

## ENVIRONMENTAL PRODUCT DECLARATION IN ACCORDANCE WITH EN 15804+A2 & ISO 14025 / ISO 21930

MPA Sector Level AC (Asphalt Concrete)  
Mineral Products Association Ltd Asphalt



EPD HUB, HUB-1655

Publishing on 18.08.2024, last updated on 18.08.2024, valid until 18.08.2029.

## GENERAL INFORMATION

### MANUFACTURER

Manufacturer	Mineral Products Association Ltd Asphalt
Address	297 Euston Road, London, NW1 3AD, United Kingdom
Contact details	mpaasphalt@mineralproducts.org
Website	www.mineralproducts.org

### 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 modules C1-C4, D
EPD author	Malcolm Simms
EPD verification	Independent verification of this EPD and data, according to ISO 14025: <input type="checkbox"/> Internal verification <input checked="" type="checkbox"/> External verification
EPD verifier	Xinyuan Zhang, 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	Asphalt Concrete
Additional labels	MPA / Sector Level
Product reference	MPA AC
Place of production	United Kingdom
Period for data	2022
Averaging in EPD	Average UK production
Variation in GWP-fossil for A1-A3	+6.8% / -31.3%

### ENVIRONMENTAL DATA SUMMARY

Declared unit	1 metric tonne
Declared unit mass	1000 kg
GWP-fossil, A1-A3 (kgCO <sub>2</sub> e)	52.16
GWP-total, A1-A3 (kgCO <sub>2</sub> e)	52.18
Secondary material, inputs (%)	0.01
Secondary material, outputs (%)	100
Total energy use, A1-A3 (kWh)	413
Net fresh water use, A1-A3 (m <sup>3</sup> )	0.17

## PRODUCT AND MANUFACTURER

### ABOUT THE MANUFACTURER

MPA Asphalt is part of the Mineral Products Association (MPA) - the trade association for the aggregates, asphalt, cement, concrete, dimension stone, lime, mortar and industrial sand industries.

As such MPA is not a manufacturer in its own right but represents the significant majority of asphalt manufacturers across the UK and has collected and collated data from its membership in the preparation of this Sector Level EPD.

### PRODUCT DESCRIPTION

Asphalts are described as homogenous mixtures typically of coarse and fine aggregates, filler aggregate and bituminous binder, used in the construction of a pavement e.g. roads, footways, cycleways, airfields and car parks.

Asphalt Concretes (AC) are asphalts “in which the aggregate particles are continuously graded or gap-graded to form an interlocking structure” (see BS EN 13108-1).

For the purposes of this EPD an average composition for AC was derived as typical of products used in the UK in the structural layers (base and binder courses) of bound pavements.

Further information can be found at <https://www.mineralproducts.org/Mineral-Products/Asphalt.aspx>.

## PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass- %	Material origin
Minerals - coarse aggregate - Fine aggregate	-66 -30	UK Quarries
Fossil materials - bitumen	-4.3	Refined crude oil (Europe)

## 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	N/A

## FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1 metric tonne
Mass per declared unit	1000 kg

## 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	MND	MND	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 considered the material losses occurring during the manufacturing processes as well as losses during electricity transmission. Component material losses are considered negligible as they are generally recovered back to stock and re-introduced back into the production process. The study also considered the material losses occurring during the manufacturing processes from evaporation of water - assumed to be 5% by mass of aggregate.

It is appreciated that significant impacts are resultant on the LCI datapoint used for bitumen, which is understood to be under review. Therefore, the datapoint for bitumen for this EPD has been selected from the ecoinvent v3.8 database Reference product: bitumen adhesive compound, hot. Data for transport of bitumen was derived from producer purchase records, as a mean of distances from refinery / supply depot to production sites.

The datapoints for aggregates were selected on the basis of background research for the MPA Sustainable Development Report 2020/2021. This report provided average aggregate haulage distances, which vary significantly e.g. whether asphalt is produced at a quarry location or is imported.

An average composition for AC was derived as typical of products used in the UK in the base and binder layers (courses) of bound pavements.

Sector energy data is compiled from data representing 96% of estimated England and Wales production (71% of UK) volumes. Fuel mixes from electricity, natural gas, heavy fuel oil, diesel, kerosene, LNG, LPG and reprocessed fuel oil were considered.

