

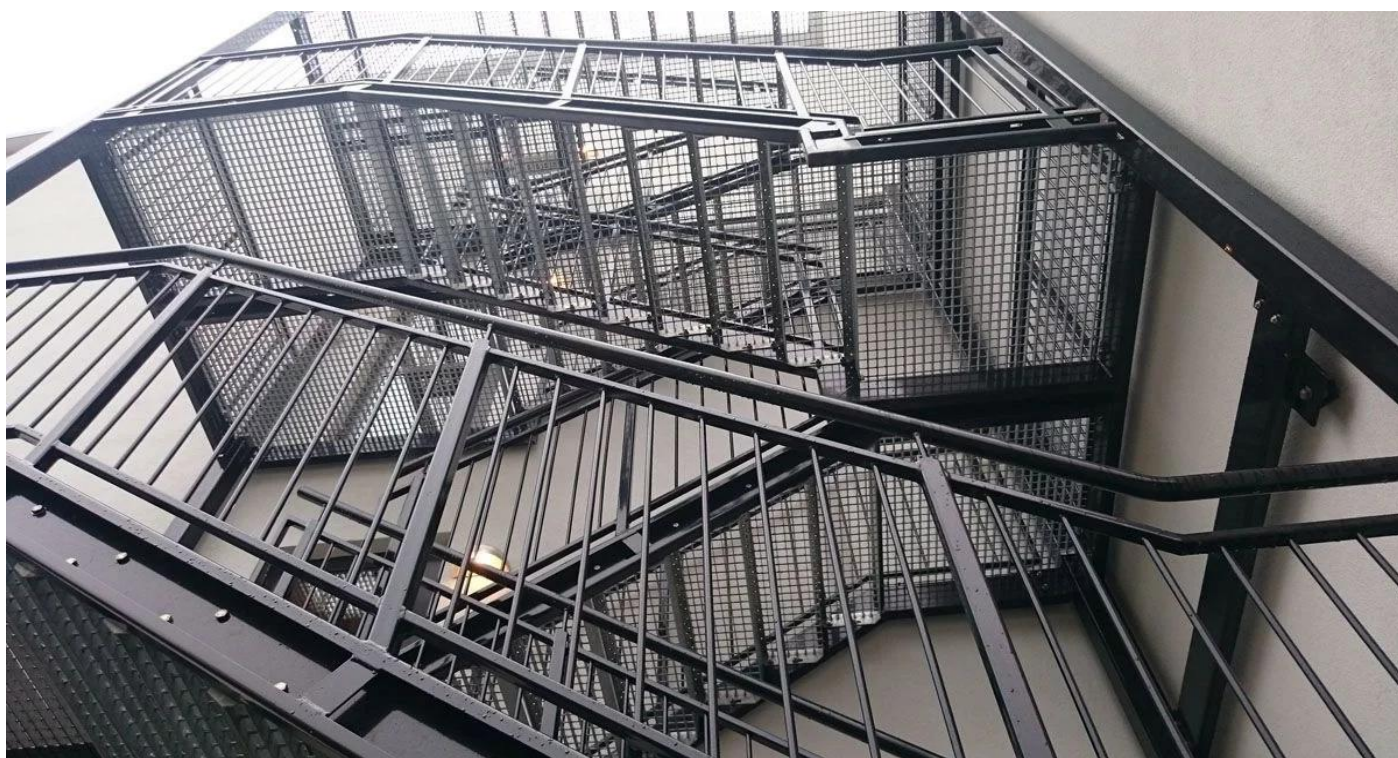
ENVIRONMENTAL PRODUCT DECLARATION

No. 03-10/2025



RAPMET
STEEL PRODUCTS FACTORY

STEEL STRUCTURES • PLATFORM GRATINGS • STRAIGHT STAIRS • SPIRAL STAIRCASE •
BALUSTRADES • RAMPS • PLATFORMS



Owner of the declaration:

RAPMET Sp. z o.o.

Program owner :

Łukasiewicz Research Network – Institute of Ceramics and Building Materials Centre for Environmental Engineering

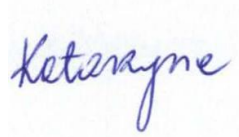
Program Name :

Environmental Product Declarations – B2B

Date of issue: 27.10.2025

Declaration valid until: 27.10.2030

1. GENERAL INFORMATION

Products covered by the declaration	Steel structures, platform gratings, straight stairs, spiral stairs, balustrades, ramps, platforms, etc. - powder coated, galvanized, galvanized and powder coated, stainless steel and acid-resistant.
Program owner: Łukasiewicz Research Network – Institute of Ceramics and Building Materials Centre for Environmental Engineering in Opole. http://www.icimb.pl/opole/	Owner of the declaration: RAPMET Sp. z o.o. Przemysłowa 1 str. 57-312 Jaszkowa Dolna Phone: +48 74 867 40 65 Mail: handel@rapmet.pl http://www.rapmet.pl//
Declared unit:	1 ton
Date of issue:	27.10.2025
The declaration is valid for:	27.10.2030
Life Cycle Analysis (LCA):	A1-A3, C1-C4 and D according to the PN-EN 15804+A2 (cradle-to-gate with options)
Rules for Categorization of the Device (PCR)	PN-EN ISO 15804+A2:2020-03 Sustainability of construction works. Environmental declarations of the product. Basic principles of categorization of construction products, ICIMB-PCR A.
Representativeness:	Polish product, year 2024/2025
Declared durability:	25 years
Reasons to perform LCA:	B2B Network
Product Standards	PN-EN 1090-2+A1:2024-10; EN ISO 3834-2:2021-09
Declarations resulting from different programs or made in violation of the standard may not be comparable.	
The Łukasiewicz Research Network of the Institute of Ceramics and Building Materials, Center of Environmental Engineering, provides access to the Type III environmental declaration for steel structures to interested parties.	
The owner of the declaration is responsible for the information and underlying evidence. The 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 life cycle assessment.	
Author's team: Katarzyna Kiprian MSc Ewa Głodek-Bucyk PhD Patryk Okoń MSc Kamil Ryfiak BEng Approved:  Joanna Poluszyńska PhD Director of the Center for Environmental Engineering  Ewa Głodek-Bucyk PhD Leader of the Engineering Research Group Process	Review: The CEN standard PN-EN 15804+A2 serves as the main PCR document. Independent verification of declarations and data according to the standard EN ISO 14025:2010 ☐ Internal ☒ External  Katarzyna Grzesik PhD DSc

2. MANUFACTURER AND PRODUCT INFORMATION

RAPMET Sp. z o.o. is a family manufacturing company with many years of experience in the production of light steel structures for applications in the industrial and infrastructure sectors. The beginnings of the company date back to 1977, when the activity was started as a one-man locksmith shop. Since then, the company has undergone dynamic development – both technologically and organizationally – transforming into a modern company with a wide range of operations, operating on the domestic and European markets.

For many years, RAPMET Sp. z o.o. has been exporting over 50% of its production to foreign markets – mainly to the Scandinavian countries, i.e. Sweden, Norway, as well as to Iceland, Greenland and the Faroe Islands. The products are used in industrial construction, residential, energy, chemical industry, transport, infrastructure and the maritime sector. Over the years, the share of stainless steel products has increased, which has significantly increased the company's customer base.

