

Environmental Product Declaration

EPD INTERNATIONAL EPD SYSTEM

ECO PLATFORM EPD VERIFIED

MARCEGAGLIA SPECIALTIES

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

STAINLESS STEEL WELDED TUBES

Marcegaglia Specialties S.p.A.

This EPD covers multiple products, based on the average results of the product group

Programme: **The International EPD® System,**
www.environdec.com

Programme operator: **EPD International AB**
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An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at www.environdec.com

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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
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Standard EN 15804 serves as the Core Product Category Rules (PCR)
Product category rules (PCR): *Construction products (EN 15804:A2), 2019:14 version 1.3.1, CPC 4128* PCR review was conducted by: The Technical Committee of the International EPD System. Review chair: Claudia A. Peña – Contact through the secretariat www.environdec.com/contact
Life Cycle Assessment (LCA) LCA accountability: Made HSE S.r.l.
Third-party verifier: Independent third-party verification of the declaration and data, according to ISO 14025, via: ☒ EPD verification by accredited certification body
Third-party verification: *Bureau Veritas Italia S.p.A.* is an approved certification body accountable for the third-party verification The certification body is accredited by: *Accredia*
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 registered in different EPD programmes, or not compliant with EN 15804, may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same version number) or be based on fully-aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterisation factors); have equivalent content declarations; and be valid at the time of comparison. For further information about comparability, see EN 15804 and ISO 14025.

COMPANY INFORMATION

Owner of the EPD:

Marcegaglia Specialties S.p.A - www.specialties.marcegaglia.com

Contact:

For more information about this Environment Product Declaration the following references are available:
Mail: francesco.fronzoni@marcegaglia.com - Tel.: +39 0543 470309 / +39 335 1797674

Company description:

Marcegaglia Specialties S.p.A. is one of the world's leading players in the stainless steel products sector, thanks to its various production plants in Italy and abroad. It manufactures and sells hot-rolled and cold-rolled flat products, hot-rolled and cold-rolled long products, welded tubes, and drawn and peeled bars. Specifically, the Forlimpopoli plant only manufactures welded stainless steel tubes for structural applications, fluid transport, heat exchange, decoration, mechanical and automotive applications.

Product/system certifications:

- Quality Management System ISO 9001
- Environmental Management System ISO 14001
- Health and safety management system ISO 45001
- Energy Management ISO 50001
- Social responsibility management system SA 8000
- Carbon footprint systematic approach ISO 14067
- Organizational Carbon Footprint ISO 14064

Production site's name and localization:

Via Mattei, 20 – 47034 Forlimpopoli (FC)

PRODUCTS INFORMATION

Product name: Stainless steel welded tubes

Product identification: Stainless steel welded tubes

Product description:

A wide range of welded stainless steel tubes, in various thicknesses, diameters, and lengths, with circular or regular cross-sections, for structural applications, fluid transport, heat exchange, decoration, mechanical, and automotive applications.

Specifically, the products manufactured at the plant are:

- Welded tubes (laser, HF or from Automotive division);
- Welded and pickled tubes (outside and/or internally);
- Welded and annealed tubes;
- Annealed and pickled welded tubes.

Product catalogs can be downloaded from the company website, providing comprehensive descriptions of the technical characteristics of the products and the relevant standards for the various applications.

From the company web site is possible to download the catalogue whit the technical information of the product:

Stainless steel welded tubes	Dimensions
Min-Max Thickness [mm]	From 0,8 to 6
Min-Max Diameter [mm]	From 6 to 406,4

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

Geographical scope: Global

LCA INFORMATION

Declared unit:
The declared unit is 1 ton of stainless steel welded tube.

Reference service life – RSL:
The products in this study have an estimated useful life of 50 years [Ref.: Federal Institute for Research on Building, Urban Affairs, and Spatial Development (BBSR)].

Time representativeness:
All the data used for this LCA analysis are referred to the year 2025.

