Environmental Product Declaration

In accordance with ISO 14025:2006 and EN 15804:2012+A2:2019/AC:2021 for:

Precision and structural steel tubes and profiles

from

EMC Distribution Ltd.

Programme:	The International EPD System, www.environdec.com
Programme operator:	EPD International AB
Type of EPD:	EPD of multiple products, based on the average results of the product group
EPD registration number:	EPD-IES-0031530
Version date:	2026-05-11
Validity date:	2031-05-10
	An EPD may be updated or depublished if conditions change. To find the latest version of the EPD and to confirm its validity, see www.environdec.com



GENERAL INFORMATION

Programme Information	
Programme:	The International EPD® System
Address:	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
Website:	www.environdec.com
E-mail:	support@environdec.com

Product Category Rules (PCR)
CEN standard EN 15804 serves as the Core Product Category Rules (PCR)
Product Category Rules (PCR): ***Construction products 2019:14, version 2.0.1, valid until 2030-04-07, UN CPC Code: 4128***
PCR review was conducted by: Technical Committee of the International EPD® System. ***The review panel may be contacted via info@environdec.com***

Third-party Verification
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via: ☒ **EPD process certification* without a pre-verified LCA/EPD tool** Third-party verifier: **"Dedal - Attestation and Certification" Ltd.** Accredited by: EA BAS - Executive Agency "Bulgarian Accreditation Service" Accreditation number: 12 ОСП *EPD process certification involves an accredited certification body certifying and periodically auditing the EPD process and conducting external and independent verification of EPDs that are regularly published. More information can be found in the General Programme Instructions on www.envrondec.com.
Procedure for follow-up of data during EPD validity involves third party verifier: ☒ Yes ☐ No

The EPD owner has the sole ownership, liability, and responsibility for the EPD.
EPDs within the same product category but published in different EPD programmes, may not be comparable. For two EPDs to be comparable, they shall be based on the same PCR (including the same first-digit 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 identical scope in terms of included life-cycle stages (unless the excluded life-cycle stage is demonstrated to be insignificant); apply identical impact assessment methods (including the same version of characterisation factors); and be valid at the time of comparison.
For further information about comparability, see EN 15804 and ISO 14025.

In this Environmental Product Declaration (EPD), numbers are presented using the SI style with a decimal point (.) as the decimal mark and no thousand separator. Where appropriate, scientific notation (e.g. 1.15E+02) is used to ensure clarity and consistency across tables and indicators.

INFORMATION ABOUT EPD OWNER

Owner of the EPD: EMC Distribution Ltd.

Address: Bulgaria, Ruse 7000, Tutrakan 100 Blvd

Contact: Radoslav Tsonev, qs_manager@emc-distribution.eu

Contact information of the LCA practitioner: Geomanch Ltd., geomanch.studio@gmail.com

Description of the organisation:

EMC Distribution Ltd. is a Bulgarian industrial company specializing in the manufacture of precision electro-welded steel and aluminium tubes and profiles. Established in 1987, the company has developed into one of the leading producers in Bulgaria and the Balkan region, with a strong presence on the international markets and exports a significant portion of its production (over 75%) to European and global markets.

EMC Distribution's products are widely used in industries such as:

- Construction;
- Automotive manufacturing
- Furniture production;
- Electrical installations;
- Machinery and equipment manufacturing.

Product-related and management system-related certifications:

EMC Distribution operates under internationally recognized management systems, including:

- ISO 9001:2015 – Quality management;
- ISO 14001:2015 – Environmental management;
- ISO 50001 – Energy management;
- IATF 16949:2016 – Automotive quality standard.



PRODUCT INFORMATION

Product name: Precision and structural steel tubes and profiles



Product description:

The products consist of precision and structural electro-welded steel tubes and hollow profiles, manufactured from low-carbon and high-strength steel grades and intended for use in construction, industrial, and mechanical applications.

Product identification:

UN CPC code: 4128 – Tubes, pipes and hollow profiles, of steel.

European product standards:

- EN 10305-3 – Precision cold formed welded tubes
- EN 10305-5 – Cold formed welded square and rectangular tubes
- EN 10219 – Cold formed welded structural hollow sections
- EN 10255+A1 – Non-alloy steel tubes suitable for welding and threading
- EN 39 – Steel tubes for scaffolding

The product shapes include:

- Round tubes
- Square and rectangular hollow sections
- Oval and flat-oval profiles
- Custom-shaped hollow profiles

Technical characteristics and performance

Material composition:

The tubes and profiles are manufactured from cold-rolled steel coils, including:
Low-carbon cold-rolled steel: DC01, DC02, DC03, DC04, ST12, ST32, 08 kp
High-strength steel grades: HC260LA, HC300LA, HC340LA, HC380LA, HC420LA, DP600, DP800
Low-carbon cold-rolled steel sheets in coils, suitable for chrome-nickel coating applications.
Raw material is supplied as cold-rolled steel coils.

