ENVIRONMENTAL PRODUCT DECLARATION

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

Raw Particleboard

Kronospan Ltd.

EPD HUB, HUB-0864

Publishing date 23 November 2023, last updated date 23 November 2023, valid until 23 November 2028

Making circularity a reality

GENERAL INFORMATION

MANUFACTURER

Manufacturer	Kronospan Ltd.
Address	Chirk, Wrexham, UK
Contact details	sustainability@kronospan.co.uk
Website	https://kronospan.com/en_UK/express-services

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 1.0, 1 Feb 2022
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	Daniel Grantham
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal certification ☑ 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	Raw Particleboard
Additional labels	P2, P5, Fast Clean & Fast Protect
Product reference	-
Place of production	Chirk, UK
Period for data	October 2020 - September 2021
Averaging in EPD	No averaging
Variation in GWP-fossil for A1-A3	0%

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 m3
Declared unit mass	639 kg
GWP-fossil, A1-A3 (kgCO2e)	198
GWP-total, A1-A3 (kgCO2e)	-818
Secondary material, inputs (%)	78.3
Secondary material, outputs (%)	100.0
Total energy use, A1-A3 (kWh)	1360.0
Total water use, A1-A3 (m3e)	4.46

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

Kronospan Ltd is the UK's longest established manufacturer of wood-based panel products. We produce particleboard (PB), high/ medium density fibreboard (HDF/ MDF), melamine-faced (MF) products, laminate flooring and worktops. Our products are used in construction, furniture manufacture and the DIY industry.

PRODUCT DESCRIPTION

Particleboards (PB) are one of the most commonly used wood-based sheet materials for a multitude of applications. The boards are manufactured from wood chips and synthetic resin based binders pressed under high temperatures and pressure. Kronospan Ltd. manufacture a wide range of particleboards; each board type has its own product characteristics specifically developed for its intended use.

The Global Kronobuild® product line of particleboards includes; P2, P3, P5, Fast Clean and Fast Protect. The product needs a declaration of performance taking into consideration BS EN 312:2010 Particleboards - Specification

Further information can be found at https://kronospan.com/en_UK/express-services.

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass- %	Material origin
Metals	-	-
Minerals	-	-
Fossil materials	8 - 10%	Global
Bio-based materials	85 - 87%	UK
Moisture Content	4 – 5 %	UK

BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

Biogenic carbon content in product, kg C	277.091
Biogenic carbon content in packaging, kg C	0.677

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1 m3
Mass per declared unit	639 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	Deconstr./demol.	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.

Raw material/energy supply (A1):
Extraction and processing of raw materials (e.g. logs, wood chips).). The wood waste (wood leftovers, trimmings) and sanding dust are burned in an on-site biomass plant. The thermal energy generated is recycled for consumption in production.

Transportation to manufacturing site (A2):
• Transportation of the round wood and chipped wood to the Chirk site.
• Transportation of chemicals and packaging from manufacturer/supplier to the Chirk site.

Manufacturing (A3):
The proper manufacturing of the boards and treatment of waste generated from the manufacturing process up to the end-of waste state during manufacturing is included in module 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.

Module A4:
This module considers 218 km truck transport to site (diesel driven, EURO 6, 40 tons total load, 61% utilization) from average delivery distance within the timeframe.

Module A5:
Installation has been excluded as a factor because, typically, this product undergoes reprocessing by our customers to make final construction products. There are boundless variations in processing methods, auxiliary materials, energy consumption, wastage, etc.

Of the packaging materials:
- Wooden laths assume 50% chipped to be used as secondary fuel in the next system and 50% incinerated for energy recovery.
- Plastic strapping: assumed 44.2% recycled (from UK Gov. figures for 2021) and the remaining amount is assumed to be landfilled.

PRODUCT USE AND MAINTENANCE (B1-B7)

Not included. Air, soil, and water impacts during the use phase have not been included in the study.

PRODUCT END OF LIFE (C1-C4, D)

Module C1:

Manual dismantling → no loads in C1 have been generated.

Module C2:

Transport to waste treatment site after dismantling using EURO 6 truck average (50 km assumed).

Module C3:

The scenario at the end of life assumes the full recycling of the product as particleboard can be recycled and returned to the system as post-consumer waste wood. The end-of-waste status for the wood board is achieved at the waste treatment site where the material is recycled.

