

Bituminous self-adhesive Waterproofing Membranes for weather-exposed surfaces of above ground structures



PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Positive side waterproofing with cold self-adhesive bituminous membranes for weather exposed areas of above ground structures (such as roofs, garages or balconies).

1.2 REFERENCES

- A. Abdichtungsreport 2-2005 (only German)
- B. Technical contribution: Abdichtung gegen Radon
- C. Product flyer KSK membranes

1.3 SUBMITTALS

- A. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation methods.

1.4 PERFORMANCE REQUIREMENTS

- A. The base of waterproofing system shall be a cold bitumen / rubber based self-adhesive membrane applied to all substrates (mineral based, polystyrene boards, wooden). Self-adhesive membrane should be laminated on the top side with an aluminium foil. Sealing membrane should be highly ductile so it can easily be applied to difficult details. Membrane should be also vapor barrier, immediately waterproof, crack bridging, weather resistant, UV resistant and resistant to frost and de-icing salts. The waterproofing system shall be KÖSTER KSK ALU 15, manufactured by KÖSTER Bauchemie AG, Aurich, Germany. Primer shall be a thin coat of KÖSTER KBE Liquid Film applied to the substrate. Alternatively, primer should be KÖSTER KSK Primer BL. All details, exposed edges of the waterproofing layers as well as around pipe penetrations and other junctions and endings should be waterproofed with liquid sealant KÖSTER KBE Liquid Film.



1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications:

1. Manufacturer shall have no less than five years experience in manufacturing polymer modified bituminous and crystallizing cementitious waterproofing systems. The system shall be specifically formulated and marketed for waterproofing. System design shall not have changed for a minimum of five consecutive years prior to start of the work.

B. Installer Qualifications:

1. Applicator shall be approved by the manufacturer, experienced in surface preparation and application of the material and shall be subject to inspection and control by the manufacturer.

2. Installer shall have no less than three years experience installing the specified waterproofing systems, or have been factory certified and trained in the KÖSTER Training Program.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to the job site in their original unopened containers, clearly labeled with the manufacturer's name and brand designation.
- B. Store products in an approved ventilated dry area; protect from contact with soil, dampness, freezing and direct sunlight.
- C. Handle products in a manner that will prevent breakage of containers and damage to products.
- D. Liquids should not be stored in areas with temperatures over than + 30 °C or below + 5°C.

1.7 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.
 - 1. Do not apply bituminous waterproofing to unprotected surfaces in wet weather or to surfaces on which ice, frost or water is visible.
 - 2. Do not apply bituminous waterproofing when the temperature is lower than + 5 °C or expected to fall below this temperature within 24 hours from time of application.
 - 3. Do not apply bituminous waterproofing in rain, snow, fog or mist.
- B. Protection: Protect bituminous waterproofing to prevent damage from active rain for a minimum period of 24 hours from time of application. Protect bituminous waterproofing to prevent damages due to backfilling (for example before placing a layer of gravel on top of the membrane), all according to manufacturer's data sheet.

1.8 WARRANTY

- A. Installer of waterproofing system shall provide standard installation warranty for workmanship.



PART 2 PRODUCTS

2.1 MANUFACTURER

- A. Acceptable Manufacturer: KÖSTER BAUCHEMIE AG • Dieselstraße 1-10 • D-26607 Aurich • Tel. 04941/9709-0 • Fax -40 • info@koester.eu • www.koester.eu
- B. Substitutions: Not permitted.
- C. Requests for substitutions will be considered in accordance with provisions section.
- D. Provide the materials of one manufacturer throughout the project as specified.

2.2 SYSTEM - POSITIVE SIDE WATERPROOFING WITH COLD SELF-ADHESIVE BITUMINOUS MEMBRANES FOR BELOW GROUND STRUCTURES (FOUNDATION SLABS AND WALLS)

- A. Bitumen / rubber based self-adhesive membrane cold applied to all substrates (mineral based, polystyrene boards or wood), laminated on the top side with an aluminium/PET foil, highly ductile, vapor impermeable, immediately waterproof, crack bridging, weather resistant, UV resistant and resistant to frost and de-icing salts.
 - 1. Product: KÖSTER KSK ALU 15
 - 2. Physical Properties:
 - a. Thickness: 1.5 mm.
 - b. Length: 20 m.
 - c. Width: 0.96 m.
 - d. Weight: 2.0 kg/m²
 - e. Protective layer: Aluminium / PET laminate
 - f. Application temperature: +12°C to +35°C
 - g. Softening temperature of the elastomeric / bitumen self adhesive compound: +110 °C
 - h. Cold bending property (r = 15 mm, 3 sec): -10°C
 - i. Breaking load lengthwise: 35 N / 5 cm.
 - j. Breaking load across: 35 N / 5 cm.
 - k. Elongation at break of the adhesive compound: 1200 %.
 - l. Bonding (180° pull-off): 36 N / cm.
 - m. Resistance to water pressure: to 4 bar for 24 hours.
 - n. Color of the surface: Aluminium colored.

