Statement of Verification

BREG EN EPD No.: 000591 Issue 01

This is to verify that the

Environmental Product Declaration

provided by:

CCL Stressing International Ltd

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:

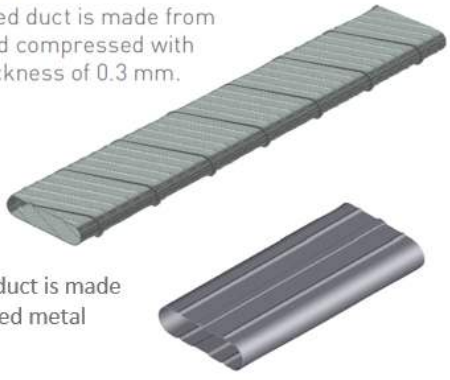
1 kg of Flat Ducts

Company Address

CCL Stressing International,
Unit 8,
Millennium Drive,
Leeds,
LS115BP

METAL DUCT

CCL's corrugated duct is made from rolled sheet and compressed with a minimum thickness of 0.3 mm.



CCL's smooth duct is made from roll-formed metal

Signed for BRE Global Ltd	Emma Baker Operator	27 June 2024 Date of this Issue
27 June 2024 Date of First Issue		26 June 2029 Expiry Date

BRE Global Verified EPD

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ECO PLATFORM EPD VERIFIED

Environmental Product Declaration

EPD Number: 000591

General Information

EPD Programme Operator	Applicable Product Category Rules
BRE Global Watford, Herts WD25 9XX United Kingdom	BRE Environmental Profiles 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**
CCL Stressing International Unit 8, Millennium Drive, Leeds, LS115BP	LCA Consultant: Bala Subramanian LCA Tool: BRE LINA A2
Declared/Functional Unit	**Applicability/Coverage**
1 kg of Flat Duct	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)

CCL Stressing Systems Ltd,
Unit 8,
Millennium Drive,
Leeds,
LS115BP

Construction Product:

Product Description

The Flat Ducts are used with the XF multistrand post-tensioning anchor systems (or equivalent). It is mostly used in floors and bridge deck construction. Flat Ducts are used in buildings, containment, and civil structures, as well as remedial applications. The ducts cover the whole anchor range and are used with 13 mm and 15 mm nominal diameter strands.

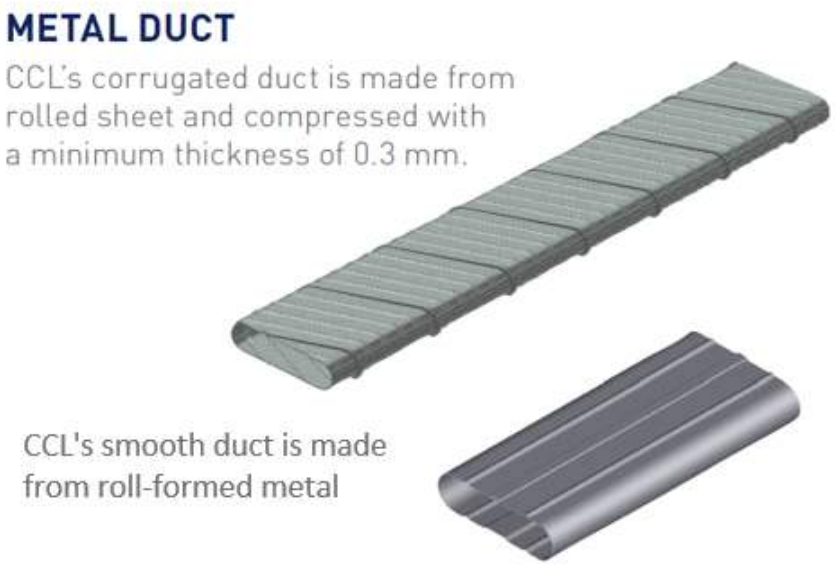
Technical Information and standards:

Property	Value, Unit
Tensile Strength; R_m	330-485 N/mm2
Elongation; A_{80}	18% Min
Yield Strength; R_e min. (Guidance only)	280-395 N/mm2
Hardness; HB (Guidance Only)	116 HB

Note: Technical properties of all products assessed within this EPD.

