



ENVIRONMENTAL HAZARDS

THERMAL HAZARDS

MECHANICAL HAZARDS

NBC HAZARDS

Protective Textiles Industry... ...Flaming New Opportunities



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From the MD's Desk



Mr. Samir Gupta, MD, BCH

“ *The market for technical textiles and nonwovens is in transition. Sustainability and innovation are the mantras for real success in future. One should focus on a long term strategy and approach. There are opportunities on the horizon that will fuel growth in the near future, especially in the emerging markets.* ”

Before we talk about the current outlooks, it might be useful to go back and take a look at the various happenings that took place in the first half of year 2008. To stay in tune with what is happening in the industry, we spent a lot of effort exploring the world and interacting with the industry leaders to assess business conditions whether it was at INDEX 08- the world famous nonwoven show, MTEX 08- the transport textiles show or AUTEX 08- the conference on textiles.

Notable is that there's plenty of re-organization taking place. Several companies are close to embarking on major decisions to consolidate manufacturing facilities. Others are forming partnerships while some are severely affected by the rise in prices of different commodities and shifting markets and are close to shutting down. Keeping in mind that all happens for the better we surely feel that 'Technical Textiles & Nonwovens' is one of the most promising industries for times to come. The latest research and development activities being carried out at various organizations around the globe have very positive feeling about the growth prospects of this industry incorporating the multi functional new types of fibres which will be substituting other materials. More and more use of high end textile fibres and composites is being integrated in the different manufacturing processes and product categories. Non textile products today like steel, plastic etc. are also being replaced by textile products because of their versatile nature coupled with many other benefits. R&D is the backbone of any industry and the source for fostering innovation to stay ahead in the race.

Furthermore, sustainability besides innovation has become the buzzword in the industry and in this issue we have featured an article on sustainability which should not only be read but embedded in everyone's way of doing business. *We all need to remember that long term sustainability is a short cut to real success.*

Owing to rapid globalization there is a lot of interest generated in actual cross border buying and selling of products which we are facilitating through 'The BCH Trade Nucleus'. This is intentional to stimulate healthy growth amongst continents and speed up the process of capitalizing on each one's own strengths.

I would also invite one and all to participate in the industry events happening in India in the last quarter of 2008 namely- The International Symposium on Geotextiles during Constru India 2008, International Conference on Technical Textiles and Nonwovens at IIT Delhi and the Edana Training Courses on Nonwovens and absorbent Hygiene Products at New Delhi.

Lastly I'd like to take this opportunity to thank you all for your support in the past and look forward to working with you in the future.

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If you have a product or service that you want to vend into this escalating global market place of Technical Textiles & Nonwovens, look no further. For the most effective way to show your presence through advertising in the BCH publication- TechTex India & website- www.bch.in, simply contact us at info@bch.in.



I am really delighted by the relevant information, presentation and the purpose, your periodical can serve to the cause of promoting technical textiles in India. Accept my hearty congratulations and keep up the spirit of change - change of betterment, change for achieving new heights and the change that would attract more and more readers.

Y.K.Kusumgar, Kusumgar Corporates, India

This magazine is absolutely fantastic because of the enthusiastic and informative writing. The amount of the quality content per issue is really amazing, and I recommend this magazine to anyone interested in technical textiles and nonwoven industry.

Ajay Sahnii, Ahlstorm Fibre Composites India Pvt. Ltd., India

I like reading TechTex India because its so innovative and fresh! It really is one of the most used magazines I get. The information in each issue is worth reading and it's a treat for those who want to excel in the nonwoven industry.

Rakesh Jha, RIL, India

We are amazed to see the professionalism of your work for TechTex India.

Giorgio Belletti, Cascine Ameli 15, Italy

Protective Textiles Industry...

...Flaming New Opportunities

The safety of man & his personal equipment has become an important issue in today's era of industrialization, where he faces dangers from a myriad of sources - be it man-made or natural. Emphasis is being laid on protecting man from both occupational and recreational hazards. At the same time, the range of hazards and the means of combating them continue to grow and become even more complex. As a result, new fibres, structures & clothing systems are being developed whose sole purpose is to provide improved protection, whilst maintaining comfort, efficiency and well-being.

Many health & safety legislations are being introduced in different sectors of the economy, all of which indicate that the technical textile market in protective sector will grow by leaps & bounds.

SOME FACTS

- 12 Indians die everyday due to gun violence
- Direct and indirect losses due to fire in India are estimated to be more than 1200 crores annually with around 20,000 fatal injuries
- An industrial disaster that occurred due to release of methyl isocyanate in Bhopal, India, resulted in the death of more than 3,000 people

SOME FACTS

Every situation is like a coin, having two different faces to it. Even though industrialization & developments in technology has led to betterment in quality of life, at the same time it has also exposed us to greater dangers from constantly evolving physical, biological & chemical attacks. Protective textiles are one of the simplest & easiest means to protect oneself from most of these hazards faced.

Classification of Protective Textiles on the Basis of Hazards Faced

The main objective of a protective textile is to either prevent direct contact with the hazardous material or prevent it from further transmission.

1. Mechanical Hazards

These include threats like ballistic, high speed projectiles, knives, high atmospheric pressure and physical detection, to name a few.



Policeman wearing high visibility jacket

In case of *high speed projectiles*, the protective textile absorbs the kinetic energy of the moving object and dissipates the heat energy safely & rapidly to minimize blunt-force trauma. The strength of fabric & the type of weave used are also a major concern since too tight a weave will be unable to dissipate the energy & too loose a weave will allow the projectiles to enter through the gaps.

In case of *high atmospheric pressure*, protective textiles are designed as fully enclosed air impermeable suits, having their own air supply.

In case of *physical detection*, protective textiles are either dyed with a high visibility dye or printed with camouflage prints to increase visibility or avoid detection respectively. High visibility can be achieved either by using reflective materials (that shine when light strikes), photo-luminescent materials (that store daylight & give yellow light in dark) or fluorescent materials (which make red-orange visible in daytime).

2. Thermal Hazards

These include threats like fire & high temperatures. The requirements for protection against heat & flame range from moderate exposure to radiant heat to severe exposure to both radiant & convective heat at the same

Table 1: Types of Fibres Used for Making Protective Textiles

Class	Name of Fibre	Desired Properties
Cellulosic	Cotton, Rayon	Moderate strength, high degree of heat conductivity, good moisture absorbency
Protein	Wool, Silk	Elasticity, Resiliency, low degree of heat conductivity
Polyamide	Nylon, Polyester, Aramid	High Tenacity, good elasticity, excellent resiliency, resistant to mildew, insects & alkalies, hydrophobic. Aramids are heat resistant also
High Performance Inorganic Fibres	Carbon, Glass, Ceramic	Heat resistant, light weight, anti static, chemical stability
Ultra High Molecular Weight Polyethylene	HMPE fibre	Extremely High Strength, high modulus, light weight, high impact strength, highly durable, high light stability, chemical stability
Polybenzoxazole	PBO	High strength, high modulus, highly heat resistant
Polyetherketones	PEEK	High chemical stability
Polybenzimidazole	PBI	Highly heat resistant

Cover Story

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time as seen in case of fire-fighters. Protection can be provided by using apparel made from inherent fire-retardant fibres or by coating the fabric with fire-retardant finishes. Ease of ignition, burning rate & rate of heat release are few important properties to be kept in mind while using them for making the end product.



Industrial worker in high temperature zone

3.Environmental Hazards

These include threats like low temperature at high altitudes, heavy rain, high speed wind & UV rays. In such situations, a high level of protective function is required in combination with comfort, water & wind proofing & freedom of movement. The textile can be finished with different finishes to provide these functions. Extreme cold weather garments should provide a high degree of thermal insulation and be less bulky & light weight.



A Skydiver in high altitude low temperature zone

4.Biological Hazards

Protection is required against bacteria, virus, various toxins, blood agents etc. Protection can be provided by either making the textile completely impermeable (like NBC Suits) that even have their own air supply or by adopting a chemical-release approach where in certain chemicals are applied as a finish or incorporated directly into the fibre matrix to stop the growth of the biological agent.

Table II: Types of Fabrics Used

Construction Technique	Application Areas
Plain Woven or 3-D Woven	Impact Protection Apparel
Nonwoven	Chemical/Biological Protective Apparel, Breathable Waterproof/Windproof Apparel
Knitted	Seamless Apparel, Cut/Slash/Abrasion Resistant Apparel

5. Chemical Hazards

While calling a chemical 'hazardous', points like the basis of level of risk, amount of chemical, exposure time, toxicity & state of matter (particulate/liquid/gas) need to be kept in mind, since different phase behave differently. The route of chemical entry into human body can be oral, respiratory or dermal, of which dermal exposure is most common. On interaction with chemical, the textile material can either disintegrate or allow penetration of the chemical. *Impermeable*

It is important to realize the fact that no single combination of protective clothing equipment is capable of providing protection from all the hazards. They should, thus, be used in combination with other protective methods.

protective structures (like that of PVC) are mainly used for protection against liquids & gases and are made of coated/laminated textile materials. But these structures are impermeable to water vapor also, hence are uncomfortable to wear for long periods of time.



Cleaning staff dumping off hazardous material

Permeable protective structures are mainly used for particulate protection & also provide protection against selective gases. Such materials work on the principle of 'selective absorption' (permit the flow of water vapor but limits penetration of hazardous gases). They also contain additional substances that either neutralize the hazardous molecules or bind the molecule, thereby rendering them inactive.

6.Nuclear Hazards

People working in the health sector & nuclear power plants are exposed to hazardous a, and ? radiations. To protect against these radiations - absorption & transmittance of the rays should be low with a high reflectance at the same time. Nuclear protective wear fabrics can be made from a blend of cotton & polyester. Disposable nonwoven textiles made of polyethylene spun-laced materials can be used for protection against radioactive dust & particulate matter.



Worker working with Nuclear Waste

7.Electrical Hazards

These include threats against electrostatic discharges & high-voltage electricity. Conductive protective clothing

Table III: Types of Finishing Treatments

Treatment	Application Areas
Dyeing & Printing	Camouflage Apparel, High Visibility Apparel
Mechanical Processing	Done to control final thickness & pore size of the textile
Chemical Processing	Fire Retardant, Water / Liquid Repellent, UV Finish, Anti static
Lamination	Waterproof Apparel
Seams	Is very important in case of waterproof & chemical protective apparel. The seams can be coated with polymer or adhesive or bonded seams can be used

Cover Story

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is a must for individuals working in the vicinity of very high-voltage equipment. In addition, these must be flame resistant. The protective textiles made for such threats are either made of incorporated materials that are good conductors of electricity (like metals, carbon, synthetic fibres etc), coated with a finish (like anti-static) or are laminated with conductive polymer films.

Protective Textiles- Fibres to End Products

Fibres form an important constituent for a finished protective textile. Most common fibres being used for protective textiles are natural fibres like cotton, wool & silk that provide comfort properties like good moisture absorbency & low degree of heat conductivity. On the other hand man made fibres like polyamides, PBO, PBI, etc. provide strength, resiliency, resistance to heat, light weightness & chemical stability. A blend of both can be used to provide ideal protection-comfort properties. Mostly woven & knitted textiles are used to provide protection against mechanical impact & nonwovens are used to provide chemical/biological protection. Most common finishes to be applied on textiles are chemicals that provide protection against fire, hazardous liquids and environment (See Table 1, 11 and III for reference).

Product Portfolio

The Protective Clothing Systems cater mainly to two different sectors the defense & the industrial sector for which there are certain requirements:

Physical Requirements: Resistance against weather elements, wear and tear

Physiological Requirements: Moisture permeability/Breathability

Special Requirements: Protection against any other natural/manmade hazards such as bullets, chemicals or radiation.

Products in Defense Sector



Products used can be grouped as follows:

Personal Clothing

A variety of Clothing products are available in the market which include:

Vests: Are worn under the shirt to provide warmth in cold weather conditions. They are generally knitted,

having a composition of wool and nylon.

Balaclava Caps: They are caps made of high quality wool. They totally cover the face and head of the wearer and are used to provide warmth in cold areas.

Combat Trousers: Are usually made of 100% cotton and printed with camouflaging disruptive print to help the soldiers blend into the surroundings.

Combat Jackets: They are similar in composition to combat trousers & can be made from cotton-polyester blend fabric to improve their handle & durability.

Shirts: Are usually worn over vests & are made from a blend of woven polyester viscose.

Specialist Clothing

It includes high altitude uniforms, NBC suits, fire retardant suits.

NBC Suits: They are required to provide protection against biological, chemical & nuclear weapons. These suits are impervious to air, liquids & gases and have their own air supply.

Fire Retardant Suits: The prerequisites of fire retardant textiles are flame resistance, breathability, integrity, insulation, high abrasion resistance and ease of handling & wearing comfort. They can be made of either inherent FR fibres or a finish maybe applied.

Ballistic Protective Clothing (Vest/Jacket): These provide protection against high speed moving projectiles like shrapnel & bullets. They are made of high tenacity aramid fibres, usually in plain weave.

Unit Equipment

Tents & Shelters: The current tents being used are double layered - made of cotton or polyester-viscose fabrics. They are finished with water proof finish.

Tarpaulins & Covers: They are used to cover trucks, weapon stocks, clothing and other military equipment. Currently, they are being made of cotton and finished with water proof finish.

Parachutes: They are of three main types - Normal (used day to day), high altitude types (used in extreme cold regions) and dropping type (used for dropping packages). They are made of waterproof textile fabrics that have low weight & strength.

Products in Industrial Sector

The industrial sector is a major part of any economy. People working in heavy industries i.e. iron and steel plants, oil refineries, mining, shipping & construction and chemicals are exposed to many hazards on a daily basis. Product range for this sector includes the following:

High Temperature Apparel: A material which can be

Cover Story

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used at a temperature more than 200°C without decomposition and losing its physical properties, is considered a High Temperature Textile. Since workers working in high temperature zones are constantly exposed to flashes and splashes, they wear overalls to protect them.

Chemical Protective Clothing: Hazmat (Hazardous Materials) response suits are being made from impermeable multilayer laminated fabrics. Such membranes provide complete protection to the wearer against air, vapors & liquids. Recently efforts are being made to develop selective membranes that exhibit selectivity in diffusion of hazardous & non-hazardous materials.

High Visibility Apparel: The most common method of achieving high visibility is to use reflective tapes made of 100% polyester or nylon fibres or high visibility dyes that can be adhered to the desired area of the garment.

Clean Room Textiles (CRT): In the use of CRT where the environment is protected from the wearer as clothing carries a good amount of dust, ions, hair, tobacco smoke, etc. and it is said that the human body sheds one billion skin cells every day. The clean room textiles should be lint free, antistatic and should retard human contamination of textiles. Woven, nonwoven and laminate fabrics are used for clean room textiles. Tarpaulins & Covers are also used in some industries.

The World Market for Protective Textiles

In the international technical textile market protective textiles account for about 5.4% of the total technical textiles. In recent years developed economies have seen a decline in the number of people employed in primary and other traditional "smokestack" manufacturing industries. This has been accompanied by reduced exposure to danger in the workplace through the use of robots, other automation and safety devices. These trends have had a negative effect on the demand for protective clothing. However, this has been partially offset by a general extension of protection performance to more conventional workwear used in low risk applications.

The consumption of Protective textiles is increasing at a stagnant growth rate and according to Government estimates, it is expected that it will reach a value of 7286 US \$ Mn. globally by the year 2011-2012.

Protective Textiles in India

Protective Textiles in India comprise 3% of the total technical textiles. The defense is the largest end-user of various protective clothing, followed by public utilities

personnel like fire service, police, para-military forces, industrial security forces, border security forces, etc. Apart from this, the Industrial sector also is an important consumer of protective textiles.

