

ENVIRONMENTAL PRODUCT DECLARATION

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

Steel Beams

Tibnor Denmark A/S



EPD HUB, HUB-2402

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Created with One Click LCA

GENERAL INFORMATION

MANUFACTURER

Manufacturer	Tibnor Denmark A/S
Address	Prinsessens Kvarter 11, 7000 Fredericia, Denmark
Contact details	danmark@tibnor.com
Website	www.tibnor.dk

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	Patrik Bjelovuk , Tibnor AB
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal verification ☑ External verification
EPD verifier	Imane Uald Lamkaddam as an authorized verifier for EPD Hub

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	Steel Beams
Additional labels	
Product reference	Further processed steel beams based upon steel conforming to EN10025
Place of production	Taulov, Denmark
Period for data	Calendar year 2023
Averaging in EPD	Multiple manufacturers
Variation in GWP-fossil for A1-A3	N/A %

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 kg of steel beam
Declared unit mass	1 kg
GWP-fossil, A1-A3 ($kgCO_2e$)	0,614
GWP-total, A1-A3 ($kgCO_2e$)	0,578
Secondary material, inputs (%)	100
Secondary material, outputs (%)	99
Total energy use, A1-A3 (kWh)	2.85
Net freshwater use, A1-A3 (m^3)	0

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

Tibnor supplies steel, metals and production services to the industry in the Nordics and Baltics. We are driven to make a difference for all our customers. For we, just like them, have to work harder, smarter and better to compete in global competition. As a modern distributor of steel and metals, we understand that our role extends far beyond the actual delivery. We make a difference! We are the natural choice

PRODUCT DESCRIPTION

Steel beam profiles are used primarily for load-bearing structural elements such as beams and columns in building and civil engineering. However, they also find application in vehicles and machines.
Beam profiles have high bending and axial stiffness, much higher than for example solid square or
round sections with the same cross-sectional area. Common beam profiles can have two planes of
symmetry as H- or I-profiles or only one plane as U-profiles (channels).
After rolling, they are cooled individually and cut to length.
The steel grades used for beam profiles are most often weldable, low-carbon constructional steels with
an iron content of 98% or more. As with other steel products, beam profiles used in building and civil
engineering constructions can at the end of their useful life be recovered and recycled to 100%.

Further information can be found at www.tibnor.dk.

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass %	Material origin
Metals	100	
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	
Biogenic carbon content in packaging, kg C	

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1 kg of steel beam
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		
×	×	×	×	×	MND	MND	MND	MND	MND	MND	MND	×	×	×	×	×		
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.

Tibnor purchase beams from several suppliers (A1). The exact allocation of volume between suppliers varies over the years depending on availability and cost.
The beams are delivered to Taulov (A2) where they can be cut and processed according to the customers wishes and requirements or delivered to the customer in standard stock lengths (A3).
Some beams are delivered directly from the supplier to the customer. The transport from suppliers is done by train, ship, and/or in some rare cases by truck , the products are always bundled, sometimes with steel wires from the mills . When sent to customers from Tibnor´s site the products are either bundled or also secured with steel strip with clips, if cut in short pieces EU pallets can be used.
Electricity used at the site is fossil free, waste from production is steel scrap (A3).

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.

The transportation process in module A4 comprises impacts from transportation of the products from Tibnor's Warehouses to the customer in Denmark.
Delivery to customer site either is directly from our supplier or from Tibnor´s warehouse (A4). Transportation from Tibnor´s warehouse is done by truck (Euro 6). Vehicle capacity utilization is at least 70% A5 is excluded.

