

# Mechanically **fastened**

## Product Information

### ALKORFLEX \* 35096

Light grey calendered membrane of CPE with laminated woven polyester reinforcing. Conforms to DIN 16737.

#### Application

Used as waterproofing membrane on mechanically restrained systems.

- Production unit certified ISO 9001
- UV, age and weather resistant, official test report 20.000 H xenotest
- Easy to install
- Resistant against a wide range of chemicals
- Resistant against normal atmospheric pollution
- Resistant to bitumen and oil

- Compatible with PS, PUR, PVC-R but not with PVC-P
- Even after many years on site, perfectly weldable
- High moisture vapour permeability
- High bacteria resistance, will not rot
- Root resistance in accordance with DIN 4062 part 1
- Factory mutual approved, class 1
- Excellent mechanical properties
- Limited maintenance
- Resistant against fire spread and heat radiation according DIN 4102 part 7 for roof slope  $\leq 20^\circ$
- Self-extinguished and moderately flammable (B2) according DIN 4102 part 1
- Inflammability in accordance with BS 476 part 3, 1958
- External quality control

Product Data	DIN norm 16726	Requirements according to DIN 16737	Average production values ALKORFLEX * 35096		Units
			1,2 mm	1,5mm	
Tensile strength	5.6 C-VI	L $\geq$ 800 T $\geq$ 800	1837 1660	1867 1747	N/50 mm N/50 mm
Elongation	5.6 C-VI	L $\geq$ 10 T $\geq$ 10	18 22	18 22	% %
Shrinkage (6h at 80°C)	5.13	$\leq$ 1	-0,2	-0,2	%
Cold crack temperature (-20 °C)	5.14	no cracks	no cracks	no cracks	-
Tear strength	5.8.2	L $\geq$ 180 T $\geq$ 180	255 341	276 378	N N
Lamination strength	5.9	$\geq$ 80	125	140	N/50 mm
Vapour diffusion resistance ( $\mu$ )	5.15	$\leq$ 80.000	calc. val. 33.000	calc. val. 33.000	-
Root resistance	5.16	no perforation	no perforation	no perforation	-
Resistance to static perforation	UEAtc	-	L 4	L 4	-

Size/Weight	Thickness	Width	Weight	Roll length	Roll weight
ALKORFLEX * 35096	1,2 mm	1,05 m	1,60 kg/m <sup>2</sup>	25 ml	ca. 40 kg
	1,2 mm	1,60 m	1,60 kg/m <sup>2</sup>	25 ml	ca. 63 kg
	1,5 mm	1,05 m	2,00 kg/m <sup>2</sup>	20 ml	ca. 40 kg
	1,5 mm	1,60 m	2,00 kg/m <sup>2</sup>	20 ml	ca. 62 kg

Standard conditions of sale are included in price lists, all sales of **RENOLIT WATERPROOFING** products are made under these conditions ALKORPLAN® is delivered in rolls. Every delivery may contain up to 10% of short rolls (minimum length: 8 m)

