

# @volve

Printex Monthly News Bulletin

January 2017 | Issue 48



## Tips of the MONTH

Don't try to add more years to your life. Better add more life to your years.

Blaise Pascal

The only true wisdom is in knowing you know nothing.

Socrates

“The natural flights of the human mind are not from pleasure to pleasure, but from hope to hope.”

Samuel Johnson

*Exert your talents, and distinguish yourself, and don't think of retiring from the world, until the world will be sorry that you retire.* ~ Samuel Johnson

*Passion requires focused direction, and that direction must come from three other areas: your purpose, your talents, and your needs.*

~ Steve Pavlina

# Apparel, Textiles, Clothing & Fashions Industry Market Research

While Asia, particularly China, has enjoyed a dominant position in shoes, apparel and household textiles manufacturing for several years, makers of these items located in developed nations such as the U.S. and Canada have suffered a long period of decline. For example, roughly 98% of the shoes sold in America each year are imports, and the majority of these imports come from Asia. To consumers in Europe and North America, this growing reliance on Asia as a low-cost producer has meant very low retail prices for goods of reasonable quality.

However, recent increases in the cost of doing business in China, including rapidly rising labor costs, have put Chinese manufacturers in a much less favorable position.

Competition from manufacturing based in very low-cost nations in Africa, as well as Vietnam, Indonesia, Sri Lanka, Mauritius, Malaysia, Cambodia, Bangladesh, Pakistan, the Philippines and elsewhere is intense, and a large portion of apparel manufacturing formerly done in China is moving to these areas at a rapid pace.

While China continues to have a robust apparel manufacturing industry, it is also moving up the industrial chain by fostering manufacturing that requires greater skills, better technology and more investment in advanced equipment. Industry segments that are rapidly evolving in China include InfoTech, automobiles, trains, aerospace, medical equipment and telecommunications gear.

China's textile exports soared from \$7.2 billion in 1990 to \$111.7 billion in 2014, according to the World Trade Organization's International Trade Statistics 2015. India is a distant second in this category, at \$18.3 billion in 2014 (up from only \$2.1 billion in 1990). Europe as a whole (the EU28) also had strong exports at \$74.8 billion. In terms of apparel, China enjoyed a 38.6% market share of global exports in 2014, at \$187 billion, up from a mere \$8.9 billion in 1990. The rest of Asia, not including China, had a 21.3% market share (\$103 billion) in 2014, down from a 25.7% market share in 2013. The EU28 enjoyed a 6.6% market share (\$32 billion), when considering only exports made to nations outside the EU and ignoring intra-EU trade.

In many parts of China, manufacturers have had increasing difficulties in attracting and retaining workers in recent years. Wages have risen dramatically as a result. At the same time, as demand for employees has risen, workers have been calling for better working conditions. In fact, apparel and textile workers in many parts of the world are beginning to demand shorter hours and safer working environments. The collapse of a multi-story apparel factory in Bangladesh in 2013, killing more than 1,100 workers, immediately resulted in a global focus on workers' rights and working conditions in the apparel manufacturing sector.

The apparel and textile manufacturing industry has historically been one that has few barriers to entry, little capital investment needed and a high level of low-skilled labor involved—a few sewing machines, a bit of training and some dim electric lights were enough to start up a factory. When China's wages were extremely low, the nation had a clear advantage in this industry, particularly in light of its tendency to cluster factories near shipping ports and logistics centers so that goods could be sent to customers with minimal delay. Today, however, wages are climbing very rapidly as China's urban workers have many options in terms of places and industries in which to work. Demand for workers is high, and they are able to expect much higher pay than those in less-developed nations.

Many Chinese firms are massive in size, with tightly integrated units providing rapid design, manufacturing and logistics. One of the most interesting organizations is the Esquel Group of Companies. Esquel ([www.esquel.com](http://www.esquel.com)) is one of the world's largest producers of cotton shirts, with an output of more than 60 million garments each year. The firm's vertically integrated operation starts in China where it oversees nearly 4,700 acres of cotton farms, which supply Esquel's spinning, dyeing and knitting facilities, which in turn produce 90 million yards of high-quality cotton fabric annually.

Esquel has manufactured clothing on behalf of brands including Banana Republic, Tommy Hilfiger, Hugo Boss, Brooks Brothers, Abercrombie & Fitch, Nike, Nordstrom and Lands' End, as well as private-label items for retailers such as Marks & Spencer. The Esquel companies transform their fabric into premium men's and women's wear at plants in China, Hong Kong, Malaysia, Mauritius, Sri Lanka and Vietnam. The company also sells its products through its proprietary brand, PYE, which markets high-end cotton apparel in China with a flagship luxury retail store in Beijing. Esquel maintains group sales offices in select locations around the world, including U.S. offices in New York City and regional locations convenient to key accounts. Unlike many textile companies, the firm has an expressed strategy of in-company resource development, seeking to ensure high standards of quality and consistency across all of its product lines.

Meanwhile, some manufacturers outside of Asia have become both efficient and quick to react to consumer trends. The most notable company in this category is Spain's Inditex. The firm is famous for its lean inventory and fast-fashion strategy. It can get a new item of clothing from its 300-person design team, through its manufacturing plants and into its thousands of stores in as little as two weeks. The company operates several manufacturing facilities in Spain. Many of its outside suppliers are located in Spain and elsewhere in Europe. The firm has been opening large numbers of new retail stores under the Zara, Pull & Bear, Massimo Dutti and Oysho brands.