Data Quality:
The primary data come from the company, and the secondary data come from Ecoinvent database.

Database e software:
Ecoinvent database v.3.11, April 2025 / Software used SimaPro rel. 10.5.0.1.

Description of system boundaries:
The study is “from cradle to gate with options (A1-A3 + A4 + C1-C4 + D)”, as outlined in the table below (reference: PCR 2019:14 “Construction products” version 1.3.1).

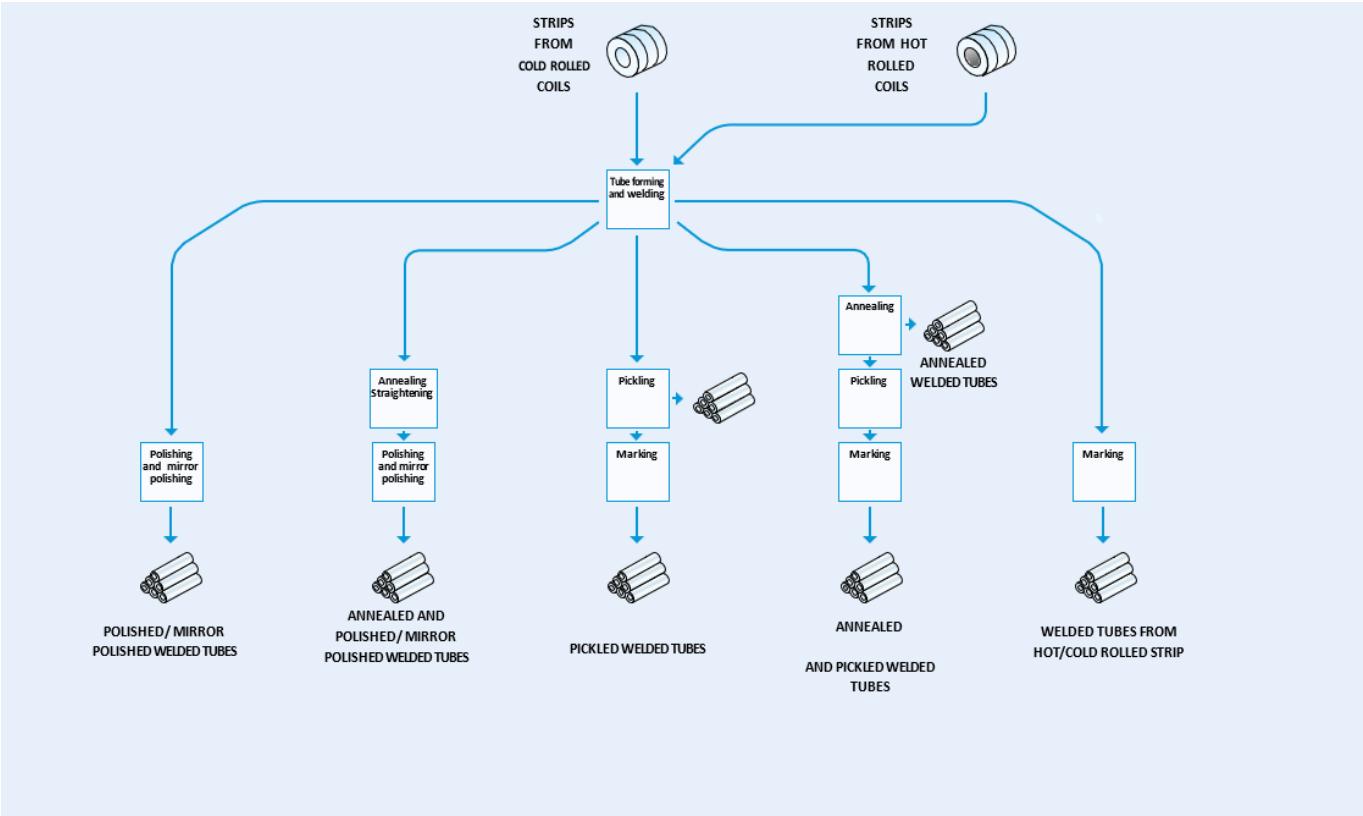
Modules A1-A3 describe the raw materials, the transport until the production’s site and the production’s process.

