

Test rig for drag force measurements

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Ships' performance is affected by the drag force at the underwater hull. This drag force depends on the physical and biological hull roughness. If the former can be controlled by the manufacturing process and by means of opportune anti-corrosive surface treatments, the latter needs several developments for avoiding bio fouling. In order to test these developments at laboratory scale a test rig has been designed and assembled.

It consists of a 200 mm diameter stationary cylinder fixed to a frame through a torque meter and sank into a rotating tank of marine water. The measuring device is uncoupled from the actuation part allowing a precise recording of the drag force. The gap between the stationary test cylinder and the tank can be decided changing the tank inner diameter, therefore, both Couette and turbulent flow can be reproduced.

Precise measurements of the drag force in two ranges 0-1 Nm and 0-10 Nm can be carried out. The opportune dimensioning of the system allows reaching velocities up to 30 knots for a rotating speed of 1500 rpm. The performances of the test rig and its limits are herein illustrated.

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