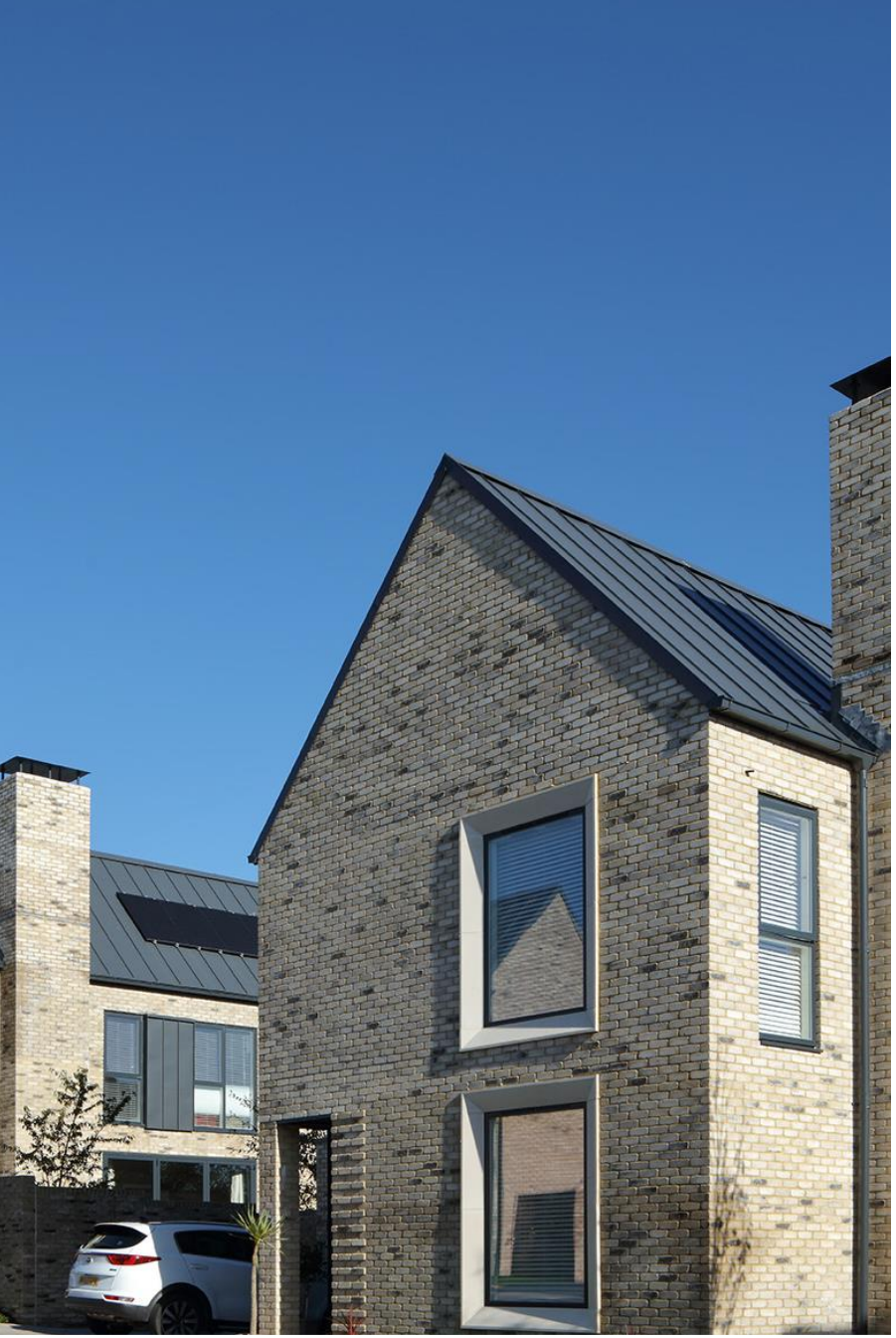


Marshalls

ENVIRONMENTAL PRODUCT DECLARATION

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

Concrete Facing Bricks
Marshalls

EPD HUB, HUB-1808
Published on 26.08.2024, last updated on 26.08.2024, valid until 26.08.2029

Created with One Click LCA

Marshalls

GENERAL INFORMATION

MANUFACTURER

Manufacturer	Marshalls
Address	Landscape House, Premier Way, Elland HX5 9HT, England, UK
Contact details	epd@marshalls.co.uk
Website	www.marshalls.co.uk

