Deutsches Institut für Bautechnik

Approval body for construction products and types of construction

Bautechnisches Prüfamt

An institution established by the Federal and Laender Governments

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European Technical Assessment

ETA-13/0655 of 21 May 2014

General Part

Technical Assessment Body issuing the European Technical Assessment:	Deutsches Institut für Bautechnik
Trade name of the construction product	Rhepanol fk - System
Product family to which the construction product belongs	Mechanically fixed roof waterproofing
Manufacturer	FDT Flachdach Technologie GmbH & Co. KG Eisenbahnstraße 6-8 68199 Mannheim DEUTSCHLAND
Manufacturing plant	Werk Hemsbach Flachdach Technologie GmbH & Co. KG Stettiner Straße 8 69502 Hemsbach
This European Technical Assessment contains	13 pages including 7 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	Guideline for European technical approval of "Mechanically fastened flexible roof waterproofing membranes", ETAG 006, Edition March 2000, amended November 2012, used as European Assessment Document (EAD) according to Article 66 Paragraph 3 of Regulation (EU) No 305/2011.

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Specific Part

1 Technical description of the product

1.1 Definition of the construction product

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

The waterproofing sheets are compatible with bitumen.

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

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

1.1.1 Waterproofing sheet and hook-and-loop tape

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

The waterproofing sheets are delivered in rolls with a standard length of 15 m and a maximum width of 1.05 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" shall be welded with hot air with a minimum width of 30 mm. The joints overlap of "Rhepanol fk" shall be made by bonding of the factory-made self-adhesive edge. The minimum joint overlap is 50 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/m²]**	**effective thickness of waterproofing layer without backing [mm]**	**Mass per unit area [g/m²]**
Rhepanol fk	Polyester fleece approx. 190	1,5	2375 ≤ Fg ≤ 2750
Rhepanol fk hot air weldable	Polyester fleece approx. 190	1,5	2050 ≤ Fg ≤ 2370

For fastening the waterproofing sheet to the substrate the hook-and-loop tape "Gripfix" (width 125 mm) is fastened to the roof by the mechanical fasteners. The waterproofing sheet is attached with the polyester fleece cladded side on the hook-and-loop tape.

1.1.2 Fasteners, washers

The fasteners can be used from the manufacturer SFS intec approved by ETA-08/0262 or by the manufacturer AFAST approved by ETA-08/0285. The fasteners are CE-marked on the basis of the relevant ETAs. 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

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

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

The mechanically fastened flexible roof waterproofing system "Rhepanol fk -System" is intended to create a roof waterproofing for non-utilized roofs.

The roof waterproofing system can be installed on flat or sloped roofs to resist the passage of water to the building's internal structure. The possible roof substrates are specified sheet decks, concrete, aerated concrete or timber (see Annex A3).

In the manufacturer's technical documentation to this European technical approval (ETA) the manufacturer gives information concerning the substrates which the mechanically waterproofing system is suitable for and how these substrates shall be pretreated.

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 fastenend 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 Mechanical resistance and stability (BWR 1)

Not applicable

3.2 Safety in case of fire (BWR 2)

Essential characteristic	Performance
Component: Membrane	according to EN 13956, see Annex A2

3.3 Hygiene, health and the environment (BWR 3)

Essential characteristic	Performance
Component: Membrane	according to EN 13956, see Annex A2,
Component: hook-and-loop-tape	
Peel resistance of joints between waterproofing membrane and hook-and-loop-tape	See Annex A3
Shear resistance of joints between waterproofing membrane and hook-and-loop-tape	See Annex A3
Tensile properties	See Annex A3
Dimensional stability	See Annex A3
Release of dangerous substances	The component does not contain dangerous substances specified in Technical Report 034 (version March 2012)
Component: Fastener	according to ETA-08/0262 resp. ETA-08/0285
System	
Release of dangerous substances:	Use category see Annex A1

3.4 Safety and accessibility (BWR 4)

Essential characteristic	Performance
Component: Fastener	according to ETA-08/0262 resp. ETA-08/0285
Component: Membrane	
Slipperiness	No performance determind (npd)
System	
Resistance to wind uplift	See Annex A3

3.5 Protection against noise (BWR 5)

Not applicable

3.6 Energy economy and heat retention (BWR 6)

Not applicable

3.7 Sustainable use of natural resources (BWR 7)

For the sustainable use of natural resources no performance was investigated for this product.

