Sarex

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Saraquest

Exclusive Insight

Chemistry Behind Good Feelings

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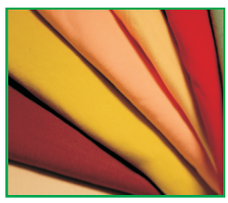


Soft and yet “extremely absorbent” textiles

Aquasoft-KN

The success of silicones is based on their extraordinary material characteristics, such as low surface tension and unique surface properties, which clearly distinguish them from organics. Negative effects of common silicone softeners on fabric properties are reduced water absorbency and tendency of yellowing. These disadvantages make them unsuitable for the high grade finishing of cotton Knits ,towels and bed sheets.

A good towel should be both wonderfully soft and hydrophilic. The same applies to modern clothing textiles: the wearer expects a soft hand combined with optimum hydrophilicity. Only textiles boasting both properties can satisfy today's increased demands for wearing comfort.

The trend in modern textile finishing is definitely toward softness and hydrophilicity – a combination that is anything but obvious for silicone textile softeners.

We at **SAREX,** developed a innovative hydrophiilic silicone softener- **Aquasoft-KN** which imparts outstanding surface smoothness on the fabric.

Aquasoft-KN is sutaible for terry towel, knits and woven fabrics.

Unique feature of Aquasoft-KN

Givs excellent softness with good hydrophilicity

Shear stable silicone softener hence sutaible for jets, soft flow and garment drum machine.

Can be used for moisture management finish.

Application:

Exhaust application

1-3 % (owf) Aquasoft-KN

pH 5.5 - 6.0, Temp. 35-40^{0}C,treat for 20-30 min.

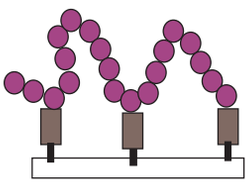
Pad application

10-40 g/l Aquasoft-KN

pH 5.0 - 6.0, pad with 65-70% pick up, dry at 140-160^{0}C.

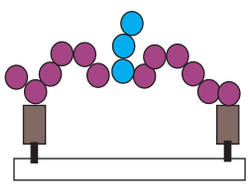
Silicone softener structure and its performance

Hydrophilic softener, the polymer molecule is built up such that the hydrophilic chains end up on the fiber surface. Interacting with the anchoring groups, they thus form a hydrophilic layer directly on the fiber surface, without diminishing the mobility of the silicone chains or the resultant soft hand.



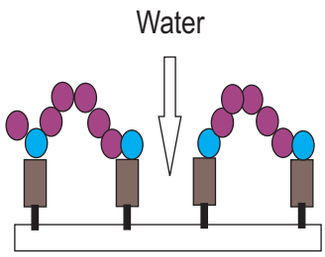
The silicone chains (purple) completely shield the fiber surface. The anchoring groups (grey) are attached

--> Softness
--> No Hydrophillicity



The silicone chains (purple) are supplemented by hydrophillic side chains (blue), which form a hydrophilic layer on the fiber surface

--> Softness
--> poor Hydrophillicity



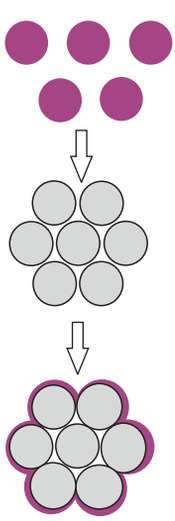
Hydrophilic chains (purple) are attached via anchoring groups (grey) directly to the fiber surface

--> Softness
--> Excellent Hydrophillicity

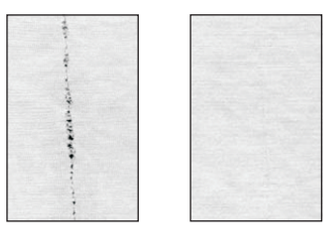
Effect of particle size on Handfeel

Particle size of softener has significant effects on the kind of handfeel of a textile finish. Aquasoft-KN which is Macroemulsions containing larger silicone particles, are deposited on the surface, where they generate surface softness. The typical characteristics are optimal smoothness, a excellent hand, high resiliency and good sewing properties. Aquasoft-KN gives excellent surface smothness by formation of elastic film on fabric surface.

