

Environmental Product Declaration

In accordance with ISO 14025 and EN 15804:2012+A2:2019 for:

EnviroBuild Hyperion Composite Products
(Decking, Cladding, and Fencing)



From:

EnviroBuild Materials Ltd. (EnviroBuild)

Programme

The International EPD® System,
www.environdec.com

Publication date

2021-05-17

An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at www.environdec.com

Programme operator

EPD International AB

Revision date

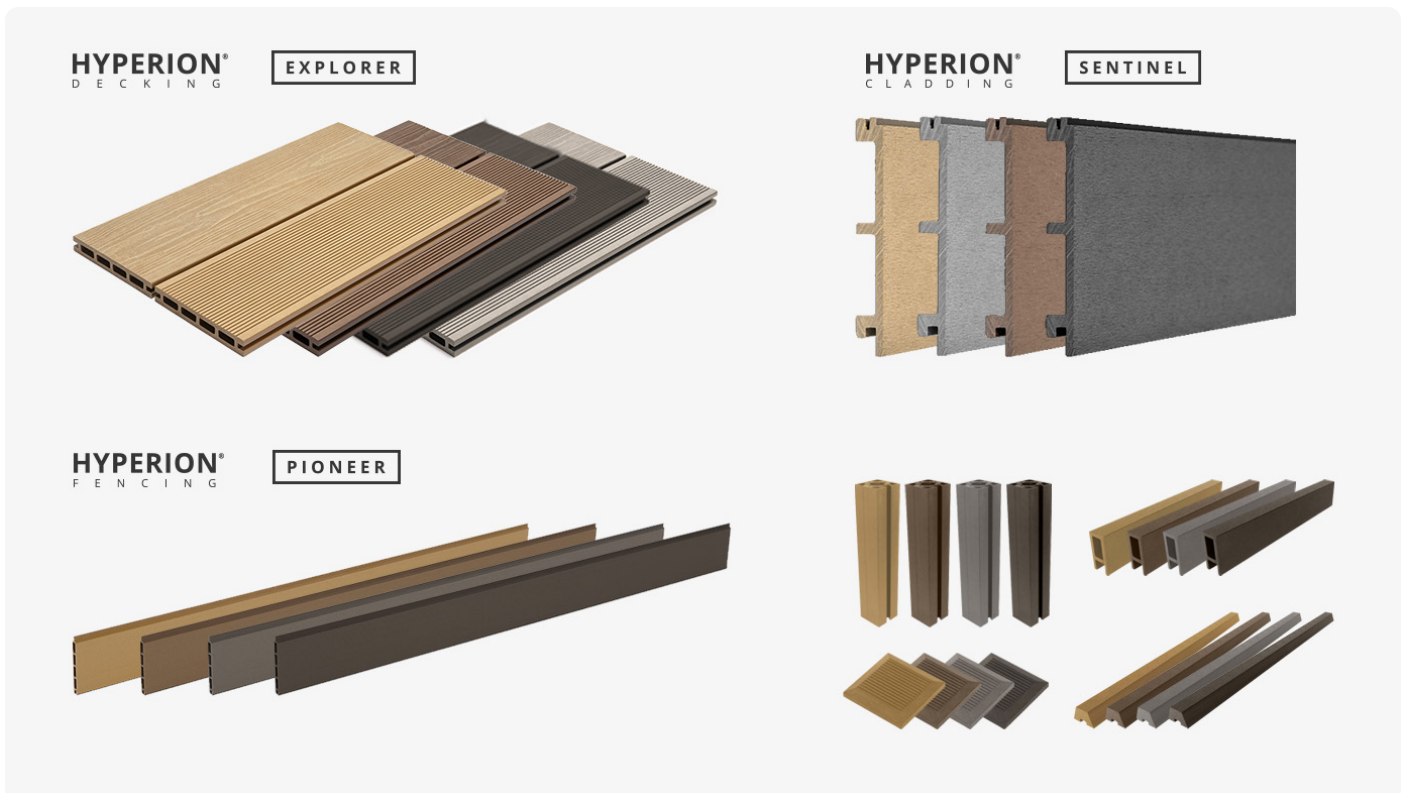
2022-02-28

EPD registration number

S-P-03566

Valid until

2027-02-27



Programme

The International EPD® System

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CEN standard EN 15804 serves as the Core Product Category Rules (PCR)

Product category rules (PCR): Construction Products 2019:14 version 1.1
UN CPC Code: 36990 Articles of plastics n.e.c.

PCR review was conducted by:

The Technical Committee of the International EPD® System. See www.environdec.com/TC for a list of members.

Review chair: Claudia A Pena, University of Concepcion, Chile.

The review panel may be contacted via the Secretariat www.environdec.com/contact-us.

Independent third-party verification of the declaration and data, according to ISO 14025:2006:

External Internal

covering:

EPD process certification EPD verification

Third party verifier:

Chris Foster

EuGeos Limited

Procedure for follow-up of data during EPD validity involves third party verifier:

Yes No

The EPD owner has the sole ownership, liability, and responsibility for the EPD.

EPDs within the same product category but from different programmes may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804. For further information about comparability, see EN 15804 and ISO 14025.

Company

Owner of the EPD

EnviroBuild Materials Ltd.

