ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025

HTC-P2P Timber Connector
Hilti AG

EPD HUB, HUB-2539
Published on 14.02.2025, last updated on 09.01.2026, valid until 14.02.2030

Life Cycle Assessment study has been performed in accordance with the requirements of EN 15804, EPD Hub PCR version 1.2 (24 Mar 2025) and JRC characterization factors EF 3.1.

Created with One Click LCA

GENERAL INFORMATION

MANUFACTURER

Manufacturer	Hilti AG
Address	Feldkircherstrasse 100, 9494 Schaan, Liechtenstein
Contact details	sustainability@hilti.com
Website	www.hilti.group

EPD STANDARDS, SCOPE AND VERIFICATION

Program operator	EPD Hub, hub@epdhub.com
Reference standard	EN 15804:2012+A2:2019/AC:2021 and ISO 14025
PCR	EPD Hub Core PCR Version 1.2, 24 Mar 2025
Sector	Construction product
Category of EPD	Third party verified EPD
Parent EPD number	-
Scope of the EPD	Cradle to gate with options, A4-A5, and modules C1-C4, D
EPD author	Timothe Letient, Hilti AG
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

This EPD is intended for business-to-business and/or business-to-consumer communication. 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	HTC-P2P Timber Connector
Additional labels	-
Product reference	2425950, 2482729
Place(s) of raw material origin	Europe, China
Place of production	Stuttgart, Germany (City: commercially sensitive)
Place(s) of installation and use	Worldwide
Period for data	Calendar year 2023
Averaging in EPD	Multiple products
Variation in GWP-fossil for A1-A3 (%)	±10.71
GTIN (Global Trade Item Number)	-
NOBB (Norwegian Building Product Database)	60767490
A1-A3 Specific data (%)	26,3

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 kg of Connector HTC-P2P
Declared unit mass	1 kg
Mass of packaging	0,1042 kg
GWP-fossil, A1-A3 ($kgCO_2e$)	5,67
GWP-total, A1-A3 ($kgCO_2e$)	3,61
Secondary material, inputs (%)	40,3
Secondary material, outputs (%)	55
Total energy use, A1-A3 (kWh)	21
Net freshwater use, A1-A3 (m^3)	0,05

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

The Hilti Group supplies the worldwide construction and energy industries with technologically leading products, systems, software and services. With about 34,000 team members in over 120 countries the company stands for direct customer relationships, quality and innovation. The headquarters of the Hilti Group have been located in Schaan, Liechtenstein, since its founding in 1941. The company is privately owned by the Martin Hilti Family Trust, which ensures its long-term continuity. The Hilti Group's purpose is making construction better, based on a passionate and inclusive global team and a caring and performance-oriented culture.

PRODUCT DESCRIPTION

The Hilti HTC-P2P is a point connector used to align and fasten horizontal panels made of Cross Laminated Timber (CLT), such as CLT floors. It provides tensile and shear resistance to in-plane loads and is approved for static and seismic applications. The product is made of cross-laminated veneer lumber in European beech and is installed in a pre-machined cutout in the CLT panel. Fastening is achieved using an impact wrench with a specially designed adapter. The product requires a declaration of performance considering the European Technical Approval ETA-24/1199, assessed based on EAD 130336-00-0603 Point connector-dovetail made of plywood for cross laminated timber. The product is designed according to the EOTA Technical Report TR085.

Further information can be found at www.hilti.group

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass %	Material origin
Metals	49	Europe, China
Minerals	0	-
Fossil materials	0	-
Bio-based materials	51	Europe

BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

Biogenic carbon content in product, kg C	0,250
Biogenic carbon content in packaging, kg C	0,0423

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1 kg of Connector HTC-P2P
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	ND	ND	ND	ND	ND	ND	ND	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.

A market-based approach is used in modelling the electricity mix utilized in the factory.

