Inhibiting the spread of fire & smoke in concealed spaces

As part of the comprehensive FIREPRO® range of products, ROCKWOOL Fire Barrier systems offer labour-saving solutions to prevent fire and smoke spread within roof and ceiling voids for all general conditions encountered on site.
Fire Barrier Systems

The vertically hung Fire Barriers are capable of achieving both integrity and insulation protection periods from 15 to 120 minutes, and the friction fitted Fire Barrier Slab can also provide 60 minutes integrity and insulation. It is ROCKWOOL’s essential insulation performance that limits the heat transfer through the barriers, preventing ignition of combustible materials in adjacent areas.

The ‘Quick Fit’ support system is patented (grant number is GB2393119B) and offers a quick, cost effective installation method for the Fire Barriers for periods of up to 60 minutes. This focus on ease of construction and installation has the added benefit of reducing the risks of installation error. 90 and 120 minute systems are also available using the traditional support methods (see section on 1½ and 2 hour barriers for typical specification).

Extended drops are easily catered for, with the system capable of maintaining its performance in void heights up to 10.5 metres – refer to sections on extended drops for further guidance.

Fixing solutions to concrete decks – The benefits:
- Fast patented angle and clamping plate system
- No nuts and bolts to fasten
- Simple hammer fix fixing system
- Simple angle support with stamped tongues
- One angle supports 2 barriers for 1 hour

Fixing solutions to timber and steel – The benefits:
- No bolts required
- Standard no.10 wood screws for timber
- Self tapping screws for steel purlins
- Fixings for clamping plate extended to 450mm
- Speed of installation increased
- Costs of installation reduced

Firestopping solutions for voids up to 1 metre using FireBarrier Slab – The benefits:
- Simple butt joint foil faced slab
- No fasteners or angles
- Cost of installation reduced
- Only 40mm intumescent sealant coat back to penetrations
Fire Barrier Systems

Table 1

<table>
<thead>
<tr>
<th>Product</th>
<th>Fire performance Integrity (mins)</th>
<th>Insulation (mins)</th>
<th>Report no.</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>½ hour Cavity Barrier</td>
<td>60</td>
<td>15</td>
<td>116911</td>
<td>1 layer 50mm Fire Barrier</td>
</tr>
<tr>
<td>½ hour</td>
<td>60</td>
<td>30</td>
<td>119720</td>
<td>1 layer 60mm Fire Barrier</td>
</tr>
<tr>
<td>1 hour Fire Barrier</td>
<td>60</td>
<td>60</td>
<td>116912</td>
<td>2 layers 50mm Fire Barrier</td>
</tr>
<tr>
<td>1½ hour Fire Barrier</td>
<td>90</td>
<td>90</td>
<td>51812</td>
<td>2 layers 50mm Fire Barrier</td>
</tr>
<tr>
<td>2 hour Fire Barrier</td>
<td>120</td>
<td>120</td>
<td>44509</td>
<td>2 layers 60mm Fire Barrier</td>
</tr>
<tr>
<td>1 hour Fire Barrier Slab</td>
<td>240</td>
<td>60</td>
<td>122729</td>
<td>100mm foil faced slab</td>
</tr>
</tbody>
</table>

It is essential to ensure that the fire insulation criteria of any barrier specified meets the requirements set out in the Approved Document B.

Description

ROCKWOOL Fire Barrier has a 25mm galvanised wire mesh stitched with wire, to one face, to produce a flexible Fire Barrier with optional aluminium foil faces.

ROCKWOOL Fire Barrier Slab has a factory applied foil finish to both faces.

ROCKWOOL Fire Barrier and Fire Barrier Slab achieve a reaction to fire classification of A1 as defined in BS EN 13501:1. ROCKWOOL Fire Barrier systems have been developed to inhibit the spread of flames, heat and smoke through concealed spaces in buildings and improve sound reduction.