Contact

Hayden Cotgrove

Description of the organisation

Agents involved in the sale of timber and building materials

Name and location of the product site(s)

Head office

EnviroBuild
30 Great Guildford Street
London
United Kingdom
SE1 0HS

envirobuild.com
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Warehouse

Essex
United Kingdom

Production site

Anhui Province
China

Product-related or management system-related certifications

- ISO9001:2008 Quality Management Systems
- ISO14001:2004 Environmental Management Systems
- Testing by SGS to EN15534:2004 Wood-plastics composites (WPC). Characterisation of WPC materials
- FSC Forest Stewardship Council

Product

Product name

Hyperion Wood Plastic Composite

Product identification

Composite made from cellulose-based materials and thermoplastics, EN 15534-1:2014 and EN 15534-4: 2014

Product description: Hyperion Sentinel Cladding

Hyperion offers innovative ranges of wood-polymer composite (WPC) products, produced by extruding lengths composite material. The Sentinel Cladding range is produced using a composite of 60% FSC® certified wood reclaimed from post-industrial manufacturing and 30% recycled High Density Polyethylene (HDPE), with the rest of the material being made up of a bonding agent, additives and a tint. The Sentinel cladding system is specified to a Class B fire rating (according to EN 13501-1), meaning it's suitable for commercial use. The high recycled plastic content of the composite cladding boards gives them a high durability, meaning they offer low maintenance requirements, and high scratch and stain resistance. The Sentinel Cladding profile is designed to facilitate a hidden clip system, allowing for there to be no exposed screws in the finished system.



Product description: Hyperion Explorer Decking

Hyperion offers innovative ranges of wood-polymer composite (WPC) products, produced by extruding lengths composite material. The Explorer Decking system is produced using a composite of around 57% FSC® certified Eucalyptus wood fibre and 30% recycled High Density Polyethylene (HDPE), with the rest of the material being made up of a bonding agent, additives and a tint. The Explorer system is designed to include a natural, realistic embossed wood-grain texture. The high recycled plastic content of the composite decking boards gives them a high durability, meaning they offer low maintenance requirements, and high scratch and stain resistance. The Explorer Decking profile is designed to facilitate a hidden clip system, allowing for there to be no exposed screws in the finished system.



Product description: Hyperion Pioneer Fencing

Hyperion offers innovative ranges of wood-polymer composite (WPC) products, produced by extruding lengths composite material. Pioneer Fencing is produced using a composite of around 57% FSC® certified Eucalyptus wood fibre and 30% recycled High Density Polyethylene (HDPE), with the rest of the material being made up of a bonding agent, additives and a tint. The high recycled content in Hyperion Pioneer Fencing ensures the product will not rot or splinter and removes the need for treating. This innovative fencing system offers panels, panel caps, posts and post-caps in a variety of colours, allowing the creation of many custom colour combinations. The posts contain a 4-way groove system, making installing fence panels at 90 or 180-degrees more simple. Installation is also made more simple via a quick and easy tongue and groove profile, allowing panels to slide into place.



Product Dimensions

Product Code	Name & Description	Weight (kg/m)	Weight (kg/m ²)
D-E-B-4, D-E-G-4, D-E-O-4, D-E-S-4, D-E-W-4	Explorer Decking Board	2.80	18.7
DA-E-CP-B, DA-E-CP-G, DA-E-CP-O, DA-E-CP-S, DA-E-CP-W	Explorer Edge Board	1.91	-
C-B-G-4, C-B-O-4, C-B-S-4, C-B-W-4	Sentinel Cladding Board	1.95	13.0
CA-B-C-G, CA-B-C-O, CA-B-C-S, CA-B-C-W	Sentinel Cladding Corner Trim	1.06	-
CA-B-F-G, CA-B-F-O, CA-B-F-S, CA-B-F-W	Sentinel Cladding Fascia	2.13	-
F-FP-G.2, F-FP-O.2, F-FP-S.2, F-FP-W.2	Pioneer Fence Panel Slat	2.43	16.2
F-FT-G-2.4, F-FT-O-2.4, F-FT-S-2.4, F-FT-W-2.4	Pioneer Fence Post	5.67	-
F-PC-G.2, F-PC-O.2, F-PC-S.2, F-PC-W.2	Pioneer Fence Post Cap	0.20 (per unit)	-
F-FC-G.2, F-FC-O.2, F-FC-S.2, F-FC-W.2	Pioneer Fence Panel Cap	1.26	-
F-PI-G, F-PI-O, F-PI-S, F-PI-W	Pioneer Fence Post Insert	0.65	-

Dimensions are given in kg/m and kg/m² as decking, cladding and fencing products all tend to be purchased according to the perimeter or area required, with the exact dimensions of each product being less important except for specific circumstances. Further details about each product can be found at envirobuild.com/pages/technical-downloads.

Product Characteristics of Hyperion Explorer Decking Products

Characteristic	Reference	Unit
Density	EN 15534-1:2014 EN 15534-4:2014	1.26 g/cm ³
Linear Thermal Expansion	EN 15534-1:2014 EN 15534-4:2014 ISO 11359-2:1999	34.2E-6 K ⁻¹
Flexural Strength	EN 15534-1:2014 EN 15534-4:2014	27.4 MPa
Flexural Modulus	EN 15534-1:2014 EN 15534-4:2014	3969 MPa
Brinell Hardness	EN 15534-1:2014 EN 15534-4:2014	79 MPa
Water Absorption	EN 15534-1:2014 EN 15534-4:2014	4.32%
Reaction to Fire	EN ISO 9239-1:2010 EN ISO 11925-2:2020	Cfl - s1
Slip resistance (Dry), PTV	EN 15534-1:2014 EN 15534-4:2014 CEN/TS 15676:2007	73 (Longitudinal) 56 (Horizontal)
Slip resistance (Wet), PTV	EN 15534-1:2014 EN 15534-4:2014 CEN/TS 15676:2007	38 (Longitudinal) 45 (Horizontal)

Product Characteristics of Hyperion Sentinel Cladding Products

Characteristic	Reference	Unit
Density	EN 15534-1:2014 EN 15534-5:2014	1.26 g/cm ³
Linear Thermal Expansion	EN 15534-1:2014 EN 15534-5:2014	46.8E-6 K ⁻¹
Flexural Modulus	EN 15534-1:2014 EN 15534-5:2014	1837 MPa
Screw Pull Out	EN 15534-1:2014 EN 15534-5:2014 EN 1383:2016	479 N
Water Absorption	EN 15534-1:2014 EN 15534-5:2014	5.46%
Reaction to Fire	EN 13823:2010+A1:2014 EN ISO 11925-2:2010	B - s2, d0
Reaction to Fire - Single Flame Source	EN 13823:2010+A1:2014	Flaming droplets or particles were not found

UN CPC code: 36990 Articles of plastics n.e.c.

