ENVIRONMENTAL PRODUCT DECLARATION

EN

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

Programme operator:
EPD International AB

EPD registration number:
S-P-07027

Publication date:
2022-10-10

Revision date:
2024-05-13

Valido fino:
2027-09-20

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

In accordance with
ISO 14025 and
EN 15804:2012+A2:2019 for:

TUBE SECTIONS FROM HOT AND COLD STRIPS, HEAT TREATED AND DRAWN

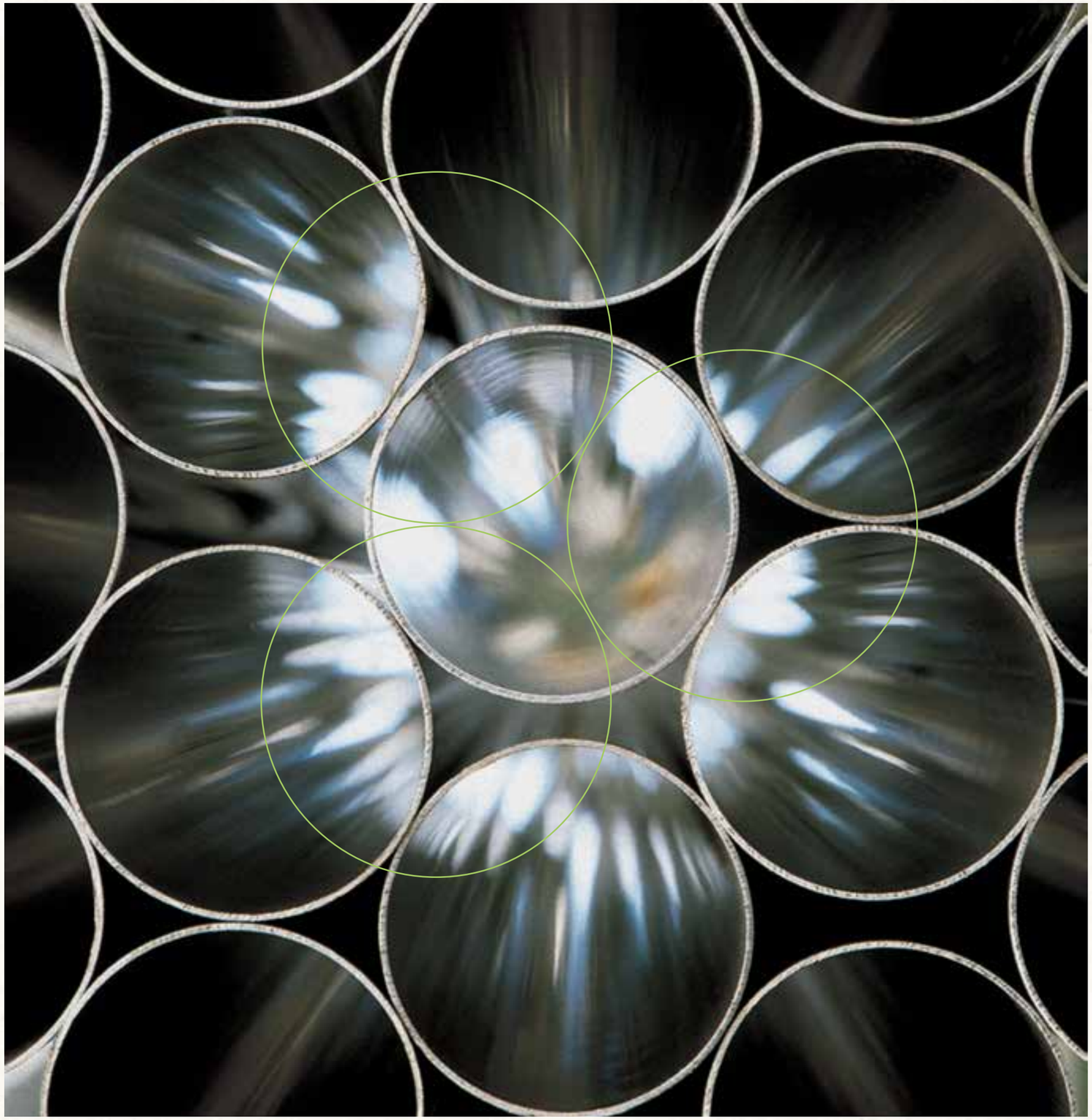
From:

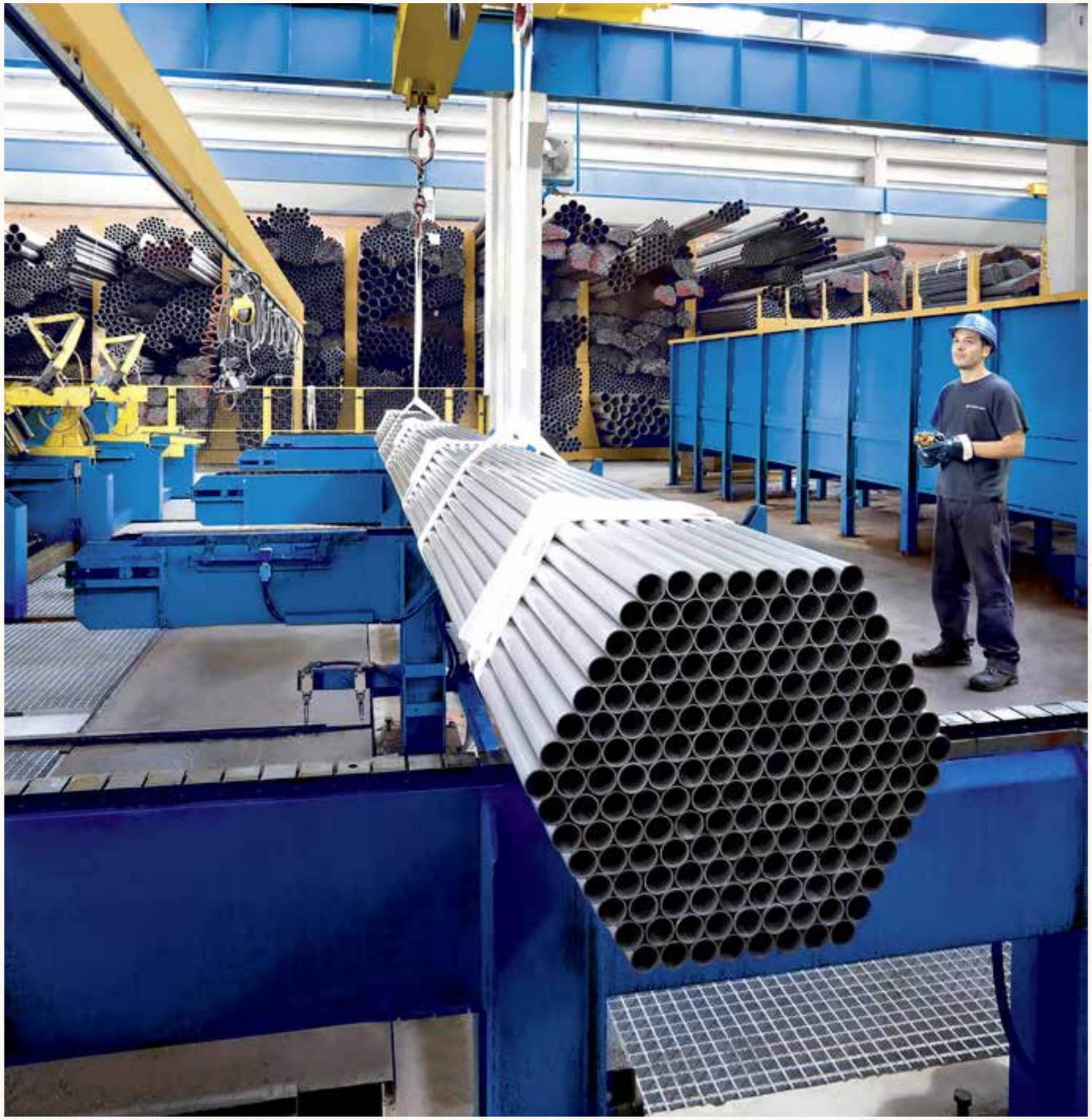
Marcegaglia Carbon Steel S.p.A.

MARCEGAGLIA CARBON STEEL

ECO PLATFORM EPD VERIFIED

EPD® THE INTERNATIONAL EPD® SYSTEM





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:	info@environdec.com

The standard EN 15804 represents the framework for the Product Category Rules (PCR)

Product Category Rules (PCR):
Construction products, 2019:14, version 1.11, UN CPC 54.

The review of the PCR was conducted by:
The Technical Committee of the International EPD® System. Review chair: Claudia A. Peña – Contact via the Secretariat www.environdec.com/contact

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 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 from different programmes may not be comparable. EPDs of construction products may not be comparable if they do not comply with UNI EN 15804. For further information about comparability, see EN 15804 and ISO 14025.

INFORMATION ON THE COMPANY

Owner of the EPD:
Marcegaglia Carbon Steel S.p.A.
info.carbonsteel@marcegaglia.com

Contact:
For more information on this product declaration and/or its configurations, the following references are available:
Email: *info@marcegaglia.com*
Phone: *+39 0376 6851*

Description of the organisation:
Marcegaglia Carbon Steel S.p.A. is the company of the Marcegaglia Group that transforms and markets flat products (coils, strips, and sheets) in carbon and pre-painted steel (PPGI) and carbon steel tubes. The company, thanks to advanced production technology and the most modern automation systems, enters the market for the creation of any type of finish on components and accessories, allowing it to satisfy the most demanding and customized requests.

Certification relating to the product and/or the management system:
- Quality management system compliant with the requirements of the standard UNI EN ISO 9001:2015 (certificate n° 10233/04/S, RINA Services SpA);
- Environmental management system compliant with the requirements of the standard UNI EN ISO 14001:2015 (certificate n° EMS-262/S, RINA Services SpA);
- Health and safety management system compliant with the requirements of the standard UNI ISO 45001:2018 (certificate n° OHS-260, RINA Services SpA);
- Energy management system compliant with the requirements of the standard UNI CEI EN ISO 50001:2018 (certificate n° EnergyMS-137, RINA Services SpA);
- Social responsibility management system compliant with the requirements of the standard SA 8000:2014 (certificate n° SA-2040, RINA Services SpA);
- Carbon Footprint Product - CFP Systematic Approach management system compliant with the requirements of the standard ISO 14067:2018 (certificate n° IT330357–1, Bureau Veritas Italia SpA).

Name and location of the production sites:
- Boltiere plant: Marcegaglia street, 2 – 24040 - Boltiere (BG) ;
- Casalmaggiore plant: Vanoni street, 25 – 26041 Casalmaggiore (CR);
- Dusino San Michele plant: Corso Industria street, 20 – 14010 - Dusino San Michele (AT);
- Gazoldo degli Ippoliti plant: Bresciani street, 16 – 46040 - Gazoldo Degli Ippoliti (MN);
- Lomagna plant: Milano street, 41 – 23871 – Lomagna (LC);
- Rivoli plant: Acqui street, 68 – 10098 - Rivoli (TO).

INFORMATION ON THE PRODUCT

Product name:
Tubes sections from hot and cold strips, heat treated and drawn

Product identification:
Tubes sections from hot and cold strips, heat treated and drawn

Product description:
From the first transformation, as part of its controlled production chain, Marcegaglia Carbon Steel obtains the widest range of carbon steel welded tubes in the world. The Marcegaglia Carbon Steel production of tubes obtained from hot rolled, cold and galvanized strip covers a wide range of uses, guaranteeing specific suitability for subsequent reworking.

With great versatility and flexibility, Marcegaglia precision tubes allow you to interpret and respond to the needs of specific uses such as radiators, roller systems, greenhouses, doors and windows, fences, furniture, sports equipment, automotive, mechanical industry and many others. Marcegaglia is able to provide the widest range in the world of welded and cold-calibrated steel tubes for precision uses, to meet the needs of each market segment.

The range is divided into round, square, rectangular, oval, elliptical, triangular and semi-oval tubes and is completed by a very wide range of special shapes, with the possibility of customization on customer needs.

Marcegaglia supplies a wide range of cold-formed welded tubes for structural uses (CE approval) and hollow sections of unalloyed and fine-grain steels, hot finished or cold formed with heat treatments for special structural uses.

Finally, Marcegaglia Carbon Steel boasts a wide range of precision cold drawn tubes, welded and seamless, in all varieties of carbon and low alloy steels, for automotive, hydraulic and mechanical applications.

