CMC POLAND

Type III Environmental Product Declaration

CMC Commercial Metals

it's what's **inside** that counts

CMC Poland Sp. z o.o. is a Polish mill that manufactures and sells its products on domestic and foreign markets. We run our manufacturing and processing operations in a manner that supports and promotes environmental responsibility. We minimize our impact on the environment by limiting the use of natural resources in our products. The quality and good reputation of CMC Poland products are guaranteed by over 120 years of experience and tradition as well as state-of-the-art technological solutions in the area of production, environmental protection and occupational safety. Our main production activity is carried out in Poland, in Zawiercie.

General information

Owner of the declaration	CMC Poland Sp. z o.o. ul. Piłsudskiego 82 42-400 Zawiercie
EPD program operator	Building Research Institute ul. Filtrowa 1 00-611 Warsaw
Declared product	Declared products include reinforcing bars and ribbed wire rod for concrete reinforcement, prefabricated reinforcement, steel wires, rods and welded mesh for concrete reinforcement produced at CMC Poland Sp. z o.o. plants in Zawiercie, Dąbrowa Górnicza, Żyrardów and Rzeszów.
Declared unit	1 tonne
Declaration number	422/2023
Date of issue	17.03.2023r.
Validity date	17.03.2028r.
Reason for performing LCA	B2B
Representativeness	Polish and European

ITB is the verified member of The European Platform for EPD program operators and LCA practitioner www.eco-platform.org

Verification

The verification of the Type III Environmental Declaration is carried out according to the guidelines of EN ISO 14025 and ISO 21930. Once verified, the document is valid for 5 years unless the inputs change significantly.

EN 15 804+A2 serves as the basis for PCR

Independent verification of declarations and data according to ISO 14025:2010

☑ external ☐ internal

Independent verifier appointed by Building Research Institute – Michał Piasecki, PhD, Eng.

LCA analysis by CMC Poland Sp. z o.o.

Product description

The LCA study was carried out to develop the EPD III type environmental declaration. The recipients of EPD are clients of CMC Poland Sp. z o. o. direct and indirect. Hot-rolled products are widely used in the construction industry for the reinforcement of reinforced concrete elements and structures, as well as in communication engineering.

Ribbed bars and ribbed wire

Ribbed bars and ribbed wire rod B500B, B500SN and B500SP are designed for reinforcement of reinforced concrete elements and structures designed according to the following standards: PN-EN-1992-1-1:2008 or PN-B-03264:2002 (for steel grade A-IIIN) or PN-S-10042 (for steel grade A-IIIN), which may work under dynamic and repeatedly changeable loads. They can also be used in communication engineering, for road engineering structures and railroad engineering structures. Products are offered as bundles of rods or coils.

Prefabricated reinforcements

Prefabricated reinforcements are produced from B500B, B500SN and B500SP ribbed bars and B500A, B500SN and B500SP ribbed wire rod, which are designed for reinforcement of reinforced concrete elements and structures. Prefabricated reinforcements are manufactured on the basis of individual technical documentation provided by customers and delivered to the place of installation.

Wires, rods and mesh

Wires, rods and mesh of B500A, B500SP, B550A, B550B, NK500AB-W, B500NA grade are designed for reinforcement of reinforced concrete elements and structures designed according to the rules and requirements defined in PN-EN 1992-1-1:2008 standard, of minimum yield strength 500 MPa.

Technical data

Parameter	Value	Unit
Declared unit	1000	kg
Density	7,833	kg/m^3
Modulus of elasticity	E – 210; G – 80	GPa
Heat transfer coefficient	58	W/m·K
Melting point	1425 - 1540	°C

Delivery

Dimensions of declared products may vary depending on the order. Technical information about the specific products can be found at https://www.cmc.com

Basic materials

92.5% of steel scrap is used in steel production, of which Post-Consumer is 89.5%; Pre-Consumer is 3.0%. In addition to steel scrap, iron alloys (1.3%) and non-ferrous alloys (6.2%) are used in production. 99.7% of the materials used in production were imported from closer than 800 km (500 miles).

The produced steel does not contain any substances listed in Annex XVII or XIV of the Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 (REACH).

