



Journal of the **TEXTILE Association**

VOL. 73

NO. 1

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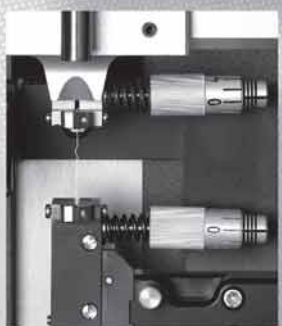
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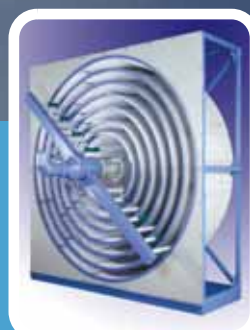
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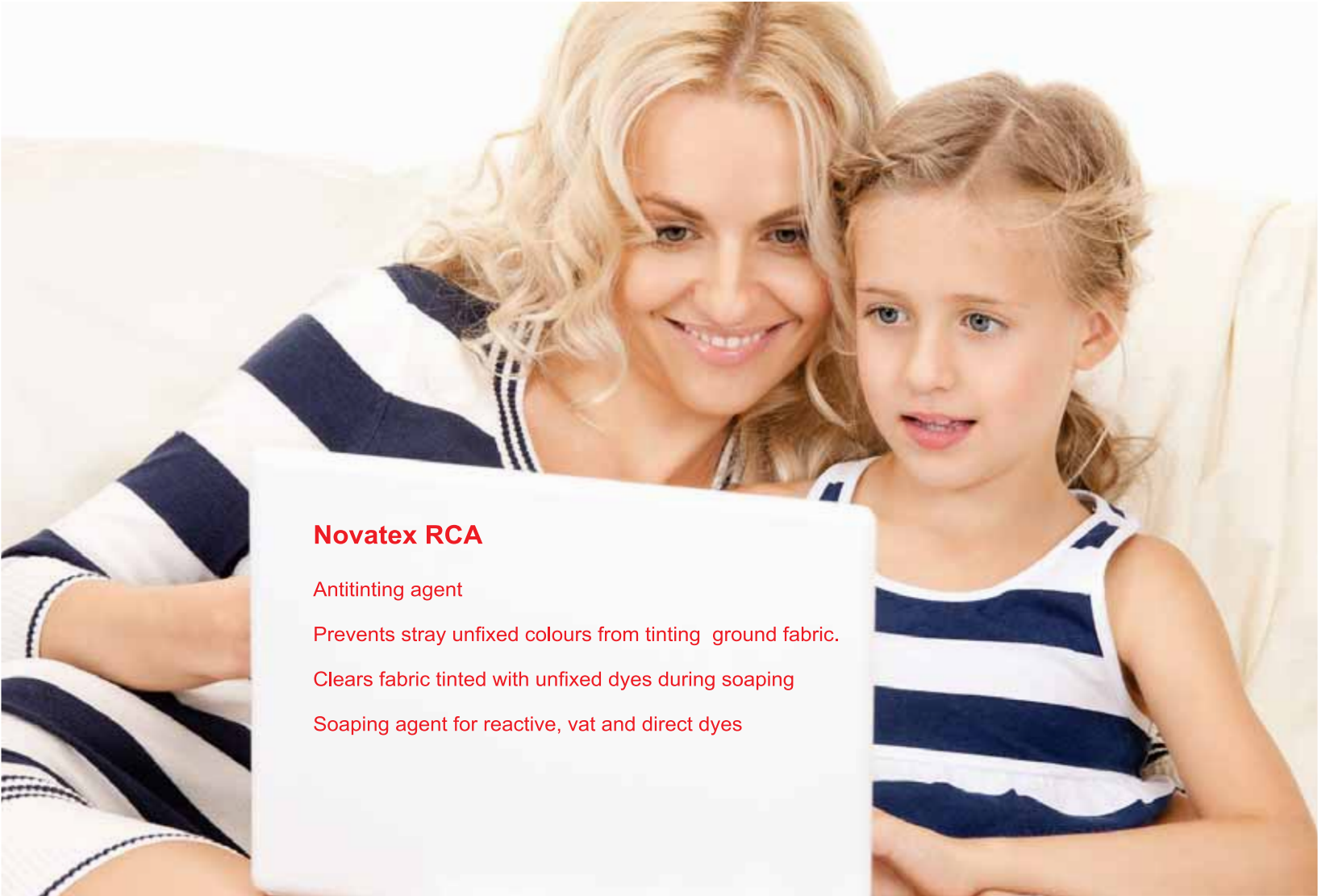


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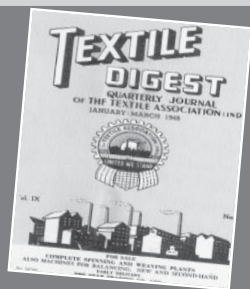
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- State Government Bodies
- Textile Engineers
- Fashion & Textile Designers
- Research Organizations & Students
- Textile Parks, SEZ
- Consultants
- Publications

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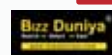


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KEYNOTE SPEAKER

Daniel R Dwight
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DAY ONE: SESSION ONE: THE INDUSTRY

Keynote presentation: Global expansion through sustainability and social responsibility
Daniel R. Dwight, Cooley Group

Coating and laminating technology review *Randy E. Meirowitz, PhD, RnD Solutions, San Diego, CA USA*

The European coating and laminating sector *Ariadna Detrell Agrupació d'Empreses Innovadores Textils*

Nonwovens for coating and laminating – a growing worldwide market *Speaker to be confirmed*
Discussion session 1

SESSION TWO: MATERIALS, TECHNIQUES, AND MACHINERY
Innovative powder impregnation technology *Jérôme Ville, Fibroline France SARL*

An eco friendly applicator – economic aspects and creative potential *Jürgen Hanel, Monforts*

Comparison of different adhesive application methods in the technical textile industry *Stephan Schultheis, ITW Dynatec*

Low temperature activation / high temperature resistant lamination using 100% solids adhesive *Michiel van Duijn, MORCHEM*

Application of novel atmospheric plasma machine for textiles *Illya Kulyk, Veneto Nanotech*
Discussion session 2

DAY TWO

Development in environmental laminating processes and laminated products
Karl Lansu, Klieverik Heli

High technical films and membranes for laminated products
Frans Goossens, Falt Plast Spa

Practical aspects of nanotechnology in coating and laminating *Speaker to be confirmed*

Commercializing technology – printed electronics: a field of the future for coating
Thomas Kolbusch, Coatema

Enhancement of and adding value and function to coating and laminating by digital imaging
Speaker to be confirmed
Discussion session 3

SESSION 3: EMERGING TECHNOLOGIES

Application of biobased and biodegradable materials in textile coating *David De Smet, Centexbel*

Introduction of biocides into coated fabrics – a study of insect repellent and insecticide coatings for textile applications
Helena Esteve, LEITAT Technological Center, Terrassa (Barcelona), Spain

Fibrous transistors: influence of substrate size on copper layer deposition, stability and roughness
Lina Rambašek, Ghent University
Discussion session 4

(Programme subject to change)



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World Textile – Challenges towards Excellence

TAI, Mumbai Unit and TAI, Central Office will jointly hold 2012 All India Textile Conference in Mumbai on November 30 & December 1, 2012 (i.e. Friday & Saturday). This Conference will provide a Double Treat to the Textile Professionals as it will coincide with the India-ITME Exhibition which will be held from 2nd to 7th December 2012. This will be wonderful opportunity to those who intends to visit India ITME Exhibition to listen to global experts as well senior textile magnets including beaurocrates, who will be specially visiting for attending India-ITME Exhibition. The Conference will cover topics and panel discussions which hitherto not covered so far. So book your dates for double treat Textile Conference & India ITME.

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- Textile Business in Asian Countries
- Business opportunities n Burma and Africa - Emerging new low cost production centres
- Financials – Banks & institutional support for textile projects
- Surviving in currency fluctuation situations
- Supply chain management & logistics
- Consumer expectations & rising demands
- Environmental issues & overcoming these regulations
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- Initiative Fibre – Natural & man-made, including Organic Cotton
- Innovation in textile machinery
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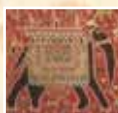
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Editorial

Welcome

to the Peer Reviewed Journal of Textile Association (India)

Every institution in the globalized world has to take the first lesson: to be ready to change; Every era has its peculiar problems and so also the solutions that emerge with respect to such issues. Gone are those days during the pre-Globalization period when a lot of compartmentalization existed in all the fields... economic, political, social, technological and so on. Those protectionists' measures may have been necessary at that time. But today, even the parents cannot dictate their children to be near the home town, if they really wished their progress and growth. Message is loud and clear that there is need for every institution to wing its ways for soaring high to reach an apex of success. However, equally true is the case, that everyone agrees with the need for change; but when it comes to implementation, change becomes the first victim of resistance. This is mainly because of the inherent inertia and the habit of being always in the comfort zone. Who would like to go through another cycle of experimentation till optimum is reached? But why don't we understand that "no pains, no gains". In our day to day life we have been accepting these changes, so also we need to welcome the changes when the rationale is convincing.

Recently I was on the UK tour, for establishment of International links of my Institute of Chemical Technology (formerly known as UDCT) with the Universities like Leeds, Manchester, Bolton etc. I also lectured at some places and during my interaction with faculty of all these universities I have found tremendous change in the kind of courses they are now teaching over the ones they were teaching conventionally. Taking into consideration of fast changing scenario of UK and Europe, where in core manufacturing of Textiles and apparels has been almost moved out of Europe, instead of delivering hard core chemical processing and fabric manufacturing course, they have shifted their focus on fashion and its Management, retail management and promotion of brands, retail stores management, consumer preference and designing aspects, etc. Also some of the areas of technical textiles for sportswear, personal care products and medical textiles and composites are also being stressed in their curricula.

What about our steps in India? Of course it does not any way indicate that we in India are not changing. A lot of our Institutes are also in the process of changing or have changed their course contents to cater to the needs of the time which is evident when I visit them on behalf of a number of Government funding agencies. However, we can still find the room for becoming "relevant". These questions in terms of how relevant are we should periodically be asked if any Institution has to

grow and for that matter even, we the G.C. members in the mid -sixties need to ask ourselves as to are we re-training ourselves to become more relevant. It's not the question of young versus old, it's the question of being relevant or irrelevant.

Taking the clue from deeper discussion held in G.C. meeting at New Delhi and the existing situation in the country of educational Institutions mainly in Textiles, it is high time we need to have a very good peer reviewed journal so that good authors would like to publish their work. Many of them, can then take pride in publication of good work in our Journal and they in turn may stand to benefit since, in that case their publication will have a good number of citations and slowly the journal of Textile Association will have higher impact factor. I very well know that kind of change requires preparedness to put in extra efforts on the part of reviewers, editors and editorial boards. The process may be slow, but firm conviction in this respect will fetch the due relevance and significant presence the JTA deserves in due course.

Hence while we can continue publishing the important news and views about the products as well as shop-floor experiences, the section of articles which will be published will undergo first scrutiny and review for their quality from panel of experts in the respective field. So the authors also have to write papers in the format which is standardized and mention the authenticity and vouch for the originality of the work, while sharing the copy rights with JTA and themselves. In the era of increasing transparency, we need to be careful of avoiding plagiarism and hence these declarations from authors would also be required. Having done that, many of the authors and researchers will turn to JTA and for publication in it will be considered for their personal promotions. In this new era where in continuous evaluation at every level is being done, my friends in Industry, Education and research Institutes will agree that there is such a strong need of a journal having very good readership and thus impact factor which can also enhance the number of citations a given author gets for his/her publication in the Journal.

Given the Global scarcity of good number of Journals publishing relevant work in Textile and its related field, I am sure our step of getting into this new generation Journal of Textile Association will be welcomed by each and every one. In-fact it is a major step of image building of the Textile Association (India) whose mouth piece is this Journal.

So let us welcome PEER REVIEWED JOURNAL of Textile Association from Sept-Oct. Issue.

Prof. (Dr.) Mangesh D. Teli,

Chairman, Editorial Board, JTA





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A Review on Auto Coner Winding Package Defects and Probable Remedies

Suchibrata Ray* and Biswapati Chatterjee

Government College of Engineering & Textile Technology

Abstract

Since globalization, market has become more competitive. In today's competitive market the customers are becoming more and more sensitive regarding quality. Therefore, every parameter regarding yarn and package quality is of prime importance and must be met out in closest tolerance. In spite of producing best quality yarn, defects generated during winding operation will make the quality yarn as unacceptable to the customer. So, it has become most essential for quality yarn producers to prevent occurrences of any kind of winding package defects. Here we have tried to highlight the sources and remedial measures for winding package defects, practiced in the yarn manufacturing industry.

Keywords

Winding, Defects, Patterning, Loop gate, Adaptor, Deflector plate, Tension sensor, Doffing.

1. Introduction

The ring spinning system still dominates over other new spinning technologies and is likely to continue as a most versatile machine for yarn manufacturing. The bigger size yarn package (called cones) of normally 1.5 - 2.5 kgs are produced on Auto coner winding machine from the small yarn packages (yarn cop) of normally 45 -70 gms. It is essential to facilitate the next manufacturing processes. The preparation of better quality yarn packages is important for satisfactory performance during knitting and weaving processes. Most popular winding system for all categories of normal yarn other than special type of yarn, is drum winding. Drum winding machines rotates forming package through surface contact with a cylindrical drum, and the yarn is traversed either by an independent traverse, typically by a wing cam or by grooves in the drum [1]. In this winding operation, packages are sometimes being produced with different kinds of defects in it. The performance of latest generation high speed machines in next manufacturing processes gets largely affected by such defective packages. Also, defect in the package leads to cone rejection and subsequently a large amount of hard waste is generated. In this paper, certain causes of faults generation and few remedial steps are high-

lighted, which are to be taken to reduce or minimize the winding package defects.

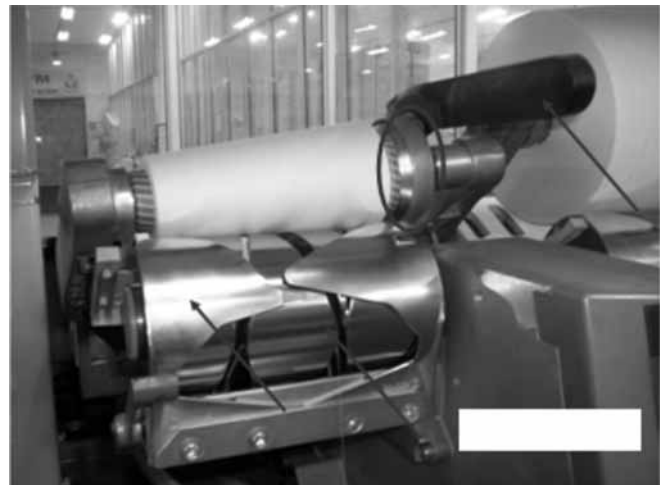


Figure 1.1 : Auto Coner Winding Machine

2. Types of yarn package defects

The defects are classified as per their nature and appearance. In any condition none of the defects is desirable. Therefore the seriousness of all the types of defects is same. Any sort of defect causes yarn package rejection. The frequency of occurrence of all kinds of package defects is definitely different. The nature of twelve package defects is as follows in order of its increasing frequency of occurrence [2].

- ◆ Jali cone
- ◆ Bunch cone
- ◆ Cut cone

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- ◆ Ribbon cone
- ◆ Hard/Soft Cone
- ◆ Displaced/loose yarn layers
- ◆ Over doff cone
- ◆ Dirty Cone
- ◆ Stained cone
- ◆ Drum jammed cone
- ◆ Squeezed cone
- ◆ Webbed cone

3. Package defects, reasons of generation and their remedies

All kinds of winding defects as listed above have been individually defined and their probable causes with suggested remedies have been discussed here.

3.1 Jali Cone



Figure 3.1 : Jali Cone

Definition: Certain yarn portion comes out of its traverse position during package formation and gets winded cross on bottom or top surface of the package. Yarn is visible on the small or big side of the cone either across the side, around the tube, or going back in the cones [1].

3.1.1 Probable causes

- ◆ Improper timings of drum brake.
- ◆ Variation in winding acceleration.
- ◆ Yarn is out of deflector plate.

3.1.2 Remedies

1. Winding acceleration and brake timings to be checked and standard timings to be set.

3.2 Bunch Cone



Figure 3.2 : Bunch cone

Definition: A small group of yarns get spliced with single yarn and goes into the cone.

3.2.1 Probable causes

- ◆ Yarn trapped in gripper arm.
- ◆ Ring frame bobbin slough off.
- ◆ Pre- cleaner setting too loose.
- ◆ Improper working of Loop gate.

3.2.2 Remedies

- ◆ Any cut mark in gripper arm to be checked.
- ◆ Top bunch setting of ring frame cop to be set at 10 mm.
- ◆ Pre cleaner setting to be adjusted.
- ◆ Loop gate setting and functioning to be checked.

3.3 Cut Cone

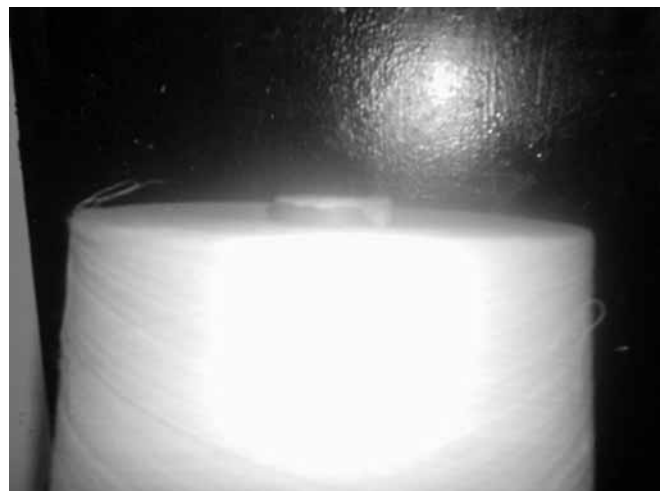


Figure 3.3 : Cut cone

Definition : The yarn is broken on the edges or in the middle of the cone.

3.3.1 Probable causes

- ◆ Tight setting of deflector plate.
- ◆ Setting of suction mouth taper.
- ◆ Wrong handling of the package (pushing) after doffing.
- ◆ Any cut mark on drum.
- ◆ Wax deposition on cone aligner (Patti) plate.
- ◆ Rubbing with traverse belt.

3.3.2 Remedies

- ◆ Deflector plate and suction mouth setting to be adjusted.
- ◆ After doffing, package to be gently pushed.
- ◆ Traverse belt to be checked for any sharp edges.
- ◆ Deposited wax to be cleaned properly.

3.4 Ribbon cone

Definition: A pattern or ring is formed on the surface of the package by the drum when drum rpm are staying the same [2].

3.4.1 Probable causes

- ◆ Anti-patterning device does not work.
- ◆ Power failure occurs while winding machine is running.

3.4.2 Remedies

- ◆ Anti-patterning device working to be checked and adjusted.
- ◆ Winding machine to be stopped before power fail.

3.5 Hard and Soft cone

Definition : Package hardness varies from its desired value resulting in great difference in package density from one winder head to another [2].

3.5.1 Probable causes

- ◆ Improper tension setting - too high produce hard cone and low tension produce soft cone.
- ◆ Loop gate remains always "on".
- ◆ Higher "pre- tensioner" setting.
- ◆ Improper setting of cradle pressure - too high produce hard cone and low tension produce soft cone.
- ◆ Defective tension sensor.

3.5.2 Remedies

- ◆ Tension, Pre-tensioner and cradle pressure set-

tings are to be set as per material type and package parameters.

- ◆ Defective tension sensors to be replaced or repaired.
- ◆ Loop gate functioning to be checked.

3.6 Displaced / loose yarn layers

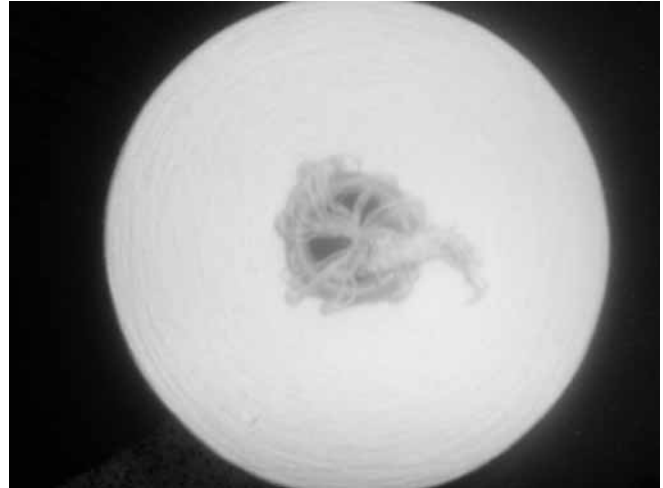


Figure 3.4 : Loose yarn layers

Definition: Some layers of yarn are pushed out on the small diameter side of the package.

3.6.1 Probable causes

- ◆ Paper cone slips from adaptor.
- ◆ Poor fitting of paper cone on adaptor (mis-matching of paper cone and adaptor).
- ◆ Surface of paper cone is slippery

3.6.2 Remedies

- ◆ Paper cone to be fitted properly in the adaptor by operator.
- ◆ Surface of empty paper cone must be rough enough to hold the initial yarn layers.
- ◆ Adaptor gauge to be maintained symmetrical from nose to tail so that paper cone fits properly in the adaptor.

3.7 Over doff cone

Definition : Package weight exceeds from required weight.

3.7.1 Probable causes

- ◆ Length sensor does not work.
- ◆ Wrong length setting in informant of the machine.
- ◆ Wrong work practices by the operator; like not doffing of the full package and further restarting of winding with the full doff package.

3.7.2 Remedies

- ◆ Rouge drums to be identified and functioning of length sensor to be checked periodically.
- ◆ Length vis-à-vis package weight calculation to be done rightly and desired length to be set in the informatory of the machine.
- ◆ Doffing to be done when drum gives yellow light (full doff signal) only.

3.8 Dirty cone

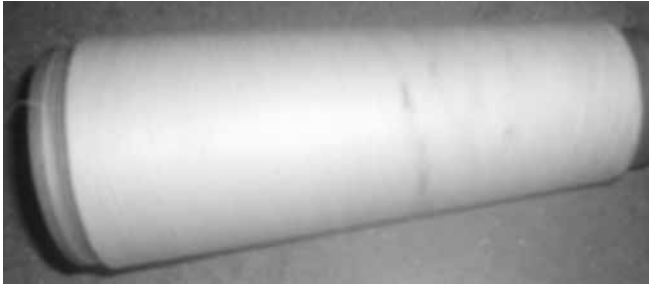


Figure 3.5 : Dirty cone

Definition: Package surface gets dirty or contaminated with oil drops or carbon particles.

3.8.1 Probable causes

- ◆ Use of dirty hands by operators.
- ◆ Un-cleaned machine parts.
- ◆ Wrong work practice - cleaning of adaptor by blow of compressed air. Oil particles coming with compressed air get deposited.

3.8.2 Remedies

- ◆ Machine parts and hands have to be cleaned continuously.
- ◆ Cleaning of Adaptor to be carried out by a dry piece of cloth only. Compressed air cleaning practice to be completely stopped.

3.9 Stained cone



Figure 3.6 : Stained cone

Definition: A dark ring appears on a specific area or portion of the package. It is generated because of surface friction between package and other machine parts.

3.9.1 Probable causes

- ◆ Lapping in drum.
- ◆ Deflector plate touches the package.
- ◆ Full doff cone touches with fixed back side machine part.

3.9.2 Remedies

- ◆ Full doff packages have to be picked up immediately after full doff length reaches.
- ◆ Bended deflector plates have to be straightened up.

3.10 Drum jammed Cone



Figure 3.7 : Drum jammed cone

Definition: Winding of yarn on small portion (along the traverse) of the package because of defective traverse action.

3.10.1 Probable causes

- ◆ Deflector plate got bent.
- ◆ Jamming or lapping on drum.

3.10.2 Remedies

- ◆ The deflector plate to be made straight.
- ◆ Drum jamming/lapping to be avoided or to be cleaned immediately in case of jamming.

3.11 Squeezed cone



Figure 3.8 : Squeezed cone

Definition: After full or partial cone building cone shoulder bends inwards.

3.11.1 Probable causes

- ◆ Poor handling of empty paper cones.
- ◆ Use of lower collapsing strength (CS) empty paper cones.
- ◆ Use of higher temperature than standard during material conditioning.

3.11.2 Remedies

- ◆ Soft handling of package after doffing and during packing.
- ◆ Standard cone collapsing strength (CS) to be maintained as per variety of paper cones.
- ◆ Temperature in conditioning to be maintained as per cone type (as mentioned below):
 - Low CS cone: 60 degree celcius
 - High CS cone: 65 Degree celcius

3.12 Webbed cone

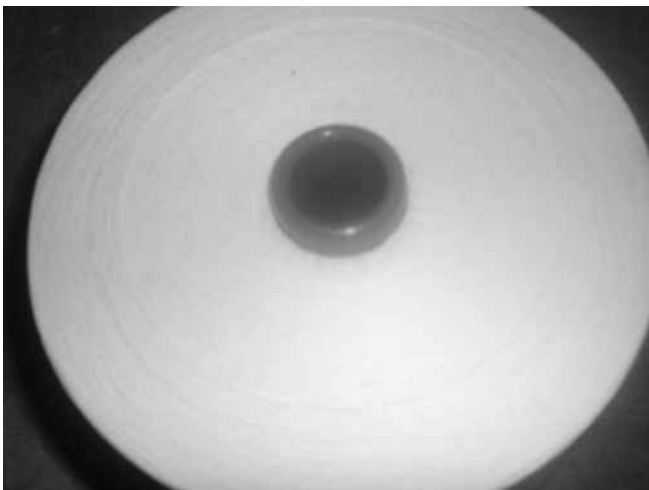


Figure 3.9 : Webbed cone

Definition: Yarn layers come out of cone surface and forms a web like appearance.

