Sika® Watertight Concrete Construction Solutions

Close to Your Business…
A History of Waterproofing

Founded in 1910 in Zurich, Switzerland by the inventor Kaspar Winkler, Sika’s first generation of admixtures earned widespread acclaim. Sika-1, Sika-2, and Sika 4a were the products that laid the foundations for today’s worldwide Sika group and its industry prominence. By providing vital benefits such as faster set times and waterproofing, these systems quickly propelled Sika into early and sustained growth.

Today, with more than 100 years of experience in watertight concrete construction, Sika Corporation introduces the “Whitebox” concept to the U.S. market. This system offers an economical solution for membrane free, watertight concrete structures such as basements, underground parking garages, water retaining structures, tunnels, etc.

The “Whitebox” concept offers a comprehensive solution for watertight structures. A full range of concrete admixtures for the production of watertight concrete is supported by a complete spectrum of products for watertight joints including waterstops, single use or re-injectable injection hose systems, swelling waterstops and versatile sealing systems.

This combination of multiple technologies in one system allows Sika to present an extensive and custom tailored approach which addresses the customer’s needs in an economically efficient way. Sika’s watertight concrete admixtures along with Sika ViscoCrete can be used to produce watertight, Self Consoli-dating Concrete (SCC). The combination of a highly flowable and well consolidated concrete coupled with properly specified waterstops is the key to a watertight joint. The use of watertight SCC provides the assurance of a high level of densification around PVC waterstops, injection hoses and expanding profiles even in intricate places, thereby significantly reducing the possibility of any water penetration.

A watertight concrete structure can be designed to keep water in or to keep water out, or both, particularly in the water industry. This can be the case for both fresh water supply and wastewater treatment facilities.

In the future, greater controls on water quality and increasing regulations for the protection of groundwater will require the construction of many more watertight concrete structures.

These same positive trends in environmental legislation worldwide will also lead to many more requirements for watertight construction.

- Watertight Concrete Construction Solutions

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<th>Keep Water IN</th>
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<td>Waste Water Treatment Structures</td>
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Dense, Impermeable Concrete
Watertight concrete requires minimized capillary volume, low absorption and reduced permeability. Sika’s range of concrete admixtures addresses specific issues and problems that may occur in your project.

Construction and Movement Joints
Embedded in concrete, across and/or along the joints, waterstops form a watertight diaphragm preventing the passage of fluid through the joint.

Unique “strip and seal” system to seal and waterproof difficult and irregular cracks and joints. It withstands extreme movements and chemical exposure while maintaining a watertight seal.

One-time use or re-injectable hose systems installed in concrete joints to waterproof and seal cracks or voids along the joint area.

Swelling waterstop profile expands its original volume when exposed to water. This expansion creates an effective compression seal within joints of limited movement or penetrations.
Standards and Design Criteria for Watertight Concrete Structures

Grade 1

Performance
Some damp areas tolerable; Local drainage may be necessary

Typical usage
- Basic storage
- Unfinished basements
- Underground parking structures
- Plant rooms (excluding electrical equipment)

Grade 1 represents cost effective basic level of membrane-free, watertight concrete system, addressing low pressure water intrusion, and non-moving joints. Grade 1 can be used in cases where minor damp patches and air humidity are tolerable and when aesthetics are not critical. Typical applications include underground parking structures, or non-electrical utility or storage rooms.

Grade 2

Performance
No water penetration but moisture vapor tolerable; ventilation may be required

Typical usage
- Retail storage areas
- Most water and wastewater treatment plants
- Plant rooms and workshops requiring drier environment with electrical equipment in the area

Grade 2 represents an intermediate level of membrane free, watertight concrete system, addressing medium pressure water intrusion and non-moving / moving joints. This grade can be used in cases when vapor passage is acceptable but no visible dampness is permissible. Grade 2 can be successfully used in underground retail storage, small to medium size inground water retaining structures or residential swimming pools.

Grade 3

Performance
No water penetration acceptable; Dry environment – ventilated Dehumidification and air conditioning if required.

