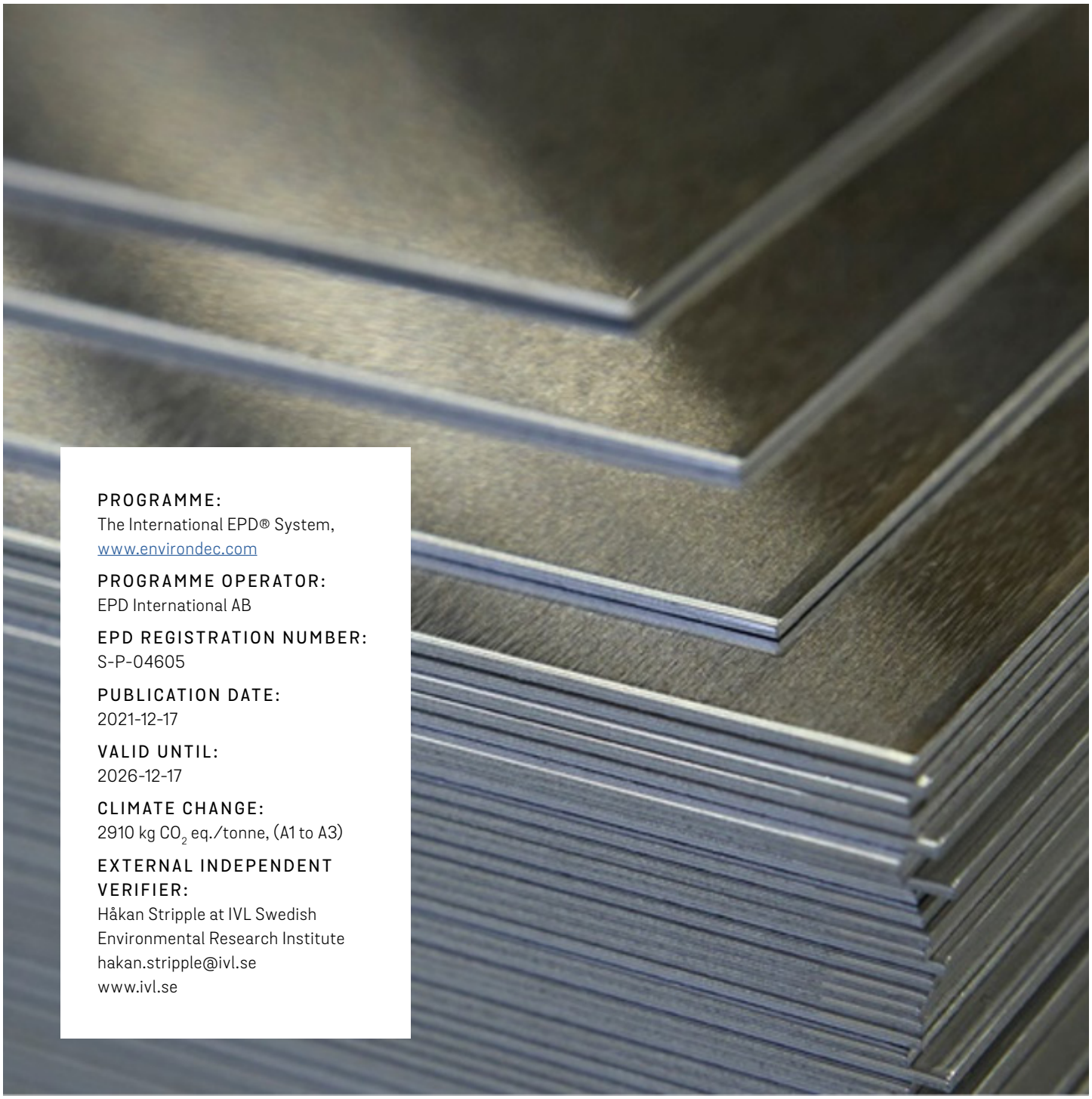
ENVIRONMENTAL PRODUCT DECLARATION

In accordance with ISO 14025 and EN 15804:2012+A1:2013

HOT ROLLED STAINLESS STEEL

STENA STÅL AB



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

PROGRAMME OPERATOR:
EPD International AB

EPD REGISTRATION NUMBER:
S-P-04605

PUBLICATION DATE:
2021-12-17

VALID UNTIL:
2026-12-17

CLIMATE CHANGE:
2910 kg CO_2 eq./tonne, (A1 to A3)

EXTERNAL INDEPENDENT VERIFIER:
Håkan Stripple at IVL Swedish Environmental Research Institute
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PROGRAMME INFORMATION

Programme:	The International EPD® System EPD International AB Box 210 60 SE-100 31 Stockholm Sweden www.environdec.com info@environdec.com

CEN STANDARD EN 15804:2012+A1:2013 SERVED AS THE CORE PCR

Product category rules (PCR):	PCR 2012:01 Construction products and construction services, version 2.33
PCR review was conducted by:	The Technical Committee of the International EPD® System. Chair: Massimo Marino. Contact via info@environdec.com
Independent third-party verification of the declaration and data, according to ISO 14025:2006:	☐ EPD process certification ☑ EPD verification
External independent verifier:	Håkan Stripple, IVL, The Swedish Environmental Research Institute
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 from different programmes may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804:2012+A1:2013.

