KNAUF INSULATION
Technical Solutions

Fire protection | 07/2019

Knauf Insulation Fire-teK® System for Ventilation Ducts EI 30 (ve ho i↔o) S and EI 60 (ve ho i↔o) S

tested in accordance with EN 1366-1

FIRE-TEK

with ECOSE® TECHNOLOGY

The Knauf Insulation Fire-teK® system

System description 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

The Knauf Insulation Fire-teK® system

Knauf Insulation Fire-teK® BD 908 ALU
Knauf Insulation Fire-teK® BD 912 ALU

FIRE-TEK

Product name	Application	Fire resistance class	Density (kg/m³)	Thickness (mm)
Knauf Insulation Fire-teK® BD 908 ALU	Solid ceiling Drywall Solid wall	EI 30 (ve ho i ↔ o) S	80	60
		EI 45 (ve ho i ↔ o) S		
Knauf Insulation Fire-teK® BD 912 ALU		EI 60 (ve ho i ↔ o) S	120	60
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 908 ALU and Fire-teK® BD 912 ALU 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 908 ALU Knauf Insulation Fire-teK® BD 912 ALU										
Properties	**Reference**	**Description/specifications**							**Unit**	**Test method/ Requirement**
Building material class	–	A1							–	EN 13501-1
Thermal conductivity depending on temperature	ϑ	50	100	200	300	400	500	600	°C	EN 12667
Fire-teK® BD 908 ALU	λ	0.040	0.049	0.067	0.092	0.123	0.163	0.215	W/(m·K)	
Fire-teK® BD 912 ALU	λ	0.040	0.045	0.059	0.075	0.096	0.121	0.153	W/(m·K)	
Water repellency	W_p	≤ 1.0							kg/m²	EN 1609
AS quality	–	≤ 10							ppm	EN 13468
Water vapour diffusion equivalent air layer thickness	s_d	≥ 200							m	EN 12086
Melting point of fibres	–	≥ 1,000							°C	DIN 4102-17
Absence of silicone in fibres	–	Manufactured without silicon oil additive							–	–

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

Fire resistance class EI 30 (ve ho i↔o) S

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

Fire resistance class EI 60 (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.

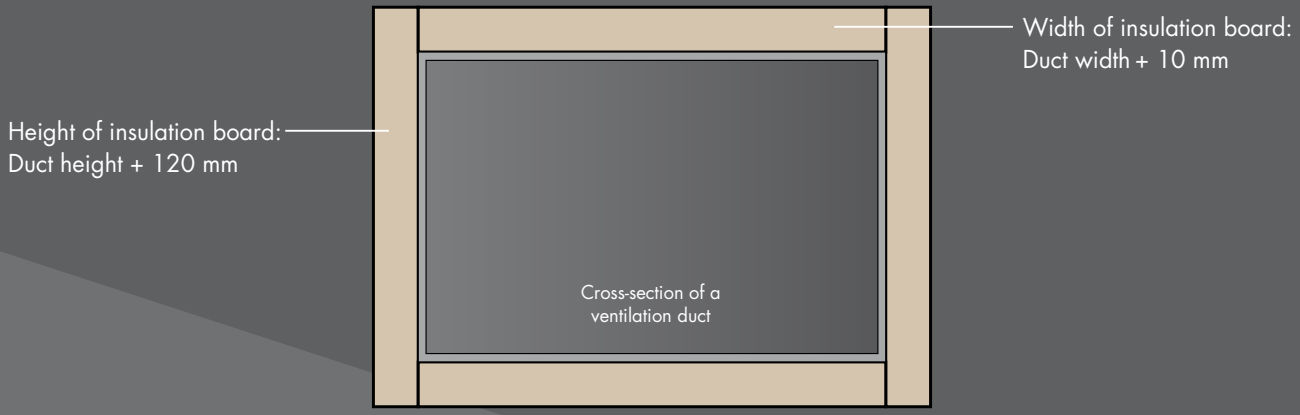
Benefits of the Knauf Insulation Fire-teK® system:

- Quick and easy to use
- Matching aluminium look
- Compact 60 mm
- Simple installation for EI 30/EI 45/EI 60
- 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:**

