Statement of Verification

BREG EN EPD No.: 000550 Issue 01

This is to verify that the

Environmental Product Declaration

provided by:

Specwall SP Ltd

is in accordance with the requirements of:

EN 15804:2012+A1:2013

and

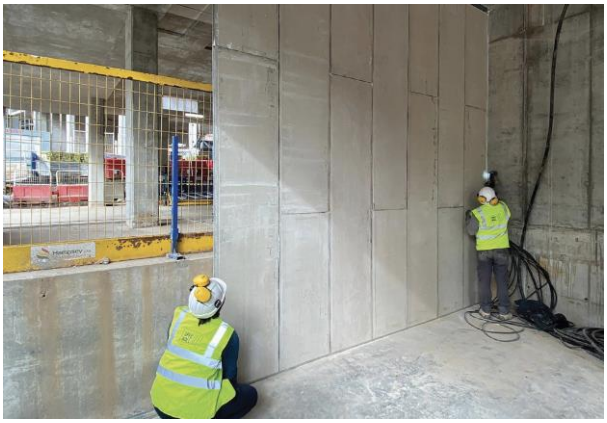
BRE Global Scheme Document SD207

This declaration is for:

1m2 of Specwall SP A1 100mm Panel

Company Address

Specwall SP Ltd
St Mary's Parsonage,
Manchester.
M3 2PN



Signed for BRE Global Ltd	Emma Baker Operator	08 December 2023 Date of this Issue
08 December 2023 Date of First Issue		31 October 2027 Expiry Date

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Environmental Product Declaration

EPD Number: 000550

General Information

EPD Programme Operator	Applicable Product Category Rules
BRE Global Watford, Herts WD25 9XX United Kingdom	BRE Environmental Profiles 2013 Product Category Rules for Type III environmental product declaration of construction products to EN 15804:2012+A1:2013
Commissioner of LCA study	**LCA consultant/Tool**
Specwall SP Ltd St Mary's Parsonage, Manchester. M3 2PN	Tool: BRE LINA v2.0 Consultant: Chris Wilson, Trident Utilities Ltd.
Declared/Functional Unit	**Applicability/Coverage**
1m2 of Specwall SP A1 100mm Panel	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 ☐Internal ☒ 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+A1:2013. 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+A1:2013 for further guidance

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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
☑	☑	☑	☑	☑	☐	☐	☐	☐	☐	☐	☐	☑	☑	☐	☑		☑

Note: Ticks indicate the Information Modules declared.

Manufacturing site(s)

Technical Supplies & Services Co. LLC.
P. O Box 77031, Dubai Investments Park – Phase 2
Dubai, UAE

Construction Product:

Product Description

The Specwall SP A1 100mm panel is a sandwich wall panel made of fibre cement board on the exterior. The Interior composite core material is a system of lightweight concrete mix made from Ordinary Portland cement, additives, aggregates and admixtures.
The panels are available in thickness of 100 mm. One side of the panel has Male-Tongue profile and other side Female – Groove profile. When the panels are erected, the Tongue and groove fit together to form a precise fit. The result is high quality wall system resulting in less manpower and faster assembly.
The A1 panel was developed in response to changing market needs and provides exceptional fire ratings of 4 hours or more, beyond current legislation.
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Technical Information

Property	Value, Unit
Reaction to fire EN ISO 11821716	A1
Fire Integrity and Insulation BS EN1364-1 2015	216 minutes
Acoustic Property BS EN ISO 10140-2 2021	40 dB Rw
Density BS EN 12390-7	650 - 750 kg/m3

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Main Product Contents

Material/Chemical Input	%
Portland Cement, Pulverised Fuel Ash & Calcium Silicate Board	78 %
Water	21%
Aggregates,& Admixtures	1%

Manufacturing Process

The concrete mixing process uses a batching process; the proportion of raw materials are mixed in accordance with the specification. Panel moulds are assembled into holding frames and the wet concrete mix is pumped into the panel moulds. The filled moulds are then moved over to curing areas. After the curing time, the holding frames (holding the moulds together) are brought to the de-moulding station.
The panels are stacked in pallets and kept in the yard/stock are for further curing. The panels are then watered for 3 days at least twice a day. After curing, the panels are brought to the recessing/bevelling machine for any finishing or surface repairs required. The panels are then packed onto pallets, labelled, strapped together and wrapped in plastic. QC and delivery label/stamps are added prior to dispatch.

