



सत्यमेव जयते
Ministry of Textiles
Government of India

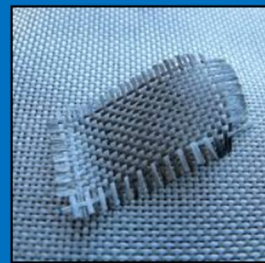
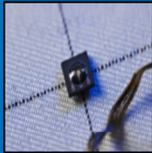
 **TECHNOTEX-2016**



Knowledge Paper on

Technical Textiles: Towards a Smart Future

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Executive Summary

The global technical textile market is growing along with new innovations and developments. While a large part of the demand comes from developed countries, the increasing industrialization and development of emerging countries is driving the growth of the overall market. USA is the largest market for consumption of technical textiles products accounting for a share of 23% followed by Western Europe, China and Japan with a share of 22%, 13% and 7%, respectively. In terms of product segments Clothtech, Packtech and Agrotech have the largest share of global technical textiles market. Non-woven, Composites, Fibers and Meditech segments had a significant share of about 75% in the global technical textiles market, but the rapid growth of automobile industry in market and growing acceptance of geotextiles is expected to drive the growth of Mobiltech and Geotech segments.

The Indian market for technical textiles is projected to be INR 92,499 Crore in 2015-16, growing at a CAGR of around 11.8%. Packtech is the largest segment with 42% share of the market, followed by Indutech, Mobiltech and Hometech. India's technical textiles market size accounts for 4% share in the world's market. Technical textiles constitutes of 51 high growth potential products which accounts for 23% of the total technical textile industry in 2012-13, known as high growth potential technical textiles. The total high growth potential technical textile market in India is estimated to be INR 14,830 crore for 2012-13 and is expected to grow at 16% till 2015-16. The overall technical textile market size is expected to reach INR 1,16,217 crore till 2017-18. India exported technical textile products worth US\$1.7 bn in 2014-15 with a CAGR of 16% since 2007-08. India mainly exports commodity products which are not very Research and Development intensive. Indutech and Packtech are the largest exported segments with a share of 44% and 30% respectively. The imports is mainly driven by Indutech segment accounting for 83% of the total imports of technical textiles. Several international companies have already entered the Indian market and more investments are expected in future.

The key growth drivers for Indian market include increasing consumer profiles and income levels, growing end user industries like Automobiles, Healthcare, Sports etc. and overall infrastructure and industrial development in India. Apart from this, the initiatives taken by the Government in attracting investments in technical textiles will also drive growth of the industry.

Smart textiles represents the next generation of textiles with use in several fashion products, furnishing and technical textiles applications. The basic concept of smart textiles consists of a textile structure that senses and reacts to different stimuli from its environment. The development of smart textiles are the result of new type of textile fibers & structure, miniaturization of electronics and wireless wearable technologies.

The global smart textiles market was estimated to be around US\$ 580 million in 2015. Smart textiles can be split on the basis of their end use industry namely, fashion & entertainment, sports

& fitness, medical, transportation, protection & military and architecture. These industry cover more than 90% of the global smart textiles industry. In terms of regions, North America and Europe comprise 80% of the global smart textile market.

India's smart textile market is at a nascent stage with a few start-up companies testing the waters. Further focus is needed in research & development and foreign investment in the sector to boost this sector in India.

Overall technical textiles and smart textile market has bright future in India. Overall consumption in India is expected to grow and the growth of various end use industries offers good potential for the technical textiles industry. India also offers many benefits for manufacturing of technical textiles including availability of raw materials, competitive labour cost, modern production facilities etc. Besides this favorable Government policies and support can further boost investments in technical textiles in India. This knowledge paper further details the overall market scenario for technical textiles and the potential for smart textiles globally and in India.

1. Technical Textiles: Global and Indian Perspective

1.1 Global Technical Textiles Market

The global technical textiles industry is constantly changing in terms of applications, technologies, innovation and performance. Along with the product innovations and developments the demand for technical textiles is also growing with newer applications and growth of end user industries. A large part of demand for technical textiles comes from various end-use industries such as automotive, sports equipment and sportswear, environmental protection, construction, healthcare, packaging, clothing, and agriculture. Accordingly, technical textiles is segregated into 12 major segments viz. Agrotech, Meditech, Buildtech, Mobiltech, Clothtech, Oekotech, Geotech, Packtech, Hometech, Protech, Indutech and Sportech. The global technical textiles market is led by the developed regions like US and EU, while emerging markets like China, India are showing high growth potential.

The global technical textiles industry is characterized by huge Research & Development investments that result in innovations and novel products. There have been a steady growth both in terms of production and consumption of technical textiles end product. Technical textiles are consumed in the form of unspun fibers, yarn and fabric, with a large part of end use of technical textiles being consumed in the form of fabric.

Clothtech, Packtech and Agrotech have the largest share of global technical textiles market. In terms of investment potential, Non-woven, Composites, Fibers and Meditech segments account for around 75% of the investments in the sector. Further, the rapid growth of automobile industry and growing acceptance of geotextiles is expected to drive the growth of Mobiltech and Geotech segments as well.

US is the largest market for consumption of technical textiles products accounting for a share of 23% followed by Western Europe, China and Japan with a share of 22%, 13% and 7%, respectively. The rest of the world accounts for 35% share in the consumption of technical textiles. Emerging regions such as Asia Pacific and Latin America are presumed to witness rapid growth in multiple segments of technical textiles. Countries such as China, India and Brazil are projected to lead their respective regional markets and are expected to witness brisk growth in the technical textiles market. Favorable government initiatives and policies encouraging infrastructure spending, manufacturing, medical etc. are expected to play a key role in shaping these countries.

As the market for technical textiles consumption is increasing, many country fulfill their demand by importing these advanced textiles from United States. Major export markets for U.S. companies are Vietnam, India, Taiwan and Brazil. Korea and Taiwan are also emerging as a strong competitor to US, with their focus on innovation.

1.2 Indian Technical Textiles Market

1.2.1 Domestic Market Scenario

Technical textiles in India continues to grow along with the growth of end user industries. Technical textiles currently contributes around 0.75% of the India's GDP and accounts for around 12% of the Indian textile market, which is less as compared to the other developing countries like China where technical textiles accounts for 20% of the total textile industry. India's technical textiles market size accounts for around 4% share in the world's market.

The technical textile market size is expected to reach INR 1,16,217 crore till 2017-18. Packtech is the largest segment with 42% share of the market, followed by Indutech, Mobiltech and home tech with a share of 11%, 10% and 10%, respectively. In terms of growth, Geotech is expected to grow fastest at a CAGR of 30%.

Table 1: Technical textiles market size (in Rs. Crore)

Sl. No.	Segment	Market size 2007-08 (in INR crore)	Market size 2012-13 (in INR crore)	Growth (2008-13) CAGR	Projected growth (2013-16)	Market size (E) 2013-14 (in INR crore)	Market size (P) 2015-16 (in INR Crore)	Market size (P) 2017-18 (in INR Crore)
1	Agrotech	553	826	~ 8%	~12%	929	1,191	1,614
2	Meditech	1,669	3,321	~ 15%	~9%	3,622	4,281	5,142
3	Mobiltech	3,183	6,607	~ 17%	~12%	7,370	9,173	11,433
4	Packtech	14,630	28,020	~ 14%	~11%	31,181	38,733	48,318
5	Sportech	2,851	4,132	~7%	~12%	4,645	5,877	7,111
6	Buildtech*	1,317	2,514	~14%	~12%	2,819	3,577	4,587
7	Clothtech#	3,466	4,835	~ 7%	~11%	5,357	6,591	8,133
8	Homotech\$	4,345	6,249	~ 5%	~14%	7,119	9,274	12,145
9	Protech	1,302	1,988	~ 7%	~9%	2,176	2,722	3,139
10	Geotech	185	683	~30%	~13%	772	991	1,275
11	Oekotech	68	120	~12%	~10%	132	160	193
12	Indutech	3,206	6,625	~15%	~14%	7,567	9,929	13,127
	Total technical textile market	36,775	65,920	~12%	~11.8%	73,689	92,499	1,16,217

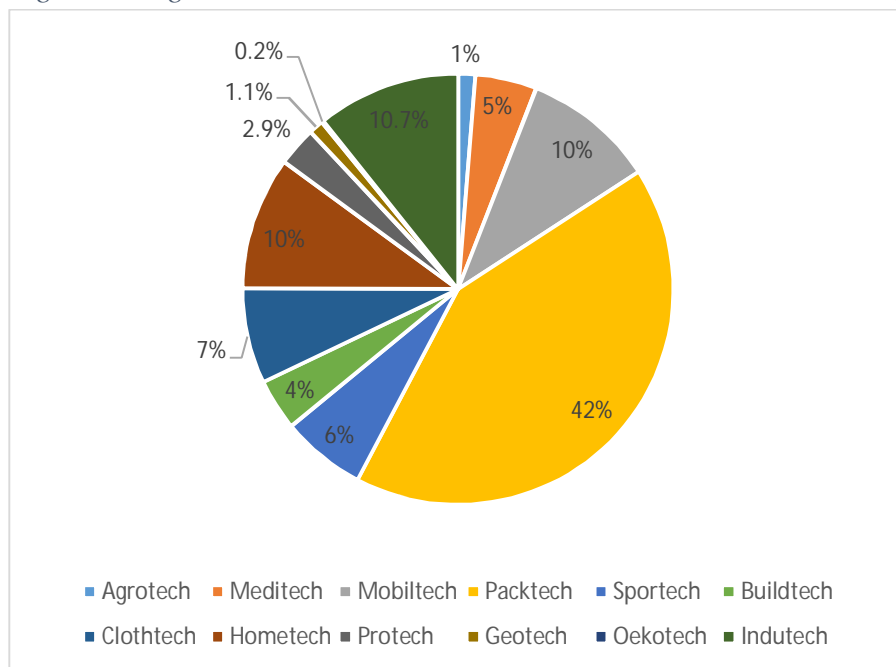
Source: IMAcS analysis

*Buildtech market size for 2007-08 and onwards excludes market of floor and wall covering

