Environmental Product Declaration

In accordance with ISO 14025 and EN 15804 for:

Reinforcing mesh

from

Tibnor AB

Programme:	The International EPD® System, www.environdec.com
Programme operator:	EPD International AB
EPD registration number:	S-P-02041
ECO EPD Ref. No.:	00001191
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Company information

Owner of the EPD:
Tibnor AB, Box 600, 169 26 Solna, Sverige, +46 10 484 00 00, info@tibnor.se, www.tibnor.se

Description of the organisation:
Tibnor supplies steel and other metals to industry in the Nordics and Baltics. We are the meeting point where our know-how and expertise and that of our customers & suppliers converge to create smarter solutions. Together, we make industry in the Nordics even stronger. A subsidiary of SSAB, Tibnor has 1,100 employees across 7 countries. In 2017, we had sales of SEK 8 billion. For more information: www.tibnor.se
In Köping Tibnor AB has its main warehouse for the majority of our products, including mesh.

Product-related or management system-related certifications:
Tibnor AB: ISO 9000, ISO 14001
Tibnor AB, Köping: SBS G/004

Name and location of production site:
Tibnor AB, Köping

Product information

Product name:
Reinforcing Steel meshes

Product identification:
Further processed concrete reinforcing based upon steel conforming to SS-EN 10080:2005 and SS 212540:2014

Product description:
Reinforcing steel is encased in concrete in order to improve the tensile strength of the latter in structures bearing axial or bending loads. The steel is relatively simple and comprises about 99 % iron. The reinforcing-steel products consist of steel meshes with a diameter of 5 mm to 12 mm. Steel reinforcing will normally last over the life of the concrete structure. It is 100 % recyclable in the event that the structure is demolished.

UN CPC code:
4126

Geographical scope:
Europe

LCA information

Declared unit:
1 kg steel reinforcing meshes with packaging

System boundary:
Cradle to gate (with options)

Reference service life:
not applicable

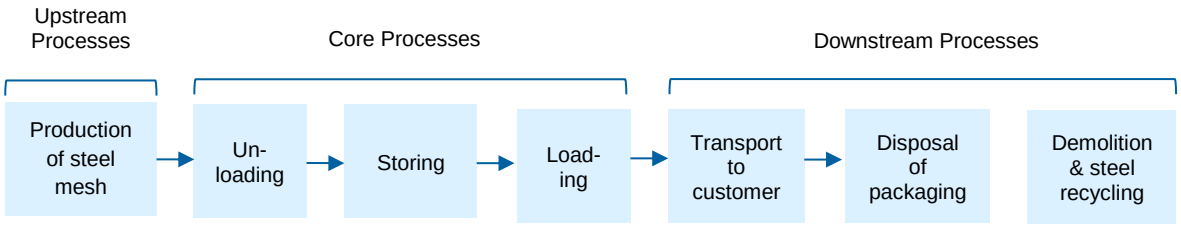
Time representativeness:
2019

Database(s) and LCA software used:
The manufacturing process was modelled based on manufacturer-specific data. For the upstream processes of steel, supplier-specific information in the form of EPDs was used where available. Otherwise, generic background datasets were used for the upstream and downstream processes.

For the LCA modelling the software GaBi, version 9.2, Service Pack 40, distributed by thinkstep was used. The background datasets used were taken from the current versions of various GaBi databases. The datasets contained in the databases are documented online. All necessary processes within the defined system boundaries were considered.

The background datasets used for accounting purposes should not be older than 10 years. In this study, no datasets older than 10 years were used.

System diagram:



Description of system boundaries:

X = declared modules; MND = module not declared:

Production			Installation		Utilization Stage							Disposal Stage				beyond system boundary
raw material supply	transport to the manufacturer	manufacture	transport to the construction site	installation in the building	use / application	maintenance	repair	replacement	renewal	energy input for operation	water use for operation	dismantling / demolition	transport	waste management	landfilling	reuse, recovery or recycling potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	MND	MND	MND	MND	MND	MND	MND	X	X	X	X	X

Cut-off criteria:
The wooden pallets used for packaging have a mass share of 0.3 %. Due to the low mass share compared to steel and the fact that the wooden pallets are reused, no modelling was carried out. It can also be strongly assumed that the environmental impact of wood pallets will not exceed 1 %.

