

Saraqvest

Exclusive Insight



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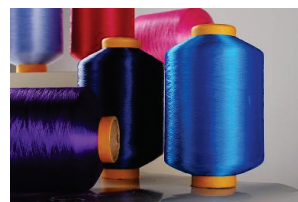
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Sarex beats the heat of increase in cost of Reactive Dyes



Sarabloom-SL

Reactive dyes are the most predominant class of dyes for cellulose. Today 50% of cellulose are dyed with these dyes. Share of reactive dyes among all textile dyes is 29%, which is next to disperse dyes consumption (32.5%).

Reactive dyes are expected to take share from other cellulosic dyes like sulphurs and azoics on environmental ground, vats on cost and application, directs on fastness. Due to drawback of various classes of dyes it is expected to increase in volume of reactive dyes in the early part of the next century.

In today's fashion world Blacks and Navy are the classical colors for every fashion trend irrespective of seasons. Color depths of these two shades vary from deep to deepest. The challenge is always to satisfy the buyers need for deepest black or navy.

The dyers are facing a challenge to achieve black shades within the cost frame set by the buyer due to the increasing price of Reactive Black dye.

The main driven factor for increases in price of reactive dyes is the growing pressure from increased environmental controls in the production of important raw material and dye intermediate in Asia, specially in China, which impact on the whole supply and value chain of dyes worldwide. The most impacted intermediate chemicals are H acid, bromaminic acid and anthraquinone derivatives.

In an endeavor to beat the heat of increasing dyestuff prices, **Sarex** offers a innovative solution **Sarabloom-SL**. **Sarabloom-SL** enhances the depth of dyed fabric by 10-30 % which helps dyer to achieve the required depth without using more dyestuff which brings total dyestuff cost under control and even saves cost of processing.

Sarabloom-SL is developed on light physics principle, it reduces the refractive index of substrate and thus decreases reflection of light resulting in reduction in Lightness Value (L) and increase in colour value, making the

shade appear deeper and sharper

Unique feature of Sarabloom-SL:

- The color depth of black and navy dyed fabrics can be increased by 10-30 % .
- Good durability to multiple home laundering.
- No impairment of wet and dry Rubfastness.
- Imparts good handfeel.

Application :

Sarabloom-SL : 20-30 g/l

pH : 5.0 - 6.0

Pad expression : 70 %

Dry : 90-120° C

Curing : 160° C / 3 min.

Achieve required percentage of shade with less quantity of dyestuff by using Sarabloom-SL -

At Sarex, we have conducted the various trials to minimize the dye consumption by using Sarabloom-SL and it was found that 15 - 20 % dyestuff may be saved.

Sarex Solutions to beat the heat of rising prices of Reactive dyestuffs

Experiment :

1. Cotton fabric is dyed with 5 % and 6 % shade with Reactive Black B.
2. 5 % dyed fabric was treated with 20 g/l Sarabloom-SL.
3. Colour value of 20 g/l Sarabloom-SL treated fabric (5 % dyed fabric) was determined against 6 % dyed fabric.
4. Fastness properties of both fabrics were evaluated.