The company employs over 70 employees and constantly invests in development. The company's headquarters are located in a modern facility built in 2024, which includes a production hall with an area of 3300 m², a warehouse hall and a stainless steel etching plant. The plant's location in the south-western part of Poland provides convenient access to the main transport routes, enabling the efficient implementation of projects on the European market.



GROUP OF PRODUCTS COVERED BY THE DECLARATION

STEEL STRUCTURES · PLATFORM GRATINGS · STRAIGHT STAIRS · SPIRAL STAIRCASE ·
BALUSTRADES · RAMPS · PLATFORMS

carbon steel hot dip galvanized

carbon steel powder coated

carbon steel hot dip galvanized
and powder coated

stainless steel and acid-resistant

The **PRODUCTION PROCESS** begins with the acceptance of the steel into the warehouse, where it is subjected to quality control and delivery control. Then the material goes to the preparation stations, where operations such as cutting, drilling and punching holes, marking, bending or deburring are performed. The prepared components are cleaned and then subjected to a welding process. As a result of these activities, a steel product is created, which in further stages is subjected to surface treatment depending on the type of product.

In the case of carbon steel structures, they can be hot-dip galvanized and/or powder coated. Both of these processes are carried out by external subcontractors. Structures made of stainless steel, on the other hand, are subject to chemical processes - etching and passivation, which ensure corrosion resistance of the surface after the welding process. This operation is performed in-house.

Every stage of production - from material preparation, through welding, surface treatment, to packaging and storage - is subject to systematic quality control. Depending on the customer's requirements, ready-made steel structures can include a wide range of construction products – such as straight, procedure and spiral stairs, ladders, balustrades, platform gratings and other architectural details – made of both carbon steel and stainless steel or acid-resistant, protected by hot-dip galvanizing, powder coating, a combination of both methods or chemical processes characteristic of stainless steels.

RAPMET Sp. z o.o. has certificates of conformity of factory production control in accordance with EN 1090-1, entitling it to manufacture steel load-bearing elements and their sets up to EXC3 class according to EN 1090-2.

Meeting the requirements of ISO 3834 and PN-EN 1090 confirms that the offered steel structures are of the highest quality and are manufactured in conditions supervised by competent personnel with appropriate authorizations.

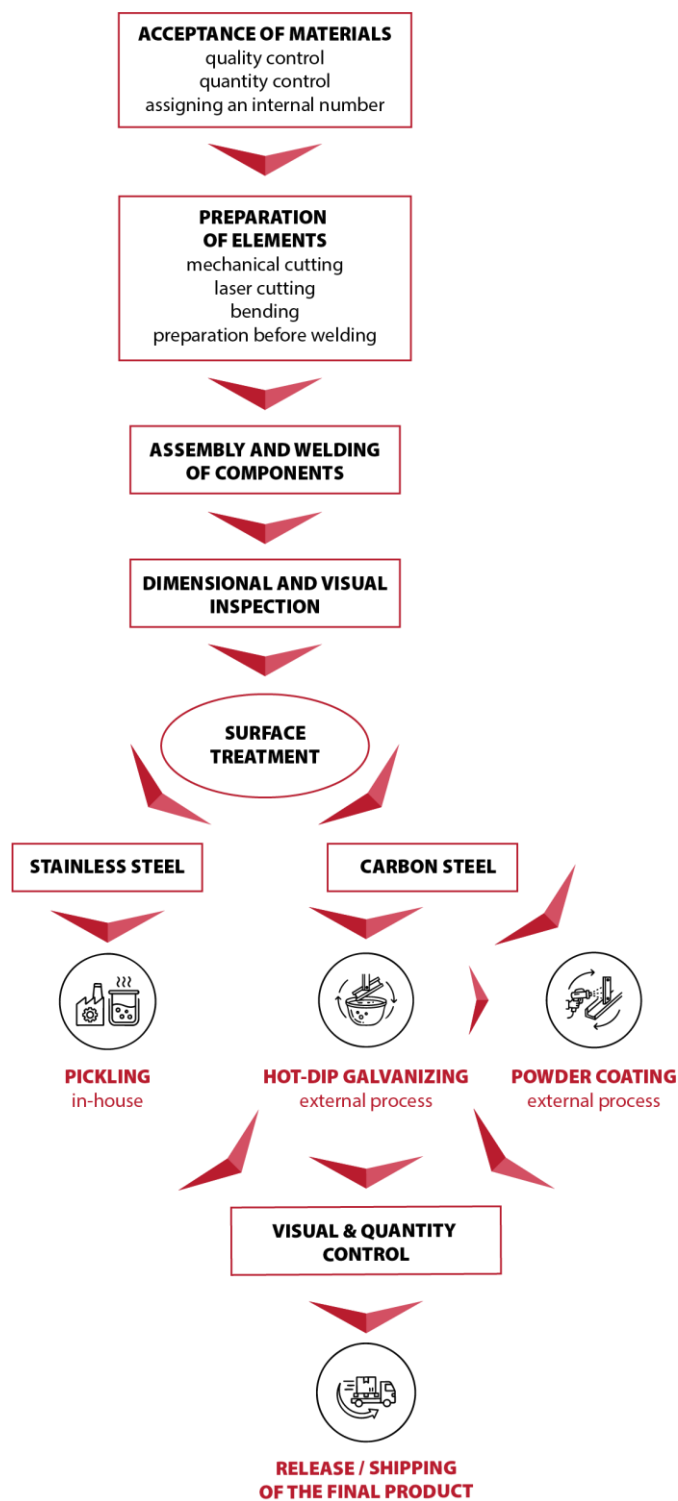


Figure 1 Production diagram of steel structures manufactured by RAPMET Sp. z o.o. in the production plant in Jaskowa Dolna.