Typical usage
- Residential areas, offices, restaurants
- Recreation centers, gymnasiaum
- Data storage centers

Grade 3 represents an advanced level of membrane free, watertight concrete system, addressing medium water pressure water intrusion and non moving / moving joints. Grade 3 can be used in cases when a dry, ventilated environment is required. This grade represents concrete with high aesthetic and long durability requirements used in a wide variety of applications, such as below grade offices, retail stores, restaurants, other residential applications or large, above ground water retaining structures or large, commercial swimming pools.

Independent Testing

Selected pore blocking, watertight concrete admixtures produced by Sika have been tested by British Board of Agrément and received certification for watertight concrete systems.

To determine the best technical solution to address various aspects of your project, please contact your local Sika sales representative.
Concrete Production for Watertight Concrete Structures

Construction stages

**Formwork**
In the formwork, every joint must be tight and sealed to prevent any leakage of concrete paste. Close fitting formwork will result in a smoother concrete finish.

**Steel Reinforcement**
In watertight construction, the design, placement and tying of steel reinforcement is particularly important to minimize any potential problems such as:
- Obstruction of joint sealing systems with congested reinforcement or by changes from their designed position and/or incorrect installation of the joints.
- Congestion of reinforcement leading to inadequate concrete compaction and voids or honeycombing in the hardened structure.
- Crack formation due to insufficient steel reinforcement or inadequate concrete cover, which could result in structural damage and reduced structural integrity and structure service life.

**Concrete Placement**
Transport
- While transporting watertight concrete, ensure concrete remains in constant motion.

Placing
- Watertight concrete can be placed by all normal means including pumping, pouring or crane and bucket. Care must be taken to ensure that reinforcement is displaced and that waterstops are not damaged.

**Concrete Finishing**
Proper finishing techniques for a flat concrete surface are very important to ensure the structure’s long term durability and serviceability.

**Concrete Curing**
For watertight concrete, thorough and correct curing is essential. Immediate covering with damp burlap, plastic sheeting or curing blanket or the immediate use of a curing compound which acts as a continuous evaporation reducing system is critical.

**Joint Surface Preparation**
Use Sika® Rugasol® surface retarder on the formwork for concrete joint faces to easily obtain a suitable rough surface for optimum aggregate interlock with the subsequent concrete placement.

**Formwork removal**
Formwork loosening and formwork removal should be done without shock or vibration to the early age concrete. Sufficient compressive strength must be achieved before the formwork is removed.

**Concrete Curing**

This graphic illustrates the quantity of water which evaporates from the exposed surface if no curing takes place. With the example shown there is a loss of approx. 0.25 lb/ft²/hr (1.2 kg/m²/hr).
Sika® Concrete Production for Watertight Concrete Structures

The concrete mix design and technology

Testing the Reduction in Water Permeability

Depth of penetration of water under pressure (as per DIN 1048 and EN12390-8)
Concrete specimen is subjected to a water pressure of 72 psi (500 kPa) for 72 hours. After 72 hours, the specimen is cut from the center and the depth of water penetration is measured in millimeters.

Rate of water absorption, sorptivity (as per ASTM C-1585)
Concrete specimen is cut and conditioned as described in the test method. The circumference of the specimen is sealed and one end is exposed to water. Rate of absorption is calculated by measuring the change in mass of the specimen at periodic intervals up to 9 days.

Blocking of the Concrete’s Capillary Pores

For waterproof concrete, Sika® Watertight Concrete Powder or Sika®ViscoCrete is added. These products contain stearates which react with the calcium hydroxide in concrete and form insoluble calcium stearate, which coats the surface of the pores, forming a strong hydrophobic layer. When subjected to hydrostatic pressure, the globules push in front of the water and squeeze together forming a physical barrier in the capillary, which then effectively blocks the pores – even at pressures of up to 10 bar (145 psi) or 100 meters head of water.

Reducing Capillary Pores and Voids by Water Reduction

Concrete containing High Range Water Reducing Admixture.

