

The logo for KÖSTER, featuring the word in a bold, blue, sans-serif font with a stylized 'O'.

Waterproofing Systems

KÖSTER Injection Technology



Crack Injection

Waterproofing with Acrylic Gels

Void Injection

Soil Stabilization





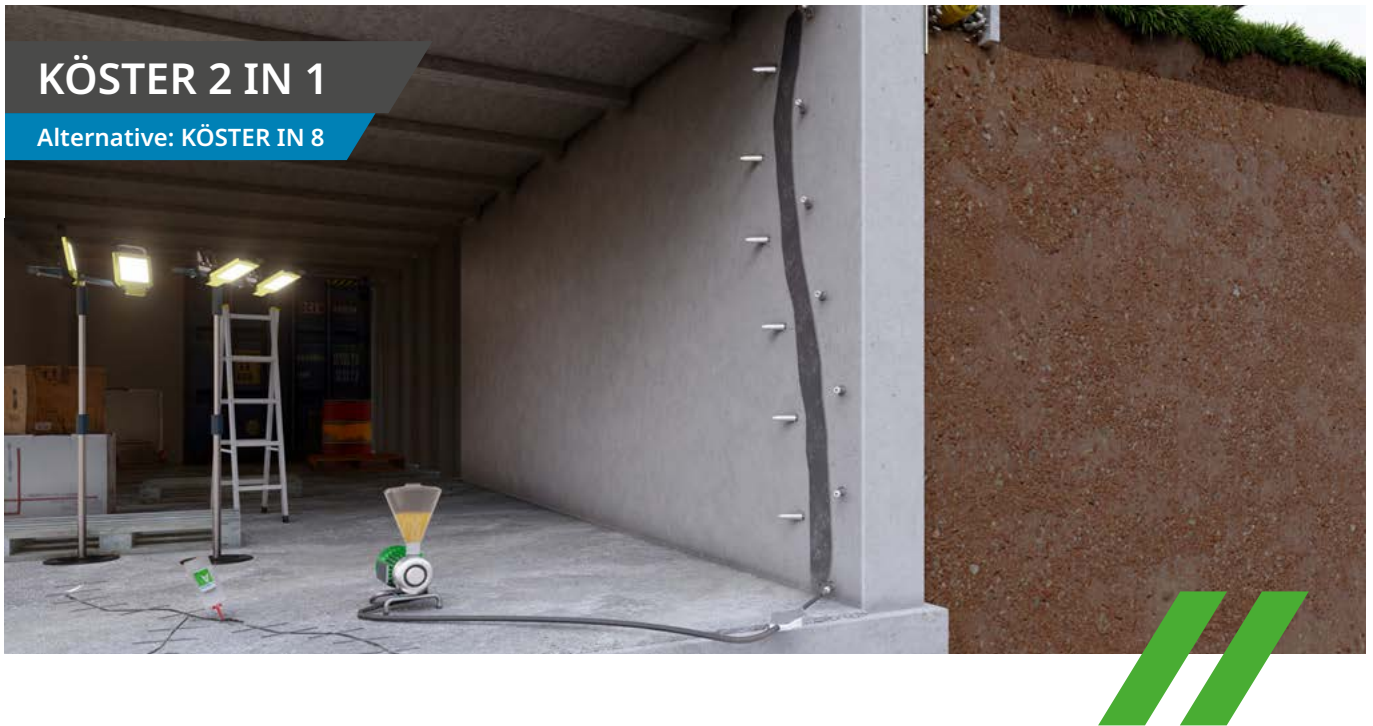
KÖSTER injection technology for crack repair: Waterproofing and structural reinforcement with KÖSTER polyurethane and epoxy resin systems.



Crack Injection



Crack Grouting for Water-Bearing Cracks



Water bearing cracks are permanently sealed with polyurethane injection resins. First, the crack is temporarily sealed (plugged) on the surface with KÖSTER Waterproofing Slurry or Mortar. The injection packers are installed to the left and right of the crack, pointing toward it. This ensures that the crack is always targeted even if it doesn't run perpendicular to the surface. Work proceeds from the bottom up. Every third drill hole is initially left open to check the filling of the crack. Dry or damp cracks are sealed with KÖSTER 2 IN 1.

KÖSTER 2 IN 1 is a universally applicable, two-component, solvent-free PU injection resin for both dry and water-bearing cracks. What makes it special: Upon contact with water, KÖSTER 2 IN 1 forms a highly elastic foam that stops the water and displaces it from the crack. If there is no water in the crack, the material cures into an elastic solid resin for permanent crack waterproofing. For faster flowing water, the fast-curing, foaming injection resin KÖSTER IN 8 is used.

KÖSTER IN 8 foams vigorously upon contact with water, increasing its volume up to 30 times. This produces a solid, viscoelastic, and waterproof polyurethane foam. The foam remains elastic after the reaction and can therefore accommodate crack movements, meaning that additional post-injection with a solid resin is not necessary in many cases.

KÖSTER 2 IN 1



- Reacts to form a foam upon contact with water and an elastic solid resin in a dry environment
- Suitable for dry and water-bearing cracks, making it versatile for use in various injection situations

KÖSTER IN 8



- Single-component
- Very fast-acting, high-foaming injection resin for rapid water stoppage
- KÖSTER IN 8 Accelerator available for an even faster reaction

Structural Repair



KÖSTER KB-Pox IN



In structural crack repair, KÖSTER KB-Pox IN, an epoxy injection resin, is injected into the cracks by pressure injection. To completely fill even fine cracks, an injection pressure of over 10 bar is generally required.

