



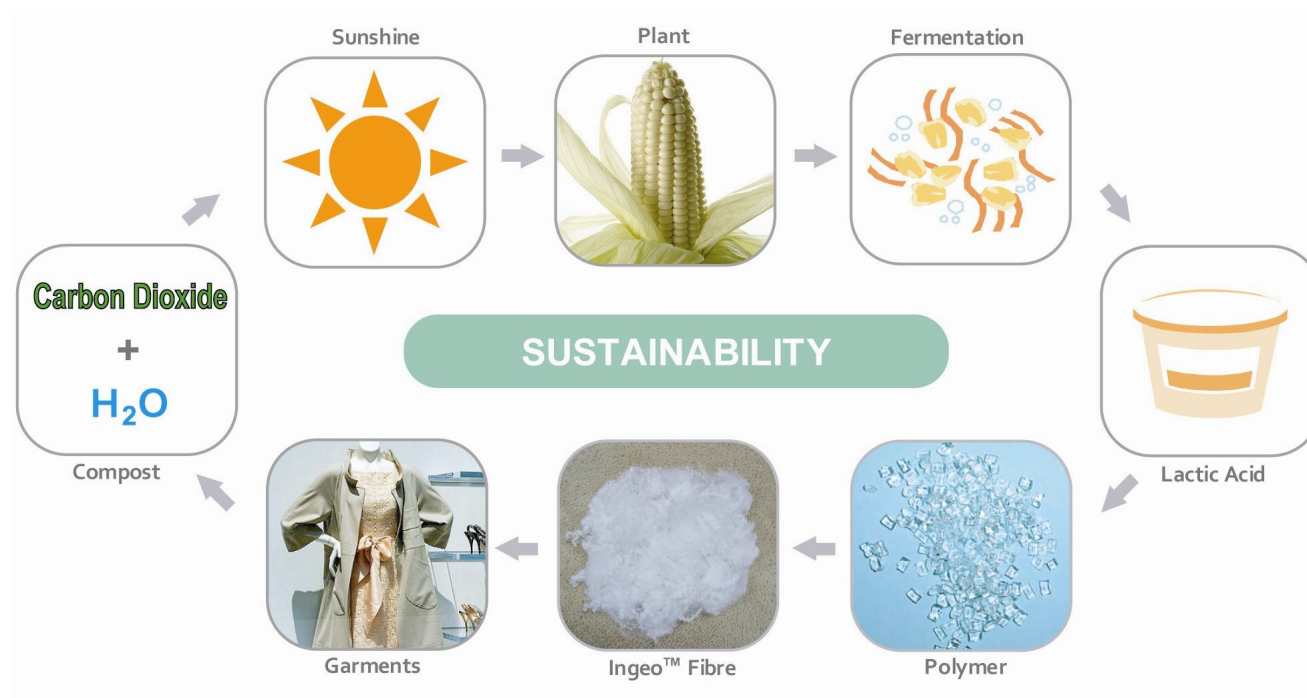
Natural selection  
ingenious material made from nature

The world's first man-made fiber from 100% annually renewable resources.



