

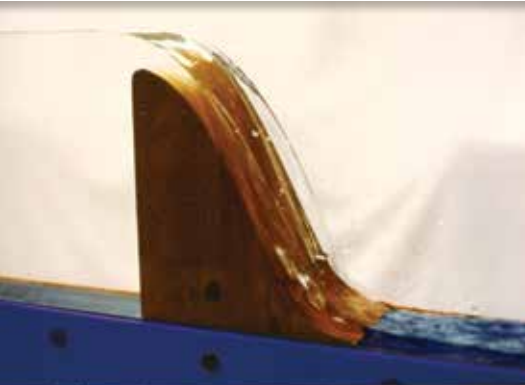


## EXPERIMENTAL CAPABILITIES

- > Study of open channel flume
- > Use of hook and point gauges to measure water level
- > 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 waves
- > Hydraulic jump
- > Using hydraulic structures for control of flow e.g. sluice gate
- > Applying and understanding Manning's formula
- > Use of a Pitot-static tube to measure flow rate and velocity profiles (using optional C4-61)

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. The MKII version is supplied as an accessory to the F1-10 Hydraulics Bench, and can be used with any recently supplied F1-10.





C4-64 Free overflow spillway section with blended reverse curvature



C4-64 Free overflow spillway section with ski jump



Crump weir - (supplied)

## 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 allows 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 at the discharge end.

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

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 flowmeter which can be fitted to the C4-MkII to allow direct flow measurements to be taken.

## SOFTWARE

Optional educational software is available (C4-MkII-ABASIC) 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.

## 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
- 2 Vernier level gauges

## OPTIONS

### 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 (2 required for a 5m flume)



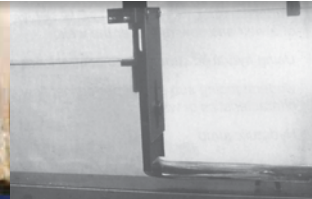
Sharp crested weir - (supplied)



Broad crested weir - (supplied)



C4-65 Syphon spillway



Adjustable undershot weir (supplied)



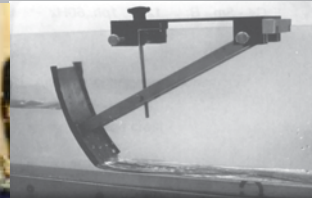
Hydraulic jump



Venturi flume - (supplied)



C4-65 Air-regulated syphon



C4-66 Model radial gate

### ORDERING DETAILS

**C4-MkII-2.5-10**

Multi-purpose Flume, 2.5m, with basic accessories

**C4-MkII-2.5-10-A/B/G**

As above supplied with F1-10 Hydraulics Bench

**C4-MkII-5.0-10**

Multi-purpose Flume, 5m, with basic accessories

**C4-MkII-5.0-10-A/B/G**

As above supplied with F1-10 Hydraulics Bench

**C4-MkII-2.5-11**

Multi-purpose Flume, 2.5m, with basic accessories and flowmeter

**C4-MkII-2.5-11-A/B/G**

As above supplied with F1-10 Hydraulics Bench

**C4-MkII-5.0-11**

Multi-purpose Flume, 5m, with basic accessories and flowmeter

**C4-MkII-5.0-11-A/B/G**

As above supplied with F1-10 Hydraulics Bench

**C4-MkII-ABASIC**

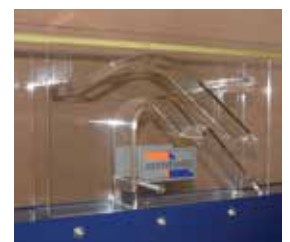
Educational Software



C4-67 Wave generator and \*wave absorbing beach



C4-65 Air-regulated syphon



C4-65 Syphon spillway



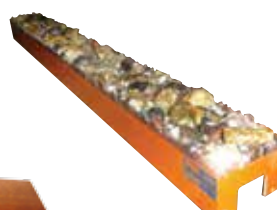
C4-62 Culvert fitting, one edge square, one rounded



C4-66 Model radial gate



C4-64 Free overflow spillway section complete with ski jump, sloping apron and blended reverse curvature attachments



C4-69 Artificially roughened bed



C4-61 Pitot tube and \*manometer

(\*equipment not shown)

## ESSENTIAL ACCESSORIES

Armfield F1-10 Hydraulics Bench

## REQUIREMENTS

### Electrical supply:

The F1-10 requires an electrical supply, please refer to the F1 data sheet for details.

F1-10-A: 220/240V/1ph/50Hz, 10A

F1-10-B: 110/120V/1ph/60Hz, 10A

F1-10-G: 220V/1ph/60Hz, 10A

## 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

## SHIPPING SPECIFICATION

### C4-MkII-2.5

Gross weight 330kg

Volume 2.8m<sup>3</sup>

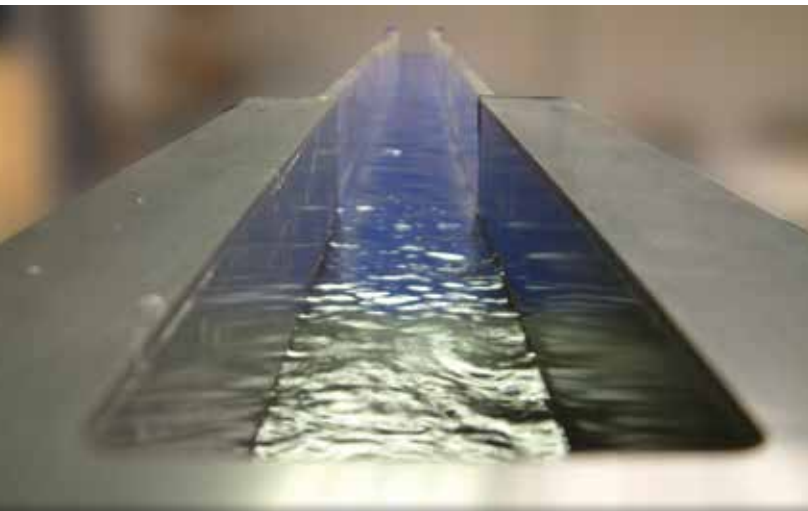
### C4-MkII-5.0

Gross weight 380kg

Volume 3.0m<sup>3</sup>

## ORDERING SPECIFICATION

- A 76mm wide, 250mm high open channel for use with an F1-10 Hydraulics Bench
- Available in 2.5m and 5.0m working section lengths
- Clear acrylic sides to give visibility of the working section
- A jacking system permits the slope of the channel bed to be adjusted between -1% and +3%
- Inlet tank with flow stilling arrangement
- Includes a Venturi flume, sharp and broad crested weirs, 2 vernier level gauges, adjustable undershot weir and crump weir
- Wide range of other models available as accessories
- Optional flowmeter
- Comprehensive instruction manual



\* Excluding DMX range



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