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Environmental Product Declaration

In accordance with ISO 14025 and EN 15804:2012+A2:2019 for:

Primed and painted steel structures

from JSC Litana ir Ko

Programme:	The International EPD® System, www.environdec.com
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An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at www.environdec.com

Company information

Owner of the EPD:
JSC Litana ir Ko
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Tel +370 46 455352
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Description of the organisation: Litana Group of companies was established in 1992 in Gargzdai, Lithuania. Litana Group generates annual turnover of 120 mln. Euros (2019) and has over 1600 employees in 10 branch companies.

Litana Group core business activities are:
- Industrial and civil engineering design
- Manufacturing of steel structures
- Organization and management of industrial and civil construction
- Execution of industrial projects
- Electrical installation
- Rent and assembly of scaffolding structures
- Shipbuilding (steel works, installation of pipelines, painting, insulation)

JSC Litana ir Ko is certified according to international quality management, environmental and occupational safety standards:
• ISO 45001:2018/(LST ISO 9001:2018)
• ISO 14001:2015/(LST ISO 9001:2015)
• ISO 9001:2015/(LST ISO 9001:2015)

Name and location of production site(s): The manufacturing plant of JSC Litana ir Ko is based in Gargzdai (Lithuania).

Product information

Product name: Primed and painted steel structures

Product identification: The manufactured metal structures comply with the requirements of the European Union (EU), health and environmental protection regulations and are marked with the CE mark.

The manufacturing process of the product is certified and complies with the following European Union regulations:

1. EN1090-2:2018, execution class up to EXC3, groups of parent metal 1.1, 1.2, 1.4, 8 and 10 according to CEN ISO/TR 15608:2017, welding processes 111, 135, 136, 138 and 141 according to EN ISO 4063:2010, covered by anti-corrosion coating.
2. LST EN ISO 3834-2:2006 certification covers: manufacturing of various metal constructions, items and components, when used certified welding processes EN1090-2:2018, LST EN 13480-2:2017, LST EN 13480-4:2017, LST EN 13480-8:2017, basic groups of metal 1.1, 1.2, 1.4

according to CEN ISO/TR 15608:2017, welding processes 111, 135, 136, 138 and 141 according to EN ISO 4063:2010.

Product description: Primed and painted steel structures such as columns, trusses, beams and non-standard structures (railings, supports, etc.) are declared.

Black steel primed and painted structures are used in residential, industrial, commercial, storage, sports and other buildings as load-bearing and auxiliary structures for a building or s structure. The structures ensure the designed mechanical stability, resistance, hygiene and fire safety of the building or structure.

Constructions are produced in various sizes and shapes. According to the production equipment and premises, the maximum weights and geometrical parameters of structures or their components are possible: weight – 10t, length – 17m, height – 6m, thickness of elements (components) –100mm (cutting elements mechanically and using gas plasma), elements (components parts) thickness – 16mm (for rolling and bending elements mechanically).

UN CPC code: 412

Geographical scope: Europe

LCA information

Functional unit / declared unit: In accordance to the PCR the declared unit is 1 kg of the product.

Reference service life: The reference service life for the primed and painted steel structures is set at 50 years.

Time representativeness: Primary data was collected internally. The production data refers to the average of the year 2020.