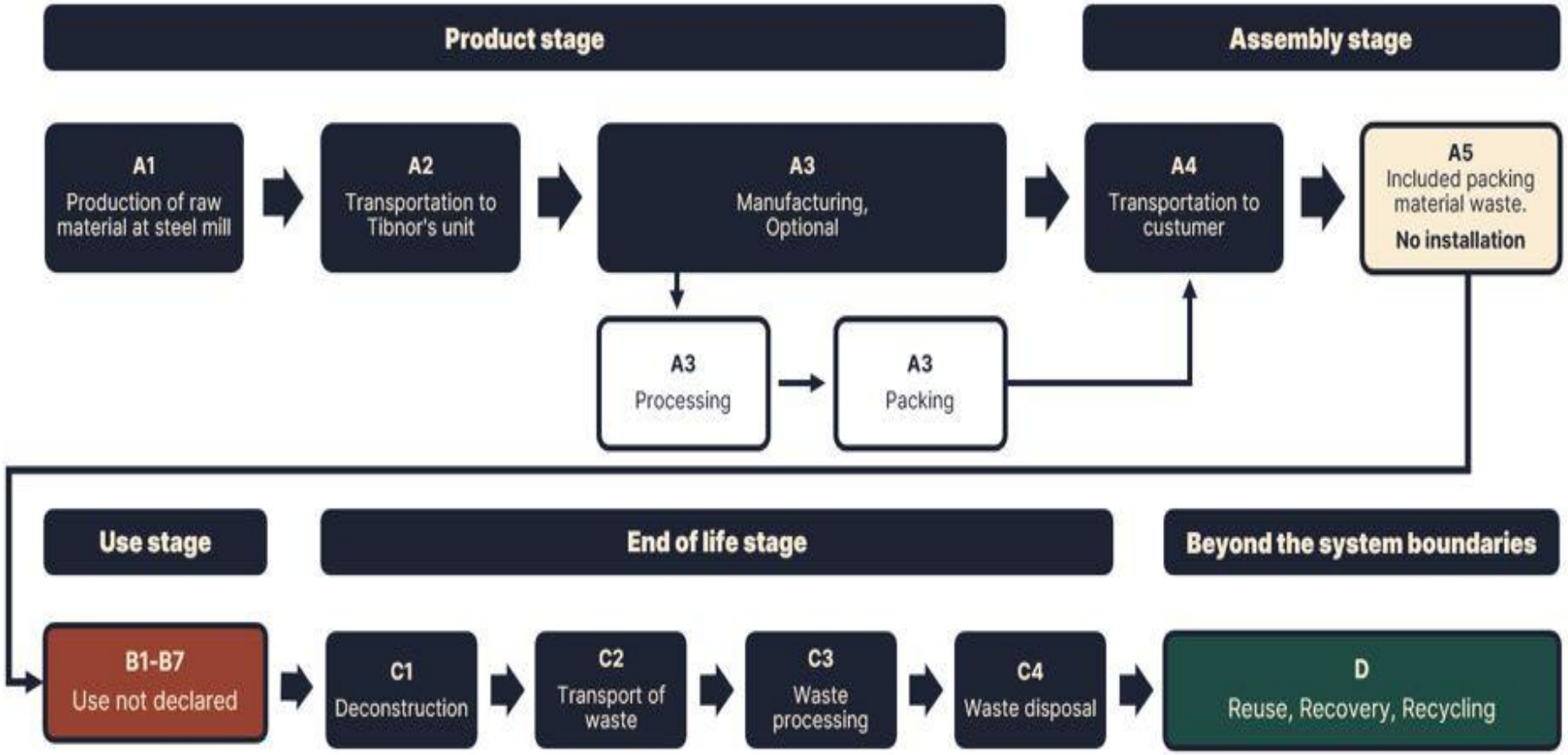
PRODUCT USE AND MAINTENANCE (B1-B7)

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)

Demolition is assumed to consume 0,01 kWh/kg of product. The source of energy is diesel fuel used by construction machines (C1). It is assumed that 100% of the waste is collected and transported to the waste treatment center. Transportation distance to treatment is assumed as 20 km and the transportation method is assumed to be lorry (C2). Approximately 93% of steel(hot rolled) is assumed to be recycled (C3). It is assumed that the remaining 7 % of steel is divided between 6% re-use and 1% taken to landfill for final disposal (C4). Due to the recycling process, the end-of-life product is converted into recycled steel, while the wooden pallet is incinerated for energy recovery (D)

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	Not applicable
Ancillary materials	Not applicable
Manufacturing energy and waste	Allocated by mass or volume

AVERAGES AND VARIABILITY

Type of average	Multiple manufacturers
Averaging method	Averaged by shares of total volume
Variation in GWP-fossil for A1-A3	N/A %

The average in this EPD is from multiple manufacturers who have EPD as a base
There is no other average result considered in this study since this EPD refers to one specific product produced in one production plant.