One of the more interesting recent developments in apparel manufacturing has been a certain amount of reshoring, which is the return of some of the business to plants based in the country where retail sales are made. Some designers and retailers find that their orders are not of sufficient size to interest major offshore plants, or their need for fast delivery makes it impossible to use overseas manufacturers. As U.S. firms are active in this trend, there is promising growth among many American manufacturers. Likewise, the need for extremely high quality is keeping some manufacturing of luxury apparel and accessories at home by Italian designers. As wages continue to rise in emerging nations, and overseas shipping time slows fast fashion, some portion of

clothing manufacturing will continue to reshore. Growing productivity from better manufacturing technology will add to this trend, and this reshoring will not lead to high levels of new jobs. Instead, modest numbers of workers will be hired to run advanced factory computers and robots, as well as sewing machines.

Apparel and accessory retailers generally enjoyed substantial growth in sales around the world during recent decades. Leading American, Japanese and European brands opened large numbers of new stores in developing markets in Asia and elsewhere. However, as of 2013-2016, China's growth was slowing, and the entire nation was going through a new focus on reducing corruption among public officials (officials who were often the recipients of lavish gifts) as well as conspicuous consumption in general. This has been particularly hard on the luxury clothing and accessories market.

During 2015, America exported \$23.7 billion in textiles and apparel (down from \$24.4 billion the previous year) and imported \$111.9 billion (up from \$107.5 billion). These numbers are from the U.S. International Trade Administration.

In the European Union (EU), the textile and apparel sector is quite large, particularly in Spain, where global leaders like Inditex have their headquarters, as well as in nations that enjoy lower operating costs, such as the Baltic States and Eastern European States. Nearby, the textile and apparel industry remains a major part of the economy of Turkey. South America, Central America and Africa also play minor roles in world apparel trade. Globally, the World Trade Organization (WTO) reports that apparel and textile exports were \$797.4 billion in 2014, up substantially from \$766.2 billion the year before.

Over the past several years, manufacturers of basic synthetic textiles, such as polyester fabrics, have been dealing with a global manufacturing glut. Synthetic textile manufacturing had traditionally been dominated by the largest global chemicals firms, but many of them have exited the business by selling their holdings.

Trade agreements among the U.S. and its trading partners attempt to foster employment in certain parts of the world (such as low-income areas in the Caribbean) and allow U.S. consumers fair access to reasonably priced goods, while providing some sort of relief to U.S.-based businesses. Because trade agreements will never satisfy all parties concerned, they tend to lead to controversy and much critical discussion. On the retail end, consumers of apparel have long enjoyed wide selections and moderate prices in North America, Asia, Europe and elsewhere.

During 2015, retail sales at clothing, shoes and accessories stores in the U.S. totaled \$223.7 billion (after subtracting jewelry sales of \$30.5 billion), according to the Bureau of the Census. In addition, Plunkett Research estimates that 80% (\$132.4 billion) of sales at department stores, as well as 60% (\$27.9 billion) of sales at sporting

goods stores were for apparel and shoes. Assuming that 17% (\$59.0 billion) of the goods sold via e-commerce in America consist of apparel, shoes and accessories, this would put the total retail and online clothing, shoes and accessories market in America at \$443.0 billion.

Apparel retailing has always been a tough, highly competitive business, and many chains rise dramatically and then fail. Retail fashion merchandising is a vast challenge (witness the recent ups and downs of retail giant The Gap). Just-in-time inventory, driven by highly computerized supply chain management systems, is now an immense asset to major retailers. Nonetheless, price pressure from major discounters like Wal-Mart, Target and Kohl's can keep profit margins thin at stores that sell moderately priced apparel. Some of the most successful retail chains are those that focus on niche markets with special tastes and needs, such as Chico's FAS, which caters to 35- to 60-year-old women who want flattering fashions that suit their figures, and Abercrombie & Fitch, which focuses on the 18- to 22-year old market.

So-called "fast fashion" stores that sell the latest designs at very low prices have been enjoying soaring growth in the world's largest markets. These stores include brands owned by Inditex, along with H&M, headquartered in Europe, and Uniqlo, from Japan.

Speaking of figures, the well-documented expanding girth of consumers in many nations is placing new challenges upon fashion merchandisers as overweight people of all ages, tastes and income brackets require clothes in larger sizes. Designers and merchandisers face the task of developing and presenting larger clothes in a flattering light. "Vanity sizing" is a trend in which manufacturers have restated sizes to make consumers feel smaller. Clothes that were once described as a woman's size 12 are now an 8 or 10.

While Americans (as well as residents of many other countries from Mexico to China) have been putting on weight, they have also developed a keen interest in sports apparel and workout gear to wear at the gym and in other recreational activities. At the same time, consumers are wearing athletic gear, such as yoga pants, for non-athletic activities in a trend called "athleisure." This is one of the fastest-growing product categories in the apparel and shoe sector. Over 50 million Americans have some sort of gym membership, and they need appropriate clothing to wear while they work out. Plunkett Research estimates the active sports apparel segment of the U.S. retail clothing market at approximately \$70 billion for 2015.

Demographic changes will offer immense opportunities to U.S. fashion merchandisers. To begin with, the nation's millions of Baby Boomers (post World War II babies born from 1946 through 1964) are beginning to

enter the 65+ age category. As more and more of these people become seniors, their tastes and needs will bring great revenues to savvy apparel sellers who learn how to cater to this market. Meanwhile, the rapid growth of ethnic consumer groups in America, Hispanics in particular, will offer superb marketing and product development opportunities.

