



## SOIL PERMEABILITY

Co-efficient of permeability is evaluated using Darcy's law which states that the rate of flow of a liquid through a porous medium is directly proportional to hydraulic gradient across it, subject to the conditions that the flow is steady, laminar and the soil is saturated. IS : 2720 (part XVII) recommends two methods for laboratory determination of permeability viz. (i) Constant Head Method (ii) Variable Head Method. The first method is for sandy soils and the second for silts and clays.

The maximum particle size in the specimen is restricted to 10 mm and the coefficient of permeability should be in between  $10^{-3}$  to  $10^{-7}$  cm/Sec. for the results to be dependable.

### ●● HS12.05

#### Permeability Apparatus IS:2720 (Part-XVII), IS 11209

It comprises:-

- i) Compaction Permeameter Mould  
1000ml capacity, clamped between  
top and bottom drainage plates having



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recess for porous stones. Supplied along with a false bottom plate for use during compaction of soil in the permeameter and extension collar.

- ii) Stand pipe panel, with three glass tubes of 6 mm, 10 mm and 20 mm dia, one meter long, supplied with wooden meter scale and 3 meter rubber tubing.

#### ACCESSORIES:

**HS12.05.1** Steel over head tank, 400mm diameter x 1000mm height with one inlet and five outlet valves.

**HS12.05.2** Porous stones set for top and bottom drainage.

**HS12.05.3** Set of glass tubes fitted on panel

**HS10.76** Rammer light, 2.6 kg x 310 mm fall.

**HS10.77** Rammer heavy, 4.89 kg x 450 mm fall.

### ●● HS12.10

#### Universal Permeameter IS:2720 (Part-XVII), IS 11209

Suitable for both constant head as well as falling head permeability tests. The apparatus consists of: -



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- i) A wooden stand fitted with nine glass stand pipes of diameter ranging from 6 mm to 75 mm. A 75 mm dia tube is fitted with an overflow pipe. A rubber bung with brass tube is provided for constant head tests.
- ii) Permeability mould 1000 ml capacity with detachable collar, 50 mm high, one base plate, metallic perforated swell plate and a solid false bottom plate for compaction of soil.

**ACCESSORIES:**

- HS12.10.1** A bottom tank to collect water
- HS12.10.2** Set of glass pipes 6 mm to 75 mm diameter.
- HS12.10.3** Permeability mould complete assembly.

●● **HS12.15**

**Miniature Field Permeameter**

Suitable for high pressure permeability tests on soil and rock cores. Comprises:

- i) A metallic mould 33 mm dia x 71 mm high complete with collar, base plate, top plate and porous stones.
- ii) Water tank fitted with pressure gauge capacity 7 kg/cm<sup>2</sup>, valve and regulator.
- iii) Indicator pipette 6mm dia x 300mm long.

**ACCESSORIES:**

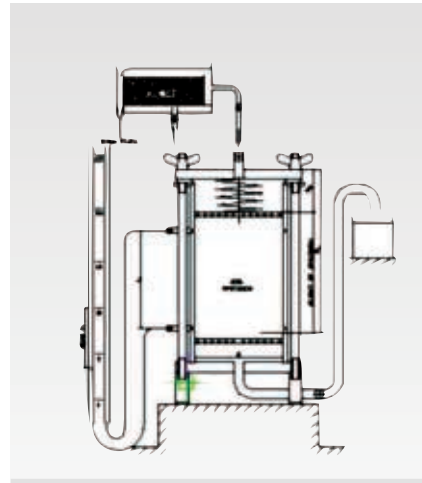
- HS12.15.1** Foot Pump to apply pressure of 7 kg/cm<sup>2</sup>
- HS12.15.2** Mould with collar.

●● **HS12.20**

**Permeability Test apparatus as per IS : 2720 Pt XXXVI for granular soils**

The unit is used for determining co-efficient of permeability of granular soils by a constant head method and under conditions of laminar flow of water. The unit is suitable for disturbed granular soil containing less than 10% soil passing through 75 micron sieve.

The apparatus consists of a acrylic chamber with approximate diameter of 350mm and length about 600mm, plugged at both ends by porous plates. Monometer is provided for head measurement between two points in the acrylic chamber. Arrangement is also provided for constant head.



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●● **HS12.25**

**Permeability Apparatus for Toxic Materials**

Permeability System As per ASTM D5084

The apparatus consists of a control panel with three lines each for

- In-effluent line
- Effluent line and
- Cell pressure line.

Push in valves are provided in each line to set and measure pressure either on digital display or on master gauge. It has provision for additional modules with three lines for each cell. One module is for one cell.

Each system includes:

	HS12.05 1 Cell	HS12.10 3 Cell
Master		
Control Panel	1	1
Additional Panel	1	2
Test chambers	1	3
De-airing system	1	1

**Permeability Cells**

Each cell has a chamber with stainless steel base and aluminum top.

Stainless steel base is resistive to toxic materials. Acrylic pedestal accommodates different sizes of specimens. 70 mm pedestal is supplied as standard with the unit.

**ACCESSORIES:**

- HS 12.20.1** Additional Panel
- HS12.20.2** Adopters for 100mm sample.
- HS 12.20.3** De airing system chambers 15 liter capacity.
- HS 102.05** Compressor 10Kg/sq cm
- HS 102.60** Vacuum Pump