Sarex

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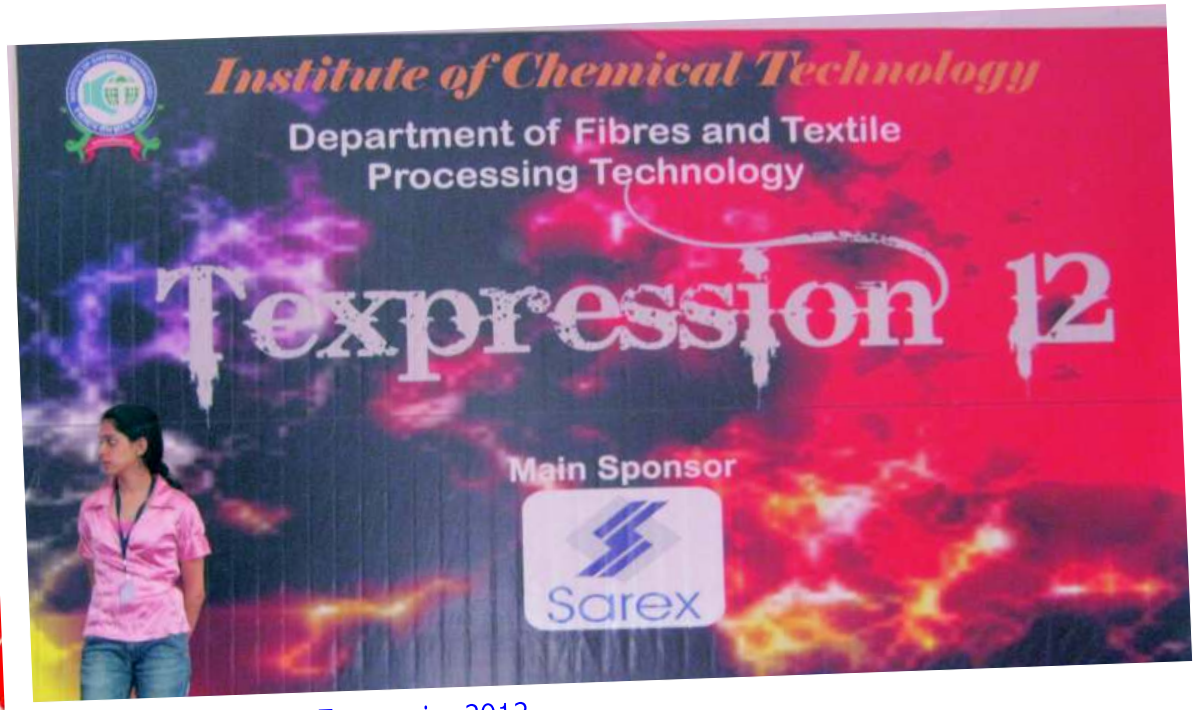
Saraquest

Exclusive Insight



Sarex Sponsored Event: Texpression 2012

This year Sarex sponsored Texpression and Texquest event organized by the Textile Department of ICT (formarly known as UDCT) on 21st March 2012. Texpression is the yearly meet of the alumni and well wishers of this department with the present students and Faculty of the Department while, Texquest is the national level technical paper presentation competition of students on latest topics of interest for the textile industry.

Texquest gives an opportunity to the students of various Textile Institutes from all over India, to present their papers in the spirit of Healthy Competition. This programme was the feast of knowledge where selected presentations were made on the topics of contemporary importance.

Contents

INKJET Printing

Sarasol-1101

The attraction to textiles with multi coloured designs has continued for centuries. Printing contributes an important role in decoration of fabric, clothing, sports wear and numerous other aspects. Printing is a process of applying colour to fabric in a definite patterns or designs. It is also known as localized application of dye or pigment in thickened form to substrate to create an attractive design with well defined boundaries. Printing not only makes a fabric look attractive, it also helps hide manufacturing defects.

Due to aesthetic appeal, the demand for printed textiles is increasing day by day. The development of textile printing has forced. Printersa to think to reduce the time, latest technology with innovative products to get better quality of prints. Now a days, along with good appearance, the customers are also conscious about the quality.

The recent advances in textile printing include non-impact printing, which comprise techniques like Electrophotography, magnetography and inkjet printing.

