



cottonworks™

Sleep Better with Cotton



With hundreds of easily searchable resources, we're your go-to textile tool for discovering what's possible with cotton.

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Type your questions using the Q&A feature at any time during the webinar.



A recording of this webinar will be available on **cottonworks.com**.

# Webinar Support



# Today's Speakers



**Marcy Gang**

Executive Account Manager  
Supply Chain Marketing



Cotton  
Incorporated



**Mary Ankeny**

Vice President  
Product Development &  
Implementation Operations



Cotton  
Incorporated





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Sleep Better with Cotton

# Home as a Sanctuary

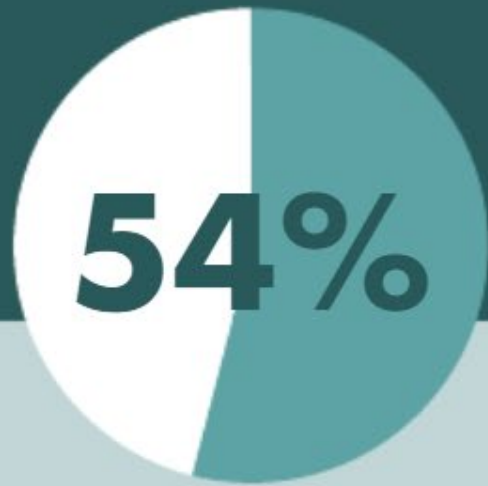
The COVID-19 pandemic has re-shaped consumers' priorities, and has shifted our values, behaviors and habits in an extremely short period of time.

- 66% of consumers say they are staying home more now than they were before the pandemic [1]
- 42% say a “comfortable home” is a top value; just behind “Keeping my family safe” (48%), and “Health and wellness” (47%) [1]
- 55% say they are taking more time for self-care now compared to before the pandemic [1]

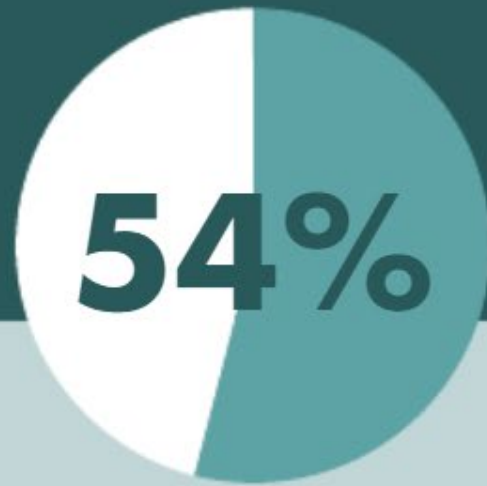
\*Cotton Incorporated's Coronavirus Consumer Response Survey, Wave 7, conducted August 6, 2021



## Consumers are seeking out comfort:



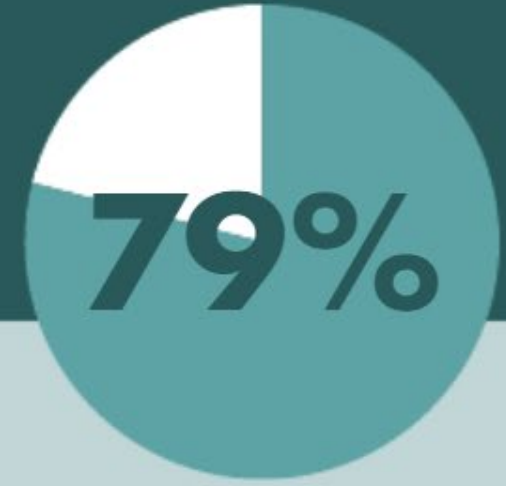
Cooking  
More  
Often



Eating  
Comfort Food  
More Often



Wearing  
Comfortable  
Clothes



Just Want to  
Curl Up in a  
Cozy Bed

# Cotton: Familiar & Loved

80% of consumers say they have purchased sheets made from cotton, while significantly fewer say they have purchased sheets made from polyester (40%), microfiber (38%), rayon from bamboo (13%), rayon (12%) [1]

Nearly all these consumers (98%) described their experience with cotton sheets as positive. [1]

More than 9 out of 10 (91%) who have purchased cotton sheets say they are likely to buy them again the future. [1]

[1] Cotton Incorporated's Lifestyle Monitor, June 2021

# Sheets & Bedding

PRIMARY PURCHASE  
DRIVERS when purchasing

|                |            |
|----------------|------------|
| <b>COMFORT</b> | <b>90%</b> |
| QUALITY        | 86%        |
| DURABILITY     | 83%        |
| SOFTNESS       | 83%        |
| PRICE          | 80%        |

58% of consumers say fiber content is important when purchasing home textiles because it tells them:

|               |     |
|---------------|-----|
| SOFTNESS      | 44% |
| QUALITY       | 42% |
| TEMP CONTROL  | 38% |
| COMFORT       | 37% |
| SWEAT CONTROL | 29% |



# Consumer Preference for Quality

**86%**

Believe quality sheets  
and bedding help  
you sleep better

**73%**

Say 100% cotton is  
important for  
home textiles

**78%**

Consumers willing  
to pay more for  
quality

# Natural Solution

When thinking of sustainability in clothing, consumers connect it with naturalness and low environmental impact, looking for items made of natural fibers, especially cotton.

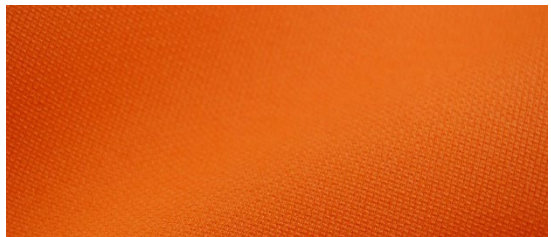
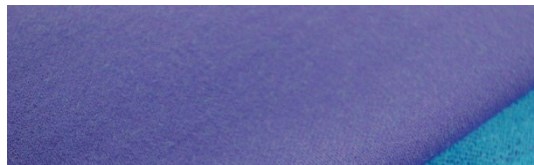
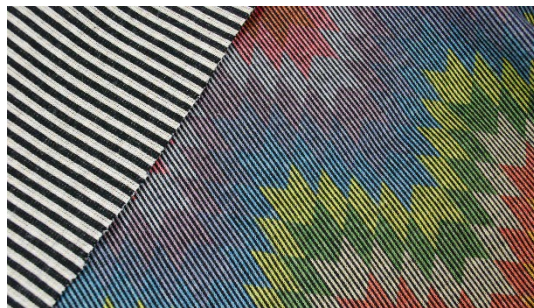
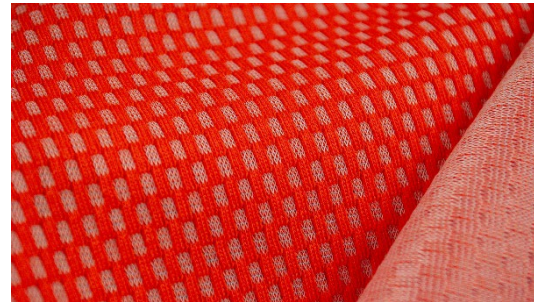
- Cotton is considered the safest of fibers - 88% of consumers consider cotton to be safe for the environment, significantly higher than manmade fibers such as polyester (38%) and rayon (44%).
- What Makes Clothing Sustainable? *Made from natural fibers like cotton (48%) and ability to be recycled (44%)* are the top factors consumers say they look for to determine clothing sustainability.



