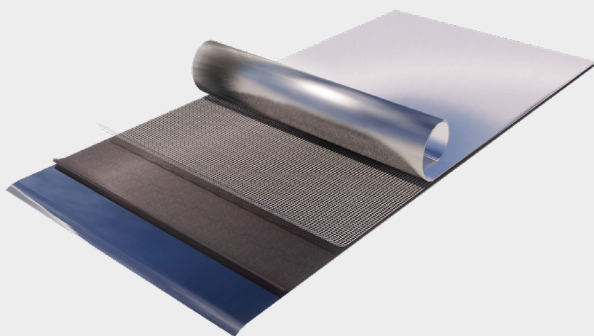




# Installation Manual

ALUSHELL



A PRODUCT BY SEALECO

ROOFING



# Installation Manual

# AluShell

## Preface

The information in this manual is a guideline to provide sound waterproofing. The base for the guideline is many years of practical and design experience obtained by SealEco. Local legislation or design practice may differ slightly from these specifications and instructions, however the information enclosed should be considered as a general guideline towards the most effective product use and application in a given situation when installing AluShell. Since the handling and installation is beyond our control, SealEco retains no responsibility for these areas. We make every effort to ensure that the information provided in this document is current and accurate. However, errors, misprints, inaccuracies, omissions or other errors may sometimes occur despite our best efforts. SealEco does not warrant that the content of this document including, without limitation, product-/installation descriptions or photographs and illustrations, is accurate or complete. AluShell can only be installed after a successful training course. Please contact your local AluShell supplier.

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# 1 General instructions

## Substrate

AluShell can be used on all common roof constructions like: concrete, timber or corrugated metal deck. It is the responsibility of the roofer to choose the correct roof design, taking into account all the roof parameters and desires from the customer and architect. The roofing substrate shall have adequate strength and rigidity to carry actual loads from wind, snow, ballast, solar panels. We recommend a minimum slope of at least 2%. Ponding water is not allowed.

The substrate shall be relatively even - equivalent to wood floated concrete. It shall be clean and free from water in any form as well as contaminations like oil or grease. Screws or nails must be properly entered into substrate without risking coming out.

The smoothness of the substrate is important under splice areas. Difference in level more than 5 mm must be levelled before splicing.

## Vapour barrier

When installing a warm roof a suitable vapour barrier must be applied under the insulation and it should be installed to be air tight over the entire surface. It is important that all connections towards pipe penetrations, upstands, drains, etc. are made perfectly airtight to prevent condensation and convection.

At roof terminations, and connections to walls, the vapour barrier shall be brought up over the thermal insulation, so the insulation will be enclosed.

As far as the substrate and the indoor climate allows it, SealEco recommends the use of an AluShell vapour barrier

## Insulation

Different types of insulation can be installed onto AluShell without risk of migration. The chosen insulation must be suitable for low slope roofing and adapted to the requirements of the roof design.

Insulation should have a compression strength at 10% deformation of minimum 60 kPa (60 kN/m<sup>2</sup>) to assure a proper installation. Apart from this all local demands have to be fulfilled.

Install only insulation suitable for the roof in accordance with the guidelines of the supplier.

## 2 List of materials

All Technical Data Sheets and Safety Data Sheets can be consulted on our documentation app on [www.SealEco.com](http://www.SealEco.com). Availability depending on country. Contact your local supplier for more information.

### 2.1 AluShell vapour barrier

**AluShell** is a high-quality self-adhesive air and vapour control layer composed of a reinforced aluminum foil, a self-adhesive layer of high polymer SBS and a silicone protective film. Due to its high resistance to water vapour permeability, AluShell can be used for almost all flat roofs in combination with most indoor climate conditions. AluShell is available in two thicknesses 0.4 mm and 0.6 mm. AluShell 0.4 mm can only be applied in mechanically fixed roof applications.



