



# **Compendium on Standards in Technical Textiles sector**

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Government of India  
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## 1. Executive summary

Technical Textiles are defined as textile materials and products used primarily for their technical performance and functional properties. Unlike conventional textiles where aesthetic value is one of the key usage considerations, Technical Textiles are used on account of their specific physical and functional properties. Technical Textiles are used individually as a stand-alone product, or as a component/part of another product to improve the performance of the product. Technical Textiles are also referred to as industrial textiles, functional textiles, performance textiles, engineering textiles, and hi-tech textiles.

Technical Textiles represent a multi-disciplinary field with numerous end-use applications. Technical textiles fabrics have application in almost all major areas of economic activity: aerospace, shipping, sports, agriculture, defense, healthcare, construction, etc. Nonwovens are the key materials used for manufacturing Technical Textile products. Nonwoven fabrics are engineered fabrics that may be a limited life, single-use fabric or a very durable fabric. Nonwoven fabrics provide specific functions such as absorbency, liquid repellence, resilience, stretch, softness, strength, flame retardancy, washability, cushioning, filtering, microbial barrier, sterility, etc. These properties are often combined to create fabrics suited for specific jobs, while achieving a good balance between product use-life and cost. They can mimic the appearance, texture and strength of a woven fabric and can be as bulky as the thickest paddings. In combination with other materials they provide a spectrum of products with diverse properties, and are used alone or as components of apparel, home furnishings, health care, engineering, industrial and consumer goods.

Some of the technical textile products require mandatory prescriptions for their use. The Expert Committee on Technical Textiles (ECTT) constituted by the Ministry of Textiles has also recommended mandatory prescriptions for certain items. One of the major deterrents for the expansion of usage of many technical textiles products is absence of standards and regulatory legislation in India. In USA and Western European countries, legislation for mandatory use of such products has led to increase in demand.

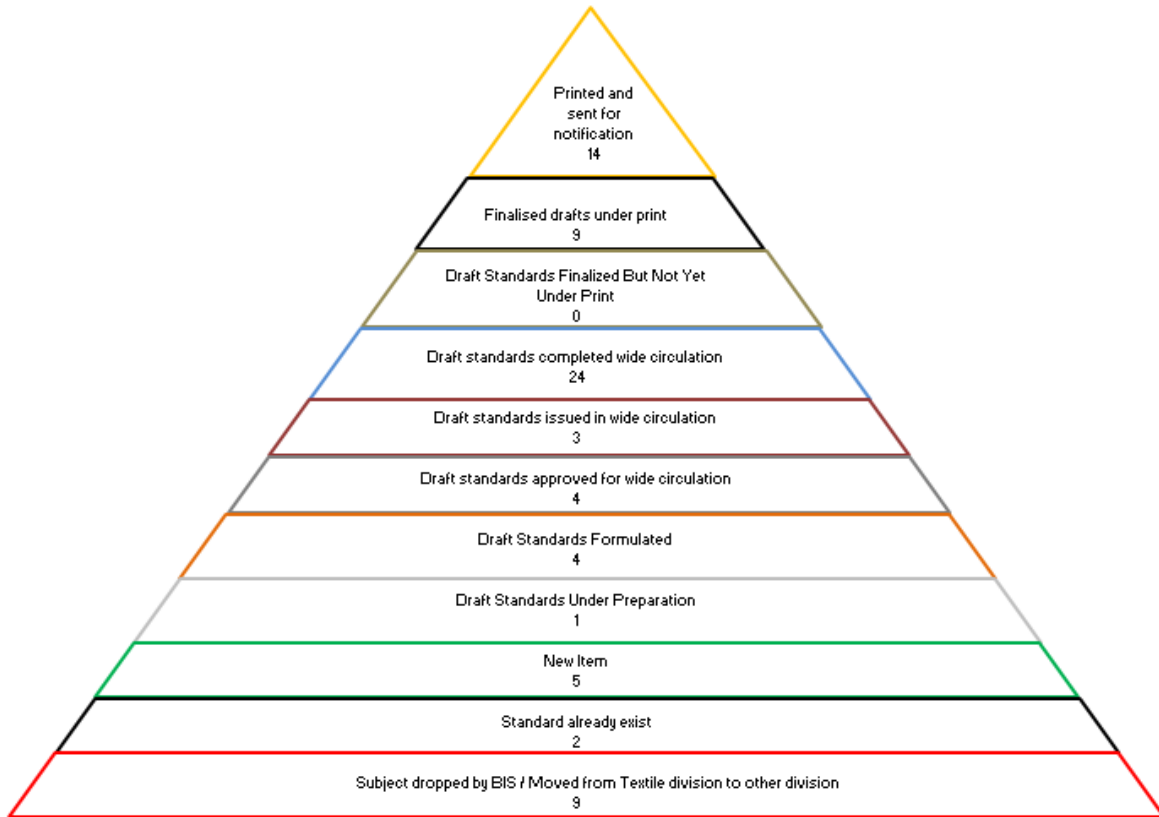
There is a need of standardization and regulation for each product category and its segment and it will also have a positive impact on the consumption of Technical Textile products. Standards are the possible way towards ensuring regulatory use of Technical Textile products. If regulations pertaining to usage are introduced in Indian context the full market potential of technical textiles may be realized in an expedited manner, as on one hand it will create a steady market whereas on the other hand the manufacturing sector will be required to upgrade itself to the level of international standards.

## a. Recent development in standards formulation for Technical Textile sector

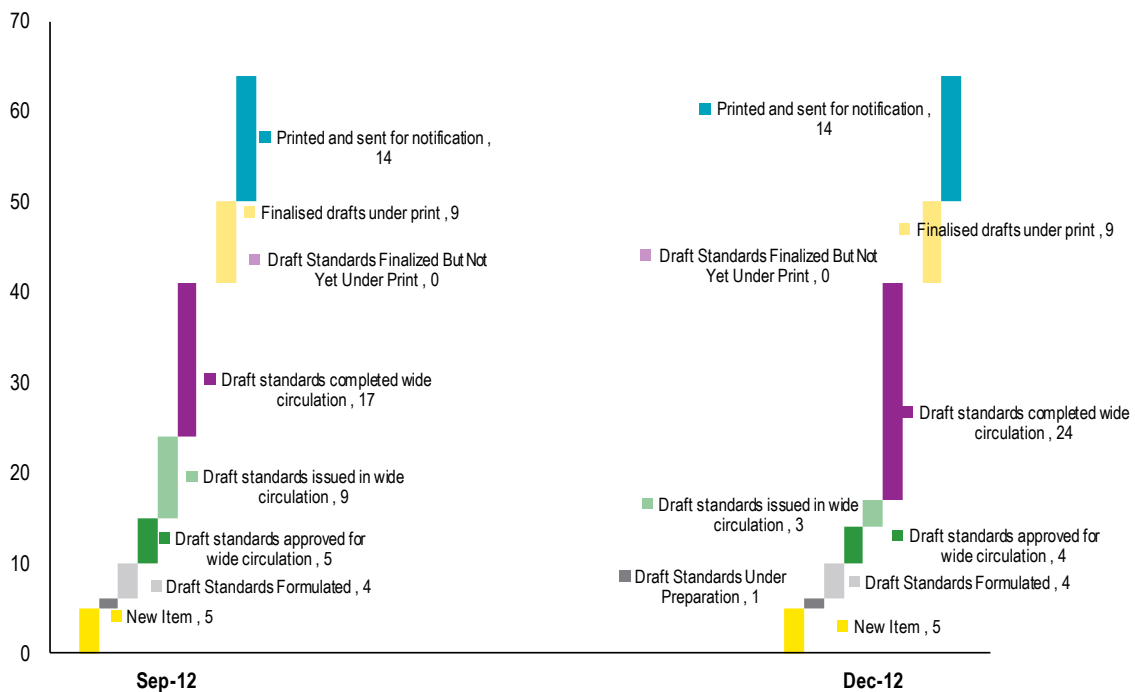
A meeting was conducted with BIS on 14<sup>th</sup> January 2013 to take the update on the progress of standard formulation. There are 10 standards with respect to Technical Textiles which are printed and sent for notification by BIS in last three quarters (March 2012-Dec 2012). Following are the details of printed standards:

1. Agro Textiles - Shade Nets for Agriculture and Horticulture Purposes – Specification: IS 16008:2012  
*(Within this standard, BIS has clubbed the specifications of 3 submitted Shade net standards, i.e. Specifications for Shade net 50%, 75% and 90% for Agriculture Application. Thus, have formulated 1 standard against 4 submitted standards)*
2. Textiles-Test Methods for Non-wovens Part 9 Determination of Drapability including Coefficient: IS 15891 (Part 9): 2012
3. Test Methods for Nonwovens Part 6 Absorption: IS 15891 (Part 6) : 2012
4. Textiles - Test Methods for Nonwovens Part 7 Determination of Bending Length: IS 15891 (Part 7) : 2012
5. Textiles - Test Methods for Nonwovens Part 8 Determination of Liquid Strike - Through Time (Simulated Urine): IS 15891 (Part 8): 2012
6. Protective clothing Part 3 Resistance of materials to penetration by liquids: IS 15758 (Part3): 2007
7. Test method for non-wovens - Part 1 Determination of mass per unit area: IS 15891 (Part 1): 2011
8. Test method for non-wovens - Part 2 Determination of thickness: IS 15891 (Part 2): 2011
9. Test method for non-wovens - Part 3 Determination of tensile strength and elongation: IS 15891 (Part 3): 2011
10. Test method for non-wovens - Part 4 Determination of tear resistance: IS 15891 (Part 4): 2011

There were 64 standards which are currently submitted to BIS for formulation out of which 14 standards (4 standards clubbed into 1 standard) are printed and sent for notification and 9 draft standards are finalized and are under print stage. The status of submitted standards to BIS is shown on subsequent page:



The most significant progress has been made at the draft standards completed wide circulation stage in last quarter (i.e. quarter ending Dec'12) vis-à-vis quarter ending Sep'2012. The progress made in last quarter with respect to standard formulation is shown below to represent the number of standards at each stage:



