

ECOSIL<sup>®</sup>  
SAMIL SPINNING



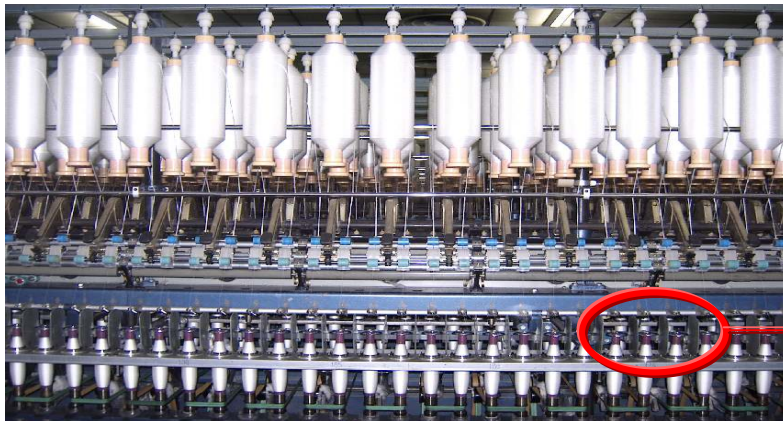
SAMIL SPINNING CO., LTD.

- ◆ Registered trademark of yarn produced by very innovative and advanced technology by using the machine newly adopted by Samil Spinning, based on Lenzing's TENCEL, MODAL, VISCOSE RAYON, PREMIUM MODAL etc.
  
- ◆ ECOSIL, a compound word of ECO, a shortened word of ECOLOGY, and a Korean word SIL(yarn).

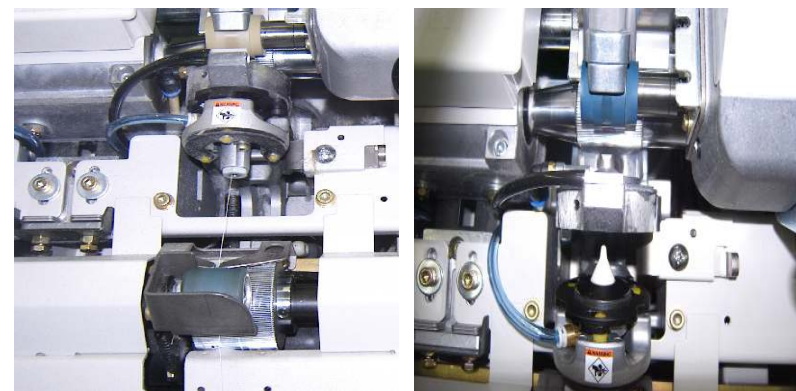
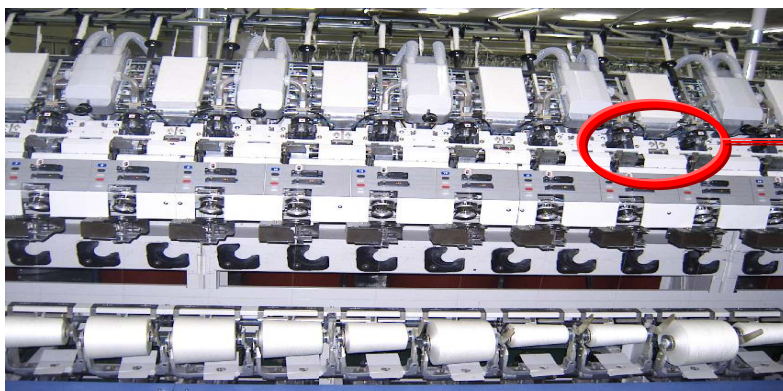
# Yarn making process