The major product listing in India includes fire retardant textiles, ballistic protective clothing and high visibility clothing. The fire retardant textile industry in India is characterized by the existence of a few well-known global brands and a few units in the decentralized sector with a presence in the local markets. Ballistic clothing has two major user segments, Military and Police for vests and bulletproof jackets and is usually made from piles of Para aramid and meta aramid fibres. The Aramid fibres and fabrics are generally imported by the Indian manufacturers. The use of uni-directional fabrics made from UHMPE (Ultra High Performance Polyethylene) offer outstanding mechanical properties with a high percentage of absorbed energy versus total impact energy. The design of high altitude protective clothing for armed forces needs to meet both functional and comfort properties. Indian Protective clothing for Extreme Cold Weather comprises jacket, waist coat, trousers, cap glacier, gloves rappelling and gloves glacier. These are manufactured from low cost PVC or PU coated substrates. Water and wind proof materials offering new standards in comfort and performance are being used. Defense Research & Development Organisation, Kanpur has developed considerable facilities for design and development of high-altitude protective clothing. High Visibility Clothing is being used in mining, building and construction, by traffic police, airport workers, and staff working near railway lines. Phosphorescent, fluorescent and retro-reflective materials are used in this segment. Other accessories include parachutes, tarpaulins, etc.

There exists an Indian standard IS 15748 which specifies the performance requirements and methods of testing the protective clothing materials



Indian Soldiers in Protective Clothing for Bomb Detection

and gives design recommendations for the clothing where necessary. Protective clothing complying with this standard is intended to protect industrial workers against brief contact with flame and against at least one type of heat which may be in the form of convective heat, radiant heat, large molten metal splashes or a combination of these heat hazards. Though a lot is being done to bring legislation into the industrial sector but the process seems to be very slow

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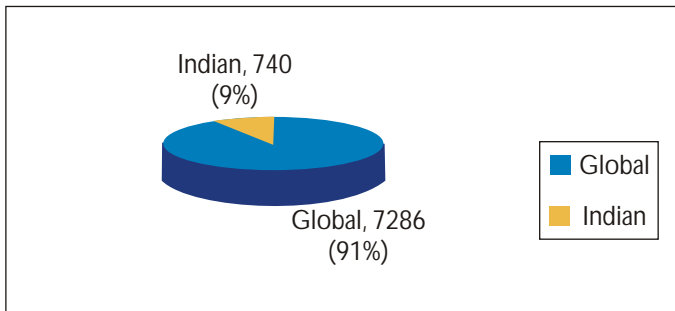


KNITTING , WEAVING , FELTING , TUFTING , SEWING

Cover Story

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thus having an impact on demand for such textiles which are very costly. It is estimated that the protective textile industry will grow at an annual growth rate of almost 25% if the regulatory framework is in place totaling to a value of almost 740 US\$ Mn by 2011-12. Nevertheless this industry is still seeing a healthy growth rate of 17% currently which is very promising.



Estimated Market Size of Protective Textiles in 2011-12 (in US \$ Mn)

The Indian Defense with a total strength of 1.5 Mn individuals comprises of the army, navy, air force. Approximately 25-30 % are involved in high risk, counter insurgency & special operations in super high attitude areas and require protective clothing. The annual demand for Protective Clothing in Indian defense is as follows: (Table IV)

Table IV: Annual Demand (2008) for Protective Textiles in Defense Sector		
Item	Demand Quantity (in pcs)	Supply Source
Personal Clothing		
Service Uniform	3.7 Mn	Indian
Camouflage Uniform	4.7 Mn	Indian
Rainwear	2.3 Mn	Indian
Backpack	2.3 Mn	Indian
Accessories- Caps, Belts, Hats, Helmets	2.3 Mn	Indian
Accessories Sock	4.7 Mn	Indian
Specialist Clothing		
High Altitude Uniform	0.6 Mn	Indian + West Europe
High Performance Uniform	25,000	Indian + West Europe
NBC Suits	0.3 Mn	Indian + West Europe
FR Suits	0.2 Mn	Indian
Bullet Proof Jackets	0.2 Mn	
Unit Equipment		
Tents & Shelters	35,000	Indian
Tarpaulins & Covers	12,000	Indian

Note : Above figures are approximate upto +/- 10%.

The Ordnance Factories Organization is the largest and oldest departmentally run production organization in the country engaged in the manufacture of Defense hardware & troop comfort items like parachutes for Army & Air force, high altitude & combat clothing, tents

of various types, uniforms & clothing Items, and floats for light assault bridges.

India has developed five types of protective systems and equipment for its troops as a safeguard against Nuclear, Biological and Chemical (NBC) hazards. The development of all five types of protective systems and equipment has been completed and their induction into the service has been formally approved. These protective systems and equipment are: NBC individual protective equipment, NBC collective protection system, NBC medical protection equipment, NBC detection equipment and the NBC decontamination system.

In developing countries like India, demand for protective clothing is promoted by increased levels of industrialisation & also by increased observation of health, safety and hygiene legislations. However, fire retardant suits remain the only widely used product in the industrial sector whose demand is estimated to be of 1.4 Mn pieces annually.

Conclusion

The future of protective textiles in India surely seems to be very bright as India is a developing nation and will be seen incorporating the latest of innovations. It is evident from the population and economy growth, that both the defense and the industrial sector will be well equipped. The authorities, especially the defense, are becoming active in understanding the need of these products and many standardization and legalities are already in process. Better understanding of the market will enable the authorities to strategise effectively & cater to the growing demand.

The future will surely be comprising of knitted fabrics and synthetic fabrics which will be dominating the scene. Specialized fibres in which chemicals can be incorporated into the fibre matrix will also see a good demand. Nanotechnology which was dealt in detail in the last issue will be the future for such high tech textiles as the performance of such products would be much greater. ■

A GLANCE THROUGH

Most of the growth in demand in India is expected to be for special forces & para military forces. Currently, most of the domestic demand for specialist personal protection equipment is being met by imports. Scope in the growth of demand exists for tents & shelters. Lack of proper research, standardization & testing is greatly impeding the growth of protective textiles in India.

A GLANCE THROUGH

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Growing Textile Industry: Role of Government

Effects of Rupee Escalation on Textile Industry

The Textile trade bodies and associations have represented that the appreciation of the rupee vis-à-vis US dollar during 2007, has adversely affected the exports of textiles and clothing from India. However, trade statistics available for the period April-December, 2007 indicate that the overall exports at USD 14935.69 million in this period denote an increase of 9.33% in US dollar terms, over the corresponding period of 2006-07, though in rupee terms, the exports at Rs.60351.09 crore represent a small decline of 2.9% over the corresponding period of 2006-07, due to the aforesaid weak position of the dollar. As per estimates made by Confederation of Indian Textile Industry (CITI), for every export loss of rupee one crore, there would be a job loss of 34-35 workers. However, no physical quantification of actual job losses, on account of appreciation of the rupee, has been made by CITI.

The Government has announced several relief measures to support the textiles industry which has been representing that textile exports have been affected by the appreciation of the value of rupee vis-a-vis the US Dollar. These measures include the following:-

- (i) DEPB rates enhanced by 3% for 9 sectors including textiles (also handlooms), RMGs and handicrafts. For other items, DEPB rates enhanced by 2%.
- (ii) ECGC premium reduced by 10%.
- (iii) Amount of Rs.600 crore released for clearing arrears of CST reimbursement and terminal excise duty.
- (iv) Duty drawback rates enhanced by 10-40% of the existing rates.
- (v) Subvention on credit rate allowed upto 4% including interest subsidy of 2%.
- (vi) Refund of service tax paid by exporters on services linked to export of goods viz port services for exports, transport of goods by road from container depot to port of export, general insurance services for insurance of goods for export, technical testing and analysis agency services and inspection and certification services, storage & warehousing services and clearing activity services.
- (vii) Customs duty on intermediates for Polyester staple fibre and polyester filament yarn reduced from 7.5% to 5%; on paraxylene, a raw material for the intermediate PTA reduced from 2% to 0%; on other man-made filament yarn & staple fibres of acrylic & viscose from 10% to 5%; on spun yarn of man-made staple fibres & filament yarn (other than nylon) from 10% to 5% and reduced on polyester chips from 7.5% to 5%.

This information was given by the Minister of State for Textiles, Shri E.V.K.S. Elangovan in a written reply in the Rajya Sabha on 30th April 2008.

National Technology Mission on Technical Textiles

In pursuance of the announcement made by the Prime Minister, the Government will shortly launch Technology Mission on Technical Textiles in support for the development of the technical textile industry in the country in terms of capacity building of manufacturers: standardization, product development, common testing facilities; domestic and export market development and skill development. Besides, the Government will implement "Development and Growth of Technical Textiles" Scheme during the XIth Five Year Plan at an estimated cost of Rs.44 crore. The Government intends to create a Development Council for Technical Textiles to identify the problems of the industry and suggest measures.

Government to Set up Centres of Excellence (CoE) for Technical Textiles

The Union Minister of Textiles, Shri Shanker Singh Vaghela has announced that Government is setting up four Centres of Excellence (CoE), under the National Technology Mission on Technical Textiles, in order to provide infrastructure support at one place for thrust areas of technical textiles. These centres would be equipped with internationally accredited testing labs, training facilities for trainers and technicians from the industry, IT-enabled information centre and other requisite support to the technical textile entrepreneurs. These four CoEs would be ready within six to seven months. These centres are: Bombay Textile Research Association (BTRA) in association with IIT, Mumbai for Geotech; Silk & Art Silk Manufacturing Industry Research Association (SASMIRA) for Agrotech; Northern India Textile Research Association (NITRA) for Protech and Southern India Textile Research Association (SITRA) for Meditech, both in association with IIT, Delhi. ■

SUSTAINABILITY..... "A RISING TIDE"

No More a Suppressed Issue

The intrinsic worth of the sustainability movement is being continuously pondered upon and the pressure of the gigantic "green" signal seems to be engulfing the world. The importance of the green and sustainable products is being realized by one and all.

Sustainability can be defined in numerous ways.

- ⊗ "Sustainable development meets the needs of the present without compromising the ability of the future generations to meet their own needs". - *World Commission on Environment and Development, Our Common Future, 1987*
- ⊗ "Sustainable development is concerned with the development of a society where the costs of development are not transferred to future generations, or at least an attempt is made to compensate for such costs". *Pearce, 1993*
- ⊗ "Sustainability relates to the maintenance and enhancement of environmental, social and economic resources, in order to meet the needs of current and future generations." - *Gilbert, Stevenson, Girardet, Stren, 1996*

Sustainable Development in other words relates to longevity. It is a pattern of resource use that aims to meet human needs while preserving the environment so that these needs can be met not only in the present, but in the indefinite future. It is not something that will fade away but these proceedings will be implanted in one's personal life and businesses. It speaks about handling and managing the resources available presently in a fruitful manner.

Pillars of Sustainability

Sustainability can be explained in a variety of ways, but the most visual is that of the three pillars or dimensions. Sustainable development talks about the three P's which focus on a Healthy Planet (Ecology), Healthy Profit (Economy) and Healthy People (Society). This means that for a business activity to be sustainable and successful the above three fundamentals have to be adhered to.

Ecology: This is a branch of biology dealing with the relations and interactions between organisms and their environment.

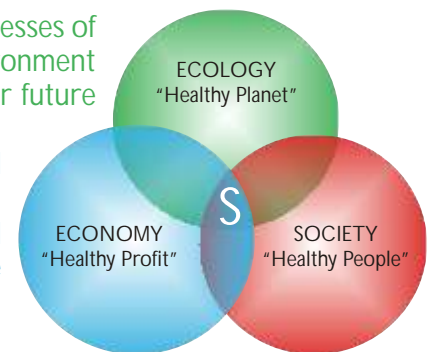
Environmental sustainability is the process of making sure that the current processes of interaction with the environment are pursued with the idea of keeping the environment as natural and pristine as possible, by avoiding a severe level of degradation, for future generations.

Economy: Economy consists of activities related to the production and distribution of goods and services in a particular geographic region.

Economic sustainability requires that a development should be profitable and deliver a healthy rate of return to all concerned. It also strives to build viable economic opportunities for those who live in a region.

Society: Society is a highly structured system of human organization for large-scale community living that normally furnishes protection, continuity, security, and a national identity for its members.

Social sustainability might seem a little more abstract than other elements of sustainability, but it is just as important to undertake any activity with full consideration of physical, psychological and developmental health of mankind.



Sustainability is all about balance - balancing the economic needs of people with social needs and the needs of the environment. In a sustainable development everyone is a user and a provider of information or feedback whether positive or negative. It stresses the need to change from old sector-centered ways of doing business to new approaches that involve cross-sectoral co-ordination and the integration of environmental, economical and social concerns into all developmental processes.

The textile industry acknowledges that a more integrated vision is needed and new tools should be developed to prepare for the mounting economic, social and environmental challenges which will form the foundation of success in true terms.

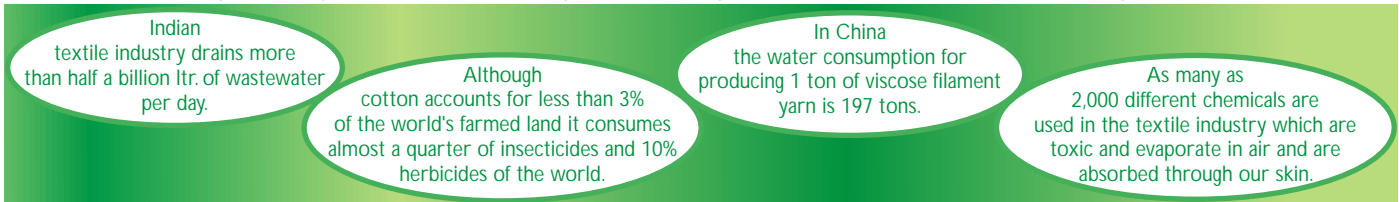
Special Feature

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Environmental Aspects of Sustainability in the Textile Industry



The Textile Industry alone is a major user of synthetic fertilizers and pesticides, solvents and detergents, toxic chemicals and petrochemicals. The use of all these hazardous materials has high environmental impact leading to the land degradation and contamination contributing to the depletion of rapidly diminishing fossil fuels. Apart from the usage of the various raw materials the various processes of the textile industry comprising of the manufacture of different fibres, fabrics and end products too have a great negative effect on the environment. Petrochemicals used in the manufacturing of the synthetic fibres emit green house gases and at the same time use large amount of water for



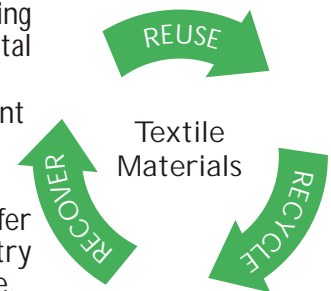
cooling along with the lubricants which act as a source of contamination. Processes like washing, dyeing and finishing, drying, ironing etc. too consume a large amount of energy and resources. To overcome these environmental impacts of the textile industry, worldwide there has been an attempt to make comprehensive Sustainable Textile Standards for fundamentally recreating the way the goods and services are provided in an industrial society.

Respect and care for the environment is one of the cornerstones of sustainable development. It stresses on preserving and enhancing the ecosystem locally and globally. A truly sustainable textile would meet or exceed all industry performance and cost requirements, delight the end user through pleasing aesthetic and tactile qualities while continuously striving for environmental improvements. It comprises of:

- 🌱 Using raw materials and processes that are safe for the consumer and the environment
- 🌱 Supporting an integrated solid and liquid waste management approach
- 🌱 Product lifecycle actively supporting the reuse or recycling or recovery of materials

The textile industry must be seen doing their best to protect the environment and offer the customers an ecological choice through some kind of "green" message. The industry should focus on "reuse, recycle and recover" strategy to become environmentally viable.

The environmental effects of such approach results in improved environmental performance, improved resource use, bio-diversity, sustainable production processes, reduced green house emissions. The textile industry has to implement environment friendly procedures in both their production facilities and office infrastructure.



Ecological Innovations- The Only Solution to Sustainability

Innovation is truly the only mantra that is needed for sustainability. The proper combination of materials and processes linked to technology leads to innovation. As environmental concern increases, many countries are looking out for new ways to conserve the natural resources and reduce the polluting impact of the textile industry.

- 🌱 According to Ye Yongmao, vice president of the CCFA, Chinese companies are developing five biotechnologies for a greener chemical fibre industry. They include industrialization technology for biomass PLA materials, bio-polyol technology, industrialization of renewable fast growth forest, protein fibre technology.
- 🌱 Teijin innovated fibre-to-fibre recycling where the EcoCircle system recycles polyester fabric into virgin quality fibres and serves the environmentally conscious clothing company Patagonia.
- 🌱 Indian polyester superpower Reliance Industries are burning VOC's in boilers and using rice husk to fire boilers as a means to save energy and also recycling all the glycol without redistillation so that there is no waste from recovery.

