

## Steel structures



**EPD Program Operator:**

Building Research Institute (ITB)  
Address: Filtrowa 1, 00-611 Warsaw, Poland  
Website: [www.itb.pl](http://www.itb.pl)  
Contact: Justyna Tomaszewska  
[j.tomaszewska@itb.pl](mailto:j.tomaszewska@itb.pl)  
[energia@itb.pl](mailto:energia@itb.pl)

**Owner of the EPD:**

PROMOSTAL Sp. z o.o. Sp.k.  
Address: Fabryczna 7/29,  
16-020 Czarna Białostocka, Poland  
Website: <http://www.promostal.pl>  
Tel.: (+48) 85 876 86 01  
Contact: [sekretariat@promostal.pl](mailto:sekretariat@promostal.pl)

ITB is the verified member of The European Platform for EPD program operators and LCA practitioner [www.eco-platform.org](http://www.eco-platform.org)

### Basic information

This declaration is the type III Environmental Product Declaration (EPD) based on EN 15804 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. Their aspects were verified by the independent body according to ISO 14025. Basically, a comparison or evaluation of EPD data is possible only if all the compared data were created according to EN 15804 (see point 5.3 of the standard).

**Life cycle analysis (LCA):** A1-A5, C1-C4 and D modules in accordance with EN 15804 (Cradle to gate with options)

**The year of preparing the EPD:** 2019

**Product standard:** EN 1090-1 and -2, ISO 3834-2

**Service Life:** 100 years for standard product

**PCR:** ITB-PCR A (PCR based on EN 15804)

**Declared unit:** 1 ton

**Reasons for performing LCA:** B2B

**Representativeness:** Polish product

## MANUFACTURER

Promostal Sp. z o.o. Sp.k. was established in 2008 by the managing and engineering team experienced in the field of steel structures. The company undertakes design, fabrication and erection of steelwork for all the forms of construction in industrial and commercial buildings, but also steel constructions for the technology. The production is executed in the workshop halls on the area of 7000 m<sup>2</sup>, where also the designing department using TEKLA Structures software is situated. The company provides complete service including delivery and assembly by Promostal Sp. z o.o. Sp.k. or Promostal AS. To meet customers' expectations, the company offers the CE marking of its products. Promostal has met all the procedure requirements and became a qualified supplier of steel structure also in the German market (Registernummer: 011.160038).

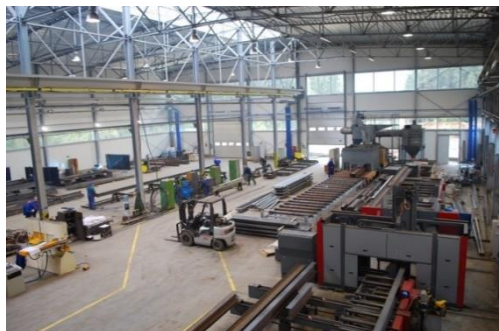


Fig. 1. A view of the Promostal Sp. z o.o. Sp.k. production hall in Czarna Białostocka.

## PRODUCT DESCRIPTION

The steel structures are manufactured in execution classes from EXC1 to EXC4 according to EN 1090-1 and EN 1090-2. The maximum dimensions of the structures are 6 m x 6 m x 50 m and the weight of a shipping element up to 50 tons. The steel structures can be painted hydrodynamically and / or hot dip galvanized. Welding methods utilized by Promostal Sp. z o.o. Sp.k. are compliant with PN-EN-ISO 40663: 111, 121, 131, 135, 136, 138, 141, 783. Steel semi-finished products used for the manufacturing of the steel structures have steel grade from S235 up to S500 and originate from various still mills which names are listed in Table 1. An average composition of a steel structure produced by Promostal Sp. z o.o. Sp.k. is presented in Table 2.