Typical production ranges include:

Diameter: Ø9.75 mm to Ø170 mm
Wall thickness: approx. 0.4 mm to 6.0 mm

Application and intended use:

These steel tubes and profiles are designed for use in:

- Construction sector
- Structural and load-bearing elements
- Frameworks, railings, façade systems
- Scaffolding systems
- Industrial applications
- Mechanical components
- Transport and automotive parts
- Furniture and interior systems
- Electrical and technical installations

Functional role in buildings:

- Provide structural strength and load-bearing capacity
- Enable modular construction and prefabrication
- Contribute to rigid and durable assemblies
- Support high mechanical resistance applications
- Allow versatile forming and welding
- Ensure long service life with appropriate corrosion protection

Restrictions and limitations:
Structural use must comply with EN 1993 (Eurocode 3) for steel structures.
Not suitable for highly corrosive environments without appropriate surface protection, applications requiring stainless or special alloy steels without specification, high-temperature structural applications without material verification.

HF welding technology ensures:

- Continuous production
- High dimensional accuracy
- Strong and uniform weld seams
- Minimal material loss
- Reduced waste generation
- No welding consumables

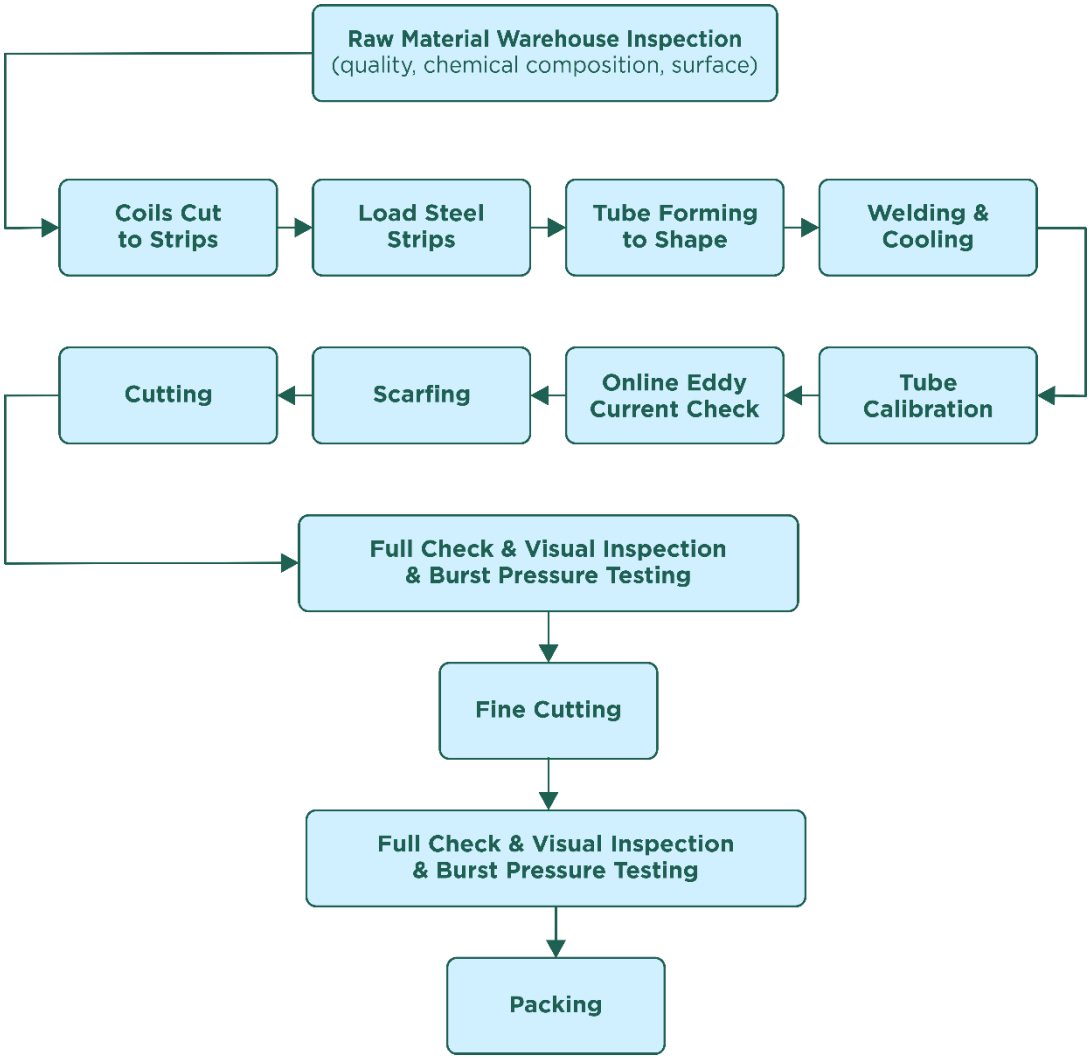
Name and location of production site: Factory of EMC Distribution Ltd. in Ruse, Bulgaria

Location: Bulgaria, Ruse 7000, Tutrakan 100 Blvd

Name of manufacturer(s): EMC Distribution Ltd.