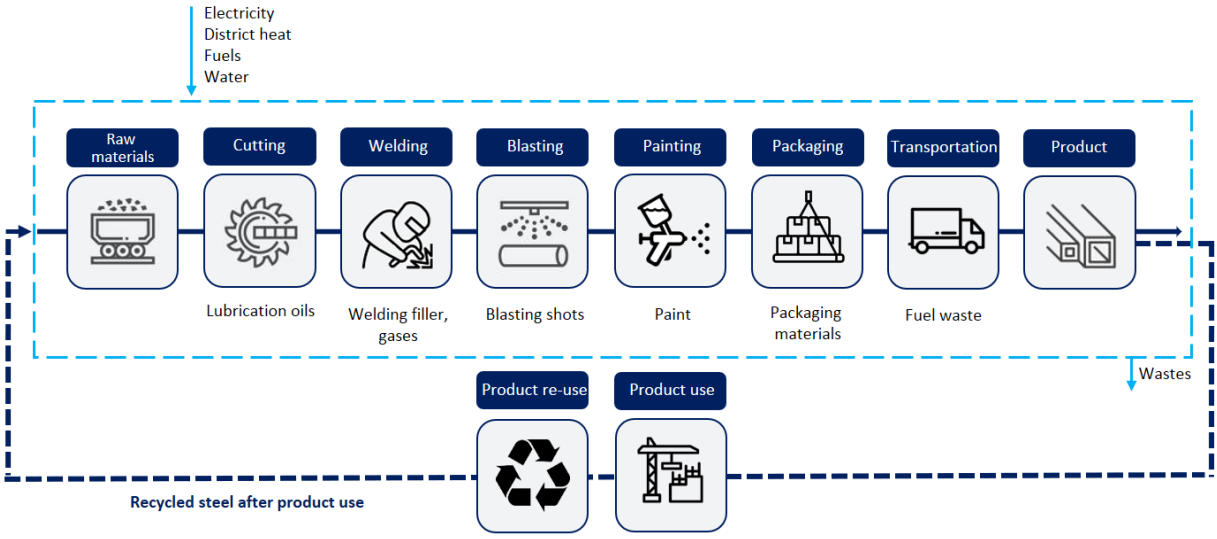
Database(s) and LCA software used: The Ecoinvent database provides the life cycle inventory data for the raw and process materials obtained from the background system. The used database is Ecoinvent 3.6. The LCA software used is One Click LCA.

Description of system boundaries: Cradle to gate with options. The LCA was carried out considering the Product stage phases (A1, A2, A3), Distribution (A4), End of life (C1, C2, C3, C4), Potential environmental benefits (D) in accordance with EN 15804.

Data quality: The foreground data collected internally is based on yearly production amounts and extrapolations of measurements on specific machines and plants. Overall, the data quality can be described as good. The primary data collection has been done thoroughly.

Cut-off criteria: Life cycle inventory data for a minimum of 95% of total material and energy input flows have been included in the life cycle analysis. Although, only materials having in summa less than 1% of weight of product were not used in calculations.

System diagram:



System boundary:

Product stage		Construction process stage			Use stage							End of life stage				Resource recovery stage
Raw material supply	Transport	Manufacturing	Transport	Construction installation	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	MND	MNR	MNR	MNR	MNR	MNR	MNR	MNR	x	x	x	MND	x

Description of the system boundary (X = Included in LCA; MND = Module Not declared)

Product stage:
A1: This stage considers the extraction and processing of raw materials as well as energy consumption.
A2: The raw materials are transported to the manufacturing plant. In this case, the model includes road transportation of each raw material.
A3: This stage includes the manufacture of products and packaging. It has considered all the energy consumption and waste generated in the production plant.

Production process description

Black steel raw materials (profiles and sheets) are cut with mechanical saws and thermal cutting using CNC plasma cutting machines. Hydraulic oils and specialized emulsions are used to reduce the wear of cutting machines and ensure stable cutting quality. The final products are welded from individual elements of steel products using electric welding in a shielding gas environment. Before the painting process, the surfaces of welded products are cleaned in a chamber using steel shot blasting. The cleaned products are primed and painted using two-component paints. After drying the painted surfaces, the product is packaged and transported to the end user. Metal waste generated during production is sorted, part is sent to specialized processing units of the company, the remnants of suitable dimensions are used for the production of other structures.

Construction process stage:

A4: This stage includes transport from the production gate to the construction site where the product shall be installed.

Transportation is calculated based on data form manufacturer and a scenario with the parameters described in the following table.

Parameter	Value/Description
Vehicle type used for transport	EURO 5 truck with a trailer with an average load of 7,5-16t and container ship
Distance	96 % of production: Truck – 263 km; Ship - 460 km. 4 % of production: Truck – 226 km.
Capacity utilization	56 % of the capacity in volume (truck) 50 % of the capacity in volume (ship)

Use stage:

In normal use scenario, it is assumed that no maintenance (B2), repair (B3), replacement (B4) and refurbishment (B5) is needed.

