Statement of Verification

BREG EN EPD No.: 000624 Issue 01

This is to verify that the

Environmental Product Declaration

provided by:

Zentia Profiles Limited

BRE Global Verified EPD

is in accordance with the requirements of:

EN 15804:2012+A2:2019

and

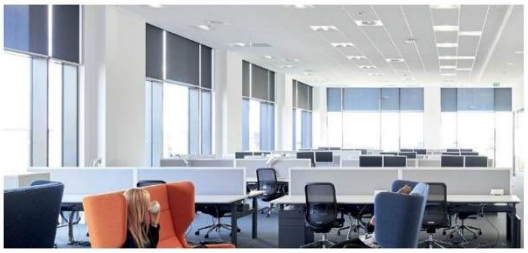
BRE Global Scheme Document SD207

This declaration is for:

1 Linear Metre of Rolled Steel Suspended Grid System (Unpainted)

Company Address

Zentia Profiles Limited,
401 Princesway Central,
Team Valley,
Gateshead NE11 0TU
United Kingdom



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Signed for BRE Global Ltd	Emma Baker Operator	17 September 2024 Date of this Issue
17 September 2024 Date of First Issue		16 September 2029 Expiry Date

BRE Global Verified EPD

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: 000624

General Information

EPD Programme Operator	Applicable Product Category Rules
BRE Global Watford, Herts WD25 9XX United Kingdom	BRE 2023 Product Category Rules (PN 514 Rev 3.1) for Type III environmental product declaration of construction products to EN 15804:2012+A2:2019
Commissioner of LCA study	**LCA consultant/Tool**
Zentia Profiles Limited, 401 Princesway Central, Team Valley, Gateshead NE11 0TU United Kingdom	LCA tool: BRE LINA A2 LCA Consultant: Tom Proctor
Declared/Functional Unit	**Applicability/Coverage**
1 linear metre of rolled steel suspended grid system (unpainted)	Other (please specify). Product specific
EPD Type	**Background database**
Cradle to Gate with C and D and Options	ecoinvent v3.8

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: Bala Subramanian
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)

Zentia mineral suspended ceiling grid is manufactured at the following factory:

401 Princesway Central
Team Valley
Gateshead NE11 0TU
United Kingdom

Construction Product:

Product Description

Zentia's suspended ceiling grid system is produced in the traditional roll forming and press stamping method. This product is used in conjunction with Zentia suspended ceiling membranes. The product is made up of Galvanised Steel Ribbon with Metal Clips.

This EPD applies to the following products: Class A1 Substructure components - type 1, Gridline 15 Butt Cut & Joggled, Perimeter 19 trim, Gridline 24 (including Corrosive Resistant, Max, System Z / Corridor, Butt Cut & Joggled, Seismic), main runners, cross tees, perimeter trims, and accessories. The LCA analyses have been conducted for one linear metre of rolled steel suspended grid system by using the average weight, i.e. 0.2956 kg/m for Gridline 15, 0.1977kg/m for Perimeter 19 trim and 0.2663 kg/m for Gridline 24.

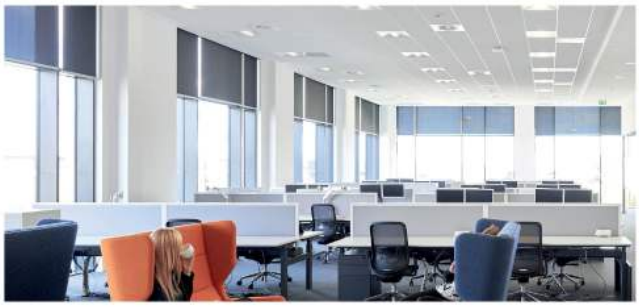
The grid system supports the Zentia suspended ceiling membranes, which are typically 600x600mm in size, with different shapes and sizes also available. The end user can use the results in the EPD to calculate the impacts for bespoke grid system used in the construction sector. For example, a typical 100m2 installation of 600x600mm suspended ceiling tiles requires:

- 70m of perimeter trim at 0.7 m/m2
- 84m of main runner to go through the length of the room and support the cross tees.
- 251m of cross tees to run parallel to the main runners and support the membrane.

The suspended ceiling membranes that this grid system is used to support is not included in this EPD. Additional components that enable the suspension of the ceiling system are also not included, which are the hold down clips, hangers, and top fixings.