A holistic, cradle-to-grave, life-cycle approach must be considered in order to minimize the use of resources, energy and environmentally damaging substances.

Sustainable textiles have to be seen in a global and holistic perspective, where designers, manufacturers, consumers, as well political institutions and the decision-makers have to consider the environmental impacts of the industry. Virtually every process and every product is now being labeled as "green". Environmental protection is now deep-seated in every business success and an important part of every profitable decision. ■

There is a need to galvanize ourselves with a new mindset where waste minimization and recycling becomes a vital feature both in the home and workplace. Someone has rightly said, "Its all in the mind."



In this issue only the Planet (Ecology) Pillar of Sustainability has been discussed whereas the other pillars will be discussed in the forthcoming issues.

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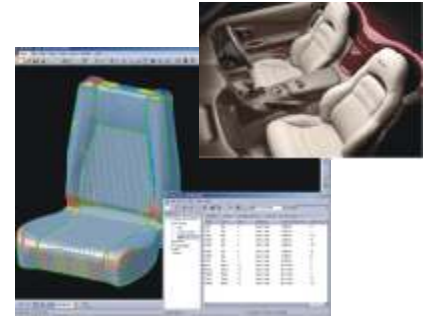
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Seat Trim Engineers Sitting Pretty with VISTAGY Seat Design Environment™ 2.0 Software

VISTAGY Inc., is a leading global provider of specialized engineering software and the creator of Seat Design Environment™ (SDE) 2.0, the latest version of its proven 3D development environment that is tailored specifically to the design and manufacture of seats for the transportation interiors industry. The SDE provides the industry's only complete engineering environment integrated directly into popular commercial 3D CAD systems for more efficiently managing all aspects of seat trim development, from conception, design and cost modeling to document generation and manufacturing.



With VISTAGY's Seat Design Environment you can define a complete 3D master model directly inside the 3D CAD system

In light of constant competitive pressure to deliver inexpensive transportation seats more quickly and accurately, engineers strive to obtain design feedback and manufacturing cost information very early in development to ensure final seats meet specifications and deadlines. The SDE addresses this need by enabling engineers working within their familiar CAD system to easily create a single, complete 3D virtual product definition of the seat architecture and cover including all non-geometric data associated with the model such as material specifications, stitch types and sewing instructions.

This single master CAD model helps engineers more efficiently share design detail across teams, obtain instant feedback on constantly-changing design and cost data, and automatically generate critical manufacturing documentation at the click of a mouse. As a result, OEMs and suppliers accelerate seat delivery time from months to days while eliminating physical prototyping, improving manufacturing accuracy, and assessing how the trim interacts with the seat architecture and ultimately the entire interior. The SDE helps customers to answer questions early in development about whether a seat can be manufactured as designed, how it will look or perform, and how much it will cost. Instead of constructing manual drawings and physical prototypes, engineers can now create complete 3D virtual product definitions using a comprehensive engineering environment specialized for transportation seat development, eliminating previously tedious, time-consuming and error-prone tasks.

New capabilities in the SDE enable engineers to be more efficient and productive, freeing up time to concentrate on developing new innovations, including:

Cost Modeling

Engineers can now obtain immediate feedback on seat manufacturing cost data by automatically exporting product definition detail contained in the master CAD file to cost model documents. As a result, engineers can make more informed decisions early in design about critical design-to-cost drivers such as material types and quantities, seam placement, sewing instructions, assembly sequencing, and hardware quantities.

Integrated Materials Databases

The SDE contains a variety of "out-of-the-box" design databases relevant to the seat development process, and integrates them into the CAD system. These databases, which are launched from the CAD environment and instantly available to engineers, contain lists of cover materials, seam types, needles, threads, standardized parts, and notes and specifications that are used to define a seat. As a result, searching for this data takes far less time and introduces fewer errors.

Automatic Document Generation

The SDE enables engineers to automatically export and format detailed product data from the master model to a wide variety of documents, including engineering drawings, bills of materials, spreadsheets, web pages, quality planning forms, and other formats. As a result, the SDE saves time and helps eliminate the tedious, error-prone tasks of manually creating documentation, especially when frequent changes occur.

With these features and capabilities, the SDE makes it easy to create complete virtual seat design definitions directly in the CAD model even for those who have little or no CAD experience. VISTAGY customers generally get up-to-speed on the SDE within a day, and do not require extensive training because the software works within the current development environment. ■

Nanomagic!!!...Soon We have Clothes that Clean Themselves!!!

Water and soil repellency has been one of the major targets of the textile industry worldwide. With the changing lifestyles people have less time to devote to their daily chores particularly cleaning and laundering clothes. So here is some good news for those who want to get rid of sending their favourite suit to the dry cleaner and to be able to rid from the tedious job of cleaning clothes! Thanks to scientists who are developing ways that would make clothes digest stains as soon as they occur!

Process

The "self-cleaning" process makes fabrics repel water, resist stains and even kill off the bacteria that grow in sweat and make clothes smell. The self cleaning textiles can be manufactured by application of either fluorocarbons or by nanotechnology.

How Fluorocarbons Work?

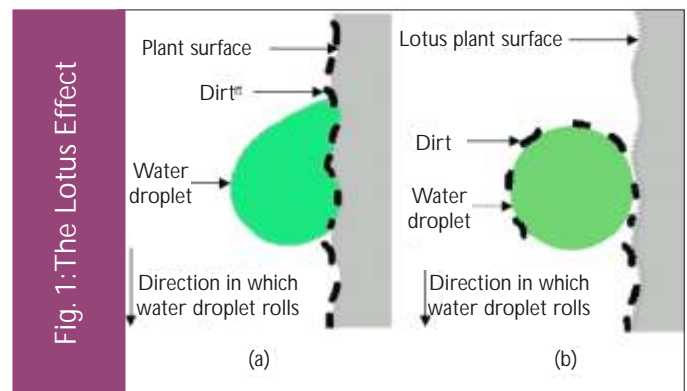
Fluorocarbons generally lower the surface tension by forming a thin film of coating around the fibre. They usually are cationic in nature but can also be non-ionic and anionic. Some useful fluorocarbons are perfluoroalkyl acrylate copolymers and their fundamental structure resembles that of acrylic resins. Fluorocarbons can be applied in a number of ways. They can be applied by padding, kiss coatings, spray, foam and exhaust. The padding method is one of the most commonly used for treating fabrics with fluorocarbons, because of the consistency and completeness of fabric coverage that can be achieved. In the case of treatment of garments with fluorocarbons, the exhaust or spray methods can be used. Treatment with fluorocarbons has to be carefully carried out, as the quality of the water and oil repellent properties are much dependent on the right kind of processing. Crosslinking agents are indispensable for improving the durability of fluorocarbon water repellent agents.

However fluorocarbons have certain limitations as in frequent washes reduces the effect; less durable for cotton etc. To achieve even greater durability and other advantages new methods have been developed using nanotechnology.

Nanotechnology Based Self Cleaning Fabrics

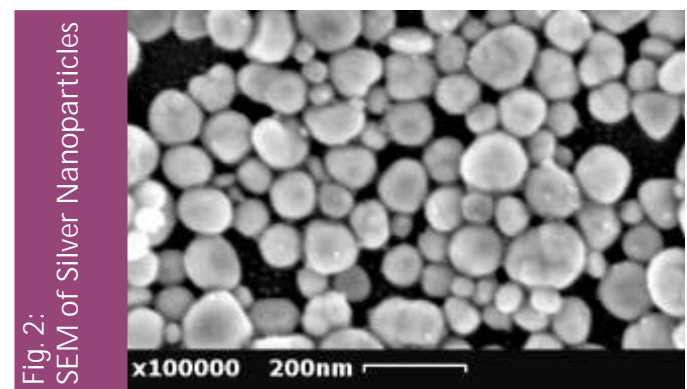
Using Silver Nano Particles: Silver nanoparticles (Fig. 2) offer superior resistance to dirt as well as water and require much less cleaning than conventional fabrics. The patented coating polymer film (polyglycidyl methacrylate) mixed with silver nanoparticles can be permanently integrated into any common fabric, including silk, polyester and cotton. Dupont™ Teflon®

fabric protector uses nanotechnology to provide superior soil and stain resistance for fabrics & leather. The mechanism is similar to the lotus effect occurring in



nature, whereby water drops adhere to leaf surfaces [Fig. 1(a)], whereas they roll down on lotus leaves [Fig. 1(b)].

Applications: In addition to suits, the new coating could be applied to hospital garments, sportswear, military uniforms and rain coats. Other possible applications include awning material for outdoor campers, fabrics for lawn furniture and convertible tops for cars. Silver

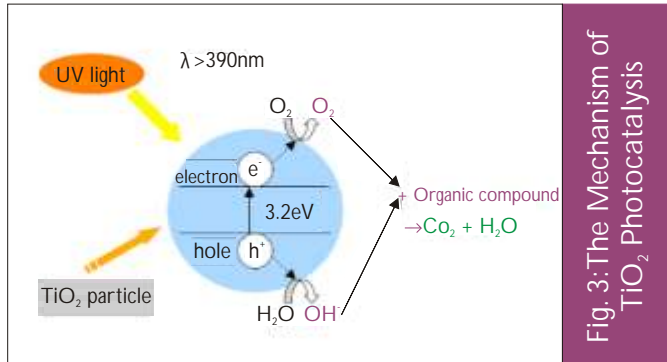


nanoparticles inhibit the multiplication and growth of those bacteria and fungi which cause infection, odour, itchiness and sores. Hence, nano-silver particles are widely applied to socks in order to avoid growth of bacteria.

Special Feature

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Catalytic Self Cleaning: Nano-sized silver, titanium dioxide and zinc oxide are used for imparting self-cleaning and anti-bacterial properties. Part of the oxygen in the air or water is turned into active oxygen by a catalyst containing the metallic ion, thereby destroying the organic substance to create a sterilizing

Fig. 3: The Mechanism of TiO₂ Photocatalysis

effect. Nanomaterials possess enhanced catalytic abilities due to their highly stressed surface atoms which are very reactive. With the use of nano-sized particles, the number of particles per unit area is enormously increased.

Photocatalytic Cleaning: Titanium dioxide is a photocatalyst which when coated on fabrics acts as an anti-bacterial photocatalyst that helps to break down carbon-based molecules. Once triggered by sunlight, clothing made of such fabrics will be able to remove dirt, pollutants and micro-organism by itself. The coating, which is non-toxic, can be permanently bonded to the fibre and does not alter its texture and feel (Fig. 3).

“Japan Exlan Co., Ltd. has developed a photocatalytic

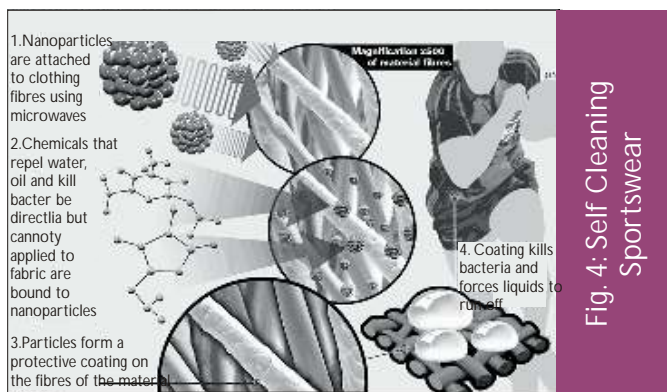


Fig. 4: Self-Cleaning Sportswear

acrylic fibre “SELF CLEAR” yarn with higher-dimensional self-cleaning properties which had been elusive with conventional photocatalytic fibres, and started recently sailing their product for manufacture of clothing, sportswear, uniforms, bedding, carpets, and daily goods.”

Using Microwaves: This technology attaches nanoparticles to clothing fibres using microwaves. Then, chemicals that can repel water, oil and bacteria are directly bound to the nanoparticles. These two elements combine to create a protective coating on the fibres of the material. This coating both kills bacteria and forces liquids to bead and run off. Over time, the effectiveness of the coating falls as the active chemicals are knocked off, but the scientists claim it can be restored by soaking the material in a fresh solution of the same chemicals (Fig. 4).

Applications: Sportswear is one of the biggest areas where this technology will be used. Besides that it could have many other applications - The anti-bacterial properties could be of great use for chefs in kitchens and in hospitals where antibiotic resistance is a big problem. Scientists working for the US Air Force have already produced T-shirts and underwear that can be worn for weeks at a time without washing, and the technology has now been licensed to a London company, Alexium, to develop for civilian applications.

New Advances

Scientists are developing a coating of 'live' enzymes that would make clothes digest stains as soon as they occur. The process known as *spin coating* involves placing a large dollop of a liquid onto a flat surface, which is then rotated at great speed. This generates powerful centrifugal forces that push the solution towards the surface edges and cause some liquid to evaporate, leaving behind a thin, solid film over the entire surface.

Applications: Such enzyme-coated materials could have a wide range of uses, including self-healing materials or protective suits able to digest chemical or biological hazards.

Going Commercial

Breakthroughs in nanotechnology have made self-cleaning fabrics both practical and economical. Self-cleaning property will become a standard feature in future clothing and other commonly used materials that will help us to maintain hygiene, minimise the spreading of pathogenic micro-organisms, particularly in textiles and clothing. But the work is still in progress and there are a whole lot of challenges that need to be overcome to prove the viability of any self-cleaning treatment. Also an important step in the commercial development of these fabrics is an industrial evaluation which involves testing whether existing textile manufacturing equipment can be used feasibly and economically in their production. ■

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Diversification into Nonwovens - Challenging New Markets

Needlepunch Nonwovens Playing a Vital Role

D. Burkhardt; I. Mählmann; S. Bernhardt; J.P. Dilo

Worldwide nonwovens are gaining more and more shares in many fields. At present especially Indian markets for nonwovens are on an immense growth. Due to the good industrial development in India followed by the extension of infrastructure for transportation (rail, road, air and sea [1: TechTex India Jan-Mar 2008 Vol. 2, Issue 1] & the upgrading needs and possibilities of a modern society Indian domestic markets are demanding geotextiles, automotive textiles, filter textiles, wipes, hygiene-textiles etc. One can literally say that nonwovens are a part of modern living!

The Indian Scene

The growing demand of geotextiles for example is a result of the ongoing upgrading and extension of India's infrastructure. More than 1.7 million km of the actual Indian road network are still unpaved roads (app. 53%) [2: TechTex India April-June 2008 Vol. 2, Issue 2, p.7]. The actual investments planned by the government for infrastructure projects are more than 61.6 billion US\$ [2]. These figures picture the huge potential for geotextiles in India. With respect to the outstanding features of needlepunched nonwovens, these products form the major share of the entire geotextiles consumption in India today. But there is still a lack of availability on the Indian market, so that most of the domestic demands are still being met by imports [1, 2]. Similar to this growth further market fields for needlefelted nonwovens are developing fast, e.g. India's domestic automotive industry.

willow (2), and oiling station. Fibre opening and blending is a most important fibre preparation to reach stable process conditions which are the base for both, high machine performance and high quality products. Depending on the fibre fineness the fibre tufts from the mixing chamber (3) are usually further opened in a fine opener (4).

The following process step is carding (5) including the card feeding (5a). The configuration of the card (5b) is essential for the fibre orientation in the card web. Depending on the application the type of card feeding, the type of card and also the number of cards may vary. It is necessary to mention that besides roller cards airlaying machines are utilized for certain applications: e.g. sound absorption nonwovens in the automotive field or insulation nonwovens for buildings.

