Roofing... with style
Design manual
**INTRODUCTION**

In producing this document, the Technical Department of Alkor Draka have sought to provide essential design information. The Design Manual is intended to be used in conjunction with the System Documents:

- **ALKORFLEX® A**
- **ALKORFLEX® F**
- **ALKORFLEX® L**
- **ALKORPLAN® A**
- **ALKORPLAN® F**
- **ALKORPLAN® L**

By selecting the system and membrane type best suited to the prevailing conditions, the appropriate section of the manual can be referred to. Experience has shown that most roofs have a relatively small number of detail variations, with these variations appearing on roofs with distinctly different specifications, the method of application only varying slightly. Consequently, this document does not provide drawings of every conceivable detail. The Technical Department of Alkor Draka will provide specific design assistance whenever necessary.

**Windload Calculation**

ALKORFLEX® and ALKORPLAN® roofing systems offer three fastening alternatives:

- **F**: mechanically fastened
- **L**: loose laid (incl. inverted roof or garden roof)
- **A**: adhered (with an ALKORPLUS polyurethane glue or hot bitumen)

The effect of windloads on a flat roof must be understood, in order for the construction of the roof and the method of attachment of the waterproofing layer, to be designed accordingly.

For mechanical fastening, a steeldeck structure is the most common. In this case, the internal pressure of the building will penetrate through the roof structure via the joints in the metal deck. The membrane will have to cope with both wind uplift as well as internal pressures. On concrete surfaces, however, the internal pressure is unlikely to affect the underside of the membrane.

The roof design should ensure that the roof system has sufficient capacity to resist the calculated uplift pressures, using adhesion, applied loadings, dead weights or mechanical fasteners. The calculation of the wind uplift forces should also take account of local applied pressure zones, perimeters, areas, bases of plant rooms, or other large pieces of plant.
ALKORFLEX® 81191 metalsheet

Galvanized 0.6 mm steel sheet with an 0.6 mm unreinforced ALKORFLEX® membrane laminated onto its surface. The bottom face is treated with an anti-corrosion coating.

- UV-stabilized
- excellent adhesion between steel sheet and ALKORFLEX®
- excellent mechanical properties
- can be cut and formed into any required shape using common steel handling equipment

Application
Specifically developed to be used as an accessory for ALKORFLEX® roofing systems in order to provide high-quality upstands and parapets:

- intermediate fastening on unbonded upstands over 50 cm high
- metal profiles to cover parapets
- linear edge restraint

<table>
<thead>
<tr>
<th>Metalsheet Delivery Conditions</th>
<th>Thickness [NBN A43-201]</th>
<th>Colour</th>
<th>Width</th>
<th>Length</th>
<th>Weight</th>
<th>Quantity/pallet</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALKORFLEX® 81191</td>
<td>1.1 mm</td>
<td>light grey</td>
<td>1.00 m</td>
<td>2.00 m</td>
<td>5.4 kg/m²</td>
<td>50</td>
</tr>
</tbody>
</table>

ALKORFLEX® 81092/81093/81094 corners
ALKORFLEX® inner- (81092) and outer corners (81093) as well as roof light 70° corners (81094) for a reliable and quick finish of various corner types.

- unreinforced ALKORFLEX®
- colour: light grey

ALKORFLEX® 81036 Liquid
Liquid 81036 seam sealer is applied to the edge of the welded seams

The complete ALKORPLUS accessory, which can be used in combination with ALKORFLEX® and ALKORPLAN® includes:

- glass fleece separation layer 81001
- Protection and separation layer 81005
- Vapour control layer 81012
- Adhesive tape 81057
- Welding fluid 81025
- PE bottle 81145 and nozzle 81245
- Applicator brush 81345
- Cleanser 81044
- Detailing contact adhesive 81040
- Compressive foam strip 81058
- Polyurethane glue 81068
- Applicator 81069
- Aluminium tape 81192
- Polyurethane glue 81192

Please ask for the detailed ALKORPLUS product information.
ALKORPLAN® 81170/81171 metalsheet

Galvanized 0.6 mm steel sheet with an 0.8 mm unreinforced ALKORPLAN® membrane laminated onto its surface. The bottom face is treated with an anti-corrosion coating.

