Statement of Verification

BREG EN EPD No.: 000682 Issue 01

This is to verify that the

Environmental Product Declaration

provided by:

SAS International

BRE Global Verified EPD

is in accordance with the requirements of:

EN 15804:2012+A2:2019

and

BRE Global Scheme Document SD207

This declaration is for:

1 m2 of SAS Chilled Panels using Horizon Steel product with a Polyester powder coated (PPC) finish ceiling product/system with chilled elements are spaced at 100mm centres and consisting of 8 elements per panel with the weight of 12.45 kg/m2.

Company Address

SAS International
EMAC House,
Unit 28, Sutton Park Ave,
Reading
RG6 1AZ
United Kingdom

Signed for BRE Global Ltd	Hayley Thomson Operator	12 May 2025 Date of this Issue
12 May 2025 Date of First Issue		11 May 2030 Expiry Date

BRE Global Verified EPD

This Statement of Verification is issued subject to terms and conditions (for details visit www.greenbooklive.com/terms.

To check the validity of this statement of verification please, visit www.greenbooklive.com/check or contact us.

BRE Global Ltd., Garston, Watford WD25 9XX.
T: +44 (0)333 321 8811 F: +44 (0)1923 664603 E: Enquiries@breglobal.com

ECO PLATFORM EPD VERIFIED

Environmental Product Declaration

EPD Number: 000682

General Information

EPD Programme Operator	Applicable Product Category Rules
BRE Global Watford, Herts WD25 9XX United Kingdom	BRE Environmental Profiles 2023 Product Category Rules for Type III environmental product declaration of construction products to EN 15804+A2 PN 514 Rev 3.1
Commissioner of LCA study	**LCA consultant/Tool**
SAS International EMAC House, Unit 28, Sutton Park Ave, Reading RG6 1AZ United Kingdom	LCA Consultant: SAS International Tool: BRE LINA Version A2
Declared/Functional Unit	**Applicability/Coverage**
1 m2 of SAS Chilled Panels using Horizon Steel product with a Polyester powder coated (PPC) finish ceiling product/system with chilled elements are spaced at 100mm centres and consisting of 8 elements per panel with the weight of 12.45 kg/m2.	Other (please specify). Product specific
EPD Type	**Background database**
Cradle to Gate with Module C and D	Ecoinvent 3.8
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+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
☑	☑	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	☑	☑	☑		☑

Note: Ticks indicate the Information Modules declared.

Manufacturing site(s)

SAS International
EMAC House,
Unit 28, Sutton Park Ave,
Reading
RG6 1AZ
United Kingdom

Construction Product:

Product Description

SAS International offers a wide range of metal ceiling types, including metal linear ceilings, suspended ceilings, metal ceiling baffles, and more. We also provide a fully bespoke service to create custom metal ceilings tailored to specific project requirements. Our ceiling products are designed to meet a broad spectrum of customer needs. For further information, please visit: https://sasintgroup.com/Metal ceiling solutions are commonly incorporated into:

- Office spaces
- Meeting spaces
- Co-working spaces
- Educational institutions
- Public buildings
- Retail premises
- Airports
- Restaurants
- Leisure centres
- Exhibition spaces

The LCA analysis is conducted for 1m^2 SAS Chilled panels with a Polyester powder coated (PPC) fi nish ceiling product/systems for a cost-effective use in ceiling applications. The manufacturing process for all SAS Chilled panels products within the group is the same, with similar compositions. Therefore, the LCA analysis is

conducted based on 1m^2 of SAS Chilled Panels with Polyester powder coated (PPC) finish with chilled elements are spaced at 100mm centres and consisting of 8 elements per panel used for ceiling applications.

SAS Chilled panels are highly versatile and can be customised to meet a range of cooling capacity requirements by varying the number of cooling elements integrated into each panel. The cooling performance is directly influenced by the number of elements and their arrangement within the panel.

To provide greater flexibility in design and performance, SAS Chilled panels can be specified with different element spacings, allowing for optimal cooling performance tailored to the needs of the space. The closer the spacing between elements, the higher the cooling capacity of the panel. Conversely, wider spacing reduces cooling capacity but may be sufficient for less demanding environments.

