Report on
Workshop-cum-Exhibition on Medical Textiles
TECHNOTEX- 2009
"Providing Better, Secure & Sustainable Life"
Organised by Ministry of Textiles & FICCI

- The Workshop on Medical Textiles, first in the series of TECHNOTEX-2009 Workshops on Technical Textiles was organized on 1st September 2009 by Ministry of Textiles and FICCI in New Delhi. Over 150 representatives of Industry, Government and Hospitals attended the Workshop. Key speakers of the Workshop were:

  - ✓ **Shri P K Pradhan**, Additional Secretary, Ministry of Health & Family Welfare
  - ✓ **Shri Bhupendra Singh**, Joint Secretary, Ministry of Textiles
  - ✓ **Shri Shishir Jaipuria**, Chairman, FICCI Taskforce on Technical Textiles & Managing Director, Ginni Filaments Ltd.
  - ✓ **Shri A. B. Joshi**, Textile Commissioner, Government of India
  - ✓ **Dr Arindam Basu**, Director, SITRA
  - ✓ **Dr Narendra Pandey,** President- Elect, Association of Surgeons of India
  - ✓ **Dr I P Singh**, Head of Surgery, Jagpravesh Hospital, Government of Delhi

- Following are the main highlights of the discussions of the Workshop:

- Explaining the importance of new generation medical textiles, Dr Arindam Basu, Director, SITRA mentioned a crucial finding of a study that every year around 5000 patients are killed due to cross infections i.e. infection that patients did not have when they are admitted to the hospital but catch during their hospital stay. Use of disposable nonwoven medical fabrics plays an important role in reducing hospital infections. As indicated by international studies, use of nonwoven products reduces infection by 2.5 times compared to traditional textiles.

- Non-woven disposables have many advantages over disposables like high barrier to blood or body fluids, low lint and compatibility with multi-sterilization methods such as steam, ETO etc.

- Non-woven disposables not only have properties to prevent infection but they are also very comfortable for doctors (in the sense they have good breathability and are soft). In the case of reusable surgical gowns as the number of washes increases from 0 to 30, the bacterial filtration efficiency reduces from 92.8% to 69.2% and air permeability increases from 5.8 $cm^3/cm^2/sec$ to 6.5 $cm^3/cm^2/sec$. Whereas, disposable non-woven surgical gowns have 95-

98% bacterial filtration efficiency and 25-30 $cm^3/cm^2/sec$ air permeability. Hence, disposable non-woven products are much safer and comfortable compared to reusable products.

- Also, total costs of single use fabrics are generally lower than re-usables as indicated by various studies. Even overall health cost reduces due to usage of nonwovens as cross infection decreases. According to the report of Expert Committee on Technical Textiles, cost of reusable products per usage is Rs.5 per cap and Rs.3.25 per mask. However, the cost of disposable cap is almost half at Rs.2-3 per cap and the cost of disposable mask is slightly lower at Rs. 3 per mask.

- There is also a need for speciality wound care products since the gauze bandages and crape bandages used currently cause discomfort for the patient and in many cases the curing takes long time. Currently, Indian Standards are only for woven cotton bandages, whereas in developed countries like in Japan, pharmacopeia provides for nonwoven gauges (through Bulletin No. 133). Similarly in Europe, standards are there for nonwoven dressings under EN 1644-1. In India it is recommended that standards need to be prescribed for nonwoven disposables to encourage production of medical disposables of international standards. In this context, AAMIPB 70/ CEN standards for drapes and gowns; EN 868-1 and EN 868 – 2 for sterilization wraps can be referred.

- Nonwoven as an option along with woven bandages and gauges should be included in schedule F-2 of Drugs & Cosmetic Act and Indian pharmacopoeia.

- In Indian pharmacopoeia, in addition to cotton and viscose, products of man-made fibres like polyester should also be included.

