ENVIRONMENTAL PRODUCT DECLARATION

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

T-Nut
MiTek Finland Oy

EPD HUB, HUB-2434
Published on 08.12.2024, last updated on 08.12.2024, valid until 07.12.2029

Created with One Click LCA

GENERAL INFORMATION

MANUFACTURER

Manufacturer	MiTek Finland Oy
Address	Voittajankaari 2, Karstula 43500, Finland
Contact details	mitek.fi@mii.com
Website	www.mitek.fi

EPD STANDARDS, SCOPE AND VERIFICATION

Program operator	EPD Hub, hub@epdhub.com
Reference standard	EN 15804+A2:2019 and ISO 14025
PCR	EPD Hub Core PCR Version 1.1, 5 Dec 2023
Sector	Construction product
Category of EPD	Third party verified EPD
Scope of the EPD	Cradle to gate with options, A4-A5, and modules C1-C4, D
EPD author	Ville Lindén MiTek Finland Oy
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal verification ☑ External verification
EPD verifier	Haiha Nguyen, as an authorized verifier acting for EPD Hub Limited

The manufacturer has the sole ownership, liability, and responsibility for the EPD. EPDs within the same product category but from different programs may not be comparable. 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.

PRODUCT

Product name	T-Nut
Additional labels	-
Product reference	401314, 401315
Place of production	Karstula, Finland
Period for data	Calendar year 2022
Averaging in EPD	Multiple products
Variation in GWP-fossil for A1-A3	0%/+2%

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 kg
Declared unit mass	1 kg
GWP-fossil, A1-A3 ($kgCO_2e$)	4,27E+00
GWP-total, A1-A3 ($kgCO_2e$)	3,56E+00
Secondary material, inputs (%)	15.7
Secondary material, outputs (%)	92.5
Total energy use, A1-A3 (kWh)	17.9
Net freshwater use, A1-A3 (m^3)	0.04

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

MiTek Finlands main products are nailplates and Posi-struts for truss manufacturers, builder products and truss design programs and services.

PRODUCT DESCRIPTION

EPD consist of T-Nut connectors that are manufactured with steel components welded together. Connectors are used in log buildings for threaded rod connections to connect multiple logs together. Multiple size.

Final product is electrogalvanized.

Further information can be found at www.mitek.fi.

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass %	Material origin
Metals	100	EU, Asia
Minerals	-	
Fossil materials	-	
Bio-based materials	-	

BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

Biogenic carbon content in product, kg C	0
Biogenic carbon content in packaging, kg C	0.196

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1 kg
Mass per declared unit	1 kg
Functional unit	-
Reference service life	-

SUBSTANCES, REACH - VERY HIGH CONCERN

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

PRODUCT LIFE-CYCLE

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		
x	x	x	x	x	MND	MND	MND	MND	MND	MND	MND	x	x	x	x	x		
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction/ demolition	Transport	Waste processing	Disposal	Reuse	Recovery	Recycling

Modules not declared = MND. Modules not relevant = MNR

MANUFACTURING AND PACKAGING (A1-A3)

The environmental impacts considered for the product stage cover the manufacturing of raw materials used in the production as well as packaging materials and other ancillary materials. Also, fuels used by machines, and handling of waste formed in the production processes at the manufacturing facilities are included in this stage. The study also considers the material losses occurring during the manufacturing processes as well as losses during electricity transmission.

The manufacturing process for T-Nuts commences with the purchase of the steel parts used in the products. Steel plates are purchased as pre-fabricated to size from supplier from Finland and steel nut is puchased from a supplier from Finland. Steel nuts are manufactured in Taiwan. Pre-purchased externally sourced steel parts are storaged in the designated welding facility. Welding is done with Mag welding machine. The assembled product is sent to a subcontractor for a electrogalvanizing process. Finished product is send back to warehouse and shelved to wait an purchase order.

