KNAUF INSULATION
Technical Solutions

FIRE-TEK

INSTALLATION MANUAL: KNAUF INSULATION FIRE-TEK® DuctProtect 30-120 C SYSTEM

For ventilation duct EI 30 (ve ho i ◄► o) S till EI 120 (ve ho i ◄► o) S tested in accordance with EN 1366-1

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THE KNAUF INSULATION FIRE-TEK® DuctProtect 30-120 C SYSTEM

KNAUF INSULATION FIRE-TEK® WM 908/910 GGB AND FIRE-TEK® STICK

With our Knauf Insulation Fire-teK® DuctProtect 30-120 C SYSTEM you decided for a system which provides passive fire protection for circular ventilation ducts.
Mineral Wool wired mats which are faced with black tear-resistant aluminium foil and reinforced with wire mesh on one side, are the main components of the system.
In addition to providing relevant protection in the event of a fire, the Knauf Insulation Fire-teK® DuctProtect 30-120 C SYSTEM has good thermal and acoustic insulation properties.

Wired mat Fire-teK® WM 908/910 GGB

Non-flammable adhesive Fire-teK® STICK

Benefits of the Knauf Insulation Fire-teK® DuctProtect 30-120 C SYSTEM:

- Quick and easy to use:
  - › No gluing at the joints necessary
  - › Standardized installation for EI 30 - EI 120
  - › No welding pins required
- Matching black and desent look
- Compact 40, 60, 80 or 100 mm
- No doubling layers at duct joints
- Suitable for moulded parts
- Excellent thermal and acoustic insulation
- Mineral Wool with ECOSE® Technology
- Eurofins Certification Indoor Air Comfort Standard

Product name	Fire resistance class	Thickness [mm]	Application of circular components
Knauf Insulation Fire-teK® WM 910 GGB	EI 30 (ve ho i↔o) S	40	Solid ceiling Dry wall Solid wall
Knauf Insulation Fire-teK® WM 908 GGB	EI 30 (ve ho i↔o) S	60	
	EI 60 (ve ho i↔o) S	80	
	EI 90 (ve ho i↔o) S	100	
	EI 120 (ve ho i↔o) S	100	

APPLICATION

The Knauf Insulation Fire-teK® DuctProtect 30-120 C SYSTEM with wired mats Fire-teK® WM 908 GGB / Fire-teK® WM 910 GGB has been developed for use on circular ventilation ducts. The maximum duct diameter is 1,000 mm. Depending on the fire classes, the system requires insulation thicknesses in a range of 40, 60, 80 or 100 mm.
By default, Mineral Wool mats with a pre-attached wire mesh enable an installation also in tight spaces and on variable diameters.
It's also possible to use felt mats and mount the wire mesh onsite for proper fixation of the mat. Depending on the insulation thickness and mounting, a fire resistance of up to 120 minutes can be guaranteed.

TECHNICAL DATA

Knauf Insulation Fire-teK® WM 908 GGB / 910 GGB

Properties	Symbol	Description				Unit	Test method
Reaction to fire	–	A1				–	EN 13501-1
Thermal conductivity depending on temperature Fire-teK® WM 908 GGB	ϑ	50	100	200	300	°C	EN 12667
	λ	0,040	0,046	0,062	0,084	W/(m·K)	
	ϑ	400	500	600		°C	
	λ	0,112	0,146	0,190		W/(m·K)	
Thermal conductivity depending on temperature Fire-teK® WM 910 GGB	ϑ	50	100	200	300	°C	EN 12667
	λ	0,040	0,046	0,060	0,079	W/(m·K)	
	ϑ	400	500	600		°C	
	λ	0,102	0,131	0,166		W/(m·K)	
Water soluble chloride ions (AS quality)	–	≤ 10				ppm	EN 13468
Water absorption	W_p	≤ 1.0				kg/m²	EN 1609
Water vapour diffusion resistance coefficient	μ	1				–	EN 14303
Melting point of fibres	–	≥ 1000				°C	DIN 4102-17
Air flow resistance	r	≥ 40				kPa·s/m²	EN 29053
Silicon-free	–	Manufactured without silicon oil additive					

Width of the wired mats: 500 or 900 mm

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FIRE SAFE DUCT INSULATION

1. DIMENSIONING AND CUTTING THE MATS

Preparation of the cut-to-size mat for installation on the ventilation duct. To simplify the work, use the table (Table 1) with most common duct diameters, which shows needed length of mats.