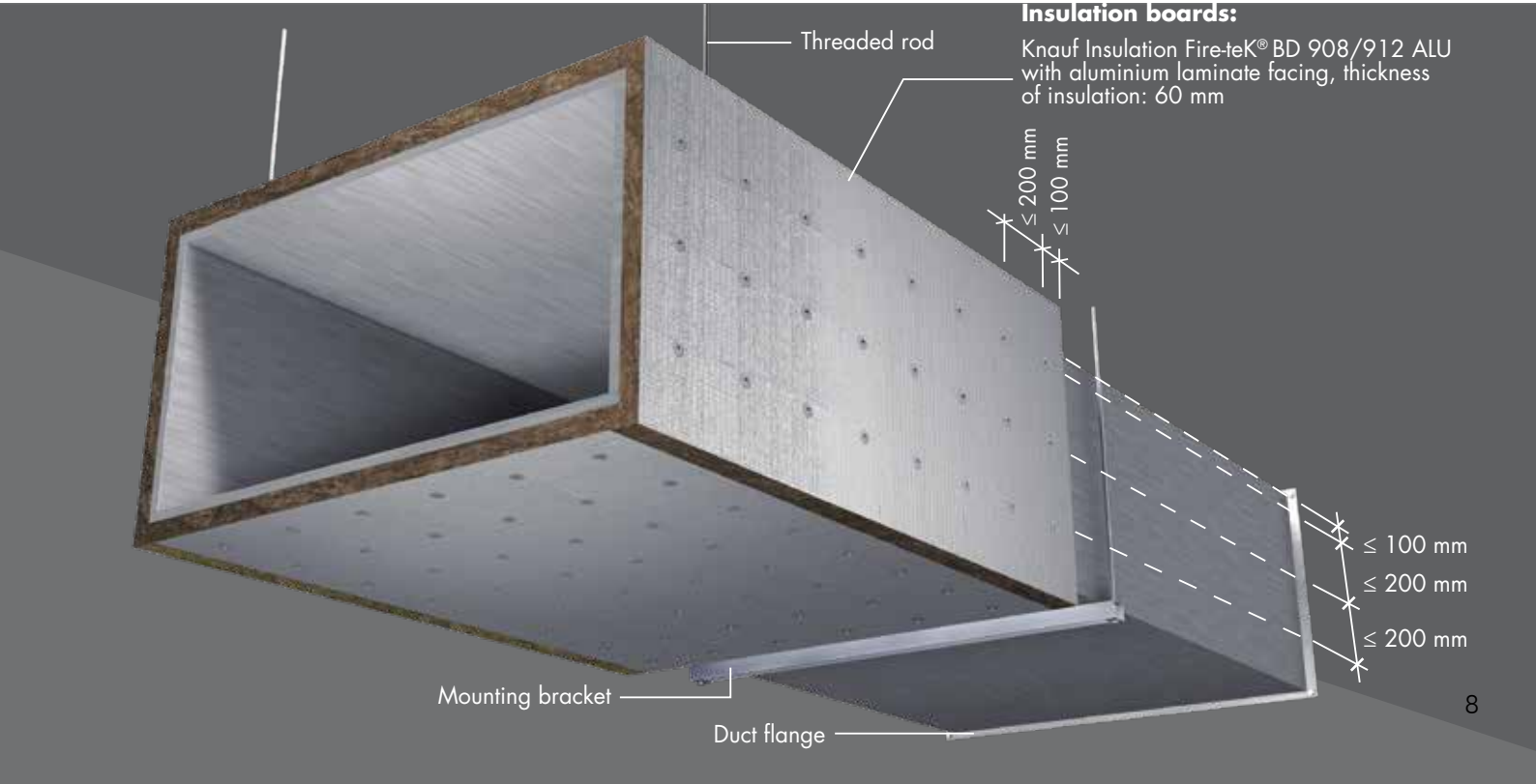
- W = 1,000 mm + 10 mm = 1,010 mm

Height of bare duct = 600 mm

Size of cut boards for **sides:**

- H = 600 mm + 120 mm = 720 mm

2. Attach the insulation boards
with stud welding



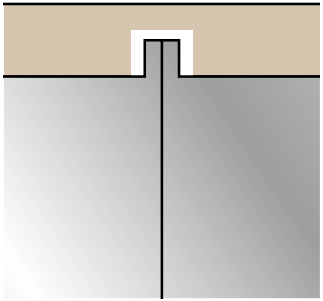
Installation

- 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

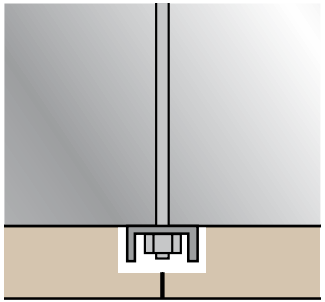
Remarks:

- 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 1,250 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
- Max. spacing of threaded rods/suspension 1,500mm
- 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

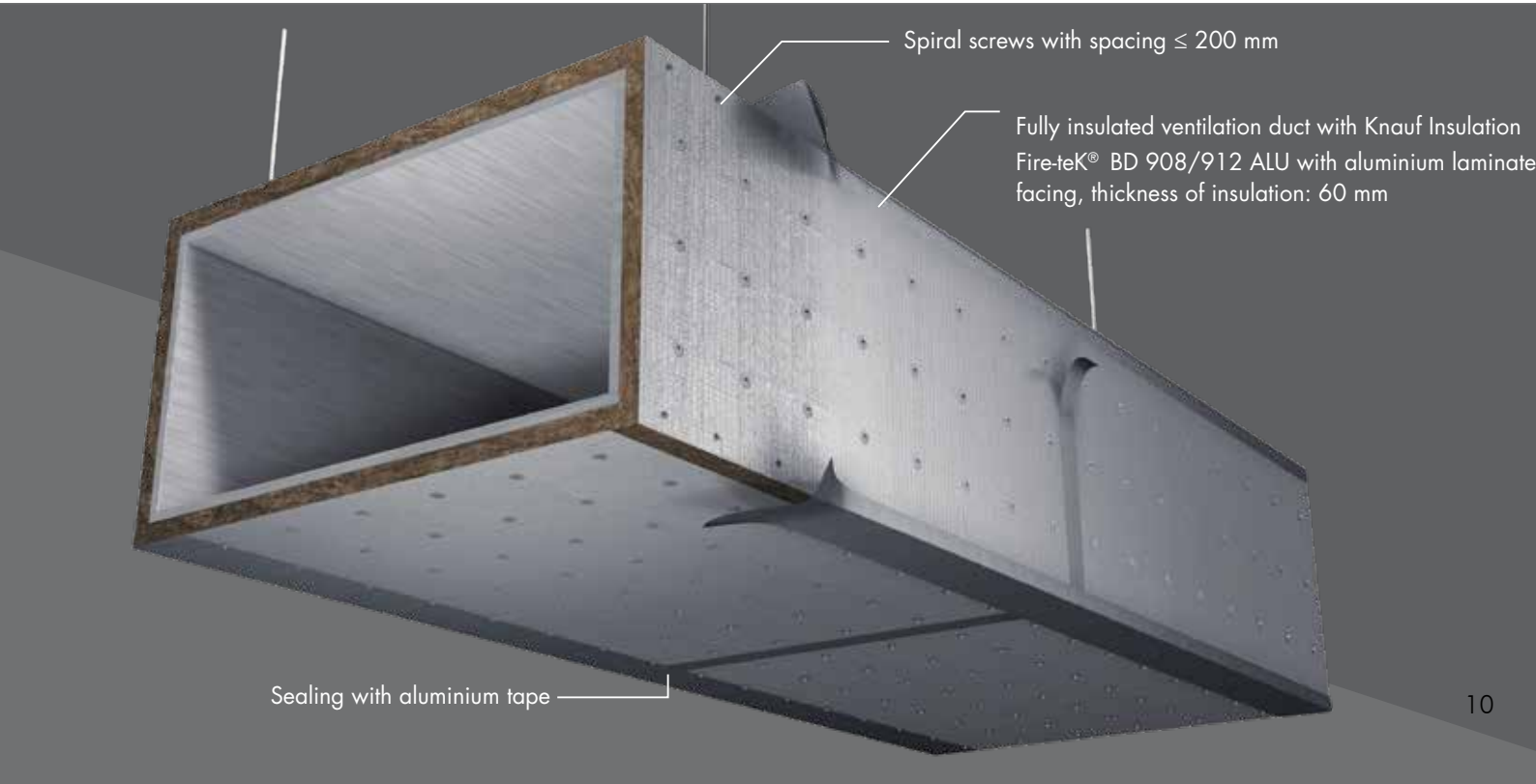


Flange insulation detail



Mounting bracket detail

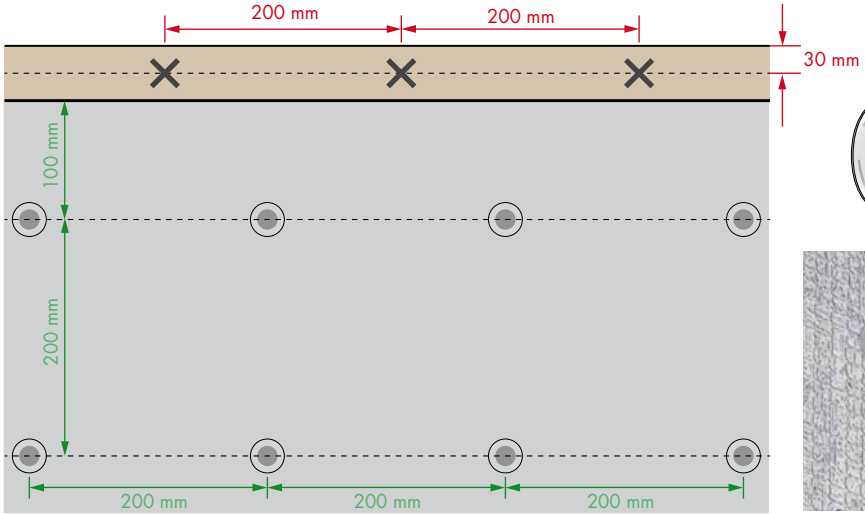
3. Connect
the edges of the duct

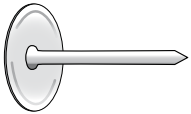


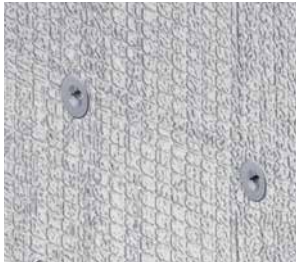
Assembly instructions

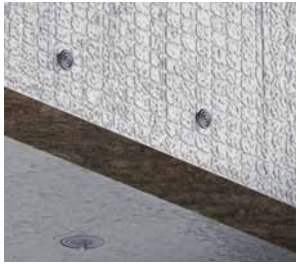
