

# Environmental Product Declaration

In accordance with ISO 14025 and EN 15804 +A2



The Norwegian  
EPD Foundation

**Owner of the declaration:**  
Utboja Armering og Sveis AS

**Program holder and publisher:**  
The Norwegian EPD foundation

**Declaration number:**  
NEPD-3294-1938-EN

**Registration Number:**  
NEPD-3294-1938-EN

**Issue date:** 03.01.2022  
**Valid to:** 03.01.2027

**Product name**

Steel reinforcement products

**Manufacturer**

Utboja Armering og Sveis AS

## General information

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**Product:**

Reinforcement steel

**Program Operator:**

The Norwegian EPD Foundation  
Post Box 5250 Majorstuen, 0303 Oslo, Norway  
Tlf: +47 23 08 80 00  
e-mail: post@epd-norge.no

**Declaration Number:**

NEPD-3294-1938-EN

**This declaration is based on Product****Category Rules:**

EN 15804:2012+A2:2019  
NPCR Part A Construction products and services  
NPCR 013:2021 Part B for Steel and aluminium  
construction products.

**Statements:**

The owner of the declaration shall be liable for the underlying information and evidence. EPD Norway shall not be liable with respect to manufacturer, life cycle assessment data and evidences.

**Declared unit:**

One kg of reinforcement steel

**Declared unit with option:**

1kg of reinforcement steel, cradle-to-gate A1-A3  
with options

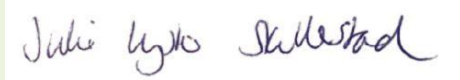
**Functional unit:**

Not applicable

**Verification:**

Independent verification of the declaration and data, according to ISO14025:2010

internal  external



Independent verifier approved by EPD Norway

**Owner of the declaration:**

Utbjoa Armering og Sveis  
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**Manufacturer:**

Utbjoa Armering og Sveis  
Saltnesveien 25, 5584 Bjoa  
Phone: +47 95 06 82 49  
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**Place of production:**

Utbjoa Industriområde

**Management system:**

Certified, Kontrollrådet NS-EN 10080: 2005

**Organisation no:**

994077716

**Issue date:**

03.01.2022

**Valid to:**

03.01.2027

**Year of study:**

2021

**Comparability:**

EPDs from other programmes than The Norwegian EPD Foundation may not be comparable.

**The EPD has been worked out by:**

Alexander Borg



Approved (Manager of EPD Norway)

## Product

### Product description:

The product type analyzed in this report is steel reinforcement products which is a typical construction material for buildings and infrastructure used to support concrete structures

### Product specification:

Products start out as pre-produced steel components from hot-rolled steel, which after cutting and welding is shaped into specialized steel reinforcement products. Products will vary in size and shape and are produced in accordance with specific standards and project needs.

Materials	KG	%
Reinforcement steel	1	100
Plastic packaging	0,0009	
Wood packaging	0,0007	

### Technical data:

Utbjoa Armering og Sveis is certified to supply rebar according to NS 3576-3:2012 and NS-EN 17660:2006 part 1 and 2. The products are produced according to NS-EN 10080:2005.