Modules C1-C4 describe the transport, the demolition process and the end of life of the products. These operations aren’t under the company’s control. In this regard, literature relating to the construction sector is used. It is considered:

- an average diesel consumption equivalent to 46 MJ for each ton of material demolished;
- an average distance of 80 km to transport the material to the recovery center;
- an average electricity consumption of 28 kWh for each ton of material sorted.

Module D considers stainless steel obtained from the demolition of tubes after use and intended for recycling. The calculation of the environmental benefits from stainless steel recovery is based on the guidelines provided in the document "Product Category Rules for Type III environmental product declaration of construction products to EN 15804:2021 – Par. 6.3.5.6. Benefits and loads beyond the product system boundary, information Module D."

STAINLESS STEEL PRODUCTS MANUFACTURING PROCESS – SYSTEM DIAGRAM



DESCRIPTION OF MAIN ACTIVITIES

The Marcegaglia Specialties S.p.A. plant in Forlimpopoli manufactures a wide range of stainless steel laser tube mills in various diameters and thicknesses for structural applications, fluid transport, heat exchange, decoration, mechanical and automotive applications.

The production cycle begins with the delivery of raw materials to the Forlimpopoli plant. Depending on their origin, the materials may reach the plant through different transport modes. Coils sourced from European steelworks are transported by road, while coils imported from Asia are initially transported by sea and subsequently by road. In particular, the Asian coils are shipped to the Marcegaglia Ravenna S.p.A. plant, which is equipped with a dedicated port quay, and are then transported by road to Forlimpopoli. Therefore, due to the geographical location of the Forlimpopoli plant, the last stage of the journey is always carried out by road.

The raw materials supplied to the plant consist of:

- Coils from the Marcegaglia Gazoldo Inox plant, and transported to Forlimpopoli by road;
- Coils sourced from other European steelworks, also transported by road;
- Coils imported from Asian steelworks, which are transported by sea to the Marcegaglia Ravenna S.p.A. plant and subsequently delivered to Forlimpopoli by road.

In detail, the processing cycle takes place through the stages described below.

SLITTING LINES (SLITTERS)

The coil is unrolled, cut into strips (the width of which corresponds to the circumference the tube will have once formed) using circular slitting blades, and rewound into a number of strips intended for the production lines listed below.

HFIW (High Frequency Induction Welding) STAINLESS STEEL TUBE PRODUCTION MILLS AND AUTOMOTIVE DIVISION