- ▶ There is 1 new item which has been added in the list of submitted standards to BIS for Buildtech segment.
  - a. Textiles - Synthetic Fibers for reinforcement in concrete for use in construction works
  
- ▶ Following draft Geotech Standards has completed wide circulation and draft standard will be finalized soon:
  - a. Specification for geo-textiles used in subsurface drainage application
  - b. Specification for geo-textiles for permanent erosion control in hard armor systems
  - c. Specification for geo-textiles used in subgrade separation in pavement structures
  - d. Specification for geo-textiles used in subgrade stabilization in pavement structures
  - e. Specification for geo-grids used as reinforcement of base and subbase layers in pavement
  - f. Specification for geogrids used as soil reinforcement in mechanically stabilised earth (MSE) retaining structures
  - g. Natural Fibre Geotextiles (Jute Geo Textiles) and Coir Geotextiles (Coir Bhoovastra) - Glossary of Terms for Erosion Control Products
  - h. Design practice for installation of geotextiles as pavement fabric
  - i. Guidelines for installation of geotextile used in Subsurface drainage application
  - j. Guidelines for installation of geotextile for permanent Erosion Control in Hard Armor Systems
  - k. Guidelines for installation of geotextile used in subgrade separation in pavement structures
  - l. Guidelines for installation of geogrids used as reinforcement of base and subbase layers in pavement structure
  - m. Guidelines for installation of geogrids as soil reinforcement in mechanically stabilized earth (MSE) retaining structures
  - n. PVC Geo-membranes for lining - Specification (First revision of IS 15909)
  - o. Standard Test method for Biological clogging of geotextile or soil/ Geotextile filters
  - p. Standard test method for effect of temperature on stability of geotextile
  - q. Standards practice for laboratory immersion procedures for evaluating the chemical resistance of geosynthetics to liquids
  - r. Geotextiles - method of test for grab breaking load and elongation
  
- ▶ The concern Textile Division Committee of BIS has dropped following standards:
  - a. Geosynthetics to be used in Railways: *Committee decided to drop this item*
  - b. Cellulose wadding: *Committee decided to drop this item*
  - c. Perforated film absorbent dressings: *Committee decided to drop this item*
  - d. Evaluating Light transmission percentage and shading percentage of the nets: *This standards is clubbed with shade net standards*
  - e. Standards for medical textiles: *Committee decided to drop this item*
  - f. Vapour permeable water proof plastic wound dressings: *There is very limited production of this product in India*
  
- ▶ Following standards are transferred to Petroleum, Coal and Related Products Department (PCD) of BIS given the nature of requirements:

- a. Smoke generation Part 1 Guidance on optical density testing based on ISO 5659
  - b. Smoke generation Part 2 Determination of optical density by a single chamber test based on ISO 5659 Part 2:1994
  - c. Smoke generation Part 3 Determination of optical density by a dynamic flow method based on ISO/TR 5659 Part 3:1999
- ▶ Standards for “Evaluating Degradation of textiles to Accelerated UV exposure” and “Fishing nets – Methods for the determination of mesh size” already exist and corresponding standards are IS 13162 (part 2): 1991 and IS 15788: 2008 respectively.

## 2. Overview

### 2.1 INTRODUCTION TO TECHNICAL TEXTILES

Technical Textiles are materials and products used primarily for their technical performance and functional properties. Technical Textiles represent a multi-disciplinary field with numerous end-use applications. Technical Textiles are used individually or as a component/part of another product to improve the performance of the product. Technical Textiles are also referred to as industrial textiles, functional textiles, performance textiles, engineering textiles, and hi-tech textiles.

Technical Textile has become a major segment globally because of several advantages like functional requirement, health and safety, cost effectiveness, durability, high strength etc. The global Technical Textile has shown an increase in consumption from 25% (1998) to 37% (2010). The largest segments are Mobiltech, Indutech and Sportech and they contribute to about 55-57% of the total Technical Textiles on a global basis, presently.

The global market size of Technical Textile in 2010 was estimated to be INR5.72 trillion (US\$ 127 billion<sup>1</sup>), which has grown at an annual rate of approximately 3% since 2005. In India, the market size of Technical Textile sector is estimated to be INR570 billion (US\$12.67 billion<sup>1</sup>) in 2010-11, which has grown at an annual growth rate of 11% since 2007-08. Within Technical Textiles, segments of Packtech, Clothtech and Hometech capture two-thirds of the market, while share of Oekotech, Geotech and Agrotech is almost negligible.

India is yet to find a significant place in global Technical Textile market. Although slow, but a perceptible sign of growth has been observed in a few specialized fields in Indian Technical Textile consumption and contribution. Consumption of certain medical and health care textiles is growing in the country. With emerging trends, it is expected that the consumption of Technical Textiles in India will far outpace that in other developed countries. However, a lot needs to be done on various fronts in India to attain this growth level.

#### *Classification*

Technical Textiles represent a multi-disciplinary field with numerous end-use applications. This industry has penetrated major areas of economic activity: aerospace, shipping, sports, agriculture, defense, healthcare, construction, etc. Depending on the product characteristics, functional requirements and end-user applications, the highly diversified range of Technical Textile products have been classified into following 12 categories.

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<sup>1</sup> exchange rate of US\$1 = INR45 has been used for this document



**Figure 1: Segments of Technical Textiles**



## 2.2 NECESSITY OF STANDARDS

One of the major deterrents for expansion of technical textile market in India is the absence of standards and regulatory legislation. Standards, as a driving factor in the Technical Textile business, are the framework for any manufacturer of Technical textile products. There is a need of standardization and regulation for each product category and its segment and it will also have a positive impact on the consumption of Technical Textile product in India. Standards are the possible way towards ensuring regulatory use of Technical Textile products. Without having standards in place the regulatory framework cannot be developed or implemented to the fullest. The standards become more critical from the aspect that several technical textile products have crucial application in infrastructure, live saving applications, personal protection, etc.

Standards are the first step towards ensuring regulatory use of technical textile products. For instance, in **Geotech**, as a general practice worldwide, the works/contracts awarded by the respective authorities mandate the use of geotextile for the work wherein the kind, standard and the amount of the geotextile to be used for the particular work are also specified. In Europe, CE marking has been made mandatory for the geotextile products to be supplied for public works. These requirements have been introduced to standardize test methods throughout Europe and provide a consistent framework for the specification of geotextiles based on their application.

Similarly, in **Protech** segment there are regulations mandating the use of personal protective clothing /equipment in most of the developed countries. However, each of the mandated product / component is also specified as per certain standards. Like in USA, the federal regulations mandate the use of personal protective equipments (PPE) under —Occupational Health and Safety Act (OHSA) wherein an employer is obliged to provide for its employee safety by means of using standardized personal protective equipment. Similar acts and rules exist elsewhere in developed countries of EU, Australia, South Africa, etc. which mandates the use of Technical Textiles, as depicted below.

US	Europe
<p>In U.S, federal regulations mandate the use of personal protective equipments (PPE) under —Occupational Health and Safety Act (OHSA). The highlights of the OHSA regulations related with PPEs are as follows:</p> <ul style="list-style-type: none"> <li>▶ The act obliges an employer to eliminate any reasonably foreseeable risk to the health and safety of any person at the place of work. If it is not reasonably practicable to eliminate the risk, the employer is mandated to control the risk and the usage of PPE is advised and recommended for the same.</li> <li>▶ The act mandates the employer to provide and ensure the use of protective equipment at the place of work wherever it is necessary by reason of hazards of processes or environment, chemical hazards, radiological hazards, or mechanical irritants encountered in a manner capable of causing injury or impairment in the function of any part of the body through absorption, inhalation or physical contact. The act also mandates the equipment to be maintained in a sanitary and reliable condition.</li> <li>▶ In case the employees provide their own protective equipment, the employer shall be responsible to assure its adequacy, including proper maintenance, and sanitation of such equipment.</li> <li>▶ The Regulation also mandates the use of particular types of PPE in certain circumstances as a means of control. This include use of harnesses in elevated work platforms and use of specific types of PPE in asbestos removal processes</li> </ul>	<p>In Europe, the Personal Protective Equipment at Work Regulations act governs and mandates the use of PPEs at the workplace. The regulations are somewhat similar to those in OHSA. Following points summarizes the act</p> <ul style="list-style-type: none"> <li>▶ The regulations mandate the employers to provide free of charge PPEs to his employees who may be exposed to a risk to their health or safety while at work except where and to the extent that such risk has been adequately controlled by other means which are equally or more effective.</li> <li>▶ The regulation also mandates the use of PPEs by self-employed persons.</li> <li>▶ The law also mandates the employer to take into account the seriousness and frequency of the risk when deciding on the frequency of use of PPE.</li> <li>▶ The law also states the requirements for compatibility, assessment, maintenance, and accommodation etc. of the PPEs.</li> <li>▶ The regulation applies to and mandates the usage of PPEs like safety helmets, gloves, eye protection and high-visibility clothing, Safety footwear, chemical protective clothing, thermal protection clothing etc.</li> </ul>

South Africa	Australia
<p>The South African Department of Health has a protective clothing policy for radiation control. The policy regulates the use of protective clothing at the places having radiological emission. The policy mandates the use of:-</p> <ul style="list-style-type: none"> <li>▶ Protective aprons (workers)</li> <li>▶ Protective gloves (workers)</li> <li>▶ Thyroid shields for patients and radiation workers</li> <li>▶ Gonad shields for patients</li> </ul>	<p>In Australia, “Motorcycling Australia”, the governing body of motorcycle sport, encourages and recommends the use of PPEs for all motorcycle activities. But, the body does not support the mandatory imposition of the use of protective clothing. The body also supports enforcement and registration authorities which act to encourage the use of protective equipment by motorcyclists. The body has taken a number of initiatives for the same, including the following:</p> <ul style="list-style-type: none"> <li>▶ The body supports the removal of GST and all other taxes on CE Standards approved protective clothing with a belief that this will reduce the price of protective clothing.</li> <li>▶ It supports the adoption of the CE standards for impact protection, back protectors, protective clothing, protective footwear and stone and debris shields by all manufacturers.</li> <li>▶ It supports the prosecution of any person or organisation importing or selling protective clothing which purports to meet any Standard but does not.</li> <li>▶ The institute also supports the prosecution of any person or organisation importing, manufacturing or selling labels which are intended to mislead as to compliance of any protective equipment with a Standard.</li> </ul>

The establishment of standards for key technical textile products will provide Indian authorities a foothold to start moving towards a regime of mandatory usage regulation. The user industry which is largely dependent on imports for such products will also be able to ensure the quality of products which are manufactured as per the standards. This will create a pull for technical textile products and lead to the overall development of the sector.

