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## CONTENTS

<b>Editorial</b> R. V. Adivarekar	<b>308</b>
<b>Moisture Transmission Behavior of Microfibre Blended Fabrics</b> P. Kandhavadi, T. Ramachandran & B. Geetha Manohari	<b>311</b>
<b>A Study to Reduce the Stiffness of Air Vortex Yarn</b> T.K.Sinha, Tanveer Malik	<b>316</b>
<b>Removal of Dyes from Textile Wet Processing Industry : A Review</b> C. Parvathi, T. Maruthavanan, S. Sivamani & C. Prakash	<b>319</b>
<b>Application of Herbal Extracts for Antimicrobial Property</b> R. V. Adivarekar, N Kanoongo, M Nerurkar, & N Khurana	<b>324</b>
<b>The Rebirth of Himroo</b> Jinal Sangani & Sabita Baruah	<b>331</b>
<b>Texperience</b> <b>Indian Textile Industry - Past and Present</b> Shri M. K. Mehra	<b>336</b>
<b>Texnotes</b> <b>Microbial Dyes: The Undisputed Natural Dyes</b> Madhura Nerurkar, Chet Ram Meena & Neha Khurana	<b>338</b>
<b>OTHER FEATURES</b> <b>Unit Activities</b> <b>News</b> <b>Form IV</b> <b>ATA / GMTA Exam Results</b> <b>Exam Schedule - 2011</b> <b>Subject Index</b>	<b>340</b> <b>341</b> <b>339</b> <b>354</b> <b>357</b> <b>358</b>

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# Editorial



## World Textile Conference: Experience the Joy of Collective Winning

On behalf of the JTA's Editorial Board, Editor and my personal behalf as Chairman of the Editorial Board, I take this opportunity to welcome the delegates to the World Textile Conference which is being held in Mumbai on the theme "Vision 2020: Emerging New Opportunities Worldwide and Challenging Business Strategies". This is the first time in the history of Textile Association, the World Textile Conference is being held, although there have been a number of International Conferences which were held under the aegis of TAI. Many of them were devoted to discuss hard core technological development and thus they were dominated by the presence of the technocrats. However, this conference is different on that count, as a particular Technology is not going to be discussed in detail here but what kind of technology is needed to address the challenges of emerging avenues. The conference is thus more dominated with the management subjects on the policy level, strategy level, looking through glass on the forecasting level and calling for preparation to face these changes successfully. Another heartening feature of this conference is that the Textile Department of Institute of Chemical Technology has joined hands with TAI as its formal partner in organizing this mega event and the pleasure and honor of TAI having ICT( formerly UDCT), which has now attained a station of number one Deemed University in the country, as its partner was aptly admired by its President, Mr.D.R.Mehta. With such a synergistic association, blessed with support from Office of the Textile Commissioner, MOT, GOI, and a number of Industries such as SKNL, RIL, Bombay Rayon, Alok industries, LMW etc; one would definitely expect a two day feast of enlightenment of knowledge and enrichment of experience while participating in the deliberations and presentations made by eminent experts in the field.

On the front of content of the subjects to be discussed in this conference, the topics reflect the wide gamut and in most of the cases, the presentations cover the strategies used, business policies adopted, opportunities available and how to exploit them to make best use of the present day business environment. It can be seen that although technology is backbone of this industry-dedicated to Textiles and Apparels as well as Technical Textiles, the platform is given to understand the new opportunities emerging globally and what kind of challenging business strategies are required so that India emerges as a force to reckon with in the inaugural session the presence of CMDs of various companies and also distinguished personalities from NGOs and felicitation of those who excelled in various field sets the tone of the conference that collectively we must plan for making this as a global enterprise, without forgetting the human values and commitment to ethics.

A session on "India Emerges as a Global Textile Destination" is expected to cover the present day opportunities existing in the World Trade, resurgence in Indian textiles, how one should maximize growth and integration of value chain etc. Session on "Winning strategies of success" is expected to share the experiences of how turnaround was made by those companies who are presently leading the business. There are two sessions devoted to the winning strategies in Specialty textiles and technical textiles and it goes without saying, that this segment in India has a large potential to grow and many delegates waiting for good avenues for diversification will benefit out of the rich experience of the international and eminent national presenters. A wide spectrum of subjects such as defense textiles, non-wovens and composites will be discussed in depth. Collaborative Strategies with Global Brands & Buyers -A Panel Discussion will surely give opportunity to the delegates to get to know as to how to deal with them. Another fast growing business of today: Indian Denim Industry and there will be a special session to reflect on the Global Perspective about denim and kind of challenges ahead, so also the opportunities one can exploit. A session on "Global Economic & Financial Perspective" will be of great value as we have to fall in line with the international standards as far as financial reporting system is concerned. The issues of good governance and transparency will have to be tackled with and the trust of the stake holders has to be earned. While doing that how does one respond to fluctuation in the currency market will also be the topic for discussion. A panel discussion on "Textile Machinery & Technology for 2020" is expected to outline what is in offing or at least what is required. Given the fact that ITMA is around the corner, some of these technologies may be soon showcased there. Last but not the least, a presentation by Advertisement Guru Pralhad Kakkar on "Fashion world influencing the Consumer" is expected to place our efforts in right perspective as to what we should look for and what are the parameters which influence consumers, so that many a time predictability of various trends can be well understood in this light. This will be followed by Fashion show by Aditi Govitrikar and Shraddha Nikam. All these sessions will be Chaired by the eminent personalities in the respective field and thus their remarks are also going to be another source of knowledge.

Being one of the hosts, we also have the responsibility to make every one comfortable for this two day mega event. Again for the first time, a cluster type sitting arrangement is made so that delegates are truly comfortable. Since the programme of the conference is packed, there is hardly any possibility of taking liberty to spill over some one's else's time. So my humble request to the speakers, that please follow the time frame given by the Programme Committee. Also a request to the Chairpersons to co-operate with the organizers for maintaining the time schedule. We welcome the questions in writing and even in advance at this stage so that we can put them to the presenters and response can be truly enlightening.

Psychologist say that state of happiness increase productivity. Post World Cup the country, even it may be for a short spell, is in the state of happiness simply because everyone is experiencing the joy of collective Victory. Happy Days Are Here Again! Enjoy the Conference by actually participating in the deliberations of each and every session, so that our goal of collectively enriching our experience to take on the challenges with much clarity and vigor is fulfilled.

**Prof.(Dr.)Mangesh D.Teli,**  
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*Editorial*

Journal of the  
**TEXTILE ASSOCIATION**



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# Moisture Transmission Behavior of Microfibre Blended Fabrics

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## Abstract

Abstract Moisture transmission through textiles has a great influence on the thermo-physiological comfort of the human body which is maintained by perspiring both in vapour and liquid form. The clothing to be worn should allow this perspiration to be transferred to the atmosphere in order to maintain the thermal balance of the body. Micro fibre fabrics allow large quantities of water through the outer surface of the material within seconds due to the presence of micro capillaries. Blending small proportion of hydrophobic fibre like micro polyester with hydrophilic fiber enhances the wickability and drying characteristics of the fabric resulting in excellent moisture handling capability and easy care. Hence Micro polyester fiber is selected to blend with micro lyocell fiber to produce yarns with varying blend proportions and the fabrics produced were investigated for their moisture management property. From the experimental result, it has been found that water vapor permeability, liquid water permeability and moisture spreading of the material increases with the increase in number of hydrophilic group in the material, but the dry ability of the material increases with the increase in the micro polyester proportion.

## Keywords

Blended fabrics, microfiber, moisture management, capillary action

## 1. Introduction

Moisture management property is an important aspect of any fabric meant for apparels, which decides the comfort level of that fabric. Every human being sweats during different kinds of activities. An important feature of any fabric is how it transports this water out of the body surface so as to make the wearer feel comfortable [1]. Moisture management can be referred as its ability to transport, store and dispose liquid water and moisture from the surface of the skin to the atmosphere through the fabric [2-3]. The mechanism by which moisture is transported in textiles is similar to the wicking of a liquid in capillaries. Capillary action is determined by two fundamental properties of the capillary such as its diameter and surface energy of its inside face. The smaller the diameter or the greater the surface energy, the greater the tendency of a liquid to move up the capillary. In textile structures, the spaces between the fibres effectively form capillaries. Hence, the narrower the spaces between these fibres, the greater the ability of the textile to wick moisture. Fabric constructions, which effectively form narrow capillaries, pick up

moisture easily. Such constructions include fabrics made from micro fibres, which are packed closely together. The surface energy in a textile structure is determined largely by the chemical structure of the exposed surface of the fibre. Hydrophilic fibres have a high surface energy and consequently, they pick up moisture more readily than hydrophobic fibres. Hydrophobic fibres, by contrast, have low surface energy and repel moisture[4].

Synthetic fibers, especially micro fiber development, have made a big way for sophisticated textiles and apparel, medical and allied applications. During the last few years, major fibre producers have gone for more value added products with improved properties. In recent years there has been a trend towards finer filaments as fineness of fiber is very important in determining the aesthetic properties of fabric.

Micro fibers have found their way into varied applications conceivable as their novel properties offer huge potential in terms of both function and aesthetics. Micro denier fibers have excellent flexibility and yarns with better regularity and elongation contribute for perfect knitability ensuring woven fabrics with better softness, drape, wicking and dimensional stability than normal denier fiber woven fabrics thus ensuring

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excellent mechanical and comfort properties. The hairiness of the micro fiber yarns are very low and this in turn creates a low lint shedding propensity and it will generate lesser fly during knitting. However, the high cost, lack of experimentation, less research in this field and want of expertise to handle these new fibers hinders its growth [5].

In the present study, micro lyocel fiber is blended with micro polyester fiber in different blend proportions to produce 30s count ring spun yarns. Plain woven fabrics were produced and investigated for their moisture management properties.

## 2. Materials And Methods

### 2.1 Fiber parameters

The fibre parameters of micro polyester and micro lyocell fibers are given in Table 2.1.

*Table 2.1. Microfibre parameters*

Parameters	Micro polyester	Micro Lyocel
Staple length, mm	38	34
Fiber denier	0.8	0.9

### 2.2 Yarn and Fabric production

Blending and yarn spinning was carried out in pilot mill with five blend proportion of Micro lyocell and Micro polyester such as (ML/MP): 100% ML, 85/15, 70/30, 50/50, 30/70, 15/85 & 100% MP. Ring spun yarns of 30s Ne were produced from each blend proportion and Plain woven fabrics were produced using sample loom. The woven fabric specifications are given in Table 2.2.

*Table 2.2 Woven fabric specifications*

Ends per inch (EPI)	88
Picks per inch (PPI)	98
Fabric Aerial density (Grams per square metre)	150
Fabric thickness (mm)	0.45
Cover factor	24

## 2.3 Testing methods

### 2.3.1 Wickability test

In this method, wick up was observed by determining the rate of time at which the water moved upward on a fabric strip of 5"x1" suspended vertically with its lower ends dipping into a dye solution (50g dye in 100ml of water) as per BS3424. The effect was observed for both warp and weft directions at different time

intervals. Higher wicking value shows greater liquid water transport.

### 2.3.2 Drying rate test

Quick drying capability of the fabric was evaluated by its drying rate as per ASTM D 4935-99. The fabric specimen of the size 100x100mm<sup>2</sup> was put on the plate of the balance and the dry weight was recorded as  $w_f$  (g). The weight of water previously added in fabric was equal to 30% of the dry weight and then the wet weight was recorded as  $w_o$  (g). The change in weight of water  $w_i$  (g) at regular intervals was continuously measured. The remained water ratio (RWR) was calculated using the following equation to express the change in water weight remained in the specimen over the time for drawing the evaporating curve from 100% to 0%:

$$\text{RWR (\%)} = [w_i \text{ (g)} - w_f \text{ (g)} / w_o \text{ (g)} - w_f \text{ (g)}] \times 100\%$$

### 2.3.3 Water vapour permeability test

The sample specimens were conditioned and measurements made in the standard atmospheric laboratory condition ( $70 \pm 2^\circ\text{F}$  and  $65 \pm 5\% \text{RH}$ ). The rate of moisture vapour diffusion through the fabric is determined according to the Simple Dish Method, similar to ASTM E96-80. A fabric sample is placed on a water dish (82 mm in diameter and 19 mm in depth) allowing a 9 mm air space between the water surface and specimen. A vibration free turntable carrying 8 dishes rotates uniformly at 5 meters per minute to insure that all dishes are exposed to the same average ambient conditions during the test. The assembled specimen dishes are allowed to stabilize for two hours before taking the initial weight. They are weighed again after a 24 hours interval. Then the rate of moisture vapour loss (MVTR) is calculated in units of g/m<sup>2</sup> per 24 hours. A higher MVTR value indicates there is a greater passage of moisture vapor through the material.

### 2.3.4 Water spreading test

The ability of the fabric to absorb water is measured by the time taken to absorb a drop of water in seconds as per AATCC 79:2000. A drop of water is allowed to fall on a sample of size 20cm x 20cm, and the height of water drop is controlled by a syringe, with one ml of water.

## 3. Results And Discussions

### 3.1 Wickability behavior

Wicking is the spontaneous flow of a liquid in a porous substance, driven by capillary forces. Liquid transfer

mechanisms include water diffusion and capillary wicking, which are determined mainly by effective capillary pore distribution, pathways and surface tension. Figure 3.1 and 3.2 represents the wicking behavior of micro fibres blended woven fabrics in warp and weft direction respectively. All fabric samples exhibit higher wickability in warp direction compared to weft direction. It is also inferred that the wicking increases with increase in the micro lyocell component of the blend.

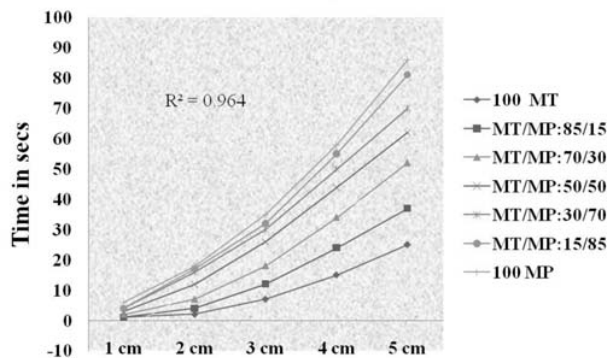


Figure 3.1 Wick ability behavior of microfibre blended woven fabrics (warp direction)

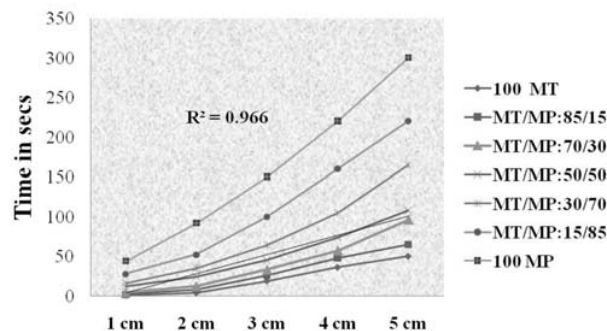


Figure 3.2 Wick ability behavior of microfibre blended woven fabrics (weft direction)

G.K.Tyagi (2009) states that the hydrophilic groups of manmade cellulosic component of the fiber mix governs the liquid moisture transport through capillary interstices in yarns, it may obviously be the contributing factor for high wickability of the micro lyocell rich fabrics[6]. Lyocell is a highly hydrophilic fiber; it has a good absorbency. Due to its high affinity to water and more surface energy, water molecules are attracted by the fibres and hence exhibit higher absorbency. Micro lyocell fibres, due to its finer structure, form more inter fibrillary channels in the yarn which induces capillary action of the absorbed water leading to higher wicking of micro lyocell rich fabrics[7-8]. It can also be observed that as the fiber composition varies, there

is a substantial variation in wicking behavior. Being hydrophobic in nature polyester has less affinity to water molecules, hence shows lower wickability. The effect of inter fibrillary spaces due to micro structure is the same for both micro lyocell and micro polyester fabrics, but the hydrophilicity has dominant effect on the wicking behavior. Further the higher wickability is due to the decrease in contact angles and increased pore volumes of the micro lyocell rich fabrics.

### 3.2 Drying rate

Liquid transporting and drying rate of fabrics are two vital factors affecting the physiological comfort of garments. The moisture transfer and quick dry behaviors of textiles depend mainly on the capillary capability and moisture absorbency of the fibers. These characteristics are especially important in garments worn next to the skin or in hot climates. In these situations, textiles are able to absorb large amounts of perspiration, draw moisture to the outer surface and keep the body dry [9-11]. By analyzing the behavior in room temperature, the RWR is lower for the skin conditions as the heat provided by the environment enables quicker evaporation. Based on the results of the drying rate, the performance ranking is shown below: MP: 100 > MT/MP: 15/85 > MT/MP: 30/70 > MT/MP: 50/50 > MT/MP: 70/30 > MT/MP: 85/15 > MT: 100

Results shows that, as the micro polyester component of the blend increases, the drying rate also increases. Presence of micro polyester improves the drying rate and dry feel of the garment.

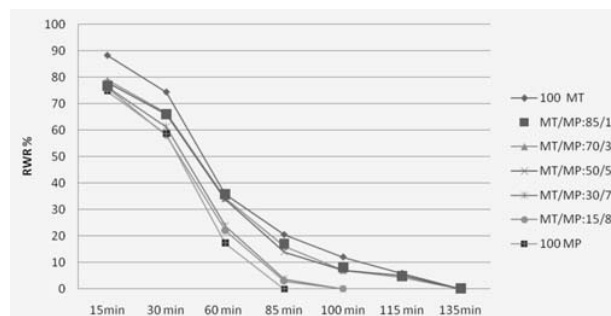


Figure 3.3 Drying behavior of microfibre blended woven fabrics

Moreover the curve shows an inflection point at about 30min, corresponding to a lower evaporation. In fact, the first part of the curve, represented by higher slope, corresponds to the moisture release from the fabric and the second part of the curve, with a lower slope, corresponds to the moisture release from fibers.

Polyester rich fabrics sheds off moisture very fast due to poor bonding of water molecules with the fibre and hence exhibits higher slope in both parts of the curve. On contrary, micro lyocell rich fabrics dry comparatively slower than the micro polyester rich fabrics.

### 3.3 Water Vapor Transmission

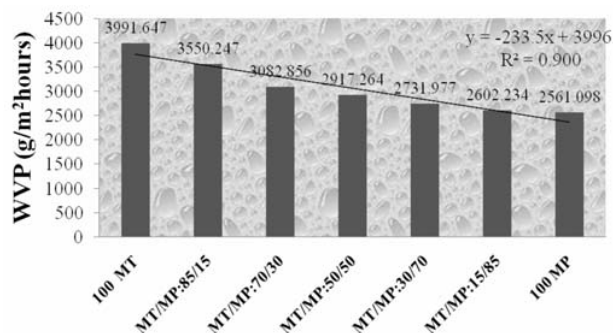


Figure 4. Water vapor permeability behavior of micro fibre blended woven fabrics

Figure 3.4 represents the water vapor permeability of microfibre blended woven fabrics. From the experimental result it has been observed that water vapour permeability increases with increase in micro lyocell content of the fabric, due to the increase in number of hydrophilic group in the material. When vapour transmits through a textile layer two processes are involved in that; diffusion and sorption-desorption. Water vapour diffuses through a textile structure in two ways, simple diffusion through the air spaces between the fibers and yarns along the fiber itself [2]. At a specific concentration gradient, the diffusion rate along the textile material depends on the porosity of the material and also on the water vapour diffusivity of the fibre. Diffusivity of the material increases with the increase in moisture regain [12]. As the micro lyocell proportion in the fabric increases, moisture regain of the material also increases causing higher diffusivity. In the same way moisture transfer through sorption-desorption process will increase with the hygroscopicity of the material. A hygroscopic fabric absorbs water vapour from the humid air close to the

sweating skin and releases it in dry air. This enhances the flow of water vapour from the skin to the environment comparatively to a fabric which does not absorb and reduces the moisture built up in the microclimate. Hence, micro polyester fabric with less hygroscopicity provides higher resistance to the water vapour transfer.

