Flamebar BW11 Fire Rated Ductwork is protected by design right

Standards

The range of ***FLAMEBAR*** BW11 Fire Duct has been tested by the Loss Prevention Council in accordance with BS 476 Part 24 (1987) and ISO Standard 6944 (1985), for vertical and horizontal ductwork, with fire inside and outside the duct, in excess of 4 hours Stability, Integrity and Insulation for ventilation ductwork, smoke extract ductwork or kitchen extract ductwork.

FLAMEBAR BW11 has been test by UL in the USA to determine compliance with NFPA 90A (Installation of Air Conditioning and Ventilation Systems) for flame spread and smoke development with the following results:

NFPA Stipulation	Flame Spread not to exceed 25	Smoke Development no higher than 50
FLAMEBAR BW11 Results	9.4	0.2

Test conducted in accordance with UL Standard 723 "Test for Surface Burning Characteristics of Building Materials" (ASTM E84)

FLAMEBAR BW11 Fire Duct has also passed the hose stream test to ASTM – E119 with water pressure of 207 KPa (30 psi) for 2½ minutes.

FLAMEBAR BW11 Fire Duct has also been tested by London Underground Limited (underground metro system) to BS 6853 and satisfied the Fire Safety Code of Practice requirements for smoke emission and toxic fume emission.

Impact Test of *FLAMEBAR* BW11 Fire Duct
Impact test to BS 5669, in which a dart imparts 44.15 joules (32.5 ft pound force) at maximum drop, resulting in a small indentation which passes under the criteria of BS 5669.
FLAMEBAR BW11 Fire Duct also has undergone impact testing to the requirements of Appendix A BS 5588 Part 5.

Properties

Exterior Weathering of *FLAMEBAR* BW11 Fire Duct
Duplicate samples were placed on the exterior weathering frame and left totally exposed from January 1993. The results so far show:

1 Some dirt pick-up which can be cleaned off.
2 No mould growth.
3 No chalking.
4 Materials has remained totally intact.

Considering the length of time the samples have been exposed, the material is in good condition.

Artificial Weathering of *FLAMEBAR* BW11 – OUV Weatherometer
The samples undergoing artificial weathering have undergone over 22,000 hours of alternate UV and condensation cycling which is extremely excessive in duration terms. 22,000 hours is equivalent to 60 years external exposure.

Expansion of *FLAMEBAR* BW11 Fire Duct
As all steel expands with temperature, there will naturally be an expansion of fire duct under fire conditions as follows:

At 1100 C and expansion of 0.01562mm per mm (0.016 in per in)
At 600 C and expansion of 0.00852mm per mm (0.008 in per in)
At 430 C and expansion of 0.006106mm per mm (0.006 in per in)

Thermal Properties of *FLAMEBAR* BW11 Fire Duct
'U' value – thermal transmittance.
FLAMEBAR BW11 without insulation = 5.0 w/m^{2}k (0.88 Btu/ft^2/hr^{0}F)
FLAMEBAR BW11 with 50 mm insulation = 0.833 w/m^{2}k (0.147 Btu/ft^2/hr^{0}F)
FLAMEBAR BW11 with 100mm insulation = 0.48 w/m^{2}k (0.08 Btu/ft^2/hr^{0}F)

Chemical Resistance of *FLAMEBAR* BW11 Fire Duct
The coating has been tested in standard 10% solutions of the following acids:
Hydrochloric, Nitric and Sulphuric.
Standard 10% solutions of the following Alkalies:
Sodium Hydroxide and Potassium Hydroxide.
The following Solvents:
Xylene and Acetone.
After 10 days immersion, all of the above chemicals failed to cause a breakdown of the product structure.