KÖSTER KB-Pox IN is characterized by very high flank adhesion, compressive, and flexural tensile strength. As a result, the repaired crack is stronger than the surrounding concrete. Superficial floor cracks can be repaired through saturation after mixing the two components in the 1-kg (combination) container.

KÖSTER Screed Anchors ensure a full-surface bond of the repaired crack. Subsequently, the treated areas can be finished with floor coatings or other flooring systems.

- Make cuts perpendicular to the crack at regular intervals
- Insert KÖSTER Screed Anchors to improve bonding
- Sprinkle quartz sand over the fully filled cracks in cases of weak concrete or screed to achieve a mineral surface for further coatings



Legal Basis:

Standards and Regulations in Injection Technology



Standards and regulations specify when and how injections are to be performed, which materials are suitable, and how effectiveness is verified. Additionally, they serve as recognized rules of the art, a contractual basis, and a benchmark for assessing proper execution in the event of damage.

In short: Regulations and standards for crack injection ensure that injections are performed safely, effectively, durably, and in compliance with legal requirements.

Important Guidelines for Injections

Standards: DIN EN 1504, Part 5 “Injection of Concrete Structures”

The standard describes the principles of injection technology, such as for structural reinforcement or waterproofing. It defines areas of application and distinguishes between force-fit (F), elastic (D), and the swelling (S) filling of cracks, voids, and defects in concrete. Additionally, moisture conditions are classified as dry, damp, and wet.

The standard specifies exactly which performance characteristics injection materials must meet for test certificates and CE Certification.

Related Technical Rules for Maintenance (TR Maintenance)

TR Maintenance was introduced in early 2021 by the German Institute for Building Technology as the successor guideline to the DAFStb guideline “Protection and Repair of Concrete Components” (RL-SIB 2001) and reflects the current state of the art. It replaces large parts of RL-SIB 2001, but is still applied in part alongside its valid sections (especially Part 3), with TR Maintenance taking precedence. The goal is to improve planning and execution as well as to align with European standards.

In terms of content, it regulates general planning principles, construction products, requirements for contractors, supervision of execution, and specifies testing procedures.

STUVA: ABI Technical Note “Waterproofing of Structures by Injection”

The ABI technical bulletin from STUVA addresses new grouting materials, application techniques, and environmental aspects based on current practical experience. It is intended for planners, clients, and contractors, as well as manufacturers and operators in tunnel construction. Additionally, it places a strong emphasis on execution, supervision, and quality assurance through personnel and equipment.

WTA Technical Bulletin 5-20-09/D “Grout Injection”

The WTA technical bulletin “Gel Injection” focuses on the injection of Acrylic gels. As with traditional crack injection, it describes the procedure, injection materials, and requirements for those performing the work.



Good to Know:

Sealing with KÖSTER Injection Systems



Sufficient pressure is required to completely fill a crack. This ensures that resin or injection grout is transported deep into the crack, particularly in the case of vertical cracks. To achieve this, the crack is typically sealed at the surface with an injection barrier. This allows pressure to build up and prevents uncontrolled leakage of the injection material.

Processing

Before applying the sealant, the crack surface is cleaned to remove dust, dirt, or loose concrete. To improve the adhesion of the injection barrier, it is beneficial to cut into the crack approximately 1-2 cm deep and wide beforehand.

Materials

Fast-setting products are often required for crack sealing. KÖSTER Injection Barrier is a fast-setting, cement-bound mortar that allows even wet cracks to be sealed quickly and easily. The surface must be pre-wetted before application. If higher compressive strength of the sealant is required, KÖSTER KB-Pox IN is an ideal choice as an epoxy resin-bound, fast-setting, and highly robust grouting material. The material can be applied to dry to slightly damp substrates.

The specified curing time for the grouting resin used must be observed in each case.



Waterproofing Against Severe Water Ingress

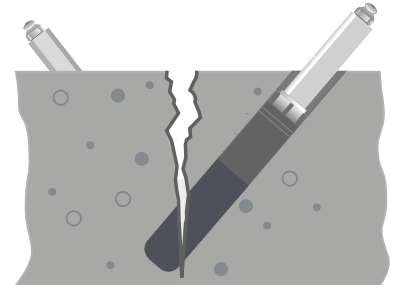
In the event of severe water ingress, it may be necessary to seal the leak mechanically. Depending on the nature of the water ingress, the breach is plugged with a suitable object (e.g., soft wooden wedges), or a wooden or metal strip with a rubber gasket attached to the back. It is attached to both sides of the crack before injection begins. It is crucial that the injection material is not flushed out by the flowing water. In the event of severe water ingress, fast-setting injection materials (e.g., KÖSTER IN 8 with KÖSTER IN 8 Accelerator) must be used.



Crack Injection with KÖSTER 2 IN 1

The following case study of a cracked railway bridge foundation illustrates the crack injection method for waterproofing.

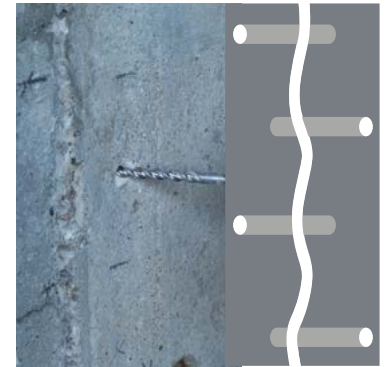
The crack path is usually clearly visible on the surface, but its course inside the structure is generally unknown. Therefore, the drill holes are placed on alternating sides of the crack facing inwards to ensure that at least every second packer hole bisects the crack. This ensures that the crack is not missed.



