Type III Environmental Product Declaration No. 524/2023

Issuance date: 17.11.2023
Validity date: 17.11.2028

Steel structures and steel structure components

Owner of the EPD:

Valmont Polska Sp. z o.o.
Address: Sucharskiego 6
08-110 Siedlce, Poland
Tel.: +48 25 643 04 00
Website: https://www.valmont.pl/
Contact: valmont@valmont.com

EPD Program Operator:

Instytut Techniki Budowlanej (ITB)
Address: Filtrowa 1,
00-611 Warsaw, Poland
Website: www.itb.pl
Contact: Michał Piasecki
m.piasecki@itb.pl
energia@itb.pl

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

Basic information

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

Life cycle analysis (LCA): A1-A3, A4-A5, C1-C4 and D modules in accordance with EN 15804+A2 (Cradle-to-Gate with options)

The year of preparing the EPD: 2023

Product standard: PN EN 1090-2, EN 40-5:2002

Service Life: 50 years

PCR: ITB-PCR A

Declared unit: 1 ton

Reasons for performing LCA: B2B

Representativeness: Poland, European, 2022

MANUFACTURER

Valmont Polska Sp. z o.o. was established in July 1994 as a joint venture between Valmont Industries and Mostostal Siedlce S.A. In cooperation with Valmont's French branch and Mostostal Siedlce, Valmont Polska organized the sale of steel lighting poles on the Polish market. In 1996, the shareholders decided to establish a production plant in Siedlce. In 1997, production of complete galvanized lighting poles began. The years 2000-2019 were marked for Valmont Poland by a significant increase in sales on domestic and export markets and further investments in development. In addition, Valmont's team of employees continuously focused on improving customer satisfaction by expanding the product range to include tramway poles, signal poles, power poles and tall masts. During this period, Valmont also introduced a lean production management system to increase productivity and shorten delivery times. Thanks to the consistently good performance in the Polish and Central European markets served by Valmont Polska, a new investment was finally decided upon and a brand new Valmont Polska factory with the modern technology for the production of lighting poles was completed in 2019. The Valmont Polska factory is the center of excellence for the entire Valmont group in the EMEA region. Today, Valmont Poland provides excellent products and services in Poland and Central and Eastern Europe, offering global experience and manufacturing resources combined with the expertise of local engineers and representatives in the region.

PRODUCTS DESCRIPTION

Valmont Polska Sp. z o. o. at the plant in Siedlce produces steel lighting, signaling, tram and power poles and high masts The production process is partially automated and is based on the acceptance of metallurgical materials for production (steel coils or steel sheets) and then cold processing of steel (unwinding, cutting, bending). The shaped elements are welded longitudinally by one of the following three methods, depending on the technological process: – SAW (submerged arc welding) – submerged arc welding, – PAW (plasma arc welding) – plasma welding, – ERW (electric resistance welding) – electric resistance welding. The structure is finished in black, including welding of the base and accessories, using MIG-MAG welding and mechanical methods - cutting, grinding, burning. The products are protected against corrosion by hot-dip galvanizing in external galvanizing plants, and can optionally be powder coated or hydrodynamically coated in external painting shops. The steel columns covered by this EPD are manufactured in several conicities made out of hot-rolled steel sheet with few thicknesses and grades based on customer requirements and local norms. The product range is presented in the product catalogue and is described in terms of material, shape, height, taper, together with the conditions of use (passive safety).Depending on the type, the pole is circular or octagonal in cross-section.

LIFE CYCLE ASSESSMENT (LCA) – general rules applied

Unit

The declared unit is 1 ton of product. Conversion from a ton to one piece of product is possible by adopting a conversion factor (ton -> piece) by the weight of an specific pole (for 50 kg piece conversion factor is 0.05).