Yield stress RE > 500 MPa – Rm/Re > 1.15

Elongation Agt > 7,5 %

Density 7 700 kg/m<sup>3</sup>

### Market:

Nordic countries

### Reference service life, product:

Not relevant for declared unit

### Reference service life, building:

60 years

## LCA: Calculation rules

### Declared unit:

1kg of reinforcement steel, cradle-to-gate A1-A3 with options

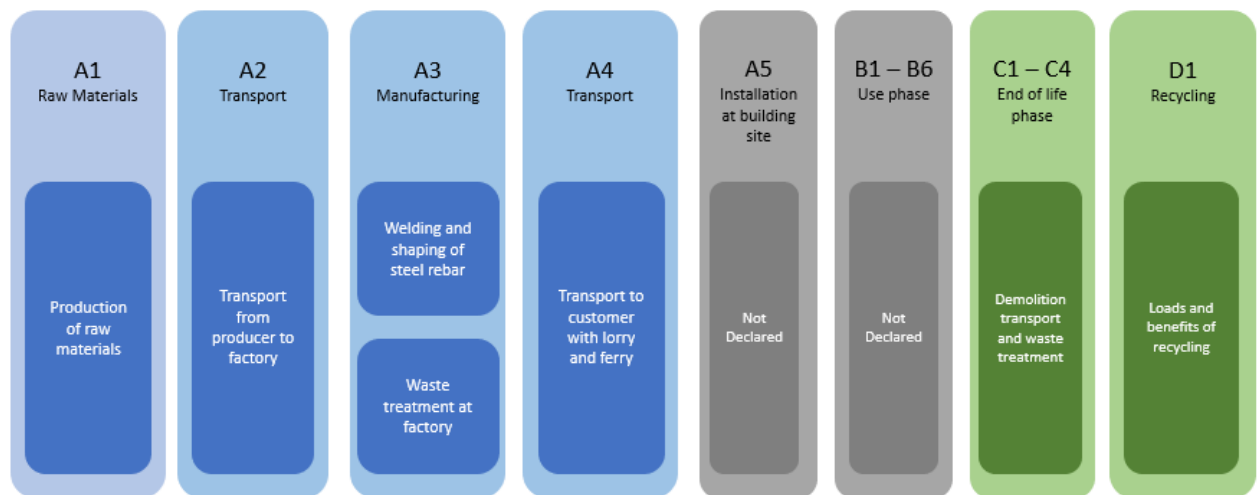
### Data quality:

General requirements and guidelines concerning the use of generic and specific data and the quality of those are as described in EN 15804: 2012+A1:2019, clause 6.3.6 and 6.3.7., including ISO14044:2006, 4.2.3.6. The data is representative according to temporal, geographical and technological requirements. Reference year for the manufacturer's specific data is 2020.

Database used has been ecoinvent v3.7. Calculations have been carried out using Simapro v9. No data is older than 5 years.

**Allocation:**

The allocation is made in accordance with the provisions of EN 15804. Production activities, energy, water and waste production in-house is allocated equally among all products through mass allocation. Effects of primary production of recycled materials allocated to the main product in which the material was used. The recycling process and transportation of the material is allocated to this analysis.



**System boundary:**

Modules are declared according to the PCR. Declared modules are shown in Figure 1. Gray boxes denote modules not declared.

**Cut-off criteria:**

All major raw materials and all the essential energy is included. The production process for raw materials and energy flows that are included with very small amounts (<1% energy, mass, impact) are not included. This cut-off rule does not apply for hazardous materials and substances.

**LCA: Scenarios and additional technical information**

The following information describe the scenarios in the different modules of the EPD.

**Transport from production place to assembly/user (A4)**

Type	Capacity utilisation (incl. return) %	Type of vehicle	Distance KM	Fuel/Energy consumption	value (l/t)
Truck, Euro 6	85 %	Lorry, 28t	77,2	0,0186 l/tkm	1,43
Boat		Ferry	5,5		

Scenario for distance to building site is calculated based on transport statistics of the manufacturer.

### End of Life (C1, C3, C4)

	Unit	Value
Hazardous waste disposed	Kg	
Collected as mixed construction waste	Kg	
Reuse	Kg	
Recycling	Kg	0,95
Energy recovery	Kg	
To landfill	Kg	0,05

### Transport to waste processing (C2)

Type	Capacity utilisation (incl. return) %	Type of vehicle	Distance KM	Fuel/Energy consumption	value (l/t)
Waste collection	50 %	Lorry 28t	19	0,4 l/tkm	7,4
Truck	26 %	Lorry 7,5-16t EURO 6	278	0,04 l/tkm	12,2

To provide a plausible scenario for transportation to waste processing, a study of Norwegian waste treatment was used as proxy data (Raadal et al., 2009).