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-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP – total[1)]	kg CO_2e	5,78E-01	2,94E-02	3,63E-02	MND	MND	MND	MND	MND	MND	MND	3,31E-03	1,88E-03	2,17E-02	5,27E-05	-2,21E-03
GWP – fossil	kg CO_2e	6,14E-01	2,94E-02	4,01E-04	MND	MND	MND	MND	MND	MND	MND	3,31E-03	1,88E-03	2,17E-02	5,27E-05	-2,21E-03
GWP – biogenic	kg CO_2e	-3,59E-02	0,00E+00	3,59E-02	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
GWP – LULUC	kg CO_2e	2,23E-04	1,17E-05	3,34E-07	MND	MND	MND	MND	MND	MND	MND	3,30E-07	6,92E-07	2,84E-05	4,97E-08	-5,90E-06
Ozone depletion pot.	kg CFC-$_{11}$e	1,36E-08	6,80E-09	6,87E-11	MND	MND	MND	MND	MND	MND	MND	7,07E-10	4,32E-10	2,68E-09	2,13E-11	-1,75E-10
Acidification potential	mol H^+e	6,92E-03	8,56E-05	2,89E-06	MND	MND	MND	MND	MND	MND	MND	3,44E-05	7,95E-06	2,75E-04	4,95E-07	-1,48E-05
EP-freshwater[2)]	kg Pe	4,90E-06	2,09E-07	1,11E-08	MND	MND	MND	MND	MND	MND	MND	1,10E-08	1,54E-08	1,16E-06	5,52E-10	-2,17E-07
EP-marine	kg Ne	2,98E-03	1,78E-05	1,33E-06	MND	MND	MND	MND	MND	MND	MND	1,52E-05	2,36E-06	5,82E-05	1,71E-07	-3,43E-06
EP-terrestrial	mol Ne	2,35E-02	1,98E-04	1,13E-05	MND	MND	MND	MND	MND	MND	MND	1,67E-04	2,61E-05	6,72E-04	1,89E-06	-3,85E-05
POCP ("smog")[3)]	kg NMVOCe	8,08E-03	7,40E-05	3,29E-06	MND	MND	MND	MND	MND	MND	MND	4,59E-05	8,34E-06	1,85E-04	5,48E-07	-1,04E-05
ADP-minerals & metals[4)]	kg Sbe	5,47E-07	1,06E-07	1,13E-09	MND	MND	MND	MND	MND	MND	MND	1,68E-09	4,40E-09	2,92E-06	1,21E-10	-5,41E-09
ADP-fossil resources	MJ	8,81E+00	4,37E-01	6,46E-03	MND	MND	MND	MND	MND	MND	MND	4,45E-02	2,82E-02	2,94E-01	1,44E-03	-4,48E-02
Water use[5)]	m^3e depr.	8,71E-02	2,04E-03	5,79E-04	MND	MND	MND	MND	MND	MND	MND	1,20E-04	1,26E-04	5,70E-03	4,58E-06	-1,17E-03

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-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Particulate matter	Incidence	2,98E-06	2,38E-09	4,53E-11	MND	MND	MND	MND	MND	MND	MND	9,22E-10	2,16E-10	3,60E-09	9,97E-12	-3,10E-10
Ionizing radiation[6)]	kBq U235e	1,85E-02	2,29E-03	5,75E-05	MND	MND	MND	MND	MND	MND	MND	2,05E-04	1,34E-04	3,28E-03	6,53E-06	-1,13E-03
Ecotoxicity (freshwater)	CTUe	1,35E+00	3,64E-01	6,65E-03	MND	MND	MND	MND	MND	MND	MND	2,68E-02	2,54E-02	1,33E+00	9,42E-04	-5,91E-02
Human toxicity, cancer	CTUh	1,08E-09	1,12E-11	4,93E-13	MND	MND	MND	MND	MND	MND	MND	1,03E-12	6,23E-13	4,08E-11	2,35E-14	-1,15E-12
Human tox. non-cancer	CTUh	3,38E-09	3,58E-10	2,11E-11	MND	MND	MND	MND	MND	MND	MND	1,94E-11	2,51E-11	1,82E-09	6,16E-13	-4,23E-11
SQP[7)]	-	3,65E+00	3,10E-01	8,21E-03	MND	MND	MND	MND	MND	MND	MND	5,79E-03	3,25E-02	5,91E-01	3,09E-03	-4,53E-02

