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An Approach to Evaluate Different Properties of Printed Cotton Fabric by using Polyethylene and Silicon Softener

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Abstract

This study shows the different effects of silicon softener and polyethylene softener on cotton printed fabric. The samples were treated with both softeners, and different tests have been examined like color fastness to washing, color fastness to water, color fastness to perspiration, pH. These tests results are all the same but color fastness to rubbing with polyethylene softener (Dry: 4/5, Wet: 2/3) is better than the silicon softener (Dry: 4, Wet: 2). Also, tensile tear strength of fabric with polyethylene softener (Tensile Strength in Warp: 209N, Tensile Strength in Weft: 214N and Tear Strength in Warp: 12.41N, Tear Strength in Weft: 14.17N) is better than the silicon softener (Tensile Strength in Warp: 177N, Tensile Strength in Weft: 158N and Tear Strength in Warp: 9.81N, Tear Strength in Weft: 10.67N). On the other hand, hand feel of the sample finished with silicon softener is better than the fabric treated with polyethylene softener. In overall context, this study shows that, if better hand feel is required then silicon softener can be used but, if hand feel as well as other test requirements(tensile, tear, etc.)which is required by buyer, polyethylene softener is appropriate to use.

Index terms—

1 Introduction

oftener is a completing operator that connected to material enhances its handle giving satisfying touch. When in doubt, the softening specialists connected are greasing up operators, which encourage the fiber sliding inside the texture structure, along these lines allowing simpler twisting and wrinkling of the texture. By and large, the term of the impact is constrained since the items connected amid the treatment are disposed of by ensuing washing; hence, they should be connected in the last phase of the treatment. **??**1] Cleanser (likewise called texture conditioner) is utilized to anticipate static stick and make texture milder, i.e. Softening operators are connected to materials to enhance their hand, wrap, cutting and sewing characteristics. It is accessible as a fluid or as dryer sheets. Cleansing agents work by covering the surface of the material filaments with a thin layer of synthetic concoctions; these synthetic substances have ointment properties and are electrically conductive, consequently making the strands feel smoother and averting development of friction-based electricity. As the material goes under different mechanical and compound procedures that make the surface of the material cruel.For instance, Removal of normal oil and waxes by scouring and fading. Pitch completing of material additionally grants some level of brutality. Soaping of material likewise adds brutal inclination to the material. As buyers are significantly more thinking about the dash of material. This is an additional explanation behind utilizing conditioner. [2] II.

2 Literature Review

Polyethylene can be modified by air oxidation in the melt at high pressure to add hydrophilic character (mainly carboxylic acid group). Emulsification in the presence of alkali provides higher quality and more stable products.

They show high lubricity that is not durable to dry cleaning. They are stable to extreme pH conditions and heat at normal textile processing condition, and compatible with resins and fluorescent brightening agents. They impart lubricity especially required for yarns. Matsoft PE emulsion and Matsoft PEW emulsion belongs to this category.

Silicones are macromolecules comprised of a polymer backbone of alternating Silicon and Oxygen atoms with organic groups attached to silicon. Silicone's softening capability comes from the siloxane backbone's flexibility and its freedom of rotation along the Si-O bonds.

They are insoluble in water, and therefore must be applied on fabrics after emulsification or dissolution in organic solvents. They feature quite a good fastness to washing. They create a lubricating and moderately waterproof film on the surface and give fabrics a silky hand. They show good temperature stability and durability, with a high degree of permanence for those products that form cross-linked films and a range of properties from hydrophobic to hydrophilic. According to requirements, the required properties the organ reactive group is modified and the results are achieved.

3 Results

Compare the results

4 IV.

materials and methods Curing: Curing was done by using 150°C temperature for 4-5 minutes

Finishing: Then we divide the fabric into half. Each half has one meter of fabric. We finish one half of the fabric with 'Silicon' softener &another half of the fabric with 'Polyethylene' softener by the 'Monforts' stenter machine

5 Discussion

As we can see from this table, we can compare these two softeners by the following-1. Thread in PPI (Pick per Inch) of fabric treated with silicon softener is a little bit higher than the fabric treated with polyethylene softener. 2. GSM of fabric treated with silicon softener is a little bit lower than the fabric treated with polyethylene softener. 3. Tensile strength of fabric treated with polyethylene softener is better than the fabric treated with silicon softener. 4. The same way tearing strength of fabric treated with polyethylene softener is better than the fabric treated with silicon softener. 5. Also, color fastness to rubbing is more improved of fabric treated with polyethylene softener than the fabric treated with silicon softener. 6. But we can see that the color fastness to Washing, Water, Perspiration are equally the same for both fabrics which individually treated with silicon & polyethylene softener. 7. The pH of fabric treated with silicon softener is a little bit higher than the fabric treated with polyethylene softener. 8. The hand feel of fabric treated with silicon softener is better than the fabric treated with polyethylene softener.

After observing all the above topics, we can conclude that the polyethylene softener is more appropriate to finish the fabric than with silicon softener.

6 VII.

7 Conclusion

This report shows that, for getting a better hand feel, silicon softener is preferable, but the required strength cannot be achieved by it.

This report also shows that to get required strength and color fastness to rubbing polyethylene softener is preferable, though hand feel is not as good as silicon softener. Year 2019 J D R polyethylene softener is more appropriable than silicon softener for printed cotton fabric.

Figure 1:

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Polyethylene Softener	3 kg
Acetic Acid	0.05 kg
Temperature	150°C
Speed	20 m/min

Finishing recipe of silicon softener for 100 Liter of liquor for 1 meter of sample fabric-

Figure 2: Table 4 :

5

Silicon Softener	3 kg
Acetic Acid	0.05 kg
Temperature	150°C
Speed	20 m/min

Figure 3: Table 5 :