

## Statement of Verification

BREG EN EPD No.: 000514

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 FPL09 & DW/144 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: 000514

### 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 FPL09 & DW/144 Ductwork System (9.52 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
A1	A2	A3	A4	A5	Related to the building fabric					Related to the building		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

FPL09 is an unsprayed fire-resistant duct system used for single compartment smoke extract systems.  
 DW/144 is a duct system used for non-fire-resisting applications.

### 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 EN1366-9



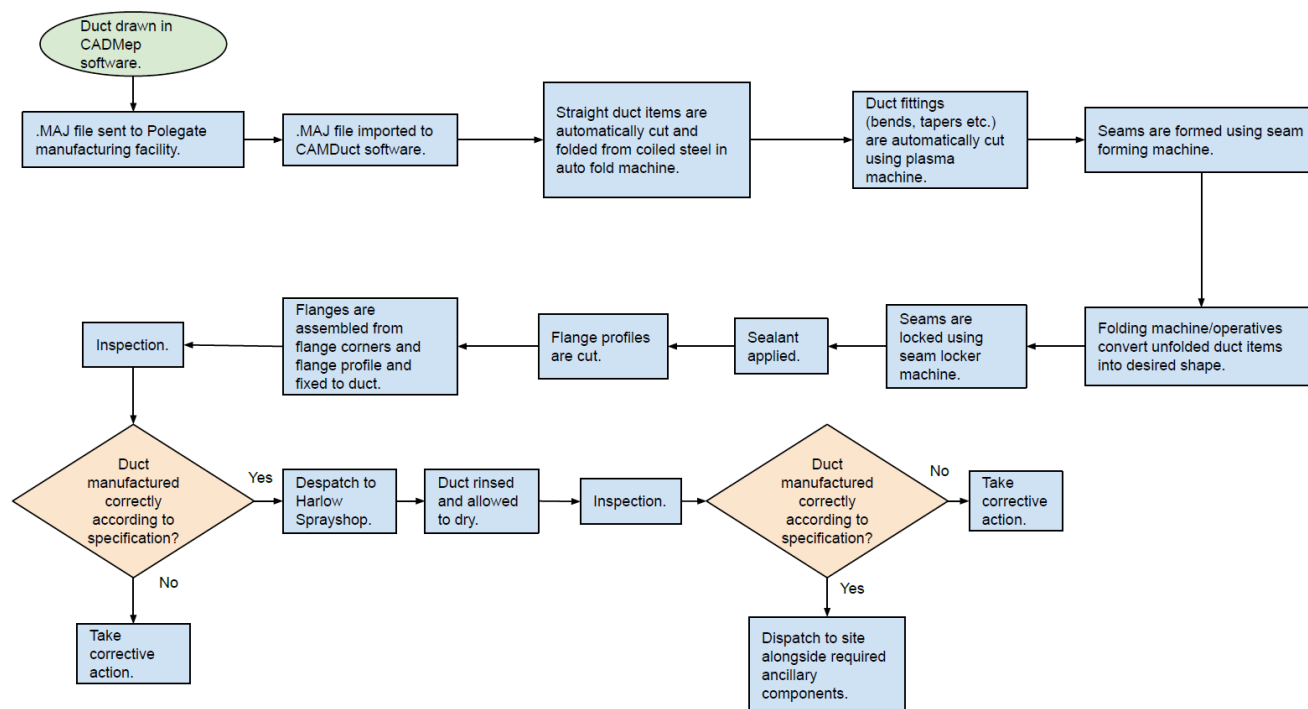
### Main Product Contents

Material/Chemical Input	%
Galvanised steel sheet	65.7%
Steel flange system	14.9%
Flamebar Intumescent Acrylic Sealant	1.7%
Flamebar Fibre Gasket	0.9%
Steel bearers	12.1%
Steel threaded rod	4.4%
Concrete screw anchor	0.3%

## 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. It is then transported to site for installation.

## Process flow diagram



## Life Cycle Assessment Calculation Rules

### Declared unit description

1m<sup>2</sup> of FPL09 & DW/144 Ductwork System (9.52 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. FPL09 & DW/144 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 5% 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 FPL09 & DW/144 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	3.32E+01	2.07E-06	3.28E-01	1.20E-01	3.35E-02	1.37E-02	4.47E+02
	Transport	A2	2.43E+00	4.44E-07	8.37E-03	2.26E-03	1.50E-03	6.52E-06	3.66E+01
	Manufacturing	A3	6.90E+00	6.14E-07	2.99E-02	7.39E-03	2.03E-03	6.49E-06	1.11E+02
	Total (of product stage)	A1-3	4.25E+01	3.13E-06	3.66E-01	1.30E-01	3.70E-02	1.37E-02	5.94E+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	3.51E+01	3.07E-04	3.51E+01	4.78E+02	0.00E+00	4.78E+02
	Transport	A2	5.37E-01	2.22E-06	5.37E-01	3.65E+01	0.00E+00	3.65E+01
	Manufacturing	A3	7.14E+00	1.30E-05	7.14E+00	1.34E+02	0.00E+00	1.34E+02
	Total (of product stage)	A1-3	4.28E+01	3.22E-04	4.28E+01	6.48E+02	0.00E+00	6.48E+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	7.90E-01
	Transport	A2	0.00E+00	0.00E+00	0.00E+00	8.25E-03
	Manufacturing	A3	0.00E+00	0.00E+00	0.00E+00	2.78E-02
	Total (of product stage)	A1-3	0.00E+00	0.00E+00	0.00E+00	8.26E-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	6.01E+00	2.63E+00	1.05E-03
	Transport	A2	1.70E-02	1.65E+00	2.52E-04
	Manufacturing	A3	1.63E-02	2.29E-01	5.99E-04
	Total (of product stage)	A1-3	6.05E+00	4.51E+00	1.90E-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 65.7%, followed by the steel flange system at 14.9%, and then steel bearers at 12.1%. The other inputs make up the remaining 7.3%.

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 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 FPL09 & DW/144 Ductwork System (9.52kg). It is chosen as the representative of FPL09 & DW/144 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:

<u>Duct Size</u>			<u>kg/m<sup>2</sup></u>	<u>Conversion factors</u>
100	x	100	7.53	0.7904
150	x	150	7.22	0.7581
250	x	250	9.52	1.0000
500	x	250	8.46	0.8887
500	x	500	8.95	0.9401
800	x	500	9.95	1.0452
800	x	800	9.93	1.0432
1000	x	1000	11.67	1.2256
1500	x	1000	13.50	1.4179
1500	x	1500	14.36	1.5081
2000	x	1000	16.90	1.7747
2000	x	2000	17.98	1.8887
3000	x	1250	17.93	1.8833
3000	x	3000	18.62	1.9560

## References

BSI. Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products. BS EN 15804:2012+A1:2013. London, BSI, 2013.

BSI. Environmental labels and declarations – Type III Environmental declarations – Principles and procedures. BS EN ISO 14025:2010 (exactly identical to ISO 14025:2006). London, BSI, 2010.

BSI. Environmental management – Life cycle assessment – Principles and framework. BS EN ISO 14040:2006. London, BSI, 2006.

BSI. Environmental management – Life cycle assessment – requirements and guidelines. BS EN ISO 14044:2006. London, BSI, 2006.

BSI. Fire resistance tests for service installations – Single compartment smoke extraction ducts. BS EN 1366-9: 2008. London, BSI, 2008.

Pre Consultants bv. SimaPro 8 LCA Software 2013. <http://www.pre-sustainability.com>

Ecoinvent Centre. Swiss Centre for life Cycle Inventories. <http://www.ecoinvent.org>