Environmental

Product Declaration

In accordance with ISO14025:2006 for:

TUBOS REUNIDOS GROUP

SEAMLESS CARBON STEEL PIPES FOR MECHANICAL, INDUSTRIAL AND STRUCTURAL APPLICATIONS (QUENCHED AND TEMPERED)

Programme
The International EPD® System
www.environdec.com

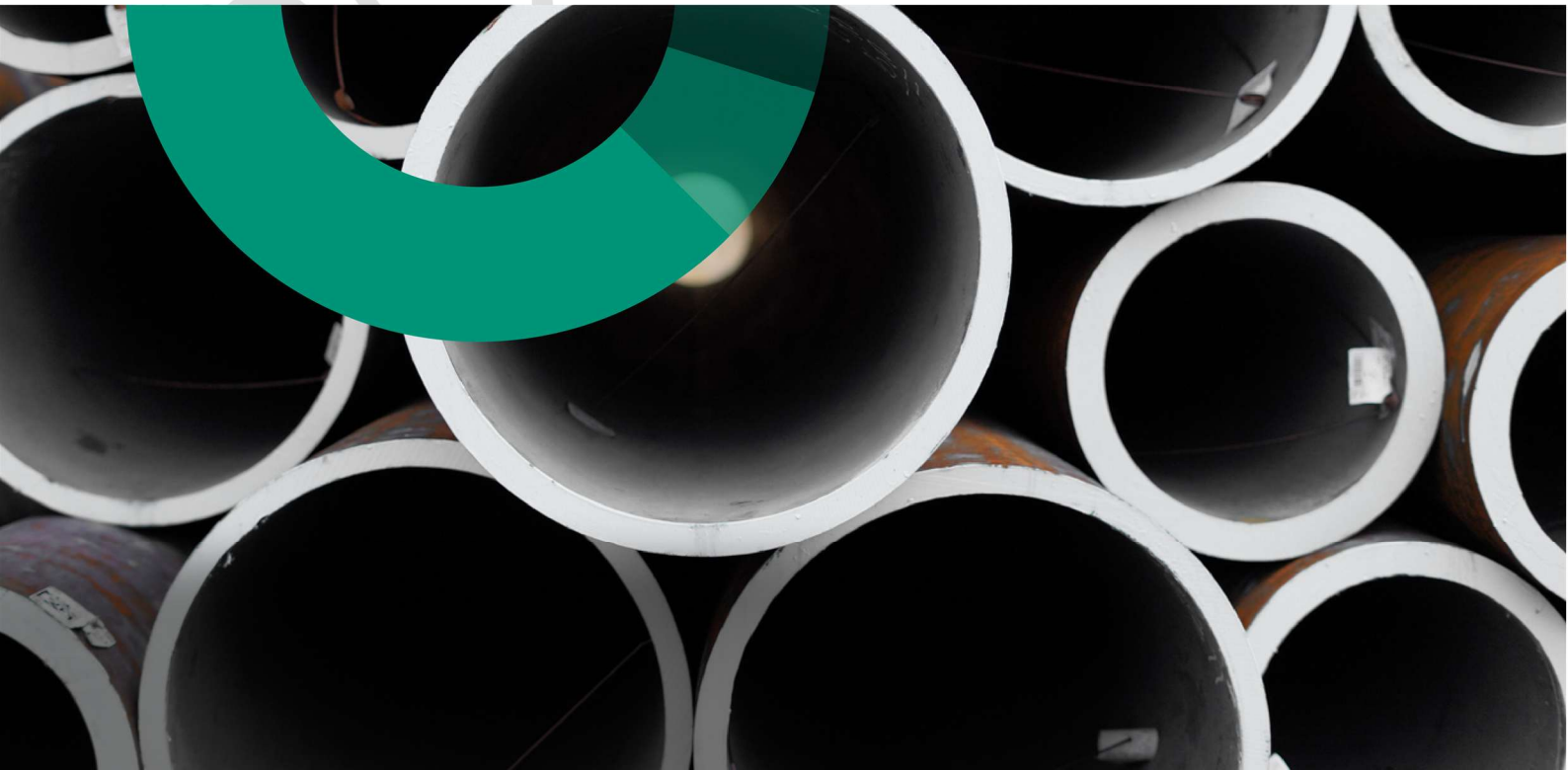
Programme operator
EPD International AB

Type of EPD
EPD of multiple products from a company

EPD registration number
EPD-IES-0015704:001

Version date
2026-01-22

Validity date
2031-01-22



Programme Information

Programme: The International EPD® System

EPD International AB Box 210 60, SE-100 31 Stockholm Sweden

www.environdec.com
info@environdec.com

PRODUCT CATEGORY RULES (PCR)

PCR: Fabricated Metal Products, Except Construction Products, 2023:01, version 2.0.0

Product category classification: UN CPC 4128

PCR review was conducted by: The Technical Committee of the International EPD® System. A full list of members is available at www.environdec.com. The review panel may be contacted via info@environdec.com

