

Statement of Verification

BREG EN EPD No.: 000541

Issue 02

This is to verify that the
Environmental Product Declaration
provided by:
Mayflex UK Limited



is in accordance with the requirements of:
EN 15804:2012+A2:2019
and
BRE Global Scheme Document SD207

This declaration is for:
Excel 1U Fibre Optic Patch Panels

Company Address

Mayflex UK Limited
Unit 15,
Junction Six Industrial Park,
Electric Avenue
Birmingham
B6 7JJ



Laura Critien
Operator

25 October 2023
Date of this Issue

25 October 2023
Date of First Issue

24 October 2028
Expiry Date



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Environmental Product Declaration

EPD Number: **000541**

General Information

EPD Programme Operator	Applicable Product Category Rules
BRE Global Watford, Herts WD25 9XX United Kingdom	BRE 2021 Product Category Rules (PN 514 Rev 3.0) for Type III environmental product declaration of construction products to EN 15804:2012+A2:2019.
Commissioner of LCA study	LCA consultant/Tool
Mayflex UK Limited Unit 15, Junction Six Industrial Park, Electric Avenue Birmingham B6 7JJ	LCA Tool: BRE LINA A2 LCA Consultant: Bala Subramanian
Declared/Functional Unit	Applicability/Coverage
Excel 1U Fibre Optic Patch Panels	Other (please specify). Product Specific
EPD Type	Background database
Cradle to Gate with options	ecoinvent
Demonstration of Verification	
CEN standard EN 15804 serves as the core PCR ^a	
Independent verification of the declaration and data according to EN ISO 14025:2010 <input type="checkbox"/> Internal <input checked="" type="checkbox"/> External	
(Where appropriate ^b)Third party verifier: Pat Hermon	
a: Product category rules b: Optional for business-to-business communication; mandatory for business-to-consumer communication (see EN ISO 14025:2010, 9.4)	
Comparability	
Environmental product declarations from different programmes may not be comparable if not compliant with EN 15804:2012+A2:2019. Comparability is further dependent on the specific product category rules, system boundaries and allocations, and background data sources. See Clause 5.3 of EN 15804:2012+A2:2019 for further guidance	

Information modules covered

Product			Construction		Use stage							End-of-life				Benefits and loads beyond the system boundary
					Related to the building fabric					Related to the building						
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Raw materials supply	Transport	Manufacturing	Transport to site	Construction – Installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction demolition	Transport	Waste processing	Disposal	Reuse, Recovery and/or Recycling potential
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Note: Ticks indicate the Information Modules declared.

Manufacturing site(s)

Mayflex UK Limited
 Unit 15,
 Junction Six Industrial Park,
 Electric Avenue
 Birmingham
 B6 7JJ

Construction Product:

Product Description

The Excel range of LC patch panels are sliding drawer "tray style" housings suitable for either direct termination or splicing of up to 96 fibres in 1U of rack space. Each panel is manufactured from high quality 1.2 mm thick steel and finished in Black powder coat to provide a strong and durable unit. All panels feature a pull-out drawer for easy access for splicing etc. The drawer is mounted on steel ball-bearing sliders for smooth action. To the front of the patch panel the specified number of adaptors are loaded from left to right. Each panel utilises colour coded adaptors, beige, aqua and violet for Multimode, blue for Singlemode, and green for Singlemode APC. Each duplex (or quad) adaptor accommodates two (or four) connectorised fibres. On the rear panel, there are 4 gland entry holes which allow cable entry on both LHS and RHS – 2 are suitable for M20 (or PG13.5) glands, and 2 are suitable for M25 (or PG19) glands. There are also 8 holes (8mm) to allow for blown fibre tubes to be inserted.

Each panel has included within it a set of fixing brackets, and a cable management pack which includes cable entry glands, cable ties, splice holders, cage nuts and screws. The LC panels can be assembled to order using a combination of adaptors, pigtailed and splice cassettes as required.

