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The Norwegian EPD Foundation

ENVIRONMENTAL PRODUCT DECLARATION

in accordance with ISO 14025, ISO 21930 and EN 15804

Owner of the declaration:	JSC B Group
Program operator:	The Norwegian EPD Foundation
Publisher:	The Norwegian EPD Foundation
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ECO Platform reference number:	-
Issue date:	16.06.2020
Valid to:	16.06.2025

Reinforcement steel products

B Group



www.epd-norge.no



General information

**Product:**

Reinforcement steel products

Owner of the declaration:

JSC B Group
Contact person: Tomas Durgcolas
Phone: +370 6 5203437
e-mail: td@bgroup.lt

Program operator:

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

Manufacturer:

JSC B Group
Gelezinio vilko str. 18a LT-08104, Vilnius, Lithuania
Phone: +370 5 2139332
e-mail: info@bgroup.lt

Declaration number:

NEPD-2060-929-EN

Place of production:

Vilnius, Lithuania

ECO Platform reference number:**Management system:**

-

This declaration is based on Product Category Rules:

CEN Standard EN 15804 serves as core PCR
NPCR 013 version 3.0 - "PCR- Part B for steel
and aluminum construction products".

Organisation no:

301744649

Statement of liability:

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

Issue date:

16.06.2020

Declared unit:

1 kg of reinforcement steel bars

Year of study:

2019,
updated 2020

Declared unit with option:

1 kg of reinforcement steel bars for concrete with
service life of 60 years

Comparability:

EPD of construction products may not be comparable if they not
comply with EN 15804 and seen in a building context.

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

Christoffer Venås

Verification:

The CEN Norm EN 15804 serves as the core PCR.
Independent verification of the declaration and data,
according to ISO14025:2010

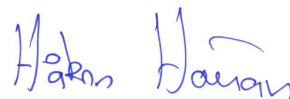
internal external

Third party verifier:



Michael M. Jenssen, Asplan Viak AS
(Independent verifier approved by EPD Norway)

Approved



Håkon Hauan
Managing Director of EPD-Norway

Product

Product description:

Ribbed reinforcement bars, also known as rebars, are steel bars used as a tension device in reinforced concrete and reinforced masonry structures to strengthen and hold the concrete in tension. The EPD considers reinforcement steel products that are prefabricated and hot-rolled at steel works and transformed into different reinforcement steel products like straight, cut and bend rebars and mesh, roll mesh and special welded products according to customer specifics.

Technical data:

The functional unit is 1 kg.
See the following website for technical data:
http://www.bgroup.lt/Bgroup_katalogas.pdf



Product specification:

Materials	kg	%
Steel	1	100 %

Recycled content of steel: <94%

Market:

Norway, Sweden and Finland

Reference service life, product:

The reference service life is 60 years

Reference service life, building:

The reference service life of 60 years has been assumed for the building in all calculations.