Chair of the PCR review: Hüdai Kara

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: Certinalia, S. L

info@certinalia.com

Accredited by: ENAC nº125/C-PR283 accreditation

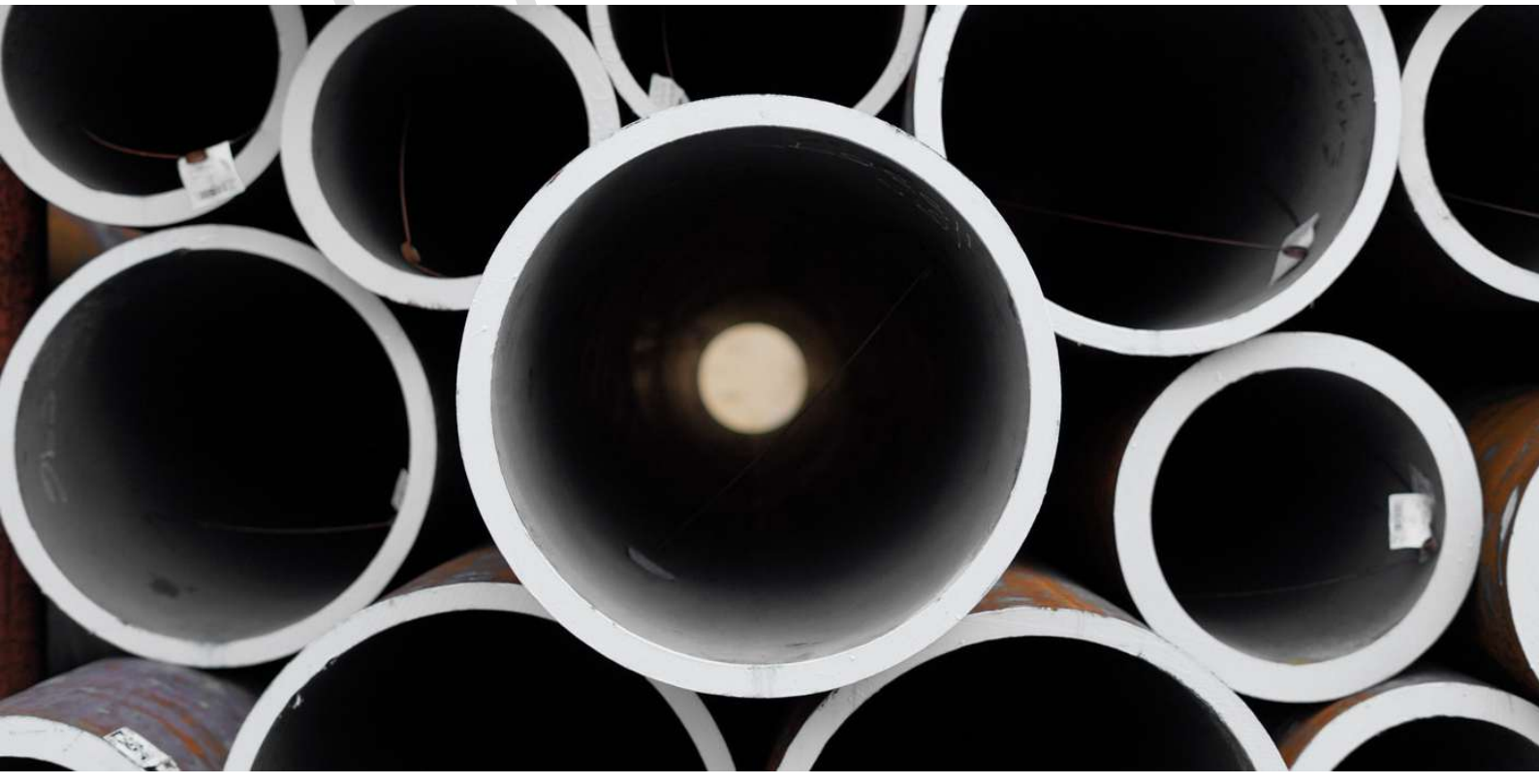
*EPD process certification involves an accredited certification body certifying and periodically auditing the EPD process and conducting external and independent verification of EPDs that are regularly published. More information can be found in the General Programme Instructions on www.environdec.com.

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 of the EPD. EPDs within the same product category but from different programmes 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 ISO 14025.



Company Information

Owner of the EPD: **Tubos Reunidos Group S.L.U.**

CONTACT DETAILS

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(+34) 945 89 71 00
www.tubosreunidosgroup.com

LCA PRACTITIONER

IK-ingenieria
Av. Cervantes 51, Edif. 10, panta 5, Dpto. 7, 48970 Basauri, Bizkaia (Spain)