Technical Information

Property	200-466	200-460	200-462	200-464	200-489
Fibre Capacity	48	48	48	48	96
Adaptor Capacity	24	24	24	24	24
No. of Adaptors	24	4	8	12	24
With pigtailed	No	No	No	No	No

Property	200-466	200-460	200-462	200-464	200-489
Fibre type	Multimode	Multimode	Multimode	Multimode	Multimode
Adaptor Type	LC-Duplex	LC-Duplex	LC-Duplex	LC-Duplex	LC-Quad
Panel Colour	Black	Black	Black	Black	Black
RAL-number	9005	9005	9005	9005	9005
Mounting Width	19"	19"	19"	19"	19"
Height (U)	1U	1U	1U	1U	1U
Height	43.5 mm	43.5 mm	43.5 mm	43.5 mm	43.5 mm
Width	483 mm	483 mm	483 mm	483 mm	483 mm
Depth	219.5 mm	219.5 mm	219.5 mm	219.5 mm	219.5 mm
Operating Temperature	-40 to +80 °C	-40 to +80 °C	-40 to +80 °C	-40 to +80 °C	-40 to +80 °C
IP Rating	IP20	IP20	IP20	IP20	IP20
Cable Entry 20mm	2	2	2	2	2
Cable Entry 25mm	2	2	2	2	2
Material	Cold rolled steel	Cold rolled steel	Cold rolled steel	Cold rolled steel	Cold rolled steel
Material Thickness	1.2mm	1.2mm	1.2mm	1.2mm	1.2mm
Material Coating	Powder Coating	Powder Coating	Powder Coating	Powder Coating	Powder Coating
Cable Gland (PG 13.5)	1	1	1	1	1
Cable Gland (PG 19)	1	1	1	1	1
Nylon cable tie	7	7	7	7	7
Cable ties	4	4	4	4	4
48 Position splice holder	1	1	1	1	2
Label holder	2	2	2	2	2
Mounting twist tie	4	4	4	4	4
Cage nuts/screws	4	4	4	4	4

Property	200-470	200-472	200-474	200-476	200-488
Fibre Capacity	48	48	48	48	96
Adaptor Capacity	24	24	24	24	24
No. of Adaptors	4	8	12	24	24
With pigtails	No	No	No	No	No
Fibre type	Singlemode	Singlemode	Singlemode	Singlemode	Singlemode
Fibre class	OS2	OS2	OS2	OS2	OS2
APC-type	No	No	No	No	No
Adaptor Type	LC-Duplex	LC-Duplex	LC-Duplex	LC-Duplex	LC-Quad
Panel Colour	Black	Black	Black	Black	Black

Property	200-470	200-472	200-474	200-476	200-488
RAL-number	9005	9005	9005	9005	9005
Mounting Width	19"	19"	19"	19"	19"
Height (U)	1U	1U	1U	1U	1U
Height	43.5 mm	43.5 mm	43.5 mm	43.5 mm	43.5 mm
Width	483 mm	483 mm	483 mm	483 mm	483 mm
Depth	219.5 mm	219.5 mm	219.5 mm	219.5 mm	219.5 mm
Operating Temperature	-40 to +80 °C	-40 to +80 °C	-40 to +80 °C	-40 to +80 °C	-40 to +80 °C
IP Rating	IP20	IP20	IP20	IP20	IP20
Cable Entry 20mm	2	2	2	2	2
Cable Entry 25mm	2	2	2	2	2
Material	Cold rolled steel	Cold rolled steel	Cold rolled steel	Cold rolled steel	Cold rolled steel
Material Thickness	1.2mm	1.2mm	1.2mm	1.2mm	1.2mm
Material Coating	Powder Coating	Powder Coating	Powder Coating	Powder Coating	Powder Coating
Cable Gland (PG 13.5)	1	1	1	1	1
Cable Gland (PG 19)	1	1	1	1	1
Nylon cable tie	7	7	7	7	7
Adjustable cable tie	4	4	4	4	4
48 Position splice holder	1	1	1	1	2
Label holder	2	2	2	2	2
Mounting twist tie	4	4	4	4	4
Cage nuts and screws	4	4	4	4	4