# FABRIC DEVELOPMENTS



FABRICAST™  
fabriccast information system





# SEARCHABLE FABRICS

If you know what you are looking for, you can search FABRICAST™ directly.

## Filter

Wovens (430), Knits (383)

Fabric Type

Fiber Content

Fabric Weight

Fabric Technology

- ☐ STORM COTTON™ Technology (51)
- ☐ TransDRY™ Technology (51)
- ☐ WICKING WINDOWS™ Technology (17)
- ☐ TOUGH COTTON™ (9)
- ☐ NATURAL STRETCH® (4)
- ☐ STORM DENIM™ Technology (3)

Reset Filters

7186

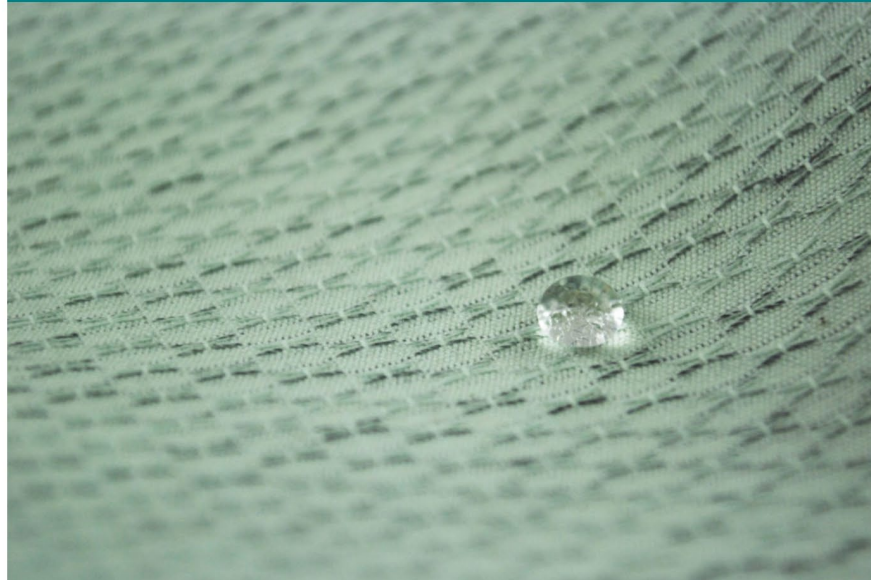
[< Back to Search Results](#) | [Resources](#) > [FABRICAST™](#) > [7186](#)

 Download 3D File

Browzwear 

CLO 

Browzwear files are compatible with version 7.9 and later.



30/1 cotton warp with pick/pick fill, finished with STORM COTTON™ technology

Project  
7186

Fabric Category  
Wovens, 3D Digital Fabrics

Fabric Type  
Dobby - Deflected

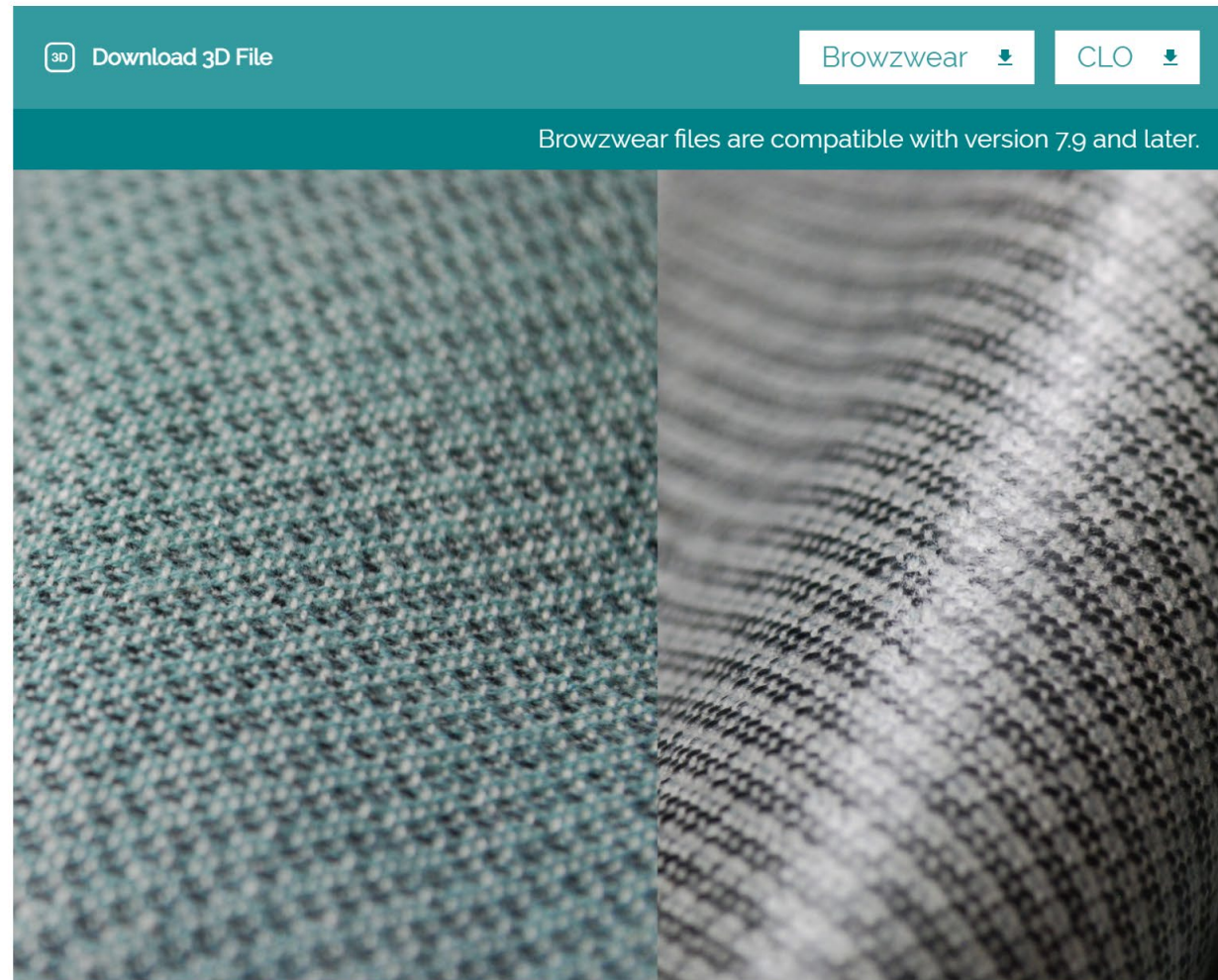
Fiber Content  
94% Cotton/4% Polyester/2% Rayon

Finished Fabric Weight  
6.4 oz/yd<sup>2</sup> - 217 g/m<sup>2</sup>

Technology  
STORM COTTON™ Technology

[ADD TO LIST](#) 

# DIGITAL FABRIC LIBRARY



Laminated two-sided dobby

Project

6994-2

Fabric Category

Wovens, 3D Digital Fabrics, Trending  
Fabrics: Fall/Winter, FABRICAST™  
New Release

Fabric Type

Dobby

Fiber Content

100% Cotton

Finished Fabric Weight

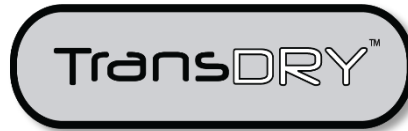
10.2 oz/yd<sup>2</sup> - 347 g/m<sup>2</sup>

ADD TO LIST ?