Other codes for product classification: UK Commodity Code 3926 9097 90, Plastics and articles thereof; rubber and articles thereof.

LCA Information

Functional unit

1 kg of Hyperion wood plastic composite installed for 30 years as part of a cladding, decking or fencing system.

Reference service life

30 years

Time representativeness

2019-2021

Geographical scope

UK and China

Database(s) and LCA software used

Database: EcoInvent 3.6
 LCA Software: OpenLCA 1.11.0
 Impact Assessment Method: As specified in EN 15804+A2, using the characterisation factors published by the European Commission's Joint Research Centre and implemented in EuGeos' IA15804 database.

Description of system boundaries

(c) Cradle to grave and module D (A + B + C + D)

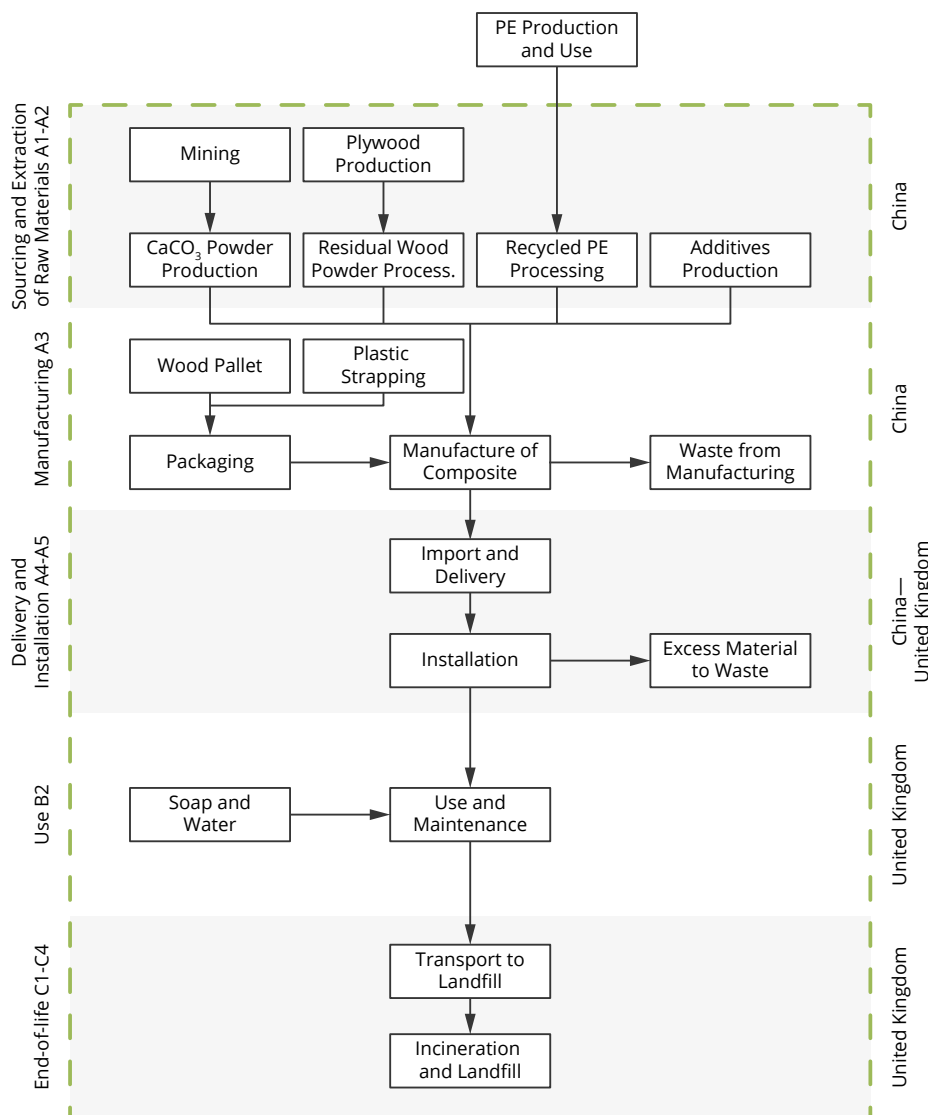
More Information

LCA practitioner

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System diagram



Assumptions

Quantity	Unit	Description	Module	Justification
-	-	Additives	A1	Additive quantities are known, but composition unknown. So typical compositions have been found, and similar chemicals modelled in the LCA.
200	kg/m ³	Wood flour density	A1	Based on typical saw dust density.
100	km	Distance from warehouse to construction site	A4	Distance from warehouse to construction site is assumed to be a typical distance of 100 km.
0	kWh	Energy of warehouse	A5	Products are not expected to stay in the warehouse for a significant amount of time, so the energy use of their storage has not been considered.
0.3	kWh	Electricity used per sqm of decking/cladding/fencing	A5, C1	Electricity needed to run a typical 600 W drill for half an hour.
30	Years	Reference service life	B2	EnviroBuild expectations. WPC as a material will last longer, but on average customers are predicted to keep their decking/cladding/fencing for around 30 years.
2	Years	Frequency of deck maintenance	B2	EnviroBuild recommendation to maintain deck quality and lifespan. Module may be ignored for cladding and fencing.
24	m ² /5L	Quantity of decking cleaner necessary for each clean	B2	Based on recommendations for popular decking cleaner.
1	%	Proportion of soap in decking cleaner	B2	Based on typical soap usage for deck cleaning. Also assumed that deck is cleaned with soap and water and not some other chemical.
100	km	Distance from construction site to landfill site	C2	Typical distance
		Landfill end of life	C4	Whilst EnviroBuild recommend that any left-over materials or materials at the end of life be remade into other products, all material is eventually expected to end up in landfill even if not at the end of the RSL, so all has been modelled as being landfilled.

