

▶▶ Roofing Membrane System Rhepanol® hfk

Edition
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Content	Page
Roofing membrane system Rhepanol® hfk	4
The system – an overview	4
Rhepanol® hfk mechanically fastened at the membrane overlap	8
Application techniques	9
Technical details	18
Rhepanol® hfk loose-laid with ballast	29
Application techniques	30
Technical details	36
Rhepanol® hfk bonded fixing	42
Application techniques	43
Technical details	49
Rhepanol® hfk-sk full-size self-adhesive	58
Application techniques	59
Technical details	67
Product information	74
Data sheet Roofing membrane Rhepanol hfk	76
Data sheet Roofing membrane Rhepanol hfk-sk	78
Data sheet Rhepanol laminated metal sheet	80
Data sheet FDT vapour control layer fk	82

Data sheet FDT vapour control layer alu-gv-sk	83
Data sheet FDT glass fleece 120 g/m ²	84
Data sheet FDT protection layer	85
Data sheet Rhepanol paving tile	86
Data sheet FDT roofing membrane adhesive	87
Data sheet FDT adhesive U	88
Data sheet Rhepanol primer sk-W/sk-L	90
Data sheet FDT gravel stop profile	91
Accessories	92
Service	99
Drainage equipment calculation	100
Wind uplift calculation	101
Standards and regulations	102
Important notes on fire protection	104
Legal Notice and disclaimer	105

Rhepanol® hfk – advantages

The roofing membrane with a strong character

- 75 years of experience in waterproofing with polyisobutylene (PIB)
- Rhepanol fk, the oldest synthetic roofing membrane made in Germany
- With welding edge for reliable sealing of the seams, without welding aid
- Fleece backing with extremely high tensile strength
- Made of polyisobutylene (PIB), therefore compatible with bitumen
- Rhepanol hfk - one roofing membrane for all application methods, mechanically fastened, bonded and with ballast, except for green roofs
- Resistant to UV radiation
- Flexible at temperatures as low as $-40\text{ }^{\circ}\text{C}$, tested according to DIN EN 495-5
- Hail-resistant according to DIN EN 13583
- Free of plasticizers and halogen-containing fireproofing agents
- Application without open flame
- No need for surface protection
- Comprehensive warranty on materials
- Ideal for new build and refurbishment



Rhepanol.

Quality control

Official seal of approval

FDT does not focus on short-term profit, but on high-quality and durable products. Therefore, we have established stringent quality control requirements that eliminate sources of error. This in-house quality assurance system for the whole company has been certified according to **DIN EN ISO 9001**, the world's most strict quality standard, and is constantly monitored by TÜV SÜD Management Service GmbH. We pay the same attention to materials control carried out during production as to the quality assurance measures and the highly mechanised production.

Control measures (amongst others):

- No blisters or cracks
- Thickness, width
- Weight per square metre
- Maximum tensile force, elongation at maximum tensile force
- Dimensional stability after storage at +80 °C
- Bending at low temperatures

In addition, Rhepanol hfk is permanently monitored by an officially approved testing institute. In 1980, we have signed a quality control agreement with the State Material Testing Institute Darmstadt, plastics department.

The regular controls carried out by the Material Testing Institute not only include production, but also external stores and building sites. The quality control of an independent testing institute provides additional security when waterproofing flat roofs with Rhepanol hfk.

Warranty on materials

Warranty certificates are available for all roofing membranes supplied by FDT. FDT offers comprehensive warranty, securing everybody's investments in new buildings or refurbishment.

Ecology

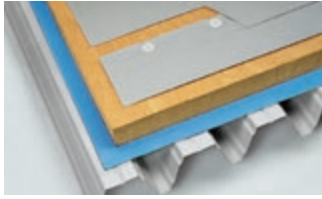

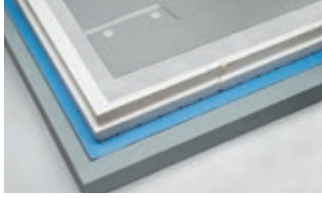
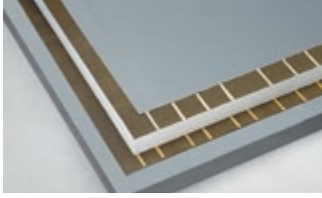






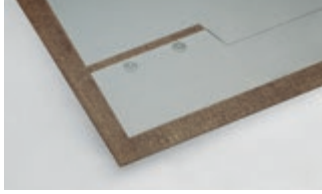

As early as 1990, Rhepanol fk has been subjected to a life cycle assessment by the renowned and independent Batelle-Institute. It confirmed the outstanding ecological profile of Rhepanol fk during its whole life cycle. In 2002, the C.A.U. GmbH (Company for Ecological Consulting and Analytics Ltd.) was commissioned to update this study for Rhepanol fk according to DIN EN ISO 14040 et sqq. The result was a life cycle assessment containing an analysis and a valuation of all ecological aspects of the entire life cycle of the product. The conclusions reconfirm the statements made in 1990.

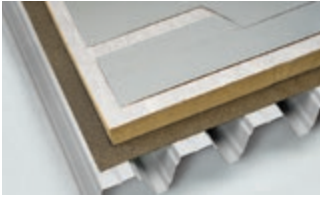
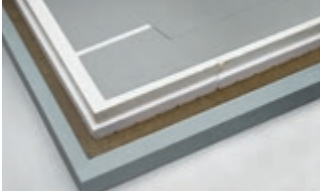
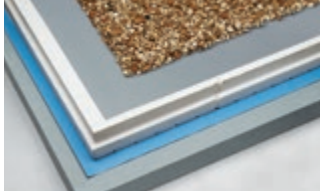
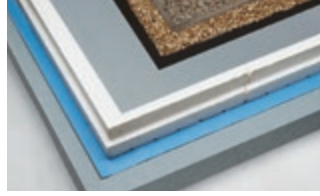





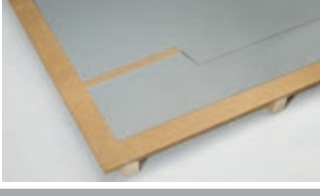


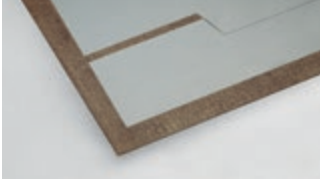

The Environmental Product Declaration for Rhepanol hfk issued in 2015 adds another significant eco label to the rating.

We shall be glad to provide you further information.



**Overview on Rhepanol® hfk and Rhepanol® hfk-sk
Application methods and roof build-ups**

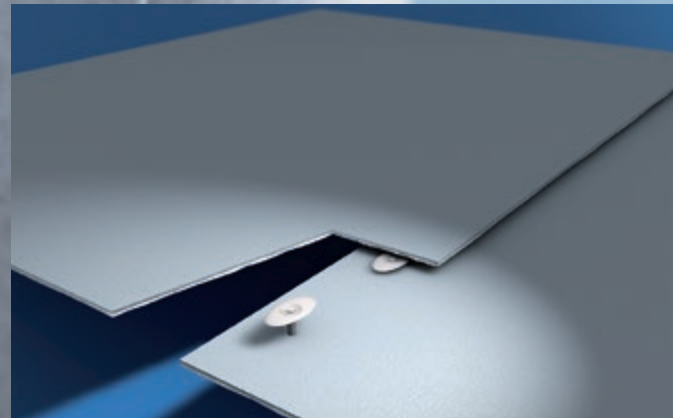
Non-traffic roof areas, slopes up to 20°			
Roof type	Supporting deck	mechanically fastened at the membrane overlap	bonded fixing*
Non-ventilated roof (warm roof)	Profiled steel decking		
	Reinforced concrete		
	Aerated concrete		
Ventilated roof (cold roof)	Timber board cladding		
	Chipboards/ veneer boards		
Old bituminous roofing	On stable old roofing independent of the type of supporting deck (refurbishment)		

		Slope up to 3°	Used roof areas, slope up to 3°
Supporting deck	full-size self-adhesive (Rhepanol® hfk-sk)	loose-laid with ballast*	loose-laid with ballast*
Profiled steel decking			
Reinforced concrete			
Aerated concrete			
Timber board cladding			
Chipboards/ veneer boards			
On stable old roofing independent of the type of supporting deck (refurbishment)			

Terraces, balconies

*For the sealing of green roofs, we recommend our roofing membrane Rhepanol hg.

Rhepanol® hfk
mechanically fastened at
the membrane overlap



Safety and functional efficiency, supporting construction

Safety and functional efficiency

In case of mechanical fastening, the roof sealing is separated from the lower layers and components across the complete area. Movements of these layers and components can therefore not pass on stresses to the sealing, which is significant for the prevention of damage, especially on lightweight roofs.

The integrated, highly tear-resistant synthetic fleece of Rhepanol hfk allows diffusion of any retained moisture, thus ensuring vapour pressure compensation. Rhepanol hfk is compatible with bitumen and can be applied without additional separation layers directly onto bituminous sheets. The integrated synthetic fleece protects the membrane against movement originating from the substrate.

Application instructions

Supporting construction

- The supporting deck structure has to meet the technical requirements with regard to load-bearing capacity, deflection, anchorage and drainage.
- Substrates for application must be free of open cracks, rough concrete and sharp projections.
- Joints have to be formed according to constructional requirements, as their width or movement may impede the functional efficiency of the roof sealing.
- Clean, dry and even roof surfaces.
- An intrusion of air underneath the roof sealing at the roof perimeter and at roof penetrations must be prevented. Therefore, these areas have to be made wind-proof, in the case of profiled steel decking, e.g. by closing the corrugations with suitable material.
- For compatibility reasons, timber board cladding, chipboards and the like may be treated only with salt-based wood preservatives. Oil or solvent based impregnation agents must not be used.
- Natural wood boarding must be thoroughly swept with a broom. In individual cases, an FDT synthetic fleece 300 g/m² may be useful as an additional protection layer in order to prevent perforation of the membrane by sticking out splinters.

Vapour control layer, thermal insulation layer

Vapour control layer

In the case of non-ventilated roofs, we recommend the following vapour control layers:

- For non air-conditioned rooms (e.g. living rooms and offices or similar rooms without suspended ceiling according to DIN 4108-3): vapour control layer fk (polyethylene) with air space width equivalent to water vapour diffusion $s_d \geq 100$ m.
- In the case of aerated concrete supporting decks with correctly calculated thermal insulation, you may leave out a vapour control layer, if the room temperature stays below 20 °C and the relative air humidity inside the room will not exceed 65%. In case of doubt, we recommend a calculation of the building physics according to DIN 4108-3 in order to identify the diffusion characteristics of the roof build-up. With lightweight steel deckings, we also principally recommend the installation of a separate vapour control layer, which should be formed as an air barrier according to the provisions of the Thermal Insulation Regulation. The vapour control layer fk is applied with a seam overlap of 100 mm, with the seams being sealed with connection or seam tape. The vapour control layer must be taken up and flashed at connections and cappings; at roof penetrations it must be flashed.
- For rooms with high air condition loads: In case of air-conditioned rooms and rooms with high air condition loads, as well as high pressure rooms, please consult our experts to identify the right layer build-up and application method.
- National standards and regulations must be observed.

Thermal insulation layer

When designing the thermal insulation layer (Energy Saving Regulation EnEV, DIN 4108) on steel profile supporting decks, consideration must also be given to load bearing capacity.

As materials for thermal insulation layers we recommend:

- For roof slopes up to 20°: large-sized insulation boards made of expanded polystyrene (EPS DAA dm, building material class B1) with rebated edge according to DIN EN 13163, size 1.25 x 1.25 m or 1.25 x 1.00 m. For fire protection reasons, on top of the insulation boards, a fire protection layer fk – a specially coated woven glass cloth – is required.
- Flexible insulation boards or expanded polystyrene foam boards EPS DAA dm with backing according to DIN EN 13163. For fire protection reasons, bituminous sheets with an integrated glass fleece or fabric ≥ 60 g/m² are required as a lining. Use linings with a PE foil or fleece facing.
- Large-sized non-flammable mineral fibre boards (MW DAA, building material class A), according to DIN EN 13162.
- Small-sized insulation boards can be used, provided they can be properly fastened.
- Rigid polyurethane foam boards according to DIN EN 13165, PUR 028 DAA, fire class E, according to DIN EN 13501-1. Fastening of the boards in accordance with manufacturer's instructions.

Insulation boards or board sections that are not sufficiently fixed by linear fastening must be secured in a stable position with additional fasteners prior to applying the roofing membrane.

- Insulation materials that are not dimensionally stable and which buckle or bulge must not be installed. Generally, insulation boards must be laid brick-bond pattern.
- National standards and regulations must be observed.

Fastener/fastener spacing

Rhepanol hfk mechanically fastened at the membrane overlap

Roofing membranes Rhepanol hfk are loose-laid and mechanically fastened at the membrane overlap. The seam overlap is at least 100 mm. Depending on the substrate, different fastening elements are used. The membrane seams are securely joined by homogeneous hot air welding.

On profiled steel decking and timber board cladding the Rhepanol hfk membranes must be arranged perpendicularly to the corrugations or boards to achieve the most regular wind load distribution possible into the supporting deck.

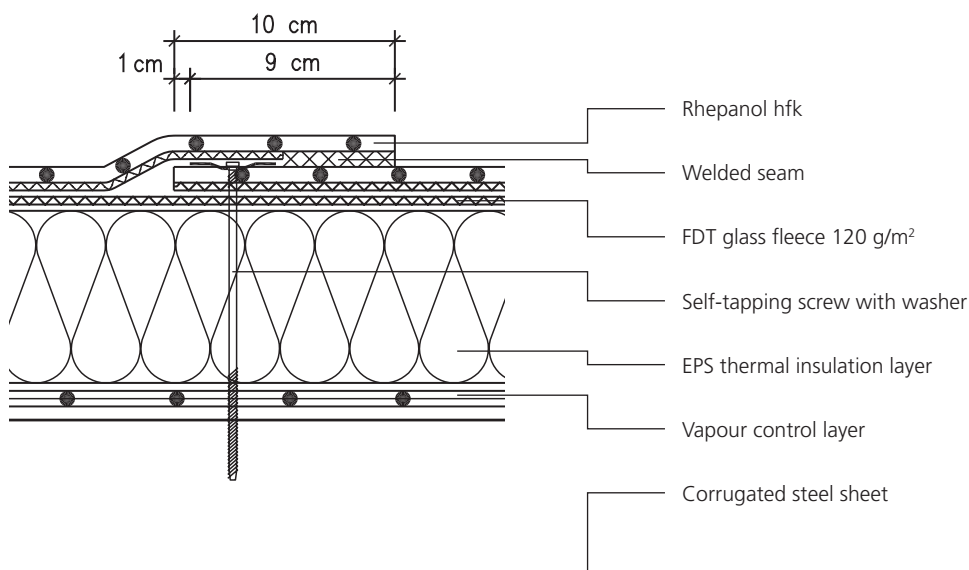
Rhepanol hfk can be used on roofs with a slope up to 20°. For slopes exceeding 20°, Rhepanol fk roofing membranes are to be applied.

Note:

- In-line fastening spacing min. 150 mm, max. 600 mm.
- Fastener spacing on the same corrugation at profiled steel decking must not be less than 200 mm.

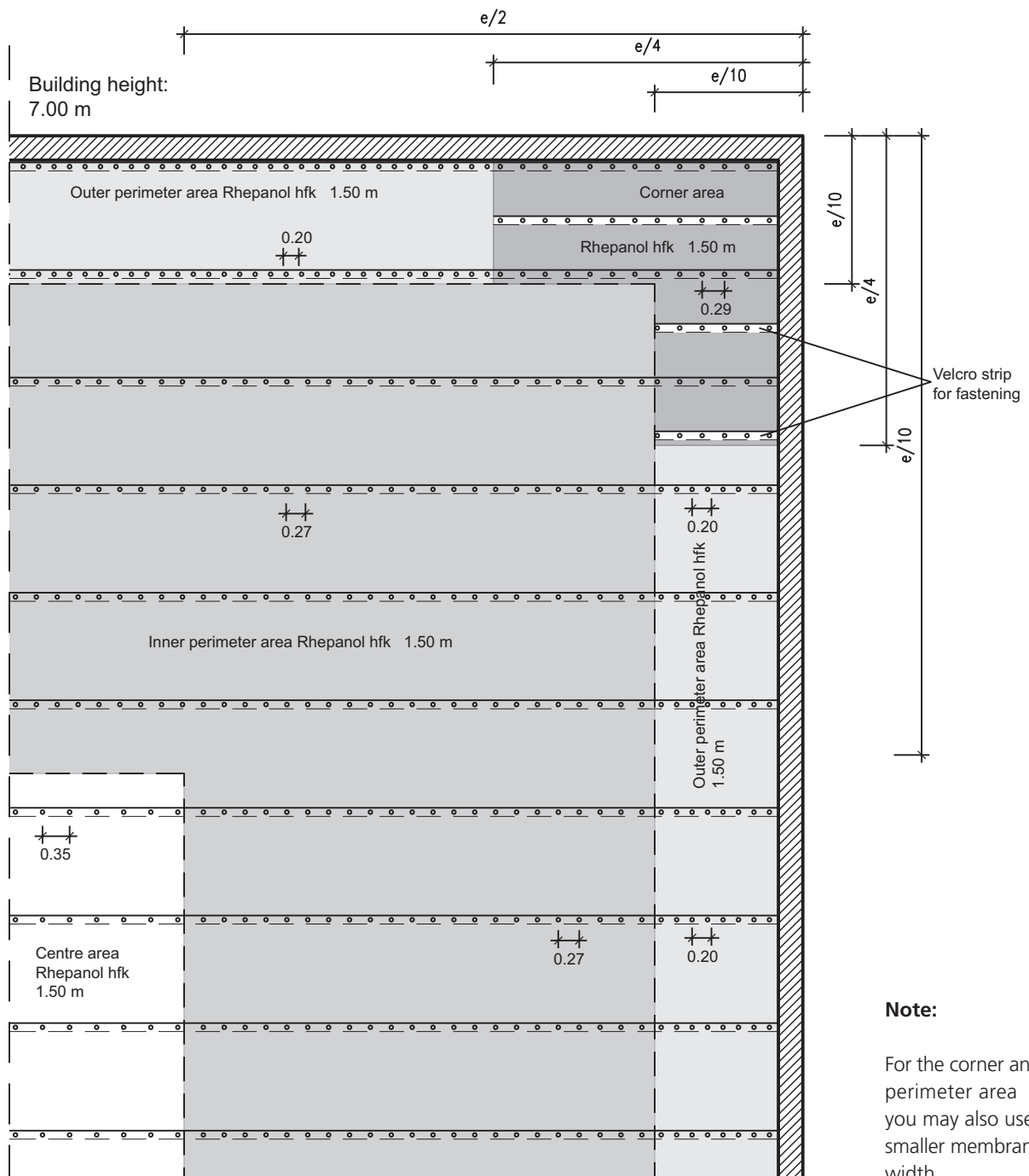
Wind forces according to DIN EN 1991-1-4, as well as the corresponding design load of the applied fasteners are relevant for calculating the amount and layout of fasteners.

On request, computer-based project specific calculations of the necessary amount of fasteners are carried out.



*Economic laying without open flame:
mechanical fastening at the membrane overlap.*

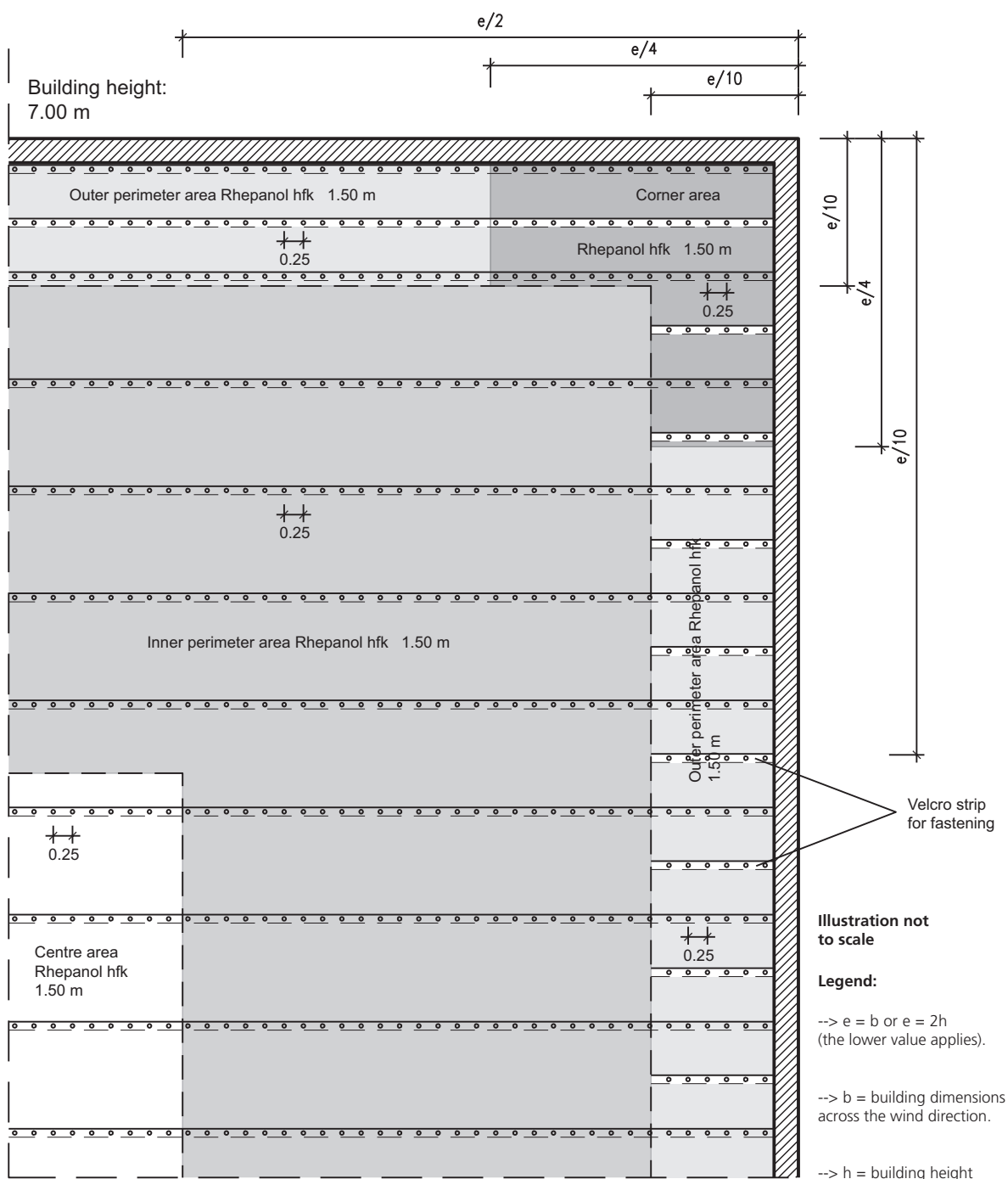
Fastening example: Substrate – reinforced concrete



Note:

For the corner and perimeter area you may also use smaller membrane width.

Fastening example: Substrate – profiled steel decking



Flashings and cappings

All flashings and cappings are carried out with Rhepanol hsg flashing strips.

If the flashing membrane is bonded, then at flashing heights over 200 mm, full-size adhesive bonding is necessary. Valley areas are left unbonded at a width of 200 mm to allow movement compensation. In case of mechanical fastening of the flashing membrane, e. g. the FDT fastening profile or the backed Rhepanol coated metal sheet can be used. Apply flashing strips max. 150 mm in the roof area.

In case of wall flashings, the upper edge of the Rhepanol hsg flashing strip is pressed to the substrate with rigid wall connection profiles such as „Classic“ and additionally secured with FDT sealant A or S.

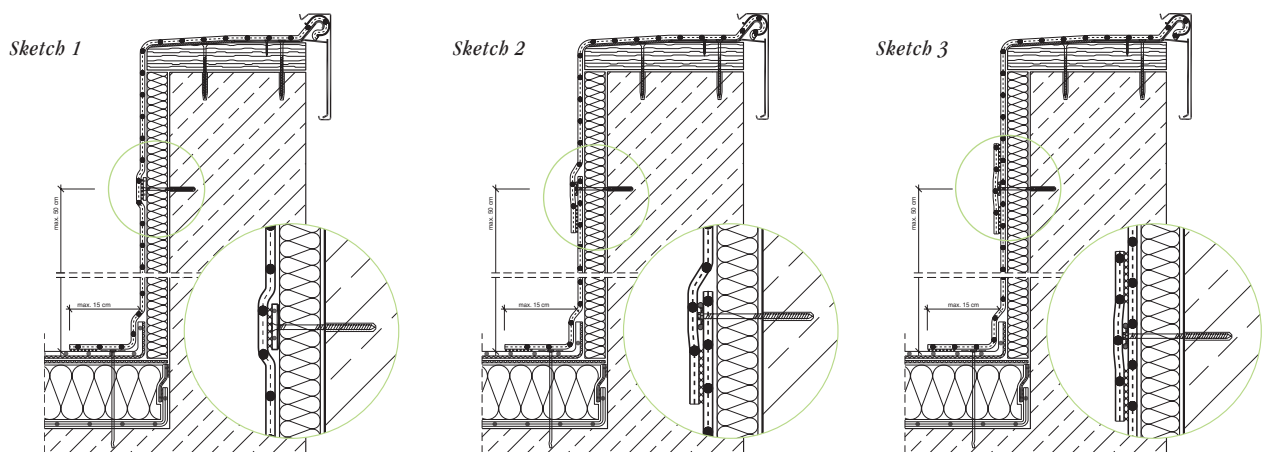
The two-part FDT roof edge trims ensure flexible, yet windproof capping of the roof perimeter. When laying Rhepanol hsg flashing membranes, in the area of cappings, bracket-mounted gutters and wall flashings also backed Rhepanol coated metal sheets can be used.

Like galvanized sheets, the necessary flashing and capping profiles are cut from coated metal sheets and bent according to the specification and the local requirements.

Forming of flashings and cappings is identical for all application methods. You will find examples on this topic in the drawings “Technical details”.

Additional requirements for roof refurbishment:

- In the case of uneven substrates, protection layers are necessary. Rigid polystyrene foam insulation boards or sheets can be recommended.
- The strength of the supporting deck is crucial for the anchoring of the fastening elements. If there is doubt about the strength, e.g. of old pumice or aerated concrete panels, pull-out tests will be necessary to define the amount of fasteners depending on the object.



Sketch 1: Parapet flashing/capping intermediate fixing with Rhepanol coated metal sheet

Sketch 2: Parapet flashing/capping intermediate fixing with FDT fastening profile

Sketch 3: Parapet flashing/capping intermediate fixing with FDT fastening profile

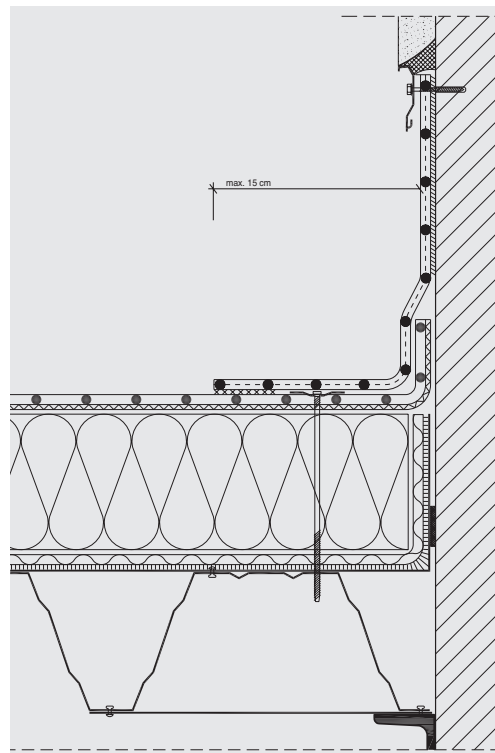
Linear perimeter fixing

Linear perimeter fixing

A linear perimeter fixing at flashings and cappings or built-in details is generally necessary.

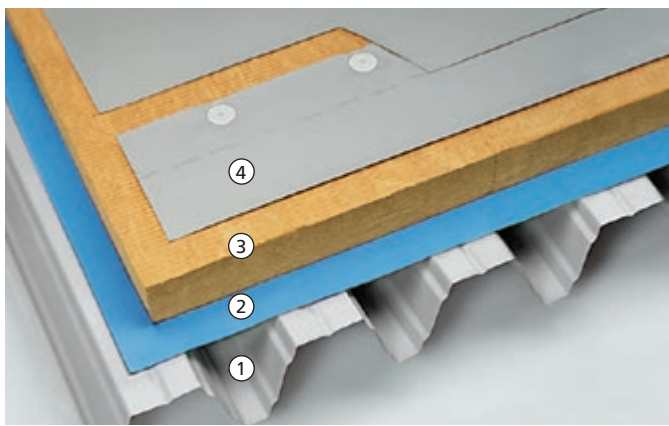
The perimeter fixing of the roof build-up, including the roofing membrane, is achieved in each instance with at least four in-line fastening elements per metre or the FDT fastening profile.

National standards and regulations must be observed.

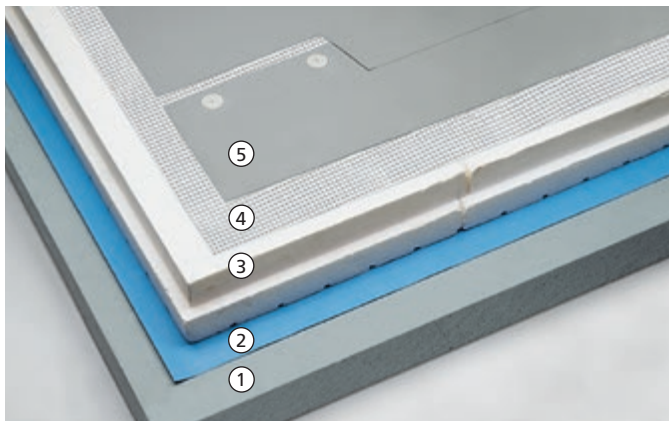


Sketch: Linear perimeter fixing

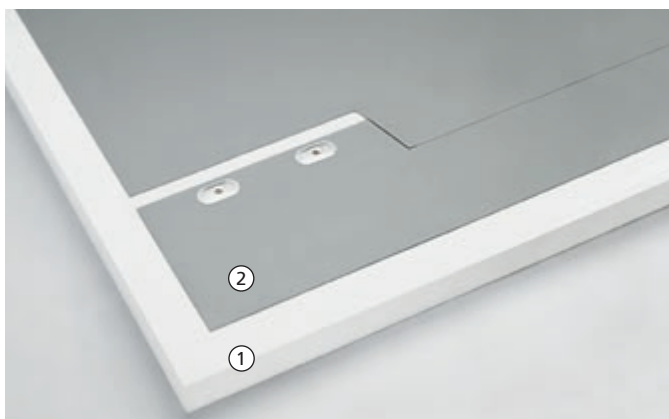
Layer build-ups

Examples of layer build-ups
Non ventilated roof (warm roof)

- ① Profiled steel decking
- ② FDT vapour control layer fk
- ③ Mineral wool boards
- ④ Roofing membrane Rhepanol hfk, laid perpendicularly to the corrugations



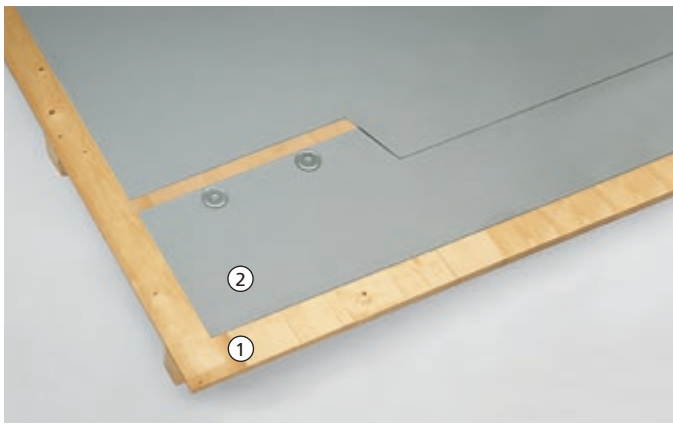
- ① Reinforced concrete
- ② FDT vapour control layer fk (protection layer if necessary)
- ③ Thermal insulation layer EPS
- ④ FDT glass fleece 120 g/m²
- ⑤ Roofing membrane Rhepanol hfk, mechanically fastened



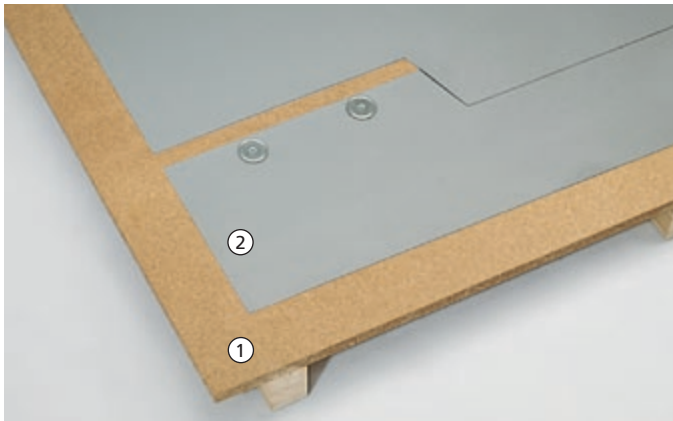
- ① Aerated concrete
- ② Roofing membrane Rhepanol hfk, mechanically fastened

Layer build-ups

Examples of layer build-ups Ventilated roof (cold roof)



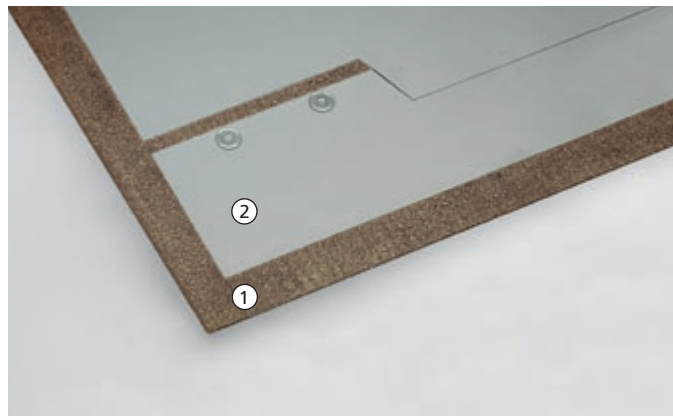
- ① Suitable timber board cladding, min. 24 mm thick
- ② Roofing membrane Rhepanol hfk, mechanically fastened perpendicularly to the timber board cladding



- ① Suitable chipboards, min. 22 mm thick
- ② Roofing membrane Rhepanol hfk, mechanically fastened

Examples of layer build-ups Old bituminous roofing

- ① Old bituminous roofing, independent of the supporting deck (refurbishment)
- ② Roofing membrane Rhepanol hfk, mechanically fastened