# MOISTURE MANAGEMENT

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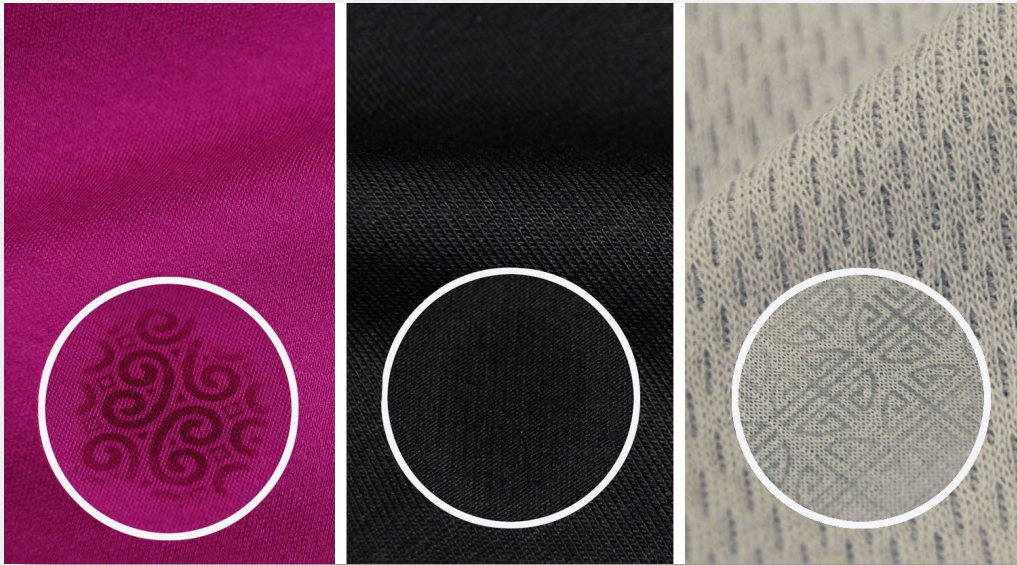


- Permanent yarn treatment
- Reduces cotton's absorbent capacity
- Moves moisture away from the body
- Keeps you cooler and drier
- Versatile across all knit and woven product
- Available in C6 and non-fluorine formulas

# MOISTURE MANAGEMENT

---

## WICKING WINDOWS™



- Print application
- Reduces cotton's absorbent capacity
- Moves moisture away from the body
- Dries more quickly than untreated cotton
- Versatile across all knit and woven product categories



# DURABILITY

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## TOUGH COTTON™

UNTREATED  
COTTON



---

TOUGH  
COTTON™



- Engineered finish to dramatically improve abrasion resistance, durability and strength of cotton fabrics
- Available in resin and non-resin versions
- Good hand and sewability



**7215**

*cotton stretch plain weave  
with TransDRY<sup>®</sup> technology*





**SK-2057-1A**

cotton/spandex jersey with  
WICKING WINDOWS™ + PCM Technology







100% cotton sheeting with  
WICKING WINDOWS™ + PCM Technology





**SK-2057-1A**

cotton/spandex jersey with  
WICKING WINDOWS™ + PCM Technology







**7278**

*100% cotton hypertexture dobby weave,  
minimally processed*





**7258**

100% cotton sateen sheeting +  
TOUGH COTTON™ technology

 cottonworks™





**7082-5**    *napped double face dobby*



**7128**    *highly napped double face dobby*





# Cotton Sleep/Loungewear



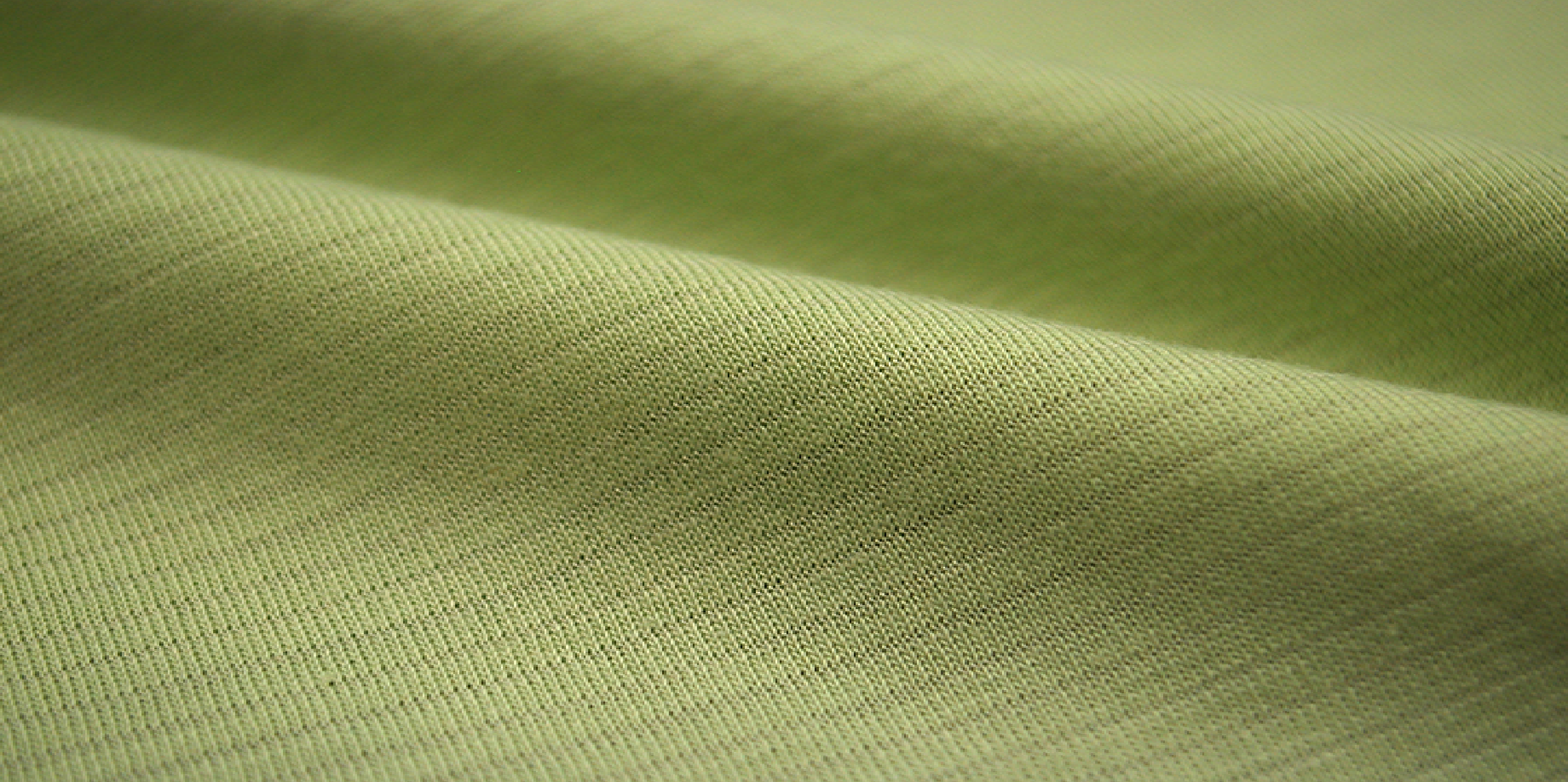


**SK-2109-1B**

*sueded stretch cotton plated jersey +  
TransDRY® technology*

 cottonworks™





**SK-2111-2**

*cotton rich jersey with TransDRY<sup>®</sup> technology &  
XT2<sup>®</sup> antimicrobial technology*

 cottonworks™



[MGang@cottoninc.com](mailto:MGang@cottoninc.com)  
Marcy Gang | *Executive Account Manager*





# The Body's Environment

A sleeping system (sheets and pajamas) along with air temperature and humidity creates a thermoneutral environment.

| Measurable Attributes  | Range                          |
|------------------------|--------------------------------|
| Human Core Temperature | 36°C – 38°C (96.8°F – 100.4°F) |
| Skin Temperature       | 28°C -32.5°C (82.4°F – 90.5°F) |
| Optimum Humidity Level | 40% - 60%                      |

In a hot ambient environment:

- Type of sleepwear and bed covers have a stronger impact than under cold ambient environment.
- More disrupted sleep patterns and increased periods of wakefulness.