Preventing or greatly reducing Compaction Pores by using a soft/plastic Consistency of Concrete

The use of Self Consolidating Concrete offers unique benefits such as:
- No vibration and less finishing
- Improved quality and durability
- Improved concrete/waterstop interlock
- Reduced noise and improved health and safety condition
- Reduced labor and equipment

Freeze Thaw Durability

Use of Sika Watertight Concrete Powder enhances the freeze/thaw durability of concrete.

Shrinkage Reduction

Drying concrete shrinkage can be significantly reduced by use of shrinkage reducing admixture.

Rapid Chloride Permeability

Rapid Chloride permeability test performed as per ASTM C 1202

Water Permeability

Water Permeability test performed as per modified DIN 1044 / DIN 12390-8 (3 bar / 144 psi).

Hydrophobic pore blocking agents effectively reduce water permeability and chloride permeability through the concrete. This results in improved concrete durability. Concrete treated with Sika Watertight Admixtures shows significant improvement over reference concrete and also over concrete containing High Range Water Reducing Admixture.

The Structure of Capillary Pores and Voids in Concrete

The important relationship between the concrete structure’s compaction and its pore content is illustrated in the following graphics:

Solid substance
Kind of pores
Radius of pores
Moisture absorption by:

<table>
<thead>
<tr>
<th>Size in m</th>
<th>Solid substance</th>
<th>Kind of pores</th>
<th>Radius of pores</th>
<th>Moisture absorption by:</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 2 µm</td>
<td>Gravel</td>
<td>Coarse pores</td>
<td>&gt; 2 mm</td>
<td>Adsorption</td>
</tr>
<tr>
<td>2 µm – 50 µm</td>
<td>Sand</td>
<td>Micro-capillary pores</td>
<td>2 – 5 µm</td>
<td>Condensation</td>
</tr>
<tr>
<td>2 nm – 2 µm</td>
<td>Cement gel</td>
<td>Micro-pores</td>
<td>2 – 0.1 µm</td>
<td>Capillary suction</td>
</tr>
<tr>
<td>2 nm</td>
<td>Sillcafume powder, (hydrat.)</td>
<td>Micro-pores</td>
<td>2 nm</td>
<td>Capillary suction</td>
</tr>
<tr>
<td>2 nm</td>
<td>Sillcafume powder, (powder)</td>
<td>Meso-pores</td>
<td>2 nm</td>
<td>Capillary suction</td>
</tr>
<tr>
<td>2 [m]</td>
<td>Cement gel</td>
<td>Capillary pores</td>
<td>2 mm</td>
<td>Adsorption</td>
</tr>
<tr>
<td>2 [m]</td>
<td>Cement gel</td>
<td>Voids</td>
<td>2 mm</td>
<td>Adsorption</td>
</tr>
</tbody>
</table>
Concrete Jointing Technology for Producing Watertight Concrete Structures

There are 3 different principles that can be applied to produce waterproof joints in watertight concrete structures:

**Principle 1: Integral Cast-In-Place**
Water ingress is stopped within the structural concrete.

**Ideal for use:**
- Where exterior waterproofing is undesirable for aesthetic reasons
- Where the waterproofing has to be protected from direct contact with aggressive water, hydrostatic water pressure or ground movement (e.g. due to abrasion)
- Where source of hydrostatic head pressure can be from either inside or outside of the structure

**Ideal for use:**
- Where exterior waterproofing is undesirable for aesthetic reasons
- Where the waterproofing has to be protected from direct contact with aggressive water, hydrostatic water pressure or ground movement (e.g. due to abrasion)
- Where source of hydrostatic head pressure can be from either inside or outside of the structure

**Principle 2: Internal Surface Applied**
Water ingress is stopped at the interior surfaces of the structure.

**Principle 3: External Surface Applied**
Water ingress is stopped at the exterior surfaces of the structure.

**The Selection Criteria (Principle 1–3)**

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Water pressure Grade 1</td>
<td>Greenstreak® Waterstop</td>
<td>Sika© VT Injection Hose System</td>
<td>SikaFuko® Injection Hose System</td>
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<td>Water pressure Grade 2</td>
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<tr>
<td>Water pressure Grade 3</td>
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<td>Movement joint</td>
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<tr>
<td>Continuous rebar jointing</td>
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<tr>
<td>Connection to existing buildings (movement)</td>
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<td>Abrasion/mechanical damage</td>
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<tr>
<td>Chemical attack</td>
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<td>n/a</td>
</tr>
<tr>
<td>Aesthetic aspects</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
</tbody>
</table>