Usually the card is followed by a cross lapper (7) which controls the product weight and width. The batt weight

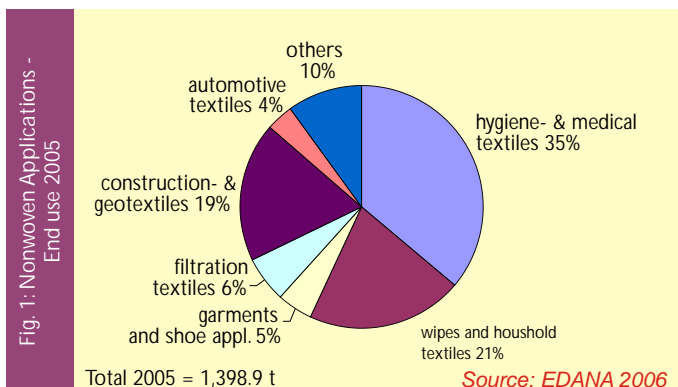
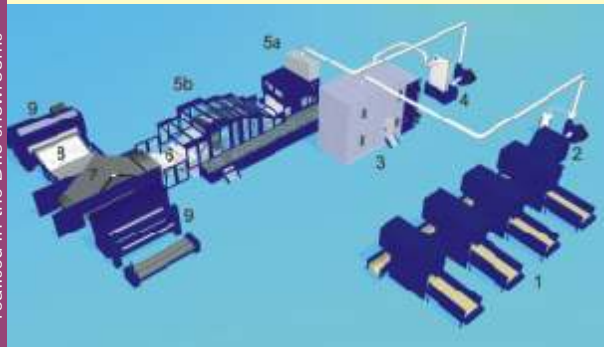


Fig. 2: Schematics of nonwoven line including opening, blending, carding, cross lapping, drafting & needling as realised in the Dilo showrooms



Production Process of a Needle punched Nonwoven

Generally spoken a modern production line for needle felting (Fig. 2) consists of the following sub processes: bale opening and tuft opening (1 and 2), fibre blending and fine opening (3,4), carding (5) (with card feeding (5a) and carding (5b)), web drafting and control circuit "Profiline CV1" (6), cross lapping (7), lap drafting (8) and needling (9).

Shown is the bale opening (1) as a "component dependent" line with 4 openers followed by a carding

after the cross lapper is set to be higher than the target weight of the final product since the following needling passages (9) and - depending on the application - the following drafting sequences (8) will reduce the batt weight.

Finally the needling process takes place. Needling normally is performed by several needling machines or passages depending on the application. Down stroke needling, up stroke needling and needling from both sides simultaneously or alternating is employed. Outstanding quality and evenness achieved through the

Hyperlacing Technology for Lightweight Nonwovens



Dilo is now introducing the Hyperlacing technology for the production of lightweight fine fleeces in a weight range of ca. 30–80 g/m² and applications in the sectors medicine, hygiene, filtration, synthetic leather and linings.



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DILO Hyperpunch technology where a horizontal movement of the needles drives the material gently through the needling zone.

Geotextile Line: (Fig. 3a) A standard universal high-production card in a working width of typically 3 m is required after the opening process, followed by a modern high-speed crosslapper including web drafting and a control circuit "Profiline CV1" for keeping an even cross profile after the various needling and lap drafting stages. A card feeder with modern controls for an even card feed is, of course, a prerequisite. A standard

universal needling line for the production of geotextiles comprises pre-needling with two needle boards down-stroke, usually in a working width of 6 m or more followed by a felt drafter. The DILO felt drafting system using "wrap

rollers" was the first of its kind and originally developed in the early 1980s. Since then it has been successfully applied for various geotextile production lines worldwide. After the needling stage a heat setting process maybe applied in order to reach an increase of strength properties.

Hyperlacing Line: (Fig. 3b) comprises a high performance card feeding system followed by a "Delta Card". The Delta Card concept leads to perfect blending at high production rates by means of a roller delta between the pre-opener and main cylinder consisting of a counter-rotating transfer roller and a lower doffer and transfer roller. The cross lapper is followed by an up-stroke and a down-stroke needling machine each equipped with two needle boards. Then the actual Hyperlacing process is realized by the application of 6 Cyclopunch machines leading to "high intensity needling" creating a surface with high abrasion resistance. Naturally the line is equipped with the web drafting and control circuit "Profiline CV1". A Hyperlacing line allows throughput speeds over 100 m/min at low energy consumption for the production of lightweight nonwovens in the range of 30 to 80 g/m² for linings, filtration, synthetic leather, hygiene or wipes.

Automotive Line: (Fig. 3c) To reach the surface

characteristics for an automotive headliner for example another order of needle punching machines is used: first down-stroke, followed by one up-stroke continued by 3 down-stroke needle looms whereas a felt drafting unit to orientate the fibres is not necessary.

Positive Prospects

Although these lines seem to be highly specialised, the needle felting process is a highly economical and flexible process allowing the realization of numerous products for different applications. As said before a strong

expansion of the needle felting nonwoven market can be expected in India. The highest potential in growth is always a question of timing and of technology. The starting point should be as early as possible in order to gain major shares in the Indian market which is currently still mainly supplied

by imports [2]. Technological leadership is gained through the investment of highly productive quality machines which offer the economics in the long run.

The following segments are the most important ones: automotive, geotextiles, wipes, filtration, synthetic leather and hygiene and medical. Every company or investor should decide about:

- The segment judging its own possibilities regarding the marketing of the new product.
- It is essential to select a supplier who is not only able to deliver, install and start up a production line with outstanding operational availability but also includes production know how in the nonwovens line.
- The selected supplier for the nonwoven line should not only be a contractor but should become a long term partner.

With DILO as the market leader in nonwoven plants, DILO-technology customers can expand their lead and get a unique market position. DILO technology and the DILO research centres enable customers to develop and to produce nonwoven products of outstanding quality on the basis of a most efficient production process, with low energy consumption, little waste and maintenance requirements. ■

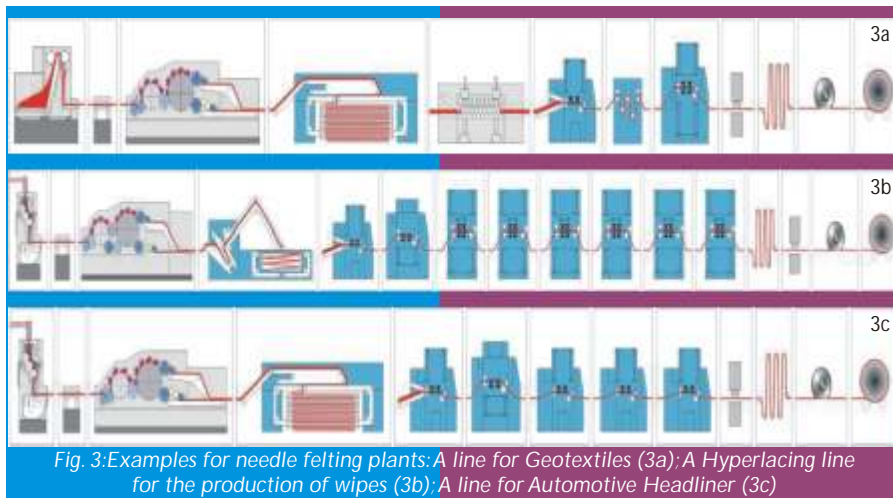


Fig. 3: Examples for needle felting plants: A line for Geotextiles (3a); A Hyperlacing line for the production of wipes (3b); A line for Automotive Headliner (3c)

Widening Scope of Narrow Fabrics for Technical Applications

COMEZ S.p.A.



To survive in an extremely competitive market, textile companies worldwide have been looking for value added products with functional capabilities. Technical textiles are an innovative sector, one that is highly specialized and holds great potential for the future. Within the vast world of textiles intended for technical use numerous enterprises see narrow fabrics as being of strategic significance with regard to their existing and future markets. For a variety of applications, narrow fabrics are the so-called "golden link" within functional textiles, sometimes without even being noticeable!

Definition of Narrow Fabrics

Narrow fabrics, sometimes referred to as "small wares" are defined as any textile fabric, less than 52 cms in width with two selvages. Narrow fabrics perform a number of functions. Some are decorative such as ribbons & bows. Others are informative, as in the case of labels. However, many are functional with special performance functions. Crochet knitting machines, weaving needle looms & double needle bed warp knitting machines are used in the manufacture of narrow fabrics. Further, length cutting and winding machines, welders & special sewing machines are used to manufacture finished products.

Possible Product Portfolio

Agro Textiles: Agriculture has numerous links with the world of technical textiles (used as aids in harvesting, or for protecting and stocking products, etc.). The various applications of narrow fabrics in this sector include:

- Nets designed for the packaging of products
- Fabrics providing protection from hail, sunlight & animals
- Nets for sustaining creeping plants
- Monofilament & metallic yarn tapes used for animal fencing
- Monofilament, rafia, polypropylene nettings used for stocking and shipping products
- Nylon braids used on the bottoms of fish farming tanks for collecting organic deposits

Industrial Textiles: Industrial applications in engineering are extremely diverse and growing in number and type, covering a wide array of sectors.

- Bands in Kevlar and/or fibreglass are used as reinforcements for walls (the fibres are arranged without evolutions, either lengthwise or crosswise, thus maximising the fibre's resistance characteristics)
- Kevlar, carbon and fibreglass tapes are used for lining tubes, safety coverings on airline

- engines and ship chimney "funnels"
- Tubular netting in fibreglass or PP for lining cables
- Kevlar fabric used for lining engine parts to avoid the dispersion of parts in case of breach
- High strength polyester and Teflon ribbon, employed as a central core for resin and fibreglass bearings for low speed mechanical uses such as fork lifts, etc.
- Carbon tapes used as support fabric for loudspeakers

Sport Textiles: Sports and leisure activities, whether at a professional or amateur level, are increasingly growing in importance. Many sports garments, as well as a great variety of other objects employ narrow fabrics to offer high technical performances (anti-friction fabrics, protective and breathable fabrics).

- Three-dimensional bands in polyester used for sports footwear
- Bands in Kevlar, carbon, fibreglass, and aramid fibres used as inserts in sports accessories
- Carbon ribbons used for sports articles or components
- Carbon inserts for racing footwear
- PP, polyester, rubber, cotton and rafia netting

Medical Textiles: The medical and hygiene sector is a field in which narrow fabrics find many possible applications:

- Rigid gauzes, for hospital use or for bandages, in natural or man-made materials, depending on whether they come into contact with skin or are used simply as coverings
- Semi-elastic gauzes in cotton or polyester with elastomer, used for bandages requiring a small degree of compression
- Elastic bandages in rubber, nylon and monofilament used in the production of ankle and knee-bands, body belts, shoulder supports, etc.
- Bands in cotton, polyester and rubber



Comez Tubular Fabrics



Comez 3D Fabrics

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used for girdles

- Fibreglass bands used in first aid
- Tubular elastic nets for post-operative bandage containment
- Elastic bands incorporating female part of Velcro fastener for post-operative use
- Monofilament fabric for surgical use, as a permanent prosthesis, or in protecting organs or tissue
- Tubular elasticized nylon and rubber fabric covered with polyester

Transport Textiles: The transport sector is one of the most important outlet markets for narrow fabrics where they are employed for furnishings, technical and structural functions.

- Specially treated PP ribbons used as safety belts
- Three-dimensional fabrics in polypropylene or polyester for covering automobile seats
- Polyester fabrics, flat or 3D, used as seat liners
- Polypropylene netting used to create special containers in automobiles, trains or airplanes

Home Textiles: Narrow fabrics are also widely employed in this sector, whether for the comfort and safety specifications offered by certain fibres, or for increasingly relevant factors related to practicality.

- Stair-like PP weave for supporting & moving "VENETIAN" shutters
- Polyester ribbons used in joining carpeting
- Ribbons produced using aramid, carbon fibres or fibreglass used for laminated panels in furniture
- Ribbons for edging on mattresses
- Bands produced with polypropylene, raffia and covered rubber used in furniture as backrests and seats on armchairs, sofas, chairs



Comez Technical Ribbons

Market Situation & Customer Oriented Approach

The demand for narrow fabrics for technical applications is definitely expanding and companies are noticing several aspects of this phenomenon. They're seriously considering the customer's requirements in order to provide them the best possible solutions in relation to the textile structure to be adopted.

- First of all, there is a search for the use of different materials or fibres that does not imply any variations in the structure itself of the tape or fabric. A typical example could be a tape that is meant for decorative use if made of nylon, whereas if used for insulation it is made of glass fibre. In both cases, no modifications are required on the textile machine, only the yarn changes.
- Secondly, there is a search for the possibility to slightly modify the structure of the narrow fabric with the aim of making the use of the required fibres possible & easier. What is requested from the machinery manufacturer is an intervention regarding the preparation of the material (for example beams or creels) & possibly small adjustments on the machine.
- Third and most demanding aspect is that regarding the narrow fabric manufacturers' demand for special machinery upon realizing that its production method is different.

A Look into the Future

A bright future lies ahead for narrow fabric applications particularly in both industrialised & emerging nations as the people are getting more & more educated & aware of the various functional textiles available in the market. Newer applications will continue to develop & higher growth rates can be forecasted for applications of narrow fabrics in the transport sector, medical and sports textiles. The growing intelligent textiles market will further boost the market for these fabrics thus making it a field of great interest to the existing and new entrepreneurs. ■

Striking Market Demand with Customer Oriented Approach

Italy's COMEZ S.p.A. based in Cilavegna (PV) is one of the world's leading suppliers of this technology. COMEZ research has led to the designing of crochet machines, needle looms, and electronic double needle bed machines that present ideal characteristics for the production of narrow fabrics:

- A high degree of versatility when using special yarns, which can be processed safely while maintaining high operating speeds; the use of different types of needles allows for the working of different types of fibres;
- These machines can produce a wide range of warp weaves (such as closed knit tricot, open knit tricot, closed chaining effect, open chaining effect) that confer to the fabric excellent characteristics in dimensional stability or three-dimensional effects;
- Thanks to the use of an exclusive electronic drive system, it is possible to obtain very long and varied pattern repetitions and special effects on fabrics, guaranteeing a constant and uniform yarn feed - a fundamental element in the production of technical articles.



Comez DNB/EL-800- 8B
Electronic Double Needle Bed
Warp Knitting Machine

index08
WORLD'S LEADING NONWOVENS EXHIBITION

New ideas

Nonwovens Exhibition
15-18 April, 2008; Geneva, Switzerland

INDEX 08 closed its doors having broken all records, confirming its title as 'The world's leading Nonwovens exhibition'. This triennial event witnessed some 520 exhibitors exhibiting their goods and services for the nonwovens industry, not only from Europe, but also from Middle and Far Eastern countries. One of the most noticeable phenomena of this year's visitors was the number attending from so-called 'technical' applications, such as the filtration, automotive or construction industries, following the advances which nonwovens continue to make in these important sectors. In fact the Chinese delegation formed the largest block of exhibitors from outside continental Europe. Furthermore, Indian exhibitors namely BCH, Birla cellulose (Aditya Birla group), Fiberweb India, Ginni Nonwovens and Reliance Industries Ltd. were also overwhelmed with the show having obtained many positive offerings and opportunities.



BCH booth at index



Pierre Wiertz, EDANA
introduces index Awards

The innovation highlight of the exhibition was undoubtedly the unveiling of the winners of the INDEX 08 Awards. Five Awards, covering everything from product and process innovation to marketing brilliance, were presented to the winning companies during a special ceremony on the first day of the INDEX 08 exhibition.

Under the umbrella theme of 'Solutions for Tomorrow', visitors were treated to a series of more than 30 free presentations by exhibitors, including two special sessions dedicated to filtration applications and Nanotechnology. Moreover, the presentation made by Mr. Samir Gupta, MD, BCH provided the audience with an insight into the current situation in India and the extreme potential in this emerging market for nonwovens and technical textiles.

The 'Innovation Pavilion', which featured European Union-funded FP6 and FP7 projects, provided a glimpse of what the future could hold for nonwovens and attracted a great deal of interest from exhibition attendees.

'For an industry in metamorphosis, confronted by difficult circumstances compounded by a weakening dollar and rising oil prices, INDEX 08 showed the nonwovens industry at its creative best: dynamic, innovative and continually diversifying into new application areas' stated Pierre Wiertz, General Manager of EDANA, the sponsor of INDEX.



Dr Klatt speaks in the
Nanotechnologies session

mtex

New business

International Trade Fair & Symposium for Textiles
and Composites in Vehicle Manufacturing
3-5 June, 2008; Chemnitz, Germany

The mtex international trade fair & symposium for textiles and composites in vehicle manufacturing organized by Messe Chemnitz attracted a record of international visitors and exhibitors for a grand three day show from 3rd-5th June 2008 at Chemnitz. With nearly 140 German and international companies, research institutes and institutions as exhibitors, the event became an international information and presentation platform for managers from all branches of the vehicle manufacturing sector like automobile and commercial vehicle industry, railway and carriage fitters, the shipbuilding industry and the aerospace sector.

The spectrum of companies exhibited their products and services ranging from manufacturers of the latest vehicle equipment, seating and panels to fibre-reinforced composites that are used in vehicle and aircraft manufacturing, which have been developed to accommodate extreme levels of rigidity and the lowest possible weight levels.

