

FOUR ELEMENTS
ENERGY BIOTECH. CO., LTD
COOL

Presented by Mavis Chen

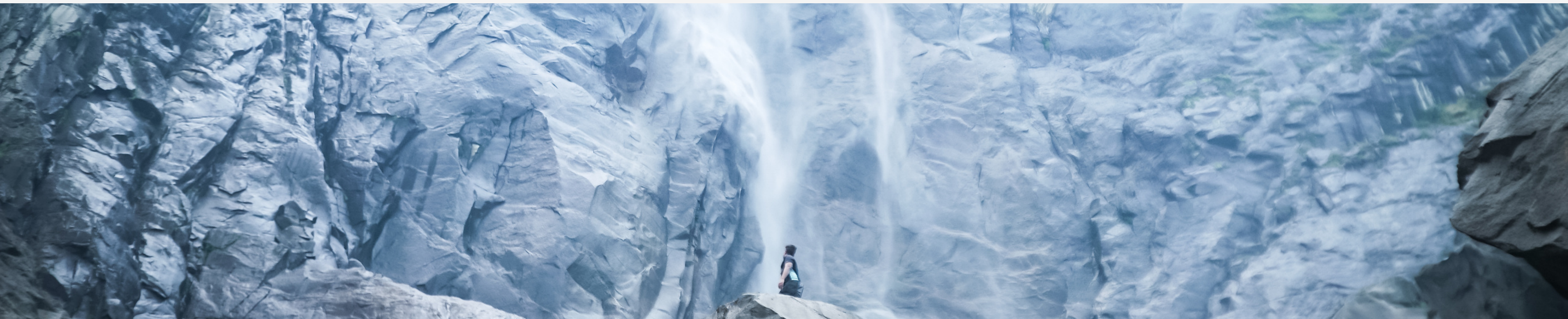
TALENT- COOL SERIES



COOLNESS

-FUNCTIONAL YARN-

UNIQUE TECH: LIQUID METAL + MINERAL ELEMENT
IMPLANTING ZINC AND VARIOUS ELEMENTS INTO FIBERS
TO MAKE NEW TECH. COOLING YARN



Talent Cool

| COOL/ NI COOL

2009

The global warming is getting more and more intense.

2016

The summer temperatures are rising and the season is getting longer.

1 ————— 2 ————— 3 ————— 4

2003

Inventing liquid zinc metal, turning zinc into tiny ions, and spreading them evenly throughout the material, helps increase better quality.

2018

Converting 99.9% pure zinc into nanoparticles and embedding them into the masterbatch. After years of research and continuous improvement, the yarn production process has reached a stable and mature stage.



I-COOL

POLYESTER: 50D/72F, 75D/72F,
150D/ 144F

NI-COOL

(Nylon)

POLYAMIDE: 70D/48F, 70D/ 72F,
140D/ 96F, 140D/144F

Talent Cool

POLYESTER/ NYLON
ADVANTAGE

Inventing liquid zinc metal, turning zinc into tiny ions, and spreading them evenly throughout the material, helps increase better quality. The material is water-insoluble, contributing to environmental conservation.

Implanting zinc into fibers achieves permanent antibacterial properties and cooling effects. In addition to using zinc, known for its good thermal conductivity, we've also increased the moisture content. With these dual functionalities, I cool and Ni cool has a greater advantage over regular cooling yarns.

value 3+1

Besides cooling sensation, it also offers antibacterial, odor-reducing, and UV-resistant functionalities, making it ideal for summer products.

Talent Cool



I COOL (POLYESTER)

I cool (polyester) has excellent moisture-wicking and breathability, making it very suitable for outdoor sportswear.



