WATERPROOFING
LEAK SEALING SOLUTIONS WITH SIKA INJECTION SYSTEMS

FOR CONCRETE, MASONRY AND NATURAL STONE STRUCTURES

BUILDING TRUST

LEAK SEALING SOLUTIONS

For Concrete, Masonry and Natural Stone Structures

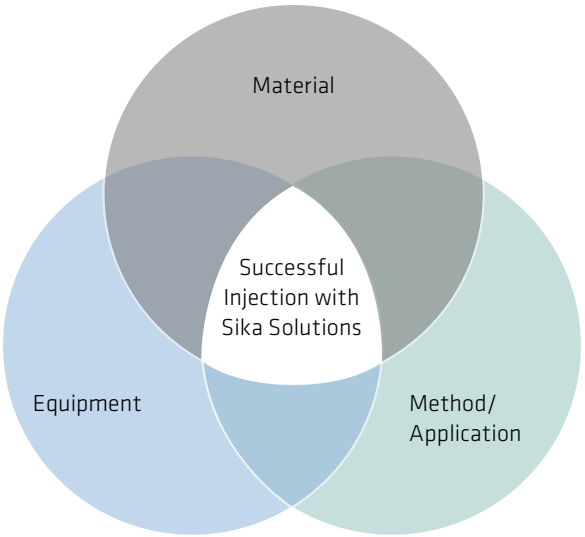
LEAKING CONCRETE STRUCTURES BELOW GROUND such as basements and civil engineering structures, can have a greatly reduced service life due to steel corrosion and concrete damage, in addition to any reduced functionality and use. In order to avoid the expensive costs of repairs to the structure, or to water damaged interior finishing's, furnishings or other goods, plus the costs of any operational downtime, these leaks can often be securely sealed and waterproofed by injection.

Sika provides an extensive range of injection systems for all types of leak sealing applications in concrete, masonry and natural stone structures. These can be used at any time, including during the initial construction works, or later to extend the service life during any subsequent refurbishment, according to the specificproject's requirements.Sika injection systems can not onlyclose, flexibly bridge, seal and make leaking structures watertight for the long term, some can also be used to increase or restore structural integrityand load bearing capacity, thereby providing complete and durable maintenance solutions.

Sika's high performance injection materials are also fully compatible with Sika's complete Engineered Waterproofing range and they can be used for the repair and sealing of cracks, voids, joints, hoses and compartment systems inmanydifferent structures. As a prerequisite, all of Sika'sinjec- tion products are also fully tested and conform to all of the relevant global standards.

SUCCESSFUL WATERPROOFING WITH SIKA INJECTION SYSTEMS

There are three primary success factors involved in ensuring the effectiveness and durability of injection works. It is essential that the right combination of injection materials, injection equipment and injection method must be selected and this is what Sika's extensive technical and practical experience provides:



INJECTION MATERIAL
The selection of the right injection material and indeed the right specific injection product for the defined project requirements is the first key factor for success. This especially means the materials viscosity, flexibility and behaviour in contact with water that can all significantly influence the effectiveness of the injection.

INJECTION EQUIPMENT
Appropriate equipment for the selected injection material, including for the correct preparation, mixing and delivery of the material is the second key success factor. This means everything from the initial dosage and mixing, through delivery from a suitable pump, to use of the right packers/ports/connectors.

INJECTION METHOD / APPLICATION
Thirdly, the correct injection method and application techniques must be used by trained, competent and experienced contractors, in order to ensure the success and provide complete and permanent leak sealing solutions.

ADDITIONAL ADVANTAGES OF SIKA

COMPLETE SIKA SOLUTIONS
Sika is a 'full range' supplier, which means that Sika not only has the full range of alternative injection technologies and materials, but we are also the world's leading supplier of engineered waterproofing, concrete repair and protection solutions in order to prevent, or to seal and waterproof, any types of leaks in your structure – from the 'Basement to the Roof.'

SIKA INJECTION SOLUTIONS TO GLOBAL STANDARDS
Sika's injection solutions are tested and approved to the leading global standards to provide safe and reliable injection solutions.

TECHNICAL EXPERTISE AND PRACTICAL EXPERIENCE
Sika provides advice and support from the technical team office through to completion of the injection and any associated works on site. This expert technical advice and practical assistance is to help you ensure the selection and installation of the right injection materials, with the correct equipment and application.

TRAINING
We understand that on many projects it will be preferable to use an experienced Specialist Contractor for injection works to seal any leaks that occur, whilst on others for different practical and logistic reasons, it will be better to train teams from the main contractor to do the work. This is why Sika provides unrivalled technical and practical training both on and off site, to help ensure that both the engineering staff and the site operatives fully understand the requirements and procedures – all supported with Sika's detailed documentation including Method Statements and Quality Control checklists.

LOCAL SIKA PRESENCE
All around the world there are experienced Sika professionals to provide this technical support exactly where it is required, in your office or on site.