As an order for the product comes in from customer, order content is counted and packed on a wooden pallet with plastic wrapping. In the warehouse forklifts are used for heavy loads.

No waste is produced at MiTek factory in the manufacturing process.

TRANSPORT AND INSTALLATION (A4-A5)

Transportation impacts occurred from final products delivery to construction site (A4) cover fuel direct exhaust emissions, environmental impacts of fuel production, as well as related infrastructure emissions.

A4

Manufacturer transports the finished product to customer. Average transport distance from the warehouse to customer is calculated from transporter data and used in calculation as 378km. This is calculated averaging the distance and weight of the shipment. Transport method assumed to be used is lorry 16-32m, EURO5.

A5

Product is installed to the building with screws and or bolts. Screws and or bolts are purchased by the builder in some cases same time as the connector. For these calculations it is assumed that screws are manufactured in Taiwan. No waste is produced from the product itself. Packaging material goes to waste treatment.

Electricity consumption of power tools has been included in the calculation.

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)

C1-Deconstruction:
The product is removed from the construction by powertool.

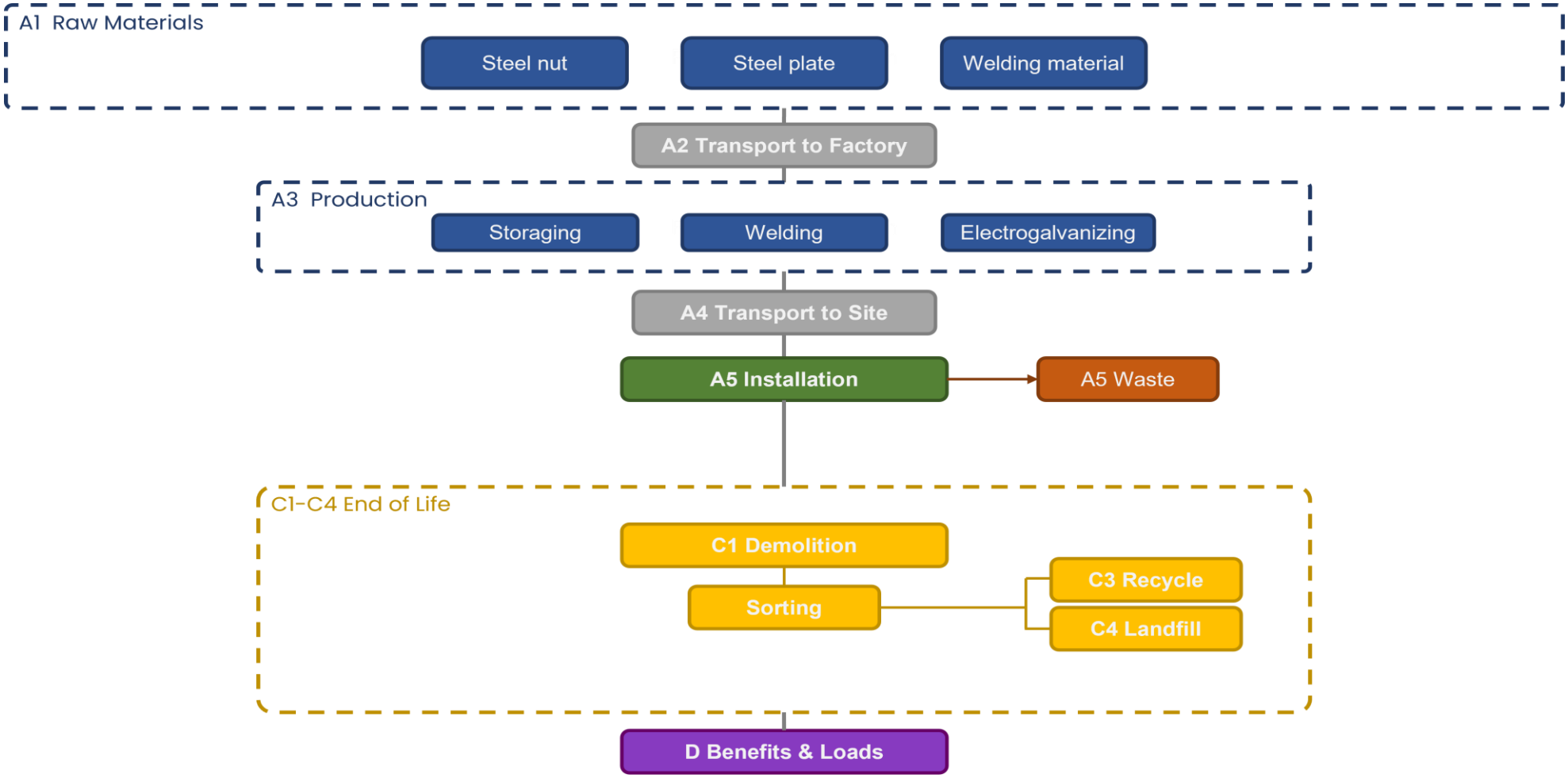
C2-Transport to waste processing facility or landfill:
No data is available for the average distance from demolition site to recycling centre and since every journey will be different. A distance and mode of 50km of truck has been modelled. This will allow endusers of the EPD to calculate their own bespoke impacts for the module C2 based on the predicted route and distance their disassembled product will take.

