

FIREPRO® FIRE DUCT SYSTEMS

Single layer fire protection for rectangular,
circular and oval ducts.



FIRE DUCT SYSTEMS

Rectangular and circular, single layer fire protection for steel ductwork.

As part of the comprehensive ROCKWOOL FIREPRO® range of fire protection products, Fire Duct Systems provide fire protection, thermal and acoustic insulation for circular and rectangular steel ductwork.





Advantages

- Specified with confidence
- Quick and easy to install
- Fully certified to BS 476–24 (duct types A and B)
- ½, 1, 1½ and 2hour fire protection for stability, integrity and insulation
- Choice of fixing options
- Single layer, enabling verification of system installation
- Space efficient, non-brittle, strong and safe
- Multi-role insulation: fire protection, acoustic and thermal
- Can be installed on standard DW144/42 ductwork

Description

Fireduct Systems

Three products are available in the Fire Duct Systems range:

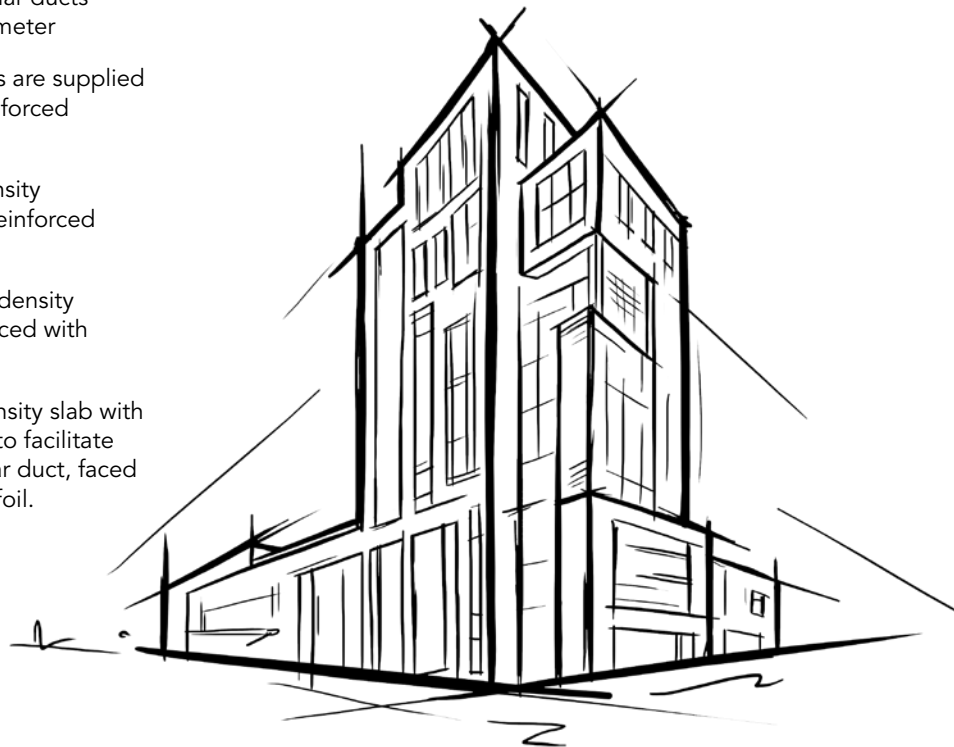
- Fire Duct Slab – for rectangular ducts
- Fire Duct Section – for circular ducts between 60mm and 356mm diameter
- Fire Duct PSM – for circular ducts greater than 406mm diameter

All three Fire Duct products are supplied faced on one side with reinforced aluminium foil.

Fire Duct Slab is a high density insulation slab faced with reinforced aluminium foil.

Fire Duct Section is a high density pre-formed pipe section faced with reinforced aluminium foil.

Fire Duct PSM is a high density slab with factory machined grooves to facilitate installation around a circular duct, faced with reinforced aluminium foil.



Applications

System Options – rectangular ducts

Welded pin fixing method

Attachment by welded pins allows extremely rapid installation with slab joints simply butted together.

Welded pins are generally spaced at 350mm maximum centres along the length of the duct and at 500mm maximum centres across the width and depth of the duct. Pins are required on all four sides of vertical ducts, but may be omitted from the top face of horizontal ducts, see Figures 5 and 6 on page 10.

Longitudinal corner joints fixed with pigtail screws at 250mm maximum centres (screw length to be 2 x slab thickness). Side wall slabs must overlap top and bottom slabs (as shown). Cross joints bonded with FIREPRO® Glue.

Alternative joint methods

Instead of pigtail screws, longitudinal joints can be fixed with FIREPRO® Glue and nails, at 500mm max. centres.

Instead of glue, cross joints can be protected with centrally positioned, 100mm wide Fire Duct strips fixed along both edges with pigtail screws at 250mm max. centres.

Mitre-joint fixing methods

The use of mitre-joints at slab corners allows installation in situations where welding may not be practical.

