

Environmental Product Declaration

In accordance with ISO 14025:2006 and EN 15804:2012+A2:2019/AC:2021 for:

**Hot rolled structural shapes manufactured
from steel scrap**



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

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THE INTERNATIONAL EPD® SYSTEM



LATIN AMERICA

INTERNATIONAL EPD SYSTEM



EPD Content

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1. Programme information



Programme:	The International EPD® System
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Product Category Rules (PCR)

CEN standard EN 15804:2012+A2:2019/AC:2021 serve as the core Product Category Rules (PCR)

PCR review was conducted by: The Technical Committee of the International EPD System. See www.environdec.com for a list of members. Review chair: Claudia A. Peña, University of Concepción, Chile. The review panel may be contacted via the Secretariat www.environdec.com/contact.

Life Cycle Assessment (LCA)

LCA accountability:

Elena Dominguez, Mireya González, Dulce Zaragoza (2025), Life Cycle Assessment of Hot rolled structural shapes manufactured from scrap by Gerdau Corsa, Center for Life Cycle Assessment and Sustainable Design – CADIS.

Third-party verification

Independent third-party verification of the declaration and data, according to ISO 14025:2006, via:

☒ EPD verification by individual verifier

Third-party verifier: Itxaso Trabudua, IK Ingeniería SL.

Approved by: The International EPD® System

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 characterization factors); have equivalent content declarations; and be valid at the time of comparison.

2. Company information



Owner of the EPD:	GERDAU CORSA S.A.P.I. DE C.V
Contact:	Rigoberto Torres Villeda (Market Development Advisor) rigoberto.torres@gerdau.com Tel:5544010036
Description of the organisation:	Gerdau Corsa is a leader in the production of long steel in the Americas and one of the main suppliers of special long steel in the world. It is the largest recycler in Latin America and annually transforms millions of tons of scrap into steel. Gerdau has a technical team focused on understanding and meeting customer needs, providing solutions for every requirement. In addition to delivering high-quality steel products, offer value-added services such as custom-length cuts to optimize the fabrication of steel structures for buildings and industrial applications. Our extensive network of steel mills spans the United States, Argentina, Peru, Uruguay, Brazil, Canada, and Mexico
Product-related or management system-related certifications:	ISO 9001:2015, 14001:2015 and 45001:2018
Name and location of product site:	Manufacturing plant: Km. 3 Ctra. Mex. - Cd. Sahagún, Zona Ind. Tepeapulco, Cd. Sahagún, Hidalgo 43990, Mexico.

GERDAU CORSA

Gerdau's history began in 1901 with a factory in Porto Alegre, Brazil. Today, Gerdau products are present in the daily lives of millions of people.

Gerdau arrived in Mexico in March 2007 with the acquisition of the Tultitlan steel plant (Sidertul). In 2008, Gerdau created a commercial alliance with the Aceros Corsa commercial bar plant and in 2012, Gerdau and Aceros Corsa unified the brand in Mexico under the name Gerdau Corsa. In 2015, Gerdau Corsa starts operations at Planta Sahagun, a structural profiles plant located in Ciudad Sahagun, in the state of Hidalgo.

At Gerdau Corsa, we believe in the transformative power of steel, and since the beginning of our history, the main objective has been to transform the lives of the people around us. Steel can turn projects into reality and drive the development of a better society and a better place to live.



3. Product information



Product name:	Hot rolled structural shapes manufactured from steel scrap
Product description:	Hot rolled structural shapes manufactured from steel scrap. Are also known as W, HP and C Shapes, their application is generally in the construction of steel structures using them in structural elements such as columns, beams, trusses, deep foundations, etc.
UN CPC code:	UN CPC 4124 Barsand rods, hot rolled, of iron or steel.
Geographical scope:	Mexico

Hot rolled structural shapes

Hot rolled structural shapes manufactured form steel scrap, are also known as W, HP and C Shapes, their application is generally in the construction of steel structures in elements such as columns, beams, trusses, Deep foundations, etc.

Gerdau Corsa as a leader in the production of this type of product in Mexico has the ability to manufacture more than 110 different shapes manufactured under national and international norms, such as NMX-B-284 Industria Siderúrgica-Acero Estructural De Alta Resistencia Baja Aleación Al Manganeso-Niobio-Vanadio-Especificaciones y Métodos De Prueba and ASTM A6 / A6M (Standard Specification For General Requirements For Rolled structural steel bars, plates, shapes, and sheet piling), also their products are subjected to chemical and mechanical properties tests to ensure product quality.

Uses
• In the construction industry as columns, beams, trusses and Deep foundations. • Metallic barriers and structural support. • Industrial buildings.

