



System Information

Membrane Lining System
for Potable Water Reservoirs
(Sikaplan® WT 4300)

Waterproofing for Drinking Water Storage

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Reservation with respect to product and application information
All data in our product information are based on our current knowledge and experience. They do not release users from careful testing of the application and strict observation of the relevant processing regulations because of the wide range of possible influences during the application and use of our products. Legally valid assurances of specific characteristics or suitability for special purposes of application other than those provided in our documentation for the specific product cannot be inferred from our information. Any protective rights or existing laws and provisions must be followed by the recipient or processor of our products at their own responsibility. Moreover our general terms and conditions of sale and warranty are valid.



Waterproofing for Drinking Water Storage

General

Every owner of a drinking water reservoir or tank expects his installation to meet high standards of quality, durability, and reliability. The installation must not only remain watertight for many years, it must meet all the sanitary requirements. It should also be easy to clean and maintain.

As a system provider and manufacturer of waterproofing for drinking water storage, together with our installation partners as technical experts we apply our entire know-how and experience to achieve these goals for you.

Advantages of Waterproofing Systems with Sikaplan® WT 4300

- The design of the flexible waterproofing membrane **Sikaplan® WT 4300** including the complete system of matching components gives you decisive advantages in installation and during use:
- **Sikaplan® WT 4300** meets all sanitary requirements for drinking water quality. Approvals have been obtained in AT, BE, CH, DE, DK, FR, IT, NL, SP, UK, USA and other countries.

– Sika has over 40 years of experience and competence in membrane waterproofing.

– The system is durable and economical; materials are covered by a comprehensive manufacturer guarantee.

– Installation is fast because the system is simple, efficient, and reliable (no drying or curing time required).

– The system protects the structure against saturation from within and attack by concrete-corroding water.

– It can be applied to virtually any container form and requires minimal substrate preparation.

– The system bridges cracks up to 6 mm wide.

– Lightweight materials.

– The system is complete, it includes all components.

– Sika can help writing specifications and installing the system.

– Sika installation technicians can provide on-site support.

– Resistant against approved water treatment agents (allowed chlorine concentration and water temperature, according to Product Data Sheet).

– The system requires very little maintenance; it is very easy to clean because the liner is smooth and light in colour.

– The membrane is very easy to weld.

– The liner contains no solvents, fungicides, heavy metals, or plasticizers.

– No harmful vapours are given off during installation.

– Recyclable materials.

– Resistant against approved cleaning agents.

We will be glad to provide the following information:

- Technical data

– Installation Guidelines and Installation Recommendations

– Application brochures and technical System Information brochures

– Material samples

– Recommendations for cleaning and sanitizing drinking water tanks and reservoirs
- National approvals for **Sikaplan® WT 4300** for drinking water storage:

• England, WRAS (BS 6920) and DWI

• USA, NSF 61

• Belgium / Netherlands, Belgaqua Belg-118/2, SWDE / hydrocheck 031

• Denmark, Miljøstyrelsen J.nr.M 241-0105

• Germany, DVGW W270, KTW

• France, ACS du CRECEP Ville de Paris N° 02 MAT.PA 039

• Italy, D.M. 21.3.73 e successivi aggiornamenti

• Austria, ÖNORM B 5014/Teil 1

• Switzerland, SVGW, BAG

• Spain, O.T.E.C. n° 06818

Waterproofing for Drinking Water Storage

System Recommendations


Design	<div>A perfectly functioning waterproofing system for drinking water storage requires all of the following:</div> <div><div>– Careful design (including detail drawings)</div><div>– Early selection of system and materials</div><div>– Detailed specifications for tenders (bids)</div><div>– Installation by qualified waterproofing contractors only</div><div>– Co-ordination and monitoring of the installation work</div></div>	<div>The Sikaplan® waterproofing system for drinking water storage includes the following components:</div> <div><div>– Pressure-free drainage</div><div>– Levelling and drainage layer</div><div>– Sikaplan® WT 4300-15 C polymeric waterproofing membrane</div><div>– Flashings for fittings</div><div>– Components for perimeter terminations</div></div>
Substrate Preparation	<div>The structure of the reservoir or tank must be properly designed to withstand the hydrostatic loads so that the waterproofing membrane will suffer no damage due to deflection or settlement.</div> <div>The substrate must be clean, smooth, and free of projections and gravel pockets. Cracks in concrete structures</div>	<div>(4 mm wide or greater) must be grouted or filled with a structural material before the membrane is installed. Expansion joints must be covered with a metal expansion joint cover.</div> <div>Before the waterproofing is installed the contractor must inspect and accept the substrate.</div>
Pressure-free Drainage	<div>Pressure-free drainage must be provided behind the membrane to remove any water that collects there (e.g. migrating water or condensate). The number of drainage holes (drilled with a diameter of at least 20 mm) depends on the reservoir size. The</div>	<div>drains should be located at the lowest point of the reservoir floor, typically near the reservoir drain. Reservoirs located beneath the water table require special detailing. The plans of the engineer and the waterproofing specialist must be followed.</div>
Levelling and Drainage Layer	<div>A 500 g/m² white polypropylene mat is applied as a levelling and drainage layer. It smoothes out slight unevenness and protects the waterproofing membrane against mechanical damage. The levelling and drainage layer does not substitute proper substrate preparation as described above. The drainage characteristics of S-Felt M 500 white permit any migrating water or condensation water</div>	<div>behind the membrane to flow to the lowest point, where the water is eliminated by the pressure-free drainage system.</div> <div>Sheets of S-Felt M 500 white with seams lapped are applied to the prepared substrate and fastened with nail-drive anchors.</div>



Waterproofing for Drinking Water Storage System Recommendations

Sikaplan® WT 4300-15 C polymeric waterproofing membrane	Sikaplan® WT 4300 has a broad chemical resistance and is compatible with approved water treatment chemicals and cleaning agents. This FPO membrane also boasts an outstanding ecological profile. Sikaplan® WT 4300 contains no fungicides, heavy metals, or plasticizers.	
Installation	Sikaplan® WT 4300 sheets are loose laid over the levelling layer. Adjoining sheets are lapped 8 to 10 cm and seams are thermally welded. The membrane is usually applied to the walls first, then to the floor, then both are welded together. Along ridges and valleys, and for mid-field securement, the Sikaplan® WT laminated inox strip PP must first be installed. The membrane is then welded or tack-	welded to these strips. The metal flashing strips are typically butted together and secured to the substrate with stainless-steel nail-drive anchors. Installers must be careful not to damage the membrane on sharp edges or corners. Additional mid-field securement is required if turbulent water flow or suction is to be encountered.
UV Protection	Sikaplan® WT 4300 is temporarily UV-resistant (max. 6 months). Installation in an outdoor reservoir requires the application of suitable UV protection.	
Storage	Sikaplan® WT 4300 must be protected from the elements on the job site. By keeping the membrane clean and dry, seam preparation can be held to a minimum.	
Flashings at Fittings	Special care is required to perfectly seal the membrane at all penetrations (inlets, outlets, mounts, etc.). All connections should be executed with a clamp flange (observe local codes or standards, e.g.	DIN 18195 or SIA 272). The fixed piece must be set flush with the concrete surface to allow proper termination in the plane of the membrane.