EPD STANDARDS, SCOPE AND VERIFICATION

Program operator	EPD Hub, hub@epdhub.com
Reference standard	EN 15804+A2:2019 und ISO 14025
PCR	EPD Hub Core PCR Version 1.1, 5 Dec 2023 EN 16757 Product Category Rules for concrete and concrete elements
Sector	Construction product
Category of EPD	Third party verified EPD
Parent EPD number	-
Scope of the EPD	Cradle to gate with options, A4-B1, and modules C1-C4, D
EPD author	Alice Turner and Mike Edwards
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	Concrete Facing Brick
Additional labels	Peakdale, Parkview, Fairway, Sandstock, Vintage, Kingsvale, Contemporary and Glenwall ranges
Product reference	N/A
Place of production	Blencowe, Buxton, Grove, Maltby and Ranskill
Period for data	2022
Averaging in EPD	Multiple factories
Variation in GWP-fossil for A1-A3	+2.3 / -2.5%

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 tonne
Declared unit mass	1000 kg
GWP-fossil, A1-A3 ($kgCO_2e$)	104 $kgCO_2e$
GWP-total, A1-A3 ($kgCO_2e$)	96 $kgCO_2e$
Secondary material, inputs (%)	0.06
Secondary material, outputs (%)	97.5
Total energy use, A1-A3 (kWh)	230
Net freshwater use, A1-A3 (m^3)	0.58

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

Marshalls is the UKs largest manufacturer and supplier of building and hard landscaping products, including paving blocks and flags, kerbs, drainage channels, concrete bricks, roof tiles, screeds, mortars, street furniture and natural stone paving. It provides products for both commercial and domestic markets.

PRODUCT DESCRIPTION

The product is a dense facing brick.
A dense facing brick consists of limestone aggregates with Portland cements and in some cases SCMs (supplementary cementitious materials), with various proportions of oxide pigment and secondary processes providing a wide spectrum of colours and finishes to suit user requirements. The standard brick format is a rectangular cuboid with a declared size of 215x100x65mm; a perforated brick has slotted perforations, a frogged facing brick has a scalloped recess to the top bed facing, and a solid facing brick is solid throughout.
The brick is intended for use in construction where the application requires a finished face directly from the brick masonry facade.
Marshalls Bricks & Masonry dense facing bricks are concrete bricks for use in construction. All Marshalls' bricks comply with BS EN 771-3: 2011:+A1 2015 Specification for Masonry Units: Aggregate Concrete Masonry Units. The bricks are manufactured to both high quality standard and to a keen quality system to maintain a consistent unit performance. The dense facing bricks are manufactured to achieve a mean air-dried strength of 22.5N/mm2 and have high durability equivalent to that of a clay facing brick class F2.

There is no specific test for durability within BS EN771-3:2011+A1:2015, with concrete bricks having a direct relationship between strength and durability. To confirm compliance with the F2 designation, the bricks are further tested beyond the requirement of BS771-3:2011+A1:2015 for durability performance based on the clay brick method described within BS EN 771-1: 2011:+A1 2015.

Further information can be found at www.marshalls.co.uk.

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass %	Material origin
Metals	-	-
Minerals	100	EU
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	2.1

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1 tonne
Mass per declared unit	1000 kg
Functional unit	-
Reference service life	60 years

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	x	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.

Perforated dense facing bricks manufactured using a semi-dry concrete mix. Raw materials are delivered directly into holding bays or storage silos that feed the production line. Brick production then involves the compaction of a semi-dry mix of graded limestone aggregate, cement, SCMs (supplementary cementitious materials), water, pigments and additives in a mould. A waterproof resin or acrylic treatment is applied to the external finished faces. “Green or uncured bricks from the mould are transferred to an insulated chamber where they cure. The board is moved to a chamber where the bricks remain in place while they cure and achieve strength. The length of time in the curing chamber is dependent on atmospheric conditions; on very rare occasions some heat is required to accelerate this process but usually the concrete cures naturally via an exothermic process.

Cured bricks are packed, stretch hood wrapped and palletised via an automated process. They then cure further into the stockyard until dispatched to customers.

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: During the time period measured, manufacture of dense facing bricks took place at five different sites within the UK: Blencowe, Buxton, Grove, Maltby & Ranskill. Transport to site or yard is undertaken by articulated lorries with Euro 6 engines. We have calculated that the average journey undertaken by these products from manufacturing site to installation site during the time period allocated was 232km. This is over 2 legs: 78km to an internal service centre (distribution hub) and 154km to the customer site or yard.

