

Environmental Product Declaration

In accordance with ISO 14025 for:

16MnCr5 Case hardening steel

SIDENOR ACEROS ESPECIALES S.L.



Programme	The International EPD System - www.environdec.com
Programme operator:	EPD International AB
EPD registration number:	EPD-IES-0008594
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Geographical scope:	Europe
Reference PCR	PCR 2015:03 Basic iron or steel products & special steels, except construction products (v2.0) (CPC 412) v2.1.1





SIDENOR ACEROS ESPECIALES S.L.

Sidenor is a steel company, leader in the European steel industry for the production of special steel long products. It is also an important supplier of cold finished products in the European market. The company has production centers in Basque Country, Cantabria and Catalonia as well as business delegations in Germany, France, Italy and the U.K.

The company has highly specialized facilities offering solutions for all industrial sectors requiring high quality steel services.

Sidenor's steel production capacity exceeds one million tons annually, primarily destined to the automobile, machinery, capital equipment, naval and civil construction, defence, energy, mining and petrochemical industries. In all of these industries, Sidenor's special steel is used to manufacture reliable products.

The company is at the frontline of the sector thanks to their intense research commitment. Having one of the largest R&D centres in the European steel sector, Sidenor's technological developments offer optimization of products and processes.



Sidenor believes that the continuity of a business is related to its environmental performance. This concern is reflected in its daily practices, in investments for continued upgrading of equipment and in environmental awareness programs.

Sidenor invests millions of euros annually in research and technology to reduce particle and CO₂ emissions in the atmosphere. The Sidenor Special Steel Production Plants include modern systems of smoke aspiration and purification, effectively capturing the particles generated during the steel production process. This filtered material, which in the past was sent to landfills, is currently treated as a by-product, used as raw material in the zinc recycling industry. In this way, Sidenor reaffirms its commitment to discovering sustainable solutions for their activities.

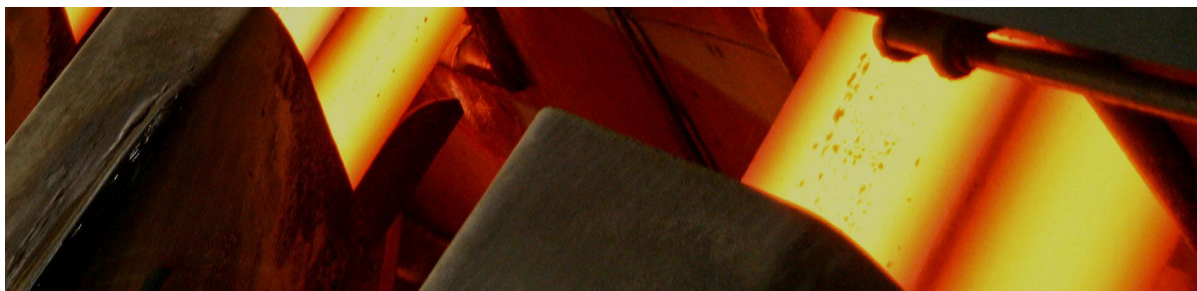
Sidenor also seeks to continually implement improvements to reduce CO₂ production, such as the substitution of Fuel-oil for natural gas in treatment ovens, the development of energy-efficiency projects, continuous technological updating and the use of scrap as a principle raw material.

During the steel production process, water is used on a large scale for equipment and product refrigeration. This process is conducted in a closed-loop process through chemical-physical treatment of the water, allowing for its internal reuse and thereby considerably reducing its consumption.



Every year, at Sidenor, we invest to improve our behavior towards the environment, thus improving the prevention of our environmental impacts. Based on this principle, all of the Sidenor plants have adopted the Environmental Management System under ISO standard 14001. The goal is to ensure the complete process overview, from the use of primary materials, the industrial and product distribution stages, to the appropriate destination of by-products created in the process. Our Environmental Management System relates Sidenor activities in an integrated management system certified according to:

