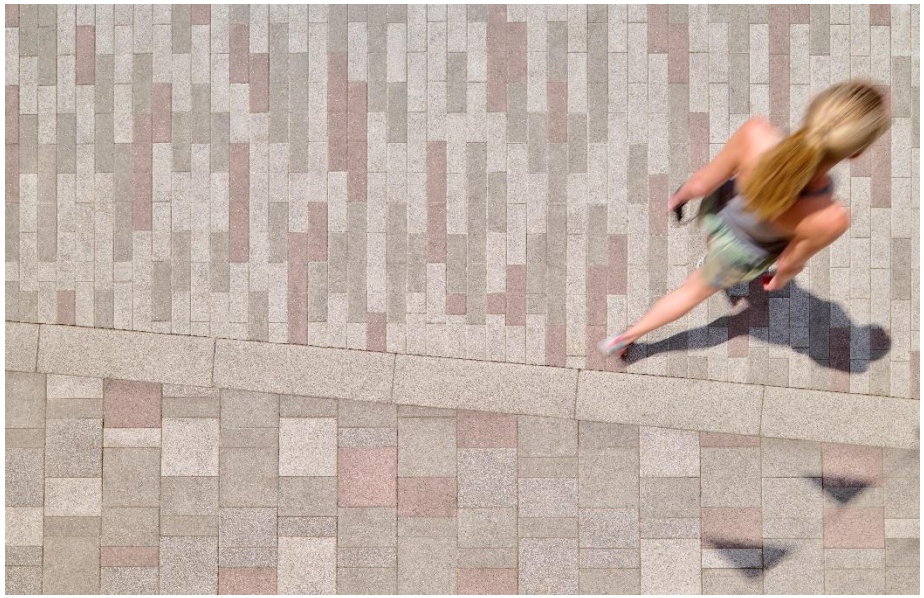
Marshalls

ENVIRONMENTAL PRODUCT DECLARATION

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

Modal X – All colours, all sizes and all finishes
Marshalls



EPD HUB, HUB-3596
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Life e Cycle Assessment study has been performed in accordance with the requirements of EN 15804, EPD Hub PCR version 1.1 (5 Dec2023) and JRC characterization factors EF 3.1

Created with One Click LCA

Marshalls

GENERAL INFORMATION

MANUFACTURER

Manufacturer	Marshalls Plc
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	and ISO 14025
PCR	EPD Hub Core PCR Version 1.2, 24 Mar 2025 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	M Edwards & L Taylor - Marshalls PLC
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

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	Modal X
Additional labels	-
Product reference	N/A
Place(s) of raw material origin	Mainly UK with a very small percentage of EU sourced
Place of production	St Ives (Cambridgeshire)
Place(s) of installation and use	UK
Period for data	Calendar year 2024
Averaging in EPD	Multiple product colours
Variation in GWP-fossil for A1-A3 (%)	+ 4.42% / - 7.73%

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 m²
Declared unit mass	184 kg
GWP-fossil, A1-A3 ($kgCO_2e$)	18.1
GWP-total, A1-A3 ($kgCO_2e$)	14.0
Secondary material, inputs (%)	0.62
Secondary material, outputs (%)	94
Total energy use, A1-A3 (kWh)	65.3
Net freshwater use, A1-A3 (m^3)	0.24

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, bricks, roof tiles, street furniture and natural stone paving. It provides products for both commercial and domestic markets.

PRODUCT DESCRIPTION

The product is a concrete paving unit. Paving units are laid in an interlocking pattern on a sand and aggregate sub-base to create an attractive trafficable surface.

This document is for a dual-layer paving unit manufactured using a semi-dry mix, comprising of an advanced backing mix containing high levels of cement substitutes complemented by a 6-12mm facemix layer comprising of premium materials to create a variety of different aesthetics. The two layers are cast together in the mould, creating one homogenous unit. These units frequently receive a secondary process to create different textures on the surface and expose the premium aggregates in the face.

Concrete paving units are manufactured according to BS EN 1338:2003/BS EN 1339:2003, which requires that a minimum strength of the units must be achieved. Other factors which must be satisfied to achieve the standard include slip / skid resistance, freeze / thaw performance and water absorption. Test methods and minimum criteria are detailed in the standard.