TYPICAL SOURCES OF LEAKS IN CONCRETE STRUCTURES

1

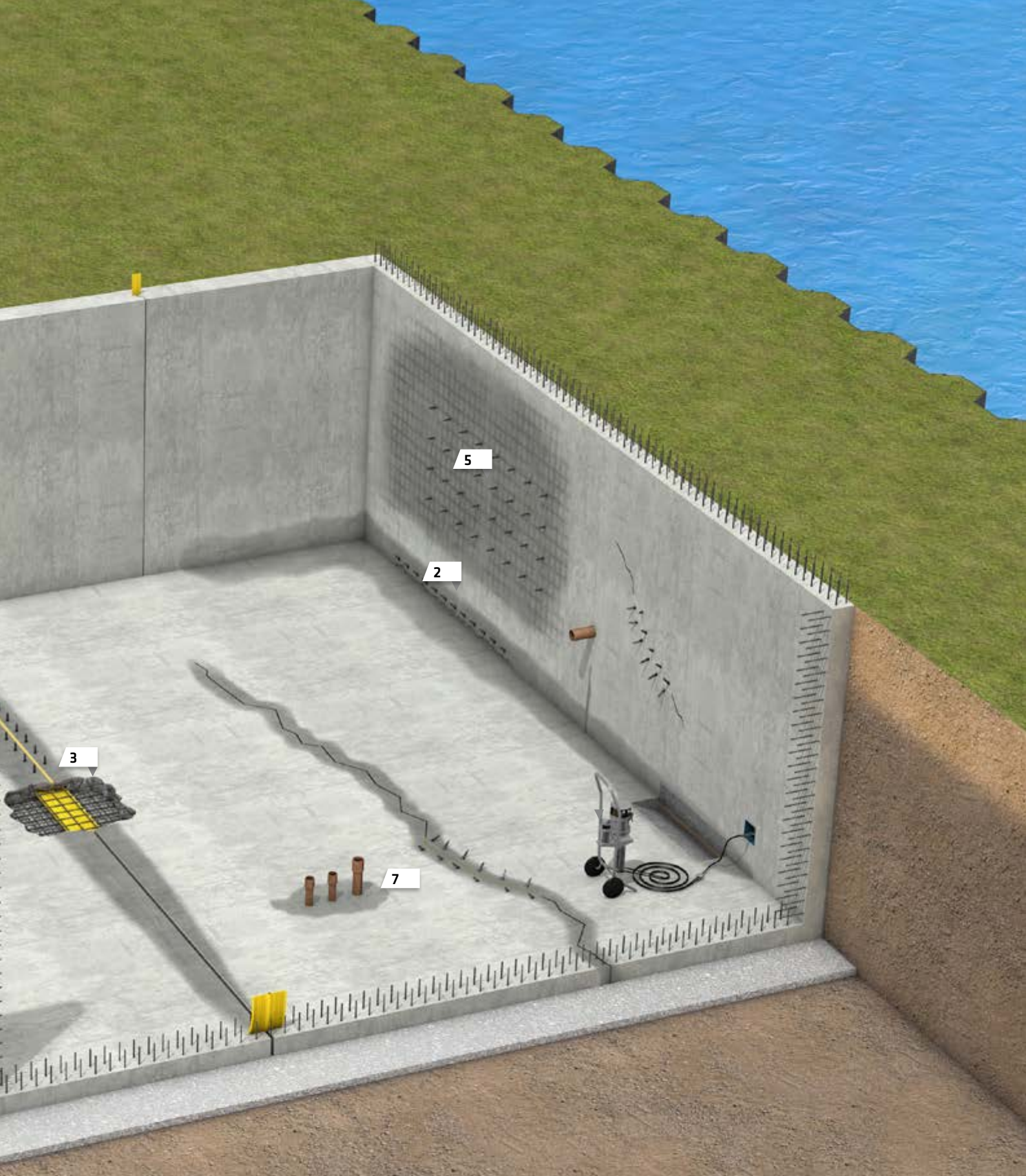
Leaking Cracks

2

Leaking Construction Joints

3

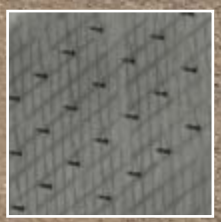
Leaking Movement Joints



4

Leaking Areas of Voids i.e. Honeycombing

5



Leaking Areas i.e. at Wall Ties

6

Leaking Compartment Membrane System

7

Leaking Penetrations i.e. Pipe Penetrations

INJECTION MATERIAL TECHNOLOGIES AND SIKA INJECTION PRODUCTS

POLYURETHANE FOAM RESINS

Polyurethane foaming resins are designed to expand with water to temporarily block the passage of water through the crack or void . Their fast expansive reaction with water forms a tough and flexible / elastic foam. For permanent waterproofing, these polyurethane foaming resins are re-injected with a suitable non-foaming injection resin – usually also based on polyurethane as below.

POLYURETHANE RESINS

Polyurethane resins are hydrophobic, flexible and used for the non-structural injection sealing and waterproofing of voids,cracks andjoints. Their low viscosity allows good penetration into the concrete structure to seal the leaks and achieve a durable elastic seal. Polyurethane resins seal with very good edge adhesion to concrete with their hydrophobic characteristics. Invoids, cracks and joints with high water ingress, pre-injection as temporary waterstopping with a Polyurethane foaming resin as mentioned above is required.

