



# FIREMAC FM FIRE DUCT SYSTEM TEST SUMMARY

## TEST STANDARD: BS 476: PART 24: 1987

	ORIENTATION		DUCT TYPE		FIRE RESISTANCE			
	Horizontal Orientation	Vertical Orientation	Duct Type A	Duct Type B	Stability	Integrity	Insulation	Smoke Extract
Firemac FM 60 Fire Duct	X	X	X	X	X	X		
Firemac FM 60i Fire Duct	X	X	X	X	X	X	X	
Firemac FM 60S Fire Duct	X	X	X	X	X	X		X
Firemac FM 60Si Fire Duct	X	X	X	X	X	X	X	X
Firemac FM 120 Fire Duct	X	X	X	X	X	X		
Firemac FM 120i Fire Duct	X	X	X	X	X	X	X	
Firemac FM 120S Fire Duct	X	X	X	X	X	X		X
Firemac FM 120Si Fire Duct	X	X	X	X	X	X	X	X
Firemac FM 240 Fire Duct	X	X	X	X	X	X		

BS 476: Part 24: 1987 outlines the method for determination of the fire resistance of ventilation ductwork. This standard exposes the duct to a cellulosic fire curve. This procedure entails testing duct type A (for fire outside) and duct type B (for fire inside and outside), evaluating their performance in horizontal and vertical orientation, giving consideration to the following performance criteria:

**Stability:** Stability failure shall be deemed to have occurred in duct A within the furnace, and in ducts A and B outside the furnace when the duct collapses in such a manner that the duct no longer fulfils its intended function.

**Integrity:** The presence and formation in the test specimen of cracks, holes or other openings outside the furnace through which flames or hot gases can pass shall constitute integrity failure. Integrity failure shall also be deemed to have occurred when the cotton pad referred to in ISO 834 subclause 6.2.3.1 is ignited.

**Insulation:** Insulation failure shall be deemed to have occurred when the temperature rise above initial ambient temperature in the laboratory on the unexposed surface of the test specimen outside the furnace exceeds either 140°C as an average value (see 5.1.4); or 180°C as a maximum value read by any surface thermocouple.

Please note that where the duct is located 500mm or more from personnel or combustible materials – the approval authority may accept a relaxation on the insulation requirement.

The annex to the test standard includes guidance which considers that a duct is required to extract smoke in the event of a fire must maintain over 75% of its cross sectional area when exposed to a fully developed fire. The annex also includes guidance for kitchen extract ducts, with consideration given to an additional performance criterion intended to prevent the ignition of grease inside the duct when there is a fire outside the kitchen compartment. It must, however, be noted that as kitchens are normally within a fire-resisting compartment, the fire entering the kitchen from a duct is unlikely to spread further than the kitchen – and so most approval authority's may accept that the main risk is a fire starting within the kitchen, entering the duct and passing to other compartments. In such a situation, there is a less onerous requirement with regards to the kitchen extract criterion.



# FIREMAC FM FIRE DUCT SYSTEM TEST SUMMARY

## TEST STANDARD: EN 1366-1

	ORIENTATION		DUCT TYPE		FIRE RESISTANCE			
	Horizontal Orientation	Vertical Orientation	Duct Type A	Duct Type B	Mechanical Stability	Integrity	Insulation	Smoke Leakage
Firemac FM120 Fire Duct System (EN)	X	X	X	X	X	X		

EN 1366-1 outlines the method for determination of the fire resistance of ventilation ductwork. This standard exposes the duct to a cellulosic heat curve. This procedure entails testing duct type A (for fire outside) and duct type B (for fire inside and outside) in horizontal and vertical orientation, giving consideration to the following performance criterion:

This is the time in completed minutes for which the test specimen continues to maintain its separating function during the test without:

- Ignition of the cotton pad applied, as defined within EN 1363-1.
- Permitting the penetration of a gap gauge, as defined within EN 1363-1.
- Resulting in sustained flaming, as defined within EN 1363-1.
- the volume flow rate measured in duct A exceeds  $15 \text{ m}^3 / (\text{m}^2 \text{ h})$ , related to  $20^\circ\text{C}$  and 1013 mbar, related to the internal surface area of the duct inside the furnace.

Smoke Leakage: Failure of this criterion shall have occurred if the flow rate in duct A during the test exceeds  $10 \text{ m}^3 / (\text{m}^2 \text{ h})$ , related to  $20^\circ\text{C}$  and 1013 mbar, related to the internal surface area of the duct inside the furnace.

Please note that where the duct is located 500mm or more from personnel or combustible materials – the approval authority may accept a relaxation upon the insulation requirement.



# FIREMAC FM FIRE DUCT SYSTEM TEST SUMMARY

## TEST STANDARD: EN 1366-8

	ORIENTATION		DUCT TYPE		FIRE RESISTANCE			
	Horizontal Orientation	Vertical Orientation	Duct Type A	Duct Type B	Stability	Integrity	Insulation	Smoke Extract
Firemac FM 120S Fire Duct System (EN)	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>		<b>X</b>

EN 1366-8 outlines the method for determination of the fire resistance of smoke control ductwork. This standard exposes the duct to a cellulosic heat curve. This procedure entails testing duct type C, giving consideration to the following performance criterion:

**Leakage:** The duct shall not have a leakage exceeding 10 m<sup>3</sup>/h per 1 m<sup>2</sup> of internal surface area. This shall be related to the surface area of the duct from the perforated plate to the end of the duct by the inlet nozzles.

**Integrity:**

This is the time in completed minutes for which the test specimen continues to maintain its separating function during the test without:

- Ignition of the cotton pad applied, as defined within EN 1363-1.
- Permitting the penetration of a gap gauge, as defined within EN 1363-1.
- Resulting in sustained flaming, as defined within EN 1363-1.
- the volume flow rate measured in duct A exceeds 15 m<sup>3</sup> / (m<sup>2</sup> h), related to 20°C and 1013 mbar, related to the internal surface area of the duct inside the furnace.

**Reduction in cross-section:** The internal dimensions (width and height for rectangular ducts, diameter for circular duct) of the smoke extracting ductwork shall not decrease by more than 10 % during the test. This shall be by the measurements taken in accordance with 10.3.6 and 10.3.7.

**Mechanical stability:** If the duct inside the furnace collapses, so that it can be judged as not being able to maintain its smoke extraction or fire resistance function, this shall be regarded as failure under the criterion of mechanical stability.

Please note that where the duct is located 500mm or more from personnel or combustible materials – the approval authority may accept a relaxation upon the insulation requirement.

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