



**S**  
SERIES

**Standard teaching and research flume – S6-MKIII**

The Armfield S6-MKIII laboratory flow channel is one of the most important tools available to the hydraulics or civil engineer whether engaged in teaching basic principles or researching solutions to practical problems.

Many applications in fluid mechanics are associated with the flow of water through an open channel where the water has a free surface that is exposed to the air at atmospheric pressure.

The flumes are available in different lengths from 5 to 17.5 meters increasing in 2.5 meter increments. Armfield flumes are installed in educational and research establishments throughout the world.

- TILTING UP TO 17.5 METERS
- MODULAR DESIGN
- CONTROL SOFTWARE SUPPLIED AS STANDARD
- DATALOGGING
- SEDIMENT TRANSPORT OPTIONS
- MANUAL OR ELECTRICAL JACKING

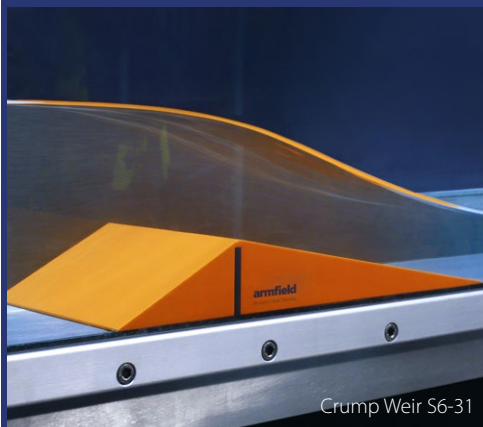


A comprehensive range of accessories, and measuring instruments is available including discharge control, wave generation and a closed loop for sediment transport studies.

Optional accessories, models & instruments

Wave generation options available

Enhanced control features



Crump Weir S6-31



**Features / benefits**

- ▶ Accurate for education and research
- ▶ Software supplied as standard with 15" high-definition touch screen
- ▶ Designed for ease of visibility: toughened glass sides, slimline side supports and comfortable viewing height
- ▶ Modular construction supplied in pre-glazed sections for rapid and easy site assembly
- ▶ Wave generation options which can be used to propagate random or regular waves in the working section
- ▶ Optional glass base window sections for (PIV) analysis

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Issue: 3

URL: <http://www.armfield.co.uk/flumes>

Applications

ME CE

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## S6-MK-III Glass Sided Tilting Flumes

