

INSTALLATION MANUAL

Fire-teK® WM 910



Fire protection of large cavities



DESIGN CONSIDERATIONS

Every building must be designed and constructed in such a way that in the event of an outbreak of fire within the building, the unseen spread of fire and smoke within concealed cavities in its structure and fabric is inhibited. In England the Building Regulations (Approved Document B, Volume 2, section 9) require cavity barriers to sub-divide voids if they extend beyond certain dimensions. In addition cavity barriers are also required to be placed above fire resisting partitions. Rock mineral wool products are ideal to act as cavity barriers due to their inherent non-combustibility. For specific periods of fire resistance in small and large voids (as required by the Building Regulations) it is necessary to use products that have been tested and assessed to offer the required performance when installed to manufacturer's guidelines. The designer should consult the relevant document in each nation in order to determine the exact requirements that need to be met.

DEFINITIONS

The following definitions are taken from the Building Regulations - England Fire Safety Approved Document B, Volume 2, section 9.

Cavity barrier

A construction within a cavity, other than a smoke curtain, to perform either of the following functions:

- Close a cavity to stop smoke or flame entering.
- Restrict the movement of smoke or flame within a cavity.

Fire stop (fire-stopping)

A seal provided to close an imperfection of fit or design tolerance between elements or components, to restrict the spread of fire and smoke.

Provisions

The provisions are given in Building Regulations - Fire Safety Approved Document B, Volume 2, section 9 for cavity barriers in specified locations. The provisions necessary to restrict the spread of smoke and flames through cavities are broadly for the purpose of sub-dividing cavities, which could otherwise form a pathway around fire separating elements, and closing the edges of cavities; therefore reducing the potential for unseen fire spread. These should not be confused with fire stopping details, section 10. Concealed spaces or cavities in the construction of a building provide a ready route for smoke and flame spread. This is particularly so in the case of voids in, above and below the construction of a building, e.g. walls, floors, ceilings and roofs. As any spread is concealed, it presents a greater danger than would a more obvious weakness in the fabric of the building.

LARGE CAVITY BARRIERS

Cavity barriers, tested from each side separately, should provide a minimum of both of the following:

- a. 30 minutes integrity (E30)
- b. 15 minutes insulation (I15).

Please check the relevant building regulations in your countries (England & Wales, Scotland, Northern Ireland and Republic of Ireland).

CONCEALED CAVITIES

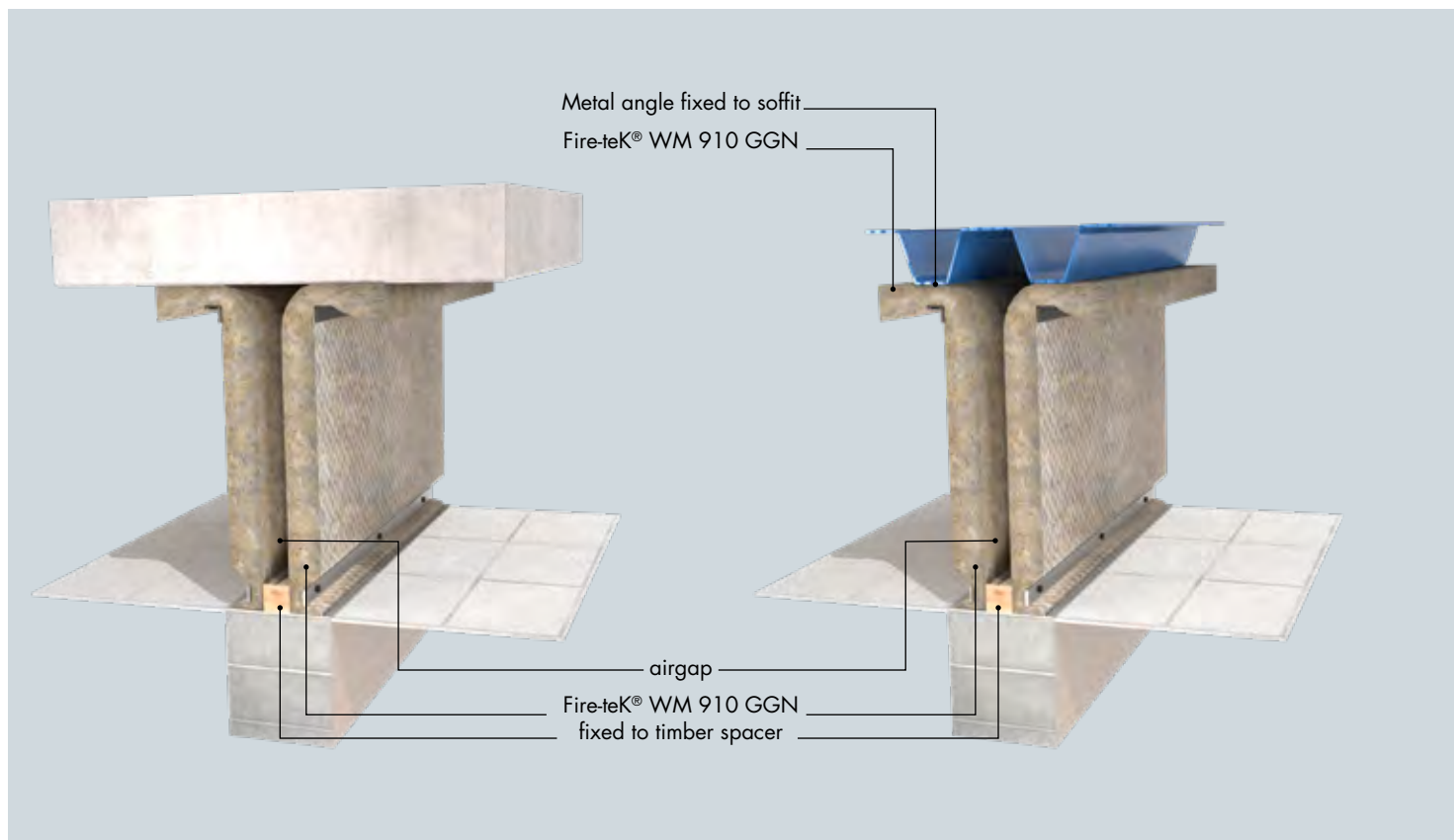
Fire and smoke spread in concealed spaces is particularly hazardous because fire can spread quickly throughout a building and remain undetected by the occupants of the building. Cavity barriers are used to sub divide cavities and so prevent smoke and flame from by-passing fire-resisting walls and partitions. The maximum distance between barriers must be appropriate to the location of each cavity. Also, due consideration must be given to the class of surface exposed within the cavity. Cavity barriers should achieve at least 30 minutes fire resistance, providing a minimum of 30 minutes integrity and 15 minutes insulation. For full details about the position and spacing of cavity fire barriers refer to the relevant sections of the appropriate Building Regulations.

