Environmental Product Declaration

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

Austenitic Cold Rolled Annealed Pickled Sheets and Coils

From

Jindal Stainless Limited

Programme:	The International EPD® System, www.environdec.com
Programme operator:	EPD International AB
Licensee	EPD India
Type of EPD:	EPD of multiple products from a company
EPD registration number:	EPD-IES-0007804:001
Version date:	2025-11-12
Validity date:	2030-11-11

An EPD may be updated or depublished if conditions change. To find the latest version of the EPD and to confirm its validity, see www.environdec.com

*EPD of multiple products, based on the average results of the product group (refer to page number 4 for product grades included).

General information

Programme information

Programme:	The International EPD® System	Licensee: EPD India
Address:	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden	EPD India, a licensee of the International EPD® System 422, Midas, Sahar Plaza Mumbai, India-400059
Website:	www.environdec.com	www.environdecindia.com
E-mail:	support@environdec.com	info@environdecindia.com

Product Category Rules (PCR)
CEN standard EN 15804 serves as the Core Product Category Rules (PCR)
Product Category Rules (PCR): PCR 2019:14 Construction products, version 2.0.1 Published on 2025.06.05. Based on CEN standard EN 15804. CEN standard EN 15804 serve as the core PCR. UN CPC code 412.
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.

Third-party Verification
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via: ☒ **Individual EPD verification without a pre-verified LCA/EPD tool** Third-party verifier: Dr. Nasser Ayoub, Helwan University Email: nassermayoub@gmail.com Approved by: 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 published in different EPD programmes, may not be comparable. For two EPDs to be comparable, they shall be based on the same PCR (including the same first-digit 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 identical scope in terms of included life-cycle stages (unless the excluded life-cycle stage is demonstrated to be insignificant); apply identical impact assessment methods (including the same version of characterisation factors); and be valid at the time of comparison.
For further information about comparability, see EN 15804 and ISO 14025.

Information about EPD Owner

Owner of the EPD: Jindal Stainless Limited

Address: Jindal Stainless Limited, KNIC, Danagadi, Jajpur, Odisha, India – 755026

Contact: Mr Kalyan Bhattacherjee, Chief Sustainability Officer (CSO)

Email: esg_jajpur@jindalstainless.com

Address and contact information of the LCA practitioner commissioned by the EPD owner:

Dr. Rajesh Kumar Singh, VP Consulting, Sphera Solutions

707 Meadows, Sahar Plaza, Chakala (J.B. Nagar), Andheri East, Mumbai, Maharashtra, India – 400059

Description of the organisation:

Founded in 1970, Jindal Stainless Limited (JSL) is India's largest stainless steel manufacturer and a prominent global player, renowned for its technological expertise and vertically integrated operations. With a total melt capacity of 2.9 million tonnes per annum, JSL caters to diverse sectors including automotive, infrastructure, railways, kitchenware, and industrial processing.

The Jajpur facility is a fully integrated stainless-steel complex, encompassing ferrochrome production, steel melting shop, captive power generation, and robust hot & cold rolling capabilities. JSL's diverse product portfolio spans ferritic, austenitic, martensitic, duplex, and chrome-manganese grades, meeting international standards (AISI, ASTM, EN, JIS, and IS) and tailored customer requirements. Its proprietary brand, Kromel 6+, exemplifies innovation in cookware-grade stainless steel.

JSL places strong emphasis on ESG principles, embedding environmental stewardship, social responsibility, and ethical governance into its core business strategy. The company is actively working to reduce its carbon footprint through the adoption of energy-efficient technologies, increased reliance on renewable energy, and circular economy practices. On the social front, JSL's CSR programs support education, healthcare, skill development, and community development across its operational regions, reaffirming its commitment to inclusive and sustainable growth. In terms of governance, JSL upholds the highest standards of transparency, compliance, and ethical conduct. The company has implemented a comprehensive governance framework supported by over 30 policies covering areas such as anti-corruption, human rights, responsible sourcing, whistleblower protection, board diversity, cyber security, and stakeholder engagement. To explore more about Jindal Stainless Limited's ESG journey and governance practices, visit https://www.jindalstainless.com/stainless-steel-esg/

Product-related or management system-related certifications: Jindal Stainless Ltd. holds a comprehensive portfolio of both product-related and management system-related certifications.

Management System Certifications include ISO 9001:2015 (Quality), ISO 14001:2015 (Environment), ISO 45001:2018 (Occupational Health & Safety), ISO 50001:2018 (Energy), ISO/IEC 17025:2017 (Laboratory), IATF 16949:2016 (Automotive Quality), AS9100D (Aerospace Quality), and ISO/TS 22163:2017 (Rail Industry).

Product-related certifications and compliances include NORSOK M-650, REACH, RoHS, AD 2000-Merkblatt WO, various Indian Standards (IS 5522, IS 69, IS 15997, IS 9294, IS 9516, IS 3502), and Japanese Industrial Standards (JIS G 4304, JIS G 4305, JIS G 4312), covering a wide range of stainless steel grades and applications.