- ***Strip storage area:*** This is the area in front of the entrance to each production line where the strips, ready for conversion into tubes, are stored in uniform batches. The semi-finished product has specific dimensions, with widths ranging from 30.6 mm to 470 mm and external diameters from 1300 to 2200 mm.
- ***Decoilers:*** The lines are equipped with two decoilers, installed on a rotating structure which, by rotating alternately through 180°, enable the material to be fed rapidly onto the line.
- ***Strip joining:*** This allows the consecutive sections of the strips (head-to-tail) to be sheared and the edges to be aligned at the correct distance for TIG welding.
- ***Floop:*** The flywheel function is activated by storing enough material to maintain a constant output flow during reel changeover and welding operations. Once the operation is complete, it uses up the tape stored in the accumulator and, together with the active reel, adjusts to the process speed.
- ***Forming roller table, finishing rollers and guide roller:*** The entire system consists of a series of forming rollers and vertical and horizontal adjusters, in which the strip is progressively shaped until it takes on the form of a tube with the specified diameter. During this process, the rollers are lubricated and cooled using a 4% emulsion.
- ***High-frequency induction welding (HFIW) and deburring machines:*** Under the effect of the induced current, the tube flanges are heated to the melting point and, under controlled pressure, are welded together, causing the molten metal containing the casting impurities to flow out. This metal, which solidifies rapidly to form external and internal beads on the tubes, is mechanically removed by three deburring machines, two of which operate externally to the tube and one, if required, internally to the tube itself.
- ***Cooling tank:*** The tube undergoes controlled cooling in a closed-circuit tank to bring it down to room temperature.
- ***Calibrating roller bench, mandrels:*** This system consists of a series of stands with vertical and horizontal grooved rollers where the tube is calibrated to the required circumference and then shaped into the required profile using the mandrels, resulting in bars with round, square or rectangular cross-sections, or special profiles.
- ***Weld identification:*** For the Automotive division only, upon specific customer request, the weld zone of the tube is marked with red dye. This is carried out automatically using a dedicated spray applicator installed on the production lines.
- ***Blowing, deburring:*** During transport, all round, square and rectangular bars pause briefly in the blowing section, where they are cleaned internally from the emulsion and deburring residues. The liquid nebulised by the pressurised air is collected, together with the deburring residues, in a soundproofed enclosure on the opposite side.
- ***Brushing machines for round, square and rectangular tubes:*** *tube marking machine:* The bars, having been moved along, are conveyed to the brushing machines for surface finishing; these brushing machines also operate within soundproofed safety enclosures. They are then conveyed via the roller conveyor to the packing station.
- ***Packaging and weighing machine:*** The marked tube is moved on again and grouped, depending on whether it is round, square or rectangular in cross-section, into layers to be stacked into packs of hexagonal, square or rectangular shape respectively. The finished pack is fed to the packaging machine, which applies circumferential strapping.

STAINLESS STEEL LASER LINES

- ***Strip storage:*** This is the area in front of the entrance to each line where the strips, ready for tube processing, are stored in uniform batches. The semi-finished product has specific dimensions, with widths ranging from 33.7 mm to 855.3 mm and external diameters from 700 to 2000 mm.

- ***Decoilers:*** The lines are fitted with two uncoiling reels, installed on a rotating frame, which, by rotating 180°, alternately allow the material to be sent quickly into the line. The strip to be processed is placed on the standby reel so that, during uncoiling, the reverse burr faces upwards.
- ***Strip joining:*** It enables the shearing of consecutive sections of the strips, end-to-end, and the alignment of the edges at the correct distance for an initial weld.
- ***Floop:*** The storage function is activated by accumulating a quantity of material sufficient to maintain a constant output flow during reel changeover and welding operations. Once the operation is complete, the strip stored in the floop is exhausted and the material flow adjusts, together with the active reel, to the process speed.
- ***Forming roller table, finishing rollers and guide roller:*** The entire system consists of a series of supports with forming rollers, vertical and horizontal shafts, in which the strip is progressively shaped until it takes on the desired tube shape with the specified diameter. The rollers are lubricated and cooled using a 4% emulsion.
- ***Laser welding and bead rolling:*** The tube flanges are brought together under appropriate pressure and welded using a laser beam. The source protection shield is connected to a limit switch which, when triggered, puts the line into emergency stop.
- ***Deburring units:*** To remove the excess material created during welding, the weld bead undergoes a process similar to brushing as it passes through deburring units positioned longitudinally (lamellar) and transversely (fabric-type) to the direction of the tube's feed.
- ***Calibrating roller bench, mandrels:*** This system consists of a series of stands with vertical and horizontal grooved rollers where the tube is calibrated to the required circumference and then shaped into the desired profile using the mandrels; where required, it is processed into bars with round, square or rectangular cross-sections, or into special profiles. During this process, the rollers are cooled with water.
- ***Inspection and brushing of round, square or rectangular tubes:*** This process, which is closely linked to product quality, enables the identification of minimal inaccuracies and irregularities, below a certain threshold, relating to the quality of the weld. The bars pass through one or more stations, within which the brushing machines operate to reduce surface roughness.
- ***Marking and cutting into bars:*** In this final stage, common to all tubes, inkjet marking takes place. Cutting can be carried out using a blade, a disc or a laser cutter.
- ***Visual inspection, deburring, strapping and weighing:*** The tubes are first grouped together at the side of the workbench by an automatic mechanical system, where the operator carries out a visual inspection of the weld and the straightness of the tube.

