Environmental Product Declaration

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

Galvanized steel tube

of

Padana Tubi & Profilati Acciaio S.p.A.

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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.

Programme information

Programme:	The International EPD® System EPD International AB Box 210 60 SE-100 31 Stockholm Sweden www.environdec.com info@environdec.com
EPDs within the same product category but registered 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 version number up to the first two digits20) 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.	

Accountabilities for PCR, LCA and independent, third-party verification
Product Category Rules (PCR)
CEN standard EN 15804 serve as the core Product Category Rules (PCR).
Product category rules (PCR): PCR 2019:14 Construction products, version 1.3.2
PCR review was conducted by: The Technical Committee of the International EPD® System. See www.environdec.com for a list of members. Review chair: Claudia A. Peña, University of Concepción, Chile. The review panel may be contacted via the Secretariat www.environdec.com/contact.
Life Cycle Assessment (LCA)
LCA accountability: *Deloitte & Touche S.p.A., Via Tortona 25 - 20144, Milano, Italy*
Third-party verification
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via: ☒ EPD verification by accredited certification body Third-party verification: *Bureau Veritas Italia* is an approved certification body accountable for the third-party verification The certification body is accredited by: Accredia*, certification number 0009VV*
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 of the EPD.

1. Company Information

Owner of the EPD

Padana Tubi & Profilati Acciaio S.p.A, via Porta Murata 8/A - 42016 Guastalla (RE)

Description of the Organisation

Padana Tubi & Profilati Acciaio S.p.A. with registered office in via Porta Murata 8/A, Guastalla (RE), is one of the European leaders in the production of welded carbon-steel and stainless-steel pipes for carpentry.
Padana Tubi is a company with 13 plants on a surface of about 400,000 square metres, all located in the territory of the Municipality of Guastalla (RE). These areas are dedicated to the storage and production of raw materials and finished products, respectively, for an average annual volume of about 800/900 thousand tons of steel produced and sold. The company has about 700 qualified employees.

There are 13 Padana Tubi plants, named A to O:

A – via Portamurata - production of carbon steel tubes
B – via Roncaglio - production of carbon steel and galvanised tubes
C – via Dossetti – stainless steel tube warehouse
D – via De Gasperi - production of stainless steel tubes
E – via Togliatti – stainless steel satin-finishing
F – via Ferrari – stainless steel satin-finishing
G – via Dossetti - production of stainless steel tubes
H – via Nenni – stainless steel tube warehouse
I – via Dossetti – carbon steel tube warehouse
L – via Nenni – stainless steel tube warehouse
M – via Dossetti - stainless steel tube warehouse
N – via Portamurata - carbon steel tube warehouse
O – via Salati – production of carbon steel tubes

As far as its main activities are concerned, Padana Tubi takes care of the reception of raw materials, the sorting of materials in specific warehouses, the fabrication of carbon, stainless and galvanised profiles, their packaging and the disposal of waste, and the transport of finished products internally and externally within the company boundaries.

Certifications

Padana Tubi & Profilati Acciaio S.p.A. meets the highest quality standards and has obtained the following certifications:

- UNI EN ISO 9001:2015
- UNI EN ISO 14001:2016

- UNI EN ISO 45001:2018
- CE mark, certifying compliance with applicable European Comminity standards
- BS EN 10219-1:2006
- ISO 14064-1: 2018

2. Production Information

Product name

Galvanized steel tube.

Product Identification

Padana Tubi's Carbon Division was involved in the production of:

- Sendizimir galvanised tubes for precision applications in accordance with UNI EN 10305-5 (only square-rectangular profiles 1.5 to 3 mm thick);

The product range includes:

- Sendizimir galvanised tubes with a thickness of 1.5 to 4 mm;

Profile lengths can vary from 4500 mm to 15000 mm.

In terms of recycled content, the analysed pipe family has the following characteristics:

- Electric arc furnace steel (EAF), with a recycled content of 80%;
- Blast oxygen furnace steel (BOF), with an average recycled content of 18.67%.

