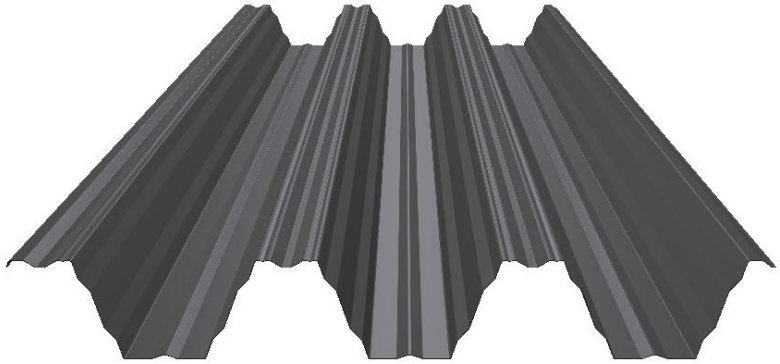
ENVIRONMENTAL PRODUCT DECLARATION



IN ACCORDANCE WITH 15804+A2 & ISO 14025 / ISO 21930

LOAD-BEARING STRUCTURES, ROOF/WALL SHEETS, STEEL PURLINS, LISTS, ROLLS AND SHEETS

GENERAL INFORMATION

MANUFACTURER INFORMATION

Manufacturer	Weckman Steel Oy
Address	Härkäläntie 72, 19110 Vierumäki
Contact details	sales@weckmansteel.fi
Website	www.weckmansteel.fi

PRODUCT IDENTIFICATION

Product name	Load-bearing structures, roof/wall sheets, steel purlins, lists, rolls and sheets
Place of production	Vierumäki, Finland

Jukka Seppänen
RTS EPD Committee Secretary

Laura Apilo
Managing Director

EPD INFORMATION

EPDs of construction products may not be comparable if they do not comply with EN 15804 and if they are not compared in a building context.

EPD program operator	The Building Information Foundation RTS sr Malminkatu 16 A, 00100 Helsinki, Finland http://cer.rts.fi
EPD standards	This EPD is in accordance with EN 15804+A2 and ISO 14025 / ISO 21930 standards.
Product category rules (PCR)	The CEN standard EN 15804+A2 serves as the core PCR. In addition, the RTS PCR (English version, 26.8.2020) is used.
EPD author	Ipek Goktas, at One Click LCA Ltd Suvilahdenkatu 10 B 00500 Helsinki, Finland www.oneclicklca.com
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal certification ☑ External verification
EPD verifier	Silvia Vilčeková, Silcert, s.r.o.
Verification date	22-08-2022
EPD number	RTS_193_22
ECO Platform nr.	-
Publishing date	September 06, 2022
EPD valid until	September 06, 2027

PRODUCT INFORMATION

PRODUCT DESCRIPTION

Load-bearing corrugated sheets W-70/900, W-115/750, W-130/950 and W-155/840 can be used as load-bearing structures in attic and intermediate floors, roofs and walls. Load capacities of span lengths up to 9 m. Due to their large load capacity they can even be used as concrete casting moulds.

PRODUCT APPLICATION

Web holes are available for W-70/900 and W-115/750 profiles, allowing reduction of echo in, e.g., sports halls.

Steel purlins (Z and C models) are used as secondary support structures in attic floors (Z) and walls ©.

Corrugated roof sheets are traditional tin roof profiles. Some of them can be used on the walls too.

Further information can be found at www.weckmansteel.fi

PRODUCT RAW MATERIAL COMPOSITION

Raw materials	Weight [kg]	Post-consumer [%]	Renewable [%]	Material origin
Steel	960	20%	-	Europe
Zinc Coating	20	-	-	Europe
Powder Coating	20	-	-	Europe

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass [%]	Material origin
Metals	98%	Europe
Minerals	-	-
Fossil materials	2%	Europe
Bio-based materials	-	-

SUBSTANCES, REACH – VERY HIGH CONCERN

The product does not contain any REACH SVHC substances in amounts greater than 0.1 % (1000 ppm).

