

Statement of Verification

BREG EN EPD No.: 000539

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 Environ floor-standing racks

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: 000539

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 Environ floor-standing racks	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 Environ range of floor-standing racks are a versatile range with features suitable for a wide variety of applications within the data, security, audio visual and telecommunications markets. The range covers Equipment (ER), Communications (CR) and Server Racks (SR). The racks are available in a multitude of footprints and heights. There is a choice of 2 widths – 600mm and 800mm, 4 depths – 600mm, 800mm, 1000mm and 1200mm, and heights ranging from 15U to 47U. The ER/CR range is designed for use within small equipment rooms and data centres with a choice of doors from glass, solid steel and vented full-width and wardrobe style double doors. The load capacity is 800kg UDL. The SR range is designed for housing larger active equipment, so is available up to 1200mm deep and has a load capacity of up to 1500kg (UDL), which is ideal for large servers and UPS's.

There are a large of accessories available for the racks including cable management, air baffle kits, fan trays, plinths, earthing kits, combination, and electronic locks etc. All these are available separately or pre-built into the racks. All racks are supplied with a full accessory kit which includes casters, adjustable feet, and baying kit.

Product name:	Item Code	Weight (kg)
Environ CR600 24U Rack 600x600mm Glass (F) Steel (R) B/Panels No/Mgmt Black Flat Pack	542-2466-GSBN-BK-FP	58.5
Environ CR800 42U Rack 800x800mm Glass (F) Steel (R) B/Panels F/Mgmt Black Flat Pack	542-4288-GSBF-BK-FP	142
Environ ER800 42U Rack 800x1000mm W/Vented (F) D/Vented (R) B/Panels F/Mgmt Black Flat Pack	542-42810-WDBF-BK-FP	155
Environ SR800 42U Rack 800x1000mm W/Vented (F) D/Vented (R) B/Panels R/Mgmt Black Flat Pack	544-42810-WDBR-BK-FP	168

In this EPD, Environ SR800 42U Rack 800x1000mm W/Vented (F) D/Vented (R) B/Panels R/Mgmt Black Flat Pack with the weight of 168kg has been taken as a representative among their group and the end user table is included at the end of the EPD to enable the impacts of the other floor-standing racks.

Technical Information

Property	542-2466-GSBN-BK	542-4288-GSBF-BK	542-42810-WDBF-BK	542-42810-WDBR-BK
Width	600mm	800mm	800mm	800mm
Depth	600mm	800mm	1000mm	1000mm
Height (Internal U)	24U	42U	42U	42U
Height (External)	1270mm	2070mm	2070mm	2000mm
Mounting Profiles	Front & rear	Front & rear	Front & rear	Front & rear
Profile spacing	19"	19"	19"	19"
Load Capacity	800kg	800kg	800kg	1500kg
Front door type	Glass	Glass	Vented - single	Vented - single
Rear door type	Steel	Steel	Vented - double	Vented - double
Removable Roof Plate	Yes	Yes	Yes	Yes
Earthing Studs	Yes	Yes	Yes	Yes
Door Locks	Single lock barrel	Single lock barrel	Swing Handle	Swing Handle
Side Panels	Yes	Yes	Yes	Yes
Cable Management	No	Yes - Front	Yes - Front	Yes - Rear
RAL Colour	Black RAL9004	Black RAL9004	Black RAL9004	Black RAL9004
Finish	Powder Coat	Powder Cost	Powder Coat	Powder Coat
IP Rating	IP20	IP20	IP20	IP20
Material	Cold Rolled Steel	Cold Rolled Steel	Cold Rolled Steel	Cold Rolled Steel
Rail Thickness	2.0mm	2.0mm	2.0mm	2.0mm
Rail Finish	Galvanised	Galvanised	Galvanised	Galvanised
Rail U Markings	Yes	Yes	Yes	Yes
Side Panel Locks	Yes	Yes	Yes	Yes
Castors	Yes	Yes	Yes	Yes
Castor Height	70mm	70mm	70mm	70mm
Levelling Feet	Yes	Yes	Yes	Yes
Feet Height	50-80mm	50-80mm	50-80mm	50-80mm
Baying Kit	Yes	Yes	Yes	Yes

