Statement of Verification

BREG EN EPD No.: 000513 Issue 01

This is to verify that the

Environmental Product Declaration

provided by:

Fire Protection Ltd

BRE Global Verified EPD

is in accordance with the requirements of:

EN 15804:2012+A1:2013

and

BRE Global Scheme Document SD207

This declaration is for:

1m² of Flamebar BW18 Ductwork System

Company Address

Flamebar House
South Road
Templefields
Harlow, Essex
CM20 2AR

FPL PASSIVE FIRE PROTECTION SPECIALIST

Signed for BRE Global Ltd	Emma Baker Operator	15 December 2023 Date of this Issue
15 December 2023 Date of First Issue		31 October 2027 Expiry Date

BRE Global Verified EPD

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ECO PLATFORM EPD VERIFIED

Environmental Product Declaration

EPD Number: 000513

General Information

EPD Programme Operator	Applicable Product Category Rules
BRE Global Watford, Herts WD25 9XX United Kingdom	BRE Environmental Profiles 2013 Product Category Rules for Type III environmental product declaration of construction products to EN 15804:2012+A1:2013
Commissioner of LCA study	**LCA consultant/Tool**
Fire Protection Ltd Flamebar House South Road Templefields Harlow, Essex CM20 2AR	LCA consultant: Francis Yu Tool: BRE LINA v2.1
Declared Unit	**Applicability/Coverage**
1m² of Flamebar BW18 Ductwork System (26.48 kg/m²).	Product Specific.
EPD Type	**Background database**
Cradle to Gate	Ecoinvent 3.2

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: Roger Connick
a: Product category rules b: Optional for business-to-business communication; mandatory for business-to-consumer communication (see EN ISO 14025:2010, 9.4)

Comparability
Environmental product declarations from different programmes may not be comparable if not compliant with EN 15804:2012+A1:2013. Comparability is further dependent on the specific product category rules, system boundaries and allocations, and background data sources. See Clause 5.3 of EN 15804:2012+A1:2013 for further guidance

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)

Fire Protection Ltd
Chaucer Industrial Estate
Dittons Rd
Polegate
BN26 6JF

Fire Protection Ltd
Flamebar House
South Road
Templefields
Harlow
CM20 2AR

Construction Product

Product Description

Flamebar BW18 has been designed and developed to form a lightweight, highly durable fire rated ductwork system which complies with the latest European test standards, EN1366 Part 1, Part 8 and classified under EN13501 with a fire performance up 180 min. The system is fabricated from galvanised steel, prepared and is then sprayed with a coating using a specially formulated water-based compound. The coating contains selected mineral fillers and is applied to a nominal thickness of 2 mm. The ductwork is produced in sections and is assembled on site utilising FLAMEBAR gaskets and sealants. A thermal insulation, with a density of 105 kg/m^3 is be applied around the duct. A single layer of 50mm to achieve up to EI120 and a double layer of 50mm to obtain up to EI180. The system has been successfully tested for international use, under cellulosic fire conditions, to give in excess of four hours fire resistance in the event of a fire. Flamebar BW18 fire rated ductwork is produced in sections and assembled on site utilising tested fireproof gaskets/sealants.

Technical Information

Property	Value, Unit
Duct size	Any duct size up to 3000x3000mm is available.
Duct shape	Rectangular, Flat Oval, Circular
Scrap metal distribution	50% of scrap metal attributed to galvanised steel sheet. 25% of scrap metal attributed to steel bearers. 12.5% of scrap metal attributed to steel flange system. 12.5% of scrap metal attributed to threaded rods.

