

ECOSIL[®]

SAMIL SPINNING

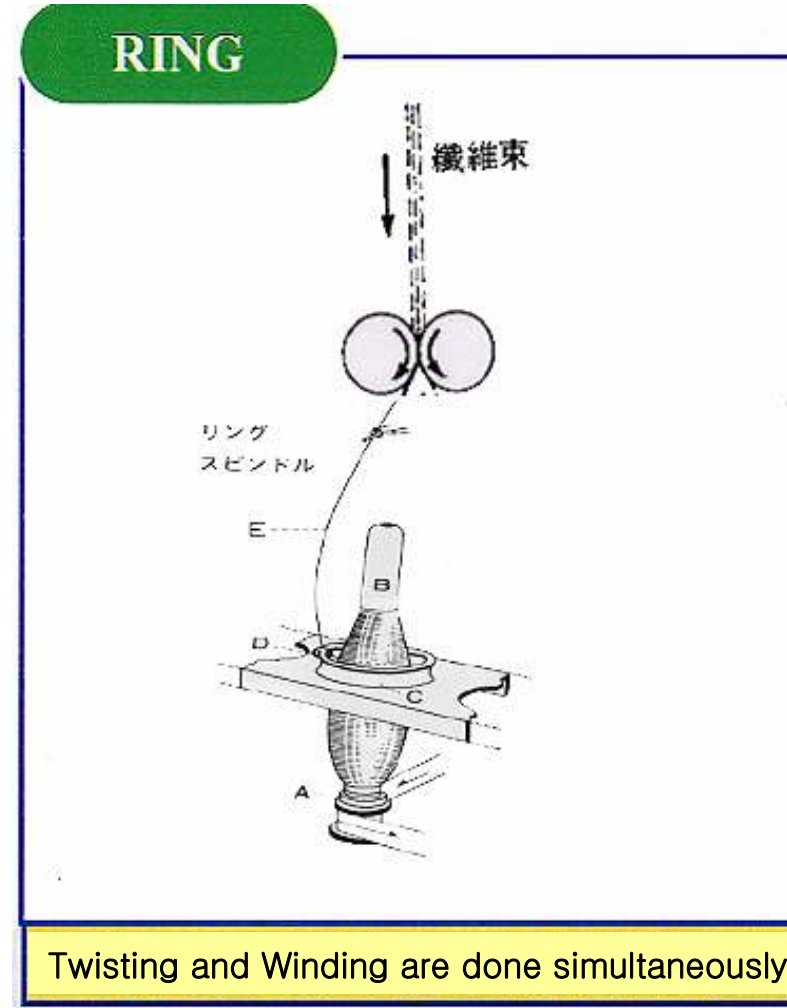
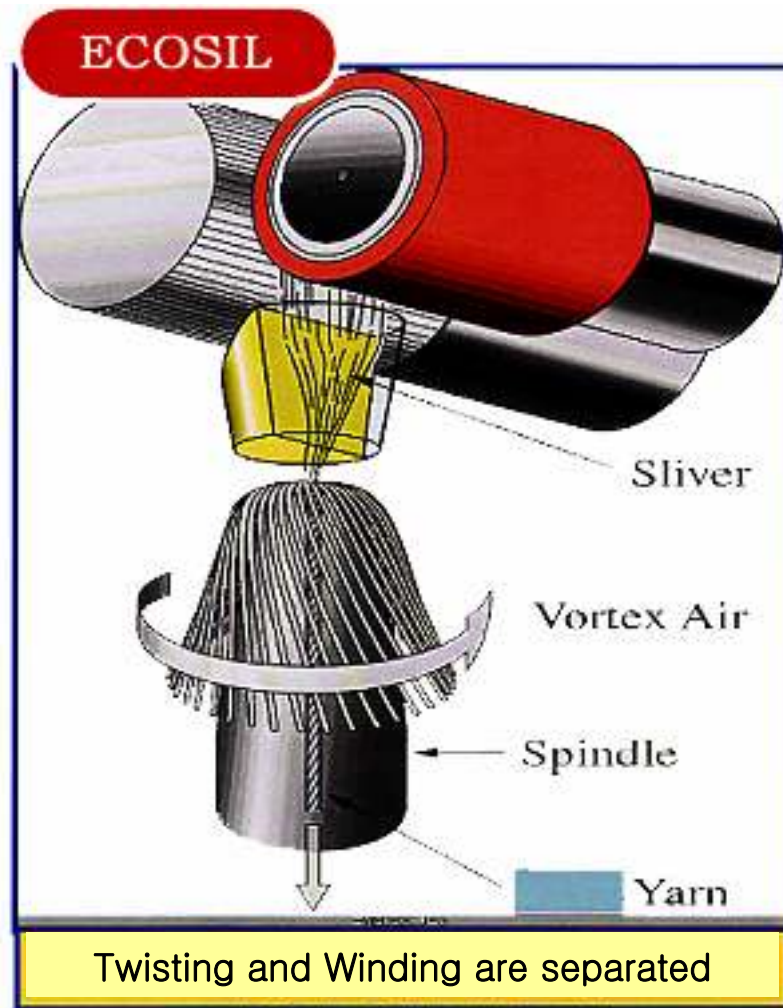


Samil Spinning Co., Ltd.

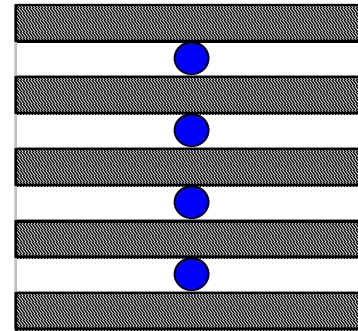
◆ ECOSIL is a trademark of raw yarn produced by innovative and advanced technology of Samil spinning's new spinning machine using Lenzing's TENCEL, Micro TENCEL, MODAL, Micro MODAL, VISCOSE RAYON, etc.

◆ ECOSIL is a compound word of ECO (ECOLOGY) and SIL (It means yarn in Korean).