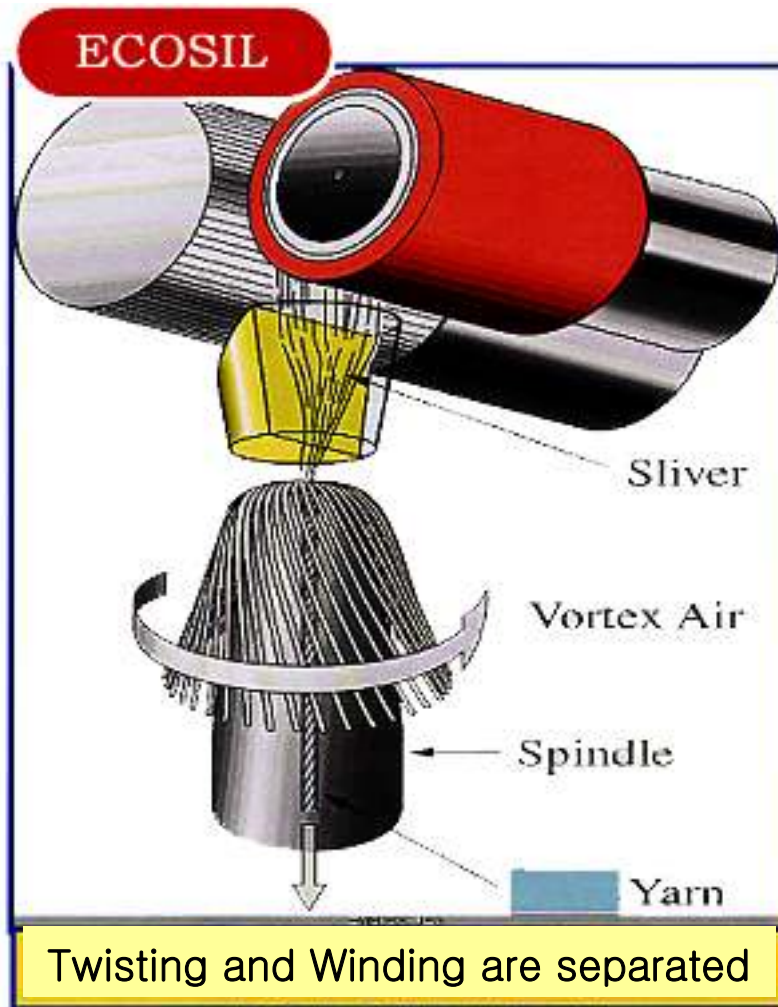


## 1. Traditional spun yarn production system – ring yarn

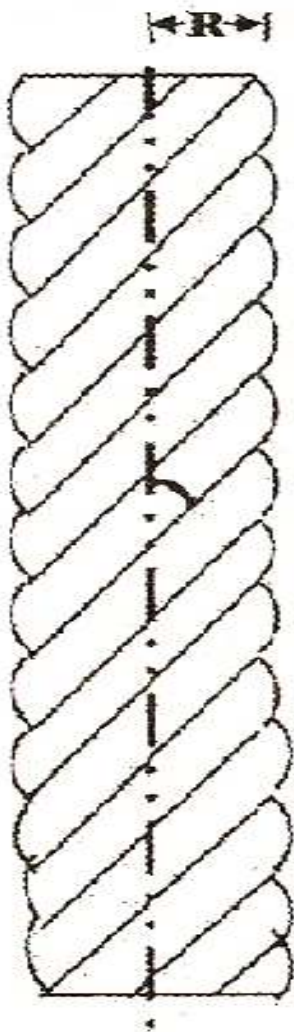


## 2. ECOSIL spun yarn production system– ECOSIL yarn





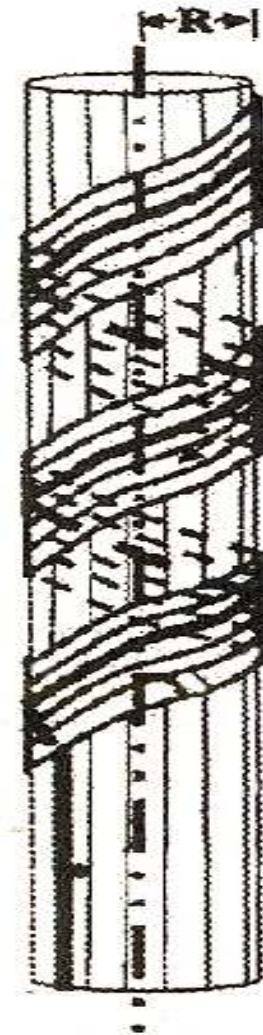
□ Rough view of yarn



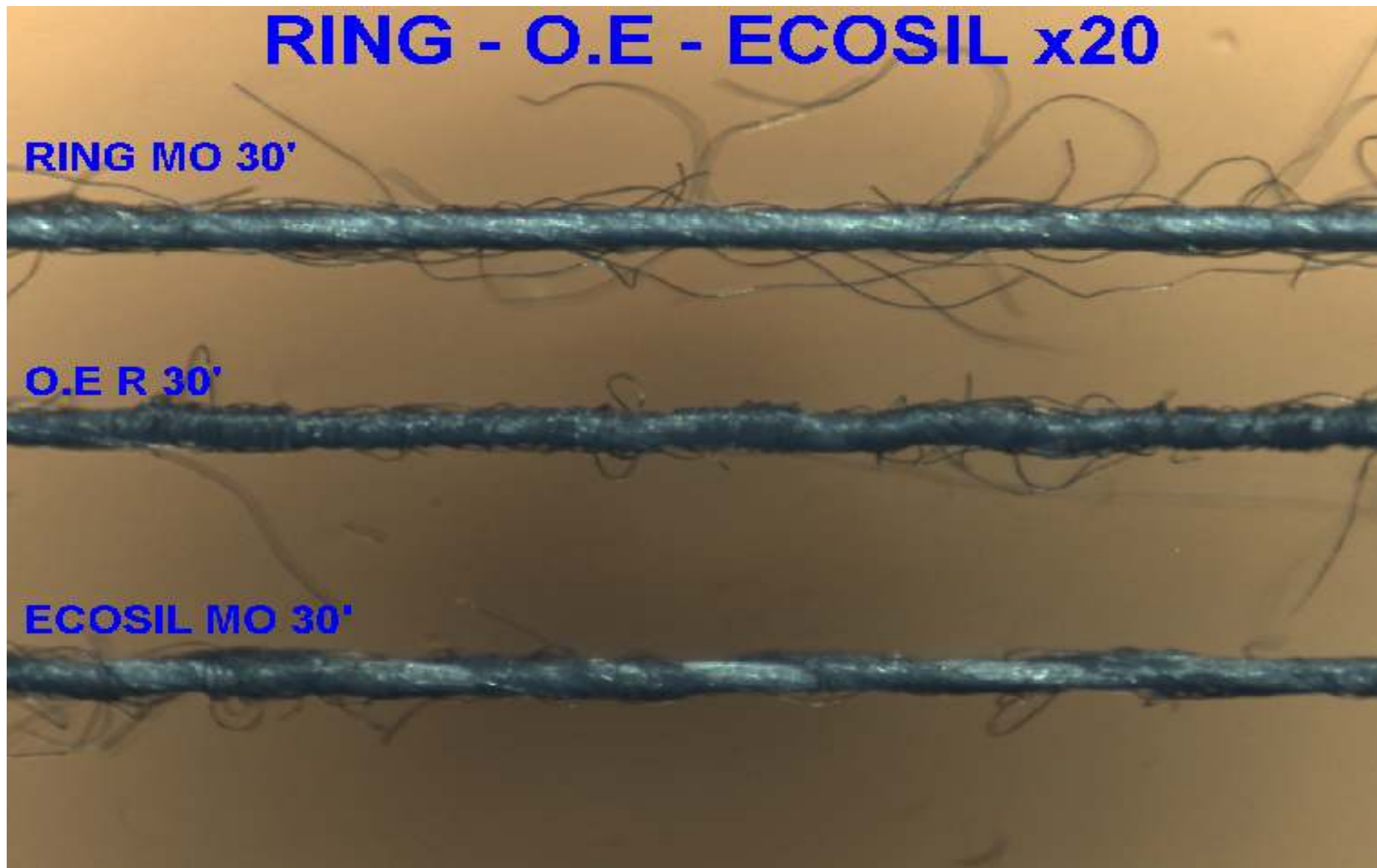
Ring  
yarn



Rotor yarn

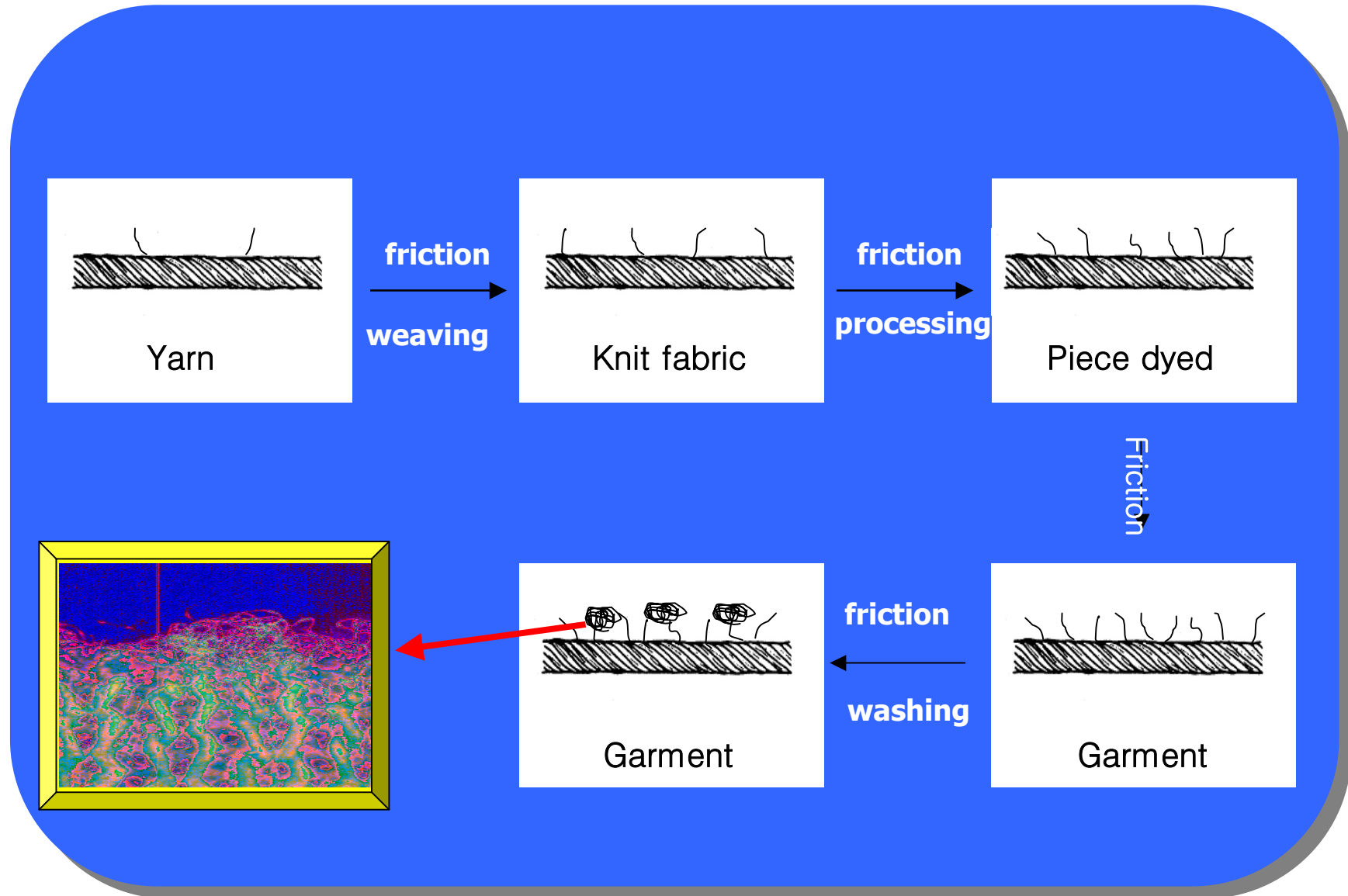


Ecosil



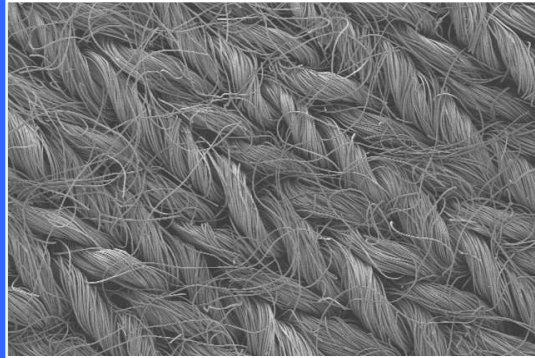
1. Less Hairiness & Clear Appearance
2. Resistance to pilling & Abrasion
3. Moisture Absorption & Wash Resistance
4. Stability against Deformation

# □ Pilling mechanism

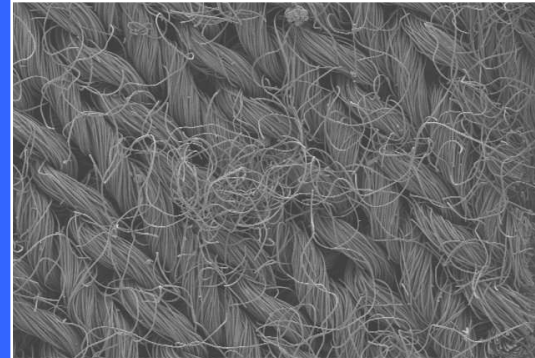




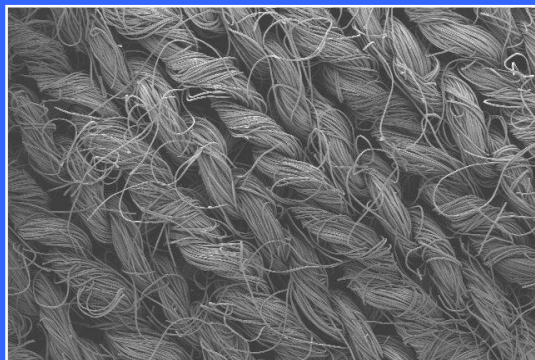
■ RING Viscose



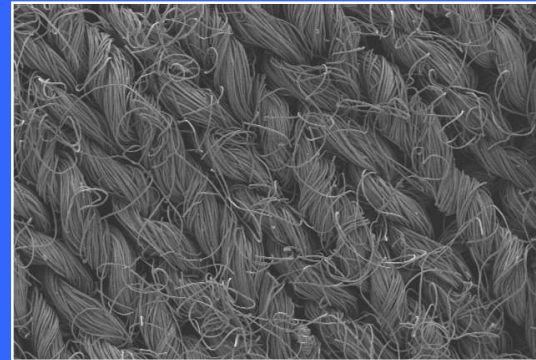
→  
Pilling test



■ ECOSIL Viscose

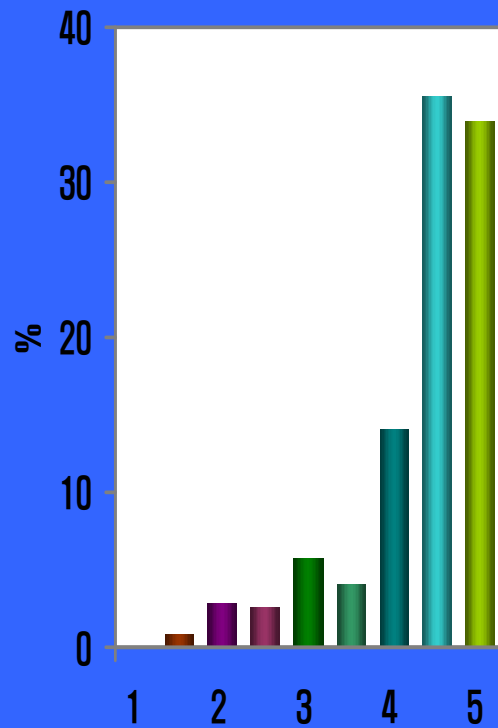


→  
Pilling test



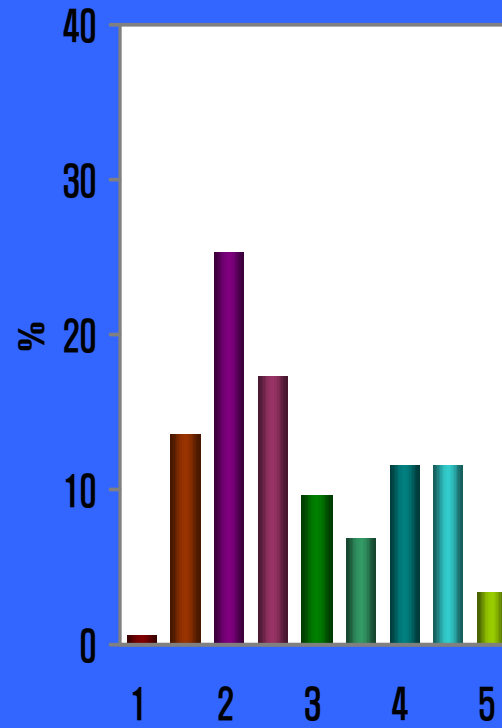
Item	Method	Effect	Remarks
Burning	Burning fine hairs with flame etc.	0.5–1 grade improvement	<ul style="list-style-type: none"> <li>•Temporary effect(fine hairs may recur by friction)</li> <li>•Not applicable to spandex mixture</li> </ul>
Anti-pilling agent treatment	Inhibiting fine hairs by preventing slip between fabrics	0.5 grade or little effect	
Enzyme treatment	Removing fine hairs with enzyme	1 grade at least improvement (for cotton)	<ul style="list-style-type: none"> <li>•Low practicability by serious decrease of strength</li> <li>•High treatment cost</li> </ul>