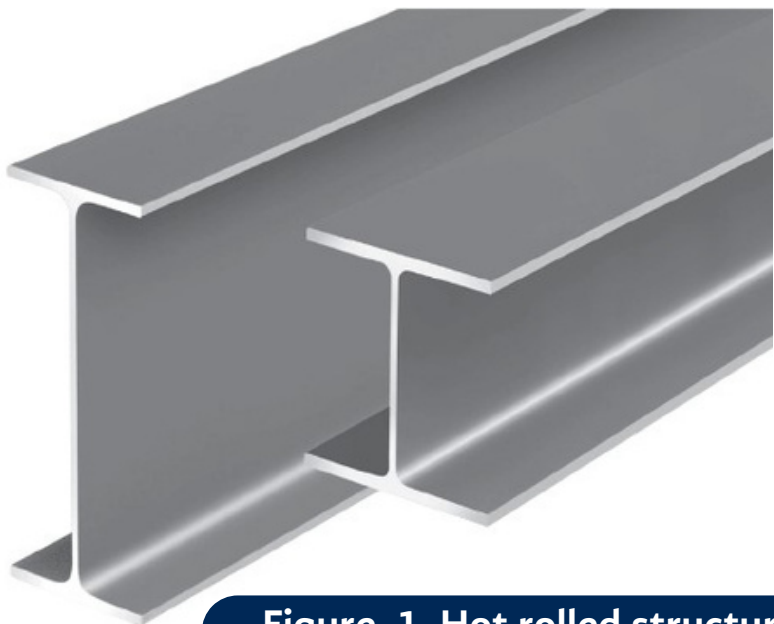


Figure. 1. Hot rolled structural shapes.

Available Steel Norms and Grades for hot rolled structural shapes:		
• ASTM A992/A992M • ASTM A572/572M - o Grade 50 - o Grade 55 - o Grade 60 - o Grade 65	• ASTM A36/A36M • ASTM A529/A529M - o Grade 50 - o Grade 55	• ASTM A588/A588M - o Grade A - o Grade B - o Grade K
• ASTM A709/A709M - o Grade 36 - o Grade 50 • A • B - o Grade 50W	• CSA G40-20 / G40-21 - o Grade 345WM	• NMX-B-284 - o Class C, Grade A99
SAE J403 Chemical Compositions of SAE Carbon Steels - Q 255 - S355JR - SAE 1040	SAE 1050 - SAE 1080 - SAE 1541 - SAE 1010 - SAE 1018	SAE1029 - SAE1035 - SAE 4140 - SAE1045 - SAE1060

Available geometries according to ASTM A6/A6M 24-a

The information on the tables of technical specifications is required, please consult the official Gerdau Corsa website <https://www.gerdaucorsa.com.mx>. Where you can download the Profiles Manual, you can also contact Facebook / Instagram / and LinkedIn.

4. LCA information



Environmental potential impacts were calculated in accordance with EN 15804:2012+A2:2019/AC:2021 sustainability of construction works and PCR 2019:14 Construction products Version 1.3.4. This EPD is in accordance with ISO 14025:2006.

Environmental potential impacts were calculated through Life Cycle Assessment (LCA) methodology conformity to ISO 14040:2006 and ISO 14044:2006. An external third-party verification process of the EPD was conducted according to General Program Instructions from the International EPD® System Version 5.0. Verification includes a documental review and a validation of both the underlying LCA study and documents describing additional environmental information that justify data provided in the EPD.

4.1. Declared unit

1000 kg of Hot rolled structural shapes manufactured from steel scrap by Gerdau Corsa at the Sahagún plant in Hidalgo State.

4.2. Reference service life

No applicable

4.3. System boundary

The potential environmental impacts were calculated through Life Cycle Assessment (LCA) methodology for Hot rolled structural shapes manufactured from steel scrap according to ISO 14040:2006 and ISO 14044:2006.

According to EN 15804:2012+A2:2019/AC:2021 section 5.2 the following type of EPD is “cradle to gate with modules C1-C4 and module D (A1-A3 +C+D). This EPD is based on information upstream processes and core processes, modules A1 to A3, and approximations of scenarios C1, C2, C3, C4, and D based on construction sector statistics in Mexico (see **Table 2**). Does not include A4-A5 Construction stage and B Usage stage.

Life cycle stage	Information about the modules contained in the stages	EPD			
		Cradle-to-gate with modules C1-C4 and module D	Cradle-to-gate with modules C1-C4, module D and optional modules	From cradle to grave and module D	EPD construction services: Cradle to door with modules A1-A5 and optional modules
A1-A3 products stage	A1) Raw material procurement	Mandatory	Mandatory	Mandatory	Mandatory
	A2) Transport				
	A3) Manufacture				
A4-A5 Construction stage	A4) Transport	-	Optional for goods Required for services	Mandatory	Mandatory
	A5) Construction / installation				
B Usage stage	B1) Use	-	Optional	Mandatory	Mandatory
	B2) Maintenance				
	B3) Reparation				
	B4) Replacement				
	B5) Remodeling				
	B6) Operational energy use				
	B7) Operational water use				
C End of life stage	C1) Deconstruction, demolition	Mandatory	Mandatory	Mandatory	Optional
	C2) Transport				
	C3) Waste processing				
	C4) Final disposition				
D Benefits and charges beyond the system limit	D) Reuse, recycling or energy recovery potential	Mandatory	Mandatory	Mandatory	-

Table 1.System boundary.

