

Approval body for construction products
and types of construction

Bautechnisches Prüfamt

An institution established by the Federal and
Laender Governments



European Technical Assessment

ETA-13/0655
of 9 May 2022

English translation prepared by DIBt - Original version in German language

General Part

Technical Assessment Body issuing the
European Technical Assessment:

Deutsches Institut für Bautechnik

Trade name of the construction product

Rhepanol fk and Rhepanol hfk - System

Product family
to which the construction product belongs

Mechanically fixed roof waterproofing

Manufacturer

FDT Flachdach Technologie GmbH
Eisenbahnstraße 6-8
68199 Mannheim
DEUTSCHLAND

Manufacturing plant

FDT Flachdach Technologie GmbH
Eisenbahnstraße 6-8
68199 Mannheim
DEUTSCHLAND

This European Technical Assessment
contains

14 pages including 8 annexes which form an integral part
of this assessment

This European Technical Assessment is
issued in accordance with Regulation (EU)
No 305/2011, on the basis of

EAD 030351-00-0402

This version replaces

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Specific part

1 Technical description of the product

1.1 Definition of the construction product

The mechanically fastened flexible roof waterproofing sheets systems "Rhepanol fk and Rhepanol hfk -System" consist of different flexible waterproofing sheets on the basis of polyisobutylene (PIB), a hook-and-loop tape "Rhepanol Gripfix System" and sets of shanks and washers.

The waterproofing sheets are compatible with bitumen, and do not contain any substances that are intended to inhibit or prevent root penetration (root protection agents).

The kits with the components waterproofing sheet, hook-and-loop tape, shank and washer can be assembled for creating a mechanically fastened one-layer roof waterproofing system.

The insulation material is not a component of this system. The system build-up is given in Annex A1.

1.2 Waterproofing sheet and hook-and-loop tape

The waterproofing sheets "Rhepanol fk", "Rhepanol fk hot air weldable" and "Rhepanol hfk" are clad with polyester fleece and CE-marked according EN 13956.

The waterproofing sheets "Rhepanol fk" and "Rhepanol fk hot air weldable" are delivered in rolls with a standard length of 15 m and a maximum width of 1.05 m.

The waterproofing sheet "Rhepanol hfk" is delivered in rolls with a maximum length of 15 m and a maximum width of 2.05 m.

The manufacturers declared value (MDV) of the effective thicknesses of the waterproofing layer is 1.5 mm.

The joints overlap of "Rhepanol fk hot air weldable" and "Rhepanol hfk" is welded with hot air. The width of the weld is at least 30 mm for "Rhepanol fk hot air weldable" and at least 20 mm for "Rhepanol hfk".

The joints overlap of "Rhepanol fk" shall be made by bonding of the factory-made self-adhesive edge.

The minimum joint overlap is 50 mm respectively 100 mm depending on jointing technique.

Table 1 gives the general description of the flexible waterproofing sheets. The accompanying mechanical characteristics are stated in the Annex A2.

Table 1: Waterproofing sheets

Membrane	Cladding/Backing layer [g/m ²]	effective thickness of waterproofing layer without backing [mm]	Mass per unit area [g/m ²]
Rhepanol fk	Polyester fleece approx. 190	1,5	$2375 \leq F_g \leq 2750$
Rhepanol fk hot air weldable	Polyester fleece approx. 190	1,5	$2050 \leq F_g \leq 2370$
Rhepanol hfk	Polyester fleece approx. 190	1,5	$1840 \leq F_g \leq 2160$

The waterproofing sheets are fastened to the substrate with the hook-and-loop tape "Rhepanol Gripfix System" (width 125 mm), with a combination of "Rhepanol Gripfix System" and seam fastening or only with seam fastening.

The hook-and-loop tape "Rhepanol Gripfix System" is fastened to the roof with the mechanical fasteners. The waterproofing sheets is attached with the polyester fleece-laminated side on the hook-and-loop tape "Rhepanol Gripfix System" and rolled on at least twice with the "FDT Universal Roller".