\$ Homotech market for 2007-08 includes plush fabric for soft toys instead of total soft toys and technical textile furniture fabrics only

#Clothtech market includes only specialised sewing threads

Figure 1: Segment wise share in technical textiles market in 2015-16(P)



Source: IMAcS analysis

Technical textiles constitutes of 51 high growth potential products which accounts for 25% of the total technical textile industry in 2015-16, known as high growth potential technical textiles. Some of the examples of high growth potential technical textiles are Shade nets, Mulch Mats, Crop covers, Anti Hail & Anti Bird nets, Baby Diaper (TT Component), Incontinence Diaper (TT Component), Sanitary Napkin (TT Component), Surgical Disposables, Disposable Bed-sheets, Artificial Heart Valves, Bullet Proof Jackets, FR Apparel, Nuclear and biological protective clothing, Chemical Protective clothing, Industrial gloves (TT component) etc. The total high growth potential technical textile market in India is projected to be INR 23,044 crore for 2015-16 and this market is expected to grow to INR 30,402 till 2017-18.

Table 2: Market summary of high growth potential technical textiles

Sl. No.	Segment	Total Tech Market size 2012-13 (in INR crore)	High Potential Tech market share 2012-13	High Potential Tech market size (in INR crore)	High Potential Tech Projected CAGR (2013-16)	High Potential Tech Market size (E) 2013-14 (in INR crore)	High Potential Tech Market size (P) 2015-16 (in INR crore)	High Potential Tech Market size (P) 2017-18 (in INR crore)
1	Agrotech	826	21%	173	~23%	212	321	361
2	Meditech	3,321	19%	631	~15%	752	973	1,317
3	Mobiltech	6,607	1.7%	112	~12%	276	346	447
4	Packtech	28,020	7%	1,961	~18%	2,164	3,000	4,171
5	Sportech	4,132	14%	578	~16%	662	884	851
6	Buildtech	2,514	26%	654	~14%	757	987	1,296
7	Clothtech	4,835	16%	774	~12%	852	1,079	1,367
8	Homotech	6,249	42%	2,625	~17%	3,112	4,295	5,946
9	Protech	1,988	54%	1,074	~14%	1,225	1,583	1,814
10	Geotech	683	100%	683	~13%	772	991	1,275
11	Oekotech	120	-	-	-	-	-	-
12	Indutech	6,625	84%	5,565	~16%	6,042	8,585	11,557
	Total technical textiles market	65,920	23%	14,830	~16%	16,826	23,044	30,402

Source: IMaCS Analysis

Note: High growth potential technical textiles includes Shade nets, Anti Hail & Anti Bird nets, Baby Diaper (TT Component), Incontinence Diaper (TT Component), Sanitary Napkin (TT Component), Surgical Disposables, Disposable Bed-sheets, Artificial Heart Valves, Bullet Proof Jackets, FR Apparel, Nuclear and biological protective clothing, Chemical Protective clothing, Industrial gloves (TT component) etc.

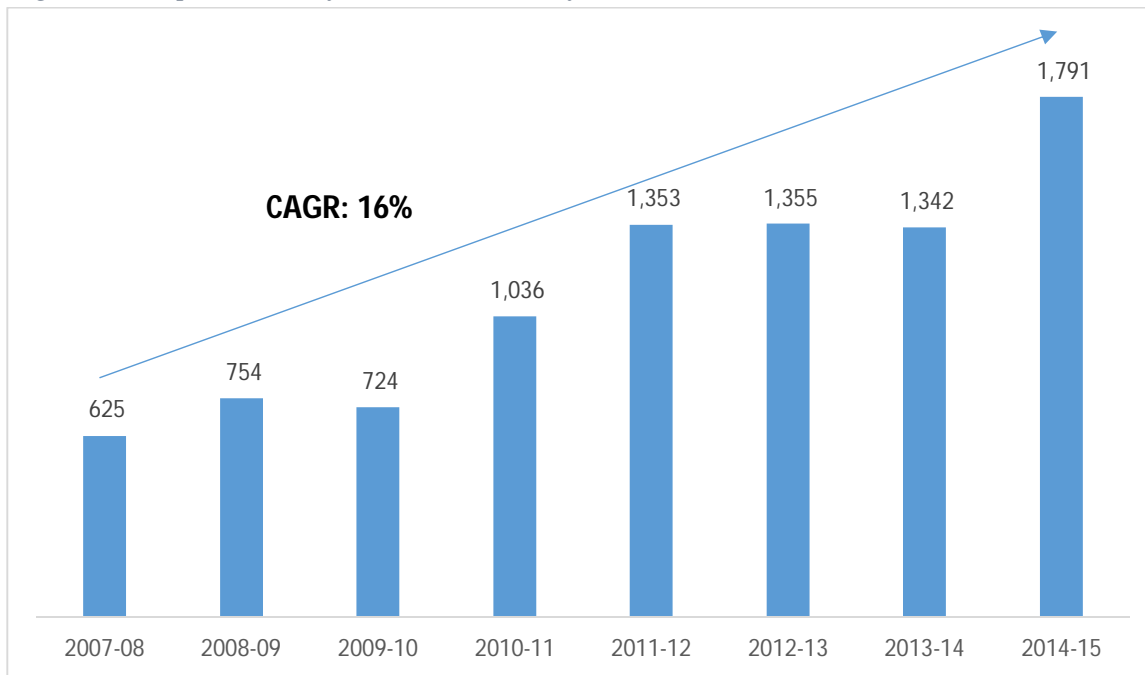
Following are the growth drivers for some of the key technical textiles segments:

Sector	Growth drivers
Mobiltech	<ul style="list-style-type: none"> • Growing Automobile industry • Growing usage of products like seat belts, airbags and automotive carpets
Sportech	<ul style="list-style-type: none"> • Increasing National and International tournaments in India • Government Schemes such as subsidies to university/colleges to improve sports infrastructure • Increasing popularity of sports and sportswear
Buildtech	<ul style="list-style-type: none"> • Demand is expected to increase on account of increasing spending on infrastructure • Increasing awareness and usage of products like architectural membrane, scaffolding nets
Meditech	<ul style="list-style-type: none"> • Growth of Healthcare industry • Growth in population and product acceptance
Protech	<ul style="list-style-type: none"> • Increase in Defense spending • More and more hazardous industries are making use of fire retardant clothing & chemical protective clothing
Geotech	<ul style="list-style-type: none"> • Significant investment in infrastructure is being planned in India by Government; on its own and in Public-Private-Partnership mode where Geotech products will have a lot of scope

1.2.2 Export of Technical Textiles from India

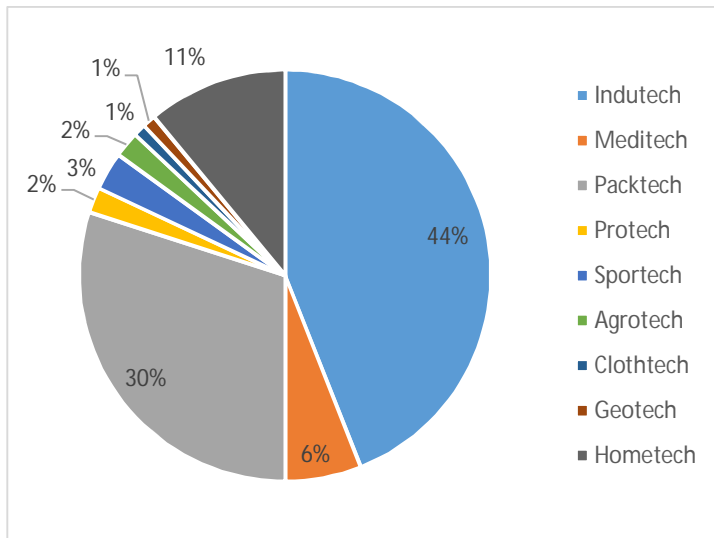
India exported technical textiles products worth US\$1.7 bn in 2014-15 with a CAGR of 16% since 2007-08. India mainly exports commodity products which are not very Research and Development intensive. Indutech and Packtech are the largest exported segments with a share of 44% and 30% respectively. The products include flexible intermediate bulk containers (FIBCs), tarpaulins, jute carpet backing, hessian, fishnets, surgical dressings, crop covers, etc. Segment like Meditech, Agrotech, Mobiltech and Geotech are also gaining competitiveness in the market.

