



Journal of the **TEXTILE Association**

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NO. 3

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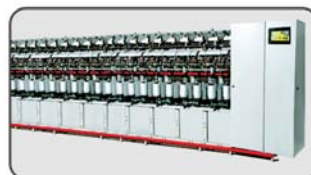
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Visitor Profile

- Textiles, Fabrics & Fibers sector
- Textile and Garment Machinery, Processing and Finishing sector
- Raw materials, Textile and Garment Auxiliaries
- Accessories and Spare parts, Textile Solvents, solutions sector
- Textile parks, SEZ
- Research Institutes

Unique Features

- Pre-fixed business meetings on request
- Product launches
- Textile Technology seminar and speakers session
- Showcasing innovation & research projects by universities / institutes.
- Networking Programs
- Cultural programs

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Topics to be covered:

- Textile Business Potentials of BRIC regions and possibilities of trading in local currencies
- Textile Business in Asian Countries
- Business opportunities in Burma and Africa - Emerging new low cost production centres
- Financials – Banks & institutional support for textile projects
- Surviving in currency fluctuation situations
- Supply chain management & logistics
- Consumer expectations & rising demands
- Environmental issues & overcoming these regulations
- State and Central Government Policies & their strategic plans to support to the textile industry
- Initiative Fibre – Natural & man-made, including Organic Cotton
- Innovation in textile machinery
- Innovations in chemicals & dyes to beat the challenges
- Textile Operation / Process with unconventional energy sources
- Development potential in non apparel sector
- Global Denim Scenario
- Technical Textiles

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Full Page (Black & White) :	Rs. 8,000 /-

TECHNICAL DATA

Size of Book :	27.5 cm (Height) X 22 cm (Width)
Positive Size :	24 cm (Height) X 18 cm (Width)
Printing :	Offset Process

Note:

- Advertisement rates do not include cost of positive.
- We need Positives/ CD for printing Advertisements.
- For multi colour advertisements, set of progressive proofs is to be supplied by the party.
- Advertisement material/confirmation along with Cheques / Drafts must reach on or before 20th November 2012.
- No outstation Cheque will be accepted. Outstation Advertisers may please forward advertisement charge by way of DD / at part Cheque only.

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Life Members :	Rs. 1200 /-
Non Members :	Rs. 2500 /-
Students :	Rs. 500 /-
Spot Registration :	Rs. 3000 /-
Overseas Delegates :	USD 100

Note:

- Registration form duly filled should reach to the TAI, Mumbai Unit by 24th November 2012.
- Please produce appropriate receipt of delegate fee payment at the reception on the day of conference.
- Only 500 delegates will be registered on first come first serve basis due to limited capacity of the venue.
- Spot registrations shall be entertained based on availability of delegation.
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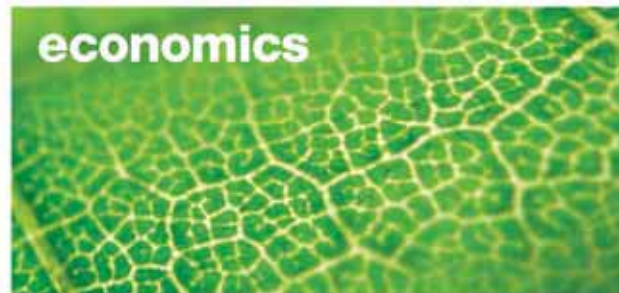
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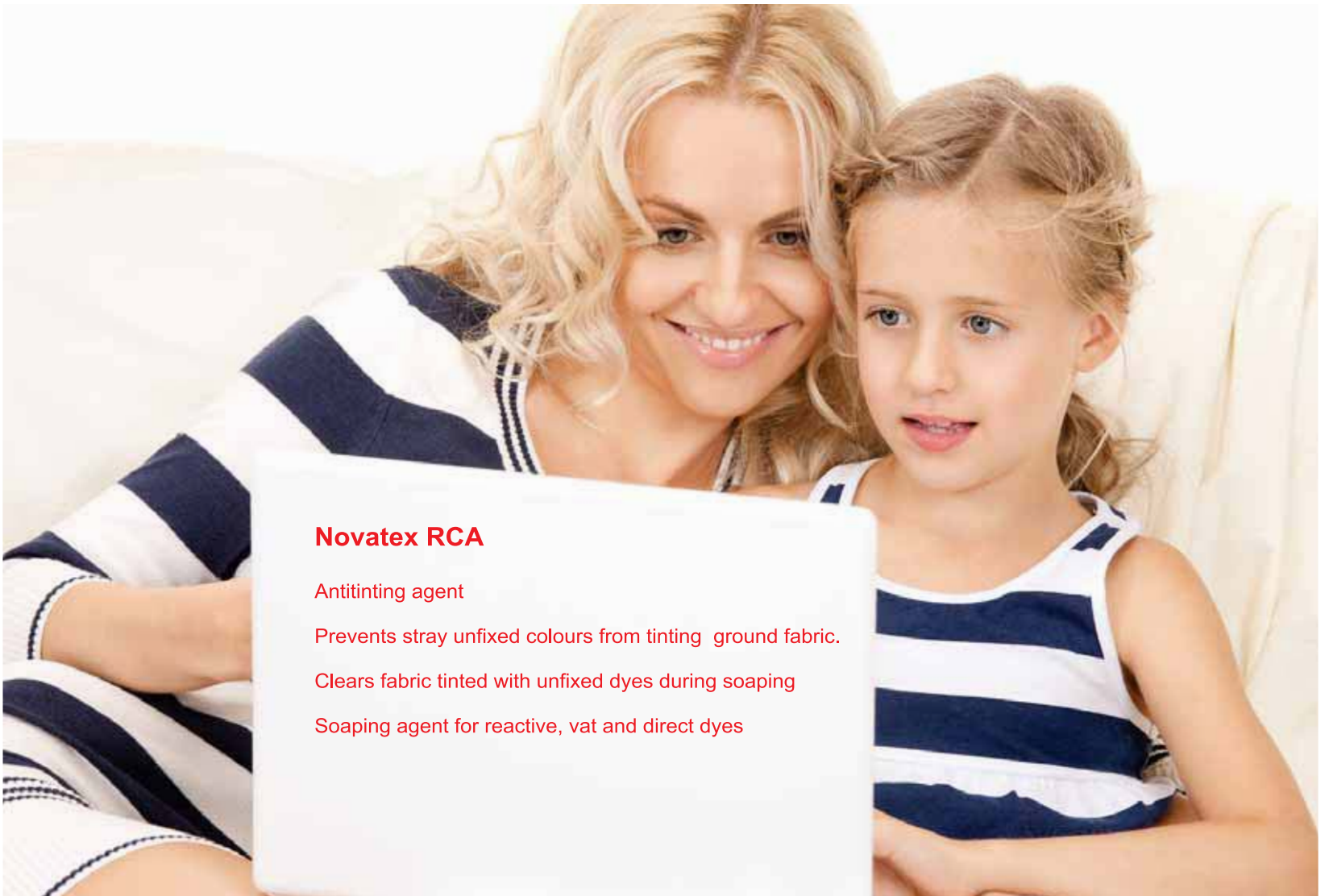
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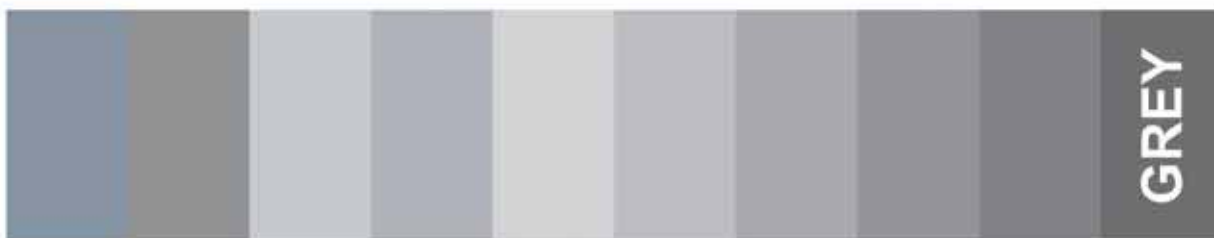
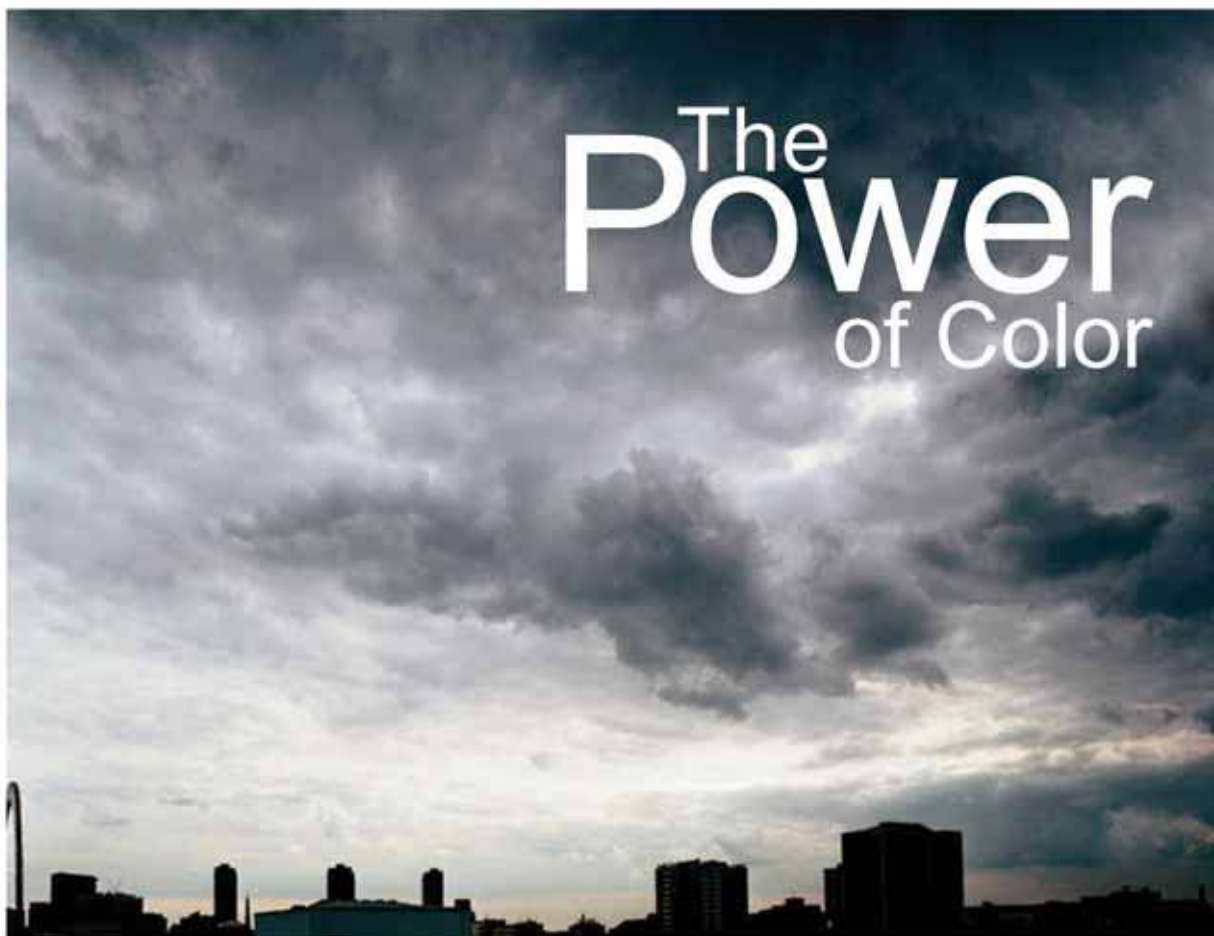
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- Home Textiles - 510 units
- Composite Mills - 47 units
- Weaving/Processing/Knitting - 640 units
- Garment Machinery & Spares - 140 units
- Textile Machinery & Spares - 610 units
- Textile & Apparel Parks - 44 parks

Cost of Printed Copy - INR 1000 / US\$ 50, Cost of CD Copy - INR 1000 / US\$ 50
Bundled Cost (Printed Copy + CD) - INR 1500 / US\$ 75



Rs. 1000 / US\$ 50

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(The mouthpiece of the Textile and Clothing Industry in India)

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Who should exhibit? • Fabric producers (mills, powerlooms, handlooms) • Fibre & Yarn manufacturers • Manufacturers for Dress material, sarees • Home textile • Contract manufacturers for garments & accessories • Producers of trimmings & embellishments • Fabric & Garment process houses • CAD/CAM & Software companies • Design studios • Fashion institutes • Packaging & Presentation service providers • Trade publications • Hosiery & Knitwear

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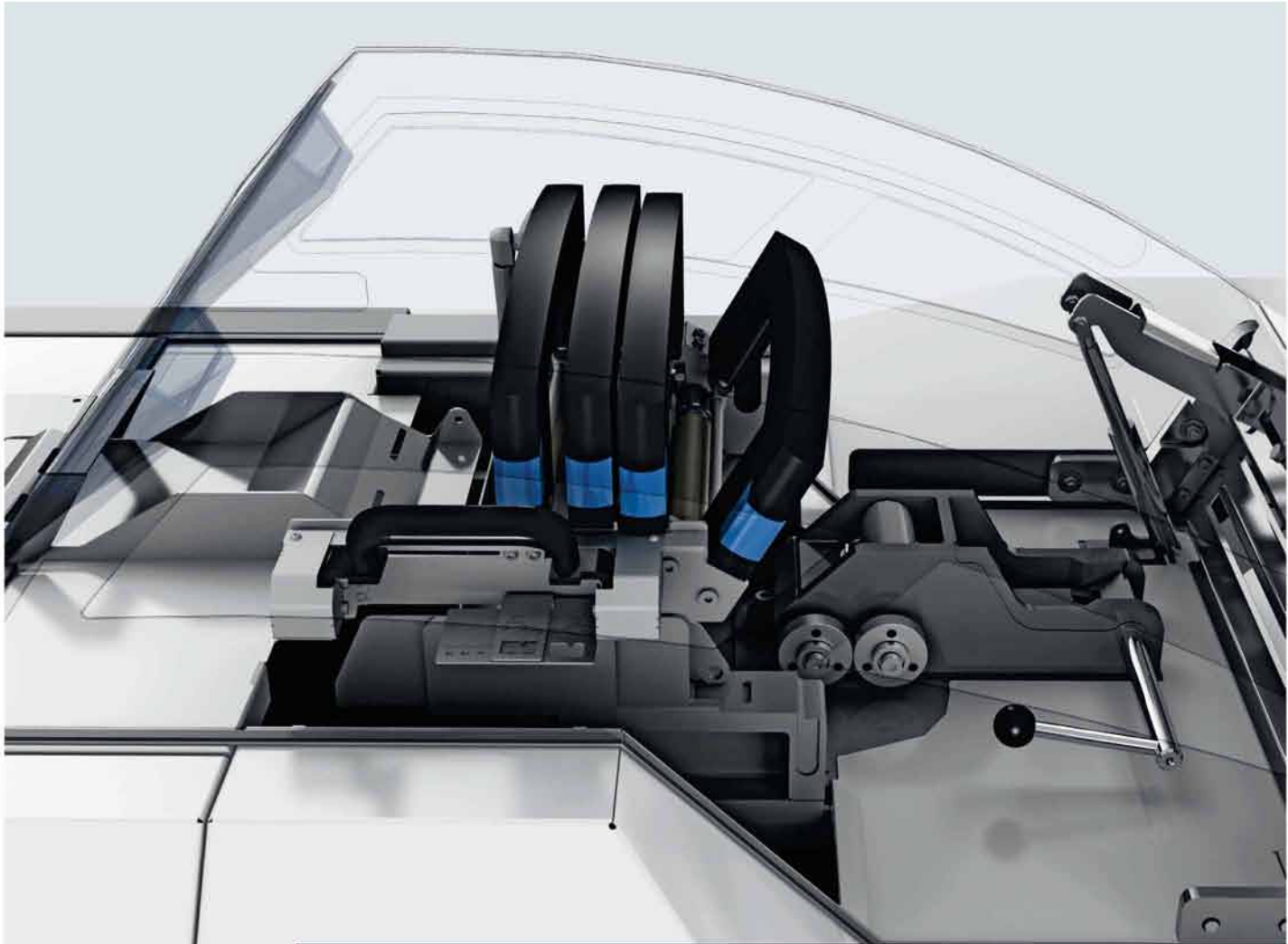
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Mr. Amit Gupta

Senior Assistant Director
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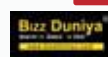
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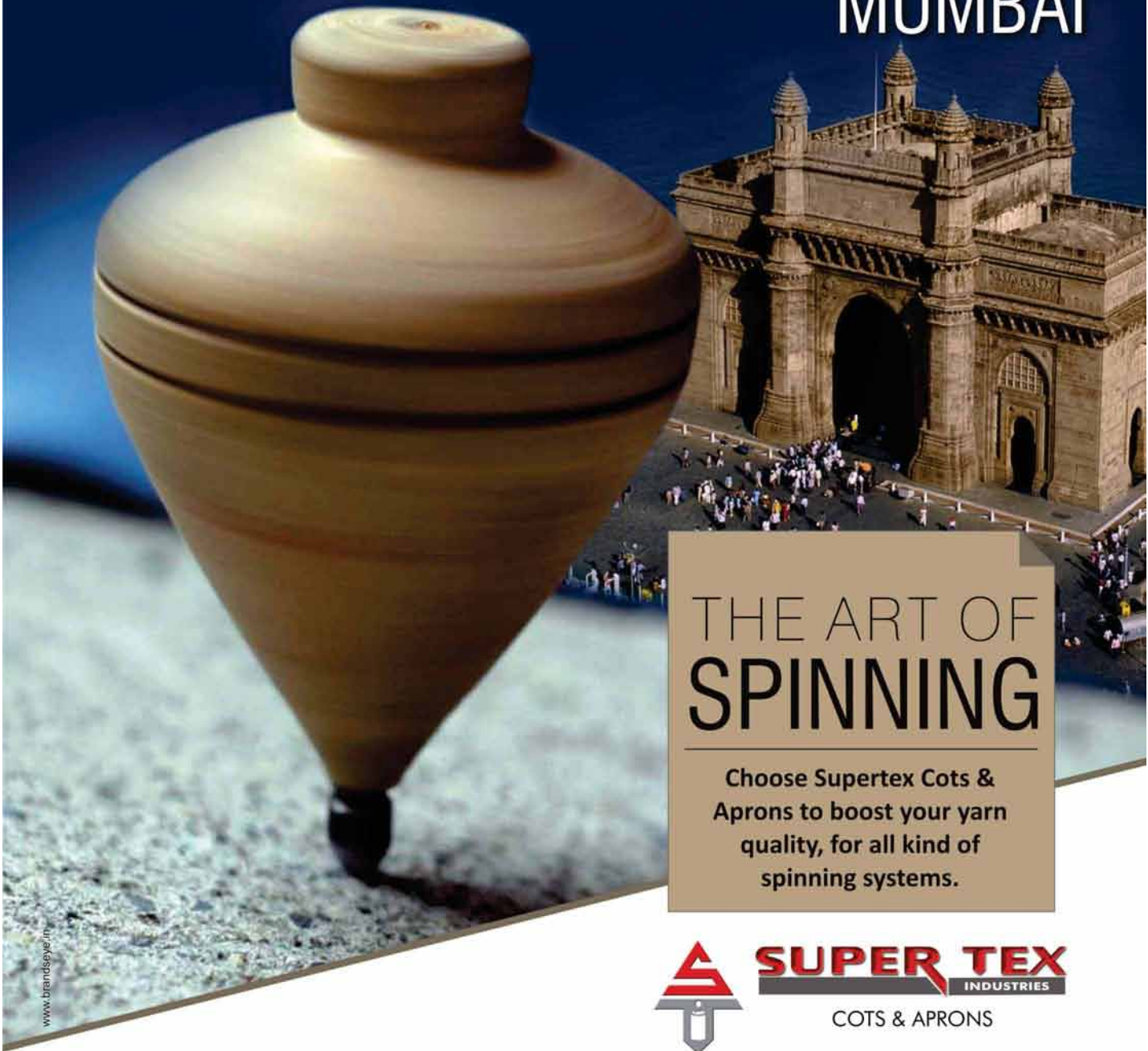
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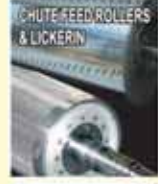
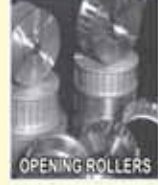
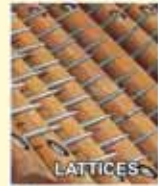
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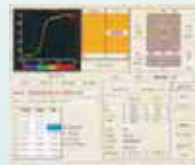
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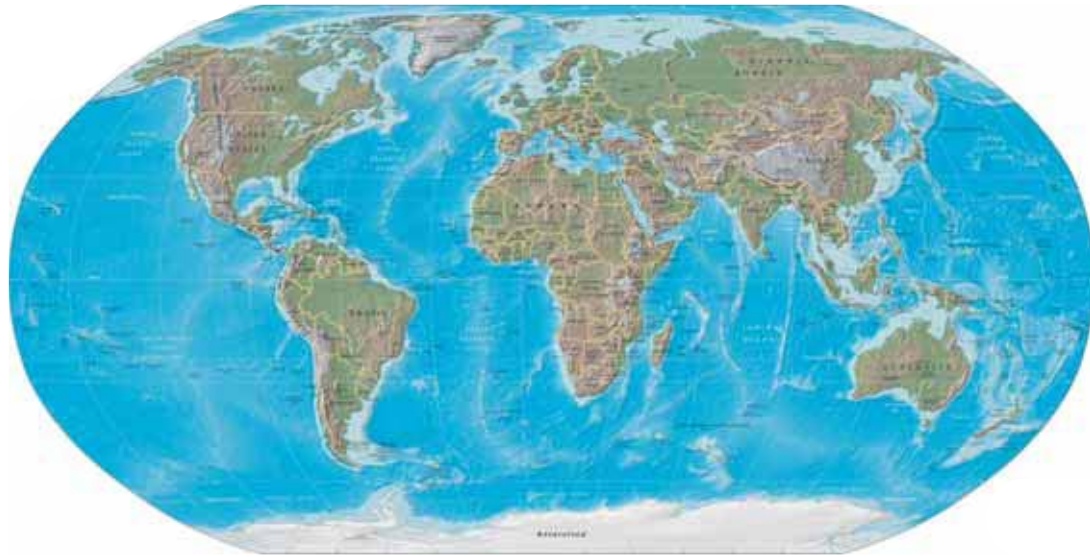
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Forthcoming Events

MUMBAI!

Humming with Festival Season Resonating with Textile Conferences and Seminars

A prolonged paralysis of decision making process at the Central government level seems to have been over and the government risking its stability seems to have been determined to go ahead with certain initiatives required for boosting the economy. Decline in manufacturing level as well as exports in general coupled with the challenge of meeting the fiscal deficit left the government almost no choice but to go for some decisions which appear to be bitter pills against the prevailing political surrounding giving rise to every passing day a new story of corruption, scandals or misappropriations. It is indeed a "perform or perish" kind of a situation given the limited period before the next elections are set in 2014. Whatever may be the reasons of revival of the stand, which is applauded by every single business house with regard to opening up of FDI in retail and insurance sector and decisions with regard to disinvestment of some of the Navratna companies, the stock market is going north words instilling some level of confidence in foreign and domestic investors. However, clearly the cautious attitude of the investors is being reflected since the uncertainty at the implementation level of such decisions is still prevailing. Whatever is said and done, it surely at present has sent a positive note and Mumbai –the financial capital of the country is showing the signs of humming with financial activities resonating with the spirit uplifted by just concluded Ganapati festival. This spirit is expected to continue further as festival season is setting in with Dussehra, Durga pooja and Deepawali and consumers all over will be in the buying /purchasing spree come what may, boosting the consumption levels.

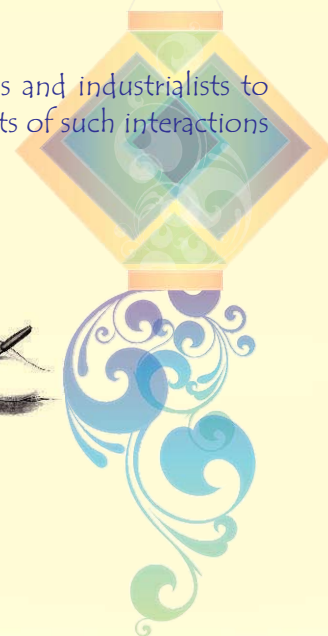
Under the backdrop of such a positive spirit emanating from the market, there have been a few events which took place to celebrate the excellence of the textile enterprises. For example, export excellence award ceremony was just concluded under the aegis of ITAMMA in Mumbai, at Ghia Hall where in companies like Precitex and others were awarded for their splendid performance in exports. Being a member of the jury which finalized these awards it is heartening to note that Indian Textile Accessories and Machinery Manufacturers Association is doing yeomen service by encouraging the indigenous manufacturers to create their stamp in other countries by exporting their goods. CITI also organized a similar "India Textile Summit" at Hotel Trident taking the stock of how the Indian Textile Apparel industry is doing and what prospects it has in this globalized business surrounding. FICCI's one day Conference "TAG 2012" held in Mumbai on 10th October 2012 at Hotel Lalit, focused on the changes and challenges in the Textile and Apparel Industry. This conference addressed the issue of the trends in fibre demand especially in cotton, polyester and viscose and respective speakers from Alok Industries, Reliance and Birla Cellulose spoke on these topics. Importance of innovation and new strategies for

sourcing were also discussed from the brands' perspectives. On the same evening, we also saw a Chhattisgarh Chief Minister Dr. Raman Singh with his whole expert team consisting of some ministers and secretaries who played host to the Road Show where in large number of industrialists were present. The state government was elaborating on kind of facilities they offer for investment in Chhattisgarh, a state which has 40% surplus energy.

While these were the events which just got over, there is something big going to happen which is been awaited for the whole year when its preparations were set in motion. Yes! I am talking about India –ITME 2012, the showcasing of latest textile machinery through over 700 exhibitors from over 70 countries. More than 1,00,000 footfalls are expected and the booking for the exhibition stalls was closed almost a year back. This speaks for itself the importance of India ITME not only in the eyes of those who visit similar shows, once in four years but also for the manufacturers of textile machinery from different parts of the globe. Coupled with this exhibition which is going to be held in Mumbai from 2nd December to 7th December 2012, there will be two international symposia and one official conference "Tex Summit 2012" of India ITME to be held on 3rd, 4th and 5th December 2012, respectively. Since I am personally involved as a convener of this Symposia as well as Tex Summit 2012 which is being organized by UDCT/ICT on the theme, "Building a sustainable value chain through green technology: flourish or perish". I am sure that the participants in these events will have the feast of knowledge in the field of the latest developments in textile machinery for manufacture of fabrics and apparels as well as various technologies encouraging the sustainable production of the goods. There are international speakers who will also speak on strategic sustainability marketing of the machinery and the goods to be able to meet the demands of international brands and modern enlightened consumers. The topic such as the scope of technical textiles and technological alternatives for sustainable and responsible production, alternative sources of energy and fibres and emerging accreditation international standards ensuring the social and environmental accountability on one hand and enlightening the consumers on the other hand in terms of the brand credentials, will also be discussed in depth. Just before the India ITME is going to be inaugurated there would be 10th International and 68th AITC going to be held on 30 November and 1 December 2012 in Mumbai on the theme, "World Textile – Challenges towards Excellence" by TAI Central and Mumbai Unit.

In short, "Challo Mumbai" is the call for most of the textile professionals and industrialists to participate wholeheartedly in these upcoming events. I am sure that the fruits of such interactions would result significantly in the growth of our textile business.

Prof. (Dr.) Mangesh D. Teli,
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Low Salt Reactive Dyeing of Cellulose

Anindya Chandra, Chet Ram Meena, Nirmal K Gupta & R.V. Adivarekar*

Department of Fibres & Textile Chemical Processing Technology
Institute of Chemical Technology.

Abstract

Reactive dyes is the only class of dyes which becomes integral part of cotton fabric by getting covalently bonded to cotton textiles and fills the gap between direct and vat dyes. However, have lower affinity as compared to direct dyestuffs and inorganic salt is required when using reactive dyestuffs in order to accelerate adsorption which may range from 5 to 125% on weight of goods. It is known that the chloride and or sulphate content of textile wastewater can be a primary source of pass-through aquatic toxicity in industrial and municipal discharge of treated wastewater as there is no known commercially viable process to remove the dissolved salts from the treated water prior to returning the treated wastewater to the natural waterway. The following study is aimed at chemically modifying cotton to find out the possibility of no salt or low salt dyeing with cold brand reactive dyes in self shades and further evaluation of their important fastness properties.

Keywords

Cationisation, Electrolyte, Zeta Potential, Low salt reactive dyeing.

1. Introduction

Reactive dyes are the only textile colourants designed to bond covalently with the substrate on application and differ from other dyes that depend on physical adsorption or mechanical retention. Reactive dyes fill the gap between the direct and vat dyestuffs in respect of fastness properties and cost. Reactive dyes are valued for their brilliance, availability in a full range of colours and exceptional application and versatility [1].

As reactive dyestuffs have a lower affinity as compared to direct dyestuffs, more inorganic salt is required when using reactive dyestuffs in order to accelerate adsorption and thus the exhaustion of dyestuff during initial phase of dyeing to increase the utility of reactive dyestuffs. While around 10gpl of glauber salt is usually appropriate for dyeing with direct dyes; an average of 50gpl is used with reactive dyes [2]. High concentration of salt is undesirable in aqueous effluents. Sulphate discharge may be even more dangerous, since it attacks concrete pipes and also increases the accumulation of sulphate ions, which is associated with an increase in total acidity of streams, lakes and rivers [3]. Structural modification of cotton fibres can be done either to reduce (resist) or increase (assist) the affinity

of cotton fibres for anionic reactive dyes. Chemical modification of cotton is generally done by blocking the functional groups (-OH groups) already present in the fibre or by introduction of new functional groups in the fibre [4]. Other important aspects of chemical modification of cotton fibres are to achieve shorter dyeing time, lower temperature of dyeing than normal, low salt or no salt to exhaust the bath, neutral pH fixation of modified fibre, etc. Cotton has -OH groups as polar groups and the accessibility of polar groups is of paramount importance in chemical modification. Cotton fibre can be modified in two ways, i.e. surface modification and internal modification. By surface modification, the surfaces can be made more polar without altering the desirable properties using various chemicals like acid, alkali, oxidizing and reducing agents and organic solvents can be used [3].

One of the highly researched area of modification is addition of cationic character to cotton by pretreatment with cationising compounds. Pretreatment with a reactive quaternary agent is one such treatment which increases the exhaustion of anionic dyes. The technique is of interest with reactive dyes also as several limitations of the conventional process are apparently overcome [5-8]. However, it is difficult to avoid preferential reaction of the agent in the surface regions of the fibre resulting in marked (and most undesirable) differences in hue and brightness compared to conventional dye-

* **All correspondence should be addressed to;**

R. V. Adivarekar

Institute of Chemical Technology, Matunga, Mumbai - 400 019.

E-mail : rv.adivarekar@ictmumbai.edu.in

ing of natural cotton fibre [9].

Dyeing processes, which rely on a colourless pretreating agent to enhance the equilibrium uptake of dye, are highly vulnerable to factors responsible for variation in the content and distribution of the agent in the modified fibre. It is difficult for the dyer to ensure uniform uptake of a mixture of dyes by unmodified cotton and thus this task becomes even more difficult if the cotton has already been modified irregularly by pretreatment with a colourless agent [10].

2. Materials and methods

2.1. Fabric

The fabric used in this study was 100% cotton with a plain weave structure with GSM - 102 gm/m², Count - 40 x 40 Ne, Width - 142 cm. This fabric was supplied by Mafatlal Industries Ltd. Textile Division, Nadiad Unit (India).

Chemicals used for the dyeing, Glauber salt (N_{a2}SO₄, 10H₂O), Sodium carbonate (N_{a2}CO₃), all of AR grade were supplied by S.D. Fine chemicals. Auxipon NP, non ionic detergent, used for washing of the fabric was supplied by Auxichem Ltd. India. Four different cationising agents used for the cationisation of cotton were Lupasol G100, Lupasol P, Lupasol SK and Lupasol FG supplied by BASF Ltd., India.

Acid dyes, Sandolan Brilliant Red 3BNI was supplied by Clariant Pvt. Ltd. India and reactive dyes, Reactive Yellow M4G, Reactive Red M5B, Reactive Blue MR were provided by Colorband India Pvt. Ltd.

2.2 Experimental methods

2.2.1. Cationisation of cotton

The bath was set to neutral pH with requisite amount of water in Rota dyer machine (Rossari Lab. Tech. Pvt. Ltd., India). Predissolved cationising agent was added as per recipe. The material was entered at room temperature and the temperature was raised to 70°C and treatment was carried out for 30 mins. The material to liquor ratio was 1:20. After that the fabric was washed with cold water and reactive dyeing of cationised cotton fabric was carried out.

2.2.2. Acid dyeing procedure

The dyepot was set with the pre dissolved dye, water and fabric in a rotadyer machine, the temperature was raised to 100°C. Dyeing was continued for 60 min in case of 1% shade depth. The soaping was carried out

with 2gpl non-ionic soap for 20 min at 95°C followed by cold wash and drying.

2.2.3. Dyeing of cotton fabric with M-brand reactive dye

The dyepot was filled with the predissolved dye, predissolved salt, water and fabric. Dyeing was started at RT and temperature was allowed to rise to 40°C. After holding the temperature at 40°C for 15 min, required amount of soda ash was added and dyeing was continued for length of time depending upon the depth of the shade. After the completion of dyeing the exhausted bath was drained and after treatment was carried out. The same procedure was followed for other colours from same class of dye with M:L - 1:20, Shade -1.0% and 3.0%, Salt - 60-70 gpl and Soda ash - 15-20 gpl.

2.2.4. Dyeing of cationised cotton fabric with M-brand reactive dye

Dyeing was carried out at 40°C, starting from RT keeping the other parameters unchanged in the rotadyer machine. Dyeing of cationised cotton was also carried out using low amount of electrolyte (10gpl, 20gpl and 30gpl) in the similar fashion as described above, followed by after treatment.

2.2.5. One bath cationisation and reactive dyeing

In this method instead of using electrolyte which is responsible for decreasing zeta potential and facilitating adsorption of dye molecules into the fabric, only required amount of cationising agent is used in the dyebath along with the dye and dyeing was carried out in conventional manner, followed by after treatment.

2.2.6. Cationisation followed by washing and then reactive dyeing

In this case, cationisation was carried out with the optimized recipe in exhaust process. After the cationisation the fabric was washed to remove the superficial cationising agent with cold water to get even dyeing and the washed material was taken for reactive dyeing.

2.2.7. Washing-off of reactive dyed substrate

After dyeing, washing-off treatment was carried out at M: L - 1:20 to remove the unfixed and hydrolysed dye. Cold wash at room temperature for 5 minutes was followed with hot wash at 70°C for 5-10 minutes and soaping at 95°C for 20 minutes with 2gpl non-ionic detergent. Finally cold wash was followed by drying.

2.2.8. Determination of moisture regain

The known weight of fabric sample in weighing bottle was kept in drying oven at 105°C for two to three hours till constant weight was obtained and weight of dried sample was measured.

Moisture Regain = (Original weight - Oven dry weight) / Oven dry weight x 100 %

2.2.9. Determination of whiteness index

The whiteness of the sample was evaluated by determining the CIE whiteness Index using Spectra flash SF 300, Computer Colour Matching System supplied by Datacolor International, USA. An average of four readings at different areas was taken.

2.2.10. Colour yield measurement

Dyed samples were evaluated for the depth of the colour by determining K/S values and colour strength (%) using Spectraflash SF 300 computer colour matching system supplied by Datacolor International, U.S.A. An average of four readings was taken at four different sample areas was used to calculate the reflectance values and Kubelka Munk K/S function which is given by:

$$K/S = (1-R)^2 / 2R$$

Where,

'R' is the reflectance at complete opacity

'K' is the absorption coefficient

'S' is the scattering coefficient

Tone of the colour and colour difference was evaluated on the same machine in terms of CIE L^* , a^* , b^* values and dE.

2.2.11. Colour fastness measurement

Colour fastness to washing was tested using the ISO Test Method 105-CO3, colour fastness to crocking was measured by the ISO crockmeter Method 105-X12 and light fastness was measured by the AATCC Test Method 16A.

2.2.12. Determination of physical properties

The tensile strength was determined by using ASTM Test Method D2261-11 (Mag Electronic Tensile Tester). The bending length was determined by using Shirley Stiffness Tester using ASTM Test Method D1388-8.

