

UNIVERSITI TEKNOLOGI MARA

**IMPACT OF WELDING CURRENT
AND JOINT TYPE DESIGN ON
TENSILE PROPERTIES OF WELDED
MILD STEEL JOINT BY USING
SMAW**

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ABSTRACT

Oil and gas today are being developed in many sectors. Upstream, midstream and downstream. So, throughout the development, one of the major department is facilities and in it, basically welding play an important role for its completion. So, welding is referred to as a mechanical work to combine separate thermoplastics and metals, by inflicting fusion, which is totally different from using low-temperature steel-joining strategies such as soldering & brazing, which the base metal does not melt. In the heavy and small industries, welding is extensively used in fabrication, preservation and restoring the elements of a system and structure. Welding current is the most influencing parameter in process that have full authorities to manipulate the intensity of penetration, fusion and the electrode feed rate. The quantity of heat evolved for the duration of welding relies upon the current used for a given filler wires and dimension of electrode. Therefore, it is critical that an accurate current is used to supply appropriate best of weld and decrease the distortion problems on the activity.

In this study, with the objective to investigate how does welding process parameter can affect the tensile properties of welded mild by varying the current given. So, 6mm thick of mild steel plates were welded using different joint designs which are Single V, Double V and Flat. In the fusing process, welding current was varied in all the cases but all other parameter such arc voltage, arc time, wire feed rate is fixed recorded. Mechanical tensile properties such as percentage of elongation, yield strength and ultimate tensile strength is evaluated. Results indicated that the optimum current of 110A with single V joint design depict maximum UTS in comparison to other welding joints. As for the material selection, mild steel plate of 6mm thick with specification of AA10119 is used which are extensively implemented within the metal structure fabrication.

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CHAPTER ONE

INTRODUCTION

In order to prepare a good engineer someday, a golden opportunity has been given to the final year students from Chemical Engineering Faculty of Universiti Teknologi MARA (UiTM) to conduct a final year project individually and under supervision of the lecturer. In this project, students need to present an excellent output to handle the project successfully with highly skills of problem solving. By doing so, these students must have a good input and great application on the project that they obtain along almost for four years of academic session and the experience from the industrial training period. This is non-other than to achieve the vision of the university or any other teaching institute which is to shape a successful young generation for the future.

1.1 BACKGROUND

Within the heavy and small industries, welding is widely used by skilful metal worker in fabrication, renovation and repair of components and systems. Whilst there are numerous strategies for joining metals, welding is one of the most convenient and fast approach available. A welded joint is acquired when two smooth surfaces are brought into touch with every different and both pressure or heat or each are applied to achieve a bond. The tendency of atoms to bond is the fundamental foundation of welding. The internal diffusion between the materials is the underlying precept in all welding procedures. In welding the steel substances are joined to perform a perfect connection via the metallic bonds between the atom. As mentioned earlier, any welding activity need some sort of energy to connect the separate metal, usually heat. The relative quantity of pressure and heat are essential for this process to occur. This can differ from two extreme cases in which either to exert only pressure or heat. Usually,