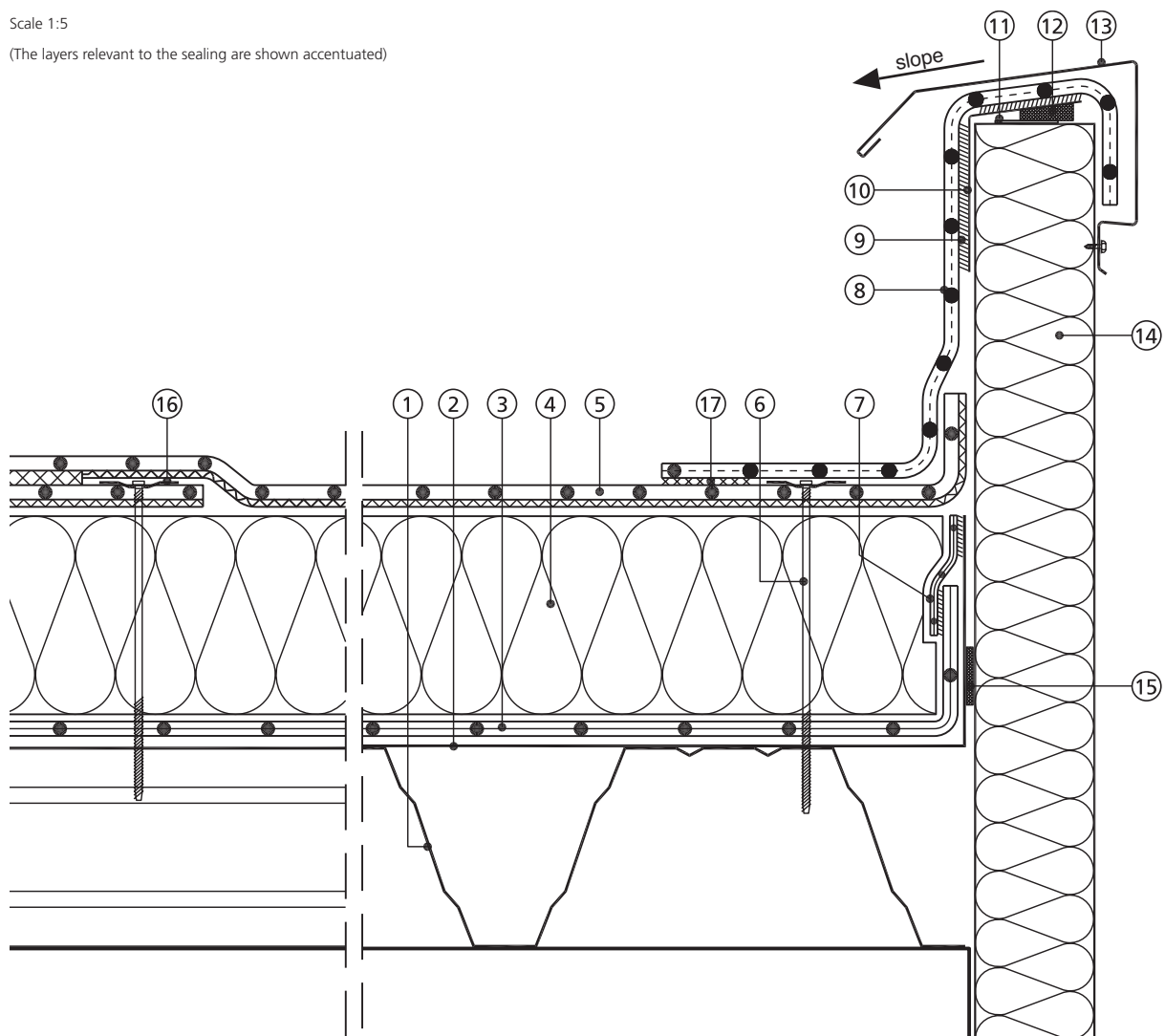


Parapet

Non ventilated roof

Scale 1:5

(The layers relevant to the sealing are shown accentuated)

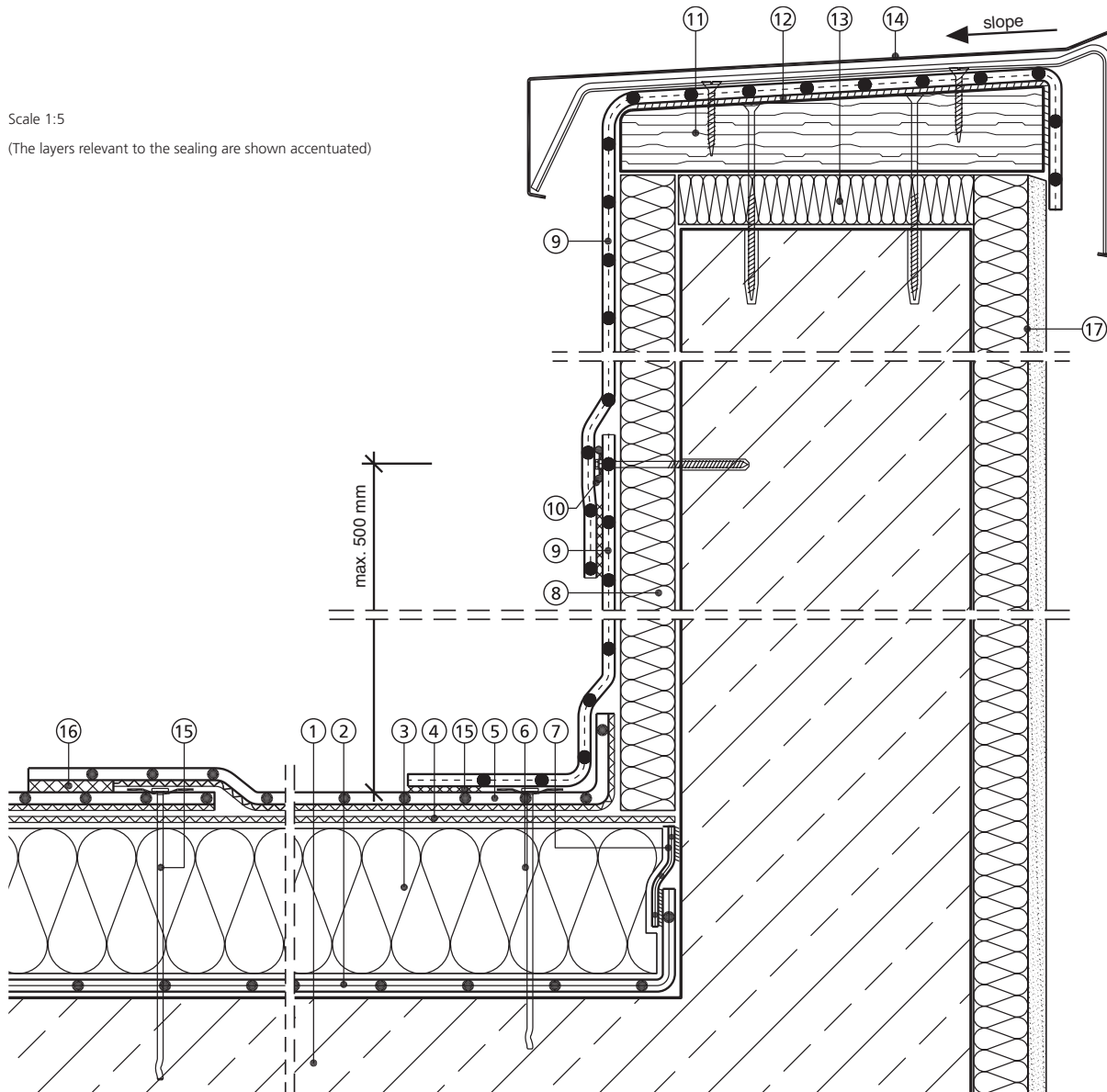


- | | |
|--|--|
| ① Profiled steel decking, corrosion protected | ⑨ Rhepanol contact adhesive 50 |
| ② Supporting bracket | ⑩ Parapet bracket |
| ③ FDT vapour control layer fk | ⑪ Aluminium foil |
| ④ Mineral wool thermal insulation | ⑫ Pre-compressed tape |
| ⑤ Roofing membrane Rhepanol hfk,
mechanically fastened | ⑬ Capping |
| ⑥ Perimeter fixing with single fasteners through
the roofing membrane | ⑭ Thermal insulation |
| ⑦ FDT connection tape for FDT vapour control layer fk | ⑮ Airtight pre-compressed tape |
| ⑧ Rhepanol hsg flashing strip | ⑯ Mechanical fastening at membrane overlap |
| | ⑰ Hot air welded seam |

Parapet
Non ventilated roof

Scale 1:5

(The layers relevant to the sealing are shown accentuated)



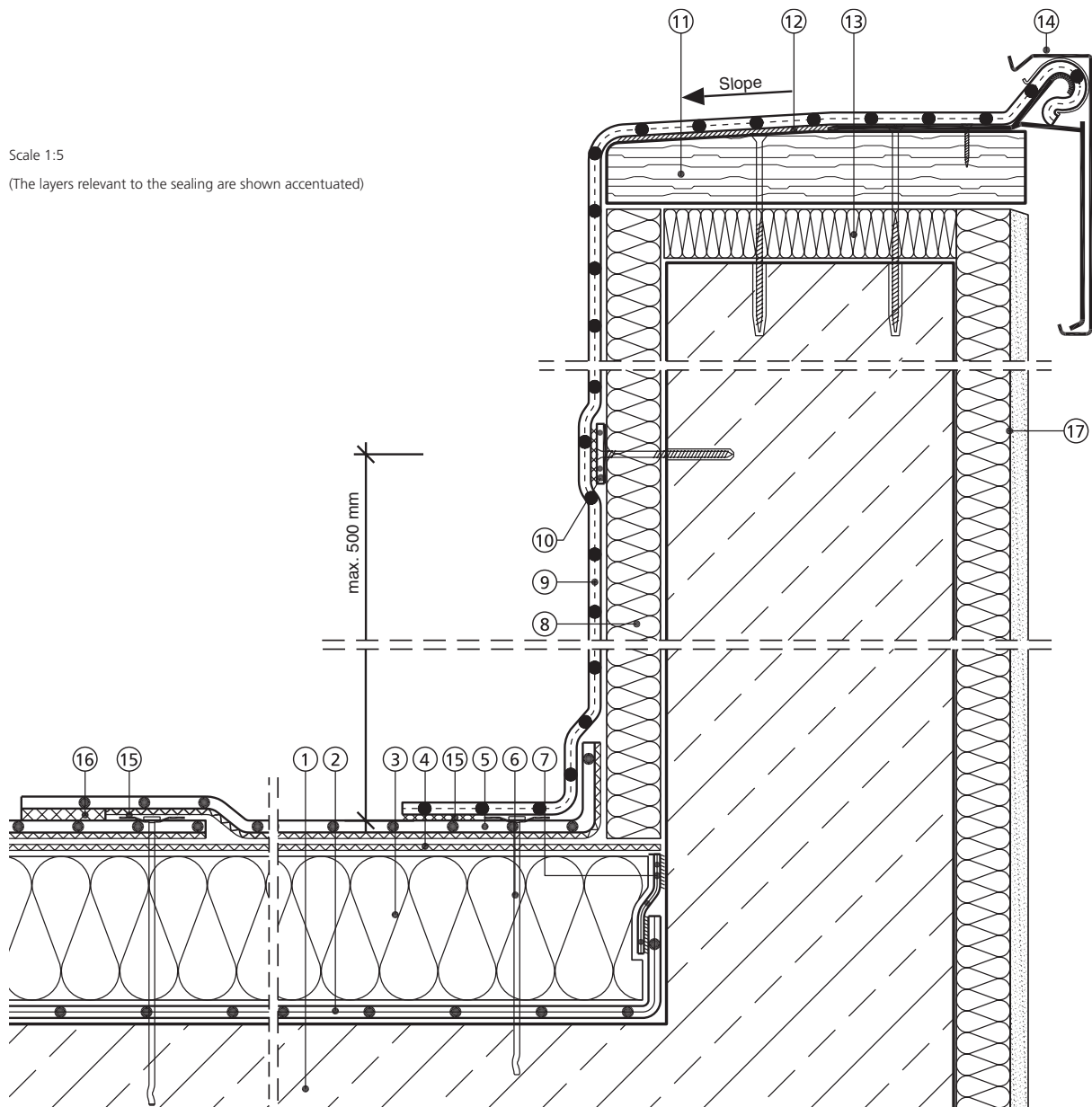
- | | |
|---|--|
| ① Reinforced concrete | ⑧ Vertical thermal insulation |
| ② FDT vapour control layer fk (protection layer on concrete, as required) | ⑨ Rhepanol hsg flashing strip |
| ③ Thermal insulation EPS | ⑩ Intermediate fixing with FDT fastening profile |
| ④ FDT glass fleece 120 g/m ² | ⑪ Treated timber profile |
| ⑤ Roofing membrane Rhepanol hfk, mechanically fastened | ⑫ Rhepanol contact adhesive 50 |
| ⑥ Perimeter fixing with single fasteners through the roofing membrane | ⑬ Pressure-resistant thermal insulation |
| ⑦ FDT connection tape for FDT vapour control layer fk | ⑭ Capping |
| | ⑮ Mechanical fastening at membrane overlap |
| | ⑯ Hot air welded seam |
| | ⑰ Thermal insulation composite system |

Parapet

Non ventilated roof

Scale 1:5

(The layers relevant to the sealing are shown accentuated)

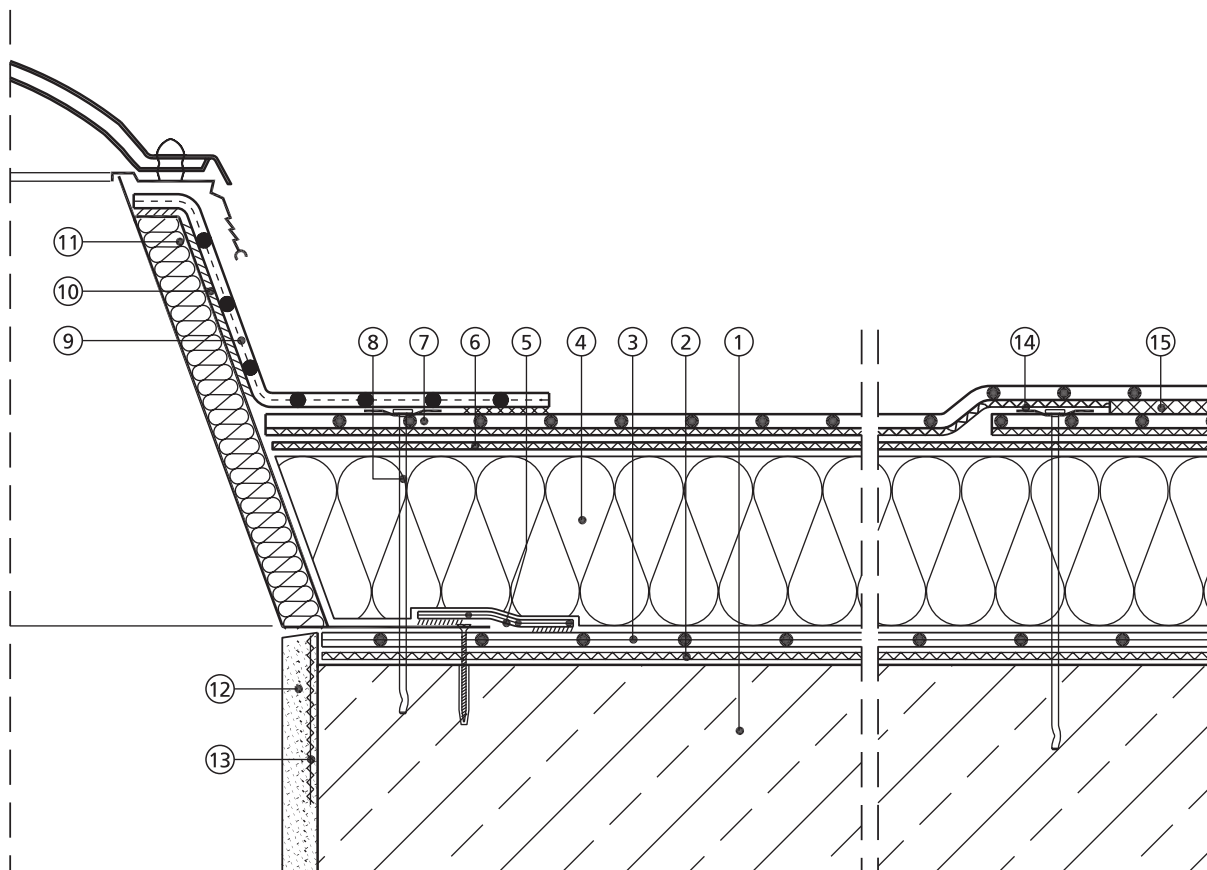


- | | |
|---|--|
| ① Reinforced concrete | ⑨ Rhepanol hsg flashing strip |
| ② FDT vapour control layer fk (protection layer on concrete, as required) | ⑩ Intermediate fixing with Rhepanol coated metal sheet |
| ③ Thermal insulation EPS | ⑪ Treated timber profile |
| ④ FDT glass fleece 120 g/m ² | ⑫ Rhepanol contact adhesive 50 |
| ⑤ Roofing membrane Rhepanol hfk, mechanically fastened | ⑬ Pressure-resistant thermal insulation |
| ⑥ Perimeter fixing with single fasteners through the roofing membrane | ⑭ FDT roof edge trim |
| ⑦ FDT connection tape for FDT vapour control layer fk | ⑮ Mechanical fastening at membrane overlap |
| ⑧ Vertical thermal insulation | ⑯ Hot air welded seam |
| | ⑰ Thermal insulation composite system |

Rooflight connection
Non ventilated roof

Scale 1:5

(The layers relevant to the sealing are shown accentuated)



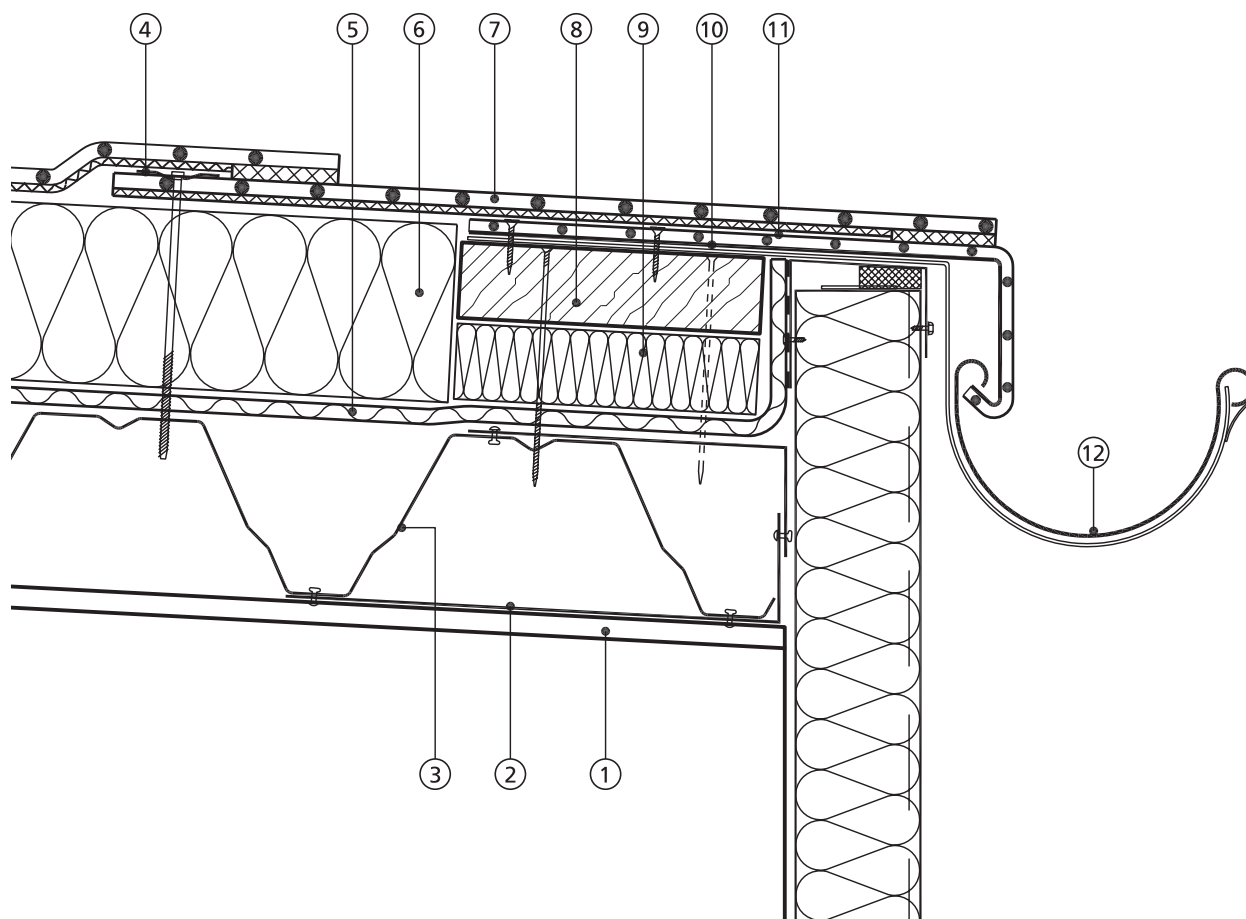
- | | |
|---|---|
| ① Reinforced concrete | ⑧ Perimeter fixing with single fasteners through the roofing membrane |
| ② Protection layer on concrete (e. g. FDT synthetic fleece 300 g/m ²) | ⑨ Rhepanol hsg flashing strip |
| ③ FDT vapour control layer fk | ⑩ Rhepanol contact adhesive 50 |
| ④ Thermal insulation EPS | ⑪ Rooflight kerb |
| ⑤ FDT connection tape for FDT vapour control layer fk | ⑫ Render |
| ⑥ FDT glass fleece 120 g/m ² | ⑬ Structural support |
| ⑦ Roofing membrane Rhepanol hfk, mechanically fastened | ⑭ Mechanical fastening at membrane overlap |
| | ⑮ Hot air welded seam |

Gutter

Non ventilated roof

Scale 1:5

(The layers relevant to the sealing are shown accentuated)



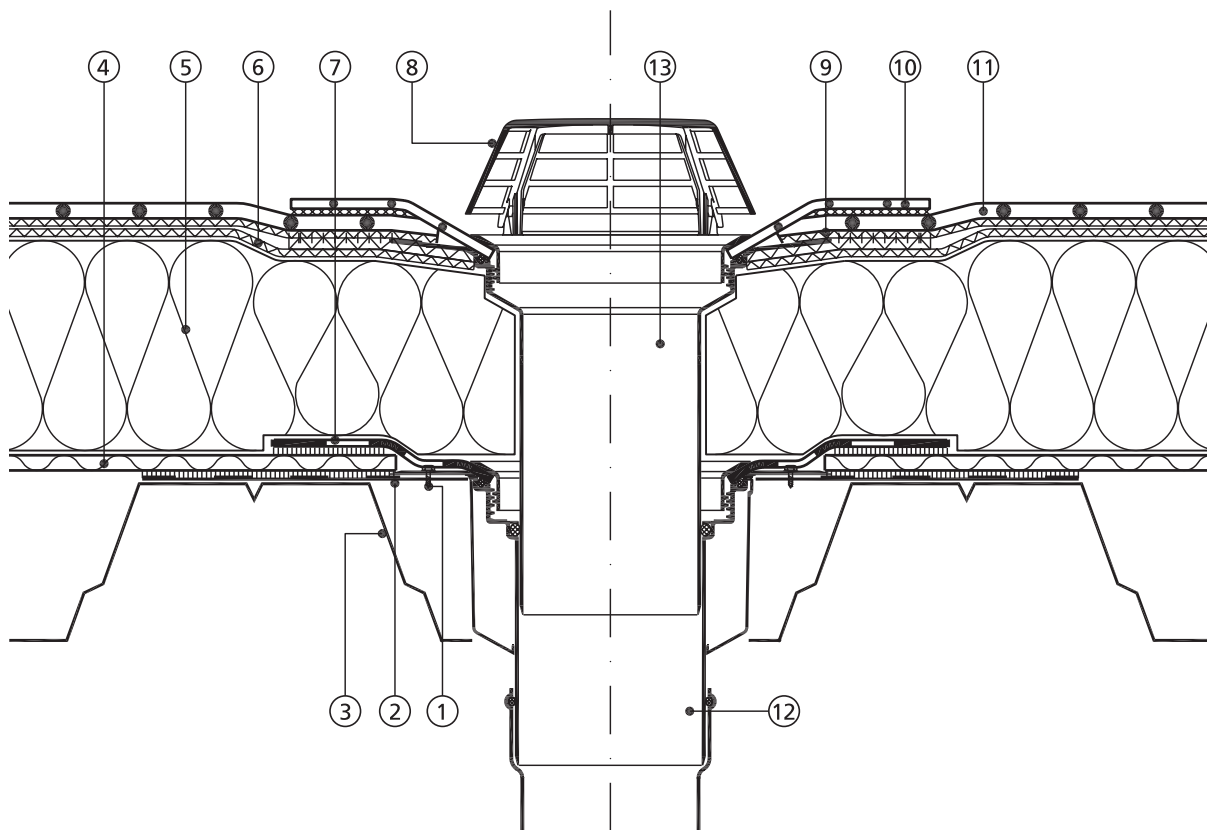
- ① Supporting deck
- ② Supporting bracket
- ③ Profiled steel decking, corrosion protected
- ④ Mechanical fastening at membrane overlap
- ⑤ Vapour control layer
- ⑥ Mineral wool thermal insulation
- ⑦ Roofing membrane Rhepanol hfk, mechanically fastened

- ⑧ Treated timber profile (salt-based)
- ⑨ Pressure-resistant thermal insulation
- ⑩ Bracket
- ⑪ Rhepanol coated metal sheet
- ⑫ Gutter

FDT VarioGully with Gripfix ring Non ventilated roof

Scale 1:5

(The layers relevant to the sealing are shown accentuated)



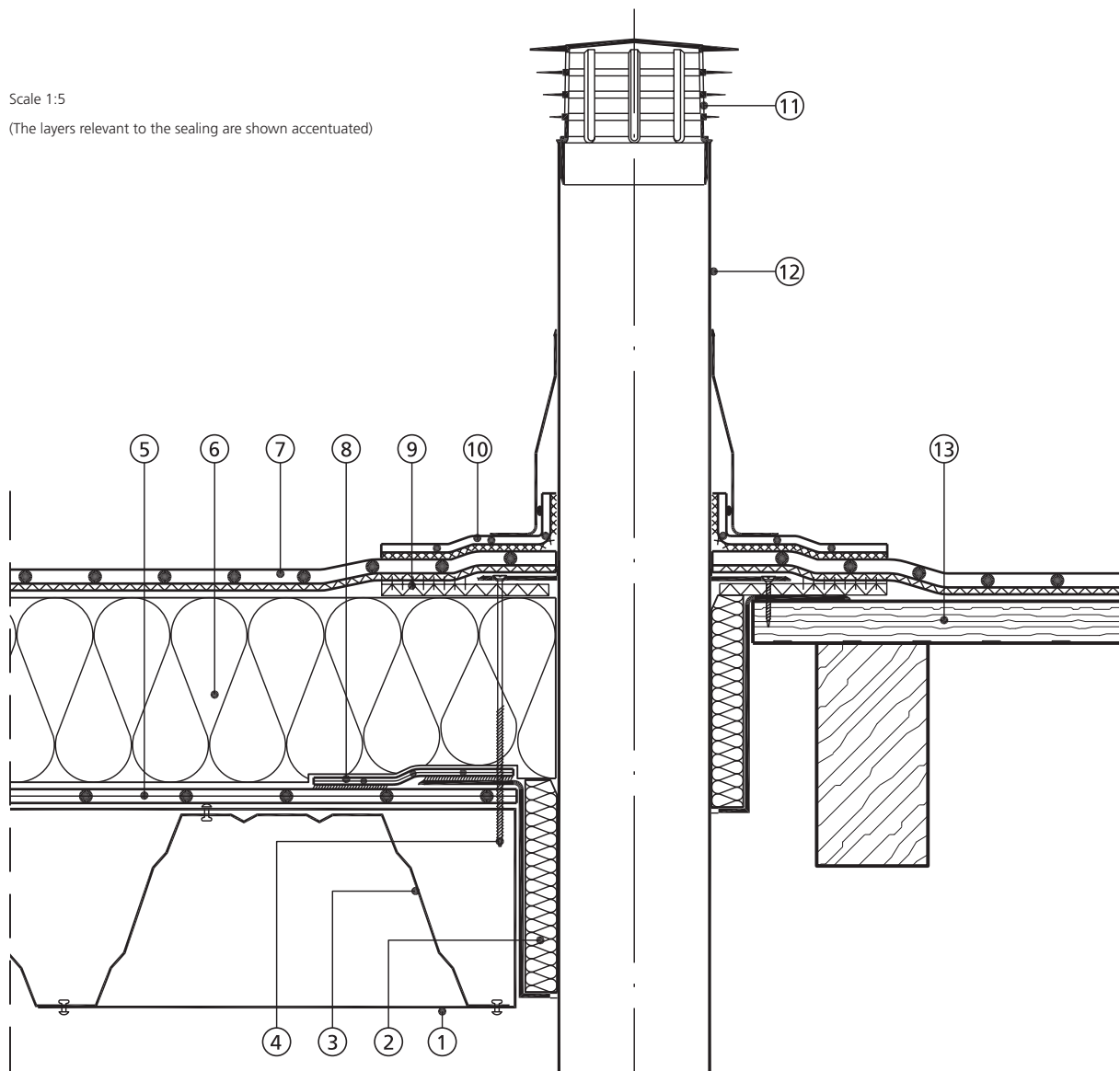
- | | |
|--|---|
| ① FDT VarioGully fixing (4 fasteners per outlet) | ⑧ FDT gravel stop/leaf guard |
| ② Stiffening metal plate | ⑨ Gripfix ring |
| ③ Profiled steel decking, corrosion protected | ⑩ Rhepanol h collar |
| ④ Vapour control layer | ⑪ Roofing membrane Rhepanol hfk,
mechanically fastened |
| ⑤ Thermal insulation EPS | ⑫ FDT VarioGully |
| ⑥ FDT glass fleece 120 g/m ² | ⑬ FDT VarioGully warm roof extension |
| ⑦ Vapour control collar | |

FDT vent pipe

Non ventilated roof/ventilated roof

Scale 1:5

(The layers relevant to the sealing are shown accentuated)



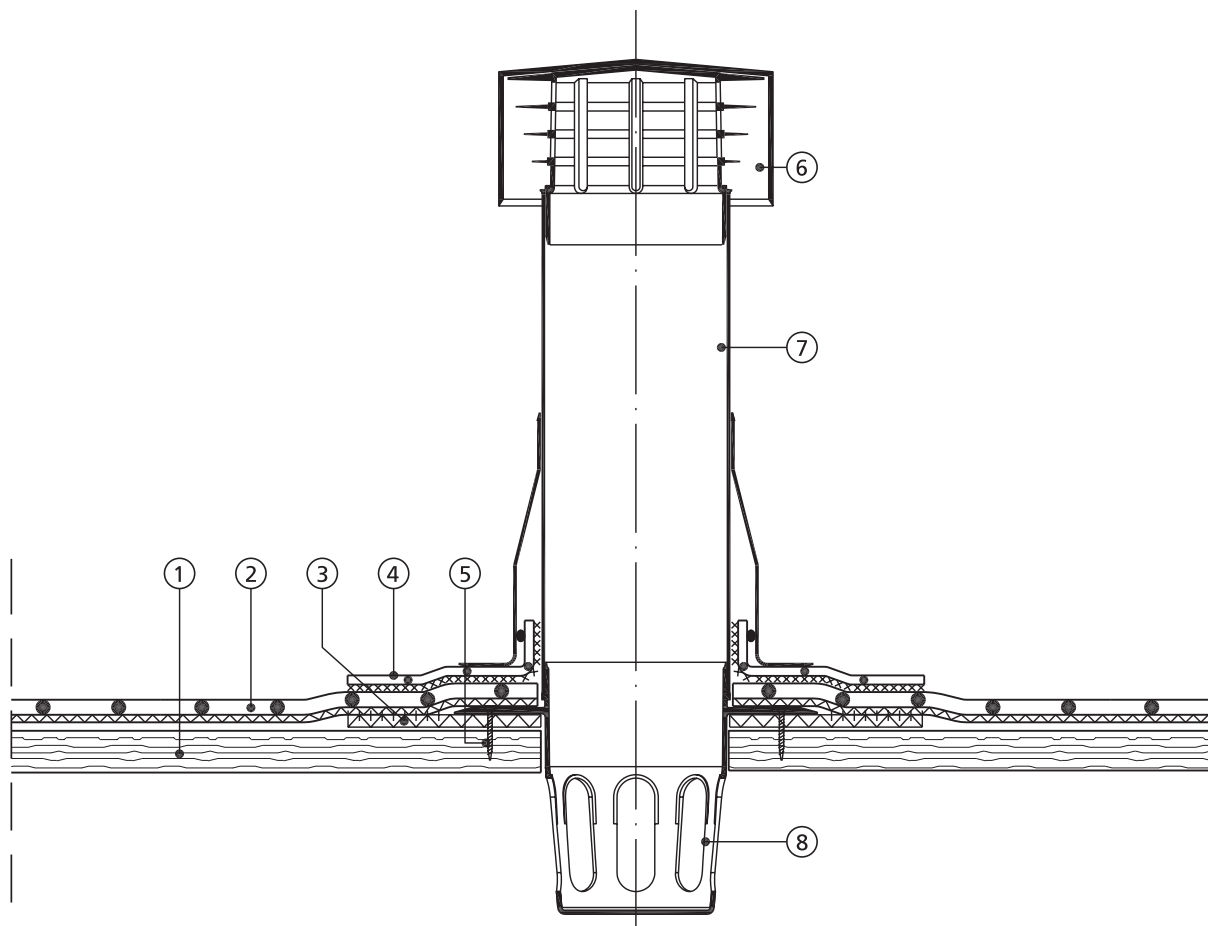
- ① Metal angle
- ② Penetration kerb insulation sleeve
- ③ Profiled steel decking, corrosion protected
- ④ Mechanical fastening
- ⑤ FDT vapour control layer fk
- ⑥ Mineral wool thermal insulation
- ⑦ Roofing membrane Rhepanol hfk, mechanically fastened

- ⑧ FDT connection tape for FDT vapour control layer fk
- ⑨ Gripfix ring
- ⑩ Rhepanol h collar
- ⑪ Vent pipe hood, removable
- ⑫ FDT vent pipe DN 125/DN 100
- ⑬ Timber deck

FDT cold roof vent Ventilated roof

Scale 1:5

(The layers relevant to the sealing are shown accentuated)



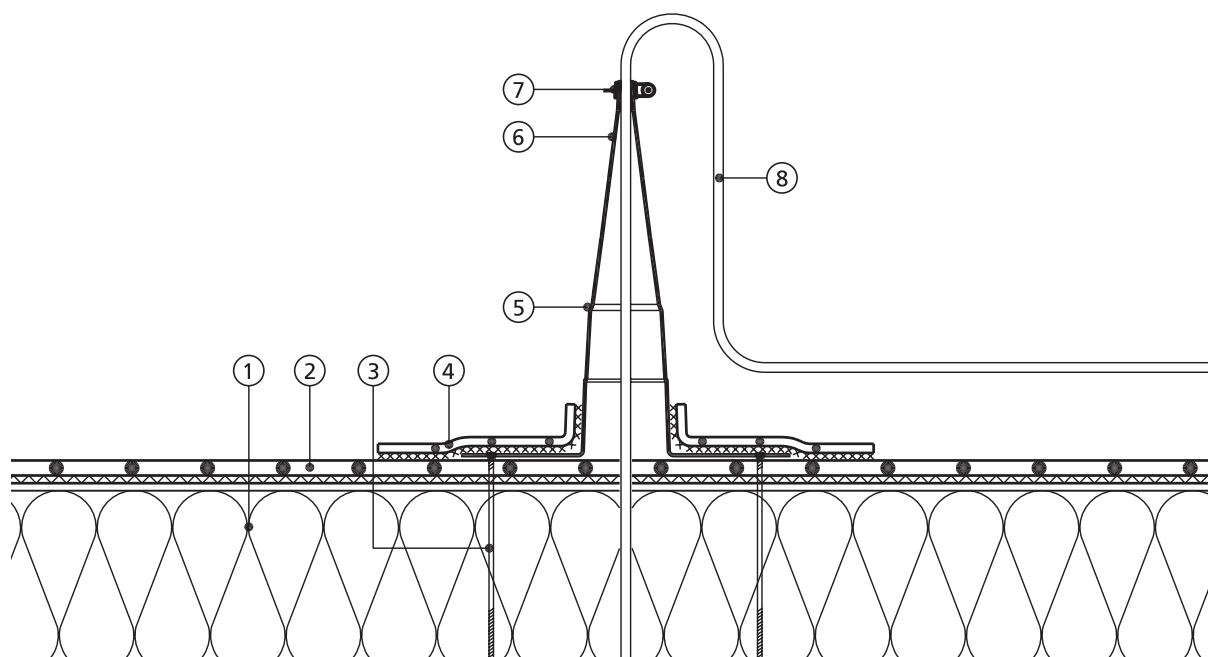
- | | |
|---|-----------------------------|
| ① Roof boarding | ⑤ Mechanical fastening |
| ② Roofing membrane Rhepanol hfk,
mechanically fastened | ⑥ FDT weather cap DN 125 |
| ③ Gripfix ring | ⑦ FDT cold roof vent DN 125 |
| ④ Rhepanol h collar | ⑧ Condensate collector |

Lightning conductor collar

Non ventilated roof

Scale 1:5

(The layers relevant to the sealing are shown accentuated)