From the company website it is possible to consult the product catalogs within which the technical characteristics of the same are described in detail.

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

Geographical scope:
Worldwide

INFORMATION ON THE LCA

Functional unit:
The functional unit of the system considered is 1 tonne of tube product.

Reference service life - RSL:
For the products under study it is not possible to quantify the exact useful life as much also depends on their future use. However, it is emphasized that even when the deadline is reached, the product can be recycled and reused again to generate other raw materials.

Time representativeness:
The data used are representative of the year 2023.

Database(s) and LCA software used:
Ecoinvent database v.3.9.1,, January 2023 / Software used SimaPro rel. 9.5.0.0.

Description of the system boundaries:
The study is "Cradle to gate with modules C1 – C4 and module D (A1 – A3 + C + D)" (reference: PCR 2019: 14 vers. 1.11).

Modules A1-A3 include material procurement processes (raw and auxiliary materials) as well as manufacturing processes.

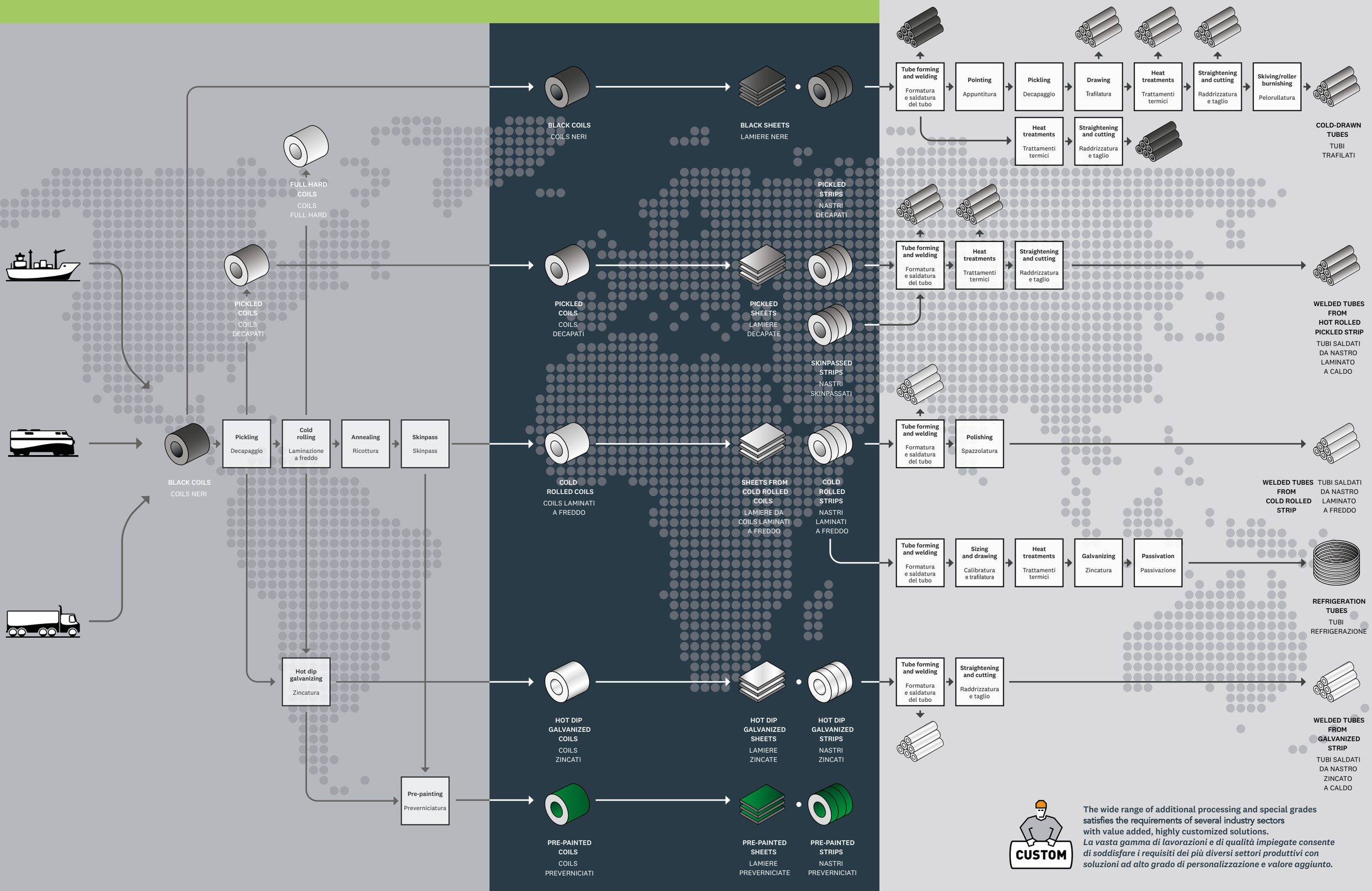
Modules C1-C4 consider the uninstallation, transport, sorting and disposal of components deriving from the end-of-life operations of road barriers. These operations are not directly controllable by the company: in this regard, literature data relating to the construction sector are therefore used. It is considered:
- an average consumption of diesel fuel equivalent to 143.2 MJ as well as 0.013 MWh of electricity for each ton of demolished material;
- an average distance of 80 km to transport the material to the recovery center;
- the same energy consumption already mentioned for the demolition activity also for the waste treatment activity.

Module D considers the recovery and recycling potential of steel deriving from end-of-life processes: the calculation of the environmental benefits deriving from the recovery of steel is based on the indications provided by the document "Product Category Rules for Type III environmental product declaration of construction products to EN 15804: 2012 - Par. 6.3.4.6. Benefits and loads beyond the product system boundary, information Module D ".

DIFFERENCES VERSUS PREVIOUS VERSIONS

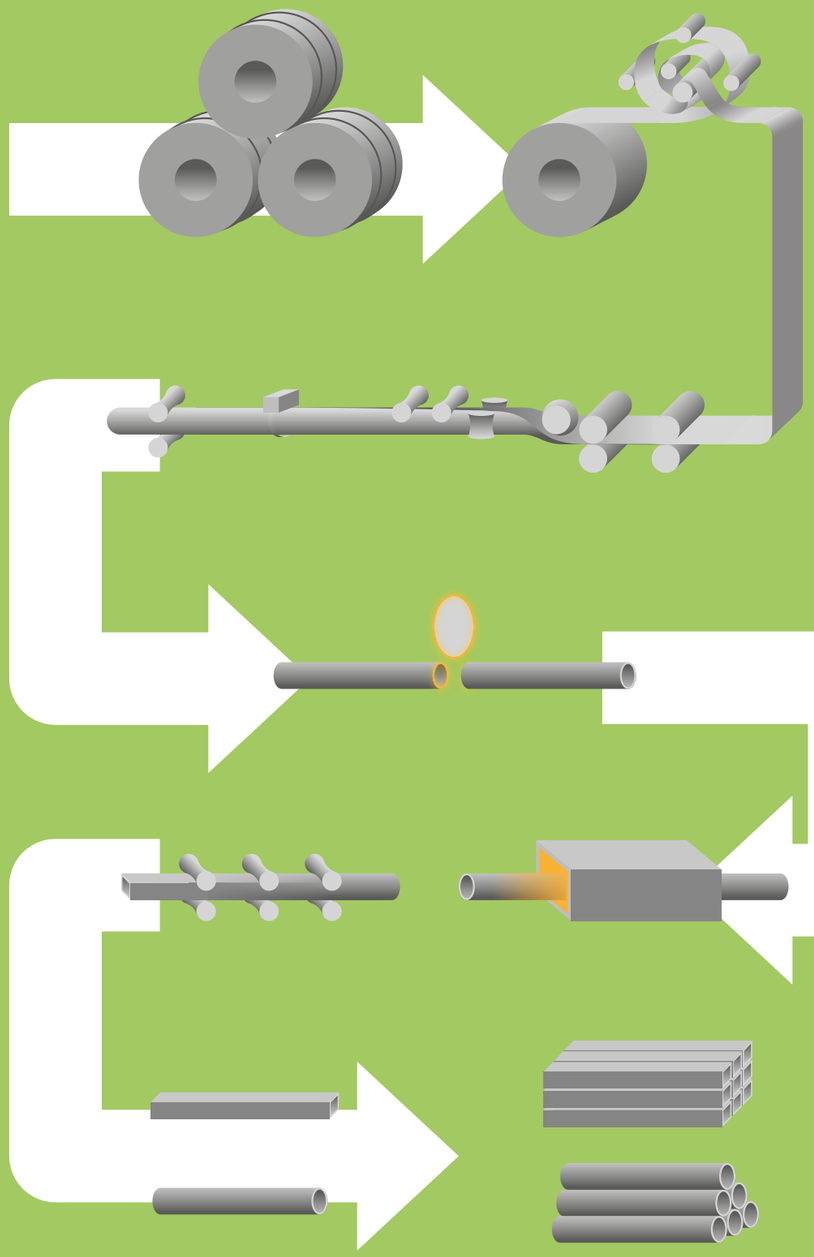
Compared to the previous version of the EPD Declaration (revision on 16/02/2023), the main changes made to the data analyzed are listed below:
- Site-specific data were collected and used (for modules A1, A2 and A3) in relation to all environmental matrices in reference to the year 2023, above all a part of electric energy supply from renewable sources and the subsequent Guarantees of Origin (GO) cancellation.

CARBON STEEL PRODUCTS MANUFACTURING PROCESS

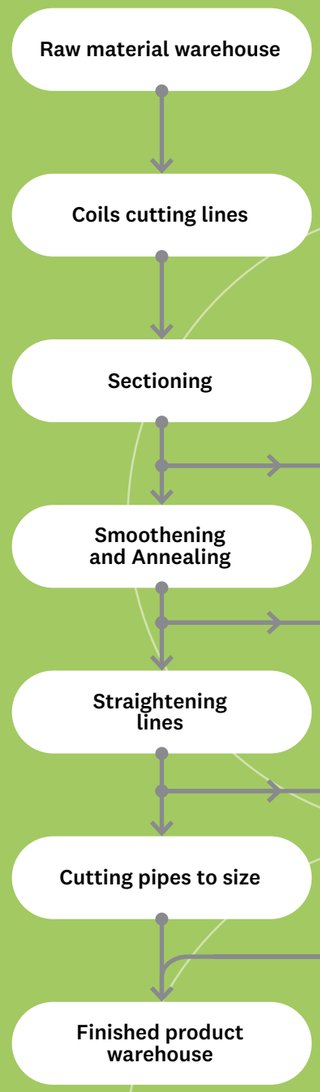


The wide range of additional processing and special grades satisfies the requirements of several industry sectors with value added, highly customized solutions.
La vasta gamma di lavorazioni e di qualità impiegate consente di soddisfare i requisiti dei più diversi settori produttivi con soluzioni ad alto grado di personalizzazione e valore aggiunto.

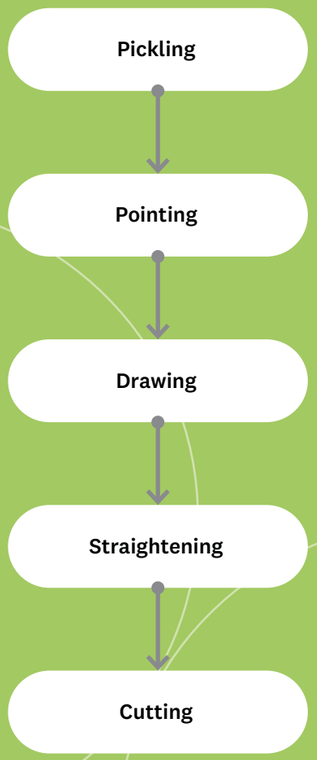
DIAGRAM OF THE PRODUCTION PROCESS OF THE TUBES



BLOCK DIAGRAM OF THE PRODUCTION PROCESS OF THE TUBES



BLOCK DIAGRAM OF THE TUBE DRAWING PRODUCTION PROCESS



Other informations

DESCRIPTION OF THE MAIN ACTIVITIES

Starting from the raw material represented by carbon steel strips coming mainly from the plants of Marcegaglia Carbon Steel S.p.A. of Ravenna, Gazoldo degli Ippoliti and Corsico, the tubes are produced at the plants of Gazoldo degli Ippoliti, Casalmaggiore, Lomagna and Dusino through special plants called "tubifici", aimed at the production of welded profiles by induction. These systems can be schematised in three sections (inlet, central, outlet). In particular, the strips, suitably sheared, are processed by profiling machines composed of operating heads equipped with steel rollers to obtain the tubes welded in line. Operationally, the following steps are carried out:

INPUT SECTION: consists of a feeding zone and a strip accumulation area;

CENTRAL SECTION: is the portion of the system dedicated to the creation of the profile. It consists of:

- Forming - Finishing;
- Welding;
- Calibration;
- Cutting;

OUTPUT SECTION: is the portion of the system dedicated to the evacuation and unloading of the profile.

