



van Beek
E P D M

Application Instructions
for VB-EPDM Roof Systems.

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1. Introduction:

VB-EPDM is a synthetic, single-layer vulcanised rubber membrane with a unique composition which guarantees a long lifespan and minimal environmental impact. Since the first roof was installed in the Netherlands in 1968, many millions of square metres of roofs have been sealed with this unique product that has also been successfully used to seal gutters, walkways, balconies, ponds and water basins. VB-EPDM is available in various thicknesses. Membranes measuring up to 3,000 m² can be made from a single piece, which considerably reduces the time taken to install it on the roof and minimises the risk of processing mistakes. Van Beek EPDM B.V. is also able to manufacture bespoke three-dimensional membranes. The increasingly advanced prefab vulcanising techniques mean that, these days, even extremely difficult details can be prefabricated in the factory. VB-EPDM is fitted without the use of flame or hot air and is KOMO and CE certified.

Van Beek EPDM B.V. has a training centre where we can train your workers to become all-round EPDM specialists. Our specialised and experienced EPDM team is at hand to answer any questions you may have about VB-EPDM system applications relating to the most diverse sealing issues.

You can find further information about Van Beek EPDM b.v. on our website www.vbbv.com. We would like to invite you to visit our site.

In the following sections you will find a summary of the instructions for processing the VB-EPDM membranes. We would like to point out that besides these instructions, nationally applicable rules and regulations must also be complied with.

2. General application instructions:

VB-EPDM has the following unique properties:

- Elasticity amounts to more than 300%. VB-EPDM can adapt to size changes in the building excellently. This is a big advantage with movements in building parts.
- The expected lifespan amounts to more than 50 years. This conclusion was drawn by the Süddeutsche KunststoffZentrum based on a comprehensive investigation of roofs that were already 30 years old and still fulfilled their function.
- External fire resistance according to Broof(t1) if in FR quality.
- Softener-free.
- Inert; no loss of material properties occurs during use.
- Root-resistant on extensive green roofs according to FLL test.
- Ecologically responsible. According to the Nibe (Dutch Institute for Building Biology and Ecology), EPDM is one of the most ecological products for sealing construction work.
- Resistant to micro-organisms.
- Resistant to very many chemical substances, with the exception of hydrocarbons, oil and grease. We will be pleased to provide you with a list on request.

VB-EPDM can be used for the following roof sealing systems:

- VB-EPDM loosely laid with ballast.
- VB-EPDM mechanically attached with Thermofix®.
- VB-EPDM adhered to the substrate.

VB-EPDM systems basically consist of VB-EPDM membranes offered together with a complete range of accessories. This complete package allows you to seal flat roofs for a long period with 100% certainty and consists of the following components:

- KS-100 contact adhesive
- KS-150 PU dispersion adhesive
- KS-1000 spray adhesive for processing with a compressor
- KS-2000 spray adhesive in pressure vessel
- KS-301 adhesive paste
- VB-9510 rubber sealant
- VB-drain rainwater outlet
- Prefab moulded parts
- Thermofix® fasteners
- Tools

Before starting to process VB-EPDM, it is important to bear the following points in mind:

1. VB-EPDM is supplied in a package with protective cloth and/or plastic foil, provided with a roll-out drawing and/or roll dimensions. Checking for transport damage before opening the package is recommended.
2. VB-EPDM can be processed in just about all weather conditions. Extra attention is required at temperatures above 35°C (too fast drying of adhesive), in case of high air humidity (no adhesive strength) and in case of strong winds (waving of the VB-EPDM membrane).
3. Substrate check:
 - a. Flat: No sharp edges or protruding parts, possible use of a protective fabric (polyester membrane min 200 g/m²).
 - b. Dry: No water, snow, hoar frost or ice.
 - c. Clean: Brush clean, remove any stubborn dirt with a hard brush.
 - d. Firm: Existing surface suitable for attaching the chosen VB-EPDM system.
 - e. Holes: Level or fill any holes in the surface with a suitable material.
4. Stress-free installation of VB-EPDM is required. VB-EPDM is permanently elastic and will always try to take on its original shape. After rolling out, a relaxation time of at least 30 minutes (depending on the temperature) is required. At temperatures below +5°C it is recommended to not store VB-EPDM membranes packaged for a long time in an unheated situation. This extends the relaxation time.
5. VB-EPDM is not resistant to certain hydrocarbons such as petrol, oil, etc, nor to animal fats. The use of cleaning products, chemical resources, pesticides or herbicides and other additives in combination with the goods supplied is at one's own risk. These resources can have a negative influence on the product properties. Damage as a result of their use is not covered by the guarantee. A resistance list is available on request.

Instructions for determining membrane dimensions:

1. It is important to order the prefab membrane at roof size to the extent possible.
2. Along the roof edges, take account of at least 5 cm of extra material.
3. With the application of a number of membranes on a roof surface, take account of extra material for making seam joints.
4. When measuring the roof, take account of the roof shape and accessibility for vertical transport.
5. When placing and rolling out the membrane, take account of the maximum roof load (concentrated load). Possibly use a roll-out trestle to roll the membrane out suspended from the crane.



1. roll-out trestle

6. VB-EPDM membranes are always provided with rolling out instructions mentioning the membrane dimensions, the direction of rolling out, the foil thickness, the foil type and the weight.

When applying VB-EPDM, it is important to bear the following points in mind:

1. Firm perimeter fastening must be applied for each VB-EPDM system. One can choose a mechanically attached system variant or an adhered one.
2. When working with a number of VB-EPDM membranes on one roof surface, there must be a seam joint between the membranes. It is important to have the seams staggered at least 5 cm.
3. Only apply VB-EPDM systems with clean, sound tools and system-specific components.
4. In case of existing roofing (bitumen, PVC), any loose roofing, blistering and wrinkling must be removed and repaired beforehand.
5. In case of vegetation roofs, the seam joints and details must be made using the vulcanisation technique. Compartmentalisation in the roofing system is also recommended.
6. VB-EPDM systems may in no case whatsoever come into contact with low-melting bitumen or tarry roofing.
7. Walking on the VB-EPDM system must be avoided to prevent mechanical damage. For future maintenance on, for example, installations, it is recommended to provide walkways on the roof (drainage tiles on tile bearers).
8. The top side and bottom side of VB-EPDM are the same.
9. Repair activities are also simple to carry out after years.
10. Check the VB-EPDM membrane during rolling out for damage.
11. Any insulating panels must always be attached in the surface according to the manufacturer's instructions to obtain a windproof system. The choice of the type of insulation and/or the presence of a certain protective coating can influence the application of a specific VB-EPDM fastening system. The compression strength of the insulating plate determines any accessibility to the roof surface area. Connect the insulating panels firmly to avoid thermal bridges.
12. Ensure temporary water drainage of the membranes during processing so no unnecessary static overloading due to water accumulation can occur.

3. VB-EPDM loosely laid with ballast.

The building construction must be statically suitable to bear the weight of the ballast. This is examined in consultation with our works office.

For the instructions for determining the membrane dimensions, see page 5.

The VB-EPDM membrane must be rolled out and folded according to the instructions with the formation of an air cushion. Then the membrane can be aligned in the correct position. Immediately after the application of the membrane, it must be protected against wind loads with ballast. Do not have the processing times immediately follow each other. Ensure temporary ballast which does not damage the VB-EPDM membrane and which is also windproof enough.

Points for attention:

- Always apply a protective layer (minimum polyester membrane 200 g/m²) on uneven surfaces such as concrete.
- Unbroken, washed gravel can be applied directly on the EPDM.
- When use is made of broken gravel or a ballast layer with sharp parts, always apply a sufficiently strong protective layer (minimum polyester membrane 200 g/m²).
- Protect the VB-EPDM membrane if the gravel is blown on the roof. The hose couplings must particularly be packed.
- When use is made of concrete roof tiles, do not directly lay them on the EPDM. Use tile bearers in such cases.
- In case of reversed roof systems in combination with XPS insulation, always lay a protective membrane on the insulation.
- In all the above cases, have all protective layer seams overlap each other by at least 15 cm.



2. rolling out VB-EPDM membrane



3. folding out VB-EPDM membrane

4. VB-EPDM mechanically attached with Thermofix®.

The Thermofix® system uses patented elements to fasten the VB-EPDM membrane in the substrate without perforation. The system can be used on an uneven substrate. A condition for correct application of the Thermofix® system is a wind load calculation made by Van Beek EPDM BV.

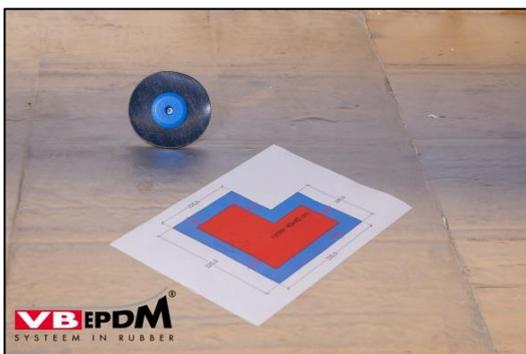
For the instructions for determining the membrane dimensions, see page 5.

Before applying the system, the associated fastening plan must be at hand. If this is not the case, there is the risk that the system will not be sufficient for the occurring wind load. Van Beek EPDM can make this available on request.

The Thermofix® system can be used on most common surfaces, such as wood, sectioned steel plating, concrete or cellular concrete. The system can also be used on insulation material with the exception of uncoated polystyrene foam. In the latter case extra protective measures are required to prevent fusion due to heat.

