ENVIRONMENTAL PRODUCT DECLARATION

EN

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The International EPD® System
www.environdec.com

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EPD International AB

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

STAINLESS STEEL WIRE ROD

from

Marcegaglia Fagersta Stainless AB

MARCEGAGLIA
FAGERSTA STAINLESS

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

CEN standard EN 15804 serves as the Core Product Category Rules (PCR)

Product Category Rules (PCR)
Construction products (EN 15804:A2), 2019:14, UN CPC 54, version 1.3.3

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

Independent verification of the statement and data, according to the UNI EN ISO 14025:2010
☐ process EPD certification ☒ verification EPD

Third-party verification
Bureau Veritas Italia S.p.A.

The certification body is accredited by:
International EPD® System Technical Committee

Procedure for follow-up of data during EPD validity involves third party verifier:
☒ Yes ☐ No

The EPD owner has the sole ownership, liability, and responsibility for the EPD.

EPDs within the same product category but registered in different EPD programmes, or not compliant with EN 15804, may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same version number) or be based on fully-aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterisation factors); have equivalent content declarations; and be valid at the time of comparison. For further information about comparability, see EN 15804 and ISO 14025.

COMPANY INFORMATION

Owner of the EPD:
Marcegaglia Fagersta Stainless AB
www.fagersta.marcegaglia.com

Contact:
To obtain more information about this Environment Product Declaration are available this contact:

Technical Support:
Mail: *info@marcegaglia.com*
Tel: *+46 223 45500*

Company description:
Marcegaglia Fagersta Stainless AB is one of the first mill in the world to roll stainless wire rod, specialised in thinner dimensions of wire rod and drawn wire. Key customers are producing welding wire, spring wire, cold-heading products and high temperature applications.

Product/system certifications:

- Quality Management System ISO 9001:2015 (n° 00005766, LRQA);
- Environmental Management System ISO 14001:2015 (n° 00005764, LRQA);
- Energy Management ISO 50001:2018 (n° 00005765 LRQA)

Production site's Name and localization:

- P.O. box 508 SE, 73725, Fagersta – Sweden

PRODUCT INFORMATION

Product name:
Stainless steel wire rod

Product identification:
Stainless steel wire rod

Product description:
Stainless steel wire rod with different dimensions and quality properties for structural, industrial and domestic application.

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

Geometry	Diameter [mm]
Round	From 5 to 18

Content information:

Product content	Weight, kg	Post-consumer material, weight
Stainless Steel	1000	78.3 %

Packaging materials	Weight, kg	Weight-% (versus the product)
Carbon steel	0.02	0%
Plastics	0.48	0%

Electricity information
The electricity used in the manufacturing process of module A3 accounts less than 30% of the GWP-GHG results of modules A1-A3 and the impact of electricity use in the manufactory phases is 0.0105 kg CO_2 eq/kWh

LCA INFORMATION

Declared unit:
the declared unit is 1 ton of wire rod.

Reference service life – RSL:
The RLS of the rolled products are estimate around of 50 years [Rif.: Federal Institute for Research on Building, Urban Affairs and Spatial Development (BBSR)].

Time representativeness:
All the data used for this LCA analysis are referred to the year 2022.

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

Database e software:
Ecoinvent database v.3.9.1, January 2023 / Software SimaPro rel. 9.5

