

ABSTRACT

This study uses the welding method of Gas Metal Arc Welding (GMAW), where welding is suitable for aluminum materials that have a thin thickness though, such as in the body of the ship and aircraft. Apart from being strong, aluminum is a metal that is resistant to corrosion so aluminum is widely used for the production of ship and aircraft bodies. This study uses GMAW 2 layer tack weld welding method with 3 grips on one side with AA 5052 series aluminum material thickness of 5 mm. The purpose of this study was to investigate the effect of the results using 3 grips and variations in weld speed against angular distortion, physical properties, and mechanical properties of AA 5052 materials using GMAW / MIG welding.

This study uses a variation of speed that is 6 mm / s, 7 mm / s, and 8 mm / s, and welding parameters using fixed voltage $E = 19$ V, and $I = 110$ A. After the welding process is carried out, the next step is to observe weld results include measurement of distortion, tensile testing, impact testing, microstructure testing, and hardness testing (vickers).

Based on the results of tests that have been conducted, the results of welded specimens with a speed of 6 mm / s have the largest angular distortion with a value of 9.69° . The greatest value of tensile strength was obtained at a variation of speed of 7 mm / s with a value of 156.47 MPa. The highest impact value is obtained at a speed variation of 7 mm / s with a value of 0.26 J / mm². The results of the highest hardness values were obtained in specimens with a speed variation of 8 mm / s in three regions, namely Heat Affected Zone (HAZ), Weld Metal (WM), and Base Metal (BM).

Keywords: GMAW 2 layer tack weld, AA 5052, angular distortion, physical and material properties