Woven



Pilling grade

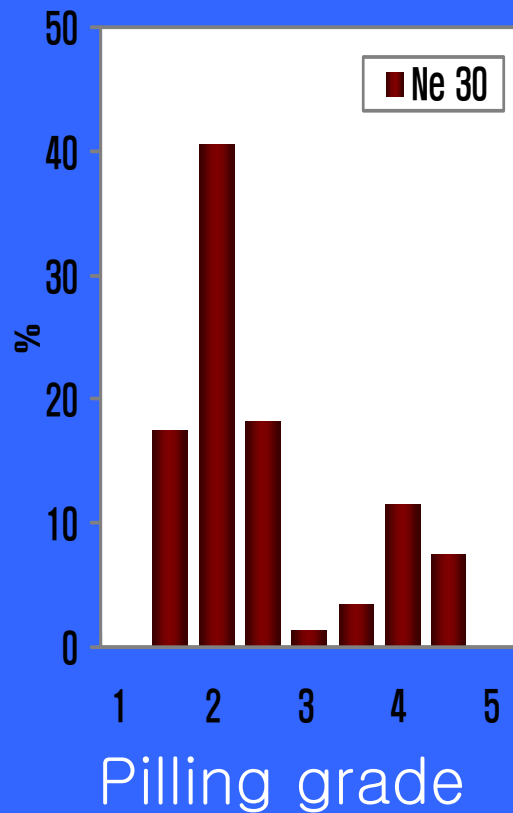
Knit



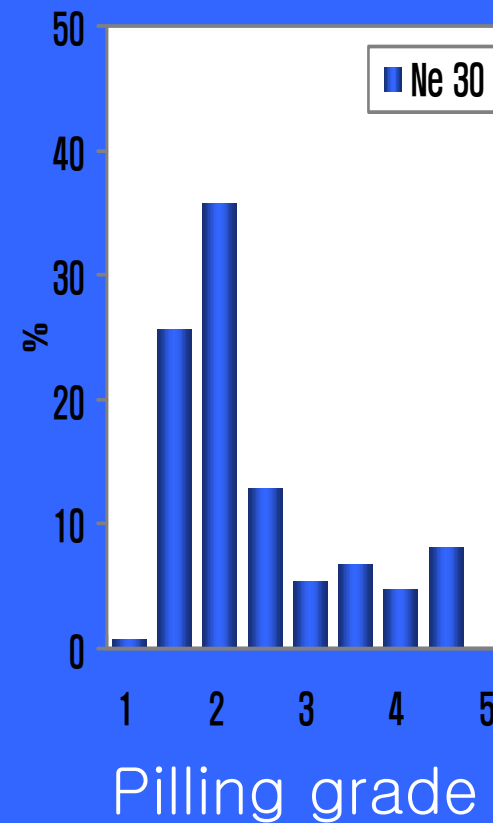
Pilling grade

Woven has relatively higher pilling grade, while knit has lower pilling grade.

JERSEY

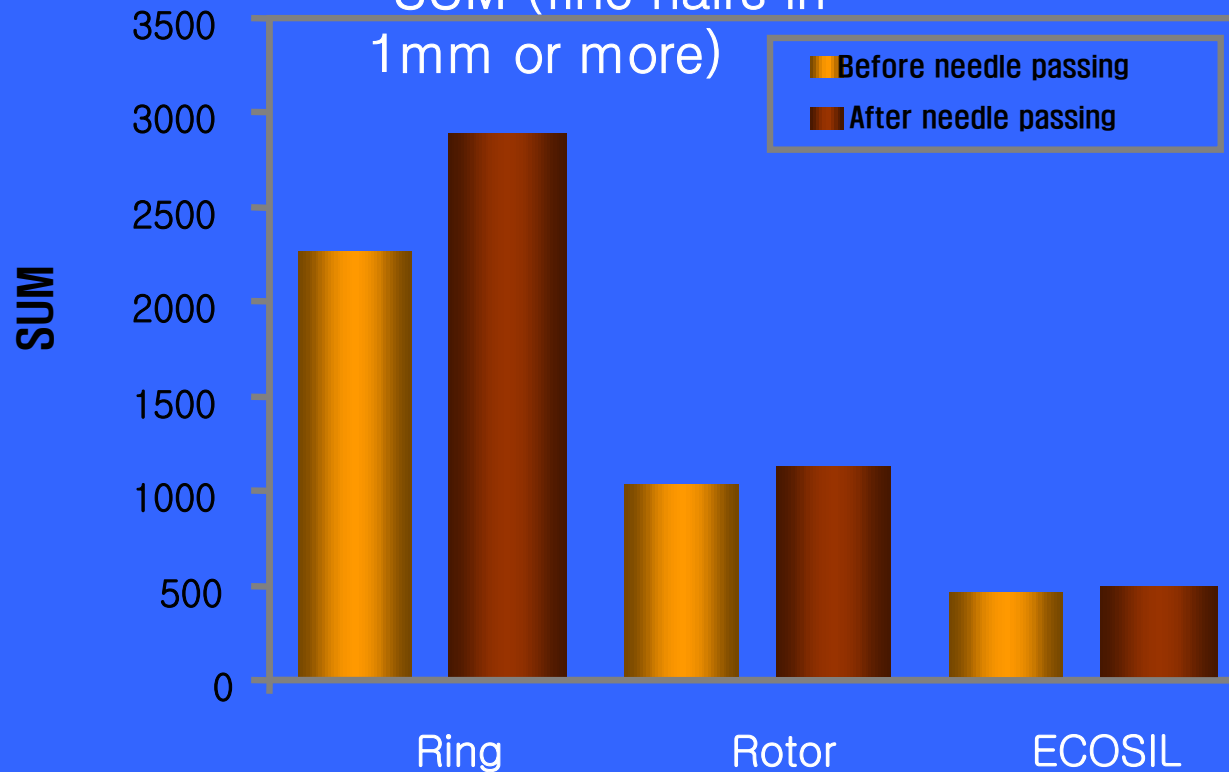


RIB



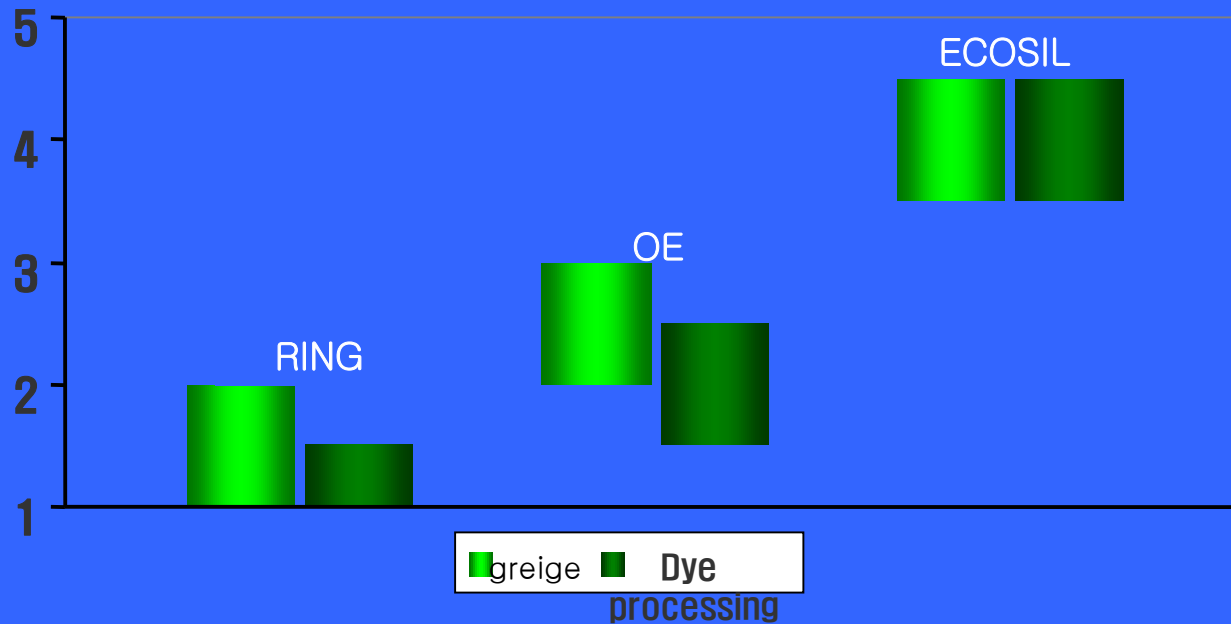
■ Viscose NE 30'

■ SUM (fine hairs in 1mm or more)



■ Viscose NE 30'

Pilling grade



- Not chemical but physical anti-pilling
- Friendly to the human body
- Without additional cost burden on post processing
- Without influence upon physical properties;  
without need of additional anti-pilling processing



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Let's view Outlast video.



- • • Not too hot .
- • • Not too cold .
- • • Just right .



