



वस्त्र मंत्रालय  
MINISTRY OF  
**TEXTILES**

सत्यमेव जयते

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Azadi Ka  
Amrit Mahotsav

June 2023 Edition



# NTTM Newsletter

**Capturing Technical Textiles' developments & updates**

National Technical Textiles Mission  
MINISTRY OF TEXTILES

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## NTTM in the News

- **6th Mission Steering Group (MSG): 20 R&D Projects in Geotech, Protech, Indutech, Sustainable Textiles, Sportech, Buildtech and Speciality Fibres cleared under National Technical Textiles Mission**

While chairing the 6th Mission Steering Group (MSG) meeting of the National Technical Textiles Mission on 8<sup>th</sup> June 2023, Union Minister of Textiles, Commerce and Industry and Consumer Affairs, Food and Public Distribution, Shri Piyush Goyal said that international benchmarking, deliberations with the industry and demand assessment are critical to identify high value & high-volume potential products to catalyze research and innovation in Technical Textiles in India.

Ministry of Textiles approved 20 R&D projects worth INR 61.09 crores across key strategic areas of Geotech, Protech, Indutech, Sustainable Textiles, Sportech, Buildtech segments and Specialty Fibres (Carbon Fibre and Ultra High Molecular Weight Poly Ethylene) during the 6th MSG meeting. Among these 20 R&D projects, 3 Projects from Geotech, 6 of Protech, 1 Indutech, 1 Sportech, 2 Sustainable Textiles, 2 Buildtech, 2 Carbon Fibres, 2 Specialty/Functional Fibre and 1 Ultra High Molecular Weight Poly-Ethylene (UHMWPE) were approved.

While addressing the meeting, Shri Piyush Goyal said that it is necessary to identify the areas where high strength lightweight Technical Textiles could be used as an alternative material in automobile, aviation, infrastructure and medical sectors for enhancing efficiency, advancement and sustainability.

The Minister noted that massive outreach exercise is the need of the hour to attract more R&D proposals in the priority areas under NTTM wherein Ministry of Textiles, Ministry of Science and Technology and

Ministry of Commerce and Industry may collaborate.

Shri Goyal also said that private engineering colleges of good repute to be encouraged to work together with Textile Research Associations (TRAs) or reputed Government institutes for wider awareness, benefits and optimal utilization of NTTM Scheme and foster research & innovation ecosystem across India.

Senior Officials from NITI Aayog, Ministry of Road Transport and Highways, Ministry of Heavy Industries, Ministry of Railways, Ministry of Jal Shakti, Department of Expenditure, Department of Higher Education, Department for Promotion of Industry and Internal Trade and members from other Ministries, and eminent members from the industry attended the meeting. [Read More](#)

- **Ministry of Textiles conducts 'National Conclave on Sportech: The Future of Sport Textiles and Accessories Industry in India' under National Technical Textiles Mission**

The Ministry of Textiles in partnership with Indian Technical Textiles Association (ITTA) and Wool Research Association (WRA) organized a full-day National Conclave on Sportech on the theme "The Future of Sport Textiles and Accessories Industry in India", on 2nd June 2023 at Shangri-La Eros Hotel, New Delhi.

There were technical sessions in the conclave focusing on Market size, Gaps, Experience and Expectations of consumers towards adoption of Indian Sports Textiles, Sports Goods and Accessories: Coated fabrics, Nets, Leather and Rubber Products, Innovations & Research in Composites and Smart Textiles and Design, Branding & Quality in the Value Chain.



Chief Guest, Smt Darshana Vikram Jardosh, Hon'ble Minister of State for Textiles & Railways, Government of India, highlighted that India is an emerging player in sports textiles, with tremendous scope for growth in the coming years. She mentioned that the government has significant focus on creating sports culture in India through its flagship schemes such as Khelo India, Fit India Movement, Target Olympic Podium Scheme, etc. This would support in enhancing the penetration of sports textiles in the country. Further, the factors such as rising health consciousness and increasing sports events being organized in India are also fostering the demand for sports goods and sports textiles.

Smt Rachna Shah, Secretary, Ministry of Textiles, Government of India, stated that the government is working to make India a hub for the technical textiles. Our flagship interventions such as National Technical Textiles Mission (NTTM), Production Linked Incentive (PLI) scheme, PM Mitra Park initiative, among others are focused towards increasing the scale, size and integration of textiles and technical textiles in India.

Shri. Rajesh Kr. Pathak, Secretary, Technology Development Board, highlighted that there is a need to facilitate and have confidence on various scientists and researchers working on product and technology development in technical textiles, including sportech. This will catalyze the development of entire ecosystem of technical textiles in India.

Shri. Rajeev Saxena, Joint Secretary, Ministry of Textiles, Government of India, highlighted that India's Technical Textiles

market has a huge potential backed by a significant growth rate of 10%, increased penetration level of 9-10% and placement as the 5th largest technical textiles market in the world. He highlighted that India's sportech market at around USD 1.17 million is minimal as compared to country's population size. Therefore, focus should be on developing this sector to meet domestic needs with indigenously produced quality sports textile products & accessories.



More than 300 participants attended the conclave including Officials and Representatives from Central Ministries, user Departments (sportech) of Central and State Governments, Institutes, industry leaders, scientific experts, researchers, and professionals related to technical textiles especially Sportech along with around 16 exhibitors. [Read More](#)

- **Union Textiles Minister Shri Piyush Goyal holds sixth interactive meeting with the Textile Advisory Group in Rajkot to review initiatives for cotton value chain**

Hon'ble Union Minister of Textiles, Commerce & Industry and Consumer Affairs and Food & Public Distribution, Shri Piyush Goyal presided over the sixth interactive meeting with the Textile Advisory Group (TAG), on 22nd April, 2023, to review the progress of initiatives for cotton value chain, as part of the Saurashtra Tamil Sangamam which is being conducted under the 'Ek Bharat Shreshtha Bharat' Initiative in Gujarat in Rajkot.

Shri Piyush Goyal noted the progress in the project on Traceability, Certification and Branding of Kasturi Cotton India and lauded that branding of Indian Cotton will add great

value to the entire cotton value chain from farmers to end users. Shri Goyal emphasized the need for strengthening certification systems for organic cotton and requested industry for active participation in promotion of organic cotton production amongst cotton farmers. Hon'ble Minister advised to hold detailed plan of action to boost organic cotton production on cluster based approach.

