



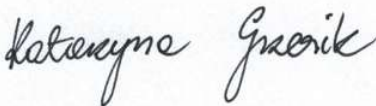
**ENVIRONMENTAL PRODUCT DECLARATION**  
**no. 01-10/2024**

**Steel structures**



<b>Declaration owner:</b>	<b>Weldon Sp. z o.o.</b>
<b>Program owner:</b>	<b>Łukasiewicz – Institute of Ceramics and Building Materials Environmental Engineering Center</b>
<b>Name of program:</b>	<b>Environmental Product Declaration – B2B</b>
<b>Date of issue:</b>	<b>30.10.2024</b>
<b>Declaration valid until:</b>	<b>30.10.2029</b>

### 1. OVERVIEW

<b>Product of declaration:</b>	Steel structures: <ul style="list-style-type: none"> <li>• made of carbon steel,</li> <li>• made of galvanized steel,</li> <li>• made of painted steel,</li> <li>• made of painted and galvanized steel.</li> </ul>
<b>Program Owner:</b> Łukasiewicz – Institute of Ceramics and Building Materials Environmental Engineering Center in Opole. <a href="http://www.icimb.pl/opole/">http://www.icimb.pl/opole/</a>	<b>Declaration owner:</b> <b>Weldon Sp. z o.o.</b> 39-102 Brzezówka 90 a Telefon: +48 14 6466730 Adres e-mail: sekretariat@weldon.pl <a href="https://www.weldon.pl/">https://www.weldon.pl/</a>
<b>Declared unit:</b>	1 tona
<b>Date of issue:</b>	30.10.2024
<b>Declaration valid until:</b>	30.10.2029
<b>Life Cycle Analysis (LCA):</b>	The LCA analysis includes modules A1-A3, A4, A5, C1-C4 and D according to PN-EN 15804+A2 (Cradle-to-Gate with options)
<b>Product Categorization (PCR) Rules</b>	PN-EN 15804+A2:2020-03 Sustainability of construction works. Environmental Product Declarations. Basic principles of categorization of construction products, ICIMB-PCR A
<b>Representatives:</b>	Polish product, year 2023
<b>Declared durability:</b>	50 years
<b>Reasons for performing LCA:</b>	B2B
<b>Standardy produktu</b>	EN 1090-1, EN 1090-2, ISO 3834-2
<b>Declarations that are the result of different programs or are not performed in accordance with the standard may not be comparable.</b>	
The Łukasiewicz – Institute of Ceramics and Building Materials Environmental Engineering Center provides access to the Type III environmental declaration for steel structures to interested parties.	
<b>The declaration owner is responsible for the information and the base evidence. Łukasiewicz Research Network - Institute of Ceramics and Building Materials Center for Environmental Engineering is not responsible for the manufacturer's information and data and evidence regarding the life cycle assessment.</b>	
<b>Authors' team:</b> Katarzyna Kiprian, M.Sc. Ewa Głodek-Bucyk, Ph.D. Patryk Okoń, M.Sc. <b>Approved:</b>  Joanna Poluszyńska, PhD Director of the Environmental Engineering Center  Ewa Głodek-Bucyk, Ph.D. Leader of the Process Engineering Research Group	<b>Review:</b> CEN standard PN-EN 15804+A2 serves as the main PCR document. Independent verification of declarations and data according to EN ISO 14025:2010 <input type="checkbox"/> Internal <input checked="" type="checkbox"/> External  Katarzyna Grzesik, PhD, DSc

## 2. MANUFACTURER AND PRODUCT INFORMATION



Figure 1. Company Weldon Sp. z o.o. in Brzezówka.

Weldon Sp. z o.o. from Brzezówka was established in January 2003. (a view of the company is shown in Figure 1) from the merger of Metal System Sp. z o.o. Dębica and Eko-Świat Ropczyce, which, after consolidation, brought the necessary technical knowledge and key technological solutions for containers, modular buildings, noise barriers, steel structures and power poles. The company is one of the national leaders in the segment of production of a wide range of containers and modular buildings as well as steel structures. Since 07.08.2013, Dębica Galvanizing Plant has been part of the Weldon, providing anti-corrosion protection services through hot-dip galvanizing of steel structures and metal elements.

As part of the quality policy, products are subject to rigorous quality control. On the premises of the plants, special attention is paid to the protection of the natural environment as well as occupational health and safety. The company has the following certificates:

- Integrated Management System: Quality, Environment and Health and Safety PN-EN ISO 9001:2015-10; PN-EN ISO 14001:2015-09; PN-ISO 45001:2018-06.
- System AQAP 2110:2016.
- Quality system in Welding according to PN-EN ISO 3834-2:2021-9.
- Compliance of the Factory Production Control according to PN-EN 1090-1+A1:2012; PN-EN 1090-2:2018-09 (steel structural elements, 1090-1+EXC3).
- Welding rail vehicles and their components according to PN-EN 15085-2:2021-03.

An important area of the company's activity is the production of steel structures, steel warehouses and production halls and their assembly. The company manufactures the following steel structures: boarding bridges, supporting structures, industrial stairs, stairs for containers, technical stairs, emergency stairs, spiral stairs, stairs for tanks, technical ladders, staircases, steel platforms, steps and stair platforms, steel railings and railings, steel stairs, trainers for the army and fire brigade, power poles, acoustic screens and individual, non-standard technical containers dedicated to the following industries: energy, aviation, heating, railway and construction.

Another branch of the Company's activity is Weldon Sp. z o.o. Green Wall Noise Barriers (presented in Figure 2), which have the National Technical Assessment No. IBDiM-KOT-2018/0172 issue 1 issued by the IBDiM in Warsaw. The company has a dedicated production line for the construction of power poles (Fig. 3). The plant manufactures all types of truss-steel poles and a full range of steel structures for the power industry, such as linear gates, elevations, brackets, reinforcements and anchors. Structures for all power facilities made of steel, which is subjected to the galvanizing process, guaranteeing high corrosion resistance.



Figure 2. Noise barriers manufactured by Weldon Sp. z o.o.



Figure 3. Power pole produced by Weldon Sp. z o.o.

## **PRODUCT DESCRIPTION AND APPLICATION**

EPD covers steel structures in execution classes from the lowest EXC1 to the highest EXC3 in accordance with PN-EN 1090-2:2018-09.

The process of preparing the material for production begins with the gathering of steel at the machines, which is then subjected to various technological processes depending on the future application of the element, such as: gas and plasma cutting, band saw cutting, guillotine cutting, laser cutting, punching holes, drilling holes, marking, bending, turning, threading and deburring. All processes involving the preparation of the material are carried out on devices with a high degree of automation, which allows to reduce losses occurring during steel processing and to increase the efficiency of the time needed to make individual elements of steel structures. The prepared elements are blasted by blasting, and then the joints of the elements are made by welding. Shot blasting and welding are automated. After these processes, a carbon steel structure is obtained. Depending on the individual requirements of the customer, the carbon steel structure is subject to the process of hot-dip galvanizing, painting with the use of painting units or both processes. The finished product is packed and assembled according to individual customer requirements.

Production of steel structures is presented on the scheme (fig.4).

