**Type III Environmental Product Declaration No. 746/2025**

Issuance date: 17.02.2025
Validation: 26.03.2025
Validity date: 17.02.2030

# Composite bars with diameters from Ø 6 mm to Ø 33 mm


## Owner of the EPD:

Comrebars Sp. z o. o.
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## EPD Program Operator:

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

**Basic information**

This declaration is the Type III Environmental Product Declaration (EPD) based on EN 15804+A2 and verified according to ISO 14025 by an external auditor. It contains the information on the impacts of the declared construction materials on the environment and their aspects verified by the independent body according to ISO 14025. Basically, comparison or evaluation of EPD data is possible only if all the compared data were created according to EN 15804+A2.

**Life cycle analysis (LCA):** A1-A3, A4, C1-C4 and D modules in accordance with EN 15804+A2
(Cradle-to-Gate with options)
**Product standards:** IBDiM-KOT/2021/0793, SK TP-23/0028
**The year of preparing the EPD:** 2025
**Service Life:** 100 years for standard product
**PCR:** ITB-PCR A
**Declared unit:** 1 kg
**Reasons for performing LCA:** B2B
**Representativeness:** Slovakia, European, 2023

## MANUFACTURER

**Comrebars Sp. z o. o.** ComRebars is an European manufacturer of composite bars with production plant in Stropkov, Slovakia. The technology of producing building materials from glass fibers allows to offer competitive prices and conditions compared to traditional steel bars. Company has a modern production line where produces composite bars in accordance with the technical approval IBDiM-KOT/2021/0793 and Factory Production Control. Comrebars operates based on research on material properties, as well as approvals for selected key foreign markets. The manufacturer provides comprehensive service from a design and construction team, which will ensure project optimization and technical support, thus giving a specific, ready-made solution. Since the company was founded in 2015, it has been cooperating with construction companies in Poland, and the products can be found in thousands of Polish and foreign roads, bridges, tunnels, in the foundations of hundreds of houses and housing estates, at railway stations, in industrial halls, water, aviation and military infrastructure.

## PRODUCTS DESCRIPTION AND APPLICATION

GFRP composite bars are the answer to the needs of the construction sector in terms of a successor to reinforcing steel, e.g. beams, slabs. For the production of prefabricated reinforced concrete elements. The bars can be used as poles in gardening and as posts for fences in pastures. ComRebars composite bars are not only cheaper per meter by up to 25% (than carbon steel and by up to 50-60% than galvanized and stainless steel), but also significantly reduce the required thickness of concrete. Other advantages of composite bars over steel bars:
they reduce material losses during cutting by 90% compared to steel;

- more cost-effective transport, logistics, personnel, speed and ease of installation that does not require as much heavy equipment and maintenance;
- due to their durability and non-reactivity, they do not require repair, replacement or renovation in concrete;
- composite bars are characterized by 2.5 times higher strength than AIIN steel;
- are a durable, long-lasting material, resistant to water, including salt water and other aggressive environments, which is why they are used in ports and water infrastructure, where they easily replace several times more expensive stainless steel;
- nine times lighter than steel, increasing transport efficiency many times.

Composite bars are resistant to chlorides, acids and chemicals, can be used in acidic and alkaline environments. Due to this, they are great for the construction of sewage and in the aquatic environment. They do not create an obstacle to the penetration of electromagnetic waves. They are an electrical insulator and do not conduct electricity - they can be used in magnetic resonance units in medical centers. composite bars have a low thermal conductivity coefficient λ, they are a thermal insulator. composite bars have more than a hundred times lower thermal conductivity compared to steel bars. Below in Table 1, there are produced diameters of ComRebars composite bars covered by EPD.