ACRYLATE RESINS

Acrylate resins are hydrophilic, very flexible and used for non-structural injections of cracks, joints and voids, including for injection hose systems, compartment systems and area (e.g. Grid and Curtain) injection works. For application Acrylate resins have a extremely low viscosity (similar to water) and therefore have ideal penetration abilities. Their reaction (hardening) time is also adjustable, which allows flexibility in adaptation of the injection material to the prevailing conditions on site (e.g. temperature and injection distance etc.). Acrylate resin based materials seal and waterproof leaks through their hydrophilic swelling behaviour in contact with water. The injection equipment is also easily cleaned with water.

EPOXY RESINS

Epoxy resins have relatively high tensile and compressive strengths in relation to concrete, they are generally regarded as 'rigid' materials and widely used for structural repairs by injections of cracks and voids in load bearing reinforced concrete structures or elements. Their low viscosity allows excellent penetration into cracks in the structure and this also helps to ensure permanent and durable load transfer based on their excellent adhesion to the concrete. Epoxy resin based materials are suitable for many different structural injection requirements and applications in dry and slightly damp conditions.

MICROFINE CEMENT SUSPENSION

Microfine cement suspensions are non-flexible and therefore non-movement accommodating, rigid, polymer modified, injection materials (also often known as Microfine cement grouts),which are based on blends microfine cements. They are now widely used for structural injection works to seal non-moving cracks, voids and daywork joints for example. Due to their polymer modification, these cement based materials can also have high flow characteristics and very good penetration ability.

Sika® Injection-101 RC
Sika® Injection-101 RC is a low viscosity, fast-foaming, solvent-free, water-reactive 2-component polyurethane foaming resin based injection product, which cures to a very dense and hard-elastic foam with a very fine cellular structure. It has stablee xpansion with no shrinkage after curing. The free-foaming volume expansion rate in contact with water is up to 40 times. The reaction time of Sika® Injection-101 RC can be even further accelerated with Sika® Injection-AC10.

Sika® Injection-107
Sika® Injection-107 is a ready-to-use 1-component polyurethane based, slightly flexible, foaming injection resin for permanent sealing of cracks, voids and interstices in concrete.

Sika® Injection-201 CE
Sika® Injection-201 CE is a very low viscosity, solvent-free non-foaming 2-compnenent polyurethane resin based injection product, which hardens in both dry and wet conditions. In contact with water it will form an elastic and flexible compound and therefore this also helps to create a durable watertight pore structure within the concrete. Sika® Injection-201 CE is tested and approved to EN 1504-5, and has an easy to use mixing ra- tion of 1:1 by volume. The hardening reaction can also be further accelerated with Sika® Injection-AC20.

Sika® Injection-304
Sika® Injection-304 is an ultra-low viscosity, elastic and very quick-setting polyacrylic resin based injection gel. The reaction time is adjustable between 40 seconds and 4 minutes. Due to this fast reaction time, Sika® Injection-304 is only injected with a 2-component pump and it is generally used for sealing and waterproofing areas of damage or leaks with high water ingress, including under hydrostatic pressure.

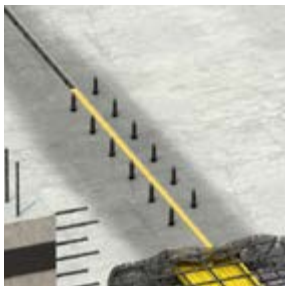
Sika® Injection-310
Sika® Injection-310 is an easy-to-use 1-component, powder based acrylate based resin for permanent watertight sealings.

Sika® Injection-307
Sika® Injection-307 is a very low viscosity, elastic polyacrylic injection resin with versitle and adjustable reaction time used for permanent watertight sealing of cracks, joint injection and voids. Sika® Injection-307 hardens in both dry and wet conditions to form an elastic, steel passivating and flexible gel-like material, which also has high chemical resistance. It can be injected with either a 1- or 2-Component Injection pump and is mainly used as a re-injectable leak sealing resin system for SikaFuko® hoses and around damaged membrane / compartment systems. The reaction time is adjustable between 8 and 50 minutes. Sika® Injection-307 also provides corrosion protection to RC steel.

Sikadur®-52 N/LP
Sikadur®-52 is a rigid, solvent-free, low viscosity, high strength structural, epoxy resin based injection product. It is used to structurally bond and seal cracks over 0.3mm in width. Sikadur®-52 is also tested and approved according to European Standard EN 1504-5.

Sika® Injection-190 GB
Sika® Injection-190 GB is a rigid, 2-component injection product, based on a blend of polymer modified microfine cements It is widely used for sealing, filling and structural strengthening of wider cracks and into or around construction joints. It is also used for the injection of SikaFuko® Injection Hoses as a re-injectable system.

