A study on processing condition of latent & potential crimped yarns

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1. INTRODUCTION

This study is aiming to develop latent & potential crimped yarn and its fabric by analysis of yarn texturing technology, weaving technology and dyeing technology. For this purpose, optimized process conditions are chosen. The yarn and fabric properties of each process are measured and discussed. Final goal of this research is to set data-base system as a basic work for making a good processing condition of latent & potential crimped yarns and its fabric

2. EXPERIMENTAL

2.1. Specimens

Table 1 shows latent & potential crimped yarn for experiment.

Table 1. latent & potential crimped yarn

Yarn type	Cross-section shape	Denier
Low IV	Round	85D
High-shrinkage	Peanut	155D

2.2. Method of test

Table 2, 3 shows yarn draft and dyeing condition.

	Yarn speed (m/min)	R1 (℃)	H/P (℃)	R2 (℃)	DR	Air-pressure (kgf/cm^2)
PET POY 85/12 →PET 50/12	700	90	160	40	1.45 1.5 1.55 1.62	3
PET POY 155/24+PET POY 85/36 →PET 185/60	700	90	160	40	1.45 1.5 1.55 1.62	4

Table 2. Draft conditions.

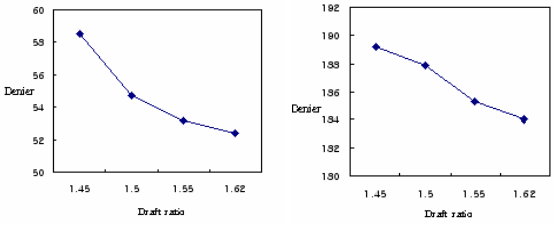
Table 3 Pretreatment & deweighting conditions.

Deweighting	owf	1:20
	Temp.	90,100 ℃
	Curing time	10,20,30 min
	NaOH	2 N
Dyeing	dyes	Dianix Red AC-E Dianix Yellow AC-
	owf	0.5, 1, 3, 5, 10 %
	Curing temp.	130 ℃
	Curing time	40 min

3. RESULT & DISCUSSION

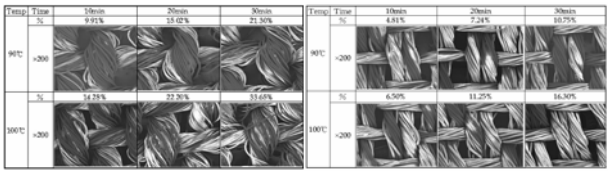
3.1. Draft condition and latent & potential crimped yarn's physical property

Fig. 1 shows that latent & potential crimped yarn's denier is slightly decreased with draft ratio increase. Fig 2 shows deweghting fabric of regular PET fabric and latent & potential crimped yarn fabric. In case of 90℃ and 100℃, regular PET fabric show remarkable difference of the deweghting rate when temperature increase, while latent & potential crimped yarn fabric is do not show sudden deweghting in increasing temperature, because it occurs deweghting very slowly.



PET 50/12 PET 185/60

Fig 1. Denier according to Draw ratio.



(Regular PET fabric) (Developed PET 50/12 fabric)

Fig 2. Deweighting fabrics

3.2. Result of computer color matching

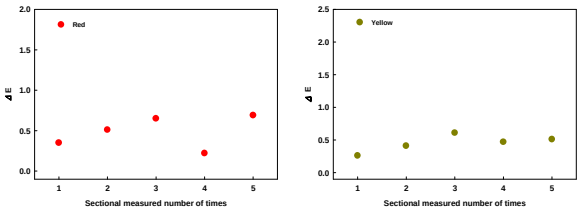


Fig 3. Diagram of ⊿E according to sectional measured number of times using the CCM

The color difference variation is 0.4~0.7. It means that latent & potential crimped yarn fabric was uniformity dyeing allover fabric.

4. CONCLUSION

Draft ratio and denier is contrary to each other. And the deweighting speed is slow than regular PET fabric. The latent & potential crimped yarn fabric is uniformity dyeing allover fabric. The purpose of this study is to develop high latent & potential crimped yarn and fabric process condition.

[1] Ali Demir, *Synthetic Filament Yarn Texturing Technology,* Prentice Hall, 1997.

[2] L Hollick and D K Wilson, *Yarn texturing technology*, The Textile Institute 2001.