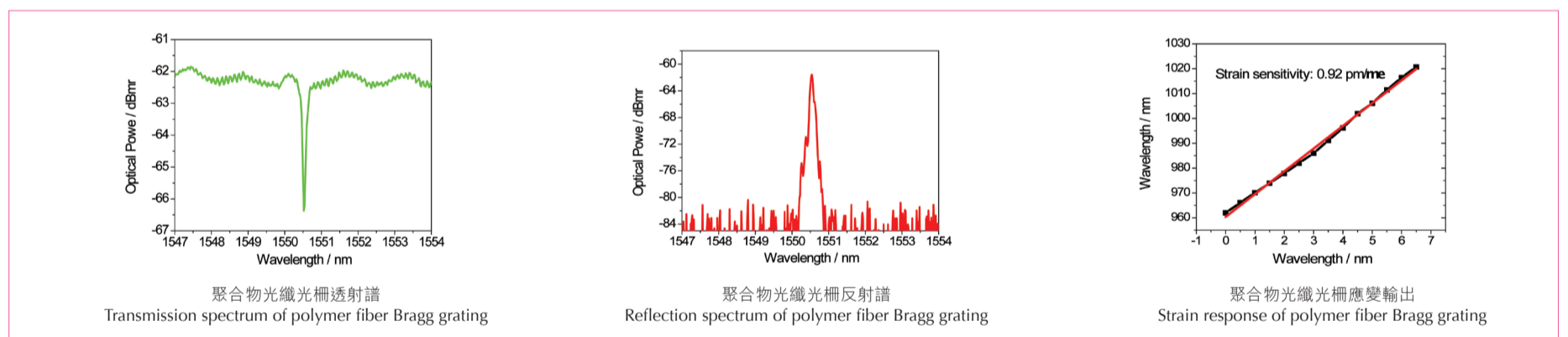
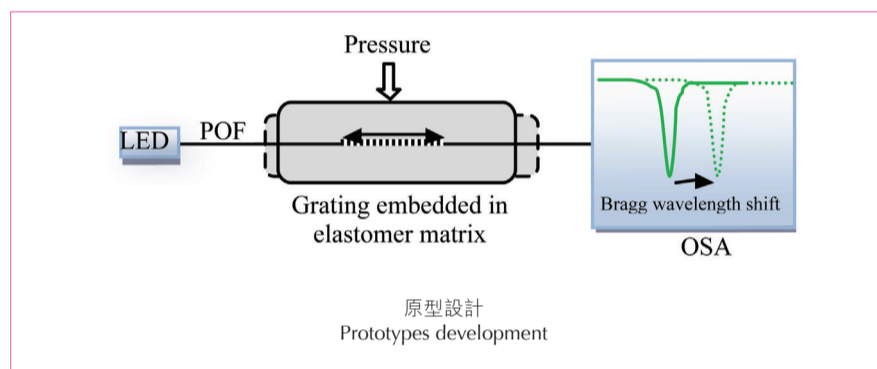
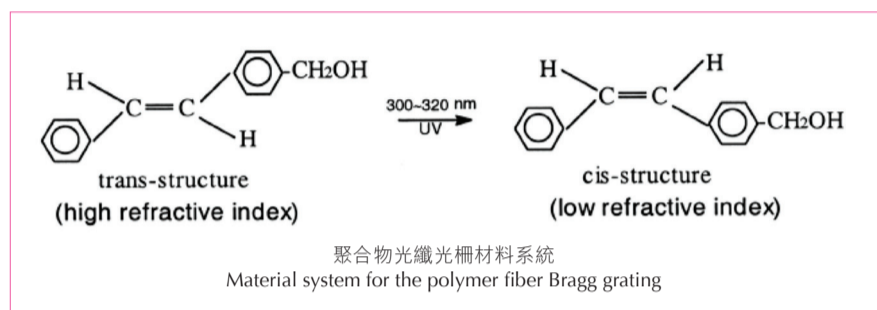


