Environmental Product Declaration

In accordance with ISO 14025 and EN 15804 +A2

Owner of the declaration:
MetEst Steel OÜ

Program holder and publisher:
The Norwegian EPD foundation

Declaration number:
NEPD-5626-4911-EN

Registration Number:
NEPD-5626-4911-EN

Issue date: 03.01.2024
Valid to: 03.01.2029

Product name

Welded and surface treated steel structures

Manufacturer

METEST

General information

Product:
Welded and surface treated steel structures

Program Operator:
The Norwegian EPD Foundation
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Declaration Number:
NEPD-5626-4911-EN

This declaration is based on Product Category Rules:
EN 15804:2012+A2:2019
NPCR PART A "Construction products and services" (v2.0)
NPCR 013:2019 Part B for Steel and Aluminium Construction Products (v4.0)

Statements:
The owner of the declaration shall be liable for the underlying information and evidence. EPD Norway shall not be liable with respect to manufacturer, life cycle assessment data and evidences.

Declared unit:
1 kg of Welded and surface treated steel structures

Verification:
Independent verification of the declaration and data, according to ISO14025:2010

internal ☐ external ☒

Signature

Elisabet Amat
Independent verifier approved by EPD Norway

Owner of the declaration:
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Manufacturer:
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Place of production:
69107, Kõvaküla, Estonia

Management system:
ISO 9001, ISO 14001, EN 1090 and EN ISO 3834

Organisation no:
EE102080546

Issue date:
03.01.2024.

Valid to:
03.01.2029.

Year of study:
2023

Comparability:
EPDs from other programmes than EPD Norge may not be comparable.

The EPD has been worked out by:
Bureau Veritas Latvia

Approved (Manager of EPD Norway)

Product

Product description:

Products produced by MetEst Steel OÜ are used as a part of structural steel frame for buildings, bridges or other load bearing frames. Products are assembled on the construction site with the help of heavy lifting equipment and are joined together by locking mechanism, welded on-site or with bolt connection.

Product specification:

The product composition is >99% Steel (incl. Welding wire) and <1% substances for surface treatment.

Products materials	KG	%
Steel (incl. welding wire)	0,9967	99,67
Paint	0,0029	0,29
Thinners	0,0004	0,04
Hardeners	<0,0001	<0,01
TOTAL	**1,0000**	**100,00**
Packaging materials	KG	%
Wooden spacers	0,0027	100,00
TOTAL	**0,0027**	**100,00**

Technical data:

- Tensile strength up to 3mm: 510 – 680 MPa
- Tensile strength 3mm - 100mm: 470 – 630 MPa
- Thermal conductivity: 40-50 W/m·K
- Density: 7850 kg/m^3

Market:

Nordic and Baltic countries

Reference service life, product:

According to NPCR 013:2019 Part B, reference service life has been declared as equal to the building service life.

LCA: Calculation rules

Functional/Declared unit:

Declared unit is taken as NPCR 013:2019 foresees. The functional unit should be applied when a specific function and scenario that is typically used is known for the product. Considering variety of typical functions and scenarios of the product, the declared unit has been used. Therefore the Declared unit is "1 kg of Welded and surface treated steel structures ".

Data quality:

The production data are from 2022, the database data are from 2013 – 2021 i.e. no data is older than 10 years. Additionally, data on suppliers of Hot rolled steel plates is based on a shorter period, therefore, results of impact assessment included in EPD are a subject for review one year after acquiring status of 3rd party verified and valid EPD.

