

Research on the ship propeller blade to determine changes in the mechanical properties based on the forces projection

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Abstract

The ship propeller is a key component in producing the propulsion force of the ship motion. Therefore the stability of structure strength is required to ensure the effectiveness of propulsion force generation. This research examines the existing ship propeller and the effects of casted specimen on the changes of mechanical properties of the propeller structure. The specimen prepared is referred to ASTM E8 2008 standard and including two projections is Longitude and Latitude projected, according to the forces analysis exerted on blade structure. The experiments perform on the used propeller by cutting into pieces of specimen and casted specimen of copper alloy of Nickel Aluminium Bronze (Ni-Al-Br). The mechanical testing is conducted on tensile test, tensile strength and hardness test. The results show strong influence of the mechanical properties of existing propeller are lower from the standard requirement and different in each specimen projection of Yield Strength is 23.67% to 31.84% and the Tensile Strength is 12.20% to 20.17%, and the elongation percentage is 28.19% to 35%, respectively. The latitude projection shows greater compared to longitude projection. An experimental result for the casted specimen showed a reading of mechanical properties is 3% to 5% difference compared to the cutting specimen. From the results of these experiments have found that fixing projections in this study are reasonable and can be used in subsequent studies and mechanical properties of the material are not homogenous across the blade structure. Therefore, a comprehensive study should be undertaken to overcome this problem in the future. © 2006 -2017 Asian Research Publishing Network (ARPN).

Author keywords

Mechanical properties, Projection, Specimen, Strength, and experiments