Scenario

Transport to building site

Quantity (per declared unit)

Fuel type and consumption of vehicle or vehicle type used for transport	Freight container ship, heavy fuel oil, 2.51E-03 kg per t*km Freight lorry, diesel, 1.62E-02 kg per t*km
Distance	Freight container ship, 22,000 km Freight lorry, 370 km
Capacity utilisation	100%
Bulk density of transport goods	1260 kg/m ³

Installation in the building

Quantity (per declared unit)

Ancillary materials for installation	None considered
Water use	None considered
Other resource use	None considered
Quantitative description of energy type and consumption during the installation process	Market mix of UK electricity, 0.0188 kWh per kg
Waste materials on building site before waste processing, generated by product's installation	0.05 kg of waste wood plastic composite, considered to be 57% waste wood and 43% inert waste
Output materials as a result of waste processing at the building site	None considered
Direct emissions to ambient air, soil, and water	None considered

Maintenance

Quantity (per declared unit)

Maintenance process	Use soap and water, in a ratio of 1:99, for a quantity of 0.026 L per kg per maintenance
Maintenance cycle	Once every two years
Ancillary materials for maintenance	None considered
Waste material from maintenance	Wastewater 0.026 L per kg per maintenance
Net fresh water consumption during maintenance	0.026 L per kg per maintenance
Energy input during maintenance	None considered

RSL Information

Quantity (per declared unit)

Reference Service Life	30 years
Design application parameters	Installed according EnviroBuild installation guides
An assumed quality of work, when installed in accordance with the manufacturer's instructions	5% waste, no need for replacement of parts
Outdoor environment	Typical UK weather conditions
Usage conditions	Typical residential environment. Cladding and fencing to be used in typical UK climate, decking to see typical residential usage. All cladding products are expected to be used together as part of a complete cladding system, and the same goes for decking and fencing products.
Maintenance	Clean every two years with soap and water (see maintenance)

End-of-life	Quantity (per declared unit)
Collection process	Waste collection by lorry freight, 100 km distance
Recovery system	None considered
Disposal specified by type	1 kg for final deposition. 43% inert waste, 57% waste wood
Assumptions for scenario development	All material goes to landfill. No material is reused or recycled. No waste processing.

Cut-off Rules and Data Quality

Life cycle inventory data is according to EN 15804. 100% of all inflows (mass and energy) have been accounted for, for every declared module.

Whilst this EPD is based on a range of products, as those products are all manufactured from identical materials and from almost identical production processes, it can be asserted that GWP-GHG indicator does not differ between the products (per declared unit) by more than 10%.

Allocation

Co-product allocation is based on the physical mass of each product from the manufacturing process, as per EN 15804. Whilst each product from the factory may have a slightly different value, as the analysis has been completed on the basis of the declared unit of 1 kg of the material overall, the differences in value of the products were not considered as the material content and manufacturing processes were identical or close enough to. As every product from the manufacturing process was considered for the process, the co-product allocation did not need to be considered.

The only exception here is for the industrial residual wood powder content, which is produced as a by-product of the production of plywood. As this process is for a biogenic carbon input, the coproduct allocation must also be physical, according to EN 15804.

Energy for Manufacturing

Data for the energy used in module A3 (manufacturing) is from the EcoInvent 3.6 database for wind power production in China, the total climate change impact of which is **0.0368 kg CO₂ eq./kWh**.

Modules Declared, Geographical Scope, Share of Specific Data (in GWP-GHG Indicator) and Data Variation

	Product Stage		Construction Process Stage			Use Stage							End of Life Stage				Resource Recovery Stage		
	Raw Material	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling potential		
Module	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D		
Modules Declared	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
Geography	CN	CN	CN	CN, GB	GB	GB	GB	GB	GB	GB	GB	GB	GB	GB	GB	GB	GB		
Specific data used	>90%					-	-	-	-	-	-	-	-	-	-	-	-	-	
Variation: Products	<10%					-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation: Sites	Not relevant					-	-	-	-	-	-	-	-	-	-	-	-	-	-

Content Information

Product Component	Weight, kg	Post-consumer material, weight-%	Renewable material, weight-%
Industrial Residual Wood Powder ¹	0.57	0	100
Recycled Polyethylene ²	0.30	100	0
Calcium Carbonate Powder	0.06	0	0
Additives	0.07	0	0
Total	1.00	30	57

Packaging materials	Weight, kg	Weight-% (versus the product)
Pallet (Wood)	2.28E-03	0.218
LDPE	3.89E-04	0.0389
Woven Polypropylene	9.72E-04	0.0972
Pearl Cotton	9.72E-04	0.0972
Steel	1.98E-05	0.00198
Total	4.63E-03	0.463