Property	Value, Unit
120 minutes Integrity & Insulation test	BS EN1366-1 for BW18 ventilation and kitchen extract ducts and BS EN1366-8 for BW18 multi compartment smoke extract ducts.
Fire Propagation class	Class O, BS 476 Part 6
Surface spread of flame	BS 476 Part 7
Hose stream test	ASTM-E119 with water pressure of 207 KPa (30 psi) for 2.5 mins
Other test	BS 6953 & Fire Safety Code of Practice requirements for smoke emission and toxic fume emission & USA NFPA 90A

Main Product Contents

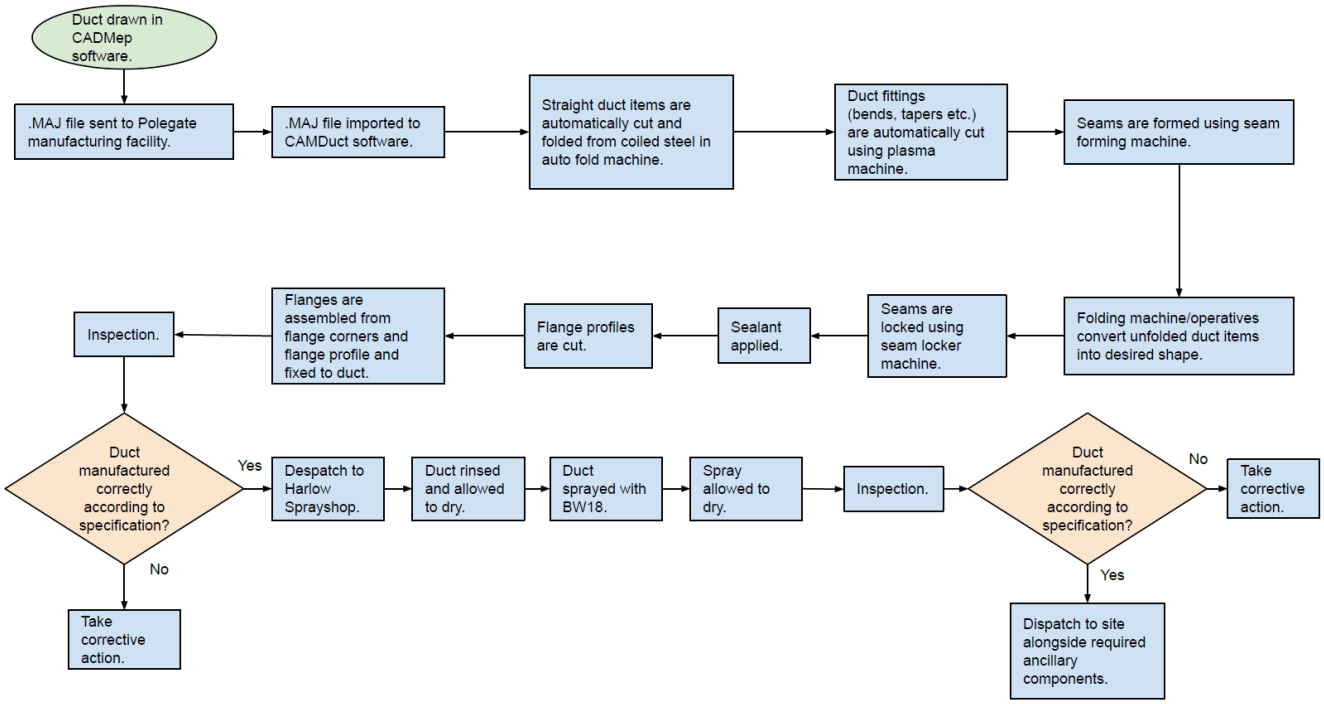
Material/Chemical Input	%
Galvanised steel sheet	26.85%
Flamebar BW18	10.96%
Steel flange system	8.68%
Flamebar Intumescent Acrylic Sealant	0.35%
Flamebar Fibre Gasket	0.18%
Steel bearers	6.22%
Steel threaded rod	1.75%

Material/Chemical Input	%
Concrete screw anchor	0.06%
FPL 110 Mineral Wool Insulation	44.93%
Steel Insulation Pins/Spotter Plates	0.02%

Manufacturing Process

Fire resistant duct is constructed from coiled steel at Polegate Factory, converted into square, rectangular, circular and other specific shapes. Flanges are added. It is then transported to the Harlow Sprayshop where the duct is then jet washed and factory fire sprayed with Flamebar BW18, a specially formulated water-based compound. It is then transported to site for installation.