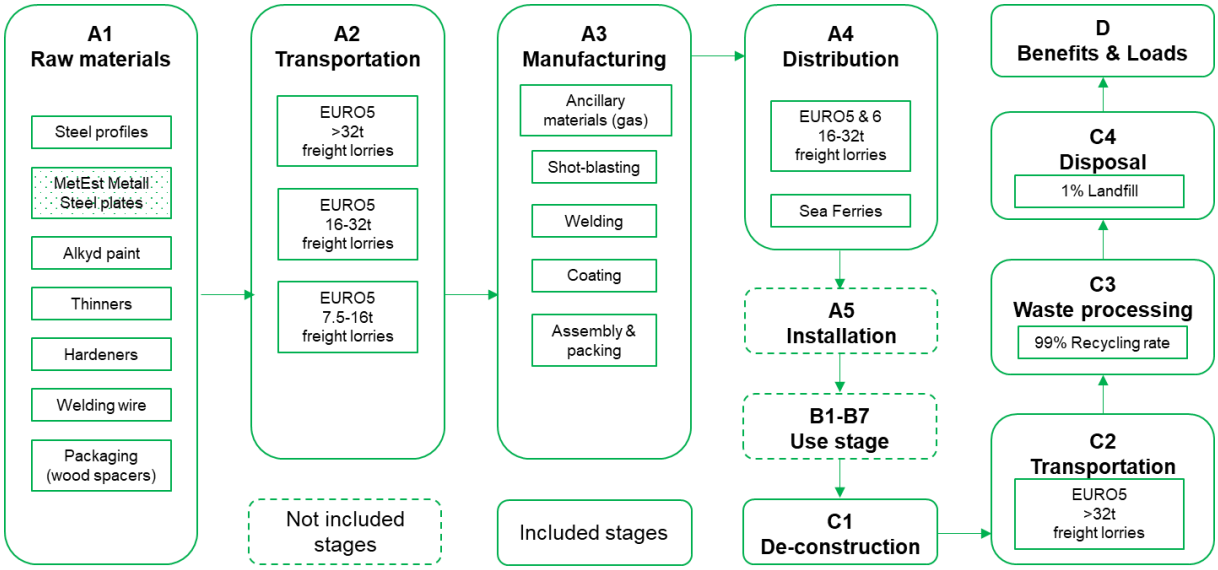
Database used is mainly Ecoinvent v3.8. The LCA software used is SimaPro 9.5.

Allocation:

General allocation principles were applied according to ISO 14044:2006 4.3.4 and in line with the provisions of EN 15804:2012+A2. Incoming energy, water and generation of waste are allocated equally among all products through mass allocation. The material and energy consumption in manufacturer's data according to recorded production is also indicated per declared unit of the product. The effects of primary production of recycled materials have been allocated to the main product in which the material has been used. Welded and surface treated steel structures considered in this LCA study are produced in one manufacturing plant.

System boundary:

According to NPCR 013:2019 Part B, Cradle-to-gate only EPDs are not valid and at minimum, Cradle-to-gate with options that include life cycle modules A1-A3, A4, C1-C4 and D are required. Therefore, this LCA study has been performed as "Cradle-to-gate with options, modules C1-C4 and module D", also including Transportation module A4. All major materials, use of energy and resources, as well as waste treatment are included for phases A1-A3, A4, C1-C4 and D.



Cut-off criteria:

All materials have been accounted for in the LCA according to the data provided by manufacturer. There is no missing data for processes in the system boundaries. All the materials and processes, which have been accounted for by the manufacturing company for the relevant manufacturing process are included in the LCI. The cut-off in LCA is according to PCR:" General cut-off criteria are given in standard EN 15804:2012+A2, clause 6.3.6.

This is a cradle-to-gate with options LCA study, therefore, stages A1-A3, A4, C1-C4 and Module D have been included. Although some flows are not included in the system boundaries:

- emissions related to infrastructure processes
- long-term emissions
- manufacture of equipment used in production, buildings, or any other capital goods
- transportation of personnel to and within the manufacturing plant

LCA: Scenarios and additional technical information

The following information describe the scenarios in the different modules of the EPD.

Product stage (A1, A2, A3)

- **Raw material supply (A1)**

In module A1 extraction and processing of raw materials and generation of electricity and heat from primary energy resources, used to produce these raw materials, are included. Main raw material for manufacturing of the product is Hot rolled steel, with additional raw materials, i.e. alkyd paint, thinners, hardeners and welding wire, that is also Steel.

The secondary material used in product is also Steel – according to manufacturer provided data, recycled share of incoming Steel ranges from 85% to 100% depending on supplier and type of material.

- **Transport of raw materials (A2)**

For module A2, the transportation of raw materials and packaging materials to the production plant, the following assumptions have been made (see Table below). According to manufacturer provided data, EURO5 emission standards have been applied as standard value for all Freight lorries used for supply. When emission standard has not been declared, conservative value of EURO5 has been used.

Considering main supplier of raw material for Steel structures (MetEst Steel OÜ) manufacturing purposes, no distance has been declared for transportation module A2 – more than 99% of Steel plates is coming from second manufacturing company, i.e., MetEst Metall OÜ. Therefore, no distance has been declared (see Table below) and transportation is included only in internal transportation mode, provided by use of electric vehicles and machinery.