Website: https://www.emc-distribution.eu/

Manufacturing process:



Technical service life:

Steel products are durable and the expected service life depends on application conditions and corrosion protection, typically 30-50+ years in construction applications.
Influencing factors: Steel grade, surface protection, environmental exposure (humidity, salinity, pollutants), and maintenance conditions. Steel products are fully recyclable without loss of properties.

Technical performance and chemical parameters:

Technical properties	Value	Unit	Chemical composition	Value	Unit
Product type	Cold rolled steel (DC01)	–	Carbon (C)	0.12	%
Thickness	0.85	mm	Manganese (Mn)	0.6	%
Width	1140	mm	Silicon (Si)	0.014	%
Tensile strength	270-410	MPa	Sulfur (S)	-	%
Yield strength	280	MPa	Phosphorus (P)	0.045	%
Elongation $_{80\%}$	28	%	Chromium (Cr)	-	%
Surface quality	A	–	Nickel (Ni)	-	%
Edge condition	HO	–	Copper (Cu)	-	%
Surface finish	m	–	Titanium (Ti)	-	%
Roughness (Ra)	1.75	µm	Molybdenum (Mo)	-	%
Density	7850	kg/m³	Carbon equivalent (CEV)	0.157	%

CONTENT DECLARATION

Mass (weight) per declared unit:

Product content	Mass, kg	Post-consumer recycled material, mass-% of product	Biogenic material, mass-% of product	Biogenic material, kg C/product or declared unit
Low Carbon Steel	1000	5.9	0	0
TOTAL	**1000**	5.9	**0**	**0**

Packaging materials	Mass, kg	Mass-% (versus the product)	Biogenic material, kg C/product or declared unit
Wooden beams and boards	4.01	0.4	2.00
TOTAL	4.01	0.4	**2.00**

1 kg biogenic carbon in the product/packaging is equivalent to the uptake of 44/12 kg of CO_2.

The product does not contain substances included in the Candidate List of Substances of Very High Concern (SVHC**)** according to Regulation (EC) No 1907/2006 (REACH) in concentrations exceeding 0.1% by weight of the product or any component of the product**.**

LCA INFORMATION

Declared unit: 1 metric ton (1000 kg) of steel tubes and profiles

Reference service life: Not applicable

Time representativeness: The foreground data used for the LCA calculation is collected from the factory of EMC Distribution Ltd. in Ruse, Bulgaria, for the full production year of 2025.

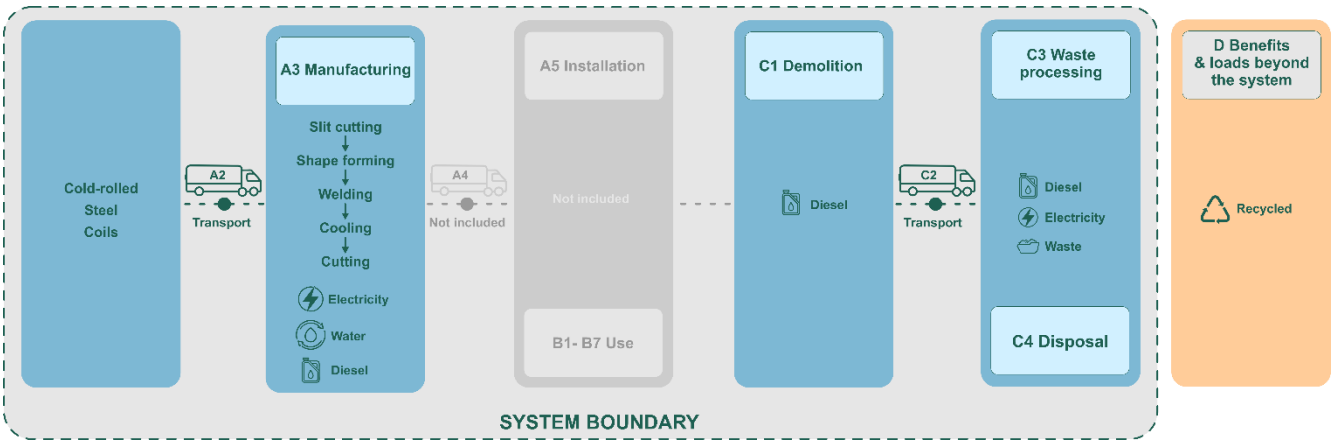
Geographical scope:

Modules A1-A3 (Product stage) are modelled to represent production in Bulgaria and the European Union, using regionally representative datasets. Where site-specific data were not available, global datasets were applied in accordance with EN 15804+A2.
Modules C1-C4 (end of life) are modelled according to the mandatory default data from the PCR to represent average scenarios that are considered representative for European as well Global practices.
Module D (benefits and loads beyond the system boundary) is modelled using Global average datasets.