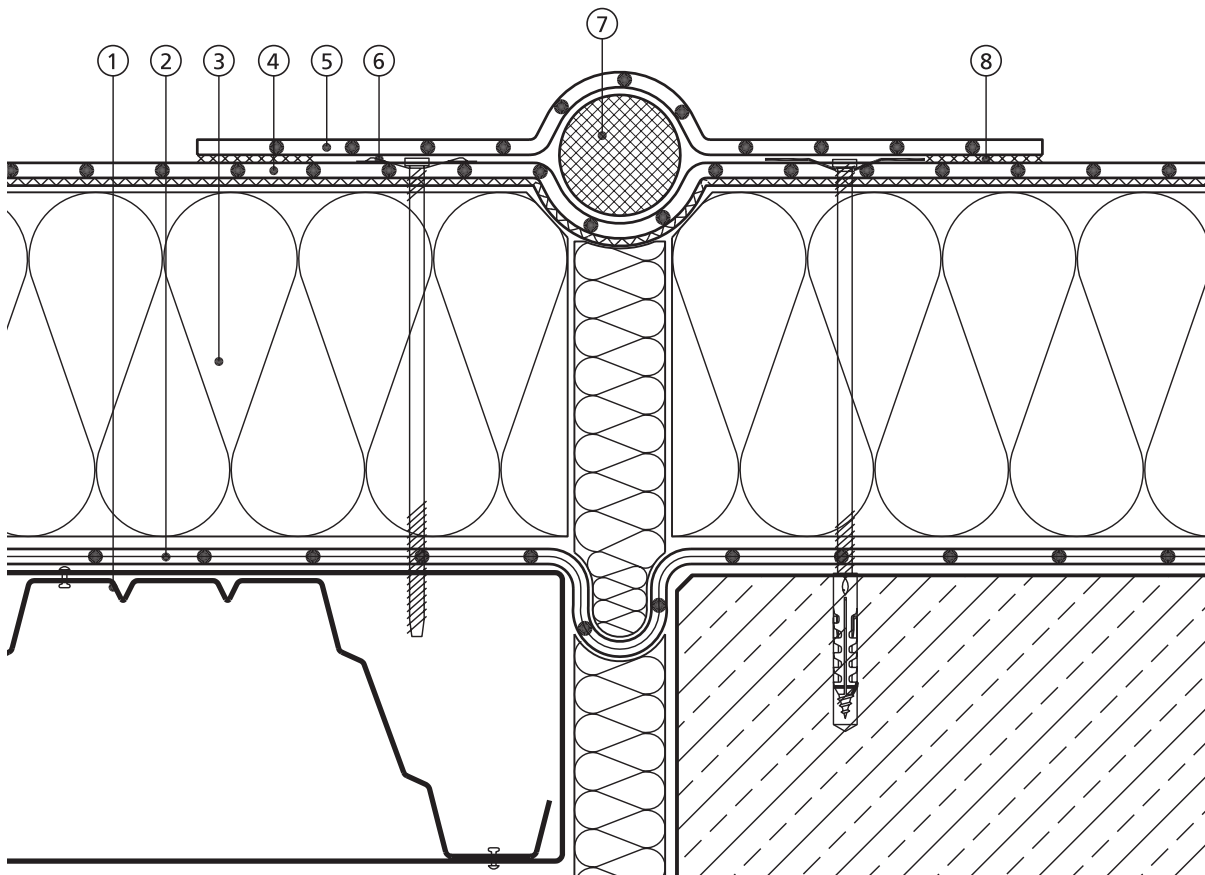
- ① Mineral wool thermal insulation
- ② Roofing membrane Rhepanol hfk, mechanically fastened
- ③ Mechanical fastening of the FDT lightning conductor sleeve with countersunk screws

- ④ Rhepanol h collar
- ⑤ Cut edge for pipe connection DN 50
- ⑥ FDT lightning conductor sleeve
- ⑦ Pipe clamp
- ⑧ Lightning conductor

Expansion joint Non ventilated roof

Scale 1:5

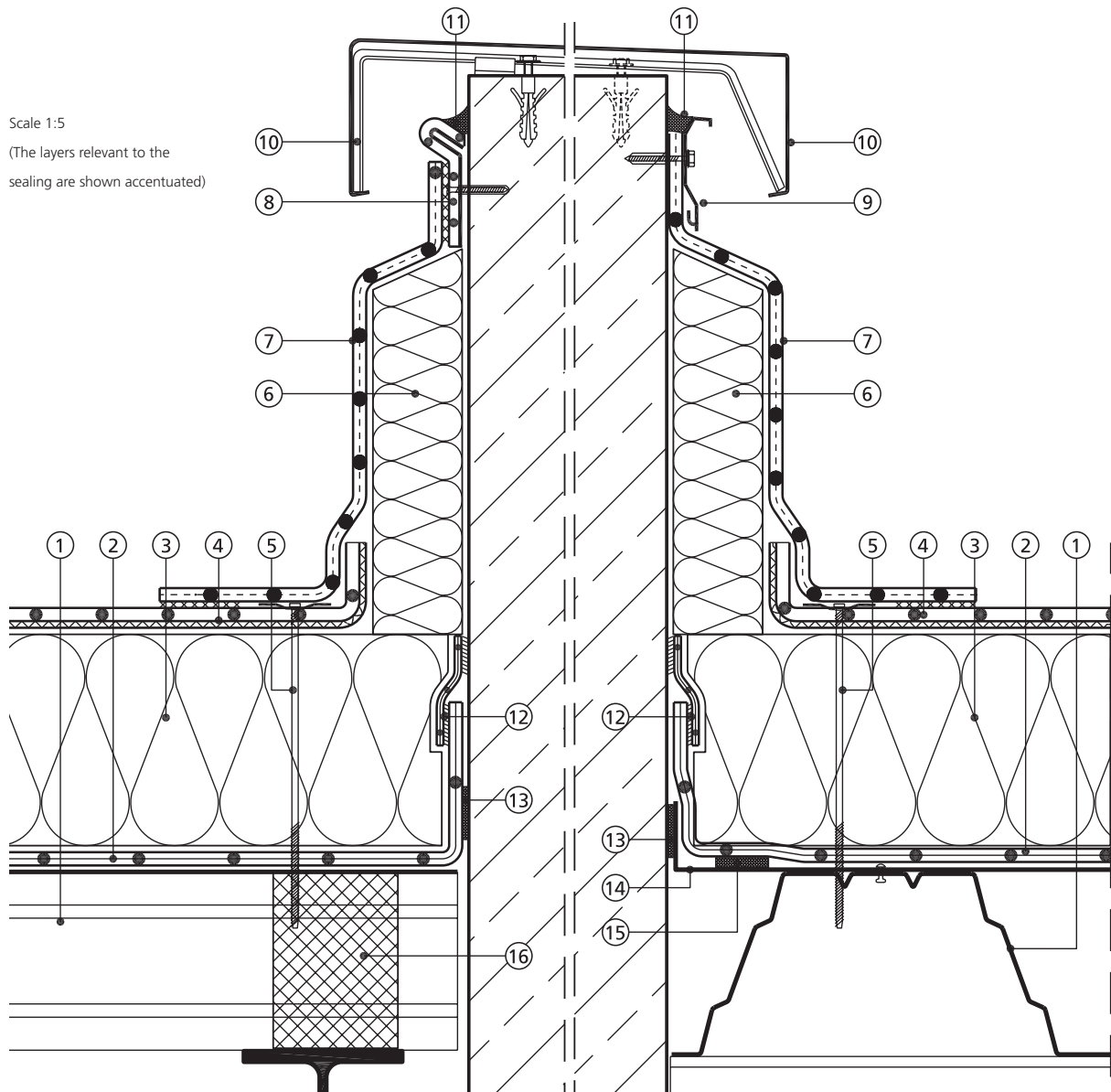
(The layers relevant to the sealing are shown accentuated)



- | | |
|--|-----------------------|
| ① Corrugated steel sheet | ⑤ Rhepanol h strip |
| ② FDT vapour control layer fk
(protection layer on concrete, as required) | ⑥ Single fastener |
| ③ Mineral wool thermal insulation | ⑦ Neoprene cord |
| ④ Roofing membrane Rhepanol hfk,
mechanically fastened | ⑧ Hot air welded seam |

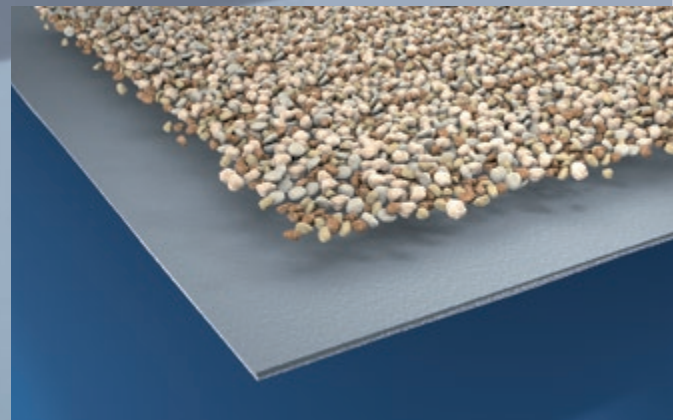
Firewall

Non ventilated roof/warm roof



- | | |
|--|---|
| ① Profiled steel decking, corrosion protected | ⑧ Upper trim with Rhepanol coated metal sheet |
| ② Vapour control layer PE 0.25 mm, DIN 18234-2 | ⑨ FDT aluminium wall connection profile |
| ③ Mineral wool thermal insulation according to DIN 18234-2 | ⑩ Firewall capping |
| ④ Roofing membrane Rhepanol hfk, mechanically fastened | ⑪ FDT sealant A |
| ⑤ Perimeter fixing with single fasteners (4 fasteners per metre) | ⑫ FDT sealing tape for PE vapour control layer |
| ⑥ Vertical mineral wool thermal insulation | ⑬ Pre-compressed tape |
| ⑦ Rhepanol hsg flashing strip up to the upper edge | ⑭ Angle bracket |
| | ⑮ FDT seam tape for vapour control layer according to DIN 18234-2 |
| | ⑯ Insulation fillet |

Rhepanol® hfk
loose-laid with ballast



Safety and functional efficiency, supporting construction, vapour control layer

Safety and functional efficiency

Because of loose laying, the roof covering is separated from the other layers of the build-up across the complete area. Movements and cracks in the supporting construction are not transferred into the roof covering.

The ballast ensures the membrane remains secure against wind uplift forces.

Rhepanol hfk is compatible with bitumen and can be applied without additional separation layers directly on old bituminous sheets.

The integrated, highly tear-resistant synthetic fleece of Rhepanol hfk allows diffusion, ensuring reliable vapour pressure compensation. Furthermore the fleece backing provides protection against stresses originating from the substrate.

Application instructions

Supporting construction

- The supporting deck structure has to meet the requirements with regard to load-bearing capacity, deflection, anchorage and drainage.
- Clean, dry and even roof surfaces.
- Substrates for application must be free of open cracks, rough concrete, sharp edges and stones.
- Joints have to be formed according to constructional requirements, as their width or movement may impede the functional efficiency of the roof sealing.
- The roof slope should not exceed 3° to prevent the ballast slipping off. In case of steeper roof slopes, application is to be agreed with our FDT Technical Department.

- An intrusion of air underneath the roof covering at the roof perimeter and at roof penetrations must be prevented. Therefore these areas have to be made windtight.
- For compatibility reasons, timber board cladding, chipboards and similar may be treated only with salt-based wood preservatives. Oil or solvent based impregnation agents must not be used.
- National standards and regulations must be observed.

Vapour control layer

In the case of non ventilated roofs, we recommend the following vapour control layers:

- For non air-conditioned rooms (e.g. living rooms and offices or similar rooms without suspended ceiling): FDT vapour control layer fk (polyethylene) with air space width equivalent to water vapour diffusion $s_d \geq 100$ m.

In the case of aerated concrete supporting decks with correctly calculated thermal insulation, you may leave out a vapour control layer, if the room temperature stays below 20 °C und the relative air humidity inside the room will not exceed 65%.

The vapour control layer is applied with a seam overlap of 100 mm, with the seams being sealed with connection or seam tape. The FDT vapour control layer fk must be taken up and flashed at connections and cappings; at roof penetrations it must be flashed.

Vapour control layer

Thermal insulation layer

- For rooms with high air condition loads (e.g. swimming pools, air-conditioned rooms):
 - aluminium composite foil (e. g. FDT vapour control layer alu-gv-sk)
 - vapour control membrane with metal tape reinforcement.
- If laid on a rough substrate, synthetic vapour control membranes are to be installed on an additional levelling layer (e. g. FDT synthetic fleece 300 g/m²).
- National standards and regulations must be observed.

Thermal insulation layer

You must bear in mind tread-fastness when designing the thermal insulation layer on steel profile supporting decks. Expanded polystyrene foam boards with rebated edge according to DIN EN 13163 and a length of max. 1.25 m are especially suitable materials for thermal insulation layers.

With roof areas for walking on, insulation materials with higher compression strength must be used in accordance with the expected loads.

Insulation materials that are not dimensionally stable and which buckle or bulge must not be installed.

The insulation elements must be laid in a brick-bond pattern.

National standards and regulations must be observed.

The guidelines of the insulation board manufacturer must be observed.

Rhepanol hfk, loose-laid

Roofing membranes Rhepanol hfk are loose-laid with a seam overlap of min. 50 mm. The membrane seams are securely joined by homogeneous hot air welding. At all flashings and trims, built-in details etc., linear perimeter fixing with at least 4 fasteners/m is required.

Ballast

Immediately apply ballast on loose-laid roofing membranes to secure its position against wind uplift.

Suitable materials are:

- Round washed gravel, min. 50 mm thick, washed natural uncrushed stones, e. g. 16 – 32 mm diameter
- Paving slabs in a gravel bed on a protection layer

If appropriate gravel is not available or the gravel is applied pneumatically, then, as under paving slabs, you will need an additional protection layer (e.g. synthetic fleece or FDT protection layer). Under screed you will have to apply the FDT protection layer (the overlaps have to be welded).

PE layers and coarse rubber protective sheets must have an underlying synthetic fleece layer (FDT synthetic flees 180 g/m² or 300 g/m²).

For ballast the provisions of national wind load standards must be observed.

Flashings and cappings, roof refurbishment

All flashings and cappings are carried out with Rhepanol hsg flashing strips.

If the flashing membrane is bonded, then at flashing heights over 200 mm, full-size adhesive bonding is necessary. Valley areas are left unbonded at a width of 200 mm to allow movement compensation. In case of mechanical fastening of the flashing membrane, e. g. the FDT fastening profile or the backed Rhepanol coated metal sheet can be used. Apply flashing strips max. 150 mm in the roof area.

In case of wall flashings, the upper edge of the Rhepanol hsg flashing strip is pressed to the substrate with rigid wall connection profiles such as „Classic“ and additionally secured with FDT sealant A or S.

The two-part FDT roof edge trims ensure flexible, yet windproof capping of the roof perimeter. When laying Rhepanol hsg flashing membranes, in the area of cappings, bracket-mounted gutters and wall flashings also backed Rhepanol coated metal sheets can be used.

Like galvanized sheets, the necessary flashing and capping profiles are cut from coated metal sheets and bent according to the specification and the local requirements.

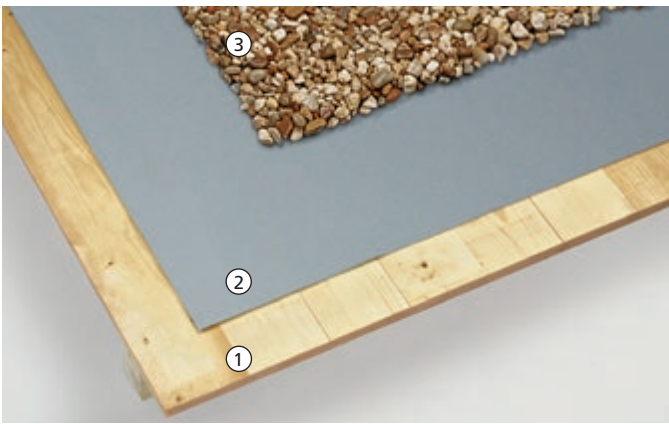
Forming of flashings and cappings is identical for all application methods. You will find examples on this topic in the drawings “Technical details”.

Additional requirements for roof refurbishment:

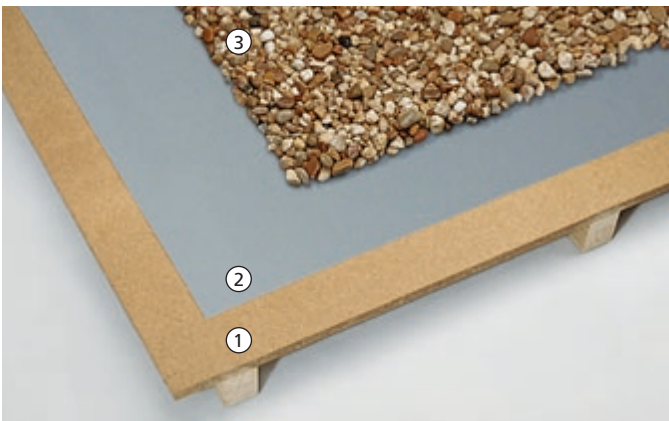
- Thoroughly sweep the roof area. Remove any blisters, projections and coarse roughness.
- On rough substrates (such as embedded gravel), a protection layer is necessary. We recommend suitable polystyrene insulation boards, which provide additional insulation at the same time.
- Temporary storage of gravel must not exceed the maximum load of the supporting deck.
- Soiled gravel must be cleaned (e.g. by sieving). Otherwise, appropriate protection layers such as synthetic fleece 300 g/m² must be applied.

Layer build-ups

Examples of layer build-ups Ventilated roof (cold roof)



- ① Suitable timber board cladding, min. 24 mm thick
- ② Roofing membrane Rhepanol hfk
- ③ Round washed gravel, e.g. 16/32 mm

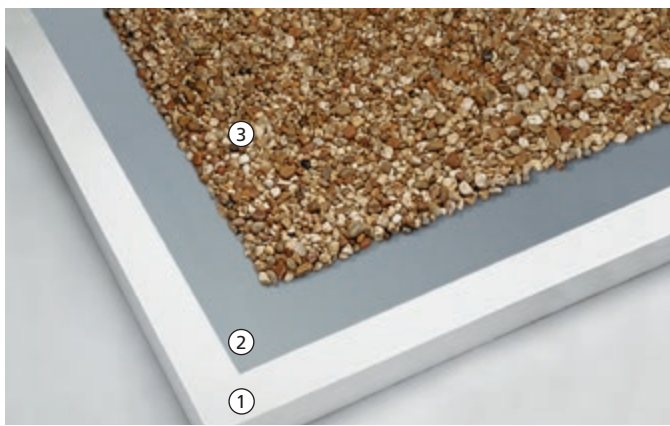


- ① Suitable chipboards, min. 22 mm thick
- ② Roofing membrane Rhepanol hfk
- ③ Round washed gravel, e.g. 16/32 mm

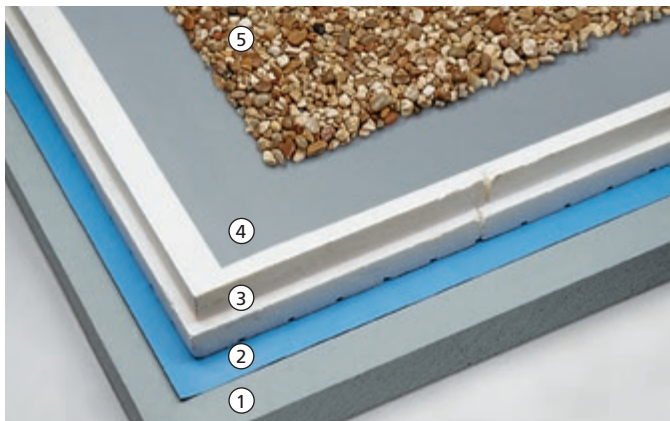
Layer build-ups

Examples of layer build-ups

Ventilated roof (warm roof)



- ① Aerated concrete
- ② Roofing membrane Rhepanol hfk
- ③ Round washed gravel, e.g. 16/32 mm

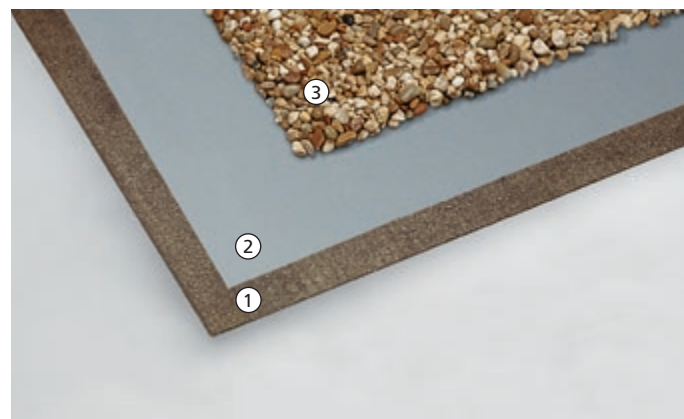


- ① Reinforced concrete
- ② FDT vapour control layer fk
- ③ Thermal insulation layer EPS
- ④ Roofing membrane Rhepanol hfk
- ⑤ Round washed gravel, e.g. 16/32 mm

Examples of layer build-ups

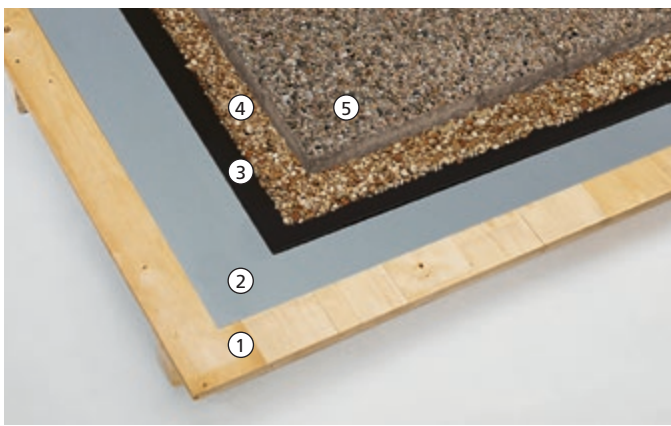
Old bituminous roofing

- ① Old bituminous roofing, independent of the supporting deck (refurbishment)
- ② Roofing membrane Rhepanol hfk
- ③ Round washed gravel, e.g. 16/32 mm

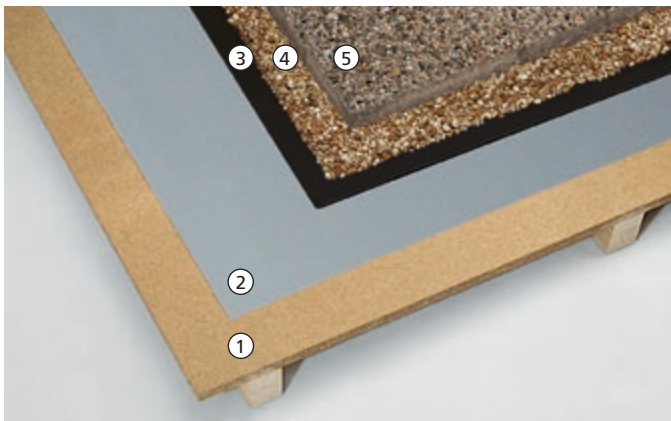


Layer build-ups

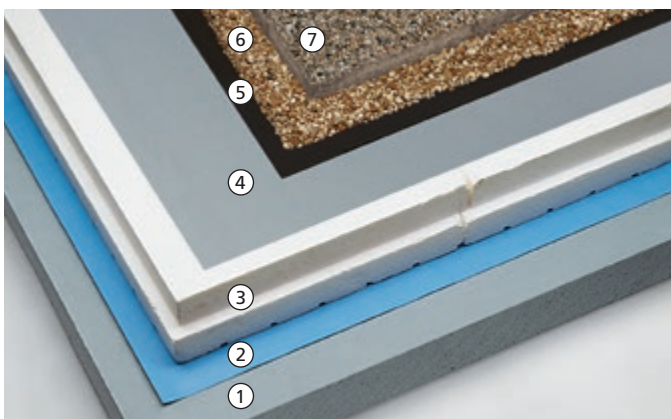
Examples of layer build-ups for decks and terraced areas



- ① Suitable timber board cladding, min. 24 mm thick
- ② Roofing membrane Rhepanol hfk
- ③ Protection layer, e.g. FDT protection layer
- ④ Fine gravel bed, min 30 mm thick
- ⑤ Paving slabs, e.g. 500/500/50 mm



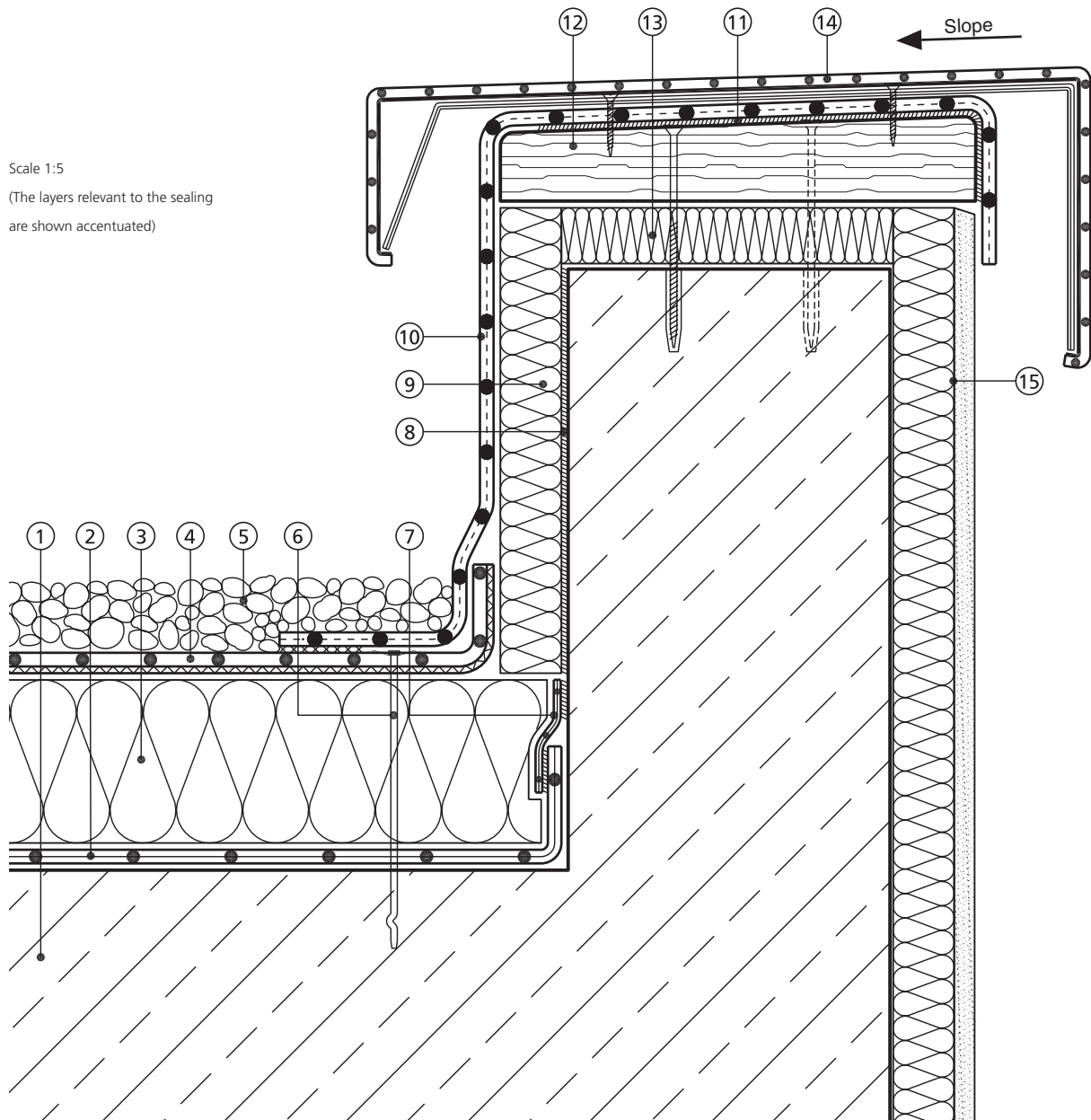
- ① Suitable chipboards, min. 22 mm thick
- ② Roofing membrane Rhepanol hfk
- ③ Protection layer, e.g. FDT protection layer
- ④ Fine gravel bed, min 30 mm thick
- ⑤ Paving slabs, e.g. 500/500/50 mm



- ① Reinforced concrete
- ② FDT vapour control layer fk (protection layer for concrete if necessary)
- ③ Thermal insulation
- ④ Roofing membrane Rhepanol hfk
- ⑤ Protection layer, e.g. FDT protection layer
- ⑥ Fine gravel bed, min 30 mm thick
- ⑦ Paving slabs, e.g. 500/500/50 mm

Capping

Non ventilated roof



Scale 1:5

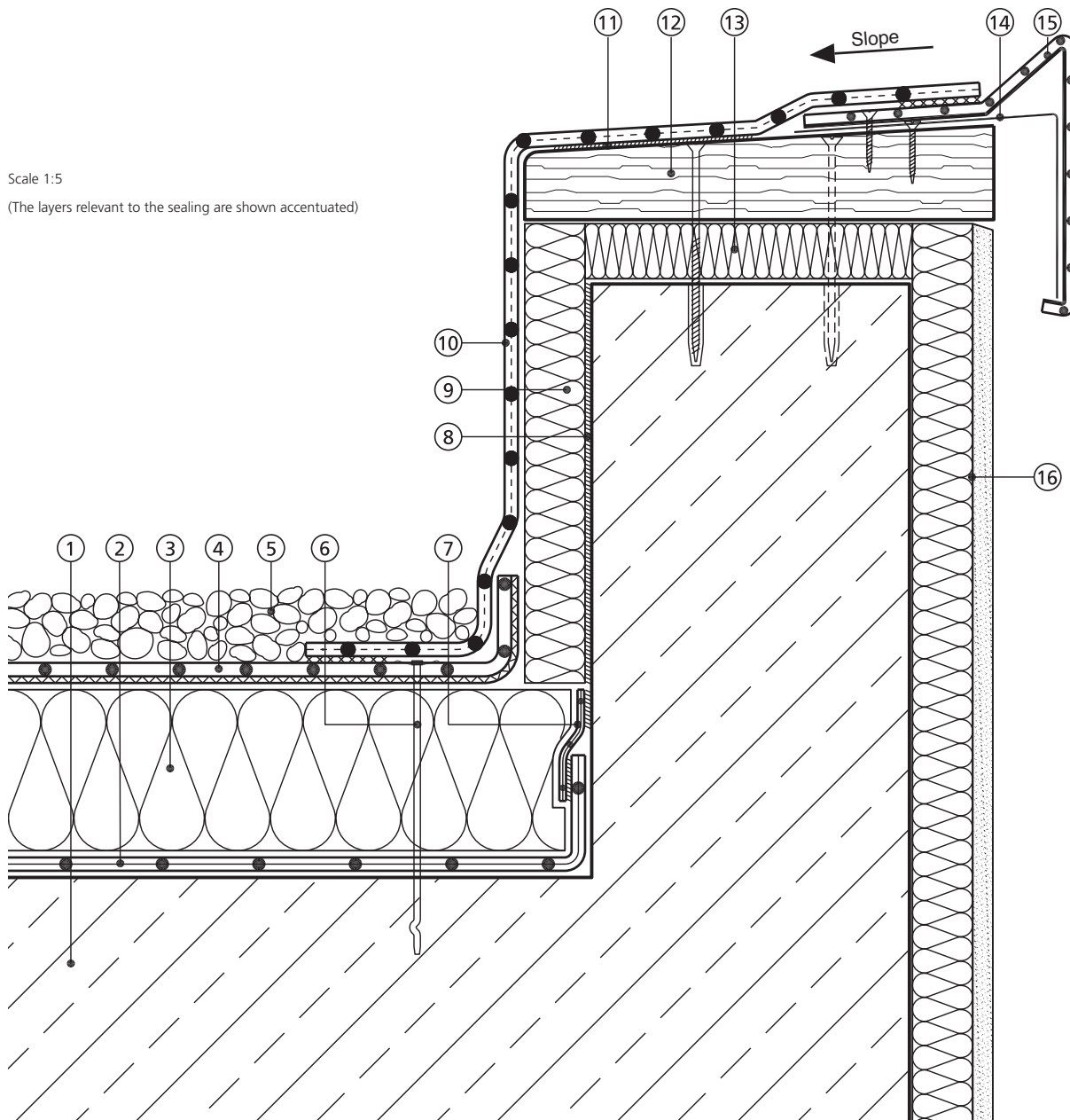
(The layers relevant to the sealing are shown accentuated)

- | | |
|---|---|
| ① Reinforced concrete | ⑧ Adhesive bond |
| ② FDT vapour control layer fk (protection layer on concrete, as required) | ⑨ Vertical thermal insulation |
| ③ Thermal insulation | ⑩ Rhepanol hsg flashing strip |
| ④ Roofing membrane Rhepanol hfk, loose-laid | ⑪ Rhepanol contact adhesive 50 |
| ⑤ Min. 50 mm round washed gravel 16/32 mm | ⑫ Treated timber profile (salt-based) |
| ⑥ Perimeter fixing with single fasteners through the roofing membrane | ⑬ Pressure-resistant thermal insulation |
| ⑦ FDT connection tape for FDT vapour control layer fk | ⑭ Parapet capping made of Rhepanol coated metal sheet |
| | ⑮ Thermal insulation composite system |

Parapet
Non ventilated

Scale 1:5

(The layers relevant to the sealing are shown accentuated)



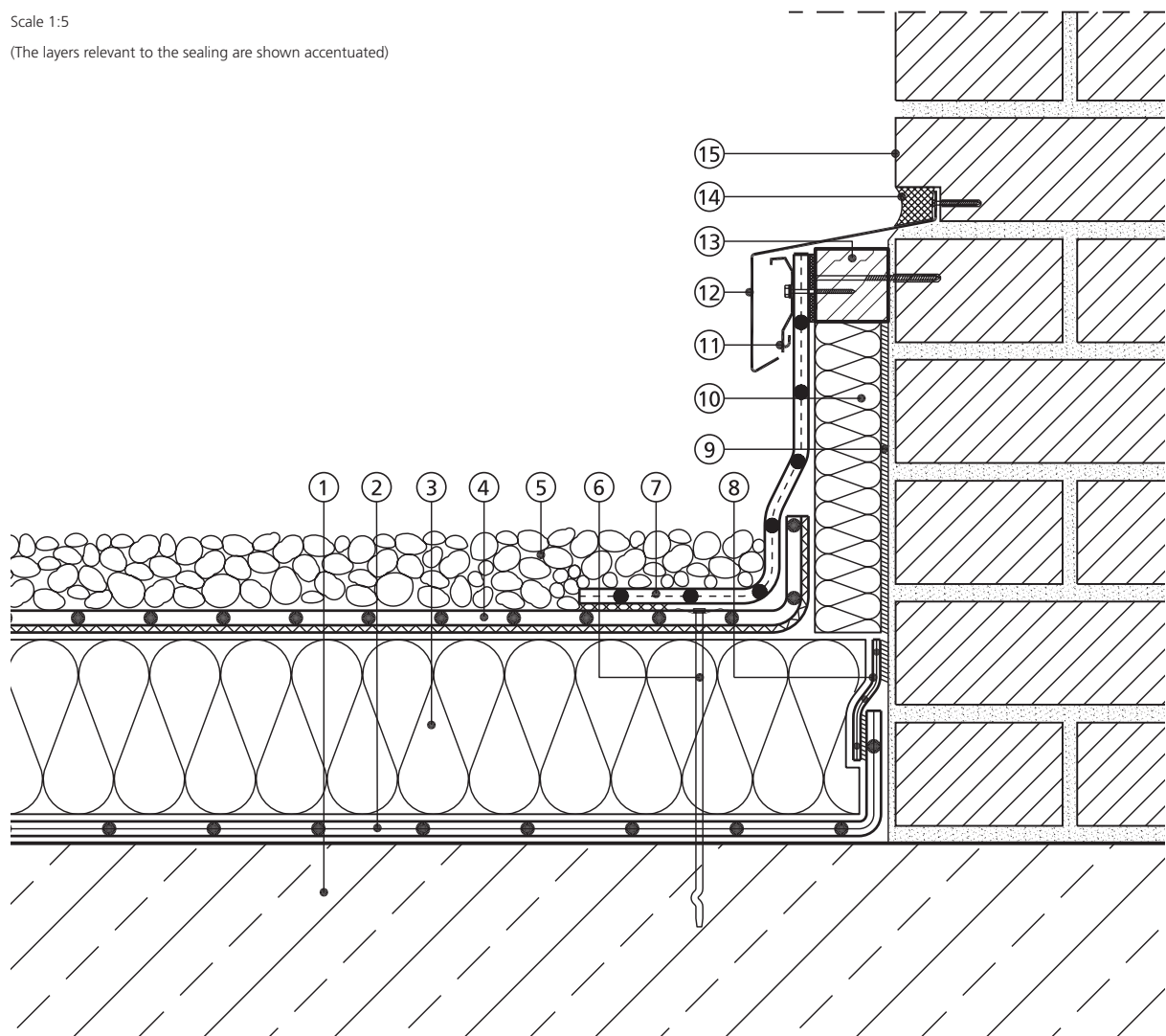
- | | |
|---|---|
| ① Reinforced concrete | ⑧ Adhesive bond |
| ② FDT vapour control layer fk (protection layer on concrete, as required) | ⑨ Vertical thermal insulation |
| ③ Thermal insulation | ⑩ Rhepanol hsg flashing strip |
| ④ Roofing membrane Rhepanol hfk, loose-laid | ⑪ Rhepanol contact adhesive 50 |
| ⑤ Min. 50 mm round washed gravel 16/32 mm | ⑫ Treated timber profile (salt-based) |
| ⑥ Perimeter fixing with single fasteners through the roofing membrane | ⑬ Pressure-resistant thermal insulation |
| ⑦ FDT connection tape for FDT vapour control layer fk | ⑭ Stiffening profile |
| | ⑮ Rhepanol coated metal sheet |
| | ⑯ Thermal insulation composite system |

