Environmental Product Declaration

In accordance with ISO 14025:2006:

STEEL BILLETS (100% RENEWABLE ELECTRICITY)

from

NERVACERO

Programme:	The International EPD® System, www.environdec.com
Programme operator:	EPD International AB
EPD registration number:	S-P-08501
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An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at www.environdec.com

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

Accountabilities for PCR, LCA and independent, third-party verification
Product Category Rules (PCR)
PCR 2015:03 version 2.0. Basic iron or steel products & special steels, except construction products (UN CPC 4112 and 412)
PCR review was conducted by: *The Technical Committee of the International EPD System. Chair: Massimo Marino. Contact via: info@environdec.com*
Life Cycle Assessment (LCA)
LCA accountability: *Anthesis-Lavola*
Third-party verification
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via: ☒ EPD verification by accredited certification body Third-party verification: Tecnalia R&I Certificacion, SL, info@tecnaliacertificacion.com is an approved certification body accountable for the third-party verification. The certification body is accredited by: ENAC nº125/C-PR283 accreditation.
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 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.

Company information

Owner of the EPD:
NERVACERO (Celsa Group)

Contact:
Carlos Javier Abajo Fuentes. Email: cabajo@gcelsa.com

Description of the organisation:
CELSA Group is Europe's leading producer of low-emission, circular steel and Europe's largest circular supply chain. It recycles ferrous scrap to produce steel in electric arc furnaces, using the most sustainable technology and the most environmentally and energy efficient. In 2021 it had a production of 6.6 million tons, recycled 7.1 million tons of ferrous scrap and recovered 2.6 million tons of by-products. 96% of its final product is made from recycled steel. The company, present in Spain, France, Poland, UK, Ireland, Norway, Denmark, Finland, and Sweden, is made up of 6 business groups and has 120 work centers, 7 steel mills, 10 rolling mills and 45 recycling plants, as well as transformation and distribution companies, which generate direct, indirect, and induced employment for more than 70,000 professionals.

Nervacero, acquired in 1988 by Celsa Group what allowed us become leaders in the Spanish market in steel products for reinforcing concrete. Nervacero has a production capacity of one million tons of liquid steel per year.

Name and location of production site(s):
NERVACERO: Barrio Ballonti, S/N, 48510 Valle de Trapaga, Vizcaya, Spain

Product information

Product name:
Semi-finished steel products (billet)

Product identification:
The results in this EPD are an average representative of all steel billets manufactured for CELSA at the Melt Shop. Averages are obtained through the total production, total consumption of raw materials and total generation of waste and emissions in CELSA Nervacero facilities.

Product description:
The product consists of 100 % recycled steel produced by the Electric Arc Furnace route from post-consumer and pre-consumer scrap.

The billet is a semi-processed steel product with a square section from 140x140 mm and with multiple rectangular sections options (starting from 150x210 mm) manufactured to specific alloy standards, dimensions and shapes for various applications based on custom specification. Billets are produced in melt shops from scrap metal utilizing electric arc furnace (EAF) technology. Billets are the feedstock for long products of small cross section that are produced through rolling and forging processes. The chemical composition of billets is shown below.

The following table corresponds to the main characteristics of the steel billets manufactured by CELSA Nervacero:

Characteristics	Values and units
Size (wide x high)	140x140, 160x160, 210x150, 240x150, 270x150, 320x150, 360x140
Size (length)	min 5.5 m, max 12.40 m (not all combinations section - length are permitted)
Weight	min 900 kg, max 3950 kg
Grade S235	C: 0.05 - 0.10%, Mn: 0.50 - 0.90 %, Si: 0.15 - 0.25%, S < 0.035, P < 0.035, N < 110 ppm
Grade S275	C: 0.08 - 0.20%, Mn: 0.50 - 0.90 %, Si: 0.15 - 0.25%, S < 0.035, P < 0.035, N < 110 ppm
Grade S355	C: 0.07 - 0.18%, Mn: 0.60 - 1.40 %, Si: 0.15 - 0.35%, S < 0.025, P < 0.025, N < 110 ppm
rebar grades	C: 0.10 - 0.38%, Mn: 0.50 - 1.30 %, Si: 0.15 - 0.30%, S < 0.045, P < 0.045, N < 120 ppm
wire rod grades	C: 0.05 - 0.13%, Mn: 0.35 - 0.60 %, Si: 0.06 - 0.15%, S < 0.015, P < 0.015, N < 100 ppm
Observations	other elements as V, Nb o Al can be added as required (but less than 0.10%)

The average composition of the declared products is shown in the following table:

Chemical composition	%
Fe	98
FeSi,SiMn, CuSi, FeB, Al, FeV, C & other charge additives	2
Material components	**%**
Post-consumer scrap	92,80
Pre-consumer scrap	7,20
Internal recycling	2.83
Renewable material	0
Biogenic carbon dioxide	0

Products do not contain any of the substances listed on the “Candidate List of Substances of Very High Concern (SVHC) for authorization".

