Environmental Product Declaration

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

Steel Reinforcement Bar

from

Stena Stål AB

Gör mer möjligt.

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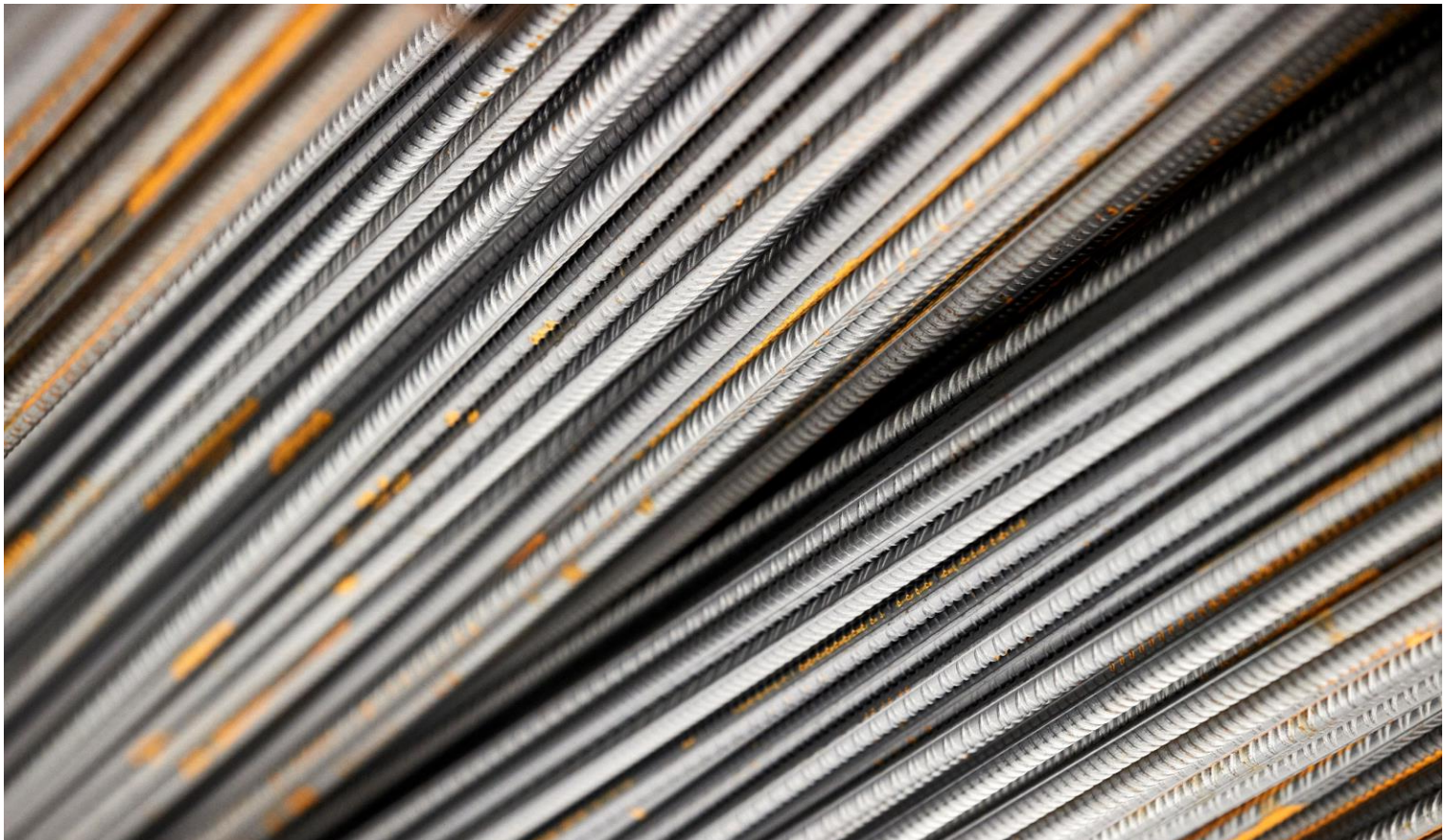
An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at www.environdec.com