4. LCA information



	Product stage			Construction process phase		Usage stage						End of life stage				Resource recovery stage
	Raw material supply	Transport	Manufacturing	Transport	Construction facility	Use	Maintenance	Repair	Restoration	Operational energy use	Operational use of water	Demolition/Deconstruction	Transport	Waste processing	Disposal	Reuse – Recovery – Recycling - potential
Module	A1	A2	A3	A4	A5	B1	B2	B4	B5	B6	B7	C1	C2	C3	C4	D
Declared modules	X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
Geography	MX USA CA PER CHN IND BR	MX	MX	ND	ND	ND	ND	ND	ND	ND	ND	MX	MX	MX	MX	MX
Specific data used	>90%			-	-	-	-	-	-	-	-	-	-	-	-	-
Product variation	0%			-	-	-	-	-	-	-	-	-	-	-	-	-
Site variation	0%			-	-	-	-	-	-	-	-	-	-	-	-	-

X = Declared module; ND = No declared module; NR = No reported; MX= Mexico, USA= United States of America, CA=Canada, PER=Peru, CHN=China, IND=Indian, BR:Brazil

Table 2.Description of the modules included in this EPD.

4. LCA information



4.4 Description of information modules

Description of information modules is included in **Table 3**.

A1) Raw materials supply	A2) Transportation	A3) Manufacturing	C) End of life	D) Benefits and charges beyond the system limit
				
• Consumption and production of raw materials. • Consumption and production of electrical energy. • Consumption and production of natural gas and diesel. • Packaging materials for raw materials.	• Distance of transport of raw materials, auxiliary inputs and packaging to the manufacturing site. • Fuel consumption and emissions related to transport requirements.	• Consumption of auxiliary inputs. • Water consumption and production. • Packaging materials for auxiliary inputs and final product. • Emissions to air and water. • Waste generation. • Transport distance for waste disposal.	• Demolition. • Transport final destination. • What can be recycled. • What goes to fill what is wasted and not recycled.	• Avoided loads and benefits.

Table 3. Description of information modules included in this EPD.

4. LCA information

4.5 Description of the manufacturing process

Product stage (modules A1, A2, A3). This stage includes the acquisition of raw materials, transportation and the manufacturing process. It includes the processing of scrap used as the main raw material, the procurement of other raw materials and their associated packaging. It also includes the generation of electrical energy and the production of fuel for the manufacturing process; also, the transportation of raw materials and auxiliary inputs to the manufacturing centers; in relation to the manufacturing process, it includes the production of auxiliary materials, the consumption of water, waste and emissions generated.

The **manufacturing process of Flow diagram of Hot rolled structural shapes** is shown in Figure 2 and is described below: The process begins with the collection and processing of scrap metal at various yards across the country. This material is transported to the Sahagún plant, where it is processed to produce billets, the raw material used for manufacturing structural profiles. The pre-processed scrap is loaded into the electric arc furnace, where it is melted into liquid steel. This molten metal is then transferred to a ladle and moved to the ladle furnace, where a deoxidation process is carried out to remove residual oxygen and perform chemical adjustments. The steel then moves to the continuous casting area, where it is poured into molds and solidified into billets.

The billets are stored at the Sahagún plant for one of three possible uses: they may be sent to the La Presa plant, sold to third parties, or reintegrated into the production line for structural profile manufacturing. Next, the billets are fed into the reheating furnace to reach the optimal temperature for shaping. They then pass through the descaling and rolling areas, where they are formed into their final shape. Afterward, the material is cooled at ambient temperature and subjected to various quality control processes to ensure the final product meets the required physical, mechanical, and chemical specifications. Finally, the finished product is shipped to various distribution centers.

End of life stage (modules C1, C2, C3, C4). These life cycle stages include fuel consumption for the demolition of 1000 kg of steel, transport of waste to recycling and sanitary landfill, processing of deconstruction waste for recycling and disposal of waste in sanitary landfill.

Resource recovery stage (module D). Avoided loads and benefits from stopping the production of virgin ore for steel.



Figure. 2. Flow diagram of Hot rolled structural shapes manufactured from Hot rolled structural shapes.

4. LCA information



4.6 Assumptions

Assumptions were made for each life cycle module, which are shown in the LCA report. This document presents the assumptions for the end-of-life module.

Life Cycle Module	Assumptions
End of Life	• It is assumed that 98% of steel is recycled in Mexico (ALACERO, 2022). • It is assumed that 2% of waste is disposed of in landfills. • It is assumed that the transport distance of steel waste to the recycling site is 250.71 km. • Fuel consumption and emissions data are assumed for the dismantling and handling of steel.

4.7 Cut-off criteria

All flows of fuel, energy, materials and supplies necessary to produce the Hot rolled structural shapes manufactured from steel scrap have been considered; materials that could be used in preventive or corrective maintenance of machinery and equipment were disregarded, as well as the use of uniforms and personal protective equipment or other auxiliary materials, leaving out textiles impregnated with oils or plastics and the final disposal of these as hazardous waste.

4.8 Allocation

In the evaluated product system, steel scrap is the raw material used in the production of billets (the raw material), with post-consumer scrap accounting for over 90 % of the total input. This information is based on primary data obtained directly from the operational records of Gerdau Corsa for the reference period.