The production cycle of hot tubes and cold tubes is essentially the same: the difference consists in the type of rolling of the incoming strip, which can have been hot or cold rolled.

The Boltiere and Rivoli plants specialized in drawing steel tubes, where the tubes are the raw material. In order to be machined, carbon steel tubes must be pre-treated on the surface. The surface cleaning operation is carried out chemically, through a degreasing and acid pickling process. In order for the subsequent drawing of the tubes to be carried out, they must be pointed. Pointing can take place before or after pickling.

The drawing process consists in the cold elongation of the tubes and the consequent reduction of their thickness by traction. The drawn tubes can then follow two paths:

- be used in succession for straightening, cutting and shipping;
- be destined for heat treatment and then undergo a second pickling treatment and subsequently the steps referred to in the previous point.

To recondition the raw material, restore the structure of the metal (modified following the drawing action) and to obtain a perfect cleaning of the tubes, the products can be subjected to a heat treatment process.

ALLOCATION RULES

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

Modules declared, geographical scope, share of specific data (in the 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	> 90%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variations-product	Not relevant			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variaition-site	Not relevant			-	-	-	-	-	-	-	-	-	-	-	-	-	-

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

Information on the content

The raw material (black coil) purchased by Marcegaglia Carbon Steel S.p.A. is characterized by a recycled content equal to 20.9%: this percentage is calculated as the weighted average of the same value associated with the incoming raw material and deriving from both Type III environmental declarations and self-declarations in compliance with the UNI EN ISO 14021 standard. The steel comes both from integral cycle (with recycled content equal to 18.4%) and from electric furnace (with average recycled content equal to 77.2%).

The materials used for packaging the final products consist of plastic and/or metal straps, wooden saddles and polyester bands. The quantities of such packaging relative to one tonne of final product identify a value of less than 1%.

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

Product components	Weight [t]	Post-consumer material, weight [%]
Steel	1	20.9

Tube sections from hot and cold strips, heat treated and drawn

Environmental information

The environmental performance indicators refer to 1 tonne of tube product.

ENVIRONMENTAL IMPACTS

Impact category	ID	U.o.M.
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

CONSUMPTION OF RESOURCES

Impact category	ID	U.o.M.
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	ID	U.o.M.
Hazardous waste disposed	HW	kg
Non-hazardous waste disposed	NHW	kg
Radioactive waste disposed	RW	kg

OUTPUT FLOWS

Impact category	ID	U.o.M.
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

** 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.*

Profiled tubes from hot and cold rolled strip, heat treated and drawn

TUBE PROFILED BY HOT ROLLED STRIP

ID	U.o.M.	A1-A3	C1	C2	C3	C4	D
GWP - t	kg CO_2 eq	2.550E+03	2.001E+01	1.387E+01	2.001E+01	6.145E-02	-1.142E+03
GWP - fossil	kg CO_2 eq	2.551E+03	2.000E+01	1.385E+01	2.000E+01	6.138E-02	-1.138E+03
GWP - biogenic	kg CO_2 eq	-2.301E+00	1.284E-03	1.230E-02	1.284E-03	3.515E-05	-2.431E+00
GWP - luluc	kg CO_2 eq	1.640E+00	2.336E-03	6.699E-03	2.336E-03	3.706E-05	-7.565E-01
GWP - GHG	kg CO_2 eq	2.555E+03	2.001E+01	1.386E+01	2.001E+01	6.144E-02	-1.140E+03
ODP	kg CFC-11 eq	3.748E-05	3.483E-07	3.016E-07	3.483E-07	1.778E-09	-1.992E-05
POCP	kg NMVOC eq	1.158E+01	2.153E-01	6.809E-02	2.153E-01	6.624E-04	-5.427E+00
AP	mol H+ eq	1.110E+01	1.528E-01	4.534E-02	1.528E-01	4.625E-04	-5.151E+00
EP - freshwater	kg P eq	8.897E-01	1.257E-03	9.711E-04	1.257E-03	5.112E-06	-5.546E-01
EP - marine	kg N eq	2.687E+00	6.516E-02	1.560E-02	6.516E-02	1.776E-04	-1.180E+00
EP - terrestrial	mol N eq	2.845E+01	7.079E-01	1.648E-01	7.079E-01	1.903E-03	-1.197E+01
WDP	m³ depriv.	4.241E+02	9.363E-01	8.206E-01	9.363E-01	6.757E-02	8.336E+01
ADP - F	MJ	2.732E+04	2.676E+02	1.971E+02	2.676E+02	1.530E+00	-1.205E+04
ADP - MM	kg Sb eq	1.293E-02	8.708E-06	4.360E-05	8.708E-06	8.523E-08	-8.189E-03
PERE	MJ	3.950E+03	9.468E+00	3.830E+00	9.468E+00	1.699E-02	-1.347E+03
PERM	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PERT	MJ	3.950E+03	9.468E+00	3.830E+00	9.468E+00	1.699E-02	-1.347E+03
PENRE	MJ	3.309E+04	2.727E+02	1.958E+02	2.727E+02	1.523E+00	-1.487E+04
PENRM	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PENRT	MJ	3.309E+04	2.727E+02	1.958E+02	2.727E+02	1.523E+00	-1.487E+04
SM	kg	2.980E+02	2.698E-02	0.000E+00	2.698E-02	2.947E-04	-2.112E+02
RSF	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NRSF	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
FW	m³	1.921E+01	3.386E-02	3.356E-02	3.386E-02	1.633E-03	-1.331E+01
HW	kg	1.354E+02	6.981E-02	0.000E+00	6.981E-02	1.326E-03	-7.168E+01
NHW	kg	7.058E+02	2.646E-01	0.000E+00	2.646E-01	1.331E-02	-4.425E+02
RW	kg	2.068E-01	1.127E-04	0.000E+00	1.127E-04	1.915E-06	-9.637E-02
REUSE	kg	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RECYCLE	kg	5.722E+00	4.059E-02	0.000E+00	4.059E-02	4.828E-04	-5.796E+02
EN-REC	kg	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
EE-E	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
EE-T	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

HOT ROLLED AND PICKLED STRIP PROFILED TUBE

ID	U.o.M.	A1-A3	C1	C2	C3	C4	D
GWP - t	kg CO_2 eq	2.411E+03	1.408E+01	1.087E+01	1.408E+01	4.142E-01	-9.704E+02
GWP - fossil	kg CO_2 eq	2.417E+03	1.389E+01	1.086E+01	1.389E+01	4.135E-01	-9.677E+02
GWP - biogenic	kg CO_2 eq	-8.526E+00	1.893E-01	9.037E-03	1.893E-01	4.255E-04	-2.067E+00
GWP - luluc	kg CO_2 eq	1.745E+00	1.656E-03	5.184E-03	1.656E-03	2.532E-04	-6.430E-01
GWP - GHG	kg CO_2 eq	2.421E+03	1.392E+01	1.087E+01	1.392E+01	4.150E-01	-9.702E+02
ODP	kg CFC-11 eq	3.367E-05	2.440E-07	2.369E-07	2.440E-07	1.092E-08	-1.693E-05
POCP	kg NMVOC eq	1.604E+01	1.454E-01	5.502E-02	1.454E-01	3.986E-03	-4.613E+00
AP	mol H+ eq	1.057E+01	1.039E-01	3.601E-02	1.039E-01	2.789E-03	-4.379E+00
EP - freshwater	kg P eq	8.118E-01	9.075E-04	7.666E-04	9.075E-04	4.133E-05	-4.714E-01
EP - marine	kg N eq	2.553E+00	4.385E-02	1.243E-02	4.385E-02	1.076E-03	-1.003E+00
EP - terrestrial	mol N eq	2.692E+01	4.772E-01	1.313E-01	4.772E-01	1.153E-02	-1.018E+01
WDP	m³ depriv.	4.262E+02	1.914E+00	6.973E-01	1.914E+00	3.122E-01	7.086E+01
ADP - F	MJ	2.602E+04	1.882E+02	1.565E+02	1.882E+02	8.891E+00	-1.024E+04
ADP - MM	kg Sb eq	1.739E-01	6.141E-06	3.189E-05	6.141E-06	8.024E-07	-6.961E-03
PERE	MJ	2.748E+03	1.298E+01	2.948E+00	1.298E+01	1.451E-01	-1.145E+03
PERM	MJ	0.000E+00	0.000E+00	3.333E-01	6.667E-01	1.000E+00	0.000E+00
PERT	MJ	2.748E+03	1.298E+01	3.282E+00	1.364E+01	1.145E+00	-1.145E+03
PENRE	MJ	2.909E+04	1.889E+02	1.554E+02	1.889E+02	8.805E+00	-1.260E+04
PENRM	MJ	0.000E+00	0.000E+00	3.333E-01	6.667E-01	1.000E+00	0.000E+00
PENRT	MJ	2.909E+04	1.889E+02	1.558E+02	1.895E+02	9.805E+00	-1.260E+04
SM	kg	3.474E+02	3.551E-02	1.769E-02	3.551E-02	-1.126E-01	-1.795E+02
RSF	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NRSF	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
FW	m³	1.245E+01	2.497E-02	2.926E-02	2.497E-02	7.900E-03	-1.144E+01
HW	kg	1.120E+02	5.923E-02	8.513E-03	5.923E-02	2.017E-03	-3.373E+01
NHW	kg	5.198E+02	2.494E-01	4.128E-04	2.494E-01	5.619E-03	-1.863E+02
RW	kg	2.129E-01	1.332E-04	1.441E-04	1.332E-04	2.561E-05	-8.192E-02
REUSE	kg	0.000E+00	0.000E+00	3.333E-01	6.667E-01	1.000E+00	0.000E+00
RECYCLE	kg	4.961E+00	5.602E-02	2.026E-02	5.602E-02	4.075E-03	-4.926E+02
EN-REC	kg	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
EE-E	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
EE-T	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

TUBE PROFILED BY COLD-ROLLED STRIP (FULL HARD)

ID	U.o.M.	A1-A3	C1	C2	C3	C4	D
GWP - t	kg CO_2 eq	2.881E+03	6.742E+00	8.976E+00	6.742E+00	1.120E+00	-1.472E+03
GWP - fossil	kg CO_2 eq	2.916E+03	6.177E+00	8.965E+00	6.177E+00	1.118E+00	-1.468E+03
GWP - biogenic	kg CO_2 eq	-3.691E+01	5.638E-01	6.895E-03	5.638E-01	1.206E-03	-3.135E+00
GWP - luluc	kg CO_2 eq	2.213E+00	7.969E-04	4.217E-03	7.969E-04	6.855E-04	-9.754E-01
GWP - GHG	kg CO_2 eq	2.919E+03	6.269E+00	8.989E+00	6.269E+00	1.122E+00	-1.473E+03
ODP	kg CFC-11 eq	4.232E-05	1.346E-07	1.961E-07	1.346E-07	2.921E-08	-2.568E-05
POCP	kg NMVOC eq	3.282E+01	1.888E-02	4.698E-02	1.888E-02	1.063E-02	-6.998E+00
AP	mol H+ eq	1.305E+01	2.056E-02	3.018E-02	2.056E-02	7.443E-03	-6.642E+00
EP - freshwater	kg P eq	1.012E+00	7.416E-04	6.380E-04	7.416E-04	1.138E-04	-7.151E-01
EP - marine	kg N eq	3.152E+00	3.779E-03	1.045E-02	3.779E-03	2.873E-03	-1.521E+00
EP - terrestrial	mol N eq	3.340E+01	4.373E-02	1.104E-01	4.373E-02	3.078E-02	-1.544E+01
WDP	m³ depriv.	4.694E+02	4.012E+00	6.265E-01	4.012E+00	8.015E-01	1.075E+02
ADP - F	MJ	3.158E+04	8.493E+01	1.311E+02	8.493E+01	2.361E+01	-1.553E+04
ADP - MM	kg Sb eq	1.482E-02	3.457E-06	2.418E-05	3.457E-06	2.237E-06	-1.056E-02
PERE	MJ	1.106E+03	2.352E+01	2.384E+00	2.352E+01	4.015E-01	-1.737E+03
PERM	MJ	0.000E+00	0.000E+00	1.000E+00	2.000E+00	3.000E+00	0.000E+00
PERT	MJ	1.106E+03	2.352E+01	3.384E+00	2.552E+01	3.401E+00	-1.737E+03
PENRE	MJ	3.171E+04	9.074E+01	1.299E+02	9.074E+01	2.337E+01	-1.906E+04
PENRM	MJ	0.000E+00	0.000E+00	1.000E+00	2.000E+00	3.000E+00	0.000E+00
PENRT	MJ	3.171E+04	9.074E+01	1.309E+02	9.274E+01	2.637E+01	-1.906E+04
SM	kg	1.497E+00	1.498E-02	5.307E-02	1.498E-02	-3.381E-01	-2.721E+02
RSF	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NRSF	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
FW	m³	1.867E+00	1.933E-02	2.714E-02	1.933E-02	2.043E-02	-1.753E+01
HW	kg	1.146E+00	6.066E-03	2.554E-02	6.066E-03	4.394E-03	-1.082E+01
NHW	kg	1.506E-01	4.944E-04	1.238E-03	4.944E-04	2.240E-04	-1.087E+00
RW	kg	1.694E-02	1.045E-04	4.322E-04	1.045E-04	7.443E-05	-1.243E-01
REUSE	kg	0.000E+00	0.000E+00	1.000E+00	2.000E+00	3.000E+00	0.000E+00
RECYCLE	kg	3.135E+00	2.141E-02	6.079E-02	2.141E-02	1.162E-02	-7.473E+02
EN-REC	kg	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
EE-E	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
EE-T	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

