Waterproofing Systems

KÖSTER BAUCHEMIE AG
P-5101/838/14
MPA-BS

KÖSTER NB 1 Grey

Technical Data Sheet W 221 025

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- 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
- Official test certificate, Institute for Hygiene, Gelsenkirchen – Tank and tank-lining, according to the regulations of the DVGW, Tech. regulations for potable water
- Official test certificate, Institute for Hygiene, Gelsenkirchen – Tank and tank-lining, according recommendation of the "Drinking Water Affairs" working group of the Plastics Commission of the Federal Health Office.
- Official test certificate, Institute for Hygiene, Gelsenkirchen - Testing in accordance with DVGW worksheet W 347 "Hygienic requirements for cement-bonded materials in drinking water environment"
- Worksheet W 270, December 1990, about the reproduction of micro-organisms on materials for use in drinking water environments
- European technical assessment, ETA-17/0025 of August 18, 2017, "Set of a mineral, non-flexible waterproofing slurry based on cement."
- BBA Agrément Certificate 19/5619 for KÖSTER NB 1 Grey System, issued 31 January 2019.
- BBA Approval Inspection Testing Certification, including parameters Resistance to water penetration, Sulfate resistance, Durability
- Building Research Institute Warsaw, technical approval, mineral concrete protection, ITB-KOT-2020/1303, edition 1
- Building Research Institute Warsaw, Technical Approval, Sealing Mortar, ITB-KOT-2019/1303, Edition 1
- Cracow Institute of Ceramics and Building Materials, Manufacturer Production Control Certificate No. 008-0834UWB-123

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

CE	**KÖSTER BAUCHEMIE AG Dieselstraße 1-10, 26607 Aurich 13 W 221 EN 1504-3:2005 Product for structural and non structural repair for concrete Applying mortar by hand (3.1) EN 1504-3: ZA. 1a**
Compressive strength	Class R1
Chloride ion content	≤ 0.05 %
Adhesive bond	≥ 0.8 MPa
Restrained shrinkage/expansion	NPD
Carbonation resistance	NPD
Elastic modulus	≥ 10 GPa
Reaction to fire	Class A1
CE 0761	**KÖSTER BAUCHEMIE AG Dieselstraße 1-10, 26607 Aurich 17 W 221 ETA-17/0025 Construction set with a mineral, cement based, non-flexible waterproofing slurry**
Adhesive tensile strength	≥ 0.05 MPa
Watertightness	Watertight
Water resistance	≥ 0.5 MPa
Freeze-thaw resistance	≥ 0.5 MPa
Stability	No change to surface
Watertightness in final condition	
For the use a)	Up to 3 m
For the use b)	Up to 20 m
Shrinkage	≤2.5 mm/m
Release scenarios regarding BWR 3	S/W 1

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.

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.
- Crystallizing waterproofing system.
- Penetrates into the substrate and creates a chemical and mechanical bond that will last as long as the wall itself - inseparable waterproofing-substrate bond.
- Open to water vapor diffusion.
- Resistant against chlorides, sulphates and phosphates.
- Abrasion resistant.
- Certified for drinking water environments.
- Does not contain corrosion promoting ingredients.
- No VOC, no emissions of environmentally harmful ingredients.
- Suitable for a wide variety of substrates.
- Works also on masonry and on very porous substrates like shotcrete, aerated concrete and cinderblock.
- Suitable for moist surfaces.
- Substrate does not have to be continually kept wet to cure.
- Can seal the hairline cracks caused by the shrinkage and settlement of the surface (self-healing).
- Inhibits salt movement in the substrate when used as a system together with KÖSTER Polysil TG 500.
- Easy to apply, fast and safe to use.
- Seamless application.
- Long pot life.