2.2.13. Determination of zeta potential [11]

The Anton Paar Electrokinetic analyzer (EKA) was used for measurement of zeta potential of the samples from

the measurement of streaming potential and specific electrical conductivity of the applied electrolyte using the Fairbrother-Mastin approach. The formula for the determination of zeta potential is as mentioned below;

$$\zeta = dU / dp \cdot \eta / \epsilon \cdot \epsilon^0 \cdot k \times 10^{-8}$$

Where,

= Zeta potential (mV)

dU / dp = Slope of the streaming potential versus pressure (mV/ mbar)

η = Electrolyte viscosity (mPa.s)

ϵ = Permittivity (As/Vm)

ϵ^0 = Dielectric constant of electrolyte

k = Electrolyte conductivity (mS/m)

2.2.14. Fourier Transform Infrared Spectroscopy

Fourier Transform Infrared Spectroscopy - 8400S, SHIMADZU (FTIR) of the treated samples was carried out which provides specific information about chemical bonding and molecular structures, making it useful for analyzing dye fibre interaction. Chemical bonds vibrate at characteristic frequencies and when exposed to infrared radiation, they absorb the radiation at frequencies that match their vibration modes. Measuring the radiation absorption as a function of frequency, produces a spectrum that can be used to identify functional groups and compounds.

3. Results and Discussion

The present study attempts to develop a no salt or low salt reactive dyeing process. Reactive dyeing of cationised cotton material was carried out in absence as well as with little addition of electrolyte using cold brand reactive dyes in light, medium and dark self shades and comparison was made with control sample i.e cotton dyed with same dye and dyeing conditions without cationisation.

3.1. Effect of concentration of cationising agent on colour yield

Optimization of cationisation process parameters such as concentration of cationising agent, temperature and time of treatment in terms of K/S values of Acid dyeing with Sandolan Brilliant Red 3BNI, of cationized cotton was carried out. Table 3.1 shows the K/S values of acid dyed cationised cotton using four cationising agents, Lupasol P, Lupasol G100, Lupasol SK and Lupasol FG respectively, concentration ranging from 1% to 9% o.w.f. In case of Lupasol P optimized concentration is 4%, where as in case of Lupasol G100,

Lupasol SK and Lupasol FG it is 5%, 8% and 2% respectively. The K/S value of acid dyed cationised cotton differs from one cationising agent to another due to varying charge densities of these cationising agents. It is also observed that for a particular concentration, K/S value of cationised cotton follow a general rule. Lupasol P has the highest charge density (20 meq/gram) and the cotton treated with this cationising agents exhibit highest K/S value where as K/S value decrease as the charge density decreases for a particular concentration. The charge densities of the cationising agents are mentioned in the experimental method.

Table 3.1: Effect of concentration of cationising agents on cotton

Cone % o.w.f	K/S value of acid dyed cationised cotton			
	Lupasol P	Lupasol G100	Lupasol SK	Lupasol FG
1	0.768	0.755	0.498	0.401
2	0.808	0.790	0.528	0.446
3	0.818	0.795	0.555	0.411
4	0.941	0.811	0.472	0.398
5	0.867	0.846	0.548	0.370
6	0.861	0.816	0.560	0.414
7	0.862	0.821	0.593	0.365
8	0.857	0.819	0.636	0.357
9	0.852	0.811	0.552	0.318

3.2. Effect of temperature of cationisation on colour yield

Table 3.2 shows the K/S values of cationised cotton in five different treatment temperatures. It is clear from the table that the optimized temperature is 70°C for all four cationising agents. Extent of cationisation increases as the temperature increases from 40°C, at 70°C it gives the maximum cationising effect on the cotton fabric and decreases beyond 70°C. It is also clear that at a particular temperature Lupasol P treated cotton fabric offered maximum K/S value as compared to the other cationising agents and K/S value decreased as the charge density of those cationising agents decreased.

Table 3.2: Effect of temperature on cationisation of cotton

Temp. (°C)	K/S value of acid dyed cationised cotton			
	Lupasol P	Lupasol G100	Lupasol SK	Lupasol FG
	Conc. 4%	Conc.5%	Conc.8%	Conc. 2%
40°C	0.801	0.792	0.496	0.392
50°C	0.823	0.816	0.512	0.401
60°C	0.857	0.821	0.572	0.417
70°C	0.912	0.832	0.612	0.431
80°C	0.903	0.813	0.601	0.425

3.3. Effect of time of cationisation process on colour yield

Table 3.3 shows the K/S values of acid dyed cationised cotton with respect to varying time of treatment. The optimum cationisation takes place in 30 mins. of treatment time for all the cationising agents. Again it is observed that for a particular time of treatment, Lupasol P offers maximum K/S value where as Lupasol FG offers the least.

Cationising agents used to generate cationic sites in the cotton fabric are polyethyleneimine based and are branched, spherical polymeric amines. Due to their high charge density they get adsorbed tightly on negatively charged surfaces. When these cationising agents react with the cotton fabric some nitrogen is retained by the cotton, as indicated by its affinity for acid wool dyes. Acid dyes have very low substantivity to the cotton fibres. Acid dyeing of cationised cotton proves that acid dye can be retained by the cationised cotton by virtue of ion-ion interactions between the sulphonic acid groups in the dye molecules and the cationic sites present in the fibre.

Table 3.3 : Effect of treatment time on cationisation of cotton

Time (min)	K/S value of acid dyed cationised cotton			
	Lupasol P	Lupasol G100	Lupasol SK	Lupasol FG
	Conc. 4%	Conc.5%	Conc. 8%	Conc. 2%
20	0.813	0.756	0.512	0.398
30	0.889	0.802	0.598	0.413
40	0.861	0.792	0.587	0.401
50	0.841	0.781	0.556	0.382

Textsmile

A: Why are you late?
 B: There was a man who lost a hundred dollar bill.
 A: That's nice. Were you helping him look for it?
 B: No, I was standing on it.

3.4. Analysis by Fourier Transform Infrared Spectroscopy (FTIR)

Fig. 3.1 indicates the IR spectra of untreated cotton fabric, Fig. 3.2, Fig. 3.3, Fig. 3.4 and Fig. 3.5 represent the cotton fabric treated with Lupasol P, Lupasol G100, Lupasol SK and Lupasol FG respectively.

In case of cotton treated with cationising agent Lupasol P shown in Fig. 3.2, a sharp peak is observed in the region of 1473.51 cm⁻¹ is due to -C=N stretching frequency and this group is generated due to reaction between the primary amine present in the cationising agent and the acetal groups present in the cellulose. In case of the other cationising agents too when applied on cotton, sharp peak of -C=N was observed as shown in Fig. 3.3, 3.4 and 3.5. Actually peak due to -C=N group arises in the range of (1469 - 1489) cm⁻¹ and sharpness of the peak is due to the double bond present in it. So, FTIR analysis reveals the strong covalent bond formation between the primary amine of the cationising agent and the acetal of cellulose keeping the positive site of the cationising agent intact which is responsible for decreasing the zeta potential of treated cotton when subjected to reactive dyeing even in the absence of electrolyte.

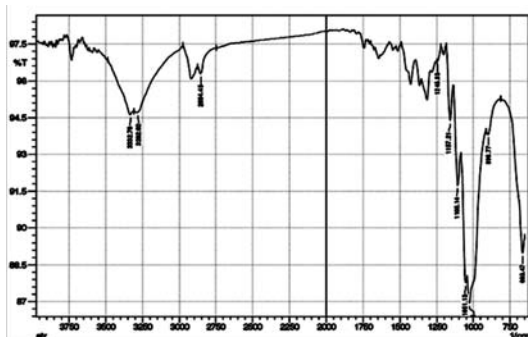


Figure 3.1: IR Spectra of untreated cotton

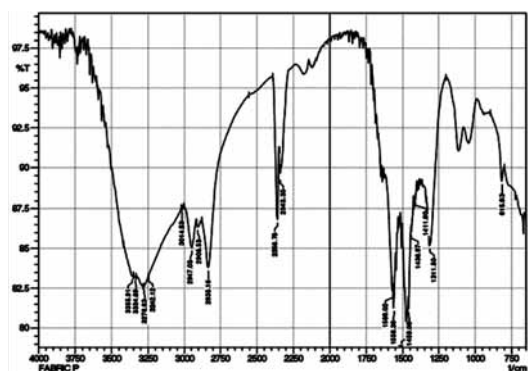


Figure 3.2: IR Spectra of treated cotton with LUPASOL P

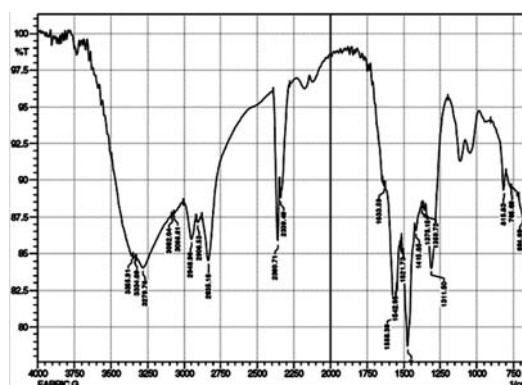


Figure 3.3: IR Spectra of treated cotton with LUPASOL G 100

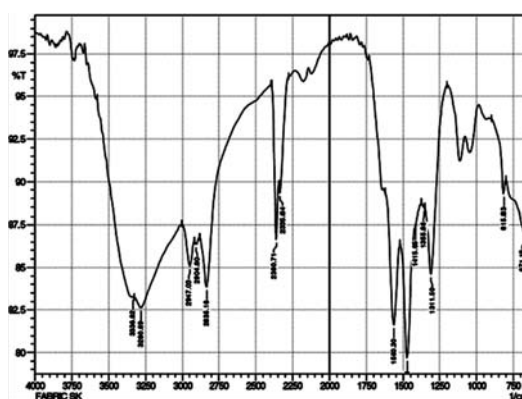


Figure 3.4: IR Spectra of treated cotton with LUPASOL SK

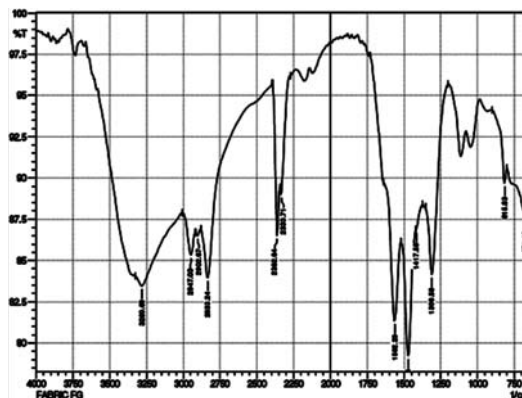


Figure 3.5: IR Spectra of treated cotton with LUPASOL FG

3.5. Electrokinetic behaviour of untreated and treated substrate

Electrokinetic behaviour of untreated cotton as well as cotton treated with LupasolG100 and Lupasol P was studied by measuring zeta potential in Electrokinetic analyzer. In case of the untreated cotton, zeta potential value decreases as pH changes from 3 to 5 and after

that it remains more or less constant as shown in Fig. 3.6. In both the cases zeta potential decreased as pH changed from acidic to alkaline however the zeta potential values remained positive. In aqueous media, the pH is one of the important factor that affects its zeta potential. If more alkali is added to the solution then particles tend to acquire more negative charge. If acid is added in this solution then a point will be reached when charge will be neutralized. Further addition of acid will cause a build-up of positive charge. Therefore a zeta potential versus pH curve will be positive at low pH and lower or negative at high pH. When we consider pH 3.2, it is clear from the Fig. 3.6 that, at the mentioned pH untreated cotton has zeta potential of -6.838 mill volts where as in case of Lupasol G100 and Lupasol P treated cotton the figure is 22.02 mV and 19.37 mV respectively. In case of untreated cotton, the surface charge is negative due to presence of hydroxyl groups.

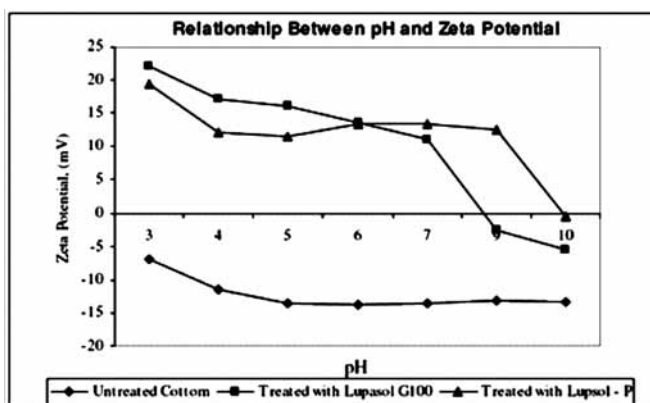


Figure 3.6: Potential of cotton and cationised cotton

Cotton treated with abovementioned cationising agents acquire positive charge on the surface and in this case

Table 3.4: Effect of cationising agent on whiteness index, MR%, tensile strength and bending length of cationised cotton

Samples	Whiteness index	MR %	Tensile strength				Bending length (cm)
			Warp		Weft		
			Strength (kgf)	Elongation (%)	Strength (kgf)	Elongation (%)	
Untreated	61.79	8.74	9.31	1.97	8.30	2.01	2.39
Lupasol G100	55.62	8.42	8.94	2.02	8.17	2.23	2.48
Lupasol P	55.18	8.39	8.91	2.13	8.13	2.29	2.51
Lupasol SK	57.19	8.37	8.96	2.27	8.20	2.29	2.44
Lupasol FG	57.52	8.40	8.99	2.09	8.21	2.07	2.47

double layer in the fabric interface is formed by the positive charge present in the cotton and adsorbed negative charge from the suspension medium. As a consequence, the concentration of H⁺ ion remains constant resulting in increase in potential difference between the material surface and liquid medium thus offering positive zeta potential.

If we consider neutral pH, similar result was observed. In this pH region, zeta potential value of untreated cotton is -13.52 mV where as in case of Lupasol G100 and Lupasol P treated cotton the value is 13.55 mV and 13.44 mV respectively. The high zeta potential values for those of treated cotton facilitates the rapid adsorption of reactive dyes in absence of electrolyte or in presence of little amount of electrolyte.

3.6. Effect of cationising agent on performance properties

Cationised cotton treated with various aforesaid cationising agents as well as untreated cotton fabric were tested for performance properties such as whiteness index, moisture regain, tensile strength (warp wise and weft wise) and bending length and results could be seen in the Table 3.4. It can be seen from the results that the whiteness index (CIE) decreased after treatment with the cationising agents due to the presence of nitrogen in the treated fabric. The decrease in whiteness index was slightly more for the Lupasol G100 and Lupasol P as compared to the other two cationising agents (Lupasol SK and Lupasol FG). For moisture regain it was found that the moisture regain of all the cationised samples treated with various cationising agents are slightly lower than the untreated one but the difference is not significant.

In case of tensile strength, the strength of all the cationised cotton samples was slightly lower than the untreated one in both the warp and weft direction whereas elongation % slightly increased in case of cationised cotton with respect to the untreated sample. Decrease in tensile strength in both warp and weft direction could be attributed to disruption of fibre orientation due to incorporation of bulky groups. It is clear from the results of bending length that, after cationisation, fabric becomes stiff but the stiffness is not significant in comparison to the untreated fabric.

3.7. Comparison between cationising processes

After pretreatment of the normal cotton fabric with various types of cationising agents mentioned above, an attempt was made to dye the treated material with various reactive dyes. Three different process sequences were tried to establish the commercially feasible process, which are discussed below:

3.7.1. One bath cationisation and reactive dyeing

In this method instead of using electrolyte which is responsible for decreasing zeta potential and facilitating adsorption of dye molecules into the fabric, only required amount of cationising agent is used in the dyebath along with the dye and dyeing was carried out in conventional manner, followed by after treatment. Unsatisfactory results were observed giving very low colour yield in the dyed material as compared to the conventional reactive dyeing for the equal shade percentage. This could be attributed for the complex formation between the cationising agent and the dye molecule itself in the bath. Cationising agents are positively charged materials, which will bind with the negatively charged dye anions through electrostatic attraction thereby forming complex which is difficult to adsorb and further diffuse into the fabric offering very low colour yield.

3.7.2. Cationisation followed by reactive dyeing

In this case cationisation of normal cotton fabric was carried out in exhaust process using the optimized recipe mentioned earlier and the fabric was taken directly for reactive dyeing. In this case dyeings were uneven. This is due to presence of excess loosely adhered cationising agent on the fabric surface responsible for uneven dyeing. This phenomenon proves that the washing-off treatment after cationisation is necessary to remove the superficial cationising agents so that even dyeing can take place.

3.7.3. Cationisation followed by washing and then reactive dyeing

This method seems to be most appropriate among all discussed earlier. In this case, cationisation was carried out with the optimized recipe in exhaust process. After the cationisation the fabric was washed to remove the superficial cationising agent with cold water to get even dyeing and the washed material was taken for reactive dyeing. In this case even dyeing took place due to even distribution of cationising agent and removal of loosely adhered cationising agent on the fabric surface. Moreover, adsorbed cationising agent was held with strong covalent bonding with the cellulose and could not be washed out. Reactive dyed cationised cotton offered satisfactory result in terms of colour yield as compared to normal cotton fabric dyed in the conventional way using very less amount of electrolyte though there exist problems in terms of colour difference which will be discussed later.

3.8. Effect of combined cationising agent and electrolyte on colour yield

The aim of the present study is to achieve the comparable dyeing in terms of colour strength on cationised cotton either in the absence of electrolyte or using very little amount of electrolyte with respect to conventional reactive dyed cotton. Conventional reactive dyeing and reactive dyeing of cationised cotton fabric was carried out in medium (1.0%) and dark (3.0%) depths with self shades of primary colours (Yellow, Red and Blue) as mentioned in the experimental methods. The comparison was done in terms of K/S value, colour strength (%) and colour difference (dE) value.

On dyeing with reactive yellow M4G by the various methods, the K/S and colour strength values were compared and are shown in Table 3.5. It is clear that the Lupasol P and Lupasol G100 treated cotton offers 84.34% and 80.57% colour strength respectively as compared to the conventionally reactive dyed cotton material which is taken as control sample having colour strength 100%. In case of Lupasol SK and Lupasol FG very low colour strength was obtained (60.26% and 56.48% respectively) as compared to the conventionally reactive dyed cotton material. Wide difference of colour strength among those cationising agents can be explained in terms of their individual charge density as mentioned earlier. Thus, cationising agents having higher charge density (e.g. Lupasol P and Lupasol G100) offered better result as compared to those cationising agents (e.g. Lupasol SK and Lupasol FG) having lower charge density.

It is obvious that cationisation of cotton fabric increases the substantivity of cotton for reactive dyes thus diminishing or eliminating the amount of electrolyte required and increasing the efficiency of dye-fibre reaction, which is further supported by the result of reactive dyeing of Lupasol P and Lupasol G100 treated cotton. During dyeing of cotton with reactive dyes, repulsion between the negatively charged cellulose and dye anions hinder the proper adsorption of dye molecules into the fabric. Addition of electrolyte decreases the zeta potential

Similar set of experiment was carried out with Reactive Red M5B and Reactive Blue MR from cold brand class of reactive dyes in absence of electrolyte in the dyebath. From the Table 3.6 - 3.7 it is clear that Lupasol P and Lupasol G100 treated cotton offer 85 - 88 and 82 - 87% colour strength as compared to the conventionally reactive dyed cotton. In case of Lupasol SK and Lupasol FG treated cotton, low colour strength (57 - 62% and 52 - 64% respectively) as compared to the Lupasol P and Lupasol G100 treated cotton fabric

Table 3.5 : Effect of cationising agent on K/S value and colour difference of reactive yellow M4G dyed cationised cotton

Parameters	K/S value	Colour Strength (%)	L*	a*	b*	dE
Standard	3.074	100.00	88.11	-3.17	65.64	
Lup G	2.477	80.57	89.66	2.00	61.15	7.02
Lup G+10gpl salt	3.112	101.25	85.92	1.96	65.12	5.60
Lup G+20gpl salt	3.186	103.64	85.76	1.82	66.28	5.55
Lup G+30gpl salt	3.421	111.26	85.61	1.93	67.14	5.87
Lup P	2.593	84.34	89.43	2.79	62.61	6.81
Lup P+10gpl salt	3.075	100.02	86.01	2.16	64.76	5.79
Lup P+20gpl salt	3.149	102.43	85.81	1.73	64.82	5.47
Lup P+30gpl salt	3.215	104.56	85.70	1.67	64.97	5.49
Lup SK	1.853	60.26	91.23	-1.06	58.21	8.33
Lup SK+10gpl salt	1.985	64.58	90.52	-0.94	59.41	7.04
Lup SK+20gpl salt	2.161	70.29	90.03	-0.81	59.87	6.52
Lup SK+30gpl salt	2.376	77.27	89.88	-0.59	60.12	6.34
Lup SK+40gpl salt	2.465	80.18	89.81	-0.49	60.94	5.67
Lup FG	1.736	56.48	91.97	-1.54	57.41	9.23
Lup FG+10gpl salt	1.897	61.71	90.86	-1.34	58.01	8.31
Lup FG+20gpl salt	2.119	68.92	90.57	-1.01	58.79	7.59
Lup FG+30gpl salt	2.310	75.13	89.94	-0.83	59.91	6.45
Lup FG+40gpl salt	2.436	79.25	89.71	-0.68	60.48	5.94

between the negatively charged cellulose and the anions thereby facilitate the dye adsorption to the material. Generally high amount of electrolyte is needed to reduce the zeta potential between the negatively charged cellulose and dye anions. Hence, creating cationic sites through application of cationising agent on the cotton helps to overcome the zeta potential between the cellulose and dye anions and thus eliminate the need of large amount of electrolyte in reactive dyeing.

was observed. It is clear from the above set of experiments that the cationising agents alone cannot provide the acceptable level of colour strength as compared to the normal reactive dyed cotton material.

Texttreasure

Never tell your problems to anyone...20% don't care and the other 80% are glad you have them.

- Lou Holtz

Table 3.6 : Effect of cationising agent on K/S value and colour difference of reactive red M5B dyed cationised cotton

Parameters	K/S value	Colour strength(%)	L*	a*	b*	dE
Standard	8.959	100.00	50.29	62.09	0.04	
Lup G	7.377	82.35	52.46	52.97	-6.93	11.68
Lup G+10gpl salt	9.082	101.38	44.38	55.23	-6.54	11.19
Lup G+20gpl salt	10.004	111.67	43.58	55.78	-5.97	10.99
Lup G+30gpl salt	10.194	113.79	43.12	56.13	-5.69	10.94
Lup P	7.702	85.97	52.03	52.51	-6.47	11.71
Lup P+10gpl salt	9.179	102.46	44.12	54.99	-5.60	10.96
Lup P+20gpl salt	9.618	107.36	43.69	55.72	-5.11	10.51
Lup P+30gpl salt	10.367	115.72	43.01	55.87	-5.02	10.83
Lup SK	5.140	57.37	54.17	49.12	-7.68	15.58
Lup SK+10gpl salt	5.596	62.46	54.01	50.69	-7.53	14.18
Lup SK+20gpl salt	6.192	69.12	53.24	52.68	-7.27	12.27
Lup SK+30gpl salt	6.777	75.65	52.91	53.15	-6.94	11.64
Lup SK+40gpl salt	6.942	77.49	52.57	54.12	-6.47	10.54
Lup FG	4.692	52.37	54.99	48.56	-8.33	16.58
Lup FG+10gpl salt	6.076	67.82	53.47	51.55	-7.24	13.19
Lup FG+20gpl salt	6.414	71.60	53.05	52.29	-7.04	12.40
Lup FG+30gpl salt	6.594	73.60	52.98	53.68	-6.67	11.09
Lup FG+40gpl salt	6.823	76.16	52.83	53.94	-6.58	10.80

Also it can be observed that when even 10gpl electrolyte is added in the dyeing bath where the fabric is pretreated with Lupasol P or Lupasol G, the depth in terms of relative strength obtained is better than the fabric dyed with conventional dyeing process using 60gpl electrolyte in case of all dyes. Hence, cationised cotton treated with Lupasol P and Lupasol G can be dyed

with cold brand reactive dye using 1/6 amount of electrolyte as compared to the normal dyed cotton. In case of Lupasol SK and Lupasol FG, due to their poor efficacy despite addition of substantial amount of electrolyte, satisfactory results were not obtained and thus these two cationising agents weren't taken for further study.

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Table 3.7 : Effect of cationising agent on K/S value and colour difference of reactive blue MR dyed cationised cotton

Parameters	K/S value	Colour strength(%)	L*	a*	b*	dE
Standard	2.786	100.00	56.45	-8.72	-30.60	
Lup G	2.421	87.77	56.64	-8.14	-26.30	4.34
Lup G+10gpl salt	2.944	105.67	54.51	-7.99	-27.12	4.05
Lup G+20gpl salt	3.073	110.29	54.02	-7.86	-27.81	3.79
Lup G+30gpl salt	3.267	117.25	53.12	-7.41	-28.36	4.22
Lup P	2.459	88.27	56.51	-8.67	-25.90	4.70
Lup P+10gpl salt	2.826	101.42	54.62	-8.18	-27.18	3.91
Lup P+20gpl salt	3.141	112.73	53.44	-8.29	-28.28	3.82
Lup P+30gpl salt	3.285	117.86	53.04	-7.83	-28.26	4.23
Lup SK	1.735	62.91	57.43	-7.79	-22.42	8.47
Lup SK+10gpl salt	1.916	69.49	57.03	-7.66	-23.42	7.28
Lup SK+20gpl salt	2.005	72.70	56.97	-7.31	-24.57	6.21
Lup SK+30gpl salt	2.089	75.75	56.89	-7.02	-24.99	5.88
Lup SK+40gpl salt	2.185	78.45	56.82	-6.81	-25.23	5.71
Lup FG	1.771	64.22	57.36	-8.01	-22.87	7.81
Lup FG+10gpl salt	1.860	67.41	57.15	-7.94	-23.01	7.66
Lup FG+20gpl salt	1.959	71.02	57.04	-7.85	-23.81	6.87
Lup FG+30gpl salt	2.057	74.56	56.93	-7.82	-24.19	6.49
Lup FG+40gpl salt	2.157	77.43	56.89	-7.71	-24.58	6.12

The above results also corroborate that cationisation did not take place with the all hydroxyl groups present in the cellulose. It is thought that the reactive dye anions not only rushes to the cationic sites of the fibre where the modification takes place, the presence of electrolyte reduces the electrostatic repulsion between the remaining dye anions and the unmodified centres in the fibre structure. The dual action of the cationising agents as well as the little amount of electrolyte present in the dyebath are together responsible for increase in K/S value and colour strength of cationised reactive dyed cotton as compared to the normal reactive dyed cotton material. The above results also confirm that cationising agents having higher charge density can increase substantivity of cotton for reactive dyes along with the little amount of electrolyte present in the dyebath.

In 3% shade depth, from the data tabulated in the Table 3.8 it is clear that to match the K/S value and

colour strength of the Lupasol G100 and Lupasol P treated cotton with that of normal dyed cotton, it requires 10gpl electrolyte in the dyebath. Similar result was found with Reactive Red M5B and Reactive Blue MR. It is also clear that cationisation alone cannot provide acceptable K/S value and colour strength, than that of normal dyed cotton fabric but dyeing can be carried out in presence of 1/7th amount of electrolyte than that of conventional process, which clearly shows the advantage from environment point of view.

Textsmile

A teenage girl had been talking on the phone for about half an hour, and then she hung up. "Wow!," said her father, "That was short. You usually talk for two hours. What happened?" "Wrong number," replied the girl.

Table 3.8 : Effect of cationising agent on K/S value and colour difference of 3% reactive dyed cationised cotton

Dye	Salt Concentration	K/S	Colour Strength (%)	L*	a*	b*	dE
Reactive Yellow M4G	Control	6.658	100.00	86.47	1.16	80.73	
	Lup G	5.460	82.00	88.54	6.15	76.23	7.03
	Lup G+10gpl salt	6.723	100.97	84.19	6.99	78.66	6.59
	Lup G+20gpl salt	6.757	101.49	84.01	7.13	79.26	6.62
	Lup G+30gpl salt	7.489	112.49	82.34	7.62	80.57	7.72
	Lup P	5.980	89.18	88.04	7.71	77.01	7.69
	Lup P+10gpl salt	6.820	102.43	83.87	8.01	78.41	7.68
	Lup P+20gpl salt	7.170	107.69	83.01	8.34	80.23	7.98
	Lup P+30gpl salt	7.717	115.89	82.20	8.87	81.86	8.88
Reactive Blue MR	Control	7.981	100.00	43.16	-6.35	-36.23	
	Lup G	6.458	80.92	44.28	-7.33	-31.72	4.74
	Lup G+10gpl salt	8.280	102.85	42.18	-7.01	-32.02	4.37
	Lup G+20gpl salt	8.413	105.41	41.96	-6.81	-32.21	4.22
	Lup G+30gpl salt	8.757	109.72	40.94	-6.02	-32.97	3.96
	Lup P	6.243	78.23	44.89	-7.32	-30.76	5.81
	Lup P+10gpl salt	8.257	103.46	42.01	-6.91	-31.02	5.36
	Lup P+20gpl salt	8.438	105.73	41.92	-6.82	-31.97	4.46
			8.844	110.82	40.83	-6.51	-32.57
Lup P+30gpl salt Reactive RED M5B	Control	16.263	100.00	44.21	63.60	7.30	
	Lup G	13.604	83.65	45.92	54.82	-1.92	12.84
	Lup G+10gpl salt	16.464	101.24	37.77	55.23	0.14	12.75
	Lup G+20gpl salt	16.980	104.41	36.52	56.12	0.98	12.45
	Lup G+30gpl salt	17.435	107.21	35.97	56.97	1.13	12.24
	Lup P	13.556	83.35	45.77	53.88	-1.98	13.52
	Lup P+10gpl salt	16.643	102.34	37.21	54.44	0.32	13.47
	Lup P+20gpl salt	16.803	103.32	36.98	54.75	1.01	13.04
	Lup P+30gpl salt	17.155	105.39	36.25	56.09	1.23	12.51

Thus, the reactive dyeing of cationised cotton in presence of little amount of electrolyte offers comparable results in terms of K/S value and colour strength to that of normal dyed cotton. The aforementioned result also suggests that successful dyeing could be done with all three primary colours and no uneven dyeing took place.

3.9. Effect of cationising agent on performance properties

Performance properties of reactive dyed normal cotton fabric, reactive dyed cationised cotton in absence of electrolyte and cationised cotton dyed with reactive dyes in presence of different electrolyte concentrations

were evaluated in terms of wash fastness, light fastness and rubbing fastness. Results are tabulated in the Table 3.10. From the tables it is clear that comparable results were observed among all dyed fabrics dyed using various techniques. Results from the table also indicate the results were comparable in terms of wash fastness of all three primary colours within a particular dye class irrespective of shade depth. In some cases it was found that only cationised reactive dyed cotton fabric shows 0.5 grade lesser wash fastness properties where as results are comparable between normal dyed cotton fabric and cationised cotton dyed with reactive dye in varying electrolyte concentration.

Table 3.9 : Effect of cationising agent on performance properties of 1% reactive dyed cationised cotton

Dye	Salt Concentration	Fastness					
		Wash			Rubbing		Light
		Fading	Staining		Dry	Wet	
			Cotton	Wool			
Reactive Yellow M4G	Control	4 - 5	4 - 5	4 - 5	4 - 5	3 - 4	5
	Lup G	4	4	4	4 - 5	3 - 4	4
	Lup G+10gpl salt	4 - 5	4 - 5	4 - 5	4 - 5	3 - 4	4
	Lup G+20gpl salt	4 - 5	4 - 5	4 - 5	4 - 5	3 - 4	4 - 5
	Lup G+30gpl salt	4 - 5	4 - 5	4 - 5	4 - 5	3 - 4	4 - 5
	Lup P	4	4	4	4 - 5	3 - 4	4
	Lup P+10gpl salt	4 - 5	4 - 5	4 - 5	4 - 5	3 - 4	4
	Lup P+20gpl salt	4 - 5	4 - 5	4 - 5	4 - 5	3 - 4	4
	Lup P+30gpl salt	4 - 5	4 - 5	4 - 5	4 - 5	3 - 4	4 - 5
Reactive Blue MR	Control	4	4	4 - 5	4 - 5	3 - 4	4 - 5
	Lup G	3 - 4	4	4 - 5	4 - 5	3	3
	Lup G+10gpl salt	4	4	4 - 5	4 - 5	3 - 4	3 - 4
	Lup G+20gpl salt	4	4	4 - 5	4 - 5	3 - 4	3 - 4
	Lup G+30gpl salt	4	4	4 - 5	4 - 5	3 - 4	3 - 4
	Lup P	3 - 4	4	4 - 5	4 - 5	3	3
	Lup P+10gpl salt	4	4	4 - 5	4 - 5	3 - 4	3 - 4
	Lup P+20gpl salt	4	4	4 - 5	4 - 5	3 - 4	3 - 4
	Lup P+30gpl salt	4	4	4 - 5	4 - 5	3 - 4	3 - 4
Reactive RED M5B	Control	4	4	4 - 5	4 - 5	3 - 4	4 - 5
	Lup G	3 - 4	4	4	4 - 5	3 - 4	3 - 4
	Lup G+10gpl salt	4	4	4 - 5	4 - 5	3 - 4	3 - 4
	Lup G+20gpl salt	4	4	4 - 5	4 - 5	3 - 4	4
	Lup G+30gpl salt	4	4	4 - 5	4 - 5	3 - 4	4
	Lup P	3 - 4	4	4	4 - 5	3 - 4	3 - 4
	Lup P+10gpl salt	4	4	4 - 5	4 - 5	3 - 4	3 - 4
	Lup P+20gpl salt	4	4	4 - 5	4 - 5	3 - 4	3 - 4
	Lup P+30gpl salt	4	4	4 - 5	4 - 5	3 - 4	4

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Table 3.10 : Effect of cationising agent on performance properties of 3% reactive dyed cationised cotton

Dye	Salt Concentration	Fastness					
		Wash			Rubbing		Light
		Fading	Staining		Dry	Wet	
			Cotton	Wool			
Reactive Yellow M4G	Control	4	4	4 - 5	4 - 5	3 - 4	5 - 6
	Lup G	4	4	4 - 5	4 - 5	3	4 - 5
	Lup G+10gpl salt	4	4	4 - 5	4 - 5	3 - 4	4 - 5
	Lup G+20gpl salt	4	4	4 - 5	4 - 5	3 - 4	5
	Lup G+30gpl salt	4	4	4 - 5	4 - 5	3 - 4	5
	Lup P	4	4	4 - 5	4 - 5	3	4 - 5
	Lup P+10gpl salt	4	4	4 - 5	4 - 5	3 - 4	4 - 5
	Lup P+20gpl salt	4	4	4 - 5	4 - 5	3 - 4	5
	Lup P+30gpl salt	4	4	4 - 5	4 - 5	3 - 4	5
Reactive RED M5B	Control	3 - 4	4	4	4 - 5	3 - 4	4 - 5
	Lup G	3	3 - 4	3 - 4	4 - 5	3	3 - 4
	Lup G+10gpl salt	3 - 4	4	4	4 - 5	3 - 4	3 - 4
	Lup G+20gpl salt	3 - 4	4	4	4 - 5	3 - 4	3 - 4
	Lup G+30gpl salt	3 - 4	4	4	4 - 5	3	3 - 4
	Lup P	3	4	4	4 - 5	3 - 4	3
	Lup P+10gpl salt	3 - 4	4	4	4 - 5	3 - 4	3 - 4
	Lup P+20gpl salt	3 - 4	4	4	4 - 5	3 - 4	3 - 4
	Lup P+30gpl salt	3 - 4	4	4	4 - 5	3 - 4	3 - 4
Reactive Blue MR	Control	3 - 4	4	4	4 - 5	4	4 - 5
	Lup G	3	3 - 4	4	4 - 5	3 - 4	3
	Lup G+10gpl salt	3	4	4	4 - 5	3 - 4	3
	Lup G+20gpl salt	3 - 4	4	4	4 - 5	3 - 4	3 - 4
	Lup G+30gpl salt	3 - 4	4	4	4 - 5	3 - 4	3 - 4
	Lup P	3	3 - 4	4	4 - 5	3 - 4	3
	Lup P+10gpl salt	3 - 4	4	4	4 - 5	3 - 4	3
	Lup P+20gpl salt	3 - 4	4	4	4 - 5	3 - 4	3 - 4
	Lup P+30gpl salt	3 - 4	4	4	4 - 5	3 - 4	3 - 4

As far as rubbing fastness is concerned, performance of the materials under study in terms of dry as well as wet rubbing fastness showed almost comparable results. Lightfast of only cationised cotton and cationised cotton reactive dyed with varying electrolyte concentration showed decrease in light fastness as compared to the normal dyed cotton fabric. At an average, light

fastness reduction of 1-2 grade is noticed which may be due to presence nitrogen content in the cationic groups in the modified cotton. However it is not still clear that how the presence of cationic groups affects the light fastness since there are several factors involved in the photo fading mechanism of colourants. It may be possible that cationic groups present in the

cellulose acts as a photocatalyst, leading to the acceleration of chromophore decomposition under exposure to light, thereby reducing the light fastness of modified fibre.

