Fire Barrier Systems

Tools required

- Electric screwdriver or drill
- Snips
- Insulation knife or saw

Ancillary products

0.9mm galvanised annealed wire, Trapezoidal Firestops, ROCKWOOL Fire Barrier support angle and clamping plate, Fire Barrier Angle and Strap

Fixing and application

½ hour cavity barrier

Figures 1-6 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 3 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 Figure 6).

For fixing to timber, the ROCKWOOL clamping plate is used, compressing the barrier to the timber, fixed at 450mm centres using No.10 woodscrews.

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.

For fixing to concrete soffits (Figure 7-9), 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 maximum 450mm centre.

The ROCKWOOL Fire Barrier Fixing System incorporates an angle support and clamping plate

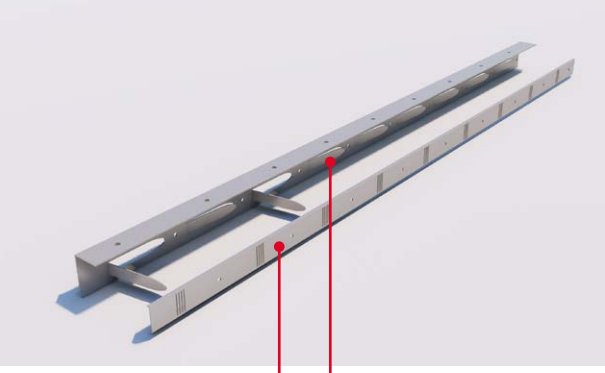


Figure 1

Fire Barrier traverse to rafters

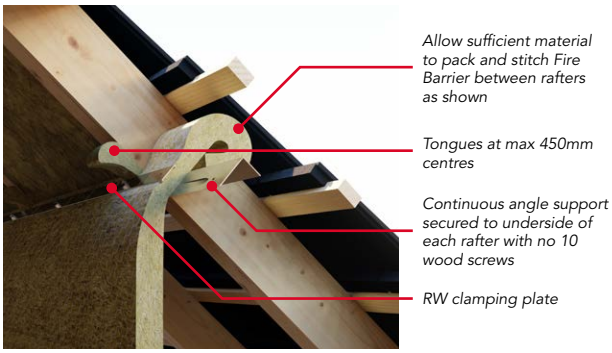
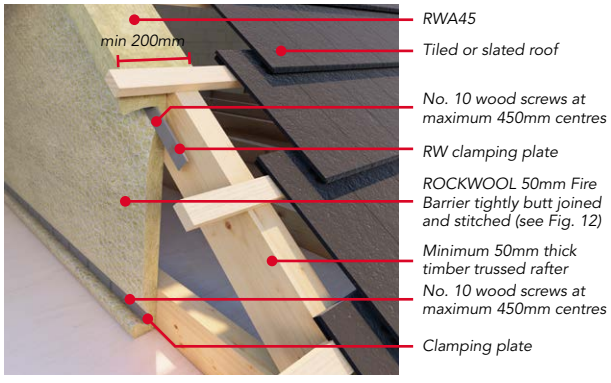


Figure 2

Half hour protection for timber truss construction 50mm thick or more.



Note: nail plate protection required - see Figure 6

For fixing to concrete soffits (Figure 7-9), 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 maximum 450mm centre.

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 (Figure 10 & 11). The barrier is otherwise fixed for timber construction as previously shown on Figures 1-6.

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 13. For additional guidance and drops in excess of 6m, please refer to Figure 28 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 (see Figure 12). 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 Figure 14). For extended drops, 1.5mm diameter galvanised and annealed wire is used (see Figure 13).

Figure 3

Half hour protection for timber truss construction 35 to 49mm thick.