UN CPC code:
41121 - Non-alloy steel in ingots or other primary forms, and semi-finished products of non-alloy steel

Geographical scope:
Global. Products under study are produced in Spain but can be used at a global scale.

LCA information

Declared unit:
1 tonne (1000 kg) of semi-finished steel product at the manufacturer gate produced with 100% renewable electricity mix with guarantee of origin.

Reference service life: Not applicable

Time representativeness:
The inventory data refers to the 12-month period between January 2021 and December 2021, representing conventional operation conditions.

Database(s) and LCA software used:
The LCA modelling of CELSA Nervacero steel products was carried out using SimaPro 9.3 LCA software which was the most up-to-date version available at the time of the LCA.

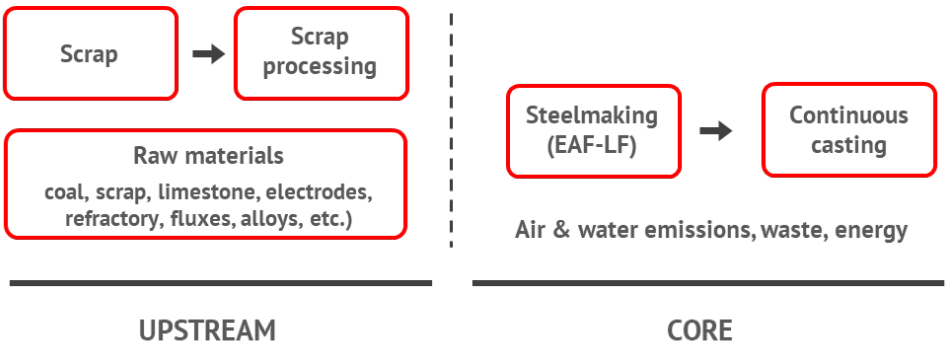
Unless otherwise indicated, all relevant background LCI datasets were sourced from the Ecoinvent database v3.8 (Ecoinvent, 2021; Wernet et al., 2016). In certain cases, the original Ecoinvent datasets were adapted to the specific requirements of the LCA analysis. These modified datasets have been distinctly identified in this report and the changes are clearly described.

Description of system boundaries:
This EPD provides information on the production stage of steel products (raw material supply, transport to plants and manufacturing - cradle to gate EPD type). The information is presented in a modular way separated in the following stages.

Upstream stage
This stage includes the extraction and production of raw materials (coal, scrap, limestone, electrodes, refractory, fluxes, chemicals, alloys, etc.) and the transportation to the steel manufacturing facility.

Core stage
This stage includes the manufacturing process for steel including core process related material consumption, energy production and consumption (included electricity), emissions to air and water, waste generated during manufacturing and its treatment (slag, sludges, etc.) and emissions generated during manufacturing.

System diagram:



More information:
Company website for more information: https://www.celsagroup.com/
Name and contact information of LCA practitioner:

Lavola –Anthesis Group
Rambla de Catalunya, 6, planta 2, 08007 Barcelona
+34 938 515 055
www.anthesisgroup.com

Cut-off rules:
In accordance with PCR 2015:03, data for elementary flows to and from the product system contributing to a minimum of 99% of the declared environmental impacts have been included. This cut-off criteria does not apply to products classified as hazardous wastes or that may cause significant impacts during extraction, transformation, use or disposal. Based on this cut-off criteria and specific system boundary definition criteria defined in PCR 2015:03, ancillary materials (such as expendable components, spare parts and chemicals for wastewater treatment, etc.), energy used in head offices and sales offices, and the production of maintenance equipment are not considered in the analysis.

Hypotheses and considerations applied:
The main hypotheses and assumptions made in this study are as follows:

- Post-consumer steel scrap was modelled as burden free when entering the system although transport to the plant was included.