Procedure:

1. Lay out the fastening grid according to the diagram provided (**photo 4**).
2. Fasten the Thermofix® elements in the surface (**photo 5**) so there is sufficiently firm anchoring. Do not overtighten the screws. If the black part of the Thermofix® element curls upwards, loosen the screw so the black disc again lays flat on the surface.
3. Apply the VB-EPDM membrane according to the rolling out instructions and mark all screw holes of the elements on the membrane with chalk (**photo 6**). Then lay the dock boards for the Thermofix® machine (**photo 9**). Then place the Thermofix® machine (**photos 7 + 8**) in such a way that the marked point is central in the sight hole of the machine (**photo 10**) and switch the machine on (**photo 11**).
4. Warm the Thermofix® elements through the VB-EPDM membrane using the Thermofix® machines until the machine gives the signal to stop. Move the machine to the following element and cover the still hot melted element on the VB-EPDM membrane with the 'Thermofix® weight' (**photo 12**) until the Thermofix® process for the following element is complete. Continue with the whole Thermofix® grid in this way. The elements melting with the bottom side of the membrane makes the connection with the substrate (**photo 13**).
5. A processor can operate a maximum of 3 machines simultaneously.



4. Thermofix® fastening grid + Thermofix® element.



5. Thermofix® elements fastened.



6. Element marked with chalk.



7. Thermofix® machine.



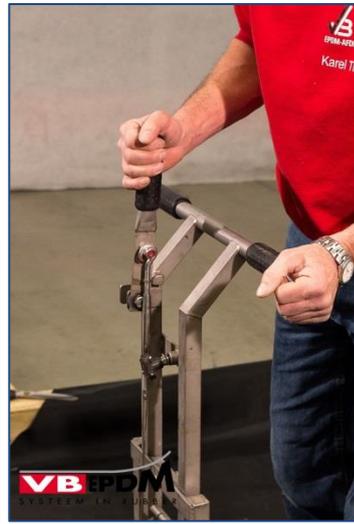
8. Thermofix® hand punch.



9. Machine on dock boards.



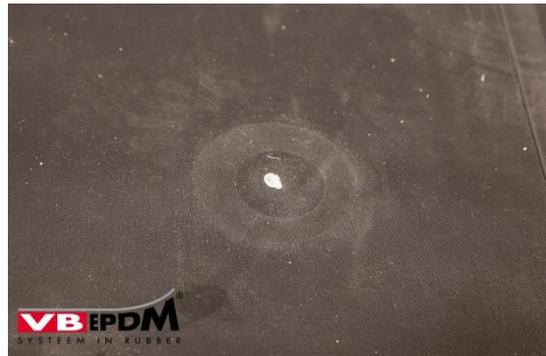
10. Machine correctly in position.



11. Switch machine on.



12. 'Thermofix® weight' for covering warm element.



13. Thermofix® element ready.

5. VB-EPDM adhered to the substrate.

With the application of a VB-EPDM system adhered on the substrate, it is advised to restrict the maximum membrane dimension to 500 m². In case of membranes to be glued, there must be as little folding as possible. For this, mention the required seam direction and date of implementation when ordering.

For the instructions for determining the membrane dimensions, see page 5.

When do you choose an adhered VB-EPDM system?

- Mechanical fastening of the VB-EPDM membrane in the substrate is not possible.
- The use of ballast is not possible because of static considerations.
- The roof has uneven height differences.

Points for attention:

- The surface to be adhered to must be flat and have no underlying cavities.
- In case of renovation, first inspect the firmness of the existing roof structure.
- The substrates to be glued must be suitable for gluing. Extra attention must be paid to the suitability and the type of protective coating on the insulation.
- Direct adhesion with KS-150 or KS-150 S on existing slate bitumen is possible.
- It is recommended to always make a physical construction calculation of the roof structure. Moisture build-up in the construction can adversely affect the adhesive strength of the KS-150 or KS-150 S adhesive.
- Temperature fluctuations during the work can result in folds in the foil.
- Adhesive consumption approx 0.25 – 0.40 l/m² single-sided in the plane.
- Adhesive consumption approx 0.40 – 0.60 l/m² at edges and corners.

Procedure:

1. Apply the VB-EPDM membrane according to the rolling out instructions.
2. The membrane part applied against and over the roof elevation is folded back to ± 25 cm in the plane. Then roll the membrane back parallel to the seam direction (possibly using a tube or pipe) very evenly and without folds to ± half of the membrane length (**photo 14**).
3. To apply the adhesive in rows, ± 5 holes, diameter ø8 mm, centre-to-centre 4 cm, must be made in the bottom of the can as well as a ventilation hole in the top of the can (**photos 15 + 16**). Then take the can by hand and lay parallel to the rolled-up membrane over the roof surface (**photo 17**). Keep the glue can at a maximum height of 40 cm above the roof plane. Apply the KS-150 or KS-150 S adhesive evenly in rows with centre-to-centre ± 40 mm to an advised width of 150 cm on the substrate (**photo 18**). It is recommended to increase the adhesive quantity applied at edges and corner areas by ± 50%.
4. Evenly roll the membrane back in the fresh adhesive (avoid blisters, tension and folds) and firmly smooth from the middle (without causing folds) with a soft broom (**photo 19**). This ensures good adhesion between EPDM and substrate.



14. VB-EPDM membrane rolled back.



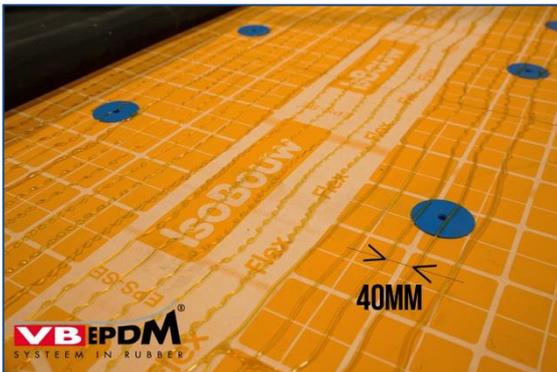
15. Make holes in KS-150 can with awl.



16. Holes in can KS-150.



17. Apply KS-150 adhesive.



18. Applied evenly spread KS-150.



19. Smooth membrane with soft broom.

6. Seam joint.

A seam joint is understood as an overlapping joint between two VB-EPDM membranes or two pieces of VB-EPDM foil. VB-EPDM membranes are factory-produced by means of the 'hot-bonding principle'. By applying pressure and heat, fully homogenous cross-net joints are formed that are stronger than the EPDM material itself. These joints can also be made on the construction site, for example if root resistance must be guaranteed. In other cases the VB-EPDM membrane joints can be made on the construction site with the combined application of KS-100 contact adhesive and VB-9510 rubber adhesive.

Procedure:

1. The substrate and overlapping foil must be clean and dry.
2. The VB-EPDM foil parts must overlap each other by at least 25 cm (**photo 20**).
3. Mark the top foil thinly with a piece of chalk on the bottom foil, then bring the top foil back 14 cm.
4. Keep the front 4 cm of the overlap free of adhesive. Apply KS-100 contact adhesive on the rear 10 cm of the overlap on both sides with a soft paint roller (**photo 21**).
5. When the KS-100 is dry, meaning no strands are drawn after finger contact, the seam can be carefully pressed shut without air inclusions (**photo 22**). With a flat hand, always smooth the EPDM foil from the middle of the seam to the sides.
6. Firmly press the foil of the glued part with a silicone pressure roller. The pressure applied determines the adhesion of the glue (**photo 23**).
7. In the remaining part of the seam, apply beading of VB-9510 rubber sealant. Smoothly apply the beading zigzagged over 4 cm width (**photo 24**). Cut off the plastic nozzle at a diameter of 10 mm. Make sure that VB-9510 is not applied on KS-100 contact adhesive. The sealing effect does not then originate.
8. Lightly press the foil of the sealed part with a silicone pressure roller in such a way that the sealant spreads uniformly and out of the seam (**photo 25**). The minimum thickness of the VB-9510 after rolling must be 1 mm.
9. Neatly remove the excess sealant flowing from the seam with a blade (**photo 26**).



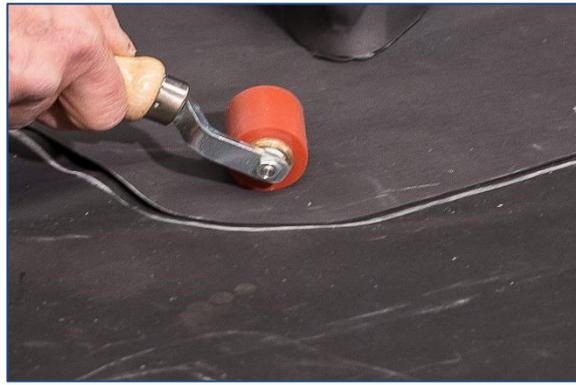
20. Overlap between VB-EPDM membranes.



21. Application KS-100 contact adhesive.



22. Folding VB-EPDM seam joint shut.



23. Rolling glued seam with silicone roller.



24. VB-9510 rubber sealant applied zigzagged.



25. Rolling adhesive/sealant seam with silicone roller.



26. Remove emerging rubber sealant.

7. Upstand and perimeter fastening.

Perimeter fastening is a compulsory and required detail to prevent the VB-EPDM from peeling loose under the influence of wind loads, shrinkage and expansion. Perimeter fastening must be applied for each fastening system of the VB-EPDM membrane.

Perimeter fastening can take place by direct adhesion of the membrane to a suitable substrate or – if the substrate is not suitable – to an additionally applied galvanised corner section or a reinforced EPDM strip, which must be mechanically fastened in the substrate (see § 7.4).

