Injection grouts for the maintenance and refurbishment of buildings and infrastructure.

**EXPERIENCE**
The production and marketing of injection products has for decades been the undivided focus of our company’s business activities. As the construction industry’s first ever provider of acrylic grouts, RASCOR boasts a longer track record (dating back to 1963) than any other player in the sector in the manufacture of these highly sensitive products.

**RESEARCH AND DEVELOPMENT**
Advances in construction technology – by paving the way for taller structures, deeper foundations and solutions to increasingly difficult subsoil conditions – have, in turn, imposed ever more complex requirements on injection products. As a result, RASCOR’s Research and Development department has seen itself confronted with continually growing demands. An expanding portfolio of special products coupled with refinements to our time-honoured standard products testify to the success of this department.

1. Joint sealing
2. Crack injections
3. Grout curtains
4. Consolidating injections, ground stabilization, controlled structural lifting
ECOLOGY AND ENVIRONMENTAL PROTECTION
In addition to the demands placed by the wide assortment of grouting applications, injection products are subject to various other requirements that are no less important.

A large number of adequately performing products in use for decades have had to be withdrawn from the market by manufacturers in the recent past, due to their demonstrably negative environmental impact. Preliminary trial versions of all RASCOflex Injection Grouts are put through wide-ranging environmental hygiene tests prior to their development into marketable products. Indeed, we not only rely on our own in-house test methods. We also commission externally accredited institutes to investigate our materials from a variety of ecological aspects. As RASCOR, we deliberately set the bar high. We always aim to achieve the maximum possible and not just the minimum necessary.

PERSONAL SAFETY AND SECURITY
Safe product handling and use is a further key issue. In developing our products, we give top priority to safety issues and health-friendly formulations. The necessary personal protective equipment is specified with the utmost care. Moreover, the products are assembled and packaged in such a way as to guarantee customer-friendly shipment and storage.

The specified safety precautions for application are limited to the use of protective clothing, gloves, goggles etc., as is normal for most reactive synthetic resins. For up-to-date information on these precautions, please consult the relevant safety data sheets.

CHEMICAL RESISTANCE
RASCOflex Grouts exhibit an above-average chemical resistance, both in their liquid and polymerized states, i.e. both prior to and during service. They are suitable for use in sewage plants treating domestic waste, applications involving contact with acids and alkalis, and in the chemical industry. In the latter case, however, a prior water analysis is required.

RASCOflex Resin Grouts can be divided into three main categories – acrylics, polyurethanes and urea-silicates – and their specific chemical resistance varies according to product type. Our acrylic grouts are resistant to most chemical action, including diluted acids and alkalis, rot and bacterial growth – and this without the inclusion of any special protective colloids, fungicides or pesticides in the formulations. It is, however, recommended that the suitability of the selected RASCOflex Resin Grout always be checked in advance for the relevant application.

FIRE PERFORMANCE
The fire behaviour of RASCOflex Acrylic and Urea-Silicate Grouts is uncritical, as certified by the results of the stringent suitability test for products used in the London Underground. RASCOflex Acrylic and Urea-Silicate Grouts are non-combustible and release hardly any measurable gases, even under long-term fire exposure.
Through their extra-low viscosity, high flexibility and hydrophilic properties, RASCOflex AY Acrylic Grouts seal even the finest cracks against high water pressures.
**RASCOFLEX AY108**

Apart from its use in remedial joint and crack injections, RASCOflex AY108 resin grout also boasts a successful, decades-long track record as an integral part of designed-in, preventive waterproofing solutions, e.g. to seal construction joints, expansion joints and penetrations using injection channels, injection collars, crack inducers and stop ends. It is now an established feature of waterproof concrete basement systems. For further details, please consult the „RASCOtec Injection System“ and „White Tank System RASCOR“ brochures. RASCOflex AY108 excels by a number of highly advantageous properties, specifically its reversible swelling action (i.e. volumetric increase/decrease) and its chemical and temperature resistance. Use of the RASCOflex AY-AC Accelerator also allows the grout to be injected against very high water pressures and flows in remedial waterproofing applications.