1.3 Fasteners, washers

The following fasteners can be used and are CE-marked on the basis of the relevant ETAs:

- SFS intec, with the declared performances according to ETA-08/0262,
- AFAST, with the declared performances according to ETA-08/0285 or
- ZKSK, with the declared performances according to ETA-08/0033.

The different shanks and washers are stated in table 2 and 3.

Table 2: Shanks

Trade name	Type	Nature	Geometry
SFS IR2-4.8 x L (ETA-08/0262)	screw	coated carbon steel	4.8 x L mm
Guardian BS 4.8 x L (ETA-08/0285)	screw	coated carbon steel	4.8 x L mm
ZKSK (ETA 08/0033)	screw	Hardened carbon steel	4.8 x L mm

Table 3: Washers

Trade name	Type	Nature	Geometry
SFS IR 82 x 40 (ETA -08/0262)	washer	steel plate with aluzinc protection	82 x 40 mm
Guardian Sleeve R(P) (ETA-08/0285)	washer	Polypropylen	82 x 40 mm
Guardian Sleeve R-45 (ETA-08/0285)	washer	Polypropylen	43 mm, (∅)
Guardian Sleeve R-48 (ETA-08/0285)	washer	Polypropylen	48 mm, (∅)
Guardian Sleeve SP-50-S (ETA-08/0285)	washer	Sendzimir galvanized steel	50 mm, (∅)
ZKSK (ETA 08/0033)	holder	Polyamid PA6	50 mm, (∅)

2 Specification of the intended use in accordance with the applicable European assessment Document

The mechanically fastened flexible roof waterproofing sheets systems "Rhepanol fk and Rhepanol hfk -System" is used for waterproofing roofs to prevent the passage of water from one plane to another.

The roof waterproofing system can be used on new roofs or to upgrade existing roofs, also on horizontal surfaces. The possible roof substrates are specified sheet decks, concrete, aerated concrete or timber (see Annex A3).

The insulation material must be CE marked according to the relevant harmonized European standards and shall have a minimum stiffness as stated in Annex A1.

The verifications and assessment methods on which this European Technical Assessment is based lead the assumption of working life of the mechanically fastened waterproofing system of 10 years. The indications given on the working life cannot be interpreted as a guarantee given by the producer, but are to be regarded only as a means for choosing the right products in relation to the expected economically reasonable working life of the works.

The performances given in Section 3 are only valid if the mechanically fastened flexible roof waterproofing membrane is used in compliance with the specifications and conditions given in Annex B.

3 Performance of the product and references to the methods used for its assessment

3.1 Safety in case of fire (BWR 2)

Essential characteristic		Performance
External fire performance of roofs	System	see Anne A1
Reaction to fire	Sheet	see Annex A2

3.2 Hygiene, health and the environment (BWR 3)

Essential characteristic		Performance
Resistance to peel (joint)	Sheet / Sheet & Hook-and-loop-tape	See Annexe A2 / A3
Resistance to shear (joint)	Sheet / Sheet & Hook-and-loop-tape	See Annexe A2 / A3
Resistance to tear	Sheet	See Annex A2
Resistance to cold bending/folding	Sheet	See Annex A2
Resistance to water pressure	Sheet	See Annex A2
Resistance to water vapour permeability	Sheet	See Annex A2
Tensile properties	Sheet / Hook-and-loop-tape	See Annexe A2 / A3
Resistance to static and impact loading	Sheet	See Annex A2
Dimensional stability	Sheet / Hook-and-loop-tape	See Annexe A2 / A3
Thickness	Sheet / Hook-and-loop-tape	See Annexe A2 / A3
Flow resistance at elevated temperature for bituminous sheets	Sheet	No performance assessed (not applicable)
Resistance to ageing media	Sheet / Sheet & Hook-and-loop-tape	See Annexe A2 / A3

3.3 Safety and accessibility (BWR 4)

Essential characteristic		Performance
Resistance to wind loads (Wind uplift test: W_{adm})	system	See annex A3
Slipperiness	Sheet	No performance assessed
Fastener axial load	Fastener	See corresponding ETA
Resistance to fastener unwinding	Fastener	See corresponding ETA
Mechanical resistance/brittleness of plastic fastener	Fastener	See corresponding ETA
Resistance to corrosion of metallic fastener	Fastener	See corresponding ETA
Mechanical resistance after heat ageing of plastic fasteners	Fastener	See corresponding ETA