Module C4:

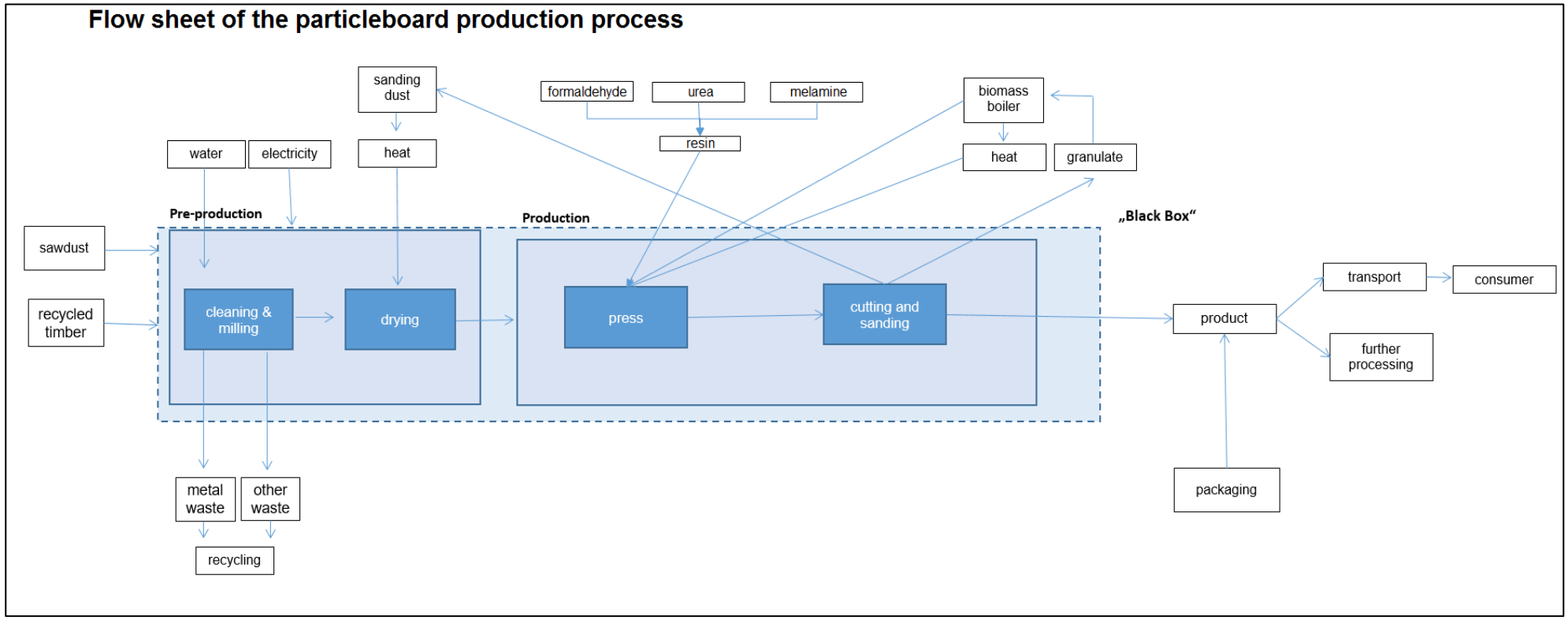
Within the EoL scenario, no disposal to landfill will occur, thus this module will show Zero values.

Module D:

The benefits from the recycling of the particleboard into new product (modelling it as avoided raw material) is calculated and shown in module D.

The utilisation of the laths in an incineration plant and the resulting energy is assigned to module D. It is also assumed that the energy production from biomass meets an R1 value > 0.6. Energy produced in the form of electricity and thermal energy replaces thermal energy from natural gas (GB) and electrical energy (GB).

MANUFACTURING PROCESS



Recycled Timber is cleaned and milled into various sized chips in the pre-production stage. At this stage the contaminants from the cleaned recycled timber are sent off site for further recycling. The timber is then sent to a dryer for moisture removal before further sorting and grading in preparation for the press. Resin is added and the material enters the press where the raw board is formed, before being sanded and cut to size.

Thermal energy from biomass is used in the drying process and to heat the press and electricity is generated from Natural Gas in our Natural Gas CHP units. Residues are sent for energy recovery for either direct heat in the drying process or to the biomass that provides heat for the presses and various other processes on site. Finished product are either transported by road to customers or internally transferred for further processing.

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	Allocated by mass or volume
Packaging materials	Allocated by mass or volume
Ancillary materials	Allocated by mass or volume
Manufacturing energy and waste	Allocated by mass or volume

AVERAGES AND VARIABILITY

Type of average	No averaging
Averaging method	Not applicable
Variation in GWP-fossil for A1-A3	0%

This EPD is product and factory specific and does not contain average calculations.

