MOBILE BED AND FLOW VISUALISATION TANK – S2

PRACTICAL DEMONSTRATION AND VISUALISATION CAPABILITIES

- *Mobile bed experiments*
- *Flow around model engineering structures*
- *Experimental investigation of erosion and deposition*
- *Characteristics of meandering water courses*
- *Two dimensional flow visualisation by the Ahlborn technique*
- *Boundary layer suction demonstration*
- *Velocity distribution in duct flow*
- *Hydraulic analogy to compressible flow*
- *Civil engineering model testing*

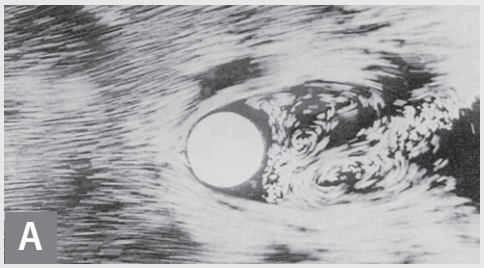
Practical demonstration and visualisation are essential elements of fluid flow study.

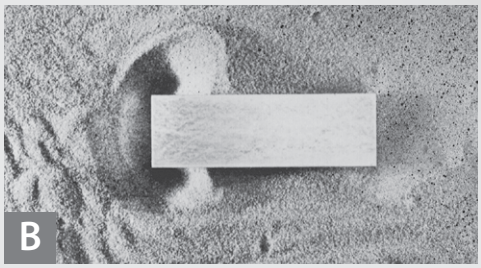
This Armfield unit may be used in two principal fields of study. The first involves detailed investigation of mobile bed situations. These may be in relation to water courses or civil engineering structures.

The second field involves two dimensional flow visualisation. This may be undertaken using the Ahlborn (c.1902) dust indicator technique or by any other suitable method of flow visualisation

BM TRADA CERTIFICATION ISO 9001:2008 UKAS QUALITY MANAGEMENT 012

<EXTENDED> WARRANTY 2 years 2YR WARRANTY ON ALL ARMFIELD PRODUCTS





DESCRIPTION

The tank is moulded from self coloured Oxford Blue (BS0105) glass fibre reinforced plastic with steel reinforcements to provide ridgidity. It is manufactured in three sections; the inlet tank, the working section and the discharge reservoir tank. The sections are joined by flanged connections and despatched from the factory as a complete assembly. A drop-tight adjustable overshot weir with upstream sand trap is accommodated within the discharge tank. The inlet tank features a perforated baffle plate which spreads the flow evenly across the width of the table.

A removable glass sheet coloured blue on one side, white on the other, is provided to cover the sand bed when flow visualisation experiments are in progress. A pair of adjustable aluminium instruments rails are fitted to the top of the tank. These extend over the full length of the working section and one rail carries a positioning scale.

The depth gauge supplied is used to measure the water level and to map the contours of the sand bed produced during excercises. It is provided with a stainless steel hook and point and incorporates a Vernier scale enabling levels to be determined accurately.

The gauge is designed for mounting on the instrument carrier assembly which can be positioned over any point of the working area. The main carrier (longitudinal traverse) is provided with a locking device and cursor to operate in conjunction with the instrument rail scale. The sub-carriage (transverse traverse) operates on rails provided by the main carriage. There is again a transverse scale and locking device. The correct use of the apparatus is described in a comprehensive manual supplied with the tank.

Water flow is provided by a centrifugal pump made of materials which are selected for their corrosion resistance as is the pipework which includes an electrically operated flow regulating valve.

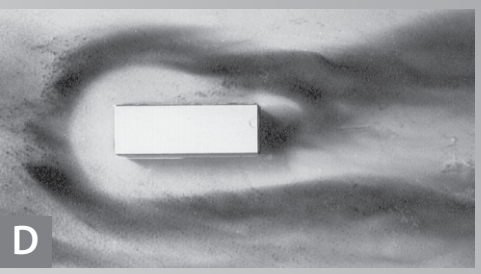
A GRP moulding carries the pump, control valve, rigid pipework and 'in-line' flowmeter.