The 2008 mtex was also accompanied by a two-day Specialist Symposium on 4 and 5 June, 2008 and the European Entrepreneurs forum of Technical Textiles on 5 June 2008. The high quality symposium focussed on "New Materials in Lightweight Construction and Composites" and "Trends for Interiors and Seats". The forum organized by the ETT CLUB dealt with MOBILTECH issues with Speakers from Italy, France and India. The technical presentation namely 'Automotive Textiles in India- a Market Perspective' made by Mr. Samir Gupta, MD, BCH invoked huge interest from the audience due to the growth scenario in the Indian automotive industry recently. Werner Zirnzak from the industrial association for yarns, fabrics and technical textiles, which issued the invitations for the meeting, was delighted with the high quality of the trade visitors: "Both the lectures and the subsequent discussions and conversations were very informative. The selection of subjects was very well received by many guests who travelled here". The 2008 mtex Symposium once again provided a high-quality transfer of knowledge on technical textiles in all kinds of vehicle manufacturing from automobiles and commercial vehicles to railway carriages and even planes and ships.



Mr. Samir Gupta, MD,
BCH, at ETT Club
Convention during mtex



New networks

World Textile Conference
24-26 June, 2008; Biella, Italy



Giorgio Rovero, Chairman,
Autex 2008

The 8th AUTEX Conference organized by the Materials Science and Chemical Engineering Department of the Politecnico di Torino became an important forum for exchanging news and information between academia and industry in the field of textile engineering all over the world. The event took place in Biella, Italy from 24th-26th June 2008.

The Conference stimulated the interactions to conjugate production excellence, product innovation, energy conservation and environmental concern. Beside the topics characterizing the AUTEX 2008 Conference, a special opportunity was also given to synthesize the industrial perspectives and the research efforts with the organization of a forum, followed by one-to-one meetings.

Participants from nearly 36 nations witnessed this World Textile Conference and all together generated a new basis for perspectives, projects and common work.

This conference aimed to give an overview on advanced textile technology and corresponding environment-friendly technologies.

The three day conference was held with parallel sessions dealing with specific topics like nanomaterials, electrospinning, sustainability, pretreatment dyeing and finishing, spinning and weaving technologies, smart textiles, logistics, quality, supply chain management and plasma treatment. There were also 160 poster presentations in the programme.

Presentations were also invited from the leading experts in India i.e. Dr. V.K. Kothari, IIT Delhi; A. Aneja, Reliance Industries Limited, India; E. Menezes, Rossari Biotech, India; Samir Gupta, BCH; A.K. Pattanayak, Indian Institute of Technology, India; S. Subramanian, Anna University, India; N.V. Padaki, Indian Institute of Technology, India; B. Das, Indian Institute of technology, India; which provided the audience with an insight on new development trends, most likely oriented to improve the quality of life through the excellence of goods.



Mr. Samir Gupta and
Giorgio Belletti during
the Autex Gala dinner

A one day international symposium on

Geotextiles in India

What, Where & Why?

17 October, 2008

MMRDA Exhibition Ground, Bandra-Kurla Complex, Mumbai, India



During CONSTRU India 2008

Symposium Highlights

- Worldwide trends in the adoption of geotextiles for infrastructure projects
- Various products available internationally, their classification, functions & applications
- Latest developments on the products & applications front
- Standards & specifications for testing & installation of geotextiles
- Changing Indian Scenario
- Future prospects in India

Who should attend

The attendees would comprise of designers, contractors, installers and decision makers of the industry who are keen on using innovative products for their projects. Also in attendance will be manufacturers, traders and R&D personnel whose main area of function and interest is geotextiles and related industries.

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For more information contact: info@bch.in or visit www.bch.in

Forthcoming Events

July-September 2008

Architex

01-02 July; Torino, Italy; www.architextorino.com

International Nonwovens Technical Conference
2008

08-11 September; Houston, USA; www.inda.org

Outlook 2008

17-19 September; Cascais, Portugal; www.edana.org

October-December 2008

The Nonwovens Research Academy

09-10 October; Chemnitz, Germany; www.edana.org

CONSTRU India 2008

16-18 October; Mumbai, India; www.construindia.com

International Symposium on Geotextiles in India;

17 October; Mumbai, India; www.bch.in

China International Trade Fair for Technical Textiles
and Nonwovens

20-22 October; Shanghai, China; www.messefrankfurt.com

IFAI Expo 08

21-23 October; Charlotte, USA; www.ifaiaexpo.com

JEC Composites Asia

22-24 October; Singapore; www.jeccomposites.com

International Conference on Technical Textiles and
Nonwovens

11-13 November; New Delhi, India;

www.textileconferenceiitd.com

EDANA Training Courses on Nonwovens &
Absorbent Hygiene Products

12-15 Nov, New Delhi, India; www.edana.org, www.bch.in

India-ITME 2008

15-22 November; Bangalore, India; www.india-itme.com

Filtration 2008

09-11 December; Philadelphia, USA; www.inda.org

Future of Wipes Conference

11-12 December; Georgia, USA; www.futureofwipes.com

January-March 2009

Vision 2009

26-29 January; Los Angeles, USA; www.inda.org

Middle East Nonwovens Symposium

10-11 February; Dubai, UAE; www.edana.org

Needlepunch 2009

24-26 March; Myrtle Beach, USA; www.inda.org

April-June 2009

Texmac India 2009

15-18 April; New Delhi, India; www.texmacfairs.com

Techtextil North America 2009

21-23 April; Las Vegas, USA; www.techtextilna.com

Asia Nonwovens Exhibition and Conference 2009

20-22 May; Shanghai, China; www.nonwoven-asia.com

Techtextil 2009

16-18 June; Frankfurt, Germany;

www.techtextil.messefrankfurt.com

Announcement & Call for Papers

International Conference on

Technical Textiles & Nonwovens



11-13 November, 2008

Department of Textile Technology
IIT DelhiPapers are invited for both Oral and Poster presentations in the
following areas of Technical Textiles & Nonwovens :

- Emerging trends in Technical Textiles
- Evaluation methods
- Recent innovations
- Structure-property relationships
- Developments in Raw materials
- Market potential
- Product developments
- Techno-economics
- Applications of Nonwovens

Poster papers will be judged by a panel of judges and the best 3
paper will be awarded prizes (First prize – Rs. 5,000/-, Second
prize – Rs. 3,000/- and Third prize – Rs. 2,000/-)

DEADLINES:

Submission of one page abstract : 15 July, 2008
 Acceptance of abstract : 31 July, 2008
 Submission of full paper : 30 August, 2008

CONTACT DETAILS:

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Fax : 011-2658 1103

STRATEGIC PARTNER:



Website: www.bch.in

For more details visit us at : www.textileconferenceiitd.com

Technical Textiles

India: Long-term, Rapid Growth Predicted for Indian Technical Textiles



It is forecasted that India's nonwoven and technical textile industry will enjoy average annual growth of 15% for the next decade, which is three times the yearly 5% expected in the USA and Europe.

The technical textile industry could well develop into a vibrant, indigenous sector. Both domestic textile units and the Union Ministry of Textiles seem to be focusing attention on it. Asian countries, led by China and India, may drive the future growth of this industry. The Textile Ministry has set up an ad-hoc committee, with the intention of converting it into a development council for growth and export promotion of technical textiles. It has also initiated a baseline survey of the domestic technical textile industry to assess the production, consumption, export, import and technology level.

Further, the modified Technology Upgradation Fund Scheme extends 10 per cent capital subsidy in addition to five per cent interest reimbursement for technical textile machinery. The adhoc committee is working on issues such as recommending mandatory use of technical textiles in critical areas and controlling illegal imports.

France: NSC Nonwoven and Ahlstrom Brignoud- A Joint Success

NSC Nonwoven has made use of all its know-how to design, deliver, install and start up on time an ultra modern ProDyn® needling line for Ahlstrom at its new plant based in Brignoud.

This ProDyn® line is equipped with all the latest innovations in Laroche opening-blending technology, with the new Thibeau Excellence® card, associated with a Dynamic Asselin crosslapper & drafter which feeds a set of many Asselin A50R needle looms.

The complete line is managed and piloted by an Asselin-Thibeau Supervision system. Ahlstrom reinforces its leadership in industrial nonwoven applications and finds new opportunities- thanks to the new ProDyn® line.

Transport Textiles

USA: Battelle and Unidym Form an Alliance for Carbon Nanotubes

Unidym, Inc., a majority-owned subsidiary of Arrowhead Research Corporation, and Battelle have extended their existing relationship to include an alliance focused on multi-functional nanocomposites for aerospace and transportation applications. The companies will collaborate with aerospace and automotive companies, and their composite materials suppliers, which require carbon nanotube formulated coatings, sealants, adhesives and load-bearing composites. Both companies have seen interest in applications such as high



performance carbon nanotube, enhanced carbon fiber composites, carbon nanotube based thermoplastic nanocomposites that can be injection molded, and thermoset nanocomposites that can be fabricated with various Resin Transfer Molding (RTM) processes and through the compression molding of nanostructured Sheet Molding Compound (SMC) formulations.

Geo Textiles

China: TenCate Opens New Factory in China

13th June, 2008 has marked the opening by Royal TenCate (Koninklijke TenCate nv) of its new factory for geosynthetic materials near the city of Zhuhai (pop. 1.5 m) in Guangdong province, China. TenCate Geosynthetics will use this plant to produce textiles for the strongly growing Asian market.

TenCate's new production location will cover a total of 135,000 square metres - of which 28,500 square metres have now been built on. This will include personnel accommodation. The Zhuhai factory will process polypropylene into fibres for geosynthetic materials including TenCate Geotube®, a dedicated product for dike building and land reclamation.

The new factory will start contributing to the revenues of TenCate's sector Geosynthetics & Grass from the second half of 2008.

Clothing Textiles

Germany: Hohenstein Institute Develops Antimicrobial Efficacy Test



The International Textile Research Centre of the Hohenstein Institute has developed a two-part test to determine the qualitative and quantitative efficacy of antimicrobial textiles in reducing perspiration odour. The first stage of the test involves use of a microbiological cell model in which the antimicrobial textile impedes the metabolism of microbes that generate particular odour substance, and the use of gas chromatography/mass spectrometry analysis to measure the amount of odour substance generated as well as the efficacy of the textile. The second stage comprises a controlled wear test in which test participants apply their own perspiration to the textiles, and the qualitative and quantitative assessment of odour reduction in the antimicrobial textile is compared with conventional textiles.

The institute will provide a Hohenstein quality label for use by textile manufacturers that have verified the efficacy of their products through independent testing.

Construction Textiles

Russia: Ahlstrom Inaugurates its New Glass Fibre Plant in Russia

Ahlstrom Corporation, global leader in fibre-based materials, celebrates the inauguration of its new glass fibre tissue production facility in Redkino, Tver Region, Russia. The plant produces glass fibre tissue for Russian construction and plastic composite industries and employs initially 80 people. The Tver plant is Ahlstrom's first fully owned production facility of fibre-based materials in Russia.

The investment including the plant facility, glass fibre tissue machine and required infrastructure is worth approximately EUR 40 million. The production capacity of the plant is 250 million square meters per year, which raises Ahlstrom's total glass fibre tissue production capacity in Europe to half a billion square meters. The plant's main product application is cushion vinyl floor coverings and other applications include wall coverings, laminate surface layers, building panels, pipe wrapping and bitumen roofing.

Agro Textiles

India: Dupont Launches New Products in India

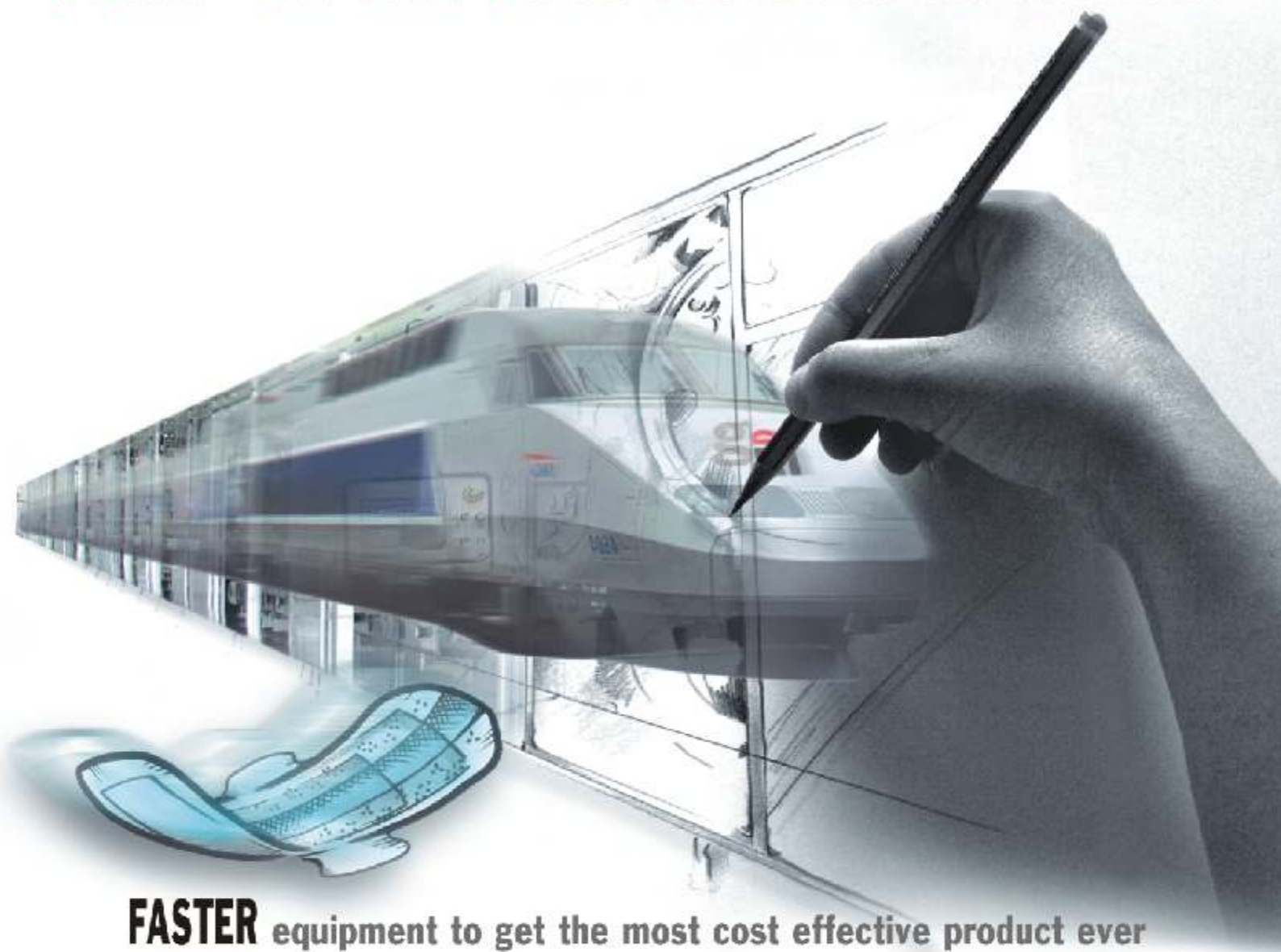
DuPont™ RootBarrier Pro is a coated nonwoven structure based on Xavan®, ideal to prevent invasive growth and damage by aggressive plant roots. DuPont Building Innovations recently launched a range of landscaping solutions at the national seminar of the Indian Society of Landscape Architects (ISOLA) in Chennai, India. DuPont Landscape Systems' managers Evelyne Toudert and Georges Karam introduced the products to more than 150 landscape architects. Some of the products included landscaping geotextile products for weed control, root barriers and an innovative ground-stabilization grid that makes the turf "motorable." All of the products received an enthusiastic response and numerous inquiries.

DuPont Building Innovations already has a presence in the landscaping market with the DuPont™ Xavan® Pondliner. The new product launch is expected to significantly increase revenue and help architects create better landscapes at airports, residential townships, industrial complexes, corporate parks, golf clubs and resorts.

DuPont™ Ground Grid is an innovative, three-dimensional honeycomb structure made from Xavan®.



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sanitary napkins, adult and light Inco products, underpads.