CONTENT INFORMATION

Product content	Weight, kg	Post-consumer recycled content
Stainless Steel welded tube	1,000	65 %

The materials used for packaging the final products consist of metal strapping and plastic caps. The quantities of such packaging in relation to one ton of final product represent less than 1%.

Allocation rules

An allocation was made on a mass basis for energy consumption, water discharges, atmospheric emissions and waste.

MODULES DECLARED

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

	A1-A3 Product stage			A4-A5 Construction process stage		B1-B7 Use stage							C1-C4 End of life stage				D Benefits and loads beyond the system boundary
	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	GLO	GLO	IT	-	-	-	-	-	-	-	-	-	GLO	GLO	GLO	GLO	IT
Specific data	>80%					-	-	-	-	-	-	-	-	-	-	-	-
Variations-product	<10%					-	-	-	-	-	-	-	-	-	-	-	-
Variations-site	Not relevant					-	-	-	-	-	-	-	-	-	-	-	-

X = Module considered | **ND** = Module not declared | **GLO** = Global | **IT** = Italy

ENVIRONMENTAL INFORMATION

The environmental performance indicators refer to 1 ton of stainless steel welded tube. The characterization factors used in this assessment are based on EN 15804+A2 - EF 3.1, which provide a method for quantifying the environmental impact.

Environmental impact

Impact category	Abb.	Unit
Climate change - total	GWP - t	kg CO_2 eq
Climate change - Fossil	GWP - fossil	kg CO_2 eq
Climate change - Biogenic	GWP - biogenic	kg CO_2 eq
Climate change - Land use and LU change	GWP - luluc	kg CO_2 eq
Climate change - Greenhouse Gases	GWP - GHG	kg CO_2 eq.
Ozone depletion	ODP	kg CFC11 eq
Photochemical ozone formation	POCP	kg NMVOC eq
Acidification of land and water	AP	mol H+ eq
Eutrophication	EP - freshwater	kg P eq
	EP - marine	kg N eq
	EP - terrestrial	mol N eq
Water use *	WDP	m^3 depriv.
Resource use, fossils *	ADP - F	MJ
Resource use, minerals, and metals *	ADP - MM	kg Sb eq

** The results of this environmental impact indicator shall be used with care as the uncertainties of the results are high and as there is limited experience with the indicator.*

Resource use

Impact category	Abb.	Unit
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	PERE	MJ
Use of renewable primary energy resources used as raw materials	PERM	MJ
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	PERT	MJ
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	PENRE	MJ
Use of non-renewable primary energy resources used as raw materials	PENRM	MJ
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)	PENRT	MJ
Use of secondary material	SM	kg
Use of renewable secondary fuels	RSF	MJ
Use of non-renewable secondary fuels	NRSF	MJ
Use of net fresh water	FW	m^3

Waste production

Impact category	Abb.	Unit
Hazardous waste disposed	HW	kg
Non-hazardous waste disposed	NHW	kg
Radioactive waste disposed	RW	kg

Output flows

Impact category	Abb.	Unit
Reuse	REUSE	kg
Materials for recycling	RECYCLE	kg
Materials for energy recovery	EN-REC	kg
Exported energy-electricity	EE-E	MJ
Exported energy-thermal energy	EE-T	MJ

