CHAPTER – 10

TECHNICAL TEXTILES

INTRODUCTION:

10.1 Technical textiles are textile materials and products used for their technical performance and functional properties. Unlike conventional textiles used traditionally for clothing or furnishing, technical textiles are used basically on account of their specific physical and functional properties and mostly by other user industries. Technical textiles are used individually or as a component/part of another product to improve the performance of the product. Technical textiles are also referred to as industrial textiles, functional textiles, performance textiles, engineering textiles, invisible textiles and hi-tech textiles.

Table – 10.1

Segments of technical textiles – end use application wise

	**Agrotech** Horticulture + landscape gardening, agriculture + forestry, animal keeping		**Meditech** Hygiene, medicine
	**Buildtech** Membrane, lightweight + massive construction, engineering + industrial building.		**Mobiltech** Cars, ships, aircraft, trains, space travel
	**Clothtech** Garments, shoes		**Oekotech** Environmental protection, recycling, waste disposal
	**Geotech** Road infrastructure, Railways, Irrigation and Hydraulic structures, Waste Landfills, Dams etc.		**Packtech** Packaging, protective-cover systems, sacks, big bags, container systems
	**Hometech** Furniture, upholstery + interior furnishing, rugs, floor coverings		**Protech** Person and property protection
	**Indutech** Filtration, cleaning, mechanical engineering, chemical industry		**Sporttech** Sport and leisure, active wear, outdoor, sport articles.

10.2 Technical textiles represent a multi-disciplinary field with numerous end use applications. This industry has penetrated major areas of economic activity: aerospace, shipping, sports, agriculture, defence, medical, manufacturing, etc. Based on the product specification and end-use applications technical textiles can be broadly grouped into 12 segments as given in Table 10.1.

10.3 The global market size of technical textiles was estimated by David Rigby Associates, International Consultants who are the only agency following technical textiles to have a volume of 19.68 million tones with a value of US$ 106.90 billion in 2005, and is expected to increase to 22.77 million tones with a value of US$ 127 billion by the year 2010. The major segments are mobiltech, indutech and sporttech which account for about 57 percent of the global size of the technical textiles industry. David Rigby Associates has estimated the overall growth of 3.59 percent in volume terms and 3.20 percent in value terms. However, the growth rate in Asia is projected to be higher at 4.23 percent as against 2.60 percent in North America and 2.14 percent in Western Europe. The segment-wise market size and future growth of the 12 sectors is given as follows.

Table – 10.2

Segment-wise global market size of technical textiles

Volume – '000 tones; Value – US$ million

Technical Textile Sectors	Year				CARG (percent)	
	2005		2010			
	Volume	Value	Volume	Value	Volume	Value
Mobiltech	2828	26861	3338	29282	3.02	1.34
Indutech	2624	16687	3257	21528	3.98	4.85
Sporttech	1153	16052	1382	19062	3.40	3.21
Buildtech	2033	7296	2591	9325	4.63	4.73
Hometech	2499	7622	2853	8778	2.70	2.66
Clothtech	1413	7014	1656	8306	2.95	3.19
Meditech	1928	6670	2380	8238	4.43	4.33
Agrotech	1615	6568	1958	8079	3.55	3.84
Protech	279	5873	340	6857	3.63	2.82
Packtech	2990	5329	3606	6630	3.52	4.20
Geotech	319	927	413	1203	4.94	4.98
Total	**19681**	**106899**	**23774**	**127288**	**3.59**	**3.20**
Of which Oekotech	***287***	***1039***	***400***	***1389***	***6.45***	***5.67***

Source: David Rigby Associates (DRA).

10.4 Technical textiles is a major activity in industrialized countries which have been gradually switching over from conventional textiles to technical textiles. In Western Europe and USA, technical textiles account for over 30-40 percent of textile activity. Even in China technical textiles activity accounts for 20 percent of textiles activity, while in India it is less than 10 percent.

10.5 In line with production activity, the consumption of technical textiles is the highest in industrialized countries. USA, Western Europe and Japan account for about 52 percent of the total technical textile consumption in the World.