DESCRIPTION OF THE ORGANISATION

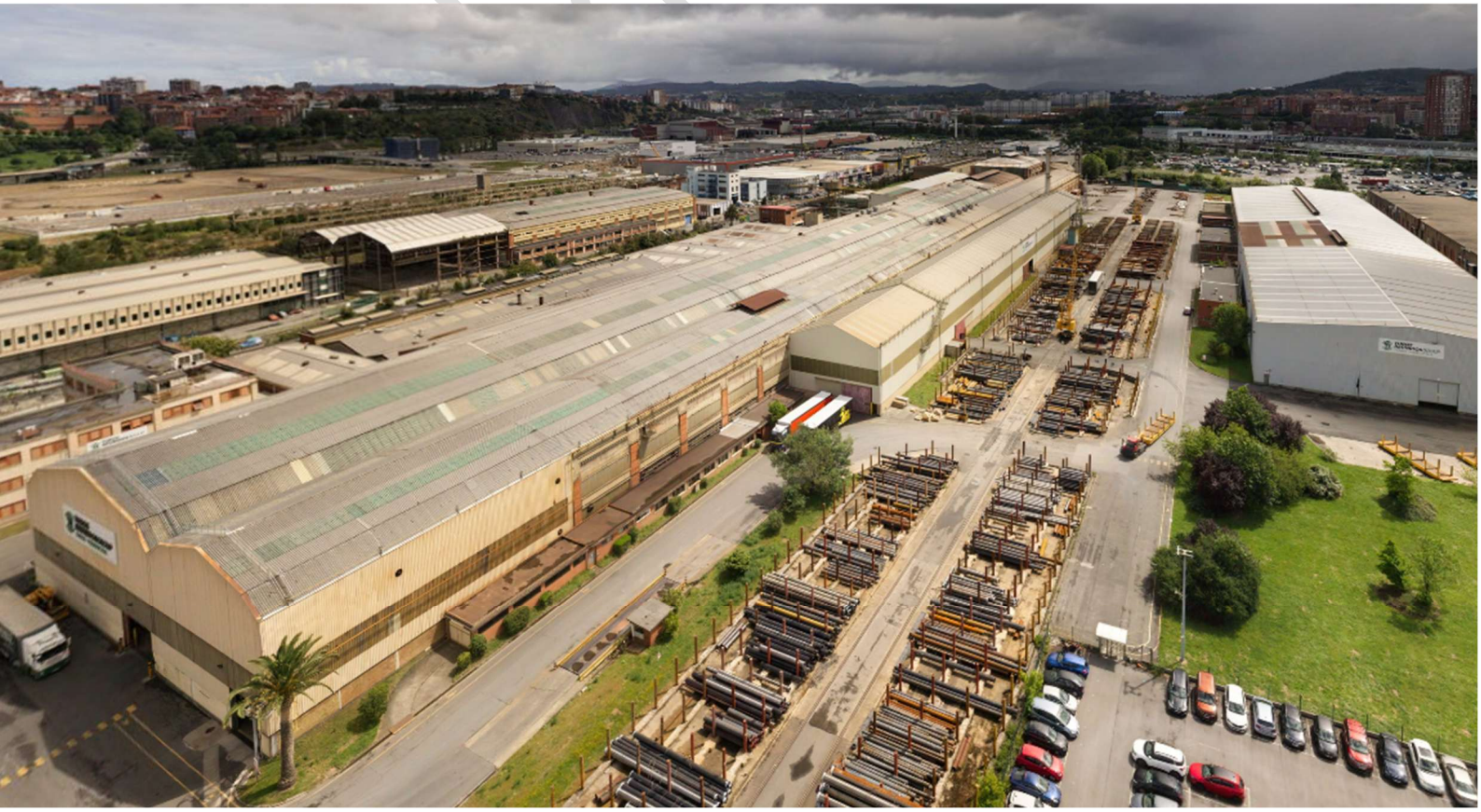
Next Generation Tubes

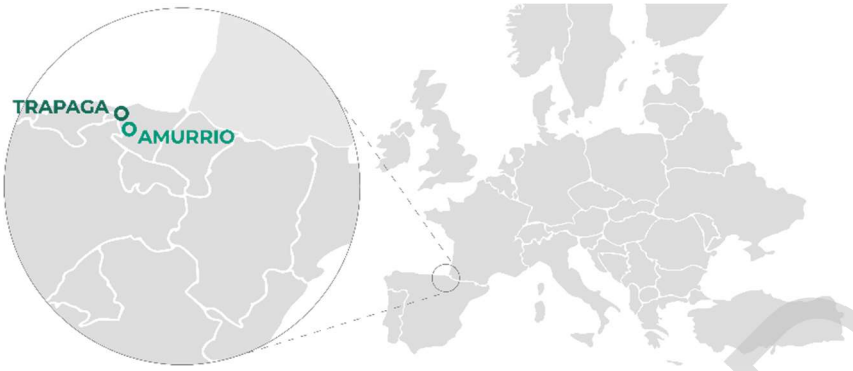
We develop and produce seamless steel tubes with special and complex requirements, designed and tailor-made for each and every customer in stainless steel as well as in high alloys, carbon grades and in Special finishings.

We meet and even exceed all the industrial processes and requirements of the energy sector (bioenergy, solar, wind, CCUS, hydrogen...), and we are also present in other sectors such as handling and lifting machinery, mobility and other industrial mechanical applications.

Our international presence in more than 100 countries and our vocation for excellence in service allows us to be closer to the needs of each client. We also combine 130 years of experience with an outstanding desire for innovation in products as well as in flexible and in integrated processes and management.

We are committed to sustainable development and work towards reducing our environmental footprint and to boosting our process circularity while providing solutions aimed to promote projects for the transition towards a decarbonized economy.





AMURRIO MILL

Manufactures hot-rolled and cold-drawn seamless carbon and alloy steel tubes up to 13% Cr., for Energy industries like Oil&Gas, Petrochemical, Chemical, Power generation and energy transition industries as Hydrogen, CCUS, Biothermal, Biofuels. As well as other applications like Mobility, Construction and Mechanical Engineering.

Range of products

- **Hot rolled:** 26,7 mm to 180 mm in Ø and up to 25,1 m in length.
- **Cold drawn:** 15 mm to 118 mm in Ø and up to 20,1 m in length.

We also provide special finishing operations / conditions as: “U” bent, studded, finned tubes, coatings, etc.

TRAPAGA MILL

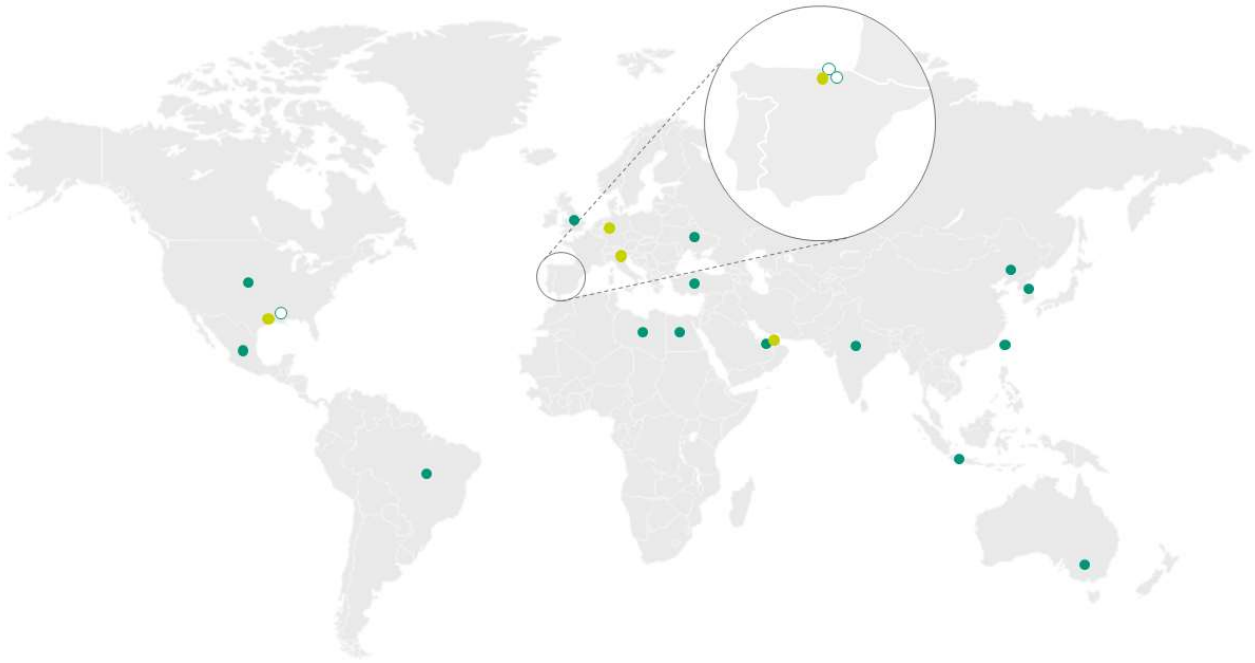
Manufactures stainless, alloy and carbon steel seamless tubes.