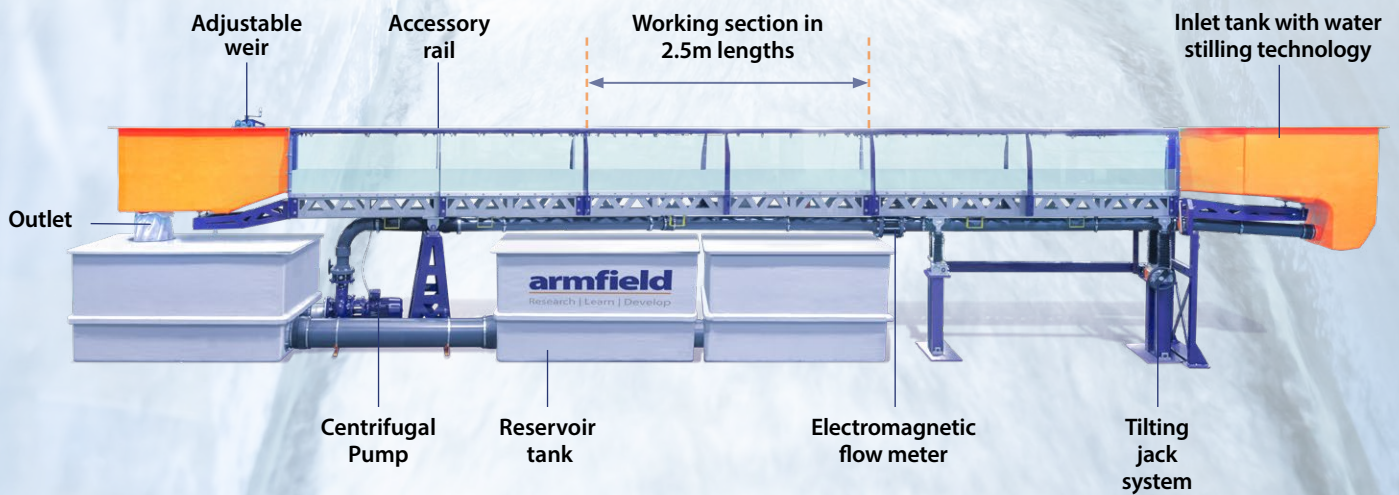
### Description

There are numerous design features associated with Armfield flumes

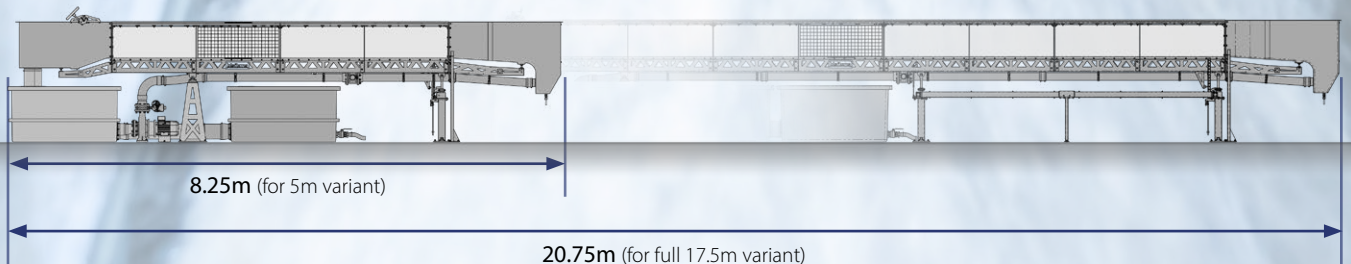
\* *Not all features are appropriate for every channel.*

- ▶ Accurate for education and research
- ▶ Extremely stable design, no user adjustments required to the flume bed
- ▶ Floor space requirements reduced to a minimum
- ▶ Fabricated high precision stainless steel channel bed
- ▶ Quick conversion to closed-loop recirculation for sediment transport studies
- ▶ Precision screw jacks provide accurate slope adjustment with minimum effort (powered jacks available as an option)
- ▶ Adjustable instrument rails with positioning scales fitted over the whole working length
- ▶ Fully profiled inlet tank fitted with stilling and smoothing devices
- ▶ Discharge tank with adjustable overshoot weir and draft tube to avoid splashing and enhance noise reduction
- ▶ Modular construction supplied in pre-glazed sections for rapid and easy assembly on site
- ▶ Wave generation options, both regular and random
- ▶ Comprehensive range of optional accessories, instruments and models available
- ▶ Non-corroding durable GRP tanks throughout
- ▶ Transparent sides are of toughened glass, which is extremely strong, abrasion resistant, dimensionally stable, does not discolour or scratch and is inherently safe
- ▶ Working section allows adjust-ability, enabling extremely accurate setting
- ▶ Under frame designed to reduce load deflections to a minimum
- ▶ Close tolerances specified and achieved.

### S6-MKIII - Teaching and research flume



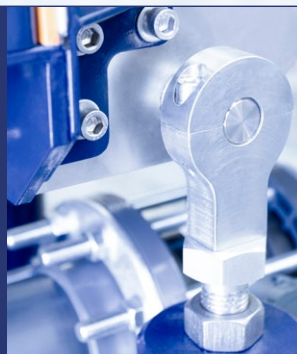
Working section from 5 meters to 17.5 meters



#### Engineering

The most important aspect of a tilting flume is retaining the integrity of the working section.