NI COOL (POLYAMIDE)

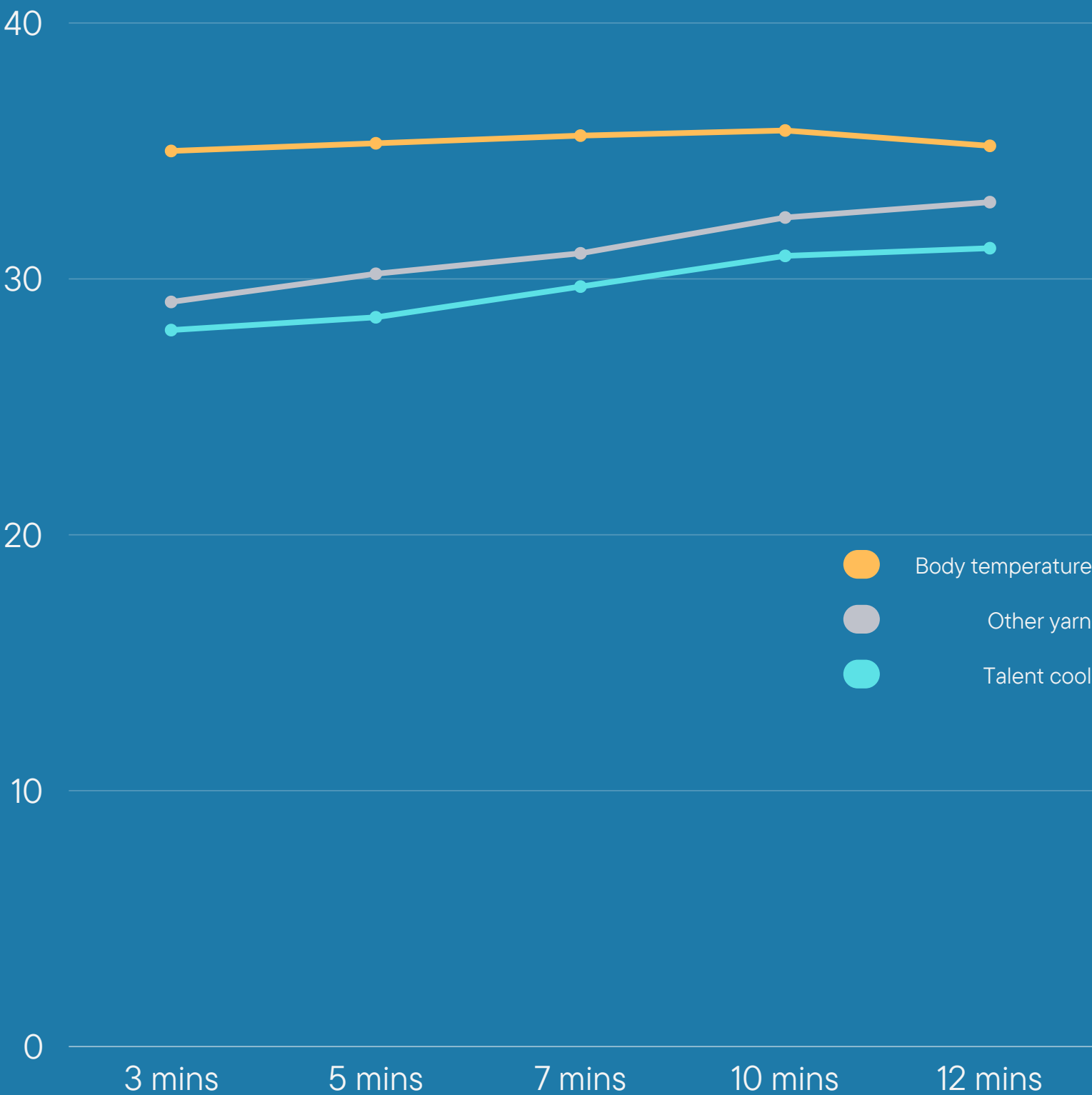
Ni cool (polyamide) silky soft, perfect for making inner wear, underwear, and leggings.

Continuous cooling sensation experiments

ASTM D7024-04

This test method covers the determination of the overall thermal transmission coefficient due to conduction for dry specimens of textile fabrics, battings, and other materials and the determination of the temperature regulating factor (TRF) defined below.

- The yellow line represents body temperature.
- The gray line represents the temperature after wearing fabric woven with another brand's cooling yarn.
- The green line represents the temperature after wearing fabric woven with Talent Cool series yarn.