Mitre-joint method

All joints bonded with ROCKWOOL FIREPRO® Glue. Longitudinal corner joints secured with nails while ROCKWOOL FIREPRO® Glue cures.

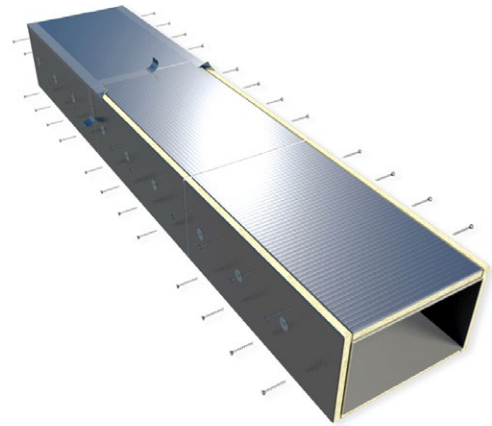


Figure 1
Stud-welded pins, pigtail screws

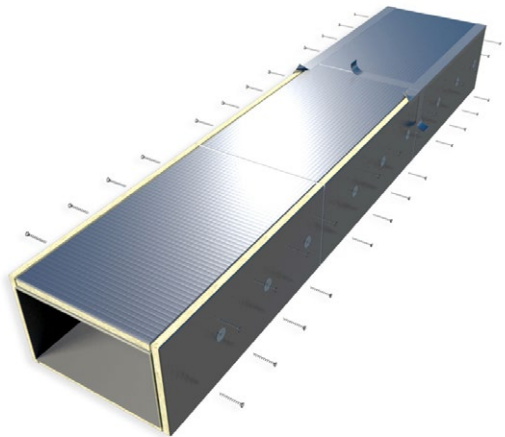


Figure 2
Stud-welded pins, nail and glue

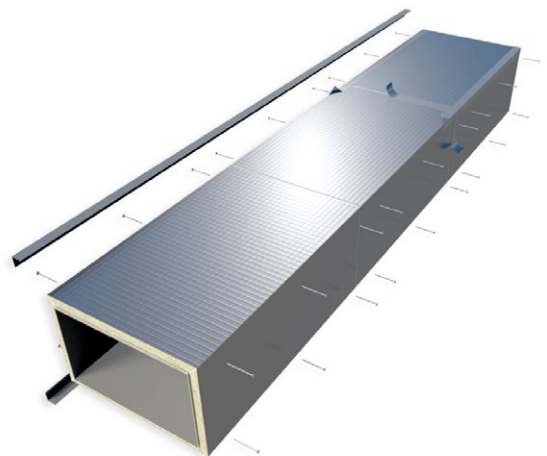


Figure 3
Mitre joint, nails and glue

System options – circular ducts

FireDuct Section

Circular steel ducts of between 60mm and 356mm diameter may be protected using Fire Duct Section. Fire Duct Section must be glued with ROCKWOOL FIREPRO® Glue at the joints and in the grooves. Steel bands or wires must be fitted circumferentially to the system at 300mm nominal centres to hold all joints and grooves tightly closed while the glue cures.

Where required, cover strips and bearer protection pieces are to be cut from Fire Duct Section (or Fire Duct PSM) of the appropriate diameter. The foil covering is to be removed from the area of Fire Duct Section immediately beneath the cover strips prior to gluing into position and securing with steel nails or pins.

All joints are to be securely taped with 75mm wide plain soft aluminium foil self-adhesive tape (Idenden type T303, or similar and approved) to maintain a continuous vapour barrier.

The hanger system is as described on page 66 of our FIREPRO® Brochure and as shown in Figures 1 and 2, with the angle bearer formed into a circular shape to suit the diameter of the duct or the Fire Duct Section (depending on whether the hanger is located inside or outside the protection).

Fire Duct Section is used to protect the drop rods as described on page 8 of this brochure. General installation principles are as otherwise described in this Product Data Sheet for Fire Duct Slab.

Fire Duct PSM

Circular steel ducts of 406mm and greater diameter may also be protected using Fire Duct PSM.

Fire Duct PSM must be glued at the joints and in the grooves with ROCKWOOL FIREPRO® Glue. Steel bands or wires must be fitted circumferentially to the system at 300mm nominal centres to hold all joints and grooves tightly closed while the glue cures.

General duct, hanger and installation details are as described for Fire Duct Section.