Ink Jet Printing

Ink-jet printing is one of the most innovative development fields during the last few years. The first successful product using ink-jets was developed by Elmquist in Sweden in 1951 using the continuous ink jet method which was further modified by Hertz. The second major break through in the inkjet technology of drop on demand was invented by Zolten in 1972. More recently, the hot melt ink-jet system (also known as solid ink-jet and thermoplastic ink-jet) was discovered by Data products, Howtek and Tektronix which was gained extensive demand from the market.

As a consequence, the technology is moving into textile printing and fabrication of color filters for liquid crystal displays. Ink-jet printing had myriad applications, such as in photographic imaging, producing large color posters and in other industrial applications viz marking , coding and addressing of packaging material.

Several factors play a key role in he successful operation of ink-jet system, including hardware design, computerized color management: ink and E formulations.

Ink-jet technology

Ink-jet printing simply involves squirting droplets of ink on to a substrate to produce an image. Ink-jet can be divided into two major technology types: continuous and drop-on-demand .

Ink Formulation and Substrate

Pretreatment:

The ink formulation for any jet printing system must meet very stringent physical and chemical criteria. It must be formulated to yield very specific properties that enable optimum drop formation and compatibility with the particular printer, while at the same time giving excellent image and color quality.

Pre and post treatments:

In case of inkjet printing, a highly effective pre-treatment is necessary. Fabric must be singed to remove surface hairs to have better fabric printing quality and also to prevent the risk of flaws being generated by surface fibres touching the print head and blocking the nozzles. Removal of impurities from fabrics are essential with uniform absorbency and whiteness. In inkjet printing the colour depth obtainable is an important limiting factor and mercerized cellulosic fabric can be used to increase the apparent colour depth of the print.

For jet printing of textiles using piezo or bubble jet printers the fabric is first given a treatment by padding with a solution of thickener and a variety of agents to facilitate dye absorption and fixation followed by drying. This results in the droplets of dye being absorbed largely on to the surface fibers and produces a stronger, more sharper prints despite the fact that wetting out is inferior as compared to the untreated fabric. This is because of the very low pick up of printing ink compared with conventional screen-printing method.

Sarex has developed speciality product for pretreatment of Inkjet printing 'Sarasol-1101"

Unique Features of Sarasol-1101

- Sarasol-1101 is a specialty product for improvement of colour value during ink-jet printing on all types of fabric with disperse reactive and acidt

.

- Sarasol-1101 is used in padding before ink-jet printing, which increases the localized viscosity of ink, thereby avoiding bleeding and spreading of prints.

- Sarasol-1101 improves, levelness, sharpness and color yield of prints

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- Sarasol-1101 is ready to use product only dilution is required

- Sarasol-1101 is consistent in term of viscosity, rheology and performance.

- Sarasol-1101 is stable on pretreated fabric as there is no bacterial attack.

- With Sarasol-1101 the feel of the fabric is not affected.

- Sarasol-1101 controls inks deposit on the fabric.

Application Recipes for Inkjet printing

Ink-Jet direct printing on polyester (Disperse ink)

Fabric pretreatment with
Sarasol-1101: 80-100 g/l
Sarakol-NF : 5-10 g/l
Padding followed by drying and then ink-jet printing. Steam at 180 deg.C for 8 min or thermofix at 180-190 deg.C for 1-2 min or calendering at 200-210 deg.C for 30 sec.

Printed fabric is given washing as follows:
Rinse 5 min with cold water and soaped for 5 min at 40 deg.C with 1 g/l Sarakol-CR and reduction clearing with 0.75-1 g/l Reducon-ACD(Conc) at pH 4.5 – 5.0 at 60-70 deg.C for 10 min.

Ink-Jet printing on cotton or viscose (Reactive ink)

Fabric pretreatment with
80-100 g/l : Sarasol-1101
5-10 g/l : Sarakol-NF
50-100 g/l : Urea
30-40 g/l : Soda-ash
10- 20 g/l : Super R Salt
Padding followed by drying and then ink-jet printing, Steam at 102-105 deg. C for 7-10 min or thermofix at 140-150 deg. C for 3-5 min.