# Factors Impacting a Good Night's Sleep

- Complex interaction of microclimates happen between skin-sleepwear; and sleepwear-bedsheet.
- $\uparrow$  in microclimate temperature  $\geq 2^{\circ}\text{C}$  the neutral range will result in reduced sleep quality.
- Levels of humidity above the optimum range will negatively impact sleep.
- Ambient conditions also influenced by room temperature, humidity and airflow.
- Poor quality sleep has direct impact on health, physical and cognitive performances.



Second microclimate (Sleepwear-Bedsheet)

First microclimate (Skin-Sleepwear)

Buguet, A., Allin, L., Dittmar, A., Muzet, A., Peyrin, L., & Roussel, B. 1983. Human reactions to chronic heat. *Proc Int Union Physiol Sci*, 101.

Libert, J.P., Di Nisi, J., Fukuda, H., Muzet, A., Ehrhart, J., & Amoros, C. 1988. Effects of continuous heat exposure on sleep stages in humans. *Sleep*, 11, 195-209.

Okamoto-Mizuno, K., Tsuzuki, K., & Mizuno, K. 2005a. Effect of humid heat and exposure in later sleep segments on sleep stages and body temperature in humans. *Int. J. Biometeorol.*, 49, 232-237.

Tsuzuki, K., Okamoto-Mizuno, K., & Mizuno, K. 2004. Effects of humid heat exposure on sleep, thermoregulation, melatonin, and microclimate. *J. Therm Biol.*, 29, 31-36.



# Sleep Study Design

Study conducted at RMIT University in Australia

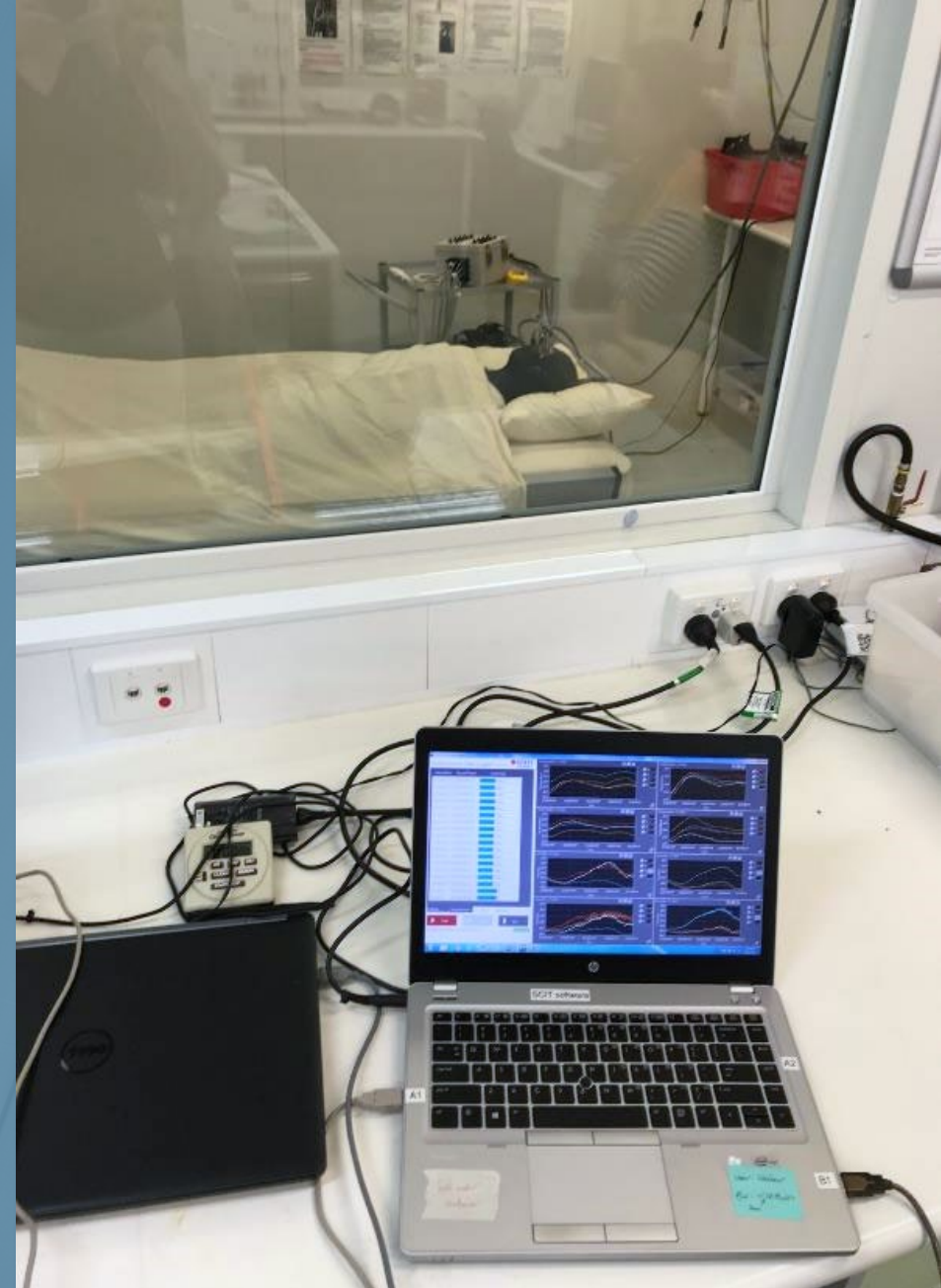
Thermal manikin (Newton) was our subject

