

## Technical information for Kanecaron “MS”

Kanecaron Tech. Division

### 1. Introduction

Kanecaron new fiber type, *“MS” is dye able and shrinkable type* for High pile use.

### 2. Characteristics

- a) *Wide color variations for some colors layer fabric*, Chinchilla, Soft Mink, Sable, Raccoon and Fox as middle hair.
- b) *Availability for any colors*. (There is limited in color density. Please see subject 4.Dyeing affinity).
- c) *Better printability. Discharging* and tip printing are available for making original fabric.
- d) *Superior Blooming* with smooth hand touch.

MS can be dyed under low temperature. Therefore, it has difference dyeing recipe and process compare with usual fibers. Please fully understand the following information prior to use.

### 3. Specification

(1)Type	MS (Middle Shrinkable Fiber for Middle Hair)
(2)Fineness	<i>7.8 dtex</i>
(3)Staple cut length	38mm, 51mm, 76mm
(3)Shrinking rate	<i>less than 5% in dyeing process under 70°C.</i> <i>approx 25% in Tentering process under 130°C for 3 min.</i>
(3)Color	Raw White
(4)Cross section	Ribbon cross
(5)Luster	Dull

### 4. Dyeing affinity

#### (1) Saturation Value (SF)

*Sf value is 1.2* base on Malachite Green 2.5%omf Bath at 70 degrees C for 60min.

Acceptable dyestuff concentration is less than  $\sum f_{MS} = 1.2$ .

Notice-1.  $\sum f_{MS}$  = innate f value of MS x dyestuff concentration.

F value of MS on each dyestuff is indicated figure-1 and figure-2.

Example.

Yellow D-2RL	1.50%omf ( $f_{MS}$ 0.51)	: 1.50 × 0.51 = 0.765
Red D-BRL	0.40%omf ( $f_{MS}$ 0.77)	: 0.40 × 0.77 = 0.308
Blue D-2RL	0.20%omf ( $f_{MS}$ 0.56)	: 0.20 × 0.56 = 0.112
		<b>total <math>\sum f_{MS} = 1.185</math></b>

Notice-2. Dark color, Black and Brown that are dyed by over  $\sum f_{MS} 1.2$  dyestuff are not recommend that has problem in rubbing and washing fastness.

(2) Dyestuff absorption behavior

- 1) The absorption speed of MS is higher than previous other Kanecaron fibers, therefore when dyeing with less than  $\Sigma f_{MS} 0.2$  concentration, you should use approx. 0.5% of retarder to avoid uneven dyeing.
- 2) The contained metal-ion obstructs to absorb dyestuff. We recommend using the Soft water (hardness less than 50ppm) for getting reproducible dyeing result.

(3) Shrinking behavior

- 1) To get even shrinking, you should keep temperature  $70 \pm 2^\circ\text{C}$  in the dyeing process. And when drying fabric in Tentering process, Temperature of the surface of fabric is kept between 125 and 135°C.

(4) Recommendable dyestuff

- 1) Recommendable dyestuff is shown the following table-1. We recommend to exam whether dyestuff is proper for dyeing of MS.
- 2) There is difference in color between after dyeing and after Tentering, depending on dyestuff. We recommend to exam in the beaker scale preliminarily.






Table-1. Recommendable dyestuffs for stock dyeing.

	Color Index No.	Commercial Name	$f_{MS}$ value
European	Basic Yellow 28	Maxilon Golden Yellow GL (Ciba)	1.26
	Basic Red 46	Maxilon Red GRL (Ciba)	1.38
	Basic Blue 147	Astrazon Blue F2RL (DyStar)	1.04
Korean	Basic Yellow 28	Golden Yellow GL	0.66
	Basic Red 46	Red GRL	1.65
	Basic Blue 3	Blue BG	0.89
Chinese	Basic Yellow 28	Yellow X-GL	0.61
	Basic Red 46	Red X-GRL	1.30
	Basic Red 14	Red X-5GN	0.97
	Basic Blue 3	Blue X-GB	1.82
	Basic Blue —	Blue X-BL	1.50