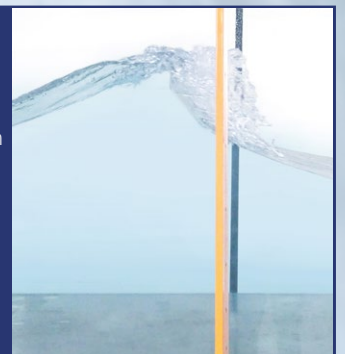
To achieve this requires an extremely rigid design which ensures almost no deflection regardless of load or tilt.



#### Experiments and Research

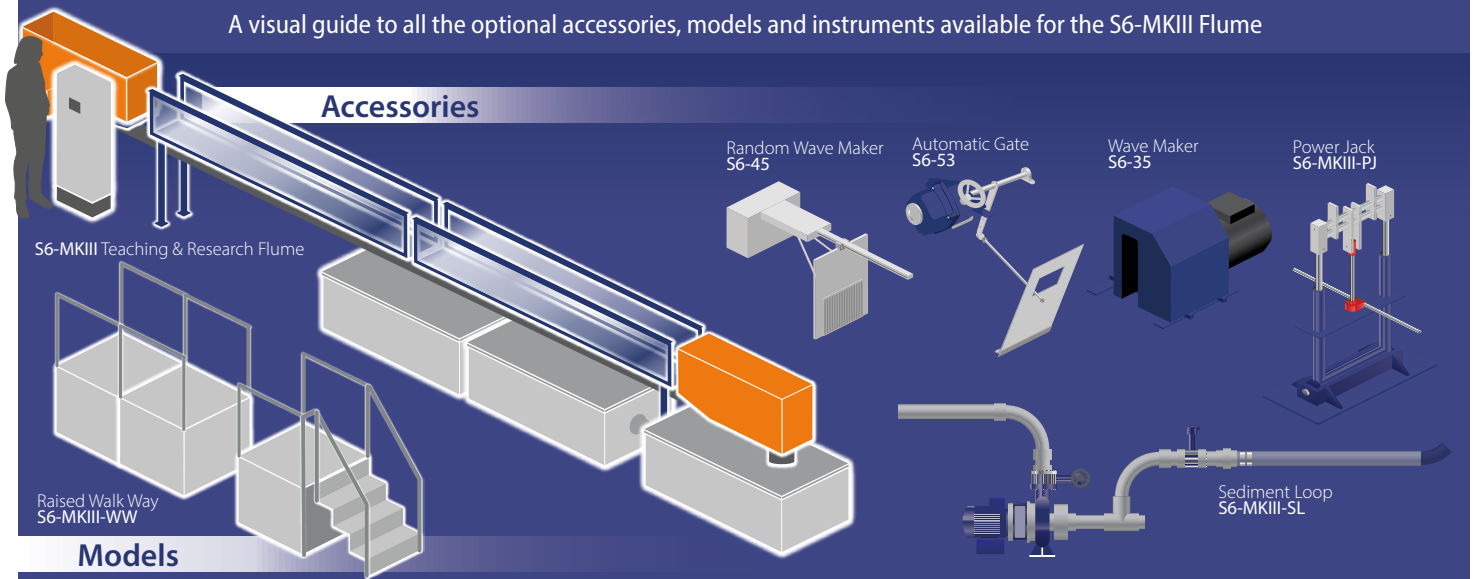
The Armfield S6-MKII flume has been developed during 30 years of continuous production, and examples are installed in educational and research establishments throughout the world.

The flumes are available in different lengths to suit the application, short versions for basic investigations and longer versions for investigations of gradually varied flow profiles with non-uniform channel flow.