LICENSEE

FOR FURTHER INFORMATION PLEASE REFER TO OUR TECHNICAL AND APPLICATIONS MANUALS

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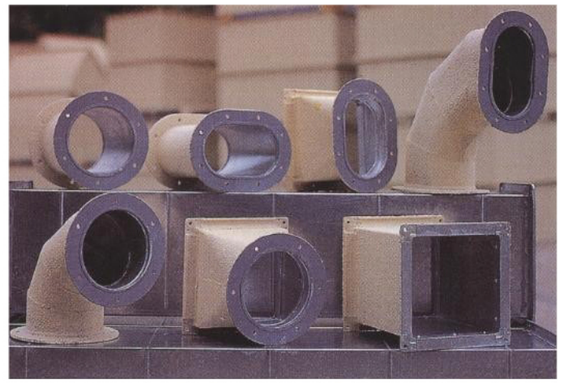
delta6/05

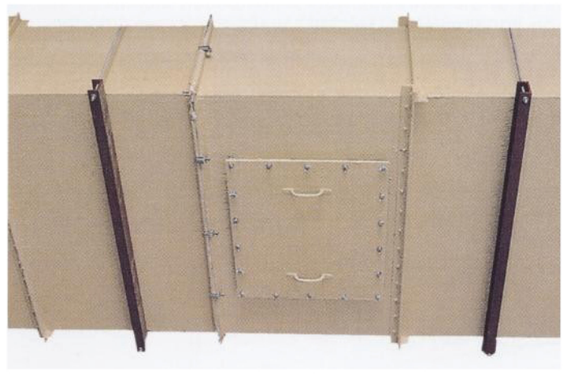
Flamebar BW11 Fire Rated Ductwork

FIRE RATED DUCT PROVIDING UP TO 4 HOURS FIRE RESISTANCE WHEN TESTED TO BS 476 Part 24 AND ISO 6944

Construction

FLAMEBAR BW11 Fire Duct is constructed from galvanized sheet steel manufactured to the HVCA or SMACNA standard, the degreased and factory fire sprayed with **FLAMEBAR** BW11 which is a specially formlated water based compound. This contains selected mineral filters in a low permeability elastomeric binder to a thickness of approximately 1mm to give a finished product which has been successfully tested for international use under Cellulosic Fire Conditions in excess of 4 hours duration. Ductwork is produced in sections and is assembled on site utilising tested fireproof gaskets/sealants.





The unique properties of **FLAMEBAR** BW11 has enabled us to design a low density, highly durable material which accommodates induced stress arising from extreme and varying conditions eg Climatic Moisture and Structural Loading Variations and the effect of thermal shock during a fire.

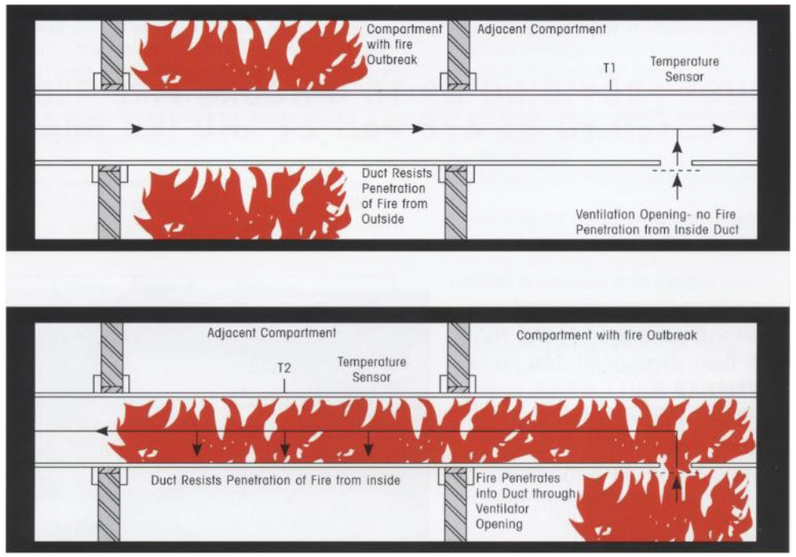
The completed system has been tested accredited by BRE to BS 476 Part 24 (1987) and also classified by UL to ISO 6944 (1985) up to a temperature of 1133°C.

Flamebar BW11 Fire Rated Ductwork

System Advantages

The **FLAMEBAR** BW11 System offers the following advantages:

The system is tested for up to 4 hours for Stability, Integrity and Insulation in accordance with BS 476 part24 and ISO 6944 for both type A and B fires.