□ Structure of Twisting

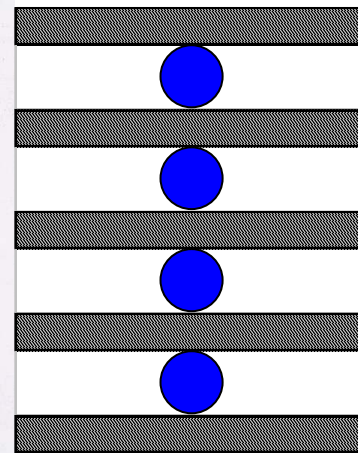
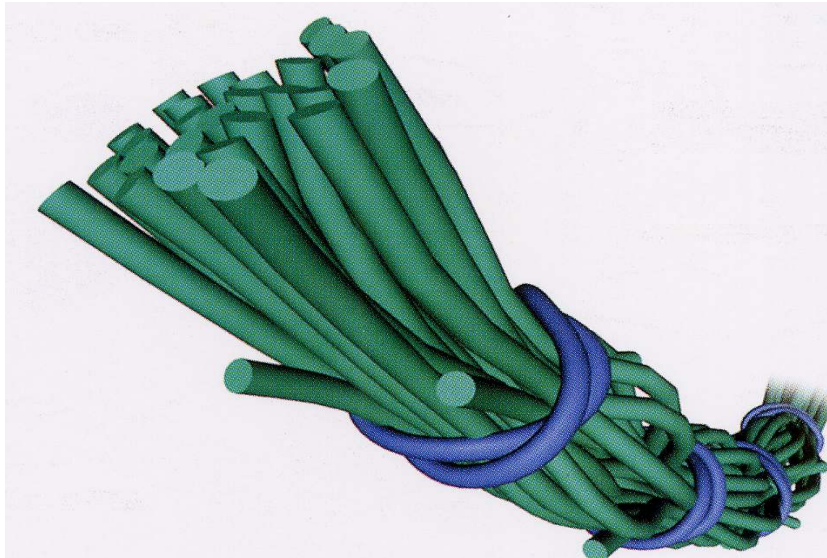


Comparison of yarn structure



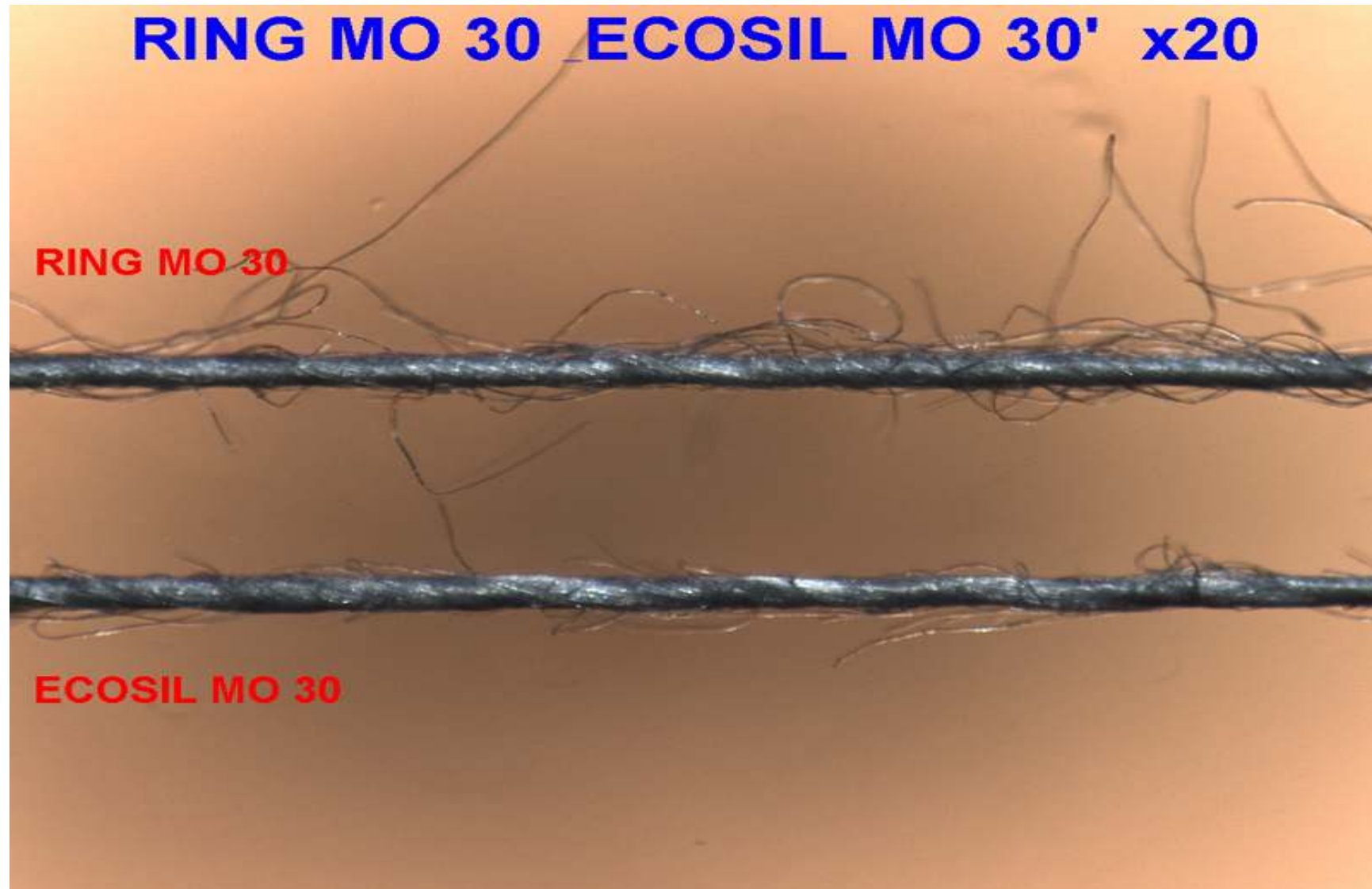
RING

Entire yarns are rotating



ECOSIL

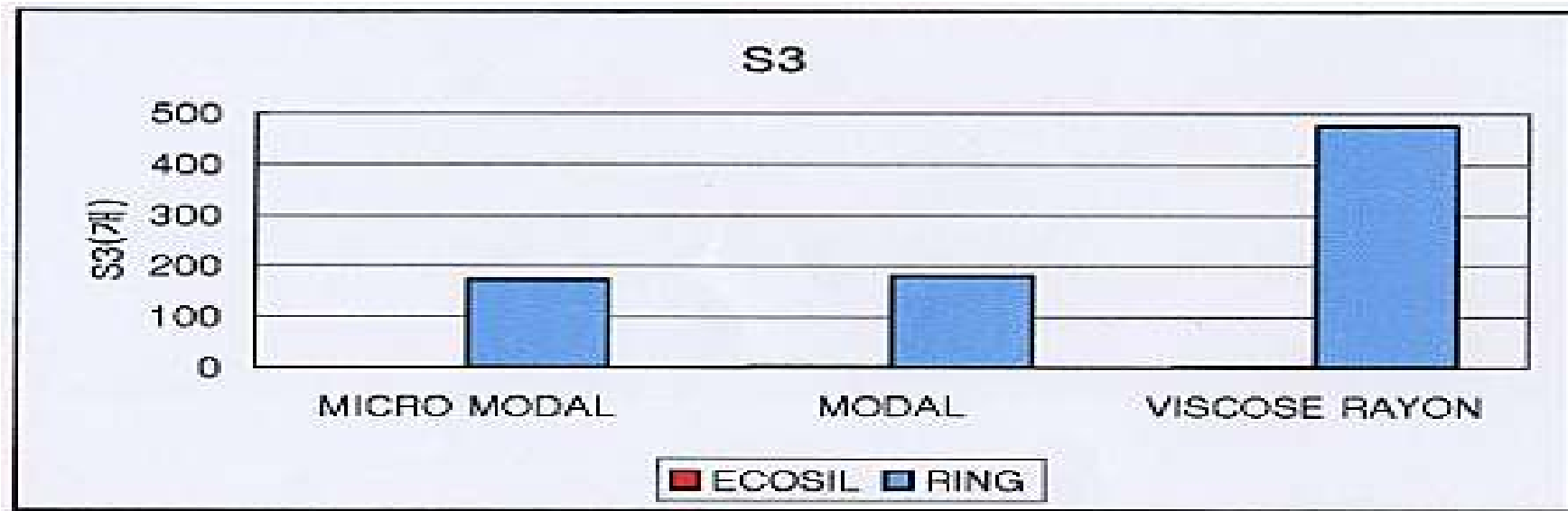
Inner yarns are still, and outer yarns are rotating