Database(s) and LCA software used: Ecoinvent v3.11, EN15804 add-on, open LCA v2.5.0

Description of system boundaries: EPD "type a" according to the PCR - Cradle to gate with modules C1-C4 and module D (A1-A3 + C + D).

Process flow diagram:



Allocation:

There is no allocation of yield losses from A3 to co-products. According to EoW criteria from the PCR, the yield losses are processed as scrap waste.

In addition, all foreground input data for module A3 (electricity consumption, fuels, water use, raw materials, auxiliary materials, consumables, packaging materials, and transport activities) were quantified at site level and scaled to the declared unit of 1 metric ton of finished product, based on:

- the total annual production volumes;
- the total annual consumption of inputs.

Cut off criteria:

All identified processes, material and energy inputs, emissions, and waste streams within the defined system boundaries have been taken into account. No flows of known environmental or hazardous significance have been intentionally omitted. Where limited data availability may exist for marginal inputs, these are estimated to represent less than 1% of the total mass, energy demand, and environmental impact, both individually and cumulatively.

Data quality:

Primary data for the period 01.01.2025 - 31.12.2025 were provided directly by the manufacturer and are representative of the actual production conditions in the production plant in Ruse, Bulgaria, and include raw material volumes, electricity consumption, fuel consumption, water use, auxiliary materials, consumables, packaging materials, waste generation, transportation means and distances and production volumes. Data were collected using internal production records, invoices, technical sheets and FPC and ERP system records.
Primary data were used to model foreground processes, while secondary (background) data were sourced from the ecoinvent v3.11 database. No datasets from different LCI/LCA databases were mixed.
Data quality for both primary and secondary data was assessed and found to be sufficient to fulfil the defined goal and scope of the study. No data rated as poor or very poor were identified during the assessment.
The data quality assessment was performed in line with EN 15804:2012+A2:2019, Annex E and the overall data quality of the study can be described as good.

Infrastructure and capital goods modelling:

Infrastructure and capital goods are not modelled in this LCA study. Infrastructure and capital equipment that are already included in the background datasets used (ecoinvent v3.11), such as those related to electricity production, transportation, and material manufacturing, are included as provided in those datasets.

Electricity purchased in the manufacturing process:

Electricity consumed during the manufacturing stage (module A3) is purchased from the public grid and modelled using the Bulgarian residual mix as defined by AIB (2024). The life cycle impacts are calculated using ecoinvent v3.11 dataset - “Electricity, low voltage, residual mix - BG”, which include upstream processes, infrastructure, and transmission losses for resulting in a GWP-GHG value of 0.615 kg CO_2 eq/kWh.

Characterisation methods:

The environmental impact indicators were calculated using the EN 15804+A2 reference package, including the additional mandatory GWP-GHG indicator, with characterisation factors based on Environmental Footprint (EF) method version 3.1.
The declared indicators include: Core environmental impact indicators according to EN 15804+A2; Additional mandatory indicator GWP-GHG; Resource use, waste, and output flow indicators as specified in the standard. The applied characterisation methods and indicator definitions are consistent across all life-cycle stages and modules.

Modules declared, geographical scope, share of primary data (in GWP-GHG results) and data variation (in GWP-GHG results):

	Product stage			Distribution/ installation stage		Use stage							End-of-life stage				Beyond product life cycle
	Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
Module	**A1**	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Modules declared	X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
Geography	EU	RER	EU	-	-	-	-	-	-	-	-	-	GLO	RER	GLO	GLO	GLO
Share of primary data	5%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	<10%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	Not Relevant - 0%			-	-	-	-	-	-	-	-	-	-	-	-	-	-

Modules/processes/life-cycle stages declared are noted with “X”.
Modules/processes/life-cycle stages not declared are marked as “ND”.

Share of primary data contributing to the GWP-GHG results for modules A1–A3:

Process	Source type	Source	Reference year	Data category	Share of primary data, of GWP-GHG results for A1–A3
A1 – Raw material steel coils	EPD + collected data	EPD; manufacturer	2024 / 2025	Upstream EPD data, conservatively treated as 0% primary	**0%**
A2 – Transport to manufacturing site	Collected data + database	Manufacturer; ecoinvent v3.11	2025	Primary data	**3%**
A3 – Electricity used in manufacturing	Collected data + database	Manufacturer; ecoinvent v3.11	2025	Primary data	**2%**
A3 – Diesel used in manufacturing	Collected data + database	Manufacturer; ecoinvent v3.11	2025	Primary data	**0%**
A3 – Other inputs and waste treatment	Collected data + database	Manufacturer; ecoinvent v3.11	2025	Representative secondary data	**0%**
Total					**≈ 5%**

The share of primary data is calculated based on GWP-GHG results. It is a simplified indicator for data quality that supports the use of more primary data, to increase the representativeness of and comparability between EPDs. Note that the indicator does not capture all relevant aspects of data quality and is not comparable across product categories.