**Table 1. Origin of the steel semi-finished products used by Promostal Sp. z o.o. Sp.k. for the production of the steel structures**

L.p.	Name of a steel mill						
1	ISD Huta Częstochowa	2	Vitkowice Steel	3	Byelorussian Metallurgical Company	4	Alchemia Oddział Rurexpol
5	ArcelorMittal Dąbrowa Górnicza	6	Vallourec Deutschland	7	Interpipe NMPP	8	Alchemia Oddział Walcownia Rur Batory
9	ArcelorMittal Beval & Differdafge	10	Dillinger Hütte	11	ArcelorMittal Tubular Products Kraków	12	Alchemia Walcownia Rur Andrzej
13	ArcelorMittal Ostrava	14	Illsenburg Grobblech	15	ArcelorMittal Galati	16	Salzgitter Mannesmann Grobblech
17	Walcownia Blach Batory	18	Arvedi Tubi Acciaio	19	Železiarne Podbrezová	20	LLC Severstal TPZ – Sheksna
21	PEINER TRAGER	22	CMC Poland	23	ROHRWERK MAXHÜTTE	24	ArcelorMittal Kraków
25	STAHLWERK THURINGEN	26	CELSA Huta Ostrowiec	27	Valcovny trub Chomutov	28	Walcownie Ostrowieckie WOST
29	TATA STEEL	30	ArcelorMittal Tubular Products LEXY	31	MARCEGAGLIA KLUCZBORK	32	VOESTALPINE KREMS
33	SSAB Europe	34	Corinth Pipeworks	35	Huta Pokój	36	BENTELER Steel/Tube

## Environmental Product Declaration Type III ITB No. 082/2019

37	DANSTEEL	38	Alessio Tubi	39	Huta Łabędy	40	AZOUSTAL IRON& Steel Works
41	AFV Acciaierie BELTRAME	42	Trinecke Zelezary Morawia Steel	43	Padana Tubi	44	Manessman Line Pipe
45	ILYICH IRON AND STEEL WORKS						

**Table 2. An average composition of a steel structure manufactured by Promostal Sp. z o.o. Sp.k.**

Component	% contribution (mass)
Steel	94.5%
Ancillary materials (i.a. welding wire, gases)	3.0%
Anticorrosive paint	1.6%
Packaging materials	0.9%

### APPLICATIONS

Promostal Sp. z o.o. Sp.k. manufactures wide range of steel structures dedicated for the construction of large building structures, towers (including pipe towers), bridges, viaducts, foot-bridges, trestle bridges, conveyor enclosures, cranes, but also elements of equipment as well as other, non-standard welded structures. The steels structures are intended for bolted, welded or otherwise connected constructions of buildings, bridges and other structures or in composite steel and concrete structures, for example:

- single storey buildings (industrial and storage halls, etc.)
- multi-storey buildings (offices, residential buildings, shops, car parks, high rise, etc.)
- bridges (railway bridge, road bridge, pedestrian bridge, etc.)
- other structures (power plants, stadiums, convention centers, airports, stations, etc.)

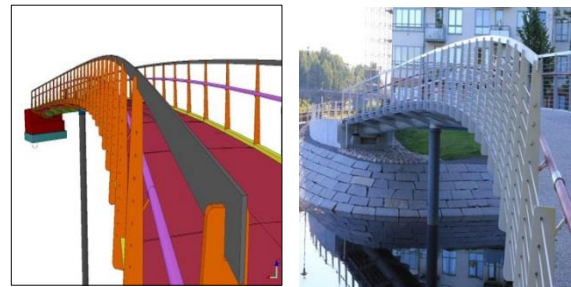


Fig. 2. A project of a bride carried out by Promostal Sp. z o.o. Sp.k.

Promostal Sp. z o.o. Sp.k. can also provide steel columns, beams, trusses, HSQ beams, embedded details and other unstandardized steel details and sections made of welded hot-rolled steel plates for building frame structures.

### Examples of the executed projects:



Fig. 3. RHI Fusion plant (Norway)



Fig. 4. Horten high school (Norway)



Fig. 5. Sewage treatment plant of Lotos group (Poland)

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

### Allocation

The allocation rules used for this EPD are based on general ITB PCR A. Production of the steel structures is a line process in one factory of Promostal Sp. z o.o. Sp.k. in Czarna Białostocka (Poland). Allocation was done on product mass basis. All impacts from raw materials extraction are allocated in A1 module of the EPD (including materials and energy consumption, transportation, emissions and wastes resulting from the production of steel semi-finished products in the steel mills). 100% of impacts from line production of Promostal Sp. z o.o. Sp.k were inventoried and were allocated to the steel structures production. Module A2 includes transport of the steel semi-finished products from their polish suppliers located in Poland to Promostal factory in Czarna Białostocka. Municipal waste and waste water of whole factory were allocated to module A3. Energy supply was inventoried for whole the production process. Emissions in the factory are measured and were allocated to module A3.