Outlined below are the typical element spacing configurations commonly applied. This information is essential for understanding the environmental impact of each configuration and enables informed decision-making when specifying panels to meet both performance and sustainability goals.

Chilled element per M2 of panel	Element centres per M2
8	100mm
6	150mm
4	250mm
2	500mm

Technical Information

Property	Value, Unit
Systems are manufactured and tested in accordance with BS EN 13964:2014 including essential characteristics performance:	
Reaction to Fire:	A1 European Reaction to Fire Classification fire system (Euro classes)
Release of Formaldehyde:	CLASS E1
Release of Asbestos:	NO CONTENT
Durability:	CLASS B

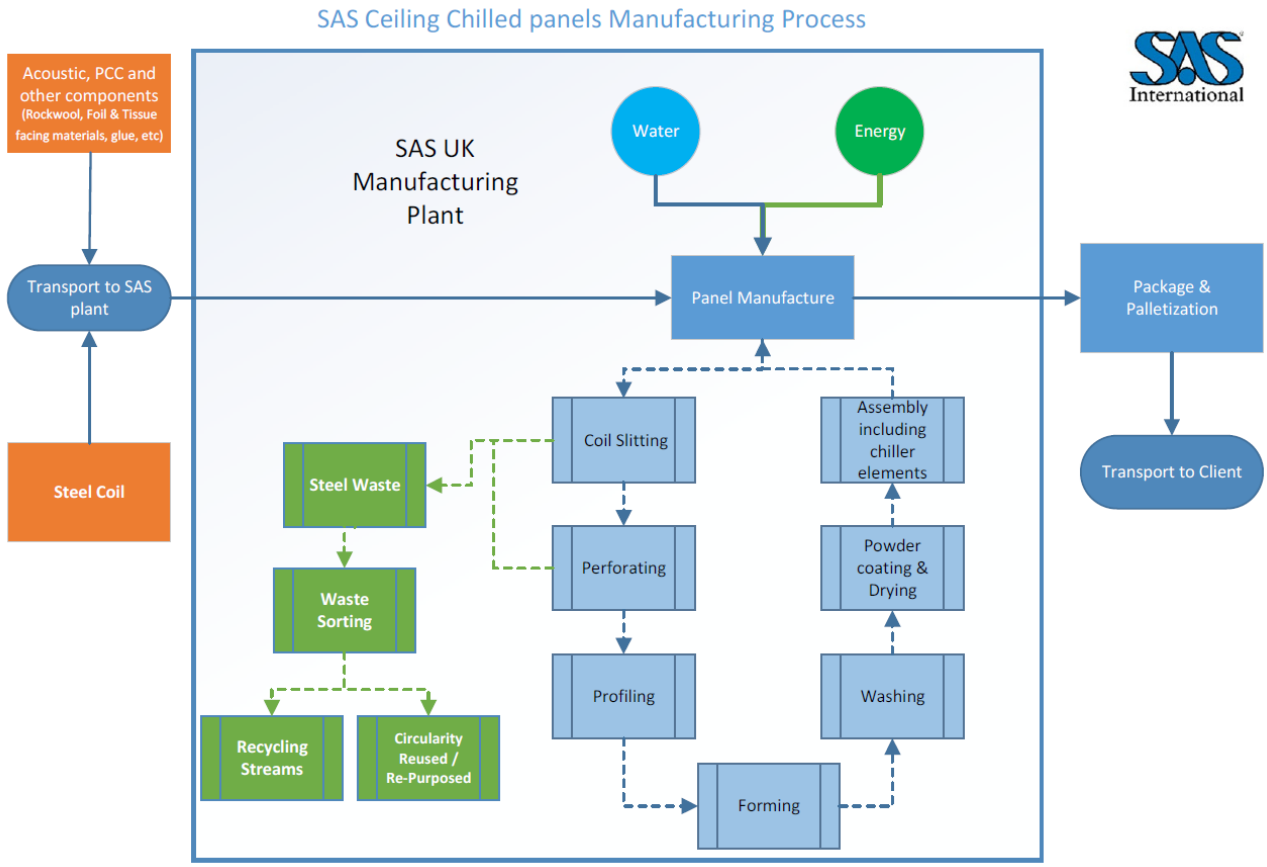
Main Product Contents

Material/Chemical Input	%
Steel	50
Aluminium extrusion	30
Copper Pipe	10
Others	10