In this study, allocation procedures were applied for by-products generated during industrialization and input of scrap to billet manufacturing process, which are shown in the **Table 4**. The scrap life cycle inventory was formed for a 99.8% scrap functional unit, since 0.21% of material consumption and transportation corresponds to the waste of recyclable ferrous material, which Gerdau Corsa sells after accumulating a certain amount.

Coproduct	Quantity	Unit	Assignment
Residue of recyclable ferrous material	2.14	kg	0.21%
Scrap	1000	kg	99.8%
Total	1002.14	kg	100%

Table 4. Allocation for scrap.

To form the inventory of the Hot rolled structural shapes, the steelmaking and rolling processes and the by-products generated in each case were considered. In the rolling stage, it was formed according to the allocation made between the Hot rolled structural shapes and the metal shell as shown in **Table 5**. Therefore, the inputs will be affected by 98.32%.

Coproduct	Quantity	Unit	Assignment
Metal shell	20	kg	1.68%
Hot rolled structural shapes	1000	kg	98.32%
Total	1020	kg	100%

Table 5. Allocation for the manufacturing process of the Hot rolled structural shapes in Sahagún.

Table 6 below shows the allocations related to the billet manufacturing process, according to the quantity needed to manufacture the structural profile. This allocation is made according to the by-products reported for the steelmaking stage. Therefore, the inventory of the steelmaking stage consisted of 86.22% of the raw materials used.

Coproduct	Quantity	Unit	Assignment
Slag that is sold	150	kg	12.96%
Ferrous metal powder	9.7	kg	0.82%
Billet	1020	kg	86.22%
Total	1180	kg	100%

Table 6. Allocation for the manufacturing process of the Billet manufactured in Sahagun.

The allocation of waste follows the Polluter Pays Principle, as established in the PCR. Waste is assigned to the system that generates it until it reaches the end-of-waste state. If this state is not met, all treatment impacts remained with the generating system.

4.9 Time and Geography

Direct data obtained from Gerdau Corsa is representative for 2023 for La Sahagún site, in Mexico.

4.10. Excluded lifecycle stages.

The modules: A4, A5, B1, B2, B3, B4, B5, B6, B7.

5. Content declaration



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Hot rolled structural shapes manufactured from steel scrap is produced in electric arc furnaces. The typical composition is in **Table 7**.

Table 7. Content Hot rolled structural shapes manufactured from steel scrap.

Product components	Weight, kg	Weight, %	Chemical substances	Number CAS	Health class ¹	Post-consumer recycled material, weight-% of product	Pre-consumer recycled material, weight-% of product	Biogenic content (kg)	Biogenic content (kg C/product)
Steel scrap*	922.50	92.25	Iron	7439-89-6	Not listed	61.8%	38.2%	0.0	0.0
Anthracite	0.50	<1	Anthracite	8029-10-5	Not listed	0.0	0.0	0.0	0.0
Dolomite	33.73	3.37	Calcium oxide (CaO) and magnesium oxide (MgO)	471-34-1	Not listed	0.0	0.0	0.0	0.0
Hard Coal	21.78	2.18	Coal	7440-44-0	Not listed	0.0	0.0	0.0	0.0
Calcitic lime	11.03	1.10	Calcium oxide	471-34-1	Not listed	0.0	0.0	0.0	0.0
Ferrosilicon Manganese	10.32	1.03	Iron, Manganese and silicon	11114-55-9	Not listed	0.0	0.0	0.0	0.0
FERRO NIOBIO (Fe Nb)	0.1	< 1	iron and niobium alloy	11110-73-7	Not listed	0.0	0.0	0.0	0.0
FeCr (high carbon) alloys	0.029	< 1	iron-chromium alloy	11114-46-8	Not listed	0.0	0.0	0.0	0.0
Packaging materials			Weight, kg			Weight-% (versus the product)		Biogenic content (kg)	Biogenic content (kg C/product)
Composite material (paper and a polyester (PET))			1.04E-03			<1		0.0	0.0

*Steel manufactured in Gerdau Corsa uses 100% steel scrap as source of iron.
1 According to EN15804 declaration of material content of the product shall List of Substances of Very High Concern (SVHC) that are listed by European Chemicals Agency.
NOTE: 1 kg of biogenic carbon is equivalent to 44/12 kg of CO₂.

5.1 Distribution packaging

The 3-layer composite material, which is made up of two layers of special paper and a polyester (PET) core is used as packing material for Hot rolled structural shapes.

5.2 Biogenic carbon information

The Hot rolled structural shapes manufactured from steel scrap doesn't have biogenic carbon content. Biogenic carbon from packaging and products was excluded from the system, since by mass it represents less than 5% and have no biogenic carbon content ("2019:14 Construction products, Version 1.3.4").