### System limits

The life cycle analysis of the declared products covers “Product Stage”, A1-A3 modules (Cradle to Gate) with options (A4-A5, C1-C4 and D) in accordance with EN 15804+A1 and ITB PCRA. The details of systems limits are provided in product technical report. All materials and energy consumption inventoried in factory were included in calculation. Office impacts were also taken into consideration. In the assessment, all significant parameters from gathered production data are considered, i.e. all material used per formulation, utilised thermal energy, internal fuel and electric power consumption, direct production waste, and all available emission measurements. It can be assumed that the total sum of omitted processes does not exceed 5% of all impact categories. In accordance with EN 15804+A1, machines and facilities (capital goods) required for and during production are excluded, as is transportation of employees.

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

Steel semi-finished products used for the production of the steel structures come from various steel mills listed in Table 1. Ancillary materials such as welding wires, gases used for welding purposes, anticorrosive paints and packaging materials come from local Polish suppliers. Data on transport of the different products to the manufacturing plants is collected and modelled for factory by assessor. Means of transport include trucks. For calculation purposes Polish and European fuel averages are applied.

### A3: Production

The manufacturing of the steel structures is carried out with the use of various steel semi-finished products such as beams, profiles, plates or tubes depending on the desired geometry and the final application. Preliminary shot blasting initiates the formation process of each steel structure.

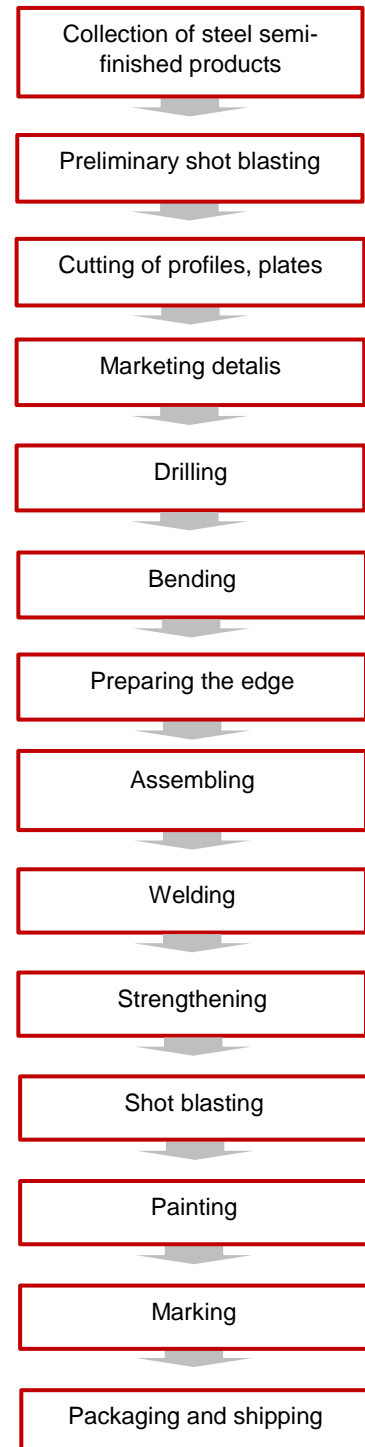


Fig. 6. A scheme of manufacturing steel structures in Promostal Sp. z o.o. Sp.k factory in Czarna Białostocka.

Such prepared steel semi-finished products are subjected to cutting, marking, drilling and bending. Then the component undergoes operations providing the proper quality of its edges and is assembled and welded according to a project. In the next steps such obtained structure is strengthened, shot blasted, painted and marked.

**A4: Transport to the construction site**

Steel constructions manufactured by Promostal Sp. z o.o. Sp.k. in 2018 were distributed to constructions sites located in Europe and North America. An average distance between Czarna Białostocka and a constructions site country were used for the environmental impact calculations. The list of destinations is presented in Table 3.

