

# Effect on DTP process by cotton treated with atmosphere plasma

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## ABSTRACT

Fabrics for Digital Textile Printing (DTP) are different from it of general textile printing. It is necessary to pre-treatment of chemical agents for desired quality. But this process does not correspond with simplification of DTP processing. In this research, we pre-treated of cotton fabric for DTP by atmosphere plasma treatment and we understood that pre-treatment of fabric by atmosphere plasma treatment was more simple DTP process.

## 1. INTRODUCTION

In this research, we substituted atmosphere plasma treatment for pre-treatment processing of DTP fabric. We compared physical properties of each processing and inquired into application of atmosphere plasma apparatus.

## 2. EXPERIMENT

### 2.1 Samples and agents

Cotton jacquard of this research was provided from DYETEC. Polyvinyl Alcohol (PVA) and Sodium Alginate were used for increasing of DTP ink adhesion.

### 2.2 Atmosphere plasma treatment

Atmosphere plasma apparatus was manufactured by API. Table 1 is control condition of plasma treatment. Adhesion of ink on fabric surface was increased by atmosphere plasma.

Table 1 Control condition of plasma treatment

Power	0.2kW
Speed of treatment	3m/min
Gas	He
Frequency	1

### 2.3 Digital Textile Printing

We used CMX (Colorspan, Yuhan-Kimberly Co., Ltd.) for DTP printing on cotton jacquard.

### 2.4 Tensile strength

Surface of fabric treated with atmosphere plasma was reformed and made unevenness. We used tensile strength meter MICO 350, Testomeric Co., Ltd.)

### 2.5 Dyeing durability by washing

We used household washing machine to measure dyeing durability. Washing was worked from 1 time to 3 times. We measured dyeability of fabric each time. We used CCM (Color-eye 3100, GretagMacbeth Co., Ltd.) to measure of dyeability.

### 3. RESULTS AND DISCUSSION

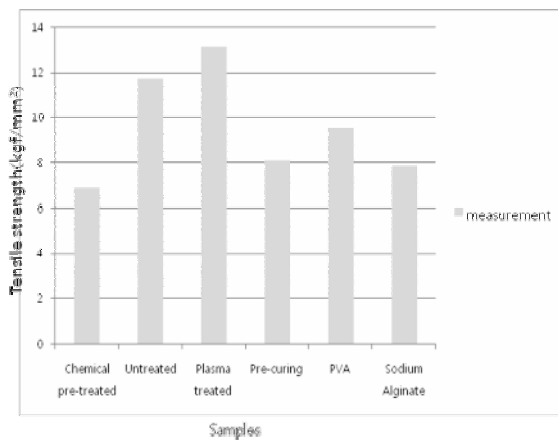


Fig. 1 Tensile strength of samples by control condition

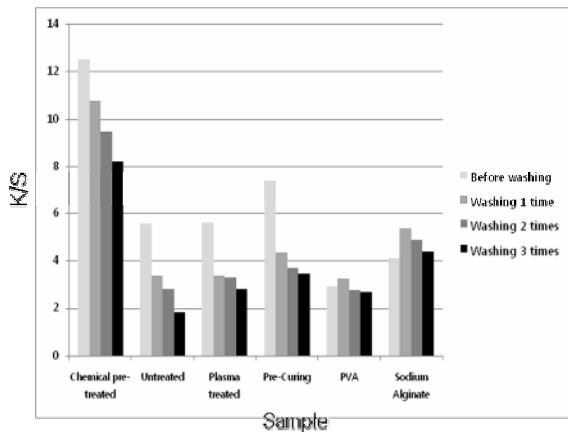


Fig.2 Dyeability of fabrics by washing number

1. Treated fabrics have more excellent tensile strength than chemical treated fabric. Chemical treated fabric contains various chemical agents for defending a spread of ink and helping ager. Fabric becomes stiff by this agents and it is rented easily. We consider that chemical agents within fabric have influence on tensile strength.

2. K/S is that chemical pre-treated DTP fabric is higher than the others. But its K/S is more decrease than the others as washing number and sodium alginate is higher K/S value than before washing.

Because it has several characteristics of emulsification stability, adhesion and viscosity.

### 4. CONCLUSION

We expect if dyeing durability is improved by atmosphere plasma treatment and coating of sodium alginate, it alternate existing pre-treatment process of DTP fabric by continual and simple.

### 5. REFERENCES

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