We are manufacturers of Hot rolled Seamless Steel Tubes specialized in big sizes and heavy wall, mainly for structural and mechanical engineering, oil and gas, hydrogen, powergen, refineries, chemical, petrochemical and fertilizer plants, nuclear, offshore wind, among other.

Range of products

- **Outside diameter:** 193 mm - 711 mm (7 1⁄2 " - 28")
- **Wall Thickness:** 6,35 mm - 125 mm (1/4 " - 5")

Our International Network



3
R&D Centers

5
Sales Offices

15
Countries with Sales Agency

Our Markets

ENERGY

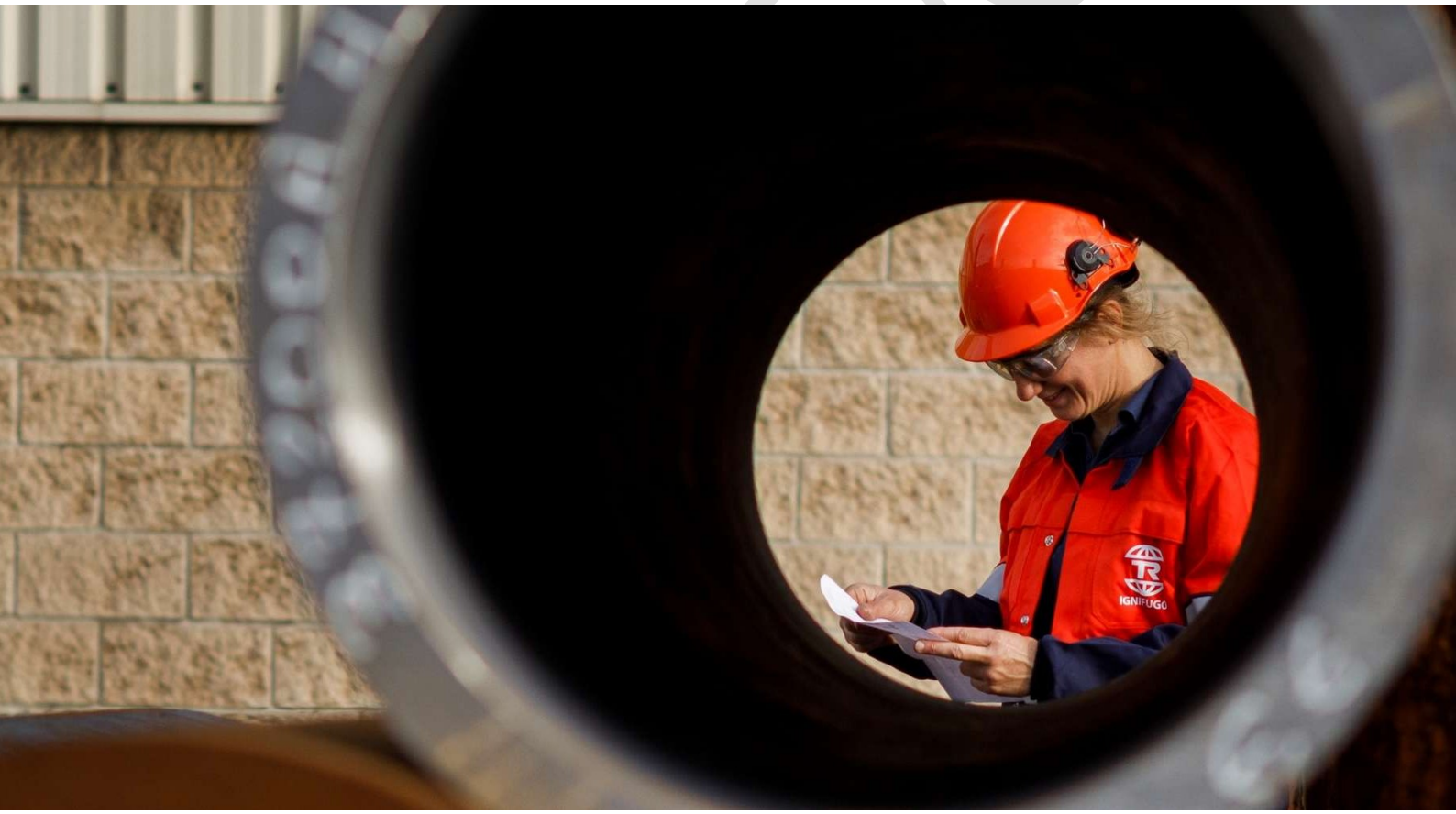
Bioenergy | Hydrogen | Nuclear | Carbon Capture | Geothermal | Oil & Gas

INDUSTRY

Offshore Wind | Solar | Construction | Mobility | Engineering

Quality, Safety and Sustainability

Tubos Reunidos Group is a leading company in seamless steel tube solutions. The Group is addressing industrial transformation through a culture deeply rooted in sustainability, with the aim of supporting its customers in their decarbonization processes, and it focuses on the manufacturing of low-emission tubular solutions. The company operates internationally and is present across a wide range of industrial sectors. The Group is certified to the highest standards of quality (ISO 9001, API and ASME), environment (ISO 14001, ISO 14064), energy management (ISO 50001), and occupational health and safety (ISO 45001).