A5: In the UK, installation of dense facing bricks is a manual process.

Bricks are laid by hand by skilled trades men. Losses and breakages during installation are negligible and have not been considered. Packaging treatment data is based on Eurostat packaging data and is assumed to be transported 50km.

PRODUCT USE AND MAINTENANCE (B1-B7)

B1: The carbonation (sequestration) value has been calculated as per methodology outlined in EN 16757:2022 Annex G.

Once installed in a building, no maintenance of brickwork using concrete bricks should be expected for a minimum of 60 years. After this time, it would be normal for the re-pointing of the mortar between bricks to be addressed within the maintenance plan.
Air, soil, and water impacts during the use phase have not been studied.

PRODUCT END OF LIFE (C1-C4, D)

C1: In the UK, at the end of life removal of dense facing bricks can be a manual or mechanical process. The bricks can be separated, cleaned and re-used.
We have assumed a figure of 0.01kWh/kg to allow for the use of diesel machines during this phase. Ref:(Bozdağ, Ö & Seçer, M. 2007).

C2: It is assumed that 7% of product is transported 100km to a waste processing site to be landfilled, and 93% of product is reused. This is evidenced on UK Governments Statistics on Construction Waste website: 7. Recovery rate from non-hazardous construction and demolition (C&D) waste –Table5: England, 2010–2020: https://www.gov.uk/government/statistics/uk-waste-data/uk-statistics-on-waste#recovery-rate-from-non-hazardous-construction-and-demolition-cd-waste

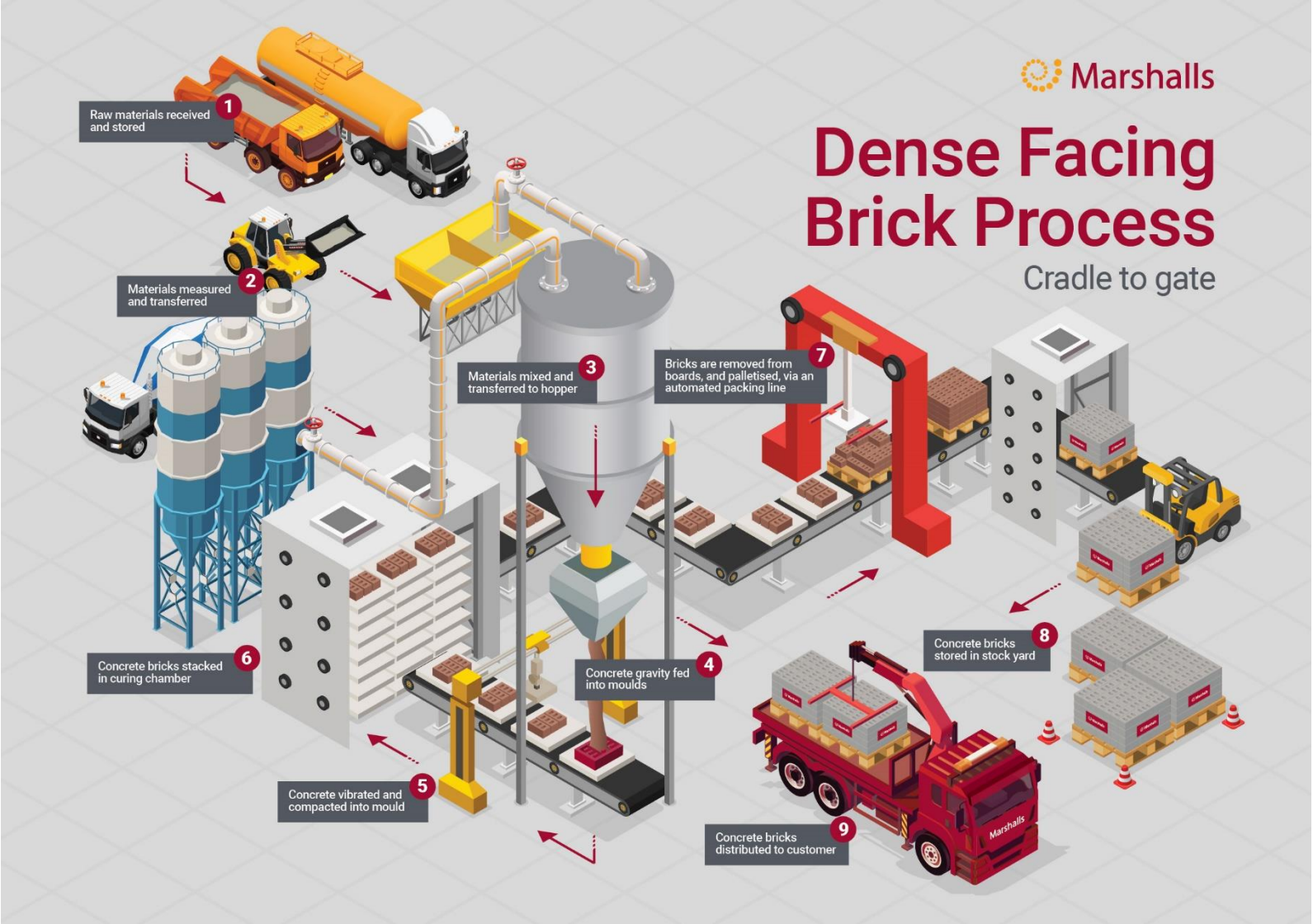
C3: All material (whether used on site or treated at a waste processing facility) will be crushed. 93% will be reused; 7% will be transported to landfill.