Department stores have changed their business models drastically. While they were historically sellers of virtually every type of product, arranged by category in well-defined spaces within giant buildings (thus the use of the word "department" to describe them), most department stores in America today are primarily apparel and accessories stores. When consumers shop at stores like Nordstrom, Neiman Marcus or Dillard's, they find floor after floor of shoes, clothing, accessories and cosmetics. This change has created problems within the department store industry, as managers, faced with intense competition, developed the habit of continuously discounting apparel in sale events, consequently putting pressure on profitability. Consumers have been trained to wait for items to go on sale before they make purchases, thus lowering profit margins at stores. Nonetheless, department stores remain major forces in apparel retailing today.

In many Asian nations including China, however, a department store of today typically looks more like one did in America 100 years ago. Department stores in China are known to sell everything from medicinal herbs to clothing to furniture and even automobiles. The world's largest department stores by far are found in Asia.

Another sweeping change in apparel retailing is the rising success of e-commerce. Retail apparel chains are employing bricks and clicks together successfully. That is, they create synergies between very active web sites and their retail stores. Other firms, such as Bluefly.com, sell apparel through the Internet only, often at everyday discount prices. Catalog retailers continue to do reasonably well, particularly if they operate well-designed web sites to supplement their printed catalogs. The Internet has enabled another recent trend: apparel companies that claim to source their clothing at the same manufacturers used by well-known fashion companies, and then sell, via their web sites only, high quality apparel direct to consumers at modest prices. One of the better known companies with this business model is Everlane, [www.everlane.com](http://www.everlane.com), that states, "We spend months finding the best factories around the world—the very same ones that produce your favorite designer labels." Meanwhile, a growing number of fashion companies, such as Worth and The Carlisle Collection, are enjoying success selling women's fashions in the home via independent reps—somewhat like the success of similar companies that sell cosmetics.

# What Every Garment Screen Printer Should Know about

## FABRIC TESTING

This article identifies the key fabric characteristics you should assess and outlines the procedures to use when testing various materials

Mike Ukena

One of the most common themes I come across in my discussions with garment printers is how an ink did not work right on a particular fabric. Invariably, as these discussions progress, it becomes clear that the printers did absolutely nothing in advance to make sure that the substrates, inks, and processing conditions they used were a good match for each other.

I am going to go out on a limb here and make a broad statement: Not all fabrics will accept plastisol. Or to put it another way, not all plastisols will work on all fabrics. When we consider the costs associated with the goods we are printing, it becomes clear that testing is imperative in order to make sure that everything we expect will work actually does.

Of course, we want to avoid going over the top with our testing regimen. For example, if we are printing standard white or black cotton T-shirts from a name-brand mill, then testing each batch is a bit excessive. However, I would say that whenever the garment fabric contains other natural and man-made fibers, such as polyester, rayon, polynosic, silk, nylon, etc., tests for ink compatibility and print performance should always be performed. I also recommend testing whenever a job comes along that involves a fabric weight different than what we're accustomed to printing. So if our regular work usually involves 5.5-oz T-shirts and we receive an order that involves 12-oz, 80/20 fleece, it's time to test.

### Kinds of Tests

What types of testing are we talking about? The following list covers variables that are worthy of consideration for all garment screen printers:

- \* fabric composition and color fastness
- \* fabric coating/treatment
- \* fabric weight
- \* moisture retention
- \* heat sensitivity (dryer and flash)
- \* dye sublimation
- \* intended ink suitability
- \* catalyst
- \* wash fastness
- \* fibrillation

Note that not all of these variables will come into play in every garment job we face. But some will always apply.

### Fabric composition and color fastness

What is the fabric made of? Is it polyester? Is it a blend? More importantly, is it labeled correctly? Determining what the fabric is composed of must always be the first step in deciding whether we can print on it or not. Once we have ascertained the composition, we can decide which other tests are necessary and what ink or ink/catalyst combination is best suited for the job.

For instance, if the fabric is labeled as 100% polyester, then we know that that ink adhesion will not likely be an issue. We also know that a catalyst probably won't be

necessary--unless the fabric has a waterproof coating, in which case a catalyst may be required to boost adhesion. If we don't test for such a coating, however, we are just shooting in the dark and may end up eating the goods if we make a mistake.

If the fabric is polyester, we also need to see if it is overly susceptible to bleeding and dye sublimation. If the fabric was properly heat set when it was produced, then good quality, low-bleed plastisols designed for 100% polyester should work fine. However, there is currently a wave of improperly set polyester flooding the market, and it will sublimate and bleed even when you do everything correctly. That's why testing is imperative on all goods that contain polyester.

Color fastness can be evaluated by performing a crock test. A simplified crock test consists of rubbing a piece of white-cotton fabric against the fabric. Give the fabric three hard rubs with the dry cotton material, then wet the cotton and give the polyester fabric three more hard rubs. If a large amount of dye transfers to the white cotton, further testing is essential to ensure that the dye will not migrate through the plastisol when you print the fabric. We'll look at a more conclusive test for dye migration and sublimation later in this article.

Note that crock testing should be done on all types of colored fabric. Even 100% cotton can show signs of dye migration if there is unbound dye on the material when it is printed. A good example of this phenomenon is indigo-dyed denim. Excess indigo dye can indeed migrate through plastisol ink and ruin any print you produce on this material.

### **Fabric coating/treatment**

Most fabric coatings are designed for moisture blocking. However, some of the new treatments are also designed as stain blockers. In either case, the coatings can greatly affect the adhesion of ink.