Production

Feedstock materials for steel production are steel scrap, including proprietary shredded scrap, alloying and ferroalloying additives, slag-forming additives, carburizers and frothing agents. In an electric arc furnace (EAF), the melting of the charge takes place using an electric arc, and oxygen and gas. Post-furnace

treatment of steel is carried out in ladle furnaces and includes deoxidation, desulfurization, correction of chemical composition and temperature of steel. Thus, the prepared steel is transported to the COS equipment, where steel billets are cast.
The billets are then directed to the rolling lines, where they are given the desired shape and size. The final step involves the labelling of the products.
The production of wires and bars in ductility class A is created by a cold rolling process that uses the raw materials described in the paragraph above. Mesh welding is carried out on multipoint welding machines equipped with automatic packing and stacking systems.

Environment and health during production

Environmental, occupational health and safety and quality management at CMC Poland is compliant with the implemented and certified Integrated Management System based on the international ISO standards:

- 9001 – Quality management systems
- 14001 – Environmental management system.
- 45001 – Health and safety management systems

Packaging

Ribbed bars are transported in bundles tied with plain wire rod. Nets for concrete reinforcement are assembled in packages tied in at least four places with a smooth roller. The wire rod used for packaging should be recycled after collection as steel scrap.

Conditions of use

No changes in material composition should occur during use. The need for maintenance will depend on how the product is used.

Environment and health during the use phase

Under normal conditions of use, steel products, due to the low possibility of release of metals from steel, do not cause adverse effects on human health of the environment.

Reference usage time

The reference period for the service life of ribbed bars, ribbed wire rod, prefabricated reinforcement and concrete reinforcing wires, rods and mesh is limited by their application, i.e. the life of the structure or building in which the products will be installed. It is estimated that under standard conditions, the reference shelf life of the products is 100 years.

Extraordinary effects

Water pollution

Under normal conditions of use, steel products, due to the low possibility of release of metals from steel, do not cause adverse effects on human health and the environment. Product impacts are not anticipated in the event of flooding.

Mechanical damage

Environmental and human health hazards are not expected to occur in the event of mechanical destruction.

Reuse phase

Ribbed bar, ribbed wire rod, precast reinforcement, wire, bar, and mesh for concrete reinforcement shall not be reused after service.

Liquidation

Spent ribbed bar and ribbed wire rod, prefabricated reinforcement, concrete reinforcement wires, rods and mesh are valuable secondary raw materials that should be 100% collected and reprocessed into new products.

Other information

Ribbed bar and ribbed wire rod, prefabricated reinforcement, wire, bar and mesh for concrete reinforcement at the end of the product life cycle should be fully recycled.

System Limits

The life cycle analysis of the studied products includes the „Product Stage", modules A1-A3 (cradle to gate). The calculation includes consumption of scrap metal, raw materials, additives, water, gas, electricity, emissions to water and air, and information about waste generated.

Deliveries that are made by rail (A2 module) and road are included in the calculation.
Average transportation distances were used for the calculations which are respectively:

Material	average distance [km]
ADDITIVES	193
scrap (vehicular transport)	183 - 204
scrap (electric railroad transport)	293 - 375
scrap (diesel rail transport)	12

We transport our products using:

- HGV, EURO 0-6 mix with a capacity of 22 and 27 tons,
- HGV, EURO 5 with a capacity of 17,3 and 22 tons,
- rail transport with the use of both electric and diesel traction with a capacity of 1452 tons,
- sea transport with a capacity of 1,500 - 20,000 DWT.

Transportation between production departments is also included.
European standards for average combustion were used for the calculations.
The production scheme of the claimed products is shown in Figure 1.
Due to the way of conducting sewage monitoring in the Zawiercie plant, sewage emissions to water were included in the flow for the melt shop installation.
It is assumed that the sum of the omitted processes does not exceed 5% of the total impact categories, according to EN 15804 guidelines. The machinery and equipment required for production as well as the transportation of employees were excluded from the calculations.

Type EPD - from cradle to gate. A1-A3 modules. The cradle to gate approach can be specifically used because the product is used as a concrete reinforcement element (input to new product). The end-of-life action should therefore be calculated for reinforced concrete.