Figure 2: Export trend of technical textiles from India (US\$ million)



Source: Office of the Textile Commissioner

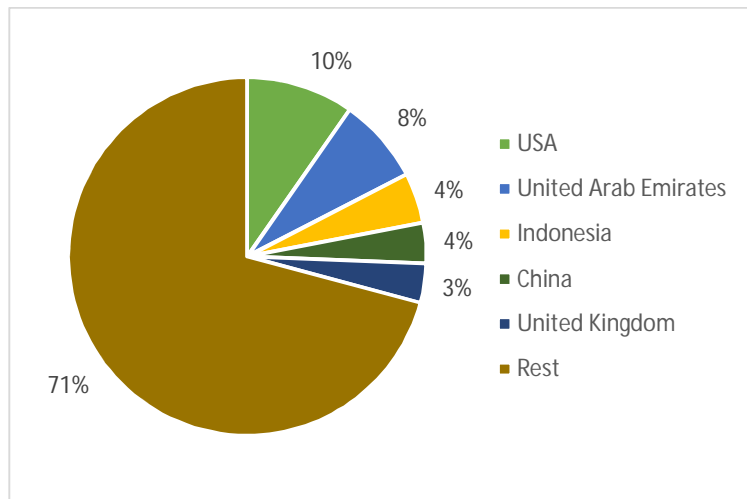
Figure 3: Segment wise share in total exports in India



Source: Office of the Textile Commissioner

Largest export markets include USA, UAE, Indonesia, China and UK

Figure 4: Major markets for India



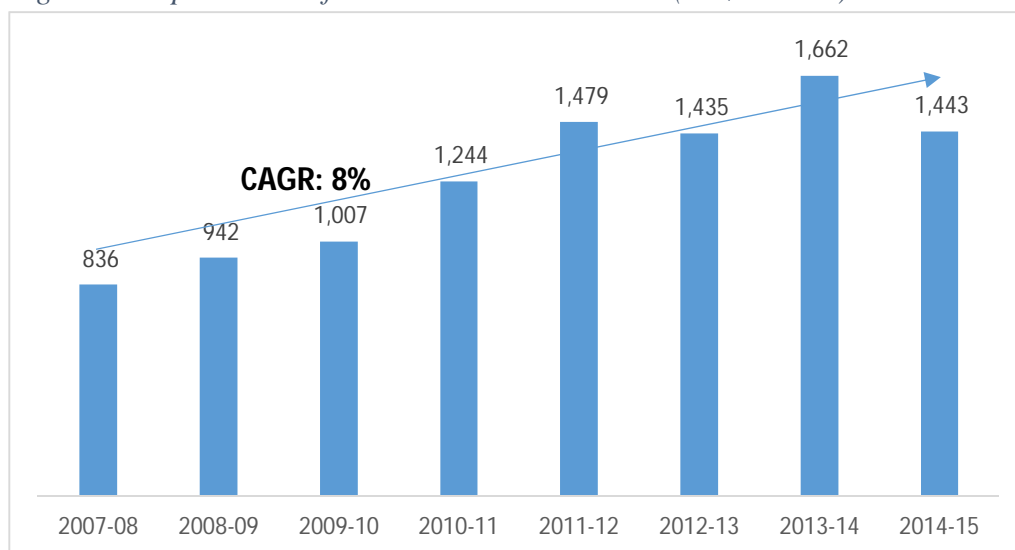
Source: UN Comtrade

Note: export market share is mainly for non-woven, waddings, felts, twines, coated fabric, special woven fabrics etc.

1.2.3 Import of Technical Textiles in India

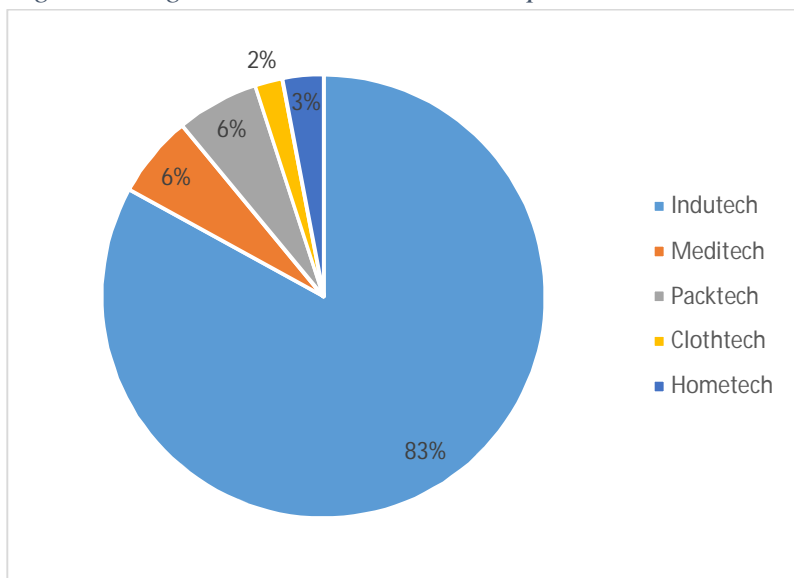
Despite fluctuations in recent times the overall imports of technical textiles has increased over the years along with the market demand. Imports of technical textiles is around US\$1.4 bn in 2014-15 with a CAGR of 8% since 2007-08. The imports is mainly driven by Indutech segment accounting for 83% of the total imports, followed by Meditech, Packtech, Clothtech and Hometech. Major imported products include baby diapers, adult diapers, PP spun bound fabric for disposables, wipes, protective clothing, hoses, webbings for seat belts, etc.

Figure 5: Import trend of technical textiles to India (US\$ million)



Source: Office of the Textile Commissioner

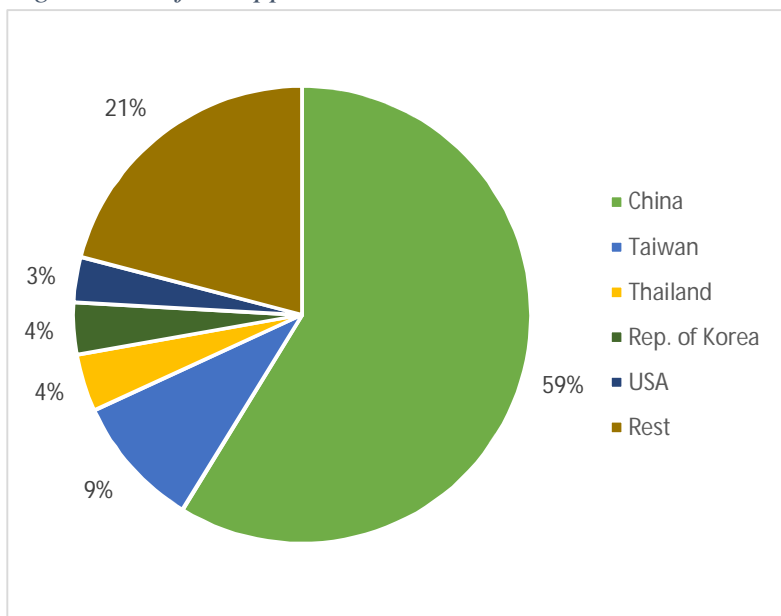
Figure 6: Segment wise share in total imports in India



Source: Office of the Textile Commissioner

Largest importing countries include China followed by Taiwan, Thailand, South Korea and US

Figure 7: Major Suppliers to India



Source: UN Comtrade

Note: Import country share is mainly for non-woven, waddings, felts, twines, coated fabric, special woven fabrics etc.

1.2.4 Investments in Technical Textiles

The Indian technical textiles industry is largely unorganized in nature and size of the manufacturing units vary to a large extent. Although there are various large players present, the production of certain goods is still concentrated to the small scale segment like canvas tarpaulin, carpet backing, woven sacks, shoe laces, soft luggage, zip fasteners, stuffed toys, fabrication of awnings, canopies and blinds, etc. There are a few Multi-National Companies like Ahlstrom, Johnson & Johnson, Du Pont, Procter & Gamble, 3M, SKAPs, Kimberly Clark, etc. which are internationally very large players in technical textiles and have set up their units in India as well. Large Indian companies include SRF, Entremonde Polycoaters, Kusumgarh Corporates, Supreme Nonwovens Pvt. Ltd., Garware Wall Ropes, Century Enka, Techfab India Ltd., Pacific Non-Woven, Vardhman, Unimin, etc. Going forward further investments are expected along with the growing market attractiveness.

Table 3: Key Investments in Technical textiles Sector in India

S. No.	Name of the Company	Type of Investment	Year of Investment	Segment of Technical textiles
1	Johnson and Johnson	Subsidiary	1947	Meditech
2	Procter & Gamble	Subsidiary	1951	Meditech
3	3M	Joint Venture	1988	Nonwovens, Indutech
4	Dupont	Subsidiary	1994	Protech
5	Kimberley-Clark	Joint Venture	1994	Meditech
6	Maccaferri	Subsidiary	1997	Geosynthetics
7	Freudenberg	Subsidiary	1998	Indutech and Nonwoven
8	Karl Otto Braun GmbH	Subsidiary	1998	Meditech
9	Schoeller Textil AG	Joint Venture	2003	Protech
10	SKAPS	Subsidiary	2004	Geosynthetics
11	Strata Geosystems Ltd.	Joint Venture	2004	Geosynthetics
12	Ahlstrom	Subsidiary	2006	Nonwoven
13	Lindstrom	Subsidiary	2007	Protech
14	Klopman	Subsidiary	2009	Protech
15	Honeywell	Subsidiary	2009	Protech and Packtech
16	Terram	Subsidiary	2010	Geosynthetics
17	NanoHorizans & Indorama	Joint Venture	2010	Specialty fibers

S. No.	Name of the Company	Type of Investment	Year of Investment	Segment of Technical textiles
18	Shri Lakhmi Cotsyn Defence	Capacity Expansion	2011	Protech
19	Arvind Mills & Dupont	Strategic Alliance	2011	Protech
20	Arvind Mills & PD Fiberglass Group	Joint Venture	2011	Composites
21	Sanhrea Technical textiles	Capacity expansion	2011	Nonwovens
22	Alok International & Richard and Kathy Hilton	Joint Venture	2012	Hometech
23	Precot Meridian & VMI, Holland	Joint Venture	2012	Nonwovens, Meditech
24	HB Fuller	FDI	2012	Nonwovens
25	SK Capital	FDI	2012	Indutech, Composites
26	Hindustan Technical Fabrics & Toho Tenax Co. Ltd. , Japan	Strategic Partnership	2012	Indutech, Composites
27	Kaman Group & Kinenco India	Joint Venture via FDI	2012	Composites, Mobiltech
28	Caparo, UK	New Project	2012	Composites, Mobiltech
29	Fiberweb Holding	FDI	2013	Geotech
30	Arvind & OG Non wovens	Joint Venture	2014	Nonwovens

Source: Market reports

1.2.5 Government Schemes/Initiatives for Technical textiles

I. Technology Mission on Technical Textiles: Technical textiles are the textile materials and products used for their technical performance and functional properties. Unlike conventional textiles which are 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 represent a multi-disciplinary field with numerous end use applications. To remove the impediments hampering the production of technical textiles in the country and to meet growing demand in the domestic and export market the govt. has launched Technology Mission on Technical Textiles (TMTT) during December 2010 with two mini-missions for a period of five years (from 2010-11 to 2014-15) with a fund outlay of INR 200 crore.

