ENVIRONMENTAL PRODUCT DECLARATION

In accordance with ISO 14025:2006 and EN 15804:2012+A2:2019/AC:2021 for:

STEEL STRUCTURAL BRACKETS

from UAB VMG Technics

Programme:	The International EPD® System, www.environdec.com
Programme operator:	EPD International AB
Type of EPD:	EPD of multiple products, based on the average results of the product group EPD of product recently on the market – results of this EPD shall be used with care as the LCI data is not yet based on 1 year of production which may result in increased uncertainty.
EPD registration number:	EPD-IES-0028415
Version date:	2026-01-16
Validity date:	2031-01-16

An EPD may be updated or depublished if conditions change. To find the latest version of the EPD and to confirm its validity, see www.environdec.com

VMG TECHNICS

GENERAL INFORMATION

Programme:	The International EPD® System
Address:	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
Website:	www.environdec.com
E-mail:	support@environdec.com

CEN STANDARD EN 15804 SERVES AS THE CORE PRODUCT CATEGORY RULES (PCR)

PRODUCT CATEGORY RULES (PCR)

PCR 2019:14 Construction products (EN 15804+A2) (version 2.0.1) (2.0.1), UN CPC code 412 – products of iron or steel

PCR review was conducted by: The Technical Committee of the International EPD System. See www.environdec.com for a list of members. Review chair: C Rob Rouwette (chair), Noa Meron (co-chair). The review panel may be contacted via the Secretariat www.environdec.com/contact.

c-PCR: not applicable

THIRD-PARTY VERIFICATION

Independent third-party verification of the declaration and data, according to ISO 14025:2006, via:

☒ Individual EPD verification without a pre-verified LCA/EPD tool

Third-party verifier: Mari Kirss, Meetripuu OÜ
Approved by: 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 published in different EPD programmes, may not be comparable. For two EPDs to be comparable, they shall be based on the same PCR (including the same first-digit version number) or be based on fully aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have identical scope in terms of included life-cycle stages (unless the excluded life-cycle stage is demonstrated to be insignificant); apply identical impact assessment methods (including the same version of characterisation factors); and be valid at the time of comparison. For further information about comparability, see EN 15804 and ISO 14025.

INFORMATION ABOUT EPD OWNER

Owner of the EPD:

UAB VMG Technics

Pramones st. 14, Dirvupiai
92498 Klaipedos dist. Lithuania

info@vmg-technics.eu

Address and contact information of the LCA practitioner commissioned by the EPD owner:

Urtė Valdavičė, UAB Vesta Consulting.

Description of the organisation:

UAB "VMG Technics" was founded in 2005. The company operates its own innovation and R&D park, where it develops innovative technologies that become growth drivers for its customers' factories. Its team focuses on key areas such as sensors, advanced analytics, machine learning, artificial intelligence, human–machine interaction, robotics and automation, and advanced engineering. The company's goal is to continually raise the bar for how technology, innovation, and industrial mechanics can operate. By driving value creation and strengthening competitive advantage in production processes, its teams support strategic decision-making, enable forward-thinking and planning, help prevent operational errors, and provide all necessary solutions from a single source.

Product-related or management system-related certifications:

The company has implemented and maintains a certified management system that complies with international standards: quality management in accordance with LST EN ISO 9001:2015, environmental management in accordance with LST EN ISO 14001:2015, occupational health and safety management in accordance with ISO 45001:2018, and energy management in accordance with ISO 50001. Through continuous improvement and transparency, the company supports its clients in achieving both performance and sustainability goals.

PRODUCT INFORMATION

PRODUCT NAME:
STEEL STRUCTURAL BRACKETS

UN CPC code:
412 – products of iron or steel

Product group description:
Steel Structural Brackets are one-piece non-welded three-dimensional nailing plates to be used in timber-to-timber or timber-to-concrete connections. The Brackets are connected to the timber members by anchor nails or screws. Steel Structural Brackets are made from pre-galvanized steel according to EN 10346:2015.

Product application areas:

Intended use of Steel Structural Brackets are timber constructions, where both flanges of the bracket are fixed to strength graded timber, glulam, softwood- or laminated logs, laminated veneer lumber (LVL), plywood, cross laminated timber (CLT) with edge glued lamellas, or corresponding timber material.

Steel Structural Brackets have been assessed as having satisfactory durability and serviceability when used in timber structures when the timber species described in Eurocode 5 (EN 1995-1-1: 2004) are used and the structures are subject to the dry, internal conditions defined by service classes 1 and 2.