A visual guide to all the optional accessories, models and instruments available for the S6-MKIII Flume

## Accessories



S6-MKIII Teaching & Research Flume

Random Wave Maker  
S6-45

Automatic Gate  
S6-53

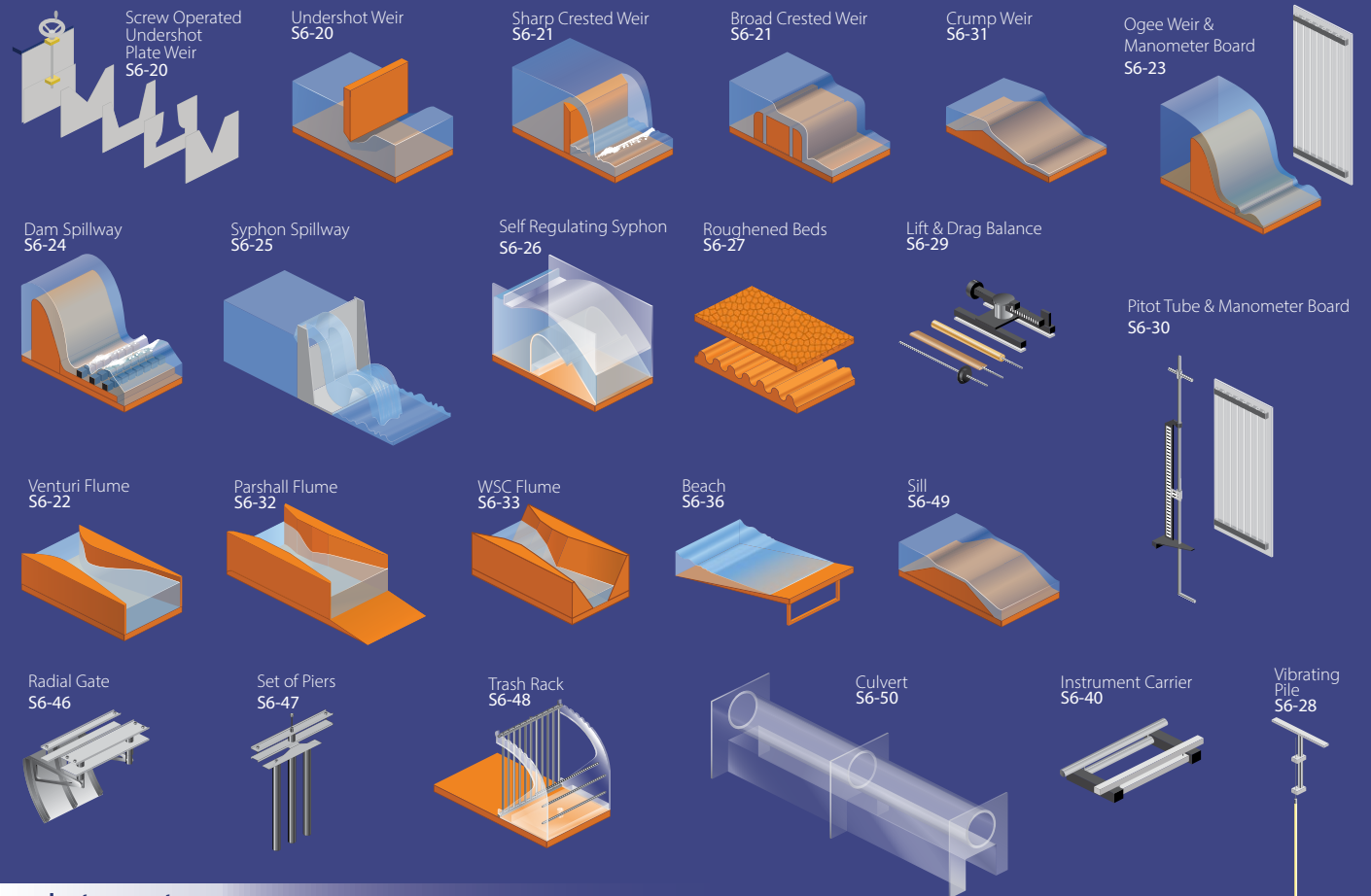
Wave Maker  
S6-35

Power Jack  
S6-MKIII-PJ

Raised Walk Way  
S6-MKIII-WW

Sediment Loop  
S6-MKIII-SL

## Models



Screw Operated  
Undershot  
Plate Weir  
S6-20

Undershot Weir  
S6-20

Sharp Crested Weir  
S6-21

Broad Crested Weir  
S6-21

Crump Weir  
S6-31

Ogee Weir &  
Manometer Board  
S6-23

Dam Spillway  
S6-24

Syphon Spillway  
S6-25

Self Regulating Syphon  
S6-26

Roughened Beds  
S6-27

Lift & Drag Balance  
S6-29

Pitot Tube & Manometer Board  
S6-30

Venturi Flume  
S6-22

Parshall Flume  
S6-32

WSC Flume  
S6-33

Beach  
S6-36

Sill  
S6-49

Radial Gate  
S6-46

Set of Piers  
S6-47

Trash Rack  
S6-48

Culvert  
S6-50

Instrument Carrier  
S6-40

Vibrating  
Pile  
S6-28

## Instruments

Zagni Flow  
S6-37

Velocity Meter  
S6-42

Pitot Tubes  
H30-1H to H30-3H

Vernier Hooks &  
Point Gauges  
H1-1 to H1-11

Velocity Probes,  
Digital Indicators &  
Data Logger  
H33 to H33-10

Wave Probe Systems  
H40-1-4 to H40-2-3

Manometer including:  
- water  
- pressurised  
- water over mercury  
H12-1 to H12-9



## Ordering specification

- ▶ A self-contained glass sided tilting flume for fluid mechanics laboratory experiments, project work and research activities
- ▶ The flume working channel is assembled from modular sections of 2.5m length. A wide choice of standard lengths are available from 5m upwards
- ▶ The flume cross-section is 300mm wide by 450mm deep
- ▶ A fabricated high precision stainless steel bed provides excellent strength and rigidity, eliminating the need for a separate under-frame. No adjustments other than the jacking stations are necessary in order to set up and maintain the equipment, achieving typical bed deformations better than 1mm