Note: Technical properties of all products assessed within this EPD

Applicable standards

Applicable Standard	Subject
ANSI/EIA-310-E	Electronic Industries Association standard for horizontal spacing, vertical hole spacing, rack opening and front panel width
BS EN 60297-3-100:2009	Mechanical structures for electronic equipment. Dimensions of mechanical structures of the 482,6 mm (19 in) series. Basic dimensions of front panels, sub-racks, chassis, racks and cabinets
DIN 41494 Part 1 & 7	Panel Mounting Racks for Electronics Equipment; Racks And Panels, Dimensions; Dimensions of cabinets and suites of racks
WFD	Compliant to Waste Framework Directive
SCIP	Compliant - Does Not Contain Substances of Concern in Products

Note: Technical standards of all products assessed within this EPD



Main Product Contents

Material/Chemical Input	%
Carbon Steel	99
Other	0-1

Note: Material composition of all products assessed within this EPD

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.

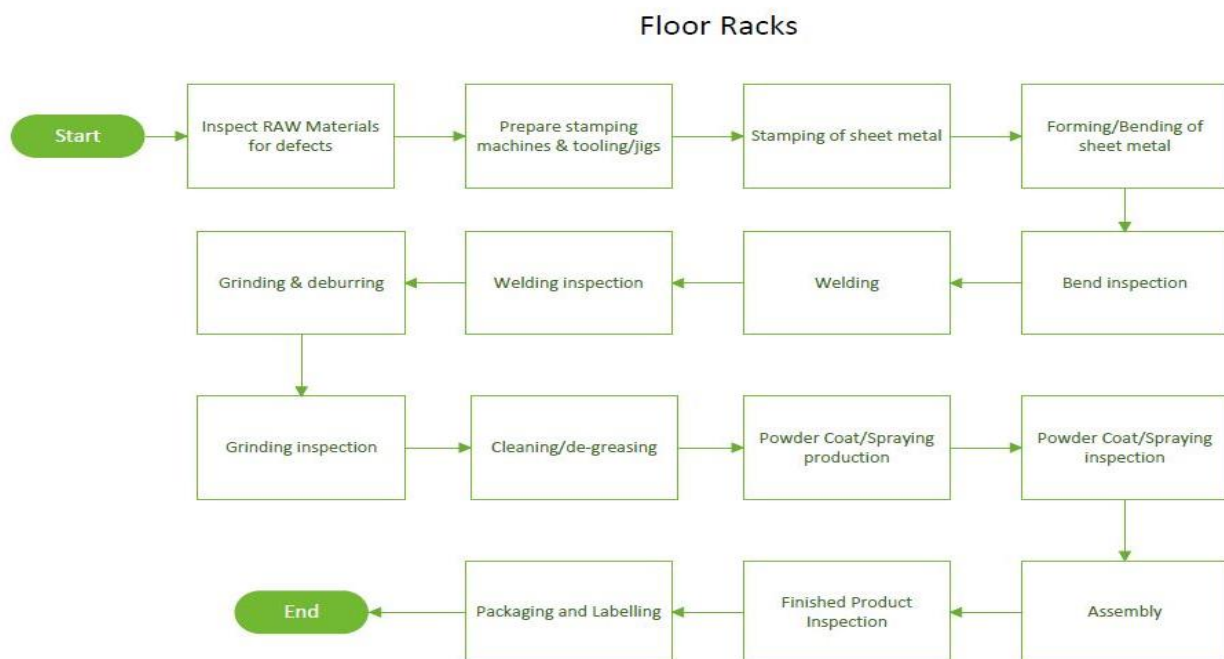
The shaped work piece now goes through the welding process. The first produced sample is inspected by the production operator, foreman and quality control class inspector to confirm production is accurate and without errors. Random inspections on products continue throughout production. The welding process 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. Doors, handles, hinges, and other items. Once this is completed, the product is fully inspected to confirm accuracy and quality, it is then packaged & labelled and ready to be shipped.

Process flow diagram



Assembly and Installation

Installation of Excel Environ floor-standing racks is simple by selecting a suitable fixings appropriate for the floor.

