

# Technical Tuesdays

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## Alkaline Weight Reduction Of Polyester Fabrics

### Why the need of Weight Reduction of Polyester Fabrics .

Polyester is one of the versatile manmade fiber, finds its use in a variety of applications such as apparel, industrial fabrics, etc. As of now, poly (ethylene terephthalate) that is PET fibre is the most widely manufactured fibre having overtaken polyamide fibre.

Even though polyester exhibits good properties like melting point, modulus etc, it still suffers from deficiency of comfortability. One of the disadvantages of PET fibre is its hydrophobic surface and low water sorption due to its compact structure which may affect in both dyeing and printing.

Thus lots of efforts has been taken for its scientific modifications so as to impart greater comfort, better draping qualities, improved moisture regain and natural silky appearance, improved appearance, wettability, colour strength etc .

Polyester fabrics with silk like feel can be achieved by

- a] Modification of weave, yarn density and other process.
- b] By the use and application of softening agents.
- c] Weight reduction by Sodium Hydroxide treatment

### Weight reduction by Sodium Hydroxide treatment.

The weight reduction of polyester is nothing but Saponification of Terephthalic ester, caused by sodium hydroxide. Under predetermined conditions, alkaline hydrolysis involves the progressive peeling of polyester surface resulting in loss of weight without altering its favorable properties.

Polyester is susceptible to the action of bases, depending on their ionic character. Ionisable bases like caustic soda, caustic potash and lime water only affect the outer surface of the polyester filament.

Primary and secondary bases and ammonia on the other hand, can diffuse into the polyester fibre and attack in depth resulting in breakage of polyester chain molecules by amide formation.

### Standard Recipe for 20 % Weight Reduction

- 1) 10 % w/v NaOH for 30 to 40 Minutes at 85° to 90° C.
- 2) 20 % w/v NaOH for 15 to 20 Minutes at 85° to 90° C.

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Improvement in the properties on PET fabric after Weight Reduction Treatment .

## 1. Handle and Drape

All alkali treated polyester fabrics show a better handle and appearance which increases with increased weight loss. The treatment results in increased fineness of fabric. There is a large improvement in softness, better drape and handle.

## 2. Hydrophilicity

The moisture content of the fabric remains almost the same. The water spreading is appreciably improved after the weight reduction treatment.

## 3. Static Charge

Polyester fabrics are well known for their static charge accumulation problems. All the treatments at higher levels of weight loss decrease considerably the charge developed and also the time of dissipation.

## 4. Reduction in Pilling Tendency

All fabric samples show strength loss to some extent which increases with increase in weight loss. However due to the shelling, the yarn becomes finer and absolute strength per denier does not appear to change appreciably. Also helping in reducing the Pilling tendency because for pilling one of the factor is also high tenacity .

## 5. Denier Reduction

Caustic reduction is the etching away of the outer surface of the filaments to reduce their diameter or effective denier.



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