C4: It is assumed that 7% of material will go to landfill.

D: Due to the recycling potential of concrete, it can be used as secondary raw material, which avoids the use of virgin raw materials. The 93% of concrete going to waste processing is converted into secondary raw materials after recycling. The benefit of recycled concrete claimed in module D have excluded the amount of secondary material input. In addition incineration of the strapping and packaging generates energy. As wastes removed from a building, dense facing bricks fall under European Waste Catalogue (EWC) code 17 01 02.

D: Incineration of the strapping and packaging generates energy. Concrete reused at end-of-life prevents virgin aggregate being used.

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	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	Multiple factories
Averaging method	Averaged by shares of total mass
Variation in GWP-fossil for A1-A3	+2.3 / -2.5%

This EPD covers 8 concrete brick ranges manufactured at 5 locations. The product ranges only differ very slightly in terms of colour and/or finish.

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	9,59E+01	3,67E+00	-3,60E+00	9,60E+01	2,01E+01	8,18E+00	-2,53E+01	MND	MND	MND	MND	MND	MND	3,31E+00	9,39E+00	8,66E+00	1,32E-01	-9,08E+00
GWP – fossil	kg CO_2e	9,59E+01	3,67E+00	4,07E+00	1,04E+02	2,01E+01	4,78E-01	-2,53E+01	MND	MND	MND	MND	MND	MND	3,31E+00	9,38E+00	8,63E+00	1,32E-01	-6,45E+00
GWP – biogenic	kg CO_2e	0,00E+00	4,46E-06	-7,69E+00	-7,69E+00	8,12E-03	7,70E+00	0,00E+00	MND	MND	MND	MND	MND	MND	6,06E-04	3,63E-03	1,76E-02	8,58E-05	-2,62E+00
GWP – LULUC	kg CO_2e	2,49E-02	1,43E-03	2,63E-02	5,27E-02	7,82E-03	6,29E-05	0,00E+00	MND	MND	MND	MND	MND	MND	3,30E-04	3,46E-03	6,35E-03	1,24E-04	-4,28E-03
Ozone depletion pot.	kg CFC-$_{11}$e	4,05E-06	8,62E-07	9,37E-07	5,85E-06	4,73E-06	1,19E-08	0,00E+00	MND	MND	MND	MND	MND	MND	7,07E-07	2,16E-06	1,77E-06	5,33E-08	-1,09E-06
Acidification potential	mol H^+e	3,43E-01	1,20E-02	3,10E-02	3,86E-01	6,55E-02	7,09E-04	0,00E+00	MND	MND	MND	MND	MND	MND	3,44E-02	3,97E-02	7,41E-02	1,24E-03	-4,84E-02
EP-freshwater[2)]	kg Pe	1,25E-03	3,11E-05	1,51E-04	1,43E-03	1,70E-04	1,97E-06	0,00E+00	MND	MND	MND	MND	MND	MND	1,10E-05	7,68E-05	2,12E-04	1,38E-06	-1,14E-04
EP-marine	kg Ne	7,72E-02	2,63E-03	1,11E-02	9,09E-02	1,44E-02	3,28E-04	0,00E+00	MND	MND	MND	MND	MND	MND	1,52E-02	1,18E-02	2,80E-02	4,29E-04	-1,48E-02
EP-terrestrial	mol Ne	9,50E-01	2,92E-02	1,22E-01	1,10E+00	1,60E-01	3,11E-03	0,00E+00	MND	MND	MND	MND	MND	MND	1,67E-01	1,30E-01	3,08E-01	4,71E-03	-1,84E-01
POCP ("smog")[3)]	kg NMVOCe	2,41E-01	1,13E-02	3,78E-02	2,90E-01	6,19E-02	8,84E-04	0,00E+00	MND	MND	MND	MND	MND	MND	4,59E-02	4,17E-02	8,59E-02	1,37E-03	-4,68E-02
ADP-minerals & metals[4)]	kg Sbe	6,32E-04	8,99E-06	4,31E-05	6,84E-04	4,90E-05	3,00E-07	0,00E+00	MND	MND	MND	MND	MND	MND	1,68E-06	2,20E-05	2,69E-05	3,03E-07	-8,19E-05
ADP-fossil resources	MJ	4,76E+02	5,74E+01	6,98E+01	6,03E+02	3,15E+02	1,09E+00	0,00E+00	MND	MND	MND	MND	MND	MND	4,45E+01	1,41E+02	1,46E+02	3,61E+00	-9,98E+01