Product information

Product name: Austenitic Cold Rolled Annealed Pickled (CRAP) Sheets and Coils.

Product identification: Stainless Steel Grades (301/L/LN, 304/L, 316/L, 316Ti, 321, 310S, 201/L/LN, 204Cu (N2), J4 (N1), JSLU DD (N1), JSLU SD-M (N7), JT (N7))

UN CPC code: 412.

Product description:

Jindal Stainless Limited (JSL) manufactures a comprehensive range of Austenitic stainless steel grades in Cold Rolled Annealed and Pickled (CRAP) condition, developed through the further processing of Hot Rolled Annealed and Pickled (HRAP) material. In this process, HRAP coils are cold rolled to achieve reduced thickness and improved surface finish, followed by annealing and pickling to restore ductility and remove surface oxides. The resulting CRAP material offers enhanced dimensional accuracy, superior surface quality, and improved mechanical properties, making it suitable for precision applications. Grades manufactured in CRAP condition include 301, 301L, 301LN, 304, 304L, 316, 316L, 316Ti, 321, and 310S, which are used across sectors such as automotive, architecture, and chemical processing. In addition, JSL offers cost-effective and proprietary grades such as 201, 201L, 201LN, 204Cu (N2), J4 (N1), JSLU DD (N1), JSLU SD-M (N7), and JT (N7), tailored for applications including kitchenware, automotive trim.

The technical details of the product are given below:

Mechanical Properties	Yield Strength (MPa)	>170
	Elongation (%)	>30
Technical Information	Modulus of Elasticity (GPa)	195
	Density (Kg/m^3)	7990
Dimensions	Thickness (mm)	0.26-5
	Width (mm)	1600

Manufacturing process: Jindal Stainless Limited has stainless steel manufacturing plant at Jajpur, in Odisha. The plant has Steel Melting Shop (consists of EAF, AOD, LRF, CCS, GRINDER), Hot Strip Mill (HSM), Hot Annealing and Pickling Line (HAPL)/COMBO, Cold Annealing and Pickling Line (CAPL),

Hot Pickling Line (HPL), Z-mill and Finishing Line (Sliter/CTL). The output from Finishing line is CRAP Sheets and Coils respectively.

Product Application: The product caters to a broad range of industrial, commercial and infrastructure applications, including the use in consumer goods, kitchenware, automotive trim, chemical processing.

Name and location of production site(s):

Jindal Stainless Limited, Jajpur
KNIC, Danagadi, Jajpur
Odisha, India – 755026.

Content Declaration

The mass (weight) of one unit of a product, as purchased or per declared unit: 1 tonne.

The average material properties of Austenitic stainless steel of various are given below:

Typical material properties of Austenitic stainless steel

Product Components	Mass (%)	Post-consumer material, mass-% of product	Biogenic material, mass% and kg C/kg
Carbon	0.004 - 0.15 %	-	0
Chromium	10 – 26 %	-	0
Nickel	0.01 - 22.0 %	-	0
Molybdenum	0.01 - 4.00 %	-	0
Nitrogen	0.005 - 0.250 %	-	0
Scrap	Rest	55.8%	0
Total (Stainless Steel)	100%	-	-

Products do not contain any substances that can be included in “Candidate List of Substances of Very High Concern for Authorization” and raw materials used are not part of the EU REACH regulation.

LCA information

Declared unit: 1 tonne of Austenitic CRAP Sheets and Coils.

Time representativeness: The collection of foreground data refers to January 2024 - December 2024.