End of Life stage:

This stage includes the following modules:

C1, Deconstruction, dismantling, demolition.

Consumption of fuel in demolition process is calculated according to transported mass.

C2, Transport of the discarded product to the processing site

Steel structures are transported to the processing site. Materials are transported by truck with a >32t trailer. A transportation distance of 150 km has been considered.

C3, Waste processing for reuse, recovery and/or recycling

Based on Europe average 90% of steel are transformed into secondary material in a recycling plant.

C4, Discharge (disposal)

10% of the steel cannot be separated and are assumed to be landfilled.

Benefits and loads beyond the system boundary (D):

Benefits of recyclable waste generated in the phase C3 are taken into account in the phase D. The recycled steel has been modelled to avoid use of primary materials. The scrap content in the studied product has been acknowledged and only the mass of primary steel in the product provides the benefit in order to avoid double counting. 10 % of primary steel is taken into account.

Content information

Product components	Weight, kg	Weight, %
Steel profiles	0,46	46
Steel sheets	0,51	51
Welding consumables	0,02	2
Epoxy primers and paints	0,01	1
TOTAL	1	100

No dangerous substances from the candidate list of SVHC for Authorisation are used in the product.

Packaging

Distribution packaging: protective film; wooden pallets, cardboards.

After use, packaging materials can be re-used or recycled. Plastic film and carboards can be collected separately and directed to the cycle. Wooden pallets can be re-used again.

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Environmental Information

Potential environmental impact – mandatory indicators according to EN 15804:2012+A2:2019

Results per declared unit											
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**	**A4**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-total	kg CO_2 eq.	9.153E−1	1.325E−1	1.228E−1	1.17E+00	5.423E−2	3.297E−3	1.364E−2	2.315E−2	5.274E−4	0.00E+00
GWP-fossil	kg CO_2 eq.	9.162E−1	1.325E−1	1.157E−1	1.16E+00	5.423E−2	3.296E−3	1.363E−2	2.467E−2	5.266E−4	0.00E+00
GWP-biogenic	kg CO_2 eq.	−1.841E−3	3.396E−6	6.332E−3	4.494E−3	−2.125E−5	2.419E−7	3.862E−7	−1.548E−3	7.224E−7	0.00E+00
GWP-luluc	kg CO_2 eq.	8.703E−4	3.996E−5	7.857E−4	1.696E−3	2.442E−5	2.785E−7	4.103E−6	2.801E−5	1.564E−7	0.00E+00
ODP	kg CFC 11 eq.	8.644E−8	3.113E−8	1.667E−8	1.342E−7	1.189E−8	7.117E−10	3.204E−9	3.544E−9	2.168E−10	0.00E+00
AP	mol H^+ eq.	4.148E−3	3.113E−4	6.612E−4	5.12E−3	2.339E−4	5.636E−6	3.203E−5	2.017E−4	2.483E−6	0.00E+00
EP-freshwater	kg PO_4^{3-} eq.	5.928E−4	9.453E−6	5.639E−5	6.586E−4	4.492E−6	1.197E−7	9.72E−7	2.097E−5	5.452E−8	0.00E+00
EP-marine	kg N eq.	7.614E−4	4.452E−5	1.272E−4	9.331E−4	4.451E−5	7.58E−7	4.582E−6	2.191E−5	4.867E−7	0.00E+00
EP-terrestrial	mol N eq.	7.657E−3	4.755E−4	1.293E−3	9.425E−3	4.855E−4	8.11E−6	4.894E−5	2.479E−4	5.282E−6	0.00E+00
POCP	kg NMVOC eq.	2.994E−3	2.621E−4	3.872E−4	3.643E−3	1.642E−4	8.069E−6	2.701E−5	8.701E−5	2.166E−6	0.00E+00
ADP-minerals&metals*	kg Sb eq.	1.225E−5	2.276E−6	1.539E−6	1.606E−5	1.843E−6	5.034E−9	2.326E−7	1.367E−6	4.812E−9	0.00E+00
ADP-fossil*	MJ	1.45E+01	2.04E+00	1.78E+00	1.83E+01	7.899E−1	4.482E−2	2.096E−1	3.34E−1	1.466E−2	0.00E+00
WDP	m^3	9.80E+01	1.58E+00	1.01E+02	2.01E+02	9.095E−1	9.623E−3	1.625E−1	1.79E+00	4.535E−3	0.00E+00
Acronyms	GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; 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; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption										

** Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.*

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Use of resources

Results per declared unit											
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**	**A4**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	MJ	1.39E+00	2.597E−2	1.55E+00	2.96E+00	1.313E−2	2.454E−4	2.669E−3	5.366E−2	1.19E−4	0.00E+00
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	1.39E+00	2.597E−2	1.55E+00	2.96E+00	1.313E−2	2.454E−4	2.669E−3	5.366E−2	1.19E−4	0.00E+00
PENRE	MJ	1.73E+01	2.08E+00	2.40E+00	2.18E+01	8.086E−1	4.512E−2	2.136E−1	3.81E−1	1.481E−2	0.00E+00
PENRM	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	1.73E+01	2.08E+00	2.40E+00	2.18E+01	8.086E−1	4.512E−2	2.136E−1	3.81E−1	1.481E−2	0.00E+00
SM	kg	1.13E+00	7.128E−4	9.336E−2	1.23E+00	3.901E−4	2.228E−5	7.322E−5	1.00E+00	3.991E−6	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^3	8.558E−3	4.281E−4	7.986E−4	9.785E−3	1.353E−4	4.007E−6	4.415E−5	1.396E−4	1.611E−5	0.00E+00
Acronyms	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 re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water										

Waste production and output flows

Waste production

Results per declared unit											
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**	**A4**	**C1**	**C2**	**C3**	**C4**	**D**
Hazardous waste disposed	kg	2.767E−1	2.003E−3	5.553E−3	2.842E−1	9.404E−4	4.882E−5	2.061E−4	1.787E−3	1.378E−5	4.882E−5
Non-hazardous waste disposed	kg	2.59E+00	2.206E−1	2.689E−1	3.08E+00	4.994E−2	5.218E−4	2.279E−2	1.067E−1	1.003E−1	5.218E−4
Radioactive waste disposed	kg	5.589E−5	1.414E−5	1.305E−5	8.308E−5	5.428E−6	3.177E−7	1.456E−6	1.975E−6	9.74E−8	3.177E−7

Output flows

Results per declared unit											
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**	**A4**	**C1**	**C2**	**C3**	**C4**	**D**
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
Material for recycling	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.0E+02	0.00E+00	0.00E+00
Materials for energy recovery	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
Exported energy, electricity	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
Exported energy, thermal	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

Reading example: 9.00E-03 = $9.0*10^{-3}$ = 0.009

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Programme information

Programme:	The International EPD® System
Address:	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
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CEN standard EN 15804 serves as the Core Product Category Rules (PCR)
Product category rules (PCR): PCR 2019:14 Construction products (version 1.1)
PCR review was conducted by: The International EPD® System
Independent third-party verification of the declaration and data, according to ISO 14025:2006: ☐ EPD process certification ☒ EPD verification
Third party verifier: Silvia Vilčeková, Silcert, s.r.o Approved by: The International EPD® System 
Procedure for follow-up of data during EPD validity involves third party verifier: ☒ Yes ☐ No

The EPD owner has the sole ownership, liability, and responsibility for the EPD.

EPDs within the same product category but from different programmes may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804. For further information about comparability, see EN 15804 and ISO 14025.

References

- General Programme Instructions of the International EPD® System. Version 3.01;
- PCR 2019:14 Construction products (version 1.1)
- EN 15804:2012+A2:2019 Sustainability of construction works. Environmental product declarations. Core rules for the product category of construction products;
- ISO 14044:2006 Environmental management. Life Cycle Assessment. Requirements and guidelines.
- ISO 14025:2010 Environmental labels and declarations. Type III environmental declarations. Principles and procedures.

Tools and database

- One Click LCA tool;
- Ecoinvent 3.6 database

Contact information

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Vesta Consulting, UAB

https://www.vestaconsulting.lt/

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