

Abstract

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Stationary and Low Speed Performance Characteristics of Open and Ducted CPPs

Existing available systematic propeller tests provide useful data base to help the designer understand the factors which influence propeller performance under various operating conditions. They also provide design diagrams, and/or charts, which will assist in selecting the most appropriate dimensions of actual propellers to particular ship applications. Some information pertaining to stationary operation is not explicitly given by these tests. Typical examples of stationary low speed applications includes tug boats, fishing vessels, dynamic/ tracking and heavy lift vessels. In early work by the authors, static performance characteristics of open and ducted fixed pitch propellers have been studied. Thrust, torque, and efficiency have been identified in static mode condition and related to both configurationally and operational conditions. The present work is an extension to the previous study where controllable pitch propellers with and without ducts are addressed. The parameters necessary required to assess the performance of these thrusters in open and ducted modes while working at stationary low speed mode are inferred from the using existing systematic thruster data. AU-series for controllable pitch open propeller and Wageningen ducted CPP –series are examined. Static performance characteristics are studied in the ahead and astern conditions. Comparisons were made between a) open and ducted controllable pitch thrusters, b) different types of ducts and c) ahead and astern conditions. Reference was also made to fixed pitch thrusters performance.