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# Saraquest

Exclusive Insight



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**CHEMISTRY BEHIND  
GOOD FEELINGS**



## Textile Chemical Manufacturing

“Customer Delight” is the key strategy of **Sarex Chemicals** as its main motto is to provide solutions to the customers rather than selling products.

**Sarex Chemicals** is a bluesign® system partner. Most of the products offered by Sarex are Reach Pre-Registered and more than 100 products are GOTS certified. Moreover, Sarex also has been accredited by

- ✓ ISO 17025 : 2017 (NABL certified lab)
- ✓ ISO 45001: 2018
- ✓ ISO 14001: 2015
- ✓ ISO 9001: 2015

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# ERGOFIX-ALS

## All-in-one Dye Fixing Agent For Cellulosic

Dye fixing agents are of considerable interest in the art of textile colouration. Dyed and printed fabrics often have unsatisfactory wet fastness, especially washing and water fastness. This is found with dyeings carried out using direct dyestuffs, acid dyestuffs and to a lesser extent, reactive dyestuffs.

All direct dyestuffs are regarded as being substantive to cellulosic materials whereas the reactive dyes are considered substantive as well as reactive. Direct dyes are normally applied from an aqueous dyebath containing an electrolyte. They impart moderate to good light fastness but moderate to poor washing fastness. Although the dyeing process with direct dyes is simple, it lacks in the wet fastness properties.

In case of all reactive dyestuffs, part of the dyestuff will react chemically with a hydroxyl group on the cellulosic fibre and part of the dyestuff will react with the water present in the dyebath to form hydrolyzed dye. The unreacted and hydrolyzed dye may be removed by repeated washing however the washing-off process is costly and time consuming than dye fixing process.

The indigo dyeing of cellulosic yarns and fabrics, because of the essentially surface nature of such dyeing, creates a fabric subject to considerable and persistent wash down or loss of colour during extended use. For nearly two decades, customer preference and acceptance, particularly in denim fabrics such as jeans and overalls, has been highly favorable to the so-called washed-down look. Today, the tide of customer and styling preference has swung toward denims more stable to washing, in either home or commercial washing machines. Not only is more wash fastness being sought in jeans and overalls, but denim has been promoted to a high-fashion fabric for use in suiting's, slacks, dresses, and the like. Jeans are also now considered business casual in many creative workplaces.

In industry, cationic dye fixing agents are used to overcome the problem of poor wet fastness properties with direct and reactive dyeing's on cellulosic fabric and indigo dyed denim fabrics. In order to improve the fastness of dyed materials, an after treatment chemical "dye fixing agent" is typically applied to the dyed material. Due to non eco-friendliness of formaldehyde based dye fixing agents, a demand for non formaldehyde based fixing agents have increased.

### Properties of good fixing agent include:

- ✓ Improving overall fastness properties
- ✓ Good capability with cross linking agents

- ✓ Good affinity for the fibre
- ✓ Good levelling and migration properties
- ✓ No effect on the shade
- ✓ Stable to steaming and dry heat

It is undesirable that dyestuffs exhibit a lack of wet fastness since the removed dyestuff may be absorbed by undyed textile material being washed in the same washing operation and in addition the dyed substrate does not retain its original shade. It is known to treat the textile with a dyefixing agent after dyeing in order to improve the wet fastness of the dyed substrates. With this background Sarex has developed an all in one dye fixing agent, **Ergofix-ALS**.

Ergofix-ALS is an all in one dye fixing agent for cellulosic's dyed with Reactive, Direct, Indigo and Sulphur dyestuffs. Below mentioned are the unique features of the product which meet the requisite of customers for improved fastness properties.

### Unique Features:

- ✓ Ergofix-ALS is an all in one dye fixing agent for cellulosic's dyed with Reactive, Direct, Indigo and Sulphur dyestuffs.
- ✓ Improves the Washing fastness, Perspiration fastness and Water fastness.
- ✓ For Indigo denims, can be applied after desizing and before or after stone washing or enzyme treatment.
- ✓ Applicable by exhaust as well as pad application.
- ✓ Formaldehyde free hence complies with Oekotex standard.