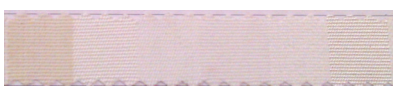
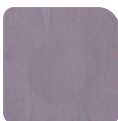
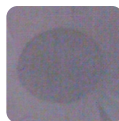
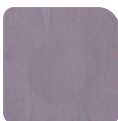
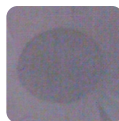
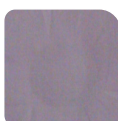
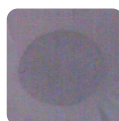
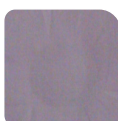
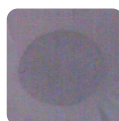
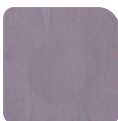
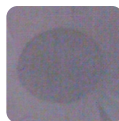
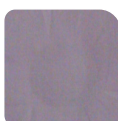
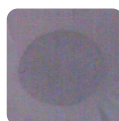
Table-1) Performance Properties of 6 % Reactive black B dyed and 20 g/l Sarabloom-SL treated (5 % Reactive black B dyed fabric)														
Dyed Fabric														
Treatment	Dyeing : 6 % Reactive Black B Dyefixing : 1 % Finishing : Conventional Softener	Dyeing : 5 % Reactive Black B Finishing : 20 g/l Sarabloom-SL (Dry on wet)												
Color Strength	100 % (Initial)	100 % (Initial)												
	98 % (after 3 HL)	98 % (after 3 HL)												
Wash Fastness														
	Rating on cotton : 4-5	Rating on cotton : 4-5												
Rubbing Fastness	<table style="margin: auto; border: none;"> <tr> <td style="text-align: center;">DRY</td> <td style="text-align: center;">WET</td> </tr> <tr> <td style="text-align: center;"></td> <td style="text-align: center;"></td> </tr> <tr> <td style="text-align: center;">4-5</td> <td style="text-align: center;">3-4</td> </tr> </table>	DRY	WET			4-5	3-4	<table style="margin: auto; border: none;"> <tr> <td style="text-align: center;">DRY</td> <td style="text-align: center;">WET</td> </tr> <tr> <td style="text-align: center;"></td> <td style="text-align: center;"></td> </tr> <tr> <td style="text-align: center;">4-5</td> <td style="text-align: center;">3-4</td> </tr> </table>	DRY	WET			4-5	3-4
	DRY	WET												
														
4-5	3-4													
DRY	WET													
														
4-5	3-4													
Feel	Softfeel	Softfeel (softness matches)												
Costing	Approximate Rs. 33 / Kg	Approximate Rs. 28 / Kg												
Saving		Approximate 17 %												

Table-2) Color strength of 6 % Reactive black B dyed and 20 g/l Sarabloom-SL treated (5 % Reactive black B dyed fabric)

Washing	Shade percentage	Colourant strength	dE	Da	Db	Dc	h	DH
Initial	6 % (Std)	100	-	-	-	-	295.989	-
	5 % shade	92	0.230	0.008	0.205	-0.182	296.614	0.095
	20 g/l Sarabloom SL (on 5 % dyed fabric)	105	0.879	-0.121	-0.398	0.327	288.536	-0.257
After 3 HL	6 % (Std)	100	-	-	-	-	295.989	-
	20 g/l Sarabloom SL (on 5 % dyed fabric)	103	0.849	0.307	-0.423	0.475	294.528	-0.072

Results: Table 1 & 2 shows that treatment of 20 g/l Sarabloom-SL shows 18 % saving in consumption of dyes stuff and 17 % saving in cost of dyeing.

Acid Reductive Clearing agent for Polyester Dyeing



Reducon-ACD (Conc)

In present global scenario synthetic fibres are the product of 2nd generation, they are greatly employed in both apparel and non apparel sector.

Among the synthetic fibres polyester is the most important and widely used due to its high strength, dimensional stability, abrasion resistance, resiliency, as well as suitability for blending with natural fibres.

Polyester has also high chemical resistance, high moth proofness, and excellent wash and wear and permanent press characteristics. Polyester fabric when blended with cotton and wool, gives high quality fabric. These unique properties make it the largest trade fibre in the synthetic fibre world.

Polyester is difficult to dye. Following factors are responsible for making polyester fibre difficult to dye.

1. High Fibre Crystallinity
2. Hydrophobic Character of Fabric
3. Absence of Chemically active group.

Disperse dyes are the most important class of dye used in dyeing polyester fibres and provide a wide range of hues with good build-up and fastness properties.

Disperse dyes are non ionic in nature with low aqueous solubility at dyeing temperature. These dyes are applied in the form of an aqueous dispersion.