Process flow diagram



Life Cycle Assessment Calculation Rules

Declared unit description

1m² of Flamebar BW18 Ductwork System (26.48 kg/m²).

System boundary

This is a cradle-to-gate EPD, reporting all production life cycle stages (modules A1 to A3) in accordance with EN 15804:2012+A1:2013.

Data sources, quality and allocation

The supporting LCA study was carried out using BRE LINA v2.1 using manufacturer-specific data provided by Fire Protection Ltd for the production period of the 12 months from 01/November/2020 to 31/October/2021 at

the Polegate Factory and Harlow Sprayshop, England sites. Flamebar BW18 Ductwork System production data includes data for all product variants. As the total weight of the input materials is less than the total weight of the output in the data collection, a 3% of material uplift has therefore been implemented for the input raw materials to make the input weight equal to the output weight.

Polegate premises are shared with a third party who has offices on site. The third party is responsible for 3.5% of electricity, gas and water bills. This split has been calculated and agreed upon by both parties using meter readings. Harlow premises are shared with a third party who has offices and a test laboratory on site which includes a gas-powered test furnace. The third party is responsible for 11.9% of electricity, 50% of gas and 20% of water bills. This split has been calculated and agreed upon by both parties using meter readings. Fire Protection Ltd have offices on both sites, it is unknown how much electricity and gas is used to power the offices, therefore the full site quantity (after percentages have been removed for other organisations) is assigned to manufacture.

The sites manufacture and spray other products in addition to Flamebar BW18 duct system and allocated values for energy, water, waste and wastewater have been allocated on square metre basis as a percentage of total site production. Secondary data has been obtained for all other upstream and downstream processes that are beyond the control of the manufacturer (i.e. raw material production) from the ecoinvent 3.2 database. All ecoinvent datasets are complete within the context used and conform to the system boundary and the criteria for the exclusion of inputs and outputs, according to the requirements specified in EN15804.

Flamebar Fibre Gasket was created separately in LINA according to the background LCI datasets from ecoinvent v3.2 and the ingredient lists offered by Fire Protection Ltd.

Quality Level	Geographical representativeness	Technical representativeness	Time representativeness
Very Good	Data from area under study.	Data from processes and products under study. Same state of technology applied as defined in goal and scope (i.e. identical technology).	n/a
Fair	n/a	n/a	There is approximately 5-6 years between the ecoinvent LCI reference year, and the time period for which the LCA was undertaken.

Specific European and 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 Fair as the background LCI datasets are based on ecoinvent v3.2 which was compiled in 2015. Therefore, there is approximately 5-6 years between the ecoinvent LCI reference year and the time period for which the LCA was undertaken.

Cut-off criteria

All raw materials, packaging materials, transportation, process energy, general energy, water use, production and non-production waste have been included where appropriate. Only direct emissions to air, water and soil, which are not measured, have been excluded.

LCA Results

Parameters describing environmental impacts

			GWP	ODP	AP	EP	POCP	ADPE	ADPF
			kg CO2 equiv.	kg CFC 11 equiv.	kg SO2 equiv.	kg (PO4)3- equiv.	kg C2H4 equiv.	kg Sb equiv.	MJ, net calorific value.
Product stage	Raw material supply	A1	3.93E+01	4.56E-06	4.89E-01	1.60E-01	5.88E-02	8.65E-03	7.42E+02
	Transport	A2	3.56E+00	6.47E-07	1.26E-02	3.45E-03	2.34E-03	9.78E-06	5.36E+01
	Manufacturing	A3	7.67E+00	6.33E-07	3.27E-02	8.01E-03	3.00E-03	1.01E-05	1.28E+02
	Total (of product stage)	A1-3	5.05E+01	5.84E-06	5.35E-01	1.72E-01	6.41E-02	8.67E-03	9.24E+02

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

Parameters describing resource use, primary energy

			PERE	PERM	PERT	PENRE	PENRM	PENRT
			MJ	MJ	MJ	MJ	MJ	MJ
Product stage	Raw material supply	A1	5.48E+01	2.68E-04	5.48E+01	8.10E+02	0.00E+00	8.10E+02
	Transport	A2	8.28E-01	3.97E-06	8.28E-01	5.34E+01	0.00E+00	5.34E+01
	Manufacturing	A3	8.11E+00	2.60E-05	8.11E+00	1.55E+02	0.00E+00	1.55E+02
	Total (of product stage)	A1-3	6.37E+01	2.98E-04	6.37E+01	1.02E+03	0.00E+00	1.02E+03