- Direct CO2 emissions generated in the smelter due to the combustion of elemental carbon and the calcination of carbonates present in the raw materials have been included according to direct gas emission reporting of the plant.

- Metal scrap transport distances were calculated using a scrap purchasing database. Entries to this database included: point of origin of the metal scrap, distance travelled, means of transport and load. Based on this information, a weighed transport distance of scrap transported was calculated. A similar database was used to obtain the transport distances for the rest of the raw materials. Due to the wide range of products included in this database, and the large number of points of origin, a country base analysis was carried out to define the weighted contribution of each location for each product category.

Allocation: Total energy consumption was attributed entirely to total production. This is also the case for raw materials and waste generation.

The steel making process generates coproducts which have a commercial application. These include the EAF steelmaking slag and EAF steel dust. A physical allocation method based on the calorific value of the coproducts has been used. This methodology is based on the procedures developed by the World Steel Association and EUROFER (see references).

Additional information:
The 100% renewable electricity mix was modelled as reported in the energy guarantee of origin certificate. This electricity mix is shown below:

	%
Wind	100%
Carbon footprint GWP-GHG	0.024

(kg CO2 eq./kWh)

Data quality requirements: The quality of the data used to calculate this LCA meets the following requirements:

- The data used in the LCA were as up to date as possible (updated within the last 10 years for generic data and within the last 5 years for manufacturer-specific data).

- Used background data are of recognised prestige and acceptance in the technical and scientific fields. In particular, the Ecoinvent database, in the most recent version existing at the time of the study, is considered to be of preferential use.

- Regionally specific datasets were used to model the energy consumption (electricity, natural gas or diesel). For the processes of transport, production of raw materials or end-of-life, datasets were chosen according to their technological and geographical representation of the actual process.

Environmental performance

Potential environmental impact – mandatory indicators according to EN 15804

Environmental impact indicators				
	Unit	Upstream	Core	Total
Global Warming Potential - fossil fuels (GWP-fossil)	kg CO2 eq	1,14E+02	7,69E+01	1,91E+02
Global Warming Potential - biogenic (GWP-biogenic)	kg CO2 eq	7,72E-01	5,92E-01	1,36E+00
Global Warming Potential - land use and land use change (GWP-luluc)	kg CO2 eq	1,73E-01	2,11E-02	1,94E-01
Global Warming Potential - total (GWP-total)	kg CO2 eq	1,15E+02	7,76E+01	1,92E+02
Depletion potential of the stratospheric ozone layer (ODP)	kg CFC-11 eq	1,40E-05	5,39E-06	1,94E-05
Acidification potential, Accumulated Exceedance (AP)	mol H+ eq	6,29E-01	1,45E-01	7,74E-01
Eutrophication potential - freshwater (EP-freshwater)	kg P eq	5,54E-03	1,48E-03	7,02E-03
Eutrophication potential - marine (EP-marine)	kg N eq	1,36E-01	2,90E-02	1,65E-01
Eutrophication potential - terrestrial (EP-terrestrial)	mol N eq	1,54E+00	2,72E-01	1,81E+00
Photochemical Ozone Creation Potential (POCP)	kg NMVOC eq	5,23E-01	9,98E-02	6,23E-01
Abiotic depletion potential - non-fossil resources (ADPE)	kg Sb eq	1,38E-03	6,88E-04	2,07E-03
Abiotic depletion potential - fossil resources (ADPF)	MJ	1,94E+03	5,50E+02	2,49E+03
Water (user) deprivation potential (WDP)	m3 eq	8,39E+01	-2,07E+00	8,18E+01

Use of resources

Indicators describing resource use				
	Unit	Upstream	Core	Total
Use of renewable primary energy as energy carrier (PERE)	MJ	2,29E+02	1,66E+03	1,89E+03
Use of renewable primary energy resources used as raw materials (PERM)	MJ	0,00E+00	0,00E+00	0,00E+00
Total use of renewable primary energy (PERT)	MJ	2,29E+02	1,66E+03	1,89E+03
Use of non renewable primary energy as energy carrier (PENRE)	MJ	2,05E+03	6,01E+02	2,65E+03
Use of non renewable primary energy resources used as raw materials (PENRM)	MJ	0,00E+00	0,00E+00	0,00E+00
Total use of non renewable primary energy resource (PENRT)	MJ	2,05E+03	6,01E+02	2,65E+03
Use of secondary material (SM)	kg	9,28E+02	0,00E+00	9,28E+02
Use of renewable secondary fuels (RSF)	MJ	0,00E+00	0,00E+00	0,00E+00
Use of non renewable secondary fuels (NRSF)	MJ	0,00E+00	0,00E+00	0,00E+00
Net use of fresh water (FW)	m3	2,44E+00	-2,21E-02	2,42E+00