3. LCA: CALCULATION RULES

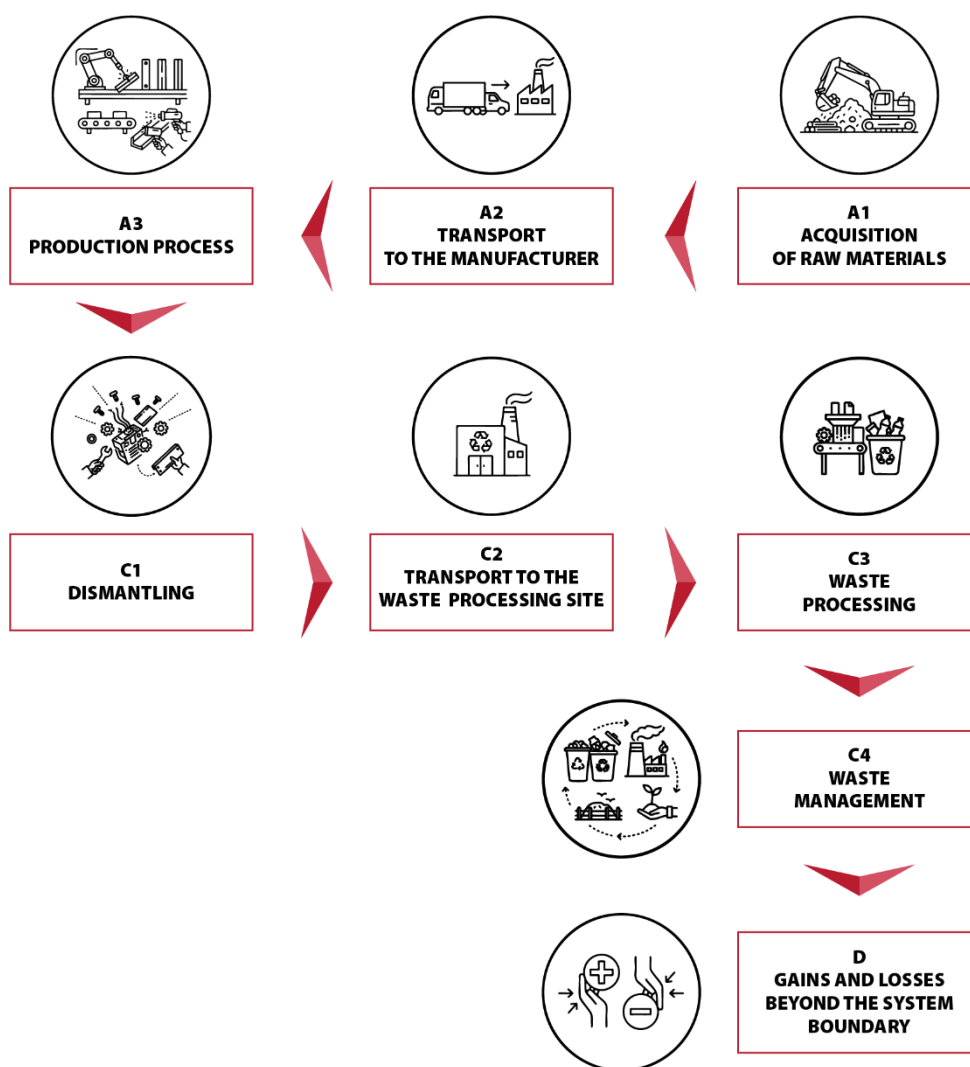
The environmental declaration is based on data provided by the owner of the declaration, RAPMET Sp. z o.o., for the production plant located in Jazkowa Dolna. The study covers processes related to the manufacture of steel structures, i.e.: platform gratings, straight stairs, spiral stairs, balustrades, ramps, platforms – in four material and technological variants:

1. Powder-coated steel structures,
2. Galvanized steel structures,
3. Galvanized and powder-coated steel structures,
4. Stainless and acid – resistant steel structures.

For each of the above-mentioned types of structures, separate life cycle assessments (LCA) were carried out, covering all relevant processes occurring in the production system. The amount of raw material consumption was given for each type of steel structure. Data on energy consumption and emissions were provided for each type of steel structure. The allocation was made based on data provided by the manufacturer.

System limitations

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



**Data colleration
period**

Data regarding the production process were provided in 2025 for the period 01.06.2024 - 31.05.2025 (12 months) and correspond to the production technology at that time,

Declared unit

1 ton

Assumptions

A1 – extraction and consumption of raw materials refers to specific mass shares in the production process per unit of declared product,
A2 – distances from the place of raw material extraction to the production plant, individual for each raw material, means of transport varied depending on the method of raw material delivery,
A3 – CO₂, NO_x, SO₂, and dust emission values from the production process obtained as a result of estimates based on fuel consumption,
C1 – describes the handling of steel structures during dismantling/demolition. Calculations are performed based on a developed scenario,
C2 – refers to the transport of waste from the construction site to a recovery or disposal facility. Calculations are made based on a developed scenario,
C3 – takes into account the environmental impact of processing demolition waste containing steel structure elements at a waste recovery facility. Calculations are made based on a developed scenario,
C4 – takes into account the environmental impact of the storage and recycling of steel structure elements. Calculations are performed based on the developed scenario,
D – concerns the impact and effects of the use of secondary material. 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 has been included in the environmental declaration.

General data

The data for the calculation comes from Ecoinvent v. 3.10 and has been supplemented with KOBiZE CO₂, SO₂, NO_x, CO and total particulate matter emission indicators for electricity, December 2024.
 Emission coefficients for electricity were determined with the actual KOBiZE data. The Polish electricity emission factor (Ecoinvent supplemented with current national data from KOBiZE) is 0.597 kg CO₂/kWh. A detailed analysis of the data quality was part of the external audit..

Allocation

All data on the components produced in the plant were provided by the owner of the declaration RAPMET Sp. z o.o. 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.

4. LCA: SCENARIOS AND ADDITIONAL TECHNICAL INFORMATION

The life cycle assessment was developed in accordance with the requirements of PN-EN ISO 15804+A2:2020, PN-EN ISO 14025, and PN-EN ISO 14040. The product categorization rules were adopted in accordance with PN-EN 15804. For the purposes of analyzing the life cycle of products covered by the environmental declaration in the “cradle to gate with options” scope, scenarios were developed for modules C1-C4 and D:

Module C1 - Demolition/dismantling - Manual dismantling using power tools and preliminary sorting of waste on site was adopted. such as drills, angle grinders, hammer drills. Preliminary sorting on site was adopted. The separated fractions are sent to a waste treatment plant. The use of a forklift to transport dismantled steel structure parts was assumed.

Module C2 – Transport – After initial sorting at the demolition site, the recyclable fraction and the reusable fraction are separated, and the appropriate quantities are sent for further processing.

- Transport is carried out using trucks with a load capacity of 16-32 tons, meeting 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 takes place at a distance of 100 km from the demolition site.

Module C3 - Waste treatment – Steel components are dismantled and sorted on site. After dismantling, clean steel scrap reaches end-of-waste status and is transferred directly to a collection point/steel mill without additional shredding or separation operations at the treatment plant. No environmental impacts are assigned to module C3. Environmental indicator values: 0.

Module C4 – Waste storage, including physical pre-treatment and disposal site management (environmental impacts). It is assumed that at the end of their service life, all steel structure components are sent for full material recovery without generating waste requiring storage or incineration. There are no disposal processes, and therefore no emissions to the environment have been assigned. Environmental indicator value: 0.

Module D – Material reuse potential – environmental benefits resulting from reuse, material recovery, and energy recovery at the end of the life cycle of steel structures were taken into account. After dismantling, all steel elements are sent for further processing, which brings significant potential for the recovery of secondary raw materials. It was assumed that 89% of the product's mass (0.89 kg/kg of product) is steel scrap sent for material recycling, while 11% of the mass (0.11 kg/kg of product) can be reused without remelting, e.g., in the form of structural elements used in new buildings.

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

5. LCA: RESULTS

The table below shows the LCA modules taken into account when calculating the environmental impact categories for the products covered by the declaration.