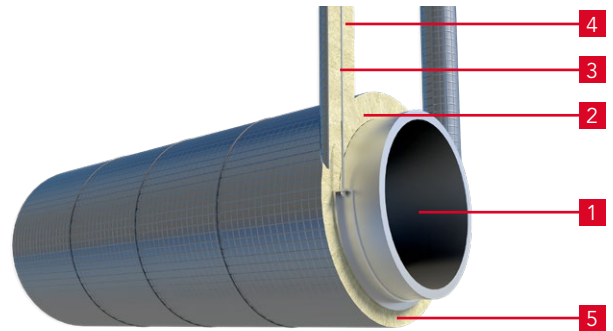


Figure 1
Fire Duct Section applied to circular duct

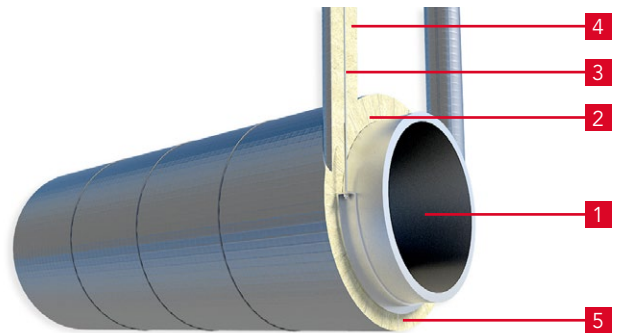


Figure 2
Fire Duct PSM applied to circular duct

Notes to Figures 1 and 2

1. Circular steel duct to DW/144
2. Fire Duct Section/Fire Duct PSM
3. M10 steel drop rods at 1500mm maximum centres
4. Fire Duct Slab/Section – protection to hanger system
5. 30 x 30 x 3mm minimum steel angle bearer

Performance

Fire

Fire Duct Slab & Fire Duct PSM

- Non-combustibility: Class A1 to BS EN 13501-1

Fire Duct Section

- Non-combustibility: Class A2 to BS EN 13501-1

Fire resistance

Performance summary – Fire Duct Slab, Section and PSM.

Three performance criteria; stability, integrity and insulation, are required in equal measure for all ducts which pass through fire-rated walls or floors.

Fire Duct System test data

The Fire Duct products have been tested and assessed by the Loss Prevention Certification Board (LPCB) of the BRE in accordance with BS 476 – 24, 'Fire tests on building materials and structures – Methods for determination of the fire resistance of ventilation ducts'.

Fire Duct products can be used to provide fire protection to horizontal, vertical, rectangular, circular, ventilation and smoke extract steel ductwork fully in accordance with BS 476 – 24, ducts 'Type A' and 'Type B', "Fire outside duct" and "Fire inside duct".

The ½, 1, 1½, and 2 hour periods of fire resistance stated in this manual are for stability, integrity and insulation in equal measure. For example, the 60 minutes duct constructions shown are certified for 60 minutes stability, 60 minutes integrity and 60 minutes insulation.

pH Neutrality

ROCKWOOL insulation is chemically compatible with all types of pipes, ducts, equipment and fittings. (Guidance is given in BS 5970 regarding the treatment of austenitic stainless steel pipework and fittings). Stone wool insulation is chemically inert. A typical aqueous extract of ROCKWOOL insulation is neutral or slightly alkaline (pH 7 to 9.5).

Standards & approval

The product has been authorised for use in LUL surface and sub-surface premises when installed in accordance with this data sheet – please refer to the LUL Approved Product Register website www.LU-apr.co.uk for specific details.

Fire Duct Systems are third party approved by the Loss Prevention Council Certification board (LPCB) for performance and quality and are listed in the "Red Book" - certificate no. 022f. Certificates can be accessed online at www.rockwool.co.uk or www.redbooklive.com

'Kitchen extract' ducts

These are subject to separate BS 476–24 requirements and are additionally covered for ½ and 1 hour protection periods.

Fire Resistance (hours)	Duct type	Required Fire Duct thickness (mm)	Joint options	Hanger protection Fire Duct Slab (mm)	Hanger protection Hanger Section (mm)	Max. duct size for mitre-joint, glued system (mm)
½	HVAC & smoke extract	40	BC	40	17 x 30	1500 x 1500
½	Kitchen extract	40	BC	40	17 x 30	1500 x 1500
1	HVAC & smoke extract	40	BC	40	17 x 40	1000 x 1000
1	Kitchen extract	90	ABC	40	17 x 40	1500 x 1500
1 ½	HVAC & smoke extract	70	ABC	50	17 x 50	1200 x 1200
2	HVAC & smoke extract	90	ABC	60	17 x 70	1000 x 1000

Product information

Dimensions

Fire Duct Slab

- Size: 1200 x 2000mm
- Thicknesses: 40, 50, 70 and 90mm*
- Facing: reinforced aluminium foil

Fire Duct Section

- Diameters: 60 to 356mm
- Thicknesses: 30, 40 and 90mm*
- Facing: reinforced aluminium foil

Fire Duct PSM

(Made of Fire Duct Slab with factory machined grooves to suit specific duct diameters)

- Diameters: 406mm and above*
- Thicknesses: 40 and 90mm*
- Facing: reinforced aluminium foil

Fire Duct Section for use on hangers

- Nominal OD from 17mm
- Thicknesses: from 30mm*
- Facing: reinforced aluminium foil

Durability

ROCKWOOL stone wool insulation products have been proven in service for over 60 years, in a wide range of climates and degrees of exposure. ROCKWOOL insulation will generally perform effectively for the lifetime of the building, plant or structure.