Product Table – Technical Information

Product Name	Width (mm)	Fire Reaction (EN 13501-1)
24mm Gridline	24	A1
15mm Gridline	15	A1
19 mm Perimeter trim	19	A1



Main Product Contents

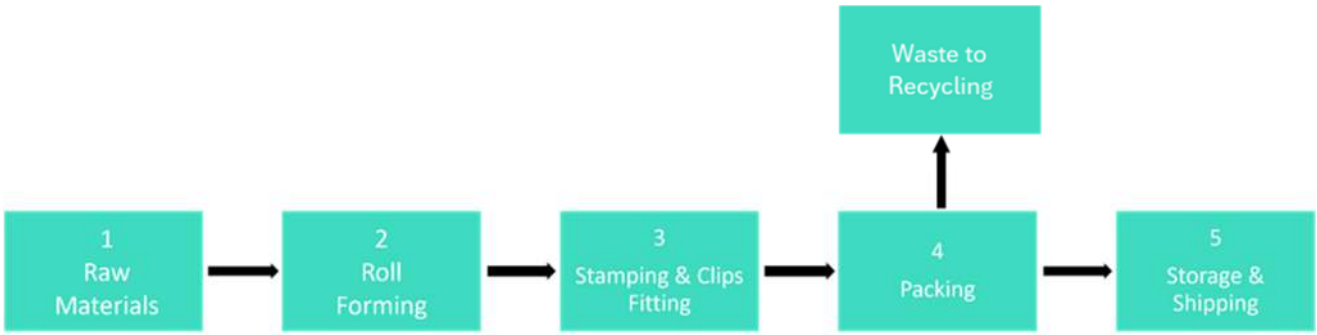
Material Input	%
Galvanised Steel Ribbon	99.4
Metal Clips	0.6

Note: The above product content is same for all the products covered in this EPD.

Manufacturing Process

The suspended ceiling grid system is produced in the traditional roll forming and press stamping method. Steel is delivered to the site and pulled from a coil of ribbon through a series of consecutive rolls that incrementally bends the steel into its desired shape. The material then has holes pressed into it and it is cut to the specific size of the desired product. Clips are then attached at the ends, to allow the grid to be attached to other sections of the grid system. Depending on the desired appearance, the capping colour can be changed.

Process flow diagram



Construction Installation

Transport to site (A4) is calculated on the assumption that Zentia sells ceiling grid to distributors, 90% of which are in the UK. The remaining distributors are within Europe. It is assumed that the grid is used in large commercial buildings which tend to be located within large cities. The furthest of which from the factory is London, hence the EPD assumes this distance for A4 – 450 km.
Construction installation (A5) has a wastage rate of 5%. No further materials or energy are associated with the construction of the product. There are no known increased hazards over and above those typically found on a building site. Personal protective equipment should be worn.

Use Information

There is no energy use associated with the product once installed.

End of Life

The service life of Zentia's suspended ceiling grid is up to 30 years if manufacturer's recommendations on installation and use are followed. At the end of use and where ceiling grid are removed without damage, they can be re-installed in other contexts. According to the BRE PCR3.1, 95% of the steel products will be recycled and 5% will be considered as a natural loss during the waste processing and will be ended up in Landfilling.

Life Cycle Assessment Calculation Rules

Declared unit description

1 linear metre of rolled steel suspended grid system (unpainted)

System boundary

This cradle-to-gate with C and D and options EPD has been assessed in accordance with the modular approach as defined in EN15804:2012+A2:2019 and BRE 2023 Product Category Rules (PN 514 Rev 3.1) and includes the processes covered in the manufacturing site and product stage A1 to A3, A4, A5, C1-C4 and D.

Data sources, quality and allocation

Specific primary data derived from Zentia's production process at the Princesway Team Valley, Gateshead factory, has been modelled using the LINA LCA software A2 and the ecoinvent 3.8 database. In accordance with the requirements of EN 15804:2012+A2:2019, the most current available data has been used.

In the manufacturing unit, Zentia Grid systems are the only product manufactured, available in 15mm, 19mm, and 24mm thicknesses. The LCA analysis is conducted for the individual products, i.e., Gridline 15 Butt Cut & Joggled, Perimeter 19mm trim, Gridline 24mm including 24 Corrosive Resistant, 24 Max, 24 System Z / Corridor, 24 Butt Cut & Joggled and Seismic, and all the results are enclosed in the EPD.

Once the product is manufactured in the Zentia manufacturing unit, it will be powder-coated and sent to the construction site for installation. However, the manufacturer has confirmed that during the data collection period, the paint line was not installed in the manufacturing unit. Therefore, the LCA analysis has been conducted for the unpainted grid systems, using the manufacturer-specific production data covering a period of one year (01/01/2021 – 31/12/2021).

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 EN 15804:2012+A2:2019.

Zentia's steel grid is the only product manufactured at the Princesway factory. Site-wide values for energy, water, and waste have been taken from bills. Figures for the raw materials, ancillary materials, and packaging were from actual usages. Allocation of energy, water, and waste has been done by mass according to the provisions of the BRE 2023 PCR PN 514 Rev 3.1 and EN 15804:2012+A2:2019.

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).	There is less than 5 years between the ecoinvent LCI reference year, and the time period for which the LCA was undertaken.