### 2.2 AluShell types

**AluShell 0.6** is suitable for adhesion to wooden plates, concrete and profiled metal plates. AluShell 0.6 can also be used as a temporary seal, but for a limited time of 4 weeks. In this case, the roof must be placed under a slope, as provided for in local flat roofs regulations.

SealEco recommends a slope of at least 2% in this case.



Width (mm)	Length (m)	Weight/roll (kg)	Rolls/pallet (pcs)
1080	30	20.6	24

**AluShell 0.4** is only used in mechanically fixed roof build ups. AluShell 0.4 has been tested according to DIN18234-1 (fire load > 10500kJ/m<sup>2</sup>) to be applied on profiled steel sheet in industrial applications. AluShell 0.4 can not be used as a temporary seal. It has to be covered the same day.



Width (mm)	Rolllength (m)	Weight/roll (kg)	Rolls/pallet (pcs)
1080	50	22.6	30

### 2.3 Primer - Cleaner

**Cleaning Wash 9700** is a technical petrol used for cleaning weathered rubber membranes before installation and repair.



**Primer 9800** is a polymer based primer for consequent use with self-adhesive SealEco rubber membranes, and for priming porous substrates.

**Coverage:** 100-375 g/m<sup>2</sup> depending on substrate



2.4 Accessories

Accessories

Silicone pressure roller 40 mm



Silicone pressure roller 80 mm



Silicone pressure roller Leister 40 mm



Reinforced EPDM scissors



Brass detail roller



Brass detail roller Leister



**i** Availability depending on country. Contact your local supplier for more information.

## **3 Work preparation - Quality assurance and control**

### **3.1 Preparation of the workspace**

The basic behind efficient and safe roof installation is preparation and careful planning of the work. Make sure all pipe penetrations, drains and other details are ready, so the vapour barrier can be perfectly installed. Determine a correct compartmentalization in advance.

The roofing work as well as quality assurance becomes easier and more secure if there is a way to split the roof in smaller areas that can be finished in detail during each working period. Ensure to have the necessary tools/accessories available prior to beginning installation:

- AluShell vapour barrier
- Primer 9800 - Cleaning Wash 9700
- Scissors - Utility knife - Silicone pressure roller - Brass detail roller
- Brush - Roller - Spraying set for Primer 9800
- Measuring equipment - Chalk line - Broom - Screwdriver - Rags  
- Standing up pressure roller

### **3.2 Materials handling and storing**

Check upon delivery that the materials match the order acknowledgement, shipping documents and product labels. Missing or damaged goods should be reported to SealEco. Store all materials according to the product specifications. Packages shall not be opened until the material shall be applied. If the installation work is interrupted, unprotected rolls shall be covered or put back in their packaging. Make sure that the substrate can carry the load when material is placed on the roof (point load).

Do not allow traffic or work by other contractors until installed roof areas are satisfactory protected. Keep the work site in good order and free from construction debris, loose nails, metal pieces, etc.

The shelf life of AluShell is 12 months after manufacturing date.

### **3.3 Climatological circumstances**

When adhering AluShell, or using Primer 9800, the surface and ambient temperature is at least +5°C. At temperatures between +5°C and 15°C it is recommended to heat up the AluShell and Primer 9800 to room temperature to improve tack and sprayability. In case of precipitation, mist or risk of condensation, the installation of AluShell will be stopped immediately.

### **3.4 Weathering**

When Alushell is exposed to the sun, rain, wind, etc. the toplayer will desintegrate after a certain time. Therefore we advise to cover the Alushell as soon as possible. This is depending on the thickness of the membrane. You will find the correct info in the TDS.

### **3.5 Quality assurance and control**

Quality control and assurance are essential elements in the installation of the AluShell vapour barrier.

As the quality of the vapour barrier is highly dependent upon the workmanship of the installer only contractors that are trained and certified by SealEco are allowed to do installations.

### **Documentation**

Each installation should be carefully documented and added in the as-built plan. It should include data like batch numbers and/or production dates of the vapour barrier, as well as the weather conditions.