¹ Wood powder from industrial residue of plywood production in Jiangsu, China

² Recycled plastic source is in Jiangsu, China

Potential Environmental Impact – Mandatory Indicators According to EN 15804

Results per functional unit

Indicator	Unit	A1	A2	A3	Tot. A1-A3	A4	A5	B2	B1 & B3-B7	C1	C2	C3	C4	D
GWP Fossil	kg CO ₂ eq.	1.75 E+00	4.56 E-02	4.53 E-02	1.84 E+00	2.23 E-01	2.79 E-02	7.96 E-03	0.00 E+00	7.27 E-03	8.97 E-05	0.00 E+00	4.12 E-01	0.00 E+00
GWP Biogenic	kg CO ₂ eq.	-4.43 E+00	-8.88 E-06	-9.42 E-03	-4.44 E+00	-7.23 E-05	1.63 E-01	4.13 E-03	0.00 E+00	-1.94 E-06	-1.59 E-08	0.00 E+00	3.25 E+00	0.00 E+00
GWP LULUC	kg CO ₂ eq.	4.92 E-03	2.52 E-05	3.51 E-04	5.29 E-03	1.48 E-04	2.02 E-05	1.21 E-02	0.00 E+00	9.50 E-06	4.98 E-08	0.00 E+00	2.14 E-04	0.00 E+00
GWP Total	kg CO ₂ eq.	-2.68 E+00	4.56 E-02	3.62 E-02	-2.59 E+00	2.23 E-01	1.90 E-01	2.42 E-02	0.00 E+00	7.27 E-03	8.98 E-05	0.00 E+00	3.66 E+00	0.00 E+00
ODP	kg CFC 11 eq.	1.98 E-07	1.06 E-08	2.90 E-09	2.12 E-07	4.59 E-08	6.99 E-09	1.20 E-09	0.00 E+00	7.37 E-10	2.10 E-11	0.00 E+00	1.25 E-07	0.00 E+00
AP	mol H ⁺ eq.	1.19 E-02	4.33 E-04	3.30 E-04	1.27 E-02	6.44 E-03	1.20 E-04	9.47 E-05	0.00 E+00	2.75 E-05	8.58 E-07	0.00 E+00	1.84 E-03	0.00 E+00
EP Freshwater	kg P eq.	8.47 E-05	7.01 E-07	7.99 E-06	9.34 E-05	1.54 E-06	7.27 E-07	6.30 E-05	0.00 E+00	2.44 E-07	1.36 E-09	0.00 E+00	9.66 E-06	0.00 E+00
EP Freshwater	kg PO ₄ ³⁻ eq.	2.60 E-04	2.15 E-06	2.45 E-05	2.86 E-04	4.74 E-06	2.23 E-06	1.93 E-04	0.00 E+00	7.49 E-07	4.18 E-09	0.00 E+00	2.96 E-05	0.00 E+00
EP Marine	kg N eq.	2.62 E-03	1.75 E-04	1.50 E-04	2.94 E-03	1.64 E-03	7.84 E-05	1.11 E-04	0.00 E+00	5.09 E-06	3.46 E-07	0.00 E+00	1.47 E-03	0.00 E+00
EP Terrestrial	mol N eq.	3.65 E-02	1.92 E-03	6.92 E-04	3.91 E-02	1.82 E-02	2.57 E-04	3.25 E-04	0.00 E+00	6.02 E-05	3.80 E-06	0.00 E+00	3.94 E-03	0.00 E+00
POCP	kg NMVOC eq.	8.70 E-03	5.31 E-04	2.12 E-04	9.44 E-03	4.72 E-03	1.36 E-04	5.18 E-05	0.00 E+00	1.51 E-05	1.05 E-06	0.00 E+00	2.43 E-03	0.00 E+00
ADP Minerals & Metals*	kg Sb eq.	2.62 E-05	1.08 E-06	2.53 E-06	2.98 E-05	2.22 E-06	2.71 E-07	5.43 E-07	0.00 E+00	5.31 E-08	2.13 E-09	0.00 E+00	4.36 E-06	0.00 E+00
ADP Fossil*	MJ	2.73 E+01	7.50 E-01	6.28 E-01	2.87 E+01	2.95 E+00	6.09 E-01	9.19 E-02	0.00 E+00	1.25 E-01	1.48 E-03	0.00 E+00	9.68 E+00	0.00 E+00
WDP*	m ³	2.47 E+01	9.16 E-02	3.50 E-01	2.51 E+01	3.31 E-01	2.56 E-01	1.91 E-01	0.00 E+00	1.09 E-02	1.66 E-04	0.00 E+00	4.89 E+00	0.00 E+00

Acronyms

GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption

* Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.

Potential Environmental Impact – Additional Mandatory and Voluntary Indicators

Results per functional unit

Indicator	Unit	A1	A2	A3	Tot. A1-A3	A4	A5	B2	B1, B3-B7	C1	C2	C3	C4	D
GWP-GHG ³	kg CO ₂ eq.	1.77 E+00	4.56 E-02	6.01 E-02	1.88 E+00	2.22 E-01	1.89 E-01	2.16 E-02	0.00 E+00	7.27 E-03	8.98 E-05	0.00 E+00	3.64 E+00	0.00 E+00

Use of Resources

Results per functional unit

Indicator	Unit	A1	A2	A3	Tot. A1-A3	A4	A5	B2	B1, B3-B7	C1	C2	C3	C4	D
PERE	MJ	5.62 E+01	1.16 E-02	2.88 E+00	5.91 E+01	2.58 E-02	4.14 E-02	1.17 E-01	0.00 E+00	3.30 E-02	2.31 E-05	0.00 E+00	1.68 E-01	0.00 E+00
PERM	MJ	1.08 E+01	0.00 E+00	4.13 E-01	1.12 E+01	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00
PERT	MJ	6.70 E+01	1.16 E-02	3.29 E+00	7.03 E+01	2.58 E-02	4.14 E-02	1.17 E-01	0.00 E+00	3.30 E-02	2.31 E-05	0.00 E+00	1.68 E-01	0.00 E+00
PENRE	MJ	1.31 E+01	7.65 E-01	6.24 E-01	1.45 E+01	2.98 E+00	6.95 E-01	1.89 E-02	0.00 E+00	1.99 E-01	1.51 E-03	0.00 E+00	9.91 E+00	0.00 E+00
PENRM	MJ.	1.62 E+01	0.00 E+00	4.44 E-02	1.62 E+01	0.00 E+00	0.00 E+00	9.71 E-02	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00
PENRT	MJ	2.93 E+01	7.65 E-01	6.68 E-01	3.07 E+01	2.98 E+00	6.95 E-01	1.16 E-01	0.00 E+00	1.99 E-01	1.51 E-03	0.00 E+00	9.91 E+00	0.00 E+00
SM	kg	3.95 E-01	2.60 E-04	1.58 E-03	3.96 E-01	3.08 E-04	2.06 E-04	1.07 E-03	0.00 E+00	1.39 E-05	5.14 E-07	0.00 E+00	3.84 E-03	0.00 E+00
RSF	MJ	3.93 E-02	2.80 E-04	0.00 E+00	3.96 E-02	5.10 E-04	2.58 E-04	1.55 E-04	0.00 E+00	6.95 E-05	5.87 E-07	0.00 E+00	3.77 E-03	0.00 E+00
NRSF	MJ	-1.69 E-02	-1.93 E-03	0.00 E+00	-1.88 E-02	-6.97 E-03	-6.46 E-04	-1.80 E-04	0.00 E+00	7.72 E-05	-3.81 E-06	0.00 E+00	-1.45 E-02	0.00 E+00
FW	m ³	3.28 E-02	1.24 E-04	5.65 E-03	3.85 E-02	2.20 E-04	4.83 E-04	1.74 E-03	0.00 E+00	3.45 E-05	2.40 E-07	0.00 E+00	8.98 E-03	0.00 E+00

Acronyms

PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water

³ The indicator (GWP-GHG) includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. This indicator is thus almost equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.