Applicable Standard	Subject
ISO/IEC 11801	Information Technology – Generic Cabling for Customer Premises
IEC 60304	Standard Colours for Insulation for Low-Frequency Cables and Wires
IEC 61754	Fibre optic interconnecting devices and passive components - Fibre optic connector interfaces
TIA/EIA 568.D	Generic Telecommunications Cabling for Customer Premises
RoHS	Compliant to the Restriction of Hazardous Substances
WFD	Compliant to Waste Framework Directive
SCIP	Compliant - Does Not Contain Substances of Concern in Products



Main Product Contents

Material/Chemical Input	%
Steel	90-95
Plastics	0-5
Nylon	0-1
Others	0-2

Manufacturing Process

Incoming materials are selected and inspected for defects and anomalies. Once approved for production they are prepared for stamping. Production starts with blanking which is the separation of the workpiece from the primary sheet. Once the workpiece is ready, it is stamped into a useable shape by a die and a press. The workpiece is then bent into the required shape by means of applying force using a press brake tool, the work piece is then inspected.

The shaped work piece now goes through the welding process. The first produced sample is inspected by the production operator, foreman and quality control class inspector to confirm production is accurate and without errors. Random inspections on products continue throughout production. The welding process comprises the use of jigs and welding fixtures depending on product model specifications.

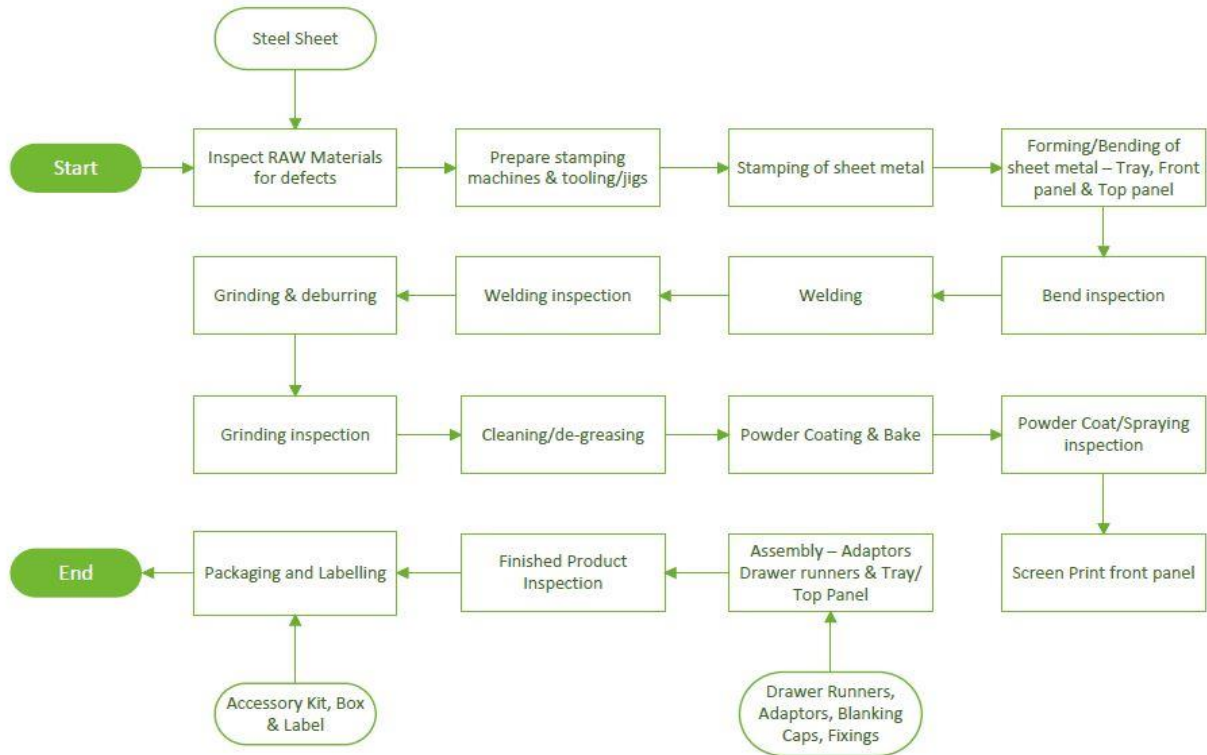
The work piece now enters the grinding & de-burring process to remove all excess metal shavings and rough edging from the previous steps. Once complete, the product is inspected for manufacturing errors and dimensions to ensure all is within tolerance for later assembly.