Printed fabric is given washing as follows:

Rinse 5 min with cold water and soaping-off with 1 g/l Sarakol-CR at 98 deg. C for 5 min. twice. Rinse 3 min at boil (twice). Rinse 5 min with warm / cold water.

Ink-Jet printing on silk, wool and polyamide (acid and metal complex inks)

Fabric pretreatment with Sarasol-1101 (silk):
80-100 g/l Sarasol-1101
80-100 g/l Urea
10-20 g/l Ammonium Sulphate
10 g/l Supergen MXFabric

Pretreatment with Sarasol-1101 (wool, polyamide):
100-120 g/l Sarasol-1101
80-100 g/l Urea
10-20 g/l Ammonium tartrate (25%)
10 g/l Supergen MX

Padding followed by drying and then ink-Jet printing Print-steam at 102-105 deg.C for 10-20 min followed by washing.

In case of polyamide / wool fixation with 0.4-1.5 g/l Sarafix (NEW), pH 4.5-5.5 at 70-80 deg.C for 15-20 min is recommended.

Advantages of Digital Printing

- Digital Printing is creative, rapid .
- Digital printing allows avoid engraving and from sampling to printing with the same machine thereby extremely short delivery time.
- Reproducible results obtained
- Design can be changed on-line by using computer controlled ink-jet nozzles.
- Ink-jet printing saves time. It speeds up the process between design and industrial production sampling for shade
- Environmentally friendly, water and energy consumption low.

PRINTING : an art of multicolour design

INTRODUCTION

Textile printing is the most versatile and important of the methods used for introducing color and design to textile fabrics. Considered analytically, it is a process of bringing together a design idea, one or more colorants and a textile substrate, using a technique for applying the colorants with some precision.

Early forms of textile printing are stencil work, highly developed by Japanese artists and block printing. In the latter method a block of wood, copper or other material bearing a design in intaglio with the dye paste applied to the surface is pressed on the fabric and struck with a mallet. A separate block is used for each color, pitching the pins at the corners guide, the placing of the blocks to assure accurate repeating of the pattern.

In cylinder or roller printing, developed c.1785, the fabric is carried on a rotating central cylinder and pressed by a series of rollers each bearing one color. The design is engraved on the copper rollers by hand or machine pressure or etched by pantograph or photoengraving methods; the color paste is applied to the rollers through feed rollers rotating in a color box, the color being scraped-off from the smooth portion of the rollers with knives.

DIFFERENT METHODS OF PRINTING

Screen Printing

Screen printing is nothing but an extension of stenciling. Accurate printing of multi colored designs requires stable screens.

(a) Flat-bed and Cylinder Presses

Flat-bed and cylinder presses are similar in that both use a flat screen and a three step reciprocating process to perform the printing operation.

Fig.: Flat Bed Printing Machine

(b) Rotary Screen Presses

Rotary screen presses are designed for continuous, high-speed web printing. The screens used on rotary screen presses are seamless thin metal cylinders.

Fig.: Rotary Screen Press

Block Printing Process

Block printing is popular because of the rich and vibrant colors. Originally, natural dyes were used but today they have been replaced by chemical and artificial colors. The main colors used are red, yellow, blue and saffron.

The main tools of the printer are wooden blocks in different shapes and sizes. The underside of the block has the design etched on it.

Fig.. Wooden Blocks

Transfer Printing

Transfer printing is a term used to describe textile and related printing processes in which the design is first printed onto a flexible non textile substrate and later transferred by a

separate process to a textile. The different kinds of transfer printing methods are:

(a) Sublimation Transfer:

This method depends on the use of a volatile dye in the printed design. When the paper is heated the dye is preferentially absorbed from the vapor phase by the textile substrate with which the heated paper is held in contact. The release of dye vapor is dependent not only on the vapor pressure of the dye but also on the rate of diffusion of the vapor through the surface layers of the paper and the affinity of the dyes for the cellulosic substrate or the or the thickener, binder or other additive used in making the paper or the ink.

(b) Melt Transfer:

In this method, the design is printed on paper using waxy ink and a hot iron applied to its reverse face pressing the paper against the fabric. The ink melts on to the fabric in contact with it and gets adhered to the surface, thus transferring the design from paper to the fabric.