4 Assessment and verification of constancy of performance (AVCP) system applied, with reference to its legal base

According to EAD No. 030351-00-0402, the applicable European legal act is: 98/143/EC.
The system to be applied is: 2+

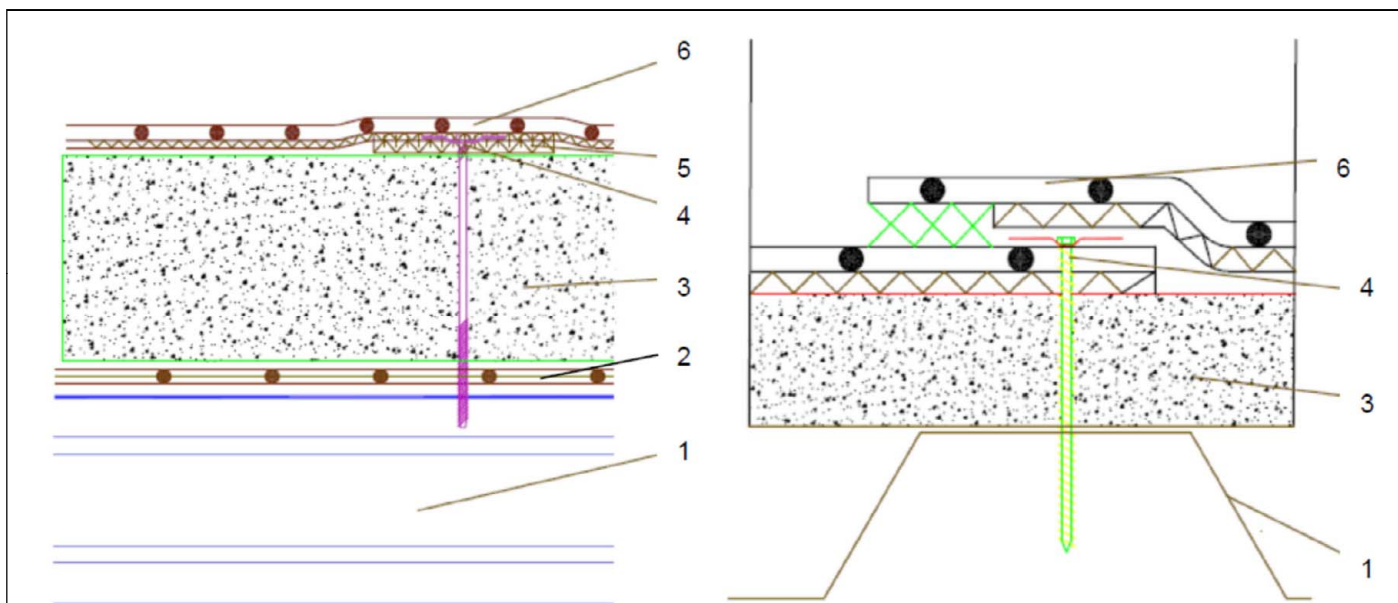
5 Technical details necessary for the implementation of the AVCP system, as provided for in the applicable EAD

Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited with Deutsches Institut für Bautechnik.

Issued in Berlin on 9 May 2022 by Deutsches Institut für Bautechnik

Bettina Hemme
Head of Section

beglaubigt:
Gnamou



Fixing with hook-and loop tape

Overlap, hot welded

- 1 Substrate (not part of the kit)
- 2 Vapour control layer (optional. not part of the kit)
- 3 Thermal insulation ¹⁾ (not part of the kit)
- 4 Fastener (according to relevant ETAs)
- 5 Rhepanol-hook-and-loop tape "Rhepanol Gripfix System"
- 6 Rhepanol fk / Rhepanol fk with hot air weldable / Rhepanol hfk – waterproofing sheet according to EN 13956

¹⁾ It shall be ensured that the insulation material on site has:

- a 10 % compression ≥ 60 kPa (EN 826)
- a point load behaviour ≥ 650 Pa, deformation 5 mm (EN 12430)

The insulation material must be CE marked according to the relevant harmonized European standard.