1. Insert top and bottom panels into the side frames. And fixed the frame on the front door position with 4 M5*8 self-tapping screws.
2. Use 16 M8*12 inner hex round screws and M8 flange nut for fixing the top & bottom panels into two side frames.
3. Fix mounting profile on the frame with 8 M6*12 head screws.
4. Insert back panel into the hinge of the frame, with C shaped circlip fixed.
5. Fix the removable cable entry panels.
6. Install front glass door into frames, put a door latch at the right bottom.
7. Install side panels into both sides of frames, switch the door to be smooth.

End of Life

Excel Environ floor-standing racks is made up of 100% steel, so at the end of life the 95% of the floor standing racks will be recycled and 5% is assumed as unrecoverable.

Life Cycle Assessment Calculation Rules

Declared / Functional unit description.

Excel Environ floor-standing racks.

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 Environ floor-standing racks manufactured as a proportion of the total manufactured during the data collection period (01/01/21-31/12/21). Mayflex receives the floor-standing racks from their PRC manufacturing partners, therefore the transportation used to transfer the products from PRC to the UK is included in the LCA analysis. In the manufactures site, other products are manufactured in addition to the floor-standing racks, 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 Excel Environ range of floor-standing racks are a versatile range, and the range covers Equipment (ER), Communications (CR) and Server Racks (SR). The racks are available in a multitude of footprints and heights. There is a choice of 2 widths – 600mm and 800mm, 4 depths – 600mm, 800mm, 1000mm and 1200mm, and heights ranging from 15U to 47U. In this EPD, the Environ SR800 42U Rack 800x1000mm Black with the weight of 168kg has been taken as a representative among their group.

After the manufacturing, the final product will be powder coated before sending to the customer site, therefore the Powder coat material is also one of the ingredients in the raw material list. During the LCA modelling, there is no direct dataset for the powder coating products in the LINA background however LINA has an unspecified organic pigment dataset which is used as a proxy dataset. 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 - Environ SR800 42U Rack 800x1000mm Black 168kg

(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	3.68E+02	3.67E+02	8.79E-01	2.88E-01	2.69E-05	1.65E+00	1.68E-01
	Transport	A2	8.29E+01	8.28E+01	3.74E-02	4.40E-02	1.80E-05	1.31E+00	4.25E-03
	Manufacturing	A3	1.17E+01	1.72E+01	-5.67E+00	1.02E-01	1.86E-06	8.54E-02	8.02E-03
	Total (Consumption grid)	A1-3	4.63E+02	4.67E+02	-4.75E+00	4.33E-01	4.68E-05	3.05E+00	1.80E-01
Construction process stage	Transport	A4	4.81E+00	4.80E+00	4.09E-03	1.89E-03	1.11E-06	1.95E-02	3.09E-04
	Construction	A5	8.73E-03	5.98E-03	2.59E-03	4.06E-06	7.79E-10	3.03E-05	7.80E-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	3.49E-01	3.49E-01	2.98E-04	1.37E-04	8.08E-08	1.42E-03	2.25E-05
	Waste processing	C3	9.19E+00	9.19E+00	3.24E-03	9.17E-04	1.96E-06	9.55E-02	2.85E-04
	Disposal	C4	4.43E-02	4.42E-02	4.38E-05	4.18E-05	1.79E-08	4.16E-04	4.05E-06
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-2.93E+02	-2.93E+02	6.69E-01	-1.85E-01	-1.34E-05	-1.13E+00	-1.29E-01