DESCRIPTION OF SYSTEM BOUNDARIES (X = INCLUDED IN LCA; ND = NOT DECLARED)

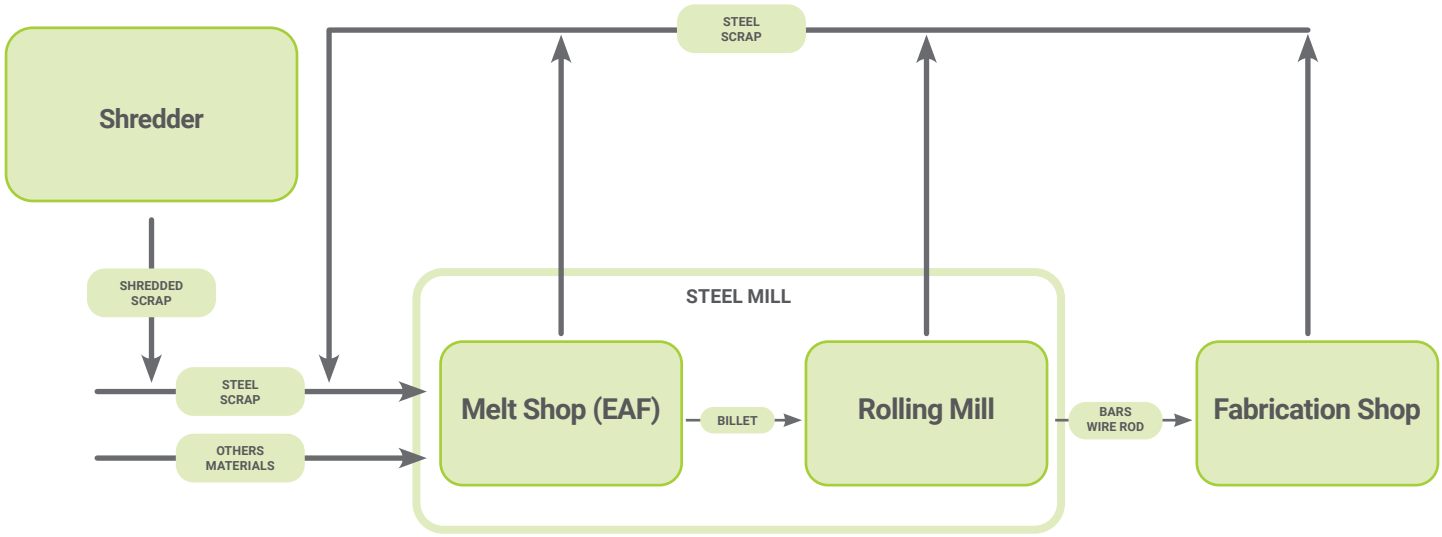
Product stage			Construc-tion phase		Stage of use							End-of-life stage				Benefits and burdens bey-ond system boundaries
Extraction and production of raw materials / supply of raw materials	Transporting	Manufacturing of a product	Transportation to the construc-tion site	Construction process/applica-tion/assembly	Operation	Maintenance	Repair	Change	Renovation	Energy consumption during the use phase	Water consumption in use phase	Demolition/Tearing down	Transporting	Waste treatment	Storage	Potential for reuse, recovery and recycling
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