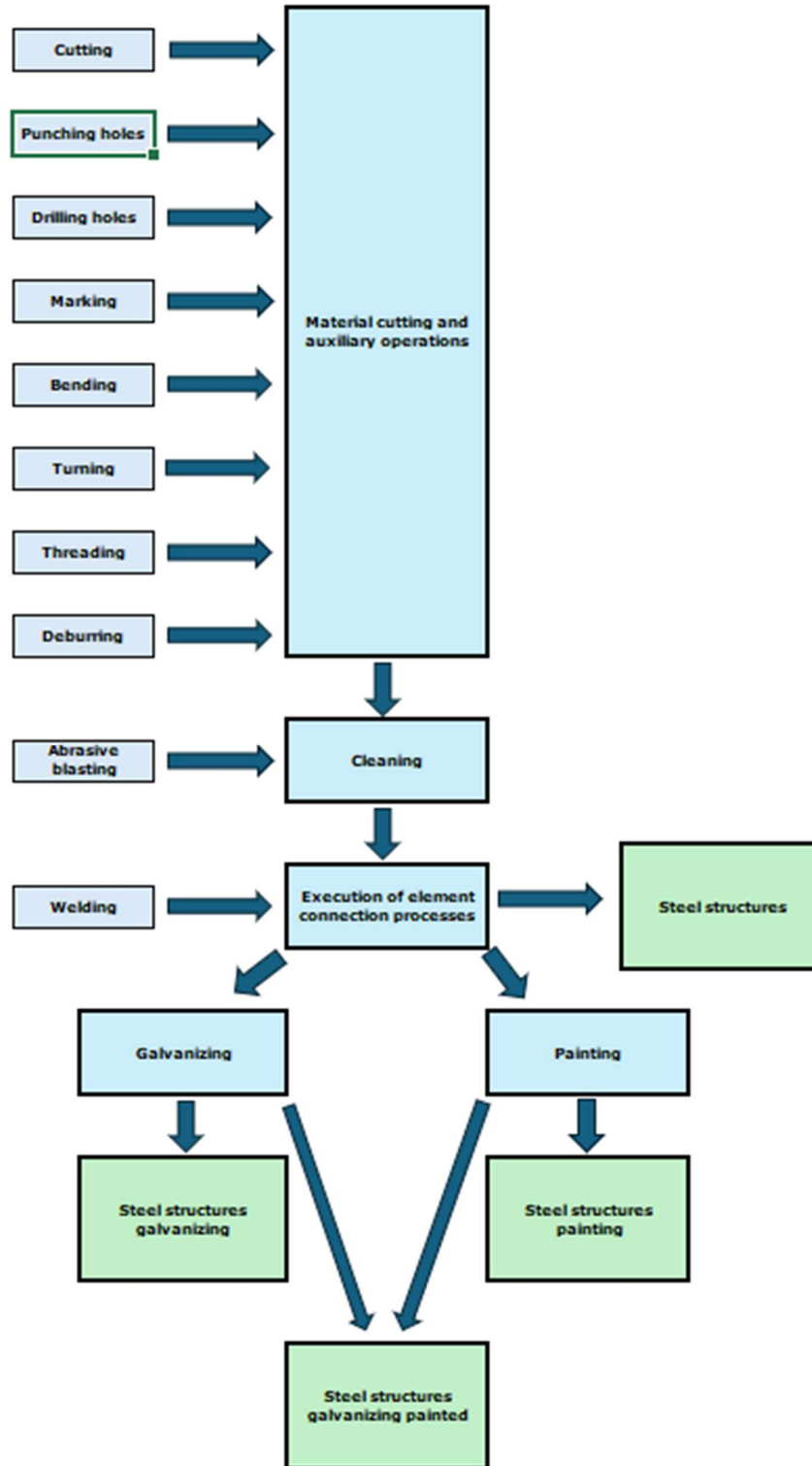


Figure 4: Production process of steel structures manufactured in Weldon Sp. z o.o..

### 3. BASIC DATA

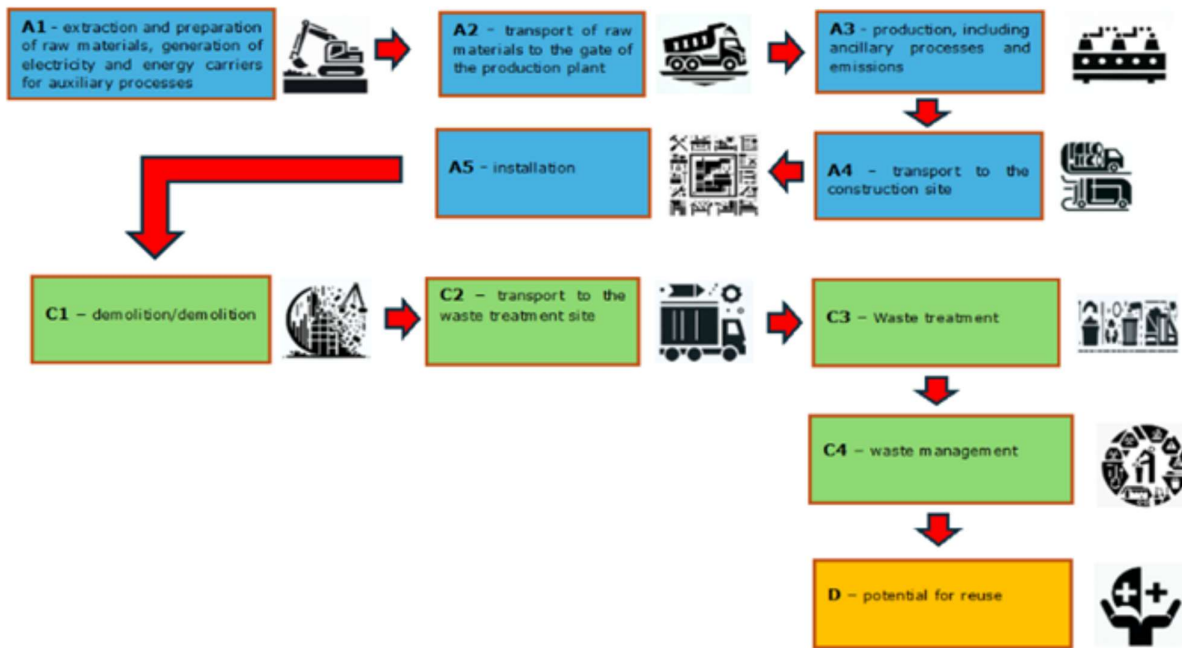
The environmental declaration is based on average data provided by Weldon Sp. z o.o. The products covered by the declaration are manufactured in three production plants. The average values of input and output streams were calculated on the basis of data provided by the manufacturer from three production plants for individual types of steel structures (carbon steel, painted steel, galvanized steel, painted and galvanized steel) from the period from 01.01.2023 to 31.12.2023. They were delivered to the program owner in a summary form.

The amount of raw material consumption is given for individual types of steel structures. Data on energy consumption and emissions are provided for individual types of steel structures. The allocation was made on the basis of data provided by the manufacturer.

### 4. LCA: CALCULATION RULES

#### System limitations

The life cycle analysis of the tested products includes modules A1-A3, A4, A5, C1-C4 and D (Cradle to Gate with options) in accordance with EN 15804.



#### Data collection period

Data on the production process were provided in 2024 for the period 01.01.2023 - 31.12.2023 (12 months) and correspond to the production technology of the time.

#### Declared unit

**1 ton**

#### Assumptions

**A1** – extraction and consumption of raw materials refer to specific mass shares in the production process, per unit declared of the product,

**A2** – distances from the place of obtaining raw materials to the production plant individual for each raw material, means of transport differentiated due to the method of delivery of raw materials,

**A3** – CO<sub>2</sub>, NO<sub>x</sub>, SO<sub>2</sub> and dust emission values from the production process received from the manufacturer.

**A4** – transport of steel structures to the construction site is carried out according to a developed scenario. It assumes the method of transport and the distance over which the materials are transported.

**A5** – assembly of steel structures is carried out according to the developed scenario. It determines the consumption of energy and materials and the amount of waste generated as a result of the assembly process.

**C1** – describes the procedure during the disassembly/demolition of a steel structure. The calculations are performed on the basis of the developed scenario.

