## INVESTIGATION OF WELD STRENGTH FOR DIFFERENT WELD CONDITIONS USING DESIGN OF EXPERIMENT AND EXPERIMENTATION

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### ABSTRACT

Failure mode is a qualitative measure of resistance spot weld (RSW) performance. To ensure reliability of resistance spot welds during vehicle lifetime, process parameters should be adjusted so that the pullout failure mode is guaranteed. In this work, failure mode of resistance spot welds is to be studied under quasi-static tensile test. It is required to search for new weld quality criterion for resistance spot welded steels. An adhesive layer with appropriate thickness and elastic modulus is necessary to obtain reasonable distribution of stresses in the whole lap region of a weld-bonded joint.

In the first part of work spot weld information and failure causes will be discussed, along with it the adhesives and their applications in welding will also be discussed. DOE will be done using Minitab software for selection of combinations for experimentations. In later part of work analysis will be done using ANSYS and further validation of the results using UTM machine.

## DEVELOPMENT OF ALUMINIUM BASED SILICON CARBIDE PARTICULATE METAL MATRIX COMPOSITE FOR CYLINDER LINER

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### ABSTRACT

Cylinder liner is used in engine block to give a wear protective surface for piston and piston rings. Friction accounts for a loss of over 30% of the total vehicle power. Over half of that power loss can be attributed to the frictional loss between piston rings and cylinder bores. One of the ways to aid in an automobile's fuel economy by reducing vehicle weight and reducing friction loss simultaneously is to remove the cast iron cylinder block liners and replace them with a lighter, more thermally efficient material.

The Aluminum based Silicon Carbide Metal Matrix Composites exhibits required properties. The composite is to be prepared by powder metallurgy route followed by sintering. The wear test is carried out for the composite both at ambient and elevated temperature by using pin on disc method. The wear affecting parameters such as normal load, sliding speed and temperature are to be varied and wear is to be observed for both composite and cylinder liner material. Thus an attempt is made through this project to serve one additional composite material for the given application.