*Table 1. Produced diameters of ComRebars composite bars*

| Product Name | Diameters | Color |
|---|---|---|
| Composite bars Ø 6 mm | Ø 6 mm | Cream |
| Composite bars Ø 7 mm | Ø 7 mm | Cream |
| Composite bars Ø 8 mm | Ø 8 mm | Cream |

| | | |
|---|---|---|
| Composite bars Ø 9 mm | Ø 9 mm | Cream |
| Composite bars Ø 10 mm | Ø 10 mm | Cream |
| Composite bars Ø 11 mm | Ø 11 mm | Cream |
| Composite bars Ø 12 mm | Ø 12 mm | Cream |
| Composite bars Ø 14 mm | Ø 14 mm | Cream |
| Composite bars Ø 15 mm | Ø 15 mm | Cream |
| Composite bars Ø 16 mm | Ø 16 mm | Cream |
| Composite bars Ø 17 mm | Ø 17 mm | Cream |
| Composite bars Ø 18 mm | Ø 18 mm | Cream |
| Composite bars Ø 19 mm | Ø 19 mm | Cream |
| Composite bars Ø 20 mm | Ø 20 mm | Cream |
| Composite bars Ø 22 mm | Ø 22 mm | Cream |
| Composite bars Ø 25 mm | Ø 25 mm | Cream |
| Composite bars Ø 30 mm | Ø 30 mm | Cream |
| Composite bars Ø 31 mm | Ø 31 mm | Cream |
| Composite bars Ø 32 mm | Ø 32 mm | Cream |
| Composite bars Ø 33 mm | Ø 33 mm | Cream |

All additional technical information about the product is available on the manufacturer's website.

## LIFE CYCLE ASSESSMENT (LCA) – general rules applied

### Unit

The declared unit is 1 kg of product.

### System boundary

The life cycle analysis (LCA) of the declared products covers: product stage – modules A1-A4, end of life – modules C1-C4 and benefits and loads beyond the system boundary – module D (cradle-to-gate with options) in accordance with EN 15804+A2 and ITB PCR A (v 1.6) . Energy and water consumption, emissions as well as information on generated wastes were inventoried and were included in the calculations. It can be assumed that the total sum of omitted processes does not exceed 5% of all impact categories. In accordance with EN 15804+A2, machines and facilities (capital goods) required for the production as well as transportation of employees were not included in LCA.

### Allocation

The allocation rules used for this EPD are based on general ITB PCR A. Production of the Composite bars is a line process conducted in factory of Comrebars Sp. z o. o. located in Stropkov (Slovakia). Allocation was done on product mass basis. All impacts associated with the extraction and processing of raw materials used for the production of the declared product are allocated in module

A1 of the LCA. Impacts from the global line production of Comrebars Sp. z o. o. were inventoried and 100% were allocated to Composite bars production. Water and energy consumption (electricity, natural gas), associated emissions and generated wastes are allocated to module A3. Packaging materials were taken into consideration.

**System limits**

Minimum 99.0% input materials and 100% energy consumption (electricity, natural gas) were inventoried in a processing plant and were included in the calculation. In the assessment, all available data from production have been considered, i.e. all raw materials/elements used as per formulation process, utilized thermal energy for heating, and electric power consumption. Thus, material and energy flows contributing less than 1 % of mass or energy have been considered. It can be assumed that the total sum of neglected processes does not exceed 1 % of energy usage and mass per modules A or D. Machines and facilities required during production are neglected. The packaging products (stretch film, pallets, etc.) are included.

**Modules A1 and A2: *Raw materials supply and transport***

Modules A1 and A2 represent the extraction and processing of raw materials (mainly fiberglass, and epoxy resin) and transport to the production site. The fiberglass used comes from foreign suppliers. Module A2 (transport) includes truck and sea transport and uses Polish, Slovak and European averages for fuel data.

**Module A3: *Production***

The production of the Composite bars is carried out in factory of Comrebars Sp. z o. o. in Stropkov in Slovakia. The production includes the receipt of raw material deliveries for production, which are mainly fiberglass and epoxy resin. In the first stage of production, glass fibers in the form of roving are fed into the resin application tank where the fibers are impregnated. Then the combined main raw materials are fed into the forming dies where the composite rod is shaped. The next stage is curing, which is done by heating in a multi-zone cross-linking furnace and then cooling in a multi-stage cooler. The next stage is pulling the bars to obtain the required diameter. The final stage is cutting the finished composite bars to specific lengths. The finished composite bars are packed and shipped to customers. The diagram of the production process is shown in Figure 1.