The first test to perform in order to determine whether a coating is present is to see if water soaks into the fabric. We just sprinkle a few drops of water on the fabric. If the water penetrates after a few seconds, it is unlikely that the fabric is coated. We can further verify the presence or absence of a coating by creating a test print on the fabric. First, we print the material with an uncatalyzed plastisol and cure the print as specified by the ink manufacturer. If the ink peels off, we repeat the test with an appropriate catalyst, such as Nylobond. The catalyzed print must be allowed to stand for at least 24 hours, and preferably 72 hours, to fully cure. Then, if the ink does not peel off, the goods can be released for production. If the ink does peel off, even with a catalyst, we should not print these goods.

### **Fabric weight**

Fabric weight is important because of the difference in heat energy that may be required to elevate the fabric to

the proper temperature for curing. If a shop is used to running T-shirts and, all of a sudden, heavy coveralls or sweatshirts are introduced, the dryer settings have to be changed. We cannot expect a dryer that is set for 200-gram T-shirts to handle moisture-laden 2000-gram coveralls at the same belt speed and temperature.

### **Moisture retention**

Moisture is the most overlooked factor in plastisol curing. Most printers, especially the ones who have not been burned by this factor yet, do not realize that moisture can greatly effect the cure rate of plastisol. The reason is that when you introduce a damp garment to a dryer, the fabric and ink temperature do not rise to the proper level because the dryer energy is being expended just to get rid of the moisture.

I have seen heavyweight sweatshirts, with a high cotton content (cotton holds more moisture than polyester) drag the heat right out of a moderate-sized electric dryer. As few as six sweats, one after the other, dropped the dryer temperature by more than 50°F. Fortunately, we caught it and realized what was happening. It also became clear why some of the better dryers out there feature alarms that warn of unexpected temperature drops.

We can perform a real simple test to check the moisture content of fabric. We simply weigh one garment, run it through the dryer, and then reweigh the piece. The difference in the weight is the moisture removed. For example, if you have a sweatshirt that weighs 560 grams before the dryer and 525 grams after the dryer, the moisture content equals 6.25% by weight. Another way to look at this situation is that if each garment has that much moisture, it means the dryer has to get rid of a liter of water for every 29 shirts placed through the unit. That is a lot of moisture, and it really puts a strain on the dryer.

### **Heat sensitivity**

Many specialty fabrics are much more sensitive to the normal dryer and flash temperatures than what most shops are used to. Cotton T-shirts can handle a fairly wide range of temperature without showing ill effects. But if we try to dry or flash nylon panels at across the same temperature range, we would end up frying them. The nylon will take the same ink and cure just fine, but it must be processed at the low end of the ink-curing range, not the high end.

Most printers are familiar with the care that must be taken with temperature in regards to polyester: too hot, and the dye may sublimate. Most of the other fabrics that are coming into our world these days are also much more sensitive and require a narrower curing and flashing range than is acceptable for cotton.

## Dye sublimation

Earlier, we looked at the issue of color fastness and touched on dye sublimation. We can perform a specific test to ascertain the dye-sublimation potential of polyester and similar man-made fabrics. The test requires a piece of white cotton or cotton/poly fabric, a sample of the polyester substrate, a heat-transfer press, and a small amount of plasticizer. Because few shops keep pure plasticizer reducer in stock (and for good reason too!), I suggest using a small amount of a gel clear ink instead. Plastisol gel inks contain an aggressive plasticizer and will help give a quick response to this test.

We start by placing a small drop of gel ink on the test fabric. Next, we place the white test swatch on top of the fabric and place the sandwich of fabrics in a heat press at 350°F for approximately 15 seconds. The time can vary but should be consistent from test to test to ensure continuity. For the same reason, we should always use the same ink for the test.

After removing the fabric and test swatch from the heat press, peel the materials apart. A small amount of dye transfer into the gel ink on the white test swatch indicates a normal, well-prepared polyester fabric. A large amount of dye transfer indicates a problem. Examples of the results that can be achieved with this test are depicted in Figure 1.



**Figure 1 Testing for Dye Sublimation**

*These photos show the results of dye-sublimation tests conducted on three different fabric samples, including--from left to right-- a) blue Spandex, b) a red 50/50 cotton/poly blend from a major mill, and c) a red 100%-polyester material of unknown origin. Each sample was smeared with a small amount of gel clear plastisol, covered with a white cotton test material, and pressed in a standard heat-transfer unit at 350°F for 12 seconds. Samples were allowed to sit for one minute, then were peeled apart and examined. Sample a showed no dye sublimation and is suitable for printing with conventional plastisol. Sample b displayed moderate dye sublimation, indicating that it should be printable with a quality, low-bleed underbase and carefully monitored flashing and drying conditions. Sample c showed significant migration. Another sample should be printed with high-quality, low-bleed underbase for polyester and the results assessed in 72 hours.*

If a large amount of dye transfers, we should print a white, low-bleed ink designed for 100% polyester on another piece of the fabric and cure the sample as recommended by the manufacturer. Then we place the sample in a warm place for 24 hours (a car dash board, office heat register, or a warm dryer top make ideal test-holding areas). If the dye sublimates through the ink, the fabric is unsuitable for screen printing with plastisol.

## Intended ink suitability

If a particular ink is specified for any job, it is important to make sure that ink will adhere to the fabric, will not allow dye migration, and will stand up to the environment for which the product is intended. This last item may seem like a no-brainer, but I cannot count the number of times printers have told me that the general purpose plastisol that they printed on mesh football jerseys did not hold up very well. Duh! It was never formulated for that application. In this situation, athletic plastisols designed to resist abrasion would have been a much better choice.

