ATTRACTIVE AND NEW INNOVATIONS IN THE TEXTILE WORLD-PART 1

Journey of textile fibres The first-generation textile fibres were those that were procured directly from the nature and that era lasted for 4,000 years.

The second generation consisted of man-made fibres like nylon and polyester, which were a result of the efforts taken by chemists in 1950, to evolve with materials that resemble natural fibres.

The third generation includes fibres from under-utilised natural resources to meet the needs of the ever-growing population.

These are not just alternatives or addition to the existing natural fibres, but are believed to have diversified characteristics that can aid in various application areas.

As a result of shifts in textile industry, the technical textile sector is growing in developed economies with application in diverse fields.

1. During the industrial age from 1775 to 1850, natural fibre extraction and production was at its peak. The period between 1870 and 1980 marked the epitome of synthetic fibre exploration at the end of which the word 'technical textiles' was coined. After a decade, more innovations, including flexible materials, extremely light-weight structures, 3D moulding, evolved in the field of smart textiles.

The twentieth century marks the information age where space suits, robots, self-cleaning textiles, panel electroluminescence, chameleonic textiles, body monitoring garments are commercially successful.

2.Synthetic polymers have huge potential and abundant functionality that can outperform natural fibres. For example, bio-polymers derived from corn have been extensively used in creating high-tech fibres with supreme functionality with application in biodegradable and flushable diapers.

Such advanced techniques have made possible fibres that dissolve in water, thereby reducing dumping in sanitation pipes. The compostable pads are designed so that those have 100 per cent bio-degradable natural materials in them. These researches have definitely improved the quality of life.

3.Current research Conventional textiles are woven or knitted materials whose use is based on test results. In contrast, technical textiles are developed based on the user applications. Their applications include space suits, artificial kidney and heart, pesticide-repellent clothing for farmers, road construction, bags to prevent fruits from being eaten by birds and efficient water-repellent packaging materials.

The different branches of technical textiles include clothing, packaging, sports and leisure, transport, medical and hygiene,industrial, invisible, oeko-textiles, home, safety and protective, building and construction, geo-textiles and agro-textiles.

Comparing the consumption trends with the rest of the world, India has a share of 35 per cent in textiles for functional applications in garments and shoes (clothtech), 21 per cent in textiles for packaging applications (packtech), and 8 per cent in sports textiles (sportech). The rest accounts for 36 per cent. But globally the leading sector is textiles used in the construction of automobiles, railways, ships, aircraft and spacecraft (mobiltech), which is 25 per cent of the over technical textiles market, followed by industrial textiles (indutech) at 16 per cent and sportech at 15 per cent, with all other fields comprising 44 per cent. Products that can boost the industry include webbing for seat belts, diapers and disposables, geotextiles, fire

retardant fabrics, ballistic protective clothing, filters, non-wovens, hoardings and signages. The biggest strength of India is its huge resource network and a strong domestic market.

India's textile industry has woken up to the enormous potential of the technical and non-woven sectors. Strong government support through policies, introduction of appropriate legislation and development of proper tests and standards can make a positive impact on this industry's growth. The prime need of the hour is that of more trained personnel. There should be more plans to train workers and to start incubation centres for lab-to-land experiments. The significant contributions of the research associations in the country are highly commendable. They include the Ahmedabad Textile Industry Research Association (ATIRA), the Bombay Textile Research Association (BTRA), the South India Textile Research Association (SITRA), the Northern India Textile Research Association (NITRA), the Wool Research Association (WRA), the Synthetic & Art Silk Mills' Research Association (SASMIRA) and the Man-made Textile Research Association (MANTRA).

Thirty three integrated textile parks, which include five in Tamil Nadu, four in Andhra Pradesh, five in Karnataka, six in Maharashtra, six in Gujarat, two in Rajasthan, and one each in Uttar Pradesh and West Bengal, should work in cohesion to bring the entire supply chain under one roof.4,5 Geo-textiles Textiles used to cover the earth or floor are categorised as geotextiles. Such textiles are used today for construction of houses, bridges, dams and monuments that increases their life. [6] Cool fabrics Technical fabrics developed by Adidas help in maintaining normal body temperature at 37 degrees C. Examples are labels like Clima 365, Climaproof, Climalite that serve this purpose. Elextex consists of a lamination of five layers of conducting and insulating textiles forming an all fabric touch sensor (1 cm2 or 1 mm2). It is certified by the Bureau of Indian Standards (BIS) and can be sewn, folded and washed. These have huge scope in sports textiles. References:

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