

METHOD STATEMENT

Sika[®] Compartment Injection

10/2021 / VERSION 5

BUILDING TRUST
CONSTRUIRE LA CONFIANCE



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1 SCOPE

This method statement describes the step by step procedure for injection and re-injection of leaking compartments/membranes.

2 SYSTEM DESCRIPTION

This method statement describes the flexible sealing of leaking compartments and the preparation (re-)injection of compartment systems.

This method statement describes the requirements for furnishing and installing re-injectable membrane compartments in concrete structures and furnishing and injection resin when required to create a continuous diaphragm to prevent fluid migration in the event of membrane damage.

Following the initial injection operation, all outlet hoses to the control injection flanges shall be cleaned with water and left prepared for future injection procedures. All work shall be in strict accordance with Sika recommendations.

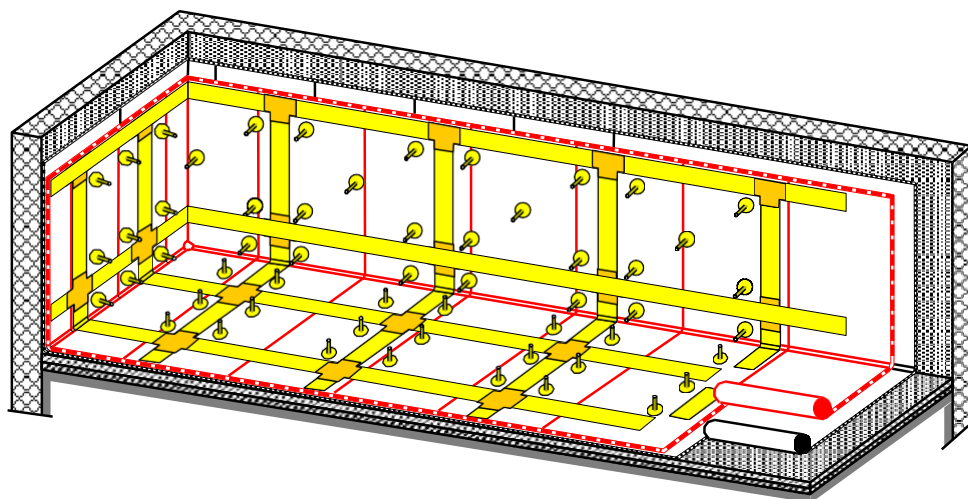
2.1 GENERAL BACKGROUND INFORMATION

Building structures with basements below ground usually need to be watertight. Waterproofing works dependent on the basement structure are required to prevent leakage into the structure and to protect the structure against the harmful influences of aggressive ground- or seawater.

Highly flexible single layer (or if required, double layer) Sikaplan waterproofing membranes can protect a structure against water from damp soil contact, percolating water and groundwater under hydrostatic pressure.

In situations with leaking waterproofing membranes caused by mechanical damage to the membrane (whether a loose-laid and single or double layer system), infiltrating water may underflow and travel uncontrollably between the installed membrane and the structure.

A compartment system with waterstops, specially welded single or double layer membranes, and injectable tubes provides the possibility of control and repair by injection, if required, during service life.



For the installation procedures and details with the Sikaplan WP waterproofing membranes based on PVC, check the Method Statement “Basement Waterproofing with Membranes” No. 8506403.

This Method Statement will only discuss the “Basement Waterproofing with Membranes” and summarize the most important information for compartment installation of PVC Membranes (e.g. Sikaplan WP 1100 series). The membrane (PVC or TPO) will be installed according to Sika recommendations. For TPO Membranes, use the compatible TPO control sockets and waterstops.

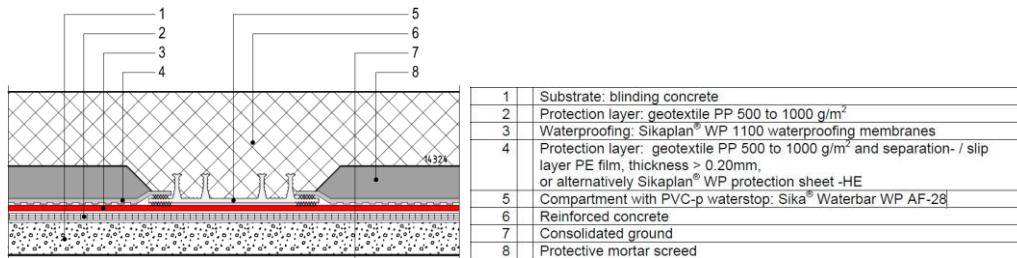
To prevent local leakage that may affect the entire membrane system due to ingress of water, independent membrane “compartments” will be established with the installation of appropriately placed waterstops. The compartment size should not exceed 150 m². Local leakage will influence only the compartment area affected by the membrane damage due to the blockage of water through the waterstops (i.e. Sika Waterbar WP AF-28) welded onto the membrane system.