Comparison of ECOSIL & Ring spun Characteristics



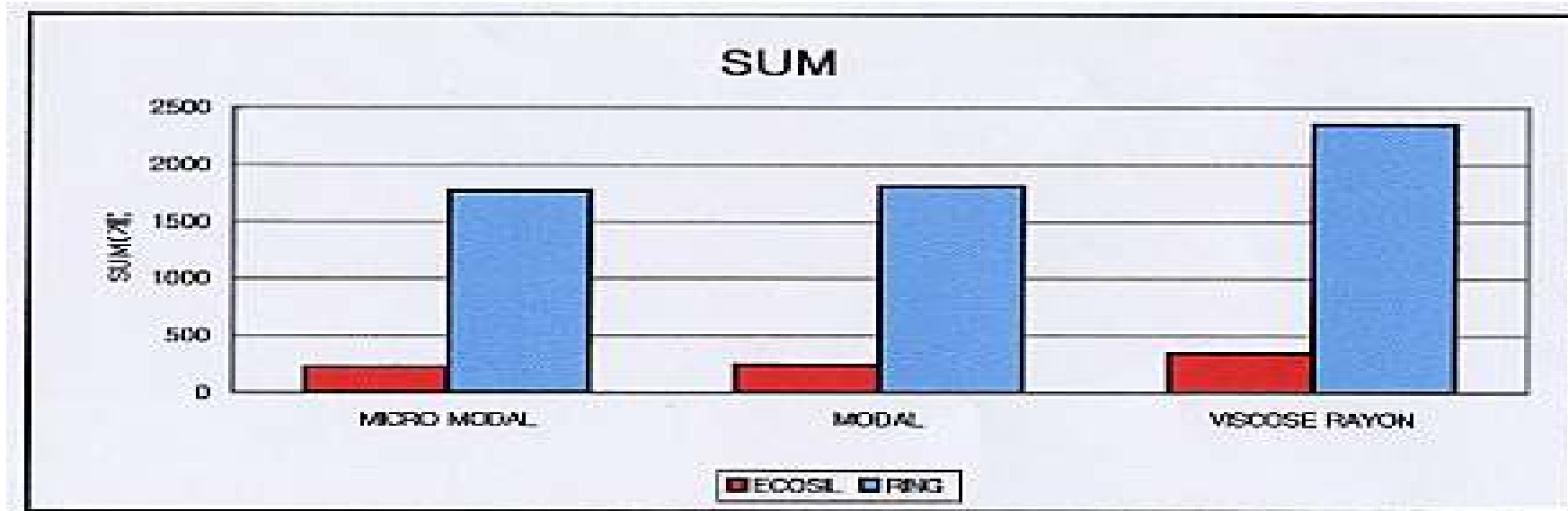
ITEM	Hairiness (S3)	
	ECOSIL	RING
MICRO MODAL	0	172
MODAL	1	179
VISCOSE RAYON	1	475



Comparison of ECOSIL & Ring spun Characteristics



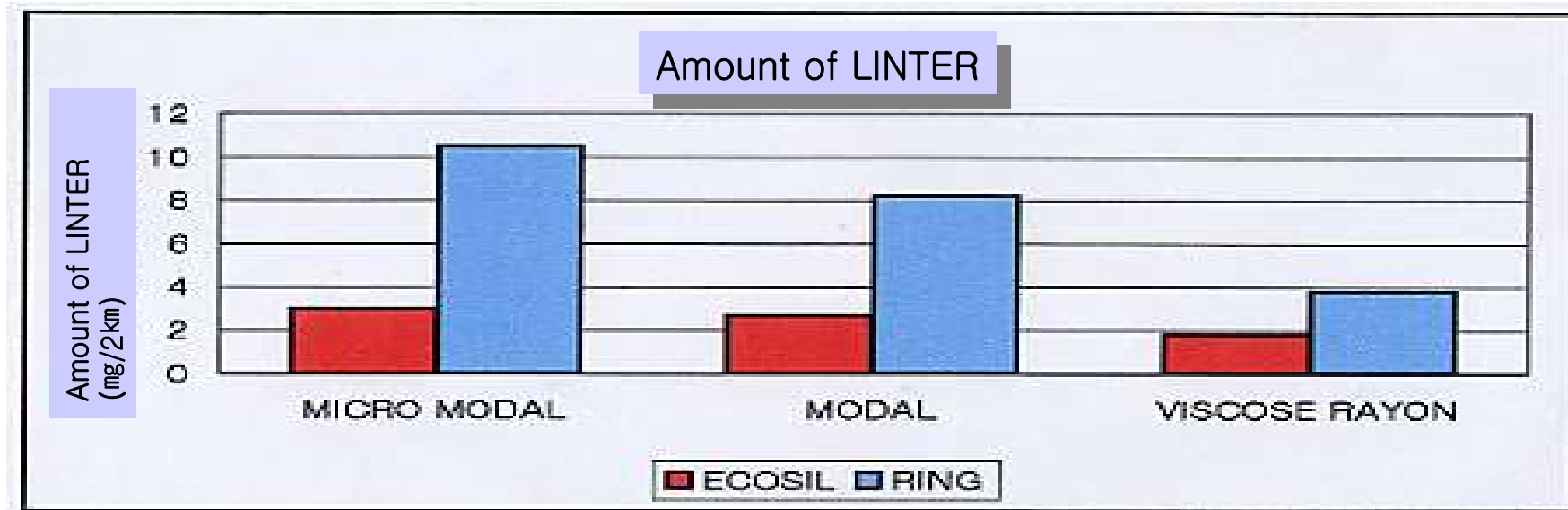
ITEM	Hairiness (SUM)	
	ECOSIL	RING
MICRO MODAL	222	1765
MODAL	245	1804
VISCOSE RAYON	350	2355