Product Information

PRODUCT NAME

SEAMLESS CARBON STEEL PIPES FOR MECHANICAL, INDUSTRIAL AND STRUCTURAL APPLICATIONS (QUENCHED AND TEMPERED)

PRODUCT IDENTIFICATION

Quenched and tempered pipes for mechanical, industrial and structural applications.

PRODUCT DESCRIPTION

This EDP describes the Seamless Carbon Steel Tubes and Pipes for Mechanical, Industrial, Structural and Natural Gas and Oil applications produced Tubos Reunidos Group.

The product is carbon steel seamless hot-rolled quenched and tempered pipes for general purpose applications

The raw material used for this product is ingots produced in an electric-arc furnace, melting recycled scrap.

The technical characteristics of the products are according to the following standards:

- EN 10297-1 Seamless circular steel tubes for mechanical and general engineering purposes - Technical delivery conditions - Part 1: Non-alloy and alloy steel tubes
- EN 10216-3: Seamless steel tubes for pressure purposes - Technical delivery conditions - Part 3: Alloy fine grain steel tubes
- API 5L: Pipe line for Petroleum and natural gas industries

CONSTRUCTIONAL DATA

NAME	VALUE	UNIT
Yield strength at room temperature	>350	MPa
Tensile strength at room temperature (min.)	>485	MPa
Elongation	>20	%

OUTSIDE DIAMETER	WALL THICKNESS		GRADE
8” - 28”	8.18 mm to 125 mm	EN 10297-1	E460K2-E590K2-E730K2
		EN 10216-3	P620Q-P620QH
		API 5L	X52Q- X60Q-X65Q-X70Q

PRODUCTION SITE

Plant of Tubos, located in Amurrio (Spain), and plant of Products located in Trápaga (Spain).

LIST OF PRODUCTS

The manufacturing of the tube with the specific quality has been achieved by using different material recipes (different quantities of scrap and ferroalloys). The manufacturing site and the production process involved are the same.

The 5 recipes of scrap and ferroalloys used to manufacture the tube have been included in the analysis. For each environmental impact category, the average value of the results has been declared in accordance with the options permitted by the PCR and the GPI.

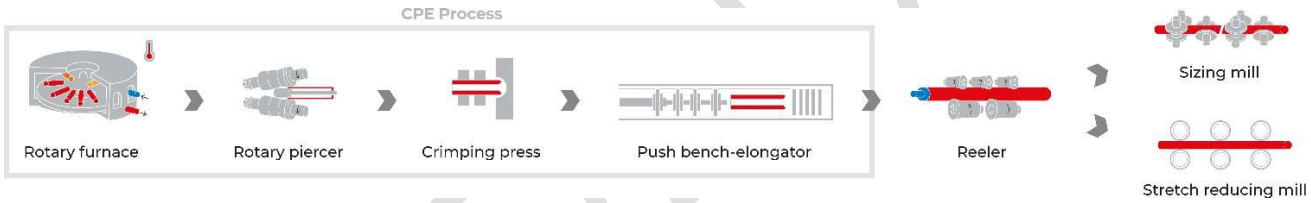
General Manufacturing Specification

STEEL PRODUCTION

The steel used by TRG is produced in our steel shop in Amurrio and comes from the melt of high-quality scrap; we have an electric process with EAF. From the furnace, the steel is transported to a ladle furnace to obtain the ingot that feed the rolling facility in Trápaga.

ROLLING FACILITY

The ingot get to the furnace to achieve the appropriate temperature to follow the process: rotary piercer, crimping press, push bench elongator, reeler and finally to the walking beam furnace. After passing through the calibration press, we obtain the thickness rolling and diameter sizing in order to obtain the desired final dimensions.



HEAT TREATMENTS

We are working in the effectiveness of our heat treatments before the finishing lines in order to improve day by day the performance of our tubes and to be stronger in our way to a better sustainable process with less emissions, less consumptions and higher efficiency.

The heat treatment process is continually being improved, to meet the needs of the clients, to walk with them in their energy transition through innovative and sustainable tubular solutions.

FINISHING AND PACKING

Finally, the tube moves to the finishing line, where it is hydraulic tested, inspected and packed.

The data for electricity generation for production were obtained from the specific electricity mix of the retailer, obtained from information published by the Comisión Nacional de los Mercados y la Competencia (CNMC), https://gdo.cnmc.es/CNE/accesoEtiquetado.do, and represent the company's energy consumption profile.

Content declaration

For this study, it has been decided to report the average values of the results. The composition of the tube in all cases is 100% steel, and what varies as a result of the different recipes is the quantities of the different raw materials used.

Regarding the percentage of post-consumer scrap, the average value is declared.

PRODUCT CONTENT	MAS, KG	POST-CONSUMER RECYCLED MATERIAL, MASS-% OF PRODUCT	BIOGENIC MATERIAL, MASS-% OF PRODUCT	BIOGENIC MATERIAL, KG C/ DECLARED UNIT
Steel	1.000	21,62%	0%	0

The chemical composition ranges for the steel used in the tube, taking into account all the material recipes included, are listed below.

PRODUCT COMPONENT	SYMBOL	WT %
Carbon	C	≤0.30
Manganese	Mn	≤1.65
Silicon	Si	≥0.10
Sulphur	S	≤0.035
Phosphorus	P	≤0.035
Chromium	Cr	≤0.40
Cupper	Cu	≤0.40
Nickel	Ni	≤0.40
Molybdenum	Mo	≤0.15
Vanadium	V	≤0.12

The product does not contain, or release substances classified as hazardous according to Regulation (EC) No. 1907/2006 (REACH), and no component of the product is classified as hazardous according to Regulation (EC) No. 1272/2008 (CLP)

The product is distributed without packaging.