Biological

ROCKWOOL stone wool is a naturally inert and rot-proof material that does not encourage or support the growth of fungi, moulds or bacteria, or offer sustenance to insects or vermin.



*Some thicknesses may be subject to minimum order quantities. Some combinations of diameter and thickness may not be available or may be subject to a minimum order quantity.

Installation instructions

Hangers, bearers and flanges

Fire Duct products are approved to provide fire protection to steel ductwork, wholly constructed using steel fixings in accordance with current B&ES specification DW/144 and superseded specification DW/142.

Where there are constructional options within DW/144 and DW/142, these are expanded upon below. These details are primarily concerned with duct joint types and the suspension method.

DW/142 flanged cross joint types J3, J4, J5 and J6 are acceptable for use with the Fire Duct System, without modification.

Fire Duct Slab, Fire Duct Section or Fire Duct PSM may be installed either outside or inside the hanger system.

Bearers will require additional protection only when positioned outside the Fire Duct layer.

Drop rods will normally be protected with Fire Duct Section or with Fire Duct Slab blocks (see Figure 4).

Alternatively, the support steelwork may be sized so that separate protection is not required. Design of this 'unprotected support' method is independent of the Fire Duct System.

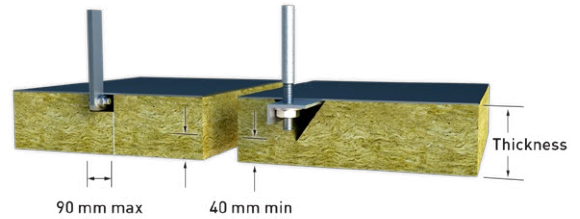
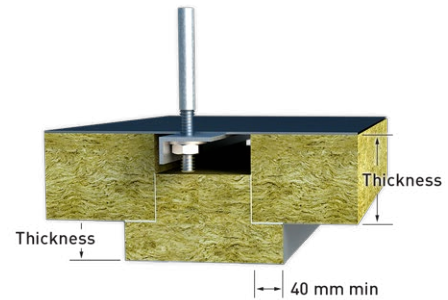
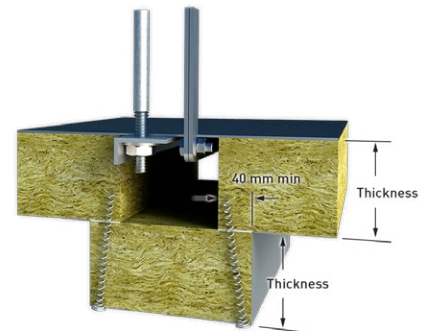


Figure 3
Joint Option A - Rebated protection



Joint Option B - Protection using 'T' section



Joint Option C - Protection using block cover strip

Item	Duct size (mm)		
	Up to 1500 x 1500	Up to 2000 x 2000	Up to 3000 x 3000
Max hanger centres (mm)	1500	1500	1500
Min drop rod size	M10	M10	M12
Min angle bearer (mm)	30 x 30 x 3	50 x 50 x 5	50 x 50 x 6

* DW/144 and DW/142 do not specifically cover ducts larger than 3m wide. Please contact ROCKWOOL for details (contact details on back cover).

Protection of hangers outside Fire Duct System

Hangers outside the Fire Duct System are protected by cutting a rebate into a block of Fire Duct Slab, Fire Duct PSM or Fire Duct Section.

The rebate should be no larger than necessary to accommodate the bearer. The block should be glued and pinned in position (see Figure 3, Option A) or secured using pigtail screws.

Other J Joints

If type J1 or J2 cross joints are fitted, then the joints must be upgraded to at least the J3 specification. This can be done by adding steel fixing bolts and fastenings in line with the J3 joint type. Also a minimum S3 stiffener should be fitted to the duct adjacent to the cross joint. This will upgrade the cross-sectional stiffness of the duct.

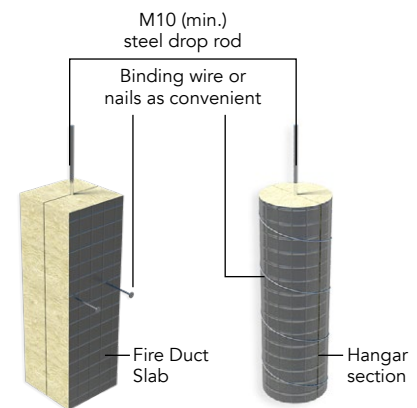


Figure 4
Isometric view of drop rod protection options

ROCKWOOL FIREPRO® Glue

ROCKWOOL FIREPRO® Glue has a pH value of 11. It is provided in 17 kg drums and should always be stirred before use.

Where required, 1–1.5mm of glue should be applied to each Fire Duct joint. The glue is generally applied by spatula or trowel.

Where present, any foil facing must be removed from surfaces prior to the application of FIREPRO® Glue. Take care to remove any FIREPRO® Glue from all aluminum foil surfaces with a damp cloth.