TUBE PROFILED BY GALVANISED STRIP

ID	U.o.M.	A1-A3	C1	C2	C3	C4	D
GWP - t	kg CO_2 eq	3.049E+03	1.779E+01	1.305E+01	1.779E+01	2.378E-01	-1.298E+03
GWP - fossil	kg CO_2 eq	3.050E+03	1.770E+01	1.304E+01	1.770E+01	2.375E-01	-1.294E+03
GWP - biogenic	kg CO_2 eq	-3.319E+00	9.504E-02	1.140E-02	9.504E-02	2.303E-04	-2.764E+00
GWP - luluc	kg CO_2 eq	2.101E+00	2.079E-03	6.286E-03	2.079E-03	1.451E-04	-8.601E-01
GWP - GHG	kg CO_2 eq	3.055E+03	1.772E+01	1.305E+01	1.772E+01	2.382E-01	-1.297E+03
ODP	kg CFC-11 eq	4.772E-05	3.127E-07	2.840E-07	3.127E-07	6.350E-09	-2.265E-05
POCP	kg NMVOC eq	1.733E+01	1.826E-01	6.457E-02	1.826E-01	2.324E-03	-6.171E+00
AP	mol H+ eq	1.348E+01	1.308E-01	4.281E-02	1.308E-01	1.626E-03	-5.857E+00
EP - freshwater	kg P eq	1.076E+00	1.171E-03	9.156E-04	1.171E-03	2.322E-05	-6.306E-01
EP - marine	kg N eq	3.284E+00	5.493E-02	1.474E-02	5.493E-02	6.267E-04	-1.341E+00
EP - terrestrial	mol N eq	3.466E+01	5.972E-01	1.558E-01	5.972E-01	6.716E-03	-1.362E+01
WDP	m³ depriv.	5.764E+02	1.449E+00	7.882E-01	1.449E+00	1.899E-01	9.479E+01
ADP - F	MJ	3.344E+04	2.372E+02	1.861E+02	2.372E+02	5.210E+00	-1.370E+04
ADP - MM	kg Sb eq	5.745E-02	7.833E-06	4.037E-05	7.833E-06	4.438E-07	-9.311E-03
PERE	MJ	4.143E+03	1.181E+01	3.589E+00	1.181E+01	8.107E-02	-1.531E+03
PERM	MJ	0.000E+00	0.000E+00	1.667E-01	3.333E-01	5.000E-01	0.000E+00
PERT	MJ	4.143E+03	1.181E+01	3.756E+00	1.214E+01	5.811E-01	-1.531E+03
PENRE	MJ	3.920E+04	2.424E+02	1.848E+02	2.424E+02	5.164E+00	-1.688E+04
PENRM	MJ	0.000E+00	0.000E+00	1.667E-01	3.333E-01	5.000E-01	0.000E+00
PENRT	MJ	3.920E+04	2.424E+02	1.850E+02	2.427E+02	5.664E+00	-1.688E+04
SM	kg	1.969E+02	2.498E-02	8.846E-03	2.498E-02	-5.611E-02	-2.401E+02
RSF	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NRSF	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
FW	m³	2.737E+01	3.143E-02	3.249E-02	3.143E-02	4.767E-03	-1.520E+01
HW	kg	1.166E+02	5.918E-02	4.256E-03	5.918E-02	1.837E-03	-6.790E+01
NHW	kg	6.106E+02	2.206E-01	2.064E-04	2.206E-01	1.113E-02	-4.082E+02
RW	kg	1.518E-01	1.114E-04	7.203E-05	1.114E-04	1.400E-05	-1.096E-01
REUSE	kg	0.000E+00	0.000E+00	1.667E-01	3.333E-01	5.000E-01	0.000E+00
RECYCLE	kg	6.013E+00	3.739E-02	1.013E-02	3.739E-02	2.339E-03	-6.590E+02
EN-REC	kg	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
EE-E	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
EE-T	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

TUBE PROFILED BY COLD STRIP (strip subjected to cold rolling, annealing and skin-passing)

ID	U.o.M.	A1-A3	C1	C2	C3	C4	D
GWP - t	kg CO_2 eq	2.925E+03	1.603E+01	1.196E+01	1.603E+01	3.260E-01	-1.244E+03
GWP - fossil	kg CO_2 eq	2.934E+03	1.589E+01	1.195E+01	1.589E+01	3.255E-01	-1.241E+03
GWP - biogenic	kg CO_2 eq	-1.093E+01	1.422E-01	1.022E-02	1.422E-01	3.279E-04	-2.650E+00
GWP - luluc	kg CO_2 eq	1.873E+00	1.855E-03	5.735E-03	1.855E-03	1.992E-04	-8.246E-01
GWP - GHG	kg CO_2 eq	3.028E+03	1.591E+01	1.196E+01	1.591E+01	3.266E-01	-1.287E+03
ODP	kg CFC-11 eq	4.411E-05	2.815E-07	2.605E-07	2.815E-07	8.636E-09	-2.172E-05
POCP	kg NMVOC eq	1.821E+01	1.642E-01	5.980E-02	1.642E-01	3.155E-03	-5.916E+00
AP	mol H+ eq	1.274E+01	1.172E-01	3.941E-02	1.172E-01	2.208E-03	-5.615E+00
EP - freshwater	kg P eq	9.800E-01	1.013E-03	8.411E-04	1.013E-03	3.227E-05	-6.046E-01
EP - marine	kg N eq	3.093E+00	4.937E-02	1.359E-02	4.937E-02	8.513E-04	-1.286E+00
EP - terrestrial	mol N eq	3.275E+01	5.370E-01	1.435E-01	5.370E-01	9.122E-03	-1.305E+01
WDP	m³ depriv.	5.038E+02	1.597E+00	7.428E-01	1.597E+00	2.511E-01	9.088E+01
ADP - F	MJ	3.211E+04	2.113E+02	1.713E+02	2.113E+02	7.051E+00	-1.313E+04
ADP - MM	kg Sb eq	1.410E-02	6.880E-06	3.613E-05	6.880E-06	6.231E-07	-8.927E-03
PERE	MJ	3.782E+03	1.153E+01	3.269E+00	1.153E+01	1.131E-01	-1.468E+03
PERM	MJ	0.000E+00	0.000E+00	2.500E-01	5.000E-01	7.500E-01	0.000E+00
PERT	MJ	3.782E+03	1.153E+01	3.519E+00	1.203E+01	8.631E-01	-1.468E+03
PENRE	MJ	3.720E+04	2.172E+02	1.701E+02	2.172E+02	6.985E+00	-1.618E+04
PENRM	MJ	0.000E+00	0.000E+00	2.500E-01	5.000E-01	7.500E-01	0.000E+00
PENRT	MJ	3.720E+04	2.172E+02	1.704E+02	2.177E+02	7.735E+00	-1.618E+04
SM	kg	2.135E+02	1.098E-02	1.327E-02	1.098E-02	-8.425E-02	-2.302E+02
RSF	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NRSF	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
FW	m³	1.805E+01	2.786E-02	3.088E-02	2.786E-02	6.333E-03	-1.460E+01
HW	kg	1.152E+02	3.110E-02	6.385E-03	3.110E-02	2.341E-03	-5.774E+01
NHW	kg	5.892E+02	9.606E-02	3.096E-04	9.606E-02	1.253E-02	-3.400E+02
RW	kg	1.644E-01	7.093E-05	1.081E-04	7.093E-05	2.040E-05	-1.051E-01
REUSE	kg	0.000E+00	0.000E+00	2.500E-01	5.000E-01	7.500E-01	0.000E+00
RECYCLE	kg	5.877E+00	1.474E-02	1.520E-02	1.474E-02	3.358E-03	-6.318E+02
EN-REC	kg	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
EE-E	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
EE-T	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Tube sections from hot and cold strips, heat treated and drawn

TUBE PROFILED AND HEAT TREATED BY HOT-ROLLED STRIP

ID	U.o.M.	A1-A3	C1	C2	C3	C4	D
GWP - t	kg CO_2 eq	2.575E+03	1.436E+01	8.402E+00	1.436E+01	6.145E-02	-1.116E+03
GWP - fossil	kg CO_2 eq	2.575E+03	1.436E+01	8.391E+00	1.436E+01	6.138E-02	-1.113E+03
GWP - biogenic	kg CO_2 eq	-8.857E-01	3.291E-03	6.454E-03	3.291E-03	3.515E-05	-2.376E+00
GWP - luluc	kg CO_2 eq	1.611E+00	1.616E-03	3.947E-03	1.616E-03	3.706E-05	-7.394E-01
GWP - GHG	kg CO_2 eq	2.579E+03	1.436E+01	8.398E+00	1.436E+01	6.144E-02	-1.114E+03
ODP	kg CFC-11 eq	4.490E-05	2.285E-07	1.836E-07	2.285E-07	1.778E-09	-1.947E-05
POCP	kg NMVOC eq	1.217E+01	1.985E-01	4.397E-02	1.985E-01	6.624E-04	-5.305E+00
AP	mol H+ eq	1.148E+01	1.331E-01	2.824E-02	1.331E-01	4.625E-04	-5.035E+00
EP - freshwater	kg P eq	9.409E-01	4.416E-04	5.972E-04	4.416E-04	5.112E-06	-5.421E-01
EP - marine	kg N eq	2.784E+00	6.167E-02	9.777E-03	6.167E-02	1.776E-04	-1.153E+00
EP - terrestrial	mol N eq	2.955E+01	6.703E-01	1.033E-01	6.703E-01	1.903E-03	-1.170E+01
WDP	m³ depriv.	5.482E+02	4.057E-01	5.865E-01	4.057E-01	6.757E-02	8.148E+01
ADP - F	MJ	2.881E+04	1.881E+02	1.227E+02	1.881E+02	1.530E+00	-1.178E+04
ADP - MM	kg Sb eq	1.415E-02	5.015E-06	2.263E-05	5.015E-06	8.523E-08	-8.004E-03
PERE	MJ	3.840E+03	1.313E+00	2.231E+00	1.313E+00	1.699E-02	-1.316E+03
PERM	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PERT	MJ	3.840E+03	1.313E+00	2.231E+00	1.313E+00	1.699E-02	-1.316E+03
PENRE	MJ	3.481E+04	1.861E+02	1.222E+02	1.861E+02	1.523E+00	-1.453E+04
PENRM	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PENRT	MJ	3.481E+04	1.861E+02	1.222E+02	1.861E+02	1.523E+00	-1.453E+04
SM	kg	3.112E+02	1.446E-05	0.000E+00	1.446E-05	3.684E-04	-2.064E+02
RSF	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NRSF	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
FW	m³	2.126E+01	1.630E-02	2.491E-02	1.630E-02	1.633E-03	-1.301E+01
HW	kg	1.564E+02	5.914E-05	0.000E+00	5.914E-05	1.657E-03	-7.006E+01
NHW	kg	8.256E+02	1.916E-04	0.000E+00	1.916E-04	1.663E-02	-4.325E+02
RW	kg	2.507E-01	8.956E-08	0.000E+00	8.956E-08	2.393E-06	-9.420E-02
REUSE	kg	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RECYCLE	kg	7.142E+00	1.877E-05	0.000E+00	1.877E-05	6.035E-04	-5.665E+02
EN-REC	kg	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
EE-E	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
EE-T	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