**Table 3. Destinations of steel structures manufactured by Promostal Sp. z o.o. Sp.k. in 2018.**

Country	% of production	Distance, km	Type of transport	Fuel consumption l/100 km
Poland	33.1%	250	Lory truck > 16t	35
Denmark	30.4%	1350	Lory truck > 16t	35
Norway	26.5%	2120	Lory truck > 16t	35
Switzerland	6.2%	1600	Lory truck > 16t	35
Sweden	2.3%	2160	Lory truck > 16t	35
USA	1.4%	440	Lory truck > 16t	35
Germany	0.086%	1130	Lory truck > 16t	35
Belgium	0.003%	1500	Lory truck > 16t	35

**A5: Installation process**

Impacts from the use of cranes, service platforms, electric tools, welders and consumable such as welding wires, coatings, steel fitting elements and associated energy consumption were included in the calculations.

**C1: Demolition**

It is assumed that impacts which occur during the demolition stage amount to 1/3 of burdens caused by the use of cranes, service platforms and electric tools in the installation stage (A5). This module takes into account 1% of losses resulting from the collection of mixed construction wastes.

**C2: Transport to waste processing**

Transport from a demolition site to a waste processing plant is estimated to an average 50 km on a 24 ton loaded lorry with 85% capacity utilization and fuel consumption of 35 L per 100 km.

**C3: Waste processing**

This module takes into account sorting, shredding and pressing of the steel at the end-of-life.

**C4: Disposal**

Steel is 100% recyclable, thus it is estimated that at the end-of-life only 1% of the declared product is disposed to landfill in the form of mixed construction wastes. Utilization of packaging material such as stretch foil, PP bands, wooden spacer and steel mounting elements which constitute less than 1% of the total system flows was not taken into consideration.

**D: Re-use, recovery, recycling potential**

Benefits and loads beyond the system boundary were calculated using a net scrap formulation proposed by World Steel Association in *Life cycle inventory methodology report (2017)* where the net scrap is determined as a difference between the amount of steel recycled at end-of-life and the scrap input from previous product life cycle (assumed 60%).

**Table 4. Re-use, recovery and recycling potential – scenario information**

Parameter	Value
Collection	100%
Loss (mixed construction waste)	1%
Recycling	98%
Re-use	1%
Net scrap	380 kg

**Data collection period**

The data for manufacture of the declared products refers to period between 01.01.2018 – 31.12.2018 (1 year). The life cycle assessments were prepared for Poland as reference area.

**Data quality**

The values determined to calculate the LCA originate from verified Promostal Sp. z o.o. Sp.k inventory data.

**Assumptions and estimates**

The impacts of the representative the steel structures were aggregated using weighted average. Impacts were inventoried and calculated for all products of the steel structures.

**Calculation rules**

LCA was done in accordance with PN-EN 15805 and ITB PCR A document.

**Databases**

The data for the processes come from the following databases: Ecoinvent v.3.5, specific EPDs, ELCD, Ullmann's, ITB-Data. Specific data quality analysis was a part of external ISO 14001 audit. Characterization factors are CML ver. 4.2 based on EN 15804:2013+A1 version (PN-EN 15804+A1:2014-04).

**LIFE CYCLE ASSESSMENT (LCA) – Results**

**Declared unit**

The declaration refers to functional unit (FU) – 1 ton of the steel structures produced by Promostal Sp. z o.o. Sp.k

**Table 5. System boundaries for the environmental characteristic of the steel structures**

Environmental assessment information (MNA – Module not assessed, MD – Module 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	MD	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MD	MD	MD	MD	MD