### 3.4 Moisture spreading

The water spreading behavior of micro fibre blended woven fabrics is shown in Figure 3.5

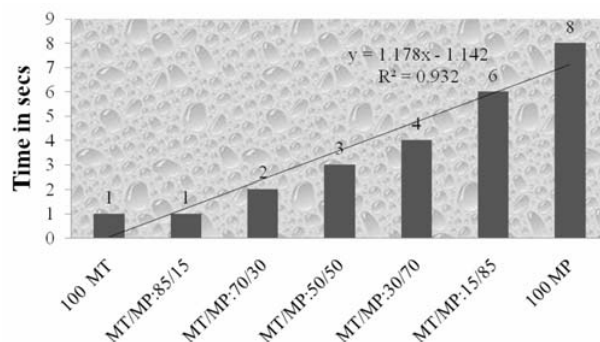


Figure 5. Water spreading behavior of micro fibre blended woven fabrics

Sanjay S Chaudhari states that the smaller the diameter of the fibre or the greater the surface energy, the greater is the tendency of a liquid to get absorbed through the fabric[13]. Owing to the high surface energy and excellent hydrophilic property of the micro lyocell, it picks up the moisture more readily than micro polyester which is a hydrophobic fibre. Brojeswari Das (2009), Dr Naresh M. Saraf explains that higher spreading rate is due to the decrease in contact angle between the fabric surface & water and increase in inter fibre and inter yarn pores & pore volumes of the material[14]. As the micro lyocell proportion increases in the fabric, number of water absorbing group increases, leading to higher hydrophilicity and higher absorption rate. On the other hand, the amount of water taken up by the pores will be dependent on the porosity of the material. Being highly porous in nature due to its micro structure, micro lyocell exhibits higher water absorbency.

## Texttreasure

“Sex and religion are closer to each other than either might prefer.”

- Saint Thomas Moore (1478-1535)

#### 4. Conclusion

Blending has an important role in moisture related comfort properties of clothing. From the present study it has been observed that water vapor transmission, water spreading and vertical wicking increases with the increased hydrophilic content of the fabrics. The micro fibre blends exhibits rapidity or higher rates of moisture management ability which greatly influences the thermo physiological and wear comfort of garments worn next to skin. Presence of a small amount of micro polyester enhances the moisture management and dry ability of the micro lyocell blended fabrics. Hence these fabrics can be effectively used in sports wear and bed linens for effective moisture management and drying properties..

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## Textsmile

*Five surgeons were taking a coffee break and were discussing their work. The first said, “I think accountants are the easiest to operate on. You open them up and everything inside is numbered.”*

*The second said, “I think librarians are the easiest to operate on. You open them up and everything inside is in alphabetical order.”*

*The third said, “I like to operate on electricians. You open them up and everything inside is color-coded.”*

*The fourth one said, “I like to operate on lawyers. They’re heartless, spineless, gutless, and their heads and their butts are interchangeable.”*

*Fifth surgeon said, “I like Engineers...they always understand when you have a few parts left over at the end...”*

# A Study to Reduce the Stiffness of Air Vortex Yarn

T.K.Sinha\*, Tanveer Malik  
 Department of Textile Technology,  
 Shri Vaishnav Institute of Technology and Science

## Abstract

Air vortex yarns are being getting popularity as because the yarn properties are comparable with ring yarn and the productivity is very high. Besides having good properties, one of the weaknesses of this yarn is high degree of stiffness. Present study was carried out at S.V.I.T.S to look into the possibility of reduction of stiffness of such yarn.

## Keywords

Air vortex, stiffness, spinning, twist

## 1. Introduction

One of the main disadvantages of air vortex yarn is very high degree of stiffness as compare to ring spun yarn. High stiffness in vortex yarn may be due to fascinated yarn structure where the centre parallel fibres are held together by surface wrapper fibre. The tip of the leading end of the fibre escapes the twist and remains untwisted in the core of the yarn where the surface fibres wrap the core parallel fibre. Since the majority of the fibre in the core remains untwisted, the bending modulus of the yarn increases which causes increase in the stiffness value. Second deficiency is variability in twist level in the spun yarn and twist can vary within a very wide range causing generation of weak points.

An attempt was made through this study to find the possibility of reducing the stiffness value of the yarn and increase in the strength.

Air vortex spinning is the one of the latest high speed spinning which has the industrial success even on 100 % cotton yarn and at a delivery speed of 400 to 450 m/min on medium count range. It has 3 to 4 times more speed than rotor and 20 times more speed than ring frame. This yarn has got ring yarn like structure on visual observation. Vortex yarn has got two part structure which can be simply revealed by untwisting

a vortex yarn by hand. None of the conventional twist measurement methods are suitable for vortex yarn. The air vortex spinning method takes drawn cotton clean sliver and drafts it to the desired yarn count using a 4 rollers / apron drafting system. The drafted fibres are then sucked into a nozzle where a high speed vortex air current wraps the fibres around the outside of a hollow stationary spindle. A vacuum around the base of the spindle acts to comb out shorter fibres and neps. Fibres are pulled down a shaft that runs through the middle of the spindle. Yarn twist is inserted as the fibres swirl around the apex of the spindle before being pulled down the spindle shaft. the productivity of air vortex yarn comes through its delivery speed, that it spins yarn directly from sliver and the fact that yarn is wound and cleared directly onto a package that can be sold by the mill.

The principle of formation of air vortex yarn has explained nicely by using numerical simulation analysis by zenguang pei and chongam yu [1].

Murata has demonstrated the Air vortex spinning on 100 % cotton at 400m/min. The characteristics of yarn and fabric are comparable with ring spun yarn and fabric [2].The yarn made by MVS is better in yarn strength, thick places, hairiness and fabric properties like greater pilling resistance, lower shrinkage, higher air permeability, etc [3].The better yarn strength in Vortex spinning is due to increased no. of wrapper fibres as the wrapper fibres enter 3- dimensionally [4]. More increase in wrapper fibre provides better gripping of core parallel fibres and this causes increase in yarn strength but elongation decreases [5]. Dr. Anbumani

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and C Rameshkumar [6] has stated that the draping coefficient of air vortex spun yarn fabric is poor due high degree of stiffness

**1.1. Excellent Feature Of Vortex Yarn**

Vortex has the least of hairiness among all types of spun yarn which gives the clear appearance of vortex fabric. The structure of vortex hardly emits hairiness, so pilling is extremely suppressed. The vortex yarn has got special fibre structure that makes absorbed water diffuse instantly, which provides refreshing feeling when wearing. The wash resistance is also excellent. Vortex prevents waste fibre being generated. So repeated washing hardly deforms clothes.

**1.2. Yarn Structure**

Basically the structure of vortex yarn is fascinated that the centre part is twisted less and the outer part is twisted more. In vortex spinning, the tip of the fiber is focused to the center of the yarn by the vortex of compressed air so that the center of the yarn is always made straight without twisting. The other tip of the fibre forms the outer layer which is twisted. While the center of vortex yarn is zero twist regardless of the materials, in the case of cotton 100%, twisting starts near the center of the yarn, and the outer side is fully twisted. In the case of the synthetic fibre zero twist area is larger, and twisting is made stronger toward the outer side. The center of the yarn is not twisted. Twisting is given toward the outer side of the yarn, twisting at the center of the yarn is loose, while the outer side is fully twisted. Thus, vortex spinning produces various types of yarn depending on the ratio of blending or the material

**2. Materials And Methods**

20 tex polyester cotton blended yarn of 65/35 % was made in a vortex spinning machine at 300 m/min. Two sample of yarn were made 2/20 tex two fold yarn and 2/20 tex twisted double yarn. The twist used in the double yarn was 13.8 T.P.I.

From these two sample of yarn three sample of fabric were made on loom keeping count, epi, ppi, everything same.

Sample No 1 —Woven fabric made out of 2/20 tex folded yarn and directly used for testing.  
 Sample No 2—Woven fabric made out of 2/20 tex twisted double yarn and directly used for testing  
 Sample No 3—Woven fabric made out of 2/20 tex folded yarn and chemically processed with a silicon based softening agent.

After making the fabrics, these are tested thoroughly in a lab under standard atmosphere and condition.

**3. Results And Discussion**

The single yarn properties were checked and found as follows.

*Table 3.1: Single yarn properties*

S. No.	MEAN VALUE	
1	ACTUAL COUNT	20.11
2	COUNT C.V	1.0 %
3	R.K.M . VALUE	11.7
4	R.K.M. C.V	17.1 %
5	ELONGATION %	7.0 %
6	U %	11.65
7	THIN (-50 %)	8.73
8	THICK (+50% )	11.38
9	NEPS (+200% )	23
10	TOTAL IMPERFECTION	43
11	HAIRINESS	4.5
12	OBJECTIONABLE FAULT	20
13	TOTAL FAULT	88

The above test results of the vortex yarn, shows a very good count c.v., reasonably good yarn strength, U% and reduced imperfection and faults.

The Three Fabric Sample Were Made And Tested.

*Table 3.2 : Fabric sample properties*

S.No.	Properties	Average Value		
		Sample No.1 (2 fold yarn)	Sample No.2 (2 fold twisted yarn)	Sample No.3 (treated with softener)
1	GSM	123.8	127.3	125.6
2	Pilling	Grade 5	Grade 5	Grade 5
3	Abrasion resistance	% wt loss-2.0 %thickness loss-3.1	% wt loss-2.3 % thickness loss-3.4	% wt loss-2.1 % thickness loss-3.2
4	Bending length (cm)	Warp/Weft 3.45/3.67	Warp/Weft 2.9/2.3	Warp/Weft 2.5/2.4
5	Flexural rigidity (mg-cm)	508.36/611.95	310.47/154.88	196.25/173.6

From Table 3.2 it is clearly understood that the stiffness of fabric sample no. 1 is high. This fabric was made with 2 fold parallel yarn of vortex yarn. The high degree of stiffness of vortex yarn has influenced the high degree of stiffness of the fabric.

In sample no. 2 the vortex yarn was twisted in a standard doubling machine. The fabric made out of it, shows reduction of stiffness as the flexural rigidity has come

down to 310 mg-cm from 506 mg-cm. The stiffness has further reduced in the sample no.3, where the sample fabric (2 fold untwisted yarn) had been treated with a standard softening agent. This treatment shows stiffness value drastically reduced as compared to sample no 1 which is basically 2 fold vortex yarn and marginally reduced as compared to sample no. 2 which is 2 fold twisted vortex yarn.

The pilling tendency found no change, so one can say twisting and softening treatment had not changed the pilling tendency. Similarly abrasion resistance has also not significantly changed.

#### 4. Conclusion

From the preceding discussion following conclusion can be drawn.

1. Air vortex yarn has high degree of stiffness.
2. Stiffness of air vortex yarn can be reduced by twisting in the double yarn as well as by chemical treatment with a softening agent.
3. Treatment with softener may give marginally better result as compare to twisting.

4. Pilling and abrasion may not have any effect on the twisting or softener treatment of the vortex yarn.

#### Acknowledgement

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## Textsmile

*A student comes into his lab class right at the end of the hour. Fearing he'll get an "F", he asks a fellow student what she's been doing. "We've been observing water under the microscope. We're suppose to write up what we see." The page of her notebook is filled with little figures resembling circles and ellipses with hair on them. The panic-stricken student hears the bell go off, opens his notebook and writes, "During this laboratory, I examined water under the microscope and I saw twice as many H's as O's."*

*The Unjust Salary Theorem asserts that scientists can never earn as much as sales people. This theorem is proved as follows. Start by using the physics formula*

$$\text{Power} = \text{Work} / \text{Time}$$

*Now you probably have heard that Knowledge is Power and Time is Money. Substitute these tautologies into the formula for power to obtain*

$$\text{Knowledge} = \text{Work}/\text{Money}$$

*Solving for Money, one finds*

$$\text{Money} = \text{Work} / \text{Knowledge}.$$

*Therefore, the less you know, the more you make.*

# Removal of Dyes from Textile Wet Processing Industry : A Review

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## Abstract

The objective of this review is to discuss the various methods of treating effluents from the textile industry. Several countries, including India, have introduced strict ecological standards for textile industries. With more stringent controls expected in the future, it is essential that control measures be implemented to minimize pollution problems. Industrial textile processing comprises pretreatment, dyeing, printing, and finishing operations. These production processes not only consume large amounts of energy and water, but they also produce substantial waste products. This review combines a discussion of different types of dyes from textile wet processing industry, with a discussion of advanced methods of effluent treatment, such as Membrane filtration, Coagulation/flocculation, Sorption and ion exchange, Electrolysis, Advanced oxidation processes and Biological techniques.

## Keywords

Effluent, Coagulation, Ion exchange, Electrolysis

## 1. Introduction

Ever since the beginning of humankind, people have been using colorants for painting and dyeing of their surroundings, their skins and their clothes. Organic natural colorants have also a timeless history of application, especially as textile dyes. These dyes are all aromatic compounds, originating usually from plants (e.g. the red dye alizarin from madder and indigo (Figure 1.1) from wood) but also from insects (e.g. the scarlet dye kermes from the shield-louse *Kermes vermilio*), fungi and lichens.

Synthetic dye manufacturing started in 1856, when the English chemist W.H. Perkin, in an attempt to synthesise quinine, obtained instead a bluish substance with excellent dyeing properties that later became known as aniline purple, Tyrian purple or mauveine. Perkin, 18 years old, patented his invention and set

up a production line. This concept of research and development was soon to be followed by others and new dyes began to appear on the market, a process that was strongly stimulated by Kékulé's discovery of the molecular structure of benzene in 1865. In the beginning of the 20<sup>th</sup> century, synthetic dyestuffs had almost completely supplanted natural dyes [1].

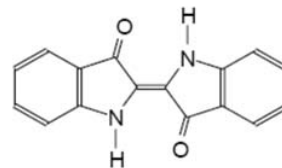


Figure 1.1 Indigo

## 2. Environmental impacts of Dyes

Many dyes are visible in water at concentrations as low as 1 mg l<sup>-1</sup>. Textile-processing wastewaters, typically with a dye content in the range 10 - 200 mg l<sup>-1</sup> [2, 3], are therefore usually highly coloured and if discharged in open waters present an aesthetic problem. As dyes are designed to be chemically and photolytically stable, they are highly persistent in natural environments. The release of dyes may

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therefore present an ecotoxic hazard and introduces the potential danger of bioaccumulation that may eventually affect man by transport through the food chain.

### 3. Dye removal techniques

Various physical, chemical and biological pre treatment, main treatment and post treatment techniques can be employed to remove colour from dye containing wastewaters. Physicochemical techniques include membrane filtration, coagulation/flocculation, precipitation, flotation, adsorption, ion exchange, ion pair extraction, ultrasonic mineralisation, electrolysis, advanced oxidation (chlorination, bleaching, ozonation, Fenton oxidation and photocatalytic oxidation) and chemical reduction. Biological techniques include bacterial and fungal biosorption and Algal biodegradation treatment processes. Several factors determine the technical and economic feasibility of each single dye removal technique. They are the dye type, wastewater composition, dose and costs of required chemicals, operation costs (energy and material) and environmental fate and handling costs of generated waste products. In general, each technique has its limitations. The use of one individual process may often not be sufficient to achieve complete decolourisation. Dye removal strategies consist therefore mostly of a combination of different techniques.

#### 3.1. Membrane filtration

Nanofiltration and reverse osmosis, using membranes with a molecular weight cut-off (MWCO) below ~10,000 Dalton, can be applied as main or post treatment processes for separation of salts and larger molecules including dyes from dyebath effluents and bulk textile-processing wastewaters. Filtration with bigger membranes, i.e. ultrafiltration and microfiltration, is generally not suitable as the membrane pore size is too large to prevent dye molecules passing through [4] but it can be successful as pretreatment for further nanofiltration or reverse osmosis. Membrane filtration is a quick method with low spatial requirement. Another advantage is that the permeate, as well as some of the concentrated compounds, including non-reactive dyes, can be reused. This reuse, however, applies mostly only for smaller waste flows. The disadvantages of membrane techniques are flux decline and membrane fouling, necessitating frequent cleaning and regular

replacement of the modules. Another important drawback is that the generated concentrate must be processed further, for instance by ozonation. The capital costs of membrane filtration are therefore generally rather high [4]. Filtration techniques for the treatment of textile wastewaters are especially widely applied in South Africa.

#### 3.2. Coagulation/flocculation

Coagulation/flocculation is often applied in the treatment of textile-processing wastewater, either to partly remove Chemical Oxygen Demand (COD) and colour from the raw wastewater before further treatment to polish the final effluents of biologically or otherwise treated wastewater [4] or even as the main treatment process. The principle of the process is the addition of a coagulant followed by a generally rapid chemical association between the coagulant and the pollutants. The thus formed coagulates or flocs subsequently precipitate or are to be removed from the water phase by flotation.

Various inorganic coagulants are used, mostly lime, magnesium, iron and aluminium salts. Inorganic compounds are, however, generally not very suitable to remove highly soluble (sulphonated) dyes from solution unless rather large quantities are dosed. Coagulation/flocculation with inorganic chemicals generates considerable volumes of useless or even toxic sludge that must be incinerated or handled otherwise. This presents a serious drawback of the process.

Recently developed organic polymers have been proven highly effective as dye coagulants, even for coagulation of reactive dyes, while the sludge production associated with polymer dosing is relatively low. Most of the polymers used for colour removal are, however, cationic and may be toxic to aquatic life at very low concentrations (less than 1 mg/l) and in biological wastewater treatment plants, some cationic polymers have been found to inhibit the nitrification process.

