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KÖSTER

Method Statement

Negative side waterproofing with KÖSTER KD System

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Table of Contents

KÖSTER
Waterproofing Systems

Table of Contents

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1 General information

1.1 Scope

This method statement is intended for use by developers, contractors and applicators as a general guideline for the application of the waterproofing system KÖSTER KD System.
While this document describes the tools, equipment, materials and process for preparing and installing the waterproofing system, it must be used and referred to, in combination with all other relevant technical information available for the product and its components.

1.2 Manufacturer

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1.3 Definitions

Absorption
The process by which one substance, such as a solid or liquid, takes up another substance, such as a liquid or gas, through minute pores or spaces between its molecules. An absorption process is generally reversible.

Environmentally Friendly
Common expression and marketing term widely use referring to articles and services, policies, regulations, laws, among others, declaring a minimal or no impact to the environment or ecosystem.

Fast setting Mortar
It is a mineral, multipurpose fast-setting repair mortar. Ideal where rapid strength, durability and low shrinkage setting are required.

Negative Side Waterproofing
Negative side waterproofing means that the waterproofing layer is applied to the side of the construction member which is opposite to the side with direct contact to the water.

2 System description

2.1 System features

The environmentally friendly KÖSTER KD System stops active water ingress and safely seals off pressurized water from the negative side. It is resistant to salts which are harmful to the building structure and to aggressive substances which are present in the ground. Salts will not detach the fully cured KÖSTER KD System coating from the substrate.

2.2 Characteristics/Advantages

- Easy to apply
- Surface waterproofing against pressurized water from the negative side
- Also suited for positive side waterproofing
- No external excavation necessary
- KÖSTER KD 2 Blitz Powder seals active leaks in seconds.
- Penetrates deeply into the substrate and blocks the pores
- Resistant to salts which are harmful to the building structure
- Salts will not detach the fully cured KÖSTER KD System coating from the substrate.
- Decades of well-proven experience

2.3 Main products and components

KÖSTER KD 1 Base
Fast curing mineral sealing slurry with excellent resistance to aggressive ground water and high water pressure.

KÖSTER KD 2 Blitz powder
Highly reactive powder with extremely short setting time. With application of the dry powder, active water leaks are sealed within seconds.

KÖSTER KD 3 Sealer
Extremely low viscosity silicifying liquid. The active ingredients penetrate deeply into the substrate and react to form an insoluble compound. The pores are plugged and permanently sealed through the mineralization process.

2.4 Associated products

KÖSTER Joint Sealant FS-V black

See online

KÖSTER Restoration Plaster Grey

See online

KÖSTER Restoration Plaster White/Fast

See online

KÖSTER Restoration Plaster White/Light

See online

KÖSTER SB Bonding Emulsion

See online

KÖSTER Waterstop

See online

KÖSTER KB-Flex 200

See online

KÖSTER Repair Mortar Plus

See online

KÖSTER KB-FIX 5

See online

KÖSTER Restoration Plaster White

See online

2.5 Associated literature

- Waterproofing Report 2-2007 Negative Side Waterproofing
- System brochure Negative Side Waterproofing
- Application video KÖSTER KD System
- KÖSTER Product Flyer KÖSTER KD System

3 Tools and Equipment

3.1 Tools

KÖSTER Brush for slurries

Mixing vessels (30 l)

KÖSTER Brush for Liquids

Trowel

3.2 Equipment

Single paddle mixer

3.3 Cleaning

Clean all tools and equipment immediately after use with water. Cured and hardened material can only be removed mechanically.

4 Environmental, health and safety

4.1 Personal Protection Equipment (PPE)

The following is a short overview of Personal Protective Equipment and serves only as a guideline. Contractors and Employers are responsible for meeting the occupational safety guidelines in their countries, states, and localities.

Eye protection
Employers must be sure that their employees wear appropriate eye and face protection and that the selected form of protection is appropriate to the work being performed and properly fits each worker exposed to the hazard.

Head protection
Employers must ensure that their employees wear head protection if any of the following apply: Objects might fall from above and strike them on the head; they might bump their heads against fixed objects, such as exposed pipes or beams; or there is a possibility of accidental head contact with electrical hazards.

Foot and Leg Protection
Employees who face possible foot or leg injuries from falling or rolling objects or from crushing or penetrating materials should wear protective footwear.

