ENVIRONMENTAL PRODUCT DECLARATION

as per *ISO 14025* and *EN 15804+A2*

Owner of the Declaration	Mostostal Siedlce Limited liability company LP
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-MOS-20220213-CBA1-EN
Issue date	16.11.2022
Valid to	15.11.2027

Steel structures, pallets and platform gratings + coating (optional)

Mostostal Siedlce Limited liability company LP

Institut Bauen und Umwelt e.V.

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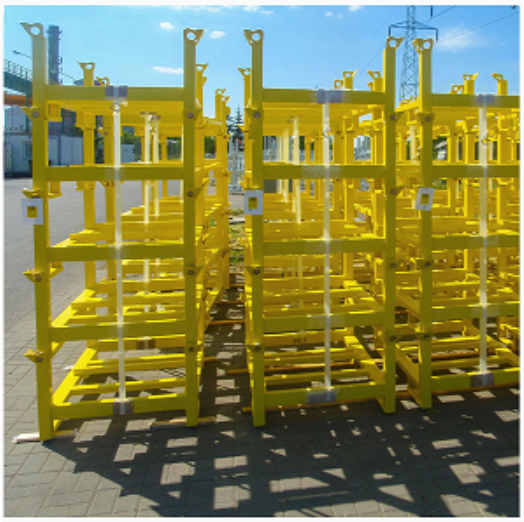

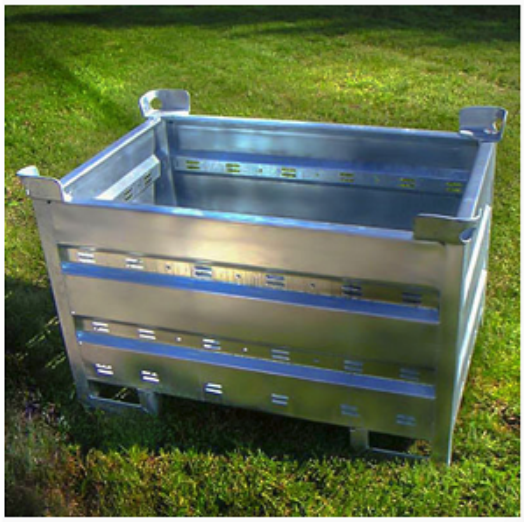

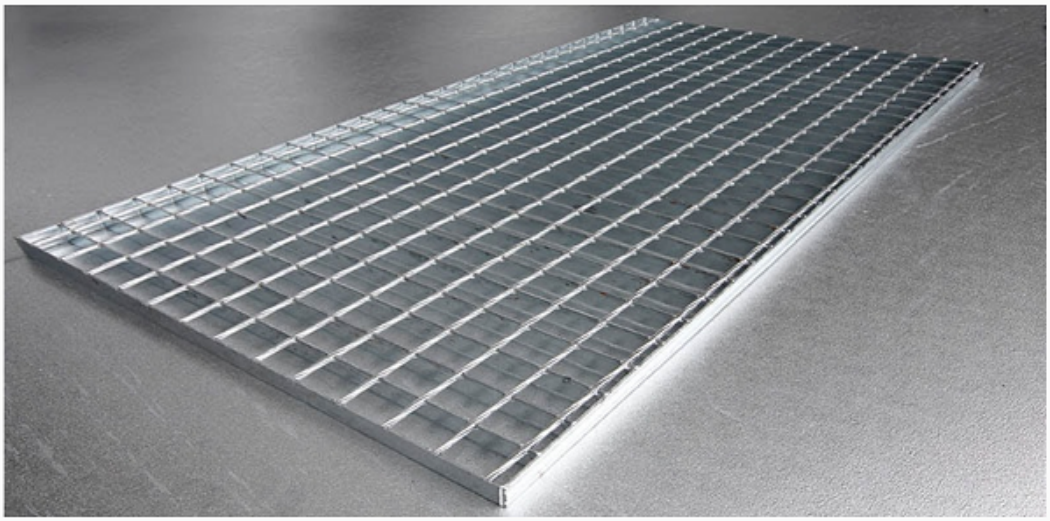

General Information

Mostostal Siedlce
Limited liability company LP

Programme holder
IBU – Institut Bauen und Umwelt e.V.
Hegelplatz 1
10117 Berlin
Germany

Declaration number
EPD-MOS-20220213-CBA1-EN

This declaration is based on the product category rules:
Structural steels, 11.2017
(PCR checked and approved by the SVR)

Issue date
16.11.2022

Valid to
15.11.2027

Dipl. Ing. Hans Peters
(chairman of Institut Bauen und Umwelt e.V.)