Wall connection

Non ventilated roof

Scale 1:5

(The layers relevant to the sealing are shown accentuated)



- | | |
|---|---|
| ① Reinforced concrete | ⑧ FDT connection tape for FDT vapour control layer fk |
| ② FDT vapour control layer fk (protection layer on concrete, as required) | ⑨ Adhesive bond |
| ③ Thermal insulation | ⑩ Vertical thermal insulation |
| ④ Roofing membrane Rhepanol hfk, loose-laid | ⑪ FDT aluminium wall connection profile Classic |
| ⑤ Min. 50 mm round washed gravel 16/32 mm | ⑫ Overhang |
| ⑥ Perimeter fixing with single fasteners through the roofing membrane | ⑬ Treated timber profile (salt-based) |
| ⑦ Rhepanol hsg flashing strip | ⑭ FDT sealant A or S |
| | ⑮ Brick work, with render at flashing area |

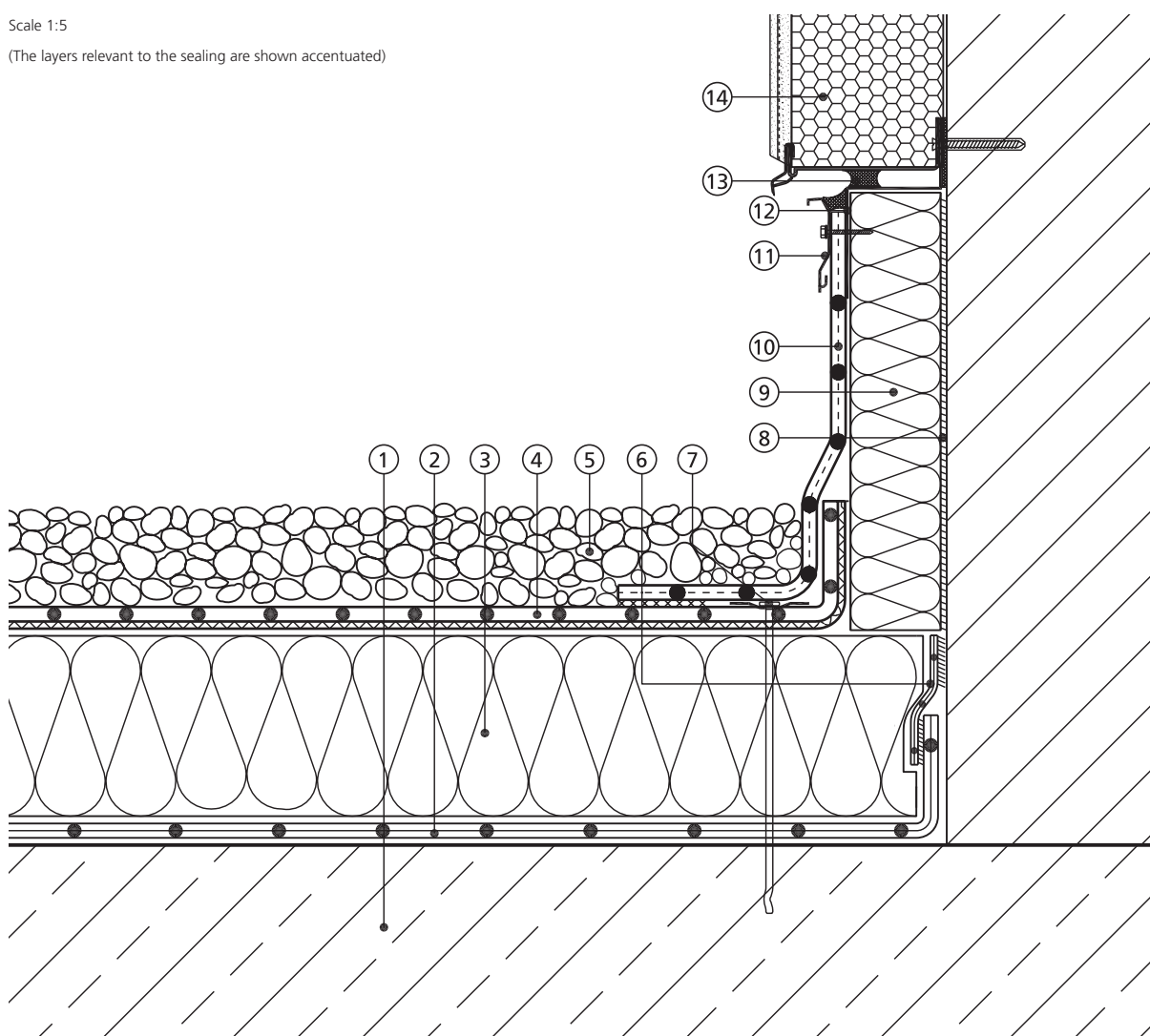
Wall connection with thermal insulation composite system

composite system

Non ventilated roof

Scale 1:5

(The layers relevant to the sealing are shown accentuated)



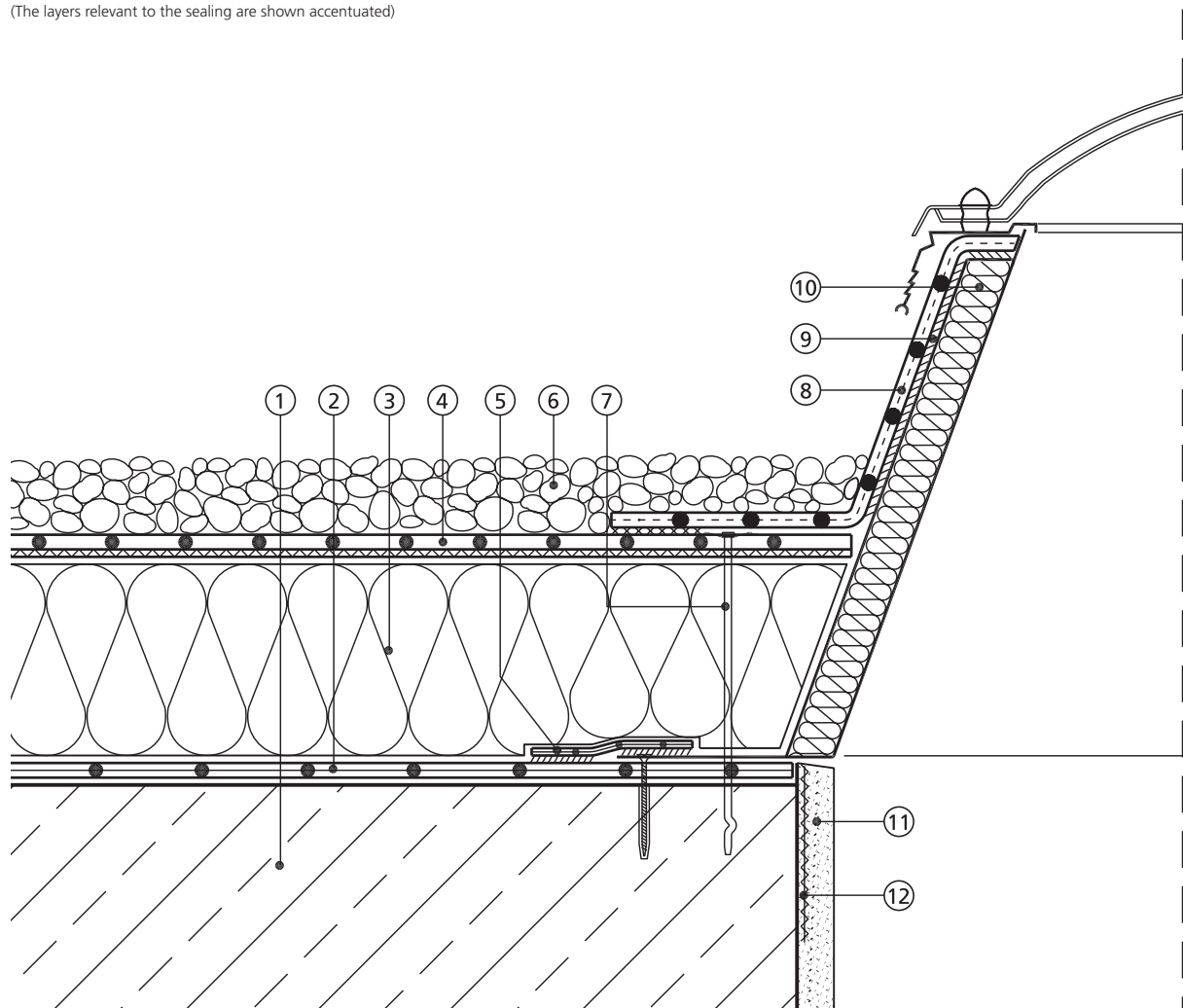
- | | |
|---|---|
| ① Reinforced concrete | ⑧ Adhesive bond |
| ② FDT vapour control layer fk (protection layer on concrete, as required) | ⑨ Vertical thermal insulation |
| ③ Thermal insulation | ⑩ Rhepanol hsg flashing strip |
| ④ Roofing membrane Rhepanol hfk, loose-laid | ⑪ FDT aluminium wall connection profile Classic |
| ⑤ Min. 50 mm round washed gravel 16/32 mm | ⑫ Z-profile with sealing towards pos. 11 |
| ⑥ FDT connection tape for FDT vapour control layer fk | ⑬ Permanently elastic sealing |
| ⑦ Perimeter fastening with single fasteners through the roofing membrane | ⑭ Thermal insulation composite system with base profile |

Rooflight connection

Non ventilated roof

Scale 1:5

(The layers relevant to the sealing are shown accentuated)

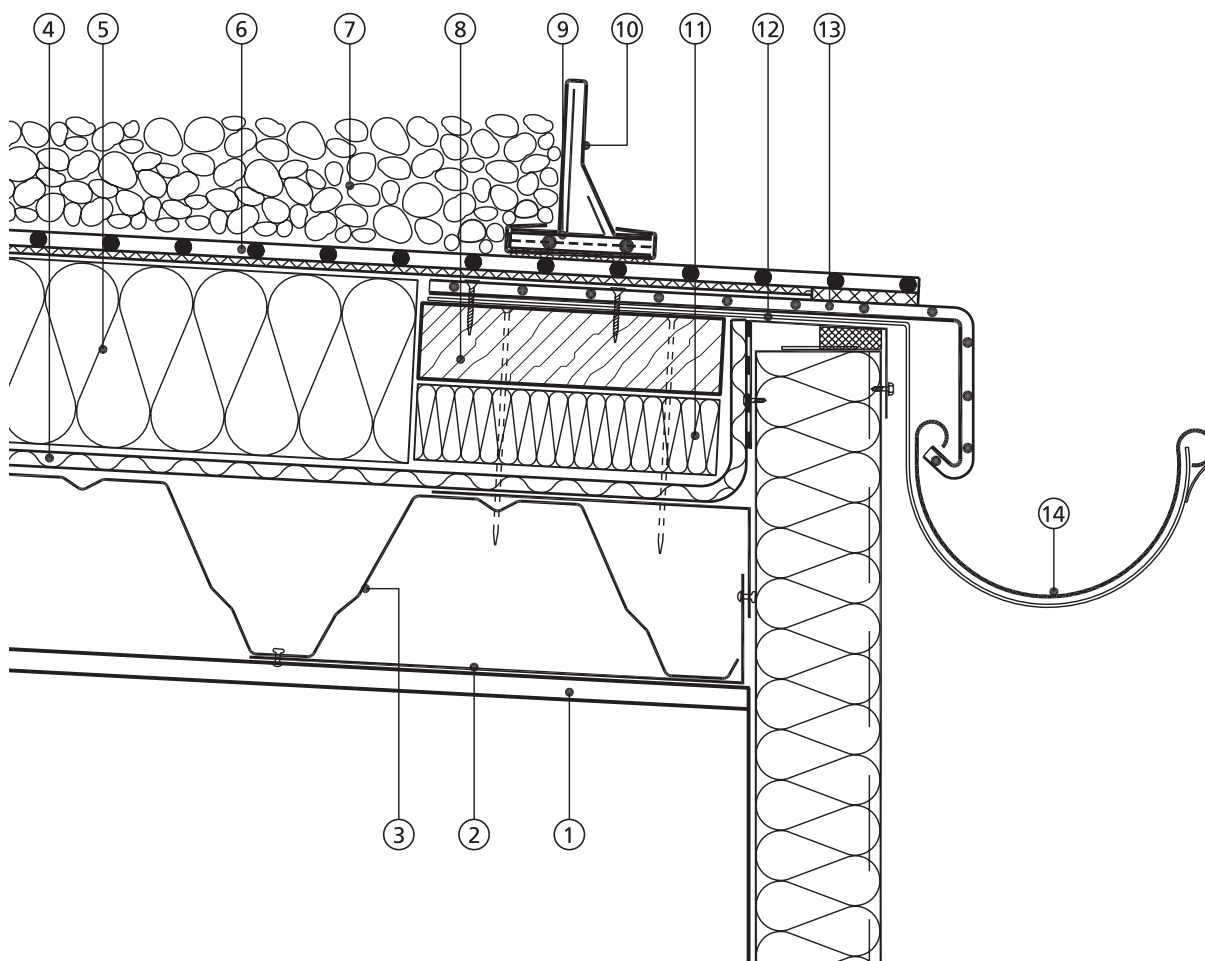


- | | |
|---|---|
| ① Reinforced concrete | ⑦ Perimeter fixing with single fasteners through the roofing membrane |
| ② FDT vapour control layer fk (protection layer on concrete, as required) | ⑧ Rhepanol hsg flashing strip |
| ③ Thermal insulation | ⑨ Rhepanol contact adhesive 50 |
| ④ Roofing membrane Rhepanol hfk, loose-laid | ⑩ Rooflight kerb |
| ⑤ FDT connection tape for FDT vapour control layer fk | ⑪ Render |
| ⑥ Min. 5 mm round washed gravel 16/32 mm | ⑫ Structural support |

Gutter**Non ventilated roof**

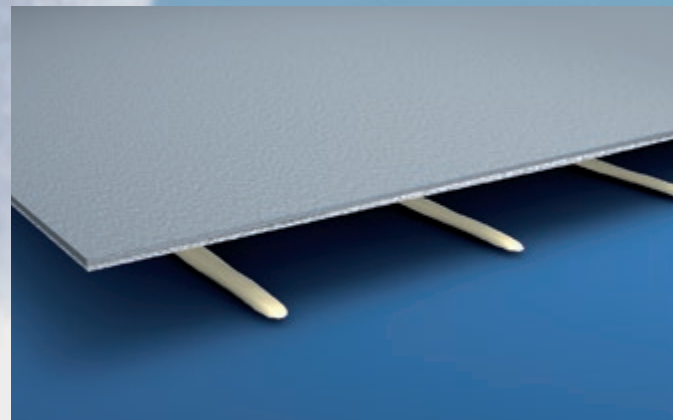
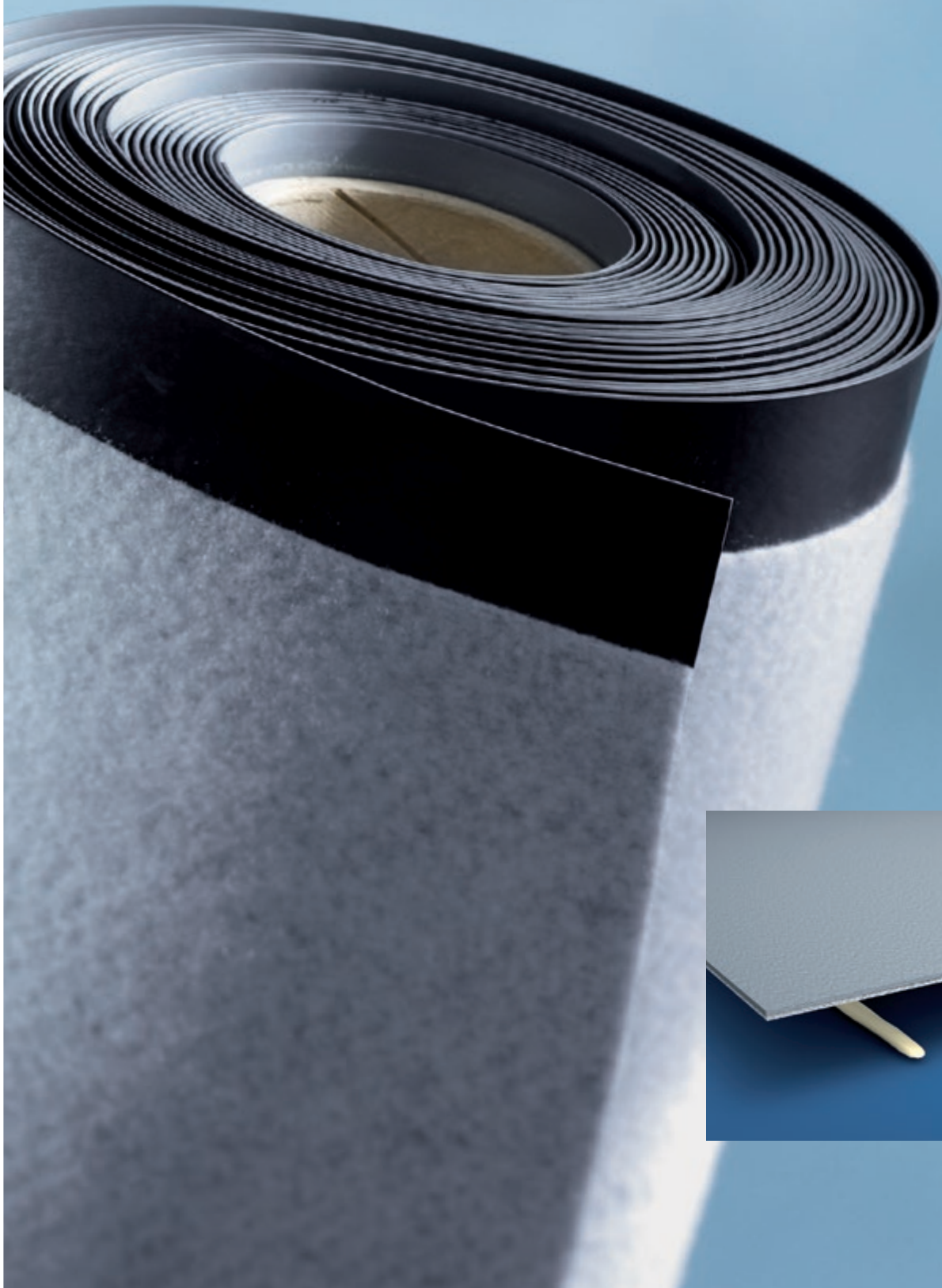
Scale 1:5

(The layers relevant to the sealing are shown accentuated)



- | | |
|---|---|
| ① Supporting deck | ⑨ Rhepanol holder with clamp |
| ② Supporting bracket | Supporting strip |
| ③ Profiled steel decking, corrosion protected | Rhepanol hsg flashing strip |
| ④ Vapour control layer | ⑩ FDT gravel stop profile |
| ⑤ Thermal insulation | ⑪ Pressure-resistant thermal insulation |
| ⑥ Roofing membrane Rhepanol hfk, loose-laid | ⑫ Bracket |
| ⑦ Min. 5 mm round washed gravel 16/32 mm | ⑬ Rhepanol coated metal sheet |
| ⑧ Treated timber profile (salt-based) | ⑭ Gutter |

**Rhepanol® hfk
bonded fixing**



Safety and functional efficiency, supporting structure, vapour control layer

Safety and functional efficiency

Bonding Rhepanol hfk in stripes ensures maximum possible mobility of the roofing membrane. The integrated, highly tear-resistant synthetic fleece of Rhepanol hfk allows diffusion, thus ensuring reliable vapour pressure compensation and secure bonding to the substrate. Rhepanol hfk is compatible with bitumen and can be bonded without additional separation layers, directly to old bituminous sheets. The integrated synthetic fleece protects the membrane against stresses originating from the substrate.

Application instructions

Supporting construction

- The supporting deck structure has to meet the technical requirements, especially for loadbearing capacity, deflection, anchorage and drainage.
- Substrates for application must be free of open cracks, rough concrete and sharp projections.
- Joints have to be formed according to constructional requirements, as their width or movement may impede the functional efficiency of the roof waterproofing.
- An intrusion of air underneath the roof covering at the roof perimeter and at roof penetrations must be prevented. Therefore these areas have to be made windtight.
- Clean, dry and even roof surfaces.

- The necessity for pre-coating to provide reliable adhesion and dust bonding depends on the substrate conditions.
 - Aerated concrete panels must always be pre-coated.
 - It is not necessary to pre-coat coated profiled steel decking, except when welding on bituminous sheets (only as bonding agent).
- National standards and regulations must be observed.

Vapour control layer

In the case of non ventilated roofs, we recommend the following vapour control layers:

- For non air-conditioned rooms (e.g. living rooms and offices or similar rooms without suspended ceiling): vapour control membrane with air space width equivalent to water vapour diffusion $s_d \geq 100$ m. In the case of aerated concrete supporting decks with correctly calculated thermal insulation, you may leave out a vapour control layer, if the room temperature stays below 20 °C and the relative air humidity inside the room will not exceed 65%.
- For rooms with high air condition loads (e.g. swimming pools, air-conditioned rooms): vapour control layer with aluminium reinforcement, glass fleece or woven glass tissue reinforcement.

In case of doubt, we recommend a calculation of the building physics in order to identify the diffusion characteristics of the roof build-up.

Vapour control layer

Thermal insulation layer

With lightweight steel decking, we also recommend in principle the installation of a separate vapour control layer, which should be formed as an air barrier according to the provisions of the Thermal Insulation Regulation.

- The vapour control layer must be taken up and flashed at connections and cappings; at roof penetrations it must be flashed.
- National standards and regulations must be observed.

Note:

- For bonding the insulation layer with FDT adhesive U, use vapour control membranes without PE backing or talcum coating.

Thermal insulation layer

The thermal insulation layer is to be designed in accordance with the thermal protection requirements.

As materials for thermal insulation layers we recommend:

- Flexible insulation boards or expanded polystyrene foam boards according to EN 13163 with backing. For fire protection reasons, bituminous sheets with an integrated glass fleece or fabric $\geq 60 \text{ g/m}^2$ may be necessary as a lining.

- Mineral fibre boards MW DAA according to DIN EN 13162 (e. g. Bondrock MV or Megarock). In case of bonded application using mineral fibre insulation material, the type of insulation material and the adhesive/amount of adhesive needed is to be defined depending on the project.
- Insulation boards made of expanded polystyrene, EPS DAA dm/dh, Euro Class E, with rebated edge according to DIN EN 13163.

As a lining, use bituminous sheets without PE backing.

Generally insulation boards must be laid brick-bond pattern. Insulation materials that are not dimensionally stable and which buckle or bulge, or insulation elements with insufficient lining stability must not be installed.

Bonding of EPS thermal insulation layers is preferably done with FDT adhesive U, a one-component polyurethane adhesive

Basic requirements:

- force-locking bond of the insulation to the substrate
- for insulation layers $> 150 \text{ mm}$ multiply bonded laying is required

For roof slopes exceeding 7° , additional supporting measures are necessary to prevent the materials slipping off while the adhesive is curing. For further information on the adhesive and its application see data sheet FDT adhesive U.

- National standards and regulations must be observed.

Consumption of FDT adhesive U for thermal insulation¹⁾

Building height ²⁾ Wind zone 1 and 2	Inner area DIN EN 1991-1-4	Perimeter and corner area DIN EN 1991-1-4	Min. amount of adhesive stripes/m ³⁾
0–8 m	160 g/m ²	220 g/m ²	8
over 8–20 m	180 g/m ²	250 g/m ²	8

¹⁾ For mineral fibre insulation materials as substrate, the adhesive consumption is to be defined depending on the project.

²⁾ At building heights over 20 m and for buildings in wind zones 3 and 4 according to DIN EN 1991-1-4, it is necessary to define the amount and distribution of adhesive needed or appropriate object-related measures for membrane position stability.

³⁾ In case of profiled steel decking, 2 adhesive stripes per corrugation. As the vapour control membrane may sag, the adhesive stripes must be placed on the corrugation shoulders.

Rhepanol® hfk bonded with FDT roofing membrane adhesive

Rhepanol hfk bonded with FDT roofing membrane adhesive

With the specially designed adhesives for Rhepanol, the roofing membrane is securely bonded to the substrate. The adhesive is applied in stripes with at least 8 stripes per metre.

Adhesive consumption depends on the location and height of the building and on the bonding substrate.

For building heights over 20 m and in the case of roofs with high wind exposure, it is necessary to calculate the amount of adhesive needed to fix the membrane securely depending on the project.

For roof slopes exceeding 15°, additional mechanical fastening may be necessary to prevent the roofing membrane slipping off while the adhesive is curing. At slopes exceeding 20°, application should be agreed with our experts. For information on the adhesive, its application and processing see data sheet (page 87).

Consumption of FDT roofing membrane adhesive for the roofing membrane Rhepanol hfk¹⁾

Building height wind zone 1 and 2	Inner area acc. to DIN EN 1991-1-4	Perimeter and corner areas acc. to DIN EN 1991-1-4	Min. amount of adhesive stripes/m ¹⁾
0–8 m	150 g/m ²	200 g/m ²	8
over 8–20 m	180 g/m ²	250 g/m ²	8

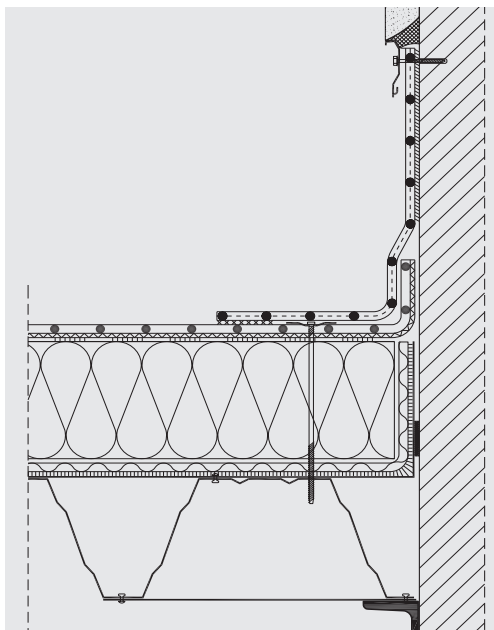
¹⁾ For mineral fibre insulation materials as substrate, the adhesive consumption is to be defined depending on the project.

Hazard identification, safety precautions, transport markings, see EC safety data sheet.

Linear perimeter fixing, flashings and cappings, roof refurbishment

Linear perimeter fixing

A linear perimeter fixing at flashings and cappings or built-in details is generally necessary. The perimeter fixing of the roof build-up, including the roofing membrane, is achieved in each instance with at least four in-line fastening elements per metre or the FDT fastening profile. Apply flashing strips max. 150 mm in the roof area.



Sketch: Linear perimeter fixing.

Flashings and cappings

All flashings and cappings are carried out with Rhepanol hsk flashing strips. With flashing heights of over 200 mm Rhepanol fk should be fully adhered to the upstands. Valley areas should be left unbonded for an area of 200 mm to allow for movement.

For mechanically fastening of the flashing membrane FDT fastening profiles or Rhepanol laminated metal sheets can be used. The upper edge of the Rhepanol hfk roofing membrane is pressed to the substrate with rigid wall connection profiles such as "Classic" and additionally secured with FDT sealant A or S. The two-part FDT roof edge trims ensure flexible, yet windproof capping of the roof perimeter.

When laying Rhepanol hfk to parapets, bracket mounted gutters and flashings it may be appropriate to use Rhepanol laminated metal flashings. The necessary flashing and capping profiles are cut from Rhepanol laminated metal sheets and bent according to the specification and the local requirements like galvanized sheets. Forming of flashings and cappings is identical for all application methods. For drawing example see "Technical details".

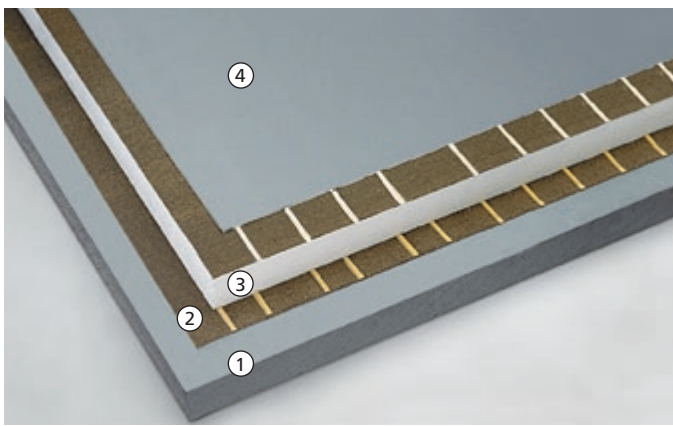
Additional requirements for roof refurbishment:

- Before overlaying with Rhepanol hfk the adhesion between the old roofing layers, as well as to the supporting deck must be completely secure. Otherwise mechanical fastening will be necessary.
- With old roofs bonded with cold bituminous adhesive a mechanical fastening of the old roof is obligatory due to the plastic dimensional dynamics of the cold bituminous adhesive.
- The substrate must be suitable for bonding, free from chippings and thoroughly cleaned.

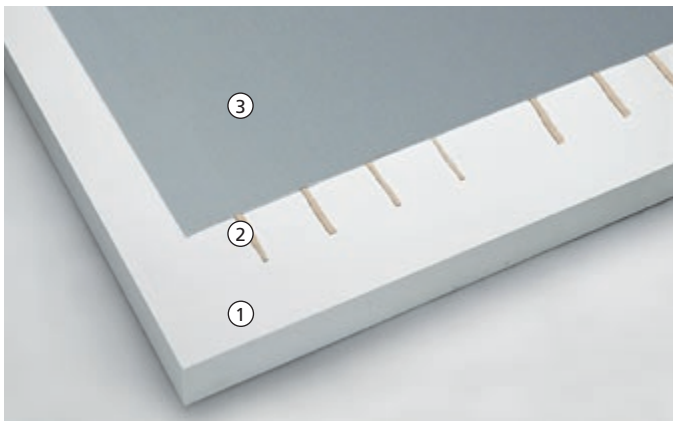
Roof build-up

Examples for layer build-ups

Non ventilated roof (warm roof)



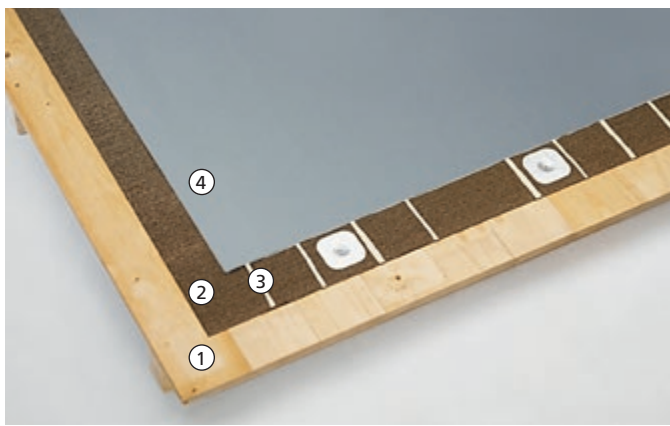
- ① Reinforced concrete
- ② Bituminous vapour control layer, bonded
- ③ EPS thermal insulation layer, bonded with FDT adhesive U
- ④ Roofing membrane Rhepanol hfk, bonded with FDT roofing membrane adhesive e.g. on EPS panels with bituminous felt



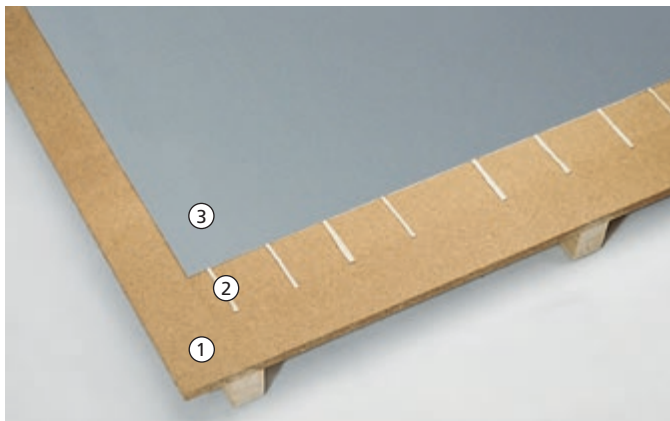
- ① Aerated concrete, pre-coated as required
- ② Adhesive stripes FDT roofing membrane adhesive
- ③ Roofing membrane Rhepanol hfk, not bonded over board joints (sliding strips over cross joints as required)

Roof build-up

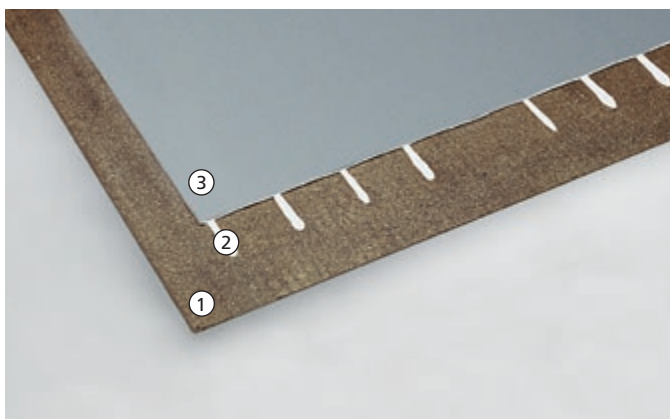
Ventilated roof (cold roof)



- ① Timber board cladding, min. 24 mm thick
- ② Bituminous sheet with tear-resistant reinforcement, mechanically fastened, closed seams
- ③ Adhesive stripes of FDT roofing membrane adhesive
- ④ Roofing membrane Rhepanol hfk



- ① Suitable chipboards, min. 22 mm thick
- ② Adhesive stripes FDT roofing membrane adhesive
- ③ Roofing membrane Rhepanol hfk, not bonded over board joints (sliding strips as required)

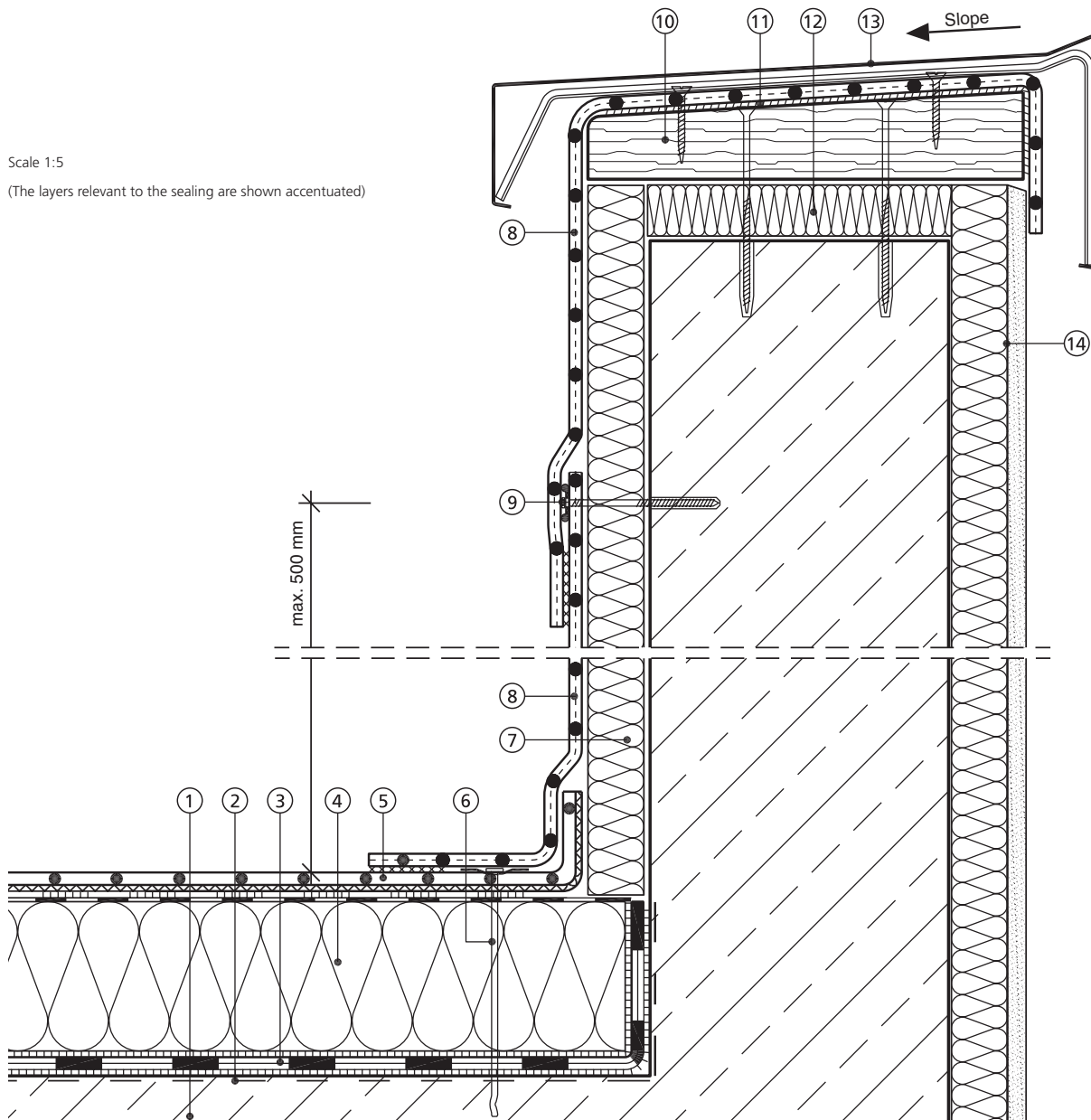


- ① Stable old bituminous roofing, independent of the type of supporting deck (refurbishment)
- ② Adhesive stripes FDT roofing membrane adhesive
- ③ Roofing membrane Rhepanol hfk