Specific UK datasets have been selected from the ecoinvent LCI for this LCA. The quality level of geographical and technical representativeness is therefore Very Good. The quality level of time representativeness is Very Good as the background LCI datasets are based on ecoinvent v3.8 which was compiled in 2021. Therefore, there is less than 1 years between the ecoinvent LCI reference year and the time period for which the LCA was undertaken.

The emission factors, CO_2 emissions for every 1 kWh of energy used, was 0.312 kgCO2eq/kWh for GB national grid electricity and 0.232 kgCO2eq/kWh for GB natural gas, at industrial furnace.

Zentia grid are made up of 99% steel and 1% metal clips. Therefore, in the end-of-life calculations, 95% of Zentia's steel grid is recycled, and 5% is considered as steel loss during waste processing, as referenced in the BRE PCR 3.1.

Cut-off criteria

All stages of the manufacturing process have been included. All inputs or outputs have been included 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. Upstream extraction and/or processing of inputs are included within the use of the background datasets within LINA.

LCA Results

Summary of Main Indicators (A1-A3)					
Product	**Global warming (GWP-total)**	**Non-renewable consumption (ADPF)**	**Primary energy usage (PERT+PENRT)**	**Waste Production (HWD+NHWD+RWD)**	**Water Consumption (FW)**
Unit	kg CO2 eq	MJ	MJ	Kg	m3
24 mm	6.96E-01	8.16E+00	9.18E+00	1.47E+00	8.47E-03
15 mm	7.72E-01	9.05E+00	1.02E+01	1.63E+00	9.40E-03
19 mm	5.07E-01	5.97E+00	6.72E+00	1.08E+00	6.21E-03

LCA Results - Gridline 24 (including Corrosive Resistant, Max, System Z / Corridor, Butt Cut & Joggled, Seismic) with the density of 0.2663 kg/m

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	6.78E-01	6.75E-01	2.64E-03	6.61E-04	3.81E-08	8.79E-03	3.26E-04
	Transport	A2	1.80E-02	1.80E-02	1.53E-05	7.10E-06	4.17E-09	7.52E-05	1.16E-06
	Manufacturing	A3	-6.14E-04	1.94E-02	-2.04E-02	1.03E-04	2.15E-09	7.79E-05	5.69E-06
	Total (of product stage)	A1-3	6.96E-01	7.12E-01	-1.78E-02	7.71E-04	4.44E-08	8.94E-03	3.33E-04
Construction process stage	Transport	A4	1.99E-02	1.99E-02	1.70E-05	7.82E-06	4.61E-09	8.08E-05	1.28E-06
	Construction	A5	6.00E-02	3.61E-02	2.39E-02	3.87E-05	2.31E-09	4.49E-04	1.67E-05
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	2.22E-03	2.21E-03	1.89E-06	8.69E-07	5.12E-10	8.98E-06	1.43E-07
	Waste processing	C3	1.46E-02	1.46E-02	5.14E-06	1.45E-06	3.11E-09	1.51E-04	4.51E-07
	Disposal	C4	7.03E-05	7.01E-05	6.95E-08	6.62E-08	2.84E-11	6.59E-07	6.42E-09
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-2.65E-01	-2.66E-01	8.33E-04	-7.53E-05	-1.06E-08	-9.64E-04	-1.05E-04

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

24 mm LCA Results (continued)

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	9.10E-04	3.22E-02	3.01E-03	2.52E-05	7.50E+00	3.33E-01	1.08E-07
	Transport	A2	2.25E-05	2.46E-04	7.51E-05	6.25E-08	2.72E-01	1.22E-03	1.55E-09
	Manufacturing	A3	3.56E-05	2.28E-04	7.34E-05	9.04E-08	3.86E-01	9.37E-03	1.27E-09
	Total (of product stage)	A1-3	9.68E-04	3.27E-02	3.16E-03	2.54E-05	8.16E+00	3.44E-01	1.11E-07
Construction process stage	Transport	A4	2.43E-05	2.66E-04	8.15E-05	6.92E-08	3.01E-01	1.35E-03	1.72E-09
	Construction	A5	4.93E-05	1.65E-03	1.61E-04	1.27E-06	4.14E-01	1.72E-02	5.60E-09
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	2.71E-06	2.96E-05	9.05E-06	7.69E-09	3.35E-02	1.51E-04	1.91E-10
	Waste processing	C3	6.70E-05	7.34E-04	2.02E-04	7.49E-09	2.00E-01	4.62E-04	4.05E-09
	Disposal	C4	2.29E-07	2.51E-06	7.30E-07	1.60E-10	1.96E-03	8.98E-05	1.33E-11
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-2.29E-04	-2.43E-03	-1.34E-03	-2.00E-07	-2.69E+00	-1.91E-02	-1.78E-08

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.