KNAUF INSULATION FIRE-TEK WM 910 GGN

Rock Mineral Wool wired mat Fire-teK® WM 910, supplied with a galvanised-steel wire mesh and galvanised-steel stitching wire on one side, is the main component of the system. Fire-teK® WM 910 must be installed in accordance with the specifications detailed below and on the following pages. If these specifications are not followed the installation cannot be deemed to offer any specific period of fire protection.

Use Fire-teK® WM 910 GGA, with reinforced aluminium foil between the mineral wool surface and wire mesh, when the ceiling void is used as an air plenum.

Product	Description	Application
Fire-teK® WM 910 GGA	Aluminium foiled faced	Air Plenum or where foil finish is desired
Fire-teK® WM 910 GGN	Unfaced	General application



FIRE PERFORMANCE OF THE SYSTEM

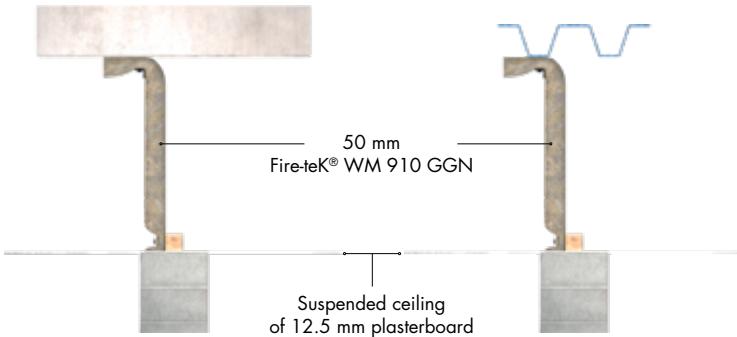
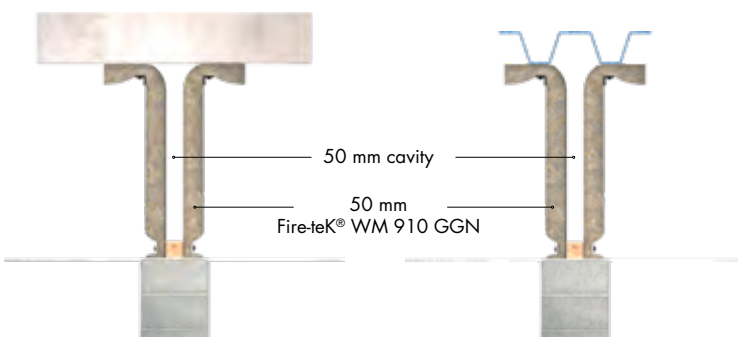
Fire-teK® WM 910 is made from Rock Mineral Wool and classified as non-combustible (Euroclass A1) according to EN 13501-1.

