

1, March, 2011 Tuesday 10:26 AM

ATA Journal for Asia on Textile & Apparel
 纺织及成衣 (亚洲版)
www.AdsaleATA.com

[Advanced Search](#)

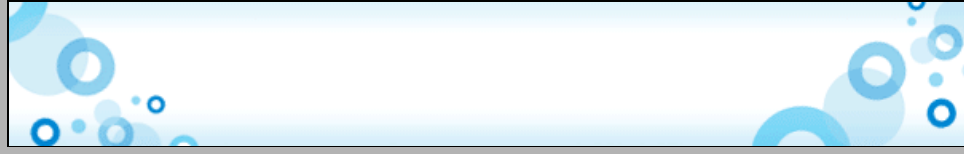
Top Search : [Dyestuff](#) | [Loom](#) | [Chemicals](#) | [Finishing](#) | [ShanghaiTex](#)

Reader / Member Login
 Login Name:
 Password:
[Forgot password](#)

[New Reader / Member Registration](#)

- [Main](#)
- [Services](#)
- [About Us](#)
- [Job Vacancy](#)
- [Contact Us](#)
- [Media Kit](#)
- [Subscription](#)
- [2011 Event Calendar](#)
- [News](#)
- [Daily Market News](#)
- [Focus](#)
- [5-minute Interview](#)
- [Journal for Asia on Textile & Apparel](#)
- [Feature Story](#)
- [Market Focus](#)
- [China Focus](#)
- [Machinery Technology](#)
- [Material Technology](#)
- [Nonwovens & Technical Textiles](#)
- [Chemicals & Auxiliaries](#)
- [Industry News](#)
- [Environmental Watch](#)
- [Retail Scene](#)
- [Corporate Profile](#)
- [Association News / Conferences](#)
- [Journal for Asia on Textile & Apparel Latest Issue](#)
- [CIAMI 2010 Official Visitors' Guide \(In Chinese only\)](#)
- [ITMA Asia + CITME 2010 Countdown eNewsletter - 1st Issue](#)
- [ITMA Asia + CITME 2010 Countdown eNewsletter -](#)

[Main](#) > [Journal for Asia on Textile & Apparel - Nonwovens & Technical Textiles](#) >



| [Print](#) | [E-mail this page](#) | [Submit Article](#) | [Last Page](#) | [More](#) | [Next Page](#)

Technical knits provide more diverse applications

Issue date:28/02/2011

ATA Journal for Asia on Textile & Apparel - Feb 2011 Issue

Source:Journal for Asia on Textile & Apparel

by Seshadri Ramkumar

The worldwide market for specialty textiles in 2010 was about US\$127 billion, according to the 2010 statistics from Roseville-Minnesota, US-based Industrial Fabrics Association International. Due to economic recession, the growth was expected to be around 2-3 %. According to David Rigby Associates (DRA) of England, the growth in near future, in value terms is expected to be 3.2 %.



Karl Mayer's warp knitting machine (Image source: Karl Mayer)

Over the past decade, tremendous efforts have been made around the world including China and India to develop value-added textile products or technical textiles. It is widely recognized that the Techtextil fair organizer, Messe Frankfurt pioneered the categorization of technical textiles into 12 categories. These are: 1) Agrotech; 2) Mobiltech; 3) Buildtech; 4) Clothtech; 5) Geotech; 6) Hometech; 7) Indutech; 8) Medtech; 9) Oekotech; 10) Packtech; 11) Protech and 12) Sportstech. As is evident from the above 12 categories, technical textiles are grouped into products that find applications in different fields. However, there are certain interconnections among these categories and hence it may be slightly confusing to compartmentalize technical textiles into these specific 12 categories. Also, for emerging economies such as India, China, Vietnam, Indonesia and Bangladesh which are the current textile powers, such a classification will not be of much use as they have a nascent technical textiles sector. In addition, from the point of view of marketing and growing this sector in developing economies, it will be very difficult to divide technical textiles into 12 categories right at this stage.

Knitted fabrics with non-apparel/non-commodity applications can be classified as technical knits. Knitted fabrics that have value-added applications belong to the emerging class of textiles known as technical textiles. Although this terminology is fairly recent, fabrics with non-apparel applications have been known in our industry as specialty fabrics or industrial textiles. Technical knits, or knitted fabrics are most widely used in medical textiles, agrotexiles, geotextiles, automobile textiles and protective textiles.

