

Novel Effects on Garments and Fabrics

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CLOTHING IS one of the three basic needs of the human species. This basic need is transitioned into a demand when it is directed to a specific type of clothing. Fashion demands are the driving force behind garment-manufacturing units.

Garment processing is an emerging technology, which involves first making garments and then imparting aesthetic qualities. Value-addition has gained overwhelming popularity due to the fashion world's taste for a distressed and worn-out look. It allows substantially higher earnings in relation to the cost of imparting the effect, which may be either functional or aesthetic.

In many cases, the garment may not look desirable or attractive if it remains untreated. Aesthetic value-addition by the application of a fashion treatment or ornamentation attracts the immediate attention of consumers, making a garment more appealing. This kind of value-addition is governed by the latest 'trends' and provides a differentiator from competing products.

The global demand for these treatments has created a very healthy atmosphere for the growth of garment processing, which can include the fading of particular portions of a garment, distressed or worn-out looks, stone-washed soft handle, creasing, vintage, etc.

As the competition increases, there is a need to implement newer technologies that will give better results. We at Sarex are experimenting with fabric and garment details, including embellishments in order to add value to garments.

Stylistic Feature: Permanent Crease (Wrinkle)

Saracrease PW has been developed to achieve desirable localised creases on any portion of the garment, to satisfy the casual and used look, which is the rage among modern youth.

It is specifically designed to impart soft wrinkles at any desired location on a garment, as shown in Figure 1. Unlike conventional glyoxal