Waterproofing for Drinking Water Storage System Recommendations

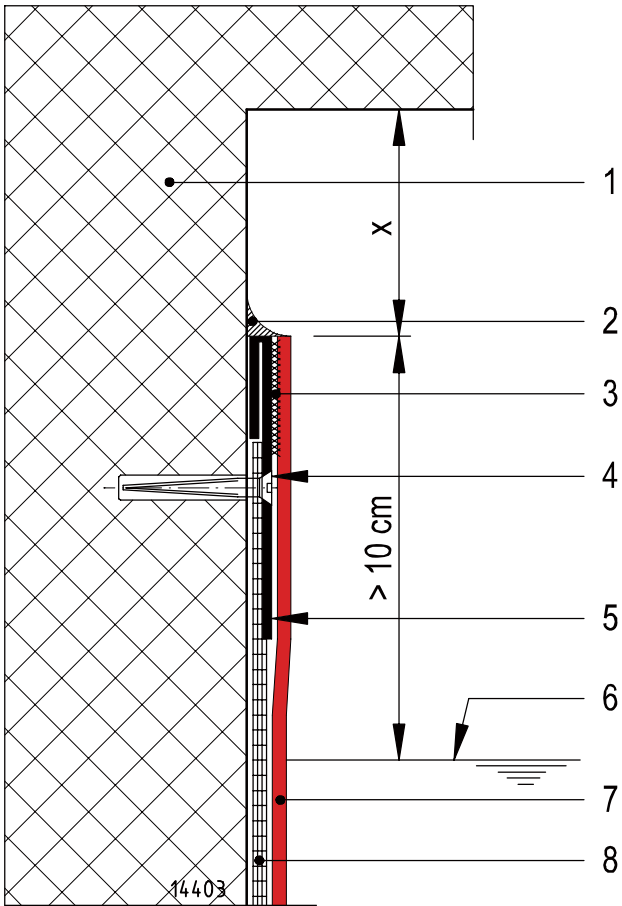
Edge Terminations	Unless codes or standards require otherwise, edge terminations are to be located at least 10 cm above the maximum water level. Waves in the water surface must be considered, such as those caused by pump operation. Edge terminations are secured with flat profiles or Sikaplan® WT laminated inox strip PP. The flashing strips are brake-formed as called for by the edge detail and fastened in place. The edge of the Sikaplan® WT 4300 membrane is then welded to the flashing strip.	Due to hygiene, the edge termination detail must always be finished with the application of sealant. Membrane edges secured with flat profiles or with laminated metal strips are not a watertight termination. These details are merely edge securement, which is why they must be located above the maximum water level.
Mid-field Membrane Securement	– Floors: with nail-driven anchors or clad metal flashing strips – Walls: in seams with nail-drive anchors; in fields with laminated metal strips	– Additional securement in fields will be necessary to resist extraordinary mechanical loads (turbulent flow, suction).
Exhaust Valves	To prevent “breathing” of the membrane during filling and draining, one-way exhaust valves should be installed above the water level (approx. one valve per 20m² of wall area).	
General Application Recommendations	Consult the Sikaplan® WT application manual for detailed installation recommendations. Test welds must be performed at the start of each day to determine exact welding parameters. Avoid black shoe soles, black electrical cords, and other objects that can leave marks on the membrane.	



Waterproofing for Drinking Water Storage

Detail Drawings

Edge termination with laminated metal
Sikaplan® WT laminated inox
 strip PP



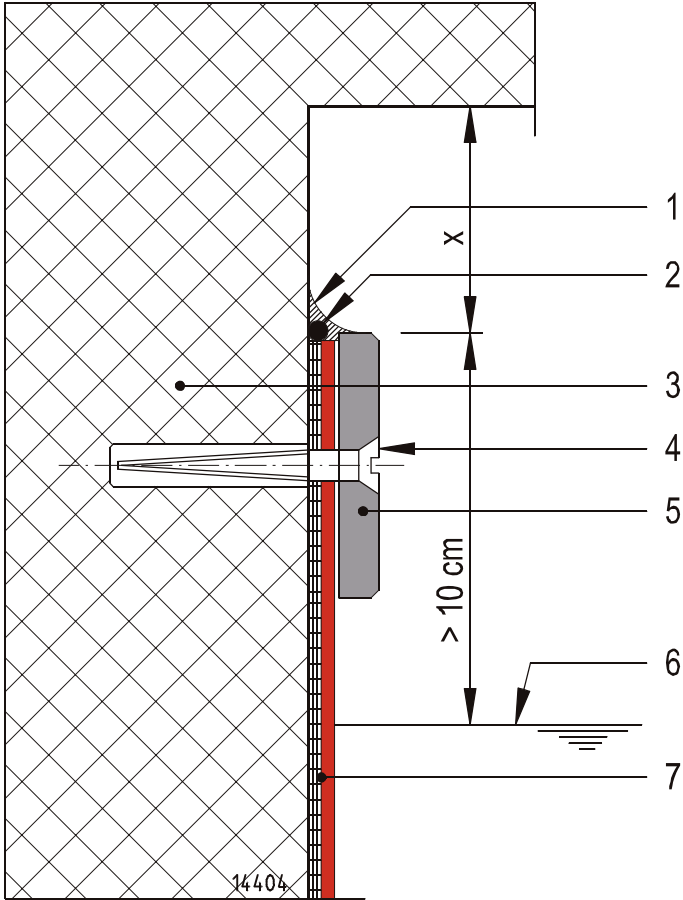
Space X: minimal working height

- 1 Concrete construction
- 2 Sealant fillet with **Ottoseal S27**
- 3 Hot air welding
- 4 Mechanical fixing (with stainless steel screw or anchor bolt, spacing 25 cm)
- 5 **Sikaplan® WT** Laminated stainless steel strip OS 75/25 PP
- 6 Maximum water level
- 7 **Sikaplan® WT 4300**
- 8 Levelling layer: synthetic felt **S-Felt M 500** white