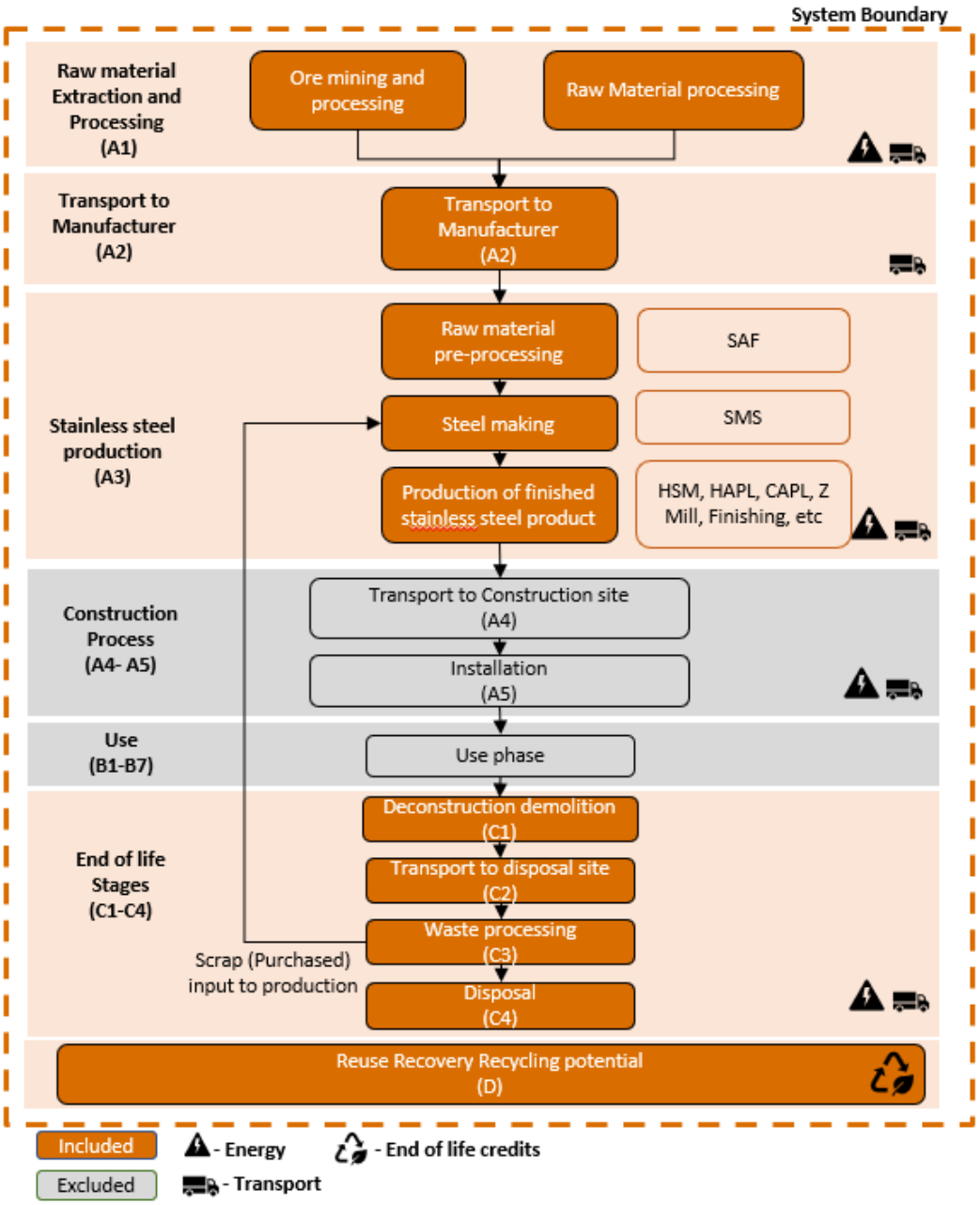
Geographical scope: The product is manufactured in India whereas the EoL of the product is global.

Database(s) and LCA software used: The background data has been taken from the latest available Sphera Managed LCA Content 2025.1 and the LCA model was created using Sphera's LCA for Experts (LCA FE) software, version 10.9.

Description of system boundaries: The system boundary includes cradle-to-gate with modules C1-C4 and module D (life cycle stages A1-A3, C1-C4 and D).

Reference package used: EN 15804 reference package based on EF 3.1.

System diagram:



***Module A1 to A3*:** The product stage includes the provision of all materials, energy i.e. extraction, processing, transportation and production of the product, as well as waste processing up to the end waste stage or disposal of final residues during the product stage. The electricity for the manufacturing process (Module A3) has been sourced from coal-based captive power plant, India's electricity grid, solar photovoltaics and Indian Energy Exchange. The composition considered in India's electricity grid mix is hard coal – 59.24%, lignite - 12.13%, hydro – 10.49%, natural gas - 4.29%, wind – 4.40%, solar photovaltaics – 4.00%, etc. The emission factor of the electricity mix for the GWP-GHG indicator is 1.03 kg CO2eq./kWh.

Module C1 to C4: Within this EPD, the modules C1-C4 are included. These modules consider the dismantling of the considered product (C1), the transportation of the dismantled components to their End of Life (EoL) destination (C2), the waste processing for recovery or recycling (C3) as well as the disposal (C4). At EoL, the stainless steel material leaves the product system in C3 for recycling in Module D. The considered EoL scenario for the stainless steel material is 95% recycling and 5% landfill.