Perimeter fastening is applied along roof edges, wall connections and roof passages and is the 25-cm-wide part in the horizontal roof plane. Not properly performed perimeter fastening can result in leakage, condensation and damage to the VB-EPDM roof sealing system.

Upstand fastening is the vertical or diagonal part of the roof elevation to be glued. This vertical or diagonal part is normally sealed with the continuous part of the roof membrane itself.

In the event of elevations taller than 100 cm, it is recommended to seal them with a separate VB-EPDM edging strip and finish with a KS-100/VB-9510 seam joint on the roof membrane (see § 6).

7.1 Upstand and perimeter fastening with KS-100 contact adhesive (consumption depending on the substrate: $\pm 0.45 \text{ l/m}^2$ applied double-sided):

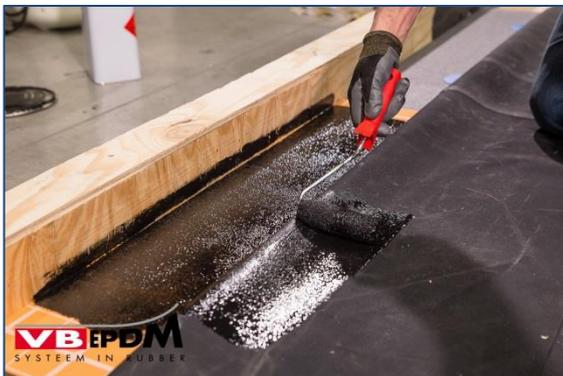
1. At the upstand and perimeter fastening, the VB-EPDM is brought back along its whole length by at least 25 cm in the roof plane (**photo 27**).
2. The substrate must be suitable for adhesion with KS-100 contact adhesive and must also be sufficiently fastened to the remaining construction.
3. KS-100 contact adhesive must be thoroughly stirred before use (**photo 28**).
4. Apply KS-100 with a soft paint roller to the substrate and the bottom of the VB-EPDM (**photo 29**).
5. When the KS-100 is dry, meaning no strands are formed after contact (**photo 30**), the foil can be carefully applied without air inclusions. Rub the foil carefully with a flat hand. Always work from the middle to the sides (**photo 31**).
6. Firmly press the glued part with a silicone pressure roller (**photo 32**).
7. Apply upstand fastening identically to perimeter fastening.
8. Finish the edging watertight (**photo 33**).



27. VB-EPDM membrane folded back.



28. Stirring KS-100 contact adhesive.



29. Application KS-100 contact adhesive.



30. Finger test.



31. Pressing with flat hand.



32. Rolling with silicone roller.



33. Edging finished.

7.2 Upstand fastening with KS-1000 spray adhesive for refillable spray system (consumption depending on the substrate: $\pm 0.35 \text{ l/m}^2$ applied double-sided):

1. At the vertical part of the upstand fastening, the VB-EPDM is brought back along its whole length to in the upstand.
2. The substrate must be suitable for adhesion with KS-1000 spray adhesive and must also be sufficiently fixed to the remaining construction.
3. Apply KS-1000 spray adhesive to the substrate and the bottom of the VB-EPDM with a compressor spray system (**photos 34 + 35**).
4. When the KS-1000 is dry, meaning no strands are drawn after contact with a finger, the foil can be carefully applied without air inclusions. Rub the foil carefully with a flat hand. Always work from the middle to the sides.
5. Firmly press the glued part with a silicone pressure roller.
6. Finish the edging watertight.
7. Work with spray adhesive must be done with great care according to the instructions on the label. Spray adhesive must under no circumstances be used as a replacement for KS-100 for perimeter fastening. This adhesive is unsuitable for forces coming from the roof plane.



34. Application spray adhesive.



35. Spray gun.

7.3 Upstand fastening with KS-2000 Spraybond in a pressure vessel (consumption depending on the substrate: $\pm 0.20 \text{ l/m}^2$ applied double-sided):

1. At the vertical part of the upstand fastening, the VB-EPDM is brought back along its whole length to in the upstand.
2. The substrate must be suitable for adhesion with KS-2000 Spraybond and must also be sufficiently fixed to the remaining lower construction.
3. Apply KS-2000 Spraybond to the substrate and the membrane with a suitable spray gun (**photos 34 + 35**).
9. When the KS-2000 is dry, meaning no strands are drawn after contact with a finger, the foil can be carefully applied without air inclusions. Rub the foil carefully with a flat hand. Always work from the middle to the sides.
4. Firmly press the glued part with a silicone pressure roller.
5. Finish the edging watertight.
6. Work with spray adhesive must be done with great care according to the instructions on the label. Spray adhesive must under no circumstances be used as a replacement for KS-100 for upstand fixing. This adhesive is unsuitable for forces coming from the roof plane.

7.41 Perimeter fastening with galvanised corner section or reinforced perimeter fastening strip:

1. At the upstand and perimeter fastening, the VB-EPDM is brought back along its whole length by at least 25 cm in the roof plane.
2. The substrate must be suitable for fastening screws.
3. The 100mm/250mm galvanised corner section, e.g. set at 95 degrees, must be pushed into the substrate with both sides. The section must be screwed at a maximum centre-to-centre distance of 300 mm with suitable fastening accessories approx 10 mm from the upstand. A reinforced EPDM strip at least 250 mm wide and metal pressure plates fixed with a maximum centre-to-centre distance of 300 mm can be used as an alternative (**photo 36**).
4. For the further procedure, see § 7.1 – 7.3.



36. Reinforced EPDM strip as perimeter fastening.

8. Details.

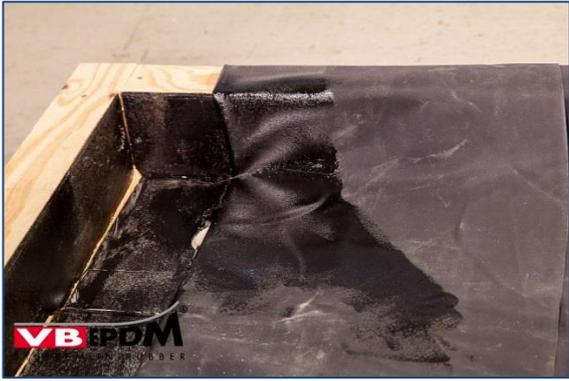
VB-EPDM systems are designed to keep your building watertight for a long time. To optimise the long life expectancy, it is necessary to carefully finish the system details.

8.1. Inner corner:

One can seal inner corners by folding in the surplus EPDM material vertically behind the roof membrane.

To do this, proceed as follows:

1. One side of the roof elevation is glued according to section 7. (photo 37)
2. Use chalk to mark the seam cut on the folded back VB-EPDM foil. (photo 38)
3. The VB-EPDM foil is shortened with scissors to 1 cm in front of the corner. (photo 39)
4. The cut is rounded off at the end to prevent tearing into the foil.
5. Then carefully fold the VB-EPDM foil in the corner. (photos 40 + 41)
6. Use chalk to mark the seam cut at the opposite corner side on the VB-EPDM foil. (photo 42)
7. The VB-EPDM foil is shortened with shears to 1 cm in front of the corner. (photo 43)
8. Round off the cut at the end to prevent tearing into the foil.
9. Fold the excess EPDM material according to the photo behind the roof membrane. (photo 44)
10. Adhere the inside of the open fold with KS-100, allow to dry and press together. (photo 45)
11. Now glue the front of the adhered part in point 10 with KS-100, allow to dry and fold into the corner. (photo 46)
12. Diagonally cut into the VB-EPDM foil on the horizontal side of the roof edge. (photo 47)
13. Seal the outer, not adhered 4 cm of the overlap with VB-9510 rubber sealant. Smoothly apply the beading zigzagged over 4 cm width **(photo 24)**. Cut off the plastic nozzle at a diameter of 10 mm. Make sure that VB-9510 is not applied on KS-100 contact adhesive. The sealing effect does not then originate.
14. Finish the corner waterproof with VB-9510 rubber sealant. (photos 48+49)
15. Lightly press the foil of the glued part with a silicone pressure roller in such a way that the sealant spreads uniformly and out of the seam. The minimum thickness of the VB-9510 after rolling must be 1 mm. (photo 50)
16. Neatly remove the excess sealant flowing from the seam with a blade. (photo 51).
17. The folded inner corner is now ready. (photo 52)



37. Glued-in roof elevation at inner corner.



38. Marking seam cut.



39. Cutting in inner corner with scissors.



40. Folding inner corner step 1.



41. Folding inner corner step 2.



42. Marking seam cut.



43. Cutting in with scissors.



44. Folded inner corner.



45. Gluing in inside corner.



46. Gluing folded inner corner.



47. Cutting in upper part with scissors.



48. Sealing upper part inner corner.



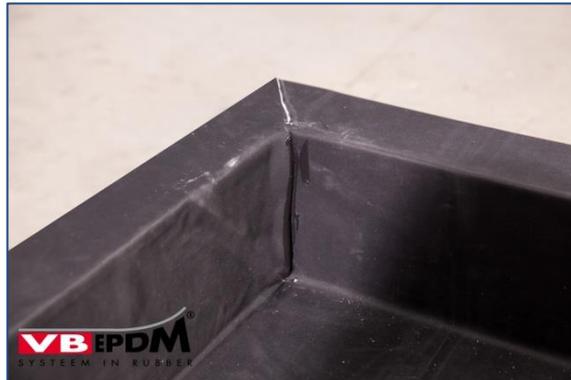
49. Sealing inner corner.



50. Rolling with silicone roller.



51. Remove excess VB-9510.



52. Inner corner ready.

It is also possible to fit a prefab inner corner sealing sleeve fastened with the customary KS-100/VB-9510 joint to the VB-EPDM membrane.