**C2** – refers to the transport of construction waste to a recovery or disposal plant. The calculations are performed on the basis of the developed scenario.

**C3** – takes into account the environmental impact during the processing of construction and demolition waste containing elements of the steel structure in the waste recovery plant. The calculations are performed on the basis of the developed scenario.

**C4** – takes into account the environmental impact of storage and recycling of steel structure elements. The calculations are performed on the basis of the developed scenario.

**D** – refers to the impact and effects of the use of secondary material. The calculations are performed based on the developed scenario.

**Cut-off-criteria**

99% of all mass streams involved in the production process were taken into account. All energy used in production is included in the environmental declaration.

**General data**

The data for the calculations come from Ecoinvent v. 3.10, KOBiZE. Emission factors for electricity were determined using the actual KOBiZE data. The Polish electricity emission factor (Ecoinvent supplemented with current national data from KOBiZE) is 0.685 kg CO<sub>2</sub>/kWh. A detailed analysis of data quality was part of an external audit.

**Allocation**

All data on components manufactured in the Weldon Sp. z o.o. plant were provided by the manufacturer and were referred to the declared unit of the product – **1 ton**. The allocation rules used in this EPD are based on the general ICIMB-PCR A principles.

**5. LCA: SCENARIOS AND ADDITIONAL TECHNICAL INFORMATION**

The life cycle assessment has been developed in accordance with the requirements of PN-EN ISO 15804+A2:2020, PN-EN ISO 14025 and PN-EN ISO 14040. The rules for product categorization have been adopted in accordance with the PN-EN 15804 standard.

For the life cycle analysis of products covered by the cradle to gate with options environmental declaration, scenarios have been developed for modules A4, A5, C1-C4 and D:

**Module A4 - Transport to the construction site** - Transport is carried out using specialized vehicles with a load capacity of 16-32 tons meeting the EURO 6 emission standards; at your own or the customer's request, depending on the terms of the order Loads on trucks are secured with straps with tensioners or chains. In the car, anti-slip mats and/or pads will be used under the structural elements and between the structure and chains or belts to protect the anti-corrosion coating from damage. Repair of any damage caused by transport will take place during assembly on the construction site. Average distance from plant to customer calculated individually for the type of steel.

Steel structures				
	carbon	painted	galvanized	painted and galvanized
Average distance from the plant to the customer (km)	80	835	475	259

Transport was assumed – 100% load capacity.

**Module A5 – Installation** - The impact of the use of auxiliary lifts/pick-up trucks, winches, electric tools and the associated energy consumption were taken into account in the calculations.

**Module C1 - Demolition/demolition** – Manual demolition with the use of power tools such as drills, angle grinders, impact wrenches, auxiliary cranes/HDS and winches was adopted. On-site pre-sorting was adopted. The separated fractions are directed to the waste treatment plant. The estimated energy consumption for the demolition of 1 kg of steel structure, with the use of typical machines, can be about 0.03-0.2 kWh/kg, depending on the technology and machinery used.

**Module C2 – Transport** – After initial segregation at the demolition site, waste after separating the recyclable fraction, the fraction for reuse and the fraction for storage in a landfill, the appropriate quantities are directed to further processes.

- Transport is carried out by trucks with a load capacity of 16-32 tons, meeting the EURO 6 emission standards,
- Transport to the plant where the product will be reused takes place at a distance of 100 km from the demolition site.
- Transport to the recycling plant (steel mill) takes place at a distance of 100 km from the demolition site.
- Transport to the landfill takes place over a distance of 100 km.

**Module C3 - Waste treatment** - All waste goes to the waste treatment plant. Electricity consumption per 1 kg of waste is 0.03 kWh/kg, and energy consumption for internal transport vehicles is 0.3 MJ/kg. The following processes were assumed for the calculations: unloading (loader). It was assumed for further calculations (based on the literature LCA for steel construction <https://op.europa.eu>), that recycling will be 88%, reuse - 11% and landfilling 1%

**Module C4 – Waste management** – It has been assumed that 1% of waste separated in the treatment process will be landfilled (module C3).

**Module D - Material reuse potential** - included benefits of recycling steel scrap (used in steel production), benefits of material reuse.

The calculations were carried out in accordance with LCA for steel construction <https://op.europa.eu/>, and the approach developed by the World Steel Association.

**6. LCA: RESULTS**

The table below shows the LCA modules taken into account in the calculation of the environmental impact categories for the products covered by the declaration.

<b>DESCRIPTION OF SYSTEM BOUNDARIES (X – INCLUDED IN LCA, MND – UNDECLARED MODULE)</b>																	
Production stage		Construction phase			Stage of use							End of life stage				Benefits and flows beyond the system boundaries	
Mining & Sourcing	Transport	Production	Transport	Construction Process	Usufruct	Maintenance	Repair	Exchange	Renovation	Energy consumption	Water consumption	Demolition	Transport	Waste Treatment	Waste management	Potential for reuse	
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D	
X	X	X	X	X	MND	MND	MND	MND	MND	MND	MND	X	X	X	X	X	

The following tables present the results of the LCA analysis for the product – **1 ton of steel structure**.

Explanations of the abbreviations used to describe the impact category are provided below:

- GWP-total** Global warming potential
- GWP-fossil** Global warming potential fossil fuel
- GWP-biogenic** Global warming potential biogenic
- GWP-luluc** Global warming potential land use and land change
- ODP** Depletion potential of the stratospheric ozone layer
- AP** Acidification potential of land and water
- EP-freshwater** Eutrophication potential, fraction of nutrients reaching freshwater end compartment
- EP-marine** Eutrophication potential, fraction of nutrients reaching marine end compartment
- EP-terrestrial** Eutrophication potential, Accumulated Exceedance
- POCP** Formation potential of tropospheric ozone photochemical oxidants
- ADP-minerals&metals** Abiotic depletion potential for nonfossil resources
- ADP-fossil** Abiotic depletion potential for fossil resources
- WDP** Water (user) deprivation potential
- PM** Potential incidence of disease due to PM emissions

<b>IRP</b>	Potential Human exposure efficiency relative to U235
<b>ETP-fw</b>	Potential comparative Toxic Unit for ecosystems
<b>HTP-c</b>	Potential comparative Toxic Unit for humans (cancerogenic)
<b>HTP-nc</b>	Potential comparative Toxic Unit for humans (non-cancerogenic)
<b>SQP</b>	Potential soil quality index
<b>PERE</b>	Use of renewable primary energy excluding renewable primary energy resources used as raw materials
<b>PERM</b>	Use of renewable primary energy resources used as raw materials
<b>PERT</b>	Total use of renewable primary energy resources
<b>PEN-RE</b>	Use of non-renewable primary energy resources excluding non-renewable primary energy resources used as raw materials
<b>RE</b>	Use of non-renewable primary energy resources used as raw materials
<b>PENRT</b>	Total use of non-renewable primary energy resources
<b>SM</b>	Use of secondary material
<b>RSF</b>	Use of renewable fuels
<b>NRSF</b>	Use of non-renewable secondary fuels
<b>FW</b>	Use of net fresh water

