

EXPERIMENTAL STUDIES ON JOINING COPPER WIRE - COPPER SHEET USING ULTRASONIC METAL WELDING

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ABSTRACT

Ultrasonic welding is a solid state joining process that produces joints by the application of high frequency vibratory energy in the work pieces held together under pressure without melting. In electronic and automotive applications, copper wires are connected to the equipment (alternator/rectifier) by a solid state joining process. For such an application ultrasonic metal welding is useful. This paper presents a study of ultrasonic welding of copper wire to thin copper sheet as many of the industrial applications are in need of this kind of contact technology. Quality of the welded joints is evaluated based on mechanical tests and the quality criterion is then applied to evaluate the weldability. A second order regression model equation is developed to predict the weld strength of the joint based on the experiments conducted using full factorial design of experiments.

KEYWORDS: Ultrasonic welding, Alternator, Rectifier.