Hand Protection
When selecting gloves to protect against exposure hazards, always check with the manufacturer or review the manufacturer's product literature to determine the gloves' effectiveness against specific workplace chemicals and conditions. Gloves commonly used are: Coated fabric gloves and Chemical - and Liquid - Resistant Gloves

Hearing protection
Suitable hearing protection must be provided for the job environment.

4.2 Material safety & First Aid

Every KÖSTER product is labeled with specific information and symbols as to the related dangers. Please consult the respective Material Safety Data Sheet for specifics.

You can access the Material Safety Data Sheets by scanning the QR codes on the packagings.

If inhaled:
Remove person to fresh air and keep comfortable for breathing. In all cases of doubt, or when symptoms persist, seek medical advice. Inhalation of dust may cause irritation of the respiratory system.

In case of contact with eyes:
Rinse immediately with plenty of flowing water for 10 to 15 minutes holding eyelids apart. Subsequently consult an ophthalmologist. Following eye contact: Risk of serious damage to eyes.

After ingestion:
Do NOT induce vomiting. Rinse mouth immediately and drink plenty of water. Call a physician in any case!

In case of accident or if you feel unwell:
Seek medical advice immediately (show the label if possible). Treat symptomatically.

After contact with skin:
Wash immediately with plenty of water. Change contaminated clothing. The product develops an alkaline pH value with moisture and can cause irritation. Contains chromium (VI). May produce an allergic reaction.

4.3 Waste disposal

Disposal recommendations
Dispose of waste according to applicable legislation.

Contaminated packaging
Completely emptied packages can be recycled.

Guidance on classification of waste according to EWC-Stat categories
List of Wastes Code -
Residues/unused products (101311)
WASTES FROM THERMAL PROCESSES; wastes from manufacture of cement, lime and plaster and articles and products made from them; wastes from cement-based composite materials other than those mentioned in 10 13 09 and 10 13 10 according to German regulations.

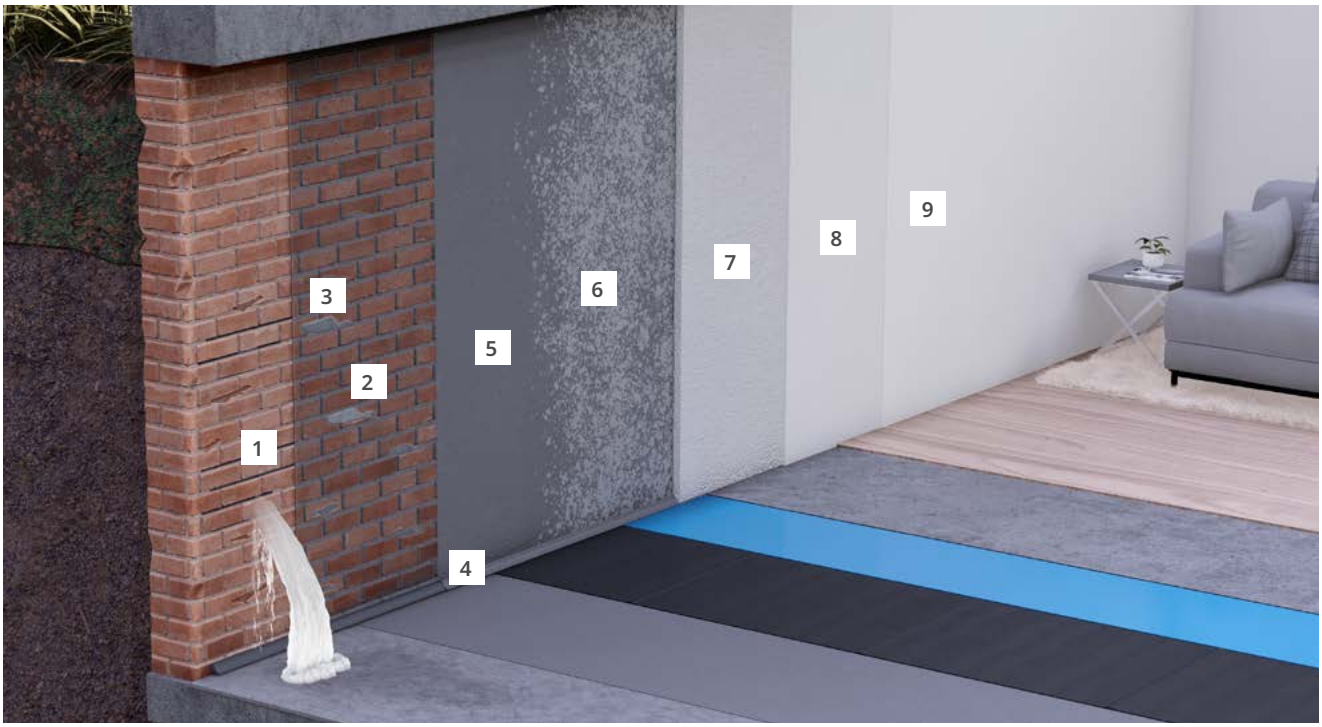
List of Wastes Code -
Used product (170107)
CONSTRUCTION AND DEMOLITION WASTES (INCLUDING EXCAVATED SOIL FROM CONTAMINATED SITES); concrete, bricks, tiles and ceramics; mixtures of concrete, bricks, tiles and ceramics other than those mentioned in 17 01 06 according to German regulations.