Comparison of ECOSIL & Ring spun Characteristics



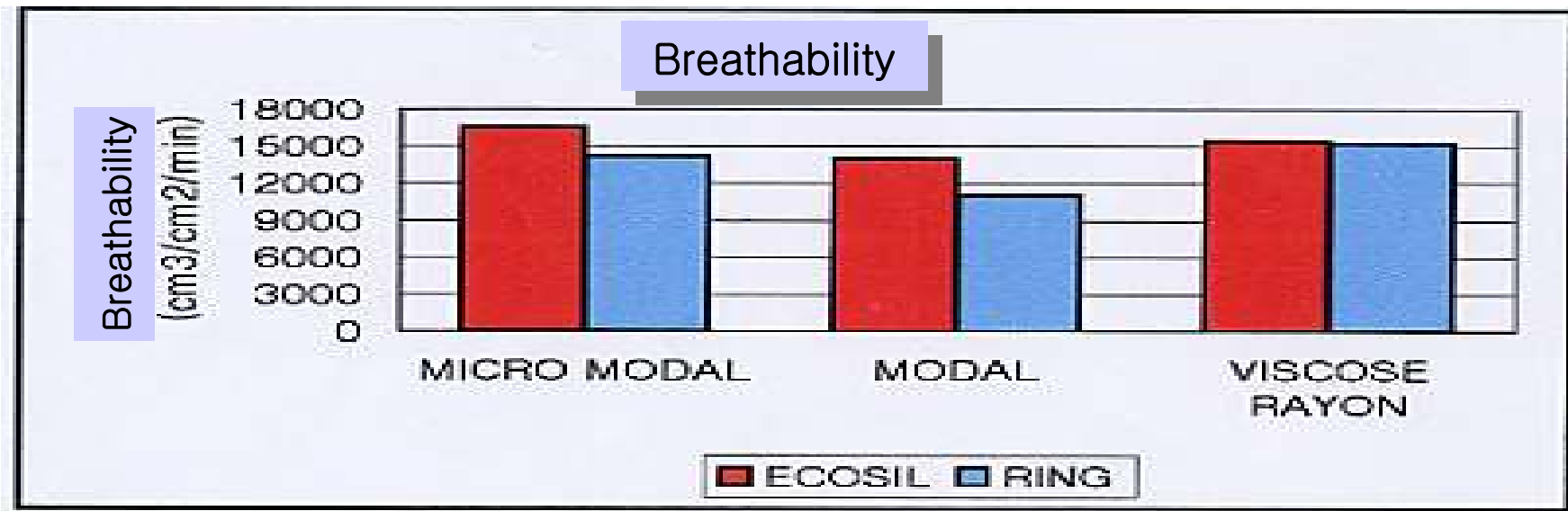
ITEM	Amount of LINTER	
	ECOSIL	RING
MICRO MODAL	3.0	10.5
MODAL	2.7	8.2
VISCOSE RAYON	1.8	3.8



Comparison of ECOSIL & Ring spun Characteristics



ITEM	Breathability	
	ECOSIL	RING
MICRO MODAL	16548	14196
MODAL	13969	11028
VISCOSE RAYON	15438	15222



Comparison of ECOSIL & Ring spun Characteristics



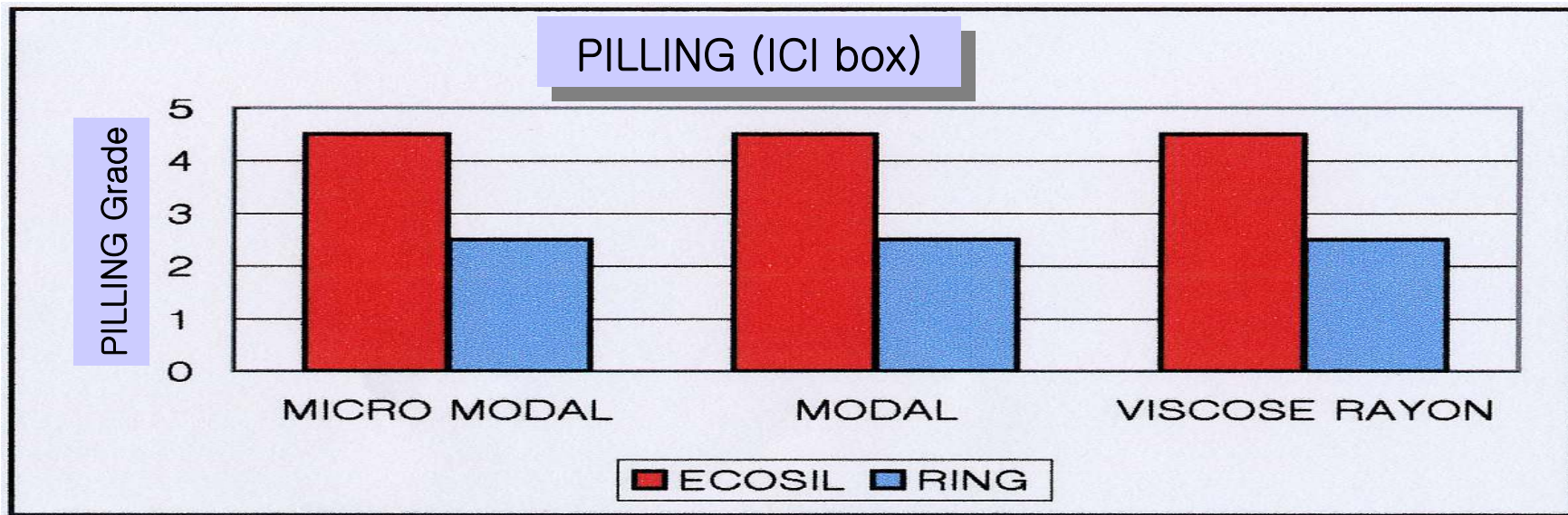
ITEM	Thickness of fabric (mm)	
	ECOSIL	RING
MICRO MODAL	0.55	0.48
MODAL	0.57	0.52
VISCOSE RAYON	0.57	0.53