PERFORMANCE DURING THE TENTH PLAN:

10.6 Considering the potential of technical textiles in the country, the Government constituted an Expert Committee on Technical Textiles (ECTT) in the year 2002 to assess the status of the industry in the country and formulate an action plan to exploit the opportunities available for this industry in the domestic and global markets. The committee submitted its report in July, 2004. The committee has analysed the growth of the technical textiles industry; estimated the production upto the year 2007-08 and suggested a five year action plan for its growth. The segment-wise market size of the technical textile industry is given below:

Table – 10.3

Estimated segment-wise market size of technical textiles during the Tenth Plan

(Rs. crore)

Segment	2002-03	2003-04	2004-05	2005-06	2006-07
Clothtech	6071.74	6833.20	7198.50	7583.33	7988.73
Packtech	3614.65	4086.00	4588.35	5152.46	5785.93
Sporttech	1417.52	1534.15	1649.35	1773.20	1906.36
Mobiltech	1270.97	1381.55	1454.91	1532.17	1613.53
Buildtech	1114.43	1181.58	1254.89	1332.75	1415.43
Hometech	883.39	1029.72	1199.77	1397.89	1628.74
Indutech	887.59	961.93	1050.64	1147.53	1253.35
Meditech	851.88	932.95	1036.76	1152.12	1280.32
Protech	425.19	520.25	652.65	818.74	1027.11
Geotech	196.21	350.00	591.45	999.45	1688.91
Agrotech	281.48	303.56	337.66	375.59	417.77
Oekotech	0.00	14.70	24.72	41.57	69.91
Total	**17015.06**	**19129.59**	**21039.64**	**23306.80**	**26076.09**

Source: ECTT Report.

10.7 The Indian technical textile industry produces items of all the 12 segments of the technical textiles industry. However, the production is limited and scattered. The demand for many of the items is met through imports particularly by Defence and Police forces. All types of units, including Multi National Companies (MNCs), large scale units, SSI units, and cottage units are present in this industry. However, some segments have significant participation by small scale and cottage sector units like HDPE / PP bags making units, fishnets, shoe laces, sewing thread, canvas and tarpaulin, stuffed toys etc.

10.8 Government has also initiated some measures for promoting the growth of the industry during the Tenth Plan period. It has covered all the technical textile machinery under Technology Upgradation Fund Scheme (TUFS). Even second hand imported machinery for manufacturing of nonwoven and converting it into finished product has been covered under TUFS. In addition, major machinery for production of technical textiles has been covered under concessional customs duty of 5 percent. Sanitary napkins / baby diapers have also been dereserved to promote setting up of the large scale units.

APPROACH TO THE ELEVENTH FIVE YEAR PLAN:

10.9 Technical textiles is an important part of the textile industry and its potential is still largely untapped. The growth of this industry will have an important bearing on the over all growth of the textile industry. The accelerated growth of the Indian economy would impact favourably on the growth of the technical textiles. With increase in disposable income, the consumption of technical textiles is expected to increase, and in case indigenous production does not keep pace, imports will take place resulting in large scale foreign exchange outgo and loss of investment opportunities. Therefore, during the Eleventh Plan period, this industry is considered as a thrust industry and creation of awareness and conducive policy environment to promote the growth of this industry would be the important feature of the plan exercise.

PROJECTIONS FOR THE ELEVENTH FIVE YEAR PLAN:

10.10 The growth of different segments of the technical textile industry in future will depend on the growth drivers of the respective segments. The growth of the some of the segments will however depend on the regulatory framework. The

growth of different segments is projected under two scenarios; (Scenario - I) without regulatory framework; and (Scenario - II) with regulatory framework for items covered under Protech, Geotech and Oekotech. The overall growth rates under Scenario – I works out to 14.94 percent per annum; while under Scenario – II, it works out to 24.57 percent per annum. The details are given below:

Table – 10.4
Growth rates and estimated market size of technical textiles during 2007-12

(Rs. crore)