Knitted fabrics with medical applications

One of the important applications of knits in the medtech area is the spacer fabric. The University of Bolton in England and The South Indian Textile Research Association (SITRA) in Coimbatore, India have been working actively in this technology. These fabrics are predominantly warp knitted fabrics and mainly synthetic materials are used in developing these fabrics. As a principle, the spacer material which is normally a pile like structure is laid between the top and bottom layers and provides good wicking and breathability characteristics. A recent research project at SITRA focuses

Other ATA Articles

Feature Story
 Innovation and sustainability for global textile industry
 Textile industry review and outlook 2011

Market Focus
 Cotton and yarn price hikes worry home textile manufacturers
 Home textiles: differentiation for fleeing the commodity trap

China Focus
 12th Five-Year Plan marks new era of China's textile industry
 Coping with roller coaster of material prices

Machinery Technology
 Special Edition: Knitting Technology
 Some knitting machinery suppliers and their products
 Special Edition: Knitting Technology
 Stitch quality control on flat bed knitting machines

Material Technology
 Recycled fabrics to meet demand for new applications
 Developments of elastic fabrics enable wider applications

Nonwovens & Technical Textiles
 Technical knits provide more diverse applications
 Innovations fuel the use of nonwoven-based medical textiles

Chemicals & Auxiliaries
 Efficient communication is the key to effective colour management
 Silicone softeners enhanced in stability with decreased particle size

Industry News
 Industry News (February 2011)
 Industry News (December 2010)

Environmental Watch

2nd Issue
ITMA Asia + CITME 2010 Countdown eNewsletter - 3rd Issue
Journal for Asia on Textile & Apparel Issues
Feb 2011 Issue
Dec 2010 Issue
Oct 2010 Issue
Aug 2010 Issue
Jun 2010 Issue
Apr 2010 Issue
Useful Statistics
Industry related Policies and Speeches
Policies
Important Speeches
Useful Links
Reader Survey

on spacer fabrics in orthopedic shoes particularly used for diabetic patients. These spacer fabrics can also be functionalized with antibacterial treatments. Another important day-to-day application where knitted fabrics are used to enhance life style is the compressional socks used to alleviate the sufferings due to deep vein thrombosis (DVT) and blood clots. These socks are used in cases of vein disorders, leg swelling, embolism, edema, aching legs and varicose vein situations. Depending on the severity of thrombosis and blood clotting situations, the selection of compressional knitted socks can be made. In general, there are 3 different categories of knitted compressional socks. These are: 1. mild with compressional pressure of 8-15 mm/Hg compression, 2. moderate with compressional pressure of 15-20 mm/Hg compression and 3. firm with compressional pressure of 20-30 mm/Hg compression.

As is evident from the above pressure levels, the firm knits are useful for severe swelling and vein disorders. For aching legs and varicose vein situations, mild pressure socks are sufficient. These socks range from US\$9 to US\$40 at the retail level depending on the pressure levels and the type of fiber used. The compressional socks, which are predominantly knitted fabrics, come in 4 sizes such as small, medium, large and extra large. The raw materials that are used are predominantly synthetics such as nylon and spandex. In some situations, other materials such as cotton, polyester and natural rubber latex can be used. The common combinations are: 1) 80% nylon and 20% spandex; 2) 90% nylon and 10% spandex; 3) 85% nylon and 15% spandex. The commonly used restoring dress socks have 85% nylon and 15% spandex combination. Another application of knitted fabrics is their use as bandages for Lymphedema. In this regard, the South India based SITRA has come up with creep and elastic bandages consisting of materials such as cotton, viscose, rubber filament and so on.

The SITRA is leading the charge in India to develop textile products with medical applications. The Government of India as part of its mission to develop technical textiles in its Phase 1 of the mission has created four Centers of Excellence which focus on: a) Medical textiles; b) Protective textiles; c) Agro textiles and d) Geo textiles. The SITRA has been designated as the center of excellence in medtech. In December 2010, the center's director said that about 10 crore Indian rupees have been spent in equipping the center with the advanced European machinery such as warp knitting machinery from Karl Mayer and compressional socks making machinery from Merz, Germany. A dedicated lab is being built to commission a 600 mm wide hydroentangling unit as well. This center also has a good analytical testing lab to test medical textiles and has instruments such as High Performance Liquid Chromatography (HPLC), Atomic Absorption Spectrophotometer, GC-MS and so on.

One of the important aspects of knitted fabrics for applications in the medical field is to enhance its utility by functionalizing them. Functionalization means imparting added characteristics by involving new chemicals and finishes. For example, imparting broad spectrum and cost effective antimicrobial treatments in an ongoing challenge. In this instance, one should take in to account the broad-spectrum capabilities of silver at the expense of its cost. In terms of medical applications, although cost is not an issue it is still an uphill battle to convince the customer with a product with added cost.