To do this, proceed as follows:

1. Cut the VB-EPDM foil at the inner corner to size. **(photo 53)**
2. Place the sealing sleeve in the corner and mark the sealing sleeve edge on the membrane. **(photo 54)**
3. Cut off the sealing sleeve, fit in the inner corner and mark the position with chalk on the VB-EPDM foil. **(photo 55)**
4. Glue the VB-EPDM membrane and the sealing sleeve with KS-100 contact adhesive. Keep the 4-cm-wide outer edge free of adhesive. **(photos 56 + 57)**
5. After the adhesive has dried, the sealing sleeve can be pressed with a flat hand. **(photos 58 + 59)**
6. Then firmly roll the glued part of the sealing sleeve with a silicone roller. **(photo 60)**
7. Finish the outer 4 cm with VB-9510 rubber sealant. **(photo 61)**
8. Lightly roll the foil of the sealed part with a silicone roller in such a way that the sealant spreads evenly and flows out of the seam. The minimum thickness of the VB-9510 after rolling must be 1 mm. **(photo 62)**
9. Neatly remove the excess sealant flowing from the seam with a blade. **(photo 63).**
10. The inner corner is now finished waterproof with a prefab inner corner sealing sleeve. **(photo 64)**



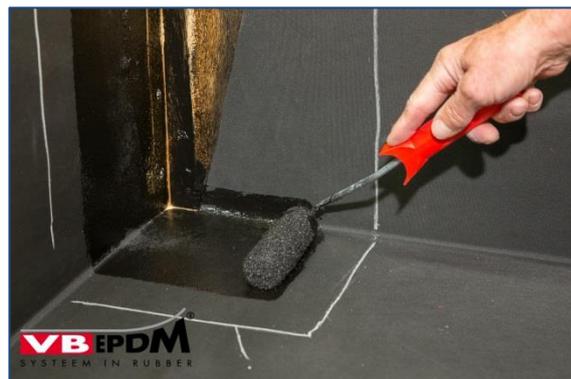
53. VB-EPDM cut to size at inner corner.



54. Mark sealing sleeve edge on membrane.



55. Sealing sleeve position marked on membrane.



56. Gluing in membrane.



57. Gluing in sealing sleeve.



58. Fitting sealing sleeve.



59. Rubbing sealing sleeve with flat hand.



60. Rolling sealing sleeve with silicone roller.



61. Zigzagged sealing.



62. Roll the sealed part with silicone roller.



63. Remove emerging excess rubber adhesive.



64. Inner corner sealing sleeve ready.

8.2 Outer corner:

At the outer corners there is too little EPDM material present to itself seal the roof membrane. It is best to carefully cut into the roof membrane so the EPDM foil falls around the corner. Then upstand and perimeter fastening can take place as described in § 7. Prefab corner sealing sleeves are always fixed with KS-100 contact adhesive, then sealed with VB-9510 rubber adhesive 4 cm wide.

To do this, proceed as follows:

1. Fold back the VB-EPDM membrane to in the upstand and mark the height of the roof elevation on the EPDM membrane. Mark a diagonal 45° line running from the corner on the EPDM membrane. (photo 65)
2. Carefully cut into the VB-EPDM membrane. The cut is rounded off at the end to prevent tearing into the foil. (photo 66)
3. Then the foil 'falls' around the corner and can be fixed according to § 7. The membrane now covers both sides of the roof elevation. (photo 67)
4. Position the prefab corner piece fitting over the corner and mark the circumference and position with chalk on the VB-EPDM membrane. (photos 68 + 69)
5. Before starting gluing, mark the adhesive-free zone (40 mm) with chalk on the prefab corner piece and the membrane. (photo 70)
6. Carefully provide the corner piece part and the membrane part in the chalk markings with KS-100 contact adhesive and allow to dry. (photos 71 + 72)
7. Fold the corner piece double (to avoid premature contact with the adhesive) and carefully apply in the correct place. Avoid cavities under the corner piece in the upstand. (photos 73 + 74)
8. Then firmly press the corner piece with a flat hand and roll with the silicone roller. (photos 75 + 76)
9. Seal the outer, not adhered 4 cm of the prefab corner piece with VB-9510 rubber sealant. Smoothly apply the beading zigzagged over 4 cm width (**photo 24**). Cut off the plastic nozzle at a diameter of 10 mm. Make sure that VB-9510 is not applied on KS-100 contact adhesive. The sealing effect then does not originate. (photo 77)
10. Roll the seal seam with a pressure roller. The minimum thickness of the VB-9510 after rolling must be 1 mm. (photo 78)
11. Neatly remove the excess sealant flowing from the seam with a blade. (photo 79)

Optional (in the event of a very tall or wide roof edge):

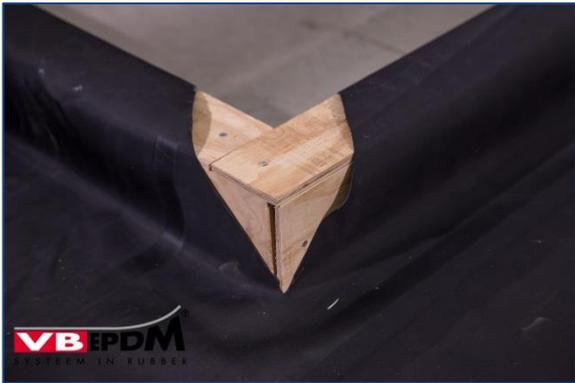
12. After the assembly of the standard prefab corner piece, very tall or wide outer corners are sealed by placing an extra piece of VB-EPDM foil over the corner piece. The strip must fall to over the upper detail edge to then be folded there. Assembly and sealing takes place in the customary way: first glue with KS-100 contact adhesive then seal 4 cm wide with VB-9510 rubber sealant. (photos 80 to 83)



65. Marking outer corner.



66. Cutting rounded off into membrane at outer corner.



67. Membrane cut in.



68. Marking prefab outer corner piece.



69. Positioning prefab outer corner piece.



70. Mark adhesive-free zone.



71. Gluing in prefab outer corner piece.



72. Gluing in membrane.



73. Application prefab corner piece.



74. Application prefab corner piece.



75. Pressing with flat hand.



76. Pressing with silicone roller.



77. Application VB-9510.



78. Rolling with silicone roller.



79. Remove excess sealant with blade.



80. Marking upper part corner sealing sleeve.



81. Gluing in corner sealing sleeve and substrate.



82. Application corner sealing sleeve.



83. Application corner sealing sleeve.

8.3 Round roof lead-through:

The finishing of a round roof lead-through takes place with a prefab sealing sleeve or directly from the membrane.

The opening to be incorporated must be fixed firmly in the substrate. Special lightning conductor sealing sleeves are available for round roof lead-throughs smaller than \varnothing 5 cm. Note the minimum sealing height of 15 cm above the water-bearing surface.

Cavities around lead-throughs must always be carefully filled with PUR foam to prevent internal condensation.

Roof lead-throughs with a diameter from \varnothing 5 cm are directly cut out of the VB-EPDM membrane at \pm 70% of the diameter. The membrane is fixed on the substrate with KS-100 contact adhesive and finished watertight with VB-9510 rubber sealant. Then apply an EPDM strip in the usual way to adhere and seal the opening. Also note the minimum sealing height of 15 cm above the water-bearing surface here. The joint around the lead-through is finished with VB-9510 rubber sealant; finally, a metal clamping is tightened around the lead-through finger-tight.

To do this, proceed as follows:

1. Glue the VB-EPDM membrane on the substrate with KS-100 contact adhesive.
2. Mechanically fix the lead-through (flashing, etc) in the substrate. **(photo 84)**
3. Degrease the aluminium flashing. **(photo 85)**
4. Then cut a circular sealing sleeve with an outside diameter of at least 28 cm larger than the bottom diameter of the flashing.
5. Measure the diameter of the roof opening and cut a hole of \pm 70% of the lead-through diameter in the sealing sleeve. **(photo 86)**
6. Place the sealing sleeve over the roof lead-through and mark the circumference on the VB-EPDM membrane. **(photo 87)**
7. Mark the 40-mm-adhesive-free zone on the sealing sleeve and the membrane. **(photo 88)**
8. Carefully apply KS-100 contact adhesive to the sealing sleeve and the membrane part in the chalk marking and allow to dry. **(photos 89 + 90)**
9. As soon as the adhesive is dry, the sealing sleeve can be placed over the lead-through. **(photo 91)**
10. Then firmly roll the adhered part with a silicone roller. **(photo 92)**
11. Fold back the upright sealing sleeve edge on the inside to in the roof plane. **(photo 93)**
12. Then seal the inner edge of the sealing sleeve with VB-9510. **(photo 94)**
13. Pull the prefab union sleeve tightly over the lead-through. **(photo 95)**
14. Position the union sleeve at least 20 mm over the collar of the cut sleeve. **(photo 96)**
15. Finish the overlap between both sleeves watertight with VB-9510 rubber sealant. **(photo 97)**
16. Cut the top side of the union sleeve to size and seal with VB-9510. **(photo 98)**
17. Seal the outer, not adhered 4 cm of the sealing sleeve with VB-9510 rubber sealant. Smoothly apply the beading zigzagged over 4 cm width **(photo 24)**. Cut off the plastic nozzle at a diameter of 10 mm. Make sure that VB-9510 is not applied on KS-100 contact adhesive. The sealing effect then does not originate. **(photo 99)**
18. Roll the seal seam with a pressure roller. The minimum thickness of the VB-9510 after rolling must be 1 mm. **(photo 100)**
19. Neatly remove the excess sealant flowing from the seam with a blade. **(photo 101)**
20. After assembly of the top hood, the roof lead-through is waterproof. **(photo 102)**



