

ABSTRACT

MATERIAL EFFECT ON ALUMINIUM 1100 DAN 5083 TENSILE STRENGTH , VIOLENCE , AND STRUCTURE OF MACRO WELDING USING FRICTION STIR WELDING

**By:
ADITIYA EKA PRASETYA**

One branch of science that are taught in Mechanical Engineering is a metal welding techniques. Along with the times, welding technology has been progressing rapidly. One is the friction welding (friction stir welding).

FSW (friction stir welding) is a welding method including friction welding, which does not require fillers. Heat is used to melt the metal work resulting from friction between the rotating object (pin) with a stationary object (workpiece) . In this study, the material used is aluminum 1100 and aluminium 5083. This study was conducted to determine the effect of the aluminum material to mechanical testing including tensile testing, hardness and macro photos.

Results of tensile testing in 1100 and 5083 aluminum with a wide variety of materials tensile test results obtained, the welding of aluminum 1100 with 1100 aluminum obtained yield was 56,94 N/mm², then welding of aluminum 5083 with 5083 aluminum obtained yield was 94,59 N/mm² while in tensile testing of welding aluminum mix between 1100 and 5083 obtained yield was 54,02 N/mm². It can be concluded that the effect of the materials and elements contained in the material affects the welding tensile strength and tensile strength of greatest value in the welding of aluminum 5083 and 5083. While in hardness testing result, namely the aluminum in 1100 and 1100 in the amount of 38,7 HRb, on aluminum 5083 and 5083 in the amount of 107,4 HRb. While the aluminum mixture of 29.4 HRb hardness value. It can be concluded that the value of hardness depending on the type of material and is directly proportional to the value of tensile strength in friction stir welding method welding. In observation of the macro picture can be seen, the results of tensile testing of aluminum in 1100 and 1100 showed a rough surface, aluminum 5083 and 5083 showed a smooth surface. While aluminum mixture showed a rougher surface than the variation in 1100 and 5083. So it can be concluded that the fine grains of the weld results it will greatly affect the strength or hardness weld results.

Key words : *Friction stir welding , Tensile testing, hardness, Macro Photo.*