

**MULTI-PURPOSE TEACHING FLUME**

Model Number : GOTT-MPTF-01

**FEATURES**

- Standard Flumes
- Special Flumes, Tanks and Basins
- Acvillary Equipment
- Sediment Transport Facilities

**SPECIFICATIONS**

Flume has been designing and supplying open channel facilities (sometimes referred to as flumes) to hydraulic laboratories throughout the world. This brochure presents the full range of channels/flumes available both teaching & research, Standard & special.

There are also general comments about the design, flexibility & accuracy of flumes in order to assist those embarking on the specifying & purchase of flumes for advanced studies or research. Usually channels are of rectangular prismatic section. The dimensions of the working cross-section and length are the principal features, which determine both the functional suitability and the cost of a channel.

Depending on customer requirements, channels can be designed to incorporate the following alternative features:

- Fixed bed or variable slope
- Self-contained or laboratory supplied water
- Open circuit or re-circulating sediment load.
- Choice of working section materials (glass, metal, wood).
- Inclusion of a wave generator and beach.
- Sediment sampling.

Because of the physical size and the general heavy nature of the construction, it is easy to forget that a flume is an instrument and in many instances required to have a high level of integrity regarding both its working dimensions and ability to achieve repeatable results. These are cornerstones of the design, manufacture and final installation.

**DIMENSIONS**

The critical dimensions of a flume are the working length and cross-section (width and depth). Working length also means usable length. All too often the turbulent entry conditions require a substantial portion of what would be described as the working section before suitable flow conditions prevail. Flumes are designed such that the working length is maximized. The overall dimensions of the flume are also minimized through careful design of the inlet and outlet conditions and sensible use of the space underneath the flume and immediately adjacent.

**MATERIALS**

The materials of construction are of paramount importance, not only for the durability and longevity required of an expensive piece of equipment, but also suitability for purpose. Many flumes are used for sediment transport studies and therefore the materials in contact with the sediment must have some abrasion resistance.

Clarity of flow visualization is an essential ingredient, particularly if laser Doppler anemometry or sophisticated photography is involved. Even potable water will abrade a surface but water containing harsh particles, such as sediment; will quickly damage any soft material. This is why all flumes are constructed with acrylic glass viewing panels, whether these be small portholes or full length working sections.

**SET-UP AND ASSEMBLY**

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**UNIFORM FLOW**

Within the limited confines of a laboratory flume it is critical that the best possible working conditions are achieved as quickly as possible after the flow enters the working section. Much hinges on the entry conditions and particularly the means used to settle and direct the flow as it enters the inlet tank and is re-directed into the working section.

**INLET TANK DESIGN**

We designed carefully shaped tank, with profiling to walls or base, whilst remaining compact in its length, an essential ingredient to minimize the waste of laboratory space. Within the tank various stilling devices are incorporated.

**LEVEL CONTROL – THE OUTLET WEIR**

Of equal importance is the method of controlling the level within the flume. This is usually done through a weir at the discharge end. Many options exist either an adjustable overshoot tilting weir or, for more complex flow conditions, a venetian blind weir with either vertical or horizontal slats.

**WATER SUPPLY**

Traditionally hydraulic laboratories were constructed with under floor sumps and elevated header tanks linked with a ring main. Modern laboratories rarely enjoy these facilities. We able to supply flumes either in a non self-contained configuration, where they can be serviced from an existing header tank and discharge to a laboratory sump, or as fully self-contained facilities, where floor mounted reservoirs, pumps, pipework, valves and flow meters are incorporated, including, where appropriate, re-circulating loops for sediment transport.

**TILTING FLUME**

Many areas of study require or are enhanced by using flumes with a tilting capability. This mostly translates into positive slope but sometimes there is the requirement for negative slope. The most important aspect of a tilting flume is retaining the integrity of the working section, i.e., maintaining tolerances.

To achieve this requires an extremely rigid design that ensures almost no deflection regardless of load or tilt. Design of the jacking system is crucial in guaranteeing this.

**JACKING SYSTEM**

Tilting flumes need jacks to raise and lower them. The need for stability and the size and weight of the installation make this element of crucial importance. Various options are available, including chain drive and hydraulic lift. None, however, give the degree of repeatable accuracy achievable with screw jacks driven through shafting and gearboxes.