## Catalyst

The most common catalyst for plastisol is a nylon bonding agent, such as Nylobond. Fortunately, this catalyst will work in a wide range of applications other than nylon bonding. For instance, a waterproof polyester-blend jacket can most likely be printed with the addition of Nylobond to the ink. Several very heat-sensitive fabrics may also be printable with plastisol as long as Nylobond is added. The addition will allow the print to be cured at the very low end of the plastisol cure range and therefore not damage the fabric. Still, we must create test prints to make sure the catalyst works before committing to production.

## Wash fastness

If there is any possible question about ink adhesion to a particular fabric, a wash test is still the absolute best test you can run. If you cannot afford to have a washer in your shop, make sure that there is a regular procedure for taking the samples home or to a coin laundry for testing when necessary.

## Fibrillation

Fibrillation is the result of printing with high mesh counts on ring-spun fabric. The fabric fibers lift through the ink film after the first wash. Some customers will describe the print as "faded." In reality, the ink is all there, but the ink film was not strong enough to prevent the fibers from breaking through. If you have any concern about a particular fabric, or a particular customer, run a wash test on a sample that is printed in the same manner as the final product will be (use the same inks and mesh counts). Make sure that the customer understands the consequences and the limitations before proceeding with production.

## Only a matter of time

One issue that all these tests have in common is that they take time to perform. If you were to run all the tests listed here, it might take the better part of a day or even two days to get a satisfactory answer about a fabric's printability and its compatibility with particular inks and additives. However, if you think that you cannot afford to take the time to do these tests, ask yourself the following two questions.

1. Can you afford to buy the goods when the customer rejects the order?
2. Do you have the time and money to run the job again...properly?

The old adage, "never enough time to do it right, but always enough time to do it over" really applies to screen printing. You need to develop the discipline to conduct proper tests on questionable fabrics. I would recommend that you publish a statement on whatever documentation your customer may see that indicates that testing may be required. If you publish a price list, put it there. Make a sign and put it in the office where everyone can see it. If you have a company Website, put it there as well. Even a sales brochure should have a statement that explains your testing policy. Here is an example of what such a policy statement might say:

Due to the nature of modern fabrics, it may be necessary to conduct testing to ascertain the printability of an order. These tests take from one to three days, which must be added to the time required to process your order. In addition, if a fabric is found suitable for printing but requires extra steps, additional charges may be required. We reserve the right to reject orders on fabrics that we deem unsuitable for screen printing.

The statement could also incorporate the following concept: Please note that if we determine that a fabric requires testing before printing, it will be necessary to use one or more of the pieces to conduct the test(s). Please make sure to include extras with your order.

If we are asked to print on a customer's \$200 jackets, we may find the customer reluctant to waste one for testing. This dilemma can be addressed in two ways: We can ask the customer to get us a sample of the fabric from the manufacturer, along with instructions for printing it. Or we can offer to give the job our best shot with no testing or guarantees.

If your customer accepts the offer to print without testing, your responsibility is to keep the waste to a minimum. You would need to probably set up the job twice. First, print one and wait and see what happens. Then set up again and print the rest if the first one was okay. In this scenario, the customer will have to realize that they need to pay extra for the second setup. For expensive garments, this may still be an acceptable way to go. It's not perfect, but it protects you. It's better not to complete the job and have a moderately angry customer than to ruin the garments and have an irate customer demanding compensation.

Substrate Test Form				
Customer	ABC Promo		Order #	1234
Fabric Composition	Cotton/Poly		Type of Print	Sim Process
Fabric Type	80/20 Fleece		# of Colors	7
Color Fastness	Poor	Fair	Good	Good
Coating	yes	no		no
Fabric Weight	750 gsm			
Moisture Level	Low	Med	High	Med
Heat Sensitivity	Low	Med	High	Low
Dye Sublimation	Low	Med	High	Low
Intended Ink OK	yes	no		yes
Catalyst	yes	no		no
Wash Fastness	Poor	Fair	Good	Nil
Fibrillation	Poor	Fair	Good	Nil
Test	OK TO PRINT, USE HB UNDERBASE INK			
Department Recommendations	Poly coated - slow dryer 200% w/ temperature change			
Tested By:	44			Date: 2-1-05

**Figure 2 Fabric-Testing Form**

*It's a good idea to create a standard document that identifies all the important fabric characteristics that must be tested before a job is approved for production.*

## The test department

Setting up a testing department is not expensive, because the needs in this department are very basic. A small shop does not need a separate setup at all. Since everything should be fairly close together, walking around to the different tools needed for testing should be simple. Larger shops, however, can benefit from a purpose-built test area, which would include the following components:

- \* heat-transfer press for dye-sublimation tests
- \* various screens for generating table-top test prints
- \* a washer and dryer
- \* counter space or table for holding equipment and filling out paperwork

I did not include a conveyor dryer because I think it is essential that tests for curing, heat sensitivity, and moisture be conducted using the production dryers. A small lab dryer will never give the correct data to compare to the actual shop conditions.

To ensure that we leave no stones unturned in our fabric testing, it's also useful to create a standard form on which we can record the results of our tests, such as the example shown in Figure 2. This form has been filled out with the results of tests conducted on a batch of heavy sweats. The most important aspect is the comments made by the tester, which should be transferred to the job ticket. In fact, a good policy would be for the test form to be a regular part of the job ticket so there is never any question about the suitability of a fabric for printing.

Testing will require more work on the front end but save time and money over the long haul. It takes only a few returned orders and unhappy customers to justify testing on a regular basis.