Smt. Darshana V. Jardosh, Hon'ble Minister of State for Textiles and Railways and TAG Chairman Shri Suresh Kotak also guided the TAG meeting. Smt Rachna Shah, Secretary, Ministry of Textiles, appealed to all cotton value chain stakeholders to work together in a cohesive manner to achieve the Hon'ble PM's dream of five F's from Farm to Foreign in the Cotton Textile Value Chain & regain Supremacy in Cotton to enhance value returns to producers. [Read More](#)

- **Brainstorming Session Explores Growth in Hometech, Clothtech in Rajkot:** A Chintan Shivir, a brainstorming session on technical textiles, the flagship scheme of the National Technical Textiles Mission, was recently held in the city of Rajkot in Gujarat, India. The session was intended to explore growth opportunities in hometech and clothtech during the Saurashtra Tamil Sangamam. Shri Piyush Goyal, Hon'ble Union minister of Commerce and Industry, Consumer Affairs, Food, and Public Distribution and Textiles, and Smt. Darshana Vikram Jardosh, Hon'ble Minister of State for Textiles and Railways, also attended the event.

The session was jointly organised with the Synthetic and Rayon Textiles Export Promotion Council (SRTEPC) and Indian Technical Textiles Association (ITTA) encompassing participation of more than 50 major industries in the application areas of home textiles and cloth textiles such as industrial sewing threads, adhesive tapes, labels and batches, furniture and coated fabrics, mosquito nets, fibrefill, filter fabrics,

household wipes, stuffed toys, among others.

The brainstorming session focused on investment and export opportunities and prospects of hometech and clothtech in India and the world, dialogues with leading hometech and clothtech industry magnates, a presentation by the Gujarat state and an interactive Q&A session with the leadership.

[Read More](#)

- **Centre announces launch of 2 Quality Control Orders for 31 items**

Ministry of Textiles announced the launch of 02 Quality Control Orders (QCOs) for 31 items consisting of 19 Geo Textiles and 12 Protective Textiles in the Phase-I, following due process of notification of Technical Regulations. These QCOs mark the first technical regulation from India for the Technical Textiles industry informed the Joint Secretary, Shri Rajeev Saxena.

Out of the 31 items, 19 items belong to the Geo Textiles category, including Laminated High Density Polyethylene (HDPE) Woven Geomembrane for Waterproof lining, PVC Geomembranes, Needle punched non-woven geobags, Polypropylene Multifilament woven geobags, Jute Geotextiles, Open Weave Coir Bhoovastra Geotextiles used in sub-grade separation in pavement structures, Geotextiles used in Subsurface Drainage Application, Geotextiles used in Sub-grade Stabilization in pavement structures, High Density Polyethylene (HDPE) Geomembranes for lining, Geotextiles used as protection (or cushioning) materials, Geotextiles for permanent erosion control in hard armor systems, Geogrids for flexible pavements, Polymeric strip/geostrip used as soil reinforcement in retaining structures, Geogrids used in reinforced soil retaining structures, Reinforced HDPE membrane for effluents and chemical resistance lining, and Geocells.



These two Geo Textiles and Protective Textiles QCOs shall come into force immediately after 180 days from the date of its publication in the Official Gazette. The conformity assessment requirements specified in these QCOs are equally applicable to domestic manufacturers as well as foreign manufacturers who intend to export their products to India. Ministry of Textiles is planning to issue 02 more QCOs for 28 items in Phase-II, including 22 items of Agro Textiles and 06 items of Medical Textiles. In Phase-III, 30+ more Technical Textiles items may be considered for QCO issuance.

▪ **Meeting of Officials of Ministry of Textiles with Official of Ministry of Defence**

Meeting with the Officials of the Ministry of Defence under the Chairpersonship of Smt. Dipti Mohil Chawla, Additional Secretary, Department of Defence regarding Opportunities to enhance usage of Technical Textiles in Defence Sector on 30th May 2023 at Ministry of Defence, South Block, New Delhi. The interaction commenced with a presentation by the Shri Rajeev Saxena, Joint Secretary, MoT & Mission Coordinator, NTTM on Technical Textiles and their prospective usage in the defence sector; followed by a comprehensive interaction with the officials from different departments of the MoD.

▪ **Ministry of Textiles under NTTM participated in “TECH4TEX - Technical Textile Conclave on Sportech”**

Ministry of Textiles under NTTM participated in “TECH4TEX - Technical Textile Conclave on Sportech” on 19th June, 2023 at Dr. B. R. Ambedkar NIT

Jalandhar, organized by Punjab State Council for Science & Technology (PSCST) has organized, in collaboration with NIT-Jalandhar, Wool Research Association Mumbai, Technology Enabling Centre, Panjab University, Chandigarh, CII Punjab. The conclave focused on strengthening the sport sector of Punjab. Participants from industry, academia, and research institutions graced the conclave.



During Open House Session participants from industry and research institutions discussed the technological gaps and requirement in sports sector with respect to materials, advanced materials, fibres, composites, and waste management.

The industry stressed the importance of establishing a testing and certification laboratory in Punjab. Currently, samples have to be sent to either Meerut or private testing centres, which is time-consuming and not economically feasible for all industries. It was proposed during the discussions that since Punjab has a textile industry cluster in Amritsar, Jalandhar, and Ludhiana, a clustered approach should be taken for establishing the testing facility.

A survey needs to be conducted to assess the testing requirements and equipment needs, and a central testing facility should be established at academic institutions viz. NIT Jalandhar, GNDU Amritsar.

Depending upon the gap assessment/ need required; It was decided that the industries will submit a concept note on each of their problems along with research institute, to PSCST which will take it further to NTTM & Govt. of India for their addressal.

## NTTM R&D Update

Under Component I – Research, Development and Innovation of NTTM, 109 R&D Projects\* valuing INR 325 Crores have been approved as of June 2023.

### Summary of Approved Projects

#### High Performance and Specialty Fiber Recommended by Cabinet Committee Note

#	Focused Area of Research	Number of Projects
1	Meta Aramid and Para Aramid Fiber/Fabric	2
2	Carbon Fiber / Fabrics and Applications	9
3	Glass Fiber and Application	2
4	Specialty/Functional Fiber	4
5	Ultrafine Nano Fiber and Non-woven webs	8
6	Ultra-High Molecular Weight Polyethylene (UHMWPE)	5
7	Nylon 66	1
8	High Tenacity / Super High Tenacity Polypropylene	0
9	Ceramic Fiber and Applications	1
10	Polybenzoxazoles (PBO) Zylon	0
11	High Tenacity / Super High Tenacity Nylon	0
12	High Tenacity / Super High Tenacity Polyester	0
13	High Tenacity / Super High Tenacity Viscose	0
<b>TOTAL</b>		<b>32</b>

#### Application Sectors

#	Segment	Number of Projects
1	Geotech	14
2	Protech	17
3	Agrotech	11
4	Meditech	8
5	Indutech	8
6	Mobiltech	5
7	Sustainable Textiles	5
8	Sportech	4
9	Smart & E-Textiles	1
10	Packtech	1
11	Buildtech	3
<b>TOTAL</b>		<b>77</b>