Fire Outside -Duct Type A

Fire Inside -Duct Type B

As well as being used for Fire Rated Smoke Extract, Kitchen Exhaust and Pressurisation Systems, the **FLAMEBAR** BW11 system can also be used instead of drywall fire rated shafts.
By eliminating drywall shafts, floor space is maximized and as **FLAMEBAR** BW11 is both water and mould resistant, the Fire Rated Shaft can be constructed before the building is completely watertight, thereby reducing construction time and greatly reducing the need for additional site inspections.

The **FLAMEBAR** BW11 ducts arrive on site as finished sections ready for installation.

As the **FLAMEBAR** BW11 system can be based upon DW144 or SMACNA ductwork construction standards the fire duct sections can be constructed using the TDF or slide-on flange system, jointed together incorporating the **FLAMEBAR** Intumescent Gasket, the installation can be carried out by competent duct erectors.

Plant items such as in-line fans and silencers, subject to casing thickness and suitable construction, can be sprayed with **FLAMEBAR** BW11 and thereby rated as part of the certified system eliminating the need for special enclosures.
The **FLAMEBAR** BW11 system is the lightest weight certified system on the market. Therefore as well as the load on the structure being eased, handling and site erection are made easier.

Flamebar BW11 Fire Rated Ductwork

Flexibility in Design

FLAMEBAR BW11 offers complete flexibility in design – rectangular, flat oval and circular ducts are available.

The construction of the initial galvanized sheet steel duct means that all **FLAMEBAR** BW11 fire ducts have normal standards of air tightness and are therefore easily capable of being successfully pressure tested.

Extract From Typical Construction Standard – Up To 2 Hours Stability, Integrity & Insulation

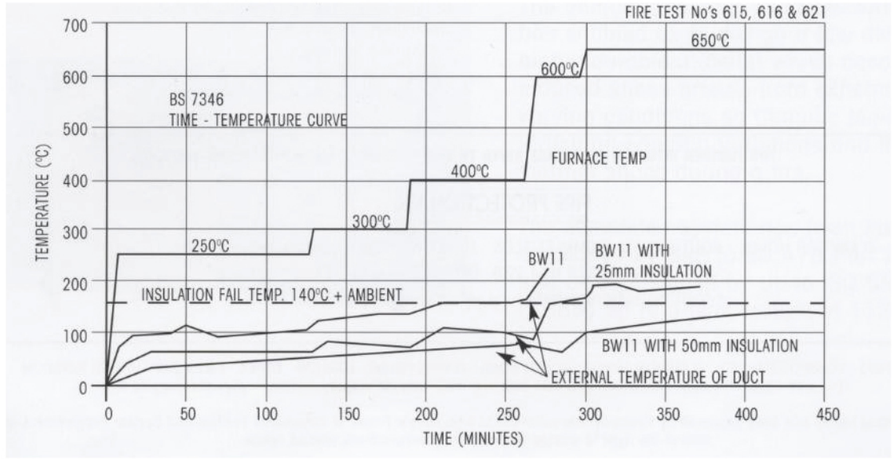
A series of Construction Standards are produced that directly relate to the requirements of each individual project. These Standards represent varying periods of fire resistance, ductwork profile and operational requirement of the duct system (i.e. smoke extract, ventilation duct or kitchen extract).