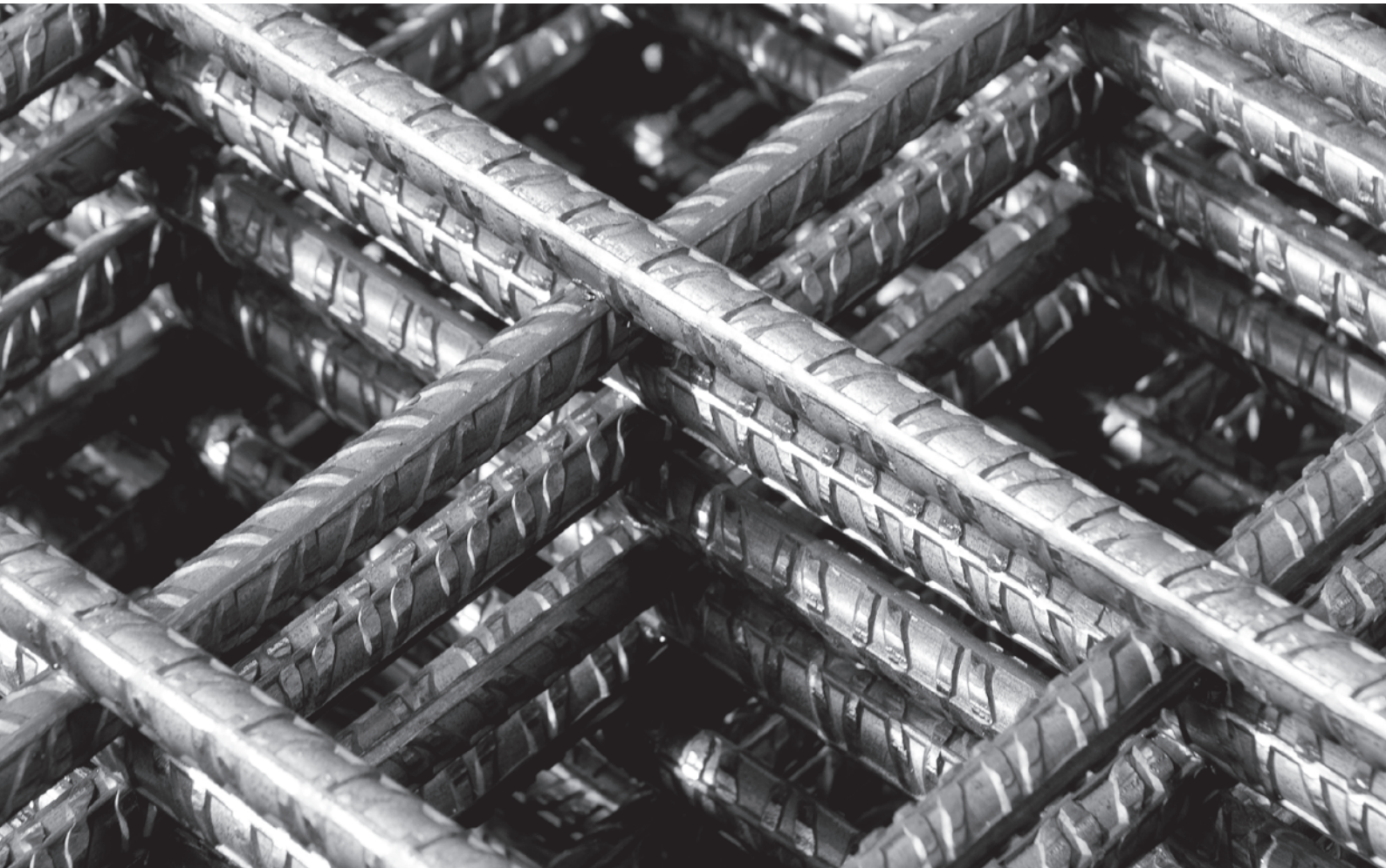
System Limits

Modules A1-A3 for the claimed products include:

- providing resources, additives and energy,
- transport of raw materials and additives to the production site,
- production processes, including recycling of production/post-production scrap.

Fig. 1 Flow diagram





The declaration covers products manufactured in the Zawiercie, Dąbrowa Górnicza, Żyrardów and Rzeszów plants, whose environmental impact in relation to total production is 5 %. A mass allocation was used to calculate the LCA. The impacts of individual plants were averaged based on the plants' production volumes during the analysis period.

Data for LCA calculations were collected from the production departments of CMC Poland Sp. z o.o., which are collected in the form of reports, whether in electronic or paper form. Functional unit for which calculations were made up to 1 ton of product and for such a unit calculations were made for all production departments. On the basis of production reports and information from departments, inputs and outputs to individual processes were defined. The entire inventory was collected in a file called „input data". These data were then used as input for the LCA calculations in the GaBi software (Sphera). Electricity grid mix for Poland modeled by Sphera.

Data collection period

Data for LCA calculations were inventoried at CMC Poland Sp. z o.o. production plants in Zawiercie, Dąbrowa Górnicza, Żyrardów and Rzeszów and come from the period 01.01.2021 – 31.12.2021 (1 year).

Comparability

Comparison or evaluation of EPD data is only possible if all data sets for comparison have been created in accordance with EN 15804+A2.

LCA: Results

This EPD was prepared using GaBi version 10.5.1.124 software.