The nominated depth for the product specified in this document is 80mm. Conversion factors for different depths are listed in the document.

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

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass %	Material origin
Metals	N/A	N/A
Minerals	100	EU
Fossil materials	N/A	N/A
Bio-based materials	N/A	N/A

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	1.096

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1m² of 80mm thick product
Mass per declared unit	184 kg
Functional unit	-
Reference service life	50 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	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 = ND. 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.

Facemix concrete units are manufactured using a semi-dry concrete mix. Two different specified blends of aggregates, binder material, water and admixtures are dispensed from hoppers into two mixers. The premium facemix mixture is then emptied into a mould to a depth of 6-12mm. The secondary backing mix is then added to top the moulds up. A precision-cut tamper plate applies pressure to the top of each cell in the mould. The tamper plate lifts, and the mould is removed, leaving the cast concrete units on a board. In some instance, a secondary process is applied to the surface of the units to create a different surface texture or aesthetic. The board is moved to a chamber where the units 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. Once sufficiently cured, in some instances a secondary process is applied to blast or otherwise texture the surface. The units are collected by robot (cubed) and stacked on a banding machine.

Any water lost during manufacture is recycled - collected and reintroduced to the mix. Material waste during manufacture is negligible.
Straps are secured around the units. In some cases, the units are stacked in such a way as to leave voids near the base which allow FLT forks to penetrate the stack and transport it without the need for a pallet.
Some facemix products require an additional protective plastic film hood (to protect the top layer and / or to keep the pack secure). In these cases, the hood is placed over the pack by robot, and then the whole pack is passed through an oven to shrink the film securely round the units.

The use of green energy in manufacturing is demonstrated through contractual instruments (REGOs, GOOs, 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.

A4: During the time-period measured, manufacture of Modal X concrete units took place at one manufacturing site within the UK - St Ives. 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 169 km.

A5: In the UK, installation of concrete paving is a manual process. Units are laid by hand.

PRODUCT USE AND MAINTENANCE (B1-B7)

B1: The carbonation (sequestration) value has been calculated as per methodology outlined in EN 16757:2022
Air, soil, and water impacts during the use phase have not been studied.

PRODUCT END OF LIFE (C1-C4, D)

C1: In the UK, removal of concrete paving is a manual process.

C2: It is assumed that 6% of product is transported 35km to a waste processing site to be landfilled, and 94% of product is recycled and a transportation distance of 125km has been allowed for (WRAP-Carbon WARM V.2 Document). The percentage split is evidenced on UK Governments Statistics on Construction Waste website: 7. Recovery rate from non-hazardous construction and demolition (C&D) waste:

Table7:England, 2010–2022: www.gov.uk/government/statistics/uk-waste-data/uk-statistics-on-waste#recovery-rate-from-non-hazardous-construction-and-demolition-cd-waste.