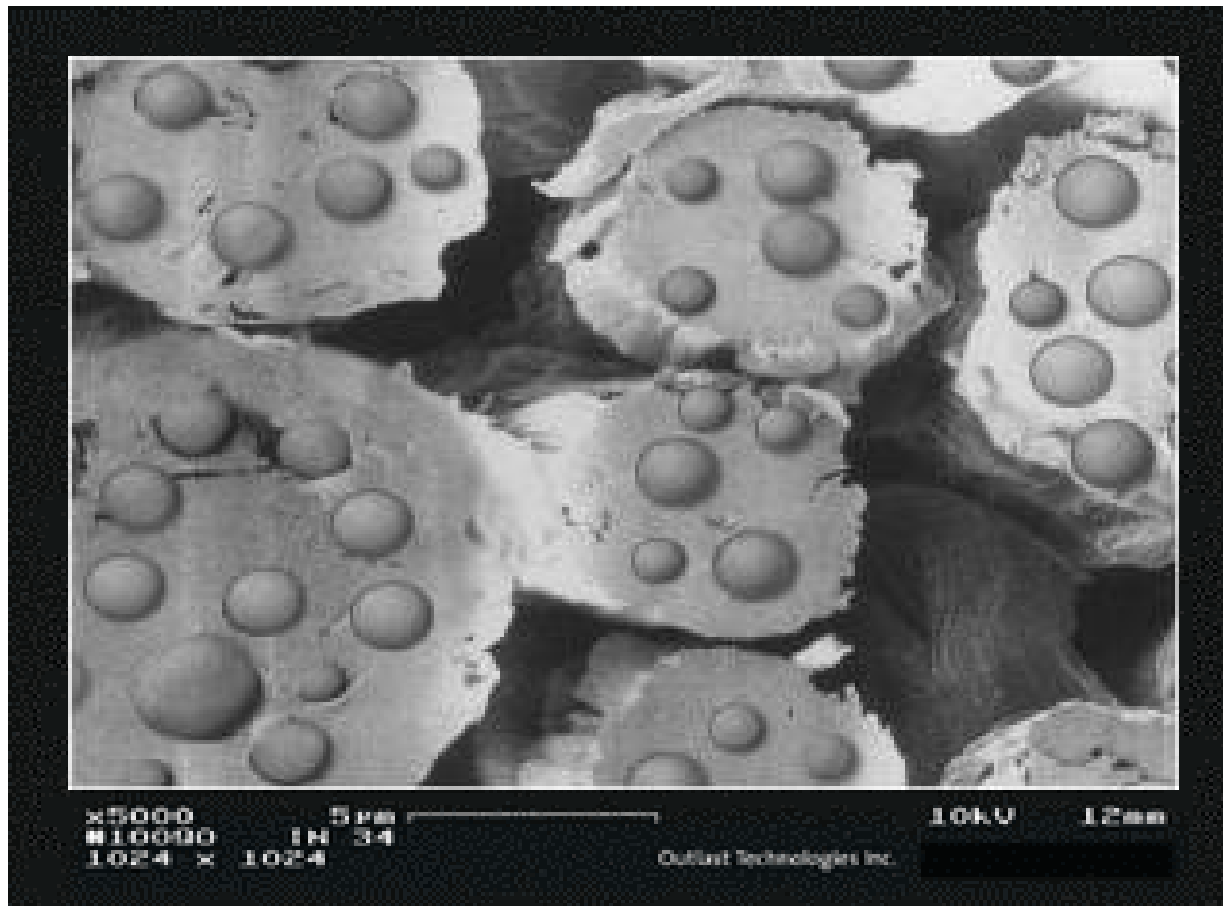


## Outlast?

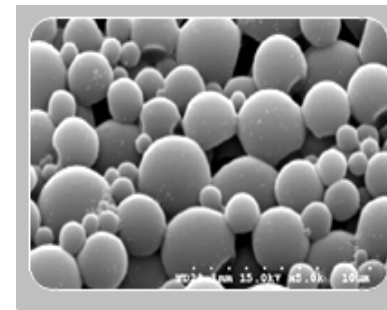
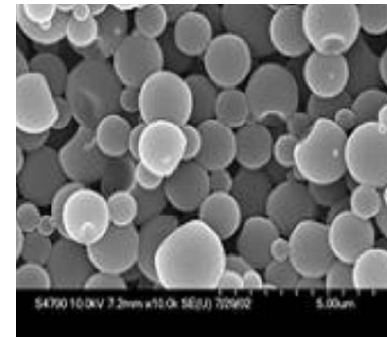
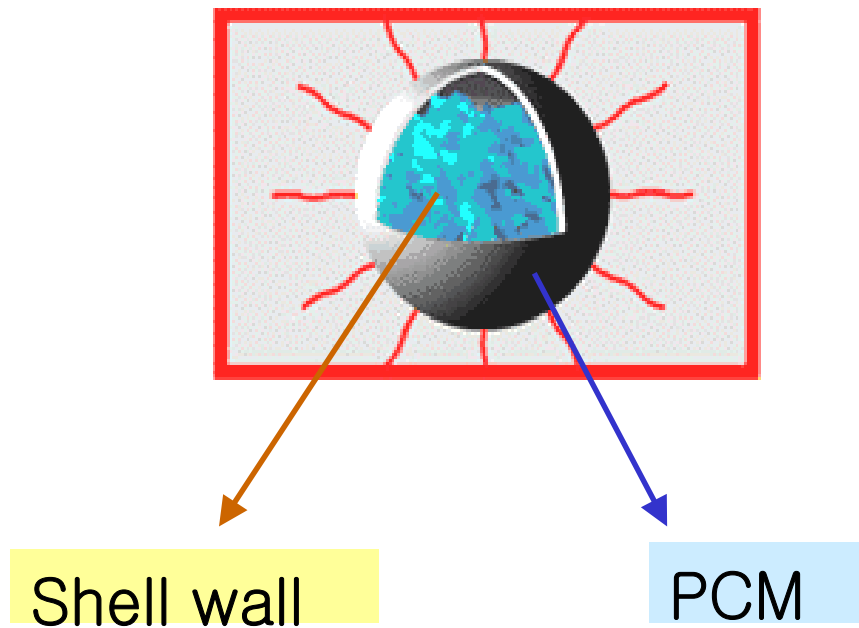
Thermo-regulating new material developed and used by NASA.

- ◆ Outlast, which was developed by NASA for protection from changes in external temperature that cannot be predicted by an astronaut upon space exploration, is being used for a space suit. The effectiveness has already been proven, such that it is being used experimentally for special suits of the U.S. Army as hi-tech material.

◆(PCM:Phase Change Material) embedded in fiber



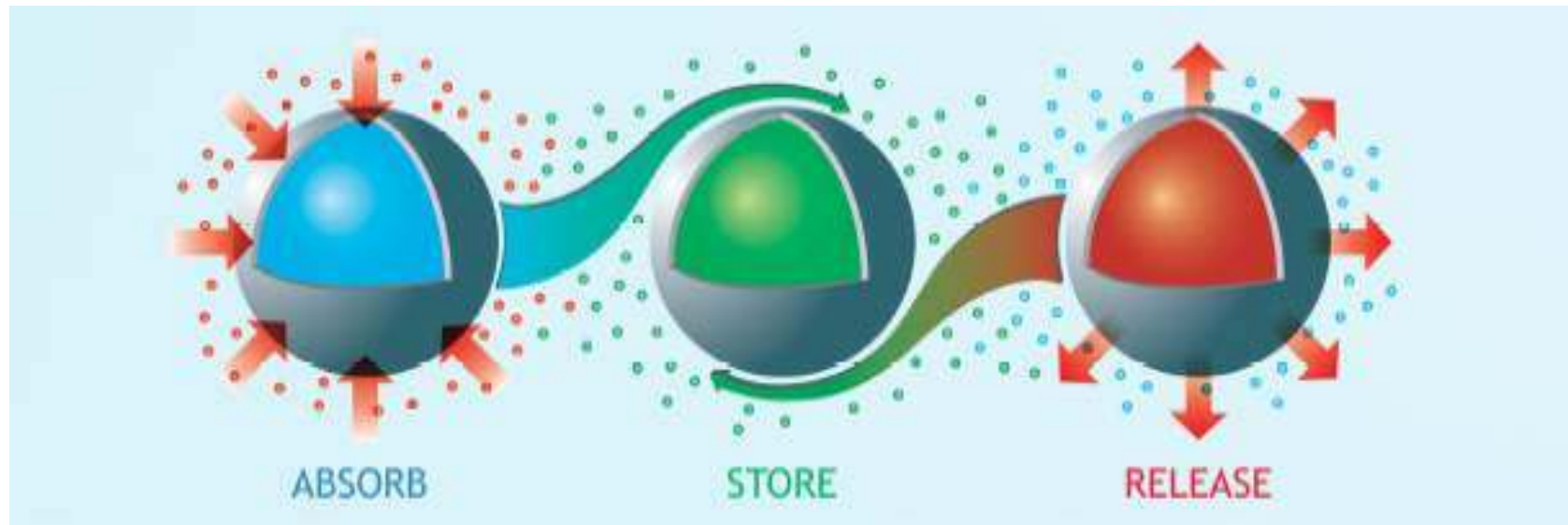
◆ PCM (Phase Change Material)

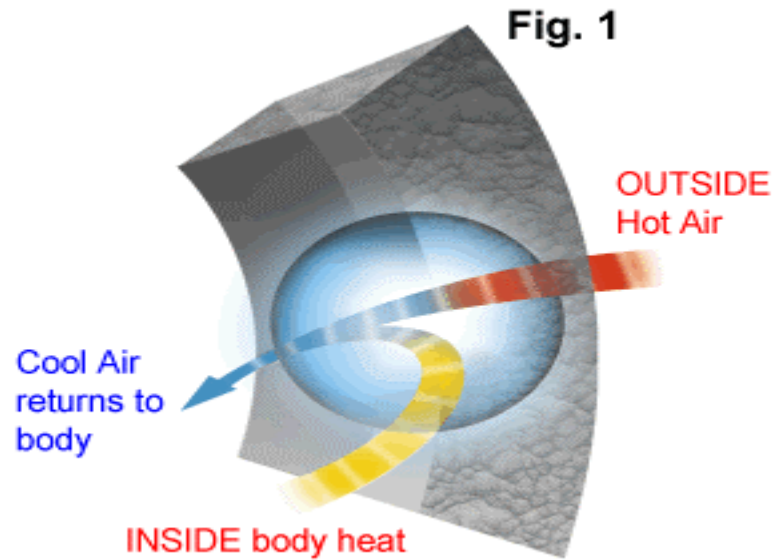


[ MICROCAPSULE ]

