

**AMS**  
AIR MOVEMENT SUPPLIES



# SUREFIRE 96kg/m<sup>3</sup> HIGH TEMPERATURE AND FULLY ENCAPSULATED FIRE RATED INSULATION

Tested under BS 476 + EN 15871 and  
rated to EN 1366-1 for fire.

Tested under EN 12101-7 and  
rated to EN 1366-8 for smoke.

*"Leadership and learning  
are indispensable to each other."  
— John F. Kennedy*



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## Fire rated insulation

Fire rated insulation ensures that the temperature measured (inside in Type A and outside in Type B) does not exceed 140°C mean average above ambient during the test and is deemed automatically failed if any thermocouple rises to 180°C.

**SureFire** insulation is a blanket made from low bio-persistence wool with a thickness of Type 38 (actual mm) or Type 50 (nominal 40–45mm thick). It is a totally inorganic and exonerated from classification under Nota Q of EU Directive 97/69/EC. It is a lightweight, easy to install insulation with an attractive finish similar to the finish of standard thermal insulation.

It has a resistance to both thermal shock and mould growth (anti-microbial), and can be used in hospitals because it has the required encapsulated insulation to ensure there is no migration of fibres.

This scrim provides additional handling strength in addition to providing protection against moisture absorption.

**SureFire** insulation has exceptional insulation properties withstanding temperatures of 1200°C. At a typical ambient temperature of 25°C the thermal conductivity would be 0.044 W/mK.

## Integrity

The integrity of the entire system is based on the performance of all elements from penetration seals to smoke leakage to cross sectional area.

When all of the components perform to the required standard, only then can the integrity be classified.

**SureFire** achieved exceptional results in all areas and therefore has a level of integrity others can only hope to achieve.

**SureFire** achieved a benchmark result for the type of steel ductwork tested which was noted in the independent accredited Warrington Exova test laboratory and not having been achieved before.

**SureFire Insulation Results with Type 38 and Type 50 in BS 476 and EN test results 96kg/m<sup>3</sup>**

Fire resistance (minutes)	Protection thickness (mm)	
	Duct A	Duct B
30	≥ 25	≥ 50
60	≥ 38	≥ 76
90	≥ 100	≥ 100
120	≥ 50	–
180	≥ 100	–

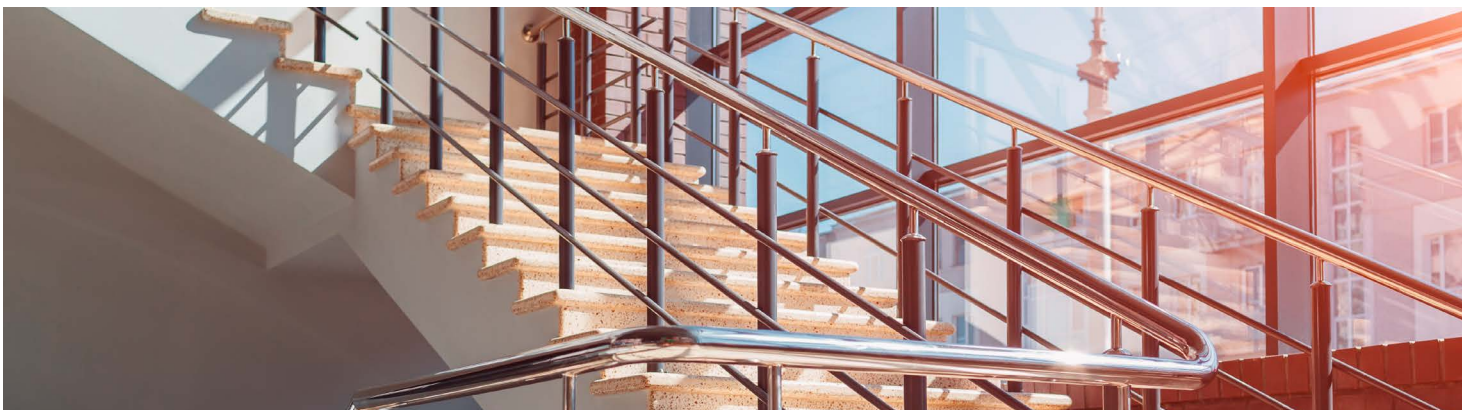
Type 50 can replace Type 38 to achieve the same results when needed.



