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文章名称: 小型轴流通风机中叶片周向弯曲影响气动性能的数值模拟 ————— 郑剑飞 等

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:: 文章简介 ::

摘要: 以小型低压大流量通风机为模型, 通过对其内部流场的三维数值模拟, 说明了叶片不同周向弯曲对其气动性能的影响, 分析了叶片弯曲带来这些影响的原因。结果表明: 在小型低压大流量通风机的内部流动损失中, 通流损失部分所占比例大于二次流损失部分, 因此降低其通流损失是降低小型低压大流量通风机内部流动损失的一个有效办法; 推荐在小型低压大流量通风机的设计中采用叶片的适度前弯, 此时压头和效率与径向叶片差别不大, 但有利于扩大叶轮的稳定性。关键词: 轴流通风机; 气动性能; 数值模拟中图分类号: TH432.1 文献标识码: B 文章编号: 1006-8155(2008)02-0009-04 Numerical Simulation of the Effects of Skewed Blades on Aerodynamic Performance of Small Type Axial-flow Fan Abstract: The 3-D numerical simulation of internal flow field of the small type fan model with low pressure and high flowrate is carried out, which specifies the influences of different types of skewed blades on aerodynamic performance. The reason for those influences from skewed blades is analyzed in this paper. The result shows the loss due to velocity is of higher ratio than the loss due to the secondary flow during the internal flow losses of small type fan with low pressure and high flowrate. So an effective way to decrease the internal flow loss of small type fan with low pressure and high flowrate is to decrease the loss of the first term. Furthermore, in the process of designing small type fan with low pressure and high flowrate, it is advisable to adopt the appropriate forward-skewed blades. The way is helpful to extend the stability of impeller, however the differences between head, efficiency and radial rotor are not so obviously. Key words: axial-flow fan; aerodynamic performance; numerical simulation Key Words: Small axial fan; Skewed blades; Aerodynamic performance; Fan design

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