The crack is opened on the surface in a V-shape (approx. 1 to 2 cm deep). Loose debris and dust are then removed with a brush.



The positions where the injection packers are to be placed are marked. The holes for the packers are drilled along the crack on both sides, alternating at intervals of approximately 10 to 15 cm.



The holes are drilled toward the crack at an angle of approximately 45°. The drill holes are cleaned with compressed air or water.



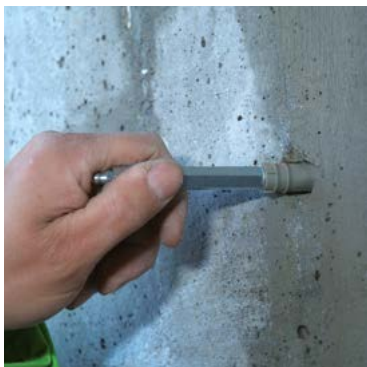
The V-shaped opening of the crack is cleaned with a wire brush.



The crack is pre-wetted.



To prevent material loss, the crack is sealed with sealing mortar, for example KÖSTER KB-Fix 5. Working time approx. 20 min., full curing time approx. 60 min. (at +20 °C).



The KÖSTER packers are inserted into the drill holes, with every third drill hole remaining open for the time being.



The packers are tightened with a wrench.



The A-component is dispensed first, followed by the B-component in a 1:1 ratio, and both are mixed until a homogeneous, streak-free mixture is achieved.



The injection pump is operated in accordance with the operating instructions. The fully mixed resin is then poured into the pump hopper. The mixed material must be used within its pot life.



The injection whip is connected to the packer, the valve is opened by turning it 90°, and the material is pumped from bottom to top through the packers into the crack. Application is performed using the KÖSTER 1C Injection Pump.



The pump is cleaned with KÖSTER PUR Cleaner according to the instructions. After the resin has cured, the packers are removed and the drill holes are sealed, e.g., with KÖSTER KB-Fix 5.



Acrylic gels enable the waterproofing of buildings that would otherwise be impossible. KÖSTER Injection Gel G4 is a high quality, high-end Acrylic gel for all applications. KÖSTER Injection Gel S4 is for particularly fast applications, and with the addition of KÖSTER B+ for increased elasticity and flank adhesion for retroactive joint sealing.



Waterproofing with Acrylic Gels



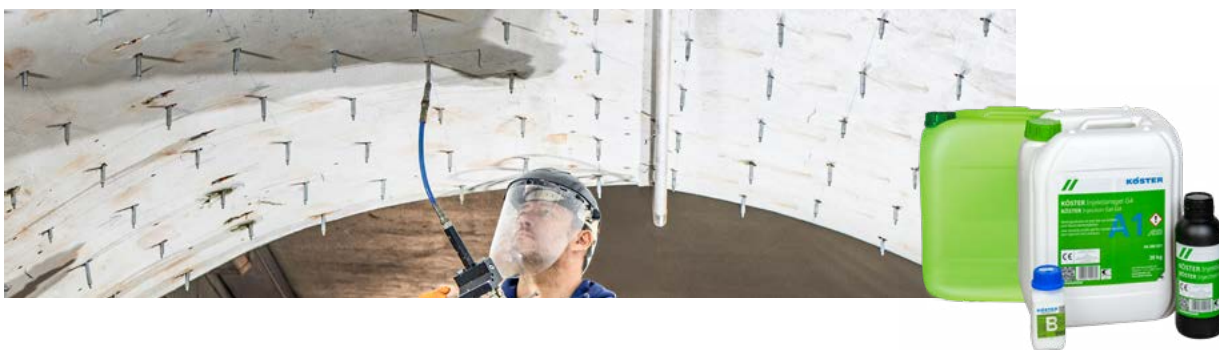


Our Acrylic Gels:

KÖSTER Injection Gel G4 and KÖSTER Injection Gel S4

KÖSTER Injection Gel G4 and KÖSTER Injection Gel S4 are water-based Acrylic gels used for waterproofing structures via injection. Due to their very low viscosity, they penetrate deep into fine cracks, pores, and voids, forming an elastic, waterproof gel.

KÖSTER Injection Gel G4 is primarily used for large-scale waterproofing, particularly for curtain injection to retrofit an exterior waterproofing of structures in contact with the ground. In addition, it can be used for masonry injection, cavity backfilling, and applications in tunnel and shaft construction. The material has the appropriate building authority approval for curtain injection.



KÖSTER Injection Gel S4, on the other hand, is more frequently used for targeted waterproofing measures, such as joint and crack injection or stopping water ingress. A particular advantage is the adjustable reaction time, which varies between approximately 20 seconds and 3 minutes depending on the dosage of the B component and can thus be adapted to different construction site conditions. Additionally, the polymer dispersion KÖSTER B+ can be used to achieve increased adhesion to mineral substrates.