PROFILED TUBE, HEAT TREATED AND STRAIGHTENED BY HOT ROLLED STRIP

ID	U.o.M.	A1-A3	C1	C2	C3	C4	D
GWP - t	kg CO_2 eq	2.632E+03	1.436E+01	8.402E+00	1.436E+01	6.145E-02	-1.104E+03
GWP - fossil	kg CO_2 eq	2.632E+03	1.436E+01	8.391E+00	1.436E+01	6.138E-02	-1.101E+03
GWP - biogenic	kg CO_2 eq	-7.794E-01	3.291E-03	6.454E-03	3.291E-03	3.515E-05	-2.351E+00
GWP - luluc	kg CO_2 eq	1.637E+00	1.616E-03	3.947E-03	1.616E-03	3.706E-05	-7.315E-01
GWP - GHG	kg CO_2 eq	2.636E+03	1.436E+01	8.398E+00	1.436E+01	6.144E-02	-1.103E+03
ODP	kg CFC-11 eq	4.593E-05	2.285E-07	1.836E-07	2.285E-07	1.778E-09	-1.926E-05
POCP	kg NMVOC eq	1.242E+01	1.985E-01	4.397E-02	1.985E-01	6.624E-04	-5.248E+00
AP	mol H+ eq	1.173E+01	1.331E-01	2.824E-02	1.331E-01	4.625E-04	-4.981E+00
EP - freshwater	kg P eq	9.593E-01	4.416E-04	5.972E-04	4.416E-04	5.112E-06	-5.363E-01
EP - marine	kg N eq	2.842E+00	6.167E-02	9.777E-03	6.167E-02	1.776E-04	-1.141E+00
EP - terrestrial	mol N eq	3.016E+01	6.703E-01	1.033E-01	6.703E-01	1.903E-03	-1.158E+01
WDP	m³ depriv.	5.594E+02	4.057E-01	5.865E-01	4.057E-01	6.757E-02	8.062E+01
ADP - F	MJ	2.945E+04	1.881E+02	1.227E+02	1.881E+02	1.530E+00	-1.165E+04
ADP - MM	kg Sb eq	1.442E-02	5.015E-06	2.263E-05	5.015E-06	8.523E-08	-7.919E-03
PERE	MJ	3.919E+03	1.313E+00	2.231E+00	1.313E+00	1.699E-02	-1.302E+03
PERM	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PERT	MJ	3.919E+03	1.313E+00	2.231E+00	1.313E+00	1.699E-02	-1.302E+03
PENRE	MJ	3.558E+04	1.861E+02	1.222E+02	1.861E+02	1.523E+00	-1.437E+04
PENRM	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PENRT	MJ	3.558E+04	1.861E+02	1.222E+02	1.861E+02	1.523E+00	-1.437E+04
SM	kg	3.169E+02	1.446E-05	0.000E+00	1.446E-05	3.684E-04	-2.042E+02
RSF	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NRSF	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
FW	m³	2.168E+01	1.630E-02	2.491E-02	1.630E-02	1.633E-03	-1.287E+01
HW	kg	1.594E+02	5.914E-05	0.000E+00	5.914E-05	1.657E-03	-6.932E+01
NHW	kg	8.413E+02	1.916E-04	0.000E+00	1.916E-04	1.663E-02	-4.279E+02
RW	kg	2.554E-01	8.956E-08	0.000E+00	8.956E-08	2.393E-06	-9.320E-02
REUSE	kg	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RECYCLE	kg	7.295E+00	1.877E-05	0.000E+00	1.877E-05	6.035E-04	-5.604E+02
EN-REC	kg	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
EE-E	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
EE-T	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

PROFILED TUBE, HEAT TREATED, STRAIGHTENED AND CUT FROM HOT ROLLED STRIP

ID	U.o.M.	A1-A3	C1	C2	C3	C4	D
GWP - t	kg CO_2 eq	2.731E+03	1.436E+01	8.402E+00	1.436E+01	6.145E-02	-1.092E+03
GWP - fossil	kg CO_2 eq	2.730E+03	1.436E+01	8.391E+00	1.436E+01	6.138E-02	-1.089E+03
GWP - biogenic	kg CO_2 eq	-6.757E-01	3.291E-03	6.454E-03	3.291E-03	3.515E-05	-2.326E+00
GWP - luluc	kg CO_2 eq	1.669E+00	1.616E-03	3.947E-03	1.616E-03	3.706E-05	-7.236E-01
GWP - GHG	kg CO_2 eq	2.734E+03	1.436E+01	8.398E+00	1.436E+01	6.144E-02	-1.091E+03
ODP	kg CFC-11 eq	4.788E-05	2.285E-07	1.836E-07	2.285E-07	1.778E-09	-1.906E-05
POCP	kg NMVOC eq	1.281E+01	1.985E-01	4.397E-02	1.985E-01	6.624E-04	-5.192E+00
AP	mol H+ eq	1.211E+01	1.331E-01	2.824E-02	1.331E-01	4.625E-04	-4.928E+00
EP - freshwater	kg P eq	9.837E-01	4.416E-04	5.972E-04	4.416E-04	5.112E-06	-5.305E-01
EP - marine	kg N eq	2.925E+00	6.167E-02	9.777E-03	6.167E-02	1.776E-04	-1.128E+00
EP - terrestrial	mol N eq	3.105E+01	6.703E-01	1.033E-01	6.703E-01	1.903E-03	-1.145E+01
WDP	m³ depriv.	5.744E+02	4.057E-01	5.865E-01	4.057E-01	6.757E-02	7.975E+01
ADP - F	MJ	3.069E+04	1.881E+02	1.227E+02	1.881E+02	1.530E+00	-1.152E+04
ADP - MM	kg Sb eq	1.473E-02	5.015E-06	2.263E-05	5.015E-06	8.523E-08	-7.834E-03
PERE	MJ	4.064E+03	1.313E+00	2.231E+00	1.313E+00	1.699E-02	-1.288E+03
PERM	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PERT	MJ	4.064E+03	1.313E+00	2.231E+00	1.313E+00	1.699E-02	-1.288E+03
PENRE	MJ	3.701E+04	1.861E+02	1.222E+02	1.861E+02	1.523E+00	-1.422E+04
PENRM	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PENRT	MJ	3.701E+04	1.861E+02	1.222E+02	1.861E+02	1.523E+00	-1.422E+04
SM	kg	3.227E+02	1.446E-05	0.000E+00	1.446E-05	3.684E-04	-2.020E+02
RSF	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NRSF	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
FW	m³	2.223E+01	1.630E-02	2.491E-02	1.630E-02	1.633E-03	-1.273E+01
HW	kg	1.627E+02	5.914E-05	0.000E+00	5.914E-05	1.657E-03	-6.857E+01
NHW	kg	8.583E+02	1.916E-04	0.000E+00	1.916E-04	1.663E-02	-4.233E+02
RW	kg	2.607E-01	8.956E-08	0.000E+00	8.956E-08	2.393E-06	-9.219E-02
REUSE	kg	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RECYCLE	kg	7.554E+00	1.877E-05	0.000E+00	1.877E-05	6.035E-04	-5.544E+02
EN-REC	kg	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
EE-E	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
EE-T	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

TUBE PROFILED AND HEAT TREATED BY HOT ROLLED AND PICKLED STRIP

ID	U.o.M.	A1-A3	C1	C2	C3	C4	D
GWP - t	kg CO_2 eq	2.372E+03	1.436E+01	8.402E+00	1.436E+01	6.145E-02	-6.284E+02
GWP - fossil	kg CO_2 eq	2.370E+03	1.436E+01	8.391E+00	1.436E+01	6.138E-02	-6.267E+02
GWP - biogenic	kg CO_2 eq	-2.233E-01	3.291E-03	6.454E-03	3.291E-03	3.515E-05	-1.338E+00
GWP - luluc	kg CO_2 eq	1.570E+00	1.616E-03	3.947E-03	1.616E-03	3.706E-05	-4.164E-01
GWP - GHG	kg CO_2 eq	2.374E+03	1.436E+01	8.398E+00	1.436E+01	6.144E-02	-6.276E+02
ODP	kg CFC-11 eq	3.800E-05	2.285E-07	1.836E-07	2.285E-07	1.778E-09	-1.097E-05
POCP	kg NMVOC eq	1.079E+01	1.985E-01	4.397E-02	1.985E-01	6.624E-04	-2.988E+00
AP	mol H+ eq	1.055E+01	1.331E-01	2.824E-02	1.331E-01	4.625E-04	-2.836E+00
EP - freshwater	kg P eq	8.048E-01	4.416E-04	5.972E-04	4.416E-04	5.112E-06	-3.053E-01
EP - marine	kg N eq	2.590E+00	6.167E-02	9.777E-03	6.167E-02	1.776E-04	-6.494E-01
EP - terrestrial	mol N eq	2.730E+01	6.703E-01	1.033E-01	6.703E-01	1.903E-03	-6.592E+00
WDP	m³ depriv.	5.471E+02	4.057E-01	5.865E-01	4.057E-01	6.757E-02	4.589E+01
ADP - F	MJ	2.638E+04	1.881E+02	1.227E+02	1.881E+02	1.530E+00	-6.632E+03
ADP - MM	kg Sb eq	1.074E-02	5.015E-06	2.263E-05	5.015E-06	8.523E-08	-4.508E-03
PERE	MJ	3.487E+03	1.313E+00	2.231E+00	1.313E+00	1.699E-02	-7.414E+02
PERM	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PERT	MJ	3.487E+03	1.313E+00	2.231E+00	1.313E+00	1.699E-02	-7.414E+02
PENRE	MJ	3.088E+04	1.861E+02	1.222E+02	1.861E+02	1.523E+00	-8.183E+03
PENRM	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PENRT	MJ	3.088E+04	1.861E+02	1.222E+02	1.861E+02	1.523E+00	-8.183E+03
SM	kg	5.591E+02	1.446E-05	0.000E+00	1.446E-05	3.684E-04	-1.163E+02
RSF	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NRSF	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
FW	m³	1.980E+01	1.630E-02	2.491E-02	1.630E-02	1.633E-03	-7.328E+00
HW	kg	1.830E+02	5.914E-05	0.000E+00	5.914E-05	1.657E-03	-3.946E+01
NHW	kg	8.496E+02	1.916E-04	0.000E+00	1.916E-04	1.663E-02	-2.436E+02
RW	kg	3.340E-01	8.956E-08	0.000E+00	8.956E-08	2.393E-06	-5.305E-02
REUSE	kg	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RECYCLE	kg	6.402E+00	1.877E-05	0.000E+00	1.877E-05	6.035E-04	-3.190E+02
EN-REC	kg	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
EE-E	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
EE-T	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