Manufacturing Process

The Bridgend factory is split into two separate units; Unit 1 is where the tile systems are formed, including the addition of the various types of acoustic padding. Key Unit 1 processes include: slitting of the steel/ Steel coils, perforating, washing, spray coating and drying. These processes account for the most energy intensive stages of the products life cycle. Unit 2 is where the grid systems are rolled and formed; it houses less energy-intensive processes than Unit 1.

Process flow diagram



Construction Installation

SAS recommend installation by an experienced specialist ceiling contractor under guidance of SAS Design and Technical documentation to ensure install is within all relevant codes, safe and fit for purpose

Use Information

The frequency of cleaning will depend upon the function and usage of each area and the efficiency of the air conditioning / heating system. This period can only be determined after hand over and occupancy. If the ceiling is heavily soiled; surface dust and dirt should be removed by dry cleaning before any wet cleaning is undertaken. This should be completed using either; a dry clean, soft cloth, a soft brush or a vacuum cleaner with brush attachment. Wet cleaning should then take place using a mild detergent diluted in warm water. This should be applied using a soft, clean cloth and rinsed off. When cleaning perforated tiles, take care to ensure that the acoustic backing does not become wet. Please ensure that all H&S guidelines are followed. For non-standard powder coat applications, such as textured, mirror finish or metallic specialist cleaning is recommended. Due to nature of these surfaces, they are very susceptible to scratching. Our paint finish has been tested with a wide array of cleaning agents however, we are unable to test all products on the market. We therefore recommend any cleaning agent is tested on a small nonvisible area first.

Note: The Use stage is not a scope of this LCA

End of Life

At the end of its service life, SAS international ceiling product will be removed manually from the building without the use of power tools. As the product is made up of Steel which has a valuable recycling or repurposing percentage, it will therefore be either recovered via SAS or sent to a processing unit for recycling. It is assumed as 100% recovery rate from the deconstruction unit.

Life Cycle Assessment Calculation Rules

Declared / Functional unit description

1 m^2 of SAS Chilled Panels using Horizon Steel product with a Polyester powder coated (PPC) finish ceiling product/system with chilled elements are spaced at 100mm centres and consisting of 8 elements per panel with the weight of 12.45 kg/m^2.

System boundary

This is a cradle-to-gate with modules C & D LCA, reporting all production life cycle stages of modules A1 to A3 and end of life stages C1-C4, and D in accordance with EN 15804:2012+A2:2019 and BRE 2023 Product Category Rules (PN 514 Rev 3.1).

Data sources, quality and allocation

SAS International Steel ceiling systems are available in various systems, sizes and perforated and manufactured with the same basic method with only the geometry of each system that varies between systems and nothing more specifically in the composition. Therefore, in this LCA\EPD modelling, the quantity used in the data collection for this EPD is the total quantity of SAS Horizon Steel Product manufactured during the data collection period (29/01/2023 - 29/12/2023) have been used. Allocation by mass has been used to calculate the amount of input energy flow - natural gas, water, and waste flows per selected products according to the provisions of the BRE PCR PN514 and EN 15804. Raw material quantities have been uplifted 1% proportionally to account for production wastes.

