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G20 भारत 2023 INDIA

FICCI

# India 2047 – Vision and strategic roadmap for technical textiles

February 2023

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पीयूष गोयल
PIYUSH GOYAL

वाणिज्य एवं उद्योग,
उपभोक्ता मामले, खाद्य और सार्वजनिक वितरण तथा
वस्त्र मंत्री, भारत सरकार
MINISTER OF COMMERCE & INDUSTRY,
CONSUMER AFFAIRS, FOOD & PUBLIC DISTRIBUTION AND
TEXTILES, GOVERNMENT OF INDIA

## FOREWORD

I am delighted to learn that the Ministry of Textiles and Federation of Indian Chambers of Commerce & Industry (FICCI) are jointly organising the 10th edition of TECHNOTEX 2023 from 22nd to 24th February, 2023 in Mumbai.

India's textiles sector holds a prominent position in India's manufacturing sector output and is the second largest employer in India. The sector has recently moved up the value chain and has diversified into technical textiles. Technical textiles play a substantial role in the progress of India's manufacturing given their extensive applications across end-user industries such as infrastructure & construction, healthcare & medical technology, agriculture, defence, automobile among others. India's technical textile sector has a huge potential and is a sunrise sector that will contribute significantly to building a new & developed India by 2047.

Under the dynamic leadership of Hon'ble Prime Minister Shri Narendra Modi, the Government is actively promoting research and innovation in technical textiles to enhance exports and global competitiveness of this sector. This is being done through initiatives like the National Technical Textile Mission that aims to increase the domestic market size of technical textiles. It is worth noting that technical textile products are being used across the world owing to their superior functionalities. The sector became even more relevant during the COVID-19 crisis when a stringent ban on export of critical medical equipment was witnessed. It is praiseworthy that the Indian technical textiles industry rose up to the challenge and India became the second largest manufacturer of PPE kits. With India's Presidency at G20, technical textiles will be an important segment to enable India to lead the world.

I congratulate the Ministry of Textiles and FICCI for jointly organising TECHNOTEX 2023 and wish the exhibition success in enabling India to position itself as a world leader in the technical textiles sector.

**Piyush Goyal**

दर्शना जरदोश
DARSHANA JARDOSH

रेल एवं वस्त्र राज्य मंत्री
भारत सरकार
MINISTER OF STATE FOR
RAILWAYS AND TEXTILES
GOVERNMENT OF INDIA

## MESSAGE

Technical Textiles are a high technology sunrise sector which is steadily gaining ground in India. High performance textiles known as technical textiles are used not only in apparel but also in industries including agriculture, medicine, building infrastructure, automotive, aerospace, sports, protective gear, packaging, etc. These products derive their demand from development and industrialization in a country. Given the rate at which emerging nations are industrialising, the market for technical textiles is anticipated to expand alongside global industrial expansion.

In recent years, India's market for technical textiles has grown drastically. This is due to applicable innovations and increased public knowledge of technological textiles. The Ministry of Textiles, Government of India, in collaboration with FICCI, organises the TECHNOTEX series of International Exhibition & Conference to support the industry. TECHNOTEX provides a platform for stakeholders from across the value chain to interact and forge alliances with industries from across the globe.

Government of India has ambitious plans and programmes to develop India as one of the leading hubs of Technical Textiles globally and set up a robust manufacturing base in India. Simultaneously, Government is also working towards a sustainable and healthy market growth in the domestic sector as well as encourage exports.

I am sure this mega platform would provide the industry a wonderful opportunity to interact and exhibit their product and services. Additionally, this would demonstrate and educate the public at large on latest technologies available globally. I send my warmest greetings to all of the attendees and exhibitors at TECHNOTEX 2023.

Darshana Jardosh

**(Darshana Jardosh)**

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रचना शाह, भा.प्र.से.
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सत्यमेव जयते

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17 February 2023

**Foreword**

Indian Technical Textiles market is the 5th largest in the world and is rapidly growing. The segment accounts for around 15% of the overall Textiles and Apparel market in India and holds importance from the employment and investment standpoint.

Technical Textiles is the forerunner of many new applications covering almost all walks of life and having immense potential for bringing in higher level of productivity, efficiency, cost economics, and offering innovative solutions to many engineering and general applications.

Under National Technical Textiles Mission (NTTM) and PLI for Textiles scheme, India has strongly positioned itself to create capabilities and scale through investment and research for realizing the goal of the Atmanirbhar Bharat. The schemes will also enhance the penetration of Technical Textiles across various spheres of industries and markets.

The end-usage of Technical Textiles products cater to a wide array of industries, thereby exhibiting a plethora of opportunities as a high value sector in India.

Government is making all efforts to promote Technical Textiles and has undertaken various initiatives in this direction, including PLI scheme for Textiles, PM MITRA Parks, National Technical Textiles Mission, rationalization of HSN Codes, development of more than 500 BIS standards & issuance of QCOs for Technical Textiles, amongst others.

A series of successful TECHNOTEX editions has been jointly organized by Ministry of Textiles and FICCI in the past and we are happy to note that this 10th edition of TECHNOTEX 2023 has been scheduled at the most opportune time when India has assumed the G-20 Presidency.

This is an excellent initiative as it brings together all the global and domestic stakeholders of Technical Textile industry under one roof and provides a platform to showcase India's strength.

Going ahead, we will seek to leverage our existing strengths and capabilities to expedite the growth of Technical Textiles sector, a sunrise area with immense potential.

**I wish TECHNOTEX 2023 a huge success as we jointly strive towards realizing a new growth story in Technical Textiles!**

Rachna

**(Rachna Shah)**

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संयुक्त सचिव
**Rajeev Saxena, I.R.S.S.**
**Joint Secretary**

भारत सरकार
वस्त्र मंत्रालय
Government of India
Ministry of Textiles
Udyog Bhawan
New Delhi-110 011

**17th February 2023**

## Foreword

Technical Textiles, also known as functional textiles is considered as sun-rise sector, has immense potential for export as well as domestic consumption. In pursuance to Hon'ble Prime Minister's clarion call on "Aatma Nirbhar Bharat", and in view of the tremendous potential available for growth in the country, Government of India has identified Technical Textiles as a thrust segment with application areas across all key sectors in India. There are some inherent weaknesses in India, identified as lack of high performance fibers, lack of technical textile machinery, unavailability of trained and skilled manpower in this highly specialized area besides lack of awareness.

To overcome, these weaknesses, Govt. of India launched National Technical Textiles Mission (NTTM) in year 2020 for 4 years upto March 2024 with the objective of increasing penetration level of technical textiles from 5-10% as compared to 30-70% in the developed world. Along with this, Government is intricately working with industry, research and academic institutions, trade bodies and the State Governments to promote all aspects of this sunrise segment of technology to place India as one of the leading global players in Technical Textiles.

The sector holds tremendous opportunities across various flagship missions and schemes of the Government of India including Jal Jivan Mission, Mission for Integrated Development of Horticulture, National Health Mission, National Investment Pipeline and Strategic Sectors such as Defence, Space and Paramilitary.

Through consistent efforts and engagements, India's market and penetration of technical textiles is envisioned to grow strongly in the coming years. Going forward, NTTM is going to be instrumental in this effort.

We have developed various initiatives and schemes under NTTM to strengthen the end-to-end Technical Textiles ecosystem including Guidelines for Grant for Internship Support in Technical Textiles (GIST), General Guidelines for Enabling Academic Institutions in Technical Textiles – For Private and Public Institutes, and General Guidelines for Design, Development and Manufacturing of Machinery/Tools/Equipment/ Instruments for Technical Textiles.

I believe that the 10th Edition of Technotex 2023 will play a pivotal role in paving a substantial path for the overall development of the segment. This Technotex Thought Leadership will serve as a catalyst in disseminating information and generate higher awareness amongst stakeholders and beneficiaries. I wish it all the success.

**(Rajeev Saxena)**

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President

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# Message from President - FICCI

The global technical textiles market is expected to grow at a CAGR of 5.2% to reach USD 274 billion by 2027 thereby presenting a large opportunity. While the sector is growing rapidly backed by increasing demand for technical textiles across industries and new applications, the Asia-Pacific Region in particular is poised to register the highest growth with India being a large contributor.

The Indian technical textiles market is the 5th largest in the world and, having grown at 8-10% per annum over the last 5 years, stood at USD 21.95 billion in 2021-22. However, annual growth can potentially be scaled up to 15-20% over the next 5 years so as to garner a larger slice of the global pie.

In this context, I commend the Government of India for its sustained focus on promoting technical textiles and manmade fibers through initiatives such as Performance Linked Incentives (PLI) scheme, National Technical Textiles Mission (NTTM), and PM Mega Integrated Textile Region and Apparel (PM MITRA) parks. I believe this will provide an impetus to the sector by augmenting manufacturing capacity, and play a catalytic role in developing India as one of the leading hubs of technical textiles globally.

On its part the Ministry of Textiles, Government of India has played an active role by creating a platform which supports large scale participation from the technical textile industry. This effort is supported by Maharashtra as the 'Host State' with Karnataka, Tamil Nadu, and Madhya Pradesh as 'Partner States' for this year's event; West Bengal too will showcase policies and opportunities at the event.

Technotex 2023, an international Exhibition & Conference on Technical Textiles is scheduled to be held from February 22nd - 24th, 2023 and will feature an impressive showcase of products by our 'International Partner' Taiwan (RoC) while companies from South Korea, Russia, Germany, Switzerland, Luxembourg, and Guinea will also be exhibiting at the event in addition to Indian industry. Buyers from more than 30 countries and a large number of business visitors are expected to attend, thereby providing myriad opportunities to exhibiting companies.

I take this opportunity to convey my best wishes to all stakeholders on behalf of FICCI for Technotex 2023.

**Subhrakant Panda**
President, FICCI

# Foreword – KPMG in India

India has always been a leading player in the traditional textiles and natural fibres segment. But in the recent times, we have made remarkable progress in the specialised area of technical textiles as well. India's leap towards modernisation and its manufacturing competitiveness are the key contributors to the growth of this segment.

The world noticed the manufacturing capability of Indian technical textiles during the past 3 years. From being a non-producer of COVID Grade Personal Protective Equipment (PPE), India rose to become world's second largest producer and exporter of PPEs and N-95 Masks in a period of six months during 2020.

Considering technical textiles' rapid growth and diverse applications in almost all walks of life, we believe that the future of the textile sector is intimately linked with the growth of the technical textile industry which is expected to fuel our Hon'ble Prime Minister's 'Atma Nirbhar' Mission.

I would like to put on record the remarkable efforts and initiatives under by the Government to proactively address the challenges of the industry and facilitate the creation of an enabling environment, such as creation of PLI scheme, National Technical Textiles Mission, development of new HSN Codes, strengthening quality regulation through QCOs, among others.

I believe the true potential of technical textiles in India is immense. The government's key projects in infrastructure development including PM GATI SHAKTI, highways, railways, irrigation, power, renewable energy, irrigation, healthcare, etc., presents significant opportunities for technical textiles to be used extensively.

In order to further capitalize on market opportunities presented by global trade and investment dynamics, India needs to focus creating world-class technical textiles ecosystem, up-skill the workforce, facilitate creation of advanced indigenous technologies& products and foster strategic international collaborations.

It gives me immense pleasure to share with you that we have come up with a report on the technical textile sector, providing a detailed overview of technical textiles landscape at a global and national level. The report provides key insights and interventions required across varied time span to achieve a consistent growth in the technical textiles in India during the 'Amrit Kaal'.