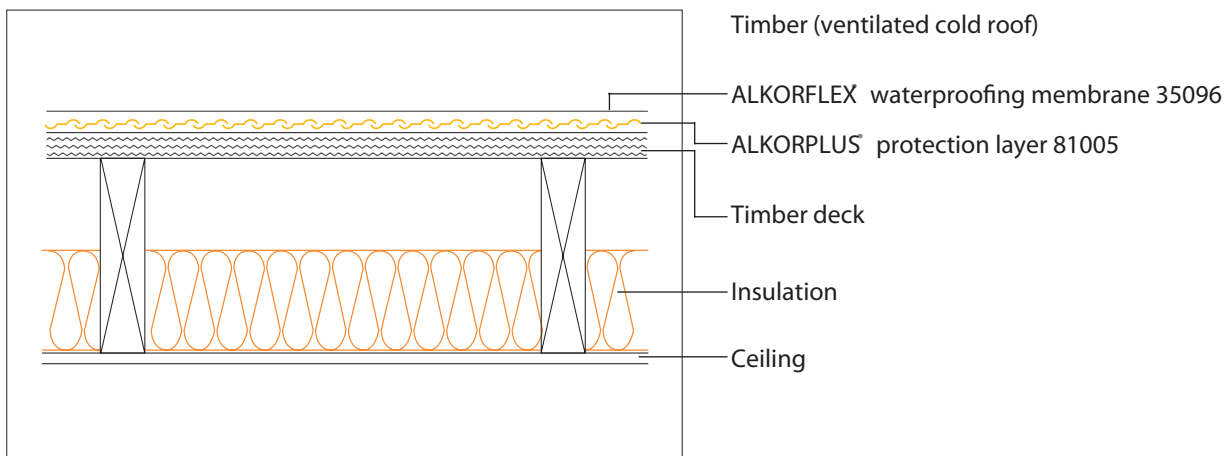
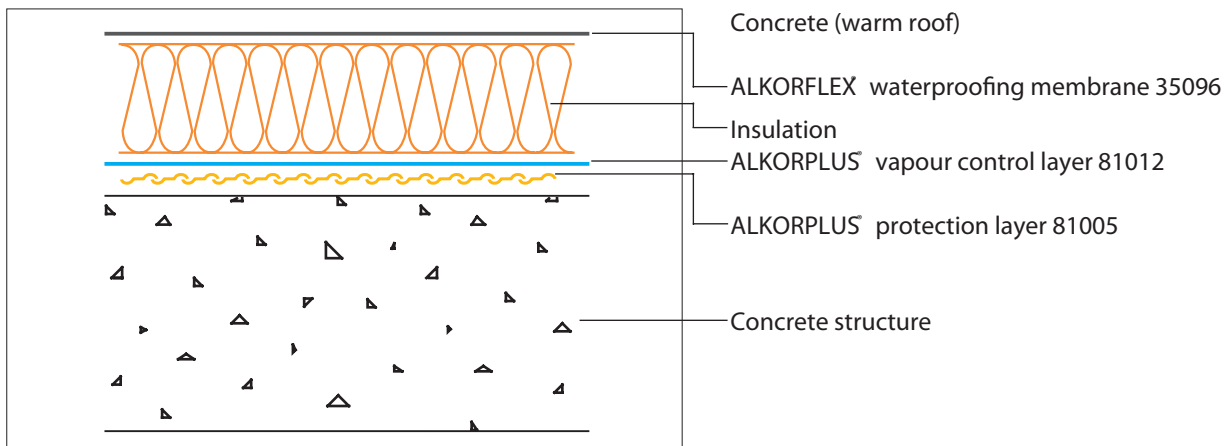
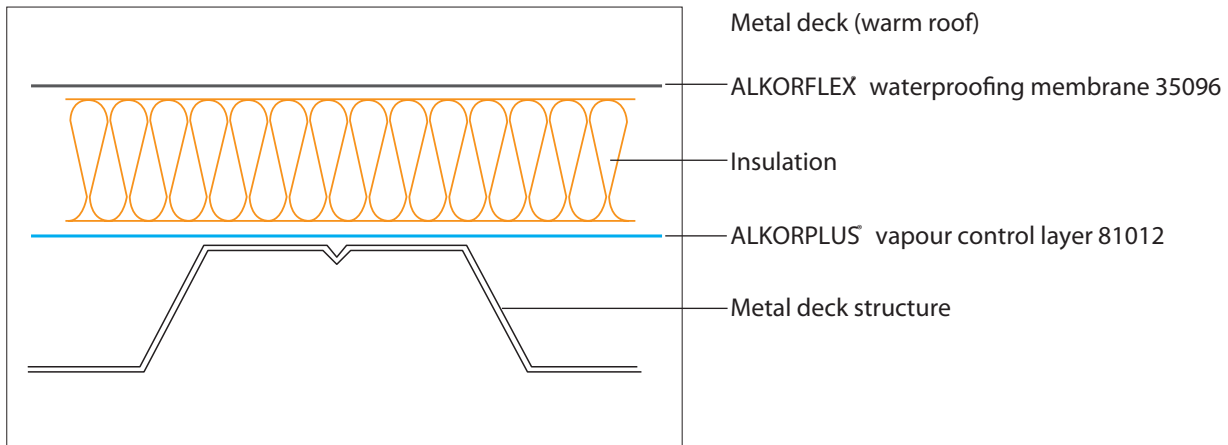
Storage: Store dry. Rolls to be parallel and in original packing where possible. Do not stack in cross form or under pressure.