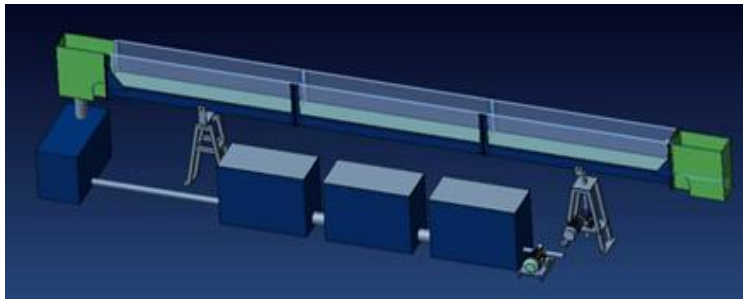
**SEDIMENT TRANSPORT****RECIRCULATING SEDIMENT SYSTEMS**

For this configuration a flow channel requires a recirculating loop enabling the water containing sediment in suspension to be re-circulated. Our flow channels can be designed to incorporate such loops, the pipework being designed to ensure the sediment stays in suspension and does not settle out within the system.

Sediment is abrasive and this makes the selection of materials of particular importance. Pumps are usually lined with glass, valves are reduced to a minimum and flow metering is via electro-magnetic flow meters that do not require any components within the flow. Flow visualization areas must be of Acrylic glass and GI mild steel is essential on the base and in tanks.

**ANCILLARY HARDWARE**

These typically include sediment feeders and sediment samplers. We have in-depth experience of all these options and are happy to advise on supply.



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**MAJOR DESIGN FEATURES**

There are numerous design features associated with channel facilities, many are unique. The following list is not exhaustive. Not all features are appropriate to every channel.

- Accurate for education and research
- Extremely stable design, no user adjustments required to the flume bed.
- Floor space requirements reduced to minimum.
- Fabricated high precision channel bed.
- Can be readily converted to closed-loop recirculation for sediment transport studies.
- Designed for ease of visibility:- glass sides; comfortable viewing height. Etc.
- Discharge tank with adjustable overshot weir.
- Modular construction - supplied in pre-glazed sections for rapid and easy assembly on site.
- Standard flumes have a comprehensive range of accessories, instruments and models available.
- Non-corroding, durable materials used throughout for water contacting surfaces.
- Transparent sides are of Acrylic glass, which is extremely strong.

**ADVANCED FLOW CHANNEL**

We offer a range of standard cross sections in both tilting & fixed bed configuration. These are:

300mm wide x 450mm deep Tilting only

600mm wide x 600mm deep

1000mm wide x 1000mm deep

The length of a flume is dictated by many factors. Common amongst them are experimental requirements, space availability and cost. Standard flumes are therefore available as modular units ranging from 5M to 15M in increments of 2.5M

**TECHNICAL DETAILS**

Width	: 300mm
Depth	: 450mm
Length	: As ordered (multiples of 2.5m)
Walls	: Acrylic glass
Bed	: Exclusively fabricated from GI Mild Steel
End tanks	: Fiber Glass Sump tanks
& Pipework	: Fiber Glass & PVC (Polyvinylchloride)
Pump	: Close coupled centrifugal
Flow regulation valve	: Hand wheel operated
Flow meter	: Electro-magnetic
Maximum flow rate	: 26 Liters/sec

**EXPERIMENTAL MODELS & INSTRUMENTATION**

- Adjustable Undershot Weir
- Broad Crested Weir
- Level Gauge
- Crump Weir

**ELECTRICAL SUPPLY :**

415V x 3 Phase x 20A

**Manuals :**

- (1) All manuals are written in English
- (2) Model Answer
- (3) Teaching Manuals

**General Terms :**

- (1) Accessories will be provided where applicable.
- (2) Manual & Training will be provided where applicable.
- (3) Design & specifications are subject to change without notice.
- (4) We reserve the right to discontinue the manufacturing of any product.

**Warranty :**

2 years

**ORDERING INFORMATION :**

ITEM	MODEL NUMBER	CODE
MULTI-PURPOSE TEACHING FLUME	GOTT-MPTF-01	888-111

\* Proposed design only, subject to changes without any notice