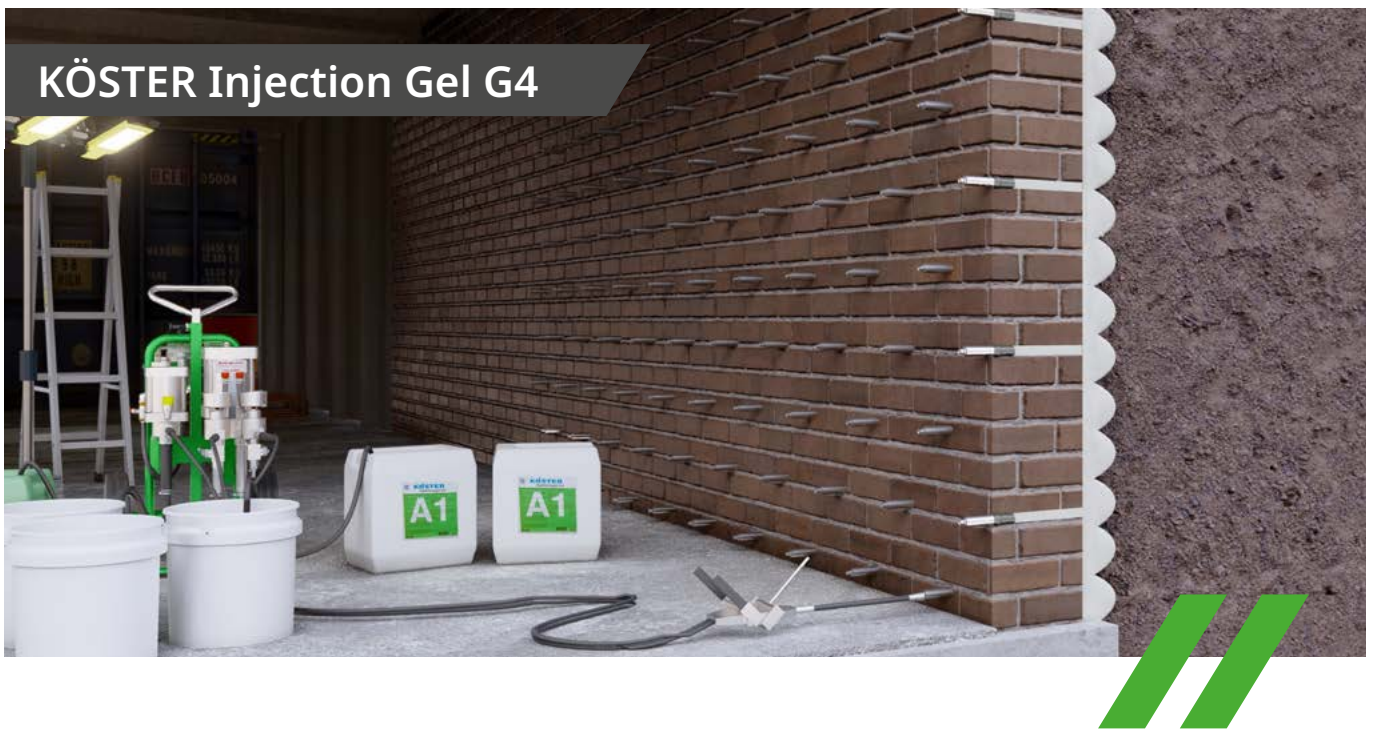
For Additional Sealing of Joints:

KÖSTER Injection Gel S4 B+

KÖSTER B+ is a synthetic dispersion used as an additive with KÖSTER Injection Gel S4. It improves flank adhesion of the acrylic gel on mineral substrates and increases the elasticity and tear resistance of the cured gel. This makes the system particularly suitable for joint and crack injections and can also accelerate the gels reaction speed.



Curtain Injection



Waterproofing the exterior of a basement from the inside? During repairs, it is not always possible to expose the exterior basement walls, for example because the area that needs to be excavated is built over or inaccessible for other reasons. In such cases, interior waterproofing (negative waterproofing) should be considered first. However, in some instances—such as with historic buildings or when special architectural requirements apply—this is also not an option.

In these cases, curtain injection represents an effective method for retrofitting waterproofing on building components in contact with the ground. With KÖSTER Injection Gel G4, it is possible to apply a waterproofing layer to the exterior wall by injecting from the inside.

Water present behind the wall poses no challenge for KÖSTER injection gels, as they do not react with it but instead binds it within their matrix, creating a waterproof, elastic body. Due to the gel's extremely low viscosity, injection is possible in difficult soil conditions such as fine sand, silt, and some clays. Application is performed using the KÖSTER Acrylic Gel Pump and KÖSTER Gel Packers.

KÖSTER Injection Gel G4

Low viscosity

KÖSTER Injection Gel G4 is almost as fluid as water and can therefore easily penetrate fine pored structures under pressure.

Testing

KÖSTER Injection Gel G4 has passed a large number of ecological and toxicological tests and has building authority approval for the respective applications.



Masonry Injection / Area Injection



KÖSTER Injection Gel G4



Vertical masonry injection (also known as area injection) is a standardized method for retrofitting waterproofing in masonry or other monolithic structures when excavation is not possible

Drilling

Drilling is performed from the interior of the structure and is typically carried out horizontally. At wall/floor junctions and in wall corners, holes are additionally drilled at an angle. The drilling depth depends on the wall thickness and is generally approximately 2/3 of the wall thickness.

Drill Hole Grid

The drill holes are arranged horizontally and vertically in a staggered pattern. The spacing depends on the type of masonry, while the diameter depends on the packers used.

Preparation and Injection

The boreholes are fitted with KÖSTER injection packers. In most cases, an injection barrier is required to prevent material loss. For exposed masonry, re-grouting can alternatively be performed without significantly altering the appearance.

Injection and Post-Treatment

Injection with KÖSTER Injection Gel G4 is carried out in several stages until backpressure builds up in the pump. The drill holes are then plugged with mortar. If necessary, the surface can be further treated for decorative and functional purposes.

Horizontal Barriers with Acrylic Gels



Rising damp in masonry occurs when water is transported upward through the capillary pores of the building material. This can lead to damage such as plaster spalling, salt efflorescence, or permanent moisture penetration of the wall. To stop the transport of moisture, injection methods are used in which a material is introduced into the masonry, where it forms a water-retardant or waterstopping barrier. In basements, rising damp can also be associated with water pressing in from the outside, e.g., if the wall/floor connection has become leaky.