The anchor is made of 50% carbon steel and 50% plywood. The sleeve's steel and wire are produced in China, while the other steel components are assumed to be produced in Europe from wood sourced in Baltic countries or in Romania. Transportation is by sea freight and lorry. The sleeve is produced in China and supplied to Germany, also transported by sea freight and lorry. The sleeve is cold-formed, machined, and tapped at Hilti's manufacturing site in China. The plywood is manufactured in Germany. All parts are then assembled and packaged automatically at the same site, in Germany. Faulty parts and production waste are considered in A3 and 100% recycled for steel based materials and 100% incinerated for heating for wood based materials. Packaging waste during production is minimal and therefore neglected. Electricity is used at every production stage, with compressed air mainly consumed by pneumatic drives during cold forming and automatic assembly. In the Hilti manufacturing site in China, electricity is 100% renewable, comprising 100% certified wind energy. For transportation to customers anchors are packed in cardboard sales boxes and transported on wooden pallets.

The use of green energy in manufacturing is demonstrated through contractual instruments (GOs, RECs, etc.), and its use is ensured throughout the validity period of this EPD.

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.

Transportation impacts that occurred from final product delivery to the construction site (A4) cover fuel direct exhaust emissions, environmental

impacts of fuel production, as well as related infrastructure emissions. For phase A4, a sales-weighted average transport distance has been applied based on road transport from the logistic center in Nendeln, Liechtenstein to markets in Mainland Europe.

PRODUCT USE AND MAINTENANCE (B1-B7)

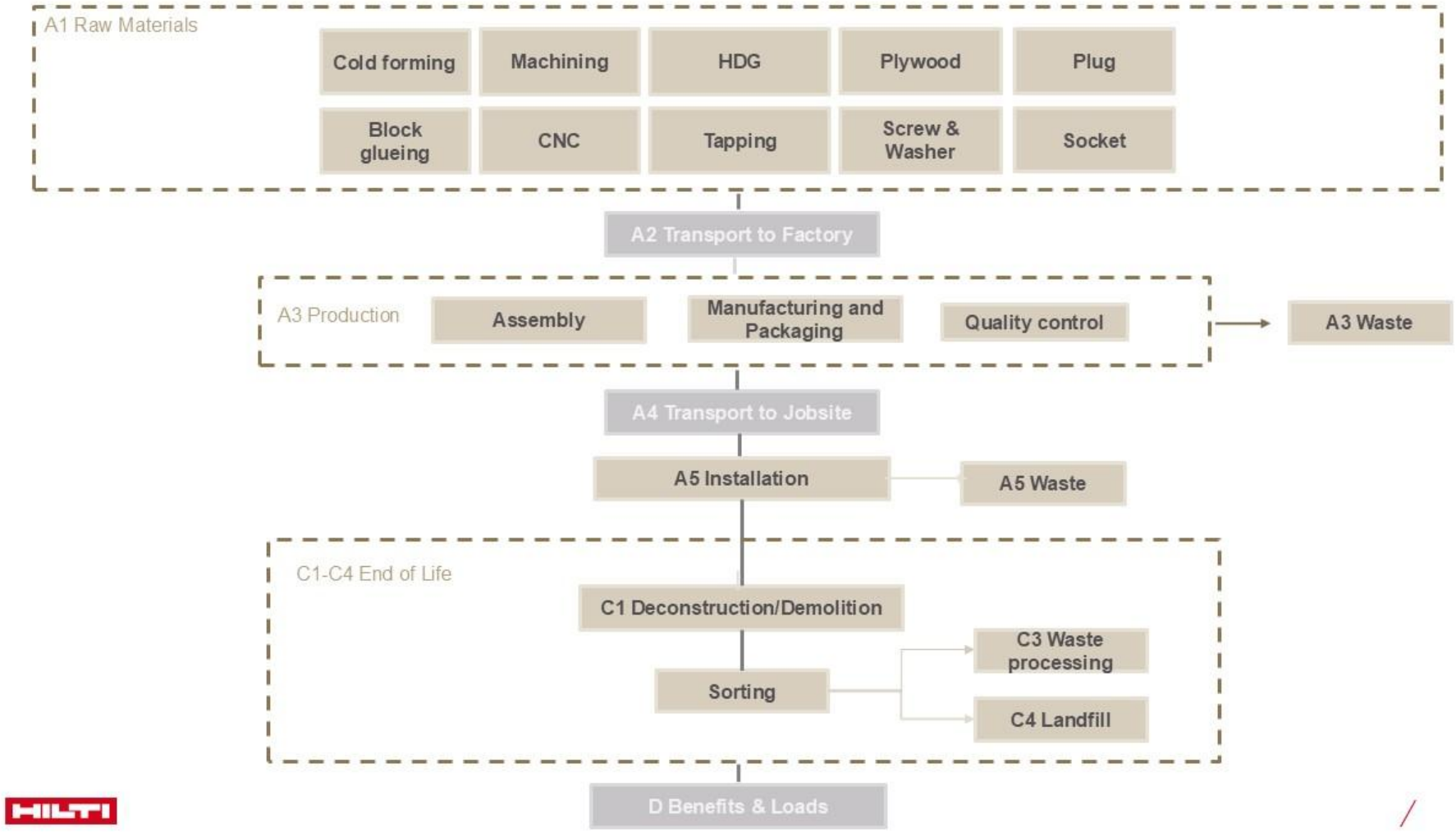
No emissions during lifecycle as this product consumes no power in operation and requires no routine maintenance.

