

# **The Study of Surface Roughness and MRR of Mild Steel using Manual Plasma Arc Cutting Machining**

## **Abstract**

Manufacturing companies define the qualities of thermal removing process based on the dimension and physical appearance of the cutting material surface. Therefore, the roughness of the surface area of the cutting material and the rate of the material being removed during the manual plasma arc cutting process was importantly considered. Plasma arc cutter Selco Genesis 90 was used to cut the specimens made from Standard AISI 1017 Steel manually based on the selected parameters setting. Two different thicknesses of specimens with 3mm and 6mm were used. The material removal rate (MRR) was measured by determining the weight of the specimens before and after the cutting process. The surface roughness (SR) analysis was conducted to determine the average roughness (Ra) value. Taguchi method was utilized as an experimental layout to obtain MRR and Ra values. The results reveal that for the case of manual plasma arc cutting machining, the SR values are inversely proportional to the MRR values. The quality of the surface roughness depends on the dross peak that occurred during the cutting process.