# SUREFIRE 96kg/m<sup>3</sup> HIGH TEMPERATURE AND FULLY ENCAPSULATED FIRE RATED INSULATION

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Stairwell pressurization must always be insulated.

# Introduction

SureFire 96kg/m<sup>3</sup> insulation is a flexible blanket composed of high temperature fibres classified for applications to 1200°C (2192°F) and fully encapsulated in a durable glass fibre reinforced aluminium foil facing for easy handling and installation.

The foil encapsulation of the blanket prevents water, moisture or grease ingress ensuring good integrity and avoiding promotion of mould growth.

## Features

- Thin and lightweight
- Contours easily to complex duct designs
- Fully foil encapsulated for fast and clean installation
- Contains 1200°C (2192°F) rated fibre
- Good sound absorption
- A1 Reaction to Fire Classification in accordance with EN 13501-1

## Applications

- Fire Protection of ventilation ducting for up to 2 hours in accordance with ISO 6944, BS 476 part 24 and EN 1366-1 standards.

## Benefits

- Simple flexible wrap is fast and easy to install in one or two layers.
- Easy fixing with steel banding minimizes installation time and complexity.
- Tested with Morgan Ceramic Fastwrap both rated 96kg/m<sup>3</sup>.
- Can be installed off-site on request (especially for CE marked extract ductwork EN12101-7) with collars fitted on-site to complete.

## Commercial kitchen exhaust ducts - pressurization and ventilation ducts

SureFire 96kg/m<sup>3</sup> insulation is specially developed flexible encapsulated insulation wrap designed for the fire protection of ductwork within all types of buildings meeting various international and national building code and fire test standard performance requirements.

Ductwork in buildings is insulated to prevent fire spread within a building through the duct or to ensure the duct function is maintained when exposed to a fire. Fire may occur either inside or outside the duct. Stringent fire tests exist worldwide to prove the effectiveness of ductwork fire insulation systems.

SureFire 96kg/m<sup>3</sup> insulation ductwork fire protection can be used for heating and ventilation, kitchen grease extraction and pressurisation ductwork whilst ancillary products and systems are also available for access doors, venting duct and plastic pipe protection.

## Kitchen Extract Ducts BS476 - Standard E120, option E240

Details of the construction of kitchen extract ducts at sizes up to 3000mm wide × 2000mm high, are shown in table on next page. This gives details of the requirements for steel thickness, cross joints, longitudinal joints and intermediate stiffeners. The construction is the same as for normal ventilation ducts.

The insulated thicknesses for kitchen extract duct systems are given on page 2 for 30-minute and 60-minute ratings.

# Direct Insulation Test Results for 96kg/m<sup>3</sup>

SureFire 96kg/m<sup>3</sup> insulation is a foil encapsulated alkaline earth silicate wool with a nominal density of 96kg/m<sup>3</sup>. The wrap, supplied in rolls 610mm wide has a thickness of 38mm or 50mm. The thicknesses of insulation required for the ducts are shown below.

## Fire Testing and Results – Fastwrap 96kg/m<sup>3</sup> (BS 476)

Fire resistance (minutes)	Protection thickness (mm)		
	Duct A	Duct B	Kitchen extract
30	38	50	38
60	38	76	76
120	38	-	-

Test Report	Description
BRE TE 85868	Fire test Duct A and Duct B 125 minutes
BRE 86738	Fire test Duct A and Duct B 120 minutes
BRE 217087	Fire test Duct A 98 minutes
BRE 208017	Fire test Duct A 174 minutes
WF 157967	Assessment of FireMaster FastWrap+ system performance on ducts

## SureFire Test Results

### SureFire BS 476 listings

BS 476 Part 24	Integrity	Insulation	No. of layers	Thicknes of insulation
Duct A: Vertical	240mins	120mins	2	76mm
Duct A: Horizontal	240mins	120mins	2	76mm
Duct B: Vertical	240mins	60mins	2	76mm
Duct B: Horizontal	240mins	90mins	2	100mm