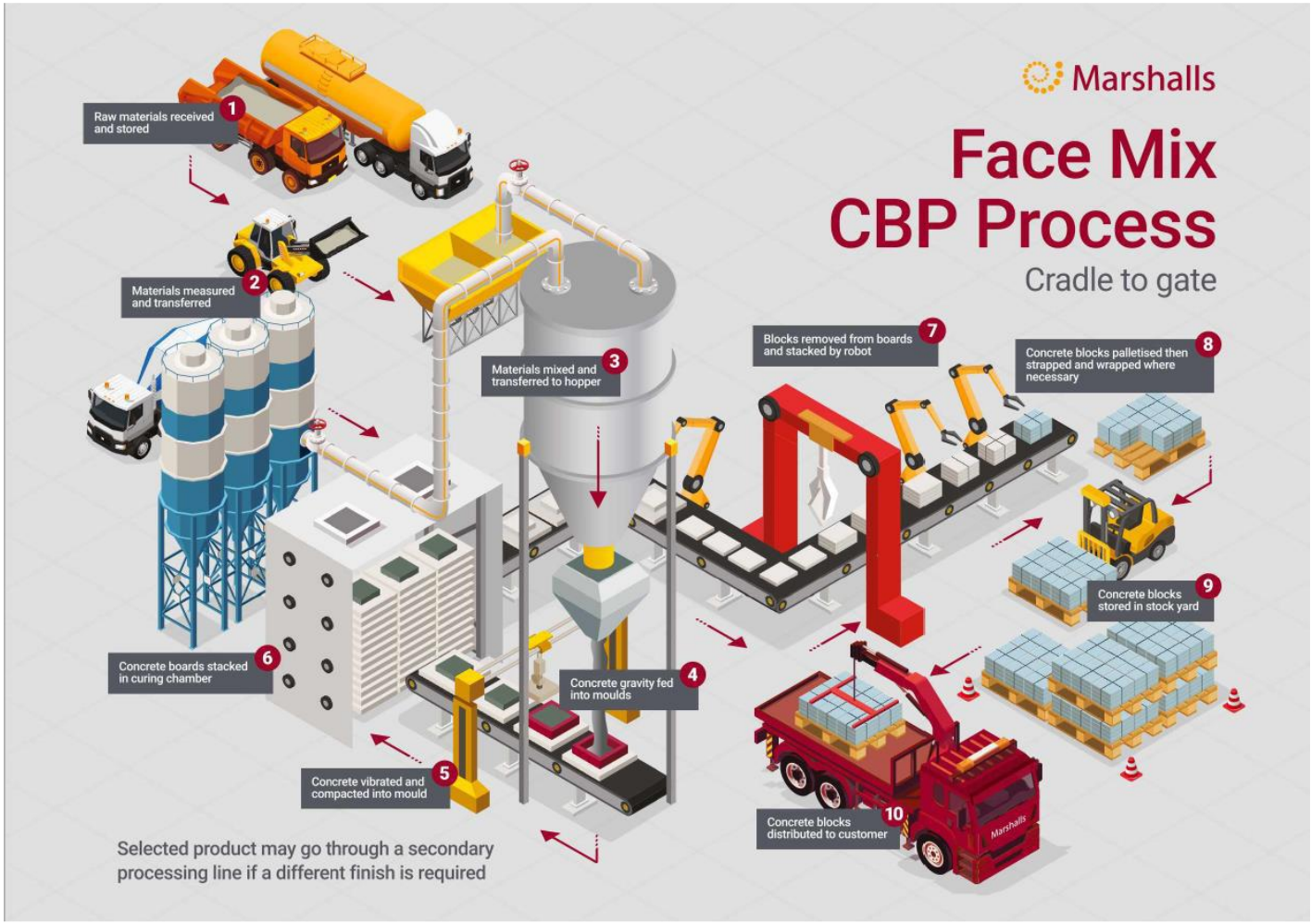
C3: All material (whether used on site or treated at a waste processing facility) will be crushed. 94% will be recycled/reused; 6% will be transported to landfill.

C4: It is assumed that 6% 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 94% 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.

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 processes, for which data is available for, are included in the calculation. There is no neglected 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.

All industrial processes from raw material acquisition and pre-processing, production, product distribution and installation, and end-of-life management are included. For easier modelling and because of lack of accuracy in available modelling resources many constituents under 0,1% of product mass are excluded. These include some concrete admixtures which are all present in the product only in very small amounts and have no serious impact on the emissions of the product. Further, water used for cleaning and maintenance of the equipment, transportation and waste streams of the packaging materials used for delivering the raw materials to the factory are omitted since the quantified mass contribution is less than 0.1%.

The production of capital equipment, construction activities, and infrastructure, 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	Not applicable
Ancillary materials	Not applicable
Manufacturing energy and waste	Allocated by mass or volume

PRODUCT & MANUFACTURING SITES GROUPING

Type of grouping	Multiple product colours
Grouping method	Based on a representative product
Variation in GWP-fossil for A1-A3, %	+ 4.42% / - 7.73%

EPD results in this document represent the colour with the highest volume of sales. However, all other product colours covered by this EPD use the same basic mix design with only very minor differences in aggregates used in the face. The maximum variation A1-A3 GWP fossil between the numbers stated in this EPD and any of the other colours is stated above. These products are available in different depths and a conversion table is available at the end of this document.