Ventilation duct cross-section

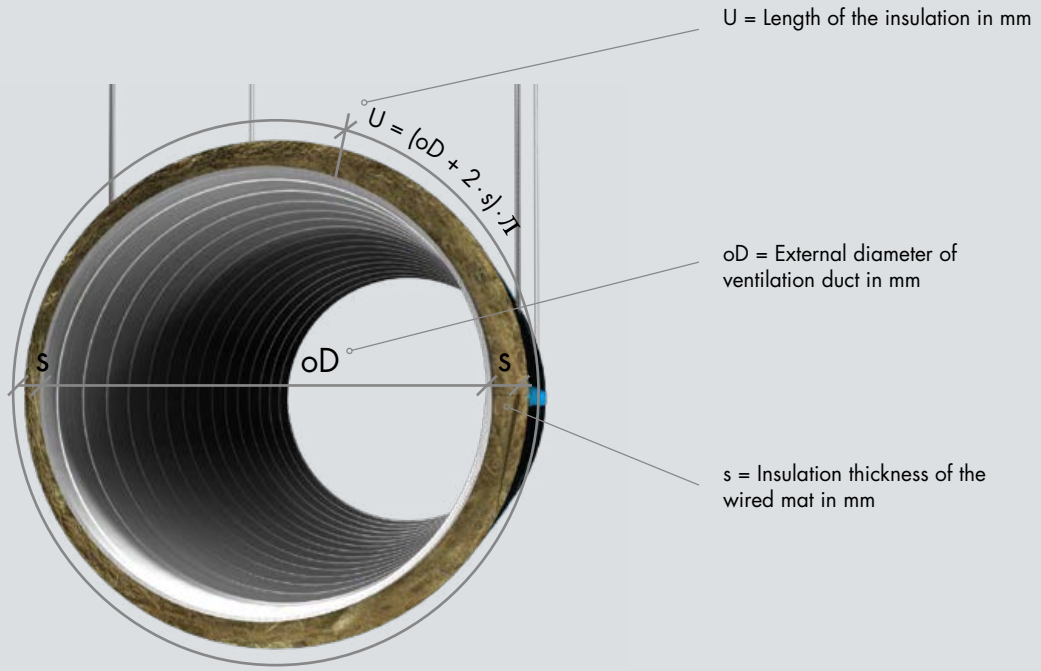

Table 1 Typical duct diameters and according lengths for the mats

Section for Knauf Insulation Fire-teK® WM 908/910 GGB - Length of the mat in mm

	EI 90 / EI 120		EI 60		EI 30		EI 30
oD	Mat length in mm for 100 mm thickness*	oD	Mat length in mm for 80 mm thickness*	oD	Mat length in mm for 60 mm thickness*	oD	Mat length in mm for 40 mm thickness*
63	826	**63**	701	**63**	575	**63**	449
71	851	**71**	726	**71**	600	**71**	474
80	880	**80**	754	**80**	628	**80**	503
90	911	**90**	785	**90**	660	**90**	534
100	942	**100**	817	**100**	691	**100**	565
112	980	**112**	855	**112**	729	**112**	603
125	1021	**125**	895	**125**	770	**125**	644
140	1068	**140**	942	**140**	817	**140**	691
150	1100	**150**	974	**150**	848	**150**	723
160	1131	**160**	1005	**160**	880	**160**	754
180	1194	**180**	1068	**180**	942	**180**	817
200	1257	**200**	1131	**200**	1005	**200**	880
224	1332	**224**	1206	**224**	1081	**224**	955
250	1414	**250**	1288	**250**	1162	**250**	1037
280	1508	**280**	1382	**280**	1257	**280**	1131
300	1571	**300**	1445	**300**	1319	**300**	1194
315	1618	**315**	1492	**315**	1367	**315**	1241
355	1744	**355**	1618	**355**	1492	**355**	1367
400	1885	**400**	1759	**400**	1634	**400**	1508
450	2042	**450**	1916	**450**	1791	**450**	1665
500	2199	**500**	2073	**500**	1948	**500**	1822
550	2356	**550**	2231	**550**	2105	**550**	1979
560	2388	**560**	2262	**560**	2136	**560**	2011
600	2513	**600**	2388	**600**	2262	**600**	2136
630	2608	**630**	2482	**630**	2356	**630**	2231
650	2670	**650**	2545	**650**	2419	**650**	2293
700	2827	**700**	2702	**700**	2576	**700**	2450
710	2859	**710**	2733	**710**	2608	**710**	2482
800	3142	**800**	3016	**800**	2890	**800**	2765
850	3299	**850**	3173	**850**	3047	**850**	2922
900	3456	**900**	3330	**900**	3204	**900**	3079
950	3613	**950**	3487	**950**	3362	**950**	3236
1000	3770	**1000**	3644	**1000**	3519	**1000**	3393

* thickness and product respecting EI class

Example for dimensioning the mats

Ventilation duct with external diameter 100 mm for EI 90/EI 120:

Circumferences = Length of the mat = (oD + 2*s) * л = (100 + 2*100) * л = 942 mm

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2. INSTALLATION OF THE MATS

The horizontal ventilation ducts are hung with threaded rods (max. tensile strength: EI 30/EI 60: 9 N/mm² and EI 90/EI 120: 6 N/mm²). For EI 90 and EI 120 two-side hanging rods of min. M10 is requested. For EI 30 and EI 60 minimum of M8 is requested.
The suspension devices are placed in the insulation, the threaded rods don't need to be insulated. Use ventilation ducts with air insulation requirements in accordance with EN 12237. The number of suspension pairs required results from the static dimensioning. For respecting the weight of wired mats see Table 2.

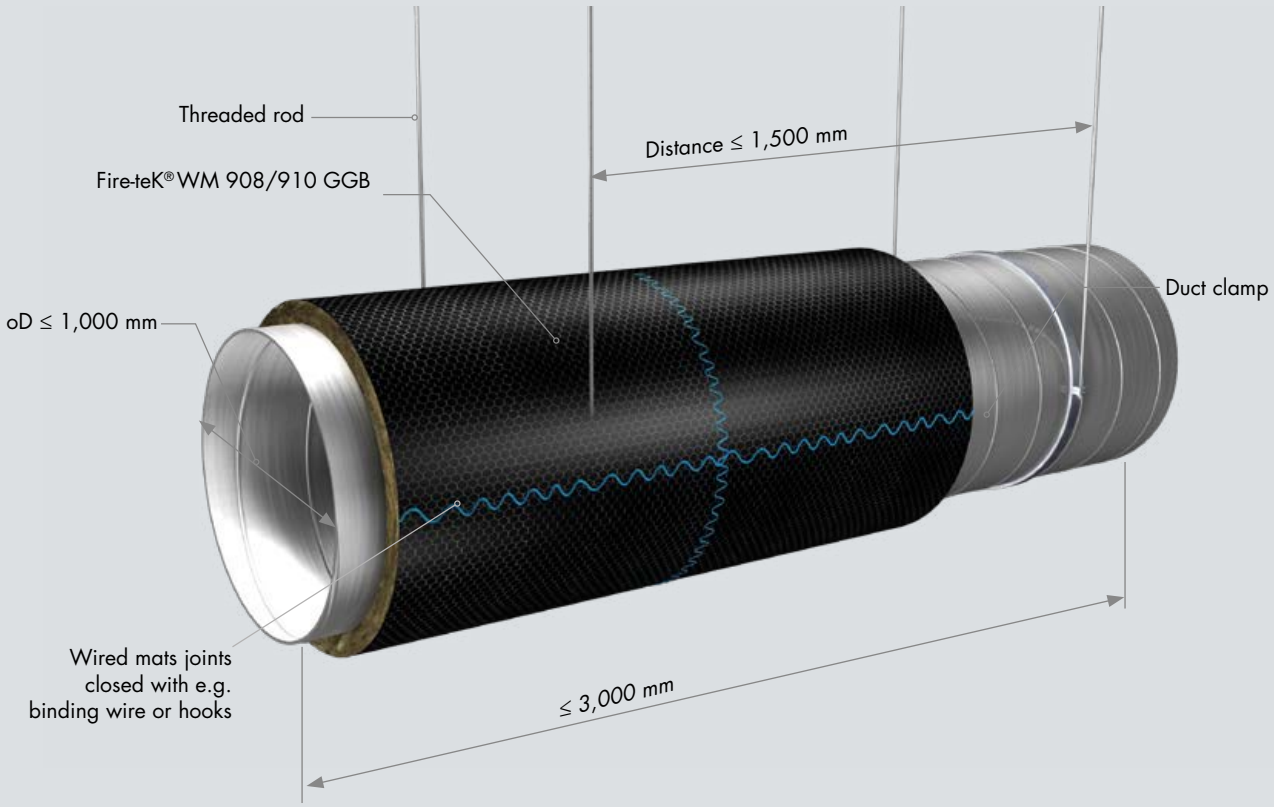


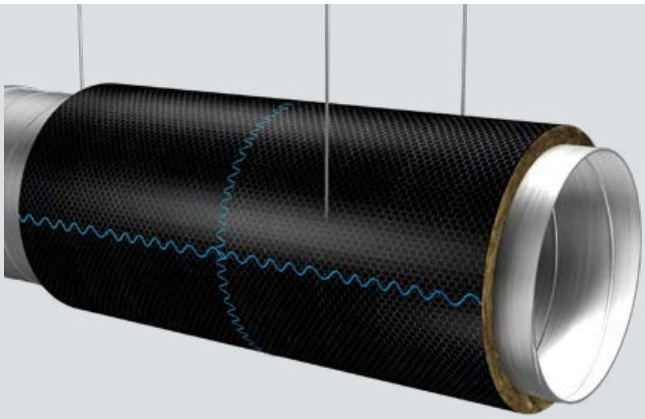
Table 2 Basis to calculate the correct dimensioning of the required threaded rods