Waste Production

Results per functional unit

Indicator	Unit	A1	A2	A3	Tot. A1-A3	A4	A5	B2	B1, B3-B7	C1	C2	C3	C4	D
Hazardous waste disposed	kg	9.30 E-02	9.34 E-04	2.28 E-03	9.62 E-02	3.23 E-03	1.09 E-03	1.62 E-03	0.00 E+00	3.97 E-04	1.83 E-06	0.00 E+00	1.38 E-02	0.00 E+00
Non-hazardous waste disposed	kg	2.83 E+00	1.22 E-01	2.63 E-01	3.22 E+00	1.29 E-01	1.94 E+00	2.56 E-02	0.00 E+00	8.66 E-03	2.40 E-04	0.00 E+00	3.86 E+01	0.00 E+00
Radioactive waste disposed	kg	8.74 E-05	4.82 E-06	1.36 E-06	9.36 E-05	2.06 E-05	4.25 E-06	2.78 E-07	0.00 E+00	1.39 E-06	9.56 E-09	0.00 E+00	5.72 E-05	0.00 E+00

Output Flows

Results per functional unit

Indicator	Unit	A1	A2	A3	Tot. A1-A3	A4	A5	B2	B1, B3-B7	C1	C2	C3	C4	D
Components for re-use	kg	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00
Material for recycling	kg	8.74 E-05	4.82 E-06	7.33 E-05	1.65 E-04	2.06 E-05	4.25 E-06	2.78 E-07	0.00 E+00	1.39 E-06	9.56 E-09	0.00 E+00	5.72 E-05	0.00 E+00
Materials for energy recovery	kg	3.85 E-04	2.74 E-06	0.00 E+00	3.88 E-04	4.99 E-06	2.52 E-06	1.52 E-06	0.00 E+00	6.81 E-07	5.75 E-09	0.00 E+00	3.69 E-05	0.00 E+00
Exported energy, electricity	MJ	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00
Exported energy, thermal	MJ	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00

Information on Biogenic Carbon Content

Results per functional unit

Biogenic carbon content	Unit	Quantity
Biogenic carbon content in product	kg C	0.254
Biogenic carbon content in packaging	kg C	1.02E-03

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO₂

Environmental Information for Hyperion Sentinel Cladding and Hyperion Fencing Products

Potential Environmental Impact – Mandatory Indicators According to EN 15804

Results per functional unit

Indicator	Unit	A1	A2	A3	Tot. A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
GWP Fossil	kg CO ₂ eq.	1.75 E+00	4.56 E-02	4.53 E-02	1.84 E+00	2.23 E-01	2.79 E-02	0.00 E+00	7.27 E-03	8.97 E-05	0.00 E+00	4.12 E-01	0.00 E+00
GWP Biogenic	kg CO ₂ eq.	-4.43 E+00	-8.88 E-06	-9.42 E-03	-4.44 E+00	-7.23 E-05	1.63 E-01	0.00 E+00	-1.94 E-06	-1.59 E-08	0.00 E+00	3.25 E+00	0.00 E+00
GWP LULUC	kg CO ₂ eq.	4.92 E-03	2.52 E-05	3.51 E-04	5.29 E-03	1.48 E-04	2.02 E-05	0.00 E+00	9.50 E-06	4.98 E-08	0.00 E+00	2.14 E-04	0.00 E+00
GWP Total	kg CO ₂ eq.	-2.68 E+00	4.56 E-02	3.62 E-02	-2.59 E+00	2.23 E-01	1.90 E-01	0.00 E+00	7.27 E-03	8.98 E-05	0.00 E+00	3.66 E+00	0.00 E+00
ODP	kg CFC 11 eq.	1.98 E-07	1.06 E-08	2.90 E-09	2.12 E-07	4.59 E-08	6.99 E-09	0.00 E+00	7.37 E-10	2.10 E-11	0.00 E+00	1.25 E-07	0.00 E+00
AP	mol H ⁺ eq.	1.19 E-02	4.33 E-04	3.30 E-04	1.27 E-02	6.44 E-03	1.20 E-04	0.00 E+00	2.75 E-05	8.58 E-07	0.00 E+00	1.84 E-03	0.00 E+00
EP Freshwater	kg P eq.	8.47 E-05	7.01 E-07	7.99 E-06	9.34 E-05	1.54 E-06	7.27 E-07	0.00 E+00	2.44 E-07	1.36 E-09	0.00 E+00	9.66 E-06	0.00 E+00
EP Freshwater	kg PO ₄ ³⁻ eq.	2.60 E-04	2.15 E-06	2.45 E-05	2.86 E-04	4.74 E-06	2.23 E-06	0.00 E+00	7.49 E-07	4.18 E-09	0.00 E+00	2.96 E-05	0.00 E+00
EP Marine	kg N eq.	2.62 E-03	1.75 E-04	1.50 E-04	2.94 E-03	1.64 E-03	7.84 E-05	0.00 E+00	5.09 E-06	3.46 E-07	0.00 E+00	1.47 E-03	0.00 E+00
EP Terrestrial	mol N eq.	3.65 E-02	1.92 E-03	6.92 E-04	3.91 E-02	1.82 E-02	2.57 E-04	0.00 E+00	6.02 E-05	3.80 E-06	0.00 E+00	3.94 E-03	0.00 E+00
POCP	Kg NMVOC eq.	8.70 E-03	5.31 E-04	2.12 E-04	9.44 E-03	4.72 E-03	1.36 E-04	0.00 E+00	1.51 E-05	1.05 E-06	0.00 E+00	2.43 E-03	0.00 E+00
ADP Minerals & Metals*	kg Sb eq.	2.62 E-05	1.08 E-06	2.53 E-06	2.98 E-05	2.22 E-06	2.71 E-07	0.00 E+00	5.31 E-08	2.13 E-09	0.00 E+00	4.36 E-06	0.00 E+00
ADP Fossil*	MJ	2.73 E+01	7.50 E-01	6.28 E-01	2.87 E+01	2.95 E+00	6.09 E-01	0.00 E+00	1.25 E-01	1.48 E-03	0.00 E+00	9.68 E+00	0.00 E+00
WDP*	m ³	2.47 E+01	9.16 E-02	3.50 E-01	2.51 E+01	3.31 E-01	2.56 E-01	0.00 E+00	1.09 E-02	1.66 E-04	0.00 E+00	4.89 E+00	0.00 E+00