Table-2. Recommendable dyestuff for Discharging

	Color Index No.	Commercial Name	$f_{MS}$ value
European	Basic Yellow —	Cathilon Discharge Yellow NLH	1.16
	Basic Red 70	Cathilon Red CD-FGLH	0.56
	Basic Blue 41	Astrazon Blue FGGL	0.44
Korean	Basic Yellow —	Yellow GRR	0.14
	Basic Red —	Cationic Red DG	0.77
	Basic Blue 41	Blue GRL	0.44
Chinese	Basic Yellow —	Yellow D2RL	0.51
	Basic Red 24	Red DBRL	0.77
	Basic Blue —	Blue D2RL	0.56

(※2)Result: Table-3. Method of how to check Usable dyestuff

Procedure	For example of color change		
	① Beaker dyeing (plain color) (70°C for 60min.) ↓ ②Drying at 70°C ↓ ③Drying at 130°C for 3min.		
	↓	↓	↓
			
Change of color	Small	Small	Much
Change of color depth			
Judgment	Excellent	Good	Poor

3) When using the other dyestuffs except above, we recommend to check the range of color change in accordance with pre-dyeing indicated on Table-3.

## 5. Color matching operation in laboratory

1) How to estimate final product color

Please make sure the color difference between after dyeing and after drying in accordance with pre-dyeing indicated on Table-3.

2) Pre-Dyeing water

We recommend using pure water or soft water (hardness is less than 50ppm) at a beaker scale.

## 6. Stock dyeing

1) Quality of Dyeing water

Contained metal-ion obstructs to absorb dyestuff. We recommend using soft water (less than 50ppm). In case of not using soft water, we recommend using the treated water by [Sodium hexa metaphosphate](#). This chelating agent is effective to decrease metal-ion in dyeing water. Amount should be at the range of 0.5-2.0 g/l, depending on water hardness. (Please see Table-4).

Chelating agent: Sodium hexa metaphosphate

Table-4.

Water hardness	~100ppm	~200ppm	~300ppm	~400ppm
Concentration of Sodium hexa metaphosphate	0.5 g/l	1.0 g/l	1.5 g/l	2.0 g/l

2) Packing

Setting the right dyeing condition is the most important for getting good dyeing quality and productivity.

a) Packing density : It is preferable that it kept between 0.25~0.35 g/ml.

b) Packing density (g/ml) = Weight of fiber / Volume of basket of dyeing M/C.

c) Pump capability :

Pump head pressure : 5~10 mmH<sub>2</sub>O = 49Pa~98Pa

Pumping flow rate : 0.1~1.0 ℓ/sec/kgf

If packing density is lower than above, it is caused unevenness dyeing by slanted liquid flow. If packing density is higher than above, it is caused unevenness dyeing between inside and outside.

Water and Stamping M/C are used when packing "MS fiber" into Obermaier dyeing M/C.

Temperature of water should be controlled less than 70°C.

### 3) Bath ratio

Bath ratio should be kept 1:10 ~ 20. (1=weight of fiber, 10 ~ 20=weight of water). It is important to fix same dyeing condition and quality.

### 4) Chemicals for dyeing

PH should be adjusted to approx.3-4 using acetic acid and sodium acetate.

In case of light shade (less than  $\Sigma$  fMS 0.2) you should use retarder (approx.0.5% at maximum) to avoid uneven dyeing. We recommend PAN-type retarder.

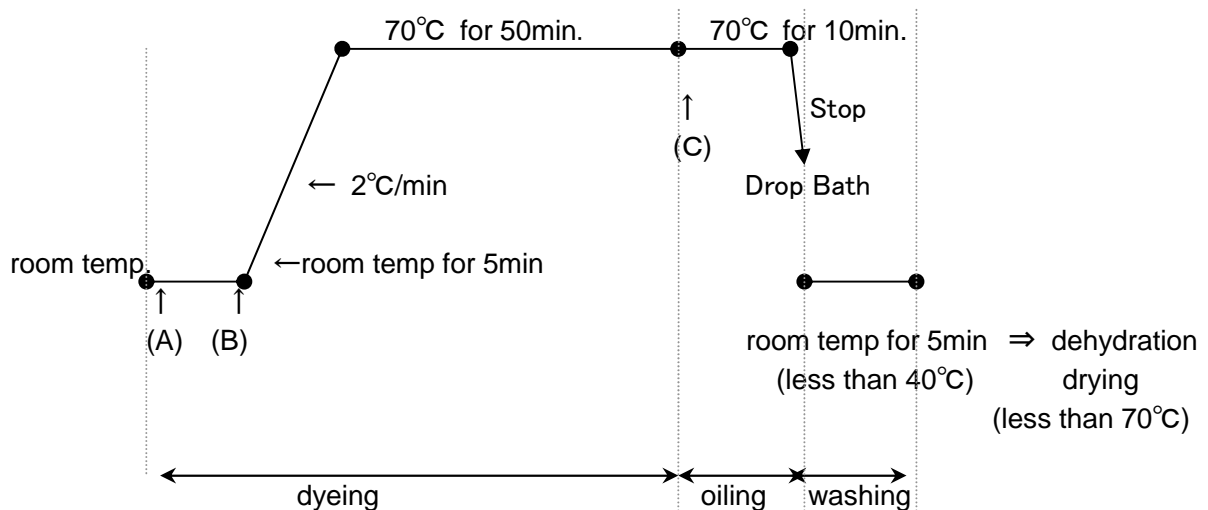
Do not use carriers. It causes the shrinking damage.