### Mechanism:

Ergofix-ALS has the capability to fix the unfixed dyes by forming a complex with the dyes and making them insoluble in water and thus improving the wet fastness properties of the dyed fabric.

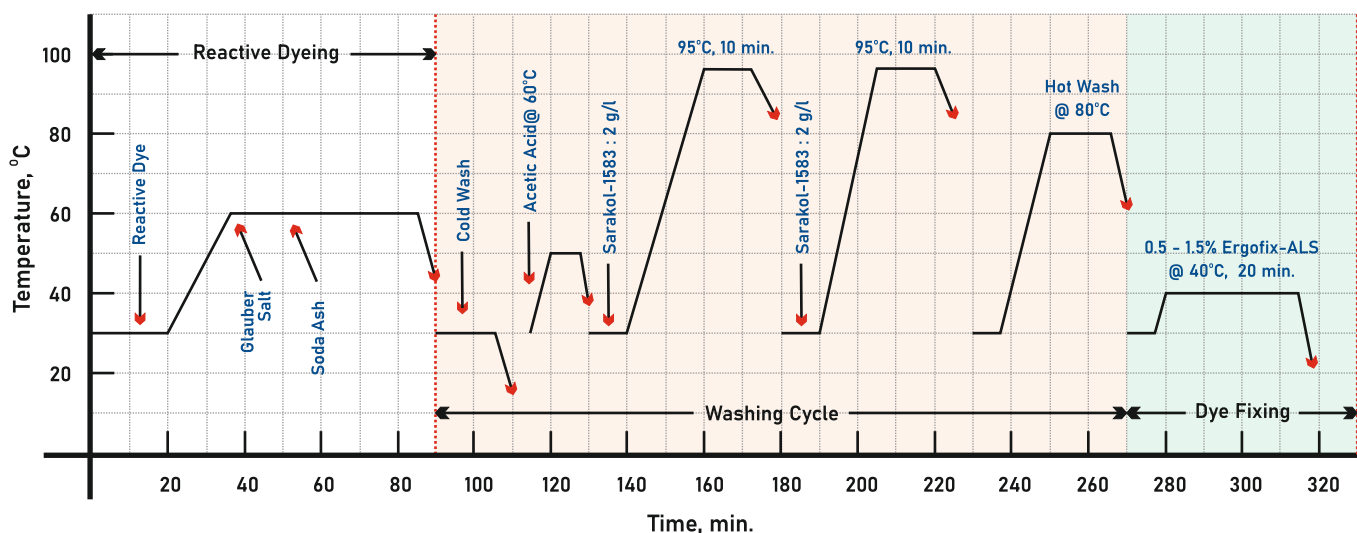
### Materials & Methods:

Materials : 100% Cotton fabric, Indigo dyed Denim Cotton fabric  
 Chemicals : Ergofix-ALS  
 Dyestuff : C.I. Reactive Red 152 (6% shade), C.I. Direct Blue 94 (4% shade)

### Application:

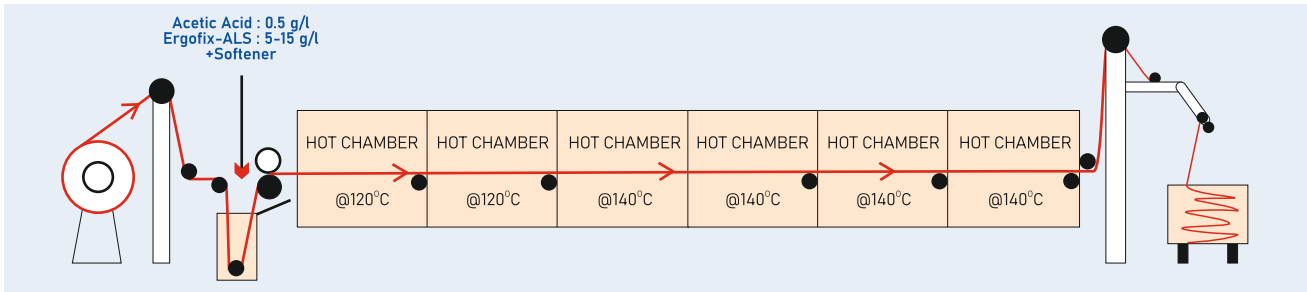
Dyeing of cotton fabric was carried out with C.I. Reactive Red 152 (6% shade) and C.I. Direct Blue 94 (4% shade) dyes as per the standard procedure. After the completion of dyeing process, fabrics were subjected for dye fixing treatment. The recipe followed for the dyefixing is explained in the below given flowchart. To study the efficiency of dye fixing agents, the treated fabric were subjected for fastness study.