TMTT has been extended for another two years (FY 2015-16 & FY 2016-17) with the left out fund of TMTT i.e. INR 55.30 crore. Under the extension of TMTT, new components i.e. Focus Incubation Center (FIC), Scheme for Promoting Usage of Agrotexiles and Geotechnical textiles in India (excluding North Eastern States) have also been introduced.

The details of two mini missions under TMTT are given below:

Mini-Mission- I (Allocation: INR 156 crore)

Objectives: Standardization, creating common testing facilities with national / international accreditation, indigenous development of prototypes and resource center with I.T. infrastructure.

Interventions

(a) Setting up of four Centers of Excellence (COEs) to provide infrastructure support at one place for the convenience of manufacturers of technical textiles.

In addition to four COEs already established in Agrotech (SASMIRA, Mumbai), Geotech (BITRA, Mumbai), Protech (NITRA, Ghaziabad) and Meditech (SITRA, Coimbatore) under erstwhile Scheme for Growth and Development of Technical Textiles (SGD TT), four Additional COEs are being set up for Nonwovens (DKTE, Ichalkaranji), Composites (ATIRA, Ahmedabad), Indutech (PSG College of Technology, Coimbatore) and Sportech (WRA, Thane) to support the manufacturers of technical textiles of respective segment.

Details of Centers of Excellence set up by Ministry of Textiles on Technical Textiles are given below:

Center of Excellence	Segment	Contact Person	Email
The Bombay Textile Research Association (BTRA), LBS Marg, Ghatkopar (w) Mumbai – 400 086. Website: http://btraindia.com/geotech.asp	Geotextiles & Oekotech	Dr. Anjan K. Mukhopadhyay, Director	btra@vsnl.com
Synthetic & Art Silk Mills Research Association (SASMIRA) Marg, Worli, Mumbai – 400 025. Website: http://sasmiraagrotech.com/index.html	Agrotextiles & Packtech	Shri U.K. Gangopadhyay, Executive Director,	ukg1959@yahoo.co.in
Northern India Textile Research Association (NITRA), Sector 23, Raj Nagar, Ghaziabad -201 002. Website: http://www.nitracoeprotech.org/	Protective Textiles & Mobiltech	Dr. Arindam Basu, Director General	mail@nitratextile.org
South India Textile Research Association (SITRA), Post Box No. 3205, Aerodrome Post, Coimbatore – 641 014. Website: http://www.sitrameditech.org.in/index.php	Medical Textiles	Dr. Prakash Vasudevan, Director	prakash.vasudevan@gmail.com
D K T E's Textile & Engineering Institute, Rajwada, Post Box No.130, Ichalkaranji-416115, Kolhapur. Website: http://www.dktecoenonwovens.in/index.html	Non-Wovens & Clothtech	Dr. P.V. Kadole, Principal	pvkadole@gmail.com
PSG College of Technology, Avinashi Road, Peelamedu, Coimbatore – 641 004. Website: http://www.psgtech.edu/coeindutech/index.html	Industrial Textiles & Homotech	Smt. Thilagavathi Govindharajan, Director	thilagapsg@gmail.com
Ahmedabad Textile Industry's	Composites	Dr. A. K.	anil2005sharma@

Center of Excellence	Segment	Contact Person	Email
Research Association (ATIRA), P.O. Ambawadi Vistar, Ahmedabad – 380015. Website: http://www.atira.in/UserFiles/File/CoE/New_index.htm	& Buildtech	Sharma, Director	gmail.com
Wool Research Association (WRA), PO Sandoz Baug, Kolshet Road, Thane-400607. Website: http://wraindia.com/PRESS%20RELEASE.htm	Sports Textiles	Shri M. K. Bardhan, Director,	wra@wraindia.com

The essential facilities to be created in the Center of Excellence are as follows:

- i) Facilities for testing and evaluation of products of identified segments of technical textiles with national / international accreditation and collaboration with foreign institutes / laboratories
- ii) Resource Centre with I.T. infrastructure
- iii) Facilities for indigenous development of prototypes
- iv) Facilities for training of core personnel and regular training of personnel from the technical textile industry
- v) Knowledge sharing with stake holders
- vi) Incubation Centre
- vii) Setting up of standards at par with global level

(b) Upgradation of existing four Centers of Excellence

As stated above, 4 COEs have already been established but these centers are not having facilities for development of prototypes, incubation center for products of their segments and provision for recurring expenditure for appointment of experts. Therefore, a fund support is being provided to the existing COEs to upgrade them in line with new COEs.

Mini-Mission-II (Allocation INR 44 crore)

Objectives: Support for domestic & export market development of technical textiles

Interventions

(a) Support for business start-up

Technical Textiles is a new area and entrepreneurs find it difficult to invest in this field due to lack of knowledge about technology, raw material, process etc. Therefore, support for 'business start-up' is being provided. The COE and other associations / institutes / independent reputed consultants are being empaneled by the MOT / Office of the Textile Commissioner who will

prepare project reports and do the hand holding of the potential entrepreneurs till the completion of the projects.

(b) Providing fund support for organizing workshops

Reputed National and International agencies including the Indian Diaspora settled abroad are being invited to conduct Seminars, Workshops and short term training programmes in which knowhow about latest technology ,international practices ,market details ,global scenario etc. is being shared.

(c) Social compliance through standardization, regulatory measures

Consultants have been engaged to identify the needed regulatory changes required along with international best practices and also the strategy to facilitate such changes in the rules and regulations. 2 studies on developing measures for promoting usage of Agrotech and Geotech had been have been approved & same have been placed in this Office Website

(d) Market development Support for marketing support to bulk and institutional buyers etc.

Under the intervention Buyers-sellers meet are being organized across the country wherein the indigenous manufacturers can showcase their products and institutional buyers are being invited for enhancing their marketing competitiveness.

(e) Market development Support for export sales

There are many reputed technical textiles fairs organized abroad like TECHTEXTIL and Industrial Fabrics Exhibition, Index etc., the participation in which will improve the export potential of the indigenous manufacturers. Some of the technical textiles units are also participating in the exhibition of application based fairs. The support includes participation in Technical Textile fairs/Application based fairs by the Indian technical textiles manufacturers to exhibit their products.

(f) Contract Research and Development through IITs/TRAs/Textile Institutes

Technical textiles is high technology area where most of the new material high-end converted products are imported, there is strong need for indigenous development of products for which R&D is of prime importance. Therefore, contract research will be covered under this head. Individual unit or two or more unit may come together for a Contract research proposal.

i. Scheme for Promoting usage of Agrotextiles in India (Excluding North Eastern Region):

With the overwhelming response of the Schemes for promoting usage of Agrotextiles in NER, a new Component "Scheme for Promoting Usage of Agrotextiles in India (excluding North Eastern States)" have been introduced & funded under Mini-Mission-II of Technology Mission on Technical Textiles (TMTT) for a period of two years (2015-16 & 2016-17) with a fund outlay of INR 5 crore.

Demonstration Centers depicting the benefits and usage of Agrotextiles will be set up under the Scheme with 100% Govt. support with upper ceiling limit of INR 20 lakh/Demo center. Agrotextile kits will also be disbursed to the farmers with 90% contribution by the Government and 10% contribution from farmers/state Government. Upper ceiling limit of Central Govt. Contribution will be INR 5 lakh/farmer.

ii. Focus Incubation Centre's (FIC):

In order to help the potential investors to enter into technical textiles, Ministry of Textiles is setting up Focus Incubation Centre's (FIC) in the COEs established under TMTT on plug and play model. Accordingly an amount of INR17.45 crore has been released to six CoEs namely ATIRA, DKTE, NITRA, PSG College of Technology, SASMIRA & SITRA for setting up of FICs. The above FICs are entrusted with the following objectives and responsibilities

- i) Industrial sheds with basic infrastructure/basic machineries may be made available to the prospective entrepreneurs for setting up their units for production on commercial scale.
- ii) FICs may be provided to new entrepreneurs on "Plug and Play" model with mentoring by the concerned CoE for taking up the innovation on commercial scale.
- iii) Once they get established they shall shift to their own facilities and the center will be made available to new entrepreneurs.
- iv) CoEs have to establish the FIC's in their area within a time period of six months.
- v) There will be separate line of equipment's for each entrepreneur.
- vi) FICs would be run by entrepreneurs and not the CoEs.
- vii) Setting up of Incubation Center by the COEs may be completed on a time bound manner i.e. within six months. Basic infrastructure covering industrial shed with machineries may be provided to new start up entrepreneur on "plug and play" system for production of technical textiles on commercial scale, giving attention to requirements under the Government sponsored schemes of various Departments like M/o Agriculture, M/o RD, DONER, etc. The CoEs may do handholding of such new entrepreneurs and extend them necessary support and guidance.
- viii) Indian Institute of Technology, Delhi has also been requested to make aware their fresh IIT graduates about these facilities for helping them in starting up new business.