Sl. No.	T. T. Sector and its products	Without regulatory framework estimated market size during 2006-07 as per ECTT	Without regulatory frame-work		With regulatory framework for items covered under Protech, Geotech and Oekotech	
			Assumed growth rate	Estimated market size during 2011-12	Assumed growth rate	Estimated market size during 2011-12
1	**Clothtech**: Shoe laces, Interlinings, Zips, Narrow fabrics, Taffeta fabric.	7988.73	12	14078.87	12	14078.87
2	**Packtech**: Polyolefin woven sacks including FIBC, Soft luggage products, Food grade jute bags, Jute sacks / Hessian.	5785.93	20	14397.25	20	14397.25
3	**Sporttech**: Shoe Component, Sports Composites, Sleeping bags, Artificial Turf, Balloon & Parachute fabrics.	1906.36	12	3359.66	12	3359.66
4	**Mobiltech**: Seat belts, Nylon tyre cord fabric, Seat covers, carpets, Helmets, Headliners, Insulation felts.	1613.53	15	3245.39	15	3245.39
5	**Buildtech**: Hoardings / Signages, Scaffolding nets, Awnings and canopies, Tarpaulins.	1415.43	15	2846.94	15	2846.94
6	**Hometech**: Fiberfill, Jute Carpet backing cloth, Stuffed toys, Blinds.	1628.74	16	3420.91	16	3420.91
7	**Indutech**: Conveyor belts, Hoses, Ropes, Computer ribbons, Battery separators, Filtration products, Decatising cloth, Bolting cloth.	1253.35	12	2208.83	12	2208.83
8	**Meditech**: Sanitary napkins, Incontinence diapers, Baby diapers, Surgical dressings, Healthcare textiles, Sutures, Medical devices & implants.	1280.32	12	2256.36	20	3185.85
9	**Protech**: Fire retardant textiles, Ballistic protective clothing etc.	1027.11	17	2251.89	25.45	3191.32
10	**Geotech**: Geotextiles, geomembrane, Civil / Geotechnical engineering.	1688.91	15	3397.00	68.98	23269.28
11	**Agrotech**: Fishing nets & Fishline, Shade fabrics, Woven and non woven covers for crops, Mulch mat.	417.77	8	613.84	8	613.84
12	**Oekotech**: Environment Control: Municipal solid Waste, Industrial hazardous waste etc.	69.91	12	123.21	68.17	940.33
	Total	**26076.09**	**14.94**	**52200.13**	**24.57**	**74758.46**

RECOMMENDATIONS:

Survey to build up the database of technical textiles units:

10.11 In order to make policy decisions, it is of utmost importance to have a comprehensive database of technical textiles units in the country. Therefore, a base line survey of technical textiles units should be carried out to get the information on the number of units, type of units, type of products produced, investment, turnover etc. Since this industry is widely dispersed and quite complex, the fund requirement for carrying out the base line survey is estimated at around Rs.1 crore.

Fiscal policy support:

Concessional customs duty for specialised fibres / yarns:

10.12 For the production of many of the items of technical textiles, specialized fibres / yarns are required, i.e., Aramide, chronic fibres, optical fibres, glass staple fibre etc. Such specialized fibres / yarns are not produced in the country and they are quite expensive. Therefore, these fibres / yarns should be permitted to be imported at concessional customs duty of 5 percent, and also be exempted from CVD. ECTT has also recommended the concessional import of these fibres / yarn. A list of 36 items of such fibres / yarns is at **Appendix – 10.1**.

Concessional customs duty for technical textiles machinery:

10.13 Most of the technical textiles machinery are not produced in the country. Therefore, the units have to perforce import the same. Some of the technical textile machinery are already covered under the concessional customs duty of 5 percent. It is suggested that the list may be enlarged and a comprehensive list of technical textile machinery should be covered under the concessional customs duty list.

Counter Vailing Duty (CVD) exemption for technical textile machinery:

10.14 The indigenous availability of technical textile machinery is negligible. Further most of the technical textiles machinery is very expensive, and 16 percent CVD increases the cost of machinery, which discourages setting up of the units in India. Therefore, imported technical textiles machinery should be exempted from CVD.