Weight of the insulation material in kg per meter (without duct)

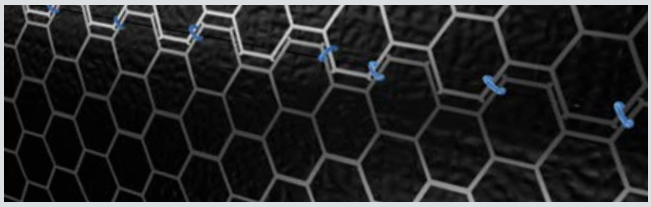
oD in mm	500 mm				900 mm			
	EI 30		EI 60	EI 90 / EI 120	EI 30		EI 60	EI 90 / EI 120
	40 mm	60 mm	80 mm	100 mm	40 mm	60 mm	80 mm	100 mm
63	0,9	1,2	3,0	3,7	1,6	2,2	5,4	6,7
71	0,9	1,3	3,1	3,8	1,7	2,3	5,5	6,9
80	1,0	1,4	3,2	4,0	1,8	2,4	5,7	7,1
90	1,1	1,4	3,3	4,1	1,9	2,6	5,9	7,4
100	1,1	1,5	3,4	4,2	2,0	2,7	6,1	7,6
112	1,2	1,6	3,5	4,4	2,2	2,9	6,4	7,9
125	1,3	1,7	3,7	4,6	2,3	3,1	6,6	8,3
140	1,4	1,9	3,8	4,8	2,5	3,4	6,9	8,7
150	1,4	2,0	4,0	4,9	2,6	3,5	7,1	8,9
160	1,5	2,0	4,1	5,1	2,7	3,7	7,3	9,2
180	1,6	2,2	4,3	5,4	2,9	4,0	7,7	9,7
200	1,8	2,4	4,5	5,7	3,2	4,3	8,1	10,2
224	1,9	2,6	4,8	6,0	3,4	4,6	8,6	10,8
250	2,1	2,8	5,1	6,4	3,7	5,0	9,2	11,5
280	2,3	3,1	5,4	6,8	4,1	5,5	9,8	12,2
300	2,4	3,2	5,7	7,1	4,3	5,8	10,2	12,7
315	2,5	3,4	5,8	7,3	4,5	6,0	10,5	13,1
355	2,7	3,7	6,3	7,8	4,9	6,6	11,3	14,1
400	3,0	4,1	6,8	8,5	5,4	7,3	12,2	15,3
450	3,3	4,5	7,4	9,2	6,0	8,1	13,2	16,5
500	3,6	4,9	7,9	9,9	6,6	8,9	14,3	17,8
550	4,0	5,3	8,5	10,6	7,1	9,6	15,3	19,1
560	4,0	5,4	8,6	10,7	7,2	9,8	15,5	19,3
600	4,3	5,8	9,0	11,3	7,7	10,4	16,3	20,4
630	4,5	6,0	9,4	11,7	8,0	10,8	16,9	21,1
650	4,6	6,2	9,6	12,0	8,3	11,1	17,3	21,6
700	4,9	6,6	10,2	12,7	8,8	11,9	18,3	22,9
710	5,0	6,7	10,3	12,9	8,9	12,1	18,5	23,2
800	5,5	7,5	11,3	14,1	10,0	13,4	20,4	25,4
850	5,8	7,9	11,9	14,8	10,5	14,2	21,4	26,7
900	6,2	8,3	12,4	15,6	11,1	15,0	22,4	28,0
950	6,5	8,7	13,0	16,3	11,6	15,7	23,4	29,3
1000	6,8	9,2	13,6	17,0	12,2	16,5	24,4	30,5

3. MAT JOINTS

There are no gaps of Mineral Wool allowed at the joints. The wire mesh must therefore be sewn in the longitudinal and cross-wise junctions with binding wire (Picture 1) or secured with binding wire loops (Picture 2) or mat hooks (not shown). It is not required to close or cover the joints with additional aluminium tape.



Picture 1: Cross-wise junctions with binding wire



Picture 2: Binding wire loops

IMPORTANT NOTES

KEEP IN MIND THE MAXIMUM DIMENSIONS

- Duct diameter ≤ 1,000 mm
- Distance between the threaded rods/suspension ≤ 1,500 mm
- Length of the individual ventilation duct ≤ 3,000 mm

FOLLOW THE INSTALLATION INSTRUCTIONS

The Knauf Insulation Fire-teK® DuctProtect 30-120 C SYSTEM only provides the stated class of fire-resistance for ventilation ducts if installed in accordance with the installation guidelines.