TTRI

財團法人紡織產業綜合研究所

Taiwan Textile Research Institute



試驗報告

TEST REPORT

日期: Aug. 15, 2014

收件日期: Aug. 11, 2014

報告編號: TP308472

數量: 1PC

報告頁次/頁數: (P1/1)

來文字號: FE-14-16

報告抬頭: FOUR ELEMENTS ENERGY BIOTECHNOLOGY CO., LTD.(T8726)

試件類別: Knitted Fabric

地址: 2F-6, .NO. 150, JILIN ROAD, TAIPEI 10458, TAIWAN, R.O.C.

Test Items	Test Results	Test Methods
Average temperature (°C)	31.5	ASTM D7024-2004(Modify)

Note: Sample description is given by the client: 90% SMELLESS NYLON (70D/68F), 135gm/m2
10% SPANDEX (20D). 135gm/m2
BUYER NO.: 14060060
ART NO.: ECO-1023

正本

ORIGINAL



試驗報告

日期: Jul.28,2014 收件日期: Jul.16,2014
Date: Jul.28,2014 Date of Receipt: Jul.16,2014

TEST REPORT

報告編號: TP307529 數量: 1PC 報告頁次/頁數: (P1/1) 來文字號: FE14-13
Report No.: TP307529 Quantity: 1PC Page Order/Pages: (P1/1) Ref. No.: FE14-13

報告抬頭: FOUR ELEMENTS ENERGY BIOTECHNOLOGY CO., LTD.(T8726) 試件類別: Knitted Fabric
Report Title: FOUR ELEMENTS ENERGY BIOTECHNOLOGY CO., LTD.(T8726) Item: Knitted Fabric

地址: 2F-6, .NO. 150, JILIN ROAD, TAIPEI 10458, TAIWAN, R.O.C.
Address: 2F-6, .NO. 150, JILIN ROAD, TAIPEI 10458, TAIWAN, R.O.C.

Test Items	Test Results	Test Methods
Touch feeling of warmth or coolness Q-max(W/cm ²)	0.192	FTTS-FA-019-2010 25± 2℃, 65± 5%RH

Note: Sample description is given by the client: 90% SMELLESS NYLON (70D/68F), 10% SPANDEX (20D). 135gm/m2

BUYER NO.: 14060060

ART NO.: ECO-1023

Cooling sensation

01

INSTANT COOLING SENSATION MEASURED
USING THE Q-MAX VALUE AS A BASIS.

Standards

Weave fabric: 0.13

Knitted fabric: 0.17

02

THE ADVANTAGE OF I COOL/ NI COOL

Zinc, being a metal, possesses rapid thermal conductivity, aiding in the quick dissipation of body heat.

03

THE ADVANTAGE OF I COOL/ NI COOL

Talent cool has a higher moisture content compared to regular yarn, which helps in regulating body temperature.



試驗報告

日期: 2014.07.28 收件日期: 2014.07.16
Date: 2014.07.28 Date of Receipt: 2014.07.16

TEST REPORT

報告編號: TP307529 數量: 1件 報告頁次/頁數: (P1/1) 來文字號: FE14-13
Report No.: TP307529 Quantity: 1件 Page Order/Pages: (P1/1) Ref. No.: FE14-13

報告抬頭: 三加一能量科技股份有限公司(T8726) 試件類別: 針織布
Report Title: 三加一能量科技股份有限公司(T8726) Item: 針織布

地址: 104 台北市中山區吉林路150號2樓之6
Address: 104 台北市中山區吉林路150號2樓之6

試驗項目	試驗結果	試驗方法
接觸溫冷感 Q-max (W/cm ²)	0.192	FTTS-FA-019-2010 25± 2℃, 65± 5%RH

註: 依委託者所提供來樣資料為: 90% SMELLESS NYLON (70D/68F), 10% SPANDEX (20D). 135gm/m2

BUYER NO.: 14060060

ART NO.: ECO-1023

VALUE 3+1

測試內容：

1. 抗菌效力評估測試

依據 AATCC TM100-2019。

測試菌種：金黃色葡萄球菌 *Staphylococcus aureus* (ATCC 6538)
樣品測試前殺菌條件：無滅菌
樣品中和溶液：Dey Engley Broth
界面活性劑濃度：0.05% Triton X-100
接觸時間：24 小時
培養溫度：37±2°C
培養時間：24-48 小時
培養基：Nutrient Agar
樣品重量：1.0±0.1 克