System boundary

The life cycle analysis of the declared products covers “Product Stage” A1-A3, A4-A5, C1-C4+D modules in accordance with EN 15804 and ITB PCR A (cradle to gate with options). Energy and water consumption, emissions as well as information on generated wastes were inventoried and were included in the calculation. It can be assumed that the total sum of omitted processes does not exceed 5% of all impact categories. In accordance with EN 15804+A2, machines and facilities (capital goods) required for the production as well as transportation of employees were not included in LCA.

Allocation

The allocation rules used for this EPD are based on general ITB’s document PCR A. Production of the covered steel products is a line process (as presented in Figure 1) conducted in the manufacturing plant located in Siedlce (Poland). Input and output data from the production is inventoried and allocated to the production on the mass basis. The declaration covers a wide range of steel products. Their production resources and processing stages are basicly similar, so it is possible to average the production by product weight. The production process carried out at another company's plant is galvanizing and optional special coating, which was included in the calculations.

System limits

Minimum 99.0% input materials and 100% energy consumption (electricity, gas, LPG, other) were inventoried in a processing plant and were included in the calculation. In the assessment, all significant parameters from gathered production data are considered, i.e. all material used per formulation, utilized thermal energy, and electric power consumption, direct production waste and available emission measurements. Tires consumption for transport was not considered. Substances with a percentage share of less than 0.1% of total mass were excluded from the calculations. The packaging products (wooden pallets) are included. Modules A5, B1-B5 are not assessed. In B1-B5, only marginal maintenance is required.

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

The modules A1 and A2 represent the extraction and processing of raw materials (mainly steel elements) and transport to the production site. The steel sheets are semi-products commonly used to produce prefabricated elements, skeleton frames, steel structures. Steel used come from a specific suppliers producing steel with EAF technology and BOF. For A2 module (transport) European averages for fuel data are applied.

Module A3: *Production*

The product specific manufacturing process line is presented in Figure 2, an input steel/semi-product is processed to a dedicated shape. The production process is partially automated and is based on receiving metallurgical materials for production (steel coils or steel sheets), followed by cold processing of the steel (unwinding, cutting, bending). The shaped parts are welded longitudinally by one of the following three methods depending on the process: SAW / PAW / ERW. Black finishing of the structure, including welding of the base and accessories is carried out by MIG-MAG welding methods and mechanical methods - cutting, grinding, burning. Products are protected against corrosion by hot-dip galvanizing in outdoor galvanizing shops, optionally they can be powder-coated or hydrodynamically painted in outdoor painting shops.