#### 3.3. Sorption and ion exchange

Activated carbon or other materials can be used to remove dyes from wastewater, either by adsorption (anionic dyes) or by combined adsorption and ion exchange (cationic dyes). Sorption techniques yield waste sludge, i.e. dye-saturated material that should be disposed off or regenerated. As there are nonionic,

anionic and cationic dyes, most adsorbents do not remove all different dye types. Activated carbon is capable of adsorbing many different dyes with high adsorption capacity but it is expensive and the costs of regeneration are high because desorption of the dye molecules is not easily achieved [4]. Various other (mostly low-cost) adsorbents have therefore been investigated as an alternative to activated carbon. Those adsorbents include:

- non-modified cellulose (plant) biomass, e.g. corn/maize cobs, maize stalks, wheat straw, linseed straw, rice husks, wood chips, sawdust, bark, coirpith, banana pith, bagasse pith, palm fruit bunch particles, peat moss, peat, linseed cake, sugar beet pulp, sugar industry mud, cotton waste and cellulose;
- modified cellulose biomass, e.g. carbonised coirpith, carbonised coconut-tree sawdust, chemically modified sunflower stalks, polyamide-epichlorohydrin-cellulose carbamoyl-cellulose, quaternised-cellulose, quaternised-lignocellulose; sugarcane bagasse derived anion exchange resin;
- bacterial biomass, e.g. *Aeromonas*, actinomycetes, activated sludge; dried and powdered biogas waste slurry;
- fungal biomass;
- yeast biomass;
- chitin, a material that can be found in e.g. shells, insect shields and fungal cell walls; chitosan, deacylated chitin; cross-linked chitosan fibres;
- soil material, e.g. sand, silica, natural clay, bentonite clay, diatomite clay, montmorillonite clay, vermiculite clay, fuller's earth, synthetic clay;
- wood charcoal, bone charcoal, barbecue charcoal, magnetic charcoal;
- activated bauxite, activated alumina;
- other materials, e.g. pressed sludge cake (pulp mill waste), pyrolysed tire, leather hide powder, dealginated seaweed, coal dust, chrome sludge, steel plant slag, fly ash and hair.

Some of these materials show high dye removal capacities, comparable or especially in the case of disperse dyes - even higher than activated carbon. This depends strongly on the dye class. Many of the materials listed, e.g. rice husks, bark, cotton waste and hair, have a high capacity for binding (cationic) basic dyes but hardly remove dyes from other classes. Acid and reactive dyes are generally the most difficult to remove. Some materials, e.g. bentonite clay, bind

several dye types except acid dyes whereas Fuller's earth, an adsorbent capable of binding dyes from many classes including acid dyes fails to bind reactive dyes. Chitin and chitosan have extremely high acid and reactive dye binding capacity.

Based on adsorption capacity for two basic dyes and one acid dye, it was calculated that the use of natural clay, bagasse pith and maize cob would require only about 2-10% of the costs of activated carbon, even though the adsorption capacity of these low-cost materials was considerably lower than that of activated carbon. To evaluate the feasibility of a potential dye adsorbent, not only its costs and its dye-binding capacity should be considered, but also its adsorption kinetics, its regeneration properties and its requirements and limitations with respect to environmental conditions like pH, temperature and salt concentration. In a review of the literature on the removal of acid dyes by using dead plant and animal matter, it was concluded that cross-linked chitosan and quaternised lignocellulose were the best materials with respect to adsorption or ion exchange capacity, adsorption kinetics and costs. Most non-modified biological materials had a low adsorption capacity, adsorbents with a high adsorption capacity like chitin, chitosan and polyamide-epichlorohydrin-cellulose had the drawback of very slow kinetics, and quaternised cellulose was too expensive.

Despite the large number of publications on dye adsorption, full-scale application is limited to combinations, e.g. combined adsorption and biodegradation in activated carbon amended activated sludge systems or anaerobic bioreactors, or combined sorption and coagulation by a synthetic clay slurry.

### 3.4. Electrolysis

Electrolysis is based on applying an electric current through to the wastewater to be treated by using electrodes. The anode is a sacrificial metal (usually iron) electrode that withdraws electrons from the electrode material, which results in the release of Fe(II) ions to the bulk solution and precipitation of Fe(OH)<sub>2</sub> at the electrode surface. Moreover, water and chloride ions are oxidised, resulting in the formation of O<sub>2</sub>, O<sub>3</sub> and Cl<sub>2</sub>. The cathode is a hydrogen electrode that produces H<sub>2</sub> gas from water. Organic compounds like dyes react through a combination of electrochemical oxidation, electrochemical reduction, electrocoagulation and



aromatic amines. For several aromatic amines, this can be achieved by biodegradation under aerobic conditions.

### 3.7. Fungal biodegradation

Lignin-degrading fungi, white-rot fungi, can degrade a wide range of aromatics. This property is mainly due to the relatively non-specific activity of their lignolytic enzymes, such as lignin peroxidase, manganese peroxidase and laccase. The reactions catalysed by these extracellular enzymes are oxidation reactions, e.g. lignin peroxidase catalyses the oxidation of non-phenolic aromatics, whereas manganese peroxidase and laccase catalyse the oxidation of phenolic compounds.

The degradation of dyes by white-rot fungi was first reported in 1983 and has since then been the subject of many research papers. An exhaustive review of these papers was recently published. Virtually all dyes from all chemically distinct groups are prone to fungal oxidation but there are large differences between fungal species with respect to their catalysing power and dye selectivity. A clear relationship between dye structure and fungal dye biodegradability has not been established so far. Fungal degradation of aromatic structures is a secondary metabolic event that starts when nutrients (C, N and S) become limiting. Therefore, while the enzymes are optimally expressed under starving conditions, supplementation of energy substrates and nutrients are necessary for propagation of the cultures. Other important factors for cultivation of white-rot fungi and expression of lignolytic activity are the availability of enzyme cofactors and the pH of the environment.

Although stable operation of continuous fungal bioreactors for the treatment of synthetic dye solutions has been achieved, application of white-rot fungi for the removal of dyes from textile wastewater faces many problems. As wastewater is not the natural environment of white-rot fungi, the enzyme production may be unreliable and the biomass growth and retention in bioreactors will be a matter of concern. As treatment of large water volumes may be difficult, extraction and concentration of dyes prior to fungal treatment, may be necessary. Furthermore, the low optimum pH for lignin peroxidase (4.5 - 5) requires extensive acidification of the usually highly alkaline textile wastewater and causes inhibition of other useful microorganisms like bacteria. Moreover, other

wastewater constituents, especially aromatics, may interfere with fungal dye degradation.

### 3.8. Algal biodegradation

Degradation of a number of azo dyes by algae has been reported in a few studies. The degradation pathway is thought to involve reductive cleavage of the azo linkage followed by further degradation (mineralisation) of the formed aromatic amines. Hence, algae have been demonstrated to degrade several aromatic amines, even sulphonated ones. In open wastewater treatments systems, especially in (shallow) stabilisation ponds, algae may therefore contribute to the removal azo dyes and aromatic amines from the water phase.

## 4. Conclusions

Waste minimization is of great importance in decreasing pollution load and production costs. This review has shown that various methods can be applied to treat textile effluents and to minimize pollution load. Traditional technologies to treat textile wastewater include various combinations of biological, physical, and chemical methods, but these methods require high capital and operating costs. Technologies based on membrane systems are among the best alternative methods that can be adopted for large-scale ecologically friendly treatment processes. A combination methods involving adsorption followed by nanofiltration has also been advocated, although a major drawback in direct nanofiltration is a substantial reduction in pollutants, which causes permeation through flux.

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# Application of Herbal Extracts for Antimicrobial Property

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## Abstract

Application of herbals on cotton opens up new avenues for herbal as well as Textile industry i.e. clean room fabrics, as herbal treated garments can be used in medical gown, operation theater fabric etc. Application of wound healing herbals on cotton has a scope in wound healing / wound dressing manufacturing. In order to analyze and explore the possibility of herbal medicine for bandages and wound dressing, various extracts of the colouring / medicinal substances from the different herbals like Amla, Myrobolan, Garlic, Turmeric, Neem, Tulsi, Aloe vera, Henna, Peepal and Banyan leaves were applied on the cotton fabric and their evaluation for the antimicrobial property was carried out.

## Keywords

Anti microbial property, Herbal, Medical textile, Wound dressing.

## 1. Introduction

The use of herbs to treat disease is almost universal among non-industrialized societies. A number of traditions came to dominate the practice of herbal medicine at the end of the twentieth century such as;

- The herbal medicine system, based on Greek and Roman sources
- The Siddha and Ayurvedic medicine systems from various South Asian Countries
- Chinese herbal medicine (Chinese herbology)
- Unani-Tibb medicine
- Shamanic Herbalism [1]

Among the 120 active compounds currently isolated from the higher plants and widely used in modern medicine today, 80 percent show a positive correlation between their modern therapeutic use and the traditional use of the plants from which they are derived.

More than two thirds of the world's plant species - at least 35,000 of which are estimated to have medicinal value - come from the developing countries.

Herbalists tend to use extracts from parts of plants, such as the roots or leaves but not isolate particular phytochemicals. They argue that the different phytochemicals present in many herbs will interact to enhance the therapeutic effects of the herb and dilute

toxicity. Herbalists deny that herbal synergism can be duplicated with synthetic chemicals. In specific cases the claims of synergy and multifunctionality have been supported by science [2].

The healing value of herbal treated textile (or herbal garment) and its usage is based on the principle of touch. By coming in contact with herbal cloth, the body loses toxins and its metabolism is enhanced.

Herbal garments helps in fighting many common and prevalent diseases such as hypertension, heart ailments, asthma, diabetes and skin diseases. For diabetes, Mimosa pudica (touch-me-not), cumon/cumin seeds, Magnolia champaca (champa) flower and Hibiscus rosa-sinensis or shoe flower (ghudahal) are combined in the herbal dye. The main herbs used in the herbal dye for arthritis are curry leaves and apocynceae. Whereas, for skin diseases, the herbs used are turmeric, neem, indigo and sandalwood. Cuscus grass is good for asthma patients, sandalwood; with its mild fragrance has a soothing effect that helps in fighting stress. Rubia cordifolia, majith are known to be effective against diseases like leprosy. Katha, catechu is used for treatment of parasitic infestation and itching.

Some of the other herbal dyes used are catechu, pomegranate rind, madder, castor oil, sweet basil, lime, wild turmeric, henna leaves, curry leaf tree, aloe vera, certain herbal fruits, etc, each having their own healing effects.

Textiles treated with medicinal herbals can be used in

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medical gown, operation room theater fabric etc. Also by application of wound healing herbals on cotton have a scope in wound healing / wound dressing manufacturing.

## 2. Materials And Methods

Cotton Fabric used in this investigation was received from Premier mills, Mumbai.

### 2.1 Herbal Drugs

- |                     |   |
|---------------------|---|
| 1. Amla Powder      | Local shop, Mumbai                            |
| 2. Myrobalan Powder | Local shop, Mumbai                            |
| 3. Tulsi            | Fresh Leaves from<br>ICT Garden               |
| 4. Neem             | Fresh Leaves from<br>ICT Garden               |
| 5. Garlic           | Local Vegetable Market                        |
| 6. Turmeric         | Lijjat, Sahakari Bahandar,<br>Matunga, Mumbai |
| 7. Henna Powder     | Local shop, Mumbai                            |
| 8. Peepal Leaves    | Fresh Leaves from<br>ICT Garden               |
| 9. Banyan Leaves    | Fresh Leaves from<br>ICT Garden               |
| 10. Aloe Vera       | Fresh Leaves from<br>ICT Garden               |

### 2.2 Extraction of herbals

Extraction of herbal for 2 % was carried out by taking 2 gms of it in 100 ml water and then boiled for 1 hr. It was then kept overnight and filtered out. The volume of filtrate was adjusted to 100 ml and extract was considered to be of 2% concentration.

### 2.3 Herbal Treatment

Cotton fabrics were treated by extract of different concentrations (5%, 10%, & 15%) of Amla, Myrobalan and Garlic for mordanting at 90°C for 1 hr. Samples were then washed with cold water and were air dried. After mordanting the samples were treated by 2% extract of the different herbals like Turmeric, Neem, Tulsi, Aloe vera gel, Peepal Leaves, Banyan Leaves and Henna Powder with different concentrations (2%, 5%, 10%, 15%, 20%, and 30% owf) at 90°C, then it was given cold wash and dried in air.

### 2.4 Antimicrobial Test

The herbal treated cotton fabric were tested for the antimicrobial properties against gram positive as well as gram negative bacteria according to the AATCC 100-2004 method.

## 3. Results And Discussion

In order to analyze and explore the possibility of using fibres as carrier of herbal medicine for bandages and wound dressing, a set of experiments was carried out to extract the colouring / medicinal substances from the different herbals like Amla, Myrobolan, Garlic, Turmeric, Neem, Tulsi, Aloe vera, Henna, Peepal and Banyan leaves. The herbal dye extracted from these herbals having the botanical name *Phyllanthus emblica* (Amla), *Terminalia chebula* (Myrobolan), *Allium sativum* L. (Garlic), were used as mordants while, *Curcuma longa* (Turmeric), *Azadirachta indica* (Neem), *Ocimum tenuiflorum* (Tulsi), *Aloe-Vera* (Aloe Vera), *Ficus religiosa* (Peepal), *Ficus benghalensis* (Banyan) and *Lawsonia inermis* (Henna) were used as herbal medicines and were applied on cotton fabric. Cotton fabric was used as carrier material to evaluate the preliminary performance properties of the herbals to be used as a medicine in bandages or wound healing medical textiles.

Initially treatment with 5 %, 10%, 15% & 20% on the weight of fabric of amla, myrobolan and garlic was given with 2% extract of the herbal. Depending upon the % owf to be applied, the required quantity of this extract was taken, MLR was maintained to 1:30 and treatment was carried out as per the method described in the experimental part. These mordanted fabrics were then treated with different percentages such as 2%, 5%, 10%, 15%, 20% & 30% of 2% herbal extract of turmeric, neem, tulsi, aloe-vera, henna, peepal leaves and banyan leaves. These herbal treated fabrics then were evaluated for their antimicrobial properties against the Gram positive and Gram negative bacteria by AATCC 100 test method. Antimicrobial activity of the herbals can give the preliminary idea about the application of the herbal treated textile as wound healing bandage or wound dressing. Also if these herbals show good antimicrobial properties after applying on to the textile fibres or fabrics, they can be used in treatment of absorbent layer of diaper or sanitary napkin so that it will help in retarding or stopping the growth of microbes which in turn can take care of the undesired rashes in some cases to the wearer's skin.

These herbals may act as medicament by killing the microbes around the skin / wound resulting in unhindered, desired, faster wound healing. Hence the evaluation of these herbal treated textiles for the antimicrobial properties was undertaken.[3]

**Table 3.1 : Antimicrobial activity of herbals used as mordant against the Gram +ve bacteria & Gram -ve bacteria**

Sr. No.	Samples	% reduction of Gram +ve bacteria	% reduction of Gram -ve bacteria
1	Amla 5%	78	72
2	Amla 10%	90	85
3	Amla 15%	98	93
4	Amla 20%	99	98
5	Myrobolan 5%	78	68
6	Myrobolan 10%	90	75
7	Myrobolan 15%	95	85
8	Myrobolan 20%	99	95
9	Garlic 5%	75	65
10	Garlic 10%	88	80
11	Garlic 15%	94	85
12	Garlic 20%	98	92

The results with respect to Gram +ve & Gram -ve bacteria namely; Staphylococcus aureus & Escherichia Coli are given in Table 3.1. From the table it can be said that all the three herbals used as mordants showed good antimicrobial properties against both type of bacteria. In all the cases it is evident that as the concentration of herbals increases, % reduction of bacteria also increases. In other words, higher was the concentration of these herbal extract on the fabric, higher was the possibility of its diffusion in the nutrient and thus more was its resistance to the growth of microorganisms. This was true in all the three different herbals. The control sample i.e untreated sample, did not show any reduction and on the contrary has shown increase in the number of bacterial colonies. This clearly indicates that the fabric used here typically acts as a vehicle or carrier for the medicinal extract and it does not interfere in any way in the reduction of microbial growth. From the table it is seen that practically 100 % reduction in growth is given by amla, myrobolan and garlic at 20% concentration. Overall it ranges from 78% to 99% for Gram +ve bacteria while for Gram -ve bacteria it ranges from 72% to 98%.

Among the three herbal extracts amla and myrobolan gave the maximum % reduction of microorganism followed by garlic. These three are known to be wound healing medicine in Ayurved. [4]

**Table 3.2 : Antimicrobial activity of different herbals against the Gram +ve & Gram -ve bacteria**

Sr. No.	Samples	% reduction of Gram +ve bacteria	% reduction of Gram -ve bacteria
1	Turmaric 2%	73	72
2	Turmaric 15%	88	85
3	Turmaric 30%	95	93
4	Neem 2%	70	46
5	Neem 15%	95	80
6	Neem 30 %	98	93
7	Tulasi 2%	75	38
8	Tulasi 15%	95	83
9	Tulasi 30 %	98	94
10	Aloe-vera 2%	45	35
11	Aloe-vera 15%	60	65
12	Aloe-vera 30 %	75	80
13	Banyan 2%	35	15
14	Banyan 15%	55	34
15	Banyan 30 %	70	48
16	Peepal 2%	49	10
17	Peepal 15%	68	45
18	Peepal 30 %	78	70
19	Henna 2%	10	10
20	Henna 15%	40	40
21	Henna 30 %	75	70

Similarly the results in Table 3.2 show the extent of reduction in the growth of Gram +ve & Gram -ve bacteria by different herbals. In this case too, higher was the extract concentration; higher was the reduction in microbial growth, irrespective of the type of microbes. With regards to the ability of seven different medicinal herbal extracts on their application on cotton fabric in offering antimicrobial property, the order is as follows; Tulsi = Neem > Turmeric > Aloe-vera > Peepal > Banyan > Henna

Highest concentration (30%) under study of neem & tulsi showed 98% reduction in bacterial growth while highest concentration (30%) of turmeric has shown 95% reduction. The other herbals did not give more than 75% reduction even at highest concentration of 30%. Hence it was though appropriate to study the combination of these herbal extracts with the so called mordants as described earlier to get increased reduction in bacterial growth.

**Texttreasure**

*“Don't be so humble - you are not that great.”*

*- Golda Meir (1898-1978) to a visiting diplomat*

The further sets of experiments were devoted to study the effect of seven herbal extracts on application on pretreated (mordanted) cotton fabric with Amla, myrobolan and garlic as a mordant in exhibiting synergetic effect on antimicrobial property with less concentration of application of the herbal extract if possible.

**Table 3.3 : Antimicrobial activity of Turmeric mordanted with Amla, Myrobolan and Garlic against the Gram +ve & Gram -ve bacteria**

Sr. No.	Samples	% reduction of Gram +ve bacteria	% reduction of Gram -ve bacteria	
1	Turmeric 2%	73	72	
2	Turmeric 15%	88	85	
3	Turmeric 30%	95	93	
4	Amla 5% + Turmeric	2%	80	78
5		15%	90	85
6		30%	97	92
7	Amla 20% + Turmeric	2%	85	80
8		15%	97	92
9		30%	99	98
10	Myrobolan5% + Turmeric	2%	78	75
11		15%	89	80
12		30%	96	93
13	Myrobolan20% + Turmeric	2%	85	85
14		15%	96	95
15		30%	99	98
16	Garlic 5% + Turmeric	2%	75	70
17		15%	85	82
18		30%	93	90
19	Garlic 20% + Turmeric	2%	83	80
20		15%	85	80
21		30%	97	92

Table 3.3 shows the results of application of Turmeric extract on mordanted cotton with three different mordants namely amla, myrobolan and garlic. The concentrations of mordants taken were 5% and 20% while those of turmeric extracts were 2%, 15% and 30%. From the table it is clear that mordanting shows definite increase though marginal in reduction of growth of both types of microorganisms. As the concentration of turmeric was increased keeping mordant concentration same, the reduction in bacterial growth was increased in all the cases. The trend as seen earlier remained same, that the myrobolan gave almost comparable results as of Amla while garlic giving slightly inferior results. In case of combination of Amla and tumeric as well as Myrobolan and turmeric the % reduction of almost 90% and more was observed in

combination of 5% + 15%, 5% + 30%, 20% + 15% and 20% + 30% where first value is for mordant while second value is for herbal extract. In case of Garlic + turmeric more than 90% reduction was observed in combination of 5% + 30% and 20% + 30% only. Thus at different combination of the herbal concentrations as seen from the table, more than 90% reduction in bacterial growth could be achieved which as per norms is quite enough to be used as medicament for wound healing or in diaper absorbent layer to reduce the microbial growth on skin.

