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# Saraquest

Exclusive Insight

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**CHEMISTRY BEHIND  
GOOD FEELINGS**



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## 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 Laboratory)
- **ISO 45001 : 2018**
- **ISO 14001 : 2015**
- **ISO 9001 : 2015**



# SARACREASE-HG (CONC)

Lubricating And Crease  
Preventing Agent In  
Textile Wet Processing



In textile wet processing, many chemicals have been used to ease the main processes in wet processing. These chemicals are not responsible for main purposes like scouring, bleaching and dyeing but they are so important to be used in those processes to satisfy the modern sophisticated wet processing requirements. These are called auxiliaries. One such auxiliary is the Lubricating agent which is very important for trouble free processing. In low liquor ratios and high temperature, when fabric is processed in full-loaded rope dyeing machines viz., jets, overflows or winch becks, fabric becomes prone to crease, chafe as well as wrinkle line. In high temperature, if crease or chafe mark and wrinkle line is formed, these are permanently seen on the fabric surface and cannot be removed easily. So the Lubricating agent is used to prevent running crease-crack-chafe and crush mark as well as wrinkle line. It offers reliability in the pretreatment, dyeing and soaping bath for difficult textiles.

With the evolution of high turbulence and high torque dyeing equipment, increased attention has been given to the lubricants employed in textile wet processing. Because jet/over flow machines transport the fabric in rope form, creases are inevitable, but if the creases are rapidly and continuously moved they do not become permanent. When dyeing at longer liquor ratios, this shifting in position of the folds is easier than under short liquor ratio processing conditions. Inside the jet nozzle, the surface of the fabric becomes subjected to stress and friction between fabric and fabric or between fabric and metal, resulting in a more fibrillated surface, abrasion marks, or permanent fibre damage.

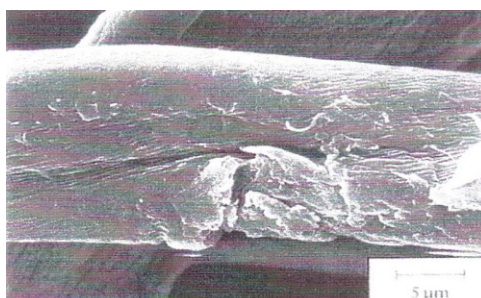
## CAUSES OF CREASES

**Following listed are some of the factors which causes the creases during wet processing:**

- When fabric is passed through a nozzle, high friction is imposed between fabric to fabric and fabric to metal.
- High twisting tension is caused by tighten rope and entanglement during continuous circulation of fabric inside the machine.
- At high temperature, liquor viscosity reduces dramatically. In the machine, fabric in rope form faces continuous squeezing (when pass through the winch) and cushioning (when come out from the winch). In high temperature when liquor viscosity is very less, fabric cushioning ability decreases hence permanent crease marks are being produced.
- Woven fabric is processed in open-width, certain tension and less time required. So, the possibility of creasing is less in woven fabric and lubricating agent does not use in woven fabric processing. However, knit fabric is processed in rope form; require longer fabric exposure in high temperature. Single jersey and its derivatives are highly crease prone. Double jersey (as like rib, purl and interlock fabric) is less crease prone because it has more space to relax in its structure.
- Poor suitability of machine (folds not moved).



- Too heavy a batch of fabric.
- Sewn ends with no opportunity to balloon.
- Stationary fabric sitting on hot metal of machine under pressure giving a glazed mark.



**Abrasion marks on cotton fibre**

The basic requirement of a lubricating agent in wet processing is that it should form a thin, uniform protective coating around the fibre to lower the surface friction and flexural rigidity, thus minimizing the formation of durable creases during high temperature wet-processing. The formation of creases and many other undesired phenomena can be avoided by reduction of friction. Thus, it has become increasingly important to select chemistries of anti-creasing agents/lubricants with discernment.

The lubricating agent should be used as per the type of fabric and condition of the process. The need of lubricating agent is more in pretreatment process than in the dyeing process because high temperature is required in pretreatment compared to dyeing process.

Lubricating agent when used in higher amount, produces high viscous water. This provides the fabric with a thick layer of water having lubricating function. This viscous layer reduces the friction of solid parts while rubbing against each other and avoids the formation of crease marks and improves running properties of ropes. However there are some shortcomings of conventional lubricating agent which is explained below.