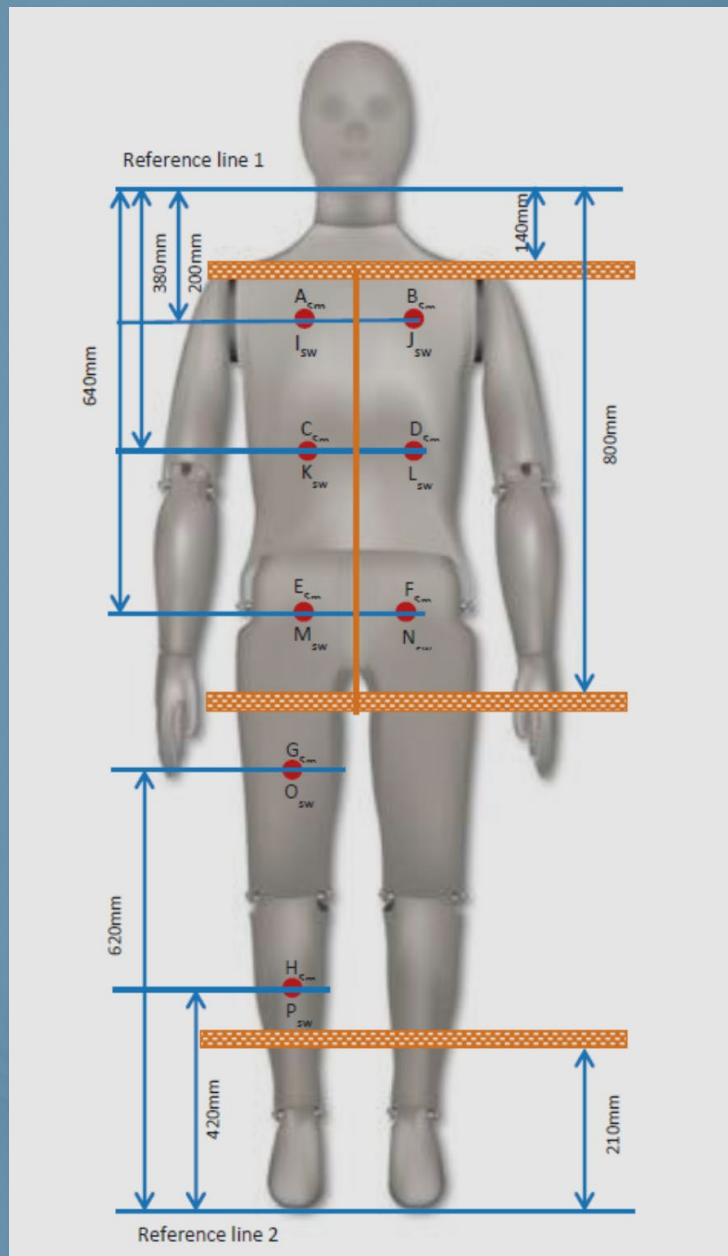
Newton was programmed to simulate skin temperatures and trans-epidermal water loss (perspiration) conditions of a person sleeping in hot thermal conditions.

Factors considered during the experiment

- Thermal environment
- Types of sleeping systems (sheets & sleepwear)
- Human skin temperature
- Trans-epidermal water loss during sleep (perspiration)
- Number of sleep stages and their duration.

Complete experiment housed in a climate-controlled chamber.





Sensor positioning on the manikin



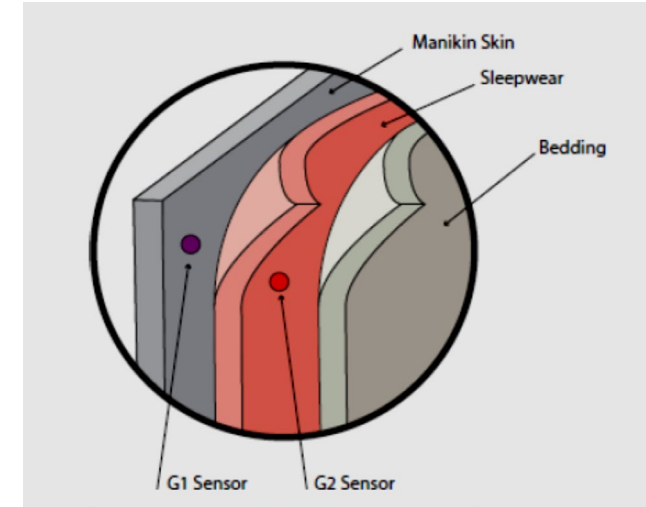
Manikin in supine sleeping position with the sensors attached



# Sleep Study Design

## Sleep System Combinations

| BEDDING / SLEEPWEAR                   | Ensemble A        | Ensemble D           | Ensemble E              |
|---------------------------------------|-------------------|----------------------|-------------------------|
| Fitted Sheet                          | 100% Cotton woven | 100% Polyester woven | 60% Cot/ 40% Poly woven |
| Flat Sheet                            | 100% Cotton woven | 100% Polyester woven | 60% Cot/ 40% Poly woven |
| Pillow Cover                          | 100% Cotton woven | 100% Polyester woven | 60% Cot/ 40% Poly woven |
| Sleepwear                             | 100% Cotton knit  | 100% Polyester knit  | 60% Cot/ 40% Poly knit  |
| Fitted Sheet (wt.) oz/yd <sup>2</sup> | 3.6               | 3.2                  | 3.9                     |
| Sleepwear (wt.) oz/yd <sup>2</sup>    | 4.7               | 5.0                  | 5.1                     |

