

Tandem Electro gas Welding of Higher-Strength Hull Structural Steel

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ABSTRACT

The container ship size tends to become larger. The enlargement of container ships requires the thicker plate in upper side shell and inner shell. Conventional electro gas welding process with one torch is an efficient vertical up position welding method for thick plate. However, it is not possible to apply one torch EGW (Electro gas welding) process to the thicker plate than 60mm and the new method is demanded. Tandem electrode gas welding having two torches was applied for welding of the thicker plate. Optimal welding conditions were determined to satisfy the class rule requirements up to heat input of 55 kJ/mm. The welding procedure using the tandem electro gas welding process was approved by the class societies.

KEY WORDS: Electro gas welding (EGW), High heat input, Crack tip opening displacement (CTOD).

INTRODUCTION

As time goes by, ships which especially including container ship are rapidly enlarging. Therefore, thick steel plate is required. As ship size grows and demand of thick steel plate is increasing. Structural point of view, container ship requires thick steel plate for supporting longitudinal strength in side shell or hatch coaming. In a view of erection stage of welding, one run electro gas welding is very efficient method for thick steel plate comparing with any other welding process. However, increasing of demand of thick steel plate requires higher welding efficiency such as tandem (2 torch) EGW. In case of welding that is thicker than 60 mm, tandem electro gas welding with 2 torch is very high efficient welding process. Therefore, this paper shows an evaluation of applicability of tandem EGW through the result of mechanical tests on one steel maker's product in advance. In addition, in case of EH36 grade steel plate, Products of the three steel makers were tested. Those of two steel makers were tested for EH40 grade steel plate. Actual applying region is shown in Fig.1 in detail.

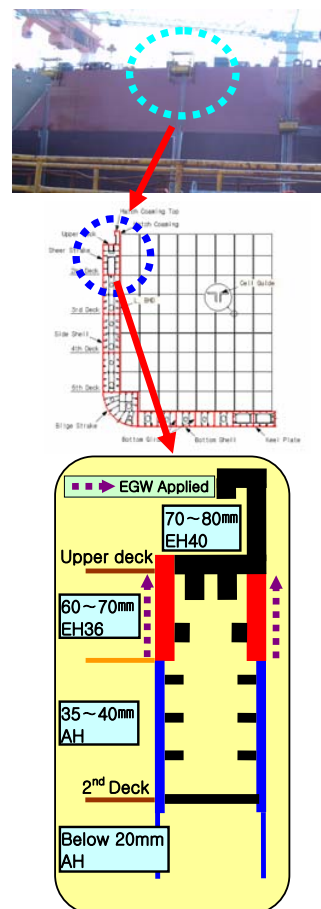


Fig.1 Schematic illustration about actual application point of EGW