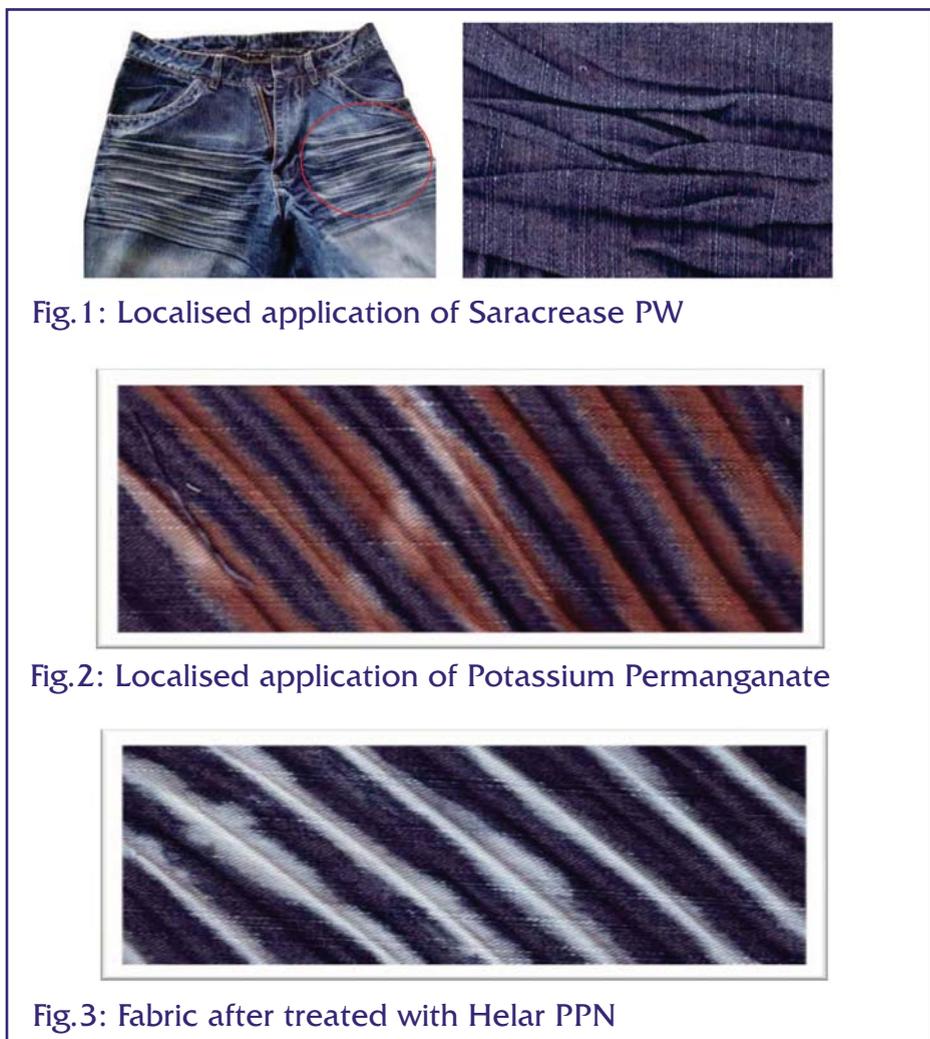


Fig. 1: Localised application of Saracrease PW

Fig. 2: Localised application of Potassium Permanganate

Fig. 3: Fabric after treated with Helar PPN

resins or melamine resins, it imparts naturally soft and sharp creases without altering tone change or patch/ring formation after drying and curing. Finishing with Saracrease PW is durable to multiple home launderings, with minimal impact on tear/tensile strength.

Sparkle Spray: Potassium Permanganate Neutraliser

Generally, bleaching of denim garments is carried out using sodium or calcium hypochlorite to achieve fading of the entire

garment, whereas for localised fading or bleaching highlights, the preferred product, potassium permanganate, is applied by spray, brush or any other suitable technique.

Potassium permanganate has the potential of achieving dazzling-white bleach effects but suffers from the yellow-brown stains of residual manganese oxides. These yellow-brown stains need to be neutralised/eliminated to get the effect of white discharge. Eliminating manganese oxides using conventional bisulphites, metabisulphate blends or other



Technical Briefing: Novel Effects

inorganic products is a cumbersome, polluting and smelly affair due to the odours of sulphur.

Helar PPN, developed by Sarex, is an extremely effective permanganate neutraliser, which simplifies elimination of yellow-brown stains in a single wash, without any of the problems indicated above. Garments treated with Helar PPN (Figure 2) display bright-white discharge effects without tendering or onset of

delayed yellowing. The product is also available in a form of a 100% powder. Helar PPN (Conc) is easily dilutable to the required strengths.

Contrast Magic Wash

Sarafinish OMP is an innovative product to achieve a variety of aesthetically appealing effects on all kinds of textile substrates and garments. It gives a certain fashion look, which

is in high demand. Put simply, it involves the differential discolouration of different parts of the fabric structure in denim and other garments.

Sarafinish OMP is a unique formulation to create special effects on denim and non-denim garments, either alone or by using thermocol balls for mechanical abrasion on the surface of the garment.

Sarafinish OMP achieves these fashion effects in an essentially dry (water-free) garment processing sequence. It works on the unique principle of microscopic localised bleaching of the very upper surface of the textile, leaving the lower and middle portions totally unaffected – as a result of which the textile exhibits a superbly contrasted effect, highlighting the colour difference between the faded top and unaffected lower portion of the substrate.

This principle allows exotic effects on pile fabrics, corduroys, ribbed jerseys, terry towels (Figure 4), carpets, etc. Some of these effects are popularly known as French frost, white wash, ice wash, snow wash, or acid wash. Apart from these effects, Sarafinish OMP can create the cracked look, black sky look, bright white look, etc. The advantage of Sarafinish OMP is that it can be used for denim garments as well as non-denim garments such as fleece, T-shirts, etc.

These novel effects can be imparted by the following two methods:

Ball Blast Effect: This effect can be achieved by filling the drum washer to 3/4 capacity with thermocol balls of varying sizes. The balls are wetted out with a little water before loading in the machine. Sprinkle 1-5% Sarafinish OMP on these wet thermocol balls and rotate the drums for 5-10 minutes, for even distribution of Sarafinish OMP. Load the machine with desized dry garments and treat for 10-15 minutes, depending upon the effect required. Unload and treat the garments with mild peroxide or sodium hydrosulphite to remove traces of Sarafinish OMP.

Ocean Wash Effect: Wet out the garments with water and tumble in a tumble drier without heat to achieve 65% pick up of water uniformly on the garments. Add 30-40% Sarafinish OMP on weight of dry garments and tumble for 8-15 minutes to obtain the required effect. Unload and rinse the garment to remove traces of Sarafinish OMP. Best results are obtained by washing with 1% hydrogen peroxide 50%, pH 10-10.5 at room temperature for 10-15 minutes, followed by rinsing at 60°C for 2 minutes. Carry out soaping with Saralan Jet LF 0.5% at 80-85°C for 10-15 minutes, followed by rinsing. Garments can then be treated with a required tint and/or softener.