Status	Standard	Grade
Preferred	BS EN 10346:2009	Dx51d+Z275 NAC/MAC
Alternative	BS EN 10346:2009	Dx51d+Z225 NAC/MAC
Alternative	BS EN 10346:2009	Dx51d+Z200 NAC/MAC
Alternative	BS EN 10346:2009	Dx51d+Z140 NAC/MAC

Note: National standards of all products assessed within this EPD.



Main Product Contents

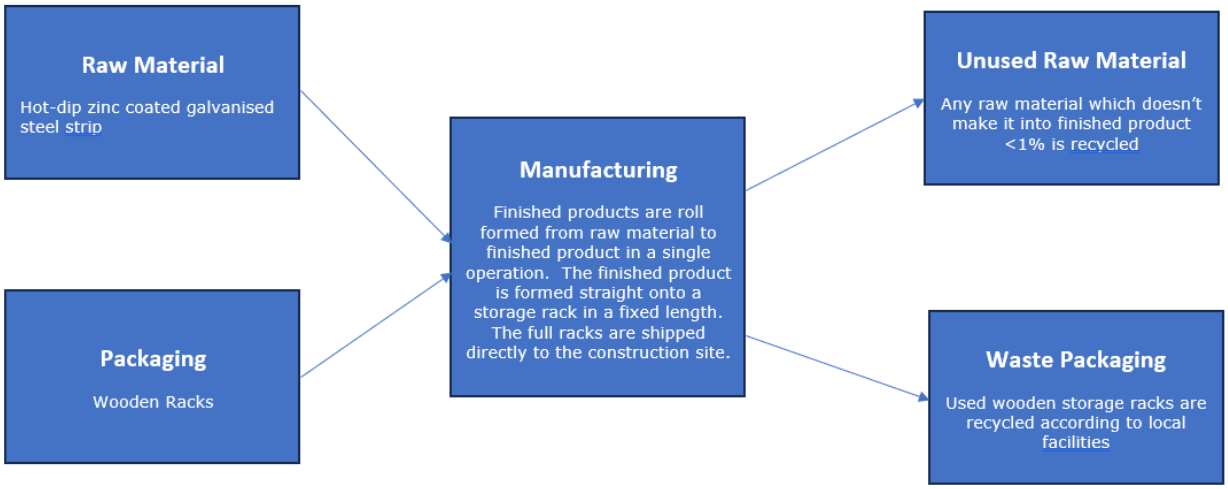
Material Input	%
Galvanised Steel	100

Note: Material composition of all products assessed within this EPD.

Manufacturing Process

Flat Ducts are manufactured from steel strip sheets for prestressing tendons in compliance with EN 523 as required in EAD 160004-00-0301 "Post-tensioning systems for prestressing of structures".

Process flow diagram



End of Life

The end-of-life stage starts when the construction product is replaced, dismantled, or deconstructed from the building or construction work and does not provide any further function. Deconstruction will happen for the entire building by using power tools, so while comparing the energy used to deconstruct the building and the quantity used to remove the Flat ducts, which is very small, it is negligible. The recovered steel is transported for recycling, while a small portion is assumed to be unrecoverable and remains in the rubble, which is sent to landfills (BRE PCR 3.1).

Life Cycle Assessment Calculation Rules

Declared / Functional unit description.

1 kg of XF Flat Ducts

System boundary

This is a cradle-to-gate with modules C and 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 2021 Product Category Rules (PN 514 Rev 3.1).

Data sources, quality and allocation

The datasets are derived from Ecoinvent v3.8, and the LCA tool used was BRE LINA A2. In this EPD, Flat Ducts product have been calculated for 1kg. The quantity used in the data collection for this EPD is therefore a total production data of Flat ducts produced during the data collection period (01/01/20-31/12/20) manufactured at CCL Stressing Systems Ltd.

CCL manufactures other products along with the Flat Ducts therefore allocation of fuel consumption, water consumption & discharge, and waste emissions was required, and this has been done according to the provisions of the BRE PCR PN514 and EN 15804.The original data collection form has been used while doing an LCA analysis, there was a no uplift in the given data. Electricity consumption was determined by measuring the consumption on the manufacturing site for all production lines and weighted proportionally by production of the ducts. The consumption of water is calculated based on the factual consumption. The manufacturer has confirmed that there are no packaging materials has been used during the data collection period.

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.