The solution: KÖSTER Injection Gel G4 as the ideal horizontal barrier.

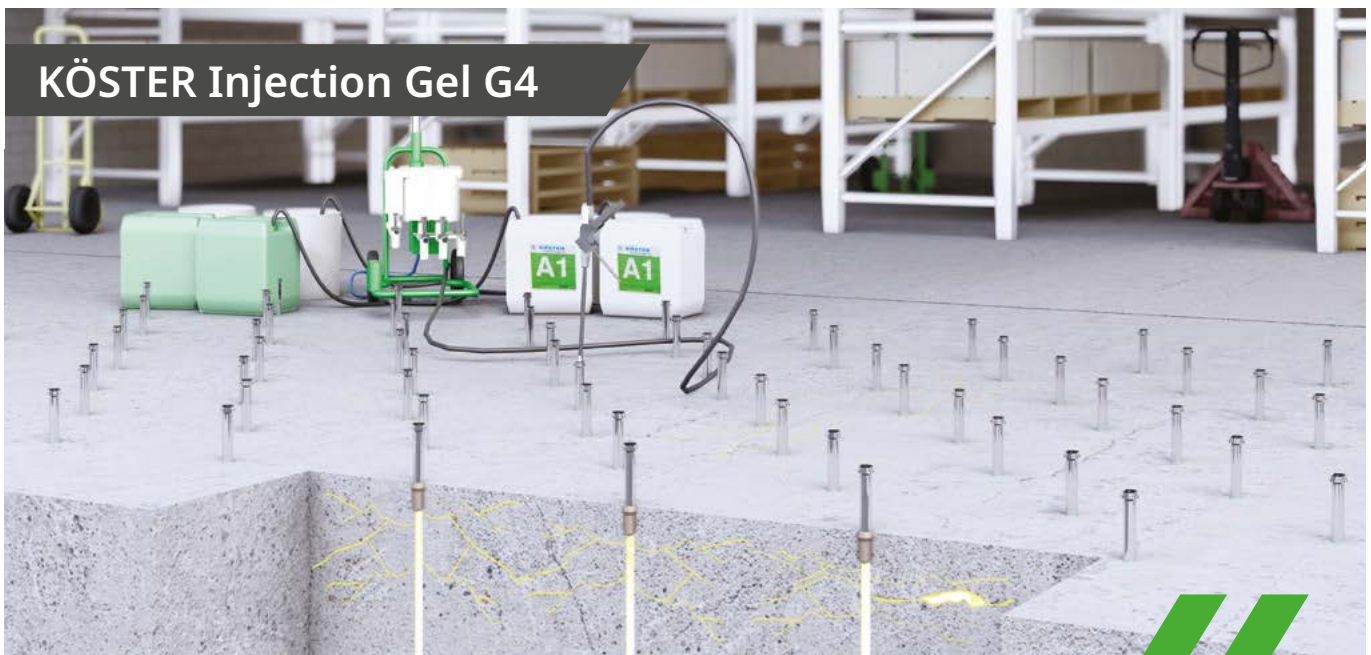
Here, KÖSTER Injection Gel G4 is the ideal horizontal barrier: KÖSTER Injection Gel G4 is characterized by its unusually low viscosity (similar to water) and thus penetrates fine-pored structures and capillaries. Within the masonry, it reacts to form an elastic gel that fills voids and seals water pathways—even against pressurized water.



Typical Signs of Rising Damp



Concrete Injection



Concrete structures can suffer damage to their microstructure due to extreme influences such as temperature cracking and prolonged water transmission. The result is increased porosity, which compromises the durability of the concrete. Construction defects such as insufficient compaction or vibration can also lead to voids or cracks in the concrete.

All of these situations require a system capable of reliably filling even the finest cracks and voids and permanently sealing water pathways within the structure.

Although concrete injection is not among the most common applications, it is an important area of application for acrylic gels. Crucial factors here are the material's very low viscosity and its reliable reaction, without compromising the steel reinforcement.

Application with KÖSTER Injection Gel G4

- Extremely low-viscosity acrylic gel that follows the water pathways within the structural element
- Seals leaks precisely at the source
- Drill holes are arranged in a suitable grid and fitted with packers
- Injection is carried out in several phases until backpressure develops in the pump
- Subsequent sealing of the drill holes (e.g., with KÖSTER KB-Fix 5)



Retroactive Joint Sealing



Retroactive joint sealing with KÖSTER Injection Gel S4 is performed using an injection process in which a low-viscosity acrylic gel is precisely injected into the joint to be sealed. The goal is to permanently stop water penetration and to seal the joint in an elastic and watertight manner. The system is particularly suitable for structures in contact with the ground such as basements, underground garages, or civil engineering structures.

Injection Gel S4 has an adjustable reaction time of approximately 20 seconds to 3 minutes and can thereby be flexibly adapted to different requirements. Adding the KÖSTER B+ component improves flank adhesion as well as elongation and tear resistance while simultaneously accelerating the reaction. Very often, only one or a few packers are required for joint injection.

Processing

- Joint sealing is performed using the KÖSTER Acrylic Gel Pump
- Injection of the mixed components through packers into the joint
- Uniform distribution of the gel and formation of a flexible, watertight seal

The system is used to retroactively seal joints, even against existing pressurized water. Care must be taken to protect the gel from drying out, e.g., by using supplementary joint systems. This creates a durable and reliable seal against both pressurized and non-pressurized water.