- Little excess use of such lubricating agent produces high viscous water which may have adverse effect, such as gel formation, impairs solubility of dyes etc.
- Many of the auxiliaries used in pre-treatment or dye bath have to be solubilized. However the solubility of chemicals and dyes reduces in high viscosity.
- Also, this undesirable high viscosity in turn has an adverse effect in automatic dosing systems.

Looking at the shortcomings of conventional lubricating agent, requirement for low viscosity and cold water soluble lubricating agent is increasing day by day. Sarex offers a product **Saracrease-HG (Conc)** which covers the shortcomings of the conventional lubricating agent. Saracrease-HG (Conc) will not increase the viscosity of water and hence suitable for Auto dispensing. Since it does not increase the water viscosity, it is suitable in high temperature wet processing. It is compatible with dyeing auxiliaries even at low liquor ratio. Dissolution is easy and dilutions are stable.

#### ● **UNIQUE FEATURES**

- Concentrated, low foaming crease preventing agent for all types of substrates and garments.
- Prevents fabric to fabric abrasion and fabric to metal abrasion.
- Prevents the formation of running creases during pre-treatment and dyeing.
- Used for natural and synthetic fibres, their blends and for garments.
- Ideal product for low liquor ratio machine i.e. 1:3 to 1:5 MLR.
- Ideal product for Polyester/Cotton blends and high temperature bleaching and dyeing.
- Product is suitable for auto dosing and auto dispensing at 1:20 dilution.



● **MECHANISM**

Saracrease-HG (Conc) is a low foaming lubricating agent which forms a thin and uniform protective coating around the fibre which lowers the surface friction and flexural rigidity thus minimizing fibre-to-fibre friction, fibre-to-metal friction and the formation of durable creases during high temperature wet-processing. It provides sliding properties to the yarns in knitted fabrics so that the friction between fibre to fibre and fiber to metal is less.

● **APPLICATION PROCESS**

Fabric type	Dosages of Saracrease-HG (Conc) (1:20 dilution)
Upto 140 GSM	1%
140-220 GSM	1.5%
Above 220 GSM	2%
For Lycra, Modal, Viscose	2%

It is recommended to add Saracrease-HG (Conc) to the machine prior to loading of the batch.

● **PRODUCT PERFORMANCE DATA**

**A) Deformed and Displaced Loops**

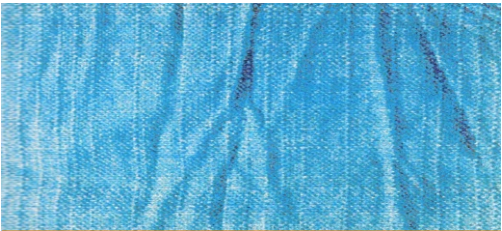


**Without Saracrease-HG (Conc)**  
Yarns are more compressed and loops appeared more closed

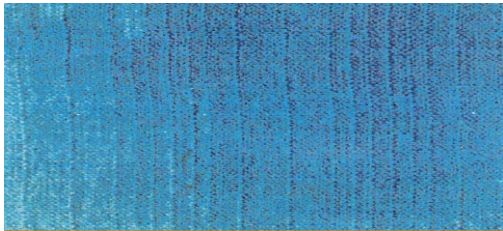


**With Saracrease-HG (Conc)**  
Yarns are more closed and loops are more open

**B) As a Dyebath Lubricant**



**Dyeing in absence of Saracrease-HG (Conc)**



**Dyeing in presence of Saracrease-HG (Conc)**

Saracrease-HG (Conc) offers a solution for crease marks which are generated during wet processing. It prevents the fabric from permanent and sharp crease marks.



**D**ye 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 dyeing's 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 dye bath 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 dye bath 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.

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. 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 dye fixing agent includes:

- Good affinity for the fibre.
- Improving overall fastness 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 after dyeing with a dyefixing agent in order to improve the wet fastness of the dyed substrates.

With this background, Sarex has developed a cost effective dye fixing agent, **Sarafix-ECO** for cellulosic's dyed with Reactive and Direct dyestuffs. Below mentioned are the unique features of the product which meet the requisite of customers for improved fastness properties.

## ● UNIQUE FEATURES

- Sarafix-ECO is a cost effective dye fixing agent for cellulosic's dyed with Reactive and Direct dyestuffs.
- Improves the Washing fastness, Perspiration fastness and Water fastness.
- Applicable by exhaust as well as pad application.
- Formaldehyde free hence complies with Oekotex standard.

## ● MECHANISM

Sarafix-ECO 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.