## Mechanically fastened system

Application instructions for ALKORFLEX membranes, mechanically fastened on metal deck, wood or concrete. For other substrates, please seek advice and guidance from the technical dept. of **RENOLIT WATERPROOFING**

Membranes to be used:

ALKORPLAN<sup>®</sup> F 35096 - thickness 1,2 or 1,5 mm - width 1.05 or 1.60 m



# Roof construction

Before the waterproofing membrane is installed, the roofdeck has to be free of irregularities, water, frost, ice and debris such as screws, metal off-cuts, etc.

## Structure

- metal deck  
The minimum thickness for metal deck to be used with mechanical fasteners is 0.7 mm. All construction work is carried out according to current requirements and design criteria.
- timber structure  
The minimum thickness of the supporting structure will be:
  - wood: 25 mm
  - plywood (exterior quality): 19 mm (preferably 22 mm) and would be conform to the relevant requirements of BS S262 Part II 1989

Any treatment should be compatible with the components and the chosen method of attachment of the insulation or single ply membrane.

The supporting elements are installed and fixed to obtain a closed deck surface where all vertical movement is excluded. Height or thickness tolerances between panels must not exceed 3 mm.

- concrete roofdeck  
A concrete supporting structure should comply with the minimum quality BS 8110 part I 1985. The surface is to be smooth and flat with no protrusions or irregularities over 2 mm. (ideally powerfloated).

## Protection layer

On rough surfaces or wooden structures, an ALKORPLUS® protective layer is used to ensure that no damage occurs to the ALKORFLEX® membrane or the vapour control layer. Protective layers are loosely laid with a 50 mm overlap. Refer to table 1.

## Vapour control layer

Condensation can occur on the underside of the membrane during cold periods. The membrane has a reasonable level of vapour permeability so this condensate will disperse in a period of warmer weather.

If higher humidity exists in a building there may be a build up of condensation in the construction which will not be fully removed in the drying periods.

Depending on the predicted interior climate in the building and the hygrometric characteristics of the roofing materials, a vapour control layer may be required.

The ALKORPLUS® LDPE vapour control layer is available in the standard version 81012. The vapour control layer is laid with an overlap of 100 mm and taped with ALKORPLUS® adhesive tape 81057. When the joint is fully supported it must be hand rolled to secure to the tape. The vapour control layer is laid parallel with the crowns of the metal deck and the overlap seams will occur above the crown of the deck and the joint sealed by use of pressure. The vapour control layer is taken up the detail and taped to it.

## Insulation

The insulation is installed in accordance with the manufacturers' guidelines. The compressive strength must be adequate for mechanical fastening with a minimum of 0.07 N/mm<sup>2</sup> at 10 % compression (according to DIN 18165 part 1). On metal decks, the dimensions and thickness of the insulation boards must suit the dimensions of the metal deck profile.

Application as	Protective layer
ALKORPLUS® 81004 fleece PP/PES 500 g/m <sup>2</sup>	on rough surfaces
ALKORPLUS® 81005 fleece PES 300 g/m <sup>2</sup>	on rough surfaces or upstands
ALKORPLUS® 81008 fleece PES 180 g/m <sup>2</sup>	on rough upstands

Table 1: ALKORPLUS® protective layers

### ALKORFLEX® membrane

On top of the insulation, the ALKORFLEX® membrane is rolled out free of tension, at 90° to the deck direction.