<b>MAIN IMPACT INDICATORS: 1 ton of carbon steel structure</b>											
Indicator	Unit	Life cycle stage									
		A1	A2	A3	A4	A5	C1	C2	C3	C4	D
GWP-total	kg CO <sub>2</sub> eq.	1,89E+03	8,25E+01	2,96E+02	1,36E+01	6,37E+01	6,37E+01	2,01E+01	5,54E+01	2,79E-02	-1,28E+03
GWP-fossil	kg CO <sub>2</sub> eq.	1,90E+03	8,24E+01	2,85E+02	1,36E+01	6,36E+01	6,36E+01	2,00E+01	5,43E+01	2,78E-02	-1,29E+03
GWP-biogenic	kg CO <sub>2</sub> eq.	-3,55E+00	5,30E-02	1,08E+01	9,41E-03	9,55E-02	9,55E-02	1,39E-02	1,07E+00	7,37E-05	2,62E+00
GWP-luluc	kg CO <sub>2</sub> eq.	5,71E-01	2,70E-02	2,24E-01	4,51E-03	7,16E-03	7,16E-03	6,65E-03	2,45E-02	2,90E-06	-3,51E-01
ODP	kg CFC11 eq.	9,08E-06	1,64E-06	1,56E-06	2,70E-07	9,47E-07	9,47E-07	3,99E-07	5,07E-07	4,29E-10	-6,08E-06
AP	mol H+ eq.	6,45E+00	1,67E-01	1,09E+00	2,83E-02	5,66E-01	5,66E-01	4,17E-02	3,87E-01	2,46E-04	-4,37E+00
EP-freshwater	kg PO <sub>4</sub> eq.	8,80E-01	5,55E-03	2,99E-01	9,20E-04	4,25E-03	4,25E-03	1,36E-03	3,05E-02	8,22E-07	-5,95E-01
EP-marine	kg N eq.	1,55E+00	3,96E-02	2,02E-01	6,79E-03	2,60E-01	2,60E-01	1,00E-02	1,49E-01	1,14E-04	-1,05E+00
EP-terrestrial	mol N eq.	1,67E+01	4,28E-01	1,57E+00	7,33E-02	2,84E+00	2,84E+00	1,08E-01	1,58E+00	1,25E-03	-1,13E+01
POCP	kg NMVOC eq.	5,80E+00	2,79E-01	4,76E-01	4,70E-02	8,47E-01	8,47E-01	6,94E-02	4,67E-01	3,73E-04	-3,94E+00
ADP-minerals & metals	kg Sb eq.	1,68E-03	2,70E-04	3,06E-04	4,42E-05	2,38E-05	2,38E-05	6,52E-05	3,32E-05	1,14E-08	-1,13E-03
ADP-fossil	MJ	1,93E+04	1,16E+03	2,98E+03	1,91E+02	8,28E+02	8,28E+02	2,82E+02	6,56E+02	3,64E-01	-1,30E+04
WDP	WDP (m <sup>3</sup> ) świat. ekw	4,24E+02	4,62E+00	-2,91E+01	7,93E-01	1,84E+00	1,84E+00	1,17E+00	2,02E+00	7,87E-04	-2,75E+02

**ADDITIONAL IMPACT INDICATORS 1 ton carbon steel structure**

		Life cycle stage									
Indicator	Unit	A1	A2	A3	A4	A5	C1	C2	C3	C4	D
PM	Disease incidence	2,18E-01	9,33E-03	3,74E-03	1,68E-03	2,66E-02	2,66E-02	2,48E-03	1,38E-02	1,20E-05	-1,49E-01
IRP	kBq U235 eq.	5,91E+01	1,65E+00	2,35E+00	2,48E-01	3,78E-01	3,78E-01	3,66E-01	3,76E-01	2,01E-04	-3,65E+01
ETP-fw	CTUe	5,47E-01	3,46E-03	1,86E-01	5,72E-04	2,65E-03	2,65E-03	8,45E-04	1,90E-02	5,11E-07	-3,70E-01
HTP-c	CTUh	5,25E-04	5,46E-07	2,70E-07	9,64E-08	2,43E-07	2,43E-07	1,42E-07	1,43E-07	1,07E-10	-3,58E-04
HTP-nc	CTUh	7,93E-06	6,99E-07	3,05E-06	1,20E-07	1,24E-07	1,24E-07	1,77E-07	3,45E-07	4,91E-11	-5,35E-06
SQP	-	4,27E+03	6,42E+02	4,38E+02	1,15E+02	6,03E+01	6,03E+01	1,70E+02	7,09E+01	4,48E-01	-2,89E+03

**INDICATORS DESCRIPTIONS RESOURCE CONSUMPTION: 1 ton carbon steel structure**

		Life cycle stage									
Indicator	Unit	A1	A2	A3	A4	A5	C1	C2	C3	C4	D
PERE	MJ	7,66E+02	2,14E+01	2,65E+02	3,29E+00	6,82E+00	6,82E+00	4,85E+00	2,49E+01	1,08E-02	-4,91E+02
PERM	MJ	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
PERT	MJ	7,66E+02	2,14E+01	2,65E+02	3,29E+00	6,82E+00	6,82E+00	4,85E+00	2,49E+01	1,08E-02	-4,91E+02
PEN-RE	MJ	2,44E+04	1,16E+03	3,76E+03	1,92E+02	8,40E+02	8,40E+02	2,83E+02	7,37E+02	3,66E-01	-1,66E+04
RE	MJ	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
PENRT	MJ	2,44E+04	1,16E+03	3,76E+03	1,92E+02	8,40E+02	8,40E+02	2,83E+02	7,37E+02	3,66E-01	-1,66E+04
SM	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
RSF	MJ	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
NRSF	MJ	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
FW	m <sup>3</sup>	1,12E+01	2,56E-01	4,88E+00	3,53E-02	7,18E-02	7,18E-02	5,21E-02	4,95E-01	1,48E-05	-6,80E+00

**INDICATORS DESCRIBING OUTPUT STREAMS AND WASTE: 1 ton carbon steel structure**

		Life cycle stage									
Indicator	Unit (referenced to DU)	A1	A2	A3	A4	A5	C1	C2	C3	C4	D
Amount of hazardous waste	kg	WN	WN	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Amount of non-hazardous waste	kg	WN	WN	6,02E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Amount of radioactive waste	kg	WN	WN	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Reusable components	kg	WN	WN	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Recyclable materials	kg	WN	WN	6,02E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Energy Recovery Materials	kg	WN	WN	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported Energy	MJ/energy carrier	WN	WN	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

**BIOGENIC CARBON**

<b>Biogenic carbon content in the product (kg C<sub>org</sub>)</b>	<b>0,00E+00</b>
<b>Biogenic carbon content per package (kg C<sub>org</sub>)</b>	<b>0,00E+00</b>

