





## KÖSTER NB 1 Grey

Technical Data Sheet W 221 025

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- Official test certificate, Institute for Hygiene, Gelsenkirchen – Tank and tank-lining, according to the regulations of the DVGW, Tech. regulations for potable water
- National Technical Approval P-5101/838/14 MPA BS by the MPA Braunschweig Mineral Waterproofing Slurry for Waterproofing of Constructions according to Building Regulation List (Bauregelliste) A, Part 2, No. 2.49
- Worksheet W 270, December 1990, about the reproduction of micro-organisms on materials for use in drinking water environments
- Test Certificate Bautest GmbH, Dresden

### Mineral based, sulfate resistant waterproofing system for positive and negative side waterproofing against pressurized water

	<p><b>KÖSTER BAUCHEMIE AG</b>                  Dieselstraße 1-10, 26607 Aurich                  13                  W 221                  EN 1504-3:2005  <b>Product for structural and non structural repair for concrete</b>  <b>Applying mortar by hand (3.1)</b>                  EN 1504-3: ZA. 1a</p>
Compressive strength Chloride ion content Adhesive bond Restrained shrinkage/expansion Carbonation resistance Elastic modulus Reaction to fire	Class R1 $\leq 0.05\%$ $\geq 0.8$ MPa NPD NPD $\geq 10$ GPa Class E
 0761	<p><b>KÖSTER BAUCHEMIE AG</b>                  Dieselstraße 1-10, 26607 Aurich                  17                  W 221                  ETA-17/0025  <b>Construction set with a mineral, cement based, non-flexible waterproofing slurry</b></p>
Adhesive tensile strength Watertightness Water resistance Freeze-thaw resistance Stability Watertightness in final condition For the use a) For the use b) Shrinkage Release scenarios regarding BWR S/W 1	$\geq 0.05$ MPa Watertight $\geq 0.5$ MPa $\geq 0.5$ MPa No change to surface Up to 3 m Up to 20 m $\leq 2.5$ mm/m 3

Waterproofing with KÖSTER NB 1 Grey should only be carried out on substrates that are free of moving cracks. Moving cracks should be considered construction joints and treated accordingly with KÖSTER Joint Tape, KÖSTER Injection Resins, or KÖSTER Joint Sealant FS. KÖSTER SB-Bonding Emulsion introduces flexibility to the material.

#### Advantages

- positive and negative side waterproofing against pressurized water
- resistant against chlorides, sulphates and phosphates
- certified for drinking water environments
- penetrates into the surface where crystallization leads to inseparable waterproofing-substrate bond
- does not contain corrosion promoting ingredients
- no VOC, no emissions of environmentally harmful ingredients
- works also on masonry and on very porous substrates like shotcrete, aerated concrete and cinderblock
- substrate does not have to be continually kept wet to cure
- inhibits salt movement in the substrate when used as a system together with KÖSTER Polysil TG 500
- easy application, long pot life
- seamless application

#### Technical Data

Fresh mortar density	1.85 kg / l
Modulus of Elasticity	approx. 11,000 N/mm <sup>2</sup>
Compressive strength (24 hours)	> 5 N / mm <sup>2</sup>
Compressive strength (7 days)	> 20 N / mm <sup>2</sup>
Compressive strength (28 days)	> 35 N / mm <sup>2</sup>
Flexural tensile strength	> 2 N / mm <sup>2</sup>
Flexural tensile strength (7 days)	> 4.5 N / mm <sup>2</sup>
Flexural tensile strength (28 days)	> 10 N / mm <sup>2</sup>
Adhesive tensile strength	> 1.5 N / mm <sup>2</sup>
Waterproof against pressurized water (positive and negative side)	up to 13 bar
Coefficient of water vapor diffusion resistance ( $\mu$ )	60
Sd value at 2 mm layer thickness	0.12
Pot life	approx. 2 hours
Resistant to foot traffic	after approx. 2 days
Full cure	after approx. 2 weeks

#### Fields of Application

KÖSTER NB 1 Grey can be used in new construction and repair for horizontal and vertical waterproofing of concrete, masonry or cementitious plaster, on porous concrete, on shotcrete, in wet rooms, bathrooms, showers, new basements, inside of basements, inside elevator shafts, tunnels, leaking retaining walls, underside of leaking ceilings, tanks, silos, sewage treatment plants, manholes, drinking water tanks etc..