General information

Programme information

Programme:	The International EPD® System
Address:	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
Website:	www.environdec.com
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Accountabilities for PCR, LCA and independent, third-party verification
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 (EN 15804:A2),* version 1.3.1
PCR review was conducted by: *The Technical Committee of the International EPD® System. A full list of members available on www.environdec.com. The review panel may be contacted via info@environdec.com*
Life Cycle Assessment (LCA)
LCA accountability: *Thomas Eknor Morrell, Niclas Silfverstrand, Katarzyna Dziubanii* *Ramboll Sweden AB*
Third-party verification
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via: ☒ EPD verification by individual verifier *Katrin Molina-Besch, Miljögiraff AB* *katrin@miljogiraff.se* *Post: Miljögiraff, Övre hövik 25b, 430 84 Styrsö* *Visit: Bläsgatan 2, 414 63 Göteborg* 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 characterisation factors); have equivalent content declarations; and be valid at the time of comparison. For further information about comparability, see EN 15804 and ISO 14025.

Company information

Owner of the EPD:
Stena Stål AB

Contact:
Jacob Hedin: jacob.hedin@stenastal.se

Description of the organisation:
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, Stena Stål 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 SS-EN1090 and SBS 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/

Product-related or management system-related certifications:
ISO 9001, ISO 14001, ISO 45001, SS-EN1090 and SBS certificates.

Name and location of the warehouse operations:
Sweden: Västerås, Lidköping, Helsingborg, Jönköping, Luleå, Skellefteå, Kalmar, Gothenburg, Timrå, and Örnsköldsvik.
Norway: Moss.

Product information

Product name:
Steel reinforcement bar.

Product description:
Reinforcement steel bars for use in concrete constructions in order to increase the strength of the material.

UN CPC code:
41241 and 41242.

Geographical scope:
Both the production and market are located in Sweden.

LCA information

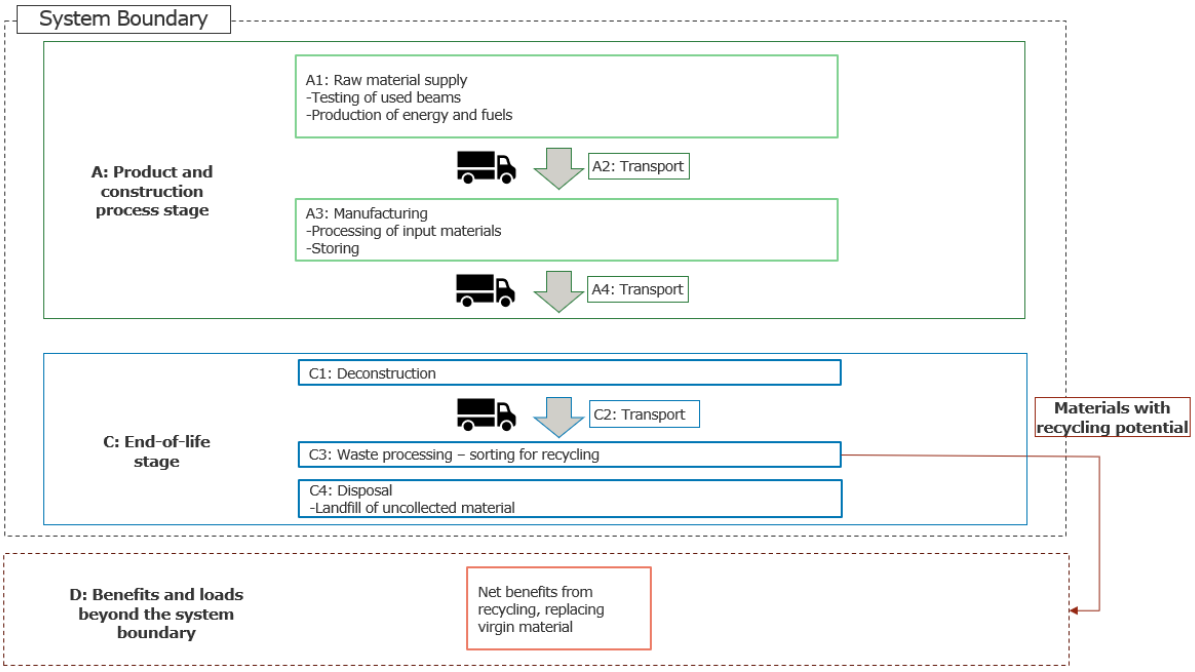
Declared unit:
1 metric tonne of Steel reinforcement bars.

Time representativeness:
The data represents the period between September 1, 2021 and August 31, 2022.