<b>MAIN IMPACT INDICATORS: 1 ton painted steel structure</b>											
	Life cycle stage										
Indicator	Unit	A1	A2	A3	A4	A5	C1	C2	C3	C4	D
GWP-total	kg CO <sub>2</sub> eq.	1,98E+03	9,83E+01	6,00E+02	1,95E+01	6,37E+01	6,37E+01	2,01E+01	5,54E+01	2,79E-02	-1,28E+03
GWP-fossil	kg CO <sub>2</sub> eq.	1,98E+03	9,82E+01	6,03E+02	1,95E+01	6,36E+01	6,36E+01	2,00E+01	5,43E+01	2,78E-02	-1,29E+03
GWP-biogenic	kg CO <sub>2</sub> eq.	-	6,35E-02	-	1,35E-02	9,55E-02	9,55E-02	1,39E-02	1,07E+00	7,37E-05	2,62E+00
GWP-luluc	kg CO <sub>2</sub> eq.	1,22E+01	3,29E-02	3,41E-01	6,47E-03	7,16E-03	7,16E-03	6,65E-03	2,45E-02	2,90E-06	-3,51E-01
ODP	kg CFC11 eq.	1,10E-05	1,96E-06	6,91E-06	3,88E-07	9,47E-07	9,47E-07	3,99E-07	5,07E-07	4,29E-10	-6,08E-06
AP	mol H+ eq.	7,78E+00	1,99E-01	1,73E+00	4,06E-02	5,66E-01	5,66E-01	4,17E-02	3,87E-01	2,46E-04	-4,37E+00
EP-freshwater	kg PO <sub>4</sub> eq.	9,07E-01	6,79E-03	4,17E-01	1,32E-03	4,25E-03	4,25E-03	1,36E-03	3,05E-02	8,22E-07	-5,95E-01
EP-marine	kg N eq.	1,72E+00	4,68E-02	3,63E-01	9,75E-03	2,60E-01	2,60E-01	1,00E-02	1,49E-01	1,14E-04	-1,05E+00
EP-terrestrial	mol N eq.	1,75E+01	5,05E-01	2,98E+00	1,05E-01	2,84E+00	2,84E+00	1,08E-01	1,58E+00	1,25E-03	-1,13E+01
POCP	kg NMVOC eq.	6,22E+00	3,30E-01	1,08E+00	6,74E-02	8,47E-01	8,47E-01	6,94E-02	4,67E-01	3,73E-04	-3,94E+00
ADP-minerals & metals	kg Sb eq.	2,24E-03	3,36E-04	6,49E-04	6,34E-05	2,38E-05	2,38E-05	6,52E-05	3,32E-05	1,14E-08	-1,13E-03
ADP-fossil	MJ	2,06E+04	1,38E+03	6,38E+03	2,74E+02	8,28E+02	8,28E+02	2,82E+02	6,56E+02	3,64E-01	-1,30E+04
WDP	WDP (m <sup>3</sup> ) world ekw	4,89E+02	5,56E+00	-	1,14E+00	1,84E+00	1,84E+00	1,17E+00	2,02E+00	7,87E-04	-2,75E+02
<b>ADDITIONAL IMPACT INDICATORS: 1 ton painted steel structure</b>											
	Life cycle stage										
Indicator	Unit	A1	A2	A3	A4	A5	C1	C2	C3	C4	D
PM	Disease incidence	2,29E-01	1,08E-02	1,00E-02	2,41E-03	2,66E-02	2,66E-02	2,48E-03	1,38E-02	1,20E-05	-1,49E-01
IRP	kBq U235 eq.	6,57E+01	2,05E+00	5,32E+00	3,56E-01	3,78E-01	3,78E-01	3,66E-01	3,76E-01	2,01E-04	-3,65E+01
ETP-fw	CTUe	5,65E-01	4,22E-03	2,59E-01	8,21E-04	2,65E-03	2,65E-03	8,45E-04	1,90E-02	5,11E-07	-3,70E-01
HTP-c	CTUh	5,25E-04	6,66E-07	1,17E-06	1,38E-07	2,43E-07	2,43E-07	1,42E-07	1,43E-07	1,07E-10	-3,58E-04
HTP-nc	CTUh	8,99E-06	8,31E-07	4,53E-06	1,72E-07	1,24E-07	1,24E-07	1,77E-07	3,45E-07	4,91E-11	-5,35E-06
SQP	-	5,51E+03	7,39E+02	1,95E+03	1,66E+02	6,03E+01	6,03E+01	1,70E+02	7,09E+01	4,48E-01	-2,89E+03
<b>INDICATORS DESCRIPTIONS RESOURCE CONSUMPTION: 1 ton painted steel structure</b>											
	Life cycle stage										
Indicator	Unit	A1	A2	A3	A4	A5	C1	C2	C3	C4	D
PERE	MJ	1,04E+03	2,65E+01	6,08E+02	4,72E+00	6,82E+00	6,82E+00	4,85E+00	2,49E+01	1,08E-02	-4,91E+02
PERM	MJ	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
PERT	MJ	1,04E+03	2,65E+01	6,08E+02	4,72E+00	6,82E+00	6,82E+00	4,85E+00	2,49E+01	1,08E-02	-4,91E+02
PEN-RE	MJ	2,57E+04	1,37E+03	7,45E+03	2,75E+02	8,40E+02	8,40E+02	2,83E+02	7,37E+02	3,66E-01	-1,66E+04
RE	MJ	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
PENRT	MJ	2,57E+04	1,37E+03	7,45E+03	2,75E+02	8,40E+02	8,40E+02	2,83E+02	7,37E+02	3,66E-01	-1,66E+04
SM	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
RSF	MJ	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
NRSF	MJ	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
FW	m <sup>3</sup>	1,31E+01	3,23E-01	7,03E+00	5,07E-02	7,18E-02	7,18E-02	5,21E-02	4,95E-01	1,48E-05	-6,80E+00

<b>INDICATORS DESCRIBING OUTPUT STREAMS AND WASTE: 1 ton painted steel structure</b>											
Indicator	Unit (referenced to DU)	Life cycle stage									
		A1	A2	A3	A4	A5	C1	C2	C3	C4	D
Amount of hazardous waste	kg	WN	WN	1,74E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Amount of non-hazardous waste	kg	WN	WN	6,32E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Amount of radioactive waste	kg	WN	WN	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Reusable components	kg	WN	WN	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Recyclable materials	kg	WN	WN	6,33E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Energy Recovery Materials	kg	WN	WN	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported Energy	MJ/energy carrier	WN	WN	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

<b>BIOGENIC CARBON</b>	
<b>Biogenic carbon content in the product (kg C<sub>org</sub>)</b>	<b>0,00E+00</b>
<b>Biogenic carbon content per package (kg C<sub>org</sub>)</b>	<b>1,55E-03</b>

<b>MAIN IMPACT INDICATORS: 1 ton galvanized steel structure</b>											
Indicator	Unit	Life cycle stage									
		A1	A2	A3	A4	A5	C1	C2	C3	C4	D
GWP-total	kg CO <sub>2</sub> eq.	1,90E+03	1,16E+02	3,65E+02	1,63E+00	6,37E+01	6,37E+01	2,01E+01	5,54E+01	2,79E-02	-1,28E+03
GWP-fossil	kg CO <sub>2</sub> eq.	1,90E+03	1,16E+02	3,70E+02	1,63E+00	6,36E+01	6,36E+01	2,00E+01	5,43E+01	2,78E-02	-1,29E+03
GWP-biogenic	kg CO <sub>2</sub> eq.	3,41E+00	7,59E-02	-5,52E+00	1,13E-03	9,55E-02	9,55E-02	1,39E-02	1,07E+00	7,37E-05	2,62E+00
GWP-luluc	kg CO <sub>2</sub> eq.	5,85E-01	3,90E-02	2,93E-01	5,42E-04	7,16E-03	7,16E-03	6,65E-03	2,45E-02	2,90E-06	-3,51E-01
ODP	kg CFC11 eq.	9,21E-06	2,31E-06	2,45E-06	3,25E-08	9,47E-07	9,47E-07	3,99E-07	5,07E-07	4,29E-10	-6,08E-06
AP	mol H+ eq.	6,49E+00	2,37E-01	1,41E+00	3,40E-03	5,66E-01	5,66E-01	4,17E-02	3,87E-01	2,46E-04	-4,37E+00
EP-freshwater	kg PO <sub>4</sub> eq.	8,84E-01	8,04E-03	3,70E-01	1,11E-04	4,25E-03	4,25E-03	1,36E-03	3,05E-02	8,22E-07	-5,95E-01
EP-marine	kg N eq.	1,56E+00	5,57E-02	2,69E-01	8,17E-04	2,60E-01	2,60E-01	1,00E-02	1,49E-01	1,14E-04	-1,05E+00
EP-terrestrial	mol N eq.	1,68E+01	6,01E-01	2,16E+00	8,82E-03	2,84E+00	2,84E+00	1,08E-01	1,58E+00	1,25E-03	-1,13E+01
POCP	kg NMVOC eq.	5,83E+00	3,92E-01	6,89E-01	5,65E-03	8,47E-01	8,47E-01	6,94E-02	4,67E-01	3,73E-04	-3,94E+00
ADP-minerals & metals	kg Sb eq.	3,42E-03	3,98E-04	4,44E-04	5,32E-06	2,38E-05	2,38E-05	6,52E-05	3,32E-05	1,14E-08	-1,13E-03
ADP-fossil	MJ	1,94E+04	1,63E+03	4,02E+03	2,30E+01	8,28E+02	8,28E+02	2,82E+02	6,56E+02	3,64E-01	-1,30E+04
WDP	WDP (m <sup>3</sup> ) world ekw	4,27E+02	6,62E+00	-2,50E+01	9,54E-02	1,84E+00	1,84E+00	1,17E+00	2,02E+00	7,87E-04	-2,75E+02