## What is Ingeo™(PLA) ?

### Production and Life Cycle



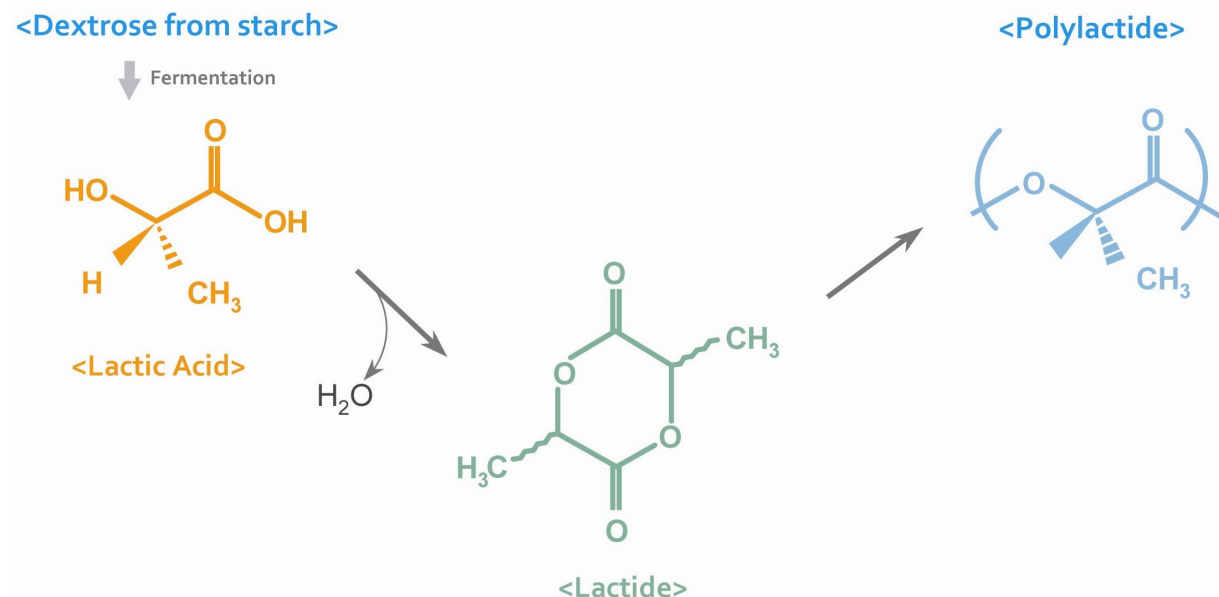
■ The only man-made fiber derived 100% annually renewable resource → not oil

■ Ingeo™ means : **In**gredients from the Earth  
**geo** = greek for earth



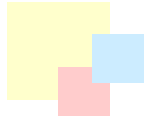
## What is Ingeo™(PLA) ?

