

3. Technical Textiles

Ms. Bhamare Sayali Sanjay

Assistant professor and HOD,
Department of B. Voc - Fashion Designing,
K.V.N. Naik College, Canada Corner,
Nashik, Maharashtra.

The textile products which are manufactured for non-aesthetic purpose are termed as technical textiles. Their function is the primary criterion. Technical textiles include textiles for, medical textiles, automotive applications agro textiles, geotextiles, and protective clothing.

Technical Textiles sector is large and growing. It also supports a vast array of other industries. Technical textile materials are currently most widely used in filter clothing, furniture, hygiene medicals and construction material. The global growth rate of technical textiles is about 4% per year while the growth of home and apparel textiles is at a rate of 1% per year.

3.1 About Technical Textiles:

Technical Textile industry is knowledge based research oriented. It has been slowly but steadily gaining ground due to its functional based requirements such as health and safety, high strength, light weight, cost effectiveness, durability, versatility. Customization, eco friendliness, logistical convenience, user friendliness, etc.

3.1.1 Global Scenario:

In the global scenario, 56% of total global consumption includes predominant segments such as mobiltech, indutech and sportech. Overall growth rates of the apparel and home textiles are at the rate of 1% per annum while the overall growth rates of the technical textiles are at 4% per annum.

3.1.2 World Market for Technical Textile:

The world market for technical textile was estimated to be around 19.68 million tonnes with a value of approx. Rs. 50,000 crores during 2005. The drivers for future growth of this industry are expected to be Asian countries like with increase in indigenous production, there is excellent potential for export of technical textiles particularly in the SAARC countries, where this industry is not well developed and depends on import to meet their domestic demand. China and India are the two Asian countries. Scenario of Technical Textile in India. Prime minister Dr. Manmohan Singh announced the technology mission on Technical Textiles under the 5 year plan in 2007.

That mission addressed "major constraints for improving productions and consumption of technical textile". In 2008-09, four Centers of Excellence (COEs) were set up to catalyze industry support and build capacity in the sectors of Geo-tech, Pro-tech, Medi-tech and Agro-tech. Each of these COEs was set up with an initial out lay of Rs 11 crores from the central government. In 2010 a fund outlay of Rs 200 crores was announced to support the mission.