24 mm LCA Results (continued)

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	3.92E-02	2.68E+01	4.81E-09	2.61E-08	2.41E+00
	Transport	A2	1.40E-03	2.12E-01	6.90E-12	2.22E-10	1.86E-01
	Manufacturing	A3	5.46E-03	3.36E-01	3.48E-11	2.31E-10	2.28E+00
	Total (of product stage)	A1-3	4.61E-02	2.74E+01	4.85E-09	2.66E-08	4.87E+00
Construction process stage	Transport	A4	1.55E-03	2.35E-01	7.61E-12	2.46E-10	2.07E-01
	Construction	A5	2.33E-03	1.37E+00	2.43E-10	1.33E-09	2.47E-01
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	1.72E-04	2.61E-02	8.46E-13	2.74E-11	2.30E-02
	Waste processing	C3	9.00E-04	1.17E-01	4.52E-12	8.47E-11	2.54E-02
	Disposal	C4	8.70E-06	1.24E-03	3.14E-14	8.13E-13	4.11E-03
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-4.76E-03	-7.96E+00	-1.42E-09	-5.47E-09	-5.25E-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.

24 mm 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	6.63E-01	0.00E+00	6.63E-01	7.41E+00	0.00E+00	7.41E+00
	Transport	A2	3.83E-03	0.00E+00	3.83E-03	2.67E-01	0.00E+00	2.67E-01
	Manufacturing	A3	1.28E-01	3.18E-01	4.47E-01	3.29E-01	5.79E-02	3.87E-01
	Total (of product stage)	A1-3	7.95E-01	3.18E-01	1.11E+00	8.01E+00	5.79E-02	8.07E+00
Construction process stage	Transport	A4	4.24E-03	0.00E+00	4.24E-03	2.96E-01	0.00E+00	2.96E-01
	Construction	A5	-2.13E-01	2.68E-01	5.59E-02	3.91E-01	1.80E-02	4.09E-01
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	4.71E-04	0.00E+00	4.71E-04	3.28E-02	0.00E+00	3.28E-02
	Waste processing	C3	1.12E-03	0.00E+00	1.12E-03	1.96E-01	0.00E+00	1.96E-01
	Disposal	C4	1.67E-05	0.00E+00	1.67E-05	1.92E-03	0.00E+00	1.92E-03
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-9.31E-02	0.00E+00	-9.31E-02	-2.64E+00	0.00E+00	-2.64E+00

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

24 mm 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	1.02E-01	0.00E+00	0.00E+00	8.21E-03
	Transport	A2	0.00E+00	0.00E+00	0.00E+00	3.03E-05
	Manufacturing	A3	6.38E-03	3.10E-09	0.00E+00	2.25E-04
	Total (of product stage)	A1-3	1.08E-01	3.10E-09	0.00E+00	8.47E-03
Construction process stage	Transport	A4	0.00E+00	0.00E+00	0.00E+00	3.36E-05
	Construction	A5	5.41E-03	1.55E-10	0.00E+00	4.25E-04
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	3.73E-06
	Waste processing	C3	0.00E+00	0.00E+00	0.00E+00	1.14E-05
	Disposal	C4	0.00E+00	0.00E+00	0.00E+00	2.10E-06
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	0.00E+00	0.00E+00	0.00E+00	-4.63E-04

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

24 mm LCA Results (continued)

Other environmental information describing waste categories					
			HWD	NHWD	RWD
			kg	kg	kg
Product stage	Raw material supply	A1	2.38E-01	1.20E+00	1.71E-05
	Transport	A2	3.00E-04	5.32E-03	1.84E-06
	Manufacturing	A3	9.31E-04	2.49E-02	1.85E-06
	Total (of product stage)	A1-3	2.39E-01	1.23E+00	2.08E-05
Construction process stage	Transport	A4	3.32E-04	5.90E-03	2.04E-06
	Construction	A5	1.20E-02	6.19E-02	1.08E-06
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	3.69E-05	6.55E-04	2.26E-07
	Waste processing	C3	2.63E-04	1.84E-03	1.38E-06
	Disposal	C4	2.04E-06	2.88E-05	1.28E-08
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-5.22E-02	-4.88E-01	-4.64E-06

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

24 mm LCA Results (continued)

	Other environmental information describing output flows – at end of life								
			CRU	MFR	MER	EEE	EET	Biogenic carbon (product)	Biogenic carbon (packaging)
			kg	kg	kg	MJ per energy carrier	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	0.00E+00
	Transport	A2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Manufacturing	A3	0.00E+00	1.44E-08	1.88E-10	9.25E-07	5.19E-06	-1.12E-04	-2.56E-03
	Total (of product stage)	A1-3	0.00E+00	1.44E-08	1.88E-10	9.25E-07	5.19E-06	-1.12E-04	-2.56E-03
Construction process stage	Transport	A4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Construction	A5	0.00E+00	1.19E-02	2.07E-10	4.62E-08	2.59E-07	1.19E-04	2.41E-03
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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Waste processing	C3	0.00E+00	2.53E-01	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	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	0.00E+00

CRU = Components for reuse;
MFR = Materials for recycling

MER = Materials for energy recovery;
EEE = Exported Electrical Energy
EET = Exported Thermal Energy