Reaction to fire: class E according to EN 13501-1²⁾
External fire performance of roofs class F_{ROOF} according to EN 13501-5²⁾

²⁾ These values are declared by Declaration of Performance (DoP) according to EN 13956 by the manufacturer values.

Information for users on external fire performance of roof decks:

For different roofing systems classification documents for the classification B_{ROOF} (t1), (t2), (t3) are available according EN 13501-5. The classification in the declaration of performance of the sheets is only valid for supporting decks which are described in the classification documents according CEN/TS 1187 and according EN 13501-5.

Rhepanol fk and Rhepanol hfk – System
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System build-up of the roof waterproofing

Annex A1

Characteristic	Test method	Unit	Value Rhepanol fk	Value Rhepanol fk hot air weldable	Value Rhepanol hfk
Thickness ¹⁾	EN 1849-2	mm	1.5	1.5	1.5
Mass per unit area	EN 1849-2	g/m ²	2650	2200	1900
Reaction to fire ¹⁾	EN 11925-2	-	class E	class E	class E
Water tightness ¹⁾	EN 1928 (B)	kPa	≥ 400	≥ 400	≥ 400
Peel resistance of joints ¹⁾	EN 12316-2	N/50 mm	≥ 80	≥ 150	≥ 150
Shear resistance of joints ¹⁾	EN 12317-2	N/50 mm	≥ 200	≥ 200	≥ 200
Tensile strength ¹⁾	EN 12311-2 (A)	N/50 mm	≥ 400	≥ 400	≥ 400
Tensile elongation ¹⁾	EN 12311-2 (A)	%	≥ 50	≥ 50	≥ 50
Resistance ag. dynamic indentation ¹⁾	EN 12691	mm	≥ 300	≥ 300	≥ 700
Resistance ag. static indentation ¹⁾	EN 12730 (A+B)	kg	≥ 20	≥ 20	≥ 20
Resistance to tearing ¹⁾	EN 12310-2	N	≥ 150	≥ 150	≥ 150
Resistance to hail ¹⁾ hard	EN 13583	m/s	≥ 17	≥ 17	≥ 25
Dimensional stability ¹⁾	EN 1107-2	%	≤ 0.5	≤ 0.5	≤ 1.0
Resistance to cold bending ¹⁾	EN 495-5	°C	≤ - 25	≤ - 25	≤ - 50
Resistance to UV radiation ¹⁾	EN 1297 5000 h, visible	-	pass	pass	pass
Water vapour transmission ¹⁾	EN 1931	μ	220000	220000	160000
Exposure to bitumen ¹⁾	EN 1548	-	pass	pass	pass
Resistance to liquid chemicals including water ¹⁾	EN 1847 Liste C	-	pass	pass	pass
Root resistance ¹⁾	EN 13948	-	npa*	npa	resistant
Resistance to ageing media - heat ageing, EN 1296 ²⁾					
Peel resistance of joints	EN 12316-2	%	Δ ≤ 20	Δ ≤ 20	Δ ≤ 20
Shear resistance of joints	EN 12317-2	%	Δ ≤ 20	Δ ≤ 20	Δ ≤ 20
Resistance to cold bending	EN 495-5	°C	Δ ≤ 15	Δ ≤ 15	Δ ≤ 15
Resistance to ageing media - ultra violet (UV) radiation ageing, EN 1297 ²⁾					
Resistance to cold bending	EN 495-5	°C	Δ ≤ 15	Δ ≤ 15	Δ ≤ 15
Resistance to ageing media - water aging, EN 1847 ²⁾					
Reel resistance of joints	EN 12316-2	%	Δ ≤ 20	Δ ≤ 20	Δ ≤ 20

¹⁾ These values are declared by Declaration of Performance (DoP) according to EN 13956 by the manufacturer values.

²⁾ These values are determined in accordance with EAD 030351 00 0402.