Methods of Polyester Dyeing

1. Carrier Dyeing
2. High temperature High Pressure Dyeing
3. Thermofixation Dyeing
4. Solvent Dyeing System.

Irrespective of method of dyeing of polyester with disperse dyes, unfixed disperse dyes remains on to the fibre surfaces after dyeing, which will considerably reduces wash fastness, sublimation, dry cleaning fastness as well as dulling of the shades



Current Trend

In order to remove unfixed disperse dye conventional reduction clearing is carried out with caustic & hydros (Sodium dithionite) at 70°C for 10-20 mins. The treatment with caustic & hydros often sufficient to clear the fibre surfaces but the ease of removal varies from chromopore of the dye.

Drawbacks of sodium dithionite :

- Produce sulphite and sulphate
- High concentrations of sulphate increases TDS in effluent.
- Unpleasant odor.
- Corrosion of the effluent drainage system.

Sarex Solution for Caustic-Hydrosulphite:

In order to overcome disadvantages of reduction clearing by Caustic-Hydrosulphite. **Sarex** has developed special concentrated reduction clearing agent **Reducon ACD (conc)** which works under acidic pH.

Features of Reducon-ACD (conc)

- Concentrated & Available in powder form.
- Works under acidic pH hence alkalifying the bath & fresh post cleaning treatment is not required.
- Dyeing followed by reduction clearing in same bath is possible Saves time, energy, and water.
- Elimination of caustic hydrosulphite helps in reduction in TDS of effluent.

Application

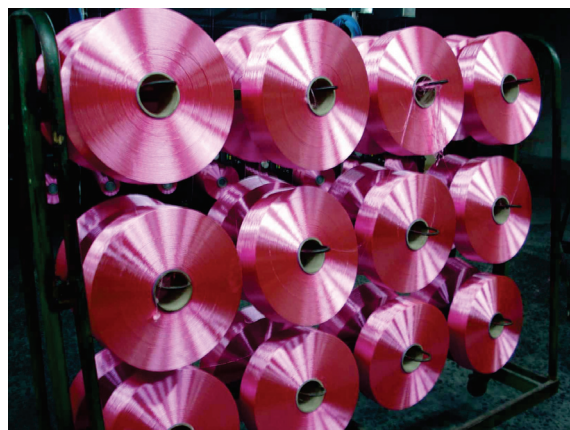
For medium depth of shades

Reducon-ACD (conc) : 0.3 - 0.5 g/l

For deep shades

Reducon-ACD (conc) : 0.5 - 0.75 g/l

treat for 10-20 mins at 70-80°C, rinse, hot and cold wash.



Study of Reducon-ACD (conc) against Conventional Method

Maroon and Dark Navy depth of shades were used for study. Dyeing of polyester fabric was carried out at pH 4.5, 130°C for 45 min

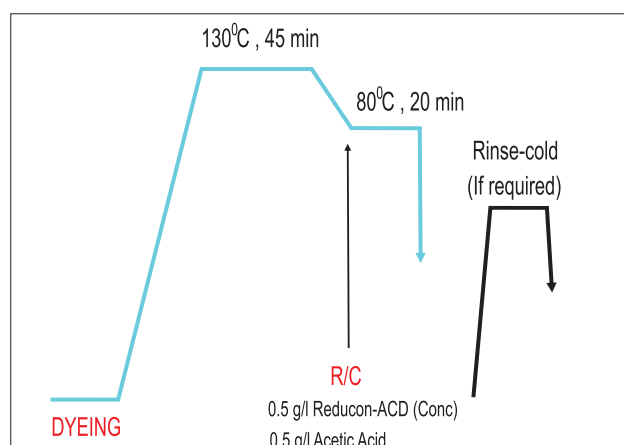
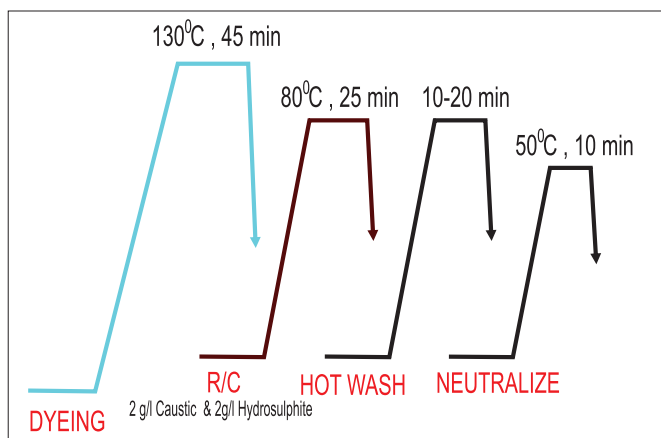
Process flow diagram of Dyeing of polyester followed by Reduction Clearing

