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Sarex

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Saraquest

Exclusive Insight

Sarex stands for quality products!

Chemistry Behind Good Feelings

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One bath dyeing cum bleaching agent

Dyebleach-BL

In textile industry, Polyester/Cotton (P/C) blends have dominant market share of about 60% in the knit sector. These blends are popular due to their aesthetic value and user friendly performance. 100% cotton knit fabric exhibits lower shape retention but higher moisture absorbency whereas 100% polyester fabric shows lower absorbency with higher strength and shape retention. Limitations of both fibres are offset by their blending which shows good strength and shape retention with an acceptable absorbency. However, processing of P/C blends poses some challenges as cotton is non-absorbent in grey stage and needs to be scoured / bleached similar to 100% cotton before dyeing. In the exhaust dyeing of P/C blends, general practice is to first run the fabric through a preparatory process of scouring / bleaching and then dye each component separately under its optimum conditions, i.e. in a two-bath process. In high temperature (HT) dyeing method, polyester portion is dyed at 130°C and cotton part is dyed at 60-80°C however the dye bath is to be drained. This normally is a long process of over 8 hours of production time to dye both components with satisfactory fastness property.

To address the issue of productivity, economy and rising environmental concerns, several attempts have been made in the past to shorten this process.

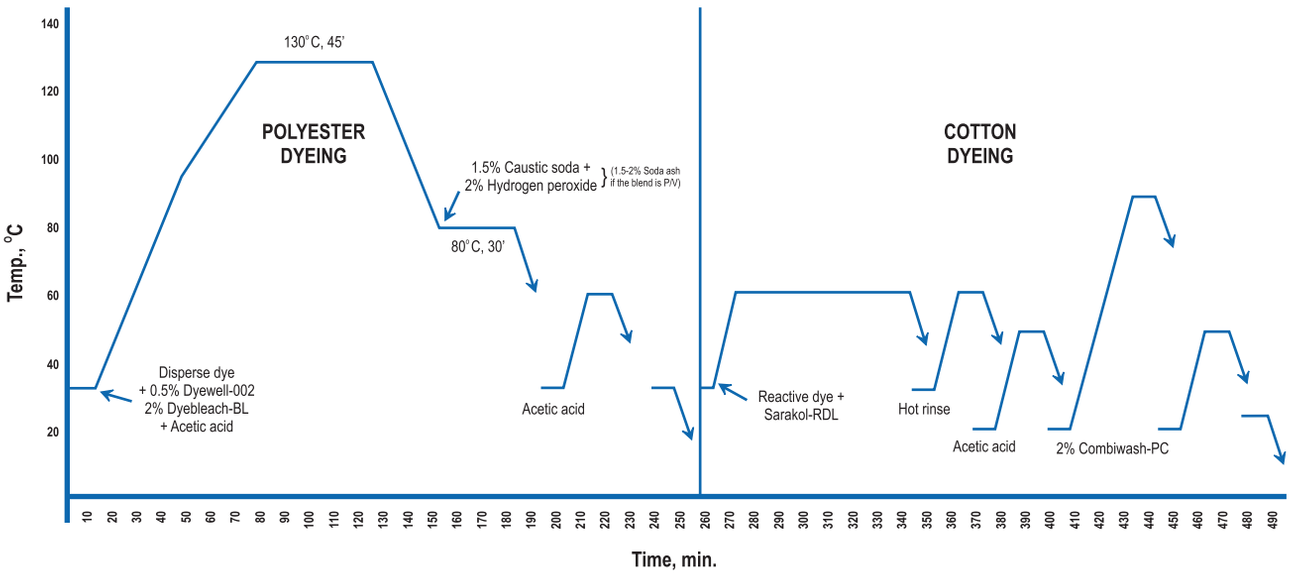
Sarex has developed a product **Dyebleach-BL** which aids the dyeing of P/C blends without the bleaching process and thereby reducing the consumption of steam, water and power.

Unique Features:

- Polyester and cotton dyeing without pre bleaching - Shorter processing time.
- Only jet dyeing machine does complete combined bleaching and dyeing step.
- No need to use jiggers for cotton bleaching thus makes jigger available for dyeing. Improves productivity of the plant.
- No need of reduction clearing.
- It bleaches cotton portion, hence most suitable for light and medium shades retaining their brightness.
- Avoids at least two drains in entire processing, thus reduce water consumption, steam for heating, process time, effluent load.