- Awareness needs to be created about the latest medical textile products amongst the Indian health personnel in both Government and private hospitals and there is a need to encourage use of disposable products.

- Mr Shishir Jaipuria, Chairman, FICCI Taskforce on Technical Textiles presented the industry perspective on medical textiles.

- Depending on the area of application, medical textiles are categorized as non-implantable, healthcare and hygiene products, implantable and extra-corporeal. Current domestic consumption of medical textiles is worth Rs. 2365 crore of which Rs. 1514 crore is the technical textiles component which will reach Rs. 2263 crore by 2012-13.

- Mr Jaipuria indicated that healthcare & hygiene is the largest segment among the medical textile products & there are various reasons for growth of this segment like growing awareness among society for hygiene & safety, frequent interactions of medical professionals with international medical societies, availability of new technologically advanced products & medical tourism etc.

- Medical textiles made up of traditional fibres have many limitations like less durability, they form lint which can adhere to the wounds, less resistant to acids, lack anti-microbial properties, can attract mildew under hot and humid conditions (as prevalent in India), residual starch left in cotton can act as a feedstock for micro-organisms which can worson the wounds, attracts dust and foreign impurities like hair, jute, colour yarn, HDPE, etc. left in the finished fabric may be harmful.

- Giving example of latest developments in the field of medical textiles, Mr Jaipuria said that various technological developments have taken place in medical textiles sector like breathable viral barrier gowns (level4), which have advantages over traditional gowns as it reduces cross-contamination between medical staff & patients body fluids and it also has superior barrier properties against virus and influenza.

- Mr Jaipuria highlighted the need for developing standards for Medical Textile products since absence of standards has encouraged the use of lot of sub standard items which are not suitable for health and hygiene.

- Several measures are required to enhance the production and consumption of medical textiles in the country like:

  - ✓ Amendments in Schedule F-II of Indian Drugs & Cosmetic Act to include medical textiles made from man-made fibres.
  - ✓ Provide DEPB/Drawback benefits to the medical textiles sector for encouraging exports.
  - ✓ To encourage conversion of technical textiles 20-25% capital subsidy should be provided in lieu of 5% interest rate under TUFS to convertors as is the case for powerloom sector presently.

- Dr N K Pandey, Chairman, Asian Institute of Medical Sciences and President- Elect of Association of Surgeons of India presented the user perspective for medical textiles.

- Medical textiles constitute different types of bandages, surgical gauzes and other surgical dressings like anklet, eye pad and implants etc. There is an increasing need of medical textiles in the Indian market because of changes in demographic composition of the population, aging of the population, changes in living standards of the people and increased awareness about diseases.

- Many innovations have taken place in medical textiles field. Dr Pandey highlighted some important developments in various segments of medical textiles. These are given below:

  - **<u>Compression and Bandage segment</u>**

  ✓ The design of pressure garments for the treatment of hypertrophic scarring caused by burns.
  ✓ Evaluation of the pressure distribution performance of padding bandage materials
  ✓ Elastic fabrics for use in pressure garments – comfort properties
  ✓ Methods of calculation of local pressure of elastomer products

  - **<u>Developments in materials and processes are:</u>**

  ✓ New developments in the manufacture of circular knitting machines for the production of medical textiles
  ✓ Non-wovens – the choice for the medical industry into the next millennium
  ✓ Production of yarns and fabrics from alginate fibres for medical applications
  ✓ Opportunities and challenges for fibrous products in healthcare and medical applications
  ✓ Knitting seamless three-dimensional shell structures on modern electronic flat-bed knitting machines
  ✓ Medical textiles with specific characteristics produced on flat knitting machines

  - **<u>Developments in Healthcare and hygiene sector are:</u>**

  ✓ Development of a versatile antimicrobial finish for textile materials for healthcare and hygiene applications
  ✓ Air permeability and porosity evaluation of antiallergical bed linen
  ✓ Influence of sterilization on the properties and performance of O R disposable garments
  ✓ Formation of creases in bedsheets – a cause of decubitus
  ✓ The design of needlefelts to control the flow of liquids in incontinence products