Estimates and assumptions:
- The collection rate for waste is 95 %

Allocation:
No allocations were made for the modelling of production processes, as the available data do not concern other products manufactured in the plant and there are no coupling processes. Nor were any multi-input processes carried out.
Allocations in the LCA datasets used are documented accordingly in the datasets themselves.
Potential credits and avoided burdens resulting from the scrap recycling in the end of life (Module C3) are assigned to module D.

LCA scenarios and additional technical information

Transport from production place to user (module A4)
The average transport distance to the customer is 443 km by truck. Transport is mainly carried out by diesel-powered trucks, EURO 4 with an average load factor of 61 %.

Type	Capacity utilization	Type of vehicle	Average distance
Truck	61 %	EURO 4	443 km

Dismantling/demolition (module C1)
60 % of the reinforced concrete is demolished with cable excavator and wrecking ball (diesel consumption of excavator: 60.8 litres/hour; capacity approx. 15 m³/h) and 40 % is dismantled with hydraulic excavator and tongs (diesel consumption of excavator: 36.1 litres/hour; capacity approx. 20 m³/h). The ratio of reinforcing steel to concrete content is 4.8 %, corresponding to 120 kg reinforcing steel per m³ reinforced concrete (Source: German Environment Agency). Calculated diesel consumption for the demolition of 1 kg reinforcement steel is 0.0013 litres.

Type	Share	Reinforced concrete/hour	Diesel/ hour	Steel in reinforced concrete
Cable excavator and wrecking ball	60 %	15 m^3	60.8 l	4.8 % = 120 kg
Hydraulic excavator and tongs	40 %	20 m^3	36.1 l	4.8 % = 120 kg

Transport (module C2)

With a collection rate of 100 %, the transports are carried out by truck over 75 km and with a capacity utilization of 50 %.

Since the product is poured into concrete, it is collected as mixed construction waste.

Type	Capacity utilization	Type of vehicle	Average distance
Truck	50 %	EURO 4	75 km

Waste processing (modules C3 and C4)

Steel rebars must be mechanically separated from the concrete surrounding them prior to recycling so that the steel can be made available to a downstream product system as secondary material. This is considered in module C3. Corresponding potentials and avoided loads are assigned to module D. The landfilling of remaining 5 % which are not collected for recycling is considered in module C4.

Waste	kg for re-use	kg for recycling	kg for energy recovery	kg to landfill
Steel scrap	-	0.95	-	0.05

Content declaration

Product

Materials	Share
Steel	100 %

Substances of very high concern
The product does not contain any substances listed in the “Candidate List of Substances of Very High Concern (SVHC) for authorisation” exceeding 0.1 % of the weight of the product.

Packaging

Mesh is loaded on wooden pallets.

Recycled material

Provenience of recycled materials in the product:
98 %

Environmental performance

Potential environmental impact

Parameter	Unit	A1 -A3	A4	A5	C1	C2	C3	C4	D
Global Warming Potential (GWP)	kg CO2-eq.	5.19E-01	2.92E-02	0.00E+00	3.67E-02	6.90E-03	2.40E-03	6.82E-04	-3.06E-02
Stratospheric ozone depletion potential (ODP)	kg CFC11-eq.	4.31E-08	7.32E-18	0.00E+00	6.04E-18	1.73E-18	7.98E-18	3.75E-18	9.33E-17
Acidification potential of soil and water (AP)	kg SO2-eq.	2.68E-03	1.24E-04	0.00E+00	1.32E-04	2.96E-05	1.68E-05	4.37E-06	-5.92E-05
Eutrophication potential (EP)	kg PO43--eq.	6.85E-04	3.09E-05	0.00E+00	3.14E-05	7.40E-06	4.05E-06	4.92E-07	-4.12E-06
Formation potential for tropospheric ozone (POCP)	kg Ethene-eq.	1.58E-04	-4.60E-05	0.00E+00	1.31E-05	-1.10E-05	1.86E-06	3.29E-07	-1.43E-05
Potential for abiotic depletion of non-fossil resources (ADPE)	kg Sb-eq.	-2.42E-05	2.71E-09	0.00E+00	3.06E-09	6.41E-10	2.73E-09	2.63E-10	-5.17E-07
Potential for abiotic depletion of fossil fuels (ADPF)	MJ	8.25E+00	3.99E-01	0.00E+00	5.01E-01	9.44E-02	4.67E-02	9.67E-03	-2.87E-01