Comparison of ECOSIL & Ring spun Characteristics



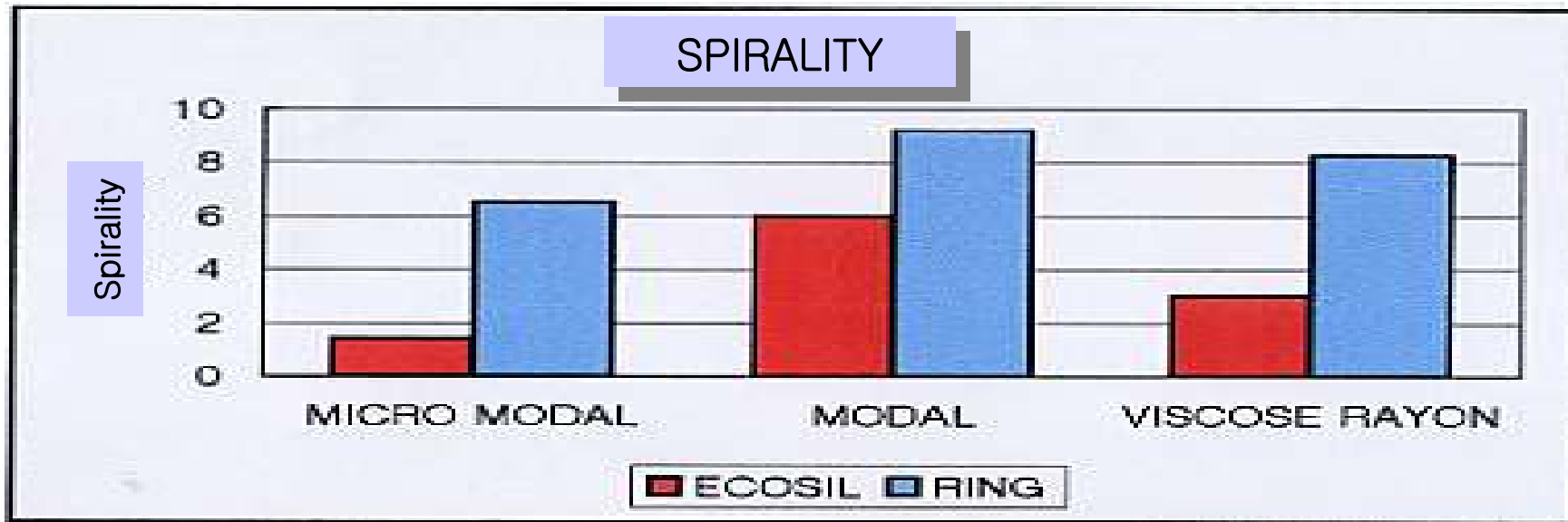
ITEM	PILLING (ICI box)	
	ECOSIL	RING
MICRO MODAL	4.5	2.5
MODAL	4.5	2.5
VISCOSE RAYON	4.5	2.5



Comparison of ECOSIL & Ring spun Characteristics



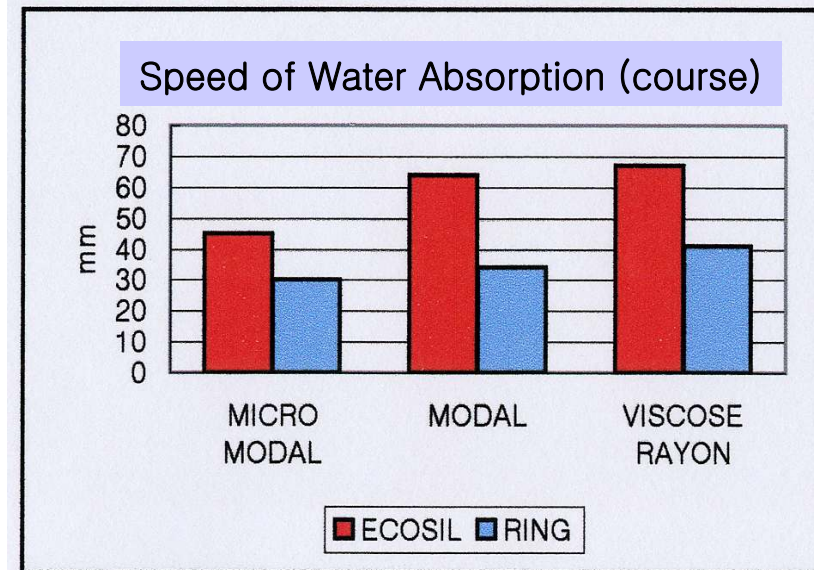
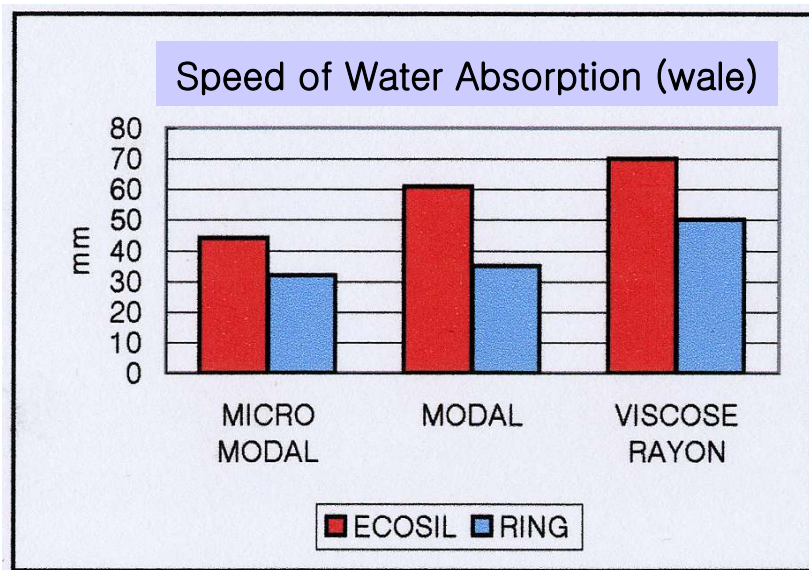
ITEM	SPIRALITY (%)	
	ECOSIL	RING
MICRO MODAL	1.4	6.5
MODAL	6.0	9.2
VISCOSE RAYON	3.0	8.3



