ABSTRACT

EFFECT OF HEAT TREATMENT AND MULTILAYER WELDING WITH 100 A, 125 A DAN 150 A TO MECHANIC STRENGTH ON LOW CARBON STEEL G17CrMo9-10 USING WELDING STANDARD ASTM A488

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On industrial workplace that known there are have a realtion with industrial machinery. Industrial machinery is using specific component of materials. Material failure that called crack often happen causes dinamic rotation, even theres get alot dinamic load that accepted by materials, there still fas from ultimate strenght of material. This have risk when product opened on casting proccess. Based on that risk needed repair for material called welding.

This reseach using three different treatment, the first material is non -heat treatment and non welding material, second using heat treatment material, and the last using heat treatment and welding material with ampere variation 100A,125A, and 150A. This specimen using proccess of casting and continued by heat treatment (normalizing-tempering-quenching). Normalizing is use a temperature of 910°C. Tempering use a temperature of 720°C, and last heat treatment quenching is ise temperature of 950°C. All heat treatment each holding time are 5.5 hour, 5 hour, and 5.5 hour. And welding proccess using standart A488 ASTM with variation 100A, 125A, and 150A. Welding proccess using 7016 filler for steel. After specimen are ready for all material that the first material is non-heat treatment and non welding material, second using heat treatment material, and the last using heat treatment and welding material, next step are getting data with doing tensile test, hardness test, microstructure test. This happen
for knowing how big the effect of heat treatment and welding process on material mechanical strength.

Based on research of tensile test, hardness test, and metallography test, the most high hardness value is material using heat treatment and welding with 125A. The value of hardness on weld metal is 18 HRc, HAZ is 35, and base metal is 12 HRc. And on tensile strength test the most high value is material using heat treatment and welding with 125A on 625.06 MPa, then the structure micro that shown on all material is martensite temper and ferrite

*Key word*: Low carbon steel G17Cr-Mo9-10, Annealing - Quenching Temper, welding 100 A, 125A and 150A, Structure micro