FIRE SAFE WALL/CEILING PENETRATION

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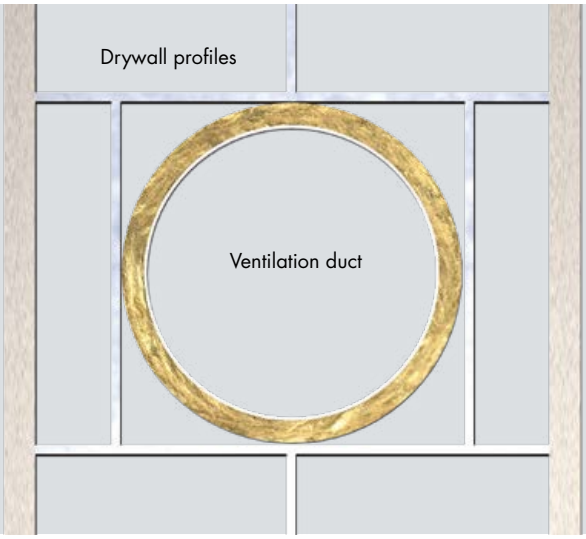
INSTALLATION FOR DUCTS THROUGH WALLS / CEILINGS

1. PREPARATION OF THE WALL

The system can be used for drywall, solid wall and solid ceilings. The definition of the wall penetration covers fire classes from EI 30 up to EI 120.



Drywall detailed structure

2. CLOSING THE ANNULAR GAP

The gap between the ventilation duct and fire wall/ceiling must be filled with Mineral Wool (density: ≥ 80 kg/m³). Finally, cover the gap on both sides of the penetration with a fire safe sealing compound like Fire-teK® STICK, layer thickness approx. 5 mm.

Note: Properties of the fire stopping compound: Only silicate based, inorganic sealants, resistant up to 1200 °C can be used, like Fire-teK® STICK.

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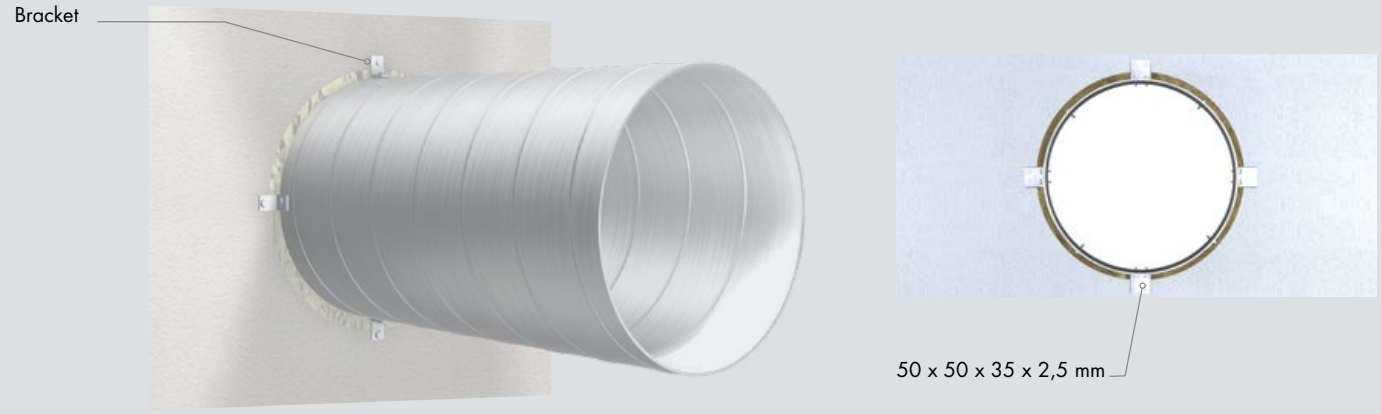
3. FASTENING THE VENTILATION DUCT AND PENETRATION THROUGH THE WALL