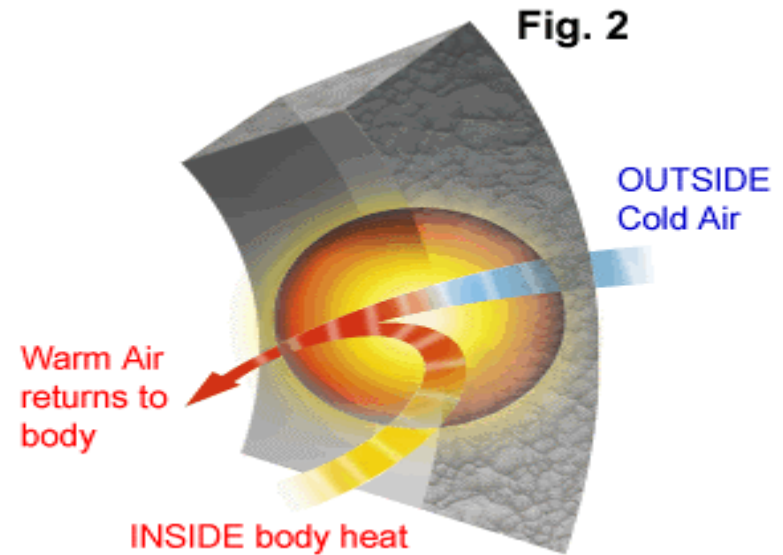
PCM in 2 ~ 5 Micron as paraffin wax

◆ Theory of PCM



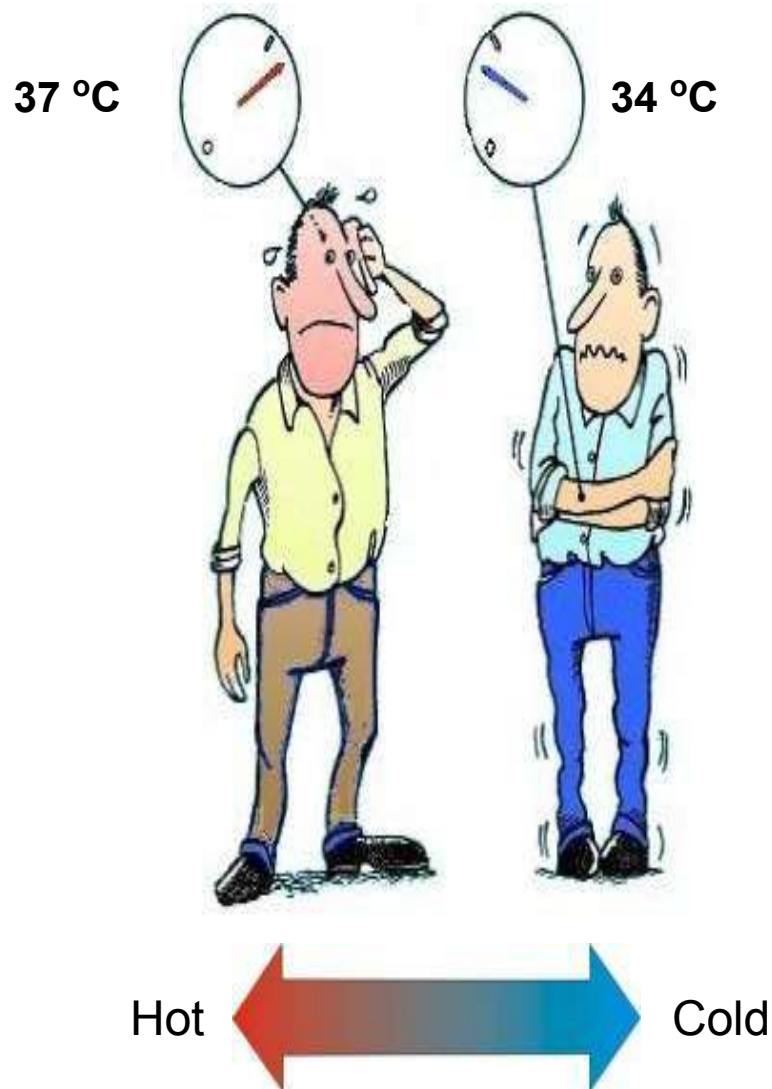


When external temperature increases, the capsule absorbs heat, causing a cold feel.



When external temperature decreases, the capsule emits heat, making the body warm.

Upon movement from comfortable indoors to warm or cold outdoors, inhibits sharp temperature changes.



## Temperature control of the human body

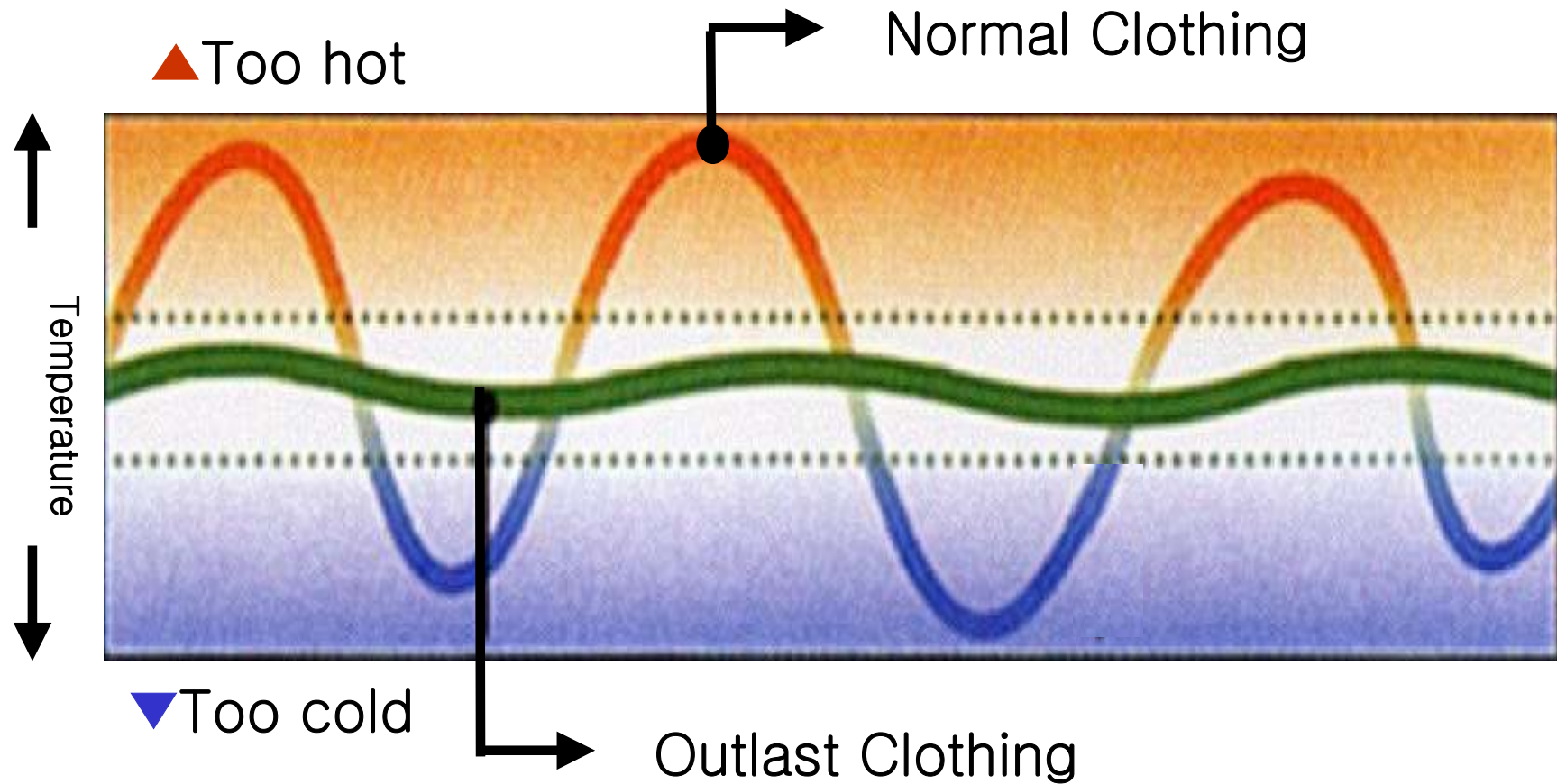
◆ Heat protection mechanism

⇒ Makes the body tremble

◆ Heat reduction mechanism

⇒ Causes sweating





### ◆ Clothes

- Keeps comfort all day long.
- Reduces overheat, sweat or cold.
- Maintains balance of temperature changes.

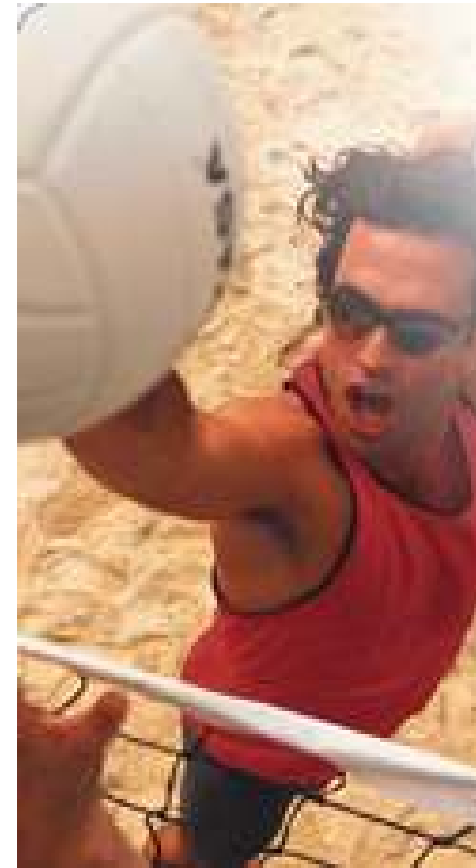
### ◆ Bedclothes

- Helpful for sound sleep.
- Reduces overheat and sweat upon sleep.

### ◆ Shoes

- Minimizes a blister.
- Reduces overheat and sweat.
- Keeps the foot dry and comfort.