SYSTEM BOUNDARIES (X –MODULE INCLUDED IN LCA, MND – MODULE NOT DECLARED)																
Products stage			Construction process stage		Use stage							End-of-life stage				Benefits and loads beyond the system boundary
Raw material supply	Transport	Production	Transport	Construction process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction	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
X	X	X	MND	MND	MND	MND	MND	MND	MND	MND	MND	X	X	X	X	X

The following tables present the results of the LCA analysis for steel structures. 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
IRP	Potential Human exposure efficiency relative to U235
ETP-fw	Potential comparative Toxic Unit for ecosystems
HTP-c	Potential comparative Toxic Unit for humans (cancerogenic)
HTP-nc	Potential comparative Toxic Unit for humans (non-cancerogenic)
SQP	Potential soil quality index

PERE	Use of renewable primary energy excluding renewable primary energy resources used as raw materials
PERM	Use of renewable primary energy resources used as raw materials
PERT	Total use of renewable primary energy resources
PEN-RE	Use of non-renewable primary energy resources excluding non-re - newable primary energy resources used as raw materials
RE	Use of non-renewable primary energy resources used as raw materials
PENRT	Total use of non-renewable primary energy resources
SM	Use of secondary material
RSF	Use of renewable fuels
NRSF	Use of non-renewable secondary fuels
FW	Use of net fresh water

MAIN IMPACT INDICATORS: 1 ton - Carbon steel structures hot dip galvanized

Life Cycle Stage									
Indicator	Unit	A1	A2	A3	C1	C2	C3	C4	D
GWP-total	kg CO ₂ eq.	2,13E+03	4,03E+01	1,37E+02	5,53E-05	1,90E+01	0,00E+00	0,00E+00	-1,83E+03
GWP-fossil	kg CO ₂ eq.	2,17E+03	4,03E+01	1,36E+02	5,50E-05	1,90E+01	0,00E+00	0,00E+00	-1,84E+03
GWP-biogenic	kg CO ₂ eq.	-4,78E+01	2,78E-02	4,68E-01	1,91E-07	1,32E-02	0,00E+00	0,00E+00	6,13E+00
GWP-luluc	kg CO ₂ eq.	8,63E-01	1,34E-02	1,92E-01	7,83E-08	6,31E-03	0,00E+00	0,00E+00	-3,85E-01
ODP	kg CFC11 eq.	1,22E-05	8,01E-07	2,47E-07	9,02E-14	3,78E-07	0,00E+00	0,00E+00	-7,81E-06
AP	mol H ⁺ eq.	7,29E+00	8,37E-02	5,85E-01	2,34E-07	3,96E-02	0,00E+00	0,00E+00	-6,44E+00
EP-freshwater	kg P eq.	9,31E-01	2,75E-03	1,56E-01	6,38E-08	1,29E-03	0,00E+00	0,00E+00	-7,21E-01
EP-marine	kg N eq.	1,74E+00	2,00E-02	1,10E-01	4,28E-08	9,51E-03	0,00E+00	0,00E+00	-1,49E+00
EP-terrestrial	mol N eq.	1,87E+01	2,16E-01	8,92E-01	3,41E-07	1,03E-01	0,00E+00	0,00E+00	-1,60E+01
POCP	kg NMVOC eq.	6,86E+00	1,39E-01	2,50E-01	9,51E-08	6,58E-02	0,00E+00	0,00E+00	-5,67E+00
ADP-minerals & metals	kg Sb eq.	2,85E-03	1,33E-04	1,87E-04	7,59E-11	6,18E-05	0,00E+00	0,00E+00	-9,83E-04
ADP-fossil	MJ	2,32E+04	5,66E+02	1,47E+03	5,93E-04	2,67E+02	0,00E+00	0,00E+00	-1,89E+04
WDP	WDP (m ³) world eq.	3,15E+02	2,35E+00	2,48E+00	2,80E-06	1,11E+00	0,00E+00	0,00E+00	-1,80E+02

ADDITIONAL IMPACT INDICATORS: 1 ton - Carbon steel structures hot dip galvanized

Life Cycle Stage									
Indicator	Unit	A1	A2	A3	C1	C2	C3	C4	D
PM	Disease incidence	1,46E-04	2,93E-06	1,53E-06	4,98E-13	1,40E-06	0,00E+00	0,00E+00	-1,25E-04
IRP	kBq U235 eq.	1,23E+03	7,49E-01	1,28E+00	5,17E-07	3,47E-01	0,00E+00	0,00E+00	-2,77E+01
ETP-fw	CTUe	5,79E-01	1,71E-03	9,72E-02	3,97E-08	8,01E-04	0,00E+00	0,00E+00	-4,49E-01
HTP-c	CTUh	5,12E-04	2,86E-07	1,45E-07	5,65E-14	1,35E-07	0,00E+00	0,00E+00	-5,81E-04
HTP-nc	CTUh	9,61E-06	3,55E-07	1,68E-06	6,83E-13	1,68E-07	0,00E+00	0,00E+00	-6,57E-06
SQP	-	9,92E+03	3,37E+02	3,77E+02	1,53E-04	1,61E+02	0,00E+00	0,00E+00	-3,62E+03

INDICATORS DESCRIPTIONS RESOURCE CONSUMPTION: 1 ton - Carbon steel structures hot dip galvanized

Life Cycle Stage									
Indicator	Unit	A1	A2	A3	C1	C2	C3	C4	D
PERE	MJ	2,08E+03	9,89E+00	1,98E+02	8,08E-05	4,59E+00	0,00E+00	0,00E+00	-4,49E+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
PERT	MJ	2,08E+03	9,89E+00	1,98E+02	8,08E-05	4,59E+00	0,00E+00	0,00E+00	-4,49E+02
PEN-RE	MJ	2,46E+04	6,02E+02	1,56E+03	6,29E-04	2,84E+02	0,00E+00	0,00E+00	-2,01E+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
PENRT	MJ	2,46E+04	6,02E+02	1,56E+03	6,29E-04	2,84E+02	0,00E+00	0,00E+00	-2,01E+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
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
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
FW	m ³	1,81E+01	1,02E-01	2,19E+00	8,94E-07	4,65E-02	0,00E+00	0,00E+00	-3,99E+00

INDICATORS DESCRIBING OUTPUT STREAMS AND WASTE: 1 ton - Carbon steel structures hot dip galvanized

Life Cycle Stage									
Indicator	Unit (expressed per DU)	A1	A2	A3	C1	C2	C3	C4	D
Hazardous waste	kg	WN	WN	6,31E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Non-hazardous waste	kg	WN	WN	7,17E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Radioactive waste	kg	WN	WN	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Components for re-use	kg	WN	WN	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for recycling	kg	WN	WN	8,90E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for energy recovery	kg	WN	WN	5,01E-02	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	2,57E+02

BIOGENIC CARBON

Contents organic carbon in product (kg C _{org})	0,00E+00
Contents organic carbon in packaging (kg C _{org})	2,45E-02

MAIN IMPACT INDICATORS: 1 ton - Carbon steel structures hot dip galvanized and powder coated

