

Evaluation of Mechanical Properties of Welds Fabricated at a Close Proximity on Offshore Structures

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Abstract : This manuscript presents the results of an experimental investigation performed to study the material and mechanical properties of two weld joints fabricated within close proximity. The experiment was designed using welded S355 D Z35 with distances between two parallel adjacent weld toes at 8 mm. These distances were less than the distance that has normally been recommended in standards, codes, and specifications. The main idea of the analysis is to determine any significant effects when welding the joints with the close proximity of 8mm using the SAW welding process of the one joint with high heat put and one joint welded with the FCAW welding process and evaluating the destructing and nondestructive testing between the welded joints. Further, we have evaluated the joints with Mechanical Testing for evaluating by performing Tensile test, bend testing, Macrostructure, Microstructure, Hardness test, and Impact testing. After evaluating the final outcome of the result, no significant changes were observed for welding the close proximity of weld of 8mm distance between the joints as compared to the specification minimum distance between the weldments of any design should be 50mm.

Keywords : S355 carbon steel, weld proximity, SAW process, FCAW process, heat input, bend test, tensile test, hardness test, impact test, macro and microscopic examinations

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