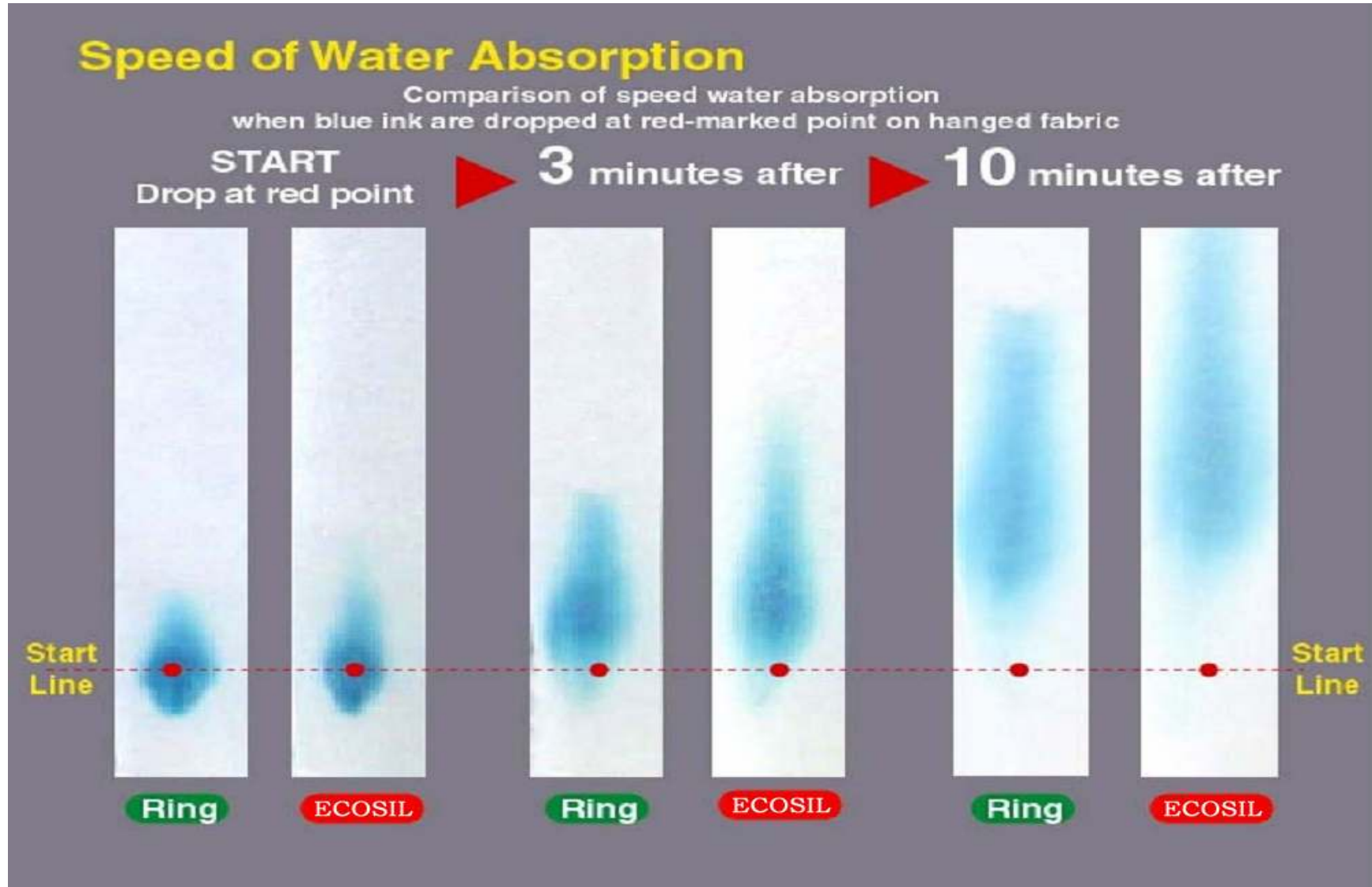
Comparison of ECOSIL & Ring spun Characteristics



ITEM	Speed of Water Absorption (wale)		Speed of Water Absorption (course)	
	ECOSIL	RING	ECOSIL	RING
MICRO MODAL	44	32	45	30
MODAL	61	35	64	34
VISCOSE RAYON	70	50	67	41