The fixing solutions described in this data sheet have been designed to simplify detailing and incorporate, where possible, commonly available building fasteners and components.

Fire Barrier slab dimensions

1000mm x 666mm x 100mm

Table 2 - Fire Barrier dimensions

<table>
<thead>
<tr>
<th>Standard width 1 metre Thickness (mm)</th>
<th>Length (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>4</td>
</tr>
<tr>
<td>60</td>
<td>3.5</td>
</tr>
</tbody>
</table>

Applications & design

ROCKWOOL Fire Barrier solutions can be applied as a hanging curtain or as a friction fitted slab. The barrier is continuously supported and secured to the soffit by its head. At the base, it is preferable in a cavity barrier situation to wire the barrier to the ceiling grid although it is acceptable to let it drape freely, turned back across the ceiling (see Fig13).

If the Fire Barrier is to form a continuation within a void of a fire resistant wall/partition, it is essential to fix the barrier to the wall/partition head to maintain integrity.

Regulations, standards and product approvals

Compartmentation: ROCKWOOL Fire Barriers and Fire Barrier Slabs are able to meet the fire requirements of Building Regulations applicable to all parts of the UK and Ireland where fire resistant (compartment) walls need to be continued above a ceiling into the roof void, for all periods up to 2 hours and 1 hour respectively.

Concealed spaces (cavities): Similarly ROCKWOOL Fire Barriers and Fire Barrier Slabs satisfy the specific requirements for divisions of space within concealed cavities (Cavity Barriers) as defined in Building Regulations, intended to restrict the passage of smoke and flames through extended roof voids.

Certification: Fire Barrier Systems have been independently tested and assessed to BS 476: Part 22 by accredited laboratories. They are third party approved for performance and quality by the Loss Prevention Council Certification board (LPCb) and are listed in their Fire and Security ‘red book’ - certificate no. 022c. Certificates can be accessed online at www.rockwool.co.uk or www.redbooklive.com

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.uk for specific details.

Acoustic performance

The correct use of Fire Barrier within structural cavities and voids will reduce the level of transmitted sound.

Table 3

<table>
<thead>
<tr>
<th>Room to room attenuation</th>
<th>Rw dB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Typical lay-in grid suspended ceiling</td>
<td>30</td>
</tr>
<tr>
<td>As above, with 50mm ROCKWOOL Fire Barrier</td>
<td>42</td>
</tr>
<tr>
<td>Applied as 2, but ROCKWOOL Fire Barrier foil faced</td>
<td>44</td>
</tr>
<tr>
<td>Applied as 2, but two thickness of 50mm ROCKWOOL Fire Barrier – both foil faced</td>
<td>50</td>
</tr>
<tr>
<td>ROCKWOOL Fire Barrier Slab foil faced both faces</td>
<td>50</td>
</tr>
<tr>
<td>If ceiling is plasterboard, add between 2–3 db</td>
<td></td>
</tr>
</tbody>
</table>

Note: values are approximate

SoundPro range of acoustic solutions

Fire Barrier Systems are part of the ROCKWOOL SoundPro range of acoustic solutions.
½ hour Cavity Barrier – typical fixing methods

Figures 4-8 show typical details for Fire Barrier applied to a timber truss construction as a half hour cavity barrier within the roof section, to satisfy the requirements of Building Regulation B3 – (4) i.e. 30 minutes fire integrity and 15 minutes fire insulation.

If the truss is constructed from a minimum timber size of 35 to 49mm thick, both sides of all truss members/bracing require protection from fire in order to minimise charring and retain strength. Figure 6 shows strips of 50mm Fire Barrier used on the reverse side of the truss (for this purpose). Nail plate fixings may fail prematurely in fire unless protected (see Fig 9).

The new ROCKWOOL fixing system incorporates an angle support and clamping plate.