◆ Active Sports Wear



◆ Casual Out Wear



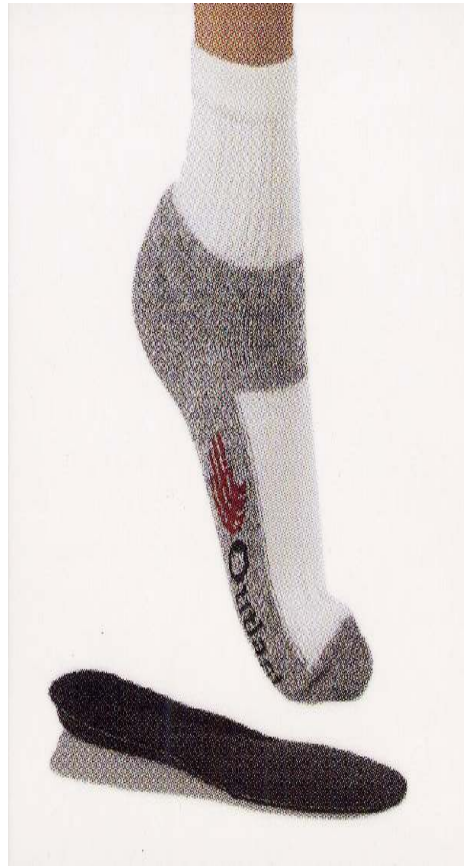
◆ Inner Wear



◆ Bedding



◆ Shoes, Socks







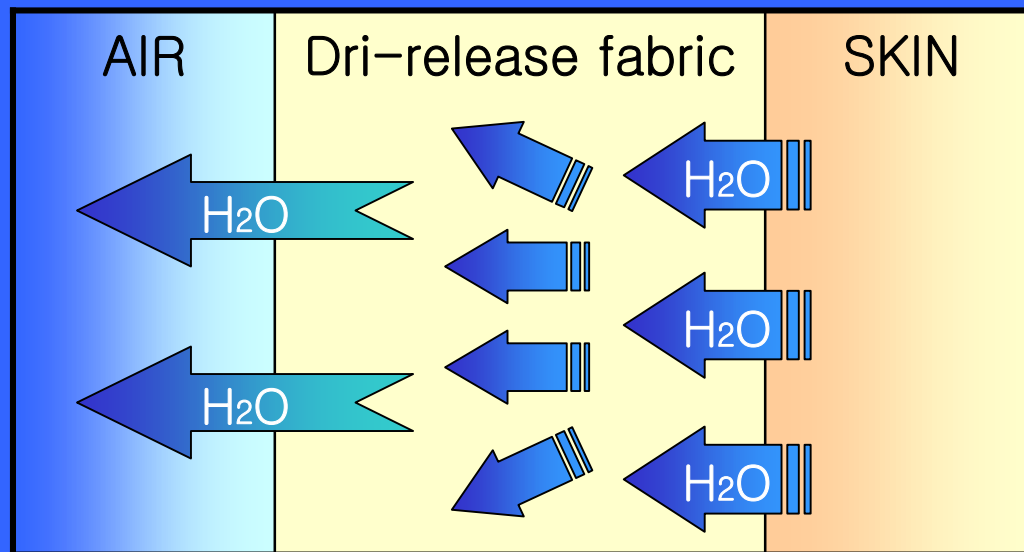
The Performance World  
of



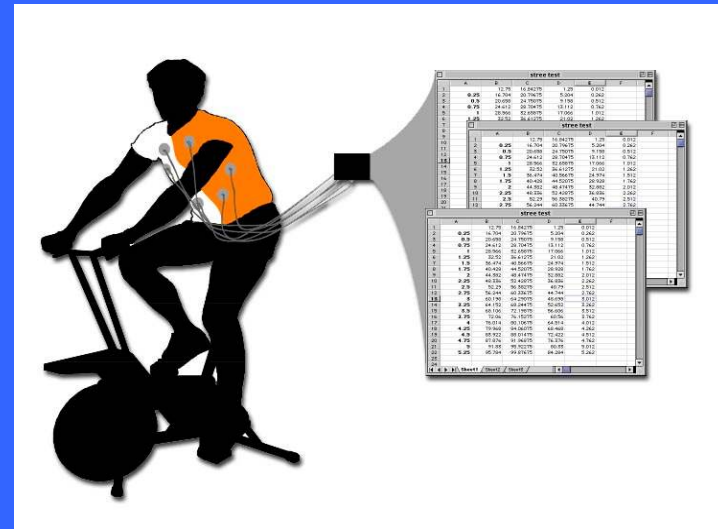
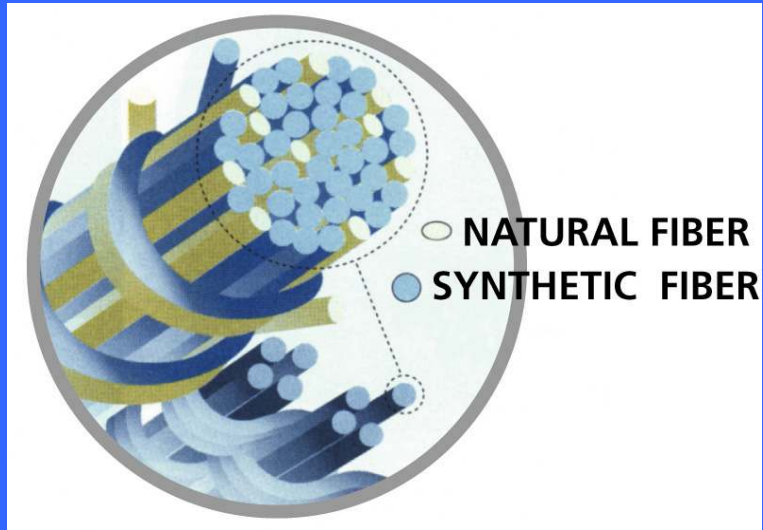
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## □ Dri-release with Fresh Guard?

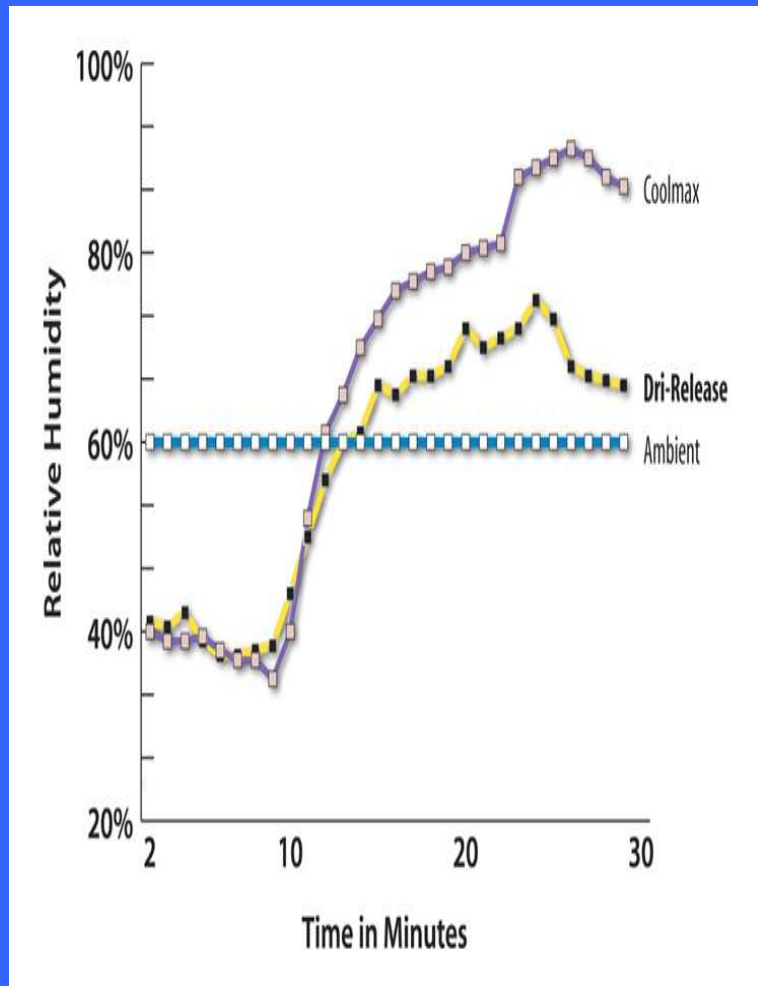
- ◆ Patented special Yarn Technology, keeping a sense of comfortable wear by virtue of excellent moisture discharge performance as well as rapid drying
- ◆ Comfortable state kept by limiting creation and growth of smell factors from bacteria without harmful chemical treatment



# □ Dri-release?



◆ Dri-release maintains cool & quick dry 4 times faster than cotton by using the patented system of natural fibers and synthetic fibers; natural fibers absorb sweat on the skin, while synthetic fibers are broadly spread and discharged in fabric.




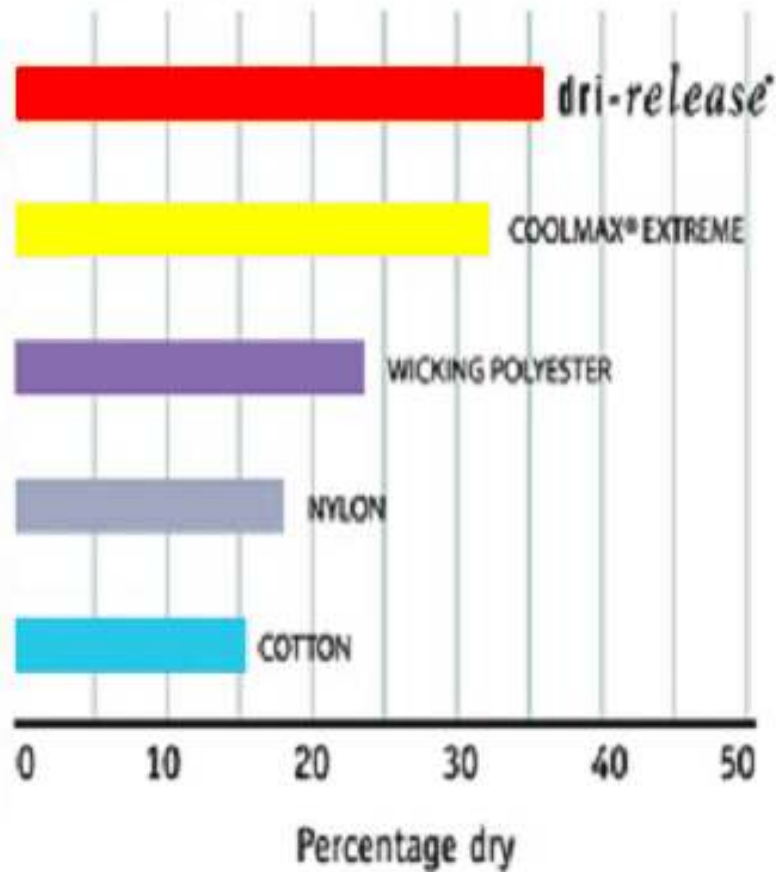
◆ The subject of experiment was directed to attach a humidity sensor and run for 20 minutes after wearing a T-shirt for testing of fabric humidity by time.