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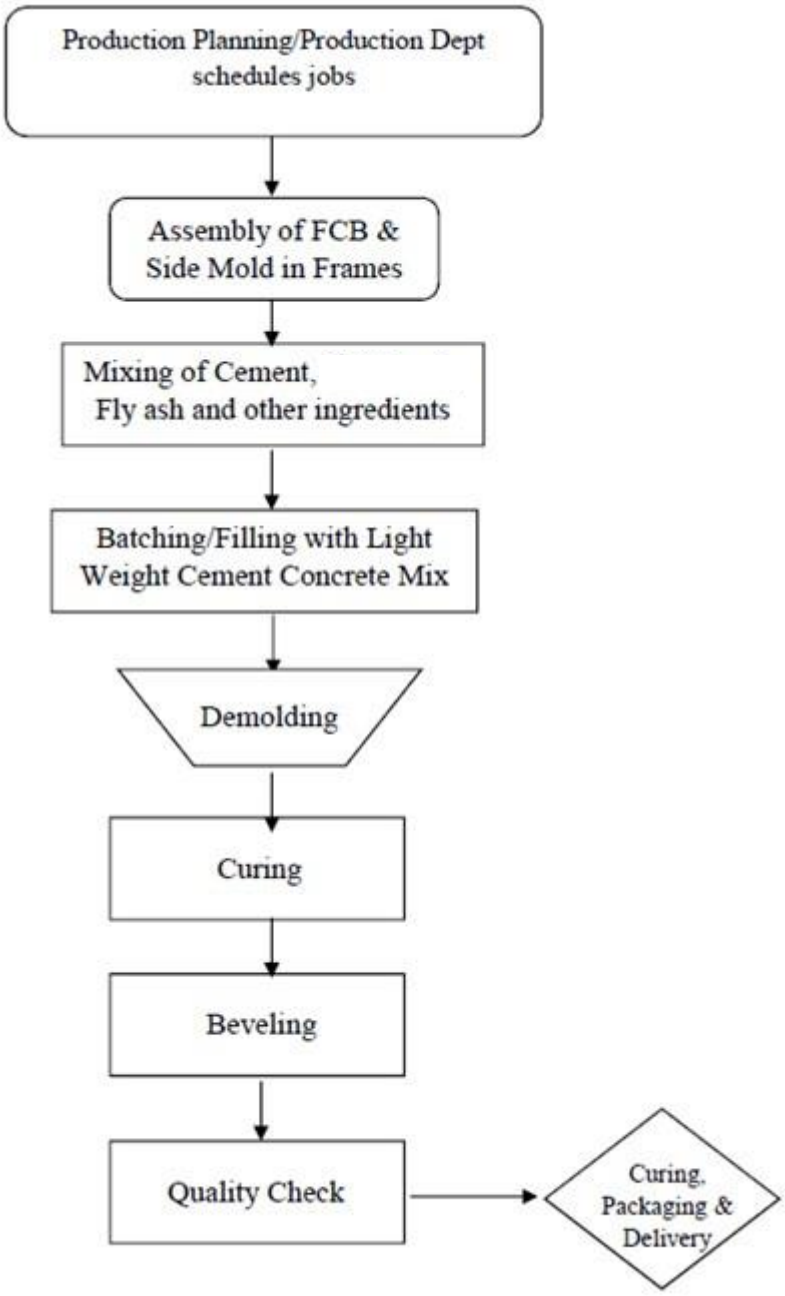
Process flow diagram



Construction Installation

The product will be installed in floor applications. The solid, lightweight panels fit together using a simple tongue and groove system. Simple adhesive and dowel system used to fix them together. Panels connect directly to floor and ceiling via base and head track channels. Full bead of fire mastic used in the tracks along the length of the panel. Panels can be cut to size on site using circular saws or hand saws. All off-cuts can be reused elsewhere on site

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Use Information

The product will be left alone after installation, there are no known associated environmental impacts.

End of Life

At the end of the product lifetime (30 years) the panel can be removed and reused in a different location within the building. To reuse the product it can be dismantled by cutting down the middle of the panel to remove. The panel would then have a replacement male and female groove re-formed along its length. The panel can then be reinstalled as before. It is assumed that 50% of panels will be re-used. The remaining 50% of panels, Specwall will receive back 10% of panels to use as samples for architects etc. 38% will be recycled and used a sub-base in road construction (“down cycling”), paving applications, engineering fill or landfill engineering, while only a small proportion is re-used as recycled aggregates in the concrete industry (high-value application)100% yield assumed, and 2 % sent to landfill (ZHAO, Z. et al. (2020).