- UV-stabilized
- excellent adhesion between steel sheet and ALKORPLAN®
- excellent mechanical properties
- can be cut and formed into any required shape using common steel handling equipment

**Application**
Specifically developed to be used as an accessory for ALKORPLAN® roofing systems in order to provide high-quality upstands and parapets:
- intermediate fastening on unbonded upstands over 50 cm high
- metal profiles to cover parapets
- linear edge restraint

### Metalsheet Delivery Conditions
<table>
<thead>
<tr>
<th></th>
<th>Thickness [NBN A43-201]</th>
<th>Colour</th>
<th>Width</th>
<th>Length</th>
<th>Weight</th>
<th>Quantity/pallet</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALKORPLAN® 81170</td>
<td>1.4 mm</td>
<td>light grey/charcoal grey/charcoal</td>
<td>1,00 m</td>
<td>2,00 m</td>
<td>5,8 kg/m²</td>
<td>50</td>
</tr>
<tr>
<td>ALKORPLAN® 81171</td>
<td>1.4 mm</td>
<td></td>
<td>1,00 m</td>
<td>3,00 m</td>
<td>5,8 kg/m²</td>
<td>30</td>
</tr>
</tbody>
</table>

**ALKORPLAN® 81060/81061/81062 corners**
ALKORPLAN® inner- (81060) and outer corners (81061) as well as roof light 70° corners (81062) for a reliable and quick finish of various corner types.
- unreinforced PVC-P ALKORPLAN®
- colour: light grey

**ALKORPLAN® 81088 outlets**
Unreinforced ALKORPLAN® outlets for a reliable and aesthetic finish of existing water outlets, including outlet grating
- unreinforced PVC-P ALKORPLAN®
- colour: light grey
- dimensions:
  - Ø 70 mm for water outlets of ca. 80 mm in diameter
  - Ø 85 mm for water outlets of ca. 100 mm in diameter
  - Ø 110 mm for water outlets of ca. 125 mm in diameter

**ALKORPLAN® 81038 Liquid PVC**
Liquid 81038 seam sealer is applied to the edge of the welded seams

![Fig. 4: ALKORPLAN® metalsheet and profiles](image)

![Fig. 5: ALKORPLAN® inner-, outer- and 70° angles](image)
Roof edge seal 1

Roof edge seal 2

Minimum height 3 cm

Minimum overlap see table

Minimum spacing 2 cm

ALKORPLUS 81058 compressive foam strip

ALKOR protection fleece as required or ALKOR flashing glued into position

ALKOR flashing

Minimum overlap pursuant to flat roof directive

<table>
<thead>
<tr>
<th>Minimum overlap</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>up to 8 m</td>
<td>≥ 5 cm</td>
</tr>
<tr>
<td>over 8 m</td>
<td>≥ 8 cm</td>
</tr>
<tr>
<td>over 20 m</td>
<td>≥ 10 cm</td>
</tr>
</tbody>
</table>

Min. 10 cm over top of sheet
Roof edge seal 3

**MINIMUM OVERLAP PURSUANT TO FLAT ROOF DIRECTIVE**

<table>
<thead>
<tr>
<th>Width</th>
<th>Overlap</th>
</tr>
</thead>
<tbody>
<tr>
<td>up to 8 m</td>
<td>5 cm</td>
</tr>
<tr>
<td>over 8 m</td>
<td>8 cm</td>
</tr>
<tr>
<td>over 20 m</td>
<td>10 cm</td>
</tr>
</tbody>
</table>