The work piece is now thoroughly cleaned/de-greased prior to powder coating/spraying. This process takes place on a conveyor and the parts will be passed through an oven to bake on the coating. Once complete, it will be quality inspected.

The final stage of production is the assembly of the product. The drawer runners are assembled to the tray and inner adaptor panel is added. When the Tray is assembled, it is attached to the top cover. Once the assembly is completed, the product is fully cleaned and inspected to confirm accuracy and quality. It is then packaged with the accessory kit & labelled ready to be shipped.

Process flow diagram

Fibre Optic Panels



Construction Installation

Loaded patch panels are supplied with pre-configured adaptors for fast, easy installation. All patch panels are supplied with a cable management kit and cage nuts, cabinet installation is completed using the supplied fixing arms.

End of Life

Loaded patch panels made up of steel and plastics on it, so at the end of life the cabinet will be recycled, and plastics will be sent to landfill.

Life Cycle Assessment Calculation Rules

Declared / Functional unit description

Excel Loaded patch panels with the weight of 3.54 kg per panel.

System boundary

This is a cradle-to-gate LCA, reporting all production life cycle stages of modules A1 to A3 and A4 and A5 (transportation and installation) and end of life stages C1-C4, and D in accordance with EN 15804:2012+A2:2019 and BRE 2021 Product Category Rules (PN 514 Rev 3.0).

Data sources, quality and allocation

The quantity used in the data collection for this EPD is the total quantity of Excel LC patch panels manufactured as a proportion of the total manufactured during the data collection period (01/01/21-31/12/21). Mayflex receives the Excel Loaded patch panels from their PRC manufacturing partners, therefore the transportation used to transfer the products from PRC to the UK is included in this LCA analysis. Other products are manufactured in addition to the Excel Loaded patch panels, therefore the allocation of electricity and water consumption and discharge are required, and this has been done according to the provisions of the BRE PCR PN514 and EN 15804. The allocation factor was based on the total kg production output of the Loaded fibre patch panel products compared to the total kg production output of the manufacturing site over the data collection period.

The Excel Loaded patch panels are available in different colours beige, aqua and violet for Multimode, blue for Singlemode, and green for Singlemode APC. However, the weight of each fibre panel is similar - 3.54 kg per panel. So, in this EPD the total production data has been used for the LCA modelling. Secondary data has been obtained for all other upstream and downstream processes that are beyond the control of the manufacturer (i.e., raw material production) from the ecoinvent 3.8 database. All ecoinvent datasets are complete within the context used and conform to the system boundary and the criteria for the exclusion of inputs and outputs, according to the requirements specified in EN15804 A2.

ISO14044 guidance. Quality Level	Geographical representativeness	Technical representativeness	Time representativeness
Very Good	Data from area under study.	Data from processes and products under study. Same state of technology applied as defined in goal and scope (i.e., identical technology).	n/a
Very Good	n/a	n/a	There is approximately 1-2 years between the Ecoinvent LCI reference year, and the time period for which the LCA was undertaken.

Specific European datasets have been selected from the ecoinvent LCI for this LCA. Manufacturer uses the national grid electricity for production, so therefore the national grid electricity dataset has been used for the LCA modelling (Ecoinvent 3.8). The GWP carbon footprint for using 1 kWh of Electricity, China is 1.054 in kgCO₂e/kWh. The quality level of time representativeness is also Very Good as the background LCI datasets are based on ecoinvent v3.8 which was compiled in 2021. Therefore, there is less than 5 years between the ecoinvent LCI reference year and the time period for which the LCA was undertaken.