84. Mechanically fixing lead-through.



85. Degrease flashing.



86. Circular sealing sleeve cut to size.



87. Marking sealing sleeve on membrane.



88. Mark adhesive-free zone.



89. Gluing in sealing sleeve.



90. Gluing in substrate.



91. Placing sealing sleeve.



92. Rolling adhered part.



93. Sealing sleeve edge folded back.



94. Sealing inner edge with VB-9510.



95. Application prefab union sleeve.



96. Union sleeve positioned.



97. Sealing with VB-9510 along bottom side.



98. Sealing with VB-9510 along top side.



99. Sealing with VB-9510 in the roof plane.



100. Rolling seal seam with silicone roller.



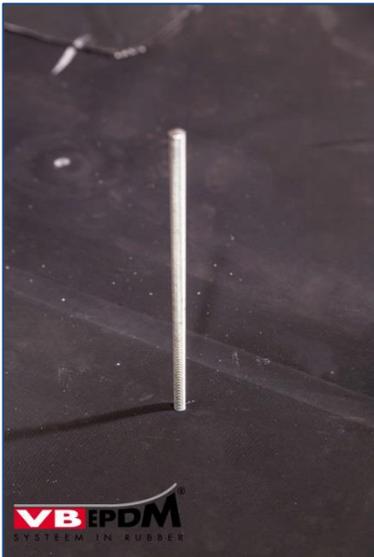
101. Remove excess sealant with blade.



102. Round roof lead-through ready.

Option (with lightning conductor sealing sleeve):

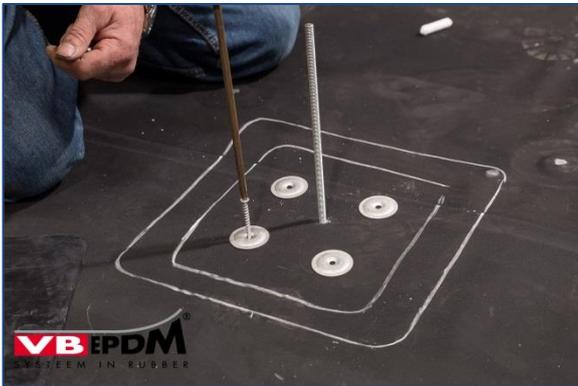
1. Cut the VB-EPDM to size so the membrane falls around the opening without stress. **(photo 103)**
2. Measure the diameter of the roof opening and cut the sealing sleeve to size.
3. Position the prefab lightning conductor sealing sleeve and mark with chalk. **(photo 104)**
4. Mark the adhesive-free zone on sealing sleeve and membrane. Then remove the sealing sleeve.
5. Firmly mechanically fix the VB-EPDM membrane in the substrate. **(photo 105)**
6. Glue the VB-EPDM membrane and the sealing sleeve with KS-100 contact adhesive and allow to dry.
7. In case of a very small lead-through diameter, apply sufficient VB-9510 rubber sealant on the opening at the top side of the lightning conductor sealing sleeve. **(photo 106)**
8. In case of larger diameters, the VB-9510 can be applied from the outside in the sealing sleeve.
9. Carefully pull the prefab sealing sleeve over the opening and position well in such a way that the VB-9510 leaves the sealing sleeve. **(photo 107)**
10. Then firmly roll the adhered part with a silicone roller.
11. Seal the outer, not adhered 4 cm of the sealing sleeve with VB-9510 rubber sealant. Smoothly apply the beading zigzagged over 4 cm width **(photo 24)**. Cut off the plastic nozzle at a diameter of 10 mm. Make sure that VB-9510 is not applied on KS-100 contact adhesive. The sealing effect then does not originate. **(photo 108)**
12. Roll the seal seam with a pressure roller. The minimum thickness of the VB-9510 after rolling must be 1 mm. **(photo 109)**
13. Neatly remove the excess sealant flowing from the seam with a blade. **(photo 110)**



103. Membrane without stress around opening.



104. Positioning lightning conductor sealing sleeve.



105. Mechanically fixing membrane.



106. Application of VB-9510 on opening.



107. Placing lightning conductor sealing sleeve.



108. Sealing the sealing sleeve with VB-9510.



109. Rolling with silicone roller.



110. Removal of excessive sealant.

8.4 Rectangular roof opening:

Rectangular roof openings are cross cut in the VB-EPDM membrane in such a way that the edges of the opening are covered by the membrane.

The corners are fixed watertight with prefab corner pieces and finished with KS-100 contact adhesive and VB-9510 rubber adhesive.

As an alternative, the opening can be finished as a whole with a custom-made prefab sealing sleeve, fixed as described above.

Specially divided square sleeves are available in the case of upward openings on request.

To do this, proceed as follows:

1. Mark the circumference of the opening on the EPDM membrane with chalk. **(photo 111)**
2. Cross cut the membrane. **Note protection against falling!** **(photo 112)**
3. The cut is rounded off at the end to prevent cutting into the foil. **(photo 113)**
4. Fold the cut in VB-EPDM parts back and mechanically fix the dome upstand. **(photo 114)**
5. Mark the upstand height of the dome upstand with chalk. **(photo 115)**
6. Cut the VB-EPDM membrane to size with shears. **(photo 116)**
7. Adhere the VB-EPDM membrane according to the procedure described in § 7. Note an adhesive-free zone of 40 mm on the top side of the dome upstand. **(photos 117 + 118)**
8. Keep the substrate and VB-EPDM membrane separate from each other during the drying time. **(photo 119)**
9. After drying, firmly press the VB-EPDM foil with a flat hand on the substrate and roll with the silicone pressure roller. **(photo 120)**
10. Seal the upper, not adhered 4 cm of the VB-EPDM with VB-9510 rubber adhesive. Smoothly apply the beading zigzagged over 4 cm width **(photo 24)**. Cut off the plastic nozzle at a diameter of 10 mm. Make sure that VB-9510 is not applied on KS-100 contact adhesive. The sealing effect then does not originate. **(photo 121)**
11. Roll the seal seam with a pressure roller. The minimum thickness of the VB-9510 after rolling must be 1 mm.
12. Neatly remove the excess sealant flowing from the seam with a blade.
13. Assemble the prefab corner pieces according to the procedure in § 8.2 **(photos 122 to 129)**



111. Marking opening.



112. Cutting into membrane (**Note protection against falling!**).



113. Rounded cut.



114. Assembled dome upstand.



115. Marking upstand height.



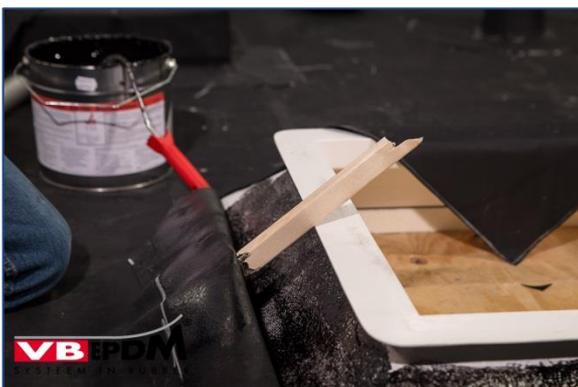
116. Membrane cut to size.



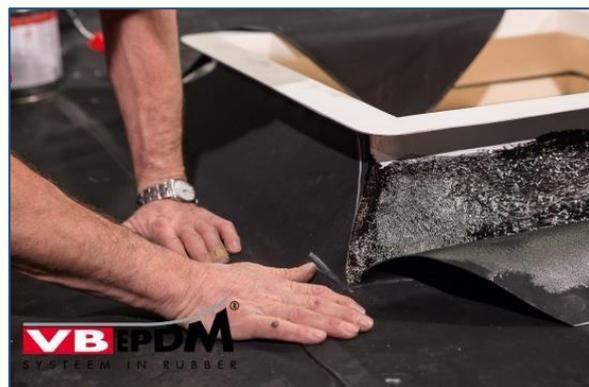
117. Gluing in dome upstand.



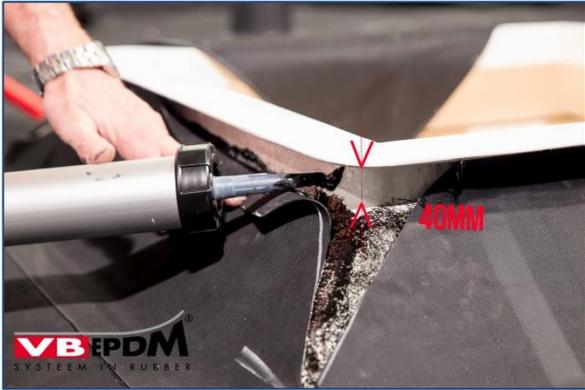
118. Gluing in dome upstand with adhesive-free zone.



