

Analysis of The Effect of Double V Weld Angle Variations in GTAW Welded Joints of ST 37 Steel on Tensile Strength and Microstructure.

Supervised by Ir. Dicky Adi Tyagita, S.T., M.T.

Moch Raffy Hadiwinoto

Automotive Engineering Study Program
Engineering Department

ABSTRACT

The angle in the welding process is related to the volume of the weld. The size of the angle greatly affects the strength and microstructure of the material, the larger the angle, the greater the weld volume which results in decreased tensile strength of the material and the larger grain size microstructure of the material. This is caused by the heat input received by the material increasing as the weld volume increases during the welding process. This study aims to determine the effect of variations in angles of 55 °, 60 °, and 65 ° on Ultimate Tensile Strength and microstructure (Grain Size). The method used is experimental using ST 37 with a thickness of each plate of 10 mm. The study was conducted at the State Polytechnic of Malang. The results showed that the best current was obtained at a variation of 55 ° with an average highest tensile strength of 258.114 Mpa and a Grain Size of 4.472 with the number of grains in the circle area of 172 pcs / mm². The larger the angle used in the welding process, the greater the weld volume, which results in increased heat input received by the material and reduces tensile strength and changes the microstructure of the grain size to become larger.

Keywords : *Gas Tungsten Arc Welding, Low Carbon Steel, Ultimate Tensile Strength, Grain Size*