I am confident that this report will be useful for the entrepreneurs, industry players and the Government in understanding the current market scenario of technical textiles and will play a pivotal role in shaping the growth of the sector as a manufacturing and export hub.

I would like to thank Ministry of Textiles & FICCI for providing KPMG this opportunity to present this dynamic report to industry stakeholders at Technotex 2023.

**Mohit Bhasin**
Partner and Global Co-lead for Economic Growth Practice, Government & Public Services (G&PS)

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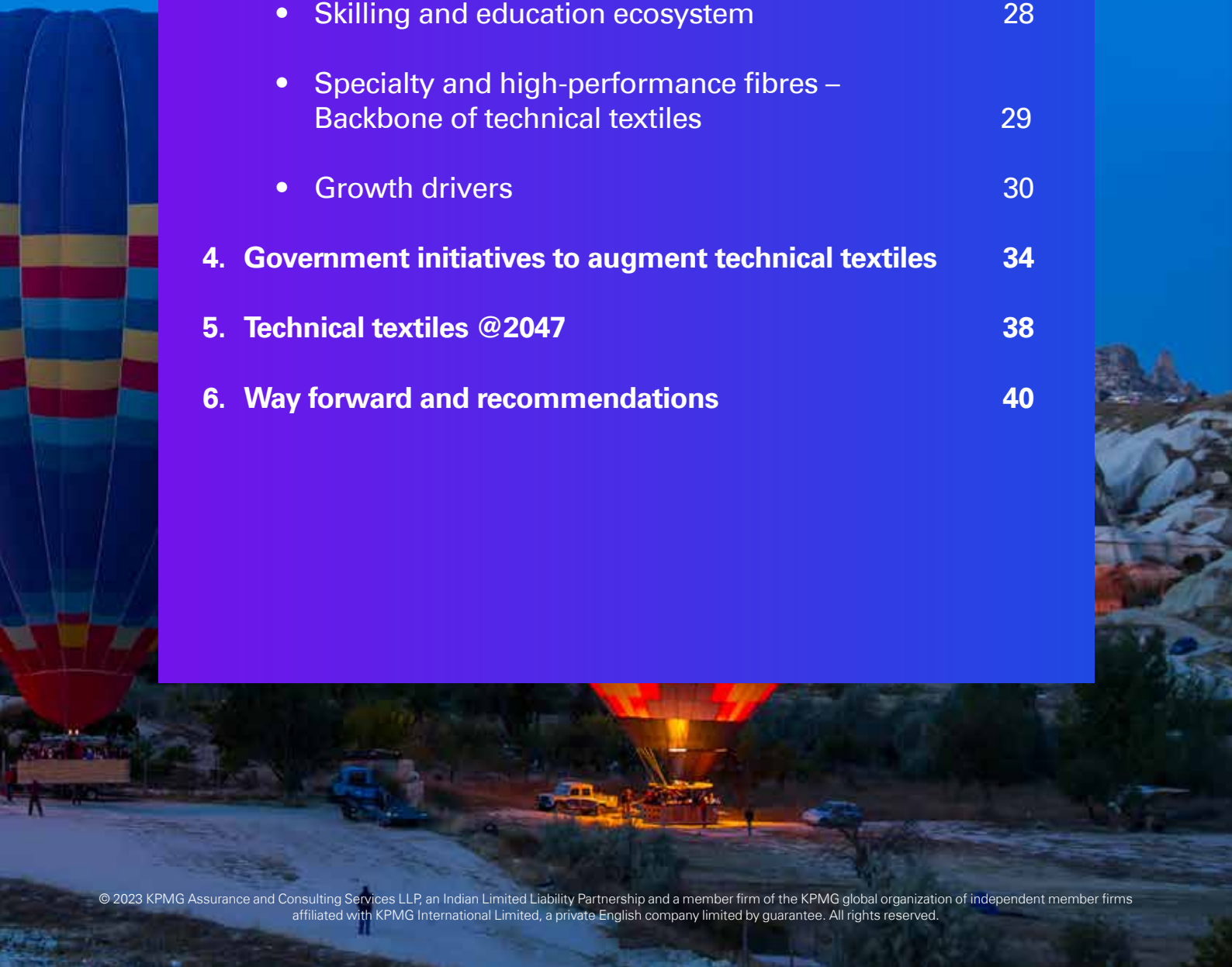
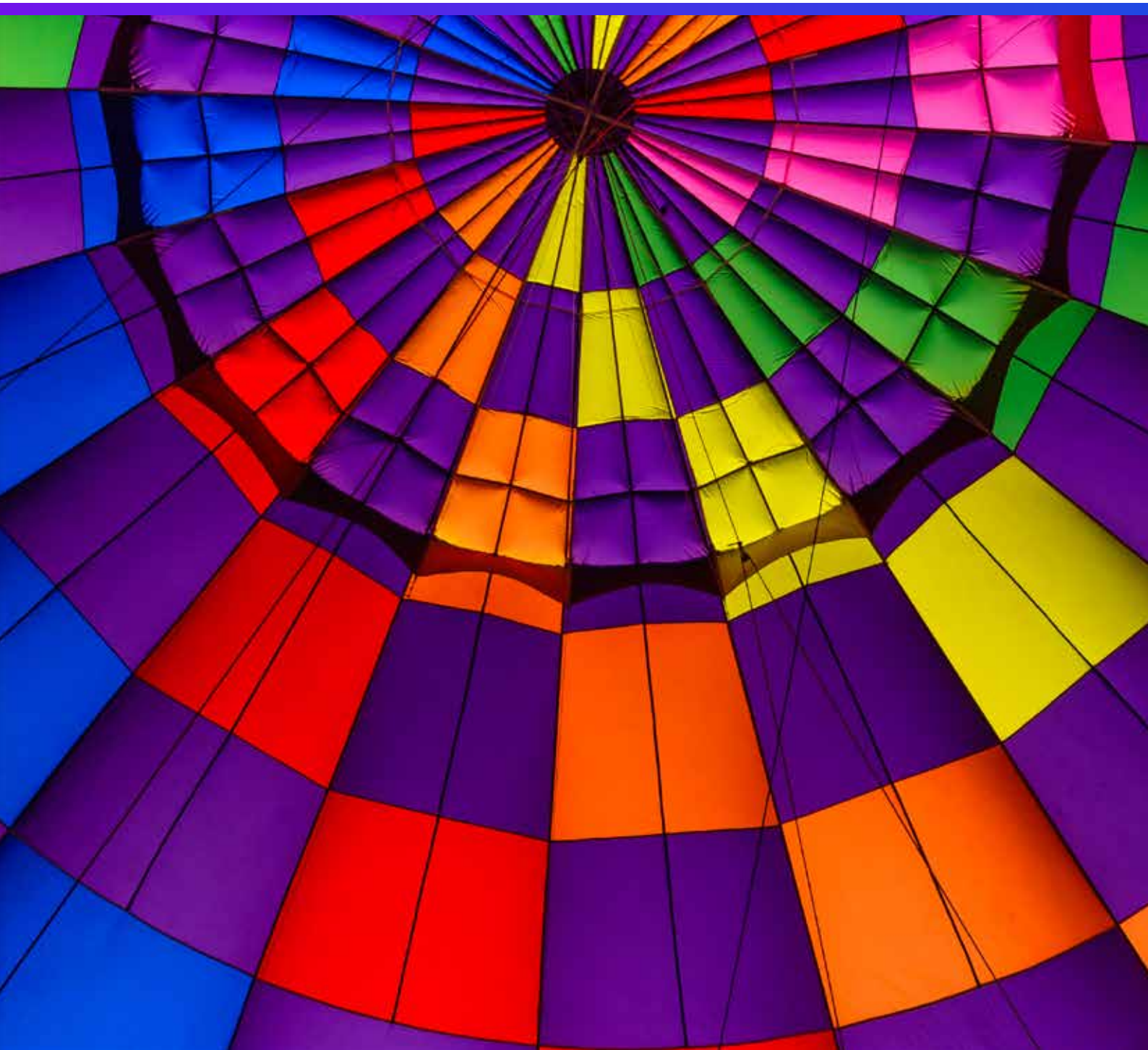


# 01 Introduction



# Introduction

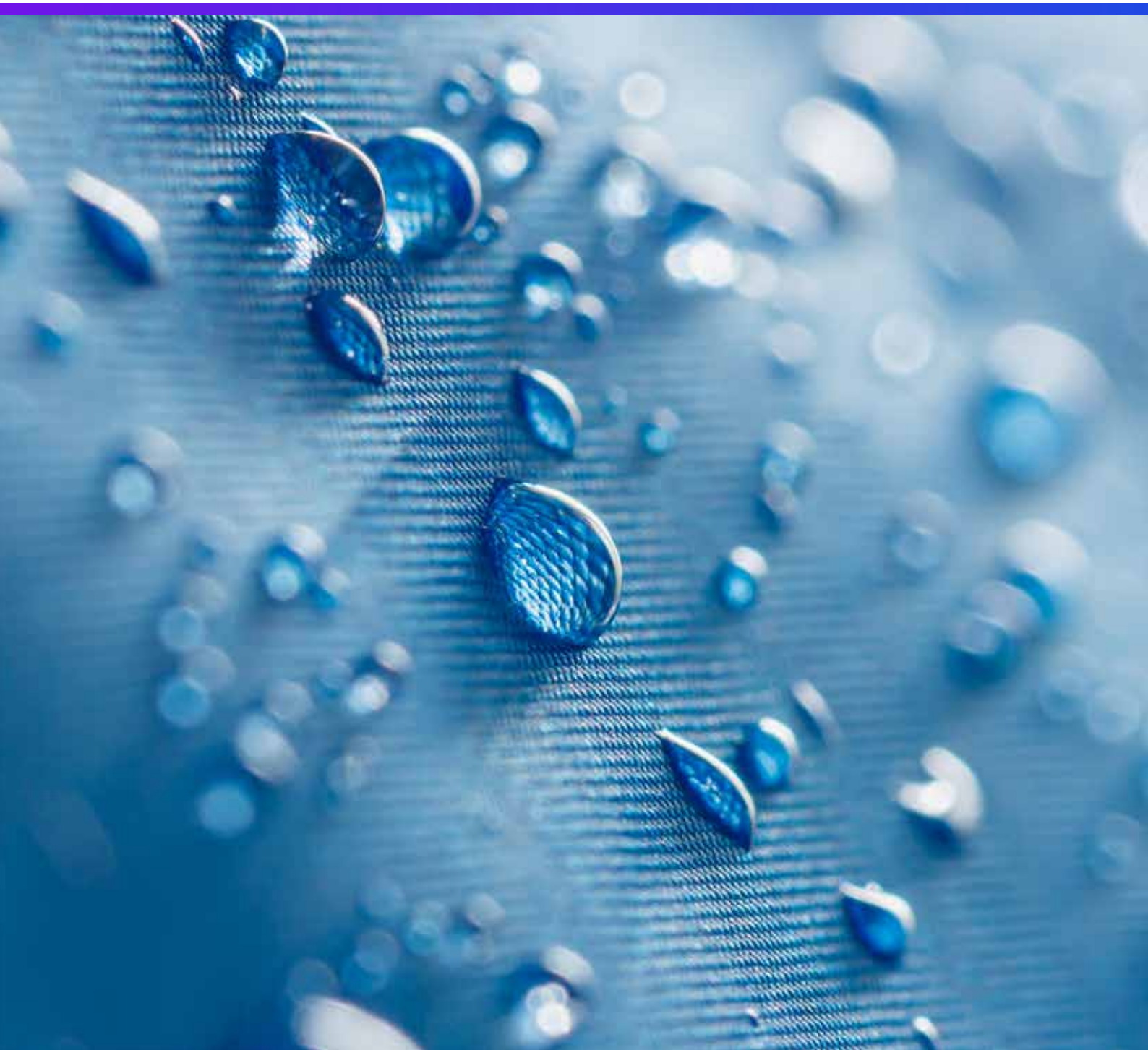
Technical textiles are textile products that have technical performance and functionality as their primary focus. The end usage of these products cater to a wide array of sectors including construction, agriculture, aerospace, automotive, healthcare, protective gear, home care, among others. Technical textiles products exhibit enhanced performance over the traditional textiles, the products that largely focus on the aesthetics.

