND	MND	MND	MND	MND	1.40E-03	3.72E-02	-2.52E+01	-6.72E+00	-1.43E+01
Non-re. PER as energy	MJ	9.78E+02	3.10E+01	3.00E+01	1.04E+03	MND	MND	MND	MND	MND	MND	MND	MND	MND	4.43E-01	2.35E+00	2.63E+00	4.19E-01	-2.23E+01
Non-re. PER as material	MJ	2.16E-01	0.00E+00	2.63E+00	2.85E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	0.00E+00	0.00E+00	-3.73E-02	-2.81E+00	0.00E+00
Total use of non-re. PER	MJ	9.78E+02	3.10E+01	3.26E+01	1.04E+03	MND	MND	MND	MND	MND	MND	MND	MND	MND	4.43E-01	2.35E+00	2.59E+00	-2.39E+00	-2.23E+01
Secondary materials	kg	7.20E+00	1.46E-02	1.10E+00	8.32E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	4.45E-05	1.01E-03	3.30E-03	1.88E-03	4.44E-01
Renew. secondary fuels	MJ	3.10E-02	4.25E-05	1.05E-01	1.36E-01	MND	MND	MND	MND	MND	MND	MND	MND	MND	2.97E-07	1.28E-05	1.31E-04	3.53E-05	-3.10E-02
Non-ren. secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	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	6.84E-01	2.25E-03	6.82E-02	7.54E-01	MND	MND	MND	MND	MND	MND	MND	MND	MND	1.91E-05	3.41E-04	1.11E-03	-7.51E-02	1.52E-02

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	6.41E+01	4.20E-02	8.57E-02	6.42E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	1.80E-04	3.41E-03	2.16E-02	9.27E-03	-3.42E-01
Non-hazardous waste	kg	2.39E+02	5.89E-01	3.17E+00	2.43E+02	MND	MND	MND	MND	MND	MND	MND	MND	MND	2.97E-03	6.83E-02	5.92E-01	1.01E+02	-9.00E-01
Radioactive waste	kg	1.72E-03	3.68E-06	3.49E-05	1.76E-03	MND	MND	MND	MND	MND	MND	MND	MND	MND	2.69E-08	7.05E-07	2.41E-06	1.25E-06	1.66E-04

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	MND	MND	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	MND	MND	MND	MND	MND	MND	MND	MND	MND	0.00E+00	0.00E+00	8.52E+00	0.00E+00	0.00E+00
Materials for energy rec	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	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	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	0.00E+00	0.00E+00	0.00E+00	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	8.42E+01	2.49E+00	2.07E+00	8.88E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	3.40E-02	1.55E-01	2.52E-01	5.42E-01	-3.16E+00
Ozone depletion Pot.	kg $CFC_{-11}e$	6.78E-07	2.85E-08	5.42E-08	7.61E-07	MND	MND	MND	MND	MND	MND	MND	MND	MND	4.17E-10	2.59E-09	1.92E-09	4.89E-09	-3.10E-08
Acidification	kg SO_2e	3.93E-01	5.52E-02	4.88E-03	4.53E-01	MND	MND	MND	MND	MND	MND	MND	MND	MND	3.02E-04	2.93E-04	1.87E-03	1.24E-03	-1.30E-02
Eutrophication	kg PO_4^3e	5.63E-02	6.12E-03	4.78E-03	6.72E-02	MND	MND	MND	MND	MND	MND	MND	MND	MND	6.85E-05	7.30E-05	2.85E-04	6.26E-04	-1.01E-03
POCP (“smog”)	kg C_2H_4e	2.38E-02	2.75E-03	5.30E-04	2.71E-02	MND	MND	MND	MND	MND	MND	MND	MND	MND	2.47E-05	2.98E-05	1.24E-04	1.68E-04	-9.76E-04
ADP-elements	kg Sbe	1.71E-03	2.69E-06	8.04E-06	1.73E-03	MND	MND	MND	MND	MND	MND	MND	MND	MND	1.46E-08	4.36E-07	1.24E-05	5.10E-07	-2.51E-06
ADP-fossil	MJ	9.78E+02	3.10E+01	3.22E+01	1.04E+03	MND	MND	MND	MND	MND	MND	MND	MND	MND	4.43E-01	2.35E+00	2.63E+00	5.23E+00	-2.25E+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

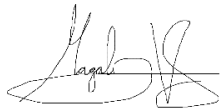
I hereby confirm that, following detailed examination, I have not established any relevant deviations by the studied Environmental Product Declaration (EPD), its LCA and project report, in terms of the data collected and used in the LCA calculations, the way the LCA-based calculations have been carried 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 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
15.02.2025



VERIFIED ISO 14025