Category	Subcategory	Unit	Quantity
Collection process	Collected separately	kg	1000
	Collected with mixed construction waste	kg	0
Recovery	Reuse	kg	0
	Recycling	kg	950
	Landfill	kg	0
	Incineration	kg	0
	Incineration with energy recovery	kg	0
	Energy conversion efficiency rate	kg	0
Disposal	Material for final disposal	kg	50
Transport	Deconstruction site to scrap processing plant	km	0
	Scrap processing plant to site for end of waste	km	100

Other specific module details are considered according to the default data for modelling EoL stages provided in PCR 2019:14 Construction products, version 2.0.1 as given below:

Module	Process	Quantity	Energy carrier
C1	Demolition/deconstruction of steel	1.1 kWh/tonne	Diesel
C2	Transport (for products/materials not to be incinerated)	~80 km	16-32 tonne lorry (Euro 5)
C3	Loading and unloading at sorting facility	1.8 kWh/tonne	Diesel
	Mechanical sorting	2.2 kWh/tonne	Electricity
	Fragging of steel	7.4 kWh/tonne	Diesel

**Transport to landfill site (Module C2) is considered 80 km*

***Module D*:** Module D includes all the declared benefits and loads from net flows leaving the product system that has not been allocated as co-products and that has passed the end-of-waste state in the form of reuse, recovery and/or recycling potentials. Net scrap approach has been applied and the benefit from metal recycling has been accounted in the module D.

In the EoL net scrap approach (Amount of steel recycled at EoL – Scrap input from previous product life cycles) has been used.

Module A4 was not considered due to the global distribution of products to diverse customers, resulting in highly variable transportation distances. Similarly, Module A5 and Module B were excluded because the products are intermediate goods used across multiple sectors in a wide range of applications, hence there is no direct use case.

Cut-off criteria:

The environmental impact of the product studied has been assessed by considering all significant processes, materials, and emissions. Excluded flows are assumed to have a negligible impact, contributing less than 5% to the cumulative impact assessment categories. The production of capital equipment, facilities, and infrastructure required for manufacture has not been considered. The product is transported in bulk, therefore contribution of packaging to the total impacts were found negligible (contributing less than 5% to the cumulative impact assessment categories) and hence excluded from the study.

Data quality and sources:

Data quality is compliant with ISO 14025:2006. All primary data were collected for January 2024 - December 2024. All background data come from the Sphera Managed LCA Content 2025.1 database.

Allocation: With any multi-product system, allocation rules are defined to relate the system inputs and outputs to each of the products. Several methods are documented in ISO 14040:2006 and ISO Technical Report 14049. No allocation has been applied in the current study.

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

	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 declared	X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
Geography	GLO		IND	-	-	-	-	-	-	-	-	-	GLO				GLO
Specific data used	38.14%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	<10%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	0%			-	-	-	-	-	-	-	-	-	-	-	-	-	-

(X- declared modules and ND- Module not declared).

Data quality assessment:

Description of data quality assessment and reference years	The EPD covers Austenitic CRAP Sheets and Coils product from Jajpur, India and provided data for the period January 2024 - December 2024. Background data was sourced from the Sphera Managed LCA Content 2025.1 using Sphera's LCA for Experts (LCA FE) software, version 10.9. No fair, poor or very poor data was found during the assessment of relevant data using EN15804:2012+A2:2019, Annex E, only E.2.

Data quality assessment					
Process	**Source type**	**Source**	**Reference year**	**Data category**	**Share of primary data, of GWP-GHG results for A1-A3**
Manufacturing of Product	Collected data	EPD owner	2024	Primary data	15.19%
Generation of electricity used in manufacturing	Collected data	EPD owner	2024	Primary data	17.00%
Transport of raw materials to the manufacturing site	Database	Sphera MLC 2025.1	2021	Primary data	4.52%
Production of Ferrochrome High Carbon	EPD	EPD-IES-0006068	2024	Primary data (92.82%)	1.43%
Other processes	Database	Sphera MLC 2025.1	2021	Secondary data	0.0%
Total share of primary data, of GWP-GHG results for A1-A3					38.14%

Note: The share of primary data is calculated based on GWP-GHG results. It is a simplified indicator for data quality that does not capture all relevant aspects of data quality. The indicator is not comparable across product categories.

Results of the environmental performance indicators

The environmental performance of the functional unit of 1 tonne of Austenitic CRAP Sheets and Coils reported below using the parameters and units as specified in PCR 2019:14 v2.0.1.

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. The scenarios included are currently in use and are representative of one of the most probable alternatives.