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 v3.10.1 and One Click LCA databases as sources of environmental data. Allocation used in Ecoinvent 3.10.1 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	1,41E+01	2,24E+00	-2,30E+00	1,40E+01	5,97E+00	4,26E+00	-1,54E+00	ND	ND	ND	ND	ND	ND	0,00E+00	4,29E+00	7,63E-01	6,95E-02	-1,80E+00
GWP – fossil	kg CO_2e	1,41E+01	2,24E+00	1,72E+00	1,81E+01	5,97E+00	1,85E-01	-1,54E+00	ND	ND	ND	ND	ND	ND	0,00E+00	4,29E+00	7,63E-01	6,95E-02	-2,09E+00
GWP – biogenic	kg CO_2e	0,00E+00	0,00E+00	-4,02E+00	-4,02E+00	0,00E+00	4,07E+00	0,00E+00	ND	ND	ND	ND	ND	ND	0,00E+00	8,51E-04	-7,79E-05	-2,21E-05	2,89E-01
GWP – LULUC	kg CO_2e	2,26E-03	1,03E-03	3,58E-03	6,86E-03	2,14E-03	1,28E-04	0,00E+00	ND	ND	ND	ND	ND	ND	0,00E+00	1,52E-03	7,82E-05	3,97E-05	-2,11E-03
Ozone depletion pot.	kg CFC-$_{11}$e	4,26E-07	3,30E-08	3,31E-08	4,92E-07	1,19E-07	1,50E-09	0,00E+00	ND	ND	ND	ND	ND	ND	0,00E+00	8,54E-08	1,17E-08	2,01E-09	-1,82E-08
Acidification potential	mol H^+e	5,38E-02	1,06E-02	8,52E-03	7,29E-02	1,24E-02	4,90E-04	0,00E+00	ND	ND	ND	ND	ND	ND	0,00E+00	1,34E-02	6,89E-03	4,93E-04	-1,28E-02
EP-freshwater[2)]	kg Pe	1,21E-03	1,69E-04	3,72E-04	1,75E-03	4,02E-04	2,25E-05	0,00E+00	ND	ND	ND	ND	ND	ND	0,00E+00	2,85E-04	2,20E-05	5,71E-06	-7,46E-04
EP-marine	kg Ne	5,12E-03	3,15E-03	2,39E-03	1,07E-02	2,98E-03	5,02E-04	0,00E+00	ND	ND	ND	ND	ND	ND	0,00E+00	4,53E-03	3,20E-03	1,88E-04	-2,84E-03
EP-terrestrial	mol Ne	1,33E-01	3,45E-02	2,72E-02	1,95E-01	3,22E-02	1,99E-03	0,00E+00	ND	ND	ND	ND	ND	ND	0,00E+00	4,92E-02	3,50E-02	2,05E-03	-3,36E-02
POCP ("smog")[3)]	kg NMVOCe	4,10E-02	1,30E-02	1,08E-02	6,49E-02	2,07E-02	6,57E-04	0,00E+00	ND	ND	ND	ND	ND	ND	0,00E+00	2,10E-02	1,04E-02	7,35E-04	-9,49E-03
ADP-minerals & metals[4)]	kg Sbe	4,52E-05	6,04E-06	6,35E-06	5,76E-05	1,99E-05	2,62E-07	0,00E+00	ND	ND	ND	ND	ND	ND	0,00E+00	1,40E-05	2,74E-07	1,10E-07	-9,76E-06
ADP-fossil resources	MJ	9,84E+01	3,22E+01	2,63E+01	1,57E+02	8,40E+01	1,28E+00	0,00E+00	ND	ND	ND	ND	ND	ND	0,00E+00	6,03E+01	9,98E+00	1,71E+00	-2,68E+01
Water use[5)]	m^3e depr.	3,39E+00	1,56E-01	5,40E-01	4,09E+00	4,18E-01	3,42E-02	0,00E+00	ND	ND	ND	ND	ND	ND	0,00E+00	2,96E-01	2,49E-02	4,92E-03	-2,70E+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.