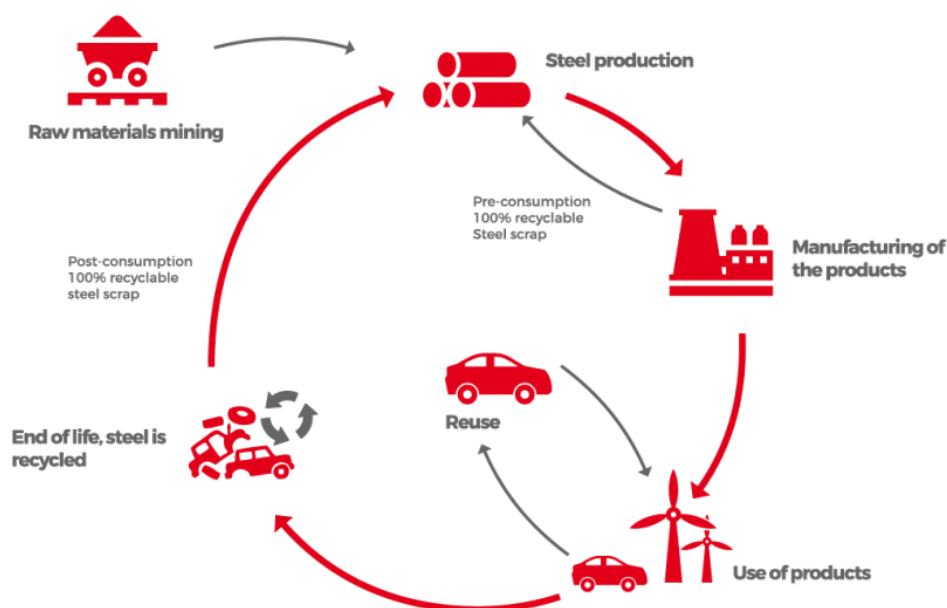
- **ISO 9001** Quality management systems – Requirements
- **ISO/TS16949** Quality management systems— Particular requirements for the application of ISO 9001:2008 for automotive production and relevant service part organizations
- **ISO 14001** Environmental management systems - Requirements with guidance for use
- **ISO 50001** Energy management systems - Requirements with guidance for use
- **ISO 45001** Occupational Health & Safety Management



At Sidenor, 100% of the steel produced is from post-consumer and pre-consumer ferrous scrap, recycling every year about 800,000 ton of industrial waste and obsolete materials for community. By using scrap in its production process, Sidenor also reduces the energy required in the steel production process, and consequently,

CO2 emissions. These materials are reused and transformed into new steel products.

We recycle the waste steel from the production process of the automobile industries or household appliances, among others. Recycling scrap also generates work for thousands of people through an extensive chain of scrap collection and processing.



LCA INFORMATION

Declared unit: 1 Ton of 16MnCr5, Case hardening steel product at the SIDENOR BASAURI manufacturing plant gate.

Time representativeness: data from the year 2023 has been using for the LCA calculation.

Database and LCA software used: An internal LCA software has been developed and our processes to produce EPDs have been quality assured by an external certification body with an EPD Process Certification.

The Ecoinvent 3.9 database has been used.

LCA references:

The LCA study has been carried out in accordance with the following standards:

- ISO 14040. Environmental management. Life cycle assessment. Principles and framework
- ISO 14044. Environmental management. Life cycle assessment. Requirements and guidelines
- ISO 14025. Environmental labels and declarations. Type III environmental declarations. Principles and procedures
- PCR 2015:03 Basic iron or steel products & special steels, except construction steel products 2.1.1.

Cut off rules and Allocation criteria

Primary data concerning the energy consumption, resource consumption and waste production on SIDENOR BASAURI PLANT is taken from the internal company quality control system. The data provided is not broken down by the selected declared unit, but they are provided for the total of the company

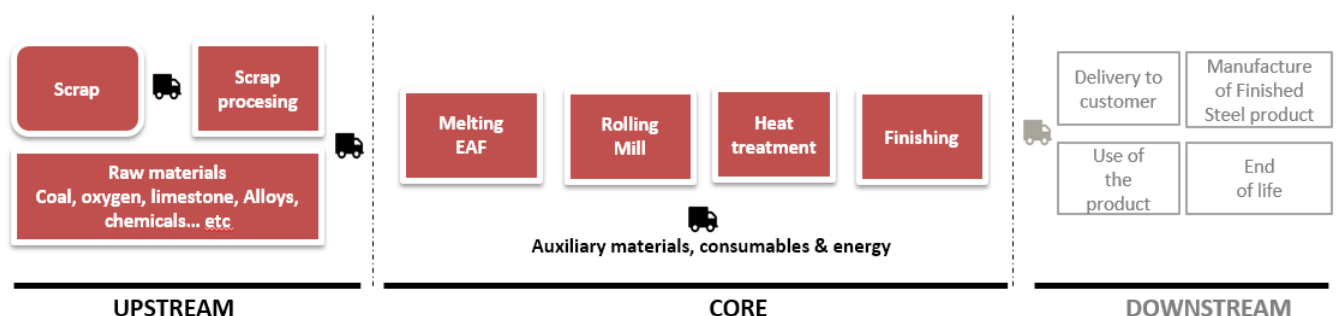
in the year selected. Therefore, distinction has been made between the specific characteristics of each process, the quantity of material processed, and based on calculations it has been estimated the allocation of the proportional part the environmental aspects per ton of the declared steel. No cut off rule has been taken into account on this study, so all the data compiled has been used for the LCA.

Description of system boundaries: This is a cradle-to-gate EPD. The following is included:

-UPSTREAM PROCESSES: Extraction and production of raw materials (scrap, limestone, electrodes, refractory, fluxes, chemicals, alloys....etc.). Transportation of raw materials during the production chain and to the steel manufacturing facility

-CORE PROCESSES: Manufacturing process for special steels (material consumption, energy production and consumption, emissions to air, water and soil...), waste generated during manufacturing and its treatment, emissions generated during manufacturing.