Mechanism of Macroemulsion Silicone



Sewability



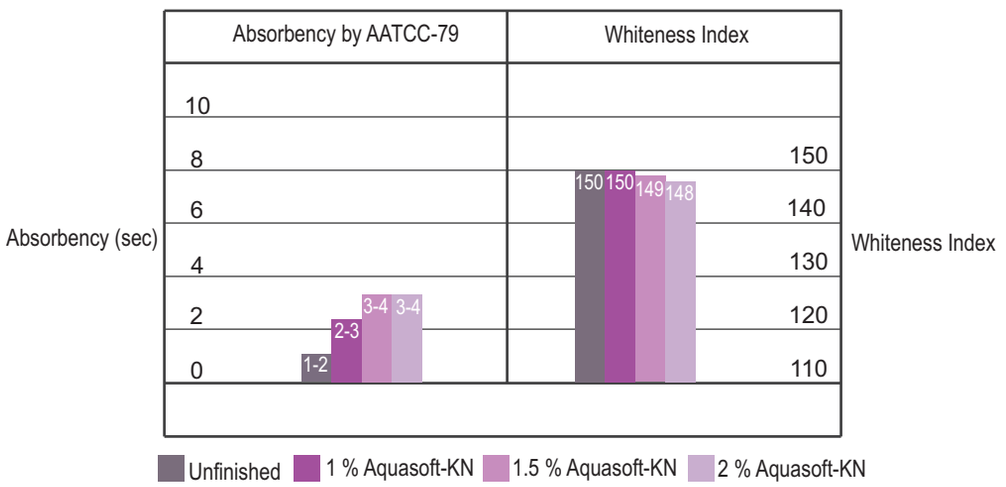
Unfinished Fabric

Fabric finished with Aquasoft-KN

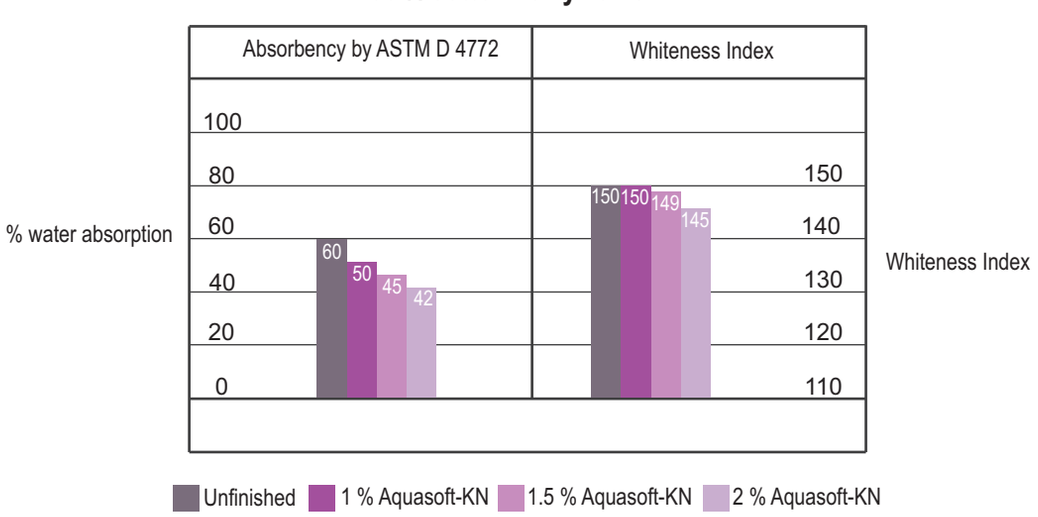
Performance Data:

100 % cotton knits and Terry towel are finished with 1, 1.5 and 2 % Aquasoft-KN and performance data of finished fabric is evaluated . From data it is clear that fabric finished with Aquasoft-KN does not hamper Whiteness Index of finished fabric and also it gives very good hydrophillicity.