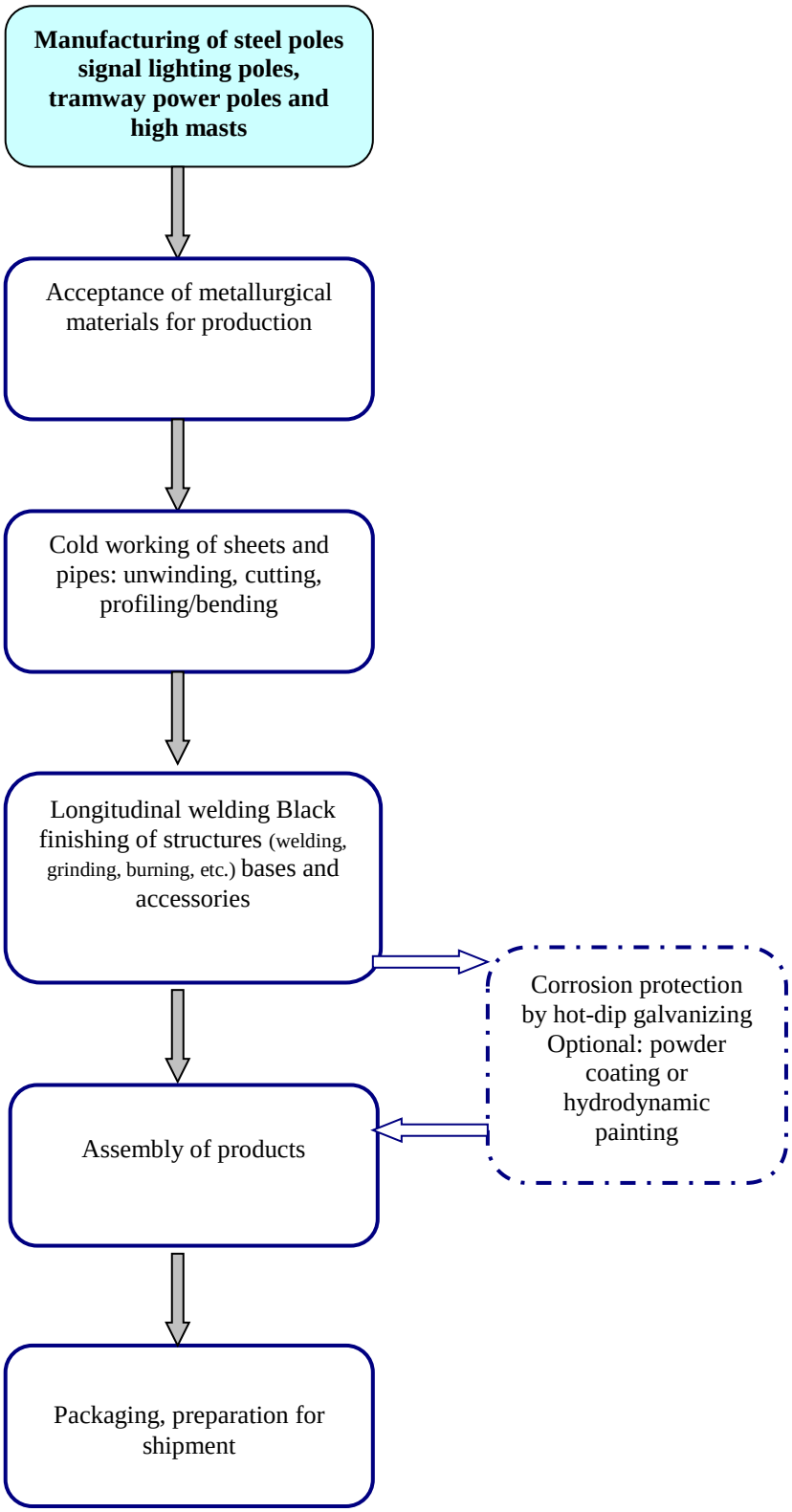

Figure 2 Manufacturing process scheme (A3)

Module A4: transport to consumer

Steel rolls (hot rolled sheet), ancillary materials and packaging materials come from both local and foreign suppliers. Transport is carried out by lorries. For calculation purposes Polish and European fuel averages were applied.

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

For the end-of-life of the lighting pole/structure it is assumed that the pole is dismantled, and the totality of the components are collected. Five per cent of the materials are mixed with the dismantling waste and ninety-eight per cent is separated and sent to recycling. 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 endof-life and the scrap input from previous product life cycle.

Table 1 End-of-life scenario for the steel products and steel structure components

Material	Material recovery	Recycling	Landfilling
Scrap	100%	98%	2%

Electricity at end-of-life (module C) has been modelled using an average Polish electricity mix as the location where the product reaches end-of-life is unknown.

Data collection period

The data for manufacture of the declared products refer to period between 01.01.2022 – 31.12.2022 (1 year). The life cycle assessments were prepared for Poland and Europe as reference area.

Data quality

The data selected for LCA originate from ITB-LCI questionnaires completed by Valmont Polska Sp. z o.o. and verified during data audit. No data collected is older than five years and no generic datasets used are older than ten years. The representativeness, completeness, reliability, and consistency is judged as good. The background data for the processes come from the following resources database Ecoinvent v.3.9.1 (steel, welding, paints, polyester, polyethylene terephthalate production, EUR-flat pallet, structural timber). Specific (LCI) data quality analysis was a part of the input data verification. Where no background data was available, data gaps were complemented by manufacturer information and literature research.