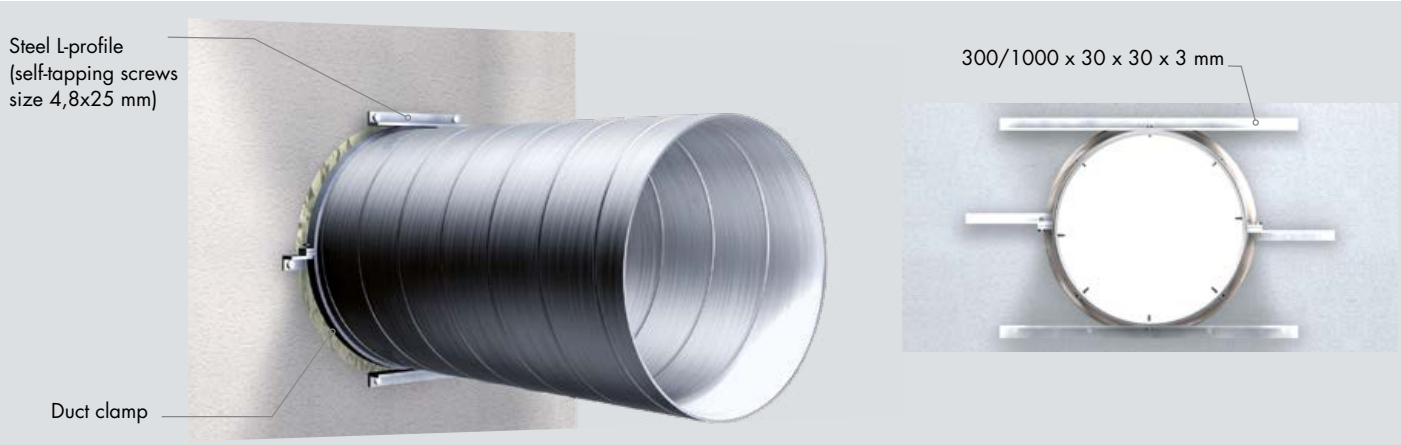
3.1. Fire-teK® WM 910 GGB (40 mm thickness) for EI 30



- Assembly of the steel bracket profiles (50 x 50 x 35 x 2,5 mm) for attaching the ventilation duct on all four sides.
- The brackets are fixed to the duct using two 4.8 x 25 mm self-tapping screws for each bracket.
  Each bracket is fixed to the wall using two 3.9 x 35 mm screws.

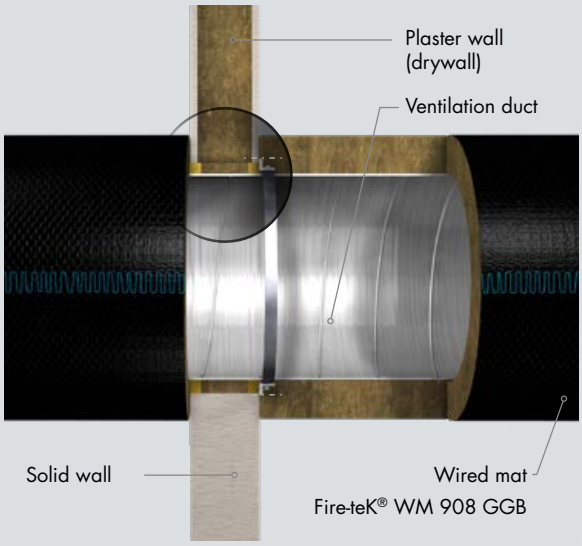
Note: Both sides of the wall must be installed as shown in the illustrations.

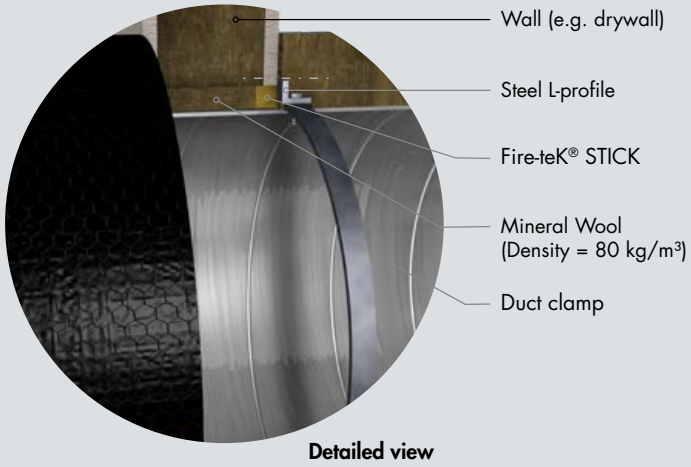
3.2. Fire-teK® WM 908 GGB for EI 30 (60 mm), for EI 60 (80 mm) and for EI 90 / EI 120 (100 mm)



- Assembly of duct clamp directly on the duct intersection.
- Fixation of the steel L-profiles (300/1000 x 30 x 30 x 3 mm) for attaching the ventilation duct on all four sides.
- Fixation of the duct sections to the profile and the wall with screws (∅ 6.0 x 60 mm), using a duct clamp.

Note: Both sides of the wall must be installed as shown in the illustrations.