**Table 3.4: Antimicrobial activity of Neem mordanted with Amla, Myrobolan and Garlic against the Gram +ve & Gram -ve bacteria**

Sr. No.	Samples	% reduction of Gram +ve bacteria	% reduction of Gram -ve bacteria	
1	Neem 2%	70	46	
2	Neem 15%	95	80	
3	Neem 30 %	98	93	
4	Amla 5% + Neem	2%	85	75
5		15%	97	85
6		30%	98	96
7	Amla 20% + Neem	2%	98	93
8		15%	99	97
9		30%	99	99
10	Myrobolan 5% + Neem	2%	83	75
11		15%	91	83
12		30%	98	94
13	Myrobolan 20% + Neem	2%	97	91
14		15%	99	95
15		30%	99	99
16	Garlic 5% + Neem	2%	80	75
17		15%	88	88
18		30%	98	98
19	Garlic 20% + Neem	2%	95	86
20		15%	99	94
21		30%	99	99

In the similar set of experiments neem extract treatment was given to mordanted cotton fabric and then treated fabrics were evaluated for the antimicrobial properties and the results are shown in Table 3.4. From the table it can be observed that neem is showing excellent antimicrobial activity against both type of bacteria and giving almost 100% reduction in microbial growth. Even 5% Amla and 2% neem have given 85% reduction in microbial growth, which is clearly the synergetic effect of the combination as 5% amla has shown only 78% reduction in microbial growth while 2% neem has shown 70% reduction in microbial growth. From the table it can also be observed that as the concentration

of application of the herbal extract and mordant increases, % reduction in microbial growth also increases which is but obvious.

**Table 3.5 : Antimicrobial activity of Tulasi mordanted with Amla, Myrobolan and Garlic against the Gram +ve & Gram -ve bacteria**

Sr. No.	Samples	% reduction of Gram +ve bacteria	% reduction of Gram -ve bacteria	
1	Tulasi 2%	75	38	
2	Tulasi 15%	95	83	
3	Tulasi 30 %	98	94	
4	Amla 5% + Tulasi 2%	80	75	
5		Tulasi 15%	96	90
6		Tulasi 30%	98	96
7	Amla 20% Tulasi 2%	97	87	
8		Tulasi 15%	99	95
9		Tulasi 30%	99	99
10	Myrobolan 5% Tulasi 2%	80	73	
11		Tulasi 15%	90	88
12		Tulasi 30%	98	95
13	Myrobolan20% Tulasi 2%	85	85	
14		Tulasi 15%	94	88
15		Tulasi 30%	98	96
16	Garlic 5% Tulasi 2%	75	70	
17		Tulasi 15%	85	85
18		Tulasi 30%	92	90
19	Garlic 20% Tulasi 2%	85	81	
20		Tulasi 15%	92	91
21		Tulasi 30%	97	95

Results of similar experiments with tulsi are shown in Table V. Tulsi has also shown similar results rather slightly better as compared to neem. As it is well a known herb having very good antimicrobial properties and here also it is giving good antimicrobial activity on application to the cotton fabric. It is giving practically 100% reduction in microbial growth in most of the combinations. It is difficult to distinguish the better one however, both Neem and Tulsi seems to be offering desired antibacterial property.

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**Table 3.6 : Antimicrobial activity of Aloe vera mordanted with Amla, Myrobolan and Garlic against the Gram +ve & Gram -ve bacteria**

Sr. No.	Samples	% reduction of Gram +ve bacteria	% reduction of Gram -ve bacteria	
1	Aloe-vera 2%	45	35	
2	Aloe-vera 15%	70	65	
3	Aloe-vera 30 %	80	78	
4	Amla 5% Aloe-vera 2%	70	69	
5		Aloe-vera 15%	80	78
6		Aloe-vera 30%	90	89
7	Amla 20% Aloe-vera 2%	75	73	
8		Aloe-vera 15%	89	85
9		Aloe-vera 30%	97	94
10	Myrobolan 5% Aloe-vera 2%	70	68	
11		Aloe-vera 15%	82	80
12		Aloe-vera 30%	90	89
13	Myrobolan 20% Aloe-vera 2%	75	70	
14		Aloe-vera 15%	85	84
15		Aloe-vera 30%	96	91
16	Garlic 5% Aloe-vera 2%	68	65	
17		Aloe-vera 15%	80	75
18		Aloe-vera 30%	90	85
19	Garlic 20% Aloe-vera 2%	70	69	
20		Aloe-vera 15%	84	83
21		Aloe-vera 30%	94	90

**Table 3.7 : Antimicrobial activity of Banyan leaves mordanted with Amla, Myrobolan and Garlic against the Gram +ve & Gram -ve bacteria**

Sr. No.	Samples	% reduction of Gram +ve bacteria	% reduction of Gram -ve bacteria	
1	Banyan 2%	35	15	
2	Banyan 15%	55	34	
3	Banyan 30 %	70	48	
4	Amla 5% Banyan 2%	70	65	
5		Banyan15%	75	70
6		Banyan30 %	85	80
7	Amla 20% Banyan2%	73	65	
8		Banyan15%	80	80
9		Banyan30 %	94	91
10	Myrobolan 5% Banyan 2%	68	60	
11		Banyan15%	74	70
12		Banyan30%	88	80
13	Myrobolan20% Banyan2%	70	63	
14		Banyan15%	78	78
15		Banyan30%	92	89
16	Garlic 5% Banyan2%	65	60	
17		Banyan15%	70	65
18		Banyan30%	85	80
19	Garlic 20% Banyan2%	68	62	
20		Banyan15%	75	76
21		Banyan30%	90	87

**Table 3.8 : Antimicrobial activity of Peepal mordanted with Amla, Myrobolan and Garlic against the Gram +ve & Gram -ve bacteria**

Sr. No.	Samples	% reduction of Gram +ve bacteria	% reduction of Gram -ve bacteria
1	Peepal 2%	49	10
2	Peepal 15%	68	45
3	Peepal 30 %	78	70
4	Amla 5%	Peepal 2%	70
5		Peepal 15%	85
6		Peepal 30%	90
7	Amla 20%	Peepal 2%	76
8		Peepal 15%	90
9		Peepal 30%	96
10	Myrobolan 5%	Peepal 2%	60
11		Peepal 15%	75
12		Peepal 30%	85
13	Myrobolan20%	Peepal 2%	66
14		Peepal 15%	81
15		Peepal 30%	90
16	Garlic 5%	Peepal 2%	58
17		Peepal 15%	75
18		Peepal 30%	85
19	Garlic 20%	Peepal 2%	61
20		Peepal 15%	83
21		Peepal 30%	91

**Table 3.9: Antimicrobial activity of Henna mordanted with Amla, Myrobolan and Garlic against the Gram +ve & Gram -ve bacteria**

Sr. No.	Samples	% reduction of Gram +ve bacteria	% reduction of Gram -ve bacteria
1	Henna 2%	10	10
2	Henna 15%	40	40
3	Henna 30 %	75	70
4	Amla 5%	Henna 2%	60
5		Henna 15%	74
6		Henna 30%	87
7	Amla 20%	Henna 2%	65
8		Henna 15%	80
9		Henna 30%	93
10	Myrobolan 5%	Henna 2%	57
11		Henna 15%	66
12		Henna 30%	84
13	Myrobolan 20%	Henna 2%	62
14		Henna 15%	72
15		Henna 30%	89
16	Garlic 5%	Henna 2%	56
17		Henna 15%	64
18		Henna 30%	84
19	Garlic 20%	Henna 2%	60
20		Henna 15%	70
21		Henna 30%	88

Similarly remaining herbals; Aloe-Vera, Banyan leaves, Peepal leaves and Henna extract were used for treating the cotton fabric after mordanting with amla, myrobolan and garlic extract. The results are shown in Table 3.6 – Table 3.9. From these tables it can be confidently said that mordanting has positive effect on the antimicrobial properties. In other words, herbal treatment on the mordanted cotton fabric has better antimicrobial properties than the non mordanted cotton fabric especially at lower concentration of application. This effect is more conspicuous here as compared to the previous herbals, turmeric, neem and tulsi as alone aloe – vera, banyan leaves, peepal leaves and henna are less effective in imparting antimicrobial property. Among these herbals aloe-vera is more effective in imparting antimicrobial property than the banyan leaves, peepal leaves and henna.

From these experiments it can be said that amla, myrobolan, garlic, turmeric, neem and tulsi has shown excellent antimicrobial activity when applied on to the textile when used alone as well as in combination. So in other words, these herbal extracts can be used in wound dressing bandages. Generally wound heals naturally on its own and the process become faster when one provides better condition for healing like cleanliness, moist environment and microbe free environment. Thus in conclusion it could be said that;

1. Extracts of Amla, Myrobolan, Garlic, Tulsi, Neem and Turmeric impart excellent antimicrobial property alone as well as in combination.
2. Amla, Myrobolan and Garlic when tried as mordant, Amla and Myrobolan showed better results compared to garlic extract.
3. Tulsi, Neem and Turmeric extract when evaluated in combination with amla, myrobolan and garlic, imparts excellent antimicrobial property.
4. Other herbal extracts like aloe-vera, Henna, Banyan leaves and Peepal leaves are not very much promising in imparting antimicrobial property by this type of exhaust application on fabrics which can be seen from the results. Hence one can not recommend the use of these herbals for imparting antimicrobial property with these parameters of the application.

It is to be noted that these experiments are quite preliminary and require additional data to clearly come out with the product, which can in fact offer capacity of wound healing comparable to the products available in the market based on the allopathic medicine.

**4. Conclusion**

In order to analyze and explore the possibility of herbal medicine for bandages and wound dressing by extracts of the colouring / medicinal substances from the different herbals like Amla, Myrobolan, Garlic, Turmeric, Neem, Tulasi, Aloe – vera, Henna, Peepal and Banyan leaves, study was done on the cotton fabric and evaluation for the antimicrobial property was done. The results show that extracts of Amla, Myrobolan, Garlic, Tulsi, Neem and Turmeric impart excellent antimicrobial property when applied alone as well as in combination. Amla, Myrobolan and Garlic when tried as mordant, Amla and Myrobolan showed better results compared to garlic extract. Other herbal extracts like aloe vera, Henna, Banyan leaves and Peepal leaves are

not much promising in imparting the antimicrobial property by the type of exhaust application on fabrics, hence, cannot be recommended the use of these herbals for imparting antimicrobial property with researched parameters of the application.

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*“You can avoid reality, but you cannot avoid the consequences of avoiding reality.”*  
- Ayn Rand (1905-1982)

## The Rebirth of Himroo

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### Abstract

From about 600 years ago, when the Indian city of Delhi was being governed by emperors from the Tuglak dynasty, noticeable amount of interchanges were taking place between Indian and Persian weavers. During an ebullient time in Indian history, when emperor Mohammed Bin Tuglak and his loyal herd of elephants tried to relocate their headquarters to Daulatabad in Maharashtra, some precious trade secrets of Persian shawl weaving techniques clandestinely found their way into the narrow alleys of Aurangabad. At a later period in history, and in the Mogul period, weavers who enjoyed imperial patronage began challenging the supremacy of the Persian weavers. The Himroo shawls produced in India evoked intense curiosity in neighboring foreign lands. This not only guaranteed a lucrative export market, but also uplifted the image of the Mogul dynasty. However, the disintegration of the empire of Aurangzeb resulted in the Maratha and British incursions. These unwarranted political upheavals not only inflicted deep injuries upon civil society, but also disrupted everyday life and stifled the artistic spirit central to Indian culture.

With this short piece of literature, we wish to awaken a new spurt of interest in the ancient fabric weaving art of Himroo. While doing so, we have tried to employ a style of narration that was once the hallmark of British historians digging into India's rich past. We have collected relevant bits and pieces of information from Indian history and woven it into a story about Himroo.

### Key words

Himroo weaving, Persian weaving

### 1. Introduction

Culturally, weavers in Turkey and Persia had been burning the midnight oil to conserve a vibrant fabric weaving tradition that often gave a purpose to one's life. While some aging historians hold the view that Himroo weaving originated from Persia, others wish to remain uncommitted to this controversial view.



Fig.1.1: Authentic Himroo shawl

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Nevertheless, Himroo weaves radiated a stately character that readily appealed to the discerning tastes of the nobility from many countries. It is no secret that Kings, Queens, Emperors, and Sultans of that era had a collection of Himroo clothing quietly stashed away in their wardrobes. During the rule of the Tuglak dynasty, weavers in India had discovered the ingenious Persian technique of weaving shawls by blending threads of silk, cotton, and gold. In Persia, shawls were being woven in the northeast regions. Later, however, while the Persian weavers were pouring attention on carpet weaving, Indian weavers stealthily began perfecting the art of weaving Himroo shawls. In other words, the epicenter of Himroo shawl weaving shifted from Persia to India.



Fig.1.2: Boy climbing tree (Ajanta inspired)

The founding generation of Mogul emperors of India had never severed their deep cultural and religious ties with Persian civilizations. Mogul emperor Babur, who was the sagacious grandfather of Akbar The Great, was outstandingly Persian in social demeanor, lineage and philosophical thought. Incidentally, a renowned Persian architect named Ustad Ahmed Lahauri was invited by emperor Shah Jahan to conceive, design and build the Taj Mahal at Agra. During the Tuglak and Mogul periods, Himroo weaving, with its distinctive Persian parentage, had become a favorite creative occupation for those who desired a break from everyday monotony.

## 2. Objectives

Principally, we wish to identify major social, political, and historical factors, which collectively altered India's national fabric and crippled the Himroo weaving industry. Additionally, from a new vantage point of prudent modernity, we also wish to point out inadequacies in archaic Himroo weaving practices that need to be rectified for revival of this craft in the 21<sup>st</sup> century. In our discussion, we shall also examine the fitness of Himroo fabric creations for induction into contemporary fashion wear, while also making an attempt to add a strong cultural angle to the idea of Globalization. Our intent is to generate a rush of consumer curiosity in new age Himroo products by unraveling the fascinating history behind Himroo weaving. Perhaps, a new sense of awareness about India's glorious past could help enkindle a new wave of demand for Himroo merchandise in India, Indonesia, Malaysia, Pakistan, Iran, and Iraq.

## 3. Materials, Methods and Products

One of the greatest secrets unknown to the Western world is that expensive looking Himroo fabrics can be produced on a simple pit loom. Pit looms are often used by tribal weavers in Assam and Orissa. However, Himroo fabrics can be successfully mass produced on modern day Jacquard looms also. These Jacquard looms utilize punched cards arranged to compose figured weaves. The punched cards systematically activate leashes to raise or drop warp strands, while permitting the admission of weft yarns inside a shuttle. This way, Himroo weavers aspire to create a composite fabric with cotton in the warp and weft, and additionally brocaded by weft silk. Short warps are made possible by winding yarn on iron shafts from the bobbin creel. Long warps require drum winding. In modern times, rayon is being substituted for weft silk. Typically, 2-ply staple yarns of either 40 or 60 count are utilized for

the warp, while 2-ply 20 count cotton yarns are utilized for producing the main weft. Nowadays, 150 denier rayon or 2-ply 40 count hand spun varieties of silk are being used for brocading. Synthetic dyes are currently favored over vegetable dyes.



*Fig 1.3 : Silk yarns on paratia (stick cage)*

Silk yarns tend to break easily. Therefore, weaving with silk yarn requires exceptional dexterity, skill, patience, concentration and composure. It is said that only craftsmen gifted with the passion of a spider for weaving, and the keen eyesight of a hawk can make headway in this profession. The typical production cycle for a Himroo shawl is 2 to 3 weeks. In modern machine driven societies, the wages that Himroo weavers presently earn do not justify the quantum of labour, soulful artistic passion, and dedication that goes into the making of a product. Moreover, in a mechanized world devoid of character, unskilled workers shackled to an assembly line and entrusted with a repetitive job are able to earn better wages than a highly skilled craftsman with aesthetic intelligence. Such logic defying systems of economic reward conceived by Western business tycoons have collided directly with the philosophy of nurturing and rewarding artistic talent in the Eastern civilizations.

Himroo fabrics tend to be too heavy for contemporary tastes. With their characteristic heaviness, they are not ideally suitable for modern day garments. However, elegant Himroo creations in the form of trims, collars, and patches can be used as embellishment supplements on modern apparel styles. In interesting feats of ingenuity, Himroo fabrics can be used to create a new line of modern day fashion accessories such as neck ties, stoles, belts, buttons and handbags. In recent

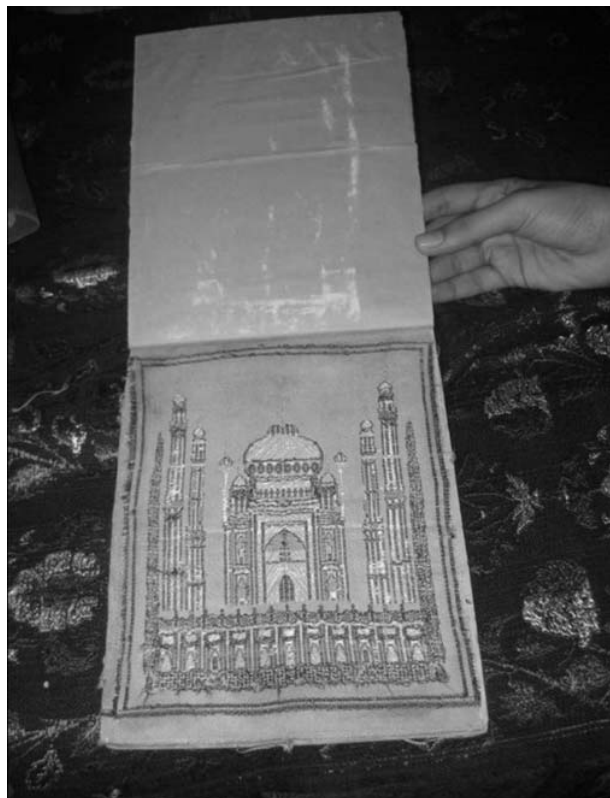
decades, and in a humiliating act of surrender to the mass production ideologies of the West, Himroo shawls are being produced on power looms. In the city of Aurangabad, power looms engaging in cost effective Himroo production are using rayon as a substitute for silk. This has brought Himroo shawls within the mass market envelope, while unintentionally and unwittingly snatching away its exclusivity factor. At present, the most significant clientele for Himroo shawls in India comprise of foreign tourists from the West, who find the unusually colorful Indian artistry compellingly captivating and unusual.