PRODUCT STANDARDS, TECHNICAL SPECIFICATIONS, PHYSICAL PROPERTIES OF THE PRODUCT

Further information can be found at www.weckmansteel.fi

PRODUCT LIFE CYCLE

MANUFACTURING AND PACKAGING (A1-A3)

Needed specific steel coils are taken from storage to reeling machine.

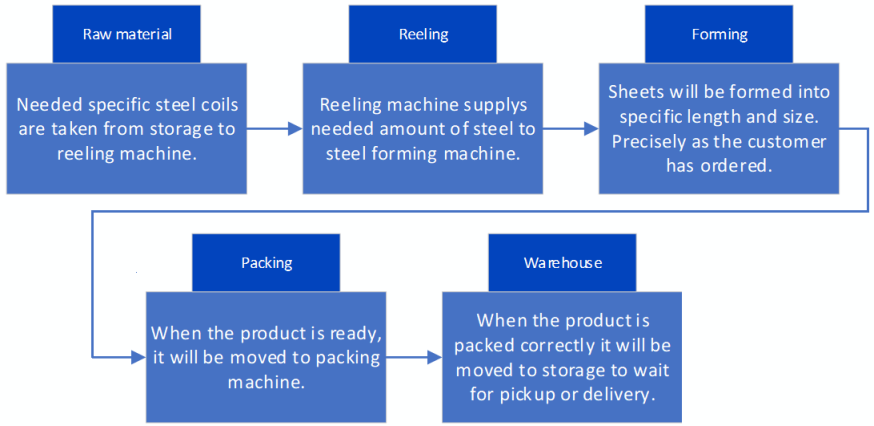
Reeling machine supplies needed amount steel to steel forming machine.

Sheets will be formed into specific length and size. Precisely as the customer has ordered.

When the product is ready, it will be moved to packing machine.

When the product is packed correctly, an employee will move it to storage, to wait for pickup or delivery.

Steel sheet forming process



TRANSPORT AND INSTALLATION (A4-A5)

This EPD does not cover the construction phase. Air, soil, and water impacts during the construction phase have not been studied.

PRODUCT USE AND MAINTENANCE (B1-B7)

This EPD does not cover the use phase. Air, soil, and water impacts during the use phase have not been studied.

PRODUCT END OF LIFE (C1-C4, D)

100% of the end-of-life product is assumed to be collected separately. (C1) The collected end-of-life product is sent to the closest waste treatment facilities for recycling and landfilling by lorry (C2). 99% of the end-of-life product is recycled (C3) and the remaining 1% is landfilled (C4). Due to the recycling potential of steel, the end-of-life product is replaced with the primary steel (D).

LIFE CYCLE ASSESSMENT

LIFE CYCLE ASSESSMENT INFORMATION

Period for data	year 2021

DECLARED AND FUNCTIONAL UNIT

Declared unit	1 tonne
Mass per declared unit	1000 kg

BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

Biogenic carbon content in product	-
Biogenic carbon content in packaging	-

SYSTEM BOUNDARY

This EPD covers the life-cycle modules listed in the following table.

Product stage			Assembly stage		Use stage							End of life stage				Beyond the system boundaries		
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D	D	D
X	X	X	MND	MND	MND	MND	MND	MND	MND	MND	MND	x	x	x	x	x	x	x
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstr./demol.	Transport	Waste processing	Disposal	Reuse	Recovery	Recycling

Modules not declared = MND

CUT-OFF CRITERIA

The study does not exclude any modules or processes which are stated mandatory in the reference standard 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. 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.

The modules A4-A5 and B1-B7 have not been calculated nor included in the LCA calculations.

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.

ALLOCATION, ESTIMATES AND ASSUMPTIONS

Allocation is required if some material, energy, and waste data cannot be measured separately for the product under investigation. In this study, as per the reference standard, allocation is conducted in the following order;

1. Allocation should be avoided.
2. Allocation should be based on physical properties (e.g., mass, volume) when the difference in revenue is small.
3. Allocation should be based on economic values.

Allocation used in environmental data sources is aligned with the above. The allocation for 1 tonne product is handled based on the total annual production.

All estimations and assumptions are given below.

