



Study of open channel flows and visualization of flow patterns around objects is a subject of interest in basic fluid mechanics. A small flow channel with a provision to control flow velocity and to inject dye into the flow can provide a very useful tool to study several aspects of potential flow and streamline patterns. Flow visualization channel is an important apparatus for students in fluid mechanics, hydraulics, civil, mechanical and related areas in science and technology.

The Tesca Flow Visualization Channel is a bench top open channel unit and has been designed to conduct experiments related to open channel flows and to visualize stream line patterns over or around various objects. The apparatus consists of a clear acrylic flow channel having large width-to -depth ratio. Overshot and undershot weirs are provided at the inlet and exit of the channel section. The channel section has a bell mouth entry to reduce flow disturbances. The 32096 Hydraulic Bench or any other standard hydraulic bench models can be used to supply and recycle water. The water flow rate can be varied using the membrane type flow control valve fixed at the exit of the flow channel. Water flow rate and hence the flow velocity is measured by the volumetric measuring tank (of the hydraulic bench). Water is supplied from the supply tank at a constant head. The supply tank consists of glass beads to reduce flow disturbances. Flow patterns are visualized using dye injection through needle valves. Dye injection rate can be controlled and adjusted to improve the quality of flow patterns. Different scaled models of sharp and broad crested weirs, cylinders, hump, symmetrical and unsymmetrical airfoils, airfoil with flap, wing, hump, disc and cuboid are provided. Models can be fixed in the test section using suitable fixtures. The water level in the channel is measured using a depth gage. The complete unit is manufactured from corrosion resistant materials.

OPTIONS:

Computer based learning software is included to enable students understand and conduct experiments

Note: Specifications are subject to change.

Tesca Technologies Pvt. Ltd.

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and tabulate results. The Tesca Flow Visualization Channel Demonstration Apparatus is an important experimental set-up for any Fluid Mechanics and Hydraulics Laboratory of an educational institution.

List of Experiments:

1. Study of open channel flows
2. Study of flow over weirs – over shot and under shot weirs, broad and narrow crested weirs.
3. Familiarization with water flow visualization technique.
4. Demonstration of laminar and turbulent flow.
5. Study of streamline patterns around cylinders at different Reynolds numbers.
6. Study of streamline patterns around airfoils with and without flap and various incidences.
7. Study of flow pattern around hump, disc, cuboid etc.
8. Study of vortex shedding from cylinders and bluff bodies.
9. Comparison of observed streamline patterns with theory.

Important Features and Specifications:

1. Flow visualization channel with bell mouth entry, 650mm length, 20mm width and 140mm height, transparent, made of clear acrylic.
2. Supply tank with glass beads, 20 liters capacity.
3. Dye injection system, 0.5 liters reservoir capacity, 5 dye injection needles with needle valves at exit.
4. Depth gauge. 0 – 150mm range.
5. Model fixture.
6. Models: overshoot weir, undershot weir, broad crested weir, sharp crested weir, hump, small cylinder, large cylinder, symmetrical airfoil, symmetrical airfoil with flap, un-symmetrical airfoil, wing, disc and cuboid.
7. Computer based learning software.

Option:

1. A self contained unit of Flow Visualization Channel mounted on a mobile platform with a flow controlled closed circuit water circulation unit consisting of a centrifugal pump, flow meter, corrosion resistant sheet metal measuring tank and a sump tank will be supplied on request.
2. Models of any other geometry required by the user can be supplied on request.

Services Required:

1. Water Supply.
2. Electrical Supply, 240 V, single-phase, 50 Hz.

Overall Dimensions:

Height: 0.75m, Width: 0.50m, Length: 0.90m.

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