Water use[5)]	m^3e depr.	1,89E+01	2,57E-01	1,33E+00	2,05E+01	1,41E+00	4,73E-02	0,00E+00	MND	MND	MND	MND	MND	MND	1,20E-01	6,31E-01	1,34E+00	1,15E-02	-1,58E+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	2,85E-06	4,17E-07	8,27E-07	4,10E-06	2,29E-06	9,16E-09	0,00E+00	MND	MND	MND	MND	MND	MND	9,22E-07	1,08E-06	8,87E-06	2,49E-08	-1,05E-06
Ionizing radiation[6)]	kBq U235e	3,88E+00	2,75E-01	5,83E-01	4,74E+00	1,51E+00	9,84E-03	0,00E+00	MND	MND	MND	MND	MND	MND	2,05E-01	6,71E-01	1,40E+00	1,63E-02	-1,22E+00
Ecotoxicity (freshwater)	CTUe	2,94E+03	5,11E+01	6,85E+01	3,05E+03	2,80E+02	1,33E+00	0,00E+00	MND	MND	MND	MND	MND	MND	2,68E+01	1,27E+02	1,02E+02	2,36E+00	-1,34E+02
Human toxicity, cancer	CTUh	5,66E-08	1,26E-09	2,74E-09	6,06E-08	6,86E-09	4,19E-10	0,00E+00	MND	MND	MND	MND	MND	MND	1,03E-09	3,11E-09	4,45E-09	5,89E-11	-8,38E-09
Human tox. non-cancer	CTUh	9,68E-07	4,92E-08	6,33E-08	1,08E-06	2,70E-07	2,56E-09	0,00E+00	MND	MND	MND	MND	MND	MND	1,94E-08	1,25E-07	8,54E-08	1,54E-09	-1,23E-07
SQP[7)]	-	1,50E+02	6,60E+01	8,96E+02	1,11E+03	3,62E+02	1,43E+00	0,00E+00	MND	MND	MND	MND	MND	MND	5,79E+00	1,62E+02	1,43E+02	7,72E+00	-1,57E+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[8)]	MJ	3,72E+01	6,47E-01	1,29E+02	1,66E+02	3,55E+00	5,85E-02	0,00E+00	MND	MND	MND	MND	MND	MND	2,54E-01	1,59E+00	7,63E+00	3,13E-02	-2,72E+01
Renew. PER as material	MJ	0,00E+00	0,00E+00	6,27E+01	6,27E+01	0,00E+00	-6,27E+01	0,00E+00	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,70E+01
Total use of renew. PER	MJ	3,72E+01	6,47E-01	1,91E+02	2,29E+02	3,55E+00	-6,26E+01	0,00E+00	MND	MND	MND	MND	MND	MND	2,54E-01	1,59E+00	7,63E+00	3,13E-02	-1,38E-01
Non-re. PER as energy	MJ	5,36E+02	5,74E+01	5,74E+01	6,50E+02	3,15E+02	1,09E+00	0,00E+00	MND	MND	MND	MND	MND	MND	4,45E+01	1,41E+02	1,46E+02	3,61E+00	-9,56E+01
Non-re. PER as material	MJ	4,33E+00	0,00E+00	1,36E+01	1,79E+01	0,00E+00	-1,17E+01	0,00E+00	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	-3,96E+00	-2,98E-01	4,33E+00
Total use of non-re. PER	MJ	5,40E+02	5,74E+01	7,09E+01	6,68E+02	3,15E+02	-1,06E+01	0,00E+00	MND	MND	MND	MND	MND	MND	4,45E+01	1,41E+02	1,42E+02	3,31E+00	-9,12E+01
Secondary materials	kg	5,75E-01	1,59E-02	1,25E-01	7,16E-01	8,73E-02	1,07E-03	0,00E+00	MND	MND	MND	MND	MND	MND	1,74E-02	3,91E-02	5,26E-02	7,59E-04	-3,91E-02
Renew. secondary fuels	MJ	2,54E-03	1,61E-04	1,11E+01	1,11E+01	8,81E-04	9,69E-06	0,00E+00	MND	MND	MND	MND	MND	MND	5,70E-05	3,95E-04	7,34E-04	1,98E-05	-3,03E-03
Non-ren. secondary fuels	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	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	5,41E-01	7,42E-03	3,15E-02	5,80E-01	4,07E-02	1,30E-03	0,00E+00	MND	MND	MND	MND	MND	MND	2,70E-03	1,83E-02	7,74E-02	3,95E-03	-3,70E-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	2,89E+00	7,57E-02	2,25E-01	3,19E+00	4,15E-01	2,48E-03	0,00E+00	MND	MND	MND	MND	MND	MND	5,96E-02	1,87E-01	3,10E-01	0,00E+00	-4,38E-01
Non-hazardous waste	kg	7,00E+01	1,24E+00	3,90E+00	7,51E+01	6,81E+00	2,95E+00	0,00E+00	MND	MND	MND	MND	MND	MND	4,19E-01	3,07E+00	1,79E+02	2,50E+01	-4,88E+00
Radioactive waste	kg	2,05E-03	3,87E-04	3,45E-04	2,78E-03	2,12E-03	3,72E-06	0,00E+00	MND	MND	MND	MND	MND	MND	3,13E-04	9,43E-04	9,89E-04	0,00E+00	-6,59E-04