◆ As time went by, Dri-release fibers faster approximate the laboratory RH compared to Polyester(Coolmax).

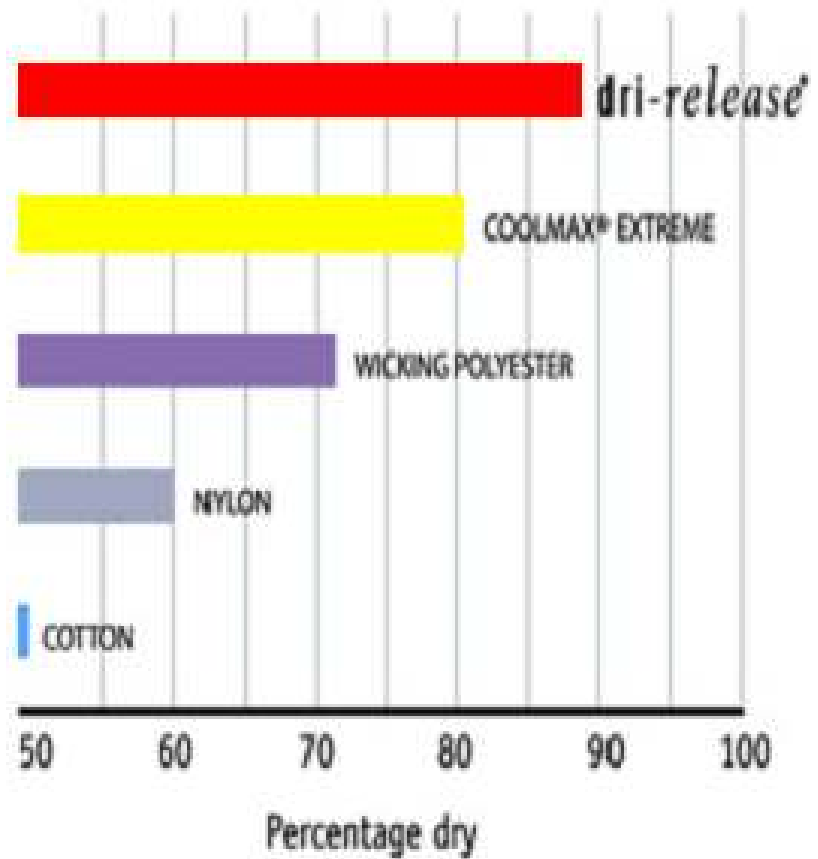
◆ This indicates that Dri-release shows cooler and faster sweat drying during exercise.

# ☐ Dries fast TEST

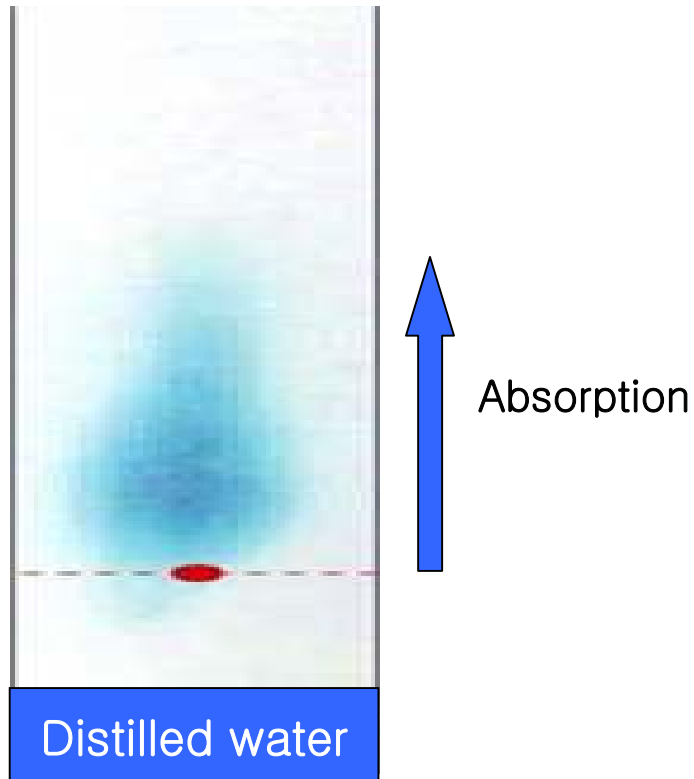
After 20 minutes 



After 60 minutes 

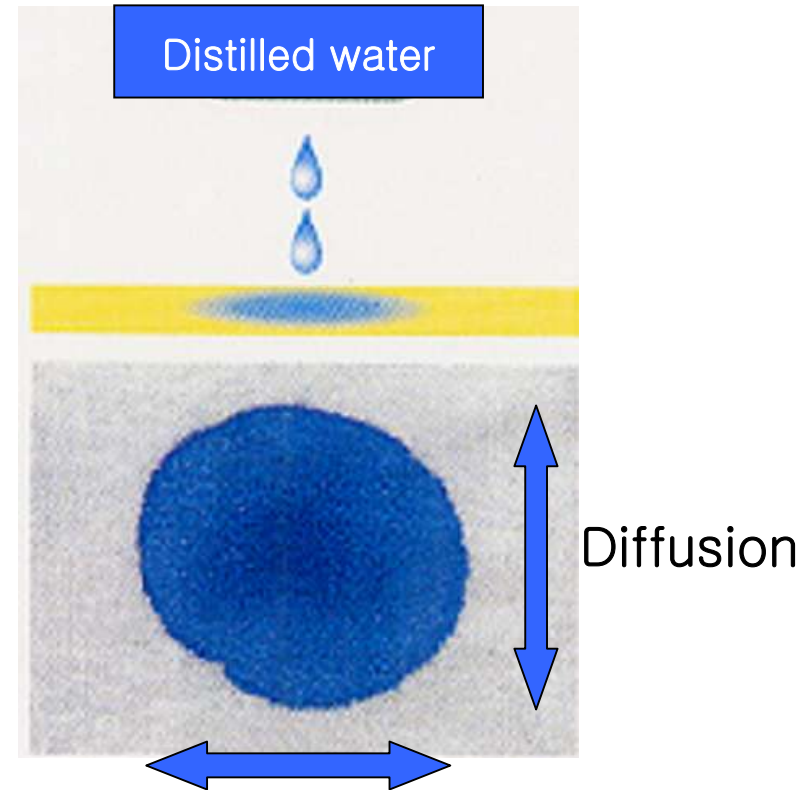


◆ Absorption speed test



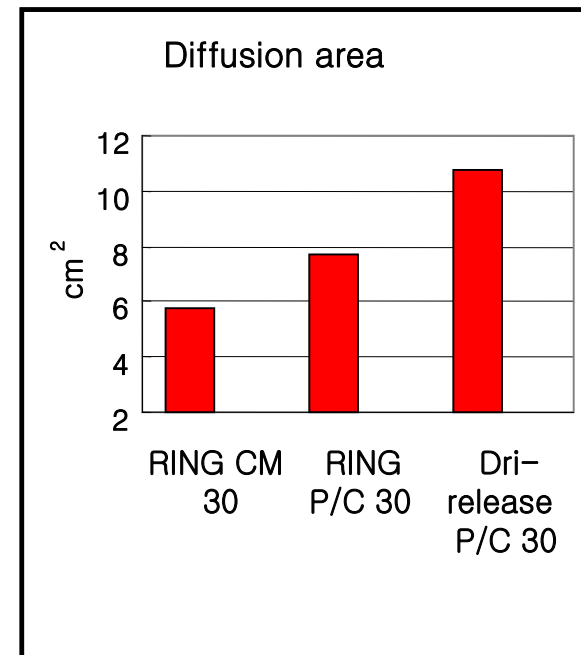
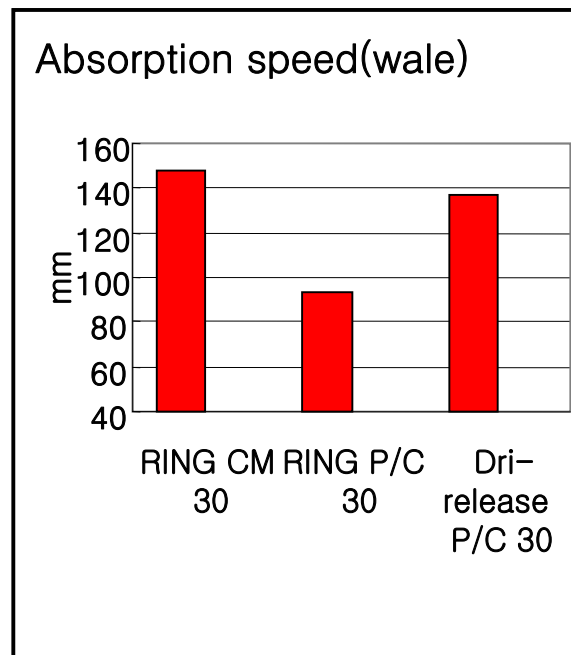
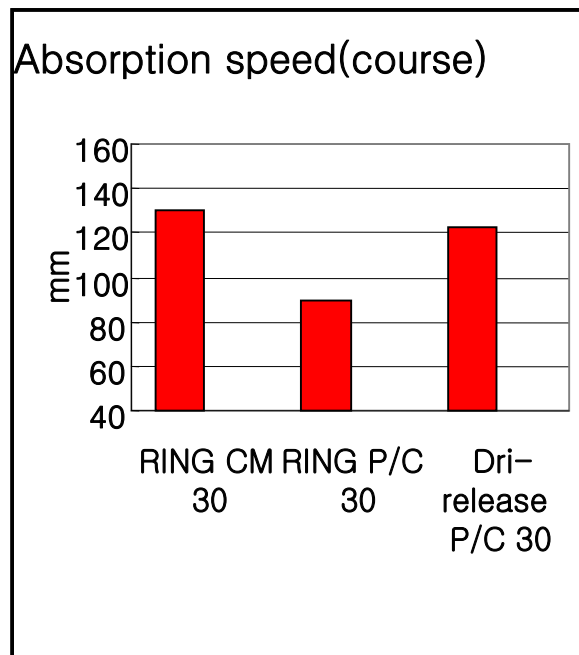
Make the fabric immersed in water and check the absorption length after 10 minutes.