Nails (for use only with mitre-joint 'glued' systems)

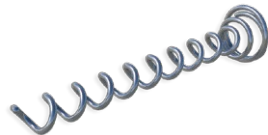
The nail length is to be 2 x board thickness (see Figure 7 for positions)

Pigtail Screws

Pigtail screws are to be used at all corner joints where FIREPRO® Glue is not used, and to secure cross joint cover strips.

Pigtail screws are to be positioned at 250mm maximum centres, and the screw length is to be 2 x slab thickness.

For horizontal ducts, pigtail screws must be inserted horizontally.



Optional edge protection

Light gauge metal angles may be glued in position to provide optional edge protection. The metal angles must be de-greased. Small pins may be required to hold the angle to the underside of the duct.

Vapour barrier

Where a vapour barrier is required, all exposed Fire Duct edges and penetrations through the foil must be sealed using aluminium foil tape.

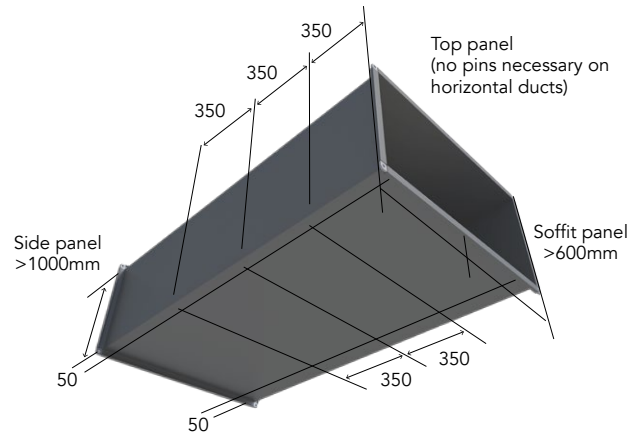


Figure 5
Steel pin arrangement where side panel does not exceed 1000mm and soffit panel does not exceed 600mm

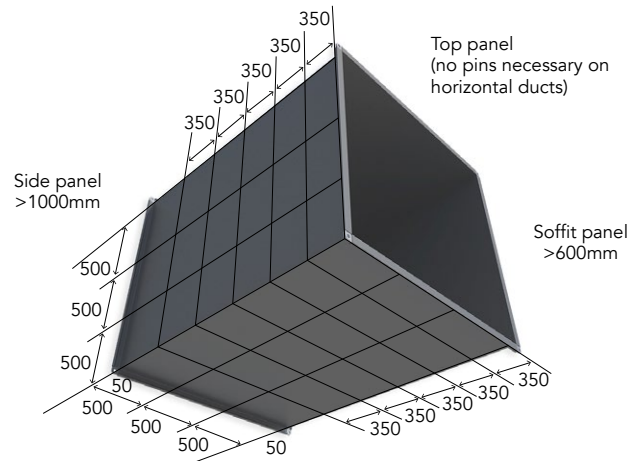


Figure 6
Steel pin arrangement where side panel is greater than 1000mm or soffit panel is greater than 600mm

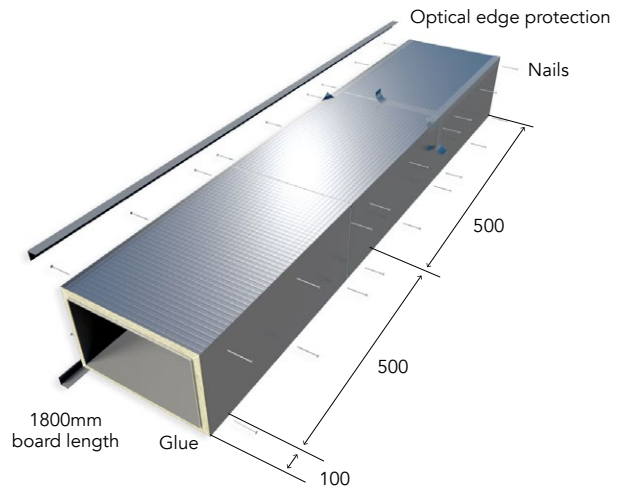


Figure 7
Rectangular ducts – 45° mitre joint system, showing installation sequence

Wall penetrations, elbows, 2 and 3-sided applications and access hatches

Wall and floor penetrations

Support to duct sides is required at all penetrations for stability purposes. This support can be provided by:

- A 30 x 30 x 2mm mild steel angle frame fixed to the duct at the penetration mid-point. Steel rivets should be used at 300mm maximum centres (Figure 8),
- Locating the duct joint at the penetration mid-point.

In all cases, low density ROCKWOOL stone wool, typically RWA45, is packed tightly into the void between the Fire Duct product and the wall opening.

120mm wide blocks of Fire Duct are glued (or secured with pigtail screws) to the duct insulation and to the wall on both sides of the penetration.

All Fire Duct to wall joints are glued. Aluminium foil is located in Fire Duct joints at wall penetrations (as shown).