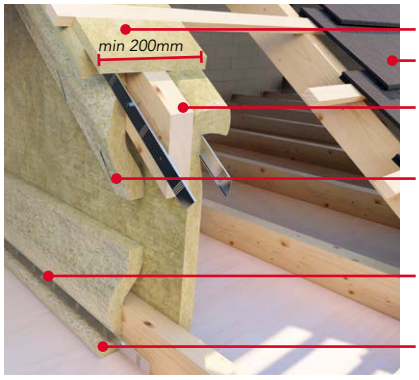


Figure 4

Head of partition

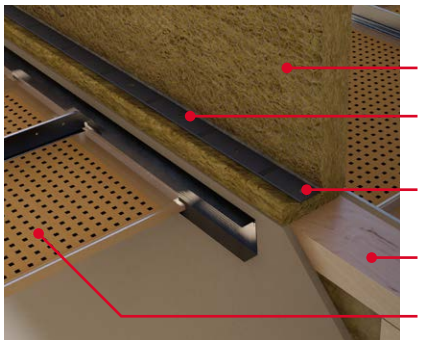


Figure 5

Barrier fitted transversely to timber joisted ceiling

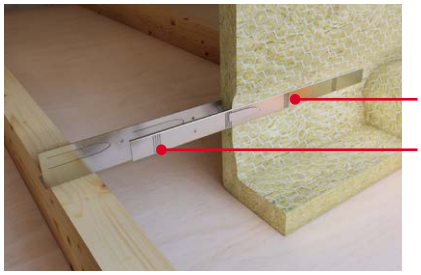


Figure 6

Nail plate protection

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 lightly 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 15 and 16). 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.

Figure 7

50mm Fire Barrier fixed to concrete soffit

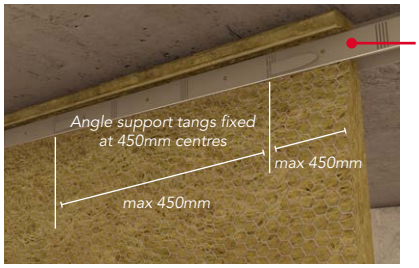


Figure 8

50mm Fire Barrier running across ribbed soffit - Section

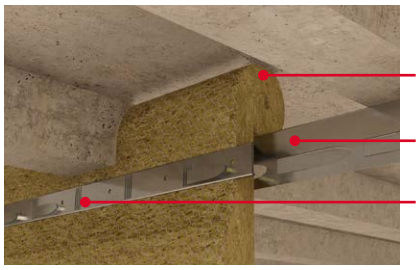


Figure 9

Alternative fixing to flat soffit or perimeter, appropriate to barriers with a shallow drop

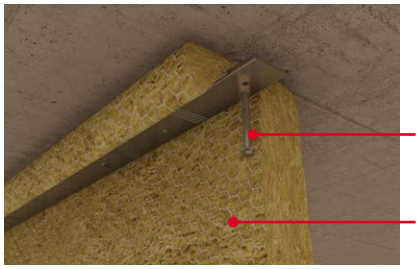


Figure 10

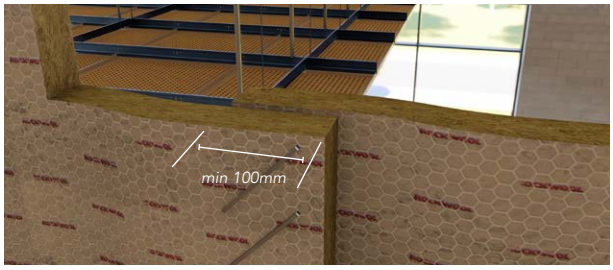
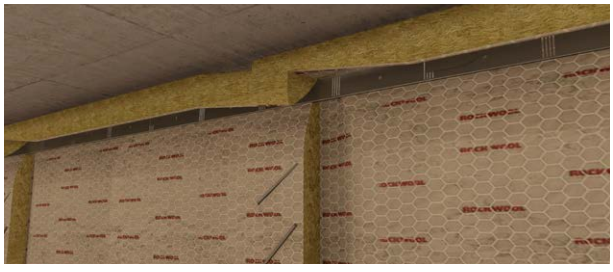


Figure 11



1 hour Fire Barrier

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 a cavity.

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.

1.5 hour Fire Barrier

The ROCKWOOL 1.5 hour Fire Barrier system uses 2 layers of 50mm Fire Barrier with staggered joints fixed as Figures 22-24. Please note: Wire reinforced faces should be placed outwards.

2 hour Fire Barrier

The ROCKWOOL 2-hour Fire Barrier (see Figures 25-27) 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 (1.5 and 2 hour Fire Barriers)

The following specification for slotted angles and straps is suitable for supporting ROCKWOOL Fire Barriers for 1.5 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).