Assumptions and estimates

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

Calculation rules

LCA was performed using ITB-LCA tool developed in accordance with EN15804+A2. Emission of greenhouse gases was calculated using the IPCC 2013 GWP method with a 100-year horizon. Emission of acidifying substances, Emission of substances to water contributing to oxygen depletion, Emission of gases that contribute to the creation of ground-level ozone, Abiotic depletion, and ozone depletion emissions where all calculated with the CML-IA baseline method

Additional information

Polish electricity (Eocinvent v 3.9.1 supplemented by actual national Kobize data) emission factor used is 0.702 kg CO_2/kWh. As a general rule, no particular environmental or health protection measures other than those specified by law are necessary.

LIFE CYCLE ASSESSMENT (LCA) – Results

Declared unit

The declaration refers to declared unit (DU) – 1 ton of Steel structures and steel structure components produced in Europe. The following life cycle modules (Table 2) were included in the analysis. The following tables 3-6 show the environmental impacts of the life cycle of selected modules (A1-A5+C1-C4+D).

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

Environmental assessment information (MD – Module Declared, MND – Module Not Declared, INA – Indicator Not Assessed)															
Product stage			Construction process		Use stage							End of life				Benefits and loads beyond the system boundary
Raw material supply	Transport	Manufacturing	Transport to construction site	Construction-installation process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction demolition	Transport	Waste processing	Disposal	Reuse-recovery-recycling potential
A1	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
MD	**MD**	**MD**	**MD**	**MD**	**MND**	**MND**	**MND**	**MND**	**MND**	**MND**	**MND**	**MD**	**MD**	**MD**	**MD**	**MD**

Table 3 Life cycle assessment (LCA) results for specific product – environmental impacts (DU: 1 ton)

Indicator	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
Global Warming Potential	eq. kg CO_2	2,36E+03	8,79E+01	4,39E+02	2,89E+03	8.34E+01	4.69E-02	7.04E+00	2.21E+01	7.04E+00	6,34E-01	-8.13E+02
Greenhouse potential - fossil	eq. kg CO_2	1,84E+03	2,08E+02	4,25E+02	2,47E+03	8.31E+01	4.69E-02	7.04E+00	2.20E+01	7.04E+00	6,32E-01	-8.16E+02
Greenhouse potential - biogenic	eq. kg CO_2	-6,54E+01	1,06E+00	1,37E+01	-5,06E+01	2.84E-01	1.23E-04	1.85E-02	7.52E-02	1.85E-02	1,61E-03	2.85E+00
Global warming potential - land use and land use change	eq. kg CO_2	9,94E-01	1,24E-01	7,29E-01	1,85E+00	3.26E-02	7.14E-06	1.07E-03	8.64E-03	1.07E-03	5,97E-04	-5.96E-02
Stratospheric ozone depletion potential	eq. kg CFC 11	9,65E-04	4,54E-05	4,10E-05	1,05E-03	1.92E-05	2.51E-10	3.77E-08	5.09E-06	3.77E-08	2,56E-07	-2.91E-05
Soil and water acidification potential	eq. mol H+	6,11E+00	8,10E-01	3,05E+01	3,74E+01	3.37E-01	4.83E-04	7.25E-02	8.93E-02	7.25E-02	5,94E-03	-3.24E+00
Eutrophication potential - freshwater	eq. kg P	5,84E-01	2,03E-02	5,79E-01	1,18E+00	5.59E-03	7.87E-05	1.18E-02	1.48E-03	1.18E-02	5,89E-05	-3.49E-01
Eutrophication potential - seawater	eq. kg N	1,26E+00	2,23E-01	1,47E+00	2,95E+00	1.02E-01	6.84E-05	1.03E-02	2.70E-02	1.03E-02	2,07E-03	-7.10E-01
Eutrophication potential - terrestrial	eq. mol N	1,34E+01	2,23E-01	1,20E+02	1,34E+02	1.11E+00	5.97E-04	8.95E-02	2.94E-01	8.95E-02	2,26E-02	-7.73E+00
Potential for photochemical ozone synthesis	eq. kg NMVOC	6,02E+00	7,57E-01	2,12E+00	8,90E+00	3.40E-01	1.72E-04	2.57E-02	9.01E-02	2.57E-02	6,58E-03	-4.08E+00
Potential for depletion of abiotic resources - non-fossil resources	eq. kg Sb	1,88E-02	1,32E-03	1,35E-01	1,55E-01	2.95E-04	1.72E-08	2.58E-06	7.80E-05	2.58E-06	1,45E-06	-1.54E-02
Abiotic depletion potential - fossil fuels	MJ	2,89E+04	3,04E+03	6,91E+03	3,89E+04	1.23E+03	7.21E-01	1.08E+02	3.27E+02	1.08E+02	1,73E+01	-6.75E+03
Water deprivation potential	eq. m^3	5,93E+02	1,88E+01	3,37E+02	9,48E+02	5.70E+00	1.38E-02	2.07E+00	1.51E+00	2.07E+00	5,50E-02	-1.16E+02