Technical textile products are manufactured using natural as well as manmade fibres such as Nomex, Kevlar, Spandex, Twaron, etc. These fibres exhibit enhanced functional properties like higher tenacity, superior insulation, improved thermal resistance, etc., and are used in varied industries and applications.

The market is divided into the following 12 segments based on their application, with the rise in the dominance of technical textiles.

**12 segments of technical textiles**

# 02 Global scenario



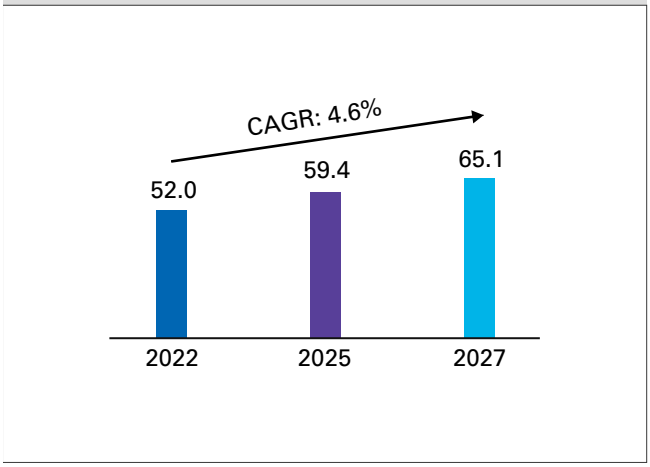
# Global scenario[1]

## Global market

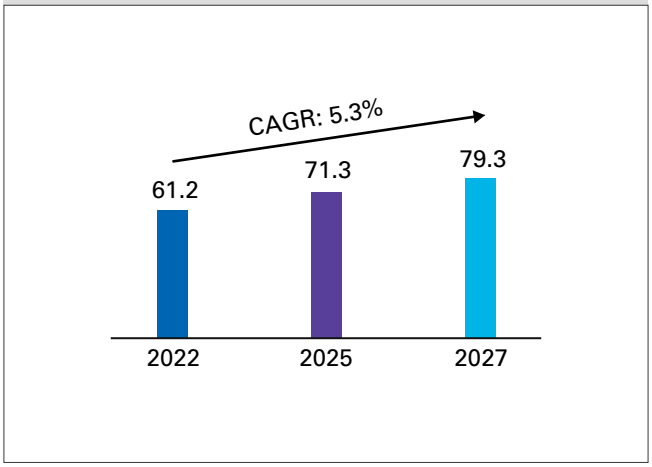
The global technical textiles market is estimated at USD212 billion in 2022 and is expected to reach USD274 billion by 2027, growing at a CAGR of 5.2 per cent during 2022-27 backed by increasing global demand for technical textiles across industries and expanding base of new applicative products being developed at a rapid rate.

**Global technical textiles market, by region (USD Bn)**

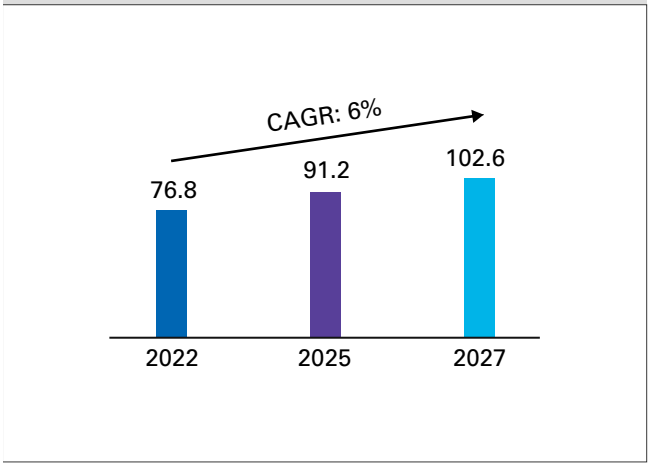
**North America (in USD Bn)**



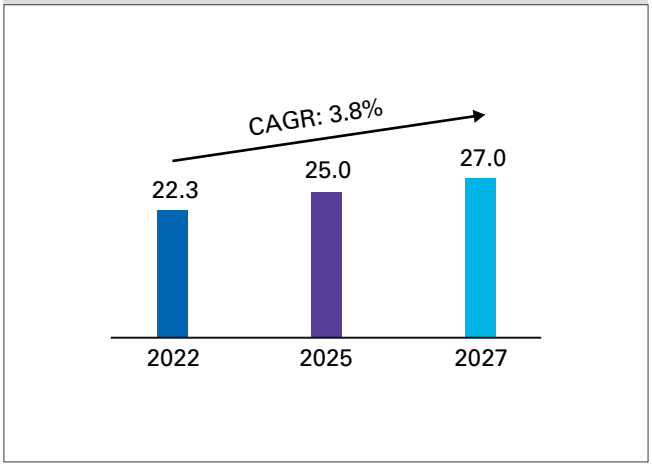

**Europe (in USD Bn)**




**Asia Pacific (in USD Bn)**




**LAMEA (in USD Bn)**




**North America:** The U.S., Canada, and Mexico;
**Europe:** UK, Germany, France, Spain, Italy, and rest of Europe;
**Asia-Pacific:** China, Japan, India, Australia, South Korea, and rest of Asia-Pacific;
**LAMEA:** Brazil, Saudi Arabia, South Africa, and rest of LAMEA

Source: Global technical textiles Market (2020-27) - Allied Market Research; KPMG in India analysis.

1. Global technical textiles Market (2020-27) - Allied Market Research

The Asia-Pacific region is poised to grow fastest and is valued at USD76.8 billion in 2022, and is projected to grow at an impressive rate with CAGR of 6 per cent to reach USD102.6 billion by 2027. This growth is attributed to sectors including healthcare, automotive, construction and industrial development apart from enhanced Government focus and increasing application cognisance towards technical textiles in the region.

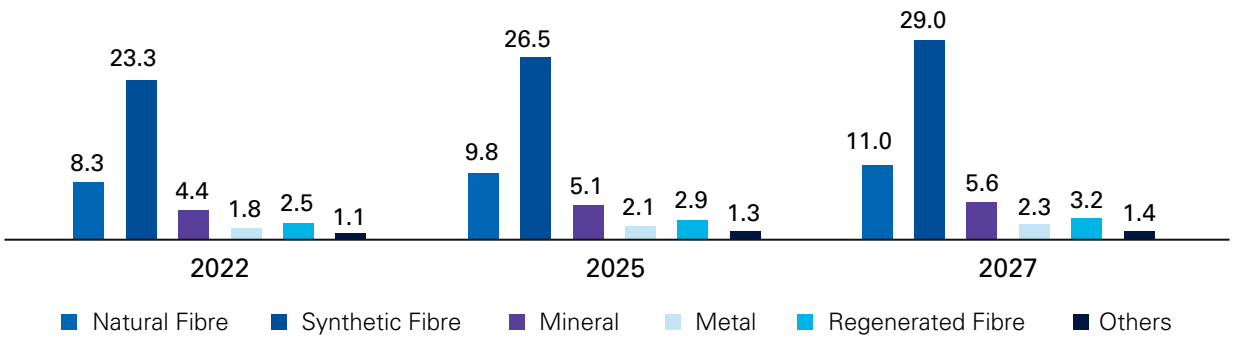
The technical textiles market is segmented based on the following parameters:

## Material

The market is categorised into natural fibre, synthetic polymer, mineral, regenerated fibre, and others based on raw material used. Currently the market is dominated by synthetics fibre, followed by natural fibres, minerals and others.

The natural fibre segment is expected to grow the most with a CAGR of 5.6 per cent in terms of volume during the period 2022-2027. This is attributed to a rise in demand for ecofriendly and sustainable products across industries such as packaging, automotive, healthcare and others.

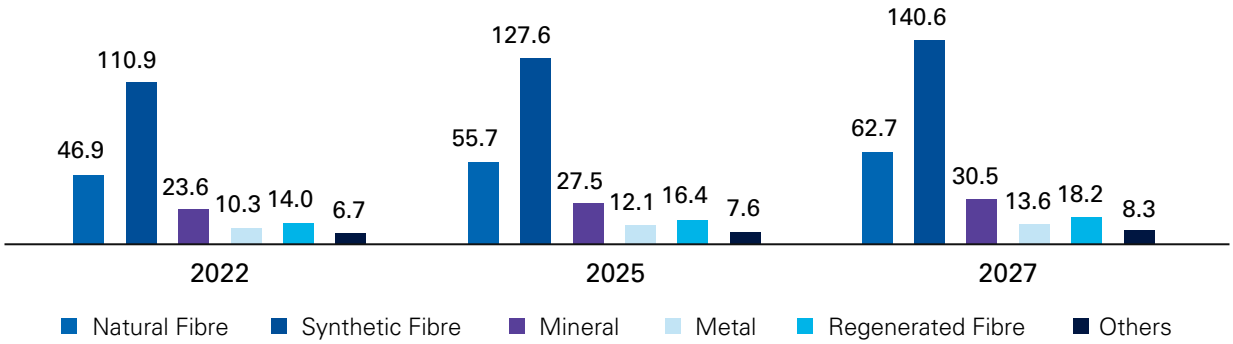
**Global technical textiles market, by material, (in '000 kilotons)**




| | | | | | | |
|---|---|---|---|---|---|---|
| **CAGR (2022-27)** | **5.6%** | **4.5%** | **4.9%** | **5.3%** | **5.1%** | **4.6%** |

Source: Global technical textiles Market (2020-27) - Allied Market Research; KPMG in India analysis.

**Global technical textiles market, by material (USD Bn)**



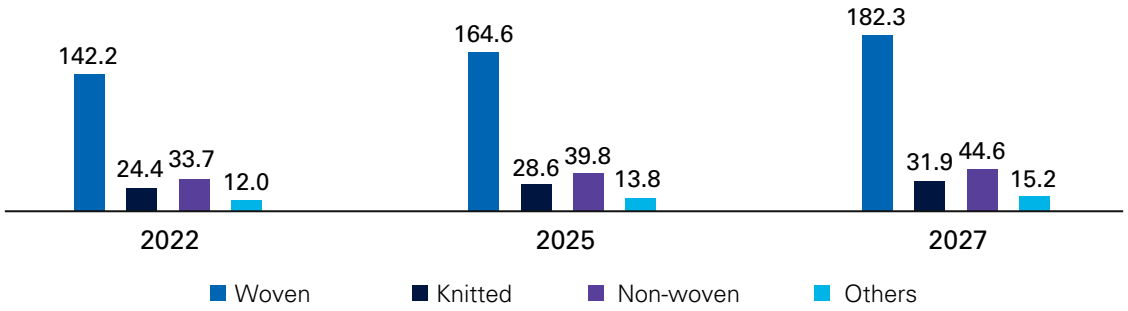

| | | | | | | |
|---|---|---|---|---|---|---|
| **CAGR (2022-27)** | **6%** | **4.9%** | **5.3%** | **5.7%** | **5.5%** | **4.5%** |

Source: Global technical textiles Market (2020-27) - Allied Market Research; KPMG in India analysis.