COMPANY INFORMATION

Stena Stål supplies a wide range of steel products to customers in Sweden and Norway. Through close collaborations with leading steel producers, products including Beams, Merchant bars, Tubes/Hollow sections, Reinforcement steel, Strip products and heavy plates, Stainless steel, Aluminium and special steels are offered. Its customers mainly consist of small and medium-sized companies in the construction and industrial sectors.

As a complement to its wholesale business, it offers the adaptation and pre-treatment of steel products, based on customer-specific needs, either in-house or in collaboration with its partners. Among other services, cutting, abrasive blasting and painting is also offered.

Stena Stål has operations in 15 locations in Sweden and in Moss, Norway, comprising warehouse, production and sales. Stena Stål is a part of the Stena Metall Group.

Stena Stål's organization maintain ISO 9001, ISO 14001, ISO 45001 and SS-EN1090 certificates. Stena Stål also provides a number of product certificates and declarations to ensure fulfilment with applicable regulations and standards. For more information:

https://www.stenastal.se/hallbarhet/

For additional information, please visit the company web site: www.stenastal.se/

Contact information: Stena Stål AB, Box 4088, 400 40 Göteborg, Sweden;

Telephone: +46 (0) 10 445 00 00

PRODUCT INFORMATION

Product name: Hot rolled stainless steel

Product identification: Hot rolled stainless steel delivered as coils, sheets and plats with varying thicknesses, widths, and lengths. Several finishes are available e.g., pickled or ground. Material Standards: EN 10088-4:2009, Tolerances according to ISO (EN) 9444-2/ 9445-2, EN 10029/and the CE-marking. For the application and use the respective national provisions apply.

Product description: Hot rolled stainless steel is used in a variety of applications in several industries, e.g., the construction industry. The steel can be load carrying and is corrosion resistant suitable for close to ocean environments and bridges.

UN CPC code: UNCPC-4121

Geographical scope: Sweden

LCA INFORMATION

The underlying Life Cycle Assessment (LCA) has been conducted in accordance with ISO 14040 and ISO 14044. The study is also performed according to PCR 2012:01 Construction products and construction services, version 2.33; EN15804:2012+A1:2013, and General Programme Instructions for the international EPD® System, version 2.5.

Declared unit: 1 metric tonne steel delivered to customer from Stena Stål's Warehouses in Sweden.

Reference service life: Not applicable for an A1-A4 assessment.

Time representativeness: The specific data for Stena Stål has been collected for the year August 2020 to September 2021. Background data are less than 10 years old.

Database and LCA software used: Modelling and environmental impact calculations are performed with the LCA software GaBi (version 10.2.1.68), using life cycle inventory data from supplier specific EPDs, GaBi Professional database 2021 and Ecoinvent 3.6.

System boundaries: The LCA is a cradle-to-customer's gate assessment covering the modules A1-A4.

Production stage			Construction process stage		Use stage							End-of-life stage				Benefits and loads beyond the system boundaries
Raw material supply	Transport	Manufacturing	Transport	Construction	Use	Maintenance	Repair	Replacement	Refurbishment	Operational Energy Use	Operational Water Use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-recovery-recycling potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

X = Included MND = Module Not Declared

Figure 2. Description of the modules covered in the EPD

Figure 3 below is a simplified process chart with system boundaries where all processes in the figure are included in the assessment. Excluded are thus; infrastructure, construction, production equipment, and tools that are not directly consumed in the production process, travelling by personnel and research and development – all in accordance with the PCR.