PERE = Use of renewable primary energy excluding renewable primary energy used as raw materials;
PERM = Use of renewable primary energy resources used as raw materials;
PERT = Total use of renewable primary energy resources;
PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials;
PENRM = Use of non-renewable primary energy resources used as raw materials;
PENRT = Total use of non-renewable primary energy resource

Parameters describing resource use, secondary materials and fuels, use of water

			SM	RSF	NRSF	FW
			kg	MJ net calorific value	MJ net calorific value	m^3
Product stage	Raw material supply	A1	0.00E+00	0.00E+00	0.00E+00	1.08E+00
	Transport	A2	0.00E+00	0.00E+00	0.00E+00	1.24E-02
	Manufacturing	A3	0.00E+00	0.00E+00	0.00E+00	9.14E-02
	Total (of product stage)	A1-3	0.00E+00	0.00E+00	0.00E+00	1.18E+00

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

LCA Results (continued)

Other environmental information describing waste categories					
			HWD	NHWD	RWD
			kg	kg	kg
Product stage	Raw material supply	A1	6.71E+00	3.65E+00	2.11E-03
	Transport	A2	2.71E-02	2.32E+00	3.67E-04
	Manufacturing	A3	3.27E-02	2.63E-01	6.12E-04
	Total (of product stage)	A1-3	6.77E+00	6.23E+00	3.09E-03

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

Other environmental information describing output flows – at end of life						
			CRU	MFR	MER	EE
			kg	kg	kg	MJ per energy carrier
Product stage	Raw material supply	A1	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
	Manufacturing	A3	0.00E+00	3.89E+00	0.00E+00	0.00E+00
	Total (of product stage)	A1-3	0.00E+00	3.89E+00	0.00E+00	0.00E+00

CRU = Components for reuse;
MFR = Materials for recycling

MER = Materials for energy recovery;
EE = Exported Energy

Interpretation

Most of the environmental impacts are attributed to the manufacturing phase, covered by information modules A1-A3 of EN15804:2012+A1:2013.

Out of the total mass of input materials, FPL 110 Mineral Wool Insulation makes up 44.9%, followed by the galvanised steel sheet at 26.9%, and then Flamebar BW18 at 11%. The other inputs make up the remaining 17.3%.

The galvanised steel sheet, steel flange system and steel bearers are responsible for the greatest impacts within each result indicator. Out of these three input materials, the galvanised steel sheet account for the greatest impact within all indicators, except for ODP, POCP, ADPE, and PERM, where Flamebar BW18, FPL 110 Mineral Wool Insulation are responsible for the greatest proportion of ODP, POCP respectively; Flamebar Fibre Gasket is responsible for the greatest proportion of ADPE and PERM.

This EPD is for 1m² of 250mm x 250mm Flamebar BW18 Ductwork System with 100mm Insulation (26.48kg). It is chosen as the representative of BW18 products because the surface area per metre of 250x250 duct is 1m², which facilitates the data collection and calculation process. The Environmental impacts of the other product in this series increase or decrease proportionally depending on the duct sizes and they can can be obtained from multiplying the LCA results of this EPD by the conversion factors below:

Duct Size			kg/m²	Conversion factors
100	x	100	32.23	1.2170
150	x	150	28.25	1.0668
250	x	250	26.48	1.0000
500	x	250	25.30	0.9554
500	x	500	25.15	0.9498
800	x	500	25.90	0.9781
800	x	800	25.78	0.9735
1000	x	1000	26.07	0.9845
1500	x	1000	29.72	1.1224
1500	x	1500	29.58	1.1171
2000	x	1000	34.25	1.2933
2000	x	2000	34.64	1.3083
3000	x	1250	41.17	1.5549
3000	x	3000	41.59	1.5706

References

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