SELECTION OF SIKA INJECTION MATERIALS

PROBLEM		REQUIREMENTS
Leaking Cracks / Penetrations Dry and / or containing water		■ Waterproofing cracks and around penetrations of width >0.2 mm with hydrostatic pressure ■ Waterproofing cracks and around penetrations of width >0.2 mm without hydrostatic pressure (dry, damp or wet surfaces) ■ Force transfer across dry cracks of width >0.3 mm
Leaking Expansion Joints (movement) and Construction / Daywork Joints (non-moving)		■ Waterproofing construction joints with and without hydrostatic pressure ■ Waterproofing joints where the original joint sealing / waterproofing system is damaged or was not properly installed
Leaking Membrane Compartment Systems		■ Waterproofing damaged and leaking sheet membrane compartment systems
Leaking Wall / Kicker Areas		■ Grid injection (into the surface for lager areas e.g. Honeycombing or poor concrete compaction etc.) ■ Curtain injection (e.g. behind the structure or element to seal leaks due to multiple tie bar holes or other multiple minor defects / leaks)

CRITERIA	SUITABLE SIKA INJECTION PRODUCTS
■ Fast and stable foaming and expansion, for temporary sealing, plus very low viscosity and long-term flexibility for permanent sealing and waterproofing.	■ Sika® Injection-101 RC (for temporary sealing) followed by: ■ Sika® Injection-201 CE (for permanent flexible sealing) ■ Sika® Injection-107 (Flexible, foaming resin for permanent watertight sealing)
■ Very low viscosity and long-term flexibility for permanent sealing	■ Sika® Injection-201 CE (for permanent flexible sealing)
■ Low viscosity, rigid, excellent adhesion and full bond to the crack substrate surfaces for structural bonding	■ Sikadur®-52
■ Fast and stable foaming and expansion for temporary sealing, plus very low viscosity and long-term flexibility for permanent sealing and waterproofing.	■ Sika® Injection-101 RC (optional for temporary sealing in case of hydrostatic pressure) followed by: ■ Sika® Injection-201 CE (for permanent flexible sealing)
Pre-installed SikaFuko® injection hose system in construction joints or as a back-up system on waterbars: ■ Very low viscosity, long term flexibility, long pot-life for optimum penetration, re-injectable for permanent sealing	■ Sika® Injection-307 (for permanent flexible sealing) ■ Sika® Injection-310 (for permanent flexible sealing) ■ Sika® Injection-190 GB (for use in dry areas only)
Damaged expansion sections of waterbars: ■ *Low viscosity, long term high flexibility, with adjustable reaction times for permanent sealing..*	■ Sika® Injection-304 (for permanent flexible sealing) ■ Sika® Injection-307 (for permanent flexible sealing)
■ Extremely low viscosity, highly flexible, long pot-life / extended reaction time, re-injectable for permanent sealing	■ Sika® Injection-307 (for permanent flexible sealing) ■ Sika® Injection-310 (for permanent flexible sealing)
■ Low viscosity, void filling, rigid material for load transfer in both (dry and damp areas)	■ Sika® Injection-190 GB (dry area) (optional, patch repairs with Sikadur®-31 CF)
■ Very low viscosity, flexible, designed for permanent sealing (in wet areas)	■ Sika® Injection-307 /-304 (optional, patch repairs with Sikadur®-31 CF) ■ Sika® Injection-201 CE (optional, patch repairs with Sikadur®-31 CF)
■ Extremely low viscosity, highly flexible, adjustable reaction time, designed for permanent sealing	■ Sika® Injection-307 /-304

EQUIPMENT FOR SIKA INJECTION MATERIALS

INJECTION PUMP TECHNOLOGIES FOR SUCCESSFUL WATERPROOFING

There are two different pump technologies available on the market today for resin and microfine cement injection, there are 1- and 2-component pumps. The most widely used are the 1- or single component pumps, which have the key advantage of being available for a much lower cost, and so the contractor's investment is a fraction of what it would be for a 2- or 2-component pump. The main reason that 2-component pumps are still used is that they are the best and in fact the only way to inject fast and very fast curing resins, because of their extremely short pot-life; plus they are best for injecting large volumes of material.

SINGLE-COMPONENT PUMPS:
The storage container of the pump is filled with the pre-mixed resin or microfine cement grout. The pot-life of this injection material starts after mixing and it is always necessary to apply the complete mixed volume within the relevant pot-life.

There are hand, piston and diaphragm pumps available using 1-component pump technologies and they are designed to accommodate and handle small or medium volumes of injection material.

2-COMPONENT PUMPS:
These have two storage containers and each container is filled separately with a different component; with the components only coming together when they are pumped through the static mixer. The pot-life therefore starts in the static mixer and so this kind of pump can be used for very fast reacting resin based materials.

There are 2-component pumps designed specifically for each of the different resin technologies available, which is due to their differing viscosity, mixing ratio and reaction time etc., as well as for different types of applications. For fast-gelling acrylate or polyacrylate resins as they are also known, a separate rinsing pump is recommended to be used for cleaning the pump and static mixer.

There are also 2-component piston pumps available which can successfully inject medium to high volumes of 2-component PU or epoxy resins, even against high hydrostatic pressure.

		Single-component pump	2-component pump (Acrylate)	Vacuum pump	Colloidal Mixer
Polyurethane Foam Resins	Sika® Injection-101 RC Sika® Injection-107	X			
Polyurethane Resins	Sika® Injection-201 CE	X			
Acrylate Resins	Sika® Injection-307/-310	X	X	X	
	Sika® Injection-304		X		
Epoxy Resins	Sikadur®-52	X			
Microfine Cement	Sika® Injection-190 GB	X		X	X

INJECTION EQUIPMENT FOR SUCCESSFUL WATERPOOFING

SINGLE COMPONENT PUMPS FOR POLYURETHANE (PU), POLYACRYLATE AND EPOXY RESINS, PLUS MICROFINE CEMENT SUSPENSIONS

Single component pumps are the universal injection pumps and suitable for a wide range of applications. They are ideal for professional crack sealing applications and for the injection of SikaFuko® hoses and membrane compartment systems.

