

离心式气液分离器设计

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【摘要】 平衡钻井技术有利于防止钻井液漏失、能及时发现和保护油气层，并能提高机械钻速等。但是由于欠平衡装备价格昂贵，制约着这一技术的发展。鉴于这种现状，自行设计了应用于欠平衡钻井的管柱式气液旋流分离器。管柱式气液旋流分离器是一种带有倾斜切向入口及气体、液体出口的垂直管。它依靠旋流离心力实现气、液两相分离，与传统的重力式分离器相比，具有结构紧凑、重量轻、投资节省成本等优点，是代替传统容积式分离器的新型分离装置。在气液两相旋流分析的基础上，建立了预测分离性能的机理模型，该模型包括了入口分离模型、旋涡模型、气泡及液滴轨迹模型；依据机理模型，提出了管柱式旋流分离器工艺设计技术指标和工艺步骤。设计根据管柱式旋流分离器的机理模型以及设计工况，完成了管柱式旋流分离器的结构设计、强度分析、理论校核、焊接工艺设计以及分离器内气液两相流的数值模拟，为工程设计和理论设计提供一定的理论依据。

【关键词】 欠平衡钻井技术 旋流分离器 气 液 两相流动 分离 机理
模型 设计

Gas-liquid Cylindrical Cyclone

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【Abstract】 The balanced well drilling technology is advantageous in preventing loss of *circulation*, can promptly discover and protect hydrocarbon zone, also can enhance the penetration rate. But the expensive under balance equipment has restricted this technology's development. In view of the situation, I designed a gas-liquid cylindrical cyclone independently for the balance under drilling. The GLCC is one kind has leans the bevelling to the entrance and the gas, the liquid exportation hangs the ascending pipe. It can realize the gas-liquid fluid separation depends upon the cyclone centrifugal force. compared with the traditional gravity type separator, which has the compact structure, the lighter weight, the smaller investment and so on. It's a new disengaging equipment which replace the traditional volume type separator. On the basis of the