

GWT

Purpose

The **GWT** (**G**ermann **W**ater permeation **T**est) is used for on-site evaluation of

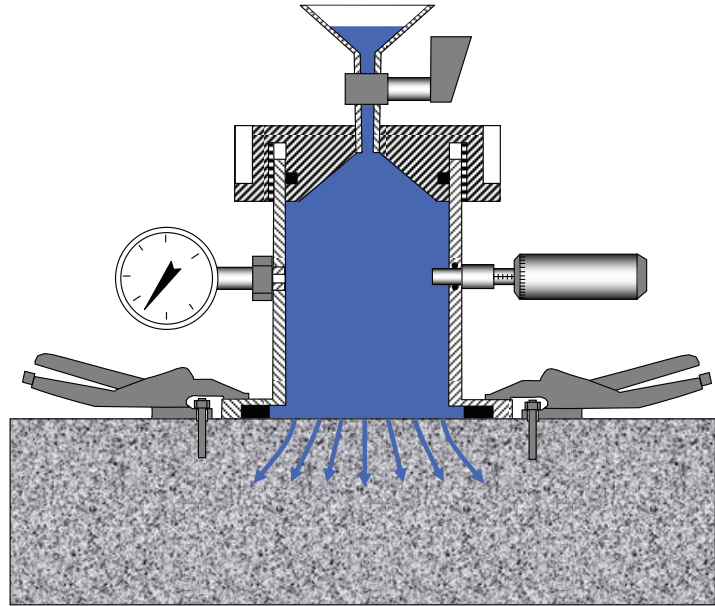
- The water permeation of the skin-concrete in finished structure
- The water permeation of masonry panels
- The water tightness of construction joints and sealed control joints
- Effectiveness of water proofing membranes

Principle

The **GWT** measures the permeation of water into the test surface under an applied pressure.

A pressure chamber containing a watertight gasket is secured tightly to the surface by two anchored clamping pliers or by means of a suction plate. Alternatively, the gasket may be bonded to the surface with an adhesive.

The chamber is filled with water and the filling valve is closed. The top cap of the chamber is turned until a desired water pressure is displayed on the gauge. As water permeates into the concrete, the selected pressure is maintained by means of a micrometer gauge pushing a piston into the chamber. The piston movement compensates for the volume of water penetrating into the material.



The travel of the piston as a function time is used to characterize the permeation of the test surface.

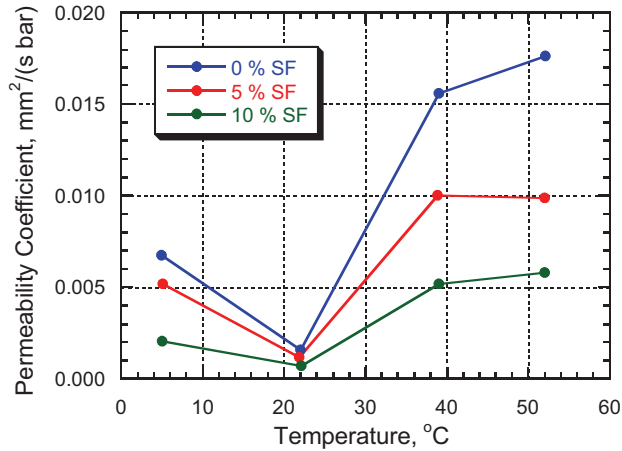
Application Examples

1. Permeation of Concrete Surface



*High-performance concrete being tested with the **GWT**. The four adjacent conical holes are from the **CAPO-TEST**. At a pressure of 1 bar or 100 kPa (left photo), water was observed to penetrate through surface cracks. After grinding off a 1.5 mm layer of the surface, the test was repeated (right photo), and the pressure was increased to 5 bar or 500 kPa. No penetration through cracks was observed. A water flux of 1.3×10^{-5} mm/s was measured.*

2. Effect of Curing on Permeability



Water permeability of concrete measured with the **GWT** for different water curing temperatures and silica fume (SF) contents. The water-cement-ratio of the concrete was 0.42 and the compressive strength was 40 MPa. The results show the benefit of silica fume in reducing permeability.

3. Masonry Permeability

The **GWT** is shown being used for testing the water tightness of a brick masonry wall. During rain and for a normal wind pressure, water penetrated the wall. The problem was shown to be related to the brick units, not to the mortar joints. The brick units had been burned at a higher temperature than normal to produce the required color, but the higher temperature increased the permeability of the brick.



GWT-4000 Kit Ordering Numbers



Item	Order #
Pressure chamber unit with 0-1.5 bar* gauge	GWT-4010
Wrench for pressure lid	GWT-4020
Extra 0-6.0 bar gauge	GWT-4030
Water filling cup	GWT-4050
Adjustable clamping pliers	GWT-4060
Set of anchoring tools	GWT-4080
Wrenches: 14 and 17 mm	GWT-4090
Sealant tape	GWT-4100
Bottles with boiled water, 3	GWT-4110
Gaskets, 10 mm thick, 4	GWT-4120
Gaskets, 15 mm thick, 4	GWT-4130
Manual	GWT-4140
Attaché case	GWT-4150

*1 bar = 100 kPa

Optional Items:

Item	Order #
Suction plate & vacuum pump	GWT-4230
Hammer drill	GWT-4240
GRA glue, box	GWT-4250



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