

조선용 후판 AH32 강에 대한 SAW 및 Hybrid(CO₂ Laser+ MIG) 맞대기 용접부의 열 및 역학적 특성 비교

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The Comparison of the Thermal and Mechanical Characteristic in Butt Joint for Ship Structure Thick Plate AH32 Steel by SAW & Hybrid(CO₂ Laser+ MIG) Welding

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Abract

Just as in the shipbuilders, automobile industry also try to reduce material consumption and weight in order to keep operating costs as low as possible and improve the speed of production. Naturally industry is ever searching for welding techniques offering higher power, higher productivity and a better quality. In the last few years, interest in these hybrid processes has risen because of the increasing shipbuilding industrial application of laser welding processes, which have certain limitations. The hybrid welding process is of great interest for shipbuilding industries all over the world. Many miles of weld must be performed on ships of this magnitude. The Meyer shipyard became the first to use an automated production line with hybrid welding to produce and fabricate large ship sections.

Hybrid welding combines two different sources of radiations and offers many advantages compared to conventional welding processes. The main advantages of hybrid welding are reduction of laser power, higher welding speed, increased seam strength, better process stability, less stress fractures, and improved gap bridging. Therefore it is important to have a details research based on the hybrid welding process applied to steel and other materials, and to have the ability both to counsel interested companies and to evaluate the feasibility of implementation of this process.

In this paper concentrate on the comparison of the thermal and mechanical characteristics in Butt joint of ship structure AH32 steel by using hybrid welding and conventional SAW. For this purpose, fundamental welding phenomena of hybrid process using CO₂ Laser and MIG is investigated by the experiments and characteristics of thermal and welding residual stress distribution of welded joint in SAW and hybrid welding are understood from the result of FE numerical simulation and experimental values.

Key Words : Hybrid Welding, Thermal and Mechanical Characteristic, Welding Residual Stress