Pipe family	% of recycled raw material	% EAF	% BOF
Galvanized steel tubes	52.3%	80%	18.67%

Product Description

The coils used for the production of galvanised pipes comply with UNI EN 10346 for concerning the technical conditions for the supply of flat steel products coated by hot continuous cold-forming.

In the production phase, special attention is paid to quality controls, in particular, in continuous are carried out:

- Dimensional checks according to UNI EN 10219-2 and UNI EN 10305-5;
- Visual checks according to 10219-2 and UNI EN 10305-5;
- Crushing tests for round tubes according to UNI EN ISO 8492;
- Checks on welding, carried out using the HF method, by means of the induced current method according to UNI EN ISO 10893-2.

The checks to determine the conformity of the tubes produced to the reference standards continue in laboratories. All the machines we use are certified and subject to periodic maintenance.

Below are the tests carried out on tube samples in laboratories:

- Tensile test UNI EN ISO 6892-1;
- Resilience test UNI EN ISO 148-1;
- Spectrometric tests to determine the chemical composition;
- Macrographic checks of the thermally altered zone.

UN CPC Code

4128 – Tubes, pipes and hollow profiles, of steel.

Geographical Region

The geographical area covered by this EPD corresponds to the area involved in the distribution and sale of the product, which is worldwide.

Production Process

The activity carried out within the company is defined as: 'manufacture of carbon and galvanised steel profiles, longitudinally welded cut to customer specifications and in compliance with national and international standards'.

The processes and activities performed within Padana Tubi are described in detail below, highlighting the interactions between the Company's specific primary processes.

The production of longitudinally welded tubes takes place according to a few main stages, which are quite similar even with different types of steel:

- Receipt of raw material: the raw material consists of coils (wide coiled steel strips) that are delivered by external suppliers to the different production units and stored in dedicated areas.
- Cutting lines: in this phase the coils are cut longitudinally to obtain strips of different widths according to the diameter of the tubes or profiles to be manufactured. The products thus obtained are placed in the strip warehouse located between the cutting lines and the loading of the profiling lines.
- Production lines: in this phase the actual production of the tube (or profile) takes place. The strip passes through a series of rotating steel rollers that gradually allow the desired profile shape (round, square, etc.) to be obtained. The following work areas can be identified in all production lines main areas: strip loading, end-welding, forming, welding, calibrating, tube inspection, bundling.
- Warehouse: tube 'bundles' are transferred by internal handling to storage areas (tube warehouse), and from there to customers.

The so-called support processes, functional to the primary ones, are:

- Internal movement (cars);
- Emulsion plant;
- Evaporative towers;
- Heating/cooling plant;
- Internal maintenance;
- External maintenance;
- Internal cleaning (office building);
- External cleaning;
- Office activities;
- Fire-fighting equipment;
- Electrical system;
- Biological sewage treatment plant in FA, Imhoff tanks

3. LCA Information

Functional Unit	1 tonne of product and packaging.
Reference Service Life (RSL)	Not applicable
Temporal Representativeness	The primary data for the plants refer to the period 01/01/2022 - 31/12/2022.
Database and LCA software	Ecoinvent 3.8 – Simapro 9.4
System boundary	From cradle to gate with options, module C1-C4, module D and optional modules.
Excluded lufe cycle phases	Module A5 and B were excluded as optional
Allocation	In accordance with EN 15804, allocations were made on the basis of mass.
Cut-off	In accordance with EN 15804, at least 95% of the total mass and energy flows per module were included.
Electric Mix (A1-A3)	Specific electricity mix demonstrated by GO (hydroelectric), auto-generated photovoltaic energy and 2022 Italian Residual Mix for outsourced processes. Their GWP – GHG are as follow: • Hydroelectric: 0,0126 kg CO_2 eq/kWh • Photovoltaic: 0,0716 kg CO_2 eq/kWh • Italian residual mix: 0,613 kg CO_2 eq/kWh
Exclusions	The construction, maintenance and decommissioning of infrastructures, defined as buildings and machinery, as well as the occupation of industrial land have not been taken into account, as their contribution to the environmental impact related to the functional unit is considered negligible.
Data quality	The Data Quality assessment was performed following the instructions of the standard EN 15804: 2021, evaluating the geographical, technical and temporal representativeness of all data used. The detailed assessment can be found in the LCA supporting study.