3.12.1 Probable causes

1. Drum stops for long time.
2. Partially built-up cone is taken out and refitted again in the same drum or other drum.
3. Yarn is running out of tension disc.
4. Tension sensor is defective.

3.12.2 Remedies

1. Drum stoppage with partially built-up cone for longer time to be avoided.
2. Only full (set length/weight) cone to be taken out

from the drum.

3. Yarn to be passed through tension disc.
4. Defective tension sensor to be replaced or repaired.

4. Conclusion

With the increasing demand for superior quality of package cones in industry, it seems natural that any form of defects generated at the winding stage is more prone to incur considerable loss in subsequent stages of production as well as down to ultimate products. Attempts have been therefore made identifying twelve (12) frequently occurring defects in package cones in high speed auto coner winding system. Their probable causes with remedies are also listed out so as to avoid any occurrence of such defects.

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Effect of Weaves & Weft Counts on Comfort Properties of PV Blended Suiting Fabrics

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Abstract

The effect of weaves & weft counts on the thermal comfort and tactile properties of polyester viscose blended fabrics have been studied by measuring the low stress mechanical properties on Kawabata Evaluation System. The thermal comfort has been studied by measuring the air permeability, thermal insulation & moisture vapour transfer properties of fabrics. The tactile properties have been studied by measuring the fabric mechanical & surface properties such as tensile, shear, bending, compression, surface roughness, surface friction and handle. The study shows that, KOSHI (stiffness) values are higher for 2/1 twill woven fabrics, NUMERI (smoothness) and FUKURAMI (fullness & softness) values are higher for 2/2 twill & 5 end satin, thus giving higher Total Hand Value (THV). Plain woven fabrics gives lower KOSHI, NUMERI & FUKURAMI, thus lower THV. Irrespective of the weave, fabrics woven using finer yarns helped in improving the surface smoothness. The air resistance is more for twill and satin woven fabrics. The air permeability & moisture transport rate is more for plain woven fabrics. Thermal insulation values are higher for 2/2 twill woven fabrics.

Keywords

Air resistance, fabric comfort, fabric handle, low stress mechanical properties, Moisture transport rate, thermal insulation value.

1. Introduction

Clothing is an integral part of human life and has a number of functions like adornment, status, modesty & protection. To be competitive, modern clothing besides having good mechanical & technological properties & being of easy care, must possess good comfort characteristics [1]. Comfort has totally replaced the durability as far as the selection of garments/ fabrics is concerned [2].

The comfort sensation of a fabric has multidimensional attributes and it is not possible to quantify it through a single physical property. It is possible to distinguish the two aspects of wear comfort of clothing.

- ◆ Thermo physiological wear comfort : It concerns the heat & moisture transport properties of clothing and the way the clothing helps to maintain the heat

balance of the body during various levels of activity.

- ◆ Skin sensational wear comfort : It concerns the mechanical contact of the fabric with the skin, its softness and pliability in movement & its lack of prickle, irritation & cling when damp.

In order to find comfort evaluation of textiles, the concept of "Fabric Hand" is commonly used to assess fabrics. Term like "Fabric Handle" or simply "Handle" or "Hand" are also used. Fabric hand refers to the total sensations experienced when a fabric is touched or manipulated in the fingers.

The handle of the fabric is influenced by its mechanical & surface properties. The ease of body movement & the level of load generated in fabric during body movement are obviously related to the fabric handle properties & therefore a study of clothing tactile comfort must be taken into account. It is concerned with the subjective judgment of roughness, smoothness, harshness, pliability, thickness, etc. Many factors may influence the fabric tactile quality such as raw material, yarn structure, fabric structure & finishing treatments.

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Many researchers have carried out extensive work on fabric handle properties [3-13]. Thermal comfort is the factor governed by the movement of heat, moisture and air through the fabric. The maintenance of thermal balance is probably the most important attribute of clothing and has drawn the attention of many textile research workers[14-18].

Efforts are being made to produce more comfortable fabrics which should satisfy three conditions i.e. good hand, possibility of making good appearance of suit and mechanical comfort for wear [19]. Thus both mechanical comfort & thermal comfort characteristics of the fabric needs to be investigated to understand the physical and physiological interrelationship between the cloth & human body. It is therefore important to examine the change in mechanical properties of fabric and the total hand value including various transmission behaviour with change in weave and weft yarn count.

The present work, therefore, is aimed to study the mechanical and thermal comfort aspects of PV blended suiting fabrics produced by using different weaves and weft counts in light weight, medium weight & heavy weight categories.

2. Material and Methods

2.1 Materials

2.1.1. Preparation of fabric samples

Fifteen samples of suiting fabrics with different weft counts and weaves were manufactured from 65:35 polyester viscose blended yarns. Dope dyed black coloured Polyester fibres of 1.4 Denier with 44 mm length & 1.5 Denier Viscose of 38 mm length were used to manufacture the yarns.

All the fifteen samples of suiting fabrics were manufactured with different constructions as shown in Table 2.1 in different weight categories on a Sulzer TW11 weaving machine. In light weight category plain woven fabrics were manufactured. In medium weight category 2/1 & 2/2 twill woven fabrics were manufactured and in heavy weight category 4 end & 5 end satin woven fabrics were manufactured.

The finishing of the fabric samples was done as per the normal process sequence followed in the suiting industry as below : grey singeing - Pre scouring - Drying Heat setting - Resin treatment (Resin 5 gpl + 10 gpl softner) Perching Stabila Conti press or Nikki Kier Decatising.

Table 2.1 : Fabric Constructional parameters, fabric thickness & fabric weight

Warp count is 2/84 Nm for all samples.

Sample Code	Weave	Weft count (Nm)	Fabric thickness		Fabric Weight (mg/cm ²)
			To mm	at max. pressure (Tm mm)	
A1	Plain	2/84	0.382	0.302	16.92
A2	Plain	1/56	0.380	0.284	15.26
A3	Plain	1/48	0.404	0.296	16.18
B1	2/1 twill	2/84	0.433	0.334	21.30
B2	2/1 twill	1/56	0.412	0.308	20.40
B3	2/1 twill	1/48	0.441	0.323	22.16
C1	2/2 twill	2/84	0.460	0.353	22.54
C2	2/2 twill	1/56	0.425	0.328	20.52
C3	2/2 twill	1/48	0.447	0.343	21.64
D1	4 end satin	2/84	0.454	0.348	22.67
D2	4 end satin	1/56	0.422	0.327	20.42
D3	4 end satin	1/48	0.443	0.333	21.13
E1	5 end satin	2/84	0.504	0.379	24.05
E2	5 end satin	1/56	0.513	0.393	25.92
E3	5 end satin	1/48	0.493	0.380	23.62

2.2 Methods

2.2.1 Yarn Properties

All the yarns were tested for tensile tests which were carried out on STATIMAT ME tester with test speed of 300 mm/min and gauge length 500 mm at a pre-tension of 0.5 CN/Text with a drop force of 90% at 10N load cell with 1% threshold.

2.2.2 Fabric tactile comfort properties

Handle properties of the fabrics were evaluated by measuring the fabric low-stress mechanical properties (tactile, shear, bending, compression, surface, roughness, and surface friction) on KAWABATA Evaluation System for fabrics (KES FB). The tensile properties and shear properties were studied on KES-FB1 (tensile and shear tester). The tensile properties were measured by plotting the force extension curve between zero and max. force of 500 gf/cm and the recovery curve. Shear properties were measured by shearing the fabric sample parallel to its long axis, keeping a constant tension of 10 gf/cm on the clamp. Bending properties were measured on KES-FB2 (Pure bending tester) by bending the fabric sample between the curvatures - 2.5 & 2.5cm⁻¹. Compressional properties were studied on KES-FB3 (Compression tester) by

placing the sample between two plates & increasing the pressure while continuously monitoring the sample thickness to a maximum pressure of 50 gf/cm². The surface roughness and surface friction were measured on KES-FB4 (Surface tester). The primary & total hand values were calculated from sixteen mechanical properties.

2.2.3 Fabric thermal comfort properties

Air permeability tests were conducted on KES-F8 AP1 (Air permeability tester).

Thermal insulation and moisture transport rate were determined by using the KES-F 7 (Thermo Labo II B). All the fabric testings were carried out in Central Institute For Research On Cotton Technology, Adenwala Road, Matunga, Mumbai.

3. Results and Discussion

3.1. Tensile properties

Tensile properties of suiting fabrics are shown in 3.1. The EMT (Tensile strain) value indicates low-stress extensibility and is related to crimp removal process during tensile loading. This factor affects tailorability and seam slippage. A higher value of EMT provides wear comfort but create problems during stitching and seam pressing.

Table 3.1 : Tensile Properties

Sample Code	LT		WT		RT		EMT	
	Warp	Weft	Warp	Weft	Warp	Weft	Warp	Weft
A1	0.718	0.669	7.40	5.57	58.77	65.05	4.13	3.34
A2	0.645	0.666	7.85	6.05	62.40	62.38	4.87	3.63
A3	0.744	0.704	8.63	4.93	59.04	68.97	4.64	2.81
B1	0.728	0.699	6.93	5.22	62.84	61.31	3.80	2.99
B2	0.715	0.710	6.85	4.55	61.68	64.28	3.83	2.57
B3	0.754	0.710	7.25	4.05	58.90	67.82	3.85	2.28
C1	0.682	0.602	6.27	5.32	57.37	64.87	3.68	3.54
C2	0.672	0.678	6.43	4.88	60.03	62.57	3.83	2.88
C3	0.698	0.628	6.43	4.68	58.36	64.17	3.68	2.98
D1	0.699	0.691	6.25	4.98	58.85	63.30	3.58	2.88
D2	0.695	0.653	6.28	4.68	64.54	62.57	3.61	2.87
D3	0.683	0.663	5.90	4.13	61.01	66.07	3.45	2.49
E1	0.679	0.688	5.45	6.90	62.82	54.36	3.21	4.03
E2	0.686	0.767	6.55	4.65	58.78	60.75	3.82	2.43
E3	0.682	0.657	6.45	5.35	59.74	59.81	3.78	3.26

EMT - Tensile Strain ; LT - Linearity of tensile Property ;
WT- Tensile Energy; RT- Tensile Resilience.

It is observed that EMT for warp is higher for all fabric samples than for weft except for sample E1. EMT values are higher for plain woven fabrics. Among all plain woven fabrics A2 has highest EMT and among all 4 end satin woven fabrics, D3 has lowest EMT.

The linearity of tensile property (LT) is indicative of wearing comfort. Lower values of LT gives higher fabric extensibility in initial strain range indicating better comfort, but on the other fabric dimensional stability decreases. It is seen that, LT is higher for B3 & lower for C1. The tensile energy (WT) values are lower for D3 and higher for A2. The tensile Resilience (RT) indicates recovery after tensile deformation. RT is higher for A3 and lower for E1. Tensile resilience values are higher for tighter construction because of crimp removal which leads to a better recovery in tight fabrics.

3.2. Shear Properties

It has been observed from table 3.2 that the shear rigidity (G) is higher for B3 (1/48 weft, 2/1 twill) and lower for E3 (1/48 weft, 5 end satin). The high value of shear rigidity causes difficulty in tailoring and discomfort during wearing. Shear rigidity of the fabric mainly depends upon the mobility of the warp and weft

threads within the fabric. The compact structure of fabric having higher pick density gives higher shear rigidity values and hysteresis of shear. An increase in picks per inch significantly increases shear rigidity and it may be because of restriction on yarn movement in the fabrics with more picks per inch.

2HG and 2HG5 indicates the hysteresis of shear force at 0.5° and 5° respectively. It is also observed from table 3.3 that the hysteresis for shear is higher for B3 i.e. 2/1 twill woven fabric made with 1/48 Nm as a weft yarn and lower for A3 i.e. plain woven fabric made with 1/48 Nm as a weft yarn.

Shearing occurs due to the relative movement of two sets of yarns in the fabric. Significant reduction in shear rigidity is observed for the 2/2 twill woven fabric than 2/1 twill woven fabric. This can be attributed to the reduction in the number of yarn interlacing of the 2/1 twill woven fabric, which would considerably bring down the frictional forces giving rise to lower shear rigidity and shear hysteresis. A similar trend is observed for the satin weave fabrics. A 5 end satin weave displayed lower shear rigidity and hysteresis (except for E2 fabric) than their corresponding 4 end satin weave fabric.

Table 3.2 : Shear & Bending Properties

Sample Code	Shear Properties						Bending Properties			
	G		2HG		2HG5		B		2HB	
	Warp	Weft	Warp	Weft	Warp	Weft	Warp	Weft	Warp	Weft
A1	1.33	1.24	2.08	1.24	4.80	4.81	0.0587	0.0551	0.0407	0.0404
A2	1.30	1.27	1.81	1.45	4.57	4.64	0.0473	0.0298	0.0292	0.0248
A3	1.17	0.94	1.86	1.31	4.19	3.61	0.0479	0.0409	0.0352	0.0367
B1	2.91	2.69	2.94	3.26	9.36	8.84	0.0908	0.0849	0.0638	0.0605
B2	3.41	3.45	3.89	2.89	10.96	9.92	0.1038	0.0589	0.0747	0.0555
B3	4.76	4.49	4.77	4.24	12.74	11.86	0.1088	0.0795	0.0818	0.0824
C1	1.86	1.73	2.55	2.24	7.07	7.05	0.0899	0.0773	0.0756	0.0615
C2	1.65	1.48	1.89	1.86	6.57	6.20	0.0859	0.0458	0.0648	0.0368
C3	1.94	1.78	2.16	2.04	7.26	6.92	0.0964	0.0662	0.0707	0.0562
D1	1.82	1.72	2.17	2.30	6.93	6.49	0.0874	0.0642	0.0574	0.0506
D2	1.59	1.48	2.24	1.92	6.26	5.67	0.0755	0.0423	0.0553	0.0320
D3	1.77	1.68	2.07	2.15	6.43	6.47	0.0821	0.0550	0.0554	0.0477
E1	1.18	1.16	1.86	1.72	4.74	4.70	0.0945	0.0551	0.0694	0.0430
E2	2.16	2.26	3.10	2.74	8.24	8.05	0.01393	0.0865	0.0918	0.0741
E3	1.08	1.01	2.05	1.34	4.36	3.91	0.0956	0.0555	0.0608	0.0405

G- Shear Rigidity ; 2HG- Hysteresis of shear at 0.5° ; 2HG5- Hysteresis of shear at 5° ;

B- Bending Rigidity ; 2HB - Hysteresis of Bending moment

3.3. Bending Properties

Bending rigidity (B) of a fabric depends upon the bending rigidity of the threads and the mobility of warp and weft threads within the fabric. Bending rigidity (B) is high for E2 & low for A2. Bending rigidity & hysteresis of bending values are higher for the fabrics with more pick density.

2HB represents the hysteresis of bending moment which is a measure of recovery from bending deformation. Hysteresis of bending moment (2HB) is high for E2 & low for A2. Bending rigidity is one of the important mechanical property influencing the tailorability of the fabric. Increase in bending rigidity increases Koshi (Stiffness). Bending rigidity is higher in warp direction than in weft direction. The bending rigidity of yarn depends on 4th power of yarn's diameter, i.e. 2nd power of yarn count. Koshi increases with yarn count.

3.4. Surface Properties

The fabric surface properties are shown in table 3.3 It is observed that the coefficient of friction (MIU) is higher for sample C1 (2/2 twill woven fabric made with 2/84 Nm weft yarn) and is lower for B2 (2/1 twill

woven fabric made with 1/56 Nm weft yarn). The mean deviation of coefficient of friction (MMD) notes the surface smoothness as perceived while moving the fingers on the fabric surface. MMD is higher for B1 (2/1 twill woven fabric made with 2/84 Nm weft yarn) & lower for C2 (2/2 twill woven fabric made with 1/56 Nm weft yarn). Also the geometrical roughness (SMD) is higher for A1 (plain woven fabric made with 2/84 Nm weft yarn) and lower for C2 (2/2 twill woven fabric made with 1/56 Nm weft yarn).

According to M.Matsudaira et. al.[6], scroopy feel of fabric increases because of increase of twist number of weft yarn. All the samples of first category are made by 2/84 Nm weft yarns whose TPI is 29.79 which is more than other yarns. Thus fabric woven using finer yarns in B2 fabrics aided in improving the surface smoothness.

3.5. Compressional Properties

The compressional properties of fabrics are measured by placing the sample between two plates and monitoring its thickness with increasing pressure. The linearity of compression (LC) mainly depends on the fabric

Table 3.3 : Surface and Compression Properties

Sample Code	Surface properties						Compression properties		
	MIU		MMD		SMD		LC	WC	RC
	Warp	Weft	Warp	Weft	Warp	Weft			
A1	0.143	0.171	0.0217	0.0152	10.72	5.28	0.624	0.125	61.06
A2	0.146	0.170	0.0171	0.0177	7.65	5.27	0.533	0.128	61.41
A3	0.142	0.175	0.0268	0.0147	8.68	4.69	0.380	0.100	64.15
B1	0.143	0.159	0.0153	0.0315	4.00	4.17	0.539	0.134	60.30
B2	0.136	0.151	0.0122	0.0181	3.71	4.15	0.495	0.127	62.74
B3	0.137	0.153	0.0168	0.0267	3.45	3.88	0.397	0.114	59.49
C1	0.162	0.172	0.0100	0.0149	3.06	3.80	0.478	0.127	69.09
C2	0.150	0.166	0.0113	0.0134	2.74	3.09	0.523	0.127	66.84
C3	0.140	0.158	0.0102	0.0162	2.95	3.73	0.427	0.110	58.38
D1	0.150	0.160	0.0114	0.0163	3.70	3.40	0.459	0.120	62.96
D2	0.150	0.153	0.0130	0.0145	3.12	2.97	0.554	0.130	56.23
D3	0.146	0.150	0.0135	0.0191	3.81	3.58	0.443	0.123	71.09
E1	0.154	0.172	0.0111	0.0149	3.19	3.88	0.466	0.146	52.94
E2	0.157	0.165	0.0145	0.0149	2.78	3.33	0.506	0.152	51.25
E3	0.150	0.177	0.0153	0.0134	3.77	3.43	0.500	0.142	57.64

MIU - coefficient of friction ;

SMD - Geometrical Roughness ;

WC - Compressional energy ;

MMD - Mean deviation of MIU;

LC - Linearity of Compression ;

RC- Compressional Resilience

thickness and compressional characteristics of the yarn. It has been observed from table 5 that LC is higher for A1 (plain woven fabric made with 2/84 Nm weft yarn) & lower for A3 (plain woven fabric made with 1/48 Nm weft yarn). Compressional energy (WC) depends upon the LC and the amount of compression. WC is higher for E2 (5 end satin woven fabric made with 1/56 Nm weft yarn) and lower for A3 (plain woven fabric made with 1/48 Nm weft yarn). The compressional resilience (RC) mainly depends upon fabric thickness and compressional characteristics of yarn. It has been observed that RC is higher for D3 (4 end satin woven fabric made with 1/48 Nm weft yarn) & lower for E2 (5 end satin woven fabric made with 1/56 Nm weft yarn).

3.6. Fabric weight and fabric thickness

The plain woven fabrics are manufactured in light weight category suiting fabrics & 5 end satin fabrics are manufactured in heavy weight category suiting fabrics. Thus the fabric weight is higher for E2 (5 end satin woven fabric made with 1/56 Nm weft yarn) and lower for A2 (plain woven fabric made with 1/56 Nm weft

yarn) and the fabric thickness is higher for E2 and lower for A2.

3.7. Fabric hand values

The fabric samples are manufactured for winter suiting, hence the three primary hand values namely Koshi, Numeri and Fukurami have been calculated and are shown in table 3.4 Primary hand values are graded by using a scale of 1-10 where 1 indicates the weakest feeling & value 10 indicates the strongest with regards to the particular descriptor.

THV gives a consolidated index reflecting the suitability of the fabric for predetermined applications in a scale of 0-5. A THV of 5 indicates that the fabric is ideal for the intended use while a THV of 0 suggests its unsuitability. A value of THV between 0-5 would indicate varying levels of suitability of the fabric for the proposed application.

In a fabric the Koshi (Stiffness) depends on its bending properties. Koshi values are higher for B3 (2/1 twill woven fabrics made with 1/48Nm weft yarn) and

Table 3.4 : Primary and Total Hand Values and Comfort properties of suiting fabrics

Sample Code	Primary Hand Values			THV	Comfort properties			
	Koshi (Stiffness)	Numeri (Smoothness)	Fukurami (Fullness & Softness)		Thermal Insulation value (Tog)	Moisture Transport rate (m) (g/sq. ms)	Air Resistance	
							(K.Pa. CV% S/m)	
A1	4.07	2.94	2.45	1.78	0.823	0.00947	0.345	16.6
A2	2.95	3.72	3.20	1.90	0.765	0.01043	0.291	17.4
A3	2.99	3.11	2.37	1.48	0.765	0.00950	0.334	15.7
B1	6.51	1.96	2.32	1.90	0.764	0.00876	1.751	13.4
B2	6.56	3.39	3.31	2.47	0.764	0.00840	1.422	11.0
B3	7.38	1.99	2.40	1.91	0.736	0.00864	2.170	12.9
C1	5.68	4.56	3.96	2.93	0.856	0.00820	1.924	11.2
C2	4.90	4.77	3.84	2.88	0.800	0.00896	1.371	10.2
C3	5.74	4.22	3.38	2.67	0.804	0.00889	1.622	13.6
D1	5.55	4.14	3.33	2.62	0.775	0.00887	1.941	7.1
D2	4.67	4.33	3.28	2.54	0.751	0.00888	1.531	7.5
D3	5.27	3.81	3.29	2.48	0.745	0.00870	1.583	9.6
E1	4.75	4.94	3.85	2.93	0.799	0.00870	1.740	12.8
E2	6.82	3.74	3.36	2.57	0.790	0.00743	2.129	16.0
E3	4.70	4.63	3.54	2.72	0.777	0.00971	1.443	4.4

lower for A2 (plain woven fabric made with 1/56Nm weft yarn). According to M. Matsudaira et. al.[6], Koshi increases with yarn count and weft yarn density. Increase in bending rigidity increases KOSHI . The KOSHI is less for A2 fabric since its bending rigidity is less. Numeri means surface smoothness. Numeri values are lower for 2/1 twill woven fabrics and higher for 5 end satin woven fabrics. It has been observed that for sample E1, Numeri value is high and for B1, the Numeri value is less.

Plain woven fabrics due to higher number of yarn interlacing, in the fabric structure presented a more uneven surface topology compared to the twill and satin weave fabrics. The long floats in the twill and satin fabrics, aided in improving the surface smoothness. It was observed that irrespective of the weave, fabrics woven using finer yarns helped in improving their surface smoothness.

Fukurami (Fullness & Softness) is the bulky, rich and well-formed feeling and it mainly depends on fabric bulk and compressional properties. It has been observed that Fukurami values are higher for 2/2 twill woven fabrics specially for C1 and lower for B1, i.e. 2/1 twill woven fabrics.

The total hand value of the fabric is estimated from the primary hand values using Kawabata System of equations. It has been observed from table 6 that THV are higher in the 2/2 twill and 5 end satin woven fabrics and lower in plain woven fabrics.

The 2/2 twill weave fabric gave better grading (THV) as a winter suiting fabric compared to 2/1 twill weave by virtue of higher fabric smoothness (Numeri), softness and fullness (Fukurami) and lower stiffness (Koshi). Similarly, 5 end satin weave gave better Total Hand Value (THV) than 4 end satin weave. They also exhibit greater surface smoothness possibly due to longer floats on the fabric surface compared to 4 end satin weave. Softness and fullness too were enhanced due to greater thickness of these fabrics. Overall the 5 end satin weave fabrics were noted to give the best grading in terms of total hand value as suiting fabric among all the fabrics under study.

3.8. Fabric comfort properties

The thermal comfort is related to fabric transmission behaviour, namely thermal insulation, moisture transport rate and air resistance. Table 3.4 shows the comfort

properties of all the fabric samples.

It has been observed that the air resistance increases for twill & satin woven fabrics. This may be attributed to compact structure of fabric & hence lesser number of pores are available for air passage. The air resistance is low for plain woven fabric A2 and high for 2/1 twill woven fabric B3. Since single yarn woven fabrics gives higher air permeability as compared to 2 ply yarns because of low packing density of single yarn [15].

The air permeability of a fabric determines its resistance to wind penetration which affects the thermal insulation of the fabric. The thermal insulation plays a major role in maintaining heat balance between the body and the environment. The main function of clothing in summer should be heat dissipation, whereas in winter it should be heat conservation which is influenced by thermal insulation.