### **Visual control**

Continuous visual controls of the work and the quality should be done throughout roof installations. Problems and faults should be detected and fixed as quickly as possible. Controlling aspect should be:

- That correct material are being used and installed with the right equipment and that proper storing at site is assured.
- That the material is installed according to the guidelines of SealEco, local regulations and in accordance with good workmanship practice.
- That the vapour barrier isn't risking mechanical abuse.



## 4 AluShell installation

### 4.1 General instructions

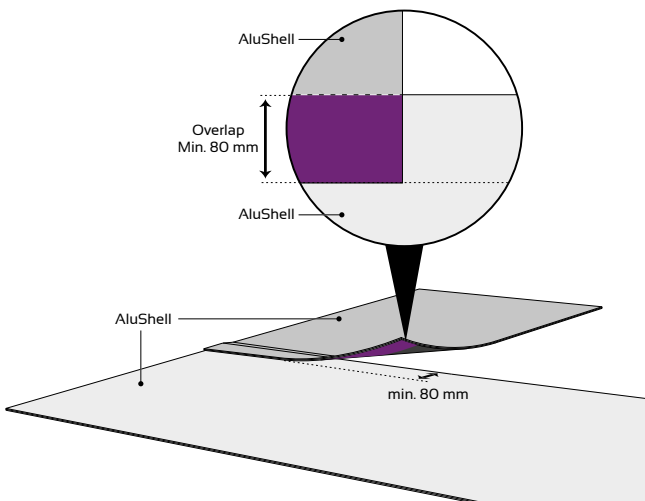
AluShell can be installed on all common substrates like: concrete, wood and corrugated metal deck. The substrate must comply with local regulations. It is important that the surface is completely clean, dry and free of oil and grease.

For adhered applications, Primer 9800 will always be fully applied on the substrate before adhering AluShell. Check the technical data sheets before use. For ballasted or mechanically fastened applications, the application of Primer 9800 is not required. Make sure the entire roof system can withstand the wind loads. Wind load calculations are the responsibility of the architect or structural engineer. The roofer will be responsible for choosing the correct roof system. For more information regarding wind loads please contact our technical department.

AluShell can be used in applications between  $-40^{\circ}\text{C}$  and  $+80^{\circ}\text{C}$ . When Alushell is placed on profiled steel plates, Alushell should be unrolled parallel to the waves and the overlap is only to be sealed on a wave top.

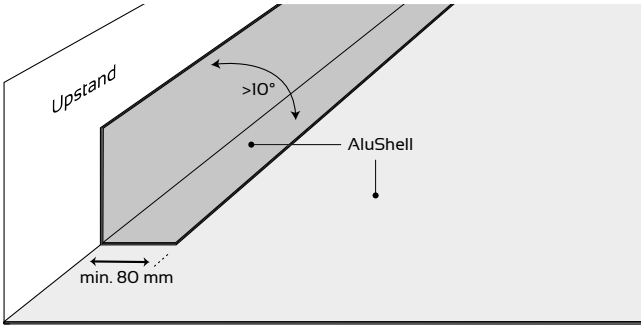
The installation of AluShell shall preferably start at the lowest part of the roof either in a valley or at the lowest side. From this position the lay-out of the membrane is done cross the slope direction with a minimum overlap of 80 mm.

Figure 1



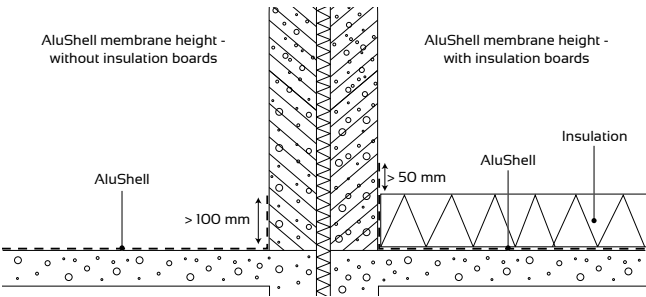
All places where the substrate makes a change in angle greater than  $10^\circ$  shall be considered as an upstand and treated accordingly. SealEco recommends to break the membrane and to use a separate AluShell strip for the upstands. AluShell shall always be fully adhered on upstands. Details like internal corners, external corners, pipe penetrations, etc should be treated with extra care. Vapour leaks will cause major problems.