- Waterproofing basements (exterior or interior horizontal and vertical surfaces)

#### Features

KÖSTER NB 1 Grey is a mineral coating containing crystallising and capillary-plugging agents. It can be used for waterproofing against ground moisture, and for non-pressurized and pressurized water. Waterproofing done with KÖSTER NB 1 Grey is characterized by excellent resistance to pressure and abrasion as well as chemical and sulphate resistance. Applied as a closed layer, KÖSTER NB 1 Grey is absolutely waterproof to pressurized water up to 13 bar. Due to its penetration into the structural member, the slurry develops an intense bond to the substrate and the capillaries are plugged. Besides the hydraulic curing of the sealing slurry, crystallizing reactions are activated in the slurry which can lead to a self healing effect when micro-cracks develop.

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- Waterproofing pools ( can also be applied under KÖSTER NB Elastic Grey or other bituminous substrates)
- Waterproofing sewage tanks, plants and pipelines
- Waterproofing water tanks
- Waterproofing drinking water tanks
- Waterproofing tunnels
- Waterproofing pile heads

## Substrate

The mineral substrate has to be sound and solid as well as free of bonding inhibiting agents such as grease or oil. Remove all bond breaking substances such as old coats, laitance, loose particles, dust, formwork, release oil, etc. The substrate must be open pored so that the KÖSTER NB1 Grey can penetrate.

Old coatings must always be removed by sandblasted or high pressure water blasting (minimum 350 bar). Substrates have to be wetted (avoid standing water) or treated with KÖSTER Polysil TG 500 prior to the application of KÖSTER NB 1 Grey. Dusty or salt-damaged substrates have to be brushed off and primed with KÖSTER Polysil TG 500, 30-90 minutes prior to the application of KÖSTER NB 1 Grey.

## Application Procedure

### Preparation of the product and application

The surface must be intensively cleaned prior to the installation, with high-pressure water to be free of any laitance, oil, curing agents, paints, foreign material or any adhesion-inhibiting substances. After cleaning the surface, cracks and expansion joints must be treated accordingly. Honeycombed areas, cavities, and chipped out areas must be treated and edges must be rounded and patched flush with KÖSTER Repair Mortar Plus. In the case of surface roughness of less than 5 mm, use KÖSTER NB1 Grey with the addition of KÖSTER NB 1 Flex in the mixing water to smooth the surface. Apply with KÖSTER Brush for Slurries and / or trowel. Dilation joints can be treated with KÖSTER Joint Tape 20/30 (according to the size of the joint) adhered with KÖSTER KB-Pox Adhesive. Make an Omega Profile in the joints to allow further movements of the joint. Alternatively KÖSTER FS-joint sealant or KÖSTER PU 907 can be used. Cracks and construction joints can be injected with KÖSTER IN injection resins. Around pipe penetrations, apply KÖSTER KBE Liquid Film after cleaning with a wire brush. For extra flexibility and durability, embed a layer of KÖSTER Glass Fiber Mesh. Alternatively KÖSTER KB Flex 200 can be used and exposed areas can be covered with KÖSTER KB Fix 5 or KÖSTER Sewer and Shaft Mortar depending on the project requirements. Install fillets 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. Blowholes and cracks on the surface caused by shrinkage do not need extra treatment prior to area waterproofing. Prime the surface with KÖSTER Polysil TG 500 to insure and maximize the chemical and mechanical resistance of the substrate, especially on salt burdened substrates. The waterproofed surface is not designed to be a trafficked surface. Horizontal surfaces subjected to foot traffic must be protected not before a minimum 48 hours after application by a coat of concrete, tile, or a protective screed.

