KÖSTER
Waterproofing Systems

KÖSTER Injection Gel S4

Technical Data Sheet IN 294

Issued: 2020-10-01

- Testing report of Insitute für Material Testing Serbia, Br./No. UIV 128/19, Resistance against pressurized water after storage under normal conditions and after 7d storage in 0,1N NaOH and 0,1N HCl
- Test report PB 5.1/19-090-1 Elution behavior with 1.0 M% B+
- Test report PB 5.1/19-090-2 Elution behavior with 0.2 M% B+
- Test report from IHG Zagreb, Croatia, No. 72530-PS / 002/19, from May 15, 2020, initial test according to EN 1504-5
- General building approval, Z-101.29-52, KÖSTER Injection Gel S4 as Gel curtain injection, valid thru 5th Aug. 2025

Acrylic gel for stopping active water ingress, joint, and curtain injection with adjustable reaction time

CE	**KÖSTER BAUCHEMIE AG Dieselstraße 1-10, 26607 Aurich 20 IN 294 EN 1504-5:2004 Concrete-Crack filler: Concrete injection for the elastic filing of cracks, voids, and defects U(D1)-W(1)-(1/2)-(5/30)**
Adhesion capacity	0,04 MPa
Elongation capacity	70 %
Water tightness	D1 watertight at 2x10^5 Pa
Viscosity	9 mPas
Working time	2:20 Min. (21 °C, slow mixture) 1:00 Min. (25 °C, slow mixture) 16 Sec. (21 °C, fast mixture) 9 Sec. (25 °C, fast mixture)
Injectability into dry medium	Injectability class: 1 (0,1 mm crack width) (<4 Min.)
Injectability into non-dry medium	Injectability class: 1 (0,1 mm crack width) (<4 Min.)
Compatibility with concrete (adhesive tensile strength after temperature changes and wet-dry cycles)	no compressive failure / loss, deformation capacity <20% in relation to the water-stored reference
Corrosion behaviour	deemed to have no corrosive effect
Dangerous substances	NPD

Features

KÖSTER Injection Gel S4 is used for stopping active water ingress, to quickly seal joints and for curtain injection. The setting time can be adjusted between 10 seconds and 3 minutes by changing the added amount of the B component.

By adding an organic dispersion to the B component (KÖSTER B+), the gel can achieve a particularly high flank adhesion on mineral substrates. The organic dispersion accelerates the gel by approximately a factor of 2 and significantly improves the elongation at break.

Colored versions of the gel can be made on site by the addition of separately supplied pigments.

The standard set is supplied as follows; A1 component: 20 kg, A2 component: 1 kg, B component (salt): 0.4 kg. All components can also be ordered separately. To increase the flank adhesion and improve the elongation and tear resistance, the B + component (dispersion) can be ordered separately. Colored versions of the gel can be made on site by the addition of separately supplied pigments.

For curtain injections KÖSTER Injection Gel G4 is recommended. When using KÖSTER Injection Gel S4 as a curtain injection, it must be noted that the injection parameters (quantity of material per stroke, number of strokes, waiting times, pressure, etc.) must be changed and the injection theory presented in the training courses is not transferable.

The KÖSTER Injection Gel S4 is resistant to pollutants commonly found in subsoil and building components; such as salts, etc.

Technical Data

Mixing ratio

Standard mixture (Salt content: 400 g)

Component A		Component B		Reaction time in seconds at + 20 °C
A1	A2	B	Water	45 sec.
20 kg	1 kg	0.4 kg	20 kg	
A1	A2	B	B+	45 sec.
20 kg	1 kg	0.4 kg	18 kg	

Slow mixtures (50 g salt; at about 1 cm filling height from the container)

Component A		Component B		Reaction time in seconds at +20 °C
A1	A2	B	Water	90 sec.
20 kg	1 kg	0.05 kg	20 kg	
A1	A2	B	B+	135 sec.
20 kg	1 kg	0.05 kg	18 kg	

Even slower mixtures are not recommended to be adjusted with the amount of salt due to the danger that the reaction does not even start under real conditions due to impurities in the injection area. Please contact our technical consultants for reaction time over 3 minutes. In these cases use KÖSTER Injection Gel G4.

