KNAUF INSULATION
Technical Solutions

FIRE-TEK

INSTALLATION MANUAL:
Fire-teK® System for Ventilation Ducts EI60 (ve ho i↔o) S
tested in accordance with EN 1366-1

with ECOSE® TECHNOLOGY

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The Knauf Insulation Fire-teK® system for ventilation ducts

The Knauf Insulation Fire-teK® system provides passive fire protection for ventilation ducts. It consists of Mineral Wool boards, which have tear-resistant aluminium foil, reinforced with glass mesh, on one side. In addition to providing protection in the event of a fire, the Knauf Insulation Fire-teK® system also has excellent thermal and acoustic insulation properties.

The boards are just 60 mm thick, so they can even be used where space is at a premium. The system provides guaranteed fire resistance of up to 60 minutes, depending on the boards used.

Building materials and building elements or components

Building materials, such as Mineral Wool boards, 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 boards 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.

Examples of fire resistance in buildings

Fire outside duct (o→i) S
Under EN 13501-3 classification, fire outside refers to duct A, which fulfils the fire resistance requirements from the outside to the inside of the duct.

Fire inside duct (i→o) S
Under EN 13501-3 classification, fire inside refers to duct B, which fulfils the fire resistance requirements from the inside of the duct to the outside environment.

Fire-resistant lines such as channels 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 installation of the building element or component
- Smoke insulation

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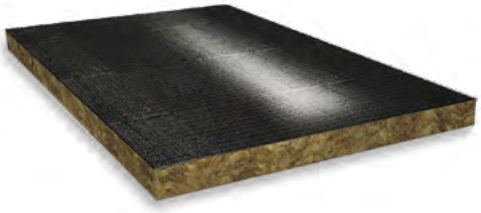
The Knauf Insulation Fire-teK® system

Knauf Insulation Fire-teK® BD 912 ALB



Product name	Fire resistance class	Density [kg/m³]	Thickness [mm]	Application
Knauf Insulation Fire-teK® BD 912 ALB	E160 (ve ho i ↔ o) S	120	60	Solid ceiling Dry wall Solid wall

Fire behaviour classification in accordance with EN13501-1

CE MW-EN 14303-T5-WS1-MV2-CL10

Application

The Knauf Insulation Fire-teK® system with Fire-teK® BD 912 ALB insulating boards has been developed for use in horizontal and vertical ventilation ducts. The maximum dimensions for the cross-section of the ventilation duct are 1,250 x 1,000 mm.* The maximum length of an individual ventilation duct is 1,200 mm.

*Can be increased under special conditions - please see page 9.

Technical data

Knauf Insulation Fire-teK® BD 912 ALB

Properties	Reference	Description/specifications								Unit	Test method/ Requirement
Reaction to fire	–	A1								–	EN 13501-1
Thermal conductivity depending on temperature	ϑ	50	100	200	300	400	500	600	650	°C	EN 12667
	λ	0,040	0,045	0,059	0,075	0,096	0,121	0,153	0,180	W/(m·K)	
Density	ρ	ca. 100								kg/m³	EN ISO 29470
Water repellency	W_p	≤ 1.0								kg/m²	EN ISO 29767
Water-soluble chloride ions (AS quality)	–	≤ 10								ppm	EN ISO 12624
Water vapour diffusion equivalent air layer thickness	s_d	≥ 200								m	EN 12086
Melting point of fibres	–	≥ 1000								°C	DIN 4102-17
Specific heat capacity	C_p	1030								J/(kgK)	EN ISO 10456
Silicone-free fibres	–	No emissions of lacquering disturbing substances								–	–
Designation code	–	MW–EN 14303–T5–WS1–MV2–CL10								–	EN 14303

Definition of fire resistance classes in accordance with EN 13501-3:

Fire resistance class EI60 (ve ho i↔o) S

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

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SYSTEM

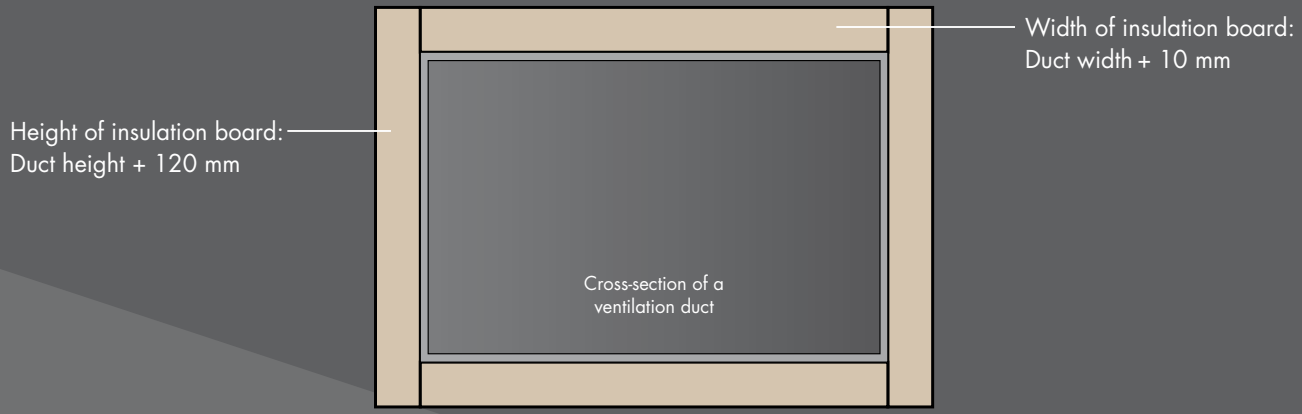
Benefits of the Knauf Insulation Fire-teK® system:

- Quick and easy to use
- Matching aluminium look
- Compact 60 mm
- Simple installation for EI60
- No built-up layers at flange connections
- Suitable for moulded parts
- Good thermal and acoustic insulation
- Mineral Wool with ECOSE® Technology

Installation Instructions

The Knauf Insulation Fire-teK® system for rectangular ventilation ducts only provides the stated class of fire-resistance if installed in accordance with the installation guidelines.

1. Cutting
the insulation boards



Example for cutting the insulation boards

Width of bare duct = 1,000 mm
Size of cut boards for **top and bottom:**
- W = 1,000 mm + 10 mm = 1,010 mm

Height of bare duct = 600 mm
Size of cut boards for **sides:**
- H = 600 mm + 120 mm = 720 mm