A1 - Raw material supply:

Module A1 covers the supplied EAF cold rolled steel coils and the wood for packaging, used for the production.

A2 - Transport:

Module A2 includes the transportation of the raw material, packaging and auxiliary materials from the suppliers to the manufacturing site. Transport is modelled using road freight vehicles of appropriate capacity (EURO 5 diesel lorries), based on actual transport distances provided by the manufacturer.

A3 - Manufacturing:

The manufacturing process includes the forming of the steel profiles and tubes using high-frequency (HF) welding technology. The process is fully automated and does not require the use of welding consumables. The yield losses are minimal. Energy consumption consists of electricity and a small amount of diesel used for internal operations. Auxiliary inputs include lubricating oil, that is supplied without packaging directly into on-site reusable industrial barrels, and process water. Generated waste streams comprise steel scrap and waste mineral oil, which are sent to appropriate treatment processes.

C1-C4 End of life stage (EoL):

Modules C1-C4 are modelled using default values of Table 4 from the PCR. In the default EoL scenario C4, 5% of the collected material is landfilled and 95% recycled.
End-of-life scenario assumptions: Two additional scenarios are developed in line with section 4.8.4 of the PCR with 100% sent to landfilling and 100% sent to recycling.

Module D - Benefits and loads beyond the system boundary:

A default routing of 95% to recycling and 5% to disposal was applied. This assumption is consistent with guidance from Worldsteel LCA eco-profile (2023) and reflects the high recovery rates typically achieved for steel products in Europe due to established collection systems and the high economic value of steel scrap.
End-of-life scenario assumptions: Two additional scenarios are developed in line with section 4.8.4 of the PCR with 100% recycling in module D and 0% recycling.

ENVIRONMENTAL PERFORMANCE

LCA results of the products - main environmental performance results

Mandatory impact category indicators according to EN 15804

Results per declared unit 1 ton							
Impact category	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Global Warming Potential - total (GWP-total)	kg CO2 eq.	2.63E+03	3.96E+00	1.52E+01	4.69E+00	8.93E-01	-1.39E+03
Global Warming Potential - fossil fuels (GWP-fossil)	kg CO2 eq.	2.62E+03	3.96E+00	1.52E+01	4.68E+00	8.93E-01	-1.39E+03
Global Warming Potential - biogenic (GWP-biogenic)	kg CO2 eq.	1.01E+00	8.00E-04	1.04E-02	2.48E-03	2.70E-04	-1.44E+00
Global Warming Potential - land use and land use change (GWP-luluc)	kg CO2 eq.	1.00E+00	4.10E-04	5.04E-03	5.80E-04	2.40E-04	-4.02E-01
Depletion potential of the stratospheric ozone layer (ODP)	kg CFC-11 eq.	1.77E-06	5.88E-08	3.32E-07	6.08E-08	1.73E-08	-5.07E-06
Acidification potential, Accumulated Exceedance (AP)	mol H+ eq.	6.43E+00	3.54E-02	4.89E-02	3.88E-02	7.37E-03	-5.19E+00
Eutrophication potential - freshwater (EP-freshwater)	kg P eq.	3.73E-02	1.30E-04	1.04E-03	8.20E-04	4.61E-05	-9.44E-01
Eutrophication potential - marine (EP-marine)	kg N eq.	1.80E+00	1.65E-02	1.65E-02	1.55E-02	3.25E-03	-1.33E+00
Eutrophication potential - terrestrial (EP-terrestrial)	mol N eq.	1.95E+01	1.80E-01	1.79E-01	1.68E-01	3.56E-02	-1.36E+01
Photochemical Ozone Creation Potential (POCP)	kg NMVOC eq.	6.25E+00	5.40E-02	7.41E-02	5.01E-02	1.12E-02	-4.16E+00
Abiotic depletion potential - non-fossil resources (ADPE)	kg Sb eq.	5.06E-04	1.46E-06	5.25E-05	2.79E-06	6.82E-07	-1.26E-02
Abiotic depletion potential - fossil resources (ADPF)	MJ	2.47E+04	5.16E+01	2.16E+02	7.21E+01	1.52E+01	-1.31E+04
Water use deprivation potential (WDP)	m3 World eq.	1.73E+02	1.33E-01	1.13E+00	3.63E-01	3.56E-01	-1.59E+02

** Disclaimer: 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 the indicator.*

The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks.

The results of the end-of-life stage (modules C1-C4) should be considered when using the results of the product stage (modules A1-A3).

Biogenic carbon leaving the product system in module A5 have been balanced out already in modules A1-A3.

Additional mandatory and voluntary impact category indicators

Additional mandatory and voluntary impact category indicators per declared unit 1 ton							
Impact category	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Global Warming Potential, Greenhouse Gases (GWP-GHG)[1]	kg CO2 eq.	2.62E+03	3.96E+00	1.52E+01	4.69E+00	8.93E-01	-1.39E+03

This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO_2 is set to zero.