Rhepanol fk and Rhepanol hfk – System
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Characteristics of waterproofing sheets: "Rhepanol fk", "Rhepanol fk hot air weldable" and "Rhepanol hfk"

Annex A2

Table 1: Characteristics of hook-and-look tape "Rhepanol Gripfix System"

Characteristics of Rhepanol-hook-and-look tape Rhepanol Gripfix System	Test method	Unit	Value Rhepanol Gripfix System
Thickness ²⁾		mm	1.5
Width ²⁾		g/m ²	125
Peel resistance of joints between Rhepanol fk/ Rhepanol hfk and Rhepanol-hook-and-look tape Rhepanol Gripfix System ²⁾	EN 12316-2	N/mm	≥ 1.8
Shear resistance of joints between Rhepanol fk / Rhepanol hfk and Rhepanol-hook-and-look tape Rhepanol Gripfix System ²⁾	EN 12317-2	N/mm	≥ 4
Tensile strength ²⁾	EN 12311-2 (A)	N/cm	≥ 200/250
Tensile elongation ²⁾	EN 12311-2 (A)	%	≥ 30/25
Dimensional stability ²⁾	EN 1107-2	%	≤ 0.5
Resistance to ageing media - heat ageing ²⁾			
peel resistance of joints between Rhepanol fk / Rhepanol hfk and Rhepanol-hook-and-look tape Rhepanol Gripfix System ²⁾	EN 12316-2	%	Δ ≤ 20
shear resistance of joints between Rhepanol fk / Rhepanol hfk and Rhepanol-hook-and-look tape Rhepanol Gripfix System ²⁾	EN 12317-2	%	Δ ≤ 20
Resistance to ageing media - water aging²⁾			
peel resistance of joints between Rhepanol fk / Rhepanol hfk and Rhepanol-hook-and-look tape Rhepanol Gripfix System ²⁾	EN 12316-2	%	Δ ≤ 20

²⁾ These values are determined in accordance with EAD 030351 00 0402

Table 2: Admissible wind loads

Admissible wind load per fastener/washer combination with waterproofing sheets on different types of substrates	Screw	Washer	Sheet Deck	Timber		
			1	1	2	3
	for seamfastening					
				W_{adm} [N]		
	SFS IR2-4.8 x L	SFS IR 82 x 40	600	400		
	Guardian BS 4.8 x L	Guardian Sleeve R(P), Guardian Sleeve R-45, Guardian Sleeve R-48 oder Guardian Sleeve SP-50-S	600			
	ZKSK	ZKSK	600			
for Rhepanol-Hook-and-look Tape "Rhepanol Gripfix System"						
			W_{adm} [N]			
	SFS IR2-4.8 x L	SFS IR 82 x 40	500	400		
	Guardian BS 4.8 x L	Guardian Sleeve R(P), Guardian Sleeve R-45, Guardian Sleeve R-48 or Guardian Sleeve SP-50-S	500			
	ZKSK	ZKSK	500			

Sheet Deck

1 Steel S280GD – EN 10326, t ≥ 0.75 mm

Timber

1 structural timber EN 338/C24, t ≥ 22mm, effective embedment depth ≥ 22 mm

2 OSB3 EN 300, t ≥ 18 mm, effective embedment depth ≥ 18mm

3 particle board EN 312/P5, t ≥ 19 mm, effective embedment depth ≥ 19 mm

Rhepanol fk and Rhepanol hfk – System
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Characteristics of hook-and-loop-tape: "Rhepanol Gripfix System"
**Admissible wind load per fastener/washer combination with waterproofing sheets
on different types of substrates**

Annex A3

Design and dimensioning

The dimensioning shall be carried out with the values for the admissible windloads according to Annex A3, table 2, taking into account the national requirements.

Especially the following factors should be taken into account:

- dead and imposed loads,
- design with respect to the decisive wind pressure on roof areas,
- structural strength, stiffness and deflection limits,
- attachment of the roof deck to the structural framing,
- provision of insulation,
- assessment of condensation risk and provisions of vapour control layers,
- sound insulation,
- fire precaution,
- roof attachments, fixture and penetrations,
- falls and drainage,
- means of access for inspection and maintenance.