- Secure the edges of the boards with spiral screws (L = minimum 120 mm)
- Distance of spiral screws: ≤ 200 mm side by side
- Distance of spiral screws: approx. 30 mm from the board edge
- Ensure staggered arrangement of spiral screws and weld pin fasteners
- Mask board joints and edges with aluminium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

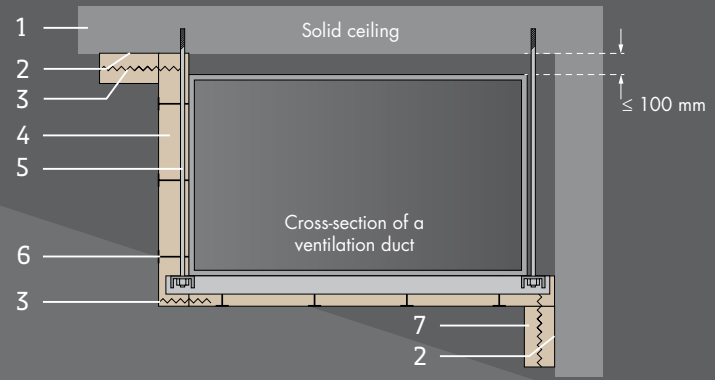
Weight table in kg per metre (without duct)

Fire-teK® BD 908 ALU (Density: 80 kg/m³) | **Fire-teK® BD 912 ALU** (Density: 120 kg/m³)

