

WATERPROOFING

Sikaplan® WT 4220

SHEET MEMBRANE SYSTEM FOR
POTABLE WATER-RESERVOIRS

TECHNOLOGY & CONCEPTS

FLEXIBLE WATERPROOFING WITH Sikaplan® SHEET MEMBRANE SYSTEMS

POTABLE WATER is an essential foodstuff. To prepare, transport and store it request highest demands on hygiene conditions in reservoirs, tanks and piping systems.

This requests a reliable waterproofing system with sheet waterproofing membrane in order to seal the reservoir construction against loss of water. Besides the function of waterproofing shall the sheet membrane protect against aggressive chemical and physical influences on reservoir structures, such as corrosion of reinforcement steel and stray currents on cementitious substrates. At least, the sheet waterproofing membrane shall be resistant against regular cleaning and maintenance procedures and shall last for decades to fulfill its function.



Sika provides high quality Sikaplan® sheet waterproofing membrane system which fulfill requests of high demanding hygiene and long lasting watertightness and possibility to repair with low investments at any time during service life.

Depending to reservoir structure and the exposures the waterproofing system shall be installed as waterproofing lining with sheet membranes, either loose laid on horizontal area and linear fixed at vertical areas, or spotwise fixed with loop and hook straps for fixing pieces with fleece backed sheet membranes. The waterproofing system shall be adjustable to be installed into reservoir, or tank structures in any form and nature of structural material, such as concrete, mortars, steel, etc..



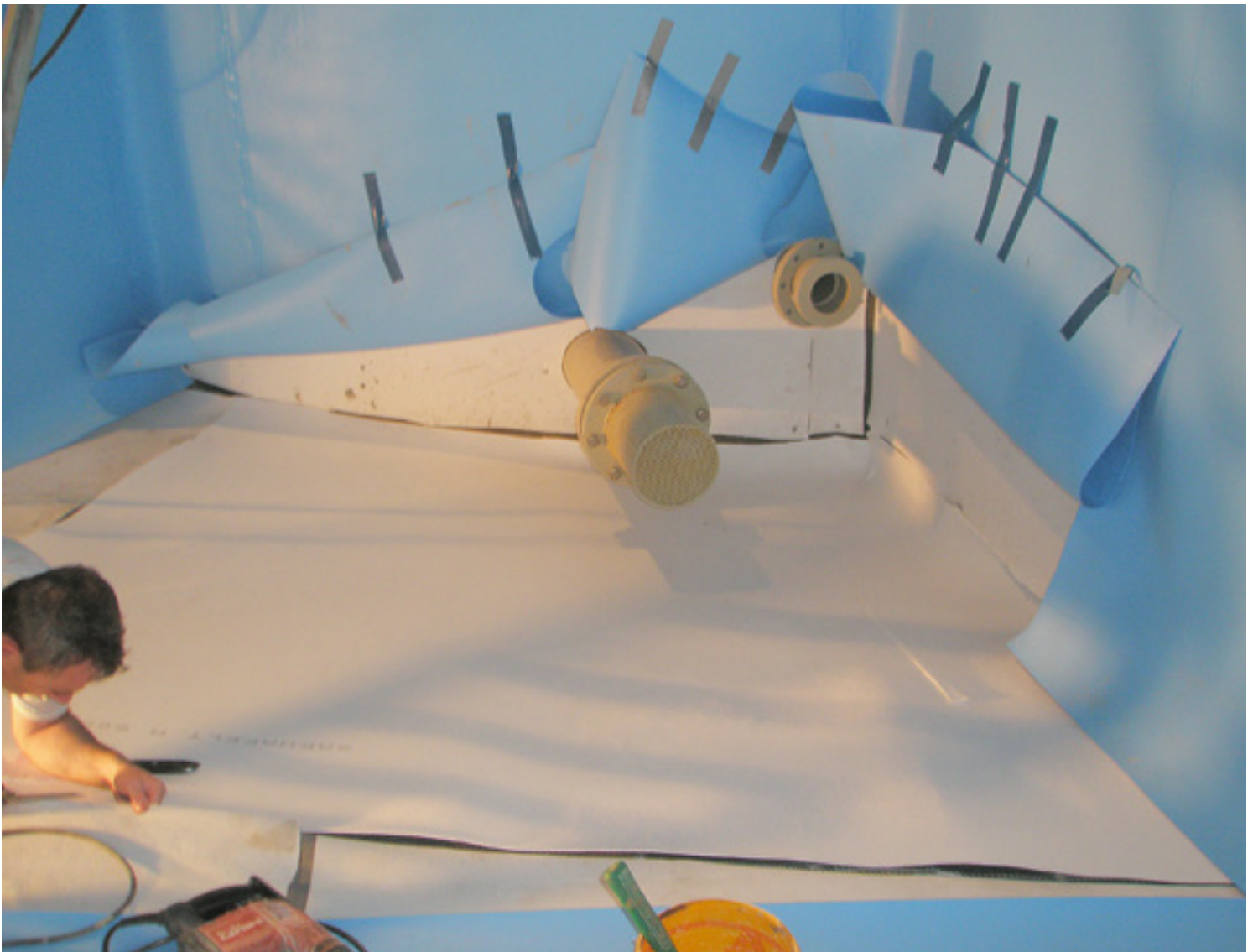
ADVANTAGES OF Sikaplan® SHEET MEMBRANE SYSTEMS

Sikaplan® waterproofing membranes are high flexible thermoplasts on base of polyolefines, installed on water faced side of reservoir construction to be waterproofed. Flexible Polyolefines fulfill high demand on water – hygiene and chemical influences of water.