Figure 12

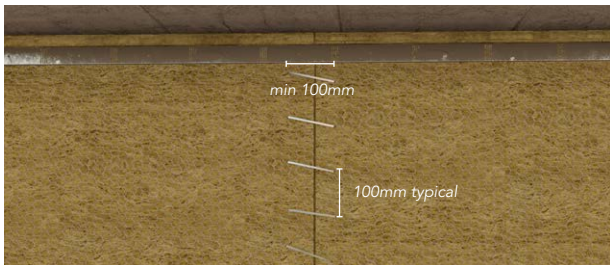


Figure 13

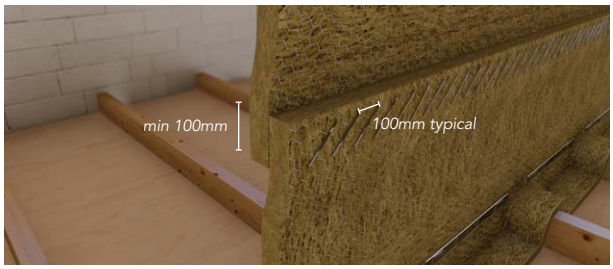
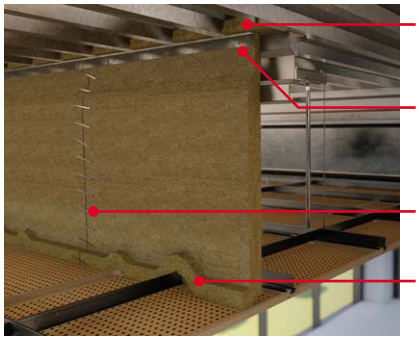


Figure 14



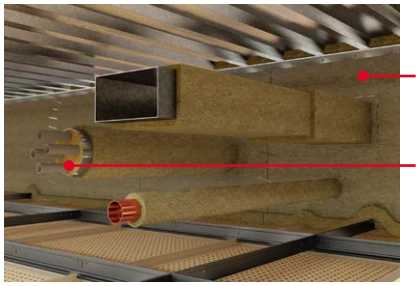
Fire Barrier cut and pushed up into profile as fire stopping

Angle or clamping plate fixing Fire Barrier to purlin with self tapping screws at 450mm centres (Hilti SMD 02Z 5.5 x 70mm)

Adjacent Barriers butt jointed and wired tightly together as Fig12.

Fire Barrier draped over suspended ceiling and wired to grid, min 100mm lap. If not wired, overlap is min 150mm

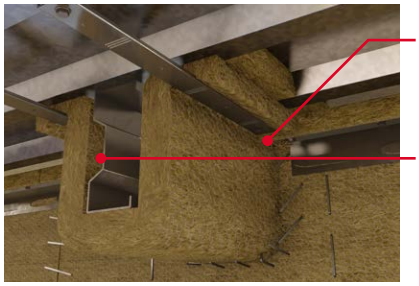
Figure 15



Sleeves wire stitched through main barrier

Fire Barrier material backing

Figure 16



Sleeves to be stitched to main barrier

Off-cuts of Fire Barrier to be packed tightly into purlin void

Ancilliaries

ROCKWOOL Ancillaries:

ROCKWOOL Fire Barrier support angle and clamping plate are speciallymanufactured for ROCKWOOL.

Clamping Plate:

3m x 40mm, 10 lengths per pack

Fire Barrier Support Angles:

3m x 34mm x 75mm, 10 lengths per pack

All steel hammer set expansion anchors for soffit fixings are available from Hilti, or Ejot. 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.

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.