4. Conclusion

An attempt is made to cationise cotton to improve the substantivity of reactive dyes to reduce the salt requirement as exhausting agent. Polyethyleneimine based cationising agents were optimised with respect to their concentration, temperature and time of treatment to yield satisfactory cationisation. The cationisation has significant impact in reduction of zeta potential in reactive dyeing of cotton, though it is proved that cationisation doesn't alone provide comparable result in terms colour strength with respect to normal dyed cotton, addition of little amount of electrolyte shows satisfactory results and sometimes higher K/S value and colour strength than that of normal cotton. Wash and rubbing fastness properties were found to be comparable with that of untreated reactive dyed cotton. However, reduction in light fastness of the order of 1-2 was observed in case of cationised cotton.

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Concurrent Dyeing and Finishing of Silk Fabric Using Methylolated Reactive Dye

Arijit Chakraborty*, Shanti Kumari, Satyajit Brahma, Raja Mitra

Department of Textile Technology, Govt. College of Engineering and Textile Technology

&

Kunal Singha

Department of Textile Technology,
Panipat Institute of Engineering & Technology

Abstract

The efficacy of concurrent dyeing and finishing of silk fabric using methylolated reactive dye in presence of catalyst using pad-dry-cure technique were examined and compared with two step conventional (control) and simultaneously dyed and finished fabric using methylolated reactive dye and finishing agent. It is observed that silk fabric concurrently dyed and finished with methylolated reactive dye shows at par dye uptake, better dry crease recovery angle (DCRA), breaking strength, fastness to washing, light, rubbing and perspiration as compared to control and simultaneously dyed and finished samples. IR and NMR spectra of the original and modified dyes and IR spectra of the dyed fabric clearly confirms the structural changes taken place during methylation and also dyeing and easy care finishing through dye-fibre crosslink formation.

Keywords

Methylolated reactive dye, Concurrent dyeing and finishing, Dry crease recovery angle, Silk fabric, IR spectra, NMR.

1. Introduction

Silk is one of the most important natural fibres with merits of wearing comfort, handle, good air permeability and elegant appearance. However, silk fabric shows a disadvantage of creasing when in storage and wearing which affects its wearability. To solve this problem, anti-wrinkle finishing agents like trimethylol melamine, 1,2,3,4-butane tetracarboxylic acid (BTCA), epoxide EPSIB, glyoxal etc. are usually applied in after treatment. In general, dyeing and anti wrinkle finishing of fabrics are separate processes. It is experienced from two step process that there is abrupt strength loss of the fabric (28-32%) which later on has been minimized to the tune of 18-21% by introducing one step dyeing and finishing technique. But irrespective of process

(one or two step) still there is problem of strength loss with high flexural rigidity generally faced by the industry.

Various attempts [1-5] have been made on the simultaneous dyeing and easy-care finishing of cellulosic fabrics with a view of saving energy, time and manpower as well as minimizing water pollution. However, such study on blended fabrics like Polyester/Cotton blends are scanty and sporadic [6-7]. But a study of the literature over the past decade revealed no information dealing with concurrent dyeing and finishing of silk fabric.

Keeping these drawbacks in mind, it has been thought worthwhile to develop a technique by which the aforesaid problem can be minimized. The only way left behind is the incorporation of suitable functional groups within the dyestuff anatomy so that the same can act as a dyestuff as well as finishing agent by forming cross links with the polypeptide chains to improve the anti-wrinkle property of the dyed fabric.

* **All Correspondence should be addressed to,**

Arijit Chakraborty,
Department of Textile Technology,
Govt. College of Engineering & Textile Technology,
12 William Carey Road,
Serampore- 712201, Hooghly, West Bengal, India
E-mail : Profarijit@rediffmail.com

2. Materials and Methods

2.1 Fabric

Commercially degummed, scoured, bleached and unfinished silk fabric (1/1 plain, 62 ends/cm, warp 22^d reeled silk yarn, 54 picks/cm, weft 34^d reeled silk yarn, 60 g/m²) was used. The material was soaked in 1gpl Iodet T (non-ionic detergent) for 30 minutes at 80°C and dried.

2.2 Chemical reagents

Catalyst used were Magnesium chloride hexahydrate (MgCl₂.6H₂O), Ammonium chloride (NH₄Cl), Ammonium nitrate (NH₄NO₃), Ammonium dihydrogen phosphate (NH₄H₂PO₄), Urea nitrate (H₂N.CO.NH₂.HNO₃) and Catalyst DN (mixed metal alkoxide based catalyst prepared in the laboratory by treating 1,2- dibromobutane with magnesium in ether and then with excess acetone and water).

Finishing agent used was KRISOF NC kindly supplied by Britacel Silicones Ltd. Mumbai.

Softner used was Paranol CEPC (an aliphatic polyethoxylated derivative described as a non-ionic softner) kindly supplied by Metel Enterprises, Hyderabad.

2.3 Dyes

Reactive dyes used were: Procion Yellow R (CI Reactive Yellow 31), Procion Brill. Yellow H4G (CI Reactive Yellow 7), Procion Brill. Blue HGR (CI Reactive Blue 26) and Procion Brill. Orange H2R (CI Reactive Orange 84) kindly supplied by ATIC.

2.4 Two step conventional dyeing and finishing

Recipe: (a) Dye bath Recipe: (b) Finishing bath

	KRISOF NC - 50g/l
Reactive dye - 5g/l	Paranol CEPC - 10g/l
Sodium carbonate - 20g/l	
Urea - 50g/l	
Sodium alginate - 10g/l	
Material:Liquor - 1:30	
(based on fabric mass)	

The fabric samples were padded twice at 80% wet pick up using the above recipe (a) and dried at 80°C for 5 minutes. After drying, the fabric is steamed for 30 seconds at 135°C (for fixation of reactive dye on silk fibres). The samples were then resin finished by pad-

ding it with the recipe (b), dried at 80°C for 5 minutes and cured or thermofixed at 160°C for 45 seconds. Then the samples were washed with water and dried at ambient conditions.

2.5 Preparation of methylolated reactive dye

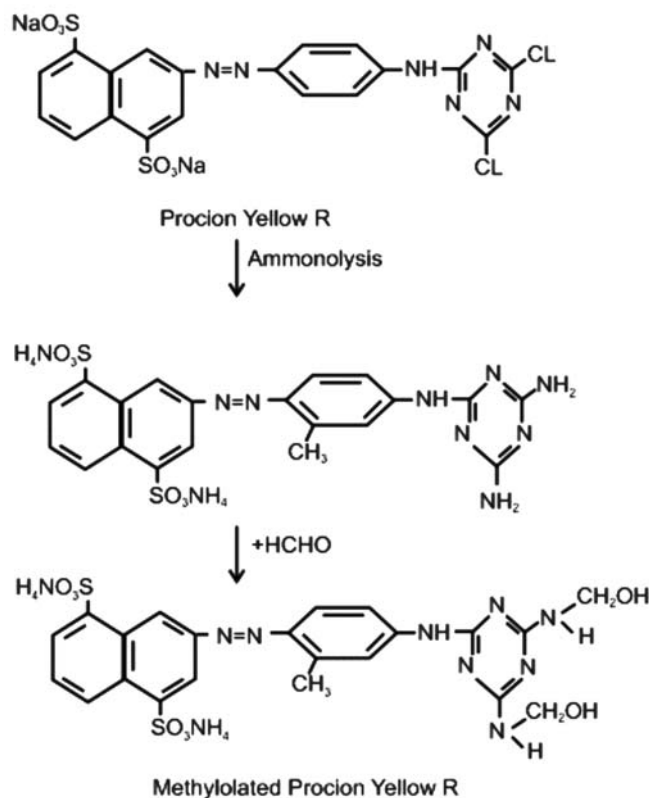


Figure 2.1 : Replacement of chlorine atoms of 2,4-dichloro- symmetrical- triazine of Procion Yellow R

The preparation of methylolated reactive dye involves two distinct steps. The first step is the conversion of chlorine atom present in the triazine ring into amino group by reacting it with aqueous ammonia solution using a specific catalyst to prevent the hydrolysis of reactive dye and to activate ammonia, 3-5 times stoichiometric ratio of ammonia was used. After ammonolysis pH was adjusted to 8.5. The second step entails the treatment with formaldehyde solution using specific catalyst to prevent the action of formaldehyde with chromophore group of the dye. The reaction is carried out in an alkaline media to effect methylation of the diaminotriazine derivative (Fig. 2.1). Then the dye was filtered in vacuum filter and the residual mass of the dye was dried in air and subjected to purification. Using methanol as a solvent, the dye mass was purified by extracting the pure dye from the mass by methanol in a soxlet apparatus by recycling the solvent number

of times in the flask fitted with soxhlet, keeping it on heating mantle. Finally, after extraction of the pure dye in the methanol solvent, methanol was distilled for further use and dried dye mass was obtained.

2.6 One step simultaneous dyeing and finishing

Recipe: (c) For simultaneous dyeing and finishing

Methylolated reactive dye	- 5 gpl
KRISOF NC	- 50 gpl
Catalyst	- X gpl
Paranol CEPC	- 10 gpl
Material:Liquor	- 1:30

Unless otherwise indicated, the combined dyeing and easy-care finishing process involved padding the fabric twice in a solution containing the above recipe. After drying at 80°C for 5 minutes, the fabric was flash cured at 160°C for 40 seconds, washed thoroughly, soaped, rinsed and finally dried.

2.7 Concurrent dyeing and finishing using methylolated reactive dye

Recipe: (d) For concurrent dyeing and finishing using methylolated reactive dye

Methylolated reactive dye	- 5 gpl
Catalyst	- X gpl
Paranol CEPC	- 10 gpl
Material:Liquor	- 1:30

The concurrent dyeing and easy-care finishing process involved padding the fabric twice in a solution containing the above recipe. After drying at 80°C for 5 minutes, the fabric was flash cured at 160°C for 40 seconds, washed thoroughly, soaped, rinsed and finally dried.

2.8 Testing

Surface colour strength [11] (K/S value indicating dye shade depth on surface) was determined by measuring corresponding reflectance value using Macbeth 2020 plus reflectance spectrophotometer and by calculating the K/S value using the following Kubelka-Munk equation [12].

$$K/S = \frac{(1-R_{\lambda, \max})^2}{2R_{\lambda, \max}} = \alpha C$$

Where C is the concentration of dye; α , a constant, and $R_{\lambda, \max}$, the reflectance of fabric sample at a particu-

lar wave length where maximum absorption occurs.

Dry crease recovery angles (DCRA) were measured using Shirley Crease Recovery tester as per standard method⁹ IS: 4681 (1968).

Dye uptake of the specimen was measured by "Beckman Series 30 UV Spectrophotometer" using the method described elsewhere [8].

Washing fastness of the dyed samples were measured using "Atlas Launderometer" as per ISO : 9002 recommendation and assessed as per the IS : 3361 (1979) and IS : 764 (1979)9 .

Light fastness of the dyed samples were measured using "Microsol Light Fastness Tester" with MBTF fading lamp and assessed as per the IS : 2454 (1967) [9].

Rubbing fastness of the dyed samples were measured using "Crockmeter" as per the IS : 766 (1956) and fastness to perspiration were also carried out as per the IS : 971 (1956) [9].

Tensile strength of the fabric samples in terms of breaking load and the force, required to break individual yarns along the initiation cut in the fabric (tear strength) were measured using a tensile strength tester (Model : INSTRON 3710- 016) as per the IS : 1969 (1968).

3. Results and Discussion

3.1 Nature and concentration of the catalyst

It is clear that the nature of the catalyst exerts a considerable influence on the colour strength, dry crease recovery as well as on the breaking and tearing strength of the concurrently dyed and finished silk fabric using methylolated reactive dye. Furthermore, for a given set of conditions, the comparison indicates that catalyst DN constitutes the best catalyst whereas $MgCl_2 \cdot 6H_2O$ represents the worst. Other catalysts lie in between. This may be attributed to the difference between catalysts in the rate of dissociation and/or decomposition, the initial pH of the dyeing cum finishing bath, and the ability to catalyse the reaction between the $-NHCH_2$ OH group of the dye and the substrate. Table 3.1 also gives a comparison of losses in fabric strength observed at equivalent levels of crease recovery improvement. It can be seen that at the highest of crease recovery improvement, losses in fabric strength are slightly lower in case of catalyst DN. The maximum strength loss in case of NH_4Cl may be due to more

acidic degradation by quick release of relatively more HCl at high curing temperature.

Table 3.1 : Effect of nature of different catalyst Methylolated Procion Yellow R (5 gpl), Catalyst (20 gpl), Nonionic softner (Paranol CEPC) (10 gpl), drying at 80°C for 5 minutes, flash curing at 160°C for 40 seconds.

Catalysts type	DCRA (W+F) (deg)	K/S	max (nm)	Breaking Strength (warp) (Kg)	Breaking strength loss (%) (warp)	Tearing Strength (warp) (g)	Tearing strength loss (%) (warp)
Blank	210	2.132	525	52.00	-	2378	-
MgCl ₂ .6H ₂ O	247	2.789	525	43.83	15.70	1965	17.35
NH ₄ Cl	271	5.260	525	42.35	18.55	1925	19.05
NH ₄ NO ₃	252	4.918	525	43.55	16.25	1941	18.36
NH ₄ H ₂ PO ₄	262	3.732	525	43.08	17.15	1973	17.05
H ₂ N.CO.NH ₂ .HNO ₃	260	5.283	525	42.84	17.62	1992	16.15
Catalyst DN	277	5.587	525	42.85	17.60	1995	16.12

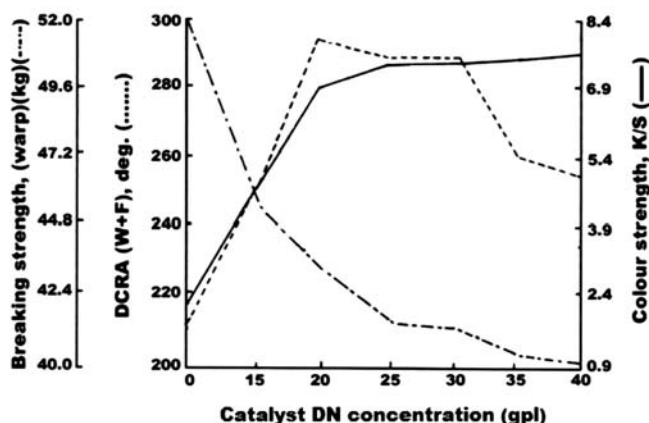


Figure 3.1: Effect of catalyst DN concentration on DCRA, K/S value and breaking strength of concurrently dyed cum finished silk fabric using methylolated Procion Yellow R

Fig. 3.1 shows the effect of catalyst DN when used at different concentrations from 0 to 40 g/l together with methylolated Procion Yellow R (5 gpl) and a non ionic softner (Paranol CEPC) (10 gpl) in the dyeing cum finishing bath on the colour strength, the dry crease recovery angle (DCRA) and the breaking strength of the concurrently dyed and finished fabrics. It is clear from Fig. 3.1 that, within the range examined, increasing the catalyst concentration upto (20 gpl) is accompanied by a significant enhancement in the dry crease

recovery as well as colour strength. This may be due to the fixation of methylolated dye through reaction mechanism in between -NHCH₂ OH group of the dye and the -OH and -NH₂ groups present in serine and lysine component of polypeptide chain of silk. On the other hand, further increase in concentration of catalyst DN i.e beyond 20 gpl, causes decrease in the dry

crease recovery angle with continuing increase in colour strength alongwith decrease in breaking strength continuously throughout the range. This may be due to higher acidic degradation and hydrolysis of the methylolated dye-cross link formed and the acidic hydrolysis of silk at higher concentration of catalyst¹⁰. At higher temperature of curing, use of higher catalyst concentration may cause some methylolated dye to crosslink with each other and remain on the surface of the fibres not allowing the dye molecules to enter inside the silk, resulting ultimately in slow increase in K/S value (surface colour strength). Moreover, higher the curing temperature even more than 160°C will cause inferior crease recovery improvement and more loss of breaking strength on silk and hence the optimum temperature is 160°C.

Textsmile

*A man walks into a shop and sees a cute little dog.
He asks the shopkeeper, "Does your dog bite?"
The shopkeeper says, "No, my dog does not bite."
The man tries to pet the dog and the dog bites him.
"Ouch," he says, "I thought you said your dog does not bite!"
The shopkeeper replies, "That is not my dog."*

3.2 Flash curing temperature

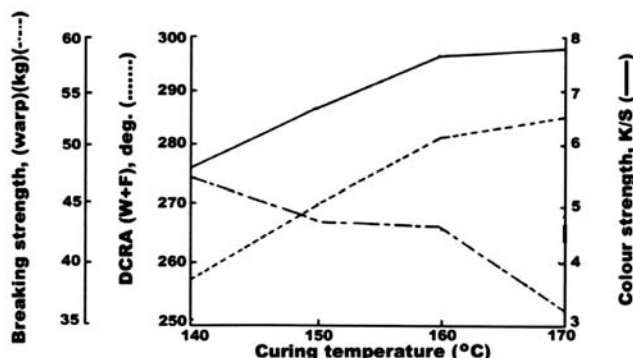


Figure 3.2 : Effect of catalyst DN concentration on DCRA, K/S value and breaking strength of concurrently dyed cum finished silk fabric using methylolated Procion Yellow R, curing time 40 seconds

Fig. 3.2 shows the effect of flash curing temperature on DCRA, K/S value and breaking strength of silk fabric treated with a dyeing cum cross linking formulation containing methylolated Procion Yellow R (5 gpl), catalyst DN (20 gpl) and Paranol CEPC (10 gpl). After drying at 80°C for 5 minutes, the fabric was cured for 40 seconds at temperatures upto 170°C, following flash cure method.

It is clear that, within the range examined, increasing the curing temperature upto 160°C is accompanied by a significant improvement in DCRA and K/S value. This is due to its favourable effect on (a) decomposition of catalyst DN (b) higher extent of crosslinking reaction of $-NHCH_2OH$ group of the dye with the reactive sites present in silk substrate as well as interaction with the dye molecules owing to extensive catalysis via efficient proton generation at high curing temperature and (c) enhancement of dye fixation directly to the

substrate [11-12]. The opposite holds true for tensile strength. The rate of deterioration of tensile strength is higher beyond 160°C. Extensive crosslinking brought about by increasing catalytic efficiency is associated with crosslinking embrittlement and molecular degradation on the fibres thereby decreasing the breaking strength [7] of the fabric, but the higher curing temperature increases K/S value due to higher thermofixation of dye on silk.

3.3 Flash curing time

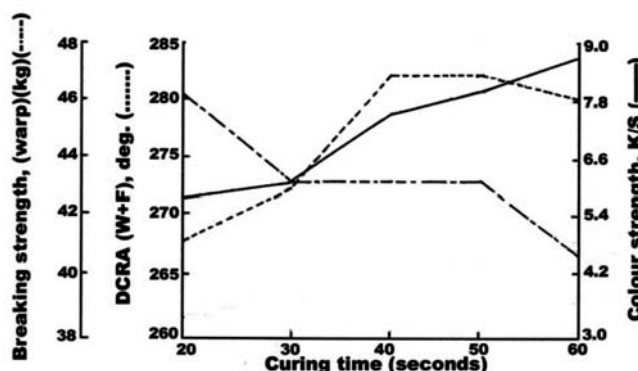


Figure 3.3 : Effect of curing time on DCRA, K/S value & breaking strength of concurrently dyed cum finished silk using methylolated procion R.

It is seen from Fig. 3.3 that, increasing the curing time from 20 to 60 seconds, K/S value increases with the decrease in breaking strength. But the rate of decrease in breaking strength increases beyond 50 seconds. In case of dry crease recovery, there is an improvement up to 40 seconds then it remains same and decreases. This may be due to increase in the frequency of the dye-fibre crosslinks owing to the breakage of existing salt linkages between silk polypeptide chain molecules in case of longer duration of curing at higher concentration of catalyst.

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3.4 Nature of the dye

Table 3.2 : Effect of dye nature on dye uptake, wrinkle recovery, breaking strength and fastness properties in concurrent dyeing and finishing using methylolated reactive dye Methylolated dye (5 gpl), Paranol CEPC (10 gpl), Catalyst DN (20 gpl), dried at 80°C for 5 minutes and cured at 160°C for 40 seconds. Figures in the brackets indicate the corresponding values of ^atwo step conventional dyeing and finishing and ^bsimultaneous dyeing and finishing using dyestuff and finishing agent (KRISOF NC), CC: Colour Change, CS : Cotton Stain.

Name of dye	Dye uptake (g/100g fabric)		DCRA (W+F) (deg)	Breaking strength (warp) (Kg)	Wash fastness	Light fastness	Rubbing fastness		Perspiration			
	Before soaping	After soaping					Dry	Wet	Acidic		Alkaline	
									CC	CS	CC	CS
Methylolated Procion Yellow R	0.697	0.657	290	43.95	4	5-6	4	3-4	3-4	3	3-4	3
	0.712 ^a	0.672 ^a	282 ^a	42.45 ^a	4 ^a	5 ^a	4 ^a	3-4 ^a	3 ^a	3 ^a	3 ^a	3 ^a
	0.765 ^b	0.681 ^b	282 ^b	42.04 ^b	3-4 ^b	5 ^b	4 ^b	3-4 ^b	3 ^b	3 ^b	3	2-3 ^b
Methylolated Procion Yellow H4G	0.607	0.507	295	42.17	3-4	4-5	4	3	3	3	2-3	3
	0.612 ^a	0.513 ^a	286 ^a	41.06 ^a	3-4 ^a	4-5 ^a	3-	3 ^a	3 ^a	3 ^a	2-	2 ^a
	0.636 ^b	0.519 ^b	288 ^b	39.76 ^b	4 ^b	5 ^b	4a	3 ^b	3 ^b	3 ^b	3 ^a	2-3 ^b
Methylolated Procion Brill. Blue HGR	0.609	0.502	291	42.46	3-4	5	3-	3-4	3	2-	3-4	3
	0.612a	0.514 ^a	284 ^a	42.09 ^a	4 ^a	5-6 ^a	4 ^a	3-4 ^a	3 ^a	3	3 ^a	3 ^a
	0.662b	0.587 ^b	286 ^b	40.13 ^b	3-4 ^b	5 ^b	3-	3 ^b	3 ^b	3 ^a	3-	3 ^b
Methylolated Procion Brill. Orange H2R	0.692	0.611	293	42.00	3-4	5-6	4	3-4	3-4	3	3	2
	0.697 ^a	0.621 ^a	279 ^a	42.05 ^a	3-4 ^a	5-6 ^a	4 ^a	3-	3 ^a	2-	3 ^a	2-
	0.722 ^b	0.662 ^b	273 ^b	39.78 ^b	3-4 ^b	5 ^b	3-	4 ^a	3 ^b	3 ^a	3 ^b	3 ^a
							4 ^b	3 ^b		3 ^b		3 ^b

The ability of Catalyst DN as an adequate catalyst for affecting concurrent dyeing and finishing of silk fabric using different methylolated reactive dyes is shown in Table 3.2. It is clear that for a given set of dyeing - finishing conditions, the dye uptake varies considerably. This variation in dye uptake could be attributed to; (a) the differences in reactivity between the various reactive groups in the reactive dyes which are reflected in the degree of fixation, (b) the mode of interaction of dye via its functional group to the reactive sites within the silk substrate [1-2,6,] (c) the differences in the sizes of the dye molecules, or (d) the hydrolysis of the dye reactive groups under a given set of conditions [1.] The highest dye uptake as well as washing and perspiration fastness properties could be achieved with methylolated Procion Yellow R. On the other hand, nature of the dye has practically no effect on dry crease

recovery. The poor light fastness may be due to structure of the dyes used which is also responsible for some photodegradation [3.] Except dry crease recovery there is no significant difference between concurrent dyeing and finishing using methylolated reactive dye, two step (control) and simultaneous dyeing and finishing using methylolated reactive dye and finishing agent. The considerable improvement in dry crease recovery in case of concurrent dyeing and finishing using methylolated reactive dye may be due to better fixation of dye through -NHCH₂ OH group inside the fibre structure but the higher curing temperature increases K/S value due to higher thermofixation of dye inside the fibre morphology.

3.5 Analysis of IR spectra of dye

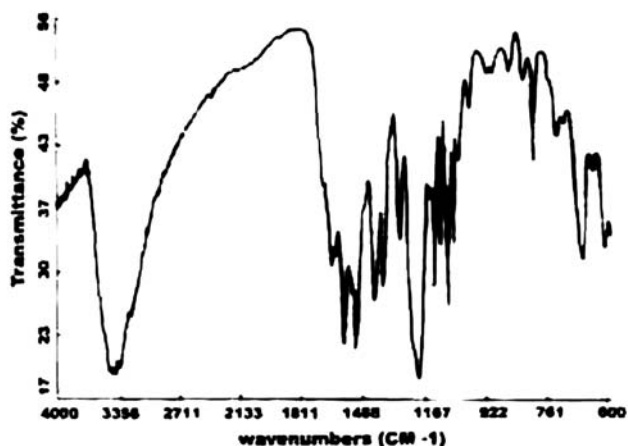


Figure 3.4 : Infrared spectrum of Procion Yellow R

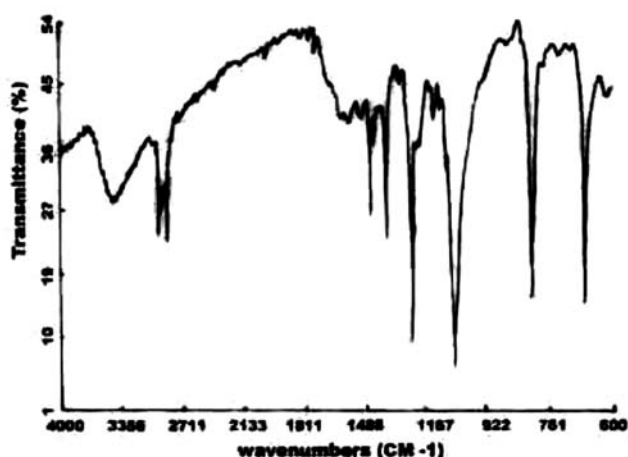


Figure 3.5 : Infrared spectrum of methylolated Procion Yellow R

It is evident from Figs. 3.4 and 3.5 that IR spectra of modified dye is entirely different from the original one. Both the $-Cl^s$ have been replaced because these peaks are prominent in the $680 - 850 \text{ cm}^{-1}$ region. The spectra of methylolated Procion Yellow R have two or more intense bands in the region $2775 - 3000 \text{ cm}^{-1}$. The first band is in the range $2850 - 2900 \text{ cm}^{-1}$ and is termed as imide I band (methylolated nitrogen atom of o-hydroxy imino methyl group of s-triazinyl ring) and the second band that lies within the range $2775 - 2800 \text{ cm}^{-1}$ is termed as imide II band (methylolated nitrogen atom of p-hydroxy imino methyl group of s-triazinyl ring). The imide I and imide II band could arise from $>N-H$ stretching or $\text{>C-N}<$ deformation.

However, in the molecule of methylolated dye there are so many electronic arrangements that the existence

of pure vibrations is unlikely and all the bands will be derived from multiple sources. However, it can be stated that both the imide bonds have considerable contributions from $\text{>C-N}<$. The imide bands are stronger and the intensity of the bands varying considerable with the degree of methylation of the sample. A medium intensity band in the range $1375 - 1400 \text{ cm}^{-1}$, possibly due to an $-O-H$ deformation variation, is the only other band of diagnostic value in the spectra of methylolated Procion Yellow R. For better understanding the NMR study of the original and modified dye-stuffs were carried out (Fig. 3.6). The spectrum of Procion Yellow R shows that the signal for Ar-CH_3 appears at 1.6 ppm, the signal for phenolic $-\text{SO}_3\text{NH}_4$ appears at 7 ppm, triazine ring appears at 3.6 ppm. But these signals become stretched in case of methylolated Procion Yellow R due to the introduction of N-methylol group within the triazine ring. As a result, the signal for Ar-CH_3 after methylation appears at 1.8 ppm, peak for phenolic $-\text{SO}_3\text{NH}_4$ has been reduced down and the signal appears at 6.9 ppm, a sharp peak for triazine ring appears at 4.1 ppm with adjacent sharp peak for $-\text{NHCH}_2\text{OH}$ at 3.6 ppm. The total study reveals that Procion Yellow R has been successfully methylolated and the structure shown in the Fig. 3.5 is thus confirmed.

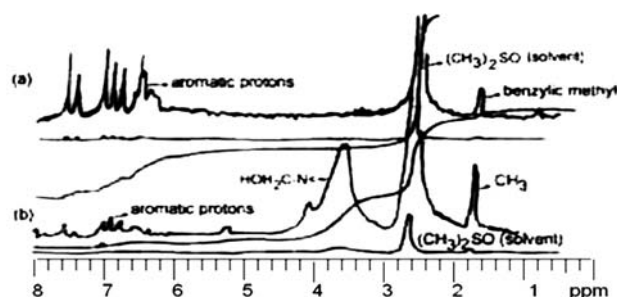


Figure 3.6 : NMR spectrum of (a) Procion Yellow R and (b) methylolated Procion Yellow R

3.6 Mechanism of fixation of methylolated reactive dye through IR spectroscopy

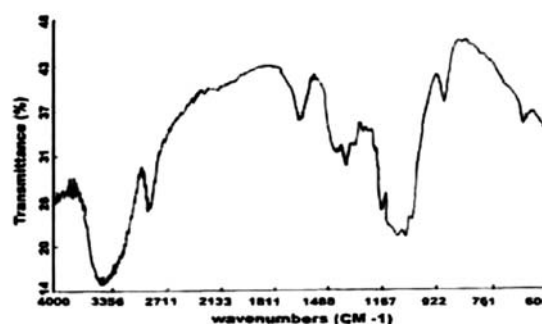


Figure 3.7 : Infrared spectrum of silk fabric

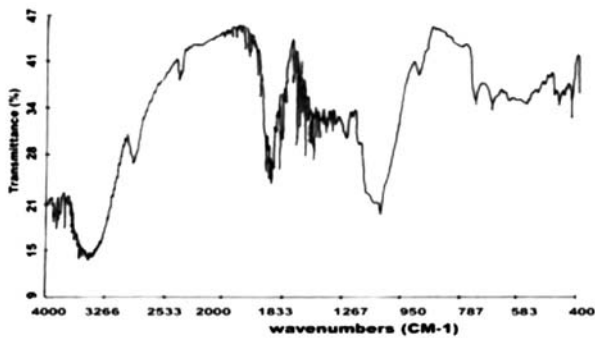


Figure 3.8 : Infrared spectrum of silk fabric dyed cum finished with methylolated Procion Yellow R and dried at 80°C for 5 minutes

Fig. 3.7 represents the absorption bands of silk fabric. The bands at 3049 and 920 cm^{-1} appears for $-\text{NH}-$ and $-\text{CO}-$ groups of polypeptide chains and bands at 1650 and 1405 cm^{-1} are due to the presence of serine-OH and lysine- NH_2 . When silk fabric is dyed cum finished with methylolated Procion Yellow R and dried at 80°C for 5 minutes, two strong bands appears at 1875 and 1056 cm^{-1} (Fig. 3.8), possibly due to $-\text{OH}$ and $-\text{NH}_2$ deformation and formation of crosslinks between serine-OH and $-\text{NHCH}_2\text{OH}$ of dye and lysine- NH_2 and $-\text{NHCH}_2\text{OH}$ of dye which become stronger and stretched at 1875 and 1056 cm^{-1} (Fig. 3.9) when dyed silk fabric is cured at 160°C for 40 seconds. The change of peaks in these regions has been observed throughout the IR study which clearly indicates the formation of bonds between the dye and the substrate¹⁸ (Figs. 3.10 and 3.11).

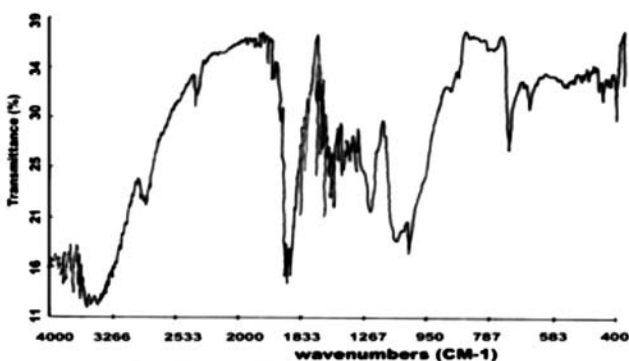


Figure 3.9 : Infrared spectrum of silk fabric dyed cum finished with methylolated Procion yellow R and cured at 160°C for 40 seconds

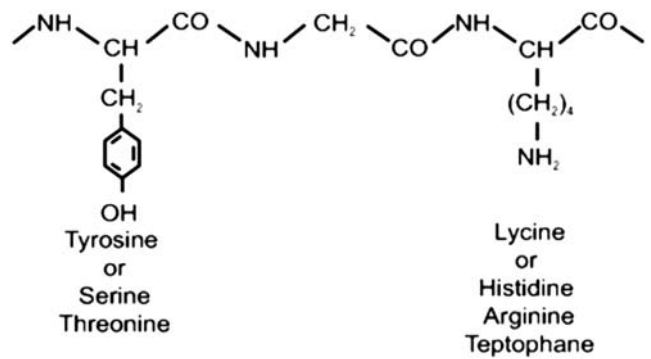


Figure 3.10 : Polar groups in silk capable of combining with methylolated reactive dye

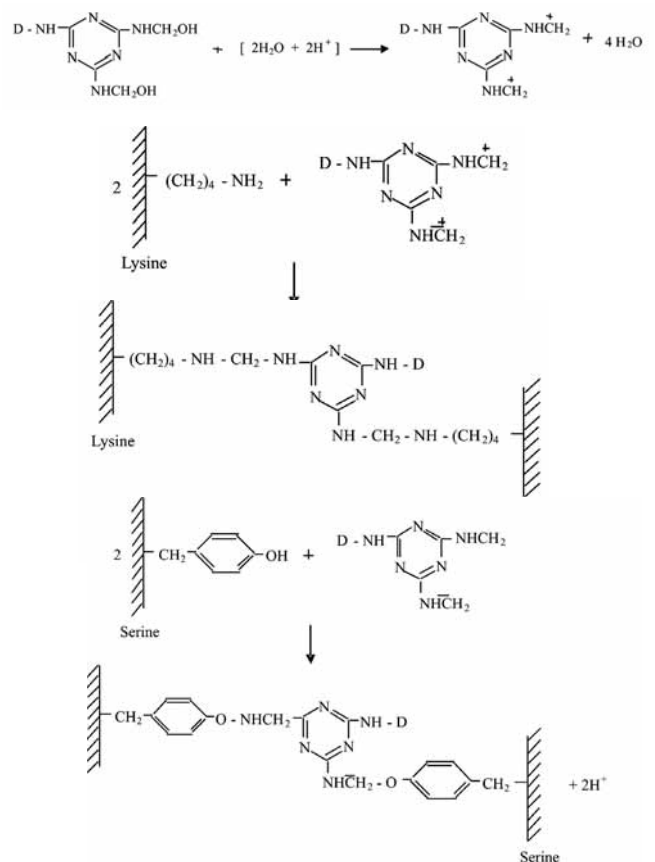


Figure 3.11 : Possible dyeing and cross-linking mechanism between methylolated reactive dye and silk

4. Conclusion

The combination of laboratory prepared mixed metal alkoxide based catalyst (Catalyst DN) and methylolated reactive dye is proved to be an efficient system for imparting concurrent dye fixation cum finishing to get easy-care properties to silk fabric using pad – dry – cure method. Among the different methylolated dyes used, the methylolated Procion Yellow R gives better dye uptake due to its low molecular size while,

Texttreasure

Advice is what we ask for when we already know the answer but wish we didn't.

- Erica Jong

methyloated Procion Brill. Yellow H4G shows comparatively low dye uptake due to their larger molecular size causing some steric hindrance. Concurrent dyeing and finishing using methyloated reactive dye and flash cure technique (160°C for 40 seconds) shows almost same or in some cases better results as compared to two step conventional (control) and simultaneously dyed and finished fabric using methyloated reactive dye and finishing agent. Hence, this process can be considered to have good potential for its application practically as an energy efficient process for concurrent dyeing and finishing of silk fabric.