After its installations, the overlaps of sheet membranes get waterproofed by heat welding. The welded seams are throughout checked on its watertightness. At least, the surface of installed and sealed waterproofing membrane get approval of its water-tightness by temporary filling with water, finally cleaning and disinfection before handover to local water au-

thorities. The installed Sikaplan® waterproofing membrane can be checked visually for leaks during maintenance and cleaning and can be, if required, repaired by welding of membrane patches at any time during service life.

Sikaplan® WT-4000 service sheet waterproofing membranes are approved according to hygiene requirements in various countries and fulfill physical requirements of various standards. These are EN 13361, DIN 18195, SIA 272 and hygiene requirements of each country.

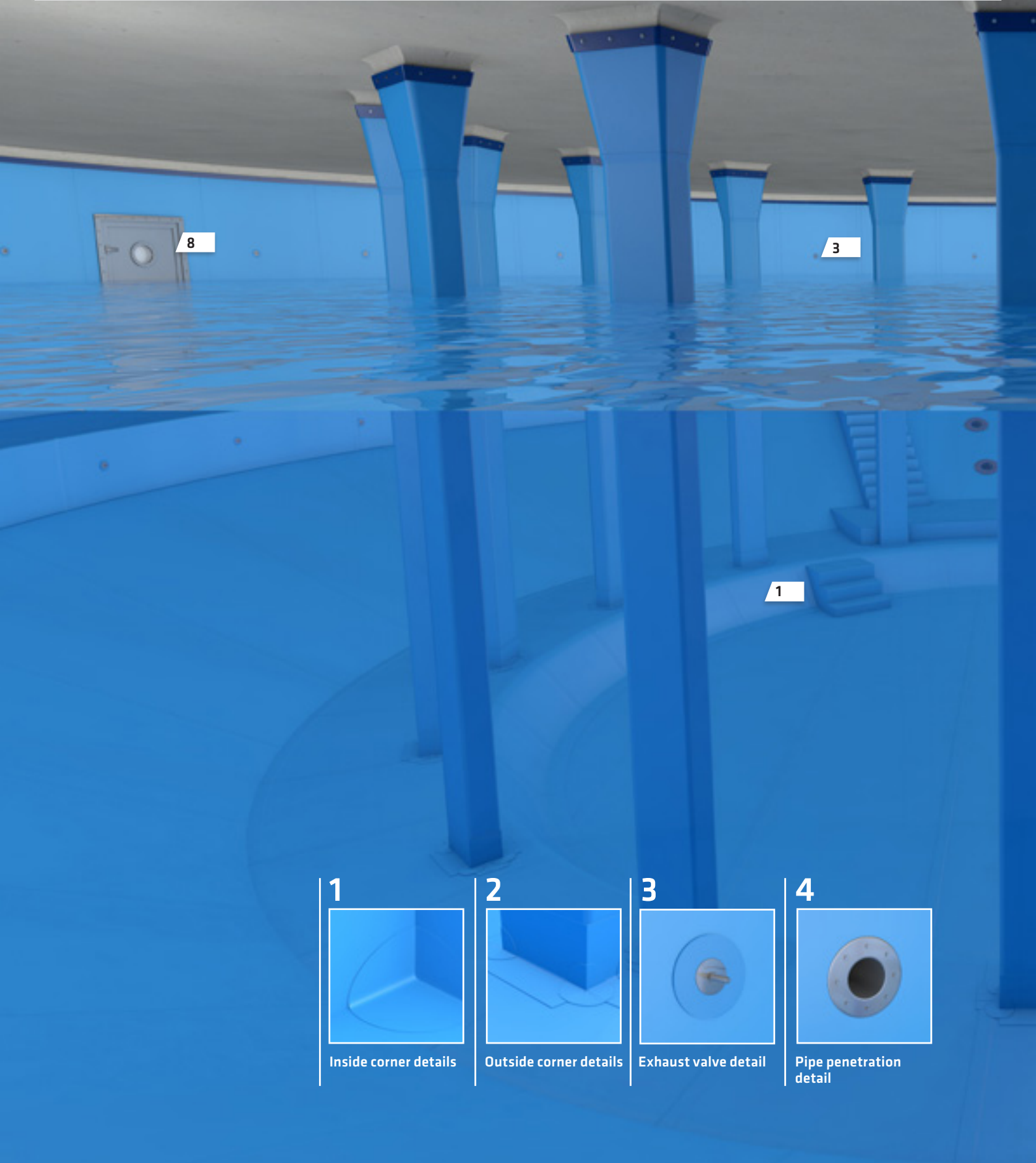


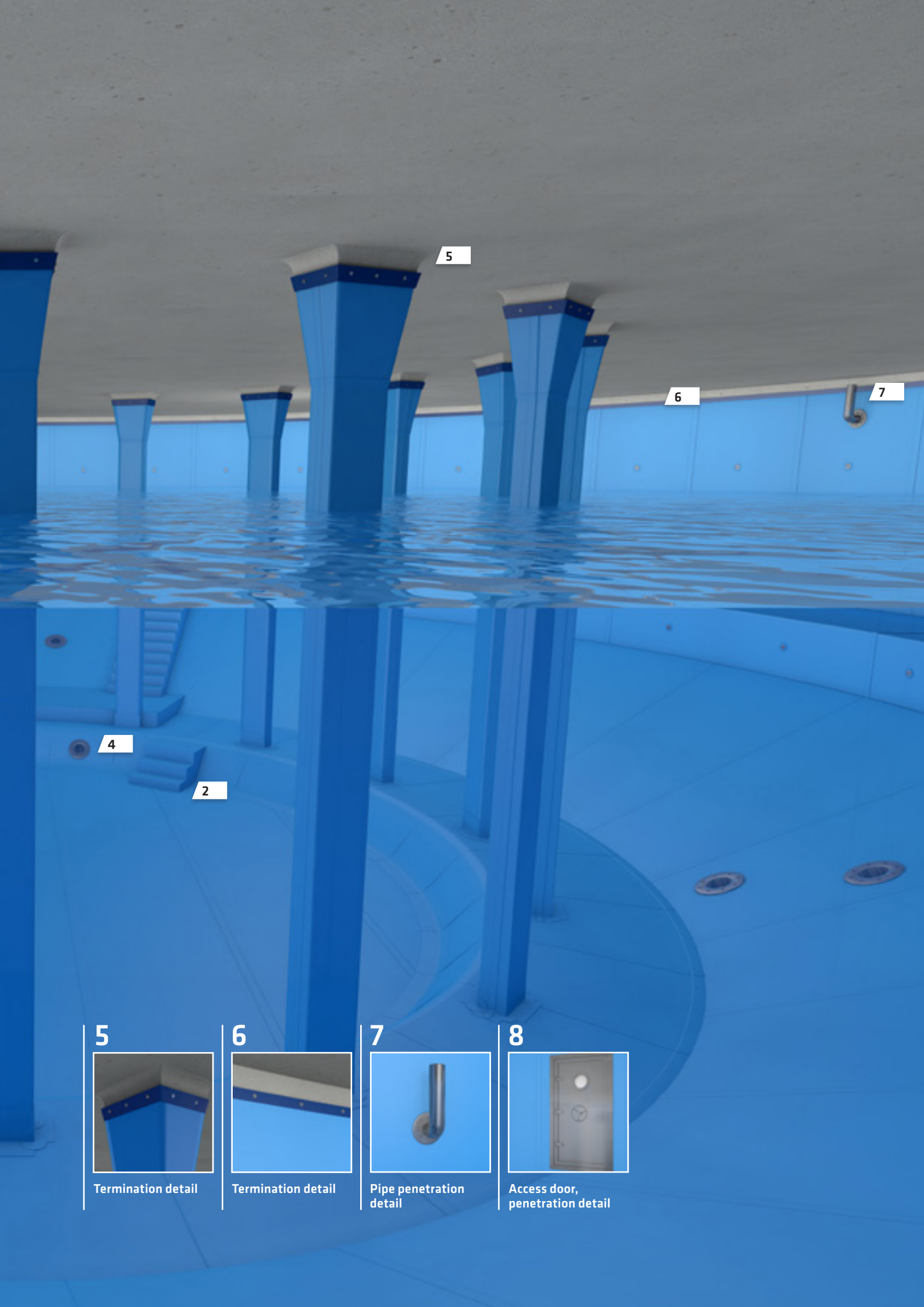
Sikaplan® WT 4220-15C

Spotwise fixed

Sikaplan® WT 4220-15C FELT 500

Linear fixed





4

2

5

6

7

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Termination detail

6



Termination detail

7



Pipe penetration detail

8



Access door, penetration detail

Sikaplan® MEMBRANE TECHNOLOGY

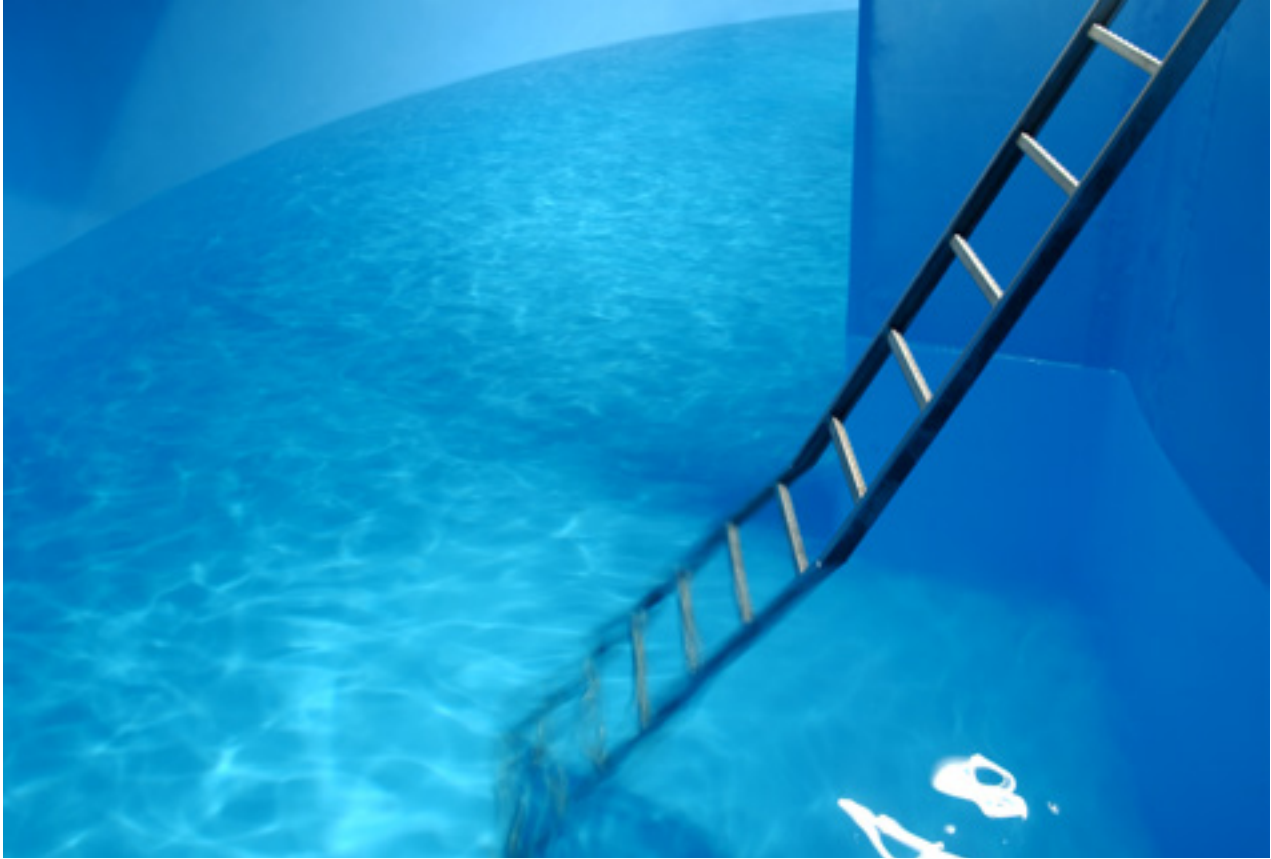
FLEXIBLE POLYOLEFINE SHEET MEMBRANE SPECIFICATION