3.8 General aspects

The verification of durability is part of testing the essential characteristics and by additional tests on the components membrane and hook-and-loop tape:

Essential characteristic	Performance
Peel resistance after long term exposure to heat and water	See Annex A2 and A3
Shear resistance after long term exposure to heat and water	See Annex A2 and A3
Resistance to cold bending/folding after long term exposure to heat, UV-radiation, water and ozone	Not applicable

Durability is only ensured if the specifications of intended use according to Annex B are taken into account

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

According to Decision of the Commission of 3. February 1998 (98/143/EC) (OJ L 42 of 14.02.1998, p. 58), the system of assessment and verification of constancy of performance (see Annex V and Article 65 Paragraph 2 to Regulation (EU) No 305/2011) given in the following table applies.

Product	Intended use(s)	Level or class	System
Systems of mechanically fastened flexible roof waterproofing Membranes	For roof waterproofing	—	2+

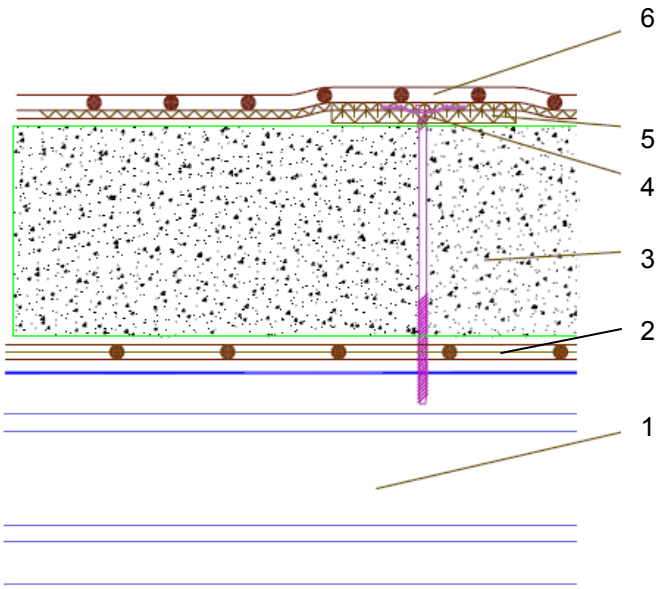
5 Technical details necessary for the implementation of the AVCP system, as provided for in the applicable EAD

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

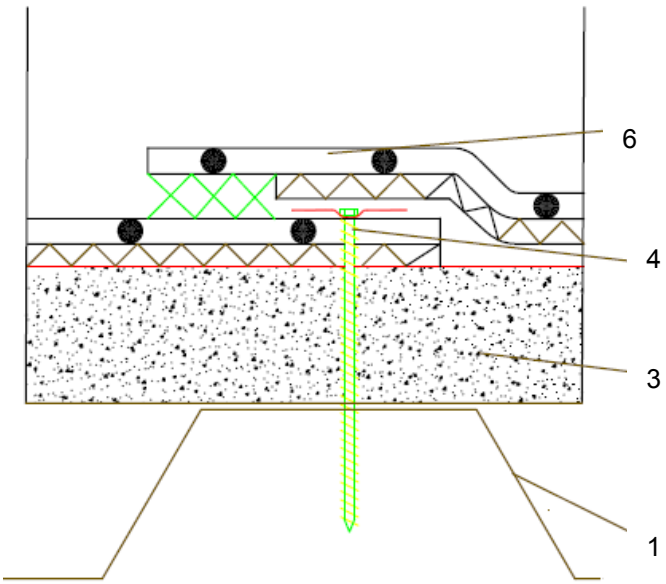
Issued in Berlin on 21 May 2014 by Deutsches Institut für Bautechnik

Gerhard Breitschaft
President

beglaubigt:
Hemme



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 Hook-and-look Tape "Gripfix"
6 Rhepanol fk hot air weldable / Rhepanol fk and – 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 13501-1[2]
External fire performance of roofs	class F_{ROOF} according to EN 13501-5[2]

[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 EN V 1187 and according EN 13501-5.