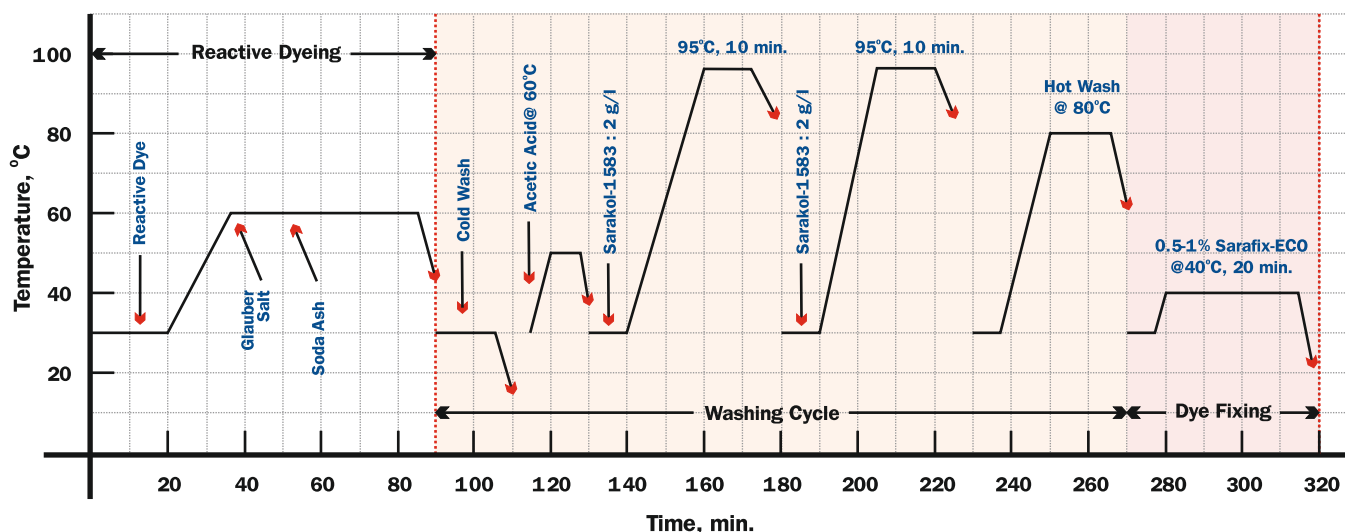
## ● MATERIALS AND METHODS

Materials : 100% Cotton fabric  
Chemicals : Sarafix-ECO  
Dyestuff : C.I. Reactive Red 152 (6% shade), C.I. Direct Blue 71 (4% shade)

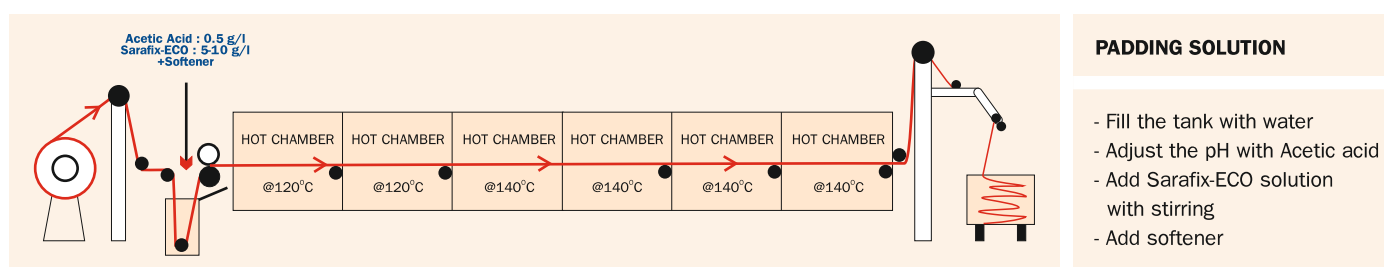
## ● APPLICATION

Dyeing of cotton fabric was carried out with 6% C.I. Reactive Red 152 and 4% C.I. Direct Blue 71 as per the standard procedure. After the completion of dyeing process, the fabrics were subjected for dye fixing treatment. The recipe followed for the dye fixing is explained in the below given flowchart. To study the efficiency of dye fixing agent, the dye fixed fabrics 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