Thermal insulation is an important measure for analysing the effect of material properties on heat transfer. Thermal insulation value is high for 2/2 twill woven fabric made from 2/84 Nm as weft yarns & low for 2/1 twill woven fabric made from 1/48 Nm as weft yarns. Higher the air resistance, lower is the thermal insulation value. Fabric thickness is the most important factor governing the thermal insulation. Other factors affecting the thermal insulation are fibre type, bulk density, fibre arrangement, compressibility and air permeability of fabric.

Moisture vapour transfer is the ability of a fabric to transfer the perspiration in form of moisture vapour through it. Higher the air resistance, lower is the moisture transport. A fabric with low moisture vapour transfer is unable to transfer sufficient moisture, leading to sweat accumulation and hence discomfort. The moisture vapour transfer of 5 end satin woven fabrics are lower than plain woven fabrics, both made from 1/56 Nm as a weft yarn. Thus it is observed that the moisture vapour transport is higher for plain woven fabrics than twill & satin woven fabrics.

4. Conclusion

The extensibility in warp direction is higher than in weft for all fabric samples. Plain woven fabrics have higher extensibility and more geometrical roughness than twill & satin woven fabrics. Linearity of compression is higher for plain woven fabric manufactured from 2/84 Nm weft yarns & lower for fabric woven in plain

weave with 1/48 Nm weft yarns. Linearity of tensile property & tensile energy values are higher for plain woven & 2/1 twill woven fabrics.

Shear rigidity & hysteresis of shear is higher for 2/1 twill woven fabrics and it is highest for 2/1 twill woven fabrics manufactured with 1/48 Nm weft yarns. This may be because of high weave density. 2/1 twill woven fabrics shows higher bending rigidity & hysteresis values and plain woven fabrics shows less bending rigidity & hysteresis values.

Coefficient of friction of 2/1 twill woven fabrics is lower as compared to other fabrics under study. Compressional energy is higher for satin woven fabrics. Fabric thickness is higher for 5 end satin woven fabrics than plain fabrics. Irrespective of the weave, fabrics woven using finer yarns helped in improving their surface smoothness.

KOSHI (stiffness) values are higher for 2/1 twill & lower for plain woven fabrics. NUMERI (smoothness) and FUKURAMI (fullness & softness) values are higher for 2/2 twill & 5 end satin, thus gives higher THV. Plain woven fabrics gives lower NUMERI & FUKURAMI, thus lower THV.

The air resistance is more for twill and satin woven fabrics. The air permeability & moisture transport rate is more for plain woven fabrics. 2/2 twill woven fabrics gives highest values for thermal insulation.

5. Industrial importance

Comfort is an important aspect in today's terms as both consumer and industry are focusing more on the comfort aspect of clothing materials. Accordingly a proper selection of weave and weft count should lead to realization of specific comfort properties of the fabric in much economic and scientific way.

This study provides a valuable insight into weave selection and yarn count so as to achieve comfort properties specific to end use requirement. Knowing the relations that may exist between fabric weave and tactile properties, manufacturers would be able to design specific touch by the weaving process instead of using finishing treatments. In general, the objective evaluation tool could be used in the product development process for technical modification and quality control.

Acknowledgement

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Effect of Plasma Treatment on Coloration & Antibacterial Activity of Silk Fabric Using Natural Fungal Extract

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Abstract

The present study aims to evaluate the commercial potentiality for improving the dye ability of natural extract on silk fabric by using low temperature plasma treatment. The fungal pigments were extracted from the species of thermomyces, purified and characterized using UV-Vis and FTIR spectra and used for dyeing process. The method is to modify the conventional dyeing process using plasma pretreatment by varying the treatment time on silk fabric before dyeing with natural fungal extract and to analyze the parameters like K/S, wash fastness, rubbing fastness, light fastness and bacterial reduction (%). The results showed that the plasma pretreated samples brings better fixation levels, improvement in fastness properties and imparts good antibacterial activity for the dyed silk fabric which was dyed using natural fungal extract at optimum conditions of 60⁰ C, 30 min at a pH of 3. It was also inferred that the plasma treated samples does not showed any influence with increase in the treatment time.

Keywords

Bacterial reduction, silk, fungal pigment, plasma treatment & antibacterial activity.

1. Introduction

The worldwide demand for colorants of natural origin, especially yellow or red pigments, is rapidly increasing in the food, cosmetic and textile sectors [1, 2]. Several research projects have so far been carried out to evaluate the techno-economic feasibility of today's alternative dye crops. Among the species examined, common madder (*Rubbia tinctorum L*), wood (*Isatis tinctoria L*) proved to be quite interesting sources of red (alizarin), and yellow (luteolin)dyes respectively, either for their agronomic characteristics or for their dyeing properties [3, 4]. In fact, all three dyes were extensively exploited until the commercial success of their synthetic analogues. The main disadvantages of these natural dyes lies in the order of magnitude of their extraction yield factors (a few grams of pigment per kg of dried raw material). This makes their current market price about USD 1/g, thus limiting their application to high-value-added natural-colored garments only. To overcome this limitation, it was suggested to exploit the potentiality of other biological sources such as fungi (both moulds and yeasts), bacteria, algae and plant

cultures, since appropriate selection, mutation or genetic engineering techniques are likely to improve significantly the pigment production yields with respect to wild organism [5, 6]. Among the several pigment-producing micro-organisms described in the literature, the fungus thermomyces has been thoroughly studied [7]. It has been traditionally used for manufacturing food colorants and fermented foods and beverages in southern and far eastern Asia, the latter being also used in medical therapy to promote blood circulation and proper cholesterol levels, prevent gastric and intestinal disorders, stimulate digestion, etc [8]. The several pigments produced by thermomyces are oligoketides and have been subdivided into three groups; rubropunctain and monascorubrin are orange pigments, presenting different side chains on the ozolactone ring [9]. Their two azoto analogues are the red pigments rubropunctamine and monascorubramine, where as their reduced forms are the yellow pigments monascin and ankaflavin [10]. This research attempted to study the influence of plasma treatment on the dyeing potential and microbe resistant characteristics of the natural fungal extract pigmented samples.

2. Materials and Methods

2.1 Materials

Bleached 100% silk fabric plain weave, yarn count 60s

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Ne with 60 ends/cm, 30 picks/cm and 80 gsm was used. Fabrics were prepared in the dimensions of 8" X 8" for plasma pretreatment before subjecting to dyeing.

2.2 Methods

2.2.1 Extraction and estimation of pigment (air-drying process)

Extracellular pigment producing fungi *thermomyces* species was isolated from soil. The fungal cultures were inoculated onto potato dextrose broth and incubated at 35°C for 5-7 days; supernatant was filtered through the filter paper. Broth having the pigment was taken in a clean glass petriplates and placed under hot air in a dust free chamber 40°C. The plate was covered with a thin muslin cloth to avoid contamination due to dust. After 8 hours of drying, the volume of the broth was reduced to one third. The condensed broth was lyophilized and the powdered pigment was stored at 4°C and is shown in Fig 2.1(a) & Fig 2.1(b).

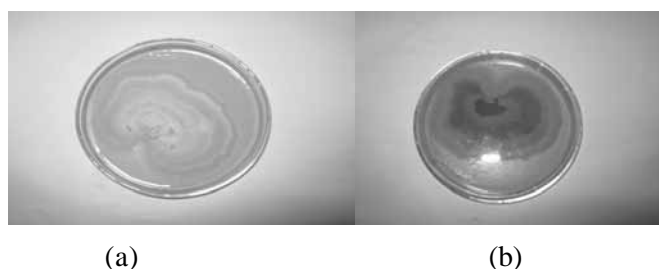


Figure 2.1(a) &(b) : Samples of extracted pigment

2.2.2 Selection of mordant

Various synthetic mordants like stannous chloride, alum, ferrous sulphate and natural mordants like myrobolan, neem oil were identified for the above process. Considering the ecofriendliness and cost effectiveness, the natural mordant myrobolan was chosen for the dyeing process. The fabric was initially pre mordanted before treating with the natural fungal extract pigment for the dyeing process.

2.2.3 Plasma pre treatment on silk fabric

Low temperature treatment of silk fabric was done using RF and DC sputtering unit. The temperature and pressure used for the treatment of silk fabric is room temperature and atmospheric pressure respectively. According to frame size silk, fabric is cut and treated for three different time periods of 15sec, 45sec and 80sec.

2.2.4 Dyeing of natural fungal extract on plasma pretreated silk fabric

Plasma treated samples for 15sec, 45 sec, 80 sec and

untreated sample are dyed using natural dye by the following procedure. Samples were steeped in the mordant bath prepared with 5 % (owm) of myrobolan. The bath ratio was 1:20. Mordanting was done at a temperature of 30°C for 20 min. Samples were rinsed with tap water and squeezed. The mordanted samples were steeped in the dye bath with liquor to ratio of 1:20 that was prepared by 5% solution (owm) of extracted dye at pH 4.5-5.5 in presence of acetic acid. Dyeing of sample was done at 30° C for 20 min. The samples were rinsed with tap water and dried at 60°C for 20 min.

2.3 Testing

The untreated and treated samples were tested for various measurements by standard test procedures. Color fastness properties of the samples were assessed using AATCC standards -fastness to washing (AATCC Test Method 61-2009), fastness to rubbing/crocking (AATCC Test Method 8-2007) and fastness to light (AATCC Test Method 16-2004). The dyed samples were analysed for the spectral values K/S determined using a Minolta 508 spectrophotometer with Macbeth Match View software (X-Rite, USA) in D65 daylight.

2.4 Determination of antibacterial activity

Bacterial strains were grown in nutrient broth at 37° C for 18-24 hr. 0.01 ml of culture broth was spread on nutrient agar plate by spread plate method. Using sterile cork borer a well was formed, and impregnated with 100ml of methanolic extract and crude extract. The plates were incubated at 37° C for 24 hr. The susceptibility of the test organism was determined by measuring the zone of inhibition around the well.

2.4.1 Determination of minimum inhibitory concentration (MIC)

The MIC was performed to test the antimicrobial activity of the methanolic extract of *P.purpuroscens*, *thermomyces sp* and *chatomium sp*. using tube dilution method (Claeys et al., 1988) the MIC (minimum inhibitory concentration) was defined as the lowest concentration of antibiotics or extracts that did not show any growth of tested pathogens at a minimum concentration. This test was performed at four concentration of the plant extract (10mg/ml, 1mg/ml, 0.1mg/ml and 0.01mg/ml). Twenty-four hours old culture of each organism was used for the study. 4/10 dilution of each organism was prepared by serial dilution technique. A four number of sterilized eppendorf tubes were taken and to this 900ml of 4/10 diluted test organism were

added. To the first tube, 0.1 ml of prepared culture extract was added and serially diluted to the last tube. The four tubes corresponding to four concentrations of the culture extract was obtained (10mg/ml, 1mg/ml, 0.1mg/ml, 0.01mg/ml). Likewise, a set of eppendorf tubes was prepared for each organism for each test samples. Simultaneously; controls were also kept for the experiment. For the second set of eppendorf tubes (4 numbers), 0.1 ml of the negative control (100 % ethanol) was added to first tube and serially diluted to the last tube. For the third set of eppendorf tubes (4 numbers), 0.1ml of the positive control, *ketoconazole* for fungi and *chloramphenicol* for bacteria (10 mg/ml) was added to the first tube and serially dilute to the last tube. For the fourth set of eppendorf tubes (2 numbers), nothing was added so that the tubes contained only the microbial cells. Similar to the ager well diffusion method, the petri plates were divided into 4 equal quadrants. After incubation of the eppendorf tubes for an hour, 50µl from each of the tubes were spotted on the petri plates. The plates were then covered and incubated for 24 hours. The growth of the organism for each dilution was observed and thus the minimum inhibitory concentration of the fungal extract was calculated as shown in Table 3.1.

3. Results and Discussion

3.1 Effect of plasma treated samples on K/S value

The K/S value of low temperature plasma treated samples show better results comparatively to the untreated sample. From Table 3.2, it is inferred that from the various plasma treated samples, 15s treated sample shows greater K/S value compared to 45 and 60 seconds treated samples. It proves that the plasma treated samples increases the depth of absorption of the natural fungal extracted pigments on the silk fabric specimen. Hence, the relative color strength of the natural fungal dyed sample is greatly influenced by the plasma treatment.

3.2 Effect of plasma treated samples on color fastness

The color fastness values of low temperature plasma treated samples exhibit good ratings comparatively to the untreated sample. From Table 3.3, it is inferred that from the various plasma treated samples, 15s treated sample shows overall good fastness ratings compared to 45 and 60 seconds treated samples. It is inferred that the plasma treated samples influences the degree of fixation and depth of penetration of the natural fungal extracted pigments on to the silk fabric specimen. Hence, the durability of the natural fungal extracted

Table 3.1 : Minimum inhibitory concentration of thermomyces sp, P.purpuroscens and Chaetomium sp. against pathogens

Pathogens	Dilution 1 (10 mg/ml)			Dilution 2 (1 mg/ml)			Dilution 3 (0.1 mg/ml)			Dilution 4 (0.01 mg/ml)		
	1	2	3	1	2	3	1	2	3	1	2	3
Gram positive bacteria												
<i>Enterococcus</i>	I	I	I	I	I	I	I	I	NI	NI	NI	NI
<i>Bacillus subtilis</i>	I	NI	NI	I	NI	NI	I	NI	NI	NI	NI	NI
<i>B.cereus</i>	I	I	NI	I	I	NI	I	I	NI	I	NI	NI
Gram negative bacteria												
<i>Escherichia Coli</i>	I	I	NI	I	NI	NI	I	NI	NI	NI	NI	NI
<i>Vibrio Cholerae</i>	I	I	NI	I	NI	NI	I	NI	NI	NI	NI	NI
<i>Salmonella typhi</i>	I	NI	NI	I	NI	NI	I	NI	NI	NI	NI	NI
Fungi												
<i>C.albicans</i>	I	I	NI	I	I	NI	I	NI	NI	I	NI	NI
<i>C.neoformans</i>	I	I	NI	I	I	NI	I	NI	NI	NI	NI	NI
Control												
Solvent control	NI	NI	NI	NI								
Chloramphenicol	I	I	I	NI								
Ketoconazole	I	I	I	I								

1- Thermomyces sp; 2 - P.purpuroscens; 3 - Chaetomium sp. NI - No inhibition; I- Inhibition

dyed silk fabric samples can be increased by subjecting to plasma pretreatment.

3.3 Effect of plasma treated samples on antibacterial activity

The antibacterial activity of low temperature plasma treated samples exhibit good bacterial reduction % comparatively to the untreated sample. From Table 3.4, it is inferred that from the various plasma treated samples, 15s treated sample shows overall good bacterial reduction % with respect to *E.coli* (negative bacteria) and *S.aureus* (positive bacteria) as compared to 45 and 60 seconds treated samples. It is inferred that the plasma treated samples influences the antibacterial activity of the natural fungal extracted pigment on the silk fabric specimen. As plasma treatment exhibits good bacterial reduction% for both positive & negative bacteria, it can be a better solution for the medical application. The results infer that apart from the plasma treatment, natural mordant and pigment also influences the pathogenic bacterial reduction to a greater extent.

Table 3.2 : K/S value of plasma pretreated dyed samples

Sample		K/S value
Untreated sample		0.337
Plasma	15 sec	0.531
treated	45 sec	0.478
sample	80 sec	0.411

Table 3.3 : Color Fastness values of plasma pretreated dyed samples

Sample		Wash fastness	Rubbing fastness	Light fastness
Untreated sample		2-3	3-4	2-3
Plasma	15 sec	4-5	4- 5	7-8
treated	45 sec	3-4	3-4	5-6
sample	80 sec	2-3	3-4	4-5

Table 3.4 : Antibacterial activity of plasma pretreated dyed samples

Sample		Bacterial reduction (%)	
		<i>Escherichia coli</i>	<i>Staphylococcus aureus</i>
Untreated sample		45%	48%
Plasma	15 sec	47%	50%
treated	45 sec	43%	41%
sample	80 sec	44%	47%

3.4 Characterization of pigment from thermomyces

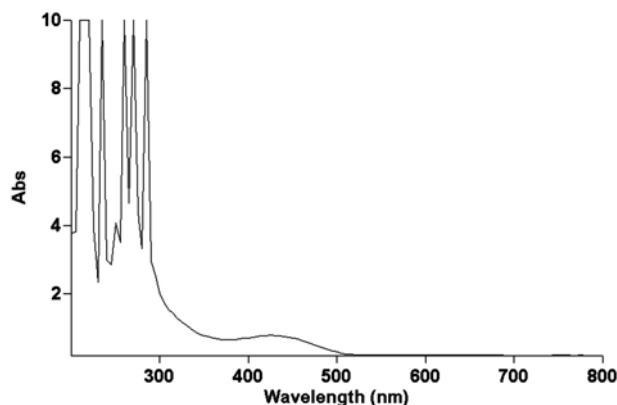
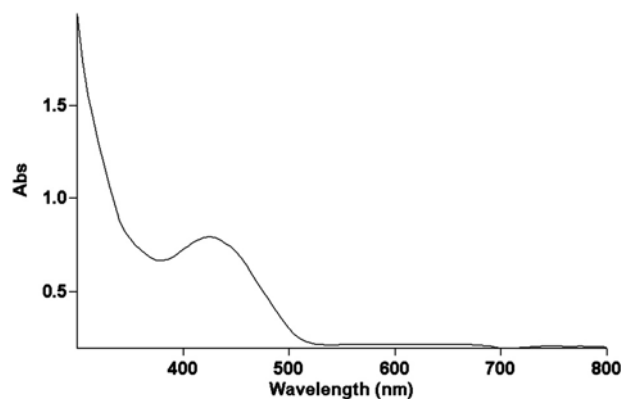


Figure 3.1 : UV-Vis Spectra of extracted fungal pigment

From the Figure 3.1, the optical density of the pigment extract was determined in a wide range of spectra using a UV-Visible spectrometer and the absorbance was recorded. The spectrum shows that the maximum absorbance of the specimen between 250-300 nm which confirms the presence of protein and carbohydrate groups in the fungal pigment.

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Believe in yourself! Have faith in your abilities! Without a humble but reasonable confidence in your own powers you cannot be successful or happy.

- Norman Vincent Peale

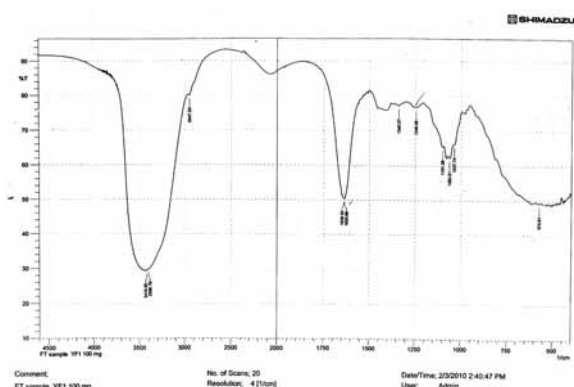


Figure 3.2 : FTIR absorption spectra

From the following Fig 3.2, the absorption in the region 3000-3500 cm confirms the presence of N-H (str) group. The absorption in the region 1500-1750 cm confirms the presence of C=O (str) group. Hence, from the observation the affinity of sample towards protein fibres was confirmed.

4. Conclusion

100% silk fabric was given low temperature plasma treatment with different durations and colored using the natural fungal extract thermomyces and the effect of coloring behavior, fastness results and antibacterial activity were analyzed. The report was focused on the surface modification of silk fabric using low temperature plasma treatment for improvement in dye fixation levels of natural fungal extracted pigment and antibacterial efficacy of silk fabric. It was concluded that the low temperature plasma treatment improves the K/S, wash fastness, rubbing fastness, light fastness and bacterial reduction (%) of silk fabric to a greater extent. The results showed that the low temperature plasma pretreated silk fabric exhibit better results than untreated silk fabric specimen. Colour strength, colour fastness ratings and antimicrobial activity were found to be good for 15sec plasma pretreated silk fabric compared to 45 and 80s treated samples. Hence, plasma

treated samples does not show any influence with increase in the treatment time & the process proves to be more eco-friendly in nature and it can be used for medical application to develop wound dressing, face mask, sutures & surgical drapes.

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Self & Mixed Shades of Catechu and Henna on Cotton and Silk using Harda as a Mordant

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Adiv-The Pure Natural

Abstract

From ancient times natural dyes are known, but they are again gaining increasing importance due to increase in awareness about sustainable environment protection and problems associated with synthetic dyes. Even though the natural dyeing has been advantageous in many ways over synthetic dyes, their limited availability of shades is hailed as one of the main limitations over synthetic dyes. Mixing of dyes to get desired shades is a common practice in case of synthetic dyes, which is however still not practiced as far as natural dyes are concerned. In the current study, the natural dyeing of cotton and silk was attempted using individual and mixed shades of catechu and henna using harda (Myrobalan) as a natural mordant. The pH sensitivity of these dyes was also screened. The various shades obtained were described in terms of colour values. The wide range of shades thus can be claimed in dyeing the compound shades of natural dyes and the issue of limited availability of shades can be overcome following this approach.

Keywords

Harda, Catechu, Henna, Natural dyeing.

1. Introduction

Textile material (natural and synthetic) is coloured for value addition, look and desire of the customers. In the past, this purpose of colouring textile was initiated using colours of natural source until synthetic colours/dyes were invented and commercialized. Due to ready availability of pure synthetic dyes of different types and its cost advantages, most of textile dyers/ manufacturers shifted towards use of synthetic colourants. Almost all the synthetic colourants being synthesized from petrochemical sources through hazardous chemical processes pose concerns regarding their eco-friendliness. Hence, worldwide, growing consciousness about organic value of eco-friendly products is being generated and a renewed interest of consumers towards use of textiles (preferably natural fibre product) dyed with eco-friendly natural dyes is on the rise. Vedas mentioned red, yellow, blue, black and white as main dyeing colours and expressed that, the ancient craftsman dyed blue from indigo, yellow from turmeric and saffron, brown from cutch and red from lac, safflower and madder. Thus,

natural dyes have been an integral part of human life since time immemorial [1-8].

Natural dyes are derived from naturally occurring sources such as plants (e.g., indigo and saffron); insects (e.g., cochineal beetles and lac scale insects); animals (e.g., some species of mollusks or shellfish); and minerals (e.g., ferrous sulfate, ochre, and clay) without any chemical treatment. A spectrum of beautiful natural colours ranging from yellow to black exists in the above sources [9-11].

The development of synthetic dyes at the beginning of the twentieth century led to a more complete level of quality and more reproducible techniques of application. As a result, a distinct lowering in the dyestuff costs per kg of dyed goods was achieved [12].

But, during the last few decades, the use of synthetic dyes is gradually receding due to an increased environmental awareness and harmful effects because of either toxic degraded products or their non-biodegradable nature. In addition to above, some serious health hazards like allergenicity and, carcinogenicity are associated with some of the synthetic dyes. As a result, a

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ban has been imposed all over the world including European Economic Community (EEC), Germany, USA and India on the use of some synthetic dyes (e.g. azodyes) containing banned amines [13]. Due to increasing awareness of environmental issues and pollution controls, natural dyes are gaining importance as they are obtained from renewable resources and they present no health hazards and some of them sometimes act as a health care products [14].

Natural dyes with few exceptions are non-substantive and hence must be used in conjunction with mordants such as tannins, metallic salts and oils [15]. In the dyeing of textiles with natural dyes, tannins are used as natural mordants which are high molecular weight compounds (between 500 to 3000) containing phenolic hydroxyl groups and they enable effective cross-links between proteins and other macromolecules. The stability of the tannin treated fibre depends upon the pH, ionic strength and metal chelators. Tannins may be further classified into two groups on the basis of their chemical structure as hydrolysable tannins and condensed tannins [16].

Dyeing with henna is known for long time. Henna has many traditional and commercial uses, the most common being as a dye for hair, skin and fingernails, a dye and preservative for leather and cloth, and as an anti-fungal. For colouration purpose, henna material is generally pasted with water and applied to that part which is to be dyed. It acts like a substantive dye for keratin and imparts an orange-red colour. In combination with metal salts, it produces a range of colours on wool and silk; camel brown with aluminium, yellow ochre with copper, mustard yellow with chrome and blackish brown with ferrous. The light fastness of dyed fabrics is good [17].

Catechu is a brown dye named as cutch and used for tanning and dyeing and for preserving fishing nets and sails. Cutch dyes wool, silk, and cotton in a yellowish-brown colour. Cutch gives gray-browns with an iron mordant and olive-browns with a copper mordant. Even though natural dyeing is considered to be ecofriendly, the use of metallic mordants which are considered to be toxic, lowers natural dye's ecofriendly advantage. Even though a lot of research has been carried out on natural dyeing of textile fibres using variety of natural dyes and the mordants, the area of mixing of natural dyes to get different shades is still remained unexplored. The self and mixed shades of catechu and henna

using alum as a mordant were reported earlier from our laboratory [18]. In continuation of the work, in the current study the natural dyeing of cotton and silk has been attempted using harda as a mordant both in self and compound shades of catechu and henna and the wide range of shades explored have been presented.