Table 4 Life cycle assessment (LCA) results for specific product – additional impacts indicators (DU: 1 ton)

Indicator	Unit	A1-A3	A4-A5	C1-C4	D
Particulate matter	disease incidence	INA	INA	INA	INA
Potential human exposure efficiency relative to U235	eg. kBq U235	INA	INA	INA	INA
Potential comparative toxic unit for ecosystems	CTUe	INA	INA	INA	INA
Potential comparative toxic unit for humans (cancer effects)	CTUh	INA	INA	INA	INA
Potential comparative toxic unit for humans (non-cancer effects)	CTUh	INA	INA	INA	INA
Potential soil quality index	dimensionless	INA	INA	INA	INA

Table 5 Life cycle assessment (LCA) results for specific product - the resource use (DU: 1 ton)

Indicator	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
Consumption of renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	1.38E+03	6.56E+01	7.29E+02	2.17E+03	1.77E+01	5.93E-02	8.90E+00	4.69E+00	8.90E+00	1.50E-01	-5.65E+02
Consumption of renewable primary energy resources used as raw materials	MJ	4.00E+02	0.00E+00	0.00E+00	4.00E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total consumption of renewable primary energy resources	MJ	1.78E+03	6.56E+01	7.29E+02	2.57E+03	1.77E+01	5.93E-02	8.90E+00	4.69E+00	8.90E+00	1.50E-01	-5.65E+02
Consumption of non-renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	2.86E+04	3.04E+03	7.29E+03	3.90E+04	1.23E+03	7.21E-01	1.08E+02	3.27E+02	1.08E+02	1.73E+01	-6.48E+03
Consumption of non-renewable primary energy resources used as raw materials	MJ	2.14E+03	0.00E+00	0.00E+00	2.14E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total consumption of non-renewable primary energy resources	MJ	3.08E+04	3.04E+03	7.29E+03	4.11E+04	1.23E+03	7.21E-01	1.08E+02	3.27E+02	1.08E+02	1.73E+01	-6.48E+03
Consumption of secondary materials	kg	4.50E+02	1.60E+00	1.75E-01	4.52E+02	4.14E-01	6.27E-05	9.40E-03	1.10E-01	9.40E-03	3.64E-03	9.88E+02
Consumption of renew. secondary fuels	MJ	1.01E+00	1.92E-02	7.56E-04	1.03E+00	4.56E-03	3.16E-07	4.75E-05	1.21E-03	4.75E-05	9.51E-05	-1.42E-01
Consumption of non-renewable secondary fuels	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	0.00E+00
Net consumption of freshwater	m^3	8.25E+00	5.01E-01	1.03E+01	1.91E+01	1.55E-01	2.07E-03	3.11E-01	4.11E-02	3.11E-01	1.90E-02	-5.83E+00

