



## 2 COMPONENT LIQUID WATERPROOFING

### PART 1 GENERAL

#### 1.1 SECTION INCLUDES

- A. Two component liquid waterproofing for positive side waterproofing on mineral substrates

#### 1.2 REFERENCES

- A. CE / EN1504-2 : 2005 Surface protection products – Coating EN 1504-2: ZA. 1d und ZA.
- B. DIN 18195 Construction Waterproofing
- C. MPA TU Braunschweig (5190/203/12-1) Test according to DIN EN 1504-2 (Surface Protection System for concrete)
- D. MPA Bremen (PZ 50846-11) Determination of the CO2 permeability according to DIN EN 1062-6:2002-10
- E. Determination of the Solar Reflectance Index (SRI) Fraunhofer Institute (Test Report P15-018e/2013)
- F. MPA Braunschweig (5190/203//12-3) Testing according to DIN EN 1062-7 (Crack bridging capability)
- G. Testing Report P15-018e/2013 - Determination of the Solar Reflectance Index of a coating
- H. Test Report - Carbon dioxide permeability

#### 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.

## 1.5 PERFORMANCE REQUIREMENTS

- A. The waterproofing system shall be a 2 component, solvent-free, liquid applied, elastic and crack bridging material. It should have high UV reflectance and stability therefore suitable for indoor and outdoor use. The coating must be fast curing and highly flexible, resistant to occasional foot traffic, aging, hydrolysis, UV-rays, frost, and salt. The material should be non-toxic, free of calcium chloride and sodium based compounds. The 2 component liquid waterproofing system shall be KÖSTER 21, manufactured by KÖSTER Bauchemie AG, Aurich, Germany. Reinforcement mesh should be KÖSTER Flex Fabric, repair mortar shall be KÖSTER Repair Mortar Plus and primer shall be KÖSTER Polysil TG 500.

## 1.6 QUALITY ASSURANCE

### A. Manufacturer Qualifications:

- 1. Manufacturer shall have no less than five years experience in manufacturing 2 component liquid 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.

## 1.7 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 the products.
  - D. Liquids should not be stored in areas with temperatures over than + 30 °C or below + 5°C.

## 1.8 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 mineral liquid waterproofing to unprotected surfaces in wet weather or to surfaces on which ice, frost or water is visible.
  - 2. Do not apply mineral liquid 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 mineral liquid waterproofing in rain, snow, fog or mist.
- B. Protection: Protect the waterproofing from active rain for a minimum period of 24 hours from time of application to prevent damage.

## 1.9 WARRANTY

- A. Installer of waterproofing system shall provide the 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.KÖSTER.eu
- B. Substitutions: Not permitted.
- C. Requests for substitutions will be considered in accordance with the provisions section.
- D. Provide the materials from one manufacturer throughout the project as specified.

## 2.2 SYSTEM – POSITIVE SIDE WATERPROOFING

A. Waterproofing: A multi purpose waterproofing product with adhesion to dry and moist substrates. It is a 2 component, solvent-free, liquid applied, elastic and crack bridging material. It is liquid applied and therefore seamless. Due to its high UV stability it is suitable for indoor and outdoor use. The white color reflects sunlight and reduces surface temperatures. The fast curing coating is highly flexible, resistant to occasional foot traffic, aging, hydrolysis, UV-rays, frost, and salt.

It seals against synthetic oils and aliphatic hydrocarbons with high boiling points (up to 2 bar) and does not contain volatile organic compounds (VOC content = 0), is free of polyurethanes, isocyanates, and bitumen.

1. Product: KÖSTER 21: Approved as surface protection system and for waterproofing of construction members.

2. Physical Properties:

- a. Crack-bridging ability: Category 1: 0.4 mm
- b. CO<sub>2</sub> permeability: SD ≥ 200 m
- c. Sd Value CO<sub>2</sub>: 924 m
- d. Water vapor permeability: SD ≥ 7,3 m (Class II)
- e. Capillary absorption and permeability to water:  $w = 0,011 \text{ kg}/(\text{m}^2 \cdot \text{h}^{0,5})$
- f. Freeze - thaw with chloride attack : MW = 0.9 N / mm<sup>2</sup>
- g. Adhesion strength by pull off test: MW = 1. 2 N / mm<sup>2</sup>
- h. Reaction to fire: Class E
- i. Thickness per layer: 0.5 mm – 2.0 mm
- j. Density: 1.55 g/m cm<sup>3</sup>
- k. Consistency and color: Pasty white
- l. SRI value: 0.93

## 2.3 SYSTEM – POSITIVE SIDE WATERPROOFING

A. Product: KÖSTER 21

1. System package for the positive side waterproofing of basements, concrete slabs, tanks, flat roofs, underneath tiles, terraces and balconies, and similar applications.

## 2.4 ADDITIONAL PRODUCTS

- A. KÖSTER Flex Fabric. Use between layers as recommended by manufacturer always as reinforcement mesh to prevent substrate cracking damage to the top layer of the waterproofing coat made with KÖSTER 21.
- B. KÖSTER Repair Mortar Plus. Use as a repair mortar for substrate defects and to install round fillets on wall-floor junctions. The mortar is watertight, fast setting, slightly expanding with excellent adhesion even to old building material substrates.
- C. KÖSTER Polysil TG 500. To be used as a primer on salt burdened or highly absorbent substrates.