Typical Signs of Damage in a Leaking Expansion Joint



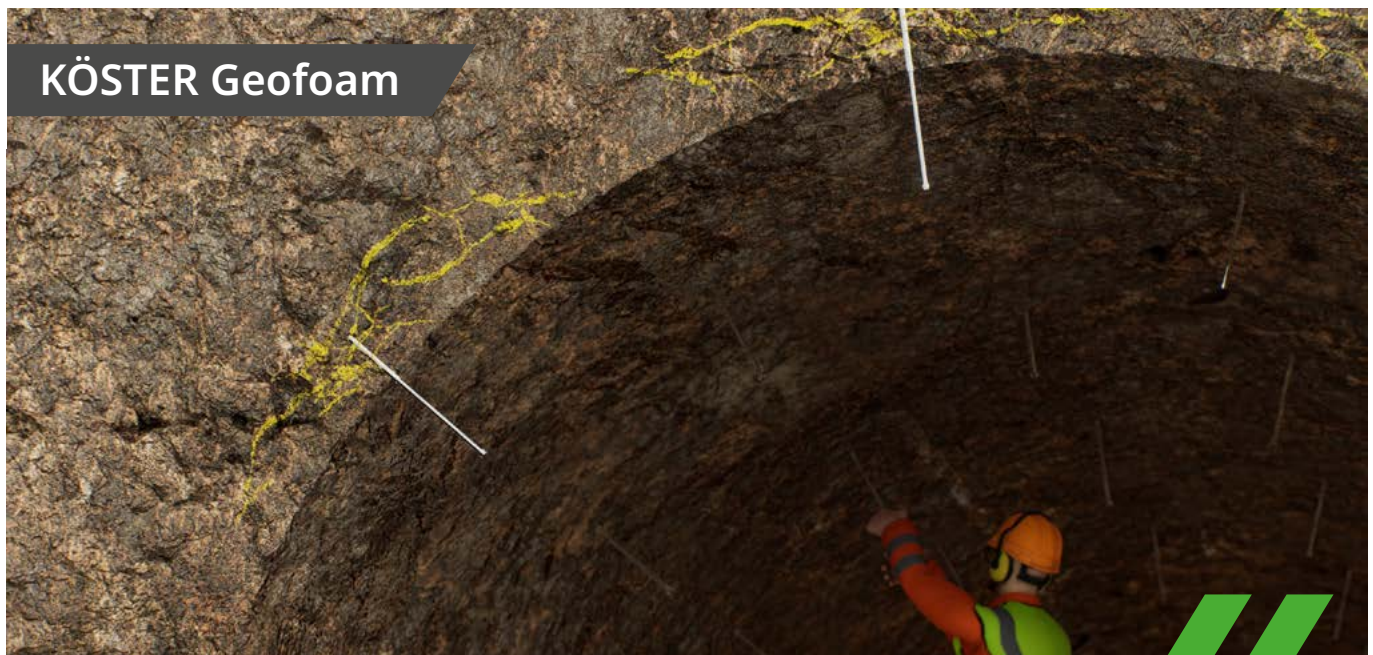
Void injections are used to fill existing voids and gravel pockets within the structure or in the surrounding structure to restore the structural integrity of a component and seal off potential water channels in the structure.



Void Injection



Void Injection with PUR Foam



Void injections fill voids, gravel pockets, or highly porous areas in structures and permanently seals them against water. Using a borehole grid and suitable packers, the injection material is precisely introduced and distributed throughout the void and pore system. This seals water-bearing areas and stabilizes the structural integrity of the component.

Cavity injection with KÖSTER Geoforum is an effective solution for this purpose. The low-viscosity, two-component polyurethane system reacts to form an expanding foam that fills cavities and compacts the surrounding structure. This stabilizes structural elements and prevents settlement.

The closed-cell foam is mechanically stable, non-absorbent, and is also suitable for stopping water ingress. The reaction time can be adjusted by adding the KÖSTER Geoforum Accelerator.

KÖSTER Geoforum

Properties

Two-component polyurethane foam with low viscosity, exceptionally high mechanical stability, and hydrophobic properties.

Application

Developed for soil stabilization in mining and tunnel construction, for backfilling voids, and for stopping water ingress. No water is required for the reaction of the mixed components.

Water stop

KÖSTER Geoforum Accelerator accelerates the reaction time to quickly stop acute water ingress.



Filling of Voids with Mineral Materials



Voids in the building structure or ground can result from washouts, settlement, or inadequate compaction. Such voids compromise the structural integrity of the structure and can lead to further damage such as cracking or settlement. To restore stability, these areas must be specifically filled and consolidated.

KÖSTER Micro Grout 1C is used for cavity injection and foundation repair; KÖSTER VGM Fast, on the other hand, is a grouting mortar used for larger cavities and areas.

In mineral cavity filling, flowable, cement-bound injection mortars are injected into the cavities via drill-packers. The material spreads throughout the cavity and then hardens into a solid mineral mass that stabilizes the subsoil.

KÖSTER Micro Grout 1C

High Strength

KÖSTER Micro Grout 1C achieves very high final compressive strength and ensures a durable and stable filling of cracks and voids.

Easy to apply

The material does not settle during application and can be applied without a special pumping device.

Good injectability

As pressure increases, the injection grout liquefies, preventing blockages in the injection area.





Soil stabilization makes the soil more stable, load-bearing, and resilient. KÖSTER Injection Gel G4 is used for soils with a fine grain size distribution. KÖSTER Geof foam is ideal for filling voids, gravel pockets and other loose soils, and significantly increases the soils compressive strength through volume expansion.