### Summary of Institute wise Approved Projects

#	Name of Institute	Number of Projects
1	IIT-Delhi	17
2	IIT-Hyderabad	7
3	IIT-Kharagpur	7
4	IIT-Bombay	3
5	IIT-Roorkee	3
6	IIT-Indore	3
7	IIT-Kanpur	6
8	IIT-Madras	4
9	IIT-BHU(Varanasi)	1
10	IIT-Guwahati	1
11	IIT-Ropar	1
12	IIT-Bhubneshwar	1
13	IIT-Mandi	2
14	IIT-Jammu	2
15	IIT Jodhpur	1
16	IISc-Bangalore	1
17	MNIT-Jaipur	2
18	NIFT-Telangana	1
19	NIT-Warangal	1
20	NIT-Puduchery	2
21	NIT-Trichy	1
22	NIT-Jalandhar	1
23	NIT-Durgapur	1
24	NITRA	5
25	BTRA	7
26	SASMIRA	3
27	SITRA	2
28	WRA	1
29	ADRDE, DRDO-Agra	2
30	DRDE, DRDO-Gwalior	1
31	DRL, DRDO-Assam	1
32	IRMRA-Mumbai	2
33	IISER, Kolkata	1
34	ICAR, Kolkata	2
35	ICAR- CIRCOT	1
36	CSIR, AMPRI-Bhopal	1
37	CSIR, NCL-Pune	1
38	CSIR- NPL, New Delhi	1
39	INST-Mohali	1
40	Bidhan Chandra Krishi Viswa vidyalaya, West Bengal	1
41	C S K Himachal Pradesh Agricultural University, Palampur	1
42	Punjab Engineering College	1
43	MIT&S- Gwalior	1
44	Thiagarajar College of Engineering, Madurai	1
45	Kishinchand Chellearam Colloge, Mumbai	1
46	UPTTI Kanpur	1
47	GCET&T , Serampore	1
<b>TOTAL</b>		<b>109</b>

\*Details of approved R&D projects is in Annexure

## Global News Update

- **Global textile industry increasingly adopting tech for sustainability:** Textile companies worldwide are increasingly adopting technologies to boost sustainability. automation and improved equipment is a key solution to reducing pollution and water waste while improving the end product. A permanent, chemical-free technology that can be applied to any surface or textile to prevent and protect against harmful pathogens, mould, and infectious diseases, is quickly replacing chemicals that have been used in textiles for nearly 100 years with almost no change. [Read More](#)
- **INDA releases North American Nonwoven Materials Annual Study 2022:** INDA, the association of the nonwovens fabrics industry, has announced the publication of a new study, North American Nonwoven Materials Annual Study 2022. The study is based on actual surveys and interviews with producers, enhancing the accuracy and relevance. As per the Study, in 2022, capacity of nonwovens in North America reached 5.565 million tonnes, an increase from the previous year of 2.4 per cent (net growth of 128,700 tonnes) and an improvement over the previous year's growth rate of 1.8 per cent. North American imports, in tonnage, decreased 24.3 per cent in 2022 and exports decreased 16.3 per cent due to market stabilization after COVID. Nonwoven production tends to stay within the region, so the net trade balance (imports less exports) accounted for less than 5.5 per cent of the region's capacity. [Read More](#)
- **Bangladesh Bank eases import rules for textile raw materials:** To facilitate easier importation of specific goods, the Bangladesh Bank (BB) has directed all banks to relax the cash margin rate related

to the initiation of import letters of credit (LCs) for 10 types of products, among which are textile raw materials. A recently issued BB circular stated that the directive stipulates that banks should determine the opening margin rate based on their relationship with the customer. This is a departure from the previous requirement where importers had to pay a 75 per cent LC margin on imports of these goods. [Read More](#)

- **New EU sustainability rules ban destructing unsold textiles, footwear:** The European parliament's committee on the environment, public health and food safety (ENVI) has banned premature obsolescence, which means manufacturers must not limit the lifetime of a product through design features. It also asks for a specific ban on the destruction of unsold textiles and footwear a year after the entry into force of the law. Companies must make available software updates, consumables, spare parts and accessories for an appropriate period. Products should also be easy to repair and consumers should have access to repair guidelines, the report said. The committee put forward its proposals to make products in the European Union (EU) more environment-friendly, circular and energy-efficient throughout their lifecycle. [Read More](#)

## India News Updates

- **Shri Piyush Goyal proposes Invest India desk for Indian textile sector:** Hon'ble Union Minister of Textiles, Commerce & Industry and Consumer Affairs and Food & Public Distribution, Shri Piyush Goyal suggested that setting up a dedicated Invest India desk in the Ministry of Textiles to assist and handhold investors looking to set up or expand their manufacturing base to meet increasing global demand in the sector. The Hon'ble Minister commended



the industry for their enthusiasm to set up and expand businesses in the upcoming PM MITRA Parks. During the industry interaction on 'Investment Opportunities in the Textiles Industry under the PM MITRA Scheme' in new Delhi, the Hon'ble Minister urged the industry to collaborate and partner for research and development (R&D) and innovation to jointly achieve greater strides in the sector. [Read More](#)

- **India's NIT Warangal develops wastewater treatment tech for textiles:** In a significant step forward for environmental protection and sustainability, a textile and apparel industry situated in Hanumakonda district of Telangana, India, has successfully developed an eco-friendly and energy-efficient wastewater treatment technology using biosurfactants and membrane technology. NIT Warangal partnered with Prime Textiles, located in the Kakatiya Mega Textile Park (KMTP), with backing from Imprint, a joint initiative of the Ministry of Education (MoE) and the Science and Engineering Research Board (SERB). They developed a pilot-scale textile effluent treatment plant harnessing biosurfactants (BS), cavitation (C), and membrane (M) technology. [Read More](#)
- **India imposes azo dye tests on Chinese textiles, to strain importers:** India has removed China from a list of countries exempt from azo dye tests for imported textiles. These tests are crucial as azo dyes, organically produced synthetic dyes, are recognised as potentially harmful to health. This new non-tariff barrier, enforced by India's Directorate General of Foreign Trade (DGFT) under the ministry of commerce and industry, might cause shipment delays and additional costs for Indian importers. As per a notification issued by DGFT, the updated exemption list now includes European Union (EU) countries, Serbia, Poland, Denmark, and the United Kingdom. The textiles imported from these countries are not subject to

testing for the presence of azo dyes. China was previously part of this list. [Read More](#)