Technical data:

The product is manufactured under controlled industrial conditions to ensure stable and repeatable technical properties. The following parameters represent typical values based on average production data:

Feature	Specification
Material	Galvanized steel DX51D+Z275 (EN 10346:2015)
Yield strength (Re)	≥ 250 N/mm²
Tensile strength (Rm)	≥ 330 N/mm²
Zinc coating mass	≥ 275 g/m²
Elongation at break (A80)	≥ 19 %
Product dimensions, mm	45x138x60 or 51x60x135 or 51x60x164 or 51x60x195 or 70x70x55 or 90x90x65
Average weigh, kg	0,1814

Technical specifications and product standards:
Steel Structural Brackets are CE marked construction products used for timber structural connections. The performance of the product is assessed based on European Assessment Document EAD 130186-00-0603. The Steel Structural Brackets are certified under the European Technical Assessment (ETA 25/0618) issued by Eurofins Expert Services Oy (Finland). The AVCP System 2+ is applied, ensuring factory production control and continuous supervision by a notified body.

Name and location of production site(s):

Pramones st. 14, Dirvupiai 92498 Klaipedos dist. Lithuania

References to relevant website for more information:

https://vmg-technics.eu/

CONTENT DECLARATION

The content declaration shows the weight of product per declared unit and the weight of product average packaging per declared unit.

The declared unit is 1 kg of Steel Structural Brackets

Product content	Mass, kg	Post-consumer recycled material, mass-% of product	Biogenic material, mass-% of product	Biogenic material, kg C / declared unit
Galvanized steel	1,00	2,00	-	-
TOTAL	**1,00**	**2,00**	**-**	**-**

The share of total recycled material in the product is 18,65%.

Packaging materials	Mass, kg	Mass-% (versus the product)	Biogenic material, kg C / declared unit
[1] Cardboard	0,01	1,00	0,001
TOTAL	**0,01**	**1,00**	**0,001**

[1]Global Warming Potential biogenic: -0,281 kg CO_2e / kg

Note. 1 kg biogenic carbon in the product/packaging is equivalent to the uptake of 44/12 kg of CO_2.

Products does not contain any REACH SVHC substances in amounts greater than 0,1% (1000 ppm).

LCA INFORMATION

DECLARED UNIT:
1 kg

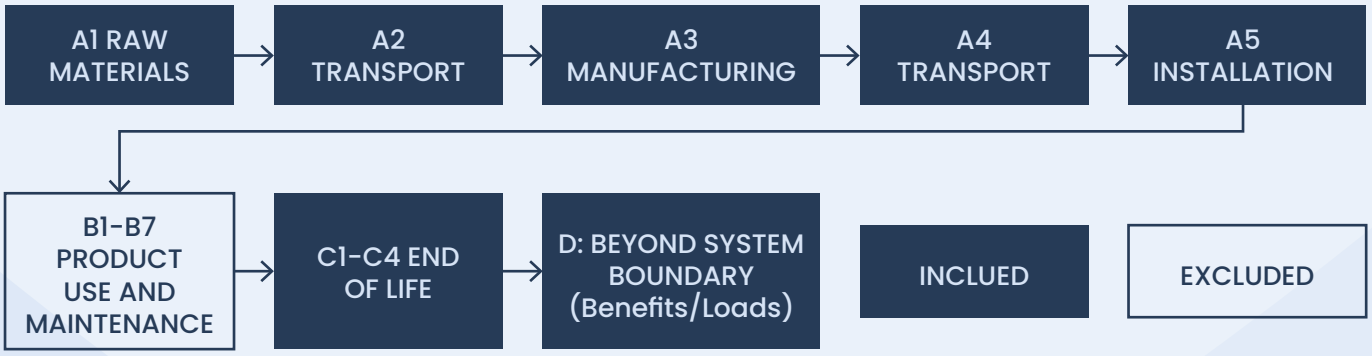
TIME REPRESENTATIVENESS:
Primary data was collected internally. The production data refers to 2025 IV quarter. The data shall be updated and re-verified when there is production data for one year of production available.

GEOGRAPHICAL SCOPE:
Europe.

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 3.11. The LCA software used is One Click LCA v.0.47.0.

DESCRIPTION OF SYSTEM BOUNDARIES:
Cradle to gate with options, modules A4-A5, C1–C4, and module D.