When subjected to full scale fire resistance tests to BS 476, a system comprising one layer of 50 mm Fire-teK® WM 910, fixed by using the components and methods detailed on the following pages achieved 15 minutes insulation (I), and retained its integrity (E) for 30 minutes. Testing to BS EN 1366-3 on a single layer of Fire-teK® WM 910 where services penetrate the barrier has also show that a single layer can achieve 15 minutes insulation (I) and 30 minutes integrity (E). A full list of service penetrations is shown below.

A single layer of 50 mm Fire-teK® WM 910 thereby satisfies the criteria laid down in the Building Regulations for cavity barriers, by meeting the minimum requirement of 15 minutes insulation (I) and 30 minutes integrity (E).

When subjected to full scale fire resistance tests to BS 476, a system comprising a double layer of 50 mm Fire-teK® WM 910, fixed by using the components and methods detailed on the following pages, achieved 61 minutes insulation, and retained its integrity for 66 minutes. A double layer of 50 mm Fire-teK® WM 910 thereby satisfies the criteria where fire barriers are required to have EI60 and EI120.

These tests incorporated vertical and horizontal joints between barriers. Fire resistance is effective from either side of the barrier. When tested, the wire side was exposed to the furnace as this is the side most vulnerable to fire. UL Technical Assessment Report Number: 4790228023-1

Knauf Insulation Solution	Fire Resistance (minutes)
<p>Large cavity barriers Insulation product: Fire-teK® WM 910 GGN Thickness: 50 mm, one side of the cavity*</p>	E30 I15
<p style="text-align: center; color: #00AEEF;">30 minutes fire resistance</p> 	
<p>Large cavity barriers Insulation product: Fire-teK® WM 910 GGN Thickness: 50 mm + 50 mm, both sides of the cavity</p>	EI60 EI120
<p style="text-align: center; color: #00AEEF;">60 minutes fire resistance</p> 	

*Also with service penetrations, see full list in table below at page 8.



BENEFITS OF THE SYSTEM

- Simple, clean and quick to install
- Provides both fire and acoustic performance
- Versatile, flexible and adaptable system

ABOUT FIRE-TEK WM 910 GGN

Contains no ozone-depleting substances or greenhouse gases.

Fire-teK® WM 910 is **produced with ECOSE®**

technology. Knauf Insulation Mineral Wool products with ECOSE® Technology benefit from a no-added formaldehyde binder made from rapidly renewable bio-based materials instead of petroleum-based chemicals.

TECHNICAL DATA

Knauf Insulation Fire-teK® WM 910 GGN

Properties	Symbol	Description	Unit	Test method
Reaction to fire	—	A1	—	EN 13501-1
Water-soluble chloride ions (AS quality)	—	≤ 10	ppm	EN ISO 12624
Water absorption	W _p	≤ 1.0	kg/m ²	EN ISO 29767
Water vapour diffusion equivalent air layer thickness	μ	1	—	
Melting point of fibres	—	≥ 1000	°C	DIN 4102-17
Air flow resistance	r	≥ 40	kPa.s/m ²	EN 29053
Silicon-free	—	Manufactured without silicon oil additive		

TYPICAL CONSTRUCTION

For 30 minutes fire resistance

A single layer of 50 mm Fire-teK® WM 910, applied as a hanging curtain, supported continuously from above and both sides, using the fixings listed in the Table at page 12.

At the base Fire-teK® WM 910 is either lapped freely on to the back of a suspended ceiling or fixed to a partition head. The maximum barrier height tested is 3000 mm and this is therefore the maximum barrier height that can be installed without additional intermediate support.

For barriers over 3000 mm high up to a maximum of 6000 mm additional intermediate support is required, and this should be located such that the maximum distance from the support to the top of the barrier or from the support to the bottom of the barrier should not exceed 3000 mm.

For 60 and 120 minutes fire resistance

Two layers of 50 mm Fire-teK® WM 910, separated by a 50 mm air space, applied as a hanging curtain with wire mesh to the outside, supported continuously from above and both sides, using the fixings listed in Table at page 12. At the base it is either lapped freely on to the back of a suspended ceiling, or fixed to a partition head.

Installation

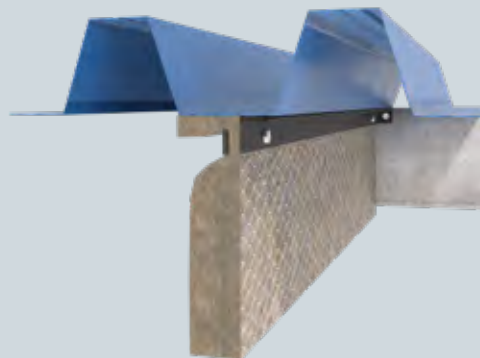
The following information and illustrations outline typical details for the installation of large cavity barriers. In case of uncertainty, refer to Knauf Insulation.

