

**VARIATIONS IN ELECTRODE MOTION AND WELDING POSITION OF
GTAW WELDS AGAINST HARDNESS AND TENSILE STRENGTH OF
STEEL SS 400**

Dicky Adi Tyagita, S.T., M.T as Chief Counselor

Ananda Dwi Kurniawan
Study Program of Automotive Mechanical
Majoring of Engineering
State Polytechnic of Jember
nanda.mareta90@gmail.com

ABSTRACT

GTAW is a welding with an electrode that is not fed or not as a metal filler and uses added materials for metal fillers using argon gas as a protective gas. This research uses three movements pattern: U, circular, and zig-zag. In the welding position there are two positions, there are flat position and vertical position. Based on the results of the study the highest average tensile test value of 450.03 N/mm² occurred in the flat welding position and U movement pattern. And the lowest average tensile test value of 312.8 N/mm² occurred in the vertical position and U movement pattern. Meanwhile the highest average hardness value of 285.2 HV was obtained in the flat position and the U movement pattern. Meanwhile the highest average hardness value of 214.8 HV was obtained in the vertical welding position with a circular pattern. It can be seen that the highest hardness values and tensile strength values are obtained at the same position and movement, namely the flat position and the U movement pattern. It can be concluded that the hardness value affects the tensile strength results where the higher the hardness value, the higher the tensile strength value. Likewise, the position and movement of the electrodes have a significant effect on the hardness value and strong tensile strength of SS 400 steel.

Keywords: *GTAW, welding position, electrode movement, tensile test, hardness test*