PROCESS FLOW DIAGRAM:



Modules declared, geographical scope, share of specific data (in GWP-GHG results) and data variation (in GWP-GHG results):

	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
Module	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Modules declared	X	X	X	X	X	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
Geography	EU	EU	EU	EU	EU	-	-	-	-	-	-	-	EU	EU	EU	EU	EU
Specific data used	73,71%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	<10%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	ND			-	-	-	-	-	-	-	-	-	-	-	-	-	-

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

DATA QUALITY:

The EPD covers products manufactured in one factory in Klaipėda (Lithuania) which provided data for the period of 2025 IV quarter. The data shall be updated and re-verified when there is production data for one year of production available. The data collection has been done internally and thoroughly. The data is based on production amounts and extrapolations of measurements on specific machines and plants. The EPD covers raw material supply, transport, product production, product transportation to customers, installation and end-of-life in European scale. The product is manufactured in a controlled industrial environment using standardized processes, including receiving galvanized steel coils, slitting, progressive stamping, quality control, packaging, and storage for shipment. The site is powered by renewable energy from the grid, additionally natural gas for heating and propane for mobile machinery use. Background data was sourced from the ecoinvent v.3.11 database. No poor or very poor data was found during the assessment of relevant data using PEF method (EN 15804:2012+A2:2019, Annex E, only E.2). The data quality assessment is done in accordance with EN 15941:2024. Overall, the data quality can be described as good. The EN 15804 reference package used is based on EF 3.1.

CONSERVATIVE DATA APPROACH:

The LCA includes upstream data with a data period of less than one year. In accordance with PCR 2019:24, Section 4.10.6, these data were applied using a conservative approach. Conservativeness was ensured by applying worst-case assumptions for key material and energy inputs, selecting upper-bound emission factors from background databases and excluding potential optimisations or environmental credits. As a result, the use of this data is considered to not underestimate the environmental impacts of the declared product.

SHARE OF PRIMARY DATA USED:

The share of primary data is calculated based on GWP-GHG results. It is a simplified indicator for data quality that supports the use of more primary data, to increase the representativeness of and comparability between EPDs. Note that the indicator does not capture all relevant aspects of data quality and is not comparable across product categories.

Declaration of data sources, reference years, data categories, and share of primary data is presented below.

Process	Source type	Source	Reference year	Data category	Share of primary data, of GWP-GHG results for A1–A3
Production of galvanized steel (A1)	EPDs	EPD-IES-0023967 EPD-IES-0023965	2021-2023	Primary data	70,48%
Transport of raw materials to manufacturing site (A2)	Database	Ecoinvent v. 3.11	2009-2024	Primary data	1,03%
Production of packaging (A3)	Database	Ecoinvent v. 3.11	2022-2024	Secondary data	0,00%
Production of ancillary materials (A3)	Database	Ecoinvent v. 3.11	2012-2024	Secondary data	0,00%
Energy used in manufacturing of product (A3)	Database	Ecoinvent v. 3.11	2000-2024	Primary data	2,20%
Waste treatment (A3)	Database	Ecoinvent v. 3.11	1997-2024	Secondary / proxy data	0,00%
Total share of primary data, of GWP-GHG results for A1-A3					73,71%

Note. Ecoinvent datapoints are based on older background flows, but updated in 2024 (v.3)

ALLOCATION, ESTIMATES AND ASSUMPTIONS:

Allocation was not applied in this study, as the product is recently introduced to the market and all material, energy, and waste flows were measured and modelled at product level. In line with EN 15804, allocation was therefore avoided, as no shared processes or aggregated data requiring allocation were identified; where background data were used, the applied datasets follow the ecoinvent system model “Allocation, cut-off, EN 15804”.

Where relevant, the methodological choices for allocation related to reuse, recycling and recovery are defined in accordance with the polluter pays principle (PPP).

Scenarios included in the LCA are based on realistic scenarios which are currently in use and are representative for one of the most likely scenario alternatives.

The production of capital equipment, construction activities, and infrastructure, maintenance and operation of capital equipment, personnel-related activities, energy and water use related to company management and sales activities are excluded.

CUT OFF CRITERIA:

The study does not exclude any modules or processes which are stated mandatory in the EN 15804:2012+A2:2019 and the applied PCR. The study does not exclude any hazardous materials or substances. The study includes all major raw material and energy consumption. All inputs and outputs of the unit processes, for which data is available for, are included in the calculation. Only the reusable pallets were cut off, as the multiple use of the pallets means that the contribution to the indicators considered is assumed to be negligible. There is no neglected unit process more than 1% of total mass or energy flows. The module specific total neglected input and output flows also do not exceed 5% of energy usage or mass.

CALCULATION RULES FOR AVERAGING DATA: :

The EPD is an EPD of multiple products, based on the average results of the product group. Average product calculations were chosen because the products in the group share common characteristics in their manufacturing process and material composition. The Steel Structural Brackets are available in different sizes (45x138x60 or 51x60x135 or 51x60x164 or 51x60x195 or 70x70x55 or 90x90x65). The difference (in %) between the product GWP-GHG results for modules A1-A3 are below 10%, since the variations in size have a minor impact on the raw material demand per declared unit (1 kg). Using an average product value allows for streamlined analysis and decision-making while maintaining a fair representation of the group as a whole. The average was calculated based on the production mass.