INSTALLATION OF 30 MINUTES CAVITY BARRIER



METAL DECK WITH OVERDECK INSULATION

If Fire-teK® WM 910 runs with the slope of the roof, a supporting steel angle should be fixed between purlins and the smoke and fire barrier clamped to this with steel strip (Figure 1). The insulation should project 80 mm beyond the strip to ensure a good seal. If fitted across the sheeting profile, Fire-teK® WM 910 should be bolted to the purlins (Figure 2). It is returned at the top, to a length equivalent to 3 times the profile depth, to allow for cutting at troughs and pushing securely into profiles.



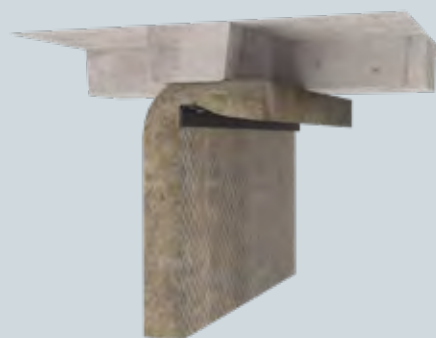
1. Metal angle fixed to purlin



2. Fixed to purlin

CONCRETE DECKS

Fire-teK® WM 910 is clamped between the deck and steel angle secured by expanding bolts. If the deck is coffered it should usually be possible to locate the cavity barrier along one of the ribs (Figure 3). If fitted across the coffering it should be clamped by steel strap, to the slotted steel angle which is secured to the ribs.



3. Fixed to rib of coffered slab

If the depth of coffering is less than 100 mm, Fire-teK® WM 910 should be returned at the top by 300 mm, to allow for cutting at the ribs and pushed securely into the coffering (Figure 4). If the depth of coffering is greater than 100 mm, Fire-teK® WM 910 should be fixed around the coffering using steel angle, as described above. Alternatively, proprietary profile fillers may be used.



4. Fixed across coffered ceiling

The perimeter of the barrier should be secured with steel strip (Figure 5).

At partitions or wall heads, if a secure fixing is available, as at soffits, Fire-teK® WM 910 should be clamped with a steel strap.