## Kitchen Extract - SureFire Ductwork Construction Details BS476 Part 24

SFE120: SUREFIRE Rated Rectangular Lockformed Duct System Galvanised Steel Construction – 120min Fire Resistance: Stability & Integrity							
Duct Size (mm)	Sheet Gauge / Thickness	Cross Joint/Connector				Stiffener	
		Type/Rating	Fastening	Tiebar	Reinforcement	Type/Rating	Spacing
0 – 400	24ga / 0.60mm	20mm SUREFIRE Slip-on flange - J2	4.8mm Rivet at 150mm	-	M8 clamp at 300mm	-	-
401 – 600	22ga / 0.80mm	20mm SUREFIRE Slip-on flange - J2		-		-	
601 – 800	22ga / 0.80mm	30mm SUREFIRE Slip-on flange - J3		-		-	
801 – 1000	22ga / 0.80mm	30mm SUREFIRE Slip-on flange - J4		-		-	
1001 – 1600	20ga / 1.0mm	40mm SUREFIRE Slip-on flange - J5	Spot Weld at 100mm	1×M10 at max. 50mm from cross joint	M8 clamp at 300mm	50×40×1.5mm angle w/ safe edge - S3	Max. 750mm to joint or stiff
1601 – 2000	20ga / 1.0mm	40mm SUREFIRE Slip-on flange - J5	Henrob at 150mm	1×M10 at max. 50mm from cross joint		50×40×1.5mm angle w/ safe edge - S3	
2001 – 2500	18ga / 1.2mm	40mm SUREFIRE Slip-on flange - J6		2×M10 at max. 50mm from cross joint		50×40×1.5mm angle w/ safe edge - S3	
2501 – 3000	18ga / 1.2mm	40mm SUREFIRE Slip-on flange - J6		2×M10 at max. 50mm from cross joint		50×50×5mm angle w/ safe edge - S5	

## EN 1366 listings

### SureFire Fire Duct EN 1366-1

EN 1366-1	Integrity	Insulation	No. of layers	Thicknes of insulation	Leakage	Insulated rating
Duct A: Vertical	132mins	180mins	2	76mm	S'Low Leakage	EI 120
Duct A: Horizontal	133mins	133mins	2	76mm	S'Low Leakage	EI 120
Duct B: Vertical	124mins	90mins	2	76mm	N/A	EI 90
Duct B: Horizontal	124mins	107mins	2	100mm	N/A	EI 90

### SureFire Smoke Duct EN 1366-8 (CE Marked) Type C Combined Rating EI 60

EN 1366-8	Integrity	No. of layers	Thicknes of insulation	Cross Sectional	Test results for insulation	Leakage	Insulated rating
Duct A: Vertical	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Duct A: Horizontal	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Duct B: Vertical	120mins	2	38mm	111mins	101mins	S'Low Leakage	EI 90
Duct B: Horizontal	120mins	2	38mm	111mins	88mins	S'Low Leakage	EI 60

## Specifications

Product	Thickness (mm)	Roll Size		Roll per Carton	Weight per Carton (kg)	Area per Roll (m <sup>2</sup> )
		Length (mm)	Width (mm)			
SureFire 96kg/m <sup>3</sup> Type 38mm	38	7620	610	1	19.6	4.6
SureFire 96kg/m <sup>3</sup> Type 50mm	40-45 nominal	6090	610	1	16	3.7

## Storage

SureFire 96kg/m<sup>3</sup> should be stored in a dry warehouse environment on pallets.

Pallets should not be stacked.



# BS 476 Fire-rated Ductwork Installation Instructions

## Ductwork Bearers (CF5907 - 120mins)

- All bearers to be set at max. 1500 centres (100mm from stiffener or joints).
- Maximum spacing of the rod to the side of duct 50mm.
- An M10 nut and bolt is to be used at each corner of flange.  
Duct clamps must not exceed the maximum spacing of 200mm.
- Gasket is placed on one face of the two mating flanges, ensuring it overlaps.  
This provides a fire and pressure resistant seal.
- Identification labels to be displayed prominently on the duct system after installation is complete.  
For drop rod and bearer sizes apply the specification for rectangular ductwork or circular ductwork.

Hangers RECTANGULAR		
Longer side (mm)	Drop rod	Bearers
Up to 1000	M10	41 × 41 2.5mm Plain Channel
1001 – 1600	M10	82 × 41 2.5mm Double Channel
1601 – 2000	M12	82 × 41 2.5mm Double Channel
2001 – 2500	M16	102 × 51mm RSC on edge
2501 – 3000	M18	102 × 51mm RSC on edge

Hangers CIRCULAR		
∅ mm	Cross Joints	Fixings
Up to 400	Socket and spigot or SMJ	M 4.8 steel rivets at 150 centres
401 – 800	25mm deep flange or SMJ	M 4.8 steel rivets at 150 centres
801 – 1000	30mm deep flange or SMJ	M 4.8 steel rivets at 150 centres
1001 – 2000	50mm deep flange or SMJ	M 4.8 steel rivets at 150 centres