Mandatory impact category indicators according to EN 15804+A2:2019

Results per 1 tonne Austenitic CRAP Sheets and Coils							
Impact indicators	Unit	A1-A3	C1	C2	C3	C4	D
GWP-total	kg CO_2 eq.	5.23E+03	4.12E-01	7.46E+00	4.15E+00	7.67E-01	-2.94E+03
GWP-fossil	kg CO_2 eq.	5.19E+03	4.12E-01	7.45E+00	4.14E+00	7.64E-01	-2.93E+03
GWP-biogenic	kg CO_2 eq.	3.96E+01	2.27E-04	4.19E-03	9.04E-03	0.00E+00	-1.15E+01
GWP-luluc	kg CO_2 eq.	5.59E+00	2.18E-04	1.66E-04	4.12E-03	3.13E-03	-5.49E+00
ODP	kg CFC -11 eq.	2.82E-05	9.73E-14	4.25E-13	1.66E-11	2.13E-12	-1.93E-08
AP	Mole of H^+ eq.	3.86E+01	3.82E-03	9.40E-03	3.35E-02	5.40E-03	-1.50E+01
EP- freshwater	kg P eq.	2.05E-01	7.46E-07	1.14E-06	7.73E-06	1.14E-06	-1.41E-03
EP- marine	kg N eq.	5.89E+00	1.97E-03	3.39E-03	1.68E-02	1.41E-03	-2.01E+00
EP- terrestrial	Mole of N eq.	6.38E+01	2.14E-02	3.82E-02	1.83E-01	1.54E-02	-2.24E+01
POCP	kg NMVOC eq.	1.82E+01	5.30E-03	9.56E-03	4.52E-02	4.23E-03	-6.23E+00
ADPE*	kg Sb eq.	1.35E-01	6.34E-08	1.59E-07	6.75E-07	4.73E-08	-8.03E-02
ADPF*	MJ	5.61E+04	5.30E+00	9.70E+01	5.85E+01	1.00E+01	-3.49E+04
WDP*	m^3 world equiv.	5.77E+02	5.81E-03	9.74E-03	2.23E-01	8.26E-02	-2.56E+02
Acronyms	**Caption:** GWP - total = global warming potential; GWP - fossil = global warming potential (fossil fuel only); GWP - biogenic = global warming potential (biogenic); GWP - luluc = global warming potential (land use only); ODP = ozone depletion; AP = acidification terrestrial and freshwater; EP freshwater = eutrophication potential (freshwater); EP - marine = eutrophication potential (marine); EP- terrestric = eutrophication potential (terrestrial); POCP = photochemical ozone formation; ADPE = abiotic depletion potential (element); ADPF = abiotic depletion potential (fossil); WDP = water scarcity.						

** Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced 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.

The results of the end-of-life stage (modules C1-C4) should be considered when using the results of the product stage (modules A1-A3).

Additional mandatory and voluntary impact category indicators

Results per 1 tonne Austenitic CRAP Sheets and Coils							
Indicator	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-GHG[1]	kg CO_2 eq.	5.18E+03	4.10E-01	7.41E+00	4.13E+00	7.62E-01	-2.92E+03
Acronyms	GWP-GHG*= global warming potential (greenhouse gases) This indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide emissions and uptake and biogenic carbon stored in the product with characterization factors (CFs) based on IPCC (2013)						

Resource use indicators according to EN 15804+A2:2019

Results per 1 tonne Austenitic CRAP Sheets and Coils							
Impact indicators	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	MJ	6.74E+03	2.21E-01	1.55E-01	1.15E+01	1.93E+00	-2.56E+02
PERM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ	6.74E+03	2.21E-01	1.55E-01	1.15E+01	1.93E+00	-2.56E+02
PENRE	MJ	5.61E+04	5.30E+00	9.70E+01	5.85E+01	1.00E+01	-3.49E+04
PENRM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	MJ	5.61E+04	5.30E+00	9.70E+01	5.85E+01	1.00E+01	-3.49E+04
SM	kg	4.95E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
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	1.69E+01	2.38E-04	2.86E-04	9.52E-03	2.42E-03	-6.77E+00
Acronyms	**Caption:** PERE = Use of renewable primary energy excluding the renewable primary energy resource used as raw materials; PERM = Use of renewable primary energy as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding the non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy used as raw materials; PENRT = Total use of non-renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water						

[1] This 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 CO_2 is set to zero.

Output flows & Waste Indicators according to EN 15804+A2:2019

Results per 1 tonne Austenitic CRAP Sheets and Coils							
Impact indicators	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
HWD	kg	8.13E-06	8.79E-10	2.21E-09	2.59E-08	2.19E-09	-3.21E-06
NHWD	kg	5.01E+02	5.43E-04	1.56E-03	1.55E-02	5.00E+01	-2.31E+02
RWD	kg	3.12E-01	1.82E-05	2.13E-05	2.39E-03	1.06E-04	-1.57E-01
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MER	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EEE	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EET	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acronyms	**Caption:** HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU: Components for re-use, MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy						

Additional environmental performance indicators according to EN 15084+A2: 2019

Results per 1 tonne Austenitic CRAP Sheets and Coils							
Impact indicators	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
PM	Disease incidences	7.59E-04	3.18E-08	9.98E-08	2.79E-07	6.73E-08	-2.68E-04
IR	kBq U235 eq.	6.26E+01	1.53E-03	1.85E-03	3.82E-01	1.18E-02	-2.61E+01
ETF	CTU_e	2.51E+04	3.83E+00	4.21E+01	3.44E+01	8.64E+00	-1.42E+04
HTP-c	CTU_h	3.09E-06	7.15E-11	6.45E-10	8.24E-10	1.33E-10	-1.24E-06
HTP-nc	CTU_h	4.43E-05	1.94E-09	1.09E-08	2.10E-08	4.99E-09	-9.73E-06
SQP	Pt	1.00E+04	7.86E-01	1.01E-01	1.23E+01	2.47E+00	-4.42E+03
Acronyms	**Caption:** PM = Particulate matter emissions; IR = Ionising radiation, human health; ETF= Eco-toxicity (freshwater); HTP-c = Human toxicity, cancer effects; HTP-nc = Human toxicity, non-cancer effects; SQP = Soil quality potential/Land use related impact.						