Figure 2



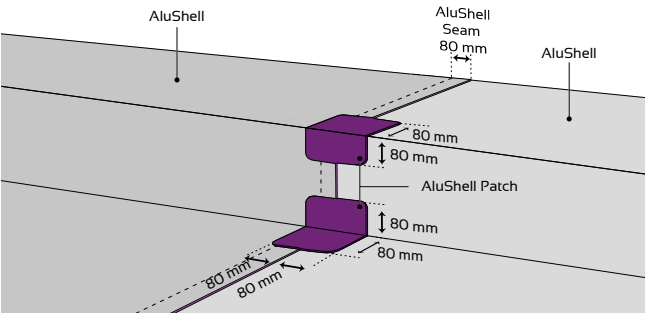
Make sure that the membrane is placed at least 100 mm vertically against all upstands. When insulation boards are being used, the AluShell vapour barrier has to be installed minimum 50 mm above insulation board level. The adhesion of the vapour barrier to the upstand must be 100% vapour tight.

Figure 3



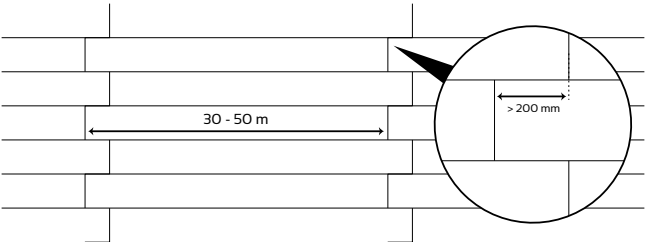
When Alushell is placed continuously, additional patches are required to reinforce the seams at the base of the upstands. The minimal seam width is 80 mm. All patches will be installed without any form of tension. See figure 4.

Figure 4



All membrane edges need to run parallel to each other. End laps should be shifted longitudinally with 200 mm to avoid too significant material thickness.

Figure 5



#### 4.2 Substrate

Before applying Primer 9800 the following must be fulfilled:

- Minimum temperature is +5°C.
- The surface is perfectly clean and dry.
- The safety instructions have been read.

Substrate	Consumption Primer	Remark
OSB	200 g/m <sup>2</sup>	Min. PTS 3 quality
Plywood	175 g/m <sup>2</sup>	Waterresistant quality
Concrete	200 g/m <sup>2</sup>	Quality and flatness according to local prescriptions
Cellular concrete	200 + 175 g/m <sup>2</sup>	Apply two layers before adhering AluShell
Profiled metalplate	100 g/m <sup>2</sup>	Free of fat, oil - to be degreased
Bitumen	200 g/m <sup>2</sup>	In case of old bitumen, blisters to be flattened and construction sound and dry
Screed	225 g/m <sup>2</sup>	Only when acceptable quality. Perform a peelttest before installation.

### 4.3 Primer 9800

Primer 9800 shall be used for adhering AluShell.

It is available in different packaging. When a pressurized canister is being used, SealEco recommends a training course for using the primer and its accessories. We have learned by experience that roofers have the tendency to apply much too little primer when using spray equipment.

When applying the primer with a brush or roller, do not forget to stir the primer before use. Use a fleece roller or a brush and apply to the entire surface, upstand included. Close the can immediately after use because the solvents will evaporate if exposed to the air.

The average consumption is in between 100 - 375 g/m<sup>2</sup> depending on the substrate. After applying the primer onto the substrate, let it flash off before adhering the membrane. (Approximately 20 minutes - 20 C° and 50% RH.)