Combustible fuels are primarily used in the process of drying and heating aggregate, while electrical energy primarily relates to the functioning of material transfer (conveyors etc.) and mixing. Mobile plant for material transfer (loading from stockpiles etc.) primarily consume diesel.

The asphalt production process can be simplified as the controlled proportioning of the mineral components and mixing with the bitumen component. To better ensure that homogenous mixing is achieved, the minerals should be dry, and heated for compatibility with the liquid bitumen, and the majority of fuel energy consumption comes from the drying process.

Packaging materials are not considered as raw materials and products are handled and transported in bulk volumes.

### TRANSPORT AND INSTALLATION (A4-A5)

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

Transportation and installation impacts occurring from final product delivery to construction site (A4) and installation (A5) are not included as they are site location, scale and method specific.

### **PRODUCT USE AND MAINTENANCE (B1-B7)**

This EPD does not cover the use phase.

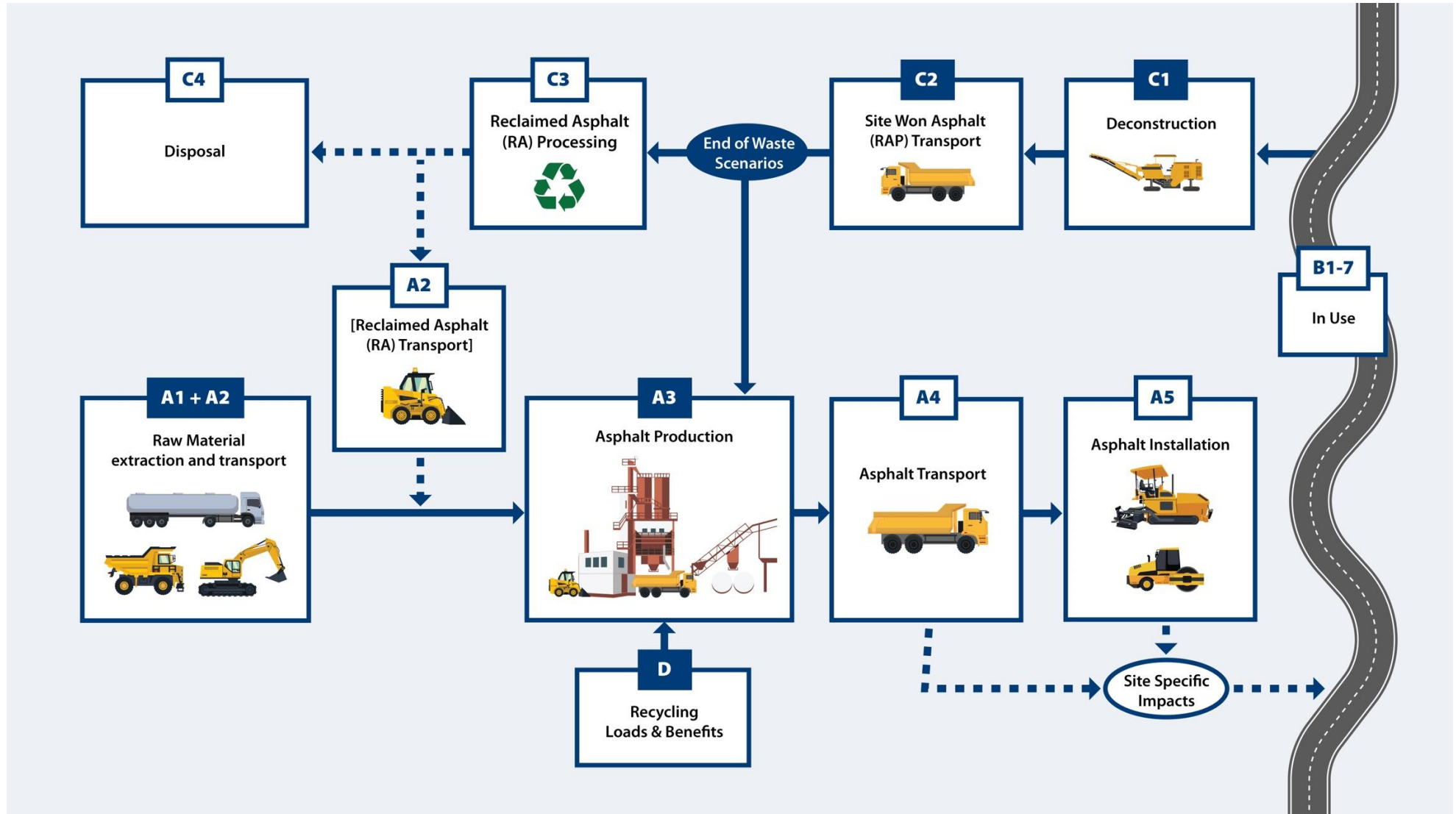
Air, soil, and water impacts during the use phase have not been studied.