Inverted duty structure on finished goods vis-à-vis raw material:

10.15 The technical textiles products supplied to World Bank assisted projects / defence have been provided with the facility of exemption from CENVAT and customs duty. However, raw materials for the production of such items attract normal rate of duty. Thus, indigenous manufacturers of finished goods are at a disadvantageous position vis-à-vis imported products. Therefore, to provide a level playing field to the indigenous manufacturers supplying to World Bank assisted projects / defence either the raw material for production of such items should also be exempt on 'actual user' basis or a scheme of advance license may be introduced. Under the scheme, facility of import of raw materials on duty free basis on the basis of standard input/output norms should be provided.

Specific rate of duty on finished technical textile products:

10.16 Under existing custom tariff, fabrics, garments, made-ups attract a specific rate of duty or *advalorem* duty, on whichever is higher basis. The specific rate of duty has been levied to protect the interest of the indigenous industry from cheap imports. To protect the interest of the indigenous technical textiles industry which would invest in large scale projects like geosynthetics, nonwoven, etc., and the converters which will be in SME sector, the duty should be levied on *advalorem* or the specific rate of duty, whichever is higher basis, to protect such units from cheap imports.

10.17 There is a wide spread import of substandard / non-specification technical textiles products into India. This is also affecting the growth of manufacturing in India, as Indian manufacturers have to compete against these spurious and sub-standard products at low prices. These products may also create hazards when used in technical applications. Thus, there is need to regulate imports and establish standards.

Modification in the Technology Upgradation Fund Scheme (TUFS):

10.18 Currently, machinery for the manufacture of technical textiles is covered under TUFS. However, machinery for the production of high-tenacity yarn is not covered under TUFS. High-tenacity yarn is required for the manufacture of a number of technical textiles items in the country, and indigenous production should be encouraged by covering it under TUFS.

10.19 The technical textiles machinery which is covered under TUFS is given the normal benefit but unlike processing machinery. Since processing is considered as a

weak link in the textiles value chain, the identified processing machinery are given 10 percent capital subsidy in addition to 5 percent interest reimbursement. To promote technical textiles in the country, identified technical textiles machinery, conversion machinery, polymerization and spinning equipment of high tenacity yarn, should also be provided the same benefit, i.e., 10 percent capital subsidy in addition to 5 percent interest reimbursement in line with processing machinery. For the SSI technical textiles units, who will mainly be the converters, the option of 20 percent CLCS on the lines of Powerlooms Sector should be implemented.

Centres of Excellence:

10.20 To promote the technical textiles industry, setting up of Centres of Excellence to start with, for potential items is necessary on the lines of such centers in U.K., by entrusting such centres a separate product / product groups. Such centres can be set up to provide infrastructure support at one place for the convenience of the manufacturers of technical textiles. It is suggested that 6 centres of excellence should be set up during the Eleventh Five Year Plan period. The centre of excellence should have the following facilities :

(i) Facilities for testing and evaluation of technical textiles with national and international accreditation;

(ii) Development of resource centre, equipped with technical literature, reference material, books, a sample bank, standards, testing procedures etc.;

(iii) Facilities for training of core personnel;

(iv) Facilities for training of personnel from industry.

(v) Facilities for product development / pilot plant (depending upon products).

10.21 The Centre of Excellence could be identified based on open tender inviting quotations from all the TRAs, IITs and other engineering institutes. It is estimated that fund requirement for setting up of the Centre of Excellence would be approximately Rs. 15 crore for each centre. Thus the total financial outlay for setting up 6 centres for these centres would be Rs.90 crore during the Eleventh Five Year Plan. The ECTT has also recommended for setting up of such centres.

Standards for technical textiles:

10.22 Technical textiles are functional textiles, therefore, stringent performance parameters are required to be met by the products. The BIS has already constituted a

committee to set up standards for technical textiles. This committee may be provided all the support and pursued for early release of standards. The Working Group recommends that a small Committee of experts may be constituted by the Office of the Textile Commissioner for compiling the information on the global standards for technical textiles products and their relevance and applicability in the Indian context and submit the same to the BIS to facilitate early release of the standards for technical textiles.