Waste production and output flows

Environmental information describing waste categories				
	Unit	Upstream	Core	Total
Hazardous waste disposed (HWD)	kg	2,06E-03	2,22E-03	4,28E-03
Non harzardous waste disposed (NHWD)	kg	7,58E+01	3,13E+01	1,07E+02
Radioactive waste disposed (RWD)	kg	9,77E-03	6,43E-04	1,04E-02

Environmental information describing output flows				
	Unit	Upstream	Core	Total
Components for re-use (CRU)	kg	0,00E+00	0,00E+00	0,00E+00
Materials for recycling (MFR)	kg	0,00E+00	1,44E+02	1,44E+02
Materials for energy recovery (MER)	kg	0,00E+00	0,00E+00	0,00E+00
Exported electrical energy (EEE)	MJ	0,00E+00	0,00E+00	0,00E+00
Exported thermal energy (EET)	MJ	0,00E+00	0,00E+00	0,00E+00

Revision changes

This document corresponds to the second version of the EPD. Editorial changes have been made compared to the previous version.

References

- Ecoinvent, 2021. Ecoinvent Database 3.8. http://www.ecoinvent.org/database/.
- General Programme Instructions of The International EPD® System. Version 3.01
- ISO 14025/ DIN EN ISO 14025:2009-11: Environmental labels and declarations - Type III environmental
- ISO 14040-44/ DIN EN ISO 14040:2006-10, Environmental management - Life cycle assessment-Principles
- PCR 2015:03 version 2.0. Basic iron or steel products & special steels, except construction products. International EPD System
- World Steel Association, EUROFER, 2014. A methodology to determine the LCI of steel industry co-products. 14 February 2014. https://worldsteel.org/steel-topics/life-cycle-thinking/methodology-for-slag-lci-calculation/
- Wernet, G., Bauer, C., Steubing, B., Reinhard, J., Moreno-Ruiz, E., Weidema, B., 2016. The Ecoinvent database version 3 (part I): overview and methodology. Int. J. Life Cycle Assess. 21, 1218–1230.

VERIFICATION STATEMENT CERTIFICATE

CERTIFICADO DE DECLARACIÓN DE VERIFICACIÓN

Certificate No. / Certificado nº: EPD08613

TECNALIA R&I CERTIFICACION S.L., confirms that independent third-party verification has been conducted of the Environmental Product Declaration (EPD) on behalf of:
TECNALIA *R&I CERTIFICACION S.L., confirma que se ha realizado verificación de tercera parte independiente de la Declaración Ambiental de Producto (DAP) en nombre de:*

NERVACERO, S.A. (CELSA Group™)
Barrio Ballonti, s/n
48510 VALLE DE TRAPAGA (Vizcaya) - SPAIN

for the following product(s):
para el siguiente(s) producto(s):

STEEL BILLETS (100% RENEWABLE ELECTRICITY).
PALANQUILLAS DE ACERO (100% ELECTRICIDAD RENOVABLE).

with registration number **S-P-08501** in the International EPD® System *(www.environdec.com).*
*con número de registro **S-P-08501** en el Sistema International EPD® (www.environdec.com).*

it´s in conformity with:
es conforme con:

- **ISO 14025:2010 Environmental labels and declarations. Type III environmental declarations.**
- **General Programme Instructions for the International EPD® System v.3.01.**
- **PCR 2015:03 v2.0. Basic iron or steel products & special steels, except construction products.**
- **UN CPC 41121 Non-alloy steel in ingots or other primary forms, and semi-finished products of non alloy steel.**

Carlos Nazabal Alsua
Manager

Issued date / *Fecha de emisión:*	20/04/2023
Update date / *Fecha de actualización:*	20/04/2023
Valid until / *Válido hasta:*	19/04/2028
Serial Nº / *Nº Serie:*	EPD0861300-E

CERTIFICACIÓN ISO 17065 Nº125 / C-PR283

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