## Technological Advancements

- **US' TCPF launches flame-resistant stretch fabric Tecasafe 360+:** Flame-resistant textile leader TenCate Protective Fabrics (TCPF) recently launched its newest innovation, an inherently flame-resistant stretch fabric called Tecasafe 360+. Blurring the line between workwear and casualwear, Tecasafe 360+ is the protective fabric representation of the stretch-comfort trend that's taken the greater consumer garment markets by storm in recent years. [Read More](#)
- **Smart fabric by Canadian researchers responds to heat, electricity:** Researchers at Canada's University of Waterloo have developed a new smart material that gets activated by both heat and electricity, enabling it to respond to two different stimuli. The unique design paves the way for a wide variety of potential applications, including clothing that warms up while one walks from the car to the office in winter and vehicle bumpers that return to their original shape after a collision. Inexpensively made with polymer nano-composite fibres from recycled plastic, the programmable fabric can change its colour and shape when stimuli are applied, the University of Waterloo said on its website. [Read More](#)
- **Scientists develop metallic coating treatment for wearable textile:** Scientists from around the world have developed a simple metallic coating treatment for clothing or wearable textiles which can repair itself, repel bacteria from the wearer and even monitor a person's electrocardiogram (ECG) heart signals. According to Researchers from North Carolina State University, Flinders University and South Korea, the conductive

circuits created by liquid metal (LM) particles can transform wearable electronics and open doors for further development of human-machine interfaces, including soft robotics and health monitoring systems.

[Read More](#)

- **Smart clothing for industrial robots:** The RobotSweater, developed by a research team from Carnegie Mellon University's Robotics Institute, is a machine-knitted textile 'skin' that can sense contact and pressure. Just as knitters can take any kind of yarn and turn it into a sock, hat or sweater of any size or shape, the knitted RobotSweater fabric can be customised to fit uneven three-dimensional surfaces. Once knitted, the fabric can be used to help the robot 'feel' when a human touches it, particularly in industrial settings where safety is paramount. [Read More](#)

## Articles on Technical Textiles

- **Sustainability Challenges for Nonwovens Industry** By Fibre2Fashion

*"Nonwoven materials are gaining popularity across multiple industries due to their lightness and ability to protect against microorganisms. However, sustainability concerns have arisen due to the disposable nature of nonwovens and their potential for environmental pollution. Manufacturers are now diversifying into greener ranges, with a growing interest in bio-based versions. The greatest challenge going forward will be cutting the carbon footprint of nonwovens by switching to organic feedstocks."* [Read More](#)

- **Innovations In Nonwovens: Versatility Is the Key** By Shri Adrian Wilson

*"The applications for nonwovens continue to expand due to the wide range of functional performance properties it is possible to engineer into them. The term 'nonwoven' - describing something that a*

*product is not, as opposed to what it actually is - has never accurately represented its industry, but any attempts to replace it over the years have floundered. The nonwovens industry is now worth an annual US\$70 billion, highly profitable and very sophisticated, with healthy annual growth rates often in double digits in certain sectors and parts of the world.*

*It is also perhaps one of the most intensive in investing in new technology, and also in research and development, and nowhere is this more evident than in the absorbent hygiene products (AHPs) industry. The key products of this industry are baby diapers, femcare products such as sanitary pads, panty liners etc, and those for coping with adult incontinence (AI)." [Read More](#)*

- **Bringing Efficiencies Through Innovation** By Shri Sanjay Bakshi

*"Nonwovens are integral components of today's numerous consumer and industrial products. As the demand for these products continues to grow, the nonwovens also need to evolve constantly. While doing so, all stakeholders in nonwoven value chain—including manufacturers and their customers as well as researchers and technologists to end-consumers of the nonwoven products—have to remain socially and environmentally conscious and responsible too. Meeting social, environmental, technical and business goals together is indeed a difficult task.*

*However, there are some global companies which have set examples by showcasing how all goals can be met and innovation be brought into nonwoven efficiencies. This feature discusses ten such companies and their recent innovations in various areas of their operations." [Read More](#)*

## Case Study: Usage of Technical Textiles in Defence

Textiles is considered as one of the most critical requirements of the armed forces, needed during combat, non-combat and emergence survival operations. The technical textiles have been a major contributor to the defense applications displaying benefits over conventional heavier materials. Below are the Department wise existing and prospective usage of Technical Textiles in Indian defence sector (non-exhaustive):

Department/ Sub- department/ Area	Existing and Prospective Usage of Technical Textiles
<b>Border Roads Organisation</b>	<p><b>Geogrids</b> for pavement reinforcement and for reducing load/stress.</p> <p><b>Geocell</b> to improve the load bearing capacity of the roads.</p> <p><b>Geo-composite</b> drain for construction of new embankment over soft subsoil.</p> <p><b>Geonets</b> as surface course/ ground reinforcement for both rehabilitation and construction of new roads.</p> <p><b>Geo membrane</b> for tunnel lining to restrict fluid seepage.</p> <p><b>Coir geo-textiles</b> for improvement of sub-grade soil strength in road pavements and stabilization of side slopes.</p> <p><b>Geo Drains</b> for drainage of trapped water below pavement.</p> <p><b>Jute geotextiles</b> for slope stabilization, especially in rural road construction.</p> <p><b>High visibility clothing</b> with its luminescent property for workers working on roads.</p> <p><b>High Altitude Clothing</b> for BRO's snow clearance team</p>
<b>Coast Guard</b>	<p><b>Protective clothing</b> including Life Jackets and Life Belts, High performance fabric swimsuits, wetsuits, scuba gear, Submariner Clothing, UV Resistant Clothing, Wind Cheaters and Raincoats, among others, that is durable to sunlight, resistant to action of</p>

Department/ Sub- department/ Area	Existing and Prospective Usage of Technical Textiles
	<p>saltwater and ultraviolet (UV) radiation, provide protection against extreme temperatures with property of high stretch, for coast guard officials and workers.</p> <p><b>Clothtech:</b> Functional Uniforms</p> <p><b>Boat Covers (higher denier fiber fabrics)-</b> To protect the boats (when not in use) from dust and other damages due to weather.</p> <p><b>Marine Vinyl upholstery Fabric and flame-retardant fabrics</b> for interior and exterior of ships/ boats for protection, longevity, waterproof, resistance to mold, mildew, chemicals, moisture and oils.</p> <p><b>Sails Fabric made from polyester, nylon, aramid, UHMWPE, carbon fibric</b> for its benefits such as lightweight, higher strength, UV resistance, among others</p> <p><b>Advanced composite materials</b> and water &amp; oil filters with good sorption properties for easy and effective use in case of oil spills/ contaminants in water</p> <p><b>Ropes and Cordages-</b> Nylon yarn and Polyethylene yarn application in heavy duty ropes and cordages</p> <p><b>Fiber Reinforced Plastic Boats-</b> an alternative for conventional boat building materials such as steel and other metals.</p>
<b>Autonomous Bodies / Institutions under Ministry of Defence<sup>1</sup></b>	<ul style="list-style-type: none"> <li>• Extreme cold/high altitude clothing</li> <li>• High Altitude tents</li> <li>• Boot Multi-Purpose</li> <li>• High performance swimwear and sportswear</li> <li>• Sleeping Bags; Sports Nets</li> <li>• Sports Footwear Components</li> <li>• High Performance Ropes and Cordages</li> </ul>
<b>Defence Public Sector Undertakings (OFB)<sup>2</sup></b>	<p><b>Protech:</b></p> <ul style="list-style-type: none"> <li>• Extreme cold/ high altitude/ fire retardant clothing (with insulation, wind proofing, moisture resistant</li> </ul>

<sup>1</sup> National Institute of Defence Estates Management (NIDEM), Sainik School Society, National Institute of Mountaineering and Allied Sports (NIMAS), among others.