Life Cycle Assessment Calculation Rules

Declared / Functional unit description

1m2 of Specwall SP A1 100mm Panel

System boundary

Type of EPD: Cradle to Gate with all options declared. The modules considered in the Life Cycle Assessment are modules A1- D inclusive.

Specific primary data derived from the Specwall SP – A1 100mm in Technical Supplies & Services Co. LLC, UAE have been modelled using BRE LINA v2.0 and the BRE LINA database v2.0.92. In accordance with the requirements of EN15804, the most current available data has been used. No inputs or outputs have been excluded, all the ancillary materials, energy, and water use are included. The only exceptions are direct emissions to air, water, and soil, which are not measured.

Data sources, quality and allocation

In this LCA analysis, one-year manufacturing data has not been selected because this product was in the development stage and started being manufactured in December 2023. However, according to BRE EN15804 A1 PCR, six months of manufacturing data have been collected from December 2022 to May 2023, and the LCA analysis has been performed. And the manufacturing unit confirms that there won't be any change in the production line for the next 5 years.

In addition to 100mm A1 panels, the site produces other products so the allocation of site energy consumption and water usage has been calculated on the basis of 100 mm A1 panels shipped to the UK (Specwall) divided by the total production output of the whole site. Allocation procedures were by physical allocation and are according to EN15804 and are based on ISO14044 guidance.

Specwall 100 mm A1 panels utilise fibre cement board and hardener as raw material ingredients. Though there was no direct dataset in Ecoinvent v3.2 to represent these raw materials, we got their chemical composition from the manufacturer and used that to model the fibre cement board and hardener datasets modelled in SimaPro. Further, the polypropylene dataset is used as a proxy dataset for Admixtures. Because there is no appropriate dataset in Ecoinvent 3.2 to represent Admixtures, so the polypropylene resin dataset has been used as a suitable proxy. In previous decades, polypropylene was used in cement mixtures, and later, the Admixtures replaced them because they had better physical properties, though, Admixture contain polypropylene as a main raw material ingredient. Regarding the grid mix, Saudi electricity mix dataset has been used because the electricity intensity in the UAE which is similar to that in Saudi.

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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 3.2 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.

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
Fair	n/a	n/a	There is approximately 5-6 years between the Ecoinvent LCI reference year, and the time period for which the LCA was undertaken.

The quality level of geographical and technical representativeness is very good as the background LCI datasets are based on Ecoinvent v3.2 which was compiled in 2015. Therefore, there is approximately 5-6 years between the Ecoinvent LCI reference year and the time period for which the LCA was undertaken.

Cut-off criteria

No inputs or outputs have been excluded. All raw materials, packaging materials, associated transport to the manufacturing site, and from the manufacturing site to the building site, process energy, water use, direct production waste, installations waste and emissions are included.

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LCA Results Specwall SP A1 100mm Panel.

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

Parameters describing environmental impacts									
			GWP	ODP	AP	EP	POCP	ADPE	ADPF
			kg CO_2 equiv.	kg CFC 11 equiv.	kg SO_2 equiv.	kg $(PO_4)^{3-}$ equiv.	kg C_2H_4 equiv.	kg Sb equiv.	MJ, net calorific value.
Product stage	Raw material supply	A1	AGG	AGG	AGG	AGG	AGG	AGG	AGG
	Transport	A2	AGG	AGG	AGG	AGG	AGG	AGG	AGG
	Manufacturing	A3	AGG	AGG	AGG	AGG	AGG	AGG	AGG
	Total (of product stage)	A1-3	4.94E+01	2.00E-06	1.37E-01	3.24E-02	1.39E-02	2.18E-04	3.38E+02
Construction process stage	Transport	A4	1.66E+01	2.85E-06	2.27E-01	2.85E-02	1.82E-02	2.13E-05	2.43E+02
	Construction	A5	6.52E+00	4.28E-07	5.03E-02	1.50E-02	4.90E-03	3.86E-04	6.91E+01
Use stage	Use	B1	MNR	MNR	MNR	MNR	MNR	MNR	MNR
	Maintenance	B2	MNR	MNR	MNR	MNR	MNR	MNR	MNR
	Repair	B3	MNR	MNR	MNR	MNR	MNR	MNR	MNR
	Replacement	B4	MNR	MNR	MNR	MNR	MNR	MNR	MNR
	Refurbishment	B5	MNR	MNR	MNR	MNR	MNR	MNR	MNR
	Operational energy use	B6	MNR	MNR	MNR	MNR	MNR	MNR	MNR
	Operational water use	B7	MNR	MNR	MNR	MNR	MNR	MNR	MNR
End of life	Deconstruction, demolition	C1	3.41E-03	8.99E-10	2.39E-05	7.85E-06	3.97E-06	4.85E-09	8.39E-02
	Transport	C2	3.40E+00	6.35E-07	1.51E-02	3.96E-03	2.50E-03	8.57E-06	5.23E+01
	Waste processing	C3	MNR	MNR	MNR	MNR	MNR	MNR	MNR
	Disposal	C4	8.10E-03	2.79E-09	6.24E-05	1.54E-05	1.08E-05	8.75E-09	2.35E-01
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-2.91E+01	-9.95E-07	-6.97E-02	-1.74E-02	-6.87E-03	-8.71E-05	-1.84E+02