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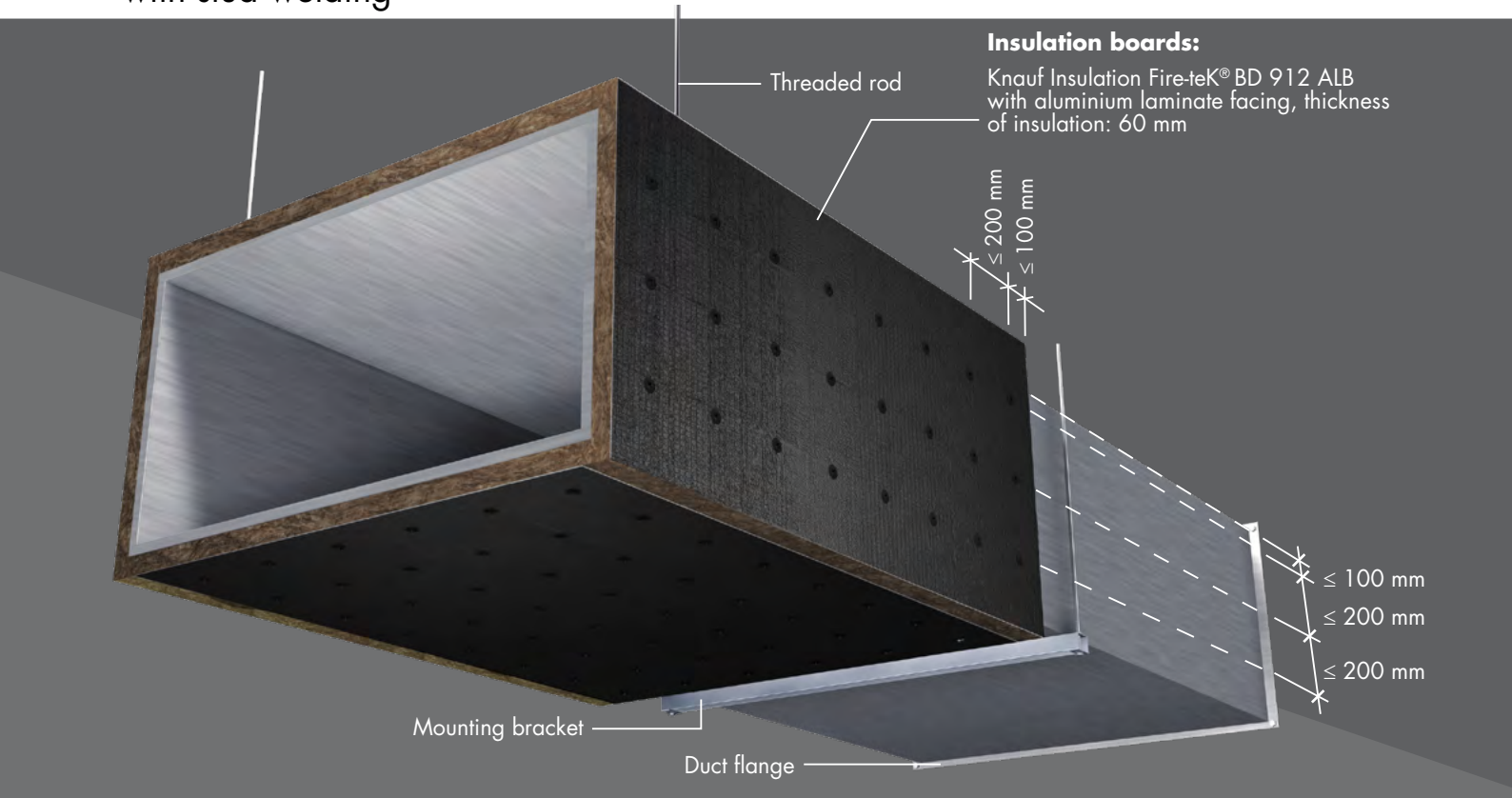
INSTALLATION

2. Attach the insulation boards
with stud welding

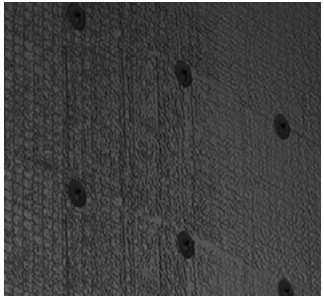


Installation

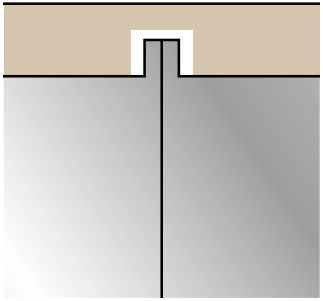
- Place the insulation boards on the ventilation duct
- Distance of weld pins (Ø 2,7 mm): ≤ 200 mm side by side
- Distance of weld pins (Ø 2,7 mm): ≤ 100 mm from the edge
- No weld pins necessary on the top face of the duct

Remarks:

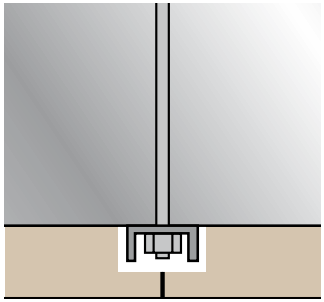
- Ducts must meet the air insulation requirements in accordance with EN 1507 and has to be stiff enough for the application
- Maximum duct cross-section 1,250 x 1,000 mm; can be increased to 1,600 mm (maximal height is 1250 mm), in condition that cross-section area of duct not exceed 1,25 m^2; stiffness of the duct has to be ensured by duct producer
- Maximum duct length 1,200 mm
- The tensile stress of the threaded rods must be maximum 9 N/mm^2
- Recommended minimum insulation thickness for board notches 30 mm



