

C4-MKII MULTI-PURPOSE TEACHING FLUME

The Armfield Multi-purpose Teaching Flume has been specifically designed to demonstrate the principles of fluid mechanics when applied to engineering structures in open channel flow.

EXPERIMENTAL CAPABILITIES

- > Use of hook and point gauges to measure water level
- > Use of a Pitot-static tube to measure flow rate (using optional C4-61)
- > Learning how to apply force-momentum and steady flow energy equations to simple flow situations
- > Understanding the relationship between water level above the crest of a weir and flow rate over the weir
- > Using hydraulic structures to control level, e.g. syphon spillways
- > Understanding sub-and super-critical flow and the underlying characteristics of standing waves
- > Hydraulic jump
- > Using hydraulic structures for control of flow e.g. sluice gate
- > Applying and understanding Manning's formula
- > Measurement of velocity profiles (using optional C4-61)
- > Waves (using optional C4-67)

DESCRIPTION

The C4MkII is a small open channel flume, available in 2.5m or 5.0m lengths, with clear acrylic sides to the working section for total visibility of the flow.

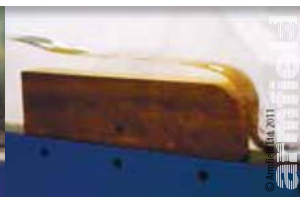
The channel is fitted with a PVC inlet tank, and is designed for free discharge into the Hydraulics Bench. The flume is mounted on a rigid framework, and can be tilted by use of a calibrated screwjack, which enables accurate slope adjustment of the channel.

The inlet tank incorporates a stilling arrangement to diffuse the water flow prior to entry into the channel, ensuring smooth uniform flow. The level in the working section of the flume is controlled using an overshoot weir (stop logs) at the discharge end.

Bed pressure tappings and fixing points for models are provided. A longitudinal scale positioned at the top of the channel enables depth gauges and Pitot-static tubes to be accurately positioned along the channel length.



Sharp Crested Weir



Broad Crested Weir



Crump Weir



Venturi Flume

The flume is designed for use with a standard Armfield F1-10 Hydraulics Bench, which provides the pumped water flow, the flow control valve and a volumetric tank for flow measurement.

Also available is an optional flow meter, which can be fitted to the C4-MkII to enable direct flow measurements to be taken.

Optional educational software is available (C4-MKII-301) offering a complete teaching package of coursework. The student manually enters data in the software, which can then be used for calculations, data processing and graph plotting.

Requires Hydraulics Bench Service unit F1-10

TECHNICAL DETAILS

Overall Dimensions:

C4-MkII-2.5		C4-MkII-5.0	
Length	2.91m	Length	5.41m
Width	0.62m	Width	0.62m
Height	1.46m	Height	1.46m
Channel Dimensions:	Width	76mm	
	Height	250mm	
Channel slope:	Adjustable between -1% and +3%		

Models and gauges supplied:

- Venturi Flume
- Sharp and Broad Crested Weirs
- Crump Weir
- Adjustable Undershot Weir
- Two Vernier level gauges (Hook and point gauges)

Optional models available:

- C4-61: Pitot tube and manometer
- C4-62: Culvert fitting, one edge square, one rounded
- C4-63: Flow splitters; central wall with various nose pieces
- C4-64: Free overflow spillway section complete with ski jump, sloping apron and blended reverse curvature attachments
- C4-65: Syphon spillway and air regulated syphon
- C4-66: Model radial gate
- C4-67: Wave generator and wave absorbing beach
- C4-68: False floor sections for gradually varied profiles
- C4-69: Artificially roughened bed 2.5m long section (two required for a 5m flume)