The Control & Injection Flange (i.e. Sikaplan WP Control Socket 6mm) shall be tack welded to the membrane to keep it in position during construction activity, at a location close to the compartment waterstop intersections (minimum 4 injection flanges per compartment).

The blue PU Tube (e.g. Sikaplan W Control Tube PU 6mm) should be inserted into the Control Socket. To prevent migration of dirt, debris, water, or concrete, cap the exposed end of the PU Control Tube during construction (e.g. Sikaplan W Lock Connection Cap 6mm). The length of the PU Tube depends on site conditions. PU Control Tube length shall be as short as possible. PU Control Tube ends should be located within a junction box so that the tube end is easily accessible during construction as well as structure service life.

Junction boxes shall be heavy-duty plastic or steel intended for embedment in concrete and of adequate size for housing and protecting the vent ends of the PU tube. Junction Boxes shall be securely fitted with temporary knock-out covers to be used during concreting operations. When exposed to view, boxes shall be fitted with covers mounted flush with the surrounding surface area. The junction boxes shall be located at the nearest wall or column (vertical element).

A heavy-duty geotextile (e.g. Sikaplan W Felt 500 PP) shall be placed over the entire membrane area, including the control sockets, for protection of the membrane. Cut/remove the geotextile to expose the compartment waterstops for embedment in future placement of structural concrete. Place a protective mortar screed (in accordance with the following detail) onto the geotextile placed over the membrane area to prevent damage of the membrane.



The compartment is now ready for the placement of reinforcement and concrete

2.2 LIMITATIONS

- Products shall only be applied in accordance with their intended use.
- Local product differences may result in performance variations. The most recent and relevant local Product Data Sheets (PDS) and Material Safety Data Sheets (MSDS) shall apply.
- All work shall be carried out as directed by qualified applicator.
- This method statement is only a guide and shall be adapted to suit local products, standards, legislation, or other local requirements.








3 REFERENCES

To ensure correct application of *Sika® Injection-306* or *Sika® Injection-310*, please refer to the following documents of each product component:

- PDS (Product Data Sheet)
- MSDS (Material and Safety Data Sheet)

4 PRODUCTS

- [Table to be adapted for local use \(do not include technical or mechanical information\)](#)

Sika Products Injection Material		Description Key words
<i>Sika® Injection-306</i> or <i>Sika® Injection-310</i>		Acrylate-based, low viscosity, flexible, swellable, re-injection possible
Sika® Waterbar WP AF-28		Waterstop WP for welding onto Sikaplan WP Membrane
Sikaplan® WP Control Socket 6mm		Control Flange for spot welding onto the membrane
Sikaplan® W Control Tube PU 6mm		Control Tube for injection
Sikaplan® W Lock Connection Cap 6 mm		Lock during construction
Sikaplan® W Injection piece		Connection Adapter to connect the control tube with the injection pump
Junction boxes		Termination and protection of blue Control Tube Vent Ends

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4.1 MATERIAL STORAGE



Materials shall be properly stored in undamaged, original, sealed packaging, in cool, dry conditions. Refer to the product data sheet for minimum and maximum storage temperatures.

5 EQUIPMENT

5.1 INJECTION EQUIPMENT

1-Component Injection pump
equipped with a hose and ball valve

A piston pump is recommended

Size of pumps can vary depending on job site conditions.



Nipple-gripper for round-head nipples.
Connection between the pump and the
Sika Injection Packer Type MPS

The nipple-gripper shall be replaced periodically
as the seal wears during normal usage



Sikaplan W Injection Piece connected to the Sikaplan W Control
tube



Tool box with screwdrivers, wrenches,
ratchet set (Diameter >6 mm up to 24 mm), tongs, etc.