Proprietary penetration seals

Where proprietary penetration seals are used, compatibility with the separating element, duct construction and Fire Duct System must be demonstrated by independent test or assessment.

Elbows (rectangular ducts)

Small elbows may simply be boxed or 'squared off'. Larger elbows may need to be protected by cutting fan shaped pieces, generally in accordance with the illustration (Figure 9).

2 and 3-sided applications (rectangular ducts)

The use of Fire Duct products incorporating welded pins is recommended for 2 and 3-sided applications.

The method illustrated (Figure 10) for three-sided applications, may also be used for two-sided applications where the duct is securely braced in the corner of a room.

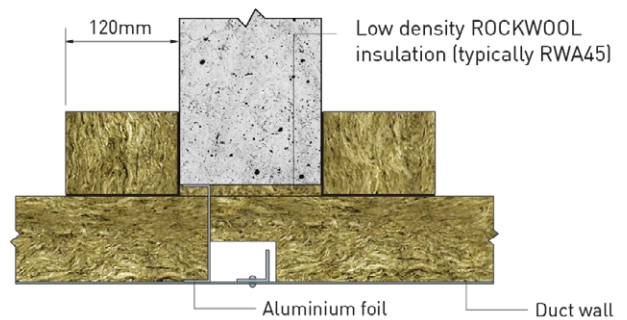


Figure 8
Steel angle frame support to duct at penetration mid point

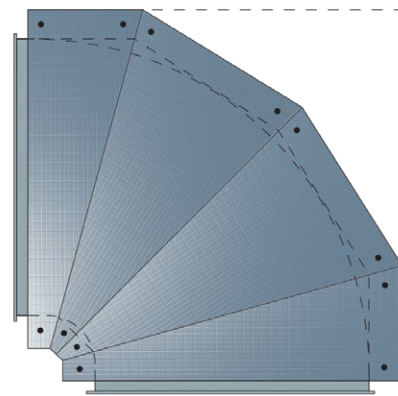


Figure 9
Typical elbow detail for rectangular ducts

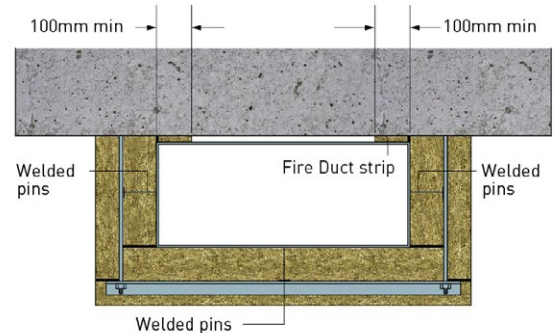


Figure 10
Three sided protection for rectangular ducts, using welded pin fixing method

Access hatches (rectangular ducts)

Steel access hatches which are constructed and fitted in accordance with DW/144 may be protected with Fire Duct Slab (Figure 11).

The Fire Duct cover may be fitted in any face of the duct. However, if the sliding cover is not in the horizontal plane the guides must be positioned so as to prevent movement of the cover due to weight, vibration etc.

The sliding cover must be a tight fit in the guides. No part of the arrangement may be within 50mm of edges or joints within the main duct protection layer of Fire Duct Slab.

All Fire Duct Slab joints (excluding sliding joints) are to be glued and pinned as previously detailed.

Access hatches (circular ducts)

Details of access hatches for circular ducts are available on request.

Handling

The Fire Duct range of products is light, easy to handle and simple to fix. The products can be cut and shaped using knives, saws, etc.

Ancillaries

Welded steel pins

Welded pins are generally spaced at 350mm maximum centres along the length of the duct and at 500mm maximum centres across the width and depth of the duct. Pins are required on all four sides of vertical ducts, but may be omitted from the top face of horizontal ducts (see Figures 5 and 6).

Details of alternative mechanically fixed pins are available from ROCKWOOL on request.