5 Fields of application

5.1 General examples

- Internal basement waterproofing in case of flowing water
- All other waterproofing against non-pressurized and pressurized water from the positive or the negative side on mineral substrates

5.2. Example for internal basement waterproofing in case of flowing water



1 Stopping active leakages	KÖSTER KD 2 Blitz Powder
2 Primer	Prewetting the surface
3 Levelling the surface	KÖSTER Repair Mortar Plus
4 Installing fillets	KÖSTER Repair Mortar Plus
5 Waterproofing layer	KÖSTER KD System
6 Plaster key	KÖSTER Restoration Plaster Key
7 Plaster	KÖSTER Restoration Plaster White
8 Fine Finish	KÖSTER Fine Plaster
9 Paint	KÖSTER Silicone Paint White

Installation process

The basement waterproofing must be done from the inside, because the water is actively entering the building. Often the only solution is the KÖSTER KD System.
KÖSTER KD 2 Blitz Powder is applied directly by hand to the active leakage. The powder reacts within a few seconds and forms a waterproof mortar.
When the active leakages are stopped, the waterproofing layer of KÖSTER KD 1 Base, KÖSTER KD 2 Blitz Powder and KÖSTER KD 3 Sealer can be applied. The material is applied to substrates that have to be sound and solid as well as free of bond inhibiting agents.

Older plaster coats must be removed; the joints raked out and all loose particles removed. Generally, the substrate is primed by prewetting.
Repairs and the installation of the fillet at the wall/floor junction are done with KÖSTER Repair Mortar Plus.
KÖSTER KD 1 Base is applied as the waterproofing layer and is brushed onto the substrate.

KÖSTER KD 2 Blitz Powder is rubbed onto the still wet surface, immediately creating a dry waterproofed layer. To harden and to strengthen this layer, the third part of the system, KÖSTER KD 3 Sealer, is applied. To waterproof the basement completely, another two layers of KÖSTER KD 1 Base are applied over the first.

Pipe penetrations are waterproofed with KÖSTER KB-Flex 200 sealing paste and plugged with KÖSTER KB-Fix 5.
In the case of damage to basement walls caused by moisture, generally a KÖSTER Restoration Plaster should be applied. KÖSTER Restoration Plasters are specially designed for the restoration of masonry with high salt and moisture contents. KÖSTER Restoration Plasters help to dry out the wall and absorb remaining salts.
Before the application of the main plaster coat, a plaster key made from KÖSTER Restoration Plaster Key is applied to provide a larger surface area and ensure an optimal bond to the substrate.

6 Substrate preparation

6.1 Project site conditions

6.1.1 Application temperature

The waterproofing system should be applied at temperatures between +2°C and +30°C. Do not apply cementitious waterproofing when the temperature is lower than +2°C or expected to fall below this temperature within 24 hours from time of application.

6.1.2 Moisture content in substrate

The substrate must be prepared in such a way that it does not absorb water from the fresh coating. This can be achieved exclusively with heavy pre-wetting.
When pre-wetting, the surface must be wet enough that it will remain damp and cold for at least 10 minutes directly before being coated.