GWP = Global Warming Potential;
ODP = Ozone Depletion Potential;
AP = Acidification Potential for Soil and Water;
EP = Eutrophication Potential;
POCP = Formation potential of tropospheric Ozone;
ADPE = Abiotic Depletion Potential – Elements;
ADPF = Abiotic Depletion Potential – Fossil Fuels;

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LCA Results (continued)

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

Parameters describing resource use, primary energy								
			PERE	PERM	PERT	PENRE	PENRM	PENRT
			MJ	MJ	MJ	MJ	MJ	MJ
Product stage	Raw material supply	A1	AGG	AGG	AGG	AGG	AGG	AGG
	Transport	A2	AGG	AGG	AGG	AGG	AGG	AGG
	Manufacturing	A3	AGG	AGG	AGG	AGG	AGG	AGG
	Total (of product stage)	A1-3	2.88E+01	1.08E-02	2.88E+01	3.42E+02	2.24E+01	3.64E+02
Construction process stage	Transport	A4	4.83E+00	8.68E-06	4.83E+00	2.45E+02	0.00E+00	2.45E+02
	Construction	A5	5.51E+00	3.74E-04	5.52E+00	7.26E+01	6.73E-01	7.32E+01
Use stage	Use	B1	MNR	MNR	MNR	MNR	MNR	MNR
	Maintenance	B2	MNR	MNR	MNR	MNR	MNR	MNR
	Repair	B3	MNR	MNR	MNR	MNR	MNR	MNR
	Replacement	B4	MNR	MNR	MNR	MNR	MNR	MNR
	Refurbishment	B5	MNR	MNR	MNR	MNR	MNR	MNR
	Operational energy use	B6	MNR	MNR	MNR	MNR	MNR	MNR
	Operational water use	B7	MNR	MNR	MNR	MNR	MNR	MNR
End of life	Deconstruction, demolition	C1	2.56E-03	7.01E-09	2.56E-03	8.44E-02	0.00E+00	8.44E-02
	Transport	C2	7.49E-01	2.52E-06	7.49E-01	5.20E+01	0.00E+00	5.20E+01
	Waste processing	C3	MNR	MNR	MNR	MNR	MNR	MNR
	Disposal	C4	6.08E-03	9.21E-09	6.08E-03	2.33E-01	0.00E+00	2.33E-01
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-9.58E+00	-6.48E-03	-9.58E+00	-1.86E+02	-1.34E+01	-2.00E+02

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

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LCA Results (continued)

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

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	AGG	AGG	AGG	AGG
	Transport	A2	AGG	AGG	AGG	AGG
	Manufacturing	A3	AGG	AGG	AGG	AGG
	Total (of product stage)	A1-3	7.70E-01	0.00E+00	0.00E+00	2.50E-01
Construction process stage	Transport	A4	0.00E+00	0.00E+00	0.00E+00	5.64E-02
	Construction	A5	2.31E-02	0.00E+00	0.00E+00	1.05E-01
Use stage	Use	B1	MNR	MNR	MNR	MNR
	Maintenance	B2	MNR	MNR	MNR	MNR
	Repair	B3	MNR	MNR	MNR	MNR
	Replacement	B4	MNR	MNR	MNR	MNR
	Refurbishment	B5	MNR	MNR	MNR	MNR
	Operational energy use	B6	MNR	MNR	MNR	MNR
	Operational water use	B7	MNR	MNR	MNR	MNR
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00	9.44E-05
	Transport	C2	0.00E+00	0.00E+00	0.00E+00	1.18E-02
	Waste processing	C3	MNR	MNR	MNR	MNR
	Disposal	C4	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	-4.62E-01	0.00E+00	0.00E+00	-1.46E-01