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	0,00E+00	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	9,32E-03	0,00E+00	1,75E+01	1,75E+01	0,00E+00	1,30E+00	0,00E+00	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	9,75E+02	0,00E+00	0,00E+00
Materials for energy rec	kg	1,09E-03	0,00E+00	0,00E+00	1,09E-03	0,00E+00	1,33E+00	0,00E+00	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	1,64E+01	0,00E+00	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	9,50E+01	3,63E+00	4,02E+00	1,03E+02	1,99E+01	5,73E-01	-2,53E+01	MND	MND	MND	MND	MND	MND	3,27E+00	9,29E+00	8,53E+00	1,29E-01	-6,36E+00
Ozone depletion Pot.	kg CFC_{-11}e	3,45E-06	6,83E-07	7,06E-07	4,84E-06	3,75E-06	9,64E-09	0,00E+00	MND	MND	MND	MND	MND	MND	5,60E-07	1,71E-06	1,41E-06	4,21E-08	-8,78E-07
Acidification	kg SO_2e	2,69E-01	9,71E-03	2,32E-02	3,02E-01	5,32E-02	5,12E-04	0,00E+00	MND	MND	MND	MND	MND	MND	2,45E-02	3,09E-02	5,49E-02	9,35E-04	-3,55E-02
Eutrophication	kg PO_4^3e	7,80E-02	2,12E-03	7,39E-03	8,76E-02	1,16E-02	5,18E-03	0,00E+00	MND	MND	MND	MND	MND	MND	5,69E-03	7,03E-03	1,77E-02	2,02E-04	-1,03E-02
POCP ("smog")	kg C_2H_4e	1,11E-02	4,48E-04	1,41E-03	1,30E-02	2,45E-03	4,39E-05	0,00E+00	MND	MND	MND	MND	MND	MND	5,36E-04	1,21E-03	1,63E-03	3,92E-05	-1,57E-03
ADP-elements	kg Sbe	4,40E-04	8,74E-06	4,28E-05	4,91E-04	4,76E-05	2,83E-07	0,00E+00	MND	MND	MND	MND	MND	MND	1,65E-06	2,13E-05	2,65E-05	2,98E-07	-8,08E-05
ADP-fossil	MJ	4,75E+02	5,74E+01	6,98E+01	6,03E+02	3,15E+02	1,08E+00	0,00E+00	MND	MND	MND	MND	MND	MND	4,45E+01	1,41E+02	1,46E+02	3,61E+00	-9,98E+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
21.08.2023

VERIFIED ISO 14025