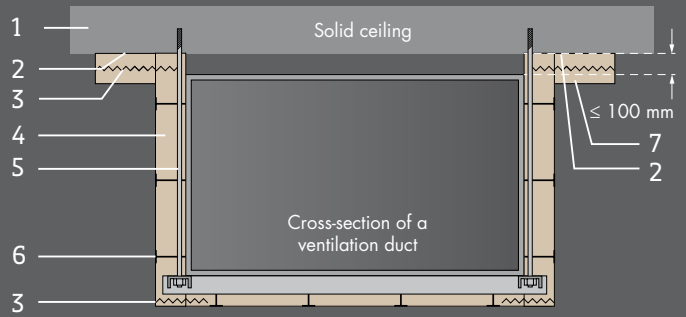
a/b	150		200		250		300		350		400		450		500		550		600		650		700		750		800		850		900		950		1000		1050		1100		1150		1200		1250	
150	4.1	6.2	4.6	6.9	5.1	7.6	5.6	8.4	6.0	9.1	6.5	9.8	7.0	10.5	7.5	11.2	8.0	12.0	8.4	12.7	8.9	13.4	9.4	14.1	9.9	14.8	10.4	15.6	10.8	16.3	11.3	17.0	11.8	17.7	12.3	18.4	12.8	19.2	13.2	19.9	13.7	20.6	14.2	21.3	14.7	22.0
200	4.6	6.9	5.1	7.6	5.6	8.4	6.0	9.1	6.5	9.8	7.0	10.5	7.5	11.2	8.0	12.0	8.4	12.7	8.9	13.4	9.4	14.1	9.9	14.8	10.4	15.6	10.8	16.3	11.3	17.0	11.8	17.7	12.3	18.4	12.8	19.2	13.2	19.9	13.7	20.6	14.2	21.3	14.7	22.0	15.2	22.8
250	5.1	7.6	5.6	8.4	6.0	9.1	6.5	9.8	7.0	10.5	7.5	11.2	8.0	12.0	8.4	12.7	8.9	13.4	9.4	14.1	9.9	14.8	10.4	15.6	10.8	16.3	11.3	17.0	11.8	17.7	12.3	18.4	12.8	19.2	13.2	19.9	13.7	20.6	14.2	21.3	14.7	22.0	15.2	22.8	15.6	23.5
300	5.6	8.4	6.0	9.1	6.5	9.8	7.0	10.5	7.5	11.2	8.0	12.0	8.4	12.7	8.9	13.4	9.4	14.1	9.9	14.8	10.4	15.6	10.8	16.3	11.3	17.0	11.8	17.7	12.3	18.4	12.8	19.2	13.2	19.9	13.7	20.6	14.2	21.3	14.7	22.0	15.2	22.8	15.6	23.5	16.1	24.2
350	6.0	9.1	6.5	9.8	7.0	10.5	7.5	11.2	8.0	12.0	8.4	12.7	8.9	13.4	9.4	14.1	9.9	14.8	10.4	15.6	10.8	16.3	11.3	17.0	11.8	17.7	12.3	18.4	12.8	19.2	13.2	19.9	13.7	20.6	14.2	21.3	14.7	22.0	15.2	22.8	15.6	23.5	16.1	24.2	16.6	24.9
400	6.5	9.8	7.0	10.5	7.5	11.2	8.0	12.0	8.4	12.7	8.9	13.4	9.4	14.1	9.9	14.8	10.4	15.6	10.8	16.3	11.3	17.0	11.8	17.7	12.3	18.4	12.8	19.2	13.2	19.9	13.7	20.6	14.2	21.3	14.7	22.0	15.2	22.8	15.6	23.5	16.1	24.2	16.6	24.9	17.1	25.6
450	7.0	10.5	7.5	11.2	8.0	12.0	8.4	12.7	8.9	13.4	9.4	14.1	9.9	14.8	10.4	15.6	10.8	16.3	11.3	17.0	11.8	17.7	12.3	18.4	12.8	19.2	13.2	19.9	13.7	20.6	14.2	21.3	14.7	22.0	15.2	22.8	15.6	23.5	16.1	24.2	16.6	24.9	17.1	25.6	17.6	26.4
500	7.5	11.2	8.0	12.0	8.4	12.7	8.9	13.4	9.4	14.1	9.9	14.8	10.4	15.6	10.8	16.3	11.3	17.0	11.8	17.7	12.3	18.4	12.8	19.2	13.2	19.9	13.7	20.6	14.2	21.3	14.7	22.0	15.2	22.8	15.6	23.5	16.1	24.2	16.6	24.9	17.1	25.6	17.6	26.4	18.0	27.1
550	8.0	12.0	8.4	12.7	8.9	13.4	9.4	14.1	9.9	14.8	10.4	15.6	10.8	16.3	11.3	17.0	11.8	17.7	12.3	18.4	12.8	19.2	13.2	19.9	13.7	20.6	14.2	21.3	14.7	22.0	15.2	22.8	15.6	23.5	16.1	24.2	16.6	24.9	17.1	25.6	17.6	26.4	18.0	27.1	18.5	27.8
