橡膠唇型旋轉油封之迴油溝設計改良暨參數研究

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摘 要

本研究利用數值方法建立橡膠唇型旋轉油封之理論模型，針對 唇型旋轉油封之迴油溝進行設計改良，於既有設計之斜紋迴油溝中 加入轉折參數，並增加迴油溝高度。以實驗與數值交互探討潤滑流 體在橡膠唇型旋轉油封(Rubber Rotary Lip Seal)中受到迴油溝 (Helix)影響所產生的迴油現象(Pumping)，使用計算流體力學商用 電腦輔助分析軟體CFD-RCR，數值方法模擬預測迴油率(Pumping Rate)，並利用迴轉測試機台輔以實驗量測橡膠唇型旋轉油封之迴 旋操作狀況下之迴油率，藉由數值與實驗比對驗證數值模型之準確 性。新型高迴油率油封針對現有設計之迴油溝加以改良，以單唇型 式的油封為基本型構，在原有的斜紋狀迴油溝中加入轉折設計，且 大幅度增加尾端的迴油溝高度。並針對改良參數進行參數研究，取 得最佳化設計。 本研究成功改良暨有之斜紋狀迴油溝設計並確實提昇迴油率 及增加油封之密封性能。

關鍵詞 : 橡膠旋轉軸唇型密封元件，迴油溝，計算流體力學，迴油率

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