PRODUCT LIFE CYCLE

PRODUCT STAGE (A1-A3)

A1: This module considers the extraction and processing of raw materials.

A2: The raw materials are transported to the manufacturing plant. In this case the model includes road transportation of each raw material.

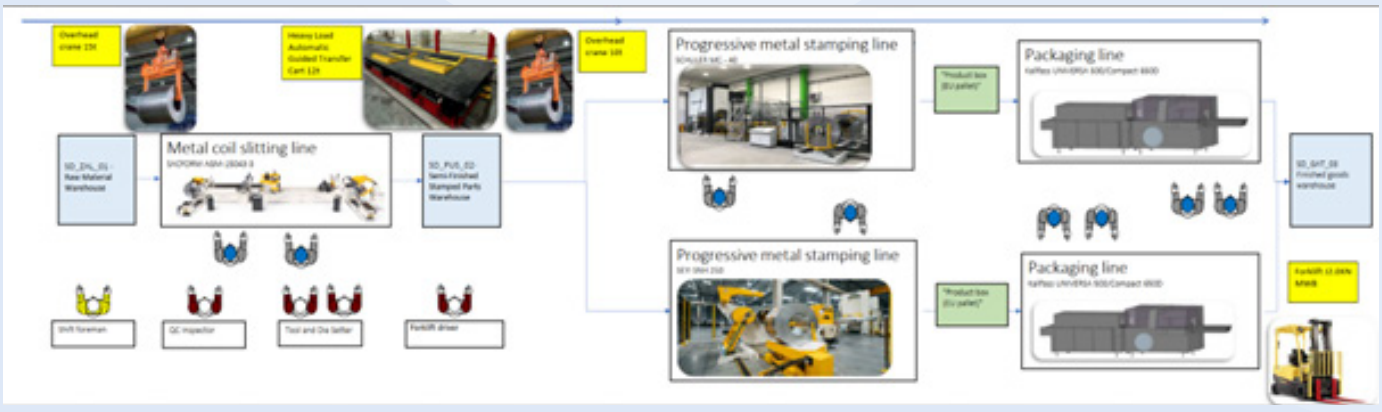
A3: This module includes the manufacture of products and packaging. It has considered all the energy consumption and waste generated in the production plant.

Manufacturing process

The product is manufactured in a controlled industrial environment using defined raw materials and standardized process steps. The production process typically includes the following stages:

- Raw material receiving: galvanized steel coils (DX51D+Z275, EN 10346:2015) are received and stored in the raw material warehouse; handling operations are performed using overhead cranes.
- Coil slitting: steel coils are slit into strips of the required width on a metal coil slitting line; prepared strips are temporarily stored in the semi-finished goods warehouse.
- Stamping: steel strips are fed into progressive metal stamping lines, where forming, bending and cutting operations are carried out using dedicated tooling.
- Quality control: during and after stamping, product dimensions, surface quality and compliance with technical specifications are inspected.
- Packaging: finished products are packed on packaging lines into boxes placed on EU pallets.
- Finished goods storage: packed brackets are transferred to the finished goods warehouse and prepared for shipment to customers.

See the manufacturing diagram below.



CONSTRUCTION PROCESS STAGE (A4-A5)

A4: Vehicle capacity utilization volume factor is assumed to be 1 which means full load. It may vary but as the role of transportation emission in total results is small and so the variety in load is assumed to be negligible. Empty returns are not considered as it is assumed that the return trip is used by the transportation company to serve the needs of other clients.

A5: Environmental impacts from installation into the building (A5) include the product installation losses, emissions of energy use in installation and generation of waste at the construction site. Installation is carried out manually or with low-energy equipment – therefore, energy use is assumed negligible. No treatment is required for the product itself during installation. Steel Structural Brackets are delivered in ready-to-install form, and the use of additional auxiliary materials are assumed negligible. Waste from product packaging is collected and treated in recycling plants.

USE STAGE (B1-B7)

Not declared.

PRODUCT END OF LIFE (C1-C4, D)

C1: Deconstruction, dismantling, demolition

At the end-of-life, demounting is assumed to be done manually and require no energy.

C2: Transport of the discarded product to the processing site

It is estimated that there is no mass loss during the use of the product, therefore the end-of-life product is assumed to have the same weight as the declared product. All the end-of-life products are assumed to be sent to the closest waste treatment facilities. Transportation distance to the closest disposal area is estimated as 80 km based on PCR 2019:14 v.2.0.1 Table 4. The transportation method is assumed as lorry which is the most common option.

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

It is assumed that end-of-life stage 90 %* of collected steel is adequately recycled (e.g., melted, sorted, and cleaned) to meet quality criteria for use in new steel production or other construction purposes, without posing environmental risks.

Yield factor = 0,9 assuming 10% material losses during recovery process.