Waterproofing for Drinking Water Storage

Detail Drawings

Edge termination with a flat section
Sikaplan® W Flat profile 30/4 V4A



Space X: minimal working height

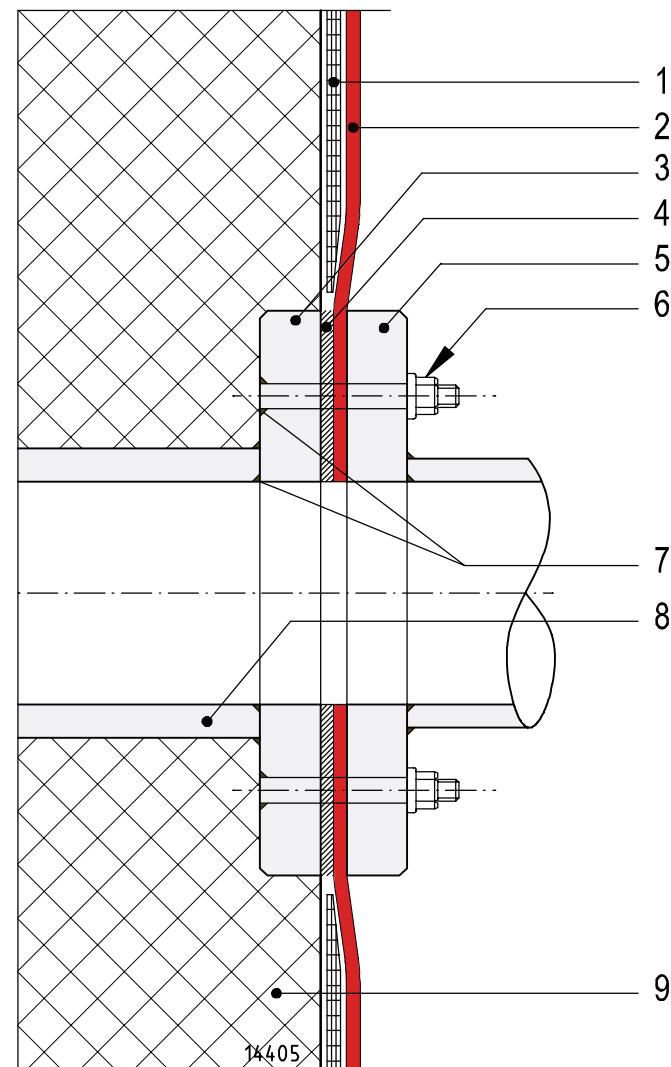
- 1 Sealant fillet with **Ottoseal S27**
- 2 Backing profile for sealant fillet
- 3 Concrete construction
- 4 Stainless steel fixing screw, spacing 16 cm
- 4 **Sikaplan® W** Flat profile 30/4 V4A (stainless steel)
- 5 Maximum water level
- 6 Levelling layer synthetic felt **S-Felt M 500** white and **Sikaplan® WT 4300**