#### 4. Historical Background and Analysis

Though the Chinese civilization were the first to produce silk, they had not been vigilant enough to guard their priceless discovery. While the Chinese were absorbed in the business of brewing aromatic concoctions from tea leaves, silk worms were secretly smuggled out of China into other parts of the world. In the 7<sup>th</sup> century, when Arabs conquered Persia and went on a rampage, silk was brought into Italy and other parts of Europe. When women in European aristocracy discovered five distinct ways of wearing a shawl to enhance their sensual appeal, shawls became high fashion garments in European culture. Thereafter, Kashmiri shawls became an important fashion accessory in the Western world. This put the Indian shawl on the world map.

In some cultures, as those in Persia, artisans and weavers enjoyed the same status as artists, scholars and intellectuals. In many medieval societies where wine was strictly forbidden, common people generally engaged in benevolent pursuits such as sharpening one's scholarly intellect by reading the scriptures, or perfecting one's skills in artistry. In Persian tradition, a woven carpet or an embroidered shawl was perceived as an exquisite piece of art that portrayed the ethnic sophistication of an entire civilization. In fact, Persian carpets that symbolized sophistry were so incorrigibly expensive that they eventually became absolute symbols of luxury, opulence, wealth and political power all over the world. To the Persian psyche, woven carpets and shawls were delicate works of art that would eventually become family heirloom. On the other hand, Westerners regarded Persian carpets as objects that the affluent classes could acquire to flaunt wealth. This bitter difference in perception is worth noting. The Persian aristocracy would place small carpets in the middle of a room to admire their intrinsic beauty, and tread

cautiously around them. In contrast, the less cultivated Western aristocracy would clumsily trample all over the carpets. To the Western psyche, while a painting on a piece of canvas represented a piece of art, an artistically woven fabric or carpet failed to evoke such a response.



*Fig. 4.1: Taj Mahal woven on Himroo*

During the tumultuous reign of Mohammed Bin Tuglak in Delhi, artisans and weavers in India had managed to strike a chord with the temperamental emperor who had a taste for fine living.

Governance under the Tuglak dynasty had a rare degree of economic sophistication where taxes were levied from affluent farmers and generous loans were given to deserving artisans, craftsmen, and weavers. Later, the Mogul dynasty is also known to have exhibited even a greater degree of sophistication and a stronger cultural compassion towards art, architecture, literature, and music. Therefore, the first signs of extinction of Himroo weaving might have surfaced during the onset of the decay of the Mogul Empire. Incidentally, there had come a time when Himroo weaving communities wished to distance themselves politically and geographically from the younger breed of whimsical

sultans of Delhi. They established new weaving havens in Aurangabad and Hyderabad. While this strategy allowed Himroo weaving activities to flourish for a short while, the weavers must have begun losing royal patronage. After the death of Aurangzeb, patronage from Delhi must have reduced to a trickle.



*Fig. 4.2: Himroo on Jacard loom*

For an unbroken period of nearly 150 years, the Moghul dynasty protected northern India from foreign invaders. In doing so, they brought stability to the region, united the people of India under one emperor, and provided uninterrupted continuity of civic tradition in society. However, during Aurangzeb's time the Mogul Empire became too lofty and unwieldy for efficient governance. It soon began cracking at the seams. The British saw this as a window of opportunity to raid India. Under British governance, labour intensive cottage industries in most parts of India began shutting down. The most basic equipment for Himroo production was the unpretentious hand operated pit loom for which the Englishmen with mechanical prowess had utter scorn. It is during this time that vibrant self sustaining village economies that had been carefully established in India over hundreds of years were systematically destroyed. In fact, during the British presence in India for about 200 years, fabrics produced cheaply on power looms with English ingenuity flooded the Indian markets. These events took a toll on all forms of weaving. More strikingly, British cultural influence dramatically altered

consumer tastes in India. In clothing accessories, emphasis began shifting to pure functionality. Incidentally, Mohandas Gandhi intentionally spun yarn on his charka as a symbolic act of revolt against mindless mechanization of the textile industry.

At a memorable time in history when artistry was seriously admired, the Himroo shawls had provided a canvas for the artistically inclined weaving communities in Aurangabad and Hyderabad. Himroo weavers could brazenly flaunt their weaving mastery, geometric perceptions and visual imagination. The adornment work on the shawls usually consisted of a sequence of mind boggling patters that yearned to invite attention. The bright geometric patterns and floral artistry in fabric artwork spontaneously appealed the Middle Eastern and European sensibilities.

The lively artistic component in ethnic men's clothing that had for centuries been a critical part of native fashion statements was somewhat under threat. In the age of machines, intricate artistry was no longer fashionable. Faced with the alternative of cheaply produced power loom fabrics, Indian consumers were not willing to pay the price that would make elaborate and labour intensive weaving artwork commercially viable.

### **5. Conclusions and Recommendations**

Like most other labour intensive crafts originating from medieval India, Himroo was also one that needed the cardinal trade secrets of the art to be quietly passed on from one financially deprived generation to the next. Often, great financial sacrifices needed to be made within Indian households intent on retaining a household tradition of Himroo weaving. Perhaps, only the power of passion for the art could keep Indian craftsmen still interested in an occupation that guaranteed financial ruin over a lifetime. In recent years, many well qualified Himroo handloom weavers have abandoned their profession and moved to greener pastures in the mechanized world.

For a delicate craft like Himroo to flourish, a certain type of cultural ambience becomes essential. Himroo can thrive in an Indian civilization that can connect emotionally with its rich heritage.

To bring Himroo closer to one's heart, the young Indian consumer would have to connect emotionally with India's 600 year old historical past. The Indian

civilization must be gently reminded that Himroo was once endorsed by the Mogul nobility. Perhaps, every Himroo shawl, with its characteristic motifs, carries with it some historical baggage. Therefore, from a consumer standpoint, owning a Himroo shawl would be culturally synonymous to owing a piece of India's Mogul heritage. For breathing new life into an ancient art, craftsmen of the current century might have to collectively come together and seek assistance from the government to help refine and reform consumer tastes to be able to build a demand for Himroo masterpieces. By simply borrowing adornment ideas from India's Mogul heritage, Himroo creations have the potential to add a touch of genealogical sophistication to contemporary fashion that were popular during the medieval Mogul era are not readily suitable for incorporation into contemporary fashion apparel in India. But consumers in Indonesia, Iran, Iraq and Pakistan may find the Mogul era motifs fascinating.

It would be comforting for the social elites in India to know that a Himroo revival movement is currently in the works. Government organizations, cooperative weaving societies, and people from academia have now woken up culturally to give a new lease of life to Himroo. The Himroo Weaver's Industrial Cooperative Society in Aurangabad is an institution actively engaged in keeping Himroo weaving alive. The cities of Nagpur and Sholapur are now boasting of a readily available pool of master weavers who can be quickly trained in the Himroo school of weaving. Himroo fabrics are now being displayed at the India International Trade Fair held every year in New Delhi. Meanwhile, efforts to educate Himroo weavers about urban markets, overseas markets, consumer preferences, marketing channels, and micro credit financing ought to be able to make significant impact.

### 5.1. Following are the fashion products developed from Himroo



Fig 5.1: Women's kurta designed with Himroo yoke, women's western wear with Himroo, tie made from Himroo and souvenir pouch designed from Himroo

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## Textsmile

*Scientist were playing hide and seek. It was Einstein's turn to seek. All scientists went and hid except Newton! Who simply drew a square of one meter and stood inside it. Einstein finished counting and spotted Newton. He screamed, 'I found Newton!' Newton calmly replied-'You are wrong. I am Newton standing in a square of one meter, which is equal to Pascal. Hence I am Pascal.'*

## Indian Textile Industry – Past and Present

**Shri M. K. Mehra**

*Director – OGTC & Past President TA (I)*



*Shri M.K. Mehra is working in Textile Industry for last 55 years and is alumnae of TIT Bhiwani. After a long spell in Textile Manufacturing he has specialized in the field of management, training and development.*

*He has undertaken three new Textile Projects and completed under his leadership. Presently he is working as Director of Okhla Garments and Textile Cluster since its inception from 2004.*

*Shri Mehra has been associated with the Textile Association (India) for over 45 years. He was President of Federation of Asian Professional Textile Association from 1991 – 1993. Chinese Institute of Textile Engineers has conferred him with Hon. Fellowship in 1997 in TAI PAI.*

*He was awarded service Gold Medal in 1980 and President Medal in 1989 during the Golden Jubilee celebration of TA (I). He was member of Textile Task Force in Planning Commission and Member of Council for technical education and Development Council for Textile Industry in Ministry of MOT.*

*He was founder member of Textile Association (India) - Delhi unit & Hon. Secretary from 1968 to 1975. He was instrumental in setting up new units in Haryana (Bhiwani), PHC Unit (Chandigarh) and Rajasthan (Bhilwara). He was Hon. Secretary of TAI Haryana unit from 1977 to 1984.*

*Shri Mehra actively participated in TAI Central activities and was chairman from 1985 – 87, Vice Presidents 1987 – 89 (Golden Jubilee Celebration) and National President from 1989 to 1993. Under his president ship 1<sup>st</sup> Inaugural Asian Textile Conference was held in 1991.*

*He was advisor for 3<sup>rd</sup> Asian Textile Conference held in New Delhi in 2003 and All India Textile Conference held in Nagpur, Bhilwara, and Chandigarh. In 1971 he introduced visit to ITMA hiring charter Flight for the first time for TA (I) Members*

*Shri M.K. Mehra is member of Indo French Technical Association and was leader of visiting group to Olympic 1980 in Moscow.*

Indian Textile Industry flourished in ancient times and was an important industry from 15<sup>th</sup> to 19<sup>th</sup> century and was famous for hand woven silk, printed phulkari, kanjivarm sarees and colorful dress materials of Gujarat & Rajasthan. In middle of 19<sup>th</sup> Century mills were set up. 1<sup>st</sup> mill was set up by Tata's in Nagpur. At the time of independence in 1947 Textile Industry was largest Industry in organized sector. It continues to be largest employer after agriculture. Large number of big Textile mills came in and around big cities like Mumbai, Ahmedabad, Solapur, Chennai, Kanpur, Delhi and large number of jute mill concentrated in Calcutta. All these were owned by prestigious top industrial groups like Birla's, Tata's, DCM, Calico, Mafatlal etc... Till sixties & seventies mills were running with very old machines & equipments installed in thirties & forties. Productivity was very low; Govt. did not allow import of modern Textile Machines with the result that mills were running in losses due to very high man machines ratio, poor maintenance & lack of training facilities. The Indian product could not compete in International market. Mills started closing and all big houses started moving out of Textiles by closing the mills. In fifties and sixties working condition were very poor, machines had group belt drive, low roof, poor lighting, lack of training. In spinning department lot of fluff and fly was generated and lot of workers suffered with chest disease. Government took over closed mills in seventies but condition did not improve and it went from bad to worst causing large scale job loss and unemployment.

In fifties- sixties the worker wages were about Rs. 1.5 per day with Rs.40 DA per month. Daily casual labour was available for Rs. 2 per day. In 1971 when I took group of technocrats for the 1<sup>st</sup> time to ITMA in Paris no machine supplier was interested to discuss or show modern machines. Till eighties situation was very bad and some thought that it is the **sunset industry**. No one was interested in investing in Textiles. All big industrial houses diversified in chemicals, cement and other capital intensive industry with higher returns. Many mills started sourcing fabric from power loom giving birth of power loom sectors which produced fabrics of poor & substandard quality.

Mid eighties & early nineties, government introduced new **Textile policy** in 1985 where Textiles Association was associated in framing new Textile policy. Import of equipment & modern machines were liberalized, replacement of old machines was allowed and new capacities were sanctioned. Finances and loans were made available through financial institutions. The new generations of industrialist were motivated to install modern machines with high productivity which was 8 to 10 times higher than older ones

Machines reduced working hands employed with better quality. The spinning industry saw highest growth between 1988 to 1996. Large numbers of modern mills were set up in rural areas in Punjab, Himachal, MP and Maharashtra.

Many export oriented units were set up with modern high speed machines. State government gave some benefits & subsidy for putting up mills in back ward areas. India became a leading exporter of good quality yarn all over the world. Weaving growth was little slow and only about 5000 shuttleless looms were installed in nineties where as there was need of about 50000 shuttleless looms.

The dyeing & printing activity saw very little improvement. Only in nineties, rotary screen printing, wide width stenters and automatic jiggers were installed only in few good units. Even today Garment Exporters face lot of difficulty in getting good quality dyed and printed fabrics especially if lot size is small.

1970 onwards Garment & Apparel Industry started growing. At the turn of century huge garment factories were put up and Garment factory hubs came up in Tirupur, Bangalore, Mumbai, Jaipur, Delhi & NCR, Ludhiana. Garment Industry has made significant progress after quota regime was over from 1<sup>st</sup> Jan 2005. They have a challenge to reduce cost, improve productivity and quality to compete with China and

countries of South East Asia like Bangladesh, Indonesia, Sri Lanka, Cambodia and others.

To improve competitiveness large number of Apparel Parks & Clusters have been set up. The Textile Industry has now achieved respectable place in world market. Countries like USA, Japan & Europe look to India for sourcing high quality Textile & Garments. The Textile association in last 50 years has made all efforts to adopt to modern technological developments and modern management practices. Now it is a fact that Textile Industry has come of an age to face world competition and it is a **sunrise industry**. Government has also initiated schemes to bring modern concept in manufacturing & marketing and encourage new products like Technical Textiles, Medical Textile. In last one decade textile industry has taken maximum advantage of Information Technology and create awareness about clean environment by adopting green technology & thereby reduce carbon foot print. I am confident that in next 5 to 6 years Indian Textile Industry will become clothier of the world.

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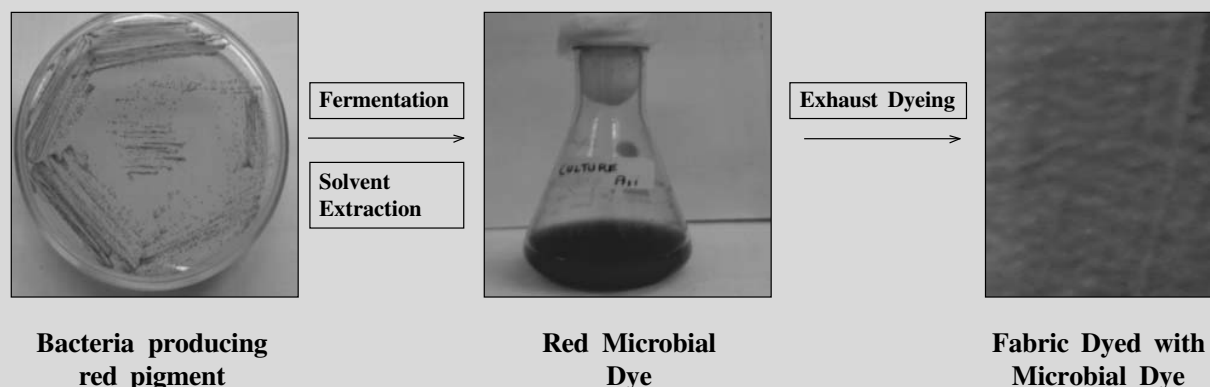
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## Microbial Dyes: The Undisputed Natural Dyes

Synthetic dyes have been extensively used in the textile industries due to their ease and cost-effectiveness in synthesis, excellent fastness properties and technically advanced colours covering the whole colour spectrum. However, this has resulted in the discharge of large amount of highly coloured waste water that creates problems for photosynthetic plants and algae since light absorption is hindered by synthetic dyes. In addition, many synthetic dyes are toxic, mutagenic and carcinogenic leading to several human health problems. Thus, the worldwide demand for dyes of natural origin is increasing in textile sectors. In spite of the availability of variety of plant and animal dyes, using plants and animals in production of natural dyes is not sustainable due to their low yields, production being seasonal and large scale destruction of species which in turn affects the biodiversity. Hence, there is an ever-growing interest in the microbial dyes due to the several reasons like their natural character, safety to use, production being independent of seasons, controlled production using industrial fermentation techniques and with a predictable yield. These dyes have inherent antibacterial properties, so the textiles dyed with the microbial dyes will give antimicrobial properties along with the dyeing. Moreover microbial cultures are easy to handle and maintain in the laboratory.

### Production of Microbial Dyes



Pigment producing microorganisms have been found in diverse habitats such as soil, fresh and marine water, air, milk, industrial wastes etc. Thus, screening of samples from this habitat to obtain pigment producing microorganisms is frequently done using traditional surface spread technique. On obtaining the desired pigment producing microorganism, the next step is the mass production of the pigment. Since the use of microbial dyes in textiles is a new concept and still research is going on, the microbial dyes are usually produced using the submerged liquid fermentation techniques. Fermentation is followed by the extraction of the pigment from the microorganism. Solvent extraction procedures are generally used as most of the pigments are insoluble in water and this pigment extract is used as a microbial dye for dyeing textile fabrics. Pigment purification methods include chromatography techniques while structural analysis of the pigment is based on the FTIR, NMR studies. Exhaust dyeing techniques are used for dyeing of natural and synthetic fibres with microbial dyes. Evaluation of the dyed fabrics for colour strength and fastness properties is usually done by the standard ISO and AATCC methods.

### Current International and National Status of Research on Microbial Dyes

The production and evaluation of microbial pigments as textile dyes is currently being investigated all over the world. Countries like US, Egypt, Japan, Italy, India etc have succeeded in obtaining microbial pigments and their subsequent dyeing with fabrics. In the dyeing and printing department of Cairo, Egypt, Anthroquinone pigment giving yellow and orange colours was extracted from a fungus named *Fusarium oxysporum* and its dyeing properties were studied on wool. Similarly, in the department of science and technology, Italy, another

fungus named *Monascus purpureus* yielding a red coloured pigment named rubropunctamine was isolated. The pigment was extracted in the ethanol and dyeing studies were carried out on wool. Microbial dyeing studies at the Institute of Chemical Technology, Mumbai, India, revealed that *Serratia* species are capable of yielding prodigiosin that give red colour. The dyeing was carried out on polyester fabrics. At the University of California, US, a *Vibrio* species producing prodiginines was isolated from marine environment and the pigment was also found to have antimicrobial activity. Its dyeing was carried out using wool, nylon and silk fibres. In Japan, at the Department of Sericulture, a bacterium named *Janthinobacterium lividum* capable of producing Violacein giving violet colour was obtained and it was dyed on silk fibres.

**Limitations**

Although it was found that the microbial dyes are capable of dyeing the textile fabrics, certain features of these dyes act as an obstacle in their commercialization. The fabrics dyed with microbial dyes show excellent rubbing fastness and satisfactory wash fastness but the light fastness properties are found to be poor. Since majority of the microbial dyes are solvent extracts, the dyeing of fabrics through such medium is economically not feasible. Moreover, a complete shade gamut covering the whole colour spectrum like those of synthetic dyes is till now unavailable in case of microbial dyes. Thus, the future work of interest would be pretreatment of fabrics or chemical modification of the microbial dyes to improve the fastness properties and screening more samples to obtain microorganisms producing pigments giving all colour shades. Hence, if we overcome the limitations of microbial dyes, they can serve as a noteworthy source of natural dyes in future.