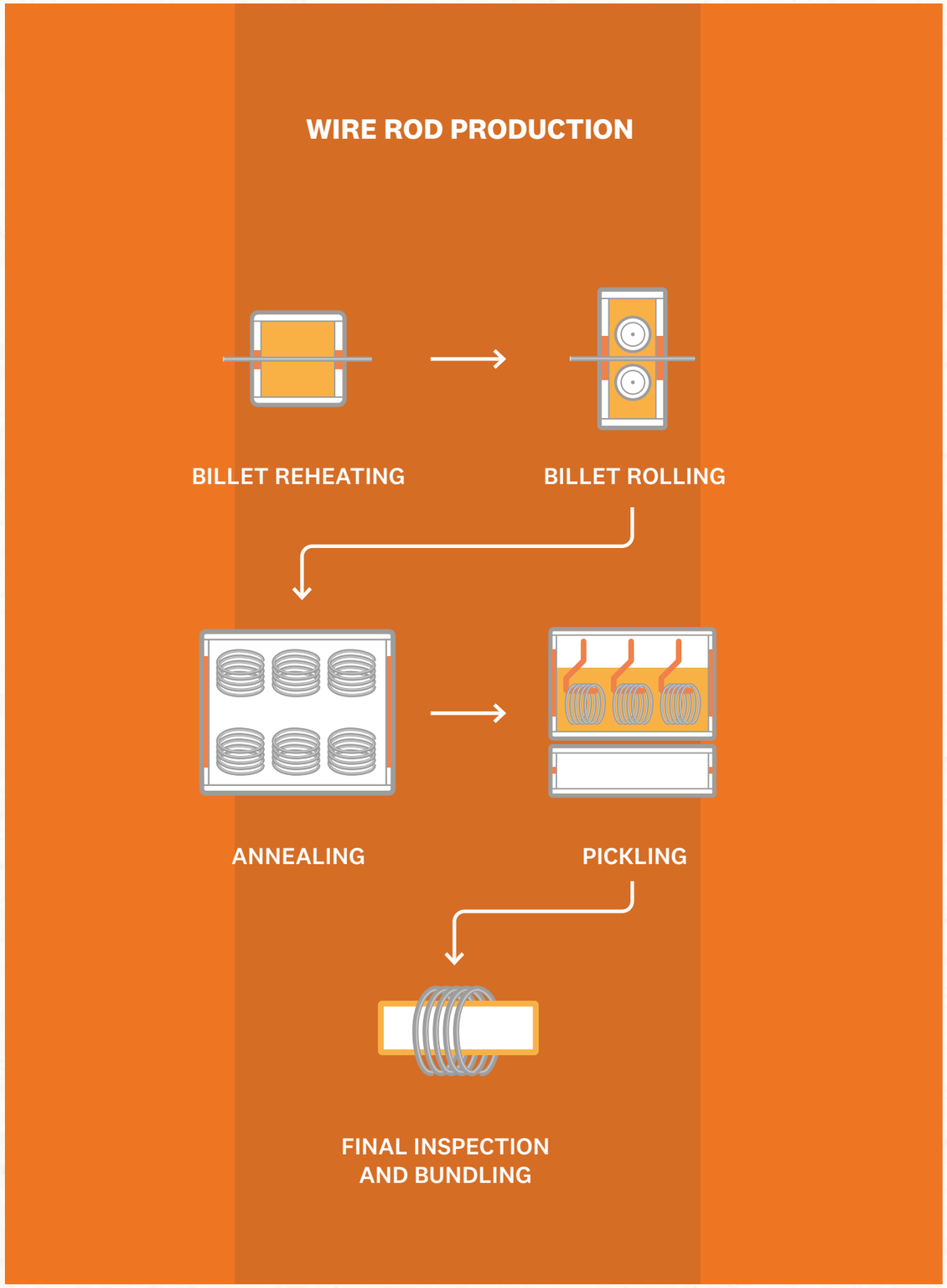
Description of system boundaries:

The study is referred "from cradle to gate with options (A1-A3 + C1-C4 + D)", like the follow table (rif: PCR 2019:14 "Construction products" version 1.3.3).

The modules A1-A3 describe the raw materials, the transport until the production's site and the production's process.

The modules C1-C4 describe the transport, the demolition process, and the end life of the products. These operations aren't under company's control. For this reason, was used the literature data from the building sectors. And considered an average distance of 50 km from the site and the waste disposal center.

The module D describe the benefits due the recycling of the stainless steel and the calculation of this is based on the document "Product Category Rules for Type III environmental product declaration of construction products to EN 15804:2021 – Par. 6.3.5.6. Benefits and loads beyond the product system boundary, information Module D".