<sup>2</sup> Munitions India Limited (MIL), Armoured Vehicles Nigam Limited (AVANI), Advanced Weapons and Equipment India

Department/ Sub- department/ Area	Existing and Prospective Usage of Technical Textiles
• <b>Procurement (Department of Defence Production)</b>	<p>application, breathable membrane, hydrophylic polyurethane coating &amp; goretex or sympatex coating)</p> <ul style="list-style-type: none"> <li>• Nuclear, Biological &amp; Chemical (NBC) Suits</li> <li>• Lightweight bullet proof jackets</li> <li>• Ballistic Helmets</li> <li>• Fire Retardant Fabrics/Apparels</li> </ul> <p><b>Smart Textiles:</b></p> <ul style="list-style-type: none"> <li>• Multi Spectral Camouflage Nets</li> <li>• Thermo regulators- Bomb Disposal Suits</li> <li>• Energy Generators</li> </ul> <p><b>Clothtech:</b></p> <ul style="list-style-type: none"> <li>• Functional Uniforms</li> <li>• Camouflage Dress</li> </ul> <p><b>Sportech:</b></p> <ul style="list-style-type: none"> <li>• High Altitude tents; Sleeping Bag</li> </ul>
<b>Armed Forces Medical Service and Colleges</b>	<p><b>Meditech:</b></p> <ul style="list-style-type: none"> <li>• Dressings/ bandages/ plasters; absorbent cotton ribbon gauze; surgical gowns, surgical drapes &amp; surgical masks etc. may be used.</li> </ul> <p><b>Protech:</b></p> <ul style="list-style-type: none"> <li>• Fire retardant curtains and blinds in the clinics, hospitals, college, etc.</li> <li>• Fire treated bedroll, bedsheet and pillow</li> <li>• Fire Retardant (FR) fabric</li> </ul>
<b>National Cadet Corps</b>	<p><b>Sportech:</b></p> <ul style="list-style-type: none"> <li>• Sleeping Bags</li> <li>• Tents</li> <li>• High performance sportswear</li> </ul> <p><b>Protech:</b></p> <ul style="list-style-type: none"> <li>• Mosquito repellent netting</li> </ul> <p><b>Clothtech:</b></p> <ul style="list-style-type: none"> <li>• Functional Uniforms</li> </ul>
<b>Canteen Stores Department (CSD)</b>	<p><b>Packtech:</b></p> <p><b>FIBC Bags</b>, which are strong, durable, eco-friendly, etc. used for storage and transportation of a wide range of materials.</p>

Limited (AWE India), Troop Comforts Limited (TCL), Yantra India Limited (YIL) (Ancillary), India Optel Limited (IOL), Gliders India Limited (GIL).

## Forthcoming Events

### July 2023

- Nanotextology, 1<sup>st</sup>-8<sup>th</sup> July 2023, Thessaloniki, Greece
- Surat International Textile Expo (SITEX), 08<sup>th</sup>-10<sup>th</sup> July 2023, Surat
- Technical Textiles Conference in NeDFI Hall (MoT with ICC), 21<sup>st</sup> July, 2023 (Tentative), Guwahati, Assam
- Weave Knitt Exhibition 2023, 22<sup>nd</sup>-24<sup>th</sup> July 2023, Surat/ Delhi
- 6th BIS National Conclave on Standards & Regulations for Technical Textiles (MoT with FICCI), 25th July 2023, in New Delhi
- International Conference on Composite Materials (ICCM), 30<sup>th</sup> July-4<sup>th</sup> August 2023, Belfast, UK

### August 2023

- Gartex Texprocess India, 03<sup>rd</sup>-05<sup>th</sup> August 2023, New Delhi
- Intertextile Shanghai Home Textiles, 16<sup>th</sup>-18<sup>th</sup> August 2023, Shanghai, China

### September 2023

- 10th FICCI National Conference & Awards for Excellency in Safety Systems, September 2023, Delhi
- International Composites Summit, 6<sup>th</sup>-7<sup>th</sup> September 2023, United Kingdom
- Techtex India 2023, 12<sup>th</sup>-14<sup>th</sup> September 2023, Mumbai, India
- International Conference on 'Scope and Opportunities in Medical Textiles (MoT with SITRA), 13<sup>th</sup> September 2023 (Tentative), at JWCC, Mumbai
- 12th International conference on Geosynthetics (ICG), 17<sup>th</sup>-21<sup>st</sup> September 2023, Italy
- Non-woven Tech Asia, 28<sup>th</sup>-30<sup>th</sup> September 2023, Delhi

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## Annexure

### Research Projects sanctioned in 1st MSG Meeting

#	Project Title	Cost (INR Cr.)	Duration (Years)	PI Name and Institute
1	Development of Carbon Nanotube Reinforced Acrylic Precursors for Carbon Fibre	18.08	2	Dr.T.V. Sreekumar, BTRA
2	Biodegradable & bioactive nanofibrous face mask' under the research topic "Surface modification of Carbon Fiber	1.99	2	Prof Prakriti Tayaliya, IIT-B
3	Carbon based Dermal Patch for Vitiligo Therapy	3.4	3	Prof Prakriti Tayaliya, IIT-B
4	High performance composite Fibres	27.52	3	Dr.Ashwini K. Agrawal, IIT-D
5	A technology platform for design and manufacturing of advanced and multi functional 3D woven Textile Structural Composites using High performance and natural fibres	20.09	2	Dr Prof.B. K.Behera, IIT-D
6	Activated and Patterned Carbon Nanofibers based Advance Design Configuration for High Performance Lithium-Ion Batteries and Supercapacitors	0.93	3	Dr.Chandra Sekhar Sharma, IIT-H
7	Scaling up of electro- spinning process for nano- fibers	1.24	3	Dr.Chandra Sekhar Sharma, IIT-H
8	Engineering Fibers for Fog Harvesting and Interfacial Solar Water Purification	1.55	3	Prof. Sameer Khandekar, IIT-K
9	Development of Tyre Tread Compound using Graphene in combination with Carbon & Silica as a Reinforcing Filler for Reducing the Rolling Resistance (RR) and Improving Fuel Efficiency	1.22	2	Dr.K Rajkumar, IRMRA
10	Design and development of facile high throughput needle less electrospinning set-up	1.9	2	Dr. PrakashVasudevan & Dr.L Amalarparamary, SITRA
11	MicroRNA Diagnostic Kit using Doped Carbon Nanofibers	0.69	2	Dr. Dharitri Rath, IIT-JAM
<b>Total Value of projects sanctioned in 1st MSG meeting</b>		<b>78.61</b>		