Overall, Transport of raw materials (A2) for Steel plates, has been considered in Raw material supply (A1) along with transport (A2) of those and Manufacturing (A3).

Material	Type of vehicle	Weight, kg per FU	Distance, km	kg*km
Steel plates	n/a	9,93E-01	0	n/a
Steel profiles	Lorry >32t, EURO5	7,90E-03	200	1,58E+00
Paint/thinners/hardeners	Lorry 7.5-16t, EURO5	3,37E-03	200	6,74E-01
Welding wire	Lorry 16-32t, EURO5	5,90E-03	200	1,18E+00
Wooden spacers	Lorry 7.5-16t, EURO5	2,70E-03	50	1,35E-01

- **Manufacturing (A3)**

The manufacturing process of Welded and surface treated steel structures includes several stages of metal processing such as cutting and bending (done by MetEst Metall OÜ) along with welding, shot blasting and coating, done by manufacturer of the product considered in this EPD. The only type of packaging required for product is wooden spacers. Module also considers production and transportation of ancillary materials, e.g., welding gas.

Steel structures are produced within the limits of one manufacturing plant. National grid mix of Electricity is the only source of energy for all manufacturing purposes except welding, where use of gas is also required. Internal transportation of materials and product is conducted with Electric skid-steer loaders, therefore, no Diesel consumption has been declared by manufacturer.

Manufacturer has two solar power plants for the purpose of self-consumption of Electricity. Installed power of the 1st solar power plant, i.e., "Metest maaraam", is 172 kW, while "Metest katus", 2nd solar power plant, installed power is 121 kW. According to the data provided by manufacturer, some of generated Electricity is also sold to the grid. Therefore, not all generated Electricity has been considered for self-consumption, that has been considered at 25,5% level of total Electricity consumption.

Not all materials are used to full potential, therefore, some waste flows are produced during the manufacturing phase. In terms of total weight, the most significant waste flow is related to MetEst Metall steel plate manufacturing – 14.68% of incoming raw material has been considered as waste metal for recycling, considering only transportation and sorting activities without loads representing activities of recycling and final disposal.

Additional types of waste and/or emissions, for manufacturer of welded and surface treated steel structures are:

- packaging (steel buckets)
- Volatile Organic Compounds, that have been calculated via intensity of emissions of paints and thinners
- Manganese compounds and particulates, that are related to welding process and based on consumption of welding wire
- iron waste, that has been taken into account as Final waste flow only for mass balance maintaining purposes.

All waste flows are collected at the gate of the manufacturer by the waste treatment company.

Transport from production place to assembly/user (A4)

Distribution market for Welded and surface treated steel structures includes Finland and Sweden. Noticeable amount of final product is also frequently marked as "Free Carrier" (FCA), meaning that the client's nominated carrier is responsible for logistics and no additional data is provided on destinations. For such cases NPCR guidelines has been used and default value of 300 km has been applied to this share of distribution market.

Distribution process to Finland and Sweden is always preceded by transportation to distribution centers, involving the use of Freight lorries, i.e. 190 km distance from manufacturing plant to the port, and Sea ferries, i.e., 87 km distance to Finland and 335 km to Sweden. Conservative scenario has been used to consider the use of EURO5 and EURO6 freight lorries, meaning equal 50% share for each. Additional scenarios for each destination country has been applied using different radius values, ranging from 50 km to 950 km.

Distribution scenarios of module A4 are described in following Table. The transportation impacts cover fuel direct exhaust emissions, environmental impacts of fuel production and is also related to infrastructure emissions.