Use category related to BWR 3 IA3

Rhepanol fk - System
FDT FlachdachTechnologie GmbH & Co. KG

System build-up of the roof waterproofing

Annex A1

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Characteristic	**Test method**	**Dimen-sion**	**Value** Rhepanol fk	**Value** Rhepanol fk hot air weldable	**Expression**
Thickness	EN 1849-2	mm	1.5	1.5	MDV*
Mass per unit area		g/m²	2650	2200	MDV
reaction to fire [1)]	EN 11925-2		Klasse E	Klasse E	pass
water tightness [1)]	EN 1928 (B)	kPa	≥ 400	≥ 400	MLV**
peel resistance of joints [1)]	EN 12316-2	N/50 mm	≥ 80	≥ 150	MLV
shear resistance of joints [1)]	EN 12317-2	N/50 mm	≥ 200	≥ 200	MLV
tensile strength [1)]	EN 12311-2 (A)	N/50 mm	≥ 400	≥ 400	MLV
tensile elongation [1)]	EN 12311-2 (A)	%	≥ 50	≥ 50	MLV
resistance ag. dynamic indentation [1)]	EN 12691	mm	≥ 300	≥ 300	MLV
resistance ag. static indentation [1)]	EN 12730 (A+B)	kg	≥ 20	≥ 20	MLV
resistance to tearing [1)]	EN 12310-2	N	≥ 150	≥ 150	MLV
resistance to hail [1)] hard	EN 13583	m/s	≥ 17	≥ 17	pass
dimensional stability [1)]	EN 1107-2	%	≤ 0.5	≤ 0.5	MLV
resistance to cold bending [1)]	EN 495-5	°C	≤ - 25	≤ - 25	MLV
resistance to UV radiation [1)]	EN 1297 5000 h, visible		pass	pass	pass
water vapour transmission [1)]	EN 1931	μ	220000	220000	MDV
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)]	prEN 13948	-	npd	npd	npd
Resistance to heat ageing, EN 1296 [2)]					
peel resistance of joint	EN 12316-2	%	Δ ≤ 20	Δ ≤ 20	pass
shear resistance of joints	EN 12317-2	%	Δ ≤ 20	Δ ≤ 20	pass
resistance to cold bending	EN 495-5	°C	Δ ≤ 15	Δ ≤ 15	pass
Resistance after long term exposure to heat UV (EN 1297)[2)]					
resistance to cold bending	**EN 495-5**	°C	Δ ≤ 15	Δ ≤ 15	pass
Resistance to water[2)]					
peel resistance of joint	**EN 12316-2**	%	Δ ≤ 20	Δ ≤ 20	pass

[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 ETAG 006.

* MDV: Manufacturer`s Declared Value
** MLV: Manufacturer`s Limited Value

Rhepanol fk - System
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Characteristics of waterproofing sheets: "Rhepanol fk" and "Rhepanol fk hot air weldable"

Annex A2

Table 1: Characteristics of Gripfix

Characteristics of Gripfix	**Test method**	**Dimen-sion**	**Value** Gripfix	**Expression**
Thickness[2)]		mm	1.5	MDV
Width[2)]		g/m²	125	MDV
peel resistance of joints between Rhepanol fk and Gripfix [2)]	EN 12316-2	N/mm	≥ 1.8	MLV
shear resistance of joints between Rhepanol fk and Gripfix [2)]	EN 12317-2	N/mm	≥ 4	MLV
tensile strength [2)]	EN 12311-2 (A)	N/cm	≥ 200/250	MLV
tensile elongation [2)]	EN 12311-2 (A)	%	≥ 30/25	MLV
dimensional stability [2)]	EN 1107-2	%	≤ 0.5	MLV
Resistance to heat ageing, EN 1296 [2)]				
peel resistance of joints between Rhepanol fk and Gripfix [2)]	EN 12316-2	%	Δ ≤ 20	pass
shear resistance of joints between Rhepanol fk and Gripfix [2)]	EN 12317-2	%	Δ ≤ 20	pass
Resistance to water[2)]				
peel resistance of joints between Rhepanol fk and Gripfix [2)]	EN 12316-2	%	Δ ≤ 20	pass