Waterproofing for Drinking Water Storage

Detail Drawings

Pipe penetration
Double clamped flange

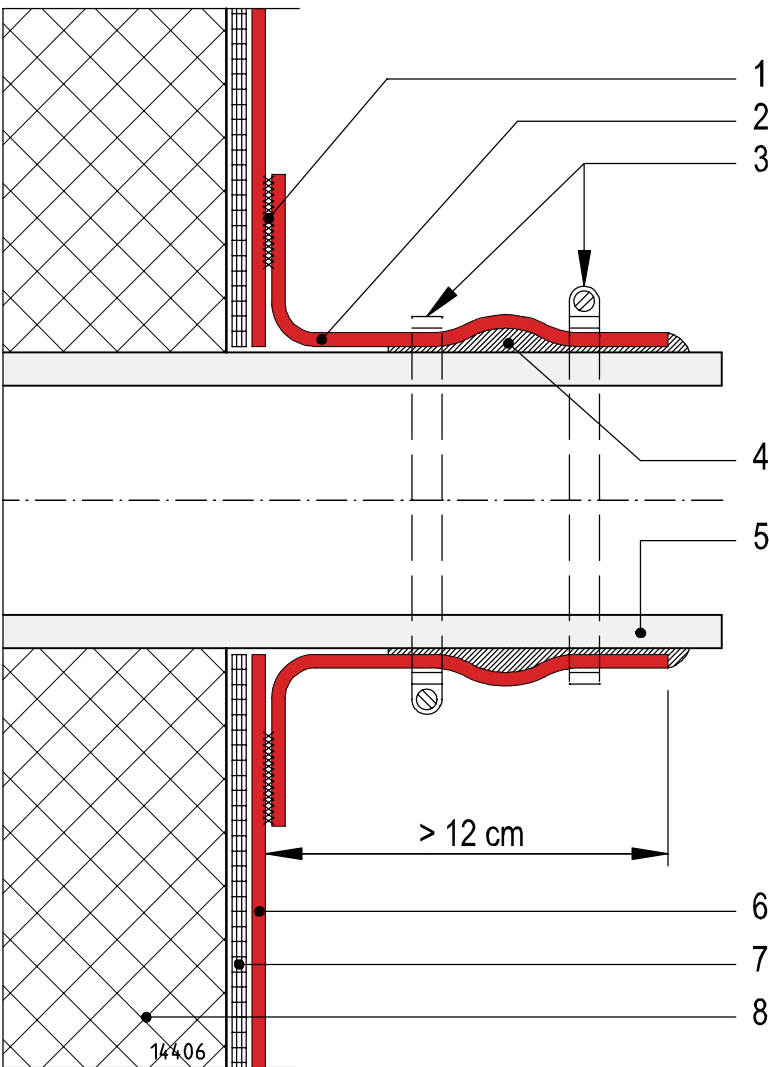


- 1 Levelling layer: synthetic felt **S-Felt M 500** white
- 2 **Sikaplan® WT 4300**
- 3 Fixed clamp flange, stainless steel or PE
- 4 Appropriate flat gasket
- 5 Loose clamp ring, stainless steel or PE
- 6 Bolt with locking nut and tapered washer, stainless steel
- 7 Watertight weld
- 8 Pipe, stainless steel or PE
- 9 Concrete construction

Waterproofing for Drinking Water Storage

Detail Drawings

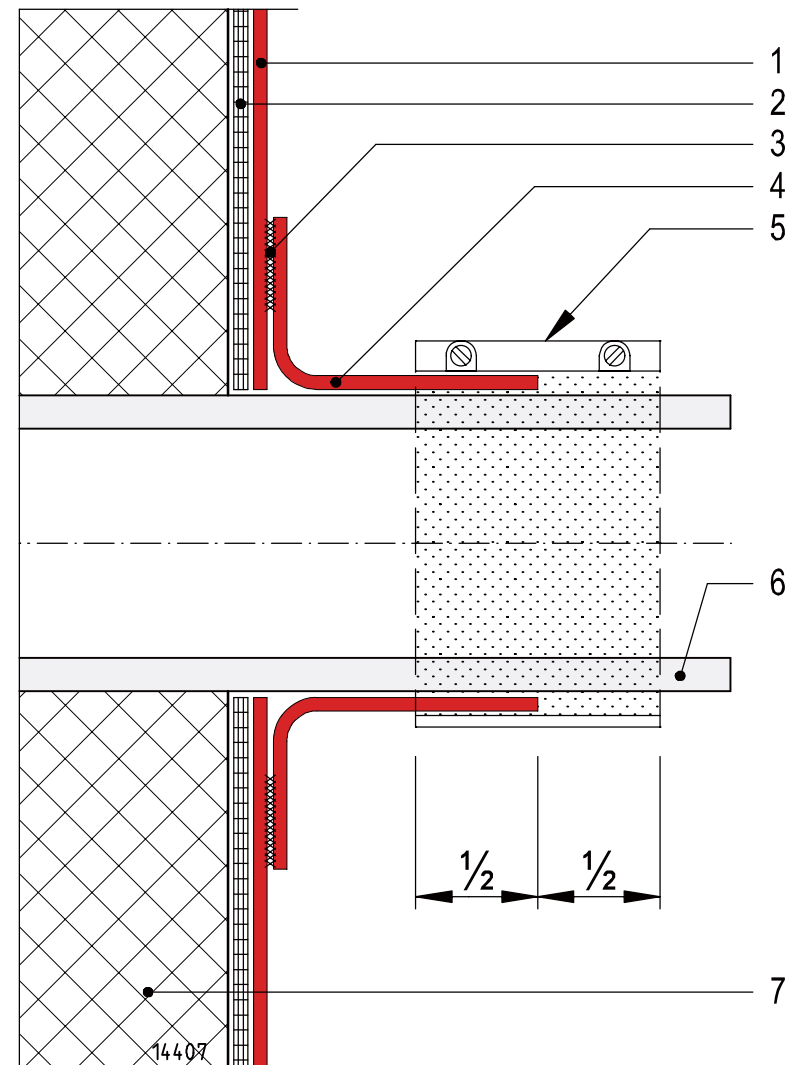
Pipe penetration
(max. 1m below water level)
Pipe sleeve made of
Sikaplan® WT 4300-18 H
Note: local standards must be complied with



