

纏繞式複合材料壓力容器設計與研究

吳彥毅、鄧作樑

E-mail: 9126613@mail.dyu.edu.tw

摘要

纏繞式複合材料壓力容器由於具有高的比強度、比剛性、重量輕及抗腐蝕等優點，因此被廣泛的應用於許多商業及航太工業上，例如：燃料槽、氧氣筒、火箭發動機殼等，但此種方法製造過程中所面臨的問題為纖維纏繞端蓋時可能發生滑移的現象，而過去許多研究，滑移的計算僅依據纏繞帶的中心線，忽略了帶寬可能對穩定度造成影響。本論文之目的主要針對纏繞帶寬對纏繞型態穩定度的影響進行研究，並在符合滑移趨勢安全值及端蓋之結構強度下，制定出最適合的纏繞式複合材料壓力容器端蓋外形，並提供最適合之長短軸A/B比、纏繞角度C及纖維帶寬BW等參數，供複合材料壓力容器初期設計及製造之參考。

關鍵詞：壓力容器，纏繞，滑移趨勢，端蓋，帶寬。

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