[2)] These values are determined in accordance with ETAG 006

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
		W_{adm} [N]			
SFS IR2-4.8 x L	SFS IR 82 x 40	600	600		
Guardian BS 4.8 x L	Guardian Sleeve R(P)	600			

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

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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 B4 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 - System FDT FlachdachTechnologie GmbH & Co. KG	Annex B1
Intended use Specifications	

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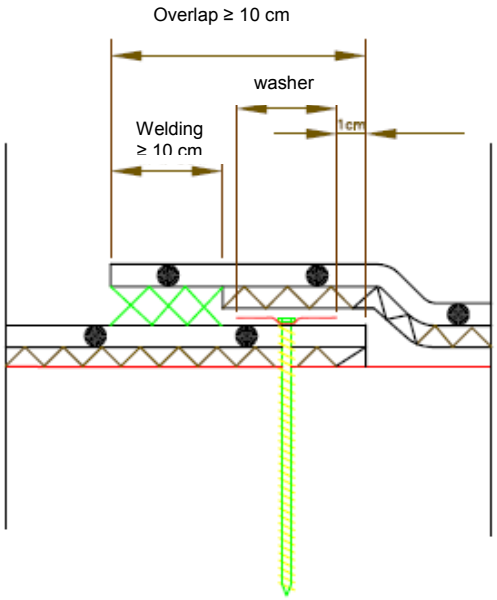
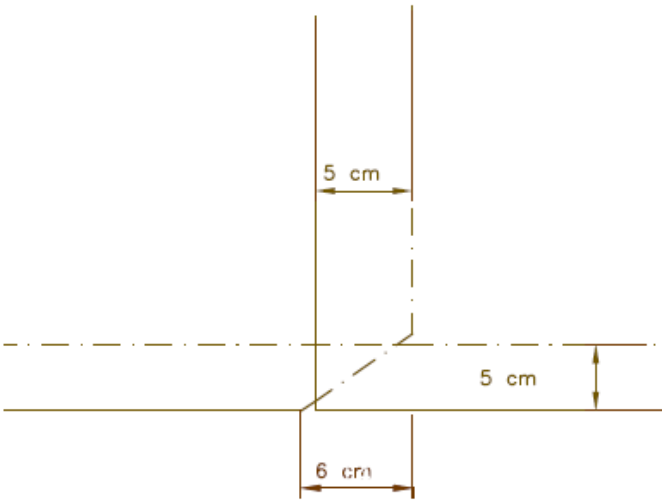
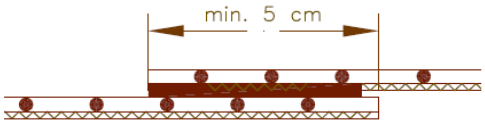