In cases where the work has been interrupted for a longer period of time (>3 h), a second layer of Primer 9800 has to be applied.

Store the primer in temperatures between +5 C° and + 25 C°. Shelf life: 12 months if stored cool in unopened original packing.

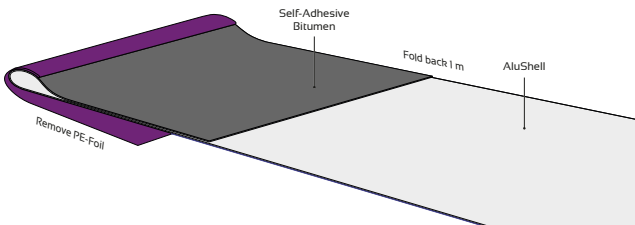
Primer 9800 is highly flammable. Read the MSDS before use.

In all cases Primer 9800 must be applied vertically.

### 4.4 Lay-out of the membrane

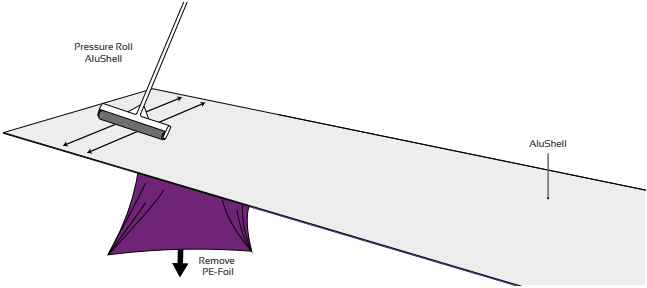
1. Apply Primer 9800 and let it flash off.
2. Position, align and cut the first AluShell roll at length.
3. Fold the AluShell membrane back for about 1 meter. Remove and position the PE protection foil so it can be removed in a 45° angle in the next step.

Figure 6



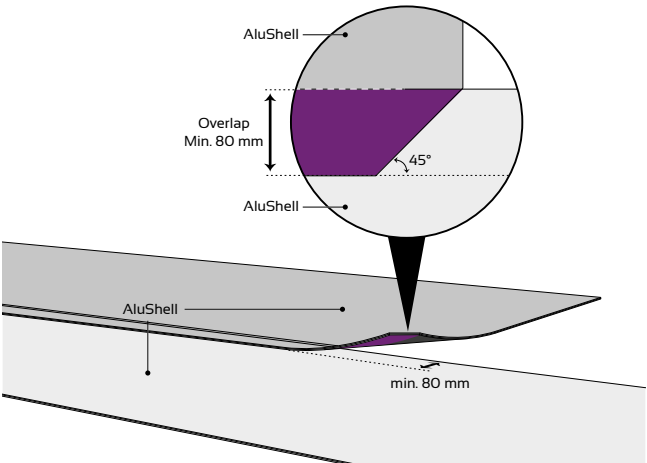
4. Fold back the AluShell membrane and adhere it onto the primer. Remove the PE-foil while pressure rolling the membrane. Avoid wrinkles or trapped air.

Figure 7



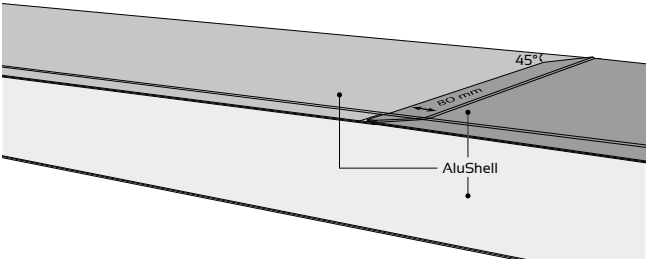
5. Unroll and adhere the next AluShell roll with a minimum overlap of 80 mm and splice the seam by rolling it with a silicon pressure roller.

Figure 8



6. When a T-splice occurs, cut the edges of the seam in a 45° angle. Unroll and adhere a new roll with a minimum overlap of 80 mm.