[1] European Chemical Agency (ECHA):
a)Candidate List: https://echa.europa.eu/es/candidate-list-table?p_p_id=dislists_WAR_dislistsportlet&p_p_lifecycle=1&p_p_state=normal&p_p_mode=view&p_p_col_id=column-1&p_p_col_pos=2&p_p_col_count=3&dislists_WAR_dislistsportlet_javax.portlet.action=searchDislists
b)Authorisation list https://echa.europa.eu/es/authorisation-list?p_p_id=dislists_WAR_dislistsportlet&p_p_lifecycle=1&p_p_state=normal&p_p_mode=view&p_p_col_id=column-1&p_p_col_pos=1&p_p_col_count=2&dislists_WAR_dislistsportlet_javax.portlet.action=searchDislists
Restriction list https://echa.europa.eu/es/substances-restricted-under-reach?p_p_id=dislists_WAR_dislistsportlet&p_p_lifecycle=1&p_p_state=normal&p_p_mode=view&p_p_col_id=column-1&p_p_col_pos=1&p_p_col_count=2&dislists_WAR_dislistsportlet_javax.portlet.action=searchDislists

6. Results of the environmental performance indicators



The Life Cycle Impact Assessment were calculated using the EN 15804+A2 Method V1.02 / EF 3.1 normalization and weighting set (PRé-Sustainability, 2021) and Ecoinvent 3.10, implemented in the SimaPro 9.6.0.1 software.

Infrastructure and capital goods are not included, in accordance with PCR 2019:14 V.1.3.4.

6.1 Potential environmental impact

Electricity impact

For the electricity used in the production process, Gerdau Mexico purchases electricity from the Federal Electricity Commission (CFE) and from an independent supplier to the CFE based on the combined cycle process (Iberdrola).

The electricity generation data in Mexico comes from the Ecoinvent 3.10 database and information from the National Center for Energy Control (CENACE), which is a decentralized public body whose purpose is to manage the Operational Control of the National Electric System in México. With both references a dataset was created, named “Electricity, high voltage, 2023 {MX}| market for electricity, high voltage | Cut-off, U”, this dataset represents the most recent electricity Mexican grid by type of technology.

The electricity from the combined cycle plant was modeled by adapting the “Electricity, high voltage {MX} | electricity production, natural gas, combined cycle power plant | Cut-off, U” dataset.

Type of technology	Total
Deep geothermal	1%
Hard coal	4%
Hydro, run-of-river	6%
Natural gas, combined cycle power plant	59%
Natural gas, conventional power plant	9%
Nuclear, boiling water reactor	3%
Wind, 1-3MW turbine, onshore	5%
Photovoltaic, 570kWp open ground installation, multi-Si	5%
Ethanol production from sweet sorghum	<0%
Oil	2%
Natural gas, burned in gas turbine, for compressor station	6%
TOTAL	100%

Table 8. Mexican electricity grid.

As part of the requirements of the PCR, the climate impact as kg CO₂ eq/kWh of the electricity used in the manufacturing process of commercial long steel hot-rolled, is reported in **Table 9**. This impact was calculated using the GWP-GHG indicator evaluated with IPCC GWP100 method.

Electricity	Participation rate %	Quantity	Total
Electricity, high voltage, 2023 {MX} market for electricity, high voltage Cut-off, U	51.55	0.463	0.239
Electricity, high voltage {MX} electricity production, natural gas, combined cycle power plant Cut-off, U Adapted Iberdrola (kg CO ₂ eq/kWh)	48.45	0.435	0.211
Total	100	0.439	0.450

Table 9. Electricity Global Warming Potential (kg CO₂ eq/kWh).

Global warming potential (GWP-GHG) of Scrap use

Another specific topic in accordance with the requirements of the PCR is the report of the Global warming potential of the scrap inputs per 1000 kg Hot rolled structural shapes; this impact was calculated using the GWP-GHG indicator and it is reported in **Table 10**

Impact Basic Category	Unit	Quantity
Global warming potential (GWP-GHG) of scrap use	kg CO ₂ eq.	7.84

Table 10. Scrap use, Global warming potential.

All information modules are reported separately. However, the total impact across all stages is also presented. Parameters describing environmental potential impacts were calculated using EN 15804+A2 Adapted version 1 (https://eplca.jrc.ec.europa.eu/permalink/EN_15804.zip) as implemented in SimaPro 9.6.0.1.

6. Results of the environmental performance indicators



Figure 3 and Table 11 show the potential impact for basic categories Module A1) Raw materials have the highest potential impact with percentages above 50% in 12 of the 13 basic impact categories evaluated. Module A3) Manufacturing is the second stage with the second highest contribution to the categories, with percentages above 15% in seven of the 13 basic impact categories evaluated. The lowest potential environmental contributions are generated in module A2) transport, six basic categories showed significant percentages between 6% and 20%, and one of 46%, which corresponds to the Depletion of the ozone layer.

