

# Ship, Power and Work Boat Model Basin Testing

# WOLFSON UNIT

FOR MARINE TECHNOLOGY AND INDUSTRIAL AERODYNAMICS

## Background

The Wolfson Unit has been conducting towing tank tests on high performance vessels for over 40 years. For a given towing tank test programme, a suitable test facility is chosen from those available within Europe. The final choice depends upon the tank size, carriage speed, wave making facilities and availability. Facilities are hired to the Wolfson Unit with only a carriage driver. All towing and measuring equipment is designed, built and operated by Wolfson Unit engineers, who also conduct the data analysis and prepare the report.



Calm water trials on the 37m motor yacht 'Ermis 2' designed by Rob Humphreys

The bulk of the testing concerns leisure craft up to 100m overall length, with speeds up to 80 knots. Clients include many high-end shipyards, such as Perini Navi, Baglietto, Princess, Sunseeker and Devonport. Since its inception, the Unit has had good working relationships with designers such as Ron Holland, Rob Humphreys, Ed Dubois, Philippe Briand, Peter Van Oossanen, Frank Mulder and Gerard Dijkstra.



65m Semi-displacement motoryacht designed by Van Oossanen and Associates

## Towing tank services

- **Model construction:** Scaled models built to lines supplied by the client.
- **Calm water tests:** Effective power and resistance at a range of speeds, displacements and trims. Improvements to spray rails, knuckles and chines, wash measurement. 3D wake surveys and self-propulsion.
- **Optimization of trim:** Optimal positioning of the Longitudinal Centre of Gravity to achieve desired running trim. Effects and penalties of transom wedges, trim tabs or interceptors.
- **Flow visualization and analysis:** Improvements in appendage design, bilge keel alignment, flow into propellers and through tunnels. Minimize resistance, noise and vibration, and increase propeller efficiency.
- **Wake survey:** Measurement of the axial flow to optimize propeller design and assess risk of vibration.
- **Tests in Waves:** Measurement of resistance, heave, trim, accelerations and wetness. Statistical quantities of motion in irregular sea spectra. Determination of seasickness incidence and crew performance. Stability and seaworthiness in beam seas or extreme conditions. Effect of bilge keels on roll reduction.
- **Manoeuvring:** Manoeuvring and directional stability trials such as Dieudonne spiral tests and zig-zag manoeuvres and docking in high winds and use of bow thrusters. Complex or innovative propulsion systems. Seakeeping and motions in irregular seas. Coupled roll and yaw stability at high speed. Susceptibility to broaching.
- **Other Tests:** Behaviour in breaking waves or wind and waves. Behaviour of barges and barge trains under tow. Exhaust outlet pressures. Surface coating resistance.

## Free running tests

Radio controlled models, built and equipped by the Wolfson Unit, and operating in open water or a seakeeping basin, are used for a variety of experiments, including:

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Recent advances in rapid prototyping have enabled affordable and representative testing of vessels with water jet propulsion.



Manoeuvring trials on a 25m Offshore Patrol Vessel - Tehnomont, Croatia



Manoeuvring trials on a 24m SWATH Trimaran designed by AUSTAL Pty