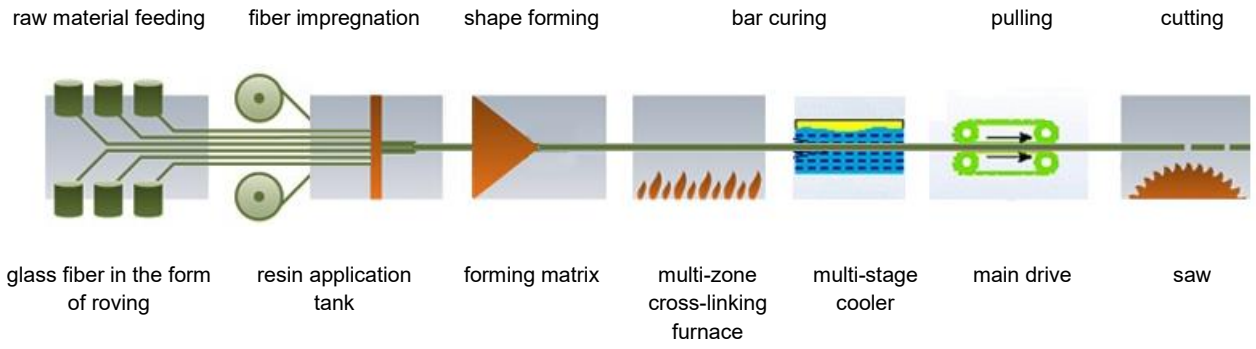


*Figure 1. Diagram of the manufacturing process of composite bars*

**Module A4: *Transport to consumer***

Transport of the Composite bars from plant to the recipient is carried out using trucks. Vehicle transport at distance 100 km is considered (emission standard: Euro 5) with 100% load capacity.

**Modules C and D*: End-of-life (EoL)***

It is assumed that at the end of life, It is assumed that 100% of the products can be recovered together with the demolition material in crushed and mixed form. Materials recovered from dismantled products are prepared/crushed as aggregate for the sub-base (C3) 90% or landfilled 10% (module C4). According to the realistic treatment practice of industrial waste 10% of composite is forwarded to landfill in the form of mixed construction and demolition wastes. Utilization of packaging material which constitute less than 1 % of the total system flows was not taken into consideration. Module D includes the profits from the use of material as an aggregate in a new product system.

**Data collection period**

The data for manufacture of the declared products refer to period between 01.01.2023 – 31.12.2023 (1 year). The life cycle assessments were prepared for Poland and Europe as reference area.

**Data quality**

The data selected for LCA originate from ITB-LCI questionnaires completed by Comrebars Sp. z o. o. and verified during data audit. No data collected is older than five years and no generic datasets used are older than ten years. The representativeness, completeness, reliability, and consistency is judged as good. The background data for the processes come from the following resources database Ecoinvent v.3.10. Specific (LCI) data quality analysis was a part of the input data verification.

**Assumptions and estimates**

The impacts of the representative products were aggregated using weighted average.

**Calculation rules**

LCA was performed using ITB-LCA tool developed in accordance with EN 15804+A2. Emission of greenhouse gases was calculated using the IPCC 2013 GWP method with a 100-year horizon. Emission of acidifying substances, emission of substances to water contributing to oxygen depletion, emission of gases that contribute to the creation of ground-level ozone, abiotic depletion, and ozone depletion emissions where all calculated with the CML-IA baseline method.

**Additional information**

Slovakia electricity emission factor used is 0.199 kg CO2/kWh (National for 2023). As a general rule, no particular environmental or health protection measures other than those specified by law are necessary.

## LIFE CYCLE ASSESSMENT (LCA) – Results

### Declared unit

The declaration refers to declared unit (DU) – 1 kg of Composite bars produced in Slovakia. The following life cycle modules (Table 2) were included in the analysis. The following tables 3-6 show the environmental impacts of the life cycle of selected modules (A1-A4+C1-C4+D).