**Notes:**
- **Very good**
- **Good**
- **Limited**
- *must consider positive vs. negative pressure*
Greenstreak waterstops for concrete joints

Greenstreak waterstops are extruded from flexible PVC material for sealing both non-moving and moving concrete joints subject to hydrostatic pressure. Waterstops are cast-in-place and can be heat welded to create a continuous diaphragm which prevents the passage of fluid through the joints.

PVC is the standard for flexible water-stops, offering a broad design selection and is accepted under the ACI 350 “Code Requirements for Environmental Engineering Concrete Structures”. Independent laboratory tests are available for the following applicable standards:
- Corps of Engineers CRD-C 572-74
- Bureau of Reclamation
- British Standards
- Various State Highway and/or Public Works Department Standards

Greenstreak offers a variety of waterstop products to accommodate many different applications. Labor saving factory fabrications are available for transitions and intersections and promote quality waterstop installation procedures. Contact a Greenstreak engineer regarding specific project needs.

Ribbed with Centerbulb is the most versatile waterstop profile available. The centerbulb accommodates lateral, transverse and shear movement and ribbed profiles outperform dumbbell profiles.

Base Seal is ideal for slab-on-grade joints, backfilled walls or tunnel applications and are easy to form. There are some limitations with transitions and intersections.

Retro-fit waterstops are also available for applications between new and existing structures. Westec brand TPER and PE waterstops are available for chemical exposure applications not suitable for PVC waterstops.

Sealing of movement and construction joints with the Sikadur® Combiflex® System

A high performance joint sealing system consisting of the Sikadur Combiflex sealing strips and Sikadur Combiflex epoxy adhesive. This system is renowned worldwide for proven performance in sealing difficult joints and/or cracks in all types of structures. It is particularly useful in watertight basement construction and can be applied to either an interior or exterior concrete surface to meet the specific project requirements.

Advantages
- Easily adaptable to the construction program.
- Easy to adapt to complicated construction details.
- Simultaneous additional crack repairs are possible.
- Damage or leaks can be repaired on exterior or interior concrete surfaces.
- Easy to control the application because it is visible.
- Easy to repair damage.

The Sika Systems

The selection of the appropriate width and thickness of the Combiflex membrane strip is dependent on the joint requirements and exposure:
- Sikadur Combiflex strip thickness of 1 mm (40 mils) for low mechanical stress.
- Sikadur Combiflex strip thickness of 2 mm (80 mils) for higher mechanical stress.

The Sikadur Combiflex strip widths available are 4, 8 and 12 in. (10, 20, and 30 cm). Special widths on request.

The Sikadur 31, Hi-Mod Gel adhesive is available in both normal and rapid hardening grades, and is suitable for potable water contact, meets NSF/ANSI Standard 61.
**Sika® - Greenstreak® Joint Sealing Technologies for Watertight Concrete Structures**

### Sealing of construction joints with SikaFuko® VT Injection Hose System

**SikaFuko® VT** is a specially designed and patented solid core PVC Injection Hose System which is installed in concrete construction joints to waterproof and seal any cracks or voids in the joint area. The SikaFuko VT System seals joints watertight and offers a complete maintenance program if leakage appears in the future. When the appropriate injection material is selected, the SikaFuko VT System can be used for multiple re-injections - a significant advantage over any other hose system available.

The SikaFuko VT Re-Injectable Hose System is a logical step forward in improving waterstop technology. Utilizing this state-of-the-art injection system results in "zero leak tolerance", easy to install and reasonably priced - SikaFuko VT simplifies the job and guarantees watertight concrete construction joints.

