레이저 성형에서 시편의 기하학적 형상에 따른 변형의 양상에 관한 연구

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Effect of Specimen Geometry on deformation in laser forming of sheet metal

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Abstract

Laser forming is a promising technology in manufacturing, such as in the shipbuilding, automobile, microelectronics, aerospace and other manufacturing industries. This process forms the sheet metal by utilization of laser-induced thermal stresses. Laser forming process has been studied extensively for rectangular shape geometry. This basic study presents the change in deformation behavior of sheet metal during transition from linear to curved geometries and irradiations as well. A series of experiments have been conducted on a wide range of specimen geometries such as quarter-circular and half circular plate. The reasons for this behavior have been analyzed. Results are compared and analyzed by simulations using ABAQUS. Influence of developed stresses on the bending has been investigated. This study provides the more understanding of forming mechanism influenced by geometry effect.

Key Words : Laser forming process, laser-induced thermal stress, deformation behavior