Resource use indicators

Resource use indicators per declared unit 1 ton							
Impact category	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Use of renewable primary energy resources used as energy carrier (PERE)	MJ	1.18E+03	3.25E-01	3.51E+00	1.53E+00	1.19E-01	-1.19E+03
Use of renewable primary energy resources used as raw materials (PERM)	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of renewable primary energy resources (PERT)	MJ	1.18E+03	3.25E-01	3.51E+00	1.53E+00	1.19E-01	-1.19E+03
Use of non renewable primary energy resources used as energy carrier (PENRE)	MJ	2.48E+04	5.16E+01	2.16E+02	7.21E+01	1.52E+01	-1.31E+04
Use of non renewable primary energy resources used as raw materials (PENRM)	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of non renewable primary energy resources (PENRT)	MJ	2.48E+04	5.16E+01	2.16E+02	7.21E+01	1.52E+01	-1.31E+04
Use of secondary materials (SM)	kg	1.07E+02	2.95E-02	2.08E-01	7.24E-02	7.72E-03	-3.82E+02
Use of renewable secondary fuels (RSF)	MJ	1.34E+00	3.06E-03	4.89E-02	2.88E-02	1.09E-03	-4.78E+00
Use of non renewable secondary fuels (NRSF)	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of net fresh water (FW)s	m3	7.37E+00	3.31E-03	2.61E-02	8.49E-03	8.41E-03	1.10E-01

Waste indicators

Waste indicators per declared unit 1 ton							
Impact category	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Hazardous waste disposed (HWD)	kg	5.08E+00	4.60E-02	2.19E-01	1.14E-01	1.29E-02	-5.87E+02
Non hazardous waste disposed (NHWD)	kg	4.19E+01	3.38E-01	2.34E+00	4.43E-01	1.33E-01	-5.80E+03
Waste | Radioactive waste disposed (RWD)	kg	1.21E-01	5.40E-06	6.35E-05	1.90E-04	1.91E-06	-3.64E-03

Output flow indicators

Output flow indicators per declared unit 1 ton							
Impact category	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Components for re-use (CRU)	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling (MFR)	kg	3.15E+00	2.44E-02	1.88E-01	9.50E+02	6.40E-03	0.00E+00
Materials for energy recovery (MER)	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported electrical energy (EEE)	MJ	2.30E+00	2.40E-03	4.15E-02	5.53E-02	8.40E-04	-1.25E+00
Exported thermal energy (EET)	MJ	8.48E-01	1.14E-03	5.03E-02	2.83E-03	4.30E-04	-9.76E+00

Additional LCA results (other environmental performance results) of the product(s)

Results for additional scenarios for EoL

Results per declared unit 1 ton - 100% sent to landfilling				
Impact category	**Unit**	**C3**	**C4**	**D**
Global Warming Potential - total (GWP-total)	kg CO2 eq.	0.00E+00	6.84406	0.00E+00
Global Warming Potential - fossil fuels (GWP-fossil)	kg CO2 eq.	0.00E+00	6.84E+00	0.00E+00
Global Warming Potential - biogenic (GWP-biogenic)	kg CO2 eq.	0.00E+00	3.18E-03	0.00E+00
Global Warming Potential - land use and land use change (GWP-luluc)	kg CO2 eq.	0.00E+00	3.62E-03	0.00E+00
Depletion potential of the stratospheric ozone layer (ODP)	kg CFC-11 eq.	0.00E+00	1.83E-07	0.00E+00
Acidification potential, Accumulated Exceedance (AP)	mol H+ eq.	0.00E+00	4.90E-02	0.00E+00
Eutrophication potential - freshwater (EP-freshwater)	kg P eq.	0.00E+00	5.70E-04	0.00E+00
Eutrophication potential - marine (EP-marine)	kg N eq.	0.00E+00	1.92E-02	0.00E+00
Eutrophication potential - terrestrial (EP-terrestrial)	mol N eq.	0.00E+00	2.10E-01	0.00E+00
Photochemical Ozone Creation Potential (POCP)	kg NMVOC eq.	0.00E+00	7.42E-02	0.00E+00
Abiotic depletion potential - non-fossil resources (ADPE)	kg Sb eq.	0.00E+00	9.59E-06	0.00E+00
Abiotic depletion potential - fossil resources (ADPF)	MJ	0.00E+00	1.61E+02	0.00E+00
Water use deprivation potential (WDP)	m3 World eq.	0.00E+00	6.75E+00	0.00E+00

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The results of the end-of-life stage (modules C1-C4) should be considered when using the results of the product stage (modules A1-A3).

Biogenic carbon leaving the product system in module A5 have been balanced out already in modules A1-A3.