C4: Discharge (disposal)

It is assumed that 10 % of steel is sent to landfills.

D: Benefits and loads beyond the system boundary

Module D includes substitution benefits for recyclable waste streams leaving the product system from modules A3 and A5, covering avoided production of corrugated board boxes, primary steel and conventional energy, while waste treatment processes are accounted for in the respective life cycle stages to avoid double counting; EU-average scenarios and a yield factor of 0,9 were applied.

In the context of end-of-life, it is assumed that steel is recovered, subsequently fully recycled into post-consumer waste and has been modelled to avoid use of primary materials. The mass of the primary materials in the product is used to prevent double counting.

*EuRIC. (2020, February). Metal Recycling Factsheet. European Circular Economy Stakeholder Platform. Retrieved from https://circulareconomy.europa.eu/platform/en/knowledge/metal-recycling-factsheet-euric

ENVIRONMENTAL PERFORMANCE

LCA RESULTS OF THE PRODUCT(S) – MAIN ENVIRONMENTAL PERFORMANCE RESULTS

The results are presented for 1 kg of product.

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804:2012+A2:2019, EF 3.1

Impact category	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-total	kg CO_2e	2,61E+00	3,26E-02	3,15E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	8,62E-03	2,00E-02	6,26E-04	-1,17E+00
GWP-fossil	kg CO_2e	2,62E+00	3,26E-02	3,34E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	8,61E-03	2,02E-02	6,26E-04	-1,15E+00
GWP-biogenic	kg CO_2e	-1,46E-03	7,39E-06	2,81E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,95E-06	-2,91E-04	2,81E-07	-1,36E-02
GWP-luluc	kg CO_2e	1,03E-03	1,46E-05	1,95E-07	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,85E-06	2,50E-05	3,58E-07	-1,38E-04
ODP	kg CFC_{-11}e	3,20E-09	4,81E-10	2,53E-12	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,27E-10	2,69E-10	1,74E-11	-3,79E-09
AP	mol H^+e	6,04E-03	1,11E-04	1,12E-06	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,94E-05	2,42E-04	4,38E-06	-4,69E-03
EP-freshwater	kg Pe	2,14E-05	2,54E-06	7,77E-08	ND	ND	ND	ND	ND	ND	ND	0,00E+00	6,70E-07	1,35E-05	5,48E-08	-8,40E-04
EP-marine	kg Ne	1,73E-03	3,65E-05	4,11E-07	ND	ND	ND	ND	ND	ND	ND	0,00E+00	9,65E-06	5,36E-05	1,68E-06	-1,05E-03
EP-terrestrial	mol Ne	1,83E-02	3,98E-04	3,06E-06	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,05E-04	6,06E-04	1,84E-05	-1,14E-02
POCP	kg NMVOCe	4,96E-03	1,64E-04	1,03E-06	ND	ND	ND	ND	ND	ND	ND	0,00E+00	4,33E-05	1,80E-04	6,63E-06	-3,87E-03
ADP - minerals &metals*	kg Sbe	3,98E-05	9,10E-08	2,62E-09	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,40E-08	1,43E-06	9,32E-10	-1,27E-05
ADP-fossil*	MJ	3,46E+01	4,73E-01	2,91E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,25E-01	2,73E-01	1,53E-02	-1,06E+01
Water use	m^3e depr.	2,47E-01	2,34E-03	6,26E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	6,17E-04	5,33E-03	6,73E-04	-2,54E-01

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 on these results are high or as there is limited experienced with the indicator. The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks. The results of the end-of-life stage (modules C1-C4) should be considered when using the results of the product stage (modules A1-A3).

ADDITIONAL (OPTIONAL) ENVIRONMENTAL IMPACT INDICATORS – EN 15804:2012+A2:2019, EF 3.1

Impact category	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Particulate matter	Incidence	9,42E-08	3,27E-09	1,78E-11	ND	ND	ND	ND	ND	ND	ND	0,00E+00	8,62E-10	3,30E-09	1,01E-10	-8,55E-08
Ionizing radiation*	kBq U235e	6,23E-02	4,12E-04	2,37E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,09E-04	2,35E-03	9,17E-06	4,48E-02
Ecotoxicity (freshwater)	CTUe	9,57E+00	6,70E-02	1,41E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,77E-02	1,34E+00	1,02E-02	-5,30E+01
Human toxicity, cancer	CTUh	2,05E-09	5,38E-12	1,70E-13	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,42E-12	1,79E-11	1,13E-13	-1,71E-10
Human tox. non-cancer	CTUh	1,40E-08	3,06E-10	5,91E-12	ND	ND	ND	ND	ND	ND	ND	0,00E+00	8,09E-11	1,23E-09	2,55E-12	-7,91E-09
SQP (Land use related impacts/soil quality)	-	4,27E+00	4,77E-01	2,41E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,26E-01	5,24E-01	3,01E-02	-4,60E+00

* Disclaimer: 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

Note: For additional environmental impact indicators calculations generic data for galvanized steel sheets were used, instead of EPD EPD-IES-0023967 and EPD-IES-0023965 because these EPDs did not declare additional indicators.