Figure 9



Continue the lay-out of the membrane cross the slope direction with a minimum membrane overlap of 80 mm. Make sure to press each splice with a roller. Indicate errors immediately after splicing and apply a patch immediately with a seam width of minimum 80 mm.

When the entire roof surface is ready, the curbs and details can be made water and airtight. Make sure every upstand, every pipe penetration, every drain is made airtight when the Alushell is interrupted. When a roof needs to be perforated after complete installation, do not forget to tighten the vapour barrier correctly. You need to treat this correct to limit the risk for convection and condensation.

## 5 Internal corners

### General instructions

Important rules to be followed at all times:

- The membrane shall be 100% clean. If not, clean the membrane.
- A separate AluShell upstand strip is being used.
- Follow all splicing instructions.
- AluShell has to be fully adhered with Primer 9800.
- Always pressure roll the membrane immediately after adhering.
- All layers around the corner are properly fixed and adhered.
- Tension in the underlying layers is not allowed.

1. After installing the AluShell membrane on the horizontal roof part adhere a separate strip onto the upstand according to figure 10 and figure 11. Fold the internal corner as instructed.

Figure 10

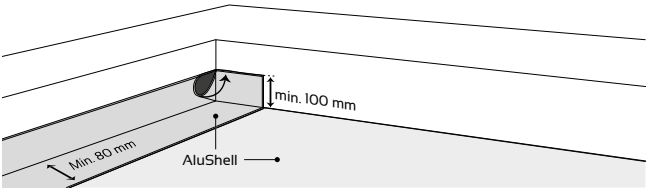
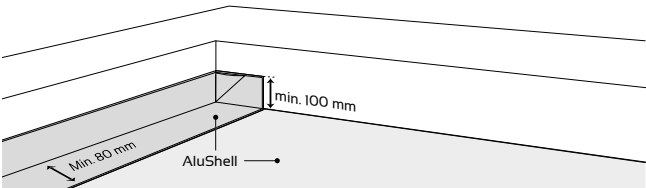
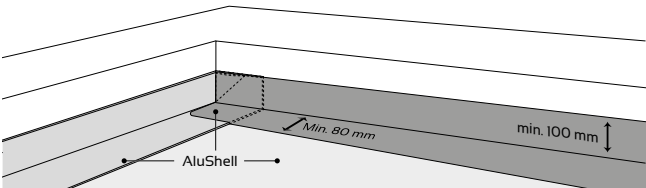


Figure 11



2. Install the next strip as instructed below. Pressure roll the T-splice with a brass detail roller.

Figure 12



## 6 External corners

### General instructions

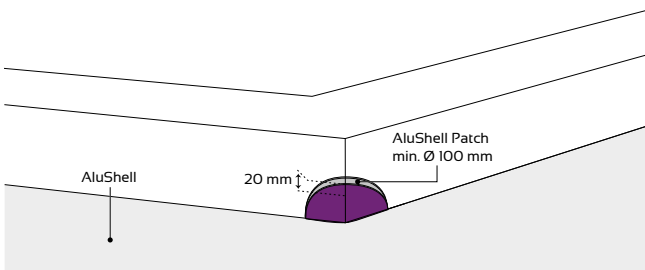
Important rules to be followed at all times:

- The membrane shall be 100% clean. If not, clean the membrane.
- A separate AluShell upstand strip is being used.
- Follow all splicing instructions.
- AluShell has to be fully adhered with Primer 9800.
- Always pressure roll the membrane immediately after adhering.
- All layers around the corner are properly fixed and adhered.
- Tension in the underlying layers is not allowed.