CONVENTIONAL SYSTEM

Reducon-ACD (conc) SYSTEM

Reduction Clearing by Conventional Process (2 g/l Caustic & 2g/l Hydrosulphite)

Reduction Clearing by Reducon-ACD (conc)



CONVENTIONAL SYSTEM

Experimental Methods:

1. After dyeing drain the dye bath.
2. Reduction clearing was carried out by adding 2 g/l Caustic + 2 g/l Hydros in dye bath at 80°C for 15 min.
3. Hot wash ----> Neutralize bath.

Reducon-ACD (conc) SYSTEM

Experimental Methods:

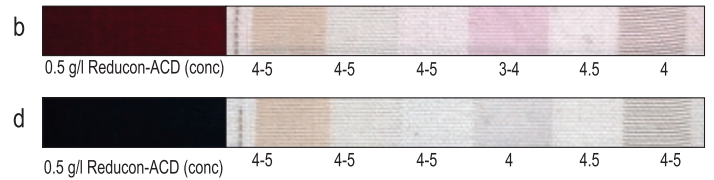
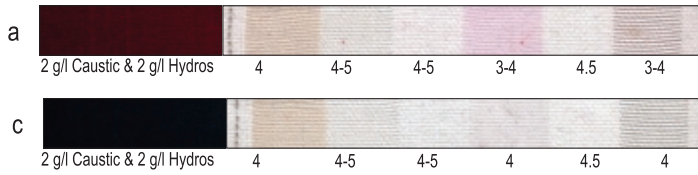
1. After dyeing cool the bath to 80°C
2. Reduction clearing was carried out at 0.5 g/l Reducon-ACD (conc) without draining dye solution at 80°C for 15 min.
3. Hot wash

Washing fastness by ISO 105 C06 C2S



Staining on Multifibre

Staining on Multifibre



Washing fastness of fabric treated with Reducon-ACD (conc) is comparable to caustic and hydros for both the shade studied.



Drawbacks of Conventional (Hydro-caustic) system

- Produce sulphite and sulphate and it increases TDS in effluent
- Reduction clearing carried out in new bath.
- Neutralization required after reduction clearing treatment
- Effect on skin and health.

Advantages of Reducon-ACD (conc)

- It does not increase TDS in effluent.
- Reduction clearing is carried out in same dye bath. as Reducon-ACD (conc) works under acidic pH
- No neutralization required after reduction clearing.
- Saves Water, energy, time.
- No skin or health hazard.



Eco-friendly Universal Dye fixing agent for Reactive and Direct dyes

Saradye-FN



Cotton known as the king of fibres and consumes more than 50 % of fibres usage in textiles both for apparel and non-apparel purpose. Several classes of dyes can be used to dye cellulosic fibres, such as direct, vat, reactive and sulphur. The choice of dye class used depends on factors such as their cost, ease of application and fastness properties.

Direct and Reactive dyes are used in dyeing of cellulosic substrate.

Reactive dyes furnish a broad gamut of shades with good light and excellent wash fastness on cellulosic fibres, thus are widely used to dye cellulosic fibres.

The main drawback of reactive dye is that it can react not only with the fibre but also with water present in dyebath and forms a hydrolysed dye. In order to remove unreacted & hydrolysed dye from fabrics, it is subjected to several washing off or dyefixing treatments. Although, washing off process is most preferable but it is costly and time consuming than dye fixing of reactive dyed materials.