Roof edge seal 4
Roof edge seal 5

Min. 10 cm over top of sheet

Façade made of steel sheet

Glued with ALKORPLUS 81040 adhesive

ALKOR flashing

Roof edge seal 6

Min. 10 cm over top of sheet

Façade made of steel sheet

ALKOR protection fleece as required

ALKOR flashing
Valley formation without edge fixing

Roof edge seal with roof edge section

ALKORPLUS 81057 adhesive tape

Minimum 30 mm

ALKORPLUS vapour control layer

ALKORPLUS separation layer as required

ALKOR flashing

ALKORPLUS protection fleece as required

Line or linear edge fixing with ALKOR composite sheet

ALKORPLUS separation layer or fire safety layer as required

ALKORPLUS 81058 compressive foam strip
Edge fixing with ALKOR composite sheet

- ALKOR protection fleece as required
- ALKOR flashing
- Section made of ALKOR composite sheet
- ALKORPLUS separation layer or fire safety layer as required
- ALKOR flashing
- ALKORPLUS vapour control layer

Minimum 30 mm

ALKORPLUS 81057 adhesive tape

Edge fixing with metal section and adhesive

- Glue with ALKOR adhesive 81040
- ALKOR flashing
- ALKORPLUS separation layer or fire safety layer as required
- ALKOR flashing
- ALKORPLUS vapour control layer

Minimum 30 mm

Metal section
Intermediate fixing with metal section

Intermediate fixing with ALKOR composite sheet strips
Intermediate fixing with ALKOR composite sheet section on heat insulation

Moving wall connection with ALKOR composite sheet
Wall connection with ALKOR composite sheet and ALKOR flashing

- Foam cord
- Joint sealing compound
- Section made of ALKOR composite sheet
- ALKOR flashing
- ALKOR protection fleece or cladding as required

Wall connection with contact pressure section

- Joint sealing compound
- Contact pressure section
- ALKOR flashing
- ALKOR protection fleece or cladding as required
Terrace door connection

Wall connection with ALKOR composite sheet and overhang section

Terrace door connection
Roof edge seal with attached gutter

Roof edge connection with counter gradient and drainage

ALKOR flashing
ALKOR composite sheet
ALKORPLUS 81057 adhesive tape
ALKOR PLUS vapour control layer
ALKOR PLUS separation layer or fire safety layer as required
ALKOR PLUS 81058 compressive foam strip
Attachment sheet made of ALKOR composite sheet
ALKOR PLUS 81057 adhesive tape
ALKOR PLUS separation layer or fire safety layer as required
ALKOR composite sheet
ALKOR PLUS vapour control layer
ALKOR protection fleece as required
Movement joint, joint cavity > 20mm

Movement joint, joint cavity < 20mm
Connection to gutter with foamed sleeve

Movement joint with auxiliary construction

Loosely positioned under vertical load

Bonded roof structure

ALKOR composite sheet
ALKOR flashing
ALKORPLUS separation layer or fire safety layer as required
ALKORPLUS vapour control layer
ALKORPLUS 81057 adhesive tape
Bitumen vapour control layer

Connection sleeve made of ALKOR flashing

ALKORPLUS separation layer or fire safety layer as required
Connection to gutter with screw flanged

Connection to renovation gutter made of rigid PVC
Connection to pipe passage

Connection to rooflight strip 1
Connection to rooflight using ALKOR composite sheet

Connection to rooflight strip 2
Connection to rooflight made of rigid PVC

Connection to rooflight using ALKOR composite sheet 2

- Joint sealing compound
- Section made of ALKOR composite sheet
- ALKOR flashing
- ALKORPLUS separation layer or fire safety layer as required
- ALKORPLUS 81057 adhesive tape
- ALKORPLUS vapour control layer
- Connection strip made of ALKOR flashing
- ALKOR flashing, fleece-laminated, bonded
PLEASE NOTE:
This version may only be used if the connection strip can withstand horizontal forces. Otherwise, additional edge fixing is required.