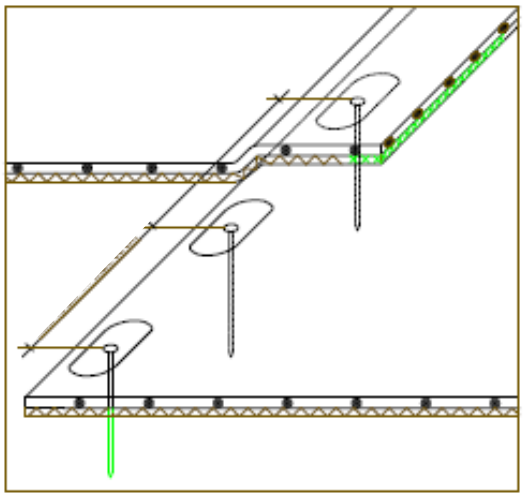
Hot welded overlap



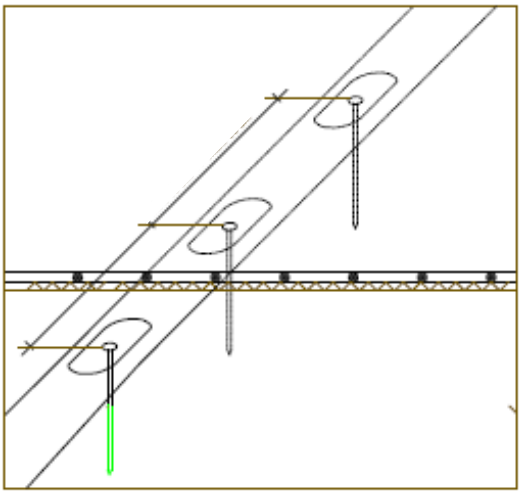
Headbutt



Overlap with self-sealing edge



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/m²
Maximum distance between fastener and edge of sheet	≥ 1 cm

Rhepanol fk - System
FDT FlachdachTechnologie GmbH & Co. KG

Dimensions of fixation and overlapping

Annex B2

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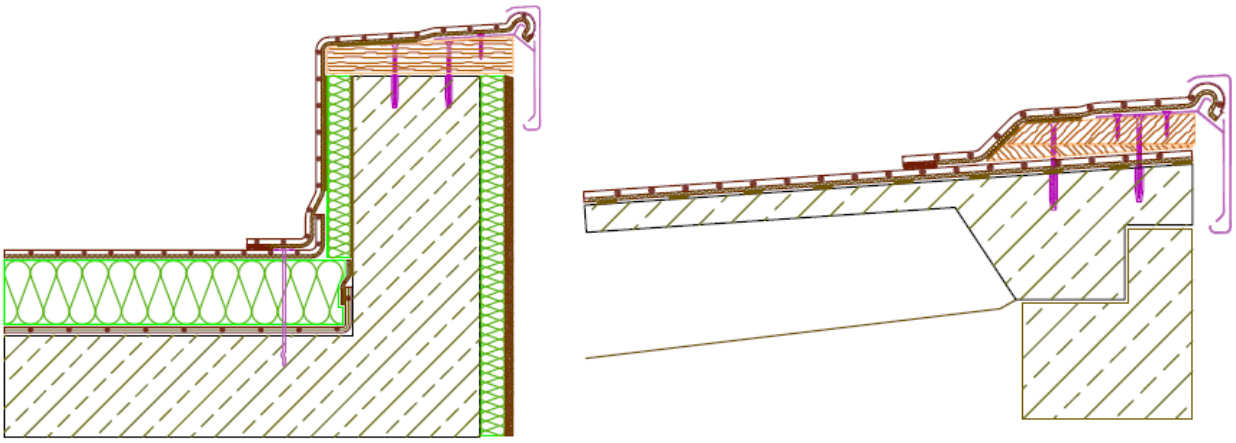
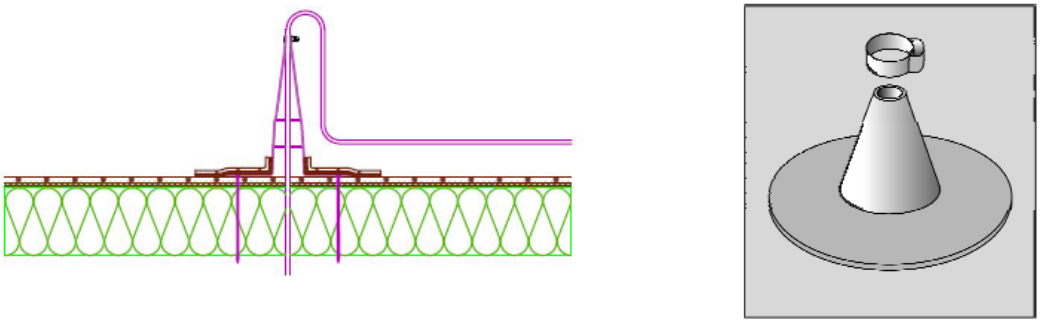
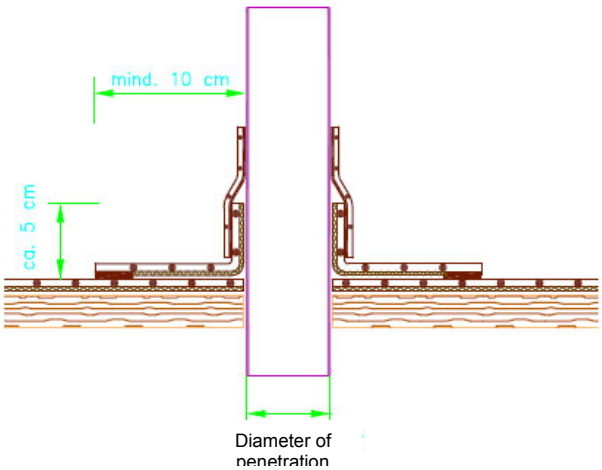
Roof edge:



