

***EFFECT OF FILLER VARIATION AND WELDING CURRENT
ON TENSILE STRENGTH AND HARDNESS VALUES OF
DISSIMILAR METAL JOINTS OF SS 304 AND SS 400 STEELS***

Mentor (Aditya Wahyu Pratama, S.T., M.T)

Bagas Rendra Mahendra

Study Program of Automotive Engineering

Majoring of Engineering

ABSTRACT

Dissimilar metal welding is a welding process that unites two metals that differ in mechanical properties and chemical composition. This study aims to the results of the dissimilar metal connection of stainless steel SS 304 and low carbon steel SS 400 with Gas Tungsten Arc Welding GTAW welding method on tensile testing and micro vickers hardness. With current variations of 100A, 110A, 120A and electrode variations of ER 308 L (2.6 mm) and ER 70S-6 (2.6 mm). The tensile test results showed the highest maximum stress at 110A current strength with ER 70S electrodes, reaching a stress of 513 N/mm² and a strain of 47%. A current of 110A with ER 308L electrode produced a stress of 433 N/mm² and a strain of 41.28%. The lowest maximum stress was recorded at a current strength of 100A with ER 70S electrodes, resulting in a stress of 392 N/mm² and a strain of 43.36%. Increasing the amperage increases heat input and filler penetration, improves melt ing between dissimilar metals, strengthens the weld joint, and makes the material more brittle. The hardness test shows the lowest value in the heat affected zone (HAZ) of low carbon steel with 110A current strength and ER 70S electrode, which is 224 HVN, while the highest value in the weld metal with 120A current strength and ER 70S electrode, reaching 436 HVN. The hardness of the material increases as the current increases due to the high heat input generated by the higher current.

Key Words : Effect of current strength variation, GTAW welding filler variation, dissimilar metal welding, tensile strength, hardness value.