

论文

基于显式有限元技术的梁截面抗撞性优化

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摘要:

本文基于显式有限元技术,采用响应面法,以结构的比吸能为优化函数,以提高吸能原件的抗撞性为目的,对正方形截面的金属薄壁梁进行了形状优化. 经过数值分析,得出了正方形截面梁的比吸能关于壁厚和截面边长的变化规律,这些规律可以用于实际吸能原件的设计,并为进一步研究奠定了基础.

关键词:

OPTIMIZATION OF BEAM SECTION WITH CRASHWORTHINESS CRITERION BASED ON THE EXPLICIT FINITE ELEMENT TECHNOLOGY

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Abstract:

In this paper,the size optimization of the metal thin-walled component with a square cross-section is performed,where the Specific Energy Absorption(SEA) is taken as the objective function by using the Response Surface Method(RSM) on a basis of explicit Finite Element(FE)algorithm.The main purpose of the size optimization of the beam section is to improve its crashworthiness for energy- absorption.The response function of SEA with respect to thickness and side length of the square sectional beam is obtained through the numerical analysis. The conclusions can be thus used to the optimal design of the practical energy- absorbing element and the further study.

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