Acronyms
 GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption

* Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.

Environmental Information for Hyperion Sentinel Cladding and Hyperion Fencing Products

Potential Environmental Impact – Additional Mandatory and Voluntary Indicators

Results per functional unit

Indicator	Unit	A1	A2	A3	Tot. A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
GWP-GHG ⁴	kg CO ₂ eq.	1.77 E+00	4.56 E-02	6.01 E-02	1.88 E+00	2.22 E-01	1.89 E-01	0.00 E+00	7.27 E-03	8.98 E-05	0.00 E+00	3.64 E+00	0.00 E+00

Use of Resources

Results per functional unit

Indicator	Unit	A1	A2	A3	Tot. A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
PERE	MJ	5.62 E+01	1.16 E-02	2.88 E+00	5.91 E+01	2.58 E-02	4.14 E-02	0.00 E+00	3.30 E-02	2.31 E-05	0.00 E+00	1.68 E-01	0.00 E+00
PERM	MJ	1.08 E+01	0.00 E+00	4.13 E-01	1.12 E+01	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00
PERT	MJ	6.70 E+01	1.16 E-02	3.29 E+00	7.03 E+01	2.58 E-02	4.14 E-02	0.00 E+00	3.30 E-02	2.31 E-05	0.00 E+00	1.68 E-01	0.00 E+00
PENRE	MJ	1.31 E+01	7.65 E-01	6.24 E-01	1.45 E+01	2.98 E+00	6.95 E-01	0.00 E+00	1.99 E-01	1.51 E-03	0.00 E+00	9.91 E+00	0.00 E+00
PENRM	MJ.	1.62 E+01	0.00 E+00	4.44 E-02	1.62 E+01	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00
PENRT	MJ	2.93 E+01	7.65 E-01	6.68 E-01	3.07 E+01	2.98 E+00	6.95 E-01	0.00 E+00	1.99 E-01	1.51 E-03	0.00 E+00	9.91 E+00	0.00 E+00
SM	kg	3.95 E-01	2.60 E-04	1.58 E-03	3.96 E-01	3.08 E-04	2.06 E-04	0.00 E+00	1.39 E-05	5.14 E-07	0.00 E+00	3.84 E-03	0.00 E+00
RSF	MJ	3.93 E-02	2.80 E-04	0.00 E+00	3.96 E-02	5.10 E-04	2.58 E-04	0.00 E+00	6.95 E-05	5.87 E-07	0.00 E+00	3.77 E-03	0.00 E+00
NRSF	MJ	-1.69 E-02	-1.93 E-03	0.00 E+00	-1.88 E-02	-6.97 E-03	-6.46 E-04	0.00 E+00	7.72 E-05	-3.81 E-06	0.00 E+00	-1.45 E-02	0.00 E+00
FW	m ³	3.28 E-02	1.24 E-04	5.65 E-03	3.85 E-02	2.20 E-04	4.83 E-04	0.00 E+00	3.45 E-05	2.40 E-07	0.00 E+00	8.98 E-03	0.00 E+00

Acronyms
 PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water

⁴ The indicator (GWP-GHG) includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. This indicator is thus almost equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.

Environmental Information for Hyperion Sentinel Cladding and Hyperion Fencing Products

Waste Production

Results per functional unit

Indicator	Unit	A1	A2	A3	Tot. A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Hazardous waste disposed	kg	9.30 E-02	9.34 E-04	2.28 E-03	9.62 E-02	3.23 E-03	1.09 E-03	0.00 E+00	3.97 E-04	1.83 E-06	0.00 E+00	1.38 E-02	0.00 E+00
Non-hazardous waste disposed	kg	2.83 E+00	1.22 E-01	2.63 E-01	3.22 E+00	1.29 E-01	1.94 E+00	0.00 E+00	8.66 E-03	2.40 E-04	0.00 E+00	3.86 E+01	0.00 E+00
Radioactive waste disposed	kg	8.74 E-05	4.82 E-06	1.36 E-06	9.36 E-05	2.06 E-05	4.25 E-06	0.00 E+00	1.39 E-06	9.56 E-09	0.00 E+00	5.72 E-05	0.00 E+00

Output Flows

Results per functional unit

Indicator	Unit	A1	A2	A3	Tot. A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Components for re-use	kg	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00
Material for recycling	kg	8.74 E-05	4.82 E-06	7.33 E-05	1.65 E-04	2.06 E-05	4.25 E-06	0.00 E+00	1.39 E-06	9.56 E-09	0.00 E+00	5.72 E-05	0.00 E+00
Materials for energy recovery	kg	3.85 E-04	2.74 E-06	0.00 E+00	3.88 E-04	4.99 E-06	2.52 E-06	0.00 E+00	6.81 E-07	5.75 E-09	0.00 E+00	3.69 E-05	0.00 E+00
Exported energy, electricity	MJ	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00
Exported energy, thermal	MJ	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00