Parapet
Non ventilated roof

Scale 1:5

(The layers relevant to the sealing are shown accentuated)

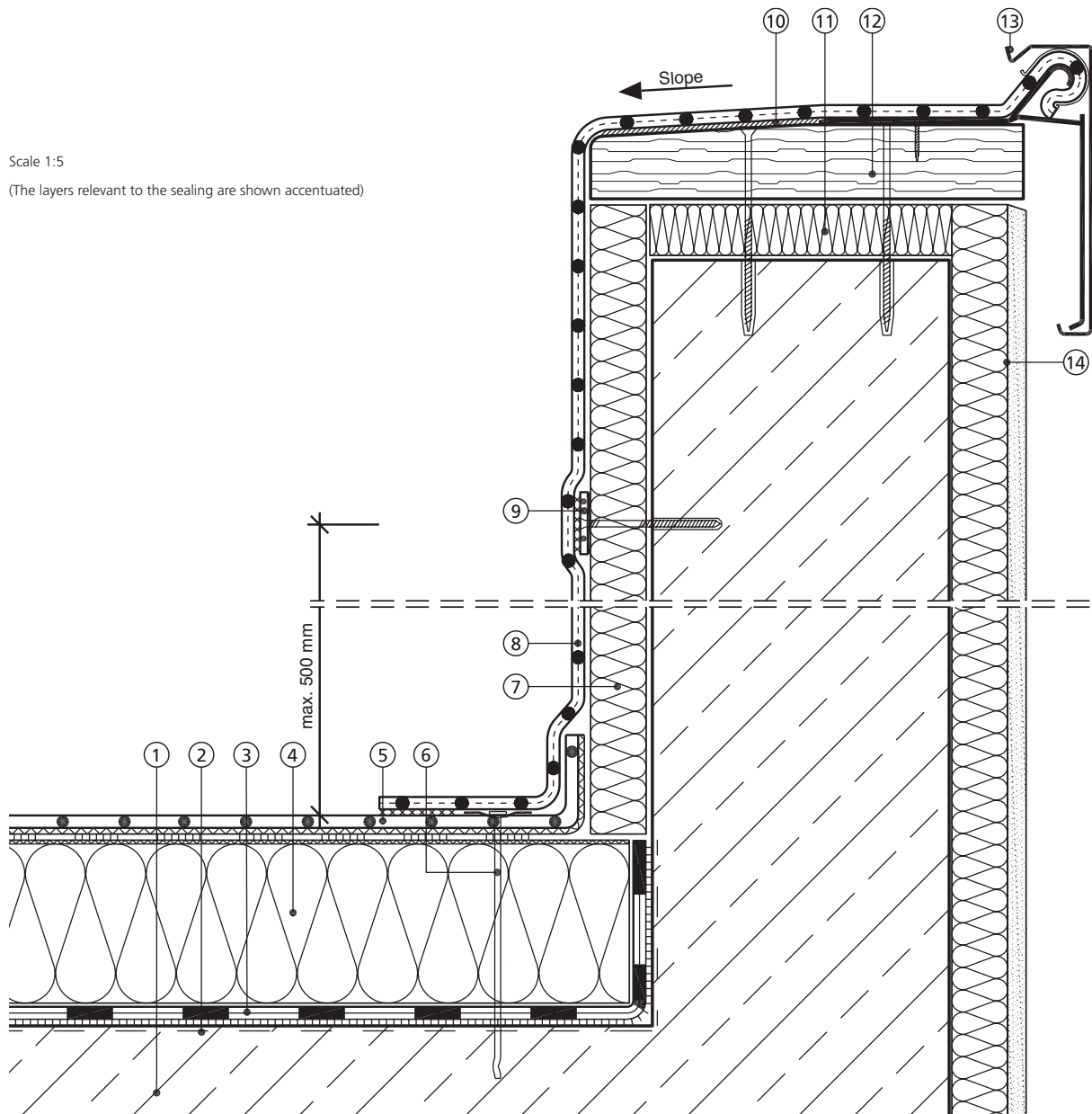


- | | |
|--|--|
| ① Reinforced concrete | ⑦ Mineral fibre insulation |
| ② Cold bitumen pre-coating, as required | ⑧ Rhepanol hsg flashing strip |
| ③ Bituminous vapour control layer, bonded | ⑨ Intermediate fixing with FDT fastening profile |
| ④ EPS thermal insulation, bituminous felt facing, bonded with FDT adhesive U | ⑩ Treated timber profile (salt-based) |
| ⑤ Roofing membrane Rhepanol hfk, bonded with FDT roofing membrane adhesive | ⑪ Rhepanol contact adhesive 50 |
| ⑥ Perimeter fixing with single fasteners through the roofing membrane | ⑫ Pressure-resistant thermal insulation |
| | ⑬ Capping |
| | ⑭ Thermal insulation composite system |

Parapet Non ventilated roof

Scale 1:5

(The layers relevant to the sealing are shown accentuated)

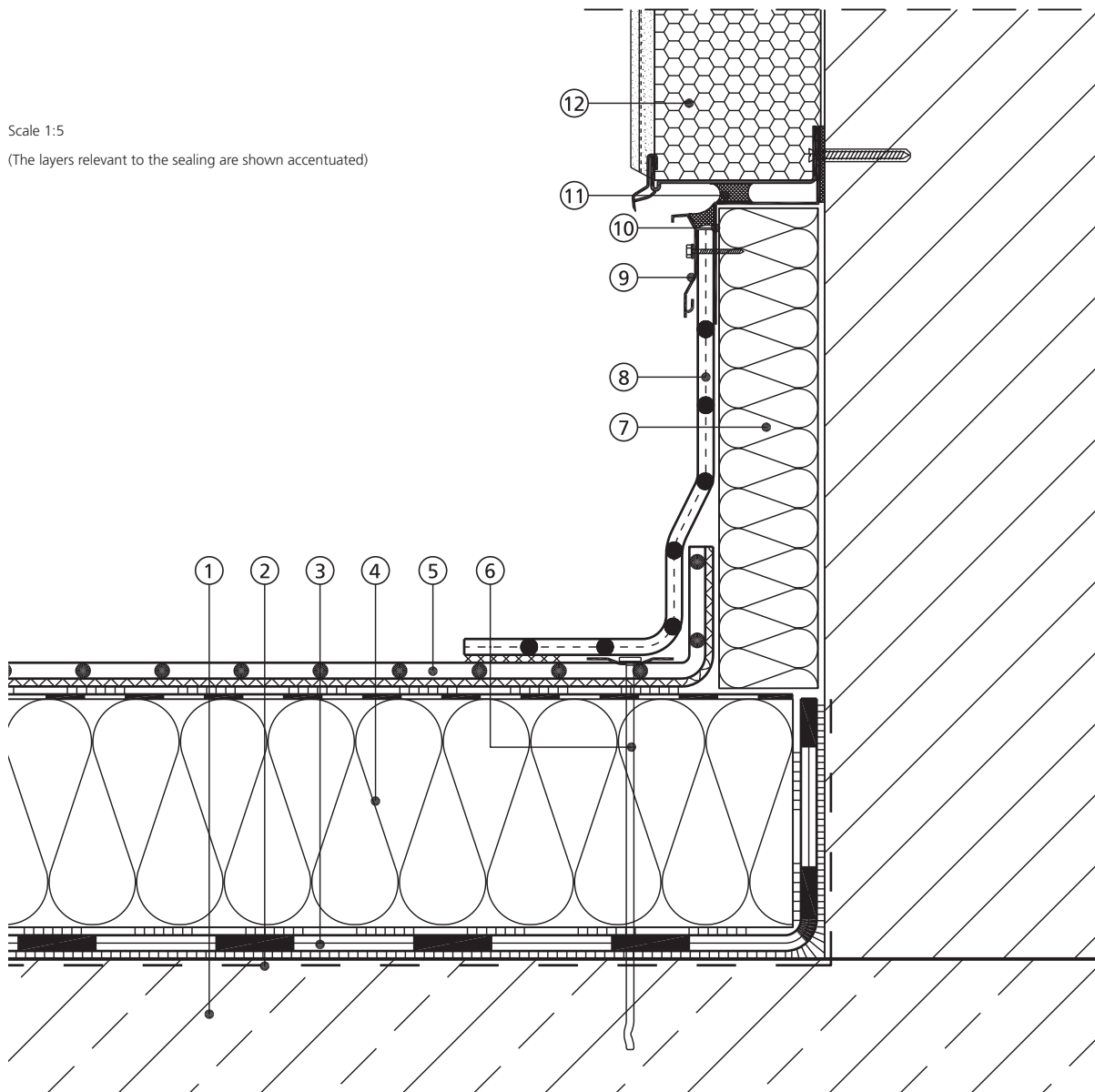


- | | |
|---|---|
| ① Reinforced concrete | ⑦ Vertical thermal insulation |
| ② Cold bitumen pre-coating, as required | ⑧ Rhepanol hsg trim strip
(welded to the coated metal sheet) |
| ③ Bituminous vapour control layer, bonded | ⑨ Intermediate fixing with FDT coated metal sheet |
| ④ Mineral wool thermal insulation, mineral fleece facing, Bondrock MV, bonded application | ⑩ Rhepanol contact adhesive 50 |
| ⑤ Roofing membrane Rhepanol hfk, bonded (in stripes) with FDT roofing membrane adhesive | ⑪ Pressure-resistant thermal insulation |
| ⑥ Perimeter fixing with single fasteners through the roofing membrane | ⑫ Treated timber profile (salt-based) |
| | ⑬ FDT aluminium roof edge trim 110 |
| | ⑭ Thermal insulation composite system |

**Wall connection thermal insulation composite system
Non ventilated roof**

Scale 1:5

(The layers relevant to the sealing are shown accentuated)



- ① Reinforced concrete
- ② Cold bitumen pre-coating, as required
- ③ Bituminous vapour control layer, bonded
- ④ EPS thermal insulation, bituminous felt facing, bonded with FDT adhesive U
- ⑤ Roofing membrane Rhepanol hfk, bonded with FDT roofing membrane adhesive
- ⑥ Perimeter fixing with single fasteners through the roofing membrane (4 fasteners/m)

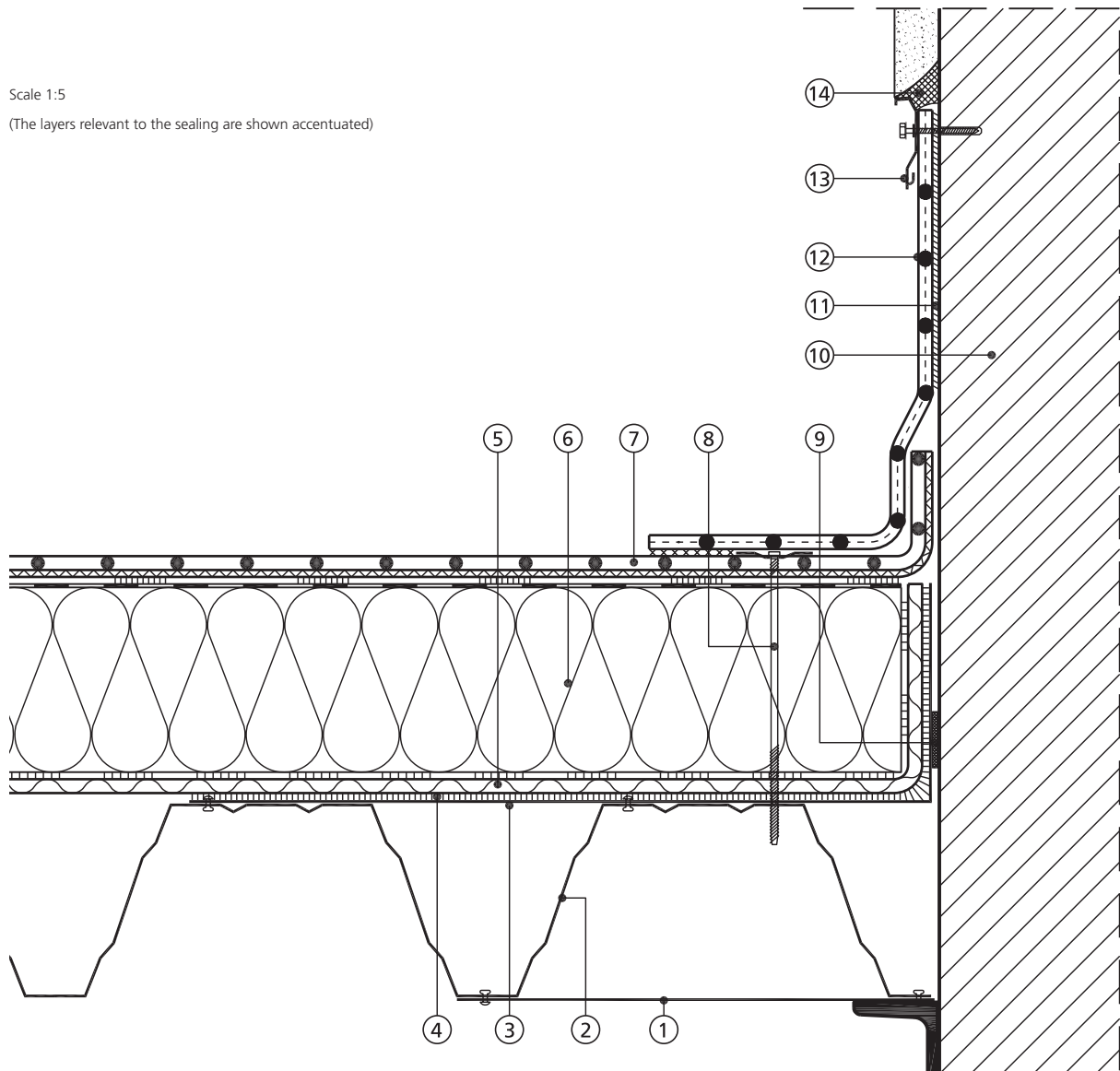
- ⑦ Vertical thermal insulation
- ⑧ Rhepanol hsg flashing strip
- ⑨ FDT aluminium wall connection profile Classic
- ⑩ Z-profile with sealing towards pos. 9
- ⑪ Permanently elastic sealing
- ⑫ Thermal insulation composite system with base profile

Wall connection

Non ventilated roof

Scale 1:5

(The layers relevant to the sealing are shown accentuated)



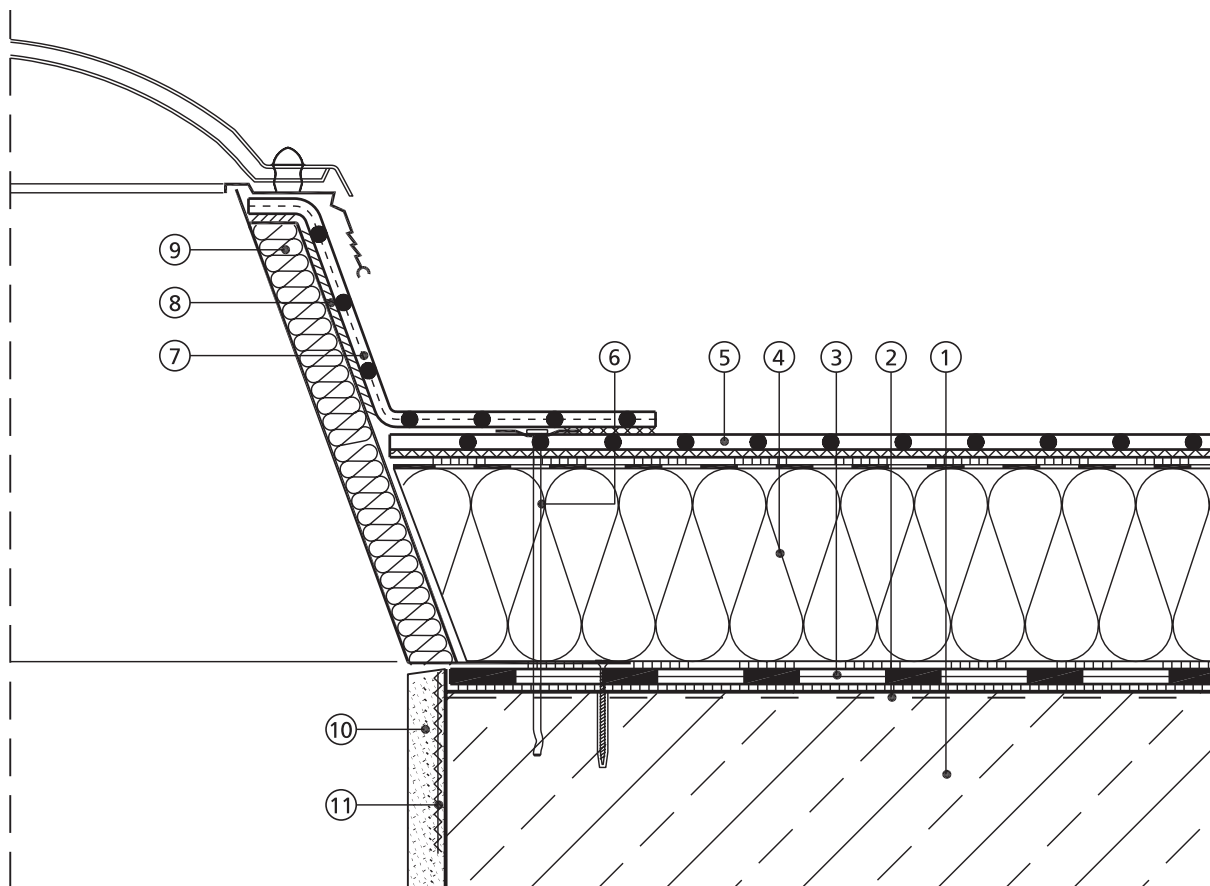
- ① Stiffening metal plate
- ② Profiled steel decking, corrosion protected
- ③ Supporting bracket
- ④ Cold bitumen pre-coating, as required
- ⑤ Vapour control layer
- ⑥ Thermal insulation, e. g. EPS, bituminous felt facing, bonded with FDT adhesive U
- ⑦ Roofing membrane Rhepanol hfk, bonded with FDT roofing membrane adhesive

- ⑧ Perimeter fixing with single fasteners through the roofing membrane (4 fasteners/m)
- ⑨ Airtight pre-compressed tape
- ⑩ Brick work
- ⑪ Rhepanol contact adhesive 50
- ⑫ Rhepanol hsg flashing strip
- ⑬ FDT aluminium wall connection profile Classic
- ⑭ FDT sealant A or S

Rooflight connection Non ventilated roof

Scale 1:5

(The layers relevant to the sealing are shown accentuated)



- ① Reinforced concrete
- ② Cold bitumen pre-coating, as required
- ③ Bituminous vapour control layer, bonded
- ④ Thermal insulation, e. g. EPS, bituminous felt facing, bonded with FDT adhesive U
- ⑤ Roofing membrane Rhepanol hfk, bonded with FDT roofing membrane adhesive

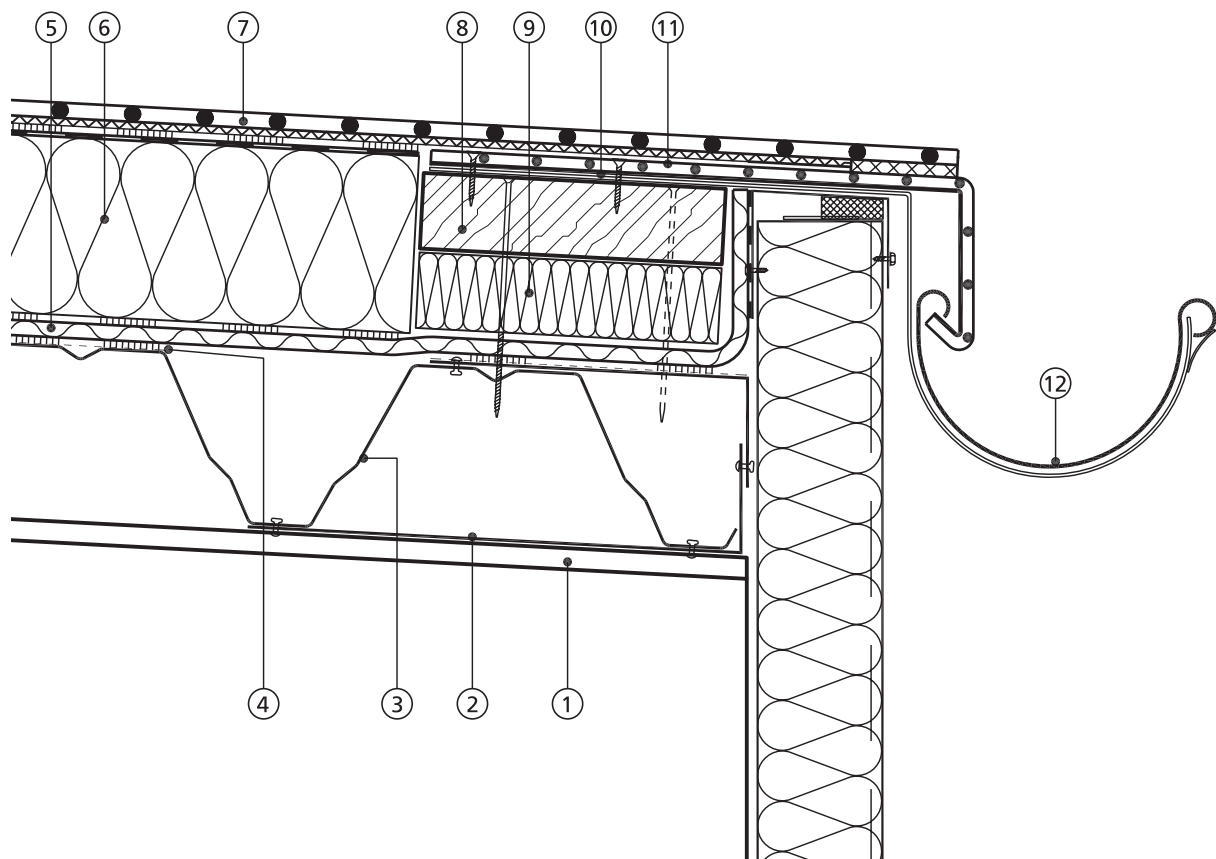
- ⑥ Perimeter fixing with single fasteners through the roofing membrane
- ⑦ Rhepanol hsg flashing strip
- ⑧ Rhepanol contact adhesive 50
- ⑨ Rooflight kerb
- ⑩ Render
- ⑪ Structural support

Gutter

Non ventilated roof

Scale 1:5

(The layers relevant to the sealing are shown accentuated)



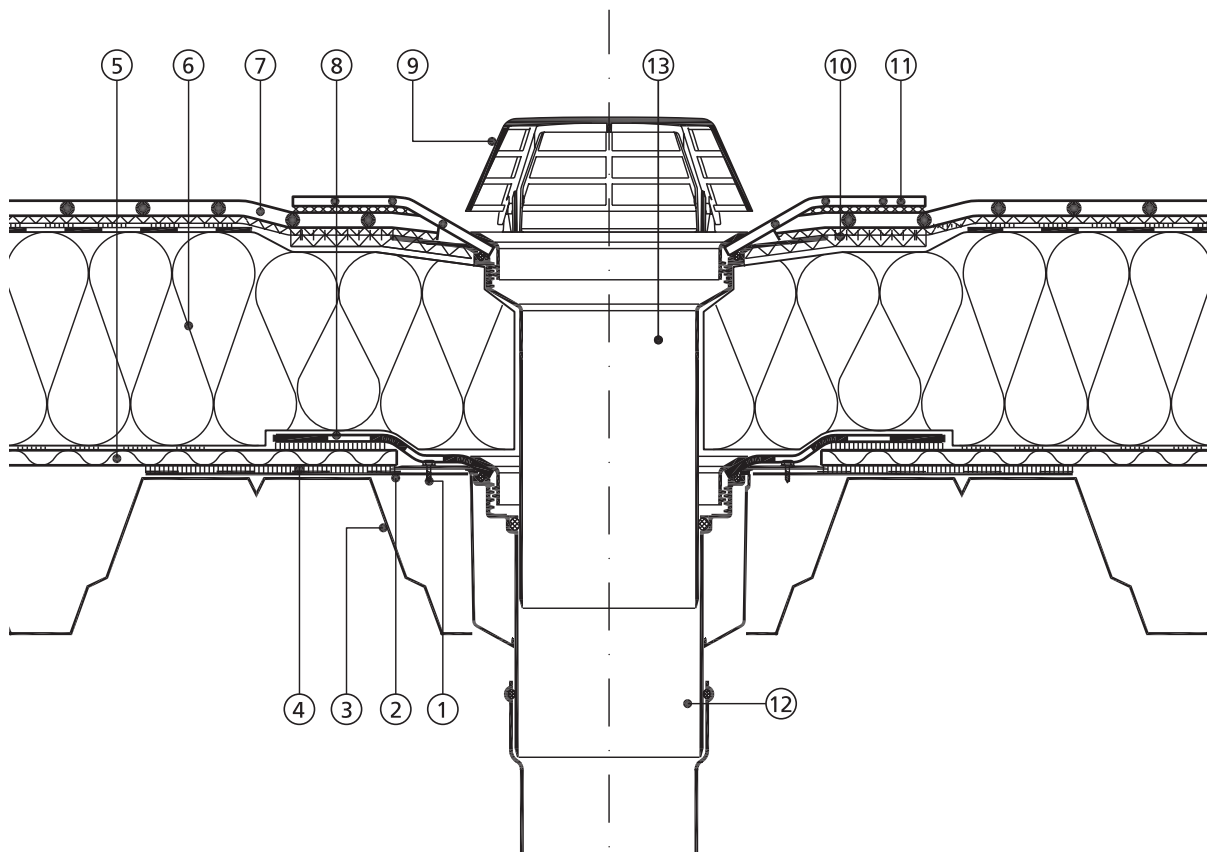
- | | |
|---|--|
| ① Supporting deck | ⑦ Roofing membrane Rhepanol hfk, bonded with FDT roofing membrane adhesive |
| ② Supporting bracket | ⑧ Treated timber profile (salt-based) |
| ③ Profiled steel decking, corrosion protected | ⑨ Pressure-resistant thermal insulation |
| ④ Cold bitumen pre-coating, as required | ⑩ Bracket |
| ⑤ Vapour control layer, bonded | ⑪ Rhepanol coated metal sheet |
| ⑥ Thermal insulation, e. g. EPS, bituminous felt facing, bonded with FDT adhesive U | ⑫ Gutter |

FDT VarioGully with Gripfix ring

Non ventilated roof

Scale 1:5

(The layers relevant to the sealing are shown accentuated)



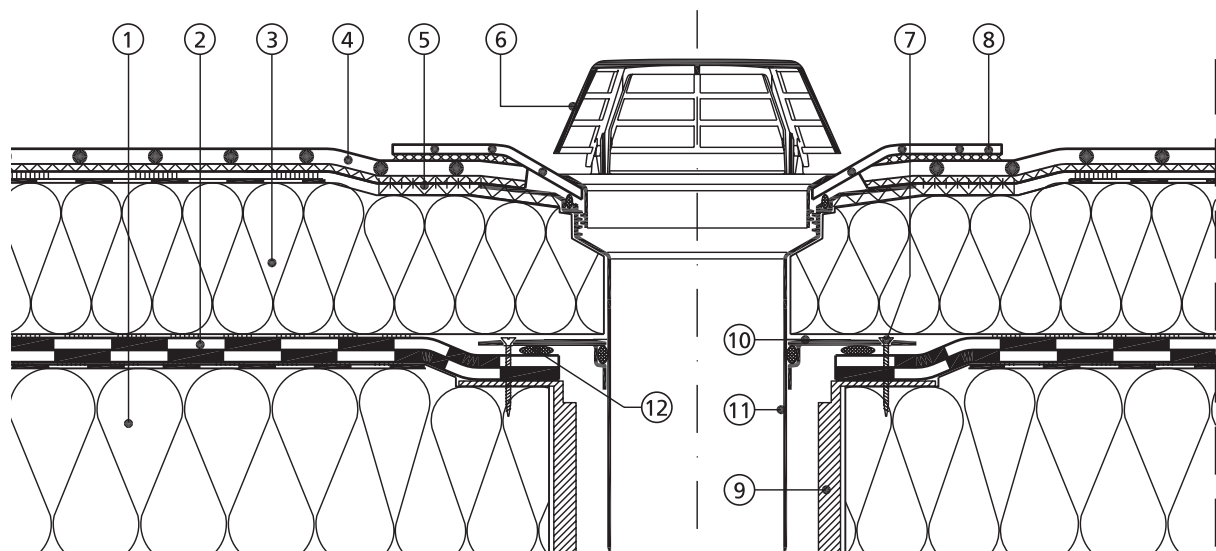
- | | |
|---|--------------------------------------|
| ① FDT VarioGully fixing (4 fasteners per outlet) | ⑧ Vapour control collar |
| ② Stiffening metal plate | ⑨ FDT gravel stop/leaf guard |
| ③ Profiled steel decking, corrosion protected | ⑩ Gripfix ring |
| ④ Cold bitumen pre-coating, as required | ⑪ Rhepanol h collar |
| ⑤ Vapour control layer, bonded | ⑫ FDT VarioGully |
| ⑥ Thermal insulation, e. g. EPS, bituminous felt facing, bonded with FDT adhesive U | ⑬ FDT VarioGully warm roof extension |
| ⑦ Roofing membrane Rhepanol hfk, bonded with FDT roofing membrane adhesive | |

FDT VarioGully refurbishment flange

Non ventilated roof

Scale 1:5

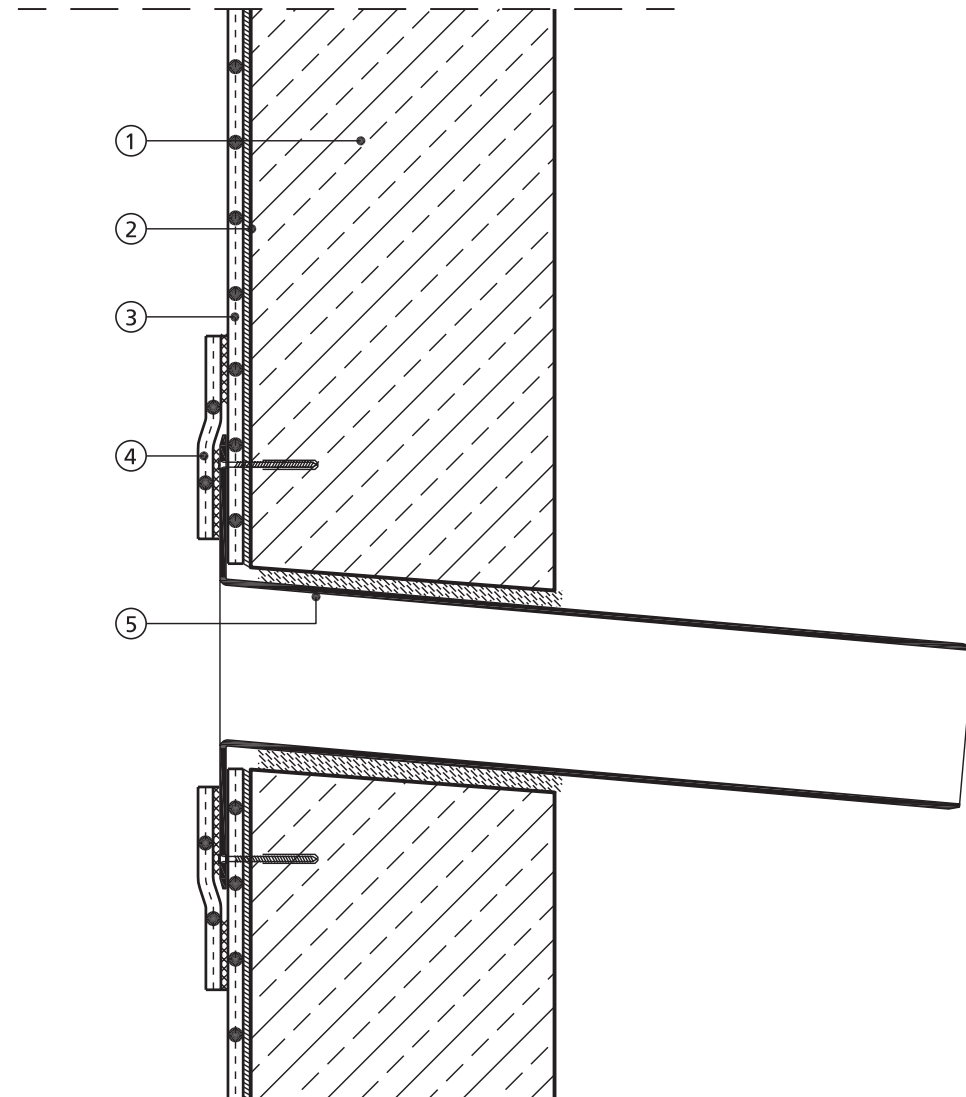
(The layers relevant to the sealing are shown accentuated)



- | | |
|--|--|
| ① Existing thermal insulation | ⑥ FDT gravel stop/leaf guard |
| ② Old roof sealing with bitumen | ⑦ FDT VarioGully fixing (4 fasteners per outlet) |
| ③ EPS thermal insulation layer, bituminous felt facing, bonded with FDT adhesive U | ⑧ Rhepanol h collar |
| ④ Roofing membrane Rhepanol hfk, bonded with FDT roofing membrane adhesive | ⑨ Existing old roof rainwater outlet |
| ⑤ Gripfix ring | ⑩ FDT VarioGully refurbishment flange |
| | ⑪ FDT VarioGully warm roof extension |
| | ⑫ Sealing cord |

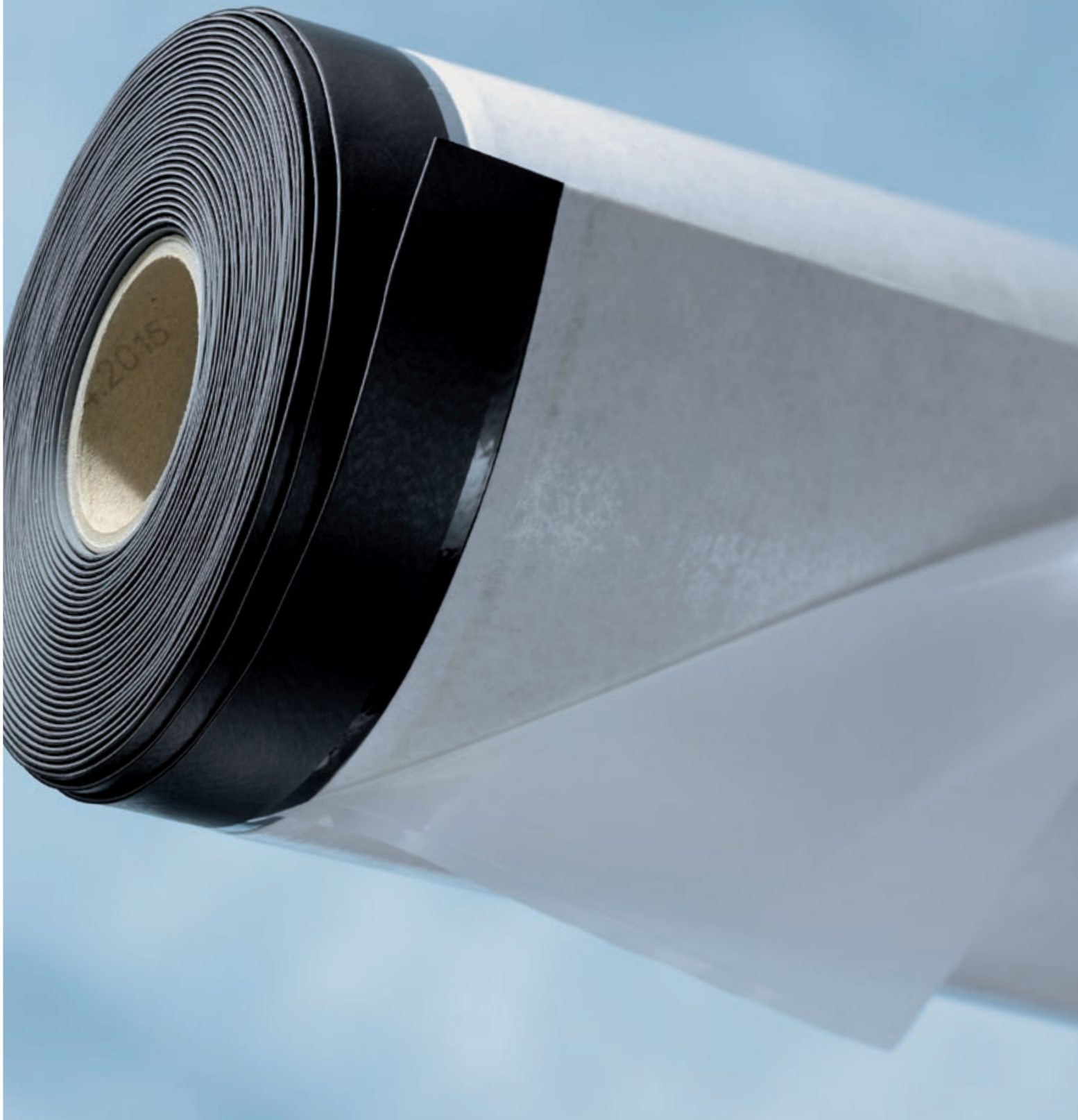
FDT emergency overflow
Non ventilated roof

Scale 1:5
 (The layers relevant to the sealing are shown accentuated)



- ① Reinforced concrete parapet
- ② Rhepanol contact adhesive 50
- ③ Rhepanol hsg flashing strip, bonded with Rhepanol adhesive 50
- ④ Rhepanol hsg flashing strip
- ⑤ FDT emergency overflow

Rhepanol® hfk-sk
full-size self-adhesive



Rhepanol® hfk-sk full-size self-adhesive

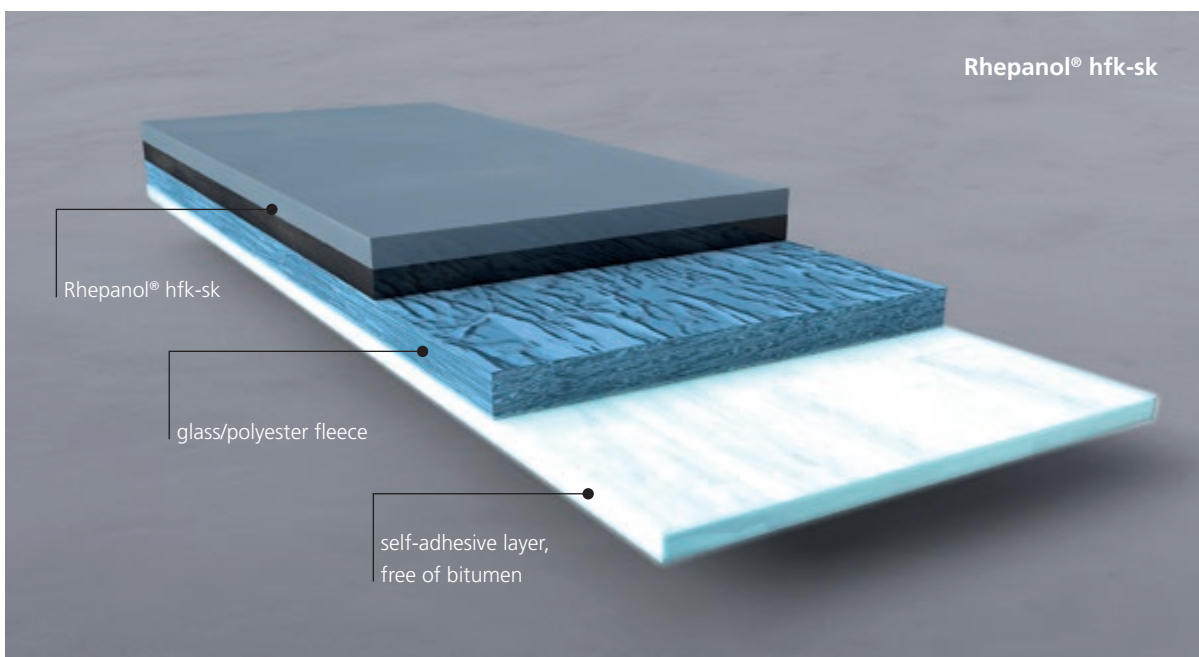
The Rhepanol hfk-sk roofing membranes come with a glass/polyester fleece backing and a synthetic adhesive compound coating. The roofing membranes are produced with a non-coated welding edge on one side for hot air seam connection.

