

다중 하중조건에서의 2층 열차 차체의 최적설계

이진민[†](한양대) · 정재준^{*}(한양대) · 이태희^{*}(한양대) · 황원주^{**}(한국철도기술연구원)
· 김형진^{**}(한국철도기술연구원)

Design Optimization of Double-deck Train Carbody under Multi-loading Condition

Jin Min Lee, Jae Jun Jung, Tae Hee Lee, Won Ju Hwang and Hyuong Jin Kim

Key Words: Double-deck Train(2층 열차), Design Optimization(최적설계), Multi-loading Condition(다중 하중조건)

Abstract : Double-deck train has been attracted growing attention as a next generation transportation around metropolis because of high passenger carrying capacity. In order to develop high-speed double-deck train with low operational costs, the carbody must be designed as light as possible. In addition, the carbody must be strong enough to ensure the safety of passengers. For these purposes, weight minimization that determines thickness of aluminum extruded panels(AEP) of the carbody can be performed. First, we select sensitive or/and important design variables through design exploration because the design variables of carbody are too many to treat all of them. Then, weight minimization is accomplished under multi-loading condition while satisfying user specified strength and stiffness constraints.

과도한 운전하중을 받는 알루미늄 Hot Mill의 응력집중해석

변성우[†](충남대 원) · 이영신^{*}(충남대) · 이현승^{**}(충남대 원)
이세훈^{**}(충남대 원)

Stress Concentration Analysis of Aluminum Hot Mill under Heavy Duty Driving Loads

Seong-Woo Byun, Young-Shin Lee, Hyun-Seung Lee and Se-Hoon Lee

Key Words: hot rolling process(열간압연공정), contact surface(접촉면), stress concentration(응력집중), optimization design(최적설계)

Abstract : The top spindle, end coupling and slipper metal are the important components of the hot rolling process and used for transmission of rotational power. In this study, the derivation of load condition is conducted for hot rolling process under slipper metal combination types and operation situations. The structural analysis is performed by applying mechanical characteristics, combination type, and rotational boundary condition of the top spindle, end coupling and slipper metal. The stress concentration of mill is analyzed. Optimal design is performed for contact surface between end coupling and slipper metal.