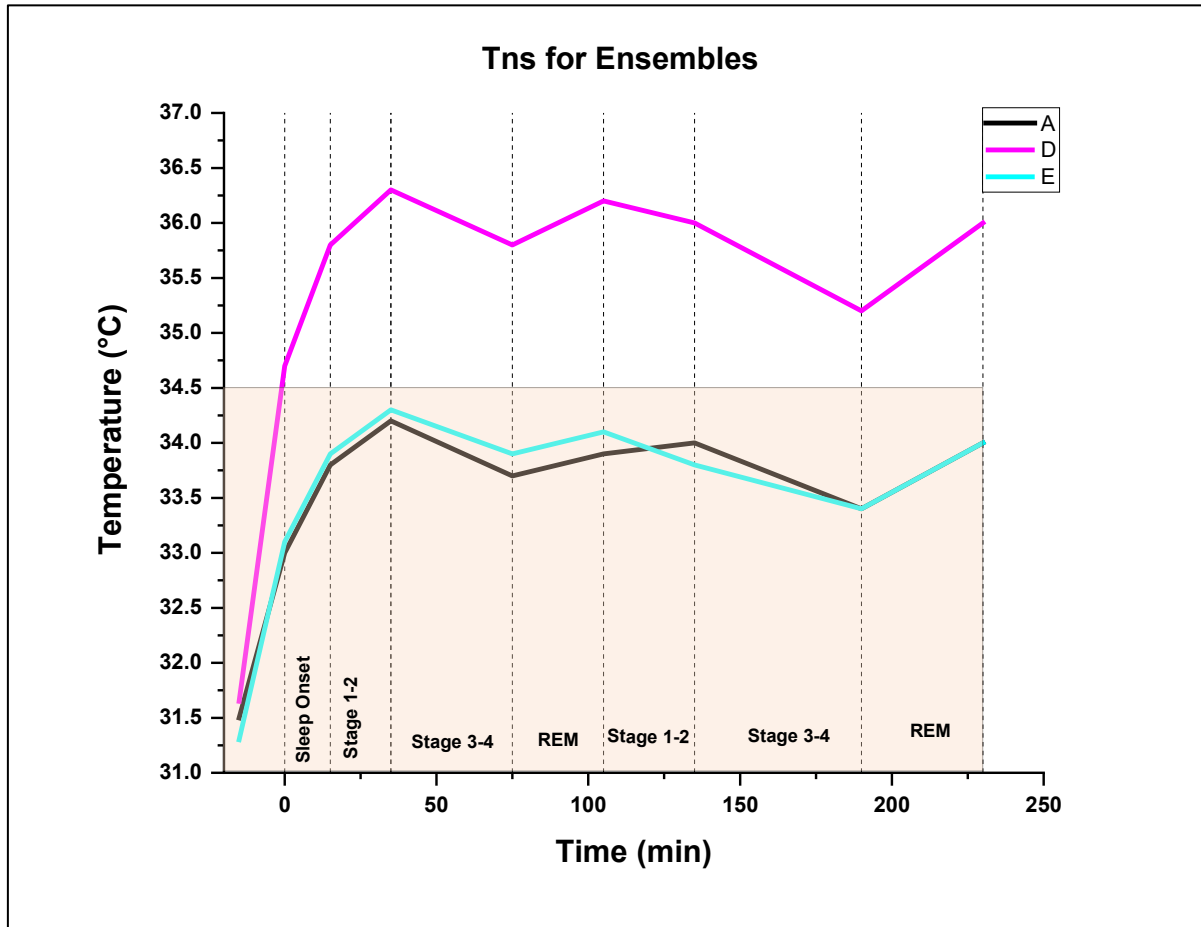


## Sleep Protocol Stages

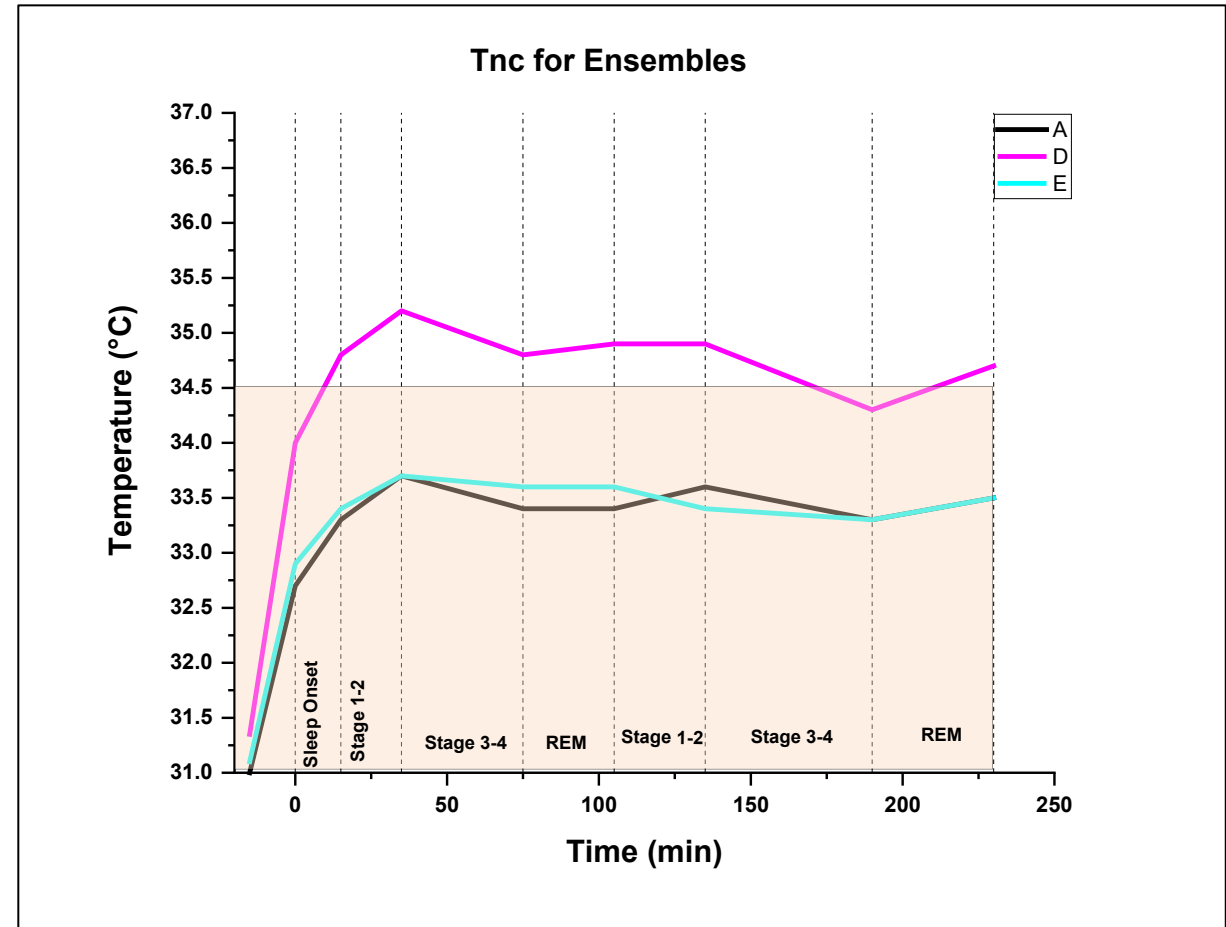
| STAGE OF SLEEP | Start time | End time | Minutes |
|----------------|------------|----------|---------|
| Sleep onset    | 0:00       | 15:00    | 15      |
| Stage 1&2      | 15:00      | 35:00    | 20      |
| Stage 3&4      | 35:00      | 75:00    | 40      |
| REM            | 75:00      | 105:00   | 30      |
| Stage 1&2      | 105:00     | 135:00   | 30      |
| Stage 3&4      | 135:00     | 190:00   | 55      |
| REM            | 190:00     | 230:00   | 40      |
| Total          |            |          | 230     |