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

All ecoinvent datasets are complete within the context used and conform to the system boundary and exclusion criteria for inputs and outputs, as 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 UK and European have been selected from the Ecoinvent LCI for this LCA. Manufacturer uses the on-site solar PV system and 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, GB kWh is 0.239 kgCO2e/kWh and for the 1 kWh of solar PV, GB kWh is 0.077 is kgCO2e/kWh. Further, the manufacturer uses Natural gas for office heating, so therefore Natural gas, at industrial furnace (kWh) has been used and the GWP carbon footprint for using 1kWh of the UK natural gas is 0.232 kgCO2eq. 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

No inputs or outputs have been excluded and all raw materials, packaging and transport, energy, water use and wastes, are included, except for direct emissions to air, water, and soil, which are not measured

LCA Results

(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	3.36E+01	3.31E+01	3.84E-01	8.13E-02	1.79E-06	8.77E-01	6.48E-02
	Transport	A2	3.30E-01	3.29E-01	2.93E-04	1.26E-04	7.70E-08	1.35E-03	2.10E-05
	Manufacturing	A3	2.07E-01	5.55E-01	-3.49E-01	5.65E-04	4.87E-08	1.12E-03	8.96E-05
	Total (Consumption grid)	A1-3	3.41E+01	3.40E+01	3.56E-02	8.20E-02	1.91E-06	8.79E-01	6.49E-02
Construction process stage	Transport	A4	MND	MND	MND	MND	MND	MND	MND
	Construction	A5	MND	MND	MND	MND	MND	MND	MND
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 and 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	1.04E-01	1.03E-01	8.82E-05	4.06E-05	2.39E-08	4.20E-04	6.66E-06
	Waste processing	C3	1.38E-01	1.37E-01	6.72E-04	1.42E-04	1.29E-08	7.52E-04	3.00E-05
	Disposal	C4	1.14E-03	1.13E-03	8.67E-06	1.14E-06	3.43E-10	9.51E-06	3.27E-07
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-5.17E+00	-5.17E+00	1.42E-02	-6.94E-03	-1.65E-07	-6.49E-02	-4.20E-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 &metals	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	5.57E-02	6.01E-01	2.12E-01	1.76E-02	3.95E+02	5.37E+01	2.57E-06
	Transport	A2	4.08E-04	4.46E-03	1.39E-03	1.03E-06	5.03E+00	2.31E-02	3.16E-08
	Manufacturing	A3	9.08E-04	3.44E-03	1.07E-03	1.49E-06	1.02E+01	2.70E-01	1.74E-08
	Total (Consumption grid)	A1-3	5.71E-02	6.09E-01	2.15E-01	1.76E-02	4.10E+02	5.40E+01	2.62E-06
Construction process stage	Transport	A4	MND	MND	MND	MND	MND	MND	MND
	Construction	A5	MND	MND	MND	MND	MND	MND	MND
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 and 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	1.26E-04	1.38E-03	4.23E-04	3.60E-07	1.56E+00	7.04E-03	8.93E-09
	Waste processing	C3	2.09E-04	2.29E-03	6.39E-04	4.57E-06	1.20E+00	1.95E-02	1.49E-08
	Disposal	C4	3.27E-06	3.57E-05	1.03E-05	3.68E-09	2.65E-02	1.19E-03	1.91E-10
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-6.70E-03	-7.61E-02	-2.21E-02	-8.52E-04	-4.80E+01	-1.09E+00	-4.66E-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	2.90E+00	6.04E+03	4.29E-07	9.92E-06	2.73E+02
	Transport	A2	2.57E-02	3.92E+00	1.21E-10	4.17E-09	4.17E+00
	Manufacturing	A3	4.76E-02	1.51E+01	6.86E-10	6.13E-09	3.24E+01
	Total (Consumption grid)	A1-3	2.97E+00	6.06E+03	4.30E-07	9.93E-06	3.09E+02
Construction process stage	Transport	A4	MND	MND	MND	MND	MND
	Construction	A5	MND	MND	MND	MND	MND
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 and 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	8.04E-03	1.22E+00	3.95E-11	1.28E-09	1.07E+00
	Waste processing	C3	9.48E-03	2.57E+00	8.12E-11	3.17E-09	8.07E-01
	Disposal	C4	1.25E-04	1.89E-02	8.11E-13	1.26E-11	6.34E-02
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-1.03E-01	-4.02E+02	-1.21E-08	-5.71E-07	-2.01E+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)