### How we extract / use the carbon

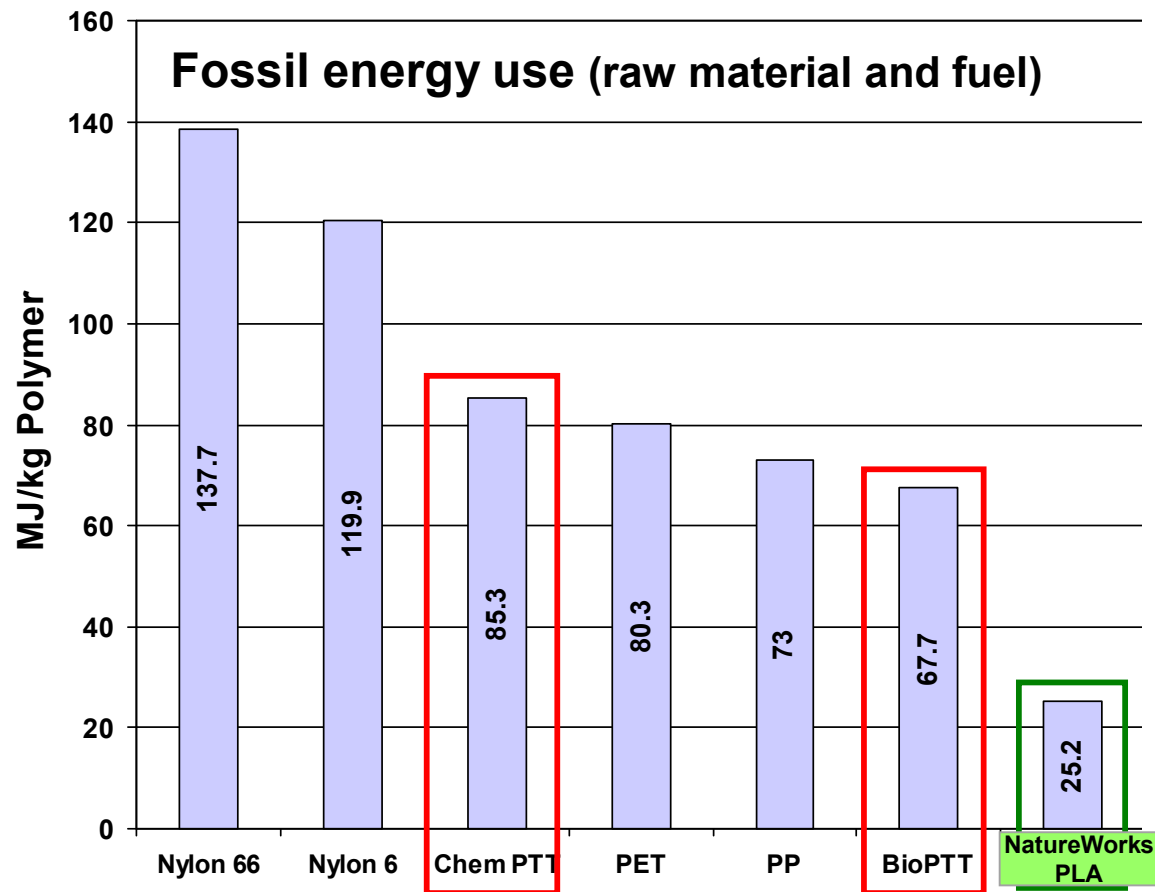


#### ► High technology fiber from nature :

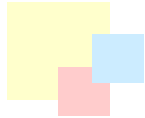
- Natural, annually renewable raw material
- Natural processes
  - \* Fermentation
  - \* Water
  - \* Heat
- Composts to ingredients which can help to grow more raw material