Fast mixtures (2.5 containers of the B-salt)

Component A		Component B		Reaction time in seconds at +20 °C
A1	A2	B	Water	20 sec.
20 kg	1 kg	1 kg	20 kg	
A1	A2	B	B+	10 sec.
20 kg	1 kg	1 kg	18 kg	

As with all reactions with injection gels, the reaction time is always dependent on the material temperature. The following diagram may be used for approximate orientation, measured for the standard mixture without KÖSTER B +:

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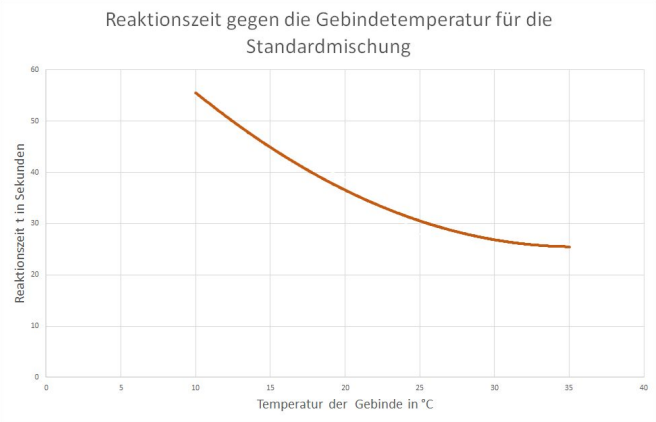

Fields of Application
Water stoppers: In the event of heavy water ingress, injection solutions can be realized if the gel times are accelerated to a high degree.

Joint injection in buildings, underground garages, bridges, and similar structures: Using KÖSTER B+ organic dispersion improves both the flank adhesion and the elongation at break, which especially makes sense when injecting joints. The reaction times are approximately halved in contrast to the standard mixture, but can still be controlled by the amount of salt. For joint injection a longer gel time is usually recommended. Sealing joints with KÖSTER Injection Gel S4 is typically done on building components in contact with soil for repair work to stop water entering from outside. Acrylic gel joint waterproofing must always be designed in such a way that the gel seal can not dry out, e.g. by using KÖSTER FS joint Sealant or KÖSTER joint tape 20.

Curtain Injection: For the demarcation of curtain injections in the edge area, a more rapid gel time (for example into gravel) may be useful to avoid further outflow of the material. It would also be possible to adjust a lower penetration of average sands over a faster reaction time.

In other cases it is recommended to use KÖSTER Injection Gel G4 with a particularly low viscosity and a standard reaction time of 4 minutes.

Application
The processing of the material is carried out with a two-component pump with a water rinsing circuit such as the KÖSTER Acrylic Gel Pump. Prior to processing, the components are adjusted to the desired gel time as described. It should be noted that the setting of the gel requires that the injection technique can be made technically feasible correspondingly shorter gel times. Too much acceleration of the gel increases the risk that the mixing head is clogged by gel.

Mixing the components

Standard mixtures
A component
The A2 component (1 kg) is completely filled in the A1 canister, closed and mixed by rocking the container on its edge for 3 minutes.

B component
For the standard mixture, which gives a gel time of 45 seconds at + 20 °C, the supplied B-component is completely filled into the empty canister and filled with 20 kg of water to a height of 21 cm (to be marked in advance).The green canister can be cleaned after use and re-used.

Other gel times, B component
For other gel times read from the diagram, the B component (powder - 50 g salt; about 1 cm filling height from the container) is taken out with the measuring cup according to the graduation and transferred to the empty green canister. This is then filled with 20 kg of water (filling height of approx. 21 cm), sealed and mixed by rocking for 30 seconds.

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All gel times with KÖSTER B+, B-component
if the organic dispersion is to be used, the measured amount of salt is transferred into the canister with the KÖSTER B+ component. The mixture is made by vigorous shaking for 3 minutes. Water is not added.

The mixed components can be processed for 2 hours.

Curtain injection
In the case of curtain injection, the building component to be injected is drilled in a grid of typically 40 cm square with a central hole in the center and with 10-18 mm high pressure packers are installed (such as the KÖSTER Superpacker). In the case of perforated bricks, injection lances (for example KÖSTER Distributor Lance) or KÖSTER Gel Packers are used which discharge the material to be injected on the outside of the building component in order to avoid filling the cavities. The injection is carried out in a multi-stage process with adjusted injection pressure and waiting time corresponding to the temperature between the injection stages. Please note: Too fast gel times for the KÖSTER Injection Gel S4 are not suitable for curtian injection, because sufficient distribution is not achieved. For detailed instructions please contact the KÖSTER technical support.

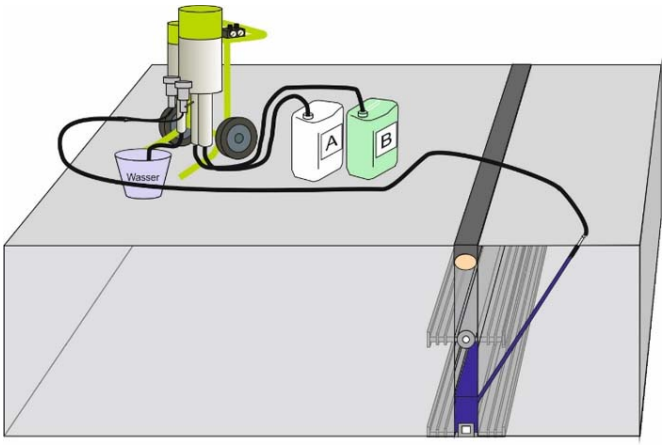
When used as a curtain injection, the applicable regulations for groundwater protection in the respective country must be observed. In Germany, a general building inspectorate test certificate is required for application as a curtain injection. KÖSTER Injection Gel G4 should be used here.