Mechanical fasteners (screws and plates) are fixed at the membrane joints. (See Fig. 1) The following lap is aligned to the first one with an overlap of min. 100 mm. A line is printed on one side of the membrane to facilitate this.

The quantity of fasteners is calculated to resist wind uplift in the central and perimeter roof area in accordance with current UK standards; BS CP 3 chapter V part II.

A minimum distance of 150 mm between fasteners is observed at all times. This may require the use of a narrower membrane in order to obtain the correct quantity of fasteners per m<sup>2</sup> with a minimum of 2/m<sup>2</sup>.

Joining ALKORFLEX® membranes can be carried out by hot air or by solvent welding with ALKORPLUS® 81025 welding fluid. The welded area should extend at least 30 mm from the membrane edge.

End laps should be staggered by 250 mm to avoid four sheet ends coinciding. All T-joints must be chamfered and hot-air welded.

Fig. 1: Mechanical fixings and overlaps

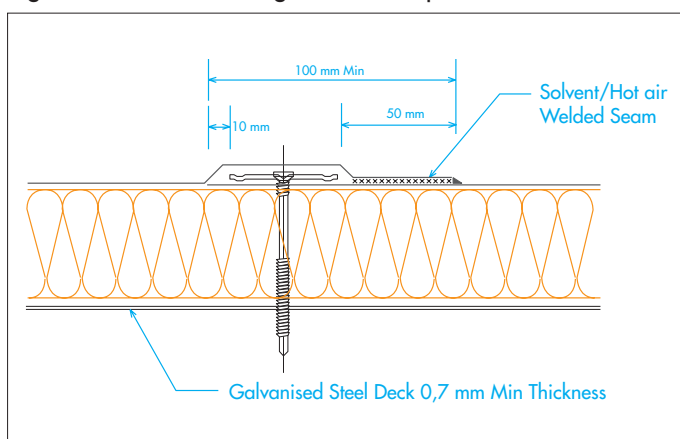


Fig. 2: Verification of weld security



After completion of the welding, weld security is verified by drawing a metal probe along the joint in a firm but non-destructive way.

## Mechanical fastening

### Fastener type

The type and length of fasteners are determined by the:

- type of structure, and
- thickness of insulation

Taking into account these parameters, a number of fasteners can be used. A list of design values is given in Table 2. Minimum distance between fasteners is 180 mm and the maximum is 360 mm.

Table 2: Design values

Design value (*) (N/fastener)	35096
<b>Metal Deck</b>	
1,05 m membrane width	
• Buildex SM ø 5,5 mm	475
• SFS Isofast IR ø 4,8 mm	475
• Ejot Climadur DABO SW8 ø 4,8 mm	475
1,60 m membrane width	
• Buildex SM ø 5,5 mm	475
• SFS Isofast IR ø 4,8 mm	475
• Ejot Climadur DABO SW8 4,8 mm	475
• Olympic fastener	475
<b>Concrete</b>	R = pull-out value F = design value
1 m membrane width	
• Buildex CT	
• SFS Spike	
	Static test: R/3 = F with max. F = 400 N
<b>Timber</b>	R = pull-out value F = design value
1 m membrane width	
• Buildex Fastener	
• SFS Fastener	
	Static test: R/3 = F with max. F = 300 N

\* For refurbishment on metal deck thinner than 0.7 mm, a lower pull-out value should be calculated. **RENOLIT WATERPROOFING** technical department will be happy to supply more information.

\* On concrete or wood, a static pull-out test should be performed to verify the deck quality.

\* A minimum of 2 fasteners/m<sup>2</sup> is observed at all times

## Supplementary fixing

Edge restraint is installed along the perimeter of the roof and around all penetrations. Special attention is paid to the windtight installation of parapets.

