

## Statement of Verification

BREG EN EPD No.: 000512

Issue 01

This is to verify that the  
**Environmental Product Declaration**  
provided by:  
**Fire Protection Ltd**



is in accordance with the requirements of:  
**EN 15804:2012+A1:2013**  
and  
**BRE Global Scheme Document SD207**

This declaration is for:  
**1m<sup>2</sup> of Flamebar BW11 Ductwork System**

### Company Address

Flamebar House  
South Road  
Templefields  
Harlow, Essex  
CM20 2AR



Emma Baker  
Operator

15 December 2023  
Date of this Issue

15 December 2023  
Date of First Issue

31 October 2027  
Expiry Date



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## Environmental Product Declaration

EPD Number: 000512

### 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
1m <sup>2</sup> of Flamebar BW11 Ductwork System (11.31 kg/m <sup>2</sup> ).	Product Specific.
EPD Type	Background database
Cradle to Gate	Ecoinvent 3.2
Demonstration of Verification	
CEN standard EN 15804 serves as the core PCR <sup>a</sup>	
Independent verification of the declaration and data according to EN ISO 14025:2010 <input type="checkbox"/> Internal <input checked="" type="checkbox"/> External	
(Where appropriate <sup>b</sup> )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
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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 BW11 has been designed and developed to be a lightweight, highly durable fire rated ductwork system complying with the latest standards. Flamebar BW11 is a specially formulated water-based compound which is sprayed onto metal ductwork. The premium coating contains selected mineral fillers in a low permeability elastomeric binder to a nominal thickness of 0.7mm to give a finished product, which has been successfully tested for international use under cellulosic fire conditions for up to and including 4 hours duration. Flamebar BW11 fire rated ductwork is produced in sections and assembled on site utilising tested fireproof gaskets and 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.
120 minutes integrity test	BS EN1366-1 for BW11 ventilation and kitchen extract ducts and BS EN1366-8 for BW11 multi compartment smoke extract ducts.
Fire Propagation class	Class O, BS 476 Part 6