**PROPERTIES**

- Injection systems for preventive waterproofing
- Suitable for use in „dry-wet“ fluctuating level zones
- Remedial injection of cracks and joints even smaller than 0.1 mm
- Protects reinforcement against corrosion
- Provides reliable seal even in contaminated environments without additional precautions

**RASCOFLEX AY408**

RASCOflex AY408 is used for injections in the subsoil and behind or under structural elements. The resulting grout curtains and membranes thus provide a reliable waterproof barrier to external buried surfaces without the need for elaborate excavations and regardless of masonry type (rubble, clay brick etc.). The injected RASCOflex AY408 membrane forms a strong, wide-area barrier to water infiltration in the problem zone.

**PROPERTIES**

- Grout curtains for wide-area external waterproof membranes
- Consolidating injections behind/below joints, cracks and fissures
- Ground stabilization

**RASCOFLEX AY808**

RASCOflex AY808 is used to stabilize and consolidate weak, water-saturated subsoils. By virtue of its high penetration, this acrylic grout is able to completely fill water-saturated soils and bind the water. This stops the ground from collapsing due to water infiltration during later excavation.

**PROPERTIES**

- Ground injections
- Ground stabilization
- Rock injections
- Ground consolidation to interrupt watercourses
- Pre-injection for ground stabilization prior to subsequent excavation
- Injection possible against permanent water pressure

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1. Injection of RASCOtec injection channel with RASCOflex AY108
2. Injection of wall crack with RASCOflex AY108
3. Injection of floor crack with RASCOflex AY108
4. Special formulation for tunnel project
5. Injection behind masonry with RASCOflex AY408
6. Stabilizing ground injection with RASCOflex AY808
RASCOflex PU Polyurethanes – versatile grouts with a wide variety of applications.

**Injection Products**

RASCOflex PU Polyurethanes are formulated so as to foam upon contact with water and thereby halt the water flow. The polyurethane grout injected behind this then gels into a compact PU mass, without any contact with water, to provide a permanent waterproof seal.

RASCOflex PU Polyurethanes can be split into three main groups. The PU309 series products form a grout body with rigid elastic properties. The PU110 series, on the other hand, exhibits low viscosity in the liquid state and cures into a “soft”, highly flexible mass, thereby making it suitable as a permanent waterproof barrier.

**Properties**
- Mixed in ratio 1:1 by volume
- Serves as both preliminary and main injection
- Also cures in the absence of water
- Gel times of only a few seconds are possible
- High final strength or extremely expansible, permanently elastic mass, depending on selected system

**Application**

All RASCOflex Polyurethane are supplied ready-to-use for mixing in the ratio 1:1 by volume. For rapid-curing materials, RASCOR recommends the use of a two-component grouting machine. The two components are fed separately to a static mixer immediately upstream of the drill hole, where they are blended into a homogeneous mix.

The slow-curing polyurethane grouts can also be injected with a one-component grouting machine. Use of a high-speed stirrer is, however, required to premix the two components to a homogeneous consistency in the mixing container.
RASCOFLEX PU309
The RASCOflex PU Polyurethane PU309 series can be classified according to their different gel times and viscosities. All grouts, however, have the same B component (isocyanate).

Each system can be additionally fine-tuned through the use of separately obtainable catalysts. While accelerators shorten the gel time and thixotropic additives increase the viscosity of the mix, special foaming agents can be used to achieve a high foam factor. These options provide for a high degree of flexibility in meeting the wide-ranging performance requirements that are often placed on a single product. RASCOflex PU309 is injected behind or directly into the problem area or into the ground using a packer or lance.

APPLICATIONS
- Provision of barrier against water infiltration
- Void filling
- Soil stabilization/consolidation
- Ground improvement
- Ballast bonding
- Sealing of cracks and joints

RASCOFLEX PU110X / PU510F
This soft, elastic polyurethane resin was specially developed as a permanent, ductile barrier both for remedial crack and joint sealing and for preventive joint waterproofing in conjunction with an injection system in civil engineering applications. The initially injected material foams slightly upon contact with water. The material following behind this then gels to provide a durable seal. For small-scale applications, the two components should be premixed and injected with a one-component machine. In case of heavy water flow, a temporary barrier can be provided through pre-injection with RASCOflex PU510F, a 1-component polyurethane foam.