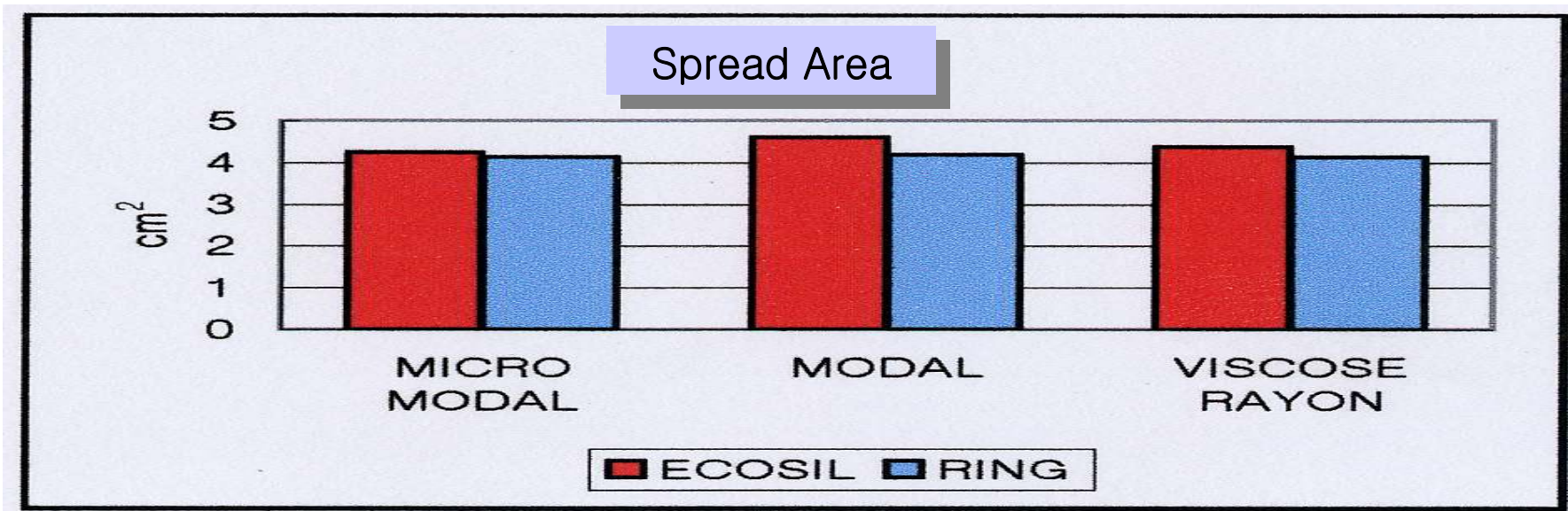
□ Excellent Moisture Absorption



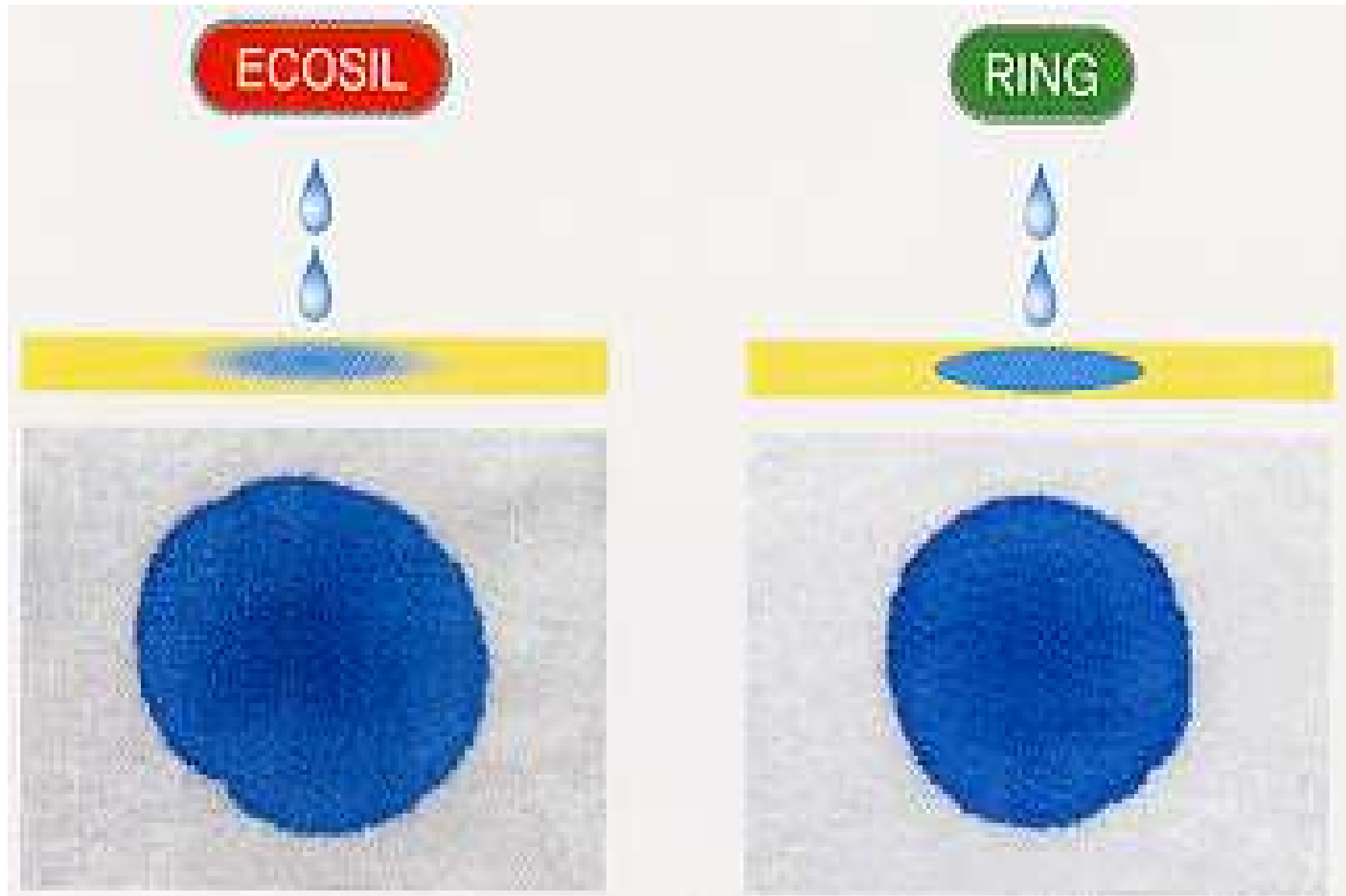
Wide Spread Area



ITEM	Spread Area (0.04cc)	
	ECOSIL	RING
MICRO MODAL	4.25	4.12
MODAL	4.61	4.18
VISCOSE RAYON	4.38	4.12



□ Tear Drop Test



ECOISL & RING COMPARISON AT A GLANCE

95% Lenzing Micro Modal 5% Lycra Single Jersey Fabric in Ne 40'

Dimensional Stability after 5th and 10th washes

	RING				ECOSIL			
NO.of washes	5 th		10 th		5 th		10 th	
Length / Width	L	W	L	W	L	W	L	W
BS Standard	-8.4	-0.3	-8.5	0.0	-4.4	-0.3	-3.9	-0.8

Spirality after 1st wash

	RING	ECOSIL
BS Standard	18.7mm	5.2mm
AATCC Standard	32.9mm	7.3mm

□ Excellent Resistance to Pilling



ICI pilling

	RING	ECOSIL
BS Standard	1-2	3-4
ASTM	1-2	2-3

Photo of ICI pilling test based on BS testing method



1. Less hairiness and Anti-filling.
 - 1) Surface is not damaged after repeated washing.
 - 2) Shape is stable due to its high durability.
 - 3) Environmentally friendly with less dregs after washing.
2. Excellent drapability and elastic touch.
 - 1) Good drapability due to twisting effect.
 - 2) Dry and elastic touch.
 - 3) Comfortable because it does not stick to body.

3. Good absorbency

- 1) Does not stick to skin and dry touch.
- 2) Cool and good air transmission.
- 3) Good for S/S.

4. Environmentally and ergonomically friendly.

- 1) Maintain its properties through physical methods.

5. Dimensional stability

- 1) Good dimensional stability.
- 2) Easy to sew.

1. ECOSIL benefits with MILL.

1) Knitting and sewing

- Better dimensional stability than ring yarn.
- Better sewing due to stable spirality.
Especially, advantageous with fine yarn.
- Easy maintenance of Knitting machine due to less hairiness dropping.
- Reduce fabric defect by 2~4% in case of peachskin finish.

2) Weaving

- Clean fabric surface due to less hairiness.
- Especially, it is more effective for cross-weaving with filament.
- Reduce thickening agent by 30~40% compared to ring yarn due to less hairiness.
- Energy-saving due to cylinder temperature which is 20% lower than traditional cylinder.
- No wavemark caused by raw yarns.

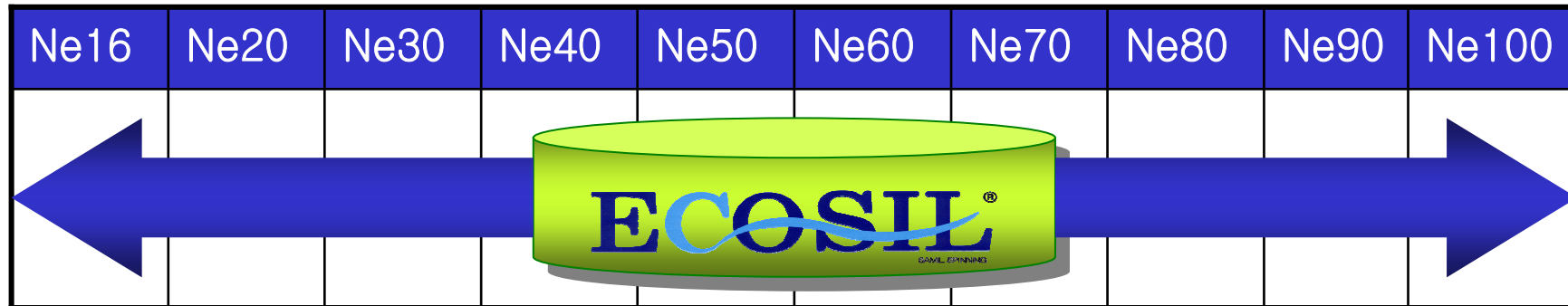
Applications

- Underwear and nightclothes which require repeated washing and are in contact with skin
- Underwear/outer garment for men/women
- Interior (curtain, bed-linen, etc.)
- Terry woven, shower towel, socks
- Industrial cloth (car seats, etc.)