### Research Projects sanctioned in 2nd MSG Meeting

#	Project Title	Cost (INR Cr.)	Duration (Years)	PI Name and Institute
12	Knitting for Composite Preform Developments using Technical Yarns	1.2	1.3	Dr. Bipin Kumar, IIT-D
13	Development of Multifunctional Graphene incorporated High Molecular Weight Polyethylene (HMWPE) or High Density Polyethylene (HDPE) fibres by an alternative melt route	0.94	2.5	Prof. Mangala Joshi, IIT-D
14	Carbon Fiber-based functional electrode materials for energy storage applications	1.1	2.5	Dr. Bhanu Nandan, IIT-D
15	Development of EMI shielding and heat generating activated carbon fabrics from textile wastes	0.42	2	Prof. Vijay Narayandas Baheti, IIT-D
16	Development of multifunctional structural geotextiles using Textile wastes and Hybrid fabrics	5.98	3	Dr Prof.B. K.Behera, IIT-D
17	Biodegradable self-sanitizing bacterial nano cellulose fabric for air and water filtration	0.5	2	Dr. Mudrika Khandelwal, IIT-H
18	Laboratory And Field Investigations on PET Geo grid-Reinforced Base/Sub base Courses.	1.94	3	Dr. (Prof.) Sireesh Saride, IIT-H
19	Use of geosynthetics in pavements over soft and expansive subgrades: A sustainable solution.	0.51	3	Prof. B. Umashankar, IIT-H
20	Development of biocompatible glass fibre composite for healthcare applications	2.03	2	Asst. Prof. Nilanjan, IIT-KGP
21	Synthesis of Carbon nanofibres from textile/cotton waste	0.63	1	Prof Swambabu Varanasi, IIT-KGP
22	Neuroprotective Smart Textile for Preventing Cerebral Palsy: Countering Brain Injury in Children	0.58	2	Prof. Prasun Kumar Roy, IIT- BHU(Varanasi)
23	Combating Pandemics through textiles: An Approach to Ease Viral/ Bacterial Infections using advanced	0.95	2	Dr. Shaikh M. Mobin, IIT-INDORE

Nano Fibrous fabrics				
24	Mass Production of High Performance Carbon Fibers and Nanofiber Separators by Electro-spinning Techniques for Rechargeable Batteries and Super-capacitors	1.3	2.3	Professor Yogesh Sharma, IIT-Roorkee
25	Performance evaluation of Water Hyacinth as an alternate geotextile material.	0.21	2	Dr. Anil Kumar Mishra, IIT-Guwhati
26	Next Generation lightweight, breathable Activated Carbon Fabric (ACF) & Nano web based multilayered chem.-bio facemask for protection against Toxic Chem-Bio Agents	1.5	2	Dr Manisha Sathe, DRDE, DRDO, Gwalior
27	PTFE coated Glass/Para-aramid fabric for large Inflatable Randomes	3.5	2	Dr. Manoj Kumar, ADRDE, DRDO, Agra
28	Development of Parachute material using high molecular weight/ high strength polyethylene yarns	3.37	2	Dr. Manoj Kumar, ADRDE, DRDO, Agra
29	Scalable Manufacturing of MXene / Graphene / 2D material Impregnated Hollow Flexible Carbon Fibers for Energy Storage and Conversion Applications	1.19	2.5	Dr. Kaushik Ghosh, Institute of Nano Science and Technology, Mohali
30	Design of fibre-like crosslinked high stable polymeric material to remediation of textile generated waste management	0.79	3	Dr. Raja Shunmugam, IISER, Kolkata
31	Insecticide incorporated Agronets: Green Technology to minimize the insecticide burden to biosphere	0.97	2	Dr.Pronobesh Chattopadhyay, Defence Research Laboratory, DRDO, Assam

**Total Value of projects sanctioned in 2nd MSG meeting** **29.61**

**Research Projects sanctioned in 3rd MSG Meeting**

#	Project Title	Cost (INR Cr.)	Duration (Years)	PI Name and Institute
32	Development of High Performance Gel Spun UHMwPE Fibres and Tapes for Bullet Proof and Geo-Grids/Geo –Composites Applications	6.14	2.5	Dr. T V Sreekumar, BTRA
33	Development of long lasting and biodegradable electrospun/ needle punch nonwoven composite mulch using natural fibrous wastes.	1.92		Prof. Vijay Narayandas Baheti, IIT-D
34	Thermo-acoustic Insulation Textiles for Automotive	1.77	2	Dr. Apurba Das, IIT-D
35	A Circular Approach for the Development of Durable Antibacterial and Moisture Management Polyester Fibres for Sports Textiles	10.34	3	Dr. Abhijit Majumdar, IIT-D
36	Development and Feasibility Studies on Drainage and Reinforcement Functions of 3D Geocomposites in Pavements	2.34	3	Dr. Sireesh Saride, IIT-H
37	Use of Perforated Basalt Fabric Reinforced Cementitious Matrix in Structural Strengthening Applications	0.92	3	Dr. Anil Agarwal, IIT-H
38	Evaluation of natural fibre based agro-textile products in protected eco-friendly structures for production of high value horticultural crops	1.75	2	Dr. Adinpunya Mitra, IIT-KGP
39	Functional textiles for tackling organophosphate insecticides, pesticides and nerve agents' toxicity	0.6	3	Dr. Abhijeet Joshi, IIT-INDORE
40	Carbon nanotube reinforced polyethylene fiber and fabric for high strength application	0.41	2	Dr. Debrupa Lahiri, IIT-Roorkee
41	Fiber reinforced cotton and polyester photonics fabrics with thermal comfort and illumination functionality	0.72	3	Dr. Ranjan Jha, IIT Bhubaneswar
42	Development of 2D nanomaterial-based photo thermally active antimicrobial nanocoated Fabrics and PPE	0.32	2	Dr. Amit Jaiswal, IIT Mandi
43	Development of E-glass/Carbon textile reinforced hybrid polymer composites for wind turbine Blade application	0.41	3	Dr. Amar Patnaik, MNIT Jaipur
44	Development of Ceramic and UHMWPE Textile Based Hybrid Polymer Composite Armor	3.63	3	Dr. Amar Patnaik, MNIT Jaipur
45	Development of Specialized Firefighting Suit	8.9	3	Dr. M.S.Parmar, NITRA
46	Development of flame-retardant Nylon 66 yarn/fibre	2.6	3	Dr. Arindam Basu,