### For Exhaust Dyeing Process on Jiggers, Soft Flows, Winch, Yarn & Fibre Dyeing and other Batch Machines





Continuous Application on Stenter



PADDING SOLUTION

- Fill the tank with water
- Adjust the pH with Acetic acid
- Add Ergofix-ALS solution with stirring
- Add softener

Product Performance Data:

1. Anti Tinting Study:

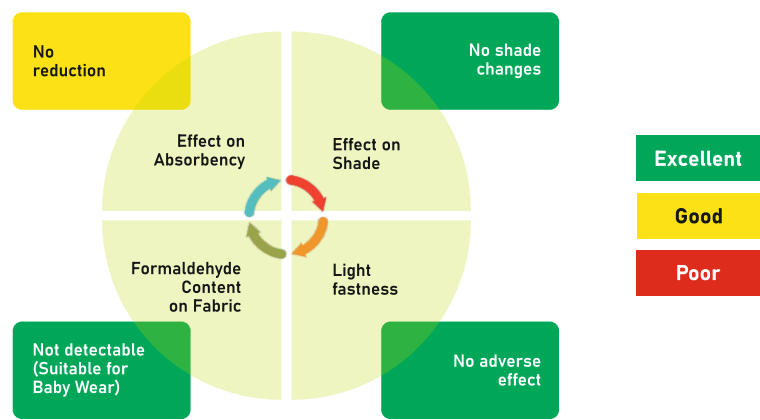
To check tinting of dye on adjacent white fabric during dye fixation step	
Treated with Ergofix-ALS	Treated with Competitor
Ergofix-ALS shows minimal tinting on the adjacent white fabric compared to the Competitor	

2. Colour Fastness To Washing - ISO 105 C10, 60°C

		ACE	CO	PA	PES	PAN	WO
 C.I. Reactive Red 152	Untreated						
	0.5% Ergofix-ALS						
 C.I. Direct Blue 94	Untreated						
	3% Ergofix-ALS						
 Indigo dyed Denim fabric	Untreated						
	2% Ergofix-ALS						

ACE : Acetate, CO : Cotton, PA : Nylon, PES : Polyester, PAN : Acrylic, WO : Wool

Effect of Ergofix-ALS on Fabric:



Ergofix-ALS is non-formaldehyde based cationic dye fixing agent for cellulosic fabrics dyed with Reactive, Direct, Indigo and Sulphur dyestuffs. Fabric dye fixed with Ergofix-ALS shows minimum staining on the adjacent multi-fibre proving its efficiency as an effective dye fixing agent. It is evident from the washing fastness results that Ergofix-ALS works effectively on all the anionic dyestuffs.



# POLYSCOUR-7170

## Powerful Scouring Aid For Polyester Greige Fabric

As in the case of any synthetic fibres, polyester is also more or less a clean and white fibre and hence does not need bleaching before dyeing. However the fibre can contain the surface sizes, lubricating agents, which are normally added during the manufacturing process and loom oil stains, spinning oil stains etc. that may be left in the fibre from manufacturing processes because of the wrong and improper working practice of fitter, jobber, beam gaiter, operator, warper, knotter, technician etc. Any kind of oil or grease mark appearing on the fabric surface of either grey or dyed fabric due to stain, dust, use of lubrication oil or grease in loom, warping machine and sizing machine is termed as oil, stain, dust and grease marks in the fabric.