Human Resources Development (HRD):

10.23 There is shortage of qualified personnel in the technical textiles sector in the country. This could be one of the reasons for the slow growth of technical textiles. To encourage setting up of the technical textiles units, it is necessary to create a pool of technical textiles experts in the country. The technical textiles institutes could be set up in private – public partnership for imparting training in different aspects of manufacturing of technical textiles items, particularly non-woven fabric, which is one of the most important segments of the technical textiles industry, and has numerous end use applications. The facilities should also be augmented in TRAs & IITs for short term & long term courses in technical textiles.

10.24 Further, there is need to include technical textiles in the existing curriculum of different branches of engineering and science. For example, Civil / Geotechnical Engineers should know about geosynthetics; automobile engineers should know about automotive textiles; medical technicians and researchers should know about medical textiles, etc. Therefore, Ministry of Textiles should take up with Ministry of Human Resources for inclusion of technical textiles in the existing curriculum of different branches of engineering.

Inclusion of viscose and Indian Pharmacoepia

10.25 The meditech world over is one of the fastest growing segments. In all developing countries, disposable medical textiles especially non-wovens are a very sensitive area and require specially engineered fibres. Hence man-made fibres, especially viscose is mostly preferred. However, in India, viscose does not find mention in the Indian Pharmacoepia and hence the concept of disposability with specially engineered fibres is hindered. Studies should be institutionalized to incorporate all possible fibres in the Indian Pharmacoepia.

Regulatory framework:

10.26 Some of the technical textiles products require mandatory prescription for their use. The ECTT has also recommended mandatory prescriptions for certain items. The items suggested for regulatory framework are as follows:

10.27 The use of geosynthetics for construction of road where subsoil California Bearing Ratio (CBR) is less than 3, and pavement overlay, may be made mandatory. ECTT has also suggested for the same. Even for subsoil with CBR greater than 3 and less than 8, geosynthetics can be used to enhance the performance of the road and to reduce maintenance costs. Therefore, this should also be encouraged. In India the poor road conditions and high maintenance cost require use of geotextiles. Analysis of global best practices for the usage of geotextiles reveals that on account of the intrinsic benefits, their application in the road and other infrastructure projects has been extensive in developed countries like USA, Europe, Japan, etc. It is noted that regulations in the developed countries do not mandate the usage of geotextiles but it is mostly based on the benefits derived like, increase in road life to 3 - 4 times of the existing roads, minimising road maintenance and improving riding quality without potholes and reflective cracking.

10.27.1 During the recent past, there has been a focused approach in India for infrastructural development across the country, particularly in the area of roads, rail roads, etc. The infrastructure can be developed as per international standards by using geosynthetics for separation, filtration and drainage, reinforcement and erosion control to improve the performance and life of the infrastructure. The usage of geotextiles is low in India due to traditional geo-technical and civil engineering practices and resistance to adopt geotextiles over conventional methods.

10.27.2 In many situations roads have to be constructed on varying soil subgrade formations. Generally, if the CBR of a natural subgrade is less than or equal to 3, then subgrade is classified as poor or soft nature.

10.27.3 It is also reported that usage of geosynthetic wherein subsoil CBR is less than 3 is more cost effective on account of saving due to reduction in aggregate layer thickness; increase in life of road by a factor of 2 and; significant reduction in maintenance cost.

10.27.4 Realizing the significance and potential of geosynthetics, IIT Bombay carried out a field trial on a 2 km. stretch of land in Pune district, in April 2004. The performance of the road for the past 24 months is reported to be satisfactory.

10.28 It is therefore recommended that use of geosynthetics for construction of roads where sub soil CBR is less than 3 and for pavement overlay may be made mandatory. Ministry of Textiles may take it up with Ministry of Roads & Highways.

10.29 Awareness should also be created for other sectors like railways, irrigation departments, ports, municipal corporations, pollution control boards, etc., about the use of geosynthetic products.

Use of Non-woven disposable healthcare items in hospitals.

