Developing of High sense & Sensibility Bonding-Free Knitted Fabrics by Appling the Ground Yarn Structure

Yushik Shin [*]**Younggu Hwang,** [**]**Sung hoon Jeong** [***]**Gihun Jeong,** [****]**Hae-lim Jeong, and** [*****]**Eunjong Son**

666-2 Sangsu-ri, nam-myun, Yangju-si, Gyeonggi-do, 482-871, Korea
[*]591-7 Majeon-ri, Gasan-myeon, Pocheon-si, Gyeonggi-do, Korea
[**]17, Haengdang-dong, Seongdong-gu, Seoul, 133-79, Korea
[***]2F, Duksung b/d, #767-22, Bangbae-dong, Seocho-gu, Seoul, 137-829, Korea
[****]466-18, Kunja-dong, Kwanjin-gu, Seoul, Korea
[*****]424, Simgok-dong, Wonmi-gu, Bucheon-si, Gyeonggi-do, Korea
E-mail: neoshin@koteri.re.kr

1. Introduction

We made Suede-Extra Fine Velboa by way of warp knitted fabrics that was intended for the 2 kinds of bonding free Textile materials. This bonding free fabric manufactured was mercerized by dyeing machine with time and NaOH solution. The processes of divided sea-island yarn and surface examined using by Scanning Electron Microscope. And also the bonding free fabric investigated by the color difference of surface and back side which were measured through dyeing behavior and dyeing fastness.

With the help of soft touch and good quality of Micro fiber items, many consumers using these goods in the various end usages.

As people in Korea become rich, however, they are in pursue of touch and good quality items in textile goods.

In the part of natural fibers, more people are interested in the newly man made synthetic fibers in the process of more new sense and multi-functions.

Especially, the sense and sensibility of human can be changed with the each step methods of Polymer, Spinning, Spun process yarn, Weaving and Knitting, Dyeing and finishing. The various sense and sensibility performance could be made by the combinations of each process.

Bonding items become more in demand in the sports-wear and casual-wear in reflect of this trend.

For the substitution of Natural fur, Sea-Island yarn items that are Suede, Jacket and Coat applied and create d new demand in the market.

This study knitted the 2 composite warp knitted fabric with different characteristic yarns, and made the pre-treatment, dyeing, mercerization, finishing, then analyzed the transition after each process.

2. Experimental

(1) Materials

In the Suede-EF-Velboa item, we used the 3 kinds of polyester Draw Textured Yarn on the warp pile knit fabrics : 75/144 DTY, 75/192 DTY, 65/192 DTY.

On the other side, we employed the Sea-Island yarn in the construction : 75d/24f Semi dull or 75d/36f Semi dull.

(2) Measurement of Alkali Mercerization and the percentage.

We measured below data to the fabrics according to as following program;
The ratio of Alkali treatment solution is 1:20
The concentration of NaOH is 0.1, 0.3, 0.5, 0.7, and 1%.
Treatment condition in the temperature and time: 90℃×30min..

We measured below data to the fabrics according to as following program;
The ratio of Alkali treatment solution is 1:20
The concentration of NaOH is 0.1, 0.3, 0.5, 0.7, and 1%.
Treatment condition in the temperature and time: 90℃×30min..

$$Weight\ loss(\%) = \frac{W_0 - W_R}{W_0} \times 100$$

where, W_0: Sample weight before treatment, W_R: Sample weight after treatment

(3) The Analysis of Scanning Electron Microscope.

The observation of the mercerized specimen was investigated on the face characteristics and partition by using the Scanning Electron Microscope.

(4) Selection and comparison of dyestuffs and color fastness.

We measured and confirmed the color fastness to washing, light, and sublimation after selected 3 kinds of high quality disperse dyestuffs which is very good to the sea-island back-side fabric.

(5) Confirm the dyeing behavior with the time of dyeing process.

In order to know the characteristics of 3 kinds of selected dyestuffs and their dyeing properties, we also analyzed and confirmed the real time concentration of dyestuff and UV-Spectrometer in the condition of 1% o.w.f. dyestuff concentration, ratio 1:15, disperse agent 0.5g/L, Ph buffer 2 g/L.