6.1.3. Relative humidity

Low levels of relative humidity increase the risk of water evaporation from the material, consequently increasing the risk of premature drying and shrinkage cracking.

6.1.4. Rain and frost

The waterproofing coating must not be exposed to mist, rain, intense heat, snow, frost, and strong wind during the application and for at least 24 hours afterwards.

6.2 Requirements

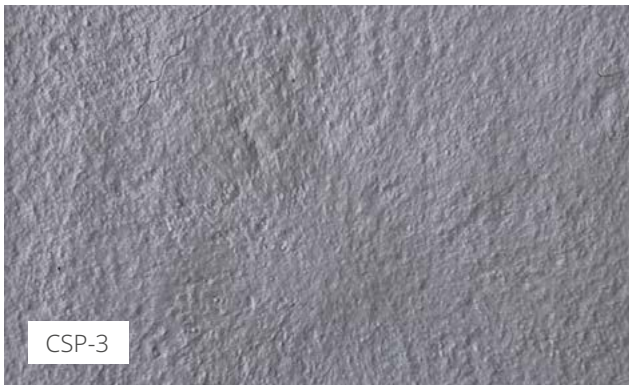
The substrate must be

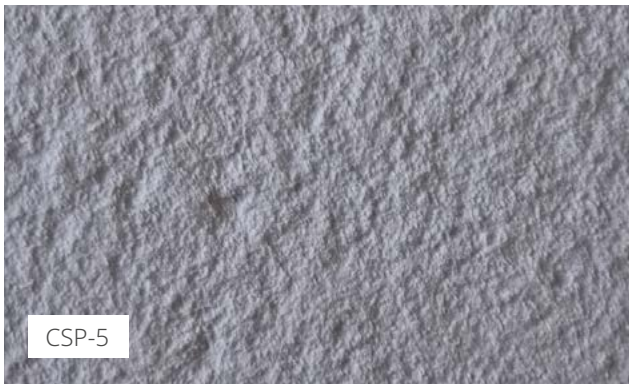
- Sound and solid
- Free of grease and oil and other adhesion inhibiting substances
- No adhesion inhibiting soilings
- Free of silicate sealer and waxs and silicate curing compounds
- Free of gypsum
- No wide gaping cracks
- Break corners and edges protrusions and offsets should be kept to a minimum
- Perfectly pre-wetted

6.3 Surface preparation

6.3.1 Concrete surfaces

Concrete surfaces must be prepared to have an open pore surface free of laitance. The surface roughness must present a structure corresponding to a Concrete Surface Profile CSP-3 up to CSP-8; according to the guidelines by the International Concrete Repair Institute (ICRI). The surface must then be intensively cleaned prior to the installation.





Suitable surface preparation methods are griding, high-pressure water blasting (at least 350 bar) and sandblasting/shotblasting.

Grinding
Suitable for creating a CSP-1 to CSP-3.

High-pressure water blasting
(at least 350 bar)
Suitable for creating a CSP-3 to CSP-10. In case there is formwork release oil on the surface, apply a suited detergent to the surface before cleaning with the water jet.

Sandblasting or **shotblasting**
Suitable for creating a CSP-2 to CSP-8.

6.3.2 Masonry

Masonry walls must be mechanically cleaned and freed from efflorescence prior to the application of the waterproofing system. Uneven brick or block work must be first rendered flush with KÖSTER Repair Mortar Plus enhanced with KÖSTER SB Bonding Emulsion.

On porous concrete, Autoclaved Aerated Concrete, or on soft brick, a sound plaster made of KÖSTER Repair Mortar must be applied.

6.4 Levelling & repairing the surface

Defects not deeper than 5 mm

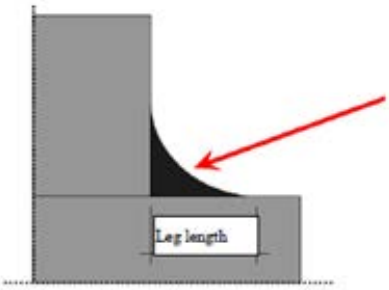
Defects up to a depth of 5 mm can be closed with KÖSTER WP Mortar

Defects deeper than 5 mm

Honeycombed areas, cavities, recesses and chipped out areas, as well as all holes or irregularities wider or deeper that 5 mm must be filled with KÖSTER Waterstop or KÖSTER Repair Mortar Plus enhanced with KÖSTER SB Bonding Emulsion before applying the KÖSTER KD 1 Base.