PROFILED TUBE, HEAT TREATED AND STRAIGHTENED BY HOT ROLLED AND PICKLED STRIP

ID	U.o.M.	A1-A3	C1	C2	C3	C4	D
GWP - t	kg CO_2 eq	2.425E+03	1.436E+01	8.402E+00	1.436E+01	6.145E-02	-6.086E+02
GWP - fossil	kg CO_2 eq	2.423E+03	1.436E+01	8.391E+00	1.436E+01	6.138E-02	-6.069E+02
GWP - biogenic	kg CO_2 eq	-1.048E-01	3.291E-03	6.454E-03	3.291E-03	3.515E-05	-1.296E+00
GWP - luluc	kg CO_2 eq	1.594E+00	1.616E-03	3.947E-03	1.616E-03	3.706E-05	-4.033E-01
GWP - GHG	kg CO_2 eq	2.428E+03	1.436E+01	8.398E+00	1.436E+01	6.144E-02	-6.079E+02
ODP	kg CFC-11 eq	3.890E-05	2.285E-07	1.836E-07	2.285E-07	1.778E-09	-1.062E-05
POCP	kg NMVOC eq	1.101E+01	1.985E-01	4.397E-02	1.985E-01	6.624E-04	-2.893E+00
AP	mol H+ eq	1.077E+01	1.331E-01	2.824E-02	1.331E-01	4.625E-04	-2.746E+00
EP - freshwater	kg P eq	8.206E-01	4.416E-04	5.972E-04	4.416E-04	5.112E-06	-2.957E-01
EP - marine	kg N eq	2.644E+00	6.167E-02	9.777E-03	6.167E-02	1.776E-04	-6.289E-01
EP - terrestrial	mol N eq	2.787E+01	6.703E-01	1.033E-01	6.703E-01	1.903E-03	-6.384E+00
WDP	m³ depriv.	5.582E+02	4.057E-01	5.865E-01	4.057E-01	6.757E-02	4.445E+01
ADP - F	MJ	2.698E+04	1.881E+02	1.227E+02	1.881E+02	1.530E+00	-6.423E+03
ADP - MM	kg Sb eq	1.094E-02	5.015E-06	2.263E-05	5.015E-06	8.523E-08	-4.366E-03
PERE	MJ	3.560E+03	1.313E+00	2.231E+00	1.313E+00	1.699E-02	-7.180E+02
PERM	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PERT	MJ	3.560E+03	1.313E+00	2.231E+00	1.313E+00	1.699E-02	-7.180E+02
PENRE	MJ	3.158E+04	1.861E+02	1.222E+02	1.861E+02	1.523E+00	-7.925E+03
PENRM	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PENRT	MJ	3.158E+04	1.861E+02	1.222E+02	1.861E+02	1.523E+00	-7.925E+03
SM	kg	5.693E+02	1.446E-05	0.000E+00	1.446E-05	3.684E-04	-1.126E+02
RSF	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NRSF	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
FW	m³	2.019E+01	1.630E-02	2.491E-02	1.630E-02	1.633E-03	-7.097E+00
HW	kg	1.864E+02	5.914E-05	0.000E+00	5.914E-05	1.657E-03	-3.822E+01
NHW	kg	8.658E+02	1.916E-04	0.000E+00	1.916E-04	1.663E-02	-2.359E+02
RW	kg	3.402E-01	8.956E-08	0.000E+00	8.956E-08	2.393E-06	-5.138E-02
REUSE	kg	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RECYCLE	kg	6.542E+00	1.877E-05	0.000E+00	1.877E-05	6.035E-04	-3.090E+02
EN-REC	kg	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
EE-E	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
EE-T	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

PROFILED TUBE, HEAT TREATED, STRAIGHTENED AND CUT FROM HOT ROLLED AND PICKLED STRIP

ID	U.o.M.	A1-A3	C1	C2	C3	C4	D
GWP - t	kg CO_2 eq	2.519E+03	1.436E+01	8.402E+00	1.436E+01	6.145E-02	-5.888E+02
GWP - fossil	kg CO_2 eq	2.518E+03	1.436E+01	8.391E+00	1.436E+01	6.138E-02	-5.872E+02
GWP - biogenic	kg CO_2 eq	1.119E-02	3.291E-03	6.454E-03	3.291E-03	3.515E-05	-1.254E+00
GWP - luluc	kg CO_2 eq	1.626E+00	1.616E-03	3.947E-03	1.616E-03	3.706E-05	-3.902E-01
GWP - GHG	kg CO_2 eq	2.522E+03	1.436E+01	8.398E+00	1.436E+01	6.144E-02	-5.881E+02
ODP	kg CFC-11 eq	4.072E-05	2.285E-07	1.836E-07	2.285E-07	1.778E-09	-1.027E-05
POCP	kg NMVOC eq	1.138E+01	1.985E-01	4.397E-02	1.985E-01	6.624E-04	-2.799E+00
AP	mol H+ eq	1.114E+01	1.331E-01	2.824E-02	1.331E-01	4.625E-04	-2.657E+00
EP - freshwater	kg P eq	8.425E-01	4.416E-04	5.972E-04	4.416E-04	5.112E-06	-2.861E-01
EP - marine	kg N eq	2.724E+00	6.167E-02	9.777E-03	6.167E-02	1.776E-04	-6.084E-01
EP - terrestrial	mol N eq	2.871E+01	6.703E-01	1.033E-01	6.703E-01	1.903E-03	-6.176E+00
WDP	m³ depriv.	5.732E+02	4.057E-01	5.865E-01	4.057E-01	6.757E-02	4.300E+01
ADP - F	MJ	2.818E+04	1.881E+02	1.227E+02	1.881E+02	1.530E+00	-6.214E+03
ADP - MM	kg Sb eq	1.119E-02	5.015E-06	2.263E-05	5.015E-06	8.523E-08	-4.224E-03
PERE	MJ	3.698E+03	1.313E+00	2.231E+00	1.313E+00	1.699E-02	-6.946E+02
PERM	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PERT	MJ	3.698E+03	1.313E+00	2.231E+00	1.313E+00	1.699E-02	-6.946E+02
PENRE	MJ	3.293E+04	1.861E+02	1.222E+02	1.861E+02	1.523E+00	-7.667E+03
PENRM	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PENRT	MJ	3.293E+04	1.861E+02	1.222E+02	1.861E+02	1.523E+00	-7.667E+03
SM	kg	5.798E+02	1.446E-05	0.000E+00	1.446E-05	3.684E-04	-1.089E+02
RSF	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NRSF	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
FW	m³	2.071E+01	1.630E-02	2.491E-02	1.630E-02	1.633E-03	-6.866E+00
HW	kg	1.902E+02	5.914E-05	0.000E+00	5.914E-05	1.657E-03	-3.697E+01
NHW	kg	8.833E+02	1.916E-04	0.000E+00	1.916E-04	1.663E-02	-2.282E+02
RW	kg	3.470E-01	8.956E-08	0.000E+00	8.956E-08	2.393E-06	-4.971E-02
REUSE	kg	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RECYCLE	kg	6.787E+00	1.877E-05	0.000E+00	1.877E-05	6.035E-04	-2.989E+02
EN-REC	kg	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
EE-E	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
EE-T	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

TUBE PROFILED AND HEAT TREATED BY GALVANISED STRIP

ID	U.o.M.	A1-A3	C1	C2	C3	C4	D
GWP - t	kg CO_2 eq	3.055E+03	1.436E+01	8.402E+00	1.436E+01	6.145E-02	-1.181E+03
GWP - fossil	kg CO_2 eq	3.051E+03	1.436E+01	8.391E+00	1.436E+01	6.138E-02	-1.178E+03
GWP - biogenic	kg CO_2 eq	1.843E+00	3.291E-03	6.454E-03	3.291E-03	3.515E-05	-2.516E+00
GWP - luluc	kg CO_2 eq	2.009E+00	1.616E-03	3.947E-03	1.616E-03	3.706E-05	-7.827E-01
GWP - GHG	kg CO_2 eq	3.057E+03	1.436E+01	8.398E+00	1.436E+01	6.144E-02	-1.180E+03
ODP	kg CFC-11 eq	5.186E-05	2.285E-07	1.836E-07	2.285E-07	1.778E-09	-2.061E-05
POCP	kg NMVOC eq	1.416E+01	1.985E-01	4.397E-02	1.985E-01	6.624E-04	-5.616E+00
AP	mol H+ eq	1.358E+01	1.331E-01	2.824E-02	1.331E-01	4.625E-04	-5.330E+00
EP - freshwater	kg P eq	1.074E+00	4.416E-04	5.972E-04	4.416E-04	5.112E-06	-5.739E-01
EP - marine	kg N eq	3.354E+00	6.167E-02	9.777E-03	6.167E-02	1.776E-04	-1.221E+00
EP - terrestrial	mol N eq	3.544E+01	6.703E-01	1.033E-01	6.703E-01	1.903E-03	-1.239E+01
WDP	m^3 depriv.	6.968E+02	4.057E-01	5.865E-01	4.057E-01	6.757E-02	8.626E+01
ADP - F	MJ	3.451E+04	1.881E+02	1.227E+02	1.881E+02	1.530E+00	-1.247E+04
ADP - MM	kg Sb eq	5.720E-02	5.015E-06	2.263E-05	5.015E-06	8.523E-08	-8.473E-03
PERE	MJ	4.457E+03	1.313E+00	2.231E+00	1.313E+00	1.699E-02	-1.379E+03
PERM	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PERT	MJ	4.457E+03	1.313E+00	2.231E+00	1.313E+00	1.699E-02	-1.379E+03
PENRE	MJ	4.152E+04	1.861E+02	1.222E+02	1.861E+02	1.523E+00	-1.538E+04
PENRM	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PENRT	MJ	4.152E+04	1.861E+02	1.222E+02	1.861E+02	1.523E+00	-1.538E+04
SM	kg	2.776E+02	1.446E-05	0.000E+00	1.446E-05	3.684E-04	-2.185E+02
RSF	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NRSF	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
FW	m^3	3.479E+01	1.630E-02	2.491E-02	1.630E-02	1.633E-03	-1.377E+01
HW	kg	1.694E+02	5.914E-05	0.000E+00	5.914E-05	1.657E-03	-7.417E+01
NHW	kg	8.689E+02	1.918E-04	0.000E+00	1.918E-04	1.663E-02	-4.578E+02
RW	kg	2.404E-01	8.956E-08	0.000E+00	8.956E-08	2.393E-06	-9.972E-02
REUSE	kg	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RECYCLE	kg	8.094E+00	1.877E-05	0.000E+00	1.877E-05	6.035E-04	-5.997E+02
EN-REC	kg	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
EE-E	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
EE-T	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Tube sections from hot and cold strips, heat treated and drawn

PROFILED TUBE, HEAT TREATED AND STRAIGHTENED BY GALVANISED STRIP

ID	U.o.M.	A1-A3	C1	C2	C3	C4	D
GWP - t	kg CO_2 eq	3.121E+03	1.436E+01	8.402E+00	1.436E+01	6.145E-02	-1.171E+03
GWP - fossil	kg CO_2 eq	3.117E+03	1.436E+01	8.391E+00	1.436E+01	6.138E-02	-1.168E+03
GWP - biogenic	kg CO_2 eq	2.000E+00	3.291E-03	6.454E-03	3.291E-03	3.515E-05	-2.494E+00
GWP - luluc	kg CO_2 eq	2.042E+00	1.616E-03	3.947E-03	1.616E-03	3.706E-05	-7.761E-01
GWP - GHG	kg CO_2 eq	3.122E+03	1.436E+01	8.398E+00	1.436E+01	6.144E-02	-1.170E+03
ODP	kg CFC-11 eq	5.302E-05	2.285E-07	1.836E-07	2.285E-07	1.778E-09	-2.044E-05
POCP	kg NMVOC eq	1.445E+01	1.985E-01	4.397E-02	1.985E-01	6.624E-04	-5.568E+00
AP	mol H+ eq	1.386E+01	1.331E-01	2.824E-02	1.331E-01	4.625E-04	-5.285E+00
EP - freshwater	kg P eq	1.095E+00	4.416E-04	5.972E-04	4.416E-04	5.112E-06	-5.690E-01
EP - marine	kg N eq	3.422E+00	6.167E-02	9.777E-03	6.167E-02	1.776E-04	-1.210E+00
EP - terrestrial	mol N eq	3.616E+01	6.703E-01	1.033E-01	6.703E-01	1.903E-03	-1.229E+01
WDP	m³ depriv.	7.107E+02	4.057E-01	5.865E-01	4.057E-01	6.757E-02	8.553E+01
ADP - F	MJ	3.526E+04	1.881E+02	1.227E+02	1.881E+02	1.530E+00	-1.236E+04
ADP - MM	kg Sb eq	5.825E-02	5.015E-06	2.263E-05	5.015E-06	8.523E-08	-8.402E-03
PERE	MJ	4.787E+03	1.313E+00	2.231E+00	1.313E+00	1.699E-02	-1.382E+03
PERM	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PERT	MJ	4.787E+03	1.313E+00	2.231E+00	1.313E+00	1.699E-02	-1.382E+03
PENRE	MJ	4.242E+04	1.861E+02	1.222E+02	1.861E+02	1.523E+00	-1.525E+04
PENRM	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PENRT	MJ	4.242E+04	1.861E+02	1.222E+02	1.861E+02	1.523E+00	-1.525E+04
SM	kg	2.827E+02	1.446E-05	0.000E+00	1.446E-05	3.684E-04	-2.167E+02
RSF	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NRSF	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
FW	m³	3.545E+01	1.630E-02	2.491E-02	1.630E-02	1.633E-03	-1.366E+01
HW	kg	1.726E+02	5.914E-05	0.000E+00	5.914E-05	1.657E-03	-7.355E+01
NHW	kg	8.854E+02	1.918E-04	0.000E+00	1.918E-04	1.663E-02	-4.540E+02
RW	kg	2.450E-01	8.956E-08	0.000E+00	8.956E-08	2.393E-06	-9.888E-02
REUSE	kg	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RECYCLE	kg	8.264E+00	1.877E-05	0.000E+00	1.877E-05	6.035E-04	-5.946E+02
EN-REC	kg	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
EE-E	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
EE-T	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