(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	-2.31E+01	1.79E-02	-7.83E+01	3.10E+02	1.30E+00	4.55E+02
	Transport	A2	6.87E-02	0.00E+00	6.87E-02	4.93E+00	0.00E+00	4.93E+00
	Manufacturing	A3	2.73E+00	3.62E+00	6.35E+00	9.95E+00	7.50E-01	1.07E+01
	Total (Consumption grid)	A1-3	-2.03E+01	3.64E+00	-7.18E+01	3.25E+02	2.05E+00	4.70E+02
Construction process stage	Transport	A4	MND	MND	MND	MND	MND	MND
	Construction	A5	MND	MND	MND	MND	MND	MND
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 and 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	2.20E-02	0.00E+00	2.20E-02	1.54E+00	0.00E+00	1.54E+00
	Waste processing	C3	7.15E-02	0.00E+00	7.15E-02	8.47E-01	0.00E+00	8.47E-01
	Disposal	C4	4.52E-04	0.00E+00	4.52E-04	2.60E-02	0.00E+00	2.60E-02
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-4.00E+00	0.00E+00	-4.00E+00	-4.77E+01	0.00E+00	-4.77E+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)

(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	9.11E+00	0.00E+00	0.00E+00	1.18E+00
	Transport	A2	0.00E+00	0.00E+00	0.00E+00	5.72E-04
	Manufacturing	A3	3.33E-02	6.50E-07	0.00E+00	6.49E-03
	Total (Consumption grid)	A1-3	9.14E+00	6.50E-07	0.00E+00	1.19E+00
Construction process stage	Transport	A4	MND	MND	MND	MND
	Construction	A5	MND	MND	MND	MND
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 and 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	1.74E-04
	Waste processing	C3	0.00E+00	0.00E+00	0.00E+00	4.82E-04
	Disposal	C4	0.00E+00	0.00E+00	0.00E+00	2.80E-05
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-2.18E-02	0.00E+00	0.00E+00	-2.80E-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)

(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	8.52E+00	2.33E+02	4.11E-03
	Transport	A2	5.46E-03	9.64E-02	1.05E+01
	Manufacturing	A3	1.24E-02	2.63E-01	3.16E-05
	Total (Consumption grid)	A1-3	8.54E+00	2.33E+02	1.05E+01
Construction process stage	Transport	A4	MND	MND	MND
	Construction	A5	MND	MND	MND
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 and 5% landfill					
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	1.72E-03	3.06E-02	1.06E-05
	Waste processing	C3	7.97E-03	1.76E-01	4.52E-06
	Disposal	C4	5.14E-05	1.08E-01	1.58E-07
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-1.06E+00	-1.60E+01	-6.60E-05