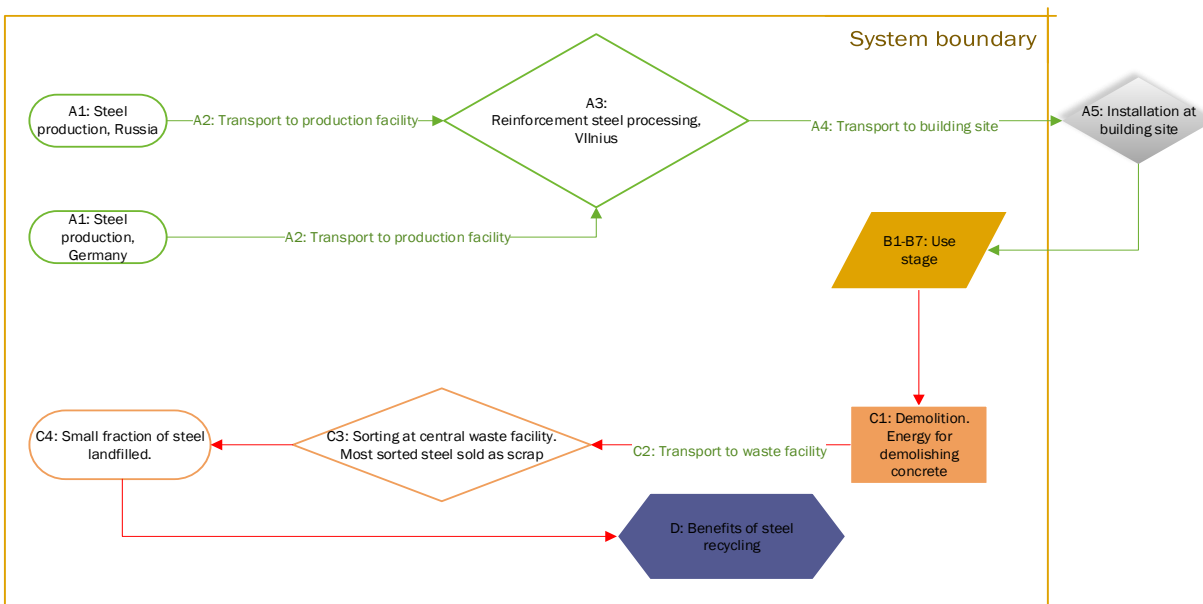
LCA: Calculation rules

Declared unit:

1 kg of steel rebar with a reference service life of 60 years.

System boundary:

A1-A3, A4, B1-B7, C1-C4, D.



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%) are not included. This cut-off rule does not apply for hazardous materials and substances.

Allocation:

The allocation is made in accordance with the provisions of EN 15804. Incoming energy and 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.

Data quality:

The data quality is according to NPCR 013 version 3.0. Data for A1-A3 is specific for the production site in Vilnius, Lithuania. The specific data was gathered for the year 2018, and covers all materials entering and exiting the B Group facility. The background data for other input materials is based on generic life cycle inventories from the ecoinvent v3.3 database. For A4, the transport from the specific production site in Vilnius to the capital of the three Nordic countries is considered (Norway, Sweden and Finland). The end-of-life stage (C) is based on Norwegian generic data. Similarities of the technology used in end-of-life in the Nordic countries makes a good approximation for the Swedish and Finnish scenarios. For module D includes a specific consideration about the net scrap steel for the product. No background data is not older than 10 years (2010) in line with the requirements of the current PCR.

LCA: Scenarios and additional technical information



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

For module A4, transport from the manufacturing to the building site is estimated based on information provided from the manufacturer. Three transport scenarios from Vilnius in Lithuania to Norway (Oslo), Sweden (Stockholm) and Finland (Helsinki) are considered for the Norwegian, Swedish and Finnish market, respectively.

Transport from production place to user (A4) in Oslo, Norway

Type	Capacity utilisation (incl. return) %	Type of vehicle	Distance km	Fuel/Energy consumption	Value (l/t)
Truck	26,3	Lorry 16-32 ton, EURO5	1000	0,044 l/tkm	44
Boat	N/A	Ferry	270	N/A l/tkm	N/A

Transport from production place to user (A4) in Stockholm, Sweden

Type	Capacity utilisation (incl. return) %	Type of vehicle	Distance km	Fuel/Energy consumption	Value (l/t)
Truck	26,3	Lorry 16-32 ton, EURO5	550	0,044 l/tkm	24,2
Boat	N/A	Ferry	270	N/A l/tkm	N/A

Transport from production place to user (A4) in Helsinki, Finland

Type	Capacity utilisation (incl. return) %	Type of vehicle	Distance km	Fuel/Energy consumption	Value (l/t)
Truck	26,3	Lorry 16-32 ton, EURO5	692	0,044 l/tkm	30,448

The goods are transported via the ferry route Ventspils-Stockholm

There is no environmental related impact (B1) during the service life. In normal use scenario, it is assumed that there is no maintenance (B2), repair (B3), replacement (B4) and refurbishment (B5). Reinforcement steel require no energy (B6) or water (B7) to operate. Thus, module B1-B7 is assumed to be zero.