STAINLESS STEEL WELDED TUBE

Abb.	Unit	A1-A3	C1	C2	C3	C4	D
GWP - t	kg CO_2 eq	4.47E+03	4.98E+00	9.49E+00	1.53E+01	7.81E-01	-1.52E+03
GWP - fossil	kg CO_2 eq	4.41E+03	4.98E+00	9.48E+00	1.52E+01	7.81E-01	-1.50E+03
GWP - biogenic	kg CO_2 eq	5.61E+01	9.99E-04	5.59E-03	6.89E-02	3.75E-04	-1.64E+01
GWP - luluc	kg CO_2 eq	3.92E+00	5.10E-04	3.41E-03	1.23E-03	4.47E-04	-1.70E+00
GWP - GHG	kg CO_2 eq	4.41E+03	4.98E+00	9.49E+00	1.52E+01	7.81E-01	-1.50E+03
ODP	kg CFC-11 eq	3.14E-03	7.39E-08	2.07E-07	3.83E-07	2.17E-08	-1.06E-05
POCP	kg NMVOC eq	1.58E+01	6.78E-02	4.97E-02	3.76E-02	8.27E-03	-5.13E+00
AP	mol H+ eq	3.12E+01	4.45E-02	3.14E-02	3.98E-02	5.47E-03	-8.60E+00
EP - freshwater	kg P eq	3.70E+00	1.60E-04	6.69E-04	2.47E-03	6.83E-05	-1.52E+00
EP - marine	kg N eq	7.58E+00	2.07E-02	1.07E-02	8.28E-03	2.10E-03	-1.57E+00
EP - terrestrial	mol N eq	4.82E+01	2.27E-01	1.16E-01	8.61E-02	2.29E-02	-1.64E+01
WDP	m^3 depriv.	1.09E+03	1.88E-01	7.89E-01	1.62E+00	8.49E-01	-4.40E+02
ADP - F	MJ	4.95E+04	6.48E+01	1.39E+02	2.44E+02	1.91E+01	-1.71E+04
ADP - MM	kg Sb eq	4.18E-01	1.73E-06	2.66E-05	2.06E-05	1.14E-06	-4.18E-02
PERE	MJ	1.54E+03	4.07E-01	2.14E+00	4.39E+00	1.79E-01	-4.52E+03
PERM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ	1.54E+03	4.07E-01	2.14E+00	4.39E+00	1.79E-01	-4.52E+03
PENRE	MJ	4.95E+04	6.48E+01	1.39E+02	2.44E+02	1.91E+01	-1.71E+04
PENRM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	MJ	4.95E+04	6.48E+01	1.39E+02	2.44E+02	1.91E+01	-1.71E+04
SM	kg	4.46E+01	2.68E-02	5.86E-02	2.91E-02	4.76E-03	-1.71E+02
RSF	MJ	1.22E-01	7.03E-05	7.73E-04	8.76E-05	9.93E-05	-4.35E-01
NRSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	1.19E+03	4.58E-03	1.94E-02	3.84E-02	1.98E-02	-1.37E+01
HW	kg	4.15E+02	7.27E-02	2.02E-01	4.47E-01	2.18E-02	-1.53E+03
NHW	kg	2.41E+03	1.06E+00	4.13E+00	1.30E+01	5.03E-01	-8.29E+03
RW	kg	9.94E-03	6.77E-06	3.82E-05	3.04E-04	2.79E-06	-2.49E-02
REUSE	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RECYCLE	kg	8.77E-01	2.89E-04	1.68E-03	1.35E-02	2.07E-04	-7.58E-01
EN-REC	kg	5.66E-03	9.21E-07	6.13E-06	3.01E-06	3.68E-07	-2.25E-02
EE-E	MJ	1.30E+01	3.07E-03	2.34E-02	1.05E+00	1.24E-03	-5.89E+00
EE-T	MJ	7.16E+00	1.44E-03	2.49E-02	1.15E-02	6.59E-04	-2.74E+01

ADDITIONAL ENVIRONMENTAL INFORMATION

The raw material purchased is characterized by a recycled content of 65%.