119. Separate drying of adhesive.



120. Pressing with flat hand.



121. Sealing top side of membrane with VB-9510.



122. Marking prefab corner piece.



123. Gluing in membrane.



124. Placing prefab corner piece.



125. Pressing with flat hand.



126. Rolling with silicone roller.



127. Sealing corner piece with VB-9510.



128. Rolling with silicone roller.



129. Removal emerging rubber adhesive.

Alternative (with a custom-made prefab sealing sleeve):

1. Mark the opening with chalk. (photo 111)
2. Cut away the membrane around the opening. **Note protection against falling!**
3. At the corners the cut is rounded off to prevent cutting into the foil.
4. Mechanically fix the dome upstand through the VB-EPDM membrane. (photo 130)
5. Carefully pull the prefab sealing sleeve over the dome upstand and position. (photo 131)
6. After folding up the prefab sealing sleeve, adhere the VB-EPDM membrane according the procedure described in § 7.1. Note an adhesive-free zone of 40 mm around on the top side and bottom side of the dome upstand. (photo 132)
7. Then apply KS-100 contact adhesive to the bottom side of the prefab sealing sleeve and allow to dry. (photo 133)
8. Carefully fold the sealing sleeve downwards, assemble without folds and firmly roll with a silicone pressure roller. (photo 134)
9. Seal the upper and lower, not adhered 4 cm of the sealing sleeve with VB-9510 rubber adhesive. Smoothly apply the beading zigzagged over 4 cm width (photo 24).
Cut off the plastic nozzle at a diameter of 10 mm. Make sure that VB-9510 is not applied on KS-100 contact adhesive. The sealing effect then does not originate. (photos 135-137)
10. Roll the seal seam with a pressure roller. The minimum thickness of the VB-9510 after rolling must be 1 mm. (photo 138)
11. Neatly remove the excess sealant flowing from the seam with a blade. (photo 139)



130. Dome upstand mechanically fixed.



131. Positioning prefab sealing sleeve.



132. Gluing in sealing sleeve + dome upstand.



133. Allow adhesive to dry.



134. Rolling with silicone roller.



135. Top side of sealing sleeve sealed with VB-9510.



136. Folding shut sealing sleeve edge.



137. Bottom side of sealing sleeve sealed with VB-9510.



138. Rolling with silicone roller.



139. Removal emerging rubber adhesive.

8.5 VB drain rainwater outlet:

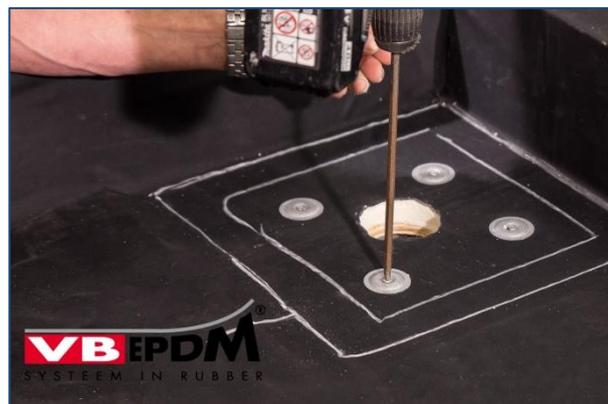
The VB drains (PE pipe with vulcanised VB-EPDM flashing) drain the rainwater off the roof. The VB drains are available in various dimensions and versions or made especially to size.

To do this, proceed as follows:

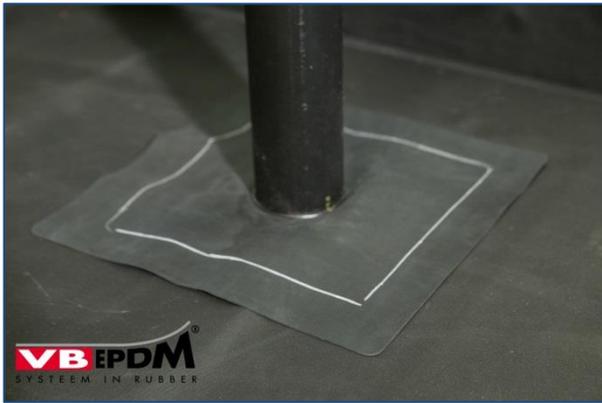
1. Carefully cut around the VB-EPDM membrane at the rainwater drain and fill any cavities along the lead-through with PU foam to prevent internal condensation.
2. Position the VB drain and draw the circumference of the flashing with chalk on the substrate. **(photo 140)**
3. Firmly mechanically fix the VB-EPDM membrane in the substrate with suitable screws and pressure distributing plates. With suitable substrates the membrane can also be adhered with KS-100. **(photo 141)**
4. Mark the adhesive-free zone with chalk on the drain flashing and the substrate. **(photos 141 + 142)**
5. Apply KS-100 contact adhesive to the VB drain flashing and membrane. Keep the 40-mm-wide outer edge free of adhesive. Allow the adhesive to dry then place the VB drain. **(photos 143 + 144)**
6. Firmly press the glued part with a silicone pressure roller.
Seal the outer, not adhered 4 cm of the flashing with VB-9510 rubber adhesive. Smoothly apply the beading zigzagged over 4 cm width **(photo 24)**. Cut off the plastic nozzle at a diameter of 10 mm. Make sure that VB-9510 is not applied on KS-100 contact adhesive. The sealing effect then does not originate. **(photo 145)**
7. Roll the seal seam with a pressure roller. The minimum thickness of the VB-9510 after rolling must be 1 mm.
8. Neatly remove the excess sealant flowing from the seam with a blade.
9. Join the PE drain pipe airtight with the down pipe.
10. A VB drain can also be sunk. With only a moderate gradient, this can improve drainage. **(photo 146)**
11. The VB drain is now ready.



140. Marking position VB drain.



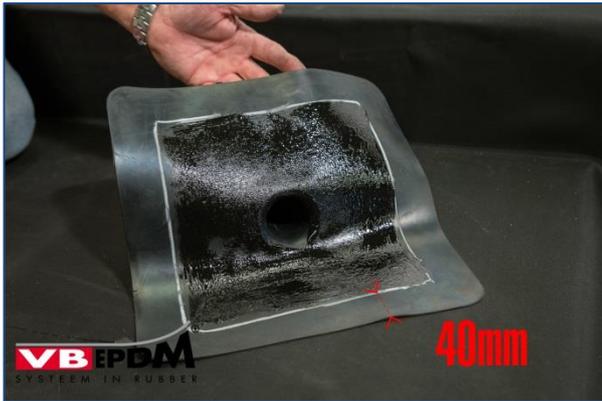
141. Mechanically fixing membrane.



142. Marking adhesive-free zone.



143. Gluing in membrane.



144. Gluing in flashing VB drain.



145. Sealing flashing with VB-9510.



146. VB drain ready.

8.6 Edge finishing with aluminium roof trim

The roof edge can be finished with aluminium roof trim.

To do this, proceed as follows:

1. Fix the roof trim strip in a suitable substrate.
2. Degrease the aluminium roof trim and rub dry with a lint-free cloth. **(photo 147)**
3. Mark the part to be glued on the VB-EPDM membrane. **(photo 148)**
4. Apply KS-100 contact adhesive to the VB-EPDM membrane and the roof trim.
Keep the 40-mm-wide outer edge free of adhesive. **(photo 149)**
5. Check that the adhesive is dry with the finger test (see § 7, point 5). **(photo 150)**
6. Fold the glued-in membrane shut and rub without creases with a flat hand. **(photo 151)**
7. Mark the part to be cut off on the VB-EPDM membrane. **(photo 152)**
8. Cut the membrane to size with foils shears. **(photo 153)**
9. Firmly press the glued part with a silicone pressure roller.
Seal the outer, not adhered 4 cm of the flashing with VB-9510 rubber adhesive.
Smoothly apply the beading zigzagged over 4 cm width **(photo 24)**. Cut off the plastic nozzle
at a diameter of 10 mm. Make sure that VB-9510 is not applied on KS-100
contact adhesive. The sealing effect then does not originate. **(photo 154)**
10. Push the VB-EPDM foil shut with a blade. **(photo 155)**
11. Roll the seal seam with a silicone roller. **(photo 156)**
12. The roof edge is now fully finished with aluminium roof trim. **(photo 157)**



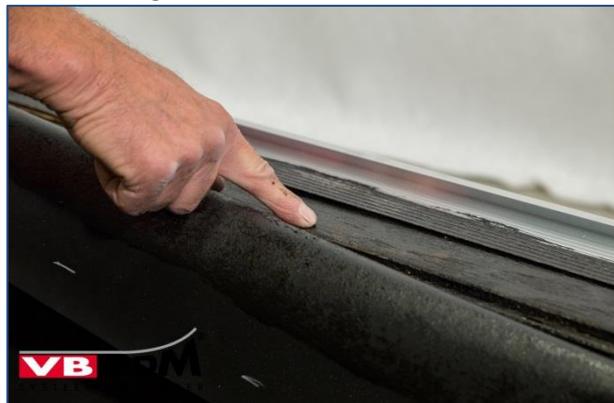
147. Degreasing aluminium roof trim.



148. Marking membrane.



149. Gluing in roof trim + membrane.



150. Finger test.



151. Smoothing adhered part with flat hand.



152. Marking off part to cut.



153. Membrane cut to size.



154. Application VB-9510 rubber adhesive.



155. Sealing seal seam with blade.



156. Rolling with silicone roller.



157. Roof edge finished.

8.7 Repairing damage in the VB-EPDM membrane:

Mechanical damage in VB-EPDM foil is easy and quick to repair. It is important that the correct materials and accessories are used.