Additional mandatory and voluntary impact category indicators

Additional mandatory and voluntary impact category indicators per declared unit 1 ton - 100% sent to landfilling				
Impact category	**Unit**	**C3**	**C4**	**D**
Global Warming Potential, Greenhouse Gases (GWP-GHG)[1]	kg CO2 eq.	0.00E+00	6.84E+00	0.00E+00

1 This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO_2 is set to zero.

Resource use indicators

Resource use indicators per declared unit 1 ton - 100% sent to landfilling				
Impact category	**Unit**	**C3**	**C4**	**D**
Use of renewable primary energy resources used as energy carrier (PERE)	MJ	0.00E+00	1.48E+00	0.00E+00
Use of renewable primary energy resources used as raw materials (PERM)	MJ	0.00E+00	0.00E+00	0.00E+00
Total use of renewable primary energy resources (PERT)	MJ	0.00E+00	1.48E+00	0.00E+00
Use of non renewable primary energy resources used as energy carrier (PENRE)	MJ	0.00E+00	1.61E+02	0.00E+00
Use of non renewable primary energy resources used as raw materials (PENRM)	MJ	0.00E+00	0.00E+00	0.00E+00
Total use of non renewable primary energy resources (PENRT)	MJ	0.00E+00	1.61E+02	0.00E+00
Use of secondary materials (SM)	kg	0.00E+00	7.23E-02	0.00E+00
Use of renewable secondary fuels (RSF)	MJ	0.00E+00	1.32E-02	0.00E+00
Use of non renewable secondary fuels (NRSF)	MJ	0.00E+00	0.00E+00	0.00E+00
Use of net fresh water (FW)	m3	0.00E+00	1.59E-01	0.00E+00

Waste indicators

Waste indicators per declared unit 1 ton - 100% sent to landfilling				
Impact category	**Unit**	**C3**	**C4**	**D**
Hazardous waste disposed (HWD)	kg	0.00E+00	1.31E-01	0.00E+00
Non hazardous waste disposed (NHWD)	kg	0.00E+00	1.71E+00	0.00E+00
Waste | Radioactive waste disposed (RWD)	kg	0.00E+00	2.32E-05	0.00E+00

Output flow indicators

Output flow indicators per declared unit 1 ton - 100% sent to landfilling				
Impact category	**Unit**	**C3**	**C4**	**D**
Components for re-use (CRU)	kg	0.00E+00	0.00E+00	0.00E+00
Materials for recycling (MFR)	kg	0.00E+00	0.00E+00	0.00E+00
Materials for energy recovery (MER)	kg	0.00E+00	0.00E+00	0.00E+00
Exported electrical energy (EEE)	MJ	0.00E+00	0.00E+00	0.00E+00
Exported thermal energy (EET)	MJ	0.00E+00	0.00E+00	0.00E+00

Results for additional scenarios for EoL - 100% sent to recycling

Results per declared unit 1 ton - 100% sent to recycling				
Impact category	**Unit**	**C3**	**C4**	**D**
Global Warming Potential - total (GWP-total)	kg CO2 eq.	4.69E+00	0.00E+00	-1.67E+03
Global Warming Potential - fossil fuels (GWP-fossil)	kg CO2 eq.	4.68E+00	0.00E+00	-1.67E+03
Global Warming Potential - biogenic (GWP-biogenic)	kg CO2 eq.	2.48E-03	0.00E+00	1.18E+00
Global Warming Potential - land use and land use change (GWP-luluc)	kg CO2 eq.	5.80E-04	0.00E+00	-3.30E-01
Depletion potential of the stratospheric ozone layer (ODP)	kg CFC-11 eq.	6.08E-08	0.00E+00	-4.73E-06
Acidification potential, Accumulated Exceedance (AP)	mol H+ eq.	3.88E-02	0.00E+00	-6.13E+00
Eutrophication potential - freshwater (EP-freshwater)	kg P eq.	8.20E-04	0.00E+00	-1.13E+00
Eutrophication potential - marine (EP-marine)	kg N eq.	1.55E-02	0.00E+00	-1.43E+00
Eutrophication potential - terrestrial (EP-terrestrial)	mol N eq.	1.68E-01	0.00E+00	-1.57E+01
Photochemical Ozone Creation Potential (POCP)	kg NMVOC eq.	5.01E-02	0.00E+00	-4.71E+00
Abiotic depletion potential - non-fossil resources (ADPE)	kg Sb eq.	2.79E-06	0.00E+00	-1.75E-02
Abiotic depletion potential - fossil resources (ADPF)	MJ	7.21E+01	0.00E+00	-1.51E+04
Water use deprivation potential (WDP)	m3 World eq.	3.63E-01	0.00E+00	-1.42E+02

** Disclaimer: 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 the indicator.*

The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks.

The results of the end-of-life stage (modules C1-C4) should be considered when using the results of the product stage (modules A1-A3).

Biogenic carbon leaving the product system in module A5 have been balanced out already in modules A1-A3.