The materials used for the packaging of the final products consist of metal strapping and plastic caps. The quantities of such packaging per ton of final product are less than 1%.

The products do not contain hazardous substances from the SVHC Candidate List for Authorization in quantities greater than 0.1%.

Regardless of the type of product considered, the elements that most affect the final result are raw materials.

The impacts of energy consumption determined by the processes carried out within the company boundaries are often marginal compared to the impact associated with the supply of raw materials.

The differences between the various indicators for stainless steel tubes, welded using either laser or HF technology, are less than 10%, regardless of the processing carried out on the tube during welding (annealing and/or pickling). Since the raw material is the same for all products, what differentiates the various products is the type of welding used (laser or HF technology) and any processing carried out after welding (pickling and/or annealing).

It should be noted that at the end of its useful life, the product is destined for recycling and that stainless steel products are, ideally, completely recyclable an unlimited number of times. Due to their structural use and the potential presence of other materials that may complicate recovery and recycling, it is recommended, as a precautionary approach, to consult ISPRA's 'Special Waste Report' No. 433/2026, which states that 88.9% of steel is destined for recycling.

VERSION HISTORY

Version 1, 2023-10-12

Original Version of the EPD

Version 2, 2024-09-19

- The most up-to-date energy mix has been considered (“European Residual Mixes Results of the calculation of Residual Mixes for the calendar year 2022” – version 1.0, 2023-06-01);
- Site-specific data (for forms A1, A2 and A3) was collected and used in relation to all environmental matrices with reference to the year 2023;
- The reference database updated to the latest available version was used (all processes refer to Ecoinvent 3.10)

Version 3, 2025-09-25

- Site-specific data were collected and used (for modules A1, A2 and A3) in relation to all environmental matrices in reference to the year 2024, above all a part of electric energy supply from renewable sources and the subsequent Guarantees of Origin (GO) cancellation;
- The reference database updated to the latest available version was used as well as the new version of the software (all processes refer to Ecoinvent 3.11 – April 2025 and the software SimaPro is in version 10.2.0.2)
- Italian updated energy residual mix has been considered (ref.: “European Residual Mixes Results of the calculation of Residual Mixes for the calendar year 2024”)

Version 4, 2026-09-25

- Site-specific data were collected and used (for modules A1, A2 and A3) in relation to all environmental matrices in reference to the year 2025, above all a part of electric energy supply from renewable sources and the subsequent Guarantees of Origin (GO) cancellation;
- Italian updated energy residual mix has been considered (ref.: "European Residual Mixes Results of the calculation of Residual Mixes for the calendar year 2025");
- C1 and C3 modules have been updated.

REFERENCES

- General Programme Instructions of the International EPD® System. Version 4.0;
- PCR 2019:14 - Version 1.3.1 "CONSTRUCTION PRODUCTS";
- BRE Global Product Category Rules (PCR) for Type III EPD of construction products to EN 15804+A2;
- Ecoinvent database v.3.11-April 2025;
- ISO 14025: 2010 "Environmental labels and declarations - Type III environmental declarations - Principles and procedures";
- ISO 14040: 2021 "Environmental management - Life cycle assessment - Principles and framework";
- ISO 14044:2021 "Environmental management - Life cycle assessment - Requirements and guidelines";
- ISO 15804:2021 "Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products";
- AIB "European Residual Mixes – Results of the calculation of Residual Mixes for the calendar year 2025", version 1.0, 2026-05-26.
- ISPRA "Rapporto rifiuti speciali – Edizione 2026" – n° 433/2026;
- "Construction and demolition waste", Michele Paleari and Andrea Campioli, 2015;
- "Metal recycling: The need for a life cycle approach", Terry Norgate, May 2013.



MARCEGAGLIA
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ECO PLATFORM
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