## Process

In terms of processes followed during intermediary stage, technical textiles are divided into woven, knitted, non-woven and others. Woven segment accounted for the highest share of 66.5 per cent, followed by Non-Woven (16.3 per cent), Knitted (11.7 per cent) and others (5.6 per cent) in 2022.

**Global technical textiles market, by process (USD Bn)**



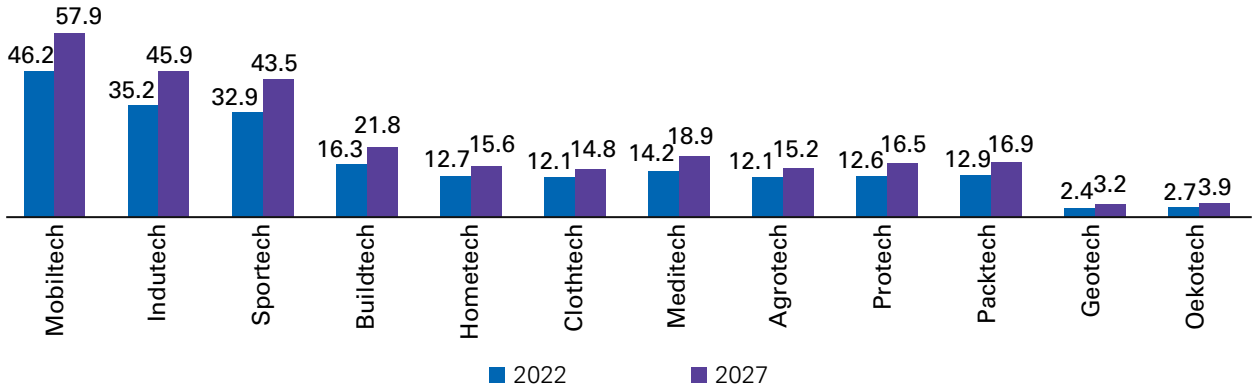

| | | | | |
|---|---|---|---|---|
| **CAGR (2022-27)** | **5.1%** | **5.5%** | **5.8%** | **4.8%** |

Source: Global technical textiles Market (2020-27) - Allied Market Research; KPMG in India analysis.

## Application

On the basis of application, the technical textiles market is categorised into Mobiltech, Sportech, Indutech, Hometech, Buildtech, Meditech, Clothtech, Agrotech, Packtech, Protech, Geotech and Oekotech.

**Global technical textile market, by application (USD Bn)**




| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **CAGR (2022-27)** | **4.6%** | **5.5%** | **5.7%** | **6%** | **4.2%** | **4.1%** | **5.8%** | **4.7%** | **5.5%** | **5.5%** | **6.4%** | **7.3%** |

Source: Global technical textiles Market (2020-27) - Allied Market Research; KPMG in India analysis

The technical textile market for Mobiltech application was valued at USD46.2 billion in 2022 and is projected to reach USD57.9 billion by 2027. This industry is expected to grow due to automobile units catering to a huge established automobile consumer base in Europe, North America and Asia.

## Key trends and growth drivers

- The consumer preference towards the strong combination of protective clothing and fashion trend is driving the demand for smart textiles and nanotechnology. More consumers have now started to prefer technical textiles over traditional textiles as it fulfils their demand for flexible, durable, high-quality and high-strength textiles in various areas such as activewear or medical apparel. Owing to such a market trend, various companies are shifting their focus adoption of new engineering technologies, and are increasing consumption of technical textiles.
- Emerging economies' demographic characteristics such as increasing population, rising birth rates and aging population shall continue to boost the demand for hygienic and personal care medical equipment (meditech), as well as buildtech segments.
- The increasing awareness and preference of nano-fibres and nano-tubes to manufacture lighter and stronger concrete material to make it long lasting in the construction industry, are providing a fillip to nanotechnology with continuous research & advancement in related technical textile materials and its properties.
- The rapid increase of technical textiles in the applicative areas of modern technology, especially in interconnected biometric garments that helps in data collection from emissions from the respiratory systems, heart, among others, are catalysing the demand for technical textiles globally. The increasing demand for remote patient monitoring (RPM) is expected to make the wearable technology as one of the most important components in the medical smart textile market.
- The combination of rising demand for newer technologies and global focus on sustainability and circular economy are raising the awareness towards use of Geotech and Oekotech solutions in advanced as well as emerging economies. Also, this has raised the hopes of making technical textiles more feasible and affordable for vast commercial use in the coming years.
- With the issue of land degradation being faced globally, Geotech products are increasingly being used to control soil erosion on hillsides and embankments. Additionally, rise in infrastructure projects in the developing economies is playing a key factor driving the market growth.

# Global best practices

At a global level, countries such as USA, Japan, UK, Germany, Israel are positioned as manufacturing hubs for specific segments of technical textiles backed by their strong R&D, technology readiness, among other factors, which has placed them in the list of global success stories.

## Usage of Geotech in European Union

Key drivers include high technology readiness level and robust R&D and university – industry linkage.


**Reservoir tsunami protection barrier, Tyrol, Austria**

Geotech barriers used to deflect avalanches from entering the reservoir


**Repair of a cracked road surface, The Netherlands**

Asphalt system used to reinforce to avoid cracks in roads


**Runway rehabilitation at Pula Airport, Croatia**

Mechanically bonded PP nonwoven with fibre glass yarns used to give strength to runway and increase the life


**Railway protection, Portugal**

For safe use of railways along the Tua river, non-woven materials were used to increase long-term filtration and low clogging risks

## Usage of Protech in Israel

Key drivers include high demand from growing defence sector and technology readiness level 7 and above:

**Kit 300**

It is a high-end camouflage technology with thermal visual concealment material reduce detectability of soldiers to keep pace with evolving challenges on the battlefieldwith evolving challenges on the battlefield

**Combat vest**

Different versions of vest have been designed for Israel Defence Forces (IDF) for different roles

**IoT – Recycling process**

Defence technology designed in Israel uses the IoT to identify the raw material of fabric to strengthen the recycling process

## Usage of Sportech in USA

Key drivers include greater footprint of sports and athletics, and presence of major sports brands

**Health and performance monitoring sports wear**

In order to improve performance of athletes, heart sensor strap monitors aerobic and anaerobic thresholds

**Hi-tech all-weather sports wear**

Waterproof woven laminated wear helps in liquid absorption, thermal comfort, UV protection, provides extreme breathability

**High tech sports uniform**

High tech jacket with heating technology. US athletes in US Winter Olympics, 2018 used these jackets

## Usage of Agrotech in Italy

Key drivers include sustainability of food systems, value chain and food security.

**Insect protection net**

It offers insect netting as well as enables improvement in microclimate protected environment agriculture

**Rain protection net**

The net protects crops from rain but allows adequate airflow, reduces rain passage by 90 per cent and keeps optimal microclimate

**Thermo reflective screen**

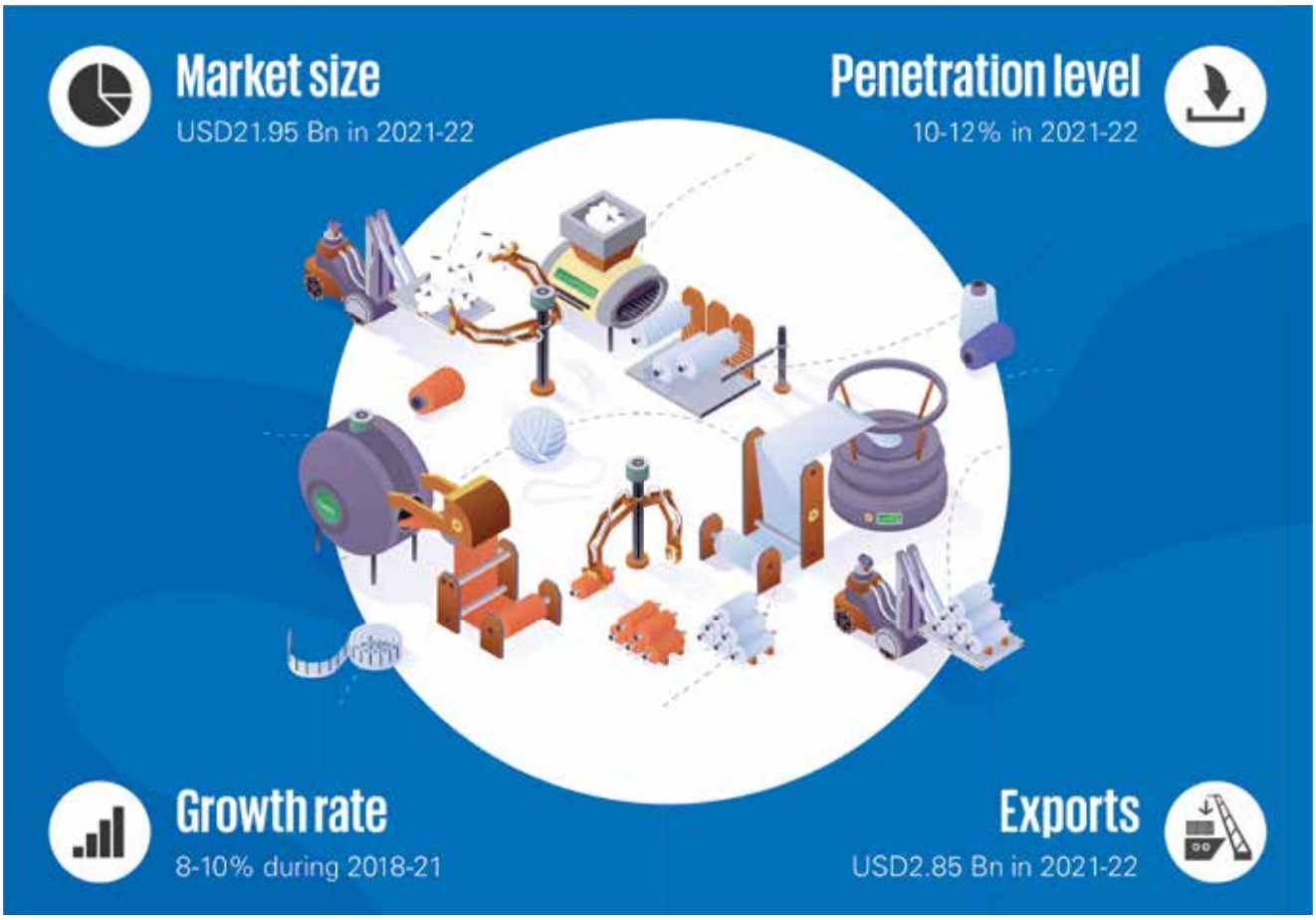
Screens with the addition of the LD additive for light diffusion, they improve the microclimate and reduce the temperature in the protected area

# 03 Indian outlook

# Indian outlook[2]

## Domestic market

Indian technical textiles market is the fifth largest in the world and stood at USD21.95 billion in 2021-22, with production accounting to USD19.49 billion and imports accounting to USD2.46 billion. In the past five years, Indian technical textiles market has grown at a rate of 8-10 per cent per annum. The Government is endeavouring to accelerate this growth to the level of 15-20 per cent over the next five years. Globally, the penetration/usage level of technical textiles across different sectors is comparatively stronger than in India. The penetration level of technical textiles in India varied from 5-10 per cent across different application areas compared to 30-70 per cent globally in 2021-22.