Database(s) and LCA software used:
LCA calculations were performed with the LCA software LCA for Experts (version 10.7.1.28), using life cycle inventory (LCI) data from Professional database and Ecoinvent 3.9.

Description of system boundaries:
Cradle to gate with options, module A4, C1–C4 and module D (A1–A3, A4 + C + D) and thus covers modules A1-A3, A4, C1-C4, and D. The life cycle stages A5 and B1-B7 are not included.

System diagram:
The figure below presents a simplified process tree with system boundaries where all instances of the figure are included in the assessment. Excluded are thus, e.g., inventory flows from 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 2019:14 and EN 15804. For further details on what is included in each module (e.g., inputs, outputs, and assumptions), see sections following the process tree.



Product stage, A1-A3:
The product stage comprises the acquisition of all raw materials, products and energy, transport to the production site, production processes, packaging, and waste processing up to the end-of-waste state or final disposal.

More specifically, this module includes the upstream processes of extraction and processing of raw materials and their packaging and the transportation of the input materials, excluding packaging, to the production sites. Furthermore, it includes the core processes in sites of storing and processing of the final product, including the end-of-life treatment of waste generated from the packaging, as well as impacts from extraction and processing of fuels used, and their transportation to the production site. The module also includes the production of purchased electricity, diesel, gas and HVO used at the production site. The electricity is a certified mix of hydro power, wind, solar, and biomass. The GWP-GHG impact of the electricity is 0.017 kg CO_2 eq./kWh.

Transport to customer, A4:
A transport distance of 120km by truck to customers has been estimated by Stena Stål.

End-of-life, C1-C4:
The main market for Stena Stål's products is in Sweden. Therefore, the end-of-life treatment of the Steel reinforcement bars is modelled for Swedish conditions. According to SCB (2020), over 99% of steel is recycled in Sweden. 95% will be assumed to reach recycling for this project with the remaining 5% going to landfill to account for materials not being fit for recycling.

End-of-life

Scenario information	Unit	Quantity
Collection specified by type	kg collected separately	1000
	kg collected with mixed waste	0
Recovery system specified by type	kg for re-use	0
	kg for recycling	950
	kg for energy recovery	0
Landfill	kg for final deposition	50
Assumptions for transportation	km	100

Re-use, recovery and recycling potential, D:
Module D includes reuse, recovery and/or recycling potential, expressed as net impact and benefits. In this case, it is assumed that module D includes the potential benefits from avoided production of steel through recycling of the net (virgin) share of materials in the product lifecycle. Furthermore, 10% losses associated with the remelting of the metal are assumed to occur outside of the system boundaries.

Cut-off rules:
General cut-off criteria as defined in EN15804 are followed. Life cycle inventory data shall according to EN 15804 include a minimum of 95% of total inflows (mass and energy) per module.

Data quality:
All processes with a significant impact have high quality datasets.

Allocation:
All sites relevant have provided site specific data for the different products for storing and processing for the period 2021-09-01 and 2022-08-31. Most sites produce multiple products, both the products included in the study and ones outside of it. Total quantities used on the sites has been allocated to the products by dividing the amount of the product in question with the total amount of all products produced at the site.

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	X	ND	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
Geography	NO	NO, SE	SE	-	-	-	-	-	-	-	-	-	SE	SE	SE	SE	SE
Specific data used	77%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	0%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	+/-19%			-	-	-	-	-	-	-	-	-	-	-	-	-	-

Content information

Product components	**Weight, kg**	**Post-consumer material, weight-%**	**Biogenic material, weight-% and kg C/kg**
Steel	1000	77%	0%, 0kg
Packaging materials	**Weight, kg**	**Weight-% (versus the product)**	**Weight biogenic carbon, kg C/kg**
Polyester strap	2	0.2%	0
Cardboard box	0.044	0.0044%	0.43
TOTAL	2.044	0.2044%	

The product does not, independent of site, 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). 5