indigenously				NITRA
47	Polyethylene Engineered Cementitious Composites (PE-ECC) for High Resilient Infrastructure	0.71	3	Dr. Madappa VR Sivasubramanian, NIT, Puducherry
48	Development and manufacture of Ultra High Molecular Weight Polyethylene (UHMWPE) nano-fabrics and its composite for reusable respiratory masks	0.55	1.5	Dr. Arunangshu Mukhopadhyay, NIT, Jalandhar
49	Development of High Strength Cost effective Seamless Technical Circular Fabric from Heavy Denier Multifilament Yarns for Geotechnical Applications	7.02	3	Dr. Manisha Mathur, SASMIRA
50	Development of Multi-layered Firefighter's suit for Protection against Thermal Hazards and Pressurized Steam	0.88	2	Chandra Shekhar Malvi, Madhav Institute of Technology & Science, Gwalior
51	Development of smart cloth using carbon nano tube reinforced nano composites	0.83	2	Dr. V. Gayathri, Thiagarajar College of Engineering, Madurai
52	Development Of Carbon Nanofiber Materials From Cow Dung/ Bio-sludges For Smart Fabric Textile And Selective CO2/H2 Energy Storage Applications By 3D Printing Technology.	0.77	3	Dr. A.K. Srivastava, (CSIR-AMPRI), Bhopal
53	Use of Jute Agro Textiles as prospective mulching material to test the suitability of mango based intercropping systems towards increasing crop productivity and promotion of livelihood security for the backward farming community Red and Lateritic Zones of West Bengal	2.42	3	Dr. Susanta Kumar De, Bidhan Chandra Krishi Viswa Vidyalaya, West Bengal
54	Sustainable use of unconventional fibres of Indian Himalayas for Agro textiles	3.15	3	Dr. Sapna Gautam, C S K Himachal Pradesh Agricultural University, Palampur
<b>Total Value of projects sanctioned in 3rd MSG meeting</b>		<b>59.1</b>		

**Research Projects sanctioned in 4th MSG Meeting**

S. No.	Project Title	Cost (INR Cr.)	Duration (Years)	PI Name and Institute
55	Development of alkaline resistance polyester for the geosynthetic applications	3.22	3	Dr. Prasanta Kumar Panda, BTRA
56	Hydrogen pressure vessel manufacturing using Textile based Composites – TeCoPV India	24.34	3	Dr. Asim Tewari, IIT-B
57	Mission for Developing Aerogels Based Textile Materials for Civilian, Industrial and Defense Applications.	5.46	2	Dr. R. S. Rengasamy, IIT-D
58	Development of metallized textiles for applications in personal protective equipment.	0.5	2	Prof. Vijay Narayandas Baheti, IIT-D
59	Development of UHMWPE Fibers and Disentangled Melt for impact mitigation	0.65	1	Dr. Ishan Sharma, IIT-K
60	Development of natural herbal extract coated seed protection bag using natural fiber with long lasting mechanical and insecticidal properties	0.5	1	Dr. Prakash Vasudevan, SITRA
61	Development of Strong and multifunctional (fire Resistant/Anti-Bacterial/Hydrophobic) fabric Using Graphene (Activated Carbon from agricultural Waste) and White-Graphene (hBN) Composite with research to product goals	1.69	3	Dr. Chandra Sekhar Tiwary, IIT-KGP
62	Ramie fibre in defence applications: Development of low-cost protective units	0.13	1	Dr. Amit Shaw, IIT-KGP
63	Development of Indigenous Encapsulated Phase Change Material (PCM)-based Active Wear Textiles and Demonstration of Commercial-scale Manufacturing	19.61	2	Dr. Sarang Gumfekar, IIT-Ropar
64	Design of Reinforced Earth (RE) Retaining wall & RE Abutments for HSR and Railway applications	0.5	1	Prof. G. Madhavi Latha, IISc Bengaluru
65	Municipal Solid Waste (Soil Like Material) and Geotextile Interaction Study for Pavement Subgrade and Embankment Applications in Soft Ground	0.3	1	Dr. K. Muthukkumaran, NIT Trichy
66	Cellulose-based indigenous high Clo value and low-density surface modified natural fibre for developing thermal layers of extreme cold climate clothing	1.56	3	Dr. M.S.Parmar, NITRA

67	Development of 3D High Performance Knitted Sports Textiles with Thermo-Physiological Comfort and Impact Protective Properties	1	1.5	Dr. Arindam Basu, NITRA
68	Development of Crop cover, mulch, soil protection fabrics and other products using Sun hemp and Banana Fibre	1	1.5	Dr. Arindam Basu, NITRA
69	Design, Development and Performance Assessment of Coir Geotextile Barriers for Landslide Mitigation	0.29	1	Dr. V. Senthilkumar, NIT, Puducherry
70	Development of Energy Responsive Agrotexile for low cost opportunities to grow off-season vegetable/fruits	0.5	1	Ravi Prakash Singh, SASMIRA
71	Development of eco-friendly natural fibres based sustainable agro-textiles for packaging of agro products with protection against rodents, microorganisms including bacteria, fungi and viruses and UV repellent properties	1.79	2	Dr. KK Misra, WRA
72	Development of jute bags for protection and quality preservation of stored seeds	0.5	1	Dr Laxmikanta Nayak, ICAR, Kolkata
73	Natural fibre waste to planting growth media: development characterization and evaluation in soilless crop production system	0.49	1	Dr Nilimesh Mridha, ICAR, Kolkata
74	Lead free ferroelectric-PVDF electrospun fibre composites for energy harvesting textile applications	0.17	1	Dr. Sanjeev Kumar, Punjab Engineering College
<b>Total Value of projects sanctioned in 4th MSG meeting</b>		<b>64.2</b>		