Use of resources

Parameter	Unit	A1 -A3	A4	A5	C1	C2	C3	C4	D
Renewable primary energy as an energy carrier (PERE)	MJ	1.38E+00	2.31E-02	3.10E-04	2.82E-02	5.46E-03	3.48E-03	1.30E-03	2.14E-02
Renewable primary energy for material use (PERM)	MJ	3.10E-04	0.00E+00	-3.10E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total renewable primary energy (PERT)	MJ	1.38E+00	2.31E-02	0.00E+00	2.82E-02	5.46E-03	3.48E-03	1.30E-03	2.14E-02
Non-renewable primary energy as an energy carrier (PENRE)	MJ	8.66E+00	4.01E-01	0.00E+00	5.03E-01	9.49E-02	4.83E-02	9.96E-03	-2.76E-01
Non-renewable primary energy for material use (PENRM)	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total non-renewable primary energy (PENRT)	MJ	8.66E+00	4.01E-01	0.00E+00	5.03E-01	9.49E-02	4.83E-02	9.96E-03	-2.76E-01
Use of secondary materials (SM)	kg	1.15E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Renewable secondary fuels (RSF)	MJ	5.16E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Non-renewable secondary fuels (NRSF)	MJ	2.31E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of freshwater resources (FW)	m^3	1.67E-01	2.69E-05	0.00E+00	3.27E-05	6.37E-06	1.36E-05	2.51E-06	-5.66E-05

Waste production and output flows

Parameter	Unit	A1 -A3	A4	A5	C1	C2	C3	C4	D
Hazardous waste to landfill (HWD)	kg	1.62E-02	1.85E-08	0.00E+00	2.34E-08	4.39E-09	1.26E-09	1.52E-10	-3.54E-08
Non-hazardous waste disposed (NHWD)	kg	4.58E-01	6.35E-05	0.00E+00	7.69E-05	1.50E-05	1.30E-05	5.00E-02	3.29E-03
Disposed radioactive waste (RWD)	kg	1.10E-04	7.39E-07	0.00E+00	6.22E-07	1.75E-07	6.37E-07	1.13E-07	9.81E-09
Components for Reuse (CRU)	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling (MFR)	kg	1.37E-02	0.00E+00	6.24E-04	0.00E+00	0.00E+00	9.50E-01	0.00E+00	0.00E+00
Substances for energy recovery (MER)	kg	2.33E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported Energy [Electricity]	MJ	3.27E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported Energy [Thermal Energy]	MJ	6.13E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

General information

Programme:	The International EPD® System EPD International AB Box 210 60 SE-100 31 Stockholm Sweden www.environdec.com Info@environdec.com
Product category rules (PCR):	PCR 2012:01 Construction products and construction services, Version 2.3
PCR review was conducted by:	The Technical Committee of the International EPD® System. Chair: Massimo Marino. Contact via info@environdec.com
Independent verification of the declaration and data, according to ISO 14025:	☐ EPD process certification ☑ EPD verification
Third party verifier:	Andreas Ciroth, GreenDelta GmbH
Accredited and approved by:	The International EPD System
	Owner of the declaration Tibnor AB Silverdalsvägen 4 635 10 Eskilstuna Sweden https://www.tibnor.se
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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.

References

The International EPD System	General Programme Instructions of the International EPD® System. Version 3.01.
The International EPD System	PCR 2012:01 Construction products and construction services, Version 2.3
DIN EN ISO 14025	Environmental labels and declarations — Type III environmental declarations — Principles and procedures; 2009-11.
DIN EN ISO 14044	Environmental management - Life cycle assessment - Requirements and guidance (ISO 14044:2006); German and English version EN ISO 14044:2006.
DIN EN 15804	Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products; German version EN 15804:2012
GaBi 9.2	Software und Datenbank zur Ganzheitlichen Bilanzierung, LBP [Lehrstuhl für Bauphysik] Universität Stuttgart und thinkstep AG, Leinfelden-Echterdingen,1992 – 2020
German Environment Agency	Weimann, K., Matyschik, J., Adam, C., Schulz, T., Linß, E. & Müller, A. (2013). Optimierung des Rückbaus/Abbaus von Gebäuden zur Rückgewinnung und Aufbereitung von Baustoffen unter Schadstoffentfrachtung (insbes. Sulfat) des RC-Materials. Umweltbundesamt.
UN CPC	United Nations Department of Economic and Social Affairs Statistics Division: Central Product Classification (CPC), Version 2.1

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