## Application

The material must be mixed using a slow speed mixer whereby the powder should be added to the mixing water or respectively to the polymer liquid. A 25 kg bag of KÖSTER NB 1 Grey is mixed with:

- 8 l of water or
- 6 l of water plus 1-2 kg KÖSTER SB-Bonding Emulsion or
- 1 jerry can (8 kg) of KÖSTER NB 1 Flex

The addition of KÖSTER SB-Bonding Emulsion or KÖSTER NB 1 Flex to the mixing water raises the ability of the material to retain water and prevents a premature drying of the coating in cases of unfavorable weather conditions, (warm, dry, windy).

When used in drinking water reservoirs only the addition of 8 l of water to each 25 kg bag of KÖSTER NB 1 Grey is permitted. The addition of KÖSTER NB 1 Flex or KÖSTER SB-Bonding Emulsion will negate the Drinking Water Certification.

The material is applied in at least two coats with a brush or a suited spraying device. Make sure that the coating is not exposed to heat, frost and strong wind during the application and for at least 24 hours afterwards. The material should be brushed vertically and horizontally to work it into the substrate.

## Application Examples

### Highly effective waterproofing with bituminous building materials

When applying a combined waterproofing system made of KÖSTER NB 1 Grey and bituminous coatings (KÖSTER Bikuthan, KÖSTER Deuxan or KÖSTER KBE-Liquid Film), KÖSTER NB 1 Grey can be applied directly to a void free masonry with flush-filled joints. After a curing time of 24 hours, the bituminous coating is brushed, troweled or sprayed on. The substrate preparation with KÖSTER NB 1 Grey increases the safety of the system significantly. It is an additional waterproofing layer. It prevents lateral movement of water and at the same time it functions as a negative side waterproofing during the construction phase.

### Negative side waterproofing in case of repair of widespread moisture penetration

Active leakages and water weeping down the wall can be stopped with the KÖSTER KD System. Brittle and loose material has to be cleaned out of joints and joints have to be closed flush with KÖSTER Repair Mortar Plus. After a waiting time of approx. 2 hours the surface which is going to be sealed has to be primed with KÖSTER Polysil TG 500 (Consumption: min. 120 g / m<sup>2</sup>, in case of strongly absorbent substrates up to 250 g / m<sup>2</sup>). After a waiting time of 30 minutes, the first coat of KÖSTER NB 1 Grey is applied (Consumption: 1.5 kg / m<sup>2</sup>). When the first coat of KÖSTER NB 1 Grey has set sufficiently so that it is not damaged by the application of a second coat, a second coat of KÖSTER NB 1 Grey is applied (Consumption: 1.5 kg / m<sup>2</sup>). The final hardening is carried out by application of a coat of KÖSTER Polysil TG 500 (Consumption: min. 250 g / m<sup>2</sup>).

### Spray application

Mix additionally approximately 250 ml of water per pack to reach a thin material suitable to be sprayed over the surfaces with KÖSTER Peristaltic Pump.

Due to varying degrees of cement hydration and the latent-hydraulic active ingredients KÖSTER NB 1 Grey can cure in various shades and tones.

### Aftertreatment

On highly absorbent substrates, in strong wind or direct sunlight, the material may tend to prematurely dry. If premature drying is observed (early lightening of the surface), spray with a bottle mister with water until the surface is dark.

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## Advantages

- Penetrates into the substrate and creates a chemical and mechanical bond that will last as long as the wall itself
- Crystallizing waterproofing system
- Abrasion resistant
- Suitable for a wide variety of substrates
- Open to water vapor diffusion
- Can seal the hairline cracks caused by the shrinkage and settlement of the surface (self-healing)
- Suitable for moist surfaces
- Easy to apply, fast and safe to use

## Consumption

2 - 4 kg/m<sup>2</sup>

Under KÖSTER NB Elastic Grey for swimming pools: approx. 1.5 kg/m<sup>2</sup> (1 coat)

In cases of ground moisture min. 2 kg/m<sup>2</sup> (2 coats)

In cases of non-pressurized water min. 3 kg/m<sup>2</sup> (2 coats)

In cases of pressurized water min. 4 kg/m<sup>2</sup> (2-3 coats)

In cases of negative side waterproofing min. 3 kg/m<sup>2</sup> (2 coats)

Under bituminous thick film sealants approx. 1.5 kg/m<sup>2</sup> (1 coat)

## Cleaning

Clean tools immediately after use with water.