Property	Value, Unit
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



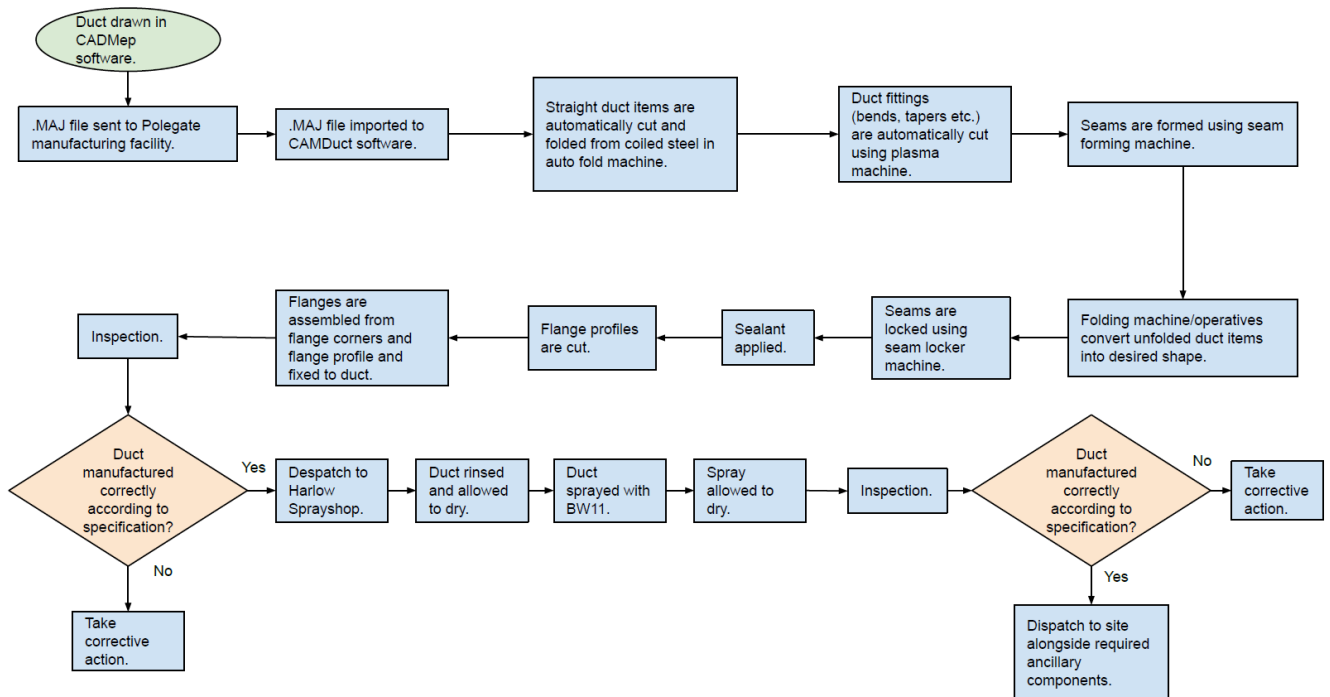
### Main Product Contents

Material/Chemical Input	%
Galvanised steel sheet	56%
Flamebar BW11	13.3%
Steel flange system	15.5%
Flamebar Intumescent Acrylic Sealant	0.7%
Flamebar Fibre Gasket	0.4%
Steel bearers	10.3%
Steel threaded rod	3.7%
Concrete screw anchor	0.1%

## 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 BW11, 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

1m<sup>2</sup> of Flamebar BW11 Ductwork System (11.31 kg/m<sup>2</sup>).

### 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 BW11 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 are 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 BW11 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 BW11 and Flamebar Fibre Gasket were 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	3.53E+01	2.25E-06	3.35E-01	1.25E-01	3.76E-02	8.47E-03	4.95E+02
	Transport	A2	2.60E+00	4.73E-07	9.14E-03	2.50E-03	1.69E-03	7.10E-06	3.91E+01
	Manufacturing	A3	7.34E+00	6.25E-07	3.15E-02	7.77E-03	2.60E-03	8.59E-06	1.21E+02
	Total (of product stage)	A1-3	4.52E+01	3.34E-06	3.76E-01	1.35E-01	4.19E-02	8.49E-03	6.55E+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	3.74E+01	2.42E-04	3.74E+01	5.27E+02	0.00E+00	5.27E+02
	Transport	A2	6.01E-01	2.79E-06	6.01E-01	3.90E+01	0.00E+00	3.90E+01
	Manufacturing	A3	7.79E+00	2.06E-05	7.79E+00	1.46E+02	0.00E+00	1.46E+02
	Total (of product stage)	A1-3	4.58E+01	2.65E-04	4.58E+01	7.12E+02	0.00E+00	7.12E+02

PERE = Use of renewable primary energy excluding renewable primary energy used as raw materials;  
 PERM = Use of renewable primary energy resources used as raw materials;  
 PERT = Total use of renewable primary energy resources;

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

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 <sup>3</sup>
Product stage	Raw material supply	A1	0.00E+00	0.00E+00	0.00E+00	8.26E-01
	Transport	A2	0.00E+00	0.00E+00	0.00E+00	9.00E-03
	Manufacturing	A3	0.00E+00	0.00E+00	0.00E+00	6.58E-02
	Total (of product stage)	A1-3	0.00E+00	0.00E+00	0.00E+00	9.00E-01

SM = Use of secondary material;  
 RSF = Use of renewable secondary fuels;

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

### LCA Results (continued)

Other environmental information describing waste categories			HWD	NHWD	RWD
			kg	kg	kg
Product stage	Raw material supply	A1	6.23E+00	2.71E+00	1.12E-03
	Transport	A2	1.95E-02	1.71E+00	2.68E-04
	Manufacturing	A3	2.59E-02	2.54E-01	6.07E-04
	Total (of product stage)	A1-3	6.28E+00	4.67E+00	2.00E-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	4.05E+00	0.00E+00	0.00E+00
	Total (of product stage)	A1-3	0.00E+00	4.05E+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, galvanised steel sheet makes up 56%, followed by the Steel flange system at 15.5%, Flamebar BW11 at 13.3%, and then steel bearers at 10.30%. The other inputs make up the remaining 5%.

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 ADPE and PERM, where Flamebar Fibre Gasket is responsible for the greatest proportion of impact.

This EPD is for 1m<sup>2</sup> of 250mm x 250mm Flamebar BW11 Ductwork System (11.31kg). It is chosen as the representative of BW11 products because the surface area per metre of 250x250 duct is 1m<sup>2</sup>, 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 be obtained from multiplying the LCA results of this EPD by the conversion factors below:

<b>Duct Size</b>	<b>kg/m<sup>2</sup></b>	<b>Conversion factors</b>
100 x 100	10.78	0.9527
150 x 150	10.98	0.9711
250 x 250	11.31	1.0000
500 x 250	10.94	0.9673
500 x 500	10.79	0.9540
800 x 500	11.06	0.9780
800 x 800	10.88	0.9618
1000 x 1000	11.31	1.000
1500 x 1000	15.87	1.4028
1500 x 1500	15.57	1.3764
2000 x 1000	18.83	1.6649
2000 x 2000	18.21	1.6102
3000 x 1250	24.54	2.1699
3000 x 3000	23.47	2.0749

## References

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