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

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LCA Results (continued)

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

Other environmental information describing waste categories					
			HWD	NHWD	RWD
			kg	kg	kg
Product stage	Raw material supply	A1	AGG	AGG	AGG
	Transport	A2	AGG	AGG	AGG
	Manufacturing	A3	AGG	AGG	AGG
	Total (of product stage)	A1-3	5.75E-01	7.41E-01	1.19E-03
Construction process stage	Transport	A4	1.02E-01	5.01E+00	1.66E-03
	Construction	A5	6.35E-01	2.74E+00	2.22E-04
Use stage	Use	B1	MNR	MNR	MNR
	Maintenance	B2	MNR	MNR	MNR
	Repair	B3	MNR	MNR	MNR
	Replacement	B4	MNR	MNR	MNR
	Refurbishment	B5	MNR	MNR	MNR
	Operational energy use	B6	MNR	MNR	MNR
	Operational water use	B7	MNR	MNR	MNR
End of life	Deconstruction, demolition	C1	6.31E-05	3.31E-01	5.19E-07
	Transport	C2	2.21E-02	3.17E+00	3.60E-04
	Waste processing	C3	MNR	MNR	MNR
	Disposal	C4	8.44E-05	1.56E+00	1.59E-06
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-3.02E-01	-5.26E-01	-6.61E-04

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

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LCA Results (continued)

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

Other environmental information describing output flows – at end of life						
			CRU	MFR	MER	EE
			kg	kg	kg	MJ per energy carrier
Product stage	Raw material supply	A1	AGG	AGG	AGG	AGG
	Transport	A2	AGG	AGG	AGG	AGG
	Manufacturing	A3	AGG	AGG	AGG	AGG
	Total (of product stage)	A1-3	0.00E+00	0.00E+00	0.00E+00	4.05E-04
Construction process stage	Transport	A4	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Construction	A5	0.00E+00	4.70E-01	0.00E+00	1.22E-05
Use stage	Use	B1	MNR	MNR	MNR	MNR
	Maintenance	B2	MNR	MNR	MNR	MNR
	Repair	B3	MNR	MNR	MNR	MNR
	Replacement	B4	MNR	MNR	MNR	MNR
	Refurbishment	B5	MNR	MNR	MNR	MNR
	Operational energy use	B6	MNR	MNR	MNR	MNR
	Operational water use	B7	MNR	MNR	MNR	MNR
End of life	Deconstruction, demolition	C1	5.90E-01	5.90E-01	0.00E+00	0.00E+00
	Transport	C2	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Waste processing	C3	MNR	MNR	MNR	MNR
	Disposal	C4	4.55E+01	2.88E+01	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	-2.43E-04

CRU = Components for reuse;
MFR = Materials for recycling

MER = Materials for energy recovery;
EE = Exported Energy

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Scenarios and additional technical information

The scenario table includes the generic values used during the LCA analysis for the Specwall SP A1 100 mm panel.

