



Tesca Water Tunnel 32475 is an important facility used to study flow around submerged bodies. Although it has wide applications, it is primarily used to measure drag on submerged bodies, flow visualization, and conduct tests on propellers and cavitations studies. Water Tunnel is an important facility for the marine, ocean, naval architecture, civil, hydraulic, and mechanical and aerospace engineering laboratories of educational institutions.

Water Tunnel for Education and Research has been designed to cater the needs of testing requirements of students and research community. It is a horizontal type closed recirculation water tunnel having a working section of size 200mm X 200mm and 800mm long. Water flow velocities upto about 0.9m/s can be obtained. The tunnel is built using stainless steel and mild steel with suitable painting to prevent corrosion. Honey combs and contraction are provided in the upstream of the working section to reduce turbulence in the flow. Transparent windows are provided in the working section to enable flow visualization and use of optical diagnostic measurement techniques such as Laser Doppler Anemometry and Particle Imaging Velocimetry. The drive system consists of an impeller and a variable speed DC motor. Model support with incidence system is provided. A model Propeller and dynamometer for drag and torque measurements are provided to carryout propeller tests. The dye injection system with an array of needles is provided to carryout flow visualization tests. Basic instrumentation is provided for pressure and velocity measurements. The tunnel components are mounted on rigid structure to avoid vibrations.

List of typical experiments

1. Study of pressure distribution on submerged bodies.
2. Velocity profile measurements in the wake of submerged bodies.
3. Drag measurements on submerged bodies.
4. Flow visualization.
5. Ship propeller testing.
6. Pump impeller testing.

Measurements

1. Pressure distributions.
2. Velocity profile.
3. Ship propeller testing - rotational speed, axial force, torque etc.,
4. Pump impeller testing - rotational speed, axial force, torque etc.,
5. Cavitations.

Specifications

1. Water Tunnel, closed circuit, recirculation type, working section size: 200mm x 200 mm X 800 mm long.
2. Material of construction: Stainless steel and mild steel, suitably painted to prevent corrosion.
3. Flow velocity: 0 - 0.9 m/s, with velocity control, steeples within limits.
4. Tunnel water capacity: 1250 liters (approx.)
5. Max. Flow rate: 1200 liters/hour.

Note: Specifications are subject to change.

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6. Anodized Aluminium honeycomb.
7. Nozzle contraction ratio: 3:1 (approx.)
8. Height of working section: about 1.5 meters.
9. Model support and incidence system.
10. Transparent windows for observation and flow visualization.
11. Inlet and outlet valves for flow control.
12. Filter for suspended particles.
13. Impeller drive, 2.5 kW variable speed DC motor, controller and speed sensor, Max. Speed: 3000 RPM, impeller made of bronze, 3-bladed, 100mm overall diameter.
14. Propeller made of stainless steel, 3-bladed, 100mm overall diameter
15. Dynamometer, strain gage type, capacity: thrust: 25N, torque: 2.5Nm, with variable speed D.C. motor and speed sensor. Max. Speed: 3000RPM.
16. Control module for tunnel drive and dynamometer motors.
17. Dye injection system.
18. Pitot-static probe.
19. Multi-tube manometer, 10 tubes, 500 mm long tubes.
20. Differential electronic pressure transducer with digital readout.
21. Digital flow meter.
22. Models – Flat plate & cylinder.

Options

1. Photo recording equipment can be supplied to suit the requirements of the user on request.
2. PC based data acquisition system can be supplied on request.

Services required

1. Water Supply and drainage.
2. Electric supply, 440V, 3- phase.50Hz.

Overall dimensions (approx.):

Length: 4m, Height: 2m, Width: 1m.

Note: Specifications are subject to change.

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