C3-Waste processing:
It is assumed that 98% of the steel per declared unit will go to recycling and 2% to landfill according to the Finnish default metal recovery rates listed in CO2data Steel sheet for roofing and cladding, hot-dip galvanized, painted or not-painted, or with COR-TEN surface Version 1.01.001,2024. The impacts associated with recycling are covered in this module.

C4-Disposal:
This scenario assumes that 2% of the product per declared unit will be un-recyclable and transported to landfill, in accordance CO2data Steel sheet for roofing and cladding, hot-dip galvanized, painted or not-painted, or with COR-TEN surface Version 1.01.001,2024.

D-Re-use, recovery and/or recycling potential:
This scenario assumes that 98% of the product per declared unit will be recyclable according to CO2data Steel sheet for roofing and cladding, hot-dip galvanized, painted or not-painted, or with COR-TEN surface Version 1.01.001,2024. No data is available for the pre-existing recycled content in the product.

MANUFACTURING PROCESS



LIFE-CYCLE ASSESSMENT

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.

ALLOCATION, ESTIMATES AND ASSUMPTIONS

Allocation is required if some material, energy, and waste data cannot be measured separately for the product under investigation. All allocations are done as per the reference standards and the applied PCR. In this study, allocation has been done in the following ways:

Data type	Allocation
Raw materials	No allocation
Packaging material	No allocation
Ancillary materials	Not applicable
Manufacturing energy and waste	Allocated by mass or volume

AVERAGES AND VARIABILITY

Type of average	Multiple products
Averaging method	Representative product
Variation in GWP-fossil for A1-A3	0%/+2%

EPD averages multiple product types and sizes. Product size varies from 0,17kg to 0,19kg. The representative product is the most sold product (401314) in kg and the variation from this is (401315) which represent the maximum of GWP fossil. Difference is due to the composition of the product where percentage of the steel part varies between products.

All of the products are assembled in the same location and with similar materials.

LCA SOFTWARE AND BIBLIOGRAPHY

This EPD has been created using One Click LCA EPD Generator. The LCA and EPD have been prepared according to the reference standards and ISO 14040/14044. The EPD Generator uses Ecoinvent v3.8, Plastics Europe, Federal LCA Commons and One Click LCA databases as sources of environmental data.