600	8.4	12.7	8.9	13.4	9.4	14.1	9.9	14.8	10.4	15.6	10.8	16.3	11.3	17.0	11.8	17.7	12.3	18.4	12.8	19.2	13.2	19.9	13.7	20.6	14.2	21.3	14.7	22.0	15.2	22.8	15.6	23.5	16.1	24.2	16.6	24.9	17.1	25.6	17.6	26.4	18.0	27.1	18.5	27.8	19.0	28.5
650	8.9	13.4	9.4	14.1	9.9	14.8	10.4	15.6	10.8	16.3	11.3	17.0	11.8	17.7	12.3	18.4	12.8	19.2	13.2	19.9	13.7	20.6	14.2	21.3	14.7	22.0	15.2	22.8	15.6	23.5	16.1	24.2	16.6	24.9	17.1	25.6	17.6	26.4	18.0	27.1	18.5	27.8	19.0	28.5	19.5	29.2
700	9.4	14.1	9.9	14.8	10.4	15.6	10.8	16.3	11.3	17.0	11.8	17.7	12.3	18.4	12.8	19.2	13.2	19.9	13.7	20.6	14.2	21.3	14.7	22.0	15.2	22.8	15.6	23.5	16.1	24.2	16.6	24.9	17.1	25.6	17.6	26.4	18.0	27.1	18.5	27.8	19.0	28.5	19.5	29.2	20.0	30.0
750	9.9	14.8	10.4	15.6	10.8	16.3	11.3	17.0	11.8	17.7	12.3	18.4	12.8	19.2	13.2	19.9	13.7	20.6	14.2	21.3	14.7	22.0	15.2	22.8	15.6	23.5	16.1	24.2	16.6	24.9	17.1	25.6	17.6	26.4	18.0	27.1	18.5	27.8	19.0	28.5	19.5	29.2	20.0	30.0	20.4	30.7
800	10.4	15.6	10.8	16.3	11.3	17.0	11.8	17.7	12.3	18.4	12.8	19.2	13.2	19.9	13.7	20.6	14.2	21.3	14.7	22.0	15.2	22.8	15.6	23.5	16.1	24.2	16.6	24.9	17.1	25.6	17.6	26.4	18.0	27.1	18.5	27.8	19.0	28.5	19.5	29.2	20.0	30.0	20.4	30.7	20.9	31.4
850	10.8	16.3	11.3	17.0	11.8	17.7	12.3	18.4	12.8	19.2	13.2	19.9	13.7	20.6	14.2	21.3	14.7	22.0	15.2	22.8	15.6	23.5	16.1	24.2	16.6	24.9	17.1	25.6	17.6	26.4	18.0	27.1	18.5	27.8	19.0	28.5	19.5	29.2	20.0	30.0	20.4	30.7	20.9	31.4	21.4	32.1
900	11.3	17.0	11.8	17.7	12.3	18.4	12.8	19.2	13.2	19.9	13.7	20.6	14.2	21.3	14.7	22.0	15.2	22.8	15.6	23.5	16.1	24.2	16.6	24.9	17.1	25.6	17.6	26.4	18.0	27.1	18.5	27.8	19.0	28.5	19.5	29.2	20.0	30.0	20.4	30.7	20.9	31.4	21.4	32.1	21.9	32.8
950	11.8	17.7	12.3	18.4	12.8	19.2	13.2	19.9	13.7	20.6	14.2	21.3	14.7	22.0	15.2	22.8	15.6	23.5	16.1	24.2	16.6	24.9	17.1	25.6	17.6	26.4	18.0	27.1	18.5	27.8	19.0	28.5	19.5	29.2	20.0	30.0	20.4	30.7	20.9	31.4	21.4	32.1	21.9	32.8	22.4	33.6
1000	12.3	18.4	12.8	19.2	13.2	19.9	13.7	20.6	14.2	21.3	14.7	22.0	15.2	22.8	15.6	23.5	16.1	24.2	16.6	24.9	17.1	25.6	17.6	26.4	18.0	27.1	18.5	27.8	19.0	28.5	19.5	29.2	20.0	30.0	20.4	30.7	20.9	31.4	21.4	32.1	21.9	32.8	22.4	33.6	22.8	34.3