Direct dyes are normally applied from an aqueous dyebath containing electrolyte. They impart moderate to good light fastness but moderate to poor washing fastness. Their most attractive feature is the simplicity of the dyeing process, but require to improve fastness properties.

In industry, cationic dye fixing agents are used to overcome a problem of Reactive and direct dyeing on cellulosic fabric. These dye fixing agents are base of formaldehyde condensation resin products and it is observed that fabrics treated with these products release formaldehyde into the atmosphere directly or during processing. Also these dye fixing agents have effect on shade and light fastness of dyed fabric. Due to several disadvantages of formaldehyde based dye fixing agent a demand for non formaldehyde based fixing agents increased.

By keeping this in mind We at **Sarex** developed a non formaldehyde dye fixing agent **Saradye-FN** for Direct as well as for Reactive dyes.

Unique feature of Saradye-FN

- Universal product for reactive as well as direct dyes.
- Does not effect either on light fastness or on the shade of treated material.
- Improves washing as well as water contact.
- Ecofriendly, formaldehyde free.
- Can be applied by exhaust as well as by padding.

Application :

Exhaust application

Saradye-FN : 0.5-2 %

pH : 5-5.5

Temperature = 40°C for 20-30 mins.

Continuous application :

Saradye-FN : 5-20 g/l

In padding alone or with other finishing chemicals or on continuous soaper in last chamber, pH 5- 5.5 with acetic acid at 35-40°C.

Saradye-FN Dye fixing agent for Reactive Dye

The Reactive dyed fabric was dye fixed with Saradye-FN by exhaustion application at 1 % and 2 % concentration, pH 5- 5.5,, M:L 1:10, Temperature 40°C for time 30 minutes. The dye fixed fabric was evaluated for fastness by ISO 105 C03 and E01



Reactive dyed fabrics are dye fixed with Saradye-FN shows no staining to very slight staining on multifibre depending

Shade variation study of dye fixed fabric

Cotton fabrics were dyed with various class of reactive dyes and then dye fixed with Saradye-FN. The shade change were determined and tabulated.

FN Class	1.5 %Cibacron Yellow FN2R + 1.5 %Cibacron Red FNR + 1.5 % Cibacron Blue FNR			
Dye Fixing Agent	Strength	DE	Da	Db
Soaped Sample	100	-	-	-
1 % Saradye-FN	104	0.480	0.096	0.293
2 % Saradye-FN	102	0.287	0.136	0.173

Table 1 Shade changes and colourant strength of fabric dyed with Cibacron FN dyes

ME Class	1 % Yellow F3R + 1 % Red F3B + 1% Blue BRF			
Dye Fixing Agent	Strength	DE	Da	Db
Soaped Sample	100	-	-	-
1 % Saradye-FN	103	0.386	-0.270	0.037
2 % Saradye-FN	104	0.566	-0.264	0.067

Table 2 Shade changes and colorant strength of fabric with ME Dyes

Vinyl Sulphone Dyes	1.0 % G.Yellow RNL + 1.0 % Blue BB + 1.0 % Red CRBL			
Dye Fixing Agent	Strength	DE	Da	Db
Soaped Sample	100	-	-	-
1 % Saradye-FN	103	0.551	0.352	0.375
2 % Saradye-FN	104	0.659	-0.026	0.215

Table 3 Shade changes and colorant strength of fabric with Vinyl Sulphone Dyes

HE Class	1 % Yellow HE4R + 1 % Red HE3B + 1 % Blue HERD			
Dye Fixing Agent	Strength	DE	Da	Db
Soaped Sample	100	-	-	-
1 % Saradye-FN	101	0.230	0.033	0.163
2 % Saradye-FN	102	0.320	0.259	0.016