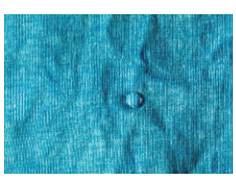
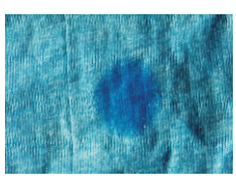
Dyebleach-BL process

For Polyester/Cotton or Polyester/Viscose woven, knit & yarn (67:37 & 48:52 blend)

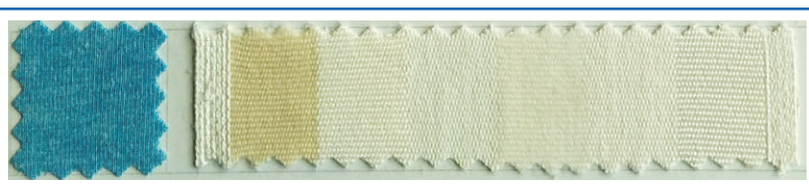
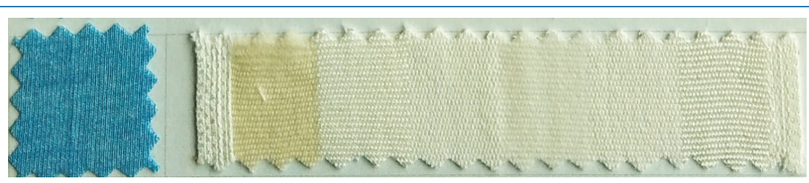


Results:

Absorbency of fabric after polyester dyeing using Dyebleach BL

	Without Dyebleach-BL	With Dyebleach-BL
Treated samples		
Absorbency, sec.	20-21 sec.	1-2 sec.
Treatment	1.5% Caustic soda + 2% H_2O_2	2% Dyebleach-BL + 1.5% Caustic soda + 2% H_2O_2

Wash fastness test showing no need of reduction clearing: ISO 105 C10

Conventional process	
Dyebleach-BL process	

Fastness equivalent to conventional process

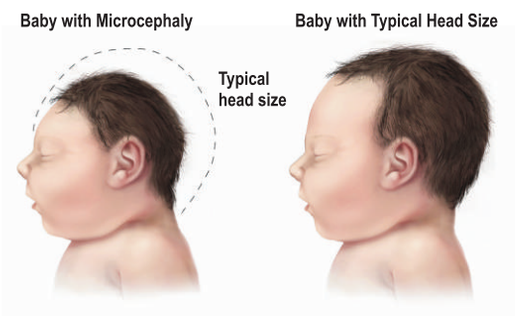
Outbreak of ZIKA

Saraguard-MOSQ & Repello-MSQ

The World Health Organization has declared an international public health emergency because of the rapid spread of the Zika virus which has been linked to serious birth defects and is transmitted mainly by mosquitoes. Zika virus outbreaks are proliferating across the globe particularly in the region of Latin American countries, such as Brazil, Colombia, Peru, Ecuador, Puerto Rico, Mexico, Panama and Venezuela etc.

The Zika virus can make anyone sick for up to a week with fever, rash, joint pain, red eyes, and other symptoms. However it is especially dangerous for women who are pregnant or considering pregnancy because it is believed that it increase the risk of babies born with microcephaly, a condition marked by an abnormally small head and incomplete brain development.

There is currently no vaccine to prevent the disease or drug to treat it, making it essential that people avoid mosquito bites, according to the Centers for Disease Control (CDC) and Prevention. The CDC emphasizes that avoiding mosquito bites requires multiple strategies, such as wearing long-sleeved pants and shirts when outdoors. But it says that mosquito repellents are essential, too.



Microcephaly: Babies born with heads and brain that are too small

Asked women not to get pregnant !

Zika virus is transmitted to people through the bite of an infected mosquito from the *Aedes* genus, mainly *Aedes aegypti* in tropical regions. This is the same mosquito that transmits Yellow fever, West Nile virus, Chikinguniya and Dengue fever.

Female *Aedes aegypti:*
Mosquito causing Zika & Dengue

The vector for Zika virus viz., *Aedes aegypti* mostly feeds during day time hence bed nets will not help much.