RESOURCE USE INDICATORS

Impact category	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Renew. PER as energy	MJ	2,13E+00	6,49E-03	-1,41E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,71E-03	5,00E-02	1,43E-04	-1,04E+00
Renew. PER as material	MJ	1,28E-01	0,00E+00	-1,28E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,36E-01
Total use of renew. PER	MJ	2,26E+00	6,49E-03	-2,69E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,71E-03	5,00E-02	1,43E-04	-9,08E-01
Non-re. PER as energy	MJ	3,44E+01	4,73E-01	2,91E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,25E-01	2,73E-01	1,53E-02	-1,06E+01
Non-re. PER as material	MJ	4,19E-04	0,00E+00	-4,19E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,90E-03
Total use of non-re. PER	MJ	3,44E+01	4,73E-01	2,49E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,25E-01	2,73E-01	1,53E-02	-1,06E+01
Secondary materials	kg	6,11E-02	2,01E-04	5,85E-06	ND	ND	ND	ND	ND	ND	ND	0,00E+00	5,32E-05	3,32E-04	3,81E-06	7,58E-01
Renew. secondary fuels	MJ	9,36E-04	2,56E-06	3,01E-08	ND	ND	ND	ND	ND	ND	ND	0,00E+00	6,76E-07	1,55E-05	7,96E-08	-1,89E-04
Non-ren. secondary fuels	MJ	5,14E-25	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water	m^3	1,05E-02	7,00E-05	1,09E-06	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,85E-05	1,22E-04	1,58E-05	-4,13E-03

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

Note: Option A was chosen for the calculations of the primary energy indicators. according to on Annex 3 of PCR 2019:14

WASTE INDICATORS

Impact category	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste	kg	6,50E-03	8,02E-04	2,67E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,12E-04	1,80E-03	1,74E-05	-3,85E-01
Non-hazardous waste	kg	1,42E-01	1,48E-02	7,73E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,92E-03	7,09E-02	1,00E-01	-4,66E+00
Radioactive waste	kg	1,18E-03	1,01E-07	6,05E-09	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,66E-08	6,01E-07	2,24E-09	1,15E-05

OUTPUT FLOW INDICATORS

Impact category	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for re-use	kg	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for recycling	kg	1,40E-01	0,00E+00	1,00E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	9,00E-01	0,00E+00	0,00E+00
Materials for energy rec	kg	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy, electricity	MJ	7,40E-03	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy, thermal	MJ	1,02E-02	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

ADDITIONAL INDICATOR – GWP-GHG

Impact category	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-GHG*	kg CO_2e	2,62E+00	3,26E-02	3,35E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	8,61E-03	2,03E-02	6,26E-04	-1,01E+00

* Disclaimer: This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO2 is set to zero.

ADDITIONAL LCA RESULTS (OTHER ENVIRONMENTAL PERFORMANCE RESULTS) OF THE PRODUCT(S)

Additional results for end-of-life 100% scenarios for modules C1-C4, D

END-OF-LIFE SCENARIO DOCUMENTATION (CORRESPONDING SCENARIOS)

Scenario parameter	Value (100% recycling)	Value (100% disposal)
Collection process – kg collected separately	1,00	1,00
Collection process – kg collected with mixed waste	-	-
Recovery process – kg for re-use	-	-
Recovery process – kg for recycling	1,00	-
Recovery process – kg for energy recovery	-	-
Disposal (total) – kg for final deposition	-	1,00
Scenario assumptions e.g. transportation	80 km	80 km

MANDATORY IMPACT CATEGORY INDICATORS ACCORDING TO EN 15804 (CORRESPONDING SCENARIO 100% RECYCLING)