PROFILED TUBE, HEAT-TREATED, STRAIGHTENED AND CUT FROM GALVANISED STRIP

ID	U.o.M.	A1-A3	C1	C2	C3	C4	D
GWP - t	kg CO_2 eq	3.229E+03	1.436E+01	8.402E+00	1.436E+01	6.145E-02	-1.161E+03
GWP - fossil	kg CO_2 eq	3.224E+03	1.436E+01	8.391E+00	1.436E+01	6.138E-02	-1.158E+03
GWP - biogenic	kg CO_2 eq	2.154E+00	3.291E-03	6.454E-03	3.291E-03	3.515E-05	-2.473E+00
GWP - luluc	kg CO_2 eq	2.082E+00	1.616E-03	3.947E-03	1.616E-03	3.706E-05	-7.696E-01
GWP - GHG	kg CO_2 eq	3.230E+03	1.436E+01	8.398E+00	1.436E+01	6.144E-02	-1.160E+03
ODP	kg CFC-11 eq	5.510E-05	2.285E-07	1.836E-07	2.285E-07	1.778E-09	-2.027E-05
POCP	kg NMVOC eq	1.488E+01	1.985E-01	4.397E-02	1.985E-01	6.624E-04	-5.521E+00
AP	mol H+ eq	1.429E+01	1.331E-01	2.824E-02	1.331E-01	4.625E-04	-5.240E+00
EP - freshwater	kg P eq	1.122E+00	4.416E-04	5.972E-04	4.416E-04	5.112E-06	-5.642E-01
EP - marine	kg N eq	3.516E+00	6.167E-02	9.777E-03	6.167E-02	1.776E-04	-1.200E+00
EP - terrestrial	mol N eq	3.716E+01	6.703E-01	1.033E-01	6.703E-01	1.903E-03	-1.218E+01
WDP	m³ depriv.	7.285E+02	4.057E-01	5.865E-01	4.057E-01	6.757E-02	8.481E+01
ADP - F	MJ	3.660E+04	1.881E+02	1.227E+02	1.881E+02	1.530E+00	-1.226E+04
ADP - MM	kg Sb eq	5.937E-02	5.015E-06	2.263E-05	5.015E-06	8.523E-08	-8.331E-03
PERE	MJ	4.948E+03	1.313E+00	2.231E+00	1.313E+00	1.699E-02	-1.370E+03
PERM	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PERT	MJ	4.948E+03	1.313E+00	2.231E+00	1.313E+00	1.699E-02	-1.370E+03
PENRE	MJ	4.397E+04	1.861E+02	1.222E+02	1.861E+02	1.523E+00	-1.512E+04
PENRM	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PENRT	MJ	4.397E+04	1.861E+02	1.222E+02	1.861E+02	1.523E+00	-1.512E+04
SM	kg	2.879E+02	1.446E-05	0.000E+00	1.446E-05	3.684E-04	-2.149E+02
RSF	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NRSF	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
FW	m³	3.626E+01	1.630E-02	2.491E-02	1.630E-02	1.633E-03	-1.354E+01
HW	kg	1.761E+02	5.914E-05	0.000E+00	5.914E-05	1.657E-03	-7.292E+01
NHW	kg	9.032E+02	1.918E-04	0.000E+00	1.918E-04	1.663E-02	-4.502E+02
RW	kg	2.500E-01	8.956E-08	0.000E+00	8.956E-08	2.393E-06	-9.805E-02
REUSE	kg	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RECYCLE	kg	8.541E+00	1.877E-05	0.000E+00	1.877E-05	6.035E-04	-5.896E+02
EN-REC	kg	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
EE-E	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
EE-T	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

TUBE PROFILED AND HEAT-TREATED BY COLD STRIP
(strip subjected to cold rolling, annealing and skin-passing)

ID	U.o.M.	A1-A3	C1	C2	C3	C4	D
GWP - t	kg CO_2 eq	3.060E+03	1.436E+01	8.402E+00	1.436E+01	6.145E-02	-1.151E+03
GWP - fossil	kg CO_2 eq	3.068E+03	1.436E+01	8.391E+00	1.436E+01	6.138E-02	-1.148E+03
GWP - biogenic	kg CO_2 eq	-9.646E+00	3.291E-03	6.454E-03	3.291E-03	3.515E-05	-2.452E+00
GWP - luluc	kg CO_2 eq	1.788E+00	1.616E-03	3.947E-03	1.616E-03	3.706E-05	-7.630E-01
GWP - GHG	kg CO_2 eq	3.073E+03	1.436E+01	8.398E+00	1.436E+01	6.144E-02	-1.150E+03
ODP	kg CFC-11 eq	5.183E-05	2.285E-07	1.836E-07	2.285E-07	1.778E-09	-2.009E-05
POCP	kg NMVOC eq	1.432E+01	1.985E-01	4.397E-02	1.985E-01	6.624E-04	-5.474E+00
AP	mol H+ eq	1.347E+01	1.331E-01	2.824E-02	1.331E-01	4.625E-04	-5.196E+00
EP - freshwater	kg P eq	1.033E+00	4.416E-04	5.972E-04	4.416E-04	5.112E-06	-5.594E-01
EP - marine	kg N eq	3.322E+00	6.167E-02	9.777E-03	6.167E-02	1.776E-04	-1.190E+00
EP - terrestrial	mol N eq	3.522E+01	6.703E-01	1.033E-01	6.703E-01	1.903E-03	-1.208E+01
WDP	m³ depriv.	6.465E+02	4.057E-01	5.865E-01	4.057E-01	6.757E-02	8.409E+01
ADP - F	MJ	3.484E+04	1.881E+02	1.227E+02	1.881E+02	1.530E+00	-1.215E+04
ADP - MM	kg Sb eq	1.486E-02	5.015E-06	2.263E-05	5.015E-06	8.523E-08	-8.260E-03
PERE	MJ	5.079E+03	1.313E+00	2.231E+00	1.313E+00	1.699E-02	-1.358E+03
PERM	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PERT	MJ	5.079E+03	1.313E+00	2.231E+00	1.313E+00	1.699E-02	-1.358E+03
PENRE	MJ	4.212E+04	1.861E+02	1.222E+02	1.861E+02	1.523E+00	-1.499E+04
PENRM	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PENRT	MJ	4.212E+04	1.861E+02	1.222E+02	1.861E+02	1.523E+00	-1.499E+04
SM	kg	2.928E+02	1.446E-05	0.000E+00	1.446E-05	3.684E-04	-2.130E+02
RSF	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NRSF	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
FW	m³	2.708E+01	1.630E-02	2.491E-02	1.630E-02	1.633E-03	-1.343E+01
HW	kg	1.775E+02	5.914E-05	0.000E+00	5.914E-05	1.657E-03	-7.230E+01
NHW	kg	9.104E+02	1.916E-04	0.000E+00	1.916E-04	1.663E-02	-4.463E+02
RW	kg	2.526E-01	8.956E-08	0.000E+00	8.956E-08	2.393E-06	-9.721E-02
REUSE	kg	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RECYCLE	kg	8.391E+00	1.877E-05	0.000E+00	1.877E-05	6.035E-04	-5.846E+02
EN-REC	kg	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
EE-E	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
EE-T	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

PROFILED TUBE, HEAT TREATED AND STRAIGHTENED BY COLD STRIP
(strip subjected to cold rolling, annealing and skin-passing)

ID	U.o.M.	A1-A3	C1	C2	C3	C4	D
GWP - t	kg CO_2 eq	3.126E+03	1.436E+01	8.402E+00	1.436E+01	6.145E-02	-1.142E+03
GWP - fossil	kg CO_2 eq	3.134E+03	1.436E+01	8.391E+00	1.436E+01	6.138E-02	-1.138E+03
GWP - biogenic	kg CO_2 eq	-9.700E+00	3.291E-03	6.454E-03	3.291E-03	3.515E-05	-2.431E+00
GWP - luluc	kg CO_2 eq	1.817E+00	1.616E-03	3.947E-03	1.616E-03	3.706E-05	-7.565E-01
GWP - GHG	kg CO_2 eq	3.139E+03	1.436E+01	8.398E+00	1.436E+01	6.144E-02	-1.140E+03
ODP	kg CFC-11 eq	5.299E-05	2.285E-07	1.836E-07	2.285E-07	1.778E-09	-1.992E-05
POCP	kg NMVOC eq	1.461E+01	1.985E-01	4.397E-02	1.985E-01	6.624E-04	-5.427E+00
AP	mol H+ eq	1.375E+01	1.331E-01	2.824E-02	1.331E-01	4.625E-04	-5.151E+00
EP - freshwater	kg P eq	1.053E+00	4.416E-04	5.972E-04	4.416E-04	5.112E-06	-5.546E-01
EP - marine	kg N eq	3.390E+00	6.167E-02	9.777E-03	6.167E-02	1.776E-04	-1.180E+00
EP - terrestrial	mol N eq	3.594E+01	6.703E-01	1.033E-01	6.703E-01	1.903E-03	-1.197E+01
WDP	m³ depriv.	6.595E+02	4.057E-01	5.865E-01	4.057E-01	6.757E-02	8.336E+01
ADP - F	MJ	3.559E+04	1.881E+02	1.227E+02	1.881E+02	1.530E+00	-1.205E+04
ADP - MM	kg Sb eq	1.514E-02	5.015E-06	2.263E-05	5.015E-06	8.523E-08	-8.189E-03
PERE	MJ	5.182E+03	1.313E+00	2.231E+00	1.313E+00	1.699E-02	-1.347E+03
PERM	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PERT	MJ	5.182E+03	1.313E+00	2.231E+00	1.313E+00	1.699E-02	-1.347E+03
PENRE	MJ	4.303E+04	1.861E+02	1.222E+02	1.861E+02	1.523E+00	-1.487E+04
PENRM	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PENRT	MJ	4.303E+04	1.861E+02	1.222E+02	1.861E+02	1.523E+00	-1.487E+04
SM	kg	2.982E+02	1.446E-05	0.000E+00	1.446E-05	3.684E-04	-2.112E+02
RSF	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NRSF	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
FW	m³	2.761E+01	1.630E-02	2.491E-02	1.630E-02	1.633E-03	-1.331E+01
HW	kg	1.808E+02	5.914E-05	0.000E+00	5.914E-05	1.657E-03	-7.168E+01
NHW	kg	9.276E+02	1.916E-04	0.000E+00	1.916E-04	1.663E-02	-4.425E+02
RW	kg	2.574E-01	8.956E-08	0.000E+00	8.956E-08	2.393E-06	-9.637E-02
REUSE	kg	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RECYCLE	kg	8.567E+00	1.877E-05	0.000E+00	1.877E-05	6.035E-04	-5.796E+02
EN-REC	kg	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
EE-E	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
EE-T	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

PROFILED TUBE, HEAT-TREATED, STRAIGHTENED AND CUT BY COLD STRIP (strip subjected to cold rolling, annealing and skin-passing)