Additional LCA results based on 100% Recycling scenario in EoL for the product:

Mandatory impact category indicators according to EN 15804+A2:2019

Results per 1 tonne Austenitic CRAP Sheets and Coils							
Impact indicators	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-total	kg CO_2 eq.	5.23E+03	4.12E-01	7.46E+00	4.15E+00	0.00E+00	-3.27E+03
GWP-fossil	kg CO_2 eq.	5.19E+03	4.12E-01	7.45E+00	4.14E+00	0.00E+00	-3.25E+03
GWP-biogenic	kg CO_2 eq.	3.96E+01	2.27E-04	4.19E-03	9.04E-03	0.00E+00	-1.28E+01
GWP-luluc	kg CO_2 eq.	5.59E+00	2.18E-04	1.66E-04	4.12E-03	0.00E+00	-6.09E+00
ODP	kg CFC -11 eq.	2.82E-05	9.73E-14	4.25E-13	1.66E-11	0.00E+00	-2.14E-08
AP	Mole of H^+ eq.	3.86E+01	3.82E-03	9.40E-03	3.35E-02	0.00E+00	-1.67E+01
EP- freshwater	kg P eq.	2.05E-01	7.46E-07	1.14E-06	7.73E-06	0.00E+00	-1.56E-03
EP- marine	kg N eq.	5.89E+00	1.97E-03	3.39E-03	1.68E-02	0.00E+00	-2.23E+00
EP- terrestrial	Mole of N eq.	6.38E+01	2.14E-02	3.82E-02	1.83E-01	0.00E+00	-2.48E+01
POCP	kg NMVOC eq.	1.82E+01	5.30E-03	9.56E-03	4.52E-02	0.00E+00	-6.92E+00
ADPE*	kg Sb eq.	1.35E-01	6.34E-08	1.59E-07	6.75E-07	0.00E+00	-8.91E-02
ADPF*	MJ	5.61E+04	5.30E+00	9.70E+01	5.85E+01	0.00E+00	-3.87E+04
WDP*	m^3 world equiv.	5.77E+02	5.81E-03	9.74E-03	2.23E-01	0.00E+00	-2.84E+02
Acronyms	**Caption:** GWP - total = global warming potential; GWP - fossil = global warming potential (fossil fuel only); GWP - biogenic = global warming potential (biogenic); GWP - luluc = global warming potential (land use only); ODP = ozone depletion; AP = acidification terrestrial and freshwater; EP freshwater = eutrophication potential (freshwater); EP - marine = eutrophication potential (marine); EP- terrestric = eutrophication potential (terrestrial); POCP = photochemical ozone formation; ADPE = abiotic depletion potential (element); ADPF = abiotic depletion potential (fossil); WDP = water scarcity.						

** Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced 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.

The results of the end-of-life stage (modules C1-C4) should be considered when using the results of the product stage (modules A1-A3).

Additional mandatory and voluntary impact category indicators

Results per 1 tonne Austenitic CRAP Sheets and Coils							
Indicator	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-GHG[2]	kg CO_2 eq.	5.18E+03	4.10E-01	7.41E+00	4.13E+00	0.00E+00	-3.25E+03
Acronyms	GWP-GHG*= global warming potential (greenhouse gases) This indicator includes all greenhouse gases included in GWP-total vbut excludes biogenic carbon dioxide emissions and uptake and biogenic carbon stored in the product with characterization factors (CFs) based on IPCC (2013)						

[2] This 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.

Resource use indicators according to EN 15804+A2:2019

Results per 1 tonne Austenitic CRAP Sheets and Coils							
Impact indicators	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	MJ	6.74E+03	2.21E-01	1.55E-01	1.15E+01	0.00E+00	-2.84E+02
PERM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ	6.74E+03	2.21E-01	1.55E-01	1.15E+01	0.00E+00	-2.84E+02
PENRE	MJ	5.61E+04	5.30E+00	9.70E+01	5.85E+01	0.00E+00	-3.87E+04
PENRM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	MJ	5.61E+04	5.30E+00	9.70E+01	5.85E+01	0.00E+00	-3.87E+04
SM	kg	4.95E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
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	1.69E+01	2.38E-04	2.86E-04	9.52E-03	0.00E+00	-7.52E+00
Acronyms	**Caption:** PERE = Use of renewable primary energy excluding the renewable primary energy resource used as raw materials; PERM = Use of renewable primary energy as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding the non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy used as raw materials; PENRT = Total use of non-renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water						

