

低比转数潜水电泵无过载设计 Non-overload Designing Research on Low Specific Speed Submersible Pump

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关键词: 潜水电泵 低比转数 无过载 数值模拟 设计 试验

摘要: 结合BQS80-180/3-90型低比转数潜水电泵的设计, 分析叶轮结构参数对泵轴功率特性的影响。在保证泵运行时最大轴功率不超过配套电动机输入功率的前提下, 为了能够减小配套电动机功率, 进一步研究减小泵最大轴功率的方法, 提出了叶轮结构参数设计判别公式。利用Fluent软件对轴功率进行预测, 结果表明: 利用该判别公式设计的叶轮, 最大轴功率与额定设计工况下轴功率的比值小于1.2。通过样机试验, 各项参数均达到额定要求, 且最大轴功率大幅度降低, 验证了判别式的实际应用效果。 Based on the design of low specific speed submersible pump, the influence of impeller structure parameters on shaft power of pump was analyzed. Under the condition of the maximum value of shaft power being no more than the input power of matching electromotor, the method of reducing the maximum value of pump was further researched in order to reduce the power of the matching electromotor. Then the design discriminated formula of the structure parameters of impeller was presented. The value of shaft power was predicted by the Fluent software. The results indicated that the ratio of maximum power of pump to the power in designing condition was less than 1.2 when the presented discriminated formula was used in design. The results of the experimentation of prototype showed that every parameter met the rating requirements; the maximum value of shaft power of pump was reduced greatly. The results demonstrated the guiding role of the discriminated formula in practice.

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