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Development of Microbe Resistant Value Added Cotton/Silk Sarees

N. Muthu Kumar* & G. Thilagavathi

Dept of Textile Technology, PSG College of Technology

Abstract

In this study, microbe resistant value added finishing has been developed from methanolic extract of neem and triclosan for textile application. The methanolic extract of neem and triclosan has been applied to cotton and silk fabrics by two methods and comparison has been made. The testing of the antimicrobial activity of finished fabrics was carried out by means of the Agar diffusion test. The tensile strength of the treated and untreated fabrics was evaluated by using Instron tensile tester. The colour fastness to perspiration of the treated and untreated fabrics was evaluated as per IS: 971-1956 standards and the colour fastness to light of the treated and untreated fabrics were evaluated as per AATCC 16-1998 standards. The absorbency of treated and untreated fabrics was evaluated by water drop method. The finishing using triclosan has given better antimicrobial activity than neem for both the fabrics. The colour fastness studies showed that there is no significant changes in perspiration fastness of the fabrics due to triclosan and neem extract treatment and the silk fabrics treated with triclosan have improvement in the light fastness compared to control fabrics. The water absorbency studies showed, the neem finishing does not alter the absorbency of the cotton and silk fabrics and triclosan finishing improves the absorbency of the both fabrics.

Keywords

Absorbency, Microbe resistant, Methanoloic extract, Neem, Triclosan.

1. Introduction

Recent market survey has quite convincingly shown that the apparel consumers all over the world are demanding functionality in the product. Some of the best examples of functionality are product attributes such as wrinkle resistance, soil release, water repellency, flame retardancy, fade resistance and resistance to microbial invasion. Among these, the antimicrobial property of fabric is being considered to be an important and inevitable parameter for garments which are in direct contact with human body. There are many natural / herbal products which show anti microbial properties. A few studies have reported extracts from different parts of diverse species of plants like root, flower, leaves, seeds etc. exhibit antibacterial properties [1-5]. G.Thilagavathi et al reported the antimicrobial character of methanolic

extract of neem leaves and prickly chaff leaves and standardized the method of application. Even though, many of the herbal extracts have shown good anti bacterial property, their wash durability is poor [1, 3-4].

Triclosan, a chlorinated bis-phenol, is a synthetic, non-ionic, broad -spectrum antimicrobial agent, possessing mostly antimicrobial along with some anti fungal and anti viral perties. Mehmet orhan et.al studied the antibacterial activity of triclosan on cotton fabrics and effectiveness of both the environmental conditions and repeated laundering on the antibacterial activity of triclosan for medical applications [6 &7]. G.Thilagavathi et al (2010) showed triclosan treated 100% cotton gauze has higher antimicrobial activity against *S.aureus* than *E.coli* [8].

The present investigation aims at developing a microbe resistant finishing treatment for silk sarees and enhancing the life of these products by protecting from the action of micro organisms.

* **All correspondence should be addressed to;**

N. Muthu Kumar
Dept of Textile Technology, PSG College of Technology,
Coimbatore-641 004, TN, India
E-mail : n.muthurajan78@gmail.com

2. Materials and Methods

2.1 Materials

Bleached 100 % cotton fabric and 100 % silk fabrics from Silk weavers Society, Coimbatore were used for the application of finish. Triclosan and Methanol from Resil chemicals, Coimbatore were used.

2.2 Methods

2.2.1. Neem extracts application procedure

The neem leaves were dried under sun shade to reduce the moisture content in the range of 10-11 %. The dried neem leaves were crushed in to small pieces and extracted in methanol for 18 hrs in a soxhlet extractor. The methanolic extracts of active substance were diluted with water(L) to M: 1:20. The extracts were applied on fabric at 10 % concentration by pad-dry-cure method. Curing of the fabric was done at 80°C for 15 minutes. 10% neem extract was added in the dye bath during dyeing for imparting anti microbial property during dyeing.

2.2.2. Procedure for finishing using triclosan

To acquire the antimicrobial activity, triclosan (6% owf) was applied to the cotton and silk fabrics using M: L = 1:10 and 6-7 PH by the conventional exhaust method. The finishing bath was heated at 40-50° C and kept for 30 min. The fabric was then taken out, squeezed and dried. For imparting anti microbial property during dyeing 6% owf of triclosan was added in the dye bath.

2.2.3. Characterization of treated fabric

The testing of the antimicrobial effectiveness of finished fabrics was carried out by means of the Agar diffusion test method according to Swiss standard (SN195920). The tensile strength, one of the important physical parameters, of the treated and untreated fabrics was evaluated by Instron tensile tester as per IS 1969-85 standards. The colour fastness to perspiration of the treated and untreated fabrics was evaluated as per IS: 971-1956 standards and the colour fastness to light of the treated and untreated fabrics were evaluated as per AATCC 16-1998 standards. The absorbency of treated and untreated fabrics was evaluated by water drop method as per AATCC 79-2000 standards.

3. Results and Discussion

3.1. Effect of antimicrobial finishes on anti-bacterial activity

Fig. 3.1- 3.4 shows Agar diffusion test results for all samples against *S.aureus* and *E.coli*. The Table 3.1 shows results of finishing using anti microbial agents. The triclosan treated cotton fabrics show a zone of

inhibition of 43 mm for *S.aureus* and 37 mm for *E.coli* and silk fabrics show a zone of inhibition of 41mm for *S.aureus* and 34 mm for *E.coli*. The antimicrobial property of the fabrics significantly improves after triclosan treatment and is found to be more effective against *S.aureus* than against *E.coli*.

Neem extract gives relatively lower activity against *S.aureus* compared to triclosan and no activity against *E.coli*. The finishing using neem extract shows a zone of inhibition of 23 mm for cotton fabric and 26 mm for silk fabric against *S.aureus*. The neem has higher activity on silk fabric than cotton material because the natural extracts have more affinity towards the protein fibres than cellulose fibres. Parthiban et al studied the antimicrobial efficacy of natural fungal extract on wool fabrics and confirmed that affinity of natural extracts towards protein structures by using UV-Visible spectrometer [9].

The Table 3.2 shows the results of the second method i.e. the anti microbial agents added during dyeing process. For the second method, the triclosan treated cotton fabrics show a zone of inhibition of 37 mm for *S.aureus* and 29 mm for *E.coli* and silk fabrics show a zone of inhibition of 33 mm for *S.aureus* and 30 mm for *E.coli*. The neem treated fabrics show no activity against both *S.aureus* and *E.coli*.

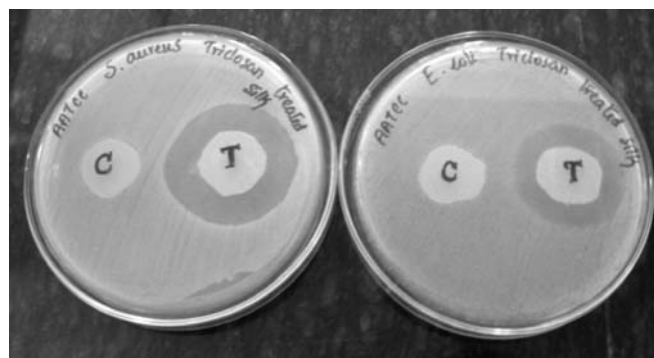


Figure 3.1: Triclosan treated silk

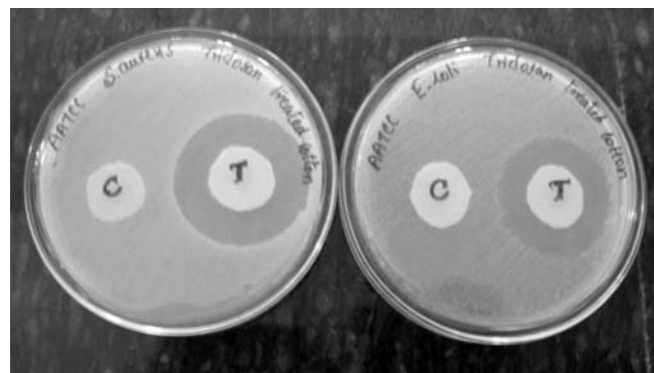


Figure 3.2 Triclosan treated cotton



Figure 3.3 Neem treated cotton

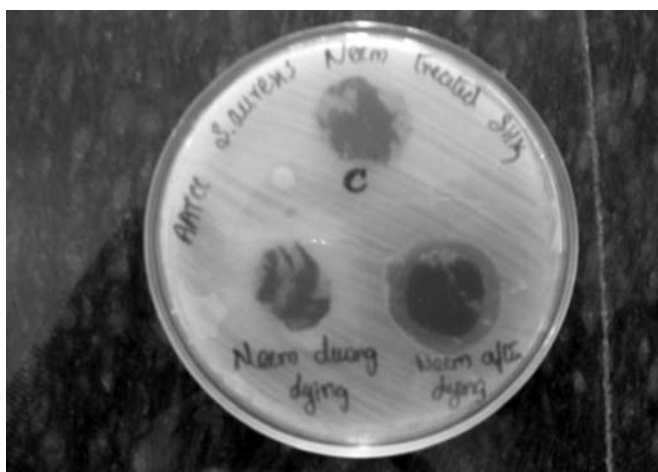


Figure 3.4 Neem treated silk

In both the methods, triclosan treated fabric samples exhibit better activity since triclosan has broad spectrum anti bacterial and antifungal activities (MIC's ranging from 0.1 mg/ml to 33 mg/ml) in bis-phenols group, which has hydroxyl -halogenated derivatives of two phenolic groups connected by various bridges and exhibits particular against Gram-positive bacteria [6]. The antimicrobial property of the fabrics significantly improves after triclosan treatment and imparting microbe resistance during dyeing is possible by using triclosan. Imparting microbe resistance during dyeing is not possible by using neem extract. The reason might be due to the influence of diffusion characteristic and depth of penetration of neem extract on to the fabric specimen [9].

3.2. Effect of anti microbial finishes on tensile properties

Joshi et al found out in their study that the neem extract treated fabrics have improved crease recovery property with marginal decrease in the tensile prop-

erty [10]. The Table 3.3 shows, the changes in tensile properties of neem and triclosan treated cotton and silk fabrics. The strength and elongation values indicate that there is no significant change in tensile properties due to antimicrobial finishing using neem. Fabrics treated with triclosan show improvement in tensile strength. This is due to chemical bonding of triclosan with fabric structure. The same result is also reported by Orhan et al and they showed that triclosan treated fabrics have marginal improvement in strength [7].

3.3. Effect of anti microbial finishes on water absorbency properties

Vaideki et al investigated the antimicrobial activity and hydrophilicity of RF oxygen plasma and neem extract treated cotton fabric and the cotton fabric treated with neem extract alone in their study. They showed that the improvement in moisture absorbency in RF oxygen plasma and neem extract treated cotton fabric due to formation of carbonyl group during surface modification and there is no change in moisture absorbency in control and cotton fabric treated with neem extract alone [11]. The Table 3.4 shows, water absorbency of fabrics treated with neem and triclosan. The absorbency values indicate that the water absorbency nature of fabric has not altered much due to neem finishing and fabrics treated with triclosan show improvement in water absorbency. For cotton fabrics the water absorbency time reduces from >5min to 2 min and for silk fabrics water absorbency time reduces from >5min to 5 sec due to triclosan finishing.

3.4. Effect of antimicrobial finishes on colour fastness properties

Table 3.5 shows, the results of the perspiration and light fastness of the control and treated cotton and silk fabrics. It is observed that there is no significant change in perspiration fastness of the both fabrics due to the neem and triclosan finishing. The results infer that substantivity characteristics of neem extract and triclosan influence the fabric properties [9].

Table 3.1 : Antimicrobial Test Results

S.No	Finished Samples		Zone of inhibition in mm	
			<i>S.aureus</i>	<i>E.coli</i>
1	Triclosan treated	Cotton	43	37
		silk	41	34
2	Neem treated	Cotton	23	-
		silk	26	-

Table 3.2 : Antimicrobial Test Results

S.No	Samples (Dyeing+ finishing)	Zone of inhibition in mm		
			<i>S.aureus</i>	<i>E.coli</i>
1	Triclosan treated	Cotton	37	29
		silk	33	30
2	Neem treated	Cotton	-	-
		silk	-	-

Table 3.3: Effect of Antimicrobial Finishes on Tensile Properties

S.No	Samples	Warp direction		Weft direction	
		Strength (Kg)	Elongation %	Strength (Kg)	Elongation %
1	Control Cotton	27.60	8.90	19.71	24.1
2	Neem treated Cotton	27.04	8.81	17.67	25.56
3	Triclosan treated Cotton	29.85	11.05	20.95	26.90
4	Control Silk	31.05	15.25	35.45	13.40
5	Neem treated silk	29.36	14.56	33.71	11.88
6	Triclosan treated silk	30.78	15.05	36.64	12.75

Table 3.4: Effect of Antimicrobial Finishes on Water Absorbency

S.No	Fabric	Control	Neem extract finishing	Triclosan finishing
1	Cotton	> 5min	> 5min	2 min
2	silk	> 5min	> 5min	5 sec

Table 3.5: Effect of Antimicrobial Finishes on colour fastness

S.No	Samples	Fastness properties	
		Perspiration	Light
1	Control Cotton	4	4-5
2	Neem treated Cotton	4	3-4
3	Triclosan treated Cotton	4	4
4	Control Silk	3-4	4
5	Neem treated silk	3-4	4
6	Triclosan treated silk	3-4	4-5

In case of light fastness, the finishing using neem extract does not change light fastness of silk and reduces the light fastness of cotton fabric from 4-5 to 3-4. The results infer that the surface adsorption characteristics of neem extract influence fabric properties, but the change in light fastness due to neem finishing is not significant [9]. The triclosan finishing does not affect the light fastness of the cotton fabrics and improves the light fastness of the silk fabrics. i.e. control fabric has the light fastness 4 and the triclosan treated fabric has the light fastness 4-5.

4. Conclusion

The neem extract and triclosan were applied directly on to the fabric by pad-dry-cure method. The triclosan treated cotton and silk fabrics show considerable zone of inhibition to both *S.aureus* and *E.coli*. The neem extract treated fabrics show considerable zone of inhibition to *S.aureus* only. Imparting microbe resistance during dyeing is possible by using triclosan and not possible by using neem. The colour fastness studies show, there are no significant changes in perspiration fastness of the cotton and silk fabrics due to neem and triclosan finishing and the triclosan finishing improves the light fastness of the silk fabrics. The water absorbency studies show, triclosan finishing improves the absorbency of both fabrics and the neem finishing does not alter the absorbency. Triclosan treated fabrics show improvement in tensile strength.

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Human Thermal Comfort and Role of Clothing in it

Sawant R.P.* & Mhetre S.B.

D.K.T.E.S. Textile & Engineering Institute

Abstract

Assuring the thermal stability of the human body is one of the most important functions of the clothing. Clothing acts as a barrier between the skin surface and surroundings. This barrier influences not only the heat exchange by convection and radiation, but also the heat exchange by the evaporation of excreted sweat. In this paper we have discussed the heat balance of human body, heat transfer through textile material and the factors affecting heat transfer through clothing.

Keywords

Heat balance, Thermal comfort, Heat transfer, Thermal properties.

1. Introduction

Human body is a complex system, in which the food and oxygen go through complex chemical reactions to produce the energy required for keeping its running. This process is commonly referred as metabolism. In fact, human is an inefficient metabolic machine. In which most of his energy intake in the form of fuel is transformed into heat. As a living man, which is known as homoexothermic, this metabolism is uninterrupted and the heat should get off the body at a certain rate so that the body core temperature could be maintained as a fairly constant temperature around 37°C for comfort. If the rate is too fast or too slow due to the environmental factors, the body temperature will be beyond this range and man will feel substantial discomfort. Therefore, the thermal comfort of human body is the balance between the body heat production and heat dissipation, if this balance is improper then human body feels discomfort, as a result human body needs some external agency to maintain this heat balance, and clothing is one of the most common devices to provide comfort in this regard.

The main purpose of textile fabrics is to maintain normal body temperature and to protect the body against varying external conditions [1]. Clothing comfort can be induced by thermal, pressure related and tactile prop-

erties, etc. Among these factors affecting clothing comfort, the thermal factor is the most decisive one affecting the comfort level [2].

The body's ability to adapt to heat and cold is crucial to the maintenance of life. If external factors become too extreme the body cannot balance the heat and death may result. The maintenance of a fairly steady body temperature even under a variety of external conditions, is important and can be controlled through proper clothing [3].

2. Heat Balance

Normally the body temperature is about 37°C. This value is achieved by balancing the amount of heat produced in the body with the amount lost. For heat loss from the body, several pathways are available as shown in Fig. 2.1. A minor role is taken by conduction. Only for people working in water, in special gas mixtures (prolonged deep-sea dives), handling cold products or in supine positions, does conductivity become a relevant factor. More important form of heat loss is convection. When air flows along the skin, it is usually cooler than the skin. Heat will therefore be transferred from the skin to the air around it. Also heat transfer through electro-magnetic radiation can be substantial. When there is difference between the body's surface temperature and the temperature of the surfaces in the environment, heat will be exchanged by radiation. Finally, the body possesses another avenue for heat loss, which is heat loss by evaporation. Due to the body's ability to sweat, moisture appearing on the skin

* **All correspondence should be addressed to;**

Sawant R.P.,
D.K.T.E.S. Textile & Engineering Institute,
Ichalkaranji-416115 (M.S), India
E-mail - ramsawant1987@gmail.com

can evaporate, with which large amount of heat is dissipated from the body. Apart from convective and evaporative heat loss from the skin, another type of heat loss also take place from the lungs by respiration, as inspired air is usually cooler and dryer than the lung's internal surface. By warming and moisturizing the inspired air, the body loses an amount of heat with the expired air, which can be up to 10% of the total heat production [4].

For body temperature to be stable, heat losses need to balance heat production. If they do not, the body heat content will change, causing body temperature to rise or fall [4]. This balance can be written as

$$M - W = C + C_k + R + E_{res} + E_{sk}$$

Where M is metabolic rate, i.e. internal energy production; W is external work; C is heat loss by

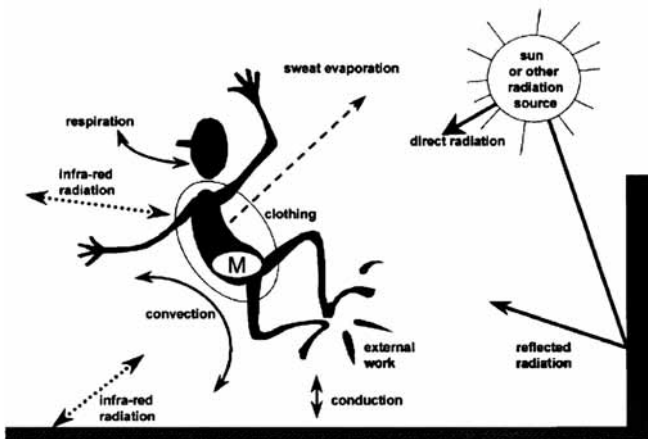


Figure 2.1: Pathways for heat loss from the body [4]

Convection; C_k is heat loss by conduction; R is heat loss by radiation; E_{res} is heat loss due to respiration and E_{sk} is heat loss by evaporation from the skin. The external work (W) in the equation is small.

3. Comfort Zone by ASHRAE

The thermal experience by an individual is depending on temperature and humidity: The higher the humidity the higher the experienced temperature. This effect is based upon the fact that at higher humidity the body's cooling system by transpiring water on the skin is reduced. ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers) in its publication on thermal environmental conditions for human occupancy have given a comfort zone for winter and summer season.

The standard recommends conditions that have been found experimentally to be acceptable to at least 80 percent of the occupants within a space [5]. The operative temperature range for building occupants in typical winter clothing is specified as 68° to 74° F (20° to 23.5°C). The preferred temperature range for occupants dressed in summer clothes is 74.3° to 79° F (23.5° to 26° C). See Fig. 3.1.

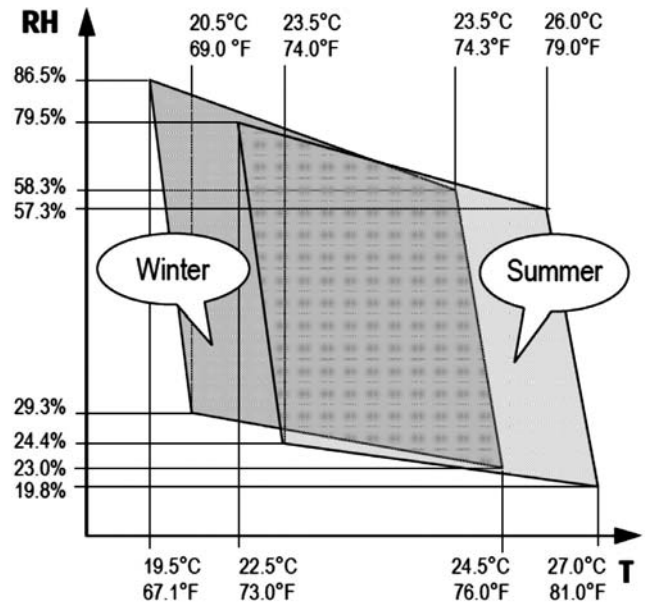


Figure 3.1: Comfort zone according to ASHRAE 55-1992 [5]

4. Heat Transfer through Textile Material

The transfer of dry heat through a textile material is a function of the thermal resistance of the materials. It is important to realize at the outset that the thermal resistance of the fibers contained in textiles has little or no effect on the heat barrier properties of garment or garment system. It is the enclosed air space which provides virtually all of the insulation, since air is particularly good insulator. Thus as long as the air cannot escape, any means of containing it will reduce heat loss. It is this matter of containment which gives textiles their excellent thermal insulation [6].

As discussed above there are five ways by which heat gets dissipated into the environment and the presence of clothing will affect the rate of heat exchange from body to environment. The rate of conduction of heat from our body slows down because of the presence of clothing. The nature of the clothing influences the rate of heat loss by conduction. The conduction heat loss is usually insignificant.

The transfer of heat from the human body to the environment through convection process [7] is expressed as

$$C = f_{cl} h_c (T_{cl} - T_a)$$

Where f_{cl} is clothing area factor (clo); h_c is coefficient of convection heat transfer (W/m^2K); T_{cl} is clothing surface temperature ($^{\circ}C$) and T_a is ambient air temperature ($^{\circ}C$). The rate of heat transfer through clothing by radiation depends on the mean temperature of surrounding environment, clothing surface temperature and characteristics of clothing. The heat transmission by radiation between the body and surrounding environment can be expressed by the following equation [7]

$$R = \epsilon_{cl} \cdot f_{cl} \cdot F_{vf} [(T_{cl} + 273.15)^4 + (T_r + 273.15)^4]$$

Where σ is the Stefan-Boltzmann constant, ϵ_{cl} is emissivity of the clothing and T_r is radiant temperature. The effective area of the body for radiation is consequently less than the total surface area, the effective area is determined with the view-factor between the body and surrounding surface (F_{vf}).

Das A. and Alagirusamy R. [7] in their book named "Science in Clothing Comfort" have explained the heat transfer through clothing when person walks through a windy environment. Normally human being wears two types of clothing, loose fit outer garment and tight fit inner garment. When a person walks through a windy environment the loose outer garment generally flaps, pumping out warm air and moisture vapor from the air gap between the tight-fitting inner garment and the loose-fitting outer garment and replacing it with cooler air from the surrounding environment, and at the same time wind may penetrate through the pores of outer garment to create dynamic heat and mass exchange. It can be clearly seen from Fig 4.1. That the entire dry heat generated by human body transmits initially through the tight fit inner garment and then divided into two components, i.e. heat flow without mass transmission and heat flow with mass transmission, while transmitting through the loose fit outer garment.

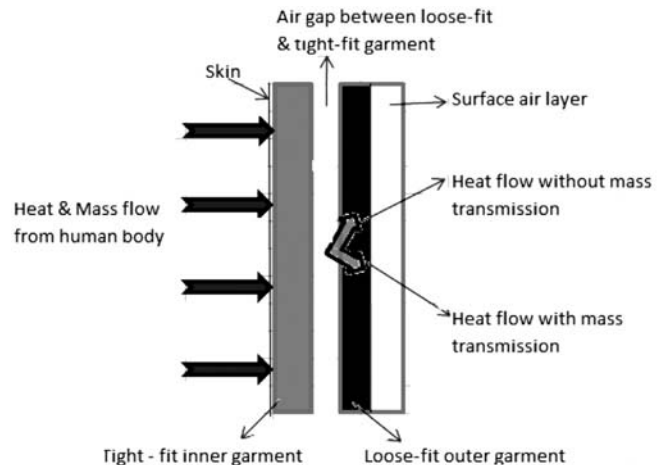


Figure 4.1: Heat and Mass transfer from human body through garments [7]

5. Thermal Properties of Textile Materials

A balance of heat loss from the body and heat generated by the body has to be maintained to keep the person comfortable. In the cold conditions the blood supply to the extremities is reduced and shivering occurs. In hot days or during high activity level, blood comes to the skin surface to reduce the body temperature. Clothing has a vital part to play in maintaining this heat balance as it modifies the heat loss from the skin surface and at the same time has the secondary effect of altering the moisture loss from the skin. The heat balance also varies with climatic conditions. It should be the main property of textiles to conserve the heat that body diverse away, and dissipate heat from body to surrounding when body generates it. Because of above two different actions, it is impossible to design a single clothing system which acts comfortable to body for all the seasons and reasons. A clothing system which is suitable for one climate may not be suitable for another climate. Good thermal insulation properties are required for clothing and textiles used specially in cold climates. In warm climate, or when the wearer performs hard work, it is important that the clothing transmits the moisture secreted by the body. Morris G.J. [1] did a good review on thermal properties of textile materials, from the survey of the literature covering twenty years on the thermal properties of textile materials, has divided the thermal properties from the available physical data into three sections: 1) The thermal insulation of textiles, i.e. the effectiveness of a fabric in maintaining the normal temperature of the human body under equilibrium conditions; 2) The cold feel of fabrics, i.e. that property which is assessed by the initial reaction of a person on touching

Texttreasure

Be more concerned with your character than your reputation, because your character is what you really are, while your reputation is merely what others think you are.

- John Wooden

a fabric: 3) Chillproofness of fabrics, i.e. the ability of a fabric to reduce the effect on the human body of sudden changes in atmospheric temperature and humidity.

Prof. Dr. L. Hes [8] explains the importance of thermal properties in wider perspective, as per Prof. Hes clothing belongs to important external factors, which influence human beings and their activity. Clothing should keep human in the state of psychological, sensorial and thermophysiological comfort.

6. Factors Affecting Heat and Mass Transfer through Fabric

The transmission of heat and moisture vapor through textile materials is one of the major concerns in the design of clothing. Following are some of the important parameters which affect the heat and moisture transmission characteristics of fabrics.

6.1 Fiber Type

Natural fibres absorb more moisture than synthetic fibres and moisture absorption is associated with increased comfort. However, many synthetics have wicking properties which move moisture to the outside where it can more easily evaporate.

6.2 Yarn Characteristics

Natural fibres are shorter and therefore rougher than the long smooth filaments associated with synthetic fibres. Smooth fibres are less apt to trap heat, making them feel cooler. Yarns produced by using different spinning technologies differ from one another in respect of their bulk, mechanical and surface properties. The properties of fabrics produced from these yarns are affected by such yarn properties as well as by their fabric construction parameters. Behera B.K., Ishtiaque S.M. and Chand S. [9] have studied the comfort properties of fabrics woven from ring, rotor and friction spun yarns. According to their study, the friction spun yarn fabric is most suitable from the standpoint of thermal comfort; rotor and ring spun yarn fabrics are comparable from the thermal comfort aspect, the rotor spun yarn fabric being slightly better.

In the studies conducted by Das et al. [10,11] the bulking treatment of ring spun cotton yarn reduces the thermal conductivity of fabrics as compared to 100% cotton fabric, which may be attributed to very bulky structure of the weft which works as an insulating medium. It entraps air in the loose fibrous assembly spaces and does not allow heat of inner layer to transmit to outer layer.

6.3 Fabric Thickness

Thickness appears to be the major determinant of insulation. For normal, permeable materials, clothing material thickness also determines the major part of the clothing vapour resistance. Many investigators have observed previously that there is a linear relationship between thermal insulation and fabric thickness.

6.4 Fabric Construction

Tightly woven fabrics with a high thread count are warmer because they are less permeable to air and thus prevent convective heat loss. Flexible fabrics allow more warm air to pass through, away from the body. Study conducted by Vivekananda M.V. et al. [12] shows that pick density has positive correlation with q-max value while cover factor and bulk density shows negative correlation with q-max. The fabric with lower pick density gives higher air permeability and heat transfer [13]. Study conducted by Barker R.L. and Lee Y.M.[14] shown that needled felt fabric constructions provide more protective insulation than comparable weft knit and woven fabrics.

6.5 Effect of Finishes

Waterproofing and water repellent finishes prevent heat loss. Light colours reflect more radiant heat than bare skin, potentially offering some protection.

6.6 Effect of Wind

In addition to being highly insulating, the thermal protection offered by clothing for cold conditions must not be degraded by wind. Wind affects heat loss in several ways: by penetrating the clothing and cooling the body; by reducing the thermal resistance of external air layers by pressing clothing layers together; by compressing insulating materials; and by causing the clothing to flap and thus promote air exchange between layers and with the environment. In arctic clothing, a tightly woven outer shell is used to prevent penetration by the wind, but compression can still cause increased heat loss from areas where insulation is provided by air layers between thin clothing layers.

7. Conclusion

Human thermal comfort depends on combinations of clothing, climate and physical activity. Therefore clothing plays an important role to protect the body against climatic influence and to assist its own thermal control functions under various combinations of environmental conditions and physical activities. The heat loss from the body and feeling of thermal comfort in a particular environment is affected by the clothing what human being wears.

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An Exploratory Study on the Techniques of Fashion Forecasting

D.Vijayalakshmi*

Department of Fashion Technology, PSG College of Technology
&

T.Ramachandran

Karpagam Institute of Technology

Abstract

The main objective of this exploratory study is to make the fashion students, blooming designers and merchandisers to explore on the various techniques of fashion forecasting and its importance in fashion business. Fashion forecasting is the prediction of trends for forthcoming years that paves way for the new directions in fashion. It involves the prediction of colour, fabric, texture, design details, trimmings, etc. Consumers are the main focus of any business; they will decide the future of success or failure of any venture. Hence this forces the manufacturers to produce products that are preferred by the consumers. This paper disseminates the various fashion and trade publications, trade shows being organised nationally and internationally and also various media that gives the source of information about the future fashion trends.

Keywords

Fashion forecasting, Merchandiser, Texture, Trimmings.

1. Introduction

Fashion is not constant; it changes periodically due to many reasons like season, consumer preferences, occasion and so on. Consumers must be quite in a mystified stage to understand, how each year the designers, manufacturers and retailers seems to know the preference of styles and colour among them and ultimately it becomes the fashion. The reality is that since 1970s there have been companies who specialise in fashion prediction and act as consultants to the people in fashion business. Many companies do the predictions, but though they are not identical there are many similarities between them [1].

Everyone involved in the fashion industry like fibre, yarn, fabric producers, chemical and wet processors, garment manufacturers and retailers should be acquainted with an enormous quantity of information in order to anticipate change and predict consumer preferences [2]. Originally fashion prediction material emerged to try and homogenise fashion markets, so that designers and manufacturers could provide fashion

able merchandise that would appeal broadly in the market place. The designer has the major role in interpreting trends for their customer [3].

2. Development of an apparel line

The apparel development usually consists of designers, product developers, pattern makers, production engineers etc. Inspiration of a design theme can be found everywhere either in the market, beach or skyscraper. Therefore the sources of inspiration are unlimited such as museums, cities, paintings, sculptures, films, photographs, books and internet [4]. A designer typically works with a merchandiser to plan the overall of an apparel line, the colour story, the fabrics, the cost, number of styles for each line. Line, group and collection are used to designate a combination of apparel items presented together to the buying public for a particular season [5].

2.1 Line

An apparel line consists of one large group or styles, developed based on a theme such as colour, fabric and design details to meet a function such as cricket, golf or tennis that links the items together. Example: NIKE develops a line for each of a variety of sports including men's cycling, men's running, men's tennis, and women's

***All correspondence should be addressed to,**

D.Vijayalakshmi,
Department of Fashion Technology,
PSG College of Technology, Coimbatore - 641 004, India
E-mail: viji0003@rediffmail.com

aerobics. A line is composed of co-ordinated items or styles such as shirts, pants, jackets, vests and sweaters that can be worn together in various combinations. These garments are moderately and popularly priced fashion. Each line is developed for a specific target consumer and could consist of as many as 50 or 60 apparel items.

2.2 Collection

Apparel presented in each fall and spring by the high fashion designers in Paris, Milan, New York, London. The designer collections include using range of apparel, including swimwear, suits, dresses, sportswear, evening wear, bridal wear..... it may include 100-150 apparel items. Collections are highly expensive. Example: Wedding collections of Ritu kumar.

2.3 Group

It might use 3 - 5 fabrics in varying combinations and include a dozen of apparel items, all carefully co-ordinated, collections / lines are divided into groups of garments. Six to eight groups in each line releases in each division. Each group has specific theme or concept.

2.4 Levels of fashion business

The three major levels of fashion business are primary level - the people who are involved in research, the raw material suppliers, fibre and yarn manufacturing. These folks should work 2 years ahead of the selling season. The secondary level - fabric manufacturers, textile designers, fashion designers, and garment manufacturers will fall under this level. These people usually start working 1 year ahead of the selling season and in the tertiary level - wholesalers and retailers are involved in the distribution and sales, they start their work before 6 months of the selling season [5]. There is one more level in the fashion business that coordinates with all the levels in fashion business it is the auxiliary level - fashion forecasters, distinction channels, advertising consultants, promotion and public relation agencies etc. Table 2.1 narrates the calendar and the activities to be performed by various people involved in fashion business [5].

Textsmile

Two atoms are walking down the street. Says one atom to the other, "Hey! I think I lost an electron!" The other says, "Are you sure??" "Yes, I'm positive!"

Table 2.1: Activities and schedule of Textile and apparel industry

S.No	Activities	Time*
1.	Development of new fibres	Several years
2.	Development of yarn and fabrics	1-2 years
3.	Colour prediction	1 - 1 ½ years
4.	Presentation of new fabric lines by fabric producers through exhibitions	1 year
5.	Shopping fabric lines (by designers/merchandisers)	8 months - 1 year
6.	Apparel design and line development	6 - 9 months
7.	Apparel collection openings, market weeks, showing lines to the retail buyers, taking order	4 - 6 months
8.	Production of garments	1 - 5 months
9.	Shipping to retail stores	1 week to 1 month
10.	Apparel for sale in retail store	0

* (before retail selling season)

2.5 Selling seasons

The selling period varies based on various factors like geographic and demographic factors. In western countries the selling period are depends on the climatic condition, festivals, holidays etc. But in India the season is mainly focused on festival (mainly diwali), wedding seasons. The design and merchandising department of each decision are responsible for creating a new line or collection each season that the manufacturer will sell to the retail stores.

The scratch work on a new line begins approximately 2 years before the selling season. In western countries most women's wear companies produce four or five seasonal lines in a year - spring, summer, transitional, fall and holiday/resort. Men's sportswear firms also have 4 line releases where as men's suits have just two. Children's wear companies have 3-4 depending upon the product focus. Few manufacturers do not follow traditional seasons instead they have their own catalogues. They plan their lines and market their products [5].

3. Fashion forecasting

The success of forecasting relies on analysing the trends and developing these for individual markets at the right

time and right place. Trends may be affected by social, cultural, political, and economic factors as well as evolutions in life style, technological developments, media and retailing. These informations will be obtained from fashion capitals such as London, Paris, Milan and New York. The importance of fashion forecasting is

- ◆ Designers, retailers or manufacturers want to produce or stock fashions that are preferred by their consumers.
- ◆ To gain profit in the business.
- ◆ To sell the goods in the planned selling season without any markdowns.

3.1 Steps in Fashion forecasting

- ◆ Studying market conditions - how does the external affairs like society, economics, physical, psychological and technology influences the consumer's buying behaviour.
- ◆ Lifestyle analysis - study and understanding the lifestyles of the men, women or children whoever is the target customer.
- ◆ Establishment of sales volume - by researching sales statistics.
- ◆ Evaluating high fashion - the popular designer collections to find fashions (colour, silhouettes, fabrications, lengths) that suggest new directions.
- ◆ Surveying fashion publications, catalogues & fashion services from around the world.
- ◆ Observing "street fashions" (what people are wearing) and keeping up with current events, the arts and the mood of the public.