Arrangement of the weld pins



Flange insulation detail



Mounting bracket detail

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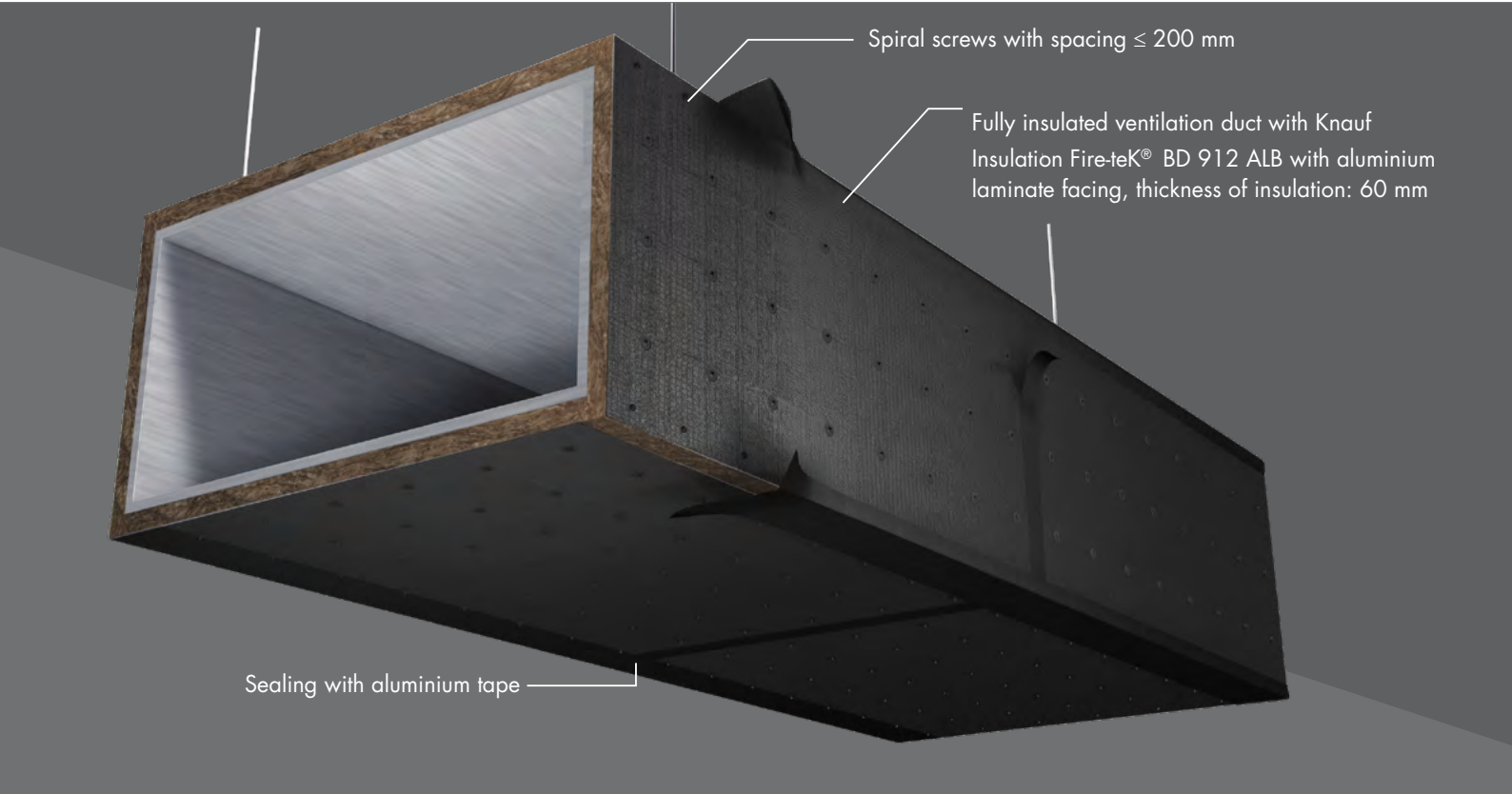
INSTALLATION