測試樣品：送檢樣品(3.8 X 3.8±0.1 公分的樣品)

結果：

試驗菌種 (保存編號)	金黃色葡萄球菌 (<i>Staphylococcus aureus</i>) (ATCC 6538)
空白對照組未經培養之菌量("0"期)(D)	1.33 x 10 ⁵ CFU/樣品
空白對照組經培養 24 小時後之菌量(B)	2.75 x 10 ⁷ CFU/樣品
測試樣品在接菌後還未經培養之菌量("0"期)(C)	1.27 x 10 ⁵ CFU/樣品
測試樣品在接菌後經培養 24 小時後之菌量(A)	<100 CFU/樣品
增殖值 (F)	2.32
抗菌效力	>99.92%

Antibacterial
UV-resistant

SGS

Textile Laboratory

Test Report

No: TXA2511 I2016 /SP

Date: Nov. 03, 2016

Page

Test Results:

2. Transmittance or Blocking of Erythemally Weighted Ultraviolet Radiation through Fabric (AATCC 183-2010)

As received	Dry evaluation	Wet evaluation
Ultraviolet Protection Factor (UPF) :	130	130
Standard Deviation :	0.38	2.21
Rated UPF :	50+	50+
Protection Category :	Excellent	Excellent
Percent Transmittance, T (UV-A) :	0.90	1.44
Percent Transmittance, T (UV-B) :	0.49	0.33
The Percent Blocking, UV-A :	99.10	98.56
The Percent Blocking, UV-B :	99.51	99.67

Test was conducted in wavelength range : 280 – 400 nm
Instrument : UV – Vis Spectrophotometer model
No. of Scans : 8

Remarks :

- Ultraviolet Protection Factor (UPF) is the ratio of the average effective ultraviolet radiation transmitted and calculated through air to the average effective UV-R irradiance transmitted and calculated through fabric.
- The limits of the spectral range of ultraviolet radiation are not well defined and may vary from country to country. The limits of the spectral range of ultraviolet radiation are not well defined and may vary from country to country. The limits of the spectral range of ultraviolet radiation are not well defined and may vary from country to country. The limits of the spectral range of ultraviolet radiation are not well defined and may vary from country to country.

Cool Feeling Textiles (FTTS-FA-019 - Version 3.0 Clause 3 & 4)

As received

Skin contact side(Back side)

Q-max(W/cm²) 0.195

Test Conditions: 1. Thermo Labo II B, TYPE : KES-F7
2. Room Temperature : 20±2°C, Humidity : 65%
3. Cool plate temperature: 25±0.1°C
Hot plate temperature: 35±0.1°C
4. Test as received sample as per client's requirement

Remark: Performance specification

Cool Feeling Textiles

Knitted ≥ 0.130

Woven ≥ 0.170

Cooling sensation
Odor-reducing

intertek
Total Quality. Assured.

測試內容：

報告號碼：TWNC0124

1. 消臭效能檢測-氨氣 (ISO 17299-2:2014, 檢知管法):

	結果 (μl/l)	
	試樣值 A	空白試樣值 B
1	5	83
2	5	83
3	5	83
	(A) 平均 = 5	(B) 平均 = 83
消臭效能(%)	94	

備註：消臭效能 = (B-A) / B x 100%

B = 未含待測物之空氣袋中的氨氣濃度平均值(μl/l)

A = 含待測物之空氣袋中的氨氣濃度平均值(μl/l)

依據客戶要求測試時間: 8 小時

PATENT CERTIFICATE

ACHIEVEMENT

FOUR ELEMENTS
ENERGY BIOTECH. CO., LTD

After years of research, our technology has matured to nanoize
specific trace elements and implant them into yarn fibers.



中華民國專利證書

新型第 M646616 號

新 型 名 稱：具微量元素纖維透氣布層結構

專 利 權 人：三加一能量科技股份有限公司

新型創作人：郭峰源

專利權期間：自2023年10月1日至2033年3月29日止

上開新型業依專利法規定通過形式審查取得專利權
行使專利權如未提示新型專利技術報告不得進行警告

經濟部智慧財產局 局長

廖承威

中華民國 112 年 10 月 1 日



注意：專利權人未依法繳納年費者，其專利權自原繳費期限屆滿後消滅。



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