(c) Film Release:

This method is similar to melt transfer with the difference that the design is held in an ink layer, which is transferred completely to the textile from a release paper using heat and pressure. Adhesion forces are developed between the film and the textile, which are stronger than those between the film and the paper. This method has been developed for the printing of both continuous web and garment panel units, but is almost exclusively used for the latter purpose. In commercial importance, it is comparable with sublimation transfer printing.

(d) Wet Transfer:

Water-soluble dyes are incorporated into a printing ink, which is used to produce design on paper. The design is transferred to a moistened textile using carefully regulated contact pressure. The dye transfers by diffusion through the aqueous medium. This method is not used to any significant extent at the present time.

Roller Printing:

This process involves use of a machine, which consists of a central pressure bowl, suitably wrapped with layers of cloth called lapping, an endless woolen blanket, a back grey and the cloth to be printed circulating in contact with each other.

STYLES OF PRINTING

Discharge Printing

In the discharge style, the fabric must be first dyed with dyes that can be discharged by selected discharging agents. The

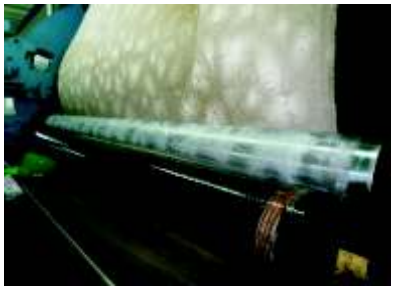


Fig. Roller Printing

discharge paste is printed onto the dyed fabric and usually during subsequent steaming, the dye in the pattern area discharged. A white discharge is thus produced. It is also possible to add a discharge resistant (illuminating) dye to the discharge print paste, to produce a colored discharge.

Resist Printing

In resist printing, the resisting agent is printed onto the undyed fabric and effectively prevents the development or fixation of the ground color, which is subsequently applied by an appropriate dyeing technique, such as dyeing, padding or overprinting.

Fig. Discharge Printing

The 'Crimp' Style

This effect can be brought about by localized fabric shrinkage with appropriate swelling agents. For example, if the fabric is printed in a stripe pattern with strong caustic soda, it shrinks in the printed areas and thus caused the unprinted area to crimp. The greater the shrinkage or contraction of the printed areas, the more pronounced the effect becomes.

Burnt Out Style

This process involves the destruction of all, or at least parts of the fabric in the printed areas of the pattern. The principle is to use a printing paste containing an agent that is capable of dissolving or destroying the fabric in the printed areas during subsequent processing.

Fig. Burnt out style of printing

Tie & Dye

The art of tying and dyeing fabric is known as Bandhani. This is done by knotting, binding, folding or sewing parts of the cloth so that when it is dyed the dye cannot penetrate these areas.

Fig. Tie and Dye Printing Style

Batik

The word batik actually means 'wax writing'. It is a way of decorating cloth by covering a part of it with a coat of wax and then dyeing the cloth. The waxed areas keep their original color and when the wax is removed the contrast between the dyed and undyed areas makes the pattern. Batik is a resist process in which the fabric is painted with molten wax and then dyed in cold dyes.

Fig. Batik Printing Style

Speck Dye Printing

The idea of speck dye printing originates from undissolved dyes or aggregated dye particles, which if present in the dyed cloth, spoil the aesthetic value of the fabric. However, in case of regularly shaped dye particles of each color, if arranged in a definite pattern, then they give novel effects.

RECENT ADVANCES IN PRINTING:
Digital Inkjet Printing

It is a non-impact technology, which allows the ejection of small droplets of ink to make direct contact with the substrate at a precise location. The inkjet technology can be divided into various basic technologies:

1. Coarse Resolution Type:

The coarse resolution type is based on valve control technology and is used in the carpet industry. The resolution of all these jet printers is relatively coarse, reaching a maximum of 40 dpi (dots per inch

2. Fine Resolution Type:

The area of fine resolution has attracted most recent research activities. This type is based on following two basic technologies:

Continuous Stream Printing

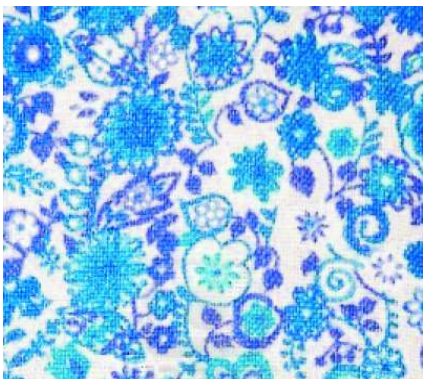
In this system, ink is forced at a high pressure through a small nozzle (15 micrometer diameter), providing a resolution of up to 2880 dpi. Continuous stream printers have a high rate of droplet ejection (around 50,000-1,00,000 droplets/second).