Agro and geotextile knits

Even though farmers are individual and independent customers, technical textiles that are used in agriculture are not like disposable items. Hence it is logical to group knitted fabrics as institutional products. Certainly, geotextiles are institutional products as they are procured by infrastructure and construction companies world over. End uses of knitted fabrics in geotextiles are basically in erosion control. Mulch fabrics are predominantly made using nonwovens and films. So, good use of knitted fabrics in agriculture is found in developing net like fabrics, which are used to protect fruits and vegetables. The Synthetic & Art Silk Mills' Research Association (SASMIRA) in collaboration with Manmade Textile Research Association (MANTRA) and Navsari University, India have been doing good work on agro textiles. SASMIRA has been designated as the lead agency for the Center of Excellence in agrotextiles. According to SASMIRA, it is reported that the agro textile sector is expected to soon reach a value of \$ 8.1 billion with a growth rate of 3.9 %. Some of the products that can be made out of knitting, particularly warp knitting are net like structures such as shade nets, crop protection nets and so on. The sector within agriculture, which is expected to use more textiles, is the horticulture sector. As is evident from the above brief discussion, the application of knits in agriculture and geotextiles is relatively limited compared to nonwovens such as the spunmelt and needlepunched fabrics.

Geotextiles are those fibrous materials that are used in conjunction with soil to enhance their structural integrity, strength, filtration and so on. Geotextiles have five important functions. These are a) Separation; b) Reinforcement; c) Filtration; d) Drainage and e) Containment. Although, woven, needle-punched and thermal bonded fabrics are predominantly used, warp knitted fabrics can also find application as geotextiles. However, at present woven grids and heavy weight needle-punched fabrics find predominant use.

Some other applications of knitted fabrics in non-apparel end-uses include bale wraps, shade fabrics and erosion control booms. With the advent of the Gulf of Mexico oil spill issue in April 2010, knitted fabric manufacturers have been able to find enhanced application of synthetic knits as wrap material for sorbent booms. Syfilco

A closer look at SVHC of REACH
Carbon emission management - new path for sustainable textile supply chain

Retail Scene

Pantone color of the year 2011 - honeysuckle
Intertextile Shanghai F/W 11/12: 3D chic

Corporate Profile

Two-legged strategy to cater for Europe and Asia
Transforming challenge into opportunity with innovation

Association News / Conferences

UCMTF sets new directions in "warmer" 2011
Coming Events Calendar (December 2010)



Supplier Highlights

TANATEX CHEMICALS TRADING (SHANGHAI) CO., LTD.
TONG GENG ENTERPRISE CO., LTD.



Most selected articles in this column

1. Liangying builds integrated industrial chain to boost regional competitiveness
2. A closer look at SVHC of REACH
3. Textile industry review and outlook 2011
4. Technical knits provide more diverse applications
5. Industry News (February 2011)
6. Coping with roller coaster of material prices
7. Special Edition: Knitting Technology Some knitting machinery suppliers and



In technical textiles, one of the major applications of knitted fabrics is in sportswear and functional textiles (Image source: 2XU)

Industrial Knitting of Ontario, Canada produces knitted fabrics for a myriad of applications such as drainage filter, erosion control materials, shade fabrics, bird netting and so on. A representative of Syfilco said that during the peak days of the oil spill the sales boomed by 10 times although it has dried up now.

The geoknit products made by Syfilco are predominantly made up of polypropylene multifilament yarns with an average denier of 600. These products can be made either by circular knitting or warp knitting. The circular knit fabric comes with diameter anywhere from 2 inches

to 30 inches.

Sports and functional textiles

One of the major applications of knitted fabrics in technical textiles is in sportswear and functional textiles. Knitted fabrics can be conveniently made into multi-layered fabrics with or without finishing to get different characteristics depending on end-use applications. For example, cotton as a next-to-skin layer in the presence of heavy moisture between the skin and the fabric will not be able to wick away the moisture immediately. This will result in clinginess and uneasy comfort level. However, if the next-to-skin layer is a synthetic material such as polyester, moisture will be wicked away instantaneously resulting in dry skin. The adjacent layer next to the synthetic layer can be a typical cotton knit which will be able to absorb the moisture. Such multi-layer knitted structures can increase the comfort and performance level of athletes.

Recently an interesting project was undertaken at Texas Tech University to develop highly breathable knitted fabrics. This project looked at the possibility of identifying different varieties of cotton, which will give enhanced moisture transport. This way, if suitable cottons were identified that have superior breathability characteristics, these cottons can be selected to develop highly breathable sportswear and performance fabrics. Results showed that chemistry of cotton, in other words the constituent sugar types in cotton influenced the structure of cotton and hence the transport of vapor through them. This project identified certain sugars in cotton fiber, which provide good breathability characteristics. This project showcases the impact of multidisciplinary research involving agriculture and engineering disciplines to develop next generation functional knits.