- 1 Hot air welding
- 2 Pipe sleeve of homogeneous **Sikaplan® WT 4300-18 H**
- 3 2 stainless steel hose clamps, staggered
- 4 Sealant bead **Ottoseal S27**
- 5 Pipe, stainless steel or PE
- 6 **Sikaplan® WT 4300**
- 7 Levelling layer: synthetic felt **S-Felt M 500** white
- 8 Concrete construction

Waterproofing for Drinking Water Storage Detail Drawings

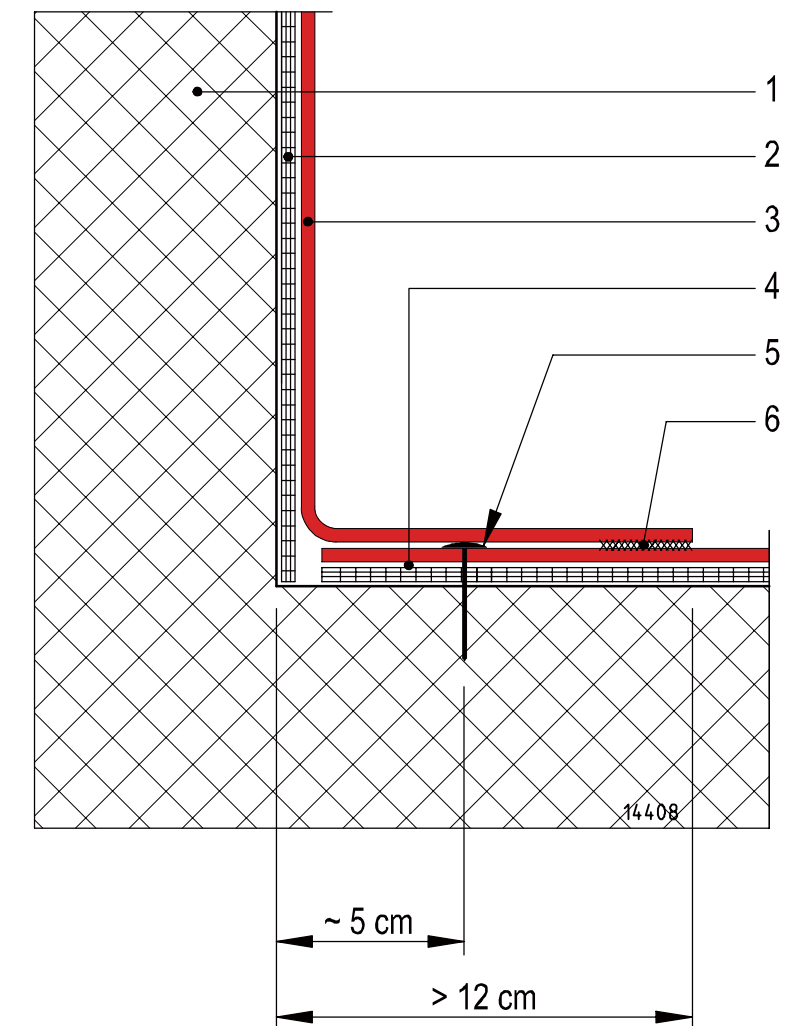
Pipe penetration
"Straub" coupling, pipe sleeve made of
Sikaplan® WT 4300-18 H



