

유전자알고리즘에 의한 고장력강 및 아연도금강의 용접조건 최적화

이은옥[†] · 김규상* · 유효선*(전북대) · 양성모**(자동차신기술연구센터)

Optimization of Welding Condition of High Tensile Strength Steel and Galvanized Steel Using Genetic Algorithm

Eun-ok Lee, Kyoo-sang Kim, Hyo-sun Yu and Sung-mo Yang

Key Words: Genetic algorithm(유전자 알고리즘), Optimum welding condition(최적용접조건), Spot welded joint(점용접부), High tensile strength steel(고장력강), Galvanized steel(아연도금강판)

Abstract : Optimum welding condition of spot welded joint was need to secure stability and reliability of vehicle body considered dynamic load history. However, due to various welding parameter of spot welding process, it was difficult that optimum welding condition conclusion satisfied welding quality. In this paper, optimum welding conditions were adopted to welding parameters like welding current, welding cycle and electrode force in the spot welded joint of high tensile strength steel and galvanized steel. Genetic algorithm was applied to decide optimum welding parameters. Genetic algorithm was created random welding condition and selected probability concept for optimization of welding condition.

벌크 아몰퍼스 금속의 파괴 인성 평가

김기현[†](안동대) · 최호연*(안동대) · 신형섭*(안동대)

Evaluation of Fracture Toughness of Bulk Amorphous Metals

Ki-Hyun Kim, Ho-Yeon Choi, Hyung-Seop Shin

Key Words: Bulk Amorphous Metal(벌크 아몰퍼스 금속), Fracture Toughness(파괴 인성), Crack initiation(균열개시), Crack propagation(균열진전), Subsize Specimen(미소 시험편)

Abstract : In previous studies, the impact fracture behaviors of bulk amorphous metals(BAM) was investigated. It was found that most of fracture energy absorbed was used in the process of crack initiation. In this study, the fracture toughness of BAM using the fatigue precracked subsize Charpy specimen was investigated. For impact fracture experiments, a newly devised instrumented impact testing apparatus was devised using semi-conductor gages attached on $\phi 20$ bar as a sensing part. A fatigue precrack was introduced to $a/W \approx 0.4$. The impact absorbed energy in the Zr-BAM specimen with precrack was significantly low as compared with the notched Zr-BAM specimens. Less shear bands were developed near the precrack tip. The development of shear bands during crack propagation was also less as compared with the case of notched Zr-BAM specimen. At that time, the K_{IC} in the precracked specimen was about $1\text{MPa}\sqrt{\text{m}}$, which was much less when compared with the K_{max} in the notched specimen which was about $90\text{MPa}\sqrt{\text{m}}$.