*Table 2 System boundaries for the environmental characteristic of the product.*

| **Environmental assessment information (MD – Module Declared, MND – Module Not Declared, INA – Indicator Not Assessed)** | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Product stage | | | Construction process | | Use stage | | | | | | | End of life | | | | Benefits and loads beyond the system boundary |
| Raw material supply | Transport | Manufacturing | Transport to construction site | Construction-installation process | Use | Maintenance | Repair | Replacement | Refurbishment | Operational energy use | Operational water use | Deconstruction 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** |
| **MD** | **MD** | **MD** | **MD** | **MND** | **MND** | **MND** | **MND** | **MND** | **MND** | **NMD** | **MND** | **MD** | **MD** | **MD** | **MD** | **MD** |

*Table 3 Life cycle assessment (LCA) results of the product – environmental impacts (DU: 1 kg)*

| Indicator | Unit | A1 | A2 | A3 | A1-A3 | A4 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Global Warming Potential | eq. kg $CO_2$ | 3.29E+00 | 1.81E-01 | 7.32E-02 | 3.54E+00 | 1.67E-02 | 6.98E-03 | 1.67E-02 | 1.50E-02 | 1.06E-03 | -9.00E-03 |
| Greenhouse potential - fossil | eq. kg $CO_2$ | 3.30E+00 | 1.81E-01 | 4.98E-02 | 3.53E+00 | 1.66E-02 | 6.85E-03 | 1.66E-02 | 1.50E-02 | 1.05E-03 | -9.00E-03 |
| Greenhouse potential - biogenic | eq. kg $CO_2$ | -1.50E-02 | 5.78E-05 | 8.09E-04 | -1.41E-02 | 5.68E-05 | 2.00E-04 | 5.68E-05 | 5.11E-05 | 1.06E-05 | -5.40E-07 |
| Global warming potential - land use and land use change | eq. kg $CO_2$ | 2.58E-03 | 7.11E-05 | 1.26E-05 | 2.67E-03 | 6.52E-06 | 2.40E-06 | 6.52E-06 | 5.87E-06 | 1.07E-06 | -4.13E-05 |
| Stratospheric ozone depletion potential | eq. kg CFC 11 | 6.81E-08 | 3.25E-09 | 1.72E-09 | 7.31E-08 | 3.85E-09 | 1.40E-10 | 3.85E-09 | 3.46E-09 | 3.20E-10 | -1.69E-09 |
| Soil and water acidification potential | eq. mol H+ | 2.00E-02 | 2.16E-03 | 1.60E-05 | 2.22E-02 | 6.75E-05 | 7.60E-05 | 6.75E-05 | 6.07E-05 | 8.88E-06 | -3.78E-04 |
| Eutrophication potential - freshwater | eq. kg P | 8.93E-04 | 9.91E-06 | 7.92E-07 | 9.04E-04 | 1.12E-06 | 1.30E-05 | 1.12E-06 | 1.01E-06 | 3.06E-07 | -1.37E-05 |
| Eutrophication potential - seawater | eq. kg N | 4.06E-03 | 5.71E-04 | 5.47E-06 | 4.63E-03 | 2.04E-05 | 1.10E-05 | 2.04E-05 | 1.83E-05 | 3.06E-06 | -3.36E-05 |
| Eutrophication potential - terrestrial | eq. mol N | 4.29E-02 | 6.31E-03 | 5.66E-05 | 4.93E-02 | 2.22E-04 | 9.30E-05 | 2.22E-04 | 2.00E-04 | 3.33E-05 | -4.51E-04 |
| Potential for photochemical ozone synthesis | eq. kg NMVOC | 1.51E-02 | 1.92E-03 | 7.04E-05 | 1.71E-02 | 6.80E-05 | 2.60E-05 | 6.80E-05 | 6.12E-05 | 9.64E-06 | -1.08E-04 |
| Potential for depletion of abiotic resources - non-fossil resources | eq. kg Sb | 2.44E-04 | 4.51E-07 | 7.87E-09 | 2.44E-04 | 5.89E-08 | 3.34E-08 | 5.89E-08 | 5.30E-08 | 3.56E-09 | -2.68E-06 |
| Abiotic depletion potential - fossil fuels | MJ | 5.12E+01 | 2.43E+00 | 6.84E-01 | 5.43E+01 | 2.47E-01 | 1.16E-01 | 2.47E-01 | 2.22E-01 | 2.43E-02 | -3.16E-01 |
| Water deprivation potential | eq. $m^3$ | 8.14E-01 | 1.02E-02 | 2.13E+00 | 2.95E+00 | 1.14E-03 | 2.40E-03 | 1.14E-03 | 1.03E-03 | 1.41E-04 | -2.34E-02 |