	Product stage			Construction Stage		Use stage							End of life stage				Resource recovery stage
	Raw materials supply	Transport	Manifacturing	Transport	Construction installation	Use	Maintenance	Repair	replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction, 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
Module declared	X	X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
Geograpgh y	GLO	GLO	IT	GLO									GLO	GLO	GLO	GLO	GLO
Specific data	>90%																
Variation - Products	Not relevant																
Variation - Site	Not relevant																

A1 – A3 Product stage

A1 - Procurement of raw materials

transport and production processes of raw materials and semi-finished products and generation of energy from primary sources

A2 - Transport

Supply of raw materials to Padana Tubi plants;

A3 - Tube production

Production of the tube at the relevant factories and relative input and output of materials and energy (consumption of process electricity, withdrawal of water resources, management of waste and processing waste generated), production of auxiliary materials used in production;

A4 – A5 Construction stage

A4 – Distribution

Distribution of the finished product and its packaging by TIR, ship and train

C1 – C4 End of life stage

C1 - Demolition

Disassembly and demolition of the product before it is sent to the end of its life;

C2 - Transport

This module includes the transport of the de-installed/demolished product to recovery and/or disposal centres;

C3 - Waste Treatment

This module includes the treatment of end-of-life tubes and distribution packaging, through recycling and/or incineration for energy recovery;

C4 - Disposal

Treatment of waste deriving from end-of-life distribution pipes and packaging, specifically it is related to landfill disposal activities;

D Benefits and loads beyond the system boundary

Module D accounts for the environmental benefits of Module C waste sent for recycling and energy recovery, which result in a reduction of impacts related to a lower use of resources and virgin raw materials in the subsequent product system.

4. Content Declaration

The only component of the pipes under study is 1 tonne galvanized steel.

The packaging consists of wooden joists.

The weight of the packaging refers to the total amount of wooden joists and steel strapping used to distribute the products during the reference period.

Packaging components	Weight (kg)	Weight (% vs the product)
Wooden joists	36.170,00	0,13%
Steel strapping	20.301,98	0,08%

5. Environmental Product Performance

Environmental impact indicators

INDICATORS		UNIT	A1	A2	A3	A1-A3	A4	C1	C2	C3	C4	D	TOTAL
Global Warming Potential **(GWP)**	GWP GHG[1]	kg CO_2 eq.	1.96E+03	1.48E+01	6.06E+01	2.04E+03	1.50E+02	4.25E+00	9.65E+00	2.76E-03	8.40E-01	-5.53E+02	1.64E+03
	TOTAL	kg CO_2 eq.	1.98E+03	1.48E+01	5.91E+01	2.05E+03	1.50E+02	4.26E+00	9.65E+00	3.21E-01	8.49E-01	-5.51E+02	1.66E+03
	Fossil	kg CO_2 eq.	1.95E+03	1.48E+01	6.01E+01	2.02E+03	1.50E+02	4.24E+00	9.65E+00	2.68E-03	7.95E-01	-5.53E+02	1.63E+03
	Biogenic	kg CO_2 eq.	2.64E+01	2.92E-02	-1.02E+00	2.54E+01	1.75E-01	1.80E-02	2.77E-03	3.19E-01	4.96E-02	2.05E+00	2.80E+01
	Land use and LU change	kg CO_2 eq.	1.17E+00	1.07E-02	1.09E-02	1.19E+00	6.74E-02	9.55E-04	1.06E-03	9.01E-07	7.49E-04	-1.58E-01	1.10E+00
Ozone depletion		kg CFC 11 eq.	1.64E-04	1.64E-04	2.96E-06	3.31E-04	1.33E-05	3.40E-05	2.10E-06	2.09E-06	2.32E-10	3.21E-07	-2.21E-05
Photochemical ozone formation		kg NMVOC eq.	8.06E+00	8.06E+00	1.47E-01	1.63E+01	5.90E-01	5.27E-01	4.94E-02	9.47E-02	6.96E-05	8.29E-03	-2.78E+00
Acidification		kg mol H^+ eq.	5.69E+01	5.69E+01	1.88E-01	1.14E+02	4.49E-01	5.53E-01	4.16E-02	6.09E-02	5.16E-05	7.47E-03	-2.01E+00
Eutrophication	Freshwater	kg P eq.	8.27E-01	1.75E-03	2.10E-03	8.31E-01	1.20E-02	2.42E-04	1.73E-04	1.39E-06	7.33E-05	-2.19E-01	6.25E-01
	Marine	kg N eq.	3.27E+00	4.93E-02	1.53E-01	3.47E+00	1.50E-01	1.57E-02	2.45E-02	2.62E-05	2.78E-03	-4.76E-01	3.19E+00