Type	Capacity utilisation (incl. return) %	Type of vehicle	Distance KM	Fuel/Energy consumption	value (l/t)
To Distribution centers in Finland and Sweden					
Road	Default value from Ecoinvent 3.8	Lorry 16-32t, EURO5	190	0,0441	8,38
Road	Default value from Ecoinvent 3.8	Lorry 16-32t, EURO6	190	0,0431	8,19
Water	Default value from Ecoinvent 3.8	Sea Ferry	87	0,0298	2,59
Road	Default value from Ecoinvent 3.8	Lorry 16-32t, EURO5	190	0,0441	8,38
Road	Default value from Ecoinvent 3.8	Lorry 16-32t, EURO6	190	0,0431	8,19
Water	Default value from Ecoinvent 3.8	Sea Ferry	335	0,0298	9,98
FCA					
Road	Default value from Ecoinvent 3.8	Lorry 16-32t, EURO5	300	0,0441	13,22
Finland					
Road	Default value from Ecoinvent 3.8	Lorry 16-32t, EURO5	100	0,0441	4,41
Road	Default value from Ecoinvent 3.8	Lorry 16-32t, EURO6	100	0,0431	4,31
Sweden					
Road	Default value from Ecoinvent 3.8	Lorry 16-32t, EURO5	50	0,0441	2,20
Road	Default value from Ecoinvent 3.8	Lorry 16-32t, EURO6	50	0,0431	2,16
Road	Default value from Ecoinvent 3.8	Lorry 16-32t, EURO5	150	0,0441	6,61
Road	Default value from Ecoinvent 3.8	Lorry 16-32t, EURO6	150	0,0431	6,47
Road	Default value from Ecoinvent 3.8	Lorry 16-32t, EURO5	600	0,0441	26,45
Road	Default value from Ecoinvent 3.8	Lorry 16-32t, EURO6	600	0,0431	25,87
Road	Default value from Ecoinvent 3.8	Lorry 16-32t, EURO5	950	0,0441	41,88
Road	Default value from Ecoinvent 3.8	Lorry 16-32t, EURO6	950	0,0431	40,96

Assembly (A5)

Module A5 has not been declared in this study.

Use stage (B1-B7)

Modules B1-B7, representing Use stage of the product, due to the absence of specific information in the use stage in terms of maintenance, repairing, and refurbishment, also have not been declared in this LCA study.

End of Life (C1, C3, C4)

- **Demolition (C1)**

According to JRC report of LCA for buildings, it has been assumed, that 0.239 MJ/kg of energy is consumed in module C1 by construction machinery that is represented by Diesel burned in building machine. Specific demand of energy represents demolition/de-construction activities for Steel frames considered for recycling.

- **Waste processing (C3)**

As a waste processing activity in module C3, recycling, i.e. sorting of Scrap steel, has been considered. Recycling represents 99% share of the product weight with remaining 1% considered for final disposal (Landfill) in module C4.

- **Disposal (C4)**

Module C4 represents Landfilling activities for final disposal of 1% share of the product and also considers additional distance of 20km for transportation of waste flow.

Type	Unit	Value
Hazardous waste disposed	kg	0,00
Collected as mixed construction waste	kg	0,00
Reuse	kg	0,00
Recycling	kg	0,99
Energy recovery	kg	0,00
To landfill	kg	0,01

Transport to waste processing (C2)

For module C2 an average transportation with 50km distance has been assumed as distance between de-construction site and waste processing facility. EURO5 >32t Freight lorry has been considered for calculations in module C2.

Benefits and loads beyond the system boundaries (D)

As described above, this study also considers module D, representing Reuse, Recovery and Recycling potential, where net benefit of avoided product (steel) has been modelled. Module also represents additional loads of Steel production.

LCA: Results

System boundaries (X=included, MND= module not declared, MNR=module not relevant)

Product stage			Assembly stage		Use stage							End of life stage				Benefits & loads beyond system boundary
Raw materials	Transport	Manufacturing	Transport	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	MND	MND	MND	MND	MND	MND	MND	MND	X	X	X	X	X

To ensure transparency for potential user of the product and in accordance with NPCR 013:2019 Part B, the table of environmental impacts represents the environmental impact of the declared unit, i.e. 1kg of Welded and surface treated steel structures.

According to statements, that are included in EPD of supplied Hot rolled steel plates, Stomana plant in Pernik (Bulgaria) produces steel from recycled scrap and is among the few steel mills producing 100% of the hot rolled plates exclusively by recycled ferrous scrap. Results of impact assessment for 1 ton of Hot rolled plates from Stomana Industry S.A. has been implemented in LCA model in order to be used as a specific dataset avoiding use of an average dataset for Steel production included in ecoinvent database.

The secondary material used in manufactured products is Steel. Recycled share of incoming Steel ranges from 85% (insignificant amount of additional elements) to 100% (main component, i.e. MetEst Metall post-processed steel plates), depending on supplier and type of material.

Global warming potential of raw material that is necessary to produce 1 kg of the product, i.e., considering additional steel profiles and welding wire, is 1,0782 kg representing Global warming potential of 1,18 $kgCO_2$ eq. It is necessary to note, that raw material for Steel structures is mainly represented by post-processed hot rolled steel plates of MetEst Metall, therefore, raw materials (A1), transportation of those (A2) and manufacturing (A3) are also included in the result. Therefore, it is possible to reassess results of this EPD when different supplier of raw material is in consideration.