More information

DESCRIPTION OF MAIN ACTIVITIES

The Marcegaglia Fagersta Stainless plant manufactures stainless steel wire rods of different diameters and for many applications.

The production cycle begins with the arrival of raw materials at the plant by road transport. The transport of raw materials from the production steel mills to the ports in Sweden is intermodal, as it makes use of different means of transportation including ships, railways and trucks.

Raw materials consist of:

- Billets arriving from the steel mills in Sweden road transport;
- Billets imported by ship that reach the port of departure by road and is then loaded onto ships. The last connection from the port to the Marcegaglia Fagersta Stainless plant is by rail and road transport.

Following there are the phases of the production:

BILLET PRETREATMENT
Depending on the application the billets are pre-treated in a grinding operation before entering into the Rolling mill. Eventual surface defects from the casting process are removed from the surface.

HOT ROLLING OF BILLET
The stainless steel billet is heated by a LPG-fuelled reheating furnace and in an electrical furnace to a predetermined temperature. The wire rod rolling mill reduces the billet's cross-sectional area by passing it through a number of rolling stands. The wire rod formed by hot rolling of the billet is wound into Wire rod coils.

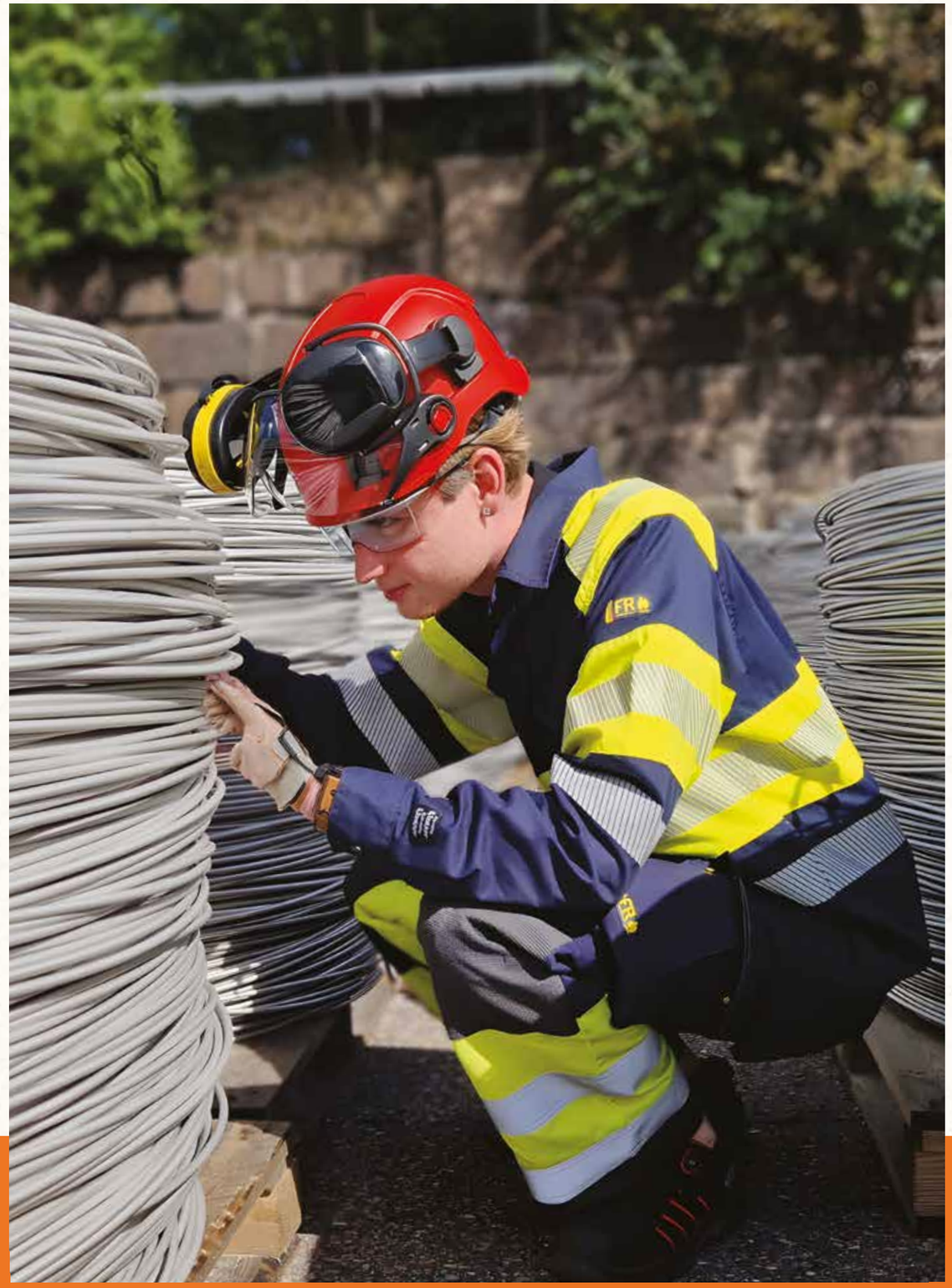
ANNEALING
Wire rods are subjected to annealing In line with the Rolling mill or in a a separate batch annealing operation. This process relieves any internal stresses and reduces the hardness of the alloy, thus enhancing its ductility in preparation for subsequent processing steps.