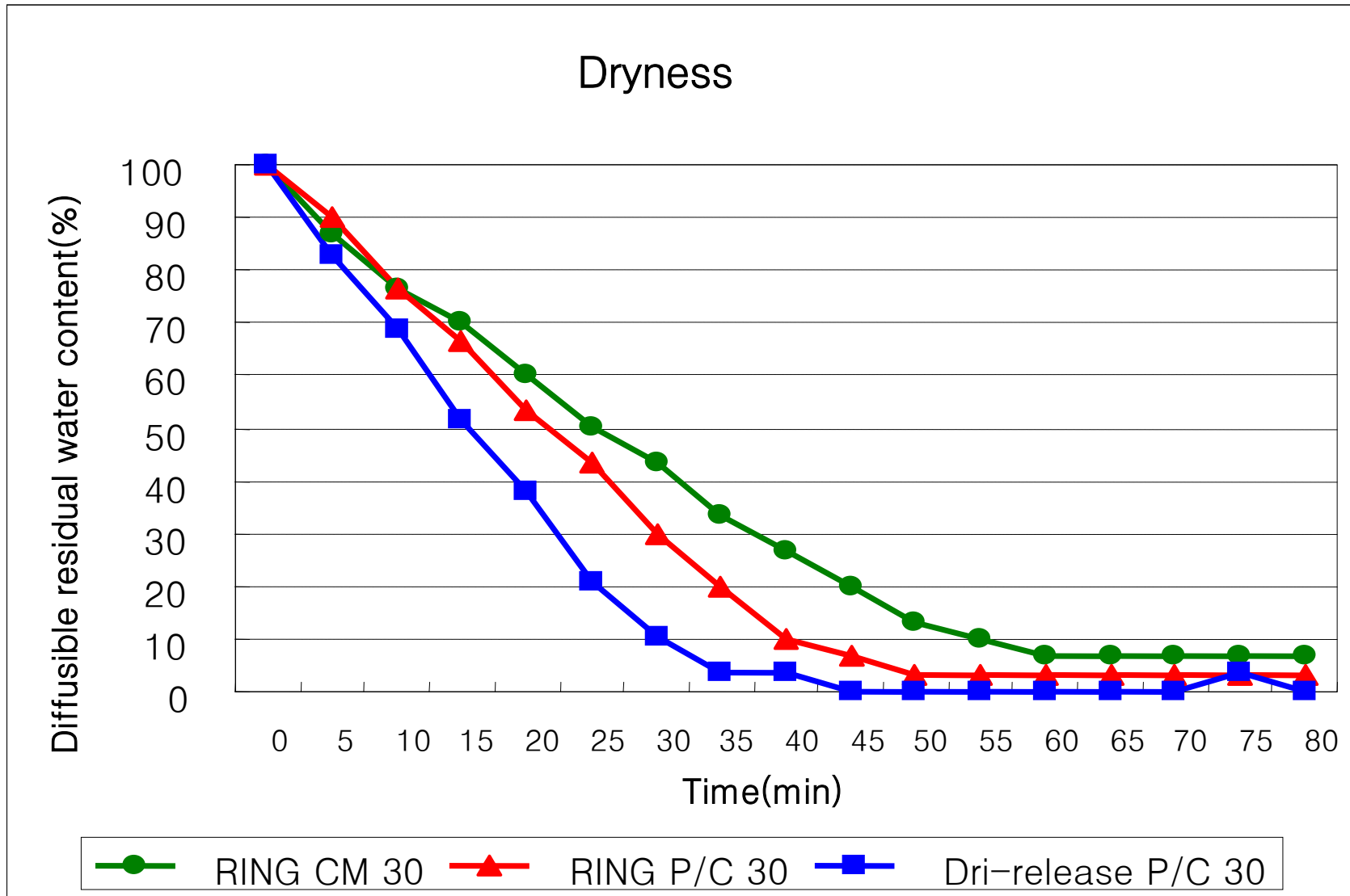
◆ Diffusion area test



Drop a certain amount of water onto the fabric and check the area after 10 minutes.

Sample	Absorption speed(mm)		Diffusion area (cm <sup>2</sup> ) (0.04cc)
	Course	Wale	
RING CM 30	130	148	5.74
RING P/C 30	89	93	7.70
Dri-release P/C 30	123	137	10.81







- 1.4 times faster drying speed compared to cotton to keep a comfortable state.
2. Dri-release produces a soft and natural touch on the skin.
3. Dri-release keeps permanent function after washing, contrary to other chemically treated materials.
4. Dri-release causes little wrinkle and pilling.
5. Excellently removes bad smells from sweat by inhibiting smells.
7. Environment-friendly and optimizes natural balance of the skin.

◆ Applicable in all fields of clothes



Mans Run T-shirts



Climate T-shirts



Sports Polo T



Plain Y-shirts



Inner Wear



Womens Plain T



Ladys skirt



Night T



Sleepwear slip



Casual



Pillowcase



Cap



Watch cap



Bra



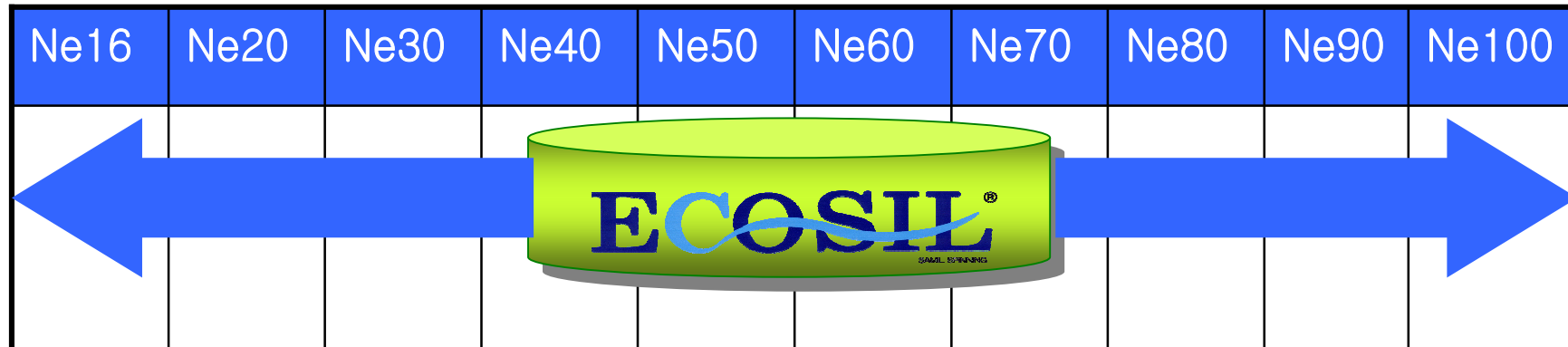
Socks

Item	Monthly output (ton)
RING	760
ECOSIL	780
Total	1540

Production item



Range of yarn count



1) ECOSIL

		COMPOSITION	Range Count
MO, TENCEL	MODAL	100%	Nec 20' ~ 40'
	Premium MODAL	100%	Nec 20' ~ 40'
	Micro MODAL	100%	Nec 20' ~ 80'
	TENCEL	100%	Nec 20' ~ 60'
	Micro TENCEL	100%	Nec 100'

# Production item



		COMPOSITION	Range Count
RAYON	RAYON	100%	Nec 20' ~ 40'
BAMBOO	BAMBOO	100%	Nec 16' ~ 40'
Cotton Blend	MODAL/COTTON (TENDEL)	70%/30%	Nec 20' ~ 40'
Silk Blend	MODAL/SILK (TENDEL, RAYON)	STANDARD 90%/10%	Nec 20' ~ 40'
		ORDER-MADE 94%/6%	Nec 20' ~ 40'
Wool Blend	MODAL/WOOL (TENDEL)	STANDARD 90%/10%	Nec 20' ~ 40'
		ORDER-MADE 94%/6%	Nec 20' ~ 40'
The Others Blend	R/P	70%/30%	Nec 20' ~ 40'
	P/R	65%/35%	Nec 20' ~ 40'
	RAYON/ACRYL	60%/40%	Nec 20' ~ 40'
	Order Made		

		COMPOSITION	Range Count
Melange Yarn	MODAL, RAYON TENCEL	3%~100% (Any Color)	Nec 16' ~ 40'
Splash Yarn	MODAL, RAYON TENCEL		Nec 16' ~ 40'
Lenzing FR	Lenzing FR	100%	Nec 16' ~ 40'
Outlast	MODAL/Outlast TENCEL, PET Micro-TEN	70%/30%	Nec 16' ~ 50'
Dri-release	P/C P/W	85%/15% 88%/12%	Nec 16' ~ 40'

2) RING

		COMPOSITION	Range Count
MO, TENCEL	MODAL	100%	Nec 20' ~ 60'
	Premium MODAL	100%	Nec 20' ~ 58'
	Micro MODAL	100%	Nec 20' ~ 100'
	TENCEL	100%	Nec 20' ~ 60'
	Micro TENCEL	100%	Nec 50' ~ 100'

# Production item



		COMPOSITION	Range Count
Cotton Blend	MODAL/COTTON (TENDEL)	70%/30% 60%/40% 50%/50%	Nec 20' ~ 50'
Wool Blend	MODAL/WOOL (TENDEL)	70%/30%	Nec 20' ~ 40'
Core yarn	MODAL, TENDEL MO/CM	Spandex core Hard core	Nec 20' ~ 40' Nec 20' ~ 45'
Slub yarn	MODAL, TENDEL MO/CM	100%	Nec 20' ~ 40'
		Any composition	
Aramid	Aramid	100	Nec 20' ~ 40'
	FR/Aramid	70%/30%	Nec 20' ~ 40'
The Others Blend	MO/P	70%/30%	Nec 20' ~ 40'
	Order Made		





Samil Spinning CO., LTD.

Thank You!