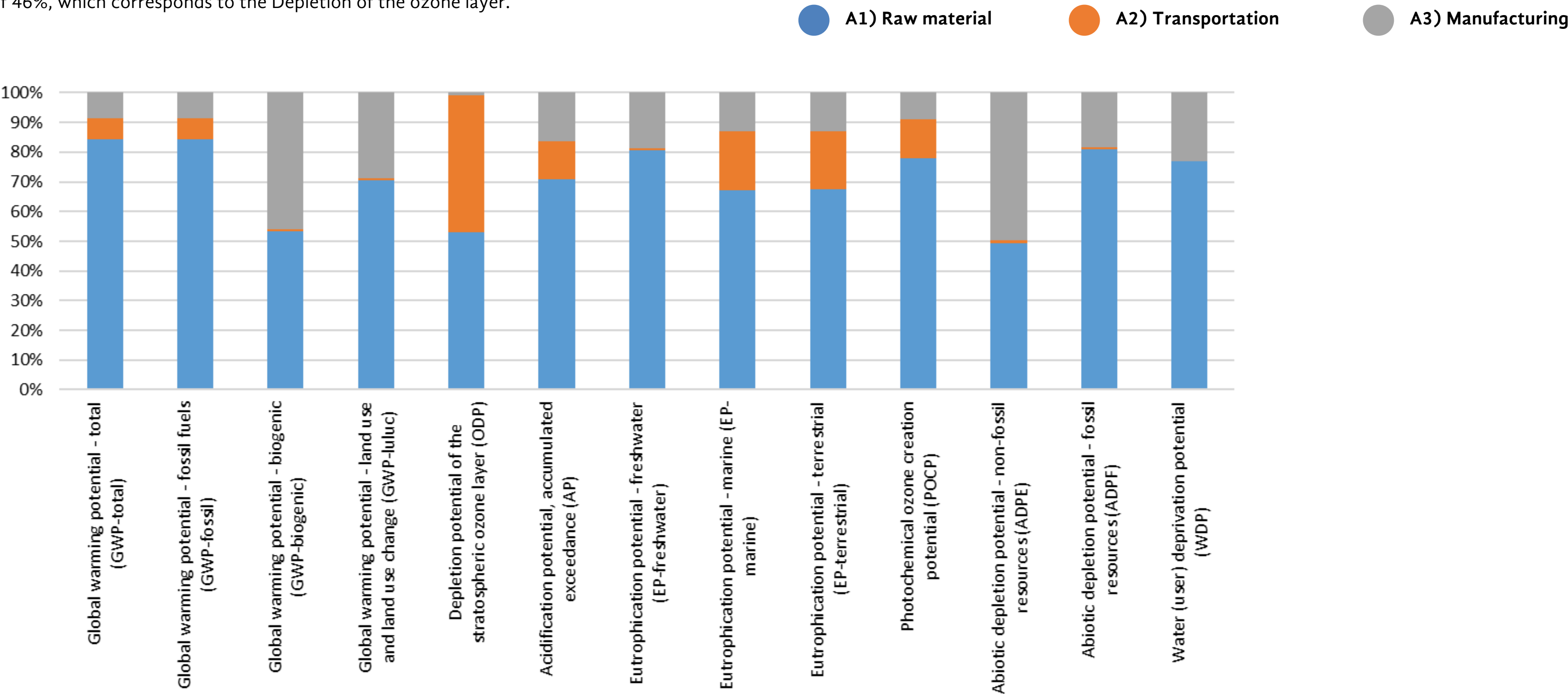


Figure. 3.A1-A3. Basic impact categories result Hot of rolled structural shapes.

6. Results of the environmental performance indicators



The results of C1-C4 and D modules are presented in **Table 12**.

Basic impact categories	Unit	A1) Raw materials	A2) Transportati on	A3) Manufacturi ng	Total
Global warming potential - total (GWP-total)	kg CO ₂ eq.	4.22E+02	3.48E+01	4.30E+01	5.00E+02
Global warming potential - fossil fuels (GWP-fossil)	kg CO ₂ eq.	4.22E+02	3.48E+01	4.29E+01	4.99E+02
Global warming potential - biogenic (GWP-biogenic)	kg CO ₂ eq.	1.01E-01	1.37E-03	8.78E-02	1.91E-01
Global warming potential - land use and land use change (GWP-luluc)	kg CO ₂ eq.	9.92E-02	9.39E-04	4.08E-02	1.41E-01
Depletion potential of the stratospheric ozone layer (ODP)	kg CFC ₁₁ eq.	1.37E-05	1.20E-05	2.55E-07	2.60E-05
Acidification potential, accumulated exceedance (AP)	mol H+ eq.	8.83E-01	1.59E-01	2.04E-01	1.25E+00
Eutrophication potential - freshwater (EP-freshwater)	kg P eq.	8.18E-03	6.19E-05	1.91E-03	1.01E-02
Eutrophication potential - marine (EP-marine)	kg N eq.	2.00E-01	5.86E-02	3.89E-02	2.98E-01
Eutrophication potential - terrestrial (EP-terrestrial)	mol N eq.	2.22E+00	6.44E-01	4.27E-01	3.29E+00
Photochemical ozone creation potential (POCP)	kg NMVOC eq.	1.20E+00	2.05E-01	1.38E-01	1.54E+00
Abiotic depletion potential - non-fossil resources (ADPE)*	kg Sb eq.	6.18E-05	1.52E-06	6.22E-05	1.26E-04
Abiotic depletion potential - fossil resources (ADPF)*	MJ, net calorific value	1.52E+03	8.81E+00	3.45E+02	1.88E+03
Water (user) deprivation potential (WDP)*	m ³ world eq. deprived	1.80E+02	3.24E-01	5.37E+01	2.34E+02

Table 11.A1-A3. Basic impact categories result of Hot rolled structural shapes.

*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.
The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks.

Disclaimer discouraging:The use of the results of modules A1-A3 without considering the results of module C.