Material properties	Sikaplan® WT 4220-15C	Sikaplan® WT 4220-15C Felt 500	Sikaplan® WT 1200-series
Material base	Flexible Polyolefine (PE), stabilized with fleece inlay	Flexible Polyolefine (PE), stabilized with fleece inlay and PP-based fleece backing 500 g/m ²	Flexible Polyolefine (PE), stabilized with fleece inlay
Colour	Light blue	Light blue (reverse white)	Light green (reverse dark grey)
Membrane thickness	1.50 mm	1.50 mm (excl. fleece backing)	1.60 mm / 2.00 mm / 3.00 mm
Roll size	2.00 m × 20.00 m		2.00 m × 20.00 m 2.00 m × 15.00 m 2.00 m × 10.00 m
Use	All kind of reservoir linings and linings of tanks for public water supply and process water for food- and beverage industry	All kind of reservoir linings and linings of tanks, requesting quick installations	All kind of reservoir linings and linings of tanks for public water supply and process water for food- and beverage industry with lower hygiene requirements
Standards/Approvals	Sikaplan® WT-4000 service sheet waterproofing membranes are approved according to hygiene requirements in various countries and fulfill physical requirements of various standards. These are EN 13361, DIN 18195, SIA 272 and hygiene requirements of each country.		
Fixing System	Horizontal: loose laid with peripheral fixation Vertical: spotwise fixing with membrane pieces Terminations: linear fixings with Sikaplan® WT Fixation Plate PE, or stainless steel metal strips	Horizontal: loose laid with peripheral fixation Vertical: stripwise fixing with Sikaplan® W Loop-and Hook Fastening strips Terminations: linear fixing with Sikaplan® WT Fixation Plate PE, or stainless steel metal strips	Horizontal: loose laid with peripheral fixation Vertical: spotwise fixing with membrane pieces Terminations: linear fixings with Sikaplan® WT Fixation Plate PE, or stainless steel metal strips





