

SUMMARY

Yusoef Alfajrie Baraqbah, *Department of Mechanical Engineering, Faculty of Engineering, University of Brawijaya, Nopember 2016, The Effect of Tool's Angle on Tensile Strength of Aluminium and Copper Friction Stir Welded Butt Joint, Academic Supervisor : Djarot B. Darmadi and Bayu Satriya Wardhana.*

Today the manufacturing industry growing rapidly along with the increasing need for manufacturing products to support the development of technology. One of the fundamental things in the manufacturing industry is connecting metal welding techniques. Splicing between aluminum and copper interesting topic in the last decade. One of the best techniques in different types of grafting material is to use friction stir welding in which the heat generated due to friction between the tool with the material to be connected. The application of aluminum and copper connections have been used on a massive scale in the manufacture of battery connectors, electrical terminals, and heat exchanger components. The advantage gained is the nature of an inexpensive and lightweight aluminum combined with thermal and electrical conductivity of copper is good.

This research will discuss methods of Friction Stir Welding using the method of experimental research which was observed directly on the object under study. In general welding can be divided into two types namely: fusion welding and solid state welding. Friction Stir Welding (FSW) is one of the latest techniques in solid state welding methods. Friction Stir Welding method Welding, a welding without the added material and its temperature does not pass through the melting point of the workpiece. A wide variety of parameters that can affect the strength of friction stir welding on welding, among others, spindle rotation speed, the speed of the translation tool, geometry pin, corner welding, dwelling time and material type tool. This study did FSW welding processes using blunt sambuangan which aims to determine the effect of variations in the welding angle to the strength of the tensile test by using aluminum and copper as a material. FSW welding method by using a blunt and control the spindle speed and welding speed. After that varying the angle of the welding, welding angle is used, -2° , 0° , 2° , 4° thus generated data such as tensile strength test.

So this research will influence data generated welding angle to the tensile strength of aluminum and pure copper connections blunt friction stir welding. At the corner welding -2° with a tensile strength of 0.28 MPa, the result is the lowest strength. While the tendency of the highest tensile strength occurs at an angle welding 2° with a tensile strength of 0.76 MPa. On the results of the macro image fracture tensile specimen after the test showed that the specimen has the highest tensile strength have a fault resilient form, going past the aluminum homogeneous distribution on both sides, and not be found void. So that the tensile strength of the smallest didapatkan cockfighting in part only get hot most contained only dipermukan workpiece and the occurrence of voids.

Keywords: Friction Stir Welding, Dissimilar metal, Tensile Strength, Welding Angle.