The pretreatment processes for polyester are mainly to remove these additives and soiling which can interfere with the dyeing process. It is important to scour the fabric before dyeing so that all foreign material is removed in order to promote even dye penetration resulting in overall level dyeing of the fabric.

The process generally involves is washing of the material with the active non-ionic surfactants in an acid, neutral or alkaline medium depending upon the degree of soiling.

Sarex has developed a product **Polyscours-7170**, a very powerful scouring aid for polyester greige fabric. The highlights of the product are listed below :

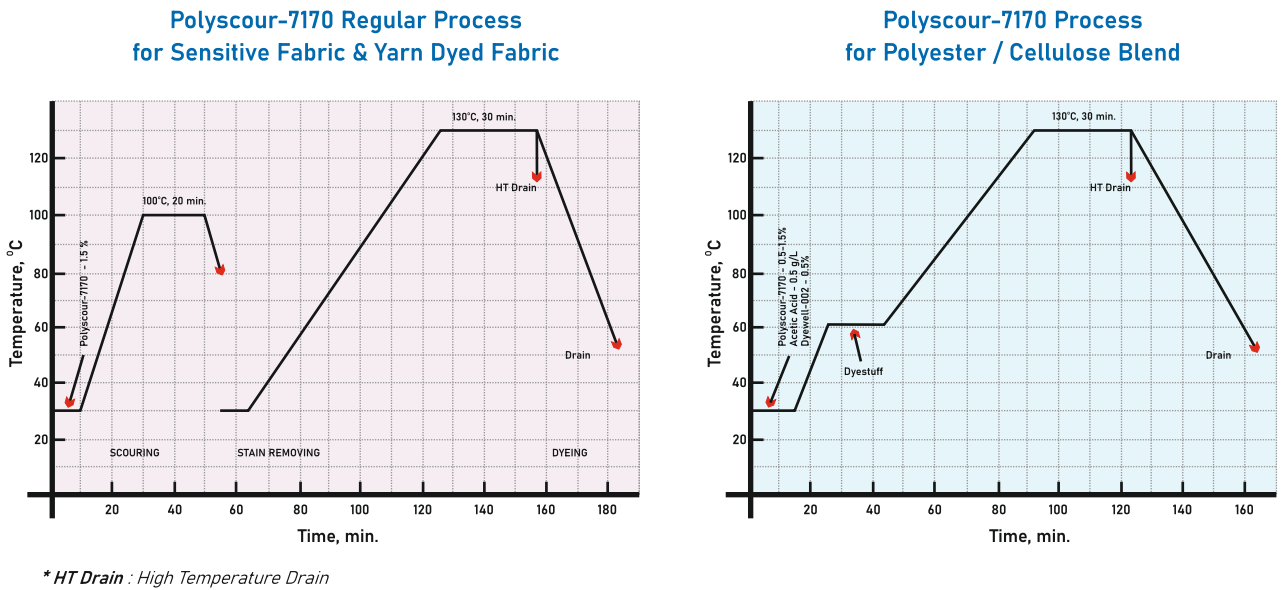
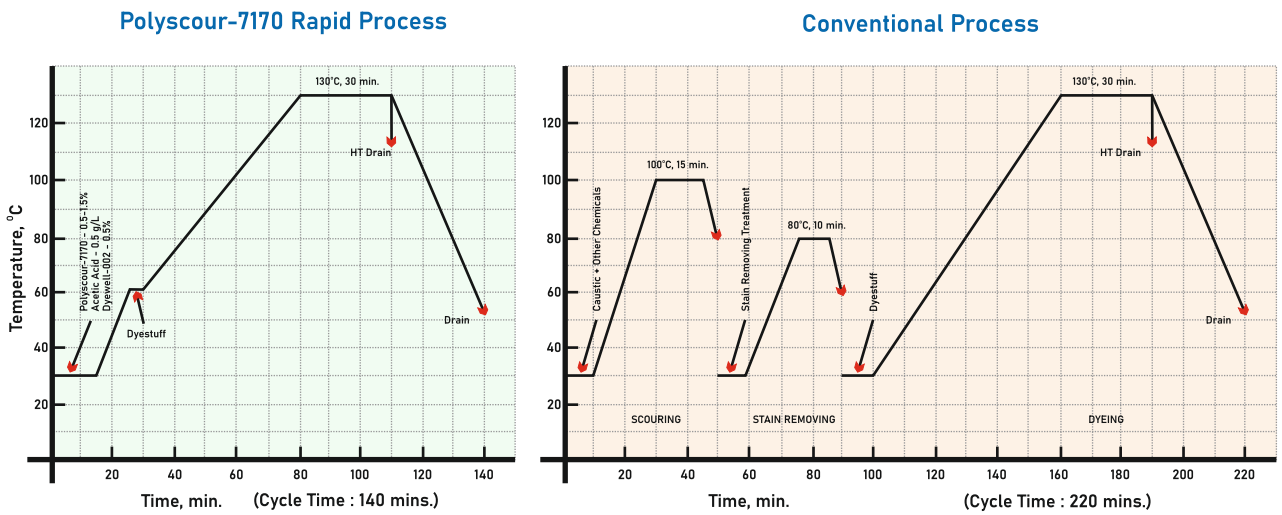
### Unique Features:

- ✓ A very powerful scouring aid for the polyester greige fabric.
- ✓ It removes various additives like spinning oil, acrylic sizes, lubricating oils along with oil stains more efficiently as compared to conventional method. Also it consumes less time.
- ✓ It has a very low foaming and high shear stability hence suitable on jet or soft flow machine and yarn dyeing vessel.
- ✓ Stable to high temperature hence combined scouring and dyeing can be carried out in the same bath.
- ✓ Powerful affinity to polyester fibre and displaces the stuck impurities.
- ✓ It gives better hand feel near to weight reduction process.
- ✓ Since it has very high emulsifying properties, it helps in removing oil from the fibre. Due to this it improves water retention and improves dyeing properties.

Mechanism:

Polyscour-7170 has a very high emulsifying/solubilizing properties which enables the removal of various Spinning/ Texturizing additives from greige polyester fabric viz., spinning oil, acrylic sizes, lubricating oils, oil stains etc. more efficiently as compare to conventional method in less time.

Application: Polyscour-7170 Rapid Process : Saves Time and Energy



\* HT Drain : High Temperature Drain

Product Performance Data:

Fabric with Oil stains

Polyscour-7170 rapid scouring process removes oil stains

From the results the performance of Polyscour-7170 is evident proving its efficacy as a powerful scouring aid for polyester greige fabric.





## CARESOFT-XC

### Softener For Towels

Any operation that improves the physical characteristics of the fabric is termed as finishing. Softener is a finishing agent which when applied to a textile material, improves its handle giving pleasing touch. Softening finishes are among the most important of textile chemical after-treatments. With chemical softeners, textiles can achieve an agreeable soft hand, smoothness, flexibility and better drape and pliability. The hand of a fabric is a subjective sensation felt by the skin when a textile fabric is touched with the finger tips and gently compressed. The perceived softness of a textile is the combination of several measurable physical phenomena such as elasticity, compressibility and smoothness. Softeners are predominantly used for textiles to apply the desired softness which is described as smooth, supple, super soft, elastic dry slushy hand feel, to improve technical properties such as antistatic/hydrophilicity, elasticity, sewability and to give synthetic fibres a certain natural touch and enhance the comfort of wearing by promoting secondary effects (moisture regulations, smoothness). Furthermore, softeners are needed as processing aids for raising, sanforising, sewing or rewinding of yarns.

Softeners are of great importance in textile processing and these days almost every single textile piece leaving a textile mill is treated with a softener. The aim of the softening treatment is to achieve a soft handle, to facilitate the processability and to improve the wearability. Often, a pleasant soft handle of a fabric is a decisive criterion in purchasing a textile article and therefore is often regarded to be the most important factor for sellability.