Drop-on-demand Printing

The majority of activity in inkjet printing today is in the drop-on-demand method. It is an asynchronous technique in which individual droplets are ejected in response to electrical impulses. These systems operate at a lower droplet production rates than the continuous stream systems as the maximum ejection rate is about 25,000droplets/s/nozzle.

PRECAUTIONS

- The ink must not dry-up in the nozzles, which have diameters down to hundredth of millimeters, as nozzle blockage would immediately result in striping faults.
- Color viscosity and surface tension should be adjusted to the production conditions.
- Continuous dye feed must also be guaranteed. This could not be offered or could only conditionally be offered on machines up till now.
- Another important problem is uniform fabric feed during printing as textile fabrics are not so uniformly flat as paper. It is necessary to set the printing heads to operate with fabrics of uneven thickness.
- The penetrating ink must not cause the fabric to arch.



REACTIVE PRINTING

Cotton is the world's most used fibre. It is cool, soft, comfortable and the principal clothing fibre of the world. Its production is one of the major factors in the world's prosperity and economic stability. In the textiles industry more than 78% of the printed goods are of cotton fabric and it has been used for the apparel purpose since centuries. It forms the background of the world textile trades. Printing on these fabric will produce a variety of designs attractively and economically.

Textile printing is the process of applying colour to fabric in definite patterns or designs. In properly printed fabrics the colour is bonded with the fiber, so as to resist washing and friction. It is related to dyeing but in dyeing, proper the whole fabric is uniformly covered with one colour, whereas in printing, one or more colours are applied to it in certain parts only in sharply defined patterns.

PRINTING OF COTTON WITH REACTIVE DYES

The full gamut of colours in the reactive class of dyes, which is one of its significant advantages, is obtained by employing a wide range of chromophores. The introduction of reactive dyes for cellulosic fibres has given the printer the possibility of using only one type of dye and simple application conditions, in place of the complex permutations necessary at one time.

The formation of a covalent bond between dye and fibre makes it possible to use dyes which, unlike the vat and direct dyes, are of small molecular size and good solubility. These dyes can be brighter, faster-diffusing and, in the hydrolysed form, easily removed in the washing-off process.

When selecting reactive dyes for printing, the factors of importance for dyeing must be considered but, in addition, attention must be paid to print paste stability and staining of the ground during washing-off.

Fabric pretreatment

For optimum results, pretreatment of the cellulosic fibre is especially important when reactive dyes are used.

- Woven fabrics must be thoroughly desized as reaction with size and azo dye reduction, under hot alkaline conditions in presence of reducing endgroups, both lead to lower colour yield.
- Mercerisation of cotton, or semi-mercerisation, is recommended because few reactive dyes give full colour value on unmercerised cotton.
- If this is not possible, however, dyes that diffuse rapidly and show minimum differences in yield may be selected.
- With regenerated cellulose also, suitable pretreatment leads to improved prints. Swelling in caustic soda solution of 4–6 ? Bé at room temperature, under tensionless conditions, improves the colour yield of the
- The fabric should be well rinsed, but not neutralised, to achieve maximum effect. An alternative would be to pre-pad with 100 g/l urea and 10 g/l soda ash.

Printing by the all-in method

A typical print paste is prepared by sprinkling the required amount of reactive dye into a stock paste. The solubility of most reactive dyes is sufficient for this sprinkling method, followed by high-speed stirring, to give perfectly smooth prints. The dye can alternatively be predissolved, using the urea to increase the solubility, in a small volume of hot water. Sodium bicarbonate should only be added after the mixture of dye solution and thickener has cooled to room temperature.