RECYCLED MATERIAL

TRG uses scrap steel as a raw material for this product. The scrap steel includes both pre- and post-consumer scrap. The average recycling percentage, taking into account pre-consumer and post-consumer scrap, is 94%.

LCA information

DECLARED UNIT

1 ton (1000 kg) of fabricated tube

REFERENCE SERVICE

Not applicable.

TIME REPRESENTATIVENESS

Primary data originated by TRG, corresponds to the year 2024.

The declared unit of "1 ton (1.000 kg) of fabricated tube" has been calculated having into account all the annual inputs and outputs of the manufacturing process in the steel mill and rolling mill in Amurrio. This production represents a quality of tube with a specific path of manufacturing steps, which are inventoried in the module A3.

GEOGRAPHICAL SCOPE

Global (A1-A2), Spain (A3), and Europe (A4, C1-C4 & D)

DATABASE(S) AND LCA SOFTWARE USED

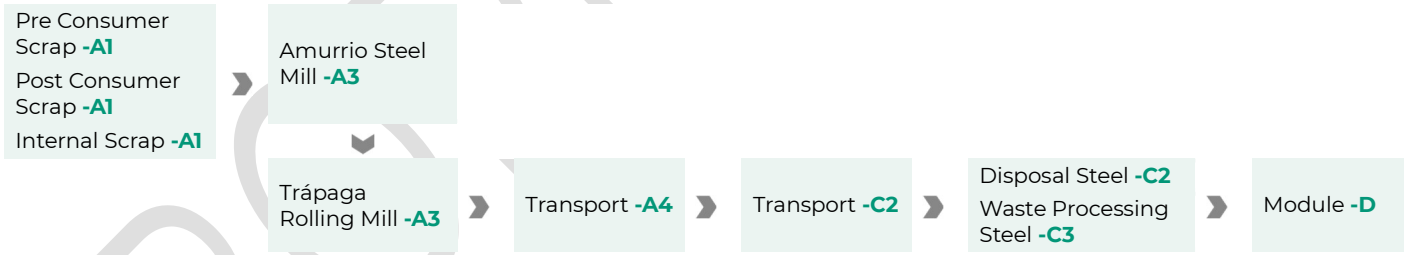
The database used was Ecoinvent 3.9.1 and the software used was SIMAPRO 9.5.01.

DESCRIPTION OF SYSTEM BOUNDARIES

The system boundaries established in this study have been defined following the guidelines of the PCR 2023:01 version 2.0.0 Fabricated metal products, except construction products, applying the "cradle-to-grave" criterion with modules A+B+C and module D.

PROCESS FLOW DIAGRAM

The scope of life cycle of assessment (LCA) is cradle-to-grave, and therefore, this study includes the extraction of materials, the manufacturing process, the transport to client, the use stage and the end-of-life. It also includes the benefits and loads beyond the system.



The tube as a scrap is assumed to end up in steel recycling.

Product stage: modules A1-A3

Module A1 – Raw material supply

- Extraction and processing of raw material for all main parts of the product including packaging
- The recycling processes of materials from the recycling of waste streams from a previous product system.

Module A2 – Transport of materials

- Transport of materials and components from the suppliers to the manufacturing plant

Module A3 – Manufacturing of the product

- Production of auxiliar materials consumed in the manufacturing process

- Generation of the energy used in the manufacturing process
- waste generated during manufacturing, including its transport and treatment.

The GWP-GHG impact of the electricity mix used for the A3 module is 0,55 kg CO2 eq/kWh.

Distribution and Installation stage: modules A4-A5

Module A4 – Transport to the installation or user

The tubes are shipped by road to several European countries. The transport scenario includes:

- The vehicle type used for transport:
- Distance: average distance
- Capacity utilization (including empty returns): assumed by Ecoinvent

Module A5 – Installation of the product

This module includes the installation of the product. The tube can have different applications and, depending on the application, the installation stage will vary, so no specific installation scenario has been specified.

Use stage: modules B1-B7

The tube has different applications. Considering that the applications do not depend on the direct control of the company, but rather on the customer, no specific scenario of use has been established. Therefore, there is no information in the following modules.

- B1: Use/application/operation of the product.
- B2: Maintenance of the product.
- B3: Repair of the product.
- B4: Replacement.
- B5: Refurbishment.
- B6: Energy use in use/application/operation.
- B7: Water use in use/application/operation.

End-of-life stage: modules C1-C4

Module C1 – Deinstallation of the metal product

This module includes the deinstallation of the product. The tube can have different applications and, depending on the application, the deinstallation stage will vary, so no specific installation scenario has been specified.

Module C2 – Transport to sorting/recycling or to end-of-life disposal site

This module includes the transport of the tube to the waste management facilities. An average of 300 km to the waste management facilities was considered.

Module C3 – Treatment of waste for recycling

This module includes the sorting, collection, and processing of the waste product.

It is considered that the tube is recyclable, but a small portion will be lost in the recycling process. Specifically, it is estimated that 95% of the pipe will be recycled.

Module C4 – Final disposal

The 5% of the tube that is not recycled is sent to landfill.

Benefits and loads beyond the system: module D

This module includes the benefits and loads beyond the system boundary due to e.g., reuse, recycling, or waste incineration with energy recovery. For this study, the D module includes, the materials sent to recycling in the module C3.

Not included

- The manufacturing process of capital goods and spare parts and/or maintenance with a life of more than three years.
- The environmental impact of infrastructure for general management
- The impact caused by people (common activities, work commuting, etc.).
- There are not specific scenarios for the installation, the use stage and the deinstallation of the tube, since the tube can have different applications which are under the control of the customer.