- ▶ Each flume incorporates a discharge tank fitted with an adjustable overshot weir and draught tube to avoid splashing and noise
- ▶ An electro-magnetic flow meter is incorporated as standard
- ▶ A comprehensive range of optional accessories and instruments is available to supplement the capabilities of the basic flume
- ▶ Closed-loop recirculation is an option for sediment transport studies

## Technical specifications

Walls	Toughened glass
Bed	Exclusively fabricated from stainless steel
End and sump tanks	GRP (Glass Reinforced Plastic)
Pipework	PVC (Polyvinyl chloride) & PE (polyethylene)
Pump	Close-coupled centrifugal
Flow regulation valve	Hand wheel operated butterfly
Flow meter	Electro-magnetic
Maximum flow rate	38 Litres/sec
Bed stability	1.0mm (typical) at 400mm water depth
Side wall stability	0.8mm (typical) at 400mm water depth
Width	0.3m
Depth	0.45m

## Requirements

## Scale



- ▶ Electrical supply 3Ph, 50-60Hz
- ▶ The user must have access to a PC
- ▶ Software requires the user to have a PC running Windows 7 or above with a spare USB port

## Tilting configurable modular flumes S6-MKIII

### Working section dimensions

Type	Tilting or standard flume
Width	0.3m
Depth	0.45m
Length (in 2.5m modular increments)	5m - 17.5m

### Packed and crated shipping specifications

Model	Volume	Gross weight
S6-MKIII-5M	18m <sup>3</sup>	2600Kg
S6-MKIII-7.5M	22m <sup>3</sup>	2900Kg
S6-MKIII-10M	27m <sup>3</sup>	3200Kg
S6-MKIII-12.5M	29m <sup>3</sup>	4400Kg
S6-MKIII-15M	31m <sup>3</sup>	4700Kg
S6-MKIII-17.5M	33m <sup>3</sup>	5000Kg

## Experimental Models & Instrumentation

A comprehensive range of optional accessories, models and measuring instruments are available for selection. These provide the basis for a large number of practical experiments in open channel flow including the use and operation of regulating and gauging structures.