## Steel structures

Environmental impacts: (FU) 1 ton							
Indicator	Unit	A1	A2	A3	A1-A3	A4	A5
Global warming potential	[kg CO <sub>2</sub> eq.]	1.51E+03	6.59E+01	2.87E+02	1.86E+03	6.72E+01	1.25E+02
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	6.26E-06	0.00E+00	0.00E+00	6.26E-06	0.00E+00	3.36E-05
Acidification potential of soil and water	[kg SO <sub>2</sub> eq.]	4.05E+00	2.61E-01	3.27E-02	4.34E+00	6.76E-01	9.10E-01
Formation potential of tropospheric ozone	[kg Ethene eq.]	5.66E-01	2.98E-02	2.62E+00	3.21E+00	3.24E-02	9.44E-02
Eutrophication potential	[kg (PO <sub>4</sub> ) <sup>3-</sup> eq.]	6.12E-01	3.91E-02	6.04E-03	6.58E-01	1.11E-01	2.09E-01
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	8.57E-04	0.00E+00	1.06E-03	1.92E-03	0.00E+00	7.79E-05
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	1.50E+04	3.00E+02	1.55E+04	3.08E+04	8.22E+02	3.33E+02
Environmental aspects on resource use: (FU) 1 ton							
Indicator	Unit	A1	A2	A3	A1-A3	A4	A5
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA	INA	INA
Use of renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA	INA	INA
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	[MJ]	1.40E+03	2.10E+01	1.67E+02	1.59E+03	5.76E+01	1.86E+01
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA	INA	INA
Use of non-renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA	INA	INA
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)	[MJ]	1.60E+04	3.15E+02	1.63E+04	3.26E+04	8.64E+02	3.50E+02
Use of secondary material	[kg]	6.41E+02	0.00E+00	0.00E+00	6.41E+02	0.00E+00	6.24E-01
Use of renewable secondary fuels	[MJ]	6.53E-03	1.58E+01	0.00E+00	1.58E+01	4.32E+01	6.37E-06
Use of non-renewable secondary fuels	[MJ]	6.30E-02	0.00E+00	0.00E+00	6.30E-02	0.00E+00	6.14E-05
Net use of fresh water	[m <sup>3</sup> ]	INA	INA	INA	INA	INA	INA
Other environmental information describing waste categories: (FU) 1 ton							
Indicator	Unit	A1	A2	A3	A1-A3	A4	A5
Hazardous waste disposed	[kg]	2.29E+00	5.17E-05	5.38E+00	7.68E+00	1.42E-04	3.47E-03
Non-hazardous waste disposed	[kg]	7.71E+01	4.80E-02	1.17E+01	8.89E+01	1.31E-01	3.74E+00
Radioactive waste disposed	[kg]	3.75E-01	0.00E+00	0.00E+00	3.75E-01	0.00E+00	3.65E-04
Components for re-use	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	[kg]	2.41E-02	0.00E+00	1.09E+02	1.09E+02	0.00E+00	7.42E-04
Materials for energy recover	[kg]	0.00E+00	0.00E+00	1.53E-02	1.53E-02	0.00E+00	0.00E+00
Exported energy	[MJ per energy carrier]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

## Environmental Product Declaration Type III ITB No. 082/2019

<b>Environmental impacts: (FU) 1 ton</b>						
Indicator	Unit	C1	C2	C3	C4	D
Global warming potential	[kg CO <sub>2</sub> eq.]	3.31E+01	3.80E+00	1.39E+01	5.29E-02	-1.20E+03
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	9.81E-06	0.00E+00	1.47E-06	1.90E-08	4.56E-06
Acidification potential of soil and water	[kg SO <sub>2</sub> eq.]	2.57E-01	2.77E-02	1.14E-01	3.98E-04	-9.17E-01
Formation potential of tropospheric ozone	[kg Ethene eq.]	2.73E-02	2.02E-03	6.82E-03	3.68E-05	-2.03E+00
Eutrophication potential	[kg (PO <sub>4</sub> ) <sup>3-</sup> eq.]	5.96E-02	4.89E-03	5.04E-02	8.43E-05	-4.43E-01
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	1.83E-05	0.00E+00	2.32E-04	5.95E-08	4.36E-04
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	8.65E+01	3.16E+01	1.98E+02	1.63E+00	-2.15E+04
<b>Environmental aspects on resource use: (FU) 1 ton</b>						
Indicator	Unit	C1	C2	C3	C4	D
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA	INA
Use of renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA	INA
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	[MJ]	4.58E+00	2.21E+00	3.29E+01	3.53E-02	1.32E+03
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA	INA
Use of non-renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA	INA
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)	[MJ]	8.40E+02	3.32E+01	1.81E+02	1.70E+00	-1.25E+04
Use of secondary material	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of renewable secondary fuels	[MJ]	0.00E+00	1.66E+00	0.00E+00	0.00E+00	0.00E+00
Use of non-renewable secondary fuels	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Net use of fresh water	[m <sup>3</sup> ]	INA	INA	INA	INA	INA
<b>Other environmental information describing waste categories: (FU) 1 ton</b>						
Indicator	Unit	C1	C2	C3	C4	D
Hazardous waste disposed	[kg]	3.53E-04	5.81E-06	3.81E-04	0.00E+00	-4.38E+00
Non-hazardous waste disposed	[kg]	1.08E+01	5.39E-03	5.16E+00	1.00E+01	2.00E+01
Radioactive waste disposed	[kg]	5.49E-03	0.00E+00	8.50E-04	0.00E+00	-3.72E-01
Components for re-use	[kg]	1.00E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	[kg]	9.80E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for energy recover	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy	[MJ per energy carrier]	INA	INA	INA	INA	INA