**Advantages**
- Patented valve design can be cleaned by using water and vacuum pressure to clear the hose for future injections.
- SikaFuko VT is suitable for a wide range of injection materials.
- The ability to re-compact SikaFuko VT provides a maintenance option to ensure a watertight joint for the life of the structure.
- SikaFuko VT is installed in the joint prior to the second pour and does not require split formwork.
- SikaFuko VT can be used to "water test" non-injected and injected joints for watertightness in a safe and simple manner.

**Typical Applications**
- Not suitable for use in movement joints.

### The SikaFuko VT Process

**Concrete Pour:** When concrete is placed around the SikaFuko VT Hose, the external pressure of the concrete seats the neoprene strips, sealing off injection openings and the injection channel.

**Injection:** The internal injection pressure compresses the neoprene strips and allows the injection material to flow out from eight longitudinal gaps. This enables a uniform discharge of the injection material over the full length of the hose.

**Cleaning The Hose:** When using an approved injection material, the SikaFuko VT Hose is easily flushed clean by using water and applying vacuum pressure. The negative pressure resets the neoprene strips, preventing injected material from being drawn back into the injection channel upon cleaning.

**Ready For Future Injection:** SikaFuko VT Injection System is ready for re-injection if needed.
Sealing of construction joints with Hydrotite® hydrophilic waterstops

Hydrotite is a state-of-the-art hydrophilic waterstop with unmatched durability and watersealing capacity. Comprised of non-bentonite, modified chloroprene rubber, Hydrotite expands up to 8 times its original volume when exposed to water. This expansion creates an effective compression seal within joints of limited movement. Recognized worldwide, Hydrotite has a proven track record as a high quality and cost effective solution to water containment needs.

Hydrotite is available in a multitude of sizes and shapes for numerous applications, including construction joints, saw-cut control joints, cracks repairs and pipe penetrations. Some profiles are offered as co-extrusions to provide directional expansion.

ADVANTAGES

- Outstanding physical properties
- Special expansion delay coating to allow concrete cure prior to expansion
- Reliable and durable (lifespan up to 100 years)
- ISO 9002 certified
- CJ-0725-3K-ADH and CJ-1020-2K-ADH offered with an adhesive backing
- Simple, low cost installation
- Appropriate for retrofit as well as new construction
- Can withstand high hydrostatic pressures (testing of up to 150’ hydrostatic head pressure for CJ profiles)

TYPICAL APPLICATIONS

- Water and wastewater treatment facilities
- Manhole structures
- Tunnels and culverts
- Dams, locks, canals, water reservoirs and aqueducts
- Pipe penetrations
- Swimming pools
- Storage tanks
- Retaining walls
- Foundations
- Slabs on grade

Sealing Construction Joints with Hydrotite CJ Profiles

As this innovative product absorbs water and expands, it conforms to gap variations along the joint. This action ensures complete sealing even under extraordinary hydrostatic pressures. Hydrotite CJ profiles are treated with a special expansion-delay coating to prevent it from reacting to the fresh concrete and expanding before curing takes place.

Sealing Pipe Penetrations with various Hydrotite Profiles

Hydrotite can be bonded to various piping materials, including concrete, steel and plastic. Bond Hydrotite to the pipe prior to concrete placement. Installation in existing walls requires an oversize cutout be made and Hydrotite installed both on the pipe and the outside diameter of the cutout. Fill the annulus with a non-shrink grout.

Contact Greenstreak for alternative strip-applied waterstops for less stringent applications, products include:

- SWELLSTOP - butyl rubber / bentonite hydrophilic
- LOCKSTOP - mastic / asphaltic waterstop
- SIKASWELL A - hydrophilic acrylate-ester

Easy Application – As moisture-cure single component water-swelling sealants, standard caulking guns can be used.

Physical Properties – After curing, they have excellent physical properties. The rubber-like elasticity of the material and expansion characteristics create an effective watertight seal.

Expansion – LEAKMASTER® and HYDROSwell™ expand when exposed to water to create an excellent water seal, while retaining rubber-like elasticity.