### 3. Existing Standards

<b>PROTECH</b>		
<b>S. No</b>	<b>BIS Standard</b>	<b>Description</b>
1.	IS 11871:1986	Methods for determination of flammability and flame resistance of textile fabrics
2.	IS 12467(Part 1):2005	Textiles - Assessment of the ignitability of upholstered furniture - Part 1 - Ignition source smouldering cigarette (Superseding IS 12467)
3.	IS 12467(Part 2):2005	Textiles - Assessment of the ignitability of upholstered furniture - Part 2 - Ignition source: match-flame equivalent
4.	IS 12722:1989	Textile floor coverings - determination of flame resistance by Tablet test.
5.	IS 13501:1992	Textiles - Determination of flammability by oxygen index
6.	IS 15589:2005 / ISO 6940:2004	Textiles fabrics - Burning behaviour – Determination of ease of ignition of vertically oriented specimens
7.	IS 15590:2005 / ISO 6941:2003	Textile fabrics - Burning behaviour - Measurement of flame spread properties of vertically oriented specimens
8.	IS 15612(Part 1):2005	Textiles - Burning behaviour of curtains and drapes - Part 1 - Classification scheme
9.	IS 15612(Part 2):2005	Textiles - Burning behaviour of curtains and drapes - Part 2 - Measurement of flame spread of vertically oriented specimens with large ignition source
10.	IS 15612(Part 3):2005	Textiles - Burning behaviour of curtains and drapes - Part 3 - Method for determining the ignitability of vertically oriented specimens(small flame)
11.	IS 15612(Part 4):2005	Textiles - Burning behaviour of curtains and drapes - Part 4 - Method of determining the flame spread of vertically oriented specimens
12.	IS 15727(Part 1):2007 / ISO 12952-1 : 1998	Textiles - Burning behaviour of bedding items - Part 1: General test methods for the ignitability by smouldering cigarette
13.	IS 15727(Part 2):2007 / ISO 12952-2 : 1998	Textiles - Burning behaviour of bedding items - Part 2 - Specific test methods for the ignitability by a smouldering cigarette
14.	IS 15727(Part 3):2007 / ISO 12952-3 : 1998	Textiles - Burning behaviour of bedding items - Part 3 : General test methods for the ignitability by a small open flame
15.	IS 15727(Part 4):2007 / ISO 12952-4: 1998	Textiles - Burning behaviour of bedding items - Part 4: Specific test methods for the ignitability by a small open flame
16.	IS 15741: 2007	Textiles - Resistance to ignition of curtains and drapes - Specification (Based on EN)
17.	IS 15742:2007	Textiles - Requirements for clothing made of limited flame

		spread materials and material assemblies affording protection against heat and flame - Specification(Based on EN)
18.	IS 15748:2007	Textiles - Protective clothing for industrial workers exposed to heat (excluding firefighters' and welders' clothing)
19.	IS 15758(Part 3):2007	Textiles - Protective clothing Part 3 Resistance of materials to penetration by liquids
20.	IS 15758(Part 1):2007 / ISO 9151 : 1995	Textiles - Protective clothing Part 1 Method of determining of heat transmission on exposure to flame
21.	IS 15758(Part 2):2007 / ISO 6942 : 2002	Textiles - Protective clothing Part 2 Assessment of material assemblies when exposed to source of radiant heat
22.	IS 15758(Part 4):2007 / ISO 15025 : 2000	Textiles - Protective clothing Part 4 Test method for limited flame spread
23.	IS 15758(Part 5):2007 / ISO 9185 : 1990	Textiles - Protective clothing - Part 5 Assessment of resistance of materials to molten metal splash
24.	IS 15764:2008	Textiles - Determination of the burning behaviour of textile floor coverings
25.	IS 15768:2007	Textiles - Resistance of ignition of upholstered composite used for non-domestic furniture(Based on EN)
26.	IS 15781:2007	Textiles - Method for determination of flammability of blankets
27.	IS 15782:2007	Textiles - Method for determining deterioration of visibility due to smoke released on combustion of materials

## GEOTECH

S. No	BIS Standard	Description
1.	IS 13162 (Part 2):1991	Geotextiles - Methods of test Part 2 Determination of resistance to exposure of ultra-violet light and water (Xenon arc type apparatus)
2.	IS 13162 (Part 3):1992	Geotextiles - Methods of test Part 3 Determination of thickness at specified pressure
3.	IS 13162 (Part 4):1992	Geotextiles - Methods of test Part 4 Determination of puncture resistance by falling cone method
4.	IS 13162 (Part 5):1992	Geotextiles - Methods of test Part 5 Determination of tensile properties using a wide width strip
5.	IS 13321(Part 1):1992	Glossary of terms for geosynthetic Part 1 Terms used in materials and properties
6.	IS 13325:1992	Method of tests for determination of tensile properties of extruded polymer geo-grids using the
7.	IS 13326(Part 1):1992	Method of test for evaluation of interface friction between geo-synthetic and soil Part 1 Modified direct shear technique
8.	IS 14293:1995	Geotextiles - Method of test for trapezoid tearing strength
9.	IS 14294:1995	Geotextiles - Method for determination of apparent opening size by dry sieving technique

10.	IS 14324:1995	Geotextiles - Methods of test for determination of water permeability-permittivity
11.	IS 14706:1999	Geotextiles - Sampling and preparation of test specimen
12.	IS 14714:1999	Geotextiles-Determination of abrasion resistance
13.	IS 14715:2000 (Standards to be revised)	Woven jute geotextiles – Specification
14.	IS 14716:1999 /ISO9864:1990	Geotextiles- Determination of mass per unit area
15.	IS 14739:1999	Geotextiles - Methods for determination of creep
16.	IS 14986:2001	Jute geo-grid for rain water erosion control in road and railway embankments and hill slopes
17.	IS 15060:2001 /ISO 10321:1992	Geotextiles - Tensile test for joints/seams by wide width method
18.	IS 15868(Part 1):2008	Natural Fibre Geotextiles (Jute Geotextiles and Coir Bhoovastra) Methods of Test - Part 1 Determination of Mass Per Unit Area
19.	IS 15868(Part 2):2008	Natural Fibre Geotextiles (Jute Geotextiles and Coir Bhoovastra) Methods of Test - Part 2 Determination of Thickness
20.	IS 15868(Part 3):2008	Natural Fibre Geotextiles (Jute Geotextiles and Coir Bhoovastra) Methods of Test - Part 3 Determination of Percentage of Swell
21.	IS 15868(Part 4):2008	Natural Fibre Geotextiles (Jute Geotextiles and Coir Bhoovastra) Methods of Test - Part 4 Determination of Water Absorption Capacity
22.	IS 15868(Part 5):2008	Natural Fibre Geotextiles (Jute Geotextile And Coir Bhoovastra) - Methods of Test - Part 5 Determination of Smoldering Resistance
23.	IS 15868(Part 6):2008	Natural Fibre Geotextiles (Jute Geotextiles and Coir Bhoovastra) Methods of Test - Part 6 Determination of Mesh Size of Coir Geotextiles by Overhead Projector Method
24.	IS 15869:2008	Textiles-open weave coir bhoovastra-specification
25.	IS 15871:2009	Use of coir geotextiles(coir bhoovastra) in unpaved roads
26.	IS 15909:2010	PVC Geo membranes for lining specification
27.	IS 15910:2010	Geo-Synthetics For Highways - Specification

<b>AGROTECH</b>		
<b>S. No</b>	<b>BIS Standard</b>	<b>Description</b>
1.	IS 15351:2008	Textiles- Laminated high density polyethylene (HDPE) woven fabric (Geo-membrane) for water proof lining (First revision)
2.	IS 15907:2010	Agro textiles - High Density Polyethylene (HDPE) Woven Beds for Vermiculture - Specification

3.	IS 4401:2006	Textiles-Twisted nylon fishnet twines (fifth revision)
4.	IS 4402:2005 /ISO 1107:2003	Textiles - Fishing nets - Netting - Basic terms and definitions (second revision)
5.	IS 4640:1993 /ISO 858:1973	Fishing nets - Designation of netting yarns in the tex system (first revision)
6.	IS 4641:2005 /ISO 1530:2003	Textiles - Fishing nets - Description and designation of knotted netting (second revision)
7.	IS 5815(Part 4):1993 /ISO 1805:1973	Fishing nets: Determination of breaking load and knot breaking load of netting yarns (first revision)
8.	IS 5815(Part 5):2005 /ISO 1806:2002	Textiles - Fishing nets - Determination of mesh breaking force of netting (second revision)
9.	IS 5815(Part 6):1993 / ISO 3090:1974	Netting yarns - Determination of change in length after immersion in water (first revision)
10.	IS 5815(Part 7):1993 / ISO 3790:1976	Fishing nets - Determination of elongation of netting yarns (first revision)
11.	IS 6348:1971	Basic terms for hanging of netting
12.	IS 6920:1993 /ISO 1532:1973	Fishing nets - Cutting knotted netting to shape ('Tapering')
13.	IS 8746:1993 /ISO 3660:1976	Fishing nets - Mounting and joining of netting - Terms and illustrations (first revision)
14.	IS 9945:1999	Fishing nets - Method for determination of taper ratio and cutting rate (first revision)
15.	IS 15788:2008	Fishing nets - Method of test for determination of mesh size - Opening of mesh
16.	IS 15789:2008	Fishing nets - Method of test for determination of mesh size - Length of mesh
17.	IS 5508 (Parts 1 to 24)	Guides for fishing gears
18.	IS 7533:2003	Polyamide monofilament line for fishing
19.	IS 14287:1995	PP Multifilament netting twine
20.	IS 6347:2003	PE Monofilament twine for fishing
21.	IS 16008:2012	Agro Textiles - Shade Nets for Agriculture and Horticulture Purposes – Specification <i>(Clubbed the specifications of 3 Shade net standards, i.e. Specifications for Shade net 50%, 75% and 90% for Agriculture Application. Thus, have 1 standard against 4 proposed standards)</i>