5. Perimeter fixing with steel strip



INSTALLATION OF 30 MINUTES CAVITY BARRIER WITH SERVICE PENETRATIONS



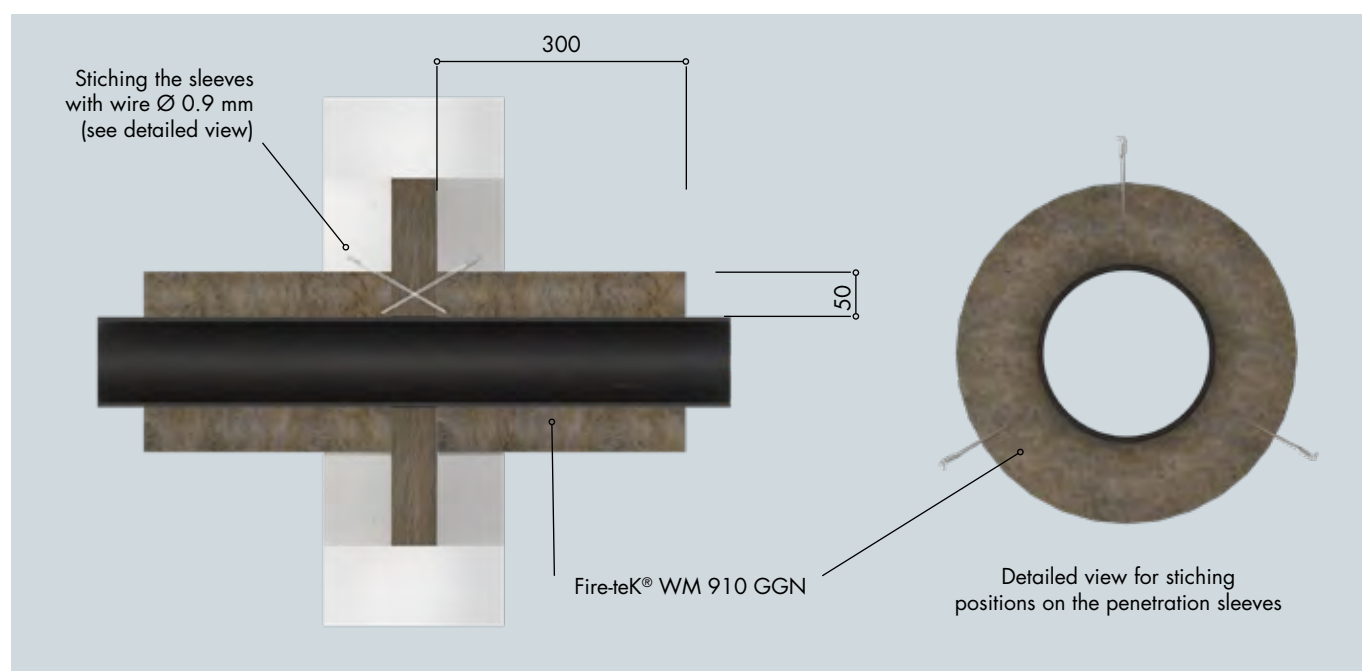
SERVICE PENETRATIONS

Service penetrations as detailed in Annex A of the UL Technical Assessment Report Number: 4790228023-1 (Section 8.1.7) may be installed through the fire barriers detailed above (30 minutes). Services must be covered by 50 mm thick Fire-teK® WM 910 insulation extending 300 mm on both sides, with the insulation stitched to the barrier. Services must be appropriately supported as close to the barrier as practical. Including the services will reduce the insulation performance according to BS 476: Part 22:1987 to 15 minutes.

Service/pipe material	Pipe diameter range	Pipe wall thickness (mm)	Insulation characteristics	Integrity (min)	Insulation (min)
Steel	15 -200	any (2.0-6.3)	Fire-teK® WM 910 GGN, 50 mm tick, 300 mm long, on each face	30	15
Cooper	15-159	any			
PVC	20-200	any			
Polyethylene (PE)	20	2			
Polypropylene (PP)	16	1.8			
Composite pipe (Geberit Mepla)	16-75	any (2.25-4.7)			
CVPS (Spears Flameguard)	26,7-88,9	any (1.98-6.58)			
Timber	63x30	-			

Note: For end capping see annex on page 14

The stitching should pass through the reinforcement mesh and the wool (Figure 11).

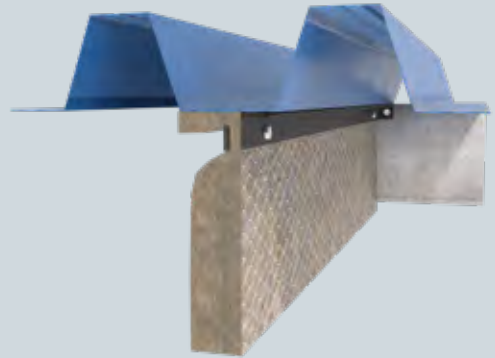


INSTALLATION OF 60 TO 120 MINUTES CAVITY BARRIER



METAL DECK WITH OVERDECK INSULATION

If Fire-teK® WM 910 runs with the slope of the roof, a supporting steel angle should be fixed between purlins and the smoke and fire barrier clamped to this with steel strip (Figure 1). The insulation should project 80 mm beyond the strip to ensure a good seal. If fitted across the sheeting profile, Fire-teK® WM 910 should be bolted to the purlins (Figure 2). It is returned at the top, to a length equivalent to 3 times the profile depth, to allow for cutting at troughs and pushing securely into profiles.



1. Metal angle fixed to purlin



2. Fixed to purlin

CONCRETE DECKS

Fire-teK® WM 910 is clamped between the deck and steel angle secured by expanding bolts. If the deck is coffered it should usually be possible to locate the cavity barrier along one of the ribs (Figure 3). If fitted across the coffering it should be clamped by steel strap, to the slotted steel angle which is secured to the ribs.



3. Fixed to rib of coffered slab

If the depth of coffering is less than 100 mm, Fire-teK® WM 910 should be returned at the top by 300 mm, to allow for cutting at the ribs and pushed securely into the coffering (Figure 4). If the depth of coffering is greater than 100 mm, Fire-teK® WM 910 should be fixed around the coffering using steel angle, as described above. Alternatively, proprietary profile fillers may be used.



4. Fixed across coffered ceiling

The perimeter of the barrier should be secured with steel strip (Figure 5).

At partitions or wall heads, if a secure fixing is available, as at soffits, Fire-teK® WM 910 should be clamped with a steel strap.



5. Perimeter fixing with steel strip

PERIMETER FIXING

Fire-teK® WM 910 should be secured with steel strap to the sides of the perimeter wall, so as to maintain the 50 mm air space (Figure 9).



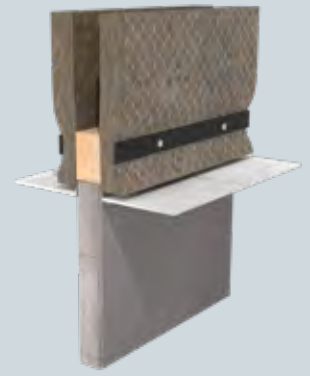
6. Fixing at perimeter

PARTITIONS AND WALL HEADS

If possible, Fire-teK® WM 910 should be secured with steel strap to the partition or wall head so as to maintain the 50 mm air space (Figure 7). If this is not possible, it should be draped with a return of at least 150 mm (Figure 9).