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. Ecoinvent v3.8 and One Click LCA databases were used 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	-1,03E+03	3,28E+01	1,82E+02	-8,18E+02	1,26E+01	2,27E-02	MND	MND	MND	MND	MND	MND	MND	0,00E+00	5,43E+00	1,02E+03	0,00E+00	-1,05E+01
GWP – fossil	kg CO_2e	9,36E+01	3,28E+01	7,14E+01	1,98E+02	1,26E+01	2,46E-02	MND	MND	MND	MND	MND	MND	MND	0,00E+00	5,43E+00	5,26E+00	0,00E+00	-1,01E+01
GWP – biogenic	kg CO_2e	-1,13E+03	0,00E+00	1,11E+02	-1,02E+03	0,00E+00	-1,95E-03	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	1,02E+03	0,00E+00	0,00E+00
GWP – LULUC	kg CO_2e	9,39E-02	1,23E-02	6,82E-03	1,13E-01	4,88E-03	2,07E-05	MND	MND	MND	MND	MND	MND	MND	0,00E+00	2,28E-03	1,19E-02	0,00E+00	-3,56E-01
Ozone depletion pot.	kg CFC_{11}e	1,61E-05	7,59E-06	6,98E-06	3,07E-05	2,95E-06	2,54E-09	MND	MND	MND	MND	MND	MND	MND	0,00E+00	1,17E-06	2,66E-07	0,00E+00	-9,64E-07
Acidification potential	mol H^+e	5,23E-01	1,31E-01	6,74E-02	7,22E-01	4,09E-02	1,87E-04	MND	MND	MND	MND	MND	MND	MND	0,00E+00	1,60E-02	2,82E-02	0,00E+00	-5,42E-02
EP-freshwater[2)]	kg Pe	2,68E-03	2,71E-04	1,47E-04	3,10E-03	1,06E-04	8,29E-07	MND	MND	MND	MND	MND	MND	MND	0,00E+00	4,61E-05	5,40E-04	0,00E+00	-3,05E-03
EP-marine	kg Ne	1,19E-01	3,71E-02	2,48E-02	1,81E-01	8,99E-03	7,49E-05	MND	MND	MND	MND	MND	MND	MND	0,00E+00	3,19E-03	3,97E-03	0,00E+00	-1,24E-02
EP-terrestrial	mol Ne	1,36E+00	4,09E-01	2,69E-01	2,04E+00	9,98E-02	7,88E-04	MND	MND	MND	MND	MND	MND	MND	0,00E+00	3,55E-02	4,48E-02	0,00E+00	-1,23E-01
POCP ("smog")[3)]	kg NMVOCe	2,88E-01	1,35E-01	7,72E-02	5,00E-01	3,86E-02	2,02E-04	MND	MND	MND	MND	MND	MND	MND	0,00E+00	1,33E-02	1,26E-02	0,00E+00	-1,22E-01
ADP-minerals & metals[4)]	kg Sbe	1,37E-03	7,76E-05	7,50E-05	1,53E-03	3,06E-05	7,77E-08	MND	MND	MND	MND	MND	MND	MND	0,00E+00	1,92E-05	1,45E-05	0,00E+00	-3,19E-05
ADP-fossil resources	MJ	2,21E+03	4,98E+02	1,24E+03	3,96E+03	1,97E+02	3,15E-01	MND	MND	MND	MND	MND	MND	MND	0,00E+00	7,88E+01	1,09E+02	0,00E+00	-1,94E+02
Water use[5)]	m^3e depr.	1,98E+02	2,23E+00	6,47E+00	2,07E+02	8,78E-01	5,14E-02	MND	MND	MND	MND	MND	MND	MND	0,00E+00	3,48E-01	2,94E+00	0,00E+00	-6,83E+00

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.

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	8,85E+02	5,61E+00	1,79E+01	9,08E+02	2,21E+00	2,58E-02	MND	MND	MND	MND	MND	MND	MND	0,00E+00	9,36E-01	1,90E+01	0,00E+00	-3,01E+03
Renew. PER as material	MJ	6,77E+03	0,00E+00	-6,52E+02	6,12E+03	0,00E+00	0,00E+00	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	-6,12E+03	0,00E+00	0,00E+00
Total use of renew. PER	MJ	7,66E+03	5,61E+00	-6,34E+02	7,03E+03	2,21E+00	2,58E-02	MND	MND	MND	MND	MND	MND	MND	0,00E+00	9,36E-01	-6,10E+03	0,00E+00	-3,01E+03
Non-re. PER as energy	MJ	1,90E+03	4,98E+02	1,24E+03	3,64E+03	1,97E+02	3,15E-01	MND	MND	MND	MND	MND	MND	MND	0,00E+00	7,88E+01	1,09E+02	0,00E+00	-1,94E+02