After installing the AluShell membrane on the horizontal roof part the external corner can be sealed. Follow these steps:

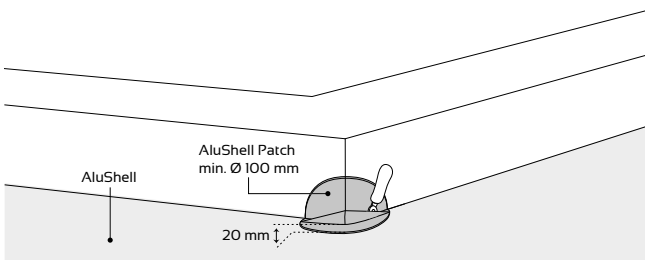
1. Cut out a circular piece with a diameter of 100 mm. Fold it in half and remove the PE-foil from one half. Adhere the piece against the upstand and pressure roll it with a silicon pressure roller.

Figure 13



2. Remove the PE-foil. Fold the top of the piece (20 mm) down and adhere minimum 20 mm on the horizontal roof part, next to the upstand. A crease will occur. Use a detail pressure roller to adhere the AluShell at the base of the upstand.

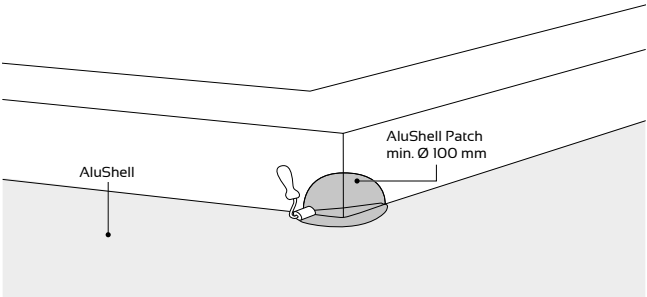
Figure 14





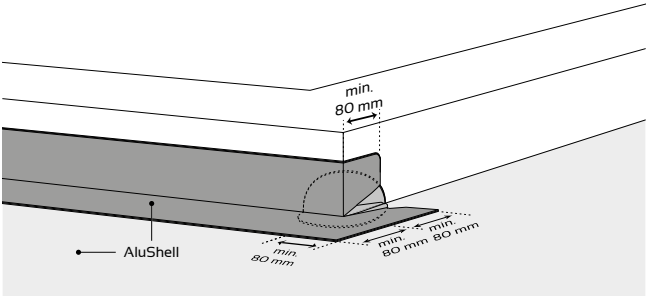
3. Roll all creases down with a silicone pressure roll.

Figure 15



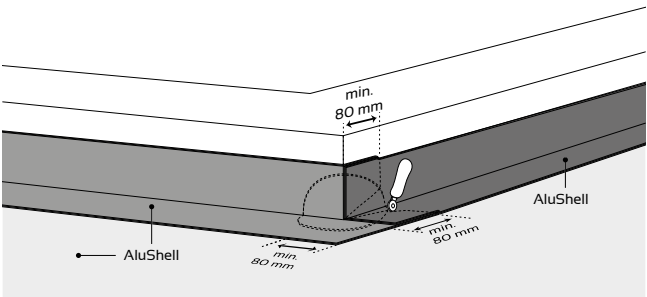
4. Adhere a AluShell strip against the upstand and onto the horizontal roof part. Cut the strip at an 45° angle to take away all tensions at the corner.

Figure 16



5. Adhere the last AluShell strip as instructed in the next figure. Make sure to pressure roll all seams with a silicon pressure roller and all differences in height with a detail pressure roller.