2.3 ADDITIONAL PRODUCTS

- A. KÖSTER SB Bonding Emulsion. Use where recommended by manufacturer to increase elasticity, flexibility, reduce water absorption, and improve bonding to steel.
- B. KÖSTER Repair Mortar Plus. Watertight, fast setting, slightly expanding repair mortar with excellent adhesion. With the addition of KÖSTER SB Bonding Emulsion, it can be used as a PCC (polymer-modified cement concrete) mortar. Use for installing fillets or levelling the surface.
- C. KÖSTER KBE Liquid Film. Highly elastic, solvent-free, sealing, liquid compound with a rubber / bitumen basis, for priming and for sealing the seams and edges of KÖSTER KSK membranes, and



- for sealing details and penetrations.
- D. KÖSTER KSK Primer BL. Solvent free, polymer-modified bitumen based strongly adhesive primer for KSK membranes and Polymer Modified Bitumen Coatings. It is characterized by very good adhesion to dry and moist mineral substrates.
 - E. KÖSTER Universal Cleaner. Solvent free cleaning agent for bituminous materials and epoxy resins.
 - F. KÖSTER SD Protection and Drainage Sheet 3-400. Green HD-PE based notched protection board which combines 3 functions in one product: (1) mechanical protection of the waterproofing layer (e.g. when backfilling the construction pit) according to DIN 18195, (2) decoupling of the waterproofing layer from any ground movement, (3) the hollow core leads seepage and backwater safely to the drainage.
 - G. KÖSTER SD Edge Profile. Finishing profile for protection and drainage sheets.
 - H. KÖSTER SD Fixing Element. Steel nails and mounting heads for the fixing of protection and drainage sheets.

PART 3. EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until concrete substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
- C. Concrete surface should be:
 - sound and solid
 - level, free of large breakouts, nests and ridges
 - absorptive
 - dry
 - clean, free of adhesion inhibiting soiling like dust, oil, grease etc.
 - free of gaping cracks
 - corners have to be broken
 - wall floor junctions have to be rounded out by the installation of fillets
 - protrusions and recesses have to be kept to a minimum

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation. All concrete surfaces must be solid, sound, and free of all laitance, oils, grease, curing agents, or other foreign materials which might affect the bonding adversely.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- C. Clean surfaces to receive bituminous waterproofing, chip or abrasive blast to a CSP-3 (ICRI Guideline 3102R13) profile to remove defective materials and foreign matter such as paint, dirt, grease, curing agents, form release agents, and mineral salts. Suitable surface cleaning method is cleaning with water jet (300 to 500 bar). In case there is form work release oil on the surface, apply a suitable detergent to the surface before cleaning with the water jet.
- D. If concrete surface has been previously treated with other agents, notify manufacturer before proceeding.



- E. Repair cracks, expansion joints, control joints, and open surface honeycombs.
 1. Use KÖSTER SB Bonding Emulsion with manufacturer approved concrete repair materials. (Such as the KÖSTER Repair Mortar Plus). Comply with requirements listed in manufacturer's technical data information. No exceptions.
 2. Moving joints and cracks are treated and detailed as expansion joints. Install an elastic sealant and corresponding primer in accordance with sealant manufacturer's instructions.
- F. Honeycombed areas, cavities, recesses and chipped out areas where form ties have been cut or removed must be routed/bush hammered to sound base and repaired according to manufacturer's instructions and patched flush with KÖSTER Repair Mortar Plus with 20 % KÖSTER SB Bonding Emulsion added to the mixing water.
- G. Uneven surfaces must be first rendered flush with KÖSTER Repair Mortar Plus with 20 % KÖSTER SB Bonding Emulsion added to the mixing water.
- H. Fillets and Coves between Horizontal and Vertical Areas: In order to reduce the tensions on the waterproofing layer, 90° angles at wall-floor junction must be rounded out by the installation of fillets. Mortar fillets should be made out of KÖSTER Repair Mortar Plus with 20 % KÖSTER SB Bonding Emulsion added to the mixing water. Rounded mortar fillets should have a leg length of 4 to 6 cm.
- I. All surfaces treated with KÖSTER Repair mortar Plus must be fully cured before the KÖSTER KSK ALU 15 membranes are installed, (min. waiting time: 24 hours).
- J. Breaking the corners: To prevent damage to the membrane due to mechanical stresses, all corners need to be broken at a 45° angle with a grinding tool. In new construction it is recommended to install a triangular wooden molding onto the top edge of the form work for the foundation slab.

