구상흑연주철 및 STS409L간의 이종용접시 발생하는 미혼합영역 및 부분혼합영역에 대한 연구

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Metallurgical investigation for unmixed zone and partially unmixed zone of dissimilar welds between nodular cast iron and STS409L

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Abstracts ; The present work investigates the microstructure evolution and mechanical properties of unmixed zone (UMZ) and partially unmixed zone (PUMZ) of dissimilar welds between nodular cast iron and STS409L. Gas tungsten arc welding (GTAW) with STS309L filer metal is employed to simulate the UMZ and PUMZ. Microstructure analysis shows that a large volume of marteniste was formed in UMZ and PUMZ with eutectic and austenite, which is due to high carbon content in nodular cast iron and fast cooling during welding. In this study, vickers hardness test was carried out to measure the mechanical properties of UMZ and PUMZ because their width is too narrow to evaluate mechanical property by conventional test methods, and the results indicate that UMZ and PUMZ are possible to act as local brittle zone (LBZ) of dissimilar welds. In additional, the present paper analyzed the failed specimen during welding and it has been confirmed that crack was initiated in the UMZ between nodular cast iron and STS309L.

Key Words : Nodular cast iron, GTAW, UMZ, PUMZ, Micro indentation test