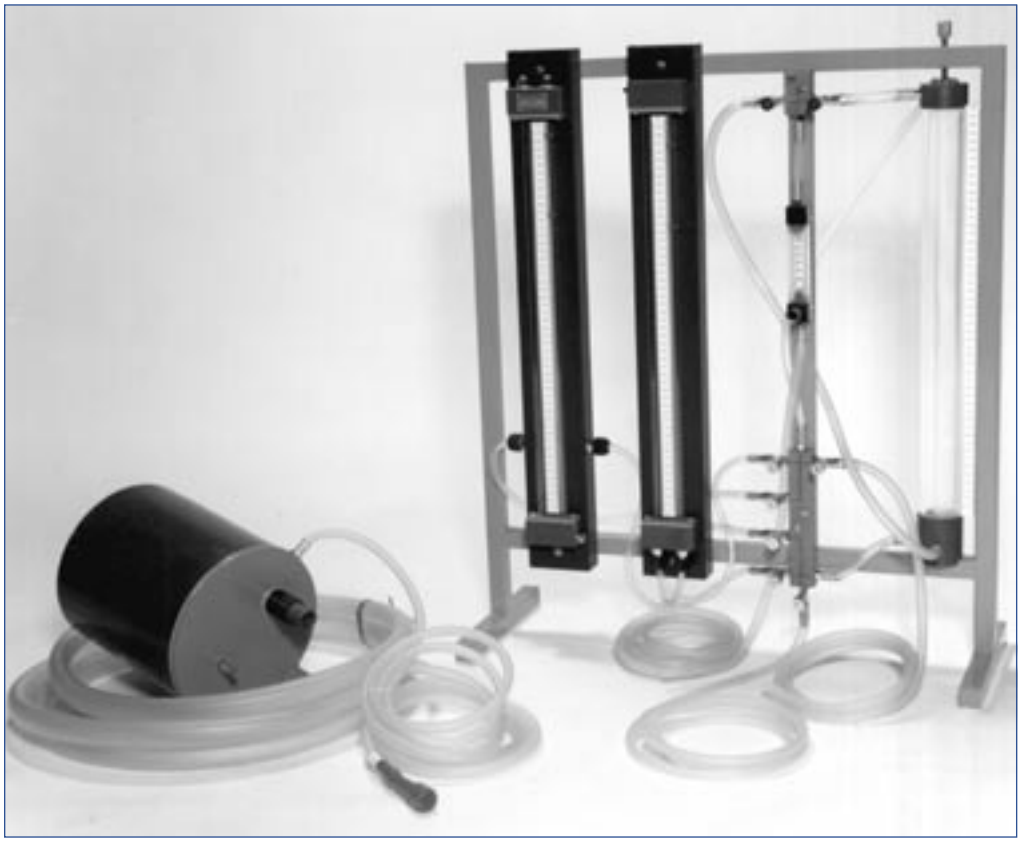
armfield

PERMEABILITY/FLUIDISATION STUDIES APPARATUS

W3
issue 8



The Armfield Permeability/Fluidisation Studies Apparatus is designed for students to measure and understand the characteristics of flow through a bed of particles. Such flows occur both naturally (in certain ground water situations) and in process plant designs.

The apparatus can also be used as part of the testing of media for water and waste water filtration.

DEMONSTRATION CAPABILITIES

- *pressure drop measurements and correlations for flow through packed beds*
- *verification of Kozeny's equation*
- *characteristics of a liquid fluidised bed*
- *measurement of permeability of selected solids*
- *attrition tests.*

Water Treatment Processes

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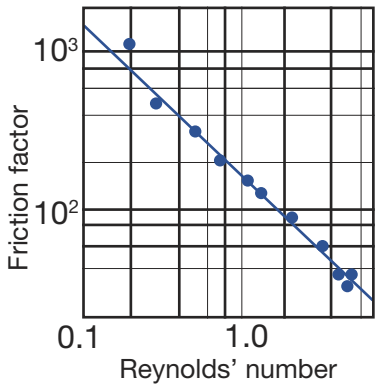
DESCRIPTION

A bed of granular medium (usually sand, but other materials can be used such as Ballotini or anthracite) is placed in a readily demountable tube through which water can be made to flow in either a downwards or upwards direction.
Flow from a laboratory tap passes through a constant head tank, which also allows air bubbles to be released, and is controlled by hand with a needle valve. The rate of flow is indicated by a variable area meter.
Pressure drop across the bed can be measured either by a 0.5m length water differential manometer or a 0.5m length Mercury manometer (see recommended accessories), depending on the magnitude. Valves are fitted for isolation of various parts of the circuit, together with air release valves.
The test section tube and all tubing connections are transparent so that operation can be observed and the presence of air bubbles easily detected.
All metal fittings are corrosion resistant.
No power connections are required and the whole apparatus can be lifted and transported by one person. Test material (Ballotini) for the packed bed is supplied but Mercury for the manometer is not included.



Pressure drop correlation for water flow through a packed bed of glass beads

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TECHNICAL DETAILS

Sample tube I/D:	*38mm*
Sample tube length:	*507mm*
Flow meter range:	*50-800ml/min*
	0.5m water differential manometer
	0.5m Mercury manometer

ORDERING SPECIFICATION

- ***Apparatus to verify Darcy's Law, to examine Kozeny's equation and to observe liquid fluidisation behaviour of a granular bed.***
- ***Equipment consists of a metal framework, constant head tank and transparent test section for observation. Flow is indicated by a Rotameter.***
- ***A 0.5m water differential manometer and 0.5m Mercury manometer are included for pressure drop across the bed.***

RECOMMENDED ACCESSORIES

Mercury thermometer
Sieve Shaker
Alternative bed materials (e.g. sand, anthracite)
Mercury for manometer (alternatively we can supply a Portable Pressure Meter: H12-8, ask for H Series Data Sheet)

SERVICES REQUIRED

Water supply:	*0.80 litres/min (max) at 0.5 bar gauge*

OVERALL DIMENSIONS

Height:	*0.79m*
Width:	*0.68m*
Depth:	*0.25m*

SHIPPING SPECIFICATION

Volume:	*1.5m³*
Gross weight:	*150kg*

Specifications may change without notice
5k/0907/JPS