Dr. Alexander Röder
(Managing Director Institut Bauen und Umwelt e.V.))

Steel structures, pallets and platform gratings + coating (optional)

Owner of the declaration
Mostostal Siedlce Limited liability company LP
Terespolska 12
08-110 Siedlce
Poland

Declared product / declared unit
1 ton of representative steel structure, pallets or platform gratings

Scope:
Steel alloy is the main material, used in over 98% of production and it was modelled as the mean value on the basis of the safety data sheets purchased steel received from the company.

EPD covered: galvanized structures, painted structures, duplex structures, structures without protection, galvanized pallets, galvanized gratings, and gratings without protection.

The owner of the declaration shall be liable for the underlying information and evidence; the IBU shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.
The EPD was created according to the specifications of *EN 15804+A2*. In the following, the standard will be simplified as *EN 15804*.

Verification

The standard *EN 15804* serves as the core PCR
Independent verification of the declaration and data according to *ISO 14025:2011*
☐ internally ☒ externally

Vito D'Incognito
(Independent verifier)

Product

Product description/Product definition
The analyzed products include steel structures, platform gratings and pallets. In addition, they may be covered with anti-corrosion protection, which is applied using hot galvanizing according to *EN ISO 1461 (DIN 50976)*, painting or power painting in a range of colours.

For the placing on the market of the product in the European Union/European Free Trade Association (EU/EFTA) (with the exception of Switzerland) Regulation *EU No. 305/2011 (CPR)* applies. The product needs a declaration of performance taking into consideration *EN 1090-1* and the CE-marking. For the application and use the respective national provisions apply.

Application
The products covered in the EPD:

- Galvanized structures;
- Painted structures;
- Duplex structures;
- Structures without protection;
- Galvanized pallets;
- Galvanized gratings;
- Gratings without protection.

Technical Data
Mostostal Siedlce manufactures steel structures based on the technical documentation of the customer and based on the internal documentation, developed by constructors working at the Company. Documentation

is developed according to the standards: PN, DIN, EN, EUROCODES and GOST in the following languages: Polish, Russian, German and English. Used IT tools are: Robot, Staad-Pro, Microstation– Structural, Rm-win, ABCpłyta, MathCad, Tekla, Bocad, RCad, and Autocad. The maximum dimensions for indivisible components composing a product are as follows: L = 30 m, B = 6.3 m, H = 4.2 m and correspond to the weight of 64 tonnes. Steel structures are carried out according to the standards: *EN 1090-1-2, BSK 07, DIN 18800-7, DIN 15018, DS 804, DIN 19704, AWS D1.1*. Platform gratings are manufactured in accordance with *DIN 24537*.

Constructional data

Name	Value	Unit
Density	7850	kg/m^3
Tolerances on dimension and shape	EN 1090-2; Annex B, Class 2	
Weldability	EN 10025-2; EN 10219	
Facture tougheness/brittle strength 20 degrees Celsius	27	J
Reaction to fire	A1 Class	
Durability / Corrosion protection	EN ISO 1461; EN ISO 12944	

Performance data of the product in accordance with the declaration of performance with respect to its essential characteristics according to *EN 1090-2.*

Base materials/Ancillary materials

Structural steels are non-or low-alloy steel products whose carbon content is amount 0.16%, Mn - 1,3%, Si 0.17%, Cr 0,04%, Ni 0.04%., Cu 0.10%, Mo, 0.01%. Iron is the main component of steel.
Abrasive blasting (shot peening) and chemical treatment (etching in acids) is employed.
The metallic coating according *EN 10346*:
Zn<99.995%
Painting protection: using the hydrodynamic method.

This product/article/at least one partial article contains substances listed in the candidate list (date: 09.09.2022) exceeding 0.1 percentage by mass: no.

Reference service life

not applicable

LCA: Calculation rules

Declared Unit

This declaration applies to 1 ton of analysed products (steel structures, pallets and platform gratings).
The LCA is calculated based on averaged volume production data of the contributing plants.

Declared unit

Name	Value	Unit
Declared unit	1	t

Type of EPD: Declaration of a representative product from the manufacturer´s plants.