*Table 4 Life cycle assessment (LCA) results of the product – additional impacts indicators (DU: 1 kg)*

| Indicator | Unit | A1-A4 | C1-C4 | D |
|---|---|---|---|---|
| Particulate matter | disease incidence | INA | INA | INA |
| Potential human exposure efficiency relative to U235 | eg. kBq U235 | INA | INA | INA |
| Potential comparative toxic unit for ecosystems | CTUe | INA | INA | INA |
| Potential comparative toxic unit for humans (cancer effects) | CTUh | INA | INA | INA |
| Potential comparative toxic unit for humans (non-cancer effects) | CTUh | INA | INA | INA |
| Potential soil quality index | dimensionless | INA | INA | INA |

*Table 5 Life cycle assessment (LCA) results of the product - the resource use (DU: 1 kg)*

| Indicator | Unit | A1 | A2 | A3 | A1-A3 | A4 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Consumption of renewable primary energy - excluding renewable primary energy sources used as raw materials | MJ | 3,38E+00 | 3,40E-02 | 1,83E-01 | 3,60E+00 | 3,54E-03 | 8.60E-03 | 3,54E-03 | 3,19E-03 | 4,27E-04 | -3,63E-02 |
| Consumption of renewable primary energy resources used as raw materials | MJ | 2,20E-01 | 0,00E+00 | 0,00E+00 | 2,20E-01 | 0,00E+00 | 0.00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| Total consumption of renewable primary energy resources | MJ | 3,60E+00 | 3,40E-02 | 1,79E-03 | 3,64E+00 | 3,54E-03 | 8.60E-03 | 3,54E-03 | 3,19E-03 | 4,27E-04 | -3,63E-02 |
| Consumption of non-renewable primary energy - excluding renewable primary energy sources used as raw materials | MJ | 4,82E+01 | 2,43E+00 | 9,20E+00 | 5,99E+01 | 2,47E-01 | 1.16E-01 | 2,47E-01 | 2,22E-01 | 2,63E-02 | -3,16E-01 |
| Consumption of non-renewable primary energy resources used as raw materials | MJ | 2,95E+00 | 0,00E+00 | 5,86E-01 | 3,53E+00 | 0,00E+00 | 0.00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| Total consumption of non-renewable primary energy resources | MJ | 5,12E+01 | 2,43E+00 | 6,84E-01 | 5,43E+01 | 2,47E-01 | 1.16E-01 | 2,47E-01 | 2,22E-01 | 2,63E-02 | -3,16E-01 |
| Consumption of secondary materials | kg | 1,21E-02 | 1,12E-03 | 4,64E-03 | 1,79E-02 | 8,27E-05 | 1.06E-05 | 8,27E-05 | 7,44E-05 | 0,00E+00 | -1,91E-04 |
| Consumption of renew. secondary fuels | MJ | 7,62E-03 | 1,05E-05 | 8,65E-08 | 7,63E-03 | 9,11E-07 | 5.91E-08 | 9,11E-07 | 8,20E-07 | 0,00E+00 | -1,16E-05 |
| Consumption of non-renewable secondary fuels | MJ | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 9.39E-05 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| Net consumption of freshwater | $m^3$ | 2,19E-02 | 2,73E-04 | 3,18E-04 | 2,25E-02 | 3,10E-05 | 3.15E-05 | 3,10E-05 | 2,79E-05 | 3,79E-06 | -5,73E-04 |