-DOWNSTREAM PROCESSES: Not included, as this EPD covers intermediate special steels that will be further processed to become a finished consumer product. The environmental impact of the Downstream stage of the finished products made by this special steels should be defined, calculated and allocated by the manufacturers of those finished products (using this EPD data as part of his own Upstream processes).





PRODUCT INFORMATION & CONTENT DECLARATION

CASE HARDENING STEELS:

Case-hardening steels have a relatively low carbon content mostly ranging between 0.10 and 0.30%.

Application:

They are intended for case hardening, a special variant of hardening. It consists of the process steps carburizing, hardening and tempering.

Chemical composition (average values in%)
C 0,16
Mn 1,25
Cr 1
S 0,065
Al 0,025
Fe 97,5

Recycled material

Provenience of recycled materials (pre-consumer or post-consumer) in the product: The hot-rolled bar steel product is made from 97,6% recycled steel and 2,4% alloying elements.

More information:

For more information on the product and Sidenor steel products, see www.sidenor.com

Steel products are considered “articles” in the European Regulation (EC) 1907/2006 about the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH). Alloying elements in the declared Steel product are not classified as hazardous. The alloying elements are bonded in the chemical matrix of the Steel products and thanks to this the release of any of these substances are negligible when the steel is used appropriately.



ENVIRONMENTAL PERFORMANCE

POTENTIAL ENVIRONMENTAL IMPACT			UPSTREAM	CORE	TOTAL
Global warming potential (GWP)	Fossil	kg CO2 eq.	225,78	258,04	483,83
	Biogenic	kg CO2 eq.	0,30	3,03	3,33
	Land use & land transform	kg CO2 eq.	0,23	1,33	1,56
	TOTAL	kg CO2 eq.	226,31	262,40	488,72
Acidification potential (AP)		mol H+ eq.	2,23	0,42	2,65
Eutrophication potential (EP)	EP, aquatic freshwater	kg P eq.	0,01	0,0032	0,01
	EP, aquatic marine	kg N eq.	0,29	0,11	0,40
	EP, terrestrial	mol N eq.	3,28	1,33	4,60
Photochemical oxidant formation potential (POFP)		kg NMVOC eq.	1,22	0,55	1,77
Ozone depletion potential (ODP)		kg CFC 11 eq.	0,0000048	0,0000096	0,0000144
Abiotic depletion potential – Elements		kg Sb eq.	0,0046	0,0009	0,0054
Abiotic depletion potential – Fossil fuels		MJ	3121,09	3557,31	6678,40
Water deprivation potential (WDP)		m3 eq.	64,16	139,79	203,95
INVENTORY INDICATORS			UPSTREAM	CORE	TOTAL
Primary energy resources – Renewable	Use as energy carrier	MJ	433,07	2978,19	3411,26
	Used as raw materials	MJ	0,00	0,00	0,00
	TOTAL	MJ	433,07	2978,19	3411,26
Primary energy resources – Non-renewable	Use as energy carrier	MJ	3118,57	3193,93	6312,50
	Used as raw materials	MJ	9,76	363,39	373,15
	TOTAL	MJ	3128,34	3557,32	6685,65



PROGRAMME-RELATED INFORMATION AND VERIFICATION

Programme:	The International EPD [®] System EPD International AB Box 210 60. SE-100 31 Stockholm. Sweden www.environdec.com info@environdec.com
EPD registration number:	EPD-IES-0008594
Product group classification:	UN CPC 412
Reference year for data:	2023
Geographical scope:	Europe

Product category rules (PCR): PCR 2015:03 Basic iron or steel products & special steels, except construction products (CPC 412) v2.1.1
PCR review was conducted by: The Technical Committee of the International EPD [®] System. The Technical Committee of the International EPD [®] System. Chair: Massimo Marino. Contact via info@environdec.com
Independent verification of the declaration and data, according to ISO 14025: <input checked="" type="checkbox"/> EPD process certification <input type="checkbox"/> EPD verification
EPD PROCESS CERTIFICATION - EPD03301 Certification Body: CERTINALIA, S.L.U. Accredited by: ENAC n°125/C-PR283 accreditation
Procedure for follow-up of data during EPD validity involves third party verifier: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

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

The verifier and the operator of the program are not responsible for any claim on the product or the legality of the product.

EPDs within the same product category but from different programmes may not be comparable.

More information about the certification system on the Environdec website: www.environdec.com

REFERENCES

- ISO 14040 Environmental management - Life cycle assessment - Principles and framework
- ISO 14044 Environmental management - Life cycle assessment - Requirements and guidelines
- ISO 14025 Environmental labels and declarations - Type III environmental declarations
- General Programme Instructions of the International EPD[®] System. Version 3.01
- PCR 2015:03 Basic iron or steel products & special steels, except construction products v2.1.1



CONTACT INFORMATION

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