10.29.1 Healthcare textiles comprise surgical clothing (gowns, caps, masks, uniforms, etc.), surgical covers (drapes, covers, etc.) and bedding (sheets, blankets, pillow cases, etc.). Healthcare textiles can be disposable or non-disposable. In India health care textiles continue to be predominantly non-disposable though in the global markets disposables are fast replacing non-disposable health care textiles.

10.29.2 Disposable healthcare textiles are replacing non-disposables all over the world due to ease of use and hygiene, infection free nature and also being cost effective by eliminating laundering. However, in India the use of non-disposable healthcare textiles is still quite significant, though there is a distinct shift towards use of disposable items. The reason for low usage of non-woven disposables could be low hygiene awareness and general perception that non-woven disposable are more expensive. However, the ECTT study has revealed that in some cases health care disposable textiles are more cost effective.

10.29.3 Considering the fact that usage of non-woven disposables is more cost effective and cases of infection at post operative stage are quite alarming in India, it is recommended that Ministry of Textiles may take it up with Ministry of Health & Family Welfare for encouraging use of nonwoven disposable healthcare items in Government hospitals.

Use of nonwoven gauge sponges and dressings in hospitals

10.30 Nonwoven medical / surgical fabrics when made into sponges, dressings and bandage rolls provide improved absorbent capacity and greater wicking. They also

produce less lint and fragments. When used for post operating and trauma dressings they enhance wound healing and patient comfort. These fabrics have replaced traditional woven gauge fabrics in all developed countries. This trend has to come to India. For this to happen, there is a need to change specifications for use and procurement of these materials. Appropriate changes in the BIS standards and Indian Pharmacopoeia is required. It is proposed that Ministry of Textiles should take up this issue with Ministry Health & Family Welfare to promote the use of nonwoven medical fabrics for wound care, and in surgical sponges.

Use of Fire retardant textiles in public places.

10.31 Public places like theatres, public halls, temporary shamiyanas, hotels and trains should use textiles which are fire retardant, providing protection and avoiding losses of human life as experienced by the country in the past. It is therefore recommended that the use of FR textiles should be made mandatory in all public places where the public has access. The Ministry of Textiles may take it up with Ministry of Home Affairs and Ministry of Railways for making use of fire retardant fabrics mandatory at public places.

10.32 In most developed countries it is mandatory to wear flame and heat resistant uniform by fire fighting personnel and workmen who are working near furnaces or similar risky places. In India also the flame and heat resistant uniform should be made mandatory for fire fighting personnel and workmen who are working near risky places. The Ministry of Textiles may take it up with Ministry of Home Affairs and Ministry of Commerce and Industry for making use of uniform made from flame and heat resistant fabrics.

Use of airbag in automotives

10.33 The use of seat belts and airbags can limit serious chest injuries in frontal collision by 65 percent, and serious head injuries by 75 percent. Realising the importance of the safety of persons traveling in commercial vehicles, a law for the installation and use of seat belts was introduced. However, no such provision exists for airbags. It is, therefore, recommended that use of airbags should be made mandatory in new vehicles.

Creating awareness by office of Textile Commissioner

10.34 The potential of technical textiles in India is still untapped. To unleash investment in this industry creating awareness is necessary. A number of awareness programmes have been organized by Regional Offices of the Textile Commissioner in association with local textiles associations / TRAs. However, it is appropriate to organise such programmes in a structured format and in a big way. In such programmes information on potential of technical textiles, identified products with potential for growth in India, Project profiles of such projects, usage of technical textiles in different areas in a cost effective manner and various initiative taken by the Government etc., should be presented.

10.35 For organising such programmes funds would be required. The fund requirement is estimated at Rs.1 crore on yearly basis for organising 10-12 programmes in different parts of the country. Therefore, Rs.5 crore would be required for organizing such programmes during the 5 years of Eleventh Five Year Plan.

Proposed Plan Outlay:

10.36 The plan outlays for the technical textile sector is given below:

Base line survey of technical textile units	Rs.1 crore
Setting up of 6 Centres of Excellence @ Rs.15 crore per centre	Rs. 90 crore
Creation of awareness for five years @ Rs.1 crore per year	Rs.5 crore
Total	**Rs.96 crore**