Output flows & Waste Indicators according to EN 15804+A2:2019

Results per 1 tonne Austenitic CRAP Sheets and Coils							
Impact indicators	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
HWD	kg	8.13E-06	8.79E-10	2.21E-09	2.59E-08	0.00E+00	-3.56E-06
NHWD	kg	5.01E+02	5.43E-04	1.56E-03	1.55E-02	0.00E+00	-2.56E+02
RWD	kg	3.12E-01	1.82E-05	2.13E-05	2.39E-03	0.00E+00	-1.75E-01
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MER	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EEE	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EET	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acronyms	**Caption:** HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU: Components for re-use, MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy						

Additional environmental performance indicators according to EN 15084+A2:2019

Results per 1 tonne Austenitic CRAP Sheets and Coils							
Impact indicators	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
PM	Disease incidences	7.59E-04	3.18E-08	9.98E-08	2.79E-07	0.00E+00	-2.98E-04
IR	kBq U235 eq.	6.26E+01	1.53E-03	1.85E-03	3.82E-01	0.00E+00	-2.89E+01
ETF	CTU_e	2.51E+04	3.83E+00	4.21E+01	3.44E+01	0.00E+00	-1.58E+04
HTP-c	CTU_h	3.09E-06	7.15E-11	6.45E-10	8.24E-10	0.00E+00	-1.37E-06
HTP-nc	CTU_h	4.43E-05	1.94E-09	1.09E-08	2.10E-08	0.00E+00	-1.08E-05
SQP	Pt	1.00E+04	7.86E-01	1.01E-01	1.23E+01	0.00E+00	-4.90E+03
Acronyms	**Caption:** PM = Particulate matter emissions; IR = Ionising radiation, human health; ETF= Eco-toxicity (freshwater); HTP-c = Human toxicity, cancer effects; HTP-nc = Human toxicity, non-cancer effects; SQP = Soil quality potential/Land use related impact.						

Additional LCA results based on 100% Landfill scenario in EoL for the product:

Mandatory impact category indicators according to EN 15804+A2:2019

Results per 1 tonne Austenitic CRAP Sheets and Coils							
Impact indicators	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-total	kg CO_2 eq.	5.23E+03	4.12E-01	7.46E+00	4.15E+00	1.53E+01	0.00E+00
GWP-fossil	kg CO_2 eq.	5.19E+03	4.12E-01	7.45E+00	4.14E+00	1.53E+01	0.00E+00
GWP-biogenic	kg CO_2 eq.	3.96E+01	2.27E-04	4.19E-03	9.04E-03	0.00E+00	0.00E+00
GWP-luluc	kg CO_2 eq.	5.59E+00	2.18E-04	1.66E-04	4.12E-03	6.27E-02	0.00E+00
ODP	kg CFC -11 eq.	2.82E-05	9.73E-14	4.25E-13	1.66E-11	4.25E-11	0.00E+00
AP	Mole of H^+ eq.	3.86E+01	3.82E-03	9.40E-03	3.35E-02	1.08E-01	0.00E+00
EP- freshwater	kg P eq.	2.05E-01	7.46E-07	1.14E-06	7.73E-06	2.27E-05	0.00E+00
EP- marine	kg N eq.	5.89E+00	1.97E-03	3.39E-03	1.68E-02	2.83E-02	0.00E+00
EP- terrestrial	Mole of N eq.	6.38E+01	2.14E-02	3.82E-02	1.83E-01	3.08E-01	0.00E+00
POCP	kg NMVOC eq.	1.82E+01	5.30E-03	9.56E-03	4.52E-02	8.46E-02	0.00E+00
ADPE*	kg Sb eq.	1.35E-01	6.34E-08	1.59E-07	6.75E-07	9.46E-07	0.00E+00
ADPF*	MJ	5.61E+04	5.30E+00	9.70E+01	5.85E+01	2.00E+02	0.00E+00
WDP*	m^3 world equiv.	5.77E+02	5.81E-03	9.74E-03	2.23E-01	1.65E+00	0.00E+00
Acronyms	**Caption:** GWP - total = global warming potential; GWP - fossil = global warming potential (fossil fuel only); GWP - biogenic = global warming potential (biogenic); GWP - luluc = global warming potential (land use only); ODP = ozone depletion; AP = acidification terrestrial and freshwater; EP freshwater = eutrophication potential (freshwater); EP - marine = eutrophication potential (marine); EP- terrestric = eutrophication potential (terrestrial); POCP = photochemical ozone formation; ADPE = abiotic depletion potential (element); ADPF = abiotic depletion potential (fossil); WDP = water scarcity.						

** Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced 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.

The results of the end-of-life stage (modules C1-C4) should be considered when using the results of the product stage (modules A1-A3).

