

TMCP 강판의 열변형 해석법 개발

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Development of Thermal Distortion Analysis Method for TMCP Steels

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Abstract

As ships become to be larger than ever, the thicker plate and the higher tensile steel plate are used in naval shipyard. Though special chemical composition is needed for high-tensile steels, recent high-tensile steels are made by the TMCP(Thermo-Mechanical control process) skill. The increase of yield stress and tensile stress of TMCP steels is induced from bainite phase which is transformed from austenite, so can be vanished by another additional thermal cycle. Aside from welding deformation which should be controlled, this character should be reflected at plate bending by heating for prediction. This study developed an algorithm which can calculate inherent strain in SDB method, one of thermal elastic-plastic analysis. In this algorithm, not only the mechanical principles of thermal deformations, but also the predicting of the portion of initial bainite is considered in inherent strain calculation. The simulations by these values showed good agreements with plate heating experiments of normalizing steels and TMCP steels, and we made inherent strain database of steels in Class rule.

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