Air, soil, and water impacts during the use phase have not been studied.

PRODUCT END OF LIFE (C1-C4, D)

At the end of its life, 60% of products are assumed to be reused and 40% are waste. The product waste will be dismantled along with the building and separated using a screw driver. For steel based materials and according to studies from worldsteel.org, it is assumed that 85% of the material will be recycled, while 15% will be sent to a landfill. For wood based materials, 100% is assumed incinerated for heating purposes. Waste treatment distances are generally assumed to be 50 km. The energy required for demolition is considered negligible. Module D benefits are accounted for both the product and its packaging.

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.

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.

This LCA study includes the provision of all materials, transportation, energy and emission flows, and end of life processing of product. All industrial processes from raw material acquisition and pre-processing, production, product distribution and installation and end-of-life management are included. Due to lack of data, some ancillary materials are excluded but they do not exceed the 1% cut-off criteria. These include materials which are used at the product manufacturing (e.g. cold forming lubricants which stay at the product after processing, cleaning agents for measuring samples etc.) only in very small amounts and have a negligible impact on the emissions of the product. 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.

VALIDATION OF DATA

Data collection for production, transport, and packaging was conducted using time and site-specific information, as defined in the general information section on page 1 and 2. Upstream process calculations rely on generic data as defined in the Bibliography section. Manufacturer-provided specific and generic data were used for the product's manufacturing stage. The analysis was performed in One Click LCA EPD Generator, with the 'Cut-Off, EN 15804+A2' allocation method, and characterization factors according to EN 15804:2012+A2:2019/AC:2021 and JRC EF 3.1.

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	Allocated by mass or volume
Manufacturing energy and waste	Allocated by mass or volume

PRODUCT & MANUFACTURING SITES GROUPING

Type of grouping	Multiple products
Grouping method	Based on a representative product
Variation in GWP-fossil for A1-A3, %	8,54

The averaging of products is calculated based on the bestselling product, but the assessment also applies to a second, near-identical item. All production locations, materials and processes are the same, but the main steel component of the second product has slightly different dimensions.

LCA SOFTWARE AND BIBLIOGRAPHY

This EPD has been created using One Click LCA EPD Generator for EPD Hub V3 and EPD System Verification v3.2.3. The LCA and EPD have been prepared according to the reference standards and ISO 14040/14044. The EPD Generator uses Ecoinvent v3.10.1/3.11 and One Click LCA databases as sources of environmental data. Allocation used in Ecoinvent 3.10.1/3.11 environmental data sources follow the methodology ‘allocation, Cut-off, EN 15804+A2‘.

ENVIRONMENTAL IMPACT DATA

The estimated impact results are only relative statements which do not indicate the end points of the impact categories, exceeding threshold values, safety margins or risks.