Alkali:

Alkali is essential to produce ionisation of accessible cellulose hydroxyl groups, which can then react with the reactive dye. Sodium bicarbonate has been the preferred alkali because it is cheap and gives sufficient print paste stability with all but the most reactive dyes. During steaming or baking it loses carbon dioxide, and increased ionisation of cellulose follows. Where the stability of the dye is high enough, sodium carbonate and even caustic soda may be preferred because the more stable dyes will give higher colour yields under more alkaline conditions.

For dyes of high reactivity the concentration of bicarbonate may be reduced or sodium trichloroacetate used. The latter decomposes during steaming to form sodium carbonate and allows the use of neutral print pastes or even pastes slightly acidified with acetic acid. The choice of alkali must therefore be made on the basis of the reactivity of the dyes to be used and the stability of print paste required. Acceptable stability for 28 days is normally attainable.

Fixation:

In textile printing, it is most important that the fixation and hydrolysis proceed to completion, so that no dye in reactive form remains to stain the white ground. The choice of dyes to be used must therefore be determined by the fixation equipment available. Dyes of high reactivity allow the use of rapid fixation processes, but if some of the dyes have lower reactivity it is safer to use normal steaming times and

temperatures.

The second factor, which then becomes relevant, is the stability of the dye–fibre bond under hot alkaline conditions. Too long fixation time will lead to a fall in colour yield. For most reactive dyes the stability of the dye–fibre bond is related to the reactivity of the dye and it is possible to obtain rapid fixation under mild conditions only at the expense of stability of the print paste and of the dye–fibre bond.

Higher reactivity can however be obtained by using reactive fluoro compounds, rather than the chloro analogues, without affecting the dye–fibre bond stability.

Urea holds some of the water very strongly and the eutectic mixture of urea and water provides the solvent required for the dye–fibre reaction to occur. In the absence of urea colour yields are low, unless fixation can take place during drying.

THICKENERS

Alginates are the only natural thickeners suitable for use in printing with reactive dyes. All other carbohydrates react with the dye and this results in low colour yields or unsatisfactory fabric handle due to insolubilisation of the thickener. Sodium alginate also contains hydroxyl groups but it reacts very little, presumably because the ionised carboxyl groups on every ring of the polymer chain repel the dye anions.

Because of the relatively high cost and limited supply of alginates, attention has recently been paid to finding alternatives. Synthetic thickeners with anionic charges show great potential.

Poly(acrylic acid) does not react at all with typical reactive dyes and colour yields are higher than with alginates.

Water oil repellent finishes from Sarex

Sarex has launched oil and water repellent finishes for the textile industry that delivers maximum performance with a minimal environmental footprint.

Sarex Products based on C8 chemistry

Careguard Conc and Careguard DM(X)

Unique features:

- Careguard-Conc and Careguard –DM(X) are non-flammable fluorocarbon C8 chemistry based durable water and oil-repellent agent
- Suitable for polyester, cotton, nylon and wool fibres and their blends.
- It does not lead to harsh feel.
- Stable to dilute acids, cross linking resins and polyethylene emulsions
- Careguard-Conc and Careguard DM(X) can be applied by padding, foam and spray process.

Sarex Products based on C6 chemistry

Careguard -775, Careguard -66(New) and Careguard-6 (HF)

Due the recent demand of ban PFOS and PFOA -containing chemicals in the European Union. Customers do also aim PFOA and PFOS free finishes.

The "Sarex Chemicals" have therefore further optimized the product range by complementing it with new products of the so-called C_6-technology. Perfluoroalkyl monomers from telomerisation with a chain length of 6 carbon atoms are used for that.

Fluorocarbon polymers made from C_6-monomers are PFOS* and PFOA*-free to the detectible limit already existing in nature.

In order to provide a green and healthy life to all consumers, Sarex Chemicals has been devoting itself in developing more and more Green Chemicals such as,

- Careguard -775
- Careguard -66(New)
- Careguard-6 (HF)

Unique features

- Careguard- 775 , Careguard-66(New) and Careguard-6(HF) is a non-flammable fluorocarbon, C6 based durable water and oil-repellent agent with inbuilt extender
- Suitable for polyester, cotton, nylon and wool fibres and their blends. It does not lead to harsh feel.
- Stable to dilute acids, cross linking resins and polyethylene emulsions
- Careguard-775, Careguard -66(New) and Caregaurd-6(HF) can be applied by padding, foam and spray process.