- **<u>Developments in Wound Care segment are:</u>**

✓ Anisotropic fluid transmission in nonwoven wound dressings
✓ Fibrous scaffolds for fissue culturing
✓ Functional requirements of bedding materials for elderly patients

- **<u>Developments in Implantable Devices are:</u>**

✓ Time dependent behaviors of some suture materials
✓ Surface treatment of the textile graft which reduces thrombogenicity and improves healing
✓ Embroidery technology for medical textiles
✓ Tissue engineered synthetic scaffolds for tissue repair – a textile approach to implant design

- Dr Pandey pointed out that implants used in surgeries like artificial heart, lung etc are mostly imported and the costs are exorbitant there is a huge demand for these products especially the diabetic products since India has one of the largest number of diabetic patients in the world. If these products are domestically produced, costs will come down significantly and demand in turn would increase for domestically produced products.

- Some of the futuristic medical textiles are fabric enhanced with nanopores; fabrics enhanced with silver nanoparticles that reduces odor; fabrics enhanced with nanoparticles which are bacteria, water & stain resistant and fabrics with nanowhiskers which enhance water & stain resistance.

- Dr I P Singh, Head of Department, Surgery, Jagpravesh Hospital also represented the user perspective. Medical textiles is an emerging sector of technical textiles industry and its growth is fuelled due to constant improvements in the healthcare sector. The use of textile materials for medical and healthcare products is classified into barrier material, bandaging and pressure garments, wound care material, hygiene material, implantable material and extra corporal devices.

- Textile material should have biocompatibility, good resistance to alkalis, acids and micro-organisms, good dimensional stability, elasticity, absorption, air permeability and should be free from impurities for effective usage in Medical field.

- Primarily, a surgical dressing should absorb excess exudates and at the same time should not make wound completely dry. It needs to maintain the body temperature, permit gaseous exchange, inhibits admission of micro-organisms to prevent & control infection, leave no residue or toxic contaminates and allow easy application and removal. A dressing should also allow minimum frequency of change of dressing, compatible to the wound, cost effective and should be made from anti-allergic material.

- There are several limitations of woven dressings like quick saturation to wound exudate, dries and sticks to the wound, causes severe trauma on dressing removal, fabric is permeable to bacteria, requires several layers of fabric and makes the treatment appear bulky and poor in retaining wound fluids. Whereas, non-woven dressings have several advantages over woven dressings like they have high absorbency rate, better wicking rate, no sizing, de-sizing and bleaching chemicals are used in manufacturing of non-woven fabrics, reduces frequency of dressing change and provides better protection from micro-organisms and infection due to even spacing of air gaps in non-woven gauze as against loose structure of woven gauze.

- Mr S K Pradhan, Additional Secretary, Ministry of Health & Family Welfare emphasized the need for providing quality healthcare to the citizens. There is a critical need for clean environment, patient safety, comfort to users and better hygiene. There is also a need to look into the issue of non-toxicability of these materials so that they can be disposed off easily.

- Mr Pradhan also highlighted the need for developing standards for each product under medical textiles based on actual needs of medical professionals and hospital administrations.

- The public healthcare system leaves a lot to be desired. Various healthcare programmes with State Governments are in process and 1.4% of the GDP is allocated to the health sector. But, given the importance of the sector there is a need to increase the allocation towards this sector to 2-3% of GDP.

- There is a dire need to bring down the cost of the materials used by medical professionals to ensure wider coverage of patients. Also, there is an immediate need to create awareness about the medical textiles products amongst the consumers so that they start demanding non-infectable and comfortable medical textiles products. In this context, the Centers of Excellence being promoted by Ministry of Textiles can play a vital role in creating awareness about the medical textiles products amongst medical professional and consumers.