## Packaging

W 221 025 25 kg bag

## Storage

Store the material dry. In originally sealed packages, the material can be stored for a minimum of 12 months.

## Safety

Wear protective gloves and goggles when processing of the material. Observe all governmental, state, and local regulations when processing the material.

## Other

## Technical Parameters

Material Class	Cementitious Crystallizing Slurry
Temp. range for application	+ 5 °C to + 30 °C
Consumption approx.	2 - 4 kg / m <sup>2</sup>
Layers	2
Primer	Water / KÖSTER Polysil TG 500
Color	Grey
Solvent free	Yes
Certified for potable water	Yes
Can be plastered over	+++ (Plaster must be open to vapor diffusion)
Crystallizing properties, penetrating	Yes
Mode of Application	Trowel, Brushable, Sprayable
Suitable for negative side waterproofing	Yes
Waiting time until backfilling	> 48 hours
Simplicity of application	+++

## Substrate

Masonry	+++
Cementitious plaster	+++
Moisture condition of surface	Dry or moist
Brick	+++
Screeds	+++
Gypsum	Should be removed

## Performance

Waterproofing max load conditions	13 Bar (Positive and Negative)
Time until rainproof	Approx. 8 hours
Chemical resistance	Good
Vapor permeability	High
UV Resistance	Long term resistant
Abrasion resistance	+++

1\* The final layer of polymer modified bitumen thick film sealants can be made by spraying KÖSTER BE Rainproof onto the fresh coating 2\* Lower + Medium ++ High +++

Wetting is sufficient (substrates should be moist). In case of highly absorbent or salt burdened substrates prime with KÖSTER Polysil TG 500

## Related products

KÖSTER IN 1	Prod. code IN 110
KÖSTER 2 IN 1	Prod. code IN 201
KÖSTER IN 2	Prod. code IN 220
KÖSTER IN 5	Prod. code IN 250
KÖSTER IN 7	Prod. code IN 270
KÖSTER Joint Sealant FS-V black	Prod. code J 231
KÖSTER Joint Sealant FS-H black	Prod. code J 232
KÖSTER Joint Tape 20	Prod. code J 820
	020
KÖSTER Polysil TG 500	Prod. code M 111
KÖSTER Restoration Plaster Grey	Prod. code M 661
	025
KÖSTER Restoration Plaster White	Prod. code M 662
	025
KÖSTER Restoration Plaster White/Fast	Prod. code M 663
	030
KÖSTER Restoration Plaster White/Light	Prod. code M 664
	025

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KÖSTER NB 2 White	Prod. code W 222 025
KÖSTER KBE Liquid Film	Prod. code W 245
KÖSTER Bikuthan 2C	Prod. code W 250 028
KÖSTER Bikuthan 1C	Prod. code W 251
KÖSTER Deuxan 2C	Prod. code W 252 032
KÖSTER Deuxan Professional	Prod. code W 256 032
KÖSTER KD 2 Blitz Powder	Prod. code W 512
KÖSTER Repair Mortar	Prod. code W 530 025
KÖSTER Repair Mortar Plus	Prod. code W 532 025
KÖSTER WP Mortar	Prod. code W 534 025
KÖSTER Waterstop	Prod. code W 540 015
KÖSTER SB Bonding Emulsion	Prod. code W 710
KÖSTER NB 1 Flex	Prod. code W 721 008
KÖSTER SD Protection and Drainage Sheet 3-400	Prod. code W 901 030
KÖSTER NB 1 Brush for slurries	Prod. code W 913 001
KÖSTER Peristaltic Pump	Prod. code W 978 001
KÖSTER Double Paddle Mixer	Prod. code X 992 001
KÖSTER Disc Stirrer	Prod. code X 996 001
KÖSTER Mortar Stirrer Set	Prod. code X 998 001

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