

# 選擇性反射近紅外線和可見光的涼爽纖維

## Cooling Fibre with Selective Near-Infrared and Visible Light Reflection

在烈日下保持身體清爽涼快  
For staying cool under the hot sun

專利申請編號: CN 201510347106.3 (中國)

這種創新的合成纖維可反射來自太陽的近紅外線及可見光，卻無阻由人體發出的中紅外線散出，可以減低熱輻射，達到良好的冷卻效果。此合成纖維的靈感來自天然植物冰草。冰草在其葉子和莖的表面形成鹽晶，利用鹽晶反射陽光，以降低自身溫度。研究人員採用雙組分熔融紡絲技術，把陶瓷晶粒加到合成纖維的內部，並保持表面平滑。用這些纖維所製成的織物可以反射大部分陽光，卻無阻體熱自由釋放，同時還能吸收大部分紫外光，故能在陽光下達到卓越的降溫效果，特別適合戶外工作人員和熱帶地區居民穿著。

### 特色與優點

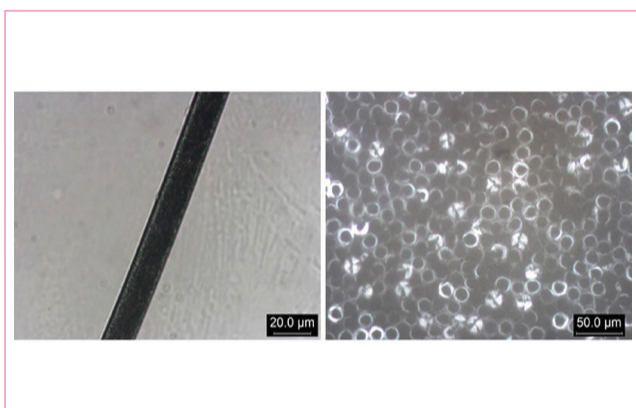
- 選擇性地反射近紅外和可見光
- 耐用度高，效果持久
- 強烈日光下可降低布料背面的溫度達4°C以上

### 應用

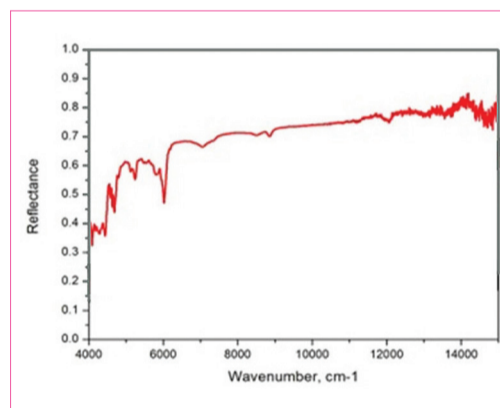
- 戶外活動服裝
- 帳篷、遮陽傘、窗簾及戶外工人制服等產品

### 獎項

- 第45屆瑞士日內瓦國際發明展 – 銀獎 (2017年3月)
- 俄羅斯國際科技協會特別獎(2017年3月)



纖維的核殼結構 (左圖 — 側面觀察; 右圖 — 截面觀察)  
The core-sheath structure of fibres (left – side view; right – cross section)



纖維針織物的近紅外反射光譜  
NIR reflection spectrum of the textile knitted from the fibres



冰草  
Salty Ice Plant

Patent Application No.: CN 201510347106.3 (China)

This novel synthetic reflects near-infrared (NIR) and visible light from the sun and allows the human body to release middle-infrared (MIR), achieving outstanding cooling effects under solar radiation. Inspired by Salty Ice Plant, a natural plant which holds salt crystals on the surface of leaves and stems and reflects sunlight to cool itself, we use bicomponent melt spinning to deposit ceramic crystals inside synthetic fibres with smooth layer.

Textiles made from these fibres reflect sunlight while allowing the body to release heat freely. In addition, these textiles can block the most of UV light by absorption. They can induce excellent cool feeling in the sun, which is especially helpful to workers in open places and residents in tropical areas.

### Special Features and Advantages

- Selective reflection of NIR and visible light
- Durable
- Able to reduce the temperature of the back-side of the cloth by more than 4°C in intense sunlight

### Applications

- Apparels for outdoor activities
- Tents, canopies, curtains, uniforms for outdoor workers

### Awards

- Silver Medal – 45<sup>th</sup> International Exhibition of Inventions of Geneva, Switzerland (Mar 2017)
- Special Merit Award – Association “Russian House for International Scientific and Technological Cooperation”, Russia (Mar 2017)

#### Principal Investigator

Dr Bin FEI

Institute of Textiles and Clothing

#### Contact Details

Institute for Entrepreneurship

Tel: (852) 3400 2929 Fax: (852) 2333 2410 Email: pdadmin@polyu.edu.hk



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