Core environmental impact indicators

Indicator	Unit	A1-A3	A4	C1	C2	C3	C4	D
GWP-total	kg CO2 eq.	1,2E+00	9,4E-02	2,1E-02	3,6E-03	2,7E-03	4,0E-05	1,0E-02
GWP-fossil	kg CO2 eq.	1,2E+00	9,4E-02	2,1E-02	3,6E-03	2,7E-03	4,0E-05	1,0E-02
GWP-biogenic	kg CO2 eq.	-3,8E-03	-3,5E-05	-7,2E-06	-1,4E-06	-9,6E-07	-8,1E-08	3,5E-05
GWP-luluc	kg CO2 eq.	6,2E-03	1,0E-06	5,1E-07	2,9E-08	5,5E-06	9,7E-10	-2,0E-06
ODP	kg CFC11 eq.	1,5E-07	2,1E-08	4,6E-09	8,4E-10	1,0E-10	8,6E-12	3,4E-10
AP	mol H+ eq.	5,7E-03	1,3E-03	2,2E-04	1,2E-05	1,3E-05	3,1E-07	3,0E-05
EP-freshwater	kg P eq.	4,9E-04	5,0E-08	1,4E-08	1,8E-09	1,4E-07	9,7E-11	4,2E-07
EP-marine	kg N eq.	1,2E-03	3,2E-04	9,9E-05	3,8E-06	2,5E-06	1,3E-07	7,0E-06
EP-terrestrial	mol N eq.	1,2E-02	3,5E-03	1,1E-03	4,2E-05	2,7E-05	1,4E-06	8,2E-05
POCP	kg NMVOC eq.	3,7E-03	9,1E-04	3,0E-04	1,1E-05	7,4E-06	3,9E-07	5,5E-05
ADP-min. & met.	kg Sb eq.	1,9E-06	3,0E-09	1,1E-09	1,5E-10	8,0E-11	1,8E-12	5,4E-10
ADP-fossil	MJ	2,0E+01	1,3E+00	2,8E-01	5,0E-02	3,5E-02	5,4E-04	7,9E-02
WDP	m3	5,6E-01	-2,2E-04	7,3E-05	-8,4E-06	4,1E-04	1,0E-07	7,7E-04

GWP-total: *Global Warming Potential;* ***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; See "additional Norwegian requirements" for indicator given as PO4 eq.* ***EP-marine:*** *Eutrophication potential, fraction of nutrients reaching freshwater end compartment;* ***EP-terrestial:*** *Eutrophication potential, Accumulated Exceedance;* ***POCP****: Formation potential of tropospheric ozone;* ***ADP-M&M****: Abiotic depletion potential for non-fossil resources (minerals and metals);* ***ADP-fossil:*** *Abiotic depletion potential for fossil resources;* ***WDP:*** *Water deprivation potential, deprivation weighted water consumption*

Additional environmental impact indicators

Indicator	Unit	A1-A3	A4	C1	C2	C3	C4	D
PM	Disease inc.	4,6E-08	5,2E-09	6,0E-09	3,6E-10	1,1E-10	8,4E-12	5,2E-10
IRP	kBq U-235 eq	2,3E-02	5,6E-03	1,2E-03	2,2E-04	1,6E-04	2,3E-06	-2,2E-04
ETP-fw	CTUe	3,1E+00	4,9E-01	9,5E-02	2,2E-02	3,7E-02	2,6E-04	2,7E-01
HTP-c	CTUh	5,7E-10	1,0E-11	1,2E-12	3,1E-13	4,2E-13	3,3E-15	-1,5E-10
HTP-nc	CTUh	6,6E-09	6,7E-10	9,9E-11	4,3E-11	2,1E-11	4,3E-13	2,0E-10
SQP	Pt	1,4E+00	3,4E-03	9,0E-04	1,3E-04	3,0E-03	4,1E-04	5,8E-03

PM: *Particulate matter emissions;* ***IRP:*** *Ionising radiation, human health;* ***ETP-fw:*** *Ecotoxicity (freshwater);* ***ETP-c:*** *Human toxicity, cancer effects;* ***HTP-nc:*** *Human toxicity, non-cancer effects;* ***SQP:*** *Land use related impacts / soil quality*