As per the CDC Advisory, Atlanta, USA:

- Use permethrin treated clothing and gear (such as boots, pants, socks, and tents.
- Use insect repellents containing N,N-Diethyl-meta-toluamide (DEET), picaridin, oil of lemon eucalyptus (OLE), or IR3535 (use as directed).

As per Environmental Protection Agency (EPA), DEET may be applied to clothing. The EPA completed a comprehensive re-evaluation of DEET in 1998 and concluded that "As long as consumers follow label directions and take proper precautions, insect repellents containing DEET does not present a health concern".

Mosquito repellents: Natural & Synthetics

Active Ingredient	Type	EPA Registered?	Duration
DEET	Chemical	Yes	8-10+ hrs
Picaridin	Chemical	Yes	Up to 8 hrs
Oil of lemon eucalyptus	Synthesized plant oil	Yes	Up to 6 hrs
IR3535	Synthesized plant oil	Yes	4-8 hrs
Plant oils (soybean, lemongrass, cedar, citronella, etc.)	No synthesized plant oil	No (exempted)	Estimated 30 min. to 2 hrs

Looking at the seriousness of the current scenario, **Sarex** has put a step forward in offering **Saraguard-MOSQ**, a DEET based and **Repello-MSQ**, a permethrin based mosquito repellent which can be applied on textiles for apparels, netting , outerwear etc..

Unique features: Saraguard-MOSQ

- Micro encapsulated mosquito and insects repellent.
- Durable to multiple home launderings.
- Suitable for polyester and blended substrates.
- Passes WHO cone test.
- Finished fabric does not have any odour.
- Controlled-release "micro encapsulated" formulas of 30-34% DEET can potentially protect for 11-12 hrs.
- Transpiration repellency.
- Keeps mosquitoes away without them touching the surface of the finished fabric.
- Block the humidity sensing holes – cannot locate the host.

Unique features: Repello-MSQ

- Permethrin based, contact insecticide.
- Recommended for natural and synthetic fibres and their blends.
- Prevents vectors such as mosquitoes, ticks etc. from landing/biting.
- Durable to multiple home launderings.
- Damages the central nervous system of insects which come into contact with it.
- Mosquito enters in a confused state “To Bite or not to Bite??”

Recommended dosage:

Saraguard-MOSQ

Saraguard-MOSQ	: 100-120 g/l
Saralink-ULF	: 30-40 g/l
Pick-up	: 70-80 %
Bath pH	: 5-6
Drying & Curing	: 150-180°C

Repello-MSQ

Repello-MSQ	: 80-120 g/l
Saralink-ULF	: 30-40 g/l
Pick-up	: 70-80 %
Bath pH	: 5-6
Drying & Curing	: 130-160°C

The finished samples were evaluated for their efficacy using WHO cone test.

Results:

Table 1 : Efficiency of Saraguard-MOSQ against *Aedes aegypti* mosquito species

SARAGUARD-MOSQ		
Padding : 120g/l Saraguard-MOSQ + 30g/l Saralink-ULF Test : Excito Repellency Test (Modified WHO/ CTD/ WHO PES/IC/96.1) Mosquito species : Male and Female – *Aedes aegypti* Number : 10 no. one time Duration of Test : 30 min		
Substrates	**Washings**	**% Repellency**
100% Cotton	0 HL	100
	10 HL	70
100% Polyamide	0 HL	90
	10 HL	70
100% Polyester	0 HL	100
	10 HL	100
P/C blend	0 HL	70
	10 HL	60
P/C: Polyester/Cotton blend fabric, HL: Home launderings		

Table 2 : Efficiency of Repello-MSQ against *Aedes aegypti* mosquito species

REPELLO-MSQ					
Application : Padding (100g/l Repello-MSQ + 30g/l Saralink-ULF) Mosquito species : Female Mosquito – *Aedes aegypti* Name of the Test : U.S. Patent 5, 198,287 and USDA Laboratory Method (W.H.O. Cone Bioassay (WHO 1998) Number : 10 per Bioassay					
Substrates	**Washings**	**Total no. Knock down**	**Total no. Unable to fly**	**Bite counts per 3 min. exposure**	**% Mortality/ Repellency**
100% Cotton	0 HL	8	2	0	100
	10 HL	6	1	1	70
100% Polyamide	0 HL	4	4	2	80
	10 HL	1	4	4	50
P/C blend	0 HL	4	0	2	45
	10 HL	0	0	4	0
P/C: Polyester/Cotton blend fabric, HL: Home launderings					

Saraguard-MOSQ & Repello-MSQ is highly effectively against *Aedes aegypti*, vector for Zika virus.