2-COMPONENT PUMPS FOR POLYACRYLATE GELS

2-component pumps are designed for curtain injection behind the structure, for high volumes, or using fast reacting polyacrylate gel resins.

VACUUM PUMPING EQUIPMENT FOR RE-INJECTION OF SikaFuko® INJECTION HOSE SYSTEMS

Vacuum pumping equipment is important for reinjection of the SikaFuko® Injection hose systems. It is used for flushing and cleaning the SikaFuko® hoses with water after injection with acrylate gel or microfine cement materials, to enable the system to be used for future re-injection if required.

MIXING EQUIPMENT FOR MICROFINE CEMENT SUSPENSIONS

A colloidal mixer is needed for the complete and thorough mixing of microfine cement suspensions such as the high performance Sika® Injection-190 GB.

NOTE: Sika Limited in the UK does not supply pump equipment

SIKA ACCESSORIES FOR SUCCESSFUL INJECTION WORKS

SIKA® INJECTION PACKERS FOR DIFFERENT APPLICATIONS

Sika® Injection Packers or Ports as they are also known, are fixed into or onto the structure and are used as nozzles to connect the injection pump to the structure and direct the material to fill the cracks or voids. Sika Connection Packers are used to connect embedded injection hoses or compartment systems.

MECHANICAL PACKERS
for high and low pressure injection where drilling holes is possible

Type MPS
For Polyurethane, Epoxy and Acrylate resin injection.

Type MPR
For Polyurethane, Epoxy and Acrylate resin injection.

Type MPC
For Microfine cement injection.

SURFACE PACKERS
for low pressure injection, where drilling holes in the surface is not possible or best avoided due to damage or the location of steel reinforcement etc.

Type SP
For Epoxy injections – generally with patch repairs.

CONNECTION PACKERS
Sikaplan® W Injection piece
for injection of membrane compartments

For Acrylate injection

SikaFuko® Packer tong
for Injection of SikaFuko® Injection hose System

Type SikaFuko® Packer tong
For Acrylate, Polyurethane, Epoxy and microfine cement injections.

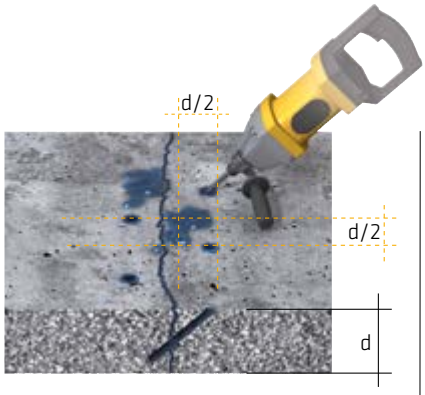
			Packer Type					
			Mechanical			Surface	Connection	
Application	Concrete/Substrate Condition/Quality	Injection Pressure	MPS	MPR[1]	MPC[2]	SP	Sikaplan® W Inj.	SikaFuko® Packer tong
Crack and void injection	Drilling not possible (steel reinforcement)	1 – 10 bar				X		
	Good or Poor (drilling is possible!)		X	X	X	X		
SikaFuko® injection								X
Compartment injection	N/A						X	
Curtain injection	Good or Poor (drilling is possible!)	10 – 200 bar		X[3]				
Crack and void injection			X	X				

1) Recommended for high pressures and high flow rates 2) Specially designed for injection with microfine cement 3) Only with button head (non-return) fitting

THE CRACK INJECTION PROCESS

CRACKS IN CONCRETE STRUCTURES can be caused as the result of excessive load or stress on the structure by internal or external forces (e.g. ground movement). Leaking cracks need to be closed and sealed to secure the watertightness and durability of the structure.

SEQUENCE OF APPLICATIONS



1. Drill holes for the packer alternating at a 45° angle to the concrete surface as shown in the picture.
Ø of drill hole = Ø of packer + 2 mm.

2. Install the mechanical packers. Tighten the mechanical packers so that they can withstand the maximum injection pressure.

3. Fix the non-return valve on the first packer and start the injection process.

4. When the injection material flows out of the second packer during the injection process, fix the non-return valve on to this as quickly as possible. Stop injection at the first packer and continue at the second packer.

5. Repeat this procedure from packer to packer.

6. If necessary, e.g. after injection of PU-foaming resins, a secondary injection procedure is carried out to ensure the crack is completely filled and sealed with non-foaming PU injection material.

GENERAL INFORMATION

- On vertical elements always start injection from the bottom and work upwards
- Slow, low pressure injection is more effective than rapid, high pressure injection
- For detailed information please refer to the Sika Method Statement for Crack Injection (Waterproofing)