<b>ADDITIONAL IMPACT INDICATORS: 1 ton galvanized steel structure</b>											
Indicator	Unit	Life cycle stage									
		A1	A2	A3	A4	A5	C1	C2	C3	C4	D
PM	Disease incidence	2,19E-01	1,30E-02	6,58E-03	2,02E-04	2,66E-02	2,66E-02	2,48E-03	1,38E-02	1,20E-05	-1,49E-01
IRP	kBq U235 eq.	5,99E+01	2,40E+00	3,57E+00	2,98E-02	3,78E-01	3,78E-01	3,66E-01	3,76E-01	2,01E-04	-3,65E+01
ETP-fw	CTUe	5,50E-01	5,00E-03	2,30E-01	6,89E-05	2,65E-03	2,65E-03	8,45E-04	1,90E-02	5,11E-07	-3,70E-01

HTP-c	CTUh	5,25E-04	7,96E-07	7,90E-07	1,16E-08	2,43E-07	2,43E-07	1,42E-07	1,43E-07	1,07E-10	-3,58E-04
HTP-nc	CTUh	8,34E-06	9,89E-07	3,85E-06	1,44E-08	1,24E-07	1,24E-07	1,77E-07	3,45E-07	4,91E-11	-5,35E-06
SQP	-	4,30E+03	8,86E+02	1,83E+03	1,39E+01	6,03E+01	6,03E+01	1,70E+02	7,09E+01	4,48E-01	-2,89E+03

**INDICATORS DESCRIPTIONS RESOURCE CONSUMPTION: 1 ton galvanized steel structure**

Indicator	Unit	Life cycle stage									
		A1	A2	A3	A4	A5	C1	C2	C3	C4	D
PERE	MJ	7,77E+02	3,11E+01	5,57E+02	3,95E-01	6,82E+00	6,82E+00	4,85E+00	2,49E+01	1,08E-02	-4,91E+02
PERM	MJ	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
PERT	MJ	7,77E+02	3,11E+01	5,57E+02	3,95E-01	6,82E+00	6,82E+00	4,85E+00	2,49E+01	1,08E-02	-4,91E+02
PEN-RE	MJ	2,45E+04	1,63E+03	4,98E+03	2,31E+01	8,40E+02	8,40E+02	2,83E+02	7,37E+02	3,66E-01	-1,66E+04
RE	MJ	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
PENRT	MJ	2,45E+04	1,63E+03	4,98E+03	2,31E+01	8,40E+02	8,40E+02	2,83E+02	7,37E+02	3,66E-01	-1,66E+04
SM	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
RSF	MJ	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
NRSF	MJ	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
FW	m <sup>3</sup>	1,12E+01	3,75E-01	6,14E+00	4,25E-03	7,18E-02	7,18E-02	5,21E-02	4,95E-01	1,48E-05	-6,80E+00

**INDICATORS DESCRIBING OUTPUT STREAMS AND WASTE: 1 ton galvanized steel structure**

Indicator	Unit (referenced to DU)	Life cycle stage									
		A1	A2	A3	A4	A5	C1	C2	C3	C4	D
Amount of hazardous waste	kg	WN	WN	6,08E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Amount of non-hazardous waste	kg	WN	WN	1,09E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Amount of radioactive waste	kg	WN	WN	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Reusable components	kg	WN	WN	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Recyclable materials	kg	WN	WN	1,02E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Energy Recovery Materials	kg	WN	WN	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported Energy	MJ/energy carrier	WN	WN	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

**BIOGENIC CARBON**

<b>Biogenic carbon content in the product (kg C<sub>org</sub>)</b>	<b>0,00E+00</b>
<b>Biogenic carbon content per package (kg C<sub>org</sub>)</b>	<b>1,55E-03</b>

<b>MAIN IMPACT INDICATORS: 1 ton of galvanized and painted steel structure</b>											
	Life cycle stage										
Indicator	Unit	A1	A2	A3	A4	A5	C1	C2	C3	C4	D
GWP-total	kg CO <sub>2</sub> eq.	1,98E+03	1,16E+02	6,55E+02	1,51E+00	6,37E+01	6,37E+01	2,01E+01	5,54E+01	2,79E-02	-1,28E+03
GWP-fossil	kg CO <sub>2</sub> eq.	1,99E+03	1,16E+02	6,56E+02	1,51E+00	6,36E+01	6,36E+01	2,00E+01	5,43E+01	2,78E-02	-1,29E+03
GWP-biogenic	kg CO <sub>2</sub> eq.	-1,64E+01	7,58E-02	-1,51E+00	1,04E-03	9,55E-02	9,55E-02	1,39E-02	1,07E+00	7,37E-05	2,62E+00
GWP-luluc	kg CO <sub>2</sub> eq.	1,22E+01	3,90E-02	3,91E-01	5,00E-04	7,16E-03	7,16E-03	6,65E-03	2,45E-02	2,90E-06	-3,51E-01
ODP	kg CFC11 eq.	1,11E-05	2,31E-06	6,99E-06	3,00E-08	9,47E-07	9,47E-07	3,99E-07	5,07E-07	4,29E-10	-6,08E-06
AP	mol H+ eq.	7,82E+00	2,36E-01	1,97E+00	3,14E-03	5,66E-01	5,66E-01	4,17E-02	3,87E-01	2,46E-04	-4,37E+00
EP-freshwater	kg PO <sub>4</sub> eq.	9,12E-01	8,03E-03	4,84E-01	1,02E-04	4,25E-03	4,25E-03	1,36E-03	3,05E-02	8,22E-07	-5,95E-01
EP-marine	kg N eq.	1,73E+00	5,56E-02	4,05E-01	7,54E-04	2,60E-01	2,60E-01	1,00E-02	1,49E-01	1,14E-04	-1,05E+00
EP-terrestrial	mol N eq.	1,76E+01	6,00E-01	3,31E+00	8,14E-03	2,84E+00	2,84E+00	1,08E-01	1,58E+00	1,25E-03	-1,13E+01
POCP	kg NMVOC eq.	6,25E+00	3,92E-01	1,18E+00	5,22E-03	8,47E-01	8,47E-01	6,94E-02	4,67E-01	3,73E-04	-3,94E+00
ADP-minerals & metals	kg Sb eq.	3,98E-03	3,97E-04	7,01E-04	4,90E-06	2,38E-05	2,38E-05	6,52E-05	3,32E-05	1,14E-08	-1,13E-03
ADP-fossil	MJ	2,07E+04	1,63E+03	6,95E+03	2,12E+01	8,28E+02	8,28E+02	2,82E+02	6,56E+02	3,64E-01	-1,30E+04
WDP	WDP (m <sup>3</sup> ) world. ekw	4,92E+02	6,61E+00	-2,64E+01	8,80E-02	1,84E+00	1,84E+00	1,17E+00	2,02E+00	7,87E-04	-2,75E+02
<b>ADDITIONAL IMPACT INDICATORS: 1 ton of galvanized and painted steel structure</b>											
	Life cycle stage										
Indicator	Unit	A1	A2	A3	A4	A5	C1	C2	C3	C4	D
PM	Disease incidence	2,30E-01	1,30E-02	1,08E-02	1,86E-04	2,66E-02	2,66E-02	2,48E-03	1,38E-02	1,20E-05	-1,49E-01
IRP	kBq U235 eq.	6,66E+01	2,40E+00	5,79E+00	2,75E-02	3,78E-01	3,78E-01	3,66E-01	3,76E-01	2,01E-04	-3,65E+01
ETP-fw	CTUe	5,67E-01	5,00E-03	3,01E-01	6,35E-05	2,65E-03	2,65E-03	8,45E-04	1,90E-02	5,11E-07	-3,70E-01
HTP-c	CTUh	5,25E-04	7,95E-07	1,23E-06	1,07E-08	2,43E-07	2,43E-07	1,42E-07	1,43E-07	1,07E-10	-3,58E-04
HTP-nc	CTUh	9,40E-06	9,88E-07	5,20E-06	1,33E-08	1,24E-07	1,24E-07	1,77E-07	3,45E-07	4,91E-11	-5,35E-06
SQP	-	5,54E+03	8,86E+02	2,05E+03	1,28E+01	6,03E+01	6,03E+01	1,70E+02	7,09E+01	4,48E-01	-2,89E+03
<b>INDICATORS DESCRIBING RESOURCE CONSUMPTION: 1 ton of galvanized and painted steel structure</b>											
	Life cycle stage										
Indicator	Unit	A1	A2	A3	A4	A5	C1	C2	C3	C4	D
PERE	MJ	1,05E+03	3,10E+01	6,60E+02	3,65E-01	6,82E+00	6,82E+00	4,85E+00	2,49E+01	1,08E-02	-4,91E+02
PERM	MJ	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
PERT	MJ	1,05E+03	3,10E+01	6,60E+02	3,65E-01	6,82E+00	6,82E+00	4,85E+00	2,49E+01	1,08E-02	-4,91E+02
PEN-RE	MJ	2,58E+04	1,63E+03	8,21E+03	2,13E+01	8,40E+02	8,40E+02	2,83E+02	7,37E+02	3,66E-01	-1,66E+04
RE	MJ	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
PENRT	MJ	2,58E+04	1,63E+03	8,21E+03	2,13E+01	8,40E+02	8,40E+02	2,83E+02	7,37E+02	3,66E-01	-1,66E+04
SM	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
RSF	MJ	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
NRSF	MJ	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
FW	m <sup>3</sup>	1,31E+01	3,75E-01	8,13E+00	3,92E-03	7,18E-02	7,18E-02	5,21E-02	4,95E-01	1,48E-05	-6,80E+00