After the scheduled annealing time, the Wire rod coil is quenched with water.

PICKLING
The pickling process removes surface oxidation on the wire rods. The wire rod is immersed in an acid bath, and after the scheduled immersion time, it is rinsed out to remove the last remaining scales and excess acid.

ALLOCATION RULES

It's used a mass allocation of the energy and water consumption and waste. Additionally, it's used a mass allocation of steel scrap because Marcegaglia Fagersta Stainless sells them to the near melting shop, so in LCA study steel scrap are considered as co-products.



MODULES DECLARED

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

	Product stage			Construction process stage		Use stage							End of life stage				Resource recovery stage
	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 de clared	X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
Geography	GLO	GLO	SE	-	-	-	-	-	-	-	-	-	GLO	GLO	GLO	GLO	GLO
Specific data	> 90%					-	-	-	-	-	-	-	-	-	-	-	-
Variations-product	Not relevant					-	-	-	-	-	-	-	-	-	-	-	-
Variations-site	Not relevant					-	-	-	-	-	-	-	-	-	-	-	-

X = Module considered;
ND = Module not declared;
GLO = Global;
SE = Sweden

Environmental information

All the performance indicators are referred of 1 ton of wire rod.

ENVIRONMENTAL IMPACT

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

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

RESOURCE USE

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

WASTE PRODUCTION

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

OUTPUT FLOWS

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

STAINLESS STEEL WIRE ROD

Abb.	Unit	A1-A3	C1	C2	C3	C4	D
GWP - t	kg CO_2 eq	2.76E+03	1.01E+00	9.06E+00	1.01E+00	1.33E+00	-6.52E+02
GWP - fossil	kg CO_2 eq	2.73E+03	1.01E+00	9.05E+00	1.01E+00	1.32E+00	-6.44E+02
GWP - biogenic	kg CO_2 eq	2.74E+01	6.36E-04	6.96E-03	6.36E-04	1.43E-03	-8.21E+00
GWP - luluc	kg CO_2 eq	2.26E+00	2.85E-04	4.26E-03	2.85E-04	8.12E-04	-6.48E-01
GWP - GHG	kg CO_2 eq	2.76E+03	1.01E+00	9.07E+00	1.01E+00	1.33E+00	-7.46E+02
ODP	kg CFC-11 eq	5.27E-05	4.09E-08	1.98E-07	4.09E-08	3.46E-08	-7.10E-06
POCP	kg NMVOC eq	1.11E+01	2.76E-03	4.74E-02	2.76E-03	1.26E-02	-2.35E+00
AP	mol H+ eq	1.47E+01	3.31E-03	3.05E-02	3.31E-03	8.82E-03	-3.69E+00
EP - freshwater	kg P eq	7.83E-01	1.21E-04	6.44E-04	1.21E-04	1.35E-04	-2.37E-01
EP - marine	kg N eq	2.95E+00	1.26E-03	1.05E-02	1.26E-03	3.40E-03	-6.49E-01
EP - terrestrial	mol N eq	3.12E+01	7.92E-03	1.11E-01	7.92E-03	3.65E-02	-6.85E+00
WDP	m^3 depriv.	7.91E+02	1.85E+00	6.32E-01	1.85E+00	9.50E-01	-1.34E+02
ADP - F	MJ	4.64E+04	1.79E+02	1.32E+02	1.79E+02	2.80E+01	-7.44E+03
ADP - MM	kg Sb eq	7.49E-02	7.86E-06	2.44E-05	7.86E-06	2.65E-06	-1.76E-02
PERE	MJ	4.03E+03	3.44E-01	2.41E+00	3.44E-01	4.76E-01	-2.56E+03
PERM	MJ	0.00E+00	0.00E+00	1.00E+00	2.00E+00	3.00E+00	0.00E+00
