ANALISIS *WELD REPAIR* PIPA API 5L *GRADE*-B MENGGUNAKAN METODE *FULL ENCIRCLEMENT STEEL REINFORCING SLEEVES*

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ABSTRAK

Korosi merupakan salah satu musuh yang sering terjadi di dunia industri minyak dan gas. Salah satu upaya mencegah korosi dengan dilakukannya standar perbaikan yang tepat, salah satunya standar ASME PCC-2. Pada penelitian kali ini akan meneliti tentang perbaikan pipa menggunakan metode *Full Encirclement Steel Reinforcing Sleeves per ASME PCC-2* dengan proses pengelasan GTAW. Proses pengelasan GTAW akan diuji melalui beberapa pengujian untuk mengetahui karakteristik hasil pengelasan dari kekuatan, kekerasan, dan tidak terdapat cacat. Karakteristik didapatkan dari pengujian makro, pengujian tarik, pengujian kekerasan, dan pengujian *penetrant*. Pada penelitian ini pengujian makro menghasilkan 6 *welding pass* dari 4 *welding layer* yaitu *1 root*, *1 hot*, *3 fill*, dan *1 cap*. Di pengujian tarik menghasilkan kekuatan tarik maksimum sebesar 579,97 N/mm^2. Di Pengujian kekerasan menghasilkan kekerasan terbesar sebesar 226 HV berlokasi di *12 o'clock*. Pada perbaikan pipa API 5L *Grade*-B terbebas dari *linear indication* dan *rounded indication* yang menghasilkan kriteria *accepted*.

Kata kunci:
Full Encirclement Steel Reinforcing Sleeves, GTAW, Makro, Tarik, Kekerasan, *Penetrant*.

ANALYSIS OF WELD REPAIR ON API 5L GRADE-B PIPE USING THE FULL ENCIRCLEMENT STEEL REINFORCING SLEEVES METHOD

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ABSTRACT

Corrosion is one of the common enemies in the oil and gas industry. One of the efforts to prevent corrosion is by implementing proper repair standards, such as ASME PCC-2. This study investigates the repair of piping using the Full Encirclement Steel Reinforcing Sleeves method per ASME PCC-2 with GTAW welding process. The GTAW welding process will be evaluated through several test to determine the characteristic of the weld, including strength, hardness, and absence of defects. Characteristic will be obtained from macroscopic examination, tensile testing, hardness testing, and penetrant testing. In this study, the macros the macroscopic examination resulted in 6 welding passes across 4 welding layers: 1 root, 1 hot, 3 fill, and 1 cap. The tensile testing resulted a maximum tensile strength of 579,97 N/mm^2. The hardness testing resulted a maximum hardness of 226 HV located at 12 o'clock. The repair of the API 5L Grade-B pipe was free from linear and rounded indications, resulting in accepted criteria.

Keywords:
Full Encirclement Steel Reinforcing Sleeves, GTAW, Macro, Tensile, Hardness, Penetrant.