<b>MEDITECH</b>		
<b>S. No.</b>	<b>BIS Standard</b>	<b>Description</b>
1.	IS 1097:1979	Handloom cotton mosquito netting (first revision)
2.	IS 674:1987	Specification for flannel, hospital, grey (third revision)
3.	IS 757:1971	Specification for handloom cotton lint, absorbent, bleached (first revision)
4.	IS 758:1988	Specification for handloom cotton gauze, absorbent, non-

		sterilized (fourth revision)
5.	IS 863:1988	Specification for handloom cotton bandage cloth, non-sterilized (second revision)
6.	IS 1143:1973	Cotton mosquito netting, square mesh (first revision)
7.	IS 1431:1973	Specification for cotton mosquito netting, round mesh (first revision)
8.	IS 1681:1998	Textiles - Hospital blankets, woollen, dyed - Specification (third revision)
9.	IS 6237:1971	Specification for handloom cotton cloth for plaster of paris bandages and cut bandages
10.	IS 10054:1996	Textiles - High density polyethylene (HDPE) monofilament mosquito netting, round mesh - Specification (first revision)
11.	IS 11046:1984	Towel, operating
12.	IS 12839:1989	Wool/polyamide blended flannel, hospital grey - Specification

## SPORTECH

S. No	BIS Standard	Description
1.	IS 2150: 1989	Fabrics for Men's and Boys' Woven Dress-Suit, Sportswear, Jacket, Slack and Trouser - Specification
2.	IS 6590:1972	Specification for braided nylon ropes for mountaineering purposes
3.	IS 4375:1975	Cotton knitted sports shirts
4.	IS 14358:1996	Textiles - Nylon laces for shoes and boots – Specification
5.	IS 2965:1987	Breaking cord for cotton parachutes (first revision)
6.	IS 2970:1987	Cotton fabrics for supply-dropping parachutes (first revision)
7.	IS 3449:1984	Cotton webbing for parachutes (second revision)
8.	IS 4726:1984	Light-weight nylon fabric for personnel parachutes (first revision)
9.	IS 14564:1998	Textiles - Cotton tapes for personnel parachutes – Specification
10.	IS 8991:1978	Specification for nylon fabrics for sleeping bags
11.	IS 7609:1988	General requirements for tents (first revision)
12.	IS 10321(Part 1): 1982	Specification for 50-kg tents – General
13.	IS 10321(Part 2): 1982	Specification for 50-kg tents - Outer fly
14.	IS 10321(Part 3): 1982	Specification for 50-kg tents - Inner fly
15.	IS 12989: 2010 / ISO 5912: 2003	Textiles-Camping tents- Specification
16.	IS 14445: 1997	Textiles - Fabrics for awnings and camping tents - Specification.
17.	IS 12991: 2005 / ISO 7152: 1997	Textiles Camping tents and caravan awnings - vocabulary and list of equivalent terms
18.	IS 14351:1996	Textiles-Ground sheets (Light weight)-Specification



19.	IS 3345:1989	Sports nets (first revision)
20.	IS 3800:1983	Batting gloves (first revision)
21.	IS 3874:1987	Boxing gloves (first revision)
22.	IS 8404(Part 2):1979	Fixed playground equipment for schools: Part II - Climbing ropes

<b>INDUTECH</b>		
<b>S. No.</b>	<b>BIS Standard</b>	<b>Description</b>
1.	IS 1178:1986	Cotton Filter Cloth
2.	IS 1422:1983	Specification For Cotton Duck
3.	IS 1424:1983	Specification For Cotton Canvas
4.	IS 1719:2000	Industrial Textile-Pressed Wool Felt
5.	IS 4388:1982	Specification For Cotton Fabrics For Reinforcement Of Rubber Hoses
6.	IS 5996:1984	Specification For Cotton Belting Ducks
7.	IS 9293:1991	Textiles - Canvas, Flax - Specification
8.	IS 11574:1986	Specification For Polyamide Filter Cloth
9.	IS 11575:1986	Specification For Polyester Filter Cloth
10.	IS 11915:1986	Specification For Nylon Fabric For Making Mountaineering Equipment
11.	IS 11986:2003	Industrial Textiles - Cotton Backing Cloth For Abrasives
12.	IS 12020 (Part 1):1987	Polypropylene Filter Cloth: Part I - Filter Cloth From Spun-Polypropylene Yarn
13.	IS 12384:1988	Specification For Rayon Duck For Industrial Use
14.	IS 12415:1988	Specification For Polyamide Duck For Industrial Use
15.	IS 12416:1988	Specification For Polyester/Cotton Belting Ducks
16.	IS 13510:2000	Duck, Polyester/Cotton Blended, Rip Stop
17.	IS 15595:2005	Industrial Textiles - Bonded Fabrics For Air Filtration
18.	IS 15891 (Part 1) : 2011	Test method for non-wovens - Part 1 Determination of mass per unit area
19.	IS 15891 (Part 2) : 2011	Test method for non-wovens - Part 2 Determination of thickness
20.	IS 15891 (Part 3) : 2011	Test method for non-wovens - Part 3 Determination of tensile strength and elongation
21.	IS 15891 (Part 4) : 2011	Test method for non-wovens - Part 4 Determination of tear resistance
22.	IS 15891 (Part 6) : 2012	Test Methods for Nonwovens Part 6 Absorption
23.	IS 15891 (Part 7) : 2012	Textiles - Test Methods for Nonwovens Part 7 Determination of Bending Length
24.	IS 15891 (Part 8): 2012	Textiles - Test Methods for Nonwovens Part 8 Determination of Liquid Strike - Through Time (Simulated Urine)

25.	IS 15891 (Part 9): 2012	Textiles-Test Methods for Non-wovens Part 9 Determination of Drapability including Coefficient
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<b>COMPOSITES</b>		
<b>S. No</b>	<b>BIS Standard</b>	<b>Description</b>
1.	IS 13360 Part 5 : Sec 25	Plastic - Methods of Testing - Part 5 : Mechanical Properties - Section 25 :Determination of Tensile Properties - Test Conditions for Isotropic and Orthotropic Fibre-Reinforced Plastic Composites
2.	IS 15768:2007	Textiles - Resistance of ignition of upholstered composite used for non-domestic furniture(Based on EN)
3.	IS 10661: 1983	Specification for Glass Fibre Reinforced Polyester Chemical Resistant Tanks
4.	IS 12701: 1996	Rotational moulded polyethylene water storage tanks
5.	IS 14399: Part 1 & 2	Hot Press Moulded Thermosetting Glass Fibre Reinforced Polyester Resin (GRP) Sectional Water Storage Tanks : Part 1 palels, Part 2: Guidelines for assembly, installation and test
6.	IS 11852: Part 1 to 8: 2001	Automotive Vehicles - Brakes and Braking Systems - Part 1 to 8
7.	IS 11852: Part 9: 2003	Automotive Vehicles - Brakes and Braking Systems - Part 9
8.	IS 2742: Part 1,3,4& 5: 1994	Automotive Vehicles - Brake Linings
9.	IS 2742: Part 2: 1994	Automotive Vehicles - Brake Linings
10.	IS 3302: 1986	Backing sheet for Stencil
11.	IS 11504: 1985	Criteria for structural design of reinforced concrete natural draught cooling towers
12.	IS 5746: Part 1: 1987	Woven Glass Fibre Fabrics for Plastic Laminates for Aerospace Purposes – Part 1: Loom-State Fabrics
13.	IS 5746: Part 1: 1987	Woven Glass Fibre Fabrics for Plastic Laminates for Aerospace Purposes – Part 2: Desized Fabrics
14.	IS 5746: Part 1: 1987	Woven Glass Fibre Fabrics for Plastic Laminates for Aerospace Purposes – Part 3: Finished Fabrics for use with Polyester Resin Systems
15.	IS 5746: Part 1: 1987	Woven Glass Fibre Fabrics Plastic Laminates for Aerospace Purposes - Part 1 : Loom-state Fabrics
16.	IS 5746: Part 2: 1987	Woven Glass Fibre Fabrics for Plastic Laminates for Aerospace Purposes - Part 2 : Desized Fabrics
17.	IS 5746: Part 3: 1987	Woven Glass Fibres Fabric for Plastic Laminates for Aerospace Purposes - Part 3 : Finished Fabrics for Use with Polyester Resin Systems
18.	IS 11273: 1992	Woven roving fabrics of 'E' glass fibre
19.	IS 5352(Part 2):1999	Textiles - Glass and Glass-Polyester Fibre Woven Tapes - Part 2 : Methods of Test

20.	IS 11320: 1997	Glass fibre rovings for the reinforcement of polyester and of epoxide resin systems
21.	IS 11551: 1996	Glass fibre chopped strand mat for the reinforcement of epoxy, phenolic and polyester resin systems
22.	IS 6746: 1994	Unsaturated Polyester Resin Systems – Specification
23.	IS 12709 : 1994	Glass fibre reinforced plastics (GRP) pipes, joints and fittings for use for potable water supply — specification
24.	IS 14402 : 1996	Glass fibre reinforced plastics (GRP) pipes, joints and fittings for use for sewerage, industrial waste and water (other than potable) — specification

## 4. Standards Committees

The non-availability of standards of technical textiles in Indian context is one of hindrance in growth of technical textile sector in India, as it is being discussed at various forums. Bureau of Indian Standards (BIS) is the empowered organization in the country for notification of the standards. In order to quicken the process of notification of standards of technical textile by BIS, Office of Textile Commissioner in its endeavor has constituted Committees for Standards one each at four of its Centers of Excellence(COEs) in their respective segments, with the Director of respective COE as convener. These committees are entrusted to formulate the draft standards in their respective segment, so that same could be sent to BIS for further action.