System boundary

Type of EPD: Cradle-to-gate (with options)
The system boundaries of the EPD follow the modular construction system as described by *EN 15804*.
The LCA takes into account the following modules:

A1-A3: Manufacturing of pre-products, packaging, ancillary materials, transport to the factory, production including energy supply and waste handling,
A4: Transport to building site,
C1:Deconstruction, demolition,
C2:Transport to waste processing plant,
C3:Waste processing,
C4: Waste disposal (incineration).
D: Potential for reuse, recovery and/or recycling (benefits for incineration and recovery of packaging materials from module A5 and envelopes incineration from module C4).

Comparability

Basically, a comparison or an evaluation of EPD data is only possible if all the data sets to be compared were created according to *EN 15804* and the building context, respectively the product-specific characteristics of performance, are taken into account.

SimaPro software and databases (mainly Ecoinvent) were used as a calculation basis.

LCA: Scenarios and additional technical information

Characteristic product properties
Information on biogenic Carbon

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Information on describing the biogenic Carbon Content at factory gate

Name	Value	Unit
Biogenic carbon content in product	-	kg C
Biogenic carbon content in accompanying packaging	1263.99	kg C

An average of around 85% of all steel is recycled at the end of a product's life. These values are based on expert judgement amongst the worldsteel LCA experts in 2020 (WSA). 15% of the end of life of steel was modelled as landfill.

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End of life (C1 - C4)
50% is cutting the dismantled structures with electricity and 50% is cutting the dismantled structures with welding gas.
25 m of cutting is needed for 1 ton of structures, gratings and pallets.

Transport of used products and packaging: 100 km.

Name	Value	Unit
Collected separately : packaging materials	2581	kg
Collected as mixed construction waste : steel	150	kg
Energy recovery	1290	kg
Landfilling	1440	kg

Reuse, recovery and/or recycling potentials (D), relevant scenario information
The avoided production of primary steel sheet is considered. Resulting potential benefits and loads for metal recycling are declared in module D.

LCA: Results

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DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; ND = MODULE OR INDICATOR NOT DECLARED; MNR = MODULE NOT RELEVANT)

PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARIES
Raw material supply	Transport	Manufacturing	Transport from the gate to the site	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction 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
X	X	X	X	ND	ND	ND	MNR	MNR	MNR	ND	ND	X	X	X	X	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A2: declared unit and product

Core Indicator	Unit	A1	A2	A3	A4	C1	C2	C3	C4	D
GWP-total	[kg CO_2-Eq.]	1.74E+3	1.97E+2	2.10E+3	9.72E+1	5.62E+0	3.19E+1	1.28E+1	1.23E+2	-4.63E+2
GWP-fossil	[kg CO_2-Eq.]	1.73E+3	1.97E+2	2.09E+3	9.71E+1	5.60E+0	3.18E+1	1.28E+1	2.19E+1	-4.63E+2
GWP-biogenic	[kg CO_2-Eq.]	2.66E+0	6.53E-2	2.55E+0	3.00E-2	1.55E-2	1.10E-2	1.92E-2	1.01E+2	-1.11E-1
GWP-luluc	[kg CO_2-Eq.]	1.02E+0	6.32E-2	5.12E+0	2.42E-2	9.58E-3	9.04E-3	7.29E-3	4.10E-3	-5.97E-2
ODP	[kg CFC11-Eq.]	9.08E-5	4.53E-5	1.58E-4	2.29E-5	2.05E-7	7.62E-6	2.26E-6	2.15E-6	-2.02E-5
AP	[mol H^+-Eq.]	8.52E+0	7.15E-1	1.25E+1	7.49E-1	2.53E-2	1.22E-1	1.10E-1	2.59E-1	-1.63E+0
EP-freshwater	[kg P-Eq.]	9.90E-2	1.43E-3	1.07E-1	6.28E-4	3.06E-4	2.33E-4	3.79E-4	2.56E-4	-2.31E-2
EP-marine	[kg N-Eq.]	1.72E+0	1.99E-1	1.97E+0	1.97E-1	4.59E-3	3.48E-2	4.29E-2	1.60E-1	-3.67E-1
EP-terrestrial	[mol N-Eq.]	1.90E+1	2.20E+0	2.04E+1	2.18E+0	4.83E-2	3.85E-1	4.72E-1	1.32E+0	-3.97E+0
POCP	[kg NMVOC-Eq.]	8.18E+0	7.10E-1	1.05E+1	6.38E-1	1.51E-2	1.29E-1	1.28E-1	3.57E-1	-2.24E+0
ADPE	[kg Sb-Eq.]	1.11E-1	6.53E-4	5.30E-3	2.03E-4	1.13E-5	7.60E-5	6.04E-7	4.19E-6	-4.41E-5
ADPF	[MJ]	1.90E+4	3.01E+3	2.32E+4	1.51E+3	6.95E+1	5.06E+2	2.02E+2	2.10E+2	-4.69E+3
WDP	[m^3 world-Eq deprived]	5.71E+2	8.65E+0	1.66E+1	4.41E+0	1.89E+0	1.67E+0	7.24E-1	-1.62E+1	4.88E+0