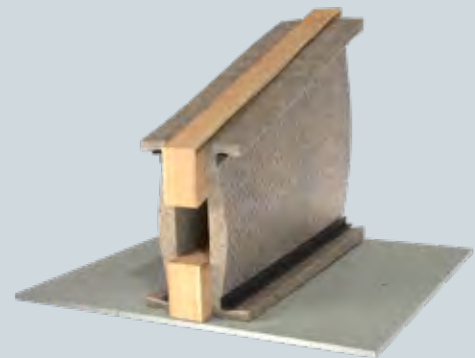
7. Fixing to wall head



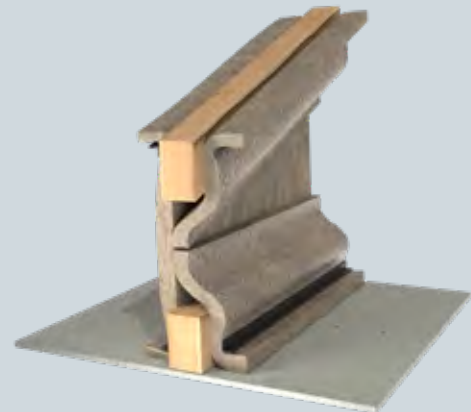
8. Fixing to timber spacer

TIMBER ROOFS

For barriers running parallel to joists and rafters, the barrier is clamped to the rafters and joists using steel angle. The timber joist, rafter, or truss shall have a nominal minimum thickness of 50 mm. Where fire protection is required from only one side, only one layer of barrier is needed with the timber on the unexposed face. Where fire protection of the timber is required from both sides, a double layer is required, one on each side (figure 9). Alternatively, individual elements can be enclosed by applying a second layer (figure 10).



9. Fixing to roof truss – double layer



10. Fixing to roof truss – individual encasement

11. Junction with rafter

12. Junction with rafter

[illegible]

FIXING SYSTEM SPECIFICATIONS

Any product used for fire protection can only be considered to be offering a specific period of fire protection when it is installed in the manner specified in the appropriate fire test report. This includes the specification of all associated fixings and supporting frame work.

Specification of angles and straps

Angle: mild steel – 50 mm x 50 mm x 2 mm

Strip: mild steel – 40 mm x 2 mm

ANGLE FIXINGS TO CONCRETE DECKS AND STEEL SECTIONS:

ANGLES 50 X 50 X 2 MM

Fire resistance period (mins)	Maximum spacing of fixings (m) for the following drop heights (m)						
	3	3.5	4	4.5	5	5.5	6
30	2	2	2	2	2	2	2
60	2	2	1.75	1.5	1.5	1	1
120	2	2	1.75	1.5	1.5	1	1
Key:	M8 bolts	M6 bolts					

FIXING CENTRES FOR ANGLES

Angle dimensions (mm x mm x mm thick)	single layer barriers			double layer barriers		
	30	60	120	30	60	120
50 x 50 x 2.0*	300	300	225	800	800	800
50 x 50 x 1.5*	300	300	200	800	800	750
50 x 50 x 1.2*	300	225	175	800	800	675
40 x 40 x 2.0	200	200	–	300	300	–

*Mild steel angle with a section size of 60 mm x 40 mm may also be used, with 60 mm length fixed to the barrier material and the 40 mm length fixed to substrate.

The angles may be used in conjunction with steel strap, nominally 40 mm wide x 2 mm thick.

For fixing to concrete decks and steel sections, minimum M6 bolts should be used. For fixing to timber, Buildex HT screws or equivalent with a minimum thread penetration into the timber of 50 mm should be used.

JOINTING FIRE-TEK WM 910 GGN



SUSPENDED CEILINGS

With suspended ceilings where positive fixing to wall heads or partition heads is not possible, the weight of Fire-teK® WM 910 and the stiffness of wire facing are such that it will form an effective seal if it laps the horizontal surface by a minimum of 150 mm. Lapped joints are only permissible where the suspended ceiling has the same fire resistance as the cavity barrier. Fire-teK® WM 910 must be slit and fitted around any crossing tees to eliminate gaps and ensure that excessive loads are not transferred to the ceiling (Figure 10).