ENVIRONMENTAL IMPACT DATA

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP – total[1)]	kg CO_2e	3,47E+00	2,70E-01	-1,85E-01	3,56E+00	9,71E-02	9,31E-01	MND	MND	MND	MND	MND	MND	MND	2,61E-03	8,73E-03	2,30E-02	1,11E-04	-1,68E+00
GWP – fossil	kg CO_2e	3,47E+00	2,70E-01	5,31E-01	4,27E+00	9,70E-02	2,13E-01	MND	MND	MND	MND	MND	MND	MND	2,59E-03	8,73E-03	2,30E-02	1,11E-04	-1,75E+00
GWP – biogenic	kg CO_2e	0,00E+00	0,00E+00	-7,17E-01	-7,17E-01	0,00E+00	7,18E-01	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	6,97E-02
GWP – LULUC	kg CO_2e	2,27E-03	1,25E-04	1,26E-03	3,65E-03	3,81E-05	1,01E-04	MND	MND	MND	MND	MND	MND	MND	2,34E-05	3,43E-06	1,91E-05	1,04E-07	-4,23E-04
Ozone depletion pot.	kg $CFC\text{-}_{11}$e	1,69E-07	6,06E-08	2,52E-08	2,55E-07	2,24E-08	1,16E-08	MND	MND	MND	MND	MND	MND	MND	1,46E-10	2,02E-09	1,05E-09	4,47E-11	-6,97E-08
Acidification potential	mol H^+e	1,23E-02	2,70E-03	5,43E-03	2,04E-02	3,94E-04	1,62E-03	MND	MND	MND	MND	MND	MND	MND	1,05E-05	3,54E-05	1,06E-04	1,04E-06	-7,34E-03
EP-freshwater[2)]	kg Pe	1,19E-04	1,70E-06	1,52E-05	1,35E-04	6,81E-07	6,59E-06	MND	MND	MND	MND	MND	MND	MND	9,78E-08	6,13E-08	9,04E-07	1,16E-09	-7,47E-05
EP-marine	kg Ne	2,68E-03	7,10E-04	4,48E-04	3,84E-03	1,18E-04	2,46E-04	MND	MND	MND	MND	MND	MND	MND	1,77E-06	1,06E-05	4,05E-05	3,60E-07	-1,50E-03
EP-terrestrial	mol Ne	2,76E-02	7,87E-03	5,05E-03	4,05E-02	1,30E-03	5,42E-03	MND	MND	MND	MND	MND	MND	MND	2,12E-05	1,17E-04	2,69E-04	3,96E-06	-1,74E-02
POCP ("smog")[3)]	kg NMVOCe	9,58E-03	2,17E-03	2,19E-03	1,39E-02	3,97E-04	8,94E-04	MND	MND	MND	MND	MND	MND	MND	5,64E-06	3,57E-05	7,58E-05	1,15E-06	-8,64E-03
ADP-minerals & metals[4)]	kg Sbe	3,89E-05	8,35E-07	2,41E-06	4,22E-05	3,44E-07	3,87E-06	MND	MND	MND	MND	MND	MND	MND	1,04E-08	3,09E-08	7,18E-07	2,54E-10	-3,19E-05
ADP-fossil resources	MJ	4,30E+01	3,88E+00	1,04E+01	5,73E+01	1,44E+00	1,78E+00	MND	MND	MND	MND	MND	MND	MND	7,82E-02	1,30E-01	1,71E-01	3,03E-03	-1,67E+01
Water use[5)]	m^3e depr.	1,25E+00	1,68E-02	2,67E-01	1,54E+00	6,66E-03	7,14E-02	MND	MND	MND	MND	MND	MND	MND	1,67E-03	5,99E-04	5,56E-03	9,62E-06	-3,45E-01

1) GWP = Global Warming Potential; 2) EP = Eutrophication potential. Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO4e; 3) POCP = Photochemical ozone formation; 4) ADP = Abiotic depletion potential; 5) EN 15804+A2 disclaimer for Abiotic depletion and Water use and optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