To do this, proceed as follows:

1. Identify the damage and remove the cause. **(photo 158)**
2. Thoroughly clean the place of the repairs (with tepid water and a scourer), so the VB-EPDM has a black colour again.
Under no circumstances use cleaning products. **(photo 159)**
3. Thoroughly rub the place of the repairs dry with a lint-free cloth or paper. Then dry with a hot-air blower. **(photos 160 + 161)**
4. Cut a repair piece out of VB-EPDM to size, at least 1.2 mm thick, (around the place of the repairs min 14 cm overlapping). Example: damage of 10 x 20 cm requires a repair piece measuring 38 x 48 cm. **(photo 162)**
5. Position the repair piece and mark around with chalk on the membrane. **(photo 163)**
6. Apply KS-100 contact adhesive to both the inside of the repair piece and VB-EPDM membrane and allow to dry. Note the adhesive-free zone of 4 cm. **(photo 164)**
7. Firmly press the glued part with a silicone pressure roller. Seal the outer, not adhered 4 cm with VB-9510 rubber adhesive. Smoothly apply the beading zigzagged over 4 cm width **(photo 24)**. Cut off the plastic nozzle at a diameter of 10 mm. Make sure that VB-9510 is not applied on KS-100 contact adhesive.
The sealing effect then does not originate. **(photo 165)**
8. Roll the seal seam with a pressure roller. The minimum thickness of the VB-9510 after rolling must be 1 mm. **(photo 166)**
9. Neatly remove the excess sealant flowing from the seam with a blade. **(photo 167)**



158. Identifying damage.



159. Cleaning place of the repairs.



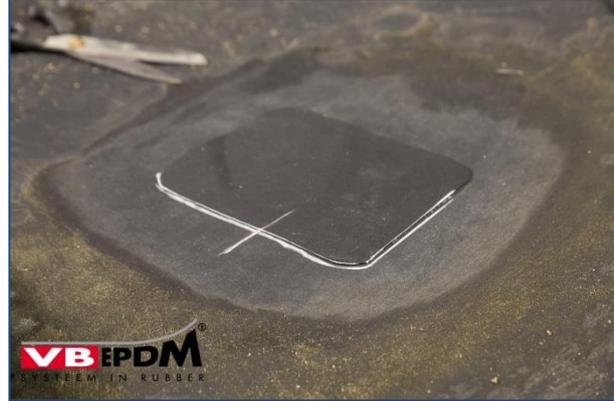
160. Rubbing place of the repairs dry.



161. Blow-drying place of the repairs.



162. Repair piece cut to size.



163. Marking repair piece.



164. Gluing in place of the repairs and repair piece.



165. Sealing repair piece with VB-9510.



166. Rolling repair piece with silicone roller.



167. Removal of excessive sealant.

8.8 Repairs tensioned upstand fixing:

In the case of upstand fixing or roof elevation showing tension (trampoline effect), this must be repaired as soon as possible to prevent further damage to the roof. It is important that the correct materials and accessories are used.

To do this, proceed as follows:

1. Loosen the tensioned foil from the edge finish.
2. Replace the EPDM foil so the EPDM foil comes at least 10 cm from the water-bearing surface above the upstand.
3. Firmly mechanically fix the EPDM foil part horizontally or vertically in the substrate or in the upstand with suitable screws and pressure distributing plates.
4. Thoroughly mechanically clean the EPDM foil with water and a scourer so the EPDM has a black colour again. Under no circumstances use cleaning products.
5. Thoroughly rub the EPDM foil, the substrate and the roof trim dry with a cloth or paper.
6. Mark a strip of VB-EPDM cut to size, sufficiently wide so the strip reaches at least 14 cm past the mechanical fixing on the existing EPDM foil.
7. Fully glue in the VB-EPDM strip and the substrate with KS-100 and allow to dry, seal 4 cm from the edge with VB-9510 rubber adhesive as described earlier.
8. Neatly remove the excess sealant flowing from the seam with a blade.

9 VB-EPDM accessories:



9.1. **VB-9510 rubber sealant:**

VB-9510 rubber sealant has been specially developed for the long-term watertightness of seam joints and details in VB-EPDM systems.

Product properties:

VB-9510 is a black, 1-component, permanently elastic paste for the long-term waterproofing of seam joints between VB-EPDM foil and between VB-EPDM foil and other materials, such as aluminium, stainless steel, concrete, brickwork and bituminous mineralised roofing. In case of doubt, one must always carry out one's own tests. VB-9510 cannot absorb shearing forces. For this the seam joint is first fixed with KS-100 contact adhesive.

Processing:

VB-9510 is processed with a hand or air pressure sprayer. The rubber sealant may only be used on a stable, dry, grease-free and clean substrate. The minimum processing temperature is +5°C. The rubber sealant is applied sufficiently wide and thick with a zigzag movement, before being pressed with a silicone pressure roller. A minimum thickness of 1 mm then remains. VB-9510 hardens from the outside to inside at approx 1 mm/24hrs, depending on the weather conditions. VB-9510 must be further processed immediately after application. A safety sheet is available for the professional user on request.

Consumption:

The consumption of VB-9510 is ± 5 metres per seam per cartridge or ± 11 metres per seam per sausage.

Packaging and shelf life:

VB-9510 is supplied in boxes of 12 cartridges (290 ml) or boxes of 12 sausages (600 ml). Empty adhesive cartridges with fully hardened adhesive residues can be disposed of as normal waste. The rubber adhesive can be used until the date specified on the box or sausage. Storage between +10°C and +25°C and protected against direct sunlight.



9.2. KS-301 adhesive paste:

KS-301 adhesive paste has been specially developed for the long-term adhesion of VB-EPDM foil to the most common construction materials.

Product properties:

KS-301 is a grey, 1-component, permanently elastic, high-quality assembly adhesive for the long-term gluing of VB-EPDM-foil to the most common construction materials (PE, PP and E-PS, however, are not simply suitable). In case of doubt, one must always carry out one's own tests.

Processing:

KS-301 adhesive paste in sausages (600 ml) is processed with a pneumatic or electric mastic gun in combination with the V-seam nozzle. The great variety of surfaces means carrying out an adhesion test in advance is recommended. The materials for gluing must be stable, flat, clean, dry and free of grease. The processing temperature can vary between +5°C and +40°C. KS-301 hardens from the outside to inside at approx 3 mm/24hrs, depending on air humidity. KSS-301 forms a surface skin within 10 minutes and must be further processed immediately after application. A safety sheet is available for the professional user on request.

Consumption:

The consumption of KS-301 is 8 to 10 metres per sausage.

Packaging and shelf life:

KS-301 is supplied in boxes of 12 sausages (600 ml). Empty adhesive sausages with fully hardened adhesive residues can be disposed of as normal waste. The adhesive paste can be used up to at least 12 months after the production date specified on the box or sausage.



9.3. **KS-100 contact adhesive:**

KS-100 is a contact adhesive specially developed for the long-term gluing of VB-EPDM foil to various substrates.

Product properties:

KS-100 is a black, solvent-containing contact adhesive, intended for making seam joints between two parts of VB-EPDM foil, but always in combination with a waterproof VB-9510 seal. The adhesive is also used for gluing VB-EPDM foil against rising edging and for upstand fixing. KS-100 can be used on practically any solvent-resistant substrate. Polystyrene foam is not resistant to KS-100.

Processing:

Take appropriate safety measures in conformity with the safety data sheet.

KS-100 must be thoroughly stirred before use. KS-100 is applied evenly with a brush or soft paint roller on both parts to be glued. Allow the adhesive to dry until no strands can be pulled (check this with the so-called finger test). Then the parts are carefully brought into contact with each other without entrapped air (corrections are no longer possible) and pressed with a pressure roller. The materials for gluing must be stable, flat, clean and dry. The lowest processing temperature is +5°C. The adhesive joint has its maximum strength after approx 72 hours (high temperatures and air humidity impede adhesion). KS-100 is flammable, so care must be taken with naked flames or heat sources.

Consumption:

Glue consumption is, depending on the substrate, approx 500 gr/m² (applied double-sided). In case of porous surfaces (for example untreated wood, concrete blocks, etc) 2 layers of KS-100 may have to be applied. It is recommend to check adhesion by carrying out a test.

Packaging and shelf life:

KS-100 is supplied in cans of 1 litre or cans of 5 litres. After ending the work, always firmly close the adhesive cans. Empty adhesive cans with fully hardened adhesive residues can be disposed of as normal waste. The contact adhesive can be used up to 12 months after the production date specified on the can (sticker) if saved cool in the original, unopened packaging.



9.4. KS-150 (S) PU adhesive:

KS-150 (S) is a PU adhesive for the surface adhesion of VB-EPDM foil to practically any horizontal and slightly pitched substrate.

Product properties:

KS-150 (S) is a yellow, low-solvent PU adhesive. The substrate must be solvent-resistant. For suitable surfaces we refer to our KOMO quality declaration.

Processing:

Take appropriate safety measures in conformity with the safety data sheet.

Shake the can vigorously a number of times before use. KS-150 (S) is applied on one side of the substrate in ridges every 40 mm (approximately 8 mm \varnothing). The materials for gluing must be stable, flat, clean and dry. The minimum processing temperature is +5°C. The VB-EPDM membrane is carefully rolled in the wet adhesive (avoid air inclusions, creases and stress). The open time (depending on ambient conditions, substrate and thickness of adhesive coat) is between 5-20 minutes. Any wrinkling can still be rectified within several minutes. Finally, firmly smooth the whole glued surface with a soft broom (without wrinkling). The adhesive strength gradually increases, with its maximum strength being reached after approximately 48 hours. KS-150 (S) is flammable, so care must be taken with naked flames or heat sources.

Consumption:

Adhesive consumption varies (depending on the substrate) between 200 – 500 g/m². The surface to glue must be at least 75%.

Packaging and shelf life:

KS-150 (S) is supplied in cans of 2 litres or cans of 6 litres. Because the packaging is perforated before use, it is recommended to use it up entirely. Any remaining adhesive hardens quickly and can no longer be used. Empty adhesive cans with fully hardened adhesive residues can be disposed of as normal waste. The adhesive can be used up to 9 months after the production date specified on the can (sticker) if saved cool in the original, unopened packaging.