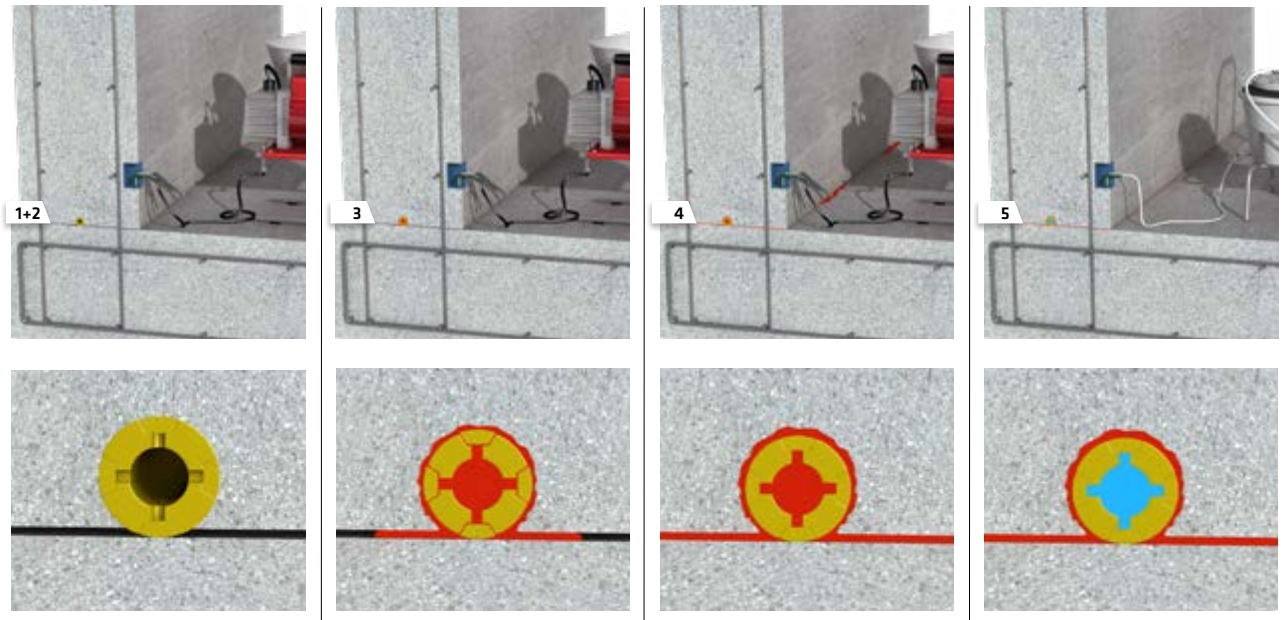
TYPICAL SIKA PRODUCT

For Waterproofing:
Sika® Injection-101 RC (temporary)
+ Sika® Injection-201 CE (permanent)
Sika® Injection-107 (permanent)
For Load Transfer:
Sikadur®-52

JOINT INJECTION WITH SikaFuko® INJECTION HOSE SYSTEM

SikaFuko® INJECTION HOSE SYSTEM is used on its own for construction joint sealing, or it is used as a back-up system in combination with waterbars. Installation is done during the concreting phases of the project.

SEQUENCE OF APPLICATIONS



1. Locate start and end of injection hose in the affected construction joint e.g. in junction boxes.
2. Connect the pump to the injection hose system e.g. through Sika® Packer tong.

3. Begin injecting the SikaFuko® hose until the material flows out of the opposite end.

4. Close the opposite end and start injecting again until material is seeping out along the length of the joint.

5. When using re-injectable materials, the SikaFuko® hose can be flushed clean with water which is also removed by vacuum. The SikaFuko® hose is then ready for future re-injection if required.

GENERAL INFORMATION

- SikaFuko® Systems must be installed before concreting the construction joint
- Documenting the location of the junction boxes and run of the hoses is important
- For detailed information please refer to the Sika Method Statement for SikaFuko®
- On vertical elements always start injection from the bottom and work upwards
- Slow, low pressure injection is more effective than rapid, high pressure injection

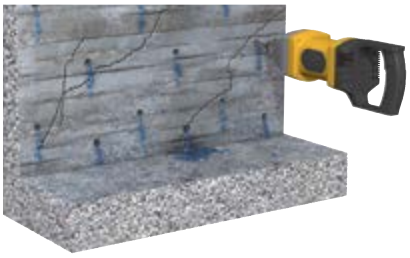
TYPICAL SIKA PRODUCT

Sika® Injection-307 (steel concrete)
Sika® Injection-310
Sika® Injection-190 GB

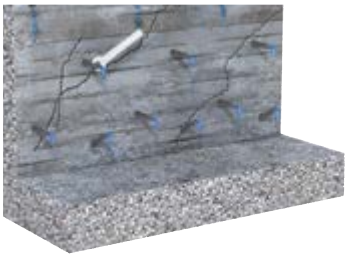
THE CURTAIN INJECTION PROCESS

BASEMENTS CAN DEVELOP LEAKS over large sections of their whole area for many reasons including inadequate concrete mix design, placing or compaction, in addition to ground movement and rising water tables etc. These larger areas can be sealed by curtain injection behind the concrete structure.

SEQUENCE OF APPLICATIONS



1. Drill holes for the mechanical packers through the leaking building component at a spacing of 30 – 50 cm as shown in the picture.

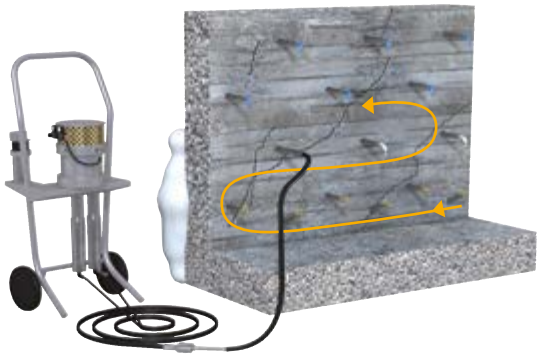


2. Install the mechanical packers. Tighten the mechanical packers so that they can withstand the maximum injection pressures.

