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Fouling control coatings (FCCs) and irregularities (e.g., welding seams) on ship hull surfaces have significant effects on the overall drag performance of ships. In this work, skin frictions of four newly applied FCCs were compared using a pilot-scale rotary setup. Particular attention was given to the effects of coating water absorption on skin friction. Furthermore, to investigate the effects of welding seam height and density (number of welding seams per five meters of ship side) on drag resistance, a new flexible rotor was designed and used for experimentation.

It was found, under the conditions selected, that a so-called fouling release (FR) coating caused approximately 5.6% less skin friction (torque) over time than traditional biocide-based antifouling (AF) coatings at a tangential speed of 12 knots. Furthermore, results of immersion experiments and supporting “standard” water absorption experiments showed that water absorption of the FR coating did not result in any significant impacts on skin friction. On the other hand, water absorption was found to actually lower the skin friction of AF coatings. This may be attributed to a smoothening of the coating surface.

The effects of welding seam height and density on drag resistance were found to be substantial when welding seam height is above 5 mm, especially at high tangential speeds (above 15 knots). Using an interpolation approach, the pilot-scale welding seam drag data could be used to estimate the drag resistance at approximated full-scale conditions, equivalent to about one welding seam per five meters of ship side. It was shown, in this case, that the contribution of welding seams to ship skin friction could very well be less significant than those of FCCs when the welding seam height is below 5 mm, a representative value for full-scale welding seam height.