

## 【熱傳導係數分析儀】

本實驗室採用之熱流式熱傳導係數分析儀 HFM 446 Lambda 是由德國耐馳公司所生產的。儀器上下方設計有兩片金屬平面板，兩平面上皆有數個高靈敏、高精度之熱流感測器。透過材料量測，在兩平板間設定溫度梯度。藉由兩平板上高精度熱流感測器監控，分別量測進出材料的熱流。若系統到達穩定狀態，熱流為恆定(常數)，那麼只要量測樣本的面積與厚度已知，利用傅立葉方程式，即可計算出熱傳導係數。HFM 446 Lambda 可以應用於廣泛領域的材料，例如隔熱材料、建築材料、聚合材料等，其熱傳導係數量測範圍介於 0.002-1 W/mK，溫度範圍為 -20°C~90 °C，精度為±1%~2%。樣品無須前處理，但需為平整表面。試體規格須為 200 mm \* 200 mm，厚度 10~50 mm 之方形。其檢測標準乃是依據 ASTM C518, ASTM C1784, ISO 8301, JIS A1412, DIN EN 12664, DIN EN 12667 之規定。

## 【HFM Thermal Conductivity Analyzer】

The HFM 446 Lambda is an analyzer for measuring thermal conductivity in the form of heat flowing which is produced by NETZCH company in Germany. There are two metal plates which located on the up- and downward designed for the instrument containing the several highly sensitive and accurate sensors. A temperature gradient is set between two plates through the material to be measured. By means of two highly accurate heat-flow sensors in the plates, the heat flow into the material and out of the material, respectively, is measured. If the state of equilibrium of the system is reached and the heat flow is constant, the thermal conductivity can be calculated by the Fourier equation as long as the measurement area and thickness of the sample are known. The range of detection is 0.002W/mK to 1 W/mK, and the temperature is -20°C ~ 90 °C. No need to preprocess the sample and need a flat surface. The size of the sample area is 200 mm\*200 mm, and the thickness ranges from 10-50 mm, and the accuracy ranges from ±1%~2%. The smooth surface is essential to fit on the sensor. The measurement standard reference can be confirmed by ASTM C518, ASTM C1784, ISO 8301, JIS A1412, DIN EN 12664, DIN EN 12667.



熱傳導係數分析儀 (HFM Thermal Conductivity Analyzer)