**Failure to install ducting without applying all of the above instructions will result in the certificate of conformity not being issued on inspection.**

For further information, contact one of our technical team at [sales@airmovementsupplies.ie](mailto:sales@airmovementsupplies.ie)

**This is a LIFE SAFETY SYSTEM.**

**Strict adherence to these instructions is essential to ensure system performs as tested in an emergency situation.**

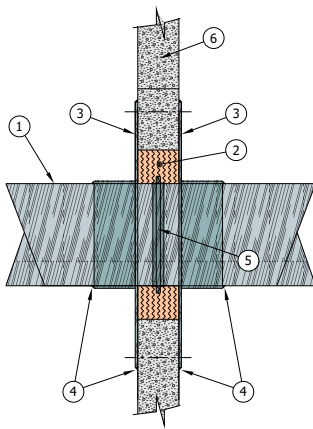
# BS476 Penetration Seals

The penetration seal system, where the duct passes through fire compartment walls and floors, is the same as that tested in report WF No. 152635 for uninsulated ducts and the same as that tested in report WF No. 183801 for insulated ducts.

Safire coated mineral fibre slab, minimum 50mm thick  $\times$  160kg/m<sup>3</sup> density, or Firetherm coated Fire Stop Board, minimum 50mm thick  $\times$  140 kg/m<sup>3</sup> density, is fitted around the duct within the opening. All edges between the slab, the wall or floor and the steel duct are sealed with SureFire FS702 intumescent acrylic sealant on both faces of the penetration seal.

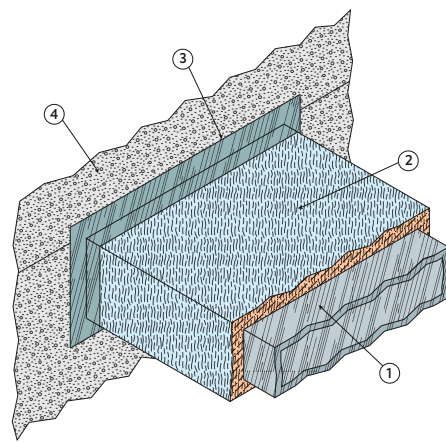
A steel angle plate collar, minimum 1.0 mm thick, is fitted around the steel duct on both sides of the wall, overlapping the wall or floor by  $\geq$  100mm on each side (BS 476 test). The Plate is fixed to the wall or floor with M8 all steel expanding 40mm anchors at 300mm maximum centres. All edges between the plate collar, the wall or floor and the steel duct are sealed with SureFire FS702 intumescent acrylic sealant. A duct cross joint or a steel stiffening collar must be positioned within the thickness of the seal assembly.

Fig. 1 Details of Uninsulated Penetration Seal (Elevation) – Rectangular or circular



1. SureFire ductwork.
2. Fire batt (2 $\times$ 50mm 140kg/m<sup>3</sup>)/Fire rated insulation (96kg/m<sup>3</sup>) or cement in solid walls or floors.
3. Steel collar plate - min 100mm or greater.
4. Fire rated mastic (SureFire FS702).
5. Duct joint or stiffener.
6. Flexible or solid wall or floor.

Fig. 2 Details of Insulated Penetration Seal



1. SureFire insulated ductwork.
2. Fire rated insulation - 96kg/m<sup>3</sup> Calcium-Magnesium Silicate Insulation blanket (2 $\times$ 38mm).
3. Steel collar plate - min 100mm greater than opening (both sides).
4. Flexible or solid wall or floor.

**Note:** All apertures for insulated/ uninsulated, rectangular/round can be less than or equal to 150mm greater than the duct size.