Basic impact categories	Unit	C1) Deconstruction	C2) Waste transport	C3) Waste treatment	C4) Waste disposal	D) Benefits and charges beyond the system boundary
Global warming potential - total (GWP-total)	kg CO ₂ eq.	3.72E-01	1.99E+01	0.00E+00	5.43E-02	-1.03E+02
Global warming potential - fossil fuels (GWP-fossil)	kg CO ₂ eq.	3.72E-01	1.99E+01	0.00E+00	5.43E-02	-1.03E+02
Global warming potential - biogenic (GWP-biogenic)	kg CO ₂ eq.	1.60E-05	9.35E-04	0.00E+00	4.44E-06	-6.26E-03
Global warming potential - land use and land use change (GWP-luluc)	kg CO ₂ eq.	1.28E-05	6.40E-04	0.00E+00	2.22E-06	-1.08E-02
Depletion potential of the stratospheric ozone layer (ODP)	kg CFC ₁₁ eq.	5.85E-09	2.86E-07	0.00E+00	8.05E-10	-2.26E-07
Acidification potential, accumulated exceedance (AP)	mol H+ eq.	3.48E-03	7.22E-02	0.00E+00	4.93E-04	-3.24E-01
Eutrophication potential - freshwater (EP-freshwater)	kg P eq.	3.51E-07	4.76E-05	0.00E+00	1.95E-07	-3.40E-03
Eutrophication potential - marine (EP-marine)	kg N eq.	1.63E-03	2.94E-02	0.00E+00	2.24E-04	-6.56E-02
Eutrophication potential - terrestrial (EP-terrestrial)	mol N eq.	1.79E-02	3.22E-01	0.00E+00	2.46E-03	-7.67E-01
Photochemical ozone creation potential (POCP)	kg NMVOC eq.	5.33E-03	1.05E-01	0.00E+00	7.43E-04	-2.64E-01
Abiotic depletion potential - non-fossil resources (ADPE)*	kg Sb eq.	1.55E-08	1.16E-06	0.00E+00	2.15E-09	-1.50E-05
Abiotic depletion potential - fossil resources (ADPF)*	MJ, net calorific value	5.25E-02	6.84E+00	0.00E+00	3.14E-02	-8.27E+02
Water (user) deprivation potential (WDP)*	m ³ world eq. deprived	3.86E-03	2.39E-01	0.00E+00	6.32E-04	-6.29E+00

Table 12.Impact assessment of C1-C4 and D modules.

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.
The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks.

6. Results of the environmental performance indicators



6.1.1. Global Warming Potential (GWP-GHG)

Table 13 shows the result of commercial long steel hot-rolled life cycle (modules A1-A3 and additional scenarios C1-C4 and D) evaluated with the IPCC GWP100 method.

Impact category	Unit	A1-A3	C1) Deconstruction	C2) Waste transport	C3) Waste treatment	C4) Waste disposal	D) Benefits and charges beyond the system boundary
Global warming potential (GWP-GHG)	kg CO ₂ eq.	5.00E+02	3.72E-01	1.99E+01	0.00E+00	5.43E-02	-9.31E+01

¹This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO₂ is set to zero.

Table 13.Climate Impact (GWP-GHG) of Hot rolled structural shapes.

6.2 Use of resources

Parameters describing resource use were evaluated with the Cumulated Energy Demand method version 1.09 (Frischknecht et al. 2007) and adjusted with option B of Annex 3 of the PCR 2019:14 Construction products. Version 1.3.4, except for the indicator of use of net fresh water that was evaluated with Recipe 2016 Midpoint (H) version 1.00 (Huijbregts et al. 2017). The detailed description of the use of resources is provided in Table 10 for Steel Hot rolled structural shapes in Table 14.

Indicators describing resource use	Unit	A1-A3	C1) Deconstruction	C2) Waste transport	C3) Waste treatment	C4) Waste disposal	D) Benefits and charges beyond the system boundary
Use of renewable primary energy as energy carrier (PERE)	MJ, net calorific value	1.64E+02	1.10E-02	4.30E-01	3.72E+02	3.31E-03	-1.69E+02
Use of renewable primary energy resources used as raw materials (PERM)	MJ, net calorific value	3.79E+02	0.00E+00	0.00E+00	-3.72E+02	0.00E+00	0.00E+00
Total use of renewable primary energy (PERT)	MJ, net calorific value	5.43E+02	1.10E-02	4.30E-01	0.00E+00	3.31E-03	-1.69E+02
Use of non renewable primary energy as energy carrier (PENRE)	MJ, net calorific value	5.90E+02	5.48E-02	7.17E+00	1.34E+03	3.30E-02	-1.51E+04
Use of non renewable primary energy resources used as raw materials (PENRM)	MJ, net calorific value	1.37E+03	0.00E+00	0.00E+00	-1.34E+03	0.00E+00	0.00E+00
Total use of non renewable primary energy resource (PENRT)	MJ, net calorific value	1.96E+03	5.48E-02	7.17E+00	0.00E+00	3.30E-02	-1.51E+04
Use of secondary material (SM)	kg	8.68E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of renewable secondary fuels (RSF)	MJ, net calorific value	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of non-renewable secondary fuels (NRSF)	MJ, net calorific value	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Net use of fresh water (FW)	m ³	1.48E-01	1.53E-04	9.87E-03	0.00E+00	2.41E-05	-2.87E+00

Table 14.Use of resources parameters of 1000 kg of Hot rolled structural shapes.