2. Material and Methods

2.1. Materials

Cotton and silk fabrics were supplied by Adiv-the Pure Natural. The cotton fabric was washed using shikakai and reetha at 60°C and then used for dyeing. Catechu and henna were purchased from market. All other chemicals used were of laboratory grade.

2.2. Methods

2.2.1. Extraction of mordant

The 1% stock solution was made by boiling 2.5 gm of mordant (harda) powder in 250 ml water for 30 min. The extract was filtered and made to 250ml and used for mordanting.

2.2.2. Extraction of dye

The 1% stock solution of the dye was prepared by boiling 2.5 g of dye in 250 ml water for 30 min. The extract was filtered and made to 250ml and used for dyeing.

2.2.3. Mordanting and dyeing of cotton and silk

The mordanting of cotton and silk fabric was carried out in rota dyer (Rota Dyer machine, Rossari® Labtech, Mumbai) keeping the liquor to material ratio of 30:1. The fabrics were introduced into the mordant solution (harda) at room temperature and slowly the temperature was raised to 95°C. The mordanting was continued at this temperature for 60 min. After mordanting the fabric was squeezed and dyed using natural dyes (catechu and henna). The mordanted fabrics were introduced in dyebath and dyeing was continued at 90°C for 60 min. After dyeing, the fabrics were squeezed and washed with cold water.

2.2.4. Compound shades on cotton and silk

In case of compound shades, the fabrics were mordanted using alum as a mordant as per the procedure mentioned in 2.2.3. The mordanted samples were then dyed using combination of two dyes catechu and henna taken in proportion 30:70, 50:50, and 70:30 of the total dye extract required for the targeted % shade. The dyeing procedure was same as described in 2.2.3.

2.2.5. Effect of pH on dyeing of Catechu and Henna

In the case of pH sensitivity study of the natural dye, the fabric samples were mordanted using alum as a mordant in the same way as mentioned in 2.2.3. The dyeing was then carried out using same procedure as mentioned in 2.2.3. and using catechu and henna at different pH (4, 7, and 9 adjusted using acetic acid and soda ash).

2.2.6. Colour value by reflectance method

The dyed samples were evaluated for the depth of colour by reflectance method using 10 degree observer. The absorbance of the dyed samples was measured on Rayscan Spectrascan 5100+ equipped with reflectance accessories. The K/S values were determined using expression;

$$K/S = \frac{(1-R)^2}{2R}$$

where, R is the reflectance at complete opacity; K is the Absorption coefficient & S is the Scattering coefficient

Dyed fabrics were simultaneously evaluated in terms of CIELAB colour space (L^* , a^* and b^*) values using the Rayscan Spectrascan 5100+. In general, the higher the K/S value, the higher the depth of the colour on the fabric. L^* corresponding to the brightness (100= white, 0= black), a^* to the red-green coordinate (+ve= red, -ve =green) and b^* to the yellow-blue coordinate (+ve =yellow, -ve =blue). As a whole, a combination of all these parameters enables one to understand the tonal variations.

2.2.7. Washing fastness

Evaluation of colour fastness to washing was carried out using ISO II methods [19]. A solution containing 5 g/L soap solution was used as the washing liquor. The samples were treated for 45 min at 50 °C using liquor to material ratio of 50:1 in rota machine. After rinsing and drying, the change in colour of the sample and staining on the undyed samples were evaluated on the respective standard scales (rating 1:5; where 1: poor; 2: fair; 3: good; 4: very good and 5: excellent).

2.2.8. Light fastness

Dyed fabric was tested for colourfastness to light according to ISO 105/B02 [20]. The light fastness was

determined using artificial illumination with Xenon arc light source, Q-Sun Xenon Testing Chamber with black standard temperature of 65 °C with relative humidity of the air in the testing chamber as 40% and daylight filter, wavelength, $k= 420$ nm. The samples were compared with the standard scale of blue wool reading (ratings, 1:8; where 1 : poor; 2 : fair; 3 : moderate; 4 : good; 5 : better; 6 : very good; 7 : best and 8 : excellent). The colour fastness to light was measured using test method.

3. Results and Discussion

The initial attempt was to find the optimum concentration of mordant and dye to further study further the effect of mixing of dyes and pH sensitivity of the dye. Hence the dyeing of cotton and silk with catechu and henna using harda as a mordant was attempted and results are summarized in Tables 3.1-3.4. The results in Table 3.1 indicate the increase in K/S values with the increasing concentration of mordant till 15% and then it is leveled off. At the constant mordant concentration, the K/S was also found to be improving with increase in dye concentration from 5% to 20%. The various shades from light to deep can be obtained using the varying concentration of alum and natural dyes both catechu and henna. The colour value in the case of natural dyes is a combined contribution of the effect of mordant and the dye. Hence the K/S was improved with mordant and dye concentration initially till the optimum was reached. The increasing concentration of either mordant or dye beyond optimum concentration did not contribute much in the improvement in K/S values. In the case of silk fabrics, the K/S values were higher than those in cotton. This might be because of higher mordant and dye absorption by the silk fabric than cotton, which is in turn was due to presence of -NH₂ groups in the silk which have more affinity for such mordant dyes. Since the different results were obtained in case of catechu and henna, the optimum concentration of harda and dyes were taken as 20% and 20% respectively in case of mixing of dyes.

Texttreasure

Destiny is not a matter of chance, it is a matter of choice; It is not a thing to be waited for, it is a thing to be achieved.

- William Jennings Bryan

Table 3.1: Effect of mordant (harda) and dye (Henna) concentration on colour strength of silk

Mordant	Dye	Colour value	CIE colour co-ordinates		
			L*	a*	b*
Alum	Henna	K/S	L*	a*	b*
5%	5%	1.3651	68.116	2.941	14.34
5%	10%	1.3651	68.116	2.941	14.34
5%	15%	1.9353	69.545	4.572	17.413
5%	20%	2.0235	69.21	4.491	16.925
10%	5%	2.7363	68.993	3.161	14.842
10%	10%	2.1326	70.898	3.082	16.883
10%	15%	3.9133	71.205	3.352	17.813
10%	20%	3.1236	70.417	3.842	17.168
15%	5%	3.5648	68.959	2.872	14.285
15%	10%	2.7605	70.74	3.08	16.601
15%	15%	2.7769	71.946	3.804	18.311
15%	20%	3.1204	72.413	3.614	18.638
20%	5%	2.9208	72.666	2.167	17.24
20%	10%	3.4945	71.696	2.796	16.553
20%	15%	4.2269	70.441	3.243	15.749
20%	20%	4.5659	72.321	3.445	18.174

Table 3.2: Effect of mordant (harda) and dye (catechu) concentration on colour strength of silk

Mordant	Dye	Colour value	CIE colour co-ordinates		
			L*	a*	b*
Harda	Catechu	K/S	L*	a*	b*
5%	5%	1.0675	71.307	4.52	16.564
5%	10%	1.8807	73.929	4.232	19.227
5%	15%	2.3413	74.732	4.132	19.83
5%	20%	3.4147	75.664	4.052	20.567
10%	5%	1.5076	72.697	4.878	18.98
10%	10%	2.04	74.508	3.644	19.049
10%	15%	3.0036	75.267	4.566	21.243
10%	20%	2.9972	75.349	4.253	20.781
15%	5%	1.1214	72.16	4.106	17.226
15%	10%	1.8854	74.369	3.395	18.465
15%	15%	2.7664	72.643	4.713	21.248
15%	20%	3.3764	72.992	5.033	21.923
20%	5%	1.7442	69.957	6.501	19.338
20%	10%	1.7514	71.427	4.242	19.584
20%	15%	3.3173	72.806	4.637	21.285
20%	20%	3.4709	73.494	4.468	21.659

Table 3.3: Effect of mordant (harda) and dye (henna) concentration on colour strength of cotton

Mordant	Dye	Colour value	CIE colour co-ordinates		
			L*	a*	b*
Harda	Henna	K/S	L*	a*	b*
5%	5%	1.2958	69.653	0.633	13.542
5%	10%	1.2884	69.183	1.181	13.582
5%	15%	1.5592	69.46	1.27	13.954
5%	20%	1.3627	70.556	0.315	14.215
10%	5%	1.388	69.18	1.442	13.889
10%	10%	1.3813	69.746	0.916	14.092
10%	15%	1.4508	69.837	1.131	14.352
10%	20%	1.5712	69.418	1.696	14.286
15%	5%	1.3931	69.388	0.917	13.621
15%	10%	1.4494	70.092	0.917	14.287
15%	15%	1.3617	69.571	1.235	14.027
15%	20%	1.6863	69.471	1.465	14.255
20%	5%	1.6197	70.228	0.703	14.264
20%	10%	1.543	69.647	1.161	14.074
20%	15%	1.5538	69.462	1.583	14.222
20%	20%	1.6933	69.569	1.777	14.434

Table 3.4: Effect of mordant (harda) and dye (catechu) concentration on colour strength of cotton

Mordant	Dye	Colour value	CIE colour co-ordinates		
			L*	a*	b*
Harda	Catechu	K/S	L*	a*	b*
5%	5%	2.6033	57.283	10.728	18.667
5%	10%	1.8147	57.689	9.021	17.811
5%	15%	2.9036	57.858	12.878	20.164
5%	20%	1.717	59.453	6.941	18.941
10%	5%	2.1413	59.497	8.89	20.234
10%	10%	2.3735	58.121	9.253	18.979
10%	15%	3.4222	58.258	11.145	20.212
10%	20%	1.7684	59.304	6.413	18.165
15%	5%	2.3438	59.482	8.35	20.082
15%	10%	1.7252	59.291	6.893	18.623
15%	15%	2.654	59.363	9.501	19.893
15%	20%	1.9641	60.196	6.739	19.125
20%	5%	2.6168	59.669	7.967	19.521
20%	10%	2.3949	58.876	8.218	18.778
20%	15%	2.9446	58.935	8.899	19.399
20%	20%	1.7252	59.611	6.854	18.579

The compound shades on cotton and silk using combinations of catechu and henna with harda as a mordant are summarized in Table 3.5.

Table 3.5: Effect of combination of two dyes (w/w) on colour strength of silk and Cotton

Fabric	Henna	Catechu	K/S	L*	a*	b*
Silk	30%	70%	4.3594	59.398	9.767	27.361
	50%	50%	4.2312	58.268	9.506	27.514
	70%	30%	3.9368	56.957	11.348	26.461
Cotton	30%	70%	6.3655	58.412	17.036	16.099
	50%	50%	5.096	58.89	17.033	16.532
	70%	30%	3.6634	59.757	10.731	15.526

The results clearly indicate increase in K/S value as concentration of catechu was increased at the cost of henna. However the different tones in the shades were obtained ranging from typical red of henna to brown of catechu.

The effect of pH on dyeing of cotton and silk with catechu and henna dyes and harda as mordant (with optimum concentration) was studied and the results are summarized in Table 3.6.

Table 3.6: Effect of pH on colour strength of silk and cotton

Fabric	Dye	pH	K/S	L*	a*	b*
Silk	Henna	4	5.5463	59.116	5.43	22.19
	Henna	7	4.3932	57.849	5.091	21.216
	Henna	9	3.2549	57.981	4.533	21.712
	Catechu	4	5.3519	60.347	10.399	32.778
	Catechu	7	5.4159	59.358	11.238	30.663
	Catechu	9	6.9318	54.394	8.53	25.453
Cotton	Henna	4	1.3253	58.621	4.794	15.928
	Henna	7	1.4016	59.215	5.257	16.326
	Henna	9	1.6223	57.627	5.239	14.655
	Catechu	4	4.2349	55.662	13.285	16.598
	Catechu	7	4.0475	57.558	15.841	18.728
	Catechu	9	2.0322	61.64	8.14	18.783

At different pH conditions different values of K/S were obtained and it was observed that in acidic conditions i.e. at pH 4, higher K/S values were obtained compared to those at pH 7 and pH 9. The acidic as well as neutral pH were more suitable for enhanced K/S values.

The fastness properties of the representative samples were estimated and are presented in Table 3.7.

Table 3.7: Fastness properties of the dyed fabrics

Fabric	Henna (%)	Catechu (%)	Washing Fastness	Rubbing fastness		Light fastness
				Dry	Wet	
Silk	0	100	4-5	4	3	6
	30	70	4	4	3	6
	50	50	4	4	3-4	6
	70	30	4	4	3-4	6
	100	0	4	4-5	3-4	5
	0	100	4	4	3	6
	30	70	4	4	3-4	6
	50	50	4	4-5	3-4	6
	70	30	4	4-5	3-4	5
	100	0	4	4-5	3-4	5

The wash fastness was of the grade "very good" to "excellent" (4-5). The rubbing fastness was in the range of "good" to "excellent" (3-5). The fastness properties were found to be comparable in the case of both the dyes and their mixtures. The fastness properties were improved with increasing mordant concentrations. The improvements in fastness properties with mordant concentration clearly indicate the positive role of mordant played in case of dyeing with natural dyes. The washing fastnesses obtained varied in the range of good to excellent grade. Light fastness was found to be improving with higher K/S values, which in turn was dependant on higher mordant and/or dye concentration.

4. Conclusion

Compound shades are obtained using combinations of dyes such as henna and catechu and harda mordant. The results are encouraging as wide range of shade gamut was obtained. Effect of pH on colour depths of different dyes and mordant combination is also studied and encouraging results were obtained and different shades were possible to obtain at different pH. The fastness properties seemed to have remained unchanged even with the use of combination of dyes.

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Efficiency and Productivity Analysis of the Indian Garment Industry During MFA Phase-Out and Post Period

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Abstract

The recent globalization scenario has put a lot of pressure on the garment manufacturers to produce garments with a competitive price by increasing the productivity. In this scenario, they have to evaluate their performance continuously and compare with the benchmarks. Generally, the numbers of garments produced per operator and per machine are used as productivity measures. As these measures do not consider all input-output bundles together, the linear programming based Data Envelopment Analysis technique, which takes into account the weighted sum of all outputs and inputs to measure the efficiency and productivity of any decision-making entity, has been applied in this paper to estimate the productivity and efficiency of the Indian garment companies during Multi Fibre Agreement phase out and post period.

Keywords

Data envelopment analysis garment industry, Malmquist productivity index, Multi fibre agreement, Technical efficiency.

1. Introduction

With the elimination of all remaining quotas of Multi Fiber Agreement (MFA) in textiles and garments from January 1, 2005, the textile and garment industries have now fully integrated into the WTO. Now, buyers are free to source textiles and garments in any amount from any country. Suppliers are free to export as much as they are able, subjected only to a system of national tariff. As a result, the garment trade offers opportunities as well as challenges to various players in the world textile and clothing market. In this scenario, job of garment producers has become challenging. The growing domestic and international competition has put a lot of pressure on the manufacturer to produce garments with a competitive price by increasing the productivity. Therefore, the need is to lead the company in the continuous improvement by enhancing the productivity. This improvement is also required to measure continuously and compare with the benchmarks to understand how much improvement has taken place and their individual rank in comparison with the top performer. One of the ways of doing this could be estimating the productivity and efficiency of the com-

pany relative to the other companies.

Although, the manufacturers are aware of the significance of productivity improvement but the data on productivity is not often available. They also find the collection and recording of productivity data, its measurement and report an additional paper work. Most of the Indian companies are not maintaining the productivity data. Garment manufacturers internationally prefer to use partial factor productivity (PFP) measures like labor and machine productivity [1]. Productivities of labor and machine are defined as number of garments produced per operator per shift and number of garments produced per machine per shift, respectively. Earlier studies on Indian garment industry [2, 3, 4, 5, 6] have also used this approach to measure the performance.

In fact, in garment production, essential inputs required are machine operators, stitching machines, fabric and other raw materials, electric power and fuel. PFP can not consider these input bundles altogether. Therefore, the concept of total factor productivity (TFP) is more appropriate in context of resource use efficiency. It is an index of output bundle divided by an index of input bundle and refers to the change in the productivity over time. When it is measured using cross sectional data at a time it is called as efficiency and when over a period

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of time using panel data called as productivity. The efficiency measured is static in nature, as the performance of a garment company is evaluated in reference to best practice in a given year. DEA based Charnes, Cooper and Rhodes [7] (CCR) and Banker, Charnes and Cooper [8] (BCC) models are widely used to measure the efficiency. It is essential to measure the shift of frontier over time. To account for this dynamic shift in frontier, the Malmquist Productivity Index (MPI) developed by Fare [9] et al. (1994) is the most suitable technique to measure the TFP.

This Data Envelopment Analysis (DEA) based MPI has been widely accepted as a good tool for measurement of TFP change of manufacturing industries. Many researchers have extensively applied this technique for the measurement of TFP change and its components in the manufacturing industry viz. China's iron and steel industry [10], Spinning mills in India [11], Chinese State Enterprises [12], Taiwan's science park [13], Australian private sector industries [14], Greek manufacturing sector [15], Indian food industry [16] and Indian textile industry [17,18]. Therefore, in the present study, the MPI technique is used to estimate the TFP growth and CCR and BCC DEA models have used to estimate the technical efficiency of the garment companies in India.

2. Methodology

There are some important non-computational aspects in the application of DEA. These are data selection, variable selection and model selection, which have been discussed briefly in this section.

2.1. Data Selection

In India, PROWESS and Capitaline databases include data on a large number of manufacturing companies, including garment companies. These sources have balance-sheet based financial data of the individual companies. The company level panel-data is only available with PROWESS and Capitaline databases. Both the databases are similar one and based on annual reports. Earlier studies [11, 16, 19, 20] have also used the PROWESS and Capitaline data to estimate the productivity and efficiency of Indian industries.

Keeping all limitations in view, we have obtained the data from CAPITALINE database of Capital Market India. It is an independent economic database which is available at <http://www.capitaline.com>. It has five modules like Capitaline (CPL) plus, CPL-TP, CPL- News, CPL-NAV and CPL-CSS. The CPL-plus module has

the data on 994 Indian textile companies which have been classified under 23 sectors. Garment industry is one of the sectors of the textile industry and the data on 109 garment companies is available with the CPL-plus. Out of 109 companies, 40 textile garment companies were selected according to availability of data for the period 1999-2008. The ten years period 1999-2008 has been selected to see how the Indian garment companies have progressed in the MFAIII-phase (1999-2001), MFAIV-phase (2002-2004), MFA-phase out (1999-2004) and MFA-post period (2005-2008).

2.2. Variable selection

In earlier DEA studies on manufacturing industry, two outputs viz. value of output [12, 21, 22, 23] and value added [14, 24, 16, 25, 26] have been most commonly used by the researchers. In the present study, we have used value of output as an output variable since net value added is used only when inputs are labour and capital. The value of output considers all inputs like employee, capital and intermediate inputs. In the garment industry, intermediate inputs like fabrics and power & fuel are also important inputs. Hence, value of output is a proper output-variable for this industry. In order to account for all inputs in the productivity calculations, plant & machinery, wages & salaries, raw material consumption, and power & fuel consumption are considered as input variables. Similar output and input variables have been used by the earlier studies [19, 20, 21, 22] on Indian manufacturing industry for performance evaluation using DEA. The variable, wages and salaries has been selected in place of number of employees since the Capitaline database do not provide the physical data on output and inputs. We have taken these financial data as the next best alternative. In DEA studies the wages and salaries are also used by the earlier researchers [16, 18, 20].

2.3. Model selection

The characteristics of garment industry are employment generation, foreign exchange earnings, massive export and domestic market. Now-a-days, majority of population in urban and rural areas go for readymade garments and the domestic market is large as thousands of units are serving it. Keeping in view the growing domestic and export markets for the Indian garment industry, the companies have to maximize the garment production using existing inputs, so output-oriented model is more appropriate in the Indian context. Here, we use the output-oriented CCR, BCC and MPI models.

2.3.1. Data Envelopment Analysis

Firstly, this paper applies DEA technique to measure the technical efficiency of the garment companies in India. We use both CCR and BCC models to estimate overall technical efficiency (OTE), pure technical efficiency (PTE) and scale efficiency (SE). Lots of literature is available for mathematical details of DEA, [27, 28, 29].

2.3.2. Malmquist Productivity Index

Recently, DEA based MPI has become popular approach to measure the TFP in the Indian manufacturing industry [16, 17, 18, 25]. This method is applied to estimate the TFP change (TFPCH), efficiency change (EFCH), technological change (TECHCH), scale efficiency change (SECH) and pure technical efficiency change (PEFCH). Here the TFP can be written as,

$$\text{TFPCH} = \text{EFCH} \times \text{TECHCH} = \text{PEFCH} \times \text{SECH} \times \text{TECHCH}$$

The above indices can be interpreted as progress, no change and regress when their values are greater than one, equal to one and less than one, respectively. For mathematical formulation of MPI, please refer Cooper et al. [27], Coelli et al. [28] et al and Ramanathan [29]. In the analysis, the productivity and TFP have been used synonymously. The TFP growth rate can be estimated as,

$$\text{TFP Growth (percent)} = (\text{TFPCH} - 1) \times 100$$

3. Empirical findings

In this section, we have discussed the results obtained by CCR, BCC and MPI models to measure technical efficiency and productivity growth. While the fundamental component of MPI is related to measures of technical efficiency related to the production frontiers, we first discuss the year-wise efficiency scores under constant returns to scale and variable returns to scale

and this is followed by the changes in productivity calculated by MPI model.

3.1. Efficiency analysis

The trends in overall technical efficiency, pure technical efficiency, scale efficiency, number of efficient companies and number of companies showing constant returns to scale (CRS), increasing returns to scale (IRS) and decreasing returns to scale (DRS) have been shown in the Figures 3.1 to 3.3 Average efficiency scores are given in Table 3.1

It is observed that the mean technical efficiency of the garment companies is 85 percent during 1999-2008, implying that the companies have produced 15 percent lesser outputs in comparison with the best production frontier. Looking at MFAIII and MFAIV phase-out period, the overall technical efficiency has decreased from 85 percent to 83 percent and again, it has increased to 86 percent in the MFA-post period. It suggests that the efficiency of the garment companies has improved in the MFA-post period in comparison with the MFA-phase out period. It could be due to removal of restrictions on garment trade from 1st January 2005. In addition to this, major markets like USA, Europe and Canada have opened their markets for garment imports from 1st January 2005. These markets are major markets for the Indian textile and clothing export. When looking at the annual average pure technical efficiency scores, average score is 90 percent, implying that companies are on average 10 percent pure technical inefficient. Further, it is examined whether companies have improved their efficiency by changing their plant-size. The DEA results show that companies are operating at an optimal scale-size with an average scale efficiency of 95 percent. This implies that the companies have to adjust scale-size by 5 percent.

Table 3.1: Mean Efficiency Scores during MFA Phase out and MFA-post period

Year	Efficiency scores			No. of efficient companies			No. of companies with their returns to scale		
	PTE	SE	OTE	PTE	SE	CRS	IRS	DRS	
1999-2001 (MFAIII)	0.85	0.90	0.95	14	21	15	14	18	18
2002-2004 (MFAIV)	0.83	0.88	0.94	13	22	14	13	17	20
1999-2004 MFA-phase out	0.84	0.89	0.95	13	22	14	13	18	19
2005-2008 MFA-post	0.86	0.90	0.95	15	24	17	15	12	23
1999-2008	0.85	0.90	0.95	14	23	16	14	15	21

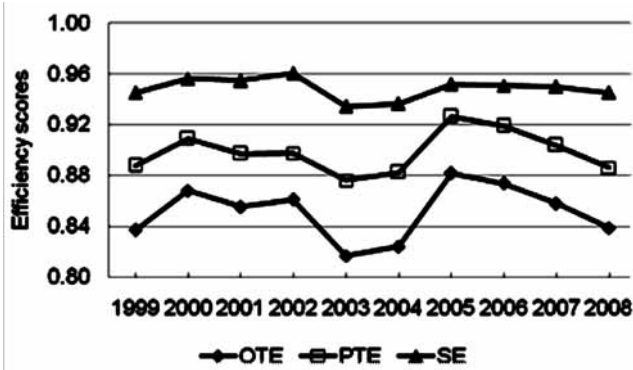


Figure 3.1 : Efficiency Trends in the Indian Garment industry

Additionally, DEA allows assessing whether a company operates at constant returns to scale, increasing returns to scale or decreasing returns to scale. It is observed from Figure 3.3 that the numbers of CRS companies have increased from 12 in 1999 to 18 in 2006. It is because the to number of IRS companies have reduced from 23 to 17 during the same period. It suggests that the companies have increased their production scale. The average investment in plant and machinery per company has increased from Rs. 4.21 crore in 1999 to Rs. 4.46 crore in 2001. During this period, the National Textile Policy 2000 has removed the restriction on investment in plant and machinery of the garment industry. Prior to 2000, the industry was reserved for small-scale. In addition to this, Technology Up-gradation Fund Scheme has provided the bank loan to the industry at a lower interest rate to expand their production capacity and to modernize the existing tech-

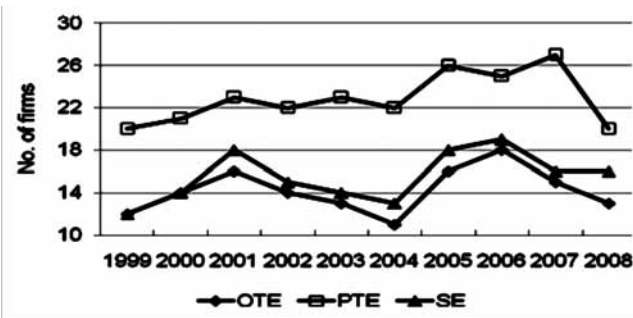


Figure 3.2: Trends in Number of Efficient Companies

If we compare simultaneously Figure 3.1 and Figure 3.2, it is observed that the number of scale efficient companies have increased from 12 in 1999 to 18 in 2001 and largely the decline in number of companies operating at increasing returns to scale from 23 to 14 during the same period. During 2001-2004, the numbers of scale efficient companies had dropped from 18

in 2001 to 13 in 2004. At this stage, the industry was at transition phase of MFA. After opening the major markets, again the numbers of scale efficient and PTE efficient companies have increased from 13 in 2004 to 19 in 2006 which resulted to increase the overall technical efficiency during this period. In 2007 and 2008, we find the declining trends in overall technical efficiency, pure technical efficiency, number of OTE, PTE and scale efficient companies, and number of companies showing constant returns to scale and increasing returns to scale. Ultimately, it has caused rapid increase in the number of decreasing returns to scale companies during this period. Initially the appreciation of rupee against dollar has hit the garment industry in 2007 and then the recession in USA and Europe markets have affected the growth and performance of the industry.