II. Scheme for promoting usage of Agrotextiles in North East Region: Ministry of Textiles, Government of India has launched a Scheme for promoting usage of Agrotextiles in North East Region in the 12th five year plan with an outlay of INR 55 crore. The aim is to encourage utilization of Agrotextiles in improving the Agriculture, horticulture and floricultural produce of the N-E states through awareness programmes, Development of Agrotextile products suitably customized for use in the North-Eastern region, Creating demonstration set-up depicting the

benefit of usage of Agrotextile products suitable for the region, Further under the scheme Agrotextile-Kits will be provided to farmers containing the Agrotextile material, instructions, right methods and practices when using Agrotextile products etc.

With increasing acceptability of Agrotextiles, entrepreneurs are expected to set up Agrotextiles production units in the country and particularly in NE Region. The scheme has been approved during December 2012 & became operational during June 2013.

III. Scheme for promoting usage of Geotechnical textiles in North East Region: A Scheme for Promoting Usage of Geotechnical textiles in North Eastern Region in the 12th five year plan with an outlay of INR 427 crore has been launched. The aim is to utilize Geotextiles in development of the infrastructure of the NE states by providing technological and financial support by meeting additionality in project cost due to the usage of Geotextiles in existing/ new project in road, hill/ slope protection and water reservoir.

With increasing acceptability of Geotextiles, entrepreneurs are expected to set up Geotextiles production units in the country and particularly in NE Region. The Scheme was approved on 03rd December 2014. The Scheme has following Components:

Component –I: Geotechnical Textiles Solution (Hard interventions) with a total outlay of INR 374 Crore

This component will finance the incremental cost of pilot stretches of identified ongoing or new projects, due to application of geotechnical textiles solutions, to be reimbursed to the State/Central Project Authorities for identified pilot projects. This component will cover the following three major infrastructure projects in the NER:

1. Road Construction
2. Hill Slope Protection
3. Lining of water reservoirs

Component –II (Soft Interventions) with a total outlay of INR 43 Crore

This Component will support activities such as site inspection and techno economic viability studies, design solutions and DPR preparation, on-site monitoring and testing, specification formulation, training and capacity building, awareness campaigns, market development support, and evaluations studies, etc. to be carried out by agencies to be identified by the Central Government.

Component –III (Administrative Expenses) – INR 10 Crore

This Component was launched by Hon'ble Minister of State for Textiles (I/C) on 24.03.2015 at Imphal, Manipur.

IV. Amended Technology Upgradation Fund Scheme (ATUFS):

Ministry of Textiles is providing 15% Capital subsidy to technical textiles sector on specified machineries which will boost the technical textiles production in India.

For more details on above schemes please visit www.technotex.gov.in & www.txcindia.gov.in

Some of the key Government of India schemes and initiatives for export promotion for textile sector including technical textiles are highlighted in the table below:

Table 4: Government Schemes/ Initiatives for Export Promotion

Schemes/Initiatives	Brief
Merchandize Exports from India Scheme (MEIS)	<ul style="list-style-type: none"> • Rewards for export of products shall be payable as percentage of realized FOB value: <ul style="list-style-type: none"> ○ For Chapter 50-60 (All types of cotton, MMF and other textiles) - reward rate is 2% for all countries ○ For Chapter 61 to 63 (apparel and made-ups)- reward rate is 2% for Group A countries which cover 34 countries including EU (28), USA, Canada, Norway, Switzerland and Liechtenstein and Group B countries which cover 140 countries including important emerging apparel and made-up markets like Japan, South Africa, Russia, China and Hong Kong, East and West African countries, etc.
Interest equalisation scheme	<ul style="list-style-type: none"> • 3% interest subvention on pre and post shipment rupee export credit for Handicrafts, Carpet, Handlooms, Small & Medium Enterprises, Readymade Garments, Made-ups, Fabrics, Coir & Coir Products, Jute & Jute Products
Export Promotion Capital Goods Scheme	<ul style="list-style-type: none"> • Allow exporters to imports capital goods which are required for the manufacture of resultant export product specified in the EPCG Authorization is permitted at nil/concessional rate of Customs duty.
Market Access Initiative	<ul style="list-style-type: none"> • Financial assistance for carrying out marketing projects abroad

Schemes/Initiatives	Brief
	<ul style="list-style-type: none"> • Assistance for building capacity for exporters, export promotion organizations, etc. • Assistance on reimbursement basis to exporters for charges/fees paid by them for fulfilling the statutory requirements in the buyer country • Assistance for conducting studies • Assistance in developing projects leading to substantial improvement in market access
Market Development Assistance	<ul style="list-style-type: none"> • Financial support to exporters registered with Export Promotion Councils • For participation in Trade Fairs/Exhibitions, assistance would be permissible on travel expenses by air in economy class and/or charges of the built up furnished stall, subject to an upper ceiling as given below: <ul style="list-style-type: none"> ○ Focus Latin American Countries (LAC) – INR 250,000 ○ Focus Africa, Focus CIS, Focus ASEAN – INR 200,000 ○ General areas – INR. 150,000 • For each region, the exporter can claim benefit once a year • Maximum number of permissible participations shall be 5 in an FY

For further promotion of usage of technical textiles products Government of India has launched schemes like “Scheme for promoting usage of Geotechnical textiles in North East region” and “Scheme for promoting usage of Agro textiles in India”. In the budget 2016-17 the basic custom duty on some key specialty fibers / yarns like nylon 66 filament yarn, para aramid fiber, nylon staple fiber etc. were reduced from 5% to 2.5%. Considering the high usage and requirement of these fibers in technical textiles, this reduction in duty will improve the competitiveness of Indian technical textiles manufacturers. Overall such steps will foster the growth of domestic technical textiles manufacturing, in line with “Make in India”.

2. Smart Textiles: Future of Technical Textiles

Smart textiles represents the next generation of textiles with use in several fashion products, furnishing and technical textiles applications. The vision is to create textile products exhibiting dynamic functionalities by combining smart materials and integrated computing power. Smart textiles can be divided into two categories i.e. aesthetic and performance enhancing. Aesthetic include fabrics that light up to the fabric that can change color. Performance enhancing fabrics have applications in sports, military, etc.

Smart textiles was first introduced in early 1900s due to the influence of military research and wearable technology. The smart textiles market has been a considerable evolution in the past few years, with a transition from passive to active smart and ultra-smart fabrics. First generation passive fabrics were proficient of only sensing environmental stimuli, while second generation active fabrics include components such as sensors, actuators and a control unit which can sense thermal, electrical and other stimuli; the third generation of smart fabrics known as ultra-smart fabrics can sense, react and adapt to environmental conditions or stimuli. Ultra-smart fabrics essentially consist of a unit which works like a brain with cognition, reasoning, and activating capacities.

The basic concept of smart textiles consists of a textile structure that senses and reacts to different stimuli from its environment. The development of smart textiles are the result of new type of textile fibers & structure, miniaturization of electronics and wireless wearable technologies. Following are the main parts included in a smart textiles:

- **Sensor materials and structures-** The sensor material have the capacity to transfer one type of signal into other. There are various type of sensors like thermal sensors, humidity sensors, pressure sensor, biosensors, chemical sensors, etc.
- **Actuator materials and structures-** These are the materials that respond to signal by changing colors, releasing substances, changing shapes, etc. the various type of actuators are chromic materials, stimuli responsive hydrogel, shape memory materials, electro luminance materials, light emitting diodes, etc.
- **Conductive materials-** These are used as a pathway for transferring data information as well as important components in the creation of sensors and actuators. Metals like silver and copper are the most conductive material. Besides this carbon and conductive polymers are also used as conductive materials.
- **Electronics-** It forms a major part of processing unit in form of integrated circuits, secondary storage, power supply and communication technologies. Most of the integrated circuits are made up of silicon because of its semiconductor properties. Organic

electronics are also suitable for wearable application as these materials are flexible, lightweight, strong and have low production cost, however the electronic properties does not match as those of silicon. The most common power sources are AA batteries or lithium batteries.

Smart textiles possess the ability to react to stimuli from electrical, thermal, chemical, mechanical, magnetic sources, and sports & fitness activities. Integration of fabrics with electronics produces new products to meet the rising demand for equipped materials in the military sector, medical sector and sports sector.

