

# 低成本、應用助催化劑系統的棉質織物阻燃處理方法

## Low Cost Flame Retardant Treatment for Cotton with Co-catalyst System

有效提升阻燃效能，減少阻燃處理的副作用

Effectively enhance flame retardant treatment and minimize its side effects

專利申請編號及國家: 2014103008594 (中國)

### 特色與優點

- 減少所需的烘焙溫度、時間及成本
- 減少棉質布料因阻燃處理所產生的副作用 (如抗撕裂強度及潔白度不足)

### 應用

纖維素織物的阻燃處理

### 獎項

2018 TechConnect全球創新獎 (2018年5月)

用天然纖維素製造的布料都是高度易燃的物料。現時已經有以不同的阻燃劑和處理方法製造阻燃紡織材料，然而，阻燃劑必須和樹脂及催化劑混合，才能有效固定附於棉質材料上，但若這樣處理，布料有可能出現抗撕裂強度和潔白度下降等的副作用。是項理大發明應用了助催化劑，以傳統浸壓-預乾-烘焙處理技術，將阻燃劑加於棉質布料上，能有效提升阻燃效能，並減少阻燃處理的副作用。



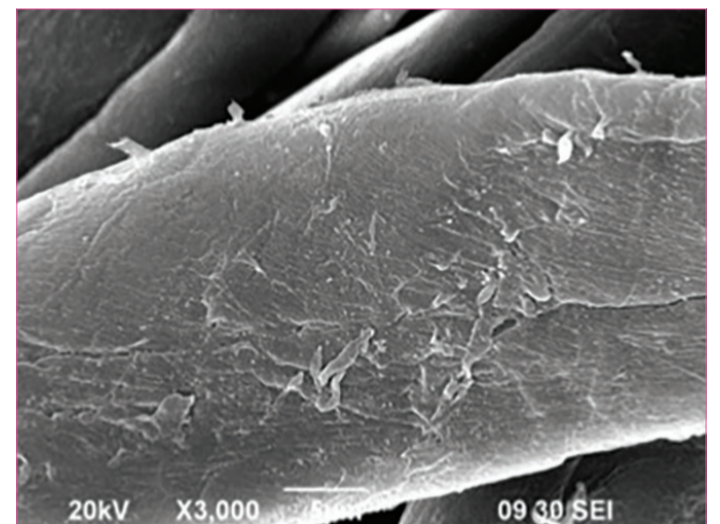
新開發的助催化劑  
The co-catalyst developed

#### • How does it work?

Sample Code	No. of Laundering	Burning time (s)	Char Length (cm)	Pass/Fail	Tearing strength (>10N)
Control	--	22.01	Entirely burned	Fail	28.0
1170	3	39.58	8.43	Fail	13.5
1150	3	38.63	9.13	Fail	16.4
X1170	3	DNI	0.75	Pass	11.5
X1150	3	DNI	0.70	Pass	16.5

X – co-catalyst system  
1 – 1 minute curing time  
150, 170 – curing temperature 150°C and 170°C

助催化劑的性能比較 (DNI=Did not ignite)  
Performance comparison of the co-catalyst (DNI=Did not ignite)



纖維表面的微觀結構  
Microstructure of fibre surface

Fabrics made from natural cellulosic fibres are highly flammable. Many flame retardant (FR) agents and application methods have been developed for producing FR textile materials. However, to be efficiently fixed onto cotton fibres, the FR agents must be used in combination with resin and a catalyst which may introduce side effects such as reduced tearing strength and whiteness. In this invention, a co-catalyst is used to effectively enhance FR treatment and minimize its side effects. The finishing formulation developed is applied to cotton fabric with conventional pad-dry-cure finishing techniques.

Patent application No.: 2014103008594 (China)

### Special Features and Advantages

- reduce the curing temperature, time and cost
- minimize the side effects, e.g. reduced tearing strength and whiteness, after FR treatment

### Application

Flame retardant treatment of cellulose-based fabrics

### Award

2018 TechConnect Global Innovation Award (May 2018)

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