Detailed view

The Mineral Wool mats are mounted flush to the wall. There is no need to penetrate the gap with the mat.
Note: Only Fire-teK® WM 908 GGB with 80 mm thickness must be used to achieve EI 60.

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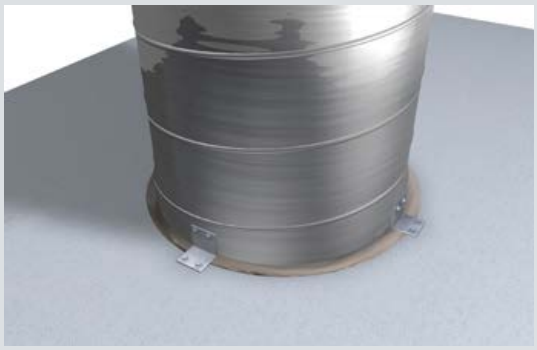
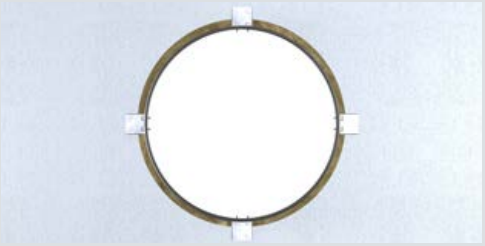
4. PENETRATION OF THE CEILINGS

The solid ceiling must have at least the same fire resistance as the required fire class of the insulation.

4.1 Fixation with brackets (EI 30) with Fire-teK® WM 910 GGB (40 mm thickness)



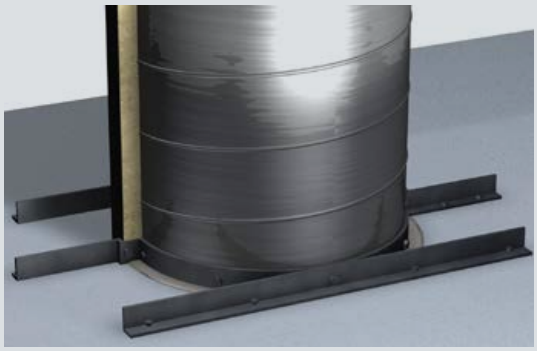


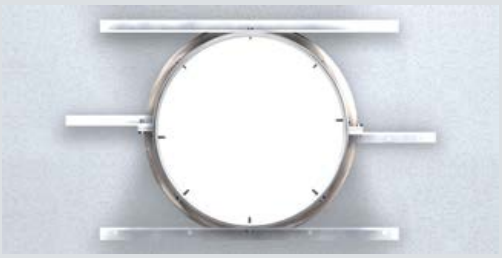
Each bracket is fixed to the deck using minimum two 6.5 x 51 mm steel screws.

- Assembly of the steel bracket profiles (50 x 50 x 35 x 2,5 mm) for attaching the ventilation duct on all four sides.
- The brackets are fixed to the duct using two 4.8 x 25 mm self-tapping screws for each bracket.
- Each bracket is fixed to the ceiling using 6.5x51 mm screws.

Note: Both sides of the ceiling must be installed as shown in the illustrations.

4.2.Fixation with L-profiles (EI 30-EI 120) with Fire-teK® WM 908 GGB





Fixation duct to duct clamp with screws 4.8x25 mm.

- Vertically insulated ventilation ducts must be fastened to the wall at least every 5 m.
- No weld pin or aluminium tape necessary for the fixation of the wired mat to the duct.