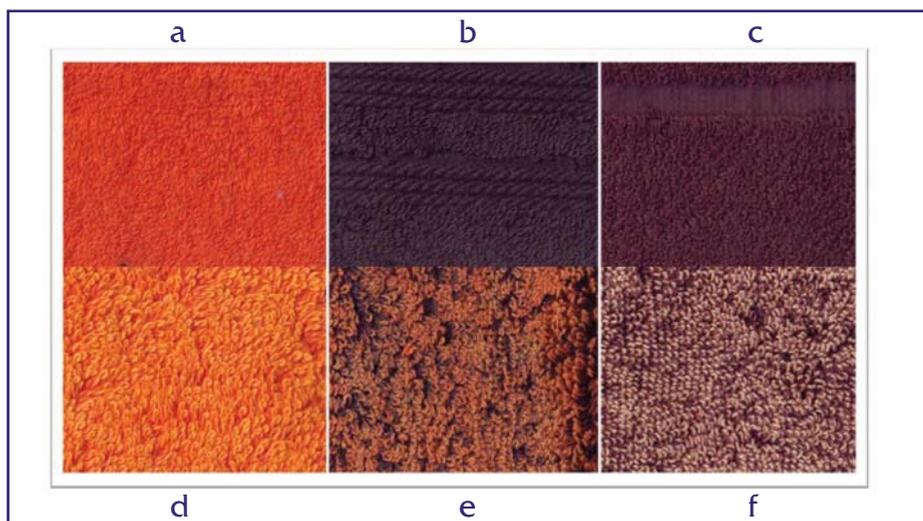


Fig.4: **a,b,c:** Dyed Terry towel before treatment with Sarafinish OMP; **d,e,f:** Dyed Terry towel after treatment with Sarafinish OMP

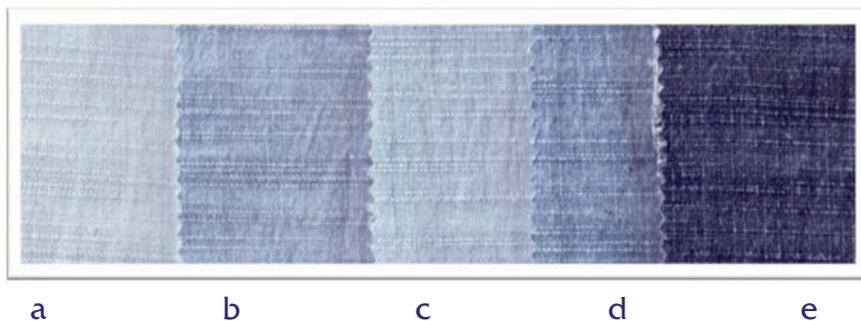


Fig.5: **a.** NaOCl (80g/l) and Sarableach BBA (0.5%) for 15 min., **b.** NaOCl (80g/l) and Sarableach BBA (0.5 g/l) for 7.5 min., **c.** NaOCl (80g/l) for 30 min., **d.** NaOCl (80g/l) for 15 min., **e.** Desized Denim

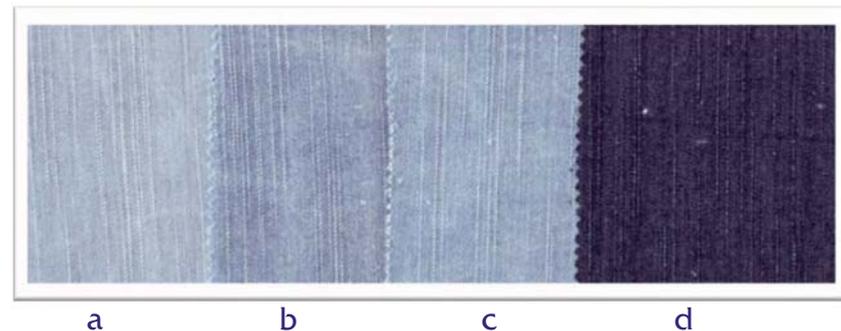
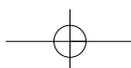