Publication of Technical Booklet, "Solutions Provider", during China Interdye, Shanghai

Sarex at China Interdye 2012, Shanghai

We Sarex, an Indian multinational and one of the renowned export house of textile chemicals, had participated in China Interdye 2012, held on 11th -13th April at Shanghai. Sarex has made rapid progress in leaps and bounds in ten years by solving customer problems and offering appropriate cost effective solutions, understanding customer needs, due to continuous & close interaction with customers, technical expertise accumulated over a period. By virtue of their interaction with foreign collaborators and using their skills to design recipes and processes to bring down cost and improve consistency for textile processors has helped us to serve our customers satisfactorily.

Our team had displayed more than 30 articles in english, spanish and portuguese language which were published in international magazines which are not only useful and interesting but also thought provoking.

Dr. Naresh M. Saraf (Centre) with valued customer

During this exihibition we released a publication "Solutions Provider" in chinese, english, spanish and portuguese language which would prove to be a real Solution Provider for the textile dyers and Finishers.

In this technical manual we have addressed new development from Sarex such as, Low Thermomigration finish, Phenolic Yellowing Quencher, Soil Release finish, Tear Strength Improver, Redyeable Hydropjhilic Silicone, Blooming agents, Mosquito repellent finish, Antimicrobial finish, Chlorox fastness improver etc keeping in mind the critical problems today industry is facing such as, thermomigration, phenolic yellowing, soil release, tear strength, redyeing problem of cellulosics finished with silicone softeners. This new publication will surely help to the industry.

Mr. Prakash M. Saraf and Mr. P. S. Thirumallippan (Consultant) with Valued Visitor

Apart from the specialty products addressed in Solution Provider, some of the interesting products Sarex has offered were dyefixing agent for polyamide and printed materials which improves wet fastness properties, a concentrated cationic retarder for acrylics, a non-formaldehyde cationic dyefixing agent for reactive dyes, a high light fast optical brightening agent for wool, polyamide, silk, cellulosic fibres and their blends etc.

Sarex Team with valued customer

Sarex is not only offering technology based products but it is the only Indian Company offering CONCENTRATED PRODUCTS for pretreatment to finishing for bulk consumers and formulators to make them competitive.

You must have seen Sarex logo in major trade exhibitions at Birmingham, Singapore, Dubai, ITMA Munich, ITMA Shanghai, ITMA Barcelona Spain and you can surely see Sarex logo in upcoming major exhibitions.

Creative Corner

6 PRINCIPLES OF LIFE

1. No point using limited life to chase unlimited money.
2. No point earning so much money you cannot live to spend it.
3. Money is not yours until you spend it.
4. When you are young, you use your health to chase your wealth; when you are old, you use your wealth to buy back your health. Difference is that, it is too late.
5. How happy a man is, is not how much he has but how little he needs.
6. No point working so hard to provide for the people you have no time to spend with.

Remember this -- We come into this world with nothing,and we leave this world with nothing!

In one day a human being breathes oxygen equivalent to three cylinders. Each oxygen cylinder on an average costs Rs 700, without subsidy. So In a day one uses Oxygen worth Rs 2100 and for a full year it is Rs 7,66,500. If we consider an average life span of 65 years; the costs of oxygen we use become a staggering sum of Rs 500,00,000. Rs 50 million. All this oxygen is derived free of cost from the surrounding trees. Very few people look at trees as a resource and there is rampart tree cutting going on everywhere which should stop.

GO GREEN

This is brilliant !!!
A compliment with a touch of humour

2 DIFFICULT THINGS TO ACHIEVE

1. To plant your ideas in someone else's h e a d .

2. To put someone else's money in your own p o c k e t .

The one who succeeds in the first one is called a TEACHER.

And the second is called a BUSINESSMAN.

The one who succeeds in both is called a W I F E .

The one who fails in both is called a HUSBAND .....!!!

Sarex

Sarex Chemicals
Sarex Overseas

Want to know more ?

Sarex Chemicals

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