- 1 **Sikaplan® WT 4300**
- 2 Levelling layer: synthetic felt **S-Felt M 500** white
- 3 Hot air welding
- 4 Pipe sleeve made of homogeneous **Sikaplan® WT 4300-18 H**
- 5 "Straub" coupling
- 6 Old pipe, steel or PE (outside surfaces at coupling are thoroughly cleaned)
- 7 Concrete construction

Waterproofing for Drinking Water Storage Detail Drawings

Intersection with overlapping
Wall/floor or wall/wall

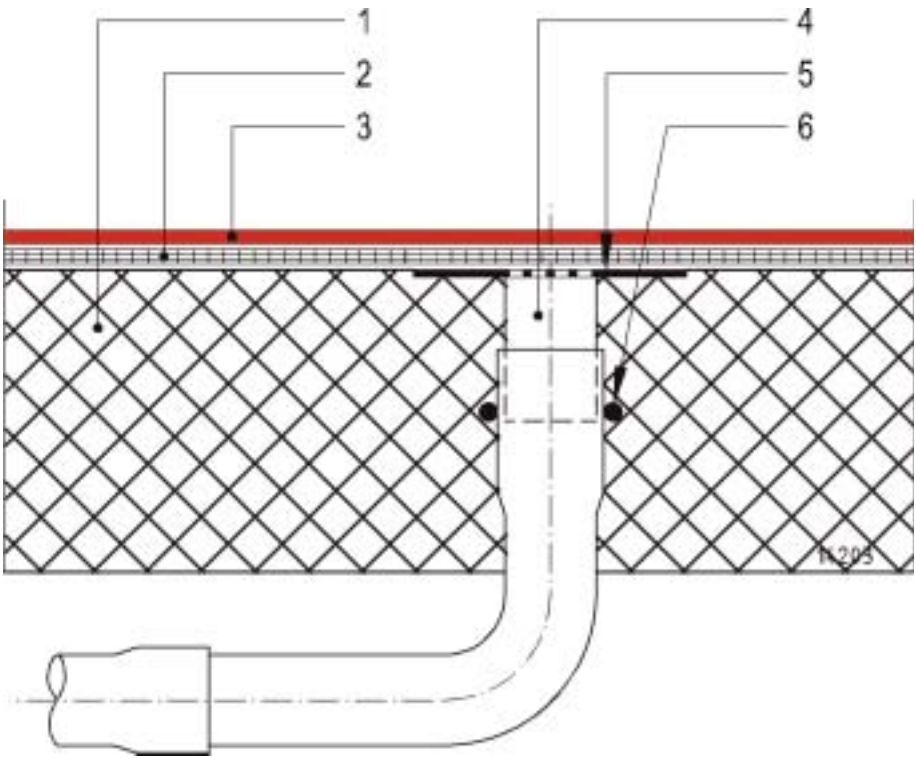


- 1 Concrete construction
- 2 Levelling layer: synthetic felt **S-Felt M 500** white
- 3 **Sikaplan® WT 4300**
- 4 Levelling layer: synthetic felt **S-Felt M 500** white and **Sikaplan® WT 4300**
- 5 Mechanical point fastening spacing 50 cm
- 6 Hot air welding

Waterproofing for Drinking Water Storage

Detail Drawings

Pressure-free drainage
 Located at lowest point,
 connected to sewer



- 1 Concrete construction
- 2 Levelling layer: synthetic felt **S-Felt M 500** white
- 3 **Sikaplan® WT 4300**
- 4 Pressure-free drainage connected to sewer
- 5 Reinforcing mesh over sewer
- 6 **SikaSwell® P** Profile watertight ring

Waterproofing for Drinking Water Storage

Welding

Hand Welding

Hand welding

Welding procedure

Sikaplan® WT 4300 surfaces to be welded must be clean and dry. Sheets should overlap at least 80 mm. Proper hand welding requires three steps:

1. Tack welding

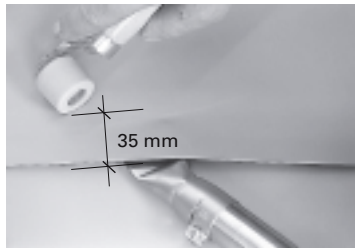
This holds the sheets in position.