Fig.6: **a.** NaOCl (40g/l) and Sarableach BBA (0.1g/l) for 40 min., **b.** NaOCl (40g/l) and Sarableach BBA (0.5g/l) for 30 min., **c.** NaOCl (80g/l) for 30 min., **d.** Desized Denim



Bleach Bath Accelerator

Sarableach BBA is a unique, highly active bleach-bath accelerator for hypochlorite bleaching of denim garments or other cotton substrates, to produce rapid fading or localised special effects. Sodium hypochlorite or calcium hypochlorite is used as a bleaching agent to achieve wash-down effects ranging from bright look to ice-wash look. As is known, bleaching with hypochlorite follows the equation below:



Note that hypochlorous acid (HOCl) is the active bleaching agent.

Sarableach BBA catalyses the above reaction dramatically (more than five times). This increase allows the following advantages:

- Due to the catalytic action of Sarableach BBA, production time can be reduced by 50% (Figure 5). Thus it is possible to double production with the same capacity. For localised effects, Sarableach BBA can be applied on desized garments, using spray, brush or other applicators; air dry and bleach as usual, followed by antichlor treatment.
- While maintaining the level of fading or wash-down effect, Sarableach BBA substantially reduces the required concentration of hypochlorite (Figure 6), leading to a lower effluent load, less-aggressive garment-processing environment and more reproducible or predictable bleaching.

The above advantages, while important for conventional garments, become extremely critical for denims in blends with Tencel garments, because Tencel and Lycra are extremely sensitive to hypochlorite, which conventionally would have led to strength loss and reduced elasticity (under normal bleaching conditions).

For garments containing Lycra and Tencel, the concentration of sodium hypochlorite can be reduced by almost 50%, with reduced effluent quantity and without affecting the end results. Due to low concentration of sodium hypochlorite in bleaching with Sarableach BBA, degradation of Lycra and Tencel is prevented.

Localised application of Sarableach BBA on desized denim garments, as well as garments dyed with sulphur and selected reactive dyes, followed by drying and bleaching with hypochlorite, can produce



Fig.7: **a.** Biopolishing with 0.5% Sarakol BSA, **b.** Biopolishing without Sarakol BSA, **c.** Grey

Fig.8: **a.** Biopolishing with 0.5% Sarakol BSA, **b.** Biopolishing without Sarakol BSA, **c.** Grey

localised bleached effect similar to sand blasting, without fabric damage.

In the case of calcium hypochlorite, which is slower in action compared to sodium hypochlorite, treatment time can be reduced by half by the addition of Sarableach BBA. Sodium hypochlorite solution, which has low stability and may decompose during storage, can still be used at lower concentration without affecting its performance.

Anti-Backstaining

All wet processing stages for denim garments, such as desizing, fading or upbraiding and biopolishing, lead to release of indigo or sulphur dye, which tints/stains the white pocketing material (cotton or polycotton) as well as the undyed weft yarn of the denim fabric.

By wet processing of denim, the usually blue-dyed denim is given a faded or worn appearance, with the characteristic white and blue contrast. Wet processing the denim material typically involves the use of amylase, pumice stone and cellulase and results in the removal of dye to give areas of lighter colour. The dye removed from the denim material

during the treatment may cause 'backstaining' or 're-deposition' onto the denim material, eg. re-colouration of the blue threads and blue colouration of the white threads, resulting in less contrast between the blue and white threads.

This tinting reduces the contrast between the dyed warp and the undyed weft in the denim garment, while the tinted pocketing leads to shabby appearance. To prevent such loose dyes in the wash liquor from depositing on the garment, special auxiliaries are used – namely anti-backstaining agents or dye-transfer inhibitors.

Sarex has developed a concentrated product, Sarakol BSA, in 100% powder form, specially formulated to avoid backstaining of labels and pockets during processing of indigo-dyed denim garments. Also, Sarakol BSA is compatible with all the enzymes used and can be added in desizing of denim garments, or during acid-cellulase and neutral-cellulase treatment for colour fading.

Thus, treatment with Sarableach BBA (Figures 7 and 8) can result in a decreased number of washes, thereby increasing productivity and decreasing the consumption of water and chemicals, including surfactants. ID