Adhesion – Before swelling, LEAKMASTER® and HYDROSwell™ adhere to various materials such as concrete, metal, and glass.

Leakmaster® LV-1 and HydroSwell™ are single component water-swelling sealants with excellent and unique properties. They may be applied in locations where conventional preformed waterstops cannot be easily used. This includes irregular shaped joints, rough surfaces, and odd penetrations.
Sika Injection Technology for Waterproofing Construction Joints or Remedial Works to Leaking Concrete Structures

Solutions for leaks and construction damage

Concrete Damage

Damage can occur to the concrete in many ways but primarily through difficulties in interpreting design aspects, inadequate or untimely consolidation, or by accident. Sika produces a full range of concrete repair systems, which are compatible with all Sika waterproofing systems.

Cracks/Honeycombing

The terms “watertight” and “vapor-tight” do not mean “crack-free”. Cracking can always occur in concrete in its plastic or in its hardened state due to the stresses imposed. These include the internal forces caused by temperature and water content changes. Sika has a complete range of products and systems for the repair of “cracks” and “honeycombing” in watertight concrete structures.

Sealing and Waterproofing of Cracks

Closing, sealing and flexible bridging of leaking cracks and honeycombing or voids in new and existing structures.

Sika® Inject 306

Flexible and penetrating acrylate resin with an adjustable reaction time and compatible with SikaFuko injection hose systems.

Sika® Inject 215

Flexible, low viscosity and quick gelling polyacrylate injection gel for permanent watertight sealing. The material reacts to form a waterproof, flexible but solid gel with good adhesion to both dry and wet substrates.

Sika®/Inject 306 is a very low viscosity, elastic, polyacrylic injection resin with a versatile and adjustable reaction time.

Sika Fix 406

Sika®/Fix Family & 100 Series Polyurethanes

Polyurethane foam products used as a waterstopping injection material for the temporary sealing of cracks or voids subjected to pressurizing and non-pressurizing water. Fast reaction when contacted by water.

Waterproofing of Construction Joints

For sealing construction joints in a watertight structure, Sika provides a full range of products and systems.

Sika® SikaFuko VT

The world’s number one injection hose system delivers Portland Cement, Microfine Cement, or other resins to seal cracks or voids and has a unique “re-injectable” design if future injections are required.

Sika® SikaFuko Eco 1

An injection hose system for delivering cements or resins for single injection applications.

Sika® Inject 306

Flexible and penetrating Acrylate resin with an adjustable reaction time and compatible with Sika SikaFuko Injection Hose Systems.

SikaFuko VT

The unique “re-injectable” design if future injections are required.

SikaFuko Eco 1

A two-component injection pump is required for fast-reacting polyacrylate gels. The individual resin components should be introduced to the mixing head separately.

Injection Packs

Injection packers are used as connection pieces between the injection pump and the structure. Mechanical packers are for high and low pressure injection where injection hole drilling is possible. Surface packers are for low pressure injection where drilling is not possible.

Surface Sealing and Waterproofing of Concrete Structures

Remedial surface sealing by curtain injection of surface defects in below ground concrete structures.

Sika® Inject 215

Flexible, low viscosity and quick gelling polyacrylate injection gel for permanent watertight sealing. The material reacts to form a waterproof, flexible but solid gel with good adhesion to both dry and wet substrates.

Surface Sealing and Waterproofing of Construction Joints

Rapid reaction when contacted by water.

Sika®/Fix Family & 100 Series Polyurethanes

Polyurethane products used as a waterstopping injection material for the temporary sealing of cracks or voids subjected to pressurizing and non-pressurizing water. Fast reaction when contacted by water.

Injection Pumps

Pumps for Polyurethane, Epoxy and Polyacrylate Resins

Single-component injection pumps designed for professional use in crack injection are suitable for Sika polyurethane, epoxy and polyacrylate injection resins.

Sika Injection 306

Sika Injection 306 is a very low viscosity, elastic, polyacrylic injection resin with a versatile and adjustable reaction time.