## 2016 Top Markets Report **Technical Textiles**

### Overview and Key Findings

#### Introduction

The technical textile industry is broad and diverse with new and innovative applications developed regularly. The technical textile industry is also increasing proportionally relative to the whole textile industry; therefore, the U.S. Department of Commerce's International Trade Administration (ITA) has committed to developing a tool for prioritizing U.S. government export promotion efforts to help target resources toward technical textile markets and sectors most likely to result in U.S. exports. This study examines the U.S. technical textile industry and highlights key markets that will see increased exports by U.S. technical textile producers. The goal of this report is to assist U.S. producers of technical textiles identify markets where demand is growing for their products. This study examines both past performance of exports in this sector and projects estimates for growth through 2017.

#### Key Findings: Top Markets and Methodology

In the *2015 Technical Textiles Top Markets Report*, ITA forecasted world demand for U.S. technical textiles to grow 4.6 percent. According to recently

released data for 2015, however, demand contracted slightly, and exports actually only grew 4 percent in 2015. Based on the latest data, ITA now projects these exports to grow from \$8.6 billion in 2015 to \$9.3 billion by 2017.

ITA identified eight countries from the top 30 for in-depth case studies: Brazil, Canada, China, India, Korea, Mexico, Taiwan and Vietnam. These markets represent a range of countries to illustrate a variety of points rather than the top markets overall. Each case study contains a brief overview of the country's textile sector before going a step further, examining the current state of its technical textiles sector, i.e. current situation and needs; challenges to exports; and opportunities for U.S. exports of technical textiles in each sub-sector.

For the eight markets ITA highlighted as growth opportunities for technical textiles, the most recent data for 2015 found minor shifts in the rankings of countries' technical textiles markets. The new data largely confirms ITA expectations that the development of new markets will drive demand for

**Figure 1: Ranking of Projected Technical Textile Export Markets (2016-2017)**

1. Mexico	11. Korea	21. Poland
2. Canada	12. Dominican Republic	22. Taiwan
3. China	13. Brazil	23. Saudi Arabia
4. Germany	14. Australia	24. Italy
5. United Kingdom	15. United Arab Emirates	25. Peru
6. Japan	16. Singapore	26. France
7. Hong Kong	17. India	27. Costa Rica
8. Honduras	18. Vietnam	28. Thailand
9. Belgium	19. Chile	29. Nicaragua
10. Netherlands	20. Colombia	30. Malaysia

US technical textiles exports.

Due to its continued focus on high value products like technical textiles, especially for use in auto manufacturing, **Mexico** maintains its position as the top destination for U.S. technical textiles. Its share of U.S. exports of technical textiles increased 3 percent from 36 percent in 2014 to 39 percent in 2015, and ITA expects its share to increase an additional 5 percent to 44 percent in 2017.

In comparing 2014 to 2015, **Canada** is still the second largest market for U.S. technical textiles. It is also the largest market for U.S. protective apparel. This is due to end user industries for oil and gas, construction and manufacturing, healthcare and mining, which all require the use of protective apparel. Additionally, Canada's demand for U.S. medical textiles was forecast by ITA to grow a mere 1 percent but actually grew 4 percent in 2015.

Along with Mexico and Canada, **China** is a major player in the technical textiles market. China's overall demand for U.S. produced technical textiles, however, has remained relatively flat. This can be explained through a possible slow shift of exported products from China to more duty friendly countries part of the recently completed Trans-Pacific Partnership Agreement, such as Vietnam.<sup>1</sup> Certain sectors of medical textiles and protective apparel of the Chinese technical textile market are experiencing high demand and accelerating at a fast pace. These two sectors exceeded last year's projections. In medical textiles and protective apparel, ITA forecasted 2015 exports to China to increase by 11 percent to \$30 million and 8 percent to \$21 million, respectively. Yet, according to the most recently published data, the U.S. actually exported \$38 million in medical textiles and \$34 million in protective apparel to China last year. China has climbed three spots from the eighth largest market for U.S. medical textiles and seven spots from the 12<sup>th</sup> largest market for U.S. protective apparel to the fifth largest markets for both sectors. China will continue to be a market destination for U.S. inputs and still maintains a large percentage of the market.

After a decade during which GDP growth averaged 3 percent to 4 percent, **Brazil** slipped into a recession in mid-2014. GDP contracted by 3 percent in 2015. This has had spillover effects for exports of technical textiles to Brazil. In last year's Top Markets Report, Brazil ranked in the top 10 in all four sub-sectors.

After updating the data to reflect 2015 exports, Brazil has dropped from the top 10 of all sub-sectors. Overall growth of demand for U.S. technical textiles in Brazil has been reduced from 8.7 percent to 2.7 percent. Although Brazil is experiencing a recession and demand is down, in the long run, Brazil is still an important market not to be overlooked.

There is still a strong demand for technical textiles in **Korea**. In last year's report, Korea was forecast to be the 12<sup>th</sup> largest market for U.S. technical textiles. Korea exceeded ITA's expectations by 2 percent and has moved up one spot to 11<sup>th</sup>. Korea also exceeded expectations in both the specialty and industrial fabric and protective apparel sectors.

Overall, **India** performed almost as expected, as ITA had forecast that India would remain the 17<sup>th</sup> largest market for U.S. technical textiles. India is forecast to be the 11<sup>th</sup> largest market for U.S. non-wovens, which is a three spot jump from 14<sup>th</sup> in last year's report. India has not performed as well in medical textiles and protective apparel. India is facing competition from countries like Vietnam. The recently concluded Trans-Pacific Partnership could be damaging to the development of India's technical textile sector, as trade moves to countries that are a part to this agreement and provides U.S. producers better tariff options.

