



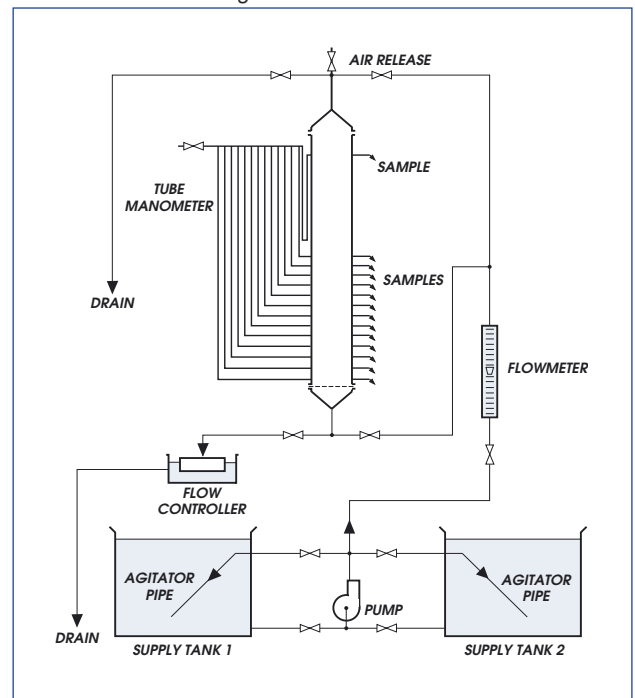
armfield

DEEP BED FILTER COLUMN

W5
issue 7



Filter column circuit diagram



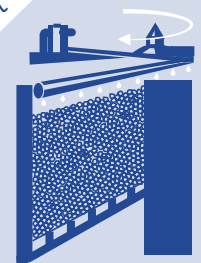
The laboratory scale Armfield Deep Bed Filter Column has been designed to operate identically to full scale granular filters. Using the same bed depth and filter media, tests on this unit provide operational data which may be scaled up to full size. Pilot trials of possible filter designs for water and sewage works can be made reliably at low cost.

DEMONSTRATION CAPABILITIES

- *measuring how fast total head loss increases with filtration run (fig. 1)*
- *measuring pressure drop profiles through the filter bed*
- *measuring suspension concentration profiles through the filter bed (fig. 2)*
- *demonstration of reversed flow fluidisation and backwashing*
- *the column may be readily adapted for absorption and ion exchange studies.*

Water Treatment Processes

W



DESCRIPTION

The Armfield Deep Bed Filter Column is a clear acrylic unit with flanged end pieces to allow easy access. The medium is supported on a corrosion resistant gauze mesh below which is packed 1kg of 10mm Ballotini to ensure good wash water distribution. Slotted sampling tubes inserted through the wall penetrate into the media, and are fitted with control valves so that suspension samples can be taken isokinetically. Plain tubes also penetrate the medium through the wall to transmit pressure to a manometer system. These sampling and manometer probes are located at 20mm depth intervals, but staggered in position, over 0.8m depth. Consequently, complete profiles of concentration changes in the suspension and of pressure variation can be measured during filter operation.

The column can be operated as a pressure filter up to 1 barg. The service system supplied comprises a pump, sump tanks, flow controller, rotameter, control valves, tubing, sampling tubes and bank of water differential manometers.

TECHNICAL DETAILS

Filter column:	Clear acrylic, 100mm internal diameter x 1350mm long
Typical media depth:	700mm
Gauze mesh size:	0.35mm
Sump tanks:	2 - capacity 350 litres each
Flow meter range:	0.5 - 5.0 litres/min
Manometers:	41 tube multi-bank
Pump rating:	0.37Kw

ORDERING SPECIFICATION

- A clear perspex column (100mm internal diameter x 1350mm long) mounted in a floor standing framework approximately 2m high.
- Service system comprises of: pump, 2 sump tanks (each 350L capacity), flow controller, rotameter (range: 0.5-5.0 litres/min), control valves, tubing, sampling tubes and a bank of 41 differential manometers.
- Operating pressures up to 1 barg can be used.
- The filtration medium is supported by a corrosion resistant gauze mesh below which is packed 1kg of 10mm Ballotini.

- Slotted sample tubes penetrate the filtration medium at various depths.
- Sampling and manometer tappings are located at 20mm depth intervals staggered in position over 0.8m column height.
- Control valves fitted to the sampling tubes allow isokinetic sampling.

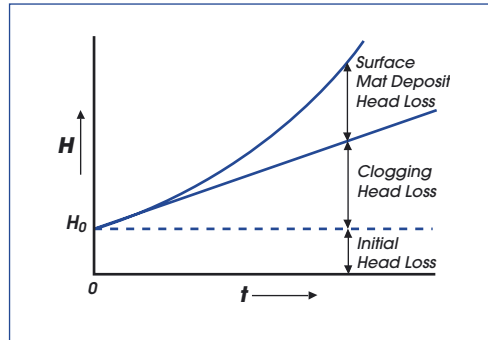


fig.1 Total head loss variation with time

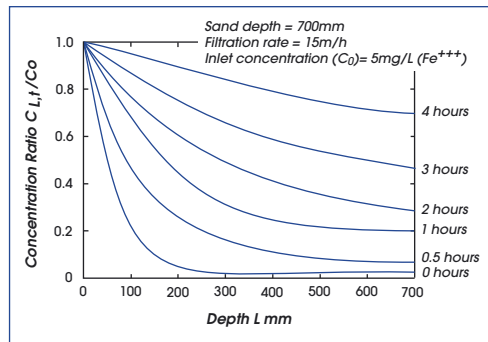


fig.2 Concentration profiles through the filter bed

ESSENTIAL EQUIPMENT

Filter Media: Approx 10kg of a test medium is required to pack the column.

Suitable alternatives include well rounded quartz-grain sand BS16-30 mesh (1.0-0.5mm), anthracite, crushed flint or aluminium oxide.

RECOMMENDED ACCESSORIES

40 sample collectors (test tubes or bottles)
 Turbidimeter or Spectrophotometer
 Flexible tubing for drain connection etc.
 1 metre rule
 Air foot-pump and pressure tubing (2.5m)

SERVICES REQUIRED

Electrical supply:

W5-A:	220-240V/1ph/50Hz
W5-B:	120V/1ph/60Hz
W5-G:	220V/1ph/60Hz

Water supply: Initial fill and laboratory drain.

OVERALL DIMENSIONS

Height:	2.2m
Width:	2.4m
Depth:	1.0m

SHIPPING SPECIFICATION

Volume:	3.8m ³
Gross weight:	370kg

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