Microwave Treatment on Cold Pad Batch Process

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Abstract

In order to promote an efficiency CPB process, we developed microwave system in CPB process. The whiteness and penetration ability of microwave-CPB pre-treated fabrics were superior to CPB only. This results indicates that microwave-CPB pre-treatment promotes CPB efficiency in agent usages and batching time.

Introduction

Cold Pad Batch(CPB) system is an important process in pre-treatment and dyeing of cotton, cotton blended textiles. However, this process has a few defects in ununiformity of pick up surfactants and dye, tension difference, temperature difference of batch and season, fine bubbles in inter-textiles, long process time, and so on.

In this regard, we developed microwave system in CPB process that it would help complement a few defects of a CPB process. In this report, we studied the effect of pre-treatment using microwave system in CPB process.

Experimental

20'S, 60'S cotton plain fabrics and 40'S linen were used in raw fabrics. Pre-treatments were performed with a two-step method in which the samples were initially dipped with 7.5vol% hydrogen peroxide (38%), 8.0 vol% sodium hydroxide(50%), 3.3 vol% sodium silicate, 0.5vol% desizing agent, 2.6vol% scouring agent, 1.1vol% penetrating agent bath. Then the samples were squeezed in 80% pick up rate. Second step was carried out 5 seconds of microwave process system. The frequency of microwave was about 30MHz. Then microwave pre-treated samples were batched for 1, 3, 6, 12, 24 hours in room temperature. The effect of pre-treatments were observed by CCM(Data color, D65) in whiteness value and penetration length.

Results and Discussion

Fig. 1 shows the microwave generating system in CPB process. Fig. 2 shows the structure of microwave generator. And Fig. 3 shows installed microwave generator of CPB process machine in Kyung Il Dyeing Co.,LTD.

Fig. 4 shows the whitenesss microwave-CPB pre-treated with increasing batching times at 20'S, 60'S cotton and 40'S linen. The whiteness of microwave-CPB pre-treated fabrics were increased about 20% than CPB only at every time. Fig. 5 shows the penetration length of microwave-CPB pre-treated with increasing batching times at 20'S, 60'S cotton and 40'S linen. The penetration ability of microwave-CPB pre-treated fabrics were increased about 20~30% than CPB only at every time. Especially initial penetration ability were superior to CPB only.

This results indicates that microwave-CPB pre-treatment promotes CPB efficiency in agent usages and batching time.

Furthermore, we will study of effects in dyeing properties in microwave system to CPB dyeing.

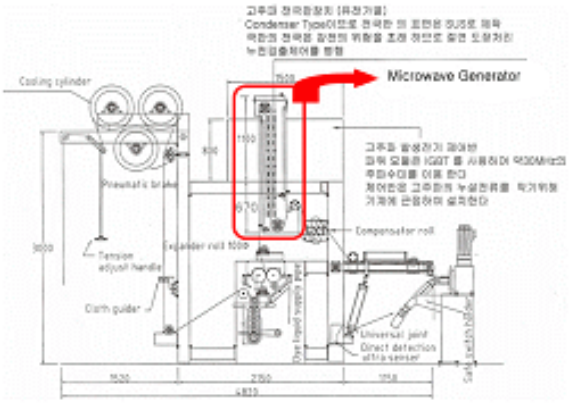

Fig. 1. Microwave system of CPB process.

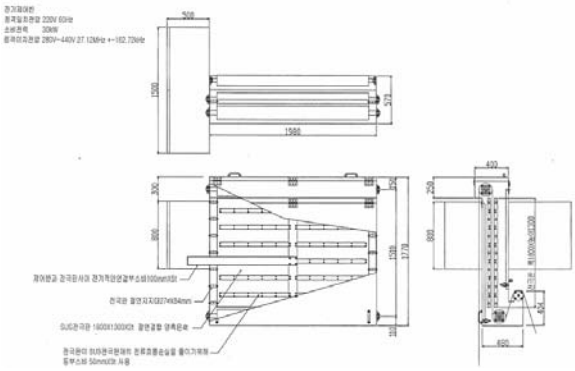

Fig. 2. Drawing of microwave generator.

Fig. 3. Installed microwave generator in Kyung Il Dyeing Co.,LTD

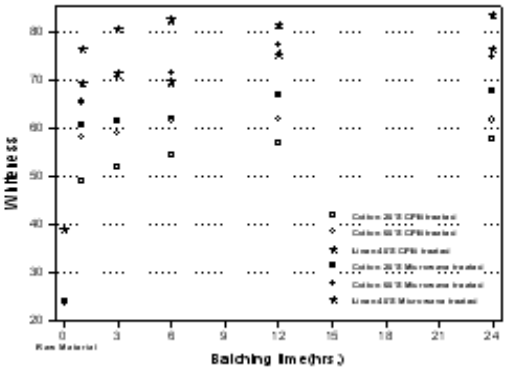

Fig. 4. Whiteness of CPB and microwave-CPB pre-treated with increasing batching times at 20'S, 60'S cotton and 40'S linen.

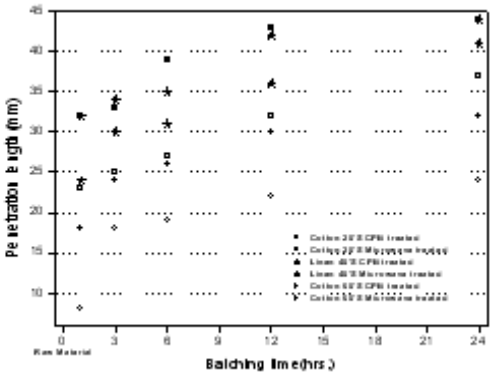

Fig. 5. Penetration length of CPB and microwave-CPB pre-treated with increasing batching times at 20'S, 60'S cotton and 40'S linen.