# Temperature Measurements

Temperature next to skin



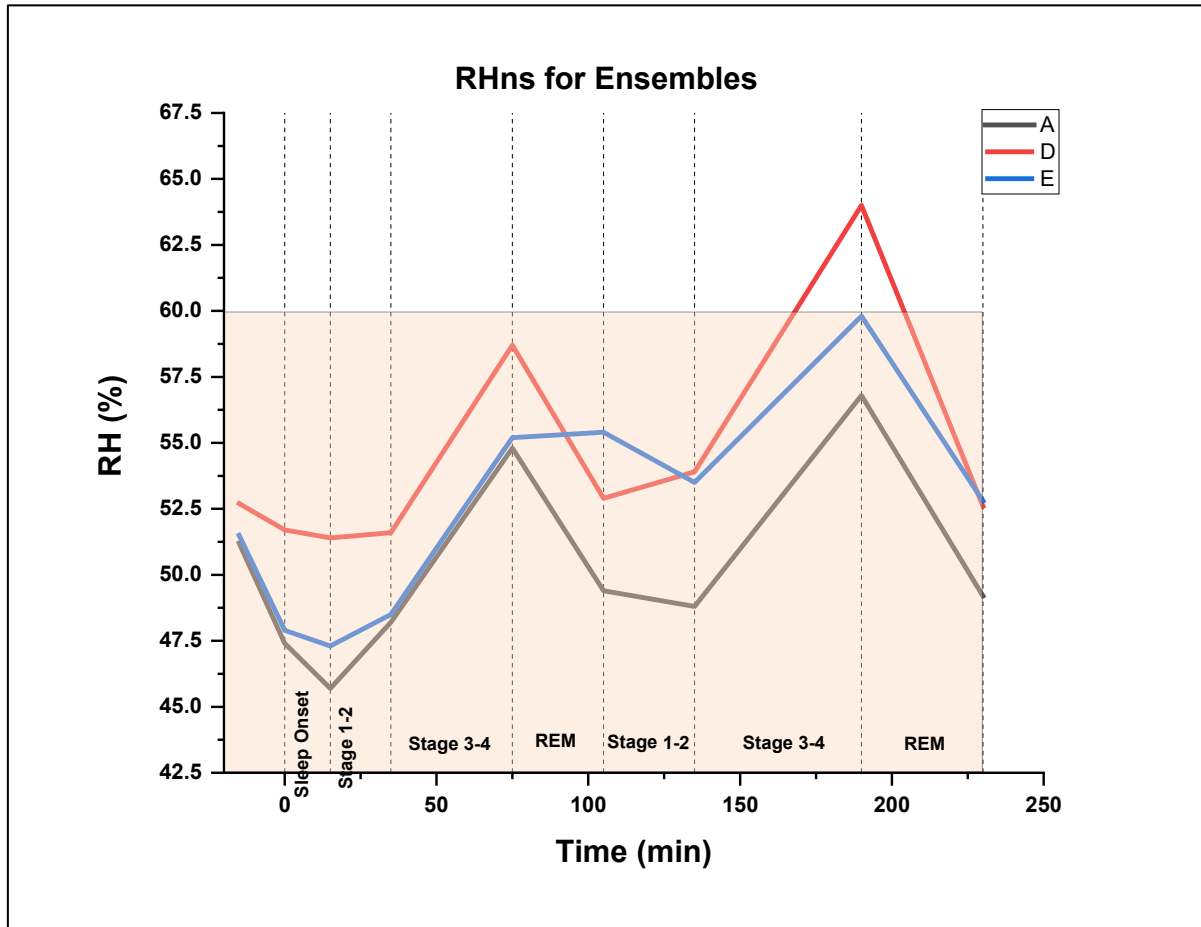
Temperature next to clothing



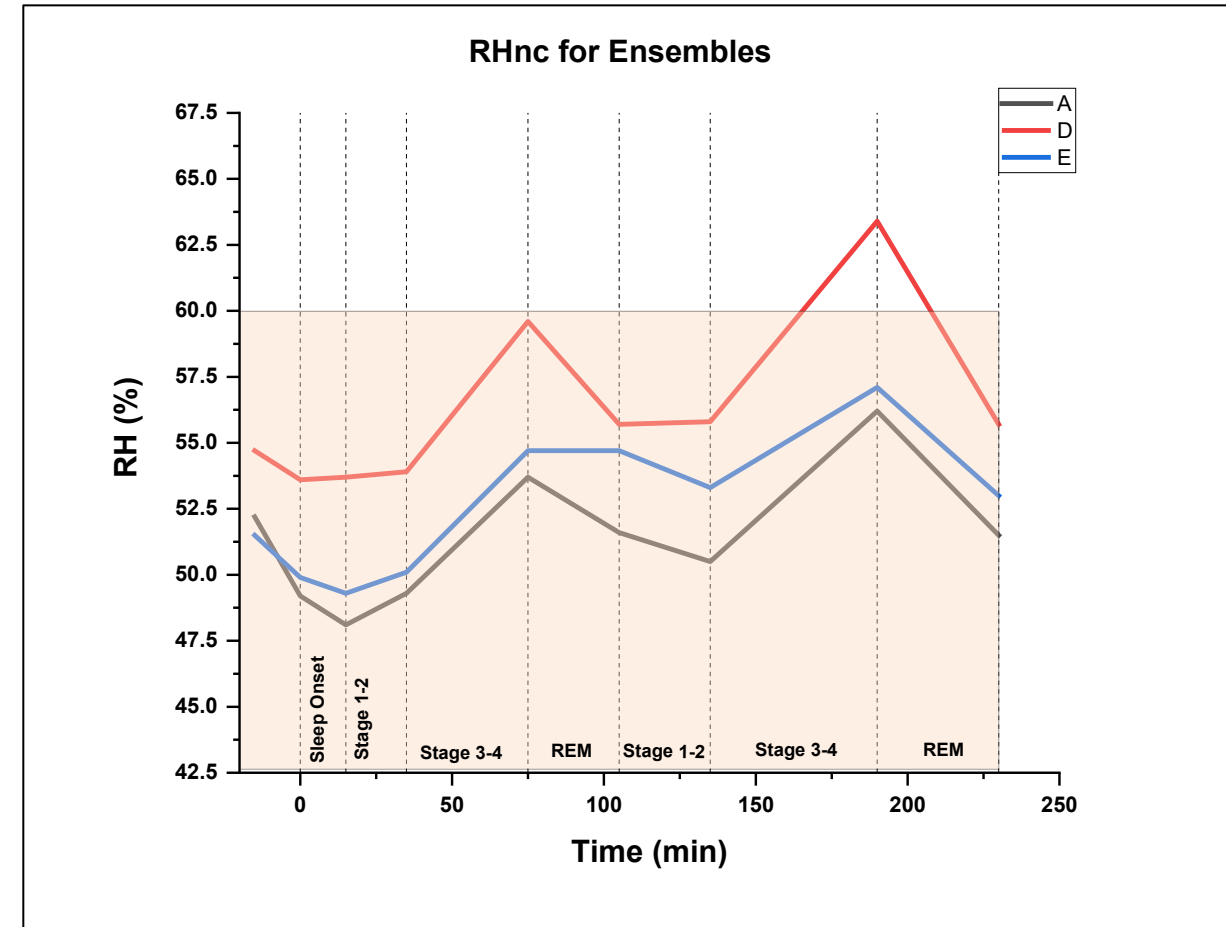


# Relative Humidity Measurements

Relative humidity next to skin



Relative humidity next to clothing



# Cotton Absorbency and Wicking

- Cotton is synonymous with comfort as it can naturally absorb moisture.
- Cotton is also able to efficiently wick moisture, allowing it to spread across the surface of the fabric and evaporate.

|                             | Cotton,<br>0 HLTD | Polyester,<br>0 HLTD | Cotton,<br>20 HLTD | Polyester,<br>20 HLTD |
|-----------------------------|-------------------|----------------------|--------------------|-----------------------|
| Water Drop Face<br>(sec)    | 6.6               | 7.0                  | 0.8                | 60                    |
| Water Drop Back<br>(sec)    | 6.6               | 4.0                  | 0.8                | 60                    |
| Horizontal Wick<br>(mm/sec) | 93.64             | 0.0                  | N/A                | N/A                   |

- Polyester must be treated with a chemical finish to allow it to wick moisture through its surface, mimicking absorption
  - Once that finish has been removed, the polyester is no longer able to move moisture and water drops will sit on the surface.



# Cotton is KIND to your SKIN

Clinical evaluation for skin sensitivity

Two types of cotton tested

- Natural cotton
  - Mechanically cleaned
  - Hydrophobic
- Purified cotton
  - Scoured and whitened
  - Hydrophilic



# The Test Lab

Product Investigations Inc.