SYSTEM BOUNDARY

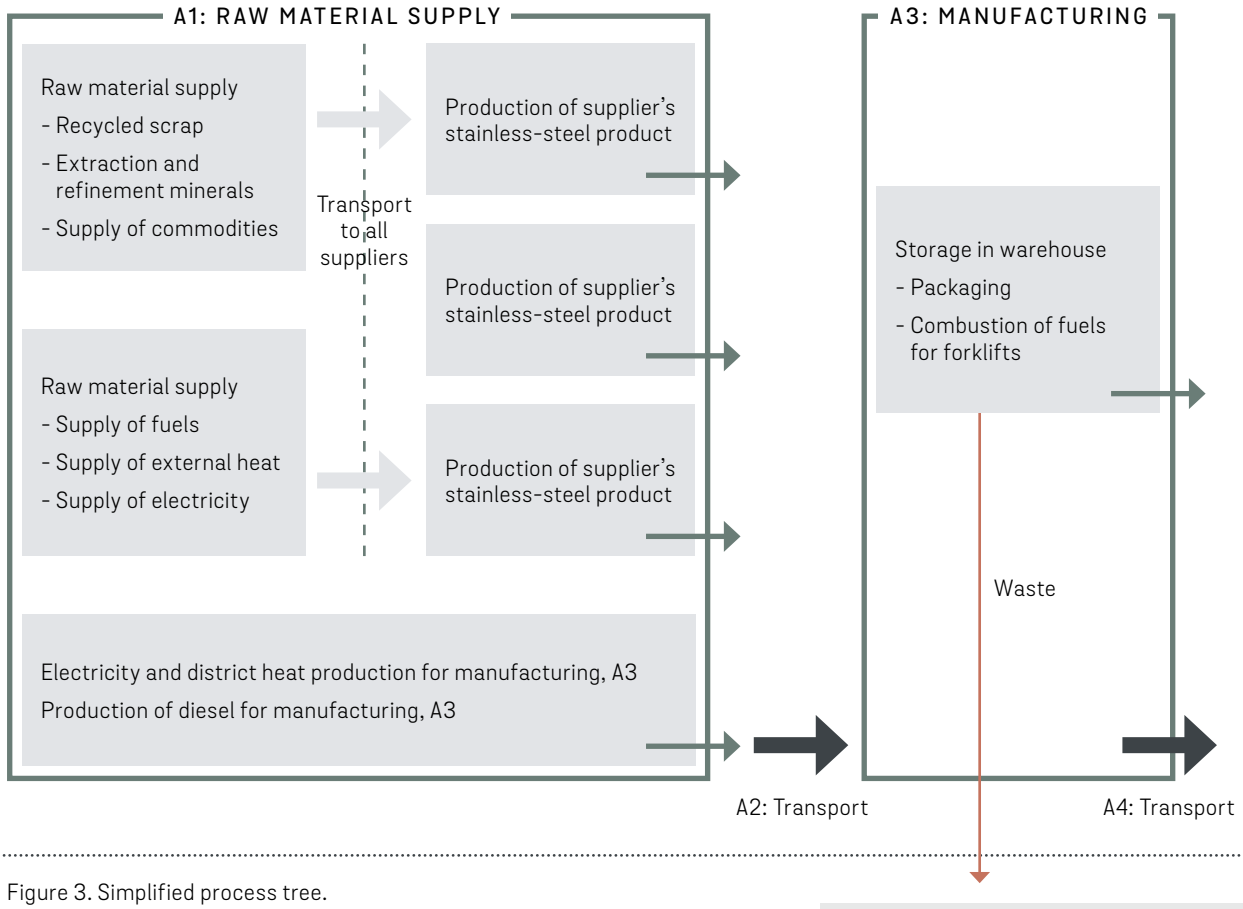

Figure 3. Simplified process tree.

THE LIFECYCLE IS DIVIDED INTO THE FOLLOWING MODULES:

Module A1: The upstream processes in A1 comprises the production of the hot rolled stainless steel at Stena Stål's suppliers. These have to a large extent been modelled with EPDs for the specific products and suppliers in question. Generic LCA data were used in the case where supplier specific EPDs were lacking. The module also includes the production of purchased electricity and district heating used at Stena Stål's warehouses, as well as the production of the diesel used for forklifts.

Module A2: The upstream process in module A2 comprises impacts from transportation of the products to Stena Stål's warehouses in Sweden.

Module A3: The core process, module A3, includes storage of the products, use of fuels and electricity on site, as well as end-of-life treatment of waste generated during processing and storage.

Module A4: The downstream process in module A4 comprises impacts from transportation of the products from Stena Stål' warehouses to the customer in Sweden. The transport is conducted with trucks, Euro 5, with an average transport distance of 375 km, one way, and a load factor of 50 %. The load factor is set to take into account a partly empty return trip.

Cut-off and allocation principles:

Several products are stored and processed at Stena Stål's facilities. The environmental impact at the site (energy use, generation of waste and emissions to air) have been allocated to the product based on weight.