Life Cycle Stage									
Indicator	Unit	A1	A2	A3	C1	C2	C3	C4	D
GWP-total	kg CO ₂ eq.	2,13E+03	4,03E+01	1,37E+02	5,53E-05	1,90E+01	0,00E+00	0,00E+00	-1,83E+03
GWP-fossil	kg CO ₂ eq.	2,17E+03	4,03E+01	1,36E+02	5,50E-05	1,90E+01	0,00E+00	0,00E+00	-1,84E+03
GWP-biogenic	kg CO ₂ eq.	-4,78E+01	2,78E-02	4,68E-01	1,91E-07	1,32E-02	0,00E+00	0,00E+00	6,13E+00
GWP-luluc	kg CO ₂ eq.	8,63E-01	1,34E-02	1,92E-01	7,83E-08	6,31E-03	0,00E+00	0,00E+00	-3,85E-01
ODP	kg CFC11 eq.	1,22E-05	8,01E-07	2,47E-07	9,02E-14	3,78E-07	0,00E+00	0,00E+00	-7,81E-06
AP	mol H ⁺ eq.	7,29E+00	8,37E-02	5,85E-01	2,34E-07	3,96E-02	0,00E+00	0,00E+00	-6,44E+00
EP-freshwater	kg P eq.	9,31E-01	2,75E-03	1,56E-01	6,38E-08	1,29E-03	0,00E+00	0,00E+00	-7,21E-01
EP-marine	kg N eq.	1,74E+00	2,00E-02	1,10E-01	4,28E-08	9,51E-03	0,00E+00	0,00E+00	-1,49E+00
EP-terrestrial	mol N eq.	1,87E+01	2,16E-01	8,92E-01	3,41E-07	1,03E-01	0,00E+00	0,00E+00	-1,60E+01
POCP	kg NMVOC eq.	6,86E+00	1,39E-01	2,50E-01	9,51E-08	6,58E-02	0,00E+00	0,00E+00	-5,67E+00
ADP-minerals & metals	kg Sb eq.	2,85E-03	1,33E-04	1,87E-04	7,59E-11	6,18E-05	0,00E+00	0,00E+00	-9,83E-04
ADP-fossil	MJ	2,32E+04	5,66E+02	1,47E+03	5,93E-04	2,67E+02	0,00E+00	0,00E+00	-1,89E+04
WDP	WDP (m ³) world eq.	3,15E+02	2,35E+00	2,48E+00	2,80E-06	1,11E+00	0,00E+00	0,00E+00	-1,80E+02

ADDITIONAL IMPACT INDICATORS: 1 ton - Carbon steel structures hot dip galvanized and powder coated

Life Cycle Stage									
Indicator	Unit	A1	A2	A3	C1	C2	C3	C4	D
PM	Disease incidency	1,46E-04	2,93E-06	1,53E-06	4,98E-13	1,40E-06	0,00E+00	0,00E+00	-1,25E-04
IRP	kBq U235 eq.	1,23E+03	7,49E-01	1,28E+00	5,17E-07	3,47E-01	0,00E+00	0,00E+00	-2,77E+01
ETP-fw	CTUe	5,79E-01	1,71E-03	9,72E-02	3,97E-08	8,01E-04	0,00E+00	0,00E+00	-4,49E-01
HTP-c	CTUh	5,12E-04	2,86E-07	1,45E-07	5,65E-14	1,35E-07	0,00E+00	0,00E+00	-5,81E-04
HTP-nc	CTUh	9,61E-06	3,55E-07	1,68E-06	6,83E-13	1,68E-07	0,00E+00	0,00E+00	-6,57E-06
SQP	-	9,92E+03	3,37E+02	3,77E+02	1,53E-04	1,61E+02	0,00E+00	0,00E+00	-3,62E+03

INDICATORS DESCRIPTIONS RESOURCE CONSUMPTION: 1 ton - Carbon steel structures hot dip galvanized and powder coated

Life Cycle Stage									
Indicator	Unit	A1	A2	A3	C1	C2	C3	C4	D
PERE	MJ	2,08E+03	8,72E-01	2,07E+02	8,08E-05	4,59E+00	0,00E+00	0,00E+00	-4,49E+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
PERT	MJ	2,08E+03	8,72E-01	2,07E+02	8,08E-05	4,59E+00	0,00E+00	0,00E+00	-4,49E+02
PEN-RE	MJ	2,46E+04	3,06E+01	2,13E+03	6,29E-04	2,84E+02	0,00E+00	0,00E+00	-2,01E+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
PENRT	MJ	2,46E+04	3,06E+01	2,13E+03	6,29E-04	2,84E+02	0,00E+00	0,00E+00	-2,01E+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
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
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
FW	m ³	1,81E+01	1,02E-01	2,19E+00	8,94E-07	4,65E-02	0,00E+00	0,00E+00	-3,99E+00

INDICATORS DESCRIBING OUTPUT STREAMS AND WASTE: 1 ton - Carbon steel structures hot dip galvanized and powder coated

Life Cycle Stage									
Indicator	Unit (expressed per DU)	A1	A2	A3	C1	C2	C3	C4	D
Hazardous waste	kg	WN	WN	6,31E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Non-hazardous waste	kg	WN	WN	7,17E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Radioactive waste	kg	WN	WN	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Components for re-use	kg	WN	WN	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for recycling	kg	WN	WN	8,90E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for energy recovery	kg	WN	WN	5,01E-02	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	2,57E+02

BIOGENIC CARBON

Contents organic carbon in product (kg C _{org})	0,00E+00
Contents organic carbon in packaging (kg C _{org})	2,45E-02

MAIN IMPACT INDICATORS: 1 ton - Carbon steel structures powder coated

Life Cycle Stage									
Indicator	Unit	A1	A2	A3	C1	C2	C3	C4	D
GWP-total	kg CO ₂ eq.	1,99E+03	4,03E+01	1,37E+02	5,53E-05	1,90E+01	0,00E+00	0,00E+00	-1,83E+03
GWP-fossil	kg CO ₂ eq.	2,03E+03	4,03E+01	1,36E+02	5,50E-05	1,90E+01	0,00E+00	0,00E+00	-1,84E+03
GWP-biogenic	kg CO ₂ eq.	-	2,78E-02	4,68E-01	1,91E-07	1,32E-02	0,00E+00	0,00E+00	6,13E+00
GWP-luluc	kg CO ₂ eq.	8,38E-01	1,34E-02	1,92E-01	7,83E-08	6,31E-03	0,00E+00	0,00E+00	-3,85E-01
ODP	kg CFC11 eq.	1,22E-05	8,01E-07	2,47E-07	9,02E-14	3,78E-07	0,00E+00	0,00E+00	-7,81E-06
AP	mol H+ eq.	6,96E+00	8,37E-02	5,85E-01	2,34E-07	3,96E-02	0,00E+00	0,00E+00	-6,44E+00
EP-freshwater	kg P eq.	9,31E-01	2,75E-03	1,56E-01	6,38E-08	1,29E-03	0,00E+00	0,00E+00	-7,21E-01
EP-marine	kg N eq.	1,66E+00	2,00E-02	1,10E-01	4,28E-08	9,51E-03	0,00E+00	0,00E+00	-1,49E+00
EP-terrestrial	mol N eq.	1,79E+01	2,16E-01	8,92E-01	3,41E-07	1,03E-01	0,00E+00	0,00E+00	-1,60E+01
POCP	kg NMVOC eq.	6,60E+00	1,39E-01	2,50E-01	9,51E-08	6,58E-02	0,00E+00	0,00E+00	-5,67E+00
ADP-minerals & metals	kg Sb eq.	1,98E-03	1,33E-04	1,87E-04	7,59E-11	6,18E-05	0,00E+00	0,00E+00	-9,83E-04
ADP-fossil	MJ	2,17E+04	5,66E+02	1,47E+03	5,93E-04	2,67E+02	0,00E+00	0,00E+00	-1,89E+04
WDP	WDP (m ³) world eq.	7,63E+02	2,35E+00	2,48E+00	2,80E-06	1,11E+00	0,00E+00	0,00E+00	-1,80E+02