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-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Renew. PER as energy[8)]	MJ	1,40E+00	6,35E-03	3,20E-04	MND	MND	MND	MND	MND	MND	MND	2,54E-04	3,18E-04	5,21E-02	1,25E-05	-2,67E-02
Renew. PER as material	MJ	3,14E-01	0,00E+00	-3,14E-01	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of renew. PER	MJ	1,72E+00	6,35E-03	-3,14E-01	MND	MND	MND	MND	MND	MND	MND	2,54E-04	3,18E-04	5,21E-02	1,25E-05	-2,67E-02
Non-re. PER as energy	MJ	8,85E+00	4,37E-01	6,46E-03	MND	MND	MND	MND	MND	MND	MND	4,45E-02	2,82E-02	2,94E-01	1,44E-03	-4,47E-02
Non-re. PER as material	MJ	2,08E-02	0,00E+00	-2,08E-02	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of non-re. PER	MJ	8,87E+00	4,37E-01	-1,43E-02	MND	MND	MND	MND	MND	MND	MND	4,45E-02	2,82E-02	2,94E-01	1,44E-03	-4,47E-02
Secondary materials	kg	1,07E+00	1,49E-04	4,28E-06	MND	MND	MND	MND	MND	MND	MND	1,74E-05	7,83E-06	3,27E-04	3,03E-07	-6,01E-06
Renew. secondary fuels	MJ	1,06E-02	1,64E-06	4,36E-08	MND	MND	MND	MND	MND	MND	MND	5,70E-08	7,90E-08	1,70E-05	7,93E-09	-4,05E-08
Non-ren. secondary fuels	MJ	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
Use of net fresh water	m^3	3,41E-03	5,56E-05	2,21E-06	MND	MND	MND	MND	MND	MND	MND	2,70E-06	3,65E-06	1,72E-04	1,58E-06	-3,51E-05

8) PER = Primary energy resources.

END OF LIFE – WASTE

Impact category	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste	kg	5,04E-03	4,96E-04	7,82E-06	MND	MND	MND	MND	MND	MND	MND	5,96E-05	3,74E-05	2,00E-03	0,00E+00	-1,51E-04
Non-hazardous waste	kg	1,22E-01	8,82E-03	1,76E-02	MND	MND	MND	MND	MND	MND	MND	4,19E-04	6,14E-04	6,37E-02	1,00E-02	-9,33E-03
Radioactive waste	kg	5,34E-04	3,01E-06	2,15E-08	MND	MND	MND	MND	MND	MND	MND	3,13E-07	1,89E-07	1,72E-06	0,00E+00	-3,25E-07

END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for re-use	kg	2,49E-06	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	4,14E-02	0,00E+00	7,80E-03	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	9,90E-01	0,00E+00	0,00E+00
Materials for energy rec	kg	1,25E-05	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
Exported energy	MJ	5,01E-05	0,00E+00	4,10E-02	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-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Global Warming Pot.	kg CO_2e	6,12E-01	2,91E-02	1,01E-03	MND	MND	MND	MND	MND	MND	MND	3,27E-03	1,86E-03	2,13E-02	5,16E-05	-2,19E-03
Ozone depletion Pot.	kg CFC_{-11}e	3,57E-08	5,39E-09	5,53E-11	MND	MND	MND	MND	MND	MND	MND	5,60E-10	3,42E-10	2,17E-09	1,69E-11	-1,53E-10
Acidification	kg SO_2e	2,45E-03	6,99E-05	2,17E-06	MND	MND	MND	MND	MND	MND	MND	2,45E-05	6,17E-06	2,22E-04	3,74E-07	-1,19E-05
Eutrophication	kg PO_4^3e	1,47E-03	1,51E-05	2,87E-05	MND	MND	MND	MND	MND	MND	MND	5,69E-06	1,41E-06	7,34E-05	8,07E-08	-8,09E-06
POCP (“smog”)	kg C_2H_4e	1,24E-04	3,48E-06	2,15E-07	MND	MND	MND	MND	MND	MND	MND	5,36E-07	2,41E-07	8,41E-06	1,57E-08	-6,55E-07
ADP-elements	kg Sbe	1,85E-06	1,04E-07	1,07E-09	MND	MND	MND	MND	MND	MND	MND	1,65E-09	4,26E-09	2,92E-06	1,19E-10	-5,38E-09
ADP-fossil	MJ	8,87E+00	4,37E-01	6,46E-03	MND	MND	MND	MND	MND	MND	MND	4,45E-02	2,82E-02	2,94E-01	1,44E-03	-4,47E-02

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ENVIRONMENTAL IMPACTS – GWP-GHG - THE INTERNATIONAL EPD SYSTEM

Impact category	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-GHG[9)]	kg CO_2e	6,14E-01	2,94E-02	4,01E-04	MND	MND	MND	MND	MND	MND	MND	3,31E-03	1,88E-03	2,17E-02	5,27E-05	-2,21E-03

9) This indicator includes all greenhouse gases excluding biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product as defined by IPCC AR 5 (IPCC 2013). In addition, the characterisation factors for the flows - CH4 fossil, CH4 biogenic and Dinitrogen monoxide - were updated in line with the guidance of IES PCR 1.2.5 Annex 1. This indicator is identical to the GWP-total of EN 15804:2012+A2:2019 except that the characterization factor for biogenic CO2 is set to zero.

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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.

Imane Uald lamkaddam, as an authorized verifier acting for EPD Hub Limited

09.02.2025