### **PRODUCT END OF LIFE (C1-C4, D)**

The environmental impacts considered for these product stages cover the machinery used in bulk deconstruction of paved areas and the transport of material prior to processing for re-use or recycling.

Their potential as inputs in future A1-A3 manufacture of similar, and/or other construction products is considered from UK Data in Asphalt In Figures (EAPA, 2021, latest update Sept '22).

# MANUFACTURING PROCESS



## LIFE-CYCLE ASSESSMENT

### PARTICIPANTS

A sample of 5 manufacturers constituting a total of 166 plants participated in the data collection. Manufacturing plants are situated in England & Wales.

The data collected from members constitutes 96% of estimated England and Wales production (71% of UK production). The EPD is considered representative for the United Kingdom. The results presented in this EPD are representative for the members participating in this study.

### ALLOCATION, ESTIMATES AND ASSUMPTIONS

All allocations are done as per the reference standards and the applied PCR. More details are provided as follows:

Data type	Allocation & assumption
A1-A2 Raw materials	Sector level (mass). Mix design for asphalt was based on a representative product. Supply distances were based on MPA Sustainable Development Report 2020/21.
A3 Packaging materials	N/A – Shipped in bulk.
A3 Ancillary materials	Sector level (mass). Upstream.
A3 Manufacturing energy and waste	Sector level (mass). Energy consumption of plants was the primary focus of a member survey. A production loss of 5% was assumed for aggregates due to moisture loss in the burner.
C-D End of Life	Scenario-based: UK Data for Asphalt in Figures (EAPA, 2021, latest update Sept '22). 37% re-use. 63% recycled.

### AVERAGES AND VARIABILITY

Type of average	Sector EPD level: multiple manufacturers.
Averaging method	Representative product
Variation in GWP-fossil for A1-A3	+6.8% / -31.3%

This EPD contains sector level average data representative of the UK market.

### 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.

### CUT-OFF CRITERIA

The study included all major raw material and energy consumption. The study did not exclude any modules or processes which are stated mandatory in the reference standard and the applied PCR, nor exclude any hazardous materials or substances.

As per the PCR and EN 15804 (§6.3.6), namely the sum of the excluded material flows to the core module shall not exceed 1% of mass and energy. Hence, the following aspects were considered negligible:

- Packaging of the asphalt, as shipped in bulk.
- Machinery production

## 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 <sup>1)</sup>	kg CO <sub>2</sub> e	2.51E+01	4.74E+00	2.23E+01	5.22E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	2.09E+00	4.23E+00	0.00E+00	0.00E+00	-1.15E+01
GWP - fossil	kg CO <sub>2</sub> e	2.51E+01	4.74E+00	2.23E+01	5.22E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	2.09E+00	4.23E+00	0.00E+00	0.00E+00	-1.15E+01
GWP - biogenic	kg CO <sub>2</sub> e	0.00E+00	0.00E+00	3.94E-03	3.94E-03	MND	MND	MND	MND	MND	MND	MND	MND	MND	0.00E+00	1.03E-03	0.00E+00	0.00E+00	-1.30E-02
GWP - LULUC	kg CO <sub>2</sub> e	6.73E-03	1.84E-03	4.75E-03	1.33E-02	MND	MND	MND	MND	MND	MND	MND	MND	MND	2.08E-04	1.56E-03	0.00E+00	0.00E+00	-4.79E-03
Ozone depletion pot.	kg CFC-11e	3.43E-05	1.12E-06	3.42E-06	3.89E-05	MND	MND	MND	MND	MND	MND	MND	MND	MND	4.46E-07	9.74E-07	0.00E+00	0.00E+00	-1.29E-05
Acidification potential	mol H <sup>+</sup> e	2.95E-01	1.54E-02	9.64E-02	4.07E-01	MND	MND	MND	MND	MND	MND	MND	MND	MND	2.17E-02	1.79E-02	0.00E+00	0.00E+00	-1.25E-01
EP-freshwater <sup>2)</sup>	kg Pe	2.10E-04	4.02E-05	9.77E-05	3.48E-04	MND	MND	MND	MND	MND	MND	MND	MND	MND	6.91E-06	3.47E-05	0.00E+00	0.00E+00	-1.50E-04
EP-marine	kg Ne	4.94E-02	3.39E-03	3.86E-02	9.14E-02	MND	MND	MND	MND	MND	MND	MND	MND	MND	9.59E-03	5.33E-03	0.00E+00	0.00E+00	-2.30E-02
EP-terrestrial	mol Ne	6.03E-01	3.77E-02	4.25E-01	1.07E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	1.05E-01	5.88E-02	0.00E+00	0.00E+00	-2.77E-01
POCP (“smog”) <sup>3)</sup>	kg NMVOCe	2.57E-01	1.46E-02	1.19E-01	3.91E-01	MND	MND	MND	MND	MND	MND	MND	MND	MND	2.89E-02	1.88E-02	0.00E+00	0.00E+00	-1.11E-01
ADP-minerals & metals <sup>4)</sup>	kg Sbe	8.11E-05	1.15E-05	2.08E-05	1.13E-04	MND	MND	MND	MND	MND	MND	MND	MND	MND	1.06E-06	9.92E-06	0.00E+00	0.00E+00	-5.06E-05
ADP-fossil resources	MJ	2.05E+03	7.43E+01	3.58E+02	2.49E+03	MND	MND	MND	MND	MND	MND	MND	MND	MND	2.81E+01	6.36E+01	0.00E+00	0.00E+00	-7.87E+02
Water use <sup>5)</sup>	m <sup>3</sup> e depr.	6.04E+00	3.32E-01	9.27E-01	7.29E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	7.54E-02	2.84E-01	0.00E+00	0.00E+00	-2.58E+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 PO<sub>4</sub>e; 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	2.10E-06	5.39E-07	2.15E-06	4.79E-06	MND	MND	MND	MND	MND	MND	MND	MND	MND	5.81E-07	4.88E-07	0.00E+00	0.00E+00	-1.08E-06
Ionizing radiation <sup>6)</sup>	kBq U235e	9.11E+00	3.56E-01	2.67E+00	1.21E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	1.29E-01	3.03E-01	0.00E+00	0.00E+00	-3.58E+00
Ecotoxicity (freshwater)	CTUe	3.43E+03	6.61E+01	1.17E+02	3.61E+03	MND	MND	MND	MND	MND	MND	MND	MND	MND	1.69E+01	5.72E+01	0.00E+00	0.00E+00	-1.27E+03
Human toxicity, cancer	CTUh	1.14E-08	1.62E-09	4.31E-09	1.74E-08	MND	MND	MND	MND	MND	MND	MND	MND	MND	6.46E-10	1.40E-09	0.00E+00	0.00E+00	-6.15E-09
Human tox. non-cancer	CTUh	3.07E-07	6.36E-08	7.83E-08	4.49E-07	MND	MND	MND	MND	MND	MND	MND	MND	MND	1.22E-08	5.66E-08	0.00E+00	0.00E+00	-1.57E-07
SQP <sup>7)</sup>	-	3.58E+02	8.54E+01	3.98E+01	4.83E+02	MND	MND	MND	MND	MND	MND	MND	MND	MND	3.65E+00	7.32E+01	0.00E+00	0.00E+00	-1.72E+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	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Renew. PER as energy <sup>8)</sup>	MJ	7.29E+00	8.36E-01	1.23E+01	2.04E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	1.60E-01	7.16E-01	0.00E+00	0.00E+00	-4.55E+00