Classification of disclaimers to the declaration of core and additional environmental impact indicators

ILCD classification	Indicator	Disclaimer
ILCD type / level 1	Global warming potential (GWP)	None
	Depletion potential of the stratospheric ozone layer (ODP)	None
	Potential incidence of disease due to PM emissions (PM)	None
ILCD type / level 2	Acidification potential, Accumulated Exceedance (AP)	None
	Eutrophication potential, Fraction of nutrients reaching freshwater end compartment (EP-freshwater)	None
	Eutrophication potential, Fraction of nutrients reaching marine end compartment (EP-marine)	None
	Eutrophication potential, Accumulated Exceedance (EP-terrestrial)	None
	Formation potential of tropospheric ozone (POCP)	None
	Potential Human exposure efficiency relative to U235 (IRP)	1
ILCD type / level 3	Abiotic depletion potential for non-fossil resources (ADP-minerals&metals)	2
	Abiotic depletion potential for fossil resources (ADP-fossil)	2
	Water (user) deprivation potential, deprivation-weighted water consumption (WDP)	2
	Potential Comparative Toxic Unit for ecosystems (ETP-fw)	2
	Potential Comparative Toxic Unit for humans (HTP-c)	2
	Potential Comparative Toxic Unit for humans (HTP-nc)	2
	Potential Soil quality index (SQP)	2

Disclaimer 1 – This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

Disclaimer 2 – The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator

Resource use

Indicator	Unit	A1-A3	A4	C1	C2	C3	C4	D
RPEE	MJ	2,2E+00	1,4E-03	3,4E-04	5,8E-05	3,9E-03	8,1E-07	-4,1E-03
RPEM	MJ	2,7E-01	4,7E-04	1,2E-04	1,9E-05	3,9E-04	9,1E-07	-6,5E-04
TPE	MJ	2,5E+00	1,9E-03	4,6E-04	7,7E-05	4,3E-03	1,7E-06	-4,8E-03
NRPE	MJ	2,0E+01	1,3E+00	2,8E-01	5,0E-02	3,5E-02	5,4E-04	7,9E-02
NRPM	MJ	5,7E-03	1,9E-06	1,6E-06	2,1E-08	1,3E-06	2,1E-09	3,5E-06
TRPE	MJ	2,0E+01	1,3E+00	2,8E-01	5,0E-02	3,5E-02	5,4E-04	7,9E-02
SM	kg	1,0E+00	0,0E+00	0,0E+00	0,0E+00	0,0E+00	0,0E+00	0,0E+00
RSF	MJ	0,0E+00	0,0E+00	0,0E+00	0,0E+00	0,0E+00	0,0E+00	0,0E+00
NRSF	MJ	0,0E+00	0,0E+00	0,0E+00	0,0E+00	0,0E+00	0,0E+00	0,0E+00
W	m^3	1,3E-02	3,6E-06	4,6E-06	1,3E-07	1,5E-05	7,2E-09	3,8E-05

RPEE Renewable primary energy resources used as energy carrier; RPEM Renewable primary energy resources used as raw materials; TPE Total use of renewable primary energy resources; NRPE Non-renewable primary energy resources used as energy carrier; NRPM Non-renewable primary energy resources used as materials; TRPE Total use of non-renewable primary energy resources; SM Use of secondary materials; RSF Use of renewable secondary fuels; NRSF Use of non-renewable secondary fuels; W Use of net fresh water

End of life – Waste

Indicator	Unit	A1-A3	A4	C1	C2	C3	C4	D
HW	kg	2,1E-05	2,5E-06	7,4E-07	1,3E-07	1,2E-08	1,4E-09	1,4E-06
NHW	kg	2,1E-01	5,6E-05	1,7E-05	2,1E-06	1,1E-04	1,0E-02	-1,6E-03
RW	kg	4,4E-05	9,3E-06	2,0E-06	3,6E-07	1,1E-07	3,8E-09	-1,6E-07

HW Hazardous waste disposed; NHW Non hazardous waste disposed; RW Radioactive waste disposed