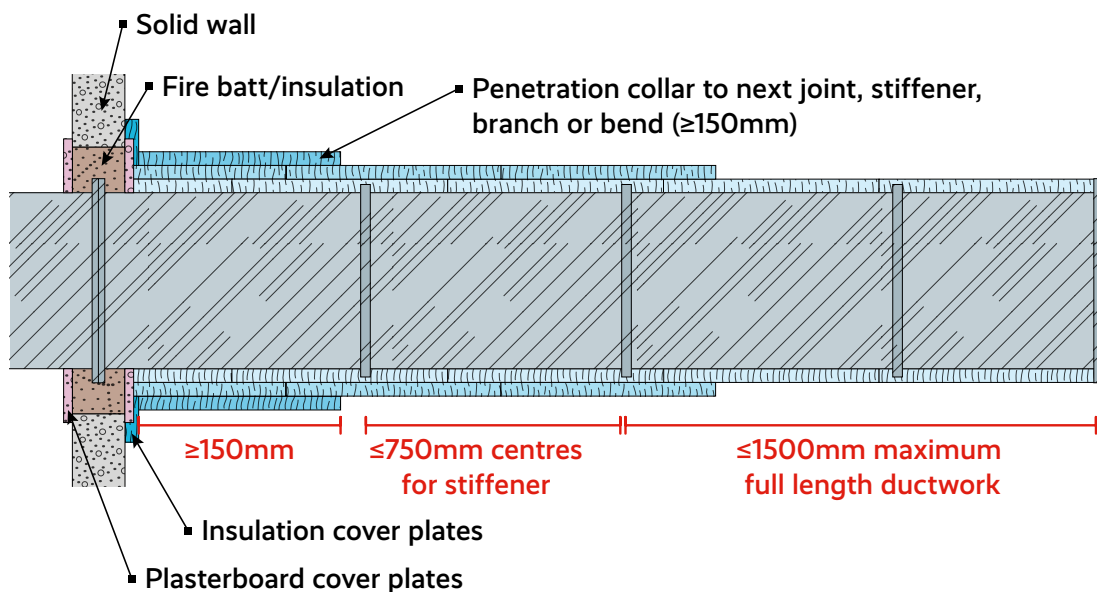


# EN Fire-rated Ductwork Installation Instruction

## Insulated Horizontal Solid Walls (EN 1366 – 1/8)

1. Ope is cut to the size plus 120mm max. (or less), e.g 500×500mm requires 620×620mm max. ope.
2. Ensure flange or stiffener is installed within ope.
3. After duct installation is complete builder can fill ope with cement, firecrete, mortar and penetration seal is complete.
4. Alternatively use 96kg/m<sup>3</sup> insulation and/or 50mm fire batt both sides friction tight and seal with fire mastic. If fire batt is used, then add the plasterboard cover plates around duct ope (see Fig. 12, page 10).
5. Picture frame insulation cover plates are then fitted over the plasterboard cover plate as shown Fig. 5/12.

**Fig. 5** Penetration seal – Solid wall insulated one side only



# EN Penetration Seals

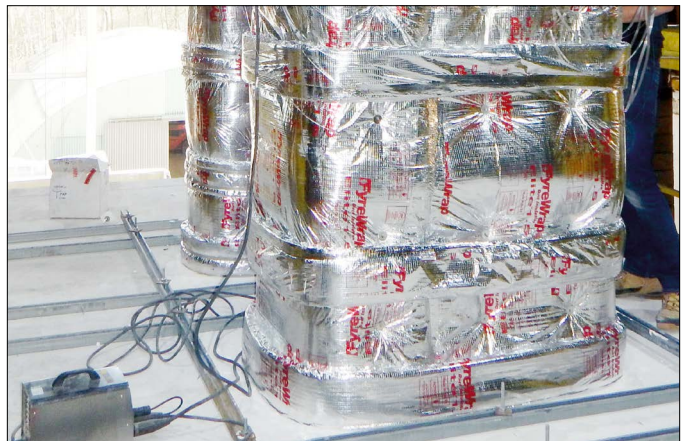
## Insulated Flexible Wall (EN 1366 – 1/8)

1. Ope is cut to the duct size plus 120mm max. (or less), e.g. 500×500mm requires 620×620mm max. ope.
2. Ensure duct joint stiffener is installed within the ope.
3. After duct install is complete (see page 3, steps 1-5, General Horizontal Requirements - Uninsulated Ductwork) and before insulation is applied, builder to fill ope with 50mm coated fire batt, around ductwork within the ope, friction tight, flush to surface and finish with a plastered cover plate on either side screwed to the groundings with 3.85mm plasterboard screws at 250mm centres.
4. First and second layer of insulation as detailed on page 12, steps 2-7 General Horizontal Requirements - Insulated.
5. Then a layer of picture frame insulation cover plate is fitted on either side and held by plasterboard screws 3.85mm (see Fig. 6).
6. Then install the penetration collar (150mm) on either side of the penetration seal (see Fig. 7).
7. Where an insulated duct finishes at the ope and an uninsulated is applied on the other side, the uninsulated side finishes with plasterboard cover plates.