The original data collection form has been used while doing an LCA analysis, there was a no uplift in the given data. Specific European datasets have been selected from the ecoinvent LCI for this LCA. Manufacturer uses the national grid electricity for production, so therefore the most recent UK consumption mix 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 in kgCO2e/kWh. The quality level of time representativeness is also Very Good as the background LCI datasets are based on ecoinvent v3.8 which was compiled in 2021. Therefore, there is less than 5 years between the ecoinvent LCI reference year and the time period for which the LCA was undertaken.

Cut-off criteria

All 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

(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	2.48E+00	2.47E+00	9.80E-03	2.35E-03	1.40E-07	3.25E-02	1.20E-03
	Transport	A2	7.32E-03	7.31E-03	6.23E-06	2.87E-06	1.69E-09	2.97E-05	4.71E-07
	Manufacturing	A3	3.85E-02	3.83E-02	1.03E-04	4.44E-05	2.71E-09	1.06E-04	5.50E-06
	Total (Consumption grid)	A1-3	2.53E+00	2.52E+00	9.91E-03	2.39E-03	1.45E-07	3.26E-02	1.21E-03
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% Recycled & 5% Landfill									
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	8.32E-03	8.31E-03	7.08E-06	3.26E-06	1.92E-09	3.37E-05	5.35E-07
	Waste processing	C3	5.47E-02	5.47E-02	1.93E-05	5.46E-06	1.17E-08	5.68E-04	1.69E-06
	Disposal	C4	2.64E-03	2.63E-03	2.61E-06	2.49E-06	1.07E-09	2.48E-05	2.41E-07
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-1.30E+00	-1.30E+00	4.08E-03	-3.68E-04	-5.19E-08	-4.72E-03	-5.14E-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

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	3.34E-03	1.20E-01	1.11E-02	9.36E-05	2.75E+01	1.23E+00	4.00E-07
	Transport	A2	8.94E-06	9.77E-05	2.99E-05	2.54E-08	1.11E-01	4.98E-04	6.31E-10
	Manufacturing	A3	2.99E-05	2.82E-04	6.96E-05	9.53E-08	9.58E-01	7.64E-03	5.56E-10
	Total (Consumption grid)	A1-3	3.38E-03	1.20E-01	1.12E-02	9.37E-05	2.86E+01	1.24E+00	4.01E-07
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% Recycled & 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	1.02E-05	1.11E-04	3.40E-05	2.89E-08	1.26E-01	5.65E-04	7.17E-10
	Waste processing	C3	2.52E-04	2.76E-03	7.58E-04	2.81E-08	7.50E-01	1.73E-03	1.52E-08
	Disposal	C4	8.61E-06	9.42E-05	2.74E-05	6.01E-09	7.35E-02	3.37E-03	4.99E-10
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-1.12E-03	-1.19E-02	-6.54E-03	-9.81E-07	-1.32E+01	-9.33E-02	-8.70E-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.

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	1.45E-01	9.88E+01	1.79E-08	9.63E-08	8.90E+00
	Transport	A2	5.68E-04	8.63E-02	2.79E-12	9.05E-11	7.60E-02
	Manufacturing	A3	3.02E-02	4.95E-01	1.03E-11	2.64E-10	3.24E-01
	Total (Consumption grid)	A1-3	1.75E-01	9.93E+01	1.79E-08	9.67E-08	9.30E+00
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% Recycled & 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	6.46E-04	9.81E-02	3.18E-12	1.03E-10	8.63E-02
	Waste processing	C3	3.38E-03	4.39E-01	1.70E-11	3.18E-10	9.55E-02
	Disposal	C4	3.27E-04	4.64E-02	1.18E-12	3.05E-11	1.54E-01
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-2.33E-02	-3.89E+01	-6.96E-09	-2.67E-08	-2.57E+00