Soil Stabilization



Soil Stabilization with Acrylic Gels



KÖSTER Injection Gel G4



Changes in the groundwater table or water currents can wash fine material out of the subsoil, creating voids. These voids compromise the stability of the soil structure and can lead to settlement, or in extreme cases, collapse.

To prevent this process, soil stabilization is carried out by injecting KÖSTER Injection Gel G4 through special injection lances.

How KÖSTER Injection Gel G4 Works

- penetrates deep into fine soil structures
- binds existing water
- increases the adhesion of soil particles
- prevents washouts
- compacts the soil and increases stability

Applications for Soil Stabilization with Acrylic Gels

- under foundations to prevent settlement and enable further construction work
- through walls to stabilize areas behind them
- for repairing or replacing pipe penetrations
- in dike construction to prevent washouts and underflow

Soil Consolidation with Geofoam



KÖSTER Geofoam and KÖSTER Geofoam Accelerator

Settlement of the building foundation, voids in the subsoil, or water ingress can significantly compromise the stability of structures. To resolve such issues quickly and permanently, injection systems are used to stabilize the subsoil and reliably fill voids.

KÖSTER Geofoam is a two-component polyurethane foam with low viscosity, high mechanical stability, and hydrophobic properties. It was developed for soil stabilization in mining and tunnel construction, the filling of voids, and the prevention of water ingress.

How KÖSTER Geofoam Works

- it is injected into the soil structure under high pressure
- spreads well in voids and open areas
- fills voids with a pressure-resistant material
- compacts the soil
- increases friction and stabilizes the substrate

When used under buildings, careful planning and monitoring is required to avoid static overloads. With the KÖSTER Geofoam Accelerator, the reaction time can be specifically adjusted, allowing the system to be used efficiently even at low temperatures or in the presence of heavy water ingress.



Start of reaction
approx. 30 sec.



Total reaction time
approx. 150 sec.



Non-sticky
approx. 200 sec.



High mechanical stability



Injection technology systems:
KÖSTER injection pumps,
KÖSTER injection packers, and accessories.



Pumps & Packers



KÖSTER Injection Pumps

Cracks, voids, or leaks in concrete and masonry can compromise the structural integrity of buildings and allow water to penetrate. To permanently repair this damage, suitable injection materials must be introduced into the affected areas in a controlled manner and under pressure.

KÖSTER injection pumps enable precisely this accurate and uniform injection of injection resins, gels, or injection grouts into cracks and voids. This allows structural elements to be sealed, cracks to be closed, or horizontal barriers against rising damp to be installed. Depending on the application, different pump types are available for various injection materials and methods.

KÖSTER Acrylic Gel Pump

Stainless steel pneumatic pump for installing KÖSTER Injection Gel G4. The KÖSTER Acrylic Gel Pump is specifically designed for installing injection gels and offers reliable and high-performance operation in injection applications.

High flow rate

Up to 10 l/min, enabling efficient work even on larger areas.

Precise mixing ratio (1:1)

Ensures uniform and reliable application of the injection gels.

Sturdy stainless steel design with a complete system

Built to last, including a mixing head, hoses, and a flushing pump for professional use.



KÖSTER 1C Injection Pump

Pump for high-pressure injections into cracks or voids. The pressure can be continuously adjusted from 0 to 200 bar. The KÖSTER 1C Injection Pump is designed for processing single-component injection materials and enables simple and flexible application in injection work.

Easy application with 1C materials

No mixing required in the pump, reducing potential sources of error

Versatile

Suitable for various injection materials and applications (e.g., crack injection).

Compatible with standard injection methods

Can be applied using standard single-component injection equipment and materials.



KÖSTER Loka Hand Pump

Hand-operated diaphragm pump for dispensing and injecting KÖSTER 1C Micro Grout.

Independent of electricity and compressed air

Manually operated, ideal for smaller or hard-to-reach construction sites.

Easy to use

A long hand lever and sturdy construction ensures comfortable operation.

Integrated pressure control

A pressure gauge and pressure equalization tank ensures controlled grouting.



KÖSTER Packer

Special injection packers are used to ensure that injection materials can be precisely introduced into cracks, joints, or voids. They connect the injection pump to the structure and enable controlled injection of the material.

KÖSTER packers are inserted into prepared boreholes and reliably seal them during injection. The injection material is introduced under pressure into the crack or void via the connection. Depending on the application, various types of packers are available, e.g., impact packers or gel packers.

KÖSTER Impact Packer 12

Plastic injection packer with ball valve for low-pressure injection. Diameter 12 mm.



12 x 70 mm

KÖSTER Gel Packer

consisting of a base, end piece, and extension pipe (800 mm)

Impact packer for gel injections with a pan-head fitting and shut-off device. With threaded connection for extension pipe. 18 mm x 115 mm.



18 x 115 mm

KÖSTER Packer

The KÖSTER packer is ideally suited for pressure injection. The arrangement of the split packer grommets ensures excellent contact pressure in the borehole. The surface of the tensioned grommets grips the borehole wall, conforms to it, and thus increases its tightness. It features a permanently mounted cone-head nipple and is galvanized.



13 x 115 mm

KÖSTER Impact Packer 12 for injection grout

Impact packer with straight-aligned blades for installing KÖSTER injection grouts, 12 x 95 mm, with compressed air nipple connection (no check valve), clear bore 7 mm.