LCA Results – Gridline 15 Butt Cut & Joggled with the weight of 0.2956 kg/m

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	7.53E-01	7.49E-01	2.94E-03	7.34E-04	4.23E-08	9.76E-03	3.62E-04
	Transport	A2	2.00E-02	2.00E-02	1.70E-05	7.88E-06	4.63E-09	8.35E-05	1.29E-06
	Manufacturing	A3	-6.81E-04	2.15E-02	-2.27E-02	1.14E-04	2.38E-09	8.65E-05	6.32E-06
	Total (of product stage)	A1-3	7.72E-01	7.91E-01	-1.97E-02	8.56E-04	4.93E-08	9.93E-03	3.70E-04
Construction process stage	Transport	A4	2.21E-02	2.21E-02	1.88E-05	8.68E-06	5.12E-09	8.97E-05	1.42E-06
	Construction	A5	6.66E-02	4.01E-02	2.65E-02	4.30E-05	2.56E-09	4.99E-04	1.85E-05
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	2.46E-03	2.46E-03	2.09E-06	9.65E-07	5.69E-10	9.97E-06	1.58E-07
	Waste processing	C3	1.62E-02	1.62E-02	5.71E-06	1.61E-06	3.45E-09	1.68E-04	5.01E-07
	Disposal	C4	7.80E-05	7.78E-05	7.71E-08	7.35E-08	3.15E-11	7.32E-07	7.13E-09
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-2.94E-01	-2.95E-01	9.25E-04	-8.36E-05	-1.18E-08	-1.07E-03	-1.17E-04

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

15 mm LCA Results (continued)

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	1.01E-03	3.58E-02	3.34E-03	2.80E-05	8.32E+00	3.70E-01	1.20E-07
	Transport	A2	2.50E-05	2.73E-04	8.33E-05	6.94E-08	3.02E-01	1.36E-03	1.72E-09
	Manufacturing	A3	3.95E-05	2.53E-04	8.15E-05	1.00E-07	4.29E-01	1.04E-02	1.41E-09
	Total (of product stage)	A1-3	1.07E-03	3.63E-02	3.51E-03	2.82E-05	9.05E+00	3.81E-01	1.23E-07
Construction process stage	Transport	A4	2.70E-05	2.95E-04	9.05E-05	7.69E-08	3.34E-01	1.50E-03	1.91E-09
	Construction	A5	5.48E-05	1.83E-03	1.79E-04	1.41E-06	4.60E-01	1.91E-02	6.22E-09
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	3.00E-06	3.28E-05	1.01E-05	8.54E-09	3.71E-02	1.67E-04	2.12E-10
	Waste processing	C3	7.44E-05	8.15E-04	2.24E-04	8.31E-09	2.22E-01	5.13E-04	4.50E-09
	Disposal	C4	2.54E-07	2.79E-06	8.11E-07	1.78E-10	2.17E-03	9.97E-05	1.47E-11
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-2.54E-04	-2.70E-03	-1.48E-03	-2.22E-07	-2.98E+00	-2.12E-02	-1.97E-08

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.

15 mm LCA Results (continued)

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	4.35E-02	2.98E+01	5.34E-09	2.90E-08	2.68E+00
	Transport	A2	1.55E-03	2.36E-01	7.66E-12	2.47E-10	2.07E-01
	Manufacturing	A3	6.06E-03	3.73E-01	3.86E-11	2.57E-10	2.53E+00
	Total (of product stage)	A1-3	5.11E-02	3.04E+01	5.39E-09	2.95E-08	5.41E+00
Construction process stage	Transport	A4	1.72E-03	2.61E-01	8.45E-12	2.74E-10	2.30E-01
	Construction	A5	2.59E-03	1.52E+00	2.70E-10	1.48E-09	2.74E-01
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	1.91E-04	2.90E-02	9.39E-13	3.04E-11	2.55E-02
	Waste processing	C3	9.99E-04	1.30E-01	5.02E-12	9.41E-11	2.82E-02
	Disposal	C4	9.65E-06	1.37E-03	3.48E-14	9.03E-13	4.56E-03
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-5.28E-03	-8.83E+00	-1.58E-09	-6.07E-09	-5.83E-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.