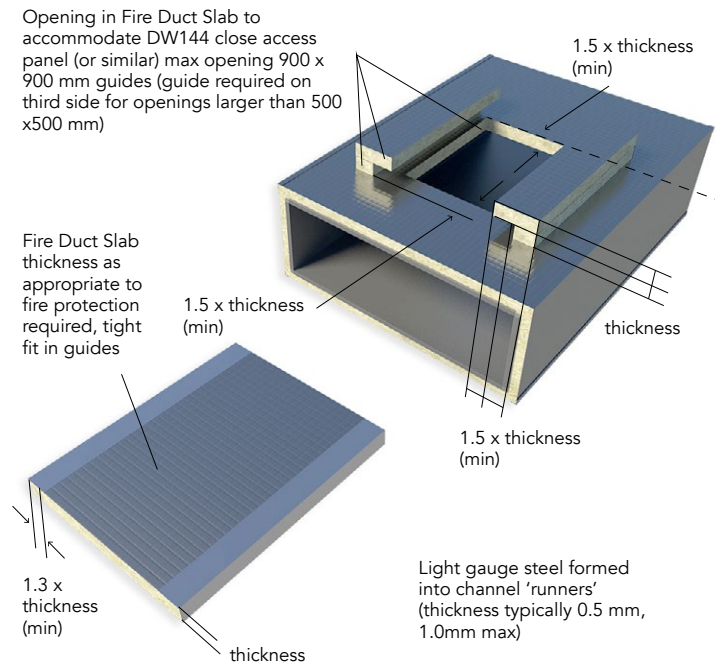


Figure 11
Removable cover panel for steel access hatch

Criteria for preparation of ductwork prior to insulation

Fire Duct products are certified to provide fire protection to ductwork conforming to Construction Details 1 to 12 in the table below and to the requirements of B&ES Specification DW/144. The table may be used as a check list for on-site verification of ductwork construction.

Construction detail	Requirement	Details of modification where needed	Within specification
1. Duct sheeting	Rigid steel (zinc-coated, alu-zinc coated, black or stainless)		
2. Sheet thickness	0.8mm or greater. See DW/144 for ducts larger than 1500mm		
3a. Welded pin fixing methods	Up to 1500 x 1500 mm: no additional system modifications		
	Up to 2000 x 2000mm: increase angle bearer size to 50 x 50 x 5mm min		
	Up to 3000 x 3000mm: increase angle bearer size to 50 x 50 x 6mm min		
	Increase drop rod diameter to M12 min		
	Up to 4000 x 4000mm: 50 x 50 x 6mm min. bearer. M12 min. drop rod		
	Incorporate additional drop rod mid-width through duct and bearer*		
	Weld (or fasten with with nuts and large washers) M15 min. strengthening rod. at mid-width of each flanged joint and penetration point to maintain cross section		
	Seal all holes with mastic		
	Above 4000 x 4000mm: 50 x 50 x 6mm bearer. M12 min. drop rod		
	Incorporate additional drop rods through duct and bearer to ensure 1500mm max. spacing along bearer*. Weld (or fasten with nuts and large washers) M15 min. strengthening rod at each flanged joint and penetration point to ensure 1500mm max. spacing along joint. Seal all holes with mastic.		
	*Additional drop rods to pass through duct and bearer. Rods to support bearer. 'Top' of duct to be held in position with steel nuts and large steel washers		
3b. Mitre-joint fixing methods		If duct dimensions exceed those shown, use welded steel pins as per Fire Duct system manual (see item 3a)	
½ hr HVAC & smoke extract	1500mm x 1500mm		
½ hr kitchen extract	1500mm x 1500mm		
1 hr HVAC & smoke extract	1500mm x 1500mm		
1 hr kitchen extract	1500mm x 1500mm		
1½ hr HVAC & smoke extract	1200mm x 1200mm		
2 hr HVAC & smoke extract	1000mm x 1000mm		
4. Flanged cross joint	Type J3, J4, J5 or J6 to HVAC specification DW/142 and DW/144	Strengthen joints (contact ROCKWOOL)	
5. Joint seal	May be included or omitted		
6. Constructional fixings	Steel		
7. Bearers	30 x 30 x 3mm (min.) steel angle. See item 3a for ducts larger than 1500mm		
8. Drop rods			
9. Drop rod anchors			
Fixed through steel suspension frame	Steel frame to be independently fire rated	Fire protect steelwork	
Fixed into concrete	Anchors to have confirmed fire rating. M10 (min.) mild steel. See item 3a for ducts larger than 2000mm	If fire rating is un-confirmed and anchor is all-steel, ie without plastic or chemical components; affix 300mm x 300mm collar of unfaced Fire Duct Slab to soffit with FIRE-PRO® Glue, keeping anchor central. Collar thickness to equal duct encasement layer. Optional self-tapping screws may be used to support collar. Glue adjacent Fire Duct drop rod protection to collar.	
10. Spacing of suspension system			
10a. Horizontal ducts	1500mm max. centres		
10b. Vertical ducts: 2 or 3 sided protection	1500mm max. centres	Install additional supports	
10c. Vertical ducts: 4 sided protection	Support at every floor (4 m max. centres)		
11. Stiffening of duct at penetration detail	Duct flange or 30 x 30 x 3mm steel angle frame fixed with steel fixings at 300mm max. centres. To be positioned within the width of the penetration. See item 3a for ducts larger than 3000mm.	Install steel angle frame	
12. Compartment wall	Fire rated masonry, concrete, brick, block, plasterboard or other fire rated construction		

Specification clauses

Typical specification clauses for rectangular ducts to be read in conjunction with system options on pages 4 and 5