100 % Cotton knits



100 % cotton Terry Towel



Levelling cum dispersing agent for polyester dyeing

Dyewell-PES

The development of disperse dyes for dyeing secondary cellulose acetate fibres in the early 1920s was a major technological breakthrough although their major use today is for the coloration of the most important group of synthetic fibres, polyesters .

Disperse dyes have extremely low water solubility and its dispersions stability is of prime importance in exhaust dyeing since failure of the dispersion will result in agglomeration and possibly precipitation of the dye which in turn will result in unlevel dyeing and dye gets deposited in machine. The property to dispersion failure is greatest in the case of HT dyeing hence additional dispersing agents are added to the dye bath which prevents agglomeration and crystallization of the dye and maintains dispersion stability.

Dyeing levelness depends on the rate at which the dye is taken up by the fiber and the extent of migration at the maximum dyeing temperature. Hence, there are two fundamental mechanisms that can contribute to a level dyeing;

(I) Control of rate of exhaustion of the dye so that it is taken evenly and slowly.

(ii) Migration of the dye after initial uneven sorption on the fiber.

The levelling capacity of a dye is its ability to even out variations by the dye distribution in the substrate. In actual practice, the requirements of dyes with matching compatibility, penetration properties and adequate automation with minimum supervision cannot be met by all the processing units and hence a range of levelling agents for different dye-fibre systems have been developed by the textile auxiliary manufacturers to meet the quality requirement.

The primary objectives of using levelling agent in polyester dyeing:

To obtain level shades.

To obtain uniform depth and tone of the shade.

To achieve optimum colour value.

By considering the requirement of process house **SAREX** has developed innovative levelling cum dispersing agent **Dyewell-PES** for polyester dyeing. **Dyewell-PES** is recommended to control the rate of dye uptake under adverse conditions of dyeing to obtain level and uniform dyeing.

Unique Feature of Dyewell-PES

Dyewell-PES is concentrated low foaming levelling and dispersing agent.

Dyewell-PES effectively ensures gradual exhaustion of dyebaths.

Dyewell-PES does not affect shade at recommended.

It improves migration of disperse dyes so level dyeing can be achieved.

Dyewell-PES can be tested with following methods for its Migration Behavior

Blue SR dyed (2% shade) PES fabric is sandwhiched with equal weight of undyed polyester fabric and treated with and without levelling agent at 130^{0}C /30min. The depth difference between dyed and undyed fabrics are compared

Figure (1) shows 0.3 g/l and 0.5 g/l Dyewell-PES shows migration of dyes on undyed fabric from dyed fabric which indicates Dyewell-PES has very good migration property.

Application:

In Exhaust dyeing of polyester tops, yarn, fibre & fabrics set the bath with

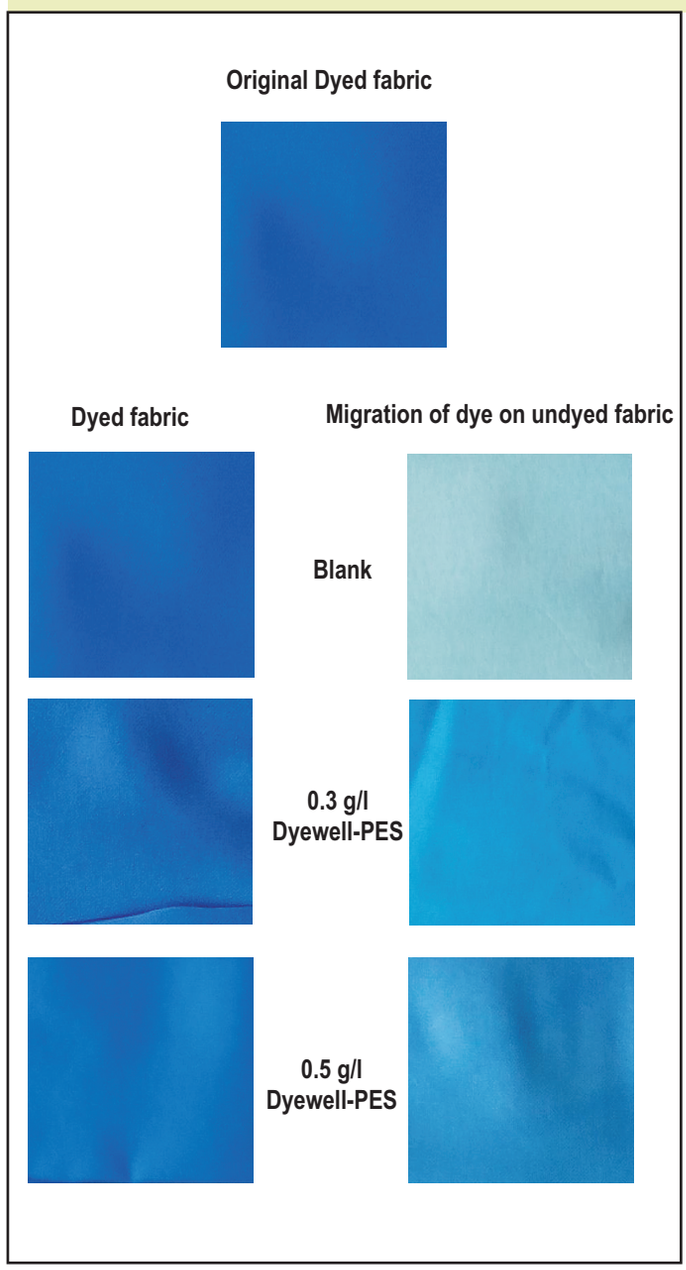
0.3-0.5 g/l Dyewell-PES

Circulate at 60^{0}C for 5-10 min., add dyestuff dispersion. Adjust pH to 4.5 - 5.5. Start Dyeing.

For correction of faulty dyeing

1.0 - 1.5 g/l Dyewell-PES
Adjust pH to 4.5 - 5.5, Treat at 130 ^{0}C for 40-60 min.

Fig (1) Migration Behavior of Dyewell-PES



Print with "Zero formaldehyde"

Nonformal-XL

Pigment printing is another area where peoples are using formaldehyde containing cross linkers generally melamine formaldehyde type which impacts on environment and also health of human being.

In recent years demand of pigment printed material increases specially in bed linens and in baby clothes. Also awareness and curiosity of consumer about eco-friendly products is also increasing and demanding.

SAREX has developed new innovative "Zero formaldehyde" cross linking agent for pigment printing i.e **Nonformal-XL**. Which replaces conventional Melamine based cross linking agents used in pigment printing without affecting performance of pigment printed fabric.

Unique feature of "zero formaldehyde"Pigment Printing system

Meets Oeko-Tex Standard 100

Meets all the requirements of major retailers, brands and eco-labels

Environmentally friendly and meets the all ecological requirements.

It has good compatibility with auxiliaries normally employed in pigment printing.

The prints posses pleasing and soft handle and good overall fastness properties.

Fabric printed with **Nonformal-XL** not only meets Oeko-Tex standard but also it cares of your printed clothes and bed linens by adding zero formaldehyde in your prints.

Application:

0.5- 1.5 % Nonformal-XL (added in print paste depending on pigment concentration.)

Print, dry and cure at 130-150^{0}C for 4 mins.