Results per declared unit						
Indicator	**Unit**	**C1**	**C2**	**C3**	**C4**	**D**
GWP- total	kg CO_2 eq.	0,00E+00	8,62E-03	2,22E-02	0,00E+00	-1,17E+00
GWP-fossil	kg CO_2 eq.	0,00E+00	8,61E-03	2,25E-02	0,00E+00	-1,17E+00
GWP-biogenic	kg CO_2 eq.	0,00E+00	1,95E-06	-3,24E-04	0,00E+00	0,00E+00
GWP- luluc	kg CO_2 eq.	0,00E+00	3,85E-06	2,78E-05	0,00E+00	-1,84E-04
ODP	kg CFC 11 eq.	0,00E+00	1,27E-10	2,99E-10	0,00E+00	-3,90E-09
AP	mol H+ eq.	0,00E+00	2,94E-05	2,68E-04	0,00E+00	-4,76E-03
EP-freshwater	kg P eq.	0,00E+00	6,70E-07	1,50E-05	0,00E+00	-8,50E-04
EP- marine	kg N eq.	0,00E+00	9,65E-06	5,96E-05	0,00E+00	-1,06E-03
EP-terrestrial	mol N eq.	0,00E+00	1,05E-04	6,73E-04	0,00E+00	-1,15E-02
POCP	kg NMVOC eq.	0,00E+00	4,33E-05	1,99E-04	0,00E+00	-3,92E-03
ADP-minerals & metals*	kg Sb eq.	0,00E+00	2,40E-08	1,59E-06	0,00E+00	-1,29E-05
ADP-fossil*	MJ	0,00E+00	1,25E-01	3,04E-01	0,00E+00	-1,08E+01
WDP*	m^3	0,00E+00	6,17E-04	5,92E-03	0,00E+00	-2,65E-01

MANDATORY IMPACT CATEGORY INDICATORS ACCORDING TO EN 15804 (CORRESPONDING SCENARIO 100% DISPOSAL)

Results per declared unit						
Indicator	**Unit**	**C1**	**C2**	**C3**	**C4**	**D**
GWP- total	kg CO_2 eq.	0,00E+00	8,62E-03	0,00E+00	6,26E-03	0,00E+00
GWP-fossil	kg CO_2 eq.	0,00E+00	8,61E-03	0,00E+00	6,26E-03	0,00E+00
GWP-biogenic	kg CO_2 eq.	0,00E+00	1,95E-06	0,00E+00	2,81E-06	0,00E+00
GWP- luluc	kg CO_2 eq.	0,00E+00	3,85E-06	0,00E+00	3,58E-06	0,00E+00
ODP	kg CFC 11 eq.	0,00E+00	1,27E-10	0,00E+00	1,74E-10	0,00E+00
AP	mol H+ eq.	0,00E+00	2,94E-05	0,00E+00	4,38E-05	0,00E+00
EP-freshwater	kg P eq.	0,00E+00	6,70E-07	0,00E+00	5,48E-07	0,00E+00
EP- marine	kg N eq.	0,00E+00	9,65E-06	0,00E+00	1,68E-05	0,00E+00
EP-terrestrial	mol N eq.	0,00E+00	1,05E-04	0,00E+00	1,84E-04	0,00E+00
POCP	kg NMVOC eq.	0,00E+00	4,33E-05	0,00E+00	6,63E-05	0,00E+00
ADP-minerals & metals*	kg Sb eq.	0,00E+00	2,40E-08	0,00E+00	9,32E-09	0,00E+00
ADP-fossil*	MJ	0,00E+00	1,25E-01	0,00E+00	1,53E-01	0,00E+00
WDP*	m^3	0,00E+00	6,17E-04	0,00E+00	6,73E-03	0,00E+00

ADDITIONAL INFORMATION

MANUFACTURING ENERGY SCENARIO DOCUMENTATION

Scenario parameter	Value	Source
Renewable energy mix (Lithuania)	0,032 kg CO_2e / kWh	The Renewable energy mix is modelled according to Guarantees of origin certificates. Data sources: ecoinvent 3.11 Country: Lithuania
Heating production (natural gas)	0,277 kg CO_2e / kWh	Data sources: ecoinvent 3.11 Country: Lithuania
Propane	0,332 kg CO_2e / kWh	Data sources: ecoinvent 3.11 Country: World

TRANSPORTATION SCENARIO DOCUMENTATION (MOST PROBABLE SCENARIO)

Scenario parameter	Value
Vehicle type used for transport	EURO 5 truck with a trailer with an average load of >32t
Distance	300 km
Capacity utilization (inc. empty return)	100 %
Bulk density of transported products	Not declared

Note. The product is distributed mainly in Lithuania. Transport distances and modes may vary significantly depending on the customer and project location.

INSTALLATION OF THE PRODUCT IN THE BUILDING SCENARIO DOCUMENTATION (MOST PROBABLE SCENARIO)

Scenario parameter	Value
Ancillary materials for installation, kg	-
Water use, m^3	-
Other resource use, kg	-
Quantitative description of energy type (regional mix) and consumption during the installation process, kWh	-
Waste materials on the building site before waste processing, generated by the product's installation, kg	-
Packaging (total)	**0,01**
Output materials as result of waste processing at the building site, kg	-
Cardboard (packaging)	**0,01**
Direct emissions to ambient air, soil, and water, kg	-

END-OF-LIFE SCENARIO DOCUMENTATION (MOST PROBABLE SCENARIO)

Scenario parameter	Value
Collection process – kg collected separately	1,0
Collection process – kg collected with mixed waste	-
Recovery process – kg for re-use	-
Recovery process – kg for recycling	0,90
Recovery process – kg for energy recovery	-
Disposal (total) – kg for final deposition	0,10
Scenario assumptions e.g. transportation	80 km

Note. Yield factor = 0,9 (assuming 10% of material is lost in the recovery process).