Scenarios and additional technical information			
Scenario	Parameter	Units	Results
Lorry > A4 – Transport to the building site	The panels are transported from Dubai to storage at Felixstowe by container ship. From storage the panels are transported by road to construction sites mainly in the London & Manchester areas.		
	Diesel / Lorry	Litre of fuel type per distance or vehicle type	16 – 32 metric ton
	Distance:	km	550
	Capacity utilisation (incl. empty returns)	%	100
	Bulk density of transported products	kg/m^3	650 - 750
A5 – Installation in the building	The solid, lightweight panels fit together using a simple tongue and groove system. Simple adhesive and dowel system used to fix them together. Panels connect directly to floor and ceiling via base and head track channels. Full bead of fire mastic used in the tracks along the length of the panel Panels can be cut to size on site using circular saws or hand saws. All off-cuts can be reused elsewhere on site		
	Material wastage rate	%	3
	Head Fixings	kg	0.787
	Base Fixings	kg	0.295 – 0.393
	Adhesives & Sealants	kg	0.225 – 0.267
	Rockwool Insulation	kg	0.25 – 0.33
	Electricity	kWh	0.02
C1 to C4 End of life,	At the end of the product lifetime (30 years) the panel can be removed and reused in a different location withing the building. To reuse the product would be dismantled by cutting down the middle of the panel to remove. The panel would then have a replacement male and female groove re-formed along its length. The panel can then be reinstalled as before. It is assumed that 50% of panels will be re-used. Of the remaining 50% of panels, Specwall will receive back 10% of these panels for recycling to use as samples for architects etc. The remaining 38% of panels will be recycled and 2 % sent to landfill. The panels sent to landfill will be sent to a local waste disposal facility. As most construction sites are in either London or Manchester this is estimated at 20kM. For panels to be returned to Specwall for reuse this will be London to Manchester 320 km		
	Panels to be reused	%	60
	Panels to recycle	%	38
	Panels to landfill	%	2
	Transport to recycle at Specwall - Lorry	km	320
	Transport to landfill at local waste disposal site	km	20
Module D	60% of panels reused, 38% recycled and 2% to landfill.		

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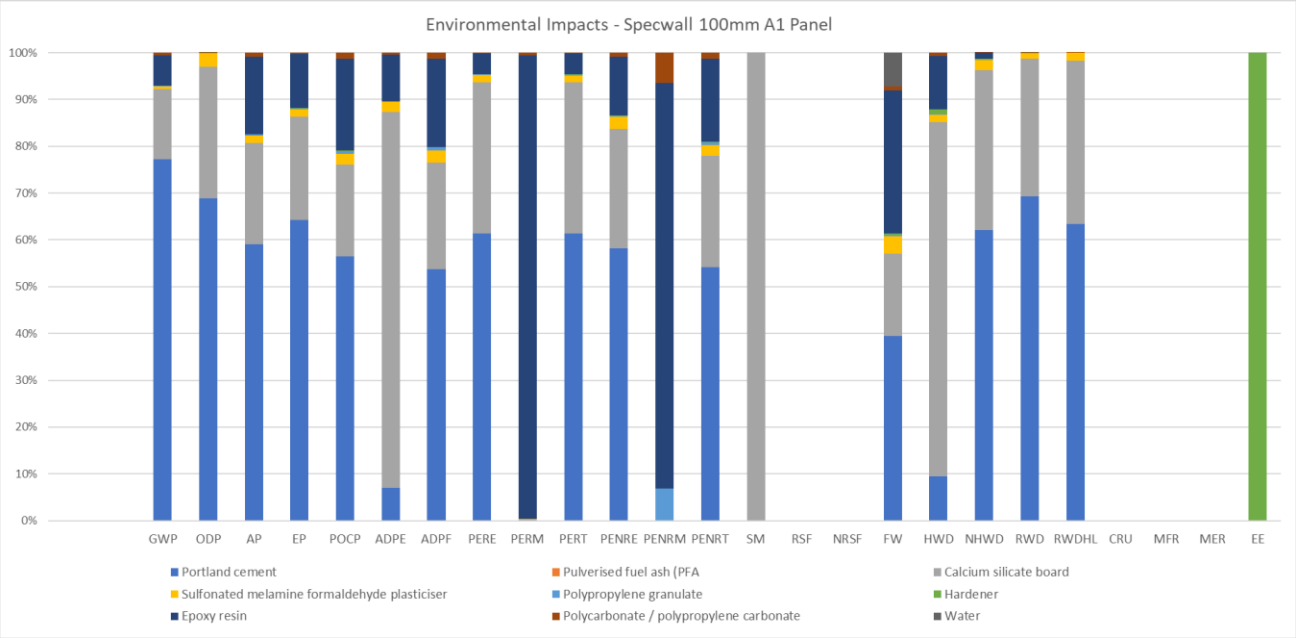
Interpretation of Results

Out of the total mass of input materials, Portland cement makes up 55%, followed by calcium silicate board of 16%, and other input materials make up the remaining of 29%. As a result, Portland cement and calcium silicate board is the responsible for the greatest impact on all indicators except PERM, PENRM, SM, and EE. Epoxy resin is one of the raw material inputs for Specwall products which has its composition of 0.6%, with its composition it is responsible for the greatest proportion of impact on PERM and PENRM, and hardener quantity is very low, but it is responsible for EE impact



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