Of all eight markets analyzed, **Taiwan's** performance as an export market for U.S. technical textiles is the most underwhelming. There has been a significant drop in the export of U.S. technical textiles to Taiwan. From 2008 to 2014, U.S. exports of technical textiles grew 13.7 percent annually. 2015 was the first year when exports did not increase from the previous year. Exports decreased 32 percent between 2014 and 2015. This contraction can be explained two ways. Taiwan's goal has always been to be a world leader of technical textiles. Taiwan now has a fully integrated supply chain and has continued to innovate and cultivate R & D capabilities. We could now be seeing Taiwan being less reliant on imported technical textiles. This could be the cause of Taiwan's decrease in demand of U.S. technical textile products. Another explanation can be found in the fact that the domestic textile sector of Taiwan continued to show contraction in December 2015, according to the Taiwan Institute of Economic Research (TIER). The increasing competition from developing economies and weak

demand from China could be the cause in the drop of orders in the technical textile sector.

**Vietnam** has continued its trend of double digit annual growth in the demand for U.S. technical textiles. ITA had forecast Vietnamese demand for specialty and industrial fabrics to grow 25 percent to \$17.2 million in 2015. Exports in this sector actually grew 30 percent to \$22.3 million. Vietnam is increasing its demand for U.S. technical textiles. The country's Vietnam National Textile and Garment Group (Vinatex) plans to invest \$441.3 million in 59 textile, dyeing, garment and infrastructure projects over the next two years. Government policies are favorable to industry; entry barriers are not high, and Vietnam is part of the Trans-Pacific Partnership Agreement with the U.S. Vietnam's textile industry is now looking forward to another boom, and this presents an opportunity for U.S. producers to increase their market share.<sup>2</sup>

Figure 1 ranks the top 30 markets for U.S. technical textile exports through 2017. ITA has forecast expected growth trends and export market potential. This study is again focusing on the eight markets referenced above and has added Singapore to the analysis.

#### Methodology

Accurately assessing the U.S. export market potential for the technical textile sector was difficult. This required several steps. The first step involved defining the technical textile sector itself. To accomplish this, this study chose four sectors of the technical textile industry to examine: non-wovens, specialty and industrial fabrics, medical textiles and protective textiles.

The second step required ITA to create a technical textile dictionary to define these four sectors. This dictionary was created using Schedule B commodity codes maintained by the U.S. Census Bureau of the International Harmonized System. This dictionary is made up of 133 schedule B commodity codes at the 10 digit level.

ITA then compiled export data for these commodity codes for a seven year time period starting at 2008 and ending in 2015. ITA then calculated compounded annual growth rates as well as export market share for the seven year period and, using

those rates, projected the expected export potential for 2016 and 2017.

#### Trade Data

All U.S. export trade data used in this study was sourced from the Office of Textiles and Apparel, International Trade Administration, U.S. Department of Commerce.

#### **Industry Overview and Competitiveness**

The technical textile market can be evaluated by application or process. This study examined one market based on process type (non-wovens) and three sectors based on application (specialty and industrial fabrics, medical textiles and protective apparel).

#### Non-wovens

The end use markets for non-wovens are classified as either disposable or durables. The disposable end use markets are made up of product categories such as absorbent hygiene, wipes, filtration, medical and surgical and protective apparel, while the durable end use markets are comprised of geosynthetics, home & office furnishings, transportation, building construction and other durables.

The ongoing drive to come up with new and better performing products is helping propel the non-woven industry forward.<sup>3</sup> Non-wovens are being used to make a variety of products lighter, more efficient and more cost effective, including packaging and autos. In the latter case, one study suggested that more than 40 individual parts now are being made using these non-wovens, principally to increase vehicle efficiency, effect cost savings, reduce energy consumption and improve acoustical insulation.<sup>4</sup>

With respect to consumer goods, rising incomes and the standard of living in developing countries are propelling individuals to purchase convenience items, promoting the production of disposable infant diapers among other items that are made with significant amounts of non-woven fabrics.

In terms of trends in the non-wovens sector, one of the fastest growing markets for non-wovens is filtration. This is driven by an increase in the consumer demand for clean air and drinking water

as well as increased fuel efficiency in vehicles and infrastructure improvements in developing countries.<sup>5</sup> Furthermore, growth in the non-wovens sector is also led by the expanding use of wipes, which is the fastest growing of the disposable categories, and increases in the transportation markets, the fastest growing of the durables.

### Specialty and Industrial Fabrics

Specialty and industrial fabrics serve a wide array of markets, from awnings to auto airbags as well as new base fabrics used in road construction, erosion control and spoil containment in landfills.

Automotive textiles represent the most valuable world market for industrial textiles. These materials cover a broad range of applications, including upholstery and seating, floor covering and trunk liners, as well as safety belts, airbags, thermal and sound insulators, filters, hoses, tires and a variety of textile-reinforced flexible and hard composites. The automotive textile industry is strong in many Asian countries such as China, Japan, India, Korea, Thailand and Taiwan. This is an area where U.S. industrial fabric producers have an opportunity to expand their market share. Markets that use specialty and industrial applications, especially the automobile and industrial markets, will continue to drive growth in the technical textiles market in 2016 and 2017.

### Medical Textiles

Medical textiles are one of the most important, continuously expanding and growing fields in technical textiles. The medical textile industry has been improving existing products and creating new ones with new materials and innovative designs. Some of these new products are being designed for less-invasive surgical procedures, infection control and accelerated healing.<sup>6</sup>

Countries are now supporting and providing various programs in order to promote the production and consumption of medical textiles. Population growth, aging populations and the construction of new medical facilities are driving forces for this industry. Some governments have also introduced diverse programs aimed at significant improvements in the healthcare of the country's population.<sup>7</sup>

The United States can maintain its global market share in medical textiles by continuing to invest in research and development (R&D) and identifying and exporting to markets with expanding medical infrastructure.