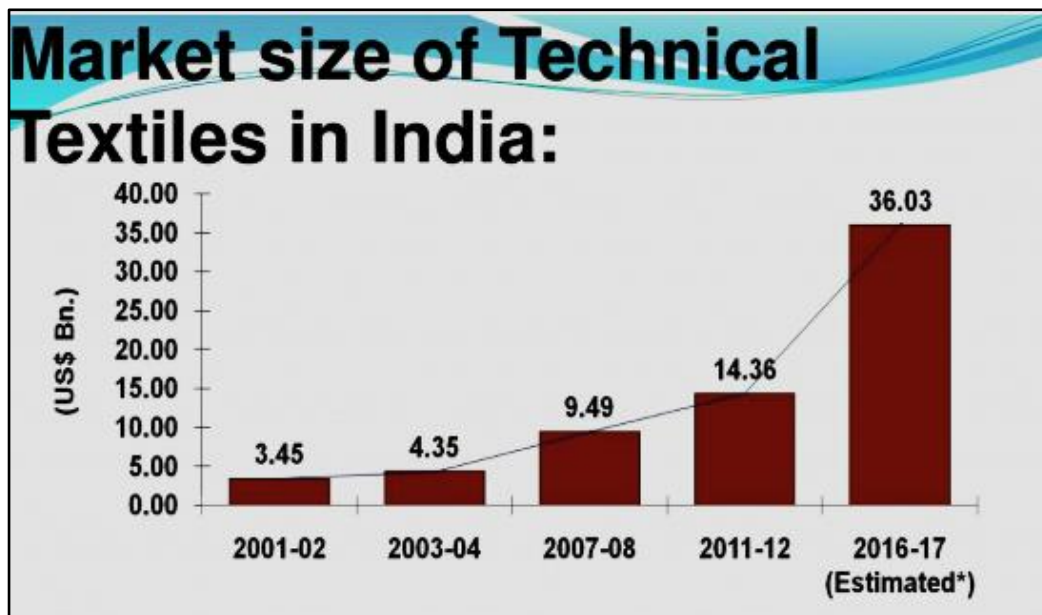


Figure 3.1: Based on the past trend of growth and estimated end user segment growth, the sub-group on technical textiles for 12th five year plan has projected the market size to Rs. 1, 58,540 cr. For the year 2016-17 with a growth rate of 20% year on year basis

3.1.3 Classification of Technical Textiles:

Depending on their end use, Technical Textiles are classified into many categories. This classification system is developed by Tech-textile, Messe Frankfurt Exhibition GmbH, is widely used in Europe, North America and Asia.

There are 12 specific application areas in technical textiles: Agro- textile, Build- textile, Home- textile, Indu- textile, Medi- textile, Mobil- textile, Oeko- textile, Pack- textile, Protech, Cloth- textile, Geo- textile and Sport- textile.

a. Agro-Tech:

Textiles which are used in agriculture sector are termed as agro-tech or agro-tex. Agro-tech are used for fertilization, crop protection etc.

Essential properties for agro- textile are strength, elongation, biodegradation, stiffness, water resistant, resistance to sunlight and toxic environment. These properties helps in healthy growth and harvesting of crops and other foodstuffs. Examples of agro- textile are: sun-screen, wind shield, anti-bird nets, greenhouse covers, fishing nets, layers for separation of fields, separation of rootless plants, protection of grassy areas, packing material for storing grass, materials for plant water management at the time of scarcity and plenty of water.

b. Build-tech (Construction Material):

Textiles which are used in the construction of architecture are termed as build tech or build-tex. These textiles are used in concrete reinforcement, insulation, façade foundation systems, air conditioning, noise prevention, visual prevention, interior construction, protection against the sun, building safety, etc. An aesthetic appealing application of build tech is the use of textile membranes for roof constructions.

This is also referred as architecture of textiles. Teflon coated glass fibre fabric, silicon coated PES or PVC coated high tenacity PES are used for their low creep properties. Examples of these construction are found in football stadium, airports and hotels.

c. Cloth-Tech:

Textiles used in clothing applications are termed as cloth-tech or cloth- textile. Fabrics are treated under high pressure and high temperature in finishing processes. Cloth-tech supports the fabric in finishing process for smooth process. Usually this can be the blend of polyester, nylon, viscose etc.

d. Geo-Tech:

These technical textiles are used in constructional or reinforcement of embankments. The main essential property of fabrics used in geo- textile is permeability. These fabrics are used with soils having ability to separate, protect, filter or drain. Geo-tech or geo-tech are applied in areas like dam engineering, soil sealing, earth and road constructions, and civil engineering and drainage systems. Non-woven as well as woven fabrics are used in geo-tech.

These fabrics must have properties like good strength, low moisture absorption, thickness and durability. Manmade fibers like polypropylene, glass and acrylic fibers are used to prevent cracking of the concrete, plastic and other building materials.

Polypropylene and polyester are used in geo textiles for dry/liquid filtration due to their compatibility property.

e. Home-Tech (Domestic Textiles):

Textiles used at home or for domestic purpose are termed as home- textile or home- textile. Home-tech are used for interior decoration, furnishing material, and carpeting. Protection against sunlight and UV rays, floor and wall coverings, fireproofing, and textiles reinforced structures, etc.

Fire retardant materials are used in contract markets such as large area buildings, busses, caravans, ships. Fire retardant properties are essential for home-tech and are obtained through either the inherent use of fire retardant fabrics such as mod acrylic, basophil or by coating fibers by fire retardant additives such as bromide of phosphorus compounds.

f. Indu-Tech (Industrial Textiles):

Textiles which are used for industrial purpose are termed as indu- textile or indu- textile. These textiles are used for chemical, electrical and mechanical applications.