### Benefits and loads beyond the system boundaries (D)

	Unit	Value
Net new scrap steel	kg	0,00749

Net new scrap for steel is calculated by subtracting the scrap content of outgoing<sup>1</sup> steel from the recycling rate. An average scrap content of 94,25% is used, reflecting sold steel in 2020. Note that outgoing scrap and the parameter for Secondary Material content (SM) differ, wherein the latter accounts for the total amount of scrap needed in the system to fulfill the declared unit.

For steel, a 95% recovery rate is assumed, wherein 5% is assumed landfilled - in effect providing a 95% recycling rate. Reuse is not included in this scenario.

<sup>1</sup> *Outgoing steel from the manufacturing process.*

## LCA: Results

System boundaries (X=included, MND= module not declared, MNR=module not relevant)

Product stage			Assembly stage		Use stage								End of life stage				Benefits & loads beyond system boundary
Raw materials	Transport	Manufacturing	Transport	Assembly	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	X	X	X	X	MNR	

### Core environmental impact indicators

Indicator	Unit	A1-A3	A4	C1	C2	C3	C4	D
GWP-total	kg CO2 eq.	4,71E-01	5,92E-03	2,13E-02	6,88E-02	2,01E-04	2,63E-04	-1,27E-02
GWP-fossil	kg CO2 eq.	4,43E-01	5,91E-03	2,13E-02	6,87E-02	1,90E-04	2,62E-04	-1,27E-02
GWP-biogenic	kg CO2 eq.	2,40E-02	1,31E-05	1,68E-05	1,31E-04	1,06E-05	8,13E-07	-8,23E-06
GWP-LULUC	kg CO2 eq.	5,88E-04	2,28E-06	1,69E-06	1,74E-05	3,86E-07	7,12E-08	1,84E-06
ODP	kg CFC11 eq.	2,82E-08	1,43E-09	4,60E-09	1,52E-08	2,10E-11	1,08E-10	-6,91E-18
AP	mol H <sup>+</sup> eq.	3,02E-03	3,81E-05	2,22E-04	2,68E-04	1,26E-06	2,48E-06	-2,28E-05
EP-freshwater	kg P eq.	5,65E-05	4,55E-07	6,44E-07	3,46E-06	7,56E-08	2,45E-08	-2,60E-09
EP-marine	kg N eq.	8,29E-04	9,26E-06	9,86E-05	8,71E-05	4,50E-07	8,64E-07	-3,40E-06
EP-terrestrial	mol N eq.	1,12E-02	1,02E-04	1,08E-03	9,53E-04	4,96E-06	9,47E-06	-3,31E-05
POCP	kg NMVOC eq.	2,33E-03	3,28E-05	2,97E-04	3,44E-04	1,40E-06	2,75E-06	-1,74E-05
ADP-M&M	kg Sb eq.	5,31E-07	1,69E-08	8,61E-09	1,86E-07	1,27E-08	5,87E-10	-2,69E-08
ADP-fossil	MJ	6,28E-01	9,62E-02	2,93E-01	9,95E-01	2,48E-03	7,35E-03	-1,11E-01
WDP	m <sup>3</sup>	1,07E-01	3,54E-04	3,76E-04	2,03E-03	1,01E-04	3,30E-04	-1,45E-03

**GWP-total:** Global Warming Potential; **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; See "additional Norwegian requirements" for indicator given as PO4 eq. **EP-marine:** Eutrophication potential, fraction of nutrients reaching freshwater end compartment; **EP-terrestrial:** Eutrophication potential, Accumulated Exceedance; **POCP:** Formation potential of tropospheric ozone; **ADP-M&M:** Abiotic depletion potential for non-fossil resources (minerals and metals); **ADP-fossil:** Abiotic

depletion potential for fossil resources; **WDP**: Water deprivation potential, deprivation weighted water consumption