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

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	2,05E+00	1,48E+00	8,10E-02	3,61E+00	4,16E-02	1,59E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,99E-02	7,10E-01	2,22E-01	-9,94E-01
GWP – fossil	kg CO_2e	4,05E+00	1,48E+00	1,44E-01	5,67E+00	4,16E-02	3,49E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,99E-02	1,42E-02	1,82E-03	-7,76E-01
GWP – biogenic	kg CO_2e	-2,01E+00	2,02E-04	-6,36E-02	-2,07E+00	9,42E-06	1,55E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,65E-06	6,96E-01	2,20E-01	-2,18E-01
GWP – LULUC	kg CO_2e	1,12E-02	7,14E-04	1,04E-03	1,29E-02	1,86E-05	3,86E-06	ND	ND	ND	ND	ND	ND	ND	0,00E+00	8,89E-06	1,54E-05	1,13E-06	-3,30E-04
Ozone depletion pot.	kg CFC_{-11}e	3,21E-08	2,13E-08	2,83E-09	5,62E-08	6,14E-10	4,60E-11	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,93E-10	1,84E-10	4,75E-11	-4,18E-09
Acidification potential	mol H^+e	2,39E-02	3,99E-02	7,10E-04	6,45E-02	1,42E-04	1,85E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	6,78E-05	1,58E-04	1,27E-05	-3,24E-03
EP-freshwater[2)]	kg Pe	1,42E-03	4,95E-05	5,23E-05	1,52E-03	3,24E-06	9,55E-07	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,55E-06	8,74E-06	1,08E-06	-3,62E-04
EP-marine	kg Ne	4,18E-03	1,01E-02	1,70E-04	1,45E-02	4,66E-05	1,92E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,23E-05	4,72E-05	4,53E-05	-7,27E-04
EP-terrestrial	mol Ne	5,35E-02	1,12E-01	1,65E-03	1,67E-01	5,07E-04	6,70E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,42E-04	4,95E-04	5,26E-05	-7,86E-03
POCP ("smog")[3)]	kg NMVOCe	1,36E-02	3,06E-02	7,27E-04	4,49E-02	2,09E-04	2,38E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	9,99E-05	1,38E-04	2,08E-05	-2,63E-03
ADP-minerals & metals[4)]	kg Sbe	9,76E-05	1,59E-06	1,19E-06	1,00E-04	1,16E-07	1,78E-08	ND	ND	ND	ND	ND	ND	ND	0,00E+00	5,55E-08	6,79E-07	3,70E-09	-7,02E-06
ADP-fossil resources	MJ	4,52E+01	1,84E+01	2,21E+00	6,58E+01	6,04E-01	4,27E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,88E-01	1,82E-01	4,11E-02	-7,97E+00
Water use[5)]	m^3e depr.	1,84E+00	5,25E-02	6,23E-02	1,95E+00	2,98E-03	1,35E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,43E-03	1,12E-02	6,40E-04	-1,60E-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, EF 3.1

