

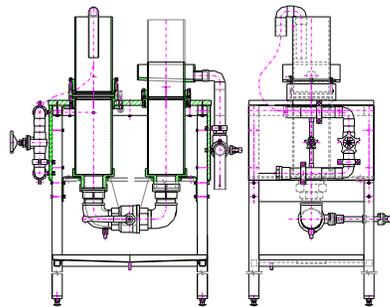
# ***POLYMERTEST***

Tř.T.Bati 299 , 764 22 Zlín, Czech Republic

## **SALES OFFER**

### **Equipment for establishing the permeability of geo-textiles in the plane perpendicular to the surface**

**Product ID: 9907 P1**



## **1. General information**

The equipment can establish the permeability of the geo-textiles and similar products in the plane perpendicular to the surface, both without weighting. The permeability is measured according to the methodology described in the **ISO 11 058: 1999** standard, namely by means of:

- a) constant hydrostatic head method;
- b) dropping hydrostatic head method; and

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### **2. Equipment design description**

Basic components of the equipment are the following:

- two transparent cylinders interconnected by distribution pipelines with cocks and valves, left one with geo-textile fixing flange;
- a device registering and evaluating the water pressure and temperature
- a stand fixing the equipment components.

Plastic transparent cylinders of equal diameter are fixed in vertical position. The coupling flanges, which are located approximately in a half of the height of the left cylinder, enable insertion and fixing of the test article. Bottom of the upper section of the left cylinder contains flange with sealing ring. Lower section of the left cylinder is fastened to the body of the cylindrical chamber. The cylindrical chamber is bolted on to the base plate. The test article is located in the cylindrical chamber. The foam rubber packing is applied above and under the test article. The wire grate below the test article prevents from its deflection. The cylindrical chamber together with a test article, packing and wire grate are closed by the flange with sealing. The flange and cylinder (both stuck together into an integral unit) are fastened to the cylindrical chamber using six bolts.

The right cylinder consists of two sections as well. Upper section of the right cylinder is exchangeable depending on the currently applied measurement method. Constant hydrostatic head method requires a shorter upper section, equipped with vessel collecting the flowing water. Outlet of the collecting vessel may lead either into the waste or into the measuring vessel. Dropping hydrostatic head method requires both sections of length being equal to the one of the left cylinder. The cylinders are fitted with flange in their lower section. Cylinder and flange form an integral unit. Flange with sealing ring is inserted into the cylindrical chamber and fastened by bolts. The cylindrical chamber is bolted on to the base plate. The lower section of the right cylinder (which is the same as the left one) is fixed in the lower part of the cylindrical chamber.

Both left and right cylinders are closed by a flange, which is stuck to them. Flanges of left and right cylinders are fitted with external thread. The thread part of each flange is pushed into the console and fastened by a nut. The flange is fastened by means of nuts with washers to the inner side of the stand feet (left and right). The connecting pipeline with ball cock is fastened to the flange thread using cap nuts. The cock grip sticks from the front side of the stand. The blowcock is located in the lower part of the pipeline.

The base plate with cylinders, connecting pipeline and ball cock are fastened to the stand by means of screws. The stand feet are fitted with adjusting screws and nuts needed for proper adjustment of the equipment. The removable container in the lower part of the stand traps the leaking water, which can be blown out. Left and right sides of the stand are fitted with plates intended for fixing cocks, valves and the water inlet and outlet pipelines.

The water inlet pipeline with two slide-valves is fastened using clips and screws to the left plate. The slide valve serves for rough regulation; precise adjustment can be reached using the fine slide-valve. The water inlet from the left cylinder pipeline is led by a flexible hose of a 40-mm diameter and flexed tube hanging on the upper edge of the cylinder.

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Clips and screws fasten the water outlet pipeline with three-way stopcock to the right plate. It is only used when the constant hydrostatic head method is applied. The water from the

container at the right cylinder is led by means of a 40-mm diameter flexible hose to the three-way stopcock and then either to the graduate or into the waste.

On one side of each cylinder is a tube, which can be used for pressure sensor connection. The pressure difference signal is led into the computer to be processed by the control software.

### **3. Equipment function**

The equipment is designed so that it complies with requirements of the ISO 11 058 standard for both measuring methods. The water is led into the left cylinder from the distribution point on the left side of the stand across two slide-valves and a ball cock. The required hydrostatic head in the left cylinder is reached by fine adjustment of regulation elements. For the constant hydrostatic head method, the three-way stopcock 101 in the lower section of the equipment is open (its arm is in horizontal position). The water flows from the left cylinder across the geo-textile and connecting pipeline into the right cylinder and then via overfall into the collecting container. Then it flows from the collecting container through a hose and a three-way stopcock into the waste. When the water level in the left cylinder is stabilised ( $70 \pm 5$  mm), the three-way stopcock on the right side of the stand is shifted into the position in which the water can be collected in a graduate. Volume of the water collected within specified time period is measured (at least 1 litre of the water or a 30-second time period is required by the applicable standards). The measurement is repeated using lower drops of the hydrostatic head for five samples of geo-textile. The operator enters measured values in the computer program, which then calculates flow speed (using pressure gradient before and after the geo-textile sample).

The dropping hydrostatic head method requires first to replace the upper section of the right cylinder with smooth and longer one. The ball cock in the lower part of the equipment is open until the water level in the right cylinder reaches the desired height (above the pressure sensor tube). Afterwards, the cock 101 will be closed and the requested hydrostatic head (min. 250 mm) is adjusted by water inlet regulation elements. Measuring sensors (pressure, temperature, time) are switched on and the ball cock 101 is opened (arm in horizontal position). The test is finished if the hydrostatic head drop and flow speed do not change for at least 2 minutes. Pressure and temperature values are recorded in defined time intervals and processed by the computer program. The result is relation of the flow speed to the pressure gradient before and after the geo-textile sample. The computer program functionality includes processing records of the water level dropping, viewing the measured data, displaying the hydrostatic head values together with corresponding times at any point of the curve, archiving the test results under requested name, viewing historical measurement values, calculating the flow speed in defined limit values with temperature effect compensation and printing all these values.

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### 4. Technical data

Diameter of the measuring cylinder (inner)	140 mm
Diameter of the geo-textile sample	170 mm
Thickness of the geo-textile sample	up to 30 mm
Permeable area of the sample	154 cm <sup>2</sup>
Inner diameter of the water inlet / outlet	40 mm
Water pressure sensor range	0 - 30,0 mbar
Water pressure measurement precision	±0,06 mbar (= ± 0,6 mm w. column)
Water temperature measurement precision	± 0,2° C

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