**Growth factors**

| | | |
|---|---|---|
| Rising demand from new application areas | Standards and guidelines | Government regulations |
| Innovation and R&D | Useful physical properties of technical textiles | Climate change |

2. Technical Textiles Industry in India: Opportunities and Challenges – Baseline Study 2020; Ministry of Commerce & Industry

Indigenously manufactured technical textiles are anticipated to serve a sizeable market for various end-use industries with focus on technical properties, innovation, rising demand from a number of industries encompassing almost all areas of manufacturing and infrastructure development. The industry has huge potential for growth, and is expected to grow at a fast pace in the coming years, driven by increasing demand for advanced materials and the growing population.

Production of Packtech, Hometech, Indutech and Mobiltech were estimated to be the highest in 2021-22.

**Technical textiles production in India**

| Segment | Production 2019-2020 (in INR Cr) | Production 2021-2022 E* (in INR Cr) | Production 2021-2022 E* |
|---|---|---|---|
| **Agrotech** | 2,244 | 2,715 | 0.38 |
| **Buildtech** | 4,196 | 5,263 | 0.73 |
| **Clothtech** | 7,680 | 8,865 | 1.23 |
| **Geotech** | 1,958 | 2,819 | 0.39 |
| **Hometech** | 13,231 | 15,410 | 2.14 |
| **Indutech** | 11,489 | 14,931 | 2.07 |
| **Meditech** | 5,891 | 7,677 | 1.07 |
| **Mobiltech** | 7,669 | 9,780 | 1.36 |
| **Packtech** | 57,614 | 61,123 | 8.49 |
| **Protech** | 2,850 | 3,597 | 0.50 |
| **Sportech** | 7,226 | 8,119 | 1.13 |
| **Total** | | **140,300** | **19.49** |

# Trade ecosystem

India's trade of technical textile products has been growing strongly and the country has been a net exporter[3]. India's exports of technical textile products grew from USD2.21 billion in 2020-21 to USD2.85 billion in 2021-22, registering a growth rate of 28.4 per cent (YoY) whereas imports grew from USD1.7 billion in 2020-21 to USD2.46 billion in 2021-22, registering a growth rate of 44 per cent (YoY).

Considering the existing global market dynamics, there exists a huge opportunity for India to emerge as one of the key leaders in world technical textile market. By strengthening research and development in strategic areas of technical textiles, upscaling manufacturing and increasing cost competitiveness, India stands a chance to be at par with advanced countries in the world.

**Exports at a glance**

| S. No. | Category | Exports (USD Million) | | | | | CAGR | | Share (%) 2021-22 |
|---|---|---|---|---|---|---|---|---|---|
| | | 2017-18 | 2018-19 | 2019-20 | 2020-21 | 2021-22 | Short Run (2020-21 - 2021-22) | Medium Run (2017-18 - 2020-21) | |
| 1 | Packtech | 693.37 | 809.23 | 740.32 | 784.45 | 1104.09 | 40.7% | 12.3% | 39% |
| 2 | Indutech | 315.71 | 370.54 | 441.74 | 522.72 | 692.68 | 32.5% | 21.7% | 25% |
| 3 | Mobiltech | 208.68 | 234.7 | 212.48 | 187.22 | 261.31 | 39.6% | 5.8% | 9% |
| 4 | Clothtech | 133.1 | 158.06 | 141.4 | 226.56 | 222.72 | -1.7% | 13.7% | 8% |
| 5 | Hometech | 130.55 | 115.56 | 130.9 | 125.64 | 136.8 | 8.9% | 1.2% | 5% |
| 6 | Meditech | 90.55 | 94.23 | 111.53 | 119.72 | 154.61 | 29.1% | 14.3% | 5% |
| 7 | Agrotech | 71.74 | 85.04 | 85.59 | 89.18 | 93.76 | 5.1% | 6.9% | 3% |
| 8 | Buildtech | 6.04 | 11.28 | 14.61 | 17.9 | 48.69 | 172.0% | 68.5% | 2% |
| 9 | Protech | 28.56 | 47.36 | 45.97 | 39.48 | 49.38 | 25.1% | 14.7% | 2% |
| 10 | Geotech | 24.18 | 34.9 | 31.33 | 27.51 | 35.06 | 27.4% | 9.7% | 1% |
| 11 | Sportech | 91.52 | 87.88 | 100.77 | 73.4 | 44.02 | -40.0% | -16.7% | 1% |
| 12 | Fibre and Filament | 0.44 | 0.76 | 1.05 | 1.58 | 0.81 | -48.7% | 16.5% | 0% |
| **Grand Total** | | **1794.44** | **2049.54** | **2057.69** | **2215.36** | **2843.93** | **28.4%** | **12.2%** | **-** |

3. 207 HSN Codes at 8-digit Level

**Import at a glance**

| S. No. | Category | Imports (USD Million) | | | | | CAGR | | Share (%) 2021-22 |
|---|---|---|---|---|---|---|---|---|---|
| | | 2017-18 | 2018-19 | 2019-20 | 2020-21 | 2021-22 | Short Run (2020-21 - 2021-22) | Medium Run (2017-18 - 2020-21) | |
| 1 | Mobiltech | 631.74 | 693.18 | 576.27 | 501.56 | 806.18 | 60.7% | 6.3% | 33% |
| 2 | Indutech | 647.32 | 661.85 | 599.44 | 505.41 | 733.08 | 45.0% | 3.2% | 30% |
| 3 | Clothtech | 261.61 | 276.2 | 270.7 | 214.53 | 281.2 | 31.1% | 1.8% | 12% |
| 4 | Hometech | 364.84 | 342.67 | 331.92 | 196.29 | 257.56 | 31.2% | -8.3% | 10% |
| 5 | Meditech | 90.23 | 116.9 | 84.23 | 113.46 | 140.47 | 23.8% | 11.7% | 6% |
| 6 | Packtech | 83.59 | 85.58 | 80.42 | 59.07 | 84.88 | 43.7% | 0.4% | 4% |
| 7 | Agrotech | 18.62 | 25.8 | 30.18 | 36.3 | 49.64 | 36.7% | 27.8% | 2% |
| 8 | Protech | 17.01 | 22.1 | 17.94 | 25.86 | 21.77 | -15.8% | 6.4% | 1% |
| 9 | Geotech | 14.51 | 14.19 | 16.37 | 17.07 | 23.14 | 35.6% | 12.4% | 1% |
| 10 | Sportech | 18.2 | 18.78 | 13.4 | 16.84 | 23.42 | 39.1% | 6.5% | 1% |
| 11 | Buildtech | 13.05 | 16.84 | 16.75 | 12.91 | 22.25 | 72.3% | 14.3% | 1% |
| 12 | Fibre and Filament | 10.49 | 10.59 | 8.79 | 12.26 | 16.04 | 30.8% | 11.2% | 1% |
| **Grand Total** | | **2171.21** | **2284.68** | **2046.41** | **1711.56** | **2459.63** | **43.7%** | **3.2%** | **-** |

Source: Ministry of Commerce and Industry

| # | HS | Description of goods | Category | India import (USD Mn) | |
|---|---|---|---|---|---|
| | | | | 2017-18 | 2018-19 |
| **Share of total technical textile imports in India** | | | | **42%** | **39%** |
| 1 | 87089500 | Parts and accessories of the motor vehicles of headings 8701 to 8705 : Other parts and accessories : Safety airbags with inflater system; parts thereof | Mobiltech | 131.97 | 142.85 |
| 2 | 59032090 | Other Fabrics Impregnated Laminated Plated And Coated With Polyurethane | Hometech | 88.13 | 114.9 |
| 3 | 59039090 | Other Fabric Plated Laminated Coated Impregnated With Other Plastics | Indutech | 69.38 | 87.71 |
| 4 | 59031090 | Other Fabrics Impregnated, Laminated Plated And Coated With PVC | Hometech | 53.16 | 72.03 |
| 5 | 59021090 | Tyre cord fabric Of nylon or other polyamides: Others | Mobiltech | 77.68 | 145.03 |
| 6 | 54022090 | High Tenacity yarn of nylon or other polyester (others and textured yarns) | Mobiltech | 52.75 | 57.75 |
| 7 | 56039400 | Non wovens Other: Weighing More Than 150 g/sqm | Clothtech | 43.84 | 50.01 |
| 8 | 59021010 | Tyre Cord Fabric Of High Tenacity Yarn Of Nylon Or Other Polyamides: Impregnated With Rubber | Mobiltech | 52.98 | 96.48 |
| 9 | 57032090 | Carpets and other textile floor coverings, tufted, whether or not made up : Of nylon or other polyamides : Other | Hometech | 28.33 | 19.87 |
| 10 | 56039200 | Non wovens Other: Weighing Between 25 g/sqm And 70 g/sqm | Clothtech | 43.84 | 50.01 |
| 11 | 54021990 | High Tenacity yarn of nylon or other polymer (others) (Less than 840 Denier) | Mobiltech | 52.75 | 57.75 |
| 12 | 53101012 | Unbleached: Containing 100% By Weight Of Jute: Sacking Fabrics | Packtech | 21.58 | 28.83 |
| **Top 12 Technical textiles import** | | | | **716.39** | **930.2** |
| **Remaining** | | | | **995.2** | **1529.4** |
| **Total** | | | | **1711.56** | **2459.63** |

Source: ITC Trademap Database

# Skilling and education ecosystem

## Dynamics of technical textiles' curriculum in India and the world

India has several strategic enablers aimed towards attaining leadership position and long-term growth in technical textiles. These key enablers establish India as a leading manufacturing hub and a major destination for investments. Globalisation, technology advancements, regulatory enforcements and the need to meet high performance standards in technical textiles have led to a greater dependence on education, skilling and capability development of the workforce at all levels. In this regard, the developed countries have already taken a lead and their cutting-edge research, production and innovative applications are driven by a set of highly competent and skilled professionals.

Therefore, the need of the hour is to bolster the existing curriculum of textile engineering courses offered by the colleges in the country. Institutions such as IIT-Delhi, IIT-Bombay, Shri Guru Gobind Singhji Institute of Engineering and Technology (SGGSIE&T), Institute of Chemical Technology (ICT), VTU, DKTE, amongst others are running successful textile technology courses and may take advantage of their existing MoUs with foreign institutes for providing training and internships to students. This will enhance their existing knowledge base and provide exposure to global best practices and technology from leading countries in technical textiles

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**Courses/programmes of technical textiles in IITs and NITs**

| Place | Degree | Modules | Civil Engineering | Textiles |
|---|---|---|---|---|
| IIT Delhi | B. Tech | 12 | 2,715 | Textile Technology: Technical1 Textile Course |
| | M. Tech | 38 | 5,263 | Fibre Science & Technology and Textile Engineering: Technical Textile Course |
| NIT, Jalandhar | B. Tech | 11 | 8,865 | Textile Technology: Technical[1] Textile Course & Non-woven Technology[2] |
| | M. Tech | 16 | 2,819 | Textile Engineering and Management: Technical Textile Course |
| Other IITs and NITs | B.Tech/ M.Tech | - | Modules on: Reinforced Earth and Geotech; Overview of Geotech; Applications of Geotech; etc. | |

Source: Data gathered from respective websites of universities/colleges
1 Including Filtration Textile, Geotech, Meditech, Protech, Sportech and Recreation textiles, Mobiltech, Protech, Mobiltech & Agrotech for NIT and IIT.
2 Nonwoven Technology: application in Medical and Hygiene, Apparel, Household and Hometech, Geotech, additionally for B. Tech NIT.