The examples for details according to Annex B2 to B5 shall be considered,

Installation

The performance of the mechanically fastened roof waterproofing system can be assumed only, if the installation is carried out according to the installation instructions stated in the technical file of the manufacturer, in particular taking account of the following points:

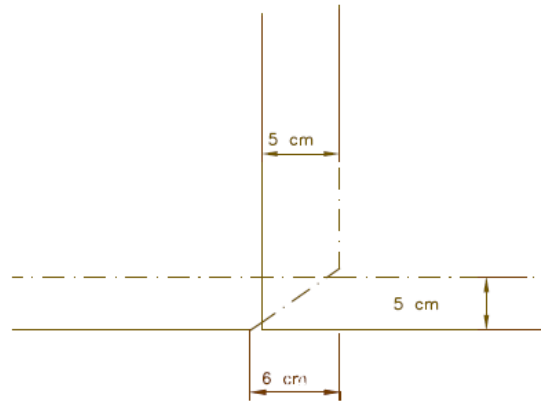
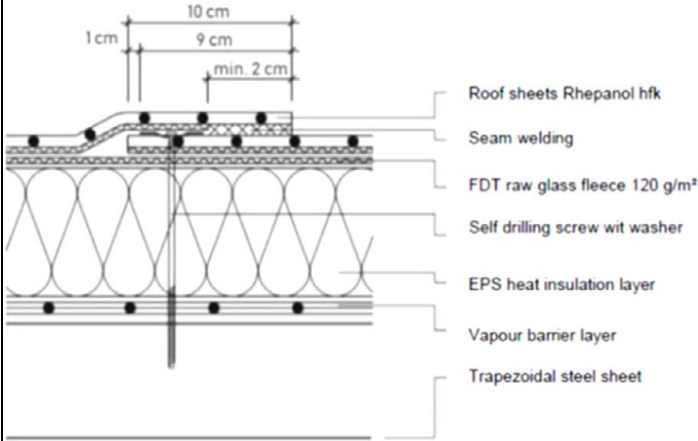
- installation by appropriately trained personnel,
- installation of only those components which are marked as components of the system,
- installation with the required tools and adjuvants,
- precautions during installation,
- inspecting the substrate surface for cleanliness and correct preparation,
- inspecting compliance with suitable weather conditions, avoid installation when temperature falls under 5 °C and the following weather conditions: high humidity, rain, snow or fog. By preheating the seam areas, welding is also possible at lower ambient temperatures,
- inspections during installation and of the finished roof waterproofing system and documentation of the results.

Rhepanol fk and Rhepanol hfk – System
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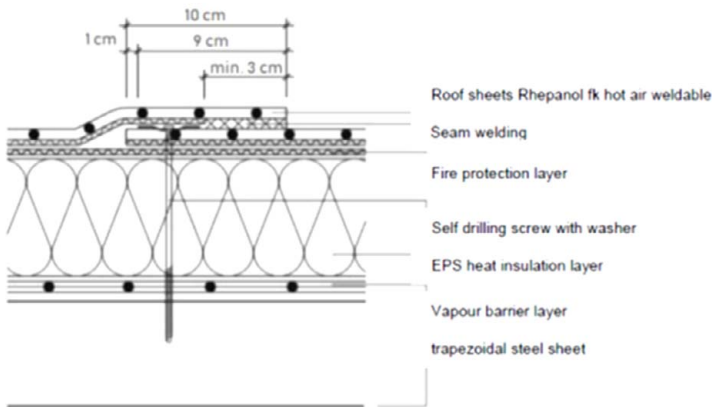
Intended use
Specifications