– By Madhura Nerurkar, Chet Ram Meena & Neha Khurana

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Mumbai  
1<sup>st</sup> March 2009

(Sd/-)  
**J.B. SOMA**  
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**TAI - Ahmedabad Unit**


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**AHMEDABAD - UNIT'S  
ACTIVITY REPORT  
FOR THE MONTH OF  
MARCH' 2011.**
**MARCH 11, 2011**

Meeting of the 9<sup>th</sup> Managing Committee Member of TAI-Ahmedabad Unit held on 11<sup>th</sup> Mar, 2011 at AC meeting room of Association. 17 Mng. Committee Members attended the meeting and 2 invitees Mr. K. D. Sanghvi, Chairman of TAI Central Office and Mr. J. B. Soma from Mumbai also attended the said meeting. Discussion was made as per agenda of the meeting and Mr. K. D. Sanghvi informed about the highlights of World Textile Conference to be held on 6-7 May, 2011 at Hotel Intercontinental The Lalit, Mumbai. He requested all the Mng Committee Members to be present in the WTC and support through the maximum delegates' registration, Advertisements and Sponsorships from the TAI-Ahmedabad to make the conference a grand success.

**MARCH 15, 2011**

To achieve multiplier effect of Cleaner Production in Textile Units, Gujarat Cleaner Production Centre(GCPC) organized a seminar on "Dissemination Programme on Cleaner Production Implementation on Textile Sector" on 15<sup>th</sup> March, 2011 at 440 Banquet & Restaurant, The Acropolis, B-Block, 3<sup>rd</sup> Floor, Thaltej, Ahmedabad.

Dr. K. U. Mistry, Chairman of GPCB was the Chief Guest while Shri Hardik Shah, Member Secretary, GPCB and Shri J. K. Vyas, Director (Environment) F & E Department, Govt of Gujarat were the Guest of Honour of the function.

Shri T. L. Patel, V. A. Trivedi and other office bearers as well as Mng. Committee Members attended this important meeting. The main focus of the meeting was to cleaner production in a pro-active and integrated solution to pollution problem by eliminating or reducing pollutants at the source during the course of processes. Cleaner Production, as a means of pollution prevention rather than pollution treatment, has strengthened the concept of environmental protection.

**MARCH 19, 2011**

Shri T. L. Patel, V. A. Trivedi and other office bearers attended CII Gujarat State Annual Day 2011 & Conference on "Gujarat : Vocational Education & Training and Skill Development-The Livelihood" on Saturday 19<sup>th</sup> March, 2011 at Alishan I, II & III, Courtyard by Marriott, Ahmedabad. The theme of CII Gujarat State Annual Day this year focused on "Vocational Education & Training and Skill Development – The Livelihood".

The theme was in line with the CII national theme of 'Business for Livelihood', which outlines the importance of job oriented growth. The inclusive growth mandate of industry can only be fulfilled if the livelihood created by industry is leveraged upon appropriately by skilled man power. This brings into focus the importance of

Vocational education and Training & skill development as a major social equalizer. Govt. of Gujarat has taken several progressive steps to bring in business into the domain of vocational education and training and skill development and this is a momentous occasion when industry can capitalize upon the significant opportunity framework facilitated by Government for making Gujarat the skill capital of India.

The sustainable growth story of Gujarat is largely linked to the onerous responsibility of making the supply of skilled man power consistent to the demand of the inward investment and this cannot be done without a collaborative effort between Government and industry.

**MARCH 30, 2011**

All office bearers and Managing Committee Members attended National Symposium on Technical Textiles: Technology for Growth held on 30<sup>th</sup> March, 2011 at Hotel St.Laurn, Ushmanpura, Ahmedabad. The symposium was jointly organized by Office of the Textile Commissioner Ministry of Textiles, Govt. of India in association with Man Made Textiles Research Association (MANTRA).

The function was inaugurated by Shri A.B. Joshi, Textile Commissioner, Govt of India. Shri H. D. Shrimali, Addl. Commissioner of Industries (Ext.) Govt of Gujarat was the Guest of Honour of the function. Shri A. K. Hazra, Dy. Director and OIC, ROTXC, Ahmedabad welcomed the function while Vote of thanks was delivered by Dr. S. K. Basu, Director, MANTRA, Surat.

## ITAMMA PRODUCT-CUM-CATALOGUE SHOW

The Indian Textile Accessories & Machinery Manufacturers' Association (ITAMMA) established in the year 1943 has completed more than six decades espousing the cause of trade and industry in general and textile engineering industry in particular. ITAMMA has on its roll more than 450 members drawn from all centers of textile engineering industry in India. To serve the members more effectively, ITAMMA has established its Liaison offices in Coimbatore and Ahmedabad.

Catalogue Shows are organized at regular intervals and this provides an opportunity for interaction among the suppliers and end-users. It is one stop solution for the user industries.



ITAMMA organized its Ninth Product - cum – Catalogue Show on 26<sup>th</sup> March 2011 at Hotel Cenneys Gateway, Salem between 4.00 p.m. to 8.00 p.m.

Earlier, a Press Meet was held in Salem on 25<sup>th</sup> March 2011 to inform the Press about the Catalogue Show, so that representatives from textile mills could be aware of the Catalogue Show.

Mr. S. Dinakaran, Jt. Managing Director of Sambandam Spg. Mills Ltd, inaugurated the Catalogue Show. About 56 Members Participated in the Catalogue Show and more than 400 Visitors visited the Catalogue Show which was a grand success.

### **SEMINAR ON “DESIGN CLINIC SCHEME FOR DESIGN EXPERTISE TO MSMEs”.**

ITAMMA organized a seminar on Design Clinic Awareness Program. Chair Facilitators were Dr. S. Ghosal from NID, Bangalore and Mr. Dyutiman Moulik, Product Engineer from Bangalore.

ITAMMA organizes Seminar at regular intervals for the benefit of its members. This Seminar gives a clear idea about how to improve their design on material which can be produced with a good design.

Various subsidies are provided by MSME for this development in Design. Product Engineer will work on the product to meet the requirements of the manufacturers with their ideas. The same will be implemented in conclusion with the manufacturer.

This Seminar organized by ITAMMA was just to make members aware of the importance of Design improvement in their products. The Seminar was a grand success.

**Overwhelming response to A.T.E.’s seminar on ETP**



For many textile processing units in Tirupur reeling under the Madras High Court order to close down, the seminar organized by A.T.E. Group on ETP could not have come at a better time. The A.T.E. group companies, A.T.E. Enterprises Private Limited and A.T.E. Envirotech Private Limited, had jointly organized a seminar on ‘Effluent Treatment Problems and Solutions’, on 25 February 2011 at Hotel Velan, Tirupur.

The seminar dwelt on the need for prudent selection of technologies and design of effluent treatment plants to ensure high performance of treatment plants. It also highlighted the advancements in sustainable technologies for effluent treatment and sludge handling, and the latest offers from A.T.E.

A.T.E. has experience of over 10 years and has executed about 120 projects in the waste water treatment area. A.T.E.’s expertise also covers areas such as reject management, which includes the patented VSEP technology for evaporative volume reduction. As a cost effective solution, A.T.E. also undertakes upgradation of the existing plants for improving their performance. A.T.E.’s solutions are increasingly gaining popularity in the textile segment as well, with several projects under execution.

The seminar was an overwhelming success with around 150 participants, including senior technocrats, from textile processing units in and around Tirupur and Perundurai. Many participants termed the seminar as an eye opener as it helped in having a clear understanding of ETP technologies, and so they felt that this would surely encourage many processing units to take the necessary decisions to achieve full compliance and move beyond that as well.



**Mr. H. K. Varga bids adieu to Karl Mayer**



Mr. Hans -Karl -Varga, Regional Sales Manager for Beam Preparation Division of Karl Mayer Group (KMO), Germany, retires from service after 50 years of his meritorious association with KMO, of which he spent the last 10 years supporting the Indian textile market. He now bids adieu thanking all loyal customers of textile industry in India.

Mr. Varga has also thanked A.T.E. for their excellent support extended during his association with KMO.

Mr Varga’s successor, Mr. Peter Obrist, also well versed in the beam preparation will take over the sales responsibilities and will serve KMO customers of the Indian textile industry.

Mr H K Varga extends his best wishes to Peter, Karl Mayer & A.T.E. for good times ahead.

**Texttreasure**

*“When one person suffers from a delusion it is called insanity; when many people suffer from a delusion it is called religion.”*  
**- Robert Pirsig (1948-)**

## **@t e** A.T.E. Enters Garment Sector Providing One Window Solution from Spinning to Garmenting

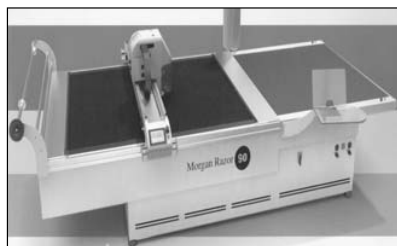
Textile engineering major, A.T.E., has entered into the garment sector, thus filling-up the only major gap in A.T.E.'s offerings across the textile value chain. While A.T.E. has thus far been the only player with complete solutions from spinning to finished fabrics, its foray into the garment segment makes it a single window solution provider from 'spinning to garment' - a unique distinction that sets A.T.E. apart.

For A.T.E., entry into garment segment was a strategic decision, considering the tremendous scope the garment sector offers for textile industry in terms of value addition and growth. Further, many of the textile majors, who are A.T.E.'s long standing customers, may consider forward integration by entering into garment manufacturing. In fact, according to A.T.E., their entry into the garment sector has been suggested by many of their existing loyal textile customers.

Garment manufacturing being labour intensive, the availability of labour and the spiraling labour costs are the twin challenges faced by this segment. A.T.E. is convinced that automation is the way forward for this sector and therefore aims to differentiate itself with technologies that can reduce the dependence on labour and ensure optimum productivity and quality.

A.T.E. has already succeeded in tying up with a number of reputed manufacturers to provide a range of automation solutions used for garment manufacturing, and is aiming to be an end to end solution provider in garment machinery in a short time. The principals currently represented by A.T.E. include:

- Morgan Tecnica, Italy – for CAD, spreaders and automatic cutters in cutting room.
- KM, Japan – for manual cutting of patterns.
- Sunstar, Korea – for basic & automatic sewing machines



*Fully digital Automatic Cutter*



*SunStar sewing machine*



*Straight  
knife cutting  
machine*

- LOIVA, Korea – for specialized sewing machines and attachments for high end production like autojig machines, button wrapping machines, button feeder attachments & digital pullers
- Dr Aykan Textiles, Turkey – for industrial washing machines & dry process like laser marking machine, ozone generators, stapling machines & washing accessories.
- Nisho, China – for finishing machines including electric boilers, steam irons & vacuum tables.
- Uzu, Thailand – for specialized machines to make front placket of polo shirts.
- Unisun, Taiwan – for automatic thread trimmers.
- MAG, India – for testing equipment like button/snap pull strength measurement, GSM measurement, swatch cutting, electronic weighing balance, color fastness assessment, etc.
- A.T.E. Envirotech Private Limited, Mumbai – for water and waste water management.
- HMX Systems Private Limited, Bengaluru – for green cooling systems offering comfort both with better economy as well as with lower carbon intensity

A.T.E. is also building up a strong sales and service team across India for this new division, which is headed by Mr K B Prasad, a professional with 18 years of experience. Considering the unique characteristics of garment industry, A.T.E. shall also keep a sufficient stock of machines to cater to the immediate needs of our customers who can get the products without any delay and hassles.

Explaining the raison d'être for A.T.E. setting its foothold in the garment sector, Mr. G V Aras, Director, Textile Engineering Group, A.T.E. Enterprises, said that "A.T.E. has always aligned its strategy to its customer expectations. Many major customers of us have been prodding us to enter this segment. So we have made this decision and we will go ahead in full steam, and our aim is to position A.T.E. as a preferred supplier in this segment as well, like in other textile sectors where we hold a pre-eminent position".

**Ramisch Guarneri ties-up with A.T.E. to promote calendars in India**



A.T.E. has partnered with Ramisch Guarneri, Italy, a leader in both conventional and controlled deflection calendars for textile and non-woven fabric processing and finishing applications.

Ramisch Guarneri is a widely acclaimed brand with more than 600 calendars being used globally for several applications in the textile industry. It offers various models of controlled deflection calendars like Nipco I, Nipco L and NipcoFlex, and Simili.

The company has already supplied more than 20 calendars in India within the last two years. This reflects the best-in-class technology and also the trust reposed by the Indian customers in Ramisch Guarneri.

As per the terms of the tie-up between A.T.E. and Ramisch Guarneri, A.T.E. will handle marketing, sales and service of the products of Ramisch Guarneri in India, with effect from April 2011.

The Indian textile industry will welcome this partnership between A.T.E. and Ramisch Guarneri as it is a perfect convergence of technology and service, with the added convenience of a single window solution from A.T.E.



*From (Left to Right) : Mr S Rajendran, Vice President – TEG, Processing, Mr Ettore Guarneri, Director – Ramisch Guarneri and Mr G V Aras, Director – Textile Engineering Division, A.T.E. Enterprises Private Limited.*

**HOHENSTEIN**

**Hohenstein India successfully organised Information seminar about Oeko-Tex® Certification in Bhilwara 09.03.2011**

In view of growing demand for skin-friendly textiles and hence the increase in demand for Oeko-Tex® Standard 100, the Ahmedabad office of Hohenstein India Pvt. Ltd. organized an information seminar on Oeko-Tex® certification on 9<sup>th</sup> March, 2011 at Mewar Chamber of Commerce & Industry, Bhilwara. Entrepreneurs, Managers from QC and Marketing departments of the textile industry, spinning, weaving, processing, home furnishing units, dyes & chemical companies etc. had assembled and took an active participation in this program.

Oeko-Tex® Standard 100 is a product certification that concentrates on human ecology part of textile processing and products. The Oeko-Tex® label contains the wording- Confidence in Textiles- Tested for harmful substances. This provides peace of mind to consumers and is an active decision making tool for a large number of overseas buyers.



Oeko-Tex® standard 100 Certification is applicable for all types of textile items including fibre, yarn, fabric, garments, home textile items, accessories like sewing threads, embroidery yarns, wash-care labels, buttons, zippers, interlining fabrics, buckles etc. For dyes and chemicals, there is a different certification known as Eco Passport.

Hohenstein India Pvt. Ltd. is a subsidiary of Hohenstein Institutes, Germany and the official

March-April 2011

representative of International Oeko-Tex® Association in India. Hohenstein is a research institute having versatile facilities for testing, evaluation, research, inspection, auditing, certification etc. for a wide range of products and services in Textiles like fibres, garments, home-textiles, accessories, dyes/chemicals, technical textiles etc.

The basic objective behind organising this seminar was to create more awareness about this standard, its importance, benefits etc; giving the correct information to the participants and clearing doubts and misconceptions. The seminar also spread information about various services provided by Hohenstein mentioned above.



The Branch Manager for Ahmedabad office, Mr. Sumit Gupta (Asst. Manager Technical Compliance) presented the details about Oeko-Tex® testing and the technicalities involved in the testing and certification. The test criteria, limit values, requirements as well as the impact of Oeko-Tex certification on international business were also discussed in details. It was highlighted that Oeko-Tex® test criteria also complies with the relevant chemicals listed in Annexure XVII of REACH. Since Oeko-Tex® certificate is considered necessary by various European and American buyers, the Oeko-Tex® label is an ideal marketing tool for all who need to market their products to Europe and the USA.

Mr. Vinay Chavan (Marketing Executive) provided comprehensive information about the history and philosophy of Hohenstein Institutes. Hohenstein Laboratories have different facilities available in

various fields. Chemical testing, clothing technology (fit & workmanship), consumer tests, function and care etc. are some of them. Hohenstein is also pioneer in providing various certifications and quality labels like Oeko-Tex® Standard 100 and Oeko-Tex® Standard 1000, UV protection, Personal Protective Equipment, RAL, Monitored Hygiene in Hotels, Testing of Medical Compression Hosiery, Skin Friendly, Barrier Textiles, Thermal Insulation, etc.

In his concluding presentation, Mr. Gupta also highlighted few specific details of the test criteria and also the correct use of the OEKO-TEX® Standard 100 label in marketing and sales so that the certificate holders can take the maximum advantage of the label, without violating the rules.

The presentations were followed by “Questions and Answers Session”. The interactive session was very lively and the various queries of the participants were resolved by Mr. Gupta. The organisers were also available for personal discussions more specific issues were addressed personally.

The event was covered by Rajasthan Patrika and ETV Rajasthan.

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**EFFECTIVE COMMUNICATION SKILL FOR CAREER DEVELOPMENT By Under Educational Activity Programmes of ACTI ORGANISED BY THE ASSOCIATION OF CHEMICAL TECHNOLOGISTS (INDIA) & ST. XAVIER'S COLLEGE, AHMEDABAD**

A Joint Lecture on effective communication skill for career development was arranged on 16<sup>th</sup> October, 2010 between 11.30 to 1.00 at Jay Chemical Hall, St. Xavier's college by ACTI and St. Xavier's college. The students from St. Xavier's College, M.G. Science College and School of Science (Chemistry Deptt.) Gujarat University were invited for the lecture. The lecture was delivered by Mr. Nehal Patel. The programme started by welcome speech and welcoming the guest with X-plant developed by Bio-technology Lab as Memento by Fr. Vincent Braganza, Principal, St. Xavier's college. Mr. Bhagat, President of ACTI gave a brief introduction about programme and speaker.



Mr. Nehal Patel gave interesting talk on various aspects and importance of communications skill which includes how to write CV, importance of skills for e-mail communications, about body gestures, importance of quality voice etc. The lecture was attended by T.Y..B.Sc. Chemistry, M.Sc. Sem-I students and other students (Total 200). At the end of the lecture session was open for Question Answers and feed back form were filled by the students. Dr. Atul Makwana, Head Chemistry Department St. Xavier's College, thanked ACTI and all participations. Finally programme was ended with Tea and Break Fast.

From ACTI Mr. Manoj Mehta, Hon. Secretary, Mr. Atul Bhow, Treasurer, Mr. Rajeshbhai Shah, Vice President & Mr. K.J.Amin, Trustee attended this programme.

**9<sup>th</sup> INDIA INTERNATIONAL TEXTILE MACHINERY EXHIBITION**

**INDIA-ITME 2012**

**Dec. 02<sup>nd</sup> to 07th, 2012**

Bombay Convention & Exhibition Centre, Goregaon (E),  
Mumbai – 400 065 (India)

## Activities of ACTI in January 2011

### “ADVANCED TEXTILE MATERIALS”



Under “Educational Activity Programme” Exclusive programme for discussions with the manufacturer of Technical Textiles and ACTI members was organized on “Advanced Textile Materials” for knowledge of the interested members on the Carbon materials used for developments of fabrics in woven, knitted and braided process and products generally used in aerospace industry. Mr. Piyush Shah, President, Fabric Developments Ltd., USA deliberated in brief after having his experience of manufacturing high-tech products over 35-40 years in USA.

### “JOB ORIENTED COURSES FOR B.Sc./M. Sc.”



Mr. N R. Bhatt, Director, M/s NRB Laboratories (India) Pvt. Ltd., Mumbai had a meeting with the Principal, St. Xavier’s College, Ahmedabad for discussions of possible job oriented courses for B. Sc. (Chemistry) in Textile Chemistry / Garment processing and Lab Testing facilities etc. In the afternoon, Mr. N. R. Bhatt had interactive discussions with the members for designing & planning of short term courses for B.Sc./ M. Sc. students, Entrepreneurs and enhancing the knowledge of technicians already working in the wet processing industry with latest quality requirements of Garments & fabrics. This programme was also organized under “Educational Activity Programme” of ACTI.