## PART 3. EXECUTION

### 3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

### 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.
- 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 2 component liquid 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, formwork release agents, and mineral salts.
- 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 Repair Mortar Plus and other manufacturer approved concrete repair materials for the substrate. 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 a joint tape such as KÖSTER Joint Tape adhered in place with high quality epoxy mortar/ adhesive KÖSTER KB-Pox Adhesive in accordance with KÖSTER'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 a sound base and repaired

- according to manufacturer's instructions and patched flush with KÖSTER Repair Mortar Plus.
- G. Uneven brick or block work must be first rendered flush with KÖSTER Repair Mortar Plus.
  - H. Construction Joints: Construction joints should be thoroughly cleaned and dampened. Apply the joint tape KÖSTER Joint Tape 20 or 30 cm wide, according to the size of the joint. Use KÖSTER KB-Pox Adhesive on both sides of the joint tape according to the Technical Data Sheet using the consumption determined by the manufacturer to create an excellent contact with the substrate. Create an omega profile in the joint tape to allow further movements of the joint.
  - I. Piping Preparation: Cut back around pipes at least 2.5 cm to give sufficient depth and clean thoroughly. Apply KÖSTER KB Flex 200. Flush up the cavity with KÖSTER KB-Fix 5.
  - J. Fillets and Coves between Horizontal and Vertical Areas: All wall-floor junctions must be installed a round fillet 12h before the waterproofing coat is applied. KÖSTER Repair Mortar Plus is to be used.
  - K. Cracks in the surface which are caused by shrinkage of the concrete have to be filled by applying a scratch coat of KÖSTER 21 before the application of the area waterproofing. When applying KÖSTER 21 as a scratch coat, you must be able to reach all areas and ensure a uniform coat which is free of pinholes and other irregularities.
  - L. Priming the substrate: Apply KÖSTER Polysil<sup>®</sup> TG 500 by brush, roller, or spray application to increase the chemical and mechanical resistance of the substrate. The consumption should be between 100 g and 250 g/m<sup>2</sup>.

### 3.3 INSTALLATION - POSITIVE SIDE WATERPROOFING

- A. Install in accordance with manufacturer's instructions.
- B. For areas with visual defects, provide the installation according manufacturer's requirements before applying the waterproofing layers.
- C. Mixing:
  - 1. Mix the 2 components inside the original package using an electrical mixer (below 400 rpm) so that a lump free, homogenous consistency is achieved. Mixing time is a minimum of 3 minutes.
  - 2. To increase workability or in hot weather where temperatures exceed + 28 °C, up to 1.6 liters of water (8 %) can be added to each 20 kg combi-package to achieve a brushable or sprayable consistency. Use only clean and potable water.
- D. Application - General:
  - 1. Wet dry surfaces thoroughly with clean water immediately prior to applying the waterproofing coat, making sure that no running or ponding water is present at the

time of application.

2. Apply the 2 component liquid waterproofing with a brush, roller, trowel, or other customary mason's tools.
    1. Work in such a way as to leave no areas void and no pin holes.
- E. Application - Roll:
1. Apply the first coat of KÖSTER 21 directly on the substrate with a consumption between 1,0 kg and 1,3 kg/m<sup>2</sup>.
  2. Embed the reinforcement mesh KÖSTER Flex Fabric into the fresh first layer and wait 24h, to be able to walk on for the application of the second layer. The waiting time between the two layers depends on the climatic conditions and the application temperature.
  3. Apply the second coat of KÖSTER 21 directly on the substrate with a consumption between 1,2 kg and 1,5 kg/m<sup>2</sup>, in order to completely cover the reinforcement mesh previously installed, and get an smooth and even surface.
  4. The KÖSTER 21 in fresh is water soluble and must be protected from rain until it has fully dried.
- F. Application - Spray:
1. Surface should be damp to the touch with no standing or running water.
  2. Use conventional spray machine suitable for spraying cementitious material, operating with an air pressure of approx. 10 bar, a 4 - 8 mm nozzle, and 25 mm delivery hose.
  3. If the material is spray applied, two coats at a minimum rate of 1.5 kg/m<sup>2</sup> per coat is required. The material can be spray applied using a 4 - 8 mm nozzle, keeping the nozzle at a distance of 30 cm from the surface. Back-roll the first coat. Apply the second coat with a 4 – 8 mm nozzle, consumption 1.5 kg/m<sup>2</sup>.
  4. Embed the reinforcement mesh KÖSTER Flex Fabric into the fresh first layer and wait 24h before trafficking for the application of the second layer. The waiting time between the two layers depends on the climatic conditions and the application temperature
  5. The fresh KÖSTER 21 is water soluble and must be protected from rain until it has fully cured.
- G. For broadcast and trowel application consult manufacturer for installation requirements and application techniques.

### 3.5 PROTECTION

- A. Protect liquid waterproofing from contact with acid (below pH 7)
- B. Touch-up, repair or replace damaged products before Substantial Completion.
- C. Do not apply the liquid waterproofing at temperatures below + 5 °C.

- D. Do not use curing compounds or water to bring mixture back to brushable consistency.
- E. The treated area must be kept clear for at least 48 hours before backfilling or applying any concrete screed or other topping.
- F. Unless broadcast and trowel application is used, the liquid waterproofing is not designed to be a wearing surface. When waterproofing a horizontal surface that will be subjected to traffic the area must be covered by concrete, cement, tile or other protective coating after 48 hours.
- G. Cured KÖSTER 21coating may be painted. Do not use lime-based paints. Any paint used must be elastomeric and breathable.
- H. Protect the treated area from temperatures below + 5 °C during application and until the material has fully cured.
- I. Use potable water for mixing and cleaning.
- J. All salt burdened substrates must be primed with KÖSTER Polysil TG 500.