Role of nonwovens materials in combating nosocomial infections

Professor Stephen J.Russell, Director, Nonwovens Research Group, University of Leeds, UK wrote a paper on Role of Nonwoven Materials in Combating Nosocomial Infections. The paper was presented by Dr. Tahir Shah. Ed HRS.

The infections that occur during hospitalization but are neither present nor incubating upon hospital admission are called Nasocomial infections. Also called 'Hospital Acquired Infections' (HAI).

Nosocomial infections delay discharge from hospitals, patients suffer additional cost, emotional strain and extra work is done by the staff of the hospital increasing healthcare and pharmaceutical budget.

Common types of these infections are Endogenous flora infections which amount to 50%, whereas 35% infections are transferred from staff and other patients, whereas, Exogenous flora infections amount to 15% of the total infections.

Common causes of HAI are MSRA, E-Coli, Clostridium (c.) Difficile, Norovirus, Mycobacterium T.B, Acinetobacter Baumannii, Salmonella, etc. In order to control HAI, target delivery of disinfectants on contaminated surfaces is required.

Functions of nonwoven materials in controlling HAI

Nonwovens materials are better than woven materials, because the latter cannot be disinfected. It is essentials to select most suitable disinfectant for wipe lotion. Wet cleaning and dry cleaning mechanisms and Dirt Removal capacity (DRC) of wipes is important. In this context nonwovens wipe structure influences particle removal. Hydroentangled and Hydrospace fabrics manufactured from 100% viscose rayon are mostly used in this application. Disinfectant delivery rate and Jet pressure must be controlled. Forming and filling of internal channels with in Hydrospace fabrics must be achieved as per the requirement of the end users.

According to EDANA, new standard EN 13795 recently introduced in Europe to ensure performance of surgical drapes, gowns and PPE will encourage the production and development of nonwovens, as conventional linen drapes and gowns will not meet this standard. Furthermore, single use nonwoven materials do meet the standard and are required to be certified by manufacturer.

To safeguard public health, nosocominal infection rates need to be reduced – these are subject to significant variation between countries. Besides, certain organisms do not respond to antibiotics and protective measure and prevention of these

Single use nonwovens will be prefered as new infection control standards come into force.

infection is much better alternative. Single-use nonwovens play a major role in decontamination, sterilisation, disinfection, clean air provision and personal protection as well as acting as barriers to HAI transmission. The Research and development in nonwoven materials seeks to improve the efficacy of products to reduce the incidence of HAI's.

Two important areas of development are targeted delivery of disinfectants onto contaminated surfaces and self-cleaning surfaces to prevent HAI transmission in hospital & healthcare establishments. ◆

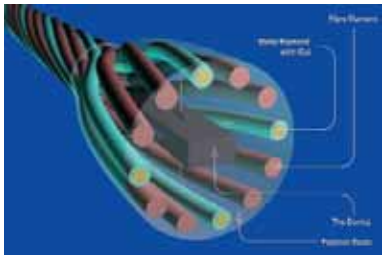
Development of electronic yarns for medical textiles

Dr. Zubair Bandukda, Textile Consultant and Educationist from U.K, former President of the Textile Institute of Pakistan (TIP) presented a paper on research done by ENTELL FIBRES on electronic yarn application for medical textiles.

Electronic yarns for medical textiles are manufactured by ENTELLL Fibres which represent latest innovation in fibre technology. Dr. Tilak Dias, Head of WLIC has been granted patent for this invention - new company called ENTELLL FIBRES was floated in May, 2008 for business development and commercialisation of Electronic yarns. These yarns can be considered as the building blocks for the next the generation of Smart Textiles. The vision entails the fabrication of electronically active and sensor fibres which will be the basic building blocks of the next generation 'SMART' fibrous materials.

Dr. Zubair Bandukda discussed the integration of electronic with apparel and interface of apparel manufacturing process. He also explained the WLIC development involving use of "Technology Platform Feed System,"(TPFS). Furthermore, research work on Micro-device Encapsulation Technology, is also in progress at the laboratory stage. Micro-devices are classified as electromagnetic chips, magnetic devices, optical devices and thermal devices.

Positioning of the µ-devices along the length of the fibres is accomplished by means of 'Resin Injection, UV curing and finishing as shown in the schematic diagram. The end-uses of Electronic yarns are in apparel, footwear, leather goods and Medical Textiles.



Micro-device encapsulation technology

Radio Frequency Identification (RFID) Technique has also been developed for future plans of work of sensing fibres, Yarns and for Temperature Mapping Systems. The RFID sewing threads in Apparel and leather products ensures brand protection against counterfeit goods (clothing and footwear). According to World RFID Markets a Retailer Perspective, Frost & Sullivan (2007), revenue losses of US$10 billion (Europe) and US$250 billion (US) are reported every year due to counterfeiting in clothing and footwear industries. Another advantage of RFID sewing thread early integeration of this technology in garment manufacturing process and supply chain transparency directives, which are expected to amount as US$11 billion industry by 2016. The RFID tracking system has shown to improve logistics, increase productivity and reduce cost.◆