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	3,47E-07	5,32E-08	1,48E-08	4,15E-07	4,16E-09	5,47E-10	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,99E-09	2,01E-09	2,90E-10	-5,73E-08
Ionizing radiation[6)]	kBq U235e	2,78E-01	8,45E-03	2,16E-02	3,08E-01	5,26E-04	1,17E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,51E-04	1,69E-03	3,59E-05	-1,50E-02
Ecotoxicity (freshwater)	CTUe	1,65E+01	1,45E+00	8,86E-01	1,88E+01	8,54E-02	7,21E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	4,08E-02	6,53E-01	2,18E-02	-1,99E+00
Human toxicity, cancer	CTUh	5,88E-09	2,98E-10	1,42E-10	6,32E-09	6,87E-12	3,51E-12	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,28E-12	1,58E-11	4,92E-13	-1,37E-10
Human tox. non-cancer	CTUh	7,65E-08	5,22E-09	1,88E-09	8,36E-08	3,91E-10	1,68E-10	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,87E-10	1,07E-09	3,38E-11	-6,45E-09
SQP[7)]	-	5,10E+01	3,37E+00	1,30E+01	6,74E+01	6,08E-01	3,65E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,91E-01	2,58E-01	9,18E-02	-3,84E+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	6,84E+00	1,41E-01	3,51E+00	1,05E+01	8,27E-03	-1,62E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,95E-03	-4,21E+00	-2,03E+00	-2,27E-01
Renew. PER as material	MJ	5,56E+00	0,00E+00	8,21E-01	6,38E+00	0,00E+00	-1,33E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	-3,84E+00	-1,21E+00	1,82E+00
Total use of renew. PER	MJ	1,24E+01	1,41E-01	4,34E+00	1,69E+01	8,27E-03	-2,94E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,95E-03	-8,05E+00	-3,24E+00	1,59E+00
Non-re. PER as energy	MJ	4,52E+01	1,84E+01	1,65E+00	6,52E+01	6,04E-01	4,27E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,89E-01	1,82E-01	4,11E-02	-7,97E+00
Non-re. PER as material	MJ	0,00E+00	0,00E+00	8,26E-02	8,26E-02	0,00E+00	-8,26E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,24E-01
Total use of non-re. PER	MJ	4,52E+01	1,84E+01	1,73E+00	6,53E+01	6,04E-01	-3,99E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,89E-01	1,82E-01	4,11E-02	-7,55E+00
Secondary materials	kg	4,03E-01	8,00E-03	7,28E-03	4,19E-01	2,57E-04	4,59E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,23E-04	2,45E-04	1,36E-05	3,91E-01
Renew. secondary fuels	MJ	1,06E-03	2,72E-05	3,62E-02	3,73E-02	3,26E-06	3,42E-07	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,56E-06	7,45E-06	2,61E-07	-5,46E-05
Non-ren. secondary fuels	MJ	0,00E+00	0,00E+00	0,00E+00	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
Use of net fresh water	m^3	5,08E-02	1,35E-03	1,58E-03	5,37E-02	8,92E-05	-7,48E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	4,26E-05	1,24E-04	-4,32E-04	-2,80E-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	3,50E+00	2,34E-02	1,06E-02	3,53E+00	1,02E-03	4,69E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	4,89E-04	2,52E-03	6,46E-05	-2,38E-01
Non-hazardous waste	kg	9,08E+00	3,33E-01	2,83E-01	9,69E+00	1,89E-02	8,89E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	9,05E-03	2,94E-01	5,97E-01	-2,11E+00
Radioactive waste	kg	7,35E-05	2,05E-06	5,51E-06	8,11E-05	1,29E-07	2,90E-08	ND	ND	ND	ND	ND	ND	ND	0,00E+00	6,15E-08	4,33E-07	8,78E-09	-3,78E-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	6,53E-03	6,53E-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
Materials for recycling	kg	0,00E+00	0,00E+00	2,38E-01	2,38E-01	0,00E+00	6,20E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	5,50E-01	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	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	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	9,98E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	1,61E+00	0,00E+00	0,00E+00
Exported energy – Electricity	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,18E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	6,80E-01	0,00E+00	0,00E+00
Exported energy – Heat	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,80E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	9,30E-01	0,00E+00	0,00E+00

ENVIRONMENTAL IMPACTS – EN 15804+A1, CML

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	4,06E+00	1,47E+00	1,45E-01	5,67E+00	4,14E-02	1,10E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,98E-02	1,42E-02	8,71E-03	-7,72E-01
Ozone depletion Pot.	kg $CFC_{-11}e$	2,75E-08	1,69E-08	2,28E-09	4,67E-08	4,90E-10	3,74E-11	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,34E-10	1,57E-10	3,80E-11	-4,39E-09
Acidification	kg SO_2e	1,91E-02	3,18E-02	5,71E-04	5,14E-02	1,08E-04	1,40E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	5,18E-05	1,23E-04	9,43E-06	-2,61E-03
Eutrophication	kg PO_4^3e	1,06E-02	3,59E-03	8,75E-04	1,50E-02	2,64E-05	1,02E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,26E-05	2,46E-05	6,32E-06	-4,81E-04
POCP (“smog”)	kg C_2H_4e	1,19E-03	1,59E-03	5,40E-05	2,83E-03	9,65E-06	3,06E-06	ND	ND	ND	ND	ND	ND	ND	0,00E+00	4,61E-06	7,82E-06	2,29E-06	-3,86E-04
ADP-elements	kg Sbe	9,72E-05	1,56E-06	1,16E-06	9,99E-05	1,13E-07	1,73E-08	ND	ND	ND	ND	ND	ND	ND	0,00E+00	5,41E-08	6,75E-07	3,60E-09	-7,01E-06
ADP-fossil	MJ	4,07E+01	1,83E+01	1,82E+00	6,08E+01	5,95E-01	4,07E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,85E-01	1,53E-01	4,05E-02	-7,73E+00