2. Pre-welding

This continuous weld joins the sheets to form a heat pocket.

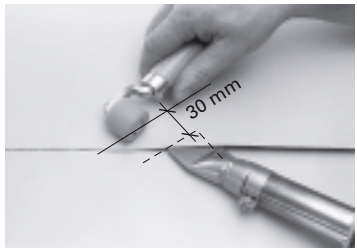
The weld is placed along the back of the overlap, leaving 35 to 40 mm of free material to be welded using a 40mm-wide welding nozzle (or 15 to 20 mm using a 20mm nozzle).



3. Final welding


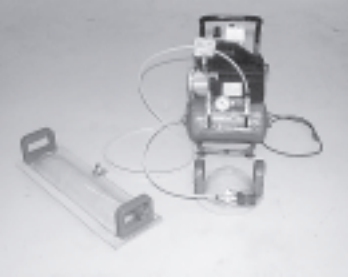

The final weld produces an airtight and watertight seam 10 to 30 mm wide (depending on nozzle width).

A Sarnafil silicone pressure roller is applied at a distance of 30 mm in front of the nozzle and parallel to it. The travel of the roller should always extend beyond the edges of the welded seam.



Waterproofing for Drinking Water Storage

Checking Seams after Welding

Checking seams after welding	Visual inspection of seams After welding, all seams should be inspected for good workmanship. Special attention should be paid to T-joints, penetrations, and flashings.	
Mechanical Testing of Seams	All seams should be mechanically tested once they have completely cooled. Probe the seams with a screwdriver (about 5 mm wide, with blunted edges). Apply light pressure along the seam, do not scratch the membrane. Mechanical testing is not a test for watertightness; it helps detect seams that are not fully welded.	
Vacuum Testing	Vacuum testing with a bell jar is used to test watertightness of seams. <ul style="list-style-type: none">– Compressor with vacuum unit– Vacuum hose– Bell jar, round or square Spray the area of the seam to be tested with a bubble-forming liquid (e.g. soapy water, leak detection spray). Centre the bell jar over the seam and press it down lightly. Perform vacuum test. Repeat the test at several locations along long seams. Test at enough locations to sufficiently cover the membrane area.	 
Checking Watertightness after Filling	Watertightness can be checked by monitoring the water level of the filled tank or reservoir.	

Waterproofing for Drinking Water Storage

Cleaning and Disinfection

General	<p>The periodic inspection, cleaning, and disinfection of drinking water containers must be performed with great care. Next to professional design and execution of the waterproofing system, proper maintenance is the basis for long-term and problem-free service.</p> <p>The extent and frequency of cleaning depends on the characteristics of the water and the container: the type of construction, type of use, and condition of the structure. Cleaning is also governed by local regulations in each country.</p> <p>Initial cleaning of a container lined with Sikaplan® WT 4300 may only be done with the aid of cleaning agents that are approved (regarding both technical suitability and hygiene) for use in cleaning drinking water containers.</p>	<p>Filling the water chamber:</p> <p>When the water chamber is filled, water samples will be taken by the waterworks or by the regulatory authority for bacteriological examination. Once it has been verified that the bacteriological measurements meet the applicable safety requirements for drinking water, the tank or reservoir will be approved for operation.</p> <p>Periodic cleaning and disinfection during service:</p> <p>Regular cleaning may be done using any standard type of suitable liquid cleaner. All applicable standards and requirements must be followed.</p> <p>Important remarks:</p> <p>A pressure steam cleaner may be used for cleaning but only if the appliance is used properly. It must be fitted with a wide-slot nozzle and no other type. A distance of at least 20 cm must be maintained between the nozzle and the liner at all times. Before the appliance is used, the manufacturer should verify that the appliance is suited to the task.</p>
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System Information

Membrane Lining System for Potable Water Reservoirs (Sikaplan® WT 4300)



Your Partner in any Part of the World

Sika is a globally active company in the speciality and construction chemicals business. It has subsidiary manufacturing, sales and technical support facilities in over 70 countries around the world. Sika is THE global market and technology leader in waterproofing, sealing, bonding, dampening, strengthening and protection of buildings and civil engineering structures. Sika has approx. 12'000 employees worldwide and is therefore ideally positioned to support the success of its customers.

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