Fig. 3: Edge restraint with ALKORFLEX® metalsheet 81191.

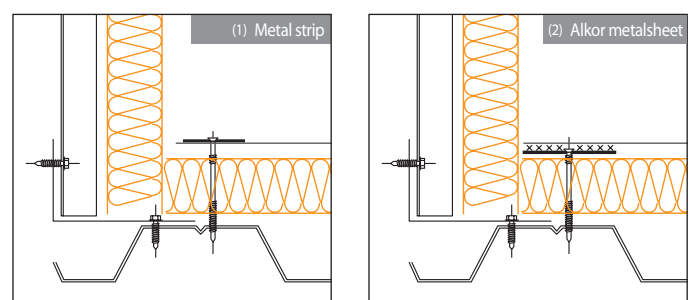


### Edge restraint

• ALKORFLEX® metalsheet 81191 is preformed to obtain a minimum width of 70 x 70 mm for an L-shaped profile. (See Fig. 3) These profiles are pre-fixed to the supporting deck. The maximum distance between fixings is 250 mm with fixings on one face only of the ALKORFLEX® metalsheet and in zig-zag formation to resist a continual tensile load of 2,7 kN/lm.

Table 3: Edge restraint fixing

Structure	concrete		metal (0,75 mm)		timber	
	fastener for concrete	number/lm	rivets 5 mm Ø	number/lm	fastener DIN 9551 6 mm Ø	number/lm
Distance between fasteners	cm	number/lm	cm	number/lm	cm	number/lm
<b>0 m - 8 m</b>						
• Metal strip 20/15 <sup>(1)</sup>					25	4
• Alkor metalsheet <sup>(2)</sup>	20	5	17	6		
<b>&gt; 8 m - 20 m</b>						
• Metal strip 20/15 <sup>(1)</sup>					20	5
• Alkor metalsheet <sup>(2)</sup>	17	6	12,5	8		



- The use of ALKORFLEX® metal to the parapet or plant kerb bases can be omitted and the membrane retained instead by the use of the 'in seam' fastener plates and screws identical to those used to secure the main roof sheet. The fasteners are placed close to the edge, with a membrane strip of at least 30 mm beyond the fastener plates.

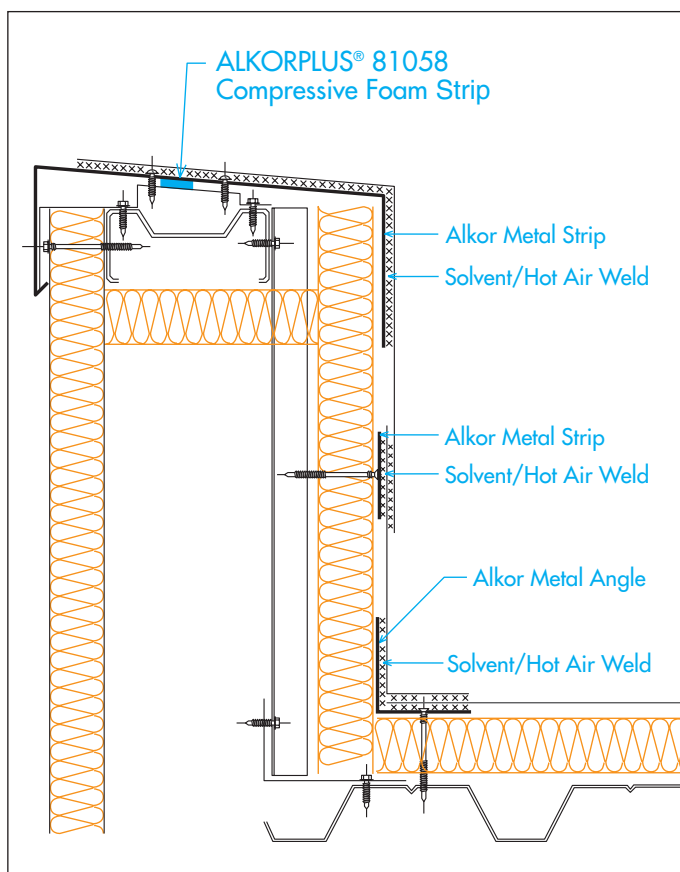
A minimum of 4 fasteners per linear metre is required. However, should a greater number of fasteners be used in the adjacent lap, the same quantity will be employed in the perimeter and edges. The perimeter fasteners are not included in the wind uplift calculation.