Figure 17



## 7 Pipe penetrations

### General instructions

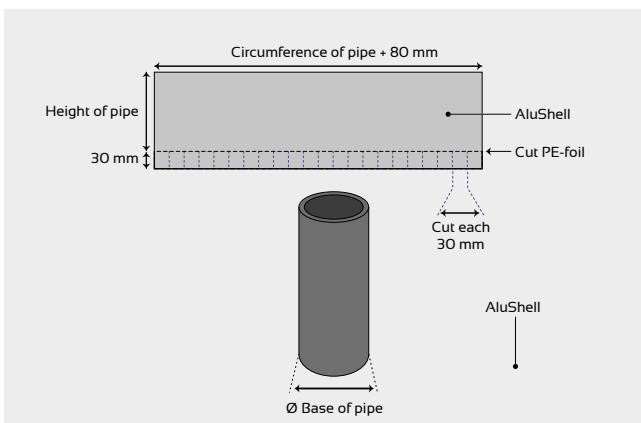
- All pipes shall be properly fixed in the substrate. Moving pipes might fatigue the AluShell and cause cracking.
- All connections have to be vapour tight to prevent convection and condensation.
- The maximum contact temperature of the pipe shall not exceed 80°C.
- The pipes shall be smooth and clean. Rusty surfaces have to be treated properly.
- The height of the AluShell strip on the pipe will be at least 100 mm and minimum 50 mm above the insulation level.
- The minimum distance from a pipe to a parapet, skylight, corner, drain or other pipe is 300 mm. If this is not the case we advise you to move the pipe. Proper splicing can't be guaranteed!

### Installation of a round pipe penetration

After installing the AluShell membrane on the horizontal roof part the pipe penetration can be sealed. Follow these steps:

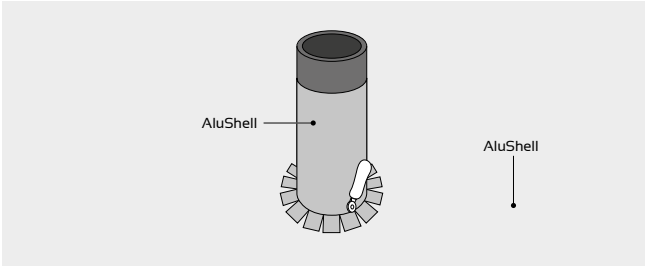
1. Prepare an Alushell piece of following length: circumference of the pipe plus 80 mm. The width of the piece is at least the needed height (see 'general instructions') + 30 mm. Mark this 30 mm and cut the Alushell strip each 30 mm at the base of the pipe.

Figure 18



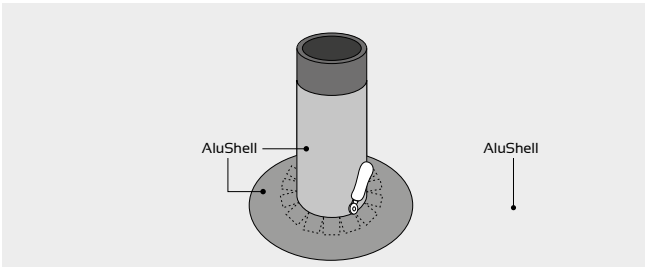
2. Adhere the prepared AluShell piece against the upstand by gradually removing the PE-foil. Make sure the base of the pipe is sealed with AluShell. Remove all pieces of the 30 mm cut AluShell. Adhere end pressure roll all parts.

Figure 19



3. Cut out a circular piece. The diameter of the piece is the width of the pipe plus two times the seam area ( $2 \times 80 \text{ mm}$ ). Determine the middle of the piece and cut out a hole in the center with a diameter equal or slightly smaller than the outer diameter of the pipe. Pull the piece over the pipe and adhere it onto the horizontal roof part. Roll with a detail and a silicon pressure roller.

Figure 20



## 8 Remarks

At temperatures below 10°C, the immediate tack of Alushell will decrease. We therefore recommend that you store the rolls at room temperature until they are actually needed. We also prescribe to pressure roll Alushell. Brushing is insufficient. Also pressure roll overlap firmly, or weld them with hot air (welding machine settings 250°C - 4 m / min - air flow rate 50%).

Alushell is a vapour barrier and not a waterproofing. Alushell 0.4 must be protected immediately against the effects of the weather. So do install the insulation immediately on top of the vapour barrier.

Alushell 0.6 can be used as a temporary seal for a maximum time of 4 weeks. It is nevertheless advisable to finish the roof immediately.



We make  
waterproofing  
easy

Your AluShell dealer:

For more information, visit **[www.SealEco.com](http://www.SealEco.com)**