3.3 INSTALLATION - POSITIVE SIDE WATERPROOFING WITH BITUMINOUS SELF-ADHESIVE WATERPROOFING MEMBRANES FOR WEATHER-EXPOSED SURFACES OF ABOVE GROUND STRUCTURES (ROOFS, GARAGES OR BALCONIES)

- A. Install in accordance with manufacturer's instructions.
- B. Application – Priming the surface:
 1. Cementitious fillets must have dried completely before primers are applied.
 2. Priming the substrate: As a primer a thin coat of KÖSTER KBE Liquid Foil is applied to the substrate (Consumption: approx. 250 – 500 g / m²). Alternatively, KÖSTER Primer BL can be used for priming. The priming layer must be allowed to dry completely. Apply the membrane on the same day.
 3. In case of strongly absorbent substrates, (e. g. porous concrete), a second primer coat may be necessary.
 4. When bonding the membranes onto the substrate on the same day on which the primer was applied, check and make sure that no condensate has formed on the surface.
 5. Bonding the membranes too early onto a surface which was primed with a solvent-containing primer which has not fully dried can lead to damages of the waterproofing.
 6. Metal substrates e.g. not corroded zinc, copper etc. as well as plastics do not need to be primed.



7. Roof penetrations such as storm drains and stack vents as well as bordering vertical areas should be primed up to a minimum height of 20 cm.

C. Application - General:

1. Do not apply KÖSTER KSK ALU 15 at temperatures below + 12 °C.
2. When applying, firmly press the applied membranes onto the substrate, avoiding trapping air and creating creases. All air bubbles should be repaired by puncturing air filled bubble, squeezing out the air through the hole, patching the puncture with a piece of membrane and sealing the patch with KÖSTER KBE Liquid Film.
3. When applying KÖSTER KSK membranes to the area, make sure to overlap the previously applied membrane by a minimum of 5 cm.
4. All overlappings of membranes must be pressed together using a roller (such as KÖSTER Rubber Hand Roller).
5. Vertical connections such as walls, chimneys or the like have to be mechanically fixed using edge profiles or metal hole strips which have to be sealed from the topside using a suited joint sealing compound in order to avoid water penetrating behind the membrane.
6. Touch-up, repair or replace damaged products before Substantial Completion.
7. Clean cutting tools with KÖSTER Universal Cleaner.

D. Application:

1. Pre-cut KÖSTER KSK ALU 15 to the required length. Cutting membranes to length is facilitated by laying a piece of wood or straight edge on top of the membrane along the course of the cut as a guide and cutting support.
2. Roll the membrane out onto the area exactly where it is intended to be affixed. Secure one end of the membrane and roll it back together.
3. Remove the protective paper from the membrane while rolling it into place.
4. All interior and exterior corners are reinforced by applying pre-cut membrane pieces approximately 30 cm wide. Remove the backing paper just before applying the membrane to the surface.
5. For waterproofing especially demanding internal and external corners use specially cut pieces of membrane.
6. Waterproof wall surfaces beginning approx. 30 cm above ground level, proceeding downwards to the wall floor junction and on to the side of the foundation. Pre-cut the membrane to the required length. Apply the membrane by removing the protective paper and pressing the membrane onto the substrate. Overlap the edge of the previously applied membrane by 10 cm. All overlapping areas of the membranes must be firmly pressed together using a KÖSTER Rubber Hand Roller. Remove the backing paper from the self-adhesive edge before applying the next membrane.
7. In order to avoid water infiltration behind the membrane, seal all exposed edges of the waterproofing layers as well as around pipe penetrations and other junctions and endings with KÖSTER KBE Liquid Film. Mechanically fix the upper ends of the membranes with large headed zinc coated nails, (5 pieces / m), or with a fixing profile. In case of rough substrates or porous concrete, a second coat may be needed after the first coat has fully dried. Embed KÖSTER Glass Fiber Mesh into the KÖSTER KBE Liquid Film around pipe penetrations.
8. On every surface where it is planned to cover membrane with additional layers (backfilling or layer of gravel) protect the KÖSTER KSK ALU 15 with KÖSTER Protection and Drainage Sheet



3-400 against damage due to backfilling. The construction pit should be backfilled immediately after full cure of the KÖSTER KBE Liquid Film. Horizontal areas must be covered within two weeks of their application.

9. It is not necessary to place a layer of gravel on top of the membrane after application (for non-walkable roof applications).