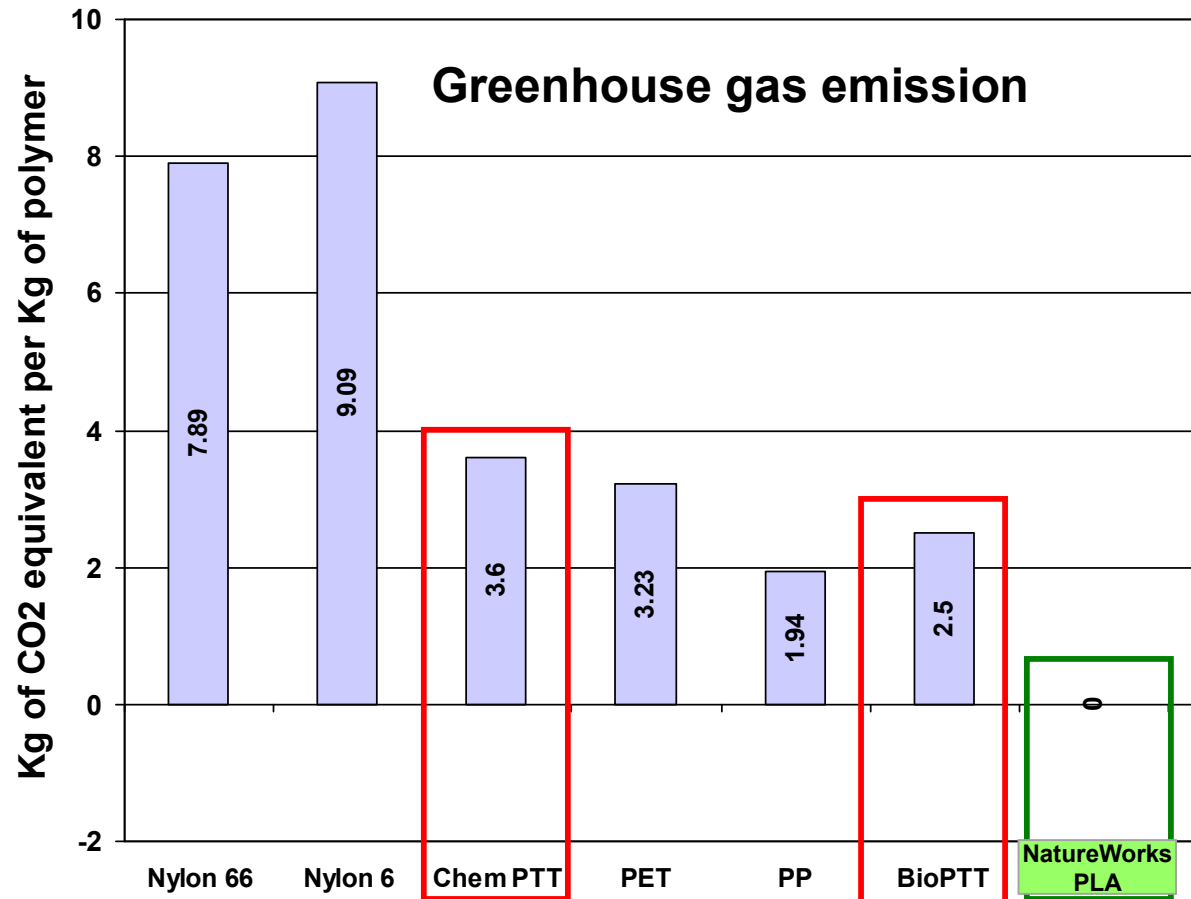
## The environment - production input



**PLA uses less fossil fuel from raw material to final polymer than any of its incumbents**



## The environment - production output



**PLA gives significantly less greenhouse gas emission from raw material to final polymer than any of its incumbents**



## Features and Additional Performances

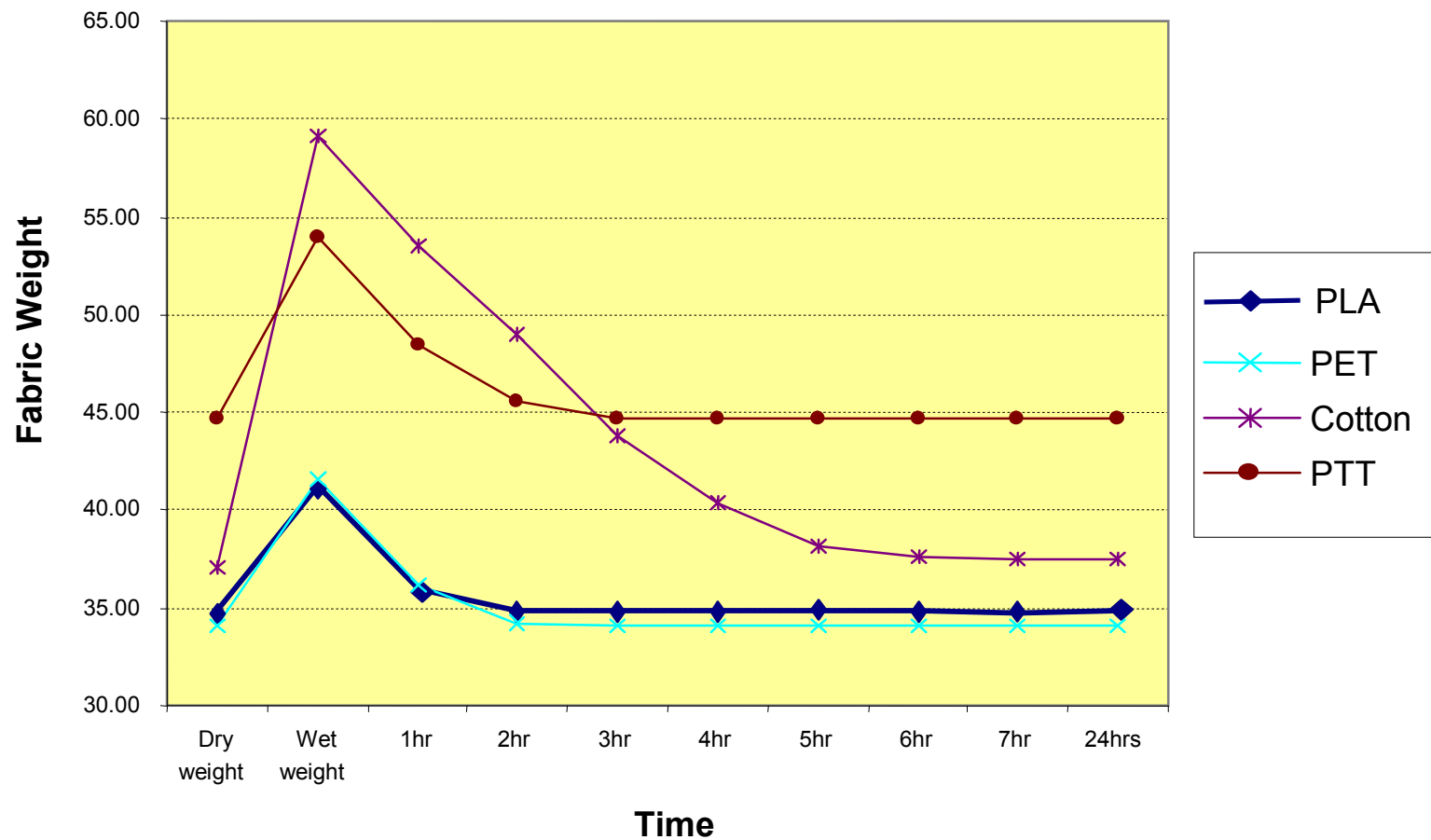
Features	Sustainability-plus performances	
Fiber from 100% plant	<ul style="list-style-type: none"> <li>▪ Excellent wicking properties</li> <li>▪ Moisture management</li> </ul>	Comfort
Bio-degradable	<ul style="list-style-type: none"> <li>▪ Low odor retention</li> </ul>	Fresh
No skin irritation	<ul style="list-style-type: none"> <li>▪ Does not support bacterial growth</li> <li>▪ Hypoallergenic</li> </ul>	No skin irritation
Silky Luster	<ul style="list-style-type: none"> <li>▪ Rapid soil release</li> <li>▪ Quick drying</li> <li>▪ Excellent after wash appearance</li> </ul>	Easy Care
Multi Functional		
Flame retardant	<ul style="list-style-type: none"> <li>▪ Difficult to ignite</li> <li>▪ Low heat of burning</li> <li>▪ Low smoke emission</li> </ul>	Fire safety regulations