MODULES DECLARED, GEOGRAPHICAL SCOPE, SHARE OF SPECIFIC DATA (IN GWP-GHG RESULTS), AND DATA VARIATION (IN GWP-GHG RESULTS):

MODULE	PRODUCT STAGE			DISTRIBUTION AND INSTALLATION STAGE		USE STAGE							END OF LIFE STAGE				REUSE, RECOVERY AND RECYCLING POTENTIAL
	Raw material	Transport	Manufacturing	Transport	Installation	Use	Maintenance	Repair	Replacement	Refurbishment	Energy use	Water use	Deinstallation	Transport	Waste management	Final Disposal	Reuse, recovery and 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	X	X	X	X	X	X	X	X	X	X	X	X	X
Geography	GLO	GLO	ES	RER	-	-	-	-	-	-	-	-	-	RER	RER	RER	RER
% Primary Data	82%				-	-	-	-	-	-	-	-	-	-	-	-	-
Variation products	+4%/-4%																
Variation sites	0%																

ADDITIONAL INFORMATION

Allocation processes:

Following the polluter pays principle, the full environmental impact of waste is assigned to the generator until the point at which the waste reaches its 'end-of-waste' status. Therefore:

- The environmental impact associated with the treatment of waste that is not used as a resource in another product system corresponds to the generator.
- The environmental impact associated with the transformation of waste into resources for subsequent use corresponds to the user of those resources.

For **post-consumer scrap steel**, the polluter pays principle was followed and the steel recycling process was considered by using a scrap indicator from the Ecoinvent database 3.9.1.

For **pre-consumer scrap from external sources**, originating from modules A1-A5 of another product system, an economic allocation based on an estimate using public data on steel prices and scrap prices in European markets was used.

The pre-consumer scrap used by the company comes from the automotive sector and is produced after the stamping process. To determine the appropriate steel price for this allocation, the price of hot-rolled steel coil plus the price of steel stamping for the automotive sector has been considered.

STEEL	TIMEFRAME	AVERAGE VALUE (€/TON)	ECONOMIC ALLOCATION
Primary steel	01/2024 – 12/2024	1.245,2 €/t	80%
Recycled steel (scrap)	07/2024 – 04/2025	305,3 €/t	20%

For primary steel, data was retrieved form an online source (Trading Economics), where the average price for hot rolled coil steel during 2024 was used (655,89 €/t). To this price, the price of stamping steel for the automotive sector (Witik et al., 2011) was added (589,31 €/t). Therefore, the price of the stamped primary steel consider is 1.245,2 €/t. The price of the recycled steel was also obtained from an online source (MEPS International).

During the manufacturing process, **the company reuses its own scrap produced in modules A1-A3**. An economic allocation has also been applied to internally recycled pre-consumer scrap, in this case using the average sale price of the tube and the price of scrap steel from public data.

STEEL	TIMEFRAME	AVERAGE VALUE (€/TON)	ECONOMIC ALLOCATION
Steel tube	01/2024 – 012/2024	2.200,0 €/t	88%
Recycled steel (scrap)	07/2024 – 04/2025	305,3 €/t	12%

During the manufacturing process of the tube, **co-products are produced**. These co-products are sold externally; therefore, an economic allocation has also been used for these co-products.

Considering that the average price of a tube sold by the company is €2.200/ton, the allocation of co-products is as follows.

STEEL/CO-PRODUCT	TIMEFRAME	AVERAGE VALUE (€/TON)	ECONOMIC ALLOCATION
Steel tube	01/2024 – 012/2024	2.200,0 €/t	97,91%
Co-products	01/2024 – 12/2024	47 €/t	2,09%

Cut-off rules

For the modules inventoried, 100% of the flows (inputs and outputs) have been included.

Data quality

The quality of data used meets the following requirements:

- Temporal representativeness: data collection was carried out during 2024. The generic data used are current and have been obtained from Ecoinvent 3.9.1, which is less than 10 years old (www.ecoinvent.org).
- Geographical representativeness: the data used are representative of the region where the product is manufactured. Data collection was obtained at the manufacturing plants. For transport, the Ecoinvent 3.9.1 was used, which has global emissions standards. The electricity mix is specific for the energy purchased in the manufacturing plants.
- Technological representativeness: Data for the life cycle stages considered are characteristic for the tube. The generic data were obtained from the Ecoinvent 3.9.1 database and represent technological processes similar to those used for fuel production, auxiliary inputs and transport. The Characterisation Factors correspond to those established in "EN 15804 Reference Package EF 3.1.

A data quality assessment according to EN 15804:2012+A2:2019/AC:2021, Table E.1: Data quality level and criteria of the UN Global Environmental Guidelines on the development of LCI databases was performed.

The **share of primary data** is calculated based on GWP-GHG results. It is a simplified indicator for data quality that do not capture all relevant aspects of data quality. The indicator is not comparable across product categories.

PROCESS	SOURCE TYPE	SOURCE	REFERENCE YEAR	DATA CATEGORY	SHARE OF PRIMARY DATA, OF GWP-GHG RESULTS FOR A1-A3
Production of raw materials	Database	Ecoinvent 3.9	2024	Representative secondary data	0,00%
Transport of raw materials to the production site	Information collected	EPD owner	2024	Primary data	2,15%
Product manufacturing	Information collected	EPD owner	2024	Primary data	80,14%
Total share of primary data, of GWP-GHG results for A1-A3					**82,29%**

Results of the environmental performance indicators

IMPACT CATEGORY INDICATORS

Results for the life cycle assessment per declared unit: "1 ton (1000 kg) of fabricated tube"