Comparison of Sarex "Zero Formladehyde" Pigment Printing System v/s Conventional Pigment Printing System

Printing System	Sarex "Zero Formladehyde" Pigment Printing System	Conventional Pigment Printing System
Pigment Printed Fabric		
Dry Rub Fastness	4	4
Wet Rub Fastness	3 - 4	3 - 4
Fastness to Dry Cleaning	4	4

Fabric printed with Sarex "Zero Formladehyde" Pigment Printing System shows comparable print effect as well as fastness with Conventional Pigment Printing System

Ink-Jet Printing

SARASOL-1101

Digital printing is the fastest growing technology for printing textiles, According to a report ,Between 2010 and 2013 digitally printed textile output rose by 200% to 70 million square meters.

Although digital methods still account for less than 2 % of the global market for printed textiles, their share is likely to expand to 10% by the early part of the next decade.

Screen printing still dominates the textile printing market with 80% of global output. However, this share is expected to fall as digital printing gains more of a foothold in the market.

Several factors play a key role in the successful operation of Ink-Jet system including hardware design, computerized color management, ink and print formulation. Ink jet printing simply involves squirting droplets of ink on to a substrate to produce an image. Ink-jet can be applied on textile substrate in three part -

1) Pretreatment 2) Printing 3) Fixing and washing

Pretreatment:

In case of ink-jet printing, a highly effective pre-treatment is necessary. Fabric must be singed to remove surface hairs to have better fabric printing quality and also to prevent the risk of flaws being generated by surface fibres touching the print head and blocking the nozzles. Further the fabric should have uniform absorbency and whiteness.

In ink-Jet printing to achieve sharpness and colour depth are important factors and to achieve these the fabric is first given a treatment by padding with a solution of thickener to hold a ink droplet. This results in the droplets of ink being absorbed largely on to the fabric surface and produces stronger , more sharper prints.

SAREX has developed a specialty product for pretreatment of Ink-Jet printing **"Sarasol-1101"**

The use of Sarasol-1101 in the pretreatment enhances the colour yields of the printed fabrics . It serves as an inhibitor of migration of ink droplet and thereby controls the levelness and sharpness of prints.

Unique Feature of Sarasol-1101

Improves colour value during ink-Jet printing on all types of fabric with disperse, reactive and acid dye.

Increases localized viscosity of ink, thereby avoiding bleeding and spreading of prints.

It Increases levelness and sharpness of print.

It is stable against bacterial attack

The feel of printed fabric is not affected.

Suggested Recipe:

Ink-Jet printing on Polyester fabric

Pre-Treatement	Printing	Fixation	Aftertreatment
Sarasol-1101 : 30 - 60 g/l Sarakol-NF : 1-2 g/l Dry at 90-110^{0}C	Ink-Jet printing with Disperse Ink	Steam at 180^{0}C for 6-8 mins or thermofix at 180-190^{0}C for 1-2 mins.	0.5-0.75 g/l Reducon-ACD (conc) at pH 4.5 to 5.0 at 60-70^{0}C for 10 mins.

Ink-Jet printing on Cotton or Viscose fabric

Pre-Treatement	Printing	Fixation	Aftertreatment
Sarasol-1101 : 50 - 70 g/l Sarakol-NF : 1-2 g/l Urea : 50-100 g/l Soda-Ash : 30-40 g/l Super-R-Salt : 10-15 g/l Dry at 90-110^{0}C	Ink-Jet printing with Reactive Ink	Steam at 102-105^{0}C for 7-10 mins or thermofix at 140-150^{0}C for 3-5 mins.	1.0 g/l Sarakol-CR at 98 ^{0}C for 5 mins (twice), Rinse 3 mins at boil, Cold wash for 3 mins.

Ink-Jet printing on Silk, wool and Polyamide fabric

Pre-Treatement	Printing	Fixation	Aftertreatment
Sarasol-1101 : 60 -80 g/l Sarakol-NF : 2-3 g/l Urea : 80-100 g/l $(NH_4)_2SO_4$ (25 %) : 10-20 g/l Supergen-MX : 10 g/l Dry at 90-110^{0}C	Ink-Jet printing with Acid / Metal complex Ink	Steam at 105^{0}C for 10-15 mins	Hot wash followed by cold wash

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