ADDITIONAL IMPACT INDICATORS: 1 ton - Carbon steel structures powder coated

Life Cycle Stage									
Indicator	Unit	A1	A2	A3	C1	C2	C3	C4	D
PM	Disease incidence	1,41E-04	2,93E-06	1,53E-06	4,98E-13	1,40E-06	0,00E+00	0,00E+00	-1,25E-04
IRP	kBq U235 eq.	9,44E+01	7,49E-01	1,28E+00	5,17E-07	3,47E-01	0,00E+00	0,00E+00	-2,77E+01
ETP-fw	CTUe	5,79E-01	1,71E-03	9,72E-02	3,97E-08	8,01E-04	0,00E+00	0,00E+00	-4,49E-01
HTP-c	CTUh	5,12E-04	2,86E-07	1,45E-07	5,65E-14	1,35E-07	0,00E+00	0,00E+00	-5,81E-04
HTP-nc	CTUh	8,77E-06	3,55E-07	1,68E-06	6,83E-13	1,68E-07	0,00E+00	0,00E+00	-6,57E-06
SQP	-	9,87E+03	3,37E+02	3,77E+02	1,53E-04	1,61E+02	0,00E+00	0,00E+00	-3,62E+03

INDICATORS DESCRIPTIONS RESOURCE CONSUMPTION: 1 ton - Carbon steel structures powder coated

Life Cycle Stage									
Indicator	Unit	A1	A2	A3	C1	C2	C3	C4	D
PERE	MJ	2,03E+03	9,89E+00	1,98E+02	8,08E-05	4,59E+00	0,00E+00	0,00E+00	-4,49E+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
PERT	MJ	2,03E+03	9,89E+00	1,98E+02	8,08E-05	4,59E+00	0,00E+00	0,00E+00	-4,49E+02
PEN-RE	MJ	2,31E+04	6,02E+02	1,56E+03	6,29E-04	2,84E+02	0,00E+00	0,00E+00	-2,01E+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
PENRT	MJ	2,31E+04	6,02E+02	1,56E+03	6,29E-04	2,84E+02	0,00E+00	0,00E+00	-2,01E+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
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
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
FW	m ³	1,81E+01	2,28E+00	9,95E-04	8,94E-07	4,65E-02	0,00E+00	0,00E+00	-3,99E+00

INDICATORS DESCRIBING OUTPUT STREAMS AND WASTE: 1 ton - Carbon steel structures powder coated

Life Cycle Stage									
Indicator	Unit (expressed per DU)	A1	A2	A3	C1	C2	C3	C4	D
Hazardous waste	kg	WN	WN	6,31E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Non-hazardous waste	kg	WN	WN	7,17E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Radioactive waste	kg	WN	WN	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Components for re-use	kg	WN	WN	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for recycling	kg	WN	WN	8,90E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for energy recovery	kg	WN	WN	5,01E-02	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	2,57E+02

BIOGENIC CARBON

Contents organic carbon in product (kg C _{org})	0,00E+00
Contents organic carbon in packaging (kg C _{org})	2,45E-02

MAIN IMPACT INDICATORS: 1 ton - Stainless and acid – resistant steel structures

Life Cycle Stage									
Indicator	Unit	A1	A2	A3	C1	C2	C3	C4	D
GWP-total	kg CO ₂ eq.	4,14E+03	4,03E+01	1,37E+02	5,53E-05	1,90E+01	0,00E+00	0,00E+00	-2,16E+03
GWP-fossil	kg CO ₂ eq.	4,15E+03	4,03E+01	1,36E+02	5,50E-05	1,90E+01	0,00E+00	0,00E+00	-2,16E+03
GWP-biogenic	kg CO ₂ eq.	-	2,78E-02	4,68E-01	1,91E-07	1,32E-02	0,00E+00	0,00E+00	-8,69E-02
GWP-luluc	kg CO ₂ eq.	3,10E+00	1,34E-02	1,92E-01	7,83E-08	6,31E-03	0,00E+00	0,00E+00	-7,49E-01
ODP	kg CFC11 eq.	3,13E-05	8,01E-07	2,47E-07	9,02E-14	3,78E-07	0,00E+00	0,00E+00	-1,08E-05
AP	mol H ⁺ eq.	2,13E+01	8,37E-02	5,85E-01	2,34E-07	3,96E-02	0,00E+00	0,00E+00	-8,68E+00
EP-freshwater	kg P eq.	1,46E+00	2,75E-03	1,56E-01	6,38E-08	1,29E-03	0,00E+00	0,00E+00	-8,08E-01
EP-marine	kg N eq.	3,94E+00	2,00E-02	1,10E-01	4,28E-08	9,51E-03	0,00E+00	0,00E+00	-1,84E+00
EP-terrestrial	mol N eq.	4,20E+01	2,16E-01	8,92E-01	3,41E-07	1,03E-01	0,00E+00	0,00E+00	-1,97E+01
POCP	kg NMVOC eq.	1,39E+01	1,39E-01	2,50E-01	9,51E-08	6,58E-02	0,00E+00	0,00E+00	-6,78E+00
ADP-minerals & metals	kg Sb eq.	8,71E-02	1,33E-04	1,87E-04	7,59E-11	6,18E-05	0,00E+00	0,00E+00	-1,46E-02
ADP-fossil	MJ	4,77E+04	5,66E+02	1,47E+03	5,93E-04	2,67E+02	0,00E+00	0,00E+00	-2,29E+04
WDP	WDP (m ³) world. eq.	1,20E+03	2,35E+00	2,48E+00	2,80E-06	1,11E+00	0,00E+00	0,00E+00	-2,60E+02

ADDITIONAL IMPACT INDICATORS: 1 ton - Stainless and acid – resistant steel structures

Life Cycle Stage									
Indicator	Unit	A1	A2	A3	C1	C2	C3	C4	D
PM	Disease incidence	3,33E-04	2,93E-06	1,53E-06	4,98E-13	1,40E-06	0,00E+00	0,00E+00	-1,55E-04
IRP	kBq U235 eq.	3,28E+02	7,49E-01	1,28E+00	5,17E-07	3,47E-01	0,00E+00	0,00E+00	-6,57E+01
ETP-fw	CTUe	9,11E-01	1,71E-03	9,72E-02	3,97E-08	8,01E-04	0,00E+00	0,00E+00	-5,03E-01
HTP-c	CTUh	3,01E-04	2,86E-07	1,45E-07	5,65E-14	1,35E-07	0,00E+00	0,00E+00	-5,41E-04
HTP-nc	CTUh	7,26E-05	3,55E-07	1,68E-06	6,83E-13	1,68E-07	0,00E+00	0,00E+00	-1,67E-05
SQP	-	2,46E+04	3,37E+02	3,77E+02	1,53E-04	1,61E+02	0,00E+00	0,00E+00	-5,96E+03