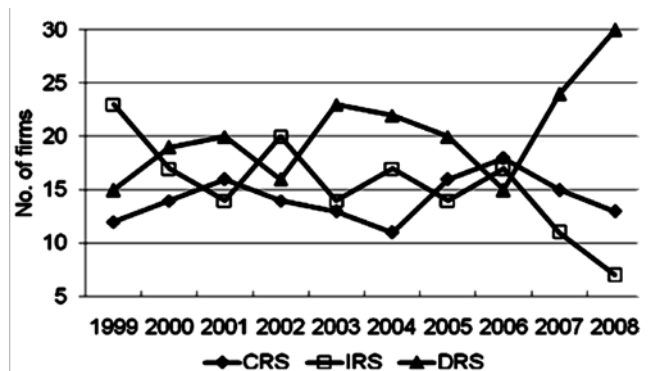


Figure 3.3 : Trends in Returns to Scale

Finally, we find that the industry was inefficient during 1999-2008 in overall technical efficiency, pure technical efficiency and scale efficiency by 15 percent, 10 percent and 5 percent. It suggests that the industry should first improve the managerial efficiency by proper allocation of inputs efficiently and then expand the plant-size to boost up the scale efficiency, which will result in improvement in the overall performance of the companies.

3.2. Productivity analysis

This part of the analysis captures the dynamic aspect of performance of garment companies by incorporating the shift in the production frontier overtime. Figure 3.4 and Figure 3.5 show the TFP growth and its decomposition during 1999-2008.

3.2.1. Productivity growth in the industry

It is observed that the industry have recorded a productivity growth of 1.6 percent per annum. While comparing the productivity in MFA-phase out and MFA-

post period, we find that the TFP has increased from 1.6 percent to 1.7 percent. The productivity in the garment companies records positive growth of 3.1 percent and 5.0 percent in the year 2005 and 2006, respectively; while in the years 2007 and 2008, it shows the negative growth rates. This suggests that the global recession has hit the industry during these years.

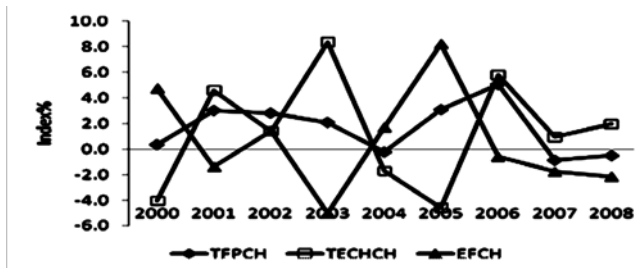


Figure 3.4 : Trends in Productivity Growth and its Components

The components of TFP change are efficiency change and technological change. We did not find much difference in the efficiency change between MFA-phase out and MFA-post periods. Looking at MFA-phase out and MFA-post period, we observe that the technological change has declined in later period from 1.4 percent to 1.0 percent. It is also observed that the number of IRS companies have reduced from 18 in MFA-phase out to 12 in MFA-post period which indicates that the companies have expanded their existing production capacity to produce garments at large scale. This resulted positive contribution of technological change to achieve the higher TFP growth in the year 2005 and 2006. On the other side, the numbers of DRS efficient companies have increased from 19 in MFA-phase out to 23 in MFA-post period. It was due to the global recession in the year 2007 and 2008. Overall the technological change has higher contribution to productivity growth in comparison the efficiency change during 1999-2008.

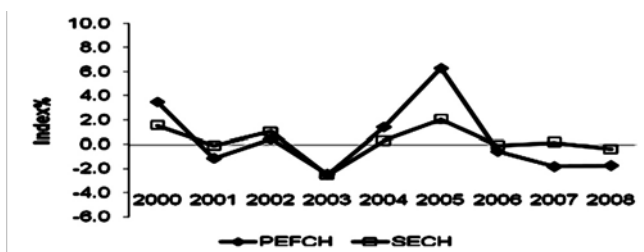


Figure 3.5 : Trends in Pure Technical Efficiency Change and Scale Efficiency Change

Further, the efficiency change can be decomposed into pure technical efficiency change and scale efficiency change as shown in Figure 3.5 To sum up, the Indian

garment companies have achieved a moderate TFP growth of 1.6 percent during the study period, in which the technological change has the highest contribution with a progress rate of 1.4 percent and efficiency change has progressed with only 0.6 percent annual growth rate. Further, decomposing the efficiency change, the pure technical efficiency change and scale efficiency change have almost equal contribution to the growth of the efficiency change.

4. Conclusion

The empirical results indicate that the pure technical efficiency has largely affected the overall performance of the garment companies in India during the period 1999-2008. It is suggested that the garment companies should first improve the managerial efficiency by proper allocation of inputs efficiently and then expand the plant-scale to boost-up the scale efficiency, which will result in improvement in the overall performance. The dynamic aspects of results indicate that the Indian garment companies have achieved a moderate productivity growth during the study period, in which the technological change has the highest contribution than the efficiency change. Further, decomposing the efficiency change, the pure technical efficiency change and scale efficiency change have the almost equal contribution in the growth of the efficiency change.

While comparing the productivity growths in MFA-phase out and MFA-post period, we find that the productivity has increased in the latter period slightly, the industry shows positive growth of productivity in the year 2005 and 2006; and negative growth in the year 2007 and 2008. It suggests that the global recession has hit the industry in the year 2007 and 2008. The analysis shows that there is not much difference in the efficiency change in MFA-phase out and MFA-post period. Looking at MFA-phase out and MFA-post period, the technological change has declined in the latter period.

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Value Addition of the Products through Traditional Danka Craft of Udaipur

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Abstract

Design has an important role in economic and social change that does not stop at creating a new or better product. Design plays an important role in encouraging environmentally sustainable and economically viable model of craft activity and help in the empowerment of marginalized groups, especially in cases where income generation, social mobilization and community rehabilitation is needed. Designers acts as an interface between tradition and contemoprisation, helping match craft production to the needs of modernity. The present study deals with product development through Danka craft of Udaipur and to study the acceptability of value added products.

Keywords

Danka Craft, Udaipur, Product development, Designs, Acceptability.

1. Introduction

1.1. Metal Embroidery

Rajasthan has rich tradition and culture in its vast glorious history. Metal embroidery a popular style of Rajasthan, found its patron in royalty. They preferred garments profusely embroidered in gold and silver because embroidery was considered auspicious which represents power and importance. The royalty were so fond of this style of ornamentation that they often employed it on a wide range of articles other than apparel, like footwear, belts, caps, cushions and even elephant caparisons and canopies. The embroidery on these garments is, sometimes, so extravagant that the surface of the ground fabric cannot be discerned. Metal embroidery is largely of three kinds- Zardozi, Gotawork and Danka work. Gold and silver are drawn through a series of dies to obtain a fine thread. This can either be hammered flat or used as it is, or it could also be wound around a silken or cotton filament core to make a thread. Nowadays, electroplating with other metals also achieves a similar effect [1].

1.2. Danke-ka-kaam

A specialty of Udaipur, danke-ka-kaam is distinguished by the use of a small; metallic square around which

zardozi is worked. The Danka is a small square plate, which varies in size but is not bigger than 1.5 cm. Although the danka was originally made of pure gold, but nowadays silver plated with gold dankas are used. Earlier, danka was also made with fine silver sheet, which was first warmed and then gold foil was applied to its surface and pressed. Of late well-finished, polished thin silver sheets of 98% purity are electroplated with gold in strips of 30 cm by 2.5 cm, then they are washed in plain water and polished once again with fine granular sand. The strip is then cut into 1.25 cm squares. The cost of danka is calculated according to its weight [2].

Maharana of Mewar used to decorate their garments with gold and silver embroidery to enhance the richness of their wearing apparel used on auspicious occasion, festival and ceremonies. The designs for embroidery were mainly floral with leaves, petals and flowers. The range of article other than a wearing apparel was very wide and instead of high cost. It was used for decorative footwear, cushions, belt, canopies, hooks etc. Leather, velvet, silk and cotton were used for embroidery. The accessories used by maharaja Jagat Singh was also decorated with danka craft [3].

Danka work is usually worked on satin, chiffon or silk fabric. The fabric is stretched tightly on a wooden frame before it is embroidered and the craftsman sits on the floor. Danka pieces are laid out on the fabric as re-

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quired by the design. The danka is pierced with a needle, drawing the thread through the fabric. About three to five strands of kasab (gold or silver wire) are placed over each danka and couched down along its edges. It is secured with eight stitches in the shape of a knot. Two stitches go into the back, two at each corner and two at each corner and two on the front. Round and flat metal braids about one quarter of a centimeter in width are used to highlight the design. Additional stitches are employed such as the chain stitch, satin stitch for the design filling, while stem and running stitches are for lighter work. The motifs that are used in danka work are inspired by nature- like the paisley, the sun and the moon, peacock, flower, leaf and their variations [4].

This traditional craft is usually practiced by Bohra community. During the rule of Rana Sajjan Singh, a strike was held by the businessmen of Udaipur, which was then not supported by the bohra community. Thus, the emperor had given all the promotional facilities' to the Bohra community in the state. The Bohra community was engaged in doing danka and zari work on saris and costumes for elite class and rulers of Udaipur [5]. The development in traditional textiles is as essential as in other fields. Indian culture and its rich heritage are reflected in costumes and the embroideries of various regions of the country. The Indian folk and traditional embroideries play an important role in fashion world. As now a day's fashion trends are fragile and consumers constantly demand innovative changes over existing fashion fields.

The main objective of the study are:

- ◆ To revive the art form by attempting to recreate on different fabrics
- ◆ To differentiate the product from what was available in the market
- ◆ Develop a marketable range of easy to produce utilitarian products.

2. Materials and Methods

2.1. Product Development

A range of kurtis and other handicraft items i.e. pouch, ring case, bangle box & key chain were developed with the use of artificial danka instead of the pure gold coated silver. These products were developed to give a boost to creativity and to develop a new market. The steps followed for the development of product range were:

(A) Preparation of Designs: After taking inspiration from the traditional motifs of danka work, new designs were prepared by the researcher for kurtis and articles such as pouch, bangle box, ring case and keychain

(B) Assessment of Designs: The prepared designs were judged by the panel of experts from field of textiles and fashion designing. Designs were selected and ranked. The data under each category was ranked on rating performa.

The scores were as under: Excellent = 5, Good = 4, Fair = 3, Average = 2, Poor = 1

(C) Selection of Fabric: The fabric selection was done by keeping in mind the commonly used fabrics, their quality, and suitability, requirement, according to the end use of article. The color of fabric was also chosen accordingly.

(D) Development of Designs on Fabric: The designs selected by the panel of judges experts from field of textiles and fashion designing were embellished on product through artificial Danka plates.

(E) Assessment of Developed Samples: The developed products were assessed in order to get the market acceptability of the samples; the panel of judges was asked to analyze the samples based on different criteria. The developed pouch, bangle box, ring case and keychain were tested for the acceptability of the items in the market. The acceptability of designs were calculated and ranked. The data under each category was ranked on rating performa. The scores were as under Excellent = 5, Good = 4, Fair = 3, Average = 2, Poor = 1

Following criteria was followed for rating the samples;

- ◆ Selection of motifs
- ◆ Design suitability according to the sample
- ◆ Selection of fabric
- ◆ Selection of colour
- ◆ Placement of motifs
- ◆ Suitability of motifs to the end use
- ◆ Quality of workmanship
- ◆ Acceptability of concept

Acceptability Index % = $\frac{\text{Highest score} \times 100}{\text{Maximum score}}$

3. Results & Discussion

◆ Preparation of Designs

After documenting traditional danka motifs, innovative designs were prepared by the researcher manually. 20 innovative designs were drawn on paper and designs varied from the existing traditional designs and included lighter to heavier work. The designs were drawn to be embellished on kurti and handicraft items as it was considered as a new diversification of the product in danka work as this craft was traditionally done on rajputi poshaks and sarees.

◆ Selection of designs

Developed danka designs were arranged in systematic manner and then shown to a panel of experts from field of textiles and fashion designing to select the best 5 designs out of 20 for developing kurti. Majority of experts appreciated the efforts made by the researcher in developing the designs. The motifs developed were innovative and creative for danka work. As per suggestions the fineness and intricacy of the motifs were further improved to get the best result. The judges were asked to rank the designs on rating performa which was excellent, good, fair, average and poor.

◆ Selection of fabric

Danka work was traditionally done on delicate fabrics such as chiffon, georgette, crape, etc. but attempt was made on stiff fabric. The fabrics selected for the development of kurtis and handicraft items were Khadi silk, Poly silk & Cotton. The colour of fabrics selected were off white, rusty pink, pastel green, pastel yellow, Indian pink, rusty maroon and black.

◆ Evaluation of Acceptability

The products were evaluated through ranking scale. Responses and preference to kurtis, pouch, keychain, bangle box and ring case with danka work were recorded.

Figure 3.1. : New Developed Design on Kurtis

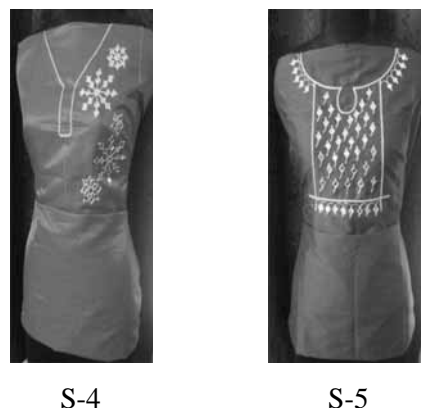
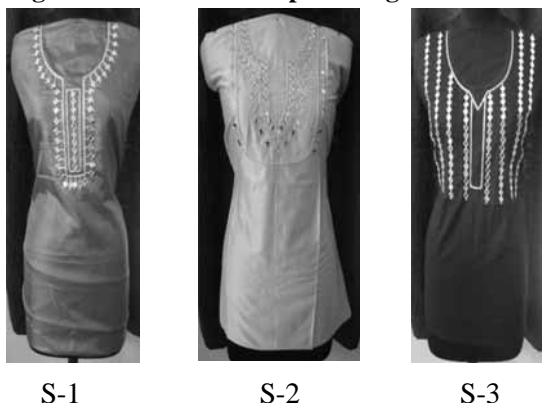


Table No 3.1 : Acceptability score of Kurti's obtained by relative ranking

Criteria of evaluation Item No.	Scores				
	S-1	S-2	S-3	S-4	S-5
Total score obtained	390	450	320	380	410
Acceptability Index(in %)	78	90	64	76	82

The rating obtained for the developed samples for the dress material (kurti) revealed that sample 2 got the highest score as (90%) followed by sample 5 (82%), sample 1 (78%), sample 4(76%) and sample 3 (64%) respectively. Sample code no. 2 and no.5 got the highest score because in both the samples colours were found to be more appealing to the panel

Table No 3.2 : Cost of developed samples

Sample No.	S-1	S-2	S-3	S-4	S-5
Cost	400/-	500/-	500/-	400/-	400/-

From the above table it was found that costing of sample S-2 &S-3 was Rs 500/- and S-1, S-4, S-5 was Rs.400/-.

Table No 3.3 : Comparison between costs of original and artificial danka

Sample No.	S-1	S-2	S-3	S-4	S-5
Cost with artificial Danka	400/-	500/-	500/-	400/-	400/-
Cost with gold plated silver Danka	1700/-	2100/-	2000/-	1800/-	1900/-

On comparing the cost of artificial danka with gold plated silver the cost of all samples in artificial danka work was much lesser in comparison to the original. But the workmanship and the overall appearance of artificial danka was quite similar to gold plated silver danka thus, makes the samples more suitable to the masses.

Figure 3.2 : Developed designs of pouch(Size 4x4 inch)



P-1

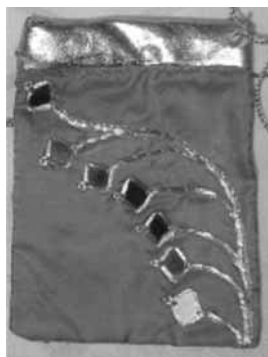
P-2



P-3



P-4



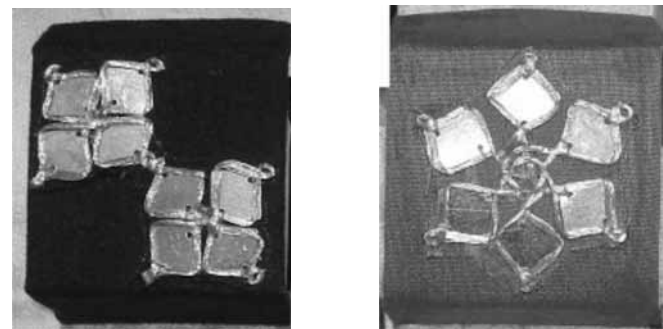
P-5

Table No 3.4 : Acceptability score of the pouch obtained by relative ranking

Criteria of evaluation	Score				
	P-1	P-2	P-3	P-4	P-5
Item No					
Total score obtained	400	390	410	360	430
Acceptability Index(in %)	80	78	82	72	86

From the above table it was found that P-5 and P-3 got highest score as compare to P-1, P-2, P-4, because in both the designs the designs the motif used, colour combination and quality of workmanship was better in comparison with the others.

Figure 3.3 : Developed designs of Ring Case(Size 1.5x1.5 inch)



R-1

R-2



R-3



R-4



R-5

Table No 3.5 : Acceptability score of the ring case obtained by relative ranking

Criteria of evaluation	Score				
	R-1	R-2	R-3	R-4	R-5
Item No					
Total score obtained	470	490	380	400	320
Acceptability Index (in %)	94	98	76	80	64

From the above table it was found that R-1 and R-2 were highly appreciated by the respondents as compare to R-3, R-4, and R-5. The result revealed that the respondents appreciated the R-1 and R-2 designs because of their colour combination, suitability of motifs to the end use, placement of motifs and overall appearance was good from others on basis of criteria of evaluation.

Figure 3.4 : Developed designs of bangle box(size 4.5x4.5 inch)

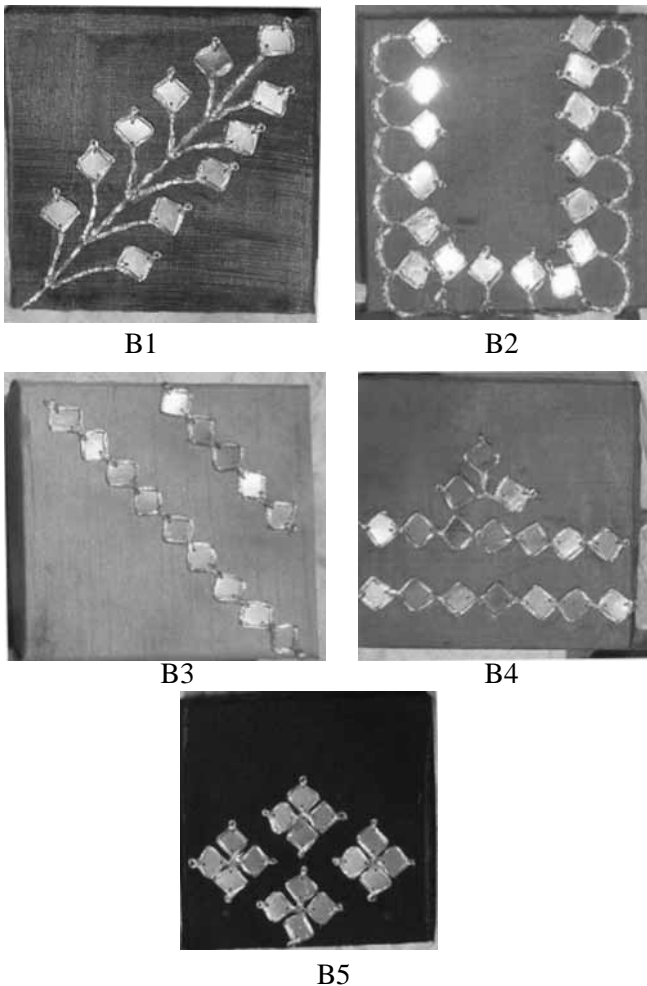


Table No 3.6 : Acceptability score of the bangle box obtained by relative ranking

Criteria of evaluation	Score				
	B-1	B-2	B-3	B-4	B-5
Total score obtained	440	470	350	380	400
Acceptability Index(in %)	88	94	70	76	80

From the above table it was found the quality of work, Placement of motifs, Selection of motifs etc of B-1 and B-2 were highly appreciated by the respondents as compare to B-3, B-4, and B-5.

Figure 3.5 : Developed designs of Keychain(size 4.5x4.5 inch)

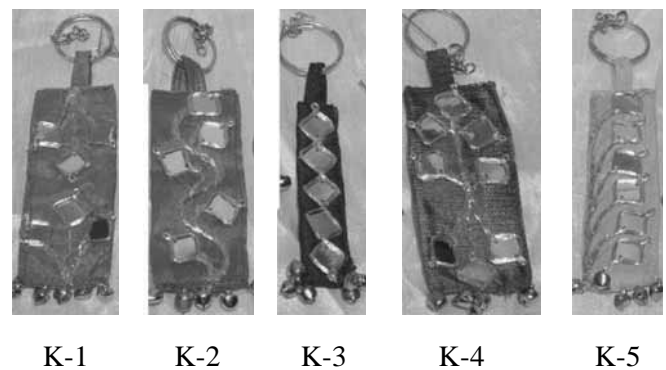


Table No 3.7 : Acceptability score of the keychain obtained by relative ranking

Criteria of evaluation	Score				
	K-1	K-2	K-3	K-4	K-5
Total score obtained	410	430	340	460	370
Acceptability Index(in %)	82	86	68	92	74

From the above table it was found that K-2 and K-4 were highly appreciated because of their overall appearance, colour, Selection of fabric, Quality of workmanship etc by the respondents as compare to K-1, K-3, and K-5.

4. Conclusion

Danka units have a small market share but the products have great opportunity among markets. This is the

type of search required by a strategy for growth is based on new product development and expansion into previously untapped markets. The danka work of Udaipur has been fading because of lack of capital, lack of promotion of new techniques, lack of organization, lack of demand and the ever increasing prices of silver. There is a need to make innovation in the present situation. A few suggestions have been listed to promote the art and the people associated.

- ◆ Assuming that there are good prospects, there is a need to set up a mission to revive the old art and build up its market value and common brand image.
- ◆ Making Danka work as historic art and to make an application for getting the trademark registered and the process patent for this art.
- ◆ Develop a pool of shop owners, exporters and agents for collecting the work in common platform and then distribute the work to the member artisans based on the skills sets and scientific costing method.

- ◆ Promotional activities should be undertaken such as trade fairs, exhibitions etc.
- ◆ This report will serve as a guideline of experimentation for upcoming designers, students, boutique owners, self-entrepreneurs and for fashion innovators to know about the trends and styles in danka craft.

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Currently working as Manager, in DyStar Textiles Services.

Current Challenges For Textile Industry

The textile Industry is constantly changing and gearing up to meet the demands of consumer and other agencies which are concerned with the consumer's health and safety. Off late the NGO activities have created a lot of awareness in the consumer demands. Changing towards achieving better quality controls, using automated machinery, environmental consciousness etc... was the passé and today because of the NGO's and other consumer forums demands and requirements, the major Brands and retailers have adapted to the ever changing requirements by giving lot of importance to the chemicals which are going in manufacturing of these products. With this ever changing trend, there is continuous pressure on the manufacturer's of Dyes & Chemicals to disclose and know more about the products which are being produced and put into the supply chain of the textile industry as a whole.

I am fortunate to be associated with the Textile Industry for past 7 years and each year has been an experience where we keep on receiving requests and demands, from the mills, exporters and retailers. All these demands have been originated due to some requirements and regulations which are changing and becoming stricter day by day. In this situation only people who adapt to the ever changing needs and demands of retailers would survive.

The awareness level on the ecological and Toxicological issues needs to improve drastically at all levels of the supply chain. It is important that the exporter who is the main link of the entire textile supply chain understands clearly the regulations and specifications of all the retailers and then communicate all these aspects clearly to his suppliers. Often it is observed that the ecological requirements are not mentioned at all in any official communication. Still the mills are getting the requests and orders with a small piece or thread for matching without any mention of the full eco requirements.

