



## KÖSTER TPO Aqua 1.5

Technical Data Sheet RT 815 U W A

Issued: 2018-06-04

Official Test Report according to 1200/530/15 A DIN EN 13967 MPA Braunschweig, Certificate of conformity of the factory production control 0761-CPR-0422 MPA Braunschweig, Test Certificate according to KTW Guidelines K-261782-15-Ko and DVGW W 270 W-271451-16-SI/NI Hygiene Institute (Ruhr District)

## Thermoplastic polyolefin waterproofing membrane for drinking water structures

### Features

KÖSTER TPO Aqua is a homogenous thermoplastic polyolefin waterproofing membrane for drinking water structures. The KÖSTER TPO Aqua complies with the hygienic requirements for potable water surroundings according to the German DVGW Worksheet W 270 and the KTW guideline. This TPO based membrane is highly tear resistant and provides a very high flexibility, so that even large cracks are bridged securely. The membrane is mechanically fastened which leads to low preparation requirements on the substrate. Overlaps are connected by hot air welding. CE mark according to EN 13967.

The main fields of application are:

- Drinking water reservoirs
- Drinking water tanks
- Water retention structures
- Water transport structures
- Artificial ponds and lakes
- Ponds with natural green oxygenation
- Fish aquaculture
- Fish ponds and lakes
- Water reservoirs for food production purposes
- Irrigation reservoirs for agricultural use

### Substrate

The substrate can be dry or moist. In case of active leakages, a negative side waterproofing is required before the KÖSTER TPO Aqua installation (please check the KÖSTER negative side waterproofing systems for more details). The substrate must be as smooth as possible and free of edges, depressions, and other defects that can mechanically damage the membrane. Edges must be rounded and depressions and holes filled and leveled with KÖSTER Repair Mortar. General substrate defects such as cracks, grease, old paints, coatings, and membranes are admissible, since the KÖSTER TPO Aqua installation is loosely laid or mechanically fastened. For direct installation on soil substrates, the soil must be excavated down to a solid layer and mechanically compacted before the installation.

For extra mechanical protection of the membrane on rough substrates, we recommend the installation of a geotextil mat (approx. 500 g / m<sup>2</sup>) on the bottom of the reservoir before installing the KÖSTER TPO Aqua.

Substrates compatible with the KÖSTER TPO Aqua include concrete, mortars, screeds, bricks, masonry, metal, plastic, wood, or almost any other type of material structure.

### Application

Every membrane has markings printed onto it to ease positioning and orientation of the membrane during application. KÖSTER TPO can be welded within a wide temperature window between + 350 °C to + 700 °C. This will depend on the environment parameters. Always do test welding before initiating the application. No chamfering of overlap seams to prevent capillary action is necessary. The KÖSTER TPO Aqua can be securely welded down to 0 °C air temperature. Test

welds are performed on site to determine the proper temperature and speed settings. During changing conditions this may have to be adjusted during work. The welds are tested at earliest 24 hours after completion and can be tested with a test needle or through a peel test. Membrane testing temperature must be less than + 20 °C. On vertical application with mechanically fixating the membrane the overlap is 11 cm, when loose laying on the bottom the overlap is 5 cm. When applying over geotextil the overlap is increased to 8 cm.

When manually welding the membranes, the top layer is first spot welded. The hot air pistol is held in one hand and with the other the membrane is pressed down and affixed. This creates an air pocket, which traps hot air during final welding maintaining a constant and correct air temperature. After the initial spot welding, the hot air pistol is uniformly pulled through the overlap. A silicone roller is used to press the membranes evenly together. Do not press the membranes together too firmly. A slight bead of TPO material exiting the weld serves as an optical quality control. The bead should have a diameter of approximately 1 mm. During manual welding make sure that the silicone roller is held parallel to the seam edge and a uniform pressure is applied. Avoid too much material exiting the seam. When installing on horizontal larger areas, an automatic welding machine is recommended. These machines combine spot and final seam welding into one work step, and the advancement drive speed can be regulated.

To insure a flawless installation all corners (such as at the membrane ends) are rounded off with scissors. This step applies to both the lower and upper membrane. It is not necessary to taper the membrane edge. T connections must be homogeneously welded to avoid capillary active defects and should be tested 24 hours after completion with a test needle.

Cross joints are vulnerable to failure and should be absolutely avoided. It is better to stagger the overlaps or to attach a cover strip to avoid a crossed joint. If a crossed joint is unavoidable all four T corners are to be covered with a welded round patch with a minimum diameter of 20 cm.

Pipe penetrations are waterproofed with a flange, 50 cm x 50 cm and a sleeve. A hole is cut into the flange 4 cm smaller than the pipe diameter. The flange is pulled over the pipe. The sleeve is then welded around the pipe overlapping the flange. KÖSTER TPO Aqua is used for this since it is a homogenous membrane.

When waterproofing corners, manually formed corners can be used using also the KÖSTER TPO Aqua. Before installing the corners the TPO membranes beneath them must be creased over the corners and welded. Exterior corners can be prepared from KÖSTER TPO Aqua. For an exterior corner a diamond shaped piece of membrane is cut and the corners rounded. The cut is pulled to the next quadrant of the cross to create an inside corner. The overlap should be then carefully welded. The inside corner is waterproofed and reinforced with a circular corner

The information contained in this technical data sheet is based on the results of our research and on our practical experience in the field. All given test data are average values which have been obtained under defined conditions. The proper and thereby effective and successful application of our products is not subject to our control. The installer is responsible for the correct application under consideration of the specific conditions of the construction site and for the final results of the construction process. This may require adjustments to the recommendations given here for standard cases. Specifications made by our employees or representatives which exceed the specifications contained in this technical guideline require written confirmation. The valid standards for testing and installation, technical guidelines, and acknowledged rules of technology have to be adhered to at all times. The warranty can and is therefore only applied to the quality of our products within the scope of our terms and conditions, not however, for their effective and successful application. This guideline has been technically revised; all previous versions are invalid.