2 and 3-sided mounting
and ducts through walls

2-sided mounting



3-sided mounting



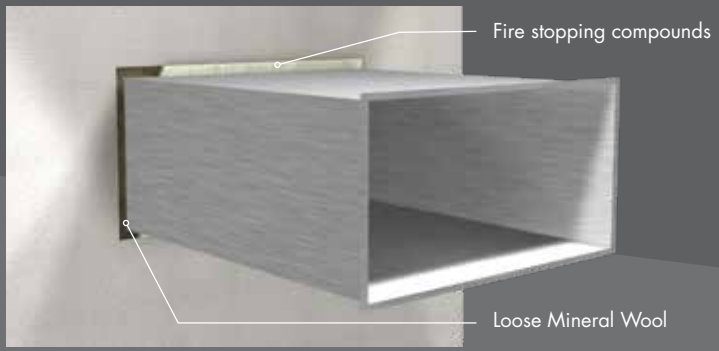
Important information:

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	5	Threaded rod
2	Fire protection paste	6	Weld pin
3	Spiral screw	7	Knauf Insulation Fire-teK® strips: 120 x 60 mm
4	Knauf Insulation Fire-teK® boards		

4. Installation for ducts through walls

4.1 Closing the gap

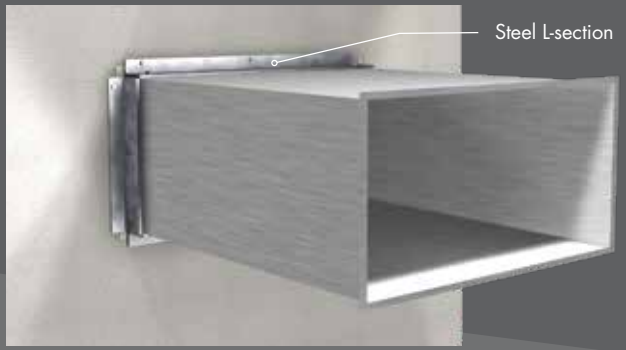


In the intersection area, the gap (≤ 30 mm) between the ventilation duct and fire safety wall must be filled with Mineral Wool (density: ≥80 kg/m³). Finally, cover the gap on both sides with a fire stopping compound, layer thickness approx. 5 mm.

Note: Both sides of the gap in the wall must be closed as shown in the sketch.

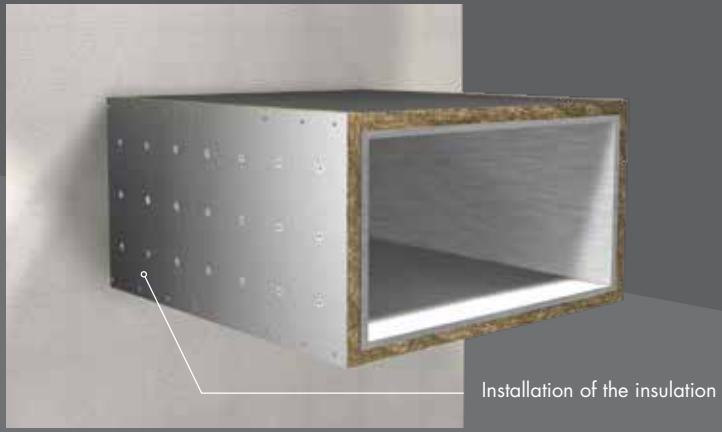
Note – properties of the fire stopping compound: Only silicate based, inorganic sealants, resistant up to 1200 °C can be used.