Cut-off criteria

All raw materials and energy inputs to the manufacturing process have been included. There were no ancillary materials used during the production and no direct emissions to air, water, or soil, which were not measured, and there were no non-production wastes recorded during the production period.

LCA Results - Excel Loaded patch panels with the weight of 3.54 kg.

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

Parameters describing environmental impacts			GWP-total	GWP-fossil	GWP-biogenic	GWP-luluc	ODP	AP	EP-freshwater
			kg CO ₂ eq	kg CO ₂ eq	kg CO ₂ eq	kg CO ₂ eq	kg CFC11 eq	mol H ⁺ eq	kg (PO ₄) ³⁻ eq
Product stage	Raw material supply	A1	8.01E+00	7.98E+00	2.17E-02	6.02E-03	3.90E-07	3.48E-02	3.53E-03
	Transport	A2	8.02E-01	8.02E-01	3.72E-05	5.42E-04	1.63E-07	2.23E-02	3.08E-05
	Manufacturing	A3	1.40E-01	4.37E-01	-3.02E-01	2.27E-03	4.40E-08	2.29E-03	1.91E-04
	Total (Consumption grid)	A1-3	8.95E+00	9.21E+00	-2.80E-01	8.82E-03	5.98E-07	5.94E-02	3.75E-03
Construction process stage	Transport	A4	1.01E-01	1.01E-01	8.63E-05	3.97E-05	2.34E-08	4.11E-04	6.52E-06
	Construction	A5	4.88E-02	5.07E-04	4.83E-02	1.66E-07	3.52E-11	5.41E-06	2.23E-07
Use stage	Use	B1	MND	MND	MND	MND	MND	MND	MND
	Maintenance	B2	MND	MND	MND	MND	MND	MND	MND
	Repair	B3	MND	MND	MND	MND	MND	MND	MND
	Replacement	B4	MND	MND	MND	MND	MND	MND	MND
	Refurbishment	B5	MND	MND	MND	MND	MND	MND	MND
	Operational energy use	B6	MND	MND	MND	MND	MND	MND	MND
	Operational water use	B7	MND	MND	MND	MND	MND	MND	MND
95% - Recycling 5% - Landfill									
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	7.36E-03	7.35E-03	6.27E-06	2.89E-06	1.70E-09	2.99E-05	4.74E-07
	Waste processing	C3	1.94E-01	1.94E-01	6.83E-05	1.93E-05	4.14E-08	2.01E-03	6.00E-06
	Disposal	C4	4.29E-01	4.29E-01	5.26E-04	9.81E-05	5.08E-08	6.42E-04	1.21E-04
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-6.17E+00	-6.18E+00	1.41E-02	-3.90E-03	-2.81E-07	-2.37E-02	-2.73E-03

GWP-total = Global warming potential, total;
 GWP-fossil = Global warming potential, fossil;
 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; and
 EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment

LCA Results (continued)

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

Parameters describing environmental impacts			EP-marine	EP-terrestrial	POCP	ADP-mineral & metal	ADP-fossil	WDP	PM
			kg N eq	mol N eq	kg NMVOC eq	kg Sb eq	MJ, net calorific value	m ³ world eq deprived	disease incidence
Product stage	Raw material supply	A1	8.25E-03	7.80E-02	3.50E-02	8.84E-05	9.57E+01	3.84E+00	6.38E-07
	Transport	A2	5.53E-03	6.14E-02	1.60E-02	1.43E-06	1.06E+01	2.93E-02	3.23E-08
	Manufacturing	A3	1.02E-03	6.80E-03	1.63E-03	2.06E-06	6.35E+00	2.52E-01	3.46E-08
	Total (Consumption grid)	A1-3	1.48E-02	1.46E-01	5.26E-02	9.18E-05	1.13E+02	4.13E+00	7.05E-07
Construction process stage	Transport	A4	1.24E-04	1.35E-03	4.14E-04	3.52E-07	1.53E+00	6.89E-03	8.73E-09
	Construction	A5	2.84E-06	2.73E-05	6.71E-06	1.25E-09	4.35E-03	-2.97E-04	5.78E-11
Use stage	Use	B1	MND	MND	MND	MND	MND	MND	MND
	Maintenance	B2	MND	MND	MND	MND	MND	MND	MND
	Repair	B3	MND	MND	MND	MND	MND	MND	MND
	Replacement	B4	MND	MND	MND	MND	MND	MND	MND
	Refurbishment	B5	MND	MND	MND	MND	MND	MND	MND
	Operational energy use	B6	MND	MND	MND	MND	MND	MND	MND
	Operational water use	B7	MND	MND	MND	MND	MND	MND	MND
95% - Recycling 5% - Landfill									
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	8.99E-06	9.82E-05	3.01E-05	2.56E-08	1.11E-01	5.00E-04	6.35E-10
	Waste processing	C3	8.91E-04	9.76E-03	2.68E-03	9.96E-08	2.66E+00	6.14E-03	5.39E-08
	Disposal	C4	1.40E-04	1.38E-03	3.77E-04	8.55E-07	2.02E+00	6.28E-02	6.05E-09
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-5.69E-03	-5.98E-02	-2.94E-02	-8.43E-06	-6.00E+01	-1.48E+00	-4.70E-07

EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment;
 EP-terrestrial = Eutrophication potential, accumulated exceedance;
 POCP = Formation potential of tropospheric ozone;
 ADP-mineral&metals = Abiotic depletion potential for non-fossil resources;

ADP-fossil = Depletion potential of the stratospheric ozone layer;
 WDP = Water (user) deprivation potential, deprivation-weighted water consumption; and
 PM = Particulate matter.

LCA Results (continued)

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

Parameters describing environmental impacts			IRP	ETP-fw	HTP-c	HTP-nc	SQP
			kBq U ²³⁵ eq	CTUe	CTUh	CTUh	dimensionless
Product stage	Raw material supply	A1	4.36E-01	2.31E+02	5.74E-08	2.42E-07	2.64E+01
	Transport	A2	4.90E-02	6.82E+00	4.60E-10	5.04E-09	2.50E+00
	Manufacturing	A3	4.83E-02	9.65E+00	4.44E-10	5.69E-09	3.18E+01
	Total (Consumption grid)	A1-3	5.33E-01	2.48E+02	5.83E-08	2.53E-07	6.06E+01
Construction process stage	Transport	A4	7.86E-03	1.19E+00	3.87E-11	1.25E-09	1.05E+00
	Construction	A5	9.42E-06	7.83E-03	1.44E-12	6.91E-11	1.40E-03
Use stage	Use	B1	MND	MND	MND	MND	MND
	Maintenance	B2	MND	MND	MND	MND	MND
	Repair	B3	MND	MND	MND	MND	MND
	Replacement	B4	MND	MND	MND	MND	MND
	Refurbishment	B5	MND	MND	MND	MND	MND
	Operational energy use	B6	MND	MND	MND	MND	MND
	Operational water use	B7	MND	MND	MND	MND	MND
95% - Recycling 5% - Landfill							
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	5.72E-04	8.68E-02	2.81E-12	9.10E-11	7.64E-02
	Waste processing	C3	1.20E-02	1.55E+00	6.01E-11	1.13E-09	3.38E-01
	Disposal	C4	1.32E-02	8.32E+00	2.68E-10	3.11E-09	4.31E-01
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-1.52E-01	-1.73E+02	-3.62E-08	-1.28E-07	-1.66E+01

IRP = Potential human exposure efficiency relative to U235;
 ETP-fw = Potential comparative toxic unit for ecosystems;
 HTP-c = Potential comparative toxic unit for humans;

HTP-nc = Potential comparative toxic unit for humans; and
 SQP = Potential soil quality index.