Annex B1

Seamfastening Rhepanol hfk



Seamfastening Rhepanol fk hot air weldable



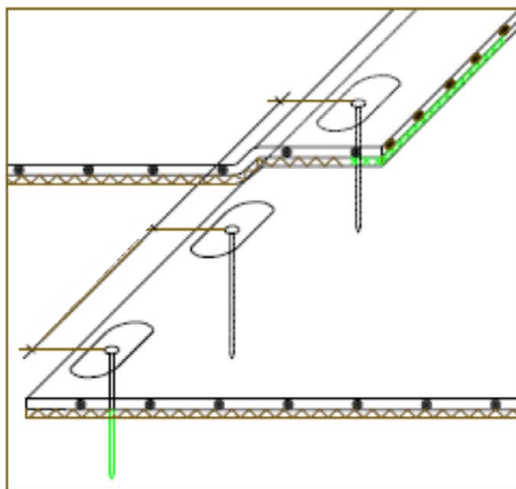
Hot welded overlap

Headbutt

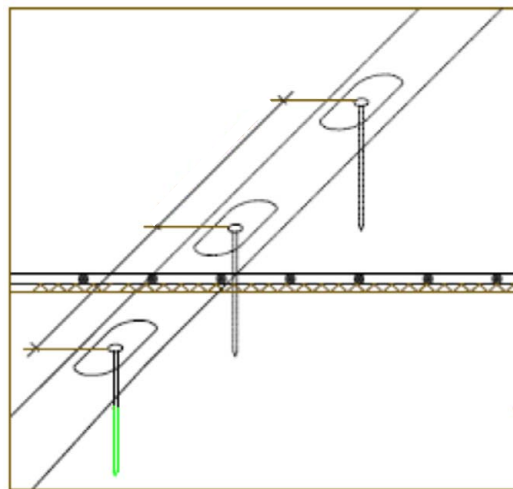
Rhepanol fk and Rhepanol hfk – System
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Dimensions of fixation and overlapping

Annex B2



Fixing with hot welded overlap



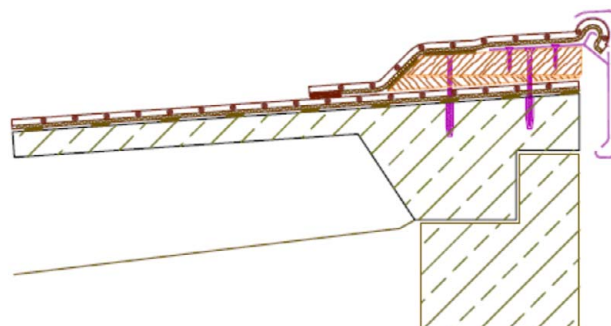
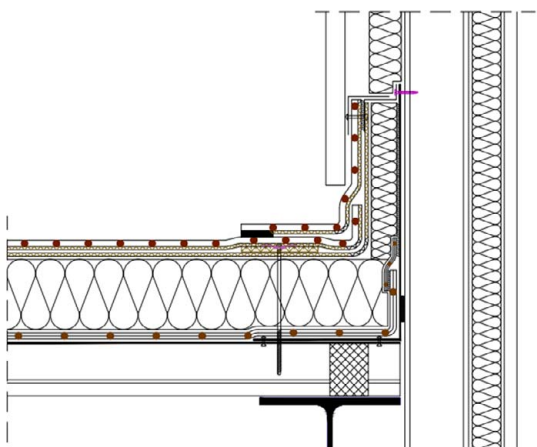
Fixing with hook-and loop tape

Minimum fastener distance	≥ 15 cm
Maximum fastener distance	≤ 65 cm
Minimum number of fastener	2 piece/m ²
Maximum distance between fastener and edge of sheet	≥ 1 cm

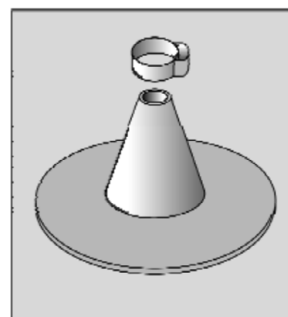
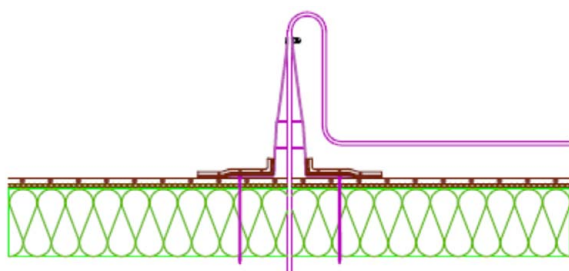
For the installation of the seamfastening and of the hook-and-loop tape, the respective installation instructions and technical manuals of the roofing membranes must also be observed.

