

ABSTRACT

Continuous drive friction welding (CDFW) is a suitable solid state welding method applied to the cylindrical metal joints of different types of Aluminum 6061 T6 and Stainless steel 304. In the process of connecting using several important parameters that can affect the results of the strength of the connection. One of the parameters that has a major effect on the connection result is the frictional pressure parameter. In this study aims to determine the effect of the magnitude of frictional pressure on tensile strength, microstructure and hardness of the result of connection.

The material used in this research is solid metal cylinder aluminum 6061 T6 and stainless steel 304. Each material is cut along 75 mm, and continued formation of specimen dimension using lathe. The welding process uses variation of frictional pressure parameters of 20 MPa, 25 MPa, 30 MPa, 35 MPa, 40 MPa, 45 MPa, 50 MPa, 55 MPa, 60 MPa, and 65 MPa. While the other parameters are made constant, that is 4 seconds swipe time, 140 MPa upset pressure, upset time 5 seconds, and engine speed 1000 rpm. To know the effect of friction pressure on the result of the connection is done observation of micro structure, testing of hardness of micro vickers, and tensile test.

In microstructure testing the result of connection having alteration of micro structure at Aluminum 6061 T6, while Stainless steel area 304 micro structure same with its parent metal. The hardness of the specimen tested the hardness of the hardness as the proximity of the connection and the degree of friction applied. For tensile testing of each connection it is explained that the tensile strength moves up as the frictional pressure increases, but once it reaches its maximum tensile strength, the tensile strength continues to decrease as the frictional pressure is applied.

Keywords: *CDFW, Aluminum 6061 T6, Stainless Steel 304, Friction Pressure, Micro Structure, Hardness, Tensile Strength*