15 mm 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	7.36E-01	0.00E+00	7.36E-01	8.23E+00	0.00E+00	8.23E+00
	Transport	A2	4.25E-03	0.00E+00	4.25E-03	2.97E-01	0.00E+00	2.97E-01
	Manufacturing	A3	1.43E-01	3.53E-01	4.96E-01	3.65E-01	6.43E-02	4.30E-01
	Total (of product stage)	A1-3	8.82E-01	3.53E-01	1.24E+00	8.89E+00	6.43E-02	8.96E+00
Construction process stage	Transport	A4	4.71E-03	0.00E+00	4.71E-03	3.28E-01	0.00E+00	3.28E-01
	Construction	A5	-2.36E-01	2.98E-01	6.20E-02	4.35E-01	1.99E-02	4.55E-01
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	5.23E-04	0.00E+00	5.23E-04	3.65E-02	0.00E+00	3.65E-02
	Waste processing	C3	1.24E-03	0.00E+00	1.24E-03	2.17E-01	0.00E+00	2.17E-01
	Disposal	C4	1.85E-05	0.00E+00	1.85E-05	2.13E-03	0.00E+00	2.13E-03
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-1.03E-01	0.00E+00	-1.03E-01	-2.93E+00	0.00E+00	-2.93E+00

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

15 mm 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	1.13E-01	0.00E+00	0.00E+00	9.12E-03
	Transport	A2	0.00E+00	0.00E+00	0.00E+00	3.36E-05
	Manufacturing	A3	7.08E-03	3.44E-09	0.00E+00	2.50E-04
	Total (of product stage)	A1-3	1.20E-01	3.44E-09	0.00E+00	9.40E-03
Construction process stage	Transport	A4	0.00E+00	0.00E+00	0.00E+00	3.73E-05
	Construction	A5	6.01E-03	1.72E-10	0.00E+00	4.71E-04
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	4.14E-06
	Waste processing	C3	0.00E+00	0.00E+00	0.00E+00	1.26E-05
	Disposal	C4	0.00E+00	0.00E+00	0.00E+00	2.33E-06
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	0.00E+00	0.00E+00	0.00E+00	-5.14E-04

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

15 mm LCA Results (continued)

Other environmental information describing waste categories					
			HWD	NHWD	RWD
			kg	kg	kg
Product stage	Raw material supply	A1	2.64E-01	1.33E+00	1.90E-05
	Transport	A2	3.33E-04	5.91E-03	2.04E-06
	Manufacturing	A3	1.03E-03	2.76E-02	2.05E-06
	Total (of product stage)	A1-3	2.65E-01	1.36E+00	2.31E-05
Construction process stage	Transport	A4	3.68E-04	6.54E-03	2.26E-06
	Construction	A5	1.33E-02	6.87E-02	1.20E-06
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	4.09E-05	7.27E-04	2.51E-07
	Waste processing	C3	2.92E-04	2.04E-03	1.53E-06
	Disposal	C4	2.26E-06	3.19E-05	1.42E-08
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-5.80E-02	-5.42E-01	-5.15E-06

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

15 mm LCA Results (continued)

	Other environmental information describing output flows – at end of life								
			CRU	MFR	MER	EEE	EET	Biogenic carbon (product)	Biogenic carbon (packaging)
			kg	kg	kg	MJ per energy carrier	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	0.00E+00
	Transport	A2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Manufacturing	A3	0.00E+00	1.60E-08	2.09E-10	1.03E-06	5.76E-06	-1.24E-04	-2.85E-03
	Total (of product stage)	A1-3	0.00E+00	1.60E-08	2.09E-10	1.03E-06	5.76E-06	-1.24E-04	-2.85E-03
Construction process stage	Transport	A4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Construction	A5	0.00E+00	1.32E-02	2.29E-10	5.13E-08	2.88E-07	1.32E-04	2.67E-03
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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Waste processing	C3	0.00E+00	2.81E-01	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	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	0.00E+00

CRU = Components for reuse;
MFR = Materials for recycling

MER = Materials for energy recovery;
EEE = Exported Electrical Energy
EET = Exported Thermal Energy

LCA Results - Perimeter trim 19 mm with the weight of 0.1977 kg/m

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	4.95E-01	4.92E-01	1.95E-03	4.67E-04	2.79E-08	6.47E-03	2.39E-04
	Transport	A2	1.33E-02	1.33E-02	1.13E-05	5.24E-06	3.07E-09	5.55E-05	8.55E-07
	Manufacturing	A3	-4.56E-04	1.44E-02	-1.52E-02	7.65E-05	1.60E-09	5.78E-05	4.23E-06
	Total (of product stage)	A1-3	5.07E-01	5.20E-01	-1.32E-02	5.49E-04	3.26E-08	6.58E-03	2.44E-04
Construction process stage	Transport	A4	1.48E-02	1.48E-02	1.26E-05	5.81E-06	3.42E-09	6.00E-05	9.52E-07
	Construction	A5	4.41E-02	2.63E-02	1.77E-02	2.76E-05	1.69E-09	3.31E-04	1.22E-05
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	1.65E-03	1.64E-03	1.40E-06	6.45E-07	3.80E-10	6.67E-06	1.06E-07
	Waste processing	C3	1.08E-02	1.08E-02	3.82E-06	1.08E-06	2.31E-09	1.12E-04	3.35E-07
	Disposal	C4	5.22E-05	5.21E-05	5.17E-08	4.92E-08	2.11E-11	4.90E-07	4.77E-09
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-1.97E-01	-1.97E-01	6.19E-04	-5.59E-05	-7.88E-09	-7.16E-04	-7.80E-05