REQUIREMENTS TO SHEET MEMBRANE LININGS

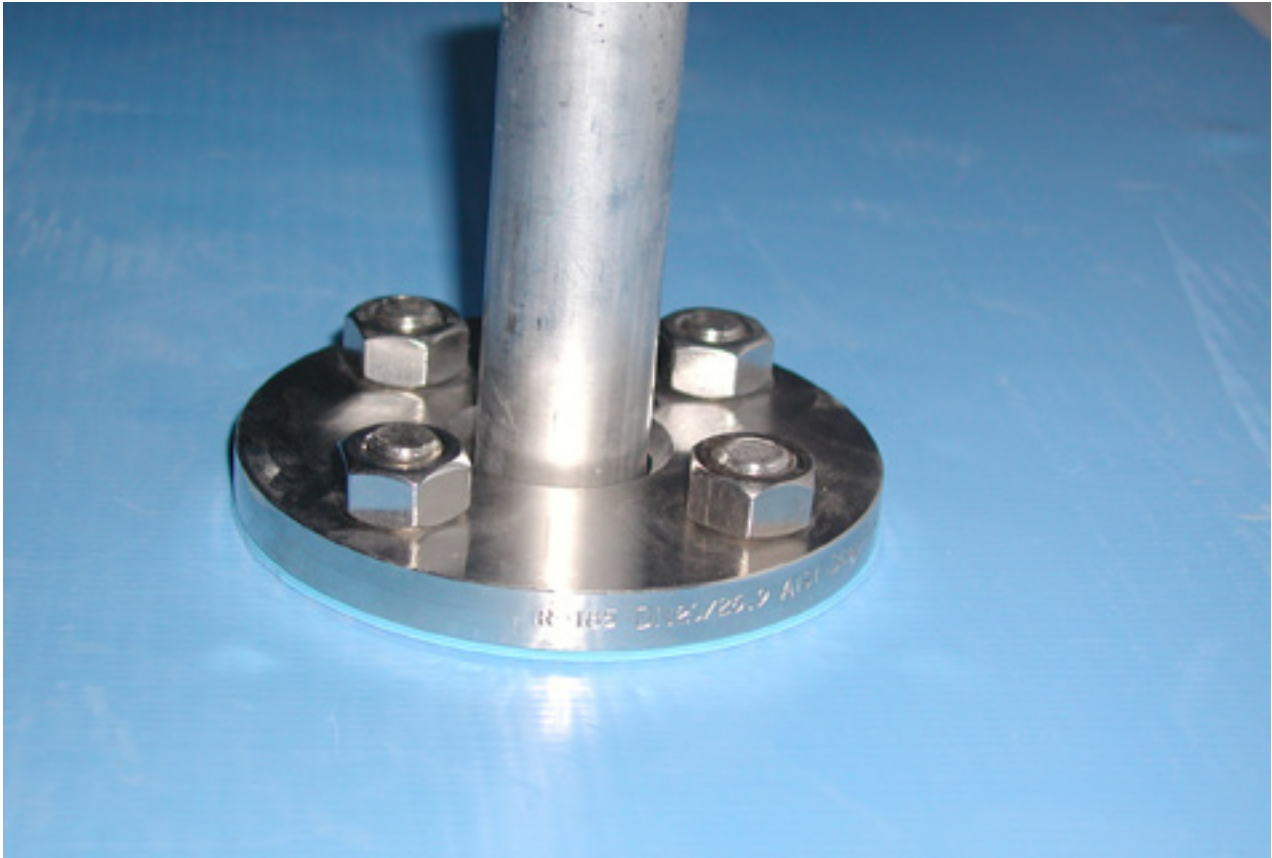


Sikaplan® sheet waterproofing membranes are approved according to hygiene requirements in various countries and fulfill physical requirements of various standards. Sikaplan® sheet membrane fulfill, beside hygiene requirements, further requirements:

- Resistant to cleaning agents
- Resistant to chlorine and ozone
- Resistant to algae and micro-organisms
- Resistant to hydrostatic pressure
- Smooth appearance of membrane surface
- Easy and reliable to install
- Long life expectancy

Country	Hygiene requirements
CH	KTW requirements, SVGW-Arbeitsblatt W 270 (testing for sheet membranes in water reservoirs)
D	KTW requirements, DVGW-Arbeitsblatt W 270 (testing for sheet membranes in water reservoirs)
AUT	Austrian Standard OeNorm B 5014 part 1 (testing of sheet membrane in water reservoirs)
UK	British Standard BS 6920 (cold / hot water) testing for use in contact with drinking water)
F	France Standard XP P 41-250-1, NF EN 1622 (testing for sheet membranes in water reservoirs)
US	American Standard NSF / ANSI 61 (testing for sheet membranes in water reservoirs)
	Physical / chemical requirements
EN	EN 13361 physical / chemical requirements for water tank liners
CH	SIA 272 / SN EN 13361 physical / chemical requirements for water tank liners
D	DIN EN 13361, DIN 18195, physical / chemical requirements for water tank liners

Sikaplan® MEMBRANES: SELECTION CRITERIA



ALL MEMBRANE TYPES, such as

- Sikaplan® WT 4220-15 C
 - Sikaplan® WT 4220-15 C Felt 500
 - Sikaplan® WT 1200-16 C
- are suitable for lining of new water reservoirs, as well as for refurbishment of existing water reservoirs. The membranes resist against commonly used cleaning mediums and against chlorinated waters up to concentrations of 0.8 mg/l at max. +40°C.

Rating (1 poor / 5 excellent)	1	2	3	4	5
Sikaplan® WT 4220-15 C					
Availability of hygiene approval	■	■	■	■	■
Speed of installation works	■	■	■	■	■
Cost for supply and apply (request for fleece underlay)	■	■	■	■	■
Safety of waterproofing during service life	■	■	■	■	■
Sikaplan® WT 4220-15 C Felt 500					
Availability of hygiene approval	■	■	■	■	■
Speed of installation works	■	■	■	■	■
Cost for supply and apply	■	■	■	■	■
Safety of waterproofing during service life	■	■	■	■	■
Sikaplan® WT 1200-16 C					
Availability of hygiene approval	■	■	■	■	■
Speed of installation works (request for fleece underlay)	■	■	■	■	■
Cost for supply and apply	■	■	■	■	■
Safety of waterproofing during service life	■	■	■	■	■

ADVANTAGES AND BENEFITS FOR Sikaplan® SHEET MEMBRANE SYSTEMS

Sikaplan® sheet membrane system fulfills a variety of benefits and advantages

ADVANTAGES FOR OWNERS

Waterreservoirs, lined with Sikaplan® WT sheet waterproofing membranes secures:

- Watertightness of reservoir structures
- Flexibility of waterproofing in case of structural movements
- Possibility to repair membrane leaks during its entire service life
- Any renovation of reservoir lining during short period



BENEFITS FOR OWNERS

Performance:

- Repairable system
- System resist against aggressive water
- Protect concrete structure against aggressive water
- Secures watertightness over cracks
- Fulfills request for long life expectancy

ADVANTAGES FOR CONSULTANTS

Sikaplan® Sheet waterproofing membrane systems to waterproof water reservoirs:

- Are approved accoring to EN standards
- Are locally approved according to hygiene requirements in many countries
- Can be performed in short times
- With flexible membranes, adjustable to details
- Is repairable in case of leaks at any time during service life



BENEFITS FOR CONSULTANTS

Cost effective:

- Fast and time saving installation
- Repairability during service life
- Security of watertightness:
- Easy access to membrane to control quality when installed

ADVANTAGES FOR CONTRACTORS

The installation of Sikaplan® sheet waterproofing membrane system:

- Can be performed on existing substrate; no priming required
- Can be installed under wet and cool conditions
- No waiting time required for curings after installation procedures
- Flexibility in timing for installation works within construction time