ABBREVIATIONS

Abbreviation	Definition
General Abbreviations	
EN	European Norm (Standard)
EPD	Environmental Product Declaration
EF	Environmental Footprint
ISO	International Organization for Standardization
LCA	Life Cycle Assessment
PCR	Product Category Rules
c-PCR	Complementary Product Category Rules
CEN	European Committee for Standardization
CPC	Central product classification
General Abbreviations	
GHG	Greenhouse gas
GWP	Global Warming Potential (kg CO_2 eq.)
GWP-fossil	Global Warming Potential from fossil sources (kg CO_2 eq.)
GWP-biogenic	Global Warming Potential from biogenic sources (kg CO_2 eq.)
GWP-luluc	Global Warming Potential from land use and land use change (kg CO_2 eq.)
GWP-total	Total Global Warming Potential (kg CO_2 eq.)
GWP-GHG	Global Warming Potential for greenhouse gases (kg CO_2 eq.)
ODP	Ozone Depletion Potential (kg CFC-11 eq.)
AP	Acidification Potential (mol H^+ eq.)
EP	Eutrophication Potential
EP-freshwater	Freshwater eutrophication potential (kg P eq.)
EP-marine	Marine eutrophication potential (kg N eq.)
EP-terrestrial	Terrestrial eutrophication potential (mol N eq.)
POCP	Photochemical Ozone Creation Potential (kg NMVOC eq.)
ADP	Abiotic Depletion Potential
ADP-minerals&metals	Abiotic depletion potential for non-fossil resources (kg Sb eq.)
ADP-fossil	Abiotic depletion potential for fossil resources (MJ)
WDP	Water Deprivation Potential (m^3)
Resource Use Indicators	
PERE	Use of renewable primary energy excluding renewable primary energy resources used as raw materials (MJ)
PERM	Use of renewable primary energy resources used as raw materials (MJ)
PERT	Total use of renewable primary energy resources (MJ)
PENRE	Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials (MJ)
PENRM	Use of non-renewable primary energy resources used as raw materials (MJ)
PENRT	Total use of non-renewable primary energy resources (MJ)
SM	Use of secondary material (kg)
RSF	Use of renewable secondary fuels (MJ)
NRSF	Use of non-renewable secondary fuels (MJ)
FW	Use of net fresh water (m^3)
Waste Indicators	
HW	Hazardous Waste (disposed) (kg)
NHW	Non-Hazardous Waste (disposed) (kg)
RW	Radioactive Waste (disposed) (kg)
Output Flow Indicators	
CFR	Components for Reuse (kg)
MR	Material for Recycling (kg)
MER	Materials for Energy Recovery (kg)
EEE	Exported Energy, Electricity (MJ)
EET	Exported Energy, Thermal (MJ)

ABBREVIATIONS

Abbreviation	Definition
Lifecycle Stages / Modules	
A1	Raw material supply
A2	Transport
A3	Manufacturing
A4	Transport to site
A5	Construction/Installation
B1	Use
B2	Maintenance
B3	Repair
B4	Replacement
B5	Refurbishment
B6	Operational energy use
B7	Operational water use
C1	Deconstruction/Demolition
C2	Transport to waste processing
C3	Waste processing
C4	Disposal
D	Reuse-Recovery-Recycling potential
Other Relevant Terms	
SVHC	Substances of Very High Concern
EC No.	European Community Number
MJ	Megajoule
kg	Kilogram
m^3	Cubic Meter
NMVOC	Non-Methane Volatile Organic Compounds
Sb eq.	Antimony Equivalents
P eq.	Phosphorus Equivalents
N eq.	Nitrogen Equivalents
CFC-11 eq.	Chlorofluorocarbon-11 Equivalents
CO_2 eq.	Carbon Dioxide Equivalents
kg C	Kilograms of Carbon
kg CO_2 eq.	Kilograms of Carbon Dioxide Equivalent
ND	Not Declared
REACH	Registration, Evaluation, Authorisation, and Restriction of Chemicals
ppm	Parts per million
PEF	Product Environmental Footprint
PPP	Polluter pays principle
EU	Europe

REFERENCES

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One Click LCA tool Version: 0.47.0

VERSION HISTORY

Original Version of the EPD, 2026-01-16