Following is the composition of the four standards committees for Geotech, Agrotech, Meditech and Protech:

### 1. Composition of the Geosynthetics Committee:

Sl. No	Name and Address	
(i)	Mr. M. Venkataraman Advisor, Geosynthetics Division, Garware Wall Ropes Ltd, Plot No.11, Block No.D-1, MIDC Chinchwad, Pune 411 019 Tel: 020-30780000, 30780150 Fax: 020-30780350 Email: <a href="mailto:mvenkataraman@garwareropes.com">mvenkataraman@garwareropes.com</a>	Member
(ii)	Mr.V.V. Vaishampayan Manging Director, Sohams Foundation Engg. Pvt. Ltd 301-303, Thapar Complex, Sector 15, CBD Belapur Navi Mumbai 400 614. Tel:022-27574038, 27565562/0882 Fax: 022-27564944 Email: <a href="mailto:sohamsfoundation@vsnl.net">sohamsfoundation@vsnl.net</a>	Member
(iii)	Mr. Narendra Dalmia Director Strata Geosystems (India) Pvt.Ltd 317, Tantia Jagani Industrial Premises, J.R. Boricha Marg Lower Parel (E), Mumbai 400 001. Tel: 022-40635100 Fax: 022-40635199 Email: <a href="mailto:nd@strataindia.com">nd@strataindia.com</a>	Member

Sl. No	Name and Address	
(iv)	<p>Sanjay Mendiratta  Director  Applications Engg. &amp; Marketing  Archana Structural engg (India) Pvt. Ltd.,  D-233/1, T.T.C. Industrial Area,  Shiravane, Mumbai – Pune Road, Nerul, Navi Mumbai 400706.  Tel: 0755-2469496, 2469497  Fax: 0755-2469498  Email: <a href="mailto:aseipl@sancharnet.in">aseipl@sancharnet.in</a></p>	Member
(v)	<p>Mr. Anant Kanoi  Managing Director,  Techfab (India) Ind.Ltd  712, embassy Centre,  Nariman Point, Mumbai 400 021  Tel: 022-22876224, 22839733  Fax: 022-22876218  Email: <a href="mailto:anant@techfabindia.com">anant@techfabindia.com</a></p>	Member
(vi)	<p>Mr. Roli Jindal  Business Manager,  D.I. Dupont India P. Ltd  7<sup>th</sup> Floor, Tower C, DLF Cyber Greens  Sector 25A DLF City,  Phase III, Gurgaon 122002, Haryana  Tel: 0124-4091818, Fax: 0124-2540889  Email: <a href="mailto:roli.jindal@ind.dupont.com">roli.jindal@ind.dupont.com</a></p>	Member
(vii)	<p>Dr. S.Y. Mhaiskar  Joint Principal, Prof. &amp;  HOD Civil engg. Dept  Sardar Patel college of Engg.,  Munshi Nagar, Andheri (W),  Mumbai 400 058  Tel: 022-26232192, 26289777 (M) 9820422602  Fax: 022-26237819  Email: <a href="mailto:Sharad_55@yahoo.co.uk">Sharad_55@yahoo.co.uk</a></p>	Member
(viii)	<p>Mr. Anand Katti  Principal,  Datta Meghe College of Engineering  Sector 3, Airoli, Navi Mumbai 400708  (M) 9820285967 Email: <a href="mailto:kattianand@hotmail.com">kattianand@hotmail.com</a></p>	Member
(ix)	<p>Mr.C.K. Choudhary  Supreme Nonwovens  6-3-1149/3, Pussy Plaza  Top floor, B.s. Makta, Begumpeth  Hyderabad 500 016  Email: <a href="mailto:c.chaudhary@supremegroup.co.in">c.chaudhary@supremegroup.co.in</a></p>	Member

Sl. No	Name and Address	
(x)	Mr. T. Sanyal, Geotechnical Advisor Jute Manufactures Development Council 3A Park Plaza, 71 Park Street, Kolkata 700 016 Phone: (91 33) 2217 2107, 2226 3438, 22172540 Fax: (91 33) 2217 2456 E mail: <a href="mailto:jmdc@giasl01.vsnl.net.in">jmdc@giasl01.vsnl.net.in</a> , <a href="mailto:jmdcindia@vsnl.com">jmdcindia@vsnl.com</a>	Member
(xi)	Dr M K Talukdar Kusumgar Corporates Private Limited 101, Manjushree, V.M. Road, J.V.P.D., Vile Parle(West), Mumbai – 400 056. Maharashtra, INDIA. Tel: +91 22 61125119 / 100 Fax: +91 22 26115651 Cell: 09987267005 email: <a href="mailto:mktalukdar@kusumgar.com">mktalukdar@kusumgar.com</a>	Member
(xii)	Shri J.C.Parihar Sr. Executive Director or his representative Geo-technical Engineering RDSO, Manak Nagar, Lucknow – 226 011 Phone no 91-522-2451200/2450567 Fax no 91-522-2458500 Email: <a href="mailto:edge@rdso.railnet.gov.in">edge@rdso.railnet.gov.in</a>	Member
(xiii)	Sh.Guru Vittal Scientist,Geotechnical Engg. Division. CRRI,PO CRRI,Delhi,Mathura Road, New Delhi Ph.09868858380 Fax-011-26845943 & 26830480	Member
(xiv)	Mr. Sharad Varshney Addl.Director (Technical) Indian roads Congress Sector 6, (Near RBI Quarters) R.K. Puram New Delhi 110 022 Tel : 011-26185303 Fax : 011-26183669 Email : <a href="mailto:secretarygen@irc.org.in">secretarygen@irc.org.in</a>	Member
(xv)	Mr.V.G. Bhawe Chief Research Officer Central Water and Power Research Station Khadakwasla, Pune 411 024 Email : <a href="mailto:wapis.mah@nic.in">wapis.mah@nic.in</a> ; <a href="mailto:vgbhawe@gmail.com">vgbhawe@gmail.com</a> Fax : 020-24381004	Member

Sl. No	Name and Address	
(xvi)	Dr. A.N.Desai, Director, The Bombay Textile Research Association, Lal Bahadur Shastri Marg, Ghatkopar(W), Mumbai-400086 Email: btra@vsnl.com.	Convener

## 2. Composition of the Agro textiles Committee:

Sl. No	Name and Address	
(i)	Shri. Amitkumar Agarwal, Managing Director CTM Technical Textiles Ltd. 205, New Cloth Market, Ahmedabad-380 002, Gujarat Email: info@ctmagrotextiles.com	Member
(ii)	Shri M. Venkataraman, Advisor (Geosynthetics Division), Garware-Wall Ropes Ltd., Plot No.11, Block No.D-1, MIDC, Chinchwad, Pune – 411019, Tel. : 020-30780150 / 27481613, Fax : 020-30780350, E-mail : mvenkatraman@garwareropes.com	Member
(iii)	Dr. Pritam Chandra, Director Central Institute of Agriculture Engineering, Nabi Bagh, Berasia Road, Bhopal – 462038 Phone: (Off.) 0755 – 2737191	Member
(iv)	Shri Khetan Chandrakant/or his representative, Entremonde Polyesters Ltd., C-17, Frist Floor Kilfire House Dalai Industries Area,Andheri,,Mumbai Email:entremonde@vsnl.com	Member
(v)	Dr. V. K. Kothari, Professor, Department of Textile Technology, IIT, Delhi Email: kothari@textile.iitd.ac.in	Member
(vi)	Shri Nitin Bhojani, Partner, B & V Agro, A-508, Mahape Village MIDC TTC Post Ghansoli, Mumbai Mobile: -9920562280, 9820182270.	Member
(vii)	Dr.S.K. Basu Director MANTRA Near Textile Market Telephone Exchange, Ring Road, Surat 395 002 Tel:(0261) 2323211, 2337062, Telefax:(0261) 2322500 E-mail:director@mantrasurat.org Website:www.mantrasurat.org	Member

Sl. No	Name and Address	
(viii)	Mr. Sunil Trivedi Neocorp International 62/63, Industrial Area, Near BSNL Pithampur'Phone: 0731-4211944	Member
(ix)	Dr. R. G. Patil, Head, Water & Soil Management Department Navsari Agricultural University, NAU, Eru Char Rasta, Navsari. Phone: 09427343511	Member
(x)	Shri R.K. Agarwal Assistant Director National Horticulture Board Ministry of Agriculture, Govt.of India 3rd Floor, MECL Complex, Seminary Hills, Near T.V. Tower Nagpur-440006,Phone: 0712-2513030	Member
(xi)	Shri U. K. Gangopadhyay, Director Silk & Art Silk Mills Research Association, Dr. Annie Besant Road, Mumbai - 400 025, Tel. : 022-24903461, Fax : 022-24530225, E-mail : sasmira@vsnl.com	Convener

### 3. Composition of the Medical textiles Committee:

Sl. No	Name and Address	
(i)	Mr. A. Shanmugavasan, Managing Director /Mr.S.Kumar Subramanian,Deputy General Manager, K. O. B Medical Textiles Pvt. Ltd Perumpali, Semmipalayam Village, Trichy Road, Palladam – 641 662, Coimbatore District Ph. 04255 277833-5, Email:office@kobmt.com	Member
(ii)	Mr. K. Sunil, Vice President, TTK Healthcare Ltd (Heart Valve Division) Plot No. A-28, KINFRA Apparel Park St. Xavier's College P. O Thumba, Thiruvananthapuram – 695 586 E-mail: <a href="mailto:heartvalue@tkhealthcare.com">heartvalue@tkhealthcare.com</a>	Member
(iii)	Mr. Shishir Jaipuria, Managing Director/Mr.Rahul Bansal, Assistant General Manager Ginni Filaments Ltd. H- 6 , Sector – 63 , Noida – 201 307 E – mail: <a href="mailto:shishir@ginnifilaments.com">shishir@ginnifilaments.com</a>	Member
(iv)	Dr. K. S. Saini Vice President Research Quality Assurance & Regulatory Affairs /Or his representative. Johnson & Johnson, B-15/1, MIDC Ind. Area Waluj, Aurangabad-431136.Email: <a href="mailto:ksaini@jnjin.jnj.com">ksaini@jnjin.jnj.com</a>	Member
(v)	Mr. Ajay Sahni	Member



