

旋流泵叶轮位置对性能影响与无叶腔流场测定 Effect of Impeller Location and Flow Measurement in Volute of a Vortex Pump

沙毅 侯丽艳

浙江科技学院

关键词: 旋流泵 叶轮位置 流场 特性 汽蚀余量

摘要: 以研制32WB8-12型旋流泵为试验样机,通过改变叶轮轴向位置的外特性试验,得出泵  $q_v-H$ 、 $q_v-P$ 、 $q_v-\eta$  和  $q_v-NPSH_c$  性能曲线变化规律;同时用5孔球形探针泵无叶腔流场进行测量,得到流场5个测点绝对速度  $v$ 、圆周速度  $v_u$ 、径向速度  $v_r$ 、轴向速度  $v_z$  和静压  $p_s$  变化情况。试验结果证明旋流泵  $q_v-NPSH_c$  曲线小流量范围与离心泵等呈相反趋势;随着叶轮伸入无叶腔尺度  $S$  的加大,泵扬程、效率和抗汽蚀性能均有提高。分析表明:无叶腔轴向旋涡运动为主流,存在回流运动;解释了外特性与内部流动参数之间的转化和因果关系;阐明旋流泵抽吸及扬程形成的原理。The experiments on changing the axial location of impeller and measurement of flow field in volute with five-hole probe were conducted on a self-built vortex pump (32WB8-12). Based on the experiments, the  $q_v-H$ ,  $q_v-P$ ,  $q_v-\eta$ ,  $q_v-NPSH_c$  curves and the absolute velocity  $v$ , the circumferential velocity  $v_u$ , the radial velocity  $v_r$ , the axial velocity  $v_z$  and the flow static pressure  $p_s$  were obtained. The experimental results proved that the  $q_v-NPSH_c$  curve showed opposite tendency in the operating conditions of small charge compared with centrifugal pump and anti-cavitation were improved with the increase of the scale  $S$  that impeller was inserted into volute. The investigation also showed that the axial vortex was dominant flow in volute but with back-flow existing at the same time. The relationship between performance and parameters of the internal flow and the suction, head formation principles of vortex pump was explained.

[查看全文](#) (请使用Adobe Acrobat 6.0版本浏览) [返回首页](#)

[引用本文](#)