We see a lot of general terms like Azo, Formaldehyde, Phthalates, Heavy metals free etc., being used in the order sheets and request forms which come to the mills. However, very few takes pains to understand the real requirements and needs of the customers and deliver what is expected. It is important that all the textile supply chain people understand the terms used in the Restricted Substances List (RSL) manuals of various brands and retailers. The Brands are taking lot of pains to create the documents for the RSL and their tool kits. Education and creating awareness is the key in current scenario and brands and retailers are doing their bit with investing lot of resources and time in getting the right message across their supply chain. They are conducting seminars, workshops, organizing pilot programs, Audits, technical assistance visits etc., to achieve the common goal of sustainable production.

Today meeting the retailer's requirements for the apparel production alone is not enough. With the constant efforts of Greenpeace on the textile apparel products and the Detox campaign, it has become important to know what are the toxins

which we release into the waste water streams during production or during the use of the product. So in current day's norms, understanding the impurity profiles, hazardous chemical residues in the products intended to use and possible contaminants are becoming more important.

The mill before they use any recipe for production need to know who is the ultimate buyer and the requirements so that there will not be any issue of non compliance coming from the wrong selection of the dyes and chemicals. More care is given to look for the fastness requirements but care also needs to be taken to look at the chemical restrictions which are to be

adhered to. Usually this information is not available easily. We need to be relying on the MSDS, declarations, Technical data sheet and the final test reports (in few cases the required tests are not conducted). However, most of the MSDS and declaration documents provided by the suppliers of dyes and chemicals are not giving adequate and accurate information.

We cannot always have quick solution for this situation but we need to constantly upgrade our knowledge through attending meetings, seminars and contacting the suppliers and manufacturers for understanding the requirements and analyzing the products to be used so that non-compliance and penalties can be avoided.

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Innovation Through Software



Sharad Tandon, CEO

Taking a slightly deviant line from the usual concept of innovation in technology, work practices, automation and / or product development into areas like technical textiles we would like to bring to attention another innovation tool which can and has been very successfully used to increase resource utilisation all over the world and in all industries.

We are talking of computers and software, in various forms and formats. Note that we have separated the two, as we have observed that computerisation for most people means putting in some computer terminals and use them as printing machines for items like Challans, invoices, salary sheets etc.

The use of technology is restricted only by how it is applied and used. Just the provision of technology by itself serves no purpose. An illustrative example would be buying a new weaving machine and not monitoring its working or efficiency.

Similarly, the use computers can be put to are defined by the software that uses them. As mentioned earlier, the first and often last step in many organisations is their use as recording and printing machines.

Yes, there are attempts made by

many, and some successfully implement what is known exotically as Enterprise Resource Planning (ERP). The successes are few and far in between specially in the smaller and medium sectors who actually stand to benefit more given lack of resources and hands.

Let's look at use of computers, or more importantly the software running in them in enabling better use of your resource and becoming a effective tool to help you take more informed decisions faster.

Alas, much as we don't agree with the label for want of anything better we have to return to ERP. What exactly does ERP mean? As the elaboration suggests, it is an Enterprise wide resource planning tool. The enterprise may itself constitute a 2 person one or a 2000 one.

The basis on which it works is simple. All the business activity is linked through a common thread and recorded centrally. The information is processed by the computer system to be presented in predefined reporting formats. The same is available to decision makers almost immediately online to monitor, and if required take corrective decisions. In short, the information required or relevant to anyone anywhere in the business chain is bought to notice or available even if it has been entered by someone sitting hundreds of kilometres away with no concern with this persons working.

The advantages are many. One, it ensures that only entry needs to be made for one figure of data. To demonstrate this lets take an example of a manual versus ERP entry for one particular item. For our

purpose I will take an item issued by the spares store to the weaving department.

In the usual manual system the ideal process would be something like - Weaving issues indent to store (in the dark as they really have no way of knowing if the last piece was used up by the night shift yesterday), store physically verifies stock and authority approving, if available issues against a slip and enters that slip in its system, updating the remainder stock, the weaving department enters the stock against spares received and puts in the machine issued to, confined to its department. Once in a month or maybe longer, the accounts is given a spare consumption record which it again inputs in its accounting system for tracking money spent and matching against budgeted or revenue expenditures. If the accounts and factory are located in different locations as is often the case even in smaller units, this activity may or may not ever happen or gets done only at times of Audit, if the auditor is fussy. Thus for one piece of 5 Rupees washer the entry is done three times, by various heads, and no means of knowing if someone has missed an entry or made a wrong one. The cost of 3 people with varying level of skills and ever increasing pay packages doing this can by no means be a thing to be ignored now. (On a diversion it's surprising how we circulate a joke of government spending Rs 500 to check on a 5 Rs envelope, not realising how often it is happening in our own backyard).

As against this in a typical ERP. the weaving department would get into the system, check for available part in stock, issue an online indent, which will pop up on the store departments screen along with warn-

ing and alerts if any (eg if the same part is being requested repeatedly for the same machine the alert level would tell the store keeper that normal consumption has been already exhausted), the same alert if required will be flashed on to higher authority or maintenance section even as the process is happening. If store issues the part, the stock is updated, if the stock is below normal a purchase indent is automatically generated and sent to those with power to sanction. At the same time the issue part value is updated in accounts under spares expenditure in revenue as well as budget. This will reflect in the relevant reports almost immediately.

Now the thing to be noted here, we are not really doing away with the concerned people. Only freeing them from the routine tasks of filling out forms and updating data. Thus they are available for more productive purposes. Also, now the information is available in relevant forms to people going to be affected by it in his or her own manner. The weaving department gets to know balance stock. The store keeper is able to see and forecast consump-

tion patterns for a particular item. The maintenance person can see excess breakdown of a part repeatedly on one machine. The accounts person is able to see in Rupee terms the happening in the plant. All this by one entry.

Now if this is so wonderful, common sense says that everyone should have implemented it long back and be working only by this. Here lies the rub. Deciding to implement ERP and actually doing it successfully are two different things. Let us examine why. Among the major hindrances are some myths or misconceptions.

MYTH 1

My people are uneducated and not from the Computer Class

ANS: The use of computers is dependant on the ease of use and not of any qualification. The widespread use of ATMs all over rural India should be enough to answer this. If a person can operate an ATM he can an ERP. Provided you design the ERP that way.

MYTH 2

It's too costly and only big play-

ers can afford it

ANS: ERPs are available in all budget ranges. Still to put a figure I would say a fully functional ERP for a group of 1 office , 3 plants and about 150 employees would cost around 20 - 25 lakhs including everything. (The key issue, payback is around 1 year at the most)

MYTH 3

It never gets implemented. Or takes years and then doesn't work

ANS: Yes, this is the most true of all the reasons for failure of ERP to take off. Understand, policy decision, like purchasing an ERP package is different and actual execution, implementing ERP is different. You have to realise that the expertise and discipline needed to implement is rarely available in house for smaller or medium units. Solution? Entrust the entire task to a outside monitoring or implementing agency. This does not mean the ERP vendor.

In summation its well said that the only thing holding us back is usually our own fears!

**- Sharad Tandon,
CEO**

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Shape Memory Polymers in Textiles



Shape-memory polymers (SMPs) are polymeric smart materials that have the ability to return from a deformed state (temporary shape) to their original (permanent) shape induced by an external stimulus (trigger), such as temperature change. Shape memory polymers were first developed in Japan in 1984. Shape Memory Materials are one group of very promising smart materials. These materials exhibit novel properties such as sensing (thermal, stress, optical, chemical), actuation, high damping, adaptive responses, super-elasticity capability and air permeability. They are used in medical, textile, garments and footwear products, composites and electrical appliances.

The synthesis, characterization, application, industrialization and modeling of different types of shape memory polymers such as Polyurethane, Poly-N-isopropylacrylamide and Polynorbornene for various purposes shows that, all shape memory materials have limited development in apparel and related areas. However, there is wider potential to apply shape memory polymer in the fields of textile and clothing such as fiber knitted and woven fabrics/garments. The concept of shape memory fabric is new and these fabrics can be prepared by applying waterborne shape memory polymers in Polyurethane series (SMP) onto fabrics through specific finishing processes. SMP generally characterized as a phase segregated statistically block copolymer has a hard segment and

a soft segment. The hard segment acts as a frozen phase and the soft segment acts as a reversible phase. This frozen phase helps to memorize the original shape while the reversible phase acts as a switch responsible for shape recovering. Once the shape memory polymer is deformed, the original shape is recovered by heating the SMP at a switching temperature which equals to the melting temperature of soft segment.

Shape memory is the ability of a product to remember its original shape upon application of an external stimulus such as chemicals, temperature, or pH. A change in shape - return to the predetermined shape, caused by a change in temperature is called a thermally induced shape memory effect. To have this smart property in fabrics, a temperature sensitive shape memory polymer (SMP) is used in fabric finishing. In general, shape memory fabrics/garments are endowed with excellent hand, shape retention, dimensional stability, good durability, wrinkle free, flat appearance, bagging recovery, comfort to wear and easy care.

Classification of Shape Memory Polymers

Shape memory polymers can be classified into four major categories based on their 'differences in fixing mechanism' and origin of 'permanent shape elasticity'.

- ◆ Chemically cross-linked Glassy

thermostat

- ◆ Chemically cross-linked semi crystalline rubbers
- ◆ Physically cross-linked thermoplastics
- ◆ Physically cross-linked block copolymer

Applications of Shape Memory Polymers

Its special and unique properties.

Shape Memory Fabric

The shirt with long sleeve could be programmed so that the sleeves shorten as room temperature becomes hotter. The fabric can be rolled up, pleated, creased and returned to its former shape by applying heat. Ex: blowing air through hair dryer.

Ergonomic

The violin is made from the combination of shape memory polymer and carbon fibres. The shape memory polymer used here is "Veriflex". It is designed to help to reduce the neck and shoulder pain of the player, as it can be reshaped as desired by the player.

SI Suits: The suit was developed to help the sailors on their journey. It adapts to the temperature variations and maintains a human body temperature. The membrane gives optimal breathability in any given atmospheric condition.

Morphing Aircrafts

Morphing materials and technologies

are adapted to construct deployable morphing aircrafts and other innovative adaptive structures that are of critical importance to air force. Medical Field: In many operations which involve stitches inside the human body, a second operation is done to remove the internal stitches. In such cases when biodegradable SMPs are used they dissolve gradually and need not be removed as their composition is harmless.

Benefits of Shape Memory Polymers over Conventional Polymers

- ◆ Toughness
- ◆ Unique shape memory properties

- ◆ Recovery to memorized shape after repeated deformation
- ◆ Ability to change from a rigid polymer to rubbery elastomer
- ◆ Over 95% (one-part resin) and 100% (two-part resin) elongation possible in elastic state
- ◆ Low viscosity for easy processing (RTM or VARTM) (two-part resin)
- ◆ Open-mold curable
- ◆ Aesthetic clarity

For application of Shape Memory Polymer on the fabrics/garments to develop the smart textiles, it is a very promising area with tremendous potential that has attracted enormous attention, but technologi-

cally it is still very challenging. Shape memory polymers are increasingly popular in the fabric engineering as they respond dynamically to changes in heat and moisture levels, ensuring greater comfort for the wearer. They are thus often used to produce high-end functional garments. It is believed that SMPs can be activated in not only functional garments, but also fashion apparel, which will be characterized with not only technological innovation, but also value-added aesthetic benefits to the wearer.

--By Chet Ram Meena



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TAI - South Gujarat Unit

TAI - South Gujarat Unit (Surat) organized an industrial visit on 19th MAY, 2012 at Navsari in Mafatlal Denim Ltd. and Cebon Apparel Pvt. Ltd.

Shri R. R. Patil, Vice President, Mafatlal Industries Ltd., gave warm welcome and briefed about the requirements in cotton textile manufacturing to visiting group who were mainly from synthetic textile industry. Visiting members discussed about the needs of surat based synthetic textile industry. Shri Girishchandra H. Bhatt, President, TAI-SGU-Surat, delivered vote of thanks especially to Shri R. R. Patil for making the visits an unforgettable one.

At Mafatlal Denim Ltd., Dr. Milind Bhortakke, Vice President-Operations, welcomed the group. The technicians showed and explained the various modern technologies for Spinning, Weaving and Processing for Denim.

At Cebon Apparel Pvt. Ltd., Mr. N. J. Moradiya, Vice President (Manufacturing), welcomed the group. He showed the high-tech garment manufacturing process and discussed on how to survive in global competitive garment market with cost cutting but not at the cost of quality. The company is an example of "High productivity and Quality with Less Man-Power".

Shri Virendra Jariwala, Hon. Jt. Gen. Secretary, TAI-Central Office, gave away the vote of thanks to Dr. Milind Bhortakke and Shri N. J. Moradiya.

TAI - Mumbai Unit

One Day Seminar on "Innovation In Weaving"

The Textile Association (India), Mumbai Unit organized a One Day Seminar on "Innovation in Weaving" in Vapi on April 28, 2012. It was attended by nearly 250 delegates.

Mr. V.C. Gupte, Chairman, TAI, Mumbai Unit welcomed the Chief Guest, Dr. Chandan Chatterjee, Director, The Center for entrepreneurs development, industries commissionerate, Govt. of Gujarat, Key note speaker Mr. Prakash Shah, Chairman & Managing Director, Prashant Group of Industries, Guest of Honour Mr. S.S. Aich, CEO, Alok Textile Industries Ltd. and Mr. Narayan Thakkar, Managing Director, Rukshmani Syntex Pvt. Ltd. Awardees Mr. G. Banerjee, Director, Shree Ram Textile Mills Ltd., Speakers, Press, Media and delegates. Mr. C. Bose, President, TAI, Mumbai Unit delivered the presidential address and briefed about the activities of TAI, Mumbai Unit.

Mr. Haresh B. Parekh, Convener & Jt. Hon. Gen. Secretary, TAI briefed about the seminar. He said that TAI, Mumbai Unit feels proud to meet the technocrats and technologists from the region of Vapi, Silvassa, Tarapur and Umbergaon. He further informed that the textile industry was the second largest sector in India till the year 2000 before other industries like IT (Information Technology), construction stepped in our country. However the textile industry is a second largest industry in our country providing employment to the people only next to agricultural sector. There is no doubt that textile industry contributes sig-

nificantly to the countries economical growth. The latest changing scenario of economic slow down has adversely affected this industry. The Govt. of India and State Govt. of Gujarat have announced various schemes to provide subsidy for the development of this industry. The textile units should take advantage of various schemes by forming clusters to come out of the economic slowdown.

Mr. Prakash Shah, Chairman & Managing Director, Prashant Group of Industries in his key note address said that preparatory process is as important as weaving. Therefore, machinery design and development on commercial scale plays a key role in growth of the sector. During his deliberations, he demonstrated the strength of the machinery manufacture by illustrating various developments made by Prashant group of Industries in terms of various weaving preparatory processes. He emphasized the importance of the collaboration in the design of machineries to shrink the time in the development.

Mr. S. S. Aich, CEO, Alok Textile Industries Ltd. in his special address informed the importance of process control and quality control in the weaving mill. He informed the steps taken to increase the productivity and production targets in the management of mill operations. As one of the leading mills in the country, he informed the ways and means pursued in his mill to achieve the high quality and productivity.

Mr. Narayan Thakkar, Managing Director, Rukshmani Syntex Pvt.

Ltd. while addressing the delegates narrated the historical transect of his career. He explained the importance of human resource development as key factor for the growth of his enterprise.



Mr. Prakash Shah, Chairman & Managing Director, Prashant Group of Industries receiving The Corporate Excellence Award by the hands of Chief Guest Dr. Chandan Chatterjee, Director, The Center for Entrepreneurs Development, Industries Commissionerate, Govt. of Gujarat.

The Textile Association (India), Mumbai Unit has set a precedent by felicitating the textile professionals for their outstanding contribution in the field of textile industry. In this seminar, the TAI, Mumbai Unit felicitated Mr. G. Banerjee, Director, Shree Ram Textile Mills Ltd. with "The Life-Time Achievement Award" for his contribution to the textile industry. The Textile Association (India), Mumbai Unit for the first time conferred "The Corporate Excellence Award" which was awarded to M/s Prashant Group of Industries for their contribution in the field of textiles.



Mr. G. Banerjee, Director, Shree Ram Textile Mills Ltd. receiving The Lifetime Achievement Award by the hands of Chief Guest Dr. Chandan Chatterjee, Director, The Center for Entrepreneurs Development, Industries Commissionerate, Govt. of Gujarat.

Dr. Chandan Chatterjee, Director, The Center for Entrepreneurs Development, Industries Commissionerate, Govt. of Gujarat was the Chief Guest of the seminar. Dr. Chatterjee in his address said that textile industry has a prominent place in India as it provides large employment and contributes to the export business. Due to the emphasis on high value added products like technical textiles, the demand for different levels of technologies has become a necessity. In the context of cost reduction, energy, efficiency and environmental aspects play key role in reinforcing the viability and profitability. He also narrated various steps taken by the state and central government in dealing with various challenges faced by the industry. He expressed his happiness for the initiative taken to hold a seminar in Vapi by the Textile Association (India), Mumbai Unit. He hoped that the deliberations would meet the objectives of technological issues confronted with the user industry.



Inaugural Address by Chief Guest Dr. Chandan Chatterjee, Director, The Center for Entrepreneurs Development, Industries Commissionerate, Govt. of Gujarat. In all, there were 7 technical papers presented during the seminar.

Mr. Rais Inamdar, General Manager, Bakubhai Ambalal spoke on "Weaving Solutions for Rapier Weaving Machines".

Mr. Navin Agrawal, General Manager - Fabric forming presented the paper on "Latest Innovations in

Fabric Forming".

Mr. Bhupesh Trivedi, CEO, REECODE Energy Solutions made the presentation on "Solar Energy has turned cheaper".

Mr. J. B. Purohit, Sr. Manager - PL Sizing and Mr. K. Suresh, Manager, Clariant Chemicals (India) Ltd. presented the paper on "Ecological Denim Manufacturing"

Mr. Sanjay Gajul, Marketing Manager - Technical, S. A. Pharmachem (Pvt.) Ltd. expressed his views on "Recent Developments of Synthetic Sizes for Spun Yarns and Size Recovery".

Mr. Tapas Nandi, President & Country Head, ITEMA Weaving (India) Pvt. Ltd. presented the paper on "Ecological solutions for any fabric".

Mr. Vilas Gharat, Managing Director, Gharat & Associates made the presentation on "Innovative HR practices"

All the papers received high response from the participants.



View of the audience

The last session began with Panel discussion, which was moderated by Mr. Sharad Tandon, CEO, Standon Consulting. The panel comprised Dr. G.S. Nadiger, Research Advisor, BTRA and speakers who presented their papers in the seminar. There was good interaction between participants, who posed many que-

ries to panel members and the same were answered by the panel members. It was a very interesting and fruitful session. The delegates were attentive till the last session to take advantage of the plenary session.

The plenary session was professionally handled by the moderators as well as the speakers. The organizers of the seminar were happy that the objectives of the seminar were fully achieved.

At the end, Mr. Arun K. Narkar, Jt. Hon. Secretary, TAI, Mumbai Unit proposed a vote of the thanks. The seminar was a grand success and was attended by over 250 participants.



Canton Fair 2012



L to R -Mr. Rupen Vikamsey, Ms Deng lizhou, Mr. Sanjay Bhide, Mr. Niu Qingbao - Consul General of the People's Republic of China, Mr. Suresh Sharma, Mr. Chandrakant Salunkhe, Mr. Mr. Liu Guoyu & Mr. Chintan Chheda

The 112th Canton Fair Press Conference was held at the Sofitel Hotel, Bandra Kurla Complex, Mumbai on Monday, 2nd July 2012. The event showcased presentations from a number of senior officials from China and India and imparted all the information needed to take advantage of business opportunities at the 112th Canton Fair. A similar event was recently conducted in Delhi on 28th June at Taj Mahal Hotel. To promote the bilateral trade event at the press conference, a team of 3 delegates from the China Foreign Trade Centre presented the scope and opportunities at the Canton Fair and how it is an indispensable event for business growth. The Canton Fair is biannual which is held in Guangzhou every spring & autumn and the large stand most comprehensive trade fair in China. It has the broadest distribution of over-

seas buyers and records the greatest business turnover in China.

The previous hosting of Canton Fair in April 2012 attracted over 200,000 buyers and close to 210 participating countries. With over 58,000 stands and 150,000 different types of products exhibited at each fair, it achieved a staggering business turnover of 37.9 billion US dollars. India's presence at the fair has been steadily growing with around 9000 buyers out of a total of 220,000 in the previous edition, which would significantly increase this year. The 112th edition of the Canton Fair will commence in three phases of five days each. Phase 1 (October 15-19, 2012) and Phase 2 (October 23-27, 2012) and Phase 3 will commence from 31st October, 2012 until the 4th of November, 2012. It will be co-hosted by the Ministry of Com-

merce, China and People's Government of Guangdong Province, and organized by China Foreign Trade Centre. Mr. Niu Qingbao - Consul General of the People's Republic of China, assured the Indian visitors complete cooperation in clearing of all travel documents to visit the Fair. He further added that he and his team would commit to extra hours, to ensure no application for visas are pending, as the official travel company for Canton Fair for 2012 appointed by The China Foreign Trade Centre (CFTC), Orbitz Corporate & Leisure Travels (I) Pvt. Ltd. will facilitate the travel arrangement for the interested Indian delegates. The event was attended by dignitaries and many eminent personalities from the corporate world and trade associations. They included Mr. Liu Guoyu - Economic and Commercial Counselor of People's Republic of China in Mumbai, Mr. Vijay Kalantri - President, AIAI; Chandrakant Salunkhe - Founder President, SME Chamber of India; Mr. Suresh Sharma - Vice President, ICECC; Mr. Ashish Pednekar -President, MACCIA; Mr. Sanjay Bhide - Secretary, Trans Asian Chamber of Commerce & Industry to name a few. Despite the sluggish global economy, the Canton Fair continues to present a vibrant Trade platform for exhibitors and buyer to network and sell to China. In an other-wise dismal Euro Debt crisis, it promotes the spirit of cooperation and offers the best sourcing choice to combat this slow-down.



Wool Research Association Setting up of Centre of Excellence in Sportech at Wool Research Association, Thane

Textiles inherently can pose immense versatility and are capable of shaping into various functional products for varied uses - from packaging material to high-end uses like defence, space, aviation, etc. These phenomena have led to a class of textile products viz. Technical Textiles. Application wise there are twelve sectors of Technical Textiles, technology wise also added are Non-wovens, Composites, Coated textiles, etc. Technical use of textiles started from the dawn of human civilization - it is said that flax fabric were used for stabilization of ground base for pyramid 5000 years ago in pre-historic era. Sail cloth, heavy duty ropes, cordages, etc also were as old to be used as technical Textiles for marine application in those days. During the decades of 70s and 80s of last century, advent of tailor-made man-made fibres, new mechanical and chemical processing technologies boosted the development of technical textiles. During the decades of 60s and 70s, textile industry in Europe and USA was in a bad shape. The entire textile industry in developed countries realized that non-conventional value added technical textiles could only offer a fresh lease of life to their ailing textile industry. Today more than 40% of total manufacturing activities of many industrialized countries comprise of Technical Textiles.

Technical Textiles on its own merit has an important place in Material Science along with Micro-Electronics and Bio-technology, which will shape the developments in this century. CAGR of Technical Textiles

in the west is 2.4%, where as it is 6.5% in India and China.

Considering the significance of knowledge based emerging technology of Technical Textiles, Ministry of Textiles, formed a Technology Mission in Technical Textiles to set up Centres of Excellence in 8 sectors of Technical Textiles and, after scrutiny and evaluation by Project Approval Committee chaired by Secretary (Textiles), have designated earlier 7 Centres of Excellence in various sectors of Technical Textiles during last few years. In the month of February 2012, request for Proposal (RFP) for Centre of Excellence (COE) in Sportech was invited by the Textile Commissioner on behalf of the Government of India. Wool Research Association (WRA) participated in the bid as the Lead Partner of a Consortium formed with Veermata Jijabai Technological Institute (VJTI), Mumbai and Kusumgar Corporates, a leading Technical Textile manufacturer, as members. Besides, the industries viz. Raymonds Ltd, Grentex & Co. Pvt.Ltd, Banswara Syntex and Shree Ram Textile Mills extended their support to WRA for setting up the COE in Sportech. After evaluation, the Project Approval Committee (PAC) approved the proposal and subsequently WRA was designated last month as **Centre of Excellence in Sportech**.

Sportech sector alongwith Mobiltech and Indutech sectors of Technical Textiles constitute 55-57% of total technical textiles on a global basis.

Apart from improving economy, sports activities have been focused as a global phenomenon to establish supremacy over other countries. Today, battles are not fought in the battlefield, but are fought in the playfields. Records set up by the sportsmen in a particular international event often are demolished in the next event. This is possible due to the availability of newer technique, overall improvement of physical and mental fitness backed by improved sportswear and equipment, that is 'Sportech'.

Today's sportsman requires special sports clothing to enhance his comfort, protection and performance to supercede his competitors. Broadly, there are three categories of sportech products viz. Sportswear, Sports goods and Sports accessories. In India there are atleast 12 clusters of sportech manufacturers and more than a dozen sports bodies representing the users of sportech.