Skylight connection with identical material connection strip

- Identical material connection strip
- ALKOR flashing
- ALKORPLUS separation layer or fire safety layer as required
- ALKORPLUS 81057 adhesive tape
- ALKORPLUS vapour control layer
- ALKOR protection fleece as required
Roof maintenance

The composition of the membranes to be employed (ALKORPLAN®) precludes the need for maintenance of the membranes or associated components.

Once Every Six Months
However BS6229: 1982 recommends that all flat roofs be inspected annually, it also states that in areas of high dust or pollution, inspections should be carried out more frequently. This ensures that dirt or debris is removed before causing damage and that signs of failure can be reported and remedial action taken at an early stage. Ideally flat roofs should be inspected once every six months, in the spring and Autumn. These inspections involve a routine look at the roof structure and its ancillary services.

In spring it is important to check that the gutters and outlets are not blocked by fallen leaves which may cause water to pond.

Once A Year
Each year it is essential that a more detailed study of the flat roof is carried out to identify any potential problems and renew damaged components.

Before any work is undertaken the original specifications should be consulted as the roof may be under guarantee. If there is a guarantee it is essential that remedial work is carried out by the original contractors to ensure that the guarantee is not invalidated.

As with the six monthly inspection, the roof must be checked for debris and gutters and outlets cleaned. Gratings and wire cages should be renewed where necessary and flashings, trims and cappings replaced if damaged.

Once Every Ten Years
The roof structure should be inspected professionally, either by a roofing contractor or roofing system manufacturer. This inspection will identify any current problems and those which are likely to occur in the future.

It is important that this inspection is carried out by a professional, as many of the potential problems will not be apparent to the untrained eye. The roof should be surveyed for the deterioration of structural elements, especially where a timber deck has been used as this is susceptible to moisture.

Roofing, do’s and dont’s

DO report a leak as soon as it is noticed. DO check with the original specification to identify the roof build up. DO consider skilled repair now rather than costly replacement later. DO record the cause of the problem and the date and location of repair for future reference. This should ideally take the form of a building book.

DO use a recognised roofing contractor or materials manufacturer. DO seek the advice of the original contractor/manufacturer should any ancillary services be installed at a later date. This will ensure that the new components are properly detailed and waterproofed to maintain the roof’s waterproofing integrity.

DO check the roof and get a written report on it before and after any work is carried out by other trades. In this way damage caused by other people will be easily identifiable.

DON’T use the roof as a working platform for adjoining buildings. Where access is required, protection must be given so as not to damage the waterproofing membrane.

DON’T allow other trades to fix units through the waterproofing membrane without proper advice. This is especially important when having television aerials, heating and ventilating plant and telephone cables installed.

DON’T drop cement, paint or solvents on the roof as these may soften and destroy the roof covering.
General instructions

- Installation instructions relative to specific fastening systems are included in the specific installation literature.
- Parapets and upstands must not damage the membrane, if necessary an ALKORPLUS protection layer will be installed.
- All parapets and upstands must be executed in a windtight way.
- Water outlets and other details are mechanically fixed to the roof.

Compatibility
Contamination of ALKORPLAN® membranes by oil, petrol and other solvents, hot or cold bituminous products, tar, etc. must be avoided as these will attack the PVC polymer, damage the appearance and reduce the life expectancy of the products. For a list of chemical resistance with a number of substances, a summary table is available.

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

Wood in contact with ALKORPLAN® membranes should only be treated with salt-based products to avoid adverse effects. Under no circumstances should solvent-based preservatives be used.

Other remarks
The following rules and regulations must be respected at all times:
- the product information and instructions for execution of particular details issued by Alkor Draka concerning ALKORPLAN® and ALKORPLUS products
- the installation instructions issued by manufacturers or suppliers of other materials and accessories used during the construction of the roof.
- all other current norms and directives

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 include an application of our products without observing existing patents, certificates, legal regulations, national or local rules, technical approvals or technical 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, nor the execution of the works.

In the case of negligence of rules, regulations and duties on the part of purchaser we will disclaim all responsibility.
Roofing... with style