Welded pin fixing method

1. All ductwork is to be insulated with*mm ROCKWOOL Fire Duct Slab, having a factory applied reinforced aluminium foil to one face and complying with Building Regulations Class 'O' requirements.
2. The Fire Duct Slab is to be fixed to the duct using 2.5mm diameter welded steel pins and 38mm spring steel washers in accordance with the ROCKWOOL Product Data Sheet 'Fire Duct systems'.
3. The foil facing is to be removed from any surfaces to which FIREPRO® Glue is to be applied.
4. All corner joints are to be fixed with pigtail screws at 250mm maximum centres. Screw length is to be 2 x slab thickness.
5. All cross joints are to be filled with FIREPRO® Glue and held tightly closed.
6. Drop rods and bearers are to be at 1500mm maximum centres and to be M10 steel rod and 30 x 30 x 3mm steel angle respectively. Ductwork is to be generally in accordance with B&ES Specification DW/144.
7. Drop rods and exposed bearers are to be insulated with*mm Fire Duct Slab or† x*mm Fire Duct Section, as appropriate. Rebates or cover pieces are to be used at duct flange and bearer locations according to site conditions and subject to ROCKWOOL approval.
8. Where a vapour barrier is required, all exposed Fire Duct edges and penetrations through the foil should be sealed using soft self-adhesive aluminium foil tape (Idenden type T303, or similar and approved).

Alternative longitudinal joints

Delete clauses 3 and 5 in Method 1 above, and insert new clause 5:

5. All joints are to be filled with ROCKWOOL FIREPRO® Glue and held tightly closed. Use nails at 500mm centres at corner joints to aid this process.

Alternative cross joints

Delete clauses 3 and 5 in Method 1 above, and insert new clause 5:

5. All cross joints are to be covered with centrally positioned 100mm wide strips of Fire Duct Slab of the same thickness as the insulation. The cover strips are to be fixed along both edges using pigtail screws at 250mm max. centres.

* Insert Fire Duct Slab insulation thickness required.

† Insert appropriate overall diameter.

Mitre-joint fixing method

1. All ductwork is to be insulated with*mm Fire Duct Slab, having a factory applied reinforced aluminium foil to one face and complying with Building Regulations Class 'O' requirements.
2. The Fire Duct joints at ductwork corners are to be 45° mitred. Square butt joints to be used elsewhere.
3. The foil facing is to be removed from any surfaces to which FIREPRO® Glue is to be applied.
4. All joints are to be filled with FIREPRO® Glue and held tightly closed.
5. All mitred joints are to be held tightly closed with nails (length = approx. 2 x Fire Duct Slab thickness) until the glue has fully cured. 2 nails juxtaposed at 90° are to be located at 3 points per 1200mm length of mitred joint and at 5 points per 2000mm length.
6. Drop rods and bearers are to be at 1500mm maximum centres and to be M10 steel rod and 30 x 30 x 3mm steel angle respectively. Ductwork is to be generally in accordance with B&ES Specification DW/144.
7. All drop rods and exposed bearers are to be insulated with*mm Fire Duct Slab or† x*mm Fire Duct Section, as appropriate. Rebates or cover pieces are to be used at duct flange and bearer locations according to site conditions and subject to ROCKWOOL approval.
8. Where a vapour barrier is required, all exposed Fire Duct edges and penetrations through the foil should be sealed using soft self-adhesive aluminium foil tape.

NBS Specifications

ROCKWOOL Fire Duct Systems are associated with the following NBS clauses:

U90 General ventilation - domestic

- 490 Site applied insulation to ductwork

Y30 Mechanical thermal insulation

- 340 Mineral fibre slabs insulation

Sustainability

As an environmentally conscious company, ROCKWOOL promotes the sustainable production and use of insulation and is committed to a continuous process of environmental improvement.

All ROCKWOOL products provide outstanding thermal protection as well as four added benefits:



Fire resistance



Acoustic comfort



Sustainable materials



Durability

Health & Safety

The safety of ROCKWOOL stone wool is confirmed by current UK and Republic of Ireland health & safety regulations and EU directive 97/69/EC: ROCKWOOL fibres are not classified as a possible human carcinogen.

A Material Safety Data Sheet is available and can be downloaded from www.rockwool.co.uk to assist in the preparation of risk assessments, as required by the Control of Substances Hazardous to Health Regulations (COSHH).

Environment

Made from a renewable and plentiful naturally occurring resource, ROCKWOOL insulation saves fuel costs and energy in use and relies on trapped air for its thermal properties.

ROCKWOOL insulation does not contain (and has never contained) gases that have ozone depletion potential (ODP) or global warming potential (GWP).

ROCKWOOL is approximately 97% recyclable. For waste ROCKWOOL material that may be generated during installation or at end of life, we are happy to discuss the individual requirements of contractors and users considering returning these materials to our factory for recycling.



Interested?

For further information, contact the Technical Solutions Team on 01656 868490 or email technical.solutions@rockwool.co.uk
Visit www.rockwool.co.uk to view our complete range of products and services.

Copyright ROCKWOOL February 2018.

Notes

February 2018

ROCKWOOL Limited

Pencoed
Bridgend
CF35 6NY

Tel: 01656 862 621
info@rockwool.co.uk
rockwool.co.uk