Human Repeat Insult  
Patch Test (HRIPT)





# Who Was Tested?

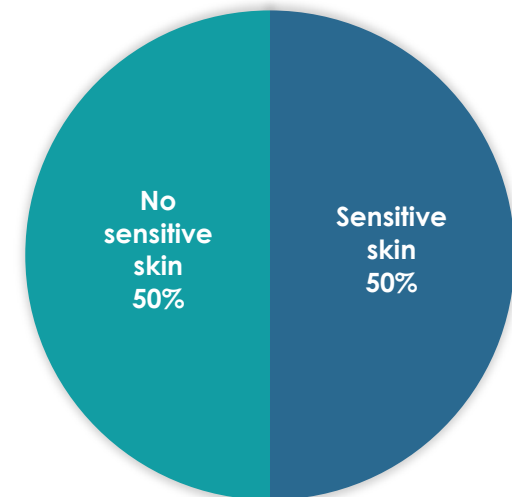
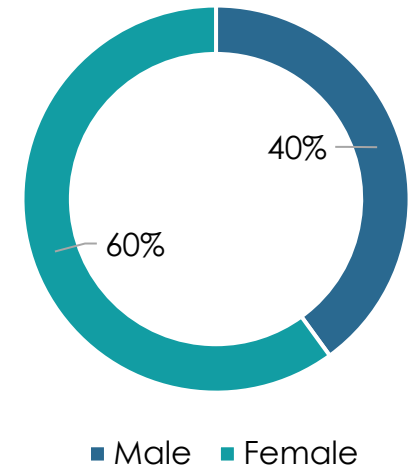
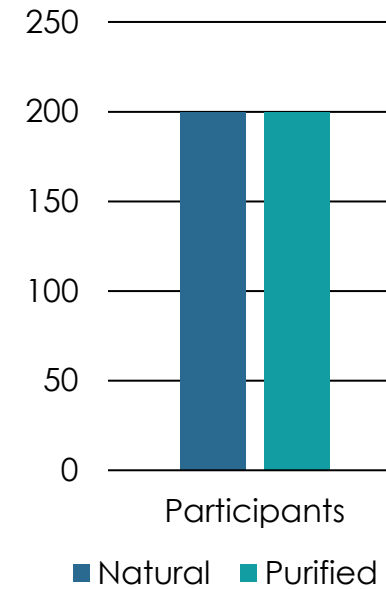
200 participants

- Natural Cotton
- Purified Cotton

50% self-perceived sensitive skin

Ages 18-84

60/40 Female to Male Ratio



# THE TEST: Human Repeat Insult Patch Test (HRIPT)

- Contact Dermatitis
- Test Regime
  - Induction Phase
  - Rest
  - Challenge Phase





# GRADING SCALE: Challenge phase

- Same patches 4cm X 4cm
- Natural & Purified Cotton
- Two sites:
  - Initial induction
  - Naïve
- 24 hours later grading:
  - 15-20 minutes
  - 24 hours
  - 48 hours
  - 72 hours

0



1



2



3



4



# THE DATA

## Zero Irritation Responses

- Registered all “0”
  - No observable irritation was recorded
- Sensitivity Test = Pass
- Dermatologist-Reviewed

| GRADE | TYPE OF RESPONSE                     | INDUCTION PHASE | CHALLENGE PHASE       |                    |
|-------|--------------------------------------|-----------------|-----------------------|--------------------|
|       |                                      |                 | ORIGINAL CONTACT SITE | NAIVE CONTACT SITE |
| 0     | NO VISIBLE CHANGE                    | 215 SUBJECTS    | 214 SUBJECTS          | 214 SUBJECTS       |
| 1     | FAINT REDNESS, UNDEFINED BORDER      | 0 “             | 0 “                   | 0 “                |
| 2     | INTENSE REDNESS, DEFINED BORDER      | 0 “             | 0 “                   | 0 “                |
| 3     | REDNESS + DEFINITE EDEMA             | 0 “             | 0 “                   | 0 “                |
| 4     | REDNESS + PAPULES, OR VESICLES, ETC. | 0 “             | 0 “                   | 0 “                |
|       | NO. OF RESPONDERS                    | 0 SUBJECTS      | 0 SUBJECTS            | 0 SUBJECTS         |
|       | NO DATA ACQUIRED                     | 0 SUBJECTS      | 1 SUBJECT             | 1 SUBJECT          |

| GRADE | TYPE OF RESPONSE                     | INDUCTION PHASE | CHALLENGE PHASE       |                    |
|-------|--------------------------------------|-----------------|-----------------------|--------------------|
|       |                                      |                 | ORIGINAL CONTACT SITE | NAIVE CONTACT SITE |
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| 4     | REDNESS + PAPULES, OR VESICLES, ETC. | 0 “             | 0 “                   | 0 “                |
|       | NO. OF RESPONDERS                    | 0 SUBJECTS      | 0 SUBJECTS            | 0 SUBJECTS         |
|       | NO DATA ACQUIRED                     | 0 SUBJECTS      | 1 SUBJECT             | 1 SUBJECT          |



# Cotton Washes Clean

- Odor builds up more slowly on cotton fabrics than on polyester fabrics
  - You may need to wash your cotton fabrics less which is better for the environment
- Cotton fabrics wash cleaner than polyester as odor is more effectively removed
- Studies indicate that odor is more cumulative on polyester
  - Polyester has a higher odor intensity both before and after laundering than cotton



# Sleep peacefully knowing your cotton sheets are ENVIRONMENTALLY FRIENDLY

- Cotton biodegrades in natural environments.
- The cotton fibers shed during laundering will biodegrade in wastewater, fresh water, coastal sea water, or on land.
- Testing has shown that polyester fibers shed during laundering and abrasion will not degrade.
  - Organisms in the environment do not recognize polyester as a food source.
  - Cotton is composed of glucose, which is a food source for microbes, bacteria, and fungi.



[1] Smith, S., Ozturk, M., Frey, M., *Soil Biodegradation of Cotton Fabrics Treated with Common Finishes*, Cellulose, March 17, 2021.; [2] Zambrano, M., Pawlak, J., Daystar, J., Ankeny, M., Cheng, J., Venditti, R., *Microfibers Generated from the Laundering of Cotton, Rayon, and Polyester based Fabrics and their Aquatic Biodegradation*, Marine Pollution Bulletin, 142 (2019), pp. 394-407.; [3] Zambrano, M., Pawlak, J., Daystar, J., Ankeny, M., Goller, C., Venditti, R., *Aerobic Biodegradation in Freshwater and Marine Environments of Textile Microfibers Generated in Clothes Laundering: Effects of Cellulose and Polyester-based Microfibers on the Microbiome*, Marine Pollution Bulletin 151 (2020) 110826.





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Sleep Better with Cotton

# Cotton Home Textiles

Topics > Retail & Marketing > Home Textiles

ADD TO LIST ?

## Cotton—Delivering All the Comforts of Home

When it comes to designing a comfortable living space, research tells us that consumers love cotton. After all, it's soft, natural, breathable, and hypoallergenic—everything your customers want for their homes. Absorbent towels. Fluffy blankets. Cool sheets. Easy-to-clean fabrics. From bedding and linens to upholstery, curtains, and more—there's something comforting and cozy about cotton textiles.

That's why cotton remains the number one fiber preferred for home textile products in the U.S. consumer market.<sup>1</sup> Products made with cotton reassure customers that they're getting a natural product that's sure to be comfortable and durable.

Known for its quality, cotton offers high performance in its most natural state—and can also be enhanced with technology for improved absorption, temperature regulation, cooling, breathability, and moisture management for the most comfortable home textiles.



## Cotton Home Textiles

Why does cotton remain the number one fiber preferred for home textile products\*?

Find out more at:  
**cottonworks.com/  
cotton-home-textiles**

\*Cotton Incorporated's 2020 Home Textile Consumer Survey.



# Webinars

## PAST WEBINARS:

Fabric Defects 101:  
Understanding &  
Overcoming Pilling

Pathways to Progress:  
Measuring  
Improvements Towards  
the 10-Year  
Sustainability Goals

Pathways to Progress:  
Increasing Cotton's  
Water Productivity

Emerging Consumers:  
Back-to-School Buying  
Behaviors Post-  
Pandemic

Pathways to Progress:  
Digging Deeper into  
Soils

Pathways to Progress:  
Reducing Climate  
Impacts in Agriculture

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