3. Conclusion

The alkali condition is like Fig. 2; NaOH Powder 0.3% and 130℃, 20 min. We also confirmed the optimum condition is 6% mercerization.
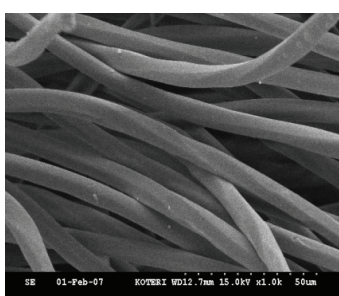
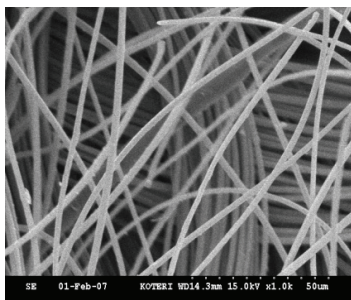**Fig. 1.** 0.3% NaOH, 130℃ 30min ×1,000 (앞)

Fig 2. 0.3% NaOH, 130℃ 30min ×1,000 (뒤)

On the table 1 and 2, we show K/S Value, the color fastness to washing, light and sublimation when dyed 3 kinds of stuffs to the Suede-EF-Velboa with the concentration of dyestuff 1.0% o.w.f.

The results show the high value of color fastness to the washing, light and sublimation more than 3 class in the clothing ends. But for the broad area of surface Suede looks rather lower dyeing color fastness.

Table 1. K/S, Color fastness EF-velboa(face)

	K/S	Washing (staining of nylon)	Light	Sublimation
Yellow S-FW	35.772 (450nm)	4	4	4
Red S-FW	21.135 (540nm)	3-4	4	4
Blue S-FW	21.433 (620nm)	4	4	4-5

Table 2. K/S, Color fastness Suede(back)

	K/S	Washing (staining of nylon)	Light	Sublimation
Yellow S-FW	4.125 (450nm)	3-4	4	4
Red S-FW	5.459 (540nm)	4	3-4	4
Blue S-FW	2.293 (620nm)	4	3-4	4-5

Fig. 3, 4 and 5 show the maximum absorption rate in the 3 kinds of high washing dyestuffs. Yellow S-FW and Red S-FW is 95% absorption. Blue S-FW is 85%. For the 3 kinds of dye-stuffs, we can find the procedure of more the 50% dyed after 40~50 min. of dyeing process.
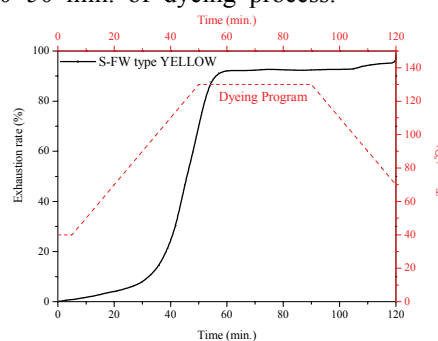
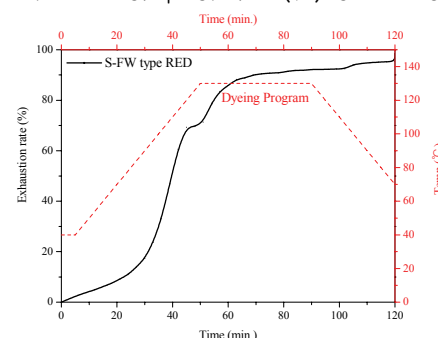

Fig. 3. Final Absorbption rate(%) of Yellow S-FW

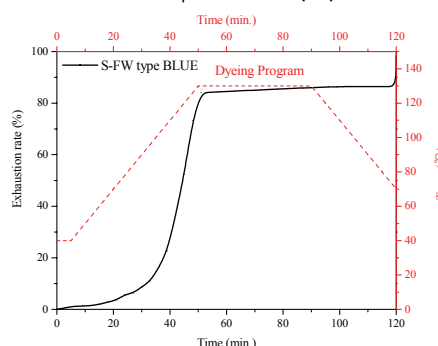**Fig. 4.** Final Absorbption rate(%) of Red S-FW

Fig. 5. Final Absorbption rate(%) of Blue S-FW