2.1 Global Smart Textiles Market

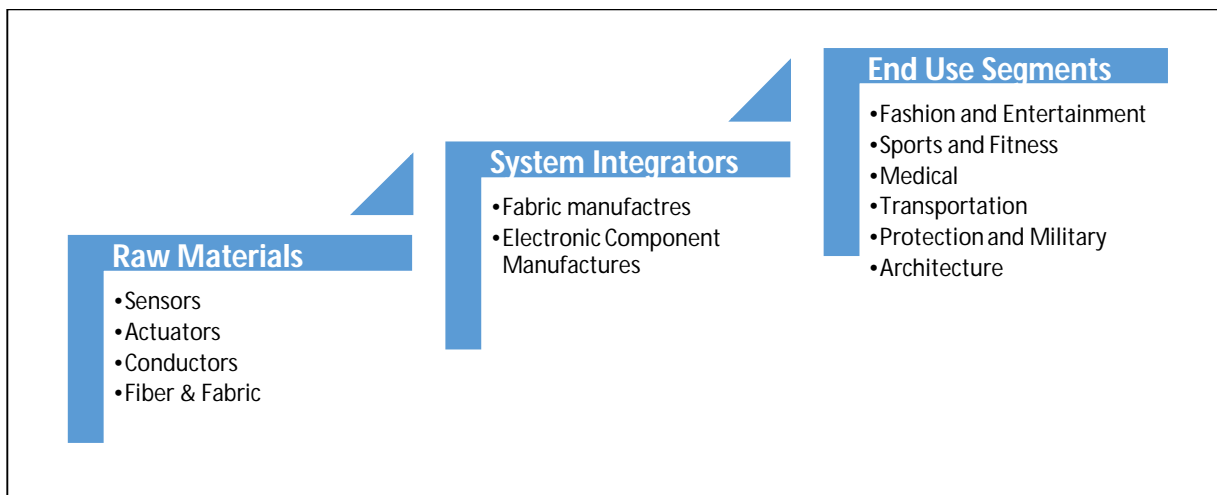
The global smart textiles market is still a relatively small market but is growing significantly along with new innovations and technology developments. The current global market is estimated to be around US\$ 580 million in 2015 and is expected to grow at a CAGR of 30% and reach US\$ 2.2 billion by 2020. The rising popularity of sophisticated gadgets and decreasing manufacturing costs of electronic components as well as fabrics along with miniaturization of electronics are expected to drive the market for smart textiles. Major drivers identified for the growth of the smart textiles market are:

1. Growing trends in the wearable electronics market
2. Increasing popularity of sophisticated gadgets with advanced functions
3. Miniaturization of electronic components
4. Rapid growth of low-cost smart wireless sensor networks

2.1.1 Smart Textiles End Use Outlook

The smart textiles ecosystem comprises of textile or fabric manufacturers, electronic component manufacturers, as well as system integrators which are responsible for catering to end-use industries. Smart textiles can be split on the basis of their end use industry namely, fashion & entertainment, sports & fitness, medical, transportation, protection & military and architecture. These industry covers more than 90% of the global smart textiles industry.

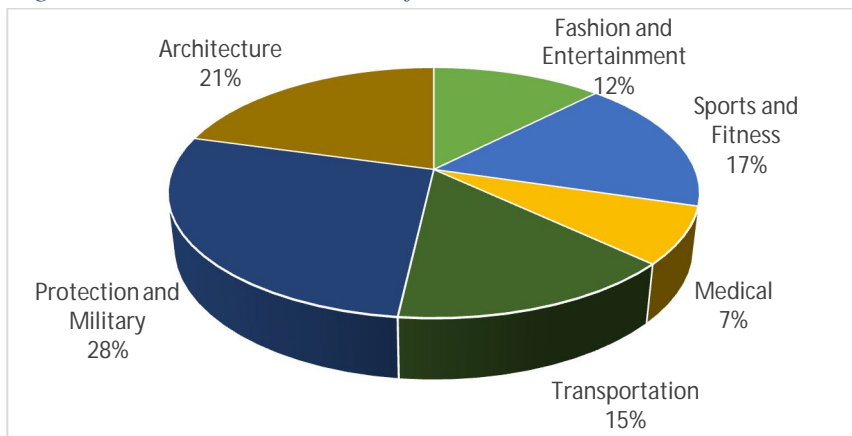
Figure 8: Smart textiles value chain analysis



Source: Market reports and Wazir analysis

Technological advancements have led to growth of smart textiles industry. Protection & military is comparatively more established than other end use industries. It is estimated to have 28% share in the smart textiles market in 2015 followed by architecture, sports & fitness and transportation industry with a share of 21%, 17% and 15%, respectively.

Figure 9: End-use wise share of smart textiles in 2015



Source: Market reports and Wazir analysis

2.1.2 Smart Textiles Regional Outlook & Major Players

Smart textiles market is largely dominated by the developed countries. North American smart textiles market which includes the US, Canada and Mexico, is expected to hold a major share in the global smart textiles industry in near future. North America accounts for 47% share in the world market of smart textiles in 2015 followed by Europe and Asia Pacific with a share of 33% and 16%, respectively. The rest of the world have only 4% share in the smart textiles market. The share of Asia Pacific countries like India, China, Taiwan, Korea and Australia is expected to grow in future significantly.

Figure 10: Major markets for Smart textiles in the World

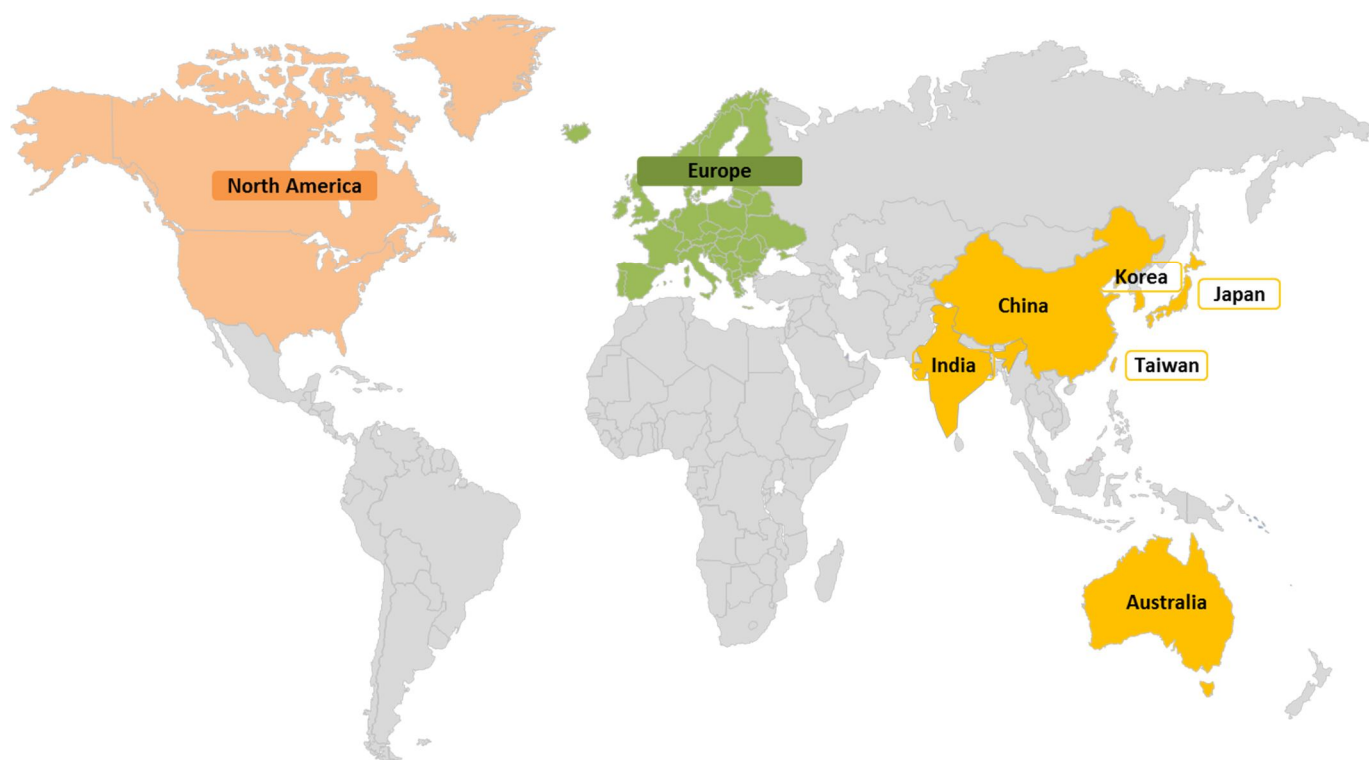
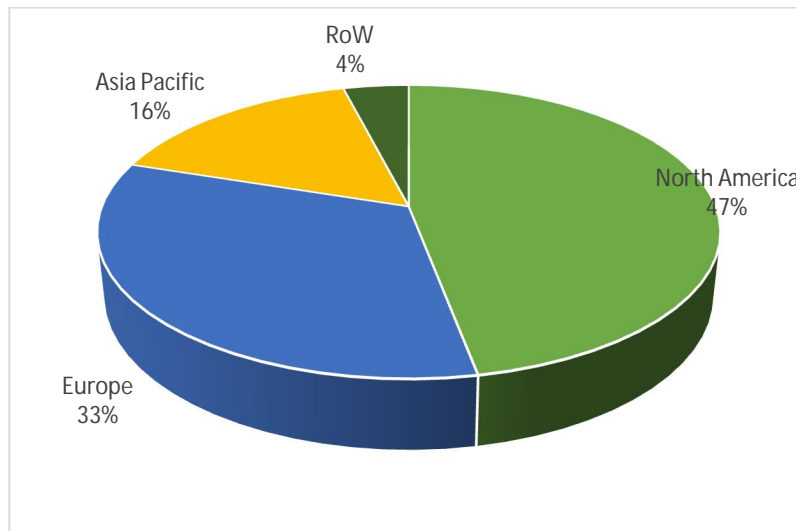


Figure 11: Region wise share of smart textiles in 2015



Source: Market reports and Wazir analysis

Europe smart textiles market including European Union, Commonwealth of Independent States (CIS) and non-member states market is also expected to account for significant market share over the next few years. Increasing number of Research & Development activities for smart fabrics is revitalizing the industry in European countries. The European Commission has co-financed a number of projects over the years in order to boost smart textiles development. They have mostly supported projects in health monitoring area. Another type projects supported by European commission are to develop technologies for smart textiles, for example stretchable electronics, integration of electronics in textiles, etc. Many USA based companies are also investing in research and development for smart textiles.

Some of the companies dealing with smart textiles are mentioned in the below table.