BENEFITS FOR CONTRACTORS

Performance:

- Flexibility of system
- System remain watertight after structural settlements

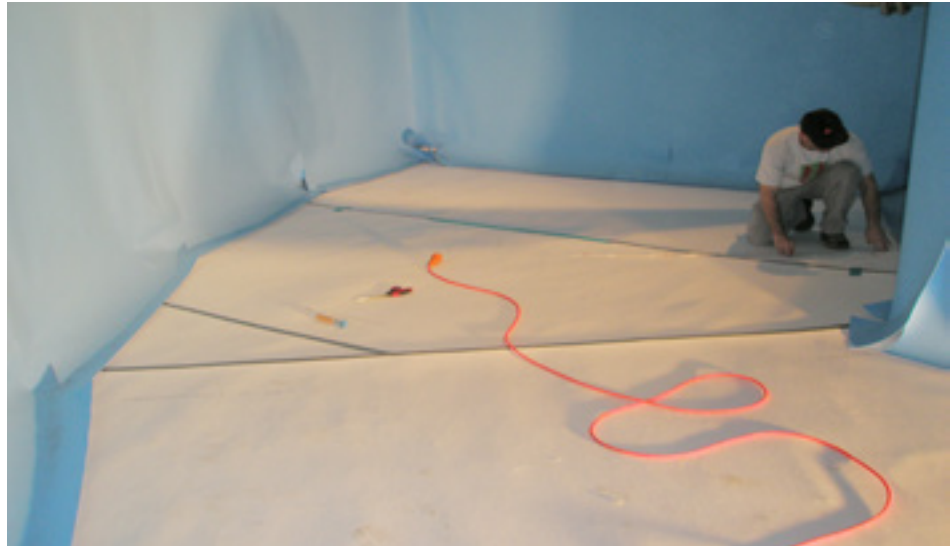


Sikaplan® WT 4220-15 C INSTALLATION PROCEDURE

1. SPOTWISE FIXING OF Sikaplan® WT 4220-15 C

1. PHASE:

- Cleaning and disinfection of substrate
- Layout cushion/drainage layers (geotextiles, or geonets)



2. PHASE:

- Membrane installation at vertical areas
- Membrane installation on horizontal areas
- Detail works at penetrations and corners



Reservoir: new, or existing for refurbishment
Substrate of structure: concrete, masonry with mortar screed
Waterproofing system: loose laid with mechanically fixing

- Cleaning of substrate with water
- Disinfection of substrate with disinfectant
- Layout of cushion layers at walls and drainage layer on bottom
- Sikaplan® FWT 4220-15 C membrane installation at walls
- Sikaplan® FWT 4220-15 C membrane installation on bottom
- Detail works at pipe penetrations and fixing elements

2. LINEAR FIXING OF Sikaplan® WT 4220-15 C FELT 500 (LOOP AND HOOK SYSTEM)

1. PHASE:

- Cleaning and disinfection of substrate
- Fixing of fixation elements



2. PHASE:

- Membrane installation at vertical areas
- Membrane installation on horizontal areas
- Detail works at penetrations and corners



Reservoir: new, or existing for refurbishment
Substrate of structure: concrete, masonry with mortar screed
Waterproofing system: loose laid with mechanically fixing

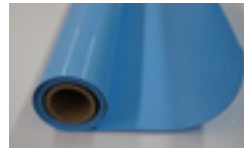
- Cleaning of substrate with water
- Disinfection of substrate with disinfectant
- Fixing of fixation strips at walls and on bottom
- Sikaplan® FWT 4220-15 C Felt 500 membrane installation at walls
- Sikaplan® FWT 4220-15 C Felt 500 membrane installation on bottom
- Detail works at pipe penetrations and fixing elements

ANCILLARY PRODUCTS TO Sikaplan® SHEET WATERPROOFING MEMBRANE SYSTEM

DESCRIPTION

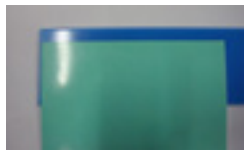
FOR Sikaplan® WT 4220 SERIES (FPO BASED)

Homogeneous sheet membrane for sealing of membrane details.



Sikaplan® WT 4220-18 H

Fixation plate for linear fixing of Sikaplan® WT 4220-15 C sheet membrane at waterproofing terminations, corners and on bottom.



Sikaplan® WT Fixation Plate PE

Stainless steel flat profile for linear fixing of Sikaplan® WT 4220-15C sheet membrane at waterproofing terminations, corners and on bottom.



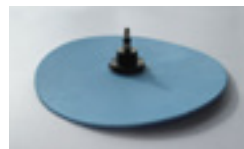
Sikaplan® W Flat Profile Stainless Steel

Fixing tapes bonded with Sikadur®-31 for the linear and permanent fixing at vertical areas, and as compartment on roof areas to be waterproofed.



Sikaplan® W Loop- and Hook Fastening Strip

Exhaust valve, welded at vertical membrane below waterproofing terminations to release entrapped air during initial filling procedure of reservoir.

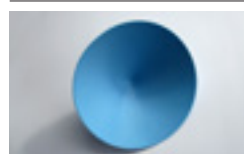


Sikaplan® WT Exhaust valve

Preformed elements for corner details to be heat welded on installed membrane.



Sikaplan® WT External Corner



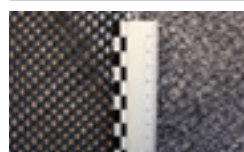
Sikaplan® WT Internal Corner

Silicone based and hygiene approved sealant to seal.