Globally, USA and UK based universities such as University of Texas, NC State University, Arizona State University, The University of Manchester, University of Glasgow, etc. have some of the most comprehensive and refined technical textile engineering courses in the world. The degree courses for Bachelor and Master of Engineering in these universities include curriculum on nonwoven processes and products, advanced non-woven processing, nonwoven characterisation methods, nonwoven product development, bio-based fibres and specialised fabrics, 3D technology, etc. Besides other countries such as Germany, Japan, Sweden also have engineering courses with focus on technical textiles.

# Specialty and high-performance fibres – Backbone of technical textiles

Specialty and high-performance fibres and composites are the backbone of the technical textiles industry, including polyester high tenacity yarn, carbon fibres and ultra high molecular weight polyethylene (UHMPE). These fibres are known for specific/special functional properties associated with high specific physical properties in at least one of the following – chemical resistance, tensile strength, limiting oxygen index and operating temperature.

From a design perspective, specialty and high-performance fibres offer more design alternatives for various items. They may be applied in a wide range of industries, including computer and communication applications, biotechnology, and ground and space transportation. High-performance fibres must meet certain requirements in terms of their extreme strength, outstanding high-temperature endurance and distinctive geometrical features, including surface morphology. Major developments in fibre and polymer technologies have led to the development of these criteria.

Few of the major specialty and high-performance fibres include aramid fibre, gel-spun polyethylene fibres, carbon fibre, metallic fibres, glass fibre, ceramic fibres, melamin fibre, polyimide fibre, polybenzimidazole fibre, basalt fibre, boron fibre, optical fibre, high-density polyethylene (HDPE), fluoropolymer, chemically and thermally resistant fibres, among others.

**Few of the key high-performance fibres and its applications**

| Specialty fibres | Polyester high tenacity yarn (HTY) | Carbon fibres | Ultra high molecular-weight polyethylene (UHMPE) |
|---|---|---|---|
| • Nylon 6 6, 6 IDY – Tire Cord, MRG, Twines, Auto parts<br>• PP Yarn - Geotextiles, Agrotextiles, etc<br>• Glass Fibres – Composites Insulation<br>• Polyester IDY – Geogrids, Tire Cords, MRG Coated<br>• Viscose HTY – Tire Cord, MRG<br>• Meta Aramid - Protective gears, Electrical Insulation Fire Resistant Suits<br>• Para Aramid<br>• Bullet Proof Vests Structural Usage Aerospace<br>• Ceramic Fiber Insulation Filtration. | • Geotextiles<br>• Geo-grids<br>• Mooring Ropes<br>• Tire Cords<br>• Automotive Seat Belts<br>• Fire Hose<br>• Lifting Slings<br>• Cargo Straps<br>• Conveyor Belts<br>• Transmission Belts | • Aircraft Wings & Aerospace<br>• Car Components<br>• Windmill Blades<br>• Bike Frame<br>• Fuel Tank | • Medical Components<br>• Bullet Proof Jackets<br>• Engineered Parts<br>• Armored Vehicles<br>• Parachutes<br>• Yarns<br>• Sheets<br>• Ropes |

In India, various R&D initiatives have been undertaken to develop such a strategic and high-specialty product. Under the flagship scheme of Ministry of Textiles – National Technical Textiles Mission (NTTM) – around 24 R&D projects have been undertaken by various premier research bodies and institutes in India for development of specialty fibres including meta aramid and para aramid fibre/ fabric (1), carbon fibre / fabrics and applications (4), glass fibre and application (2), specialty/functional fibre (2), ultrafine nano fibre and non-woven webs (7), ultra high molecular weight polyethylene (UHMWPE) (4), nylon 66 (1), high tenacity / super high tenacity polypropylene (1), and ceramic fibre and applications (2), among others.

# Growth drivers

## Standards and quality control orders

Ministry of Textiles in India is working with the Bureau of Indian Standards (BIS) to develop and maintain standards for highly specialised and technologically advanced technical textiles products. Over 500 Indian standards have already been developed by BIS and more than 40 are under development for the improvement of technical textiles product quality and boost the domestic production.

The Ministry may roll out Quality Control Orders (QCOs) for 59 technical textile products including 19 products of Geotech, 12 products of Protech, 22 products of Agrotech and 6 products of Meditech, to protect health of people, animals and plants; ensure environment safety; discourage deceptive trade practices and for the national security purposes.

Ministry of Textiles is also considering the periodic issuance of QCOs to ensure the production of standardised material and provide user access to high-quality products. The aim is to continuously develop new standards, review existing standards, harmonise Indian technical textile standards with global standards and enforce mandatory compliance for usage in various application areas.

In order to lay the foundations of becoming a developed nation by 2047, India must embrace a culture of quality and integrate it into every aspect of its processes.

## Mandatory usage

Institutional buying and mandatory usage of technical textiles across different line ministries and departments will play a pivotal role in driving the domestic market. The ministries and departments may review existing standards, codes, guidelines, SoRs, etc. and examine the different areas in which the use of technical textiles could be made mandatory. Such mandatory provisions may accordingly be incorporated in the relevant standards, specifications, codes, guidelines, SoRs, etc.

Identification of areas for usage of technical textiles across flagship schemes and programmes of different line ministries and identifying areas for mandating usage of technical textiles products across Government projects.

**01 Ministry of Agriculture & Farmers' Welfare**

Agro-based products such as insect net, shade net, vermi-bed, micro irrigation pipe, etc in Mission for Integrated Developed of Horticulture (MIDH)

**02 Ministry of Water Resources**

Geomembranes, geonets, geobags for water & soil conservation near water bodies under Jal Jeevan Mission

**03 Ministry of Railways**

Geogrids, geostrips & geotextiles in construction of railway tracks etc. under National Investment Pipeline (NIP)

**04 Ministry of Road Transport & Highways**

Geotextiles & geogrids in construction of roads under National Investment Pipeline (NIP)

**05 Ministry of Shipping**

Geobags, geotubes and geomembranes at seaports to prevent shoreline erosion under Sagarmala Program

**06 Ministry of Home Affairs**

Bullet proof jackets, protective-wear, high strength composite material etc. in Strategic Sectors such as Defence, Space and Para-military

**07 Ministry of Health & Family Welfare**

Meditech products such as adhesive plasters, single use surgical masks, bandage elastic etc. under National Health Mission (NHM)

# Case study: Technical textiles in railways

Technical textiles have become an integral part of various industries, including automobiles and transportation. Indian Railways has also begun to utilise technical textiles in various applications to improve its performance and safety of passengers.

Technical textiles usage in Indian Railways may further be enhanced as a part of various initiatives under Government of India and Ministry of Railways. Major areas include;

| Area | Railway body/ organisation | Prospective usage of technical textiles |
|---|---|---|
| **Infrastructure development, railway construction** | • RITES Ltd.<br>• IRCON | **Geotech:**<br>• Geogrids used for reinforcement /stabilisation and for reducing stress and Geobags for railway tracks.<br>• Geocell for railway embankment applications to improve the load support capacity of soft subsoil.<br>• Geo-composite drain for construction of new embankment over soft subsoil.<br>• Geonets as filters, separators, and facilitators in channelising water through lateral drainage, reinforcement of rail tracks for stress reduction.<br>• Prefabricated vertical drains that force water out of the soil matrix, facilitating soil consolidation.<br>• Geosynthetic encapsulated column (geotech/geogrid) for railway tracks to increase load carrying capacity and decrease the vertical deformation<br>• Geo membrane for tunnel lining to restrict fluid seepage and reinforced geomembrane to protect railway tracks from wear & guard the foundation against seepage.<br>• Jute geotech for slope stabilisation of railway embankments and hill slopes along railway track, for riverbank protection and railway track construction.<br>**Protech:**<br>• High visibility warning clothing for workers in railway construction for protection against heat, fire, chemicals, and to provide high visibility for employees working in low-light. |
| **Dedicated freight corridor** | • DFCCIL | |
| **Development of railway stations** | • RLDA<br>• IRSDC<br>• | |
| **Road over/ under bridges / subways** | • KRCL | |
| **Coaches and wagons** | • Railway production units<br>• Railway wagon manufacturing units<br>• RITES Ltd.<br>• COFMOW<br>• BCL | **Composites:**<br>• Composite seats, ceiling panels, composite doors, body side panels, floor covering, cab fronts and body ends, etc. in railway coaches.<br>**Hometech:**<br>• Upholstery in the coaches of passenger trains seat covers and berth covers<br>**Protech:**<br>• Fire retardant curtains and blinds in the passenger coach<br>• Fire treated bedroll, bedsheet and pillow in the passenger coach<br>• Fire Retardant (FR) fabric in the passenger coach. |

| Area | Railway body/ organisation | Prospective usage of technical textiles |
|---|---|---|
| **Construction of multi-functional complexes (MFCs) and railway colony** | • RLDA | **Buildtech:**<br>• Scaffolding nets, tarpaulins, awnings and tents in construction work<br>• Polyester matrix (IS 16481) polyester<br>**Protech:**<br>• Mosquito repellant netting |
| **Territorial Army, Railway Protection Force** | • Railway Engineers Regiments | **Protech:**<br>• Bulletproof jackets<br>• Rain ponchos<br>• Haversacks<br>• Mosquito repellant netting<br>**Clothtech:**<br>• Uniforms |
| **Medical services** | • Indian Railway Medical Service | **Meditech:**<br>• Meditech dressings/bandages/plasters; absorbent cotton ribbon gauze; surgical gowns, surgical drapes and surgical masks etc. |
| **Multi-modal logistics support** | • CONCOR | **Composites:**<br>• Composite material or carbon fibre for shipping containers<br>**Indutech**<br>• Webbing slings for lifting purpose or handling loads on port. |

# 04 Government initiatives

## to augment technical textiles

# Government initiatives[4]

Given the importance of technical textiles across different sectors, the Government undertook various dynamic interventions and initiatives to augment the segment end-to-end. Some of the key interventions undertaken by the Government.

# Current initiatives of the Government

## a. National Technical Textiles Mission (NTTM)

It is the flagship scheme of the Ministry of Textiles with an outlay of INR1480 crore and launched for the period 2020-21 to 2023-24. The objectives of the scheme are to improve penetration level of technical textiles and upgrade skillsets of the workforce, promote technical textiles' usage in various flagship schemes and missions, develop products, indigenous machineries and equipment for technical textiles in order to boost 'Make in India' as well as enable competitiveness of the industry, and position India as the global leader.

The scheme is divided into four components, namely: (i) Research, Development & Innovation (INR1000 crore); (ii) Promotion & Market Development (INR50 crore); (iii) Export Promotion (INR10 crore); and (iv) Education, Training and Skill Development (INR400 crore).

