

多级离心泵叶轮级间泄漏对轴向力的影响 Influence of Interstage Leakage on the Axial Force of the Multistage Centrifugal Pump

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关键词: 多级离心泵 叶轮 级间泄漏 轴向力

摘要: 理论分析了叶轮级间泄漏对叶轮前后盖板外侧腔体内液体流动状态的影响, 指出轴向力的实际大小与计算值之间存在着差异。通过离心泵轴向力试验装置, 对液流速度分布和轴向力进行了试验, 研究结果表明: 叶轮前后盖板外侧腔体内液体并不是以叶轮0.5倍的角速度进行运转, 前盖板外侧大于0.5倍, 后盖板外侧小于0.5倍; 叶轮两侧的压力分布不一致, 前盖板外侧压力小, 后盖板外侧压力大; 轴向力计算值小于实际轴向力, 应对行业应用的传统轴向力计算公式进行修正。 The influence of interstage leakage among impellers to the flow state outside the front and back shrouds of the multistage centrifugal pump was studied. The velocity distribution of inner flow and the value of axial force were measured by the experimental device of centrifugal pump. The results indicated that the rotation velocity of the liquid outside the front shroud was 0.5 times larger than the angular velocity of impellers, and the velocity outside the back shroud was 0.5 times less than the angular velocity. The pressure outside the front shroud was lower than the value outside the back shroud. The actual value of axial force was lower than the calculated. And the formula of the axial force should be modified.

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