INDICATOR	UNIT	A1 – A3	A4	A5	B1-B7	C1	C2	C3	C4	D
GWP- fossil	kg CO_2 eq.	1,34E+03	3,67E+02	0,00E+00	0,00E+00	0,00E+00	5,43E+01	3,20E+00	2,97E-01	-4,56E+00
GWP- biogenic	kg CO_2eq.	1,08E+00	1,24E-01	0,00E+00	0,00E+00	0,00E+00	1,75E-02	1,23E-03	1,30E-04	-4,06E-03
GWP- luluc	kg CO_2 eq.	1,17E+00	1,68E-01	0,00E+00	0,00E+00	0,00E+00	2,68E-02	1,00E-02	1,80E-04	-2,99E-03
GWP- total	kg CO_2 eq.	1,34E+03	3,67E+02	0,00E+00	0,00E+00	0,00E+00	5,43E+01	3,22E+00	2,98E-01	-4,57E+00
ODP	kg CFC 11 eq.	3,29E-05	8,00E-06	0,00E+00	0,00E+00	0,00E+00	1,18E-06	5,41E-08	8,62E-09	-7,98E-08
AP	mol H^+ eq.	4,42E+00	7,57E-01	0,00E+00	0,00E+00	0,00E+00	1,19E-01	1,76E-02	2,24E-03	-2,02E-02
EP-freshwater	kg P eq.	2,77E-01	2,54E-02	0,00E+00	0,00E+00	0,00E+00	3,86E-03	3,31E-04	2,48E-05	-2,23E-03
EP-marine	kg N eq.	1,02E+00	1,88E-01	0,00E+00	0,00E+00	0,00E+00	2,99E-02	6,80E-03	8,61E-04	-4,61E-03
EP-terrestrial	mol N eq.	1,06E+01	1,91E+00	0,00E+00	0,00E+00	0,00E+00	3,04E-01	7,24E-02	9,22E-03	-4,66E-02
POCP	kg NMVOC eq.	4,10E+00	1,18E+00	0,00E+00	0,00E+00	0,00E+00	1,84E-01	2,36E-02	3,21E-03	-2,15E-02
ADP-minerals&metals*	kg Sb eq.	5,20E-03	1,17E-03	0,00E+00	0,00E+00	0,00E+00	1,77E-04	9,66E-06	4,13E-07	-2,96E-05
ADP-fossil*	MJ	2,13E+04	5,17E+03	0,00E+00	0,00E+00	0,00E+00	7,71E+02	4,49E+01	7,41E+00	-4,80E+01
WDP*	m^3	4,04E+02	1,96E+01	0,00E+00	0,00E+00	0,00E+00	3,18E+00	2,56E-01	3,27E-01	3,51E-01
GWP-GHG[1]	**kg CO_2 eq.**	**1,34E+03**	**3,67E+02**	**0,00E+00**	**0,00E+00**	**0,00E+00**	**5,43E+01**	**3,22E+00**	**2,98E-01**	**-4,57E+00**
Acronyms	GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption									

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

[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 CO2 is set to zero.

For the modules A1-A3, the results for the GWP-GHG impact for 1 ton of fabricated tube are:

GWP-GHG A1-A3 1 t de tubo fabricado	A1	A2	A3	TOTAL
GWP-GHG [kg CO2 eq.]	237,36	28,84	1.074,35	1.340,55
GWP-GHG [%]	17,71%	2,15%	80,14%	100,00%

The GWP-GHG of manufacturing (A1-A3) 1 ton of a fabricated tube is 1.340,55 kg CO2 eq. The GWP-GHG of the transport to the customer is 366,85 kg CO2 eq.

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).

RESOURCE USE INDICATORS

RESOURCES 1 t (1.000 kg) of fabricated tube		UNIT	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Primary energy resources – Renewable	Used as energy carrier	MJ	9,60E+02	9,03E+01	0,00E+00	0,00E+00	0,00E+00	1,21E+01	8,40E-01	6,28E-02	-4,33E+00
	Used as raw materials	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
	TOTAL	**MJ**	9,60E+02	9,03E+01	0,00E+00	0,00E+00	0,00E+00	1,21E+01	8,40E-01	6,28E-02	-4,33E+00
Primary energy resources – Non-renewable	Used as energy carrier	MJ	2,13E+04	5,17E+03	0,00E+00	0,00E+00	0,00E+00	7,71E+02	4,49E+01	7,41E+00	-4,80E+01
	Used as raw materials	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
	TOTAL	**MJ**	**2,13E+04**	**5,17E+03**	**0,00E+00**	**0,00E+00**	**0,00E+00**	**7,71E+02**	**4,49E+01**	**7,41E+00**	**-4,80E+01**

Abbreviations

Abbreviation	Definition
	General Abbreviations
LCA	Life cycle assessment
PCR	Product Category Rules
EPD ®	Environmental product declaration
CCUS	Carbon Capture, Utilization, and Storage
R&D	Research and development
EU	European Community
EN	European Norm (Standard)
EF	Environmental Footprint
GPI	General Programme Instructions
ISO	International Organization for Standardization
CNMC	Comisión Nacional de los Mercados y la Competencia
CPC	Central product classification
REACH	European Regulation on Registration, Evaluation, Authorisation and Restriction of Chemicals
CC	Combined Cycle
EAF	Electric Arc Furnace
GLO	Global
ES	Spain
RER	Europe
TRG	Tubos Reunidos Group
Cr	Chromium
C	Carbon
Mn	Manganese
Si	Silicon
S	Sulphur
P	Phosphorus
Cu	Copper
Ni	Nickel
kg	kilogram
km	kilometer
ton	Metric ton (1.000 kg)
MPa	Megapascal
GWP	Global warming potential
luluc	land use and land use change
ODP	Depletion potential of the stratospheric ozone layer
AP	Acidification potential
EP	Eutrophication
POCP	Formation potential of tropospheric ozone
ADP	Abiotic depletion potential
WDP	Water (user) deprivation potential
Eq.	Equivalent(s)

Version history

Original version of the EPD.

References

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- ISO 14044:2006. Environmental management — Life cycle assessment — Requirements and guidelines.
- ISO 14025:2006: Environmental labels and declarations. Type III environmental declarations. Principles and procedures.
- General Programme Instructions of the International EPD® System. Version 5.0.1
- Product Category Rules (PCR) 2023:01 Version 2.0.0: Fabricated Metal Products, Except Construction Products: UN CPC 4128 – Tubes, pipes and hollow profiles of steel.
- Witik, R. A., Payet, J., Michaud, V., Ludwig, C. & Månson, J.-A. E. (2011). Assessing the life cycle costs and environmental performance of lightweight materials in automobile applications. Composites Part A: Applied Science and Manufacturing, 42(11), 1694–1709. https://doi.org/10.1016/j.compositesa.2011.07.024

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