For fixing to timber, the ROCKWOOL clamping plate is used, compressing the barrier to the timber, fixed at 450mm centres using No. 10 wood screws. For fixing to concrete soffits, the pre-punched angle support is fixed using Hilti DBZ or Ejot ECL 35 hammer set anchors at max. 750mm centres. For fixing to steel purlins, use Hilti SMD 02Z (5.5 x 70mm) self-tapping screws at max. 450mm centres.

To use the patented ROCKWOOL angle support system, bend tongues out to 90° and impale barrier onto them. The slotted clamping plate is then fitted by pushing the tongues through the slots, these are then bent over the face of the clamping plate completing the process.
½ hour Cavity Barrier – typical fixing methods

60–30 Fire Barrier
If 30 minutes insulation is required, use 1 layer of 60mm plain or foil faced fire barrier with 100mm vertical over lapped joints (Fig 16). The barrier is otherwise fixed for timber construction as previously shown on page 14.

Common details
Extended drops
ROCKWOOL 50mm Fire Barrier single and double layers, can be extended from a 3.5m drop to a maximum 6m drop by fixing an additional 2.5m section, stitched with overlapped joints as per Figure 17. For additional guidance and drops in excess of 6m, please refer to figure 31 and associated guidance.

Wire stitching of butt joints in ROCKWOOL Fire Barriers
Adjacent barriers must be closely butt jointed, or overlapped, and through stitched with 0.9mm galvanised annealed wire. It is essential that the barrier provides a good seal at its head, perimeter and at all joints. Where the barrier abuts a profile such as a trapezoidal deck, the material must be cut to suit and secured to fire stop the gap (see Fig 13). For extended drops, 1.5mm diameter galvanised and annealed wire is used (see Fig 17).
Penetration details
It is regarded as good practice to adequately support or reinforce services penetrating compartment walls and cavity barriers, to prevent displacement. It is recommended that such supports should be no greater than 500mm from each face of the Fire Barrier.

To maintain the integrity of the Fire/Cavity Barrier when penetrated by services with a high melting point (such as steel or copper pipes, beams or trusses) the barrier is first cut locally to accommodate the service or structural member and then re-stitched as neatly as possible. The penetration is then tightly sleeved each side of the barrier to a minimum length of 300mm, using the same barrier material. Each sleeve should be securely stitched to the main barrier to produce a tight seal and prevent future detachment (see figures 18 and 19). Where access is only available from one side, the double seal solution may be replaced by a single ‘collar’ detail – please contact our Technical Solutions Team for further advice.

If the penetrating service is manufactured from low melting point materials such as plastic or aluminium, then sleeving should be extended to at least 1000mm either side of the barrier.

This guidance applies to services such as pipes, sheathed cables and conduits, including those carried on steel trays.

For protected steel ductwork with a tested fire resistance performance (stability, integrity and insulation) at least the same as the Fire Barrier, 300mm sleeves should be applied either side of the main barrier, as for high melting point services above.

For information on achieving fire protection to steel ductwork, please refer to the ROCKWOOL Fire Duct System data sheet.

For non-fire protected ductwork, or that with a fire resistance performance less than the barrier, two sleeves should be applied to each side of the barrier. An inner sleeve of 1000mm and an outer sleeve of 300mm. All sleeves should be stitched to the main barrier.

The duct should also include an independently supported fire damper, located in the line of the main barrier. Reference should also be made to Approved Document B of England & Wales Building Regulations – Volume 1, Requirement B3, Section 7 and Volume 2, Requirements B3, Section 10.
1 hour Fire Barrier – typical fixing methods

The unique, patented ROCKWOOL support angle and clamping plate is used to fasten two 50mm Fire Barrier curtains with one support angle without the need for an airspace.

The ROCKWOOL support angle has tongues that are pushed out from opposite sides at 300mm max. centres. The ROCKWOOL Fire Barriers are then impaled on the tongues on both sides and clamped using the ROCKWOOL clamping plates. The tongues are finally bent over the clamping plates, completing the system.