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	5,89E-07	2,15E-07	1,44E-07	9,48E-07	4,40E-07	8,71E-09	0,00E+00	ND	ND	ND	ND	ND	ND	0,00E+00	3,37E-07	1,49E-06	1,12E-08	-1,79E-07
Ionizing radiation[6)]	kBq U235e	1,74E+00	2,75E-02	1,08E-01	1,88E+00	1,08E-01	3,25E-03	0,00E+00	ND	ND	ND	ND	ND	ND	0,00E+00	7,69E-02	4,42E-03	1,07E-03	-2,57E-01
Ecotoxicity (freshwater)	CTUe	1,11E+02	4,46E+00	4,63E+00	1,20E+02	1,12E+01	4,35E-01	0,00E+00	ND	ND	ND	ND	ND	ND	0,00E+00	7,91E+00	5,50E-01	1,43E-01	-5,66E+00
Human toxicity, cancer	CTUh	3,23E-08	3,77E-10	4,07E-09	3,68E-08	1,00E-09	4,56E-11	0,00E+00	ND	ND	ND	ND	ND	ND	0,00E+00	7,31E-10	7,85E-11	1,28E-11	-5,36E-10
Human tox. non-cancer	CTUh	4,40E-07	2,03E-08	1,22E-08	4,72E-07	5,32E-08	2,41E-09	0,00E+00	ND	ND	ND	ND	ND	ND	0,00E+00	3,78E-08	1,24E-09	2,94E-10	-1,65E-08
SQP[7)]	-	3,40E+01	3,10E+01	3,30E+02	3,95E+02	5,08E+01	1,17E+00	0,00E+00	ND	ND	ND	ND	ND	ND	0,00E+00	3,59E+01	7,00E-01	3,36E+00	-2,15E+01

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	9,20E+00	4,34E-01	2,51E+01	3,48E+01	1,47E+00	-3,47E+01	0,00E+00	ND	ND	ND	ND	ND	ND	0,00E+00	1,04E+00	6,32E-02	1,65E-02	4,50E+00
Renew. PER as material	MJ	0,00E+00	0,00E+00	3,57E+01	3,57E+01	0,00E+00	-3,57E+01	0,00E+00	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,91E+00
Total use of renew. PER	MJ	9,20E+00	4,34E-01	6,08E+01	7,04E+01	1,47E+00	-7,04E+01	0,00E+00	ND	ND	ND	ND	ND	ND	0,00E+00	1,04E+00	6,32E-02	1,65E-02	6,41E+00
Non-re. PER as energy	MJ	1,27E+02	3,22E+01	2,14E+01	1,81E+02	8,40E+01	-1,92E+00	0,00E+00	ND	ND	ND	ND	ND	ND	0,00E+00	6,03E+01	9,98E+00	1,71E+00	-2,68E+01
Non-re. PER as material	MJ	3,05E+00	0,00E+00	4,78E+00	7,82E+00	0,00E+00	-4,95E+00	0,00E+00	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	-2,67E+00	-2,01E-01	1,13E+00
Total use of non-re. PER	MJ	1,30E+02	3,22E+01	2,62E+01	1,88E+02	8,40E+01	-6,87E+00	0,00E+00	ND	ND	ND	ND	ND	ND	0,00E+00	6,03E+01	7,31E+00	1,50E+00	-2,57E+01
Secondary materials	kg	1,14E+00	1,39E-02	1,99E-01	1,35E+00	3,90E-02	9,29E-04	0,00E+00	ND	ND	ND	ND	ND	ND	0,00E+00	2,76E-02	4,15E-03	4,29E-04	-1,97E-02
Renew. secondary fuels	MJ	6,44E+00	1,68E-04	1,20E+00	7,64E+00	4,93E-04	9,24E-06	0,00E+00	ND	ND	ND	ND	ND	ND	0,00E+00	3,49E-04	1,08E-05	8,88E-06	-1,65E-04
Non-ren. secondary fuels	MJ	1,19E+01	0,00E+00	0,00E+00	1,19E+01	0,00E+00	0,00E+00	0,00E+00	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	2,26E-01	4,65E-03	1,30E-02	2,44E-01	1,14E-02	-3,03E-03	0,00E+00	ND	ND	ND	ND	ND	ND	0,00E+00	8,11E-03	6,60E-04	1,77E-03	-6,59E-02