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

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	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	1.11E-04	4.03E-03	0.00E+00	-2.58E-02	8.94E-04
	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	1.45E-03	2.07E-08	8.67E-04	8.98E-05	-1.15E-01
	Total (Consumption grid)	A1-3	0.00E+00	1.56E-03	4.03E-03	8.67E-04	-2.58E-02	-1.14E-01
Construction process stage	Transport	A4	MND	MND	MND	MND	MND	MND
	Construction	A5	MND	MND	MND	MND	MND	MND
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 and 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	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	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
C1 to C4 End of life	At the end of its service life, SAS international ceiling product will be removed manually from the building without the use of power tools. As the product is made up of Steel which has a valuable recycling or repurposing percentage, it will therefore be either recovered via SAS or sent to a processing unit for recycling. It is assumed as 100% recovery rate from the deconstruction unit		
C2 Transportation	50km by road has been modelled for module C2 as a typical distance from the demolition site to the pre-processing unit. However, end-users of the EPD can use this information to calculate the impacts of a bespoke transport distance for module C2 if required	Road Transport	16-32 Ton Lorry
	Distance: Deconstruction unit to pre-processing Unit	km	50
C3 Waste Processing	SAS Chilled Panels using Horizon Steel are composed of 50% steel, 29% aluminium, 10% copper, and the remaining 10% consists of a mix of PPC, mineral wool, fleece, foils, glue, and other materials. At the End of Life, the product and its associated metal components can be dismantled and sorted into various waste and recycling streams. As part of the dismantling and sorting process, powder-coated finished materials do not need to be removed from the components and will be processed through existing industry recycling methods. This sustainable practice supports resource conservation and reduces the demand for new raw materials. SAS Ceiling Tiles, primarily made from steel, aluminium, and copper are also highly recyclable. with a small amount of other materials cannot be recovered at its end of life and will be end up in landfill. According to the BRE PCR EN 15804 3.1, steel, aluminium, and copper undergo waste processing, with 95% of these materials being recycled, while the remaining 5% is considered a natural loss during processing. The energy and materials used in sorting processes are not included in Module C3, as they are assumed to be negligible.		
	Steel waste to recycling	kg	0.479
	Aluminium waste to recycling	Kg	0.273
	Copper waste to recycling	Kg	0.097
C4 Disposal	Some of the paint bonded to the Steel, aluminium, glue, and wool will be discarded as waste during the pre-processing; as this waste is unable to be recycled, it will end up in landfills.		
	Inert waste to landfill	Kg	0.107
Module D	Module D accounts for the environmental benefits and loads resulting from waste steel, aluminium, and copper collected for recycling at the end of life. These benefits and loads are calculated by excluding the pre-existing recycled content used in the primary manufacturing process. Steel Recycling: The SAS steel supplier dataset indicates that 75% of the steel content is post-consumer recycled. Therefore, the benefits of recycling steel must exclude this pre-existing recycled content. Of the 0.479 kg of recovered steel from Module C3, 0.359 kg corresponds to pre-existing scrap steel that should be avoided. The benefits are calculated for virgin steel, which is 0.120 kg. Aluminium Recycling: The aluminium supplier dataset shows that 25.90% of the aluminium content is post-consumer recycled. Similarly, the benefits of recycling aluminium are calculated by excluding this pre-existing recycled content. Out of 0.273 kg of recovered aluminium from Module C3, 0.0706 kg corresponds to pre-existing scrap aluminium that is avoided. The benefits are calculated for virgin aluminium, amounting to 0.202 kg.		

Scenarios and additional technical information			
Scenario	Parameter	Units	Results
	Copper Recycling: Copper constitutes 10% of the overall composition, with a pre-existing recycled content of 34.60%, as sourced from Ecoinvent 3.8. Excluding the pre-existing content, the benefits are calculated for virgin copper, which amounts to 0.063 kg.		

Calculations product variations

SAS Chilled panels are highly versatile and can be customised to meet a range of cooling capacity requirements by varying the number of cooling elements integrated into each panel. The cooling performance is directly influenced by the number of elements and their arrangement within the panel. This Environmental Product Declaration (EPD) is based on a configuration where the elements are spaced at 100mm centres, consisting of 8 elements per panel.

To provide greater flexibility in design and performance, SAS Chilled panels can be specified with different element spacings, allowing for optimal cooling performance tailored to the needs of the space. The closer the spacing between elements, the higher the cooling capacity of the panel. Conversely, wider spacing reduces cooling capacity but may be sufficient for less demanding environments.

Outlined below are the typical element spacing configurations commonly applied, along with the corresponding data on embodied carbon and Global Warming Potential (GWP) based on results of this EPD. This information is essential for understanding the environmental impact of each configuration and enables informed decision-making when specifying panels to meet both performance and sustainability goals.

Chilled element per M2 of panel	Element Centres per M2	GWP total Kg/CO2/M2
8	100mm	34.1
6	150mm	30.8
4	250mm	27.5
2	500mm	24.2

Interpretation of Results

The bulk of the environmental impacts are attributed to the manufacturing of SAS chilled panels at the SAS factory covered by information modules A1-A3 of EN15804:2012+A2:2019

References

BSI. Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products. BS EN 15804:2012+A2:2019. London, BSI, 2019.

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.