ABSTRACT

DIFFERENCE ANALYSIS OF THE CHEMICAL COMPOSITION OF FILLER METAL TO WELD QUALITY, HARDNESS, AND MICROSTRUCTURE AT GTAW PROCESS OF T24 (EN 7CrMoVTiB10-10) MATERIAL

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In the weld process from T24 (EN 7CrMoVTiB10-10) material and use GTAW process needed the special interesting on the selection of filler metal. Because it is a special material for the boiler structure which work in the very high temperature and work pressure.

In this research to weld T24 (EN 7CrMoVTiB10-10) material with GTAW process and use 3 filler metal variable F1, F2, and F3 with the same AWS specification. Then the quality of weldment will be examined with visual test and radiography test method. Then metallography microstructure test and hardness vickers test method will be examined too.

After the examination we get the result that the F3 better than F2 and F1 in the product of weldment. This is caused the chemical element content that influence the fluidity in the F3 better than F1 and F2. For the hardness value we get that filler metal F1 from the average value specimen 1A, 1B, and 1C (Base metal = 180,5 HV, HAZ = 252 HV, weld metal = 329 HV). For filler metal F2 from the average value specimen 2A, 2B, dan 2C (Base metal = 180,8 HV, HAZ = 235 HV, weld metal = 337 HV), and for filler metal F3 from the average value specimen 3A, 3B, dan 3C (Base metal = 180,5 HV, HAZ = 252 HV, weld metal = 329 HV). For the microstructure after the examination we get that microstructure of F1, F2, and F3 is (Base metal = Tempered Martensite with Ferrite, HAZ = Tempered martensite with spheroidized pearlite, weld metal = Tempered martensite). The grain size of spheroidized pearlite after measured we get for F1 the grain size of spheroidized pearlite is 28,71163 µm, and for F2 the grain size of spheroidized pearlite is 24,96 µm, for F3 the grain size of spheroidized pearlite is 32,03719 µm.

Key Words: Filler Metal ER90S-G, T24 (EN 7CrMoVTiB10-10) Material, Visual Test, Radiographic Test, Hardness Test, Microstructure Metallographic Test