Technical Data

Fresh mortar density	1.85 kg / l
Max. aggregate size	approx. 0.8 mm
Modulus of Elasticity	approx. 11,000 N/mm^2
Compressive strength (24 hours)	> 5 N / mm^2
Compressive strength (7 days)	> 20 N / mm^2
Compressive strength (28 days)	> 30 N / mm^2

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Flexural tensile strength (24 hours)	> 2 N / mm²
Flexural tensile strength (7 days)	> 4 N / mm²
Flexural tensile strength (28 days)	> 6 N / mm²
Adhesive tensile strength	> 1.5 N / mm²
Waterproof against pressurized water (positive and negative side)	up to 13 bar
Coefficient of water vapor diffusion resistance (μ)	60
Sd value at 2 mm layer thickness	0.12
Pot life	approx. 1 hour
Resistant to foot traffic	after approx. 1 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)
- 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 of concrete bridge elements in contact and close to the ground
- 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 KOSTER NB1 Grey can penetrate.

Suitable surface preparation methods are griding, sandblasting, high pressure water blasting (at least 350 bar) or shot blasting.

Old coatings must always be removed by sandblasting 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.

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.

Generally, each 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 (9 kg) of KÖSTER NB 1 Flex

After mixing, up to 1.0 liter of additional water can be added to the material to achieve a consistency suitable for processing.

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.

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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^2, in case of strongly absorbent substrates up to 250 g / m^2). After a waiting time of 30 minutes, the first coat of KÖSTER NB 1 Grey is applied (Consumption: 1.5 kg / m^2). 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^2).

Spray application
Mix additionally approximately 250 ml of water per bag to reach a thin material suitable to be sprayed over the surfaces with KÖSTER Peristaltic Pump.The first layer should be brushed with the KÖSTER NB 1 Brush for Slurries.
Due to varying degrees of cement hydration and the latent-hydraulic active ingredients KÖSTER NB 1 Grey can cure in various shades and tones.
In addition to the KÖSTER Peristaltic Pump, the "BMP 7" screw pump from b&m can also be used. Operation with 230 V; Hose 10 m, 3/4 "; slot nozzle; 1st gear speed, 20% speed; do not add too much air.

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.

Consumption
2 - 4 kg/m^2
Under KÖSTER NB Elastic Grey for swimming pools: approx. 1.5 kg/m^2 (1 coat)

In cases of ground moisture	min. 2 kg/m^2 (2 coats)
In cases of non-pressurized water	min. 3 kg/m^2 (2 coats)
In cases of pressurized water	min. 4 kg/m^2 (2-3 coats)
In cases of negative side waterproofing	min. 3 kg/m^2 (2 coats)
Under bituminious thick film sealants	approx. 1.5 kg/m^2 (1 coat)

Cleaning
Clean tools immediately after use with water.

Packaging

W 221 025	25 kg bag

Storage
Store the material in a dry environment. 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
Pallet content: 40 bags of 25 kg package

Related products

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
KÖSTER Restoration Plaster White/Light	Prod. code M 664 020
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 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
KÖSTER SD Protection and Drainage Sheet 3-400	Prod. code W 901 030
KÖSTER Brush for slurries	Prod. code W 913 001
KÖSTER Peristaltic Pump	Prod. code W 978 001

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Technical Data	**Product Name: KÖSTER NB 1 Grey**
Material Class	Cementitious Crystallizing Slurry
Temp. range for application	+ 5 °C to + 30 °C
Consumption approx.	2 - 4 kg / m²
Layers	2 / no primer (W)
Color	Grey
Solvent free	Yes
Certified for potable water	Yes
Can be plastered over	+++ (Plaster must be open to vapor diffusion)
Crystallizing properties, penetrates into substrate	Yes
Mode of Application	Brushable, sprayable
Suitable for negative side waterproofing	Yes
Waiting time until backfilling	> 48 hours
Simplicity of application	+++
Substrate	
Masonry	+++
Cementitious plaster	+++
Concrete	+++
Brick	+++
Screeds	+++
Gypsum	Must be removed
Moisture condition of surface	Pre-wetted or already moist
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	+++

Lower+ Medium++ High+++

W wetting is sufficient (substrates should be moist). In case of highly absorbent substrates prime with KÖSTER Polysil TG 500

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