OPTIMIZATION ELECTRICAL CURRENT OF THE SPOT TIG WELDING ON THE TENSILE STRENGTH OF MATERIAL MILD STEEL SPCG 250 USING FUZZY LOGIC METHOD

By

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STATEMENT BY THE AUTHOR

I hereby declare that this submission is my own work and to the best of my knowledge, it contains no material previously published or written by another person, nor material which to a substantial extent has been accepted for the award of any other degree or diploma at any educational institution, except where due acknowledgement is made in the thesis.

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ABSTRACT

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This research explains about the optimization of electric current TIG spot welding on the tensile strength of SPCG 250 mild steel using a fuzzy logic system. In this study using 2 types of fuzzy, namely Mamdani FIS and Sugeno ANFIS. By combining these 2 fuzzy types, the error value is 11.8712. In addition, regression analysis was also carried out on the input variable parameters of the output variable. From the results of the regression analysis, it is known that the parameters that influence it are electric current and holding time. The validation process is carried out by matching the results of fuzzy output, ANFIS output and real data to the mechanical properties of the materials which is 320 MPa, so the optimization value at current 80 A and holding time 10 with a value of 342.92 MPa is obtained. To the tensile strength test results, a decision-making system with fuzzy logic can be used using the ANFIS method.

Keyword: Spot TIG welding, Fuzzy logic, ANFIS, Optimization, Current, Holding time, Mild steel SPCG 250, MATLAB.

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DEDICATION

I dedicate this work to my beloved wife, sons and daughters who always encourage and inspire me, patiently wait and give the best prayers for my struggle.

Allah is the One Who created seven heavens in layers, and likewise for the earth. The divine command descends between them so you may know that Allah is Most Capable of everything and that Allah certainly encompasses all things in His knowledge. (Q.S. At-Talaq: 12)

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The author realizes that this thesis is still far from perfect, so the writer is open to constructive criticism and suggestions. Hopefully this thesis can be useful for Swiss German University students in general and Mechanical Engineering (Mechatronics) students in particular.

Tangerang, February 2021

Rahayu Budi Prahara

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