Non-re. PER as material	MJ	3,14E+02	0,00E+00	-8,64E+00	3,05E+02	0,00E+00	-4,29E-01	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	-3,05E+02	0,00E+00	0,00E+00
Total use of non-re. PER	MJ	2,21E+03	4,98E+02	1,23E+03	3,94E+03	1,97E+02	-1,14E-01	MND	MND	MND	MND	MND	MND	MND	0,00E+00	7,88E+01	-1,96E+02	0,00E+00	-1,94E+02
Secondary materials	kg	5,01E+02	1,38E-01	1,50E+00	5,02E+02	5,45E-02	3,51E-04	MND	MND	MND	MND	MND	MND	MND	0,00E+00	2,63E-02	4,13E-02	0,00E+00	-1,10E-01
Renew. secondary fuels	MJ	1,66E-01	1,39E-03	3,37E+02	3,37E+02	5,50E-04	2,24E-06	MND	MND	MND	MND	MND	MND	MND	0,00E+00	3,41E-04	6,62E-05	0,00E+00	-1,78E-03
Non-ren. secondary fuels	MJ	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
Use of net fresh water	m^3	4,62E+00	6,45E-02	-2,25E-01	4,46E+00	2,54E-02	-2,28E-05	MND	MND	MND	MND	MND	MND	MND	0,00E+00	9,38E-03	9,19E-02	0,00E+00	-1,99E-01

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	3,76E+00	6,59E-01	5,47E-01	4,97E+00	2,59E-01	7,58E-04	MND	MND	MND	MND	MND	MND	MND	0,00E+00	1,14E-01	4,49E-01	0,00E+00	-7,98E-01
Non-hazardous waste	kg	8,55E+01	1,08E+01	5,99E+00	1,02E+02	4,25E+00	7,50E-01	MND	MND	MND	MND	MND	MND	MND	0,00E+00	1,82E+00	2,45E+01	0,00E+00	-3,36E+01
Radioactive waste	kg	3,53E-03	3,34E-03	3,56E-03	1,04E-02	1,33E-03	1,53E-06	MND	MND	MND	MND	MND	MND	MND	0,00E+00	5,24E-04	7,86E-04	0,00E+00	-1,45E-03

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	8,63E-05	0,00E+00	0,00E+00	8,63E-05	0,00E+00	0,00E+00	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	6,39E+02	0,00E+00	0,00E+00
Materials for energy rec	kg	1,94E-04	0,00E+00	0,00E+00	1,94E-04	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	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	9,66E+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	9,12E+01	3,25E+01	7,09E+01	1,94E+02	1,24E+01	2,40E-02	MND	MND	MND	MND	MND	MND	MND	0,00E+00	5,38E+00	5,20E+00	0,00E+00	-9,98E+00
Ozone depletion Pot.	kg CFC_{-11}e	1,38E-05	6,01E-06	6,12E-06	2,59E-05	2,34E-06	2,09E-09	MND	MND	MND	MND	MND	MND	MND	0,00E+00	9,29E-07	2,30E-07	0,00E+00	-7,99E-07
Acidification	kg SO_2e	4,01E-01	1,03E-01	5,03E-02	5,54E-01	3,32E-02	1,38E-04	MND	MND	MND	MND	MND	MND	MND	0,00E+00	1,31E-02	2,38E-02	0,00E+00	-4,40E-02
Eutrophication	kg PO_4^3e	1,70E-01	2,32E-02	2,16E-02	2,15E-01	7,25E-03	1,88E-04	MND	MND	MND	MND	MND	MND	MND	0,00E+00	2,89E-03	1,89E-02	0,00E+00	-3,90E-02
POCP (“smog”)	kg C_2H_4e	2,00E-02	4,16E-03	4,55E-03	2,87E-02	1,53E-03	5,10E-06	MND	MND	MND	MND	MND	MND	MND	0,00E+00	6,51E-04	1,03E-03	0,00E+00	-1,85E-02
ADP-elements	kg Sbe	1,37E-03	7,53E-05	7,47E-05	1,52E-03	2,97E-05	7,34E-08	MND	MND	MND	MND	MND	MND	MND	0,00E+00	1,88E-05	1,44E-05	0,00E+00	-3,14E-05
ADP-fossil	MJ	2,21E+03	4,98E+02	1,24E+03	3,95E+03	1,97E+02	3,15E-01	MND	MND	MND	MND	MND	MND	MND	0,00E+00	7,88E+01	1,09E+02	0,00E+00	-1,94E+02

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
23.11.2023

VERIFIED ISO 14025