INDICATORS DESCRIPTIONS RESOURCE CONSUMPTION: 1 ton - Stainless and acid – resistant steel structures

Life Cycle Stage									
Indicator	Unit	A1	A2	A3	C1	C2	C3	C4	D
PERE	MJ	1,09E+04	9,89E+00	1,98E+02	8,08E-05	4,59E+00	0,00E+00	0,00E+00	-1,86E+03
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
PERT	MJ	1,09E+04	9,89E+00	1,98E+02	8,08E-05	4,59E+00	0,00E+00	0,00E+00	-1,86E+03
PEN-RE	MJ	5,09E+04	6,02E+02	1,56E+03	6,29E-04	2,84E+02	0,00E+00	0,00E+00	-2,43E+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
PENRT	MJ	5,09E+04	6,02E+02	1,56E+03	6,29E-04	2,84E+02	0,00E+00	0,00E+00	-2,43E+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
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
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
FW	m ³	4,50E+01	9,55E-02	2,19E+00	8,94E-07	4,65E-02	0,00E+00	0,00E+00	-8,46E+00

**INDICATORS DESCRIBING OUTPUT STREAMS AND WASTE: 1 ton -
Stainless and acid – resistant steel structures**

Life Cycle Stage									
Indicator	Unit (expressed per DU)	A1	A2	A3	C1	C2	C3	C4	D
Hazardous waste	kg	WN	WN	6,31E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Non-hazardous waste	kg	WN	WN	8,05E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Radioactive waste	kg	WN	WN	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Components for re-use	kg	WN	WN	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for recycling	kg	WN	WN	8,90E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for energy recovery	kg	WN	WN	5,01E-02	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	2,57E+02

BIOGENIC CARBON

Contents organic carbon in product (kg C_{org})	0,00E+00
Contents organic carbon in packaging (kg C_{org})	2,45E-02

6. INTERPRETATION OF RESULTS

Figure 2-5. presents diagrams of the shares of individual life cycle modules on the basic impact categories for products company RAPMET Sp. z o.o.:

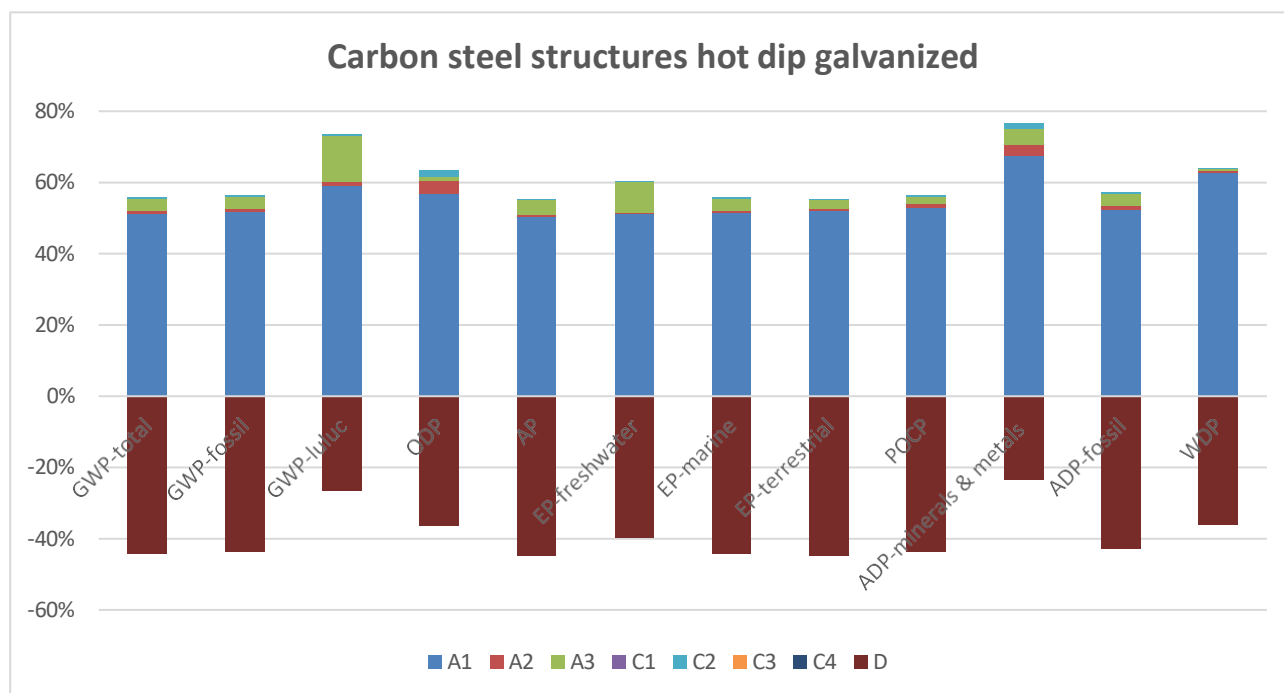


Figure 2 Shares of life cycle modules in the main categories of impact – carbon steel structures hot dip galvanized