6. Results of the environmental performance indicators



6.3 Waste indicators and output flows

Environmental indicators describing waste generation were calculated using EDIP 2003 method (Hauschild and Potting, 2005). Environmental parameters describing waste generation are provided in **Table 15**.

Impact category	Unit	A1-A3	C1) Deconstruction	C2) Waste transport	C3) Waste treatment	C4) Waste disposal	D) Benefits and charges beyond the system boundary
Hazardous waste disposed (HWD)**	kg	1.48E-01	3.36E-05	1.82E-03	0.00E+00	4.62E-06	-1.10E-02
Non-hazardous waste disposed (NHWD) **	kg	6.68E+00	1.43E-04	1.11E-02	0.00E+00	2.00E+01	-6.38E-01
Radioactive waste disposed (RWD) ***	kg	6.08E-03	2.50E-07	9.32E-06	0.00E+00	4.27E-08	-1.40E-04
Components for re-use (CRU)	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling (MFR)*	kg	1.14E-02	0.00E+00	0.00E+00	9.80E+02	0.00E+00	9.80E+02
Materials for energy recovery (MER)	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported electrical energy (EEE)	MJ, net calorific value	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported thermal energy (EET)	MJ, net calorific value	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table 15.Other indicators describing waste categories and output flows of Hot rolled structural shapes.

Environmental information describing waste categories and output flows is calculated using the EDIP 2003 method (Hauschild and Potting, 2005).
The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins, and/or risks.
*Direct indicators from Gerdau Corsa process data
**Indirect indicators are not related to Gerdau Corsa operations but to the generation during the processes of obtaining auxiliary inputs.
***No radioactive waste is produced during Gerdau Corsa operation.

7. Additional environmental information



Environment

Gerdau Corsa seeks to balance our economic, environmental, and social commitments. Each day, our team members make steel products almost entirely composed of recycled content. That's one way in which we reduce our environmental footprint.

Recycling

Steel is an endlessly recyclable material. Each year, Gerdau Corsa transforms about 1 million tons of recycled scrap into steel products. Most of the scrap comes from discarded materials. Producing steel from scrap metal reduces the amount of material deposited in landfills. The use of steel scrap as a raw material reduces energy consumption in our production process and minimizes emissions of CO₂.

8. Version history

The previous version of this EPD named Hot rolled structural shapes manufactured from steel scrap was published on July 27, 2020, in accordance with PCR 2012:01 Construction products and construction services, Version 2.3 (2018-11-15).

This EPD was updated following EN 15804:2012+A2:2019/AC:2021 standard and Construction products PCR 2019:2014 V 1.3.4.

9. Contact information

10. References

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- ALACERO. (2022). asociación Latinoamericana del Acero (ALACERO) El acero es el único material que puede ser reciclado ilimitadamente al 100%. Obtained from <https://www.alacero.org/noticias/el-acero-es-el-unico-material-que-puede-ser-reciclado-ilimitadamente-al-100>.
- BIEE. (2023). Base de Indicadores de Eficiencia Energética de México. Obtained from <https://www.biee-conuee.net/site/index.php>
- European Committee for Standardization. (2019). Sustainability of construction works — Environmental product declarations — Core rules for the product category of construction products (EN 15804:2012+A2:2019). CEN
- Frischknecht Rolf. (2007). Implementation of Life Cycle Impact Assessment Methods. Ecoinvent report No. 3.
- Huijbregts, M. A., Steinmann, Z. J., Elshout, P. M., Stam, G., Verones, F., Vieira, M. D., . . . van Zelm, R. (2017). ReCiPe 2016 v1.1. A harmonized life cycle impact assessment method at midpoint and endpoint level Report I: Characterization. Bilthoven, The Netherlands: National Institute for Public Health and the Environment.
- IMNC. (2008). NMX-SAA-14040-IMNC Gestión ambiental - Análisis de ciclo de vida - Principios y marco de referencia. México, D.F.: IMNC.
- ISO 14020. (2000). Environmental Labels and Declarations — General Principles
- ISO 14025. (2006). Type III Environmental Declarations.
- ISO 14044. (2006). Environmental management - Life cycle assessment - Requirements and guidelines. Suiza: International Organization for Standardization.
- PCR 2019:14 Construction Products V 1.3.4. (30 de 04 de 2024). EPD System. Obtained from <https://www.environdec.com/>
- PRé Consultants. (2010). Data base manual. Methods library. Retrieved abril 20, 2010, from <http://www.pre.nl/download/manuals/DatabaseManualMethods.pdf>
- PRé Sustainability. (2021). SimaPro database manual. Methods library.
- The International EPD System. (2024). General Programme Instructions for The International EPD System. Version 5.0.0 Published on 2024-06-19.
- Zaragoza, D., & Dominguez, E. (2025). Life Cycle Assessment of Hot rolled structural shapes manufactured from scrap by Gerdau Corsá. Center for Life Cycle Assessment and Sustainable Design – CADIS.