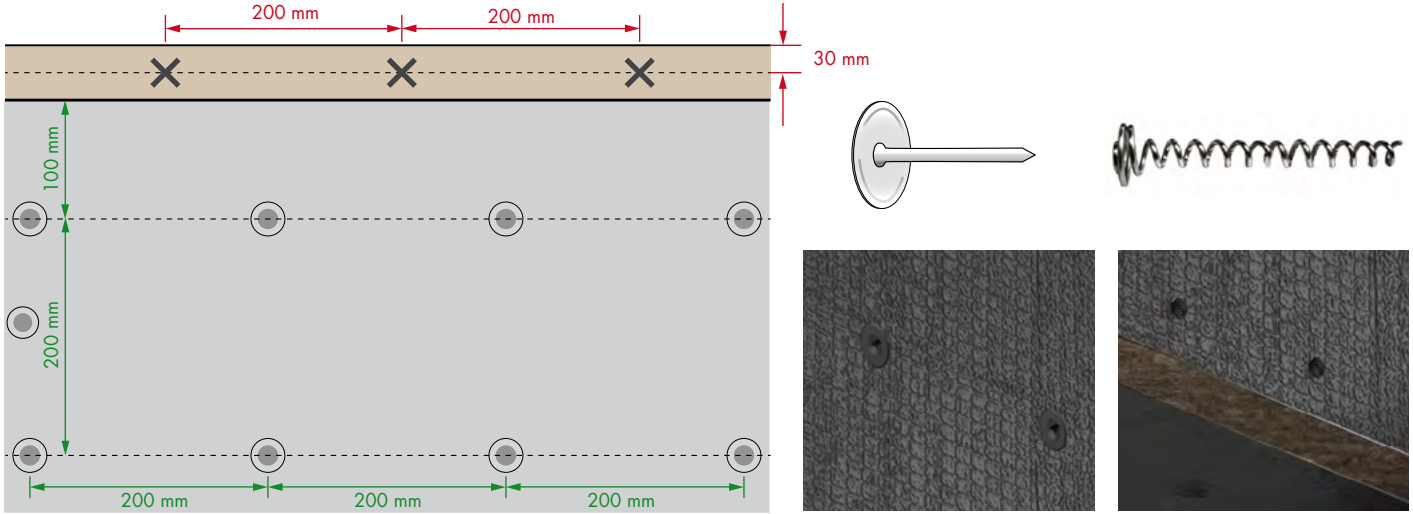
3. Connect
the edges of the duct



Assembly instructions

- Secure the edges of the boards with spiral screws (L = minimum 120 mm)
- Distance of spiral screws: ≤ 200 mm side by side
- Distance of spiral screws: approx. 30 mm from the board edge
- Ensure staggered arrangement of spiral screws and weld pin fasteners
- Mask board joints and edges with aluminium tape at the end

Assembly diagram with weld pins and spiral screws on an insulated ventilation duct



Pin (weld pin fastener)

Spiral screws at board joints

Pin (Ø 2,7 mm)

Spiral screw(L=min. 120 mm)

FIRE-TEK

Weight table in kg per metre (without duct)

Fire-teK® BD 912 ALB (Density: 120 kg/m³)