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	3,41E-01	5,43E-02	8,08E-02	4,76E-01	1,22E-01	8,47E-03	0,00E+00	ND	ND	ND	ND	ND	ND	0,00E+00	8,65E-02	1,11E-02	1,88E-03	-1,87E-01
Non-hazardous waste	kg	8,47E+00	9,93E-01	2,94E+00	1,24E+01	2,58E+00	5,40E+00	0,00E+00	ND	ND	ND	ND	ND	ND	0,00E+00	1,82E+00	1,51E-01	4,31E-02	-4,07E+00
Radioactive waste	kg	1,11E-04	6,73E-06	2,77E-05	1,45E-04	2,69E-05	8,11E-07	0,00E+00	ND	ND	ND	ND	ND	ND	0,00E+00	1,91E-05	1,09E-06	2,61E-07	-6,38E-05

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	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	3,25E-02	0,00E+00	1,10E+01	1,11E+01	0,00E+00	7,82E-01	0,00E+00	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	1,74E+02	0,00E+00	0,00E+00
Materials for energy rec	kg	5,39E-04	0,00E+00	0,00E+00	5,39E-04	0,00E+00	0,00E+00	0,00E+00	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	4,22E+00	0,00E+00	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+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	1,78E+00	0,00E+00	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	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	2,44E+00	0,00E+00	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

ENVIRONMENTAL IMPACTS – 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	1,41E+01	2,24E+00	1,72E+00	1,81E+01	5,97E+00	1,85E-01	-1,54E+00	ND	ND	ND	ND	ND	ND	0,00E+00	4,29E+00	7,63E-01	6,95E-02	-2,09E+00

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.

SCENARIO DOCUMENTATION

Manufacturing energy scenario documentation

Scenario parameter	Value
Electricity data source and quality	Heat and power co-generation, biogas, gas engine (Reference product: electricity, high voltage)
Electricity CO2e / kWh	0.15 kg CO2e / kWh
Heating data source and quality	Heat production, propane, at industrial furnace >100kW (Reference product: heat, district or industrial, other than natural gas)
Heating CO2e / kWh	0.0945 CO2e / kWh
Mobile plant fuel data source and quality	Diesel, burned in building machine (Reference product: diesel, burned in building machine)
Mobile plant CO2e / MJ	0.1 kg CO2e / MJ

Transport scenario documentation A4

Scenario parameter	Value
Vehicle type used for transport	Transport, freight, lorry 16-32 metric ton, EURO6, Europe
Average transport distance, km	169
Capacity utilization (including empty return) %	100%
Bulk density of transported products	-
Volume capacity utilization factor	1

End of life scenario documentation

Scenario information	Value
Collection process – kg collected separately	-
Collection process – kg collected with mixed waste	-
Recovery process – kg for re-use	-
Recovery process – kg for recycling	172.96
Recovery process – kg for energy recovery	
Disposal (total) – kg for final deposition	11.04
Scenario assumptions e.g. transportation	Transported 125 km (recycling) and 35 km (landfill) by lorry

Installation scenario documentation A5

Scenario information	Value
Ancillary materials for installation (specified by material) / kg or other units as appropriate	-
Water use / m³	-
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	Polyethylene film: 0.040 kg PET strapping: 0.039 kg Wood pallet: 2.36 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, incineration w. energy recovery, landfill respectively. Polyethylene film & PET strapping: 40%, 37%, 23% Wood pallet: 32%, 30%, 38%
Direct emissions to ambient air, soil and water / kg	-

THIRD-PARTY 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 compliance 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
04.07.2025

CONVERSION TABLE FOR ALTERNATIVE DEPTHS

The correlation between the material and energy inputs to calculate A1-A3 numbers is linear.

Therefore, to calculate A1-A3 (GWP Fossil & GWP Total) values for thicknesses of the Modal X product, we apply the following conversion factors to the A1-A3 number shown within this document:

Unit depth (mm)	A1- A3		
	Conversion factor	kg CO_2e - Fossil	kg CO_2e - Total
50	-37.5%	11.31	8.75
60	- 25.0%	13.58	10.50
65	-18.75%	14.71	11.38
70	-12.5%	15.84	12.25
80	**0.0%**	**18.10**	**14.00**