## Features and Additional Performances

Superior drying rate

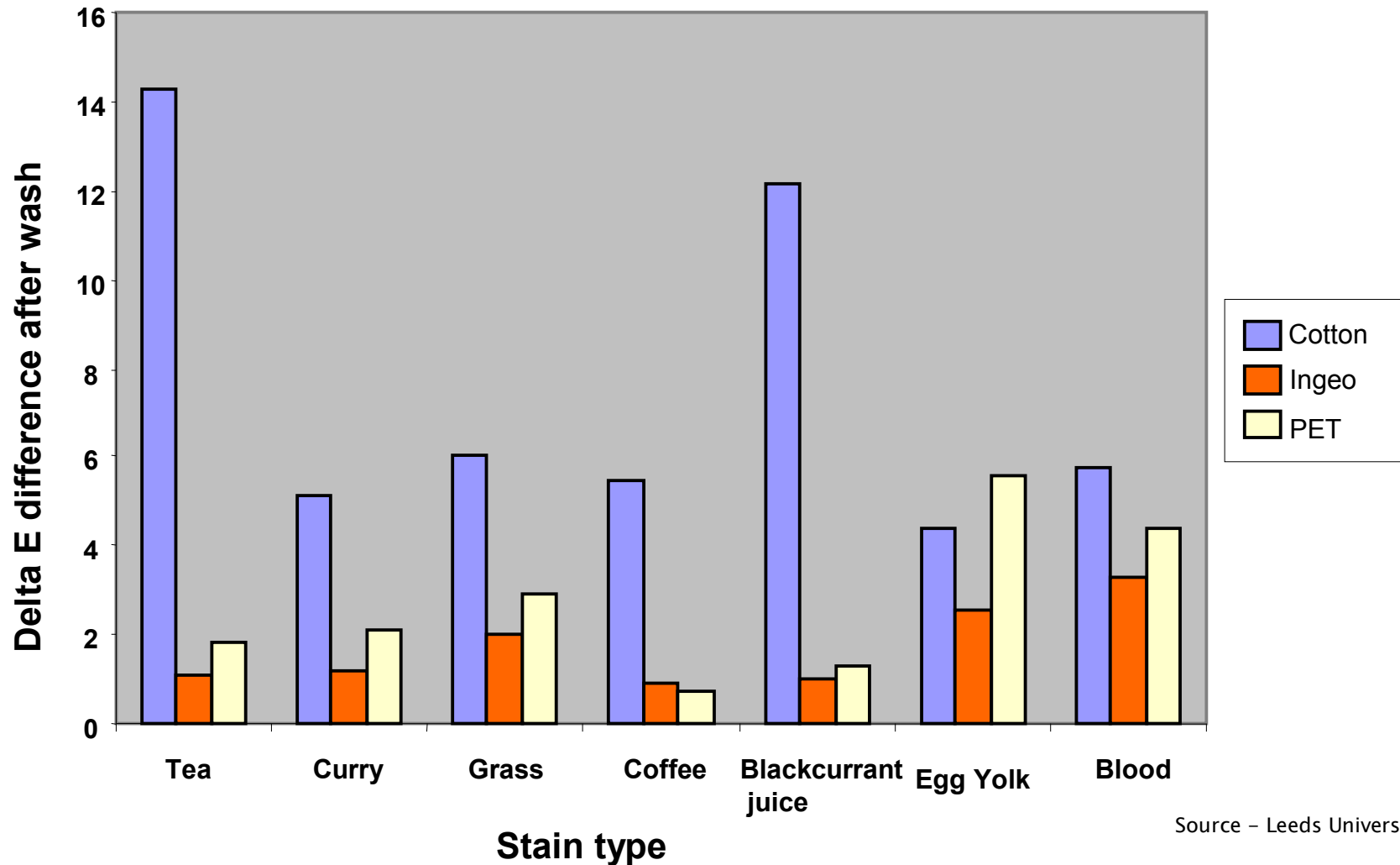
### Drying Times





## Features and Additional Performances

### Superior stain release



Source – Leeds University





## Features and Additional Performances

### Comparison with Soybean and Bamboo

Fabric - Ne30, .bird's eye pique, 230gsm

Technical Bulletin 160504

Test		Ingeo fibre	Soy	Bamboo
Wash & tumble dry shrinkage (%) AATCC 135 - 2004 IIIA	1 wash width	+0.0	-1.5	+3.5
	1 wash length	-1.3	-13.8	-15.5
	3 wash width	+0.2	-2.3	+4.8
	3 wash length	-2.2	-15.0	-17.2
Appearance after 1 and 3 washes		Satisfactory	Unsatisfactory	Unsatisfactory
Time to total dry after spin dry (hour)*		2	24	24
Pilling (ASTM D3512)		4.0	3.0	3.5
Wicking (Modified STR-TP-118) Distance in mm, after 5 min (width/length average)		15.8	1.5	7.5
Flammability (16 CFR 1615 / 1516) Char length, inch (width/length average)	Original	4.7	10+	10+
	50 x washing	4.6	10+	10+

**Ingeo™ fibre  
has superior  
performance:**

- Wash shrinkage
- After wash appearance
- Drying time
- Pilling
- Wicking
- Flammability








\*Tested by University of Bolton, UK  
All other tests by Specialised Technology Resources (HK) Ltd

	Better
	Worse
	Similar



## Care claims

**U.S.A**

	<b>Machine Wash Cold, Normal Cycle, 30°C / 85°F</b>
	<b>- or -</b>
	<b>Hand Wash Cold, 30°C / 85°F</b>
	<b>- or -</b>
	<b>Dry clean</b>
	<b>Non-Chlorine Bleach When Needed</b>
	<b>Tumble Dry, Permanent Press, Medium Heat</b>
	<b>Do Not Iron</b>
	<b>- or -</b>
	<b>Iron, Low Heat (110°C / 230°F)</b>



## **Ingeo™ fibre apparel Guideline Specifications and Test Methods**

<b>Property</b>	<b>Test Method</b>	<b>Specification</b>
<b>Wash shrinkage - jersey</b>	<b>AATCC 135-01, IV Aiii</b>	<b>+/- 6%</b>
<b>Pilling</b>	<b>ASTM D3512</b>	<b>3 - 4</b>
<b>Burst Strength</b>	<b>ASTM D3787</b>	<b>65lb-f</b>
<b>Light Fastness</b>	<b>AATCC 16E, 20 hr</b>	<b>4</b>
<b>Washing Fastness</b>	<b>AATCC61 I A, 40 °C</b>	<b>3 (change) 3 - 4 (stain on nylon)</b>
<b>Rubbing Fastness</b>	<b>AATCC 8</b>	<b>3 - 4 (wet) 3 - 4 (dry)</b>



## Ingeo™ Apparel Adoptions



PIERLUIGI FUCCI



A-STYLE



TWIN CITY



COPCOPINE



BAGUTTA



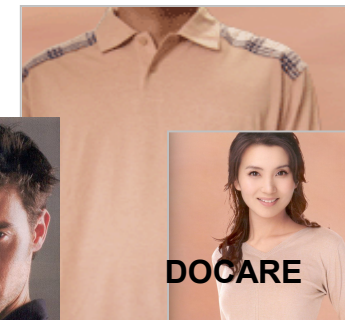
BILANCIONI



VERSACE  
SPORT



NAPAPIRJI



DOCARE



ARMANI





## Apparel Hang Tags



- Underwear/Outwear pure and blend hang tags
- Multilanguage hang tags
- Available to order with the proper order form  
(considering 15 days for the delivery)





## Summary

- **Ingeo™ fibre products:**
  - **Have sustainability**
  - **Have performance**

**To meet today's market demands**
- **Ingeo™ fibre products:**
  - **Can be easily processed from fibre to end products**
    - **On existing machinery**
    - **With conventional processing**
  - **Simple technical guidelines available**
- **Using these guidelines, commercial products are now on retail counters globally**