The system uses 50mm Fire Barrier in a double layer with joints staggered. (Please note; wire reinforced sides should be placed outwards).

Fixing to timber structure (1 hour)

When a 1 hour Fire Barrier is supported on structural timber (for example a trussed rafter), and the thickness of timber is 35–49mm, one layer of 60mm ROCKWOOL Fire Barrier must be placed on each side of the timber (see Figure 21). Where timber thickness is 50mm or greater, 2 layers of 50mm Fire Barrier are sufficient.

At the head of the barriers, the RWA45 fire stop inserts lying over the roofing felt and below the tiles / slates should be compressed by approximately 10% eg. use a 30mm thickness for 25mm thick tiling battens. To minimise the risk of dislodgement of the RWA45 as a result of roof collapse on one side of the barrier, cut the tiling battens as they pass over the supporting rafter and re-fix both parts to the top rafter edge – see detail on page 12.

Where roof tiling battens pass over the head and run perpendicular to the line of the Fire Barrier, it is recommended that they should be dis-continuous.

Figure 20 One hour Fire Barrier – General view

Figure 21 One hour protection for timber truss construction between 35 - 49mm thick

Figure 22 One hour – fixing to head

Figure 23 One hour Fire Barrier Perimeter fixing – Plan view

Figure 24 One hour – Fire Barrier Base detail
1½ hour and 2 hour Fire Barrier – typical fixing methods

1½ hour Fire Barrier
The ROCKWOOL 1½ hour Fire Barrier system uses 2 layers of 50mm fire barrier with staggered joints fixed as Fig. 25–27. Please note: Wire reinforced faces should be placed outwards.

2 hour Fire Barrier
The ROCKWOOL 2 hour Fire Barrier consists of two layers of 60mm (plain or foil-faced), wire stitched Fire Barrier with staggered vertical joints, separated by a nominal 40mm air space. The base or perimeter to which the barrier is fixed must be capable of remaining in place for 2 hours.

Angle and strap for 1½ and 2 hour Fire Barriers
The following specification for slotted angles and straps is suitable for supporting ROCKWOOL Fire Barriers for 1½ and 2 hours when tested to BS 476: Part 22. Slotted angles (62 x 41 x 2mm) and straps (38 x 2mm) manufactured from mild steel conforming to BS 1449: Part 1.1: 1991 and cold reduced to provide a minimum of 0.2% proof stress of 417 Mpa (27 tons/in2) and conforming to BS 4345: 1968 (1986) – Specification for slotted angles (inc. flat strap).
**1½ hour and 2 hour Fire Barrier – typical fixing methods**

**Durability**

For durability, we recommend that the finish should be capable of withstanding at least 200 hours salt spray and 400 hours humidity corrosion resistance testing to BS 3990: Part F. Slotted angles and straps conforming to this specification are available from the following suppliers:
- JB Products Tel: 01384 240234
- Link 51 Tel: 01952 682251
- Romstor Tel: 01442 242261

If other hardware is used to support the barriers, we recommend that the respective specifier, supplier or installer should be certain that the chosen fixing system has been both tested and approved, for the required period of fire resistance and drop height.

**Site advisory service**

ROCKWOOL provides a site advisory service by engineers, solely employed to assist with advice when installing ROCKWOOL materials on site. The service is intended for site guidance, but is not intended to be an inspection facility unless agreed under a separately financed contract agreement.

For approval of installed barriers, the installer or building owner will be referred to a suitably accredited and experienced fire assessor or fire safety engineering organisation.

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**Figure 28** Two hour Fire Barrier – General view

**Figure 29** Two hour Fire Barrier – section at head

**Figure 30** Two hour Fire Barrier – base detail
Proprietary fixings
All steel hammer set expansion anchors for soffit fixings are available from Hilti, or E jot. For perimeter fixings to concrete or masonry, use Hilti HUS Universal Screw system. For fixings to timber, use standard No. 10 steel wood screws 100mm long.