Table 5: Major companies in the world manufacturing smart textiles

S. No.	Company	Location	Sector
1	AIQ Smart Clothing Inc.	Taiwan	sports & fitness, outdoor & leisure, home & leisure, home care & health care
2	Clothing Plus Ltd.	Finland, USA	Fitness and healthcare
3	E. I. Du Pont De Nemours and Company	USA	Medical, agriculture, automotive, architectural, packaging, safety and protection
4	Gentherm Incorporated	North America, Europe, Asia	Automotive, aviation, bedding, medical & furniture
5	Interactive Wear AG	Stanberg, Germany	Wearable technologies
6	Outlast Technologies LLC	USA, Europe, Asia	Automotives and wearable technology
7	Schoeller Technologies AG	North America, Europe, Asia	Functional clothing and textiles
8	Sensoria, Inc.	USA	Wearable technology
9	Textronics, Inc. (Part of Adidas Group)	USA	Sports & fitness, health & wellness, military & safety
11	Exo2	UK	Heat technology for automotives
12	Mide Technology Corporation	USA	Wearable technology
13	Ohmatex ApS	USA	Wearable technology
14	Sensium Healthcare	UK	Healthcare
15	ThermoSoft International	USA	Heat technology for automotives
16	VivoMetrics	USA	Wearable technology

Source: Market reports and Wazir analysis

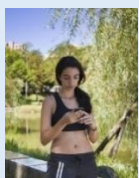
Table 6: Few examples of smart textiles products by international companies

Conductive gloves, AIQ Smart Clothing Inc.



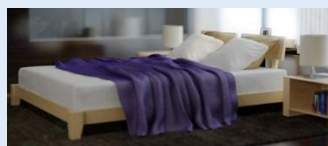
- Conductive gloves made with stainless steel fiber
- Conductive yarn is knitted or woven into the gloves fingertips
- It can be used to touch panel devices with accuracy
- They are washable and will never oxidize, making them perfectly safe for your skin and electronic devices

BioMan, AIQ Smart Clothing Inc.



- Wearable electrodes combined with modern information technology that provides vital sign monitoring for different
- Paired with Bluetooth connectivity to your smart device
- It is perfect for weight control, sports training and health monitoring

Climate control heat system, Gentherm Incorporated



- Combines the latest design in mattress comfort as well as temperature control technology to deliver the ultimate sleeping experience.
- One can choose their own heat or cool settings for a personalized microclimate sleep environment.

NuMetrex, Textronics, Inc. (Part of Adidas Group)



- Heart sensing sports bra and cardio shirt integrate special sensing fibers directly into the garment.
- This eliminates the need for a separate heart monitoring chest strap.
- Use with compatible heart rate monitoring sports watch, smart phones and cardio equipment
- Sensor fibers knit into fabric.

Electronic heating garments, AIQ Smart Clothing Inc.



- Keeps warm without the use of large heating panels or pads
- Uniquely coated stainless steel yarn is integrated into a special fabric to ensure your safety and maintain its softness.
- Guaranteed highly durable, washer safe, soft and lightweight. No need to remove heating pad before washing.

2.2 Indian Smart Textiles Market

The smart textiles market in India is at a nascent stage and is expected to gain its edge slowly and grow in the future. There are a few start-ups and early stage companies which have ventured into smart textiles primarily in the field of wearable technologies.

Table 7: Indian companies focusing on smart textiles

S. No.	Company	Brief Description
1	Ducere Technologies	Started in 2011 and a pioneer in wearable technology. The footwear brand “lechal” is one of their innovations.
2	Lumos Design Technologies	New startup in wearable technology building energy harnessing techniques into objects like bag packs and jackets
3	Broadcast Wear	New startup innovator in the field of smart apparel

The Department of Textile Technology at the Indian Institute of Technology (IIT), Delhi has recognized smart textiles as a significant area for research and development and is playing an active role as one of the pioneers in this field. The Department has established a research group on Smart and Innovative Textile Materials (SMITA). The SMITA group was established in 2000 and is a body of faculty and students from IIT Delhi who are working on the development of novel, intelligent, smart and functional textile materials for a wide range of textile applications. The main objectives of the group are:

- To create a national facility for research and technology development in the area of smart textiles based on innovative materials such as nanoparticles, nanofibers, Nano surface engineering, phase change materials and stimuli sensitive polymers.
- To bring together expertise from academia and industry to facilitate development of new technologies/products in the upcoming area of smart textiles.
- To create trained manpower that can assist industry in further research, product development and production of smart textiles based on new technologies.

SMITA group has significant funding from both government and Indian industry. It receives support from Department of Science and Technology (DST), Defense Research and Development Organization (DRDO), Council of Scientific and Industrial Research (CSIR) and Ministry of Human Resource Development (MHRD). Some of the recent industry partners include Resil Chemicals Pvt. Ltd., Pluss Polymers, Mahle Filter Systems (India) Ltd., SRF Ltd., Reliance Industries Ltd., Sterilite Optical Technologies Ltd., Aditya Birla Management Corporation Ltd., Thai Acrylic Ltd., Century Enka.

With a predominantly young population and the gradual increase in consumerism, the propensity of Indian consumers to spend on innovative products is also increasing. These factors along with R&D initiatives of industry will be the driving factors of growth for the Indian smart textile market.

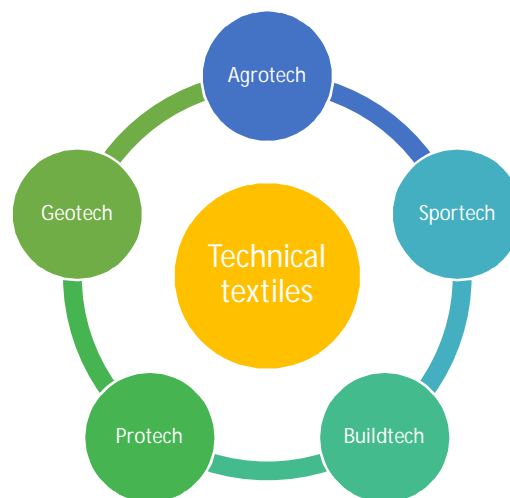
3. Way Forward

3.1 Overall Technical Textiles Market

India continues to be a favorable destination for textile manufacturing and also offers several advantages for manufacturing technical textiles products as well. India is competitive in terms of availability of raw materials, labor cost and modern production facilities. India is the largest producer of jute and cotton, second largest producer of polyester and polypropylene, which are major raw materials for technical textiles. On the wage cost aspect also, India is placed competitively. The wage rate in India is lower and is rising at a lower rate as compared to many competing nations. India has well developed infrastructure to support technical textiles manufacturing activities. There are about 70 Integrated Textile Parks around the country. These textile parks consists of required support infrastructure like effluent treatment plant, training centers and other social infrastructure providing a favorable environment to set up textile operations.

In terms of market potential India is a promising destination with an ever growing population and increasing consumption scenario. The per capita consumption of technical textiles in India is 1.7 per kg compared to around 10-12 kg in developed countries. This shows the large potential of further market growth for technical textiles in India. Segments like Indutech, Mobiltech, Meditech, Oekotech, Buildtech, and Hometech have good growth potential since the consumption of products under these segments is increasing rapidly.

Figure 12: High potential segments in technical textiles



Technical textiles is a rising sector which is steadily gaining ground in India along with development and industrialization in the country. Following are the key factors that will drive the growth of technical textiles industry and help the industry achieve its potential:

1. **Industrialization-** With the increase in investment in industry sectors, higher consumption and growing exports there are immense possibilities of growth in technical textiles.
2. **Increasing per capita income of consumer-** Per capita income increase from US\$ 450 in 2000 to US\$ 1,570 in 2014 which has led to growth in expenditure on new technologies and innovations.
3. **Increasing awareness-** Growing awareness, increasing adaptiveness and acceptance of about the superior functionality of technical textiles have encouraged higher consumption of these products.
4. **Scope for import substitution-** Although India at present imports a significant amount of technical textiles products, further investments in technology intense product segment can help in substituting imported products by the domestic product.
5. **Introduction of regulatory norms-** Lucrative market opportunities for new entrant, supportive government policies and regulatory norms can lead to exponential increase in demand and consumption of technical textiles products in India.
6. **Government FDI promotion initiatives-** Attractive FDI policies for the investor can also attract more investments in technical textile sector.

However, there are few gaps and challenges in growth of technical textiles market which needs to be overcome in order to accelerate the growth process:

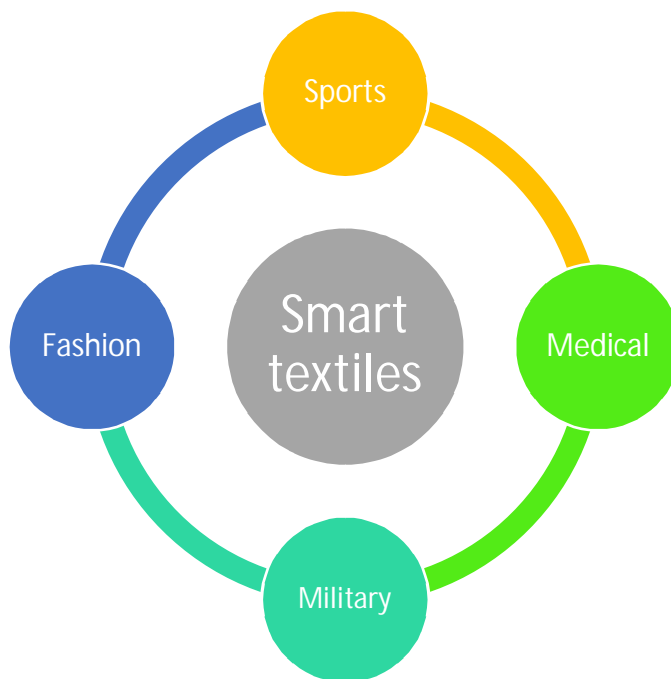
- Non-availability of high performance specialty fibers originating in India
- Dependency on import of raw material for manufacture of smart textiles
- Lack of Technology and indigenous machinery for most of the high-end Technical textiles products
- Lack of high end Research & Development
- Scarcity of skilled man power in technical textiles
- Low awareness of technical textile products amongst consumers

3.2 Overall Smart Textiles Market

Smart textile market has high potential to grow globally as well as in India. Along with further technology advancements and more players investing in smart textiles, further advance products are expected to be developed for the key end-use segments including fashion & entertainment, sports & fitness, medical, transportation, protection & military, and architecture.