Sika Fix 406

Sika®/Fix Family & 100 Series Polyurethanes

Polyurethane products used as a waterstopping injection material for the temporary sealing of cracks or voids subjected to pressurizing and non-pressurizing water. Fast reaction when contacted by water.

Incorporated in the mixing head separately.

Pumps for Polyacrylate Gels

A two-component injection pump is required for fast-reacting polyacrylate gels. The individual resin components should be introduced to the mixing head separately.

Sika® Inject 215

Flexible, low viscosity and quick gelling polyacrylate injection gel for permanent watertight sealing. The material reacts to form a waterproof, flexible but solid gel with good adhesion to both dry and wet substrates.

Sika® Inject 215 is a highly flexible, quick setting polyacrylic resin based swelling gel for waterproofing applications.

Sika®/Inject 306

Flexible and penetrating Acrylate resin with a versatile and adjustable reaction time.

Sika®/Inject 306 is a very low viscosity, elastic, polyacrylic injection resin with a versatile and adjustable reaction time.

Sika®/Inject 215 is a highly flexible, quick setting polyacrylic resin based swelling gel for waterproofing applications.

MIXERS AND PUMPS FOR MICROFINE CEMENT SUSPENSIONS

A colloidal mixer designed for complete and thorough mixing of Sika microfine cement suspensions is required. A pump capable of providing a continuous pumping of the suspension without separation is required.

Injection Packers

Injection packers are used as connection pieces between the injection pump and the structure. Mechanical packers are for high and low pressure injection where injection hole drilling is possible. Surface packers are for low pressure injection where drilling is not possible.

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Additional Sika® Technologies to Meet Individual Project Requirements in Watertight Concrete Structures

Internally applied protective coatings for increased waterproofing chemical and mechanical resistance

**Problem**
- Concrete erosion due to acidic environment
- Concrete erosion due to swelling from sulphates
- Loss of alkaline protection and corrosion of reinforcement steel

**Sika Solution**
- Application of Sikagard® EpoCem® as a pore sealer and a temporary moisture barrier
- Application of Sikagard® protective coating

**Wastewater Treatment Plant**

**Problem**
- Surface defects and blowholes (bugholes) etc.

**Sika Solution**
- Application of Sikatop® Seal 107, the cement-based, polymer-modified protective and waterproof slurry.

**Secondary Containment for Groundwater Protection**

- Application of Sikagard® EpoCem® as a temporary moisture barrier
- Application of Sikagard® as a protective coating against aggressive chemical attack

**Underground Parking Decks Waterproofing Systems**

- Increased water brought in on cars and other vehicles
- Concrete attack from de-icing salts
- Abrasion from traffic wheels

**Sika Solution**
- Application of Sikafloor® deck coating systems
- Vapor-tight and vapor-diffusible systems available

**Chemical Resistant Coatings**

- Internally applied protective coatings for increased waterproofing chemical and mechanical resistance

**Sika® Waterproofing Products**

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**Externally applied protective coatings to prevent aggressive water ingress to the structure**

**Rigid Slurry Coating for Filling and Sealing Surface Defects**

- Surface defects and blowholes (bugholes) etc.

**Sika Solution**
- Application of Sikatop® Seal 107, the cement-based, polymer-modified protective and waterproof slurry.

**Problem**
- Increased water brought in on cars and other vehicles
- Concrete attack from de-icing salts
- Abrasion from traffic wheels

**Sika Solution**
- Application of Sikafloor® deck coating systems
- Vapor-tight and vapor-diffusible systems available

**Jointing systems**

- Waterproofing systems for the sealing of both movement and construction joints, plus producing watertight compartments with Sikaplan sheet membranes

**Joint sealing hose system**

- Injectable and re-injectable joint hoses for the sealing of construction joints

**Injection**

- Solutions for remedial waterproofing of leaking concrete, joints and membranes including compartment systems

**Injection systems**

- Polymer or epoxy modified cementitious slurry coatings or waterproofing coatings for improving the concrete surface resistance

**Membranes**

- PVC and TPO membranes, external to the concrete structure. Single layer, double layer and compartment systems available.