LCA Results (continued)

			Parameters describing resource use, primary energy					
			PERE	PERM	PERT	PENRE	PENRM	PENRT
			MJ	MJ	MJ	MJ	MJ	MJ
Product stage	Raw material supply	A1	7.33E+00	0.00E+00	7.33E+00	8.43E+01	6.44E+00	9.07E+01
	Transport	A2	8.65E-02	0.00E+00	8.65E-02	1.04E+01	0.00E+00	1.04E+01
	Manufacturing	A3	-2.02E-01	6.99E+00	6.79E+00	8.17E+00	3.08E-01	8.48E+00
	Total (Consumption grid)	A1-3	7.22E+00	6.99E+00	1.42E+01	1.03E+02	6.74E+00	1.10E+02
Construction process stage	Transport	A4	2.16E-02	0.00E+00	2.16E-02	1.50E+00	0.00E+00	1.50E+00
	Construction	A5	-1.47E+00	1.47E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use stage	Use	B1	MND	MND	MND	MND	MND	MND
	Maintenance	B2	MND	MND	MND	MND	MND	MND
	Repair	B3	MND	MND	MND	MND	MND	MND
	Replacement	B4	MND	MND	MND	MND	MND	MND
	Refurbishment	B5	MND	MND	MND	MND	MND	MND
	Operational energy use	B6	MND	MND	MND	MND	MND	MND
	Operational water use	B7	MND	MND	MND	MND	MND	MND
95% - Recycling 5% - Landfill								
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	1.57E-03	0.00E+00	1.57E-03	1.09E-01	0.00E+00	1.09E-01
	Waste processing	C3	1.49E-02	0.00E+00	1.49E-02	2.60E+00	0.00E+00	2.60E+00
	Disposal	C4	8.46E-02	0.00E+00	8.46E-02	-1.02E+00	3.01E+00	1.99E+00
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-1.90E+00	0.00E+00	-1.90E+00	-5.92E+01	0.00E+00	-5.92E+01

PERE = Use of renewable primary energy excluding renewable primary energy 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 resource

LCA Results (continued)

Parameters describing resource use, secondary materials and fuels, use of water						
			SM	RSF	NRSF	FW
			kg	MJ net calorific value	MJ net calorific value	m ³
Product stage	Raw material supply	A1	0.00E+00	0.00E+00	0.00E+00	9.48E-02
	Transport	A2	0.00E+00	0.00E+00	0.00E+00	7.25E-04
	Manufacturing	A3	0.00E+00	0.00E+00	0.00E+00	6.08E-03
	Total (Consumption grid)	A1-3	0.00E+00	0.00E+00	0.00E+00	1.02E-01
Construction process stage	Transport	A4	0.00E+00	0.00E+00	0.00E+00	1.71E-04
	Construction	A5	0.00E+00	0.00E+00	0.00E+00	-6.85E-06
Use stage	Use	B1	MND	MND	MND	MND
	Maintenance	B2	MND	MND	MND	MND
	Repair	B3	MND	MND	MND	MND
	Replacement	B4	MND	MND	MND	MND
	Refurbishment	B5	MND	MND	MND	MND
	Operational energy use	B6	MND	MND	MND	MND
	Operational water use	B7	MND	MND	MND	MND
95% - Recycling 5% - Landfill						
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	0.00E+00	0.00E+00	0.00E+00	1.24E-05
	Waste processing	C3	0.00E+00	0.00E+00	0.00E+00	1.51E-04
	Disposal	C4	0.00E+00	0.00E+00	0.00E+00	1.51E-03
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	0.00E+00	0.00E+00	0.00E+00	-3.54E-02

SM = Use of secondary material;
RSF = Use of renewable secondary fuels;

NRSF = Use of non-renewable secondary fuels;
FW = Net use of fresh water

LCA Results (continued)

Other environmental information describing waste categories			HWD	NHWD	RWD
			kg	kg	kg
Product stage	Raw material supply	A1	2.86E+00	1.34E+01	1.88E-04
	Transport	A2	1.37E-02	1.34E-01	4.38E-01
	Manufacturing	A3	5.99E-02	8.71E-01	2.07E-05
	Total (Consumption grid)	A1-3	2.93E+00	1.44E+01	4.38E-01
Construction process stage	Transport	A4	1.69E-03	3.00E-02	1.04E-05
	Construction	A5	0.00E+00	0.00E+00	0.00E+00
Use stage	Use	B1	MND	MND	MND
	Maintenance	B2	MND	MND	MND
	Repair	B3	MND	MND	MND
	Replacement	B4	MND	MND	MND
	Refurbishment	B5	MND	MND	MND
	Operational energy use	B6	MND	MND	MND
	Operational water use	B7	MND	MND	MND
95% - Recycling 5% - Landfill					
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	1.23E-04	2.18E-03	7.52E-07
	Waste processing	C3	3.50E-03	2.45E-02	1.83E-05
	Disposal	C4	2.51E-01	1.23E-01	1.19E-05
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-1.15E+00	-9.82E+00	-9.65E-05