PERT	MJ	4.03E+03	3.44E-01	3.41E+00	2.34E+00	3.48E+00	-2.56E+03
PENRE	MJ	3.50E+04	9.46E+00	1.31E+02	9.46E+00	2.77E+01	-9.60E+03
PENRM	MJ	0.00E+00	0.00E+00	1.00E+00	2.00E+00	3.00E+00	0.00E+00
PENRT	MJ	3.50E+04	9.46E+00	1.32E+02	1.15E+01	3.07E+01	-9.60E+03
SM	kg	3.41E+02	1.86E-03	5.36E-02	1.86E-03	-4.01E-01	-9.00E+01
RSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	7.34E+00	4.39E-02	2.74E-02	4.39E-02	2.42E-02	-4.11E+00
HW	kg	8.81E+00	2.09E-03	2.58E-02	2.09E-03	5.21E-03	-1.08E+01
NHW	kg	1.60E+00	2.77E-04	1.25E-03	2.77E-04	2.65E-04	-1.42E+00
RW	kg	2.62E+00	3.20E-02	4.36E-04	3.20E-02	8.82E-05	-1.78E-01
REUSE	kg	0.00E+00	0.00E+00	1.00E+00	2.00E+00	3.00E+00	0.00E+00
RECYCLE	kg	4.12E+00	3.20E-03	6.14E-02	3.20E-03	1.38E-02	-2.68E+00
EN-REC	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EE-E	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EE-T	MJ	1.54E+07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Additional information

The impact of the input raw material corresponds to 87.0 % of the total impacts of the wire rod.

Marcegaglia Fagersta Stainless can heat water from public district heating network through its heat exchanger; in 2022 it sold 4284 MWh of thermal energy to the Fagersta's district heating plant.

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 87.2 % in line with what is indicated in the "Special waste report" of ISPRA - No. 367/2022.

The stainless steel wire rod is characterized by a recycled content of 78.3 %.

These percentages are calculated as average of the value associated with the incoming raw material and derived from both Type III environmental declarations as well as self-declarations in accordance with UNI EN ISO 14021.

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

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 an energy management system (certified pursuant to UNI CEI EN ISO 50001: 2018) testify to the company's commitment to pursue the continuous improvement of its environmental and energy performance. Within these management systems 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 reduce their energy consumptions.

Stainless steel
wire rod

References

General Programme Instructions of the International EPD® System. Version 4.0;

PCR 2019:14 - Version 1.3.3 “CONSTRUCTION PRODUCTS”;

BRE Global Product Category Rules (PCR) for Type III EPD of construction products to EN 15804+A2;

Ecoinvent database v.3.9.1 – January 2023;

http://unstats.un.org/unsd/default.htm;

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 construction works - Environmental product declarations - Core rules for the product category of construction products”;

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 “Rapporto rifiuti speciali” – n° 367/2022 - Edizione 2022;

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