									STABILITY, INTEGRITY AND INSULATION RATING					
									120 min STABILITY AND INTEGRITY		120 min STABILITY AND INTEGRITY 120 min INSULATION FIRE OUTSIDE 60 min INSULATION FIRE INSIDE		120 min STABILITY AND INTEGRITY 120 min INSULATION FIRE OUTSIDE 120 min INSULATION FIRE INSIDE	
LONGEST SIDE	GAUGE	STD. STRAIGHTS		STIFFENING NON-STANDARD		CROSS JOINTS	LONGITUDINAL JOINTS		HORIZONTAL DUCT 1500 BEARER CRS		HORIZONTAL DUCT 1500 BEARER CRS		HORIZONTAL DUCT 1500 BEARER CRS	
		LENGTH	BEADING	MAXIMUM SPACING	ANGLE SECTION		CORNER	SHEET	HANGER SIZE	BEARER SIZE	HANGER SIZE	BEARER SIZE	HANGER SIZE	BEARER SIZE
UP TO 400	1.0	1260 or 1510	BEADING @ 300 CRS	NIL	NIL	20 mm SLIDE-ON FLANGE	R.A.S. OR PITTSBURGH LOCK	NIL	8	40 x 20 x 1.5 mm SLOTTED CHANNEL	8	40 x 40 x 1.5 mm SLOTTED CHANNEL	8	40 x 60 x 2.5 mm SLOTTED CHANNEL
401 UP TO 600	1.0	1260 or 1510	BEADING @ 300 CRS	1260 CRS	RATING S3 FIG. 44 OR FIG. 45	30 mm SLIDE-ON FLANGE	R.A.S. OR PITTSBURGH LOCK	NIL	8	40 x 40 x 1.5 mm SLOTTED CHANNEL	8	40 x 40 x 2.5 mm SLOTTED CHANNEL	10	40 x 80 x 2.5 mm SLOTTED CHANNEL
601 UP TO 800	1.0	1260 or 1510	BEADING @ 300 CRS	1000 CRS	RATINGS S3 FIG. 44 OR FIG. 45	30 mm SLIDE-ON FLANGE	R.A.S. OR PITTSBURGH LOCK	GROOVED SEAM OR WELD.	8	40 x 40 x 2.5 mm SLOTTED CHANNEL	10	40 x 60 x 2.5 mm SLOTTED CHANNEL	10	76 x 38 RSC
801 UP TO 1000	1.0	1260 or 1510	BEADING @ 300 CRS	800 CRS	RATING S4 FIG. 44 OR FIG. 45	40 mm SLIDE-ON FLANGE	R.A.S. OR PITTSBURGH LOCK	GROOVED SEAM OR WELD.	10	40 x 60 x 2.5 mm SLOTTED CHANNEL	10	40 x 80 x 2.5 mm SLOTTED CHANNEL	12	76 x 38 RSC
1001 UP TO 1500	1.0	1260 or 1510	BEADING @ 300 CRS	625 CRS	RATING S4 FIG. 44	60 mm SLIDE-ON FLANGE WITH TIE-ROD	R.A.S. OR PITTSBURGH LOCK	GROOVED SEAM OR WELD.	12	76 x 38 RSC	12	76 x 38 RSC	16	102 x 51 RSC
1501 UP TO 2000	1.0	1260 or 1510	BEADING @ 300 CRS	625 CRS	RATING S5 FIG. 44	40 mm SLIDE-ON FLANGE WITH TIE-ROD	R.A.S. OR PITTSBURGH LOCK	GROOVED SEAM OR WELD.	16	102 x 51 RSC	16	102 x 51 RSC	20	127 x 64 RSC
2001 UP TO 2500	1.2	1235 or 1485	BEADING @ 300 CRS	500 CRS	RATING S6 FIG. 44	50 x 50 RSA WITH TIE-ROD	R.A.S. OR PITTSBURGH LOCK	GROOVED SEAM OR WELD.	20	102 x 51 RSC	20	127 x 64 RSC	25	152 x 76 RSC

FLAMEBAR Solution when Lower Fire Insulation Temperature Required

All ***FLAMEBAR*** BW11 Fire Ducting has been fully tested to BS 476 Part 24 (1987) and ISO 6944 (1985) for Stability and Integrity and Insulation up to 4 hours. However, where lower Fire Insulation temperatures are required due to ducting temperature being rated the same as the smoke extract fan or a fire engineering consultant having determined a fire engineering solution.

We are able to offer our ***FLAMEBAR*** BW11 product, either on its own or with the addition of various thickness of insulation depending upon the insulation fire rating required.

Smoke Extract Duct Test in Accordance with BS 7346 – Fire Inside Duct

Mean Furnace and Duct Surface Temperatures