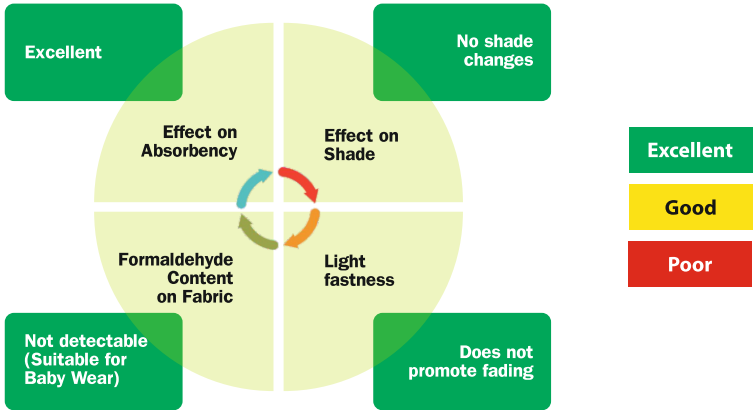
● **PRODUCT PERFORMANCE DATA**

Colour Fastness to Washing – ISO 105 C10, 60°C - 6% C.I. Reactive Red 152							
		WO	PAN	PES	PA	CO	ACE
	Blank						
	Dye fixed with 1% Sarafix-ECO						

Colour Fastness to Washing – ISO 105 C10, 60°C - 4% C.I. Direct Blue 71							
	Blank						
	Dye fixed with 3% Sarafix-ECO						

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

● **EFFECT OF SARAFIX-ECO ON FABRIC**



Sarafix-ECO is non-formaldehyde based, economical, cationic dye fixing agent for cellulosic fabrics dyed with reactive and direct dyestuffs. Fabric dye fixed with Sarafix-ECO shows minimum staining on the multi-fibre proving its efficiency as an effective dye fixing agent. It is evident from the washing fastness results that Sarafix-ECO works effectively on all the anionic dyestuffs.



**W**ith the development of digital age and the rapid flow of information, consumer behaviour is changing at an accelerated rate and becoming more demanding. E-commerce is expanding, pushing aside and stressing out physical retail establishments as new business models emerge. Fashion firms are struggling to meet the individualized demands of consumers while also dealing with intense pressure for speedy replenishments. In the pursuit of technical innovation and in the textile business, sustainability, circularity, and traceability are gaining ground. Textile business has always relied on screen printing, however the use of digital technology has dramatically increased the variety of ways one can design the fabrics. There are many traditional printing methods which have been used by the industry since ages however, considering the fast fashion, turnaround time, sustainability, customization and varied designs, Digital printing technology has become the future of textile printing.

Textile is considered as the mother of industrialization and the era of industry is associated with mechanized textile weaving. Present industry is based on automation, digitization and artificial intelligence. Likewise, textile printing has also evolved from the primitive block printing to analogue screen printing, then the fast and highly productive Rotary printing and now the sophisticated Digital Ink Jet Printing which can provide extraordinary sharp image in multiple colours on a real-time basis as per the consumer's expectation. In the last decade, Digital printing technology has revolutionized the textile printing method and over powered the traditional printing.

Screen printing has long been a staple of the textile industry, however digital printing has greatly expanded the scope of how one can decorate fabrics of all kinds. Today, if one can render an image on a computer screen, it can be exactly replicated on substrates., any colour, any graphic detail, photorealistic, and on both dark and light backgrounds, with a durability withstanding light exposure, rub, and repeat washes. Customization and sustainability is another buzzword in the industry and it is used by the digital printing sector too. People nowadays want everything custom-made. Nothing makes people happier than the ability to customize any product or service they purchase. It comes with the freedom of personalization and modification which has made digital printing possible to adapt things as one needs, and textile design is one of them. Digital textile printing quickly gained popularity after its introduction to the market.

The major benefits of Digital textile printing over conventional printing is in terms of wide coverage area, endless colour combinations, excellent sharpness of designs, quick turnaround of prints, real-time instantaneous transfer from screen to fabric, printing on any textile material and less space. Digital printing is also an ideal platform for personalization. If the industry wants to easily modify images and intricacies using variable data printing (VDP), then digital printing is the only way to go.

Pigment Inks are the ink of choice of the worldwide textile printing industry. Reactive, Acid, Disperse and Vat ink systems all have their place, however the simple fact remains that Pigment printing is number one. In 2017, out of 32 billion square meters of Textiles printed by whatever means, over 25 billion square meters were printed using Pigment Ink technology. The real strength of pigment inks is their excellent covering strength. Pigments are reflective particles and neither migrate into the fibre nor react chemically with the same. A further advantage is that pigment prints do not require post print washing which thereby minimizes the Water footprint as well as the Carbon footprint of the textile processing. Therefore, the effluent produced throughout print and fixation process is substantially reduced in comparison with other print processes. This makes pigments outstanding from all other ink classes as they can be printed on almost any textile product, no matter if it is constructed of a single fibre or being a multi-fibre blend. Pigment Printing with a market size of 25 billion meters per year, offers digital technologies the opportunity to make a huge positive impact in an established sector of the worlds textile market. For an industry that is challenged by ultra-fast delivery times, and “just in time manufacturing” the future is set for digital manufacturing. Pigment, historically, is the ink of choice for the bulk of the Textile industry, and with established credentials and performance standards, pigment appeals to the manufacturing community.