### Classification of disclaimers to the declaration of core and additional environmental impact indicators

ILCD classification	Indicator	Disclaimer
ILCD type / level 1	Global warming potential (GWP)	None
	Depletion potential of the stratospheric ozone layer (ODP)	None
ILCD type / level 2	Acidification potential, Accumulated Exceedance (AP)	None
	Eutrophication potential, Fraction of nutrients reaching freshwater end compartment (EP-freshwater)	None
	Eutrophication potential, Fraction of nutrients reaching marine end compartment (EP-marine)	None
	Eutrophication potential, Accumulated Exceedance (EP-terrestrial)	None
ILCD type / level 3	Formation potential of tropospheric ozone (POCP)	None
	Abiotic depletion potential for non-fossil resources (ADP-minerals&metals)	1
	Abiotic depletion potential for fossil resources (ADP-fossil)	1
	Water (user) deprivation potential, deprivation-weighted water consumption (WDP)	1
	Potential Comparative Toxic Unit for ecosystems (ETP-fw)	1

**Disclaimer 1** – 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

### Resource use

Parameter	Unit	A1-A3	A4	C1	C2	C3	C4	D
RPEE	MJ	3,57E+00	1,31E-03	1,52E-03	1,10E-02	1,54E-02	5,92E-05	9,10E-04
RPEM	MJ	5,97E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
TPE	MJ	1,86E-01	1,31E-03	1,52E-03	1,10E-02	1,54E-02	5,92E-05	9,10E-04
NRPE	MJ	5,90E-01	9,62E-02	2,93E-01	9,95E-01	2,48E-03	7,35E-03	-1,11E-01
NRPM	MJ	8,76E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
TRPE	MJ	6,28E-01	9,62E-02	2,93E-01	9,95E-01	2,48E-03	7,35E-03	-1,11E-01
SM	kg	1,07E+00	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	5,35E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
W	m <sup>3</sup>	4,29E-02	1,16E-05	1,41E-05	1,06E-04	1,15E-04	7,82E-06	-5,60E-05

RPEE Renewable primary energy resources used as energy carrier; RPEM Renewable primary energy resources used as raw materials; TPE Total use of renewable primary energy resources; NRPE Non renewable primary energy resources used as energy carrier; NRPM Non renewable primary energy resources used as materials; TRPE Total use of non renewable primary energy resources; SM Use of secondary materials; RSF Use of renewable secondary fuels; NRSF Use of non renewable secondary fuels; W Use of net fresh water

## End of life - Waste

Parameter	Unit	A1-A3	A4	C1	C2	C3	C4	D
HW	KG	3,65E-04	5,76E-06	7,77E-06	4,30E-05	9,08E-07	5,58E-07	0,00E+00
NHW	KG	2,33E-01	9,50E-03	3,53E-04	3,49E-02	1,05E-04	1,00E+00	0,00E+00
RW	KG	4,91E-05	6,52E-07	2,04E-06	6,90E-06	1,85E-08	4,83E-08	0,00E+00

HW Hazardous waste disposed; NHW Non hazardous waste disposed; RW Radioactive waste disposed

## End of life – output flow

Parameter	Unit	A1-A3	A4	C1	C2	C3	C4	D
CR	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MR	kg	1,62E-01	0,00E+00	0,00E+00	0,00E+00	9,50E-01	0,00E+00	0,00E+00
MER	kg	9,79E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EEE	MJ	5,02E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
ETE	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

CR Components for reuse; MR Materials for recycling; MER Materials for energy recovery; EEE Exported electric energy; ETE Exported thermal energy

Reading example: 9,0 E-03 =  $9,0 \cdot 10^{-3}$  = 0,009

## Information describing the biogenic carbon content at the factory gate

Biogenic carbon content	Unit	Value
Biogenic carbon content in product	kg C	0,00E+00
Biogenic carbon content in the accompanying packaging	kg C	3,59E-04

## Additional Norwegian requirements

Greenhouse gas emission from the use of electricity in the manufacturing phase  
National production mix from import, low voltage (production of transmission lines, in addition to direct emissions and losses in grid) of applied electricity for the manufacturing process(A3).