Penetration for lightning protection:



Penetration:



Rhepanol fk - System
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Examples for Details

Annex B3

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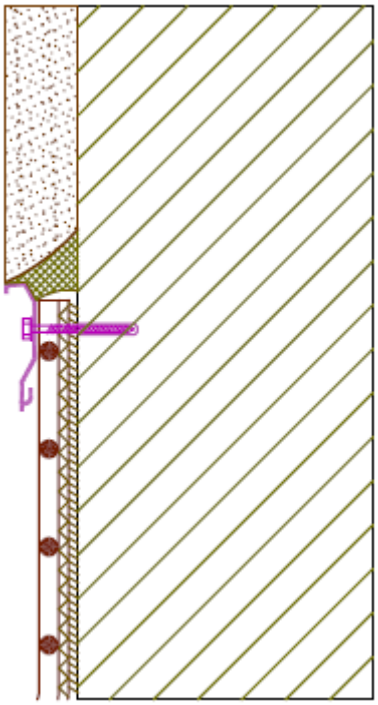
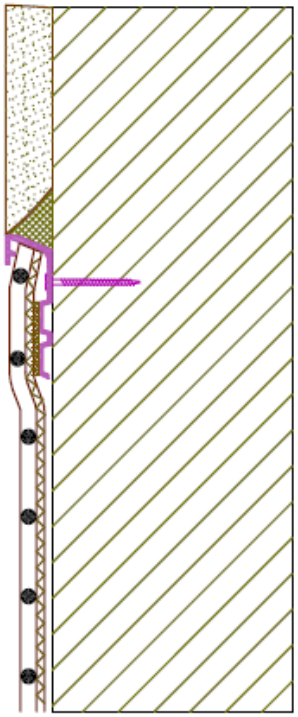
Upstand:

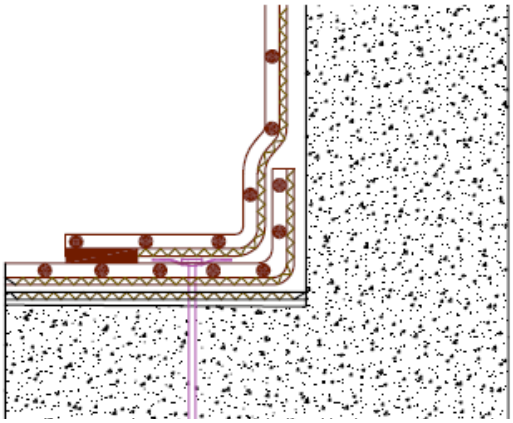


With hot welded overlap

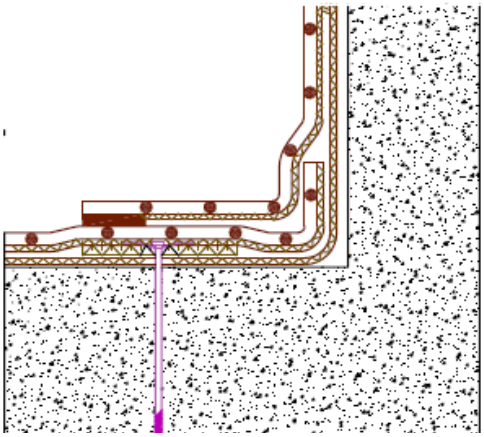


with "Gripfix"

Edge:



With hot welded overlap



with "Gripfix"

Rhepanol fk - System
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Examples for Details

Annex B4