ANALYSIS OF ELECTRODE VARIATIONS IN *SMAW WELDING RESULTS WITH* ELECTRODE VARIATIONS BASED ON *PENETRANT TEST* AND *ROCKWELL TEST* ON LOW CARBON STEEL PLATE

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Abstract

Welding machine is a machine that can connect iron intoone whole series so it can form a necessaryform, this research is done to know the value of strength in welding work objects. The study used *SMAW welding using variable* electrodes *namely AWS* E 6010, *AWS* E 6013 electrodes, *AWS* E 6016 electrodes and ampre voltage 90A, materials used in low carbon steel material types with a thickness of 6 mm, this study used two types of testing namely *Penetrant Test test* and *Rockwell Hardness test.* Based on the results of research from *the best type of electrode penetrant test* test is E6016 with one type of defect namely *sparter*. For *Rockwell test results* with E6010 electrode variations, E6013, and E6016 the best hardness values for the parent metal are found in welding using the E6016 electrode with a hardness value of 74.4 *KGF*,for the *highest hardness value at the HAZ limit using* the E6016 electrode with a hardness value of 85.2 *KGF* while for the highest hardness value on the welding area using the E6016 electrode with a hardness value of 94.2 *KGF*. From this highest hardness value where the test specimen has heat treatment due to the welding process so that the crystal element in the steel will be enlarged and the hardness value will increase stronger on the test material/specimen.

Keywords:, Carbon Steel, *Penetrant test and Rockwell test.*