*Table 6 Life cycle assessment (LCA) results of the product – waste categories (DU: 1 kg)*

| Indicator | Unit | A1 | A2 | A3 | A1-A3 | A4 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Hazardous waste | kg | 1.96E-01 | 3.41E-03 | 3.18E-04 | 1.99E-01 | 2.77E-04 | 1.20E-06 | 2.77E-04 | 2.49E-04 | 3.83E-08 | -2.21E-03 |
| Non-hazardous waste | kg | 6.92E+00 | 6.45E-02 | 1.59E-02 | 7.00E+00 | 4.92E-03 | 6.24E-05 | 4.92E-03 | 4.42E-03 | 1.00E-01 | -6.15E-02 |
| Radioactive waste | kg | 6.63E-05 | 6.18E-07 | 8.80E-05 | 1.55E-04 | 1.84E-08 | 8.70E-08 | 1.84E-08 | 1.66E-08 | 1.48E-07 | -8.34E-07 |
| 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 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Materials for recycling | kg | 9.96E-04 | 1.02E-04 | 5.22E-07 | 1.10E-03 | 7.64E-07 | 1.20E-07 | 7.64E-07 | 6.87E-07 | 0.00E+00 | -4.28E-06 |
| Materials for energy recovery | kg | 3.63E-06 | 1.20E-07 | 1.11E-08 | 3.76E-06 | 6.18E-09 | 1.05E-09 | 6.18E-09 | 5.56E-09 | 0.00E+00 | -3.98E-07 |
| Exported Energy | MJ | 5.26E-02 | 7.59E-04 | 2.22E-05 | 5.34E-02 | 0.00E+00 | 3.46E-04 | 0.00E+00 | 0.00E+00 | 0.00E+00 | -8.59E-04 |

## Verification

The process of verification of this EPD is in accordance with ISO 14025 and ISO 21930. After verification, this EPD is valid for a 5-year-period. EPD does not have to be recalculated after 5 years, if the underlying data have not changed significantly.

| The basis for LCA analysis was EN 15804+A2 and ITB PCR A |
|---|
| Independent verification corresponding to ISO 14025 (subclause 8.1.3.)<br>☒ external ☐ internal |
| External verification of EPD: Halina Prejzner, PhD. Eng.<br>LCI audit and verification: Filip Poznański, M.Sc. Eng.<br>LCA, LCI audit and input data verification: Michał Piasecki, PhD., D.Sc., Eng. |

*Note 1: The declaration owner has the sole ownership, liability, and responsibility for the information provided and contained in EPD. Declarations of construction products may not be comparable if they do not comply with EN 15804+A2. For further information about comparability, see EN 15804+A2 and ISO 14025.*

*Note 2: ITB is a public Research Organization and Notified Body (EC Reg. no 1488) to the European Commission and to other Member States of the European Union designated for the tasks concerning the assessment of building products' performance. ITB acts as the independent, third-party verification organization (ISO 17025/17065/17029). ITB-EPD program is recognized and registered member of The European Platform - Association of EPD program operators and ITB-EPD declarations are registered and stored in the international ECO-PORTAL.*

## Normative references


- ITB PCR A General Product Category Rules for Construction Products (2023)
- Krajowa Ocena Techniczna nr IBDiM-KOT/2021/0793
- SK Technické posúdenie SK TP-23/0028
- ISO 14025:2006, Environmental labels and declarations – Type III environmental declarations – Principles and procedures
- ISO 21930:2017 Sustainability in buildings and civil engineering works – Core rules for environmental product declarations of construction products and services
- ISO 14044:2006 Environmental management – Life cycle assessment – Requirements and guidelines
- ISO 15686-1:2011 Buildings and constructed assets – Service life planning – Part 1: General principles and framework
- ISO 15686-8:2008 Buildings and constructed assets – Service life planning – Part 8: Reference service life and service-life estimation
- EN 15804:2012+A2:2019 Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products
- ISO 14067:2018 Greenhouse gases — Carbon footprint of products — Requirements and guidelines for quantification
- PN-EN 15942:2012 Sustainability of construction works – Environmental product declarations – Communication format business-to-business
- https://ecoinvent.org/


LCA,LCI, input data verification
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# CERTIFICATE № 746/2025
# of TYPE III ENVIRONMENTAL DECLARATION

Products:

**Composite bars with diameters from Ø 6 mm to Ø 33 mm**

Manufacturer:

**Comrebars Sp. z o. o.**
ul. T. Kościuszki 227, 40-950 Katowice, 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+A2**

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

This certificate, issued on 17th February 2025 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, February 2025