Sikaflex® PRO-3

Drainage layer below installed membrane of horizontal waterproofing to lead condensation water below membrane to out outlet.



Sikaplan® W TunDrain Type B

Optional cushion layer below installed membrane.

Sikaplan® W Felt 300 PES Biocide /
Sikaplan® W Felt 500 PPF



HEAT WELDING OF Sikaplan® SHEET WATERPROOFING MEMBRANES

Sikaplan sheet waterproofing membranes are commonly supplied in rolls, packed and sealed on pallet to construction sites. The installation procedure of membranes considers the unrolling, fixing and positioning of rolls in order to overlap at membrane edges, which at least have to be heat welded, either by hot air-, or hot wedge system to achieve watertightness. The heat welding procedures are performed by manual welding for fixing and detailing works, and by welding with automatic machines to weld seam overlaps over long distance in continuous welding quality.

MANUAL



Hand held hot air welding gun and manual pressure roller, welding temperature adjustable. Suitable to fix sheet membrane at fixing elements and heat welding of single seam overlap welding and detail works.

SEMI-AUTOMATIC



Hand held hot air welding gun, combined with speed controlled pressure roller, welding speed and welding temperature adjustable. Suitable to heat welding of single seam overlap welding and detail works.

AUTOMATIC



Automatic heat welding machine, either by hot air, or heating wedge, roller pressure, temperature and welding speed adjustable. Machine is suitable for weldings of seam overlaps also vertical and overhead.

MANUAL WELDER AND STANDARD TOOL KIT



- 20 mm- and 40 mm nozzles
- Handheld pressure rollers
- Screw-drivers
- Knives, peelers
- Scissor
- Marking pen, metal rod
- Meter gauge
- Welding-aid metal piece for detail works
- Wire brush to clean nozzle
- Cleanser and cleaning items

QUALITY CONTROL OF WELDED Sikaplan® SHEET MEMBRANES

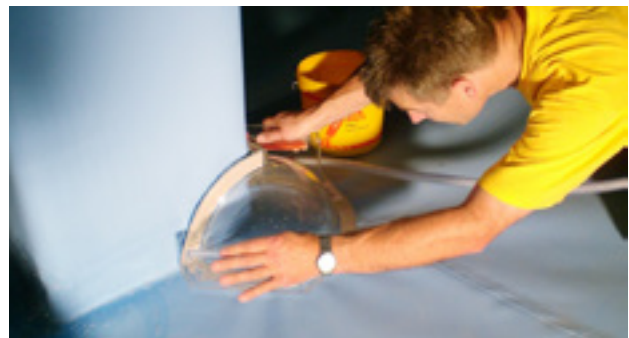
Completed waterreservoir structures, waterproofed with sheet membranes shall be exposed to pressure water. Therefore, it is essential to approve the watertightness of completed membrane installation works, prior to clean the membrane surface and fill the reservoir with water. Different methods allows to approve welded seam overlaps in particular and installed membrane in general by visual check, or testing of detail weldings with vacuum-bell.

VISUAL



Visual test with the aid of screw driver to search for capillari-
ties at seam edge.

VACUUM TESTING



Vacuum tests by using of testing kit, containing vacuum bell
and electrical vacuum pump are suitable for detail works only.
After treatment of seam edge with soap solutions, the vacuum
bell is firmly pressed over area to be tested. Any leaks are
visualized by bubbling of applied soap solution under vacuum.

WATERTIGHTNESS TEST



Prior to claning and disinfection of com-
pleted membrane lining, testing of water-
tightness by first filling of reservoir with
water in order to check water levels during
various filling stages.

CASE STUDIES

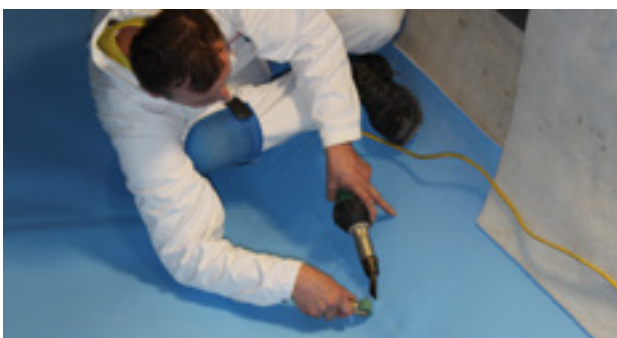
WATER RESERVOIR LYSS,
SWITZERLAND 2013



SIKA SOLUTIONS (REFURBISHMENT):

One layer Sikaplan® WP 4220-15 C, loose laid on horizontal area, linear fixed at perimeters, spotwise and linear fixed at wall area, overlaps single seam welded, visual control of welded seams.

Area to be waterproofed: 1'500 m²



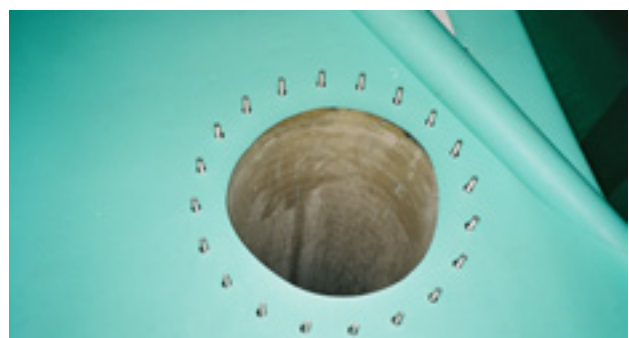
AL AJBAN WATER RESERVOIR,
ABU DHABI, U.A.E. 2003



SIKA SOLUTIONS (REFURBISHMENT):

One layer Sikaplan® WP 1200-20 C, loose laid on horizontal area, linear fixed at perimeters, spotwise and linear fixed at wall area, overlaps single seam welded, visual control of welded seams.