Caption	GWP = Global warming potential; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential of land and water; EP = Eutrophication potential; POCP = Formation potential of tropospheric ozone photochemical oxidants; ADPE = Abiotic depletion potential for non-fossil resources; ADPF = Abiotic depletion potential for fossil resources; WDP = Water (user) deprivation potential

RESULTS OF THE LCA - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A2: declared unit and product

Indicator	Unit	A1	A2	A3	A4	C1	C2	C3	C4	D
PERE	[MJ]	1.10E+3	3.91E+1	3.91E+4	1.66E+1	8.28E+0	6.17E+0	1.16E+1	3.80E+0	-5.29E+1
PERM	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
PERT	[MJ]	0.00E+0	0.00E+0	3.90E+4	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
PENRE	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
PENRM	[MJ]	1.10E+3	3.91E+1	7.81E+4	1.66E+1	8.28E+0	6.17E+0	1.16E+1	3.80E+0	-5.29E+1
PENRT	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
SM	[kg]	1.90E+4	2.94E+3	2.19E+4	1.51E+3	6.95E+1	5.06E+2	2.02E+2	2.10E+2	-4.69E+3
RSF	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
NRSF	[MJ]	0.00E+0	6.99E+1	1.35E+3	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
FW	[m^3]	7.53E+0	2.00E-1	1.28E+1	9.37E-2	2.02E-2	3.39E-2	2.33E-2	2.72E-1	-8.89E-1

Caption	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; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = 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 secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water

RESULTS OF THE LCA – WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A2: declared unit and product

Indicator	Unit	A1	A2	A3	A4	C1	C2	C3	C4	D
HWD	[kg]	1.46E+0	4.16E-3	6.57E+1	4.10E-2	2.55E-3	0.00E+0	7.06E-2	5.17E-2	-4.82E-1
NHWD	[kg]	3.12E+3	1.03E-1	2.11E+3	2.84E-1	8.69E+0	0.00E+0	1.73E+1	4.18E+3	-8.73E+2
RWD	[kg]	4.97E-5	1.02E-6	1.60E-5	2.29E-6	2.25E-7	0.00E+0	2.63E-6	1.34E-6	-1.03E-5
CRU	[kg]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
MFR	[kg]	0.00E+0	0.00E+0	1.09E+2	0.00E+0	0.00E+0	0.00E+0	8.50E+2	0.00E+0	0.00E+0
MER	[kg]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
EEE	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
EET	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0

Caption	HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy

RESULTS OF THE LCA – additional impact categories according to EN 15804+A2-optional: [declared unit and product]

Indicator	Unit	A1	A2	A3	A4	C1	C2	C3	C4	D
PM	[Disease Incidence]	1.06E-4	1.37E-5	1.32E-4	7.88E-6	6.41E-7	2.84E-6	2.36E-6	3.48E-6	-2.82E-5
IRP	[kBq U235-Eq.]	5.21E+1	1.32E+1	3.70E+1	6.60E+0	3.34E-1	2.22E+0	1.20E+0	4.98E-1	-4.49E+0
ETP-fw	[CTUe]	8.25E+4	2.27E+3	4.57E+4	1.08E+3	9.06E+1	3.88E+2	7.31E+1	3.22E+2	-9.35E+3
HTP-c	[CTUh]	1.25E-5	7.85E-8	7.61E-6	3.38E-8	4.79E-8	1.19E-8	1.38E-9	3.60E-8	-2.41E-6
HTP-nc	[CTUh]	6.04E-5	2.29E-6	2.65E-5	1.14E-6	6.99E-8	4.10E-7	8.44E-8	2.84E-6	-9.28E-6
SQP	[-]	5.48E+3	2.30E+3	4.25E+5	1.55E+3	1.03E+1	5.80E+2	8.30E+0	2.45E+2	-1.25E+3

Caption	PM = Potential incidence of disease due to PM emissions; IR = 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 (not cancerogenic); SQP = Potential soil quality index

