利用成對相互衝射膜冷卻流在靜葉片通道端壁之熱傳與有效性的實驗研究

張順富、吳佩學

E-mail: 9511167@mail.dyu.edu.tw

摘 要

本研究探討一個新的膜冷卻技術及其應用於保護葉片通道端壁的可行性。此技術乃利用偏位噴注對撞使形成比較聚集且均勻的膜冷卻有效性分佈。實驗結果與平行噴注的膜冷卻設計在相同流量、端壁進口條件、與吹氣比下做優劣比較。本實驗利用靜葉端壁之膜冷卻作測試，採用液晶熱像法，量測端壁之局部熱傳係數及膜冷卻有效性分佈。實驗皆固定主流雷諾數在 ，吹氣比為0.5、1.0、2.0，葉片前端之底板進口情形分為平滑進口、前向進口台階、與背向進口台階等三種。 結果顯示，端壁熱傳係數之分佈樣式會受到膜冷卻孔排列方式改變，但其值變化不大。在膜冷卻方面，以偏位對撞噴注的膜冷卻技術涵蓋的區域延伸較常，冷卻保護區域向吸力面偏移，而且受到吹氣比與進口台階條件的影響較小，優於平行噴注的膜冷卻設計。

關鍵詞 : 偏位噴注，端壁，膜冷卻有效性，熱傳係數，液晶熱像法。

目錄

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