Product stage			Construction phase		Stage of use							End-of-life stage				Benefits and burdens beyond system boundaries
Extraction and production of raw materials / supply of raw materials	Transporting	Manufacturing of a product	Transportation to the construction site	Construction process/ application/assembly	Operation	Maintenance	Repair	Change	Renovation	Energy consumption during the use phase	Water consumption in use phase	Demolition/Tearing down	Transporting	Waste treatment	Storage	Potential for reuse, recovery and recycling
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

RESULTS OF THE LCA LIFE CYCLE IMPACT STUDY: 1 tonne of product

Parameter	Unit	A1 – A3
Global Warming Potential (GWP)	kg CO_2 equivalent	6,00E+02
Greenhouse gas potential - fossil (GWP - fossil)	kg CO_2 equivalent	5,99E+02
Greenhouse gas potential - biogenic (GWP - biogenic)	kg CO_2 equivalent	7,73E-02
Global warming potential - land use and land use change (GWP-luluc)	kg CO_2 equivalent	7,75E-01
Stratospheric ozone depletion potential (ODP)	kg CFC 11 equivalent	3,97E-10
Soil and water acidification potential (AP)	mol H^+ equivalent	2,24E+00
Eutrophication potential - freshwater (EP - freshwater)	kg P equivalent	7,60E-04
Eutrophication potential - seawater (EP - seawater)	kg N equivalent	7,24E-01
Eutrophication potential - terrestrial (EP - terrestrial)	Mol N equivalent	7,91E+00
Potential for photochemical ozone synthesis (POCP)	kg NMVOC equivalent	1,91E+00
Potential for depletion of abiotic resources - non-fossil resources (ADP - elements)	kg Sb equivalent	7,16E-05
Abiotic depletion potential - fossil fuels (ADP - fossil)	MJ	7,72E+03
Water deprivation potential (WDP)	m^3 equivalent	9,01E+00

LCA LIFE CYCLE ESTIMATION RESULTS - RESOURCE CONSUMPTION: 1 tonne of product

Consumption of renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	-
Consumption of renewable primary energy resources used as raw materials	MJ	2,23E+03
Total consumption of renewable primary energy resources (primary energy AND primary energy resources used as raw materials)	MJ	2,23E+03
Consumption of non-renewable primary energy, excluding non-renewable primary energy resources used as raw materials	MJ	-
Consumption of non-renewable primary energy resources used as raw materials	MJ	7,73E+03
Total consumption of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ	7,73E+03
Recycled materials consumption	kg	1,10
Consumption of renewable secondary fuels	MJ	-
Consumption of non-renewable secondary fuels	MJ	-
Net consumption of freshwater resources	m^3	2,78E+00

LCA LIFE CYCLE ESTIMATION RESULTS - OUTPUT MATERIAL STREAMS AND WASTE CATEGORIES: 1 tonne of product

Hazardous waste, neutralized	kg	4,46E-07
Non-hazardous waste, neutralised	kg	3,01E+00
Radioactive waste	kg	4,70E-02
Components for reuse	kg	-
Materials to recycle	kg	2,06E+02
Materials for energy recovery	kg	5,6E+01
Energy exported	MJ	-

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Thermal Physics, Acoustics and Environment Department
02-656 Warsaw, Ksawerów 21

CERTIFICATE № 422/2023
of TYPE III ENVIRONMENTAL DECLARATION

Products:

Steel products for concrete reinforcement

Manufacturer:

CMC Poland Sp. z o.o.
ul. Piłsudskiego 82, 42-400 Zawiercie, Poland

confirms the correctness of the data included in the development of
Type III Environmental Declaration and accordance with the requirements of the standard

EN 15804

Sustainability of construction works.
Environmental product declarations.
Core rules for the product category of construction products.

This certificate, issued on 17th March 2023 is valid for 5 years
or until amendment of mentioned Environmental Declaration

Head of the Thermal Physic, Acoustics and Environment Department
Agnieszka Winkler-Skalna, PhD

INSTYTUT TECHNIKI BUDOWLANEJ

Deputy Director for Research and Innovation
Krzysztof Kuczyński, PhD

Warsaw, March 2023

Signature Not Verified
Dokument podpisany przez Michał Piasecki - ITB
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Elektronicznie podpisany przez Agnieszka Winkler-Skalna; ITB
Data: 2023.03.23 11:21:54 +01'00'

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