Sl. No	Name and Address	
	Sr. Business Development Manager, Ahlstrom Fibre Composites India Pvt. Ltd 121, Ansal Bhavan, Kasturba Gandhi Marg New Delhi – 110 001. Ph: 011 23753680, E-mail: <a href="mailto:sahni@ahlstrom.com">sahni@ahlstrom.com</a>	
(vi)	Dr. A.K.Rakshit, Vice President – Product Development Reliance House, 15 Walchand Hirachand Marg, Ballard Estate, Mumbai 400 001 Ph: 022 44716000 Email: <a href="mailto:anup_rakshit@ril.com">anup_rakshit@ril.com</a>	Member
(vii)	Mr. Manohar Samual Sr. Vice President (strategic Planning) Grasim Industries Ltd., Marketing & Business Development Division, Century Bhavan, Dr. A.B.Road, Worli, Mumbai -400 030 Ph: 022 24365130 Email: <a href="mailto:msamuel@adityabirla.com">msamuel@adityabirla.com</a>	Member
(viii)	Shri. P Bhatnagar, Standardisation Head (Textiles) Bureau of Indian Standards, Manak Bhavan, New Delhi Ph: 011 - 23231282 Email: <a href="mailto:txd@bis.org.in">txd@bis.org.in</a> (M) 09958198721	Member
(ix)	Dr.G.S.Bhuvaneshwar,Head/ Mr.C.V.Muraleedharan,Scientist-F Biomedical Technology Wing, Sree Chitra Tirunal Institute for Medical Science & Technology, Poojapura, Thiruvannthapuram – 695 012. Ph No: 0471 2340411, E-mail: <a href="mailto:gs.bhuvanesh@gmail.com">gs.bhuvanesh@gmail.com</a> / <a href="mailto:Muralicy@satimst.ac.in">Muralicy@satimst.ac.in</a>	Member
(x)	Dr. Bhuvanesh Gupta Associate Professor, Department of Textile Technology Indian Institute of Technology Hauz Khas, New Delhi – 110 016. Ph No: 011 26591412, Email- <a href="mailto:bqupta@textile.iitd.ernet.in">bqupta@textile.iitd.ernet.in</a>	Member
(xi)	Dr. Arindam Basu Director, The South India Textile Research Association, 13/37 Avanashi Road, Coimbatore – 641 014 Email: <a href="mailto:sitraindia@dataone.in">sitraindia@dataone.in</a>	Convener

#### 4. Composition of the Protective textiles Committee:

Sl. No	Name and Address	
(i)	Dr. V. K. Kothari Deptt. Of Textile Technology ,Indian Institute of Technology, Hauz Khas, Delhi – 110016 Ph. No. 011-26596604, Email : <a href="mailto:kothari@textile.iitd.ernet.in">kothari@textile.iitd.ernet.in</a>	Member

Sl. No	Name and Address	
(ii)	Dr. M.P. Aggarwal M/s Shri Lakshmi Cotsyn Ltd. 19/X-1, Krishna Puram, GT Road, KANPUR (U.P) Ph. No. 0512-2401492, 2402893 Email : <a href="mailto:shri@slcl.in">shri@slcl.in</a>	Member
(iii)	Mr. Basant Lohia M/s Tara Safe International Pvt. Ltd. 24, Sri Ram Road, Civil Lines, Delhi – 110054 Ph. No. 011-23917688, 23976368 Email : <a href="mailto:basant@tarasafe.in">basant@tarasafe.in</a>	Member
(iv)	Shri. Milind Hardikar, Group President – Project & Technologies M/s Arvind Limited, 303, Swagat Near Lal Bungalow C.G.Road, Ahmedabad 380 006 Ph: 070-26431214 Fax: 079 56261770	Member
(v)	Mr. Pawan Sharma M/s Jaya Shree Textiles (Aditya Birla Nuvo Ltd) Rishra, P.O. Prbasnagar-712249, Dist. Hooghly(W.B.) Ph. No. 033-26721146 Extn. 222 Email : <a href="mailto:pawansh@adityabirla.com">pawansh@adityabirla.com</a>	Member
(vi)	Mr. K.D. Singh M/s RSWM Limited, Bhilwara Towers, A-12, Sector -1, Noida – 201301 (U.P) Ph. No. 0120-4390300 Email : <a href="mailto:kd.singh@lnjbhilwara.com">kd.singh@lnjbhilwara.com</a>	Member
(vii)	Mr. Sandeep Khanna M/s Adigear Group, A-40, Mayapuri Industrial Area, Phase -1, New Delhi – 110064 Ph. No. 011- 43214800 Email : <a href="mailto:sandeep@adigear.com">sandeep@adigear.com</a>	Member
(viii)	Dr. A. K. Sharma ATIRA, P.O. Ambawadi Vistar Ahmedabad-380015 Ph. No. 079-6304671 Email : <a href="mailto:atira@adl.vsnl.net.in">atira@adl.vsnl.net.in</a>	Member
(ix)	Dr M K Talukdar Kusumgar Corporates Private Limited 101, Manjushree, V.M. Road, J.V.P.D., Vile Parle(West), Mumbai – 400 056. Maharashtra, INDIA. Tel: +91 22 61125119 / 100 Fax: +91 22 26115651 Cell: 09987267005 email:mktalukdar@kusumgar.com	Member
(x)	Mr. Sandip Hora M/s Aeronav Industrial safety appliances	Member

Sl. No	Name and Address	
	E-24, Sector-VII, Noida-201301 Ph. No. 0120-2425514 Email : <a href="mailto:anisaman@aeronav.org">anisaman@aeronav.org</a>	
(xi)	Dr. R. P. Singh, Additional Director Center for Fire Explosives & Environment Safety DRDO, Brig. S. K. Mazumdar Road Timarpur, Delhi-110054 Ph. No. 011-23818856 Fax : 011-2381954	Member
(xii)	Mr. Sarjeet Singh, Commander Integrated Headquarters of MOD Dte of Clothing & victualling D-II Wing, Sena Bhawan New Delhi-110011 Ph. No. 011-23012063 Fax : 011-23010284	Member
(xiii)	Mr. Shalender Singh Director Carriage R.D.S.O. Manak Nagar, Lucknow-226011 Ph. No.0522-2452492 Fax – 0522-2458500 Email: <a href="mailto:dircarriagess@gmail.com">dircarriagess@gmail.com</a> Mobile: 09794863106	Member
(xiv)	Shri Khetan Chandrakant, Entremonde Polyesters Ltd., C-17, Frist Floor Kilfire House Dalai Industries Area, Andheri, Mumbai Email:entremonde@vsnl.com	Member
(xv)	Dr. J.V. Rao NITRA, Sector 23, Raj Nagar Ghaziabad Ph. No. 0120-2783638 Email : mail@nitratextile.org	Convener

The role and responsibilities for each of the Committee on Standards are as follows:

1. Fixing specification standards for various physical / chemical / mechanical / hydraulic properties as required for different products and uses.
2. Suggesting standard methods of tests for the above characteristics.
3. Identifying Indian laboratories with accreditation to ISO 17025 for testing and certifying the technical textiles.
4. Suggesting additional equipments that may be required by Indian laboratories to test the range of properties of technical textiles.
5. To make any other recommendation as may be appropriate.

Besides the existing four standards committees, the formulation of additional four standards committees in the areas of Nonwovens, Composites, Indutech and Sportech is under process. These standard committees are being formed with the respective COE for each of the mentioned segment, and director / principal will be acting as the convener of the committee.

### **Monitoring Committee for Standards**

In the Empowered Committee meeting held at Ministry of Textiles on 02.05.2011, the progress on formulation of draft standards and notification of same by BIS were discussed and it was decided that a monitoring Committee for Standards should be constituted under Joint Secretary (Technical Textiles) with members from user industries and Director of COEs as members, for monitoring the notification of standards by BIS. Accordingly a monitoring Committee for Standards with following composition has been constituted for monitoring the notification of standards of technical textile:

<b>Sl. No</b>	<b>Name &amp; Designation/Organization</b>	
i.	Sh.Sujit Gulati, Joint Secretary/Ministry of Textiles	Chairman
ii.	Sh. A.B Joshi, Textile Commissioner/ Office of the Textile Commissioner	Member
iii.	Ms. Madhavi Das, Director, Ministry of Textiles	Member
iv.	Sh Ajay Pandit, Deputy Director/ Office of the Textile Commissioner	Member
v.	Sh. Anil Kumar, Scientist E (Textiles), / Sh. J.K.Gupta, Deputy Director, BIS	Member
vi.	Sh. U.K.Gangopadhyay, Executive Director/ SASMIRA	Member
vii.	Sh. A.N.Desai, Director/BTRA	Member
viii.	Dr Prakash Vasudevan, Director/SITRA	Member
ix.	Dr. A. K. Sharma, Director/ ATIRA	Member
x.	Dr.G.Thilagavathi, Professor & Head, Department of Textile & Fashion Technology, PSG College of Technology	Member
xi.	Prof. (Dr.) P. V. Kadole, Vice Principal (Admn.) & Head of Textile Department, DKTE College of Engineering	Member
xii.	Sh Khetan Chandrakant, Entremonde Polyesters Ltd	Member
xiii.	Sh. Mohan Kavrie, M/s Supreme Non wovens	Member
xiv.	Sh. M.K. Talukdar, M/s Kusumgar Corporates	Member
xv.	Sh. Milind Hardikar, M/s Arvind Limited	Member
xvi.	Sh Nitin Bhojani, B & V Agro	Member
xvii.	Sh. Amitkumar Agarwal, CTM Technical Textiles Ltd	Member
xviii.	Dr. R. G. Patil, Head, Water & Soil Management Department, Navsari Agricultural University	Member
xix.	Sh. Narendra Dalmia, Strata Geosystems (India) Pvt.Ltd	Member

Sl. No	Name & Designation/Organization	
xx.	Sh. T. Sanyal, Geotechnical Advisor Jute Manufactures Development Council	Member
xxi.	Sh. K. Sunil, Vice President, TTK Healthcare Ltd	Member
xxii.	Sh. Shishir Jaipuria, /Mr.Rahul Bansal, Ginni Filaments Ltd	Member
xxiii.	Representative from ITTA	Member
xxiv.	Representative from M/s Ernst & Young Pvt. Ltd.	Member
xxv.	Dr.J.V Rao, Director/ NITRA	Member Secretary

The role and responsibilities of Committee for monitoring the notification of standards are:

1. Committee will monitor the progress of Draft standards being made by various standards committees on technical textiles constituted by Office of Textile Commissioner.
2. Committee will monitor the progress of notification of standards which have been forwarded to BIS and which are being formulated and notified by BIS through other committees of BIS.
3. Committee will discuss the difficulties being faced by standard committees in formulating standards and will suggest remedial measures.
4. To make any other recommendation as may be appropriate.