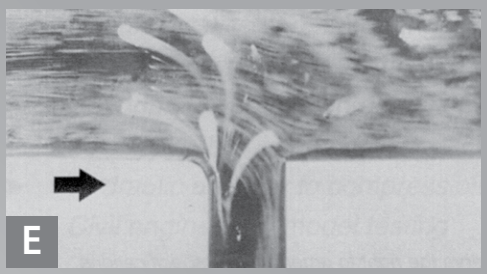
The assembly is connected to the tank by flexible hoses. The motor starter and digital meter readout are mounted in a table top cabinet supplied complete with the required flexible cables.

The tank is available with optional working lengths.

Model S2-2M: working length 2m

Model S2-4M: working length 4m





BASIC ACCESSORIES

A wide range of models and accessories is supplied for use with the equipment. Various materials which prove useful in obtaining the best results from the apparatus are supplied, including a tin of aluminium dust, lengths of hypodermic and polythene tube, dye crystals, Plasticine and poster paint. In addition the following items are supplied:

- *Model bridge piers; two rectangular, two cylindrical, two profiled and two with rounded ends.*
- *One asymetrical aerofoil shape.*
- *Two model gate guides.*
- *Eight aluminium baffles to direct the water flow for general test purposes.*
- *One set of twelve x 50mm x 50mm aluminium Tees and six 40mm equal angles all 125mm long, to enable the laboratory staff to build additional models.*

Additional Models

- *Two side wall meanders*
- *Vibration of a cylinder and box assembly*
- *Two bellmouth entries; right hand and left hand*
- *One acrylic cylinder 90° angle walls*
- *Set of tank strips*
- *One irrotational bend model*
- *One weight*
- *One retaining block*
- *One float*

Illustrations:

A: Two dimensional flow pattern on surface of water around cylinders using dust, illustrating Karman Vortices.

B: Erosion in sand bed around a square pier.

C: Erosion in sand bed around cylindrical pier.

D: Three dimensional flow pattern on bed of table around a square pier using dye crystals.

E: Right angle branch on canal. The illustration shows the two dimensional surface flow pattern in the form of streaks as well as the three dimensional flow pattern along the bed.

TECHNICAL SPECIFICATION

Working area:	*2 metres x 610mm or 4 metres x 610mm*
Max water depth:	*120mm*
Thickness of sand bed:	*60mm*
Flow range:	*0-3.6 litres/sec*
Sump capacity:	*300 litres*
Accuracy of flow metering:	*±1.5% of full scale deflection*

REQUIREMENTS

Electricity supply:
S2-2M-A: 220/240V/1ph/50Hz
S2-2M-B: 120V/1ph/60Hz
S2-4M-A: 220/240/1ph/50Hz
S2-4M-B: 120V/1ph/50Hz

OVERALL DIMENSIONS

Length: (S2-2M): 3.70m
Length: (S2-4M): 5.70m
Width: 0.71m
Height: 2.0m

SHIPPING SPECIFICATION

S2-2M:
Volume: 5.0m³
Gross weight: 590kg

S2-4M with bed extension:
Volume: 7.0m³
Gross weight: 750kg

ORDERING SPECIFICATION

- *A self contained recirculating water tank for flow visualisation and mobile bed studies.*
- *The tank is manufactured from glass reinforced plastic and all components in contact with water are of non-corroding materials.*
- *The working section has minimum dimensions of 2m(4m) x 610mm and the flow range is 0-3.5 litres/sec.*
- *Fifteen models and accessories are included as standard and a sheet of coloured glass allows rapid changeover from mobile bed to flow visualisation mode.*
- *All controls are housed in a portable console which includes a flexible cable and water safe connectors.*

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EXTENDED WARRANTY 2 years — 2YR WARRANTY ON ALL ARMFIELD PRODUCTS

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Head Office:
Armfield Limited
Bridge House, West Street,
Ringwood, Hampshire.
BH24 1DY England
Telephone: +44 1425 478781
Fax: +44 1425 470916
E-mail: sales@armfield.co.uk

U.S. Office:
Armfield Inc.
436 West Commodore Blvd (#2)
Jackson, NJ 08527
Telephone: (732) 928 3332
Fax: (732) 928 3542
E-mail: info@armfieldinc.com

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