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

19 mm LCA Results (continued)

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	6.66E-04	2.38E-02	2.20E-03	1.86E-05	5.48E+00	2.44E-01	7.97E-08
	Transport	A2	1.66E-05	1.82E-04	5.54E-05	4.61E-08	2.01E-01	9.03E-04	1.14E-09
	Manufacturing	A3	2.64E-05	1.69E-04	5.45E-05	6.71E-08	2.87E-01	6.96E-03	9.45E-10
	Total (of product stage)	A1-3	7.09E-04	2.42E-02	2.31E-03	1.87E-05	5.97E+00	2.52E-01	8.17E-08
Construction process stage	Transport	A4	1.81E-05	1.98E-04	6.05E-05	5.14E-08	2.24E-01	1.01E-03	1.28E-09
	Construction	A5	3.62E-05	1.22E-03	1.18E-04	9.38E-07	3.03E-01	1.26E-02	4.13E-09
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	2.01E-06	2.19E-05	6.72E-06	5.71E-09	2.48E-02	1.12E-04	1.42E-10
	Waste processing	C3	4.98E-05	5.45E-04	1.50E-04	5.56E-09	1.48E-01	3.43E-04	3.01E-09
	Disposal	C4	1.70E-07	1.87E-06	5.43E-07	1.19E-10	1.46E-03	6.68E-05	9.87E-12
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-1.70E-04	-1.80E-03	-9.92E-04	-1.49E-07	-2.00E+00	-1.42E-02	-1.32E-08

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.

19 mm LCA Results (continued)

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	2.88E-02	1.97E+01	3.56E-09	1.92E-08	1.77E+00
	Transport	A2	1.03E-03	1.57E-01	5.09E-12	1.64E-10	1.38E-01
	Manufacturing	A3	4.05E-03	2.49E-01	2.58E-11	1.72E-10	1.69E+00
	Total (of product stage)	A1-3	3.39E-02	2.01E+01	3.59E-09	1.95E-08	3.60E+00
Construction process stage	Transport	A4	1.15E-03	1.74E-01	5.65E-12	1.83E-10	1.54E-01
	Construction	A5	1.72E-03	1.01E+00	1.80E-10	9.79E-10	1.82E-01
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	1.28E-04	1.94E-02	6.28E-13	2.03E-11	1.71E-02
	Waste processing	C3	6.68E-04	8.68E-02	3.36E-12	6.29E-11	1.89E-02
	Disposal	C4	6.47E-06	9.20E-04	2.33E-14	6.05E-13	3.06E-03
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-3.53E-03	-5.91E+00	-1.06E-09	-4.06E-09	-3.90E-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.

19 mm 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	4.83E-01	0.00E+00	4.83E-01	5.42E+00	0.00E+00	5.42E+00
	Transport	A2	2.82E-03	0.00E+00	2.82E-03	1.97E-01	0.00E+00	1.97E-01
	Manufacturing	A3	9.53E-02	2.36E-01	3.32E-01	2.44E-01	4.30E-02	2.87E-01
	Total (of product stage)	A1-3	5.81E-01	2.36E-01	8.17E-01	5.86E+00	4.30E-02	5.90E+00
Construction process stage	Transport	A4	3.15E-03	0.00E+00	3.15E-03	2.20E-01	0.00E+00	2.20E-01
	Construction	A5	-1.58E-01	1.99E-01	4.10E-02	2.86E-01	1.33E-02	3.00E-01
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	3.50E-04	0.00E+00	3.50E-04	2.44E-02	0.00E+00	2.44E-02
	Waste processing	C3	8.31E-04	0.00E+00	8.31E-04	1.45E-01	0.00E+00	1.45E-01
	Disposal	C4	1.24E-05	0.00E+00	1.24E-05	1.43E-03	0.00E+00	1.43E-03
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-6.91E-02	0.00E+00	-6.91E-02	-1.96E+00	0.00E+00	-1.96E+00

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

19 mm 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	7.52E-02	0.00E+00	0.00E+00	6.03E-03
	Transport	A2	0.00E+00	0.00E+00	0.00E+00	2.24E-05
	Manufacturing	A3	4.74E-03	2.30E-09	0.00E+00	1.67E-04
	Total (of product stage)	A1-3	8.00E-02	2.30E-09	0.00E+00	6.22E-03
Construction process stage	Transport	A4	0.00E+00	0.00E+00	0.00E+00	2.49E-05
	Construction	A5	4.00E-03	1.15E-10	0.00E+00	3.12E-04
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	2.77E-06
	Waste processing	C3	0.00E+00	0.00E+00	0.00E+00	8.46E-06
	Disposal	C4	0.00E+00	0.00E+00	0.00E+00	1.56E-06
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	0.00E+00	0.00E+00	0.00E+00	-3.44E-04