### **Industry participation in committees**

These committees are a platform that the Office of Textiles Commissioner, Ministry of Textiles, Government of India has created for the industry stakeholders to participate in development of standards in the technical textiles industry. Interested entrepreneurs, manufacturers of technical textiles and other stakeholders can associate themselves with the committees of their interest and participate in the process of standards formulation by suggesting the products for which standards are required and helping the committee in drafting the standards. Interested companies can send their requests / proposals to the following address, for participation in the standards committee:

Office of the Textile Commissioner

New CGO Building, Nishtha Bhavan, 48, New Marine Lines, Mumbai – 400020

[tmtt.coe@gmail.com](mailto:tmtt.coe@gmail.com)

[www.technotex.gov.in](http://www.technotex.gov.in)

Interested stakeholders can also get in touch with the committee members directly or through the Center of Excellence representatives mentioned in the committee members list.

## **5. Status of Proposed standards formulated by committees and submitted to BIS**

The standards committee formed at the Office of Textiles Commissioner, Ministry of Textiles, Government of India formulates drafts standards and submits the same to BIS from time to time. Many of the standards proposed and formulated by the standards committees have been notified and circulated by the BIS in the recent past. Following provides a summary of the status of proposed standards in different segments of technical textiles, formulated by committees and submitted to BIS for their approval.

### **PROTECH**

#### **Printed and sent for notification**

1. Doc.Txd 32(766) - Protective clothing Part 3 Resistance of materials to penetration by liquids: *IS 15758 (Part3): 2007*

#### **Finalised Drafts under print:**

2. Doc.Txd 32(832) Textiles - Resistance To Ignition Of Mattresses, Divans and Bed Bases – Specification

#### **Draft standards completed wide circulation**

3. Doc.Txd 32(946)Textiles-Protection Gloves For Firefighters - Laboratory Test Methods and Performance Requirements (Based On ISO 15383: 2003)
4. Doc.Txd 32(947)Textiles-Protective Clothing For Firefighters - Laboratory Test Methods and Performance Requirements (Based On ISO 11613 : 1999)
5. Doc.Txd 32(948)Textiles-Protective Clothing For Firefighters - Laboratory Test Methods and Performance Requirements For Wild Land Firefighting Clothing (Based On ISO 15384 : 2003)
6. Doc.Txd 32(949)Textiles-Protective Clothing For Firefighters - Laboratory Test Methods and Performance Requirements For Protective Clothing With A Reflective Outer Surface (Based On ISO 15538 : 2001)

#### **Draft Standards Under Preparation**

7. Doc.Txd 32(9001) Textiles - Light weight bullet proof jackets –Specification

#### **New items**

8. Recommendations for preparation of revised specification of IS: 6685-1972 " life jackets"

### **GEOTECH**

#### **Printed and sent for notification**

9. Specifications of Geosynthetics for Highways: *IS 15910:2010*

### **Finalised drafts under print**

10. Doc.Txd 30 (935) Jute Geo-Textiles - Part 1 Strengthening of Sub Grade in Roads and Control of Bank Erosion in Rivers and Waterways (First Revision of IS 14715)
11. Doc.Txd 30(950) Jute Geo-Textiles - Part 2 Control of Bank Erosion in Rivers and Waterways (First Revision of IS 14715)
12. Doc.Txd 30 (959) Guidelines for Application of Coir Geotextiles (Coir Woven Bhoovastra) for Rain Water Erosion Control in Roads, Railways Embankments and Hill Slopes
13. Doc.Txd 30(982) Method of Test for Determination of California Bearing Ratio
14. Doc.Txd 30(985) Specification for Geotextiles used as Protection (or Cushioning) Material
15. Doc.Txd 30(983): Method of Determination of Apparent Opening Size of Geo-Textiles by Wet Sieving

### **Draft standards completed wide circulation**

16. Doc.Txd 30(961) Natural Fibre Geotextiles (Jute Geo Textiles) and Coir Geotextiles (Coir Bhoovastra) - Glossary of Terms for Erosion Control Products
17. Doc.Txd 30(1025): Specification for geo-textiles used in subsurface drainage application
18. Doc.Txd 30(1026): Specification for geo-textiles for permanent erosion control in hard armor systems
19. Doc.Txd 30(1027): Specification for geo-textiles used in subgrade separation in pavement structures
20. Doc.Txd 30(1028): Specification for geo-textiles used in subgrade stabilisation in pavement structures
21. Doc.Txd 30(1029); Specification for geo-grids used as reinforcement of base and subbase layers in pavement
22. Doc.Txd 30(1030): Specification for geogrids used as soil reinforcement in mechanically stabilised earth (MSE) retaining structures
23. Doc.Txd 30(1073): Design practice for installation of geotextiles as pavement fabric
24. Doc.Txd 30(1074): Guidelines for installation of geotextile used in Subsurface drainage application
25. Doc.Txd 30(1075): Guidelines for installation of geotextile for permanent Erosion Control in Hard Armor Systems
26. Doc.Txd 30(1076): Guidelines for installation of geotextile used in subgrade separation in pavement structures
27. Doc.Txd 30(1077): Guidelines for installation of geogrids used as reinforcement of base and subbase layers in pavement structure
28. Doc.Txd 30(1078): Guidelines for installation of geogrids as soil reinforcement in mechanically stabilized earth (MSE) retaining structures
29. Doc.Txd 30(1079): PVC Geo-membranes for lining - Specification (First revision of IS 15909)
30. Doc.Txd 30(1122): Standard Test method for Biological clogging of geotextile or soil/ Geotextile filters
31. Doc.Txd 30(1123): Standard test method for effect of temperature on stability of geotextile
32. Doc.Txd 30(1124): Standards practice for laboratory immersion procedures for evaluating the chemical resistance of geosynthetics to liquids
33. Doc.Txd 30(1125): Geotextiles - method of test for grab breaking load and elongation

## AGROTECH

### **Printed and sent for notification**

34. Agro-Textiles - Shade nets for agriculture and horticulture purposes-Specification: IS 16008: 2012
35. Textiles – Shade Nets 50% for Agriculture Application – Specification: Clubbed into Standard no: IS 16008:2012
36. Textiles – Shade Nets 75% for Agriculture Application – Specification: Clubbed into Standard no: IS 16008:2012
37. Textiles – 90% Shade Nets for Agriculture Application – Specification: Clubbed into Standard no: IS 16008:2012

### **Finalised drafts under print**

38. Doc.Txd 35(981) Jute Agro-Textile - Sapling Bags for Growth of Seedling /Sapling – Specification

### **Draft standards completed wide circulation**

39. Doc.Txd 35(980) Jute Agro-Textiles for Growth of Plants and Suppression of Weeds-Specification
40. Glossary of Agrotextiles

### **Draft standards approved for wide circulation**

41. Doc.Txd 35(1089): 100 gsm woven ground covers for horticulture application-Specification

### **Draft Standards Formulated**

42. Doc.Txd 35(1128): Textiles- Specification for non woven PP crop covers

### **New Items**

43. Doc.Txd 35(1127): Textiles-Specification for bird protection nets

## MEDITECH

### **Draft standards issued in wide circulation**

44. Doc.Txd 36(1040): Medical Textiles - method for determination of anti bacterial activity - qualitatively
45. Doc.Txd 36(1041): Medical Textiles - method for determination of anti bacterial activity - quantitatively
46. Doc.Txd 36(1042): Medical Textiles - method for evaluation of the bacterial filtration efficiency of surgical face masks

### **Draft standards approved for wide circulation**

47. Doc.Txd 36(1035): Medical textiles - Surgical face masks
48. Paraffin Gauze dressings
49. Knitted viscose primary dressings



### **Draft Standards Formulated**

- 50. Doc.Txd 36(1031): Medical textiles - Surgical drapes – Specification
- 51. Doc.Txd 36(1032): Medical textiles - Surgical gowns – Specification
- 52. Doc.Txd 36(1038): Medical textiles - Nonwoven gauze bandage - Specification

## **INDUTECH**

### **Printed and sent for notification**

- 53. Textiles- Test method for non-wovens - Part 1 Determination of mass per unit area: IS 15891 (Part 1) : 2011
- 54. Textiles- Test method for non-wovens - Part 2 Determination of thickness: IS 15891 (Part 2) : 2011
- 55. Textiles- Test method for non-wovens - Part 3 Determination of tensile strength and elongation: IS 15891 (Part 3) : 2011
- 56. Textiles- Test method for non-wovens - Part 4 Determination of tear resistance: IS 15891 (Part 4) : 2011
- 57. Test Methods for Nonwovens Part 6 Absorption: IS 15891 (Part 6) : 2012
- 58. Textiles - Test Methods for Nonwovens Part 7 Determination of Bending Length: IS 15891 (Part 7) : 2012
- 59. Textiles - Test Methods for Nonwovens Part 8 Determination of Liquid Strike - Through Time (Simulated Urine): IS 15891 (Part 8) : 2012
- 60. Textiles-Test Methods for Non-wovens Part 9 Determination of Drapability including Coefficient: IS 15891 (Part 9) : 2012

### **Finalised drafts under print**

- 61. Doc.Txd 33(984) Textiles-Water proof tarpaulins made from woven polyester fabric

### **New items**

- 62. Doc.Txd 33(936) Glass fibre filter fabrics for application at high temperature.
- 63. Doc.Txd 33(9004) Filtration efficiency of filters

## **BUILDTECH**

### **New items**

- 64. Textiles - Synthetic Fibers for reinforcement in concrete for use in construction works

## **6. Standards Identified by Standards Committee of respective CoE**

The development of standards is ongoing and long term process. Though the BIS is entrusted and finally take the responsibility of publishing the standard; the COE will prepare initial draft and propose the standard. This will be open for industry, users and academicians to use and suggest modifications towards final entrusted draft. Formulating standards is one of the important activities of COE. All COEs have initiated the process for identifying the existing standards for the gamut of products that fall under their respective segments.