▪ Modules A2 & C2: 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 assumed to be negligible. Empty returns are not considered as it is assumed that return trip is used by transportation companies to serve the needs of other clients.

▪ Module A3: Finland's grid electricity is used in the production site. The energy sources of the Finland's grid electricity for the reference year 2021 is taken in to consideration. *(Ref. https://energia.fi)*

▪ Module C1: Since there is no significant reference for disassembling of non-structural steel sections, it is assumed that 100% of the end-of-life product is collected separately and 1% of the energy used for building demolition of a building is consumed for disassembling for the non-structural steel sections. Energy consumption of a building demolition process is 10 kWh/m^2. *(Ref. Bozdağ, Ö. & Seçer, M., 2007)* Accordingly, an average mass of a reinforced concrete building is about 1000 kg/m^2. Therefore, energy consumption demolition is 0.01 kWh/kg. The source of energy consumed by work machines is assumed as diesel fuel.

▪ Module C2: Transportation distance to the closest disposal area is estimated as 50 km and the transportation method is assumed as lorry which is the most common.

▪ Modules C3 & C4: 99% and 1% of end-of-life product are assumed to be recycled and landfilled respectively. *(Ref. Milford, R. 2010)*

AVERAGES AND VARIABILITY

The results represent the average of the load-bearing structures, roof/wall sheets, steel purlins, lists, rolls and sheets.

ENVIRONMENTAL IMPACT DATA

The LCIA results are relative expressions and do not predict impacts on category endpoints, the exceeding of thresholds, safety margins or risks.

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1	A2	A3	A1-A3	A4-A5	B1-B7	C1	C2	C3	C4	D
Climate change – total	kg CO_2e	2,38E3	2,36E1	4,84E1	2,45E3	MND	MND	3,3E-2	6,38E0	5,73E1	5,28E-2	-1,15E3
Climate change – fossil	kg CO_2e	2,37E3	2,36E1	4,82E1	2,44E3	MND	MND	3,3E-2	6,37E0	5,73E1	5,27E-2	-1,16E3
Climate change – biogenic	kg CO_2e	5,59E0	1,21E-2	-9,16E-3	5,59E0	MND	MND	9,17E-6	3,9E-3	1,91E-2	1,04E-4	3,78E0
Climate change – LULUC	kg CO_2e	1,51E0	8,96E-3	1,97E-1	1,72E0	MND	MND	2,79E-6	2,25E-3	6,08E-3	1,56E-5	-2,26E-1
Ozone depletion	kg CFC11e	1,64E-4	5,38E-6	4,56E-6	1,74E-4	MND	MND	7,12E-9	1,46E-6	1,23E-5	2,17E-8	-3,72E-5
Acidification	mol H^+e	1,25E1	2,36E-1	1,8E-1	1,29E1	MND	MND	3,45E-4	2,62E-2	5,97E-1	5E-4	-5,68E0
Eutrophication, aquatic freshwater [1]	kg Pe	1,44E-1	1,74E-4	1,36E-3	1,45E-1	MND	MND	1,33E-7	5,5E-5	2,61E-4	6,36E-7	-6,94E-2
Eutrophication, aquatic marine	kg Ne	2,35E0	6,23E-2	2,95E-2	2,44E0	MND	MND	1,52E-4	7,77E-3	2,63E-1	1,72E-4	-1,1E0
Eutrophication, terrestrial	mol Ne	2,71E1	6,91E-1	3,4E-1	2,82E1	MND	MND	1,67E-3	8,59E-2	2,88E0	1,9E-3	-1,25E1
Photochemical ozone formation	kg NMVOCe	1,08E1	1,95E-1	1,06E-1	1,11E1	MND	MND	4,59E-4	2,7E-2	7,92E-1	5,51E-4	-5,98E0
Abiotic depletion, minerals & metals [2]	kg Sbe	2,96E0	3,58E-4	1,46E-4	2,96E0	MND	MND	5,03E-8	1,59E-4	8,88E-5	4,81E-7	-2,08E-2
Abiotic depletion of fossil resources [2]	MJ	2,72E4	3,54E2	1,16E3	2,87E4	MND	MND	4,54E-1	9,72E1	7,88E2	1,47E0	-9,48E3
Water use [2]	m^3e deprived	1,13E3	1,21E0	1,33E1	1,15E3	MND	MND	8,46E-4	3,45E-1	1,58E0	6,81E-2	-5,4E2

[1] The required characterisation method and data are in kg P-eq; to get PO_4e, multiply the result by 3.07.

