超臨界流體設備實驗室

技術名稱：超臨界流體高溫高壓容器設計技術

超臨界流體設備實驗室自 95 年設立以來，已建置多套自行開發之實驗機台，包括超臨界CO_2清洗實驗機台（400bar ×2L）、超臨界CO_2晶圓清洗設備（200bar ×4L）、超臨界CO_2微粉成形實驗機台（400bar ×4L），以及一台由奧地利NATEX公司所提供的高壓萃取設備（1000 bar ×5L），為國內產學研界最先進的超臨界流體製程實驗環境，可提供超臨界流體前瞻技術應用的研發。

本實驗室為持續深化超臨界流體高壓設備設計及製造能力，規劃「高溫高壓容器設計技術」為 98 年工作內容。

高溫高壓容器設計技術：建立設計溫度 500℃、設計壓力 350bar 之超臨界水批次式反應器設計技術。容器結構材料使用高溫合金鋼，上蓋開閉方式，採夾鉗式螺栓開閉設計，確保高溫密封性能與安全。反應器組裝完成後，會進行「超臨解水」於纖維素水解性能測試與驗證。

Project title: Supercritical Fluid Equipment Laboratory
Technology: SCF High Pressure Equipment Design Technology
Project manager: Mr. C.H. Hung
Abstract:

The SCF Equipment Laboratory is established in 2006. There are several self-developed bench scale units such as $SCCO_2$ cleaner (400bar× 2L), $SCCO_2$ wafer cleaner（200bar ×4L）, $SCCO_2$ micro powder formation equipment（400bar ×4L）, and a high pressure $SCCO_2$ extraction pilot plant （1000 bar ×5L） supplied by Natex company of Austria. All those equipments constitute the most advanced supercritical fluid process experimental environment in Taiwan, and which provides foresight research of the applications using supercritical fluid.

For continuously reinforcing the design and manufacturing capability, the main research content in 2009 is high temperature and high pressure vessel design technology.

The annual goal is going to establish a 500℃and 350 bar supercritical water reactor technology. A high temperature resistant alloy steel is used as the material of vessel structure, and a clamp type closure with cap screws is designed to ensure gasket against leakage under high temperature and high pressure conditions. The reactor will be tested and

verified via cellulose hydrolysis experiments under supercritical water condition.