Plenty of clean buckets



Measuring cups



Shop towels



6 HEALTH AND SAFETY

6.1 PERSONAL PROTECTION

Work Safely!



Handling or processing of injection products can cause chemical irritation to the eyes, skin, nose, and throat.

Appropriate eye protection should be worn at all times while handling and mixing products.

Safety shoes, gloves and other appropriate skin protection must be worn at all times.

Always wash hands with suitable soap after handling products and before food consumption.

In addition to protective clothing, it is also recommended to use a barrier cream on the skin. If any injection resin or hardener component contaminates clothing articles, remove the garment immediately. Friction of resin-saturated fabric on skin can cause serious chemical burns. Wash exposed skin occasionally during the workday and immediately upon contact with injection material. Avoid using solvents, as they may cause material to penetrate the skin. Additionally avoid skin contact by keeping tools and equipment clean. In addition to safety precautions, with any instance of skin contact, rinse immediately with clean warm water and use soap to thoroughly clean the skin.

FOR DETAILED INFORMATION REFER TO THE MATERIAL SAFETY DATA SHEET

1.1. FIRST AID



Seek immediate medical attention in the event of excessive inhalation, ingestion or eye contact causing irritation. Do not induce vomiting unless directed by medical personnel.

Flush eyes with plenty of clean water, occasionally lifting upper and lower eyelids. Remove contact lenses immediately. Continue to rinse eye for 10 minutes and then seek medical attention.

Rinse contaminated skin with plenty of water. Remove contaminated clothing and continue to rinse for 10 minutes and seek medical attention.

FOR DETAILED INFORMATION REFER TO THE MATERIAL SAFETY DATA SHEET OF THE CORRESPONDING PRODUCT!

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7 ENVIRONMENT

7.1 CLEANING TOOLS / EQUIPMENT

Tools and equipment used for mixing and applying *Sika® Injection-306* or *Sika®Injection-310* can be cleaned according to the PDS *Sika® Injection Cleaning Systems*.

Sika Products	Description Key words
<i>Sika® Injection Conservator</i>	Maintains valves and seals of injection equipment after use and during storage.

7.2 WASTE DISPOSAL

Do not dispose surplus material into drains. Dispose responsibly through a licensed waste disposal contractor in accordance with legislation and local / regional authority requirements. Avoid run-off into soil or waterways, drains or sewers.

Hardened resins can be disposed of with other combustible waste in a waste incineration plant. Do not incinerate the resin in an open fire, which may release potentially dangerous gases.

Uncured resin must be disposed of as hazardous waste. It is forbidden to mix it with conventional waste.

FOR DETAILED INFORMATION REFER TO THE MATERIAL SAFETY DATA SHEET

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8 DOCUMENTS – PLANINNG

After concrete placement and curing, remove the Sikaplan W Lock Connection Cap 6 mm from each Control Tube. As soon as water can penetrate into the structure and fill the compartment, the control tubes will start leaking. This is an indicator that the membrane has a leak which must be fixed.

Documents:

Prepare product data sheets, Material safety data sheets, and installation drawings showing all compartments, location of control injection flanges, all Control Tube runs, and location of junction boxes. During construction, furnish copies of such documentation to the engineer-of-record after each major task. Additionally, furnish “as-built” drawings at the time of final acceptance. Submit Operation and Maintenance Manuals containing detailed instructions for grouting and cleaning and other necessary information for future maintenance / injection.

Planning:

Submit procedures for installation, inspection, resin injection and cleaning to the engineer-of-record.

9 INJECTION PROCESS

If any leakage appears through the membrane or at the PU Control Tube vent ends at any time, flexible hydrophilic acrylate gel (e.g. Sika Injection-306, Sika Injection-310) shall be injected as a remedial measure using the following procedure to stop such leaks and seal the membrane area of the leaking membrane compartment.