### Windtight installation to parapet details

- With an ALKORPLUS® compressive foam strip 81058 underneath the ALKORFLEX® metalsheet trim, the parapet top is sealed against wind. (See Fig. 4)

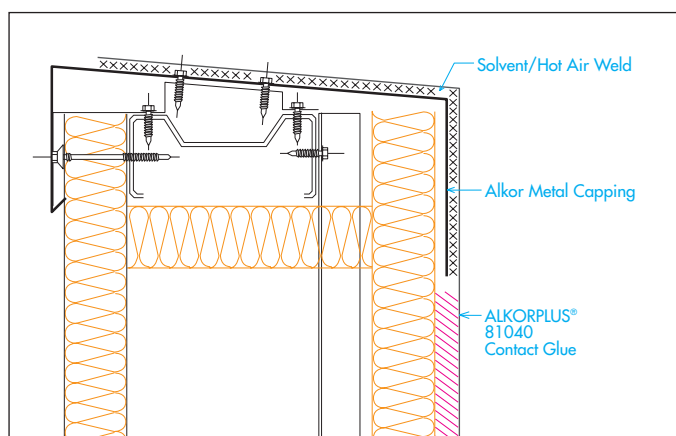
The ALKORFLEX® membrane is protected from an abrasive upstand surface by an ALKORPLUS® protective layer 81008 (min. 180 g/m<sup>2</sup>). Where the parapet height exceeds 500 mm, intermediate support with a continuous ALKORFLEX® metalsheet (50 mm wide) is required.

Fig. 4: ALKORPLUS® compressive foam strip 81058



- Parapets can also be adhered to achieve a windtight detail. (See Fig. 5) Here, the ALKORPLUS® contact glue 81040 is applied to the entire surface of both membrane and upstand with a minimum consumption of 2 x 150 g/m<sup>2</sup>. The parapet will have an Alkormetal trim, but compressive foam and intermediate fastening can be omitted.

Fig. 5: Double-sided gluing of parapets



### Execution of details

See ALKORFLEX® design manual.

## General remarks

### Compatibility

For a list of chemical resistance with a number of substances, a summary table is available.

ALKORFLEX membranes must not be brought into contact with ALKORPLAN® membranes.

### Other remarks

The following rules and regulations must be respected at all times:

- BBA, UEAtc
- BS 6229 1982 Flat roofs with continuous supported coverings
- all other current norms and directives
- the product information and instructions for execution of particular details issued by **RENOLIT WATERPROOFING** concerning ALKORFLEX® and ALKORPLUS® products
- the installation instructions issued by manufacturers or suppliers of other materials and accessories used in the construction of the roof.

Your ALKORFLEX specialist:

The information contained in the present commercial literature has been given in good faith and with the intention of providing information. It is based on current knowledge at the time of issue, and may be subject to change without notice. Nothing contained herein may induce the application of our products without observing existing patents, certificates legal regulations, national or local rules, technical approvals or ethnical specifications or the rules and practices of good workmanship for this profession. The purchaser should verify whether import, advertising, packaging, labelling, composition, possession, ownership and the use of our products or the commercialisation of them are subject to specific territorial rules. He is also the sole person responsible for informing and advising the final end user. When faced with specific cases or application details not dealt with in the present guidelines, it is important to contact our technical services, who will give advice, based on the information at hand and within the limitations of their field of expertise. Our technical services cannot be held responsible for the conception of,

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