

***Analysist of The Effect of Curreent Strength and SMAW Welding Flow Variation On  
ST-41 Steel Welding Joints Using Torsion Test***

*by*

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**ABSTRACT**

*Damage to the material structure of metal joints starts from locations that have stress concentrations. The appearance of stress concentrations can be caused by surface roughness, material defects, local heating, decarburization, and so on. Testing metal connection materials with a torsion test is necessary to determine the torsional fatigue strength of a metal material connection. The testing process is carried out by applying a twisting load to the metal material connection until it breaks. The purpose of this study was to determine the effect of variations in welding current strength and welding grooves on ST-41 steel joints with torsion tests and also the best torsional strength from variations in SMAW welding grooves and welding currents on ST-41 steel welding joints with torsion tests. This type of research is experimental research. The object of this research is the torsional strength of ST-41 steel. The results of the research obtained by the researchers are that in the same type of groove but with different currents the resulting torsional strength is different and vice versa, the torsional strength of the material is known from the value of the shear stress. The results of calculating the maximum torsional moment data for each groove variation obtained the best torsional strength value from the zig-zag groove variation of 60.61 MPa at 85A current, 57.72 MPa spiral at 95A current, and 63.50 MPa straight at 85A current.*

***Keywords :*** *Torsion test, shear stress, torsional strength, ST-41 steel*