Development of Indian standards in tune with the international standards for the products produced and used in India considering the prevailing technology of production available here, apart from improving marketability of the product will also be able to help manufactures with predictable production conforming to standards with least possible waste and lesser time improving profit margins.

Below are the standards identified for sub segments of Technical Textiles by their respective COEs which are imperative for boosting the growth of the sector in India.

### **Protech**

#### **Standard needs to be amended as per current requirement**

1. Nylon Life Jacket with expendable polyethylene foam, buckle and whistle plastic (Revision required in BIS standard framed in 1972)

#### **Standards to be formulated**

1. NYCO Combat Uniforms
2. Unarmed Combat dress
3. Pouch for ammunition and grenades made of nylon 66
4. Durable Rucksack made of Nylon 66
5. Tactical 3 Point Sling Universal
6. Multipurpose light weight load bearing frame with carrier facility and convertibility as stretcher (Aluminum)
7. Anti Mosquito Veil
8. Water Proof multipurpose rain poncho with convertibility as bivouac
9. Rain coat
10. U.V. Protective wear
11. Protective clothing for welders

### **Geotech**

#### **Standard needs to be amended as per current requirement**

1. Jute Geotextile-Part I for strengthening of sub grade in road (Revision required in IS 14715); Part II for control of bank erosion in rivers and Waterways (Revision required in IS 14715)

### **Standards to be formulated**

1. Specifications for Geotextile used in pavement overlays

### **Test standards to be formulated**

1. Determination of water permeability normal to the plane without load
2. Determination of the characteristics opening size
3. Determination of water flow capacity in their plane
4. Static (CBR) puncture resistance
5. Apparent opening size by wet sieving
6. Test method for the determination of the filtration behavior of geotextiles under turbulent water flow conditions.
7. Geotextiles and Geotextile related products- Determination of water permeability characteristics normal to the plane, under load.
8. Draft test standards under preparation for Grab breaking load and elongation of Geotextile

## **Agrotech**

### **Standard needs to be amended as per current requirement**

1. Insect nets
2. Woven packing sacks
3. Leno bags for packaing
4. Vermicompost beds
5. Geo Jute mats
6. Fishing- nets - designation of netting yarns in the tex system
7. Fishing nets — netting — basic terms and definitions
8. Fishing Nets — Description And Designation Of Knotted Netting
9. Fishing nets – cutting knotted netting to shape (“tapering”)
10. Fishing nets - determination of breaking load and knot breaking load of netting yarns
11. Fishing nets — determination of mesh breaking force of netting
12. Jute Hortipots

### **Standards to be formulated**

1. Ground covers 60 gsm Nonwoven
2. Knitted Bird Nets ½” mesh
3. Knitted Bird nets 1” mesh
4. Knitted Bird Nets 1½” mesh
5. Knitted Bird Nets 2” mesh
6. Knotted bird nets 1” mesh
7. Knotted bird nets 2” mesh
8. Harvesting Nets for mechanised harvesting

9. Harvesting nets for manual harvesting
10. Nonwoven fruit protective covers
11. Nonwoven Crop covers
12. Knitted crop covers

## Meditech

### Standards to be formulated

1. Vascular grafts
2. Hernia mesh
3. Heart patch fabric
4. Combine/wound dressing
5. Gauze Absorbent Non sterilized
6. Swab with X-Ray detectable filaments 10x10 cm –12 ply
7. Cast padding for Orthopaedic plaster
8. Orthopaedic Stockinet
9. Eye Pad
10. Colored /White Polypropylene/ Polyester Nonwoven Fabric for Boufnnet cap
11. Colored /White Polypropylene/ Polyester Nonwoven Fabric for surgeons' cap, Nurses' cap, Hood cap
12. Tie-band for all caps & face mask
13. Surgical Gown with barrier properties
14. Barrier Performance of surgical gowns
15. Compression crepe bandage
16. Elastic adhesive Bandage
17. Povidone Iodine ointment based knitted dressing, Burn dressing (BP)
18. Surgical adhesive tape
19. Adhesive bandage with medicated center pad (for minor cuts & wounds)

## Sportech

### Standards to be formulated – Sector-wise requirements

1. Sports Composites: standards to be formulated as specified by governing bodies of various sports
2. Artificial turf:
  - a. Relative Abrasiveness
  - b. Characterization of Synthetic Turf Playing Surfaces and Materials
  - c. Performance and durability characteristics
  - d. Preparation of synthetic turf and textile test pieces
  - e. Water infiltration rate
3. Parachute Fabrics:
  - a. Testing of Wide woven fabrics
  - b. Air Permeability

4. Ballooning fabrics:
  - a. Testing of ripstop woven fabrics
  - b. Resistant against tearing and ripping
  - c. Air Permeability
  - d. Flammability
5. Sail cloth:
  - a. Testing of woven fabrics
  - b. Tear resistance
  - c. Modulus of elasticity: stretch resistance per weight
  - d. Tensile strength
  - e. Creep properties
  - f. UV Resistance
  - g. Water & Air Permeability of Textile Fabrics
6. Sleeping bags:
  - a. Measurement of Sleeping Bags
  - b. Flammability
  - c. Thermal Insulation
  - d. Measuring Sleeping Bag Loft
  - e. Volume under load and easiness of packaging
  - f. Thickness and elastic recovery
  - g. Requirements for sleeping bags
7. Sport nets:
  - a. Characterization of ropes
  - b. Physical dimensions of net
  - c. Physical dimensions of Mesh opening
  - d. Knotting strength
  - e. Tensile strength
8. Sport shoes components:
  - a. For insoles, lining and in socks
    - i. Perspiration resistance
    - ii. Dimensional stability
    - iii. Heel pin holding strength
    - iv. Delamination resistance
  - b. Performance requirements for components for footwear
  - c. Shoe laces - Abrasion resistance
  - d. Standard atmospheres for conditioning and testing of footwear and components for footwear
9. Tents:
  - a. Testing of fabrics
  - b. Air & water permeability
  - c. Tensile Strength
  - d. UV protection
  - e. Antimicrobial resistance
  - f. Colour fastness

- g. Flame retardant
  - h. Waterproof
10. Swimwear:
- a. Testing of fabrics
  - b. Physical dimensions & fit
  - c. Elasticity
  - d. Frictional properties
  - e. Hydrophilicity
  - f. Colour fastness

## Indutech

### Standards to be formulated

1. Oil sorption pads
2. Scrubs
3. Automotive carpets

## Composites

### Standards to be formulated - Sector-wise requirements

1. Wind Turbine Blades:
  - a. Reinforcement
  - b. Resin
  - c. Composite products/components
  - d. Process
2. Pipe
  - a. GRP Pipes for below 200 mm diameter
3. Tanks
  - a. Pressure Vessels (both chemical resistant and non chemical resistant tanks)
4. Automotives
  - a. Process of Manufacturing Composite Parts used in automotives
  - b. Composite products/components
  - c. Resins for automotive application grades
  - d. Reinforcements such as Glass Fibre & Carbon Fibres used in automotive sector
5. Cooling Towers and it's components
  - a. Polymer-Fibre Composite Cooling Towers as well as it's other composite components
6. Aerospace - Aerospace Industry Standard needs to be amended as per current requirement
  - a. Composite products/components
  - b. New range of fabrics/performs
  - c. Process of composite parts manufacturing
  - d. New range of resins used in Aerospace Industries
7. Railways

- a. Product /component for choice of material for strength verses weight
- 8. Marine
  - a. Composite products/components
  - b. Resin
  - c. Reinforcement
  - d. Manufacturing processes
- 9. Reinforcement
  - a. 2D, 3D & Tailored Glass Fabrics
  - b. Reinforcements like Carbon, Kevlar & Hybrid fabrics
- 10. Resin
  - a. Specific applications such as automotive, aerospace, marine, construction, etc

## Nonwovens

### Test methods standards to be formulated

1. Absorption
  - a. Nonwoven Absorption - Absorbency, Absorptive Capacity, Wicking Rate
  - b. Nonwoven Absorption - Centrifuge Retention Capacity
  - c. Nonwoven Absorption - Absorption Under Pressure
2. Abrasion Resistance
  - a. Abrasion Resistance of Textile Fabrics - Taber Abrasion
  - b. Abrasion Resistance of Textile Fabrics - Martindale Abrasion (View test)
3. Bursting Strength
  - a. Diaphragm Method (Mullen)
  - b. Ball Burst (Constant-Rate-of-Traversal)
  - c. Ball Burst (Constant-Rate-of-Extension)
4. Chemical Analysis
  - a. Component Analysis
  - b. Moisture
  - c. Ash
5. Image Analysis
  - a. Fiber diameter distribution
  - b. Porosity, apertures and hole analysis
  - c. Formation Analysis
6. Permeability
  - a. Air Permeability
  - b. Water Vapor Transmission
  - c. Nonwoven Coverstock Liquid Strike-Through - Simulated Urine
7. Repellency
  - a. Water Resistance: Impact Penetration Test
  - b. Water Resistance: Hydrostatic Pressure Test
8. Surfaces and Biological
  - a. Colonies
  - b. BEE (Bacterial Entrapment Efficiency)

9. Stiffness
  - a. Cantilever
10. Tear Strength
  - a. Elmendorf
  - b. Trapezoid
  - c. Tongue
11. Tensile Strength
  - a. Grab
  - b. Seam Strength
  - c. Strip
12. Thickness
  - a. Nonwovens
13. Weight
  - a. Per Unit Area (Basis Weight)
14. Coefficient of Friction
  - a. Static and Kinetic



## 7. Important Contact details

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# Thank You

Project Management and Monitoring Consultant for TMTT

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