This market is witnessing substantial innovations in personal and medical hygiene products, and it presents a lucrative opportunity for producers. The rise of an aging population, increased birth-rate and better awareness about hygiene among women in developing countries is driving the demand in the medical textile market. Increasing access to better healthcare facilities and medical tourism are further expected to boost the growth rate of this market through 2017.

### Protective Apparel

North America emerged as the leading regional market for industrial protective apparel and accounted for over half of the total market volume in 2013. Stringent regulatory guidelines coupled with high levels of safety awareness in the industry are expected to drive the regional market growth over the next six years.<sup>8</sup>

A key factor driving growth in protective apparel is rapid industrialization and implementation of stringent industrial safety regulations in emerging markets. These measures are having a positive effect on the use of technical textiles, thus creating yet another opportunity for U.S. exports.<sup>9</sup> The Asia Pacific is expected to be the fastest growing regional market for industrial protective apparel at an estimated CAGR of 12 percent from 2014 to 2020.<sup>10</sup>

### **Global Industry Landscape**

The technical textile industry is one where applications, technologies and companies are constantly changing, and therefore, exports tend to change as well. The demand for technical textiles in many countries is growing, causing existing markets to expand and also leading to new ones. As the market share of technical textiles consumed in the emerging economies relative to textile products overall is increasing, many countries meet their domestic demand for many of these advanced textiles through imports. This creates a major opportunity for U.S. producers. U.S. producers can take advantage of these gaps and meet the needs of emerging economies through exports.

North America is the largest regional consumer of technical textiles due to the presence of the majority of end-use industries. Europe and Asia Pacific follow North America in terms of current consumption; however, development in emerging markets, including India, China, Japan, Korea and Taiwan, is expected to increase overall technical textile demand.

Korea and Taiwan in particular are both committed to focusing on technical innovation. Korea and Taiwan are also strong competitors with the United States in the global technical textile market, but there are still positive opportunities for U.S. producers.

Large scale infrastructure developments are taking place in China, India and Russia, and environmental protection regulations and building construction codes are evolving in these countries. As a result, these markets are expected to be where the strongest gains will occur in the near future. China will be the dominant market because of the amount of available land in the country, the size of its population and the number of large scale infrastructure projects which are under way and planned for the future. The increase in demand in the Chinese market is expected to account for almost half of the increase in global demand.<sup>11</sup> All indications are that the applications and markets for U.S. produced technical textiles in foreign markets will continue to evolve and grow. As current applications continue to validate the use of technical textiles, more opportunities will be created for even newer applications.

## Challenges and Barriers

When designing export promotion strategies, one must be mindful of the challenges facing U.S. technical textile exporters in international markets. First, protectionist policies, like high tariffs and the imposition of non-automatic import license requirements, limit demand for products exported from the United States. Brazil and India have used some form of protectionist policies to limit opportunities for foreign manufacturers to compete in their markets.

Second, foreign competition and continual investment in research and development can pose additional challenges to U.S. producers. If U. S. producers are not continuously innovating, it can open the door for producers of other countries. Constantly advancing and updating current products as well as developing new ones are a requirement for success in technical textiles. New product development, however, is not an easy task.

Third, lack of transparency by foreign customs agencies also has a negative effect on U.S. exports. The requirements of extensive documentation and unclear regulations could slow the flow of trade and lead to processing delays.

---

<sup>1</sup> Barrie, Leonie. "What's Happening with Apparel Sourcing?" Just Style Research. January 6, 2016.

<sup>2</sup> "Vietnam: The emerging giant in textiles & clothing". Fiber2fashion.com.

<sup>3</sup> "Textiles 2015: More Improvement Ahead." Textile World. Jan/Feb 2015.

<sup>4</sup> "Textiles 2015: More Improvement Ahead." Textile World. Jan/Feb 2015.

<sup>5</sup> "Filtration Market Update." Nonwovens Industry. November 2015.

<sup>6</sup> "Textiles 2015: More Improvement Ahead." Textile World. Jan/Feb 2015.

<sup>7</sup> Shishoo, Dr. Roshan. "High –performance textiles and nonwovens are targeted for growth." Specialty Fabrics Review. March 2011.

<sup>8</sup> "Industrial Protective Clothing Market Analysis and Segment Forecasts to 2020." Grandview Research. 2014.

<sup>9</sup> "Industrial Protective Clothing Market Analysis and Segment Forecasts to 2020." Grandview Research. 2014.

<sup>10</sup> "Industrial Protective Clothing Market Analysis and Segment Forecasts to 2020." Grandview Research. 2014.

<sup>11</sup> "Strong growth set to continue in geosynthetics market". Innovationintextiles.com. June 2013.

**NEWS FROM PRINTEX**

By the Grace of Allah Almighty, Printex achieved another Milestone by getting the Distribution of Uraskimya Chemicals – Turkey .

We wish all our Principals and the valued customers a very Happy New Year and pray to Allah to bring happiness, prosperity, peace and joyous in our lives in the years to come.



**PRINTEX Chemicals (Pvt.) Ltd.**



**Defence Road, 0.5 Km off, Bhopatian Chowk, Mauza Bhopatian,  
Rohinala Raiwind Road, Behind Zimbis Knitwear (Pvt) Ltd, Lahore.**

**Contact No. +92-42-35966300, +92-42-35966301.**

**Fax No. +92-42-35966300**

**E-mail: [printexworld@gmail.com](mailto:printexworld@gmail.com)**

**Website : [www.printex.com.pk](http://www.printex.com.pk)**