[2] EN 15804+A2 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."

ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1	A2	A3	A1-A3	A4-A5	B1-B7	C1	C2	C3	C4	D
Particulate matter	Incidence	1,82E-4	1,84E-6	7,59E-7	1,85E-4	MND	MND	9,14E-9	4,92E-7	1,58E-5	9,72E-9	-8,91E-5
Ionizing radiation, human health [3]	kBq U235e	7,17E1	1,54E0	1,8E1	9,12E1	MND	MND	1,94E-3	4,25E-1	3,38E0	6,04E-3	2,26E0
Eco-toxicity (freshwater) [2]	CTUe	1,13E5	2,62E2	5,18E2	1,14E5	MND	MND	2,66E-1	7,59E1	4,69E2	9,29E-1	-6,59E4
Human toxicity, cancer effects [2]	CTUh	1,81E-5	8,43E-9	1,12E-8	1,81E-5	MND	MND	9,53E-12	2,15E-9	1,66E-8	2,2E-11	-6,25E-6
Human toxicity, non-cancer effects [2]	CTUh	1,64E-4	2,96E-7	3,18E-7	1,65E-4	MND	MND	2,35E-10	8,71E-8	4,1E-7	6,79E-10	1,38E-4
Land use related impacts/soil quality [2]	-	5,85E3	4,41E2	3,42E1	6,33E3	MND	MND	1,16E-2	1,08E2	2,06E1	2,5E0	-2,84E3

[2] EN 15804+A2 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."

[3] EN 15804+A2 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."

USE OF NATURAL RESOURCES

Impact category	Unit	A1	A2	A3	A1-A3	A4-A5	B1-B7	C1	C2	C3	C4	D
Renewable PER used as energy	MJ	2,75E3	4,09E0	2,65E2	3,02E3	MND	MND	2,45E-3	1,38E0	5,1E0	1,19E-2	-9,45E2
Renewable PER used as materials	MJ	0E0	0E0	0E0	0E0	MND	MND	0E0	0E0	0E0	0E0	0E0
Total use of renewable PER	MJ	2,75E3	4,09E0	2,65E2	3,02E3	MND	MND	2,45E-3	1,38E0	5,1E0	1,19E-2	-9,45E2
Non-renewable PER used as energy	MJ	2,72E4	3,54E2	1,02E3	2,86E4	MND	MND	4,54E-1	9,72E1	7,88E2	1,47E0	-9,48E3
Non-renewable PER used as materials	MJ	0E0	0E0	1,43E2	1,43E2	MND	MND	0E0	0E0	0E0	0E0	0E0
Total use of non-renewable PER	MJ	2,72E4	3,54E2	1,16E3	2,87E4	MND	MND	4,54E-1	9,72E1	7,88E2	1,47E0	-9,48E3
Use of secondary materials	kg	1,97E2	0E0	4,68E-2	1,97E2	MND	MND	0E0	0E0	0E0	0E0	6,08E2
Use of renewable secondary fuels	MJ	0E0	0E0	0E0	0E0	MND	MND	0E0	0E0	0E0	0E0	0E0
Use of non-renewable secondary fuels	MJ	0E0	0E0	0E0	0E0	MND	MND	0E0	0E0	0E0	0E0	0E0
Use of net fresh water	m^3	2,88E1	6,65E-2	3,47E-1	2,92E1	MND	MND	4,01E-5	1,84E-2	7,14E-2	1,61E-3	-7,97E0

PER abbreviation stands for primary energy resources.