References
Publications
For further information on the design of cavity barriers and firestops, reference should be made to the BRE Current Paper 7/77 whilst BRE Digest Nos. 214 and 215 discuss practical problems and solutions.

Supply
ROCKWOOL Fire Barrier support angle and clamping plate are specially manufactured for ROCKWOOL.

Clamping Plate:
3m x 60mm, 10 lengths per pack
Fire Barrier Support Angles:
3m x 34mm x 75mm, 10 lengths per pack
ROCKWOOL Acoustic Intumescent Sealant:
310ml cartridges, 25 per box

Packaging of Fire Barrier
Shrink wrapped in polyethylene.

General design considerations
A cavity fire barrier must be designed to restrict the passage of both hot smoke and flame for the minimum specified period, as listed in approved Document B in support of the Building Regulations. In addition, it must be fixed in such a way that:

- It will remain effective in the event of structural movement
- There are no gaps where it abuts other elements of construction
- It complies with the requirements of Approved Document B of the Building Regulations.

Extended drops
For periods of up to 60 minutes, ROCKWOOL Fire Barriers can be used for extended void heights between 3.5 and 6m without the need for a supported frame – see Figure 14 for joining barriers with overlap. For periods of up to 90 minutes, this drop height can be increased to 10.5m (9m for 120 minutes), by the use of a simple frame system constructed from slotted angles and straps (see 1½ and 2 hour support systems).

Further details are available from ROCKWOOL Technical Solutions Team.

Fire barriers and dampers
Where ROCKWOOL Fire Barriers are installed in conjunction with fire dampers, the dampers must be supported independently of the fire barrier. HVCA or ASFP publications may be helpful.
Fire Barrier Slab

Fire Barrier Slab offers a new solution to this typical application for up to 4 hours integrity. ROCKWOOL Fire Barrier Slab is an aluminium foil faced slab used to close voids of up to 1m in height and 20m in length supported by a masonry wall (minimum density of 400 kg/m³) offering the same fire performance.

The slabs are cut to height and friction fitted within the opening. ROCKWOOL Acoustic Intumescent Sealant or ROCKWOOL LUL Intumescent Sealant is applied to the butt joints and perimeter of the barriers.

Service penetrations
The ROCKWOOL Fire Barrier Slab can be penetrated by steel pipes of up to 33mm external diameter or smaller, and steel cable trays of 305 x 50mm or smaller.

These penetrating services must be independently supported a maximum of 150mm from the face of the slabs. ROCKWOOL Acoustic Intumescent Sealant or ROCKWOOL LUL Intumescent Sealant is applied to the butt joints and perimeter of the barriers. See Figure 30.

Fire performance of ROCKWOOL Fire Barrier Slab

ROCKWOOL Intumescent Sealants
All joints are closed using ROCKWOOL Acoustic Intumescent Sealant or ROCKWOOL LUL Intumescent Sealant to ensure a tight fit during a fire situation.

Flammability
When subjected to flame, ROCKWOOL Intumescent Sealants will expand and char, blocking the passage of smoke and flame (see Fig 33). In sensitive areas, such as underground tunnels where smoke evolution could be a potential problem, use ROCKWOOL LUL Sealant.

Service temperature range
-20°C to +70°C

Coverage
Based on a 9mm x 6mm joint, ROCKWOOL Intumescent Sealants will cover approximately 5.5 linear metres. Intumescent Sealants must be applied with a minimum width of 6mm and a maximum width of 20mm.

The Intumescent Sealants will allow for 10% compression and tension movement in a butt joint. Both varieties of ROCKWOOL Intumescent Sealants are supplied in 310ml cartridges, 25 cartridges per box.

Packaging of Fire Barrier Slabs
Two slabs per pack enclosed in polythene.

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.uk for specific details.