[1] As stated in the PCR 2019:14 ”In addition, a supplementary indicator for climate impact shall be reported: GWP-GHG25. 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 CO2 is set to zero”.

	Terrestrial	mol N eq.	2.36E+02	5.43E-01	1.95E+00	2.38E+02	1.63E+00	1.73E-01	2.69E-01	2.72E-04	2.84E-02	-5.05E+00	2.35E+02
Water use		m^3 depriv.	1.05E+03	1.05E+03	8.65E-01	2.10E+03	3.82E+00	7.58E+00	4.34E-01	1.18E-01	-8.93E-04	9.96E-01	-2.95E+01
Depletion of Abiotic Resources	Fossil	MJ	2.34E+04	2.12E+02	8.54E+02	2.45E+04	2.27E+03	1.37E+02	1.31E+02	2.46E-02	2.22E+01	-5.60E+03	2.14E+04
	Non fossil	kg Sb eq.	7.31E-02	4.80E-05	2.88E-04	7.34E-02	5.36E-04	8.28E-06	8.40E-06	7.76E-09	1.82E-06	-4.18E-04	7.35E-02

Additional Environmental Impact Indicators

INDICATOR	UNIT	A1	A2	A3	A1-A3	A4	C1	C2	C3	C4	D	TOTAL
Ionising radiation	kBq U-235 eq	1.39E+02	1.41E+00	4.05E+00	1.44E+02	1.24E+01	6.61E-01	5.88E-01	7.04E-05	9.86E-02	-1.02E+01	1.48E+02
Particulate matter	disease inc.	6.11E-04	1.00E-06	9.03E-06	6.21E-04	1.25E-05	9.22E-07	1.36E-06	4.63E-10	1.50E-07	-3.70E-05	5.99E-04
Human toxicity, non-cancer	CTUh	6.29E-05	1.53E-07	4.19E-07	6.35E-05	1.84E-06	3.60E-08	4.99E-08	3.23E-10	9.28E-09	-1.14E-05	5.40E-05
Human toxicity, cancer	CTUh	2.58E-05	8.72E-09	3.62E-08	2.58E-05	6.23E-08	1.74E-09	1.32E-09	3.72E-11	3.57E-10	-2.95E-06	2.30E-05
Ecotoxicity, freshwater	CTUe	6.96E+04	1.67E+02	5.82E+02	7.03E+04	1.81E+03	7.61E+01	7.36E+01	4.92E-02	1.40E+01	-1.65E+04	5.58E+04
Land use	Pt	6.62E+03	1.15E+02	3.20E+02	7.06E+03	1.57E+03	3.05E+02	2.29E+01	7.72E-03	4.66E+01	-1.11E+03	7.88E+03