a/b	150	200	250	300	350	400	450	500	550	600	650	700
150	6.2	6.9	7.6	8.4	9.1	9.8	10.5	11.2	12.0	12.7	13.4	14.1
200	6.9	7.6	8.4	9.1	9.8	10.5	11.2	12.0	12.7	13.4	14.1	14.8
250	7.6	8.4	9.1	9.8	10.5	11.2	12.0	12.7	13.4	14.1	14.8	15.6
300	8.4	9.1	9.8	10.5	11.2	12.0	12.7	13.4	14.1	14.8	15.6	16.3
350	9.1	9.8	10.5	11.2	12.0	12.7	13.4	14.1	14.8	15.6	16.3	17.0
400	9.8	10.5	11.2	12.0	12.7	13.4	14.1	14.8	15.6	16.3	17.0	17.7
450	10.5	11.2	12.0	12.7	13.4	14.1	14.8	15.6	16.3	17.0	17.7	18.4
500	11.2	12.0	12.7	13.4	14.1	14.8	15.6	16.3	17.0	17.7	18.4	19.2
550	12.0	12.7	13.4	14.1	14.8	15.6	16.3	17.0	17.7	18.4	19.2	19.9
600	12.7	13.4	14.1	14.8	15.6	16.3	17.0	17.7	18.4	19.2	19.9	20.6
650	13.4	14.1	14.8	15.6	16.3	17.0	17.7	18.4	19.2	19.9	20.6	21.3
700	14.1	14.8	15.6	16.3	17.0	17.7	18.4	19.2	19.9	20.6	21.3	22.0
750	14.8	15.6	16.3	17.0	17.7	18.4	19.2	19.9	20.6	21.3	22.0	22.8
800	15.6	16.3	17.0	17.7	18.4	19.2	19.9	20.6	21.3	22.0	22.8	23.5
850	16.3	17.0	17.7	18.4	19.2	19.9	20.6	21.3	22.0	22.8	23.5	24.2
900	17.0	17.7	18.4	19.2	19.9	20.6	21.3	22.0	22.8	23.5	24.2	24.9
950	17.7	18.4	19.2	19.9	20.6	21.3	22.0	22.8	23.5	24.2	24.9	25.6
1000	18.4	19.2	19.9	20.6	21.3	22.0	22.8	23.5	24.2	24.9	25.6	26.4

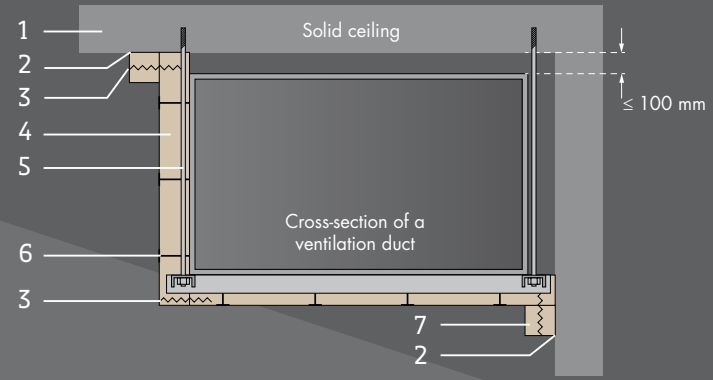
Weight table in kg per metre (without duct)

Fire-teK® BD 912 ALB (Density: 120 kg/m³)

