

[Hide Expanded Menus](#)

张大义, 洪杰, 马艳红, 梁智超. 高结构效率的斜流压气机结构设计[J]. 航空动力学报, 2013, 28(4): 866~871

## 高结构效率的斜流压气机结构设计

### Novel structural design of mixed-flow compressor with high structural efficiency

投稿时间: 2012-05-05

DOI:

中文关键词: [斜流压气机](#) [结构设计](#) [结构效率](#) [静强度](#) [振动响应](#)英文关键词: [mixed-flow compressor](#) [structural design](#) [structural efficiency](#) [static strength](#) [vibration response](#)

基金项目:

作者	单位
<a href="#">张大义</a>	<a href="#">北京航空航天大学 能源与动力工程学院, 北京 100191</a>
<a href="#">洪杰</a>	<a href="#">北京航空航天大学 能源与动力工程学院, 北京 100191</a>
<a href="#">马艳红</a>	<a href="#">北京航空航天大学 能源与动力工程学院, 北京 100191</a>
<a href="#">梁智超</a>	<a href="#">北京航空航天大学 能源与动力工程学院, 北京 100191</a>

摘要点击次数: 186

全文下载次数: 299

中文摘要:

针对高负荷斜流压气机的结构设计需求, 引入和完善斜流叶盘的结构效率评估方法, 用以协调各种设计要求和优化结构设计. 基于提高结构效率的设计思想, 提出“C”型和“M”型两种新型斜流叶盘结构方案, 并通过平均应力值、振动鲁棒系数和轮缘变形协调系数3项的分析和结构效率系数的对比, 论证了新型轮盘结构在减轻质量、提高可靠性和降低叶尖损失等方面的优势. 分析结果表明: “M”型叶盘结构方案可使平均应力提高24.7%, 质量降低20%, 振动响应降低37.9%, 轮缘最大变形降低67.6%.

英文摘要:

Structural efficiency evaluation method was employed and improved in structural design of high-load mixed-flow compressor to meet the strict requirements and to optimize the bladed disk structure. Two novel structure schemes were put forward named type “C” and type “M” to increase the structural efficiency. The key items including average stress, vibration robust coefficient and rim deformation coordination coefficient were calculated, and structural efficiency coefficient was studied and evaluated contrastively. Finally, the advantages of the novel structure schemes are proved including low weight, high reliability and low loss at blade tips. The calculation result shows the “M” structure scheme could result in that 24.7% increase in average stress, 20% decreasing in mass, 37.9% decreasing in vibration response and 67.6% decreasing in rim deformation.

[查看全文](#) [查看/发表评论](#) [下载PDF阅读器](#)