

The Armfield S17 River Flow Simulator is a professionally built tank to demonstrate and simulate the formation of river features, including flow and bed load motion. It makes an excellent introduction to the study of fluvial geomorphology and can also demonstrate sophisticated and advanced concepts for research purposes.

SIMULATION TANK FOR ENGINEERING TEACHING AND RESEARCH



Experimental content

- ▶ Experimental investigation on erosion and deposition
- ▶ Characteristics of meandering water courses - the effects of changing stream power on channel morphology
- ▶ Sediment transport and bedload motion capabilities
- ▶ Determination of hydrographs from model behaviour
- ▶ Channel morphology studies
- ▶ Channel stability
- ▶ Effect of base level change
- ▶ Demonstrating stream response to channelisation
- ▶ Formation of river features and development over time:
 - erosion
 - deposition
 - thalweg
 - cutbanks
 - sand point bars
 - riffles
 - straight, braided and meandering channels
- ▶ Gravel mining demonstration

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Applications
ME CE

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Manual preparation of simulation channel



Meandering channel set up

Description

The unit comprises a rectangular tank, made of stainless steel, measuring 215cm by 90cm. The tank is positioned and secured on a metal supporting frame. A manual jacking system enables the slope of the tank to be easily and safely adjusted, even when the tank is full of material and water.

The sturdy construction enables real sand to be used in the tank. This gives fine detailed and realistic feature simulation not obtainable on systems which use plastic pellets. In this way all principles of river formation and bed load motion can be studied. For best results the use of washed and graded sand is recommended.

The water reservoir is located at the tank discharge and water is pumped from the reservoir to the water inlet vessel using a low voltage submersible pump.

The inlet vessel is a 1.8l vessel, which can be positioned anywhere in the main tank. It is kept in its desired position by the sand within the tank.

The vessel incorporates a stilling mechanism and an outlet weir designed to produce a smooth output water flow into the main tank.

The system provides complete adjustment of water flow using a variable area flow meter and manual ball valve, which are mounted to the tank.

The water then flows through the sand where the formation of meandering channels, point bars, cut banks, riffles, thalwegs etc. can be observed and analysed.

At the end of the tank there is an outlet standpipe to return the water to the reservoir. The height of the standpipe is adjustable to enable different outlet conditions to be explored.

The system is also supplied with a sand scoop, scraper and surface profiling system, comprising a crossbeam and depth gauge.

The tank can easily be removed from the frame and the frame can be dismantled for storage using simple tools.



Initial straight channel developing meandering behaviour after a time period



Formation of braided channel



Example of bedform

Features

- ▶ Robust stainless steel tank
- ▶ Uses sand for realistic and highly detailed feature formation
- ▶ Sturdy frame with dual jacks to vary slope
- ▶ Stilled water inlet vessel featuring variable positioning
- ▶ Variable height exit
- ▶ Self-contained, includes pump and water reservoir
- ▶ Variable flow with flow meter



Erosion of deposition



Riffles and thalweg

Technical specifications

Working area	2150mm x 900mm
Flow range	1.5-15 l/min
Accuracy of flow metering	±2% full-scale
Slope adjustment - working slope	0-6°, 10° max

Overall dimensions

Length	2.60m
Width	1.06m
Height	1.02m

Packed and crated shipping specifications

Volume	1.4m³
Gross weight	120Kg

Requirements



Electrical supply: 24V dc at 2.5A max

A universal adaptor is supplied for operation from ac mains

Scale



Quick and easy draindown of system



Inlet vessel can be easily repositioned

Ordering specification

- ▶ A self-contained river flow simulator for the study and visualisation of river formations, bedload studies and fluvial geomorphology
- ▶ Stainless steel tank with a 2150mm x 900mm working area
- ▶ Tank mounted on a steel frame with jacking system to easily and safely adjust the tank slope while fully loaded
- ▶ Uses sand as the media for detailed feature development and bedload motion studies
- ▶ Water inlet vessel with stilling can be positioned anywhere in the tank
- ▶ Water reservoir, submersible pump, variable area flow meter and control valve giving flows from 1.5 to 15l/min
- ▶ Supplied with comprehensive instruction manual

Ordering codes

- ▶ S17-UK
- ▶ S17-EU
- ▶ S17-B

Armfield standard warranty applies with this product

Knowledge base

- > 28 years expertise in research & development technology
- > 50 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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