ID	U.o.M.	A1-A3	C1	C2	C3	C4	D
GWP - t	kg CO_2 eq	3.234E+03	1.436E+01	8.402E+00	1.436E+01	6.145E-02	-1.130E+03
GWP - fossil	kg CO_2 eq	3.242E+03	1.436E+01	8.391E+00	1.436E+01	6.138E-02	-1.127E+03
GWP - biogenic	kg CO_2 eq	-9.760E+00	3.291E-03	6.454E-03	3.291E-03	3.515E-05	-2.406E+00
GWP - luluc	kg CO_2 eq	1.852E+00	1.616E-03	3.947E-03	1.616E-03	3.706E-05	-7.486E-01
GWP - GHG	kg CO_2 eq	3.247E+03	1.436E+01	8.398E+00	1.436E+01	6.144E-02	-1.128E+03
ODP	kg CFC-11 eq	5.507E-05	2.285E-07	1.836E-07	2.285E-07	1.778E-09	-1.971E-05
POCP	kg NMVOC eq	1.504E+01	1.985E-01	4.397E-02	1.985E-01	6.624E-04	-5.371E+00
AP	mol H+ eq	1.417E+01	1.331E-01	2.824E-02	1.331E-01	4.625E-04	-5.097E+00
EP - freshwater	kg P eq	1.079E+00	4.416E-04	5.972E-04	4.416E-04	5.112E-06	-5.488E-01
EP - marine	kg N eq	3.483E+00	6.167E-02	9.777E-03	6.167E-02	1.776E-04	-1.167E+00
EP - terrestrial	mol N eq	3.693E+01	6.703E-01	1.033E-01	6.703E-01	1.903E-03	-1.185E+01
WDP	m³ depriv.	6.763E+02	4.057E-01	5.865E-01	4.057E-01	6.757E-02	8.250E+01
ADP - F	MJ	3.694E+04	1.881E+02	1.227E+02	1.881E+02	1.530E+00	-1.192E+04
ADP - MM	kg Sb eq	1.546E-02	5.015E-06	2.263E-05	5.015E-06	8.523E-08	-8.104E-03
PERE	MJ	5.350E+03	1.313E+00	2.231E+00	1.313E+00	1.699E-02	-1.333E+03
PERM	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PERT	MJ	5.350E+03	1.313E+00	2.231E+00	1.313E+00	1.699E-02	-1.333E+03
PENRE	MJ	4.459E+04	1.861E+02	1.222E+02	1.861E+02	1.523E+00	-1.471E+04
PENRM	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PENRT	MJ	4.459E+04	1.861E+02	1.222E+02	1.861E+02	1.523E+00	-1.471E+04
SM	kg	3.037E+02	1.446E-05	0.000E+00	1.446E-05	3.684E-04	-2.090E+02
RSF	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NRSF	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
FW	m³	2.827E+01	1.630E-02	2.491E-02	1.630E-02	1.633E-03	-1.317E+01
HW	kg	1.845E+02	5.914E-05	0.000E+00	5.914E-05	1.657E-03	-7.093E+01
NHW	kg	9.462E+02	1.916E-04	0.000E+00	1.916E-04	1.663E-02	-4.379E+02
RW	kg	2.627E-01	8.956E-08	0.000E+00	8.956E-08	2.393E-06	-9.537E-02
REUSE	kg	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RECYCLE	kg	8.849E+00	1.877E-05	0.000E+00	1.877E-05	6.035E-04	-5.735E+02
EN-REC	kg	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
EE-E	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
EE-T	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

DRAWN TUBE

ID	U.o.M.	A1-A3	C1	C2	C3	C4	D
GWP - t	kg CO_2 eq	3.221E+03	3.497E+00	1.619E+01	3.497E+00	1.114E+00	-1.392E+03
GWP - fossil	kg CO_2 eq	3.222E+03	3.498E+00	1.617E+01	3.498E+00	1.112E+00	-1.388E+03
GWP - biogenic	kg CO_2 eq	-3.817E+00	-1.214E-03	1.462E-02	-1.214E-03	1.200E-03	-2.964E+00
GWP - luluc	kg CO_2 eq	1.938E+00	4.837E-04	7.849E-03	4.837E-04	6.818E-04	-9.223E-01
GWP - GHG	kg CO_2 eq	3.229E+03	3.507E+00	1.621E+01	3.507E+00	1.116E+00	-1.393E+03
ODP	kg CFC-11 eq	6.157E-05	7.238E-08	3.518E-07	7.238E-08	2.905E-08	-2.429E-05
POCP	kg NMVOC eq	2.864E+01	1.084E-02	7.875E-02	1.084E-02	1.057E-02	-6.617E+00
AP	mol H+ eq	1.540E+01	1.315E-02	5.271E-02	1.315E-02	7.402E-03	-6.280E+00
EP - freshwater	kg P eq	1.083E+00	5.633E-04	1.131E-03	5.633E-04	1.131E-04	-6.762E-01
EP - marine	kg N eq	4.148E+00	2.387E-03	1.813E-02	2.387E-03	2.857E-03	-1.438E+00
EP - terrestrial	mol N eq	4.430E+01	2.557E-02	1.915E-01	2.557E-02	3.061E-02	-1.460E+01
WDP	m³ depriv.	6.917E+02	4.710E-01	9.340E-01	4.710E-01	7.971E-01	1.016E+02
ADP - F	MJ	3.725E+04	5.341E+01	2.292E+02	5.341E+01	2.348E+01	-1.469E+04
ADP - MM	kg Sb eq	1.576E-02	2.540E-06	5.190E-05	2.540E-06	2.224E-06	-9.984E-03
PERE	MJ	5.427E+02	6.554E+00	4.494E+00	6.554E+00	3.993E-01	-1.642E+03
PERM	MJ	0.000E+00	0.000E+00	1.000E+00	2.000E+00	3.000E+00	0.000E+00
PERT	MJ	5.427E+02	6.554E+00	5.494E+00	8.554E+00	3.399E+00	-1.642E+03
PENRE	MJ	3.731E+04	5.168E+01	2.265E+02	5.168E+01	2.324E+01	-1.802E+04
PENRM	MJ	0.000E+00	0.000E+00	1.000E+00	2.000E+00	3.000E+00	0.000E+00
PENRT	MJ	3.731E+04	5.168E+01	2.275E+02	5.368E+01	2.624E+01	-1.802E+04
SM	kg	2.596E+01	7.066E-03	9.513E-02	7.066E-03	-3.363E-01	-2.573E+02
RSF	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NRSF	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
FW	m³	2.257E+00	1.194E-02	3.877E-02	1.194E-02	2.032E-02	-1.658E+01
HW	kg	1.995E+00	7.058E-03	4.276E-02	7.058E-03	4.370E-03	-1.023E+01
NHW	kg	9.629E-02	1.595E-04	2.512E-03	1.595E-04	2.228E-04	-1.027E+00
RW	kg	5.855E-02	9.742E-04	8.091E-04	9.742E-04	7.402E-05	-1.175E-01
REUSE	kg	0.000E+00	0.000E+00	1.000E+00	2.000E+00	3.000E+00	0.000E+00
RECYCLE	kg	1.794E+01	9.456E-03	9.941E-02	9.456E-03	1.156E-02	-7.066E+02
EN-REC	kg	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
EE-E	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
EE-T	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

DRAWN AND THERMALLY TREATED TUBE

ID	U.o.M.	A1-A3	C1	C2	C3	C4	D
GWP - t	kg CO_2 eq	3.357E+03	3.530E+00	1.637E+01	3.530E+00	1.126E+00	-1.405E+03
GWP - fossil	kg CO_2 eq	3.358E+03	3.531E+00	1.635E+01	3.531E+00	1.124E+00	-1.401E+03
GWP - biogenic	kg CO_2 eq	-2.918E+00	-1.226E-03	1.478E-02	-1.226E-03	1.213E-03	-2.992E+00
GWP - luluc	kg CO_2 eq	1.974E+00	0.000E+00	7.937E-03	4.883E-04	6.894E-04	-9.311E-01
GWP - GHG	kg CO_2 eq	3.365E+03	3.541E+00	1.639E+01	3.541E+00	1.128E+00	-1.406E+03
ODP	kg CFC-11 eq	6.661E-05	7.307E-08	3.557E-07	7.307E-08	2.937E-08	-2.452E-05
POCP	kg NMVOC eq	2.977E+01	1.094E-02	7.962E-02	1.094E-02	1.069E-02	-6.680E+00
AP	mol H+ eq	1.616E+01	1.328E-02	5.330E-02	1.328E-02	7.485E-03	-6.340E+00
EP - freshwater	kg P eq	1.100E+00	5.686E-04	1.144E-03	5.686E-04	1.144E-04	-6.826E-01
EP - marine	kg N eq	4.470E+00	2.410E-03	1.833E-02	2.410E-03	2.889E-03	-1.452E+00
EP - terrestrial	mol N eq	4.779E+01	2.582E-02	1.936E-01	2.582E-02	3.095E-02	-1.474E+01
WDP	m³ depriv.	7.093E+02	4.755E-01	9.444E-01	4.755E-01	8.060E-01	1.026E+02
ADP - F	MJ	3.912E+04	5.392E+01	2.317E+02	5.392E+01	2.375E+01	-1.483E+04
ADP - MM	kg Sb eq	1.598E-02	2.564E-06	5.248E-05	2.564E-06	2.249E-06	-1.008E-02
PERE	MJ	5.869E+02	6.616E+00	4.544E+00	6.616E+00	4.037E-01	-1.658E+03
PERM	MJ	0.000E+00	0.000E+00	1.000E+00	2.000E+00	3.000E+00	0.000E+00
PERT	MJ	5.869E+02	6.616E+00	5.544E+00	8.616E+00	3.404E+00	-1.658E+03
PENRE	MJ	3.920E+04	5.217E+01	2.290E+02	5.217E+01	2.350E+01	-1.819E+04
PENRM	MJ	0.000E+00	0.000E+00	1.000E+00	2.000E+00	3.000E+00	0.000E+00
PENRT	MJ	3.920E+04	5.217E+01	2.300E+02	5.417E+01	2.650E+01	-1.819E+04
SM	kg	2.646E+01	7.133E-03	9.619E-02	7.133E-03	-3.400E-01	-2.598E+02
RSF	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NRSF	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
FW	m³	2.550E+00	1.206E-02	3.919E-02	1.206E-02	2.055E-02	-1.673E+01
HW	kg	2.151E+00	7.125E-03	4.323E-02	7.125E-03	4.419E-03	-1.033E+01
NHW	kg	1.034E-01	1.610E-04	2.540E-03	1.610E-04	2.253E-04	-1.037E+00
RW	kg	6.533E-02	9.834E-04	8.181E-04	9.834E-04	7.484E-05	-1.186E-01
REUSE	kg	0.000E+00	0.000E+00	1.000E+00	2.000E+00	3.000E+00	0.000E+00
RECYCLE	kg	1.840E+01	9.546E-03	1.005E-01	9.546E-03	1.169E-02	-7.133E+02
EN-REC	kg	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
EE-E	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
EE-T	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Additional information

Regardless of the type of product considered, the element that most affects the final result is the purchased element which represents the entrance to the various company sites, destined for the subsequent production of the semi-finished product. Among the processes carried out by the company, those that have the greatest impact are the heat treatment of the tube as well as the profiling activity.

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

SUSTAINABILITY

It should be noted that at the end of its useful life, the product is destined for recycling. In particular, the amount of steel destined for recycling is 89.1% in line with what is indicated in the "Special waste report" of ISPRA - No. 389/2023.

MANAGEMENT SYSTEM

With reference to the management systems used by the company, it is emphasized that the presence of an environmental management system (certified pursuant to UNI EN ISO 14001: 2015) and safety (certified pursuant to UNI ISO 45001: 2018) testify to the company's commitment to pursue the continuous improvement of its environmental and safety performance, for example by properly managing the hazardous substances, the waste produced by its business as well as maintaining the pollutants emitted into the atmosphere as well as water discharges. Within the environmental management system there is also a specific data management procedure for the study of the product life cycle. Year after year, the company plans new improvement objectives aimed at increasing its performance.

The company has implemented an energy management system certified in accordance with the UNI CEI EN ISO 50001: 2018 standard to identify the most relevant plants in terms of energy as well as define opportunities for improvement in order to reduce the energy consumption determined by the carrying out its business.

The company has implemented a Product Carbon Footprint - Systematic Approach management system according to ISO 14067 in order to improve the quantification and monitoring of GHG emissions and address environmental challenges in a proactive manner.

Tube sections from hot and cold strips,
heat treated and drawn

References

General Programme Instructions of the International EPD® System. Version 3.01.

PCR 2019:14 - Version 1.11 “CONSTRUCTION PRODUCTS”

Product Category Rules for Type III environmental product declaration of construction products to EN 15804:2012;

Ecoinvent database v.3.9.1– January 2023;

UNI EN ISO 14025: 2010 “Environmental labels and declarations - Type III environmental declarations - Principles and procedures”;

UNI EN ISO 14040: 2021 “Environmental management - Life cycle assessment - Principles and framework”;

UNI EN ISO 14044:2021 “ Environmental management - Life cycle assessment - Requirements and guidelines”;

UNI EN ISO 15804:2021 “Sustainability of buildings - Environmental product declarations - Development framework rules by product category”;

European Residual Mixes 2022 Association of Issuing Bodies “European Residual Mixes - Results of the calculation of Residual Mixes for the calendar year 2022” – version 1.0, 2023-06-01;

ISPRA “ Special waste report” – n° 389/2023 – Ed. 2023.

CSIRO “Metal recycling: The need for a life cycle approach” – May 2013;

Environmental engineering "WASTE FROM CONSTRUCTION AND LCA DEMOLITION FROM THE DEMOLITION OF 51 RESIDENTIAL BUILDINGS" - Michele Paleari, Politecnico di Milano – 26-11-2015;

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