In case of recycling or other recovery of generated waste, impacts are borne by the product until the waste enters the facility gate where the recycling process takes place, which is in accordance with the Polluter Pays Principle. The same method is applied for incoming raw materials of recycled origin, where the product carries the burden related to producing the raw material from the recycled material, but not the upstream production of the virgin material.

All major raw materials and all the essential energy is included. The requirement that a minimum of 95 % of the total inflows (mass and energy) shall be included is fulfilled.

CONTENT DECLARATION

PRODUCT

The products consist of 100 % stainless steel.

The product does not contain any of the substances listed on the "Candidate List of Substances of Very High Concern (SVHC) for authorisation" (http://echa.europa.eu/chem_data/authorisation_process/candidate_list_table_en.asp).

PACKAGING

Stainless coils and plates are usually delivered with interleaving paper and/or a polyethylene plastic film to protect the surface. In some cases, wooden pallets are used for truck transport.

RECYCLED MATERIAL

The product consists partly of recycled stainless steel. The majority of the product mix from Stena Stål is produced in the Electric Arc Furnace route.

The stainless steel in the product can be fully recycled in the end-of-life.

ENVIRONMENTAL PERFORMANCE

POTENTIAL ENVIRONMENTAL IMPACTS

Environmental impacts per [1 metric tonne of hot rolled stainless steel delivered to customer from Stena Stål's warehouse]			
Parameter	**Unit**	**A1-A3**	**A4**
GWP	[kg CO_2-eq.]	2.91E+03	3.25E+01
ODP[1]	[kg CFC11-eq.]	3.29E-09	8.69E-15
AP	[kg SO_2-eq.]	1.60E+01	7.61E-02
EP	[kg PO_4^{3-}-eq.]	1.04E+00	1.83E-02
POCP	[kg ethene-eq.]	9.19E-01	-2.67E-02
ADPE	[kg Sb-eq.]	1.67E-01	2.93E-06
ADPF	[MJ]	3.46E+04	4.35E+02
Caption	GWP = Global warming potential; ODP = Ozone depletion potential; AP = Acidification potential of soil and water; EP = Eutrophication potential; POCP = Photochemical ozone creation potential; ADPE = Abiotic depletion potential for non-fossil resources; ADPF = Abiotic depletion potential for fossil resources		

USE OF RESOURCES

Resource use per [1 metric tonne of hot rolled stainless steel delivered to customer from Stena Stål's warehouse]			
Parameter	**Unit**	**A1-A3**	**A4**
PERE	[MJ]	3.08E+04	2.53E+01
PERM	[MJ]	0.00E+00	0.00E+00
PERT	[MJ]	3.08E+04	2.53E+01
PENRE	[MJ]	1.08E+04	4.41E+02
PENRM	[MJ]	0.00E+00	0.00E+00
PENRT	[MJ]	1.08E+04	4.41E+02
SM	[kg]	7.22E+02	0.00E+00
RSF	[MJ]	0.00E+00	0.00E+00
NRSF	[MJ]	0.00E+00	0.00E+00
FW	[m^3]	1.92E+01	2.90E-02
Caption	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources 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 = Net use of fresh water		

[1] Almost all the impact in the ODP-category comes from stainless-steel volumes from the producer with an EPD, much larger than the proportion of steel would be expected to represent. It is likely that the EPD that represents the contributing stainless-steel volumes is more detailed in recording the flows which contribute to ODP compared to the generic data representing the other steel volumes.

WASTE PRODUCTION AND OUTPUT FLOWS

WASTE PRODUCTION AND OUTPUT FLOWS

Waste categories and output flows per [1 metric tonne of hot rolled stainless steel delivered to customer from Stena Stål's warehouse]			
Parameter	**Unit**	**A1-A3**	**A4**
HWD	[kg]	1.91E-01	2.33E-08
NHWD	[kg]	2.77E+02	6.92E-02
RWD	[kg]	1.88E+00	8.01E-04
CRU	[kg]	0.00E+00	0.00E+00
MFR	[kg]	2.78E+00	0.00E+00
MER	[kg]	3.22E+00	0.00E+00
EEE	[MJ]	0.00E+00	0.00E+00
EET	[MJ]	0.00E+00	0.00E+00
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		

REFERENCES

PCR 2012:01 Construction products and construction services, version 2.33

EN15804:2012+A1:2013 *Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products*

General Programme Instructions of the International EPD® System. Version 2.5.

ISO 14025:2006 on Type III Environmental declarations.

ISO 14040:2006 and ISO 14044:2006 on Life Cycle Assessments (LCA).

Silfverstrand, N. 2021. Project report for Environmental Product Declarations EPD® steel products, Ramboll, 2021

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