9. Junction with suspended ceiling

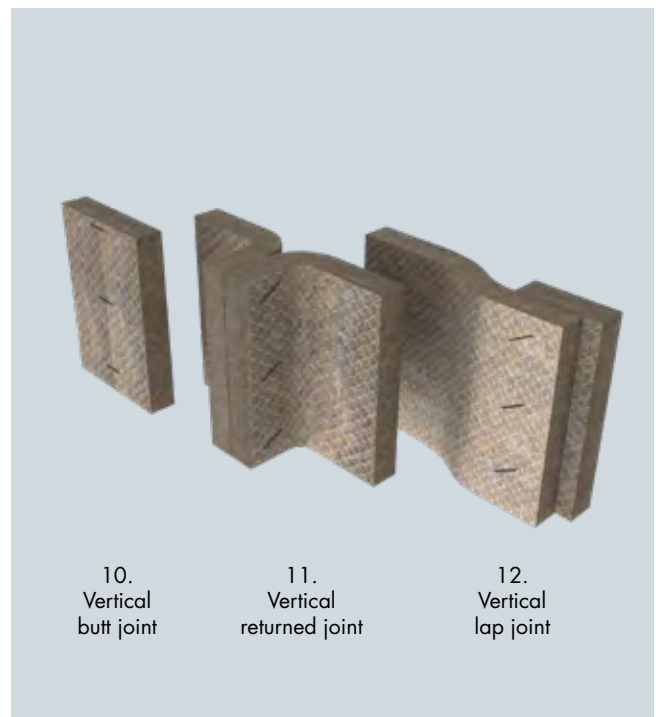
JOINTING

This section describes the approved methods for joining adjacent pieces of Fire-teK® WM 910. The methods are applicable to 30, 60 and 120 minutes large cavity barriers.

VERTICAL JOINTS

Three methods of securing the joints between adjacent pieces of Fire-teK® WM 910 are approved:

1. Joints are tightly butted together and stitched in a continuous spiral loop with 1 mm diameter galvanised lacing wire. The stitching should pass through the reinforcement mesh and the wool on each side of the butt joint at centres not exceeding 100 mm (Figure 11).
2. Alternatively the Fire-teK® WM 910 edges are returned at least 80 mm and wired together (Figure 12)
3. Or they may be lapped at least 100 mm and wired together (Figure 13).



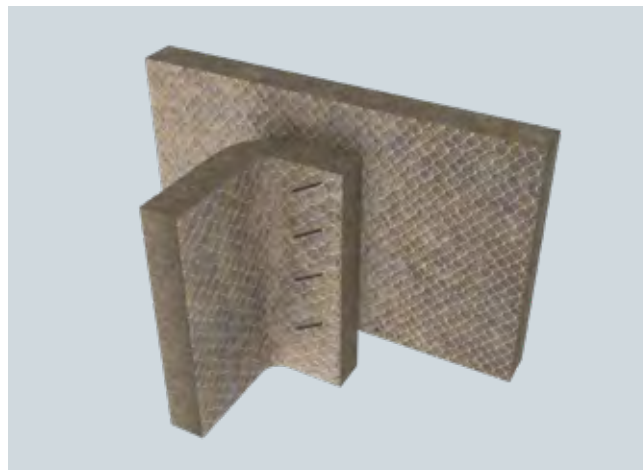
10.
Vertical
butt joint

11.
Vertical
returned joint

12.
Vertical
lap joint

PERPENDICULAR JOINTS

The junction between two barriers should be securely wired together (Figure 14) with a return of at least 80 mm.



HORIZONTAL JOINTS

All barriers can be used for drop heights up to 3000 mm without additional support. For drops between 3000 mm and 6000 mm it is necessary to introduce additional supporting members in order to support the weight of the fire barriers (Figure 15).



ANNEX

Scope of service penetrations



Pipe type	Pipe size OD (mm)	Wall thickness (mm)	End capping
PE	20	2.0	C/U, U/C, C/C
PP	16	1.8	
PVC	20	1.5	
	20	1.6-9.5	U/C, C/C
	25	1.6-9.5	
	32	1.8-9.5	
	40	1.9-9.5	
	50	2.1-9.5	
	63	2.3-9.5	
	75	2.6-9.5	
	90	2.9-9.5	
	110	3.2-9.5	
	125	3.9-9.5	
	140	4.5-9.5	
	160	5.4-9.5	
	180	6.3-8.3	
	200	7.2	
Copper and Steel	15-159	0.7/2.0-147	C/U
Steel only	160-219	2.1/5-14.7	
Spears Flameguard CPVC	26.7 (3/4")	1.98	C/U, U/C, C/C
	26.7 (3/4") – 88.9 (3")	1.98-6.58	U/C, C/C
Geberit Mepla MLC	16	2.25	C/U, U/C, C/C
	16-75	2.25-4.6	U/C, C/C
Timber	63 x 38	N/A	N/A

NON-COMBUSTIBLE PIPES

Material of class A1 or A2 in accordance with BS EN 13501-1 13
(steel, copper, stainless steel, cast iron)