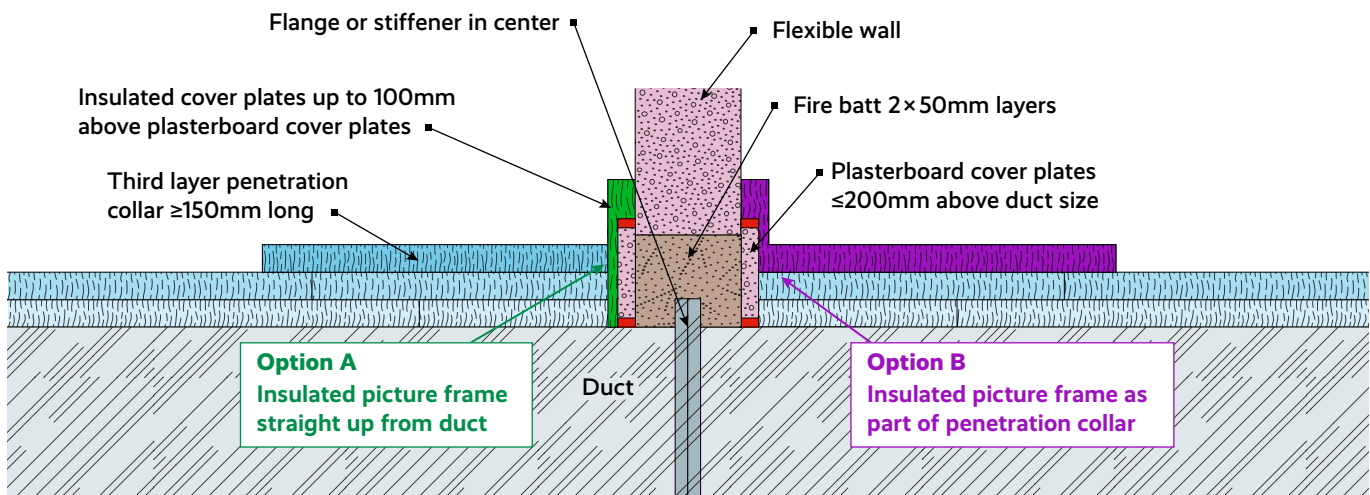
## Vertical Risers Insulated Duct

1. Proceed to SureFire EN Installation catalogue page 4, steps 1 and 2, General Vertical Requirements - Insulated Ductwork.
2. Fill ope with cement/firecrete/mortar and the penetration seal is complete.
3. For ductwork installation, see page 4, steps 1 and 2, General Vertical Risers - Insulated Ductwork.

**Fig. 6** Penetration seal – vertical insulated with cement



**Fig. 7** Finished penetration seal horizontal in flexible wall (insulated on both sides)



# EN Fire-rated Ductwork Installations Instruction (contd.)

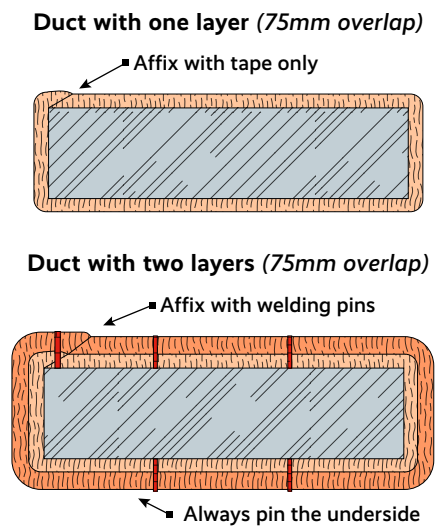
## Insulated Ductwork (EN 1366 -1/8)

1. Install uninsulated duct (see steps 1-7 on page 3 of SureFire EN Installation catalogue).
2. First layer of insulation is fitted flush to the plasterboard cover plate, tight to the duct and finished with 75mm overlap and held temporarily by Ali-Tape provided (see Fig. 3) or can also be held 38mm welded pins.
3. The second layer is staggered from the first and overlaps the first layers joint by 75mm (see Fig. 3).
4. 76mm steel pins are welded through the double layer of insulation without piercing the **SureFire**® metal duct at 350mm centres on 2 sides. One being the side with the joint overlap and always on the underside without exception.
5. The width of the duct determines the amount of pins required set at 350mm centres. For example, a 1250mm wide duct requires 4 pins across and 5 pins typically along a 1500mm length of ductwork (all start at 50mm in and then at 350mm centres or less).