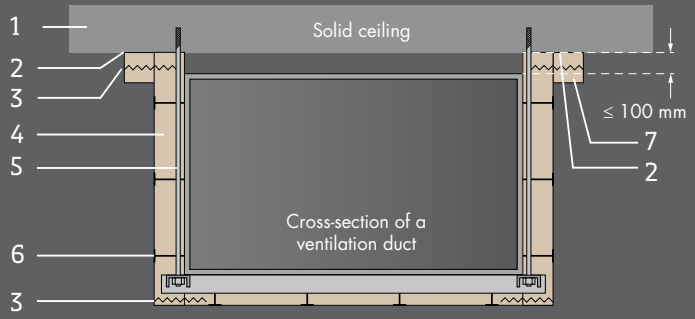
a/b	750	800	850	900	950	1000	1050	1100	1150	1200	1250
150	14.8	15.6	16.3	17.0	17.7	18.4	19.2	19.9	20.6	21.3	22.0
200	15.6	16.3	17.0	17.7	18.4	19.2	19.9	20.6	21.3	22.0	22.8
250	16.3	17.0	17.7	18.4	19.2	19.9	20.6	21.3	22.0	22.8	23.5
300	17.0	17.7	18.4	19.2	19.9	20.6	21.3	22.0	22.8	23.5	24.2
350	17.7	18.4	19.2	19.9	20.6	21.3	22.0	22.8	23.5	24.2	24.9
400	18.4	19.2	19.9	20.6	21.3	22.0	22.8	23.5	24.2	24.9	25.6
450	19.2	19.9	20.6	21.3	22.0	22.8	23.5	24.2	24.9	25.6	26.4
500	19.9	20.6	21.3	22.0	22.8	23.5	24.2	24.9	25.6	26.4	27.1
550	20.6	21.3	22.0	22.8	23.5	24.2	24.9	25.6	26.4	27.1	27.8
600	21.3	22.0	22.8	23.5	24.2	24.9	25.6	26.4	27.1	27.8	28.5
650	22.0	22.8	23.5	24.2	24.9	25.6	26.4	27.1	27.8	28.5	29.2
700	22.8	23.5	24.2	24.9	25.6	26.4	27.1	27.8	28.5	29.2	30.0
750	23.5	24.2	24.9	25.6	26.4	27.1	27.8	28.5	29.2	30.0	30.7
800	24.2	24.9	25.6	26.4	27.1	27.8	28.5	29.2	30.0	30.7	31.4
850	24.9	25.6	26.4	27.1	27.8	28.5	29.2	30.0	30.7	31.4	32.1
900	25.6	26.4	27.1	27.8	28.5	29.2	30.0	30.7	31.4	32.1	32.8
950	26.4	27.1	27.8	28.5	29.2	30.0	30.7	31.4	32.1	32.8	33.6
1000	27.1	27.8	28.5	29.2	30.0	30.7	31.4	32.1	32.8	33.6	34.3

2 and 3-sided mounting
and ducts through walls

2-sided mounting



3-sided mounting



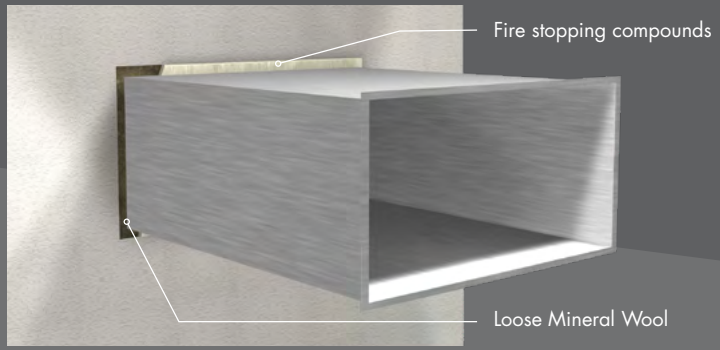
Important information:

None EN testing methods are available for 2 and 3-sided component connections. It is therefore essential that the solutions proposed here to be individually approved by the relevant fire protection authorities. Adjacent solid structural elements or components must have prior to installation at least the same level of fire resistance as the duct covering. Knauf Insulation has an expert judgement from the testing institute for the 2- and 3-sided mounting which will be sent by request.

1 Solid structural element
2 Fire protection paste
3 Spiral screw
4 Knauf Insulation Fire-teK® boards
5 Threaded rod
6 Weld pin
7 Knauf Insulation Fire-teK® strips: 60 x 60 mm

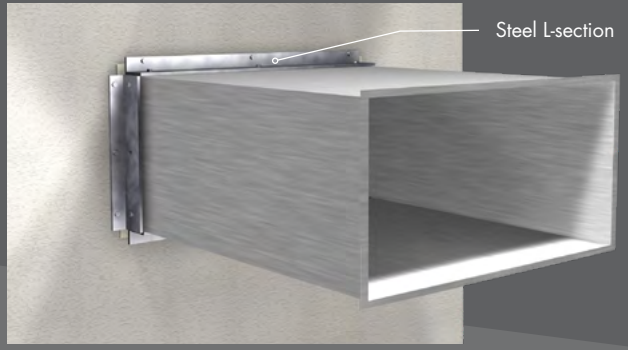
4. Installation for ducts through walls

4.1 Closing the gap



In the intersection area, the gap (≤ 30 mm) between the ventilation duct and fire safety wall must be filled with Mineral Wool (density: ≥80 kg/m³). Finally, cover the gap on both sides with a fire stopping compound, layer thickness approx. 5 mm.
Note: Both sides of the gap in the wall must be closed as shown in the sketch.