Resource use

INDICATOR		UNIT	A1	A2	A3	A1-A3	A4	C1	C2	C3	C4	D	TOTAL
Use of renewable energy resources	Use as an energy carrier	MJ, net calorific value	2.68E+03	6.42E+00	3.84E+01	2.72E+03	4.08E+01	2.80E+00	5.12E-01	8.09E-04	1.92E-01	-1.20E+02	2.65E+03
	Use as raw material	MJ, net calorific value	0.00E+00	0.00E+00	1.91E+01	1.91E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.91E+01
	TOTAL	MJ, net calorific value	2.68E+03	6.42E+00	5.75E+01	2.74E+03	4.08E+01	2.80E+00	5.12E-01	8.09E-04	1.92E-01	-1.20E+02	2.67E+03
Use of non renewable energy resources	Use as an energy carrier	MJ, net calorific value	1.33E+04	1.98E+02	8.35E+02	1.43E+04	2.15E+03	1.34E+02	1.29E+02	1.94E-02	2.12E+01	-9.53E+02	1.58E+04
	Use as raw material	MJ, net calorific value	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	TOTAL	MJ, net calorific value	1.33E+04	1.98E+02	8.35E+02	1.43E+04	2.15E+03	1.34E+02	1.29E+02	1.94E-02	2.12E+01	-9.53E+02	1.58E+04
Net use of fresh water		m^3	0.00E+00	2.95E+01	3.99E-02	2.95E+01	1.12E-01	2.99E-01	1.65E-01	4.88E-03	3.07E-05	2.38E-02	-9.70E-01
Use of Secondary material		kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of Renawable secondary fuels		MJ, net calorific value	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Use of non-renawable secondary fuels	MJ, net calorific value	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Waste

INDICATOR	UNIT	A1	A2	A3	A1-A3	A4	C1	C2	C3	C4	D	TOTAL
Hazardous waste disposed	kg	0.00E+00	0.00E+00	5.16E-01	5.16E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.16E-01
Non-hazardous waste disposed	kg	0.00E+00	0.00E+00	1.37E+00	1.37E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.51E+02	-1.36E+00	1.51E+02
Radioactive waste disposed	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Output flow

INDICATOR	UNIT	A1	A2	A3	A1-A3	A4	C1	C2	C3	C4	D	TOTAL
Materials for energy recovery	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.36E-04	0.00E+00	-1.36E+00	-1.36E+00
Material for recycling	kg	0.00E+00	0.00E+00	5.40E+01	5.40E+01	0.00E+00	0.00E+00	0.00E+00	8.50E+02	0.00E+00	0.00E+00	9.04E+02
Components of reuse	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy, electricity	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy, thermal	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

6. Additional Information

Considering the end-of-life of the product, the calculation was made by assuming secondary data from literature, in particular the disposal rates of steel (the company's main product), LDPE and wood (packaging) from PEF.
Since the mass percentage of products disposed of in non-European states is approximately 0.61%, the European PEF recycling, incineration and landfill percentages were assumed to be representative.
The percentages adopted are shown in the table below. The recycling percentages are specific to the material considered, while for the distribution between landfill and incineration of the remaining material a 55% landfill and 45% incineration PEF figure was assumed for municipal solid waste. For steel, the incineration percentage was assumed to be 0%. The recycling percentage for LDPE was assumed to be 70% from the available PEF list, since there is no specific figure for LDPE packaging.

Type of waste	Ricycling	Incineration	Landfill
Steel	85%	0%	15%
LDPE	70%	14%	16%
Wood	30%	32%	38%

The products do not contain hazardous substances from the SVHC Candidate List for Authorization in quantities greater than 0,1%.

7. References

- ISO 14040:2006/AMD 1:2020 Environmental management-Life Cycle Assessment - Principles and framework
- ISO 14044:2006/AMD 2:2020 Environmental management-Life Cycle Assessment - Requirements and guidelines
- Regolamento del Programma EPDInternational, “GENERAL PROGRAMME INSTRUCTIONS FOR THE INTERNATIONAL EPD® SYSTEM”, versione 4.0, pubblicato il 29-03-2021
- ISO 14025:2010 Environmental labels and declarations-Type III Environmental Declarations-Principles and procedures
- “General Programme Instructions for the International EPD® System, v. 4.0”
- Product Category Rules dei prodotti da costruzione – PCR 2019:14, Version 1.3.2
- EN 15804:2021 – Sustainability of construction works – Environmental product declaration – Core rules for the product category of construction products
- PEF (https://eplca.jrc.ec.europa.eu/LCDN/developerEF.xhtml)
- LCA supporting study “Padana Tubi_ReportLCA_v0”

EPD®