

1500MPa급 Hot stamping 강재의 GMAW 용접성에 관한 연구

황지혜*, 김재성*, 김철희**, 이보영***

* 한국항공대학교 항공 우주 및 기계공학부 대학원

** 한국생산기술연구원 정밀접합팀

*** 한국항공대학교 항공 우주 및 기계공학부

A study on the weldability of 1500MPa grade hot stamping steels in the GMAW

J. Hwang*, J.S. Kim**, C.H. Kim, B.Y. Lee***

* School of Aerospace & Mechanical Engineering, The Graduate School of Korea Aerospace University,
Gyeonggi-do, 412-791, Korea

** Advanced Joining Technology Team, KITECH

*** Department of Aerospace & Mechanical Engineering, Korea Aerospace University

Abstract

The use of ultra high strength steels (UTSS) is a natural result with increasing the demands for the lightweight materials and developing an innovative steel technology. Recently it has been used a 1500MPa grade hot stamping steel as automobile bodies, reinforcement parts, and seat frame parts in the automotive industry. It is a quenchenable steel manufactured by hot stamping process. It is well known that UTSS welding has softening in the heat affected zone(HAZ). Because welding is a sort of process applying heat, it should change the heat treated features and degrade the strength. This study was performed to investigate the influence of the heat input on the softening of the HAZ in the GMAW process. Each experiment was compared with that in the conditions having a different current and voltage at a same heat input. In order to analysis characteristics of the HAZ, optical microscope was used to observe microstructure and vickers hardness tests were carried out across the welds. Applying low heat input means a fast cooling rate. It leads to high hardness in the HAZ. It is found that characteristics of the HAZ are determined by microstructure obtained by different cooling rate.

Key Words : Hot Stamping, Ultra High Strength Steels, Microstructure, HAZ softening