3. Fix the button head (non-return) fittings on the first packer and start the injection process at the lowest row of drill holes.

4. When the injection material flows out of the second packer during the injection process, fix the non-return valve on it as quickly as possible. Stop injection at the first packer and continue at the second packer.

5. Continue the injection procedure from packer to packer.



GENERAL INFORMATION

- On vertical elements start injection from the bottom and work upwards
- Slow, low pressure injection is more effective than rapid, high pressure injection
- Detailed recording of the material flow in and out of each packer is important
- Test injection is recommended to define the best spacing for the packers

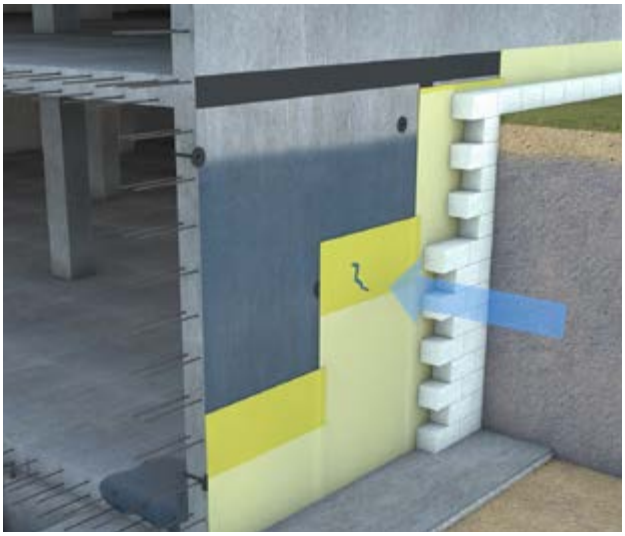
TYPICAL SIKA PRODUCT

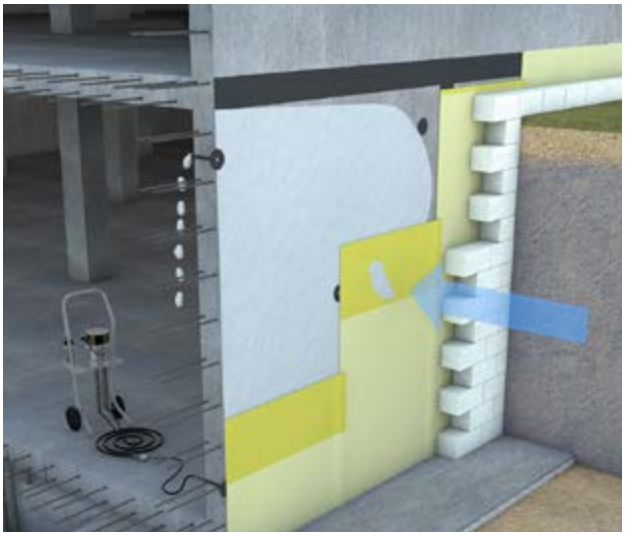
Sika® Injection-307
Sika® Injection-304 (high water ingress)

THE MEMBRANE COMPARTMENT INJECTION PROCESS

COMPARTMENTALIZED MEMBRANE SYSTEMS ARE USED for securely waterproofing basements so that in the event of any future leaking or damage to the membrane, any leaking compartment can easily be repaired and sealed by injection through flanges accessible from inside the structure.

SEQUENCE OF APPLICATIONS





1. Remove the face-plate from the junction box and expose the Control Tube vent ends for the leaking compartment. Connect a Sikaplan® W Injection Piece to one vent end.

2. Once a secure connection is made with the Sikaplan® W Injection Piece, start the injection pump. The injection process can be monitored through the remaining open vent ends of the same compartment.

3. Once the injection material is observed flowing out of an adjacent vent end, stop the pump (or close the valve on the pump assembly). Plug the vent end releasing injection material with a Sikaplan® W Injection Piece. Start pumping again through the same vent end that was being injected prior to observing material being released.

4. Repeat these procedures until all the vent ends of this compartment are injected and any water in the compartment is fully displaced and replaced by resin.

5. When the compartment vent ends are all filled with uncured injection resin under pressure, stop the pump.

6. The cleaning process to leave the Control Tubes re-injectable must begin before the injection material cures in the Control Tube vent ends.

GENERAL INFORMATION

- It is important that the entire compartment be fully injected. Partially filled compartments do not guarantee long term watertightness
- On vertical elements always start injection from the bottom and work upwards
- Slow, low pressure injection is more effective than rapid, high pressure injection
- Very good documentation is important during installation of the membrane system
- For more detailed information please refer to the Sika Method Statement for Membrane Compartment injection

TYPICAL SIKA PRODUCT

Sika® Injection-307
Sika® Injection-310 (easy to use)

CASE STUDIES

SURFACE SEALING A LEAKING SHAFT

PROBLEM
An inadequate waterproofing system had been selected for a concrete shaft standing in groundwater. Water was infiltrating the shaft from several construction joints and damaging the electrical installations.