## 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 and ITB PCR A
Independent verification corresponding to ISO 14025 (subclause 8.1.3.) <input checked="" type="checkbox"/> external <input type="checkbox"/> internal
External verification of EPD: PhD. Eng. Halina Prejzner LCA, LCI audit and input data verification: PhD. Eng. Justyna Tomaszewska, j.tomaszewska@itb.pl Verification of LCA: PhD. Eng. Michał Piasecki, m.piasecki@itb.pl

## Normative references

- ITB PCR A General Product Category Rules for Construction Products
- ISO 14025:2006, Environmental labels and declarations – Type III environmental declarations – Principles and procedure
- 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+A1:2013 Sustainability in construction works – Environmental product declarations – Core rules for the product category of construction products
- PN-EN 15942:2012 Sustainability of construction works – Environmental product declarations – Communication format business-to-business
- KOBiZE Wskaźniki emisyjności CO<sub>2</sub>, SO<sub>2</sub>, NO<sub>x</sub>, CO i pyłu całkowitego dla energii elektrycznej, grudzień 2017
- PN-EN 1090-1+A1:2012 Wykonanie konstrukcji stalowych i aluminiowych -- Część 1: Zasady oceny zgodności elementów konstrukcyjnych
- PN-EN 1090-2:2018-09 Wykonanie konstrukcji stalowych i aluminiowych -- Część 2: Wymagania techniczne dotyczące konstrukcji stalowych
- PN-EN ISO 3834-2:2007 Wymagania jakości dotyczące spawania materiałów metalowych -- Część 2: Pełne wymagania jakości
- World Steel Association 2017 Life Cycle inventory methodology report for steel products



**Building Research Institute**

00-611 Warszawa, ul. Filtrów 1

KIEROWNIK  
Zakładu Fizyki Ciepłej, Akustyki i Środowiska  
dr inż. Michał Piasecki



**Instytut Techniki Budowlanej**

00-611 Warsaw, Filtrowa 1

**Thermal Physics, Acoustics and Environment Department**

02-656 Warsaw, Ksawerów 21

# **CERTIFICATE No 082/2019 of TYPE III ENVIRONMENTAL DECLARATION**

Product:

**Steel structures**

Manufacturer:

**PROMOSTAL Sp. z o.o. Sp.k.**

ul. Fabryczna 7/29, 16-020 Czarna Białostocka, Poland

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

**PN-EN 15804+A1:2014-04**

**Sustainability of construction works.**

**Environmental product declarations.**

**Core rules for the product category of construction products.**

This certificate, issued for the first time on 10<sup>th</sup> April 2019 is valid for 5 years  
or until amendment of mentioned Environmental Declaration

Head of the Thermal Physic, Acoustics  
and Environment Department

A handwritten signature in blue ink, appearing to read 'Piasecki', is written over the printed name of Michał Piasecki, PhD.

Michał Piasecki, PhD



Deputy Director  
for Research and Innovation

A handwritten signature in blue ink, appearing to read 'Kuczyński', is written over the printed name of Krzysztof Kuczyński, PhD.

Krzysztof Kuczyński, PhD

Warsaw, April 2019