Attica/Roof edge:

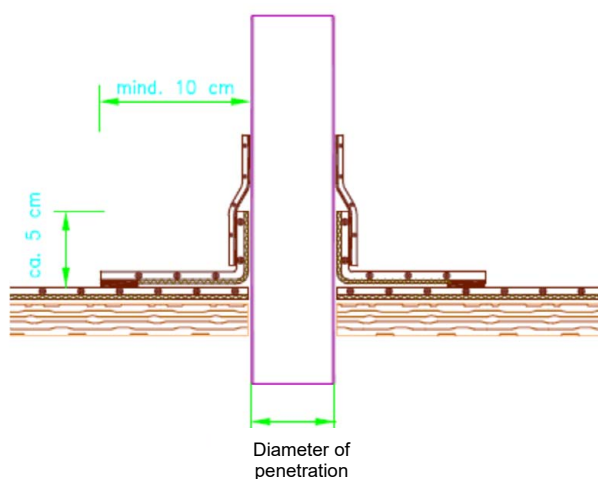
Wandanschluss (1)
Nicht belüftetes Dach



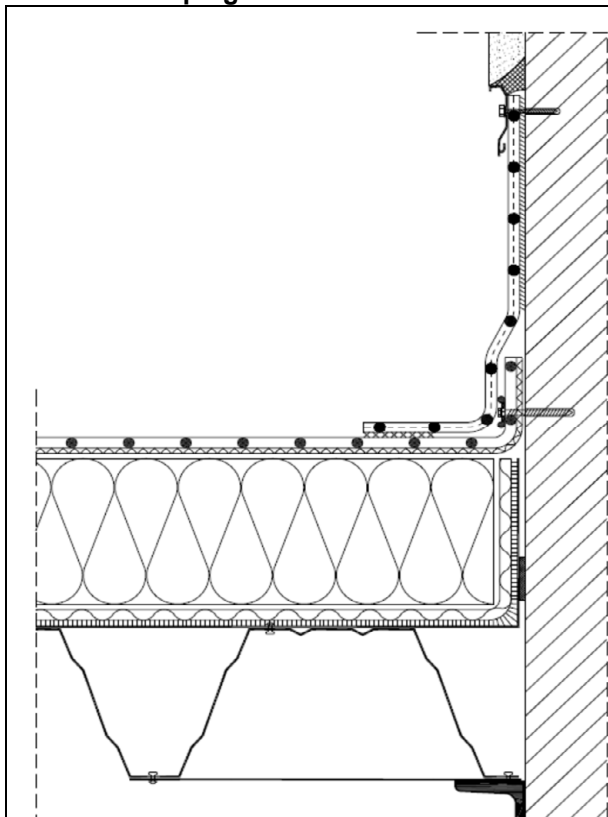
Penetration for lightning protection:



Penetration:

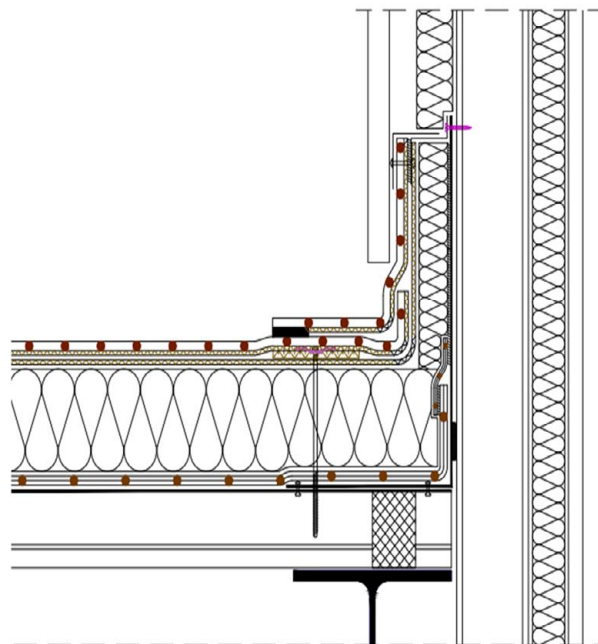


Safekeeping / wall connection:



With hot welded overlap

Wandanschluss (1)
Nicht belüftetes Dach



With Rhepanol-hook-and-look tape "Rhepanol Gripfix"

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Examples of details

Annex B5