6.5. Installation of fillets

On interior corners a fillet must be installed to reduce stress concentrations in the walls, and therefore in the coating. Install fillets d (leg length of approx. 4–6 cm) made from KÖSTER Repair Mortar Plus at least 12 hours before treating the surfaces with the waterproofing coat on all wall/floor and wall/wall junctions.



7 Applying the KÖSTER KD System

7.1. Applying KÖSTER KD 2 Blitz Powder – for stopping active water leaks

Depending on the intensity of the active leak, a sufficient amount of dry powder is applied by hand directly to the active leak without adding any extra water. In case of small active leaks where water slowly drips from the wall, the powder is rubbed firmly onto the surface until the leakage is stopped.

In areas with stronger leaks including an active water spout, a larger amount of KÖSTER KD 2 Blitz Powder is pressed into a ball between both hands, compressing as much air out as possible.

The “ball” is firmly pressed onto the leak. After a few seconds the leak should be stopped.
We suggest using smooth rubber gloves when processing KÖSTER KD 2 Blitz Powder.

7.2 Applying KÖSTER KD system

KÖSTER KD 1 Base

KÖSTER KD 2 Blitz Powder

KÖSTER KD 3 Sealer

KÖSTER KD 1 Base: in 2 coats (second layer after 30 minutes)

8 Surface details

8.1. Sealing of joints and cracks

- Prior to the application of the area waterproofing, cut grooves into the masonry/concrete along the course of the joint. Width and depth should be approx. 3 cm or more in cases where strong movements or high water pressure is expected.
- In the course of applying the area waterproofing, the KÖSTER KD System is applied into the grooves previously opened.
- After a minimum of 24 hours of applying of the KÖSTER KD System, the side-flanks of the joints (only these) are primed with KÖSTER FS Primer 2C. Cover the back of the joint with tape or a foam cord, as bonding to three flanks has to be absolutely avoided.
- Fill the joints after approx. 4 hours curing time with KÖSTER Joint Sealant FS-H/FS-V according to the technical guidelines.

8.2. Sealing of pipe penetrations

Plastic sealing (with KÖSTER KB-Flex 200 Sealing Paste)

Pipe and cable penetrations can be waterproofed with KÖSTER KB-Flex 200. As an additional safeguard and to hold the pipe/cable centered, the exposed material is covered with the KÖSTER KB-Fix 5

9 General notes

9.1 Consumption rate

KÖSTER KD 1 Base
approx. 1.5 - 2.5 kg/m²

KÖSTER KD 2 Blitz powder
approx. 1.0 - 2.0 kg/m²

KÖSTER KD 3 Sealer
approx. 0.5 kg/m²

9.2 Material packaging

KÖSTER KD 1 Base
7.5 Kg

KÖSTER KD 2 Blitz powder
7.5 kg

KÖSTER KD 3 Sealer
3 Kg

9.1 Material storage

Store the material frost free at room temperatures between +5 °C and +35 °C. Protect the material against moisture and direct sunlight. Products should always remain stored in their original and unopened containers with the original labels and batch number tags.
In originally sealed packages, the material can be stored for a period of 12 months.

9.4. Limitations

- Do not apply the material in direct sunlight with temperatures over +30 °C.
- Do not apply the KÖSTER KD System on unsuitable substrates such as: plasters containing lime, paint coatings, building materials containing gypsum
- Special conditions may require alternatives to these recommendations; therefore, warranty can only be given for the quality of the products but not for the correct usage or the workmanship of the materials.

10 Certifications

- Official testing certificate of Law Engineering Inc., Atlanta, USA.
- Adhesive tensile strength and water permeability (negative and positive side).

11 Legal disclaimer

This method statement reflects general cases with standard parameters. It is not suitable as a step-by-step guide for all and each waterproofing project as the conditions on site at the moment of the application cannot be foreseen. It is solely the applicator's responsibility to decide on the actual procedure considering the specific situation on the construction site. In any case, KÖSTER's Terms of business are valid and can be viewed under www.koester.eu