

HM 169

Visualisation of seepage flows



Description

- visualisation of two-dimensional seepage and groundwater flows
- investigation of the water pressure on structures
- closed water circuit

A descriptive method in the study of seepage and groundwater flow is the visualisation of the streamlines and their graphical representation as a flow net. The flow net provides information about the seepage of water in dams and sheet piles.

HM 169 can be used to visualise streamlines in seepage and groundwater flow on different models using a contrast medium. Furthermore, the effects of water pressure on different structures are displayed as pressure curves.

The trainer consists of a transparent tank with a sand filling. Various models can be placed in the sand bed to demonstrate typical structures. The experimental section is separated from the feed and discharge chambers by fine mesh screens. A valve is used to adjust the water supply. Using a contrast medium it is possible to make streamlines visible, as they occur in seepage and groundwater flow. A tempered glass viewing window allows for optimal observation of the experiments.

Various models allow an extensive range of experiments, such as pressure distribution on retaining walls or seepage and groundwater flow under sheet piles. The "foundation" and "retaining wall" models are equipped with tubes to show the pressures on the models.

In the experimental section there are measuring connections to detect groundwater levels. Groundwater levels are displayed on 14 tube manometers.

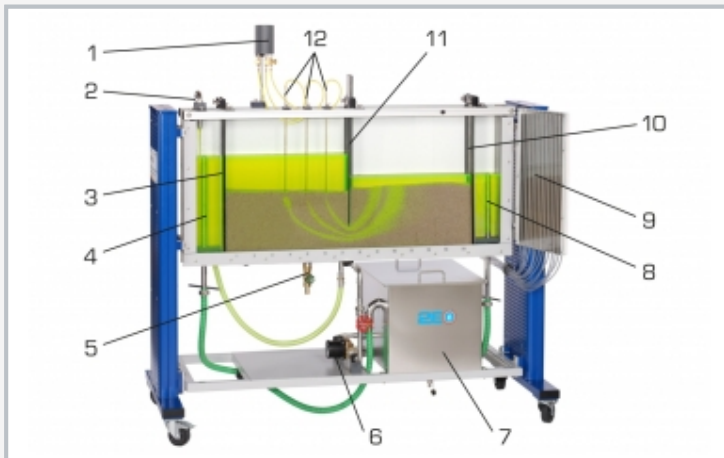
HM 169 contains a closed water circuit with storage tank and pump.

Learning objectives/experiments

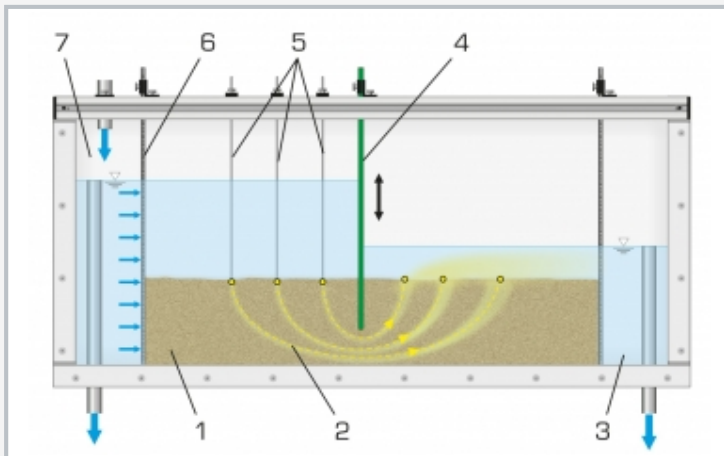
- determining flow nets in permeable media graphically
 - ▶ streamlines under a sheet pile
 - ▶ streamlines through an earth dam
 - ▶ drainage at an open ditch
- determining the pressure curve at a foundation
- determining the pressure curve at a retaining wall
- groundwater levels over time in various models

HM 169

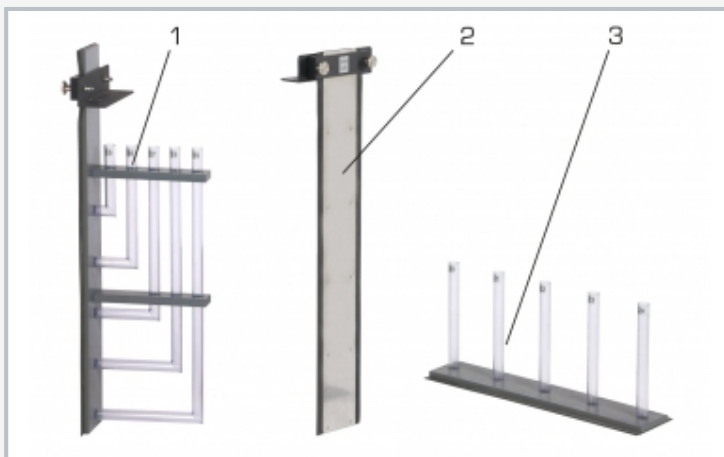
Visualisation of seepage flows



1 tank for contrast medium, 2 water supply, 3 screen, 4 overflow, 5 drain, 6 pump, 7 storage tank, 8 overflow, 9 panel with tube manometers, 10 screen, 11 "sheet pile" model, 12 lances for injecting the contrast medium



Streamlines under a sheet pile
1 sand bed, 2 streamlines, 3 discharge chamber, 4 height-adjustable sheet pile, 5 lances for injecting the contrast medium, 6 screen, 7 feed chamber



Models supplied: 1 "retaining wall" model, 2 "sheet pile" model, 3 "foundation" model

Specification

- [1] visualisation of two-dimensional seepage flows and investigation of water pressure at various models
- [2] closed water circuit
- [3] fluoresceine as a contrast medium
- [4] experimental section with tempered glass viewing window
- [5] fine-mesh screen to separate the experimental section from the feed and discharge chamber
- [6] height-adjustable overflows in the feed and discharge to adjust the water levels
- [7] 14 measuring connections with filters to detect the groundwater levels in the experimental section
- [8] "sheet pile" model for visualisation of streamlines
- [9] "retaining wall" and "foundation" models for demonstration of the water pressure
- [10] instruments: tube manometers, tubes on the "foundation" and "retaining wall" models

Technical data

Experimental section

- usable volume: 82L
- LxWxH: 1480x104x630mm

Pump

- max. flow rate: 4m³/h
- max. head: 4m

Tank for contrast medium: 0,5L

Storage tank, stainless steel: 96L

Models

- "sheet pile"
- "retaining wall"
- "foundation"

Measuring ranges

- pressure: 14x 20...650mmWC

230V, 50Hz, 1 phase

230V, 60Hz, 1 phase; 120V, 60Hz, 1 phase

UL/CSA optional

LxWxH: 1900x800x1870mm

Weight: approx. 230kg

Required for operation

sand (1...2mm grain size)

Scope of delivery

- 1 trainer
- 1 set of models
- 1 contrast medium, 1L
- 1 set of instructional material