Information on Biogenic Carbon Content

Results per functional unit

Biogenic carbon content	Unit	Quantity
Biogenic carbon content in product	kg C	0.254
Biogenic carbon content in packaging	kg C	1.02E-03

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO₂

Results Interpretation

Most of the environmental impact of the EnviroBuild Hyperion products lie in the raw material supply (A1) or in manufacturing (A3), and secondarily in the importing of the material from China to the warehouse in the UK (A4) and maintenance (B2). With a few exceptions depending on the impact category, other stages tend to have negligible impact by comparison, especially taking into that they vary so widely depending on the product application and use case anyway. Whilst EnviroBuild Hyperion wood plastic composite is technically recyclable, which could offset its environmental impact in the recovery stage (D), at present none is reclaimed for recycling at its end of life. Therefore, though this stage is declared, since there are no savings to be made for now it is zero for every indicator.

Instructions for Proper Use and Maintenance

To help maximise the lifespan of EnviroBuild Hyperion Composite Decking products, the deck should be washed with soap and water at least every 2 years. Cladding and fencing products require no such maintenance.

End-of-Life

Once the decking, cladding, or fencing products have reached their end of life, EnviroBuild recommend reusing the boards for other projects, such as building planters or similar. This is possible as the boards are not expected to lose much of their structural integrity over their expected use time.

However, EnviroBuild do recognise that it's unlikely many customers will do this with their EnviroBuild products, and even if they did, they would still need to be disposed of eventually anyway, only its service life will have increased somewhat.

The procedure for disposal of Hyperion Composite products is to arrange to take the boards to a local dump, where they will likely be sent to landfill.

Product Comparisons

Comparisons to other products, especially from LCAs not conducted by EnviroBuild as well, are discouraged due to differences in product scenarios and the data used. If they are to be compared, the results should first be converted using the table under product information to be per square meter of product, rather than per kg, as this is the unit the products will be used with. Between different decking, cladding, or fencing products there will be differences in the weight per square metre, which is why it would be more accurate to compare per square metre than per kg.

Renewable Energy Use In Manufacturing

Following these results from the previous version of this EPD (v1.0) that indicated around 33% of the climate change total of the products come from module A3 (manufacturing), energy production was switched from using the electrical grid in China to using wind energy starting from the beginning of 2021. This way,

the climate change total of the energy for manufacturing fell 96% from 1.06 kg CO₂ / kWh to 0.0371 kg CO₂ / kWh.

This was done through China's Green Energy Certificate scheme. This system allows companies to purchase renewable energy (either as solar energy or wind energy) voluntarily, and thus claim the environmental benefits of its production. More about the system can be read here:

www.there100.org/sites/re100/files/2020-10/Chinese%20GEC%20Paper_RE100_2020%20FINAL.pdf

Other Environmental Activity

We are on an environmental mission; looking to supply products that offer functional and environmental benefits over traditional construction materials. We look to supply solutions that reduce material usage, have high level of recycled content, use renewable energy in their manufacturing process, have a long working life and can be recycled again themselves. Wherever possible we incorporate environmentally friendly solutions into our supply chain, to give our products a lower carbon footprint to traditional alternatives. To go a step further, we donate 10% of our profits to sustainable causes to help become a carbon negative business. The Rainforest Trust is a non-profit charity that helps to preserve Earth's remaining rainforests through community engagement and local partnerships in vulnerable areas around the world. Rainforests are the pinnacle of life's variety and complexity, and are the most diverse places on our planet, however, an average of 200,000 acres are destroyed every day. This has detrimental consequences that are felt around the world, negatively affecting atmospheric balance, human health and organism survival, amongst others. The Rainforest Trust focuses their efforts around three main protected area types; land acquisition, land designation and community-managed areas. You can find out more about their crucial work in our blog post. Since starting donations in 2016, we have donated towards a wide variety of Rainforest Trust projects with 100% of all donations going directly to these sustainable causes. The mission of the Rainforest Trust is incredibly important; protecting vast areas of rainforest, which consequently protects us, alongside every living organism. We are proud to support its cause and share its values.

For more information, visit www.envirobuild.com/pages/sustainability-what-we-give.

Differences Versus Previous Versions

The only calculation difference to the first published version of this EPD, dated 2021-05-17, is in how the manufacturing module A3 is calculated. In the previous version, electricity is modelled using the EcoInvent database process "market group for electricity, medium voltage | electricity, medium voltage | Cutoff, U - CN". In this version, this flow has been modified to only include electricity from wind energy sources.

Other differences are only in the text, to reflect that this change in electricity source has been made.

References

- General Programme Instructions of the International EPD® System. Version 4.0
- PCR 2019:14. Construction Products. Version 1.1
- EN 15804:2012 + A2:2019 Sustainability of Construction Works. Environmental Product Declarations. Core Rules for the Product Category of Construction Products
- EN 15534:2014 Composites made from cellulose-based materials and thermoplastics (usually called wood-polymer composites (WPC) or natural fibre composites (NFC))
 - -1 Test methods for characterisation of compounds and products
 - -4 Specifications for decking profiles and tiles
 - -5 Specifications for cladding profiles and tiles
- EN 1383:2016 Timber structures. Test methods. Pull through resistance of timber fasteners
- EN 13823:2010+A1:2014 Reaction to fire tests for building products. Building products excluding floorings exposed to the thermal attack by a single burning item
- EN ISO 9239-1:2010 Reaction to fire tests for floorings. Determination of the burning behaviour using a radiant heat source
- EN ISO 11925-2:2020 Reaction to fire tests. Ignitability of products subjected to direct impingement of flame. Single-flame source test
- ISO 11359-2:1999 Plastics — Thermomechanical analysis (TMA) — Part 2: Determination of coefficient of linear thermal expansion and glass transition temperature
- CEN/TS 15676:2007 Wood flooring. Slip resistance. Pendulum test