Table 6 Life cycle assessment (LCA) results for specific product – waste categories (DU: 1 ton)

Indicator	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
Hazardous waste	kg	1.22E+01	4.82E+00	1.84E+01	3.54E+01	1.38E+00	5.59E-03	8.38E-01	3.67E-01	8.38E-01	1.84E-02	-8.19E-02
Non-hazardous waste	kg	1.00E+03	8.89E+01	9.33E+02	2.03E+03	2.46E+01	3.76E-01	5.65E+01	6.51E+00	5.65E+01	2.59E-01	-1.19E+02
Radioactive waste	kg	2.44E-02	3.34E-04	2.26E-02	4.73E-02	9.21E-05	1.08E-07	1.62E-05	2.44E-05	1.62E-05	1.15E-04	-1.31E-02
Components for re-use	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	kg	1.09E-01	1.23E-02	1.10E+03	1.10E+03	3.82E-03	4.84E-06	7.26E-04	1.01E-03	7.26E-04	3.47E-05	0.00E+00
Materials for energy recovery	kg	2.09E-03	9.45E-05	1.81E-05	2.21E-03	3.09E-05	7.78E-09	1.17E-06	8.18E-06	1.17E-06	4.11E-07	0.00E+00
Exported Energy	MJ	1.83E+01	0.00E+00	5.40E+00	2.37E+01	0.00E+00	2.31E-03	3.46E-01	0.00E+00	3.46E-01	0.00E+00	0.00E+00

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 (sub clause 8.1.3.) [x] external [ ] internal
External verification of EPD: Halina Prejzner, PhD. Eng. LCI audit and verification: Michał Chwedaczuk, M.Sc. Eng. LCA, LCI audit and input data verification: Michał Piasecki, PhD., D.Sc., eng.

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

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

Normative references

- ITB PCR A General Product Category Rules for Construction Products
- EN 1090-2:2018 - Execution of steel structures and aluminium structures - Technical requirements for steel structures
- PN-EN 1090-1+A1:2012 - Wykonanie konstrukcji stalowych i aluminiowych -- Część 1: Zasady oceny zgodności elementów konstrukcyjnych
- ISO 14025:2006, Environmental labels and declarations – Type III environmental declarations – Principles and procedures
- ISO 21930:2017 Sustainability in buildings and civil engineering works – Core rules for environmental product declarations of construction products and services
- ISO 14044:2006 Environmental management – Life cycle assessment – Requirements and guidelines
- ISO 15686-1:2011 Buildings and constructed assets – Service life planning – Part 1: General principles and framework
- ISO 15686-8:2008 Buildings and constructed assets – Service life planning – Part 8: Reference service life and service-life estimation
- EN 15804:2012+A2:2019 Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products
- ISO 14067:2018 Greenhouse gases — Carbon footprint of products — Requirements and guidelines for quantification
- PN-EN 15942:2012 Sustainability of construction works – Environmental product declarations – Communication format business-to-business
- ISO 20915:2018 Life cycle inventory calculation methodology for steel products
- KOBiZE Wskaźniki emisyjności CO_2, SO_2, NO_x, CO i pyłu całkowitego dla energii elektrycznej. December 2021
- World Steel Association 2017 Life Cycle inventory methodology report for steel products

Instytut Techniki Budowlanej
00-611 Warsaw, Filtrowa 1

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

CERTIFICATE № 524/2023
of TYPE III ENVIRONMENTAL DECLARATION

Products:

Steel structures and steel structure components

Manufacturer:

Valmont Polska Sp. z o.o.

ul. Sucharskiego 6, 08-110 Siedlce, Poland

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

EN 15804+A2

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

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

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

INSTYTUT TECHNIKI BUDOWLANEJ

Deputy Director for Research and Innovation
Krzysztof Kuczyński, PhD

Warsaw, November 2023