KÖSTER BAUCHEMIE AG • Dieselstraße 1-10 • D-26607 Aurich • Tel. 04941/9709-0 • Fax -40 • info@koester.eu • www.koester.eu

plug with a diameter of 5 cm.

The flashings and terminations are done using the KÖSTER TPO Metal Composite Sheet that should be cut at the desired dimension, and mechanically fastened to the structure. The minimum wide of the metal stripes is 16 cm for vertical wall termination and 20 cm for horizontal top edge termination. The minimum welding area of the membrane to the metal TPO is 6 cm. The flashings and TPO laminated metal must be mechanically fastened every 20 cm on vertical wall termination and 25 cm for horizontal top edge termination.

After complete installation wait 24h before filling the structure with water, in order to allow the welding to be completely cooled down.

The equipment used for the application is manual hot-air hand tool with 40 mm nozzle, automatic hot air machine with 40 mm nozzle wire brush, the KÖSTER Hand Pressure Roller 40 mm pressure, scissors, folding ruler, seam tester and temperature meter.

#### **Cleaning**


Mechanically clean tools immediately after use.

#### **Packaging**

RT 815 150 U W A                      1.5 mm x 1.50 m x 20 m, 30 sqm  
roll

The information contained in this technical data sheet is based on the results of our research and on our practical experience in the field. All given test data are average values which have been obtained under defined conditions. The proper and thereby effective and successful application of our products is not subject to our control. The installer is responsible for the correct application under consideration of the specific conditions of the construction site and for the final results of the construction process. This may require adjustments to the recommendations given here for standard cases. Specifications made by our employees or representatives which exceed the specifications contained in this technical guideline require written confirmation. The valid standards for testing and installation, technical guidelines, and acknowledged rules of technology have to be adhered to at all times. The warranty can and is therefore only applied to the quality of our products within the scope of our terms and conditions, not however, for their effective and successful application. This guideline has been technically revised; all previous versions are invalid.

**KÖSTER BAUCHEMIE AG • Dieselstraße 1-10 • D-26607 Aurich • Tel. 04941/9709-0 • Fax -40 • info@koester.eu • www.koester.eu**

 0761 15	<b>KÖSTER BAUCHEMIE AG</b> Dieselstraße 1-10, 26607 Aurich  <b>KÖSTER TPO 1.5 Aqua</b> <b>EN 13967 0761-CPR-0423</b> Homogenous waterproofing membrane made from flexible Polyolefine TPO/FPO (PE)
Length according to DIN EN 1848-2	20 m <sup>1)</sup>
Width according to DIN EN 1848-2	2.10; 1.50; 1.05 m
Effective thickness according to DIN EN 1849-2	1.5 mm
<b>Designation</b> according to SPEC 20.000-202 <b>Color</b> <b>Visible Defects</b> according to DIN EN 1850-2 <b>Straightness</b> according to DIN EN 1848-2 <b>Mass per unit area</b> according to DIN EN 1849-2 <b>Water tightness</b> according to DIN EN 1928 (Method B) <b>Resistance to shock loads</b> according to DIN EN 12691 <b>Exposure to liquid chemicals, including water</b> according to DIN EN 1847 <b>Reaction to Fire</b> according to DIN EN 13501-1 <b>Water vapor diffusion resistance</b> according to DIN EN 1931 <b>Tensile characteristics</b> according to DIN EN 12311-2 Tensile strength Elongation at break <b>Resistance to static loading</b> according to DIN EN 12730 <b>Tear continuation resistance</b> according to DIN EN 12310-2 <b>Exposure to bitumen</b> according to DIN EN 1548 <b>Shear resistance of the overlap</b> according to DIN EN 12317-2 <b>Tear resistance (nail shank)</b> according to DIN EN 12310-1	<b>DIN EN 13967:2004</b> <b>Moisture barrier type T</b>  BA-FPO/TPO-BV-1.5 white free from visible defects passed 1500 g/m <sup>2</sup> 400 kPa/72h dicht ≥ 800 mm (Method A) watertight (Verf. A)  Class E μ = 76.500  ≥ 8 N/mm <sup>2</sup> (Method B) ≥ 700 % (Method B) ≥ 20 kg ≥ 400 N passed Failure beyond the overlap  ≥ 400 N

KÖSTER TPO Aqua is not long-time UV stable. The membrane is stable during installation. Protect the membrane from permanent UV.

1) Special lengths available upon request

The information contained in this technical data sheet is based on the results of our research and on our practical experience in the field. All given test data are average values which have been obtained under defined conditions. The proper and thereby effective and successful application of our products is not subject to our control. The installer is responsible for the correct application under consideration of the specific conditions of the construction site and for the final results of the construction process. This may require adjustments to the recommendations given here for standard cases. Specifications made by our employees or representatives which exceed the specifications contained in this technical guideline require written confirmation. The valid standards for testing and installation, technical guidelines, and acknowledged rules of technology have to be adhered to at all times. The warranty can and is therefore only applied to the quality of our products within the scope of our terms and conditions, not however, for their effective and successful application. This guideline has been technically revised; all previous versions are invalid.

KÖSTER BAUCHEMIE AG • Dieselstraße 1-10 • D-26607 Aurich • Tel. 04941/9709-0 • Fax -40 • info@koester.eu • www.koester.eu