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Medical Textiles

USA: Pampers Launches UnderJams(TM) Night Wear



Approximately 5-7 million children above age five have accidents at night, i.e. one in 10 children between the ages of five and

twelve. Although in most cases, bedwetting will go away in time, parents need a quick solution to help give their children the confidence they need to partake in everyday activities. Pampers UnderJams offers all-night protection, but are designed to fit more like underwears to help give children the privacy they deserve. UnderJams offers several features that provide excellent protection with a discreet look and feel including:

- **Nightlock(TM):** The product's core absorbs and helps lock away fluids to help prevent leaks
- **LowWaist:** The design allows the product to fit more like underwear than the leading national brand
- **ComfortWear:** Materials are quiet and cloth-like for comfort and breathability
- **Varied Designs:** Product offers different designs for boys and girls



Germany: New Options Explored with NanoSpider

The vast amount of research and development work currently being carried out worldwide into nanofibre production was emphasised at a recent conference held by Elmarco, the developer of NanoSpider technology in Prague, Czech Republic. In one of four presentations by the host company at this conference, research scientist Jana Svobovoboda described work being carried out on Elmarco's NanoSpider roller spinner in the Czech Republic with chitosan, collagen and alginate to make antimicrobial and anti-viral filters for face masks.

Italy: GDM Offers After Sale Services on SSP Technology

Starting from 27th May 2008 GDM, a global manufacturer of efficient & cost effective production lines for disposable hygiene products like baby diapers, sanitary napkins and adult incontinence products has acquired the worldwide exclusivity to provide After Sales Activity on SSP technology both in terms of "original" Spare Parts and Technical Assistance. This acquisition places GDM as global supplier of After Sales Services for all manufacturers who currently use their lines or SSP equipment/technology.

Protective Textiles

India: J&K Army Floats Tender for Hi-Tech Equipment



The army has issued tenders to purchase state-of-the-art security equipment to beef up its counter security grid in the state in view of the Assembly polls stated later this year. Army's Northern Command Headquarters, which is looking after the operational area of Jammu and Kashmir, have issued three tenders to purchase Light Weight Bullet Proof Jackets (LWBPJ), Sniper Suits And Veils (SSAVS) and Handheld Radio Sets (HHRSS) to give its troops cutting-edge technology and body security apparatus during the forthcoming Assembly elections.

The Northern Command has invited technical bids for vendors for the purchase of large number LWBPJ with Kevlar fabric impregnated with rear trauma pads, groin pads, non-woven collar pads and armoured pads. These new security apparatus would be replacing the old heavy-weight bullet proof jackets in phased manner, according to the sources. Similarly, army has also tendered for purchase of the specialised SSAVS for the counter insurgency and jungle war-fare operations in Jammu and Kashmir.

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- The largest concentration of suppliers
- A gathering of industry connections unrivaled anywhere else

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- 8,000 worldwide visitors
- 100 expert speakers
- The inspiring *Design Exhibition*—far-out innovations for health and safety
- International Buyers Program designation



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Keynote Speakers



LOU HOLTZ

"Game Plan For Success"

Coach Lou Holtz, a legendary team leader and speaker on achievement, presents a message that transcends athletics focusing on people and the values that make relationships (and organizations) excel.

Tuesday, Oct. 21 – 8:30-9:30 am



DORIS KEARNS GOODWIN

"Leadership Lessons From Abraham Lincoln"

Acclaimed Pulitzer Prize-winning historian Doris Kearns Goodwin provides object lessons in leadership, political economy and successful strategy, courtesy of one of history's most compelling personalities. The presentation is based on her best-selling book: "Team of Rivals: The Political Genius of Abraham Lincoln."

Thursday, Oct. 23 – 8:30-9:30 am

A continental breakfast will be served before each event at 8:00 am. Register to attend these exciting keynote presentations with a "Full Expo" registration package. Materials will be available in March 2008 at www.ifaexpo.com.

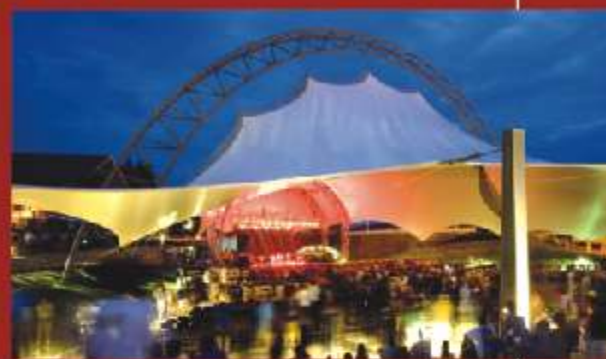
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A New Platform for Technological Information and Economic Content



Composite applications are booming in the Asia-Pacific region, and major industrial players have expressed the need for a business platform there to anticipate and take part in the region's rapid development. Secure in its long tenure as a company and its expertise in the global composite market (the JEC Composites Show Paris is the leading trade show worldwide), JEC Group

decided to launch JEC COMPOSITES Asia, a new yearly event in Singapore to connect and inform global composite players.

The first session will be held at the prestigious Suntec fairground and conference centre in downtown Singapore on October 22-23-24, 2008. In response to the considerable growth (10-15% on average) of the composite sector in that region, this new platform will provide professionals with both technological information and economic content on global markets (Log on www.jeccomposites.com/jec-show/ for more information)

Manufacturers use JEC's international network and

organisation which benefits from fifty years of experience in informing, promoting organizing events around composite materials. This includes the JEC Composites Paris trade show the n°1 in Europe and world's leading trade fair for the composite industry.

During JEC Asia, each country is invited to promote its know-how and take pulse of its competitive market. The event federate all segments, with a specific focus on the achievements of Australia, China, India, Indonesia, Japan, Korea, Malaysia, New Zealand, Philippines, Singapore, Taiwan and Vietnam.

It is supported by manufacturers of raw materials (resins and fibres), processors, machine manufacturers, distributors (Haining Chengrudan, En-Liang Enterprise, Taiwan Electric Insulator, etc.), the sector's leading companies, and the companies on JEC's board of directors: AGY, Advanced Composites Group Umeco, Chomarat, Cray Valley, CPC, DSM, Hexcel, Huntsman, Menzolit, OCV Reinforcements, Porcher Industries and Sora. Small and medium-sized companies also have the opportunity to obtain comprehensive information about all the markets.

All in all, these coming events will constitute a full programme that is sure to make JEC Asia one of the best information and exchange platforms for better understanding of the composite market. ■

Join a High Value-added Event with Rich Content!

With more than 200 exhibiting companies and 6.000 expected visitors, meet the composites community in Singapore to:

- Expand your business network: suppliers, distributors, partners.
- Prospect new contacts and make business.
- Meet major decision makers, coming from Asia-Pacific, Middle-East and western countries.
- Learn about the Asian market, trends & opportunities. This Asian platform for key industrial players will provide a complete overview of internationally available composite solutions, from raw materials to end-users.
- Discover the latest composites innovations.
- Attend a comprehensive events programme (conferences, forums, presentations...).
- Keep up with your competitive watch.
- Rely on JEC Group's experience in composites events organization.
- Benefit from the massive communication campaigns managed by the JEC Group all over the world.
- Join the JEC network with more than 200,000 professionals in the world.

To get more information on exhibiting conditions and on the programme of events during the JEC Show Asia, visit www.jeccomposites.com/jec-show/ or contact exhibitors@jeccomposites.com / +33 1 58 36 15 01

Medical Fabrics



Every day, the lives you save could include your own.

You always put the safety of your patients first. But that doesn't mean you can't look out for yourself. With highly communicable viruses such as SARS, Avian influenza and HIV, medical professionals are rethinking their own need for life-saving protection while saving lives. That's why Ahlstrom has developed its newest medical fabric, BVB (Breathable Viral Barrier). BVB's unique, tri-laminate, construction not only provides unparalleled, impervious protection against highly communicable viruses, it offers revolutionary breathability for complete comfort.



Tri-Laminate Construction



Specify Ahlstrom BVB when ordering your protective apparel. For more information or the location of the BVB distributor nearest you, visit www.ahlstrom.com

Small fibers. Big difference.



Sector Focus



- Imports continue to dominate Indian Medical Textile Markets
 - Indian Medical Tourism - Healthy and Strong
 - Indo- Foreign Partnerships becoming Fast Trends
- Branded Hospitals expanding reach to Tier II and Tier III

India's Medical Textile Industry Expands BUT...Are the Indian Hospitals really a part of the growing demand...???

With the rapid spurt in the growth of the healthcare sector in India, the medical textile sector too is witnessing a rapid transformation in terms of demand and supply. However, there has been a considerable increase in the health consciousness among people and thus a rise in demand for better quality healthcare measures. In this situation one of the topmost criterion is to control the spread of Healthcare Associated Infections (HAI) or Nosocomial Infections.

Nosocomial infections are the infections acquired during hospital stay. Nosocomial infections affect a large number of patients annually in acute care facilities and their annual patient care costs several millions of rupees. The infections can be of two types:

Endogenous infection (self infection or auto infection)- In this kind of infection the causative agent is present in the patient at the time of admission to the hospital but there are no signs of infection.

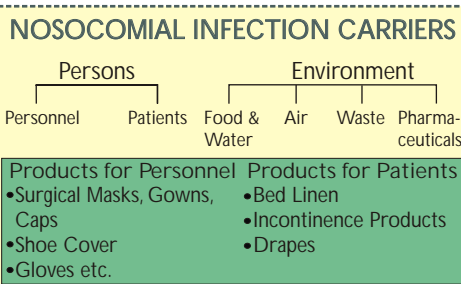
Cross- infection- While in the hospital, the patient comes in contact with new infective agents and becomes contaminated and develops infection.

The sources of these infections may be personnel, patients or environment. The outbreak of nosocomial infection may affect the

patients as well as the health care workers. The micro-organisms can be transmitted from their source to a new host through direct or indirect contact, in the air or by vector. For example, if the healthcare worker touches the patient, he therefore directly transmits a large number of microorganisms to the new host. The most common source of spread of nosocomial infection is through hands.

The two basic principles for the prevention of nosocomial infections are:

- Separating the infection source from the rest of the people
- Cutting off any route of transmission



The separation of the source does not only mean isolation of the infected patient but in a broader sense, it includes the measure that should be taken in order to act as a barrier between the infected and the potentially contaminated tissue and the environment including other patients or personnel. The basic precautions to be taken in order to

avoid infections are to ensure environmental and personnel cleanliness and separation. It is estimated, that about one-third of Healthcare Associated Infections are preventable by improvements in infection control. Stricter medical directives, regulations pertaining to medical textiles and the use of the right kind of media are required in order to prevent these infections. It is stressed that textiles have a vital part to play in dealing with the growing problems of HAI- the existing technology introduces a new generation of products that will, as a part of a wider scheme help to address this problem.

Healthcare garments can be woven, knitted or nonwoven. They could be reusable or disposable. But with the increasing awareness of disposable products the demand for the same has increased manifolds.

(i) Surgical and Isolation Gowns

Surgical gowns are garments worn during medical procedures. Gowns help prevent contamination between caregivers and patients. Surgical gowns also include isolation gowns. Nonwoven surgical gowns are found to give effective performance and are disposable. The performance features are tear resistance, fluid barrier, abrasion resistance and breathability.

(ii) Surgical Masks

Surgical masks are disposable

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devices that cover the mouth and nose during medical procedures. They help protect the caregiver and patient against microorganisms, body fluids, and small particles in the air. The major performance requirements in a surgical mask is high bacterial filtration capacity and high air permeability. They should also be light weight and non-allergic.

(iii) Surgical Caps

These are nonwoven disposables made from cellulosic fibres using parallel laid or spun laid process further with PE or PP coatings. The caps are specially designed to protect the patient against dropping of hair and dandruff of the doctors or other attending staff.

(iv) Surgical Drapes

Surgical drapes are used in operating rooms to cover patients or otherwise as cover clothes which are used to cover area around the patient. Nonwovens are used as backing material on one or both sides of a film, which is impermeable to bacteria. Nonwoven backing is highly absorbent to both body perspiration and secretions from the wound. Hydrophobic finishes may also be used as bacteria barrier.

(v) Gloves

Surgical gloves are medical safety accessories that ensure sanitary hospital conditions by limiting patients' exposure to infectious matter. They also serve to protect health professionals from disease through contact with body fluids.

(vi) Shoe Cover

The most essential requirement for a shoe cover should be that it should be slip resistant, the material should be flexible, easy to wear. It should also hold snugly to the wearer's shoe.

Other Medical Textiles

(i) Linen

Hospital Linens include bedspreads, blankets, drapes, pillow covers and cover cloths. When soiled with blood, body fluids, secretions and excretions, they should be handled in a manner that prevents skin and

mucous membrane exposures and transfer of microorganisms to other patients and environment.

(ii) Incontinence Products

The incontinence product designs need to meet the different requirements of the patients with different levels of activity. Essential requirements are that an incontinence protection must not leak, or cause discomfort or skin irritation to the patient. Incontinence textile products can be either diapers, feminine hygiene products or even underpads.

The usage of nonwoven disposable materials is advantageous in healthcare and hygiene sector due to many reasons as shown below.

ADVANTAGES OF USING DISPOSABLE NONWOVEN PRODUCTS

They are cost effective
Light in weight, flexible and versatile
Single use ensures better hygiene protection
They do not require maintenance therefore require less man power
Less inventory to be maintained therefore less investment

The Indian Mindset

Though India is moving towards becoming a global health destination, still the hospital authorities are keeping a conservative mindset in terms of changing their product procurement from conventional products to latest innovative products. In India, it has been seen that about 60-70% people entering the hospitals are going back with Nosocomial infections. The best of surgeons are taking time to incorporate newer products during surgeries even though they are at maximum risk. The ICUs of the best of hospitals are seen to be ignoring the cause of nosocomial infections. A report on the 'Sterilization of Medical Consumables in India' by the Government of India compiled under the chairmanship of Dr. S. Krishna, a pediatric surgeon highlights the fact that the sterilization system in India is very poor and inadequate. The people in the Indian hospitals are not educated

enough to ensure good purchase and use of sterilized products.

"There is no check on optimum sterilization and that is the reason why India is the largest consumer of antibiotics in the world. Products are falsely stamped and do not adhere to the standard sterilization methodology"

- Dr. S. Krishna, Chairman of the report on 'Sterilization of Medical Consumables in India' by the Government of India.

The industry feedback is that small institutions are adopting much faster to better products than the large ones. The fact cannot be denied that cost cutting and price over rules the industry inspite of charging huge sums from the patients and health insurance companies. Awareness is setting in with the domestic and foreign consumers demanding newer products that is driving the demand so far. Once the products are readily available and price is not an issue for the hospital authorities the demand is expected to grow exponentially.

It is strongly felt that right now inferior products are readily available in the market which are not very consumer friendly. Once the consumers get the touch and feel of the high end products which have the right barrier properties there surely is no looking back in a market where medical insurance plays a dominating role. Demand is ultimately going to rule the supply.

Conclusion

The Hospital Infection Control needs a multi-faceted approach, as infection control is a never ending struggle but, stricter regulations and policies are vital to maintain hygienic conditions all across the country. Proper training should also be given to the hospital staff in order to maintain hygienic conditions to prevent nosocomial infections.

There is therefore, a great challenge for the textile world and that is to develop products that meet all hygiene requirements. ■

Sleeping Bag...

...Providing Comfort & Protection Against Environment

A sleeping bag is a protective 'bag' for a person to sleep in, similar to a blanket, which can be closed with a zipper or similar means. It functions as a bed in situations where it is impossible & impractical to carry a full bed (while camping, hiking, trekking or climbing). Its primary purpose is to provide warmth and thermal insulation. It also protects, to some extent, against wind, chill, precipitation, and exposure to inclement weather conditions.

It may be used in high altitudes with temperature range of -50°C to 10°C . Sleeping bags should be light-weight and capable of providing warmth, comfort and protection from wind and water. According to international standards, the maximum permissible total weight of a sleeping bag is approximately 1.5 kg.

A sleeping bag is only an insulator, not a heat generator. Its main feature is its light weight & low volume with good insulating properties. Sleeping bag is of many types like high altitude, low altitude & travel bags

Design Types

A sleeping bag is available in many designs, the most common being basic, mummy and slumber versions.