# 用於智能服裝的聚合物光纖布拉格光柵及傳感器 Polymer fiber Bragg gratings and sensors for smart textile

## 小型纖維傳感器以用作可穿著電子器件 Small sized fiber sensors for wearable electronics

寫在聚合物光纖上的光纖布拉格光柵具有很多優勢:小的尺寸、高應變/溫度靈敏性、可靠性、大的測量範圍、高的熱光係數、高的柔軟性和彈性及低的加工成本。聚合物光柵光纖有著良好的生物相容性和安全性，因而這種傳感器可以用作生物傳感器和智能紡織服裝的可穿著電子器件。



POF 聚合物光纖	Core Material 光纖芯材料	Dye doped PMMA or MMA copolymer
	Cladding Material 光纖包層材料	PMMA or MMA copolymer
	Core Diameter 光纖芯直徑	8-15 μm
FBG 光纖光柵	Core/Cladding Ratio 光纖芯/包層直徑比	8/130
	NA 數值孔径	0.15-0.20
	Central Wavelength 中心波長	962 nm, 1310 nm, 1550 nm
	Reflectivity 反射率	up to -4 dB (63% reflection) at 1550 nm
Strain Sensitivity 應力靈敏度		0.62 pm/με at 962 nm, 0.88 pm/με at 1550 nm
Temperature Sensitivity 溫度靈敏度		-0.11 nm/°C

聚合物光纖光柵傳感器參數  
Specifications of FBG sensors

Fiber Bragg gratings (FBG) written in polymer optical fibers (POF) have small size, high strain/temperature sensitivity and reliability of POFs, large strain measurement range, high thermal-optic coefficient, high softness and flexibility, and low cost. The POF based gratings have excellent bio-compatibility and safety, which enables polymer fiber Bragg grating sensors to be used as bio-sensors and wearable electronic devices for smart textile and apparel.

### Principal Investigator

Prof. Xiaoming TAO

Institute of Textiles and Clothing

### Contact Details

The Hong Kong Research Institute of Textiles and Apparel

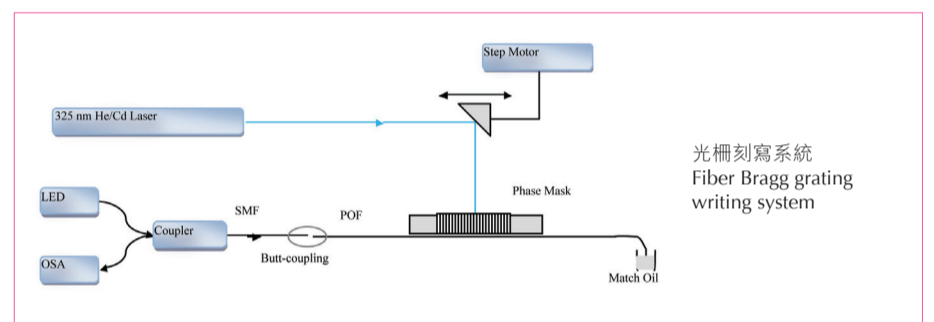
Tel: (852) 262 0180 Fax: (852) 2364 2727 Email: info@hkrita.com

### 特色與優點

- 抗電磁干擾性
- 小型，輕便
- 易於複用
- 大的應力/溫度靈敏性
- 柔軟性
- 良好的生物兼容性

### 應用

基於聚合物光纖光柵的傳感器有著良好的生物兼容性，可以作為生物傳感器或者用於智能紡織服裝的可穿著電子器件，對應變、溫度或者壓力進行檢測。



### Special Features and Advantages

- No electromagnetic interference
- Small size and light weight
- Easy to multiplex
- High strain/ temperature sensitivity
- Flexibility and ductility
- Bio-compatibility

### Application

The FBG sensors have excellent bio-compatibility and the applications are enormous. For example, bio-sensors and wearable photonic devices for smart textile and apparel in sensing of strain, temperature or pressure.