End of life – output flow

Indicator	Unit	A1-A3	A4	C1	C2	C3	C4	D
CR	kg	0,0E+00	0,0E+00	0,0E+00	0,0E+00	0,0E+00	0,0E+00	0,0E+00
MR	kg	1,3E-03	0,0E+00	0,0E+00	0,0E+00	9,9E-01	0,0E+00	0,0E+00
MER	kg	0,0E+00	0,0E+00	0,0E+00	0,0E+00	0,0E+00	0,0E+00	0,0E+00
EEE	MJ	0,0E+00	0,0E+00	0,0E+00	0,0E+00	0,0E+00	0,0E+00	0,0E+00
ETE	MJ	0,0E+00	0,0E+00	0,0E+00	0,0E+00	0,0E+00	0,0E+00	0,0E+00

CR Components for reuse; MR Materials for recycling; MER Materials for energy recovery; EEE Exported electric energy; ETE Exported thermal energy

Information describing the biogenic carbon content at the factory gate

Biogenic carbon content	Unit	Value
Biogenic carbon content in product	kg C	0,0E+00
Biogenic carbon content in the accompanying packaging	kg C	1,4E-03

Additional Norwegian requirements

Greenhouse gas emission from the use of electricity in the manufacturing phase

National production mix from import, medium voltage (production of transmission lines, in addition to direct emissions and losses in grid) of applied electricity for the manufacturing process (A3). 25.5% of consumed electricity is provided by manufacturer's solar power plants installed on the ground near manufacturing plant. Therefore, emission factor acquired from Ecoinvent v3.8, representing Estonian electricity grid mix (0.860 $kgCO_2eq/kWh$), has been recalculated to represent emission factor that is specific to manufacturing plant and has solar power share included in it:

National electricity grid	Unit	Value
Weighted value, considering 25.5% share of solar panel system generation	kg CO2 -eq/kWh	0,641

Additional environmental impact indicators required in NPCR Part A for construction products

EP-freshwater is also declared in different units - PO_4^{3-} eq.

Indicator	Unit	A1-A3	A4	C1	C2	C3	C4	D
EP-freshwater*	kg PO_4 eq.	1,5E-03	1,5E-07	4,4E-08	5,5E-09	4,1E-07	2,9E-10	1,3E-06

EP-freshwater* *Eutrophication potential, fraction of nutrients reaching freshwater end compartment. Declared as* PO_4^{3-} *eq.*

In order to increase the transparency of biogenic carbon contribution to climate impact, the indicator GWP-IOBC is required as it declares climate impacts calculated according to the principle of instantaneous oxidation. GWP-IOBC is also referred to as GWP-GHG in context of Swedish public procurement legislation.

Indicator	Unit	A1-A3	A4	C1	C2	C3	C4	D
GWP-IOBC	kg CO2 eq.	1,2E+00	9,3E-02	2,0E-02	3,6E-03	2,6E-03	3,9E-05	9,5E-03

GWP-IOBC *global warming potential calculated according to the principle of instantaneous oxidation.*

Hazardous substances

The declaration is based upon reference to threshold values and/or test results and/or material safety data sheets provided to EPD verifiers. Documentation available upon request to EPD owner.

- ☒ The product contains no substances given by the REACH Candidate list or the Norwegian priority list.
- ☐ The product contains substances given by the REACH Candidate list or the Norwegian priority list that are less than 0,1 % by weight.
- ☐ The product contain dangerous substances, more then 0,1% by weight, given by the REACH Candidate List or the Norwegian Priority list, see table.
- ☐ The product contains no substances given by the REACH Candidate list or the Norwegian priority list. The product is classified as hazardous waste (Avfallsforskiften, Annex III), see table.

Indoor environment

The product meets the requirements for low emissions.

Carbon footprint

Carbon footprint has not been worked out for the product.

Additional Environmental information

Bibliography

ISO 14025:2010	Environmental labels and declarations - Type III environmental declarations - Principles and procedures
ISO 14040:2006	Environmental management – Life cycle assessment – Principles and framework
ISO 14044:2006	Environmental management - Life cycle assessment - Requirements and guidelines
EN 15804:2012+A2:2019	Sustainability of construction works - Environmental product declaration - Core rules for the product category of construction products
NPCR Part A	NPCR Part A: Construction products and services v2.0
NPCR 013:2019 Part B	NPCR 013:2019 Part B for steel and aluminium construction products v4.0
LCA software SimaPro 9.5	
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Joint Research Centre Technical report: Model for Life Cycle Assessment (LCA) of buildings	Gervasio, H. and Dimova, S., Model for Life Cycle Assessment (LCA) of buildings, EUR 29123 EN, Publications Office of the European Union, 2018, ISBN 978-92-79-79973-0, doi:10.2760/10016, JRC110082

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