4.2 Fastening the ventilation duct



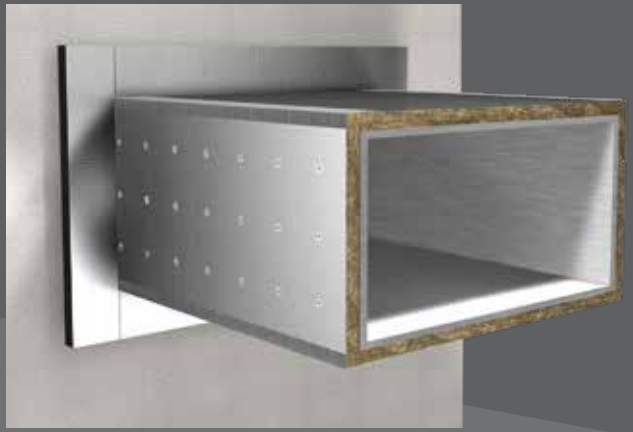
- Assembly of the steel L-sections (60 x 30 x 3 mm) for attaching the ventilation duct to the wall on all four sides
- Screwing of the steel L-sections to the wall, screw spacing approx. 250 mm, screw: Ø 6.0 x 60 mm
- Screwing of the steel L-sections to the duct, screw spacing approx. 250 mm, screw: 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 as described in steps 1 to 3 on pages 7-11.

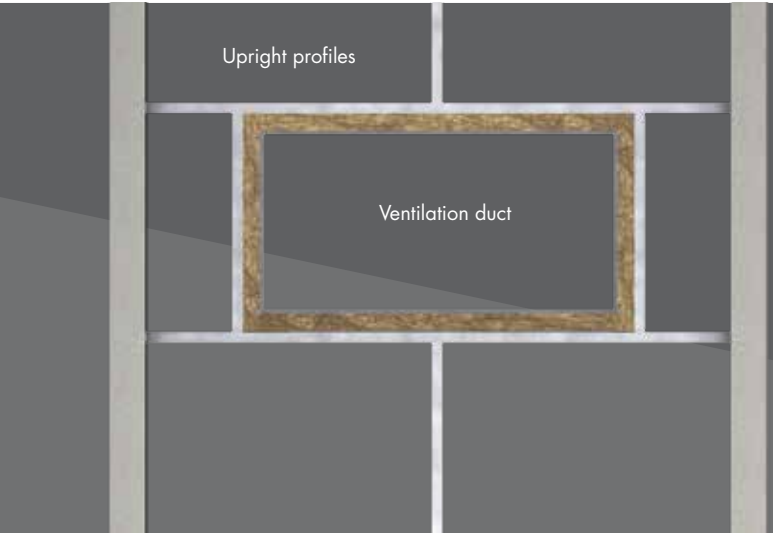
4.4 Peripheral Mineral Wool cladding



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

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 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.

ECOSE® Technology products use a formaldehyde-free binding agent, which is made of mainly natural ingredients, thereby reducing the amount of primary energy in the insulating materials. It replaces conventional phenol-formaldehyde resin binding agents and gives the products their brown colour, because they do not contain colourants. This technology was developed for Knauf Insulation Mineral Wool products in order to improve their eco-friendliness without affecting the thermal and acoustic insulation properties, or the fire protection properties.

FORMALDEHYDE-FREE BINDING AGENTS

Natural raw materials are the main components of this binding agent. No formaldehyde is added during the production process. Products manufactured with ECOSE® Technology **contain no phenols or acrylic resins.**

TECHNICAL PERFORMANCE

Fire safety solutions with the ECOSE® Technology are suitable for use primarily in fire safety and, with highly effective insulation materials, ensure that the solutions are energy efficient. All applicable **standards and guidelines are followed.**

USER-FRIENDLY

Products with the ECOSE® Technology are easy to cut, odourless, custom-fit and **simplicity itself to work with.**

ECO-FRIENDLY

Renewable raw materials in the binding agents have replaced almost all fossil fuel-based materials. We **save energy and reduce power consumption and CO_2 emissions.**

All the technical data in this document has been provided in good faith. It must be adapted to meet the specific situation on the construction site. Always make sure that you use the latest version of this information. The designer and the construction contractor are responsible for correct installation and compliance with the building regulations. Despite taking all due care and caution, the operator of the website accepts no liability the correctness, completeness or quality of the information provided or for its being up-to-date. In addition, the relevant standards and recognised rules of technology apply.

Knauf Insulation would be grateful for any suggestions for improvements or information about any possible errors.

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All product catalogues and application guides are available on our website.