National electricity grid	Unit	Value
Norway, Ecoinvent v 3.7	kg CO <sub>2</sub> -eq/kWh	0,0232

## Additional environmental impact indicators required in NPCR Part A for construction products

In order to increase the transparency of biogenic carbon contribution to climate impact, the indicator for GWP has been sub-divided into the following:

GWP-IOBC Climate impacts calculated according to the principle of instantaneous oxidation  
GWP-BC Climate impacts from the net uptake and emission of biogenic carbon from each module.



In addition, EP-freshwater shall also declared as PO4 eq.

Indicator	Unit	A1-A3	A4	C1	C2	C3	C4	D
EP-freshwater*	kg PO4 eq.	8,31E-05	5,09E-06	3,67E-05	4,59E-05	4,06E-07	4,03E-07	-1,14E-06
GWP-IOBC, fossil	kg CO2 eq.	4,43E-01	5,91E-03	2,13E-02	6,87E-02	1,90E-04	2,62E-04	-1,27E-02
GWP-BC	kg CO2 eq.	1,31E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
GWP	kg CO2 eq.	4,44E-01	5,91E-03	2,13E-02	6,87E-02	1,90E-04	2,62E-04	-1,27E-02

**EP-freshwater\*** Eutrophication potential, fraction of nutrients reaching freshwater end compartment. Declared as PO4 eq. **GWP-IOBC** Global warming potential calculated according to the principle of instantaneous oxidation. **GWP-BC** Global warming potential from net uptake and emissions of biogenic carbon from the materials in each module. **GWP** Global warming potential

## Hazardous substances

The declaration is based upon reference to threshold values and/or test results and/or material safety data sheets provided to EPD verifiers. Documentation available upon request to EPD owner.

- The product contains no substances given by the REACH Candidate list or the Norwegian priority list.
- The product contains substances given by the REACH Candidate list or the Norwegian priority list that are less than 0,1 % by weight.
- The product contain dangerous substances, more then 0,1% by weight, given by the REACH Candidate List or the Norwegian Priority list, see table.
- The product contains no substances given by the REACH Candidate list or the Norwegian priority list. The product is classified as hazardous waste (Avfallsforskiten, Annex III), see table.

## Indoor environment




Not relevant for this product category.

## Carbon footprint

Carbon footprint has not been worked out for the product.

## Bibliography

ISO 14025:2010	Environmental labels and declarations - Type III environmental declarations - Principles and procedures
ISO 14044:2006	Environmental management - Life cycle assessment - Requirements and guidelines
EN 15804:2012+A2:2019	Sustainability of construction works - Environmental product declaration - Core rules for the product category of construction products
ISO 21930:2017	Sustainability in building construction - Environmental declaration of building products
NS 3576-3:2012	Steel for the reinforcement of concrete — Dimensions and properties — Part 3: Ribbed steel B500NC
NS-EN 17660-1&2:2006	Welding - Welding of reinforcing steel - Part 1: Load-bearing welded joints (ISO 17660-1:2006) and Part 2: Non load-bearing welded joints (ISO 17660-2:2006)
NS-EN 10080:2005	Steel for the reinforcement of concrete - Weldable reinforcing steel - General
EPD-NORGE 2021	NPCR Part A:2021 Construction products and services. Reg 24.03.2021
EPD-NORGE 2021	NPCR 013:2021 Part B for Steel and aluminium construction products. Reg 06.10.2021
Raadal, H. L., Modahl, I. S., & Lyng, K. A. (2009).	Climate account for waste management. Phase I and II: Glass packaging, Metal Packaging, Paper, Cardboard, Plastic Packaging, Wet Organic Waste, Tree Waste and Refuse Waste from Households
Borg. A 2021	LCA report for steel reinforcement products, Utbjoa Armering og Sveis.

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# EPD for the best environmental decision

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