3.2 Fashion Forecasting Technique

This is done by exploring and doing research in various areas. The Fig. 3.1 illustrates the various types of research to be carried out before we start up with a fashion project [6].



Figure 3.1 : Techniques of Fashion Forecasting

3.2.1. Market Research

Marketing research is defined as the "systematic and objective approach to the development and provision of information for the marketing management decision-making process". Consumer demand is the dynamic power in apparel industry. Hence, the industry expression "you can make it only if it sells" relates to the concept of the consumer-driven market. Thus, the success of any apparel or textile company depends on determining the needs and wants of the consumer. This market research includes:

3.2.1.1. Consumer Research

This research focuses on providing information about consumer attitudes and consumer behaviour. Apparel purchase designs are based on number of factors like psychological, social and economical considerations of which consumers are not consciously aware. Some of the techniques used to know the consumers are survey i.e., questioning consumers formally or informally, meetings organized between typical target consumers. Consumer reactions are compiled and tabulated to find preferences for certain garments or accessories, colours, sizes and so on or preferences for particular retailers. This information can be used to create new products to fit specific consumer tastes [6].

3.2.1.2 Product Research

This gives information about preferred product design and characteristics. This research helps us to analyse the acceptance of any new product being introduced in the market or any existing product is re-introduced with few modifications. Few techniques that could be adopted to understand the status of product among the target consumers are

- ◆ Survey: Conducting surveys orally to their regular consumers or Send a questionnaire
- ◆ Free trail: product can be offered free of cost in exchange of feedback of the product.
- ◆ Style testing techniques: It is possible to predict how apparel consumers will react to a style. This technique is used to find out what consumers would like to buy.
- ◆ Rating: Survey the subjects by asking them to rate preferences after seeing a garment, a photo or a swatch of a fabric in various patterns and colours.

3.2.1.3 Market Analysis

It provides information about general market trends. This analysis deals with long and short range analysis.

Long range forecasting: It includes researching economic trends related to consumer's spending patterns and the business climate; it also includes sociological, psychological, political and global trends. For example: Increase in interest rate, corporate tax, rise in cost of living expenses due to inflation. All of these trends can affect the company's plans and the consumer's future purchases, changes in International trade policies will affect long range forecasting. Political fluctuations among countries can affect sourcing options when planning offshore production.

Sort range forecasting: This planning includes components such as determining the desired percentage of increased sales growth for a company. For example: sales forecasting, study on competitors, predicting changes in retailing.

3.2.2. Fashion Research

This research focuses on the fashion that includes the silhouette, colour, fabric, texture, trimmings and accessories [6].

3.2.2.1 Trend Research

Trend research activities include reading or scanning appropriate trade publications, fashion or general magazines. Fashion trend research is focussed on general garment silhouette, more specific lengths (such as blouse lengths, skirt lengths, trouser length), widths (such as pant leg width, lapel and necktie width), and design detail trends (such as simple yoke, flat/shawl collars, circular ruffled collars).

Trade publications : The readers of Trade newspapers and magazines are the personnel or professionals in the apparel or fashion industries. It will not be available in the general stores; it has to be subscribed formally by filling up the subscription form to the prescribed publishers. These publications help the readers to know about the basic raw materials to the final report on retail sales. It announces the new technical developments, analysis of fashion trends, reports on current business conditions, trades shows and fashion shows and thereby it helps all who work in the fashion industry to update new products, techniques and markets. Few important names of trade publications and their categories are cited in Table 3.1.

Table 3.1 : Trade Publications

S.No	Name of the publication	Category
1.	Women's Wear Daily(WWD)	Women's wear
2.	California Apparel News	Apparel
3.	Earn Shaw's review	Home textiles
4.	Body fashions Intimate Apparel	Lingerie
5.	Footwear news	Footwear

Fashion magazines: Fashion magazines enclose substantial information about the latest trends in silhouettes, colour, fabric, accessories, brands etc.,. Designers and merchandisers follow the appropriate publications, depending on their target market. The magazines are easily available in speciality magazine stores. Costume/ Fashion Design students, fashion designers, apparel manufacturers, folks in fashion business, people those who are interested in fashion field are the readers of this magazine. Table 3.2 gives valuable information about the names of fashion magazines that publish recent trends in that particular category.

Table 3.2 : Fashion Magazines

S.No	Name of the magazines	Category
1.	Godey's Lady's Book, Vogue, Harper's bazaar, Mademoiselle, Glamor, Seventeen, Elle, W, details, Essence, Ebony, Modern Bride, Mode.	Women's wear
2.	Gentlemen's Quarterly (GQ), Esquire, Details, Just for Black men, playboy, outside.	Men's wear
3.	Shelter magazine, Elle Décor, Metropolitan life, Architectural Digest	Home textiles

Trade shows : Specialised trade shows are held in various locations. Designers and merchandisers may attend these trade shows for fashion trend information as well.

Fashion forecasting services : Some designers and retailers subscribe to fashion trend forecasting services that provides fashion trend reports. These reports help designers to analyse the upcoming fashion trends.

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Table 3.3 : Trade Shows and Forecasting Services

S.No	Particulars
Trade shows	
1.	India International Garment Fair in the month of January at Pragati Maidan, New Delhi, India
2.	MAGIC (Men's Apparel Guild In California) - held semi-annually in Los Vegas, US.
3.	Seventh on Sixth - an organisation that manages the fashion week shows that are staged in Bryant Park in NY City.
4.	B.T.A - Big & Tall Associates - above 5'11" or more than 48" chest
Fashion forecasting services	
1.	Pat Tunsky Inc
2.	The Colour Association of the United States
3.	The Colour Committee Trend Union
4.	WGSN - Worth Globe Style Network

Table 3.3 depicts the various tradeshows being organised in different parts of the world and also the agencies that offer services for fashion forecasting. WGSN (Worth Globe Style Network) is a giant organisation in fashion business that disseminates the fashion informations. WGSN is the world's leading online research, trend analysis and news service. Their main aim is to bring to the people every day about the critical, practical and influential global information you need to develop their fashion business [7]. Figure 3.2 portrays a page from WGSN website [7].



Figure 3.2 : Creative Directions (courtesy WGSN)

Observing the high fashion: The more important and interesting aspect of trend research involves viewing

the high fashion couture & ready to wear collections in Paris, Milan, London and New York. Designers and merchandisers in some apparel companies are deputed to view these twice-yearly collection. High-fashion collections are often filled with Avant Garde (new experimental) styles. The important fashion trends or inspiration can be extracted from the collections and can be modified for a moderately priced line suitable to their target consumers.

Street fashion: Some designers and merchandisers also study consumers "on the street". If their line is an active sportswear, they watch potential consumers on the ski slopes or at the beach for a resort wear.

Shopping the market: Designers and merchandisers look for new trends that may influence the direction of upcoming line. One aspect of shopping the market involves visiting retail stores that carry the company's line.

3.2.2.2 Colour Research

Colour research is focused on selection of the colour story for a specific line based on the concept board developed by the designers. Colour is an important criteria used by the consumers in the selection of textile products including apparel and home fashions. Therefore an understanding of colour preferences by customers is crucial to successfully market a particular textile product. Some colours tend to suit the personal colouring of Europeans or Asians or North Americans. Thus some colours are labelled as "European" colours. For example: an olive green is most frequently seen in European apparel lines than in North American lines. Apparel designers keep in mind the ethnic colouring of their target consumers as they look at colour trends. But in Indian market it is very difficult to forecast the colour due to huge variety living population and diversified cultural heritage.



Figure 3.3 : Forecast with pantone colours for spring/summer 2013 denim (Courtesy WGSN)

Through the process of colour forecasting, colour palettes are selected and translated into fabrics produced by a company for a specific fashion as shown in Fig. 3.3. Some colour forecasting services predict colour trends 18 months or 24 months in advance.

Resources for colour forecasting services based in the US include The Colour Association of the United States, and Pat Tunsky. A European colour trend service is International Colour Trend Authority, based in Amsterdam. Promostyle is based in Paris, with subsidiary offices in New York, London and Tokyo.



Figure 3.4 : Mood board and colours for spring/summer 2013 (Courtesy - The Ultra Bright)

This is a forecasting report released by The Ultra Bright (TUB) for spring / summer 2013 and this was released in the month of December 2011 in their website [8]. This mood and the colour will be of great inspiration for the designers to introduce novel products. The figure 3.4 explains the shades of forest that have been associated with nature.

3.2.2.3 Fabric and Trimming Research

The designer conducts fabric research for the new product development. For instance the trend towards the use of spandex blended with wool for professional apparel, or the use of micro-fibers for men's suits and raincoats, use of metallic threads in sarees, or chenille yarns used in suiting. Resources for this kind of fabric research include the same trade publications such as International Textiles. Many exhibitions or the tradeshows are being organised in various places as listed in Table 3.4 for more specific fabric trends. The fibre, yarn mills, fibre organizations and textile manufacturers are eager to notify the fashion designers with the latest fibres, fabrics and textures through the trade shows, publications.

Table 3.4 : Fabric trade shows

S.No	Name of the fabric shows	Category
1.	Premier vision - France's fabric manufacturers	Paris
2.	Italian fabrics are shown at Ideacomo	Milan
3.	British fabrics are shown at Fabrex	London
4.	Interstoff - German, Austrian and Swiss fabrics.	Frankfurt, Germany
5.	The British Woollen show	Textitalia

4. Illustration from Interstoff Asia Essential

Interstoff Asia Essential has released the trend forecast for the wardrobes of Spring/Summer of 2012 a year ahead [9]. A team of designers and forecasters have developed many fabrics and colour boards based on few themes. One such is illustrated below.

4.1 Concept

GLEE delight, happy, excitement (Make it fancy and express it!) An urge for strangeness drive through this theme by mixing all different cultures together and breaking the established rules by combining infinite amounts of prints.

4.2 Colours

Acidic and enliven by exotic touches. To express the theme all bright cheerful colours are picked in the palette.



Figure 4.1 : Colour palette for the concept GLEE (Courtesy - Interstoff Asia Essential)

4.3 Fabrics

Fancy yarn voiles, summer tweeds, crochets. All kinds of fancy weave techniques are used: big basket weaves, cut yarns, checks and stripes awakened by acid colours and coloured slubbed yarns. Here linen, silk, rayon and cotton blends dominate.

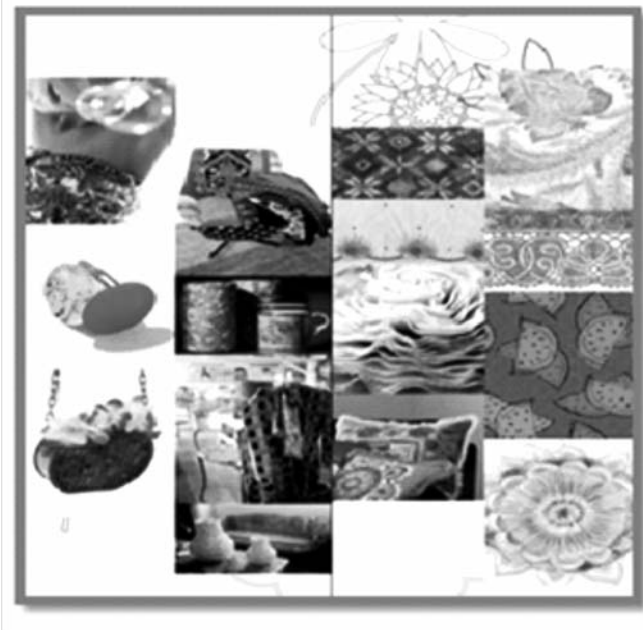


Figure 4.2 : Mood and Fabric Board (Courtesy - Interstoff Asia Essential)

4.4 Surface ornamentation and Trimmings

Brightly coloured lace and embroideries, prints are accumulated from little outlined flowers to exotic South American flowers.

5. Conclusion

The various styles for a season can be compiled and presented on trend board by the designer which is usually a collage work filled mainly with photographs from current fashion magazines [10]. Fashion forecasting helps to analyse the trends in future and it is armed with information about market research, colour trends, fabric and trim research with which the fashion designer is ready to bring everything together in the creation of a new line. We have to consider few important factors while starting a design project like identifying the basic facts about past trends, previous sales

statistics and current trends as well. The forecasts information for the next season may be gathered from the agencies/ the primary information can be obtained by the designer. It is very important to determine the difference between past forecasts and actual behaviours of the current season. A forecaster should know to be appropriate in using the forecasting tools and techniques to overcome the issue of accuracy and reliability. It is always advisable to follow the forecast continually and find out the reasons for significant deviations from expectations and do the revision whenever and wherever necessary.

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Dr. Ashok R. Athalye

Dr. Ashok Athalya is an UDCT alumni, completed Ph.D (Tech) from the department of Fibres and Textile processing Technology in 1993. Has work experience of about 19 years in technical service department at Atul Ltd, Colours division catering to wide range of dyes including Vat, Reactive, Sulphur Black, Disperse, ect. along with process and functional affect chemicals. Earlier work experience includes tech service at Crods chemicals (formerly ICI-Uniquema), Jaysynth, Hindustan Ciba-Geigy & has travelled widely for customer technical interactions in domestic as well as international markets including China, South Korea, Australia, Bangladesh, Turkey, South Africa, ect. for processing of various substrates and international repute and conducted technical seminars.

Automotive Textiles : Growth Driver for the Indian Textile Industry

The Textile Industry is considered to be the mother of Indian industrialization and plays crucial role in the national economy. The size of the Indian textile industry is estimated at approximately USD 70 bn and is expected to grow to USD 220 bn by 2020. It contributes about 14 per cent to the industrial production and 4% to the GDP. It is the second largest employment generator (after agriculture) employing nearly 3.5 cr people and accounts to 20 percent of the total workforce. Apart from the apparel and clothing segment, Technical Textiles - fabrics used for varied industrial applications, is emerging as a major growth driver for the industry. The pre-dominant segments of technical textiles are Mobile-tech (mainly Automotive textiles), Pack-tech, Home-tech and Sport-tech.

Technical Textiles is considered to be the sunrise sector of the textile industry in India, with a current market size of more than Rs.57,000 cr (US\$12.67 bn) and a growth rate poised to take off from the present 11%, to almost 20% during the 12th Five Year Plan. Further, the government is set to launch US\$44.21 mn mission for promotion of technical textiles, while the Finance Ministry has cleared setting up of four new research centres for the industry. Technical textile is the fastest growing segment in textiles in India and it has generated a lot of investor interest in recent past.

Textiles in Automotive Industry

India ranks 6th in the global automotive manufacturing countries with

annual production of about 3.9 mn units and is expected to continue its growth at 16 to 18 % per annum. According to the Society of Indian Automobile Manufacturers, annual vehicle sales are projected to increase to 5 mn by 2015 and more than 9 mn by 2020. The automotive textiles growth rate in India is increasing rapidly with the increasing population, rapid urbanization, and disposable income of growing middle class.

The non apparel, technical textiles form a part of automobiles interior in the passenger cars, especially in the premium segments. Textiles are used in terms of aesthetics of visible components - seat cover upholstery, head-lining, door panels, parcel shelf, carpeting, as well as in terms of concealed / safety components - airbag material, air/fuel filters, hoses and safety belts.

Generally, it is estimated that about 12-15 kg of textile material is incorporated into a passenger car which generally amounts to about 2.2% of the overall weight of the car. It requires considerable technical input to provide both the aesthetic and durability requirements considering the important factors like comfort and safety of end users. Additionally, being light weight than metallic components, use of textile provides substantial fuel economy. About 8 % of total cost of automobile is due to the interiors. An average of 5-6 m² of fabric is used in cars for upholstery.

Consumers expect that the interior textiles should last the life of the vehicle and show no significant signs

of wear. As the car interiors are subjected to varying temperatures and relative humidity, the seat fabric must always appear without noticeable colour fading. The most important factor governing the selection of the fabrics for car seat cover is resistance to light (UV radiation). In addition, it should have high resistance to rubbing, pilling, staining and should conform to the safety requirements such as flame retardancy. Polyester dyed with high light fast disperse dyes and treated with functional effect chemicals becomes the obvious choice.

Polyester is the most widely used fiber in Automotive textiles and accounts for about 90% of all textile seat covers worldwide. Light fastness in automotive fabrics is very crucial because the car upholstery is often subjected to sunlight during long periods of parking. Considering the various factors influencing light fastness of disperse dyestuffs, some of the possible ways to minimise this impact are

- ◆ Selection of high light fast dyestuffs
- ◆ Masking or absorbing ultra-violet rays
- ◆ Researching dyestuff's basic chromophore and improving dyestuff chemical structure
- ◆ Adding active oxygen and peroxide quencher
- ◆ Use of adequate UV absorbers

Critical fastness and functional finish requirements

There are different light fastness test methods and light fastness requirements worldwide. Light fastness tests try to simulate in a testing machine and in a shorter testing time what happens with the

textile under different climate conditions after certain time of exposure. The requirements normally vary according to where a textile is to be used in a car (seat upholstery, interior trim, head lining, etc). The specific criteria are in terms of

- ◆ On-tone fading
- ◆ Non metameric matching
- ◆ Lower shade variation limits

Car brand	Test method
Honda	JASO M 346
Toyota	TSL 2100G
Nissan	M 0154
Peugeot,	
Citroen,	
Renault	PSA D 47 131
Volkswagen ,	
Audi, Skoda,	PV 1303
Opel	GME 60292
B M W,	
Mercedes Benz (FAKRA)	DIN 75202
Ford	DVM 0067 MA
GM motors	GMW 3414
Chrysler	SAE J 1885

Apart from high light fastness, the automotive textiles need specialty effect finishes to confer desired functional properties for imparting various functional effects including;

- ◆ High water, oil and soil repellency
- ◆ High abrasion resistance and anti-pilling
- ◆ Flame retardency

Key factors for growth of technical textiles in India

India has several inherent advantages, which lends it the potential and ability to emerge as a key glo-

bal outsourcing hub for textile products.

- ◆ Self sufficiency of raw materials: India has a vast pool of raw materials for textiles, both natural and man-made. One Indian organization is the global leader in polyester fiber manufacturing and India is the 2nd largest Disperse dyes producer of the world.
- ◆ Cost competitiveness: On account of its vast population, India enjoys manufacturing cost competitiveness due to easy availability of cost competent skilled workforce across different industries. The textile industry is no exception whereby India's cost of production ranks amongst the lowest in the world today.
- ◆ Value addition capabilities: India has high value addition skills, which enables it to service niche markets worldwide. This has been acknowledged by the world's leading global retailers. With liberalization of Govt policies many international brands, retailers are expected to increase footprint in India.
- ◆ Economies of scale owing to a huge domestic market: India is among the largest textile and automobile manufacturer and consumer in the world. This gives India a natural advantage of economies of scale, which enables it to lower manufacturing overheads and improve operational efficiencies.
- ◆ Improvement in the standard of living resulting in greater demand for personal vehicles.
- ◆ High time spent in the car (increased daily commuter dis-

tances, traffic jams, long distance drives) - more demand on improved aesthetics of car interiors.

- ◆ Replacement of metallic components by textiles to reduce weight & improve fuel economy.
- ◆ Stringent Govt. legislations on safety devices in the form of seat belts, air bags.

Way forward

Considering the growth potential of the Automotive Textile segment the Government, various textile processors, specialty dyes, effect chemi-

cal manufacturers and academic institutes are expected to coordinate and work closely together. Efforts have already been initiated to set up specialized technical training courses and testing facilities in prime universities like ICT and corporate industry to develop skill base.

Further, the industry could be incentivized to engage trainees/ students from these institutes on projects to provide industry exposure. This could lead to a closer bonding between industry and academia which has been observed as a best practice to lead the development of indigenous technology and intellectual property.

Textile and allied dyes/chemical industry should implement steps to attract talent, such as offering R&D/ marketing oriented job profiles, providing attractive career paths with global exposure and developing strong in-house training programs. The areas for strengthening R&D in industry include, processing time cycle reduction, cost of production, water, energy saving and sustainable eco-friendly application process and developing new products relevant to the market needs. Such collaboration and inclusive innovation, would help reduce the environmental impact and carbon footprint of textile processing around the world.

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Genetic Engineering: A Potential Tool for Textile Sector

Modern biotechnology has given scientists revolutionary tools to probe and manipulate living systems. Genetic engineering permits extraordinary control over the time, place, level, and type of "gene expression". This introduces the possibility of altering organisms in order to optimize the production of established or novel metabolites of commercial importance and of transferring genetic material (genes) from one organism to another. With an enhanced understanding of how different genes are responsible for the various characteristics and properties of a living organism, techniques have been developed for isolating these active components (in particular, the DNA which carries the genetic code) and manipulating them outside of the cell. The next step has been to introduce fragments of DNA obtained from one organism into another, thereby transferring some of the properties and capabilities of the first to the second. Genetic engineering methods are being investigated for their potential to produce new kinds of textile fibres.

It's a known fact that cotton is the most used textile fibre in the world. However, Cotton crops are very susceptible to pest attacks and their pesticide consumption is more than 10 per cent of the world's pesticides and over 25 per cent of insecticides. With the objective of reduction in the pesticide use for cotton and increase in cotton yield, the US based agrochemical, multinational company Monsanto, introduced the genetically engineered variety of cotton, "Bt Cotton". Ba-

cillus thuringiensis or Bt is a naturally occurring soil bacterium used by farmers to control Lepidopteron insects because of a toxin it produces. Using genetic engineering, scientists have inserted the gene responsible for making the toxin into cotton crop. Bt expresses the qualities of the insecticidal gene throughout the growing cycle of the plant. The government of India allowed the production of three genetically modified Bt cotton hybrids for the three years from April 2002 to March 2005 and the varieties authorized were Bt MECH 162, Bt MECH 184 and Bt MECH 12. Initially, the Bt cotton turned out to be a major catalyst in accelerating the cotton production in India and also in promoting the growth of the Indian textile industry.

Another upcoming fibre in the textile sector is the synthetic spider silk. It has been created by Dupont scientists using recombinant DNA technology and advanced computer simulation techniques. Synthetic genes are designed to encode the gene matching the silk protein. These genes are inserted into yeasts or bacteria to produce silk proteins. The protein is dissolved and spun into biosilk fibres. The synthetic spider silk may help to create super performing garments of the future use in bulletproof vests.

With the introduction of Bt cotton and synthetic spider silk, the scope of genetic engineering is increasing in the textile sector and novel bio-engineered products are being produced. Monsanto has envisaged the transfer of a gene from a blue flower

to the cotton plant to produce blue cotton. The efforts will not end with Blue Cotton. Further initiatives will be made to genetically manipulate the cotton plant to impart natural colour, modify fibre properties and impart pesticide and herbicide resistance. Coloured cotton is also being produced not only by conventional genetic selection but also by direct DNA engineering. In nature, silkworm cocoon colours vary from white, yellow, straw, salmon, pink and green. The colours in the silk are from natural pigments absorbed when the silkworms eat mulberry leaves. Japanese researchers observed in silkworms producing white silk that the "yellow blood" or Y gene, was mutated. A segment of DNA had been deleted. The Y gene enables silkworms to extract carotenoids, yellow-colored compounds, from mulberry leaves. The scientists found that mutated insects produced a non-functional form of the carotenoid-binding protein (CBP), known to aid pigment uptake. Using genetic engineering techniques, the researchers introduced pristine Y genes into the mutant insects. The engineered worms produced working CBP and yellow-coloured cocoons. The yellow colour became more vivid after rounds of cross-breeding.

The tools of genetic engineering also enable scientist to design and create microbial cell based machines to perform useful tasks for mankind. An approach is made to develop fabrics that contain micro-fabricated bio-environments and biologically activated fibers. These fabrics will have genetically engineered bacteria or mammalian cells incorporated into them that will enable them to generate and replenish chemical coatings and chemically active components such as drug

producing bandages, protective clothing with highly sensitive cellular sensors fabrics that literally eat odours with genetically engineered bacteria, self cleaning fabrics and fabrics that continually regenerate water and dust repellents. These bio-fabrics may form the basis of a whole new line of commercial products. Thus living organisms could be biologically modified into a fashion promoter if engineered with great caution. A major breakthrough in the textile industry is eagerly awaited

through these genetic engineering applications.

By- Madhura Nerurkar & Manasi Joshi

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AHMEDABAD - UNIT

ITMA ASIA + CITME 2012

The Textile Association (India) Ahmedabad Unit arranged a delegation to attend the ITMA ASIA + CITME 2012 Textile Machinery Exhibition held on 12th -16th June, 2012 at SNIEC, Shanghai, China through official tour operator Cox & Kings Ltd. Six members of the Association visited the said International Exhibition.



Photographs had taken at ITMA ASIA + CITME 2012 Exhibition Centre, China.

Six G.C. members from The Textile Association (India) Ahmedabad Unit attended 3rd GC meeting of The Textile Association (India) held on 23rd June, 2012 at Jenny Club, Opp. CIT, Avinashi Road, Coimbatore-641014, Tamil Nadu. All G.C. members actively participated during the discussion of meeting AGENDA. The meeting was over very peacefully.

September - October 2012



Members posing during the visit to Shailm Mallikarjune Temple at Hyderabad

Seminar on "India & Latin America & Caribbean : Doing Business in Emerging Markets"

Six Office Bearers of The Textile Association (India) Ahmedabad Unit attended a Seminar on: "India & Latin America & Caribbean: Doing Business in Emerging Markets" held on 19th July, 2012 at Hotel Courtyard Marriot, Ahmedabad. The seminar conducted by the Confederation of Indian Industry supported by Govt. Gujarat under the events of Gujarat Vibrant 2013. Mr. Maheshwar Sahu, IAS, Principal Secretary - Industries & Mines Department, Govt. of Gujarat delivered welcome address in the function. Key Note address was given by Chief Guest Mr. A. K. Jyoti, IAS, Chief Secretary, Govt. of Gujarat. The whole day programme divided into two technical plenary sessions and panel discussions. The seminar was very useful for the participants.

Design Clinic Workshop

Mr. T. L. Patel- President, V. A. Trivedi- Hon. Secretary and Mr. M. S. Patel, Jt. Hon. Secretary of the Textile Association (India) Ahmedabad Unit attended a "Design Clinic Workshop" organized by the ITAMMA (Indian Textile Accessories & Machinery Manufacturers Association) on 19th July, 2012 at Hotel Fortune Landmark, Ahmedabad. Shri H. D. Shrimali, Addl. Industries Commissioner was the Chief Guest where Mr. Arvind Patwari, Director, MSME Development Institute, Ministry of MSME,

Govt. of Gujarat was the Guest of Honour of the function.

Best MSME Awards - 2010

Mr. T. L. Patel, President and V. A. Trivedi, Hon. Secretary of the Textile Association (India) Ahmedabad Unit attended award conferring ceremony of Best MSME Awards-2010 held on 20th July, 2012 at HT Parekh Convention Centre, AMA Complex, ATIRA Campus, Ambawadi, Ahmedabad. Mr. Saurabhai Patel, Hon'ble Minister of State for Industries, Govt. of Gujarat was the Chief Guest where Mr. M. Sahu, IAS, Principal Secretary, Industries & Mines Department were the Guest of Honour of the function. Mr. Kamal Dayani, IAS, Industries Commissioner delivered welcome address.

Meeting with Chinese Delegation

The Textile Association (India) Ahmedabad Unit arranged a meeting with Chinese delegation came from Shandong Charming Home Textiles Co. Ltd. 38, Shouyao Road, Shouguang, Shandong, China at 3.00 pm at AC meeting room of Association. The names of the officials were Mr. Song Guo Qing- Chairman and Board of Director, Mr. Han Li Guo- Deputy General Manager and Mr. Xi Hong Jiang - General Manager. Also renowned Industrialists were invited during the meeting. The main purpose to visit India of Chinese officials was to take proper ideas and suggestions to setup New Factory in Gujarat.

During their stay at Ahmedabad they have several Industries officials in Govt. of Gujarat, Director of CED and visited Corporation Bank to understand process of banking transaction from China if they setup factory at Gujarat. Also they visited Jindal Hometex Inc at Piplej, Ahmedabad.


Group Photo with Chinese Officials

View of Discussions at the Meeting

Lecture on "Mind & its Management"

The Textile Association (India) Ahmedabad Unit organized a lecture on "Mind and its Management" at 6.00 pm at AC Room of Association, Ashram Road, Ahmedabad. Dr. Harshdev Madhav, Prof. in Sanskrit- H. K. Arts College, Ahmedabad was the speaker of the function. Shri T. L. Patel, President welcomed Dr. Harshdev Madhav as well as all the invitees in the function. Dr. Madhav had given self introduction to the invited members. He published so many books in Sanskrit on Mind Concentration. He delivered his speech with different techniques to control our mind in different situation and also in current violence. This program was organized specially for Managing Committee Members and some invitees who were interested in it. Everybody was happy to learn the techniques to control/manage own mind. Near about 30 members participated in the lecture.


L to R: V. A. Trivedi, Dr. Harshdev Madhav, T. L. Patel

Mr. K. J. Patel sharing his views during Q&A session

DELHI - UNIT

Visit to M/s Pashupati Fabrics, Kosi Kalan

A visit was planned by The Textile Association (India) Delhi unit to M/s Pasupati Fabrics, Kosi Kalan for the students of "Textiles Committee Certified Quality Professionals Course" Batch A for Integrated Skill Development Scheme (ISDS) under Ministry of Textiles, Govt. of India, on 19th July, 2012. Mr. Pankaj Malik, Vice President of TAI Delhi and Mr. I.K. Singhal, Past President of TAI Delhi has accompanied 15 students.



Students were briefed about plant and manufacturing process available at facility of M/s Pashupati Fabrics. Students were taken around different departments and were answered by concerned persons for their queries. The whole day visit proved beneficial for the students and was praised by all students as they learned a lot about textile manufacturing processes. TAI Delhi unit was grateful to M/s Pashupati Fabrics to provide opportunity to conduct this trip.

Lecture Series

Mr. Vijay Kumar Koul, Ex-Regional Director of Target Corporation Production Services (TCPS) delivered Lecture of TITAN's Raj Rani Kaushik Lecture Se-

ries at The Technological Institute of Textile and Sciences, Bhiwani on Tuesday, 28th August 2012. Dr. Rishi Jamdagni, Director, TIT&S, Bhiwani and Dr. S. Dhamija, Professor, TIT&S, Bhiwani were present on the occasion. Mr. Shailesh Kaushik and Mr. Puneet Chawla were presented on behalf of TAI Delhi unit. Topics covered in lecture were a) Relationship between Compliance and Quality Assurance, and b) Ethical compliance.



Mr. Vijay Kumar Koul has over 30 years of experience in the field of apparels and home furnishing and has worked across various countries and cultures. He is an expert in off-shore product manufacturing, compliance, auditing and quality assurance. He worked with Target Corporation Production Services (TCPS) from April 2005 to November 2011. Target, is an American retailing company. It is the second-largest discount retailer in the United States, behind Walmart and ranked at number 33 on the Fortune 500 as on 2010. Students gave an excellent feedback and desired to plan more such lectures in future.

Felicitation Function

A Felicitation function cum social get together was held on August 19th, 2012 at Hotel Parkland Retreat, Satbari, Main Chattarpur Mandir Road, New Delhi in honor of TA(I) Delhi unit managing committee member, Mr. Shailesh Kaushik who has been recently awarded "FELLOWSHIP"- "FTI"-of "The Textile Institute, UK". TA(I) Managing Committee members and 67th All India Textile Conference Organizing Committee members were present on the occasion along with their spouse. TA(I) Delhi unit President, Mr. R.K.Vij and other eminent TA(I) Delhi personalities greeted Mr. Shailesh Kaushik for the achievement

of Fellowship award. Prof. R.C.D. Kaushik, Ex-Director, TIT&S, Bhiwani and Dr. V.K.Kothari, head of textiles deptt, IIT, Delhi was also present on the occasion.

Meeting with delegates from M/S Shandong Charming Home Textiles Co. Ltd.

A meeting was held at TA(I) Delhi office on 1st August, 2012 with a team from M/S Shandong Charming Home Textiles Co. Ltd., China . The team comprised of Mr. Song Guo Qing: Chairman and Director of Board, . Mr. Han Li Guo: Deputy General Manager and Mr. Xi Hong Jiang: General Manager. This com-



pany is already in manufacturing of Home textile furnishing products in China for about 33 years. The meeting was organized to discuss proposed project to be launched by M/S Shangdong in India for manufacturing of Home furnishing textiles and other related products. Dr. Anil Gupta and other TA(I) Delhi unit members discussed the agenda / questionnaire placed by M/S Shangdong in details and they were apprised of procedure and opportunity for factory set up in India . The most suitable location for factory, Govt. policies, FDI rules, costs involved, taxation rules, labour laws, payment modes, present textile scenario, quality standards, role of TA(I), etc. were the mainly discussed topics.

Participation:

Representatives from TA(I) Delhi participated in following events:

1. TEXCON 2012, Conference on New Paradigms for Textile Industry on 5th July, 2012 at Hotel Maurya Sheraton, Sardar Patel Marg, New Delhi
2. CII-MoMSME-WIPO - The India National Forum on sharing of best

practices on Intellectual Property for Micro, Small and Medium-Sized Enterprises for Policy Maker on 17-18 September ,2012 at India Habitat Center, New Delhi.

3. ICAHT-12, 8th International Conference on Apparel and Home Textiles on September 21st and 22nd, 2012 at India Habitat Center, New Delhi.
4. Capacity Building programme on Implication of Non-Tariff Barriers (NTBs) on Textile and Clothing exports of India on September 25th, 2012 at India Habitat Center, New Delhi.

SOUTH GUJARAT - UNIT

TAI - South Gujarat Unit (Surat)
TAI - South Gujarat Unit (Surat) organized a Road Show of India-ITME 2012, on 19th October, 2012 at The Gateway (Taj) Hotel, Surat.

Shri R. D. Udeshi, President, Polyester chain, Reliance Industries Ltd. was Chief Guest and Keynote speaker was Shri Govindprasad Sarawagi, Siddhi Vinayak Knots & Prints Pvt. Ltd. was Guest of Honor on this occasion.



From L to R: Shri R. D. Udeshi, Shri R. S. Bachkaniwala, Shri Govindprasad Sarawagi, Shri Girishchandra Bhatt & Shri Virendra Jariwala

Welcome speech by Ms Seema Srivastava, Executive Director, India-ITME Society, Mumbai, followed by Presidential speech of Shri Girishchandra Bhatt, President, TAI-SGU-Surat.

The Guest of Honor and The Chief

Guest gave valued speech and presentation to the gathering about their vision for the textile industry. A video film was shown about India-ITME Society, followed by informative words about India-ITME 2012, by Shri R. S. Bachkaniwala, Chairman, India-ITME Society, Mumbai.



Ms Seema Srivastava proposing vote of thanks

More than 350 people of textile industry from South Gujarat got the information about, 9th India International Textile Machinery Exhibition, to be held between 2nd and 7th December, 2012 at BCEC, Goregaon (E), Mumbai. Vote of thanks given by Ms Seema Srivastava.

VISIT YOUR WEBSITE

www.textileassociationindia.org

- ◆ Detail information and Data of the Textile Association (India)
- ◆ View JTA Issues on-line : Year 2008 onwards
- ◆ See ATA/GMTA Exam results
- ◆ See ATA/GMTA Exam Schedule
- ◆ Photo Gallery of TAI Events
- ◆ Access Copies of AITC Papers
- ◆ TAI Publications: Books, TABLETS, and CDs
- ◆ And much more

ICAHT-12



The 8th International Conference on Apparel & Home Textiles

The 8th International Conference on Apparel & Home Textiles was held on 21st and 22nd September at the India Habitat Centre, Delhi. The theme of the conference was "The New Excellence".

The conference was a good amalgam of workshops and presentations, drawing about 450 delegates from different parts of the country. The event was attended by industrialists, manufacturers, research institutes etc. During the event, the speakers and delegates shared their views about the current status of apparel sector in India and discussed how the anticipated growth can be achieved. Steps to address various challenges that industry faces today were discussed at length, out of which substantial suggestions and solutions emerged as inputs for framing the growth policy.



Dr. A. Sakthivel Chairmen AEPC Chief Guest delivering the Inaugural Address

India ranks as the world's fifth largest exporters of apparel contributing 4% in total world's apparel exports. The industry is extensive and wide ranging, and has contributed enormously to the country's economic development. It fulfills a vital role as an employer and a generator of foreign earnings. Despite

being one of the major contributors to Indian exports and having almost every required advantage, Indian apparel industry has not grown as it could have been. Indian apparel exports were valued at US\$ 14 bn in 2011 which has grown at a CAGR of 2% only in last five years which is very less when compared to its competitors. With a vision to provide a common platform to the industry experts for tackling the issues which have hindered the growth of apparel industries and find out the possible solutions, the conference stood up well with the theme.