APPLICATIONS
- Limited ductile sealing of cracks and joints
- Injection system for preventive joint waterproofing
- Consolidating injections behind structures and joints
- Durable, permanently elastic waterproof barrier

RASCOFLEX PU112
The tough, elastic polyurethane resin is used for the structural bonding and waterproofing of cracks in concrete fabric, masonry, rock and soft ground in a single operation. Featuring a combination of polyols, isocyanates and special additives, the PU system has been tested and approved to EN 1504-5 and DIN V 18028.

APPLICATIONS
- Structural crack and joint injections forming permanent waterproof barrier
- Grouting of injection hoses
- Bonding of concrete elements

1 Excavation support with RASCOflex PU309
2 Wide-area injections for rock stabilization with RASCOflex PU309
3 Sealing of tunnel lining joints with RASCOflex PU110X
4 Ductile crack injection with RASCOflex PU110X
5 Structural bonding & waterproofing injection with RASCOflex PU112
6 Structural bonding with RASCOflex PU112
RASCOflex US Urea-Silicate Grouts are generally mixed in the ratio 1:1 by volume. Due to their short gel times, these products must be applied using two-component injection pumps. The A and B components are thus fed separately up to the drill hole, where they are blended—like the two-component polyurethane grouts—in a static mixer.

These grouts can be split into two groups: foaming and non-foaming materials. Being insensitive to water, they cure equally well regardless of whether they come into contact with water. The foaming process is similarly independent of water contact.

**PROPERTIES**
- No high curing temperatures
- Structural bonding
- Water-independent injection
- Allows underwater structural injections
- High compressive strength
- High eco-friendliness
- Insensitive to fire
- Foams without water contact

**APPLICATION**
RASCOflex US Urea-Silicate Grouts are generally mixed in the ratio 1:1 by volume. Due to their short gel times, these products must be applied using two-component injection pumps. The A and B components are thus fed separately up to the drill hole, where they are blended—like the two-component polyurethane grouts—in a static mixer.
RASCOFLEX US409

RASCOflex US409 is a non-foaming urea-silicate resin that cures with or without water contact and even underwater. The grout forms a rigid, elastic material with compressive strengths exceeding 30 N/mm², thus making it ideal for structural and stabilizing injections, even in wet environments. The flexibility of the cured resin is a further key advantage. This allows limited amounts of subsequent movement to be accommodated without recurring structural failure.

APPLICATIONS
- Structural crack and joint injections
- Joint sealing
- Injections below concrete slabs to stabilize and lift slabs
- Lifting of road carriageways, with immediate subsequent use
- Consolidating injections below railway sleepers
- Subsoil stabilization
- Foundation strengthening in offshore applications (e.g. wind farms)

RASCOFLEX US509F

RASCOflex US509F is a foaming injection grout for void filling. The high foam factor and moisture-independent foaming action, i.e. working equally well in both wet and dry environments, combine to deliver substantial savings in material consumption. Unlike the tough, elastic polyurethane foams, the fully cured urea-silicate foam is hard and brittle. This means that the injected zone can be cut, broken or hacked away without damaging any other parts of the structure.

APPLICATIONS
- Void filling in ground
- Pre-injection in bored tunnels
- Temporary anchor seals

1 Structural injection with RASCOflex US409
2 Structural bonding of old and new fabric with RASCOflex US409
3 Foundation soil stabilization with RASCOflex US409
4 Stabilizing pre-injection with RASCOflex US509F
5/6 Preventive waterproofing to sewer launch pit with RASCOflex US509F
## FEATURES

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<tr>
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<th>AY108</th>
<th>AY408</th>
<th>AY808</th>
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**Legend:**
- **very suitable**
- **suitable**
- **unsuitable**
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<th>PU510F</th>
<th>PU112</th>
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*1) In conjunction with PU110X*