Sealing of flashings, trims, butt joints etc. is carried out with Rhepanol hsg flashing strips.

The Rhepanol hfk-sk roofing membrane features many advantages, including, of course, fire safety. To this end, the fire retarding layer has been integrated directly into the hfk-sk membrane.

The advantages of Rhepanol hfk-sk at a glance

- Long-term proven material Rhepanol
- Compatible with bitumen
- Highly resistant to perforation
- EPD certified
- Free of plasticizers and halogen-containing fireproofing agents
- Permanently resistant to UV radiation
- Hail-resistant according to DIN EN 13583
- Compatible with all kinds of insulation materials
- Extremely flexible at low temperatures
- Hot air weldable
- Dimensionally stable due to the lower polyester fleece layer
- Application without open flame
- Compatible with all elements of the Rhepanol product range
- Reduced amount of seams due to 1.50 m membrane width



Safety and functional efficiency

Supporting construction

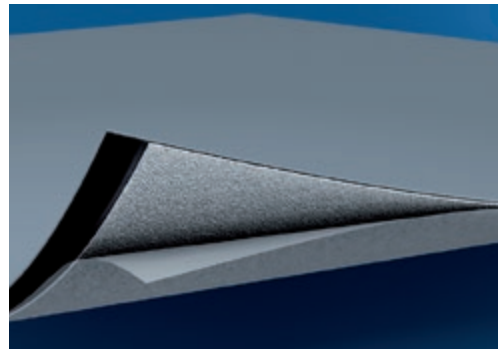
Safety and functional efficiency

Like the other Rhepanol roofing membranes, Rhepanol hfk-sk is free of bitumen and plasticizers, making it suitable for many different types of substrates. This includes direct full-size bonding on unbacked EPS rigid foam boards as well as application on bituminous substrates. After laying, the glass/polyester fleece backing being applied to the lower side of the full-size adhesive roofing membrane Rhepanol hfk-sk as the last but one layer reduces stress and strain on the whole waterproofing build-up.

The FDT range of accessories provides materially homogenous preformed details such as strips, corners and collars for detail work and furthermore all necessary primers as for example Rhepanol primer sk-W, resp. sk-L. All substrates have to be coated with primer.

Roofing membranes Rhepanol hfk-sk can be bonded with Rhepanol primer sk-W on unbacked EPS insulation materials at rated wind loads up to 3.0 kN/m² (Wres according to DIN EN 1991-1-4), on stable bituminous substrates at rated wind loads up to kN 3.5/m² (Wres according to DIN EN 1991-1-4).

Bonding on other substrates is to be agreed with our FDT Technical Department.



Application instructions

Supporting construction

- The supporting deck structure has to meet the technical requirements, especially with regard to load-bearing capacity, deflection, anchorage and drainage.
- Substrates for application must be free of open cracks, rough concrete and sharp projections.
- Joints have to be formed according to constructional requirements, as their width or movement may impede the functional efficiency of the roof sealing.
- An intrusion of air underneath the roof covering at the roof perimeter and at roof penetrations must be prevented. Therefore, these areas have to be made wind-proof.
- Clean, dry and even roof surfaces.

Safety and functional efficiency

Supporting construction

Substrate	Surface condition	Rhepanol primer sk-W/sk-L
Bituminous sheet	PE foil/fleece	yes ¹⁾
Bituminous sheet	fine sand /talcum coating	yes
Bituminous sheet	grit or fine slate coating	yes
Old bituminous sheet	weathered, soiled	yes
Synthetic membranes	weathered	no ²⁾
Concrete	slightly moist to dry, smoothed and well-cleaned, free of gravel clusters, burrs and sharp edges	yes
Steel/zinc sheets	degreased	yes ²⁾
EPS	unbacked	yes, only Rhepanol primer sk-W
Bondrock MV	backed	yes
Megarock	backed	yes
Timber formwork	flat, even	yes

¹⁾ Shortly torch with propane.

²⁾ May be necessary depending on the type of material, to be tested in individual cases; generally, consultations with the Technical Department are obligatory.

Rhepanol primer sk-W

Base	solvent-free emulsion, bitumen-free
Consistency	liquid, rollable and brushable
Colour	blue
Processing temperature	min. +5 °C
Flash-off time³⁾	approx. 30 min. (After that, the roof area can be walked on)
Storage	dry, cool, frost-protected
Shelf life	min. 12 months

³⁾ Depending on temperature and humidity

Rhepanol primer sk-L

Base	SBS rubber, solvent-containing
Consistency	liquid, rollable and brushable
Colour	red
Processing temperature	min. +5 °C
Flash-off time³⁾	approx. 15 min. (After that, the roof area can be walked on)
Storage	dry, cool, frost-protected
Shelf life	min. 12 months

³⁾ Depending on temperature and humidity

Vapour control layer

In the case of non ventilated roofs, we recommend the following vapour control layers:

- For non air-conditioned rooms (e.g. living rooms and offices or similar rooms without suspended ceiling): vapour control membrane with air space width equivalent to water vapour diffusion $s_d \geq 100$ m.
- In the case of aerated concrete supporting decks with correctly calculated thermal insulation, you may leave out a vapour control layer, if the room temperature stays below 20 °C and the relative air humidity inside the room will not exceed 65%.
- For rooms with high air condition loads (e.g. swimming pools, air-conditioned rooms): vapour control layer with aluminium reinforcement, glass fleece or woven glass tissue reinforcement.
- National standards and regulations must be observed.

With lightweight steel decking, we also recommend in principle the installation of a separate vapour control layer, which should be formed as an air barrier according to the provisions of the Thermal Insulation Regulation.

- The vapour control layer must be taken up and flashed at connections and cappings, at roof penetrations it must be flashed.
- National standards and regulations must be observed.

Note:

- For bonding the insulation layer with FDT adhesive U, use vapour control membranes without PE backing or talcum coating.

Thermal insulation layer

The thermal insulation layer is to be designed in accordance with the thermal protection requirements.

As materials for thermal insulation layers we recommend:

- Flexible insulation boards or expanded polystyrene foam boards according to EN 13163 with backing. For fire protection reasons, bituminous sheets with an integrated glass fleece or fabric $\geq 60 \text{ g/m}^2$ may be necessary as a lining.
- Mineral fibre boards MW DAA according to DIN EN 13162 (e. g. Bondrock MV or Mega-rock). In case of bonded application using mineral fibre insulation material, the type of insulation material and the adhesive/amount of adhesive needed is to be defined depending on the project.
- Insulation boards made of expanded polystyrene, EPS DAA dm/dh, Euro Class E, with rebated edge according to DIN EN 13163. The full-size self-adhesive roofing membrane Rhepanol hfk-sk is bonded to the unbacked EPS insulation boards.

Basic requirements:

- force-locking bond of the insulation to the substrate
- for insulation layers > 150 mm multiply bonded laying is required

Generally insulation boards must be laid brick-bond pattern. Insulation materials that are not dimensionally stable and which buckle or bulge, or insulation elements with insufficient lining stability must not be installed.

Bonding of EPS thermal insulation layers is preferably done with FDT adhesive U, a one-component polyurethane adhesive.

For roof slopes exceeding 7° , additional supporting measures are necessary to prevent the materials slipping off while the adhesive is curing.

For further information on the adhesive and its application see data sheet FDT adhesive U.

- National standards and regulations must be observed.

Consumption of FDT adhesive U for thermal insulation¹⁾

Building height ²⁾ wind zone 1 and 2	Inner area DIN EN 1991-1-4	Perimeter and corner area DIN EN 1991-1-4	Min. amount of adhesive stripes/m ³⁾
0–8 m	160 g/m ²	220 g/m ²	8
over 8–20 m	180 g/m ²	250 g/m ²	8

¹⁾ For mineral fibre insulation materials, the adhesive consumption is to be defined depending on the project.

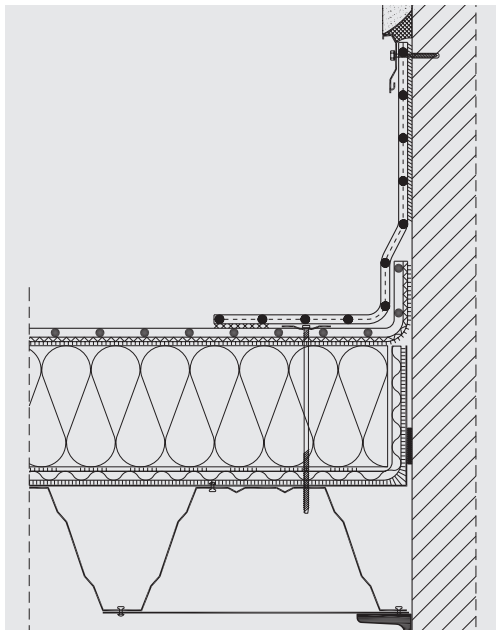
²⁾ At building heights over 20 m and for buildings in wind zones 3 and 4 according to DIN EN 1991-1-4, it is necessary to define the amount and distribution of adhesive needed or appropriate object-related measures for membrane position stability.

³⁾ In case of profiled steel decking, 2 adhesive stripes per corrugation. As the vapour control membrane may sag, the adhesive stripes must be placed on the corrugation shoulders.

Linear perimeter fixing, flashings and cappings, roof refurbishment

Linear perimeter fixing

A linear perimeter fixing at flashings and cappings or built-in details is generally necessary. The perimeter fixing of the roof build-up, including the roofing membrane, is achieved in each instance with at least four in-line fastening elements per metre or the FDT fastening profile. Apply flashing strips max. 150 mm in the roof area.



Sketch: Linear perimeter fixing.

Flashings and cappings

All flashings and cappings are carried out with Rhepanol hsg flashing strips. With flashing heights of over 200 mm the membrane should be fully adhered to the upstands. Valley areas should be left unbonded for an area of 200 mm to allow for movement.

For mechanically fastening of the flashing membrane FDT fastening profiles or Rhepanol laminated metal sheets can be used.

The upper edge of the Rhepanol hsg roofing membrane is pressed to the substrate with rigid wall connection profiles such as "Classic" and additionally secured with FDT sealant A or S. The two-part FDT roof edge trims ensure flexible, yet windproof capping of the roof perimeter.

When laying the membrane to parapets, bracket mounted gutters and flashings it may be appropriate to use Rhepanol laminated metal flashings. The necessary flashing and capping profiles are cut from Rhepanol laminated metal sheets and bent according to the specification and the local requirements like galvanized sheets. Forming of flashings and cappings is identical for all application methods. For drawing example see "Technical details".

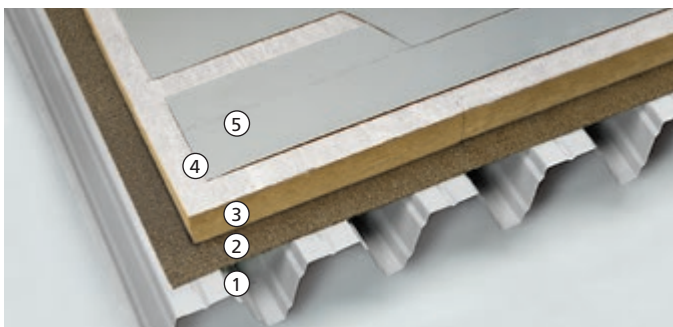
Additional requirements for roof refurbishment:

- Before overlaying with Rhepanol hfk-sk fully bonded, the adhesion between the old roofing layers, as well as to the supporting deck must be completely secure. Otherwise mechanical fastening of the existing layers will be necessary.
- With old roofs bonded with cold bituminous adhesive a mechanical fastening of the old roof is obligatory due to the plastic dimensional dynamics of the cold bituminous adhesive.
- The substrate must be suitable for bonding, free from chippings and thoroughly cleaned.

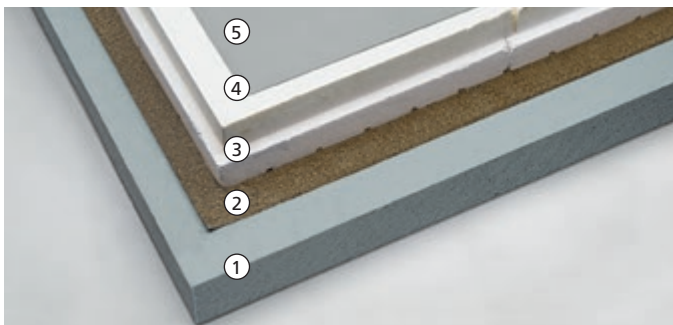
Layer build-ups

Examples of layer build-ups

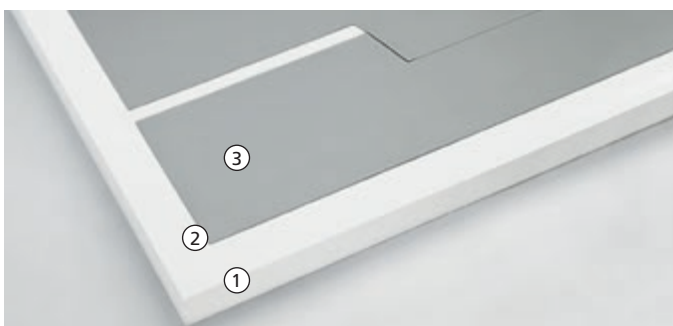
Non-ventilated roof (warm roof)



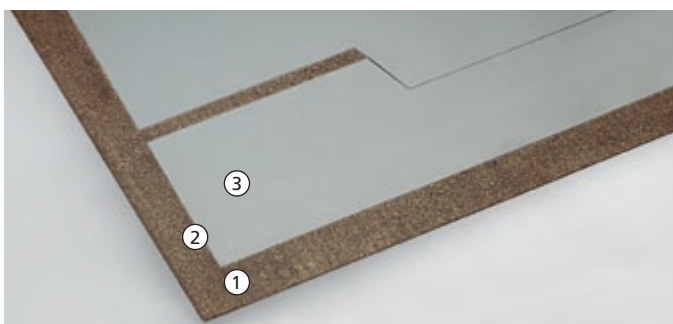
- ① Profiled steel decking
- ② Bituminous vapour control layer
- ③ Backed mineral wool thermal insulation (Bondrock MV, Megarock)
- ④ Rhepanol primer sk-W/sk-L
- ⑤ Roofing membrane Rhepanol hfk-sk



- ① Reinforced concrete
- ② Bituminous vapour control layer
- ③ Thermal insulation EPS
- ④ Rhepanol primer sk-W
- ⑤ Roofing membrane Rhepanol hfk-sk



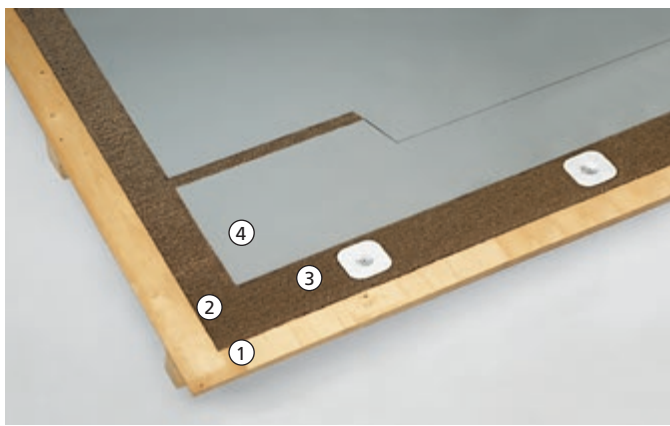
- ① Lightweight concrete
- ② Rhepanol primer sk-W/sk-L
- ③ Roofing membrane Rhepanol hfk-sk



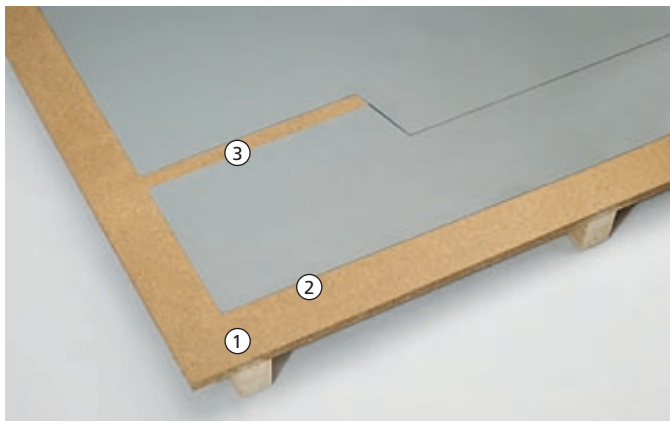
- ① Stable old bituminous roofing, independent of the type of supporting deck (refurbishment)
- ② Rhepanol primer sk-W/sk-L
- ③ Roofing membrane Rhepanol hfk-sk

Layer build-ups

Ventilated roof (cold roof)



- ① Timber board cladding, e. g. tongue-and-groove boards, min. 24 mm thick
- ② Bituminous felt with tear-resistant reinforcement, e. g. G 200 DD, mechanically fastened, closed seams
- ③ Rhepanol primer sk-W/sk-L
- ④ Roofing membrane Rhepanol hfk-sk

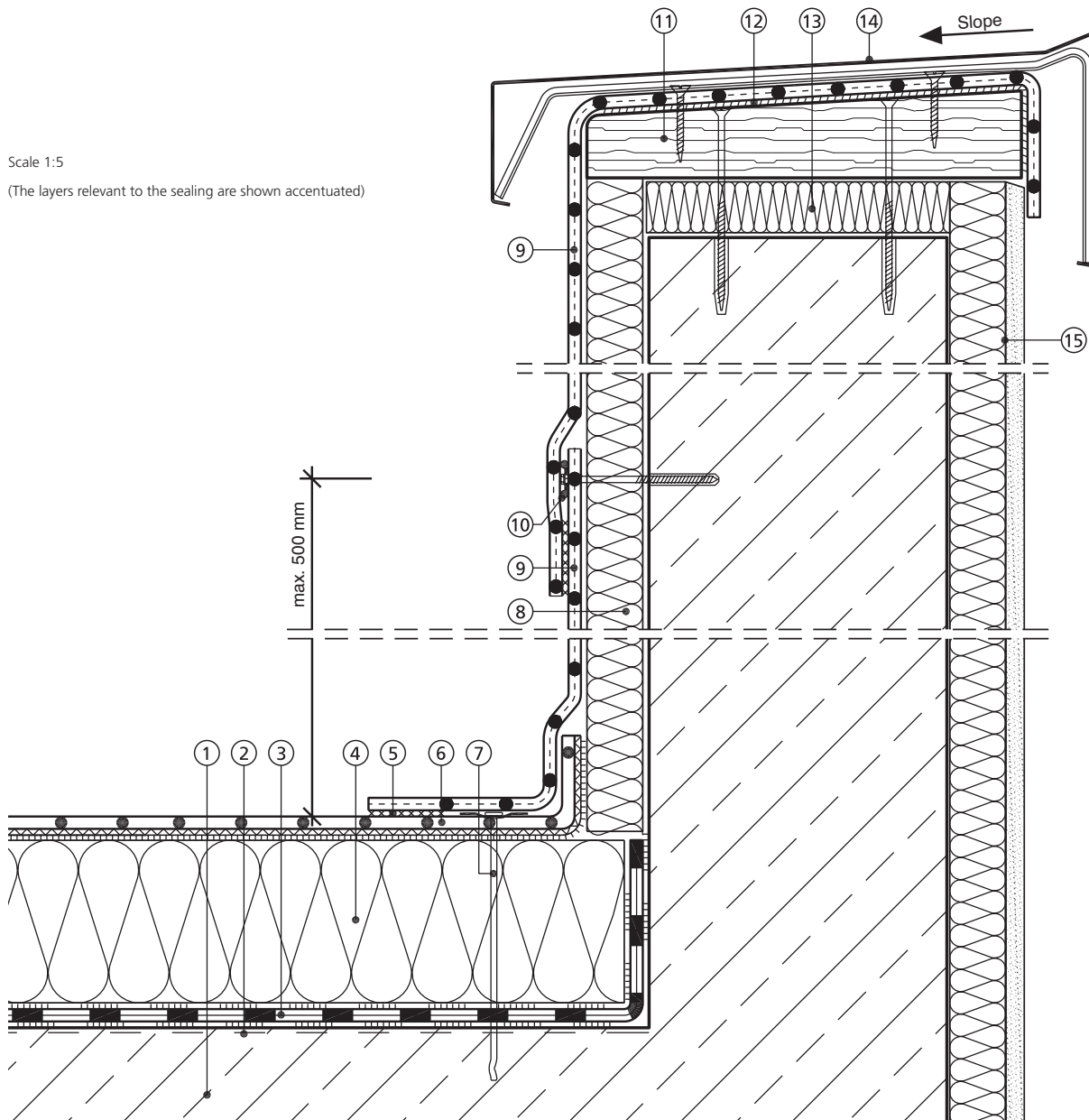


- ① Suitable chipboards, min. 22 mm thick
- ② Rhepanol primer sk-W/sk-L
- ③ Roofing membrane Rhepanol hfk-sk (sliding strips at board joints)

Parapet
Non ventilated roof

Scale 1:5

(The layers relevant to the sealing are shown accentuated)

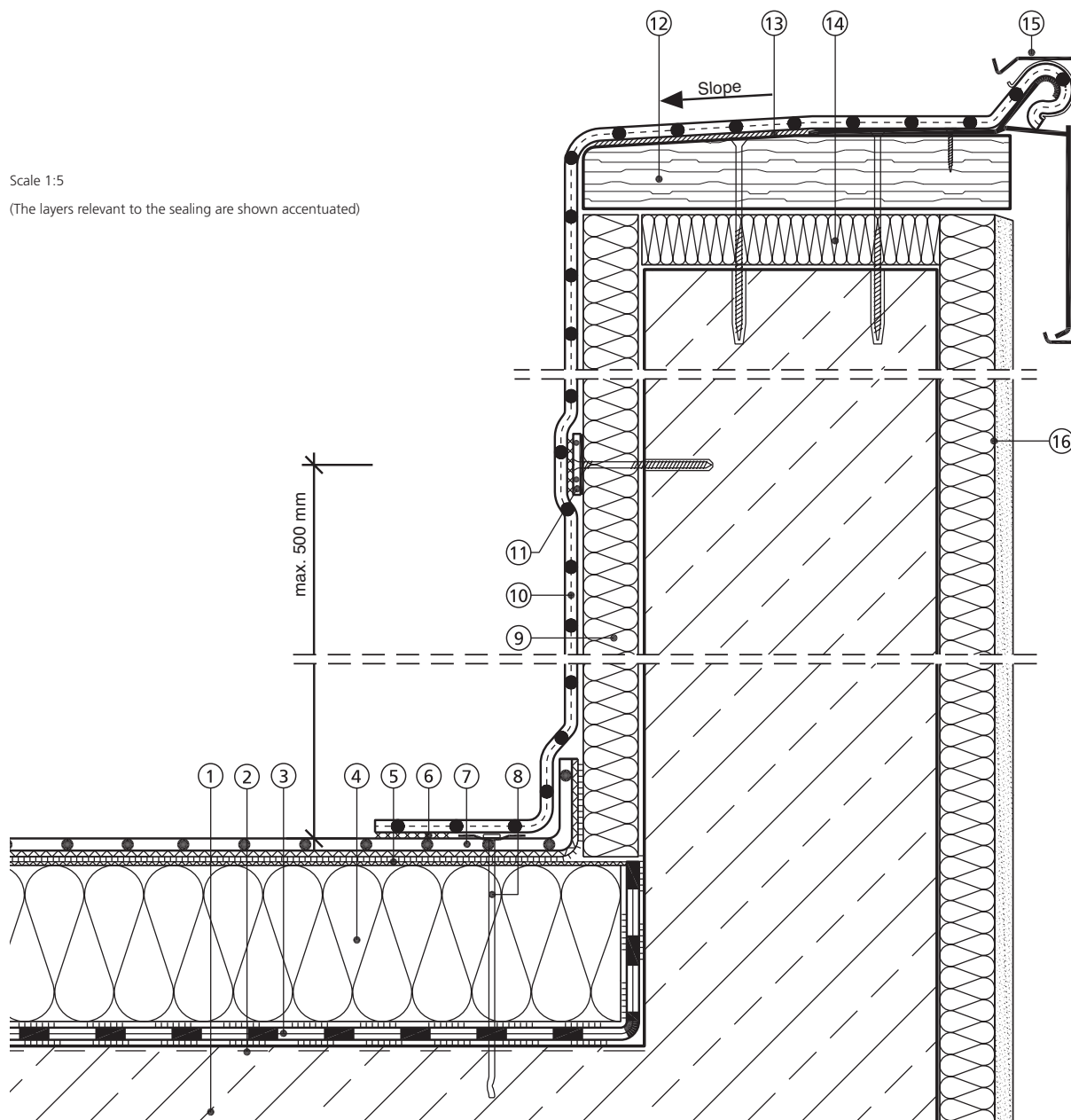


- | | |
|---|--|
| ① Reinforced concrete | ⑧ Vertical thermal insulation |
| ② Cold bitumen pre-coating, as required | ⑨ Rhepanol hsg flashing strip |
| ③ Bituminous vapour control layer, bonded | ⑩ Intermediate fixing with FDT fastening profile |
| ④ EPS thermal insulation, bonded with FDT adhesive U | ⑪ Treated timber profile |
| ⑤ Hot air welded seam | ⑫ Rhepanol contact adhesive 50 |
| ⑥ Roofing membrane Rhepanol hfk-sk, with Rhepanol primer sk-W | ⑬ Pressure-resistant thermal insulation |
| ⑦ Perimeter fixing with single fasteners through the roofing membrane | ⑭ Capping |
| | ⑮ Thermal insulation composite system |

Parapet Non ventilated roof

Scale 1:5

(The layers relevant to the sealing are shown accentuated)



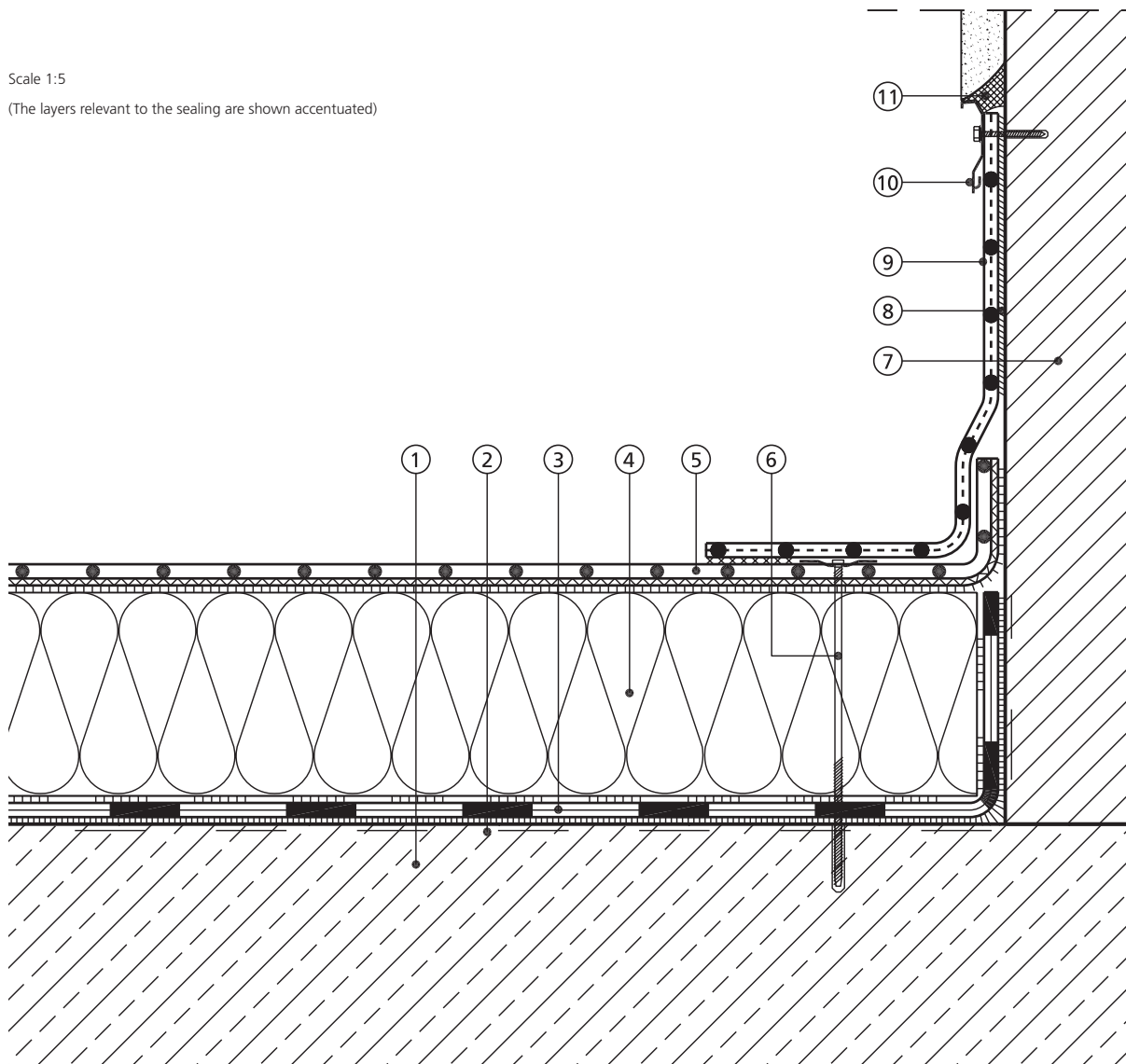
- | | |
|---|--|
| ① Reinforced concrete | ⑨ Vertical thermal insulation |
| ② Cold bitumen pre-coating, as required | ⑩ Rhepanol hsg flashing strip |
| ③ Bituminous vapour control layer, bonded | ⑪ Intermediate fixing with Rhepanol coated metal sheet |
| ④ Mineral wool thermal insulation, mineral fleece facing, Bondrock MV, bonded application | ⑫ Treated timber profile |
| ⑤ Rhepanol primer sk-W or sk-L | ⑬ Rhepanol contact adhesive 50 |
| ⑥ Hot air welded seam | ⑭ Pressure-resistant thermal insulation |
| ⑦ Roofing membrane Rhepanol hfk-sk, full-size self-adhesive | ⑮ Capping |
| ⑧ Perimeter fixing with single fasteners through the roofing membrane | ⑯ Thermal insulation composite system |

Wall connection

Non ventilated roof

Scale 1:5

(The layers relevant to the sealing are shown accentuated)