Wool Research Association (WRA) is a Textile Research Association established in 1963 by the Woollen & Worsted industry. Since last two decades, it had modestly engaged itself in the development of technical textiles. It had undertaken a few sponsored projects relating to Sportech, Indutech, Mobiltech, etc. WRA has selected to work on Sportech due to following factors :

- ◆ Increased activities and participation in sports in the country.
- ◆ Outdoor leisure pursuits.
- ◆ Availability of high performance fibres, new technologies of coatings and manufacturing process.
- ◆ Higher level of sports standards and challenges within sporting

nations.

- ◆ Newer sports requiring high dexterity, skill and sporting gears.
- ◆ Popularity of traditional sports like athletics, soccer, cricket, skiing, golf-sailing, etc in the country.
- ◆ Growth of sports facility and infrastructure in the country.
- ◆ Recent trend to combine fashion oriented sportswears and performance garments.

The Centre of Excellence in Sportech will have following infrastructure facilities:

1. Modern Accredited Testing Laboratory.
2. Prototype Development plant and machineries.
3. Incubation Centre.
4. Resource Centre with IT infrastructure.
5. Training facility for HRD in Technical Textiles.
6. Formation of standards, specifications, norms.
7. Sample Bank.
8. Seminar, Workshops, FGD, etc.

The Office of the Textile Commissioner shall provide fund support of Rs.24.50 crores for the project of COE in Sportech, which includes recurring expenditure of Rs. 3.00 crores for appointment of consultants under this project. Steering Committee for Growth and Development of Technical Textiles (SCGDTT) constituted under the chairmanship of Textile Commissioner shall monitor, review and coordinate the activities of the COE.

Texttreasure

The greatest gift that you can give to others is the gift of unconditional love and acceptance.

-Brian Tracy

Top Global Award for an Indian Scientist



Mr. Andreas Weber, TI World Immediate Past-President (left), Dr. Surinder Tandon and Dr. Peter Dinsdale, TI World President

Dr. Surinder Tandon, Senior Scientist with AgResearch, based at Lincoln, Canterbury, has been awarded the Institute Medal of the Royal Chartered Textile Institute (TI) at the 88th TI World Conference held recently on 15th May 2012 near Kuala Lumpur, Malaysia. The TI is the global association for textile professionals, and the medal is one of the Institute's most prestigious honours, recognising distinguished service to the textile industry and the Institute. It has been awarded since 1921, and Dr. Tandon is only the second New Zealand recipient. In his 23 years of research at Wool Research Organisation of New Zealand (WRONZ), Canesis and now AgResearch, he has applied his research skills culminating in many publications, and several commercial success stories for wool grower groups and industry worldwide which include several fit-for-purpose apparel and functional textiles. He has collaborated with textile academics and professionals around the globe.

Dr. Tandon, a member of the TI

NZ Section since 1992 and a Fellow of the TI, was its section chairman during 2004-07 period. He developed collaborations with the other New Zealand textile professional groups, and fashion and design schools of several universities and polytechnics to organise combined events for sharing knowledge within the New Zealand textile fraternity.

Outside his research interests, he is involved in community work, being a member and Past-President of the Rotary Club of Lincoln, President of the Christchurch Multicultural Council and President of the Christchurch Chapter of Global Organisation of the People of Indian Origin (GOPIO). He completed BText (Hons) from TIT Bhiwani in 1982, MTech from IIT Delhi in 1984 and PhD from Leeds University in 1988.

The Textile Association (India) heartily congratulate Mr. Surinder Tandon for receiving a prestigious global award and wish him best for all the success in his life.

RIETER

New Spinning Plant Makes Significant Energy Savings

Rotor spinning machines and spinning technology of the latest generation allow energy savings of up to 25 % in a cotton spinning plant.

The challenges in terms of sustainability

In a rotor spinning plant, pure increases in productivity with new spinning technology are usually only sufficient to justify new investments after a long period of time. Other benefits of modern technology that do not completely pay off in the spinning mill itself are consequently only implemented with a long delay.

Spinning machines are very big energy consumers with an energy usage ranging from 0.5 to far above 1.5 kWh per kg of yarn. They thereby decisively influence the energy-related footprint of the textile product. In some regions, particularly in Asia, the spinning plants serve to develop industrialization and to increase creation of value from locally produced cotton. There, the infrastructure is heavily strained by such big users.

With the implementation of modern rotor spinning technology, the energy requirements for worldwide textile products can be sustainably decreased. Moreover, modern technology can provide an appreciable contribution towards easing the energy supply situation in the industrially developing regions.

The initial situation

A large rotor spinning plant in the USA which was equipped in the 1980s and continually expanded over a period of 10 years, **produced with its meanwhile up to 18 years'** old machine park approx. 88 000 tons of yarn annually from domestic cotton. The spinning plant was operated with modernization mea-

asures so that the quality of the yarn remained competitive. Consistent servicing and maintenance permitted a high utilization despite an aging machine park. The investment trend for the textile industry in the USA, whose downstream processing moved to countries with low pay levels, was minimal. For this reason, new investment was postponed. Due to the comparably low energy costs, the energy consumption of the plant was previously not in focus. Detailed statements on energy consumption of new plants are, in general, hardly available because of the very high dependency on the individual applications.

The solution - sustainable investment with new technology

The rotor spinning machine in use was consistently further developed with regard to productivity and lower energy consumption to the R 60 model. A new spinning unit contains the latest developments in spinning technology. Its improved spinning stability allows equal yarn properties with a lower use of energy-intensive yarn twisting and therefore higher productivity.

Longer machines make an economical machine price possible and a more cost-effective utilization of the areas in the spinning mills. This was again only possible because the spinning positions used less energy due to the application of highly efficient central drives and energy-saving storage.

The sustainable strengths

The benefits of modern automatic rotor spinning machines are comprised of a combination of increasing the efficiency of the plant, a better utilization of the raw materials processed and a significant re-

duction of the energy consumption required for the production.

- ◆ Approx. 25 % lower specific energy and resource requirements for the production compared to old plants, due to the improved spinning technology which allows an increase in productivity of 5-10 % without more energy and resources being required.
- ◆ Lower resource requirements in downstream processing, as the more even yarn quality results in less standstills and therefore a better utilization.
- ◆ Additional conservation of resources as in certain individual cases, the improved technology also permits the use of cheaper raw materials including the reuse of waste materials generated by the spinning process and recycled fibers.



The R 60 fully automated rotor spinning machine from Rieter.

The sustainable significance of this development is even more apparent when one takes into consideration that more than 7.5 million rotor spindles are in operation worldwide, on which an amount to the scale of 9 million tons of yarn per hour is spun. This means that rotor spinning worldwide uses significantly more than 1 000 MW of electricity. The modernization of this machine park with an age of more than 20 years can therefore greatly contribute to reduction of the energy requirement.



**8th International Conference on Apparel & Home Textiles on 21st & 22nd September, 2012,
At India Habitat Centre, New Delhi.
Theme : The New Excellence**

ICAHT-12

The global apparel manufacturing industry is expected to grow more than ever in times to come.

The conference is intended to cover all aspects of the apparel industry, including the problems of small-scale enterprises in the developing world, the barriers which are hindering the growth of this industry, the strength and weakness of the manufacturers in different region, globalization issues, resource and manpower scarcity, quality of the product, trade laws, adopting new techniques to improve productivity, managing global supply chain and finally changing apparel industry trends with ever-changing fashions.

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The conference aims to provide an environment for academics, researchers and practitioners to exchange ideas and recent developments in the field of apparel manufacturing. The conference is also expected to foster networking, collaboration and joint effort among the conference participants to advance

the theory and practice as well as to identify major trends in apparel manufacturing.

The Convention will be a great opportunity for international trade fraternity to know the dual strengths that India can offer, not only as a great supplier base, but also as a fashion destination for international brand

Suitable Development is a thematic in which OGTC has been working for dissemination of knowledge to eradicate barriers and raise awareness in the sector.

Eminent speakers from Bangladesh, India, Sri-Lanka, UK, and USA will be presenting papers followed by panel discussion.

Conference also provides a unique platform to academicians and students in the field of Modeling and Fashion Designing to present the fashion perspective as the see it. The Faculty and Students of Department of Fabric and Apparel Science of Lady Irwin College will present the Fashion show.

KEY ISSUES TO BE ADDRESSED IN ICAHT 12

Environment : Carbon Foot Print Measurement in Garment Industry
Direction: A clear sense of where the organization is heading and how it will get There that is meaningful to all employees

Leadership: The extent to which leaders inspire action

Culture: Shared benefits and quality of interaction within and across unit
Accountability: The extent to which individuals understand what is expected of them, have authority to carry it out and take responsibility for delivering results.

Coordination: Ability to evaluate organizational performance and risk and to add opportunities when they arise.

Capabilities: The presence of institutional skills and talent required to execute strategy and create competitive advantage.

Motivation: Presence of enthusiasm that drives employees to put in extraordinary effort to deliver results.
External: Quality of suppliers, partners and other external shareholders to drive value.

Innovation : of new ideas and the ability of the organization to adopt and shape itself as needed

Responsible Fashion : Leading to Responsible Competitiveness

Technological Up gradation : Appropriate and Continuous up gradation and absorption

WHO SHOULD ATTEND

The garment industry owners, their CEO's, industry professionals, academicians, representatives from industry associations, researchers, consultants, service providers, final year and post graduate students etc.

INVITED SPEAKERS In (Alphabetical Orders)

SPEAKER	COUNTRY	SUBJECT
Anjuli Gopalakrishna Bruce Berton	India USA	Merchandising Enhancing Quality Focus, Customer Orientation and Customer Services.
Charles	Canada	"The Pursuit of Lean Effectiveness" (A Unified System of Business Management in Lean Organization)
Damandeep Singh Devangshu Dutta	India India	Carbon Disclosure Project Strategic Overview of the Global Garment Industry: Implications for Delhi NCR
Gunish Jain	India	Managing Uncertainty - A HR Perspective
James Hoerig	USA	Operational Excellence through Technology (RFID)
Kamal Sidhu Lal Sudhakaran	India India	Foreign Exchange Management India Operational Excellence - A Manufacturing Perspective
Philip Chamberlain	USA	Buyer's Perspective for Future Sourcing considering the Sustainable Business Development.
Praveen Nayar Prashant Agarwal	India India	Managing, Finance & Costs Motivation as a Productivity Enhancement Tool
Rajesh Bheda	India	Handling Customer Complaints Reliance
Indian Rayon Rajender Puranik	India India	Sourcing- Fabrics Merchandisers, As the face of the Company
Vijay Mathur	India	Social Compliance as the New Face of Competitiveness in Apparel Exports.
Vishal Mehta	India	Carbon Footprint Measurement - OGTC Case Study
Yoram Burg	USA	Operational Excellence through Technology

ORGANISING COMMITTEE

Chairman Mr. P.M.S. Uppal,
President OGTC

Co-Chairman Mr. Vijay Mathur,
Acting Sec. Gen. AEPC

For Further Details Contact:

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09810091812

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Conference Advisor
09868200116

Dr. Mona Suri
Convener Papers Committee
09810949709

CONFERENCE SECRETARIAT

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Phase I,
New Delhi -110 020 India
Ph. (91)11- 41609550
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Email :
ogtc@airtelmail.in,ogtc@rediffmail.com
Visit us at www.ogtc.in

Textsmile

A : I have the perfect son.

B : Does he smoke?

A : No, he doesn't.

B : Does he drink whiskey?

A : No, he doesn't.

B : Does he ever come home late?

A : No, he doesn't.

B : I guess you really do have the perfect son.
How old is he?

A : He will be six months old next Wednesday.

Delegate Fee ICAHT-12

1.	(a) Members of OGTC (b) Textile Association (I) (c) Noida /Gurgaon/Apparel Export Cluster (d) ATDC Faculty	Rs.3000/-
2.	Others	Rs.5000/-
3.	Indian Students through Institutes	Rs.2000/-
4.	Foreign Delegates	US\$.200/-

Cheque / Bank Draft to be drawn in favour of OGTC payable at Delhi.



Indian Textile Accessories & Machinery Manufacturers' Association

ITAMMA's initiative for the benefit of SMEs of Textile Engineering Industry with the support of NSIC Limited -- Focussing mainly on forthcoming 'INDIA ITME 2012' Exhibition

A Seminar - on Seminar on "Contribution of NSIC & Banking Sector in growth of SME's of Textile Engineering Industry" with the support of NSIC Limited was organized by ITAMMA in the M.C. Ghia Hall of the Indian Textile Accessories & Machinery Manufacturers' Association, at Bhogilal Hargovindas Building, 18/20, K. Dubash Marg, Kala Ghoda, Mumbai-400 001 from 5.00 p.m. onwards on 22nd June, 2012.

Shri N.D. Mhatre, Dy. Director General (Tech.), in his introductory remarks stated that "ITAMMA, even though being a body representing Textile Engineering Industry of India; has taken many initiatives in strengthening the bond between Textile Manufacturing Industry, Textile Engineering Industry and Textile R&D Institutes, which is utmost essential today for developing both the industries in the areas of Technology, Knowledge and Business. It is a known fact that the success of European Textile Engineering was due to the strong relation and interaction between these disciplines."



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

"However, today the scenario is something different as due to the closing down of textile mills and manufacturing industries in European Countries, the manufacturers there are hunting for tie-ups / collaborations with Asian Markets for sustaining their business; while the Textile Colleges and Universities abroad too are looking for transfer of Technologies in the countries like China, Taiwan and India."

"We think, this is the best opportunity for Indian textile industry to record its identity in the Global competitive market and such exhibitions are appropriate to have live interaction between two industries and further this is an appropriate step NSIC Ltd., has taken in regard with this exhibition to support ITAMMA in this mission for the benefit of SMEs."



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

Shri Chetan R. Ghia, President, ITAMMA, in his welcome speech stated that "'India ITME 2012' the largest and most prestigious textile engineering event will be held in India from 2-7 December, 2012 where more than 700 exhibitors in 655 individual stalls spread in 4 Halls covering an exhibition area in excess of 28000 to 30000 sq. mtrs. will be recorded. Considering the

average cost per sq. mtr. @ Rs.9,000/-, it indicates an investment of more than Rs.25 crores only in stall rent, where to an extent of 10 to 15% investment, i.e. about Rs.4 crores is contributed by the individual SMEs participating as Exhibitors. Further, more than 60% of them are ITAMMA members."

Shri Ghia added that "ITAMMA, being an oldest and largest Association in India representing Textile Engineering Industry, has always taken initiatives for the benefit of its members and Textile Engineering Industry as a whole, in the field of enriching knowledge and business growth. Realising the importance of our role in the 'India ITME 2012' Exhibition, ITAMMA has requested NSIC Limited to extend their help in availing the subsidy declared by NSIC Limited to the Exhibitors in forthcoming 'India ITME 2012' Exhibition."



Mr. Hemraj Singh, Chief General Manager, NSIC Limited, addressing the Inaugural Speech

Shri Hemraj Singh, Chief General Manager, NSIC Ltd briefed the audience about the various govt. initiatives, policies and intervention programmes for ensuring the upliftment and growth of the Textile Machinery & Accessories Manufacturers. He also informed the audience about the Govt. decision making it mandatory for all the govt departments and PSUs to pro-

cure atleast 20% from the SSI units from this financial year onwards. He assured the members of all sorts of help and urged them to come forward and avail these programmes for their benefit. He also emphasized on forming a strategic alliance to capitalise on the vast opportunities available to the textile machinery manufacturers in the next 10-15 years and increase the Indian market share significantly and become the leading suppliers of textile machineries and accessories.



Mr. Suryanarayanan, General Manager, CARE Rating Agency, delivering a Special Address

Shri Suryanarayanan, General Manager, CARE Rating Agency, emphasized that CARE rating is the only rating agency to have independent rating committee. While giving the introduction he mentioned that it was incorporated in April, 1993 as a Credit Rating, Information and Research Services Company, which was registered with SEBI under the Securities & Exchange Board of India Regulations in 1999 and is recognized by RBI as an External Credit Assessment Institution (ECAI) for Basel II implementation in India and follows best practices of IOSCO & ACRAA code of conduct.



Mr. Kamal Lochan Nayak, Branch Manager, NSIC Limited, delivering a Special Address

Shri Kamal Lochan Nayak, Branch Manager, NSIC Ltd., detailed the members about the various programmes and schemes of NSIC intended for bringing the overall development of the SME units in India. He deliberated on the various constraints present in the Textile Machinery manufacturing industry and showed the path for overcoming these hurdles with the help of various NSIC schemes like, iron / Steel/ Copper/ Aluminium procurement, finance facilities for procuring raw materials, machineries, etc., subsidies for participation in the domestic and international exhibitions, trade fairs, SPRS scheme under which the various exemptions are available to the SSI units for supplying the materials to the Govt & PSU sectors etc.



Mr. Manohar Choithani, Manager Marketing, Bank of India, delivering a Special Address

Shri Manohar Choithani, Manager Marketing, Bank of India in India stated that the SME sector contrib-

utes significantly to the employment and its contribution to GDP also confirms its economic importance. However, in spite of the value it adds, SME's continue to be undersupplied with financial products and services that would help them scale new heights. According to the SME chamber of India, SME's play a vital role for the growth of Indian economy by contributing 45% of industrial output, 40% of exports, employing 60 million people, creating 1.3 million jobs every year and producing more than 8000 quality products for the Indian and International market. SME's contribution towards GDP in 2011 was 17% which is expected to increase to 22% this year. SME's are now exposed to greater opportunities than ever for expansion and diversification across the sectors.

Looking into above facts, Bank of India has opened 21 centralised SME city centres all over India, mostly based in major towns with dedicated SME sales force and separate relationship management team. So today, they focus on **outreach** rather than responding to walk-ins only.



Mr. Ankur Sachdeva, Vice-President Marketing, CARE Rating Agency, delivering a Special Address

Mr. Ankur Sachdeva, Vice-President Marketing, CARE Rating Agency, through his power point presentation explained about the rating meth-

odology and significance of External Credit Rating for MSME.

He further explained in detail about the concept of Credit Rating, what it represents and doesn't represent. He also gave detailed explanation

on operation and financial risk factors. The topics like rating options for MSMEs, NSIC Care performance and Credit Rating for MSEs, long and short term rating scale-bank facilities were also covered in detail. Mr. Sachdeva further ex-

plained the need for rating supported by the benefits of same and concluded with the initiative of NSIC providing subsidy in the fee structure of Care Rating Agency.



TCL 2012, the International Conference on Textiles Coating and Laminating 2012

TCL 2012, the International Conference on Textiles Coating and Laminating 2012, is to be held in the prestigious Valencia Conference Centre in the beautiful and historic city of Valencia, Spain, on 15 -16 November 2012. The Textile Association (India) is supporting Association and JTA is Media Partner for this Conference.

Over nearly 20 years, the International Conference on Textile Coating and Laminating has built a reputation as a vital meeting place for the worldwide coating and laminating industry. Very different from an academic research meeting, TCL is a venue for practical presentations focussing on what is happening in the industry today and what will happen tomorrow. Supplemented by intensive discussion sessions actively led by the session chairs, TCL is the meeting place for senior managerial, technical and marketing staff from the international coating and laminating industry.

Keynote speaker will be the CEO

of Cooley Group, Dan Dwight, who will address many of the most topical concerns of manufacturing industry by speaking about Global Expansion through Sustainability and Social Responsibility. Mr Dwight will draw not only on his experiences with Cooley but also on his work in renewable energy and his time at General Electric to show how sustainability and social responsibility improve long-term value creation.

The conference will include presentations on:

- ◆ Production processes; Multi-functional textiles; Base fabric interaction
- ◆ New materials; Microencapsulation; Nanotechnology and nanofibres
- ◆ Plasma treatment; Welding; Specialty laminates

The topics will be discussed in relation to:

- ◆ Practicality; Cost-effectiveness; New opportunities and applications
- ◆ Environmental impact and sustainability

A special program on the afternoon of the second day will look at a range of important and emerging applications for coated and laminated materials.

Who should attend?

- ◆ Managing Directors, CEO's, Presidents and other senior managers of companies involved with the textile coating and laminating industry, whether suppliers, processors, or end users.
- ◆ Technical directors and managers concerned with the latest developments in fibres, fabrics, adhesives, films, polymers, coating and laminating techniques, converting, etc
- ◆ Marketing directors and managers who need to keep up to date with market developments and the prospects for coated and laminated textiles
- ◆ Industry analysts and others concerned with the future of the global textiles coating and laminating industry.

Early-bird registration

Now open at www.intnews.com/TCL2012.

More information

www.intnews.com/TCL2012 or sales@intnews.com

Texttreasure

If your actions inspire others to dream more, learn more, do more and become more, you are a leader.

- John Quincy Adams



ITMA 2015 to drive sustainable innovations in textile and garment machinery

17th edition returns to sizzling fashion capital of Milan for the fifth time

ITMA, the world's most established textile and garment machinery exhibition, will put the spotlight on innovations that promote sustainability for its 17th presentation in Milan, Italy, in 2015. A trendsetting showcase of exciting innovations since 1951, the theme chosen for the 2015 edition is 'Master the Art of Sustainable Innovation'.

Mr Stephen R Combes, President of CEMATEX, which owns the show, said: "The drive towards sustainability is increasingly integrated with enlightened business practices. The keyword here is 'sustainability', and we hope industry members will join us in this responsible mission to promote more eco-friendly solutions and practices for the entire textile and garment value chain."

ITMA 2015 will continue to be an industry leading platform for the textile and garment community. It is expected to span over 100,000sqm of net exhibit space and attract over 1,400 exhibitors. Miss Maria Avery, Secretary-General of CEMATEX, said: "In 2011, we introduced several new ideas that have enhanced the participation of all stakeholders. They included the inaugural World Textile Summit and Sustainable Textile Leaders Roundtable Dialogue. These were immensely popular and we intend to continue with them. We hope to further enhance the relevance and look at how we can better support the green theme."

New initiatives to drive industry forward

Among the new initiatives that will

be organised in line with the theme are conferences and workshops on sustainable innovations. The exhibition will also have a bigger focus on the waste management and recycling sector. In addition, for the research and education (R&E) sector, more emphasis will be placed on innovations that promote sustainability.

Ms Sylvia Phua, CEO of MP International which is organising ITMA 2015, added: "ITMA has always been a catalyst for industry competitiveness for over 60 years. Besides the mindset change, we believe that innovative technologies hold the key to environmental sustainability."

MP International will be working closely with CEMATEX and other key associations to ensure the new initiatives are relevant for industry players to allow for maximum benefits for their participation. Besides the value-added initiatives, ITMA remains the global marketplace and one-stop sourcing platform for emerging trends and innovative solutions.

Fashion capital presents a venue of choice

An ideal city to host ITMA 2015, Milan is widely recognised as one of the world's fashion capitals, with a long history within the fashion, clothing and textile industries. Hosting ITMA for the fifth time, the city continues to draw fashion aficionados, supermodels and international media twice yearly for its spring and autumn fairs.

Fiera Milano Rho boasts one of the largest fairgrounds in the world,

spanning 345,000 square metres of covered gross exhibition space. The venue is well-equipped with some 10 conference halls and a host of restaurants, bars and coffee houses. Designed by architect Massimiliano Fuksas, Fiera Milano Rho is located in the west of Milan and connected to the city centre via a dedicated metro station, Rho Fiera. It is also served by railway and there are 14,000 parking spaces for visitors. Fiera Milano Rho is also the site of World Expo 2015, which will take place from May to October 2015.

ITMA 2015 will be held from 12 to 19 November, and space application for the exhibition opens in mid 2013. For more information and updates, please visit www.itma.com.

For more information, please contact:

Miss Maria Avery Ms Daphne Poon
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Textsmile

A : I have the perfect son.

B : Does he smoke?

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A : He will be six months old next Wednesday.



SUPER TEX in ITMA ASIA + CITME 2012

SUPER TEX had participated in ITMA ASIA + CITME 2012, Shanghai China exhibition. They were the only cots and aprons manufacturer from India who participated in this exhibition.

SUPER TEX displayed all types of cots and aprons used for Spinning / Twxturising / Air Jet / Compact Spinning machines. SUPER TEX is well represented in China in Spinning & Texturising Industry. It has multiple agents who handle SUPER TEX products efficiently in different parts of China.



We would say the response was average the reason being the increasing number of textile exhibitions has internationally & region-

ally. Almost every country that is in textile manufacturing has their own local / regional exhibition in their country and all the information is available at the doorstep. Most of the visitors in the spinning section were from China followed by INDIA, Pakistan, Iran & Indonesia.

The local spinning industry in China is slowing down as it is facing challenges of high labor & electricity cost added by economic crises worldwide. The new spinning investments are very few this years as compared what it was during the last decade. China is mostly dependent on export market as it has more spindles (80-90 million) than required for the domestic market. Other few reasons for this may be the fluctuation in the raw material prices, which has started since 2008-2009 and currency (RMB) appreciation since last 3-4 years.

SUPER TEX is trying to penetrate in China market as they still see lot of space to penetrate in this market and are putting more efforts for the same.

of our new division "Processing Accessories", we aim to offer solutions in safety and savings.