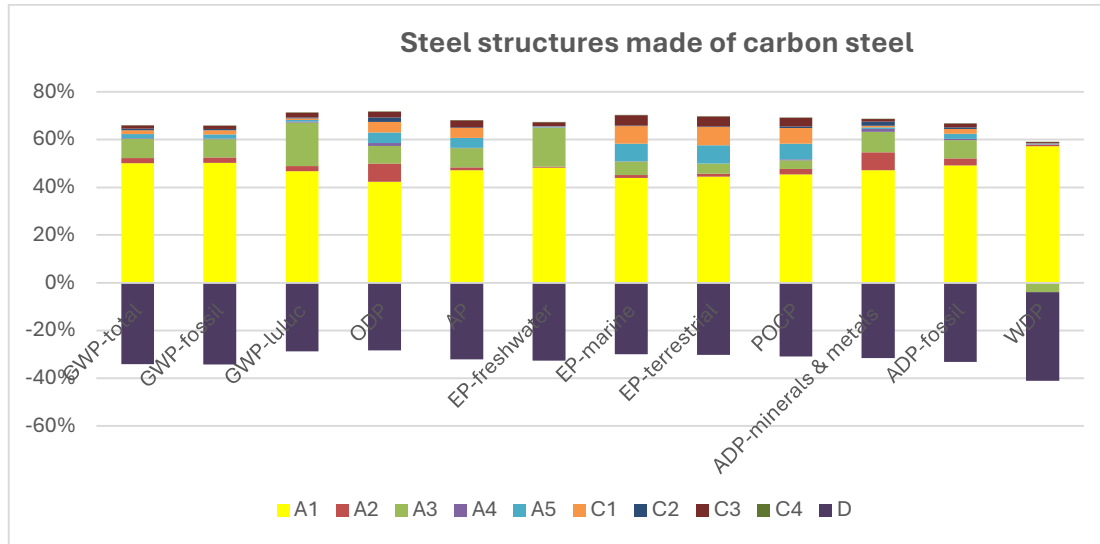
<b>INDICATORS DESCRIBING OUTPUT STREAMS AND WASTE: 1 ton of galvanized and painted steel structure</b>												
Indicator	Unit (referenced to DU)	Life cycle stage										
		A1	A2	A3	A4	A5	C1	C2	C3	C4	D	
Amount of hazardous waste	kg	WN	WN	6,25E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Amount of non-hazardous waste	kg	WN	WN	1,12E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Amount of radioactive waste	kg	WN	WN	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
Reusable components	kg	WN	WN	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
Recyclable materials	kg	WN	WN	1,05E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Energy Recovery Materials	kg	WN	WN	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
Exported Energy	MJ/energy carrier	WN	WN	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

<b>BIOGENIC CARBON</b>	
<b>Biogenic carbon content of the product (kg C<sub>org</sub>)</b>	<b>0,00E+00</b>
<b>Biogenic carbon content in the package (kg C<sub>org</sub>)</b>	<b>1,55E-03</b>

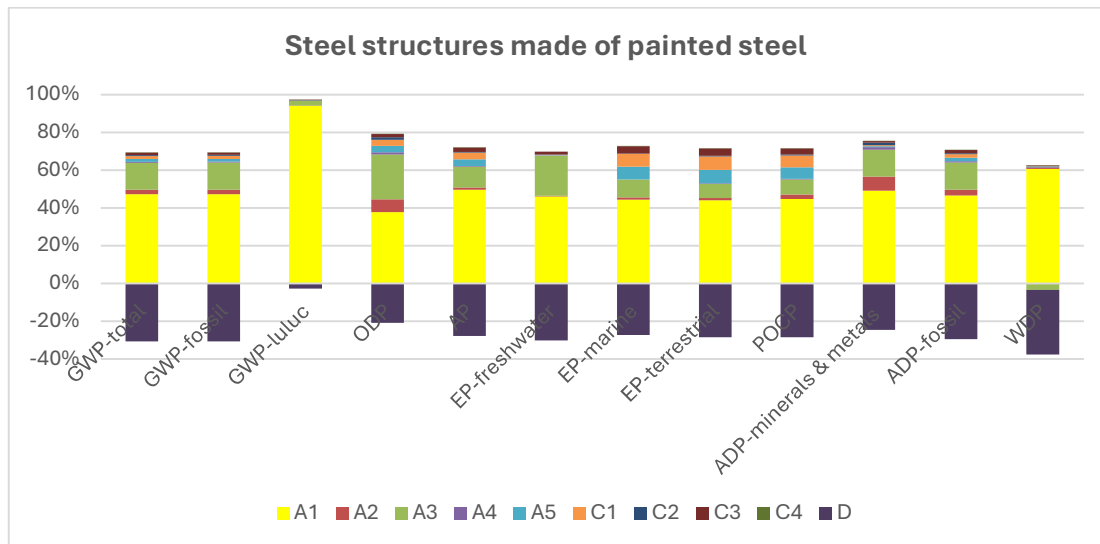
**7. INTERPRETATION OF RESULTS**

Figures 5-8 show the diagram of the contributions of individual life cycle modules to the basic impact categories for steel structures:

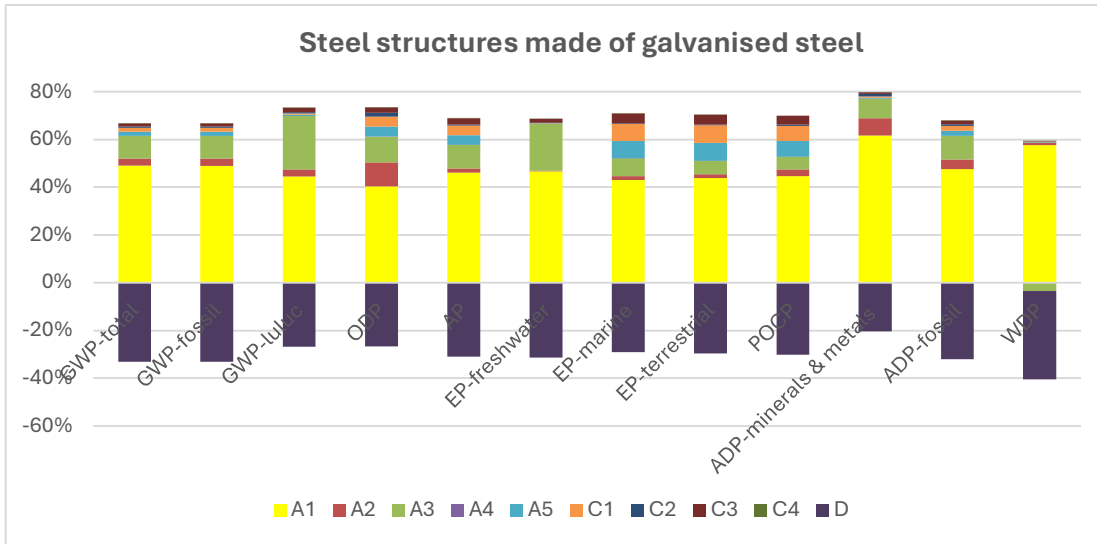
**Figure 5** Shares of life cycle modules on the main impact categories – steel structure made of carbon steel.



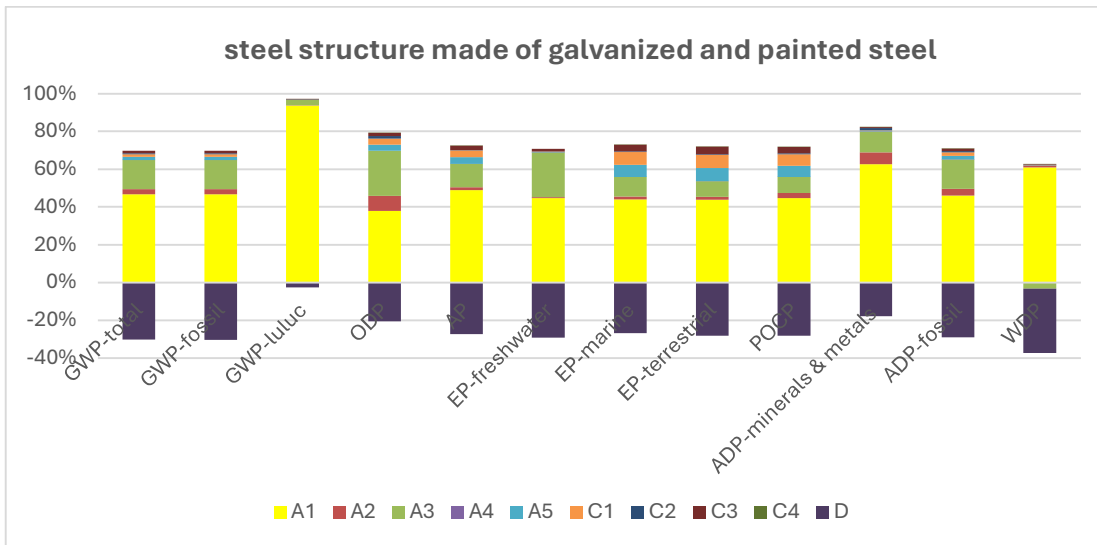
**Figure 6** Shares of life cycle modules on the main categories of influence – steel structure made of painted steel.



**Figure 7** Shares of life cycle modules for the main categories of influences – steel structure made of galvanized steel.



**Figure 8** Shares of life cycle modules for the main categories of influence – steel structure.



**LITERATURE**

- ✓ ICIMB-PCR A. General Product Category Rules for Construction Products.
  - ✓ PN-EN 15804+A2:2020, Sustainability of building structures -- Environmental product declarations -Basic principles of categorization of construction products.
  - ✓ PN-EN ISO 14025:2014-04, Environmental labels and declarations -- Type III environmental declarations -- Rules and procedures.
  - ✓ PN-EN ISO 14040:2009 Environmental management. Life Cycle Assessment. Principles and structure.
  - ✓ PN-EN ISO 14044:2009, Environmental management. Life Cycle Assessment. Requirements and guidelines.
  - ✓ ISO 21930:2017 - Sustainability in buildings and civil engineering works — Core rules for environmental product declarations of construction products and services
  - ✓ 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.
  - ✓ PN-EN 15942:2012 Sustainability of construction works – Environmental product declarations – Communication format business-to-business.
  - ✓ KOBiZE CO<sub>2</sub>, SO<sub>2</sub>, NO<sub>x</sub>, CO and total particulate matter emission factors for electricity, December 2023.
  - ✓ PN-EN 1090-1+A1:2012 Execution of steel and aluminium structures - Part 1: Principles of conformity assessment of structural elements.
  - ✓ PN-EN 1090-2:2018-09 Execution of steel and aluminium structures - Part 2: Technical requirements for steel structures.
  - ✓ PN-EN ISO 3834-2:2007 Quality Requirements for Welding Metal Materials -- Part 2: Complete Quality Requirements.
  - ✓ The Act of 14 December 2012 on Waste, Journal of Laws. 2013, item 21.
  - ✓ Act of 27 April 2001. Environmental Protection Law Journal of Laws 2024.54, consolidated text.
  - ✓ LCA for steel construction <https://op.europa.eu>.
  - ✓ World Steel Association.
  - ✓ Data from the company's website: **<https://www.weldon.pl/>**
- Explanatory material can be obtained by contacting the representative directly Weldon Sp. z o.o.



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**PROCESS ENGINEERING RESEARCH GROUP**

## TYPE III ENVIRONMENTAL DECLARATION CERTIFICATE

no. 1-10/2024

**Products:**

**Steel Structures**

**Owner:**

**Weldon Sp. z o.o.**

**39-102 Brzezówka 90A**

The declaration was developed in accordance with the requirements of the standard:

**PN-EN 15804+A2: 2020-03**

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

The declaration was verified in accordance with the requirements of the standard:

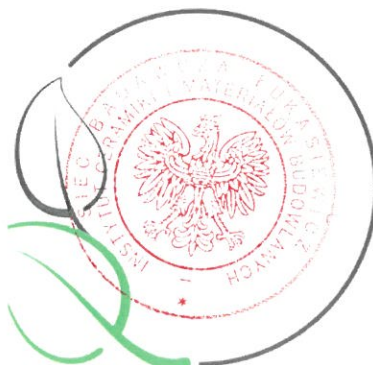
**PN-EN ISO 14025:2010**

Environmental labels and declarations  
Type III environmental declarations. Principles and procedures

The certificate was issued for the first time on **October 30, 2024** and is valid for 5 years or until the said EPD is amended.

**Process Engineering  
Research Group Leader**

Ewa Głodek-Bucyk, PhD Eng.



**Director of  
Environmental  
Engineering Center**

Joanna Poluszyńska, PhD

**Opole, October 2024**