Use (B1)

	Unit	Value
No impacts from product in use phase		0

Replacement (B4)/Refurbishment (B5)

	Unit	Value
Replacement cycle*	yr	60

* Number or RSL (Reference Service Life)

Operational energy (B6) and water consumption (B7)

	Unit	Value
Water consumption	m ³	0
Electricity consumption	kWh	0
Other energy carriers	MJ	0
Power output of equipment	kW	0

End of Life (C1, C3, C4)

	Unit	Value
Hazardous waste disposed	kg	
Collected as mixed construction waste	kg	
Reuse	kg	
Recycling	kg	0,988
Energy recovery	kg	
To landfill	kg	0,001

The end of life scenario (C1, C3 and C4) is based on background data from Ecoinvent v. 3.3. It follows the conservative approach in the NPCR 013 version 3.0: 2019.

Transport to waste processing (C2)

Type	Capacity utilisation (incl. return) %	Type of vehicle	Distance km	Fuel/Energy consumption	Value (l/t)
Truck	53,3	Lorry >32 metric ton	50	0,02 l/tkm	1

C2 represents a standard transport scenario to disposal site in Norway, which is assumed to be similar to Sweden and Finland.

Benefits and loads beyond the system boundaries (D)

	Unit	Value
Substitution of raw material	kg	0,0338

Module D is calculated based on the net scrap output, which is 0,0338 kg.

Additional technical information

LCA: Results

A1 is the most significant module for most impact categories. The manufacturing in Lithuania only has a minor importance, with transportation in A4 as the second most important contributor for the global warming impact category.

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

Product stage					Use stage								End of life stage				Beyond the system boundaries
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
x	x	x	x	MND	x	x	x	x	x	x	x	x	x	x	x	x	x

Environmental impact

Parameter	Unit	A1-A3	A4 NO	A4 SE	A4 FI	B1-B7	C1	C2	C3	C4	D
GWP	kg CO ₂ -eqv	5,81E-01	1,74E-01	9,72E-02	1,18E-01	0	5,85E-02	4,29E-03	5,09E-06	6,24E-04	6,04E-03
ODP	kg CFC11-eqv	1,96E-08	3,16E-08	1,76E-08	2,15E-08	0	1,05E-08	8,63E-10	2,05E-12	3,32E-10	2,04E-10
POCP	kg C ₂ H ₄ -eqv	1,27E-03	3,12E-05	1,81E-05	2,02E-05	0	1,16E-05	7,01E-07	1,46E-09	1,37E-07	1,32E-05
AP	kg SO ₂ -eqv	3,43E-03	6,51E-04	3,87E-04	4,06E-04	0	4,39E-04	1,68E-05	3,79E-08	2,69E-06	3,57E-05
EP	kg PO ₄ ³⁻ -eqv	2,12E-04	1,40E-04	7,99E-05	9,21E-05	0	1,02E-04	3,69E-06	8,15E-09	5,75E-06	2,21E-06
ADPM	kg Sb-eqv	2,27E-06	4,68E-07	2,58E-07	3,23E-07	0	1,84E-08	8,39E-09	5,34E-12	3,37E-09	2,36E-08
ADPE	MJ	9,20E+00	2,58E+00	1,44E+00	1,76E+00	0	8,35E-01	6,80E-02	1,66E-04	8,07E-03	9,57E-02

GWP Global warming potential; ODP Depletion potential of the stratospheric ozone layer; POCP Formation potential of tropospheric photochemical oxidants; AP Acidification potential of land and water; EP Eutrophication potential; ADPM Abiotic depletion potential for non fossil resources; ADPE Abiotic depletion potential for fossil resources