Intended use	Pipe type	Tested Pipe end configuration		Classification
		Inside Furnace	Outside Furnace	
Systems under pressure and closed systems	Sprinklers; domestic hot and cold water; heating; gas	Capped	Uncapped	C/U
Ventilated and closed systems	Rainwater; sewage	Uncapped	Capped	U/C
Closed systems	Limited applications	Capped	Capped	C/C
All intended uses	All applications	Uncapped	Uncapped	U/U

COMBUSTIBLE PIPES

Material of class B to F in accordance with BS EN 13501-1
(plastic, MCL, composite, multilayer)

Intended use	Pipe type	Tested Pipe end configuration		Classification
		Inside Furnace	Outside Furnace	
Pressurised systems	Sprinklers; domestic hot and cold water; heating; gas	Capped	Uncapped	C/U
Closed systems	Heating; sewage	Uncapped	Capped	U/C
Ventilated systems	Rainwater; sewage	Capped	Uncapped	U/C
Closed systems	Very limited applications	Capped	Capped	C/C
All intended uses	All applications	Uncapped	Uncapped	U/U

IT IS OUR RESPONSIBILITY TO PROTECT AND CONSERVE NATURE AND THE ENVIRONMENT.



Because of this we use natural materials almost exclusively as the basis for our Mineral Wool products. As part of our insulation materials, natural components enable our customers throughout the world to construct buildings with environmentally-friendly components and to save the energy which was required for production within a few weeks.

MINERAL WOOL WITH ECOSE® TECHNOLOGY

As the first mineral wool manufacturer in technical insulation, we are offering our whole product range with our natural binder ECOSE® Technology. No formaldehydes are added during manufacture, so that the binding agent mainly consists of naturally occurring raw materials. Products which are manufactured with ECOSE® Technology do not contain phenols, colouring agents or artificial dyes. The excellent technical and fire performance characteristics of the naturally brownish colored insulation materials remain at constant high level. On top our products grant benefits in handling and sustainability compared to mineral wool with standard phenol-formaldehyde binder.



ENVIRONMENT PRODUCT DECLARATION

We make every effort to provide the market with the information it needs to correctly assess the environmental effects of our products and solutions. In the assessment of the sustainability of our products we examine every phase of the life cycle of the product with the aid of an LCA (Life Cycle Assessment) from start to finish. This information is then processed and published as an Environmental Product Declaration (EPD).



THE INTERNATIONAL EPD® SYSTEM

EUROFINS GOLD

Eurofins Indoor Air Comfort Gold evaluates construction materials according to European limit values, statutory regulations and voluntary seals of quality. Only those who can maintain the high standards and ensure minimal indoor emissions are certified. Our products with ECOSE® Technology fulfil these requirements without compromise and are certified accordingly.



challenge.
create.
care.



FOR A BETTER WORLD

Our products save energy, cut emissions and are designed to make sure buildings and applications are good for the environment and keep people healthy, safe and well. Across our company, we have been working on sustainability for over a decade. We have focused on zero harm, reducing our energy use and emissions, recycling our production waste, incorporating circular economy principles and constantly campaigning for better and more sustainable buildings and applications. Over the past decade, we have achieved great things and we are proud of how we have changed our company, helped our colleagues, communities and customers and reduced our impact on the environment. But sustainability is a process of continuous improvement. We must do more for our people and our environment. That's why we've created our new sustainability strategy. We call the new strategy 'For A Better World' because it builds on the success of our mission statement: "Our vision is to lead the change in smarter insulation solutions for a better world."



LIVING WITH A GREEN HEART

LIVING WITH A GREEN HEART

The "Living with a Green Heart" initiative promotes a comprehensive approach to sustainable development with

emphasis on societal and social sustainable development, placing an informed individual at the forefront of sustainable transformation of society. "Living with a Green Heart" presents a unique story and approach that encourages companies, organisations, and individuals to:

- ✓ Create sustainable products and solutions which can transform grey cities into green oasis, build safe and comfortable homes and lead to a better world for all of us.
- ✓ Lead social sustainability actions, cocreating a more informed and kinder future for ourselves and those that come after us.
- ✓ Build a friendlier and more responsible environment for employees at all levels and in all aspects, appreciating the diversity and improving our relationships, as well as the way we work, collaborate, and coexist within our environments.

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COMPANY PROFILE

Knauf Insulation is one of the most respected names in the insulation industry worldwide with over 40 years of experience and still growing fast. Over 5.500 employees in more than 40 countries and 27 manufacturing sites. Being part of the family-owned Knauf group, Knauf Insulation Technical Solutions provides solutions for customers' requirements in industry, marine applications, heating, ventilation and air conditioning. A profound market understanding and insulation know-how enables us to provide a broad range of products to meet your specific needs.

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challenge.
create.
care.