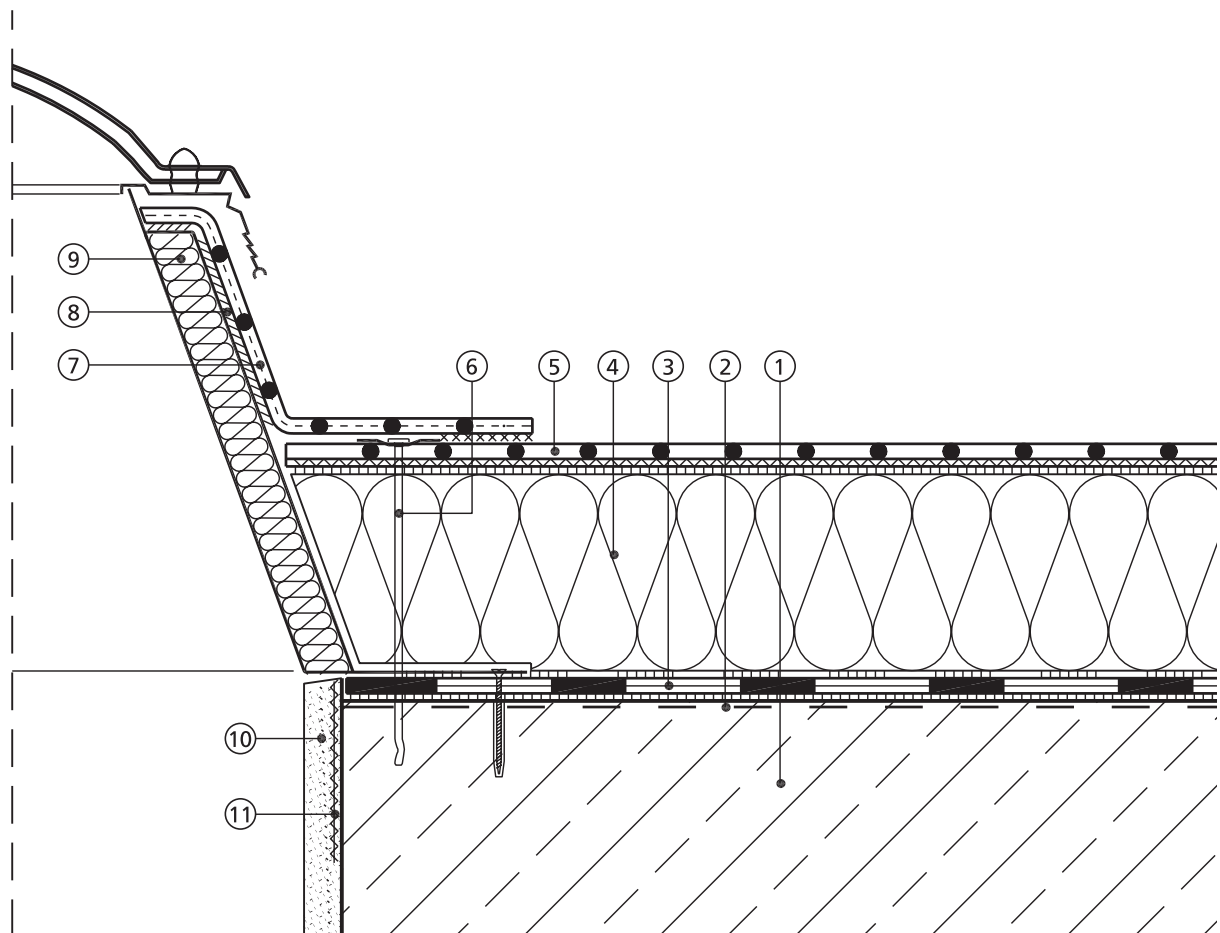
- | | |
|---|---|
| ① Concrete ceiling | ⑦ Brick work |
| ② Cold bitumen pre-coating, as required | ⑧ Rhepanol contact adhesive 50 |
| ③ Bituminous vapour control layer, bonded | ⑨ Rhepanol hsg flashing strip |
| ④ EPS thermal insulation, bonded with FDT adhesive U | ⑩ FDT aluminium wall connection profile Classic |
| ⑤ Roofing membrane Rhepanol hfk-sk, with Rhepanol primer sk-W | ⑪ FDT sealant A or S |
| ⑥ Perimeter fixing with single fasteners through the roofing membrane (4 fasteners/m) | |

Roof light

Non ventilated roof

Scale 1:5

(The layers relevant to the sealing are shown accentuated)



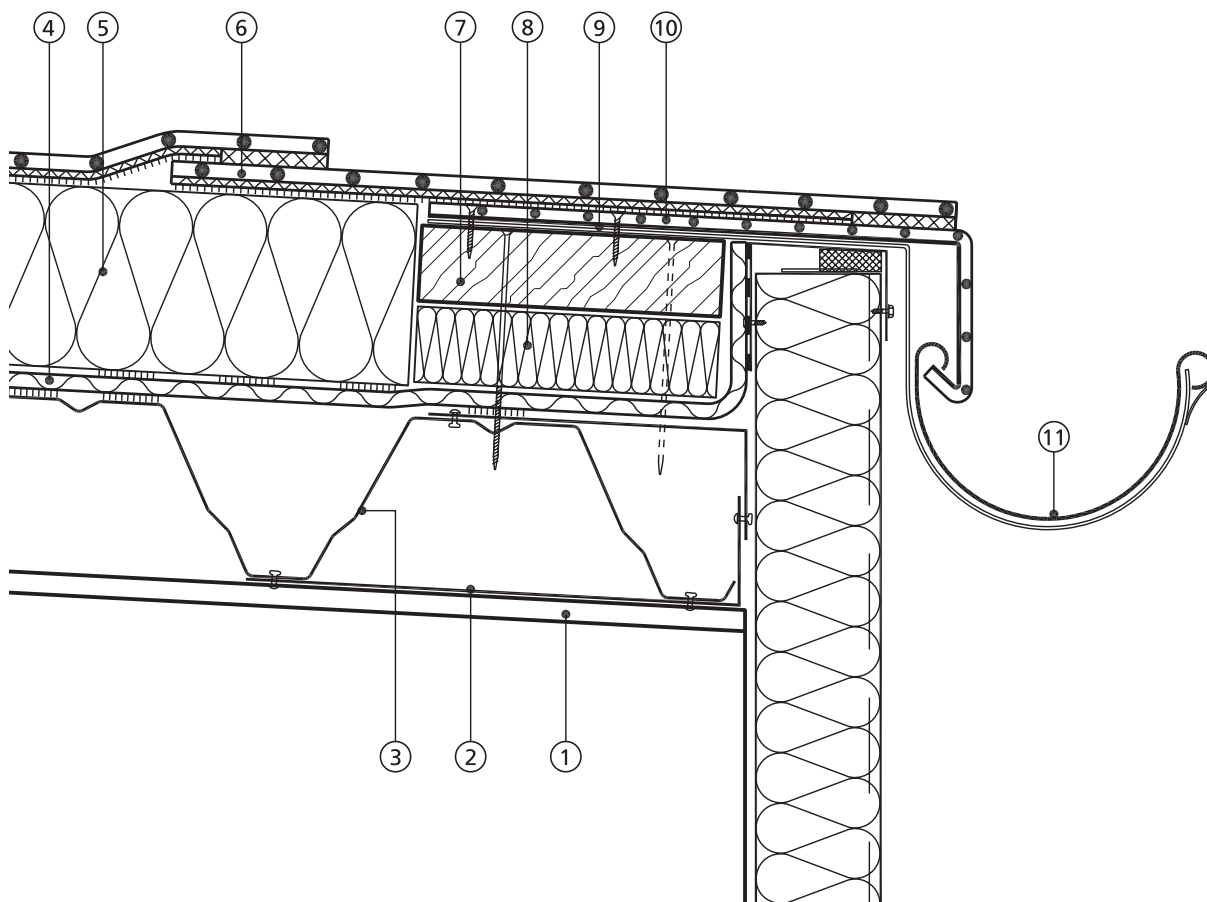
- | | |
|---|--------------------------------|
| ① Reinforced concrete | ⑦ Rhepanol hsg flashing strip |
| ② Cold bitumen pre-coating, as required | ⑧ Rhepanol contact adhesive 50 |
| ③ Bituminous vapour control layer, bonded | ⑨ Rooflight kerb |
| ④ EPS thermal insulation, bonded with FDT adhesive U | ⑩ Render |
| ⑤ Roofing membrane Rhepanol hfk-sk, with Rhepanol primer sk-W | ⑪ Structural support |
| ⑥ Perimeter fixing with single fasteners through the roofing membrane | |

Gutter

Non ventilated roof

Scale 1:5

(The layers relevant to the sealing are shown accentuated)



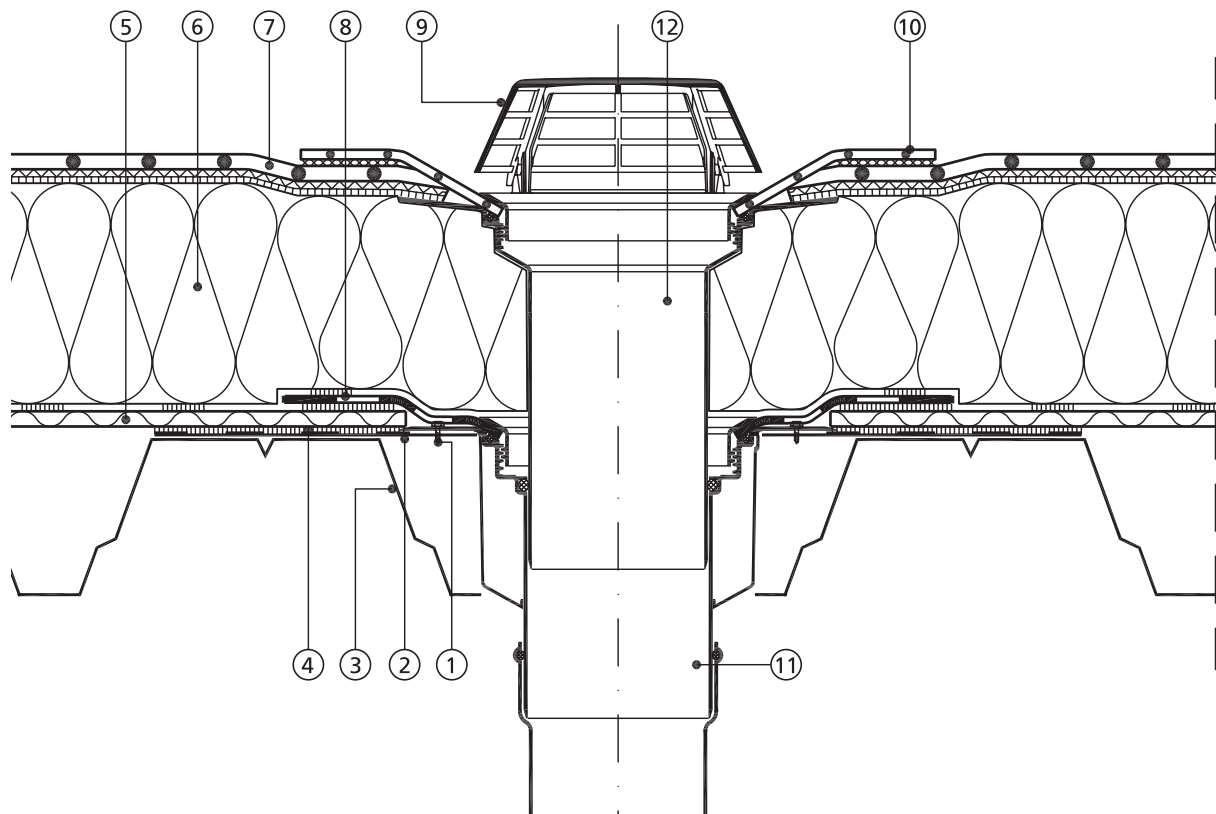
- | | |
|---|---|
| ① Supporting deck | ⑦ Treated timber profile (salt-based) |
| ② Supporting bracket | ⑧ Pressure-resistant thermal insulation |
| ③ Profiled steel decking, corrosion protected | ⑨ Bracket |
| ④ Vapour control layer, bonded | ⑩ Rhepanol coated metal sheet |
| ⑤ EPS thermal insulation, bonded with FDT adhesive U | ⑪ Gutter |
| ⑥ Roofing membrane Rhepanol hfk-sk, with Rhepanol primer sk-W | |

FDT VarioGully

Non ventilated roof

Scale 1:5

(The layers relevant to the sealing are shown accentuated)



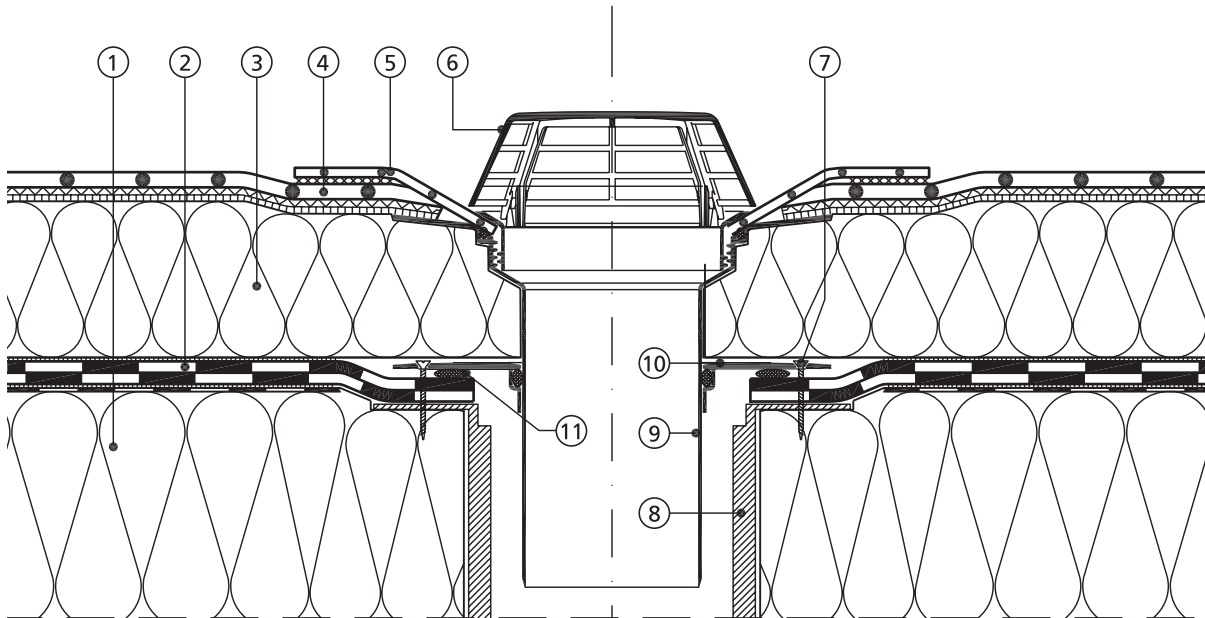
- | | |
|---|--------------------------------------|
| ① FDT VarioGully fixing (4 fasteners per outlet) | ⑧ Vapour control collar |
| ② Stiffening metal plate | ⑨ FDT gravel stop/leaf guard |
| ③ Profiled steel decking, corrosion protected | ⑩ Rhepanol h collar |
| ④ Cold bitumen pre-coating, as required | ⑪ FDT VarioGully |
| ⑤ Vapour control layer, bonded | ⑫ FDT VarioGully warm roof extension |
| ⑥ EPS thermal insulation, bonded with FDT adhesive U | |
| ⑦ Roofing membrane Rhepanol hfk-sk, with Rhepanol primer sk-W | |

FDT VarioGully refurbishment flange

Non ventilated roof

Scale 1:5

(The layers relevant to the sealing are shown accentuated)



- | | |
|---|--|
| ① Existing thermal insulation | ⑦ FDT VarioGully fixing (4 fasteners per outlet) |
| ② Existing roof sealing with bitumen | ⑧ Existing rainwater outlet |
| ③ EPS thermal insulation, bonded with adhesive U | ⑨ FDT VarioGully refurbishment flange |
| ④ Roofing membrane Rhepanol hfk-sk, with Rhepanol primer sk-W | ⑩ FDT VarioGully warm roof extension |
| ⑤ Rhepanol h collar | ⑪ Sealing cord |
| ⑥ FDT gravel stop/leaf guard | |

Product information





Roofing membrane Rhepanol® hfk

Rhepanol® hfk – the roofing membrane for all application methods

Rhepanol hfk is made of polyisobutylene (PIB), with an integrated 1.0 mm thick synthetic fleece backing and an unbacked edge. In the seam area, the roofing membranes are homogeneously connected by hot air welding. The fleece backing provides additional protection against stresses originating from the substrate. Furthermore, the fleece backing allows diffusion and ensures secure fastening onto the substrate.

Characteristics

- Roofing membrane made of polyisobutylene according to DIN EN 13956, compatible to bitumen, with polyester fleece backing, 1.5 mm thick plus fleece thickness 1.0 mm
- Weather-resistant, even without additional surface protection
- Resistant to atmospheric influences such as UV radiation or exhaust gas from industrial and heating plants
- Remains flexible, even at temperatures as low as -40 °C
- Outstanding resistance to natural ageing
- Free of plasticisers, chlorine, halogens, bitumen and PVC, resistant to rotting, non-porous (factory high-frequency testing)
- Resistant to flying sparks and radiant heat according to DIN CEN/TS 1187, confirmed by official test certificates
- Reaction to fire: class E according to DIN EN 13501-1
- Permanently resistant to UV radiation
- Hail-resistant according to EN 13583
- Thermal conductivity according to DIN 52612-1: 0.26 W/mk
- Certified with an Environmental Product Declaration (EPD) according to ISO 14025 and EN 15804



Rhepanol hfk is highly resistant to most substances commonly used in the construction of roofs. Beyond that we confirm resistance to further materials/substrates on request.

Where exposure to high concentrations of organic solvents, lacquers, fats and oils is likely, we recommend further advice from our Technical Support Team.

Quality assurance

Rhepanol hfk is subject to constant in-house and external quality control. The in-house quality assurance system for the whole company has been certified according to DIN EN ISO 9001, the world's most strict quality standard, and is constantly monitored by TÜV SÜD Management Service GmbH.

Range of application

Depending on the supporting deck and the substrate conditions, Rhepanol hfk can be applied in different ways:

- mechanically fastened at the seam
- loose-laid with ballast (except for green roofs)
- bonded fixing

Ecology and environment

Rhepanol hfk has gone through a life cycle assessment according to DIN EN ISO 14040-49 carried out by the independent institute C.A.U. GmbH (Gesellschaft für Consulting und Analytik im Umweltbereich) (Company for Ecological Consulting and Analytics Ltd). FDT will be glad to send you on request a summary of the life cycle assessment and also the Environmental Product Declaration for Rhepanol hfk. Rhepanol is not a dangerous good according to the EU Ordinance on Hazardous Substances.

Roofing membrane Rhepanol® hfk

Properties	EN standard	Results
External fire performance	DIN CEN/TS 1187	B _{roof} (t1) (Testing according DIN CEN/TS 1187 with different roof build-ups. Testing reports can be requested separately.)
Reaction to fire	DIN EN ISO 11925-2 DIN EN 13501-1	class E
Water vapour property μ	DIN EN 1931 (method B)	≥ 160,000
Tensile strength	DIN EN 12311-2 (method A) DIN EN 12311-2 (method B)	≥ 400 N/50 mm
Elongation at break	DIN EN 12311-2 (method A) DIN EN 12311-2 (method B)	≥ 80%
Joint peel resistance	DIN EN 12316-2	≥ 150 N/50 mm
Joint shear resistance	DIN EN 12317-2	≥ 200 N/50 mm (fracture outside the joint area)
Resistance to impact	DIN EN 12691 (method A)	≥ 700 mm
Resistance to static load	DIN EN 12730 (method B)	≥ 20 kg
Hail resistance rigid substrate flexible substrate	DIN EN 13583	≥ 25 m/s ≥ 35 m/s
Tear resistance	DIN EN 12310-2	≥ 150 N
Dimensional stability	DIN EN 1107-2	≤ 1%
Foldability at low temperature	DIN EN 495-5	≤ -40 °C
Exposure to bitumen	DIN EN 1548	passed
Chemical resistance	DIN EN 1847 (List annexe C)	passed
UV exposure	DIN EN 1297	class 0 (5,000 h)
Watertightness	DIN EN 1928 (method B)	≥ 400 kPa

Standard membrane dimensions: 15 m x 1.50 m x 2.5 mm,
15 m x 1.00 m x 2.5 mm,
15 m x 0.50 m x 2.5 mm

Roofing membrane Rhepanol® hfk-sk

Rhepanol® hfk-sk – roofing membrane for adhesive bonding

Rhepanol hfk-sk is made of polyisobutylene (PIB), with a glass/polyester fleece backing, a self-adhesive coating and an unbacked edge. In the seam area, the roofing membranes are homogeneously connected by hot air welding. After laying, the glass/polyester fleece backing reduces stress and strain on the whole waterproofing build-up.

Characteristics

- Roofing membrane made of polyisobutylene, compatible with bitumen, with glass/polyester fleece backing, thickness 1.5 mm plus 1.00 mm backing and self-adhesive coating pursuant to the General Building Construction Supervision Test Certificate AbP.-No. P-K14-1192.1.
- Weather-resistant, even without additional surface protection
- Resistant to atmospheric influences such as UV radiation or exhaust gas from industrial and heating plants
- Remains flexible, even at temperatures as low as -40 °C
- Outstanding resistance to natural ageing
- Free of plasticisers, chlorine, halogens, bitumen and PVC, resistant to rotting, non-porous (factory high-frequency testing)
- Resistant to flying sparks and radiant heat according to DIN CEN/TS 1187, confirmed by official test certificates
- Reaction to fire: class E according to DIN EN 13501-1
- Permanently resistant to UV radiation
- Hail-resistant according to EN 13583
- Thermal conductivity according to DIN 52612-1: 0.26 W/mk
- Certified with an Environmental Product Declaration (EPD) according to ISO 14025 and EN 15804



Rhepanol hfk-sk is highly resistant to most substances commonly used in the construction of roofs. Beyond that we confirm resistance to further materials/substrates on request.

Where exposure to high concentrations of organic solvents, lacquers, fats and oils is likely, we recommend further advice from our Technical Support Team.

Quality assurance

Rhepanol hfk-sk is subject to constant in-house and external quality control. The in-house quality assurance system for the whole company has been certified according to DIN EN ISO 9001, the world's most strict quality standard, and is constantly monitored by TÜV SÜD Management Service GmbH.

Range of application

Rhepanol hfk-sk is a self-adhesive Rhepanol hfk roofing membrane for adhesive bonding, except for green roofs.

Ecology and environment

Rhepanol fk has gone through a life cycle assessment according to DIN EN ISO 14040-49 carried out by the independent institute C.A.U. GmbH (Gesellschaft für Consulting und Analytik im Umweltbereich) (Company for Ecological Consulting and Analytics Ltd). FDT will be glad to send you on request a summary of the life cycle assessment and also the Environmental Product Declaration for Rhepanol hfk-sk. Rhepanol is not a dangerous good according to the EU Ordinance on Hazardous Substances.

Roofing membrane Rhepanol® hfk-sk

Properties	EN standard	Results
External fire performance	DIN CEN/TS 1187	B _{roof} (t1) (Testing according DIN CEN/TS 1187 with different roof build-ups. Testing reports can be requested separately.)
Reaction to fire	DIN EN ISO 11925-2 DIN EN 13501-1	class E
Water vapour property μ	DIN EN 1931 (method B)	≥ 160,000
Tensile strength	DIN EN 12311-2 (method A) DIN EN 12311-2 (method B)	≥ 400 N/50 mm
Elongation at break	DIN EN 12311-2 (method A) DIN EN 12311-2 (method B)	≥ 80 %
Joint peel resistance	DIN EN 12316-2	≥ 100 N/50 mm
Joint shear resistance	DIN EN 12317-2	≥ 250 N/50 mm (fracture outside the joint area)
Resistance to impact	DIN EN 12691 (method A)	≥ 700 mm
Resistance to static load	DIN EN 12730 (method B)	≥ 15 kg
Hail resistance rigid substrate flexible substrate	DIN EN 13583	≥ 25 m/s ≥ 35 m/s
Tear resistance	DIN EN 12310-2	≥ 150 N
Dimensional stability	DIN EN 1107-2	≤ 0.5%
Foldability at low temperature	DIN EN 495-5	≤ -40 °C
Exposure to bitumen	DIN EN 1548	passed
Chemical resistance	DIN EN 1847 (List annexe C)	passed
UV exposure	DIN EN 1297	class 0 (5,000 h)
Watertightness	DIN EN 1928 (method B)	≥ 400 kPa

Standard membrane dimensions: 15 m x 1.50 m x 2.5 mm,
15 m x 1.00 m x 2.5 mm,
15 m x 0.50 m x 2.5 mm

Rhepanol® laminated metal sheet

Application

When laying roofing membrane Rhepanol hfk in the area of cappings, bracket-mounted gutters and flashings also Rhepanol laminated metal sheets can be used. The necessary flashing and capping profiles are cut from laminated metal sheets and formed according to the specification and bent to the required dimensions like galvanized sheets.

Range of application

- Steel drip angle at bracket-mounted gutters
- Wall capping
- Wall connection profile
- Roof edge trim
- For fixation of Rhepanol hg with gravel stop profile

Properties

Rhepanol laminated metal sheets with an overall thickness of 1.2 mm consist of hot galvanized metal sheets with a Rhepanol h facing and a varnish backing.

Processing

- Rhepanol laminated metal sheets should be cut with a sharp tool and with the varnish side up. Thus, trimming of the cut sheets will not be necessary.
- The clearance should be 0.03 – 0.04 mm. Rhepanol laminated metal sheets can be processed on any standard bending machine.
- A bending radius of 1.2 – 1.8 mm is to be observed.
- Processing (cutting, bending) of the Rhepanol laminated metal sheets should be done at room temperature, approx. 18 °C.

Substrates

Suitable bearing substrates for fastening are concrete, full brickwork, timber, derived timber products, steel etc. Fasteners must be adapted to the substrate according to the following table and with respect to the corresponding manufacturer's instructions.



Product view Rhepanol laminated metal sheet

Rhepanol® laminated metal sheet

Suitable fasteners for substrates consisting of lightweight or aerated concrete, or vertically perforated bricks are to be agreed with the manufacturers. In order to prevent premature corrosion, a FDT synthetic fleece layer 300 g/m² should be installed between the sheets and the substrate (e.g. concrete or aerated concrete).

Bearing Substrates	Suitable fastening elements
Concrete or full brickwork	Nylon plugs and corrosion proof impact plugs or screws, hammer impact rivets
Timber and derived timber products	Chipboard screws
Steel	Rivets, bolts or self-tapping screws

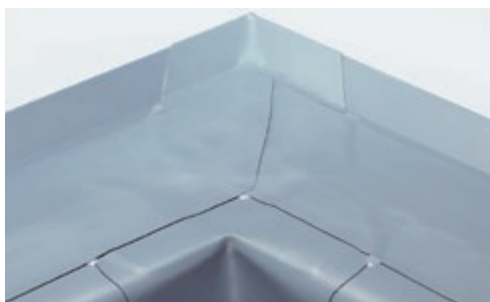
Application instructions

Rhepanol laminated metal sheets (de-burred cut edges) are butted against each other with a clearance of 4 mm (profile length max. 2.00 m), in order to permit temperature induced elongation of the profiles.

Forms of supply

Product name	Forms of supply
Rhepanol laminated metal sheet ¹⁾	30 units stack 2 x 1 m x 1.2 mm
Rhepanol laminated metal sheet ¹⁾	30 units stack 3 x 1 m x 1.2 mm
Rhepanol h strip	Roll 0.15 m x 15 m
FDT adhesive tape	Roll 0.038 m x 50 m

¹⁾ Also available as coil 30 x 1 m x 1.2 mm



Example: Roof edge trim/corner area with Rhepanol laminated metal sheet.

Joint area with Rhepanol h strips

- A 38 mm wide FDT adhesive tape is affixed to the joint area.
- Afterwards, a 150 mm wide Rhepanol h strip is applied which is homogeneously welded with hot air.

Storage

Rhepanol laminated metal sheets are factory-packed and transported on pallets. They should be stored horizontally in an even and dry place.

FDT vapour control layer fk



FDT vapour control layer fk

This layer is made of polyethylene foil (PE) and works as diffusion retarding layer acc. to DIN 4108, part 3, sec. 3.1.5.

Characteristics

- Highly vapour-retardant
- Good stability characteristics
- Reaction to fire: class E according to DIN EN 13501-1, normally inflammable
- Compatible with bitumen
- Not resistant to UV radiation

Range of application

- For non-conditioned rooms (e.g. living rooms and offices or similar rooms without suspended ceiling)
- In mechanically fastened and loose-laid layer build-ups with roofing membrane Rhepanol

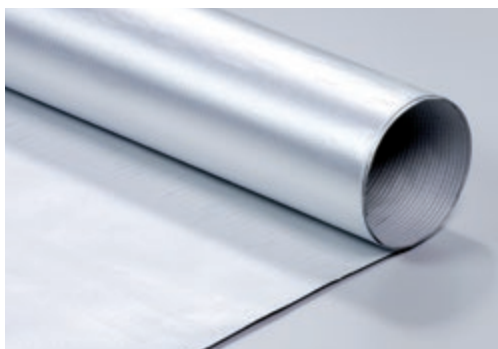
Physical data

Properties	EN standard	Results
Watertightness	DIN EN 1928 (A) (2 kPa, 24 h)	tight
Tensile strength	DIN EN 12311-2 (A)	≥ 300 N/50 mm
Elongation at break	DIN EN 12311-2 (A)	≥ 500 %
Resistance to impact	DIN EN 12691 (A)	≥ 450 mm
Tear resistance	DIN EN 12310-1 DIN EN 12310-2	≥ 250 N
Water vapour property μ	DIN EN 1931	≥ 400,000
Air space width equivalent to water vapour diffusion s_d	DIN EN 1931	≥ 160 m
Reaction to fire	DIN EN ISO 11925-2 DIN 13501-1	class E

Forms of supply

Material	Colour	Width Thickness (mm)	Nominal (m)	Length (m)
FDT vapour control layer fk		0.4	4	25
Connection tape for FDT vapour control layer fk			0.08	12
FDT seam strip	grey		0.015	25

FDT vapour control layer alu-gv-sk



FDT vapour control layer alu-gv-sk

Aluminium foil with polyester fabric reinforcement and adhesive coating. The reinforcement prevents foot traffic damage and other damage of the vapour control layer over corrugation valleys of lightweight steel decks during installation works.

Meets the requirements of DIN 18234 for vapour control sheets with low fire load.

Characteristics

- Practically vapour-proof, s_d -value > 1,500 m
- Low fire load according to DIN 18234
- Resistant to foot traffic damage
- Self-adhesive
- Reaction to fire: class E according to DIN EN 13501-1
- No additional seam tape required
- 80 mm seam overlap, self-adhesive

Range of application

- On buildings with particular indoor climate conditions, such as indoor swimming pools
- On lightweight steel decks according to the industrial building guideline, resp. DIN 18234
- In loose-laid and mechanically fastened build-ups.

Physical data

Properties	EN standard	Results
Watertightness	DIN EN 1928 (A) (2 kPa, 24 h)	tight
Tensile strength	DIN EN 12311-2 (A)	≥ 600 N/50 mm
Elongation at break	DIN EN 12311-2 (A)	≥ 2.5 %
Joint peel resistance	DIN EN 12317-1	≥ 300 N/50 mm
Resistance to impact	DIN EN 12691 (A) DIN EN 12691 (B)	≥ 50 mm ≥ 250 mm
Tear resistance	DIN EN 12310-1 DIN EN 12310-2	≥ 100 N
Air space width equivalent to water vapour diffusion s_d	DIN EN 1931	≥ 1,500 m
Reaction to fire	DIN EN ISO 11925-2 DIN 13501-1	class E
Calorific value		< 10,500 kJ/m ²
Cold bending behaviour	DIN EN 1109	≤ -30 °C
Thermal stability	DIN EN 1110	+100 °C

Forms of supply

Product name	Colour	Nominal Thickness (mm)	Width (m)	Length (m)
FDT vapour control layer alu-gv-sk	silver	0.25	1.5	100

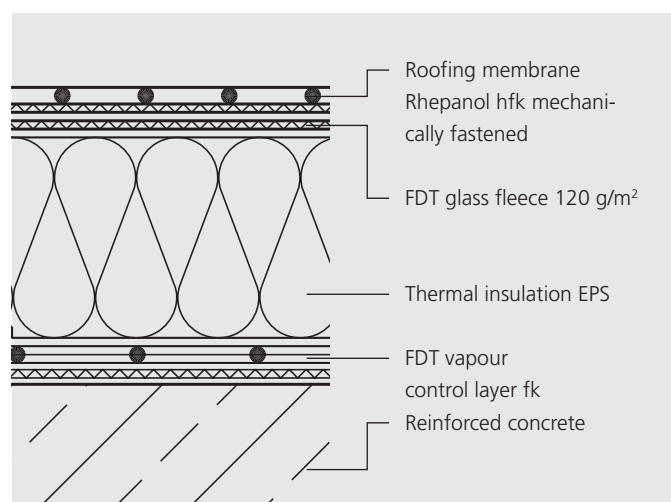
FDT glass fleece 120 g/m²

Material properties

- Fire performance class E according to DIN EN 13501-1, normal flammability
- Resistant to rotting
- Not alkali-proof and not resistant to UV radiation

Range of application

- As a fire retarding layer in mechanically fastened layer build-ups with roofing membranes Rhepanol hfk, to meet the fire protection requirements with regard to flying sparks and radiant heat.
- Overlap min. 80 mm



FDT glass fleece 120 g/m²

Properties	Value	Unit
Nominal thickness	0.7	mm
Nominal weight	120	g/m ²
Tensile strength	lengthwise 400 crosswise 260	N/5 cm N/5 cm
Elongation at break	< 2	%

Forms of supply

Product name	Colour	Width (m)	Length (m)	Weight (kg/roll)
FDT glass fleece 120 g/m ²	white	2.0	100	approx. 26

FDT protection layer

FDT protection layer

Protects the roof waterproofing against mechanical damage. The FDT protection layer consists of a 1.8 mm high perforation resistant PIB membrane with polyester fleece backing.

Range of application

For layer build-ups with synthetic roofing membranes:

- As a separation layer if non-standard gravel is used
- As a protection layer for used roof terraces with paving slabs or garden roofs or car parks

Properties

- Protection of the waterproofing against mechanical damage
- The fleece backing provides complete reliable separation from the waterproofing layer
- Membrane width of 2.05 m means economical application
- For easy sealing of the seams the FDT protection layer has no fleece backing along the whole length of one edge.

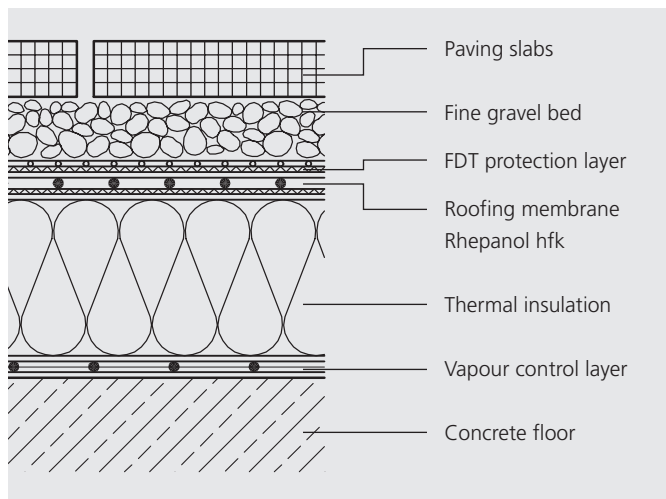
Application instructions

The FDT protection layer is loose-laid with the fleece-backed side down. Depending on the type of application, the seam connection can be carried out in different ways:

- With 80 mm seam overlap, without sealing.
- With 50 mm seam overlap and sealing by solvent or hot air welding or with a self-sealing tape. The seams must be closed if used as protection layer under screed or slabs in a bed of mortar.

The FDT protection layer is not designed for weather exposure and must always be covered.

At the edges of building elements, the FDT protection layer is applied in the form of a loosely overlapping skirt projecting approx. 250 mm into the covering area and remaining unwelded.



Forms of supply

Product name	Colour	Width (m)	Length (m)	Thickness (mm)	Weight (kg/m ²)
FDT protection layer	black lower side: white	2.05	20	1.8 ¹⁾	1.0

¹⁾ Including fleece backing

Rhepanol paving tile

Rhepanol paving tiles are made of polyisobutylene (PIB).

The structured surface (9 mm thick) ensures a safe grip, even on sloped and wet areas. Furthermore, the tile provides for good load distribution.

Range of application

Rhepanol paving tiles are used for protecting the waterproofing and for marking the maintenance walkways on roofs covered with Rhepanol.

Application instructions

- On new, clean and dry Rhepanol hfk roofs the paving tiles can be installed directly on the roof area.
- Fixing with the sealing edge: pull off the protective strip from the sealing edge, position the tile and press.
- At T-joints please seal with Rhepanol paste to prevent capillary action.
- On older and soiled roofs the seam area must be cleaned with Rhepanol solvent welding agent.
- **Important:** Finally press the edges with the FDT universal roller.
- No further measures are required to keep the tiles in place.

Note:

The edges must be sealed with Rhepanol paste all around the paving tiles. Distance between the tiles min. 30 mm.

Characteristics

- Reaction to fire: Class E in accordance with DIN EN 13501-1, normally inflammable.
- Dimensional stability after warm storage (6 h, 80 °C): < 0.2% (DIN 16726 sect. 5.13).
- Slide prevention and load distribution.
- Meets the requirements of DIN 4426 "safety requirements for workplaces and accesses" on sloped flat roofs up to 20°.