**Research Projects sanctioned in 5th MSG Meeting**

#	Project Title	Cost (INR Cr.)	Duration (Years)	PI Name and Institute
75	Cut, Slash, Stab, and Impact-Cut Resistant Textiles for Protection	4.11	3.5	Dr. Apurba Das, IIT-D
76	Development of spinnable grade meta and para-aramid polymers and their fibre spinning	8.99	3	Dr Asha Syamakumari, CSIR-NCL
77	Plasma assisted waterless dyeing of high-performance textiles using supercritical fluid for application in technical textiles	11.73	3	Dr Shital S Palaskar, BTRA
78	Preparation and Production of Technical Textile "ElecTex" with Electro-responsive Properties for Improved Wound Healing Properties	0.54	2	Dr. Santosh K. Misra, IIT-K
79	Multi-Metal and Hetero atom Decorated Lignin Derived Carbon Fibers as Energy Storage Materials	0.8	2	Dr. Rik Rani Koner, IIT-Mandi
80	3D Printed protein-based textile fibers	1	1.5	Dr. Ethayaraja Mani, IIT-M
81	Binder Free, Self-Supported Hierarchical Porous carbon Fiber For Inversely Vulcanized Li-S Battery Electrodes	0.55	1.5	Dr. Soumyadip Choudhury, IIT-Kgh
82	Development of nanocomposite jute-geotextile for high-speed railway embankment system to enhance the durability and its remotely health monitoring using Internet of Things (IoT)	1	1.5	Dr.Supriya Pal, NIT-Durgapur
83	Preparation of Lyocell CNT Composite High Strength Carbon Fibers	1	1 yr 4 months	Dr. Prasanta K Panda, BTRA
84	Electrodes for charge storage by (i) electrochemical deposition of transition metal oxide on carbon cloth and (ii) electrospun fiber from lignin based sources with subsequent carbonization	0.47	1	Dr. Somenath Ganguly, IIT-Kgh
85	Development of electro-spun carbon fibers using Bio-waste for energy storage application	0.5	1	Dr Kasilingam Rajkumar, IRMRA
86	Poly 3-Hydroxybutyrate (PHB)-based bioplastics (polymer textile): An alternative eco-friendly solution to commercial plastics for packaging industry	0.39	1	Prof. Vijayan Pallippattu, IIT-Jammu
87	Textile electrodes coated with agri/bio-wastederived activated carbon for high-performance, eco-friendly, flexible all-solidstate supercapacitors	0.5	1	Dr. Rupesh S. Devan, IIT-Indore
88	Studies on the Ballistic Energy Absorption of Polyethylene Coated Aramid Fabrics	0.27	1	Dr. R. Velmurugan, IIT-M
89	Self-healing cement based on electro spun polymer composite nanofibers	0.5	1.5	Dr. Hemlata Kapil Bagla, Kishinchand Chellaram College
<b>Total Value of projects sanctioned in 5th MSG meeting</b>		<b>32.35</b>		



### Research Projects sanctioned in 6th MSG Meeting

#	Project Title	Cost (INR Cr.)	Duration (Years)	PI Name and Institute
90	Coal tar pitch-based fibers and its conversion into carbon fibers	2.42	2	Dr. Sanjay Rangnat Dhakate,
91	Development of natural fibre-based hybrid composite for acoustic insulation	0.96	3	Dr. Mallika Datta, GCET&T, Serampore
92	Performance evaluation of selected geotextile-based liner material against seepage loss in water conservation system under a wide range of temperature	1.49	1.5	Dr. Trishikhi Raychoudhury, IIT Jodhpur
93	Sustainable process optimization for high-performance fibrous waste management and valorization	8.87	3	Dr. Bipin Kumar, IIT-Delhi
94	Functionalized Textiles for Germicidal applications	0.988	1.5	Dr. Arun Kumar Patra, UPTTI Kanpur
95	Development of indigenous High- Performance Ultra High Molecular Weight Polyethylene (UHMWPE) fibres/shields for bullet proof applications in defence and civil domains	3.32	2	Dr. Ashutosh Sharma, IIT-Kanpur
96	Additive Manufacturing of Technical Textiles for Sustainable Mobility- Agro Waste Based Materials and Product Design	0.999	2	Dr. R Gnanamoorthy, IIT-Madras
97	Development of special 3D engineered fabric impregnated with graphene and speciality chemicals	0.88	1	Dr Premnath Ram Surwase, SASMIRA
98	Fabrication of multifunctional polypropylene doped graphene oxide incorporated polyaniline nanofiber for antistatic, anticorrosion and antimicrobial applications	0.36	1.5	Dr Anand Kishore Kola, NIT-Warangal
99	Development of Prototype Melt- Spinning Machine for manufacturing Tri-lobal Cross-section Bi-Component Fibers	0.993	2	Dr. J Ramkumar, IIT-Kanpur
100	Development of High- Performance Fiber- Reinforced Concrete for Building Applications	0.996	1.5	Dr. Sahil Bansal, IIT-Delhi
101	paration of cellulose-based aerogels and its composite for thermal insulation application	0.5	1.5	Ms. Komal Kukreja, BTRA
102	Development of optically responsive melt spun bi-component filaments from recycled polyesters for thermo-regulatory smart textiles	0.5	1	Dr. Archana Samanta, IIT-Delhi
103	Conversion of coal tar pitch and natural fibre (lignocellulosic biomass) to carbon fibre	0.5	15 Months	Dr. Shushil Kumar, IIT- Roorkee
104	Development of biobased phase change material (PCM) microencapsulate thermoregulating finish for active wear application	0.5	1	Dr. Md. Vaseem Chavhan, NIFT-Telangana
105	Boron-doped diamond coated corrosion-resistant carbon materials for electro-organic synthesis, energy, and clean water applications	6.99	3	Dr. Kothandaraman R, IIT-Madras
106	The Development of treated Geosynthetic reinforced Asphalt Pavements	6.53	3	Dr. Lek haz Devulapalli, BTRA
107	3D Printed Technical Textiles for Defence Exosuits: Custom Fabrics for Physiological Monitoring and Decontamination Applications	7.13	3	Prof. Sandeep Verma, IIT-Kanpur
108	Performance based design of geosynthetic reinforced soil (GRS) walls and bridge abutments for high- speed railway (HSR) subjected to seismic loading	14.89	3	Dr. Debayan Bhattacharya, IIT-Delhi
109	Development of High- Performance Woven Protective Gloves and Seamless Knitted gloves for Industrial Uses	1.21	2	Dr. G. Krishna Prasad, ICAR-CIRCOT
<b>Total Value of projects sanctioned in 5th MSG meeting</b>		<b>61.026</b>		
<b>Total Value of projects sanctioned till 6th MSG meeting</b>		<b>324.896</b>		



वस्त्र मंत्रालय  
MINISTRY OF  
**TEXTILES**

75  
Azadi Ka  
Amrit Mahotsav

# National Technical Textiles Mission (NTTM)

## Ministry of Textiles

Udyog Bhawan, Rafi Ahmed  
Kidwai Marg  
New Delhi

## Mission Directorate

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