Table 4 Shade changes and colorant strength of fabric with HE Dyes

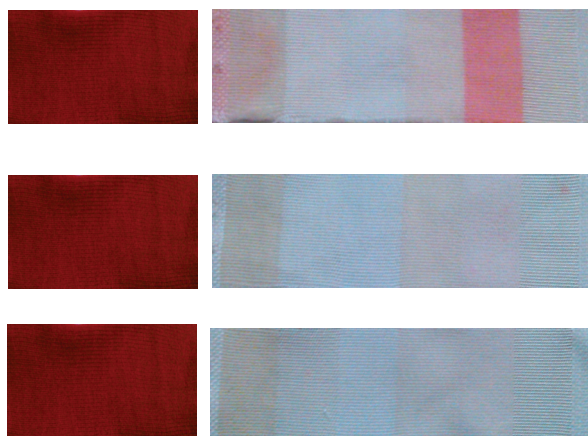
All the dye fixed fabrics do not show any shade changes irrespective of classes of dyes and concentration of Saradye-FN (Table 1-4)

Saradye-FN Dye fixing agent for Direct Dye

The Direct dyed fabric was dye fixed with Saradye-FN by exhaustion application at 1 % and 2 % concentration, pH 5- 5.5,, M:L 1:10, Temperature 40°C for time 30 minutes. The dye fixed fabric was evaluated for fastness by ISO 105 C03 and E01

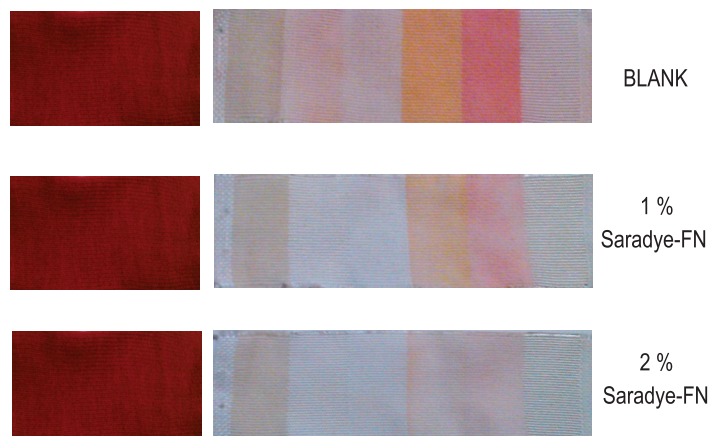
WATER CONTACT BY ISO 105 E 01

DYED COTTON STAINING ON COTTON



WASHING FASTNESS BY ISO 105 C 03

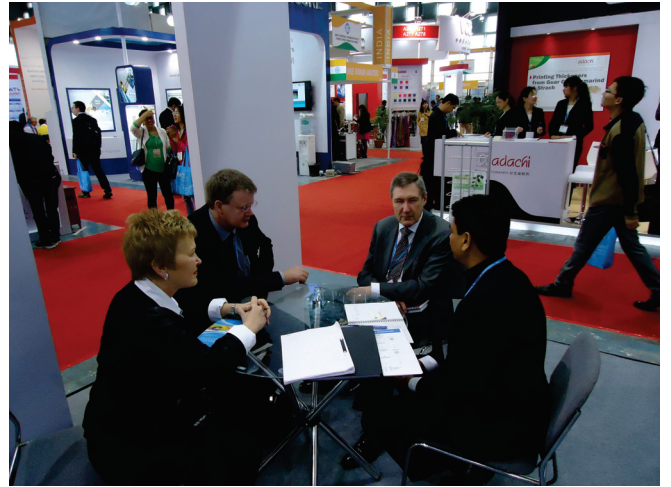
DYED COTTON STAINING ON MULTIFIBRE



Direct Dye :Scarlet 4 RR (4 % shade)

From above demonstration , It can be seen that direct dyed fabric dye fixed with Saradye-FN shows very good water contact fastness and it shows improvement in washing fastness.

SAREX participate in Interdye China, April-2014 at Shanghai





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M & S



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OHSAS 18001:2007



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GOTS

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