

Cavitation Tunnel

QinetiQ's Cavitation Tunnel is the largest facility of its type in the UK with a cross section of 2.4×1.2 m.



Working Section Dimensions

5.35 m (L) $\times$ 2.4 m (W) $\times$ 1.2 m (H)

Coaming Pressure

3.5 kPa to 160 kPa

Water Speed

8 m/s

Water Capacity

195 m³

External Drive Motor

93 kW / 2500 RPM

Internal Drive Motor

23 kW / 2000 RPM

External Dynamometry

Up to 4.4 kN thrust

Up to 250 Nm torque

Internal Dynamometry

Up to 4.4 kN thrust

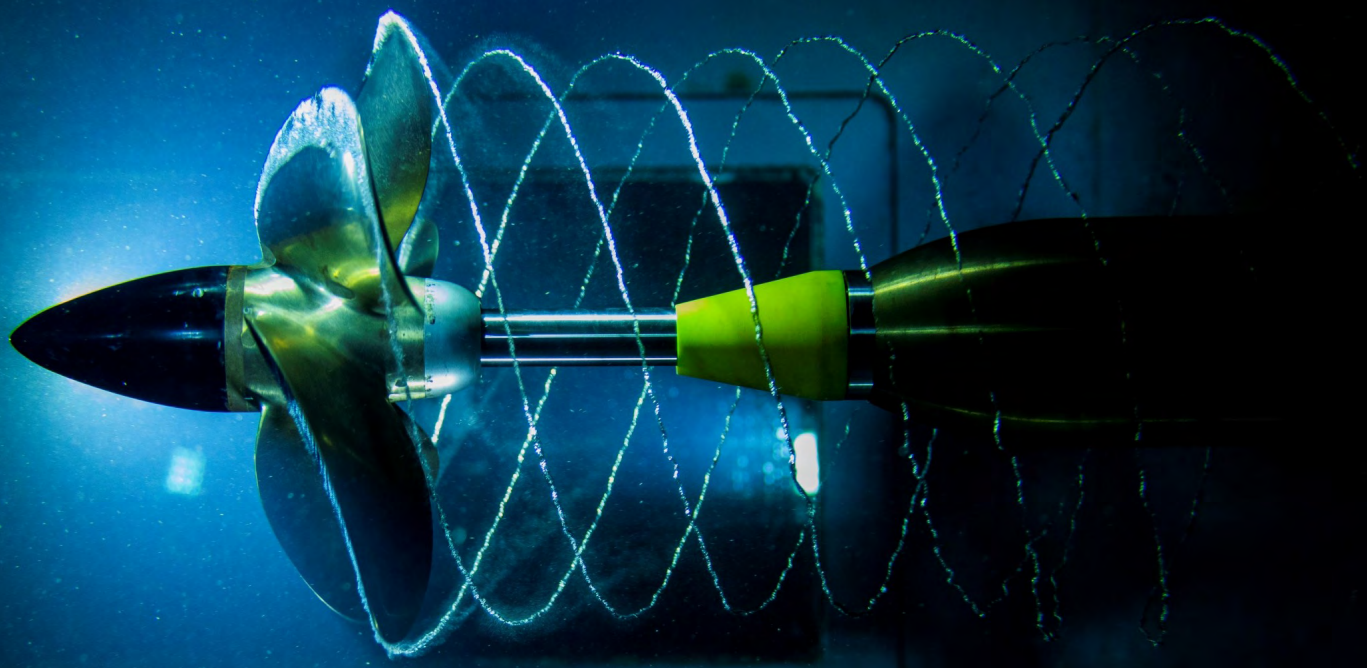
Up to 203 Nm torque

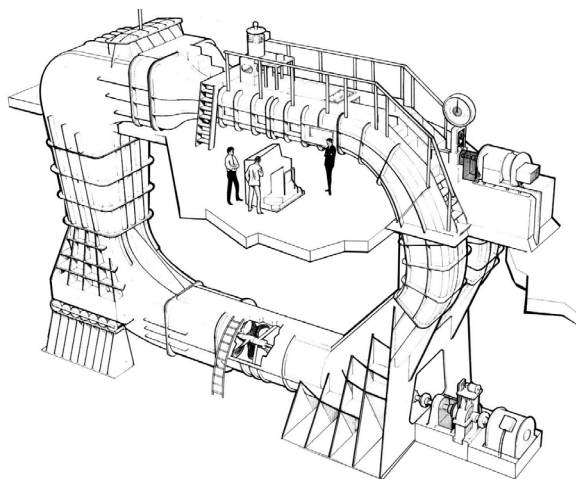
Typical Open Water Propeller Diameter

Ø300 mm

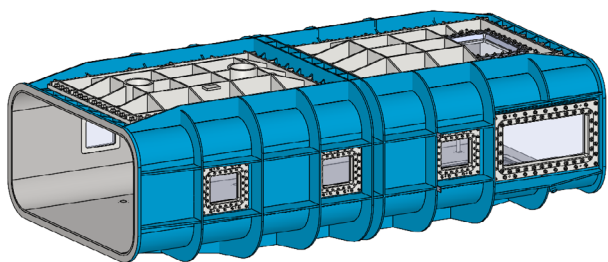
Typical Behinds Model Length

5 m





Cavitation Tunnel diagram



Cavitation Tunnel working section



Frame from high-speed videography

Features

- Open-water experiments for propulsion and cavitation evaluation of propeller models
- Behind hullform experiments for wake surveys, propulsion and cavitation assessment
- Versatile facility used for unconventional tests including renewable energy devices

QinetiQ has a wealth of experience in the design and assessment of ship propellers, the Cavitation Tunnel is one of the major facilities used in this process.

It has a large working section, making it ideal for testing hull and propeller combinations, with measurement of the propulsive performance of the propeller and its cavitation inception speed being of particular interest.

Capabilities

- Open water propeller testing
- Lid mounted surface ship models and submarine models for behind hullform propeller testing
- High speed video capture from external cameras for cavitation studies
- Open water and behind hullform dynamometer measurements for propulsion performance
- 2D Laser Doppler Anemometry of axial and tangential flow velocities via submerged internal system
- Digital Image Correlation system for understanding Fluid Structure Interaction to measure propeller blade deflection and frequency response
- Particle Image Velocimetry system for understanding wake measurements via an external setup, capable of measuring 2 or 3 velocity components
- Tests of other platform structures and features possible on request
- Propeller and Propulsor design capability through our Maritime Consultancy services
- On-site workshop capable of producing complex model scale propellers and hullforms

Tunnel Particulars

- Fwd Side viewing windows x 6 (335 × 278 mm)
- Aft Side viewing windows x 2 (944 × 411 mm)
- Upper viewing window (515 × 718 mm)
- Lower viewing window (950 × 684 mm)
- Tunnel removable lids x 2 (2200 × 1500 mm)
- Two tonne crane for model and equipment transport

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