

## ***ABSTRACT***

### **Pengaruh Variasi Arus pada Las Dissimilar Metal ST 40 dan SS304 terhadap Kekuatan Tarik, Kekerasan, dan Struktur Mikro dengan Metode Pengelasan smaw**

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*Dissimilar Metal* welding is the process of joining two metals with different chemical compositions and mechanical properties. This study aims to investigate the effect of SMAW welding current variations on the tensile strength, hardness, and microstructure of ST 40 SS 304 *Dissimilar Metal* welded joints. An experimental method was employed using 10 mm thick ST 40 and SS 304 steel plates, an X-groove joint with a 60° groove angle, a 1G welding position, and an E309L electrode with a diameter of 3 mm. The welding current variations used were 90 A, 110 A, and 130 A. The tests conducted included tensile testing, Vickers hardness testing, and microstructural examination. The results indicate that welding current variation affects the mechanical properties and microstructure of the welded joints. The highest tensile strength was obtained at a welding current of 130 A, reaching 41.85 MPa with an elongation of 5.65%, the highest hardness value in the SS 304 HAZ region was 306.2 HVN at 130 A, Microstructural observations showed that increasing the welding current resulted in coarser grain growth due to the higher heat input. Meanwhile, the welding current of 110 A produced the most homogeneous microstructure among all variations.

**Keywords:** *Dissimilar Metal Welding, SMAW, ST 40, SS 304, Welding Current, Tensile Strength, Hardness, Microstructure.*