

Abstract

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A Comparison of Buckling Strength of Y and T Stiffeners in Ship Plating

One aim of naval architects is to design structures that are strong enough and capable of absorbing impact energy. Therefore, ship plates are stiffened using different stiffeners to withstand compressive and other loads resulting from loads due to collisions, stranding, grounding. There are also uniform stresses that are most typically induced in deck bottom flange by longitudinal hull girder bending. In this paper, the T stiffener that has been widely used in shipbuilding and the Y stiffener that is starting to be used in inland waterway tankers in The Netherlands are considered. The aim of this paper is to compare the buckling strength of the T and Y stiffeners in combination with the effective width of ship plating under the action of uniformly distributed compressive loads. Two different groups of boundary conditions are considered for both T and Y stiffeners, and the elastic buckling coefficient is obtained and then the critical buckling loads are calculated. The obtained results showed that the critical buckling loads for Y stiffener are larger than that for equivalent T stiffener by about 40% for the first group of boundary conditions. The second group showed that the Y stiffener plate combination is five times stronger in compression than the equivalent T stiffener plate combination.