Summary

Antifouling coatings are designed specifically to control marine growth and maintain ship hulls in a smooth and hydro- dynamically efficient condition. Recent international regulations have removed the most effective antifouling coating from the market (TBT-self polishing). At present, there is no clear alternative that provides similar performance. Present accumulation of fouling and surface roughening leads to significant economic, performance and ecological penalties to an industry critical for world economic exchange and growth: the shipping industry. The race is now on to develop reliable and environmentally acceptable alternatives. This requires a scientific testing protocol (ccbc.fit.edu) that imitates the service conditions experienced by the coatings.

Applications

- The invention is directed to techniques for testing and evaluating materials and coatings and, more particularly, to testing and evaluating materials and coatings in moving solutions.

- Test data derived from such measurements can be used to serve as a guide for predicting the service life of anti-fouling paints in order to calculate the necessary paint thickness to fit specified deployment cycles. The aging of anti-fouling paints in service will vary depending on such factors as: berthing location, geographic area of operation, salinity, pH, and temperature of seawater. One should also note that some areas of a ship are subject to differing hydrodynamic conditions.

Advantages

- The techniques of the invention as well as the techniques the prior art are intended to measure the performance of materials exposed to flowing solutions, such as seawater, at velocities designed to subject the material to shear stresses experienced in service.

The Technology

During the last year, a dynamic aging system was designed, constructed and tested. The system operates by using a large stirring apparatus to move sea water around a 1.6m diameter tank. The paddles are made of 0.5m x 1m high pvc plate. They are rotated on automobile bearings using a 1.5hp de motor with a 30:1 reduction. This allows the motor to efficiently supply high torque at 60 rpm and generate a flow across the test panels at 20 m/s (10 knots). Currently, the system accommodates up to four 0.254m x 0.305m (1Oin x 12in) panels with a capacity of up to eight panels. Sea water is supplied from the Indian River Lagoon in Melbourne, Fla., and is continually changed over every 3 hours. The test panels are flat and lay lengthwise into the flow. The flow across the panel was measured using a boundary layer probe positioned through a test panel. The flow was found to be highly turbulent, and the velocity of the flow is about that of the paddles with little boundary layer development. The actual shear stress across the panel can be measured with a floating element force gage under the panel.

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