### 5) Oiling

After dyed, we recommend to use cationic softener to obtain softness. Cationic softener is effective by 70°C. Amount should be approx.1-2% softener.

Cationic antistatic agent use, it causes bleed out of dyestuff. We recommend to use nonionic antistatic agent in process of blending (mixing).

### 6) Dyeing process



#### < Procedure >

- 1) Set dyeing bath at 40°C. In case of not using soft water, add the optimum amount of chelating agent into the bath (Please see Table-4).
- 2) (A) Adjust PH to 3-4 using acetic acid and 0.5%omf (on mass fiber) of sodium acetate.
- 3) Run at room temperature for 5min.
- 4) (B) Add necessary amount of cationic dyestuff.
- 5) Raise temperature from room temperature to 70°C at 2°C per min.
- 6) Hold temperature at 70°C for 50min. Do not exceed 72°C.
- 7) Add 1.0-2.0%omf cationic softener and hold at 70°C for 10min.

- 8) Reduce temperature from 70°C to 60°C at 2°C per min. (= approx. 5min.)
- 9) Drop bath

<Washing>

- 1) Set washing bath at room temperature ( below 40°C). Do not exceed 40°C. In case of not using soft water, add the optimum amount of chelating agent into the bath (Please see Table-4).
- 2) Run at room temperature for 5 min. Please keep washing to the once.
- 3) Drop bath.

<Dehydration and Drying>

- 1) Dehydrate dyed fiber.
- 2) Dry at below 70°C. Do not exceed 70°C. Rough moisture content is 3-5wt%.

<Color confirmation>

- 1) Set oven-dryer at 130°C.
- 2) Put a small amount of "MS dyed fiber" into the oven-dryer and hold at 130°C for 3min.
- 3) Take out treated fiber and confirm color that is reappeared or not.

## 7. Finishing condition

- 1) Carding, Knitting, Finishing  
In accordance with general condition when use other Kanecaron fibers.
- 2) Pre Finishing  
Make pre polishing at 135°C once or twice.
- 3) Latex coating and Drying  
Dyestuff is fixed eventually and color becomes stable at this process. Temperature of dryer should be controlled at 125-135°C. "MS" fiber shrinks approx 25% under this temperature condition for 2-3min.

## 8.Summary

Subject	Quality control	Purpose	Level of Importance for Quality (*)
Fiber packing	Temp of water Less than 70°C	To avoid excess shrinkage	A
Dyeing temp	70±2°C	To keep shrinking rate	A
Dyeing time	60±10min.	Color reproducibility	B
Chemicals for dyeing	In case of light shade (less than $\sum f_{MS}=0.2$ ) Retarder = 0.5%omf	To avoid uneven dye	B
Dyeing water	Ion-exchanged water or Soft water Water hardness more than 50ppm	To stabilize dyestuff absorption and Bleed Out	A
Dyestuff	Recommendable dyes	To stabilize color	A
Dying C	Maximum $\sum f_{MS}=1.2$	Color reproducibility To keep fastness	A
Bath ratio	1:10~20	Color reproducibility	B
Drying temp.	Do not exceed 70°C	To keep shrinking rate	A
Color confirmation	Drying at 130°C × 3min	Color confirmation	B

(\*) Level of importance for quality A: Must B: Want

Notice: All of the above information is based on the examination in only our laboratory. It is intended to be helpful for only our customer's trials and is not to be considered a guarantee.