**Key initiatives undertaken under NTTM include:**

- Approved 89 research proposals worth ~INR265 crore in different application areas of technical textiles including Geotech, Agrotech, Specialty fibres, Protech, Sportech, Sustainable Textiles etc., as of January 2023.
- Launched guidelines to support indigenous development of tools, equipment, testing instruments and high-end machinery for technical textiles in India and establish an indigenous platform for domestic design, development and manufacturing.
- Guidelines to support startups and young scientists in the application areas of technical textiles is being formulated.
- Mega events and conclaves conducted to promote technical textiles including International Conference on Technical Textiles: Creating the Winning Leap in Technical Textiles on 12 March 2022 with CII, 5th National Conclave on Standards for Technical Textiles on 10 June 2022 with FICCI, Technical Textiles Conference: Geotech & Agrotech at Imphal on 23 August 2022 with ICC, National Conclave on Technical Textiles – Protech on 16 November 2022 with NITRA & ITTA, and International Conference on Technical Textiles at Chennai on 25–26 November 2022 with CII.
- Development of a Mega Demonstration Centre for Agrotech at Navsari Agricultural University (NAU), Gujarat spanning across 10,000 sq.m. The goal of the centre is to increase the Agrotech product adoption and market demand by demonstrating the application of agrotech in improving productivity and quality of horticulture and floricultural produce.
- SRTEPC has been assigned the role of the Export Promotion Council for promotion of technical textiles.
- Launched a two-week pilot skill development training course on geo-synthetics application in collaboration with IIT Madras, IIT Roorkee and IISc Bangalore during 17-28 January 2022. A total of 124 design engineers registered for the pilot skilling programme.
- Launched General Guidelines for Enabling of Academic Institutes in Technical Textiles - For Private & Public Institutes, covering funding support for enhancement and upgradation of laboratory equipment, training of lab personnel and specialised training of faculty members of the relevant department/specialisation in the university/institute, with respect to the undergraduate (UG) and postgraduate (PG) degree programmes across different areas of engineering.

4. Ministry of Textiles, Government of India

- Launched General Guidelines for Grant for Internship Support in Technical Textiles (GIST). The implementation of the GIST guideline shall be conducted in two phases, (i) Empanelment of the eligible companies, (ii) Internship Programme, wherein a grant of up to INR20,000 per student (B.Tech students in 2nd/3rd/4th year of the relevant departments/specialisations of eligible private/public institutes) per month shall be provided to the empaneled companies, subject to the maximum period of two months of funding support for internship period.
- To promote industry usage and broaden application areas of Geotech and to encourage its adoption across various programmes, projects and missions under User Ministries and Departments, in this regard the Hon'ble Minister of Textiles chaired a meeting on 24 March 2022, "Broadening Application areas of Geotech with User Ministries and Manufactures", with participation from the representatives of line ministries, industry representatives and industry associations.

## b. Production Linked Incentive (PLI) scheme for textiles

In order to promote domestic production of technical textiles, Production Linked Incentive (PLI) scheme was launched, in addition to MMF fabrics and MMF apparel. Of the 67 applications received, 17 applications received exclusively for technical textiles with projected investment of INR6,351 crore and 16 applications received in combination of technical textiles with projected investment INR5,517 crore.

## c. PM MITRA Scheme

To boost the overall textile industry and value chain, especially MMF and technical textiles, Ministry of Textiles launched PM Mega Integrated Textile Regions and Apparel Parks (MITRA) Scheme with an overall outlay of INR4445 crore over a period of seven years up to 2027-28.

Under the scheme, development of integrated large scale and modern industrial infrastructure on overall textile value chain including Spinning, Weaving, Processing, Garmenting, Textile Manufacturing, Processing, and Printing Machinery Industry, is focused. So far, 13 proposals have been submitted by different state governments including Maharashtra, Gujarat, Karnataka, Andhra Pradesh, Rajasthan, Odisha, Madhya Pradesh, Telangana, Punjab, Chhattisgarh, Uttar Pradesh, Bihar and Tamil Nadu.

## d. Quality Control Regulations

107 items identified to be brought under regulation to ensure quality: QCOs for 19 Geotech, 12 Protech, 22 Agrotech and 6 Meditech items are already under issue. 48 items of Meditech under CDSCO regulation.

## e. New HSN Codes

In addition to 207 identified technical textiles items in 2019, development of 30+ new HSN Codes dedicated to technical textiles' products:

- 30 HSN Codes/Tariff Items introduced as per Finance Bill 2022
- 2 HSN Codes/Tariff Items revised as per Finance Bill 2022
- 5 HSN Codes as per the Seventh edition of the HSN nomenclature HS-2022 which came in effect on 1 January 2022.

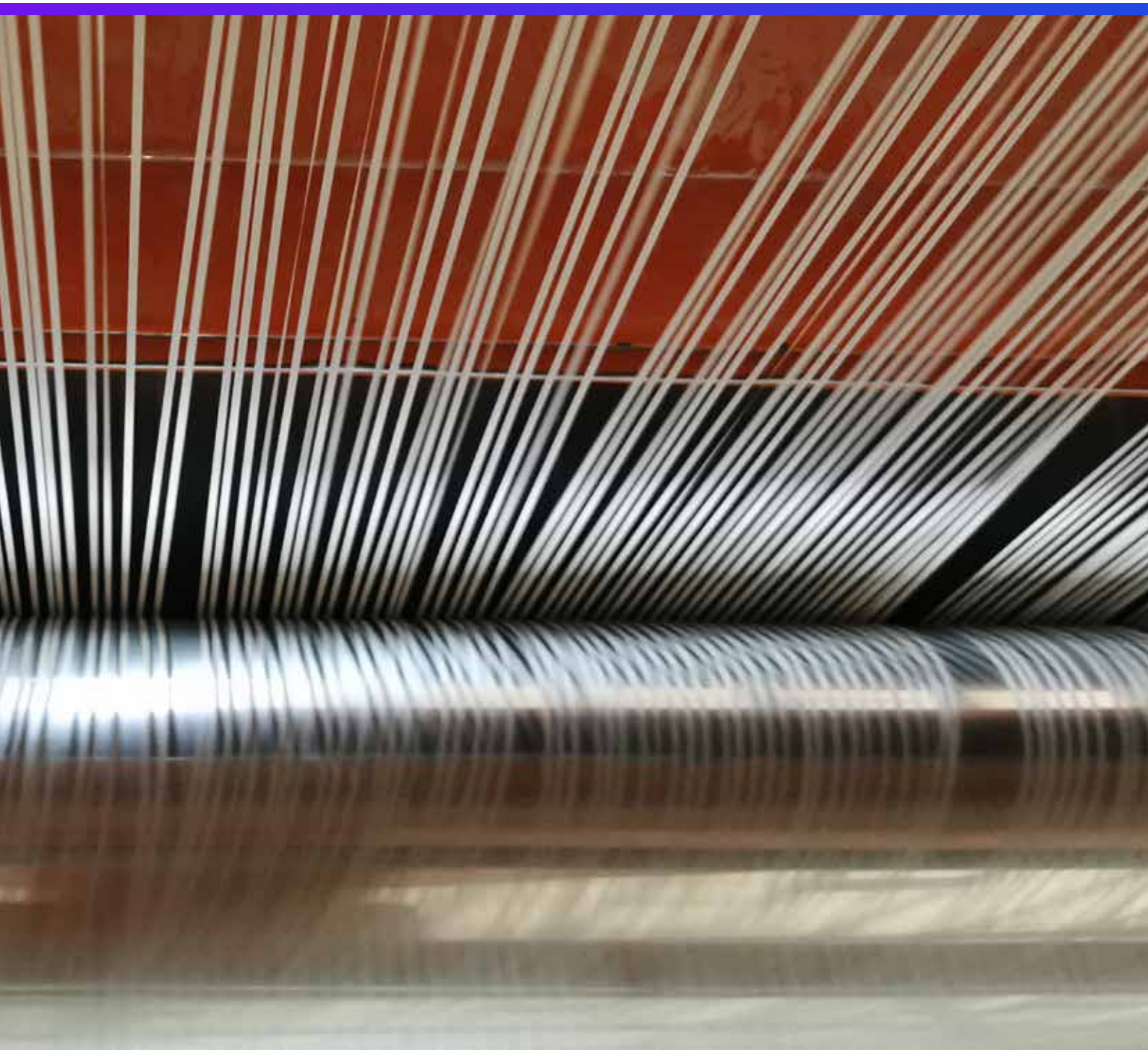
## f. Standards in technical textiles

Development of more than 500 BIS standards for technical textiles. In addition, more than 50 standards are in the process of development.

## g. Mandatory usage of technical textiles

Currently, 119 technical textiles products have been identified for mandatory usage across ten Central ministries/departments to derive the benefits of technical textiles in various fields of applications. So far, notifications for mandatory use have been issued for 68 products by the line ministries.

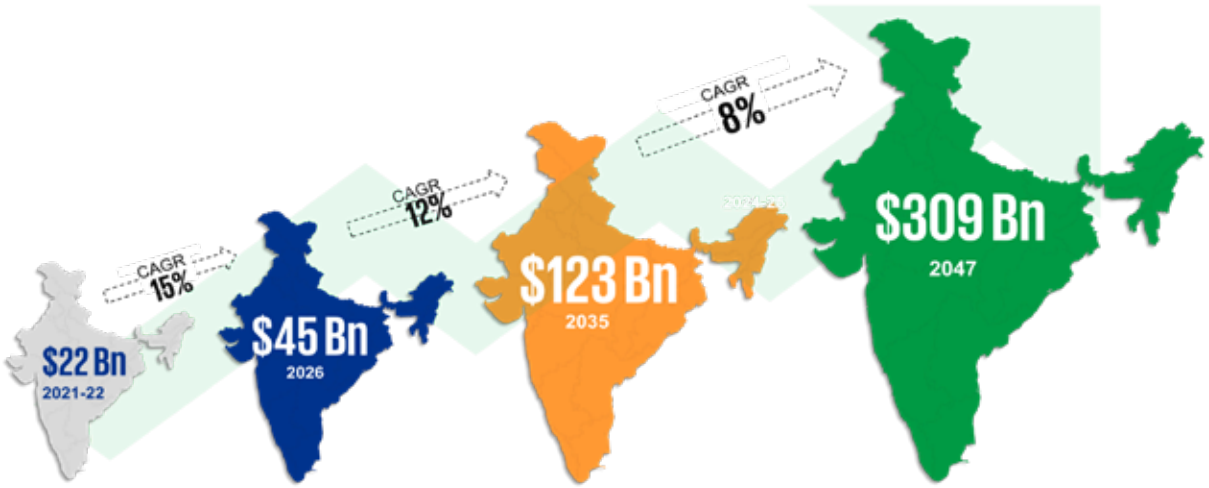
# 05 Technical textiles @2047



# Technical textiles @2047

Considering the global market dynamics for technical textiles, there are a plethora of opportunities for India to tap into unexplored export markets and domestic potential. Emphasis needs to be on strengthening R&D in strategic areas, upscaling commercialisation and increasing cost competitiveness, policy support, etc. to position India as a leading and emerging nation for technical textiles, especially in Specialty fibres, Composites, Geotech, Meditech, Agrotech.