Non leaching Antimicrobial agent

Saraguard-850

Mould, mildew, fungus, yeast, and bacteria (microorganisms) are part and parcel of our everyday life. Thousand of species of microorganisms are found in the environment, on our garments and on our bodies. Natural fibres like cotton and wool are more prone to microbial attack due to their inherent characteristics such as moisture regain and chemical composition providing a perfect environment for microbial growth. The microbial growth is influenced by relative humidity and temperature.

The growth of microorganisms impairs the functional, aesthetic and hygienic properties of textiles such as staining and degradation of textiles, obnoxious smell form the inner garments, socks and eventually a risk to humans wearing or coming in contact with these fabrics.

Odour is an unpleasant phenomenon which is caused not by human perspiration but it is the bacteria that grows in the sweat that causes it . They break down the urea, protein or lactic acid contained in the perspiration, releasing butyric acid. This penetrating odour is extremely unpleasant to the human sense of smell. The sweaty odor can be prevented if the growth of bacteria on the textiles or skin is managed.

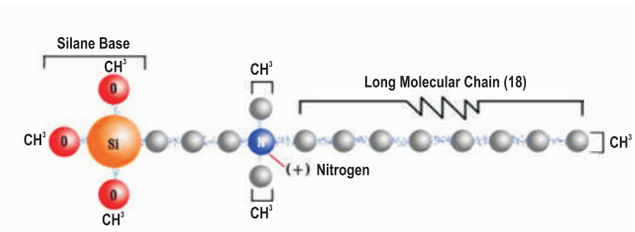
Antimicrobial finishes prevents the growth of bacteria and textile products finished with them have been proved to be environment-friendly and health-protecting, preventing diseases. The applications of antimicrobial textiles are expanding from industrial textiles to even daily use sports or outdoor wear.

Factors influencing the growth of microbes in textiles

Cotton textiles in close proximity to the human body provide an ideal living environment for bacteria, yeasts and fungi viz., nutrients, water, oxygen and warmth. In addition to providing these conditions, textiles are continuously exposed to microbial contamination from the skin, dust and airborne particles and other sources. It is not surprising that large populations of microorganisms have been isolated from textiles.

Consumers attitude towards hygiene and better lifestyle has created a rapidly increasing demand for antimicrobial textiles, which in turn has inspired **Sarex** to develop an antimicrobial finishing agent, **Saraguard-850**, which is a non-leaching type antimicrobial agent based on Silane chemistry.

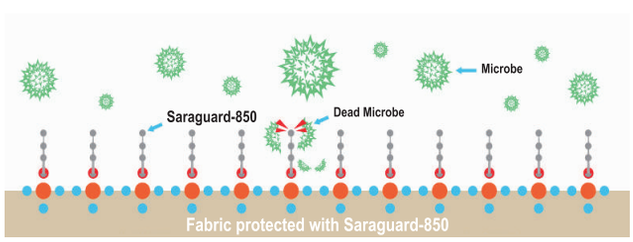
The product is characterized by its outstanding chemical, physical, toxicological and eco-toxicological properties.



Silane quaternary ammonium compound in Saraguard-850

There are 2 modes by which Saraguard 850 attaches itself to a textile substrate. The hydrolysable groups on the silicon atom in Saraguard-850 is hydrolyzed to silanols and the silanols forms chemical bond with each other and the substrate. Secondly, the silicon functionality enables the product to polymerize, after they have coated the surface, to become almost irremovable. The non-leaching behavior of such a reactive surface allows for the control of surface microbial contamination without the continuous release of toxic components into the environment which can promote the formation of resistant organisms.

Mode of action of Saraguard-850



Mechanism of microbial cell destruction by Saraguard-850

When a microbe contacts the positively charged organo-functional silane treated fabric surface, the cell membrane is physically ruptured by a sword like action and then electrocuted by a positively charged nitrogen molecule. Antimicrobial activity will be effective as long as the surface of the treated substrate remains intact.

Since it is not consumed and does not leach out, the antimicrobial activity is not depleted and continues to control microbial growth.