GOOD TO KNOW

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PASSIVE FIRE PROTECTION

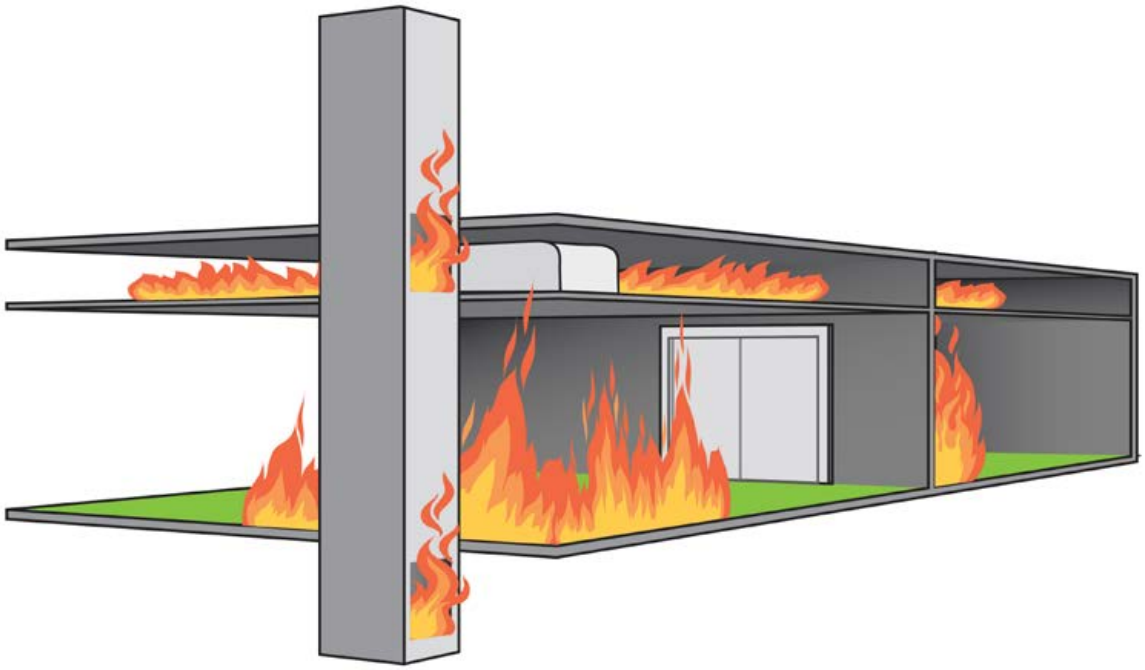
Fire-resistant lines such as ducts insulated in accordance with fire safety are components classified in accordance with **EN 13501-3**. Here, for instance, the following information may be given:

- Fire resistance duration
- The orientation of the class of fire resistance duration
- Vertical / horizontal orientation (ceiling / wall) of the building element or component
- Smoke spread

Building materials and building elements or components

Building materials, such as Mineral Wool wired mats, are classified according to their fire behaviour. The classification of fire behaviour of building materials is regulated by **EN 13501-1**.

Knauf Insulation Fire-teK® System Mineral Wool wired mats have an **A1** classification, which means that they are non-combustible and, in the event of a fire, they do not cause impaired visibility through the development of smoke.



Fire protection needs to applied on vertical and horizontal ducts penetrating different fire compartments

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FIRE SCENARIOS IN BUILDINGS

Definition of fire resistance classes in accordance with EN 13501-3:
Fire resistance class EI 30 till EI 120 (ve ho i↔o) S

Fire-resistant ventilation duct, with a fire resistance rating of 30, 60, 90 or 120 minutes for vertical and horizontal ventilation ducts, with fire resistance from inside and outside the duct as well as limiting the smoke leakage.

Fire outside duct (o→i) S
Target: Avoid fire to enter the duct and capsulate the fire in the room
Under EN 13501-3 classification, fire outside refers to so-called duct A, which fulfills the fire resistance requirements from the outside to penetrate inside of the duct.

Fire inside duct (i→o) S
Target: Avoid spread of fire to other rooms via the ducting system
Under EN 13501-3 classification, fire inside refers to so-called duct B, which fulfills the fire resistance requirements from the inside of the duct to the outside environment.

OUR MINERAL WOOL PRODUCTS WITH ECOSE® TECHNOLOGY!

Following the successful launch of ECOSE® Technology in building insulation, Knauf Insulation has decided to extend its use of this innovative binding technology to building products.
We almost exclusively use natural materials as the basic material for our mineral wool products. With our formaldehyde-free binder ECOSE® Technology, we reduce energy consumption during manufacture and improve the energy balance of our products. With the receipt of the **Eurofins Indoor Air Comfort Award**, our insulation materials have been proven to contribute to improved indoor air quality and are therefore ideally suited for sustainable use in building technical insulation.

Knowing that people spend 90% of their life time inside the air quality in their working and living environment really matters.

with ECOSE® TECHNOLOGY

ENVIRONMENTAL PRODUCT DECLARATIONS (EPD)

In order to enable a correct assessment of the impact of our insulation materials on the environment, we provide you with information relevant to your decision. Our products are assessed with regard to their sustainability over their entire life cycle. This is done with the help of a life cycle assessment across each phase - from start to finish.

We make the results available to you in the form of environmental product declarations (EPD) for each product.

https://info.knaufinsulation-ts.com/de/download-epd-labelled-products-from-knauf-insulation-technical-solutions

Our mission: To support you in your daily work.

Building Information Modeling (BIM) is a digital, future-oriented process for planning, building and operating buildings that helps increase productivity in the construction industry. It bundles all information that can be accessed at every step of the life cycle of a building, from design to demolition. Parts lists can be created just as easily during planning, as can comprehensive, timely maintenance overviews during regular operation.
BIM drawings are available for our Fire-teK products as well.

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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.

CONTACTS

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www.knaufinsulation-ts.com/

Premium member of eiif

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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