Structured surface, safe grip for maintenance walkways. Bottom layer with integrated self-sealing edge (secured with protective strip)

Product information

Colour:	anthracite/black; slight deviations in colour are possible
Surface:	structured, rib height 4 mm
Lower side:	plain, with self-sealing edge
Length/width/thickness:	800 mm/600 mm/9 mm
Tolerances:	± 5 mm
Weight:	approx. 7.3 kg/m ² or approx. 3.5 kg/tile
Delivery form:	90 pc/pallet, resp. 48 m ² /pallet

FDT roofing membrane adhesive

Properties

- FDT roofing membrane adhesive is a single component PU adhesive for bonding roofing membranes with fleece backing
- High adhesiveness
- Elastic, no embrittling
- Stable at temperatures from -40 °C to $+130\text{ °C}$
- High thermal stability
- Application method which needs no power supply
- Under normal conditions a sufficient initial hardness is reached within 1 to 5 hours. The curing time of the adhesive depends on temperature and humidity.

Storage

In non-freezing conditions. Best storage: in a dry place at $+10\text{ °C}$.

Shelf life: 12 months in tightly closed original containers.

Curing

- Roll or fold the roofing membrane onto the applied adhesive within approx. 10 min.
- For further application instructions, see container and installation instructions Rhepanol hfk.

Adhesive consumption

Building height ¹⁾ wind zone 1 und 2	Inner area DIN EN 1991-1-4	Perimeter and corner area DIN EN 1991-1-4	Number of adhesive stripes/m
0–8 m ²⁾	150 g/m ²	200 g/m ²	min. 8
over 8–20 m	180 g/m ²	250 g/m ²	min. 8

¹⁾ For building heights over 20 m and buildings in windzone 3 and 4 the adhesive consumption is to be defined depending on the project. Please contact our Technical Service Team for individual advice.

²⁾ At a consumption of 160 g/m², the running adhesive stripe should be 8 mm wide.

Technical data

Base	Colour	Bulk Density	Compulsory notification according to Hazardous Material Regulation	Not frost- proof	Installation temperature	Open time
1-K-PU	yellowish	1.1 g/cm ³	yes	no	min. $+5\text{ °C}$	within 20 min. depending on weather conditions

Forms of supply

Product name	Forms of supply	Application
FDT roofing membrane adhesive	10 kg container	for adhesive application with FDT application trolley 1 m or manual

Hazard identification, safety precautions, transport markings, see EC safety data sheet.

FDT adhesive U

Application¹⁾

- For consistent bonding of thermal insulation materials and bituminous vapour control sheets.
- To be applied in stripes with the FDT universal application trolley.

Properties

- Liquid, single-component solvent and CFC free polyurethane adhesive
- High adhesiveness
- Elastic, no embrittling
- Stable at temperatures from –40 to +100 °C
- High thermal stability
- Solvent and CFC free, does not affect rigid polystyrene foam
- Foams and compensates small level differences of the substrate
- Simple application method which needs no power supply
- No risk of burning or fire

Substrate

The bonding areas have to be solid, even, clean, dry and free of grease and oil.

Adhesive consumption

For building heights up to 20 m the consumption and the amount of adhesive stripes required are indicated on page 51 in the table "FDT adhesive U consumption for thermal insulation". For detailed application instructions see the installation instructions Rhepanol hfk and the containers.

Application method

- With the FDT universal application trolley and adapter for FDT adhesive U (6.5 kg containers) for even substrates.
- Manual application should be limited to roof areas that cannot be worked on with the application trolley, such as small areas between roof lights.



FDT universal application trolley 1 m with adapter and attached 6.5 kg containers of FDT adhesive U

Sloping areas

At roof slopes over 7°:

- Preferably, the adhesive should be applied in direction of the slope.
- Supporting measures should be applied to prevent the materials slipping off while the adhesive is curing.

Fascia boards, for example, can be used as abutment. At roof slopes over 20°, application must be agreed with our experts.

Curing

- The curing time of the adhesive depends on the temperature as well as on the ambient humidity and the air humidity. Normally a sufficient initial hardness is reached within 1 to 3 hours. A slight moistening reduces the curing time.
- In case of bonding vapour-proof materials, the curing time may be extended. However, even in very unfavourable conditions, the adhesive will be completely hardened within several days.
- With high summer temperatures (approx. 25 °C and above) and low air humidity, it is recommended slightly moistening the substrate after applying the adhesive to ensure a sufficient degree of moisture for foaming.

¹⁾ Due to its foaming characteristics FDT adhesive U is not approved for bonding of bitumen sheet compensation layers, onto which the roofing membranes are directly bonded.

FDT adhesive U

Range of application

Substrates	Bitumen sheet vapour control layers	Rigid EPS foam boards and sheets	Mineral wool boards
Reinforced concrete	X		
Aerated concrete with cold bitumen primer	X	X	
Chipboards	X		
Steel profile sheets			
– with plastic coating	X	X	
– with aluminium-zinc	X	X	
– galvanized with anticorrosive coating	X	X	
Bituminous vapour control sheets ¹⁾		X	X
Rigid EPS foam boards/sheets	X	X	
New bituminous sheets ¹⁾		X	X
Old bituminous sheets, if the surface is solid and clean	X	X	X

¹⁾ Without PE backing or talcum coating.

Do not use FDT adhesive U for bonding Rhepanol roofing membranes!

Technical data

Base matter	Colour	Consistence	Bulk density	Non-volatile
(VBF) isocyanate prepolymer	brownish	liquid	1.1 g/cm ³	100 %
Flash point	Compulsory notification according to Hazardous Material Regulation	Installation temperature	Open time	Height difference
non	yes	min. +5 °C, max. +50 °C	up to 15 minutes depending on the weather	depending on humidity, temperature and amount applied: scheduled 5 mm

Storage

Not frost-proof	Best storage	Maximum period of storage
No	in a dry place at temperatures from +10 °C to +20 °C	12 months in tightly closed original containers

Forms of supply

Product name	Forms of supply	Application
FDT adhesive U	6.5 kg container	for FDT universal application trolley 1 m

Hazard identification, safety precautions, transport markings, see EC safety data sheet.

Rhepanol primer sk-W**Rhepanol primer sk-L**

The primer layers serve as an adhesion promoter for the self-adhesive roofing membrane Rhepanol hfk-sk.

Application

Thoroughly stir up the primer prior to processing. Apply the primer evenly to the complete surface with a brush or a paint roller.

Before laying the roofing membrane Rhepanol hfk-sk, the primer must be completely dry (finger test). In cool or wet weather conditions, primer sk-L will dry faster. The condition of the bonding substrates and the necessity for precoating with primer sk-L/sk-W may change depending on the weather and construction site conditions.

If necessary, a test bonding has to be carried out. Primer must be applied only to areas, which will be waterproofed the same day.

Substrate

- The substrate must be solid, plain, clean, dry, free of dust, grease and oil as well as separating agents
- Suitable substrates see table p. 61

Consumption

- Approx. 0.2 l/m²
- Consumption depends on the substrate conditions
- The applied quantities must be increased for rugged and absorbent substrates

There are two different primers:

	Rhepanol primer sk-W	Rhepanol primer sk-L
Base	solvent-free emulsion, bitumen-free	SBS rubber, solvent-containing
Consistency	liquid, rollable and brushable	liquid, rollable and brushable
Colour	blue	red
Processing temperature	min. +5 °C	min. +5 °C
Flash-off time*	approx. 30 min. (After that, the roof area can be walked on)	approx. 15 min. (After that, the roof area can be walked on)
Storage	dry, cool, frost-protected	dry, cool, frost-protected
Shelf life	min. 12 months	min. 12 months

*Depending on temperature and humidity

FDT gravel stop profile

Application

The FDT gravel stop profiles are high-quality stainless steel elements with an attractive design. The FDT gravel stop profiles consist of 60 mm or 100 mm high and 2 m long sections – with cut-outs for unhindered rainwater drainage. Compensation of thermal elongation is provided for. The Rhepanol holders are fastened with screws and are equipped with grey or black cover tape collars. Clamps are of stainless steel and serve as a joint connector and profile stiffener over the holder.

Range of application

As a barrier on gravelled roofs along the eaves or on terraced roofs with paving slabs in a fine gravel bed.

Properties

Outstanding static properties due to special holders.

Application instructions

The holders are welded to the roofing membrane using Rhepanol hsg strips.

Processing

Preparing (cutting) of the FDT gravel stop profiles can be done with standard cutting tools such as sheet shears.

Transportation and storage

The gravel stop profiles are factory-packed in cardboard boxes with 10 profiles of 2 m length each, including the necessary holders and clamps. The boxes must be stored horizontally in a dry place.



Determination of the amount of required Rhepanol holders and clamps

Always round up to an even amount of metres. The rounded up sum of metres +1 is the required amount of holders and clamps. In case of discontinued sections every partial section is to be considered separately.

Forms of supply

Product name	Forms of supply
Package of Rhepanol gravel stop profiles, grey or black	10 units at 2 m each, incl. 21 holders and clamps

Additional items as required:

Rhepanol holders and clamps, grey or black

FDT gravel stop profile, 2 m, stainless steel silver

Internal corner for FDT gravel stop profile, stainless steel silver

External corner for FDT gravel stop profile, stainless steel silver

Rhepanol contact adhesive 50, Rhepanol sealants, Rhepanol primers

Product name	Properties	Range of application
Rhepanol contact adhesive 50	Synthetic-rubber-based contact adhesive.	For bonding Rhepanol to walls, roof lights and parapets.
Rhepanol adhesive 9	Acrylic-based dispersion adhesive.	For bonding Rhepanol to chipboards and veneer boards on roof slopes of 15°.
FDT sealant A	Solvent-free plasto-elastic.	Sealing of joints, cracks with limited movement stress. Good adhesion to e.g. ceramics, render, brick work, concrete, lightweight concrete, natural stone and Rhepanol.
FDT sealant S	Elastic solvent-containing joint.	For expansion and connection joints e.g. in glass, in bathrooms and toilets and on the roof. Good adhesion to Rhepanol.
Rhepanol primer 1	Blue coloured polymer solution with contact outstanding adhesion to steel, concrete, render finish, wood and rigid PVC.	Bonding agent for Rhepanol contact adhesive 50
Rhepanol primer 2	Transparent polymer solution with good adhesion to most nonferrous metals and stainless steels.	Especially reliable adhesive bond is reached, if coating with Rhepanol primer 2 is followed by coating with Rhepanol primer 1.



FDT VarioGully

FDT VarioGully

FDT VarioGully is a proven flat roof rainwater outlet according to EN 1253, which is regularly tested by the external testing institute LGA Bavaria. It is thermally insulated and made of highly impact resistant polypropylene (PP) and includes gravel stop/leaf guard.

In case of heatable FDT VarioGully options, the heater unit is doubly protected by the two integrated safety systems (heat monitoring relay and fuse). Connection via safety transformer 230/24 V (10 W per outlet).

Range of application:

In warm and cold roof structures in vertical and angled version. Corresponding warm roof upstands are available for insulation material thicknesses from 50 to 200 mm and 50 to 400 mm; special sizes on request. Direct connection to all vapour control membranes or roofing membranes, or with separately preformed collar.

Drainage rate:

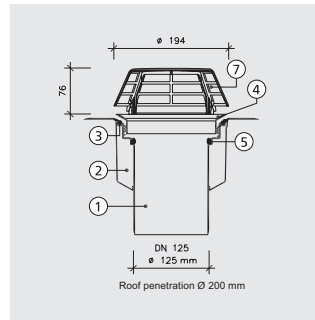
The FDT VarioGully has an outstanding drainage rate e.g. at 35 mm. This means a reduced number of outlets or smaller widths for the emergency drainage are necessary.

All components of the new programme are compatible with the existing parts and complement each other.

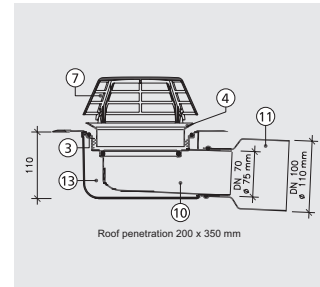
Drainage equipment calculation according to DIN 1986-100 and DIN EN 12056-3

We shall be glad to advise and assist you with the calculation for drainage equipment in consideration of design and centennial rainfall. The service form is available on page 100.

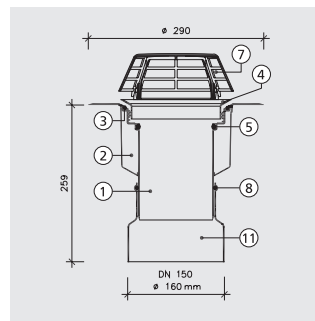
FDT VarioGully, vertical, DN 125, without reducer



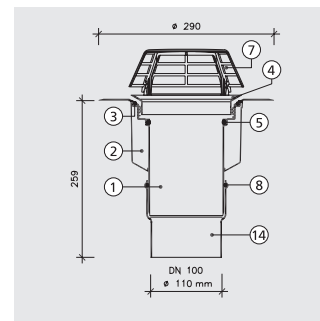
FDT VarioGully, angled, DN 100, extremely flat, overall height 110 mm, with transition piece DN 70/100



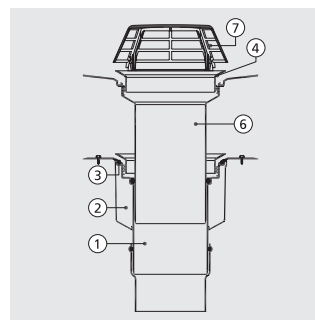
FDT VarioGully, vertical, DN 150 (160)



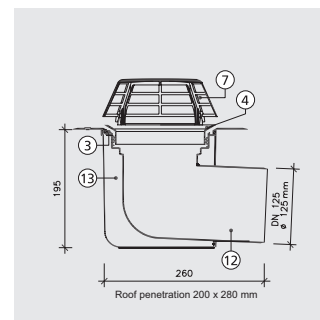
FDT VarioGully, vertical, DN 100, 1-stage, with reducer DN 125/100



FDT VarioGully, vertical, DN 125, with warm roof attachment, 2-stage, without reducer



FDT VarioGully, angled, DN 125, overall height 195 mm, 1-stage



- ① Outlet DN 125
- ② Thermal insulation vertical
- ③ FDT sealing ring oval
- ④ FDT screw ring
- ⑤ FDT roll ring

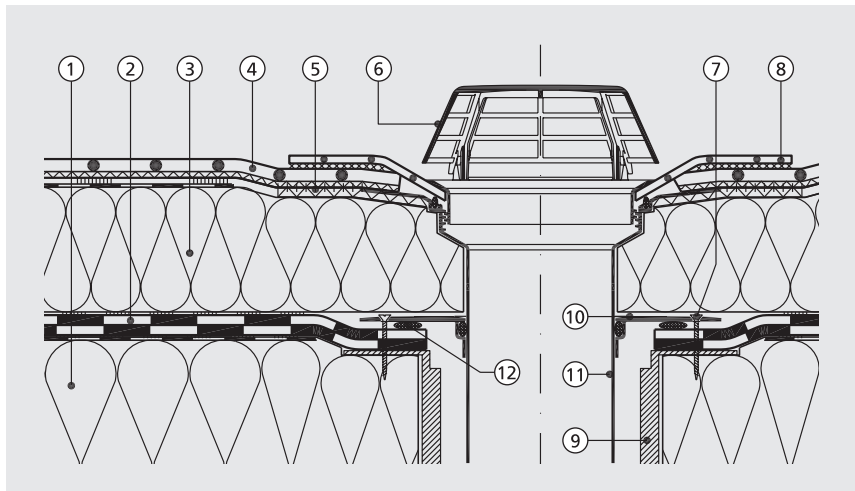
- ⑥ FDT VarioGully warm roof extension
- ⑦ FDT gravel stop/leaf guard
- ⑧ FDT roll ring DN 125
- ⑨ Transition piece DN 70/100

- ⑩ Outlet angled DN 70
- ⑪ Transition piece DN 125/100
- ⑫ Outlet angled DN 125
- ⑬ Thermal insulation
- ⑭ Reducer DN 125/100

FDT refurbishment flange, accessories for FDT VarioGully: FDT emergency outlet socket, FDT terrace grating

FDT refurbishment flange

- Ensures installation in the existing old roof without backflow.
- Supplied complete with bolts and sealing cord.
- To be used with old roof outlet up to DN 150, depending on the diameter of the run-in area, min. 137 mm and max. 210 mm.



- | | |
|--|---|
| ① Existing thermal insulation | ⑦ FDT VarioGully fixing (4 fastener per outlet) |
| ② Existing roof sealing with bitumen | ⑧ Rhepanol h-collar |
| ③ EPS thermal insulation, bonded with FDT adhesive U | ⑨ Existing rainwater outlet |
| ④ Roofing membrane Rhepanol hfk, bonded with FDT roofing membrane adhesive | ⑩ FDT VarioGully refurbishment flange |
| ⑤ Gripfix ring | ⑪ FDT VarioGully warm roof extension |
| ⑥ FDT gravel stop/leaf guard | ⑫ Sealing cord |

Accessories for FDT VarioGully:

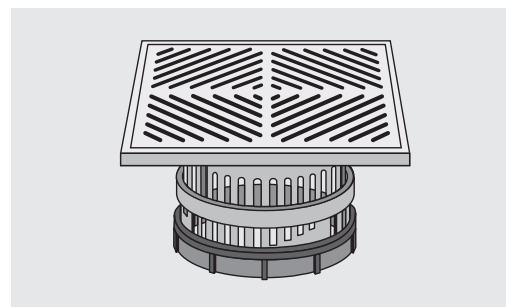
Emergency outlet socket

- For easy retrofitting of all FDT VarioGully rainwater outlets as emergency outlets
- The banking height is 20 to 50 mm resp. 20 to 110 mm.

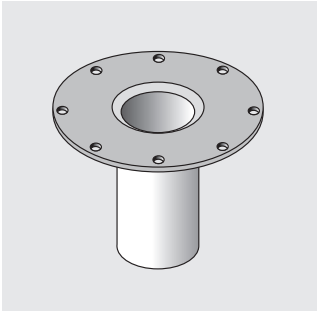
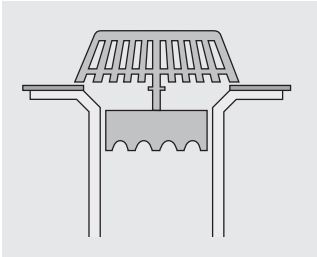
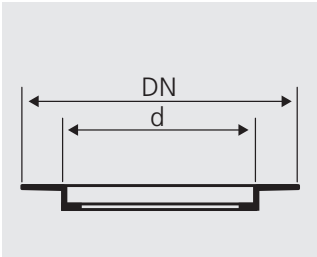
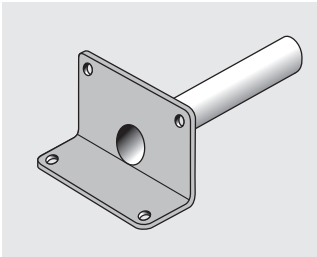
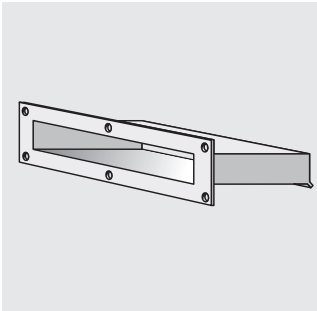


FDT terrace grating

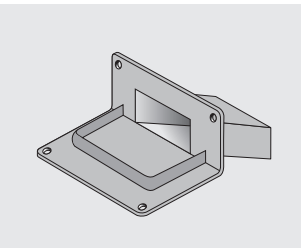
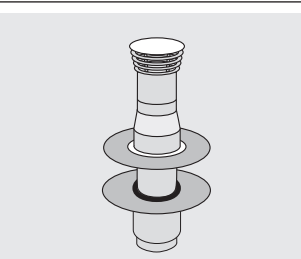
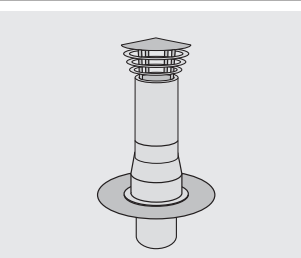
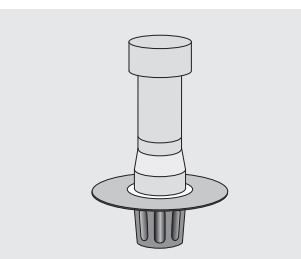
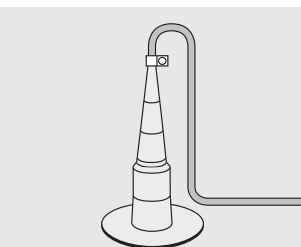
Made of aluminium with lift ring. For application on flat roofs with paving slabs or on inverted roofs. The installation height of 67 to 90 mm can be adapted to the terrace structure in steps of 3 mm. With a slab height of 90 mm or more, additional lift rings will be necessary. Each lift ring provides an additional height of 36 mm. Dimension: 200 x 200 mm.



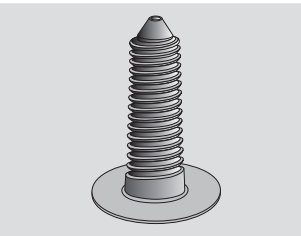
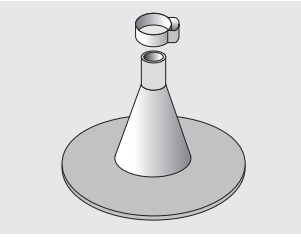
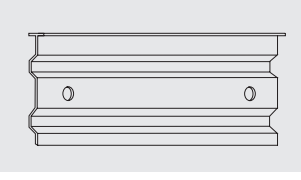

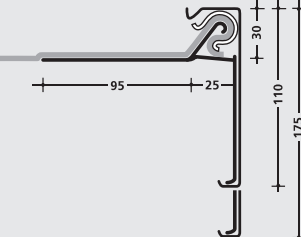
FDT RWE rainwater outlets and accessories, FDT water spouts and FDT weir overflows

Product name	Dimensions in mm		Properties/application
FDT RWE rainwater outlets	outer diameter d		<p>The true advantage of this built-in element is its simple installation. An ideal solution, e.g. when it comes to upgrading a roof during refurbishment. The rainwater outlet can be installed in the existing opening in no time at all.</p>
Rhepanol-RWE 50	50		
Rhepanol-RWE 56	56		
Rhepanol-RWE 63	63		
Rhepanol-RWE 75	75		
Rhepanol-RWE 95	95		
Rhepanol-RWE 110	110		
Rhepanol-RWE 125	125		
Rhepanol-RWE 140	140		<p>The FDT leaf guard is compatible with all rainwater outlets and can be cut to size to fit the corresponding diameter. Also suitable for all FDT through-wall outlets when cut to size.</p>
FDT leaf guard			
FDT lip seal for:	Pipe diameter		<p>The FDT lip seals are suitable for installation without backflow with all rainwater outlets as well as for installation directly into the down-pipe and old rainwater outlets.</p>
Rhepanol-RWE 95	DN 100		
Rhepanol-RWE 95	DN 125		
Rhepanol-RWE 125	DN 150		
Rhepanol-RWE 160	DN 200		<p>Especially suitable for draining smaller roof areas such as garages, carports, terraces, etc.</p>
FDT water spouts	Outer diameter d		
Rhepanol water spout 50	50		
Rhepanol water spout 75	75		
Rhepanol water spout 110	110		<p>FDT weir overflows when installed in a sufficient number provide a complete drainage of the rainwater from the whole roof or individual roof areas. Two types are available: a sink-type for larger roof areas (see fig.) or with a pipe for smaller roof areas (no fig.). Also available as water spout.</p>
FDT weir overflows	Outer diameter d		
Rhepanol weir overflow 75	75		
Rhepanol weir overflow 110	110		
Rhepanol weir overflow 200 x 100	210 x 110		
Rhepanol weir overflow 300 x 100	310 x 110		
Rhepanol weir overflow 450 x 100	460 x 110		
Rhepanol weir overflow 600 x 100	610 x 110		
Rhepanol weir overflow 800 x 100	810 x 110		
Rhepanol weir overflow 1000 x 100	1010 x 110		
Rhepanol weir overflow "special type"			

**FDT weir overflow plus,
FDT flat roof vent pipe, FDT refurbishment vent pipe,
FDT cold roof vent, FDT lightning conductor collar,**

Product name		Properties/application
FDT weir overflow plus		FDT weir overflow plus with extremely high discharge rate resp. narrow connecting width.
FDT flat roof vent pipe DN 125/100		<p>Made of rigid PVC with increased impact strength. With removable cap and bearing ring. Ready for installation with integrated Rhepanol collar. With reducer DN 100</p> <p>Body colour: grey.</p>
FDT refurbishment vent pipe for DN 100		<p>Made of rigid PVC with increased impact strength. With removable cap and ready-to-install integrated collar. For connection with vents (pipe diameter DN 100) at roof refurbishment with Rhepanol hfk.</p> <p>Body colour: grey.</p>
FDT cold roof vent DN 125		<p>Made of rigid PVC with increased impact strength. Vent cross-section of 11,400 mm². Weather cap can be removed for maintenance. Ready for installation with integrated Rhepanol collar.</p> <p>Body colour: grey.</p>
FDT lightning conductor collar Rhepanol		<p>With Rhepanol collar. For flashing on lightning protective system and for diameter up to 51 mm</p> <p>Height: 250 mm.</p> <p>Body colour: black.</p>

FDT universal covering/FDT support covering
FDT wall connection profiles/FDT roof edge trims

Product name		Properties/application
<p>FDT universal covering</p>		<p>With Rhepanol collar. For flashing against penetrations from 14 mm to 48 mm diameter.</p> <p>Flange diameter: 200 mm. Height: universal from 150 mm to 300 mm.</p> <p>Body colour: grey</p>
<p>FDT support covering</p>		<p>With Rhepanol collar. For flashing against penetrations from 14 to 50 mm diameter with stainless steel clamp for safety holders with Ø 14 – 16 mm.</p> <p>Height: 150 mm.</p> <p>Body colour: grey.</p>
<p>FDT aluminium wall connection profile Economy</p>		<p>Rigid aluminium profile in punched 3 m sections. For fixing Rhepanol and Rhenofol roofing membranes at vertical surfaces.</p> <p>Fastening with 5 fasteners per metre, hole diameter 8 mm.</p>
<p>FDT aluminium wall connection profile Classic</p>		<p>Highly rigid aluminium profile in punched 4 m sections with slot for hooking up metal sheets. For fixing Rhepanol and Rhenofol roofing membranes at vertical surfaces.</p> <p>Fastening with 5 fasteners per metre, 6.2 x 8 mm slotted holes.</p>
<p>FDT aluminium roof edge trim 110/175</p>		<p>Consisting of an extruded aluminium mounting rail and roll-formed stove enamel cover (colour: silver metal grey, similar to RAL 9007), as well as plastic clamps for fixing roofing membranes up to 5 mm thickness.</p> <p>Roofing membranes ≤ 1.5 mm must be folded back once in the clamping area.</p>

Rhepanol h preformed corners, Rhepanol h collars

Perfectly suitable for Rhepanol hfk and hfk-sk

Product name	Properties	Range of application
Rhepanol h internal corner 90°	hot air weldable.	Preformed detail for sealing internal corners with roofing membranes Rhepanol hfk/hfk-sk.
Rhepanol h external corner 90°	hot air weldable.	Preformed detail for sealing external corners with roofing membranes Rhepanol hfk/hfk-sk.
Rhepanol h rooflight corner	hot air weldable.	Preformed detail for sealing rooflight corner with roofing membranes Rhepanol hfk/hfk-sk.
Rhepanol h collar	hot air weldable incl. Gripfix ring.	For reliable flashing of Rhepanol hfk against the VarioGully. The Gripfix ring replaces contact bonding with Rhepanol contact adhesive 50.
Rhepanol h universal collar	hot air weldable incl. Gripfix ring.	Preformed detail for built-in details and roof penetrations at roofing membranes Rhepanol hfk, collar diameter 340 mm.
Rhepanol h collar loose/fixed flange	up to Ø 350 mm with self-sealing edge system and from Ø 350 mm with Rhepanol f.	For all standard rainwater outlets with bolt connection (e. g. 6 holes).
Rhepanol EPDM framing ring	as set (2 framing rings).	For flashing against loose/fixed flange outlets with roofing membranes Rhepanol hfk/hfk-sk.

Service



We shall be glad to advise and assist you with the calculation for drainage equipment and wind uplift calculation.

The service forms are available for download and printing at www.fdt.de.

Request for drainage equipment calculation for FDT VarioGully according to DIN 1986-100

Please copy and fax to +49 621 8504-445 or per e-mail to technik@fdt.de

Building project:	Client:
Name:
Address:
Postal code/City:
Country:
Contact person:
Telephone:
Telefax:
E-mail:

Geometry: Please attached DWG/DXF drawing indicating the position of the rainwater outlets and emergency overflows (fully dimensioned).

Length: m Height: m
 Width: m Roof slope:° **or** %
 Number of valleys: St. (in case of irregularly distributed valleys/gutters, please attach separate sketch with indication of slope direction)
 Roof type: without ballast ballasted with gravel ballasted with panels
 extensive vegetation < 100 mm extensive green roof > 100 mm

Intensity of rainfall: (value according to statistical rainfall)

Design rainfall l/s*ha (for standard drainage e.g. 300 l/s*ha)
 Centennial rainfall: l/s*ha (for emergency drainage e.g. 600 l/s*ha)

Downpipes: (will not be calculated from FDT)

Downpipes already planned as follows:

<input type="checkbox"/> DN 70 Ø outer 75 mm	<input type="checkbox"/> DN Ø outer mm
<input type="checkbox"/> DN 100 Ø outer 110 mm	<input type="checkbox"/> Dimension to be determined.
<input type="checkbox"/> DN 125 Ø outer 125 mm	

Drainage The drainage system is designed with

FDT VarioGully vertical horizontal DN 70 DN 100 DN 125 DN 150
 FDT weir overflow DN 50 DN 75 DN 110

Emergency drainage: The emergency drainage system for centennial rain is to be designed with:

FDT weir overflow 600 x 100 mm 300 x 100 mm 200 x 100 mm
 "tailor made" x mm (find details in product range)
 FDT weir overflow round 75 mm 110 mm
 FDT VarioGully with overflow socket:
 vertical DN 150 DN 125 DN 100 DN 70
 angled DN 125 DN 100 DN 70

Additional information:

Place/date Signature

Request for Wind uplift calculation for mechanical fastening - ballast - bonding

according to DIN EN 1991-14/NA:2010-12 according to Austrian standard according to

Please copy and fax to +49 621 8504-445 or per e-mail to technik@fdt.de

Building project:

Client:

Name:
 Address:
 Postal code/City:
 Country:
 Contact person:
 Telephone:
 Telefax:
 E-mail:

Geometry: drawing enclosed (fully dimensioned): yes no
 Length: m Height: m
 Width: m Roof slope: ° **or** %
 Parapet height: m
 (the lowest parapet height over the top edge of the roof sealing is to be considered)

Object location: Wind speed: m/s **or** wind velocity: m/s **or** gust pressure KN/m²
 Terrain category*: Height above sea level: m

Building*: Opening percentage of exterior walls <1% and approximately evenly distributed; closed building
 Opening percentage of exterior walls ≥ 1% (please enclose sketch illustrating the position of the openings)

Ballast: Gravel 16/32, cm Green roof (dry weight) kg/m²


Fasteners: Manufacturer: Type:

Application system: Gripfix system membrane overlap strip and paste system
 ballast bonding
 (FDT roofing membrane adhesive or Rhepanol contact adhesive 90)

Roofing membrane: Rhepanol® fk Rhepanol® fk with welding edge Rhepanol® hg
 Rhenofol® CV Rhenofol® CG Rhepanol® hfk Rhepanol® hfk-sk

Preferable membrane width: m Membrane thickness: mm
 Corner- and perimeter area with wide membrane width and fastening **or**
 Smaller membrane width without additional fastening

Substrate / supporting construction: Concrete: mm Lightweight concrete: mm
 Timber: mm mm

Profiled steel decking: Manufacturer: Type:
 Corrugation spacing mm Sheet thickness: mm
 Overall thickness of the layer build-up: mm

Additional information:

Place/date Signature

*For further information, please see the explanations for the Data Survey Form at www.fdt.de.

DIN/VOB and other regulations

- Manufacturer's handling instructions for the materials employed
- VOB part A: General Regulations on the Award of Contracts for Construction Services – DIN 1960
- VOB part B: General Conditions of Contract for the Execution of Building Works – DIN 1961
- VOB part C: General Technical Specifications for Building Works
- Technical Rules for Roofs with Covering – Instructions for Flat Roofs – of the German Central Association of Roofing Contractors
- Technical Rules for Metal Works in the Roofing Trade
- Guidelines for the Planning, Construction and Maintenance of Green Roofing – Green Roofing Guideline of the Research Association Forschungsgesellschaft Landschaftsentwicklung Landschaftsbau e.V. (FLL.)
- Recommendations of the Industrial Association for Roofing and Waterproofing Membranes (DUD)
- Ordinance on Energy-saving Thermal Insulation and Energy-saving Installations in Buildings (Energy Saving Ordinance – EnEV)
- Guidelines on Constructional Fire Safety in the Industrial Building Sector (Industrial Construction Guidelines – IndBauR)
- DIN EN 1991 Eurocode 1: Actions on structures:
Part 14: General actions, Wind actions
- DIN CEN/TS 1187 Test methods for external fire exposure to roofs
- DIN EN 1253 Gullies for buildings
- DIN 1986 Drainage systems on private ground (in particular DIN 1986-100)
- DIN 4102 Fire behaviour of building materials and structural elements
- DIN 4108 Thermal Insulation in Building Construction
- DIN 4109 Sound insulation in building construction
- DIN EN 12056 Gravity drainage systems inside buildings (in particular DIN EN 12056-3)
- DIN EN 13956 Flexible sheets for waterproofing – Bitumen, plastic and rubber sheets for roof waterproofing – Definitions and characteristics
- DIN EN 13967 Flexible sheets for waterproofing – Plastic and rubber damp proof sheets including plastic and rubber basement tanking sheet – Definitions and characteristics

- DIN EN 13162 Thermal insulation products for buildings – Factory made mineral wool (MW) products
- DIN EN 13163 Thermal insulation materials for buildings – Factory made products of extruded polystyrene foam (EPS)
- DIN 18195 Waterproofing of buildings, in particular
 - part 2 materials
 - part 3 handling of materials
 - part 5 sealing against non-pressing water, design and implementation
 - part 8 sealing of structural joints
 - part 9 penetrations, transitions, connections and endings
 - part 10 protection layers and protection measures
- DIN 18234 Structural fire protection in industrial buildings
- DIN 18530 Massive ceiling constructions for roofs, design and implementation
- DIN 18531 Roof waterproofing; terms and definitions, requirements, design principles
- DIN V 20000-201 Application of building products in structures – part 201: Application standard for waterproofing membranes according to European product standards for use in roof waterproofing
- DIN V 20000-202 Application of building products in structures – part 202: Application standard for waterproofing membranes according to European product standards for use in waterproofing of buildings
- Test method for the resistance against root penetration of green roofing of the Research Association Forschungsgesellschaft Landschaftsentwicklung Landschaftsbau e.V. (FLL.)
- Additional U.E.A.t.c.* guidelines for the award of Agréments for mechanically fastened roof waterproofing
- DIN SPEC 4102-23 Fire behaviour of building materials and structural elements – part 23: roof coverings – application instructions for test results of roof coverings according to DIN V ENV 1187, test method 1, and DIN 4102-7
- DIN EN 13501-1 Fire classification of construction products and building elements – part 1: Classification using test data from reaction to fire tests
- DIN EN 13501-5 Fire classification of construction products and building elements – part 5: Classification using data from external fire exposure to roofs tests

*Union Européenne pour l'Agrément technique dans la construction

Important notes on fire protection

The text of this
**“Technical Manual Roofing Membrane
System Rhepanol hfk”** as well as the illustrations of layer build-ups, roof penetrations and details do not reflect any special constructional measures for preventing the spread of fire according to DIN 18234 1-4 (Fire safety of large roofs for buildings) or to the Industrial Construction Guidelines (IndBauR), section 5.11.3.

**Our flat roof specialist will be glad to give
you more detailed information.**

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Roofing membrane system Rhepanol® hfk
Technical manual

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Editor:

**FDT FlachdachTechnologie
GmbH & Co. KG**

Eisenbahnstraße 6-8
D-68199 Mannheim

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**FlachdachTechnologie
GmbH & Co. KG**

Eisenbahnstraße 6-8
68199 Mannheim
Germany

Tel +49-6 21-85 04-0
Fax +49-6 21-85 04-2 05
www.fdt.de

Export Department:

Phone +49-6 21-85 04-3 72

Fax +49-6 21-85 04-3 78

E-Mail export@fdt.de