Unique features:

- High quality, innovative product for high-performance textiles.
- Outstanding durability and effectiveness on all fibres.
- Ease of application in the usual textile application processes.
- Effectiveness against a broad spectrum of microbes such as *Escherichia coli, Staphylococcus aureus and Klebsiella pneumoniae.*
- Acts indirectly against dust mites.
- Readily combined with many textile effects.
- Also available with markers for the highest demands in the supply chain.

Recommended dosage:

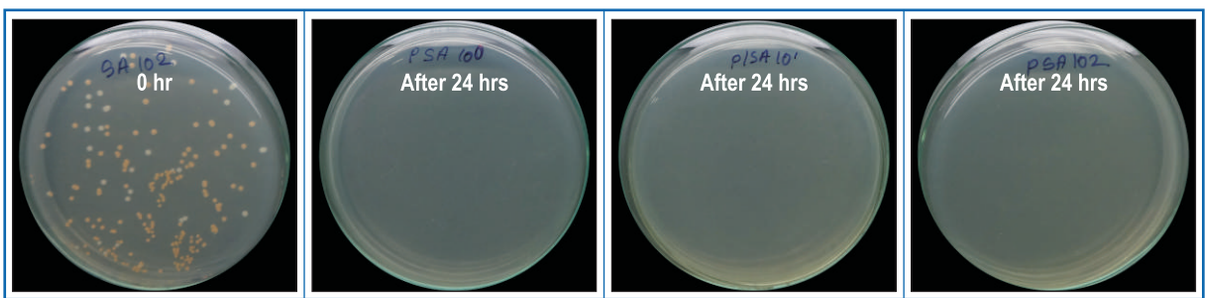
Saraguard-850	: 200-450 g/l
Pick up	: 65-70%
pH	: 5.0-6.0
Drying	: 140-160°C, 1 min (for all substrate)
	: 120-130°C, 1 min (for polypropylene)

Results:

Antibacterial activity with 420g/l Saraguard-850 treated fabric by AATCC-100 test method

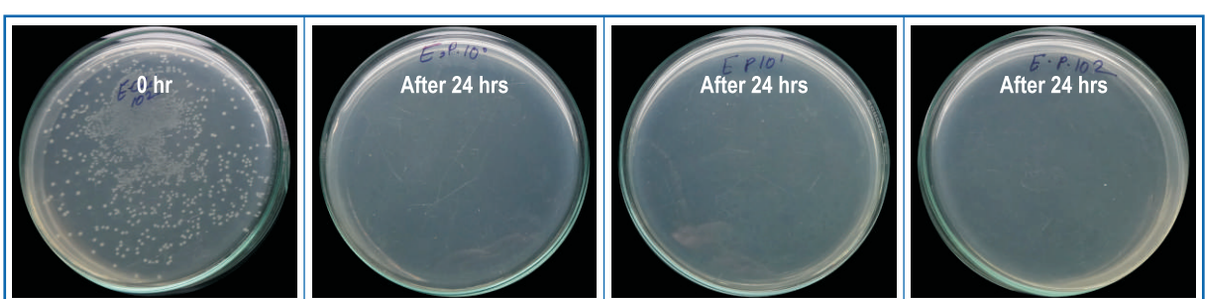
Samples	% Reduction in bacteria			
	S. aureus		*E. coli*	
	Initial	10 wash	Initial	10 wash
Unfinished	0%	0%	0%	0%
420g/l Saraguard-850	100%	92.25%	100%	94.97%

Antibacterial activity of Saraguard-850 against *S. aureus*



Unfinished fabric (10^{-2}dilution)	420g/l Saraguard-850 finished fabric (as is)	420g/l Saraguard-850 finished fabric (10^{-1} dilution)	420g/l Saraguard-850 finished fabric (10^{-2} dilution)

Antibacterial activity of Saraguard-850 against *E. coli*



Unfinished fabric (10^{-2}dilution)	420g/l Saraguard-850 finished fabric (as is)	420g/l Saraguard-850 finished fabric (10^{-1} dilution)	420g/l Saraguard-850 finished fabric (10^{-2} dilution)

420g/l Saraguard-850 shows very good antimicrobial activity against *S.aureus* and *E.coli.*

The antimicrobial finish is durable upto 10 home launderings.

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