Non-corroding materials have been used to reduce maintenance time and increase the working life of the models.

- ▶ S6-20: Plate Weirs
- ▶ S6-21: Broad Crested Weirs
- ▶ S6-22: Venturi Flume
- ▶ S6-23: Ogee Weir & Manometer Board
- ▶ S6-24: Dam Spillway Models
- ▶ S6-25: Syphon Spillway
- ▶ S6-26: Self-regulating Syphon
- ▶ S6-27: Roughened Beds
- ▶ S6-28: Vibrating Pile
- ▶ S6-29: Lift & Drag Balance & Models
- ▶ S6-30: Pitot Tube & Manometer Board
- ▶ S6-31: Crump Weir
- ▶ S6-32: Parshall Flume
- ▶ S6-33: WSC Flume
- ▶ S6-35: Wave Generator
- ▶ S6-36: Beach
- ▶ S6-37: Zagni Flow Monitoring Systems
- ▶ S6-40: Instrument Carrier
- ▶ S6-42: Velocity Meter and Mountings
- ▶ S6-45: Random Wave Maker
- ▶ S6-46: Radial Gate
- ▶ S6-47: Set of Piers
- ▶ S6-48: Trash Rack
- ▶ S6-49: Sill
- ▶ S6-50: Culvert

## Tilt parameters

Working Section	5M	7.5M	10M	12.5m	15m	17.5m
(+)%	5	5	4.5	3.6	2.9	2.5
(-)%	2.1	1.4	0.9	0.7	0.5	0.5
Total	7.1	6.4	5.4	4.3	3.4	3

## Ordering codes

### S6 MKIII flumes - cross section 300mm wide x 450mm deep

- S6-MKIII-5M-C Self Contained 5mtr Flume 415V/3Ph/50Hz\*
- S6-MKIII-5M-D Self Contained 5 mtr Flume 208V/3Ph/60Hz\*
- S6-MKIII-7.5M-C Self Contained 7.5mtr Flume 415V/3Ph/50Hz\*
- S6-MKIII-7.5M-D Self Contained 7.5 mtr Flume 208V/3Ph/60Hz\*
- S6-MKIII-10M-C Self Contained 10 mtr Flume 415V/3Ph/50Hz\*
- S6-MKIII-10M-D Self Contained 10 mtr Flume 208V/3Ph/60Hz\*
- S6-MKIII-12.5M-C Self Contained 12.5mtr Flume 415V/3Ph/50Hz\*
- S6-MKIII-12.5M-D Self Contained 12.5 mtr Flume 208V/3Ph/60Hz\*
- S6-MKIII-15M-C Self Contained 15 mtr Flume 415V/3Ph/50Hz\*
- S6-MKIII-15M-D Self Contained 15 mtr Flume 208V/3Ph/60Hz\*
- S6-MKIII-17.5M-C Self Contained 17.5mtr Flume 415V/3Ph/50Hz\*
- S6-MKIII-17.5M-D Self Contained 17.5 mtr Flume 208V/3Ph/60Hz\*
- S6-MKIII-SL Sediment Loop for S6-MKIII flume all lengths
- S6-MKIII-PJ Power Jacks for S6-MKIII flume all lengths

\* includes Manual Jacks, Control Console with Pump and storage tanks

S6-MKIII standard warranty applies with this product

## Knowledge base

- > 30 years' expertise in research & development technology
- > 52 years' providing engaging engineering teaching equipment

Benefit from our experience, just call or email to discuss your laboratory needs, latest project or application.

An ISO 9001:2015 Company



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## Aftercare

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