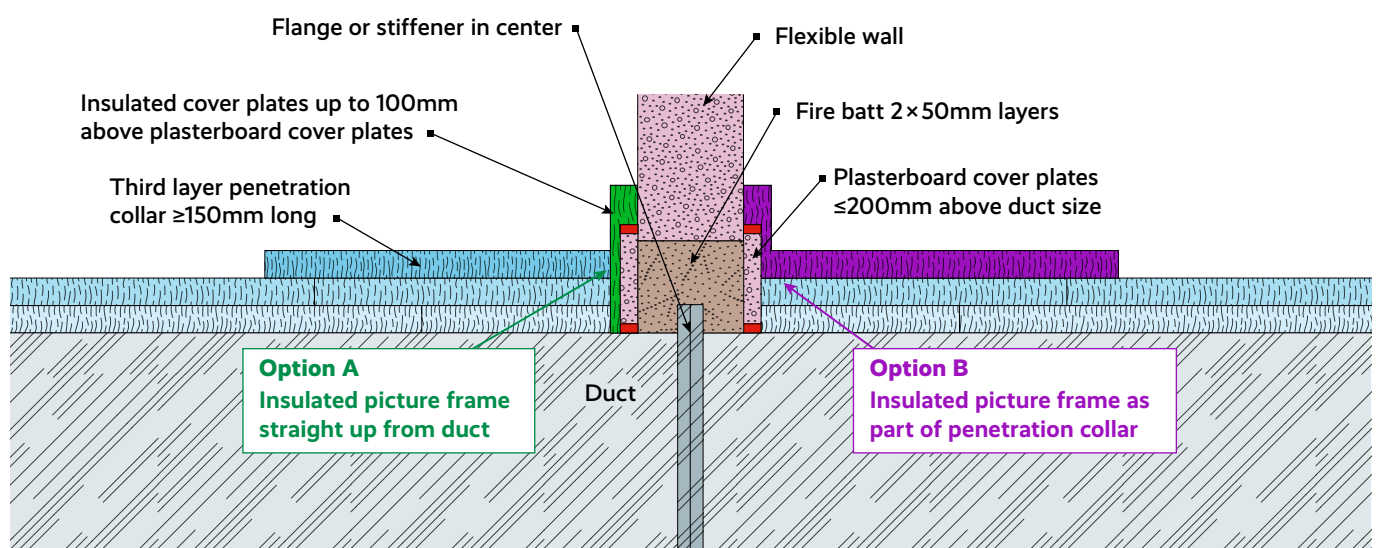
An 800mm wide duct requires 3 pins in the width and 5 along the length. The minimum amount of pins is 10 on both sides (duct width of 450mm max).

6. The penetration seal requires plasterboard cover plates, picture frame insulation over cover plates and a third layer penetration collar (150mm), detailed in Fig. 4.
7. Plasterboard and picture frame insulation cover plates are fitted with 3.85mm plasterboard screws and washers, into groundings at 250mm max centres.
8. Tabbed **SureFire**® access doors 70mm deep can be fitted as standard to be flush with the uninsulated ductwork.
9. All 10mm bearer rods should be fitted to suitable anchors in accordance with manufacturer's instruction.

**Fig. 3** Insulation



**Fig. 4** Horizontal insulation method in flexible wall



# Access Door

## SF/AD and SureFire EnSave

The maximum size of the access door is 450×450mm. Access doors must be fitted to top or sides of the duct, as follows:

- Fit to duct giving consideration for clearance and ease of use.
- The size of ope is calculated as door size -30mm, e.g. 400×400mm door, ope size cut 370×370mm.
- Mark the ductwork and cut opening.
- Fit the tabbed frame, hammering tabs securely to the ductwork, on top and sides, all around.
- For kitchen extract ductwork to be compliant to the specification DW172, access doors are installed at 2-metre centres.
- There are 2 types of access doors, one for uninsulated and one for insulated. The uninsulated 30mm deep door is identified as SF/AD. The insulated door is called the SF/AD/76.
- Access door should never be fitted on the underside of a kitchen extract system to avoid leakage. Below shows SureFire EnSave doors fitted to a smoke extract single compartment.