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

19 mm LCA Results (continued)

Other environmental information describing waste categories					
			HWD	NHWD	RWD
			kg	kg	kg
Product stage	Raw material supply	A1	1.75E-01	8.77E-01	1.25E-05
	Transport	A2	2.22E-04	3.93E-03	1.36E-06
	Manufacturing	A3	6.91E-04	1.85E-02	1.37E-06
	Total (of product stage)	A1-3	1.76E-01	9.00E-01	1.53E-05
Construction process stage	Transport	A4	2.46E-04	4.38E-03	1.51E-06
	Construction	A5	8.81E-03	4.53E-02	7.93E-07
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	2.74E-05	4.86E-04	1.68E-07
	Waste processing	C3	1.95E-04	1.37E-03	1.02E-06
	Disposal	C4	1.51E-06	2.14E-05	9.54E-09
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-3.88E-02	-3.62E-01	-3.45E-06

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

19 mm LCA Results (continued)

	Other environmental information describing output flows – at end of life								
			CRU	MFR	MER	EEE	EET	Biogenic carbon (product)	Biogenic carbon (packaging)
			kg	kg	kg	MJ per energy carrier	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	0.00E+00
	Transport	A2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Manufacturing	A3	0.00E+00	1.07E-08	1.40E-10	6.87E-07	3.85E-06	-8.29E-05	-1.90E-03
	Total (of product stage)	A1-3	0.00E+00	1.07E-08	1.40E-10	6.87E-07	3.85E-06	-8.29E-05	-1.90E-03
Construction process stage	Transport	A4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Construction	A5	0.00E+00	8.83E-03	1.53E-10	3.43E-08	1.93E-07	8.80E-05	1.79E-03
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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Waste processing	C3	0.00E+00	1.88E-01	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	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	0.00E+00

CRU = Components for reuse;
MFR = Materials for recycling

MER = Materials for energy recovery;
EEE = Exported Electrical Energy
EET = Exported Thermal Energy

Scenarios and additional technical information

Scenarios and additional technical information			
Scenario	Parameter	Units	Results
A4 – Transport to the building site	The products are sold to distributors. 90% of those are based in the UK. This product is primarily used in education, commercial and healthcare buildings. These tend to be based in larger cities, the furthest from the manufacturing plant is London – which is therefore the scenario used for the EPD		
	Fuel type / Vehicle type: 16-32 tonne lorry	Litre of fuel type per distance or vehicle type	Diesel 0.227L/km
	Distance:	km	450
	Capacity utilisation (incl. empty returns)	%	50
	Bulk density of transported products	kg/m	0.26
A5 – Installation	No further materials or energy are associated with the construction of the product. There are no known increased hazards over and above those typically found on a building site. Personal protective equipment should be worn.		
	Product installation waste	%	5
Reference service life	Zentia's grid system have a reference service life of	years	30
C1 – Deconstruction	The service life of Zentia's suspended ceiling grid is up to 30 years if manufacturer's recommendations on installation and use are followed. At the end of use and where ceiling grid are removed without damage, they can be re-installed in other contexts. As the product is made of steel and metal chips, it will be recycled to create new products. It is assumed that there will be 100% recovery of the waste products, and they will be sent to the waste processing unit for recycling.		
C2 – Transportation	The grids are typically transported 50 km by lorry to a waste management plant		
	Road transport	km	50
	Type of transport	Road	16-32 tonne lorry
	Fuel type	Litre of fuel type per distance	Diesel 0.227L/km
C3 - Pre-processing	The declared scenario assumes recycling of the product. According to the BRE PCR3.1, the 95% of the steel products will be recycled and 5% will be considered as a natural loss during the waste processing and will be ended up in Landfilling.		
	15mm Gridline – 95% recycling	kg	0.2808
	19mm Perimeter trim – 95% recycling	kg	0.1878
	24mm Gridline – 95% recycling	kg	0.2529
C4 – Disposal	5 % of steel is lost during the recycling process, this is accounted for here.		
	15mm Gridline – 5% recycling	kg	0.01478
	19mm Perimeter trim – 5% recycling	kg	0.009886
	24mm Gridline – 5% recycling	kg	0.01331

Scenarios and additional technical information			
Scenario	Parameter	Units	Results
D – Benefits and loads beyond the system	In calculating the benefits of recycling of the product at the end of life, the pre-existing recycled content has been removed and the benefits have been calculated for virgin steel.		
	Benefits of recycling 15mm Gridline	kg	0.1747
	Benefits of recycling 19mm Perimeter trim	kg	0.1168
	Benefits of recycling 24mm Gridline	kg	0.1573

Interpretation

The bulk of the environmental impacts and primary energy demand are attributed to the manufacturing phase, covered by information modules A1-A3 of EN15804:2012+A2:2019. Steel accounts for 99.4% of the total input material mass and contributes the most on overall environmental impacts.

References

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