## Industry-Academia Congregate “Competitiveness through Collaboration”

A jointly organized programme by  
Gujarat University and Association of Chemical Technologist, India(ACTI), Ahmedabad



*From L to R - Shri Pankaj R. Patel; CMD, Zydus Cadila; Dr. Parimal Trivedi, Vice Chancellor, Gujarat University and Mr. A D Bhagat, President, ACTI (Inaugural Session)*



*L to R – Mr. A D Bhagat, Mr. R V Rao, Dr. Dilip Zaveri, Mr. Rajeshbhai Shah, Dr. S D Wadekar, Mr. G D Barot, Mr. Haridas Panickar & Mr. Vinay Pandya (Panel Discussion Session)*

Gujarat University and ACTI organized an interactive conference between the industry’s stalwarts and Academic Institutes on 22<sup>nd</sup> January 2011 first time at Senate Hall of Gujarat University, Ahmedabad.

About 510 students of post graduate, M. Sc. and Ph. D. (Chemistry) of various colleges of Gujarat University attended including 100 faculty members of various colleges of Chemistry Department attended a one day conference. Year 2011 being the “International Year of Chemistry” by the UN General Assembly has been taken up with innovative spirit by both the organizations.

Dr. Parimal Trivedi, Vice Chancellor, Gujarat University; Dr. Shobhana Menon, Director, School of Sciences, Gujarat University; Mr. A D Bhagat, President, ACTI; Dr. Pranav Shrivastav & Dr. Hitesh Patel all contributed their efforts in organizing this event to have interactive discussions and impart knowledge to the students of M.Sc. and Ph. D Chemistry Department about what is happening in the Industry,

Prospects and Opportunities from the point of view career development.

The main personalities from various chemical related companies contributed such as : Shri Pankaj R. Patel; CMD, Zydus Cadila; Mr. Manish Yadav, Asstt. VP Cadila Pharma; Dr. Yesvant Samant, Chief technical Director, Finar Chemicals; Mr. Puran Singhal, GM, Veeda Clinical Research; Dr. Vikas Shirsath, Chief Sc. Office, Oxygen Bio-research Ltd.; Dr. Dilip Zaveri, Director, Bio-Care Research India Pvt. Ltd.; Mr. R V Rao, President, Colours India Inc.; Mr. Rajesh Shah, MD, Vardhman Dye-chem; Mr.G. D. Barot, Chairman, Indian Small Scale Industries Paint Association(Gujarat Region) & MD, Gunjan Paints; Dr. S D Wadekar, Technical Director, AICO Laboratory etc.

It was very successful event and ACTI has proud privilege to join its hands under the “Educational Activity Programmes” which is a special campaign for promoting educational activities.

### **Textsmile**

*Scientist were playing hide and seek. It was Einstein's turn to seek. All scientists went and hid except Newton! Who simply drew a square of one meter and stood inside it. Einstein finished counting and spotted Newton. He screamed, 'I found Newton!' Newton calmly replied-'You are wrong. I am Newton standing in a square of one meter, which is equal to Pascal. Hence I am Pascal.'*



## Overwhelming Response to InFashion 2011

The inaugural version of InFashion 2011 saw huge crowds of retailers and wholesalers throng to the event. With Innovation as the key theme, InFashion 2011 is the biggest event which hosts the entire textile and apparel manufacturing and fashion fraternity together under one roof to buy, source and view the latest innovations from the business of fashion over next two days. The opening session saw industry leaders stressing on innovation in the sector.

The opening session titled 'Innovation in Textile and Apparel Value Chain' addressed key issues in the sector including supply chain, denims and human resources. The key note address was delivered by Dr P R Roy, Director, Fiber2fashion and former Group CEO, Arvind Mills. Dr. Roy stressed on the need to innovate and highlighted that India in the past 100 years had missed the innovation cue even though it was a leader when it came to textiles. He also stressed the need to bring out eco-friendly initiatives. He reiterated that the hour had come for Indian industries to innovate and innovate fast and effectively to erase the impression that Indians cannot innovate.

Taking the Innovation theme ahead was the second

session which focused on the supply chain for textile and clothing. Chairing the session, Shreyas Joshi, President, Raymond Apparel, mentioned that looking at the constantly evolving consumers it is critical for every part of textile and garmenting business to innovate in every aspect of the business. Rajiv Ranjan, President, Mafatlal industries, Pawan Jain, CMD, Safexpress, Samar Sharma, President Apparel, Kamadgiri Fashion and Dr. P. R. Roy were part of the panel. Talking about the increasing focus on the role of supply chain in the textile business, Rajiv Ranjan, President, Mafatlal Industries said, "Supply chain has gained tremendous importance in the recent past as it is critical to the cost factor". Ranjan also mentioned that the textile industry has undergone a paradigm shift in terms of the way both international and national supplies are being handled at par.

Samar Sharma emphasised that the supply chain function in India has moved on from being a cost efficient function to a customer centric function. Commenting on the need to understand consumers, Pawan Jain, CMD, Safexpress said that, to make supply chain management efficient, the biggest innovation needs to come from textile manufacturers and that innovation will help the supply chain to add critical mass to entire equation. Jain added, "The end consumer is aware of his needs and inspirations, and the textile manufacturers should be able to respond to this need and therefore supply chain management needs to be a part of the CEO's agenda."



## Textsmile

*Scientist were playing hide and seek. It was Einstein's turn to seek. All scientists went and hid except Newton! Who simply drew a square of one meter and stood inside it. Einstein finished counting and spotted Newton. He screamed, 'I found Newton!' Newton calmly replied-'You are wrong. I am Newton standing in a square of one meter, which is equal to Pascal. Hence I am Pascal.'*

## Seminar on "Textile Education in India: Innovative Changes"

A Seminar on theme "Textile Education in India-Innovative Changes" had been jointly organized by Sardar Vallabhbhai Patel International School of Textiles & Management, Coimbatour and The Textile Association (India) Baroda Unit on 12<sup>th</sup> March 2011 at Chemical Engineering Department, The M. S. University of Baroda. The Program was coordinated Dr. Hireni Mankodi, (Associate Prof, Textile Engineering Department, M.S.U), Hon. Jt. Secretary (TAI, Baroda unit).

The Seminar was aiming to increase the Industries Institute interaction for upgradation of Textile Education in India. Nodal Centre for Upgradation of Textile Education (NCUTE) had been initially set up at RT Delhi by the Ministry of Textile, Government of India on 31st March 1998 with the main -objective to enhance

the holistic performance of Textile Industry by offering capable manpower to face emerging challenges in all facets of Textiles along with understanding latest technological developments in the field. For last few years this center was shifted to SVPISTM, Coimbatour and now they are in process of reviving its activities.

The seminar began with welcome address and remarks by Prof. R. P. Gupta (President TAI). The first session was chaired by Dr. P. C Patel (Associate Prof, Textile Engineering Department, M.S.U) which was comprise comment of speakes viz. Dr.S.Ganeshan (Chief Guest, SVPISTM), Dr. S. R. Vengsarkar (Advisor, Zenith Fibres Ltd), Prof. V. H. Kapadia (Ex. HOD, Textile Engineering Department), Prof. M. R. Patel (Principal, Vishva, karma Engineering College, Gandhinagar). They expressed their views related to subject and highlighted how Industries and Institutes can jointly improve textile education with incorporating certain innovative changes in existing system.

The Panel discussion chaired by Mr. Rajanikant Bachkaniwala (Director, Himson Industry Ltd, Surat) started discussion with strong words that "The Textile Education in India required drastic changes in education system to offer compatible manpower to face emerging challenges by industries". Mr. B. Nanavati (VP, Modren Petrofile, Vadodara) highlighted expectation of Industries from Institute. The success of panel discussion was due to active participation given by Dr. S. R. Vengsarkar, Prof. V.H. Kapadia, Mr. Hemant Dave, Prof. Mr. M. R Patel, Dr. Anjali Karolia and student of final year of Textile Engineering, MSU, Mr. Naboo. Dr. V. S. Rajan said final words that Industries and Institute need to join hand for innovative changes. The seminar ended with Vote of Thanks given by Dr. Amita Pandya (Prof Clothing and Textile Department, M.S.U). Hon. Secretary (TAI, Baroda unit). The seminar was grand success with lively discussion.



**Attention**

TAI Members

**Please update your profile on TAI Website**

Visit

[www.textileassociationindia.org](http://www.textileassociationindia.org)

## Proceedings of the Technological Conference held on 26.02.2011

60th Anniversary (Diamond Jubilee) one day Technological Conference Of the Textile Association (India), West Bengal Unit was held on 26<sup>th</sup> February, 2011 at Rotary Sadan, 94/2, Chowringee Road, Kolkata - 700 020 with the theme "TECHNICAL TEXTILES".

Dr. R.C. Tiwari, President, TAM W.B. Unit in his welcome address spoke about the activities of the West Bengal Unit and mentioned how it had crossed those years and went to celebrate its 60th years. Jute the Golden-eco-friendly natural fibre has some unique physical properties yet the contribution of Jute Fibres for technical application is limited at present. Due to renewed interest for Eco-friendly products, uses of Jute fibres for manufacturing Technical Textiles is expected to increase in future. Jute should not only centred on packaging but diverted in various ways and forms as Eco-Friendly Fibre and it has tremendous potential.

Shri Manish Poddar, Chairman Indian Jute Mills Association inaugurated the Conference by lighting the lamp and addressed the gathering that jute products have to fight with Polypropylene yet as Eco-friendly fibre it should not loose market. This is the time to utilize jute with new type of production for Technical Textiles and diversify into both old and new end use sectors.

Dr. Deb Kumar Basu, Eminent Educationist and Chief Advisor, West Bengal State Council of Science and Technology, Govt. of West Bengal as Special-Guest-in-Chief spoke about the activities of West Bengal unit of



L to R – Dr. S. K. Bhattacharyya, Dr. D. K. Basu, A. K. Roy, Dr. R. C. Tiwari and Sri Manish Poddar.

the Textile Association and gave stress On Research and Development in Jute, Cotton, Silk, Ramie and other fibres. He mentioned in details right from cultivation to finish products and gave stress on Scientific Research and quality improvement. Jute as a natural Eco-friendly fibre should get the priority and product development be ensured. Geo-Textiles, Agro-Textiles, Automotive Textiles etc. as Technical Textiles is the need of the hour. Technologists should come forward and engage themselves for the betterment of the industrial growth as well as country's benefit.

Dr. S.K. Bhattacharya, Ex-Director NIRJAFT & Ex-President T.A.(I), W.B. Unit in his key note address mentioned that the development of Technical Textiles is the outcome of constant endeavour to streamline and systematize scattered attempts made from time to time to exploit the potentiality of fibre and fibre goods to be used for functional purpose. Priority areas of technical textiles are Medical textiles, Smart textiles, Sports textiles, Aeronautical textiles, Geo-textiles, Agro textiles etc. which are subjects of interdisciplinary research all over the world.

After the vote of thanks by Shri A.K. Roy, Chairman, TA (I), W.B. Unit and after Tea Break the 1st Technical session started of 11.30 a.m. and continued upto 1.30 p.m. before lunch.

Technical Session (I), Chairman Dr. B.C. Mitra, Ex-Director NIRJA FT & Tech. Advisor IJIRA.

Paper -1 Emerging Opportunities Of Technical Textiles, by Dr. Ranjit Kumar Sarkar, Advisor, IJIRA

Paper -2 Processing Automotive Fabrics by Dr. N.N. Mahapatra - Vice President (Tech. Mktg) Hind Prakash Lonsen Industries Pvt. Ltd., Ahmedabad.

Paper -3 Technical Textiles, the new avenues for growth of Jute Products by Shri Tapobrata Sanyal, Chief Consultant, National Jute Board.

Paper -4 Jute Based Automotive Textiles, by Dr. Ashok Majumdar, Principal, Bankura Unnayani Engineering College

Paper -5 Innovative Solutions for successful Projects-Hohenstwin Institute by Shri Rajat Chakraborty, Manager, Technical Compliance NOIDA.

**After the Lunch Session at 2-30, Technical Session (2) was chaired by Dr. S.K. Bhattacharyya, Ex-Director NIRJAFT.**

- Paper -6 Aroma Textiles of Jute by Dr. Syamal Kanti Chakraborty, IJIRA.
- Paper -7 Jute Technical Textiles by Shri Subimal Palit, Jute Textile Consultant.
- Paper -8 A new vista of Application of Synthesized dispersed - azo dyes on Silk Fabric by Dr. Arijit Chakraborty, Dr. Prasanti Kumar Saha, Sri Amit Sengupta Govt. College of Eng. & Tex. Technology, Serampore and Sri Kunal Singha IIT, Delhi.
- Paper -9 Automation of Jute Processing System by Dr. Gautam Roy & Dr. Gautam Basu NIRJAFT.
- Paper-10 Protective Chemical finishing of Jute Based Textiles by Dr. A.K. Samanta & A. Bagchi I.J.T.

Paper-11 Exploring the Scope of Technical Textiles in High Fashion Garments' by Ms. Sreenanda Palit, NIFT.

Valedictory session started at 4.30 P.M. and Dr. B C. Mitra Ex-Director NIRJAFT and advisor UIRA gave the valedictory address. He spoke about the papers presented by the speakers and mentioned that the papers were full with enlightening matters.

The audience were present upto the end which revealed their enthusiasm and interest. The Textile Association (1), W.B.Unit should be encouraged to hold the Conference every year for the benefit of the members as well as the industry. The delegates took part in the deliberation to make the conference a grand success.

Lucky dip draw was arranged and 3 prizes given to the delegates present at the end of the session.



## World Textile Conference

World Textile Conference being hosted by The Textile Association India (TAI), in Mumbai on May 6-7, 2011. Theme : "Vision 2020 : Emerging New Business Opportunities Worldwide and Challenging Strategies."

The Textile Association (India) is organizing the World Textile Conference in Mumbai on May 6 and 7, 2011. The conference theme is 'Vision 2020: Emerging New Business Opportunities Worldwide and Challenging Strategies.' As D. R. Mehta, President, TAI explains. "The year 2010 has seen Indian textile industry growing phenomenally. The industry is going through a golden period now. The atmosphere is very conducive and the central unit of TAI has taken up this challenge to bring further prominence and impetus to the Indian industry." TAI is the foremost professional body, established 71 years ago, with more than 22,000 members and 27 affiliated units. TAI is not only India's but also the world's largest professional conclave.

World Textile Conference in Mumbai has a clear concept to spread a positive message across the textile and clothing world about India being the second largest textile economy in the world after China. What's more, India has the potential and capabilities to redefine the fashion word which thrives on vibrancy, colors, uniqueness and exclusiveness.

The two-day mega conference aims to provide a positive opportunity, where the textile fraternity can benefit by discussing and networking to enhance cumulative strength. The conference perspective is managerial, commercial and business instead of being just a technical one. The main area of interaction will be the shifting focus in textile and apparel sourcing towards Asia and now India, which is potentially emerging as a strong alternative in Asia.

The conference will cover all the topics that are currently vital to the Industry. "India offers large business opportunities and the two-day conference will throw light on some of these big opportunities including

### *Texttreasure*

*"People demand freedom of speech to make up for the freedom of thought which they avoid."*  
*- Soren Aabye Kierkegaard (1813-1855)*

camouflage fabrics a potential opportunity of over \$5 billion; the opportunities of medical and technical textiles that India can grab among others," says Arvind Sinha, Conference Chairman. In fact, one of the prime topics of discussion at the conference is to identify new business opportunities for India and Asia in apparel fabrics, home fashion fabrics, camouflage fabrics, medical textiles, coated fabrics, technical and defense textiles etc. Another important subject of discussion will be the Indian and international success stories and case studies in textiles and apparels; Is industry integrated in value chain to maximize growth; the developing industry in Vietnam, Bangladesh and Turkey: issues such as impact of global economic environment and along with financial issues such as IFRS, surviving in appreciating currency markets, can ethical and sustainable business be profitable business? Etc.

The conference assumes importance for India given that textile and apparel industry in the country, both domestic and exports is expected to grow from the current \$70 billion to \$220 billion by 2020, if the country keeps to its strategic plans. According to Technopak estimates, the Indian home textile market was estimated at \$3.5 billion in 2009 and is expected to reach \$9 billion by 2020. The technical textile market was estimated at \$10.5 billion in 2009 and is expected to reach \$31 billion by 2020. A total investment to the tune of \$68 billion across the textile supply chain will be required by 2020 to tap the growing potential market including \$14 billion in apparel and \$19 billion in the processing sector.

And what gives India an advantage is that it has rapidly growing consumer market with nearly 300million people constituting the market for branded consumer products. A large and diversified infrastructure spread across the country. A well-developed R&D infrastructure and technical and marketing services. A banking system-commercial banking network of over 63,000 branches supported by a number of national and state level financial institutions.

Skilled manpower and professional management including engineers, managerial personnel etc.

Leveraging these strengths many top foreign brands have already entered India. Companies like GAP, Wal Mart, Li & Fung, JC Penny, H&K Federated, Fifth Avenue, Carrefour and Zara account for 35 per cent of total textiles sourced from India.

Some brands like Tommy Hilfiger, Nike etc have entered licensing or franchising agreements in India while others like Benetton have manufacturing and retailing facilities in India. In short the opportunities are big and unlimited in this space. And the WTC will highlight this.

The two day mega event will have some big names as speakers. The keynote speaker is Mr. Nikhil Meswani, Executive Director, Reliance Industries. Among the invited speakers and panelists are: Mr. Julian Ellis, Chairman, Ellis Developments, UK. Mr. Adrian Wilson, Smart Textiles and Nanotechnology, Mr. Jiri Militky, Dean, Dept. of Textiles, University of Liberec, Czech Republic. Mr. Andrew Olah, President- Olah Inc and organizer, Kingpins Show, Mr. Robin Anson, Textile Intelligence, UK, Mr. Ashesh Amin, CFO, SKNL, Mr. Martin Jones., Marks & Spencer India, Mr. Premal Udani, Chairman, AEPC, Mr. Rahul Mehta, President, CMAI among others

The special attraction this year is WTC welcomes the alumni meets of institutions like TIT & VJTI. Sasmira and others during the conference.

**Note :**

**Date and Venue:** May 6-7, 2011, Hotel Intercontinental, The Lalit, Sahar Airport Road. Andheri (E), Mumbai (India)

**Registration :** Duly filled registration forms should reach TAI office by April 30, 2011.

Over 500 delegates will be registered on a first come first serve basis.