As a general rule, the softening agent is a textile auxiliary which reduces the coefficient of friction between fibres to obtain the surface smoothness. Also, they impart lubricating effect on fibres which facilitate the fibre sliding within the fabric structure. In most cases, duration of the softness effect is limited since the products applied during the treatment are removed by subsequent washing. It is therefore recommended to be applied in the final stage of the treatment.

The most common softeners used in textile finishing are listed below :

- ✓ Non-ionic softeners
- ✓ Anionic softeners
- ✓ Cationic softeners
- ✓ Amphoteric softeners
- ✓ Reactive softeners
- ✓ Polyethylene-based softeners
- ✓ Silicone-based softeners

Softeners provide their main effects on the surface of the fabric. Small softener molecules penetrate the fibre structure and provide an internal plasticization of the fibre forming polymer by reducing the glass transition temperature. The physical arrangement of the usual softener molecules on the fibre surface is important and it depends on the ionic nature of the softener molecule and the relative hydrophobicity of the fibre surface. Cationic softeners orient themselves with their positively charged ends toward the partially negatively charged fabrics (zeta potential), creating a new surface of hydrophobic carbon chain that provide the characteristic excellent softening and lubricity seen with cationic softeners. Anionic softeners, on the other hand, orient themselves with their negatively charged ends repelled away from the negatively charged fibre surface. This leads to higher hydrophilicity, but less softening compared to cationic softeners. The orientation of non-ionic softeners depends on the nature of the fibre surface, with the hydrophilic portion of the softener being attracted to hydrophilic surfaces and the hydrophobic portion being attracted to hydrophobic surface, thus imparting hydrophilicity or hydrophobicity.

Softening agents also impart softness on cotton terry towels when applied in appropriate amounts for achieving the desired comfort and feel. A terry towel is a textile product which is made with pile loops on one or both sides covering the entire ground surface or forming pile strips, pile checks, or other pile patterns (with hemming end or with firm selvedges). Turkish Toweling fabrics structures form a class of warp pile termed terry pile in which certain warp threads form loops or curls on the face of the cloth. Terry towel fabrics with loop piles on one or both sides find its application in bathrooms, beaches, pools etc. Cotton is one of the most versatile fibres to be used in terry toweling because of its various properties, which give durability, hygiene, softness and absorbency. Natural cotton fibre contains waxes, which prevent absorbency, so the basic requirement of terry toweling needs to be addressed while processing. Performance of terry fabric may be analyzed by the absorbency including the rate at which fabric absorbs the water and total water retention ability of fabric.

Towels are expected to have special features such as high hydrophilicity, high wet tenacity, high color fastness and soft handle. Since the cotton yarns provide all these mentioned required properties, cotton is the most common utilized fibre in terry towel. Water absorbency, which is the primary requirement of a terry towel, generally decreases with the application of conventional softeners. Sarex has introduced a new product **Caresoft-XC** which gives desirable softness with good water absorbency and water retention properties.

Following mentioned are some of the unique features of the product.

Unique Features:

- ✓ Hydrophilic and ideal for terry towels and cotton knits imparting extra soft handle
- ✓ Imparts excellent surface touch

Application Process:

Padding Process		Exhaust Process	
Dosage	: 10-50g/l	Dosage	: 0.8-5%
Pick-up	: 65-70%	Bath pH	: 5.0-6.0
Bath pH	: 5.0-6.0	Bath Temp.	: 30-40°C
Drying	: 140-160°C	Time	: 15-20 min.

