



航空学报 » 2000, Vol. 21 » Issue (3) :286-288 DOI:

论文

最新目录 | 下期目录 | 过刊浏览 | 高级检索

<< Previous Articles | >>

### 基底/功能梯度涂层结构的动态热应力分析及结构优化

王保林, 韩杰才, 杜善义

哈尔滨工业大学复合材料研究所 黑龙江哈尔滨 150001

### THERMAL STRESSES ANALYSIS AND OPTIMIZATION OF SUBSTRATE/FUNCTIONAL GRADED COATING STRUCTURE

WANG Bao-lin, Han Jie-cai, Du Shan-yi

Center for Composite Materials, Harbin Institute of Technology, Harbin 150001, China

摘要

参考文献

相关文章

Download: PDF (237KB) HTML OKB Export: BibTeX or EndNote (RIS) Supporting Info

**摘要** 研究了金属基底/功能梯度涂层结构中的动态热应力;对功能梯度材料的梯度指数进行了优化;分析了可能的破坏模式。研究表明,加热速度对结构中的热应力分布有很大的影响,存在优化的梯度指数使得结构具有最大的热强度。

**关键词:** 功能梯度材料 动态热应力 结构优化 梯度涂层

**Abstract:** The thermoelasticity problem for a functionally graded coating bonded to metal substrate due to transient heating on the coating surface is considered. The functionally graded coating is a particulate composite with volume fractions continuously varying through the thickness. The coating was treated with a series of homogeneous layers with stepwise changing volume fractions. The dynamic thermal stresses are analyzed for various coating gradients. It is shown that heating rates have significant influences on the failure mechanism of coating. For larger heating rates, the surface cracking of the coating is caused by compressing stress. While for lower heating rates, the surface cracking of the coating is caused by tensile stress. While failure mechanics of surface cracking in mind, the optimization of coating composition is presented for different heating rates.

**Keywords:** functionally graded material thermal stress optimization coating

Received 1999-02-09; published 2000-06-25

#### 引用本文:

王保林;韩杰才;杜善义. 基底/功能梯度涂层结构的动态热应力分析及结构优化[J]. 航空学报, 2000, 21(3): 286-288.

WANG Bao-lin; Han Jie-cai; Du Shan-yi. THERMAL STRESSES ANALYSIS AND OPTIMIZATION OF SUBSTRATE/FUNCTIONAL GRADED COATING STRUCTURE[J]. Acta Aeronautica et Astronautica Sinica, 2000, 21(3): 286-288.

#### Service

- ▶ 把本文推荐给朋友
- ▶ 加入我的书架
- ▶ 加入引用管理器
- ▶ Email Alert
- ▶ RSS

#### 作者相关文章

- ▶ 王保林
- ▶ 韩杰才
- ▶ 杜善义