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	3.83E-01	3.67E+00	1.64E+00	4.25E-03	4.36E+03	1.67E+02	3.15E-05
	Transport	A2	3.33E-01	3.68E+00	9.85E-01	2.16E-04	1.17E+03	4.34E+00	5.26E-06
	Manufacturing	A3	4.31E-02	2.60E-01	6.01E-02	8.57E-05	2.73E+02	1.06E+01	1.32E-06
	Total (Consumption grid)	A1-3	7.59E-01	7.61E+00	2.68E+00	4.55E-03	5.80E+03	1.82E+02	3.81E-05
Construction process stage	Transport	A4	5.87E-03	6.42E-02	1.96E-02	1.67E-05	7.26E+01	3.27E-01	4.14E-07
	Construction	A5	1.23E-05	1.13E-04	3.83E-05	3.77E-08	6.55E-02	7.10E-04	9.97E-10
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	4.27E-04	4.66E-03	1.43E-03	1.21E-06	5.28E+00	2.37E-02	3.01E-08
	Waste processing	C3	4.23E-02	4.63E-01	1.27E-01	4.72E-06	1.26E+02	2.91E-01	2.56E-06
	Disposal	C4	1.45E-04	1.58E-03	4.61E-04	1.01E-07	1.24E+00	5.67E-02	8.38E-09
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-2.70E-01	-2.84E+00	-1.39E+00	-4.00E-04	-2.85E+03	-7.03E+01	-2.23E-05

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	2.24E+01	1.13E+04	2.77E-06	1.16E-05	1.32E+03
	Transport	A2	5.75E+00	8.42E+02	3.92E-08	7.75E-07	5.64E+02
	Manufacturing	A3	1.92E+00	3.21E+02	8.95E-09	2.00E-07	7.03E+02
	Total (Consumption grid)	A1-3	3.01E+01	1.24E+04	2.82E-06	1.26E-05	2.59E+03
Construction process stage	Transport	A4	3.73E-01	5.67E+01	1.84E-09	5.94E-08	4.99E+01
	Construction	A5	3.67E-04	2.99E-01	8.35E-12	8.48E-11	2.77E-02
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	2.71E-02	4.12E+00	1.33E-10	4.32E-09	3.63E+00
	Waste processing	C3	5.68E-01	7.37E+01	2.85E-09	5.35E-08	1.60E+01
	Disposal	C4	5.49E-03	7.80E-01	1.98E-11	5.13E-10	2.59E+00
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-7.23E+00	-8.20E+03	-1.72E-06	-6.09E-06	-7.88E+02

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	3.48E+02	0.00E+00	3.48E+02	4.12E+03	1.78E+02	4.30E+03
	Transport	A2	1.33E+01	0.00E+00	1.33E+01	1.15E+03	0.00E+00	1.15E+03
	Manufacturing	A3	-6.71E+01	2.15E+02	1.48E+02	2.07E+02	1.75E+00	2.09E+02
	Total (Consumption grid)	A1-3	2.94E+02	2.15E+02	5.09E+02	5.48E+03	1.80E+02	5.66E+03
Construction process stage	Transport	A4	1.02E+00	0.00E+00	1.02E+00	7.13E+01	0.00E+00	7.13E+01
	Construction	A5	-1.15E+00	1.15E+00	0.00E+00	-1.19E-01	1.19E-01	3.67E-03
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	7.43E-02	0.00E+00	7.43E-02	5.18E+00	0.00E+00	5.18E+00
	Waste processing	C3	7.06E-01	0.00E+00	7.06E-01	1.24E+02	0.00E+00	1.24E+02
	Disposal	C4	1.05E-02	0.00E+00	1.05E-02	1.21E+00	0.00E+00	1.21E+00
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-9.02E+01	0.00E+00	-9.02E+01	-2.81E+03	0.00E+00	-2.81E+03

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	4.13E+00
	Transport	A2	0.00E+00	0.00E+00	0.00E+00	1.07E-01
	Manufacturing	A3	0.00E+00	0.00E+00	0.00E+00	2.53E-01
	Total (Consumption grid)	A1-3	0.00E+00	0.00E+00	0.00E+00	4.49E+00
Construction process stage	Transport	A4	0.00E+00	0.00E+00	0.00E+00	8.09E-03
	Construction	A5	0.00E+00	0.00E+00	0.00E+00	1.76E-05
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	5.88E-04
	Waste processing	C3	0.00E+00	0.00E+00	0.00E+00	7.19E-03
	Disposal	C4	0.00E+00	0.00E+00	0.00E+00	1.32E-03
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	0.00E+00	0.00E+00	0.00E+00	-1.68E+00