**For details contact :** Tel. +91-22-2446 1145.

**Fax:** +91-22-2447 4971

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## The Textile Association (India) – Central Office

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### RESULTS FOR ATA PART - I, (Old) : DECEMBER, 2010

Centre/Result	PASS	ATAHE
Ahmedabad	2010/OA/01, 2010/OA/03, 2010/OA/04 2010/OA/06, 2010/OA/07, 2010/OA/08	Nil
Bhilwara	2010/OA/25, 2010/OA/26, 2010/OA/28, 2010/OA/29, 2010/OA/30, 2010/OA/31, 2010/OA/33	2010/OA/21, 2010/OA/22, 2010/OA/24, 2010/OA/34
Coimbatore	2010/OA/44, 2010/OA/45, 2010/OA/46, 2010/OA/49, 2010/OA/50, 2010/OA/51, 2010/OA/52, 2010/OA/53, 2010/OA/56, 2010/OA/57	2010/OA/54, 2010/OA/59
Delhi	2010/OA/70, 2010/OA/71, 2010/OA/72	Nil
Ichalkaranji	2010/OA/82, 2010/OA/84, 2010/OA/85, 2010/OA/86, 2010/OA/88	2010/OA/83
Mumbai	2010/OA/91	Nil
Nagpur	2010/OA/100, 2010/OA/108, 2010/OA/109, 2010/OA/111, 2010/OA/112, 2010/OA/113	2010/OA/105, 2010/OA/106

<b>CANDIDATES</b>		PASSED	: 38
REGISTERED	: 73	ATAHE	: 09
APPEARED	: 58	PASS PERCENTAGE	: 65%

### RESULTS FOR ATA PART - II (Old), DECEMBER, 2010

Centre	Spinning	Weaving	Chemical Processing	T.T & Q.C.
Ahmedabad	2010/OA/501 2010/OA/502 2010/OA/503	2010/OA/601 2010/OA/603	2010/OA/702 2010/OA/703 2010/OA/705	Nil
Bhilwara	Nil	2010/OA/610	Nil	Nil
Coimbatore	2010/OA/520 2010/OA/521 2010/OA/522 2010/OA/524 2010/OA/527	Nil	Nil	Nil

Centre	Spinning	Weaving	Chemical Processing	T.T & Q.C.
Delhi	2010/OA/530	Nil	2010/OA/720	Nil
Ichalkaranji	2010/OA/540 2010/OA/541	2010/OA/630 2010/OA/631	2010/OA/730 2010/OA/732	Nil
Indore	2010/OA/550	Nil	Nil	Nil
Mumbai	2010/OA/560	Nil	Nil	Nil
Nagpur	2010/OA/571	2010/OA/650	2010/OA/740 2010/OA/744	2010/OA/821

Roll No. 2010/OA/523 of Coimbatore Centre & 2010/OA/731 of Ichalkaranji Centre will be declared on completion of ATA Part-I.

Candidates	Spinning	Weaving	Chem. Proce.	T.T & Q.C	TOTAL
Registered	22	10	16	06	54
Appeared	20	10	14	04	48
Passed	14	06	08	01	29

Passed 60%

### RESULTS FOR GMTA SEC A/B/C/D DECEMBER, 2010

Centre	Section B	Section - C			Section D	Section E
		Spinning	Weaving	Chem. Proc.		
Ahmedabad	2010/AHB/01 2010/AHB/02	Nil	Nil	2010/AHC/04-CP	Nil	
Bangalore	2010/BAB/10 2010/BAB/12 2010/BAB/15 2010/BAB/16	2010/BAC/10-S	Nil	Nil	2010/BAD/10	
Coimbatore	Nil	Nil	Nil	Nil	2010/COD/20	
Delhi	2010/DEB/21 2010/DEB/22	2010/DEC/20-S	Nil	Nil	Nil	
Ichalkaranji	Nil	Nil	Nil	Nil	Nil	
Indore	Nil	Nil	2010/INC/10-W	Nil	Nil	
Mumbai	Nil	Nil	2010/MUC/20-W	Nil	2010/MUD/40	
Nagpur	Nil	Nil	Nil	Nil	Nil	

Candidates	Section - B	Section - C			Section - D	Section - E	TOTAL
		Spinning	Weaving	Chem. Proc			
Registered	23	11	04	05	08	13	64
Appeared	14	11	03	05	06	13	52
Passed	08	02	02	02	03	13	30
Passed %	57 %	18 %	67 %	40 %	50 %	100%	58 %

**RESULTS FOR ATA PART - I (Revised) : DECEMBER, 2010**

Centre/Result	PASS	ATAHE
Ahmedabad	2010/NA/02, 2010/NA/03, 2010/NA/04, 2010/NA/05, 2010/NA/06, 2010/NA/08	2010/NA/07, 2010/NA/09, 2010/NA/11
Bangalore	2010/NA/23	Nil
Bhilwara	2010/NA/36, 2010/NA/43	Nil
Coimbatore	Nil	Nil
Delhi	2010/NA/51, 2010/NA/55, 2010/NA/57, 2010/NA/62, 2010/NA/63	2010/NA/50, 2010/NA/52
Ichalkaranji	Nil	Nil
Indore	2010/NA/102	2010/NA/100, 2010/NA/103, 2010/NA/112
Mumbai	Nil	Nil
Nagpur	2010/NA/133, 2010/NA/138	2010/NA/131

<b>CANDIDATES</b>		PASSED	: 17
REGISTERED	: 98	ATAHE	: 09
APPEARED	: 78	PASS PERCENTAGE	: 22%

BEST GMTA PROJECT – MR. BENAKAPPA S. HUBBALLI 87.4% (Sub: Application of statistical methods for evolving process norms in silk preparation process).

Ist Place in GMTA Section-D – Weaving Group Mr. Shailesh V. Mohile of Mumbai centre 248 out of 400 marks 62%

Ist Place in ATA Part-II Spinning Specilisation 286 out of 400 71.50% Mr. M. B Powar. of Ichalkaranji Centre.



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# THE TEXTILE ASSOCIATION (INDIA)

## Central Office

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programme of continued education in textile technology  
and management, by helping members acquire textile  
qualification, by rendering consultancy.

## The Textile Association [India]

### Schedule of ATA Examination December 2011

#### A.T.A. Part-I [Time 10.00 a.m. to 1.00 p.m.] OLD COURSE

- Friday, 23<sup>th</sup> December 2011 - Textile Fibres
- Saturday, 24<sup>th</sup> December 2011 - Principles of Spinning
- Sunday 25<sup>th</sup> December 2011 - Principles of Weaving
- Monday, 26<sup>th</sup> December 2011 - Principles of Chemical Processing

#### A.T.A. Part – II [Time 2.00 p.m to 5.00 p.m.] OLD COURSE

- Friday, 23<sup>th</sup> December 2011 - General Engineering
- Saturday, 24<sup>th</sup> December 2011 - Indian Text. Industry & Mill Management
- Sunday, 25<sup>th</sup> December 2011 - Group-I Spinning [S-I] Spinning Preparatory
- Monday, 26<sup>th</sup> December 2011 - Group-II Weaving [W-I] Weaving Preparation
- Group-III Chem.Proc.[CP-I] Fibre, Bleaing & Finishing
- Group-IV Text. Test. & Q. Control [TTQC-I] Testing & Statistics
- Monday, 26<sup>th</sup> December 2011 - Group-I Spinning [S-II] Ring Spinning & Doubling
- Group-II Weaving [W-II] Weaving Machines
- Group-III Chem. Proc.[CP-II] Dyeing & Printing
- Group-IV Text. Test. & Quality Cont [TTQC-II] Quality Control

#### A.T.A. Part – I (3 Years Course) [Time 10.00 a.m to 1.00 p.m.] NEW COURSE

- Friday, 23<sup>th</sup> December 2011 - Basic Engineering Sciences
- Saturday, 24<sup>th</sup> December 2011 - General Engineering
- Sunday 25<sup>th</sup> December 2011 - Textile Fibres
- Monday, 26<sup>th</sup> December 2011 - Elements of Textile Technology
- Tuesday, 27<sup>th</sup> December 2011 - Elements of Computer and its Applications

#### A.T.A. Part – II (3 Years Course) [Time 2.00 p.m to 5.00 p.m.] NEW COURSE

- Friday, 23<sup>th</sup> December 2011 - Principles of Yarn Manufacture
- Saturday, 24<sup>th</sup> December 2011 - Principles of Fabric Manufacture
- Sunday 25<sup>th</sup> December 2011 - Principles of Textile Wet Processing
- Monday, 26<sup>th</sup> December 2011 - Principles of Textile Testing and Statistics
- Tuesday, 27<sup>th</sup> December 2011 - Industrial Organization and Management

### Schedule of G.M.T.A. Examination December 2011

Section-A Date	Time 10.00 a.m. to 1.00 p.m. Subject No. & Title	Section-B Date	Time: 2.00 p.m. to 5.00 p.m. Subject No & Title
23.12.2011	A-1 English	23.12.2011	B-1 Statistics
24.12.2011	A-2 Physics	24.12.2011	B-2 Gen. Engineering
25.12.2011	A-3 Mathematics	25.12.2011	B-3 Text. Physics
26.12.2011	A-4 Chemistry	26.12.2011	B-4 Mech. of Text. Mach.
<b>Section-C Time: 10.00 a.m. to 1.00 p.m</b>			
<b>Date</b>	<b>Spinning Group</b>	<b>Weaving Group</b>	<b>Chem.Proc.Group</b>
23.12. 2011	SC1- Advanced yarn Mfg.	WC1-Advanced Fab.Mfg.	CPC1-Ele.of Chem.Engg
24.12. 2011	SC2- Mod. Yarn Prod.	WC2-Mod.Fab.Production	CPC2-Chem.of Int. & Dyes
25.12. 2011	SC-3- Proc. Control .in Spg.	WC3-Proc.Cont. in Wvg.	CPC3-Chem.& Eval.of Text. Aux.
26.12. 2011	SC-4 -Engg. Desg. of Tex. Struc.	WC4-Engg.Desi. of Text.	CPC4- Advanced Chem. Proc.
<b>Optional Papers</b>			
27.12. 2011	SO1-Spg.of Man-made Fib.& Bl	WO1-Knitting Technology	CPO1-Control Mechanism & Instrume
28.12. 2011	SO2-Long Staple Fibre	WO2-Wvg.of Fil.& Text.Yarn	CPO2-Ele.of Poly.Chemistr
29.12. 2011	SO3-Theory & Desi.of . Tex.Mac	WO3-Q.Cont.of wov & Non.wov	CPO3-Ble.Dye,Print & Fini.
30.12. 2011	SO4-T.T. & Q.C.	WO4-Geo.Text & Ind.Fab	CPO4-Compu.Colour Mach.
<b>Section-D</b>			
		<b>Time [2.00 pm to 5.00 pm]</b>	
27.12. 2011	D1- Data Pro.& Comp. Program	29.12. 2010	D2- Manmade Fib Prod & Prp.
28.12. 2011	D3- Ind.Engg & Mill Mang.	31.12. 2010	D4- Mill Org. & Proc.Contr.

1. Last Date for receiving applications at unit **25th July 2011**
2. Last Date for receiving all the applications with late fee at unit **25th August 2011.**
3. Last Date for receiving applications at the central office **25th September 2011.**

**Dr .H. V. Sreenivasamurthy**  
Chairman, P. A. C.

**V. D. Zope**  
Hon. Gen. Secretary

**JOURNAL OF THE TEXTILE ASSOCIATION**  
**VOLUME 71 – MAY 2010 TO APRIL 2011**

Subject	Authors	Issue	Page
<ul style="list-style-type: none"> <li>● <b>EDITOTIAL:</b></li> <li>➤ Welcome M.Sc. Textile Processing Degree Launched by ICT (UDCT)</li> <li>➤ New Volume of JTA</li> <li>➤ Hello Everyone</li> <li>➤ India's Growth Story or Ghost Story?</li> <li>➤ Union Budget : Sweet &amp; Sour</li> <li>➤ WTC : Experience the Joy of Collective Winning</li> </ul>	<p>M. D. Teli</p> <p>R. V. Adivarekar</p> <p>R. V. Adivarekar</p> <p>M. D. Teli</p> <p>R. V. Adivarekar</p> <p>M. D. Teli</p>	<p>1</p> <p>2</p> <p>3</p> <p>4</p> <p>5</p> <p>6</p>	<p>3</p> <p>58</p> <p>112</p> <p>169</p> <p>232</p> <p>308</p>
<ul style="list-style-type: none"> <li>● <b>CHEMICAL PROCESSING:</b></li> <li>➤ Removal of Dyes from Textile Wet Processing Industry : A Review</li> </ul>	<p>C. Parvathi, T. Maruthavanan, S. Sivamani &amp; C. Prakash</p>	<p>6</p>	<p>319</p>
<ul style="list-style-type: none"> <li>● <b>CLOTHING:</b></li> <li>➤ Defence Textiles</li> <li>➤ Thermal Comfort Characteristics of Plain Woven Fabrics</li> <li>➤ Consumer Awareness towards Ready Made Garments</li> <li>➤ Application of Herbal Extracts for Antimicrobial Property</li> <li>➤ The Rebirth of Himroo</li> </ul>	<p>Altaz Sundrani &amp; Chintan Navin Vora</p> <p>P. Senthilkumar, M. Kantharaj &amp; C. Vigneswaran</p> <p>N. Vasugi Raaja &amp; Kanikicherla Rani</p> <p>R. V. Adivarekar, N Kanoongo, M Nerurkar, N Khurana</p> <p>Jinal Sangani &amp; Sabita Baruah</p>	<p>3</p> <p>4</p> <p>5</p> <p>6</p> <p>6</p>	<p>128</p> <p>188</p> <p>257</p> <p>324</p> <p>331</p>
<ul style="list-style-type: none"> <li>● <b>DYEING:</b></li> <li>➤ Dyeing Behaviour of Self Shades and Combination Shades on Crape and Soft Silk Fabric : Part – I</li> <li>➤ Feasibility of Dyeing Multiple Textile Fibers in a Single Phase with Unique Natural Dye</li> <li>➤ The Marvel of Mata Ni Pachedi</li> <li>➤ Dyeing Without Water</li> <li>➤ Dyeing Performance of Novel Bisazo – Bisazomethine Dyes on Polyester and Nylon Fabrics - II</li> </ul>	<p>M.K. Vijayeendra, R. Yashoda &amp; N. Prabhuswamy</p> <p>Prabir Kir, Asthankar Devanand B., Jadhav Aditi S., Jawlekar Ankita K., Sayre Tina R., Borale Namrta J. &amp; Majage Supriya</p> <p>Jinal Sengani &amp; Sabita Baruah</p> <p>Deepak Kumar, Ambadas Garje, Kushal Desai &amp; Dharmendra Gupta</p> <p>Dinesh M. Patel and Bharat C. Dixit</p>	<p>1</p> <p>2</p> <p>3</p> <p>4</p>	<p>19</p> <p>62</p> <p>123</p> <p>171</p>
<ul style="list-style-type: none"> <li>● <b>FIBRES:</b></li> <li>➤ Moisture Transmission Behavior of Microfibre Blended Fabrics</li> <li>➤ Flame Retardant Systems for Textiles</li> <li>➤ Synthesis and Application of Cationic Softners</li> </ul>	<p>P. K. Kandhavadi, T. Ramachandran &amp; B. Geetha Manohari</p> <p>R.V. Adivarekar &amp; Satish Dasarwar</p> <p>Huseini Shabbir Patanwala &amp; V.A. Dorugade</p>	<p>6</p> <p>4</p> <p>4</p>	<p>311</p> <p>175</p> <p>183</p>
<ul style="list-style-type: none"> <li>● <b>FINISHING:</b></li> <li>➤ Use of Aloe Vera for Furnishing Anti Microbial Finish on Cotton Fabrics</li> <li>➤ Flame Retardant Systems for Textiles</li> <li>➤ Synthesis and Application of Cationic Softners</li> </ul>	<p>Avernita Srivastava</p> <p>R.V. Adivarekar &amp; Satish Dasarwar</p> <p>Huseini Shabbir Patanwala &amp; V.A. Dorugade</p>	<p>2</p> <p>4</p> <p>4</p>	<p>68</p> <p>175</p> <p>183</p>

Subject	Authors	Issue	Page
<ul style="list-style-type: none"> <li>● <b>KNITTING:</b></li> <li>➤ Some Studies on the Dimensional Characteristics of Polyester / Spandex Knitted Fabrics</li> </ul>	N. Gokarneshari, K. Thangamani	1	23
<ul style="list-style-type: none"> <li>● <b>MANAGEMENT:</b></li> <li>➤ Textile Engineering Industry of India Spares and Accessories Segment</li> <li>➤ Awareness and Utilisation of Consumer Rights and Duties by Textile Consumers</li> <li>➤ Global Recession – Product and Market Mix</li> </ul>	S. Chakrabarty Minakshi Jain & Suman Pant P.R. Wadje	2 2	73 77
<ul style="list-style-type: none"> <li>● <b>PRINTING:</b></li> <li>➤ Enrichment of the “King of Fabric” by Sodium Alginate and its Blend with Guar Gum</li> </ul>	Priyanka Kesarwani, Archana Singh & A.K. Gangwar	1	14
<ul style="list-style-type: none"> <li>● <b>SILK:</b></li> <li>➤ Factors Influencing Capital Formation in Sericulture – An Economic Analysis</li> <li>➤ Spider Silk</li> </ul>	C.R. Sandhya, G. Srinivasa, V.K. Rahmathulla & R.K. Rajan Usha Sayed, Navadit Kadam & Richa Khard	1 3	11 118
<ul style="list-style-type: none"> <li>● <b>SPINNING:</b></li> <li>➤ Properties of Gin Roller Covering Materials for Cotton Double Roller Gins (Part – I)</li> <li>➤ Melt Processing of Polyacrylonitrile (PAN) Polyester</li> <li>➤ Basalt Fiber</li> </ul>	Vijayan Gurumurthy Iyer Jayant Udakhe & Varun Goud Deepak Kumar	2 5 5	59 233 242
<ul style="list-style-type: none"> <li>● <b>TESTING:</b></li> <li>➤ A New Approach for the Measurement of Fabric Drapeability</li> </ul>	S.F. Harlapur, T. Ananthkrishnan & Thirumalesh R.	3	137
<ul style="list-style-type: none"> <li>● <b>TEXPERIENCE:</b></li> <li>➤ Unusual Problems in Textile Processing</li> <li>➤ Dyeing of Cotton in Various Forms</li> <li>➤ Dyeing of Acrylic Fibre in Textile Industry</li> <li>➤ Indian Textile Industry : Industry with Multifacet Opportunities for Professionals</li> <li>➤ Creativity and Innovation : Key Drivers of Success</li> <li>➤ Indian Textile Industry – Past and Present</li> </ul>	Edward Menezes N.N. Mahapatra N.N. Mahapatra Navneet Krishnan Naresh Saraf Shri M. K. Mehra	1 2 3 4 5 6	27 81 143 202 263 336
<ul style="list-style-type: none"> <li>● <b>WASTE MANAGEMENT:</b></li> <li>➤ Oxidative Process in Effluent Treatment</li> </ul>	Smita Honade & Neeraj Shrivastava	1	5
<ul style="list-style-type: none"> <li>● <b>YARN:</b></li> <li>➤ Migration Behaviour of Polyester / Viscose Blended Ring Yarns</li> <li>➤ An Artificial Neural Network System for Prediction of Dimensional Properties of Weft Knitted Rib Fabric</li> <li>➤ A Study to Reduce the Stiffness of Air Vortex Yarn</li> </ul>	B.R. Das, S.M. Ishtiaque & R.S. Rengasamy T. Saravana Kumar & V.R. Sampath T.K.Sinha, Tanveer Malik	3 5 6	113 247 316

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