Basic Type - A basic sleeping bag is simply a square blanket which is fitted with a zipper on one or two sides, thereby allowing it to be folded in half and be secured in this position. A sleeping bag of this type is packed by being folded in half or thirds, rolled up, and bound with straps or cords. The basic design works well for most camping needs but is inadequate under more demanding physical circumstances.



Basic Sleeping Bag

Mummy Type - Such a bag tapers from the head end to the foot end, reducing its volume and surface area, and hence improving its overall heat retention

properties. Some bags are designed specially to accommodate women's body shapes. Unlike the basic type, it usually does not unzip all the way to the feet since the zipper is a weak point in any sleeping bag's insulating qualities. Together with the tapered shape, such a design feature helps in protecting the feet, which are more vulnerable to heat loss than other parts of the body. It usually has a drawstring at the head end, to help prevent the escape of warm air. A mummy bag often cannot be rolled like a rectangular bag. Instead, it is simply stuffed into a stuff sack or a compression sack.



Mummy Type Sleeping Bag

Slumber Type - These are indoor sleeping bags, which are sometimes called slumber bags, are most often used by children. These are usually not designed to be weatherproof, and are often made of natural fabrics instead of the synthetic fabrics commonly used for outdoor sleeping bags. Children's sleeping bags in particular often feature elaborate, brightly-colored printed designs. Slumber bags make floor sleeping more comfortable, and are often used for sleepovers, family visits, and other situations where there aren't enough beds for everyone.



Slumber Type Sleeping Bag

Main Components of a Sleeping Bag

Shell and Lining Material Layer - The type of shell fabric and the finishing applied will affect the weight, water repellency, comfort, cost, durability and longevity of a sleeping bag. A bag can have a tightly woven shell with a durable water repellent finish. High thread count fabrics are used to minimize down leakage and to improve wind resistance. Lighter fabrics may not be as durable or down proof but with careful use may suit the extreme lightweight needs for many years. Cotton is not as strong as nylon and polyester; it absorbs moisture easily, and is hard to dry. Inside liner fabric is generally a lightweight nylon, usually lighter in weight than the shell fabric. The GSM of these fabrics vary from 40 - 125. Using an impermeable non-detachable cover



around the sleeping bag at sub zero temperature will lead to excessive moisture accumulation over a period of days. So a semi-permeable membrane is beneficial in terms of moisture accumulation.

Filling/Insulation Material Layer - The most common insulation materials used in sleeping bags are natural fills like down and feathers and batts of synthetic fibres like hollow polyester fibrefill. The insulating material is placed & sandwiched between two layers comprising of the shell and lining fabrics. More fill is generally placed into the top of a bag since heat rises and since the insulation value in the bottom of the bag is reduced due to compression.

Synthetic fibres used for insulation are usually made of extruded plastic polymer threads. These threads can be a single long strand of continuous filament or made from short staple fibres of varying lengths. Either type may also be made using hollow threads. A hollow thread has less weight, and also traps air that provide insulation. Synthetic fill also has the advantage that it does not absorb water readily, dries easily, and provides some warmth even when it's thoroughly soaked.

Draft Tube - This is an insulated tube, running parallel to and alongside the zipper. Its main function is to block the heat loss occurring through the teeth of the zipper. Depending upon the temperature requirements of the bag, this tube may be a thickly insulated simple flap of fabric, or absent altogether. For cold weather bag, a filled draft tubes may be necessary.

Baffles - Down bags may be built with continuous baffles which are uninterrupted tunnels that run from the top of the bag to the bottom. It allows fine-tuning of warmth of the bag by redistributing insulation from top to bottom and vice versa. However, continuous baffles can allow down to shift on its own, so a periodic shaking-up of the bag may be needed.

Since maximum heat is lost from the head, most sleeping bags also incorporate a hood that can be closed tightly in extreme cold weather conditions. Such bags may also include a collar (also called shoulder baffle) at the bottom of the hood to prevent heat loss from neck & shoulder areas. Usually, a foot box is also designed to accommodate the feet.

Human & environmental attributes also effect the functioning of a sleeping bag.

Besides these factors, using a ground pad made with insulating foam materials helps in preventing conductive heat loss between the body and the ground. The use of a tent also helps to create another layer of dead air space and helps to reduce convective heat loss.

The Indian Market

The demand for sleeping bags in India mainly comes from two sectors - The Defense & The Sports Industry. Of these two sectors, majority of the demand comes from the Defense, that includes both military & para military forces. This demand is mainly fed by domestic production, and is to the tune of approximately 1.2 mn units for the army and 1 mn units for the para military, annually. Imports are negligible and are seen mainly in case of down feathers that are used as a raw material for filling the sleeping bags.

Experts claim that there is a scope of growth to the tune of 100 - 200 thousands units annually in the para military sector.

In the sports sector, sleeping bags are mainly used for camping, adventure sport & mountaineering, which is now seeing a positive growth due to tremendous increase in domestic & foreign tourism. ■

Textiles- An Important Ingredient for Effective Landscaping

What is Landscaping?

By definition, "To be properly said to be landscaping a property, you must be making home improvements on that property's grounds either in a practical or in an aesthetic way".



Thus, Landscape design is the art of arranging or modifying the features of a landscape, an urban area, etc. for aesthetic or practical purposes. It is often divided into hardscape design and softscape design and is practiced by both landscape designers and landscape architects.

Hardscape, or "hardscaping" consists of the inanimate elements of landscaping, especially any masonry work or woodwork. For instance, stonewalls, concrete or brick patios, tile paths, wooden decks and wooden arbors would all be considered part of the hardscape. Softscape comprises the animate, horticultural elements of landscape design, i.e. plants.

Benefits of Landscaping

It is a known fact that landscaping can help you make your yard more beautiful; but this is not the only advantage that landscaping offers. Some other benefits of landscaping include:

- Air Purification
- Energy Saving

- Enhancement of Property value
- Increased Productivity
- Security and Privacy

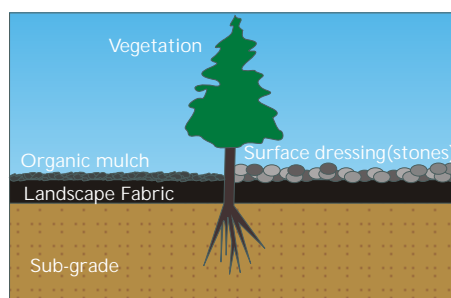
Requirements of a Good Landscape

The dual goal in planning a landscape is to design a pleasant environment and at the same time to design features that are usable, long lasting and easy to live with. The complete landscape design, along with being aesthetically appealing, should also perform some very important functions. These include:

- Help Prevent soil erosion and maintain soil fertility
- Proper water management and water conservation
- Control weeds
- Prevent arsenic pollution

Landscape Fabrics

These are defined as garden fabrics that one lays down to prevent weeds and hold in moisture. They allow water to soak in to the ground but deter weeds from growing up through it. Landscape fabrics, a form of fabric mulches technically known as geotextiles and agrotextiles, are used to fulfil the requirements of a successful landscape design. They consist of a rot proof, permeable, woven or nonwoven membrane laid between the surface dressing and the sub-grade of a landscape.



Installation of a Landscape Fabric

It is important to understand the characteristics and limitations of landscape fabrics before choosing to use them for a project.

Characteristics of Landscape Fabrics

- They allow water, air, herbicides & insecticides to flow into the soil.
- They help control weeds.
- They prevent top soil washout in heavy rains.
- They help in insulating root systems of plants from sudden temperature changes.
- Being chemically inert, they resist mildew, rotting and insects.
- They minimize planting bed maintenance conserving optimum moisture in the soil.
- They prevent surface dressing from disappearing into the sub-grade.
- They delay the decomposition of organic mulch applied over them.

Landscape fabrics are not an "install once and forget" method of landscape maintenance. An often-overlooked characteristic of landscape fabrics is that they are effective for only about five years before breaking down and need replacement.

However, when used properly, there is definitely an indispensable benefit of using these fabrics in landscape maintenance. The virtue of landscape fabrics is that, like black plastic, they serve as clean, durable weed barriers but unlike black plastic, landscape fabrics permit a certain amount of air, water and nutrients to penetrate to the soil. Most brands of landscape fabric now available are UV-stabilized, increasing their chances of holding up under direct sun and applying a layer of mulch on top increases their longevity.

Sector Focus

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Types of Commercial Landscape Fabrics

Woven Fabrics

Woven fabrics made of polypropylene and other materials allow the ideal amount of water, air and nutrients into the soil creating the perfect growing environment. Not only is bed maintenance minimized, woven ground cover helps reduce the spread of fungus and root rot by controlling water-without puddling. These fabrics are tough enough to resist tears and punctures that could mortally wound other fabrics. They can also withstand the abuse of small truck traffic and are lightweight and easy to install.

Nonwoven Fabrics

These offer excellent water and air permeability and conform easily to the ground for quick installation. Nonwoven fabrics offer the most popular range of landscape fabrics and are available in a variety of constructions. These include needle punched or heat bonded polypropylene fabrics, spun bonded polyester, coated and laminated nonwovens, etc. Nonwovens offer superior fibre distribution creating a unique weed control fabric. Owing to their exceptional strength to weight ratio, natural UV stability & unequated water and air permeability, they are fast gaining edge over wovens in landscaping applications.

Applications of Landscape Fabrics

Landscape fabrics were originally developed as weed control fabrics for commercial planting schemes. However, now they are applied to a variety of areas that include:

- **Shrub and ornamental flower beds having definite spacing between plants**
- **Around trees**

- **Under stone sidewalks**
- **Behind retaining walls**
- **Under large expanses of stone & mulch for decorative gardens**
- **Xeriscaping i.e creative landscaping for water conservation**
- **Smart landscaping for ponds**

Criteria for Selection of Landscape Fabrics

How does one go about selecting a landscape fabric? The most common method available is the comparison of fabric specifications published by each manufacturer. However, most fabric specifications pertain to construction applications rather than landscape.

Selection of a landscape fabric should be based on three areas of consideration.

1. The fabric should be strong enough to withstand the most vigorous stresses of application. Any additional strength leads to a reduction in water and air flow, and an unnecessary price increase.
2. The fabric should have an even and consistent distribution of fibres, and a small opening size to keep weedy grasses from coming up through the fabric. Weeds and grasses do not force their way through an obstacle, but rather grow to the light that comes through the smallest of openings or breaks that may exist. Weed seeds will also germinate in small accumulations of soil on fabric surface, sending tiny root hairs through the smallest openings to seek water and nutrients from the soil. This problem is largely avoided with the use of spunbonded fabrics that have almost microscopic opening size.
3. Finally the fabric must be porous enough to allow water and air to pass freely to the soil. If a fabric does not "breathe properly" plants do not get sufficient oxygen, and soils become sour and sterile. This was the

problem with using plastic sheeting as a weed preventative. When a fabric does not accept water freely it tends to wash off taking any mulch covering, rock or bark, with it. This is a common problem that people generally blame on the texture of the fabric surface.

Apart from selection, proper installation and subsequent maintenance of landscape fabrics is also equally essential.

The Indian Landscaping Industry

In India, a surging per capita income and progressive lifestyle have led to a phenomenal increase in landscape & gardening market. An aesthetically-appealing landscape is a desirable asset & a key component for any high value residential & commercial project. Ten years ago, landscaping was usually the first casualty when it came to project cost overruns; but today fund allotment of approximately 10% is made to landscaping at initial project stages as the Indian population is willing to spend on landscaping.

The landscaping industry has achieved distinct status with a lot of activities happening over the last few years. The rapid urbanization & industrialization leading to the ongoing construction boom that includes mall culture, green belts, residential townships, etc. have together given a new dimension to the art of landscaping. Landscaping is not just about plants anymore. A variety of other landscape accessories are also available in the market which compliment the softscape elements. This sector includes landscape fabrics that have revolutionized the landscape industry by bringing more technology to design, & providing effective aesthetic & functional solutions to various problems faced by landscape architects. ■

DID YOU KNOW



In Egypt, in 1304-1307, a fabric called Bukalemun was made, which changed its colour with light.

A Croatian company, Artidjana, has made a dress entirely from human hair. Designers at the Artidjana used 165ft of blonde hair in the dress which was modeled at a fashion show in the capital Zagreb.

English clergyman William Lee invented the first knitting machine, the stocking frame. Legend says that Lee invented it out of frustration with the amount of time his mistress spent on knitting. Prior to invention it took 2 working days to hand-knit one stocking. The stocking frame allowed completing the same job in less than 2 hours.

An inventor from Nottingham has developed a pouch containing a chemical crystal that acts like a giant sponge. It goes into something like shoes and draws out the moisture, preventing dampness and moulds.

Philips has developed a photonic textile, Lumalive, which uses cloth as a lighted graphic display medium. Lumalive integrates a flexible array of miniature light-emitting diodes into a piece of cloth, which allows the cloth to display graphics, text, and animation.

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Geosynthetics in Landfills: A Perspective

Landfill is a site for the disposal of waste materials & is the oldest form of waste treatment being practiced by all nations worldwide. In landfill design basal lining systems include geosynthetic sealing and drainage components to contain the fluids and contaminants which may leach from the waste as well as divert these fluids to a collection point for treatment. Geosynthetic landfill caps utilise sealing and drainage layers to prevent precipitation from penetrating into the landfill body, minimizing the generation of leachate in closed facilities. Complete geosynthetic solutions protect the environment from potential contamination of pollutants. Compared to conventional construction methods, they are also typically more economical, require less space, save resources and reduce installation costs.



The daily per capita solid waste generated in India ranges from about 100 g in small towns to 500 g in large towns and hazardous waste generation to about 2 Mn tonnes per annum. Major portion of the collected waste is disposed off in landfill sites. With growing Indian population, industrial development and economic boom, per capita waste generation is increasing. This has led to an increase in the need for having landfills in cities to have systematic and safe waste disposal. Geosynthetics being an integral part of any landfill will see a growing demand in the years to come, due to their functional qualities and willingness of the active private sector contractors to build the best of environment friendly structures.

“ BCH brings to you a dialogue with Dr. Ian D. Peggs who shares his expertise and knowledge about designing landfills with the use of geosynthetics based on his years of experience and international exposure. ”



Dr. Ian D. Peggs,
I-CORP
INTERNATIONAL

I-CORP INTERNATIONAL, Inc. has clients in over 28 countries.

BCH- What is the role of geosynthetics/geotextiles in landfills?

Dr. Ian- Geosynthetics fulfill their six major functions in the different areas of landfills: barriers, drainage, separation, reinforcement, stabilization, and erosion control.

- Geomembranes, properly selected and specified, provide the critical functions of leachate containment, protection of the groundwater, and landfill gas (LFG) containment, both for odour control and for gas collection for power generation. They are also used in landfill caps to prevent incident precipitation from becoming leachate that requires expensive treatment. Thin geomembranes, more usually termed films, are used as alternate daily covers for odour and vector control.
- Nonwoven geotextiles act as cushions between subgrade and geomembrane, and between cover soil.

Drainage layers and geomembrane act as filters between soil layers and drainage layers, as separators between different soil layers, and as interface shear strength enhancers between drainage geonets and geomembranes.

Geonets act as both primary and secondary leachate drainage layers and as LFG collection layers in landfill caps. With nonwoven geotextiles thermally bonded to one or both sides (now termed a geocomposite), they may also act as cushions for the geomembrane and can be used for the multilevel distribution of recirculated leachate in bioreactor landfills.

Geosynthetic Clay Liners (GCLs) are used primarily under geomembranes as the mineral component of a composite liner.

Geogrids and high strength woven geotextiles are used to construct walls for vertical expansion and increased capacity of landfill cells. They may also be used in temporary roads.

Erosion control products are used on the vegetated soil covers on landfill caps and in drainage channels.

An interesting role for lining systems is for the construction of wetlands to biologically treat leachate.

BCH- What are the criteria that one has to keep in mind while selecting geosynthetic materials for landfills?

Dr. Ian- The predominant problem presently is the interface shear strength between the many different

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Sector Focus

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geosynthetic and mineral layers on the slopes of bottom liners and of caps. Note that the intent of a geomembrane is to be a barrier only and not a load bearing member of the lining system.

There is an increasing trend of leaving the geomembrane cap exposed which requires consideration of wind uplift, UV & thermal aging resistances, removal of large volumes of fast flowing water & toleration to differential settlement.