END OF LIFE – WASTE

Impact category	Unit	A1	A2	A3	A1-A3	A4-A5	B1-B7	C1	C2	C3	C4	D
Hazardous waste	kg	7,5E2	3,56E-1	2,19E0	7,52E2	MND	MND	4,88E-4	1,01E-1	0E0	1,37E-3	-4,48E2
Non-hazardous waste	kg	8,02E3	3,22E1	5,28E1	8,11E3	MND	MND	5,22E-3	8,41E0	0E0	1E1	-3,77E3
Radioactive waste	kg	6,3E-2	2,44E-3	9,33E-3	7,48E-2	MND	MND	3,18E-6	6,65E-4	0E0	9,74E-6	-1,76E-3

END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1	A2	A3	A1-A3	A4-A5	B1-B7	C1	C2	C3	C4	D
Components for reuse	kg	0E0	0E0	0E0	0E0	MND	MND	0E0	0E0	0E0	0E0	0E0
Materials for recycling	kg	0E0	0E0	0E0	0E0	MND	MND	0E0	0E0	0E0	9,9E2	0E0
Materials for energy recovery	kg	0E0	0E0	0E0	0E0	MND	MND	0E0	0E0	0E0	0E0	0E0
Exported energy	MJ	0E0	0E0	0E0	0E0	MND	MND	0E0	0E0	0E0	0E0	0E0

KEY INFORMATION TABLE (RTS) – KEY INFORMATION PER KG OF PRODUCT

Impact category	Unit	A1	A2	A3	A1-A3	A4-A5	B1-B7	C1	C2	C3	C4	D
Climate change – total	kg CO_2e	2,38E0	2,36E-2	4,84E-2	2,45E0	MND	MND	3,30E-5	6,38E-3	5,73E-2	5,28E-5	-1,15E0
Abiotic depletion. Minerals & metals [2]	kg Sbe	2,96E-3	3,58E-7	1,46E-7	2,96E-3	MND	MND	5,03E-11	1,59E-7	8,88E-8	4,81E-10	-2,08E-5
Abiotic depletion of fossil resources [2]	MJ	2,72E1	3,54E-1	1,16E0	2,87E1	MND	MND	4,54E-4	9,72E-2	7,88E-1	1,47E-3	-9,48E0
Water use [2]	m^3e deprived	1,13E0	1,21E-3	1,33E-2	1,15E0	MND	MND	8,46E-7	3,45E-4	1,58E-3	6,81E-5	-5,40E-1
Use of secondary materials	kg	1,97E-1	0E0	4,68E-5	1,97E-1	MND	MND	0E0	0E0	0E0	0E0	6,08E-1
Biogenic carbon content in product	kg C	N/A	N/A	0E0	0E0	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Biogenic carbon content in packaging	kg C	N/A	N/A	0E0	0E0	N/A	N/A	N/A	N/A	N/A	N/A	N/A

[2] EN 15804+A2 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."

SCENARIO DOCUMENTATION

Manufacturing energy scenario documentation

Scenario parameter	Value
Electricity data source and quality	Customized production mix electricity, medium voltage *(Ref. https://energia.fi)* Ecoinvent v3.6, Finland, 2019
Electricity kg CO_2e/kWh (weighted average)	0.57 kg CO2e / kWh

End of life scenario documentation

Scenario parameter	Value
Collection process – kg collected separately	1000
Collection process – kg collected with mixed waste	-
Recovery process – kg for re-use	-
Recovery process – kg for recycling	990
Recovery process – kg for energy recovery	-
Disposal (total) – kg for final deposition	10
Scenario assumptions for transportation	End-of-life product is transported 50 km with an average lorry