ADDITIONAL INDICATOR – GWP-GHG

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-GHG[9)]	kg CO_2e	4,07E+00	1,48E+00	1,45E-01	5,69E+00	4,16E-02	3,49E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,99E-02	1,42E-02	1,83E-03	-7,77E-01

9) This indicator includes all greenhouse gases excluding biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. In addition, the characterisation factors for the flows – CH4 fossil, CH4 biogenic and Dinitrogen monoxide – were updated. This indicator is identical to the GWP-total of EN 15804:2012+A2:2019 except that the characterisation factor for biogenic CO2 is set to zero.

SCENARIO DOCUMENTATION

DATA SOURCES

Manufacturing energy scenario documentation

Scenario parameter	Value
Electricity data source and quality	Electricity production, wind, 1-3MW turbine, onshore, Germany, Ecoinvent
Electricity CO2e / kWh	0,0206
District heating data source and quality	-
District heating CO2e / kWh	-

Transport scenario documentation A4

Scenario parameter	Value
Fuel and vehicle type. Eg, electric truck, diesel powered truck	Diesel powered truck
Average transport distance, km	350 km diesel powered truck
Capacity utilization (including empty return) %	50
Bulk density of transported products	-
Volume capacity utilization factor	1

Installation scenario documentation A5

Scenario information	Value
Ancillary materials for installation (specified by material) / kg or other units as appropriate	-
Water use / m^3	-
Other resource use / kg	-
Quantitative description of energy type (regional mix) and consumption during the installation process / kWh or MJ	-
Waste materials on the building site before waste processing, generated by the product's installation (specified by type) / kg	Cardboard: 0.049 kg Pallet: 0.0552 kg
Output materials (specified by type) as result of waste processing at the building site e.g. collection for recycling, for energy recovery, disposal (specified by route) / kg	% are for recycling, incinerated w. energy recovery, landfill respectively. Cardboard: 83%, 8%, 9% Pallet: 32%, 30%, 38%
Direct emissions to ambient air, soil and water / kg	-

End of life scenario documentation

Scenario information	Value
Collection process – kg collected separately	-
Collection process – kg collected with mixed construction waste	Steel: 0,494 kg Plywood: 0,506 kg
Recovery process – kg for re-use	-
Recovery process – kg for recycling	Steel: 0,42 kg Plywood: 0,13 kg
Recovery process – kg for energy recovery	Steel: 0,25 kg
Disposal (total) – kg for final deposition	Steel: 0,074 kg Plywood: 0,12 kg
Scenario assumptions e.g. transportation	Transported 50 km by truck to local recycling station

THIRD-PARTY VERIFICATION STATEMENT

EPD Hub declares that this EPD is verified in accordance with ISO 14025 by an independent, third-party verifier. The project report on the Life Cycle Assessment and the report(s) on features of environmental relevance are filed at EPD Hub. EPD Hub PCR and ECO Platform verification checklist are used.

EPD Hub is not able to identify any unjustified deviations from the PCR and EN 15804+A2 in the Environmental Product Declaration and its project report.

EPD Hub maintains its independence as a third-party body; it was not involved in the execution of the LCA or in the development of the declaration and has no conflicts of interest regarding this verification.

The company-specific data and upstream and downstream data have been examined as regards plausibility and consistency. The publisher is responsible for ensuring the factual integrity and legal compliance of this declaration.

The software used in creation of this LCA and EPD is verified by EPD Hub to conform to the procedural and methodological requirements outlined in ISO 14025:2010, ISO 14040/14044, EN 15804+A2, and EPD Hub Core Product Category Rules and General Program Instructions.

Verified tools

Tool verifier: Magaly Gonzalez Vazquez
Tool verification validity: 27 March 2025 - 26 March 2028

Imane Uald Lamkaddam as an authorized verifier for EPD Hub Limited
09.01.2026