Injection Material Requirements
- Very fast reacting
- Able to form a new permanent watertight seal
- Environmentally friendly

SIKA SOLUTION
Curtain injection with
- Fast reacting polyacrylate gel resin Sika® Injection-304

Injection Equipment
- 2-component injection pump and Sika® Injection Packer MPR with button head fittings

SEALING CRACKS IN A BASEMENT

PROBLEM
A basement garage built with waterbars, suffered settlement cracks in the structure after construction. Water was infiltrating because the garage was exposed to groundwater under hydrostatic pressure.

Injection Material Requirements
First phase:
- Fast foaming injection resin
- Reacting only in contact with water

Second phase:
- Low viscosity
- No shrinkage in subsequent dry conditions
- Good adhesion to concrete
- Environmentally friendly and chemically resistant

SIKA SOLUTION
Crack injection with
- Fast reacting polyurethane foaming resin Sika® Injection-101 RC for temporary waterstopping
- Elastic, non-foaming polyurethane resin Sika® Injection-201 CE for permanent waterproof sealing

Injection Equipment
- 1-component injection pump and Sika® Injection Packer MPS

SEALING OF DAMAGED TUNNEL WATERPROOFING MEMBRANES

PROBLEM
A tunnel below groundwater level was originally waterproofed with sheet membranes and waterbars. Membranes were damaged during the construction works but this went un-noticed until later when the tunnel began leaking. Fortunately the damage location was easily identified as the membrane and waterbars were formed into compartments.

Injection Material Requirements
- Permanently elastic
- Able to form a new permanent watertight seal
- Gel time able adaptable to specific requirements
- Capable of absorbing (swelling) and releasing (shrinking) in contact with water for future security

SIKA SOLUTION
Compartment injection with
- Acrylate resin gel based Sika® Injection-307
- Acrylate resin gel based Sika® Injection-310

Injection Equipment:
- 1-component injection pump

STRUCTURAL CONCRETE CRACK REPAIRS ON A BRIDGE

PROBLEM
Cracks with the potential to become a significant structural problem occurred in the support piers of a motorway bridge due to excessive dynamic loads from increased traffic.

Injection Material Requirements
- Low viscosity material for good penetration
- High mechanical and adhesive strengths
- Suitable for both dry and damp crack conditions

SIKA SOLUTION
Crack injection with
- Low viscosity epoxy resin based Sikadur®-52 Injection for cracks >0.3 mm
- Epoxy patch repair material Sikadur®-31 CF

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Injection equipment
- Sika® Injection Packer SP
- 1-component injection pump

CRACKS IN CONCRETE STRUCTURES

STAGE OF MOISTURE			
Objectives	**Dry and Wet**	**Flowing Water**	
		"No Pressure"	**"Under Pressure"**
Closing	Sika® Injection-107 or Sika® Injection-201 CE or Sika® Injection-307/-310 or Sikadur®-52 or Sika® Injection-190 GB	Sika® Injection-107 or Sika® Injection-201 CE or Sika® Injection-304 or Sika® Injection-307 or Sika® Injection-310	Sika® Injection-101 RC
Waterproofing			Sika® Injection-101 RC + Sika® Injection-201 CE or Sika® Injection-107 or Sika® Injection-101 RC + Sika® Injection-304/-307/-310
Structural Repair	Sikadur®-52 Sika® Injection-190 GB	Not possible	Not possible
Flexible Repairs	Sika® Injection-107 or Sika® Injection-201 CE or Sika® Injection-304 or Sika® Injection-307/-310	Sika® Injection-107 or Sika® Injection-201 CE or Sika® Injection-304 or Sika® Injection-307/-310	Sika® Injection-101 RC or Sika® Injection-107 or Sika® Injection-201 CE or Sika® Injection-307/-310

SIKA FULL RANGE SOLUTIONS FOR CONSTRUCTION:


LIQUID APPLIED ROOFING


SINGLE PLY ROOFING


BITUMINOUS ROOFING


CONCRETE


CONCRETE REPAIR


STRUCTURAL STRENGTHENING


BUILDING FINISHING


WATERPROOFING


JOINT SEALING


FAÇADES


FLOORING


INDUSTRY


DISTRIBUTION

BUILDING TRUST

FOR MORE INFORMATION:

Visit: **www.sikawaterproofing.co.uk**

WHO WE ARE

Sika Limited and Sika Ireland Limited are part of the global Sika Group, specialising in the manufacture and supply of chemical based products. Sika has a leading position in the development and production of systems and products for bonding, sealing, damping, reinforcing, and protecting in the building sector and the motor vehicle industry. Sika has subsidiaries in 100 countries around the world and manufactures in over 300 factories. With more than 25,000 employees Sika generates annual sales of CHF 7.9 billion (£6.14 bn). We are also committed to providing quality, service, safety and environmental care.

In the UK and Ireland, we provide market-leading solutions for concrete, waterproofing, roofing, flooring, refurbishment, sealing & bonding, and industry, and have manufacturing sites in Welwyn Garden City, Preston, Leeds, Wishaw and Dublin with more than 920 employees and a turnover of more than £290 million.

SYSTEM CERTIFICATION ISO 9001 SGS
SYSTEM CERTIFICATION ISO 14001 SGS
SYSTEM CERTIFICATION OHSAS 18001 SGS

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