## "OPTIMIZATION OF PROCESS PARAMETERS OF FRICTION STIR WELDING FOR SIMILAR HE-30 ALUMINIUM ALLOY"

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## ABSTRACT

In this project we will use taper cylindrical tool made of High speed steel (Wc-Co) for the friction stir welding (FSW) aluminium alloy HE30 –HE30 and test the mechanical properties of the welded joint by tensile test. Finally we were compare mentioned mechanical properties and make conclusion. The result will help welding parameter optimization in different type of friction stir process. Like rotational speed, depth of welding, travel speed, type of material, type of joint, work piece dimension, joint dimension, tool material and tool geometry. We analyzed the effect of rotational speed, travel speed & axial force on tensile strength. The detailed mathematical model is simulated by Minitab17. In this investigation, an effective approach based on Taguchi method, has been developed to determine the optimum conditions leading to higher tensile strength. Experiments were conducted by varying rotational speed, transverse speed, axial force and constant welding depth using L9 orthogonal array of Taguchi method. The present work aims at optimizing process parameters to achieve high tensile strength.

## STUDY, DESIGN AND MODELING OF INTAKE VALVE OF STATIONARY IC ENGINE

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## ABSTRACT

Intake and Exhaust valves are very important engine components that are used to control the flow and exchange of gases in internal combustion engines. They are used to seal the working space inside the cylinder against the manifolds; and are opened and closed by means of what is known as the valve train mechanism. Such valves are loaded by spring forces and subjected to thermal loading due to high temperature and pressure inside the cylinder. Design of the valve depends on many parameters like behaviour of material at high temperature, vibrations, fluid dynamics of exhaust gas, oxidization characteristics of valve material and exhaust gas, fatigue strength of valve material, configuration of the cylinder head, coolant flow and the shape of the port. This project deals with the stress induced in a valve due to high pressure inside the combustion chamber, spring force and cam force at high temperature conditions. For modelling CATIA is to be used and to analyze the valve ANSYS will be used as the tool. Structural analyses are to be performed on the valve. In this stage of work, design of valve is done based on given specifications with study of valves and its failure modes, modelling of valve is done. In the next part of work analysis of valve is to be done with optimization of valve radius is to be done along with experimentation.



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