**Technical textiles market @2047 at a glance**




| # | Criteria of Indian technical textiles | 2021-22 | 2026 | 2035 | 2047 |
|---|---|---|---|---|---|
| 1 | **Total market size (USD billion)** | 21.95* | 45* | 123* | 309* |
| 2 | **Total exports (USD billion)** | 2.85# | 6* | 16* | 50* |
| 3 | **Growth rate (CAGR in %)**** | 9%* | 15%* | 12%* | 8%* |
| 4 | **Penetration level (%)** | 5-10%* | 13-20%* | 25-35%* | 40-60%* |

* Estimated; # Actual; ** With respect to previous period

Note: Market size is evaluated using pegged growth rates at 15% till 2026-27; 12 per cent till 2035-36; & 8 per cent till 2047-48

# 06 Way forward

## and recommendations

# Way forward

To achieve the technical textiles vision @2047, a slew of collaborative efforts is required across areas including R&D, investment and export promotion, market development and linkage, skilling and education, among others:

**Thematic pillars driving Indian technical textiles @2047**

## Technical Textiles to be a Thrust Sector for India's Vision @2047

**PLI-modeled Schemes** on regular intervals

**Global positioning and Branding** 'Technical Textiles India' (Similar to Wool Mark)

**Textiles Knowledge Hub** for National Tech Creation and IPR Sharing

**Strengthening R&D and Skilled Workforce in Technical Textiles**

Creation of Incubation Centers for **supporting Startups**

'Atma-Nirbhar **High-Tech' and High-Value traded products**

Restructuring Existing **Textile Research Associations (TRAs) & COEs**

**Building world-class Infrastructure and strong value chain**

**Institutional buying & Mandatory Usage** across Central / State Ministries / Departments

Emphasis on **Investment Promotion and JVs** in strategic areas

**Self-sustaining Indigenous supply chain** – Reduce Import Independence

**Projecting India as a Market for High-Value and High-Growth products through Innovation and Investments**

Support to Technical Textiles **recycling industry, etc.**

**Harmonization & Rationalization of** Technical Textiles HSN Code

**Demonstration Centers and** Kiosks displaying usage of technical textiles application

**Positioning Indian Brands as Global Champions & Preparing Industry to create customer specific products**

**Globally aligned Standards & Regulatory mechanisms**

International Collaborations for **Curriculum Development, Skilling, and Capacity Building**

Robust R&D in Strategic areas – **High-performance fibres, Machines, etc**

**India - Emerging as Global Hub for Technical Textiles**

**2022-47**

**Strategic Intervention** | **Infrastructure Intervention** | **Policy Intervention**

In order to achieve consistent growth in technical textiles in India, various measures and interventions are required in the short-term, medium-term and long-term, especially around (1) Policy, infrastructure, technology and investment (2) Labour productivity and quality (3) Research and innovation (4) Sustainability (5) Marketing and brand promotion; (6) Other specific interventions:

| | Short-term actions (2026) | Medium-term actions (2035) | Long-term actions (2047) |
|---|---|---|---|
| **Policy, Infrastructure, Technology & Investment** | • PLI-modelled schemes on regular intervals, with special emphasis on technical textile products and value chain<br>• Facilitation of PPP modelled 'Centre of Excellence' with focus on designing, market linkages, capacity building, testing centres, research on sustainable materials and technology upgradation support in technical textiles<br>• Encouraging user education about implicit benefits of technical textiles through setting up of demonstration centres and awareness drives across industrial centres<br>• Promoting joint ventures for creating indigenous machinery manufacturing hub in technical textiles<br>• Creation of incubation centres and encouragement of start-ups for entrepreneur development in technical textiles. | • Establishing world class laboratory infrastructure with focus on technical textiles products in line with international quality standards<br>• Setting up regional marketplace across key clusters for enhancing logistical ease and providing ample trade opportunities (for domestic market and exports)<br>• Dedicated measures to enhance the access of domestic companies to foreign technologies along with development of advanced indigenous technologies in technical textiles. These may include partnerships between industries and government laboratories, incentives, in the form of tax concessions and subsidies; joint ventures between foreign companies and Indian partners; and judicious development of an intellectual property regime to enable more collaborative innovation.<br>• Promoting setting up of large-scale integrated fabric manufacturing units, relevant to technical textiles.<br>• Encouraging MSMEs to adopt leasing/ renting model, whereby leading international technical textile machinery manufacturers provide select technologies and machinery through financial lease. | • Development of neo-cluster models - 'product hub and spoke models' with main clusters as hub including various craft product types and micro-clusters as spokes to strengthen the entire ecosystem. This model can be considered at state/regional level to ensure holistic value chain development for technical textiles.<br>• Focus on development of dedicated export-oriented industrial clusters in coastal states and domestic industrial clusters in interior and remote areas. |

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|---|---|---|---|
| **Labour Productivity & Quality** | • Making labelling mandatory for all types of textile and apparel manufacturers (technical textiles, etc.), indicating essential information such as fibre composition, quantity in terms of weight, dimensions, care instructions/ washing instructions/ drying and other instructions, technical properties/ specifications viz. counts/ CSP, denier/ filament / twist, etc.<br>• Adopting and popularising international quality management systems and standards e.g. ISO, ASTM, TQM and Six Sigma for Technical Textiles' products<br>• Dedicated skilling programmes for value chain, with state-specific approach to prevent migration<br>• Focus on creating future ready and super skilled workforce in areas including robotics, 3D printing, AI etc., including sub- segments of technical textiles<br>• Identification of select districts and involvement of SHGs/non-government organisations (NGOs) by providing them training, especially for Agrotech. | • Large scale technology adoption and upgradation with focus on high-growth product segments such as specialty fibres, and high-tech segments such as Mobiltech, Protech, Buildtech, Indutech, etc.<br>• Initiating 'Mission Quality' for developing quality marks/ labels based on conformance to the defined quality standards and Quality Control Orders (QCOs) for technical textiles<br>• Creation of technical textiles knowledge hub, centres of excellence for national technology creation and IPR sharing<br>• Large-scale capacity building for high wage, highly skilled workforce with tech-enabled interventions<br>• Development of state-of-the-art training centres for skilling, upskilling of technical textiles related workforce<br>• Development of curriculum and laboratory infrastructure in line with global standards in technical textiles<br>• Collaborating with international and National Institutes for Training of Trainers in technical textiles. | • Focus on creating a national network of testing laboratories near all key clusters having quality and productivity norms for technical textiles value chain<br>• Creation of labour market information portal for providing real-time information on vacancies and availability of competent manpower across the value chain. In addition, leveraging the portal for undertaking skill development initiatives as per the changing industry needs. |
| **Research & Innovation** | • Restructuring of Textiles Research Associations (TRAs)<br>• Identification of testing infrastructure gaps in India<br>• Facilitation of academia – Cluster level craft-form collaboration for product designers from National Institute of Design (NID), National Institute of Fashion Technology (NIFT), etc., as a part of curriculum to ensure the artforms are market relevant | • Laboratory, testing and product development infrastructure, especially for technical textiles, across premier government engineering institutes in India, especially in Tier 2 and 3 cities<br>• Setting up technology incubation centres in all key clusters in collaboration with premier institutes and research bodies. | • Infrastructural and mentoring support to institutions and startups for R&D on affordable products<br>• Consistent support for R&D on mission mode for technical textiles. |

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|---|---|---|---|
| **Research & Innovation** | • Future ready technology – large-scale technology upgradation<br>• Support for technical textiles machinery development with longer gestation period<br>• Strengthening research and innovation in circular textiles – processing, manufacturing, testing & design and sustainability in textiles – materials and processes. | • Driving design ideation and innovation in collaboration with global institutes<br>• Textiles knowledge hub and CoEs for national tech creation and IPR sharing. | |
| **Sustainability** | • Introducing 'Harit-Bharat' (Greening India) certification in technical textiles industry<br>• Green Fund for environmentally sustainable technologies (as part of National Textiles Fund)<br>• Establishing national system of recycling - detailing mechanism & SoPs by offering preferential benefits<br>• Special support for technical textiles recycling industry and effluent treatment plants | • Formulating a 10-year roadmap to promote the adoption of green technologies using technical textiles<br>• Supporting industry in seeking strategic alliances with global initiatives such as OEKOTECH standard, Fashion for Good, Global Recycling Standard (GRS), Zero Discharge of Hazardous Chemicals (ZDHC), CEO Water Mandate, Canopy Style Initiative (Canopy) and Textile Exchange Preferred Fibre Benchmark.<br>• Developing climate resilience technologies and products with support of national institutes, especially replacement of rubber and plastic products with technical textiles. | • Focus on R&D initiatives, including development of technical textiles through recycled materials, usage of eco-friendly natural fibres, etc.. |
| **Marketing & Brand Promotion** | • Focus on global positioning and branding 'Technical Textiles India' (similar to 'Wool Mark')<br>• Establishing dedicated retail hub 'India mart' across key global fashion hubs for promoting Indian technical textiles<br>• Increasing awareness about Government e-Marketplace (GeM) platform and supporting technical textile MSMEs to get onboarded<br>• Conducting and participating in international workshops, events, summits, expos for different sub-segments of technical textiles across India | • Creating cloud-based platform for digitally mapping supply chain of textiles for facilitating business transactions<br>• Supporting enterprises in digital cataloguing, creating digital kiosks and websites for usage of technical textiles<br>• Setting up wholesale markets for technical textiles industries at regional level to house textiles products from all the states across the value chain<br>• Developing strategy to target emerging markets such as ASEAN (Vietnam, Indonesia), WANA (Egypt, Turkey, Saudi Arabia), Oceania (Australia), CIS (Russia), NEA (South Korea) and LAC (Brazil, Chile, Colombia, Peru) for exports | • Marketing support for 40-50 global champions for establishing presence in international market<br>• Improved penetration through e-commerce, transforming unorganised to organised market infrastructure, with special focus on promoting and leveraging 'Open Network for Digital Commerce' (ONDC) for technical textiles MSMEs<br>• Focus on creating a national network of testing laboratories near all key clusters having quality and productivity norms for technical textiles value chain. |

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| **Marketing & Brand Promotion** | • Connecting with international and regional industry associations and technical textiles' associations to invite global companies to invest in India. | • Creation of demonstration centres and kiosks to display physical and virtual usage of different technical textiles application areas across major cities in India. | • Creation of labour market information portal for providing real-time information on vacancies and availability of competent manpower across the value chain. In addition, leveraging the portal for undertaking skill development initiatives as per the changing industry needs. |
| **Other Specific Interventions** | • Focus on undertaking regulatory reforms for supporting the usage of standardised technical textile products (for instance installation of airbags according to international standards)<br>• Rationalisation of HSN Codes dedicated for technical textiles. Also, aligning HSN Codes with national and international standards<br>• Promoting promotional videos across national and international forums on usage, benefits, etc. of different application areas of technical textiles<br>• Increased industry–academia connect and linkages for development of indigenous technical textiles<br>• Leveraging PM Gati Shakti initiative to catalyse industrial development, including identification of new textile clusters for reducing supply chain, boosting demand for technical textiles and logistical cost<br>• Coordination with Ministry of MSME and Ministry of Finance for leveraging online available resources to grade the performance of technical textile enterprises and assess credit worthiness.<br>• Driving the demand of technical textiles through institutional buying and robust inter-ministerial coordination for wider usage of technical textiles, especially in Ministry of Railways (MoR), Ministry of Road Transport and Highways (MoRTH), Shipping and Waterways (MoPSW), Ministry of Jal Shakti (MoJS), Ministry of Ports, Ministry of Defence (MoD), Ministry of Agriculture and Farmers Welfare (MoAFW), etc. Identifying and highlighting opportunities in various flagship programmes, missions, including the strategic sectors in India. | • Development of mechanism for comprehensive and proper recording of technical textiles' production, investment, etc. database.<br>• Harmonising technical textile standards and regulations in line with global best practices<br>• Inclusion of dedicated incentives (fiscal/non-fiscal) across states' industrial and segment-specific policies<br>• Focus on undertaking targeted technical textiles investment promotion catering to critical segments of value chain and attracting investments in textiles parks and clusters<br>• Developing a state level textiles rating system covering all technical textiles value chain components to promote healthy competition among states. | • Leveraging Virtual Reality and other state-of-the-art digital platforms (E.g.: Metaverse) for market promotion and access to new markets. |

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