As far as Digital printing is concerned, Pigment printing is only just starting to grow, with reactive and disperse printing having previously dominated the Digital textile printing sector. Digital pigment printing, despite its still low popularity, has already permanently entered the textile industry, becoming an integral part of it. Digital pigment printing is one of the four digital textile printing methods. Digital printing is divided according to the type of dye used, and this group includes pigment ink printing, disperse printing as well as acid dye printing and reactive dye printing. For the amateurs of textile printing, the main advantage of digital pigment printing will certainly be its low cost. Digital pigment ink printing eliminates the need for expensive printing plates, as in the case of screen printing, so that the sole cost of the printing process is not enormously high. Besides, the customer is not limited by the minimum order size. In the case of digital pigment ink printing, it is possible to create even a few centimeters of printed fabric. The growth of digital textile pigment printing is continuing apace, driven by its ease of use, speed of production, cost efficiencies and sustainable attributes. The pace of adoption towards digital pigment printing is accelerating and it is therefore not surprising to see the market make considerable investment in the production of pigment ink capacity. Aside from the ease, the speed and the sustainability advantages, digital pigment printing is unique in the way that it is able to print with high quality and fastness on fabrics that have mixed fibre composition.

Digital pigment printing services the five main fabric printing sectors, Fashion and Apparel, Soft Signage, Home Décor, Sportswear and Contract Décor, all of which are established markets for pigment printing. The consumer demands high volume industrial print, alongside speed, sustainability, efficiency, versatility, and flexible manufacturing. The textile sector now faces new opportunities and challenges that must be addressed and overcome. With this background Sarex has developed a product, **Sarasol-PI**, pre-treatment auxiliary for Digital pigment printing. Below mentioned are the unique features of the product which meet the requisite of customers.

● **UNIQUE FEATURES**

- Sarasol-PI is a pre-treatment coating agent which is applied by padding process for Pigment Digital printing.
- Suitable for cellulosic’s and other fabric substrates.
- It forms surface film on the fabric which prevents the ink from spreading.
- It delivers levelled and sharp prints on the substrates.
- Easy wash-off properties thus keeping the fabric soft.

● **APPLICATION**

**Ink-Jet printing on Cotton or Viscose (Pigment inks)**

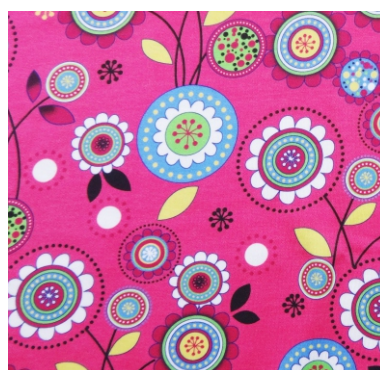
Pre-treatment (On Stenter)	Printing	Fixation
Sarasol-PI: 50-70 gpl Sarakol-NF: 1-3 g/l Pad and dry at 120-130°C	→ Ink jet printing with Pigment inks	→ Curing at 150°C, 3-5 min.



## ● PRODUCT PERFORMANCE DATA



Without Sarasol-PI



With 70 gpl Sarasol-PI



Without Sarasol-PI



With 70 gpl Sarasol-PI



Without Sarasol-PI



With 70 gpl Sarasol-PI

In the past, the demand for digital pigment printing was mainly held back by technical limitations however most of them are nowadays significantly improved. Also there are a few disadvantages compared to for instance reactive digital printing, like the low colour strength, the relatively high ink consumption and the expensive inks. Nevertheless, the popularity of Digital pigment printing system can be well explained. After all, steaming and washing with pigment printing is not necessary, which makes it a sustainable, more environmentally friendly alternative to other digital printing. This sustainability advantage helps in accepting the down sides of pigments. With the digital pigment printing's current technical progress, the horizon for the commercial fabric printer has expanded exponentially. Using pigment printing they can now print more or less any type of fabric to serve the Décor or Apparel market places on demand, without being fearful of quality or fastness issues or the consistency of high speed production.

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



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