Sealing water leaks
Generally, adjustable acrylate gels are pressed in a high-volume flow, in such a way that the hardening gel layers clog up the outflow of the water. The drilling technique must always be adapted to the circumstances in order to achieve a positive result.

Joint injection
Joint injection must always be adapted to the circumstances. Standardized cases can not be described coherently due to the large number of different joint structures.

In general, the number of packers can often be kept relatively low in the area of joint injection since the grout can spread well within the joint. For overhead work on horizontal joints (eg in multi-storey car parks), it may be useful to pre-inject the joint with KÖSTER Injection Gel S4 to prevent the gel from leaking out of the joint, and then use the KÖSTER Injection Gel S4 with the B+ component added to fill the joint .

It is always the case that the holes should be positioned so that existing waterproofing is not drilled through if possible, as shown by way of example in the illustrated injection between an inner and an outer water bar.



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To avoid soiling of surfaces, walls and floor areas should be covered before starting work. Cured gel on floor and wall surfaces can be removed mechanically if necessary.
For detailed processing instructions, please contact the KÖSTER technical department.

Consumption
Depends on the field of application

Cleaning
Clean the pump immediately after use with clean water. For this, the three intake hoses are placed in the three clean buckets supplied. The buckets are filled with clean water and pumped through the machine.

Packaging

IN 294 001 A2	1 kg
IN 294 010 B	10 kg
IN 294 018 B+	18 kg
IN 294 020 A1	20 kg
IN 294 021	Component A1: 20 kg; Component A2: 1 kg; Component B: 0.4 kg
IN 294 400 B	400 g

Storage
Store cool and dry in originally sealed containers. The containers can be stored for for a minimum of 6 months under proper storage conditions (dry, + 10 °C to + 25 °C). The A components should not be stored in direct sunlight.

Safety
Suitable liquid-tight protective clothing, chemical-resistant gloves and tight-fitting safety goggles or face shields must be worn during the processing of the product. During the application of the material pressure builds up. Do not stand directly behind the packers. In case of skin contact, wash off the material immediately with lots of soap and water. In case of eye contact, flush eyes immediately and thoroughly with water or preferably an emergency eye wash bottle. Consult a doctor. Observe all governmental, state, and local safety guidelines when processing the material.

Related products

KÖSTER KB-FIX 1	Prod. code C 511 015
KÖSTER KB-FIX 5	Prod. code C 515 015
KÖSTER Injection Gel G4	Prod. code IN 290
KÖSTER Injection Barrier	Prod. code IN 501 025
KÖSTER Masonry Packer 13 mm x 85 mm CH	Prod. code IN 901
KÖSTER Masonry Packer 13 mm x 115 mm CH	Prod. code IN 902
KÖSTER Superpacker 10 mm x 85 mm CH	Prod. code IN 912 001
KÖSTER Superpacker 10 mm x 115 mm CH	Prod. code IN 913 001
KÖSTER Superpacker 13 mm x 85 mm CH	Prod. code IN 914 001
KÖSTER Superpacker 13 mm x 115 mm CH	Prod. code IN 915 001
KÖSTER Superpacker 13 mm x 85 mm PH	Prod. code IN 916 001
KÖSTER Superpacker 13 mm x 115 mm PH	Prod. code IN 917 001
KÖSTER Acrylic Gel Pump	Prod. code IN 930 001
KÖSTER Gel Packer (Base)	Prod. code IN 931 001
KÖSTER Gel Packer (End piece)	Prod. code IN 932 001
KÖSTER Gel Packer extension pipe 800 mm	Prod. code IN 933 001
KÖSTER Grip Head	Prod. code IN 953 005
KÖSTER Joint Sealant FS-V black	Prod. code J 231
KÖSTER Joint Sealant FS-H black	Prod. code J 232
KÖSTER Joint Sealant FS-V grey	Prod. code J 233
KÖSTER Joint Sealant FS-H grey	Prod. code J 234
KÖSTER KD 2 Blitz Powder	Prod. code W 512
KÖSTER Repair Mortar	Prod. code W 530 025
KÖSTER Waterstop	Prod. code W 540 015
KÖSTER Rubber Gloves	Prod. code X 920 001

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