9.5. KS-1000 spray adhesive:

KS-1000 is a sprayed contact adhesive for gluing VB-EPDM foil to horizontal, vertical and pitched surfaces. KS-1000 is not an alternative to KS-100 for upstand fixing.

Product properties:

KS-1000 is a yellow, solvent-containing contact adhesive for gluing VB-EPDM foil to just about any substrate. In case of doubt, one must always carry out one's own tests. Polystyrene foam cannot be glued with KS-1000.

Processing:

Take appropriate safety measures in conformity with the safety data sheet.

Shake the can vigorously before use. The materials for gluing must be solvent-resistant, stable, flat, clean, dry and free of grease. KS-1000 is evenly applied with a suitable spraying installation on both surfaces to be glued. Allow the adhesive to dry until no strands can be pulled (check this with the so-called finger test). Then the parts are carefully brought into contact with each other without entrapped air (corrections are no longer possible) and pressed with a silicone roller. It is recommended to apply KS-1000 above +5°C. With certain combinations of temperature and air humidity, condensation can form on the drying adhesive coat. In that case one must stop gluing and resume the work in better weather conditions.

Note: Before cleaning or maintenance work is carried out, always first disconnect the spray gun air supply hose. Maintenance work may only be carried out by approved specialist companies! Besides the instructions for use and nationally and locally applicable regulations, the specialist technical regulations for working in a safe and professional way must also be complied with. The risk of the use of a spraying installation is fully one of the user. Anyone using the spraying installation must have read and understood the instructions for use.

When first bringing into use:

1. Assemble the air hose between spraying installation and glue gun. Tighten it firmly with an open-ended spanner.
2. Then fit the glue hose on the glue gun and the spraying installation.
3. Remove pressure vessel cover (do not remove inner vessel).
4. Fill inner vessel (max 2/3) with KS-1000.
5. Close pressure vessel cover in its original position. The spraying installation will not work optimally with a not properly closing cover.
6. Start the compressor.
7. Open the air supply and glue supply on the pressure vessel.
8. Bring the air pressure to 3 bar using the reducing valve.
9. Adjust the glue gun to one's own preferences.
10. The system is now ready for use.
11. After use, shut off the air supply and the glue supply on the pressure vessel. Close compressor air connection. Remove the glue gun nozzle and store in a closed can of thinner/cleaning spirit. Under no circumstances damage the parts during cleaning. Then the parts can be assembled again. Leave the pressure on the vessel and do not spray the glue hose empty!

In case of continuation of the work:

1. Shut off the pressure vessel air supply and relieve the pressure with the venting valve.
2. Remove pressure vessel cover (do not remove inner vessel).
3. Fill inner vessel (max 2/3) with KS-1000.
4. Close pressure vessel cover in its original position. The spraying installation will not work optimally with a not properly closing cover.
5. Start the compressor.
6. Open the air supply and glue supply on the pressure vessel.
7. Bring the air pressure to 3 bar using the reducing valve.
8. Adjust the glue gun to one's own preferences.
9. The system is now ready for use.
10. After use, shut off the air supply and the glue supply on the pressure vessel. Close compressor air connection. Remove the glue gun nozzle and store in a closed can of thinner/cleaning spirit. Leave the pressure on the vessel and do not spray the glue hose empty!

KS-1000 is flammable, so care must be taken with naked flames or heat sources.

Consumption:

Depending on the substrate, adhesive consumption is $\pm 0.35 \text{ l/m}^2$ applied double-sided.

Packaging and shelf life:

KS-1000 is supplied in cans of 25 litres. After ending the work, always firmly close the adhesive cans. Empty adhesive cans with fully hardened adhesive residues can be disposed of as normal waste. The contact adhesive can be used up to 9 months after the production date specified on the can (sticker) if saved cool in the original, unopened packing.



9.6. **KS-2000 Spraybond:**

KS-2000 Spraybond is a sprayed contact adhesive for gluing VB-EPDM foil to horizontal, vertical and pitched surfaces. KS-2000 is not an alternative to KS-100 for upstand fixing.

Product properties:

KS-2000 Spraybond is a yellow, solvent-containing contact adhesive for gluing VB-EPDM foil to just about any substrate. In case of doubt, one must always carry out one's own tests. Polystyrene foam cannot be glued with KS-2000.

Processing:

Take appropriate safety measures in conformity with the safety data sheet.

Protect the pressure vessel against direct sunlight. Shake the can vigorously a number of times before use. Then connect the hose to the vessel and the gun. Tighten firmly. Open the valve on the vessel and the system comes under pressure. Adjust the glue gun to one's own preferences. The system is now ready for use.

The materials for gluing must be stable, flat, clean, dry and free of grease. Always spray both sides evenly with KS-2000 Spraybond. Allow the adhesive to dry until no strands can be pulled with the back of the hand (check this with the so-called finger test). Then the parts are carefully brought into contact with each other without entrapped air (corrections are no longer possible) and pressed with a silicone roller. It is recommended to apply KS-2000 above +5°C. With certain combinations of temperature and air humidity, condensation can form on the drying adhesive coat. In that case one must stop gluing and resume the work in better weather conditions.

Consumption:

Depending on the substrate, adhesive consumption is ± 0.20 l/m² applied double-sided.

Packaging and shelf life:

KS-2000 Spraybond is supplied in 17-litre disposable pressure vessels. The shelf life amounts to 12 months in unopened, original packaging. Store between +5°C and +25°C in a dry, clean and dark space. Dispose of empty pressure vessels according to the safety data sheet.

9.7. VB Drain:

VB Drain is the generic term for the rainwater drains in the different VB-EPDM systems.

Product properties:

VB Drain is a special custom-made rainwater drainage system. The VB Drain is made up of a PE pipe/tube with a length of 50 cm with welded-on VB-EPDM flashing. The PE pipe/tube is available as standard in the following versions:

- Outside diameter \varnothing 32 mm 90° or 45°.
- Outside diameter \varnothing 40 mm 90° or 45°.
- Outside diameter \varnothing 50 mm 90° or 45°.
- Outside diameter \varnothing 63 mm 90° or 45°.
- Outside diameter \varnothing 75 mm 90° or 45°.
- Outside diameter \varnothing 90 mm 90° or 45°.
- Outside diameter \varnothing 110 mm 90° or 45°.
- Outside diameter \varnothing 125 mm 90° or 45°.
- Outside diameter \varnothing 160 mm 90° or 45°.
- Rectangular \pm 80 x 60 mm 90°.
- Rectangular \pm 100 x 60 mm 90°.

Special versions or different dimensions are available on request.

Processing:

The VB Drains can be used in the following situations:

- Bottom outlet.
With this version the rainwater is drained straight downwards through the roof construction and into the sewer. A 90° version is used in this situation.
- Drop outlet or side outlet.
With this type of drainage the rainwater is taken along the side of the roof through the (cavity) wall to the stand pipe. It is very important here that the drain is brought through the construction in one piece. One can choose a 90° or 45° version depending on the type of roof elevation.
- Gargoyle or emergency overflow.
A gargoyle is to prevent static overloading due to the force of rainwater. The gargoyle is normally fitted several centimetres above the water-bearing surface, as decided by an architectural engineer. This prevents the roof from failing under a larger precipitation load than calculated. A rectangular version is usually chosen in this case.

9.8. Thermofix® system:

The Thermofix® system is the mechanical fastening system for VB-EPDM membranes. The system uses patented elements to fasten the VB-EPDM membrane in the substrate without perforation.

System properties:

The unique aspect of the Thermofix® system is that use is made of flexible, reinforced EPDM discs \varnothing 105 mm with a smooth adhesive coat on one side. This side must be assembled facing upwards to enable adhesion with the EPDM membrane bottom. A very strong joint originates by heating the adhesive coat through the VB-EPDM membrane and then cooling. The flexible construction in the Thermofix® element ensures that only shearing forces can load the element. The occurring wind load is then perfectly distributed over the calculated and assembled elements.

The Thermofix® element is made up of a Thermofix® disc with synthetic socket or follower plate and a screw. The following versions are available as standard:

- Thermofix® element in wood with synthetic socket for a roof construction of 280 mm.
- Thermofix® element in wood with steel follower plate for a roof structure without insulation.
- Thermofix® element in steel with synthetic socket for a roof construction of 280 mm.
- Thermofix® element in concrete with synthetic socket for a roof construction of 290 mm.
- Thermofix® element in cellular concrete with synthetic socket for a roof construction of 400 mm.

The special fastening technique enables Van Beek EPDM BV to make the required Thermofix® fixing equipment available on a rental basis. The choice is between a standard machine and a smaller hand punch. The content of the Thermofix® box consists of:

- 1 standard Thermofix® fixing machine incl weights.
- 1 stainless steel cable incl thermoplastic connectors for grid distribution Thermofix® elements.
- 1 extended awl for perforating insulation.
- 2 pieces of chalk.
- 2 polyethylene dock boards for a soft substrate.

9.9. Equipment:



9.9.1. Foil shears:



9.9.2. Pressure roller rubber narrow:



9.9.3. Pressure roller rubber wide:



9.9.4. Pressure roller brass:



9.9.5. Sealant gun:

9.9.6. Blade:



9.9.7. Adhesive rollers:



9.9.8. Refillable spray system for KS-1000:



10 Inspection and maintenance:

VB-EPDM membranes, foil, sealing sleeves and formed parts in principle require no maintenance.

To preserve the roof, roof inspections must take place regularly (at least once a year) by specialised personnel. It is recommend to conclude a roof maintenance contract.

For more information about inspection and maintenance, we refer you to our 'Roof Inspection and Maintenance Manual'.



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