12 x 95 mm

Important Product Tests

Testing Institute	Test number	Test description
KÖSTER Injection Gel G4		
DIBt ¹	Z -101.29-28	General building authority approval. Evaluation of the injection gel regarding its effects on soil and groundwater when used as a curtain grout within the scope of state building codes.
MFGPA Leipzig ²	PB 5.1/15-500-1	Investigation of elution behavior (ecotoxicological effects on groundwater)
MFGPA Leipzig ²	PB 5.1/15-500-2	Determination of identifying characteristics
MFGPA Leipzig ²	PZ 3.1/16-134-1	Test for normal flammability (building material class B2) according to DIN 4102-1:1998
ibac ³	M 2148	Quantification of the corrosion protection effect of the gels used for reinforcing steel
Hygiene Institute of the Ruhr Region	-	Drinking water testing (seals for pipes ON < 80 mm cold water)
Hygiene Institute of the Ruhr Region	-	Drinking water testing (seals for pipes 80 mm s DN < 300 mm cold water)
Hygiene Institute of the Ruhr Region	-	Drinking water hygiene testing in accordance with the requirements of DIN EN 12873-1:2014-09 and DIN EN 1420:2016-05
Hygiene Institute of the Ruhr Region	-	Testing in accordance with DIN EN 16421: 2015-05, influence of materials on water intended for human consumption
IMS AD ⁴	UIV 001/17	Determination of water impermeability up to 7 bar
INSTITUTE IGH, d.d. ⁵	72530-PS/050/17	Changes in volume and weight after air drying and water storage cycles
Instytut Techniki Budowlanej ⁶	LZM00-01387/17/ Z00NZM	Testing for pot life, water resistance, water sensitivity, and sensitivity to dry-wet cycles
Instytut Techniki Budowlanej ⁶	LZM00-01515/17/ Z00NZM	Testing of serviceability in accordance with EN 9514: 2006
SAFE+ Certification GmbH	500324-2456-21	Drinking water approval P3 (small container components with a surface area in contact with the liquid of less than 1% of the container (e.g., repair systems))

¹ German Institute for Building Technology

² Society for Materials Research and Testing Institute for Construction, Leipzig mbH

³ Institute for Building Research, Building Preservation, and Polymer Composites

⁴ Institute for Materials Testing AG, Belgrade

⁵ Department of Materials and Civil Engineering, Croatia

⁶ Group of testing laboratories, Poland

⁷ Institute of Ceramics and Building Materials, Poland

⁸ Materials Testing Institute for the Construction Industry |

Institute for Building Materials, Solid Construction, and Fire Protection

Testing Institute	Test number	Test description
KÖSTER Injection Gel G4		
DIBt ¹	Z -101.29-52	General building authority approval. Evaluation of the injection gel regarding its effects on soil and groundwater when used as a curtain grout within the scope of state building codes.
SAFE+ Certification GmbH	500324-2456-21	Essential requirements in accordance with DIN EN 12873-2; successfully tested for contact with cold (23 °C) and warm (60 °C) water in accordance with Report No. K- 388707-24 of the Ruhr Area Hygiene Institute.
IMS AD ⁴	128/19	Determination of water impermeability on different concrete surfaces in short- and long-term studies
MFPA Leipzig ²	PB 5.1/19-090-2	Investigation of elution behavior (ecotoxicological effects on groundwater) in connection with 0.2% B+ component
MFPA Leipzig ²	PB 5.1/19-090-1	Investigation of elution behavior (ecotoxicological effects on groundwater) in conjunction with a 1% B+ component
Hygiene Institute of the Ruhr Region	-	Drinking water hygiene testing in accordance with the requirements of DIN EN 12873-1:2014-09 and DIN EN 1420:2016-05
INSTITUTE IGH, d.d. ⁵	72530-PS/002/19	Test series for the protection and repair of concrete structures in accordance with: EN 12618-1 :2003 EN 14068:2003 EN 1771:2004/AC:2005 EN 1771 :2004/AC:2005 ISO 3219:1993 EN ISO 3219:1994 ISO 9514:2005, EN ISO 9514:2005 EN 12637-1:2004 EN 14489:2004
Hygiene Institute of the Ruhr Region	-	Testing in accordance with DIN EN 16421: 2015-05, Influence of materials on water intended for human consumption
SAFE+ Certification GmbH	500322-2574	Drinking water approval P3 (small container components with a surface area in contact with the liquid of less than 1% of the container (e.g., repair systems))

KÖSTER IN 1, KÖSTER IN 2, KÖSTER IN 4

Instytut Techniki Budowlanej ⁶	AT-15-7562/2014	Polish approval for use
Instytut Ceramiki i Materiałow Budowlanych ⁷	88/10-ZKP-078-03	Confirmation of the technical provisions of the Technical Approval regarding factory production control

KÖSTER IN 2

Aquanet Laboratorium	704K/25.02.2022-1/Z	Testing for the migration of harmful substances from materials that come into contact with cold water
National Institute of public health	B-BK-60210-1445/21	Form for confirmation of professional use of the product with protective clothing
Hygiene Institute of the Ruhr Region	-	Test report in accordance with the coating guidelines of the Federal Environment Agency

KÖSTER IN 5

MPA iBMB TU Braunschweig ⁸	5311/992/11	Testing of the performance and identity characteristics of the polyurethane resin "KÖSTER KB-PUR IN 5" in accordance with DIN EN 1504-5
MPA iBMB TU Braunschweig ⁸	5311/992/11	Certificate of Conformity for Factory Production Control in accordance with standard EN 1504-5:2004

KÖSTER IN 5, KÖSTER 2 IN 1, KÖSTER IN 1, KÖSTER KB-Pox IN

MPA iBMB TU Braunschweig ⁸	5311/992/11	Certificate of conformity of the factory production control in accordance with standard EN 1504-5:2004
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