*Dr. A. Sakthivel Chairmen AEPC Chief Guest conferring OGTC Path Breaker award on Mr. Charles Dagher
Left to right : Mr. M K Mehra, Mr. R.C. Kesar, Dr. A. Sakthivel, Mr. Charles Dagher and Mr. P.M.S. Uppal*

The first day was allocated for three sessions comprising three presentations in each session. The first session was chaired by Mr. Amarjit Singh, MD, Indigo Apparels which included the presentation of Mr. Vijay Mathur, Secretary General, AEPC titled "Social Compliance as the New Face of Competitiveness in Apparel Exports". While addressing the conference, he shed light on the importance of social compliance among major buyers and

how it can influence their preferences in choosing the suppliers. He mentioned that Indian apparel exporters are unable to understand the buyer's requirement despite buyer driven nature of this industry. He shared the inferences of the study conducted by the AEPC and suggested the required interventions.

Mr. Devangshu Dutta, CEO, Third Eyesight presented his views on "Strategic Overview of the Global Garment Industry: Implications for Delhi NCR". In his presentation, he said that global apparel is not just about low cost; there is a need for "Creative Destruction" and shift in business approach.

In the third presentation of the first session, Mr. Bruce Berton, CEO, B&B International gave his expert views on "Enhancing Quality Focus, Customer Orientation and Customer Services". He mentioned the keys to successful management are "Facts, Plans, Execution and Supervision". He advised the industrialists The second session was presided by Mr. H.K.L. Magu, MD, Jyoti Apparels which comprised of the presentation by Mr. Charles Dagher, CEO, Dagher Consulting Group Pvt. Ltd. who gave his insights on "Shaping KPIs to Short and Long Term Profit Goals". He suggested that KPIs are the quantifiable measurements to achieve your vision and direct you to formulate the strategy you need to take. Managing and analyzing KPIs take time & energy, so it is necessary that appropriate ones are chosen to address the specific needs and objectives of the company. He opined if someone wants to grow, start thinking about your business. The second presentation was by Mr. Lal Sudhakaran, VP-Manufacturing, Madura Clothing on "Operational

Excellence - A Manufacturing Perspective". His presentation highlighted the steps Madura clothing has taken to build their operations and bring excellence. He stated that summation of four measurement systems i.e. KPIs, customer satisfaction, people satisfaction and societal satisfaction decides the business result. He shared the experiences of Madura clothing that how they have achieved operational excellence with their radar methodology of assessment and review system.

Mr. Anand Rao, CEO, Infinite Possibilities gave his insights on "Managing Uncertainty- HR Perspective". He emphasized on the need to invest in the employees at the time of uncertainty. He told that uncertainty about business environment has increased again and those operating in more uncertain environments report even higher levels of stress, absence and workforce. He discussed the impact on HR due to business challenges due to uncertainty and challenges faced by them. He also recommended that being proactive and planning ahead will help in reducing the impact of damage and stress. Moreover, it will also help in reducing the impact when the market opens.

The last session of the day was chaired by Mr. Praveen Nayyar, MD Dimple Creations. In this session, the first presentation was given by Mr. Sagi Shani, Optitex Ltd. (Israel) on "Operational Excellence through Technology". He explained there is a need to collaborate together with the dependence on both buyers and manufacturers required easy to use and quick to implement solution. CAD/CAM solutions are a substantial step in increasing production flow, alleviating productivity and

deadline bottlenecks. He described: Mr. Philip Chamberlain, Head of Sustainable Business Development, C&A presented on "Buyer's Perspective for Future Sourcing considering the Sustainable Business Development". He gave his insights on what are the opportunities and implications of sustainability for textile & garment manufacturers and recommended key focus areas for corporate responsibility; product, environment and people. He mentioned that the leader is someone who can access, analyse and strategically use information.

The last presentation of the day was on "Business Remodeling-To run a progressive Garment Manufacturing Business" by Mr. Virender Goyal, MD, EPIC Designers Ltd. In his presentation, he said that there is a need of paradigm shift in the way of doing business. He told India is running behind its competitors and the requirements of doing business are also changing. He highlighted:

At the end of the day, inaugural session and fashion show by Lady Irwin College and The Technological Institute of Textiles & Sciences was held. Mr. A. Sakhtivel, Chairman, AEPC was the Chief Guest of the inaugural session. In the inaugural session Mr. R.C. Kesar, Director General, OGTC gave the welcome address following the presidential address by Mr. PMS Uppal, President, OGTC. Mr. Charles Dagher was awarded "OGTC Path Breaker Award 2012". Dr. A. Sakhtivel opines that diversification of product and market is most important for India. He mentioned compliance and skill development are the need of the hour for apparel industry.

The next day of the conference was started with two presentations on "Risk Management in Apparel Industry" by Mr. Gunish Jain, MD, Royal Datamatics and "People First - Investing in Human Resources" by Mr. Rajesh Bheda, CEO, Rajesh Bheda Consulting Pvt. Ltd. This session was chaired by Mr. Lal Sudhakaran. Mr. Gunish Jain, in his presentation on risk management gave a few commandments and recommended that the fundamental duty of every business should be to reduce risk to others; not to reduce risk of ourselves and to create certainty for people you work with. Mr. Rajesh Bheda advised the industrialist to focus more on their employees as they are core to output of the industry. He suggested that investing in training, focusing on the team, managing HR department and connecting them with other department will help the industry to reach their objective.

Eight workshops followed the morning presentations. Four workshop sessions were conducted parallel at one time. Two workshops on "Addressing Customer Complaints" by Ms. Pooja Makhija, Consultant, Fashion Futures and "Understanding and analyzing test reports" by Dr. M. S. Parmar, Deputy Director & Head-R&D(P) & CQE, NITRA was presided by Mr. Rajesh Bheda, CEO, Rajesh Bheda Consulting Pvt. Ltd.

Another workshop session was chaired by Mr. Vinod Kapur, MD, Radnik Exports which included workshops on "The Pursuit of Lean Effectiveness (A Unified System of Business Management in Lean Organization)" by Mr. Charles Dagher, Consultant Dagher Consulting Group Pvt. Ltd. Third workshop was pertaining to "Carbon Footprint

Project at OGTC" by Mr. Vishal Mehta & Mr. Pranam Reddy, Cool Earth, Sustainability Services Pvt. Ltd., "Carbon Disclosure Project" by Mr. Damandeep Singh, Senior Advisor - CDP India and "Sustainable Practices within the Textile and Apparel Industry" by Mr. Pawan Mehra, MD, cKinetics. The fourth session comprised of workshops on "Managing, Finance & Costs" by Mr. Praveen Nayyar, MD, Dimple Creations and "Foreign Exchange Management" by Mr. Kamal Sidhu, MD, Neetee Clothing.

The fifth workshop session was headed by Mr. Anant Sadana, CEO, Apparel United which included workshops on "Merchandising Critical Path Management", "Customer Service Orientation", "Work Smart vs Work Hard" by Ms. Anjali Gopalakrishna, Consultant and "Merchandisers -The Face of the Company" by Ms. Sharmila Katre, Head of the Business & Technology Department PAF. Another parallel session included workshop by Mr. Som Shekhar, Principal Consultant, Wazir Advisors Pvt. Ltd. and Mr. Ram K Navratna on "Motivation as a Productivity Enhancement Tool & Using Productivity Tools effectively" which was presided by Mr. Lalit Gulati, MD, Modelama Exports Ltd. seventh session included workshop on "HR Management", "Employee Induction System" and "Incentive Systems Performance Appraisals" by Mr. Anand Rao. The last workshop session accommodated two workshops on "Marketing Strategies for Growth" by Mr. Bruce Berton, B&B International and "Buyer Centric- Garment Business Orientation" by Mr. Prashant Agarwal, Jt. Managing Director, Wazir Advisors Pvt. Ltd.

In the end, wrap up session was held with the hope of implementa-

tion of the suggested interventions will be done. Mr. M.K. Mehra announced that the next conference of OGTC will be organized on 20th and 21st September 2013.

The theme of the 9th International conference on Apparel & Home Textiles will be CREATIVE THINKING. Mr. Mehra extended invitation to all guests & delegates for 9th ICAHT.



*Mr. Vijay Mathur, Acting Sec Gen
AEPC*



Mr. Bruce Berton



Mr. Charles Dagher



Mr. Praveen Nayyar



Mr. Kamal Sidhu



Workshop in Progress



*Fashion Show by Students of Lady
Irwin College*



*Fashion Show by Students of TIT&S,
Bhiwani*

Textsmile

The patient says, "Doctor, you've got to help me. Nobody ever listens to me. No one ever pays any attention to what I have to say. The doctor says, "Next, please."

RIETER Rieter Presents All 4 Spinning Systems At The ITME 2012

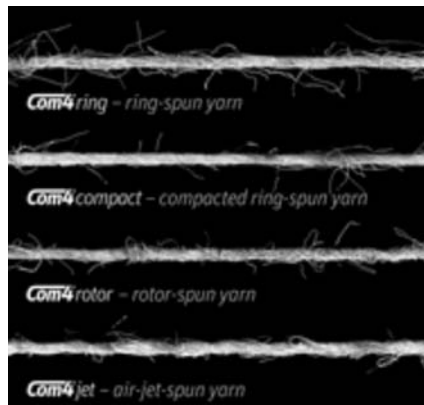
On its exhibition stand at the ITME 2012 (2 - 7 December, 2012) in Mumbai, Rieter will be demonstrating its competence across the entire spinning process and presenting all 4 end spinning systems (Hall 1, Booth No. J 14). Large 1000 mm cans can now be utilized in the Rieter fiber and spinning preparation from the card to the comber, ensuring higher efficiency and convenience in the spinning plant. Showcased on the stand will be the new air-jet spinning machine J 20, the new Rieter comber E 80 and the new draw frame SB-D 22.



E 80 Comber



SB-D 22 Double-Head Draw Frame



The 4 Rieter Com4® Yarns

The know-how relating to financing, spinning mill planning, use of the right technological elements, selection of the correct spinning process as well as many other factors is necessary to achieve success in the operation of a spinning plant. Rieter is presenting all this expertise at the ITME

Numerous highlights and innovations can be admired live on the Rieter exhibition stand. Here a brief overview:

- ◆ The new E 80 comber will be in operation. The E 80 comber stands for unrivaled quality, productivity and yield.
- ◆ The new double-sided J 20 air-jet spinning machine (operational) will be introduced for the first time to the Indian market.
- ◆ The new SB-D 22 double-head non-autoleveler draw frame guarantees maximum machine efficiency with a unique space saving can changer up to 1 000 mm can and delivery speeds up to 1 100 m/min.
- ◆ The SPIDERweb - the innovative mill monitoring from blowroom to spinning machines - will be presented on a screen.
- ◆ What the benefits and characteristics of the 4 spinning systems mean for downstream processing can be experienced by visitors in the technology showcase. Here end products and fabric samples of the 4 Rieter yarns are available.
- ◆ The latest retrofits and high-quality original spare parts will be presented by Rieter's spare parts experts.

The Exhibits In Detail

E 80 Comber

The E 80 comber meets the highest standards in terms of productivity, quality and economy together with a high degree of flexibility. The effective production performance of the E 80 comber in combination with the fully automated ROBOlap lap piecing system is 2 tonnes/day. The lead in combing technology has been extended further through CoAoPoDQ (Computer Aided Process Development). With outstanding fiber selection and optimal machine running behavior, the comber achieves superior quality values with maximum economy. The mill-proven ROBOlap fully automated lap changing and piecing system is a unique feature and still sets the standard for modern combing operations.

SB-D 22 Double-Head Draw Frame

The SB-D 22 double-head draw frame without autoleveling guarantees maximum machine efficiency with a unique can changer up to 1 000 mm. The machine concept is labor- and space-saving. At delivery speeds of up to 1 100 m/min the mill-proven Rieter 4-over-3 drafting system ensures outstanding yarn quality. Unique centralized drafting system setting and easy modification of the delivery speed on the display panel also enhance customer benefits. Energy consumption is some 20 % lower than for other manufacturers' machines.

1000 mm Cans from the Card to the Comber

Large 1 000 mm cans can now be utilized in the Rieter fiber and spinning preparation from the card to the comber. The number of different cans in the spinning mill can

thereby be reduced, which keeps the investment costs low. Thanks to larger can sizes, the operator time is reduced and the yarn quality improved as a result of the lower number of sliver piecings. The impressive size of these large cans can be seen at the E 80 comber and SB-D 22 draw frame - both will be equipped with a 1 000 mm can changer.

J 20 Air-Jet Spinning Machine

The J 20 air-jet spinning machine features up to 120 high-production spinning units. The J 20 can be equipped for separate production on both machine sides, i.e. two different yarn qualities can be spun simultaneously on one machine. In conjunction with the newly developed spinning unit, the J 20 offers maximum yarn quality, productivity and flexibility. The unique quality characteristics of the air-jet spun

yarn are reflected in benefits for spinning mills, downstream processors and end users.

SPIDERweb mill monitoring system

Rieter has developed an innovative information and data collection system in the shape of SPIDERweb. Machines and the data system come from a single source and are ideally coordinated with each other. Due to the modular structure of SPIDERweb any number of machines can be connected, from blowroom to spinning installation. The open-ended network enables additional machines or SPIDERweb workstations to be connected at any time. SPIDERweb collects comprehensive data that provide an ongoing basis for increasing output and enhancing quality.

Technology Corner

Rieter supports customers in the

choice of the right spinning process by its comprehensive technological expertise in all four spinning processes through to the textile end product. At the exhibition, Rieter provides information on the benefits of the 4 Rieter Com4® yarns by means of various end products and fabric samples.

Spare Parts and Retrofits

A reliable partner supplying a complete range of wearing, technology and standard parts. Original spare parts from Rieter ensure optimal working behaviour, smooth operation and additional security. Innovative developments plus high-quality products subjected to rigorous controls and checks enable Rieter to meet customers' most stringent safety and production requirements. Furthermore, Rieter's local warehouse facility will enable customers to plan their requirements and ensures quicker delivery.

J 20 Air-Jet Spinning Machine - A new dimension in spinning

The J 20 is a production miracle with smallest space requirements. With its high operating speed of up to 450 m/min and 120 spinning units, the J 20 air-spinning machine heads the productivity scale. Thanks to the newly developed duo-spinning unit, the J 20 offers maximum yarn quality, productivity and flexibility.

Why a new spinning technology? High productivity, low manufacturing costs per kilogram of yarn and innovative yarn properties - the development team keeps all these targets constantly in sight with the development of the air-spinning process. Achieving these by the step-by-step evolution of existing

technologies is not possible. The development of the J 10 air-spinning machine began in 2003. The market launch of the air-jet spinning technology has been carried out progressively since June 2008. The practical experience gained with the J 10 air-spinning machine has been integrated into the J 20 air-spinning machine. The J 20 is the 2nd generation of air-jet spinning machines produced by Rieter and since the ITMA 2011 is now being marketed worldwide.

The mechanical engineering concept of the air-spinning machine

The main development requirements were:

- ◆ High productivity.
- ◆ Market-conform yarn and bobbin quality.
- ◆ Flexible, simple machine settings.
- ◆ Easy to operate.
- ◆ Low downtimes for maintenance and lot changes.
- ◆ Innovative yarn properties that open new markets for spinning plants.
- ◆ Adjustable yarn properties.
- ◆ Low production costs per kilogram of yarn.
- ◆ Space-saving installation/assembly, easy to integrate in existing spinning plants.

These requirements have determined the machine concept, the individual components, the automation as well as the operating philosophy.

The high-performance concept of the J 20

In order to achieve delivery speeds of 450 m/min, numerous innovations have been incorporated in the J 20 air-jet spinning machine. In comparison: usual delivery speeds are 15-27 m/min with ring spinning and 130-250 m/min with rotor spinning. The construction of the Rieter air-jet spinning machine is similar to that of a rotor spinning machine. Between the drive frame and the end frame are 6 sections each with 20 spinning positions. 4 robots - 2 on each side - are in operation for the formation of yarn piecings, bobbin change and cleaning. Construction of sections and the machine height are selected to allow 500 mm (20") round cans with 1 070 or 1 200 mm can height to be placed in 2 rows under the machine. The large can size permits a long lifecycle and thereby reduces the number of can changes. As with the rotor spinning machine, the sliver to be spun is fed from the can bottom. This short, direct route from the can to the drafting arrangement practically eliminates the risk of faulty drafts. An enormously important aspect, as with Rieter air-jet spinning, fine sliver is used to ensure optimal drafts at high speeds.

To keep the operator requirements and the costs as low as possible, an empty tube feeder is utilized in which 350 bobbins can be created. The empty tubes are automatically fed to the robot - just in time - as soon as a bobbin change takes place. The bobbin diameter can be up to 300 mm. The tube feeder has 2 separate bobbin chains and can therefore supply tubes of different colors for the left and right machine sides. This eliminates the risk of tubes being mixed up when

2 yarn qualities are being simultaneously produced.

The J 20 air-jet spinning machine uses a winding system whereby 2 contra-rotating wings precisely guide the yarn. With this winding system, ribbon windings definitely belong to the past. The cross-angle can be freely set between 15 and 46°. It is possible to use standard bobbins or colored bobbins on the J 20. The winding system with continuously rotating wings offers the potential for future increases in production rates.

Due to the increased spinning stability with the new duo drafting arrangement, the J 20 air-jet spinning machine can - in comparison with the J 10 - be extended by one section. With 120 spinning positions, the J 20 is therefore the longest air-jet spinning machine in the world.

Machine construction for optimized production process

Construction of the J 20 - as compared to the J 10 - has been further optimized. The centrally-driven ventilators, the entire electrics and electronics as well as the supply and disposal connections are integrated in the drive frame. The filter chambers for the waste from the spinning positions and from the robots are separated from each other and are also separate for the left and the right machine sides. The waste can therefore be individually sorted which guarantees purity of material type for further use. The bobbin delivery on the drive frame is set at an ergonomic height of 1.45 meters. This enables the operator to optimally control the bobbin conveyor belt and the bobbins can be conveniently removed and placed on pallets. At the other end of the J

20 - between the last section and the tube loader - there is a free space as the service area for the robot at the rear.

Market-conform yarn and bobbin quality

With the J 20, the bobbin tension can be set over the whole bobbin. This, together with the image interference device, guarantees a perfect bobbin building process. The J 20 machines are equipped with the latest yarn clearer USTER Quantum Clearer 2; in line with the customer's requirements - with capacitive or optical sensor - with or without foreign fiber detection. All yarn clearer settings are entered on the J 20 touch screen. All disturbing yarn faults, neps, thick or thin places and optionally also foreign fibers, are detected and cleared - an essential prerequisite for the downtime-free further processing of the yarn in weaving or knitting plants and a high-quality and even fabric appearance.

New duo-spinning unit

The new spinning unit of the J 20 achieves a high yarn strength and low number of imperfections. The drafting arrangement of the duo-spinning unit can be precisely and reproducibly set. Controlled fiber guiding leads to good yarn quality as well as to a low number of quality cuts and natural thread breakages. The operator involvement is significantly reduced. With the J 20 duo drafting arrangement the productivity - compared with that of the J 10 - can be increased by 5% and this with equal or improved yarn quality.

With the duo-spinning unit, the field of application for the air-jet spinning machine has been successfully extended. The J 20 can process

viscose, Modal and blends with cotton. Deposits of fiber-fly and dirt are prevented by an optimized suction on the duo-spinning unit. There are practically no fiber deposits due to the open duo-drafting arrangement. Any fiber-fly is removed by the robot in passing.

The findings of the technological development and practical experience with the J 10 have been incorporated into the development of the J 20. The duo-spinning unit has numerous exchangeable technology elements with which it is possible to process different fiber materials and fiber counts or to achieve different yarn properties.

Automation with 4 robots

A J 20 air-spinning machine with 120 spinning positions is equipped with 4 robots, 2 on each side of the machine. The robot has various tasks: It cleans the spinning position and automatically pieces the yarn after a thread break or a clearer cut. It changes full bobbins and threads up the empty tubes - so-called doffing. A fan on the robot cleans the spinning positions from fiber-fly in passing.

The robot of the J 20 is based on the automation technology of the rotor spinning machine. The well-proven Rieter piecing technology with almost yarn-like piecings leads to a high yarn quality. The entire J 20 piecing process is electronically controlled, assisted by the yarn clearer, and settings can be made on the machine display panel. The step-by-step introduction of new fibers gives the piecing a yarn-like appearance. The spinning technology guarantees that all fibers of the yarn end are perfectly bound in the piecing process - contrary to conventional splicers. The piecers

thereby formed fulfill all requirements in downstream processing.

The robot works with a high degree of dependability. If problems occur, a trouble shooting program is shown on the robot display so that faults can be remedied without an instruction manual. When one of the two robots is in the separate maintenance and service station, the other robot automatically operates over the entire machine side.

Flexible, simple machine settings

High production speeds mean that the lots to be spun are finished increasingly quickly. The faster a machine spins, the quicker it should be able to be set for new orders. The machine concept of the J 20 is therefore arranged so that both machine sides are optionally entirely independent of each other. This makes possible the production of 2 different articles, i.e. yarns at the same time and increases the production flexibility of the spinning plants. 2 bobbin transport belts and the separate conveyance of empty tubes with different colors prevent mix-ups when 2 articles are being produced simultaneously on the machine.

Individual drive of the spinning units

The heart of the J 20 air-jet spinning machine is the spinning unit that is driven by single motors, without central gears and without driving shaft, across the entire machine length. After an ends-down or a quality cut, the individual motors automatically stop the spinning position. The spinning unit no longer uses energy and compressed air. This also applies when the maintenance personnel carry out maintenance work. Only individual spinning

positions are switched off and the rest of the machine continues production. The settings of the spinning units - such as drafts, bobbin speed, winding tension, cross-angle, spinning pressure - are carried out centrally via the machine operator panel. This enables rapid article change and increases the flexibility of the spinning plant. In addition, the machine carries out an automatic bobbin change and thereby prepares the change of article. Also with the evaluation of the machine data, top priority is given to flexibility. It goes without saying, that for each article, separate production and shift reports are available.

Lifecycle of technological parts

A great challenge with the high production speeds of the J 20 is to keep the maintenance costs as low as possible. With such high production speeds, high stress loads and abrasion levels occur. Rieter places great value on the application of new types of materials and solutions to gain long lifecycles of the relevant components. With the development of components, the physicists and chemists of Rieter's material department always provide advice and support.

For the J 20, ceramic spinning peaks were developed. These show distinctly higher lifecycles than spinning peaks made of steel. The ceramic spinning peaks are used in the production of viscose, Modal and cotton.

Leading drafting arrangement technology

Rieter's cutting-edge drafting arrangement technology was adopted for the air-jet spinning machine and adapted to the high speeds. In order to achieve the enormously high

drafts, the 3-over-3 drafting arrangement was further developed to a 4-over-4 drafting arrangement. This allows a gentle fiber drafting in 3 stages (pre-, middle and main draft).

The robust J 20 drafting arrangement is equipped with a unique, patented traversing system. The feed sliver - and consequently the produced yarn - is laterally traversed. This lengthens the lifecycle of the top rollers cots and aprons on the J 20 three-fold. Accordingly the top rollers rarely need to be replaced. In the long term, this reduces the maintenance and spare parts costs enormously and ensures constant yarn quality over a long period of time.

During the development process, care was taken that as many fiber materials as possible could be processed with the same top roller cots. The previous status of research and development with the aprons is that for viscose, Modal, cotton and blends, the same apron can be used. As top and bottom aprons in the drafting arrangement are identical, fewer aprons must be kept in stock as spares.

Low production costs per kilogram of yarn

For the majority of applications, the air-jet spinning technology has a lower energy consumption per kilogram of produced yarn than other spinning processes. Rieter's calculations take the energy requirement for the compressed air preparation into account. The intelligent shutdown of the individual spinning units thereby pays off. The development process also paid attention to the dimensions of the J 20, to ensure that an installation in existing spinning rooms is possible.

A spinning plant with J 20 needs a 25% smaller building area than a ring spinning plant for the same production capacity. This reduces the cost for buildings. A key for a perfect running behavior of the end spinning machines is a stable climate. Here the 25% lower space requirement of a J 20 compared to that of a ring spinning machine is of financial benefit. The smaller area that has to be air-conditioned results in substantial savings.

Practical experience has clearly shown that the air-conditioning in the spinning plant has a great influence on the spinning quality and the production stability with air-jet spinning. Under difficult conditions, air-conditioning can be installed directly under the spinning machine. It directs conditioned air from below to the cans, i.e. to the sliver - exactly where it is needed. Compared with the climatic conditioning of a hall, such a system can save additional energy.

ComforJet® yarn - noticeably different

A new yarn with new yarn characteristics, that opens new market opportunities for spinning plants, was the focus of development of the new spinning technology. The development team has succeeded in meeting this challenge. The type of yarn formation - turbulence with an airflow in a spinning nozzle - leads to a novel, noticeably different yarn structure. This yarn from the J 20 machine is marketed under the trade name ComforJet®. Air is a significant factor in the formation of the ComforJet® yarn and influences the yarn structure. For this reason, the ComforJet® yarns differ from ring and rotor yarns and have unique properties which show their advantages not only in the processing but

also in the end article and end use.

ComforJet® yarn with defined hairiness

With the J 20 air-jet spinning machine, the hairiness and the yarn volume can be changed and reproduced via the machine setting. This flexibility is not found with any other spinning system to this extent.

With the ComforJet® spinning process the drafted fibers run into a spinning nozzle. The front parts of the fibers form the yarn core. The loose fiber ends are wound around the parallel yarn core by the air stream - it can be imagined as the fiber sun - in the spinning nozzle. The yarn surface is very smooth. The fibers that form the hairiness are very short or form small loops. This produces the typical properties of the ComforJet® yarn - very low hairiness combined with a soft and voluminous yarn character.

Advantages of ComforJet® yarn in downstream processing

Low hairiness and the good fiber bonding in the yarn strand reduce the dust and fiber-fly formed during downstream processing. The productivity in the weaving and knitting plants increases. In addition, the product quality profits from the lower contamination by fly. With the further processing of the yarn, the typical ComforJet® yarn structure results in a higher moisture absorption. What is the consequence? With the sizing process, the concentration of the sizing agent can be reduced. When coloring, the same color intensity can be achieved with less colorant. Clear printing contours in the printing stage of ComforJet® fabrics are a result of the low hairiness of the ComforJet® yarn.

At the ITMA 2011, the ComforJet® yarn was put to the test on the stand of the company Santoni SPA. Practically no contamination by fly with the ComforJet® yarn - although the Atlas HS circular knitting machine was operating with 45 rpm at full speed.

High quality of the ComforJet® end product

ComforJet® yarns are very soft and voluminous. These properties lead to a visibly higher opacity and a very even fabric appearance. The fabrics are soft to the touch and are kind to the skin. The excellent pilling resistance is apparent in the washing cycles. Thanks to the unique Rieter piecing technology the ComforJet® piecings in fabrics and knits are not visible; an enormous quality improvement.

Who has not got annoyed when a new T-shirt has become warped and full of fiber knots - so-called pilling. ComforJet® textiles last longer. A soft touch, low pilling tendency, high dimensional stability - these are benefits of ComforJet®

yarn that consumers and garment manufacturers value.

Technology from the fiber to the yarn

Rieter is the only company to offer all 4 spinning processes from one source. For this reason, Rieter can recommend and supply to its customers the spinning system that is the most suitable for the required application. The market launch of the air-jet spinning technology demonstrated what influence the fiber and sliver preparation has on the yarn quality and productivity. More and more spinning plants are implementing the blowroom line, combing section and autoleveler draw frames from Rieter for the production of high-quality, fine sliver in order to achieve a higher efficiency with air-jet spinning.

The basic data of the J 20 at a glance.

Spinning Speed Up to 450 m/min, independent of fiber type, yarn count and end use. Yarn count Ne 30 to Ne 50. Spinning units 120

individually driven spinning units, 60 units per side, gauge 260 mm. Number of robots 4 robots, with piecer technology for invisible piecings

Drive Individual drive per spinning and bobbin unit, separate machine sides for the simultaneous production of 2 different yarns

Drafting Arrangement 4-over-4 drafting arrangement with patented traversing

Yarn USTER Quantum Clearer

clearer 2, optical or capacitive, with or without foreign fiber detection

Winding System Individually driven bobbin units for cylindrical bobbins up to 300 mm diameter.



Govt. Central Textile Institute, Kanpur ANNOUNCEMENT



GCTI 1962 BATCH GOLDEN JUBILEE CELEBRATION WILL BE HELD AT GCTI KANPUR ON 24TH NOVEMBER 2012 FROM 10.00 AM TILL DINNER. ALL 3 YEARS DIPLOMA HOLDERS, 4 YEARS DIPLOMA HOLDERS & DEGREE HOLDERS OF 1962 BATCH WITH THEIR SPOUSE ARE REQUESTED TO JOIN.

PLEASE CONTACT

SHRI K.K. AGARWAL (1962 BATCH),
C/O ALPS INDUSTRIES LTD,
57/2, SITE 1V, INDUSTRIAL AREA SAHIBABAD,
GHAZIABAD - 201 010 UP. INDIA
E-MAIL: kkgarwal@alpsindustries.com

Bhopal ITME Promotional Road Show 2012

The Textile Association (India) - Madhya Pradesh Unit jointly organized ITME Promotional Road Show 2012, in association with Spinner Club, MP Mills Stores Merchant Association and MP Textile Mills Association on 24-04-2012 at Bhopal.

Programme was inaugurated by Shri S. Pal, Head of Vardhman Group and lighting of tradition lamp was done by him along with S/s H.K Saluja (Head Nahar Group), Ashok Veda (President Spinners Club), Ravi Kumar (Head Bhaskar Group), N.S Nirban (President TAI MP Unit), Siddharth Agrawal (M.D, Sagar Manufacturing Pvt. Ltd.) and Shekhar Shrihankar (Joint Director Indian ITME Society).



Mr. Siddharth Agrawal (M.D Sagar Manufac.Pvt.Ltd.), Mr. H.K Saluja (Head Nahar Group), Mr. N.S Nirban (President TAI MP Unit), Mr. Ravi Kumar (Head Bhaskar Industries), Mr. R. Bachkaniwala (Chairman Indian ITME Society), Mr. Ashok Veda (President Spinners Club & MD Veda Group), Mr. Shekhar Shridhankar (Joint Director Indian ITME Society) lighting the lamp.

This program was attended by the dignities of various mills like Nahar Group, Anant Spinning Mills, Vardhman Fabrics, Bhaskar Industries, Sagar Group, and SEL Group etc. were present.

Mr. Ravi Kumar has thrown light on the benefit of ITME Exhibition. Mr. S. Pal explained how man

power problems can be attained in modern trend of man power shortage.

Mr. R.S Bachkaniwala highlighted the benefits of ITME for the Textile Industries in his speech. He explained that this time ITME will be better as compared to earlier held at Bangalore. ITME Society tried their level best to incorporate seminars, meeting of buyer and seller also other arrangements which are available in International exhibition.



Mr. H.K. Saluja welcome by R. Bachkaniwala.

Mr. Sidharth Agrawal M.D., Sagar Group, who has attended Spinner Club function for the first time, has informed that are putting up latest equipments for the Spinning Industries at TAMOT Village, near Obedullah Ganj.

Mr. V.K Jain (SEL Group) specially attended this program with his team. GATES Chennai regional manager Mr. Nilesh Mishra specially came to grace the occasion.

Program is very well followed by old songs and cocktail and Dinner and while giving thanks on behalf of ITME Society, Mr. Shekhar appreciated the efforts taken by Spinners Club team of Mr. Ashok Veda, specially Mr. Shrikant, Mr. Ravi and Spinner Club Secretary Mr. Ankit Veda. Program was conducted by Ms. Purvi Jain.

ITME Road Show at Indore

Spinners Club organized the Promotional Road Show on 12-05-2012 at SVITS College for textile students and Mr. R.S. Bachkaniwala addressed the students, Mr. Ashok Veda has given thanks to College Management people, Dr. V.P. Singh, Mr. T.K. Sinha and his team for nice arrangements.

In the evening, program was organized at Hotel Fortune Landmark, Vijay Nagar, Indore (MP) which began with welcome speech by Mr. Ashok Veda, President, Spinners Club & MPMSMA. He expressed that MP Textile scenario has been changed by big groups of India like Vardhman Nahar, SEL Group, Cotton County, Sagar Group, Trident Group etc. Chief Guest Mr. T.K. Baldua has delivered his speech and shared his views that how this exhibition will be helpful to all textile field as this exhibition takes place in India in every four years in which textile people get to know about latest & International textile technologies. Mr. R.S. Bachkaniwala, Chairman, Indian ITME Society explained that various countries of Europe and Asia and world famous Rieter, Marzoli, Zinser and all other big European manufacturers participating Indian exhibition.

Programme was inaugurated by Mr. T.K. Baldua, along with S/s Shantipriya Doshi (President Garment Association, Indore MP), Ashok Veda (President Spinners Club, India), M.C. Rawat (Secretary MP Textile Mills Association), C.P. Sukhlecha (Head Parasrampur International), N.S. Nirban (President TAI MP Unit), Shekhar Shridankar (Joint Director Indian ITME Society), V.K. Jain (Director SEL Manufac-

turing Co. Pvt. Ltd.), G.D. Rathi (MD Swatik Spintex) and Deepak Saxena (Chairman NTCMP & Unit Head of Burhanpur Tapti Mills).



Mr. Deepak Saxena (GMBurhanpur Tapti Mills)Mr Ashok Veda (President Spinners Club), Mr. T.K. Baldua (President MP Textile Mills Association), Mr. Shantipriya Doshi ji (President Garment Association Indore), Mr. R. Bachkaniwala (Chairman Indian ITME Society), Mr. N.S. Nirban (President TAI MP), Mr. G.D. Rathi

Mr. Shantipriya Doshi expressed that garment industries need Government help to come out to face the competition. During the function Mr. M.C. Rawat, Secretary MPTMA, Mr. R.C. Gupta, Chairman, TAI- MP, were honored by Indian ITME Society.

Various dignitaries of CLC Group, Pratibha group, Parasrampur, Dhar Textile, SEL Group, Chamunda Group, S.Kumars Ltd, Maral Overseas Ltd, Century Yarn, Century Denim & various senior people of Textile Industry were present.



Mr. Ashok Veda, Mr. N.S. Nirban, Mr. T.K. Baldua presenting Memento to Mr. R. Bachkaniwala

Besides this, various garment manufacturers, power loom Industrialist also graced the occasion. Famous economist Mr. J.L. Bhandari explained that India should accept the China challenge in near future. All speakers unanimously forecasted that, future of textile industry is bright.

Program was hosted by Ms. Harshita Jha & Vote of Thanks was given by Shri N.S. Nirban President TAI MP.

ITME Road Show at Nagpur

Indian ITME Society, Spinner Club, TAI Hinganghat Unit has jointly organized a road show cum seminar for the promotion of ITME 2012 on 28-08-2012 at Hotel The Pride, Nagpur, in which Mr. Prasant Mohota, MD, Gimatex Industries graced the occasion as a Chief Guest and Guest of Honor was Mr. N.K Batra from M.P Textile Mills Association & Head of Suryavanshi Spinning Mills, Mr. A.K Barik, President, TAI Hinganghat Unit, Mr. R. Bachkaniwala, Chairman, Indian ITME Society, Mr. Ketan Sanghvi, Ex-President, ITAMMA, Mr. Ashok Veda, President of Spinners Club & MPMSMA & Mr. Vikram Mishra Vice-President, Indorama Fibre has lightened the lamp.



Mr. Ashok Veda welcomed the entire Guest & illustrated the activities conducted by Spinner Club and also illustrated that more than 500

members have join the Club. He further told that Spinner Club is going to publish the Members Directory of Spinner Club during Indian ITME.

Mr. A.K Barik in his speech illustrated the development of Textile scenario, prevailing & further expectation in Vidharba & the country.



Mr. Batra has explained the benefit of ITME and told that everybody can't visit ITME abroad also told that one can meet their colleagues, friends, classmates and various textile dignitaries under one roof.

Mr. Prasant Mohota has illustrated the exhibition benefits in length. He was explained that such type of exhibition is beneficial in various fields. Mill owners should depute maximum delegates from their company so that knowledge of techno commercial people will be updated on world level.



Mr. R Bachkaniwala has explained that the INDIA ITME is the most important platform for every one associated with the textile industry which will take place from 2nd to 7th Dec. 2012 at Mumbai, India.

Showcasing textile technology machinery accessories and services by around 600 exhibitors from all over 42 countries and around 1,00,000 visitors.

During the function various Dignities and representatives of Raymond Mangrur Mills, RSR Mohota Mills, Visaka Industries, Suryamba Spinning Mills, Rana Denim, Indorama Fibre, Suryalakshmi Bhagirath Textile,

PBM Polytex, J.J Fine Spun Pvt. Ltd., Morarjee Mills, Br.Sheshrao Co-Operative Mills, GTN Textile, Purohit & Company, PEE VEE Textiles, Uniworth Raipur, Birla Cotspin, MRKPKSS Soot Girni graced the occasion.