Material	Prepare Sika Injection-306 or Sika Injection-310 in accordance with the PDS, using the longest possible pot life (50 min).
Junction Box	Remove the face-plate from junction box and expose vent ends of the leaking compartment. Connect Sikaplan® W Injection Piece to one vent end (PU tube).
Starting vent end	On vertical elements such as walls, start injection from the bottom of the compartment and work upwards. Otherwise begin with the vent end with the lowest water pressure. In horizontal areas such as slabs-on-grade, select any of the leaking PU tube vent ends.
Start pumping	Once a secure connection is made with the Sikaplan® W Injection Piece, start the injection pump. The compartment area between the membrane and structural concrete and PU Control Tube will be filled with injection resin. The water within the membrane compartment will be displaced through the open Control Tube vent ends and be replaced by the injection resin. The injection process will be monitored through the remaining open vent ends of the same compartment.
Pumping method	Slow, low-pressure injections are more effective than rapid, high-pressure injections. A successful injection will be indicated by the pump’s refusal of injection resin (the piston will quit pumping).

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PU Tube vent end material appears	<p>Once the injection material is observed flowing out of an adjacent Control Tube vent end, stop the pump (or close the ball valve on the pump assembly). Plug the vent end observed to be releasing injection material with an Sikaplan® W Injection Piece. Start pumping again through the Control Tube that was being injected prior to observing material being released from the adjacent Control Tube vent end. After 2-3 minutes, shift the injection pump to the plugged Closure Tube vent end (leaving the initially injected vent end plugged with the injection adapter).</p> <p>Repeat these procedures until all vent ends of this compartment are injected and the water in the compartment is fully replaced by resin.</p>
Remain injectable	<p>To ensure a re-injection, it is necessary to always inject freshly mixed injection material through the affected Sikaplan® W Injection Piece before the end of the injection material pot life. The freshly mixed material keeps the vent ends injectable if the injection takes longer than the chosen pot life of the material. The documentation gets very important.</p>
Stop pumping	<p>When the compartment is fully injected and all vent ends are filled with injection resin under pressure with uncured resin, stop the pump (or close the ball valve on the pump assembly). Disconnect the pump hose from the Sikaplan® W Injection Piece.</p>
Cleaning vent end	<p>The cleaning process which leaves the Control Tubes re-injectable must begin before injection material in the Control Tube vent ends cures. Fill the hopper of the injection pump with clean water, start the pump, and continue to run the pump until water is observed flowing into a catch bucket. Connect the pump to one Sikaplan® W Injection Piece. In vertical elements such as walls, start at the bottom of the compartment and work upwards. Pump clean water into the vent end. The uncured resin in the pipe will be pushed into the compartment and replaced by clear water. Uncured acrylate injection resins are cleanable with water. See PDS of Sika Injection Cleaning System.</p> <p>Shift the pump to the adjacent vent ends of the compartment and repeat the same process until all other vent ends are filled with clear water.</p>
Finish	<p>Keep the compartment under pressure until the injected grout is fully cured.</p> <p>Disconnect the injection adapter and let the water release.</p> <p>Replace face plate of the junction box.</p>
Re-injection procedures	<p>Remove the face plate and start the entire process from the beginning. This process is repeatable multiple times.</p>
Cleaning	<p>Clean pump and tools according to the PDS of <i>Sika® Injection Cleaning System</i>.</p>
General	<p>In general, it is important that the entire compartment must be fully injected. Partially filled compartment injections do not guarantee long term watertightness.</p>

9.1 APPLICATION LIMITS

- Always check the injection material pot life and adjust for climate conditions. Do a cup test before injection to determine actual pot life as mixed.

10 INSPECTION, QUALITY CONTROL

As “Good Practice”, the injection applicator shall apply an inspection procedure to check the quality of the system. This includes:

- **Material:**
 - Do a cup test of the injection material:
Place a small amount of injection material into a cup, and observe the time it takes to cure.
- **Finished Injection:**
 - Visual observation

11 LEGAL NOTE

The information contained herein, and any other advice are given in good faith based on Sika's current knowledge and experience of the products when properly stored, handled and applied under normal conditions in accordance with Sika's recommendations. The information only applies to the application(s) and product(s) expressly referred to herein and is based on laboratory tests which do not replace practical tests. In case of changes in the parameters of the application, such as changes in substrates etc., or in case of a different application, consult Sika's Technical Service prior to using Sika products. The information contained herein does not relieve the user of the products from testing them for the intended application and purpose. All orders are accepted subject to our current terms of sale and delivery. Users must always refer to the most recent issue of the local Product Data Sheet for the product concerned, copies of which will be supplied on request or may be downloaded from our website at: www.sika.ca

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