With the increase in awareness regarding new technologies and innovation, consumers are focusing on textile products that go a step further from the traditional function of textiles. Growth in the fashion and entertainment industry is expected to propel overall market growth thereby demanding more innovative development in the field of textiles. Additionally, demand from the sports and fitness sector has been increasing with awareness regarding health and the importance of a healthy lifestyle. End users participating in extreme sports, running, skiing, etc., have also contributed largely to demand for smart textiles. There is also ever increasing demand from Military for innovative protective equipment.

Figure 13: Sectors demanding innovation in smart textiles



Key developments that augur well for smart textile future

- **Miniaturization of electronics and advancements in wireless technology-** Majority of popular products such as laptops and mobile phones are being integrated with Bluetooth Low Energy (BLE) technology, which allows sensor based devices to connect to the internet. This is expected to be a significant driving force for the industry, since smart textiles work on the premise of electronic components such as sensors and actuators.
- **Demand from end-use industries, such as medical/personal protective equipment-** Smart textiles can be used to communicate information of the wearer such as physiological parameters including location and heart rate. This data can then be used in application areas such as healthcare as well as sports and fitness.

Major restraints that need to be overcome for further growth of smart textiles

- **Need for efficient battery-** Ensuring efficient power supply is a key issue, since using conventional batteries may render the target garment too bulky for wear. Efforts to combat this drawback include development of a lightweight fabric that acts as a credible power supply, thus fulfilling the dual purpose of wear ability and functionality.
- **Garment wash ability-** Washing and cleaning of garment made up of smart textiles is one of the important issue that need to be addressed in order to increase its demand in the market.
- **Less awareness among consumers-** Due to the less awareness about the smart textiles among the consumer, its demand in the market is also less.

For taking India a step forward in smart textiles, we have to focus more in research and development. It can only be promoted by active participation of government and industry players. We should focus on following points in order to achieve a remarkable growth in this field in near future:

1. Research and development centers for smart textiles
2. Investment in new innovation rather than producing traditional technical textiles
3. Attractive policies and schemes for new startups in smart textiles
4. Carrying out research projects in association with government and private companies
5. Encouraging collaboration/joint ventures/ tie-ups with foreign player in order establish smart textiles market in India

With inherent demand drivers, India is poised to grow as manufacturing as well as a consumption destination for overall technical textiles and smart textiles. By increasing focus on R&D and innovation and facilitating investments in this sector, the growth can be further accelerated.

Abbreviations

ASEAN	Association of Southeast Asian Nations
ATIRA	Ahmedabad Textile Industry's Research Association
BTRA	Bombay Textile Research Association
CAGR	Compound Annual Growth Rate
CIS	Commonwealth of Independent States
CSIR	Council of Scientific and Industrial Research
CoE	Center of Excellence
DKTE	DKTE Society's Textile & Engineering Institute
DRDO	Defense Research and Development Organization
DONER	Development of North Eastern Region
DST	Department of Science and Technology
FDI	Foreign Direct Investment
FIBCs	Flexible Intermediate Bulk Containers
FIC	Focus Incubation Center
FICCI	Federation of Indian Chambers of Commerce and Industry
FOB	Fret on Board
GDP	Gross Domestic Product
EPCG	Export Promotion Capital Good
IIT	Indian Institute of Technology
LAC	Latin American Countries
MEIS	Merchandize Exports from India Scheme
MHRD	Ministry of Human Resource Development
MMSF	Man Made Staple Fiber
MMFY	Man Made Filament Yarn
MNC	Multi National Company
NE	North East

NITRA	Northern India Textile Research Association
RD	Rural Development
SASMIRA	Synthetic & Art Silk Mills Research Association
SGDTT	Scheme for Growth and Development of Technical Textiles
SITP	Scheme for Integrated Textile Parks
SITRA	South India Textile Research Association
SME	Small and Medium Enterprises
SMITA	Smart and Innovative Textile Materials
TMTT	Technology Mission on Technical Textiles
TUFS	Technology Upgradation Fund Scheme
WRA	Wool Research Association

Definition of Technical Textiles Segments

Agrotech	:	Agriculture, aquaculture, horticulture and forestry technical textiles
Buildtech	:	Building and construction technical textiles
Clothtech	:	Technical components of footwear and clothing
Geotech	:	Geotextiles and civil engineering technical textiles
Homotech	:	Technical components of furniture, household textiles and floorcoverings
Indutech	:	Filtration, conveying, cleaning and other industrial technical textiles
Medtech	:	Hygiene and medical related technical textiles
Mobiltech	:	Automobiles, shipping, railways and aerospace related technical textiles
Oekotech	:	Technical textiles for environmental protection, waste disposal and recycling
Packtech	:	Technical textiles for packaging material like bags, sacks, etc.
Protech	:	Technical textiles for protective clothing
Sportech	:	Technical textiles sport and leisure product



About FICCI

The Federation of Indian Chambers of Commerce and Industry (FICCI) is an association of business organizations in India established in 1927. FICCI draws its membership from the corporate sector, both private and public, including SMEs and MNCs. The chamber has an indirect membership of over 2,50,000 companies from various regional chambers of commerce. It is headquartered in the national capital New Delhi and has presence in 12 states in India and 8 countries across the world.

FICCI is a non-government, not-for-profit organization involved in sector specific business policy consensus building, and business promotion and networking. It provides a platform for networking and consensus building within and across sectors and is the first port of call for Indian industry, policy makers and the international business community. It organizes conferences, forums, exhibition, trade fairs, etc. bringing the industry insight forward.



About Wazir Advisors

Wazir Advisors is a Management Consulting assisting its clients in strategy formulation and implementation, forming alliances and joint ventures, investments and market understanding, sector analysis and due diligence-therby providing end to end solution spanning the complete business cycle in textile value chain.

Having worked with leading Indian and International companies, public sector organizations, Government departments, development agencies, trade bodies etc., Wazir has a deep understanding of global textile sector dynamics and right connect with the people who matter.

Wazir’s team of textile experts possess experience across function – projects, operations, sourcing and marketing in the sector. The team members have worked on strategy and implementation assignments in all major textile and apparel manufacturing and consumption base. Wazir leverages its body of knowledge, contact and combined expertise of its team to deliver value to clients.

Scope of Our Operations		
Strategy	Implementation	Alliances
<p>Wazir delivers practical, implementable strategies for clients to meet their objectives.</p> <p>Be it corporate strategy intending to enhance profitability or sector growth strategy to support MSMEs or evaluating Government scheme to access its impact, we are geared to advise our clients efficiently and effectively. Our services include:</p> <ul style="list-style-type: none"> • Sector Mapping and Growth Strategy • Policy Formulation Support • Government Scheme Evaluation • Corporate Strategy • Market Opportunity Assessment • Market Entry Strategy • Location Analysis • Business Performance Enhancement • Product Diversification • Marketing and Distribution Strategy 	<p>Wazir provides implementation services to textile and apparel sector entities to convert the plans into reality. Whether it is to manage a Government scheme or to improve productivity in apparel factories or to identify the most suitable technology; we have in-house competence to cover all the critical elements of implementation. Our services are:</p> <ul style="list-style-type: none"> • Project Management and Monitoring • Re-modeling of Manufacturing Plant • Process Re-engineering • Productivity Improvement • Supply Chain Optimization • Feasibility and Techno-Economic Viability (TEV) Study • Investment Promotion • Cluster and Industrial Park Development 	<p>Partnerships and collaborations are ways to achieve accelerated growth, expand market reach and attain technical advancement. Realizing the importance and need of inter-organization alliances in textile and apparel sector, Wazir has developed broad range of services to support companies and organizations looking for inorganic growth globally. Our services include:</p> <ul style="list-style-type: none"> • Company Due-diligence • Joint Venture • Marketing Tie-up • Technology Transfer • M&A Execution • Strategic and Financial Funding



सत्यमेव जयते
Ministry of Textiles
Government of India

About Ministry of Textiles, Delhi

The Ministry of Textiles is responsible for the formulation of policy, planning, development, export promotion and regulation of the textile sector in India. The principal functional areas of the Ministry include: Textile Policy & Coordination, Man-made Fibre / Filament Yarn Industry, Cotton Textile Industry, Jute Industry, Silk and Silk Textile Industry, Wool & Woollen Industry, Decentralized Powerloom Sector, Export Promotion, Planning & Economic Analysis, Integrated Finance Matters, Information Technology.

Contact Ministry of Textiles:

Ministry of Textiles
Room# 235, Udyog Bhawan,
New Delhi – 110 017
Website: <http://texmin.nic.in>

Office of Textile Commissioner, Mumbai

The Office of Textile Commissioner formulates and implements various schemes of the Government of India in an industry-friendly manner. This office has wide reach across India through its 9 regional offices and 14 powerloom service centers in major textile clusters.

Contact Office of Textile Commissioner:

Office of the Textiles Commissioner
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Telephone Number: +91-22-22001050
Fax: +91-22-22004693
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