During the function many lucky spinners were chosen by lucky draw and Indian ITME Society & Spinners Club honored them by memento.

Mr. Ketan Sanghvi Ex-President ITAMMA delivered vote of thanks. Program followed by Music, Cocktail and Dinner.

INDIA ITME 2012

Program Schedule from 2nd - 7th December, 2012



2nd Dec.2012	Inauguration Fashion Show (Only Exhibitor & Invitees)	11.00 a.m. 07.00 p.m.	Pearl Seminar Hall - ITME Square Pearl Seminar Hall - ITME Square
3rd Dec.2012	State Partnership Day Press Conference for State Govt. officials Technical Seminar Product Launch (6 Nos.) Guj. Cultural program & Dinner (by invitation only)	10.00 am-1.00 pm 2.00 pm-3.00 pm 2.00 pm-4.30 pm 3.00 pm onwards 7.00 pm onwards	Pearl Seminar Hall - ITME Square Turquoise B-2-B Room ITME Square Pearl Seminar Hall - ITME Square Pearl Seminar Hall - ITME Square Hotel Leela
4th Dec.2012	Technical Seminar B-2-B Meetings for visiting foreign delegates	10.00 am-1.30 pm 10.00 am-5.00 pm	Pearl Seminar Hall - ITME Square Turquoise B-2-B Room ITME Square
5th Dec.2012	ICT (UDCT) Seminar on Chemical Technology B-2-B Meetings	10.00 am-6.00 pm 10.00 am-5.00 pm	Pearl Seminar Hall - ITME Square Turquoise B-2-B room ITME Square
6th Dec.2012	B-2-B Meetings Farewell Dinner (by invitation only)	10.00 am-5.00 pm 7.00 pm onwards	Turquoise B-2-B Room ITME Square Hotel Leela
7th Dec.2012	Closing Day		

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business share through JTA**



FICCI- RICCO announced "VASTRA"-2012- An International Textile Trade fair with a support of ITAMMA



FICCI in association with RICCO and Ministry of Textiles, Govt. of India & supported by ITAMMA organized a Road Show to Promote Vastra 2012 at Mumbai on 17 July, 2012.

Vastra 2012 is an International Textile and Apparel Fair taking place in Jaipur on 22-25, November 2012. Among the key speakers present were doyens of textile industry. Mr R.L. Toshniwal, Chairman and MD of Banswara Syntex Ltd, Mr. Rajendra Bhanawat, IAS, Managing Director, RIICO Ltd. More than 100 businessmen from textile industry attended the event.

"VASTRA"-2012 is planned to highlight business opportunities and provide opportunities for exploring avenues for new business relation, joint ventures, strategic alliance and partnerships worldwide. It promises to showcase the best and latest in textiles from - Fibre to Fashion.



The man helming the affair at Jaipur FICCI office Mr. Gyan prakash mentioned the highlights of the fair. He said "The event will see the pool of 500 buyers from various market across the world and domestic market which is one of the biggest flow of buyers ever". He

also mentioned that to act as catalyst in increasing the business 15 B2B meetings will be organized on a daily basis.

Adding his views on the occasion Mr Rajendra Bhanawat, IAS, managing Director, RIICO Ltd. said that "This fair will be an ideal opportunity for textile businessmen to network and increase the array of their business. Apart from this we are going to provide high tech facilities in 4 days fair to make things easier for businessmen."

In his welcome speech Mr. C. R. Ghia, President, ITAMMA said that ITAMMA, being an oldest and largest Association in India representing Textile Engineering Industry, has always taken initiatives for the benefit of its members and Textile Engineering Industry as a whole, in the field of knowledge enriching and business growth. Knowing the importance of User Industry, ITAMMA had taken initiatives in involving them actively in our various activities like -



(i) Circulation of our Quarterly Magazine, "News & Notes" having 3000 complimentary circulation, covers more than 2000 of representatives of User Industry.

(ii) Working jointly with FICCI as a supporter for VASTRA Exhibition and on series of Seminars in the coming months with SIMA in Texfair.

ITAMMA will be working jointly with CITI as a promoter member of the Sector Skill Council for Textile Industry set up by CITI for imparting training under Skill-cum-Development Programmes known as "Adding to the Skills" which is an exclusive training programme developed by ITAMMA.

VASTRA 2012 is planned to highlight Business Opportunities and provide opportunities for exploring avenues for new business relation, joint ventures, strategic alliance and partnerships worldwide. It will provide a platform for interaction with FOREIGN BUYERS through pre fixed B2B meetings and also interaction with experts and R & D labs for solutions in latest designs & trends besides textile technology.

Mr. Ghia invited his member friends of ITAMMA to participate in the VASTRA 2012 to be held at EPIP, Sitapura, Jaipur, India from 22nd to 25th November, 2012 and also informed that a special discount is offered to ITAMMA members by the organizers as ITAMMA being a supporter to this Event.

Texttreasure

Don't ask what the world needs. Ask what makes you come alive and go do it. Because what the world needs is more people who have come alive.

- Howard Thurman

French Textile Machinery at INDIA ITME 2012 Indian-French partnership

"India is a major player in the textile industry", says Bruno AMELINE, the Chairman of the French Textile Machinery Manufacturers' Association. He adds "We have already very good customers whom we consider our partners, but the Indian textile industry needs an urgent modernization which will be implemented, may be with some delays, with the support of the Technology Upgradation Fund Scheme (TUFS) put in place by the Indian government."

The French machinery manufacturers know quite well the market thanks to local representations; seminars organized regularly, the latest being in 2007 and 2010 in Delhi, Ludhiana, several times in Mumbai and the next seminar to be held in 2013. INDIA ITME is a major event and the French machinery will again be active there in December 2012.

"Our goal is always to create new opportunities for direct personal contacts with our customers, try to analyze and understand their needs and design technical solutions for enhancing their competitiveness. We are not working with a short term strategy, our commitment is a long term one" says Evelyne CHOLET, the Association Secretary General.

Let's remember that the French textile machinery has played a particularly important role in the historical development of the textile industry and is continuing to do so as it will be seen at next INDIA ITME. In particular, think about the illustrious name of JACQUARD, the

French inventor of the most sophisticated weaving technology!

For the long fibre spinning industry: new techniques to improve dramatically the quality standards, the operating and maintenance costs, and on line quality controls. The innovating range includes the design of complete lines.

For the twisting and texturing of yarns: the opportunity to develop high-tech yarns for traditional and technical applications Jacquard machines and dobbies developments make feasible spectacular increases in the speed of the production processes together with higher quality and more reliability.

Dyeing : consistency improvements together with energy and water savings. In new sectors of the textile industry like the nonwoven processes the French machinery is also at the pinpoint of innovation.

Recycling the textile materials at the end of their life cycle and transform them into new products, being environmentally friendly, is also an issue on which the French machinery manufacturers are among world leaders. French machinery manufacturers are less and less offering standard machines but, more and more, tailor made solutions designed with their customers and partners to enable these customers to introduce new products with high added value and compete successfully in their own national market and in the open world.

The following French companies will exhibit at INDIA ITME and will welcome visitors to study their

projects and offer innovative solutions.

More information can be found on the website: www.ucmtf.com

NSC Fibre To Yarn HALL 1 - STAND H7

Long staple fibre processing technology

NSC Fibre To Yarn is a world leader in fibre textile machinery including such well-known brands as N. Schlumberger, Sant' Andrea Novara, Cognetex and Seydel. It has over 25,000 of its machines currently operating around the world.

NSC Fibre To Yarn continues to develop and propose an innovating product range including

- ◆ complete spinning lines of the long fibres process
- ◆ combing
- ◆ tow to top
- ◆ recombining
- ◆ worsted spinning preparation
- ◆ semi-worsted units
- ◆ hard fibre combing and spinning.

The contribution of all the machines is economically essential according to 4 points of view

- ◆ high Production.
- ◆ high level of product quality
- ◆ energy consumption: Equipment with economic motors.
- ◆ reduced consumption of spare parts owing to a new design of kinematic.

NSC Fibre To Yarn makes it a point of honour to remain continuously aware of its numerous Indian customers who help him to improve the machinery.

LAROCHE HALL 1 - STAND H7

Opening- Nonwoven technologies- Recycling

In the textile industry, each opera-

tion of the complete cycle, from fiber preparation to garment making, generates substantial amounts of waste. In the past 20 years, LAROCHE has been deeply involved in the scientific development of the textile waste recycling technology, achieving great progress and helping discover new applications for better and cheaper products taking care of the serious environmental problems and the shortage of raw materials.

At INDIA ITME 2012 Laroche will display

- ◆ JUMBO tearing lines with improved throughput and special devices for the recycling of post-consumer clothings and carpet waste.
- ◆ New "FLEXILOFT plus" Airlay technology with improved web uniformity and weight range. The LAROCHE Airlay can run all types of fibers (synthetics, natural, recycled...) and blends of fibers and solid particles (foam chips, plastics, wood chips) which allow to make smart products from renewable resources and from waste that are otherwise discarded.
- ◆ New MINITRIM HSP 400 (high speed) edge trim opening machine LAROCHE will also present its latest innovations in:
 - ◆ high precision fiber dosing and blending lines
 - ◆ decortication lines for bast fibers (Flax, Hemp, Kenaf...) allowing gentle fibre opening and cleaning with a low processing cost
 - ◆ A new concept for flame retarding of cellulosic and recycled fibers

STÄUBLI HALL 5 - STAND P1

Shedding systems: cam, dobbies, Jacquard

STÄUBLI will exhibit a cross-section of its most modern textile machinery range including electronic dobbies and Jacquard machines, harnesses, and weaving preparation systems. Group member SCHÖNHERR carpet systems will show its exclusive carpet samples - produced on ALPHA 400 series carpet-weaving machines, and Group member DEIMO will present state-of-the-art electronic control solutions mainly for textile machinery.

On the booth one can see two fully operational weaving machines with Stäubli Jacquard machines, an air jet weaving machine producing terry towel with the new Stäubli Jacquard machine type SX, and a rapier machine with Jacquard machine LX1602 producing upholstery fabric. The newly developed generation rotary dobby type S3060/S3260 with its evolutionary new locking system allows higher running speeds and superior reliability. It will be shown on a combined demonstration unit with a pair of name selvedge Jacquard machines type CX172 on each side of the fabric.

Two types of warp tying machines are on show: new MAGMA T12 - ideally suitable for medium to coarse yarn types, and for tying technical fabrics - and proven TOPMATIC for a wide yarn range down to the finest filaments, both machines equipped with double-end detection systems.

ALLIANCE MACHINES TEXTILES HALL 6 - STAND R26

Piece dyeing

As ever: more air, less water in piece-dyeing technology and for INDIA ITME more versatility. ALLIANCE MACHINES TEXTILES, the French piece dyeing manufacturer, well-known for machines using less and less water, will present in Mumbai a complete new machine using the air technology. ALLIANCE will be present on booth of its Licensee EXOLLOYS. ALLIANCE will show the new model of its well-known RIVIERA ECO+ which allows the best performance in terms of liquor ratio and versatility. RIVIERA ECO+ GREEN is using air only to move the fabric at each revolution, just before fabric will be in contact with the liquor. This system avoids creases, especially on delicate fabrics. Air is used only to take the pleats of fabric out; air is not used to transport the fabric. In these conditions, less power is used (for example only 3 KW for one tube machine). The movement of the fabric is gentle, the surface of the fabric is protected and fabric is dyed without pilling.

Many customers in Europe, Morocco, Tunisia, Brazil, Turkey and now in INDIA are dyeing high quality viscose lycra (without creases and with a perfect surface aspect) in a liquor ratio of 1: 3 (for example for a 2 tubes machines about 400 kgs of fabric are dyed with only 1 000 Liters of water). Total liquor ratio on viscose lycra from beginning to end of dyeing is 25 liters per 1kg of fabric. A one tube industrial RIVIERA ECO+ GREEN will be shown on the booth.

CALLEBAUT DE BLICQUY HALL 6 - STAND V19

Beaching and dyeing of fibres

Facing globalization, environmental and economic challenges, and to cope with textile market new re-

quirements, Callebaut de Blicquy (CDB) will introduce at INDIA ITME their latest improvements in dye-work management optimization:

- ◆ On laboratory level, with CDB specific device for "online" colour measuring, integrated to the dyeing machine or any other equipment requiring it, and with their own lab equipment allowing both process optimization and significant production cost savings.
- ◆ On industrial level: CDB will introduce their latest developments in machines for economical and ecological Very High Density bleaching and dyeing of loose stock fibres, tow and bumps (up to 700 kg per cubic meter for acrylic or polyester tow and more than 350 kg per cubic meter for loose cotton fibres), allowing huge savings in water, steam and ingredients consumption, and so providing the most competitive cost prices (up to 25% cost price reduction). CDB will also offer their latest developments dealing with bobbins, hanks, ribbon and ready-made article dyeing, with Space Dyeing as well, and propose you pertinent solutions for partial or full water recycling and for effluent treatment.

ROUSSELET-ROBATEL HALL 6 - STAND V19

Centrifugal Hydro extraction

Centrifugal hydro extraction is still the most economical way for pre drying - and in some specific cases - drying all textile products and materials after bleaching, dyeing, washing, recycling and any other wet treatment.

Rousselet Robatel, as the centrifuge specialist, will introduce at INDIA

ITME the latest version of their continuous hydro for loose stock fibres, which is well known for allowing significant energy and cost savings at the level of the dryer in cotton bleaching and fibres dyeing continuous lines. Thanks to a new complete opening lid, basket accessibility is highly improved and centrifuge cleaning operations are easier, so increasing its flexibility to suit with regular product or colour changes.

On another side, Rousselet Robatel once more extended their particularly wide range of batch centrifugal hydro extractors with a laboratory centrifuge with a 120 mm diameter basket for very small sample processing, proposing now extractors with baskets from 120 mm up to 2 meters.

DOLLFUS & MULLER HALL 6 - STAND U37

Textile finishing Endless Felts and Conveyor Belts

Dollfus & Muller has been manufacturing felts and belts for more than 200 years. They will present at INDIA ITME 2012, their spare parts such as

- ◆ compacting felts for knit finishing
- ◆ printing dryer belts for printing
- ◆ sanforizing felts for denim and woven fabrics finishing
- ◆ decatizing felts for wool finishing
- ◆ satin wrappers for wool finishing
- ◆ tensionless dryer belts for knit finishing

Dollfus & Muller will introduce at INDIA ITME its new compacting felt for knit finishing with major evolutions compared to existing products in order to serve better the dyeing houses. The new compacting felt quality brings a special care to the

fabrics thanks to its smoothest surface, an excellent guiding and the best compacting rate in relations with a new exclusive design.

Furthermore, Dollfus & Muller will display its durable printing dryer belts. In many Asian countries, many printers of fine fabrics, scarves, flags are using the Dollfus & Muller printing dryer belts for their non-marking surfaces which can avoid as well the particles on the back side. Dollfus & Muller offers also the widest range of printing dryer belts and the strongest dryer belts for pigment bed linen producers. Finally, Dollfus & Muller will display its proven durable sanforizing palmer felts ideal for denim producers, heavy weight, shirting or bid linen fabric manufacturers. The well-known two hundred years old company is recognised to manufacture the more durable and the best water absorbent sanfor felts.

AESA Air Engineering HALL 2 - STAND 36

Air Engineering / Humidification system for textile factories

AESA Air Engineering, the leader in the field of industrial air conditioning, provides reliable solutions for textile air engineering, industrial ventilation & air conditioning as well as dust filtration, waste removal & collection in the textile, paper, tobacco and food industries. Whatever specific air engineering requirements may be, AESA Air Engineering has time tested solutions. With its Asian offices in India, China and Singapore and a network of agents, AESA combines the dynamism, rigor and experience of European and Asian engineering teams, offering the most advanced solutions, with competitive equipments. Taking its roots from 4 famous companies (Ameliorair / Air Industrie /

LTG Air Engineering/ Kenya), AESA has the experience of more than 10,000 installations running worldwide. AESA has a full range of self developed proprietary equipments and the capacity to solve any technical problem with the most appropriate solutions.

AESA is specialized in spinning, weaving, man made fiber air condi-

tioning and waste removal systems. For any given fiber like cotton, rayon, polyester, blended, wool, acrylic, fiberglass, AESA supplies complete system in order to maintain the adequate condition of temperature and humidity in a clean environment in accordance with international standards. Supplying fully automatic system using the best fil-

tration and waste collection system, AESA is leader in many countries for air conditioning in textile factories. Aesa design is focusing on optimizing the added value for clients in term of precision, reliability, waste management and energy saving solutions.



JS HUMIDIFIERS - HAPPY 30th ANNIVERSARY

Textile humidification specialist, JS Humidifiers, is celebrating 30 years in business having started solving dry air problems for textile manufacturers back in 1982. From manufacturing and selling the JetSpray humidifier to an individual industry, JS now distributes one of the World's widest ranges of humidification equipment to over 50 industries in more than 80 countries.

Rik Prowen, Operations Director at JS, comments "Taking JS from a one-product, one-industry business to being a global leader in humidification, with exports all over the world, has been challenging but continues to be great fun.

"I believe we've done a good job in raising the profile of humidification by setting high product and service standards, which have benefited our customers and the industry alike. We hope that our customers, suppliers and staff have all been as pleased to work with JS as we have been to work with them over the last 30 years."

30 years on and the company now directly employs over 65 staff in the UK, has 25 international distributors, an annual turnover of around £9.5M and in 2011 became a Mem-



L to R: Rik Prowen, Operations Director, Tim Scott, Sales & Marketing Director, Tony Fleming, Technical Director, Steve Verney, Managing Director, Jackie Verney, Mike Verney, JS Air Curtains Sales Director

ber of the Walter Meier Group. This relationship made JS part of the World's largest network of humidification specialists and expanded its product range further to include the Condair, Draabe and ML System brands.

Steve Verney, founder and Managing Director at JS, comments, "JS' success has always been based upon an innovative and forward thinking philosophy of developing new products and expanding into different markets. Over the last 30 years, as well as helping to maintain a productive textile manufacturing environment in mills across the World, JS has also kept printing presses rolling, improved the

testing of Formula One engines, maintained healthy working atmospheres in offices, preserved works of art in Buckingham Palace and kept flowers fresh in the deserts of Dubai.

"JS is proud to have helped advance manufacturing efficiencies in a multitude of industries and in so doing developed more hygienic, lower energy, more environmentally and maintenance friendly humidification equipment. We are looking forward to continuing to meet our customers' needs for the next 30 years and are excited about developing new opportunities, such as adiabatic cooling with cold water humidifiers."



Seminar on Investment Potential in Technical Textile Machines & Accessories

Indian Textile Accessories & Machinery Manufacturers' Association (ITAMMA) organized a Seminar on "Investment Potential in Technical Textile Machines & Accessories" on 17th Sept. '12 at Ghia Hall, Mumbai.



Mr. N.D. Mhatre, Dy. Director General (Tech.), delivering the Introductory Remarks

Mr. N.D. Mhatre, Dy. Director General (Tech.), ITAMMA, in his Introductory Speech stated that the applications of Technical Textiles have gained huge markets in Western countries. However, we have still to go a long way. Initiatives have been taken by Ministry of Textiles, Government of India, through TUF Scheme, Centre of Excellence, Seminars and Awareness Programmes. But, all these initiatives have been towards product development and testing. He stressed that if we wish to support the TEI of India to come out with new development/Converter Machines, etc., in this field, then the encouragement needs to be made to provide a good infrastructure with a backing of excellent R&D as well as the transfer of technology/collaborations/tie-ups should be encouraged with certain benefits. He also mentioned that it will be wise to have a healthy competition

by inviting and appreciating the technologies available overseas for their implementing through applied research and collaboration/tie-ups, etc.



A view of Audience at the Seminar

He mentioned that many a times we are not able to avail the cent percent utilization of the Hi-tech gadgets, metres, inspecting instruments, etc. in-built in these imported machines due to our environmental conditions and our manpower set up in these industries and so we go for tailor-made developments. Thus, in this case the tie-up and collaborations will provide a win-win situation to both the manufacturers overseas and Indian. Considering this scenario, ITAMMA and FICCI has taken a very small initiative for the Indian TEI to boost them to come in this field of functional and engineered textiles. He mentioned that after this seminar we will be having a detail interaction of the member-manufacturers of ITAMMA and the overseas machine manufacturers for collaborations/tie-ups; as well as interaction of Indian manufacturers of Technical Textiles to work out their requirements through Tri-party Projects, where ITAMMA being executing a role of Catalyst.



Mr. Chetan R. Ghia, President, ITAMMA, delivering the Welcome Speech

Mr. Chetan R. Ghia, President, ITAMMA, in his Welcome Speech informed that ITAMMA being an Association of Textile Machinery & Accessories Manufacturers has always taken initiatives for the benefit of its members and of Textile Engineering Industry as a whole. Considering the scope for the indigenous Machine & Accessories manufacturers for manufacturing of converting units / assemblies / machines to produce Technical Textile products, ITAMMA has made an attempt jointly with FICCI to organise this Seminar. The main focus of the Seminar will be to create a Scope of Business & Investment opportunity to the Industrialists through Know How Transfers, Collaborations, Tie-Ups, etc. in the field of Engineered Textiles.



Mr. Mohan Kavrei, CMD -Supreme Nonwovens Guest of Honour, giving his Inaugural Speech

Mr. Mohan Kavrei, CMD - Supreme Nonwovens, in his Guest of Honour Address gave a Power Point Presentation giving the difference be-

tween Woven and Non-Wovens, their manufacturing process, the technologies involved; where he covered technologies like Needle Punching, Hydro Entanglement (Spunless), Stitch Bonding Fabrics, Chemical Bonding, Calender, Thermal Bonding, Hot Air Thermo Bonding and Finishing Lines. He also gave the role of different Physical and Chemical Finishes in improving the Filter Media characteristics, the processes of Singeing, Calendering and Coating as well as the applications of Non-Wovens were covered by him in detail. Few applications which he mentioned were Dust Remover (Dry Filtration), Filter Bag manufacturing, Apparel & Fashion industry, Geo Textile applications like Filtration, Separation & Erosion Control and Automotive products like Floor Carpets, Head Liners, Engine Air Intake Filter Media and other products like Carpets, Insulations, etc. The applications of Non-Wovens in Horticulture, Hygiene, Shoes, Curtains, Decorative were also covered in detail.



Vote of Thanks at the Inaugural Session by Ms. Piya Singh, Director, Western Regional Council, FICCI

Ms. Piya Singh, Director, Western Regional Council, FICCI, delivered Vote of Thanks during the Inaugural Session.



Mr. A. Muruganantham, CEO, Jayaashree Industries, making presentation

Mr. A. Muruganantham, CEO, Jayaashree Industries, Chennai, through his Power Point Presentation involved the participants very lively through his heart catching story, involving him in the Research of this Innovation.

Mr. A. Muruganantham is one Indian social entrepreneur, who has given an opportunity to the women from low income groups in India, to afford to buy sanitary towels and provide them with an income at the same time. From a poor background in the South of India, he created the world's first low-cost machine to produce sanitary towels. According to a report by market research group AC Nielsen, "Sanitary Protection: Every woman's Health Right", 88% of women in India are driven to use ashes, newspapers, sand husks and dried leaves during their periods. As a result of these unhygienic practices, more than 70% of women suffer from reproductive tract infections, increasing the risk of contracting associated cancers.

Muruganantham re-engineered a sanitary machine and in 2006 it won the award for the best innovation for the betterment of society from the Indian Institute of Technology, Chennai. Plus, he also received an Indian Presidential Award for innovation. Currently more than 600

machines made by his start-up company, Jayaashree Industries, are installed across 23 State in India. This social entrepreneur sells @ Rs.80,000 to Rs.1 Lakh machines directly to rural women through the support of bank loans and not-for-profit organizations. A machine operator can learn the entire towel making process in three hours and then employ three others to help with processing and distribution.

Muruganantham says, "Setting-up 1,00,000 units making India as 100% sanitary napkin using country from current level of only 2% in rural also it will generate employment for one million women. No one is bothered about uneducated and illiterate people. Through this model, they can live with dignity".

The participants were impressed by the cause of the innovation he made and applauded him.



Mr. Rahul Bansal, DGM-Marketing & Business Development, Birla Cellulose (Grasim Industries Ltd.) making presentation

Mr. Rahul Bansal, DGM-Marketing & Business Development, Birla Cellulose (Grasim Industries Ltd.), gave the details about the Non-Wovens, applications of Non-Wovens, Wipes, benefits of a disposable Non-Woven Wipe, Stakeholders in Non-Woven Wipe product change and the global disposable Non-Woven Wipes market. It was mentioned that the contribu-

tion of Non-Woven Wipe is mainly in North America up to 42% while only 6% in the rest of the World. He also mentioned that in 2010 in terms of MRP sales value, the market for this product was Rs.40 crores while in 2011 it reached to Rs.60 crores and it is expected to cross Rs.75 crores in 2012 and Rs.100 crores in 2013. He also gave the details of present Indian Non-Woven Wipe market also giving the details of Non-Woven Wipe product machine suppliers of various countries. In regard with investments, he mentioned the requirement of Capital Investment of about Rs.50 lakhs to Rs.5 crores which may give a turnover of Rs.25 to 30 crores and will require about 2000 sq. ft. area. He also mentioned that the Dry Wipe machines will require only a small investment of Rs.2 to Rs.10 lakhs. He also gave the detail options of selling Wipe products.



Dr. Prabhakar Bhat, Principal, GH Rasoni Institute of Engineering and Management, making presentation

Dr. Prabhakar Bhat, Principal, GH Rasoni Institute of Engineering and Management, Jalgaon, in his informative presentation gave the current status of Technical Textile Industry in India along with its reason for not picking up in India. He also stressed on indigenous machines manufacturers to go for manufacturing of Convertor Machines; where he further explained the details about the Convertor Ma-

chines by giving various examples of convertor products in the field of Medical Textile, Hygiene, Wipes, Scrubs, Packaging and Disposables. Touching the important aspects of the Seminar, he gave guidance on investments for the manufacturing of spares / machines, where he said that scope is very limited for spares. However, investments on machines will be comparatively better. While the number of machines are less and further they are mainly coming from China and Europe. The market progression in regard with disposables and durables in different countries including India were highlighted by him; where he stated that, in India the consumption of durables in 2012 has recorded to be 70 tonnes as compared to only 12 tonnes of disposables; where the ratio of the same is vice versa in other countries. It was also suggested by him that tomorrow India may shift over from durables to disposables and so the demand for manufacturing these machines will increase. He also gave in detail the Techno-Commercial aspects regarding the market size, growth rate, plant cost, etc., in various convertor products as mentioned above. The potential for Sanitary Napkin machines was also explained in detail giving the information on its requirement as per the Indian population which was mentioned to be 69225 million pieces per year demanding 546 machines considering 25% of its usage. It was mentioned that the present price of such machine is above Rs.1.5 crores.

However, simple, slow speed, low cost and reliable indigenous machines can be manufactured up to Rs.25 lakhs. In the same way the potential in the manufacturing of machines for Baby Diapers and Wet

Wipes was also informed by Dr. Bhat. Dr. Bhat advised to go for machines manufacturing Sanitary Napkins, Baby Diapers and Wet Wipes (having scope of 50 machines in next 5 years by substituting existing imported machines costing Rs.1 crore to indigenous make machines worth Rs.10 lakhs).



Mr. Arvind Shah, Managing Partner, Arvind Agro Industries, making presentation

Mr. Arvind Shah, Managing Partner, Arvind Agro Industries, gave the details about the concept of Banana Silk and technology involved in producing fibres from banana stem. He also gave the detailed technical specifications of these products and said that the existing extracting machines are costing Rs.4,000/- to Rs.5,000/- having a capacity of manufacturing 10 kg. per shift of the banana fibres. He also gave the details of the advantages of these fibres which is eco-friendly, natural, degradable, stiff, very thin

Textsmile

A student is talking to his teacher.

Student: "Would you punish me for something I didn't do?"

Teacher: "Of course not."

Student: "Good, because I haven't done my homework."

having 40-50 denier, very light weight where 1 metre of cloth is weighing only 70 gms, not requiring starch and has a good water proof quality and is generated every year but is cheaper than cotton. However, he also mentioned some of the disadvantages like it is not absorbing sweat, having original permanent colour, gets cut at pressing age after some use and having short fibres. Various different uses were also mentioned by him including Ropes, Shabnam Bags, Wall Hangings and Decorative Handicrafts. He gave detailed figures of its production in hectare during the year 2010-11 which recorded 2,95,700 hectare all over India; where the contribution was on the highest from Andhra Pradesh and Kerala. He gave a detailed Techno-Commercial working of the production of banana silk where it was mentioned that 3000 bushes grow per hectre, 1 bush

weighing about 6 to 15 kg. depending on its height, variety and growth, giving 1 kg. fibre and 200 gms. waste and estimating to produce 3 metric tones fibre per hectre and achieving it to 9 lakhs metric tones yarn per year. He mentioned that based on these equations there is a scope of coming up of 40 to 50 yarn making industries per year and if the technology to obtain fibre from leaf is developed then the production is estimated to be doubled.

He also mentioned the scope of extracting good permanent dye from the banana stem juice up to a level of 3 to 4 kg. per stem and gave a complete estimate of industrial development potential at all India level; where it was mentioned that a motorized fibre extractor machine needs to be developed having a production of extracting about 9 lakh metric tones. Thus, giving a demand

of 60,000 such machines with an involvement of 60 industries. It was mentioned that involvement of Raiper Looms, Warping, Dyeing, Colouring and Packaging will be having a good scope. He also added the information of two new fibres such as "AGAVE-GHAYAPAT" & AMBADI: HIBISCUS-CANNABINUS.



Mr. Diven Dembla, Second Vice-President, ITAMMA, delivering Vote of Thank

Mr. Diven Dembla, Second Vice-President, ITAMMA delivered Vote of Thanks by summing up the Session.

ITMF Annual Conference 2012 (Hanoi / Vietnam, November 4-6)

"Challenges for the Global Textile Industry - Present and Future"

The ITMF Annual Conference 2012 will be held in Hanoi/Vietnam from November 4-6, 2012. The theme of the conference "Challenges for the Global Textile Industry - Present and Future" reflects the fact that the global textile industry faces a very difficult business environment. Volatile raw material markets, sovereign debt crises, currency disputes, political instability in some regions, a blocked Doha-Trade-Round, looming protectionism, growing world population, demographic changes, climate change, ... these are just a few of the short- and long-term challenges that the world economy is confronted with and which have far reaching implications for the global textile value chain. More than 20 high level experts from around the world covering relevant as-

pects along the entire textile value chain - from fiber to retail - will present their analyses and views during the ITMF Annual Conference 2012 in Hanoi. Some of the topics that will be discussed during the conference are:

- ◆ Global Cotton and Textiles: Friends or Foes?
- ◆ Review of Global Demand for Chemical Fibers
- ◆ Making a Difference in the Textile and Apparel Industry
- ◆ How to Do Business in Times of Uncertainty and Volatility
- ◆ Vietnam's Textile and Apparel Industry on the Rise
- ◆ Sustainability in the Textile Supply Chain - A Chemical Company's View
- ◆ Cotton in the World's Supply Chain: Now and into the Future

- ◆ From Fiber to Retail - How to Handle the Textile Supply Chain
- ◆ Global Changes in Clothing Consumption by 2020 and their Impacts
- ◆ China's Role in a Globalised Textile Industry - Today and Tomorrow
- ◆ The Global Textile Machinery Market Situation
- ◆ Old and New Retail Market
- ◆ Technical Textiles for Infrastructural Applications in Asia
- ◆ Challenges and Opportunities for Nonwovens - Global and Regional Market Trends

More information about the upcoming ITMF Annual Conference 2012 in Hanoi can be found on the ITMF-website at www.itmf.org. For any further question, please contact secretariat@itmf.org.



Oerlikon Saurer, Allma Product Line, at CINTE 2012

Asia's top biennial trade exhibition for technical textiles and nonwovens will take place from 22 to 24 October 2012 in Shanghai. Oerlikon Saurer, Allma Product Line, will be there to welcome customers and interested visitors to its stand and inform them about the latest news in the production of tire cord and industrial yarns.

Allma TC2 - Opening up new markets for technical yarns

The new two-for-one twisting machine Allma TC2 is characterized by its worldwide unique productivity of up to 450 m/min delivery speed, previously not achieved on the market. The machine concept offers ultimate flexibility in production, material and yarn counts. The Allma TC2 features a totally newly developed spindle concept allowing for individual settings for each individual spindle. Customers can thus quickly react to market requirements and even the smallest lots or samples can be economically produced. Fine and coarse material such as PES, PA, CV, AR, PP and PE can be processed on Allma TC2 in a broad yarn count range, offering customers new yarn constructions and product possibilities.

In addition, the new Allma PrimePac twist packages provide up to 25 percent higher package density compared to packages wound on other twisting machines. Customers can count on better unwinding properties, longer lengths for further processing and reduction of work involved in packaging.

Allma CC4 - The energy-saving miracle

The award-winning direct cabling machine Allma CC4 is revolutionizing the tire cord cabling market with energy savings of up to 50 percent. For manufacturers, these are great cost savings in production. Further advantages of Allma CC4 include up to 50 percent fewer thread breaks and a considerably reduced noise level.

In addition, Allma engineers have now developed an energy-saving retrofit package for the Allma CC3 for existing machines. With an easy to install conversion unit the cabling machines can be set to energy-save modes, thus allowing customers to reduce costs enormously.

Allma CC3-Combi - Ultimate flexibility

With the Allma CC3-Combi, tire cord, cap ply, chafer or other technical yarns can be cabled or twisted as required. The Allma CC3-Combi uniquely meets the needs of the entire tire cord market with a universal machine. Using combined spindles the machine can be employed not only for cabling but also for two-for-one twisting and can be specially adapted to the production plan and customer requirements. Changing to the other production process requires just a few easy steps. The take-up speed of 120m/min also guarantees maximum productivity for the two-for-one process.

About Oerlikon Saurer

Oerlikon Saurer with its product lines Saurer, Allma and Volkmann is a Business Unit in the textile segment of the globally successful technology group OC Oerlikon. The

product line Saurer located in Arbon (Switzerland) is the world's leading partner for high-quality shuttle embroidery machines, innovative embroidery software and a wide range of accessories. The product lines Allma (Kempton, Germany) and Volkmann (Krefeld, Germany) are the leading international suppliers of two-for-one twisting machines, cabling machines and ring twisting machines for tire cord, industrial yarns, all staple fibre yarns, carpet yarns and glass filament yarns.

About Oerlikon

Oerlikon (SIX: OERL) is a leading high-tech industrial group specializing in machine and plant engineering. The Company is a provider of innovative industrial solutions and cutting-edge technologies for textile manufacturing, drive, vacuum, thin film, coating, and advanced nanotechnology. A Swiss company with a tradition going back over 100 years, Oerlikon is a global player with more than 17 000 employees at over 150 locations in 38 countries and sales of CHF 4.2 billion in 2011. The Company invested in 2011 CHF 213 million in R&D, with over 1 200 specialists working on future products and services. In most areas, the operative businesses rank either first or second in their respective global markets.

Texttreasure

Be more concerned with your character than your reputation, because your character is what you really are, while your reputation is merely what others think you are.

- John Wooden



SRTEPC sets challenging target of US\$ 7 billion for the year 2012-13

The ambitious target of US \$ 5.5 billion set by the Council for the year 2011-12 was not only achieved but surpassed informed Shri Vinod K. Ladia, Chairman, The Synthetic & Rayon Textiles Export Promotion Council while addressing the Annual General Meeting in Mumbai on 10th September 2012. The Chairman said that despite the difficulties faced by Indian exporters in the overseas markets and unfavourable situation at home, exports of Indian man-made fibre textiles touched Rs.26974 crores (US\$ 5699 million) during 2011-12 registering a growth almost 19%. Encouraged by the performance the Council has set a challenging target of US\$ 7 billion for the year 2012-13, said Shri Ladia.



Shri Vinod K. Ladia, Chairman, SRTEPC addressing the Annual General Meeting

The Chairman noted with satisfaction that exports of man-made fibre textiles during 2011-12 were directed to over 140 countries around the globe and Pakistan with Rs.2341 crores had emerged as the leading market for Indian man-made fibre textiles followed by United Arab Emirates and Brazil.

Talking about the promotional programmes the Chairman said that there has been substantial increase in exports of our items to those destinations where the Council organized promotional programmes such as Saudi Arabia, Kuwait, Co-

lombia, Ecuador and Bangladesh.