4.2 Fastening the ventilation duct



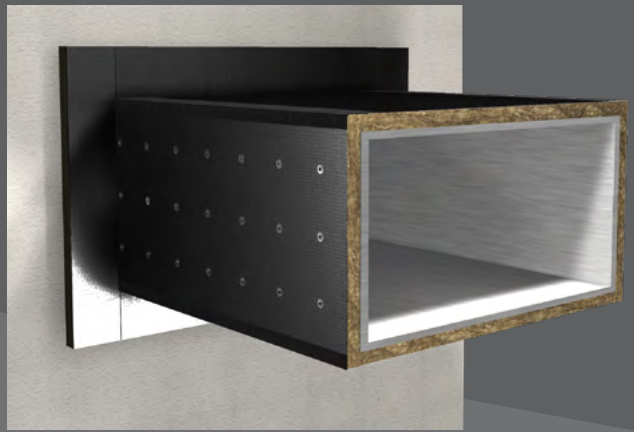
- Assembly of the steel L-sections (60 x 30 x 3 mm) for attaching the ventilation duct to the wall on all four sides
- Screwing of the steel L-sections to the wall, screw spacing approx. 250 mm, screw: Ø 6.0 x 60 mm
- Screwing of the steel L-sections to the duct, screw spacing approx. 250 mm, screw: Ø 4.2 x 19 mm The wall must have at least the same fire resistance as the fire safety insulation.

4.3 Placing the insulation boards on the duct

Installation of the insulation

Installation of the insulation as described in steps 1 to 3 on pages 7-11.

4.4 Peripheral Mineral Wool cladding



Mineral Wool collar imension 120 mm wide and 60 mm thick must be installed peripherally on both sides of the gap. The same material can be used as for the fireproof cladding. The Mineral Wool collar can be sealed with silicate fireproof adhesive.

Intersection cross-section

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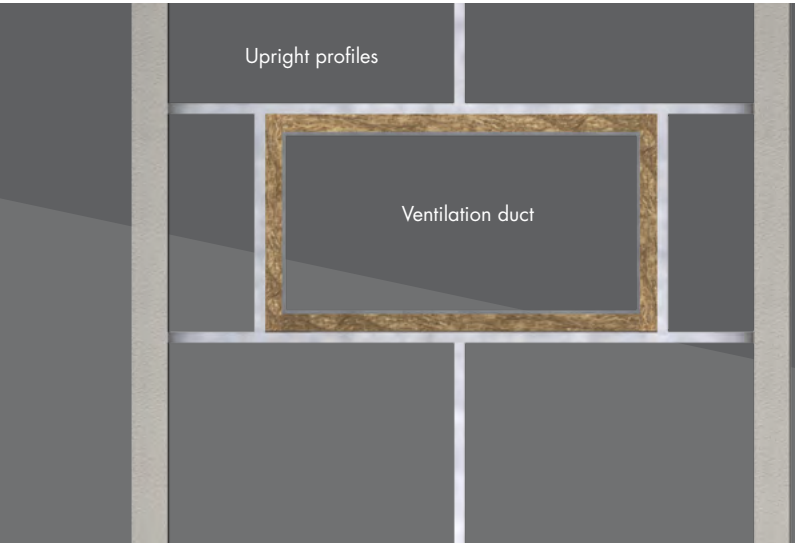
Drywall detailed structure



Note: Vertical assembly

- Vertically-insulated ventilation ducts must be fastened at least every 5 m.
- For assembly design see assembly steps above
- The solid cover must have at least the same fire resistance as the fire safety insulation.

In a drywall, the under-construction is adjusted in the intersection area as shown in the illustration. The drywall must have at least the same fire resistance as the fire safety insulation.

Our Mineral Woll 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 technical insulation 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.

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.

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.

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 6.000 employees in more than 40 countries and 29 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.

Premium member of eiif

KNAUF INSULATION Technical Solutions

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