Additional mandatory and voluntary impact category indicators

Additional mandatory and voluntary impact category indicators per declared unit 1 ton - 100% sent to recycling				
Impact category	**Unit**	**C3**	**C4**	**D**
Global Warming Potential, Greenhouse Gases (GWP-GHG)[1]	kg CO2 eq.	4.69E+00	0.00E+00	-1.67E+03

1 This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO_2 is set to zero.

Resource use indicators

Resource use indicators per declared unit 1 ton - 100% sent to recycling				
Impact category	**Unit**	**C3**	**C4**	**D**
Use of renewable primary energy resources used as energy carrier (PERE)	MJ	1.53E+00	0.00E+00	-1.59E+03
Use of renewable primary energy resources used as raw materials (PERM)	MJ	0.00E+00	0.00E+00	0.00E+00
Total use of renewable primary energy resources (PERT)	MJ	1.53E+00	0.00E+00	-1.59E+03
Use of non renewable primary energy resources used as energy carrier (PENRE)	MJ	7.21E+01	0.00E+00	-1.51E+04
Use of non renewable primary energy resources used as raw materials (PENRM)	MJ	0.00E+00	0.00E+00	0.00E+00
Total use of non renewable primary energy resources (PENRT)	MJ	7.21E+01	0.00E+00	-1.51E+04
Use of secondary materials (SM)	kg	7.24E-02	0.00E+00	-2.37E+02
Use of renewable secondary fuels (RSF)	MJ	2.88E-02	0.00E+00	-1.22E+00
Use of non renewable secondary fuels (NRSF)	MJ	0.00E+00	0.00E+00	0.00E+00
Use of net fresh water (FW)	m3	8.49E-03	0.00E+00	-7.82E+00

Waste indicators

Waste indicators per declared unit 1 ton - 100% sent to recycling				
Impact category	**Unit**	**C3**	**C4**	**D**
Hazardous waste disposed (HWD)	kg	1.14E-01	0.00E+00	-7.45E+02
Non hazardous waste disposed (NHWD)	kg	4.43E-01	0.00E+00	-1.74E+03
Waste | Radioactive waste disposed (RWD)	kg	1.90E-04	0.00E+00	-7.20E-04

Output flow indicators

Output flow indicators per declared unit 1 ton - 100% sent to recycling				
Impact category	**Unit**	**C3**	**C4**	**D**
Components for re-use (CRU)	kg	0.00E+00	0.00E+00	0.00E+00
Materials for recycling (MFR)	kg	1.00E+03	0.00E+00	0.00E+00
Materials for energy recovery (MER)	kg	0.00E+00	0.00E+00	0.00E+00
Exported electrical energy (EEE)	MJ	0.00E+00	0.00E+00	0.00E+00
Exported thermal energy (EET)	MJ	0.00E+00	0.00E+00	0.00E+00

ABBREVIATIONS

Abbreviation	Definition
EN	European Norm (Standard)
EF	Environmental Footprint
GPI	General Programme Instructions
ISO	International Organization for Standardization
CEN	European Committee for Standardization
CPC	Central Product Classification
GHS	Globally Harmonized System of Classification and Labelling of Chemicals
GRI	Global Reporting Initiative
SVHC	Substances of Very High Concern
ND	Not Declared
LCA	Life Cycle Assessment
EPD	Environmental Product Declaration
PCR	Product Category Rules
MJ	Megajoule
VOC	Volatile Organic Compounds
UN CPC	United Nations Central Product Classification
RoW	Rest of the World
GLO	Global

REFERENCES

The following standards, rules, databases, and sources were used in the preparation of this Environmental Product Declaration (EPD) and the underlying Life Cycle Assessment (LCA).

Standards and normative references:

ISO 14025:2006 - Environmental labels and declarations - Type III environmental declarations - Principles and procedures.

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

ISO 14040:2006 + Amd 1:2020 - Environmental management - Life cycle assessment - Principles and framework.

ISO 14044:2006 + Amd 1:2017 + Amd 2:2020 - Environmental management - Life cycle assessment - Requirements and guidelines.

Programme and PCR documents

International EPD® System - General Programme Instructions (GPI), Version 5.0.1,
EPD International AB, www.environdec.com

Product Category Rules (PCR) 2019:14 v2.0.1
Construction Products, publication date 2025-06-05, valid until 2030-04-07,
The International EPD® System.

LCA and background data

Ecoinvent database v3.11
Allocation cut-off by classification, ecoinvent Association, Zürich, Switzerland.

Open LCA software v2.5.0
Green Delta GmbH, Berlin, Germany.

Environmental Footprint (EF) Method v3.1
European Commission, Joint Research Centre (JRC).

Worldsteel LCA eco-profile (2023) - https://worldsteel.org/wider-sustainability/life-cycle-thinking/lca-eco-profiles-2022/global-engineering-steel-construction/

VERSION HISTORY

Original Version of the EPD, 2026-05-11

Dedal Accredited Verification of EPD Process
EN ISO 14025
EN 15804

EPD
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