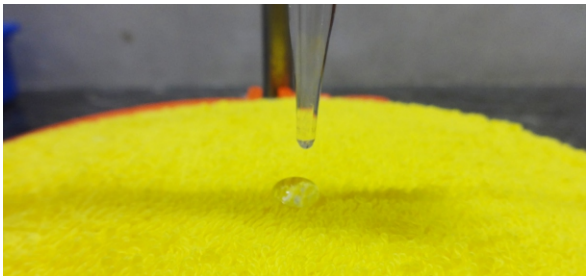
The treated towels were evaluated for Softness & Absorbency which include :

- ✓ Water drop test
- ✓ Sinking test &
- ✓ Water retention test

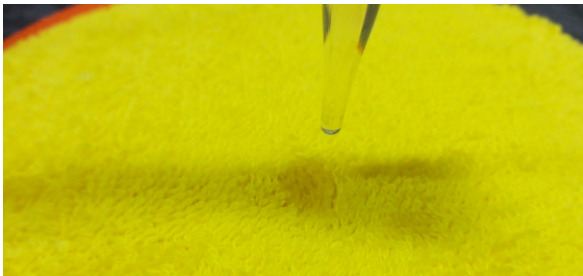
Absorbency is a materials ability to soak up a liquid. The absorbency tests performed are described below :

**Water Drop Test:**

A drop of water is dropped from a pipette. Absorption of water droplet is observed visually. Time taken by the water droplet to absorb completely in the fabric is recorded.



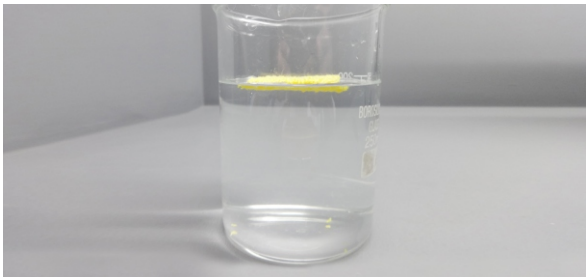
» **Unfinished Towel**  
Unfinished towel does not show water absorbency



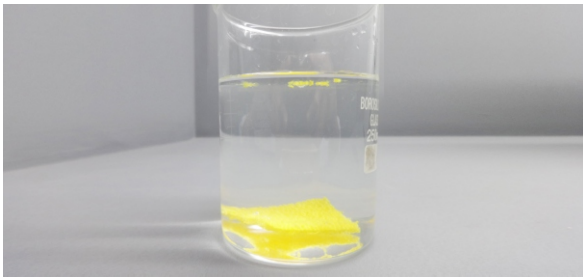
» **Finished with Caresoft-XC**  
Time taken for complete absorption of water droplet was found to be minimum (1-2 seconds) for the towels treated with Caresoft-XC

**Sinking Test:**

The time passed until the test fabrics left on the water surface, completely sinks in the water, is recorded. The shorter the immersion time, faster the water absorption rate and better the hydrophilicity of the fabric.



» **Unfinished Towel**  
The unfinished towel piece floats on the water surface indicating no absorbency



» **Finished with Caresoft-XC**  
Caresoft-XC treated towel piece sinks into the water with minimum immersion time

**Water retention Test:**

This test method determines the ability of a terry fabric to rapidly absorb and retain liquid water from surfaces such as human skin, dishes and furniture. This test method may be used to test the surface water absorption of terry fabrics for bath towels, bath sheets, hand towels, kitchen towels, dishcloths, washcloths, beachwear, bathrobes, and the like.



» **Finished with Caresoft-XC**  
Water retention of Caresoft-XC treated towel obtained is around 60-70%

**Conclusion:**

The performance study proves the efficacy of a Caresoft-XC as a hydrophilic softening agent for Cotton terry towels.

# C E R T I F I C A T I O N S



M&S



ISO  
45001:2018



ISO  
17025:2017



ISO  
14001:2015



ISO  
9001:2015



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GOTS

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### Corporate Office:

501 - 502, Waterford, 'C' Wing,  
C. D. Barfiwala Marg,  
Juhu Lane, Andheri (W),  
Mumbai - 400 058, India.



+91 (22) 6128 5566 / 4218 4218



+91 (22) 4218 4350



tcexn@sarex.com / tcexp@sarex.com



www.sarex.com



### Plants:

N-129, N-130, N-131, N-132 & N-232,  
MIDC, Tarapur - 401 506, India.



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