



# armfield

## MODEL SEDIMENTATION TANK

**W7**  
issue 8



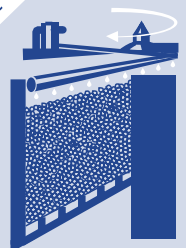
*This unit has been designed to demonstrate the hydraulic characteristics and settling efficiencies of a model settling basin. Although scale-up to industrial size sedimentation tanks is difficult, relevant deductions can be made as to how non-uniform flows occur and how these interact with the settling characteristics of particular suspensions.*

### DEMONSTRATION CAPABILITIES

- *measuring flow short-circuiting and dead space using a tracer*
- *comparison of real flow regimes with idealised flow models (fig. 1)*
- *effect of flow rate and baffle position on dispersion*
- *measuring sediment removal efficiencies and relating these to the hydraulic characteristics.*

Water Treatment Processes

W



## DESCRIPTION

Water is taken from the laboratory mains supply and is fed to the settling tank via a flow meter. For studies of sedimentation, a slurry is prepared in a sump tank and pumped via a specially designed flow meter to join the fresh water stream just before entry to the settling tank. A well-mixed slurry of known concentration and flow enters the tank uniformly under an inlet weir. This may be comparatively analysed by the Imhoff cone technique or more accurately by drying and weighing. The sump tank is continually agitated by a flow sparge device to prevent settling of solids during an experiment. For hydraulic tracer and visualisation studies, an accurate dye injection system is provided. A known volume of dye solution is injected just before the entry to the settling tank.

## TECHNICAL DETAILS

|                                       |                     |
|---------------------------------------|---------------------|
| Settling tank:                        | 1000 x 400 x 200mm  |
| Sediment sump tank capacity:          | 120 litres          |
| Water flow meter range:               | 0.5-5 l/min         |
| Sediment suspension flow meter range: | 0-2 l/min           |
| Pump flow rate:                       | 25 l/min at 5m head |
| Motor:                                | 0.1kW               |

## SERVICES REQUIRED

|                    |                      |
|--------------------|----------------------|
| Electrical supply: |                      |
| W7-A:              | 220-240V/1ph/50Hz    |
| W7-B:              | 120V/1ph/60Hz        |
| W7-G:              | 220V/1ph/60Hz        |
| Water supply:      | 5 litres/min @ 1 bar |

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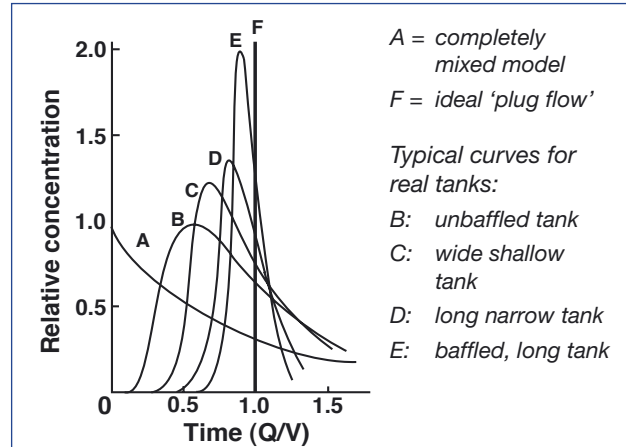


Fig. 1 Typical dispersion curves

## ORDERING SPECIFICATION

- A rigid acrylic settling tank of 80L capacity can be fed by a mains water or a slurry supply. Slurry is pumped from a 120L sump tank via a centrifugal pump. A sparging device in the sump tank keeps the slurry in suspension.
- Both supplies are fitted with a flow meter. Mains water flow meter range 0.5 - 5.0 litres/min; slurry flow meter range 0 - 2 litres/min.
- A dye injection system is incorporated to allow hydraulic tracer and flow visualisation studies.
- Measuring flow regimes using a dye tracer and comparison of these with idealised flow models.
- Effect of variables such as flow rate and baffle position on flow regimes.
- Measurement of sediment removal efficiencies.

## RECOMMENDED ACCESSORIES

Armfield Sedimentation Studies Apparatus (W2) to characterise settling regimes of selected suspension  
Precipitated calcium carbonate  
Balances  
Colorimeter - 7 narrow band-pass filters covering wavelengths 450 to 700nm

## OVERALL DIMENSIONS

|         |       |
|---------|-------|
| Height: | 1.55m |
| Width:  | 1.90m |
| Depth:  | 0.60m |

## SHIPPING SPECIFICATION

|               |                   |
|---------------|-------------------|
| Volume:       | 2.9m <sup>3</sup> |
| Gross weight: | 310kg             |