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	1.37E+02	6.34E+02	1.25E-02
	Transport	A2	1.40E+00	1.92E+01	8.01E-03
	Manufacturing	A3	8.14E-01	2.21E+01	6.24E-04
	Total (Consumption grid)	A1-3	1.40E+02	6.76E+02	2.11E-02
Construction process stage	Transport	A4	8.00E-02	1.42E+00	4.91E-04
	Construction	A5	7.67E-06	1.15E-04	2.40E-08
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	5.82E-03	1.03E-01	3.57E-05
	Waste processing	C3	1.66E-01	1.16E+00	8.70E-04
	Disposal	C4	1.29E-03	1.81E-02	8.10E-06
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-5.46E+01	-4.66E+02	-4.58E-03

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	7.59E+00
	Total (Consumption grid)	A1-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.59E+00
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	3.65E-02
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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Waste processing	C3	0.00E+00	1.60E+02	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	0.00E+00	0.00E+00	0.00E+00	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 floor standing racks 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	Installation of Excel Environ floor-standing racks is simple by selecting a suitable fixings appropriate for the floor. There won't be any installation wastages and some wastes are from packaging.		
	Cardboard waste – recycling	kg	0.0812
	Plastic waste – recycling	kg	0.0028
End of life	At the end-of-life Excel Environ floor-standing racks are disassembled on the demolition site. No power tools are used. Therefore, no impacts are associated with this module.		
C2 – Transportation	Floor-standing racks are taken back by the registered broker	Road transport	16–32-ton lorry
	Distance: Deconstruction unit to pre-processing unit	km	12.5
C3 – Pre processing	Floor standing rack is made up of 100% of steel. It is assumed that 95% of the product will go to recycling and 5% to landfills which is assumed as natural loss. The impacts associated with recycling are covered in this module.		
	No pre-processing will be takes place in the pre-processing sector therefore no impacts in Module C3.		
	Steel – Recycling	%	95
C4 - Disposal	The recovered floor standing racks will be sent to recycling while a small portion is assumed to be unrecoverable which is considered to send to landfill		
	Unrecovered floor standing rack waste to landfill	%	5
Module D – Recovered cabinet box are 95% recycled	This scenario assumes that 95% of the product is recycled. Therefore, pre-processed floor standing racks can be used in place of virgin materials. In line with this, 0.95 kg of scrap steel waste recovered from the building demolition sites can be used to offset the impacts of virgin material, and it is assumed that there is a 100% recycling yield from the recycling process.		
	95% of the rack will be recycled = 159.6 kg 5% to Landfill = 8.4 kg		

Interpretation of results:

The bulk of the environmental impacts are attributed to the manufacturing of Excel Environ floor-standing racks covered by information modules A1-A3 of EN15804:2012+A2:2019.

Individual product calculations:

The LCA results listed in the tables above are for Excel Environ floor-standing racks, which are for the processing of 168 kg. The end-user of this EPD can therefore use these results to calculate impact profiles for each floor-standing racks with different dimensions by using the weight per kg. In the below calculation table, the GWP impacts have been calculated for the standard product weight for 1 kg as an example to enable calculations for other thicknesses.

Environ floor-standing racks			CR800 42U Rack 800x800mm Glass (F)	CR600 24U Rack 600x600mm Glass (F)	ER800 42U Rack 800x1000mm
Kg	168	1	58.5	142	155
A1	3.68E+02	2.19E+00	1.28E+02	3.11E+02	3.40E+02
A2	8.29E+01	4.93E-01	2.89E+01	7.01E+01	7.65E+01
A3	1.17E+01	6.96E-02	4.07E+00	9.89E+00	1.08E+01
A1-A3	4.63E+02	2.76E+00	1.61E+02	3.91E+02	4.27E+02

References

BSI. Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products. BS EN 15804:2012+A2:2013. London, BSI, 2013.

BSI. Environmental labels and declarations – Type III Environmental declarations – Principles and procedures. BS EN ISO 14025:2010 (exactly identical to ISO 14025:2006). London, BSI, 2010.

BSI. Environmental management – Life cycle assessment – Principles and framework. BS EN ISO 14040:2006. London, BSI, 2006.

BSI. Environmental management – Life cycle assessment – requirements and guidelines. BS EN ISO 14044:2006. London, BSI, 2006.