Resource use

Parameter	Unit	A1-A3	A4 NO	A4 SE	A4 FI	B1-B7	C1	C2	C3	C4	D
RPEE	MJ	6,16E-01	3,36E-02	1,89E-02	2,25E-02	0	4,75E-03	1,11E-03	2,03E-06	5,82E-03	1,62E-02
RPEM	MJ	2,36E-02	0,00E+00	0,00E+00	0,00E+00	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
TPE	MJ	6,39E-01	3,36E-02	1,89E-02	2,25E-02	0	4,75E-03	1,11E-03	2,03E-06	5,82E-03	1,62E-02
NRPE	MJ	9,32E+00	2,63E+00	1,46E+00	1,79E+00	0	8,43E-01	7,06E-02	1,71E-04	3,53E-02	2,53E-01
NRPM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
TRPE	MJ	9,32E+00	2,63E+00	1,46E+00	1,79E+00	0	8,43E-01	7,06E-02	1,71E-04	3,53E-02	2,53E-01
SM	kg	9,66E-01	0,00E+00	0,00E+00	0,00E+00	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,26E-02
RSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0	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	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
W	m ³	2,07E-01	9,86E-02	5,63E-02	6,50E-02	0	2,08E-02	4,67E-03	8,56E-06	3,24E-02	4,85E-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 NO	A4 SE	A4 FI	B1-B7	C1	C2	C3	C4	D
HW	kg	4,75E-05	1,53E-06	8,51E-07	1,04E-06	0,00E+00	3,53E-07	1,54E-06	5,53E-11	6,48E-08	1,54E-06
NHW	kg	7,02E-02	1,19E-01	6,57E-02	8,25E-02	0,00E+00	9,45E-04	6,96E-05	2,38E-03	6,14E-05	6,96E-05
RW	kg	9,19E-04	1,78E-05	9,92E-06	1,21E-05	0,00E+00	5,92E-06	3,07E-05	1,19E-09	4,52E-07	3,07E-05

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

End of life - Output flow

Parameter	Unit	A1-A3	A4 NO	A4 SE	A4 FI	B1-B7	C1	C2	C3	C4	D
CR	kg	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA
MR	kg	2,08E-01	INA	INA	INA	INA	INA	INA	9,89E-01	INA	3,38E-02
MER	kg	INA	INA	INA	INA	INA	INA	INA	0	INA	INA
EEE	MJ	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA
ETE	MJ	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA

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

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

Additional Norwegian requirements

Greenhouse gas emission from the use of electricity in the manufacturing phase

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

Data source	Amount	Unit
Econinvent v3 (june 2014)	237	g CO ₂ -eqv/kWh

Dangerous substances

- 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 (Avfallsforskriften, Annex III), see table.

Indoor environment





There are no tests of the product regarding the indoor environment as this is not relevant for the current application. The product does not affect the indoor environment in use.

Carbon footprint

Carbon footprint has not been worked out for the product.

Bibliography

ISO 14025:2010	<i>Environmental labels and declarations - Type III environmental declarations - Principles and procedures</i>
ISO 14044:2006	<i>Environmental management - Life cycle assessment - Requirements and guidelines</i>
EN 15804:2012+A1:2013	<i>Sustainability of construction works - Environmental product declaration - Core rules for the product category of construction products</i>
ISO 21930:2007	<i>Sustainability in building construction - Environmental declaration of building products</i>
Kellenberger et al. (2007)	<i>Life Cycle Inventories of Building Products. Final report ecoinvent data v2.0 No. 7</i>
Ecoinvent (2016)	<i>Ecoinvent database v3.3. Swiss Centre for Life Cycle Inventories, Dübendorf, Switzerland.</i>
NPCR 013 version 3.0: 2019	<i>PCR- Part B for steel and aluminum construction products, The Norwegian EPD Foundation, Oslo, Norway.</i>
Venås, C (2019)	<i>LCA report: Reinforced steel products from B Group. Report nr. SC 2019:01277 from Sintef Community, Oslo, Norway.</i>

 <p>epd-norge.no The Norwegian EPD Foundation</p>	<p>Program operator The Norwegian EPD Foundation Post Box 5250 Majorstuen, 0303 Oslo Norway</p>	<p>Phone: +47 23 08 80 00 e-mail: post@epd-norge.no web: www.epd-norge.no</p>
 <p>epd-norge.no The Norwegian EPD Foundation</p>	<p>Publisher The Norwegian EPD Foundation Post Box 5250 Majorstuen, 0303 Oslo Norway</p>	<p>Phone: +47 23 08 80 00 e-mail: post@epd-norge.no web: www.epd-norge.no</p>
 <p>B GROUP</p>	<p>Owner of the declaration JSC Bgroup Gelezinio vilko str. 18a LT-08104, Vilnius Lithuania</p>	<p>Phone: +370 5 2139332 e-mail: info@bgroup.lt web: bgroup.lt</p>
 <p>SINTEF</p>	<p>Author of the Life Cycle Assessment Christoffer Venås Børrestuveien 3 0373 Oslo, Norge</p>	<p>Phone: 047 911 07 808 e-mail: christoffer.venas@sintef.no web: sintef.no</p>