Additional mandatory and voluntary impact category indicators

Results per 1 tonne Austenitic CRAP Sheets and Coils							
Indicator	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-GHG[3]	kg CO_2 eq.	5.18E+03	4.10E-01	7.41E+00	4.13E+00	1.52E+01	0.00E+00
Acronyms	GWP-GHG*= global warming potential (greenhouse gases) This indicator includes all greenhouse gases included in GWP-total vbut excludes biogenic carbon dioxide emissions and uptake and biogenic carbon stored in the product with characterization factors (CFs) based on IPCC (2013)						

[3] This 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.

Resource use indicators according to EN 15804+A2:2019

Results per 1 tonne Austenitic CRAP Sheets and Coils							
Impact indicators	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	MJ	6.74E+03	2.21E-01	1.55E-01	1.15E+01	3.87E+01	0.00E+00
PERM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ	6.74E+03	2.21E-01	1.55E-01	1.15E+01	3.87E+01	0.00E+00
PENRE	MJ	5.61E+04	5.30E+00	9.70E+01	5.85E+01	2.00E+02	0.00E+00
PENRM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	MJ	5.61E+04	5.30E+00	9.70E+01	5.85E+01	2.00E+02	0.00E+00
SM	kg	4.95E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
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	1.69E+01	2.38E-04	2.86E-04	9.52E-03	4.84E-02	0.00E+00
Acronyms	**Caption:** PERE = Use of renewable primary energy excluding the renewable primary energy resource used as raw materials; PERM = Use of renewable primary energy as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding the non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy used as raw materials; PENRT = Total use of non-renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water						

Output flows & Waste Indicators according to EN 15804+A2:2019

Results per 1 tonne Austenitic CRAP Sheets and Coils							
Impact indicators	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
HWD	kg	8.13E-06	8.79E-10	2.21E-09	2.59E-08	4.38E-08	0.00E+00
NHWD	kg	5.01E+02	5.43E-04	1.56E-03	1.55E-02	1.00E+03	0.00E+00
RWD	kg	3.12E-01	1.82E-05	2.13E-05	2.39E-03	2.12E-03	0.00E+00
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MER	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EEE	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EET	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acronyms	**Caption:** HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU: Components for re-use, MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy						

Additional environmental performance indicators according to EN 15084+A2:2019

Results per 1 tonne Austenitic CRAP Sheets and Coils							
Impact indicators	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
PM	Disease incidences	7.59E-04	3.18E-08	9.98E-08	2.79E-07	1.35E-06	0.00E+00
IR	kBq U235 eq.	6.26E+01	1.53E-03	1.85E-03	3.82E-01	2.35E-01	0.00E+00
ETF	CTU_e	2.51E+04	3.83E+00	4.21E+01	3.44E+01	1.73E+02	0.00E+00
HTP-c	CTU_h	3.09E-06	7.15E-11	6.45E-10	8.24E-10	2.67E-09	0.00E+00
HTP-nc	CTU_h	4.43E-05	1.94E-09	1.09E-08	2.10E-08	9.98E-08	0.00E+00
SQP	Pt	1.00E+04	7.86E-01	1.01E-01	1.23E+01	4.95E+01	0.00E+00
Acronyms	**Caption:** PM = Particulate matter emissions; IR = Ionising radiation, human health; ETF= Eco-toxicity (freshwater); HTP-c = Human toxicity, cancer effects; HTP-nc = Human toxicity, non-cancer effects; SQP = Soil quality potential/Land use related impact.						

Abbreviations

Abbreviation	Definition
General Abbreviations	
EN	European Norm (Standard)
EF	Environmental Footprint
GPI	General Programme Instructions
ISO	International Organization for Standardization
CEN	European Committee for Standardization
CLC	Co-location centre
CPC	Central product classification
GHS	Globally harmonized system of classification and labelling of chemicals
SVHC	Substances of Very High Concern
ND	Not Declared

References

- General Programme Instructions of the International EPD® System. Version 5.0.
- PCR 2019:14. Construction Products, Version 2.0.1, Valid upto: 2030-04-07
- Sustainability of construction works - Environmental product declarations - Methodology for selection and use of generic data; CEN/TR 15941:2010
- EN 15804: EN 15804:2012+A2:2019: Sustainability of construction works -Environmental Product Declarations - Core rules for the product category of construction products.
- EN ISO 14025: EN ISO 14025:2011-10 Environmental labels and declarations - Type III environmental declarations - Principles and procedures
- EN ISO 14040: EN ISO 14040:2009-11 Environmental management - Life cycle assessment - Principles and framework
- EN ISO 14044: EN ISO 14044:2006-10 Environmental management - Life cycle assessment - Requirements and guidelines.
- LCA FE: LCA FE Software System and Database for Life Cycle Engineering, Sphera Solution GmbH, Leinfelden-Echterdingen, 2024 (https://sphera.com/solutions/product-stewardship/life-cycle-assessment-software-and-data/managed-lca-content/)

Version History

Original Version of the EPD, 2025-11-12