Geotextiles used for filtration must match the particle size distribution of the soil to avoid clogging. The performance of the geotextile and geonet in a geocomposite must be assessed to ensure adequate compressive strength and adequate long term hydraulic flow capacity. The soil must not cause the geotextile to penetrate the geonet voids such that the flow rate will be compromised.

BCH- Would they be different for different regions of the world?

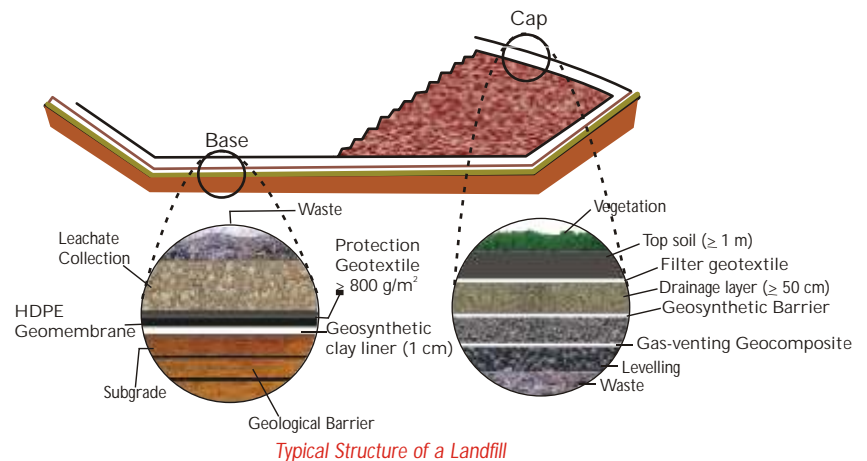
Dr. Ian- Yes, they would be different in different parts of the world. Leachate compositions are different, temperatures are different, temperature ranges are different, groundwater elevations are different, subgrade soils are different, precipitation is different, and winds are different. An exposed geomembrane in a sunny tropical leachate pond should have a different thermal and photo oxidation stabilizer package than a buried liner in Arctic regions. These factors affect the landfill liner design, the types of materials and grades of materials used.

BCH- Does the factor of biodegradability play any significant role during selection?

Dr. Ian- Biodegradability plays very little role in lining systems since liner related geosynthetics are specifically designed and formulated to be durable. Not only are there quality control tests to ensure there is sufficient stabilizer in each product, there are also QC tests to ensure that the protecting component will not be consumed too rapidly. Lifetimes for buried HDPE geomembranes have been estimated from 200 to 700 years. However, biodegradability may play a significant part in the performance of any erosion control product used to accelerate the growth of vegetation on the cap cover soil.

BCH- What are the prospects for geotextiles in landfills globally? How is the present market for geosynthetics in the US & EU?

Dr. Ian- The prospects for geotextiles and other



geosynthetics in municipal/industrial/hazardous solid waste landfills, leachate ponds, industrial waste ponds, evaporation ponds, waste and potable water lagoons/reservoirs, canal liners, and decorative ponds is simply staggering. All of these are areas that fall within "environmental protection" which can only become increasingly regulated and required.

Common perception has it that the US landfill market for bottom liners is not increasing significantly, but that there is more opportunity for capping applications as landfills are closed or as old waste "dumps" are found and covered to prevent infiltration of precipitation. In the EU there are probably many more opportunities as many newer members of the community become subjected to the EU's stringent rules and regulations. However, as indicated above, when it comes to industrial waste and potable waters the opportunity is extensive. Several years ago, Dr. Bob Koerner of the Geosynthetic Research Institute commented that the number of landfills in the US had dropped from ~8,000 to ~3,000 but that there were over 200,000 industrial ponds that could use lining systems.

BCH- Could you please give examples of some of the regulations that are followed in US & EU pertaining to the use of geosynthetics in landfills?

Dr. Ian- When landfills are built, they must meet minimum design and performance standards. In Germany it is required that there must be sufficient protection between geomembrane and overlying drainage stone to prevent any individual stone protrusion from straining the geomembrane more than 0.25%. This requires a very heavy geotextile (~3500 g/m²) or a geotextile/sand blanket. In the USA, it is assumed that all single geomembrane liners do, in fact, leak but that leakage flow rate through the primary liner should not exceed ~2000 l/h.d. If it does, the leak must be found and repaired. In addition the underliner drainage system must be able to handle and remove the leaking liquid

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Sector Focus

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without further damage to the liner or its subgrade. Note that while an individual geomembrane liner is presumed to leak, the lining system as a whole does not leak and will not release leachate to groundwater.

BCH- How do you foresee the market for geosynthetic application in India for landfills?

Dr. Ian- It can only increase rapidly as India, like all other rapidly developing countries, becomes more consumer oriented (more waste), and at the same time becomes more environmentally conscious. India, if it takes the right approach, has the great advantage of being able to learn from the experience (including the mistakes) of others (France, Germany, USA) and to install effectively functioning geosynthetic systems. Many years ago in Italy I was shown a geomembrane liner in one of the country's first geomembrane lined landfills. There was a

geomembrane in place alright, but the subgrade had not been prepared and waste including broken glass bottles was placed directly on top of, and through it! But, as required, there was a liner in it! This was obviously totally ineffective and an atrocious waste of money. The Indian geosynthetics community needs to better understand the materials from which geosynthetic products are made, the specifications and applications of the different geosynthetic products, and to convince regulators that they are very cost-effective solutions for environmental protection. Effective quality control at all stages of manufacturing and construction is required and there will need to be a few independent testing laboratories that can both translate university research projects into performance testing protocols and that can also provide rapid conformance test data. ■

Hazardous Waste Management in India-

Use of Geosynthetics in Hazardous Waste Landfills

Mr. Arun Aggarwal, Vice President, Ramky Enviro Engineers Ltd



Mr. Arun Aggarwal,
Ramky Enviro Engineers
Pvt. Ltd.

The term hazardous waste (HW) comprises of corrosive, reactive, ignitable and toxic wastes. India produces around 2 million tones of HW every year. HW management system in India is getting very organized as the people are getting aware and conscious about the impact of environmental pollution and the necessity of control and abatement of pollution. Around 14 Indian states have set up or are in the process of setting up successful waste management systems. Thanks to the Supreme Court committee that was set up which has brought about significant changes and pushed the states to set up organized systems. Some of the private sector companies that have set up excellent waste disposal systems in India are Ramky, MEPL, Baruch Enviro & Surat Infrastructure.

A landfill can be effective only if it does not allow pollution of surrounding environment. To achieve this efficiency, it is important to have right quality geosynthetic products which would prevent the leakage of polluting solids & liquids. High tensile HDPE liners and high gsm nonwoven geotextiles (approx. gsm range 285-2000gsm) are the products used. HDPE liners are used to provide impermeability & nonwoven geotextiles are used for providing cushioning & protection. GCLs are not permitted for HW landfills. HW landfills being a sensitive issue, one has to ensure that the geosynthetic products used can withstand high pressures, corrosive chemicals and exposure to sunlight. It is important for the product to be of consistent quality especially for tensile strength, permeability and uniformity in thickness. For this reason HDPE membranes used in India are being imported while nonwoven geotextiles can be indigenously procured.

At present in India, there are around 30 operating landfills for hazardous waste. There are about 15 more landfills expected to come up by 2010. Analyzing the fact that one portion of a landfill can be anywhere between 4000-5000 sq.mtrs., a double liner landfill requires for each layer approximately area of land + 25% of HDPE liner and the same amount of nonwoven geotextiles (could be more if nonwoven geotextile is used for cushioning also), one can clearly find out the potential that seems ever increasing. Besides for landfills geosynthetics also have huge potential in water storage & rainwater harvesting for the benefit of the environment which is an activity that most of the industries have taken up seriously. Central Pollution Control Board also has put down exhaustive hazardous waste management rules and rules relating to the raw materials to be used including the cross section. The industry too is not worried about the initial cost that it will have to pay for procuring the raw material. It is more worried about procuring the right product and setting up the eco-friendly landfills. It would therefore not be wrong to project a bright future for the application of geosynthetics in landfills and other environment protection related projects. ■

GDM AFTER-SALES & SERVICES

The New Frontier for Customer Satisfaction

GDM is a global company which designs and manufactures efficient and cost effective production lines for disposable hygiene products. GDM provides tailor made solutions for baby diapers, sanitary napkins, and incontinence products.

Browsing market trends and trying to satisfy today's developing market needs, GDM is now in the position to serve the market as a pioneer in after-sales and services with value added solutions. We do not just follow up on our customer's needs and requests. We go beyond that. We anticipate their needs and provide new services that will help their own operations to be more productive, efficient and effective. The latest GDM After-Sales & Service strategy is based on the four improvement areas below:

1) Customer Service Representative (CSR): Decentralised Spare Parts Warehousing available world-wide for a faster delivery (USA, Brazil, Turkey, Russia, China, India, Europe) with the CSR (Customer Service Representative) office structure. The main advantages of this service are:

Direct contact: A direct contact with the customer through a local CSR will be available (same zone time) for the customer. Each GDM CSR office will be responsible for procurement and logistics of spare parts and customer care for spare parts or intervention requests.

Virtual warehouse: Each warehouse can build and stock parts. All plants are connected with same system for checking and seeing all approved drawings directly. The central system checks availability in every plant when parts are needed. Also all invoices and transitions are made from a local plant

Technicians availability and global consulting: Technical engineers are available for urgent interventions. GDM After Sales & Service Headquarters will coordinate local engineers activities.

2) Asset Protection Service (APS): The Asset Protection Service "APS" is an innovative, customized all-inclusive maintenance and spare parts service contract with a fixed annual fee. This contract service provides: Management of spare parts inventories and order handling, including those parts used in day-to-day operations; Planned Maintenance service; Production support for predictive maintenance and process improvements analysis, including analysis of main failures; Technical documentation & training updating. With APS, GDM guarantees the uptime of its machines throughout their life-cycle. Here below are some of the most important advantages of this service:

Customer technicians' learning curve is speeded up

Fine and detailed maintenance activity

Spare parts and warranty completely covered

Fixed maintenance costs

3) Production Support & Consulting Services:

Global Consulting

Technical Assistance

Technical Survey: Making suggestions on how to minimize the production costs, analyzing new process impact and upgrading unit integration, developing new ideas and creative solutions, and studying future achievements together.

Production Support Analysis: The "production data mining service" is a system capable of managing production information from hygiene lines, providing database storage along with reporting tools and statistic analysis.

4) Documentation & Training Service: A multimedia tool to file in an easily accessible way any document (drawings, operation instructions, test parameters, troubleshooting instructions, etc.) relating to specific equipment.

The above mentioned services are only the first steps that GDM is taking to delight its customers with the aim of working with them to Generate Value. ■

The New REICOFIL Nonwovens Technology Centre

New Dimensions in Customer Research and Development

With a production speed of up to 1000 metres per minute the installed six-beam plant for hygienic and medical applications is the fastest running pilot line in the world. It is one of two lines available to REICOFIL customers in the company's new nonwovens technology centre since this April. Already today, these lines can be used for high-speed trials in order to develop and test what the market is increasingly demanding: products for hygienic and medical applications using light-weight nonwovens of 10 g/m² or even lower grammages.

"Together with our partners we will now be able to react quickly to new developments," says technical manager Hans-Georg Geus. "Trends in equipment and product development which we could only discuss with our partners in the past, can now be tested under production-like conditions". The lines installed in the new technology centre and the production lines in operation at the customers only differ with regard to their widths and enable tests to be run in three areas: hygiene/medicine, meltblown and technical nonwovens.

The second line installed in the technology centre is dedicated to the latter area which in the opinion of REICOFIL provides high development potential. "Our pilot line offers advanced possibilities for the development of completely new products using the spunbond technology," says R&D manager Detlef Frey. To this end, REICOFIL has equipped the pilot line with three X-beams. This gives visitors the flexibility to combine the spunbond technology with other processes such as hydroentanglement or thermobonding.

The new nonwoven technology centre offers in developing new concepts, supports customers, suppliers & raw material producers to optimise the operating points of their lines, find suitable raw materials for their products or they may be trained by REICOFIL in operating the lines and improving their understanding of production processes. Technical prerequisites have been created to make this viable. ■

REICOFIL Technology Centre: Technical Equipment

Line Requisites	For Medical & Hygienic Applications	For Technical Nonwovens
Equipment	SSMMMSX with calender and winder	XSXSX with calender, humidifier, dryer & winder
Technology	REICOFIL® 4	First spinbeam: Bico REICOFIL® 4 with twin screw extruder Second spinbeam: Bico REICOFIL® 3 with single screw extruder
Net Width	1 m	1m
Max. Speed	1.000 m/min	400 m/min
Raw Materials	PP, PE	Polyolefins, Polyester, PLA & others
Specials	One of the meltblown beams has its own conveyor belt and its own winder. In the offline-position it can be used as a single meltblown beam	X-positionen for various capabilities: e.g. hydroentanglement, high loft equipment, airlaid



Technical Absorbents Ltd (TAL) manufactures the Oasis PolyAcrylate Super Absorbent Fibre (Oasis SAF®) at its Grimsby production site in the UK. TAL is part of Bluestar Fibres Ltd, a wholly owned subsidiary of China National Bluestar Corporation. Due to continued growth of its superabsorbent business, TAL is now fully engaged in the planning of a large scale expansion of its OASIS SAF® production capabilities. In addition, TAL is making significant investment in new R&D, with the aim to manufacture new SAF® grades that offer superior absorbency and fluid retention capabilities. With such an increase in SAF® availability, together with significant opportunities to produce enhanced performance grades at a lower cost base, TAL is set to offer the fem hygiene, adult incontinence and diaper sectors real new development opportunity. TAL has a focused investment strategy to ensure that OASIS SAF® will continue to be the desired absorbency solution used across an extremely diverse range of applications and markets. Latest Development Projects: In collaboration with a number of partners, TAL has developed a new patent pending superabsorbent heat and moisture management fabric. The fabric has the ability to rapidly absorb perspiration, providing high levels of wearer comfort, together with a resultant cooling effect. The fabric can be laundered multi-times without loss in performance. The fabric offers significant new product design potential in a range of apparel and heat management applications. One exciting outcome of TAL's ongoing R&D work is the potential to produce the world's first superabsorbent fibre than can be processed through a conventional spunlace line. ■

Source Your Sourcing Needs, Tell Your Selling Needs... The BCH Trade Nucleus Feeds Your Needs



What is BCH Trade Nucleus

The BCH Trade Nucleus is a one-stop solution provider and guide to help Indian and International stakeholders in the field of technical textiles and nonwovens to maximize their returns from the markets by linking them with the right partners. Its goal is to help the industry players extract maximum benefits by helping them buy and sell products and thus take quick advantage of market volatility and strong trends for various product categories that fall under the umbrella of this huge industry.

Benefits of Being a Part of the BCH Trade Nucleus

Benefits to the BUYER

Access to New Products: Buyers have an opportunity to see a variety of new products available in the market. Buyers will know "what is out there" better than anyone else at one place at one time.

Quality Offerings at Competitive Price

Full Representation: Availability of entire spectrum of products catering to different segments of the industry thus meeting all demands

Access to Multiple Suppliers' Offerings: This provides an opportunity to evaluate the product offerings from different suppliers thus ensuring absolute buying satisfaction

Savings on Time & Efforts: Buyers will have to spend less time and energy looking for the products of their choice

Customised Solutions: Possibility of new product development as per the buyer's requirements

Benefits to the SELLER

Complete Product Representation: The product offerings of the sellers are represented with complete details for better understanding of the buyers

Assured Business: Buyers come prepared to buy thus ensuring serious business opportunities leading to increased market share

Minimised Operational Costs: Sellers have an opportunity to promote their products in a new market with minimal investment costs

Greater Visibility: Product visibility to a wider and much focused audience

Constant New Business Generation: Due to visibility to the potential purchasers worldwide sellers have the opportunity to have numerous business opportunities and thus multiple buyers

New Business Opportunities: Product development opportunities as requested by the buyers thus developing your own market niche

BCH Trade Nucleus: The Need

In emerging markets buying and selling is not an easy task if you want to make money while doing it! The need of the hour is to do an appropriate matchmaking between the buyer and the seller at the right time with minimum fuss and this could be achieved with the guidance of an experienced and a reliable facilitator. BCH being a service provider to the industry promises to provide this important part of your trading strategy by identifying opportunities in the existing markets, which outlines the objective of the launch of 'The BCH Trade Nucleus'. ■