ADDITIONAL (OPTIONAL) ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Particulate matter	Incidence	1,17E-07	2,02E-08	4,41E-08	1,81E-07	8,37E-09	1,73E-08	MND	MND	MND	MND	MND	MND	MND	5,98E-11	7,53E-10	1,78E-09	2,09E-11	-1,18E-07
Ionizing radiation[6)]	kBq U235e	3,41E-01	1,99E-02	1,08E-01	4,69E-01	7,54E-03	1,23E-02	MND	MND	MND	MND	MND	MND	MND	3,77E-03	6,78E-04	2,74E-03	1,37E-05	2,78E-02
Ecotoxicity (freshwater)	CTUe	6,85E+01	3,08E+00	6,11E+00	7,77E+01	1,19E+00	5,13E+00	MND	MND	MND	MND	MND	MND	MND	4,30E-02	1,07E-01	3,05E+00	1,98E-03	-6,09E+01
Human toxicity, cancer	CTUh	8,47E-09	1,15E-10	1,80E-09	1,04E-08	3,70E-11	7,63E-10	MND	MND	MND	MND	MND	MND	MND	1,11E-12	3,33E-12	4,81E-11	4,95E-14	1,40E-08
Human tox. non-cancer	CTUh	4,86E-08	2,96E-09	6,12E-09	5,76E-08	1,21E-09	4,25E-09	MND	MND	MND	MND	MND	MND	MND	2,55E-11	1,09E-10	7,64E-10	1,29E-12	-4,10E-08
SQP[7)]	-	1,16E+01	2,32E+00	6,00E+01	7,39E+01	1,01E+00	7,04E-01	MND	MND	MND	MND	MND	MND	MND	2,47E-02	9,07E-02	8,75E-01	6,48E-03	-6,27E+00

6) EN 15804+A2 disclaimer for Ionizing radiation, human health. 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; 7) SQP = Land use related impacts/soil quality.

USE OF NATURAL RESOURCES

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Renew. PER as energy[8)]	MJ	3,82E+00	5,04E-02	5,34E+00	9,22E+00	2,07E-02	1,60E-01	MND	MND	MND	MND	MND	MND	MND	1,91E-02	1,86E-03	2,78E-02	2,63E-05	-1,84E+00
Renew. PER as material	MJ	0,00E+00	0,00E+00	6,29E+00	6,29E+00	0,00E+00	-6,29E+00	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,52E-01
Total use of renew. PER	MJ	3,82E+00	5,04E-02	1,16E+01	1,55E+01	2,07E-02	-6,13E+00	MND	MND	MND	MND	MND	MND	MND	1,91E-02	1,86E-03	2,78E-02	2,63E-05	-1,49E+00
Non-re. PER as energy	MJ	4,30E+01	3,88E+00	8,07E+00	5,50E+01	1,44E+00	1,78E+00	MND	MND	MND	MND	MND	MND	MND	7,82E-02	1,30E-01	1,71E-01	3,03E-03	-1,60E+01
Non-re. PER as material	MJ	0,00E+00	0,00E+00	2,28E+00	2,28E+00	0,00E+00	-2,28E+00	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,50E-01
Total use of non-re. PER	MJ	4,30E+01	3,88E+00	1,04E+01	5,72E+01	1,44E+00	-5,00E-01	MND	MND	MND	MND	MND	MND	MND	7,82E-02	1,30E-01	1,71E-01	3,03E-03	-1,53E+01
Secondary materials	kg	1,57E-01	1,39E-03	5,11E-02	2,10E-01	4,83E-04	1,10E-02	MND	MND	MND	MND	MND	MND	MND	5,33E-06	4,34E-05	3,08E-04	6,37E-07	9,73E-01
Renew. secondary fuels	MJ	8,91E-04	1,26E-05	2,14E-01	2,15E-01	5,32E-06	1,50E-05	MND	MND	MND	MND	MND	MND	MND	2,29E-08	4,79E-07	2,50E-05	1,66E-08	-1,54E-04
Non-ren. secondary fuels	MJ	5,43E-22	0,00E+00	0,00E+00	5,43E-22	0,00E+00	0,00E+00	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water	m^3	2,82E-02	4,44E-04	7,01E-03	3,56E-02	1,81E-04	1,40E-03	MND	MND	MND	MND	MND	MND	MND	6,92E-05	1,63E-05	1,44E-04	3,32E-06	-4,83E-03

8) PER = Primary energy resources.