Yarn Count and Fiber



Available Yarn Count



Available Fiber

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

Yarn Count and Fiber



		COMPOSITION	Range Count
RAYON	RAYON	100%	Nec 20' ~ 40'
Lenzing FR	Lenzing FR	100%	Nec 16' ~ 40'
BAMBOO	BAMBOO	100%	Nec 16' ~ 40'
Cotton Blend	MODAL/COTTON (TENCEL)	70%/30%	Nec 20' ~ 40'
Silk Blend	MODAL/SILK (TENCEL,RAYON)	STANDARD 94%/6%	Nec 20' ~ 40'
		ORDER-MADE 90%/10%	Nec 20' ~ 40'
Wool Blend	MODAL/WOOL (TENCEL)	STANDARD 94%/6%	Nec 20' ~ 40'
		ORDER-MADE 90%/10%	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
Special Yarn	Melange yarn (Modal, Rayon)		
	Splash yarn		
	Lenzing FR	100%	Nec 16' ~ 40'
	Lenzing FR /Aramid Blended	70%/30%	Nec 10' ~ 40'
	Order Made	Aramid, any composition Controllable	

Capacity

ITEM	Quantity (ton/month)
1.MODAL 100%	250
2.MODAL/COTTON	60
3.Micro MODAL 100% , Micro MODAL/PIMA	30
4.MO/SILK, MO/WOOL, MO/LINEN and other blends	30
5.TENCEL, Micro TENCEL 100%, Micro TENCEL/PIMA	60
6.RAYON 100%	220
7.RAYON/ACRYL	50
8.P/R, R/P	50
9.BAMBOO etc	20
TOTAL	770

Lenzing FR is ... ?

1. Lenzing FR is an inherently flame resistant fiber, based on High Wet Modulus cellulose fiber. Unique thermal insulation properties combined with permanent flame resistance make that it offer protection from all kinds of heat and flame. Lenzing FR is biodegradable and environmentally friendly, because it is made of natural pulp.
2. The most important goal of protective clothing is to prevent the skin from burns. After all, the skin is the body's largest and most sensitive organ. Protective clothing made with blends of Lenzing FR are softer and more comfortable than those using 100% aramid fibers.

3. Lenzing FR offers protection from all kinds of heat.

Moisture absorption along with breathability and skin friendliness all have to be a given as all are vital components in flame resistant protective clothing.

Lenzing FR is a natural, flame resistant fiber with excellent moisture absorption and breathability properties. These properties make it possible for Lenzing FR to significantly reduce the risk of heat stress and heat stroke.

Specially, the function of aramid is enhanced with a blend of Lenzing FR and aramid.

□ Lenzing FR offers protection from all kinds of heat.



FIRE



RADIANT HEAT



ELECTRIC ARCS



MOLTEN METALS



FLASH FIRES

4. Lenzing FR in the ACT.

Industry protective clothing (Electric, Iron, Car, Shipbuilding, Metal)
Uniforms for fire man, police man, military man and workers of oil
Company.

Innerwear, kids wear, fabric for furniture, curtain, hometextile,
Seats for trains and air plane, hood etc.)



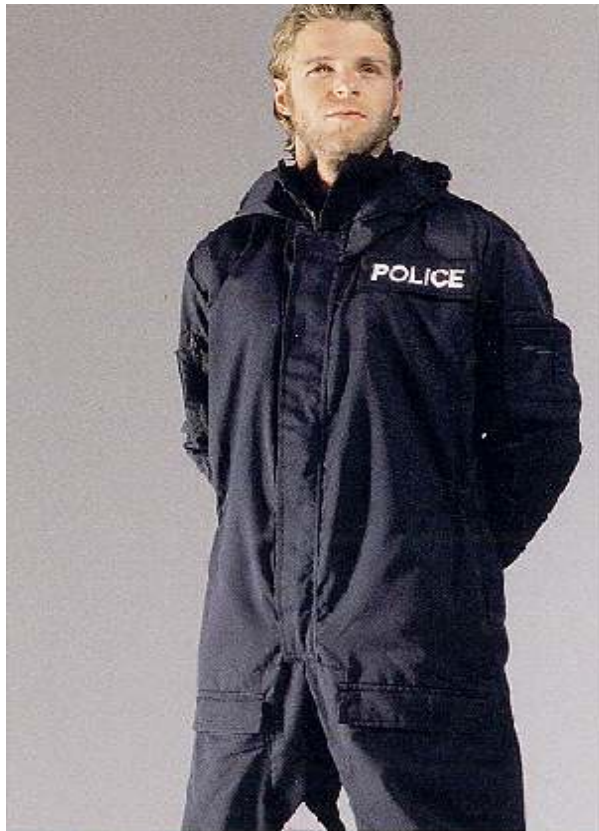
Metal industry



Petrochemical industry – flash fires



Armed forces



Police forces – flash fires



Fire brigades



Utility workers

□ Lenzing FR

□ Innerwear, Hood



5. Features and Benefits of Lenzing FR

- 1) Inherently flame resistant.
- 2) Superior Thermal Protection Properties.
- 3) No loss of flame resistance in laundering or dry cleaning.
- 4) Low thermal shrinkage when exposed to flame.
- 5) Excellent wear comfort.
- 6) Reduces heat stress and fatigue.
- 7) Breathable and non-irritating to the skin.
- 8) High electrical arc resistance.

- 9) No melting when exposed to heat or flame.
- 10) Viscose fiber is biodegradable.
- 11) Easily dyed – produces brilliant colors.
- 12) Natural anti-static properties.
- 13) Light fast and UV stable.
- 14) Easy to process on conventional equipment.
- 15) Compatible with other fibers (aramids, wool, etc.)
- 16) Fiber and pyrolysis gases are totally non-toxic.
- 17) Chemically stable.

6. We produce ...

1) Lenzing FR 100% : Ne 16'/1 ~ 40'/1

2) Lenzing FR 70% / Aramid 30% : Ne 16'/1 ~ 40'/1



Samil Spinning Co., Ltd.

Thank you ...