Examples of indu-tech are silk-screen printing propulsion technology, filtration, plasma screens, sound-proofing elements, melting processes, roller covers, lifting/conveying equipment, grinding technology, insulations, seals, fuel cell, etc.

g. Lifting Textiles:

Lifting textiles are used for lifting heavy goods. Fabrics used in lifting textiles are strongly woven with high tenacity yarns and it is treated with high temperature to control its elongations. High tenacity polyester and nylon however HMPE (High molecular Polyethylene) yarns such as dyneema are used for lifting purpose.

h. Mobil-Tech:

Textiles used in transport, automotive, aerospace are mobile-tech or mobile-tech. Reinforced and coated textiles are used in materials for engines such as timing belts, air filters, air ducts, non-woven for engine sound isolation. Mobil-textile are also used in car interiors such as safety belts, seat covers, air bags and car sealing as well.

Other examples of mobile- textile are truck covers (PVC coated PES fabrics), lashing belts for cargo tie downs, car trunk coverings (often needle felts), seat covers (knitted materials), seat belts, non-woven for cabin air filtration, parachutes, airbags, boats (inflatable), air balloons, etc.

i. Oeko-Tech or Eco-Tech (Environment Friendly):

Oeko-tech or eco-tech textiles are used in environment protection applications. These textiles are used in areas such as, air cleaning, prevention of water pollution, floor sealing, waste treatment/recycling, erosion protection, depositing area construction, product extraction, water cleaning, and domestic water sewerage plants.

j. Pack-Tech:

Textiles used in packaging of industrial, agricultural, consumer or other goods are termed as pack-tech or pack-tex. Essential properties for pack-textile are durability, good strength, flame retardant. Manmade as well as natural fibers are used for making pack-tech textiles. Examples of pack-tech are wrapping fabric, jute sacks, FIBC, tea bags, polyolefin woven sacks, leno bags, soft luggage products.

k. Pro-Tech:

Pro-tech or pro-textile are used mainly for peoples' safety at their workplaces. Technical protective fabrics are therefore used to manufacture PPE (personal protective equipment) kits. Some organisations around the world such as ASTM and ISO describes rules and regulations to fulfil by a fibre to be termed as technical protective fabric. Pro-textile are used to protect against high temperature, metal sparks, chemicals, acid impacts, bullet firings, cut resistant's, astronauts suits, electric discharge, high flames, etc. Fabric used in pro-textile are made by different blends to depending on their end use to achieve required properties. Fibers used are such as Meta-Para aramides, Wool viscoses polyamide, glass fibers, kevlar, and mod acrylic cotton.

l. Sport-Tech:

Sport-tech or sport-textile are the textiles used in sports and leisure industries. Fibers like advanced carbon fibre composites are used in sport-tex. Fabrics used in sport-textile must have properties like high strength, durability, flexibility, resistance to high temperature and toxic environment, lightweight. Examples of sport-textile are parachute, hot air balloons, artificial turf, tents, racquet frames, fishing rods, cycle frames, swimsuits, golf club, paraglides, sleeping bags, sports nets, etc.

m. Medi-Tech:

Textile products used in personal hygiene, health, personal care and surgical materials are termed as medi-tech or medi-tex. The total consumption of meditech is estimated at Rs. 1517 crores per annum. 50% of them contributes in surgical dressings. Medi-textile includes diapers, sanitary napkins, surgical sutures, disposables, artificial implants, surgical dressing, etc.

3.2 Conclusion:

Technical textiles provide opportunities to use textiles in new areas amplifying the market potential. India will have the power to manufacture technical textiles due to low cost of production. Reduction in quality leads to heavy loss since there is no second sale for these textiles because the material is made for the specific end use. So the needed raw material, machines, design and the making process should be selected mindfully. Successful implementation will lead to success. Quality is the main key to get through domestic and international market. In addition, product diversity and value added products need to be given adequate thrust by the mills to remain competitive in the coming years.