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	2.43E+00	0.00E+00	2.43E+00	2.72E+01	0.00E+00	2.72E+01
	Transport	A2	1.56E-03	0.00E+00	1.56E-03	1.09E-01	0.00E+00	1.09E-01
	Manufacturing	A3	1.56E-01	0.00E+00	1.56E-01	8.99E-01	6.01E-02	9.59E-01
	Total (Consumption grid)	A1-3	2.58E+00	0.00E+00	2.58E+00	2.82E+01	6.01E-02	2.83E+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% Recycled & 5% Landfill								
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	1.77E-03	0.00E+00	1.77E-03	1.23E-01	0.00E+00	1.23E-01
	Waste processing	C3	4.20E-03	0.00E+00	4.20E-03	7.36E-01	0.00E+00	7.36E-01
	Disposal	C4	6.27E-04	0.00E+00	6.27E-04	7.22E-02	0.00E+00	7.22E-02
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-4.56E-01	0.00E+00	-4.56E-01	-1.29E+01	0.00E+00	-1.29E+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	3.78E-01	0.00E+00	0.00E+00	3.03E-02
	Transport	A2	0.00E+00	0.00E+00	0.00E+00	1.23E-05
	Manufacturing	A3	6.62E-05	4.34E-09	0.00E+00	1.92E-04
	Total (Consumption grid)	A1-3	3.78E-01	4.34E-09	0.00E+00	3.05E-02
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% Recycled & 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	1.40E-05
	Waste processing	C3	0.00E+00	0.00E+00	0.00E+00	4.28E-05
	Disposal	C4	1.52E-05	0.00E+00	0.00E+00	7.88E-05
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	0.00E+00	0.00E+00	0.00E+00	-2.26E-03

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	8.78E-01	4.41E+00	6.30E-05
	Transport	A2	1.22E-04	2.16E-03	7.48E-07
	Manufacturing	A3	1.81E-03	2.52E-02	7.81E-06
	Total (Consumption grid)	A1-3	8.80E-01	4.43E+00	7.15E-05
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% Recycled & 5% Landfill					
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	1.39E-04	2.46E-03	8.50E-07
	Waste processing	C3	9.88E-04	6.92E-03	5.18E-06
	Disposal	C4	7.65E-05	1.08E-03	4.82E-07
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-2.56E-01	-2.39E+00	-2.27E-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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	A2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Manufacturing	A3	0.00E+00	1.28E-03	2.64E-10	8.57E-06	0.00E+00	0.00E+00
	Total (Consumption grid)	A1-3	0.00E+00	1.28E-03	2.64E-10	8.57E-06	0.00E+00	0.00E+00
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% Recycled & 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	9.50E-01	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 – Deconstruction	The end-of-life stage starts when the construction product is replaced, dismantled, or deconstructed from the building or construction work and does not provide any further function. Deconstruction will happen for the entire building by using power tools, so while comparing the energy used to deconstruct the building and the quantity used to remove the Flat ducts, which is very small, it is negligible. The recovered steel is transported for recycling, while a small portion is assumed to be unrecoverable and remains in the rubble, which is sent to landfills.		
C2- Transportation	50km by road has been modelled for module C2 as a typical distance from the demolition site to the disposal 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.	Litres per km	0.227
	Fuel type / Vehicle type	Road transport	16–32-ton lorry
	Deconstruction site to the disposal unit	km	50
C3 – Preprocessing	According to BRE PCR 3.1 end of life scenario for steel, 95 % of the waste steel will be recycled. The remaining 5 % is assumed to remain uncollected or to go to disposal e.g., landfill. The energy used for the processing the recovered steel is not included in module C3, it is assumed to be very small and are effectively negligible.		
	Recovered Flat Ducts to recycling	Kg	0.95
C4 – Disposal	5% is assumed as unrecoverable so they will be sent to landfill		
	Unrecovered Flat Ducts to landfill	kg	0.05
Module D	“Benefits and loads beyond the system boundary (Module D) accounts for the environmental benefits and loads resulting from the steel that is used as a raw material in steel making process via EAF or BOF and that is collected for recycling at end of life. These benefits and loads are calculated by excluding the pre-existing recycled steel that is used in the primary process. 1 kg of product at the end of life, becomes 0.95 kg of scrap steel and as a small percentage will have lost due to wear, this 95% of the product will be recycled. In order to calculate the benefits of the product at Module D, the pre-existing recycled content will be excluded, and the benefits will be calculated for virgin steel. According to the ecoinvent 3.8 database, hot-dipped galvanized steel sheet already includes 19% recycled material. Therefore, only 81% of the virgin material can be considered as Benefits and Loads Beyond the System Boundary. Consequently, 77% (81% * 95%) of the steel per unit will be recycled.		

Interpretation of results:

The product is made out of 100% stainless steel therefore the bulk of the environmental impacts and primary energy demand are attributed to the upstream manufacturing process of the Flat Ducts, covered by information modules A1-A3 of EN15804:2012+A2:2019.

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