**Note:** Smoke extract where doors are mounted on underside of duct.

# SureFire Weight Charts

## Weight chart for EN 15871 ductwork including insulation

EN 1366–1 Multi-compartment — Kitchen extract - Two layers

Weight chart for EN 15871 Ductwork including insulation (kg per linear metre)																					
mm \ mm	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200	1250
250	23	26	28	30	33	35	37	40	42	44	46	49	51	53	56	58	60	62	65	67	69
300	26	28	34	33	35	37	40	42	44	46	49	51	53	56	58	60	62	65	67	69	72
350	28	31	33	35	37	40	42	44	47	49	51	53	56	58	60	63	65	67	69	72	74
400	31	33	35	38	40	42	44	47	49	51	54	56	58	60	63	65	67	70	72	74	76
450	33	35	38	40	42	44	47	49	51	54	56	58	61	63	65	67	70	72	74	77	79
500	35	38	40	42	45	47	49	51	54	56	58	61	63	65	68	70	72	74	77	79	81
550	38	40	42	45	47	49	52	54	56	58	64	63	65	68	70	72	74	77	79	81	83
600	40	42	45	47	49	52	54	56	59	61	63	65	68	70	72	75	77	79	81	84	86
650	43	45	47	49	52	54	56	59	61	63	65	68	70	72	75	77	79	81	84	86	88
700	45	47	50	52	54	56	49	61	63	66	68	70	72	75	77	79	82	84	86	88	91
750	47	50	52	54	57	59	61	63	66	68	70	73	75	77	79	82	84	86	89	91	93
800	50	52	54	57	59	61	63	66	68	70	73	75	77	80	82	84	86	89	91	93	96
850	52	54	57	59	61	64	66	68	70	73	75	77	80	82	84	86	89	91	93	96	98
900	55	57	59	61	64	66	68	71	73	75	77	80	82	84	87	89	91	93	96	98	100
950	57	59	61	64	66	68	71	73	75	78	80	82	84	87	89	91	94	96	98	100	103
1000	59	62	64	66	68	71	73	75	78	80	82	84	87	89	91	94	96	98	100	103	105

## Weight chart for EN 12101–7 ductwork including insulation

EN 1366–8 Multi-compartment — Smoke extract - Two layers

Weight chart for EN 12101-7 Ductwork including insulation (kg per linear metre)																					
mm \ mm	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200	1250
250	23	26	28	32	34	36	38	41	43	45	49	51	53	55	58	60	63	65	68	70	72
300	26	28	30	34	37	39	41	43	46	48	51	54	56	58	60	63	66	68	71	73	75
350	28	31	33	37	39	41	44	46	48	51	54	56	59	61	63	66	69	71	74	76	78
400	33	35	37	40	41	44	46	49	51	53	57	59	62	64	66	68	72	74	77	79	81
450	35	38	40	42	44	47	49	51	54	56	60	62	64	67	69	71	75	77	80	82	84
500	38	40	42	45	47	49	52	54	56	58	63	65	67	69	72	74	78	80	83	85	87
550	41	43	45	47	50	52	54	57	59	61	65	69	70	72	74	77	81	83	86	88	90
600	43	45	48	50	52	55	57	59	61	64	68	70	73	75	77	80	84	86	89	91	93
650	46	48	50	53	55	57	60	62	64	66	71	73	76	78	80	82	87	89	92	94	96
700	48	51	53	55	58	60	62	64	67	69	74	76	78	81	83	85	90	92	95	97	99
750	54	56	58	61	63	65	67	70	72	74	77	79	81	83	86	88	93	95	97	100	102
800	56	59	61	63	66	68	70	72	75	77	79	82	84	86	89	91	96	98	100	103	105
850	59	62	64	66	68	71	73	75	78	80	82	84	87	89	91	94	99	101	103	106	108
900	62	64	67	69	71	74	76	78	80	83	85	87	90	92	94	96	102	104	106	109	111
950	65	67	69	72	74	76	79	81	83	85	88	90	92	95	97	99	105	107	109	112	114
1000	68	70	72	75	77	79	81	84	85	88	91	93	95	97	100	102	108	110	112	115	117

M10 Rod, 41x41 Plain Channel or 82x41 Plain Channel where highlighted in **Red**.

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**AMS**  
AIR MOVEMENT SUPPLIES



**FIRE RATED  
INSULATION**

*"The entrepreneur always  
searches for change,  
responds to it, and exploits  
it as an opportunity."*

*— Peter Drucker*