Figure 17

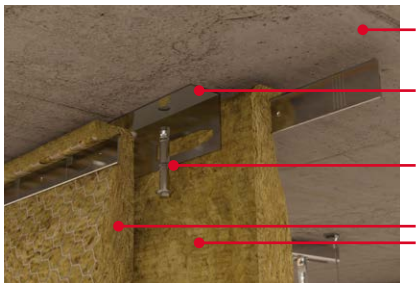


Figure 18

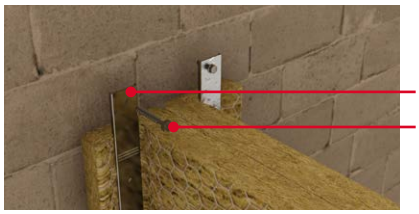


Figure 19

Figure 20

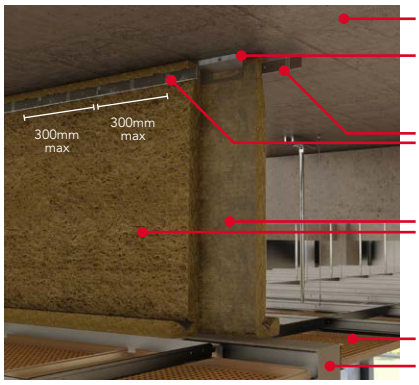
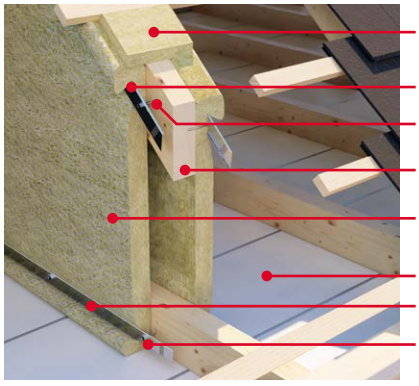


Figure 21



Other installation information

A cavity fire barrier must be designed to restrict the passage of both hot smoke and flames 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 13 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 Figure 28).

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.

Access through barriers

Where regular access is required through the barriers for maintenance purposes etc, this should be achieved by the inclusion of an independently supported fire rated door set and frame. The Fire Barriers should be clamped to the door frame with the RW clamping plate and appropriate fixings at 450mm centres.

Figure 28

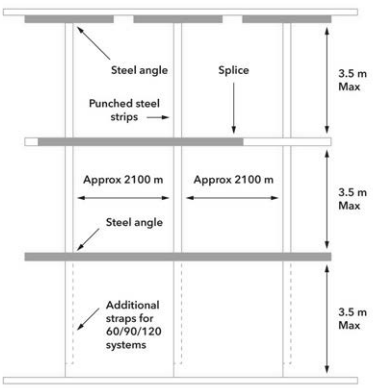


Figure 22

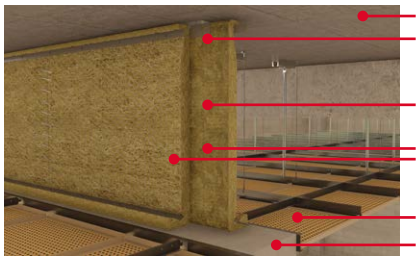


Figure 23

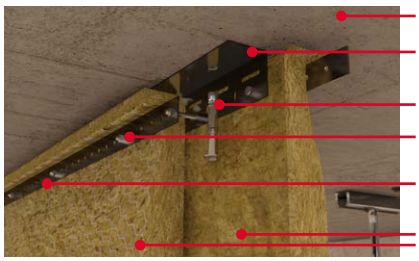


Figure 24

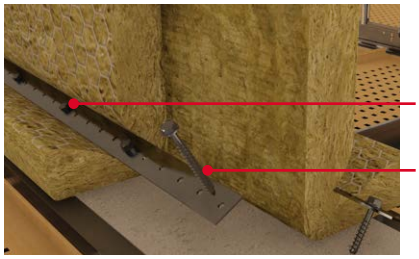


Figure 25

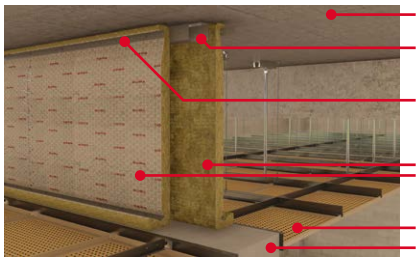
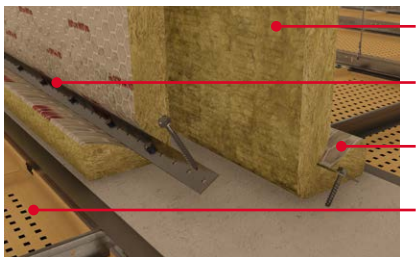


Figure 26

Figure 27



Health & safety

The mechanical effect of fibres in contact with skin may cause temporary itching.

Cover exposed skin

When working in unventilated area wear disposable face mask.

Clean area using vacuum equipment.

Waste should be disposed of according to local regulations.

Rinse in cold water before washing.

Ventilate working area if possible.

Wear goggles when working overhead.