HWD = Hazardous waste disposed;
 NHWD = Non-hazardous waste disposed;
 RWD = Radioactive waste disposed

LCA Results (continued)

Other environmental information describing output flows – at end of life								
			CRU	MFR	MER	EE	Biogenic carbon (product)	Biogenic carbon (packaging)
			kg	kg	kg	MJ per energy carrier	kg C	kg C
Product stage	Raw material supply	A1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	A2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Manufacturing	A3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.66E-01
	Total (Consumption grid)	A1-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.66E-01
Construction process stage	Transport	A4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Construction	A5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use stage	Use	B1	MND	MND	MND	MND	MND	MND
	Maintenance	B2	MND	MND	MND	MND	MND	MND
	Repair	B3	MND	MND	MND	MND	MND	MND
	Replacement	B4	MND	MND	MND	MND	MND	MND
	Refurbishment	B5	MND	MND	MND	MND	MND	MND
	Operational energy use	B6	MND	MND	MND	MND	MND	MND
	Operational water use	B7	MND	MND	MND	MND	MND	MND
95% - Recycling								
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Waste processing	C3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Disposal	C4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	0.00E+00	-3.17E-05	-1.20E-06	-4.63E-03	0.00E+00	0.00E+00

CRU = Components for reuse;
MFR = Materials for recycling

MER = Materials for energy recovery;
EE = Exported Energy

Scenarios and additional technical information

Scenarios and additional technical information			
Scenario	Parameter	Units	Results
A4 – Transport to the building site	Mayflex receives the fibre panel from PRC and without any further processing in the distribution sector they will be distributed to the customer site.		
	Fuel type / Vehicle type	Road transport	16–32-ton lorry
	Distance: Mayflex to customer site	Km	172
	Capacity utilisation (incl. empty returns)	%	49
	Bulk density of transported products	kg/m ³	342
A5 – Installation in the building	The installation of the fibre panel is carried out by manual labour, and it is installed directly on the construction without the use of power equipment during the installation. During the installation, only packaging waste resulted.		
	Pallets	Incinerated	0.033
	Paper packaging	Recycling	0.104
C1 – Deconstruction	Fibre panels are removed manually from the building sites. Therefore, no energy is associated while removing the panels from the building.		
C2 – Transportation	Recovered panels are taken back by the registered broker	km	12.5
C3- Waste processing	The end-of-life stage starts when the product is replaced, dismantled, and does not provide any further function. The composition of Excel LC patch panels is 95% steel; therefore, at the end of life, 95% of the steel is assumed to be recycled, and 5% of the other compositions are assumed to be unrecoverable, so they are sent to landfills.		
	The recovered steel is transported for recycling, while a small portion is assumed to be unrecoverable and is sent to landfill. The separation processes have not been included in Module C3 because they are assumed to be very small and effectively negligible.		
	Steel	%	95
C4- Disposal	The recovered panel is sent recycling while a small portion is assumed to be unrecoverable which is considered to send to landfill		
	Unrecoverable panel components to landfill	%	5
Module D	It is assumed that 95% of the panel used in the construction building is recovered for recycling and remaining 5% is sent to landfill. The calculation assumes that there is no yield-loss during the recycling process.		
	Recycling (95%): 3.363 kg. Landfill (5%): 0.177 kg.		

Interpretation of results:

The bulk of the environmental impacts are attributed to the manufacturing of Excel LC patch panels covered by information modules A1-A3 of EN15804:2012+A2:2019.

References

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