Renew. PER as material	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	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	7.29E+00	8.36E-01	1.23E+01	2.04E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	1.60E-01	7.16E-01	0.00E+00	0.00E+00	-4.55E+00
Non-re. PER as energy	MJ	9.72E+02	7.43E+01	3.58E+02	1.40E+03	MND	MND	MND	MND	MND	MND	MND	MND	MND	2.81E+01	6.36E+01	0.00E+00	0.00E+00	-3.87E+02
Non-re. PER as material	MJ	1.08E+03	0.00E+00	0.00E+00	1.08E+03	MND	MND	MND	MND	MND	MND	MND	MND	MND	0.00E+00	0.00E+00	-1.08E+03	0.00E+00	-4.00E+02
Total use of non-re. PER	MJ	2.05E+03	7.43E+01	3.58E+02	2.49E+03	MND	MND	MND	MND	MND	MND	MND	MND	MND	2.81E+01	6.36E+01	-1.08E+03	0.00E+00	-7.87E+02
Secondary materials	kg	1.07E-01	2.06E-02	5.55E-02	1.83E-01	MND	MND	MND	MND	MND	MND	MND	MND	MND	1.10E-02	1.77E-02	0.00E+00	0.00E+00	-7.02E-02
Renew. secondary fuels	MJ	1.20E-03	2.08E-04	2.38E-04	1.64E-03	MND	MND	MND	MND	MND	MND	MND	MND	MND	3.59E-05	1.78E-04	0.00E+00	0.00E+00	-6.10E-04
Non-ren. secondary fuels	MJ	0.00E+00	0.00E+00	6.37E+01	6.37E+01	MND	MND	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	m3	1.36E-01	9.59E-03	2.23E-02	1.68E-01	MND	MND	MND	MND	MND	MND	MND	MND	MND	1.70E-03	8.23E-03	0.00E+00	0.00E+00	-9.35E-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	6.75E-01	9.78E-02	3.18E-01	1.09E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	3.75E-02	8.43E-02	0.00E+00	0.00E+00	-4.18E-01
Non-hazardous waste	kg	8.38E+00	1.61E+00	3.90E+00	1.39E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	2.64E-01	1.38E+00	0.00E+00	0.00E+00	-6.15E+00
Radioactive waste	kg	1.45E-02	5.00E-04	1.34E-03	1.64E-02	MND	MND	MND	MND	MND	MND	MND	MND	MND	1.98E-04	4.25E-04	0.00E+00	0.00E+00	-5.50E-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	MND	MND	MND	MND	MND	MND	MND	MND	MND	0.00E+00	0.00E+00	3.70E+02	0.00E+00	0.00E+00
Materials for recycling	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	0.00E+00	0.00E+00	1.26E+03	0.00E+00	0.00E+00
Materials for energy rec	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	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	MND	MND	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 <sub>2</sub> e	2.45E+01	4.69E+00	2.20E+01	5.11E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	2.06E+00	4.19E+00	0.00E+00	0.00E+00	-1.12E+01
Ozone depletion Pot.	kg CFC-11e	2.72E-05	8.83E-07	2.86E-06	3.09E-05	MND	MND	MND	MND	MND	MND	MND	MND	MND	3.53E-07	7.71E-07	0.00E+00	0.00E+00	-1.02E-05
Acidification	kg SO <sub>2</sub> e	2.42E-01	1.25E-02	7.04E-02	3.25E-01	MND	MND	MND	MND	MND	MND	MND	MND	MND	1.54E-02	1.39E-02	0.00E+00	0.00E+00	-1.02E-01
Eutrophication	kg PO <sub>4</sub> <sup>3</sup> e	3.50E-02	2.74E-03	1.66E-02	5.43E-02	MND	MND	MND	MND	MND	MND	MND	MND	MND	3.58E-03	3.17E-03	0.00E+00	0.00E+00	-1.69E-02
POCP ("smog")	kg C <sub>2</sub> H <sub>4</sub> e	9.37E-03	5.77E-04	2.27E-03	1.22E-02	MND	MND	MND	MND	MND	MND	MND	MND	MND	3.38E-04	5.44E-04	0.00E+00	0.00E+00	-4.29E-03
ADP-elements	kg Sbe	8.04E-05	1.12E-05	2.07E-05	1.12E-04	MND	MND	MND	MND	MND	MND	MND	MND	MND	1.04E-06	9.61E-06	0.00E+00	0.00E+00	-5.02E-05
ADP-fossil	MJ	2.05E+03	7.43E+01	3.58E+02	2.49E+03	MND	MND	MND	MND	MND	MND	MND	MND	MND	2.81E+01	6.36E+01	0.00E+00	0.00E+00	-7.87E+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.

Xinyuan Zhang, as an authorized verifier acting for EPD Hub Limited  
18.08.2024