Disclaimer 1 – for the indicator “Potential Human exposure efficiency relative to U235”.This impact category deals mainly with the eventual impact of low dose ionizingradiation on human health of the nuclear fuel cycle. It does not consider effects due to possiblenuclear accidents, occupational exposure or radioactive waste disposal in undergroundfacilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.
Disclaimer 2 – for the indicators “abiotic depletion potential for non-fossil resources”, “abiotic depletion potential for fossil resources”, “water (user) deprivation potential, deprivation-weighted water consumption”, “potential comparative toxic unit for ecosystems”, “potential comparative toxic unit for humans – cancerogenic”, “Potential comparative toxic unit for humans - not cancerogenic”, “potential soil quality index”. The results of this environmental impact indicator shall be used with care as theuncertainties on these results are high as there is limited experience with the indicator.

References

AIB
Association of Issuing Bodies. European Residual Mixes. Results of the calculation of Residual Mixes for the calendar year 2020. https://www.aib-net.org/facts/european-residual-mix

AISI
American Iron and Steel Institute. Steel sustainability in the construction market. https://www.steel.org/wp-content/uploads/2020/09/Steel-Sustainability-in-Construction-Fact-Sheet.pdf

Ecoinvent
Ecoinvent database v. 3.7.1

EEA
EEA Report No 13/2019Technical guidance to prepare national emission inventories. https://www.eea.europa.eu/publications/emep-eea-guidebook-2019

EPLCA
European Platform on Life Cycle Assessment, Environmental Footprint, https://eplca.jrc.ec.europa.eu/EnvironmentalFootprint.html

IBU Instruction
GENERAL INSTRUCTIONS for the EPD programme of Institut Bauen und Umwelt e.V., v. 2.0, 2021.

PCR Part A
IBU. Product Category Rules for Building-Related Products and Services. Part A: Calculation Rules for the Life Cycle As-sessment and Requirements on the Project Re-port according to EN 15804+A2:2019; v 1.2, 2021.

PCR Part B
IBU. PCR Guidance-Texts for Building-Related Products and Services. Part B: Requirements on the EPD for Structural steels, v. 1.6, 2017.

SCI
SteelConstruction.info, The recycling and reuse survey. https://www.steelconstruction.info/The_recycling_and_reuse_survey. Access: August 2022.

SimaPro
SimaPro software, v. 9.2.0.1.

WSA
World steel association. Life cycle inventory (LCI) study 2020 data release. Seventh global LCI study for steel products. May 2021; p.19.

Standards, Regulation
AWS D1.1
AWS D1.1: Structural Welding Code—Steel. 2000.

BSK 07
The Housing Authority's handbook on steel structures, BSK 07 (Boverkets handbok om stålkonstruktioner, BSK 07), Boverket 2007.

DIN 15018
DIN 15018-3. Cranes; principles relating to steel structures; design of cranes on vehicles. 1984.

DIN 18800-7
DIN 18800-7. Steel structures - Part 7: Execution and constructor's qualification. 2008.

DIN 19704
DIN 19704. Hydraulic steel structures - Part 1: Criteria for design and calculation; Hydraulic steel structures - Part 2: Design and manufacturing. 2014.

DIN 24537
DIN 24537. Grating type. 2007.

EN 10346
EN 10346:2015. Continuously hot-dip coated steel flat products for cold forming – Technical delivery conditions.

EN 1090-1
EN 1090-1:2009+A1:2011 Execution of steel structures and aluminium structures - Part 1: Requirements for conformity assessment of structural components.

EN 1090-2
EN 1090-2:2018 Execution of steel structures and aluminium structures - Part 2: Technical requirements for steel structure.

EN 15804
EN 15804:2012+A2:2019/AC:2021. Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products.

EN ISO 14025
EN ISO 14025:2010, Environmental labels and declarations. Type III environmental declarations. Principles and procedures.

EU No 305/2011
Regulation (EU) No 305/2011 - construction products - of 9 March 2011 laying down harmonised conditions for the marketing of construction products and repealing Council Directive 89/106/EEC (Latest update: 2017).

EN ISO 1461 (DIN 50976)
PN-EN ISO 1461:2011 Hot dip galvanized coatings on fabricated iron and steel articles. Specifications and test methods (Polish version). DIN 50976. Protection against Corrosion - Coatings on iron and steel components applied by hot dip zinc coating - Requirements and testing, 1989.

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