

ABSTRACT

Dissimilar welding of solid cylinder light material and large diameter of solid cylinder with fusion welding techniques so difficult. In the past few years developing a process of solid state welding. joined of solid cylinder light material that is done as joined the axle on the car experienced problems are not joined in the middle. To overcome this, friction welding is more effective to incorporate a solid cylinder light material. Dissimilar metal types which have mechanical and thermal properties that are different can be joined by friction welding method. Dissimilar friction welding of solid cylinder light material is performed to determine the results of the microstructure, hardness and tensile strength of the joined to the upset pressure and upset time.

Friction welding is a method of grafting material to take advantage of the heat generated by the friction between the two materials are the same or different. The specialty of friction welding to joined the different materials as seen from the microstructure, prisoners temperature, and the content contained therein. In this research countinuous Drive Friction Welding (CDFW) of the dissimilar metal between the types of Aluminum Alloy 2024-T4 with Stainless Steel AISI 420. The study was conducted by varying the upset pressure and upset time. Round used for friction welding 1000 rpm. Upset pressure variations are used (40, 45, 50, 55, 60) Mpa. While variations of upset time used 20 seconds and 60 seconds. This experiment is testing the microstructure, vickers hardness testing and tensile testing with standard JIS Z 2201.

The longer upset time and the higher upset pressure, the increasingly fine metal grains. The longer upset time and the higher upset pressure, the higher hardness values. The highest results in this study contained at upset time 60 seconds and upset pressure 60 MPa with a value of 190,8 VHN. The longer upset time and the higher upset pressure to raise the value of the tensile strength. The highest results in this study contained at upset time 60 seconds and upset pressure 60 MPa with a value of 84,97 MPa.

Keyword: Friction Welding, Dissimilar Metal, Upset Pressure, Upset Time .