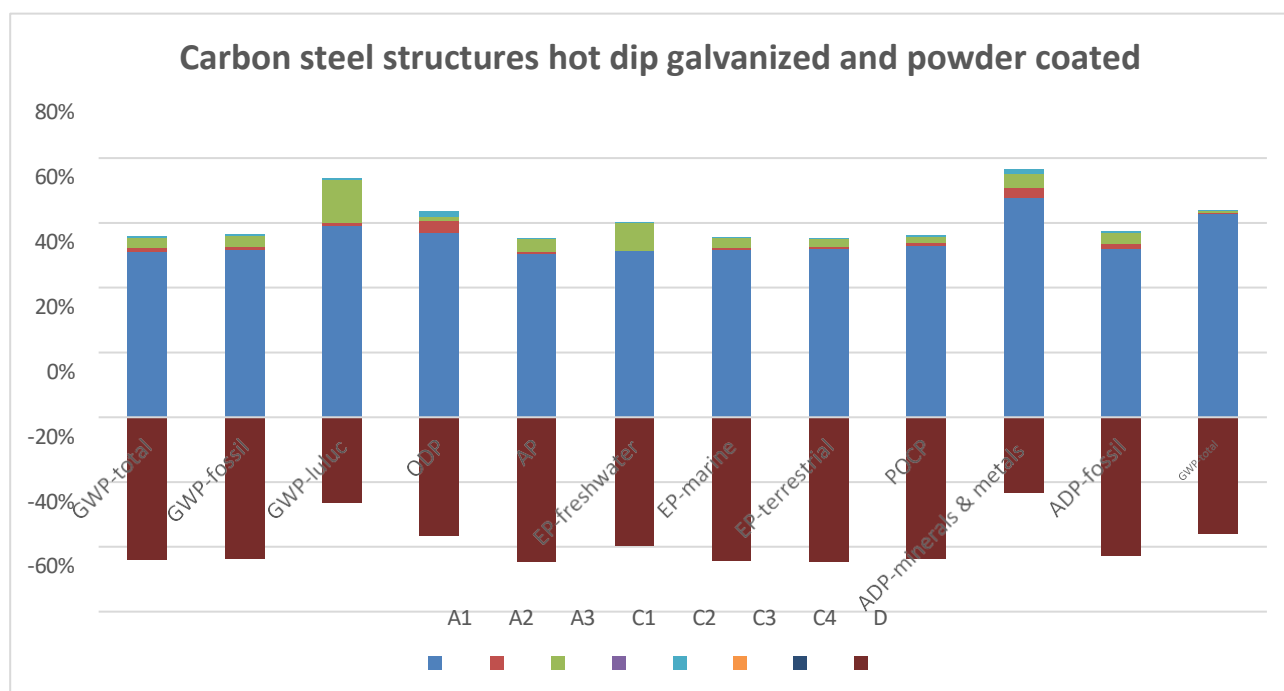


Figure 3 Shares of life cycle modules in the main categories of impact – carbon steel structures hot dip galvanized and powder coated

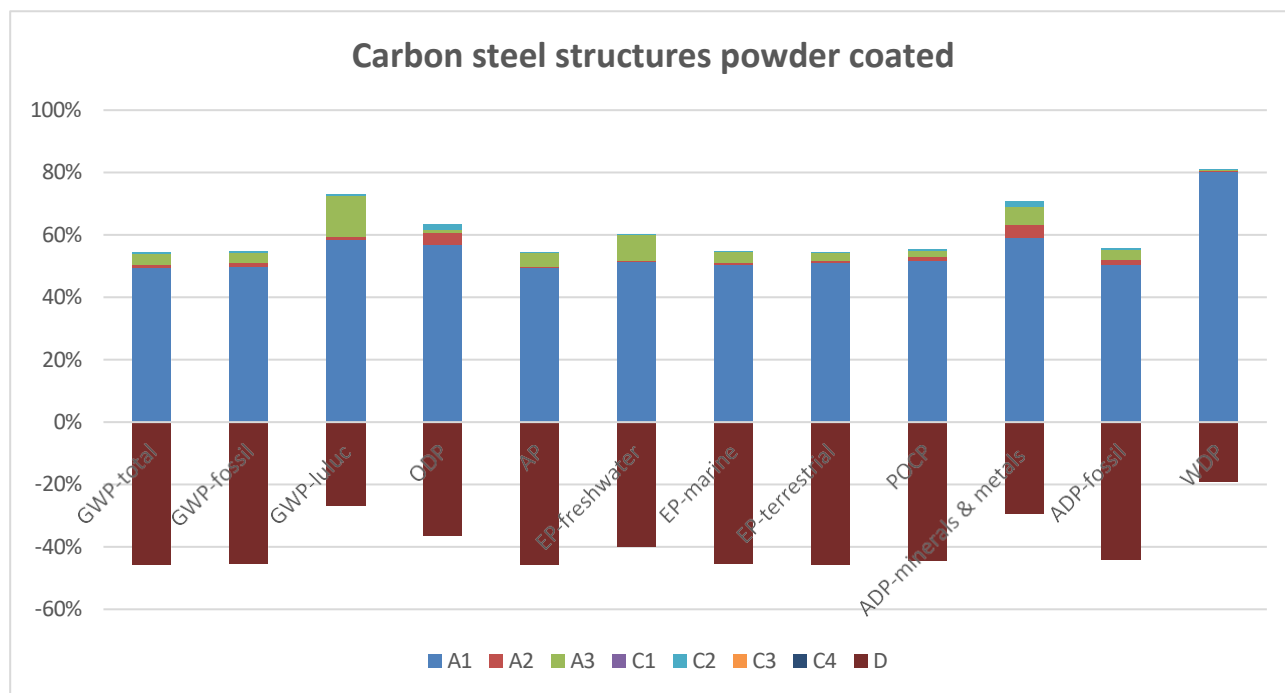


Figure 4 Shares of life cycle modules in the main categories of impact – carbon steel structures powder coated

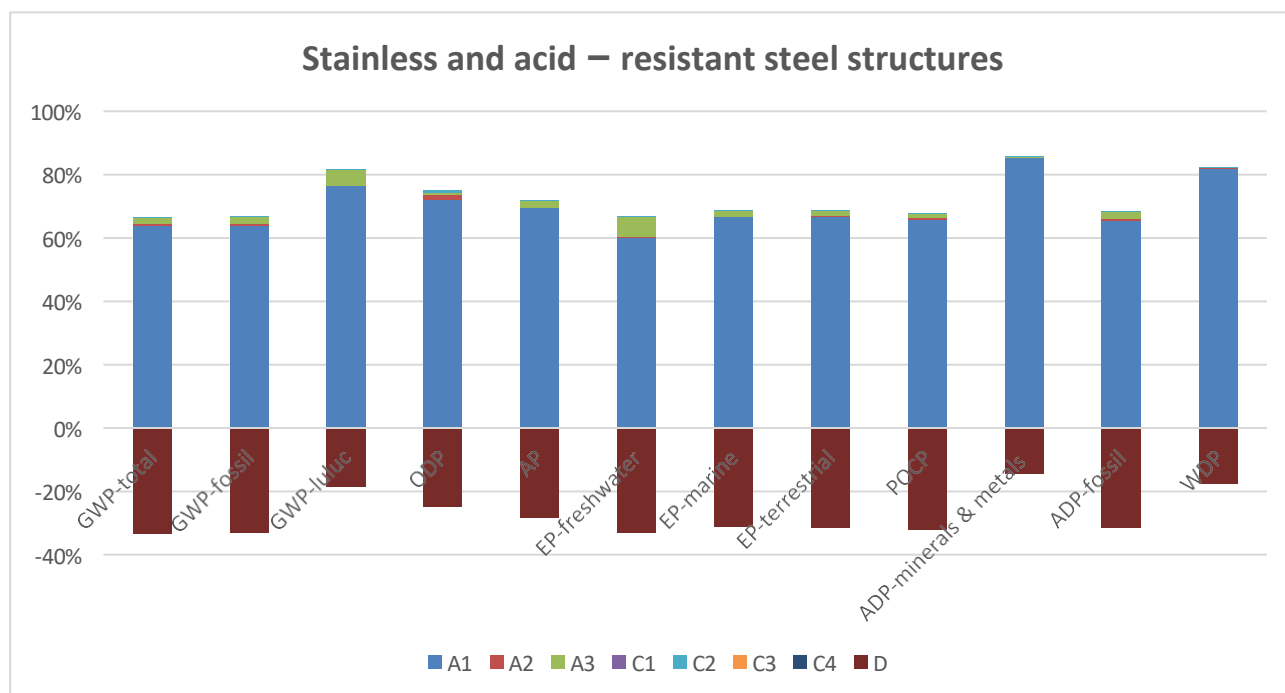


Figure 5 Shares of life cycle modules in the main categories of impact – stainless and acid – resistant steel structures

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