The Chairman informed that the highlight of the promotional programmes during the year 2011-12 was the INTEXPO Malaysia, the biggest ever Exposition of Indian textile and clothing in the ASEAN region organized during November 2011 in which nearly 100 companies participated. The event was organized in the wake of the signing of India Malaysia Comprehensive Economic Co-operation which opened up a myriad trade opportunity for both the countries. INTEXPO Malaysia was jointly inaugurated by the Hon'ble Minister of International Trade & Industry, Dato' Sri Mustapa Bin Mohammed and Hon'ble Union Minister of State for Textiles, Smt. Panabaaka Lakshmi. The Hon'ble Malaysian Minister of International Trade & Industry appreciated the initiative taken by the Council in organizing INTEXPO and hoped that it would go a long way in establishing Malaysia as a textile hub in the ASEAN region.

Speaking on the promotional programme during the year 2012-13, the Chairman said that the landmark event of the year would be the INTEXPO in Pakistan which is being organized by the Council in Karachi and Lahore during October 2012. He further stated that Pakistan has emerged as the leading market for Indian man-made fibre textiles and the Exhibition would provide an excellent opportunity to further strengthen trade ties with our immediate neighbour. He further averred that INTEXPO Pakistan is being organized with the active support of the High Commission of India in Pakistan and the

Karachi and Lahore Chambers of the Commerce & Industry and Trade Development Authority of Pakistan.

Dwelling on the policy matters the Chairman said that there is need for urgent stimuli by way of Policy support from the Government and the Council has suggested some of the urgent measures to be taken in this regard to the Government including the Hon'ble Union Minister of Commerce and Textiles.

The Chairman elaborated that the Council has made a proposal to introduce an Additional Scrip of 5% to those exporters who achieve incremental exports of a minimum 25% growth during the remaining part of the financial year. Shri Ladia also pleaded for availability of funds at lower rate for the industry to make it competitive and extension of interest subvention to all sectors of the Indian textile industry irrespective of their size and investment.

Shri Ladia pointed out that as suggested by the Council countries such as Algeria, Ukraine, Argentina, Uruguay, Paraguay, Chile and Bolivia were included under the Focus Market Scheme. He also urged the Government to include countries like Pakistan and Saudi Arabia which are the leading markets for Man made Fibre Textiles and Mercosur countries like Brazil under the Focus Market Scheme.

He also stressed the need for inclusion of Man Made fibre fabrics under the Focus Product Scheme. He opined that the MMF fabrics industry is labour intensive and substantial manufacturing takes place in the un-organised sector and result in employment generation. And thus there is huge export potential for these fabrics and hence deserve encouragement, he added.

RESPECTFUL HOMAGE



*Late Mr. V.S. Chalke
Managing Director
Oriental Synthetic &
Rayon Mills Pvt. Ltd.*

Mr. V.S. Chalke, a most dynamic member of the Textile Association (India), Mumbai Unit, passed away at the age of 81 years on 28th August 2012.

Mr. Vishwanath Shankar Chalke born on 4th March, 1931, completed his matriculation in the year 1948. He started earning for his life at the tender age of 11 and completed his studies by attending night schools. He joined Ambika Silk Mills, Mumbai on 11th Jan' 1949 as an apprentice and joined DCM Mills in 1956. He then worked in various organizations like Ethiopian Textiles, Shree Shakti Mills, New Oriental Silk Mills as a Weaving Master. He worked as a Consultant for Yarn Texturising for Reliance Textile Industry and Vimal Fabrics.

In 1970 he started his own busi-

ness of yarn trading with 4 looms. Looking at the good potential for synthetic weaving and development he developed a partnership firm with 40 looms at his disposal. In 1982 at Umbergaon with 72 looms started a private limited company known as Oriental Synthetics & Rayon Mills Pvt. Ltd. In 1993 he established a process house for synthetic, blended fabrics and technical textiles. In 2002 he added 16 Sulzer PV looms and 12 Rapier looms making total 100 looms in his organization.

In 1985 he joined as a Director of Synthetic & Art Silk Mills Association and became Vice Chairman in 1992. In 1992 he became the Vice Chairman and Chairman of SASMA. From 1998 to 2007 he was Vice Chairman of Federation of Synthetic & Art Silk Weaving

Industry. Since last 15 years Mr. Chalke is a Council Member of SASMIRA.

Mr. V.S. Chalke was a member of Administration Committee of SRTEPC for nine years and special invitee to the committee meetings of SRTEPC. He was conferred with SRTEPC Lifetime Achievement Award for outstanding contribution to man-made fibre textile industry and export trade on March 2012.

Mr. Chalke was associated with several textile organizations. He was the Life Member of TAI - Mumbai Chapter and was very actively associated with Mumbai Chapter and with his significant contribution to the Textile Industry and the academic field. The Textile Association (India) - Mumbai Chapter was honored him on 16th January 2009 with Lifetime Achievement Award by hands of Mr. A.B. Joshi, Textile Commissioner. In spite of his ill health he personally attended the function and interacted with all.

Mr. V.S. Chalke played pioneering role in development of Technical Textiles and he was guide & mentor to many textile industries. TAI lost a pillar of strength and big hearted supporter due to his departure.

The Textile Association (India) prays Almighty to give bereaved family members all the courage to withstand the loss.

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ITAMMA ANNUAL GENERAL MEETING

Indian Textile Accessories & Machinery Manufacturers' Association (ITAMMA) organized their 69th Annual General Meeting on 27th September, 2012 at Mumbai.

Hon. Shri Mohammad Arif (Naseem) Khan was to be a Chief Guest if this function but he could not attend due to Political changes taken place in Mumbai. He has conveyed with regret for his not coming. Mr. Prem Malik, Deputy Chairman, CITI was a Guest of Honour.

Mr. Chetan Ghia, President, ITAMMA welcomed Shri Prem Malik, Deputy Chairman, CITI, Association Trustees, Past Presidents, Members of the Managing Committee, Members of the Association and all present during his Presidential address.



Shri Chetan R. Ghia, President, ITAMMA, delivering President's Speech

Mr. Chetan Ghia briefed about the current scenario of Textile Engineering and the Industry with statistical figures. He also briefed about the follow-up made by ITAMMA with Govt. bodies for various issues related to textile engineering and related policy matters. Mr. Chetan Ghia further informed about their Activities, Meetings, Seminars, Workshop, Road Shows etc. at various fields and states. He also mentioned about their Website and Webinar launching.

At the conclusion of this Annual General Meeting Mr. Chetan Ghia acknowledged every one for their active support and co-operation. He further wished Mr. Naresh Mistry, the incoming President and his Co-office-bearers Mr. Diven Dembla, Mr. S. Senthil Kumar and Mr. Mayank J. Roy for sincere co-operation to them for a successful tenure.

Mr. Chetan Ghia, President announced for ITAMMA Export Excellence Awards for 2011-2012 and requested Mr. Prem Malik, Guest of Honour to present the Awards to Award winners and to address the members.



Shri. Prem Malik, Deputy Chairman, CITI, Guest of Honour delivering Special Address

Mr. Prem Malik, Deputy Chairman, CITI, in his Guest of Honour Speech congratulated all Award Winners and encouraged other fellow members and nominees by conveying his wishes for the next time. Mr. Malik further said "It needs to congratulate ITAMMA, its Office Bearers and specially Directorate for the excellent job and activities they are performing for the benefit of Textile Engineering Industry. I am making these comments because I had already gone through the various papers and documents of ITAMMA and being associated with many Associations, I am in

better position to make this statement.

He briefed about the current textile scenario covering all area of textile & clothing with quoting statistical figures.

Lastly he expressed and requested Textile Minister to include Textile Machinery in his Textile policy as other states like Gujarat, Madhya Pradesh etc work out Textile Policies for their states and this sector needs to be included at higher authorities.

Mr. Malik assured that CITI with ITAMMA can go together and knock the doors of Policy makers for the same.

At the end Mr. Naresh Mistry, Incoming President proposed a vote of thanks.

ITAMMA Export Excellence Awards for 2011-12

1. Highest Export Excellence Award for Parts & Accessories of Textile Machinery. M/s. Precision Rubber Industries Pvt. Ltd., Mumbai. Shri G.T. Dembla, Chairman of the Company received the Award.
2. Sector Based Export Excellence Award- Accessories Sector-Large Scale Manufacturers-Spinning M/s. Lakshmi Ring Travellers (Coimbatore) Ltd., Coimbatore. Shri V. Veerasaravanan, Service Engineer of the Company received the Award.
3. Sector Based Export Excellence Award - Textile Machinery Sector - M.S.M.E. - Spinning M/s. Vetal Textiles & Electronics Pvt. Ltd., Coimbatore. Shri B. Suresh Kumar, Senior Engineer of the Company received the Award.

4. Sector Based Export Excellence Award - Textile Machinery Sector - M.S.M.E. - Weaving M/s. Penguin Engineers, Coimbatore. Shri Sandip Desai, Marketing Manager, Mumbai Division of the Company received the Award.
5. Sector Based Export Excellence Award - Accessories Sector - M.S.M.E. - Spinning M/s. Super Tex Industries, Mumbai. Shri Jugal Kishore, Partner of the Company received the Award.
6. Sector Based Export Excellence Award - Accessories Sector - M.S.M.E. - Weaving M/s. Maksteel Wire Healds Pvt. Ltd., Vadodara. Shri Arpit Sidhpura, Director of the Company received the Award.
7. Sector Based Export Excellence Award - Accessories Sector - M.S.M.E. - Processing M/s. Gurjar Gravures Pvt. Ltd., Ahmedabad. Shri Rajiv L. Dalal, Managing Director and Shri Kaizar Mahuwala, Executive Director of the Company received the Award.
8. Merchant-Exporter of Textile Machinery and Accessories M/s. Sunita Impex Pvt. Ltd., Kolkata. Shri Sunil Sonika, Director of the Company received the Award.
9. Micro & Small Enterprises -- Textile Machinery and Accessories Sector M/s. Samruddhi Engineering, Ahmedabad Shri Shailesh R. Patel, Partner of the Company received the Award.

Young engineers cover future topic lightweight construction

The Walter Reiners-Stiftung (Foundation) of the German Textile Machinery Industry has again honoured three successful junior engineers. In the focus of attention of the young engineers is actually the key future issue lightweight construction in the field of aviation and automotive engineering. The award ceremony took place within the scope of the VDMA Textile Machinery Forum at the Truetzschler Group Headquarters in Mönchengladbach.

Prize-winners 2012 - Concrete Answers to complex questions

Mr Karlheinz Liebrandt, member of the board of Walter Reiners-Stiftung and co-owner of Liba Maschinenfabrik GmbH in Naila presented the awards. The promotion prize in the dissertation category endowed with 5,000 Euros has been awarded to Dr. Roman Rinberg of Chemnitz University of Technology. In his theses he developed a technology for the production of components reinforced by natural fibres for the use in door trims of cars. The basic material for these components is flax, a natural fibre.

The promotion prize of 3,000 Euros in the Diploma category has gone to Ms Dörte Marlow of Technical Univer-

sity of Dresden. The subject of her diploma thesis is simulation, dimensioning and structural testing of composite isogrid structures. The results are of particular importance for the application of these components in aviation.

Mr Johannes Thumm of University Stuttgart/ITV Denkendorf has been glad about the creativity prize endowed with 2,000 Euros. Starting point of his study were braided bike frames made of carbon. Up to date the tubes for such bike frame are braided individually and fitted together by sleeves. In his study Thumm developed concrete proposals for braided branches, which for example enable complete frames with continuous fibres.

Dropout rates - fatal for the national economy

In his keynote address Liebrandt explained the challenges confronting the industry with regard to lack of engineers. The dropout rate of 50 per cent in university engineering courses is alarming. "Such high dropout rates are fatal for the national economy. In times of demographic changes we cannot afford such wear", he added. The VDMA initiative to increase the quality of university studies in Me-

chanical Engineering and Electrical Engineering offers concrete solutions to reduce these dropout rates and to realize the full potential of junior engineers, said Liebrandt.

Walter Reiners-Stiftung (Foundation) - Promoting Talents

With the Walter Reiners-Stiftung the VDMA Textile Machinery Association is actively engaged in promoting junior engineers. Each year, the foundation provides an incentive for top performers by granting two promotion prizes for dissertations and master/diploma thesis as well as one creativity prize for seminar papers. Students regularly gain an insight into practice with excursions to member companies and to the leading textile exhibition ITMA, which are financially supported by the foundation. Particularly high-performance students are supported by scholarships



First row, L to R: Dr. Roman Rinberg, Dörte Marlow, Johannes Thumm.

Second row, Members of the Board of Foundation from L to R: Thomas Waldmann, Karlheinz Liebrandt, Stefan Kross.

oerlikon
textile components

All quality determining components from one source

Oerlikon Textile Components stands for quality and know-how in the production of textile premium components

Oerlikon Textile Components, business unit of the Oerlikon Textile segment, the world market leader in premium textile components.

Special highlights on the Staple side at ITME 2012 is the product launch of the Texparts® PK 2630 SEH weighting arm adapted for Rieter and LMW machines. Further attractions are spindles with Texparts® Zero Underwinding system, Accotex cots and aprons for finest quality yarns and the Daytex® Shrinkage Belt with the novel curved edge.

PK 2630 SE series - the World's most versatile weighting arm

Based on many years of practical experience, the experts from Oerlikon Textile Components are familiar with customer requirements, have a broad understanding of textile processes and are therefore valuable partners in the world of textiles. This competence is also evident in the advancement of high-tech components and allows the company to respond to market changes in a flexible manner. Years of experience and innovation culminated into the new PK SE series with 6 new patents. The PK 2600 SE series has excellent paralleled top rollers and individually adjustable single elements. The arms are manufactured in Germany on a fully automated line, with 100% quality control. The PK 2600 SE is available as a 3-top-roller of a 4-top-roller version, for spinning applications from standard to compact yarn. The new star in the portfolio of the PK 2600 SE series - the world's most versatile weighting arm series - is the PK 2630 SEH adapted for a hexagonal support rod, as found in Rieter and LMW ring frames. Oerlikon Textile Components has chosen the

ITME 2012 in Mumbai as the platform to launch the PK 2630 SHE.

Texparts® Zero Underwinding - A system to prevent underwound ends

There are four outstanding arguments for the Texparts® Zero Underwinding system: The first advantage is a reliable clamping of the yarn ends. The smart design provides sufficient clamping force at all times. A preloaded spring ensures secure yarn clamping. The second advantage is a fail-safe yarn cutting. With the steel yarn cutter safe cutting is achieved. The solid metal yarn cutter retains its superior cutting quality. Even challenging yarns can be cut simply and safely.

The third advantage is a precise and long-lasting function. The centrifugal ball principle ensures a precisely defined opening and closing speed. A uniform and sufficiently large clamping and opening gap is guaranteed at all times. The fourth advantage is an easy handling. In case of maintenance the easy and quick replacement of the Texparts® Zero Underwinding system is possible by maintaining the spindle upper part.

Daytex Shrinkage Belt - New edge enables to optimize customer benefit

Today about 80 % of all textiles, which are sold on the market, undergo a shrinking process. The main application still lies in the area of heavy fabrics such as denim for example but today also dress shirt fabrics are being pre-shrunk. The majority of knitted fabrics are systematically protected from shrinkage with the aid of this process.

To achieve the best price-performance ratio for a belt, two factors must be reached: an efficient utilization of area as well as a maximum lifetime of the belt. Belts all over the world are sold

per unit length (US\$/inch). This means that finding the right belt width also means finding the optimum price and/or area usage. The smaller the difference between the overall belt width and the working face width, the more efficient the use of the belt. This difference is defined by the belt edge shape. The latest feature from Oerlikon Textile Components, the Daytex® Curved Edge, optimizes the area usage. Alongside the area utilization, the edge shape also has a decisive effect on the life time of the belt. The new Daytex® Curved Edge shape greatly supports the durability of the belt. The new shape is completely free of sharp edges, which can easily become starting points for the formation of cracks.

Facts and figures

Name: Oerlikon Textile Components
Head office: Wattwil
Locations: 9 production plants and 4 sales offices worldwide
Number of employees: approx. 1000
BU-Leader: Daniel Lippuner

About Oerlikon Textile Components

Oerlikon Textile Components with its well established product lines Accotex, Daytex, Fibrevision, Heberlein, Temco and Texparts is one of the world's leading suppliers of quality determining components for all filament and staple fibre spinning applications. Highest quality and reliability are the common characteristics of all products. Continuous development ensures that Oerlikon Textile Components will always strengthen its leading position as the component supplier of choice to the textile industry. Oerlikon Textile Components with manufacturing facilities and sales offices in the Americas, Europe and Asia is headquartered in Switzerland. A global network of experienced representatives ensures prompt service and close contact with our customers in spinning mills as well as with the leading machine manufacturers.

Textechno at the ITME India 2012, Mumbai

At the ITME INDIA 2012, in Mumbai, Textechno Herbert Stein GmbH & Co. KG, the experts for quality control systems for fibres and yarns, will present the following highlights of their product range:



STATIMAT DS combines testing of tensile properties, unevenness, and count of yarn and thread in one tester. The three tests on each

package presented by the package changer are performed in rapid succession. With regard to testing technology and technical realization the STATIMAT DS offers numerous technical and technological novelties - for example a patented new capacitor design for measurement of unevenness -, united with a new design philosophy.



FAVIMAT+ is the first and only tester to combine four single-fibre test methods in one instrument on the same section of the fibre: fibre fineness, tensile properties, mechanical crimp properties and geometrical crimp structure. This instrument can be used to test a wide variety of fibres including Aramide, UHMPE, Glass and Carbon fibres. New applications of the FAVIMAT+ are the measurements of fibre-to-

metal friction as well as fibre stiffness. The test process can be fully automated by means of the AIROBOT2 linked to the FAVIMAT+. The AIROBOT2 consists of a tensionless storage for up to 500 fibres together with a fully automatic transfer system, which feeds the fibres to the FAVIMAT+ testing instrument without using pretensioning-weights.



FIBROTEST combines a fibre length measuring system, whose concept is based on the Fibrograph principle, and the tensile test on fibre bundles. The FIBROTEST offers an economic semi-automatic alternative to the high-volume technique, and - in contrast to those - delivers absolute values for tenacity, independent of calibration cotton.

The Textechno team will welcome you in Hall 1, Booth B26.

Hurry up!!!

Enroll your registration Before you get disappoint

Don't miss the opportunity to target knowledge audience

10th International & 68th All India Textile Conference

World Textile - Challenges towards Excellence

30th Nov. & 01st Dec. 2012

Hotel ITC Maratha, Sahar Road, Andheri (E), Mumbai - 400 099

E-mail : taimu@mtnl.com, taicnt@gmail.com

Basant Wire Industries Pvt. Ltd.

Basant, which has completed 25 illustrious years serving the international textile industry with PORCUPINE brand high precision Pins and Pinned Products, is participating in INDIA ITME in a big way with a display of its full range of products and also introducing innovative solutions, especially for Open-End Spinning and specialized services.

The company, over the years, has introduced several innovative as well as import substitute products and is currently a market leader in India for its range of products. Besides, it also exports to more than 35 countries worldwide.

The company has a tie-up with Stewarts of America, Inc. for manufacturing and marketing of High-tech Pin Products for high production Textile spinning machinery. Stewarts are a leading global Pinned Product manufacturer and pioneer with state-of-the-art manufacturing facility and are the chosen supplier to OEMs for Pinned Products. It is manufacturing products for waste recycling, spinning - ring, open-end and worsted, weaving, finishing, perforating, fibrillating as well as non-woven industry. It has the world's widest range of pins and pinned products manufactured under one roof.

The major products of the company are:

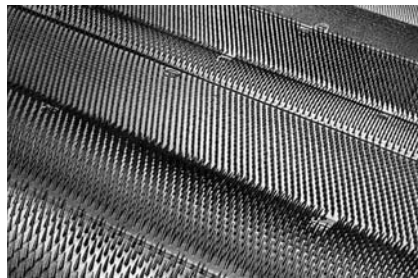
Textile pins and needles

Basant is manufacturing a wide range of high precision Pins and Needles for Textile Machines. Manufactured with European machinery and knowhow from DERIS-Werk, Germany, the Steel

Needles and Pins are available in various taper profiles, pin shapes and metallurgy in plain or keyed type as per requirement and original equipment manufacturer's standards.

Pinned lags for Waste Openers and Blowing

Basant makes pinned wooden and aluminium lags for all leading makes of machines suitable for opening fibres or hard and soft waste. Pins are of the right metallurgy and hardness to provide long life and excellent opening. Pin patterns are designed to suit the material being processed.



Wooden & Aluminium Lattices

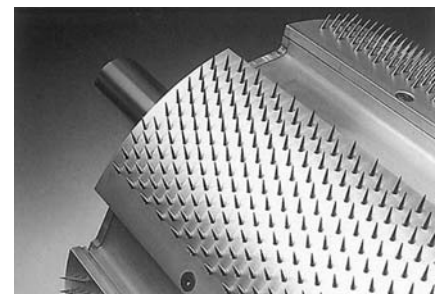
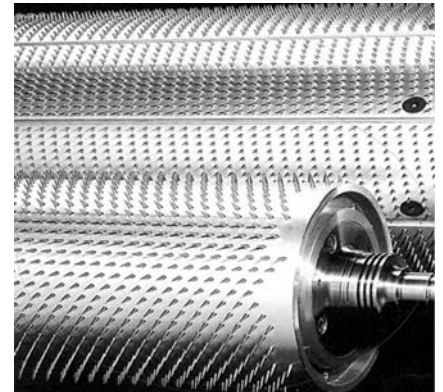
Manufacture with highest accuracy and quality for long life of 5-7 years and trouble free performance.



Pinned Beaters

LMW, Crosrol, Marzoli, etc., are now increasingly adopting the use of Pinned Beaters and Pinned Licker-ins in their fibre preparatory lines because of the huge improvement in quality, consistency and fibre yield.

Basant is helping Mills upgrade their Beaters and Cards instead of replacing them with new machines, thus saving on capital costs and enjoying major benefits in quality, productivity and fibre savings.



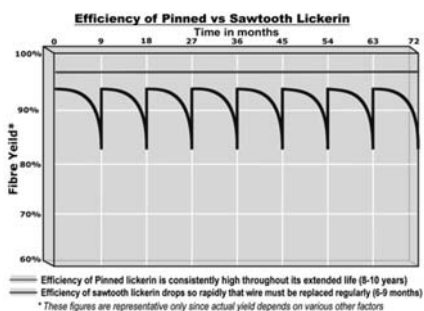
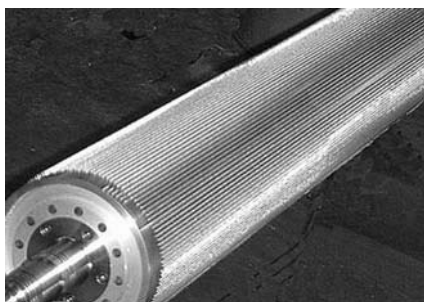
Spiral Pinned Chute Feed Rollers

Spiral pin profile significantly helps improve carding quality and reduce load on card clothing and provide lower neps and fibre rupture and improved sliver CV%.



Pinned Lickerin Rollers

Significant advantages over sawtooth lickerins are fibre savings up to 0.5 - 2%, reduced yarn imperfections of 5-10%, and long life of upto 8 years life. Another major advantage is consistent quality of yarn when compared to wire type lickerin.



Open end spinning

International quality Open End Combing rollers: Pinned and wire with all types of coatings at very attractive prices for all leading makes of Open End machines. The company shall introduce several new and cost effective designs of pin type opening rollers at the Show.

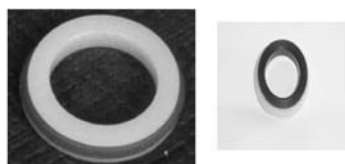
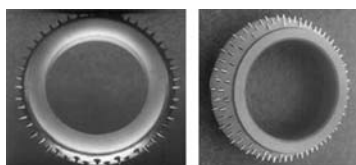


For Shuttleless Weaving

September - October 2012

Looms

The company specializes in manufacturing a wide range of temple cylinders and rings to suit all leading makers of looms and fabrics being woven. The company has the expertise to design specific solutions for clients facing temple marks in their fabrics.



For Finishing Stenters

The company manufactures Stenter Pin Plates in Brass as well as in Plastic (Patented) for all leading makes of Stenters. Even other manufacturers of pin plates use Basant pins which have high accuracy and long life. Plastic pinbars are much cheaper and lighter in weight besides providing high life and being corrosion free.



For enquiries, please contact
 Basant Wire Industries Pvt. Ltd
 E-418, Road No. 14, V. K. I. Area,
 Jaipur - 302013 India
 Tel: +91-141-2460792 Fax: +91-141-2460510
 Email : sales@bwipins.com Web: www.bwipins.com

PICANOL
 YOU ARE ALWAYS AHEAD

PICANOL AT INDIA ITME 2012

INDIA ITME 2012, which takes place from 2 to 7 December 2012 in the Bombay Convention & Exhibition Centre (BEC) is the largest exhibition of its kind in India and is expected to attract over 125000 textile visitors. Picanol will take this opportunity to present all its latest high-tech weaving machines and to underline its prominent position in the Indian market by showing four high-tech weaving machines on its booth. Besides the recently introduced airjet, the OMNIplus Summit also state of the art rapier machines like the OptiMax and the GTXplus will be on display.

In addition to these four machines, one Picanol Jacquard TERRYplus 800 weaving machine will be on display on the Stäubli booth, and an OptiMax jacquard weaving machine will be on display at the Bonas/Van De Wiele booth. The Picanol booth is located at the Open Bay Area, K1.

PICANOL PRESENCE IN INDIA

Picanol has been successfully serving the Indian market since 1956. In view of the potential and expected growth of the Indian market, Picanol decided to set up its own organization in India early 2008 in order to more actively support its local activities. Since the start of its presence, but particularly during the last decade, Picanol has been focussing strongly on local sales and service activities.

In recent years, Picanol India has seen a steady growth in its market

share, which has led to it becoming the leading provider of weaving machines on the local market today. India is a market of crucial importance for Picanol as it is one of the key textile markets in the world.

As part of its further commitment to the Indian Market and marking a new milestone in India, Picanol inaugurated new headquarters in downtown New Delhi in August 2012. Next to the main office in Delhi, regional offices in Mumbai and Coimbatore are proof of a strong Picanol presence in the Indian market with a professional team of 35 people committed to serve Picanol customers.

With the broadest product range on the market, improved local services and considerable presence, Picanol remains highly committed to India and plans to be the leading provider of weaving systems for the entire Indian weaving sector.

Picanol weaving machines on display at ITME 2012

OMNIplus Summum 4P 190cm weaving a bottomweight article (Airjet weaving machine)

Style	Bottomweight	
Warp	yarn count	Nm 17
	material	Polyester Cotton
	density	23,7 ends/cm
Weft	yarn count	Nm 17
	material	Polyester Cotton
	density	28 picks/cm
Drawing-in width	167 cm	

OMNIplus Summum 4P 340cm

weaving a sheeting fabric (Airjet weaving machine)

Style	Sheeting	
Warp	yarn count	Ne 60
	material	cotton
	density	73 ends/ cm
Weft	yarn count	Ne 80
	material	cotton
	density	32 picks/cm
Drawing-in width	297 cm	

OptiMax 6R 190 cm

weaving outdoor furnishing (Rapier weaving machine)

Style	Outdoor furnishing	
Warp	yarn count	dtex 2350
	material	PVC coated polyester
	density	16,5 ends/cm
Weft	yarn count	dtex 4000
	material	PVC coated polyester
	density	8 picks/cm
Drawing-in width	160 cm	

GTXplus6R 190cm

weaving a silk fabric (Rapier weaving machine)

Style	Silk	
Warp	yarn count	silk denier 2x Denier 31
	material	silk
	density	53,5 ends/cm
Weft	yarn count	silk denier 3x Denier 47,5
	material	silk
	density	35 picks/cm
Drawing-in width	147,3 cm	

OptiMax 8J 190 cm (On the Bonas booth) Rapier weaving machine with jacquard

Style	Ladies wear	
Warp	yarn count	dtex 50/24
	material	polyester
	density	108 ends/cm
Weft	yarn count	Denier 300
	material	polyester
	density	44 picks/cm
Drawing-in width	148,2 cm	

TERRYplus 800 (On the Stäubli booth) Airjet weaving machine with jacquard

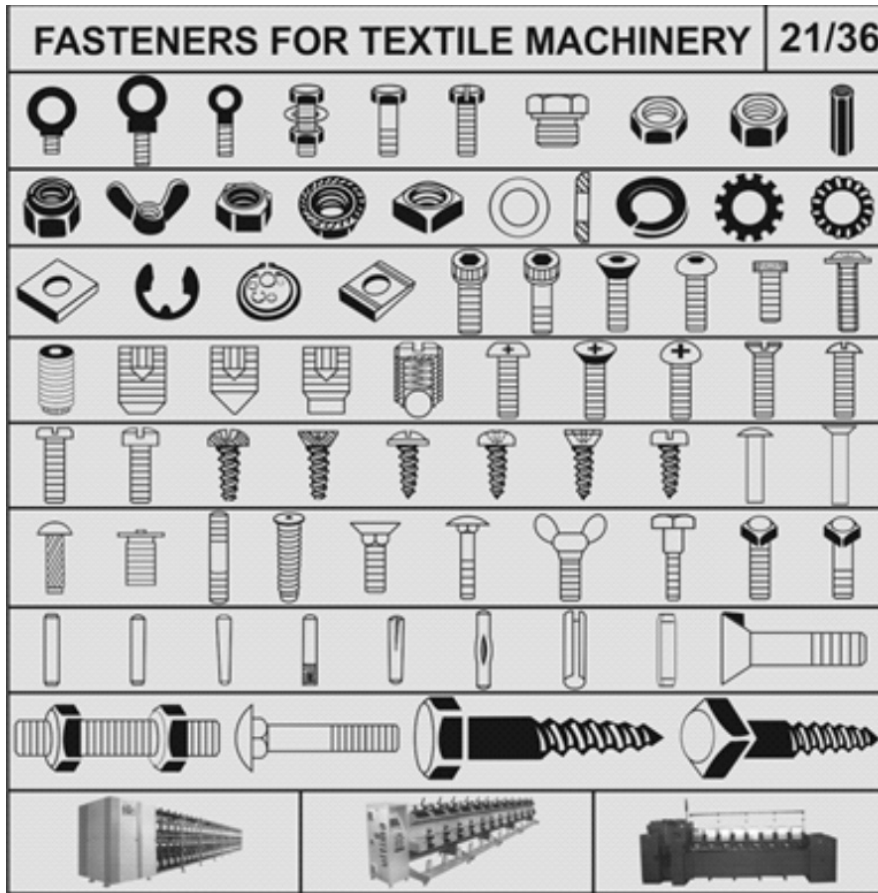
Style	Terry towel	
Warp	yarn count	ground Ne 24/2
	material	cotton
	density	11,42 ends/cm
Weft	yarn count	Ne 14/1
	material	cotton
	density	18 picks/cm
Drawing-in width	235,9 cm	

For further information please contact: Erwin Devloo, Marketing Communication Manager, at +32 (0)57 22 20 90 or by e-mail: edv@picanol.be

Textsmile

A man, complaining of headaches, entered a hospital for diagnostic tests. A doctor examined the results for a brain scan and told the patient, "I have bad news and good news for you. The bad news is that you have a serious brain disease and will die without treatment. The good news is that this hospital has developed a new procedure for brain transplants and due to a car accident this morning two 'fresh' brains are available: one is from a taxi driver and the other is from a scientist. The brain of the taxi driver costs \$225,000, while that of the scientist is only \$29.95." Puzzled, the patient asked, "Why is the scientist's brain was so much cheaper?" The doctor replied, "It's used."

ZENITH INDUSTRIAL PRODUCTS



ZIP has developed Some Fasteners items which are useful for Textile Machinery mfg unit. Ring Eye Bolt, Stay Eye Bolt, Hex head Bolt Nut Washers, Full thread Hex hd Sc, Machine Bolt, Hex head, Sq head type coach Bolt wood Sc type threads. Hex Nut Lock Nut, Dome Nut, Nylok Nut, Wing Nut, Weld Nut, Flanged serrated Hex Nut, Sq Nut, Slotted Nut, Plain Washers,

Machine Washers, Spring, Star, Wave Washers, Tapper Washers Circlip, Hex Socket type Allen Sc std hd, CSK, Button hd, Low hd, Thin hd, HTS Hex Socket Set Grub Sc KCP, Flat, Cone, Dog & Oval point. Plunger Screws Spring & Steel Ball fitted type, Slotted Grub Sc, Philips Star Punch Screws Zinc plated. Pan hd, CSK hd, Binding hd, Self Tapping Sc, Round hd, CSK

& Binding hd Rivets, Slotted Machine Sc, Cheased hd, CSK hd, Raised, Pan hd, Philister hd, Stud Full thread Spindle, Copper Zinc plated Weld Stud, Projection Bolt, Carriage Bolt, NIB Bolt, Sq hd Sc., T-Bolt Tapper hd Bolt, Wing Screws, Solid Dowel pin, Tapper pin, Grooved pin Spring Dowel pin & Spiral pin, etc. Fasteners items are as per drawing or sample.

STANDARD REFERENCE: These can be supply as per IS, DIN, ISO, BS, ASTM Standard or as per drawing or sample.

THREADS: MM Standard Coarse & Fine Pitchy, BSW, BSF, UNC, UNF.

MATERIAL'S GRADES: MS, En - 8, 8.8gr, En - 19, 10.9gr, Brass, SS 304 - 316, Nylon.

FINISHING: Natural Finish, Blackened, Yellow Zinc, Bright Zinc - Silver & Blue shades, Olive Green, Copper Zinc, Cadmium plated, Nickel plated Finishing as per requirement.

For more details please write to:- ZENITH INDUSTRIAL PRODUCTS

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INDIA
Vastra 2012
An International Textile & Apparel Fair

Date : 22nd to 25th November 2012
Venue : EPIP, Sitapura, Jaipur, India
Contact : Mr. Amit Gupta, Senior Assistant Director
 Federation of Indian Chambers of Commerce
 and Industry (FICCI), Rajasthan State Council
 202, Rajputana Tower, 2nd Floor, House No.
 A-27-B, Shanti Path, Tilak Nagar, Jaipur - 302
 004, Rajasthan, India
Tel. : +91-141 2621345, 5103768, 4061345,
Fax : +91-141 5116464
E-mail : amitgupta@ficci.com, vastra@ficci.com
Website : www.ficci.com, www.vastratex.com

Igmatex-Textile Home Furnishing and Garment Machinery Exhibition

Date : 01-03, February 2013
Venue : Huda Ground, Near Mittal Mega Mall, Panipat
Contact : Mr. Rajesh Sinha / Mr. Manoj Sinha Igmatex
 Exhibitions, B-504, Goodwil Gardens, Sector-8,
 Kharghar, Navi Mumbai - 410 201
M. : 09324077881, 09312069048
E-mail : info@igmatexfair.com, igmatex@gmail.com
Website : www.igmatexfair.com

68th All India Textile Conference
Theme : World textile - Challenges towards Excellence

Organizer : The Textile Association (India), Mumbai Chater
 jointly with TAI Central Office
Date : 30th November & 01st December, 2012
Venue : Hotel ITC Maratha, Sahar Road, Andheri (E),
 Mumbai - 400 099 India
Contact : Hon. Secretary
 The Textile Association (India) - Mumbai Chap-
 ter Amar Villa, Behind Villa Diana, Flat No. 3,
 3rd Floor, 86, College Lane, Off Gokhale Road,
 Near Portuguese Church, Dadar (W), Mumbai -
 400028, India
Tel. : +91 22-24328044, +91 22-24307702,
 +91 22-24461145
Fax : +91 22-24307708, +91 22-24474971
E-mail : taimumbaiunit@gmail.com, taicnt@gmail.com,
Website : www.textileassociationindia.com,
 www.textileassociationindia.org

In Fashion 2013 - International Textile and Ingredient Innovation Show

Date : 20th-22th March, 2013
Venue : Hall No. 1, Bombay Exhibition Centre, W.E.
 Highway, Goregaon (E), Mumbai, India
Contact : Mr. Adarsh Verma, Project Manager Images
 Multimedia Pvt. Ltd. S-21, Okhla Industrial Area,
 Phase-II, New Delhi - 110 020 India
Tel. : +91 11 40525000, Fax: +91 11 40525001
M. : +91 9999251621

E-mail : adarshverma@imagemultimedia.in,
Website : www.indiainfashion.com

INDIA ITME 2012 - 9th International Textile Machinery Exhibition

Date : 02-07th December 2012
Venue : Bombay Exhibition Centre, Western Express
 Highway, Goregaon (E), Mumbai , India
Contact : Executive Director
 India International Textile Machinery Exhibitions
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