Knitted fabrics can be surface enhanced by different methods such as brushing, calendaring, embossing, and plasma functionalization to impart a myriad of functionalities. Knitted fabrics when raised by calendars can give bulkiness, which will enable them to be used as blankets for providing necessary warmth in cold environments. Similarly, plasma functionalized knitted fabrics can have different characteristics such as water absorbency, water repellency and oil repellency and so on. Another application of knitted fabrics in the industrial set-up is its use in the automobile industry. Warp knitted fabrics are preferred as headliner fabrics in the luxury automobiles. Predominantly, they are made from polyester and blends of polyester and spandex. Nylon can also be used depending on the end-use requirements. Depending on the requirements, the face fabric can range from 80-300 grams per square meter.

Knitted fabrics on their own can find technical textile applications. These fabrics can also be made into multi-layer composites involving knits, woven and nonwoven fabrics giving them different characteristics. In addition, knitted fabrics can also be chemically modified and finished to get a number of different end-use characteristics. It is up to the knitted fabric producer to use a number of processes both mechanical and chemical to enhance the use and sales values of knitted fabrics.

Seshadri Ramkumar has is manager of Nonwovens and Advanced Materials Laboratory of Texas Tech University

We are collecting readers' comment for improving our website. If you are willing to help, please [CLICK HERE](#) to complete a survey. Your comments matter.



Write a mail to the editor : cta.ata.edit@adsale.com.hk

Copyright © Adsale Publishing Limited. Any party needs to reprint any part of the content should get the written approval from Adsale Publishing Ltd and quote the source "ATA Journal for Asia on Textile & Apparel", Adsale Textile English Website - www.AdsaleATA.com. We reserve the right to take legal action against any party who reprints any part of this article without acknowledgement. For enquiry, please contact [Editorial Department](#).

My perception of this article

their products

8. Two-legged strategy to cater for Europe and Asia
9. Recycled fabrics to meet demand for new applications
10. Home textiles: differentiation for fleeing the commodity trap

This article has not been rated.

 outstanding	 agree	 useful	 interested
 want to know more	 indifferent	 disagree	 uncomprehended

Reader's Comment

Name

Recent Comment

Email (will not be published)

Comment

[Legal Statement](#) | [Privacy Policy](#)

Remarks: Publication of the comments is at editor's discretion.



Adsale Group

Adsale Media (Magazine & eBook) Adsale Exhibition

www.adsale.com.hk

China Plastic & Rubber Journal
Website: www.AdsaleCPRJ.com
ebook: www.AdsaleCPRJ.com/eBook

China Textile & Apparel
Website: www.AdsaleCTA.com
ebook: www.AdsaleCTA.com/eBook

Journal for Asia on Textile & Apparel
Website: www.AdsaleATA.com
ebook: www.AdsaleATA.com/eBook

Chinamac Journal
Website: www.AdsaleCMJ.com
ebook: www.AdsaleCMJ.com/eBook

The 18th South China International Exhibition on Printing Industry
09/03 - 11/03/2011 Pazhou . Guangzhou , P R China

The 18th China International Exhibition on Packaging Machinery & Materials / The 15th China International Exhibition on Brewery, Beverage and Liquid Packaging
09/03 - 11/03/2011 Pazhou . Guangzhou , P R China

China (Beijing) International Lighting Exhibition & LED Lighting Technology and Applications Exhibition 2011
06/04 - 08/04/2011 Beijing , P R China

The 25th International Exhibition on Plastics and Rubber Industries
17/05 - 20/05/2011 Pazhou . Guangzhou , P R China

The China International Exhibition on Label Printing Technology
09/03 - 11/03/2011 Pazhou . Guangzhou , P R China

The International Famous Furniture Woodworking Machinery & Materials Fair
16/03 - 20/03/2011 Dongguan, Guangdong , P R China

The 13th Dongguan China Shoes . China Shoetec (Spring)
28/04 - 30/04/2011 Dongguan, Guangdong , P R China

China (Beijing) International Exhibition on Furniture, Home Fashion & Decorations
09/06 - 12/06/2011 Beijing , P R China

[>> More Adsale Exhibition](#)

[Adsale Group](#) | [About Us](#) | [Media Kit](#) | [Contact Us](#) | [Legal Statement](#) | [Privacy Policy](#)

Copyright 2009 Adsale.com All rights reserved. Best View : 1024x768 resolution with Internet Explorer 6.x or above.

Copyright © 2010