Vision on quality
www.tqc.eu

KARSTEN TUBE PENETRATION TEST
LI7500

MANUAL

1 TEST SET AND SPARES

LI7500 TQC Karsten Tube Penetration Test

LI7505 Karsten tube vertical
LI7506 Karsten tube horizontal
LI7507 Plasticine 250 gr for Karsten-tube penetration test

2 TESTING WATER PENETRATION IN BUILDING MATERIALS/COMPONENTS

A test of building materials and components for water penetration provides precise information on the amout of penetrating water per time and surface unit under the effect of water, e.g. the effect of rain on facade surfaces. The test method largely corresponds to the natural loads on the building, in particular a "pelting rain effect" on façade surfaces under wind pressure.

Depending on the test results, any protective measures against water absorption by building components already carried out on site can be checked and either corrected or supplemented as necessary.

The water penetration tester is available in two designs- for vertical and horizontal test surefaces – and is suitable for use both on the building itself and in the laboratory.

The tester, the "Water penetration tester"comes in two designs, for vertical and horizontal surfaces. It consists of a dome with a diameter of 30 mm and attached, calibrated glass tube with volume graduation (10 ml = 10 cm head of water).

The water penetration tester is pasted onto the test surface (watertight seal) with the dome using a suitable plastic cement. The use of a two-component silicone rubber has proven best for longer laboratory tests (hardens to a rubber-elastic compound, e.g. within 10 minutes).

A particular advantage is the exact recording of the amount of water that has penetrated under a pressure of 10 cm head of water per unit of time, a pressure roughly corresponding to double the wind pressure of a hurricane. This method is thus used widely in the building trade.

3 PERFOMANCE OF THE WATER PENETRATION TEST ON THE BUILDING

The water penetration tester is pasted onto the surface to be tested using a plastic sealing material (e.g. plasticine, silicone rubber, polyurethane, butyl rubber, ect.). A small bead of the sealing material ("cement") is first formed by hand which is then applied to the (dry) rim of the dome.

A watertight joint between the dome of the tester and the component surface to be tested is made by firmly pressing the dome onto the surface to be tested and pressing the cement tight. The sealing material inside the dome should leave a circular area with a diameter of around 20 mm free, corresponding to a test area of around 3 cm^2.

TQC B.V. | 2908 LL Capelle aan den IJssel | phone: +31 (0)10-7900100 | e-mail: info@tqc.eu
Molenbaan 19 | The Netherlands | fax: +31 (0)10-7900129 | www.tqc.eu

The dome is now filled up to the zero mark with tap water using a laboratory washing bottle or similar so that the water exerts a pressure of around 10 cm head of water on the surface to be tested (corresponding to the water pressure in a hurricane).

The dome is kept pressed down lightly by hand during the effect of the water to prevent the plastic cement from giving way.

The drop in the water level (from the zero mark) is recorded at regular intervals (best to use a stop watch!). As soon as 1 or 2 ml water has penetrated the dome is quickly topped up again to zero mark to maintain a steady water pressure of around 10 cm head of water.

The assessment of the water penetration capacity of waterproofness of a building material or component depends in each case on the requirements set.

Mean values from 10 individual measurements are normally calculated and the water penetration capacity specified in

ml water per minute

A figure for "ml water per minute and cm^2" is obtained by dividing the mean measured values by the size of the test area (generally 3 cm^2).

This test method allows, amongst others, a control check during the acceptance of building components which are listed as being "waterproof" (e.g. resistant to pelting rain).

It would thus appear advisable to defer acceptance of facing masonry until a test has been performed with the water penetration tester. This can be carried out quickly and easily by any building expert.




TQC B.V.
Molenbaan 19
2908 LL Capelle aan den IJssel
The Netherlands
phone: +31 (0)10-7900100
fax: +31 (0)10-7900129
e-mail: info@tqc.eu
www.tqc.eu

4 REFERENCE VALUES TO ASSESS THE TEST RESULTS

Reference values based on many years of experience to assess the results of the test are listed in the following. These apply for water penetration tests on both vertical and horizontal surfaces.

The average water penetration values per minute and 3 cm^2 of test area are listed.
These represent the maximum permissible values.

Type of building material	Water penetration value	Type of building material	Water penetration value
1. Facade surfaces in clinker or red brick outside the joint area. Mean from 10 individual tests, half of which are detemined over fire cracks single values not above	0.5 ml/min 2.0 ml/min	5. Hydrophobed waterproofing or sealing concrete acc. to DIN 4117, Nov. 1960 edition on outside surface on fresh surfaces of fractures (Note: compliance with the maximum values is not a fully valid substitute for the test of the barrier effect, see also No.7)	 0.1 ml/min 0.1 ml/min
2. Mortar joints on facade surfaces from all building stones Mean from 10 individual tests Single values not above	0.5 ml/min 2.0 ml/min	6. Hydrophobed waterproofing or sealing mortar or plaster acc. to DIN 4117. Nov. 1960 edition, as above according to No.5	
3. Exterior rendering resistant to pelting rain as No.2		7. "Waterproof concrete" acc. to DIN 1048 (not hydrophobed) on outside surfaces on fresh surfaces of fractures (Note: compliance with the maximum values is an aid to assessment for the expert but not a substitute for the standard test acc. to DIN 1048	 0.3 ml/min 0.5 ml/min
4. Facade surfaces after hydophobic silicone or siloxane impregnation in stone and joint area (Precondition: cracks sealed beforehand with permanent plastic sealing material)	0.0 ml/min		

5 IMPORTANT NOTICE ON THE PERFORMANCE OF THE MEASUREMENTS

The water penetration depth should be determined as of one minute from the start of the water penetration so that the surface wetting is not included in the measurement.

6 PERFORMANCE OF THE WATER PENETRATION TEST IN THE LABORATORY

The test in the laboratory is carried out in the same way, though it has proven useful to useful an elastic curing sealing material (e.g. air-curing silicone rubber or those with hardening agent additive) as a cement specially since the laboratory tests usually last longer than those on the building site.

7 DISCLAIMER

The information given in this manual is not intended to be exhaustive and any person using the product for any purpose other than that specifically recommended in this manual without first obtaining written confirmation from us as to the suitability of the product for the intended purpose does so at his own risk. Whilst we c of the product. Therefore, unless we specifically agree in writing to do so, we do not accept any liability whatsoever or howsoever arising for the performance of the product or for any loss or damage (other than death or personal injury resulting from our negligence) arising out of the use of the product. The information contained in this manual is liable to modification from time to time in the light of experience and our policy of continuous product development.

ANNEX A | TEST RESULTS

Test 1		ml/min	ml/min	ml/min	ml/min	ml/min	ml/min
Test 2		ml/min	ml/min	ml/min	ml/min	ml/min	ml/min
Test 3		ml/min	ml/min	ml/min	ml/min	ml/min	ml/min
Test 4		ml/min	ml/min	ml/min	ml/min	ml/min	ml/min
Test 5		ml/min	ml/min	ml/min	ml/min	ml/min	ml/min
Test 6		ml/min	ml/min	ml/min	ml/min	ml/min	ml/min
Test 7		ml/min	ml/min	ml/min	ml/min	ml/min	ml/min
Test 8		ml/min	ml/min	ml/min	ml/min	ml/min	ml/min
Test 9		ml/min	ml/min	ml/min	ml/min	ml/min	ml/min
Test 10	ml/min	ml/min	ml/min	ml/min	ml/min	ml/min	ml/min
Mean value	**ml/min**	**ml/min**	**ml/min**	**ml/min**	**ml/min**	**ml/min**	**ml/min**