Area to be waterproofed: 30'000 m²



WATER RESERVOIR LUDWIGSBURG,
GERMANY 2011



SIKA SOLUTIONS (REFURBISHMENT):

One layer Sikaplan® WP 4220-15 C, loose laid on horizontal area, linear fixed at perimeters, spotwise and linear fixed at wall area, overlaps single seam welded, visual control of welded seams.

Area to be waterproofed: 6'500 m²



WATER RESERVOIR ZOLLERNALB,
GERMANY 2006



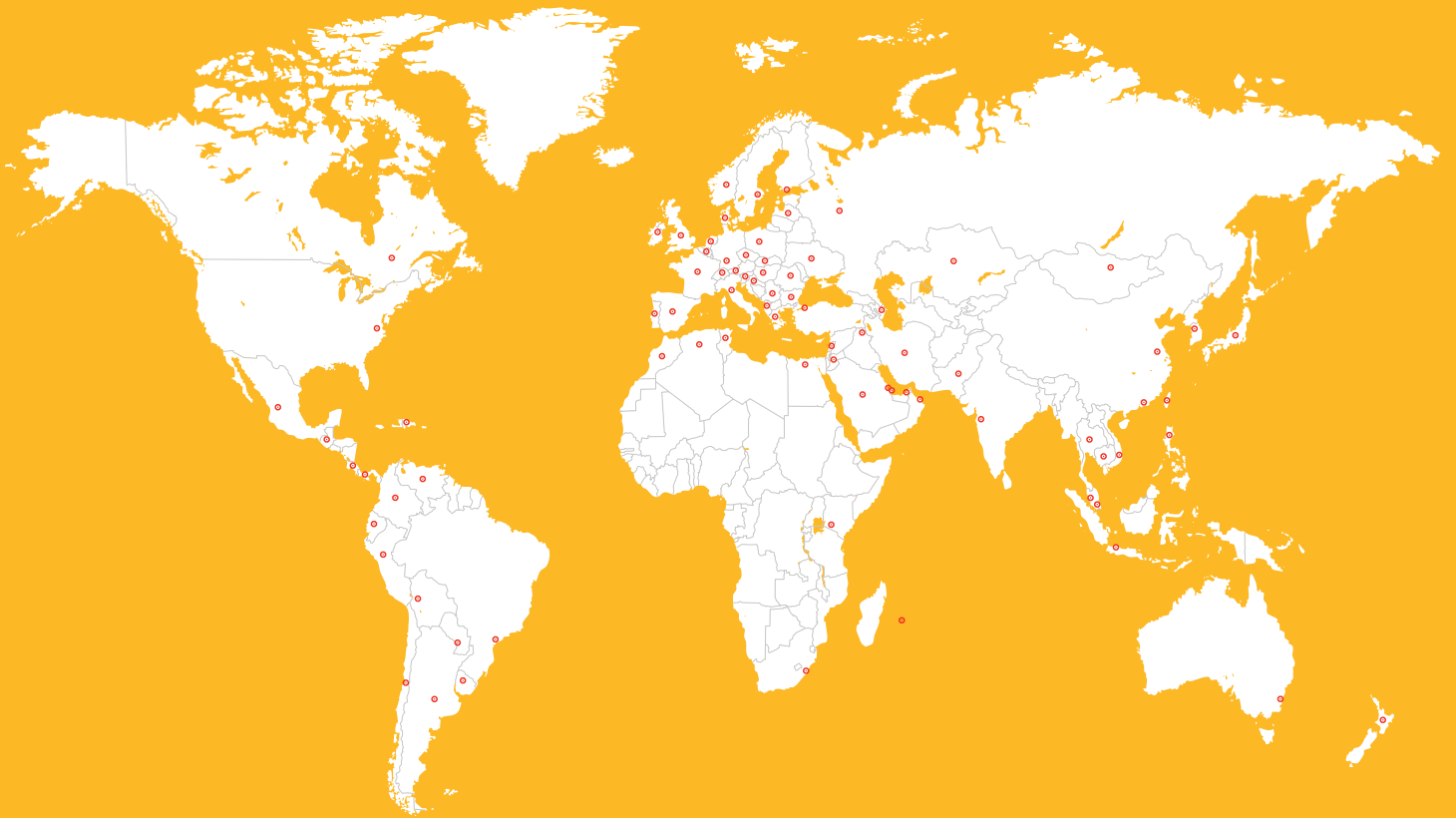
SIKA SOLUTIONS (REFURBISHMENT):

One layer Sikaplan® WP 4220-15 C, loose laid on horizontal area, linear fixed at perimeters, spotwise and linear fixed at wall area, overlaps single seam welded, visual control of welded seams.

Area to be waterproofed: 4'500 m²



GLOBAL BUT LOCAL PARTNERSHIP



FOR MORE WATERPROOFING INFORMATION:



WE ARE SIKA

Sika is a specialty chemicals company with 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's product lines feature concrete admixtures, mortars, sealants and adhesives, structural strengthening systems, flooring as well as roofing and waterproofing systems.

Our most current General Sales Conditions shall apply.
Please consult the Data Sheet prior to any use and processing.

*Sika Hellas ABEE / Waterproofing / SIKAPLAN® WT 4220 - SHEET MEMBRANE SYSTEM FOR POTABLE WATER-RESERVOIRS / v.0416 / HE#00209

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