



航空学报 » 2011, Vol. 32 » Issue (3) :538-545 DOI: CNKI:11-1929/V.20101228.1333.000

材料工程与机械制造

最新目录 | 下期目录 | 过刊浏览 | 高级检索

<< Previous Articles | Next Articles >>

### 精铸空心涡轮叶片模具虚拟修模方法

卜昆, 王虹, 周桐, 李世峰, 沈翔鸿

西北工业大学 现代设计与集成制造技术教育部重点实验室, 陕西 西安 710072

#### Method of Virtual Mold-repair for Hollow Turbine Blades

BU Kun, WANG Hong, ZHOU Tong, LI Shifeng, SHEN Xianghong

Key Laboratory of Contemporary Design and Integrated Manufacturing Technology, Northwestern Polytechnical University, Xi'an 710072, China

摘要

参考文献

相关文章

Download: PDF (2440KB) HTML 1KB Export: BibTeX or EndNote (RIS) Supporting Info

**摘要** 针对精铸空心涡轮叶片的精确控形问题,开展模具型腔优化设计中的虚拟修模技术研究。以某型号空心涡轮叶片为研究对象,采用数值模拟的方法,通过使用ProCAST软件对有限元模型进行计算,获得空心涡轮叶片的精铸位移场,基于位移场的反变形虚拟修模方法对模具型腔进行优化设计。经修模后的模具型腔仿真验证及模具型腔型号鉴定,结果表明,按此方法可得到良好的修模效果,由修模后模具加工的产品误差平均值大幅降低,合格率提高了20%,并与实心模型修模后的结果进行对比,证明空心模型能有效提高模具修模精度及可靠性。

**关键词:** 空心涡轮叶片 精铸模具 位移场 虚拟修模 ProCAST

**Abstract:** This article presents a study of the technology of virtual mold-repair for the optimal design of the mold cavity of a hollow turbine blade to precisely control its shape. The casting process of the hollow turbine blade is simulated by means of the software ProCAST, and the displacement field of the blade is calculated with a finite element model, based on which the mold cavity is optimized by the anti-deformation virtual mold-repair method. As testified by a simulation of the revised mold cavity and identified by a mold cavity model, satisfactory results of mold repair are achieved by this method. The average of the error of products, which are processed by the mould after repairing, reduced greatly, the products passing rate increased by 20%. Compared with the results of mold-repair by a solid mold, the accuracy and reliability of mold-repair by this method are effectively improved.

**Keywords:** hollow turbine blade investment casting die displacement field virtual mode-repair ProCAST

Received 2010-05-24;

Fund:

航空科学基金 (2008ZE53042); 国家科技支撑计划(2006BAF04B02)

Corresponding Authors: Tel.:029-88493232 E-mail: pukun89@nwpu.edu.cn Email: pukun89@nwpu.edu.cn

About author: 卜昆(1965-) 女,博士,教授。主要研究方向:计算机辅助技术、现代集成制造。 Tel: 029-88493232 E-mail: pukun89@nwpu.edu.cn 王虹(1984-) 女,硕士研究生。主要研究方向:计算机辅助技术、现代集成制造。 Tel: 029-88493232 E-mail: crimson840327@163.com 周桐(1985-) 男,硕士研究生。主要研究方向:计算机辅助技术、现代集成制造。 Tel: 029-88493232 E-mail: belief\_zhou@hotmail.com 李世峰(1982-) 男,博士研究生。主要研究方向:计算机辅助技术、现代集成制造。 Tel: 029-88493232 E-mail: lsf0351@sina.com 沈翔鸿(1983-) 男,硕士研究生。主要研究方向:计算机辅助技术、现代集成制造。 Tel: 029-88493232 E-mail: shin-hom@163.com

引用本文:

卜昆, 王虹, 周桐, 李世峰, 沈翔鸿. 精铸空心涡轮叶片模具虚拟修模方法[J]. 航空学报, 2011, 32(3): 538-545.

BU Kun, WANG Hong, ZHOU Tong, LI Shifeng, SHEN Xianghong. Method of Virtual Mold-repair for Hollow Turbine Blades[J]. Acta Aeronautica et Astronautica Sinica, 2011, 32(3): 538-545.

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