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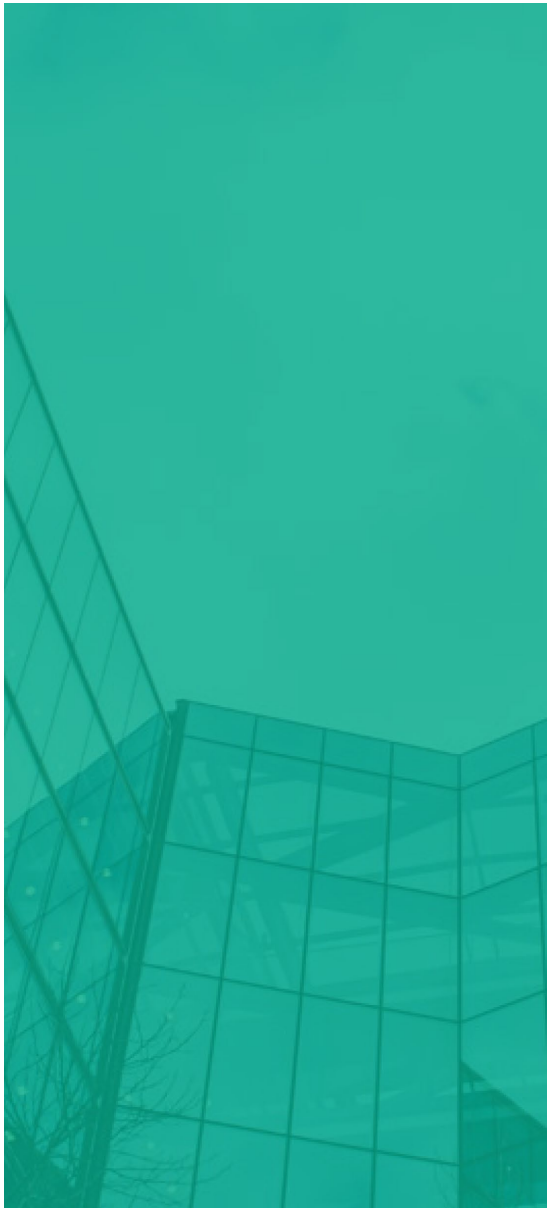

ABOUT THE MANUFACTURER

Reliable and experienced construction expert manufacturer of steel products since 1962.

EPD AUTHOR AND CONTRIBUTORS

Manufacturer	Weckman Steel Oy
EPD author	One Click LCA Ltd, www.oneclicklca.com
EPD verifier	Silvia Vilčeková, Silcert, s.r.o.
EPD program operator	The Building Information Foundation RTS sr
Background data	Ecoinvent v3.6 (cut-off)

VERIFICATION STATEMENT

VERIFICATION PROCESS FOR THIS EPD

This EPD has been verified in accordance with ISO 14025 by an independent, third-party verifier by reviewing results, documents and compliancy with EN 15804, ISO 14025 and ISO 14040/14044, following the process and checklists of the program operator for:

- This Environmental Product Declaration
- The Life-Cycle Assessment used in this EPD
- The background report (project report) for this EPD

Why does verification transparency matter? Read more online.

VERIFICATION OVERVIEW

Following independent third party has verified this specific EPD:

EPD verification information	Answer
Independent EPD verifier	Silvia Vilčeková, Silcert, s.r.o.
EPD verification started on	2022-07-06
EPD verification completed on	2022-08-22
Approver of the EPD verifier	The Building Information Foundation RTS sr

AUTHOR & TOOL VERIFICATION	ANSWER
EPD AUTHOR	IPEK GOKTAS, ONE CLICK LCA LTD
EPD GENERATOR MODULE	METAL & METAL BASED PRODUCTS
INDEPENDENT SOFTWARE VERIFIER	ANNI OVIIR, RANGI MAJA OÜ
SOFTWARE VERIFICATION DATE	25.9.2020

THIRD-PARTY VERIFICATION STATEMENT

I hereby confirm that, following detailed examination, I have not established any relevant deviations by the studied Environmental Product Declaration (EPD), its LCA and project report, in terms of

- the data collected and used in the LCA calculations,
- the way the LCA-based calculations have been carried out,
- the presentation of environmental data in the EPD, and
- other additional environmental information, as present

with respect to the procedural and methodological requirements in ISO 14025:2010 and EN 15804:2012+A2:2019.

I confirm that the company-specific data has been examined as regards plausibility and consistency; the declaration owner is responsible for its factual integrity and legal compliance.

I confirm that I have sufficient knowledge and experience of construction products, this specific product category, the construction industry, relevant standards, and the geographical area of the EPD to carry out this verification.

I confirm my independence in my role as verifier; I have not been involved in the execution of the LCA or in the development of the declaration and have no conflicts of interest regarding this verification.