

” PENERAPAN *HULL VANE* PADA KAPAL PATROLI PAT MEDAN”

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Abstract

This study aims to analyze the effect of adding Hull Vane on the performance of the PAT MEDAN patrol boat, especially in reducing the drag and pressure on the hull. The patrol boat with the main dimensions of LOA 11.5 m, LWL 10.2 m, width 2.7 m, height 1.45 m, draft 0.4 m, and speed 40 knots was modeled using software and Rhinoceros 6. Computational Fluid Dynamics (CFD) simulations were carried out with ANSYS Fluent software to evaluate four variations of Hull Vane shapes (A, V, M, W) using NACA 2414 foils. The simulation results showed that the addition of Hull Vane significantly reduced the ship's drag. The M-shape variation provided the largest drag reduction, which was 3732.72 N (reduced by 81%) from the ship without hull vane with a 0° angle variation of the foil position of 0.75% compared to the ship without Hull Vane (4566.02 N). Meanwhile, the W variation produced the lowest hull pressure, at 16,571.57 Pa, lower than the vessel without a hull vane (18,124.98 Pa). The conclusion of this study is that the hull vane is effective in improving the hydrodynamic efficiency of patrol vessels, with the M and W variations being the most optimal designs. For further research, it is recommended to conduct cost studies, analyses, and use higher computer specifications to accelerate the CFD simulation process.

Keywords: Hull vane, NACA 2414, ship resistance, CFD, patrol vessel.