Results of the environmental performance indicators

Mandatory impact category indicators according to EN 15804

Results per 1 metric tonne								
Indicator	**Unit**	**A1-A3**	**A4**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-total	kg CO_2 eq.	3.81E+02	1.16E+01	0.00E+00	8.68E+00	5.47E+01	2.64E-01	-1.55E+02
GWP-fossil	kg CO_2 eq.	3.71E+02	1.15E+01	0.00E+00	8.58E+00	5.47E+01	2.63E-01	-1.55E+02
GWP-biogenic	kg CO_2 eq.	9.38E+00	3.41E-02	0.00E+00	2.53E-02	2.05E-02	2.86E-04	4.22E-01
GWP-LULUC	kg CO_2 eq.	5.27E-01	1.07E-01	0.00E+00	7.93E-02	5.78E-03	2.54E-04	-6.66E-02
ODP	kg CFC11 eq.	3.23E-05	1.50E-12	0.00E+00	1.11E-12	1.17E-05	1.07E-07	6.41E-10
AP	mol H^+ eq.	1.29E+00	1.64E-02	0.00E+00	3.35E-02	5.68E-01	2.48E-03	-3.47E-01
EP-freshwater	kg P eq.	3.42E-03	4.22E-05	0.00E+00	3.13E-05	1.69E-03	2.41E-05	2.38E-05
EP-marine	kg N eq.	5.34E-01	5.84E-03	0.00E+00	1.56E-02	2.52E-01	8.62E-04	-8.28E-02
EP-terrestrial	mol N eq.	5.71E+00	6.94E-02	0.00E+00	1.74E-01	2.76E+00	9.42E-03	-8.97E-01
POCP	kg NMVOC eq.	1.36E+00	1.43E-02	0.00E+00	3.02E-02	7.58E-01	2.74E-03	-2.73E-01
ADP-minerals&metals*	kg Sb eq.	1.69E-04	7.60E-07	0.00E+00	5.64E-07	2.81E-05	6.01E-07	-1.25E-07
ADP-fossil	MJ	3.04E+03	1.57E+02	0.00E+00	1.17E+02	7.47E+02	7.38E+00	-1.10E+03
WDP	m^3	7.79E+01	1.40E-01	0.00E+00	1.03E-01	1.84E+00	3.39E-01	-2.27E+00
Acronyms	GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption							

** 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.*

Additional mandatory and voluntary impact category indicators

Results per 1 metric tonne								
Indicator	**Unit**	**A1-A3**	**A4**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-GHG*	kg CO_2 eq.	3.71E+02	1.15E+01	0.00E+00	8.61E+00	5.47E+01	2.63E-01	-1.55E+02

*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.

Resource use indicators

Results per 1 metric tonne								
Parameter	**Unit**	**A1-A3**	**A4**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	MJ	3.94E+03	1.14E+01	0.00E+00	8.48E+00	4.23E+00	6.40E-02	2.80E+02
PERM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ	3.94E+03	1.14E+01	0.00E+00	8.48E+00	4.23E+00	6.40E-02	2.80E+02
PENRE	MJ	3.04E+03	1.57E+02	0.00E+00	1.17E+02	7.47E+02	7.38E+00	-1.11E+03
PENRM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	MJ	3.04E+03	1.57E+02	0.00E+00	1.17E+02	7.47E+02	7.39E+00	-1.11E+03
SM	kg	1.11E+03	0.00E+00	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	0.00E+00
NRSF	MJ	6.51E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	4.76E+01	1.25E-02	0.00E+00	9.29E-03	4.28E-02	7.88E-03	-6.69E-02
Acronyms	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 re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water							

Waste indicators

Results per 1 metric tonne								
Parameter	**Unit**	**A1-A3**	**A4**	**C1**	**C2**	**C3**	**C4**	**D**
Hazardous waste disposed	kg	2.08E-01	4.87E-10	0.00E+00	3.62E-10	0.00E+00	0.00E+00	-1.65E-08
Non-hazardous waste disposed	kg	2.14E+02	2.40E-02	0.00E+00	1.78E-02	0.00E+00	5.00E+01	-2.43E+00
Radioactive waste disposed	kg	6.28E-02	2.94E-04	0.00E+00	2.19E-04	0.00E+00	0.00E+00	2.97E-02

Output flow indicators

Results per 1 metric tonne								
Parameter	**Unit**	**A1-A3**	**A4**	**C1**	**C2**	**C3**	**C4**	**D**
Components for re-use	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Material for recycling	kg	1.57E+02	0.00E+00	0.00E+00	0.00E+00	9.50E+02	0.00E+00	0.00E+00
Materials for energy recovery	kg	5.88E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy. electricity	MJ	6.67E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy. thermal	MJ	1.20E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Updates to the EPD

The EPD representing the material input for the product has been updated as it was not representable for the product.

References

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