With this tie -up, the strongest point to be mentioned is CEIA SpA, our Italian partner, are pioneers in this field, with a complete robotized plant & a strong team dedicated towards R & D. CEIA already has 56 patents in the field of electro magnetism, and they also have to their credit of supplying 100 thousand units across world -wide in various fields of industrial and non-industrial metal detection.

They cater to various sectors such as transportation, shipping, pharmaceuticals, food industry, agriculture, textiles, plastics, mining, construction & various other sectors.



CEIA metal detectors have high reliability and are based on plug and play concept with built-in function for automatic measurement of the external interferences. CEIA - the leading & a premier security provider, along with A.T.E., a textile engineering giant, with their recent association are hopeful of creating new success stories for their customers.

References : We have supplied CEIA metal detector TE - SLD to Kriplon synthetics, Mandhana dyeing, Bombay Rayon Fashion Limited, Balkrishna synthetics - Boisar, Shivalik Prints - Faridabad, Alps Industries - Meerut.

A.T.E. and CEIA - providing assurance to your machines against foreign metal particles



A situation of production lines stopping suddenly due to small metal particles entangling in the textile, resulting in damage of some crucial components of a machine is experienced by customers. The damage to the machine components and the stoppage of the production lines results in safety issues and huge losses. To avoid this, it is necessary to install a metal detector which can protect the production lines against

all metals.

A.T.E. having made its strong presence in the textiles sector, with more than 7+ decades has already established itself as a "one window solutions" provider. A.T.E. has now also made its presence felt in the field of processing accessories, while simultaneously expanding in other business areas. With our recent tie-up with CEIA and establishment



"VASTRA" - 2012- An International Textile & Apparel Fair 22-25, November 2012, Jaipur, Rajasthan

"VASTRA" - 2012 is a comprehensive trade fair and conference on Textile and Apparel. It promises to showcase the best and latest in textiles from - Fibre to Fashion, covering a complete range of High Fashion Women, Men & Kinds (Casual & Formal) Wears, Specialty Garments, Sportswear, Knitwear, Fashion & Accessories, Home Furnishings & Made-Ups, Bed Linen, Bath Towels, Curtains, Kitchen Linen, Napkins Cushion Covers, Floor Mats, Curtains & Embellishment, Fabrics & Garments, Synthetic & Rayon Fabrics, Handmade Fibres & Blends, Cotton Fabrics, Woolen Fabrics, Yarn & Made Ups, Technical Textiles, Handmade Silk Art Silk & Silk Sarees, Made Ups Dress Materials, Fashion Wears, Drill Crapes, Satin, Twill Sarees & Handkerchiefs, Blankets, Shawls, Strolls and Made Ups, Handloom Clothing, Handloom Bed Covers / Spreads, Handloom Curtains, Carpets, Durries and Rugs, Textile Based Handicrafts, Fashion Jewellery and Accessories, Jute Specialties, Packaging Materials, Floor Coverings, Sopping and Carry Bags, Wool And Woolen Products, Made Ups, Dress Materials etc. Handicrafts and Fashion Accessories Etc. Traditional Textiles, Textile Technology and Machineries.

Objectives of VASTRA 2012 -

- ◆ Showcasing India as sourcing Hub and investment destination
- ◆ Showcasing the entire value chain - Fibre to Fashion
- ◆ Presenting business opportunities

- ◆ Showcasing latest in technology and applications
- ◆ Bridging gap between Indian and Global companies through joint ventures, setting up of R&D base and strategic alliances
- ◆ Creating platform of interaction with experts, scientists, technocrats, Govt. agencies in textiles and garment
- ◆ Showcasing infrastructure availability for textile industry
- ◆ Discussions and deliberations on product and process improvement, new applications, research & development, new trends and fashion, environmental concern.

Federation of Indian Chambers of Commerce and Industry (FICCI) & Rajasthan State Industrial Development and Investment Corporation Ltd. (RIICO) are jointly organising "VASTRA - An International Textile and Apparel Fair 2012" (VASTRA - 2012) scheduled from 22nd to 25th November, 2012 at EPIP, Sitapura, Jaipur, India. This is being supported by Ministry of Textiles, Government of India.

VASTRA-2012 offers a host of business opportunities to the exhibitors and visitors :-

- Showcasing products and capabilities for business enhancement
- Launching new products
- Creating brand awareness
- Enhancing corporate image
- New applications and solutions
- Sourcing latest in products and technologies
- Business meetings and networking opportunities

Joint Ventures, Collaborations, Strategic Alliances
New Investments
Exposure to infrastructure availability

Product Profile

VASTRA-2012 aims to showcase the entire value addition chain from fibre to fashion - products as well as technology.

Fibre
Yarn
Fabric
Garments & Apparels
Made ups and accessories
Technical Textiles
Fashion Trends
Traditional Textiles
Technology and Machineries
Infrastructure for textile industry in India.

VASTRA Exhibition Highlights

First ever international exhibition on Textiles & Apparel in India
More than 10000 sq.mtr. exhibition area
More than 500 exhibitors across entire textile value addition chain - Products, Machineries, Technology
International participation
States` pavilions
Fashion show, Business shows
Fashion Designers & Studios
Live demonstration of traditional textile craft
Concurrent conferences
Business & Networking opportunities
International and Indian delegations
Buyer - Seller Meet
Participation by Government Agencies

Exhibitors Profile

Manufacturers and suppliers of :

Entire product value chain - Fibre to Fashion
 Plant & machinery
 Accessories
 Dyes & Chemicals
 Technology suppliers
 Fashion designers
 Countries and States through specific pavilions

Sectoral Industry Associations, International Industry Associations
 Research and Development, Education and Training Institutions

"VASTRA"-2012 is planned to highlight business opportunities and provide opportunities for exploring avenues for new business relation, joint

ventures, strategic alliance and partnerships worldwide. It will provide a platform for interaction with Foreign buyers through pre fixed B2B meetings and also interaction with experts and R & D labs for solutions in latest designs & trends besides textile technology.

Congratulations



Mr. A.K. Upadhyay receiving Award by hands of Honorable Shri Bhagat Churni Lal, Cabinet Minister, Punjab

Mr. Arvind Kumar Upadhyay is B.Tech & M.Tech. (Textile Technology), from Govt. Central Textile Institute, Kanpur. He is a dynamic and result oriented techno commercial textile executive with proven track record and has expertise in turning around the operations. He has 35 years of association with Organizations of high repute in India and abroad named as SKNL, Dewas.

Mr. A.K. Upadhyay is presently working as Vice President, OCM,

India Ltd., Amritsar was recently on 26th May 2012, awarded with Management Excellence Award by Management & Industrial Development Institute, Jalandhar (Punjab).

He has worked with operations as COO, Raymond, Digjam, Bhojsons Industries, Lagos, Nigeria as Director Operations Rupa Mills (Ex Raymond), Kenya as Director Technical. Mr. Upadhyay is having a high degree of adaptability by working in various textiles fields has been the hallmark of his career. He has

functional versatility of a complete textile Executive with conceptual vision and thinking for Innovation & continuous up-gradation. He actively involved in the policy formation for the survival of M.P. Textile Industries and Textile Industry in Nigeria through the Umbrella Organization of Nigerian Textile Mills Manufacturers Association for fixing tariffs and other fiscal measures including the dealing with W.T.O. by the Govt. for the protection of Local Industries.

Mr. Arvind Upadhyay was past Chairman of The Textile Association (India), M.P. Unit and under his leadership TAI - M.P. Unit organized a 65th All India Textile Conference in a grand success. He was also a Member of Corporate Advisory Board in Prestige institute of Management, Dewas, M.P.

In this joyous moment on behalf of The Textile Association (India) heartily congratulates him for this prestigious award. Association wishes him all the best for his future and endeavors for scaling new heights.

**Grow your organization's
 business share through JTA**



Rieter looks back on a successful ITMA Asia + CITME 2012

Rieter's trade-fair appearance was distinguished by many interesting discussions on the 4 spinning systems and on the complete solutions offered by Rieter. Energy savings and high fiber utilization were the central focus of visitors' interest. The red armchair from "The Comfort of Competence" campaign will be a lasting memory with visitors to the Rieter exhibition stand in Shanghai.



The Comfort of Competence

Rieter is the leading supplier for plants producing yarns from short-staple fibers. As a competent partner, Rieter makes the customers' lives easier and supports them from the initial investment discussions right up to the successful operation of a spinning plant. Expertise from

the fiber to the yarn and the finished textiles are the basis for innovative machines and unvarying yarn quality.

All this was demonstrated by Rieter on the exhibition stand at the ITMA Asia + CITME 2012 in Shanghai. The Red Armchair - The Comfort of Competence

The chance to be photographed in the red armchair with the 4 Rieter models was a highlight for many visitors to the Rieter stand and drew a smile from many. The armchair symbolizes "The Comfort of Competence" and the 4 models were dressed in garments made from the 4 Rieter yarns.



8th Annual Function on 27th June 2012 at India Habitat Centre-New Delhi OGTC taking Corporate Social Responsibility to a new level:

A recent recommendation by the Ministry of Corporate Affairs to make it mandatory for companies in the Large & Medium Sector to pledge 2% of their Annual Profits for CSR activities was met with such vocal criticism that the GOI caved into their demands and shelved the resolution. In total contrast and contradiction OGTC, the apparel gateway to India, which includes a consortium of Small & Medium Scale Industries, has been consistently working to better the cause of its employees, the society and the planet.

On a typically hot Indian summer night on June 27th, 2012 members of OGTC gathered at the India Habitat Centre, New Delhi to celebrate the 8th year of OGTC's inception. The event's Chief Guest was Mr. Paolo Guidotti, Country Manager-India Timberland. Distinguished

Guests were from all facets of the industry - including Govt. officials Manufactures, Retailers, Media and Consultants.



Chief Guest Mr. Paolo Guidotti Delivering Special Address

OGTC takes Social Responsibility very seriously. Since its inception in 2004, the body has been quietly working at the grass root level conducting a number of activities which include - Health Check-Up Camps for employees, Awareness against Child Labour, Training and Employ-

ment to the Physically Challenged, Cancer Awareness, Women Empowerment, Lean Transformation, productivity improvements, Quality Improvement, Merchandiser's Skill Development, Fire Safety, etc.

At the 8th Annual Function to celebrate OGTC's inception, the Garment Cluster added another feather in its cap, by becoming the first SME Garment Cluster in the world to launch the Carbon Footprinting Project.

As recognition of contribution to CSR the companies who had organized Health & Eye Check up camps were awarded certificates jointly by Lions Service Trust and OGTC.



Mr. PMS Uppal President delivering Presidential Address

Opening the proceedings, Mr. M.K Mehra - Director, OGTC, introduced the concept of 'Carbon Footprinting' that OGTC had undertaken. He spoke of the importance of the issue and how essential it was for the planet to work on carbon emission mitigation. In a similar vein, Mr. PMS Uppal - President, OGTC and Mr. R C Kesar - Director General, highlighted how OGTC was keen on tackling the issue of global warming at the grass root level. They spoke of OGTC's consistent commitment to their employees through various programs that they have initiated - Lean Management, Carbon Management, Health & Safety, etc to get them to participate better and be motivated. Keeping in mind the need for the common man to also get involved in the exercise they spoke of the Training programs conducted as part of the Carbon Footprint project. Interestingly the training programs were conducted at all levels - senior management, sourcing heads, mid-level, junior management and even the Floor managers of the participating units. A total of 13 units (details below), under the OGTC banner voluntarily opted to participate in the program and calculate their carbon footprint.



Releasing of OGTC Newsletter by Chief Guest Mr. Paolo Guidotti

Mr. Kesar also spoke of recognition of OGTC's work on the social front and announced about how OGTC were awarded the Bronze

medal by the European Cluster Excellence Initiative Bronze Label Certificate for their work on sustainability and social responsibility.



Mr. Paolo Guidotti Chief Guest presented Benchmarking Certificate to Mr. PMS Uppal

Before the Presentation by Mr. Pranam Reddy, Senior Managing Consultant from Cool Earth (Carbon Management consultants), lights were dimmed for the release of OGTC Goes green Poster by the Chief Guest. He spoke of the importance of Carbon Management and showcased the actions on the ground of various retailers across the globe on carbon emission management. The progress of the Carbon Footprint project was highlighted and an explanation of the various

steps involved in the implementation of the project was provided.



Eminent Personalities at the Function

The final speaker of the night was Chief Guest Mr. Paolo Guidotti, Timberland. Lauding the efforts of OGTC, he was very appreciative of the coordinated action taken up. More impressive was the fact that such an exercise was taken up voluntarily without any compulsion / stipulation from the retailers or customers of OGTC. Sharing details of Timberland's efforts on the home front and the various initiatives in place within their organization, he highlighted the growing importance to the issue & attention being given by the major retailers. Going forward there is little doubt that more suppliers across the globe would be asked to work on reporting their carbon emission footprint.



ASIAN TEXTILE CONFERENCE

A group of 9 individuals consists of **Maj. R.P. Poddar & Dr. N.M. Swami** from India, Dr. S.K. Song, Dr. S.Y. Kim & Dr. Soukil Mah from South Korea, Dr. C.H. Lin & Dr. S.C. Yao from Taiwan, Dr. Masao Takahashi from Japan and Dr. K.W. Yeung from Hong Kong, who discussed and drafted the MoA were its signatory, originator and the main founders of the Federation of Asian Professional Textile Association (FAPTA). Besides these 9 founder members, there are no other founder members of FAPTA.

Mr. M.K. Mehra, being President of

the host unit, was the founder President and Mr. P.S. Jain as Chairman of the Conference Committee for 1st ATC organized by TAI Delhi unit at New Delhi in 1991.

Next ATC-12 will be held at China in 2013 and Prof. Jae R. Youm will be the Chairman for the same. All related textile educational & research Institutes are invited to take participation in this conference and visit their official website for more information. Website details will be announced in our Journal and on TAI website.



An International Conference on Health, Wellbeing, and Sustainability -

Nirmala Niketan College of Home science

Nirmala Niketan College of Home Science, University of Mumbai, Mumbai - INDIA is hosting and organizing An International Conference on Health, Wellbeing, and Sustainability. Opportunities, Challenges and Future Directions on 10th - 12th January 2013

The College, founded in the year 1955, is one of the premier Home Science Colleges in India and has the unique distinction of being the only Home Science College affiliated to the University of Mumbai. It is a 'grant-in-aid' Institution, managed by the Nirmala Niketan Institute, with the primary aim of empowering women to face the challenges of a changing modern India.

It offers an education that ranges from the junior college to the doctoral program. Students can specialize in one of the four disciplines:

- ◆ Foods, Nutrition and Dietetics,
- ◆ Human Development,
- ◆ Textile and Fashion Technology
- ◆ Community Resource Management

About the Conference

International Conference 2013 on "Enhancing Health, Wellbeing and Sustainability - Opportunities, Challenges and Future Directions" will be an International Forum for those

who wish to present their projects and innovations, having also the opportunity to discuss the main aspects and the latest results in the field of Education and Research.

It is hoped that interactions at the conference will help deal with the above issues and challenges and others raised in the course of the deliberations.

1. Environmental Concerns and Sustainability
2. Social Justice Issues and Sustainability
3. Health and Wellbeing
4. Positivity and Wellness

Important Dates

- ◆ Last date to submit Abstract - 31st August 2012
- ◆ Last date to issue Notification of acceptance of abstract - 30th September 2012
- ◆ Early bird registration - 15th October 2012
- ◆ Last date to submit authors' registration - 15th October 2012
- ◆ Last date to submit final full length paper - 23rd November 2012

Who should attend this Conference?

This conference will be catering to students, academicians, practitioners, professionals from the industry, and

entrepreneurs, from varied disciplines -

- ◆ Nutritionists
- ◆ Dieticians
- ◆ Medical and Allied Personnel
- ◆ Psychologists
- ◆ Psychologists
- ◆ Counselors
- ◆ Psychiatrists
- ◆ Social Workers
- ◆ Educationists
- ◆ Textile Specialists
- ◆ Textile Processors
- ◆ Fashion Designers
- ◆ Fashion Stylists
- ◆ Garment Manufacturers and Exporters
- ◆ Interior Designers
- ◆ Human Relations Managers
- ◆ Anthropologists
- ◆ Philosophers
- ◆ Ergonomists
- ◆ Environmentalists
- ◆ Agriculturalists
- ◆ Supervisory personnel involved in Housekeeping and Hospitality
- ◆ Media and Communication personnel
- ◆ Human Resource Management professionals
- ◆ Government and Non-Governmental organizational personnel.

For more details about the conference visit : www.ic2013nn.com

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Obituary



*Prof. R.P. Gupta
(1928-2012)*

Prof. R.P. Gupta, most humble person of The Textile Association (India), Baroda Unit, accidentally passed away at the age of 84 years on 03rd July 2012.

Prof. Gupta, B.Sc, D.T.C., AMIET (London) & ATA qualified, was a very active and indeed he played very important role not only for Vadodara Unit, but he was a National figure and fountain of spirit. He always encouraged every one and never talked bad about any one. In Vadodara, he tried to go out of the way to make G.C. members comfortable. The man always lived for TAI activities and he actively

worked for it. He was always happy and never gets angry and also never expected personal benefits out of any thing.

Prof. Gupta was very actively associated with Textile Association (India), Baroda Unit since 1966 and worked on various positions as Hon. Secretary, Vice President and President of Association. He was senior most G.C. member and trustee of the TAI central office. Also he was a member of various committees. Under his dynamic leadership TAI Baroda unit, was awarded twice Best Unit trophy. Baroda Unit hosted 3 All India Textile Conferences in Baroda (9th - 1952, 20th - 1960 & 27th - 1970). Prof. Gupta was the first recipient of Service Memento in 1979 and then recipient of Service Gold Medal in 1982 awarded by the Textile Association (India) during the All India Textile Conferences. He has published number of articles in journals.

Prof. Gupta served in M.S. University in Dept of Chemistry for 34 years and then 10 years as faculty member and 20 years as ACC officer. He represented M.S. Univer-

sity for more than 15 times in inter university competitions in various cities of India. He was also Senior Press Supervisor in University press. Prof. Gupta also contributed his services more than 20 years as Senior Tabulator in preparing University results.

Prof. R.P. Gupta basically a R.S.S. Volunteer (since year 1940), was also actively associated with several local social and educational organizations. He used to convey the slogan that "Be happy, be laughing and live healthy". He was very punctual in time bond and not having any sort of habits other than physical exercises in which he is expert & master.

The Textile Association (India) will never forget his missionary services and feel honor for providing yeoman's service to The Textile Association (India). We pray Almighty to bestow eternal peace to the departed soul. We also pray Almighty to give bereaved family members all the courage to withstand the loss.



War against copycats at ITMA ASIA

The French Textile Machinery Manufacturers invited the press at the end of ITMA ASIA + CITME in Shanghai this June 2012. The informal and friendly meeting made possible direct contacts between the textile journalists and the machinery manufacturers, their Association's President, Bruno AMELINE and Secretary General, Evelyne CHOLET.

- Business was good at ITMA ASIA.

"Our customers are finalising many projects and, as our orders backlog

is already good, delivery time is increasing for all the machinery producers. Customers from China of course but also from India, Pakistan, Thailand and Iran visited our booths, they were particularly interested by our new technologies and our service approach," reports Evelyne CHOLET.

Some manufacturers were particularly enthusiastic about future business in India, where the textile industry needs an urgent modernization even though the implementation of the Technology Upgradation

Fund Scheme (TUFS) put in place by the Indian government is going through some delays. Also some delays are noticed in Middle Eastern countries due to the political turmoils which took place.

"But what is important analyzes Bruno AMELINE is that our customers have a real willingness to invest for the future of their own companies. They are aiming at new markets, new products, and resource efficient production processes which bring raw materials and energy savings, and they know they can rely on us to be their technology partners in many sectors".

- But the main topic at the press

meeting was the war against copycats.

"It is a global war, said Bruno AMELINE. We fight and will continue to fight all over the world because our strategy is based on Research and Development, on technology breakthroughs and on protecting our patents, brands or any other intellectual rights."

Fortunately this fight against copycats which is part of the international trade agreements is given

more and more support by the governments and the judicial systems. In China, for example, some very positive judgments have given our members significant damages for infringement by unfair competitors and some of these have even been sentenced to jail.

Such organizations as ITMA ASIA+ CITME are also helping the creative machinery manufacturers against unfair competition and machines were covered during the fair

because they were found to infringe on other exhibitors' patents.

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ITMA ASIA + CITME drawn overwhelming response

The third ITMA ASIA + CITMA exhibition geared up to showcase the latest technology in textile machinery for five days from 12th June 2012 at the Shanghai New International Expo Centre (SNIEC), Shanghai, China.

Despite current challenges in the economic climate, owners of ITMA ASIA + CITME held the expo on additional exhibition space to meet exhibitors demand. With the additional 6000 sqm exhibition space, the expo has a gross area of 132,000 square metres i.e. 30% larger than the previous show in 2010 and more than 1230 exhibitors from 27 countries and regions have participated at the 5 day event.

The expo has drawn overwhelming response from Asian buyers, especially Chinese visitors from major textile making hubs in the country. In today's challenging business landscape, there is big demand for cost-effective solution, Asian industry players are looking at a greater return on their investment and to find out the need among the comprehensive range products from this show.

Interest in the combined show re-

mained extremely strong, especially from Chinese textile machinery manufacturers, as China's textile Industry continues to transform, the demand for advanced machinery and technology is on the rise. China Customs statistics reveal that China's textile machinery foreign trade registered a year-on-year growth of 25% to reach US\$ 7.6 billion in 2011. Of this sum, exports amounted to US\$ 2.25 billion while imports totaled US\$ 5.36 billions.

ITMA ASIA + CITME 2012 boast a huge showcase of exhibits displayed over 17 sectors, ranging from spinning, nonwovens, weaving, knitting, processing, finishing, testing, handling to packing. Chinese exhibitors made the biggest country group, booked around 50% of the total exhibition space. Next to China, the bigger participating countries in terms of space booking were Germany, Italy, Japan and Switzerland.

ITMA ASIA + CITME 2012 was organized by the Beijing Textile Machinery International Exhibition Co. Ltd. and Co-organized by MP International Pte. Ltd. The Japan Textile Machinery Association (JTMA) was a special partner as-

sociation of the show. It is owned by the CEMATEX, the Sub Council of Textile Industry of the China Council for the promotion of International Trade (CCPITTEX), the CTMA, and the China International Exhibition Center Group Corp (CIEC).

On behalf of The Textile Association (India), Mr. J.B. Soma, Publisher, Journal of the Textile Association visited the ITMA ASIA + CITME 2012 exhibition, Shanghai.

Textsmile

*Two factory workers are talking.
The woman says, "I can make the boss give me the day off."
The man replies, "And how would you do that?"
The woman says, "Just wait and see." She then hangs upside-down from the ceiling.
The boss comes in and says, "What are you doing?"
The woman replies, "I'm a light bulb."
The boss then says, "You've been working so much that you've gone crazy. I think you need to take the day off."
The man starts to follow her and the boss says, "Where are you going?"
The man says, "I'm going home, too. I can't work in the dark."*

Glimpses of ITMA ASIA + CITME 2012



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 No. 34, Second Floor, 17 th Cross, Cmh Road, Laxmipure, Bengaluru, India.
Tel. : +(91)-(80)-41151841 / 2554471 /
Fax : +(91)-(80)-2554471

INDIA ITME 2012 - 9th India International Textile machinery Exhibition

Date : 2-7 December 2012
Venue : Bombay Convention & Exhibition Centre, Mumbai
Contact : India ITME, Society Route Map 76 Mittal Tower, 'B' Wing 7th Floor, 210 Nariman Point, Mumbai - 400 021.
Tel. : +91-22-2202 0032 / 2282 8132 / 2285 1579
Fax : +91-22- 2285 1578
E-mail : contactat@india-time.com

Vastra 2012, International Textile & Apparel Fair

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

ABROAD
51st Dornbirn Man - Made Fiber Congress

Date : September 19 - 21, 2012
Venue : The Kulturhaus Dornbirn Congress Centre, Dornbirn, Austria

Austrian Man Made Fibers Institute
 (Austrian - MFI)

Osterreichisches Chemief Aser Institut

Contact : Congress Office :
 Romerstrasse 2, A-6900 Bregenz, Austria
Tel. : +43 (0)5574 54720
Fax : +43 (0)5574 43443 4

28th IAF World Apparel Convention 2012

Date : September 24 - 28, 2012
Venue : Sheraton Parto Hotel & Spa, (Oporto), Portugal
Contact : Marier Solle
 Romerstrasse 2, A-6900 Bregenz, Austria
Tel. : +31 30 232 09 01
Fax : +31 30 232 09 99
E-mail : solle@iafnet.com

6th Aachen Dresden International Textile Conference 2012

Aachen Dresden is an international textil conference specially for the experts in the field of Textile Chemistry, Finishing & Functionalization.

Date : November 29 -30, 2012
Venue : Germany
Contact : Ms Annett Doerfel
 Institut of Textile Machinery and High Performance Material Technology at TU Dresden, Germany
Tel. : +49 (0)351 463 39321
E-mail : annett.doerfel@tu-dresden.de
 www.aachen-dresden-itc.de

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Date : 3rd to 6th October 2012
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Tel. : +92-21 35810637, Fax: +92-21 35810636
E-mail : info@fakt.com.pk
Website : www.igatex.pk

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