END OF LIFE – WASTE

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste	kg	5,52E-01	4,53E-03	8,49E-02	6,41E-01	1,62E-03	5,12E-02	MND	MND	MND	MND	MND	MND	MND	1,68E-04	1,45E-04	2,23E-03	0,00E+00	-5,59E-01
Non-hazardous waste	kg	4,69E+00	7,11E-02	4,77E-01	5,24E+00	2,87E-02	6,50E-01	MND	MND	MND	MND	MND	MND	MND	4,15E-03	2,58E-03	7,14E-02	2,10E-02	-3,01E+00
Radioactive waste	kg	2,38E-04	2,69E-05	4,24E-05	3,07E-04	9,92E-06	5,70E-06	MND	MND	MND	MND	MND	MND	MND	8,24E-07	8,92E-07	9,97E-07	0,00E+00	-4,57E-06

END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1	A2	A3	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	0,00E+00	0,00E+00	0,00E+00	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for recycling	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,75E-01	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	1,03E+00	0,00E+00	0,00E+00
Materials for energy rec	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,90E-02	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,13E+00	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

ENVIRONMENTAL IMPACTS – EN 15804+A1, CML / ISO 21930

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Global Warming Pot.	kg CO_2e	3,42E+00	2,68E-01	5,19E-01	4,21E+00	9,61E-02	2,20E-01	MND	MND	MND	MND	MND	MND	MND	2,56E-03	8,64E-03	3,70E-02	1,08E-04	-1,66E+00
Ozone depletion Pot.	kg CFC_{-11}e	1,50E-07	4,81E-08	2,14E-08	2,20E-07	1,78E-08	1,05E-08	MND	MND	MND	MND	MND	MND	MND	1,27E-10	1,60E-09	8,78E-10	3,54E-11	-7,66E-08
Acidification	kg SO_2e	1,00E-02	2,14E-03	4,74E-03	1,69E-02	3,06E-04	1,12E-03	MND	MND	MND	MND	MND	MND	MND	8,63E-06	2,75E-05	8,40E-05	7,86E-07	-5,94E-03
Eutrophication	kg PO_4^3e	4,99E-03	3,16E-04	6,19E-04	5,92E-03	6,94E-05	1,02E-03	MND	MND	MND	MND	MND	MND	MND	3,77E-06	6,24E-06	1,40E-04	1,69E-07	-3,06E-03
POCP (“smog”)	kg C_2H_4e	9,50E-04	6,53E-05	4,32E-04	1,45E-03	1,25E-05	6,87E-05	MND	MND	MND	MND	MND	MND	MND	3,92E-07	1,13E-06	8,33E-06	3,29E-08	-9,73E-04
ADP-elements	kg Sbe	3,86E-05	8,17E-07	2,39E-06	4,19E-05	3,36E-07	3,85E-06	MND	MND	MND	MND	MND	MND	MND	1,05E-08	3,02E-08	7,15E-07	2,50E-10	-3,19E-05
ADP-fossil	MJ	4,27E+01	3,88E+00	1,01E+01	5,67E+01	1,44E+00	1,78E+00	MND	MND	MND	MND	MND	MND	MND	7,41E-02	1,30E-01	1,71E-01	3,03E-03	-1,67E+01

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 reference standard, 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 digital background data for this EPD

Why does verification transparency matter? Read more online
This EPD has been generated by One Click LCA EPD generator, which has been verified and approved by the EPD Hub.

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 reference standard.

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.

HaiHa Nguyen, as an authorized verifier acting for EPD Hub Limited
05.12.2024

VERIFIED ISO 14025